



Risking it all
“A risk-averse or-
ganization stifles
innovation. The
early days of avi-
ation were not
risk-averse.”

—Burt Rutan,
whose SpaceShipOne
earned the \$10 million
X-Prize for privately
financed space flight

Device expands low-end, 32-bit performance

By Robert Cravotta

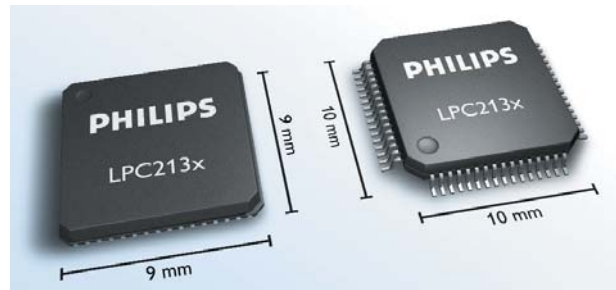
ROYAL PHILIPS Electron-ics’ LPC2130 32-bit, ARM7-based microcon-troller series expands the processing performance and feature options for low-end, 32-bit processing. These devices include as much as 512 kbytes of 128-bit-wide on-chip flash memory that enable the processor to fetch four 32-bit words in a single fetch and operate at 60 MHz with zero wait states.

The LPC2130 series devices are footprint-compatible and include the ARM debugger and embedded-trace interfaces with an ARM7TDMI-S core. The QFP and HVQFN, 9×9-mm, 64-pin packages boast 47 bit-addressable general-purpose-I/O pins that

support Atomic bit/set clear and 32-bit port-write extensions. The devices also include as much as 32 kbytes of static RAM with ECC (error-correction circuitry); dual eight-channel, 10-bit ADCs; a 10-bit DAC; and a 3V, single-voltage supply with brownout-detection and power-on-reset func-

tions. The LPC2131, LPC-2132, and LPC-2138 are available now and range in price from \$3.20 to \$7 (10,000). The LPC2134 and LPC2136 will be available in the first quarter of 2005.

►Royal Philips Electronics, www.semiconductors.philips.com.



The LPC2130 microcontroller provides 32-bit processing at speeds as high as 60 MHz with zero wait states and costs only \$3.20.

Carbon-comp resistor takes you forward into the past

IN THE 1950S AND 1960s, the carbon-composition resistor was the standard part of a BOM (bill of materials). You could easily hook probes onto the tangible axial or radial leads of their molded bodies and also read the value and tolerance from the color coding. Nearly invisible SMT devices have largely supplanted the resistors, but Stackpole Electronics has just announced a 1W carbon-comp unit, extending the company’s line of 0.25 and 0.5W offerings. The resistors are available in 2.2Ω to 2.2-MΩ values, with tolerance of ±10%.

Why offer this supposedly retro technology? These resistors, with rat-

ings of 500V continuous and 1 kV maximum, easily handle nasty overloads. They are also well-suited to the short-term pulses and high-voltage loads that occur in many of today’s low-voltage designs. According to Rob Hudspeth, director of sales, “None of those technologies [metal-film, wire-wound, and metal-oxide resistors] perform as well as a carbon-composition resistor with respect to power pulse and voltage handling.” The resistors sell for 65 cents (5000).

—Bill Schweber

►Stackpole Electronics Inc, 1-919-850-9500, www.seielect.com.



The past is prologue to the future, as these 1W carbon-composition resistors from Stackpole demonstrate. Despite modest nominal power-handling specifications, they can tolerate power pulses and high voltages that would destroy tiny SMT devices.

Telephony processors enable voice-over-data gear

LONG-TOUTED BUT SLOW-TO-MARKET VoIP (voice-over-IP) technology seems again poised for widespread deployment. In North America, many consumers use VoIP gateways with their broadband Internet links to make cheap phone

calls—especially international calls. Services such as Vonage make VoIP simple these days, but users claim spotty quality at times. Now, however, mainline telephone companies are looking at VoIP. And chip makers, including stalwarts such as Texas Instruments (www.ti.com), Broadcom (www.broadcom.com), and Intel (www.intel.com) are targeting the market. PMC-Sierra, meanwhile, just launched what may be the broadest family of VoIP chips on the market for subscriber premises.

The PMC-Sierra MSP (multi-service-processor) family includes the MSP2015, 2020, 4000, and 5000 chips. The devices range in price from \$9 to \$90 (25,000 to 50,000) based on both the chip the customer

selects and software royalties for functions such as voice codecs. At the low end, the MSP2015 is purely a MIPS-RISC-based device that targets SOHO (small-office/home-office) applications for VoIP in broadband gateways. The other chips combine DSP and MIPS cores to target applications ranging from complete analog-telephone adapters to enterprise-class IP-based private-branch exchanges.

PMC-Sierra claims several technical advantages to their offering. First, the company claims that its codec delivers PSTN (public-switched-telephone-network)-quality voice service. And the company has optimized the VoIP and router algorithms to ensure that voice traffic gets priority. PMC-Sierra claims that

the chips reduce voice latency to 87.6 msec and that the performance bests any competitive ICs.

Regardless of voice quality, the question remains about whether major service providers will roll out such VoIP equipment en masse. The Vonage-class market isn't sufficient to warrant the attention of the big chip players that are targeting the market. Moreover, the mobile handset is a heady competitor for calls within North America.

Jon Ames, product marketing manager at PMC-Sierra, claims that you need to look beyond North American shores to foresee what's to come in VoIP. Ames states, "Local tolls in the rest of the world are driving VoIP deployment. There are already 4 million subscribers in Japan. Asia will continue to ramp, and Europe will come online before there is real North American growth."

—by Maury Wright

► **PMC-Sierra**, 1-408-239-8000, www.pmc-sierra.com.

PLATFORM AIDS IN STREAMING-VIDEO PROCESSING

Celoxica developed PixelStreams as a response to the growing need for platform designs. The approach enables reuse of standardized IP (intellectual property) and still allows some hardware-design freedom. The design environment provides an interactive tool for the development of video- and image-processing applications. It offers a range of macro calls that allow users to gather, manipulate, and output streams of video-pixel data. The C-based models support design parameterization and abstraction of interface design.

Designers can use either C algorithms or a graphical editor to enter the design. Each block in the diagram represents a reusable IP core you choose from a library of video-data-manipulation functions. Designers can synthesize the C-based models from C to RTL using release V3.1 of the Celoxica DK Design Suite.

The PixelStreams platform, including the IP library and graphical editor, has a list price of \$15,000. The product requires the DK Design Suite V3.1 for output to either an RTL netlist or FPGA programming files. The platform is also available with the RC300-board platform to create a complete prototyping environment.—by Gabe Moretti

► **Celoxica**, +44 0 1235 863656, www.celoxica.com.

DILBERT By Scott Adams



► Nearly 8 million mobile-phone users have switched carriers and kept their cell-phone numbers since a new rule allowing that flexibility went into effect one year ago, according to the Federal Communications Commission.—*The Wall Street Journal*, Nov 24, 2004

Tiny capacitors are more complex than they seem

THE VENERABLE CAPACITOR, one of the oldest electronic components, has morphed into many special variations for various parameter combinations. A trio of new families from AVX

clearly illustrates that engineers have choices and trade-offs. The OxiCap NbO (niobium-oxide) solid-electrolyte devices feature ESR as low as 55 mΩ. These halogen- and lead-free capacitors, which come in standard-EIA case sizes, are alternatives to tantalum devices, due to their electrical features and high volumetric efficiency. Prices are 30 cents to 40 cents (OEM volumes).

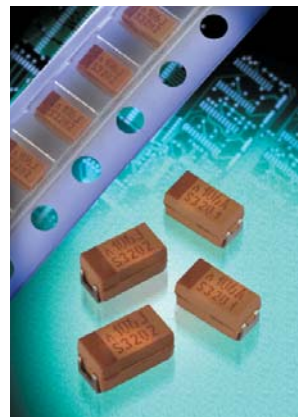
The tantalum 0402 TAC Microchip series has the highest volumetric efficiency along with low leakage, and delivers a variety of capacitance/voltage pairings, such as 10 μF at 2V and 2.2 μF at 6.3V. The -55 to +125°C devices, which sell for 45 cents to 55 cents (10,000), also feature capacitance-value stability over temperature. In addition,

a proprietary “soft-termination” technology allows the capacitor to compensate for thermal mismatch between components and pc boards, a cause of solder-joint failure.

Also taking advantage of the volumetric efficiency possible with tantalum, the TCJ series uses a conductive-polymer cathode for low ESR and can withstand the multiple-reflow-cycle, 260°C solder temperature of some lead-free soldering processes. These devices are available in 4.7- to 150-μF values at voltages of 4 to 10V; price is 25 cents to 35 cents (10,000).

—by Bill Schweber

►AVX Corp, www.avxcorp.com.



The TCJ series uses a low-ESR conductive polymer-tantalum design to withstand higher temperatures of lead-free soldering cycles, and they provide high volumetric efficiency.

Quad signal processors top new mezzanine card

BITTWARE RECENTLY ANNOUNCED the T2-PMC, a multiprocessor PCI Mezzanine Card featuring four Analog Devices (www.analog.com) ADSP-TS201 TigerSHARC DSPs, a Xilinx (www.xilinx.com) Virtex-II Pro FPGA, and multiple high-bandwidth I/O interfaces. In addition to a total of 14.4 GFLOPS of floating-point processing power, the TigerSHARC’s architecture allows the T2PM to also achieve 57.5 BOPS of 16-bit fixed-point performance.

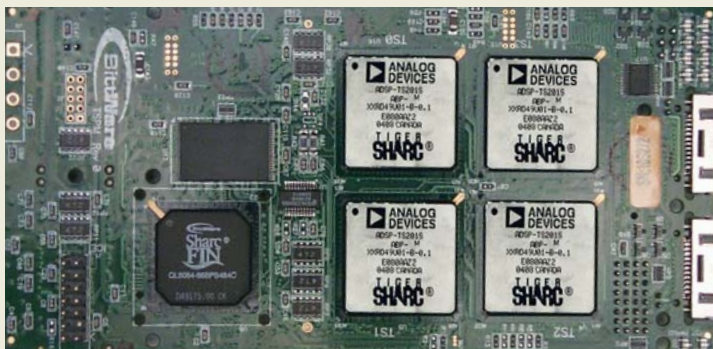
BittWare integrates this processing performance with 24 Mbits of on-chip RAM per DSP and four high-speed LVDS link ports operating as fast as 1 Gbyte/sec each. The T2-PMC interconnects two link ports from each DSP to create an interprocessor-communications ring, and the other two are routed to the onboard FPGA for I/O.

The T2-PMC implements a scalable architecture, ATLANTiS (Advanced Transfer Link Architecture for New TigerSHARC), which enables system designers to use software to configure their hardware. Jeffrey Milrod, president of BittWare, says that the PCI Mezzanine Card combines with the TigerSHARCs to give engineers flexibility in their designs.

BittWare offers complete software support for the T2-PMC, including software tools, interface libraries, and a variety of diagnostic utilities and configuration tools. The T2-PMC is available now, and prices start at \$8595.

—by Warren Webb

►BittWare Inc, 1-603-226-0404, www.bittware.com.



The T2-PMC multiprocessor PCI Mezzanine Card integrates quad TigerSHARC DSPs and an FPGA for reconfigurable-hardware applications.

►The period from 1909 to 1912 saw the number of private pilots and airplanes soar, yet the safety record of 3.5% fatalities for that era compares favorably with the 4.2% record of national governments in the space program of the United States and Russia combined.

—www.edn.com

i-Pod-sized DMMs comply with safety ratings to CAT II at 600V, CAT III at 300V

METERMAN Test Tools' \$27.95 to \$49.95 PM-series DMMs (digital multimeters) measure just $2\frac{1}{8} \times 4\frac{1}{2} \times \frac{1}{2}$ -in., including a protective rubber holster. According to the manufacturer, the size without the holster is the same as that of Apple Computer's (www.apple.com) i-Pod music player. Moreover, the less-than-3-oz meters have controls that are similar to those of the i-Pod. Notwithstanding their ability to fit comfortably into a shirt pocket, the units meet UL CAT II safety standards at 600V and CAT III at 300V. They also provide transient protection to 4 kV and overload protection to 450V.

A key to achieving the safe-

ty ratings without sacrificing the size was attaching the test leads directly to the meter; no plug-in jacks are necessary. (You can replace the leads, however, in the same way you replace the batteries; you open the case, which requires removing one Phillips-head screw.) To achieve the diminutive case dimensions, Metorman made no compromises in the size or legibility of the 4000- or 6000-count (depending on model) display. The 0.6-in.-high digits, which—for the sake of battery life are not backlit, are easy to read under a variety of lighting conditions.

Operating the controls is highly intuitive once you get the hang of holding down the

one button for two seconds to turn on the instrument. In fact, you usually don't need to manually select the operating mode; if you fail to choose a mode, the AutoTect feature on two of the three models automatically selects ac volts, dc volts, or resistance. Autoranging units also select the range for you. To conserve battery life, the units shut off if you don't use them for a while. On two of the models, The Voltect feature allows detecting the presence of ac voltages without probing the conductors. The units measure capacitance to 3000 μ F. Two of the units measure frequency to 30 kHz and ac and dc current to 2000 μ A. The top-of-the-line unit also includes a zippered carry-

ing case. All units carry a one-year "no-hassle" warranty.

—by Dan Strassberg

► **Meterman Test Tools**, 1-877-596-2680, www.metermantesttools.com.



Any of the three members of the PM series of DMMs fits comfortably in a shirt pocket and all meet UL CAT II safety standards at 600V and CAT III at 300V.

Compact controller drives multiple motors

A NEW PC/104 controller from Performance Motion Devices delivers advanced motion features, such as trajectory generation, servo-loop closure, quadrature-signal input, motor-output-signal generation, performance trace, on-the-fly changes, and commutation to dc brushed, brushless dc, and stepper motors. Available in one-, two-, three- and four-axis versions, the Magellan-PC/104 allows designers to create motion systems using standard C or C++ programming.

The Magellan-PC/104 card features S-curve, trapezoidal, velocity-contouring, electronic-gearing, and user-generated profile modes. The card accepts input parameters, such as position, velocity, acceleration, deceleration, and jerk, and generates the corresponding trajectory. The board provides servo-loop rates as high as 50 μ sec/axis, a 5 million-count/sec quadrature-encoder-input rate, and onboard trace capability of as much as 32k words. Chuck Lewin, president and chief executive officer of PMD, comments, "Motion cards have gone through an amazing evolution in the last several years. Today, it is possible to buy a cost-effective, high-volume motion card that supports multiple host-connection modes and multiple motor types, yet still

provides incredibly fast servo loop and pulse rate output." Prices for the Magellan-PC/104 start at \$540 (OEM quantities).—by Warren Webb

► **Performance Motion Devices Inc**, www.pmdcorp.com.



The Magellan-PC/104 card supports dc brushed, brushless dc, and stepper motors and communicates via a 16-bit parallel bus, CANbus, or serial port.

► According to IDC, US citizens this year collectively took 21.7 billion digital images, of which they printed only 7 billion, or 32%.