



## Module Aids in TV Tuner Architecture Conversion

Exceeding ATSC, OpenCable, DVBT/C/H, DMB-TH, and ISDB-T standards, Xceive

Corporation's SN5000A SiliconNOW tuner module helps bridge the gap between CAN tuner architecture and silicon-based TV tuner architecture. The component offers plug-and-play physical compatibility with specific CAN tuners, Xceive's XC5000 silicon tuner, and integrated programmable DSP to optimize hardware. The 50-mm x 27-mm module exhibits a two-in-one CAN replacement supporting onboard demodulation of NTSC, PAL, and SECAM TV standards. The unit comes with Xceive's QuickTune technology for a complete channel scan of more than 100 channels in less than five seconds. Another available offering includes ChannelVista, Xceive's picture-in-picture (PIP) television technology, allowing the viewer to watch up to 12 video channels simultaneously with a single tuner. The module presents RF input, CVBS output, and SIF output impedances of 75  $\Omega$ , and VSWR of 2:1 in frequencies from 42 MHz to 864 MHz while operating from a 5-V power supply.

**Xceive Corporation, 408-486-5610, [www.xceive.com](http://www.xceive.com)**



## Embedded Networking Module Lets Users Roam with Reliability

Lantronix' MatchPort b/g Pro 802.11 b/g secure embedded networking module offers users reliability and mobility. Features include IEEE 802.11i compliant radio with AES-CCMP (Advanced Encryption Standard-Counter Mode with Cipher Block Chaining Message Authentication Code Protocol) and TKIP (Temporal Key Integrity Protocol); a complete suite of 802.1x EAP (Extensible Authentication Protocols) including EAP-TLS (Transport Layer Security), EAP-TTLS (Tunneled Transport Layer Security), PEAP (Open standard from Cisco Systems, Microsoft and RSA Security), LEAP (Lightweight Extensible Authentication Protocol); end-to-end TLS/SSL 3.0 (Secure Sockets Layer) and SSH (Secure Shell) tunneling; and end-to-end AES (Advanced Encryption Standard) 128-bit encrypted tunneling. SmartRoam technology continuously tracks the radio signal strength of access points within range. Pre-authentication and caching enables smooth and automatic transition to an access point with a stronger signal, enhancing mobile reliability, while minimizing communication disruption for the user.

**Lantronix, 949-453-3990, [www.lantronix.com](http://www.lantronix.com)**



## Thin, 2.5-inch MLC-based SSD with SATA II Presented as 2.4x Faster Than an HDD



Samsung Electronics has developed what it claims is the world's fastest, 2.5-inch, 256-GB multi-level cell (MLC) based solid state drive (SSD) using a SATA II interface. The 256-GB SSD is also said to be the thinnest drive with the largest capacity to be offered with a SATA II interface. With a sequential read speed of 200 MB/s and sequential write speed of 160 MB/s, this MLC-based 2.5-inch 256-GB SSD is presented as approximately 2.4-times faster than a typical HDD. The drive is 9.5 mm thick and measures 100.3 mm x 69.85 mm. Using

the company's controller technology, the MLC 256GB SSD touts reliability equal to that of SLC SSDs, with a mean time between failures (MTBF) of one million hours. Power consumption is 0.9 W in active mode. In addition, the drive's data encryption process prevents data stored on the SSD from being accessed in an unauthorized manner, even after the SSD is removed from the PC.

**Samsung Electronics, 972-385-1114, [www.samsung.com/us](http://www.samsung.com/us)**

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## Eight-GB Mini-Registered DIMM

SMART Modular Technologies expanded its DDR2 family to include what is said to be the industry's first 8-GB PC2-5300



244-pin Mini-registered DIMM (RDIMM) designed using CoolFlex and dual die package (DDP) technologies. The new Mini-RDIMM is suited for high-density, space-constrained networking and storage applications. Configured as a 1Gx72, four-rank module using SMART-built 2-Gb (512Mx4) DDPs, this device doubles memory capacity, according to the company, by allowing 36 DRAM placements on four sides. In order to reduce loading and improve signal integrity, the device has been designed with two registers and two phase locked loops (PLLs). Following the JEDEC standard pin-out, the Mini-RDIMMs incorporate the necessary error correction code functionality to satisfy many types of data-sensitive applications. They can be mounted with vertical, right-angled, or angled sockets.

**Smart Modular Technologies**

**510-624-8291, [www.smartmodulartech.com](http://www.smartmodulartech.com)**

## Prototyping Platform Gives Students Hands-on Experience

Based on LabVIEW graphical system design software, the Elvis II design and prototyping platform allows educators to provide hands-on, project-based learn-



ing with USB plug-and-play instruments and complete integration with Multisim 10.1 software for SPICE

simulation. Educators can use NI ELVIS II with a suite of third-party boards and curriculum resources to teach control design, telecommunications and micro-controller concepts. The platform features USB plug-and-play connectivity and 12 commonly used instruments including an oscilloscope, function generator, variable power supply and isolated digital multimeter. Educators and students can use Multisim 10.1 with the ELVIS II to seamlessly switch between simulated and acquired data, overlay simulated and measured data in the same instrument, and use a single platform when simulating or testing to provide a holistic view of the circuit design process. In addition, custom in-circuit quizzes and a 3-D feature enable students to wire their circuits on a virtual replica of the system.

**National Instruments, 800-258-7022, [www.ni.com](http://www.ni.com)**



## Tunable Tactile Switches Enable Additional “Sound Effects” In Applications

C&K Components has developed a series of sound tunable tactile switches, designated the KSC ST Series. The design of the switch enables the sound intensity to be 100 percent controlled, with the ability to match the sound level of applications with two sound intensity grades. The company is also able to ensure continuity of the sound when a printed circuit board is populated with a number of switches. The KSC ST Series switches feature a range of sound levels from high (>50 dBA) to low (<30 dBA). The switches meet IP67 approvals and are available in J or G terminations with silver or gold platings. The KSC ST Series sound tunable switches are appropriate for a variety of automotive applications including steering wheels, HVAC, dashboards, door, seat and sunroof modules, as well as industrial control panels and medical and consumer applications. Pricing starts at \$0.19 in quantities of 10K to 100K.

**C&K Components, 617-969-3700, [www.ck-components.com](http://www.ck-components.com)**



## Input Module Combines Five-Way Rocker and Scrollwheel Functionality with Two Analog Cursor Control Modes

Avago Technologies announced a thin, ultra-compact input device product that combines a navigation pad module with a motion sense and interface integrated circuit (IC) to provide mouse-like pointing in a variety of mobile devices. With a low profile height of 1.7 mm and diameter of 14 mm, this navigation pad incorporates a self-centering button with click function. Based on embedded capacitive sense technology, this miniature input module will enable designers to develop input devices that can provide analog cursor control for web browsing, gaming or digital camera applications in mobile devices. The incorporated mobile navigation sense and interface IC enables the input module to operate either as a four- or eight-way switch with scrollwheel functionality, or as an analog mouse or joystick to provide end-users with new and unique navigation experiences such as rapid scrolling and panning of menus and long lists, mouse-like navigation of web pages, drag and drop operations, as well as analog joystick-like control to make mobile gaming more enjoyable. In addition, bare skin contact is not required for operation of the navigation pad module, so end-users will be able to operate the input device while wearing gloves.

**Avago Technologies, 800-235-0312, [www.avagotech.com](http://www.avagotech.com)**



## Cooling Device Marries Fan to “Open Fin” Heat Sink



Jaro Thermal's 52-mm × 52-mm × 12-mm Neon fan/heat sink combination is presented as offering both high performance and low profile. The Neon Series synergistically marries fan to 'open fin' heat sink, and dissipates .275 W/°C. This results in a desirable level of thermal resistance. The Neon Series is designed for semiconductor applications, including FPGA, XPGA, VGA, and most other low profile applications. The life expectancy is 50,000 hours at 25°C. Options include

alarm output, tachometer output, thermistor control, or a choice of a pre-applied connector. Standardized mounting holes and pre-applied spring-loaded fasteners allow for quick and easy application.

**Jaro Thermal, 561-241-6700, [www.jarothermal.com](http://www.jarothermal.com)**

## OLED Smart Switches Feature High Resolution, Programmability

NKK Switches announced the availability of its OLED SmartSwitch and SmartDisplay high resolution programmable switches. These switches offer high contrast, 180-degree viewing angles, full colors, lower power consumption, fast response times, and no backlighting requirements. These programmable pushbutton switches and displays feature a

programmable and changeable OLED module with 65,536 colors in 16-bit mode, and 256 colors in 8-bit mode. Both



devices are capable of displaying full-motion video. The emissive devices are operated by commands and data supplied via the SPI communications protocol. The switch is capable of 64-RGB × 48-pixel resolution, and the display 52-RGB × 36 pixels. The wide viewing area of the switch is 15.5 mm × 11.6 mm (horizontal × vertical), and the display is 12.9 mm × 9.9 mm. NKK's OLED SmartSwitch and SmartDisplay are suited for a variety of applications requiring a graphical user interface or real-time sequencing. They are said to simplify complex multi-decision operations in string-dependent switching systems.

**NKK Switches**

**480-991-0942, [www.nkkswitches.com](http://www.nkkswitches.com)**

## Servo Drives Supply 7 A

Measuring 5" × 3" × 1.75", Applied Motion Products' SV Series servo drives deliver up to 7-A rms continuous or 14-A rms peak output current from a 24-VDC to 80-VDC power supply. The devices provide eight digital inputs, four digit outputs, two analog inputs, and an RS-232 or RS-485 communication interface. The drives use a digital PID loop with velocity and acceleration feedfor-



ward, a digital DQ current loop with sine commutation, and a PID output filter and derivative filter. The components are appropriate for automation applications, as well as the medi-

cal, life science, packaging and label markets.

**Applied Motion Products**

**800-525-1609, [www.applied-motion.com](http://www.applied-motion.com)**

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### Thirty-two Bit MCU Family Includes Integrated Development Environment

Microchip Technology's PIC32 family of 32-bit microcontrollers (MCUs) adds performance and memory while maintaining pin, peripheral, and software compatibility with the company's 16-bit MCU/DSC families, and it is fully supported by the MPLAB Integrated Development Environment (IDE). Launching with seven general-purpose members, the PIC32 family operates at up to 72 MHz and offers ample code- and data-space capabilities, with up to 512-KB Flash and 32-KB RAM. The PIC32 family also includes a variety of communication peripherals, a 16-bit Parallel Master Port supporting additional memory and displays, as well as a single-supply on-chip voltage regulator. The family is based on the industry-standard MIPS32 architecture, with its combination of performance, low power consumption, fast interrupt response and extensive industry tool support. The MIPS32 M4K core can achieve 1.5 DMIPS/MHz operation, due to its efficient instruction-set architecture, five-stage pipeline, hardware multiply/accumulate unit and up to eight sets of 32 core registers.

Microchip Technology Inc., 888-628-6247, [www.microchip.com](http://www.microchip.com)



### High Density 40-nm FPGAs and HardCopy ASICs Offer Transceiver Options



Altera's Stratix IV 40-nm FPGAs and HardCopy ASICs feature transceiver options, and provide up to 680-K logic elements (LEs). The HardCopy IV ASIC family offers equivalent densities as the Stratix IV devices and features up to 13.3 million gates. Stratix IV GX FPGAs offer up to 48 transceivers operating at up to 8.5 Gbps and feature hard IP support for PCI Express (PCIe) Gen 1 and 2, and also support for a wide range of protocols. Programmable Power Technology optimizes logic, DSP, and memory blocks to maximize performance where needed,

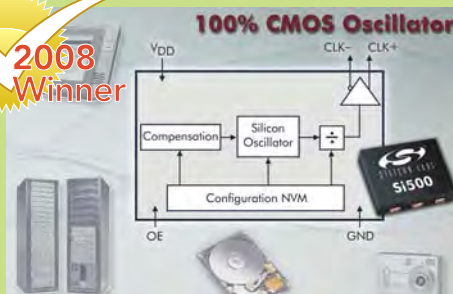
while delivering the lowest power elsewhere in the design.

Altera Corp., 408-544-7000, [www.altera.com](http://www.altera.com)

### High-Stability Oscillator Can Replace Crystal Oscillators

Silicon Laboratories introduced a 100 per cent CMOS oscillator for consumer applications. By completely eliminating the quartz resonator that must be cut and tuned for each crystal oscillator (XO) frequency, the Si500 helps enable extremely short lead times. The ultra-low phase noise silicon oscillator supports a wide frequency range, generating any output clock frequency from 0.9 MHz to 200 MHz. Using mixed-signal analog circuitry, the oscillator is compensated for frequency variation due to operating temperature range, initial frequency accuracy, supply voltage change, and output load change. The Si500 is presented as the industry's first silicon oscillator that provides temperature stability on par with crystal oscillators. The product family supports frequency stability options ranging from  $\pm 100$  ppm to  $\pm 150$  ppm, providing reliable operation and drop-in compatibility with quartz-based oscillators. Because the Si500 eliminates the mechanical resonator used for frequency generation, it provides high immunity to the shock and vibration. The Si500 supports differential clock outputs (LVPECL, LVDS, HCSL), in addition to CMOS and SSTL formats, and it supports a dual output CMOS format mode in which a single device can produce two output clocks at the same frequency.

Silicon Laboratories, 877-444-3032, [www.silabs.com](http://www.silabs.com)



### Power Modules Drive Two-Phase Switched-Reluctance Motors



Fairchild introduced what is said to be the first SRM-SPM power modules for driving two-phase switched-reluctance motors (SRM) in small motor applications. The small motor industry is migrating

from single-phase to two-phase SRM motors due to their ability to start up under difficult load conditions. Each SRM-SPM module — FCAS20DN60BB and FCAS30DN60BB — integrates two HVICs, one LVIC, four NPT IGBTs, four fast recovery diodes (FRDs), two bootstrap diodes, a thermistor, and various protection functions in a single package. By integrating 14 fully-tested power components in a 45-mm  $\times$  28-mm SIP package, these products are said to offer a 40 percent space savings. System reliability is enhanced by incorporating under-voltage lock-out and short circuit protection into the package.

Fairchild Semiconductor

888-522-5372, [www.fairchildsemi.com](http://www.fairchildsemi.com)

### Quad-SPI Serial Flash Memory

Winbond Electronics announced what is said to be the industry's first Serial Flash memory with Quad-SPI (Serial Peripheral Interface).

The W25Q16 16-Mb SpiFlash Memory is the first in a family of high-performance memories ranging from 8 Mb to 64 Mb, and features single, dual and quad I/Os in 8-pin packaging. According to the company, the W25Q16's Quad-SPI architecture allows for greater than six times the performance of the current generation of Serial Flash memories and offers a true code-execution (XIP) alternative to Parallel-NOR Flash. With Quad-SPI performance, application-specific controllers can execute code directly from Serial Flash, minimizing pin-count and SDRAM usage. It can also improve boot time for traditional code-shadow applications. The W25Q16 SpiFlash memory builds on the success of Winbond's popular W25X family of SpiFlash memories (one-through 64-megabit densities). The 25Q16 maintains function- and pin-out compatibility with the 25X, while adding Dual-I/O and Quad-I/O SPI capability.

Winbond Electronics Corp.

408-943-6666, [www.winbond-usa.com](http://www.winbond-usa.com)



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## LED-based Light Guides Presented As Thinnest

Global Lighting Technologies (GLT) has introduced LED-based high-brightness backlights that offer thinness down to 0.4 mm or less for LCDs in an array of consumer electronics products, as well as the keypads/keyboards used in mobile phones and laptop and desktop PCs. The light guides leverage the company's MicroLens light extraction technology and manufacturing processes to enable backlight assemblies <1-mm high using light guides 0.4 mm or less to become a reality. The result is BLUs that offer the thinness of electroluminescent (EL) backlighting, but with all the characteristics of today's advanced LEDs, combined with desirable light extraction. The edge-lit backlights offer thin packages that can backlight LCDs from 0.25" up to 50" diagonal and higher. Light is extracted precisely where needed, such as around thru-holes for keypads. According to the company, MicroLens can reduce the number of LEDs required, providing bright, uniform light in a thinner form factor with no hot spots or dark areas. The reduced number of LEDs needed can also mean less material required, resulting in lower manufacturing costs.

**Global Lighting Technologies, 866-922-4584, [www.glthome.com](http://www.glthome.com)**



## LED Driver Enables Dimming

LEDtronics' DC/DC Dimmer supports 5-V to 40-V

DC applications up to 2 A or 24 W. Since LEDs draw less current than traditional incandescent bulbs, one had to buy a special high-end electronic dimmer to control the desired light levels for their LED application. The DC/DC LED Dimmer is suited for 12 V DC LED products, mix-and-match LED light



strips and LED bulbs. The maximum load per dimmer is 24 W. Lowering the current to the LED can extend the life of the LED. The LED dimming range is 0-100 percent of input. Input voltage can be any DC voltage between 5 V and 40 V DC. Dimmer output voltage is continuously adjustable between zero and full-on.

**LEDtronics, 800-579-4875, [www.ledtronics.com](http://www.ledtronics.com)**

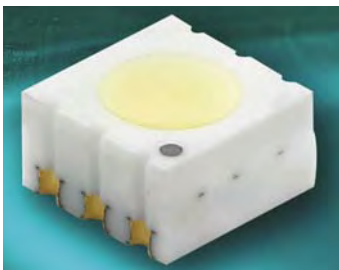
## High-Current SSLD Provides Adjustable Over-Voltage Protection for Single or Dual LEDs in Handheld Devices

National Semiconductor introduced a high-current SSLD that enables dual LED operation for the camera flash function in portable multimedia devices. The LM3553 fixed-frequency, step-up DC/DC converter with two regulated current sinks drives loads up to 1.2 A from a single-cell Li-Ion battery. The driver's adjustable over-voltage protection circuitry allows designers to drive two high-current LEDs in a series configuration, which maximizes the illumination-to-power ratio. The LM3553 can drive the camera in a high-power flash mode for still photography or a low-power torch mode for video recording. To configure the driver to fit their application, designers can use the adjustable 128-flash current levels and 16-flash timer durations via an I<sup>2</sup>C compatible interface. The LM3553 also features built-in time-out protection for the flash LEDs in case of an error condition. The flash LED driver maximizes the light output for low-power systems, with peak efficiency equal to or greater than 90 percent.

**National Semiconductor, 800-272-9959, [www.national.com](http://www.national.com)**



## SMT LEDs Present Sub-Millimeter Profile



Provided in a CLCC-6 FlatPackage configuration, Vishay's VLMW621 family of warm-white SMT LEDs is presented as having the lowest profile (0.9-mm high) of its type. The ceramic-encased InGaN devices are available with luminous intensities from 1,800 mcd to 7,100 mcd and thermal resistances of 40 K/W junction to pin and 90 K/W junction to ambient. The devices have a 140-mA forward current, a 4.3 V maximum forward voltage, and 650 mW of power dissipation with an optical efficiency of 24 lm/W and an ESD-withstand voltage up to 1 kV (according to JESD22-A114-B). Preconditioned according to JEDEC Level 4

standards, the RoHS-compliant LEDs offer a 60° half-intensity angle and are compatible with IR-reflow solder processes according to CECC 00802 and J-STD-020C, as well as automotive qualified to AEC-Q101.

**Vishay Intertechnology, 610-407-4800, [www.vishay.com](http://www.vishay.com)**

## E-Paper Modules Target Next-Generation Devices

E Ink announced general availability of its next-generation segmented display cells (SDC). The products are simple digit, icon, and alpha-numeric displays, offering desirable readability in a paper-thin form factor that uses minimal battery power. The company asserts the new SDCs are 40 percent thinner, with a wider operational temperature range and increased flexibility for repetitive 3-D bends or 2-D conformable solutions. The SDC displays use the same E Ink Vizplex technology that is shipping in popular electronic book devices. Three height levels are available, depending on backplane configuration:

thin PET 330  $\mu$ , PET 380  $\mu$ , or PI 375  $\mu$ . PET options provide 200- $\mu$  design rules for the artwork, or space and trace of 8 mils  $\times$  8 mils. The finer pitch PI option uses 100- $\mu$  design rules for 4 mils  $\times$  4 mils. Increased temperature ranges with operations from -10°C to 60°C, and storage from -25°C to 75°C. Organic non-rectangular unique shapes are possible, including holes and curves.



**Cresta Ex 2037-4 E Ink, 627-499-6000, [www.eink.com](http://www.eink.com)**

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## Active Latch Is Inter mateable with Other Existing Elements In Modular Systems

FCI introduced the Minitek CTW Active Latch, a low profile housing mateable with other elements in the modular system. The Minitek Active Latch is designed for use in harsh and high vibration environments, and is appropriate for industrial or automotive applications. The 2-mm latch houses crimp-to-wire systems, enabling discrete wiring to be attached and unattached to PCBs with an audible click. The connection is held securely in place by the latch. The Minitek 2 mm modular board-to-board and cable/wire-to-board connection is part of the company's Basics+ program for popular standard connectors.

**FCI, 800-237-2374, [www.fciconnect.com](http://www.fciconnect.com)**



## Connector Withstands 1,000 Cycles of Thermal Shock and Vibration Testing

ITT Electronic Components' Chip on Flex (CoF) filter connector technology has been tested to 1,000 cycles of thermal shock from -55°C to 125°C per MIL-STD-1344. Compared to the ceramic planar array block capacitor used in conventional filter connectors, the CoF connector uses a flexible circuit where individual chip capacitors are surface mounted on a pad adjacent to the feed thru contact. This connector design also provides reliability and protection in harsh environments. In MIL-DTL-38999 configurations, the Chip on Flex connector has passed MIL-STD-1344 and MIL-DTL-38999 Series III testing for mechanical shock, random vibration, humidity, and high altitude. The connector features a voltage rating of 200 V DC to 120 V ACrms 400 Hz. Current ratings are 15 A, 7.5 A, and 5.0 A for sizes 16, 20, and 22, respectively. The CoF connector is appropriate for high reliability military, aerospace and industrial applications including integrated avionics, radio and navigation systems, fire control devices, electronic counter measures, satellite communications, and data transmitters. Typical pricing ranges from \$125 to \$175 each in quantities of 100.

**ITT Electronic Components, 714-557-4700, [www.ittcannon.com](http://www.ittcannon.com)**



## BeO Insulator Sets Thermal Conductivity Benchmark

The BW3250 beryllium oxide (BeO) insulator from Brush Ceramic Products delivers a thermal conductivity of greater than 325 W/mK at room temperature, an increase of over 15 percent from the 285 W/mK that was previously achievable. Providing insulation in high-power RF and microwave power transistor packages as well as electron devices such as inductive output tubes, BeO has a low dielectric constant of 6.7 and a low loss index of



## USB to Synchronous Cable Enables IP Data Communications for Tactical Radios

Sealevel Systems' ACC-188 USB Synchronous Interface Adapter enables tactical radios currently used by the U.S. Armed Forces to interface to PCs and transmit IP based data. According to the company, the adapter allows warfighters to quickly transmit and receive data such as GPS maps, images, coordinates, and IM type communications. The adapter was developed to operate seamlessly with the PDA-184, a standard software product developed by the Defense Information Systems Agency (DISA). The PDA-184 software (shipped by Sealevel with the ACC-188 as part of the total solution) provides a graphic user interface (GUI) that allows war fighters to transmit and receive a variety of data types, including an instant message function and file transmission. The cable and integrated assembly consists of a printed circuit board that is tested and then encapsulated using an over-mold process, commonly called a "bump" in the cable. This process results in a rugged, shielded, battlefield-ready product capable of withstanding harsh environments. One end of the cable includes a standard type-A USB connector, suitable for use with any USB enabled computer. The other end of the cable includes a connector specific to a brand or model of tactical radio.

**Sealevel Systems, 864-843-4343, [www.sealevel.com](http://www.sealevel.com)**

0.0012 at 1 MHz, addressing the increase in losses that occur as frequency increases. Ceramic-to-metal joints and metalization coatings are generally very strong and reliable, and BeO is stable in oxygen- and moisture-containing environments. The material is available in plates measuring up to 4.5" x 4.5" with a material strength of 38,000 lb/in<sup>2</sup>.

**Brush Ceramic Products**

**520-746-0251, [www.brushceramics.com](http://www.brushceramics.com)**

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### Clamp Filters for Electromagnetic Noise Counter measures in Automotive Applications

TDK Corporation announced the development and mass production of its ZCAT08V-BK and ZCAT12V-BK automotive clamp filters for use as a countermeasure against the effects of electromagnetic noise on the cables that link the various onboard electronic control units that are used in antilock braking systems and electric power steering. These clamp filters have an original structure consisting of a vertically split cylindrical ferrite core, with an integrated resin case for mounting on cables. The ferrite material provides desirable magnetic characteristics and high-frequency absorption properties achieved through precise control of the fine structure, and the resin case and core material of these new filters enhance heat resistance and shock resistance.

TDK Corporation of America, 847-803-6100, [www.tdk.com](http://www.tdk.com)



### Waterproof Medium Gain Antenna

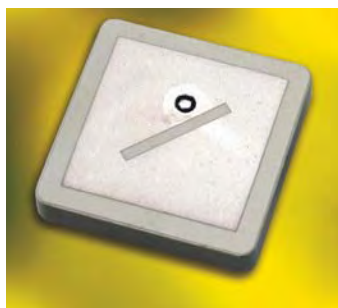


The Buccaneer from Bulgin Components is a waterproof medium gain antenna for the 2.4-GHz to 2.5-GHz frequency band. Integrating the antenna with its waterproof connector can reduce the total number of connectors in the RF chain, reducing insertion losses, effectively increasing the total system gain. The sealed antenna has an integrated SMB connector with an overall diameter of 19 mm, and the mating panel connector has a panel fixing hole of 16-mm diameter. Rated at IP68, the PX0407 provides complete protection from harsh environments, and all electrical connections are gold plated to ensure system performance and that reliability is maintained. The panel connector, PX0414, with an SMB jack, is terminated with RG-174 cable in 0.5-m, 1-m, or 1.5-m lengths. This provides fast assembly to the panel and only requires termination into the equipment.

**Bulgin Components**

760-343-3650, [www.bulgincomponents.com](http://www.bulgincomponents.com)

### Patch Antenna Receives/Transmits Two Different Frequency Bands in a Single Element



Spectrum Control designed a single element patch antenna that can receive and/or transmit two frequency bands in one 45 mm package, offering a space and cost savings compared to using two, single frequency patch antennas. These patch antennas were developed for GPS (global positioning systems) using either Globalstar: telephone and low-speed data communications or Iridium: worldwide voice and data communications using handheld satellite phones. To perform at the required frequencies, the 45-mm antenna element is mounted on a 63-mm ground plane. The frequencies available are 1,575 MHz (GPS) to 1,615 MHz (Globalstar), and 1,575 MHz (GPS) to 1,621 MHz

(Iridium). These dual frequency patch antennas are a flat ceramic, low profile antenna, with no interference issues to design around. Prices range from \$3.00 to \$8.00.

**Spectrum Control**, 814-474-0326, [www.spectrumcontrol.com](http://www.spectrumcontrol.com)

### High Frequency, High Voltage Vertical FETs

HVVi Semiconductors introduced its High Frequency, High Voltage Vertical Field Effect Transistor (HVVVFET) architecture. According to the company, its low thermal resistance and high ruggedness increase reliability and improve MTBF while the gain, efficiency, and power density characteristics offer an opportunity to eliminate amplification stages in power amplifiers. For pulsed applications in the L-band from 1,030 MHz to 1,090 MHz, the PVV1011-300 operates at 48 V and delivers over 300 W of pulsed output power while providing 15 dB of gain and 48 percent efficiency typical performance under pulsed signal conditions, with a pulse width of 50  $\mu$ s and a pulse period of 1 ms. The device is specified to withstand a 20:1 VSWR at all phase angles under full rated output power.

The device is specified to withstand a 20:1 VSWR at all phase angles under full rated output power.

**HVVi Semiconductors**

866-429-4884, [www.hvvi.com](http://www.hvvi.com)



### SiC MESFETs Surpass Silicon, GaAs Devices

Cree, Inc. unveiled its 48-V silicon carbide (SiC) RF MESFETs that are optimized for applications such as wideband MIL/Aero and defense communications, Class A and A/B amplifiers, and wireless broadband applications. Properties include high breakdown voltage, high saturated electron drift velocity, and high thermal conductivity, surpassing silicon or gallium arsenide. The 10-W Model CRF24010 has a 15-dB gain and junction-to-case thermal resistance of 3.6°C/W with operation up to 2.7 GHz. The 60 W CRF24060 has a 13-dB gain and a junction-to-case thermal resistance of 1.4°C/W with operation up to 2,400 MHz.

**Cree, Inc.**, 919-313-5505, [www.cree.com](http://www.cree.com)







## Power Management IC Maximizes Energy Performance in Multi-Kilowatt Systems

Texas Instruments introduced a single-chip, interleaved power factor correction (PFC) control circuit for multi-kilowatt communications, server and industrial systems. In line-operated systems with power levels from 75 W to 1 kW and above, the UCC28070 helps reduce total harmonic distortion, allowing systems to maximize usable outlet power and accommodate extreme variations and disturbances in worldwide AC line voltage levels. This PFC controller allows light-load phase management to enhance a system's performance — achieving higher efficiency over the entire load range. Phase management allows a system to turn on or off unused phases of the power supply. In a 1.2-kW system, the company said the UCC28070 can initiate an increase of up to 1.5 percent efficiency at a light 20 percent load condition.

Texas Instruments, 800-477-8924, [www.ti.com](http://www.ti.com)



## Isolated 2-W Single Output DC/DC Converter Offers 89 Per cent Typical Efficiency

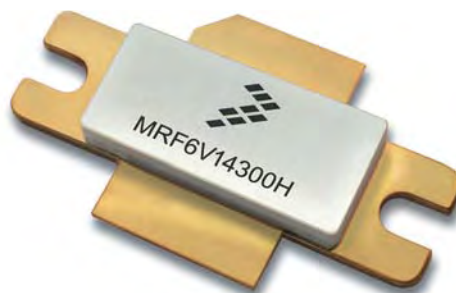
The NMK Series of isolated 2-W single output DC/DC converters from Murata Power Solutions comes in a small footprint, pin compatible, industry standard SIP package that allows easy drop-in replacement of other devices. The series also provides a straightforward power upgrade path from the company's existing 1-W NMV Series. Comprising eight models, the un-regulated NMK Series offers designers a choice of 5-V and 12-V inputs and output voltages of 5 V, 9 V, 12 V or 15 V. Efficiency of 89 percent typical (at 15-V output), an output voltage set point accuracy of 7 percent, and 2.5 percent (for a 15-V output) maximum load regulation performance combine to give the NMK series industry-leading performance for converters of this type, according to the company. The RoHS compliant converter series offers 3-kV DC isolation (for one minute) and power density of up to 1.33 W/cm<sup>3</sup>. The devices maintain full 2-W load performance across an industrial operating temperature range of -40°C to 85°C without any external heat sinking. Murata Power Solutions, 508-339-3000, [www.murata-ps.com](http://www.murata-ps.com)



## Fifty-Volt LDMOS Power Transistors Serve L-Band Radar Applications

Freescale introduced a 50-V LDMOS RF power transistor line for L-Band radar applications. The MRF6V14300H final stage device produces pulsed RF output power of 330 W at frequencies between 1,200 MHz and 1,400 MHz and offers desirable efficiency, gain, and thermal resistance at this power level and frequency. The transistors offer a standard voltage supply, low cooling costs, plus reliability of pallet design for customers designing pulsed RF power opportunities in L-Band frequencies. The thermal resistance MRF6V14300H device, packaged in a RoHS compliant, air-cavity ceramic package, is engineered to manage heat dissipation and reduce heat sink size. The thermal performance provides cooler junction temperature. Other RF performance figures include 330-W peak output power (at 1,400 MHz, 300  $\mu$ s pulse width, 12 percent duty cycle), 17 dB gain, and 60 percent drain efficiency.

Freescale Semiconductor, 800-521-6274, [www.freescale.com](http://www.freescale.com)



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## Power Management ICs Integrate High-Fidelity Audio Codec



Wolfson Microelectronics' WM8350 AudioPlus Power Management IC features an integrated high fidelity audio Codec and power management subsystem for high performance audio, extended battery life, and reduced system cost for portable audio and navigation applications. It is compatible with leading multimedia application processors. WM8350 functions include on-chip clock generation, six DC/DC converters, four LDO regulators, a battery charger, two white SSLDs and an auxiliary ADC, inside a 7-mm  $\times$  7-mm BGA package. A built-in power management controller is responsible for the output voltage settings, start-up sequence and low-power modes for all on-chip DC/DC converters and LDO regulators. Four 2-MHz DC/DC step-down converters generate the supplies for CPU core, I/O, and memory devices.

Wolfson Microelectronics

858-676-5090, [www.wolfsonmicro.com](http://www.wolfsonmicro.com)

## Converter Delivers High Power Density



Delivering a power density of over 76 W/in<sup>2</sup>, Enpirion's EN5395Q1 9 A DC/DC converter that features integrated-inductor technology and a high switching frequency. The technology enables the PwrSoC (power supply on a chip) to attain noise immunity with a small footprint. The part also offers two options for setting the output voltage. The PWM (pulse-width modulation) DC/DC converter integrates the inductor, MOSFETS, and controller into a 10-mm  $\times$  12-mm  $\times$  1.85-mm package. The part requires five external MLCC capacitors, has a footprint of 250 mm<sup>2</sup>, can deliver up to 30 W of continuous output power, and achieves up to 93 percent efficiency. Enpirion, 908-575-7550, [www.enpirion.com](http://www.enpirion.com)



## Touch Sensing Device Enables Button And Slider Replacement In Any System

Cypress Semiconductor introduced the CapSense Express capacitive touch sensing device for button and slider replacement. The device enables designers to implement up to 10 buttons and/or sliders in as little as five minutes — with no coding. The PSoC Express visual embedded system design tool and CapSense Express configuration tool allow designers to monitor and tune the performance of the buttons and sliders in real time using a graphical user interface. The CY8C201X0 and CY8C201X2 CapSense Express devices offer up to 10 capacitive and/or general purpose I/Os (GPIOs), allowing design flexibility to implement combinations of buttons, sliders, and general purpose functions like LED control and interrupt outputs. For battery powered applications, the devices offer low power consumption of 1 mA active current and 2.6  $\mu$ A in sleep mode. The new devices offer an operating voltage range of 2.4 V to 5.25 V and an industrial temperature range of -40 °C to 85 °C. In addition, 2 Kb of Flash memory and an I<sup>2</sup>C communication interface are provided so designers can choose whether to store tuning values in Flash or load them over I<sup>2</sup>C at power-up.

Cypress Semiconductor, 408-943-2600, [www.cypress.com](http://www.cypress.com)



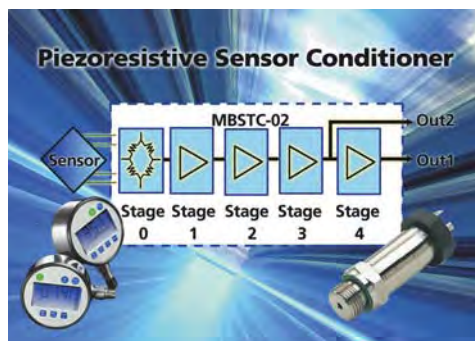
## Non-Contact Thermometer Sensor Offers Narrow Field of View

Melexis introduced the MLX90614xAC with narrow 35° field of view (FOV), allowing design engineers to measure smaller objects or increase the sensor-object distance with this thermometer. The 35° FOV is obtained by adding a viewing angle limiting metal tube to the standard TO-39 housing of the thermometer. By performing the calibration of the thermometer after this tube has been attached, the accuracy of the temperature measurements can be maintained. The thermometer applies advanced low noise amplifiers, a 17-bit ADC, and powerful DSP unit in its signal conditioning chip allowing a wide operating -40°C to 125°C and an extended object temperature range of -70°C to 380°C while maintaining a temperature resolution of 0.02°C. The MLX90614xAC has an absolute accuracy of  $\pm 0.5^\circ\text{C}$  in the object temperature range of 0°C to 50°C and  $\pm 1^\circ\text{C}$  outside that range.

Melexis, 603-223-2362, [www.melexis.com](http://www.melexis.com)



## CMOS and Adjustable Resistor-based Application-Specific Analog Signal Conditioning Chip



Microbridge Technologies introduced the MBSTC-02 CMOS device active analog circuit which incorporates the company's passive, Rejistor polysilicon adjustable resistor technology. The signal conditioning chip allows sensor calibration and temperature compensation after final assembly, which negates cumulative errors associated with the assembly processes such as manufacturing tolerance errors, error introduced by stress and packaging. Low-cost and high-precision adjustment replaces the requirement for digital signal conditioning. The MBSTC-02 enables the use of lower cost sensors in

precision applications, thereby increasing their value in the market. The MBSTC-02 incorporates low-noise operational amplifiers with Rejistors to provide precise signal conditioning with integrated temperature correction for use with sensors with a negative TC Sensitivity. Rejistors are passive adjustable resistors whose ohmic values can be field-adjusted to better than 0.1 percent tolerances, desirable for Wheatstone bridge sensor based applications. According to the company, this differential instrumentation amplifier provides complete analog calibration, compensation, and amplification for any bridge type sensors, such as pressure sensors, strain gauges, humidity sensors, and accelerometers.

Microbridge Technologies, 888-735-8786, [www.mbridgetech.com](http://www.mbridgetech.com)

## Chipscale Sensor Detects Both Proximity and Ambient Light

The CM3612 chipscale sensor from Capella Microsystems combines proximity and ambient light sensor functions in a single chip. The proximity detector



in the chip is topped with an 830-nm to 880-nm IR filter. The ambient light sensor diode has a filter that passes only the green light band (450 nm to 650 nm) to better match the brightness sensing mechanism of the human eye. The 2.35-mm  $\times$  1.8-mm  $\times$  1-mm OPLGA package also contains a digital low-pass filter to remove fluorescent light flicker, a 12-bit A/D converter, a DSP, a temperature compensation circuit, an I<sup>2</sup>C interface, an oscillator, and a driver for an IR emitter. The proximity function in the chip enables portable products to automatically turn off their screens when not being viewed, and the ambient light sensor allows the automatic adjustment of screen brightness to match external light conditions.

Capella Microsystems

408-727-8500, [www.capellamicro.com](http://www.capellamicro.com)





### Analog Transducer/sensor Meters Feature Integrated Diagnostics for Input and Output

Transducers Direct created a small, programmable meter for analog sensors/transducers, with integrated diagnostics for both input and output. The TDRO-10 meter features two-button English programming and a 67 msec. update rate. It measures  $3.78" \times 1.89" \times 1.0"$  depth, fitting into a standard 1/8 DIN cutout. The meter provides six-digit LED display with large half-inch numbers and 6-ms refresh rate. Pushbutton diagnostics allow fast determination of programming versus power supply problems. Designed for standard sensor inputs of 0 V to 10 V or 4 mA-20 mA with over-voltage protection, the meter comes in versions providing one 16-bit analog output, two or four programmable PNP digital outputs with 100 percent scalable analog retransmission, and read-only with no digital output. Their compact design makes them suitable for on mobile and off-road equipment dashboards. Quantity prices start under \$100.

**Transducers Direct, 513-583-9491, [www.transducersdirect.com](http://www.transducersdirect.com)**



### Graphic Design Software Enhances Embedded System Development



Combining a graphical programming environment with COTS multicore and FPGA hardware, National Instruments' LabVIEW 8.6 helps engineers rapidly prototype advanced control algorithms and embedded applications on flexible hardware such as CompactRIO, and deploy their systems to board-level embedded hardware. Using optimized analysis functions that provide faster execution on multicore systems, engineers can evaluate the behavior of the complete system including the FPGA, microprocessor, and host interface code, as well as simulate the interaction of an embedded device with its surrounding environment by using static data input profiles or dynamic system models. The platform also can be extended to the ARM 7, ARM 9, and Cortex-M3 microcontrollers using the LabVIEW Embedded Module for ARM Microcontrollers and to select ADI Blackfin processors using the LabVIEW Embedded Module for ADI Blackfin Processors.

**National Instruments, 800-258-7022, [www.ni.com](http://www.ni.com)**

### Oscilloscope Series Features Next-Generation Chipset, High Data Transfer Rates

LeCroy introduced WavePro 7, the first product series in the Zi Family of oscilloscopes. It represents the first deployment of the company's next-generation chipset and latest streaming architecture, X-Stream II. This oscilloscope offers complete debug with up to 6 GHz of bandwidth available. The WavePro 7's design incorporates a 15.3 in, 16:9 high definition display with a touchscreen. The company asserts the scope can solve electronic design problems within minutes instead of hours, and can be extended to an integrated second display in order to expand the oscilloscope's workspace. A removable front panel allows engineers to place the control-pod next to the circuit under test. The LSIB serial interface bus enables data to be transferred 10- to 100-times faster than any other method, according to the company. In addition, TriggerScan and WaveScan, special modes for finding rare events, shorten the time to debug a new design.

**LeCroy, Inc., 800-453-2769, [www.lecroy.com](http://www.lecroy.com)**



### Serial Analyzers for PCIe 2.0 Provide Power Management and Cross-Bus Analysis

Tektronix announced new TLA7S16 and TLA7S08 Serial Analyzers for test and validation of PCI Express (PCIe) 1.0 and 2.0 designs. The devices provide detailed PCIe 2.0 protocol information, along with cross-bus analysis. The new analyzers plug into the company's TLA7000 Series logic analyzers, adding the ability to



debug and correlate general purpose signals and other system interconnects including

memory and computer processors. The Tektronix TLA7S08 and TLA7S16 Serial Analyzers can acquire x1, x4 links or x8 links respectively. Two TLA7S16 Serial Analyzers are used for bi-directional x16 links. PCIe 2.0 links can change width (number of lanes) dynamically. For instance, an eight-lane link (x8) could change to four lanes (x4) — which requires less power — and return back to x8 when this is needed by the system. The PCIe 2.0 specification also allows for the link to dynamically alternate the speed between 2.5 Gb/s to 5 Gb/s, supporting both PCIe 1.0 and 2.0 standards.

**Tektronix, 800-833-9200, [www.tektronix.com](http://www.tektronix.com)**

### Oscilloscopes Tout Large Display, Fast Waveform Update Rate



Agilent expanded its mixed-signal and digital-storage oscilloscope portfolio with 10 new models

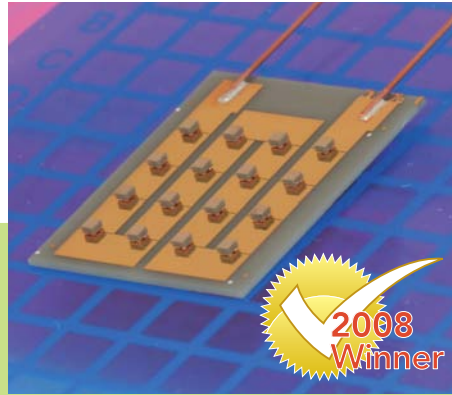
that comprise its InfiniiVision 7000 Series. The series offers bandwidths up to 1 GHz and a deep memory waveform update rate of up to 100,000 waveforms per second. Each is equipped with a 12.1-inch XGA LCD display, and comes in a 7-inch-deep, 14-lb package. The display size suits users who need to display up to 20 channels simultaneously with serial protocol. The update rate eliminates two common errors that can cause engineers to miss critical information: unresponsive controls with deep memory turned on, and traditional architectures that are blind to changes in signals being tested. For designs with both digital and analog signal measurements, the update rate is said to be 5,000 times faster than any other available scope.

**Agilent Technologies  
800-452-4844, [www.agilent.com](http://www.agilent.com)**



## Nanostructured Thin Film Harvests and Converts Waste Heat into Electricity

Nextreme has developed a miniature, thin film thermoelectric generator (TEG) that converts heat directly into electricity. Suitable for waste heat conversion applications, the solid state TEG delivers power generation densities ( $>3\text{W}/\text{cm}^2$ ) in excess of those achieved using bulk materials and is optimized to provide power in a form factor that can be as much as 20 times thinner than bulk material alternatives, according to the company. Manufactured using semiconductor fabrication techniques, the TEG is scalable, cost-effective, and can be utilized in a broad range of markets and applications including automotive, military and aerospace, thermal batteries, medical implants and wireless sensor networks. Nextreme's TEG has demonstrated output power levels of  $>100\text{ mW}$  at  $\Delta T$  of  $70^\circ\text{K}$  and  $>300\text{ mW}$  at  $\Delta T$  of  $120^\circ\text{K}$ . With modules measuring  $3.5\text{ mm} \times 3.5\text{ mm}$ , the TEG has corresponding output power densities of approximately  $1$  to  $3\text{W}/\text{cm}^2$ . The devices generate electricity via the Seebeck Effect, where electricity is produced from a temperature differential applied across the device. The temperature difference between the hot and the cold sources leads to a difference in the Fermi energy across the thermoelectric material, yielding a potential difference, which drives a current. Nextreme, 919-990-8300, [www.nextreme.com](http://www.nextreme.com)



## Digital Power Controllers Integrate Active Current Sharing



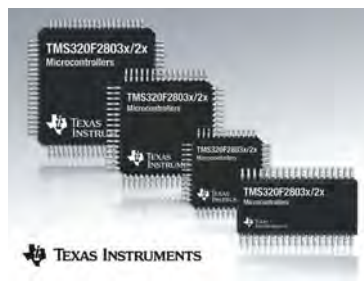
Zilker Labs introduced adaptive DC/DC power controllers for maximizing efficiency in power-constrained applications. The ZL2006 and ZL2004 — additions to the company's Digital-DC product family — include new proprietary algorithms that dynamically optimize efficiency as operating conditions change, with no interaction or additional components required. These algorithms are said to result in a full-load efficiency improvement up to 3 percent, and a light-load

efficiency increase greater than 15 percent in typical applications, reducing peak power dissipation in embedded computing, storage, and telecom/datacom applications. This enables the ZL2006 and ZL2004 to address the growing concerns of meeting Energy Star efficiency guidelines, which become progressively more difficult each year. These products allow designers to deploy one flexible device in multiple power applications due to the integration of active, accurate current sharing. The ZL2006 is a universal power building block that can be used alone or connected in parallel to address a wide variety of load currents with a single IC. Additionally, both the ZL2006 and ZL2004 support accurate, robust current sharing between paralleled ICs through a proprietary single-wire Digital-DC bus.

Zilker Labs, 512-382-8300, [www.zilkerlabs.com](http://www.zilkerlabs.com)

## MCUs Use a Hardware Accelerator to Assist the CPU

Offloading high-speed control algorithms from the main TMS320C28x CPU, Texas Instruments' Piccolo Series MCUs frees the CPU to handle I/O and feedback loop metrics via its control law accelerator (CLA) design. The units provide 32-bit real-time control in solar power micro-inverters, LED lighting, white good appliances and hybrid automotive batteries. The components use enhanced pulse width modulators (ePWM) to support frequency modulation down to 150 ps; 128-KB Flash memory, on-chip 12-bit ADC at 4.6-msps, and 40-MHz to 60-MHz variations. On-chip oscillators operate at 10-MHz each with  $\pm 1$  percent accuracy. Texas Instruments, 800-477-8924, [www.ti.com](http://www.ti.com)



## MCUs Operate Down To 0.9 V Enabling Portables to Derive Power from a Single-cell Battery



Silicon Laboratories introduced MCUs capable of operating down to 0.9 V, enabling portable devices to derive power from a single-cell battery.

The C8051F9xx family's 8-bit architecture with an integrated high-efficiency DC/DC boost converter, which can supply up to 65-mW of power for both internal MCU use and to drive other components, creates a single-cell battery system solution. For products powered by user-replaceable batteries, the family enables small form factor products, long battery life, and low overall system cost in both single- and dual-cell modes. In many low-power applications, operating from 0.9-V up to 3.6 V, the MCU is in sleep mode for the majority of the time, waking up periodically to capture data. The MCU's design techniques deliver a typical sleep-mode current of  $<50\text{ nA}$ . It can wake up from its low-power sleep mode with the CPU operating at 25 MIPS and ready to make an ADC measurement within  $2\text{ }\mu\text{s}$ . To save battery life, the C8051F9xxx's architecture yields an active-mode current as low as  $170\text{-}\mu\text{A}/\text{MHz}$ .

Silicon Laboratories

877-444-3032, [www.silabs.com](http://www.silabs.com)

## Powertrain MCUs Feature Emissions Control Technology For Combustion Engines

Freescall introduced a family of 32-bit automotive MCUs with integrated emissions control technology. The MPC563xM family includes three 32-bit powertrain MCUs designed to



help improve the efficiency and performance of small engines scaling from one to four cylinders. Built on Power Architecture technology, the MPC563xM devices help address the cost constraints of engine and transmission suppliers and provides a 32-bit solution that extends processing beyond 16-bit capabilities. Offering up to 1.5-MB of flash memory, 81-KB of SRAM, and a Power Architecture core that scales up to 80 MHz, the family is available with a QFP option, offering simplified development. The MPC563xM was developed collaboratively by Freescall and STMicroelectronics as a dual-sourced product.

Freescall Semiconductor

800-521-6274, [www.freescall.com](http://www.freescall.com)



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