

leading edge

What's hot
in the
design
community

Edited by
Fran Granville



Small fish, big pond

"In some ways, the best protection is basically being a small fry—not worth the attention of the whale."

—Jonathan Zittrain, co-director of the Berkman Center for Internet & Society at Harvard Law School, regarding copyright laws that target big retailers rather than individual consumers, in *Wired* magazine, Dec 17, 2003

LED modules give ultrawide angle

By Bill Schweber

YOU CAN GET THE LATEST wide-body additions to the Mako series of LEDs from BivarOpto in single-color or RGB triads and take advantage of

their 180° viewing angle to create high-intensity, variable-color message displays.

The LEDs, which you can mount across a wider area without any gaps, measure

0.30 in. (7.62 mm) sq with integral standoffs for easier through-hole mounting.

Each LED has a built-in heat sink and reflector-based lead frame, which can hold as many as three individually addressable die. The 0.138-in. (3.5-mm)-high, blue and white LEDs have luminous output of 250 and 500 mcd, respectively; the same-height red, yellow, and green devices each have 1100-mcd output. All units have 20-mA current at a source voltage of 1.9 to 3.4V, depending on color. Prices for the Mako-Wide LEDs begin at 35 cents (production quantities).

► **BivarOpto**, 1-949-951-8808, www.bivar.com.



Throw some color at your audience, even with 180° spread, using the Mako-Wide family of single- and RGB-color LEDs.

Device enables next-generation home networking

IDT's (INTEGRATED Device Technology's) RC32434 Interprise communications processor targets the needs of digital-home-network applications, including media servers, media adapters, and IP (Internet Protocol)-based network appliances. The MIPS 4Kc CPU core can operate as fast as 400 MHz and includes 8 kbytes of instruction and data caches. The DDR ×16 memory controller supports the same performance of ×32 SDRAM for less cost and with a smaller footprint. An integrated authentication unit includes 64 bytes of nonvolatile RAM to store encryption keys and other security data to enable anti-cloning and content-protection capabilities. The authentication unit can support several levels of security, including the ability to automatically zero the nonvolatile-RAM contents and prevent software code from

executing if it cannot determine the right key within a predetermined set of conditions.

The RC32434 includes a 32-bit Version 2.2 PCI controller with six external arbitration slots, a local-memory I/O controller, and a single 10/100 Ethernet channel with options for either a standard or a reduced media-independent interface. The 266-, 300-, 350-, and 400-MHz versions of the IDT RC32434 are available in production quantities, and they sell for \$15.50 to \$23 (10,000). Development support includes internally developed, royalty-free IDT Linux-based software with a board-support package, protocol libraries, and peripheral-driver support for Serial ATA, 802.11a/b/g, MPEG-4, and USB 2.0.

—by Robert Cravotta

► **IDT**, www.idt.com.

Flash-memory transformation responds to application and competition evolutions

NEXCOM TECHNOLOGIES' chips and modules once delivered impressive write speeds (see "Data storage in a flash," *EDN*, July 3, 1997, pg 65). Lately, however, things have been less rosy for the company.

ISSI acquired it and spun it off again a short time later as the renamed NexFlash Technologies. Its chip densities could not keep pace with the burgeoning capacity needs of dominant data-storage applications, such as digital cameras, MP3 players, and PDAs. Suppliers of alternative flash-memory technologies, such as AND and NAND, were all too happy to gobble up this business.

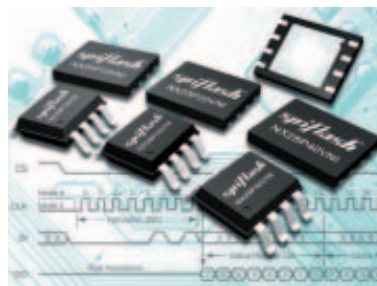
Pragmatic acknowledgment of its competitive position coupled with an expanding plethora of applications enabled by the store-and-download multitier system-memory model. These developments provided the impetus for a transformation of the company's product line (see "Spec clarifications may expand candidate catalog," *EDN*, April 17, 2003, pg 16). NexFlash's latest generation SPI flash memories are available now in 74-cent (25,000), 1-Mbit; 86-cent, 2-Mbit; and \$1.20, 4-Mbit versions. Their introduction will coincide with the lower density parts' entering full production, the companies hope. Unlike their predecessors, these devices deliver relatively low write speeds; documenta-

tion specifies 2-msec typical delays per 1- to 256-byte page, so, if you need high write throughput, you'd best consider EEPROM, battery-backed RAM, or other flash-memory technologies.

Rarely updated code-storage applications usually don't need superfast writes, though. They primarily require low-cost memories with simple interfaces that deliver high read throughput, and low-cost packaging would be nice, too. NexFlash comes through on all these counts; the chips' four-signal SPI interfaces run at 33 MHz, and the NX25P10, NX25P20, and NX25P40 all come in small- and common-footprint, low-height, eight-contact SOIC and QFN packages. Operating on a single 2.7 to 3.6V supply and across -40 to +85°C, NexFlash's spiFlash devices specify typical current draw of 4 mA for reads, 15 mA for erases and programming and, 1 µA in power-down mode.

—by Brian Dipert

► **NexFlash Technologies**,
1-408-907-3600, www.nexflash.com.



NexFlash hopes that its latest corporate incarnation and product line will lead to long-desired success.

ROCKER ENSURES THAT YOUR PRODUCTS ROLL

It may seem that rocker switches have been around forever, but new designs have emerged for contemporary applications. E-Switch has introduced its RR series of round, panel-mount switches for appliances, lamps, and other ac-powered devices. The



Modern styling and look make the RR 3130 and RR 3112 rocker switches suitable for ac-power control in today's consumer appliances.

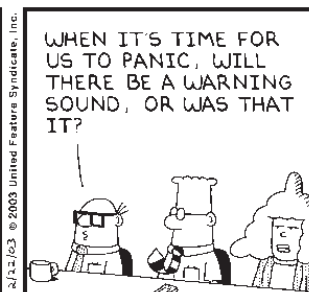
RR 3130 handles 10A at 125V ac and 6A at 250V ac; contact resistance is 50 mΩ.

To mount this switch, your design requires a keyed hole with 18.2-mm diameter in a panel as thick as 6 mm. The slightly larger RR 3112 family handles 16A at 125V ac, dropping to 10A at 240V ac and with contacts at 0.5Ω. Both switches come in various SPST, DPDT, and SPDT configurations and have LED-illumination options. Prices start at 82 cents (1000).

—by Bill Schweber

► **E-Switch**, 1-763-504-3525, www.e-switch.com.

DILBERT By Scott Adams



► **Wal-Mart Stores Inc.**, the world's largest retailer, set a one-day sales record of more than \$1.52 billion on the Friday after Thanksgiving in 2003, as customers snatched up toys and electronics. That figure represents an increase of more than 6% over the same day in 2002.

Process migrations, design optimizations squeeze out additional speed

ATI TECHNOLOGIES believes that its Radeon 9600 and 9800 graphics architectures, which it first unveiled a year ago as the closely related 9500 and 9700, still have plenty of life left in them. Latest generation announcements seem to bear out ATI's claims. The company still hasn't moved its flagship 9800 to 0.13-micron process technology, but a continued focus on design and layout optimiza-

tion has resulted in the high-end Radeon 9800 XT with a 412-MHz core and 365-MHz double-data-rate memory-clock speeds—that is, 730 Mbps per pin across a 256-bit bus (see “Product profusion portends a return to past form,” *EDN*, May 29, 2003, pg 22). ATI will this month ship \$499, 256-Mbyte boards based on Radeon 9800 XT.

For the first time, ATI Technologies will support “quality-

assured,” guaranteed over-clocking in its drivers due out in November, partially thanks to a temperature-controlled variable-speed fan and companion copper heat sink on the Radeon 9800 XT board. ATI has migrated its mainstream Radeon 9600 to a low-K dielectric variant of its 0.13-micron process, a move that has also delivered significant performance gains. The Radeon 9600 XT runs at a greater-

than-500-MHz core speed, and its 128-bit memory bus interfaces to greater-than-300-MHz, greater-than-600-Mbps-per-pin DDR SDRAM. The company is also this month making available \$199, 128-Mbyte boards based on the Radeon 9600 XT. Both chips fully support Microsoft's DirectX 9 graphics API.

—by Brian Dipert

► **ATI Technologies**, 1-905-882-2600, www.ati.com.

Power supplies celebrate diversity

ANYONE WHO supposes that power supplies are monolithic system functions is mistaken, judging from the variety of recent announcements. For example, the PTH series of nonisolated, point-of-load dc/dc converters from Artesyn Technologies Inc encompasses 15 units with current outputs of 6 to 30A. Input/output pairings are 3.3/0.8 to 2.5, 5/0.8 to 3.6, and 12/1.2 to 5.5V. The converters' footprints range from 0.87×0.5 to 1.37×1.12 in., and their prices range from \$9 to \$24.86 (10,000).

Yet, many applications do not require low voltage and high current. For laser and pulsed-light systems, as well as medical applications, the SM10 from HiTek Power can give you 100V at a “simmer” current as high as 100 mA from a 24V-dc supply. The \$325 (production volumes) supply measures 4.5×2.4×2.2 in. and in-

cludes a trigger-pulse output to drive an external trigger transformer, which some system designs require.

If you are designing for military/aerospace applications, you need a supply that meets the unique qualifying specifications of this market but may not have found one with an output voltage as low as 3.3V dc. VPT Inc offers such a supply, the DVGF+ series of 12.5W triple-output dc/dc units, with an input range of 15 to 50V dc and outputs at 3.3 and ±12 or ±15V, depending on model. The 24g supply comes in a welded hermetic package, measures 0.33 in. high, and meets the relevant military specs for performance and long-term reliability, including no internal optocouplers, for example. It includes 80V transient resistance for 1 sec. You obtain this level of performance at greater expense than that for mass-market

units; price is \$409 (100).

The miniature fluorescent lamps that find use in space-constrained applications, such as bore scopes and pipe inspection, also have unique power-supply needs. Targeting those applications, the BXA-12576 from JKL Components Corp transforms a 12V-dc source into an 800V rms ac output. Input current is 150 mA, and the supply delivers 4 mA rms at a 105-kHz operating frequency. The pencil-shaped supply measures 0.25 in. in diameter and 1.4 in. long, and the lamps it powers typically measure 2×25 to 5×150 mm. The inverters sell for \$9 (100).

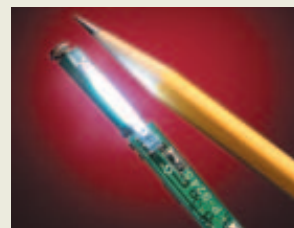
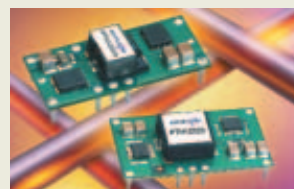
—by Bill Schweber

► **Artesyn Technologies Inc**, www.artesyn.com.

► **HiTek Power**, www.hitekpower.com.

► **VPT Inc**, www.vpt-inc.com.

► **JKL Components Corp**, www.jklamps.com.



The PTH series of nonisolated, point-of-load dc/dc converters from Artesyn encompasses 15 units with current outputs of 6 to 30A (top). The DVGF+ series of 12.5W triple-output dc/dc units from VPT has an input range of 15 to 50V dc and outputs at 3.3 and ±12 or ±15V (middle). The BXA-12576 from JKL Components transforms a 12V-dc source into an 800V rms ac output (bottom).

► **America's Army**, a multiplayer combat simulator, which the US Army developed and gives away for free, has become one of the most popular computer games on earth, with more than 2 million players.—*The Boston Globe*, Dec 9, 2003

1U-high programmable power system makes scopelike transient measurements

AGILENT SAYS that its N6700 programmable dc modular power systems offer industry-leading processing speed, autoranging outputs, and new measurement capabilities for automatic-test applications in many industries. To tailor a system to your requirements, you can mix and match from a menu of 13 modules priced at \$450 to \$2480. The modules deliver 50 and 100W per output and offer a range of features, measurement capabilities, speed, and accuracy levels. The 1U-high enclosures, which cost \$2200 and accommodate one to four modules, need no

top or bottom air vents, enabling you to mount other instruments immediately above and below them.

Although they use a switching-power architecture to achieve compactness and high efficiency, the modules deliver the low noise and ripple of linear power supplies, enabling precise control and measurements in the milliampere and microampere regions. Programming speeds are 10 to 50 times as fast as those of other programmable power supplies, and autoranging outputs enable one supply to do the job of several traditional units. In addition,

says Agilent, the modules are the first general-purpose power supplies to incorporate high-speed test extensions, which include an oscilloscopelike digitizer that simplifies system configuration and increases the accuracy of

displaying high-speed transients and pulse events in the device under test.

—by Dan Strassberg

► **Agilent Technologies**, 1-800-452-4844, www.agilent.com/find/N6700.



Ideal for incorporation into custom ATE systems, this 1U-high enclosure accommodates one to four fast-programming power-supply modules that deliver as much as 100W each and offer advanced measurement capabilities.

Tool helps design reuse

DESIGNERS OFTEN LOSE design knowledge because of unstructured documentation processes and the widening gap across time and distance within distributed-design organizations. Legacy designs or third-party IP (intellectual-property) blocks can be especially difficult to understand because of limited access to the original designers. The ability to transfer design and integration knowledge with third-party IP is essential to successful integration and to the growth of the IP market itself.

To alleviate these documentation problems, Novas Software has introduced Reusner Design Knowledge Publisher and a “smart-reuse” methodology that enables design and verification engineers to automatically extract, capture, and convey their understanding of design behavior. The technique allows design teams to electronically publish design knowledge for debugging and product documentation. The company based the product on the same architecture as its core debugging systems. In addition, Reusner uses a new visualization engine that drives the generation of documentation-quality block diagrams, schematics, and finite-state-machine diagrams. The topology-driven visualization engine has built-in synchronization control to

ensure that the design views are always current.

Reusner’s knowledge-publishing process commences with the automatic creation of graphical views from Verilog, VHDL, and mixed-language designs. Designers extract knowledge directly from the source code to produce design views. Designers can interactively edit the views by rearranging the size and location of components and their ports, rerouting connections, and annotating them with textual information. The views are available for interactive debugging with Novas’ behavior-based Verdi and Debussy debugging systems. Engineers can trace design connectivity within the saved views and use drag-and-drop features to access information in other views, such as the source code for any block or the waveform for any signal. They can also annotate simulation results directly into the views.

The product is available as an option to either the Verdi or the Debussy debugging system. The price is \$10,000 for a one-year, time-based license. Verdi and Debussy customers can access read-only Reusner design views for no additional charge.—by Gabe Moretti

► **Novas**, 1-408-467-7888, www.novas.com.

► **The best-selling item during the last week of November 2003 on Amazon.com’s new specialty meat department was the “élevages margret duck breast” from Fossil Farms, a wild game farm in Lakeville, Pa. The duck beat out the top sirloin offered on the site by Omaha Steaks, the giant mail-order butcher.—The New York Times, Dec 3, 2003**

Messaging layer for network processors and coprocessors promotes interoperability

THE NPF (Network Processing Forum) has announced the availability of the Message Layer IA (implementation agreement). The spec standardizes communication among NPEs (net-

work-processing elements), such as cryptographic engines, search engines, and other coprocessor and processor components within a networking device. By defining the format and types of information that network-processing elements can exchange, the NPF hopes to move the industry away from proprietary message formats, thus simplifying and lowering the cost of integrating network-processing technologies from multiple vendors and enabling and promoting NPE interoperability.

The Message Layer sits at the boundary between the hardware interfaces over which it runs and the software APIs that run over it. The specification outlines a set of defined message fields

from which an NPE can specify how to capture the functions and data that a valid transaction requires, how to compose these message fields into valid messages, and a model for how an NPE can receive instantiation of message fields. Through such abstraction, developers can design networking software with little or no awareness of the hard details of the underlying hardware interfaces over which messages will travel. The spec combines this feature with a high degree of flexibility, enabling the reuse of software across hardware and software interfaces. Such reuse will enable third-party developers to develop and market hardware and software that serves the entire industry rather

than a select subset of partner vendors.

The IA covers NPE-to-NPE communications over a range of common network-processing interfaces, including the NPF's Streaming Interface and Look Aside Interface, as well as various switch fabrics. All conveyances must meet a minimal set of the IA's requirements. In-band messages comprise a configured number of fixed-sized, 1-byte slots in one or more consecutive message fields, which, in a message header or message trailer, carry the NPE-to-NPE information along with the message payload. An out-of-band configuration mechanism determines the meaning associated with the in-band messages for both the sending and the receiving NPEs. The Message Layer IA is available free from the NPF Web site at www.npforum.org/techinfo/aproved.shtml.

—by Nicholas Cravotta
► **Network Processing Forum**, www.npforum.org.

SOLID-STATE INDUSTRIAL RELAY FOLLOWS TODAY'S SLIMMING TREND

With Fujitsu's FTR-SL relay, your products can be thin, too. The 1A solid-state relay in a single-inline package measures 5×28×15 mm and is pin-compatible with a Fujitsu electromechanical relay. Targeting the industrial and appliance markets, this relay comes with 5, 12, 24, and 60V



Fujitsu's super-slim solid-state relay with 1A nominal rating, supports control voltages of 5, 12, 24, and 60V dc, depending on model, and can handle 50A surges.

dc nominal control voltages. It can handle 50A surges and a peak voltage of 250V ac. The \$5 (10,000) relay integrates a varistors-snubber circuit for overvoltage and overcurrent protection and a zero-crossing circuit to minimize inrush current.—by Bill Schweber

► **Fujitsu Components America Inc.**, 1-408-745-4900, www.fc.ai.fujitsu.com.

Small and medium displays are sharp in two ways

NEW TFT (THIN-FILM-TRANSISTOR)-LCD technology from Sharp Corp yields sharp images, color fidelity and brightness, and wide viewing angle. Available in sizes from 1.5 to 6.5 in. diagonal, these displays have 300-to-1 contrast ratio and a 160° viewing angle in horizontal and vertical directions. Depending on the size, the displays, all with 25-msec response time, support QVGA, VGA, and WQVGA compatibility. The displays have resolutions ranging from 560×240 to 400×234 pixels.

These displays have excellent and pleasant image quality. For the smaller displays, Sharp uses its Advanced Super

View technology with a low-reflective, black background to minimize bright pixel defects that result from nonfunctional transistors. The company combines this technology with an advanced TFT-transreflective technology, which uses reflective LCD and backlit-transmissive technologies. The largest display uses an amorphous-silicon TFT design, which Sharp developed with Semiconductor Energy Laboratory Co Ltd of Japan.—by Bill Schweber

► **Sharp Microelectronics of the Americas**, 1-360-834-2500, www.sharpsma.com.

► **About 20% of all Windows-based computers still run Windows 95 or 98, according to International Data Corp.**