

Exhibit F

Civil Action No. 2:15-cv-01754-JRG-RSP (E.D. Texas)
Personalized Media Communications, LLC v. Samsung Electronics America, Inc. et al.

Exhibit F

U.S. Patent No. 8,711,885 – Samsung Televisions


The following claim chart includes illustrations, photographs, and references relating to accused Samsung digital televisions (“Samsung Televisions”), including, as non-limiting examples, the UN55JS7000 and UN65H6400 models. Various processors and components cited herein are intended to illustrate theories of infringement, and are not intended to exclude other processors or components used in accused Samsung Televisions from allegations of infringement. Upon information and belief, including based on information appearing on Samsung’s website, websites of Samsung’s suppliers, Samsung’s service manuals, and various standards documents, other accused models of Samsung Televisions similarly infringe, including those listed in Part II(A) of PMC’s P.R. 3-1 Disclosure of Asserted Claims and Infringement Contentions (“PMC’s P.R. 3-1 Disclosures”). Accordingly, the infringement contentions, and evidence of infringement, set forth in these charts apply to each model of accused Samsung Televisions, including those identified in Part II(A) of PMC’s P.R. 3-1 Disclosures.

In addition to the infringement theories identified below involving Advanced Television Standards Committee (“ATSC”) and Moving Picture Experts Group (“MPEG-2”) standards, Samsung Televisions similarly infringe with respect to received cable television signals, including, for example, cable television received by accused Samsung Televisions on corporate, educational, government, and other campuses, and further including cable television received by Samsung Televisions in hotels and resorts. Upon information and belief, cable television signals received by the accused products also comply with the MPEG-2 standard. Accordingly, the infringement contentions, and evidence of infringement, set forth in these charts also apply to cable television received by accused Samsung Televisions.

To the extent that multiple cases of infringement are set forth in the below charts, if no reference is made to a specific case with respect to a claim or claim element, the evidence of infringement applies to all cases of infringement set forth for that claim, or the claim(s) on which that claim depends.


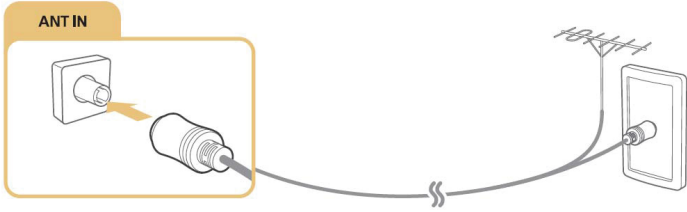
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Claim	Claim Element	Evidence of Infringement
1[a]	A method of controlling the communication of signals at a receiver station, said receiver station comprising	<p>Samsung performs a method of controlling the communication of signals at a receiver stations. Samsung Televisions are receiver stations. Examples of Samsung Televisions include the UN55JS7000 and UN65H6400 models. On information and belief, other accused models of Samsung Televisions operate similarly.</p>  <p>Samsung 4K SUHD JS7000 Series Smart TV (http://www.samsung.com/us/video/tvs/UN55JS7000FXZA) (PMCTEC00300632)</p>

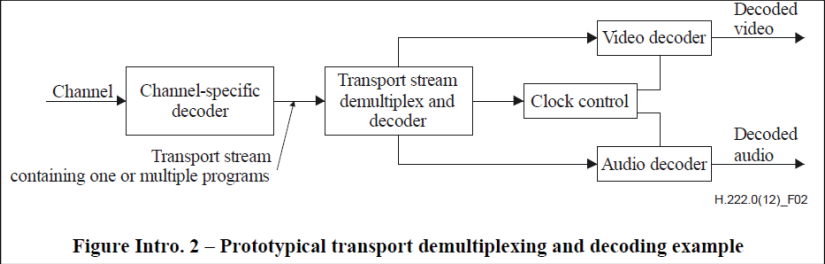
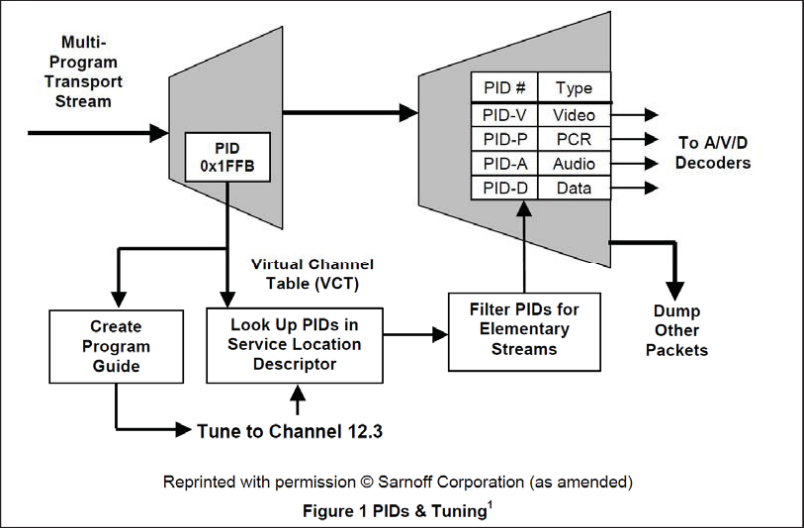
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Claim	Claim Element	Evidence of Infringement
		<p>Connecting an Antenna</p> <p>Connect a cable from an antenna or cable wall outlet to the ANT IN connector, as shown in the image below to receive broadcast signals.</p> <p> An antenna connection is not necessary if you connect a cable box or satellite receiver.</p>  <p><i>Samsung E-Manual at p. 14. (PMCTEC00300014)</i></p>
1[b]	(i) a valve for receiving and controlling the communication of signals and	<p>Samsung Televisions include several valves for receiving and controlling the communication of signals, including audio and video received over a digital TV antenna input in accordance with the Advanced Television Systems Committee (“ATSC”) digital television standard. In Samsung Televisions, valves comprise the MPEG-2 channel/transport stream demultiplexer, also referred to as the channel and/or TS decoder, and associated circuitry, processing hardware, firmware, and software.</p> <p>“The DTV system employs the MPEG-2 Transport Stream syntax for the packetization and multiplexing of video, audio, and data signals for digital broadcasting systems.”</p> <p><i>Guide to Use of the ATSC DTV Standard, ATSC, December 4, 2003 at p. 21. (PMCTEC00103772)</i></p>

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Claim	Claim Element	Evidence of Infringement
		 <p>Figure Intro. 2 – Prototypical transport demultiplexing and decoding example</p> <p>[MPEG-2, Part 1] <i>Information Technology – Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. viii. (PMCTEC00100501)</p>  <p>Figure 1 PIDs & Tuning¹</p> <p>Reprinted with permission © Sarnoff Corporation (as amended)</p> <p><i>CEA Bulletin: PSIP Recommended Practice, CEA-CEB12-A, October 2003, Consumer</i></p>

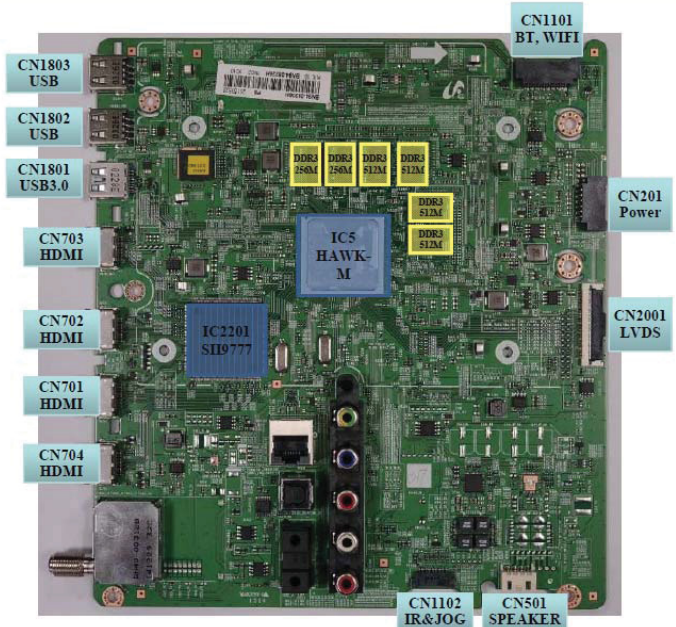
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Claim	Claim Element	Evidence of Infringement
		<p>Electronics Association, p. 3. (PMCTEC00150410)</p> <p>Upon information and belief, in the exemplary systems cited herein, the valve is included in the Hawk-M SoC on the JS7000 Samsung television model, and the X14H SoC in the H6400 Samsung television model.</p> <p>Samsung Televisions also have at least one storage device, including temporary, permanent, and/or non-volatile memory.</p> <p><u>Doctrine of Equivalents</u></p> <p>To the extent that Samsung Televisions do not literally meet the “valve” claim element of the asserted claims, Samsung satisfies the “valve” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices programmed and/or configured to function as TS demultiplexer(s) and/or PID filter(s) in Samsung Televisions (i) perform substantially the same function of controlling the flow of information; (ii) in substantially the same way, by ceasing to communicate and commencing to communicate information; and (iii) with substantially the same result of having controlled the flow of information. The processing ‘cores’, processing modules, and/or processing devices, programmed and/or configured to function as TS demultiplexer(s) and/or PID filter(s) in Samsung Televisions are not substantially different from the claimed “valve.”</p>
1[c]	(ii) at least one processor that processes said signals,	<p>Samsung Televisions include at least one processor that processes said signals. Samsung Televisions include System-on-Chip (“SoC”) configurations that have several processing ‘cores’ and/or processing modules and devices, each of which is a processor. For example, the Samsung JS7000 television includes several Samsung SoC microchips, each microchip containing several processors. The Samsung H6400 television includes the X14H microchip with several processors. In addition, Samsung Television SoC microchips contain various processing devices for ATSC, Transport Stream, video decoding, graphics, color, and on-screen display processing.</p> <p>QUAD-CORE PROCESSOR</p> <p>Enjoy a fluid browsing experience and faster control – switching between apps,</p>

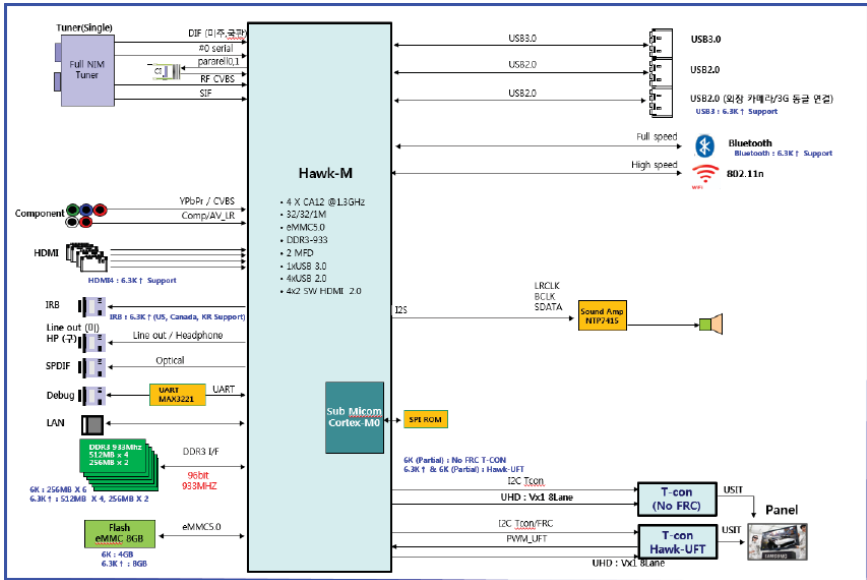
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Claim	Claim Element	Evidence of Infringement
		<p>streaming content, and other media effortlessly.</p> <p>JS7000 SUHD TV Spec Sheet at p. 2. (PMCTEC00301143)</p> <p>Main Board Layout</p>  <p>Main circuit board in Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 32. (PMCTEC00300565)</p>

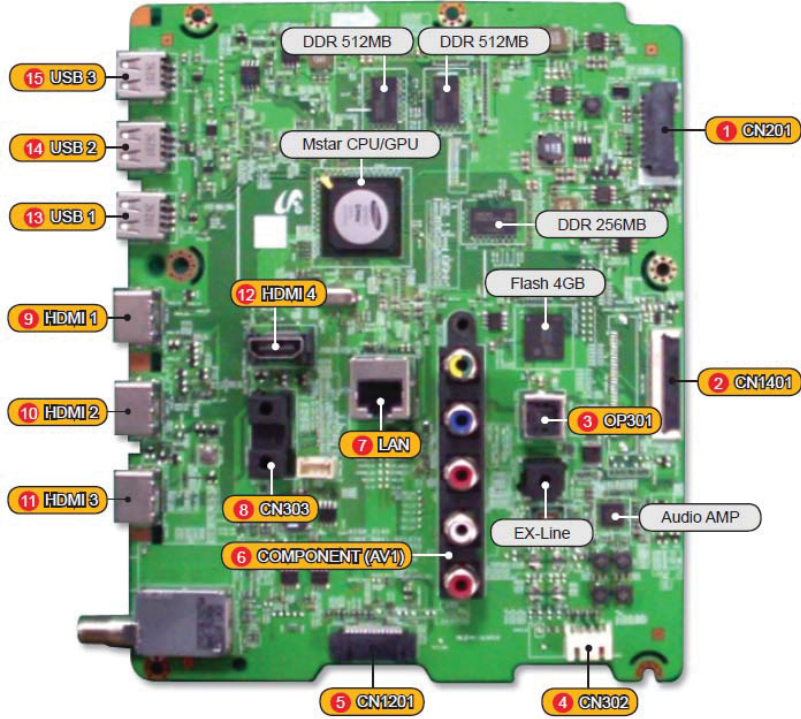
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Claim	Claim Element	Evidence of Infringement
		 <p>The diagram illustrates the internal architecture of a Samsung JS7000 series television. At the center is the Hawk-M processor, which is a quad-core processor (4x CA12 @1.3GHz) with 32/32/1M cache, eMMC5.0 storage, 3DERS-933, 2 MFD, 1xUSB 3.0, 4xUSB 2.0, and 4x2.5W HDMI 2.0. It is connected to various external and internal components:</p> <ul style="list-style-type: none"> Input/Output: Tuner(Single), Full NIM Tuner, Component, HDMI (6.3K T Support), IRB (6.3K T (IR, Camera, IR Support)), Line out (L), HP (?), SPDIF, Debug, LAN, and Flash (eMMC 5.0). Storage and Memory: 4x CA12 @1.3GHz, 32/32/1M, eMMC5.0, 3DERS-933, 2 MFD, 1xUSB 3.0, 4xUSB 2.0, and 4x2.5W HDMI 2.0. Connectivity: USB3.0, USB2.0, Full speed, High speed, Bluetooth (Bluetooth 4.0, 6.3K T Support), and 802.11n. Audio and Video: I2S, LRCLK, BCLK, SDATA, Sound Amp (90V-932), and UHD: Vx1 8Lane. Other Components: Sub Microm Cortex M0, SPE PCM, T-con (No FRC), T-con Hawk-UFT, and Panel. <p>Block diagram of Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 31. (PMCTEC00300564)</p> <p>QUAD CORE PROCESSOR Quad Core eliminates lag to give you a fluid browsing experience. It enables you to switch between apps, stream content and multi-task faster. This extra power also provides faster page refreshing.</p> <p>H6400 Smart LED TV Spec Sheet at p. 2. (PMCTEC00300705)</p>

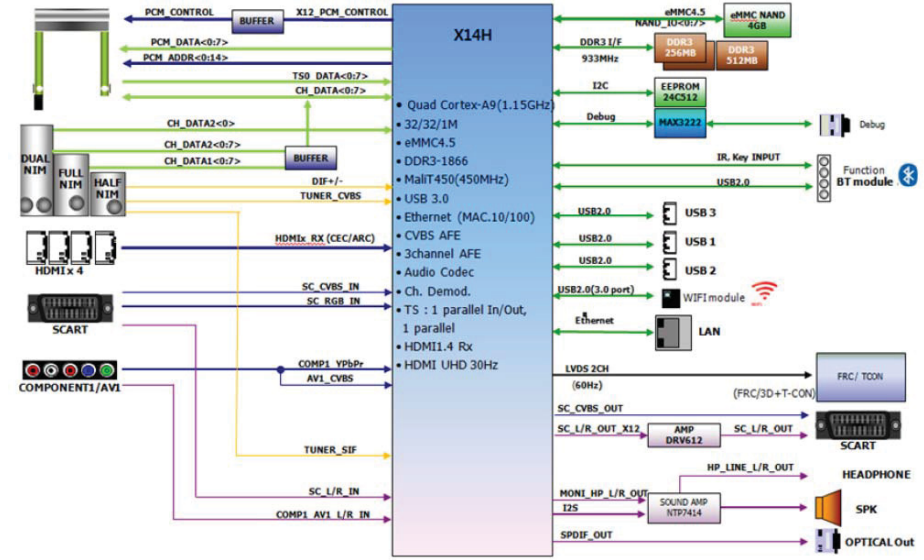
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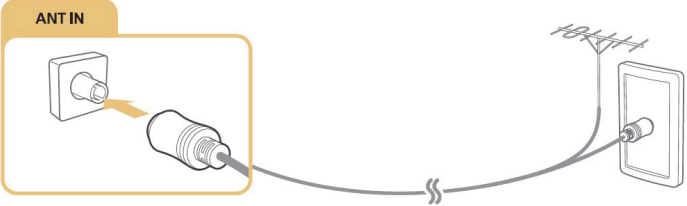
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Claim	Claim Element	Evidence of Infringement
		 <p>The image shows the main circuit board of a Samsung H6400 series television. It is a green printed circuit board (PCB) populated with various electronic components. Numbered callouts (1-15) point to specific connectors and components: 1. CN201 (top right), 2. CN1401 (middle right), 3. OP301 (middle right), 4. CN302 (bottom right), 5. CN1201 (bottom center), 6. COMPONENT (AV1) (bottom center), 7. LAN (center), 8. CN303 (center), 9. HDMI 1 (left), 10. HDMI 2 (left), 11. HDMI 3 (left), 12. HDMI 4 (center), 13. USB 1 (top left), 14. USB 2 (top left), 15. USB 3 (top left). Component labels include: DDR 512MB (top), Mstar CPU/GPU (center), Flash 4GB (middle right), EX-Line (bottom right), and Audio AMP (bottom right).</p> <p>Main circuit board in Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300621)</p>

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Claim	Claim Element	Evidence of Infringement
		 <p>Block diagram of Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300618)</p> <p>Doctrine of Equivalents</p> <p>To the extent that Samsung Televisions do not literally meet the “processor[s]” claim element of the asserted claims, Samsung satisfies the “processor[s]” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices, including components for general purpose, application, ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions (i) perform substantially the same function of processing; (ii) in substantially the same way, by performing operations on data; and (iii) with substantially the same result of having processed data. The processing ‘cores’, processing</p>

Claim	Claim Element	Evidence of Infringement
		modules, and/or processing devices, including components for general purpose, application, ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions are not substantially different from the claimed “processor[s].”
1[d]	said method comprising the steps of: receiving one of a broadcast transmission and a cablecast transmission that includes an information transmission that includes embedded signals;	<p>Samsung Televisions receive one of a broadcast transmission and a cablecast transmission. For example, Samsung Televisions receive broadcast or cablecast digital television transmissions either through the RF antenna input.</p> <p>Connecting an Antenna</p> <p>Connect a cable from an antenna or cable wall outlet to the ANT IN connector, as shown in the image below to receive broadcast signals.</p> <p> An antenna connection is not necessary if you connect a cable box or satellite receiver.</p>  <p><i>Samsung E-Manual</i> at p. 14. (PMCTEC00300014)</p> <p>The broadcast transmissions and cablecast transmissions received by Samsung Televisions include an information transmission that includes embedded signals. The embedded signals include, for example, TS packets received by Samsung Televisions in the MPEG-2 transport stream.</p>

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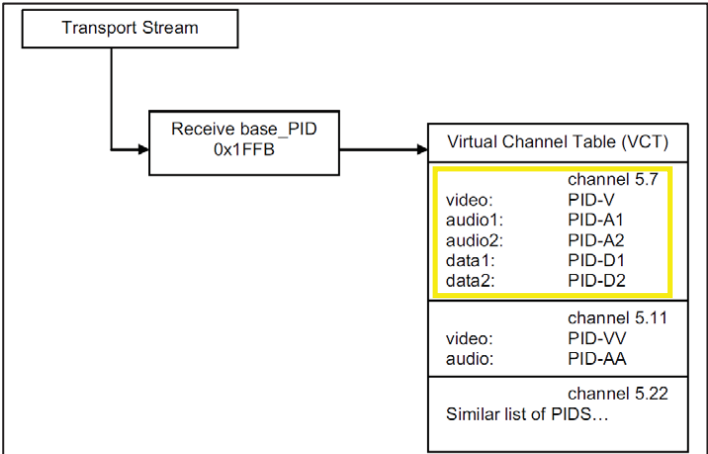
Claim	Claim Element	Evidence of Infringement
		<p><u>ATSC</u></p> <p>“Decoders must include a means to look for start codes and sync bytes (transport stream) in order to begin decoding correctly, and to identify errors, erasures or insertions while decoding. The methods to identify these situations, and the actions to be taken, are not standardized.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 15, ATSC. (PMCTEC00100091)</p> <p>“The digital television system employs the MPEG-2 video stream syntax for the coding of video and the Digital Audio Compression (AC-3) Standard for the coding of audio.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p>“The digital television system employs the MPEG-2 transport stream syntax for the packetization and multiplexing of video, audio, and data signals for digital broadcasting systems (ISO/IEC 13818- 1).”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p><u>MPEG-2</u></p> <p>“The Rec. ITU-T H.222.0 ISO/IEC 13818-1 transport stream coding layer allows one or more programs to be combined into a single stream. <i>Data from each elementary stream are multiplexed together with information that allows synchronized presentation of the elementary streams within a program.</i></p> <p>A transport stream consists of one or more programs. Audio and video elementary streams consist of access units.</p>

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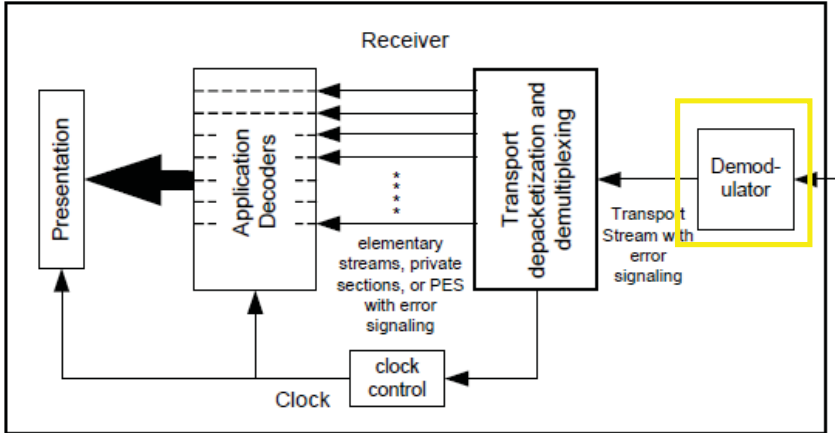
Claim	Claim Element	Evidence of Infringement
		<p>Elementary stream data is carried in PES packets. A PES packet consists of a PES packet header followed by packet data. PES packets are inserted into transport stream packets.</p> <p>The first byte of each PES packet header is located at the first available payload location of a transport stream packet.</p> <p>The PES packet header begins with a 32-bit start-code that also identifies the stream or stream type to which the packet data belongs. <i>The PES packet header may contain decoding and presentation time stamps (DTS and PTS).</i> The PES packet header also contains other optional fields. The PES packet data field contains a variable number of contiguous bytes from one elementary stream.</p> <p>Transport stream packets begin with a 4-byte prefix, which contains a 13-bit packet ID (PID), defined in Table 2-2. The PID identifies, via the program-specific information (PSI) tables, the contents of the data contained in the transport stream packet. Transport stream packets of one PID value carry data of one and only one elementary stream.”</p> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 10 (emphasis added). (PMCTEC00100515)</p>

Claim	Claim Element	Evidence of Infringement																		
		<div>Table 2-2 – Transport packet of this Recommendation International Standard</div> <table><tr><th>Syntax</th><th>No. of bits</th><th>Mnemonic</th></tr><tr><td>transport_packet(){ sync_byte transport_error_indicator payload_unit_start_indicator transport_priority PID transport_scrambling_control adaptation_field_control continuity_counter if(adaptation_field_control == '10' adaptation_field_control == '11'){ adaptation_field() } if(adaptation_field_control == '01' adaptation_field_control == '11') { for (i = 0; i < N; i++){ data_byte } } }</td><td><div>8</div><div>1</div><div>1</div><div>1</div><div>13</div><div>2</div><div>2</div><div>4</div><div>8</div></td><td><div>bslbf</div><div>bslbf</div><div>bslbf</div><div>bslbf</div><div>uimsbf</div><div>bslbf</div><div>bslbf</div><div>uimsbf</div><div>bslbf</div></td></tr></table> <div>ISO/IEC 13818-1:2013 (E) [a/k/a MPEG 2: Part 1] at p. 21. (PMCTEC00100526)</div> <div>In another example, embedded signals are the packets carrying PSI and/or PSIP data.</div> <div>Table 2-28 – Program-specific information</div> <table><tr><th>Structure Name</th><th>Stream Type</th><th>Reserved PID #</th><th>Description</th></tr><tr><td>Program association table</td><td>Rec. ITU-T H.222.0 ISO/IEC 13818-1</td><td>0x00</td><td>Associates program number and program map table PID</td></tr><tr><td>Program map table</td><td>Rec. ITU-T H.222.0 ISO/IEC 13818-1</td><td>Assigned in the PAT</td><td>Specifies PID values for components of one or more programs</td></tr></table> <div>[MPEG-2, Part 1] Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E), p. 45. (PMCTEC00100550)</div> <div>The packets carrying VCT data are also embedded signals and have the base_PID 0x1FFB</div>	Syntax	No. of bits	Mnemonic	transport_packet(){ sync_byte transport_error_indicator payload_unit_start_indicator transport_priority PID transport_scrambling_control adaptation_field_control continuity_counter if(adaptation_field_control == '10' adaptation_field_control == '11'){ adaptation_field() } if(adaptation_field_control == '01' adaptation_field_control == '11') { for (i = 0; i < N; i++){ data_byte } } }	<div>8</div> <div>1</div> <div>1</div> <div>1</div> <div>13</div> <div>2</div> <div>2</div> <div>4</div> <div>8</div>	<div>bslbf</div> <div>bslbf</div> <div>bslbf</div> <div>bslbf</div> <div>uimsbf</div> <div>bslbf</div> <div>bslbf</div> <div>uimsbf</div> <div>bslbf</div>	Structure Name	Stream Type	Reserved PID #	Description	Program association table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	0x00	Associates program number and program map table PID	Program map table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	Assigned in the PAT	Specifies PID values for components of one or more programs
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		 <p>Figure D8 Extraction of the VCT from the Transport Stream.</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable</i>, 7 August 2013, (PSIP) at p. 119 (yellow box added). (PMCTEC00104164)</p>
1[e]	demodulating said one of a broadcast transmission and a cablecast transmission to detect said information transmission therein;	Samsung Televisions demodulate said one of a broadcast transmission and a cablecast transmission to detect said information transmission therein.

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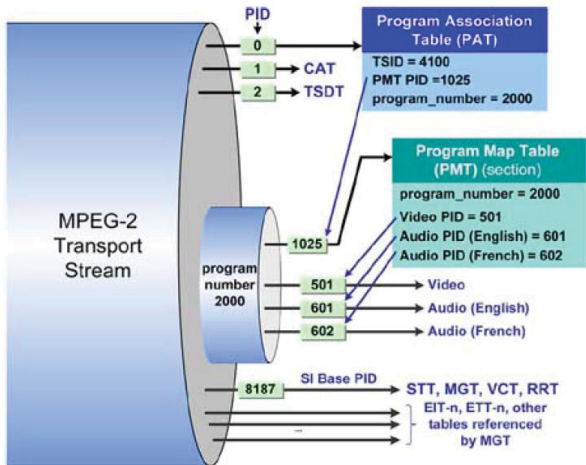
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Claim	Claim Element	Evidence of Infringement
		 <p><i>A/53 Part 3:2013 (Service Multiplex and Transport)</i> at p. 9, ATSC (yellow box added). (PMCTEC00100064)</p> <p>Upon information and belief, every accused model of a Samsung Television includes a demodulator.</p>
1[f]	detecting said embedded signals in said information transmission;	<p>Samsung Televisions detect said embedded signals in said information transmission.</p> <p><u>Case 1</u></p> <p>For example, Samsung Televisions detect transport stream (TS) packets (embedded signals) in the MPEG-2 information transmission.</p> <p><u>ATSC</u></p> <p>“Decoders must include a means to look for start codes and sync bytes (transport</p>

Claim	Claim Element	Evidence of Infringement
		<p>stream) in order to begin decoding correctly, and to identify errors, erasures or insertions while decoding. The methods to identify these situations, and the actions to be taken, are not standardized.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 15, ATSC. (PMCTEC00100091)</p> <p>“The digital television system employs the MPEG-2 video stream syntax for the coding of video and the Digital Audio Compression (AC-3) Standard for the coding of audio.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p>“The digital television system employs the MPEG-2 transport stream syntax for the packetization and multiplexing of video, audio, and data signals for digital broadcasting systems (ISO/IEC 13818- 1).”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p>

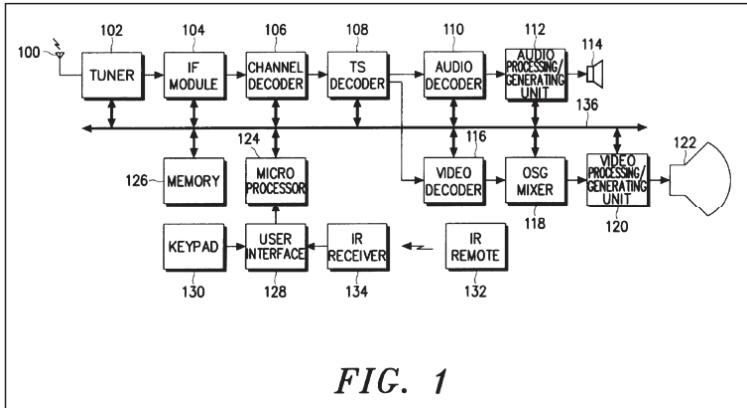
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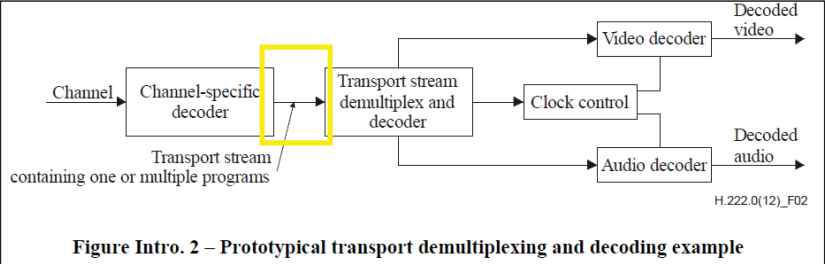
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Claim	Claim Element	Evidence of Infringement
		 <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p>The diagram illustrates the structure of an MPEG-2 Transport Stream (TS). It shows a large blue cylinder representing the TS, with a smaller blue cylinder inside representing a program (program number 2000). The TS is divided into sections, each identified by a PID (Program Identifier) and a corresponding table or stream.</p> <ul style="list-style-type: none"> PAT (Program Association Table): Located at the top right, it contains information about the TS and the programs it contains. It lists: <ul style="list-style-type: none"> TSID = 4100 PMT PID = 1025 program_number = 2000 PMT (Program Map Table) (section): Located below the PAT, it contains information about the elementary streams within the program. It lists: <ul style="list-style-type: none"> program_number = 2000 Video PID = 501 Audio PID (English) = 601 Audio PID (French) = 602 Elementary Streams: <ul style="list-style-type: none"> Video: Identified by PID 501. Audio (English): Identified by PID 601. Audio (French): Identified by PID 602. SI Base PID: Identified by PID 8187, it contains system information tables (STT, MGT, VCT, RRT) and other tables referenced by MGT. <p>The diagram shows how the TS is multiplexed, with the PAT and PMT sections providing the necessary information for the receiver to decode the elementary streams.</p> <p>MPEG-2</p> <p>“The Rec. ITU-T H.222.0 ISO/IEC 13818-1 transport stream coding layer allows one or more programs to be combined into a single stream. <i>Data from each elementary stream are multiplexed together with information that allows synchronized presentation of the elementary streams within a program.</i></p> <p>A transport stream consists of one or more programs. Audio and video elementary streams consist of access units.</p>

Claim	Claim Element	Evidence of Infringement
		<p>Elementary stream data is carried in PES packets. A PES packet consists of a PES packet header followed by packet data. PES packets are inserted into transport stream packets.</p> <p>The first byte of each PES packet header is located at the first available payload location of a transport stream packet.</p> <p>The PES packet header begins with a 32-bit start-code that also identifies the stream or stream type to which the packet data belongs. <i>The PES packet header may contain decoding and presentation time stamps (DTS and PTS).</i> The PES packet header also contains other optional fields. The PES packet data field contains a variable number of contiguous bytes from one elementary stream.</p> <p>Transport stream packets begin with a 4-byte prefix, which contains a 13-bit packet ID (PID), defined in Table 2-2. The PID identifies, via the program-specific information (PSI) tables, the contents of the data contained in the transport stream packet. Transport stream packets of one PID value carry data of one and only one elementary stream.”</p> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 10 (emphasis added). (PMCTEC00100515)</p>

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Claim	Claim Element	Evidence of Infringement
		<p>strings are separated into audio data, video data, and auxiliary data by a TS (transport stream) decoder 108.”</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. at col. 2:40-50. (PMCTEC00301156)</p>  <p style="text-align: center;">FIG. 1</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. (PMCTEC00301153)</p>
1[g]	communicating said embedded signals to said valve;	<p>Samsung Televisions communicate said embedded signals to said valve.</p> <p><u>Case 1</u></p> <p>For example, the embedded signals, such as TS packets, are communicated to the demultiplexer (also referred to as the TS decoder), which can be a dedicated module in a Samsung Television (or processing module or core in a processing chipset).</p>

Claim	Claim Element	Evidence of Infringement
		 <p>Figure Intro. 2 – Prototypical transport demultiplexing and decoding example</p> <p>[MPEG-2, Part 1] <i>Information Technology – Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. viii (yellow box added). (PMCTEC00100501)</p>

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Claim	Claim Element	Evidence of Infringement
		<p>Reprinted with permission © Sarnoff Corporation (as amended)</p> <p>Figure 1 PIDs & Tuning¹</p> <p>CEA Bulletin: <i>PSIP Recommended Practice</i>, CEA-CEB12-A, October 2003, Consumer Electronics Association, p. 3 (yellow box added). (PMCTEC00105410)</p> <p><u>Case 2</u></p> <p>In another example, Samsung Televisions communicate the PSI and/or PSIP embedded signals to the demultiplexer and/or PID filter.</p> <p>See also Doctrine of Equivalents allegations with respect to the “valve” claim element set forth above.</p>
1[h]	detecting, at said valve, valve control signals that	Samsung Televisions detect, at said valve, valve control signals that are embedded in said embedded signals.

Claim	Claim Element	Evidence of Infringement
	are embedded in said embedded signals; and	<p><u>Case 1</u></p> <p>For example, Samsung Televisions detect at the demultiplexer (at times referred to as the TS decoder), PIDs embedded in the received TS packets.</p> <p><u>ATSC</u></p> <p>“Decoders must include a means to look for start codes and sync bytes (transport stream) in order to begin decoding correctly, and to identify errors, erasures or insertions while decoding. The methods to identify these situations, and the actions to be taken, are not standardized.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 15, ATSC. (PMCTEC00100091)</p> <p>“The digital television system employs the MPEG-2 video stream syntax for the coding of video and the Digital Audio Compression (AC-3) Standard for the coding of audio.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p>“The digital television system employs the MPEG-2 transport stream syntax for the packetization and multiplexing of video, audio, and data signals for digital broadcasting systems (ISO/IEC 13818- 1).”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p><u>MPEG-2</u></p> <p>“The Rec. ITU-T H.222.0 ISO/IEC 13818-1 transport stream coding layer allows one or more programs to be combined into a single stream. <i>Data from each elementary stream are multiplexed together with information that allows synchronized presentation</i></p>

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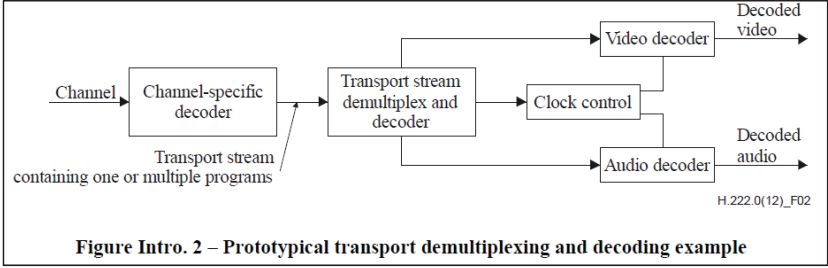
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Claim	Claim Element	Evidence of Infringement
		<p><i>of the elementary streams within a program.</i></p> <p>A transport stream consists of one or more programs. Audio and video elementary streams consist of access units.</p> <p>Elementary stream data is carried in PES packets. A PES packet consists of a PES packet header followed by packet data. PES packets are inserted into transport stream packets.</p> <p>The first byte of each PES packet header is located at the first available payload location of a transport stream packet.</p> <p>The PES packet header begins with a 32-bit start-code that also identifies the stream or stream type to which the packet data belongs. <i>The PES packet header may contain decoding and presentation time stamps (DTS and PTS).</i> The PES packet header also contains other optional fields. The PES packet data field contains a variable number of contiguous bytes from one elementary stream.</p> <p>Transport stream packets begin with a 4-byte prefix, which contains a 13-bit packet ID (PID), defined in Table 2-2. The PID identifies, via the program-specific information (PSI) tables, the contents of the data contained in the transport stream packet. Transport stream packets of one PID value carry data of one and only one elementary stream.”</p> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 10 (emphasis added). (PMCTEC00100515)</p>

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Claim	Claim Element	Evidence of Infringement																																																									
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1[i]	controlling said valve, in response to said valve control signals, so that said valve performs at	Samsung Televisions control said valve, in response to said valve control signals, so that said valve performs at least one of the functions of ceasing to communicate and commencing to communicate said embedded signals to said at least one processor.																																																									

Claim	Claim Element	Evidence of Infringement
	least one of the functions of ceasing to communicate and commencing to communicate said embedded signals to said at least one processor.	<p><u>Case 1</u></p> <p>For example, in Samsung Televisions, the demultiplexer (also referred to as the TS and/or channel decoder), ceases to communicate packets to audio or video decoders when an undesired PID control signal is found in the TS packet, and commences to communicate the packets to audio or video decoders when an appropriate PID control signal is found in the TS packet.</p>  <p>Figure Intro. 2 – Prototypical transport demultiplexing and decoding example</p> <p>[MPEG-2, Part 1] <i>Information Technology – Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. viii. (PMCTEC00100501)</p>


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Claim	Claim Element	Evidence of Infringement
		<p>Reprinted with permission © Sarnoff Corporation (as amended)</p> <p>Figure 1 PIDs & Tuning¹</p> <p><i>CEA Bulletin: PSIP Recommended Practice, CEA-CEB12-A, October 2003, Consumer Electronics Association, p. 3 (yellow box added). (PMCTEC00105410)</i></p> <p><u>Case 2</u></p> <p>Samsung Televisions control the demultiplexer and/or PID filter (valve), in response to control signals embedded in the TS packets, such as base_PID (0x1FFB) for PSIP data, and PSI PIDs (0x00 for PATs and PMT PIDs defined in the PAT), so that the valve communicates the PSI and PSIP tables to the at least one processor (such as a processing core, module, or a control processor) if the aforementioned PIDs are detected in the TS packets, and ceases to communicate the tables to the at least one processor if the aforementioned PIDs are not detected.</p>

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Claim	Claim Element	Evidence of Infringement
		<p><i>See also</i> Doctrine of Equivalents allegations with respect to the “valve” claim element set forth above.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
9[a]	A method of controlling a receiver station in a mass medium programming presentation system, said receiver station having a first processor and a second processor, wherein said first processor and said second processor are capable of receiving input from a plurality of sources, said method comprising the steps of:	<p>Samsung performs a method of controlling a receiver station in a mass medium programming presentation system. Samsung Televisions are receiver stations in a broadcast and cablecast television mass medium programming presentation system. Examples of Samsung Televisions include the UN55JS7000 and UN65H6400 models. On information and belief, other accused models of Samsung Televisions operate similarly.</p>  <p>Samsung 4K SUHD JS7000 Series Smart TV (http://www.samsung.com/us/video/tvs/UN55JS7000FXZA) (PMCTEC00300632)</p> <p>Samsung Televisions have a first processor and a second processor. Samsung Televisions</p>

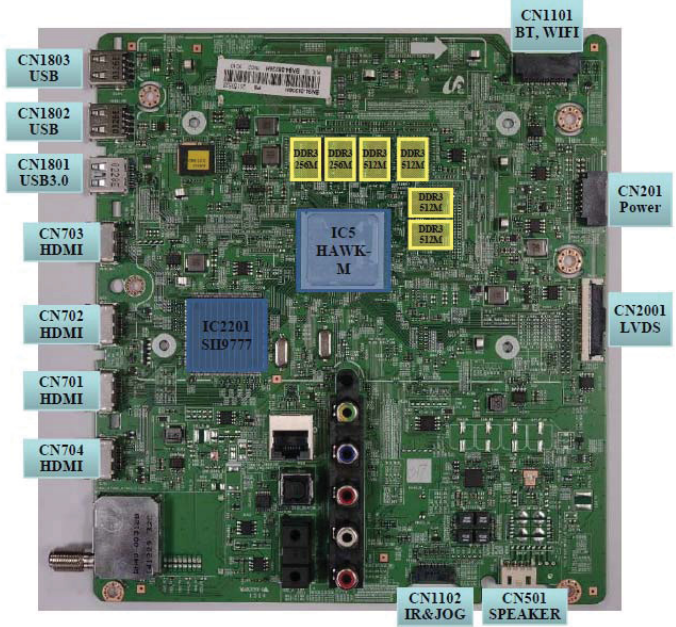
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Claim	Claim Element	Evidence of Infringement
		<p>include System-on-Chip (“SoC”) configurations that have several processing ‘cores’ and/or processing modules and devices, each of which is a processor. For example, the Samsung JS7000 television includes several Samsung SoC microchips, each microchip containing several processors. The Samsung H6400 television includes the X14H microchip with several processors. In addition, Samsung Television SoC microchips contain various processing devices for ATSC, Transport Stream, video decoding, graphics, color, and on-screen display processing.</p> <p>QUAD-CORE PROCESSOR</p> <p>Enjoy a fluid browsing experience and faster control – switching between apps, streaming content, and other media effortlessly.</p> <p>JS7000 SUHD TV Spec Sheet at p. 2. (PMCTEC00301143)</p>

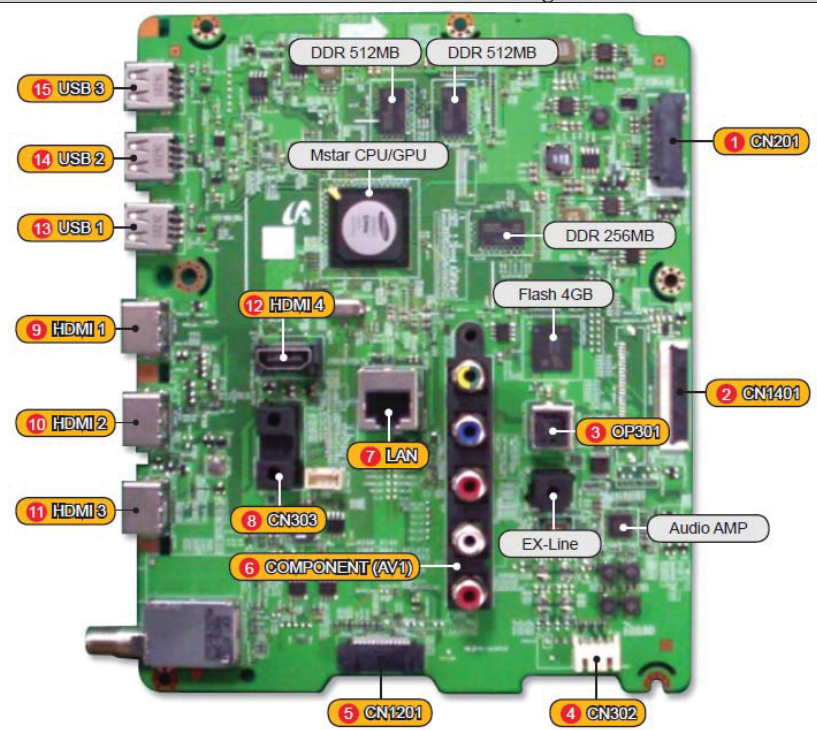
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Claim	Claim Element	Evidence of Infringement
		<div><div><div>Main Board Layout</div><div><p>The image shows the main circuit board of a Samsung JS7000 series television. It is a green printed circuit board (PCB) populated with various electronic components. Key components labeled include: IC2201 (SI19777) and IC5 (HAWK-M) in the center; four DDR3 256M memory modules (labeled DDR3 256M) arranged in a 2x2 grid; and several connectors along the edges: CN1803, CN1802, and CN1801 (USB) on the left; CN703, CN702, CN701, and CN704 (HDMI) on the left; CN1101 (BT, WIFI) at the top right; CN201 (Power) on the right; CN2001 (LVDS) on the right; CN1102 (IR&JOG) and CN501 (SPEAKER) at the bottom; and CN501 (SPEAKER) at the bottom right. A barcode sticker is visible near the top center.</p></div></div><p>Main circuit board in Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 32. (PMCTEC00300565)</p></div>

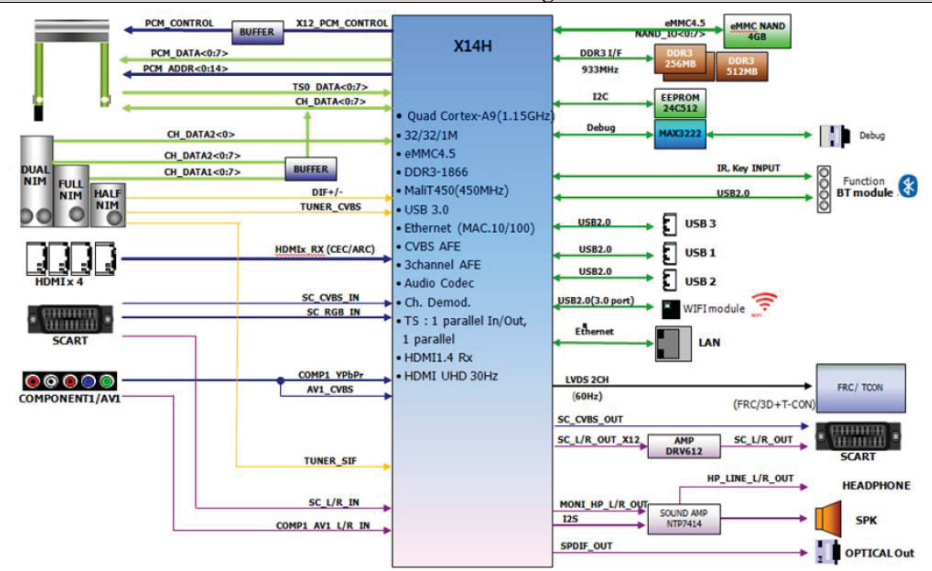
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Claim	Claim Element	Evidence of Infringement
		 <p>The image shows the main circuit board of a Samsung H6400 series television. The board is green and populated with various electronic components. Key components are labeled with callouts: 1. CN201 (connector), 2. CN1401 (connector), 3. OP301 (chip), 4. CN302 (connector), 5. CN1201 (connector), 6. COMPONENT (AV1) (connector), 7. LAN (port), 8. CN303 (connector), 9. HDMI 1 (port), 10. HDMI 2 (port), 11. HDMI 3 (port), 12. HDMI 4 (port), 13. USB 1 (port), 14. USB 2 (port), 15. USB 3 (port), Audio AMP (chip), EX-Line (port), Flash 4GB (memory), DDR 256MB (memory), Mstar CPU/GPU (chip), and two DDR 512MB (memory) modules. The board also features a large heat sink over the Mstar CPU/GPU.</p> <p>Main circuit board in Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300621)</p>

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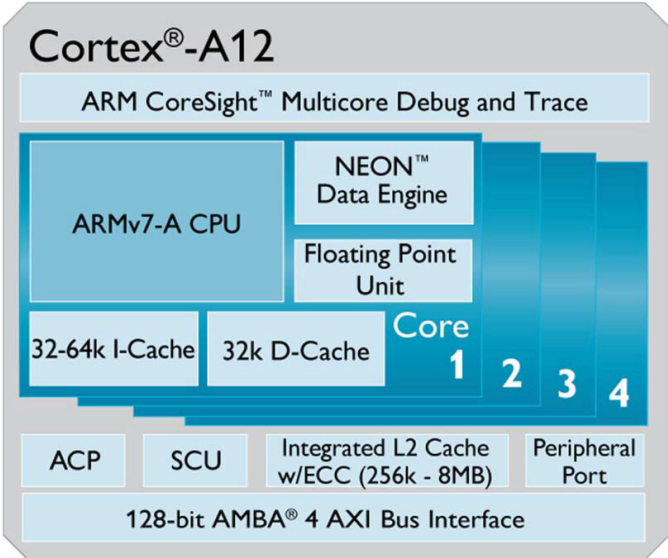
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Claim	Claim Element	Evidence of Infringement
		<div><p>Block diagram of Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300618)</p><p>Doctrine of Equivalents</p><p>To the extent that Samsung Televisions do not literally meet the “processor[s]” claim element of the asserted claims, Samsung satisfies the “processor[s]” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices, including components for general purpose, application, ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions (i) perform substantially the same function of processing; (ii) in substantially the same way, by performing operations on data; and (iii) with substantially the same result of having processed data. The processing ‘cores’, processing</p></div>

Claim	Claim Element	Evidence of Infringement
		<p>modules, and/or processing devices, including components for general purpose, application, ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions are not substantially different from the claimed “processor[s].”</p> <p>The first and second processors in Samsung Televisions are capable of receiving input from a plurality of sources. For example, the processing cores and/or video decoding processors are capable of receiving input from a plurality of sources, such as the Television’s coaxial antenna input, HDMI inputs, Wifi input, Ethernet input, and/or component inputs.</p> <p>In another example, the various processing cores and/or video decoding processors are capable of receiving inputs from various sources connected by buses and interconnects used in ARM architecture employed by processing chips in Samsung Televisions. The exemplary illustration below shows an ARM processing chip with several Processor Clusters and Media Processors, each of which is capable of receiving input from a plurality of sources, such as the on board memory components, controllers, and external peripherals. In the below illustration, the input is received via, for example, AMBA and AXI bus and interconnect.</p>

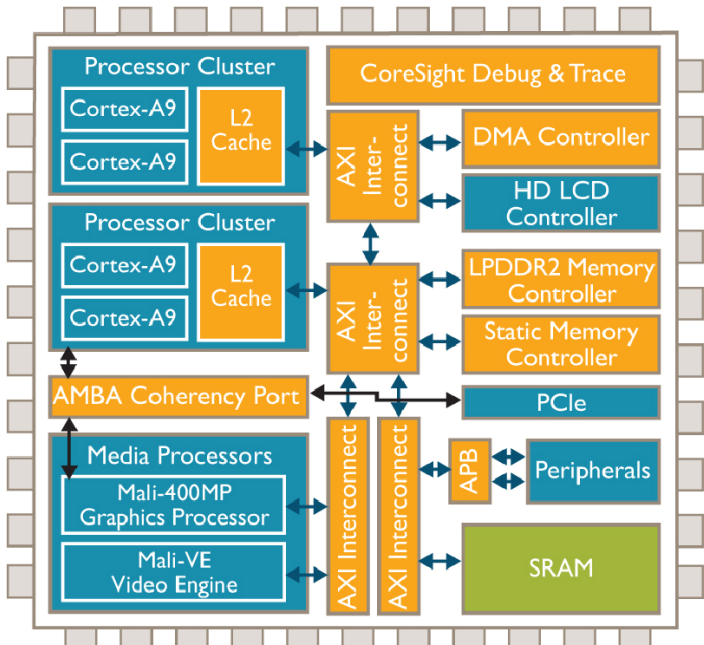
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Claim	Claim Element	Evidence of Infringement
		<div><p>Cortex[®]-A12</p><p>ARM CoreSight™ Multicore Debug and Trace</p><p>ARMv7-A CPU</p><p>NEON™ Data Engine</p><p>Floating Point Unit</p><p>32-64k I-Cache 32k D-Cache</p><p>Core 1 2 3 4</p><p>ACP SCU Integrated L2 Cache w/ECC (256k - 8MB) Peripheral Port</p><p>128-bit AMBA[®] 4 AXI Bus Interface</p></div> <p>The Top 5 Things to Know about Cortex-A12 (https://community.arm.com/groups/processors/blog/2013/10/26/the-top-5-things-to-know-about-cortex-a12) (PMCTEC00300709)</p>

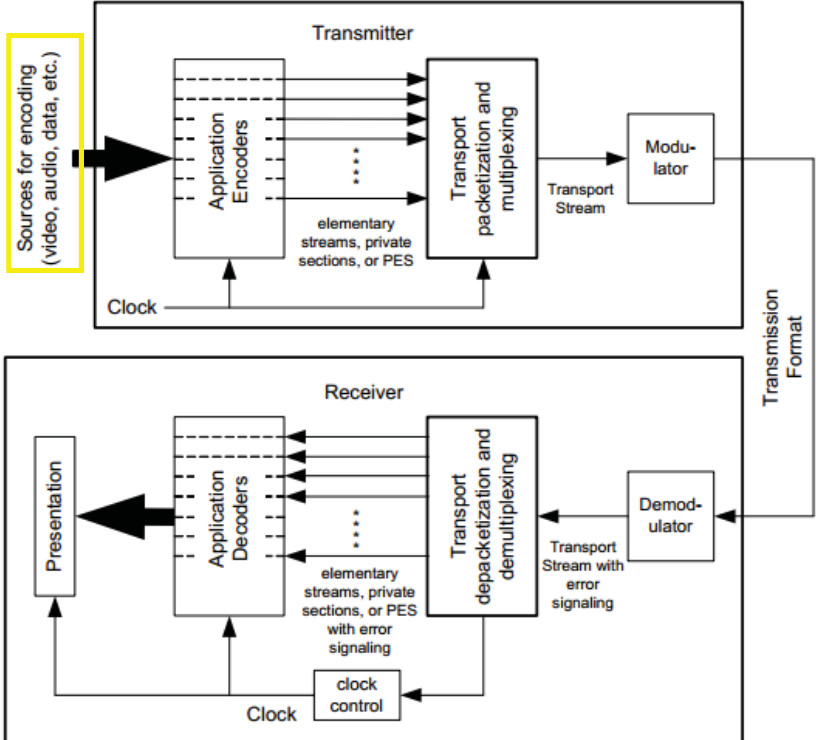
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Claim	Claim Element	Evidence of Infringement
		 <p>The diagram illustrates the internal architecture of an ARM System-on-Chip. It features two 'Processor Cluster' blocks, each containing two 'Cortex-A9' processors and an 'L2 Cache'. These clusters are connected to an 'AMBA Coherency Port'. Below the clusters are 'Media Processors' including a 'Mali-400MP Graphics Processor' and a 'Mali-VE Video Engine'. The system is interconnected via multiple 'AXI Interconnect' blocks. On the right side, various peripheral controllers are shown, including 'CoreSight Debug & Trace', 'DMA Controller', 'HD LCD Controller', 'LPDDR2 Memory Controller', 'Static Memory Controller', 'PCle', 'Peripherals' (connected via 'APB'), and 'SRAM'. Bidirectional arrows indicate the flow of data and control signals between these components.</p> <p>Diagram of ARM System-on-Chip with Cortex-A9 Processor Clusters and AMBA and AXI components (http://www.arm.com/products/system-ip/controllers/interrupt.php) (PMCTEC00000632).</p> <p>In another example, the above processors are capable of receiving input from various television programs or channels (sources) included in the ATSC transport stream:</p>

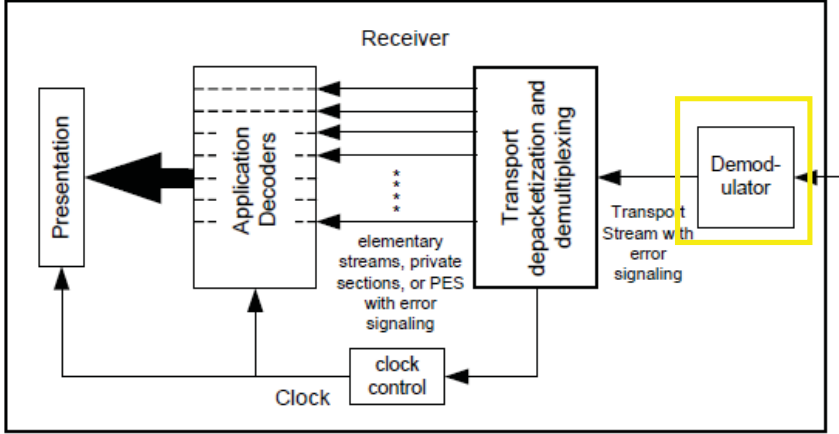
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Claim	Claim Element	Evidence of Infringement
		 <p>The diagram illustrates a digital television system with two main sections: a Transmitter and a Receiver. The Transmitter section includes 'Sources for encoding (video, audio, data, etc.)' which feed into 'Application Encoders'. These encoders output 'elementary streams, private sections, or PES' to a 'Transport packetization and multiplexing' block. A 'Clock' signal is provided to both the encoders and the multiplexing block. The output of the multiplexing block is a 'Transport Stream', which is then sent to a 'Modulator'. The Receiver section starts with a 'Demodulator' that receives the 'Transport Stream' and outputs a 'Transport Stream with error signaling'. This stream then goes to a 'Transport depacketization and demultiplexing' block. A 'clock control' block provides a 'Clock' signal to both the demultiplexing block and the 'Application Decoders'. The demultiplexing block outputs 'elementary streams, private sections, or PES with error signaling' to the 'Application Decoders', which finally lead to 'Presentation'. A 'Transmission Format' label is positioned vertically between the transmitter and receiver sections.</p> <p><i>A/53 Part 3:2013 (ATSC Digital Television System)</i> at p. 9, Advanced Television Systems Committee, Inc. (yellow box added). (PMC TEC00100064)</p>

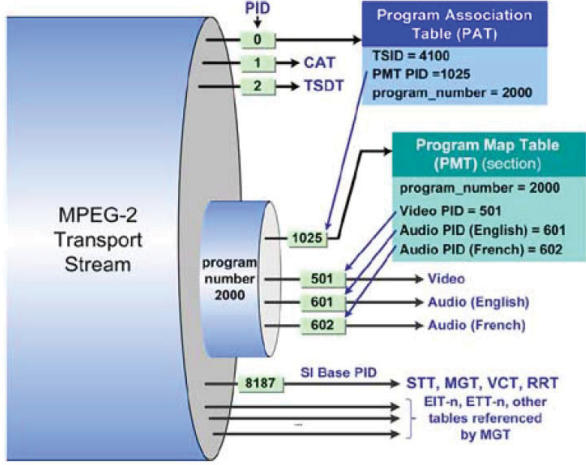
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Claim	Claim Element	Evidence of Infringement
9[b]	receiving a transmission signal at said receiver station: demodulating said transmission signal to detect said information transmission thereon,	<p>Samsung Televisions receive a transmission signal at said receiver station and demodulate said transmission signal to detect said information transmission thereon.</p>  <p><i>A/53 Part 3:2013 (Service Multiplex and Transport)</i> at p. 9, ATSC (yellow box added). (PMCTEC00100064)</p> <p>Upon information and belief, every accused model of a Samsung Television includes a demodulator.</p>
9[c]	said information transmission comprising embedded data;	<p>In Samsung Televisions, the received information transmission comprises embedded data. For example, the received ATSC signal comprises transport stream packets carrying audio, video and/or ancillary and control data (embedded data), as discussed above.</p>

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Claim	Claim Element	Evidence of Infringement
		 <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP),</i> Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78. (PMCTEC00000533)</p> <p>In another example, the embedded data is the PSI data (PAT and PMTs), and/or PSIP data (VCT).</p>
9[d]	detecting said embedded data on said information transmission;	<p>Samsung Televisions detect said embedded data on said information transmission. For example, Samsung Televisions detect transport stream (TS) packets on the MPEG-2 information transmission. The received TS packets carry audio, video, and control data. Examples of control data in the received TS packets are the Program Association Tables ("PAT"), Program Map Tables ("PMT"), and/or Virtual Channel Tables ("VCT").</p>

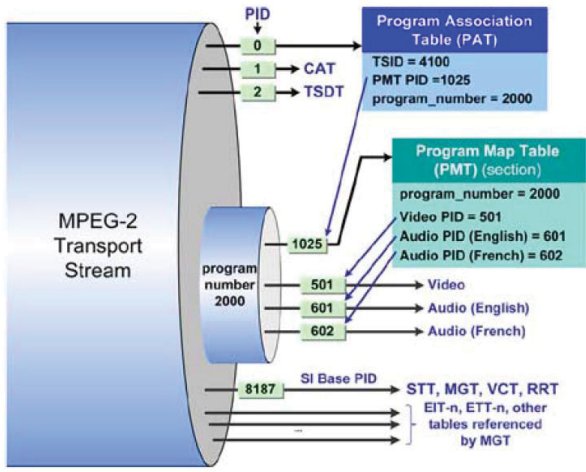
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Claim	Claim Element	Evidence of Infringement
		<p><u>ATSC</u></p> <p>“Decoders must include a means to look for start codes and sync bytes (transport stream) in order to begin decoding correctly, and to identify errors, erasures or insertions while decoding. The methods to identify these situations, and the actions to be taken, are not standardized.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 15, ATSC. (PMCTEC00100091)</p> <p>“The digital television system employs the MPEG-2 video stream syntax for the coding of video and the Digital Audio Compression (AC-3) Standard for the coding of audio.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p>“The digital television system employs the MPEG-2 transport stream syntax for the packetization and multiplexing of video, audio, and data signals for digital broadcasting systems (ISO/IEC 13818- 1).”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p>

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Claim	Claim Element	Evidence of Infringement
		 <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP),</i> Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78. (PMCTEC00000533)</p> <p><u>MPEG-2</u></p> <p>“The Rec. ITU-T H.222.0 ISO/IEC 13818-1 transport stream coding layer allows one or more programs to be combined into a single stream. <i>Data from each elementary stream are multiplexed together with information that allows synchronized presentation of the elementary streams within a program.</i></p> <p>A transport stream consists of one or more programs. Audio and video elementary streams consist of access units.</p>

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Claim	Claim Element	Evidence of Infringement
		<p>Elementary stream data is carried in PES packets. A PES packet consists of a PES packet header followed by packet data. PES packets are inserted into transport stream packets.</p> <p>The first byte of each PES packet header is located at the first available payload location of a transport stream packet.</p> <p>The PES packet header begins with a 32-bit start-code that also identifies the stream or stream type to which the packet data belongs. <i>The PES packet header may contain decoding and presentation time stamps (DTS and PTS).</i> The PES packet header also contains other optional fields. The PES packet data field contains a variable number of contiguous bytes from one elementary stream.</p> <p>Transport stream packets begin with a 4-byte prefix, which contains a 13-bit packet ID (PID), defined in Table 2-2. The PID identifies, via the program-specific information (PSI) tables, the contents of the data contained in the transport stream packet. Transport stream packets of one PID value carry data of one and only one elementary stream.”</p> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 10 (emphasis added). (PMCTEC00100515)</p>

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Claim	Claim Element	Evidence of Infringement																																																									
		<p>Table 2-2 – Transport packet of this Recommendation International Standard</p> <table> <tr> <th>Syntax</th><th>No. of bits</th><th>Mnemonic</th></tr> <tr> <td>transport_packet(){</td><td></td><td></td></tr> <tr> <td> sync_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> transport_error_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> payload_unit_start_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> transport_priority</td><td>1</td><td>bslbf</td></tr> <tr> <td> PID</td><td>13</td><td>uimsbf</td></tr> <tr> <td> transport_scrambling_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> adaptation_field_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> continuity_counter</td><td>4</td><td>uimsbf</td></tr> <tr> <td> if(adaptation_field_control == '10' adaptation_field_control == '11'){</td><td></td><td></td></tr> <tr> <td> adaptation_field()</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> if(adaptation_field_control == '01' adaptation_field_control == '11') {</td><td></td><td></td></tr> <tr> <td> for (i = 0; i < N; i++){</td><td></td><td></td></tr> <tr> <td> data_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td>}</td><td></td><td></td></tr> </table> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 21. (PMCTEC00100526)</p> <p>Also, as illustrated in a simplified block diagram and related text of an ATSC standard-essential patent:</p> <p>“Referring to FIG. 1, a tuner 102 selects one RF channel among broadcasting signals received through an antenna 100 under the control of a microprocessor 124. Thereupon, the tuner 102 outputs an IF (intermediate frequency) signal of the selected channel, which is converted by the IF module 104 into a baseband signal so as to then be delivered to a channel decoder 106. The channel decoder 106 converts the baseband signal to a channel signal to reconstruct data bit strings. Such reconstructed data bit strings are separated into audio data, video data, and auxiliary data by a TS (transport stream) decoder 108.”</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. at col. 2:40-50. (PMCTEC00301156)</p>	Syntax	No. of bits	Mnemonic	transport_packet(){			sync_byte	8	bslbf	transport_error_indicator	1	bslbf	payload_unit_start_indicator	1	bslbf	transport_priority	1	bslbf	PID	13	uimsbf	transport_scrambling_control	2	bslbf	adaptation_field_control	2	bslbf	continuity_counter	4	uimsbf	if(adaptation_field_control == '10' adaptation_field_control == '11'){			adaptation_field()			}			if(adaptation_field_control == '01' adaptation_field_control == '11') {			for (i = 0; i < N; i++){			data_byte	8	bslbf	}			}			}		
Syntax	No. of bits	Mnemonic																																																									
transport_packet(){																																																											
sync_byte	8	bslbf																																																									
transport_error_indicator	1	bslbf																																																									
payload_unit_start_indicator	1	bslbf																																																									
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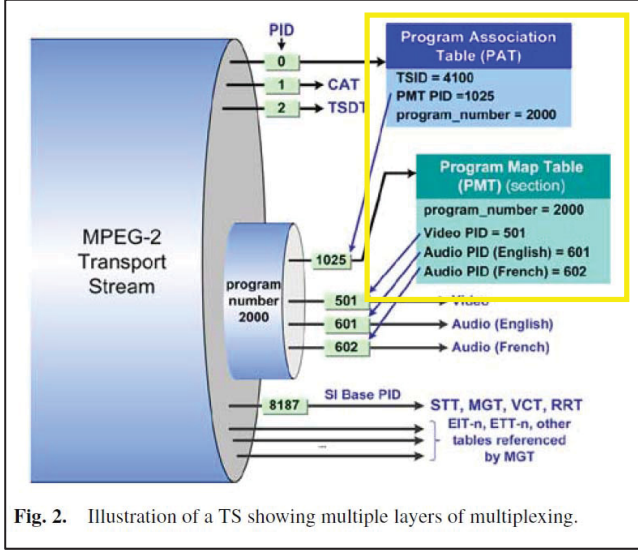
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Claim	Claim Element	Evidence of Infringement
		<p style="text-align: center;">FIG. 1</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. (PMCTEC00301153)</p>

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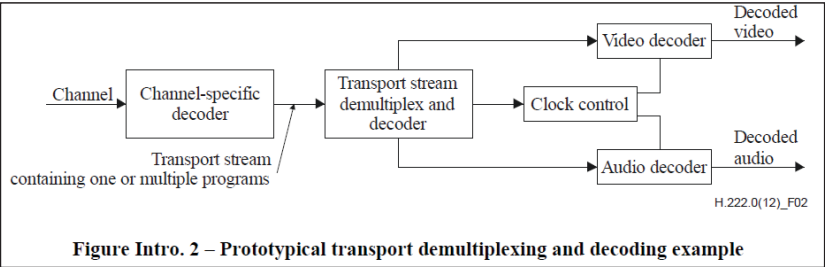
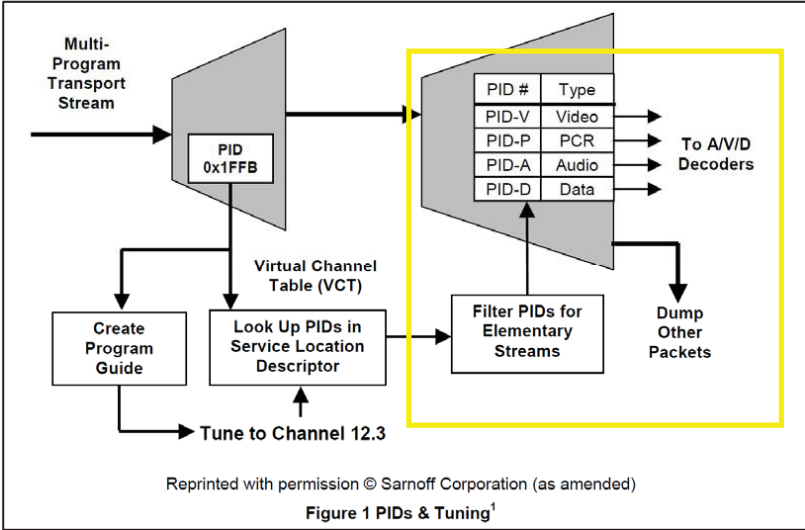
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Claim	Claim Element	Evidence of Infringement
		<p>PAT, PMT, and VCT</p>  <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP),</i> Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78 (yellow box added). (PMCTEC00000533)</p>

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Claim	Claim Element	Evidence of Infringement
		<p>Reprinted with permission © Sarnoff Corporation (as amended) Figure 1 PIDs & Tuning¹</p> <p>CEA Bulletin: PSIP Recommended Practice, CEA-CEB12-A, October 2003, Consumer Electronics Association, p. 3 (yellow box added). (PMCTEC00105410)</p>
9[e]	passing said embedded data to said first processor; and	<p>Samsung Televisions pass said embedded data to said first processor.</p> <p>For example, Samsung Televisions pass video data to a video decoding processor, and pass audio data to an audio decoding processor. In another example, the video (or audio) data is passed to various processing cores. In another example, PAT, PMT, and/or VCT data is passed to a control processor or processing core.</p>

Claim	Claim Element	Evidence of Infringement
		 <p>Figure Intro. 2 – Prototypical transport demultiplexing and decoding example</p> <p>[MPEG-2, Part 1] <i>Information Technology – Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. viii. (PMCTEC00100501)</p>  <p>Reprinted with permission © Sarnoff Corporation (as amended)</p> <p>Figure 1 PIDs & Tuning¹</p> <p><i>CEA Bulletin: PSIP Recommended Practice, CEA-CEB12-A, October 2003, Consumer</i></p>

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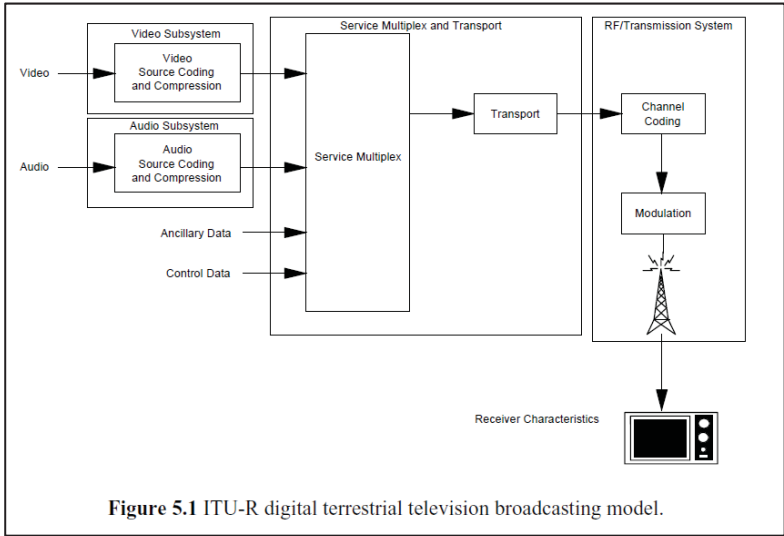
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Claim	Claim Element	Evidence of Infringement
		<p>Electronics Association, p. 3 (yellow box added). (PMCTEC00105410)</p> <p>In addition, as described in a Samsung ATSC standard-essential patent:</p> <p>“Further, the microprocessor 124 receives the auxiliary data from the TS decoder 108, whereby such auxiliary data contain the program specification information (PSI) as the table containing program related information stipulated by the MPEG2 standard, and/or the above-mentioned EPG information, etc.”</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. at col. 3:9-14. (PMCTEC00301157)</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
9[f]	selecting, by said first processor, a specific input source from said plurality of sources based on said embedded data, said embedded data causing at least one of said first processor and said second processor to commence waiting to receive said input from said specific input source.	<p>In Samsung Televisions, the first processor selects a specific input source from said plurality of sources based on said embedded data.</p> <p><u>Case 1</u></p> <p>For example, the first processor (i.e. a control processor, a video decoding processor, and/or a processing core), selects a specific input source (i.e. a selected television program/channel and/or the elementary streams corresponding to the selected television program or channel) based on the embedded data (i.e., the PSI (PAT and PMT) and/or PSIP (VCT) data).</p> <p><u>Doctrine of Equivalents</u></p> <p>To the extent that Samsung Televisions do not literally meet the “selecting, by said first processor, a specific input source from said plurality of sources based on said embedded data” claim element, Samsung Televisions meet this claim element under the doctrine of equivalents. For example, Samsung Televisions (i) perform substantially the same function of selecting the source of input data; (ii) in substantially the same way, by selecting transport stream packets corresponding to a television channel and/or program source with specific PIDs; and (iii) with substantially the same result of having selected information corresponding to a specific source.</p>

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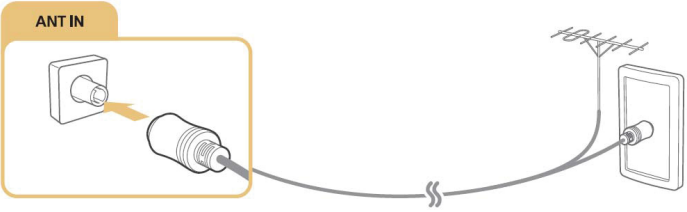
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Claim	Claim Element	Evidence of Infringement
		<p>The selection of TS packets based on PIDs corresponding to a television channel and/or program in Samsung Televisions is not substantially different from the claimed “selecting, by said first processor, a specific input source from said plurality of sources based on said embedded data.”</p> <p>In Samsung Televisions, said embedded data causes at least one of said first processor and said second processor to commence waiting to receive said input from said specific input source. For example, the embedded data discussed above causes the video and/or audio decoders to commence waiting to receive input from said specific input source discussed above.</p> <p><u>Case 2</u></p> <p>In another example, the first processor (i.e., a control processor, a video decoding processor and/or processing core), selects a specific input source (i.e., TS demultiplexer, memory buffer, register, and/or antenna input, which provides the input video data) based on said embedded data, such as, for example, video packets and their containers, and/or the PAT, PMT, and VCT data.</p> <p>In Samsung Televisions, said embedded data causes at least one of said first processor and said second processor to commence waiting to receive said input from said specific input source. For example, the embedded data discussed above causes the video and/or audio decoders to commence waiting to receive input from said specific input source discussed above.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
10	The method of claim 9, wherein the transmission signal is a broadcast signal.	<p><i>See</i> Claim 1.</p> <p>ATSC transmission signals received by Samsung Televisions are broadcast signals.</p>

Claim	Claim Element	Evidence of Infringement
		 <p>Figure 5.1 ITU-R digital terrestrial television broadcasting model.</p> <p><i>ATSC Digital Television Standard: Part 1 – Digital Television System</i>, Document A/53 Part 1: 2013, p. 18. (PMCTEC00100094)</p>
11	The method of claim 9, wherein the transmission signal is a cablecast signal.	<p>See Claim 9.</p> <p>Samsung Televisions also receive cablecast signals.</p> <p>See, e.g.,</p>

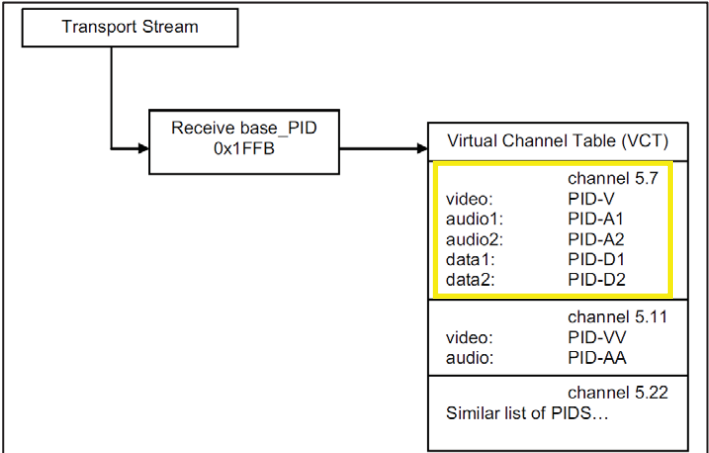
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Claim	Claim Element	Evidence of Infringement
		<p>Connecting an Antenna</p> <p>Connect a cable from an antenna or cable wall outlet to the ANT IN connector, as shown in the image below to receive broadcast signals.</p> <p> An antenna connection is not necessary if you connect a cable box or satellite receiver.</p>  <p><i>Samsung E-Manual</i> at p. 14. (PMCTEC00300014)</p>
12	The method of claim 9, wherein the transmission signal is a multi-channel signal.	<p>See Claim 9.</p> <p>In ATSC and/or cable television transmissions received by Samsung Televisions, the transmission signal is a multi-channel signal. In one example, the received multi-channel signals are transmitted on multiple frequencies. In another example, the received multi-channel signals include multiple virtual channels.</p>

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Claim	Claim Element	Evidence of Infringement
		 <p>Figure D8 Extraction of the VCT from the Transport Stream.</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable</i>, 7 August 2013, (PSIP) at p. 119 (yellow box added). (PMCTEC00104164)</p> <p>“As described by the PSIP protocol, each Transport Stream will carry a set of tables describing system information and event description. <u>For channel tuning, the first step is to collect the VCT from the Transport Stream which contains the current list of services available. Figure D8 shows this process. . .</u></p> <p>Once the VCT has been collected, a user can tune to any virtual channel present in the Transport Stream by referring to the major and minor channel numbers. Assuming that in this case, the user selects channel 5.11, then the process for decoding the audio and video components is shown in Figure D9.”</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial</i></p>


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Claim	Claim Element	Evidence of Infringement
		<i>Broadcast and Cable</i> , 7 August 2013, (PSIP) at pp. 118-19. (PMCTEC00104163-64)
13[a]	The method of claim 9, wherein said transmission signal includes mass medium programming, said method further comprising the step of	<p><i>See Claim 9.</i></p> <p>In ATSC and cable television signals received by Samsung Televisions, the transmission signal includes mass medium programming. For example, ATSC and cable television transmission signals include television programs being distributed as mass media.</p>
13[b]	outputting said mass medium programming as part of a mass medium programming presentation based on an input from said specific input source.	Samsung Televisions output said mass medium programming as part of a mass medium programming presentation based on an input from said specific input source. For example, based on the PSI (PAT and PMT) and/or PSIP (VCT) data, Samsung Televisions output a selected video television program. In another example, based on timing (PCR, DTS, and/or PTS) inputs, Samsung Televisions output a selected television program. Other examples of inputs from said specific input source include video decoding control information and containers.
14[a]	The method of claim 9, wherein said transmission signal includes data,	<p><i>See Claim 9.</i></p> <p>In ATSC and cable television signals received by Samsung Televisions, the transmission signal includes data. For example, the received transmission signals include PSIP (VCT) and/or Sequence header data. In another example, the received transmission signals include video and audio data.</p>
14[b]	said method further comprising the step of outputting said data as part of a mass medium programming presentation based on an input from said specific input source.	<p>Samsung Televisions output said data as part of a mass medium programming presentation based on an input from said specific input source.</p> <p>For example, Samsung Televisions output data, such as the channel name and number on the screen based on the VCT table input.</p>


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Claim	Claim Element	Evidence of Infringement
		 <p>Samsung JS7000 Television (yellow box added). (PMCTEC00300881)</p> <p>In another example, Samsung Televisions output audio and/or video based on the inputted packets corresponding to a television program or channel.</p>
15[a]	The method of claim 9, wherein said receiver station outputs an image,	<p><i>See Claim 9.</i></p> <p>Vizil Televisions output an image. For example, Samsung Televisions output images as part of a sequence of pictures forming a digital video. In another example, Samsung Televisions output a still image based on the received television signals.</p>

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Claim	Claim Element	Evidence of Infringement
		 <p data-bbox="516 1260 1029 1287">Samsung JS7000 Television. (PMCTEC00300881)</p> <p data-bbox="516 1314 1463 1371">In another example, Samsung Televisions display a No Signal/Check Signal Cable/Check Input image in the event that signal is lost or not obtained.</p>
15[b]	said method further comprising the step of ceasing to output at least some of said image in	Samsung Televisions also cease to output at least some of said image in response to input from said specific input source. For example, in response to an input communicating the next frame or picture of a television program, Samsung Televisions cease to output the previously displayed image.

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Claim	Claim Element	Evidence of Infringement
	response to input from said specific input source.	In the example of a “No Signal” image, Samsung Televisions will cease to output the image when a television signal is obtained based on the inputs from the selected television program or channel (specific input source).
17	The method of claim 15, further comprising the step of outputting a subsequent image based on said input from said specific input source.	<p><i>See Claim 15.</i></p> <p>Samsung Televisions output a subsequent image based on said input from said specific input source. For example, based on inputs from the selected television program or channel (such as containers for PES packets, I-, P-, B- pictures, groups of pictures, and/or sequences, and their headers and/or payloads), Samsung Televisions output a subsequent image.</p>
21	The method of claim 9, further comprising the step of determining a structure or composition of said input by processing at least a first bit of said input.	<p><i>See Claim 9.</i></p> <p>Samsung Televisions determine a structure or composition of said input by processing at least a first bit of said input. For example, Samsung Televisions determine a structure or composition of a TS packet by processing its container, including the TS packet header, which is at least a first bit of said input. In another example, Samsung Televisions determine a structure or composition of a PES packet by processing its container, including its header, which is at least a first bit of said input. In another example, Samsung Televisions determine a structure or composition of sequences, groups of pictures, pictures, slices, and/or macroblocks by processing their containers, including their headers, which are at least a first bit of said input.</p>
23	The method of claim 9, further comprising the step of selecting, by said first processor, said specific input source based on the contents of a register memory.	<p><i>See Claim 9.</i></p> <p>In Samsung Televisions, the first processor described above selects the specific input source based on the contents of a register memory. Processors in Samsung Televisions are based on ARM architecture, where operations (such as selecting a specific input source) are performed on register contents.</p> <p>“The ARM architecture is similar to a Reduced Instruction Set Computer (RISC) architecture, as it incorporates these typical RISC architecture features:</p>

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Claim	Claim Element	Evidence of Infringement
		<ul style="list-style-type: none"> • A uniform register file load/store architecture, where data processing operates only on register contents, not directly on memory contents. • Simple addressing modes, with all load/store addresses determined from register contents and instruction fields only.” <p><i>ARM Processor Architecture</i> (http://www.arm.com/products/processors/instruction-set-architectures/index.php) (PMCTEC00000290)</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “selecting, by said first processor, a specific input source from said plurality of sources based on said embedded data” claim element set forth in claim 9.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth in claim 9.</p>
26	The method of claim 9, further comprising the step of programming said receiver station to respond to said input.	<p><i>See</i> Claim 9.</p> <p>Samsung programs Samsung Televisions to respond to said input.</p> <p><u>Programming by processing PSI and/or PSIP data:</u> In one example, by receiving and processing the PSI data and/or packets (PAT and Program Map Table) and/or PSIP data and/or packets (VCT and other PSIP tables), Samsung programs its televisions to respond to said input.</p> <p><u>Programming by processing digital television containers:</u> In another example, Samsung programs its televisions to respond to said input by processing containers carrying audio, video, and other data, including, for example, PES containers and I-, P-, and B- video unit containers.</p> <p><u>Programming by original software/firmware:</u> For example, Samsung programs its televisions with multiple signal processing schemes to</p>






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Claim	Claim Element	Evidence of Infringement
		<p>process the above-discussed television programming signals by supplying instructions, including software, firmware, and/or Operating System(s) in a non-volatile memory. In another example, programming may reside inside the processors.</p> <p><u>Programming by software, firmware, and OS updates for Samsung Televisions:</u> Samsung also programs its televisions by means of software, firmware, and OS updates.</p>


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Claim	Claim Element	Evidence of Infringement
		<p>Updating the TV's Software</p> <p>(MENU/123) > MENU > Support > Software Update Try Now</p> <p>You can view your TV's software version and update it if necessary.</p> <p>Updating the TV's software to the latest version</p> <p>(MENU/123) > MENU > Support > Software Update > Update now Try Now</p> <p>You can update your TV's software by downloading the update from the Internet directly to your TV or by copying the update from a USB device that contains it to your TV.</p> <ul style="list-style-type: none">  This function requires an Internet connection.  Save the update package in the USB device's top-level folder. Otherwise, the TV will not be able to locate the update package. <p>⚠ DO NOT turn off the TV's power until the update is complete. The TV will turn off and on automatically after completing the software update. All video and audio settings return to their default settings after a software update.</p> <p>Updating the TV automatically</p> <p>(MENU/123) > MENU > Support > Software Update > Auto Update Try Now</p> <p>If the TV is connected to the Internet, you can have the TV's software update itself automatically while you are watching the TV. When the background update is completed, it is applied the next time the TV is turned on.</p> <ul style="list-style-type: none">  This function may take a longer time if another network function is running concurrently.  This function requires an Internet connection.  If you agree to the Smart Hub terms and conditions, Auto Update is set to On automatically. If you do not want the TV's software to update itself automatically, set Auto Update to Off. <p><i>Samsung E-Manual</i> at p. 26. (PMCTEC00300026)</p> <p>In another example, Samsung performs the programming step by supplying programming residing in non-volatile memory aboard a television to one or more processors.</p>

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Claim	Claim Element	Evidence of Infringement
27	The method of claim 9, further comprising the step of overwriting RAM information whose overlay time or processing time has ended based on said input.	<p><i>See Claim 9.</i></p> <p>Samsung Televisions also overwrite RAM information whose overlay time or processing time has ended based on said input. For example, Samsung Televisions overwrite video information stored in a RAM whose processing time has ended based on said input, such as, timing and synchronization signals (PCR, PTS, and/or DTS). In another example, Samsung Televisions overwrite video information stored in a RAM whose processing time has ended based on said input, such as subsequently received video packets and/or their containers.</p>
100[a]	A method of processing signals in a television receiver, said television receiver having a plurality of programmable processors, said method comprising the steps of:	<p>Samsung performs a method of processing signals in a television receiver, said television receiver having a plurality of programmable processors. Samsung Televisions are receiver stations. Examples of Samsung Televisions include the UN55JS7000 and UN65H6400 models. On information and belief, other accused models of Samsung Televisions operate similarly.</p>  <p>Samsung 4K SUHD JS7000 Series Smart TV (http://www.samsung.com/us/video/tvs/UN55JS7000FXZA) (PMCTEC00300632)</p>

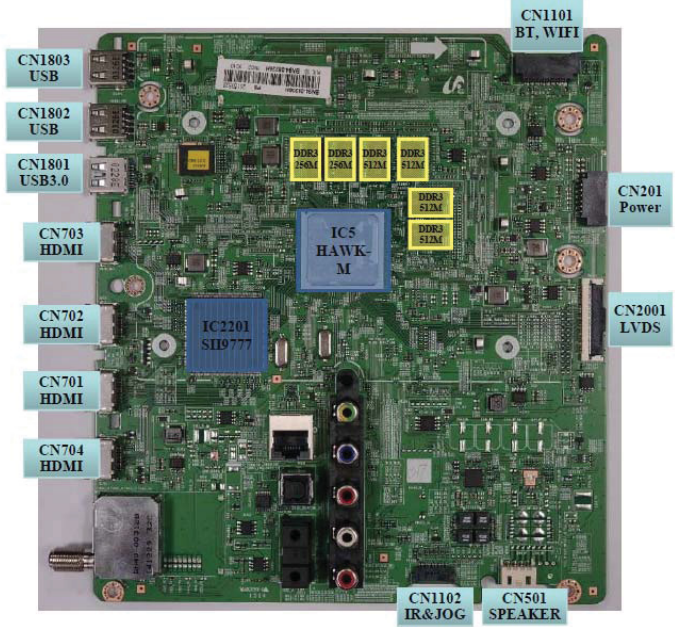
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Claim	Claim Element	Evidence of Infringement
		<p>Samsung Televisions have a plurality of programmable processors. Samsung Televisions include System-on-Chip (“SoC”) configurations that have several processing ‘cores’ and/or processing modules and devices, each of which is a processor. For example, the Samsung JS7000 television includes several Samsung SoC microchips, each microchip containing several processors. The Samsung H6400 television includes the X14H microchip with several processors. In addition, Samsung Television SoC microchips contain various processing devices for ATSC, Transport Stream, video decoding, graphics, color, and on-screen display processing.</p> <p>QUAD-CORE PROCESSOR</p> <p>Enjoy a fluid browsing experience and faster control – switching between apps, streaming content, and other media effortlessly.</p> <p>JS7000 SUHD TV Spec Sheet at p. 2. (PMCTEC00301143)</p>

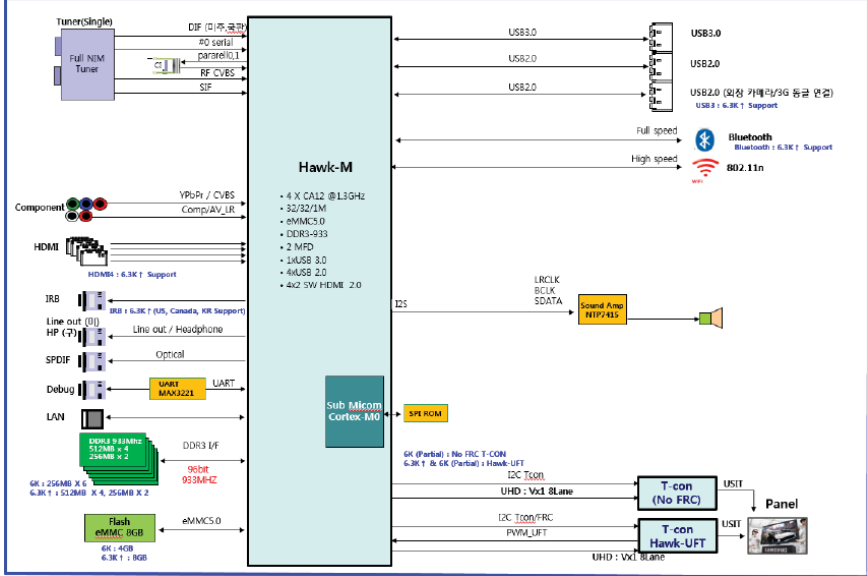
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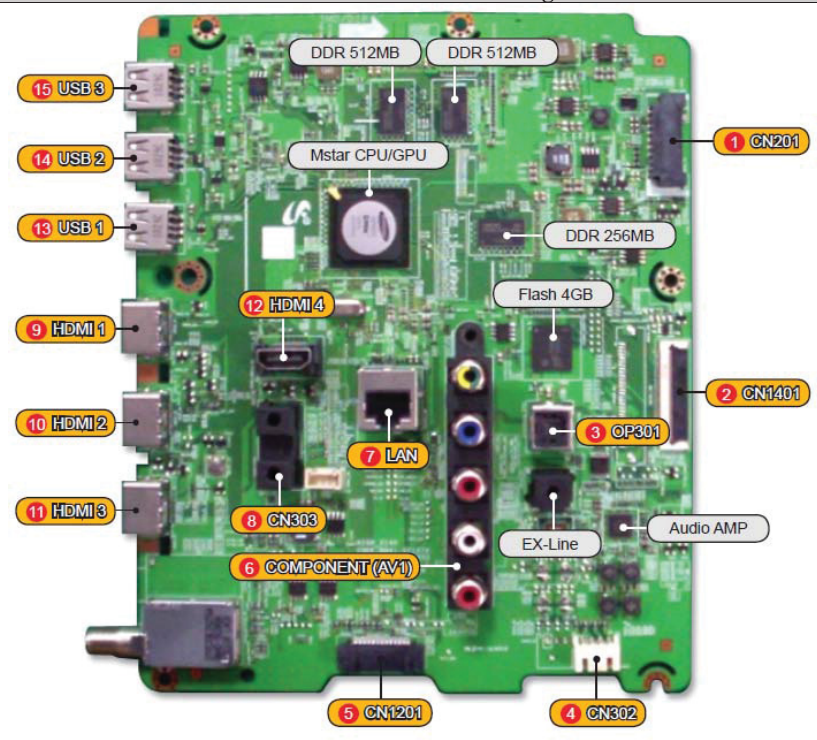
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Claim	Claim Element	Evidence of Infringement
		<div><div><div>Main Board Layout</div><p>The image shows the main circuit board of a Samsung JS7000 series television. Various components are labeled with callouts: CN1803 USB, CN1802 USB, CN1801 USB3.0, CN703 HDMI, CN702 HDMI, CN701 HDMI, CN704 HDMI, IC2201 SII9777, IC5 HAWK-M, CN1101 BT, WIFI, CN201 Power, CN2001 LVDS, CN1102 IR&JOG, and CN501 SPEAKER. The board is green with numerous electronic components, including capacitors, resistors, and integrated circuits.</p></div><p>Main circuit board in Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 32. (PMCTEC00300565)</p></div>

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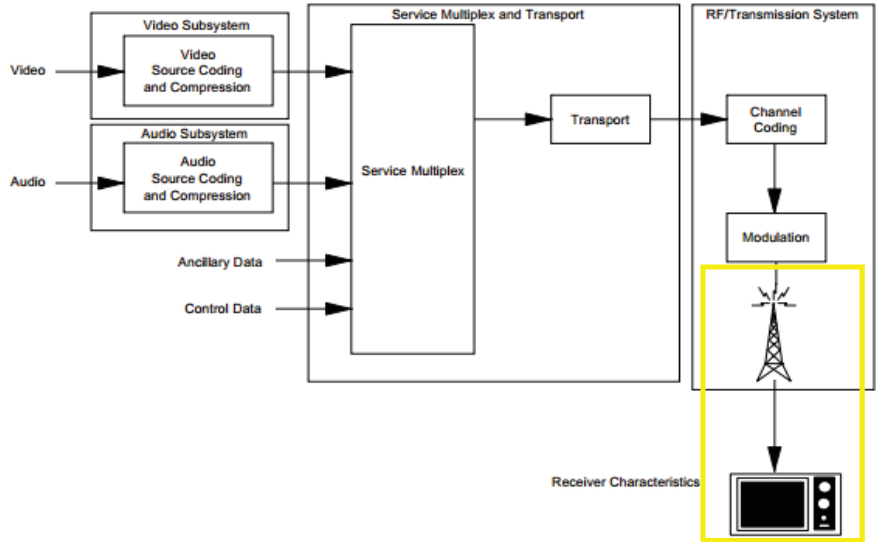
Claim	Claim Element	Evidence of Infringement
		 <p>The diagram illustrates the internal architecture of a Samsung JS7000 series television. At the center is the Hawk-M processor, which includes a 4x Cortex-A12 @1.3GHz, 32/32/1M, eMMC5.0, DDR3-933, 2 MFD, 1xUSB 3.0, 4xUSB 2.0, and 4x2.5W HDMI 2.0. To the left, various input ports are shown: Tuner(Single), Full NIM Tuner, Component, HDMI (6.3K T Support), IRB, Line out (DI), HP (7), SPDIF, Debug, and LAN. These connect to the processor via interfaces like CBF, I2S, RF CVBS, YPbPr / CVBS, CompaVAV_Ub, Line out / Headphone, Optical, UART, and LAN. Below the processor are memory components: 4GB 9.33MHz DDR3 (256MB x 4, 256MB x 2) and 8GB 9.33MHz DDR3 (256MB x 4, 256MB x 2). A Flash eMMC 5.0 (4GB, 6.3K T, RGB) is also shown. To the right, the processor connects to a Sub Micom Cortex-M0, which in turn connects to an I2S, I2C, and I2C TCON. The I2C TCON connects to a T-con (No FRC) and a T-con Hawk-UFT, which then connect to the Panel. Other connections include USB3.0, USB2.0, Full speed, High speed, Bluetooth, and BB2.11n. A Sound from WPP/415 is also shown.</p> <p>Block diagram of Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 31. (PMCTEC00300564)</p> <p>QUAD CORE PROCESSOR Quad Core eliminates lag to give you a fluid browsing experience. It enables you to switch between apps, stream content and multi-task faster. This extra power also provides faster page refreshing.</p> <p>H6400 Smart LED TV Spec Sheet at p. 2. (PMCTEC00300705)</p>

Claim	Claim Element	Evidence of Infringement
		 <p>The image shows the main circuit board of a Samsung H6400 series television. The board is green and populated with various electronic components. Key components are labeled with callouts: 1. CN201 (top right), 2. CN1401 (middle right), 3. OP301 (middle right), 4. CN302 (bottom right), 5. CN1201 (bottom center), 6. COMPONENT (AV1) (bottom center), 7. LAN (center), 8. CN303 (center), 9. HDMI 1 (left), 10. HDMI 2 (left), 11. HDMI 3 (left), 12. HDMI 4 (center), 13. USB 1 (top left), 14. USB 2 (top left), 15. USB 3 (top left). Other components labeled include: Mstar CPU/GPU (center), Flash 4GB (middle right), EX-Line (middle right), Audio AMP (middle right), DDR 512MB (top center), and DDR 256MB (middle right).</p> <p>Main circuit board in Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300621)</p>

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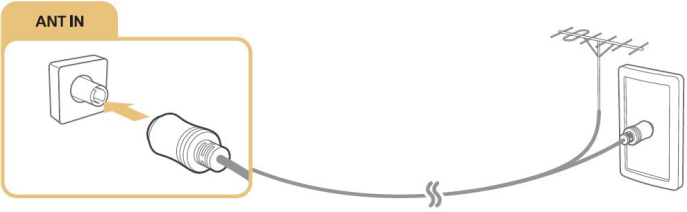
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Claim	Claim Element	Evidence of Infringement
		<p>Block diagram of Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300618)</p> <p>Doctrine of Equivalents</p> <p>To the extent that Samsung Televisions do not literally meet the “processor[s]” claim element of the asserted claims, Samsung satisfies the “processor[s]” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices, including components for general purpose, application, ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions (i) perform substantially the same function of processing; (ii) in substantially the same way, by performing operations on data; and (iii) with substantially the same result of having processed data. The processing ‘cores’, processing modules, and/or processing devices, including components for general purpose, application,</p>

Claim	Claim Element	Evidence of Infringement
		ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions are not substantially different from the claimed “processor[s].”
100[b]	receiving a television signal;	<p>Samsung Televisions receive a television signal. For example, Samsung Televisions receive ATSC-compliant television signals and cable television signals.</p>  <p>The diagram illustrates the architecture of an ATSC digital television system. It starts with 'Video' and 'Audio' inputs entering a 'Video Subsystem' (containing 'Video Source Coding and Compression') and an 'Audio Subsystem' (containing 'Audio Source Coding and Compression') respectively. These subsystems feed into a 'Service Multiplex' block, which also receives 'Ancillary Data' and 'Control Data'. The 'Service Multiplex' output goes to a 'Transport' block, which then feeds into 'Channel Coding' and 'Modulation' blocks. The 'Modulation' block output is transmitted via an antenna (represented by a tower icon) to a receiver (represented by a TV icon). A yellow box highlights the antenna and receiver components. The label 'Receiver Characteristics' is placed near the receiver icon.</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, Advanced Television Systems Committee, Inc. (yellow box added). (PMCTEC00100094)</p>

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Claim	Claim Element	Evidence of Infringement
		<p>Connecting an Antenna</p> <p>Connect a cable from an antenna or cable wall outlet to the ANT IN connector, as shown in the image below to receive broadcast signals.</p> <p> An antenna connection is not necessary if you connect a cable box or satellite receiver.</p>  <p><i>Samsung E-Manual at p. 14. (PMCTEC00300014)</i></p>
100[c]	detecting a stream of digital data in said television signal;	<p>Samsung Televisions detect a stream of digital data in said television signal. For example, Samsung Televisions detect transport stream (TS) packets in the MPEG-2 information transmission.</p> <p><u>ATSC</u></p> <p>“Decoders must include a means to look for start codes and sync bytes (transport stream) in order to begin decoding correctly, and to identify errors, erasures or insertions while decoding. The methods to identify these situations, and the actions to be taken, are not standardized.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System) at p. 15, ATSC. (PMCTEC00100091)</i></p> <p>“The digital television system employs the MPEG-2 video stream syntax for the coding</p>

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Claim	Claim Element	Evidence of Infringement
		<p>of video and the Digital Audio Compression (AC-3) Standard for the coding of audio.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p>“The digital television system employs the MPEG-2 transport stream syntax for the packetization and multiplexing of video, audio, and data signals for digital broadcasting systems (ISO/IEC 13818- 1).”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <div data-bbox="516 905 1151 1455" data-label="Diagram"> <p>The diagram illustrates the structure of an MPEG-2 Transport Stream (TS). A large blue cylinder represents the 'MPEG-2 Transport Stream'. Inside it, a smaller blue cylinder represents a 'program number 2000'. Arrows point from the TS to various components: PID 0 to Program Association Table (PAT), PID 1 to CAT, PID 2 to TSDT, PID 1025 to Program Map Table (PMT) section, PID 501 to Video, PID 601 to Audio (English), PID 602 to Audio (French), and SI Base PID 8187 to STT, MGT, VCT, RRT, and other tables referenced by MGT.</p> <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> </div> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP)</i>, Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78.</p>

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Claim	Claim Element	Evidence of Infringement
		<p>(PMCTEC00000533)</p> <p><u>MPEG-2</u></p> <p>“The Rec. ITU-T H.222.0 ISO/IEC 13818-1 transport stream coding layer allows one or more programs to be combined into a single stream. <i>Data from each elementary stream are multiplexed together with information that allows synchronized presentation of the elementary streams within a program.</i></p> <p>A transport stream consists of one or more programs. Audio and video elementary streams consist of access units.</p> <p>Elementary stream data is carried in PES packets. A PES packet consists of a PES packet header followed by packet data. PES packets are inserted into transport stream packets.</p> <p>The first byte of each PES packet header is located at the first available payload location of a transport stream packet.</p> <p>The PES packet header begins with a 32-bit start-code that also identifies the stream or stream type to which the packet data belongs. <i>The PES packet header may contain decoding and presentation time stamps (DTS and PTS).</i> The PES packet header also contains other optional fields. The PES packet data field contains a variable number of contiguous bytes from one elementary stream.</p> <p>Transport stream packets begin with a 4-byte prefix, which contains a 13-bit packet ID (PID), defined in Table 2-2. The PID identifies, via the program-specific information (PSI) tables, the contents of the data contained in the transport stream packet. Transport stream packets of one PID value carry data of one and only one elementary stream.”</p> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 10 (emphasis added). (PMCTEC00100515)</p>

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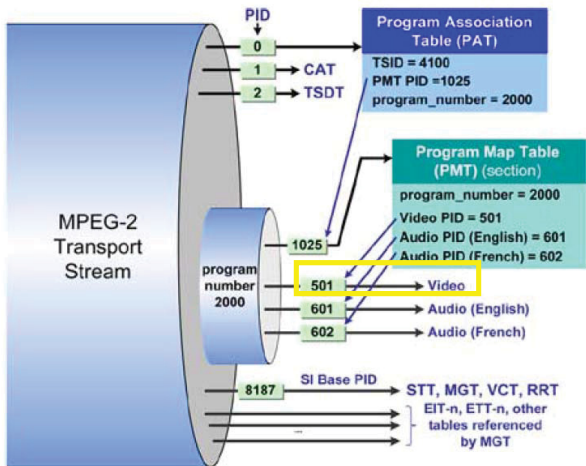
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Claim	Claim Element	Evidence of Infringement																																																									
		<p>Table 2-2 – Transport packet of this Recommendation International Standard</p> <table> <tr> <th>Syntax</th><th>No. of bits</th><th>Mnemonic</th></tr> <tr> <td>transport_packet(){</td><td></td><td></td></tr> <tr> <td> sync_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> transport_error_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> payload_unit_start_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> transport_priority</td><td>1</td><td>bslbf</td></tr> <tr> <td> PID</td><td>13</td><td>uimsbf</td></tr> <tr> <td> transport_scrambling_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> adaptation_field_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> continuity_counter</td><td>4</td><td>uimsbf</td></tr> <tr> <td> if(adaptation_field_control == '10' adaptation_field_control == '11'){</td><td></td><td></td></tr> <tr> <td> adaptation_field()</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> if(adaptation_field_control == '01' adaptation_field_control == '11') {</td><td></td><td></td></tr> <tr> <td> for (i = 0; i < N; i++){</td><td></td><td></td></tr> <tr> <td> data_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td>}</td><td></td><td></td></tr> </table> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 21. (PMCTEC00100515)</p> <p>Also, as illustrated in a simplified block diagram and related text of an ATSC standard-essential patent:</p> <p>“Referring to FIG. 1, a tuner 102 selects one RF channel among broadcasting signals received through an antenna 100 under the control of a microprocessor 124. Thereupon, the tuner 102 outputs an IF (intermediate frequency) signal of the selected channel, which is converted by the IF module 104 into a baseband signal so as to then be delivered to a channel decoder 106. The channel decoder 106 converts the baseband signal to a channel signal to reconstruct data bit strings. Such reconstructed data bit strings are separated into audio data, video data, and auxiliary data by a TS (transport stream) decoder 108.”</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. at col. 2:40-50. (PMCTEC00301156)</p>	Syntax	No. of bits	Mnemonic	transport_packet(){			sync_byte	8	bslbf	transport_error_indicator	1	bslbf	payload_unit_start_indicator	1	bslbf	transport_priority	1	bslbf	PID	13	uimsbf	transport_scrambling_control	2	bslbf	adaptation_field_control	2	bslbf	continuity_counter	4	uimsbf	if(adaptation_field_control == '10' adaptation_field_control == '11'){			adaptation_field()			}			if(adaptation_field_control == '01' adaptation_field_control == '11') {			for (i = 0; i < N; i++){			data_byte	8	bslbf	}			}			}		
Syntax	No. of bits	Mnemonic																																																									
transport_packet(){																																																											
sync_byte	8	bslbf																																																									
transport_error_indicator	1	bslbf																																																									
payload_unit_start_indicator	1	bslbf																																																									
transport_priority	1	bslbf																																																									
PID	13	uimsbf																																																									
transport_scrambling_control	2	bslbf																																																									
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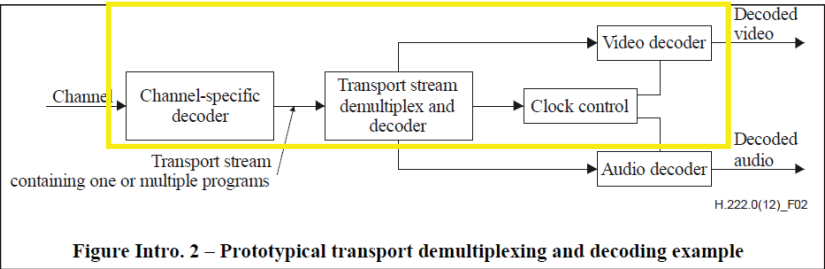
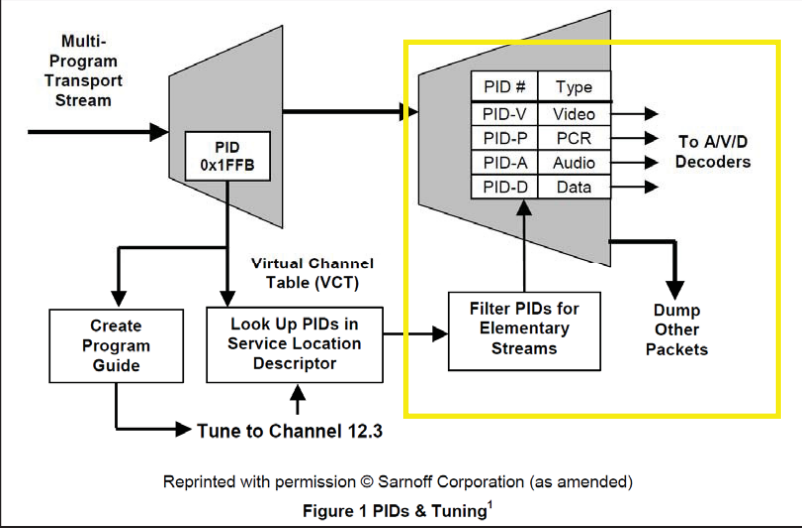
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Claim	Claim Element	Evidence of Infringement
		<p style="text-align: center;">FIG. 1</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. (PMCTEC00301153)</p>
100[d]	passing a first portion of said stream of digital data among said plurality of programmable processors in a first passing fashion;	<p>Samsung Televisions pass a first portion of said stream of digital data among said plurality of programmable processors in a first passing fashion. For example, Samsung Televisions pass video data belonging to a specific television program (first portion of said stream of digital data) among said plurality of programmable processors (from the transport stream decoder and/or demultiplexer to the video/MPEG decoder to picture upscaling/motion/on screen display processors) in a first fashion. In another example, the video packets are passed among the various processing cores and/or application specific processors. In the alternative, the first portion of said stream of digital data is the audio data belonging to a specific television program, which is also passed among said plurality of programmable processors in a first passing fashion, such as, for example, from the transport stream decoder and/or demultiplexer to an audio decoder to a digital audio processor. In the alternative, the first portion of said stream of digital data is the Program Specific Information (“PSI”) data, such as, for example, PMT tables amount the plurality of programmable processors described above.</p>

Claim	Claim Element	Evidence of Infringement
		 <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP),</i> Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78 (yellow box added). (PMCTEC00000533)</p>

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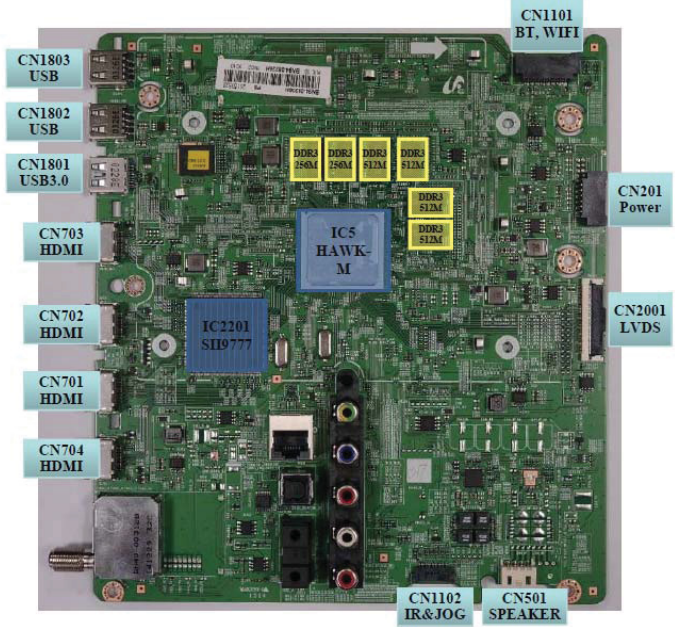
Claim	Claim Element	Evidence of Infringement
		 <p>Figure Intro. 2 – Prototypical transport demultiplexing and decoding example</p> <p>[MPEG-2, Part 1] <i>Information Technology – Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. viii (yellow box added). (PMCTEC00100501)</p>  <p>Figure 1 PIDs & Tuning¹</p> <p>Reprinted with permission © Sarnoff Corporation (as amended)</p>

CEA Bulletin: PSIP Recommended Practice, CEA-CEB12-A, October 2003, Consumer

Claim	Claim Element	Evidence of Infringement
		<p>Electronics Association, p. 3 (yellow box added). (PMCTEC00105410)</p> <p>QUAD-CORE PROCESSOR</p> <p>Enjoy a fluid browsing experience and faster control – switching between apps, streaming content, and other media effortlessly.</p> <p>JS7000 SUHD TV Spec Sheet at p. 2. (PMCTEC00301143)</p>

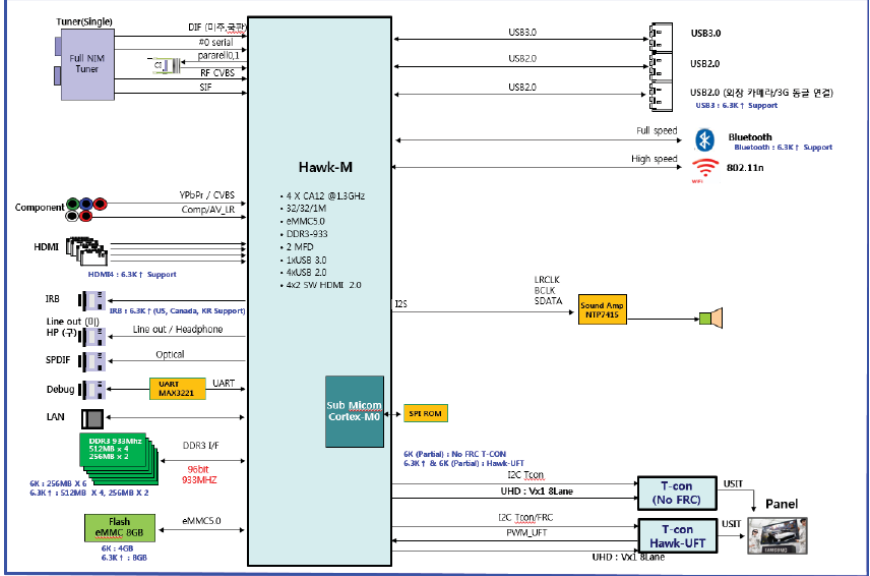
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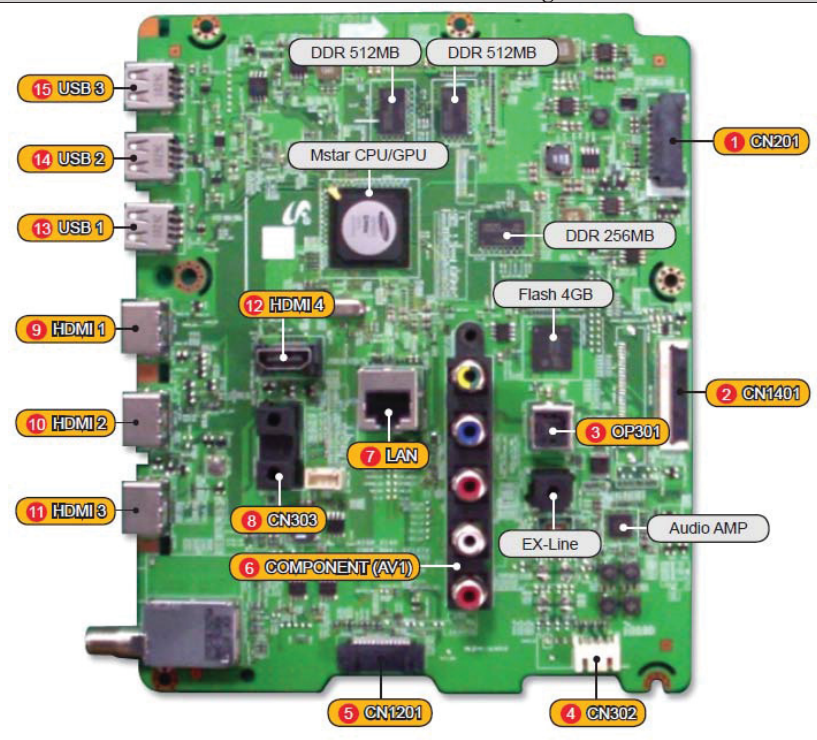
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Claim	Claim Element	Evidence of Infringement
		<div><div><div>Main Board Layout</div><p>The image shows a top-down view of a green printed circuit board (PCB) for a Samsung JS7000 series television. Various components are labeled with callouts: CN1803 USB, CN1802 USB, CN1801 USB3.0, CN703 HDMI, CN702 HDMI, CN701 HDMI, CN704 HDMI, IC2201 SII9777, IC5 HAWK-M, CN1101 BT, WIFI, CN201 Power, CN2001 LVDS, CN1102 IR&JOG, and CN501 SPEAKER. Several yellow callouts point to DDR3 memory modules, with labels like DDR3 256M and DDR3 512M.</p></div><p>Main circuit board in Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 32. (PMCTEC00300565)</p></div>

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Claim	Claim Element	Evidence of Infringement
		 <p>The diagram illustrates the internal architecture of a Samsung JS7000 series television. At the center is the Hawk-M processor, which includes a 4x CA12 @1.1GHz, 32/32/1M, eMMC5.0, DDR3-933, 2 MFD, 1xUSB 3.0, 4xUSB 2.0, and 4x2.5W HDMI 2.0. To the left, various input ports are shown: Tuner(Single), Full NIM Tuner, Component, HDMI (6.3K T Support), IRB, Line out (DI), HP (7), SPDIF, Debug, and LAN. These connect to the processor via interfaces like CBF, I2S, RF CVBS, YPbPr / CVBS, and HDM1. Below the processor, memory and storage components are detailed: 8GB 9.33MHz, 32GB x 4, 256MB x 2, 9GB, 933MHz, 6K x 256MB x 6, 6.3K T, 5.12MB x 4, 256MB x 2, and Flash eMMC 6GB, 6.3K T, RGB. To the right, the processor connects to external devices and displays. It has USB 3.0 and USB 2.0 ports, Full speed and High speed Bluetooth (Bluetooth 4.0, USB 3.0 Support), and an IRCLK, I2C, SDATA interface to a Sound from the TV. It also connects to a Sub Micom Cortex M0, which in turn connects to a SPE PCM. The processor has I2C TCON and I2C TCON FRC interfaces to T-con (No FRC) and T-con Hawk-UFT, which then connect to the Panel. The panel is labeled UHD: Vx1 8Lane.</p> <p>Block diagram of Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 31. (PMCTEC00300564)</p> <p>QUAD CORE PROCESSOR Quad Core eliminates lag to give you a fluid browsing experience. It enables you to switch between apps, stream content and multi-task faster. This extra power also provides faster page refreshing.</p> <p>H6400 Smart LED TV Spec Sheet at p. 2. (PMCTEC00300705)</p>

Claim	Claim Element	Evidence of Infringement
		<div><p>The image shows a green printed circuit board (PCB) for a Samsung H6400 series television. It is populated with various electronic components. Numbered callouts (1-15) point to specific connectors and components: 1. CN201 (top right), 2. CN1401 (middle right), 3. OP301 (middle right), 4. CN302 (bottom right), 5. CN1201 (bottom center), 6. COMPONENT (AV1) (bottom center), 7. LAN (center), 8. CN303 (center), 9. HDMI 1 (left), 10. HDMI 2 (left), 11. HDMI 3 (left), 12. HDMI 4 (center), 13. USB 1 (top left), 14. USB 2 (top left), 15. USB 3 (top left). Component labels include: DDR 512MB (top center), Mstar CPU/GPU (top center), DDR 256MB (top center), Flash 4GB (middle right), EX-Line (middle right), Audio AMP (middle right), and LAN (center). The board also features a large black heat sink for the CPU/GPU.</p></div> <p>Main circuit board in Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300621)</p>

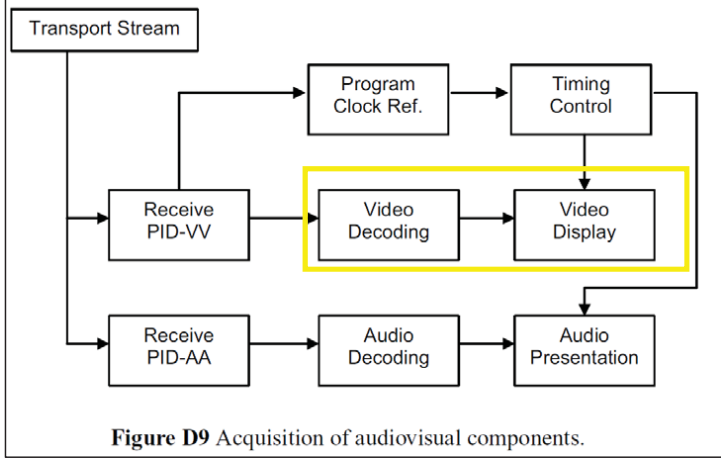
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Claim	Claim Element	Evidence of Infringement
		<p>Block diagram of Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300618)</p> <p>See also Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
100[e]	processing said passed first portion of said stream of digital data and outputting processed information from said plurality of programmable	<p>Samsung Televisions process said passed first portion of said stream of digital data and output processed information from said plurality of programmable processors. For example, the video decoders output processed information from the received and processed video packets. In another example, the motion compensation/upscaling/color correction/on screen display processors also output processed information.</p>

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Claim	Claim Element	Evidence of Infringement
	processors; and	 <p>Figure D9 Acquisition of audiovisual components.</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable</i>, 7 August 2013, (PSIP) at p. 120 (yellow box added). (PMCTEC00104165)</p> <p>In another example, where the first portion of said stream of digital data is audio, audio data is processed by the audio decoder(s) and output from the audio decoder(s) to the speakers and/or to additional audio processors, such as digital audio processors.</p> <p>In another example, where the first portion of said stream of digital data is PSI data, such as the Program Map Tables, PSI tables are processed by Samsung Televisions.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
100[f]	passing a control portion of said stream of digital	Samsung Televisions pass a control portion of said stream of digital data to a programmable control processor to cause programming of at least one processor of said plurality of

Claim	Claim Element	Evidence of Infringement												
	data to a programmable control processor to cause programming of at least one processor of said plurality of programmable processors to process said passed first portion of said stream of digital data;	<p>programmable processors to process said passed first portion of said stream of digital data. For example, Samsung Televisions pass the Program Association Table (“PAT”) packets, Program Map Table (“PMT”) packets, and/or Virtual Channel Table (“VCT”) packets to a control processor (such as, for example, the TS decoder/demultiplexer and/or a processing core). The PAT, PMT, and/or VCT control data causes programming of at least one processor of said plurality of programmable processors to process the packets carrying the video portion of a television program.</p> <p style="text-align: center;">Table 2-28 – Program-specific information</p> <table><tr><th>Structure Name</th><th>Stream Type</th><th>Reserved PID #</th><th>Description</th></tr><tr><td>Program association table</td><td>Rec. ITU-T H.222.0 ISO/IEC 13818-1</td><td>0x00</td><td>Associates program number and program map table PID</td></tr><tr><td>Program map table</td><td>Rec. ITU-T H.222.0 ISO/IEC 13818-1</td><td>Assigned in the PAT</td><td>Specifies PID values for components of one or more programs</td></tr></table> <p>[MPEG-2, Part 1] <i>Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. 45. (PMCTEC00100550)</p> <p style="text-align: center;">5. TABLE HIERARCHY AND STRUCTURE REQUIREMENTS</p> <p>The Program and System Information Protocol (PSIP) is a collection of hierarchically arranged tables for describing system information and program guide data. These tables are packetized and multiplexed according to the transport protocol detailed in ISO/IEC 13818-1 [13].</p> <p>The base PID (base_PID) is an explicitly defined value (0x1FFB) used to identify the TS packets for the following tables for terrestrial and cable systems:</p> <ul style="list-style-type: none">• The System Time Table (STT)• Master Guide Table (MGT)• Rating Region Table (RRT)• Virtual Channel Table (VCT)• The optional Directed Channel Change Table (DCCT)• The optional Directed Channel Change Selection Code Table (DCCSCT) <p>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial</p>	Structure Name	Stream Type	Reserved PID #	Description	Program association table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	0x00	Associates program number and program map table PID	Program map table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	Assigned in the PAT	Specifies PID values for components of one or more programs
Structure Name	Stream Type	Reserved PID #	Description											
Program association table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	0x00	Associates program number and program map table PID											
Program map table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	Assigned in the PAT	Specifies PID values for components of one or more programs											

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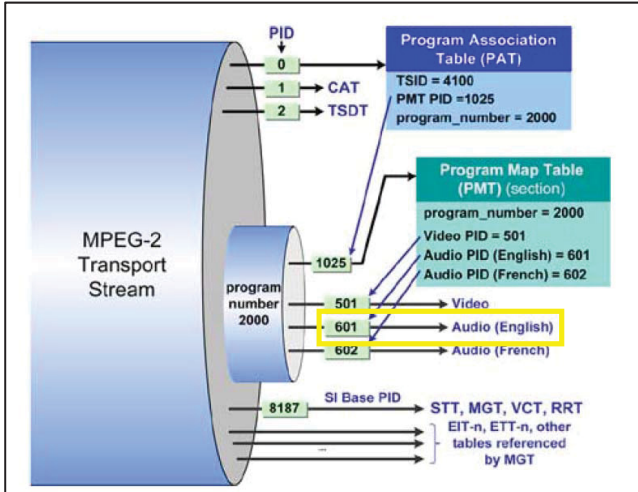
Claim	Claim Element	Evidence of Infringement																				
		<p>Broadcast and Cable, 7 August 2013, (PSIP) at p. 20. (PMCTEC00104065)</p> <div><div>Transport Stream</div><div>Receive base_PID 0x1FFB</div><div>Virtual Channel Table (VCT)<table><tr><td>video:</td><td>channel 5.7</td></tr><tr><td>audio1:</td><td>PID-V</td></tr><tr><td>audio2:</td><td>PID-A1</td></tr><tr><td>data1:</td><td>PID-D1</td></tr><tr><td>data2:</td><td>PID-D2</td></tr><tr><td>video:</td><td>channel 5.11</td></tr><tr><td>audio:</td><td>PID-VV</td></tr><tr><td>audio:</td><td>PID-AA</td></tr><tr><td></td><td>channel 5.22</td></tr><tr><td></td><td>Similar list of PIDS...</td></tr></table></div><p>Figure D8 Extraction of the VCT from the Transport Stream.</p><p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable</i>, 7 August 2013, (PSIP) at p. 119. (PMCTEC00104164)</p></div>	video:	channel 5.7	audio1:	PID-V	audio2:	PID-A1	data1:	PID-D1	data2:	PID-D2	video:	channel 5.11	audio:	PID-VV	audio:	PID-AA		channel 5.22		Similar list of PIDS...
video:	channel 5.7																					
audio1:	PID-V																					
audio2:	PID-A1																					
data1:	PID-D1																					
data2:	PID-D2																					
video:	channel 5.11																					
audio:	PID-VV																					
audio:	PID-AA																					
	channel 5.22																					
	Similar list of PIDS...																					

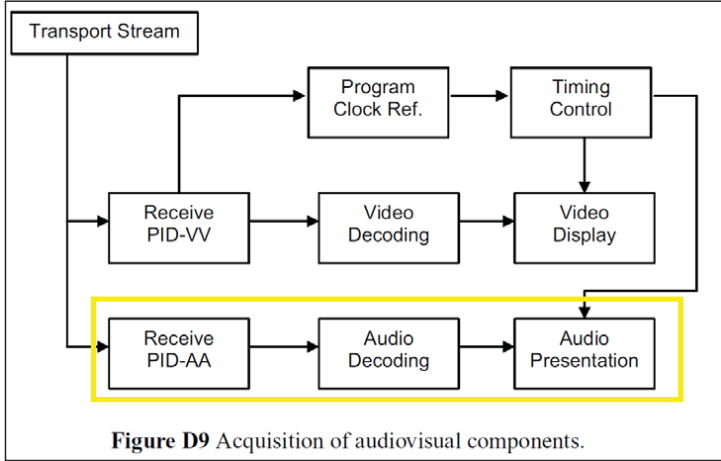
Claim	Claim Element	Evidence of Infringement
		<p>Reprinted with permission © Sarnoff Corporation (as amended)</p> <p>Figure 1 PIDs & Tuning¹</p> <p><i>CEA Bulletin: PSIP Recommended Practice, CEA-CEB12-A, October 2003, © Consumer Electronics Association 2003, p. 3 (yellow box added). (PMCTEC00105410)</i></p> <p>In another example, the control portion of said stream of digital data includes information received in the headers of various received containers, including TS packets, PES packets, and Sequence, GOP, Picture, Slice, and Macroblock containers used to process, decode, synchronize, and output audio and/or video.</p> <p>In the alternative, the control portion of said stream of digital data is additional PSI data, such as, for example, Program Association Tables and/or additional PMT.</p> <p>In addition, as described in a Samsung ATSC standard-essential patent:</p>

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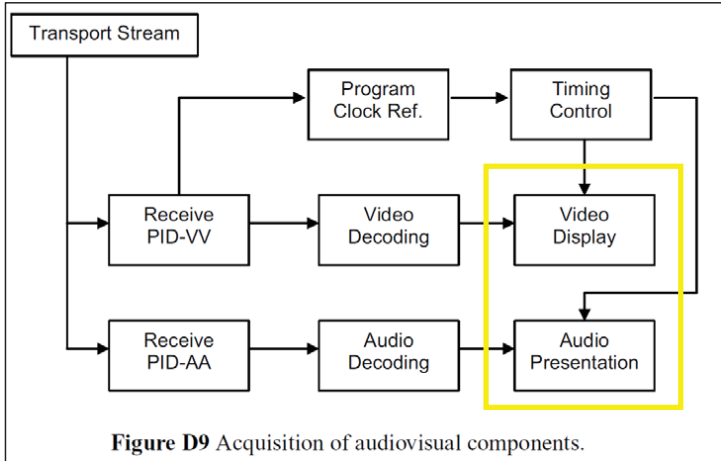
Claim	Claim Element	Evidence of Infringement
		<p>“Further, the microprocessor 124 receives the auxiliary data from the TS decoder 108, whereby such auxiliary data contain the program specification information (PSI) as the table containing program related information stipulated by the MPEG2 standard, and/or the above-mentioned EPG information, etc.”</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. at col. 3:9-14. (PMCTEC00301157)</p> <p><u>Doctrine of Equivalents</u></p> <p>To the extent that Samsung Televisions do not literally meet the “control processor” claim element of the asserted claims, Samsung satisfies the “control processor” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices programmed and/or configured to control processors, cores, modules, devices, or functionality in Samsung Televisions (i) perform substantially the same function of processing information to control a processor, apparatus, module, device, and/or functionality; (ii) in substantially the same way, by computing and/or processing information to control a processor, apparatus, module, device, and/or functionality; and (iii) with substantially the same result of controlling a processor, apparatus, module, device, and/or functionality. The processing ‘cores’, processing modules, and/or processing devices in Samsung Televisions programmed and/or configured to control processors, cores, modules, devices, and/or functionalities are not substantially different from the claimed “control processor.”</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
100[g]	controlling, with said programmable control processor, the passing of a second portion of said stream of digital data among said plurality of programmable processors	<p>Samsung Televisions control, with said programmable control processor, the passing of a second portion of said stream of digital data among said plurality of programmable processors in a second passing fashion or the outputting of second processed information from said plurality of programmable processors in response to said passed control portion. For example, Samsung Televisions control with the TS decoder/demultiplexer, processing core, and/or a decoding controller, the passing of the packets carrying audio data (second portion of said stream of digital data) among said plurality of programmable processors in a second passing</p>

Claim	Claim Element	Evidence of Infringement
	in a second passing fashion or the outputting of second processed information from said plurality of programmable processors in response to said passed control portion; and	<p>fashion, in response to the passed PAT/PMT/VCT control data (and/or the control data in the containers discussed above), such as, for example, from the transport stream decoder and/or demultiplexer to an audio decoder and/or to a digital audio processor. In another example, Samsung Televisions control, with the TS decoder/demultiplexer, processing core, and/or a decoding controller the outputting of second processed information (processed audio) from said plurality of programmable processors in response to the passed PAT/PMT/VCT control data (and/or the control data in the containers discussed above). In the alternative, the second portion of said stream of digital data is the video data belonging to a specific television program or channel, which is also passed among said plurality of programmable processors in a second passing fashion, such as, for example, from the transport stream decoder and/or demultiplexer to the video/MPEG decoder to picture upscaling/motion/on screen display processors.</p>  <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP),</i></p>

Claim	Claim Element	Evidence of Infringement
		<p>Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78 (yellow box added). (PMCTEC00000533)</p>  <p>Figure D9 Acquisition of audiovisual components.</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable</i>, 7 August 2013, (PSIP) at p. 120 (yellow box added). (PMCTEC00104165)</p> <p>In the alternative, where the first portion is PSI data, including PMT tables, and the control portion is the PAT tables, and/or additional PMT tables, the second portion of said stream of digital data is the video, audio, and PCR packets and data, which are passed among the plurality of programmable processors in a second passing fashion, and/or output in response to the above control portion.</p> <p>In addition to the exemplary processors identified above, including those from the H6400 and similar models, Samsung Televisions, such as the JS7000 and similar models, also include multi-core Systems-on-Chip ("SoC"), such as the X14H SoC, the Hawk-M SoC, and the Hawk-</p>


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Claim	Claim Element	Evidence of Infringement
		<p>UFT SoC. In Samsung Televisions with multi-core SoCs, the passing of data may occur between cores on a single SoC; between core(s) of one SoC (such as the Hawk-M) and core(s) of another SoC (such as the Hawk-UFT); and/or between two SoCs.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “control processor” claim element set forth above.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
100[h]	outputting viewable or audible information to a subscriber based on said step of controlling.	<p>Samsung Televisions output viewable or audible information to a subscriber based on said step of controlling. For example, Samsung Televisions output video and/or audio portions of a received television program or channel based on said step of controlling described above.</p>  <p>Figure D9 Acquisition of audiovisual components.</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable, 7 August 2013, (PSIP) at p. 120 (yellow box added).</i></p>

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Claim	Claim Element	Evidence of Infringement
		(PMCTEC00104165)
102[a]	A method of processing signals in a video receiver, said video receiver having a plurality of programmable processors, said method comprising the steps of:	<p>Samsung performs a method of processing signals in a video receiver, said video receiver having a plurality of programmable processors. Samsung Televisions are receiver stations. Examples of Samsung Televisions include the UN55JS7000 and UN65H6400 models. On information and belief, other accused models of Samsung Televisions operate similarly.</p>  <p>Samsung 4K SUHD JS7000 Series Smart TV (http://www.samsung.com/us/video/tvs/UN55JS7000FXZA) (PMCTEC00300632)</p> <p>Samsung Televisions have a plurality of programmable processors. Samsung Televisions include System-on-Chip (“SoC”) configurations that have several processing ‘cores’ and/or processing modules and devices, each of which is a processor. For example, the JS7000 television includes HAWK-M and HAWK-UFT SoC microchips each of which contains several processors. The H6400 television includes an X14H SoC microchip with several processors. Other models, such as for example, C9000, include multiple SoC microchips, each</p>

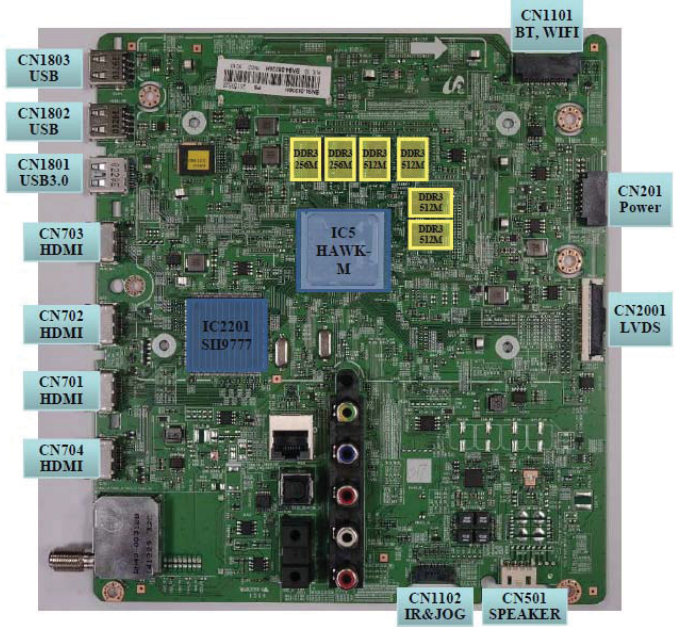
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Claim	Claim Element	Evidence of Infringement
		<p>containing one or more processors. In addition, Samsung Television SoC microchips contain various processing devices for ATSC, Transport Stream, video decoding, graphics, color, and on-screen display processing.</p> <p>QUAD-CORE PROCESSOR</p> <p>Enjoy a fluid browsing experience and faster control – switching between apps, streaming content, and other media effortlessly.</p> <p>JS7000 SUHD TV Spec Sheet at p. 2. (PMCTEC00301143)</p>

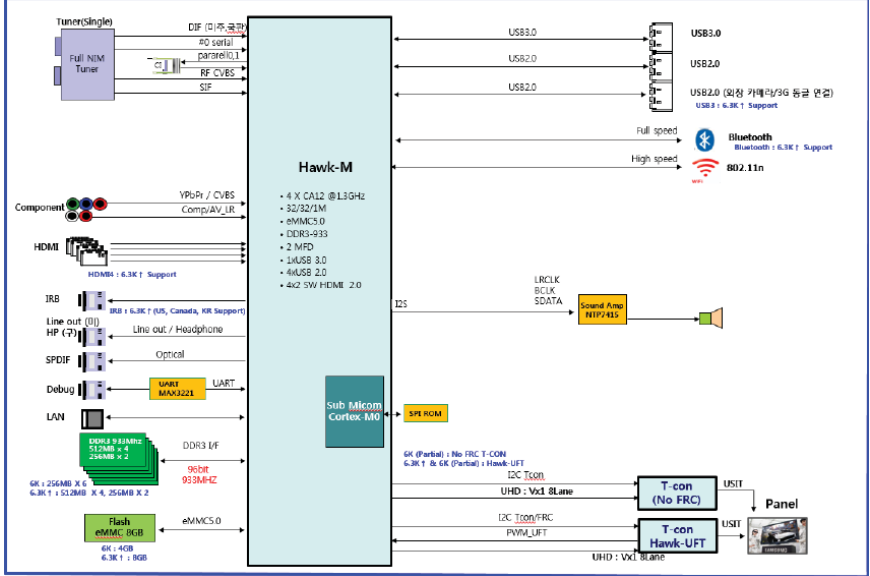
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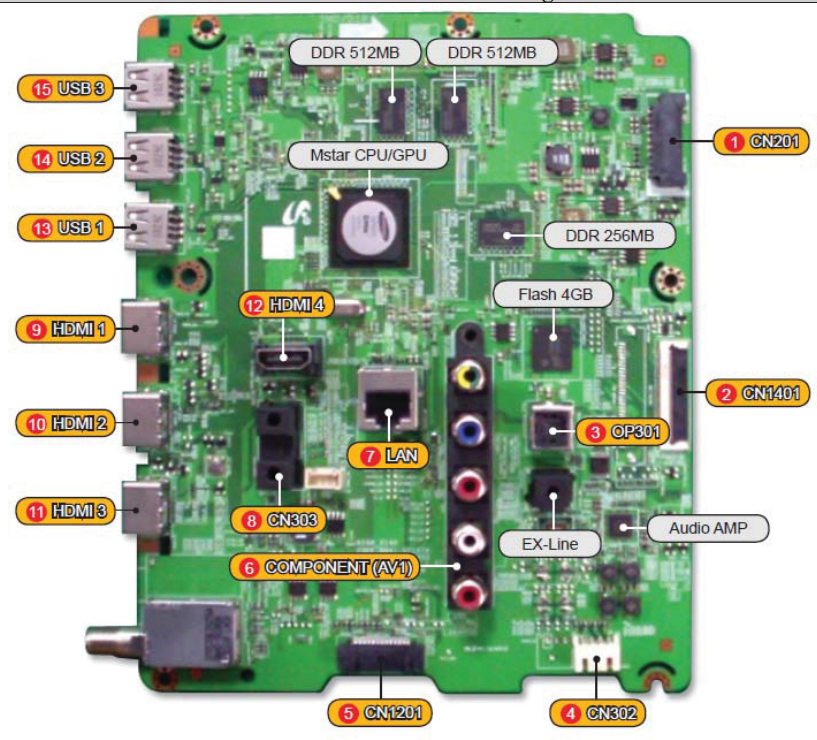
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Claim	Claim Element	Evidence of Infringement
		<div><div><div>Main Board Layout</div><p>The image shows the main circuit board of a Samsung JS7000 series television. It is a green printed circuit board (PCB) populated with various electronic components. Key components labeled include: IC2201 (SI119777) at the top center, IC5 (HAWK-M) in the middle, and several DDR3 SDRAM modules (2GB and 1GB) on the right side. Connectors are labeled on the left (CN1803 USB, CN1802 USB, CN1801 USB3.0, CN703 HDMI, CN702 HDMI, CN701 HDMI, CN704 HDMI) and on the right (CN1101 BT, WIFI, CN201 Power, CN2001 LVDS). Other labels include CN1102 IR&JOG and CN501 SPEAKER at the bottom right.</p></div><p>Main circuit board in Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 32. (PMCTEC00300565)</p></div>

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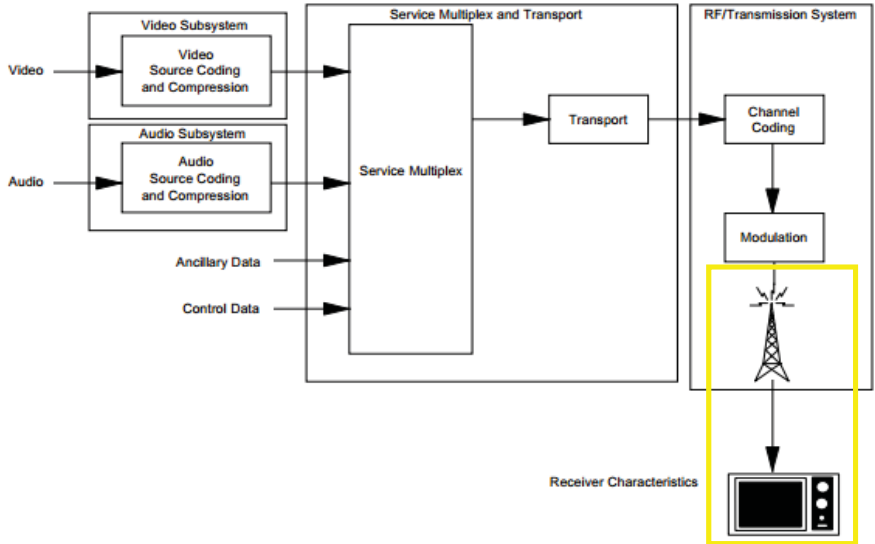
Claim	Claim Element	Evidence of Infringement
		 <p>The diagram illustrates the internal architecture of a Samsung JS7000 series television. At the center is the Hawk-M processor, which includes a 4x Cortex-A12 @1.3GHz, 32/32/1M, eMMC5.0, DDR3-933, 2 MFD, 1xUSB 3.0, 4xUSB 2.0, and 4x2.5W HDMI 2.0. To the left, various input and output ports are shown: Tuner(Single), Full NIM Tuner, Component, HDMI (HDMI 1.4 Support), IRB, Line out (D), HP (7), SPDIF, Debug, LAN, and Flash. To the right, the diagram shows USB 3.0 and USB 2.0 ports, Bluetooth, and a panel. The bottom section details the memory and storage components, including 4GB RAM (2GB x 2), 32GB eMMC (8GB x 4), and 256GB eMMC (8GB x 4).</p> <p>Block diagram of Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 31. (PMCTEC00300564)</p> <p>QUAD CORE PROCESSOR Quad Core eliminates lag to give you a fluid browsing experience. It enables you to switch between apps, stream content and multi-task faster. This extra power also provides faster page refreshing.</p> <p>H6400 Smart LED TV Spec Sheet at p. 2. (PMCTEC00300705)</p>

Claim	Claim Element	Evidence of Infringement
		<div><p>The image shows a green printed circuit board (PCB) for a Samsung H6400 series television. It is populated with various electronic components. Numbered callouts (1-15) point to specific connectors and components: 1. CN201 (top right), 2. CN1401 (middle right), 3. OP301 (middle right), 4. CN302 (bottom right), 5. CN1201 (bottom center), 6. COMPONENT (AV1) (bottom center), 7. LAN (center), 8. CN303 (center), 9. HDMI 1 (left), 10. HDMI 2 (left), 11. HDMI 3 (left), 12. HDMI 4 (center), 13. USB 1 (top left), 14. USB 2 (top left), 15. USB 3 (top left). Component labels include: DDR 512MB (top center), Mstar CPU/GPU (top center), DDR 256MB (top center), Flash 4GB (middle right), Audio AMP (middle right), and EX-Line (middle right).</p></div> <p>Main circuit board in Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300621)</p>

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Claim	Claim Element	Evidence of Infringement
		<div><p>The diagram illustrates the internal architecture of a Samsung H6400 series television. At the center is the X14H processor, which is a Quad Cortex-A9 (1.15GHz) with 32/32/1M architecture, eMMC4.5, DDR3-1866, MaliT450 (450MHz), USB 3.0, Ethernet (MAC.10/100), CVBS AFE, 3channel AFE, Audio Codec, Ch. Demod., TS : 1 parallel In/Out, 1 parallel, and HDMI1.4 Rx. The processor is connected to various external components and interfaces:</p><ul style="list-style-type: none">Inputs: DUAL NIM, FULL NIM, HALF NIM, HDMI x 4, SCART, COMPONENT1/AV1, and COMPT VPhPr AV1 CVBS.Outputs: SC CVBS_OUT, SC L/R_OUT_X12, MONI HP L/R_OUT, T2S, SPDIF_OUT, and HP_LINE_L/R_OUT.Storage and Memory: eMMC4.5, eMMC NAND 4GB, DDR3 256MB, and DDR3 512MB.Connectivity: USB 3.0, USB 2.0, USB 2.0 (3.0 port), Ethernet, LAN, and a Function BT module.Other Components: PCM_CONTROL, BUFFER, X12 PCM_CONTROL, PCM_DATA<0:7>, PCM_ADDR<0:14>, TS0_DATA<0:7>, CH_DATA<0:7>, CH_DATA2<0>, CH_DATA2<0:7>, CH_DATA1<0:7>, DIF+/-, TUNER CVBS, HDMIX RX (CEC/ARC), SC CVBS_IN, SC RGB_IN, TUNER_SIF, and COMPT AV1 L/R_IN.</div> <p>Block diagram of Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300618)</p> <p>Doctrine of Equivalents</p> <p>To the extent that Samsung Televisions do not literally meet the “processor[s]” claim element of the asserted claims, Samsung satisfies the “processor[s]” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices, including components for general purpose, application, ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions (i) perform substantially the same function of processing; (ii) in substantially the same way, by performing operations on data; and (iii) with substantially the same result of having processed data. The processing ‘cores’, processing modules, and/or processing devices, including components for general purpose, application,</p>

Claim	Claim Element	Evidence of Infringement
		ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions are not substantially different from the claimed “processor[s].”
102[b]	receiving a video signal;	<p>Samsung Televisions receive a video signal. For example, Samsung Televisions receive ATSC-compliant video signals.</p>  <p>The diagram illustrates the architecture of an ATSC digital television system. It starts with 'Video' and 'Audio' inputs entering a 'Video Subsystem' (containing 'Video Source Coding and Compression') and an 'Audio Subsystem' (containing 'Audio Source Coding and Compression') respectively. These subsystems feed into a 'Service Multiplex' block, which also receives 'Ancillary Data' and 'Control Data'. The 'Service Multiplex' output goes to a 'Transport' block, which then feeds into 'Channel Coding' and 'Modulation' blocks within the 'RF/Transmission System'. The output of the 'Modulation' block is shown as a radio tower icon, which is enclosed in a yellow box. Below the tower, a television set icon is labeled 'Receiver Characteristics', also enclosed in the yellow box.</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, Advanced Television Systems Committee, Inc. (yellow box added). (PMCTEC00100094)</p>

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Claim	Claim Element	Evidence of Infringement
		<p>Connecting an Antenna</p> <p>Connect a cable from an antenna or cable wall outlet to the ANT IN connector, as shown in the image below to receive broadcast signals.</p> <p>An antenna connection is not necessary if you connect a cable box or satellite receiver.</p> <p><i>Samsung E-Manual at p. 14. (PMCTEC00300014)</i></p> <p>In another example, the received video signals are the video portion of the ATSC signals.</p>
102[c]	detecting a stream of digital data in said video signal;	<p>Samsung Televisions detect a stream of digital data in said video signal. For example, Samsung Televisions detect transport stream (TS) packets in the MPEG-2 information transmission.</p> <p><u>ATSC</u></p> <p>“Decoders must include a means to look for start codes and sync bytes (transport stream) in order to begin decoding correctly, and to identify errors, erasures or insertions while decoding. The methods to identify these situations, and the actions to be taken, are not standardized.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System) at p. 15, ATSC. (PMCTEC00100091)</i></p>

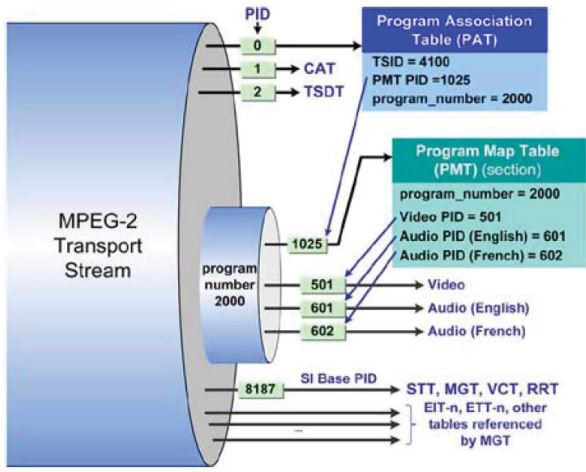
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Claim	Claim Element	Evidence of Infringement
		<p data-bbox="591 625 1453 682">“The digital television system employs the MPEG-2 video stream syntax for the coding of video and the Digital Audio Compression (AC-3) Standard for the coding of audio.”</p> <p data-bbox="591 707 1260 764"><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p data-bbox="591 789 1453 873">“The digital television system employs the MPEG-2 transport stream syntax for the packetization and multiplexing of video, audio, and data signals for digital broadcasting systems (ISO/IEC 13818- 1).”</p> <p data-bbox="591 898 1260 955"><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p>

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Claim	Claim Element	Evidence of Infringement
		 <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP),</i> Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78. (PMCTEC00000533)</p> <p><u>MPEG-2</u></p> <p>“The Rec. ITU-T H.222.0 ISO/IEC 13818-1 transport stream coding layer allows one or more programs to be combined into a single stream. <i>Data from each elementary stream are multiplexed together with information that allows synchronized presentation of the elementary streams within a program.</i></p> <p>A transport stream consists of one or more programs. Audio and video elementary streams consist of access units.</p>

Claim	Claim Element	Evidence of Infringement
		<p>Elementary stream data is carried in PES packets. A PES packet consists of a PES packet header followed by packet data. PES packets are inserted into transport stream packets.</p> <p>The first byte of each PES packet header is located at the first available payload location of a transport stream packet.</p> <p>The PES packet header begins with a 32-bit start-code that also identifies the stream or stream type to which the packet data belongs. <i>The PES packet header may contain decoding and presentation time stamps (DTS and PTS).</i> The PES packet header also contains other optional fields. The PES packet data field contains a variable number of contiguous bytes from one elementary stream.</p> <p>Transport stream packets begin with a 4-byte prefix, which contains a 13-bit packet ID (PID), defined in Table 2-2. The PID identifies, via the program-specific information (PSI) tables, the contents of the data contained in the transport stream packet. Transport stream packets of one PID value carry data of one and only one elementary stream.”</p> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 10 (emphasis added). (PMCTEC00100515)</p>

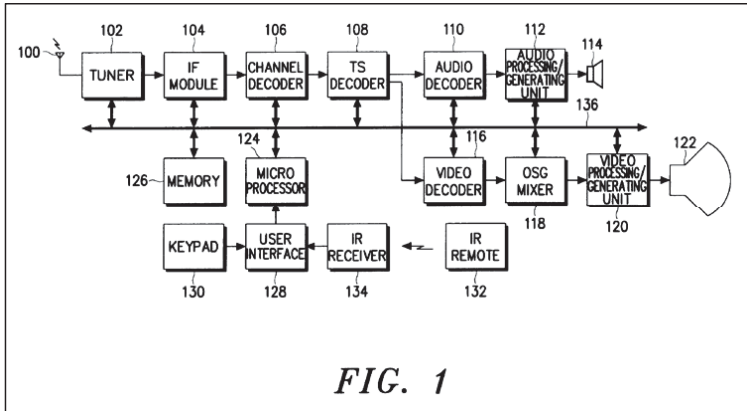
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Claim	Claim Element	Evidence of Infringement																																																									
		<p>Table 2-2 – Transport packet of this Recommendation International Standard</p> <table> <tr> <th>Syntax</th><th>No. of bits</th><th>Mnemonic</th></tr> <tr> <td>transport_packet(){</td><td></td><td></td></tr> <tr> <td> sync_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> transport_error_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> payload_unit_start_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> transport_priority</td><td>1</td><td>bslbf</td></tr> <tr> <td> PID</td><td>13</td><td>uimsbf</td></tr> <tr> <td> transport_scrambling_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> adaptation_field_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> continuity_counter</td><td>4</td><td>uimsbf</td></tr> <tr> <td> if(adaptation_field_control == '10' adaptation_field_control == '11'){</td><td></td><td></td></tr> <tr> <td> adaptation_field()</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> if(adaptation_field_control == '01' adaptation_field_control == '11') {</td><td></td><td></td></tr> <tr> <td> for (i = 0; i < N; i++){</td><td></td><td></td></tr> <tr> <td> data_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td>}</td><td></td><td></td></tr> </table> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 21. (PMCTEC00100526)</p> <p>In another example, Samsung Televisions detect a stream of digital data (TS packets carrying video) in the ATSC-compliant MPEG-2 stream.</p> <p>Also, as illustrated in a simplified block diagram and related text of an ATSC standard-essential patent:</p> <p>“Referring to FIG. 1, a tuner 102 selects one RF channel among broadcasting signals received through an antenna 100 under the control of a microprocessor 124. Thereupon, the tuner 102 outputs an IF (intermediate frequency) signal of the selected channel, which is converted by the IF module 104 into a baseband signal so as to then be delivered to a channel decoder 106. The channel decoder 106 converts the baseband signal to a channel signal to reconstruct data bit strings. Such reconstructed data bit strings are separated into audio data, video data, and auxiliary data by a TS (transport stream) decoder 108.”</p>	Syntax	No. of bits	Mnemonic	transport_packet(){			sync_byte	8	bslbf	transport_error_indicator	1	bslbf	payload_unit_start_indicator	1	bslbf	transport_priority	1	bslbf	PID	13	uimsbf	transport_scrambling_control	2	bslbf	adaptation_field_control	2	bslbf	continuity_counter	4	uimsbf	if(adaptation_field_control == '10' adaptation_field_control == '11'){			adaptation_field()			}			if(adaptation_field_control == '01' adaptation_field_control == '11') {			for (i = 0; i < N; i++){			data_byte	8	bslbf	}			}			}		
Syntax	No. of bits	Mnemonic																																																									
transport_packet(){																																																											
sync_byte	8	bslbf																																																									
transport_error_indicator	1	bslbf																																																									
payload_unit_start_indicator	1	bslbf																																																									
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transport_scrambling_control	2	bslbf																																																									
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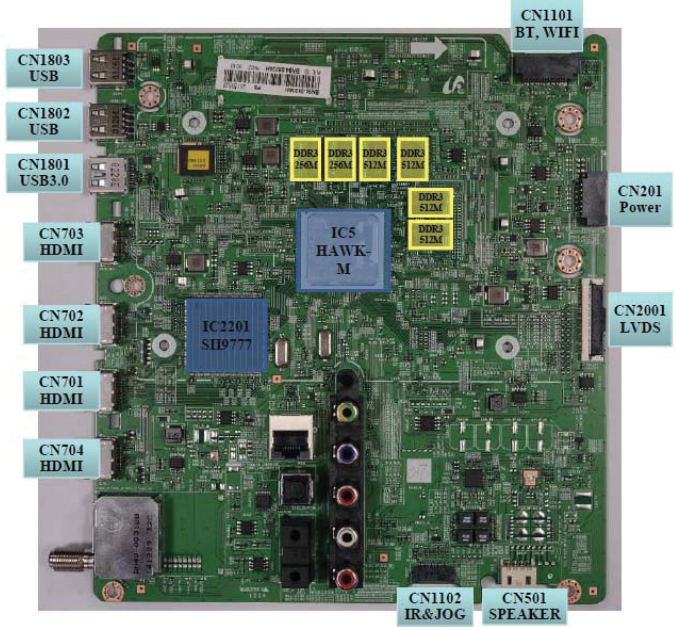
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Claim	Claim Element	Evidence of Infringement
		<p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. at col. 2:40-50. (PMCTEC00301156)</p>  <p>FIG. 1</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. (PMCTEC00301153)</p>
102[d]	passing a first portion of said stream of digital data among said plurality of programmable processors in a first passing fashion;	<p>Samsung Televisions pass a first portion of said stream of digital data among said plurality of programmable processors in a first passing fashion. For example, the first portion are the one or more of macroblocks, slices, pictures, groups of pictures, and/or sequences which are passed among various processors (including various processors inside the MPEG decoder) in a first passing fashion. In another example, the first portion are the I-pictures (or frames), which are passed among various processors (including various processors inside the MPEG decoder) in a first passing fashion.</p> <p>In the alternative, the first portion of said stream of digital data is a portion of the Program Specific Information (“PSI”) data, such as, for example, PAT table data, which is passed among the plurality of programmable processors in a first passing fashion. In another example, the</p>

Claim	Claim Element	Evidence of Infringement
		<p>first portion is PMT table data, which is passed among the plurality of programmable processors in a first passing fashion.</p> <p>QUAD-CORE PROCESSOR</p> <p>Enjoy a fluid browsing experience and faster control – switching between apps, streaming content, and other media effortlessly.</p> <p>JS7000 SUHD TV Spec Sheet at p. 2. (PMCTEC00301143)</p>

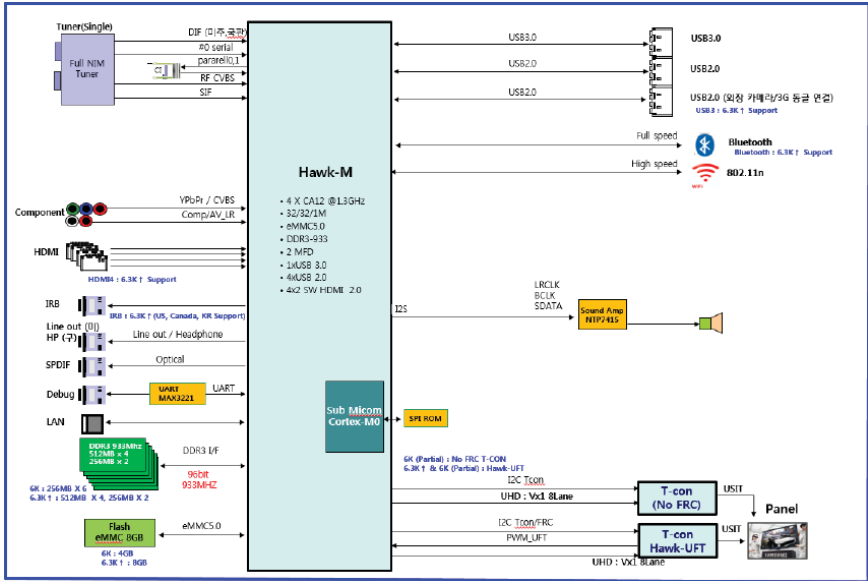
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Claim	Claim Element	Evidence of Infringement
		<div><div><div>Main Board Layout</div><p>The image shows a top-down view of a green printed circuit board (PCB) for a Samsung JS7000 series television. Various components are labeled with callouts: CN1803 USB, CN1802 USB, CN1801 USB3.0, CN703 HDMI, CN702 HDMI, CN701 HDMI, CN704 HDMI, IC2201 SII9777, IC5 HAWK-M, CN1101 BT, WIFI, CN201 Power, CN2001 LVDS, CN1102 IR&JOG, and CN501 SPEAKER. There are also several yellow labels for DDR3 256M and 512M memory modules.</p></div><p>Main circuit board in Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 32. (PMCTEC00300565)</p></div>

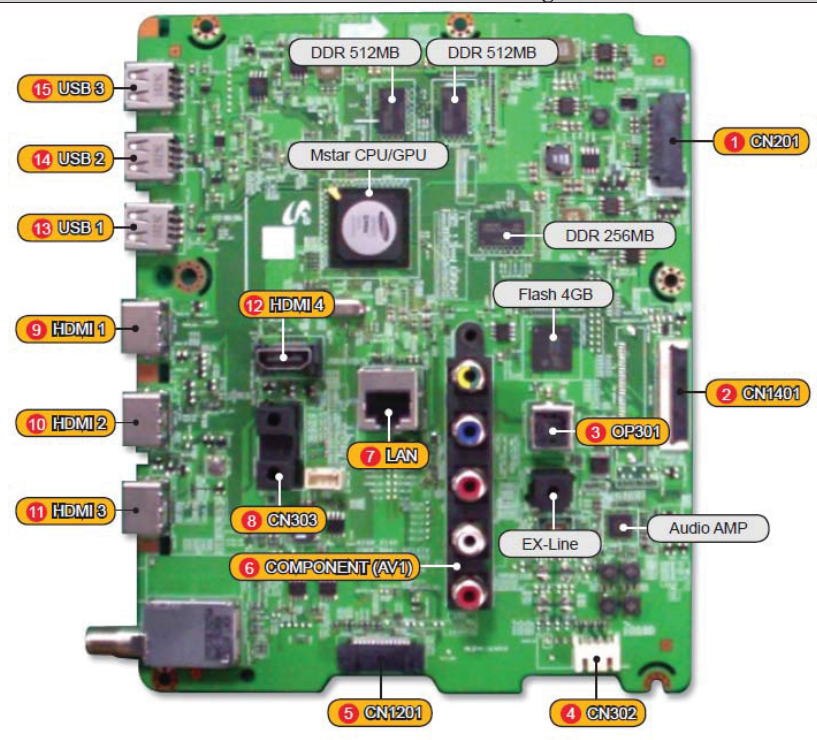
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Claim	Claim Element	Evidence of Infringement
		 <p>Block diagram of Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 31. (PMCTEC00300564)</p> <p>QUAD CORE PROCESSOR Quad Core eliminates lag to give you a fluid browsing experience. It enables you to switch between apps, stream content and multi-task faster. This extra power also provides faster page refreshing.</p> <p>H6400 Smart LED TV Spec Sheet at p. 2. (PMCTEC00300705)</p>

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Claim	Claim Element	Evidence of Infringement
		 <p>The image shows the main circuit board of a Samsung H6400 series television. The board is green and populated with various electronic components. Key components are labeled with callouts: 1. CN201 (connector), 2. CN1401 (connector), 3. OP301 (chip), 4. CN302 (connector), 5. CN1201 (connector), 6. COMPONENT (AV1) (connector), 7. LAN (port), 8. CN303 (connector), 9. HDMI 1 (port), 10. HDMI 2 (port), 11. HDMI 3 (port), 12. HDMI 4 (port), 13. USB 1 (port), 14. USB 2 (port), 15. USB 3 (port), Audio AMP (chip), EX-Line (port), Flash 4GB (memory), DDR 256MB (memory), Mstar CPU/GPU (chip), and two DDR 512MB (memory) modules. The board also features a power jack and several other smaller components.</p> <p>Main circuit board in Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300621)</p>

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Claim	Claim Element	Evidence of Infringement
		<p>Block diagram of Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300618)</p> <p>See also Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
102[e]	passing a control portion of said stream of digital data to a programmable control processor;	<p>Samsung Televisions pass a control portion of said stream of digital data to a programmable control processor. For example, a control portion of said stream of digital data is one or more of Program Association Table (“PAT”) packets, Program Map Table (“PMT”) packets, and/or Virtual Channel Table (“VCT”) packets, and/or information received in the headers of various received containers, including TS packets, PES packets, and Sequence, GOP, Picture, Slice, and Macroblock containers used to process, decode, synchronize, and output audio and/or video.</p>

Claim	Claim Element	Evidence of Infringement												
		<p>Samsung Televisions pass the control portion to a control processor (such as, for example, the TS decoder/demultiplexer, processing core, and/or a decoding controller).</p> <p style="text-align: center;">Table 2-28 – Program-specific information</p> <table><tr><th>Structure Name</th><th>Stream Type</th><th>Reserved PID #</th><th>Description</th></tr><tr><td>Program association table</td><td>Rec. ITU-T H.222.0 ISO/IEC 13818-1</td><td>0x00</td><td>Associates program number and program map table PID</td></tr><tr><td>Program map table</td><td>Rec. ITU-T H.222.0 ISO/IEC 13818-1</td><td>Assigned in the PAT</td><td>Specifies PID values for components of one or more programs</td></tr></table> <p>[MPEG-2, Part 1] <i>Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. 45. (PMCTEC00100550)</p> <p style="text-align: center;">5. TABLE HIERARCHY AND STRUCTURE REQUIREMENTS</p> <p>The Program and System Information Protocol (PSIP) is a collection of hierarchically arranged tables for describing system information and program guide data. These tables are packetized and multiplexed according to the transport protocol detailed in ISO/IEC 13818-1 [13].</p> <p>The base PID (base_PID) is an explicitly defined value (0x1FFB) used to identify the TS packets for the following tables for terrestrial and cable systems:</p> <ul style="list-style-type: none">• The System Time Table (STT)• Master Guide Table (MGT)• Rating Region Table (RRT)• Virtual Channel Table (VCT)• The optional Directed Channel Change Table (DCCT)• The optional Directed Channel Change Selection Code Table (DCCSCT) <p>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable, 7 August 2013, (PSIP) at p. 20. (PMCTEC00104065)</p>	Structure Name	Stream Type	Reserved PID #	Description	Program association table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	0x00	Associates program number and program map table PID	Program map table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	Assigned in the PAT	Specifies PID values for components of one or more programs
Structure Name	Stream Type	Reserved PID #	Description											
Program association table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	0x00	Associates program number and program map table PID											
Program map table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	Assigned in the PAT	Specifies PID values for components of one or more programs											

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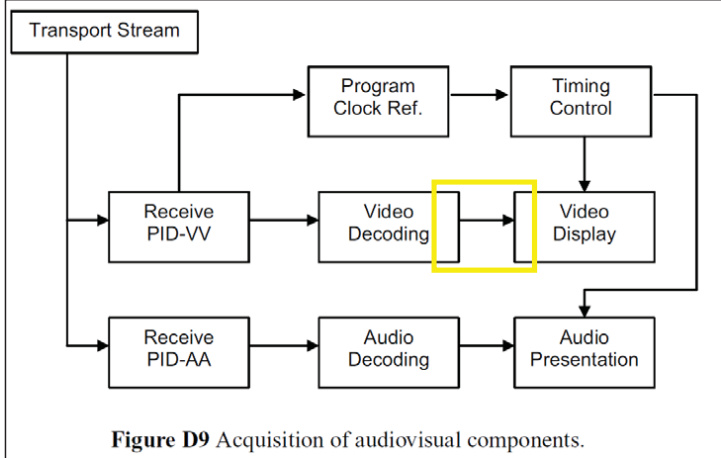
Claim	Claim Element	Evidence of Infringement
		<p>Reprinted with permission © Sarnoff Corporation (as amended)</p> <p>Figure 1 PIDs & Tuning¹</p> <p><i>CEA Bulletin: PSIP Recommended Practice, CEA-CEB12-A, October 2003, © Consumer Electronics Association 2003, p. 3 (yellow box added). (PMCTEC00105410)</i></p> <p>In the alternative, the control portion of said stream of digital data is the PAT table data. In another example, the control portion of said stream of digital data is additional PSI data, such as, for example, Program Association Tables and/or additional PMT.</p> <p>In another alternative example, the control portion of said stream of digital data is the PIDs in headers of incoming TS packets, which are passed to a programmable control processor.</p> <p>In addition, as described in a Samsung ATSC standard-essential patent:</p>


Claim	Claim Element	Evidence of Infringement
		<p>“Further, the microprocessor 124 receives the auxiliary data from the TS decoder 108, whereby such auxiliary data contain the program specification information (PSI) as the table containing program related information stipulated by the MPEG2 standard, and/or the above-mentioned EPG information, etc.”</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. at col. 3:9-14. (PMCTEC00301157)</p> <p><u>Doctrine of Equivalents</u> To the extent that Samsung Televisions do not literally meet the “control processor” claim element of the asserted claims, Samsung satisfies the “control processor” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices programmed and/or configured to control processors, cores, modules, devices, or functionality in Samsung Televisions (i) perform substantially the same function of processing information to control a processor, apparatus, module, device, and/or functionality; (ii) in substantially the same way, by computing and/or processing information to control a processor, apparatus, module, device, and/or functionality; and (iii) with substantially the same result of controlling a processor, apparatus, module, device, and/or functionality. The processing ‘cores’, processing modules, and/or processing devices in Samsung Televisions programmed and/or configured to control processors, cores, modules, devices, and/or functionalities are not substantially different from the claimed “control processor.”</p>
102[f]	controlling, with said programmable control processor, the passing of a second portion of said stream of digital video data among said plurality of programmable processors in a second passing fashion in response to said passed	<p>Samsung Televisions control, with said programmable control processor, the passing of a second portion of said stream of digital video data among said plurality of programmable processors in a second passing fashion in response to said passed control portion.</p> <p>For example, Samsung Televisions control with the TS decoder/demultiplexer, processing core, and/or a decoding controller, the passing of one or more of macroblocks, slices, pictures, groups of pictures, and/or sequences among said plurality of programmable processors in a second passing fashion, in response to the passed control portion discussed above. In another example, P- or B- pictures (or frames) are the second portion of said stream of digital data, and are passed among said plurality of programmable processors in a second passing fashion, in response to</p>

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Claim	Claim Element	Evidence of Infringement
	control portion;	<p>the passed control portion discussed above.</p> <p>In the alternative, where the first portion is the PAT table data, and the control portion is the PMT table data, the second portion of said stream of digital data is the video and PCR packets and data, which are passed among the plurality of programmable processors in a second passing fashion based on the control portion. In another example, where the first portion is PSI data, including PMT tables, and the control portion is the PAT tables, and/or additional PMT tables, the second portion of said stream of digital data is the video and PCR packets and data, which are passed among the plurality of programmable processors in a second passing fashion.</p> <p>In another alternative example, where the first portion are the PSI data, and the control portion is the PIDs in TS packet headers, the second portion are TS packets carrying video data.</p> <p>In addition to the exemplary processors identified above, including those from the H6400 and similar models, Samsung Televisions, such as the JS7000 and similar models, also include multi-core Systems-on-Chip (“SoC”), such as the X14H SoC, the Hawk-M SoC, and the Hawk-UFT SoC. In Samsung Televisions with multi-core SoCs, the passing of data may occur between cores on a single SoC; between core(s) of one SoC (such as the Hawk-M) and core(s) of another SoC (such as the Hawk-UFT); and/or between two SoCs.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “control processor” claim element set forth above.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
102[g]	processing said passed second portion of said stream of digital data and outputting processed information from said plurality of programmable	<p>Samsung Televisions process said passed second portion of said stream of digital data and output processed information from said plurality of programmable processors to a video display apparatus. For example, Samsung Televisions process the one or more of macroblocks, slices, pictures, groups of pictures, and/or sequences and output processed information from the plurality of programmable processors to a video display apparatus. In another example, Samsung Televisions process one or more P- or B- pictures (or frames) and output processed</p>

Claim	Claim Element	Evidence of Infringement
	processors to a video display apparatus; and	<p>information from the plurality of programmable processors to a video display apparatus.</p>  <p>Figure D9 Acquisition of audiovisual components.</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable</i>, 7 August 2013, (PSIP) at p. 120 (yellow box added). (PMCTEC00104165)</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
102[h]	displaying video at said video display apparatus based on said outputted processed information from said plurality of programmable processors.	<p>Samsung Televisions display video at said video display apparatus based on said outputted processed information from said plurality of programmable processors.</p>

Claim	Claim Element	Evidence of Infringement
		 <p data-bbox="516 1066 1338 1121">Samsung 4K SUHD JS7000 Series Smart TV (http://www.samsung.com/us/video/tvs/UN55JS7000FXZA) (PMCTEC00300632)</p> <p data-bbox="516 1150 1435 1205"><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
103[a]	A method of processing signals in a receiver of a broadcast or cablecast transmission, said receiver including an image receiver and having a plurality of programmable processors, said method comprising the steps of:	<p data-bbox="516 1241 1458 1377">Samsung performs a method of processing signals in a receiver of a broadcast or cablecast transmission, said receiver including an image receiver and having a plurality of programmable processors. Samsung Televisions are receivers. Examples of Samsung Televisions include the UN55JS7000 and UN65H6400 models. On information and belief, other accused models of Samsung Televisions operate similarly.</p>

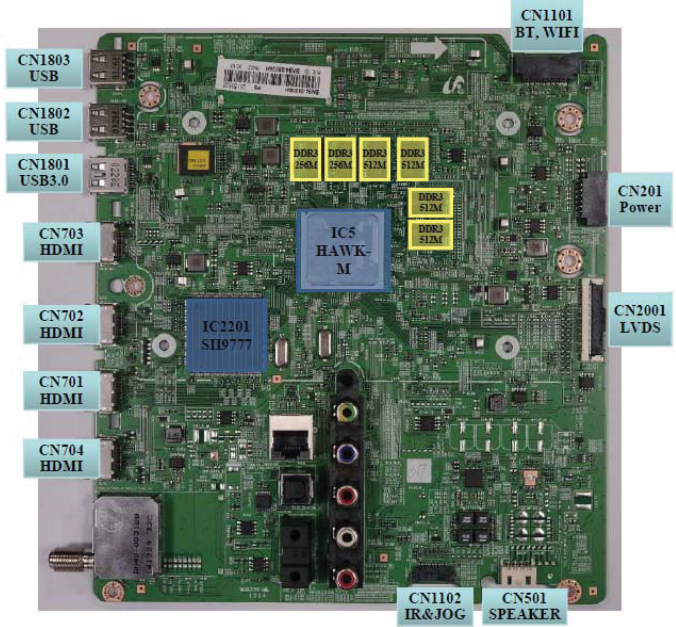
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Claim	Claim Element	Evidence of Infringement
		 <p>Samsung 4K SUHD JS7000 Series Smart TV (http://www.samsung.com/us/video/tvs/UN55JS7000FXZA) (PMCTEC00300632)</p> <p>Samsung Televisions include image receivers, including, for example ATSC and cable television receiving components and tuners.</p> <p>Samsung Televisions have a plurality of programmable processors. Samsung Televisions include System-on-Chip (“SoC”) configurations that have several processing ‘cores’ and/or processing modules and devices, each of which is a processor. For example, the JS7000 television includes HAWK-M and HAWK-UFT SoC microchips each of which contains several processors. The H6400 television includes an X14H SoC microchip with several processors. Other models, such as for example, C9000, include multiple SoC microchips, each containing one or more processors. In addition, Samsung Television SoC microchips contain various processing devices for ATSC, Transport Stream, video decoding, graphics, color, and on-screen display processing.</p>

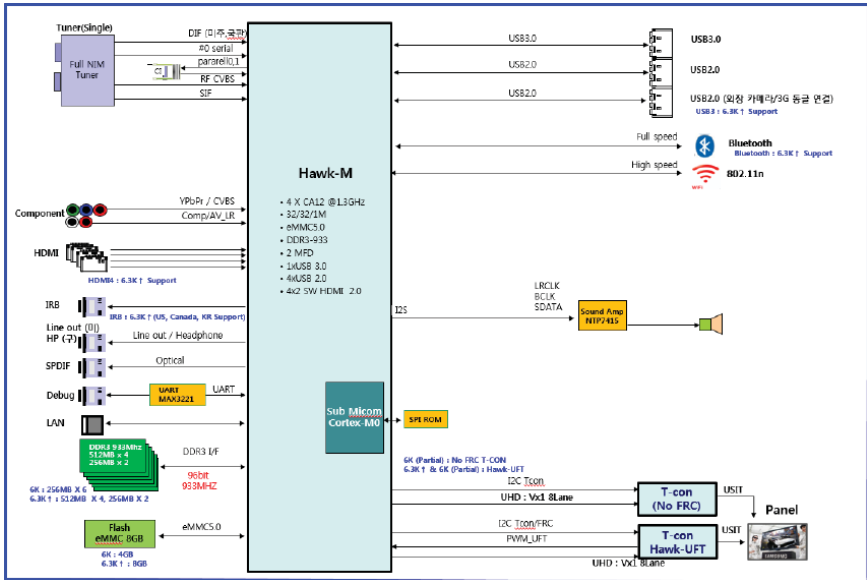
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Claim	Claim Element	Evidence of Infringement
		<div><div><div>Main Board Layout</div><div><p>The image shows the main circuit board of a Samsung JS7000 series television. The board is green and populated with various electronic components. Key components are labeled with callouts: CN1803 USB, CN1802 USB, CN1801 USB3.0, CN703 HDMI, CN702 HDMI, CN701 HDMI, CN704 HDMI, IC2201 SII9777, IC5 HAWK-M, CN1101 BT, WIFI, CN201 Power, CN2001 LVDS, CN1102 IR&JOG, and CN501 SPEAKER. The board also features several DDR3 SDRAM modules (labeled DDR3 256M and DDR3 512M) and a central processing unit (IC5 HAWK-M).</p></div></div><p>Main circuit board in Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 32. (PMCTEC00300565)</p></div>

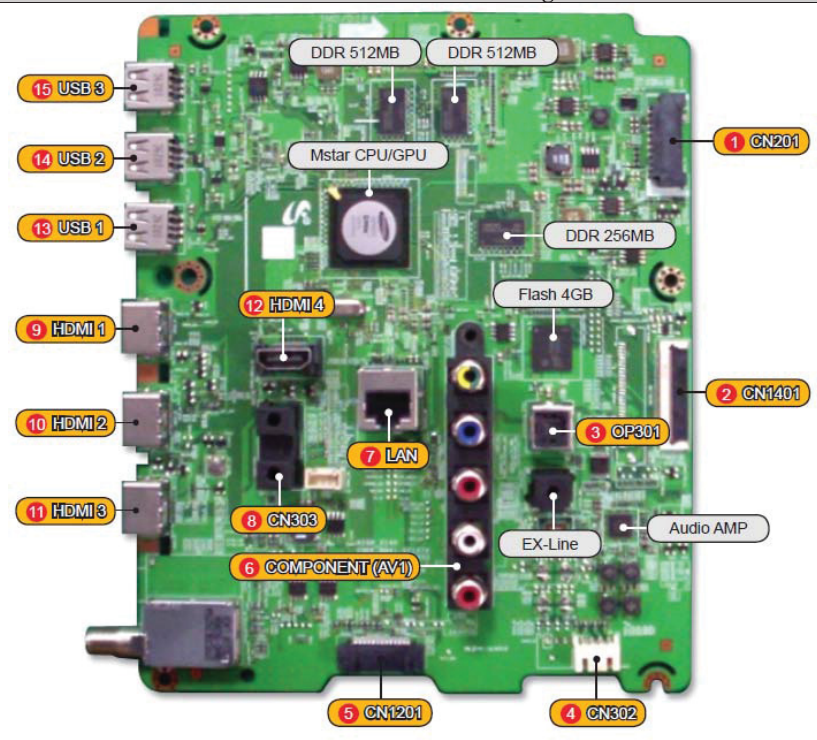
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Claim	Claim Element	Evidence of Infringement
		 <p>The diagram illustrates the internal architecture of a Samsung JS7000 series television. At the center is the Hawk-M processor, which is a quad-core processor with the following specifications: 4 x CA12 @ 1.3GHz, 32/32/1M, eMMC5.0, CDR3-933, 2 MFD, 1xUSB 3.0, 4xUSB 2.0, and 4x2.5W HDMI 2.0. The processor is connected to various external components and internal modules:</p> <ul style="list-style-type: none"> Input/Output Ports: Tuner(Single), Full NIM Tuner, Component, HDMI (6.3K T Support), IRB (6.3K T (IR), Camera, IR Support), Line out (L), HP (?), SPDIF, Debug, LAN, and Flash (eMMC 5.0, 6K, 4GB, 6.3K T, RGB). Internal Modules: Sub Mkom Cortex M0, SPE PCM, and a Sound Amp (90P-932). Connectivity: USB3.0, USB2.0, Full speed Bluetooth (Bluetooth 4.0, 6.3K T Support), and High speed Bluetooth (Bluetooth 4.0, 6.3K T Support). Display and Audio: UHD: Vx1 8Line, T-con (No FRC), T-con Hawk-UFT, and UHD: Vx1 8Line. <p>Block diagram of Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 31. (PMCTEC00300564)</p> <p>QUAD CORE PROCESSOR Quad Core eliminates lag to give you a fluid browsing experience. It enables you to switch between apps, stream content and multi-task faster. This extra power also provides faster page refreshing.</p> <p>H6400 Smart LED TV Spec Sheet at p. 2. (PMCTEC00300705)</p>

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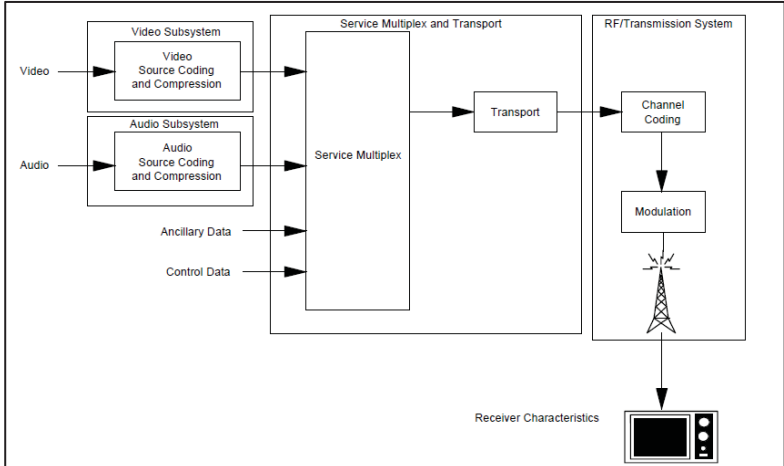
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Claim	Claim Element	Evidence of Infringement
		<div><p>The image shows a green printed circuit board (PCB) for a Samsung H6400 series television. It is populated with various electronic components. Numbered callouts (1-15) point to specific connectors and components: 1. CN201 (top right), 2. CN1401 (middle right), 3. OP301 (middle right), 4. CN302 (bottom right), 5. CN1201 (bottom center), 6. COMPONENT (AV1) (bottom center), 7. LAN (center), 8. CN303 (center), 9. HDMI 1 (left), 10. HDMI 2 (left), 11. HDMI 3 (left), 12. HDMI 4 (center), 13. USB 1 (top left), 14. USB 2 (top left), 15. USB 3 (top left). Component labels include: DDR 512MB (top), Mstar CPU/GPU (center), DDR 256MB (top right), Flash 4GB (middle right), EX-Line (bottom right), and Audio AMP (bottom right).</p></div> <p>Main circuit board in Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300621)</p>

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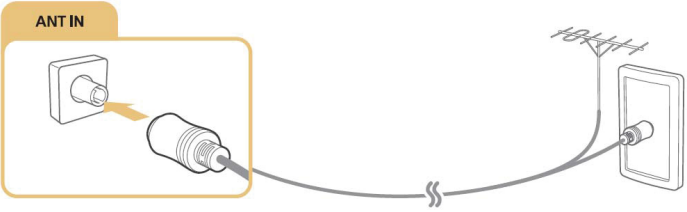
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Claim	Claim Element	Evidence of Infringement
		<div><p>The diagram shows a central X14H processor connected to various input and output modules. Inputs include DUAL NIM, FULL NIM, HALF NIM, HDMI x 4, SCART, and COMPONENT1/AV1. These connect to buffers and then to the X14H processor. The processor is a Quad Cortex-A9(1.15GHz) with 32/32/1M, eMMC4.5, DDR3-1866, MaliT450(450MHz), USB 3.0, Ethernet (MAC.10/100), CVBS AFE, 3channel AFE, Audio Codec, Ch. Demod., TS : 1 parallel In/Out, 1 parallel, HDMI1.4 Rx, and HDMI UHD 30Hz. It connects to eMMC4.5, NAND, DDR3 1/F, 933MHz, I2C, EEPROM 24CS12, Debug, IR Key INPUT, USB2.0, USB 3, USB 1, USB 2, USB2.0(3.0 port), WIFI module, LAN, LVDS 2CH (60Hz), SC CVBS OUT, SC L/R_OUT X12, AMP DRV612, SC L/R_OUT, HP_LINE_L/R_OUT, MONI_HP_L/R_OUT, SOUND AMP NT97414, I2S, SPDIF_OUT, and OPTICAL Out. It also connects to a Function BT module.</p></div> <p>Block diagram of Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300618)</p> <p>Doctrine of Equivalents</p> <p>To the extent that Samsung Televisions do not literally meet the “processor[s]” claim element of the asserted claims, Samsung satisfies the “processor[s]” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices, including components for general purpose, application, ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions (i) perform substantially the same function of processing; (ii) in substantially the same way, by performing operations on data; and (iii) with substantially the same result of having processed data. The processing ‘cores’, processing</p>

Claim	Claim Element	Evidence of Infringement
		modules, and/or processing devices, including components for general purpose, application, ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions are not substantially different from the claimed “processor[s].”
103[b]	receiving a broadcast or cablecast signal;	<p>Samsung Televisions receive a broadcast or cablecast signal. For example, received ATSC signals are broadcast signals. Received cable television signals are cablecast signals.</p>  <p>Figure 5.1 ITU-R digital terrestrial television broadcasting model.</p> <p><i>ATSC Digital Television Standard: Part 1 – Digital Television System</i>, Document A/53 Part 1: 2009, p. 18. (PMCTEC00100094)</p>

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Claim	Claim Element	Evidence of Infringement
		<p>Connecting an Antenna</p> <p>Connect a cable from an antenna or cable wall outlet to the ANT IN connector, as shown in the image below to receive broadcast signals.</p> <p></p> <p><i>Samsung E-Manual at p. 14. (PMCTEC00300014)</i></p>
103[c]	detecting a stream of digital data on said received signal;	<p>Samsung Televisions detect a stream of digital data on said received signal. For example, Samsung Televisions detect transport stream (TS) packets in the MPEG-2 information transmission.</p> <p><u>ATSC</u></p> <p>“Decoders must include a means to look for start codes and sync bytes (transport stream) in order to begin decoding correctly, and to identify errors, erasures or insertions while decoding. The methods to identify these situations, and the actions to be taken, are not standardized.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System) at p. 15, ATSC. (PMCTEC00100091)</i></p> <p>“The digital television system employs the MPEG-2 video stream syntax for the coding</p>

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Claim	Claim Element	Evidence of Infringement
		<p>of video and the Digital Audio Compression (AC-3) Standard for the coding of audio.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p>“The digital television system employs the MPEG-2 transport stream syntax for the packetization and multiplexing of video, audio, and data signals for digital broadcasting systems (ISO/IEC 13818- 1).”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <div data-bbox="516 934 1151 1484" data-label="Diagram"> <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP),</i></p> </div>

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Claim	Claim Element	Evidence of Infringement
		<p>Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78. (PMCTEC00000533)</p> <p><u>MPEG-2</u></p> <p>“The Rec. ITU-T H.222.0 ISO/IEC 13818-1 transport stream coding layer allows one or more programs to be combined into a single stream. <i>Data from each elementary stream are multiplexed together with information that allows synchronized presentation of the elementary streams within a program.</i></p> <p>A transport stream consists of one or more programs. Audio and video elementary streams consist of access units.</p> <p>Elementary stream data is carried in PES packets. A PES packet consists of a PES packet header followed by packet data. PES packets are inserted into transport stream packets.</p> <p>The first byte of each PES packet header is located at the first available payload location of a transport stream packet.</p> <p>The PES packet header begins with a 32-bit start-code that also identifies the stream or stream type to which the packet data belongs. <i>The PES packet header may contain decoding and presentation time stamps (DTS and PTS).</i> The PES packet header also contains other optional fields. The PES packet data field contains a variable number of contiguous bytes from one elementary stream.</p> <p>Transport stream packets begin with a 4-byte prefix, which contains a 13-bit packet ID (PID), defined in Table 2-2. The PID identifies, via the program-specific information (PSI) tables, the contents of the data contained in the transport stream packet. Transport stream packets of one PID value carry data of one and only one elementary stream.”</p> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 10 (emphasis added). (PMCTEC00100515)</p>

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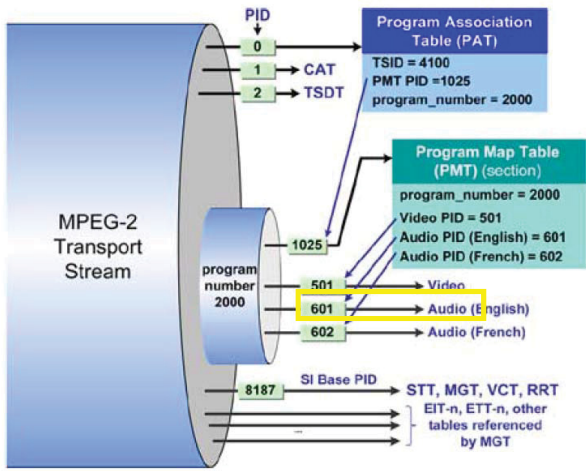
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Claim	Claim Element	Evidence of Infringement																																																									
		<p>Table 2-2 – Transport packet of this Recommendation International Standard</p> <table> <tr> <th>Syntax</th><th>No. of bits</th><th>Mnemonic</th></tr> <tr> <td>transport_packet(){</td><td></td><td></td></tr> <tr> <td> sync_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> transport_error_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> payload_unit_start_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> transport_priority</td><td>1</td><td>bslbf</td></tr> <tr> <td> PID</td><td>13</td><td>uimsbf</td></tr> <tr> <td> transport_scrambling_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> adaptation_field_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> continuity_counter</td><td>4</td><td>uimsbf</td></tr> <tr> <td> if(adaptation_field_control == '10' adaptation_field_control == '11'){</td><td></td><td></td></tr> <tr> <td> adaptation_field()</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> if(adaptation_field_control == '01' adaptation_field_control == '11') {</td><td></td><td></td></tr> <tr> <td> for (i = 0; i < N; i++){</td><td></td><td></td></tr> <tr> <td> data_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td>}</td><td></td><td></td></tr> </table> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 21. (PMCTEC00100526)</p> <p>Also, as illustrated in a simplified block diagram and related text of an ATSC standard-essential patent:</p> <p>“Referring to FIG. 1, a tuner 102 selects one RF channel among broadcasting signals received through an antenna 100 under the control of a microprocessor 124. Thereupon, the tuner 102 outputs an IF (intermediate frequency) signal of the selected channel, which is converted by the IF module 104 into a baseband signal so as to then be delivered to a channel decoder 106. The channel decoder 106 converts the baseband signal to a channel signal to reconstruct data bit strings. Such reconstructed data bit strings are separated into audio data, video data, and auxiliary data by a TS (transport stream) decoder 108.”</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. at col. 2:40-50. (PMCTEC00301156)</p>	Syntax	No. of bits	Mnemonic	transport_packet(){			sync_byte	8	bslbf	transport_error_indicator	1	bslbf	payload_unit_start_indicator	1	bslbf	transport_priority	1	bslbf	PID	13	uimsbf	transport_scrambling_control	2	bslbf	adaptation_field_control	2	bslbf	continuity_counter	4	uimsbf	if(adaptation_field_control == '10' adaptation_field_control == '11'){			adaptation_field()			}			if(adaptation_field_control == '01' adaptation_field_control == '11') {			for (i = 0; i < N; i++){			data_byte	8	bslbf	}			}			}		
Syntax	No. of bits	Mnemonic																																																									
transport_packet(){																																																											
sync_byte	8	bslbf																																																									
transport_error_indicator	1	bslbf																																																									
payload_unit_start_indicator	1	bslbf																																																									
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PID	13	uimsbf																																																									
transport_scrambling_control	2	bslbf																																																									
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Claim	Claim Element	Evidence of Infringement
		<p style="text-align: center;">FIG. 1</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. (PMCTEC00301153)</p>
103[d]	passing a first portion of said stream of digital data among said plurality of programmable processors in a first passing fashion;	<p>Samsung Televisions pass a first portion of said stream of digital data among said plurality of programmable processors in a first passing fashion. For example, Samsung Televisions pass audio data belonging to a specific television program (first portion of said stream of digital data) among said plurality of programmable processors (from the transport stream decoder and/or demultiplexer to the audio/MPEG decoder and/or to additional audio processing/amplification processors) in a first fashion. In another example, the audio packets are passed among the various processing cores and/or application specific processors. In the alternative, the first portion of said stream of digital data is the Program Specific Information (“PSI”) data, such as, for example, PAT and/or PMT tables.</p>

Claim	Claim Element	Evidence of Infringement
		 <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP),</i> Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006 at p. 78 (yellow box added). (PMCTEC00000533)</p>

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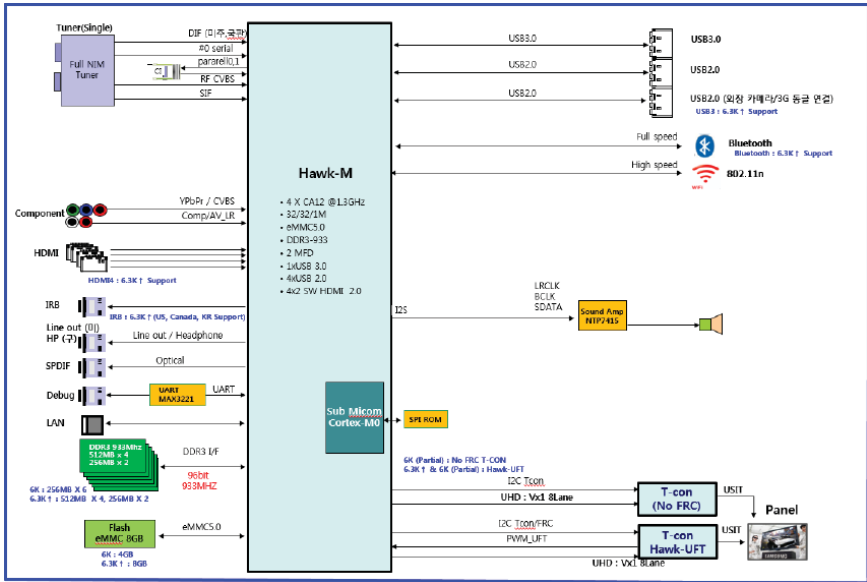
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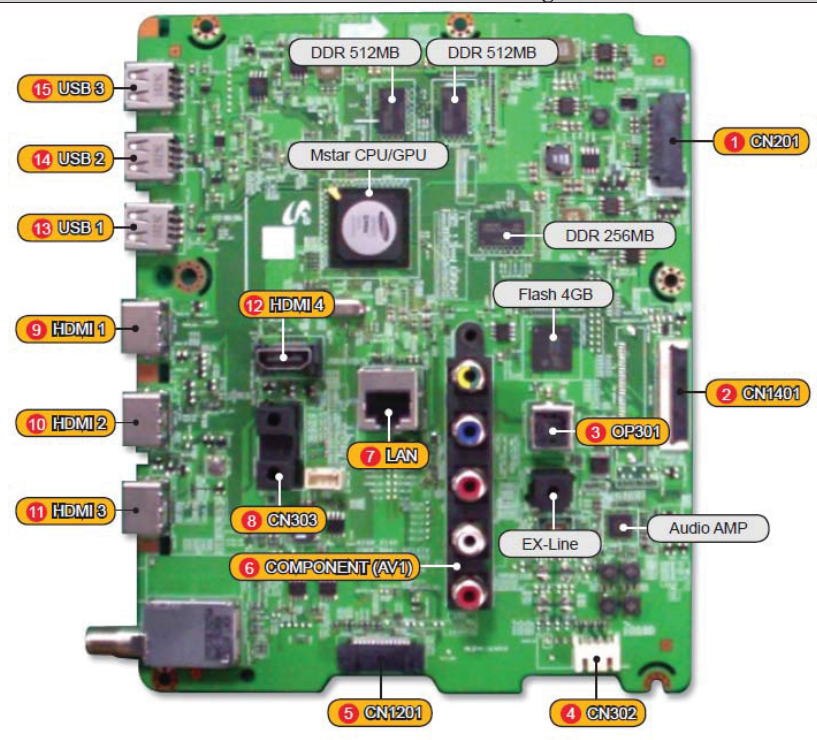
Claim	Claim Element	Evidence of Infringement
		<p>Figure Intro. 2 – Prototypical transport demultiplexing and decoding example</p> <p>[MPEG-2, Part 1] <i>Information Technology – Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. viii (yellow box added). (PMCTEC00100501)</p>

Claim	Claim Element	Evidence of Infringement
		<p>Reprinted with permission © Sarnoff Corporation (as amended)</p> <p>Figure 1 PIDs & Tuning¹</p> <p>CEA Bulletin: PSIP Recommended Practice, CEA-CEB12-A, October 2003, Consumer Electronics Association, p. 3 (yellow box added). (PMCTEC00105410)</p>

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Claim	Claim Element	Evidence of Infringement
		 <p>The diagram illustrates the internal architecture of a Samsung JS7000 series television. At the center is the Hawk-M processor, which is a quad-core ARM Cortex M0 with the following specifications: 4 x CA12 @ 1.3GHz, 32/32/1M, eMMC5.0, CDR3-933, 2 MFD, 1xUSB 3.0, 4xUSB 2.0, and 4x2.5W HDMI 2.0. To the left, various input and output modules are connected to the processor: a Tuner(Single) with Full NIM Tuner, CBF (DVB-C), RF CVBS, and SIF; Component inputs for YPbPr / CVBS and Composite; HDMI with 6.3K T Support; IRB (6.3K T, IR, Camera, IR Support); Line out (L) and HP (R) for Line out / Headphone; SPDIF for Optical; Debug with UART; and LAN. Below the processor, there is a Sub Microm Cortex M0 connected to SPE PCM. Memory components include DDR3 L/R (933M/4Z) and Flash eMMC 5.0 (4GB, 6.3K T, RGB). On the right, the processor connects to USB 3.0, USB 2.0, and USB 2.0 (외장 카메라/9G 용량 연결) (USB 3 + 6.3K T Support). It also connects to Bluetooth (Full speed, High speed) and 802.11n. For audio, it connects to I2S and LRCLK BCLK SDATA leading to a Sound Amp (933M/4Z). For video output, it connects to UHD : Vx1 8Lane and I2C Tcon/FRC leading to T-con (No FRC) and T-con Hawk-UFT, which then connect to the Panel. Other connections include UHD : Vx1 8Lane and I2C Tcon/FRC leading to T-con (No FRC) and T-con Hawk-UFT, which then connect to the Panel.</p> <p>Block diagram of Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 31. (PMCTEC00300564)</p> <p>QUAD CORE PROCESSOR Quad Core eliminates lag to give you a fluid browsing experience. It enables you to switch between apps, stream content and multi-task faster. This extra power also provides faster page refreshing.</p> <p>H6400 Smart LED TV Spec Sheet at p. 2. (PMCTEC00300705)</p>

Claim	Claim Element	Evidence of Infringement
		<div><p>The image shows a green printed circuit board (PCB) for a Samsung H6400 series television. It is populated with various electronic components. Numbered callouts (1-15) point to specific connectors and components: 1. CN201 (top right), 2. CN1401 (middle right), 3. OP301 (middle right), 4. CN302 (bottom right), 5. CN1201 (bottom center), 6. COMPONENT (AV1) (bottom center), 7. LAN (center), 8. CN303 (center), 9. HDMI 1 (left), 10. HDMI 2 (left), 11. HDMI 3 (left), 12. HDMI 4 (center), 13. USB 1 (top left), 14. USB 2 (top left), 15. USB 3 (top left). Component labels include: DDR 512MB (top), Mstar CPU/GPU (center), DDR 256MB (top right), Flash 4GB (middle right), EX-Line (bottom right), and Audio AMP (bottom right).</p></div> <p>Main circuit board in Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300621)</p>

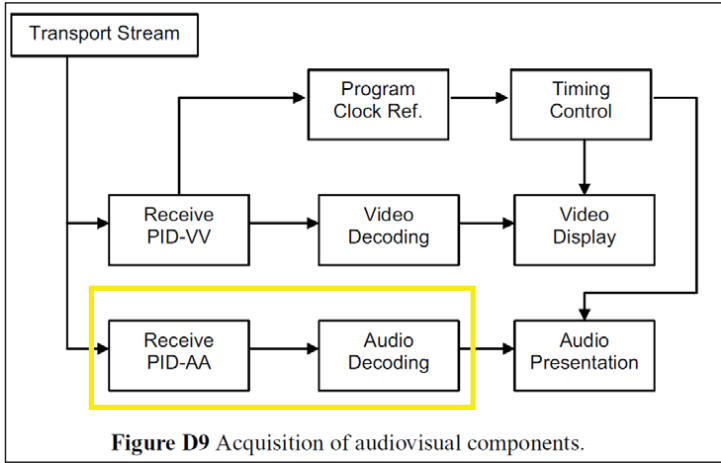
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Claim	Claim Element	Evidence of Infringement
		<p>Block diagram of Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300618)</p> <p>See also Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
103[e]	processing said passed first portion of said stream of digital data and outputting processed information from said plurality of programmable	Samsung Televisions process said passed first portion of said stream of digital data and output processed information from said plurality of programmable processors. For example, the audio decoding processor (and/or others processors identified above of said plurality of programmable processors) output processed information from the received and processed audio packets.

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Claim	Claim Element	Evidence of Infringement
	processors;	 <p>Figure D9 Acquisition of audiovisual components.</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable</i>, 7 August 2013, (PSIP) at p. 120 (yellow box added). (PMCTEC00104165)</p> <p>In another example, where the first portion of said stream of digital data is PSI data, such as the Program Map Tables, PMT tables are processed and processed information is output by processors handling PSI parsing and decoding.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
103[f]	passing a control portion of said stream of digital data to a programmable control processor,	<p>Samsung Televisions pass a control portion of said stream of digital data to a programmable control processor. For example, a control portion of said stream of digital data is one or more of Program Association Table (“PAT”) packets, Program Map Table (“PMT”) packets, and/or Virtual Channel Table (“VCT”) packets. Samsung Televisions pass the control portion to a control processor (such as, for example, the TS decoder/demultiplexer, processing core, and/or</p>

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Claim	Claim Element	Evidence of Infringement												
		<p>a decoding controller).</p> <p style="text-align: center;">Table 2-28 – Program-specific information</p> <table><tr><th>Structure Name</th><th>Stream Type</th><th>Reserved PID #</th><th>Description</th></tr><tr><td>Program association table</td><td>Rec. ITU-T H.222.0 ISO/IEC 13818-1</td><td>0x00</td><td>Associates program number and program map table PID</td></tr><tr><td>Program map table</td><td>Rec. ITU-T H.222.0 ISO/IEC 13818-1</td><td>Assigned in the PAT</td><td>Specifies PID values for components of one or more programs</td></tr></table> <p>[MPEG-2, Part 1] <i>Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. 45. (PMCTEC00100550)</p> <p style="text-align: center;">5. TABLE HIERARCHY AND STRUCTURE REQUIREMENTS</p> <p>The Program and System Information Protocol (PSIP) is a collection of hierarchically arranged tables for describing system information and program guide data. These tables are packetized and multiplexed according to the transport protocol detailed in ISO/IEC 13818-1 [13].</p> <p>The base PID (base_PID) is an explicitly defined value (0x1FFB) used to identify the TS packets for the following tables for terrestrial and cable systems:</p> <ul style="list-style-type: none">• The System Time Table (STT)• Master Guide Table (MGT)• Rating Region Table (RRT)• Virtual Channel Table (VCT)• The optional Directed Channel Change Table (DCCT)• The optional Directed Channel Change Selection Code Table (DCCSCT) <p>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable, 7 August 2013, (PSIP) at p. 20. (PMCTEC00104065)</p>	Structure Name	Stream Type	Reserved PID #	Description	Program association table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	0x00	Associates program number and program map table PID	Program map table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	Assigned in the PAT	Specifies PID values for components of one or more programs
Structure Name	Stream Type	Reserved PID #	Description											
Program association table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	0x00	Associates program number and program map table PID											
Program map table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	Assigned in the PAT	Specifies PID values for components of one or more programs											

Claim	Claim Element	Evidence of Infringement
		<p style="text-align: center;">Reprinted with permission © Sarnoff Corporation (as amended) Figure 1 PIDs & Tuning¹</p> <p><i>CEA Bulletin: PSIP Recommended Practice, CEA-CEB12-A, October 2003, Consumer Electronics Association 2003, p. 3 (yellow box added). (PMCTEC00105410)</i></p> <p>In the alternative, the control portion of said stream of digital data is additional PSI data, such as, for example, Program Association Tables and/or additional PMT. In another example, where the first portion of said stream of digital data is the PAT table data, the control portion of said stream of digital data is the PMT table data.</p> <p>In another example, the control portion of said stream of digital data includes TS packet headers, including the PIDs therein.</p> <p>In addition, as described in a Samsung ATSC standard-essential patent:</p>

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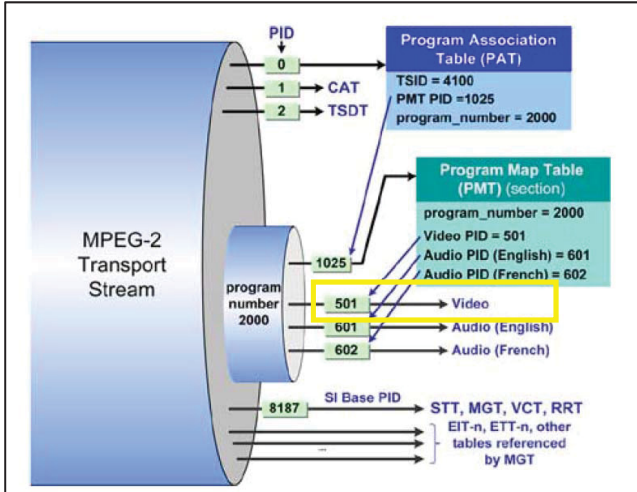
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Claim	Claim Element	Evidence of Infringement
		<p>“Further, the microprocessor 124 receives the auxiliary data from the TS decoder 108, whereby such auxiliary data contain the program specification information (PSI) as the table containing program related information stipulated by the MPEG2 standard, and/or the above-mentioned EPG information, etc.”</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. at col. 3:9-14. (PMCTEC00301157)</p> <p><u>Doctrine of Equivalents</u> To the extent that Samsung Televisions do not literally meet the “control processor” claim element of the asserted claims, Samsung satisfies the “control processor” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices programmed and/or configured to control processors, cores, modules, devices, or functionality in Samsung Televisions (i) perform substantially the same function of processing information to control a processor, apparatus, module, device, and/or functionality; (ii) in substantially the same way, by computing and/or processing information to control a processor, apparatus, module, device, and/or functionality; and (iii) with substantially the same result of controlling a processor, apparatus, module, device, and/or functionality. The processing ‘cores’, processing modules, and/or processing devices in Samsung Televisions programmed and/or configured to control processors, cores, modules, devices, and/or functionalities are not substantially different from the claimed “control processor.”</p>
103[g]	said programmable control processor programming at least one programmable processor of said plurality of programmable processors to process said passed first portion of said stream of digital data;	In Samsung Televisions, said programmable control processor programs at least one programmable processor of said plurality of programmable processors to process said passed first portion of said stream of digital data. For example, the control processor discussed above programs at least one audio decoder to process the passed audio data.

Claim	Claim Element	Evidence of Infringement
		<p style="text-align: center;">Reprinted with permission © Sarnoff Corporation (as amended) Figure 1 PIDs & Tuning¹</p> <p><i>CEA Bulletin: PSIP Recommended Practice, CEA-CEB12-A, October 2003, Consumer Electronics Association 2003, p. 3 (yellow box added). (PMCTEC00105410)</i></p> <p>In another example, where the first portion of said stream of digital data are one or more PSI/PMT packets, the programmable control processor programs a processing core, PID filter, and/or TS demultiplexer to process the PMT tables.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “control processor” claim element set forth above.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>

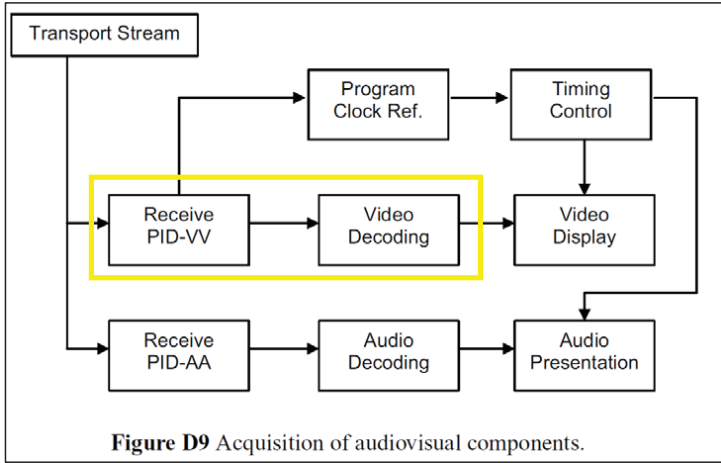
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Claim	Claim Element	Evidence of Infringement
103[h]	controlling the passing of a second portion of said stream of digital data among said plurality of programmable processors in a second passing fashion in response to said passed control portion; and	<p>Samsung Televisions control the passing of a second portion of said stream of digital data among said plurality of programmable processors in a second passing fashion in response to said passed control portion. For example, Samsung Televisions control with the TS decoder/demultiplexer, processing core, and/or a decoding controller, the passing of video data (second portion of said stream of digital data) among said plurality of programmable processors in a second passing fashion, in response to the passed PAT/PMT/VCT control data, such as, for example, from the transport stream decoder and/or demultiplexer to the video/MPEG decoder to picture upscaling/motion/on screen display processors.</p>  <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP),</i> Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78 (yellow box added). (PMCTEC00000533)</p>

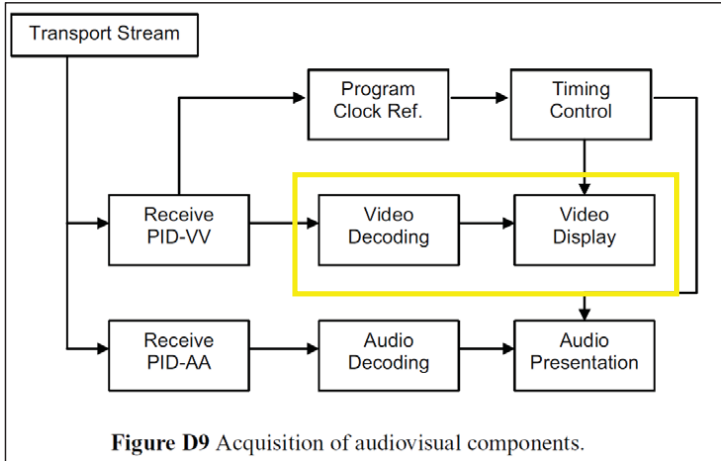
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Claim	Claim Element	Evidence of Infringement
		 <p>Figure D9 Acquisition of audiovisual components.</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable</i>, 7 August 2013, (PSIP) at p. 120 (yellow box added). (PMCTEC00104165)</p> <p>In the alternative, where the first portion is PSI data, including PMT tables, and the control portion is the PAT tables, and/or additional PMI tables, the second portion of said stream of digital data is the video and PCR data, which is passed among the plurality of programmable processors in a second passing fashion in response to the above control portion.</p> <p>In another example, the second portion of said stream of digital data includes the VCT information, which is passed among the plurality of programmable processors in a second passing fashion in response to the above control portion.</p> <p>In addition to the exemplary processors identified above, including those from the H6400 and similar models, Samsung Televisions, such as the JS7000 and similar models, also include multi-core Systems-on-Chip (“SoC”), such as the X14H SoC, the Hawk-M SoC, and the Hawk-</p>


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Claim	Claim Element	Evidence of Infringement
		<p>UFT SoC. In Samsung Televisions with multi-core SoCs, the passing of data may occur between cores on a single SoC; between core(s) of one SoC (such as the Hawk-M) and core(s) of another SoC (such as the Hawk-UFT); and/or between two SoCs.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
103[i]	processing said passed second portion of said stream of digital data and outputting image information from said plurality of programmable processors to an image display device based on said step of controlling; and	<p>Samsung Televisions process said passed second portion of said stream of digital data and output processed information from said plurality of programmable processors to an image display device based on said step of controlling. For example, the video decoding, motion compensation, upscaling, and on screen display processors (and/or others processors identified above of said plurality of programmable processors) output image information to a display device based on said step of controlling.</p>  <p>Figure D9 Acquisition of audiovisual components.</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable, 7 August 2013, (PSIP) at p. 120 (yellow box added).</i></p>

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Claim	Claim Element	Evidence of Infringement
		<p>(PMCTEC00104165)</p> <p>In another example, where the second portion includes the Virtual Channel Table data, the video decoding, motion compensation, upscaling, and on screen display processors (and/or others processors identified above of said plurality of programmable processors) output image information to a display device based on said step of controlling. The output image information includes processed VCT data, such as channel number and name.</p>  <p>Samsung JS7000 Television (yellow box added). (PMCTEC00300881)</p>


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Claim	Claim Element	Evidence of Infringement
		<i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.
103[j]	displaying said image at said image display device.	<p>Samsung Televisions display said image at said image display device.</p>  <p>Samsung JS7000 Television. (PMCTEC00300881)</p>

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Claim	Claim Element	Evidence of Infringement
		 <p>Samsung 4K SUHD JS7000 Series Smart TV (http://www.samsung.com/us/video/tvs/UN55JS7000FXZA) (PMCTEC00300632)</p>
105[a]	A method of processing signals at a receiver station, said receiver station having a plurality of programmable processors for processing a stream of digital data messages, said method comprising the steps of:	<p>Samsung performs a method of processing signals at a receiver station, said television receiver having a plurality of programmable processors for processing a stream of digital data messages. Samsung Televisions are receiver stations. Examples of Samsung Televisions include the UN55JS7000 and UN65H6400 models. On information and belief, other accused models of Samsung Televisions operate similarly.</p>

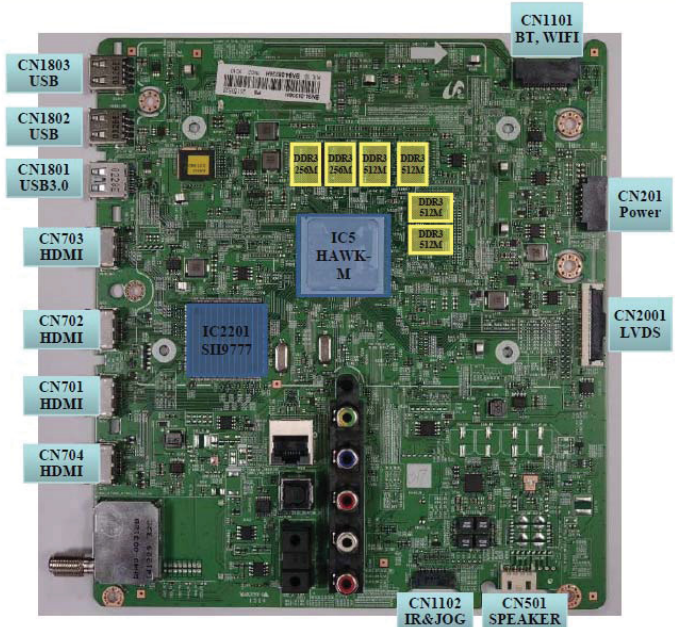
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Claim	Claim Element	Evidence of Infringement
		 <p>Samsung 4K SUHD JS7000 Series Smart TV (http://www.samsung.com/us/video/tvs/UN55JS7000FXZA) (PMCTEC00300632)</p> <p>Samsung Televisions have a plurality of programmable processors for processing a stream of digital data messages. Samsung Televisions include System-on-Chip (“SoC”) configurations that have several processing ‘cores’ and/or processing modules and devices, each of which is a processor. For example, the JS7000 television includes HAWK-M and HAWK-UFT SoC microchips each of which contains several processors. The H6400 television includes an X14H SoC microchip with several processors. Other models, such as for example, C9000, include multiple SoC microchips, each containing one or more processors. In addition, Samsung Television SoC microchips contain various processing devices for ATSC, Transport Stream, video decoding, graphics, color, and on-screen display processing.</p> <p>QUAD-CORE PROCESSOR</p> <p>Enjoy a fluid browsing experience and faster control – switching between apps,</p>

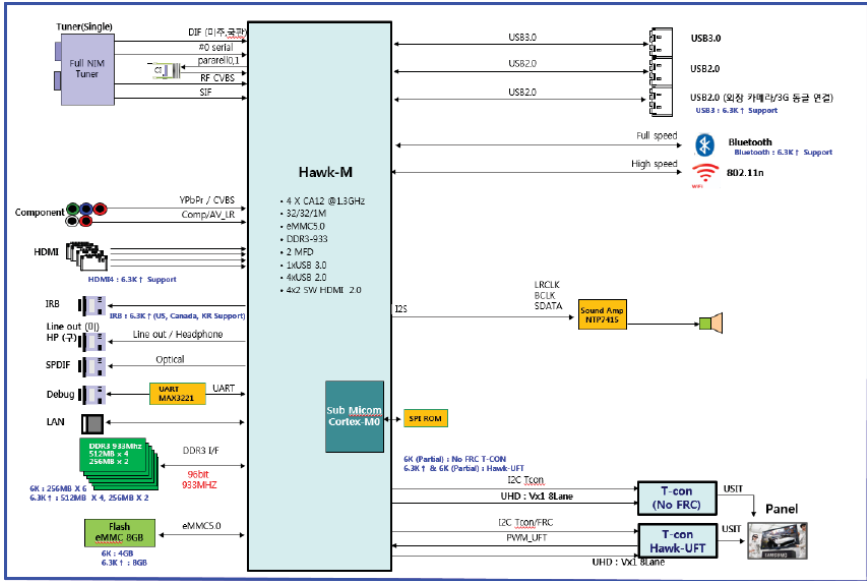
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Claim	Claim Element	Evidence of Infringement
		<p>streaming content, and other media effortlessly.</p> <p>JS7000 SUHD TV Spec Sheet at p. 2. (PMCTEC00301143)</p> <p>Main Board Layout</p>  <p>Main circuit board in Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 32. (PMCTEC00300565)</p>

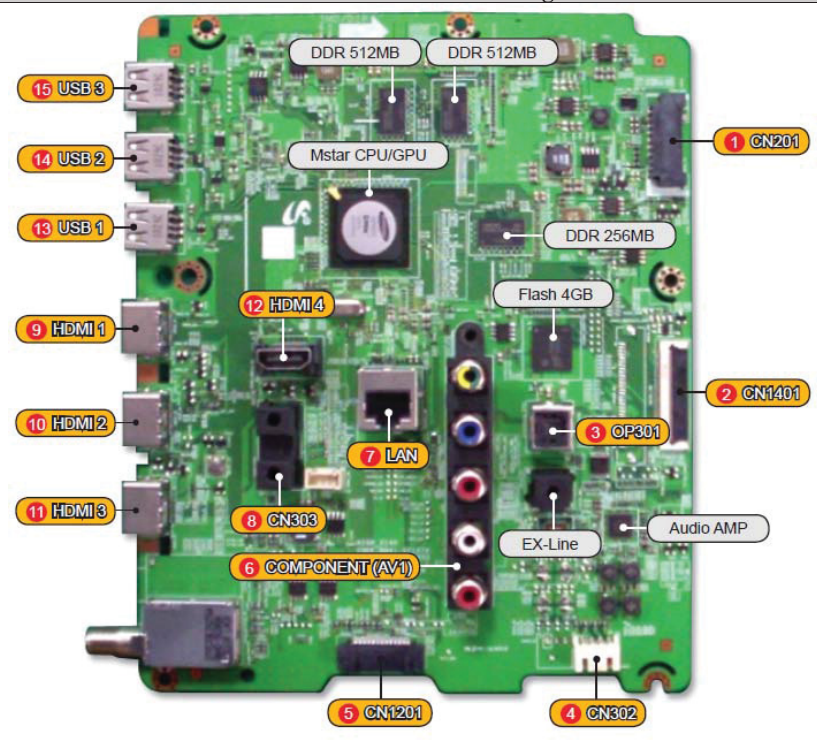
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Claim	Claim Element	Evidence of Infringement
		 <p>Block diagram of Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 31. (PMCTEC00300564)</p> <p>QUAD CORE PROCESSOR Quad Core eliminates lag to give you a fluid browsing experience. It enables you to switch between apps, stream content and multi-task faster. This extra power also provides faster page refreshing.</p> <p>H6400 Smart LED TV Spec Sheet at p. 2. (PMCTEC00300705)</p>

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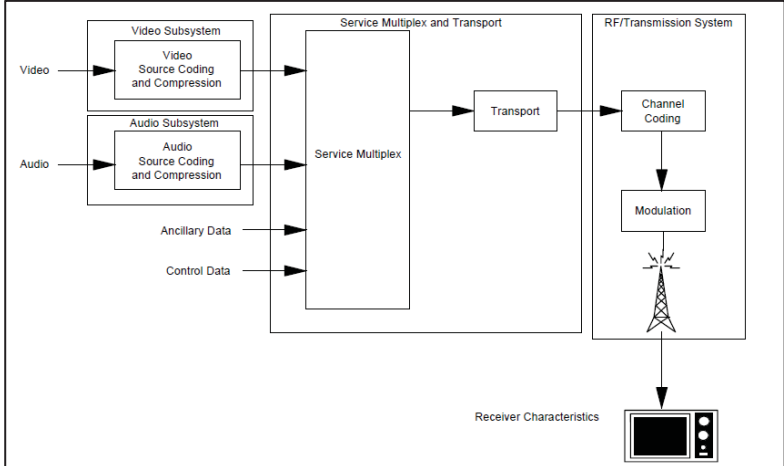
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Claim	Claim Element	Evidence of Infringement
		 <p>The image shows the main circuit board of a Samsung H6400 series television. The board is green and populated with various electronic components. Key components are labeled with callouts: 1. CN201 (connector), 2. CN1401 (connector), 3. OP301 (chip), 4. CN302 (connector), 5. CN1201 (connector), 6. COMPONENT (AV1) (connector), 7. LAN (port), 8. CN303 (connector), 9. HDMI 1 (port), 10. HDMI 2 (port), 11. HDMI 3 (port), 12. HDMI 4 (port), 13. USB 1 (port), 14. USB 2 (port), 15. USB 3 (port), Audio AMP (chip), EX-Line (port), Flash 4GB (memory), DDR 256MB (memory), Mstar CPU/GPU (chip), and two DDR 512MB (memory) modules. The board also features a power jack and several other smaller connectors and components.</p> <p>Main circuit board in Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300621)</p>

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Claim	Claim Element	Evidence of Infringement
		<div><p>The diagram illustrates the internal architecture of a Samsung H6400 series television. At the center is the X14H processor, which is connected to various input and output modules. On the left, inputs include DUAL NIM, FULL NIM, HALF NIM, HDMI x 4, SCART, and COMPONENT1/AV1. These connect to the X14H via channels like CH_DATA1, CH_DATA2, TS0_DATA, and TUNER_CVBS. The X14H also handles PCM control and data. On the right, the X14H connects to eMMC4.5 (4GB), DDR3 (256MB), and DDR3 (512MB) memory, as well as an EEPROM (24C32) and a MAX3222 I2C interface. It also manages USB 3.0, Ethernet (MAC.10/100), and CVBS AFE. The X14H is connected to an Audio Codec, Ch. Demod., and TS : 1 parallel In/Out. The X14H outputs to SC CVBS IN, SC RGB IN, COMP1 VPhPr, AV1 CVBS, TUNER_SIF, SC L/R IN, and COMP1 AV1 L/R IN. On the right, the X14H connects to LVDS 2CH (60Hz), SC CVBS_OUT, SC L/R_OUT_X12, AMP DRV612, HP_LINE_L/R_OUT, MONI_HP L/R_OUT, T2S, and SPDIF_OUT. These connect to external components like FRC/TCO, SCART, HEADPHONE, SPK, and OPTICAL Out. The X14H also manages a Function BT module, IR Key INPUT, and a WIFI module.</p></div> <p>Block diagram of Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300618)</p> <p>Doctrine of Equivalents</p> <p>To the extent that Samsung Televisions do not literally meet the “processor[s]” claim element of the asserted claims, Samsung satisfies the “processor[s]” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices, including components for general purpose, application, ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions (i) perform substantially the same function of processing; (ii) in substantially the same way, by performing operations on data; and (iii) with substantially the same result of having processed data. The processing ‘cores’, processing modules, and/or processing devices, including components for general purpose, application,</p>

Claim	Claim Element	Evidence of Infringement
		ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions are not substantially different from the claimed “processor[s].”
105[b]	receiving a broadcast or cablecast transmission;	<p>Samsung Televisions receive broadcast or cablecast transmissions. For example, received ATSC signals are broadcast transmissions. Received cable television signals are cablecast transmissions.</p>  <p>Figure 5.1 ITU-R digital terrestrial television broadcasting model.</p> <p><i>ATSC Digital Television Standard: Part 1 – Digital Television System</i>, Document A/53 Part 1: 2009, p. 18. (PMCTEC00100094)</p>

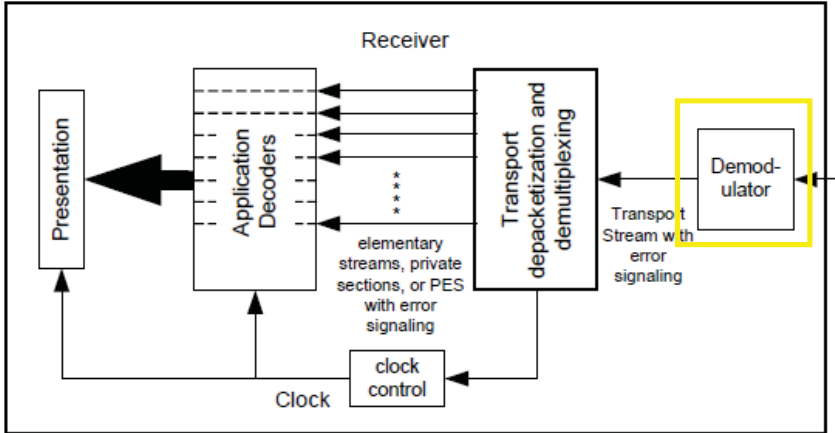
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Claim	Claim Element	Evidence of Infringement
		<p>Connecting an Antenna</p> <p>Connect a cable from an antenna or cable wall outlet to the ANT IN connector, as shown in the image below to receive broadcast signals.</p> <p> An antenna connection is not necessary if you connect a cable box or satellite receiver.</p>  <p><i>Samsung E-Manual at p. 14. (PMCTEC00300014)</i></p>
105[c]	demodulating said broadcast or cablecast transmission to detect an information transmission thereon, said information transmission including said stream of digital data messages;	Samsung Televisions demodulate broadcast or cablecast transmission to detect an information transmission thereon.

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Claim	Claim Element	Evidence of Infringement
		 <p><i>A/53 Part 3:2013 (Service Multiplex and Transport)</i> at p. 9, ATSC (yellow box added). (PMCTEC00100064)</p> <p>See, for example, the E32-C1 Samsung television model, which includes an “ATSC demodulator”:</p> <p>Upon information and belief, every accused model of a Samsung Television includes a demodulator.</p> <p>The information transmission includes said stream of digital data messages, including, for example, TS packets and/or PES packets.</p> <p><u>ATSC</u></p> <p>“Decoders must include a means to look for start codes and sync bytes (transport stream) in order to begin decoding correctly, and to identify errors, erasures or</p>

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Claim	Claim Element	Evidence of Infringement
		<p>insertions while decoding. The methods to identify these situations, and the actions to be taken, are not standardized.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 15, ATSC. (PMCTEC00100091)</p> <p>“The digital television system employs the MPEG-2 video stream syntax for the coding of video and the Digital Audio Compression (AC-3) Standard for the coding of audio.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p>“The digital television system employs the MPEG-2 transport stream syntax for the packetization and multiplexing of video, audio, and data signals for digital broadcasting systems (ISO/IEC 13818- 1).”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p><u>MPEG-2</u></p> <p>“The Rec. ITU-T H.222.0 ISO/IEC 13818-1 transport stream coding layer allows one or more programs to be combined into a single stream. <i>Data from each elementary stream are multiplexed together with information that allows synchronized presentation of the elementary streams within a program.</i></p> <p>A transport stream consists of one or more programs. Audio and video elementary streams consist of access units.</p> <p>Elementary stream data is carried in PES packets. A PES packet consists of a PES packet header followed by packet data. PES packets are inserted into transport stream packets.</p>

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Claim	Claim Element	Evidence of Infringement
		<p>The first byte of each PES packet header is located at the first available payload location of a transport stream packet.</p> <p>The PES packet header begins with a 32-bit start-code that also identifies the stream or stream type to which the packet data belongs. <i>The PES packet header may contain decoding and presentation time stamps (DTS and PTS).</i> The PES packet header also contains other optional fields. The PES packet data field contains a variable number of contiguous bytes from one elementary stream.</p> <p>Transport stream packets begin with a 4-byte prefix, which contains a 13-bit packet ID (PID), defined in Table 2-2. The PID identifies, via the program-specific information (PSI) tables, the contents of the data contained in the transport stream packet. Transport stream packets of one PID value carry data of one and only one elementary stream.”</p> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 10 (emphasis added). (PMCTEC00100515)</p>

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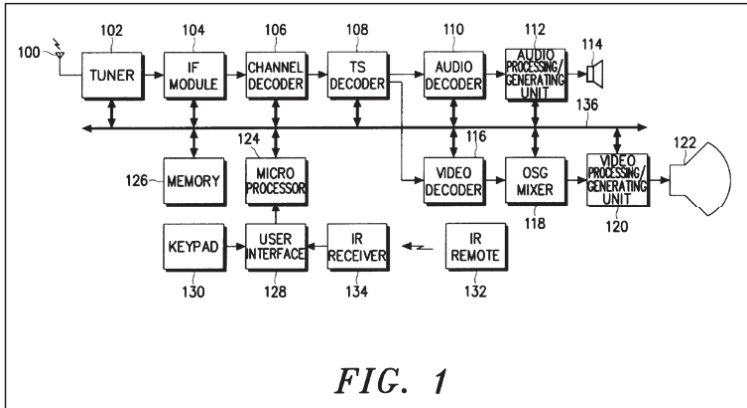
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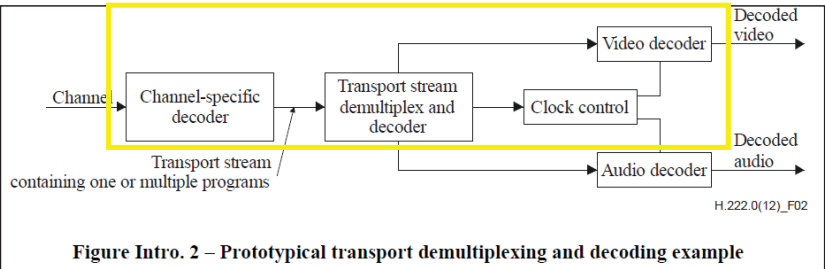
Claim	Claim Element	Evidence of Infringement																																																									
		<p>Table 2-2 – Transport packet of this Recommendation International Standard</p> <table> <tr> <th>Syntax</th><th>No. of bits</th><th>Mnemonic</th></tr> <tr> <td>transport_packet(){</td><td></td><td></td></tr> <tr> <td> sync_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> transport_error_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> payload_unit_start_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> transport_priority</td><td>1</td><td>bslbf</td></tr> <tr> <td> PID</td><td>13</td><td>uimsbf</td></tr> <tr> <td> transport_scrambling_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> adaptation_field_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> continuity_counter</td><td>4</td><td>uimsbf</td></tr> <tr> <td> if(adaptation_field_control == '10' adaptation_field_control == '11'){</td><td></td><td></td></tr> <tr> <td> adaptation_field()</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> if(adaptation_field_control == '01' adaptation_field_control == '11') {</td><td></td><td></td></tr> <tr> <td> for (i = 0; i < N; i++){</td><td></td><td></td></tr> <tr> <td> data_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td>}</td><td></td><td></td></tr> </table> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 21. (PMCTEC00100526)</p>	Syntax	No. of bits	Mnemonic	transport_packet(){			sync_byte	8	bslbf	transport_error_indicator	1	bslbf	payload_unit_start_indicator	1	bslbf	transport_priority	1	bslbf	PID	13	uimsbf	transport_scrambling_control	2	bslbf	adaptation_field_control	2	bslbf	continuity_counter	4	uimsbf	if(adaptation_field_control == '10' adaptation_field_control == '11'){			adaptation_field()			}			if(adaptation_field_control == '01' adaptation_field_control == '11') {			for (i = 0; i < N; i++){			data_byte	8	bslbf	}			}			}		
Syntax	No. of bits	Mnemonic																																																									
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105[d]	detecting a first digital data message of said stream of digital data messages on said information transmission;	Samsung Televisions detect a first digital data message of said stream of digital data messages on said information transmission. For example, Samsung Televisions detect a TS packet carrying video data from a television program.																																																									

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Claim	Claim Element	Evidence of Infringement
		<div><p>The diagram illustrates the structure of an MPEG-2 Transport Stream (TS). It shows a large blue cylinder representing the 'MPEG-2 Transport Stream'. Inside this cylinder, there is a smaller blue cylinder representing a 'program number 2000'. Arrows point from the TS to various tables and streams:</p><ul style="list-style-type: none">PAT (Program Association Table): Contains TSID = 4100, PMT PID = 1025, and program_number = 2000.PMT (Program Map Table) (section): Contains program_number = 2000, Video PID = 501, Audio PID (English) = 601, and Audio PID (French) = 602.Streams: Video (PID 501), Audio (English) (PID 601), and Audio (French) (PID 602).SI Base PID: 8187, which points to STT, MGT, VCT, RRT, EIT-n, ETT-n, and other tables referenced by MGT.<p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p></div> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP)</i>, Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78 (yellow box added). (PMCTEC00000533)</p> <p>Also, as illustrated in a simplified block diagram and related text of an ATSC standard-essential patent:</p> <p>“Referring to FIG. 1, a tuner 102 selects one RF channel among broadcasting signals received through an antenna 100 under the control of a microprocessor 124. Thereupon, the tuner 102 outputs an IF (intermediate frequency) signal of the selected channel, which is converted by the IF module 104 into a baseband signal so as to then be delivered to a channel decoder 106. The channel decoder 106 converts the baseband signal to a channel signal to reconstruct data bit strings. Such reconstructed data bit</p>

Claim	Claim Element	Evidence of Infringement
		<p>strings are separated into audio data, video data, and auxiliary data by a TS (transport stream) decoder 108.”</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. at col. 2:40-50. (PMCTEC00301156)</p>  <p style="text-align: center;">FIG. 1</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. (PMCTEC00301153)</p>
105[e]	passing said first digital data message among said plurality of programmable processors; and	<p>Samsung Televisions pass said first digital data message among said plurality of programmable processors. For example, Samsung Televisions pass the TS video packet among a plurality of programmable processors, including the TS decoder, TS demultiplexer, and/or video decoder(s) (and/or processing cores or application specific integrated circuits inside the video decoder(s)).</p>

Claim	Claim Element	Evidence of Infringement
		 <p>Figure Intro. 2 – Prototypical transport demultiplexing and decoding example</p> <p>[MPEG-2, Part 1] <i>Information Technology – Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. viii (yellow box added). (PMCTEC00100501)</p>

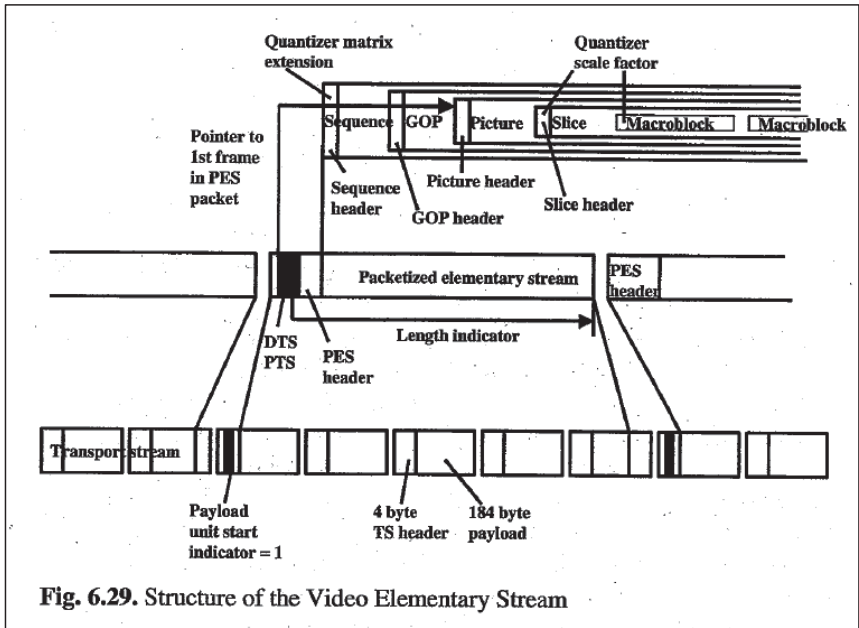
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Claim	Claim Element	Evidence of Infringement
		<p>Reprinted with permission © Sarnoff Corporation (as amended) Figure 1 PIDs & Tuning¹</p> <p>CEA Bulletin: PSIP Recommended Practice, CEA-CEB12-A, October 2003, Consumer Electronics Association, p. 3 (yellow box added). (PMCTEC00105410)</p> <p>See also Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
105[f]	causing, using a programmable control processor, at least one of said plurality of programmable processors to receive only some of said first digital data	<p>Samsung Televisions cause, using a programmable control processor, at least one of said plurality of programmable processors to receive only some of said first digital data message. For example, Samsung Televisions cause, using a TS demultiplexer, PID filter, a processing core, and/or a decoding controller, at least one of the plurality of programmable processors described above to receive only a portion of the TS video packet. In one example, the video decoders do not receive the TS header and/or padding bits. In another example, one or more processors inside the video decoder(s) do not receive the TS or PES packet headers. In another</p>


Claim	Claim Element	Evidence of Infringement
	message, thereby to cause said plurality of programmable processors to process said first digital data message selectively,	<p>example, the video de-interlacing, up/downscaling, motion compensation, post processing, and/or outputting processors do not receive the TS, PES, and/or other information included in TS video packets, such as MPEG video picture or frame containers.</p> <p>The above causes said plurality of programmable processors to process said first digital data message selectively. For example, processors will process only selective portions of the first digital data message. In addition, only certain selected processors (processors handling video) will process said first digital data message.</p> <p><u>Doctrine of Equivalents</u></p> <p>To the extent that Samsung Televisions do not literally meet the “control processor” claim element of the asserted claims, Samsung satisfies the “control processor” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices programmed and/or configured to control processors, cores, modules, devices, or functionality in Samsung Televisions (i) perform substantially the same function of processing information to control a processor, apparatus, module, device, and/or functionality; (ii) in substantially the same way, by computing and/or processing information to control a processor, apparatus, module, device, and/or functionality; and (iii) with substantially the same result of controlling a processor, apparatus, module, device, and/or functionality. The processing ‘cores’, processing modules, and/or processing devices in Samsung Televisions programmed and/or configured to control processors, cores, modules, devices, and/or functionalities are not substantially different from the claimed “control processor.”</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
105[g]	where the only some of the data message processed by said plurality of programmable processors contains a control signal;	<p>In received ATSC/cable television MPEG-2 transmissions, the only some of the data message processed by said plurality of programmable processors contains a control signal.</p> <p>For example, PES packets, which include control signals in their headers, are encapsulated in TS packets.</p>

Claim	Claim Element	Evidence of Infringement
		<p>“Elementary stream data is carried in PES packets. A PES packet consists of a PES packet header followed by packet data. PES packets are inserted into transport stream packets.</p> <p>The first byte of each PES packet header is located at the first available payload location of a transport stream packet.</p> <p>The PES packet header begins with a 32-bit start-code that also identifies the stream or stream type to which the packet data belongs. <i>The PES packet header may contain decoding and presentation time stamps (DTS and PTS).</i> The PES packet header also contains other optional fields. The PES packet data field contains a variable number of contiguous bytes from one elementary stream.</p> <p>Transport stream packets begin with a 4-byte prefix, which contains a 13-bit packet ID (PID), defined in Table 2-2. The PID identifies, via the program-specific information (PSI) tables, the contents of the data contained in the transport stream packet. Transport stream packets of one PID value carry data of one and only one elementary stream.”</p> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 10 (emphasis added). (PMCTEC00100515)</p> <p>In another example, containers of macroblocks, slices, pictures, groups of pictures, and sequences, also include control signals in their headers.</p>

Claim	Claim Element	Evidence of Infringement
		 <p>Fig. 6.29. Structure of the Video Elementary Stream</p> <p><i>Walter Fischer: Digital Televisions, A Practical Guide for Engineers, p. 89 (2004). (PMCTEC00000077)</i></p> <p>In another example, encoded video data includes control signals, such as Variable Length Coded identifiers of video data.</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
105[h]	outputting image	Samsung Televisions output image information from said plurality of programmable processors


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Claim	Claim Element	Evidence of Infringement
	information from said plurality of programmable processors to an image display device based on said causing.	<p data-bbox="516 604 1003 632">to an image display device based on said causing.</p>  <p data-bbox="516 1289 1029 1316">Samsung JS7000 Television. (PMCTEC00300881)</p>

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Claim	Claim Element	Evidence of Infringement
		 <p data-bbox="516 1066 1338 1121">Samsung 4K SUHD JS7000 Series Smart TV (http://www.samsung.com/us/video/tvs/UN55JS7000FXZA) (PMCTEC00300632)</p> <p data-bbox="516 1150 1435 1205"><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
106[a]	A method of processing signals in a receiver of a broadcast or cablecast transmission, said receiver including a controllable device and having a plurality of programmable processors, said method comprising the steps of:	<p data-bbox="516 1241 1419 1377">Samsung performs a method of processing signals in a receiver of a broadcast or cablecast transmission, said receiver including controllable device and having a plurality of programmable processors. Samsung Televisions are receivers. Examples of Samsung Televisions include the UN55JS7000 and UN65H6400 models. On information and belief, other accused models of Samsung Televisions operate similarly.</p>

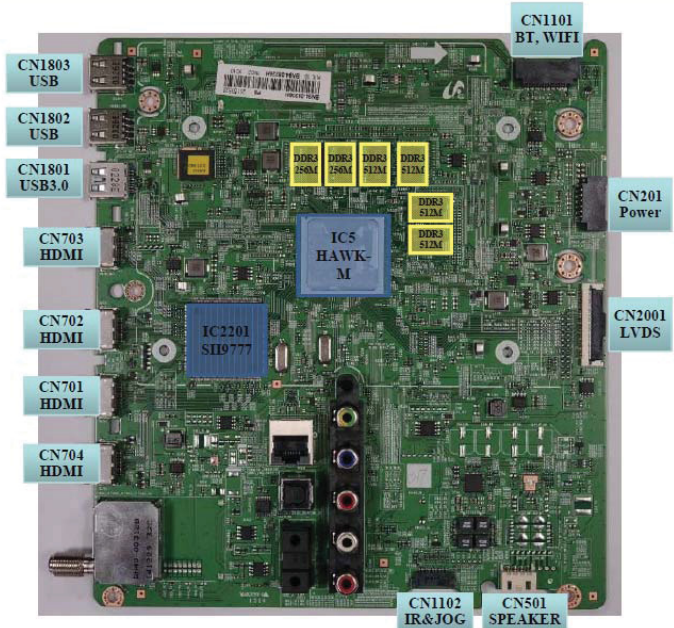
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Claim	Claim Element	Evidence of Infringement
		 <p>Samsung 4K SUHD JS7000 Series Smart TV (http://www.samsung.com/us/video/tvs/UN55JS7000FXZA) (PMCTEC00300632)</p> <p>Samsung Televisions include a controllable device, such as, for example, a TS decoder and/or demultiplexer, PID filters, processing cores, and/or video decoders.</p> <p>Samsung Televisions have a plurality of programmable processors. Samsung Televisions include System-on-Chip (“SoC”) configurations that have several processing ‘cores’ and/or processing modules and devices, each of which is a processor. For example, the JS7000 television includes HAWK-M and HAWK-UFT SoC microchips each of which contains several processors. The H6400 television includes an X14H SoC microchip with several processors. Other models, such as for example, C9000, include multiple SoC microchips, each containing one or more processors. In addition, Samsung Television SoC microchips contain various processing devices for ATSC, Transport Stream, video decoding, graphics, color, and on-screen display processing.</p>

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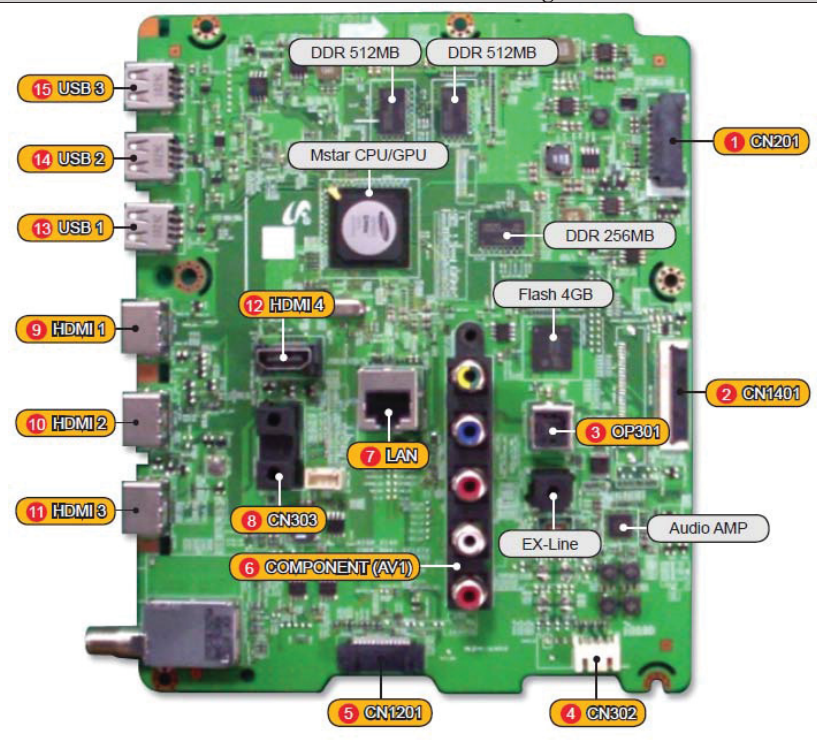
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Claim	Claim Element	Evidence of Infringement
		<p>QUAD-CORE PROCESSOR</p> <p>Enjoy a fluid browsing experience and faster control – switching between apps, streaming content, and other media effortlessly.</p> <p>JS7000 SUHD TV Spec Sheet at p. 2. (PMCTEC00301143)</p> <p>Main Board Layout</p>  <p>Main circuit board in Samsung JS7000 series television, UN JS7000 Series Service</p> <p>The image shows the main circuit board of a Samsung JS7000 series television. The board is green and populated with various electronic components. Key components are labeled with callouts: IC5 HAWK-M (the central processor), IC2201 SII9777 (a video processor), and several DDR3 memory modules (labeled 256M, 512M, 512M, 512M). Connectors are labeled on the left (CN1803 USB, CN1802 USB, CN1801 USB3.0, CN703 HDMI, CN702 HDMI, CN701 HDMI, CN704 HDMI) and on the right (CN1101 BT, WIFI, CN201 Power, CN2001 LVDS). At the bottom, CN1102 IR&JOG and CN501 SPEAKER are labeled. A barcode sticker is visible near the top center of the board.</p>

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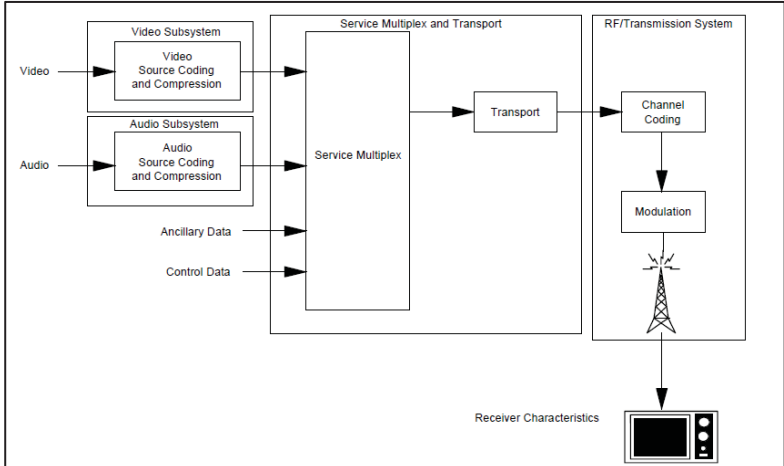
Claim	Claim Element	Evidence of Infringement
		<p>Presentation, Slide 32. (PMCTEC00300565)</p> <p>Block diagram of Samsung JS7000 series television, UN_JS7000 Series Service Presentation, Slide 31. (PMCTEC00300564)</p> <p>QUAD CORE PROCESSOR Quad Core eliminates lag to give you a fluid browsing experience. It enables you to switch between apps, stream content and multi-task faster. This extra power also provides faster page refreshing.</p> <p>H6400 Smart LED TV Spec Sheet at p. 2. (PMCTEC00300705)</p>

Claim	Claim Element	Evidence of Infringement
		<div><p>The image shows a green printed circuit board (PCB) for a Samsung H6400 series television. It is populated with various electronic components, including memory modules, a central processor, storage, and various input/output ports. The components are labeled with text and numbered callouts (1-15) in yellow boxes. The labels include: USB 3, USB 2, USB 1, HDMI 1, HDMI 2, HDMI 3, HDMI 4, LAN, COMPONENT (AV1), EX-Line, Audio AMP, Flash 4GB, OP301, CN1401, CN201, CN1201, CN302, CN303, Mstar CPU/GPU, and two DDR 512MB modules. The board also features a large black heat sink over the Mstar CPU/GPU.</p></div> <p>Main circuit board in Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300621)</p>

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Claim	Claim Element	Evidence of Infringement
		<p>Block diagram of Samsung H6400 series television, UN_H6400 Series Service Manual, pp. 5-6. (PMCTEC00300618)</p> <p>Doctrine of Equivalents</p> <p>To the extent that Samsung Televisions do not literally meet the “processor[s]” claim element of the asserted claims, Samsung satisfies the “processor[s]” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices, including components for general purpose, application, ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions (i) perform substantially the same function of processing; (ii) in substantially the same way, by performing operations on data; and (iii) with substantially the same result of having processed data. The processing ‘cores’, processing</p>

Claim	Claim Element	Evidence of Infringement
		modules, and/or processing devices, including components for general purpose, application, ATSC, Transport Stream, video decoding, audio decoding, graphics, color, scaling, motion compensation, and on-screen display, processing in Samsung Televisions are not substantially different from the claimed “processor[s].”
106[b]	receiving a broadcast or cablecast signal;	<p>Samsung Televisions receive a broadcast or cablecast signal. For example, received ATSC signals are broadcast signals. Received cable television signals are cablecast signals.</p>  <p>Figure 5.1 ITU-R digital terrestrial television broadcasting model.</p> <p><i>ATSC Digital Television Standard: Part 1 – Digital Television System</i>, Document A/53 Part 1: 2009, p. 18. (PMCTEC00100094)</p>

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Claim	Claim Element	Evidence of Infringement
		<p>Connecting an Antenna</p> <p>Connect a cable from an antenna or cable wall outlet to the ANT IN connector, as shown in the image below to receive broadcast signals.</p> <p>An antenna connection is not necessary if you connect a cable box or satellite receiver.</p> <p><i>Samsung E-Manual at p. 14. (PMCTEC00300014)</i></p>
106[c]	detecting a stream of digital data on said received signal;	<p>Samsung Televisions detect a stream of digital data on said received signal. For example, Samsung Televisions detect transport stream (TS) packets in the MPEG-2 information transmission.</p> <p>ATSC</p> <p>“Decoders must include a means to look for start codes and sync bytes (transport stream) in order to begin decoding correctly, and to identify errors, erasures or insertions while decoding. The methods to identify these situations, and the actions to be taken, are not standardized.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System) at p. 15, ATSC. (PMCTEC00100091)</i></p> <p>“The digital television system employs the MPEG-2 video stream syntax for the coding</p>

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Claim	Claim Element	Evidence of Infringement
		<p>of video and the Digital Audio Compression (AC-3) Standard for the coding of audio.”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <p>“The digital television system employs the MPEG-2 transport stream syntax for the packetization and multiplexing of video, audio, and data signals for digital broadcasting systems (ISO/IEC 13818- 1).”</p> <p><i>A/53 Part 1:2013 (ATSC Digital Television System)</i> at p. 18, ATSC. (PMCTEC00100094)</p> <div data-bbox="516 934 1151 1484" data-label="Diagram"> <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP),</i></p> </div>

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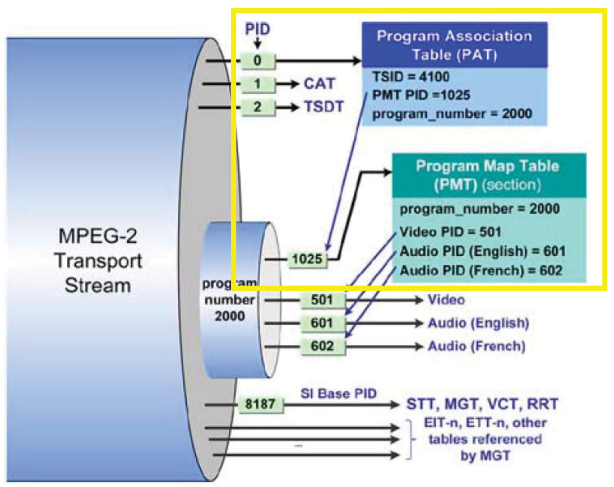
Claim	Claim Element	Evidence of Infringement
		<p>Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78. (PMCTEC00000533)</p> <p><u>MPEG-2</u></p> <p>“The Rec. ITU-T H.222.0 ISO/IEC 13818-1 transport stream coding layer allows one or more programs to be combined into a single stream. <i>Data from each elementary stream are multiplexed together with information that allows synchronized presentation of the elementary streams within a program.</i></p> <p>A transport stream consists of one or more programs. Audio and video elementary streams consist of access units.</p> <p>Elementary stream data is carried in PES packets. A PES packet consists of a PES packet header followed by packet data. PES packets are inserted into transport stream packets.</p> <p>The first byte of each PES packet header is located at the first available payload location of a transport stream packet.</p> <p>The PES packet header begins with a 32-bit start-code that also identifies the stream or stream type to which the packet data belongs. <i>The PES packet header may contain decoding and presentation time stamps (DTS and PTS).</i> The PES packet header also contains other optional fields. The PES packet data field contains a variable number of contiguous bytes from one elementary stream.</p> <p>Transport stream packets begin with a 4-byte prefix, which contains a 13-bit packet ID (PID), defined in Table 2-2. The PID identifies, via the program-specific information (PSI) tables, the contents of the data contained in the transport stream packet. Transport stream packets of one PID value carry data of one and only one elementary stream.”</p> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 10 (emphasis added). (PMCTEC00100515)</p>

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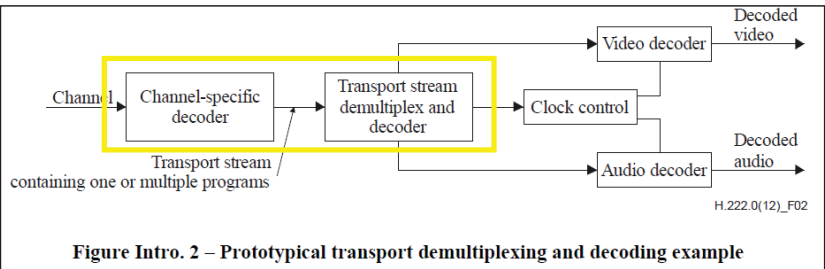
Claim	Claim Element	Evidence of Infringement																																																									
		<p style="text-align: center;">Table 2-2 – Transport packet of this Recommendation International Standard</p> <table> <tr> <th>Syntax</th><th>No. of bits</th><th>Mnemonic</th></tr> <tr> <td>transport_packet(){</td><td></td><td></td></tr> <tr> <td> sync_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> transport_error_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> payload_unit_start_indicator</td><td>1</td><td>bslbf</td></tr> <tr> <td> transport_priority</td><td>1</td><td>bslbf</td></tr> <tr> <td> PID</td><td>13</td><td>uimsbf</td></tr> <tr> <td> transport_scrambling_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> adaptation_field_control</td><td>2</td><td>bslbf</td></tr> <tr> <td> continuity_counter</td><td>4</td><td>uimsbf</td></tr> <tr> <td> if(adaptation_field_control == '10' adaptation_field_control == '11'){</td><td></td><td></td></tr> <tr> <td> adaptation_field()</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> if(adaptation_field_control == '01' adaptation_field_control == '11') {</td><td></td><td></td></tr> <tr> <td> for (i = 0; i < N; i++){</td><td></td><td></td></tr> <tr> <td> data_byte</td><td>8</td><td>bslbf</td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td> }</td><td></td><td></td></tr> <tr> <td>}</td><td></td><td></td></tr> </table> <p><i>ISO/IEC 13818-1:2013 (E)</i> [a/k/a MPEG 2: Part 1] at p. 21. (PMCTEC00100526)</p> <p>Also, as illustrated in a simplified block diagram and related text of an ATSC standard-essential patent:</p> <p>“Referring to FIG. 1, a tuner 102 selects one RF channel among broadcasting signals received through an antenna 100 under the control of a microprocessor 124. Thereupon, the tuner 102 outputs an IF (intermediate frequency) signal of the selected channel, which is converted by the IF module 104 into a baseband signal so as to then be delivered to a channel decoder 106. The channel decoder 106 converts the baseband signal to a channel signal to reconstruct data bit strings. Such reconstructed data bit strings are separated into audio data, video data, and auxiliary data by a TS (transport stream) decoder 108.”</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics</p>	Syntax	No. of bits	Mnemonic	transport_packet(){			sync_byte	8	bslbf	transport_error_indicator	1	bslbf	payload_unit_start_indicator	1	bslbf	transport_priority	1	bslbf	PID	13	uimsbf	transport_scrambling_control	2	bslbf	adaptation_field_control	2	bslbf	continuity_counter	4	uimsbf	if(adaptation_field_control == '10' adaptation_field_control == '11'){			adaptation_field()			}			if(adaptation_field_control == '01' adaptation_field_control == '11') {			for (i = 0; i < N; i++){			data_byte	8	bslbf	}			}			}		
Syntax	No. of bits	Mnemonic																																																									
transport_packet(){																																																											
sync_byte	8	bslbf																																																									
transport_error_indicator	1	bslbf																																																									
payload_unit_start_indicator	1	bslbf																																																									
transport_priority	1	bslbf																																																									
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transport_scrambling_control	2	bslbf																																																									
adaptation_field_control	2	bslbf																																																									
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Claim	Claim Element	Evidence of Infringement
		<p>Co., Ltd. at col. 2:40-50. (PMCTEC00301156)</p> <p>FIG. 1</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. (PMCTEC00301153)</p>
106[d]	passing a first portion of said stream of digital data among said plurality of programmable processors in a first passing fashion;	<p>Samsung Televisions pass a first portion of said stream of digital data among said plurality of programmable processors in a first passing fashion. For example, Samsung Televisions pass PSI portions (PAT and PMT tables) and/or PSIP portions (VCT tables) (first portion of said stream of digital data) among said plurality of programmable processors (from the transport stream decoder and/or demultiplexer to a processing core and/or to a PID filter) in a first fashion.</p>

Claim	Claim Element	Evidence of Infringement
		 <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p> <p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP),</i> Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78 (yellow box added). (PMCTEC00000533)</p>

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Claim	Claim Element	Evidence of Infringement
		 <p>Figure Intro. 2 – Prototypical transport demultiplexing and decoding example</p> <p>[MPEG-2, Part 1] <i>Information Technology – Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. viii (yellow box added). (PMCTEC00100501)</p>

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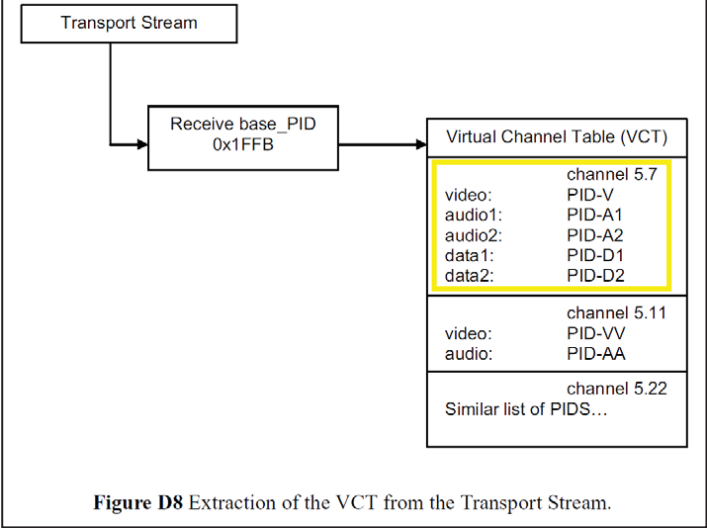
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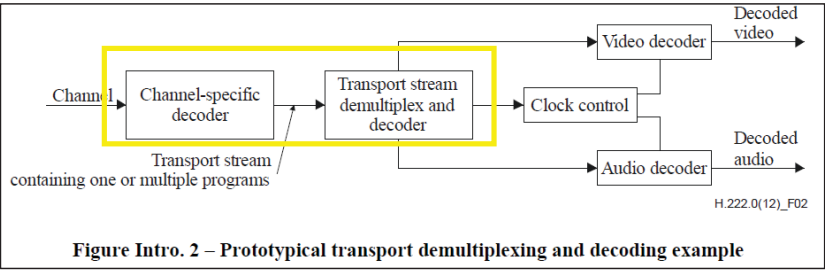
Claim	Claim Element	Evidence of Infringement
		<p>Reprinted with permission © Sarnoff Corporation (as amended) Figure 1 PIDs & Tuning¹</p> <p>CEA Bulletin: <i>PSIP Recommended Practice</i>, CEA-CEB12-A, October 2003, Consumer Electronics Association, p. 3 (yellow box added). (PMCTEC00105410)</p> <p>In addition, as described in a Samsung ATSC standard-essential patent:</p> <p>“Further, the microprocessor 124 receives the auxiliary data from the TS decoder 108, whereby such auxiliary data contain the program specification information (PSI) as the table containing program related information stipulated by the MPEG2 standard, and/or the above-mentioned EPG information, etc.”</p> <p>MPEG-LA ATSC Standard-Essential U.S. Patent No. 6,104,436 to Samsung Electronics Co., Ltd. at col. 3:9-14. (PMCTEC00301157)</p> <p>See also Doctrine of Equivalents allegations with respect to the “processor[s]” claim element</p>

Claim	Claim Element	Evidence of Infringement												
		set forth above.												
106[e]	processing said passed first portion of said stream of digital data into a first control signal;	<p>Samsung Televisions process said passed first portion of said stream of digital data into a first control signal. For example, Samsung Televisions process the passed PSI and PSIP data to identify PID numbers corresponding to various elementary streams of television programs (control signals).</p> <table border="1"><caption>Table 2-28 – Program-specific information</caption><tr><th>Structure Name</th><th>Stream Type</th><th>Reserved PID #</th><th>Description</th></tr><tr><td>Program association table</td><td>Rec. ITU-T H.222.0 ISO/IEC 13818-1</td><td>0x00</td><td>Associates program number and program map table PID</td></tr><tr><td>Program map table</td><td>Rec. ITU-T H.222.0 ISO/IEC 13818-1</td><td>Assigned in the PAT</td><td>Specifies PID values for components of one or more programs</td></tr></table> <p>[MPEG-2, Part 1] <i>Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. 45. (PMCTEC00100550)</p>	Structure Name	Stream Type	Reserved PID #	Description	Program association table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	0x00	Associates program number and program map table PID	Program map table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	Assigned in the PAT	Specifies PID values for components of one or more programs
Structure Name	Stream Type	Reserved PID #	Description											
Program association table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	0x00	Associates program number and program map table PID											
Program map table	Rec. ITU-T H.222.0 ISO/IEC 13818-1	Assigned in the PAT	Specifies PID values for components of one or more programs											

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Claim	Claim Element	Evidence of Infringement
		 <p>Figure D8 Extraction of the VCT from the Transport Stream.</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable</i>, 7 August 2013, (PSIP) at p. 119 (yellow box added). (PMCTEC00104164)</p>
106[f]	passing a control portion of said stream of digital data to a programmable control processor;	Samsung Televisions pass a control portion of said stream of digital data to a programmable control processor. For example, Samsung Televisions pass received TS packet headers and/or the PIDs identified therein to a TS processor and/or TS demultiplexer and/or PID filter.

Claim	Claim Element	Evidence of Infringement
		 <p>Figure Intro. 2 – Prototypical transport demultiplexing and decoding example</p> <p>[MPEG-2, Part 1] <i>Information Technology – Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. viii (yellow box added). (PMCTEC00100501)</p>

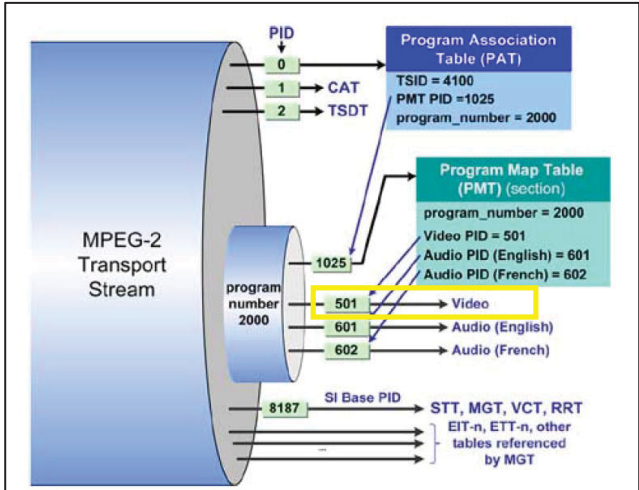
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Claim	Claim Element	Evidence of Infringement
		<p>Reprinted with permission © Sarnoff Corporation (as amended)</p> <p>Figure 1 PIDs & Tuning¹</p> <p>CEA Bulletin: <i>PSIP Recommended Practice</i>, CEA-CEB12-A, October 2003, Consumer Electronics Association, p. 3. (PMCTEC00105410)</p> <p>Doctrine of Equivalents</p> <p>To the extent that Samsung Televisions do not literally meet the “control processor” claim element of the asserted claims, Samsung satisfies the “control processor” claim element under the doctrine of equivalents. For example, processing ‘cores’, processing modules, and/or processing devices programmed and/or configured to control processors, cores, modules, devices, or functionality in Samsung Televisions (i) perform substantially the same function of processing information to control a processor, apparatus, module, device, and/or functionality; (ii) in substantially the same way, by computing and/or processing information to control a processor, apparatus, module, device, and/or functionality; and (iii) with substantially the same result of controlling a processor, apparatus, module, device, and/or functionality. The</p>

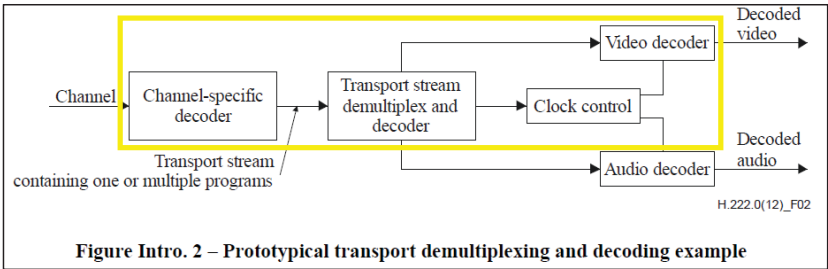
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Claim	Claim Element	Evidence of Infringement
		processing ‘cores’, processing modules, and/or processing devices in Samsung Televisions programmed and/or configured to control processors, cores, modules, devices, and/or functionalities are not substantially different from the claimed “control processor.”
106[g]	controlling the passing of said first control signal from said plurality of programmable processors to said controllable device in response to said passed control portion; and	<p>Samsung Televisions control the passing of said first control signal from said plurality of programmable processors to said controllable device in response to said passed control portion. For example Samsung Televisions control the passing of the parsed, processed, and/or programmed PID values (corresponding to various television programs or channels and their elementary streams) from said plurality of programmable processors to the TS demultiplexer and/or PID filter in response to the passed control portion discussed above. In another example, Samsung Televisions control the passing of desired PID values (such as a PID corresponding to a video elementary stream for a selected Television program or channel).</p>  <p>Fig. 2. Illustration of a TS showing multiple layers of multiplexing.</p>

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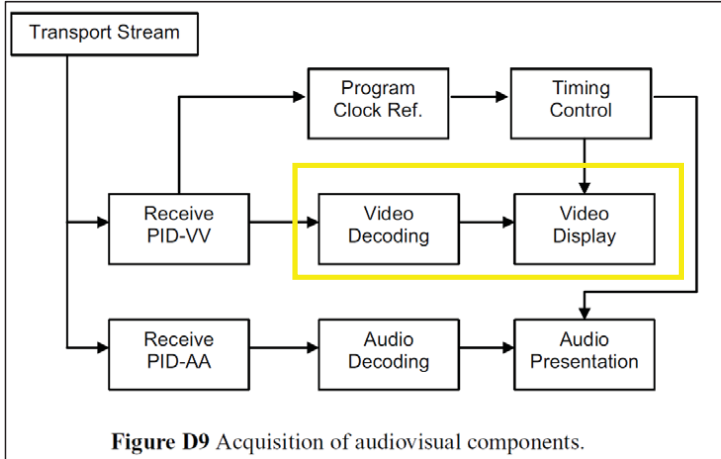
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Claim	Claim Element	Evidence of Infringement
		<p><i>The ATSC Transport Layer, Including Program and System Information Protocol (PSIP)</i>, Lechner et al., Proceedings of the IEEE, Vol. 94, No. 1, Jan. 2006, at p. 78 (yellow box added). (PMCTEC00000533)</p> <p>See also Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>
106[h]	controlling said controllable device in response to said first control signal, including: controlling the passing of a second portion of said stream of digital data among said plurality of programmable processors in a second passing fashion in response to said passed control portion; and	<p>Samsung Televisions control said controllable device in response to said first control signal, including: controlling the passing of a second portion of said stream of digital data among said plurality of programmable processors in a second passing fashion in response to said passed control portion. For example, Samsung Televisions control the TS demultiplexer, the PID filter(s), and/or processing cores to pass packets carrying video data, and/or the video data carried therein among the plurality of programmable processors in a second passing fashion (such as, from the TS decoder and/or demultiplexer to the video decoder(s) and/or processing core(s) (including application specific video decoding processors inside the decoder(s)), and/or to other video processors) in response to the passed control portion (TS packet headers and/or PIDs therein discussed above).</p>  <p>Figure Intro. 2 – Prototypical transport demultiplexing and decoding example</p> <p>[MPEG-2, Part 1] <i>Information Technology – Generic coding of moving pictures and associated audio information: Systems, ISO/IEC 13818-1:2013(E)</i>, p. viii (yellow box added). (PMCTEC00100501)</p>

Claim	Claim Element	Evidence of Infringement
		<p>Reprinted with permission © Sarnoff Corporation (as amended)</p> <p>Figure 1 PIDs & Tuning¹</p> <p>CEA Bulletin: <i>PSIP Recommended Practice</i>, CEA-CEB12-A, October 2003, Consumer Electronics Association, p. 3 (yellow box added). (PMCTEC00105410)</p> <p>In addition to the exemplary processors identified above, including those from the H6400 and similar models, Samsung Televisions, such as the JS7000 and similar models, also include multi-core Systems-on-Chip (“SoC”), such as the X14H SoC, the Hawk-M SoC, and the Hawk-UFT SoC. In Samsung Televisions with multi-core SoCs, the passing of data may occur between cores on a single SoC; between core(s) of one SoC (such as the Hawk-M) and core(s) of another SoC (such as the Hawk-UFT); and/or between two SoCs.</p> <p>See also Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>


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Claim	Claim Element	Evidence of Infringement
106[i]	processing said passed second portion of said stream of digital data to output image information from said plurality of programmable processors to an information output device.	<p>Samsung Televisions process said passed second portion of said stream of digital data to output image information from said plurality of programmable processors to an information output device. For example, the video decoder(s) (including application specific components therein) and deinterlacing, up/downscaling, composition, presentation, and other processors and/or cores process the second portion (packets carrying video data, and/or the video data carried therein) and output image information to an information output device (television monitor).</p>  <p>Figure D9 Acquisition of audiovisual components.</p> <p><i>A/65:2013, ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable</i>, 7 August 2013, (PSIP) at p. 120 (yellow box added). (PMCTEC00104165)</p>

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Claim	Claim Element	Evidence of Infringement
		 <p>Samsung JS7000 Television. (PMCTEC00300881)</p> <p><i>See also</i> Doctrine of Equivalents allegations with respect to the “processor[s]” claim element set forth above.</p>

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