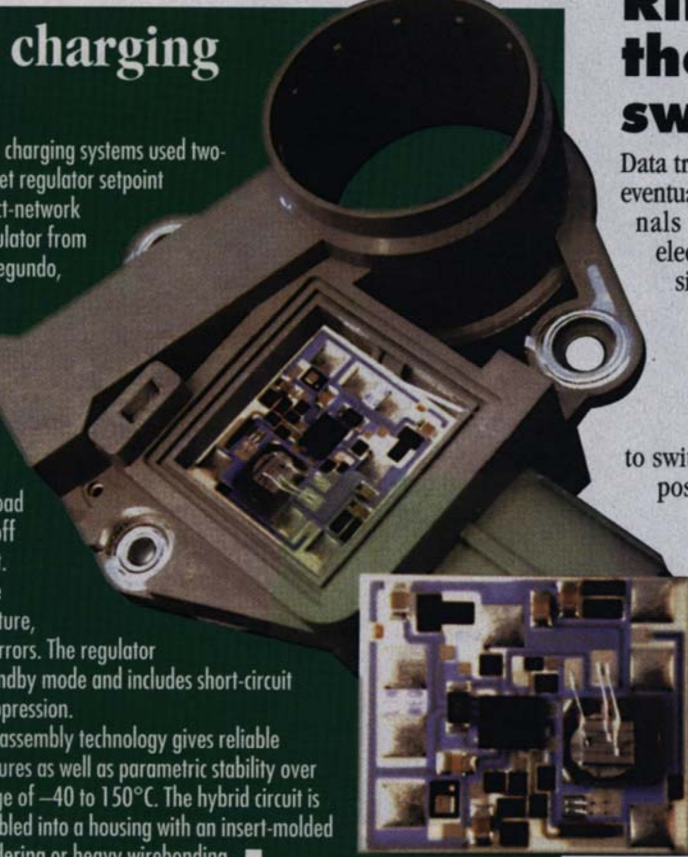
By Lawrence Kren

Intelligent charging systems



Previous intelligent automotive charging systems used two-line analog communication to set regulator setpoint voltage. But a local-interconnect-network (LIN) controlled alternator-regulator from **International Rectifier,** El Segundo, Calif., relies on a more-sophisticated serial connection for greater dynamic control.

The vehicle's engine-control unit uses the LIN to transmit charging voltage setpoint from 10.7 to 16 Vdc, load response control-ramp and cutoff speed, and field-excitation limit. Transmitted fault codes indicate mechanical, electrical, temperature, communication, and time-out errors. The regulator consumes under 200 μA in standby mode and includes short-circuit protection and EMI and ESD suppression.

The use of thick-film hybrid assembly technology gives reliable operation at elevated temperatures as well as parametric stability over the operating temperature range of –40 to 150°C. The hybrid circuit is customizable and can be assembled into a housing with an insert-molded lead frame for either flame soldering or heavy wirebonding. ■

BLUE LEDs FOR LESS GREEN

Blue LEDs have myriad applications in consumer, wireless, household, personal-care, automotive, and industrial markets. Blue was long considered the "holy grail" of LED colors, the missing color in the red-green-blue triad used to create full-color pixels in computer monitors and TVs.

Earlier blue-LED fab processes were slow and complex and about 10× more costly than those used to make red and green LEDs. But **The Fox Group Inc.,** Piedmont, Calif., has adapted a hydride vapor-phase epitaxy process used in low-cost semiconductor fab, to the manufacture of blue LEDs. The process makes blue LEDs of a quality suitable for many standard-brightness applications and at a price on par with red and green ones.

The process also raises the bar on manufacturing repeatability and consistency, says the company. Color spread is reduced by a factor of 10 to ±1 nm, and voltage range, by a factor of five to ±0.1 Vdc. Blue LEDs come in wafers, dies, and lamps in customer-specified packages. They output up to 2,000 millicandela at a dominant wavelength of 460 ±1 nm at a forward voltage of 3.5 ±0.1 Vdc. ■

Linux for cars

Linux, the ubiquitous and free operating system that by some estimates runs half of Internet servers, is targeting automobiles. Special automotive-grade Linux technology from **Metrowerks Corp.,** Austin, addresses automotive OEM demands for determinism, fast boot time, and low power consumption, as evidenced by a sub-40-msec response time, real-time capabilities, and optimized operation of MPC5200 microprocessors.

The MPC5200 from **Freescale Semiconductor Inc.,** Austin, delivers 760 Mips of computing power and consumes just 1 W. It is based on a 400-MHz MPC603e core with an integrated double-precision Floating Point Unit. A BestComm DMA controller offloads the core from I/O-intensive data transfers, while a Double Data Rate (DDR) memory controller accelerates data access with an effective memory bus speed of 266 MHz. Together, the DMA and DDR support a high-speed PCI interface, making the processor well suited for automotive telematics applications. ■

Ring aroun the photon switch

Data traveling through optical fib eventually be converted into electr nals and processed by conve electronic circuits. In many ca signals are converted back ir cal signals for retransmiss extremely slow process.

But an all-optical switc Cornell University researc lows one low-powered ligh to switch another on and off, m possible to route optical signa out conversion. Photonics icon switches have be gested since the though previous devic large by microchip sta or required high-po light beams to work.

The Cornell approa fines the beam to be s to a silicon ring resona 10 μm in diameter. R cumference determine nant wavelength, which case is 1,555.5 nm (n frared). Light resonating in t turns the device "on." The in tion of a second light beam o the same wavelength switcl ring "off." This second beam the silicon to absorb light in called two-photon absorptio in turn, changes the refractiv and adequately shifts reson quency so that the ring no resonates at 1,555.5 nm, a p that, in theory, takes place i tens of picoseconds. Rin onators will first find use i based signal routers, predi searchers, but could as well b as tunable filters to separate lengths of light in multiplexe munications systems. ■

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