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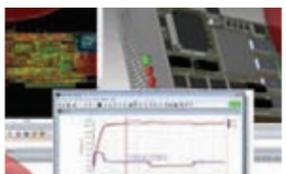
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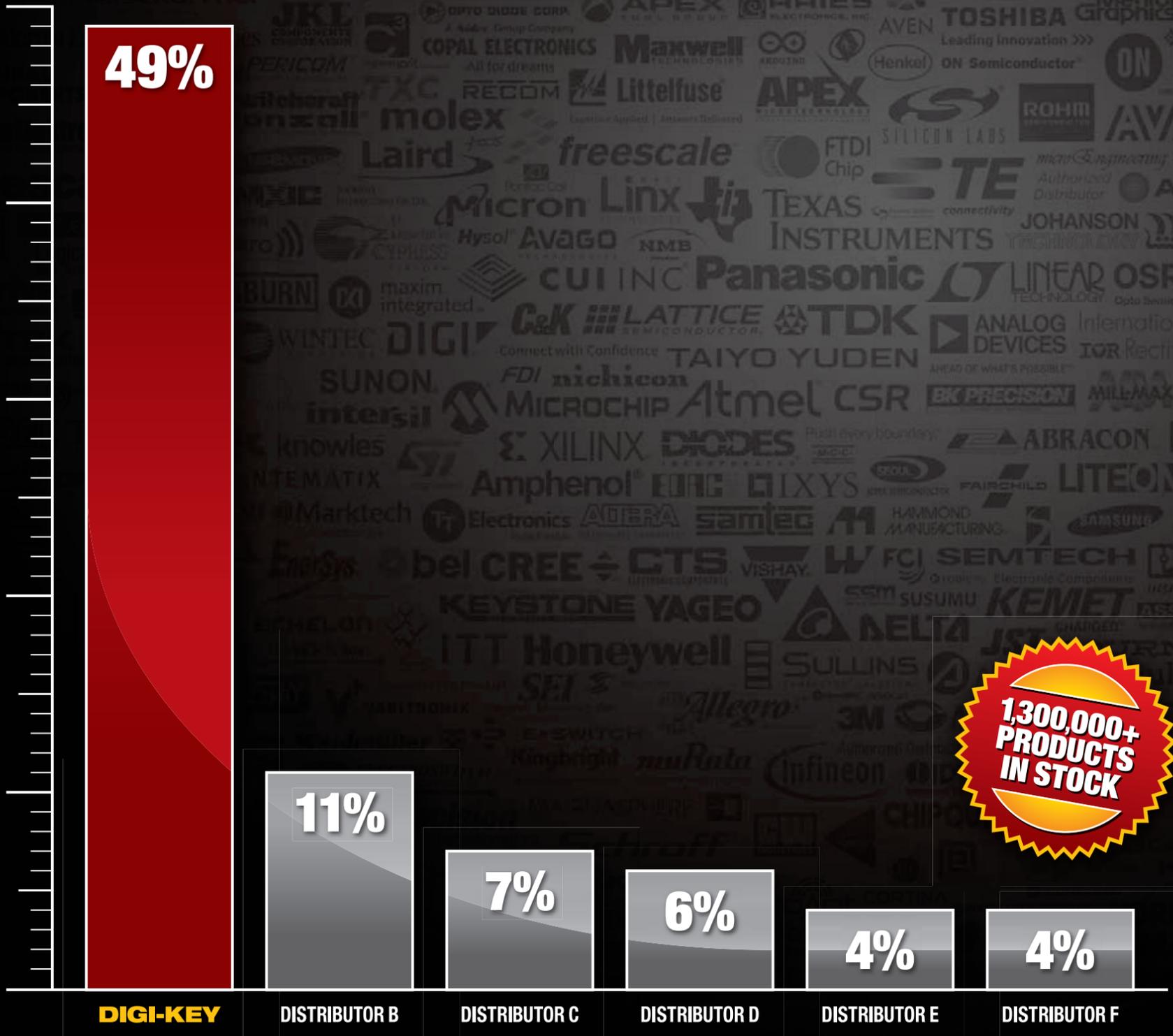
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Source: AspenCore 2015 Design Engineering and Supplier Interface Study



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PE symposium creates networking, education opportunities

Representing the single largest event of its kind in Canada, the Canadian Printed Electronics Industry Association (CPEIA) successfully held its second annual symposium this April, playing host to approximately 150 members of the international and local electronics industry.

Serving as an optimum networking and educational event, CPES2016 attendees were exposed to intelligence relating to the mixing research and development, industry expertise, commercial effort and government support. Representatives engaged with printable, flexible, stretchable and wearable electronics converged for the two-day event at Sheridan College in Oakville, ON. Most of these organizations are already working at bringing to market new products and applications across industry verticals - such as intelligent packaging, smart buildings, automotive, aerospace, healthcare and smart fabrics.

Keen ears sat in to listen to 30 in-depth presentations by field experts and leading Canadian researchers. Ten academic posters submitted by leading Canadian principal investigators and their teams, were also highlighted.

This year's symposium added a tradeshow area, featuring 12 tabletop exhibits representing product and service providers to the emerging fields. Among them were Ceradrop (MCI Group), providers of a modular-based materials deposition platform dedicated to hybrid process development. Also exhibiting its wares was Novacentrix, suppliers of photonic curing tools, materials

and expertise that enables the development and manufacturing of this next generation of printed electronics.

CPEIA handed out its inaugural industry awards, with the Product Innovation prize being delivered to Myant & Co., for its breakthrough of integrating technology into textiles. The Toronto-based firm recently released Vagalume - a collection of stylish athletic apparel that enhances visibility for safety at night, using electroluminescent technology.

The winner for CPES2016 Commercialization Award was Memtronik Innovations, for rapidly responding to a market need for an innovative new solution in the retail industry. In the space of a month, Montreal-based Memtronik implemented a novel concept in capacitive touch and illuminated displays for a top provider to the consumer market for global brand owners and retailers.

"Printable electronics can add smart functions to ordinary objects - these are technologies and applications that will drive the Internet of Things and impact a wide range of end-user verticals, including those we explored during CPES," says Peter Kallai, president and CEO of the CPEIA and Chair of the CPES organizing committee.

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NEWSWATCH

Hammond builds-on enclosure strengths with addition of new facility

119,000-sq-ft building in Guelph features new paint line, equipment

Driven by growing demand for its standard and customized enclosure products, Hammond Manufacturing Company Ltd., has constructed a brand-new 119,000-square-foot facility in Guelph ON, bringing its local footprint to approximately 450,000 square-feet and 600 employees.

The building (on Wilbert Street) features a state-of-the-art powder paint line, along with new advanced equipment, process improvements and facility modifications. With construction commencing in June of 2015, the firm took official possession early this April.

"We reached a point where it became necessary to expand our painting line at the original building (situated nearby on Edinburgh Rd North), so we took this quantum leap," says Steve Menegotto, general manager – datacom/electronic metal (Wilbert facility).

The freshly installed flexible manufacturing system includes a newly acquired punching and laser cutting system that are expected to double capacity for data/comm products, while also improving customer service and quality of product, according to Menegotto.

The facility sports some modern environmentally conscious elements, such as a closed-loop water system, reducing waste water. Equipped with a five-stage wash system, the enviro-friendly paint line also runs with a paint reclaim system, reducing waste and speeding the process.

"The new building will employ close to 100 people," says Menegotto, who has been with the firm for 20-years. Priding itself on its enclosure modification services, approximately 50% of Hammond's 19" cabinet business in Canada involves a modified product. This can include 19" cabinet assembly with specific specs for a window or door, shelves or vented door in rear.



Laser cutting area with Steve Menegotto, general manager – datacom/electronic metal, holding cut metal enclosure materials at Hammond's Wilbert St. facility.

J-Squared invests in repair lab targeting MIL-Aero sector

J-Squared Technologies Inc., Mississauga ON, a 25-year-old Canadian owned and operated company with a business unit in the United States to support the North American electronics marketplace, has invested heavily in expanding its MRO services – initially targeted towards the MIL-Aero based customers.

In addition to its distribution business, J-Squared has been focused on supporting and supplying electronic products and services into the military, aerospace, industrial, energy, transportation, medical and communications market sectors.

Full MRO support services are customized to every client's needs, including assembly, integration, prototyping, repair, rework and test. This provides 'cradle to grave' services and support for its customer's end products utilizing J-Squared's Integration and MRO facilities.



J-Squared Technologies' MRO support services lab in Mississauga is initially targeted towards MIL-Aero based customers.

Value-added proposition supports customers to the 'next level'

"This value-added proposition really helps us provide that next level of support for our customers," says J-Squared VP marketing Maria Turavani.

The move is highlighted by a significant investment in a state of the art repair lab, furnished with best-in-class diagnostic and rework equipment. This includes a fully ESD compliant work environment.



A member of J-Squared's technical staff inspects a PCB board inside the firm's new MRO services lab.

To ensure that J-Squared enhances its capabilities to service the MIL-Aero market, the company has added senior staff members with a deep understanding of its inner workings. J-Squared is in the process of implementing AS9100C and Transport Canada AMO Certifications, while also being ISO 9001/2008 and Controlled Goods certified. A committed member of the aeronautics sector, J-Squared is an active

member with the Ontario Aerospace Council (OAC), National Business Aviation Association (NBAA).

"We're not coming in new to these sectors. We are adding the necessary resources and experienced staff to augment our support," adds J-Squared president, Jeff Gibson.

The enviro-controlled facility is completely secure, ensuring IP protection to each and every customer, says Gibson. The firm also employs a specific anti-counterfeit policy, which assures that only valid components are used.

"It is very important that we can provide additional capabilities to enable our customers to receive complete solutions from J-Squared. Our goal is to support our customer's products from inception to the end-of-life for each product," Turavani says. With these additional capabilities new Mil-Aero customers are emerging from international markets, as well as increasing services to their existing customers within Canada.

J-Squared provides complete product lifecycle management support for its customers. Typically customers require a standard warranty (typically one year), extended warranty dependent on customer requirements and support services for legacy sustainment.

TüV Süd acquires Global EMC in Canada

TüV Süd strengthened its service offering in the context of electromagnetic compatibility (EMC) measurements by acquiring Global EMC Inc. in Canada.

The acquisition will reinforce TüV Süd's market presence in North America and enable the company to meet the increasing demand for EMC services in numerous industries more efficiently and effectively.

Canadian printable, flexible electronics leaders recognized

Myant & Co., Memtronik Innovations claim Canada's first industry awards at CPES2016

The Canadian Printable Electronics Industry Association (CPEIA) delivered the inaugural Innovation and Commercialization Award winners during its annual symposium yesterday.

The winner for the CPES2016 Product Innovation Award was Myant & Co., for its latest breakthrough of integrating technology into textiles. Just two weeks ago, Myant released Vagalume – a collection of stylish athletic apparel that enhances visibility for safety at night, using electroluminescent technology.

Vagalume means 'firefly' in Portuguese. Conventional reflective technology relies on an external light source to be visible. Myant's Vagalume emits its own light which is visible under any conditions and from any angle.

Functional enough to light up when you want it to, Vagalume is as thin as paper, as flexible as fabric and machine washable. Active people have the ultimate combination of style and function to light up the night.

The winner for CPES2016 Commercialization Award was Memtronik Innovations, for rapidly responding to a market need for an innovative new solution in the retail industry.

In the space of a month, Memtronik implemented a novel concept in capacitive touch and illuminated displays for a

top provider to the consumer market for global brand owners and retailers.

Memtronik used its unique expertise with human-machine interfaces, integrated electronics precision printing with DuPont materials, and surface mount assembly capabilities, to develop and ship its innovative prototypes within days.

"Our first award winners are representative of over 100 outstanding Canadian organizations"

These integrated printed circuits combine multiple functions with capacitive sensors, conductive adhesive, and controlled LED lighting, for use in 3D demo displays. Memtronik is expecting, and will be able to fulfill, volume orders quickly and locally, creating an innovative new solution for a multi-million-dollar market.

Canada's Printable, Flexible and Wearable Electronics Symposium (CPES2016), held this week at Sheridan College in Oakville ON, showcased the convergence of research and development, industry expertise, commercial

effort and government activity that gives Canada a tremendous opportunity in the explosive global market for printable, flexible and wearable electronics (PE), according to Peter Kallai, president and CEO of the CPEIA and Chair of the CPES Organizing Committee.

"This year's Symposium was once again a smashing success," Kallai says. Responding to the feedback received last year, CPES2016 broke new ground to focus on industrial applications in a host of market verticals, including health care, consumer products, intelligent buildings, connected homes, smart packaging, smart auto parts and aerospace. In fact, more than half of this year's attendees were from industry.

"Our first award winners are representative of over 100 outstanding Canadian organizations that are pioneering great innovations with printable, flexible and wearable electronics," Kallai adds. "Printable electronics can add smart functions to ordinary objects – these are technologies and applications that will drive the Internet of Things and impact a wide range of end user verticals, including those we explored during CPES. I applaud Myant and Memtronik for their efforts to commercialize new products that will help put Canada on the map in this exciting emerging market."

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Electronic Enclosures & Thermal Management

How different enclosure air flow patterns affect the choice of air-to-air heat exchangers

By W. John Bilski, senior engineer; Gary Mumma, product line manager, heat exchangers; Gregg Baldassarre, vice-president, sales and marketing, Thermacore Inc.

Designers of enclosures for electronics continue to explore ways of increasing the density of boards and devices inside electronic enclosures while minimizing internal temperatures. Today's enclosures, cabinet sizes and designs vary substantially in width and height up to seven feet tall. But they have one thing in common: The density of the electronics inside is increasing — and so is the heat load. Properly cooling the internal electronics requires thoughtful selection of heat exchangers in relation to air flow patterns inside the cabinet.

Using natural convection in the enclosure works only if the cabinet contains just a few heat-generating components. If the cabinet doors are opened to improve air circulation — or if high-powered fans are used to move air through the cabinet — then contamination from dust, vermin and debris is likely to occur. To reduce internal temperature, using air-to-liquid heat exchangers or cold plates are not a viable alternative, because they may introduce unwelcome condensate in close proximity to the electronic components.

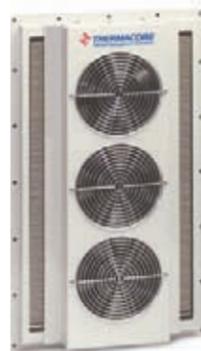
Fortunately, alternatives exist that are ideally suited for modern enclosure designs. To optimize air flow and heat transfer inside electronics enclosures, two air flow paths are commonly used — a vertical flow pattern and a horizontal flow pattern (see illustrations). Either a heat-pipe core or an impingement core may be selected depending on the air flow pattern. Both technologies will maintain a NEMA 4/IP 66 (water tight) or NEMA 12/IP55 (dust tight) seal of the enclosure.

Two-phase heat-pipe heat exchangers for vertical air flow

For tall cabinets that employ a vertical air flow pattern, a suitable heat



In an 'HX-style' heat exchanger, separate internal and external energy-efficient fans draw air through the interior and exterior portions of the heat exchanger, which are separated by a flange and closed-cell neoprene gasket.



In enclosures employing horizontal air circulation, double-sided impingement technology is used in front- or side-mounted 'HXi-style' low-profile heat exchangers.

exchanger can be made using two-phase heat-pipe technology. Heat pipes use a unique capillary action that provides extremely effective thermal conductivity.

The shape of a heat pipe can be cylindrical or planar. Inside the heat pipe, the surface is lined with a capillary wicking material. The heat pipe is evacuated and back-filled with a small quantity of a working fluid, such as water, acetone or methanol. The fluid absorbs heat in the evaporator region by vaporization. Then the vapor carries the heat to the condenser region where the vapor condenses, releasing heat to the cooling media — in this case, the ambient air surrounding the heat pipes projecting from the enclosure.

The condensed working fluid is pumped back to the evaporator side by gravity (or by capillary action if working against gravity).

Heat pipes are a totally passive heat transfer system. There is no pump to wear out or that requires an additional energy source. In application, the heat pipes are arrayed as a parallel-plate, top- or side-mounted 'HX-style' heat exchanger. Separate internal and external energy-efficient fans draw air through the interior and exterior portions of the heat exchanger, which are separated by a flange and closed-cell neoprene gasket. This arrangement prevents the introduction of potentially contaminated exterior air into the sealed NEMA (National Electrical Manufacturers Association) enclosure.

Versatile mounting options allow for heat exchanger placement on doors, side,

top or back of the enclosure. The light weight and compact size of a heat-pipe heat exchanger make it ideal for space-constrained applications. The drawback is that, due to the heat-pipe heat exchanger's compact and highly efficient design, it may be subject to fouling in dirty or oily industrial environments.

Impingement heat exchangers for horizontal air flow

In enclosures employing horizontal air circulation, double-sided impingement technology is used in front- or side-mounted 'HXi-style' low-profile heat exchangers.

The double-sided impingement system utilizes a core that separates the internal and external sides of the enclosure. Internal fans draw in the hotter, inside air and blow it toward the fin core (see horizontal illustration). By impinging against

the fins, heat is transferred from the air to the fin core. Likewise, a set of outside fans draws in the cooler, ambient air and blows it toward the outer side of the fin core, removing the waste heat.

The fin core is made of thin aluminum, a material that reduces the thermal resistance (due to conduction) to negligible levels. A double-sided impingement heat exchanger can dissipate twice the heat load compared to conventional counter-flow heat convection in which air flows parallel to the fins. Thanks to its design and efficiency characteristics, an 'HXi-style' heat exchanger is comparatively 50 percent smaller. The size

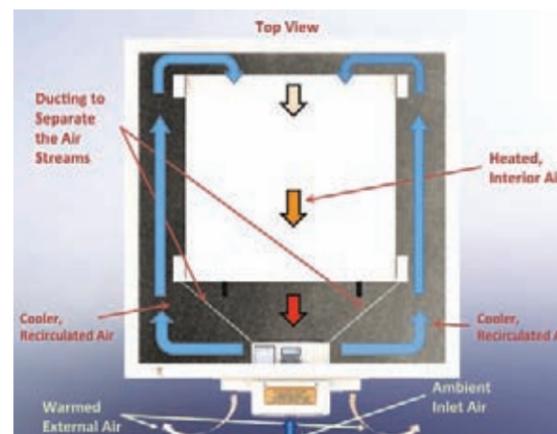
reduction allows more packaging flexibility for enclosure manufacturers.

Double-sided impingement heat exchangers also maintain the NEMA 4 and NEMA 12 integrity of the enclosures and also may meet UL and Telcordia GR-487-CORE standards.

As a closed-loop system, a double-sided impingement system employs fewer moving parts to reduce the chance of mechanical problems. Stock units are available as 2, 4, 6, or 8 fans with a low noise level of 64.5dBA for the two-fan version. Custom designs are available to handle high wattage heat dissipation requirements. Typical installations are performed using low-profile design and modular dual-fan configuration.

Depending on the cabinet size, double-sided impingement heat exchangers can be deployed singly or in combination to provide installation flexibility in any orientation. Integrated custom features such as alarms and temperature controls are also available as an option.

Additional advantages of a double-sided impingement system include a shorter air flow path through the electronics. The shorter path means less resistance to air flow and the possibility of eliminating the fan tray(s). Furthermore, due to the wide air gap between the impingement plates in the core, air can flow freely,



In enclosures employing horizontal air circulation, double-sided impingement technology utilizes a core that separates the internal and external sides of the enclosure. Internal fans draw in the hotter, inside air and blow it toward the fin core.

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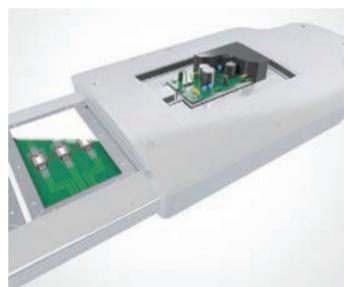
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High-performance cooling material dissipates large amounts of heat

curamik CoolPerformance Plus high-performance cooling material is an advanced liquid-cooled material that dissipates large amounts of heat and provide reliable thermal management of high-power laser diodes and other heat-generating optical devices. Products provide several layers of pure copper, formed into hermetic, three-dimensional microchannel or macrochannel water-cooled structures capable dissipating large amounts of heat in small areas. The mounting surfaces of the coolers can be diamond-milled to meet the fine tolerances required for mounting of laser diode packages, for optimum flow of heat away from the diodes.

ROGERS PES

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Thermally conductive solution transfers heat through encapsulating layer

Technomelt thermally conductive material transfers heat through the encapsulating layer and delivers dual-function performance in a single material solution. Product serves as a streamlined alternative to multi-step, messy potting processes. Materials can be melted, molded and cooled quickly under low pressure, delivering an encapsulation technique that provides a high throughput solution for protection of delicate circuitry and pcb assemblies, while forming a self-enclosed housing.

HENKEL ADHESIVE ELECTRONICS

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Double rail extrusions suit rugged subracks

Double rail extrusions with dual mounting provide the modular framework for electronics enclosures. Products provide mounting holes for a second screw, delivering more stability and strength for a modular enclosure. The rails have been tested and used in German railway applications for high resistance to shock/vibration and the ability to handle extreme loads. The extruded aluminum rails come in front and rear versions and with various interfaces. There are sets of 1HP pitch patterns of 2.5M tapped holes for snapping in card guides and mounting backplanes.

PIXUS TECHNOLOGIES

<http://ept.hotims.com/61397-38>

Thin cooling fan delivers 0.60cfm

Micro-Fan measures 17x17x4mm (at 15,000rpm) and provides static pressure of 2.413mm H₂O. Product's life expectancy is 50,000 hours, with operating voltages from 2.8 to 3.5Vdc. Device is suitable for space-limited applications, including UAVs (Unmanned-Aerial-Vehicles), pocket projectors, PDA, MID, smartphones, GPS, masks and goggles, micro fuel cells, and air-sensing usages.

JARO THERMAL

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Black NEMA enclosures are UL-listed

NBB series of black UL-listed weatherproof industrial NEMA enclosures are constructed from molded halogen-free and self-extinguishing fiber-glass reinforced polyester (FRP), suitable for use in extreme temperature or corrosive environments. NBB121 series (12x10x5 inch), NBB100 series (10x8x5 inch), NBB141 series (14x12x7 inch) and NBB181 series (10x8x5 inch) are available with aluminum mounting plates, non-metallic mounting plates or without mounting plates.

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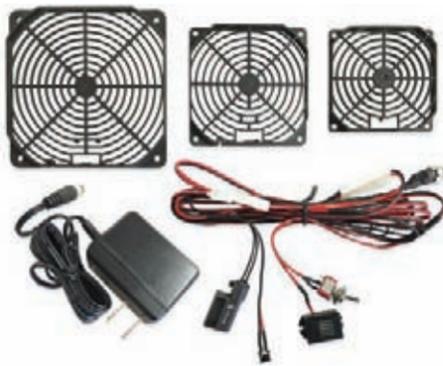
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Monitoring kit measures airflow of ac, dc fans

Airflow monitoring system is simple to implement and use. The field retrofittable AFM Kit includes an AFM-01NC airflow module, mounting clip, three plastic guards (80mm, 92mm, and 120mm), buzzer, LED and holder, switch and wall mounted power supply. Kit comes completely assembled in a 10' wire assembly, making installation even easier. Product operates an optical LED and/or audible alarm, which can be controlled with included switch, when airflow falls below 8.2ft/s due to fan filter clogs, foreign objects coming in contact with the fan blade, or fan failure.



ORION FANS

<http://ept.hotims.com/61397-41>

Enclosure family caters to evolving MDU marketplace

Five new models join the MDU Enclosure Family for use in the ever evolving MDU marketplace. Products are suitable for subscriber densities of 12 to 192. A variety of options are available for indoor and outdoor installation. Firm's Network Link Panels are available in rackmount or wallmount versions. Available stubbed or unstubbed and in a variety of connector styles and densities.

PRIORITY ELECTRONICS

<http://ept.hotims.com/61397-42>

Enclosures house Arduino, BeagleBone development boards

HAMAR family of design-specific plastic enclosures house small form factor development boards, configured for the Arduino LEONARDO, M0 PRO, UNO or Y/N, and the HAMBB, optimized for the BeagleBone Green. All models are based on the popular general purpose 1593 Series and are supplied ready to use with machined or molded I/O, power and expansion ports to suit the layout of components on the various boards. All versions are available in translucent blue, grey or black general purpose ABS with a satin finish.

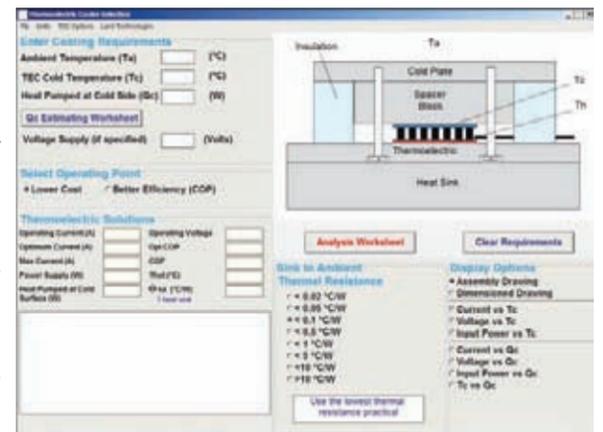


HAMMOND MANUFACTURING

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Thermoelectric module simulation software shortens design cycles

AZTEC thermoelectric module (TEM) simulation software program algorithms to further reduce thermal design time. Product selection tool permits design engineers to specify a given set of input variables based on application attributes and the software analysis outputs optimal TEMs for examination. Program enables design engineers to quickly choose a suitable TEM based on a cross comparison of TEM datasheets. Further reducing a customer's time-to-market, software contains an analysis worksheet that simulates how TEM devices will function under a specific set of operating conditions.



LAIRD TECHNOLOGY

<http://ept.hotims.com/61397-44>

Redundant, dual redundant rack systems serve wayside & sub-station installations



Redundant and Dual Redundant Rack Systems are suitable for mission critical applications where high-reliability is essential and loss of power difficult. Product's output power package range from 250W to 5000W in one 19" chassis using firm's C500 to C4500 Series units (higher power systems available upon request). Output voltages of 24, 48, 60, 100, 110, and 150Vdc (additional dc voltages are available) and input voltages 115/230Vac @ 50/60Hz single phase (3-phase ac and dc voltages available).

SCHAEFER

<http://ept.hotims.com/61397-45>



Cooling units conserve energy, boost cost efficiency

Blue e+ cooling units boosts energy conservation with its speed-regulated components and patented heat pipe technology. Delivering high energy efficiency, units provide extended component life, flexibility and ease of use. Product's cooling process uses two parallel cooling circuits working together, depending on temperature difference. The integral heat pipe dissipates heat from the enclosure as soon as the ambient temperature falls below the set point, providing passive climatization. Active climatization is achieved via the compressor's cooling circuit with speed-controlled components for demand-based cooling. Unit's provide cooling capacities up to 6,000 watts (previously up to 4,000 watts) and can be used in environments ranging from -30°C to +60°C.

RITTAL CANADA

<http://ept.hotims.com/61397-46>

Enclosure coolers protect sensitive electronics

Enclosure coolers keep electrical and electronic enclosures cool, clean and dry, and are a low-cost alternative to expensive high-maintenance air conditioners. A small mounting footprint allows use in confined spaces, and require 1/10th the space of comparable air conditioner units. Various easy-to-install models are available from 400 to 5,000 BTU with air consumption from 8 SCFM to 70 SCFM. NEMA 12, NEMA 4, NEMA 4X, Zone 2 & 22 and Class I, II, III, Div 2 ratings available.

VORTEC

<http://ept.hotims.com/61397-47>



The choice of air-to-air heat exchangers

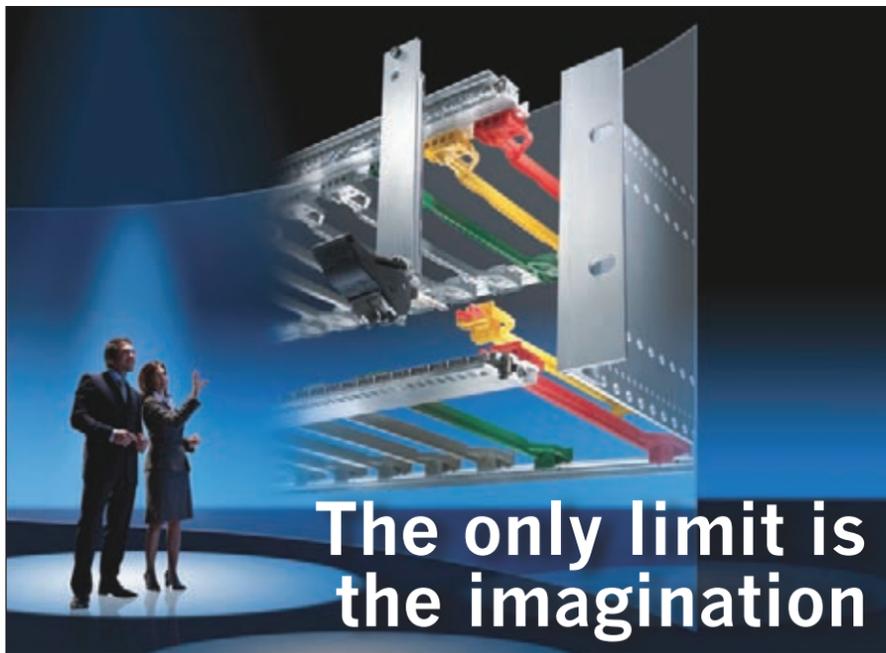
continued from page 6

reducing the risks of fouling in dirty or oily environments.

Ensuring the appropriate heat exchanger selection

Making the proper heat exchanger selection will ensure that the electronics cabinet can control the heat generated from the components within the enclosure. Effective heat transfer lengthens equipment life and improves reliability. Two heat exchanger technologies have emerged that provide optimum performance for two common enclosure air flow patterns: two-phase heat-pipe heat exchangers for vertical air flow and impingement heat exchangers for horizontal air flow. With proper application of advanced heat-pipe or fin-core components within the given heat exchanger type, reliable and efficient thermal protection can be achieved in a wide range of cabinet sizes and profiles.

For more information on heat exchangers from Thermacore Inc., go to <http://ept.hotims.com/61397-48>



The only limit is the imagination

Modular enclosure solutions and components

Pixus offers virtually unlimited configurations for 19" rackmount, desktop, and rugged enclosures. From electronics instrumentation cases to embedded systems in the latest backplane architectures, Pixus has a solution for you.

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<http://ept.hotims.com/61397-7>

Material streamlines substrate coating processes

Technomelt AS 8998 materials are suitable for high-performance low pressure molding applications. The newly-formulated product provides a streamlined and economical alternative to conventional masking techniques for various coating requirements. Product provides simple and fast dispensability to mask 'keep out zones' for printed circuit assemblies that will undergo subsequent coating or chemical deposition processes. Product delivers a fast, highly-precise, automated, easy-to-remove approach to mask specific components or designated pcb areas that must remain free of any applied protective coatings.

HENKEL ADHESIVE ELECTRONICS
<http://ept.hotims.com/61397-49>



Digital multimeter with thermal imager speeds troubleshooting

279 FC TRMS Thermal Multimeter test tool integrates a full-featured true RMS (TRMS) digital multimeter (DMM) with a thermal camera in one device to speed troubleshooting. Unit allows technicians to quickly and safely check for hot spots in fuses, wires, insulators, connectors, splices; and switches with the imager and then troubleshoot and analyze issues with the DMM. Product provides 15 electrical measurement functions including ac/dc voltage, resistance, continuity, capacitance, diode test, min/max, and frequency.

FLUKE
<http://ept.hotims.com/61397-50>



Dc fan and blower products offer wide range of package sizes, speeds, airflows

DC fan and blower product listing expanded to provide a viable, long-term source for customers when their current source obsoletes a fan or blower product. Firm has introduced 52 new dc fans and 4 new dc blowers, which includes a wide range of package size, speed (RPM), airflow (CFM), and special function combinations. Firm has increased its 25mm (OD2510 Series), 30mm (OD3010 Series), 50mm (OD5010 Series and OD5015 Series), 80mm (OD8015 Series and OD8032 Series), 92mm (OD9238 Series), and 120mm (OD1232 Series) fan product offering. Firm has added two new fan sizes to its product offering with the introduction of 35mm (OD3510 Series) and 40mm (OD4015 Series) fans.

ORION FANS

<http://ept.hotims.com/61397-52>

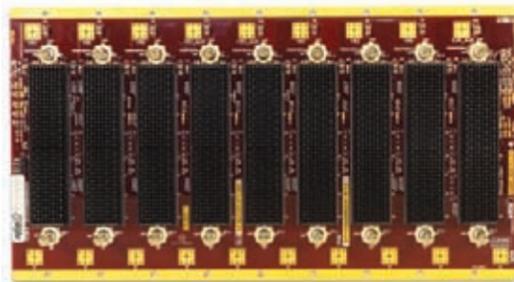


OpenVPX backplanes come in 3U and 6U configurations

Firm provides several standard profile configurations for OpenVPX backplanes and the boards are compliant to the VITA 65 specification. Firm has new 3U backplanes in 5, 9 and 18 slots and new 6U versions in 2 and 5 slots. Backplanes come with or without rear I/O connectors and are designed to cable over to firm's power boards for VITA 62 or PICMG 2.11 power supplies. Units have header options for VITA 46.11 for system management.

PIXUS TECHNOLOGIES

<http://ept.hotims.com/61397-51>



Pre-configured industrial frame boosts cooling capacity



PANDUIT

Pre-Configured Industrial Distribution Frame (IDF) is specifically engineered to deploy and protect rack mount Ethernet switches in industrial applications. Product enables consistent equipment deployment with 25% faster installation times than a traditional IDF that is not pre-configured. Unit also reduces the risk of downtime due to switch overheating. Product extends the lifecycle of the equipment such as switches and UPS systems installed in the enclosure. Unit is UL 508A Listed and UL Type 4/12, IP66 Rated to ensure safety and reliability. The wall-mount, dual hinged device accommodates up to five switches with front and rear access for quick and easy maintenance.

<http://ept.hotims.com/61397-53>

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100VA pure sine wave dc-ac inverters operate in harsh environments

CSI-100-D1-IP66 series of rugged, dc-ac inverters deliver up to 100VA pure sine wave output voltage. Microprocessor controlled high frequency PWM technology is used to convert 24Vdc, 36Vdc, 48Vdc or 125Vdc input to 115Vac at 60Hz or 400Hz, or 230Vac at 50Hz. Efficiency is typically 80% at full load. Filtering on the input and output contributes to low noise, which allows the unit to be used in EMI sensitive environments without additional filtering. The units have comprehensive electronic protection and comply with EN60950-1 and corresponding UL458 and CSA international safety standards. The rugged devices are installed in IP66-rated waterproof, die cast aluminum packages with sealed connectors. The internal module is conformal coated and ruggedized.



ABSOLUTE ELECTRONICS

<http://ept.hotims.com/61397-54>

Wire cut and strip unit expands capabilities



EcoStrip 9380 cut and strip machine provides a complete feature set at an economical price point. The flexible machine provides expanded capabilities and can be configured with rollers or belt feeding and the configuration can be quickly and easily changed by the operator. Product's 3-position design of the optional belt feeding system further enhances the customer's capabilities and can be set for normal mode, roller mode or short mode processing – depending upon the application. Unit is also compatible with a wide

range of accessories, including prefeeding, marking, stacking and coiling, which turn the stand-alone machine into a fully automatic processing line.

SCHLEUNIGER

<http://ept.hotims.com/61397-55>

Efficient power distribution system is modular, flexible

Module 18plus power distribution system is a compact wiring solution for all dc 24V load cables and signal lines, no matter if it is for decentralized power distribution or for centralized plant concepts. Product comes with state-of-the-art push-in technology for DIN rail mounting and provides panel builders with modularity, flexibility and efficiency. Product consists of three basic 13mm wide components, including 18plus-EM supply module, 18plus-AM connection module for accommodating single pole circuit breakers (ESS30, ESX10-, ESX10-S, 2210-S) and the 18plus-SM signaling module with a green LED for indicating the 'OK' condition of the aux. circuit.

E-T-A CIRCUIT BREAKERS

<http://ept.hotims.com/61397-56>



20mm coin cell battery retainers deliver ultra low profile

SMT and THM series of ultra-low profile, 20mm coin cell battery retainers are suitable for high density pcb packaging. Engineered with high efficiency spring tension to assure low contact resistance, products firmly secure batteries within the retainers. Rugged, lightweight and bearing clearly-marked polarity, devices are manufactured of Phosphor Bronze, and accept 2016, 2020, 2025 and 2032 coin cells from all major manufacturers. Products are nickel-plated for durability and high temperature soldering.

KEYSTONE

<http://ept.hotims.com/61397-57>



Heavy duty fuse clip withstands up to 1500Vac/Vdc



CS0 heavy duty fuse clip family comes with cost-effective tinned version. Designed for 10.3mm diameter fuses, device is suitable for applications with voltages up to 1500Vac/Vdc and currents to 32A. Product is available in solder and screw/rivet versions. Solder version allows direct mounting on a printed circuit board by means of through-hole technology. Screw/rivet version provides additional flexibility for basic designs. Due to the special copper alloy all versions are characterized by a strong clamping force resulting in minimal power loss.

SCHURTER

<http://ept.hotims.com/61397-58>

SPST slim relay delivers 5A switching

G6DN SPST slim power relay provides low power consumption, long life and high switching capacity. High switching 5A relay provides small width of 5mm, low coil power consumption of 110mW, long electrical life of 80K ops and specially designed cross bar twin gold plated contacts ensuring high reliability. Product provides minimum permissible load characteristics of 1mA at 5Vdc (at 120 operations/minute) and higher ambient temperature -40 to +90Celsius.

OMRON

<http://ept.hotims.com/61397-59>



Single pole spring type terminal blocks suit compact, low profile devices

Metz Connect Series SM99 and SR99 single pole spring type terminal blocks provide a spring mechanism and aimed at compact and low profile devices. Available in SMT and THR designs, devices utilize a simple push-in technique for wire insertion and a large finger-operated push-button for wire release. Products provide a wire connection indicator and test point for added connection reliability. Device's compact design allows for space optimization on printed circuit boards. Series SM99 and SR99 single pole spring type terminal blocks are rated up to 9A and accommodate a single wire cable range of 24-16 AWG. The terminal blocks are reflow-capable with a connection direction of 90°C.

HEILIND ELECTRONICS

<http://ept.hotims.com/61397-60>



Board mount ac-dc power supplies operate over wide temperature range

KWS-A board mount ac-dc power supplies are capable of starting up at 40C, as the convection cooled units will operate in ambient temperatures of up to 85°C and are rated for full load over a -10 to 45/55C range (model dependent). The encapsulated product series comprises of four power levels and four output voltages 5V, 12V, 15V and 24V. 5W and 10W models measure 38.1 x 25.4 x 21.5mm, 15W 50.8 x 25.4 x 24mm and the 25W models 63.5 x 25.4 x 29mm. Rated for Class II operation, units require no earth ground connection.

TDK-LAMBDA AMERICAS

<http://ept.hotims.com/61397-61>



west tech report

Reliability, passion, partnerships drive expansion for Shearwater

By Sohail Kamal, West Coast Correspondent



Bruce Partridge managed to combine his experience in computer systems design, embedded programming and advanced technical diving to form **Shearwater Research Inc.**, a Vancouver-based manufacturer and developer of cutting-edge dive computers.

The firm recently released its latest Shearwater Perdix dive computer in addition to moving into an expanded 17,000-square-foot-facility. I recently had the opportunity to connect with Shearwater president Steve Prescesky, to discuss his passion for the industry, along with his desire to build the most reliable products in its field. Prescesky underscores the importance of developing and nurturing partnerships with his customers, which has led to Shearwater's growth.

Q: Great to see a West Coast company develop new products over the past decade. What was the impetus for the start of Shearwater?

"Shearwater was founded by Bruce Partridge out of his love of scuba diving," explains Prescesky. "Bruce was not satisfied with the ease of use and power of trimix technical dive computers available prior to creating the first Shearwater computer in 2005. Other divers soon discovered Shearwater resulting in steady strong growth."

This growth helped move Shearwater from a home based business, and in February, they expanded into a state of the art 17,000-square-foot facility in Richmond, BC.

Q: What sets Shearwater's products apart from other dive products?

"Since the beginning, Shearwater has been focused on three attributes: Power, simplicity and reliability. The 'powerful' aspect lends itself the computers' ability to handle all of the functions that technical divers require and do so with intelligent design."

Simple can be of incredible value to divers who have to deal with limited visibility and limited dexterity due to dive suits. By decreasing the number of button-pushes required to access a feature, and by creating an intuitive menu system, Shearwater can empower people to be better divers. When dealing with products that have the ability to save lives, Prescesky underscores the importance of reliability – which cannot be overstated: "(Product) reliability means

that our customers can really trust our quality and that our products will always work despite use in harsh environments."

Q: How does the Shearwater Perdix improve on the Shearwater Petrel and why should it matter to divers?

"Shearwater is the leader in dive computers for technical and advanced divers. High production volumes and an engineering staff of eight people have allowed us to roll-out the Shearwater Perdix, which employs advanced manufacturing technologies and innovative engineered polymers to reduce the size by nearly 40%. This product retains a large and even easier to read screen," adds Prescesky. "Better ergonomics, rugged durability and compelling pricing are expanding the market for Shearwater computers to a broader base of advanced scuba divers. We have also improved battery life by 30%, achieving 45-hours from an easily replaceable AA battery."



Q: Can you share a challenge that Shearwater has had to overcome and how other tech companies can learn from your success?

"It is a big challenge for a new start-up to provide a quality product. Shearwater was able to establish an early foundation by really understanding our customer's requirements to build a viable product. Quality was built in through taking the time to refine and make good designs, along with an overriding desire to always build the most reliable product," Prescesky explains. "Through a love of diving, we have built long lasting strategic partnerships. Some of our early dive buddies became our first customers and are now true development partners – assisting us with testing, safety certifications and actually selling the products."

For more information about Shearwater, technical diving computers or rebreather control systems, visit www.shearwater.com.



Test & Measurement

Averna acquires European T&M firm

Acquisition of Test & Measurement Solutions makes Averna a truly global test-solution provider for clients in North America, Europe and Asia

Averna, a Montreal-based developer of test solutions and services for communications and electronics device-makers worldwide, has acquired 100% of Europe-based Test & Measurement Solutions for an undisclosed amount.

Averna's main shareholders, Tandem Expansion and Caisse de dépôt et placement du Québec (CDPQ), both participated in the financing of this acquisition. For CDPQ, this investment is consistent with its objective to further the international expansion of high-performing Quebec companies.

T&M Solutions develops multidisciplinary solutions to test, measure, inspect, assemble and validate products in nearly all segments of the production industry. Headquartered in Belgium and with offices in the Netherlands and Poland, T&M Solutions is a National Instruments Gold Alliance Partner and has 100 employees, including 70 engineers with almost 50 NI certifications.

This acquisition increases Averna's global reach as well as provides a strong local presence in Europe, enabling Averna to enter this market with a well-established and respected solution provider while giving it a springboard for further European deployments. In addition, T&M Solutions brings unique

expertise in semiconductor testing, vision inspection systems and precision assembly to complement Averna's existing solutions and industry strengths.

"This major expansion into Europe signals Averna's strategic positioning to accelerate growth and become a truly global Test Engineering powerhouse. Test & Measurement Solutions and Averna share complementary solution portfolios, clients and partners, so this is a real win-win arrangement for everyone," says François Rainville, vice-president of sales & marketing for Averna. "We are proud to welcome T&M Solutions' customers and employees while providing all our customers with additional expertise and increased worldwide presence."

André Gareau, Averna's president and CEO, added "We're building a strong track record of successful acquisitions and are motivated by our robust pipeline of opportunities in Europe and around the world." These are exciting times for Averna and the industry as our leading test expertise, rapid processes and global support continue to demonstrate that we are a strategic-value partner for our clients' ongoing product quality and market goals."

techniCAL signs disty deal with Fluke

techniCAL Systems 2002 Inc. has signed a distribution deal with Fluke Electronics Canada LP.

Terms of the agreement include Fluke's process calibration tools which include a full range of calibrators and troubleshooting tools for instrument technicians working in the process industries. The range of process calibrators include: documenting process calibrators, multifunction process calibrators, single function and multifunction temperature calibrators and a variety of mA loop calibrators.

Also included are a full range of electrical and industrial test tools for every application. Additionally, Fluke provides a wide selection of probes, accessories, application and product expertise for issues you face every day.

Finally, the agreement includes the Amprobe product line, which builds rugged, reliable test and measurement tools that have been trusted by professional electricians and HVAC technicians for over 65 years. The products range from an extensive line of clamp meters and digital multimeters to industry-specific tools for residential/commercial electricians, HVAC/R technicians, utilities and industrial maintenance professionals.

12-Bit wideband digital receiver comes in PXIe format

M9203A PXIe 12-bit high-speed digitizer/wideband digital receiver runs up to 3.2GS/s, with up to 2GHz instantaneous analog bandwidth. Unit is suitable for applications in wireless communication, emerging communication standards, radar and satellite communication and semiconductor automated test. Modular solutions allow microwave measurements and are highly adaptable, while integrating core signal-analysis capabilities with hardware speed and accuracy, allowing engineers to tailor the systems to fit their specific needs.

KEYSIGHT TECHNOLOGIES

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Compact handheld meters supply test kits

HHC200 Series of portable rugged environmental meters for temperature, pressure, RPM/light intensity, air flow, humidity, dew point and wet bulb measurement provide fast and accurate readings for environmental field monitoring needs. HHC201 and HHC210 digital thermometers come in two different models: infrared thermometer with laser sighting and dual thermocouple thermometer. HHC230 and HHC250 light meter and optical RPM meter measure light intensity and non-contact optical RPM with accuracy and reliability. HHC261 hygromometer for air flow and humidity measurement boosts accuracy with ambient measurement, wind chill indicator and integrated wet bulb flow vane. HHC280 and HHC281 manometers come in two different models: absolute pressure and precision differential.

OMEGA

<http://ept.hotims.com/61397-63>



Industrial handheld oscilloscope speeds electro-mechanical troubleshooting

ScopeMeter 120B Series industrial handheld oscilloscope simplifies and speeds electro-mechanical troubleshooting. Device provides Connect-and-View technology that recognizes signal patterns and automatically sets up the scope's triggering, amplitude and time base eliminating the typical trial-and-error setup process. Once the waveform is captured, the IntellaSet intelligent measurement detection automatically selects key measurements based on the acquired waveform type and displays the most relevant measurement values (for example, Vrms and Hz for a line voltage signal, or Vpeak-peak and Hz for a square wave), helping technicians easily identify and characterize potential signal faults.

FLUKE

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<http://ept.hotims.com/61397-10>



Protocol analysis system meets emerging Ethernet standards

SierraNet T328 Protocol Analysis systems provides users the state of the art analysis platform for the emerging 25G, 50G and 100G Ethernet standard and for the new 32G/128G Fibre Channel interconnections. Utilizing firm's T.A.P.3 probing technology, product provides users a completely transparent acquisition solution for all Ethernet and Fibre Channel SAN/NAS environments, ensuring the traffic captured is the traffic transiting the bus under observation.

TELEDYNE LECROY

<http://ept.hotims.com/61397-65>

USB-based real-time spectrum analyzers deliver up to 7.5GHz frequency

RSA500 and RSA600 series USB-based real-time spectrum analyzers with 4 higher-performance models targets design, spectrum management and wireless transmitter installation and maintenance applications. Units provide frequency coverage from 9kHz up to 7.5GHz with 40MHz acquisition bandwidth, a measurement dynamic range from -161dBm/Hz displayed average noise level and up to +30dBm maximum input. Both models have an optional tracking generator with an integrated internal bridge for basic device, cable and antenna testing. Through a standard USB 3.0 connection, units are operated from a desktop PC, laptop or tablet using an updated version of the full-featured SignalVu-PC software suite.

TEKTRONIX

<http://ept.hotims.com/61397-66>



Temperature and humidity data logger is compact

Senonics Bluefin 1.0TH compact temperature and humidity data logger provides Bluetooth to easily communicate with your logger at a distance in environments that you can't access or do not want to disturb. Configure the included temperature and humidity sensor straight from your Apple iPhone, iPad or iPadMini. The APP is a free download with purchase from the Apple Store. Product operates in a temperature range of -20 to 60C and provides a temperature resolution of 0.04C.

ITM INSTRUMENTS

<http://ept.hotims.com/61397-67>



Electronic production test solution boosts throughput

Flying Scorpion FLS980 Series III electronic production test solution comes with the Ultimate Accuracy Package Option along with high throughput features such as the latest version Flying Bed of Nails (FBON). Unit boosts accuracy and probing speeds and provides enhanced boundary scan, digital testing and device programming. Additional features include a heavy duty conveyor system to handle large and heavy boards, and high bandwidth HPM850 probe modules for functional testing (up-to 20GHz).

ACCULOGIC

<http://ept.hotims.com/61397-68>



Programmable, digital attenuator operates at frequency up to 20GHz

LDA-203 digital attenuator has an operating frequency of 1 to 20GHz and provides a 0 to 63dB attenuation range and a step size resolution of 0.5dB. Unit is powered and controlled by connection to a PC or self-powered USB hub and is programmable for fixed attenuation or swept attenuation ramps directly from the included graphical user interface (GUI) software. Easily programmable for ATE applications, device can also be used in WiMAX, 3G, 4G, LTE, DVB fading simulators and engineering and production test labs.

VAUNIX

<http://ept.hotims.com/61397-69>



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Unlocking Measurement Insights

<http://ept.hotims.com/61397-11>

Agilent's Electronic Measurement Group is now **Keysight Technologies**.

Addressing wireless system multi-antenna test challenge

By Sheri DeTomas, 5G solutions business lead, Keysight Technologies Inc.

More and more, people rely on their wireless devices to manage email, social media, banking, and downloading or streaming videos and movies. In order to

support these activities, consumers are demanding higher data rates and better signal integrity from their mobile devices.

LTE and LTE-Advanced are becoming more mainstream in many markets today and next generation standards in 5G are in the early research and definition phase. In cellular, LTE-Advanced is the next big technology growth area to keep up with consumer demand until we start to see roll outs of 5G.

Today, many wireless providers are working to improve connectivity and peak data rates of their mobile communications systems through implementation of LTE-Advanced multi-antenna techniques. Multi-antenna techniques are also used in wireless LAN standards like 802.11n and 802.11ac. Multi-antenna techniques are a key technology used to add capacity to a system by increasing the number of antennas at the transmitter, receiver or both.

Specifically, multi-antenna techniques are implemented to achieve better spectral efficiency and increased peak data rates. The techniques used today include:

- **Path diversity** – uses multiple antennas at either the transmitter or the receiver to improve the robustness of the signal, or the ability of the receiver to correctly receive the transmitted data. Path diversity can be implemented as transmit diversity with multiple antennas at the transmitter, transmitting to a single receiver. Path diversity can also be implemented as receive diversity where a single transmitter transmits to multiple antennas on the receiver side. Both of these multi-antenna configurations help to improve signal robustness when the channel suffers with poor signal to noise ratio.

- **Spatial multiplexing** – is a technique used in MIMO (multiple input, multiple output), where two or more antennas are used on both the transmitter and the receiver. This multi-antenna technique is used to improve spatial efficiency. With MIMO, independent and separately encoded data signals (data streams) is transmitted from each of the multiple transmitter or receiver antennas.

The data from individual antennas, at each end of the communications circuit, are combined to minimize errors and optimize data speed. MIMO is used in many of the higher data rate wireless technologies such as LTE, LTE-A, WiMAX and WLAN 802.11n/ac. The spatial multiplexing technique improves spatial efficiency and data throughput for a single user. Multi-user MIMO is a form of spatial multiplexing that can be used to send data to multiple users simultaneously in the same frequency spectrum. This technique increases system efficiency rather than increasing data throughput rate to a single user.

- **Beamsteering or beamforming** (when channel feedback is used) uses multiple antennas for directional transmissions to steer a signal in the direction of a specific receiver. The same signal is transmitted from two or more spatially separated transmitters simultaneously. Magnitude

and phase adjustments are applied so that multiple transmissions can combine destructively or constructively. The constructive (or in phase, coherent) signals combine constructively and create a beam pattern. With the constructive combination, the combined signal provides much more energy at the receiving antenna, resulting in better signal robustness and improved signal to noise ratio at the receiver. Benefits of beamsteering/beamforming include selectivity, interference management with increased gain and better SNR.

These multi-antenna techniques are used in today's wireless communications. Multi-antenna techniques with multi-user beamforming is expected to be a critical technology for 5G, utilizing hundreds of antennas at the basestation, communicating with multiple devices at one time. This is also known as Massive MIMO.

Design and development of communication systems using multi-antenna techniques presents a number of challenges. As the number of antennas increase, engineers are faced with system verification tests that are much more complicated than previous configurations.

Multi-channel synchronized test systems are helpful, providing scalability and the ability to use shared resources for triggering and synchronization

There are new challenges for validating multi-antenna configurations including the need to analyze the multiple transmit or receive chains simultaneously; and for MIMO configurations the need for a multi-channel synchronized test.

In addition, in beamforming applications, it's critical to have precise timing and synchronization between channels; and phase coherency to ensure proper inter-channel phase and magnitude measurements. To address these test challenges, multi-channel synchronized test systems are helpful, providing scalability and the ability to use shared resources for triggering and synchronization.

PXI test solutions are ideal because they can provide channel count scalability as well as time and phase synchronization to support MIMO and beamforming tests.

Synchronization between signals, or channels can be quite difficult to achieve when considering all the synchronization that needs to take place in the multiple instrument environment. Typically, a master reference signal is used to align

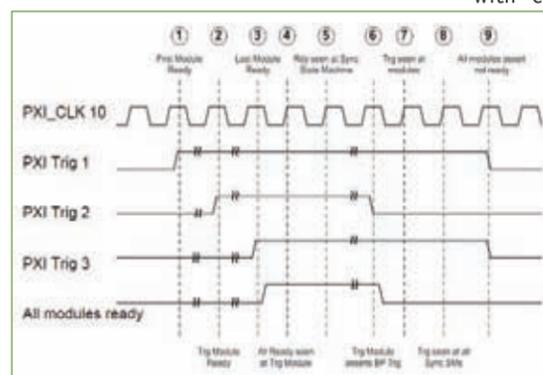


Figure 1: Using a master clk to synchronize data capture or playback

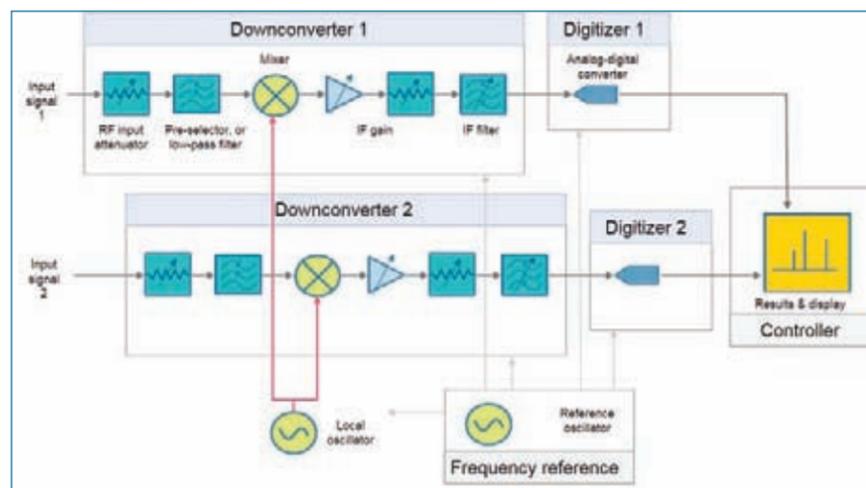


Figure 2: Using a shared LO to achieve phase coherency with multi-channel analyzers

all the clk signals. In the case shown in Figure 1, the master reference signal uses one PXI trigger line to send an initialization trigger to all the slave modules. Once all channels are armed, then, the master unit signals a trigger event and all modules will start on the next 10 MHz clk edge. This method ensures that all start actions are aligned so that data capture or playback is started simultaneously on all channels.

A common clock reference provides time alignment but not phase coherence. This can be a problem in beamforming applications since magnitude and phase shifts are used to create the beam pattern. Phase coherency between channels is typically needed to simulate the real world transmission or measurement. Two signals are said to be phase coherent if they have a constant, relative phase at all instances in time. If each signal generation or measurement channel has its own independently generated signal, then each channel would have its own phase properties. This makes it difficult to achieve a constant relative phase between the multiple channels.

A phase stable relationship between generated signals or measurement channels can be achieved using modular instruments that provide phase coherency between the channels. One method to achieve true phase coherency is to use a shared local oscillator (LO) with each channel to ensure that all channels have the same phase properties. By sharing an LO, each downconverter in the analyzer or each modulator in the source share the same phase characteristics including phase error and the RF paths can be fully characterized given the constant phase and channel to channel skew (delay in paths for each instrument). See figure 2. With this approach, the multiple signals can construct and destruct properly.

It is important to accommodate for the magnitude and phase differences between

channels in a measurement system. Without calibration, there is some degrading of measurement results. Using calibration to correct for the offsets will ensure that any measured differences are due to the device under test and not the test equipment. Corrections are achieved by measuring the channel-to-channel differences and applying adjustments. This can be done by generating a known refer-

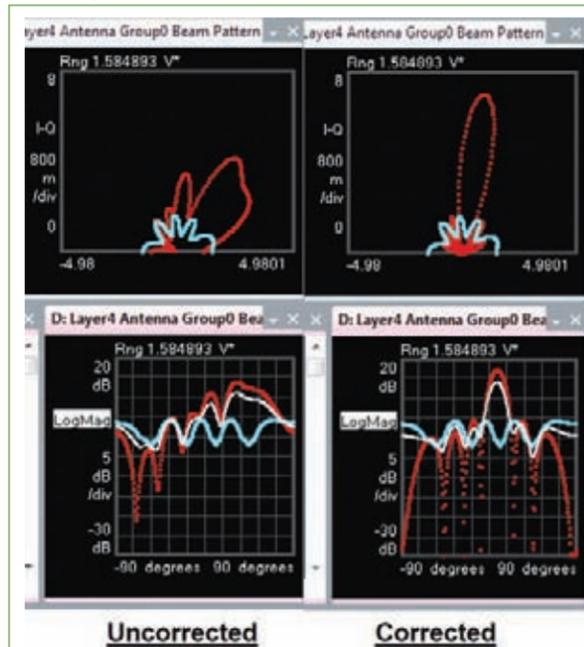


Figure 3: Measuring beam patterns with out and with time and phase corrections

ence signal on each source channel, one at a time, to each analyzer channel and measuring the result. Figure 3 shows how the calibration can impact the accuracy of the beam pattern.

To summarize, multi-antenna techniques are becoming increasingly common in today's wireless communications systems, and will be used even more in 5G communication systems. Engineers will be challenged to develop test and verification system for complex multi-channel systems. Modular instrument platforms help to address these challenges with scalable channel count, channel-to-channel synchronization, and with phase coherency and other features providing the right tools for today's and tomorrow's measurement system.

For more information on addressing multi-channel synchronization for MIMO and beamforming test, go to <http://ept.hotims.com/61397-70>

Low inductance impulse winding tester targets power chokes

19301A Impulse Winding Tester satisfies test requirements for a wide range of power inductance products from 0.1uH to 100uH including power chokes. Device provides a 1000V impulse voltage, 0.25V resolution and a 200MHz high speed sampling rate to satisfy test requirements. Product's function is to discover potential defects as early as possible. Defects can be winding layer short, poor electrode welding, and poor internal coil or core insulation.



CHROMA SYSTEMS SOLUTIONS

<http://ept.hotims.com/61397-71>

Data loggers communicate wirelessly via Bluetooth



HOBO Data Loggers MX1101 temperature/relative humidity data logger provides Bluetooth to easily communicate with your logger at a distance in environments that you can't access or do not want to disturb. Unit comes without cords and only requires a mobile device, saving considerable time recording data. Unit operates within

a temperature sensor range of -20° to 70°C and a relative humidity sensor range of 1% to 90%. Temperature Accuracy is ±0.2°C.

ITM INSTRUMENTS

<http://ept.hotims.com/61397-72>

In-circuit tester comes in 5U rack-mount instrument form factor

U9403A Mini ICT true in-circuit test unit comes 5U rack-mount instrument form factor that can be used standalone or integrated. Product features includes, VTEP vectorless test, Cover-Extend Technology, and digital library tests and boundary scan. The unmuxed per-pin programmable digital engine makes test development really flexible and easy, especially in a situation when device conditioning is needed in functional test. Standard instrument SCPI commands makes it easy to work with other instruments and external test sequencers under IVI VISA architecture. Built-in program scripting tool makes the overall test execution even more flexible for your needs.

KEYSIGHT TECHNOLOGIES

<http://ept.hotims.com/61397-73>

Performance oscilloscope probes tackle smaller, faster designs

P7700 series of TriMode probes for use with firm's performance oscilloscopes provides up to 20GHz bandwidth. Devices ease the challenges designers face when debugging circuits found in the latest mobile and enterprise designs by minimizing probe loading, improving access to smaller, more-densely packed test locations and lowering overall cost of ownership. Probe's input amplifier is located <4mm from the connection point, minimizing signal loss, probe tip capacitance and noise. Product's signal path is fully characterized and automatically de-embedded from measurement results.



TEKTRONIX

<http://ept.hotims.com/61397-74>

Optical transport tester supports encapsulation methods up to OTU4

Network Master Flex MT1100A optical transport tester addresses the challenges associated with emerging technologies being integrated into Core and Metro networks, as well as in data centers. Field portable multi-100G transport tester can support native client payloads, including Ethernet, Fibre channel, SONET/SDH and CPRI, into various ODU encapsulation. A powerful, robust instrument for testing OTN signals, unit supports 10GbE client payload using GFP mapping into ODU2 and ODU2 extended payload.



ANRITSU

<http://ept.hotims.com/61397-75>

newswatch

Teledyne LeCroy to acquire Quantum Data

Teledyne LeCroy Inc., Santa Clara CA, has entered into an agreement to acquire Quantum Data Inc., a market leader in HDMI and SDI signal generators and protocol analyzers, as well as test tools for other digital video technologies.

Teledyne LeCroy is a market leader in protocol test tools for well known serial data standards like USB, PCI Express, SAS, and SATA. The firm's strategy is to continue to expand its protocol offerings into additional wired and wireless data communication standards with the goal to be the market leader in each protocol standard.

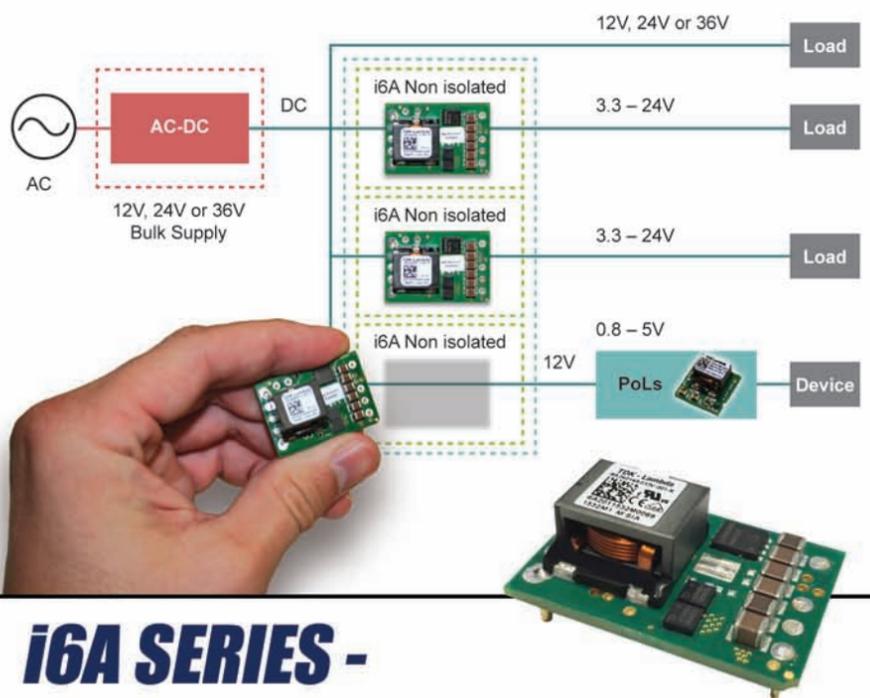
<p>TIA Series 35A Non-isolated SMT Point of Load with PMBus™ ◆ Only 0.45 in² Board Space ◆ 8 to 14V Input ◆ 0.6 - 3.3V Output ◆ Digital Adaptive Control ◆ Configurable Sequence and Fault Management http://us.tdk-lambda.com/lp/products/tia-series.htm</p>	<p>TIB Series 60A Non-isolated SMT Point of Load with PMBus™ ◆ Only 1.0 in² Board Space ◆ 8 to 14V Input ◆ 0.6 - 2V Output ◆ Digital Adaptive Control ◆ Configurable Sequence and Fault Management http://us.tdk-lambda.com/lp/products/tib-series.htm</p>	<p>TIQ Series 300-504W Isolated 1/4 Brick Converters ◆ Quarter Brick Footprint ◆ 48V Nominal Input ◆ 9.6 and 12V Output ◆ Up to 95% Operating Efficiency ◆ High True Usable Power http://us.tdk-lambda.com/lp/products/tiq-series.htm</p>
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◆ 3.5 - 17V Input
◆ 0.7 - 5.5 Output
◆ No External Tuning Components Needed
◆ DOSA Compatible Footprint
<http://us.tdk-lambda.com/lp/products/dosa2-series.htm>

TIBH Series
20A Non-isolated SMT Point of Load
◆ Only 0.36 in² Board Space
◆ 3.5 - 14V Input
◆ 0.7 - 5.5 Output
◆ No External Tuning Components Needed
◆ DOSA Compatible Footprint
<http://us.tdk-lambda.com/lp/products/dosa2-series.htm>

TICH Series
12A Non-isolated SMT Point of Load
◆ Only 0.23 in² Board Space
◆ 4.5 - 14V Input
◆ 0.7 - 8.5 Output
◆ No External Tuning Components Needed
◆ DOSA Compatible Footprint
<http://us.tdk-lambda.com/lp/products/dosa2-series.htm>

Create your own!



i6A SERIES - 250W, 3.3 to 24V 14A Output Non-Isolated Converters

The i6A is ideal for creating additional high power output voltages from a single output AC-DC supply. Rated at 250W, this 14A step-down converter can be adjusted across a 3.3V to 24V output, accepting a wide 9 to 40Vdc input.

Packaged in the industry standard 1/16th brick footprint, with an ultra high efficiency of 98%, the i6A can operate in even the most demanding thermal environments.

Contact TDK-Lambda for an evaluation board or check our website for distribution inventory

<http://us.tdk-lambda.com/lp/products/i6a-series.htm>

For more information on how TDK-Lambda can help you power your unique applications, visit our web site at www.us.tdk-lambda.com/lp/ or call 1-800-LAMBDA-4

- ◆ Only 1.2 in² Board Space
- ◆ 9 to 40V Input
- ◆ 3.3 to 24V Output
- ◆ Up to 98% Efficiency
- ◆ Minimal External Components Required



Single fiber optic connectivity solution is smaller, smarter



F01 FiberOptic single fiber optic connector is a miniature, lightweight, rugged connectivity solution that is easy to use and improves performance in harsh environments. Device is available either in pre-configured reels or integrated into custom assemblies meeting growing market needs for higher data transmission rates over long distances, while reducing space and guaranteeing performance by means of rugged miniature solutions. UPC & APC polishing reduces

insertion and return losses, making devices more secure, while IP68 sealing provides highly valuable device protection. Product's push-pull locking system allows quick and easy connections and disconnections, including removable sleeve holder (monobloc mate adapter) to ensure that end faces can be cleaned easily.

FISCHER FIBEROPTIC

<http://ept.hotims.com/61397-76>

Laser-based drilling, cutting unit handles flexible circuits

MicroLine 5000 UV laser based flex drilling and cutting system is specifically tailored to the needs of the flexible circuit industry. Unit comes with a large working area of 21" x 24" and is available in two different laser power classes, depending on customer needs for various substrates and thicknesses. Product is equipped with precise process monitoring systems as well as intelligent vision systems for fiducial recognition and alignment.



LPKF LASER & ELECTRONICS

<http://ept.hotims.com/61397-77>

Dc-dc converter targets medical applications



G/H Series 1-2W medical dc-dc converter targets medical applications that meet medical design standard EN60601-1 and ANSI/AAMI ES60601-1 3rd Edition (1xMOPP/2xMOPP).

Both creepage and air clearance of the transformer are 5mm, and 5.5mm for printed circuit board. The isolation voltage is as high as 4200Vac (6000Vdc), which is 40% higher than standard voltage (3000Vac) of 2xMOPP. Leakage current is less than 2µA, which ensures the patient's safety. Devices operate high efficiency up to 84% to save energy effectively. They have a compact dimension of SIP7 (19.50*9.80*12.50mm) and provide an input voltage range of 5 to 24Vdc and 5, 12, 15, ±5, ±9, ±12, ±15Vdc output voltages.

MORNSUN

<http://ept.hotims.com/61397-78>

Stainless steel cable gland resists micro-organisms, bacteria

Skintop INOX stainless steel cable gland with special design features prevent micro-organisms and bacteria from sticking to the surface. Product has an IP68/69K rating and withstands high pressure and high temperature wash downs. Product has a smooth surface, with no edges and is highly corrosion-resistant. Device also provides a wide variable clamping ranged.



LAPP

<http://ept.hotims.com/61397-79>

Wire, cable cutters quickly cut variety of materials

Models HC10, FC10 and HCA20 wire and cable cutters quickly cut many types and sizes of materials. The HC10 is hand operated by use of a lever, while the FC10 utilizes a foot pedal to cut material. Both units can cut material up to 1" OD, depending on material construction. An optional conversion kit is available to change an HC10 to an FC10. Using the foot pedal allows the operator to have both hands free to hold material in place while cutting. Model HCA20 is air-operated and utilizes dual electrical finger switches to activate the blade. This cuts down on operator fatigue as no physical force is needed for cutting. This unit can cut wire or cable up to 1-1/4" in diameter.



ERASER

<http://ept.hotims.com/61397-80>

Remote spectrum monitor mitigates interference problems



MS27101A Remote Spectrum Monitor interference detecting tools can be used with firm's Vision software to create a highly accurate remote solution for govern-

ment regulators and university lab researchers to identify interference patterns, record spectrum history and geo-locate the sources of problem signals to mitigate interference issues and identify illegal or unlicensed signal activity. Unit addresses the market need for an accurate remote solution for white space monitoring, harm claim threshold detection, in-building interference monitoring, positive train control system protection and locating illegal/unlicensed signal sources or similar interference.

ANRITSU

<http://ept.hotims.com/61397-81>

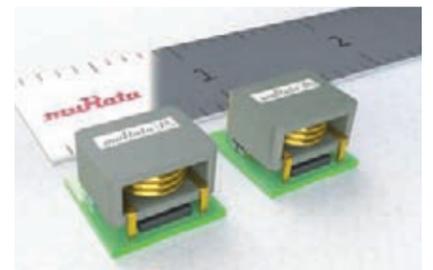
Digitally controlled PoL converters come in high density packaging

OKDL-T/6-W12, OKDL-T/12-W12, and OKDL-T/18-W12 Okami series of non-isolated point-of-load (PoL) dc-dc converters deliver 6, 12, and 18A respectively, are capable of being monitored and configured via PMBus communications. Exhibiting versatility, products accept input voltages from 4.5V to 14V and have an adjustable output voltage range from 0.6V to 5V (1.8V max for 18A model).

Designed for a minimal footprint, the high-power-density LGA modules measure 12.2 x 12.2 x 8.0mm. Devices provide a typical efficiency figure of 91.6% at 12Vin, and are able to operate in a temperature range of -30 to +95C.

MURATA POWER SOLUTIONS

<http://ept.hotims.com/61397-82>

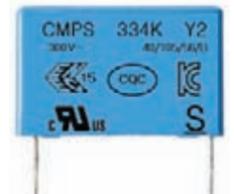


Metalized polypropylene interference suppression capacitors are RoHS compliant

Sung Ho Electronics CMPS line of Class 'Y2' metalized polypropylene interference suppression capacitors are fully RoHS compliant and Safety Agency approved. The 300Vac rated product series has a range of values from 0.001µfd through to 0.56µfd, with lead spacing from 10mm through to 27.5mm.

SP INTERNATIONAL

<http://ept.hotims.com/61397-83>



Medical power supply meets high safety standards

OB501 series power supplies for medical applications BF (Body Floating) complies with the latest EMI coexistence standard IEC 60601-1-2: 2014 (4th edition), keeping patient and operator safety in mind. Product delivers an output power of 1100W (1250W peak) and is available

in seven different voltages from 24V to 48V with an efficiency up to 89%. Product meets, conducted and radiated EN55011 class B, without requiring any additional components. Unit has an input-to-output isolation of 4000Vac (2xMOPP), an input to ground of 1500Vac (1xMOPP) and a 1500Vac (1xMOPP) output-to-ground when many conventional products offer only 500Vdc isolation.

POWERBOX

<http://ept.hotims.com/61397-84>



Schleuniger



NEW EcoStrip 9380

Welcome to the Future of Entry Level Cut & Strip

The EcoStrip 9380 offers the most complete feature set at an economical price point. This flexible machine can be configured with rollers or belt feeding unit capable of short mode processing and is easily operated via the 5.7" color touchscreen and underlying Schleuniger S.ON software. Turn the EcoStrip 9380 into a fully automatic processing line with a wide range of accessories for prefeeding, marking, stacking, coiling and tying.

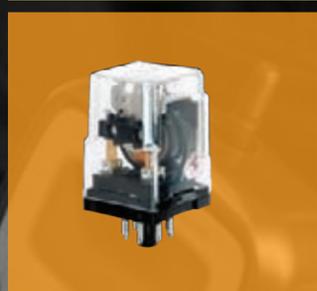
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"The displays and software are similar from machine to machine. This makes integrating a new piece of equipment into production a smooth transition." **JR Palumbo, Owner, Royce Electronic Sales**

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IoT (Internet of Things)

Why pricing for IoT is so confusing

By Peter Thorne, director, Cambashi Ltd.

There's a pattern in technology pricing, and the signs are that this pattern is emerging again for many of the technologies associated with the Internet of Things (IoT).

Cambashi calls the pattern the 'Henshell Curve' because it was a discussion with Cambashi associate Dr. Richard Henshell that crystallized our thinking into the price development trend curve shown in the diagram.

There are four phases:

Risk:

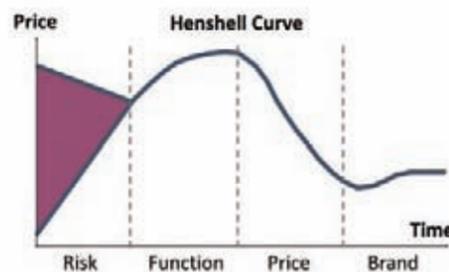
In this first phase, the technology might come from a university for free or it might cost a fortune if you commission a development team to create it for you. Each vendor in the market (and there are many) offers a different bundle of functions at a different price. We call this the risk phase, because the chosen provider may not stay the course; the technology may not develop in the way it was planned, and these changes could leave your investment stranded. There are no benchmarks to measure against. Throughout this phase the top priority for the buyers and users of the technology is to manage risk and make sure their vision of the potential benefits is a reasonable balance for this risk. This phase draws to a close as the market converges around one definition of price and function.

Function:

Many, but, not all vendors survive into this second phase. The survivors make money, because the market grows fast and the price tends to rise, so quite a large population of vendors can prosper. The key competitive factor for the user is now function, and the leading vendors invest to deliver new functions to beat the competition. The signal for the end of this phase is the appearance of a new entrant offering 80% of the function at 20% of the price.

Price:

In this phase, functional bundles are well-defined and well understood and price becomes the main competitive weapon. Part of the market discovers that the 80% offer is all it needs. Market leaders come under pressure and prices start to fall. This is a very challenging phase for larger companies, which have to find leaner business models in order to stay in the business.



Brand:

After the price wars, the survivors have a technology which is accepted at a price point that leaves a small profit margin. The technology tends to be treated as a commodity item and the key competitive factor is brand.

Vendors use strategies such as portfolio planning, and add-on services to smooth out their revenue and profit curves as one or more technologies progress through these phases. Each phase attracts different types of customer, from the adventurous, experimenting with the new technologies during the risk phase, to the very cautious, who buy only from respectable brands, after the price battles are over.

The specific piece of research that triggered this article was some work we had done to look at 'cloud providers for IoT'. This category fits into one of the six layers we use to segment IoT technology. There are of course some category gorillas, for example, Amazon Web Services for IoT; IBM Cloud (integrated into its Bluemix environment, which addresses IoT and other environments); PTC's Axeda cloud offer alongside Thingworx; Microsoft's Azure IoT Suite. But you don't have to look at this category for very long to find there are many providers, all offering something special, all with their own local or industry focus points. The available editions and pricing plans fill the shaded area in the risk phase. Some, but not all of these providers are destined for greatness, there are too many to list here, so apologies to those I haven't included, but if you look, in no particular order, at: <http://sensorcloud.com>; <https://www.carriots.com>; <http://www.arrayent.com/platform/#features#jump2>; <http://www.zatar.com>; <https://grovestreams.com/index.html>; <https://www.aylanetworks.com/products/iot-platform>; <https://electricimp.com/platform>; <https://exosite.com/architecture/scalability>

I think you will get the right impression.

Is this true across the whole of the technology and tool stacks you need for IoT? No, not entirely. For example, software development tools largely follow well-defined functionality bundles. But the picture is never static, there's always room for a new entrant, whether it's at the left hand side of the diagram (introducing a new technology), or as the disruptor, offering 80% of the results at 20% of the price and forcing the market into the price phase. That's why this is a market that is fun to watch!

IoT security requires a shift in mindset

By Harbor Research Inc.

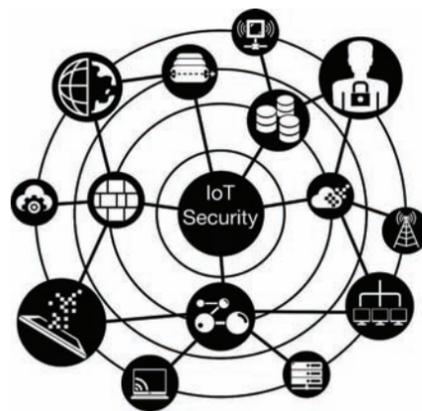
To best mitigate ever-expanding threats to security and privacy, organizations must change their ways of thinking about security. This shift in mindset is one that addresses security through a fundamentally broader scope at every level of the interaction.

What organizations and consumers alike must realize is that, while hacking seemingly occurs at a single endpoint—a thermostat, for example—the inherent systemic architecture, i.e. the network, that supports any single device renders vulnerability far greater than any single device.

Examples of cyber intrusions and security breaches are everywhere.

Single consumer devices—synonymous with 'IoT' for many people—are where we have seen the news headlines. But these are only the tip of the iceberg—and so are their security risks. Several security firms have found that many consumer devices are vulnerable to even the most basic hacking attempts. Some have made headlines, while others have quietly flown under the radar.

- Strangers hacking into baby monitors, spying on little ones.
- Security researchers hacked into a smart refrigerator by intercepting communications between the fridge and its user's Google Calendar.
- A hacker developed a \$32 device to hack into cars and garage door openers. Then there are the larger examples; examples we have barely tasted in their potential scale. Security vulnerabilities in larger contexts, in or across [fleets of] cars, buildings, factories, or even the grid,



transcend 'creepy,' privacy, even security of proprietary information. They can have profound impacts on people's safety and their lives.

- Security researchers successfully took control of a Jeep Cherokee while it was on the road and were able to remotely control some functions.
- Retailer Target's infamous customer identity and financial breach was a result of hackers penetrating the company's HVAC system service provider to gain access to Target's network passwords.
- Hackers revealed significant vulnerabilities across multiple brands of connected lightbulbs and lighting solutions.

In each example, seemingly mundane components introduce new risk as they exist and transmit data across one or more networks in a system.

In a world where objects and environments are digitally connected and placed onto networks, objects themselves become windows of data transmission and collectors of potential insight and utility—but also potential vulnerabilities.

Wavefront's connections help

Parasol shine

Greater Vancouver-based Parasol Advanced Systems Inc. has developed a line of high technology products that puts a whole new spin into the world of theatrical staging and lighting.

Parasol's technology allows lighting designers to add an entirely new dimension of movement to existing theatrical presentation devices, such as projectors, LDE walls and moving head lights. Parasol's technology and products have been featured on American Idol, at Disneyland and in the Step Up 5: All In 3D movie, to name a few.

The New Westminster BC firm experienced success since incorporating in 2006, but ran into a stumbling block a year ago when its first show in Japan saw opportunities for improvement. Company founder Hermann Fruhm sought out advice from the National Research Council of Canada Industrial Research Assistance Program (NRC-IRAP) who recommended that the company work with Wavefront to source the appropriate expertise in their field. This introduction proved valuable, as Wavefront was able to connect Parasol with the help it needed and NRC-IRAP further supported this collaboration through its Business Innovation Access Program (BIAP).

Wavefront pulled in some extra help from its network

"We suspected the problem was a wireless communication issue due to excessive path loss between the industrial wireless controllers—and the elevated noise floor that happens in the 2.4 and 5.8GHz ISM bands at concert events," says Alan Swain, VP technology & operations.

Wavefront pulled in some extra help from Karl Reardon, a senior engineer in Wavefront's Trusted Partner network. Reardon resolved the issue using 5.8GHz wireless transmitters connected directly into a leaky coaxial cable antenna system installed along the lighting trackway; similar to technology used in automated transit systems such as Vancouver's Canada Line. He combined this with quick connectors for easy assembly and disassembly. This implementation resulted in a robust solution that was virtually immune to interference from all other sources commonly found in concert venues.

With the light display ready to go, Parasol Advanced Systems took it back to Japan for the Rizin Fighting Federation 2 mixed martial arts event at the Saitama Super Arena—which turned out to be a huge success.



Circuit building blocks reduce the size, power of IoT designs

Circuit Seed, a new family of circuit building blocks for processing analog signals using fully digital components and design flow, is now able to significantly reduce the size and power of circuits, helping companies provide new offerings that the Internet of Things (IoT) will require for future product development, especially those products that assist the health of people and planet, according to Greg Waite, CEO of InventionShare.

Speaking from his Ottawa office, Waite says, "Circuit Seed is a significant game changer for the IoT and for the industry. What we have here is a major breakthrough for the IoT sensor markets. By integrating digital circuits which process analog signals – by their nature, small, low power, with higher accuracy, and which are inexpensive to design and manufacture – there is an opportunity to satisfy the consumer and business markets for sensors."

Medical device and smartphone healthcare monitoring and diagnostic technologies is a very large and burgeoning market. Medical device companies are recognizing that decentralized diagnostic and therapeutic technologies will dramatically outpace traditional lab services.

"The likelihood of accurate point of care technologies being at a physician's office, with lighter versions being mobile, in the near future is very high. We are not talking about simple heart beat and blood pressure apps; we are talking about very accurate vital measurements, but also breath and fluid analysis to detect levels of toxins, viruses, bacteria, diseases, drug levels and, yes, even cancers. Water quality, food quality, air quality all affect health and have a big impact on people and planet. You can't talk health care and not talk about the planet, food and quality – and the environment in general," adds Waite.

The sensor market is growing at a record pace, partly because of the new applications as a result of Internet communications. Sensors can be field-programmable from an Internet connection, monitored in real time and, then, be collection points for big data that leads to better management decisions and increase reaction times. Traditional markets for sensors have been industrial, health sciences, infrastructure, energy, transportation, security and public safety, mining and consumer home. Sensors are typically phase or pulse technologies. Circuit Seed foundation inventions provide superior characteristics for both designs.

Circuit Seed inventions are founded on a mixture of decades of experience and creativity, supported by a robust portfolio of IP. Circuit Seed introduces a dramatic shift in the existing way of designing analog circuits, effectively eliminating many of the known shortcomings. Benefits include: unprecedented precision without precision parts; ultra-linear operation over an extreme dynamic range (>106); low noise, ultrahigh speed (analog at logic speed) and extreme low voltage (down to ~0.1V power supply); process parameter independence; compact footprint (amplifiers about the size of a couple of NAND gates); low power (~100uW for multi-GHz-range operation down to 10pW for KHz-range operation); and portable designs between ultra-deep sub-µm CMOS technology process nodes. This paradigm shift has eliminated the use of current mirrors or differential matched pairs with traditional bulky analog transistors while being able to recover from sleep mode at logic speed.

Simulation and silicon test results have demonstrated a dramatic reduction in power, better performance and higher accuracy, all with small integrated circuit footprints. The circuit designs are much simpler, reducing product costs with faster development, so less testing is required and there are fewer parts to assemble. These circuits are far more reliable in the newest CMOS processes, making Circuit Seed a real B OONfor sensors and IoT future products.

"Due to the IoT, semiconductor companies are now looking for ways to support manufacturers" ever increasing demands to make products that are smaller, lighter, faster – products that consume less power, give off less heat and that are easier, quicker and less expensive to design, manufacture and test," says Waite.

IoT comes to the factory

Cost, efficiency and safety are driving the much-hyped Industrial Internet of Things (IIoT) as companies worldwide in a wide range of industries look for opportunities to connect nearly everything in the industrial workplace, according to a report from Lux Research.

"In cases ranging from wearables to real-time location systems in large yards, vendors like Equival and PINC Solutions are establishing a clear value proposition in the quest to find viable business cases," says Isaac Brown, Lux research analyst and lead author of the report.

"Goals range from employee safety to simple efficiency improvements in asset management – but users need to remain cautious about practical obstacles to proving this value in real operations," he adds.

According to the taxonomy developed by Lux Research, connected assets fall into four distinct categories: equipment, people, goods and environments. The IIoT systems that connected them have six discrete components, following the signal path from the sensors that measure the world around us through the actions taken by operators.

Lux Research analysts identified several case studies that demonstrate distinct value propositions. Among the highlights:

- **Daimler ups operational efficiency.** Using PINC Solutions' RFID-based systems, Daimler achieved 99% trailer yard accuracy and 50% reduction in trailer move time in its 1.3-million-sq ft plant.

- **Equival raises safety.** Equival demonstrated employee health and safety with a deployment of its IIoT systems at a chemical plant. At the heart of its EQ-02 LifeMonitor is a wearable that workers carry around their chests, which has led to a drop in injuries.

- **Sight Machine brings optimization.** By collecting and analyzing real-time data at multiple factories, Sight Machine helped an apparel manufacturer identify underperforming factories, optimize processes, and recommend a more effective preventive maintenance schedule.

What IoT, smart home device makers need to know in order to connect their devices to the web

By Cees Links, CEO of GreenPeak Technologies

Worldwide, thousands of technology companies are viewing the Internet of Things and the Smart Home as the Holy Grail for their products and profits. Most industry analysts and leaders are predicting that hundreds of millions of homes will want these new technologies.

However, before the device makers begin to design and develop new solutions, they need to understand that this market is rapidly changing and evolving, especially when looking at the Smart Home and the consumer electronics market. This is a moving target that manufacturers need to understand.

First off, the Internet of Things – especially for the Smart Home, is not about things, but instead, is about services that will make consumers' lives more comfortable, more secure and more efficient. Energy control, security, improving the efficiency of daily life, etc.

Unfortunately, the label of the IoT with the word 'things' puts many people on the wrong path of thinking.

Things are the necessary enablers, but the complete solution includes data analytics, smart phone apps and billing/support systems as well. There is an entire ecosystem at play, in which things play a (minor) role.

Also, many people confuse IoT things with connected devices. It is not enough to just web connect a device – it needs to be able to speak to other devices and systems in the home, as well as to be able to become smart – to utilize web intelligence, so that is more than just a remotely operated sensor or actuator.

If a manufacturer wants to be successful in the new and highly competitive Internet of Things market, it needs to understand two important concepts:

1. The Internet of Things and the Smart Home is not about pushing products ('things') out of the door, but it is about reinventing products into services. Internet of Things business models are

about recurring services and recurring revenue streams, not (only) about paying for a product at the check-out register.

2. Customers are buying solutions for problems, real or perceived. They are looking very specifically for things like 'security', 'energy control', 'assisted living', etc. And they want to be able to monitor and control these different solutions from the same place – a single dashboard. They don't want to have to use a variety of different apps with different user interfaces (UI) to manage their homes and their family's life.



The Family Lifestyle system uses sensors, connected devices, cloud intelligence, and social media to combine a variety of important services into a simple to use app that enables service providers to make their customer's lives easier and more secure.

Manufacturers and service providers need to work together – to bring all the different home equipment and services together under a single umbrella with a common UI – a single app (Smart Home Butler) that lets the family members, understand what is happening in their home and enable them to manage it, if not managing it for them.

Device makers need to be very precise in what problem they are solving for their customer, and evolve away from simply marketing the 'concept' of connected devices.

The end game is connected solutions that make our lives easier, safer and more efficient. Device makers and service providers need to look at the BIG picture, not just the components and the individual machines and devices.

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Embedded Systems & Engineering Software

The pcb design ecosystem

Access to design IP and collaboration is key to meeting the needs of engineers in electronics product design

By John McMillan, Mentor Graphics Corp.

In printed circuit board (pcb) design, a product creation ecosystem enables engineers to address the nuances of design early and throughout the technology development cycle. From component selection to manufacturing output, a robust, scalable and unified pcb design tool is needed to meet critical performance, schedule deadlines and cost challenges.

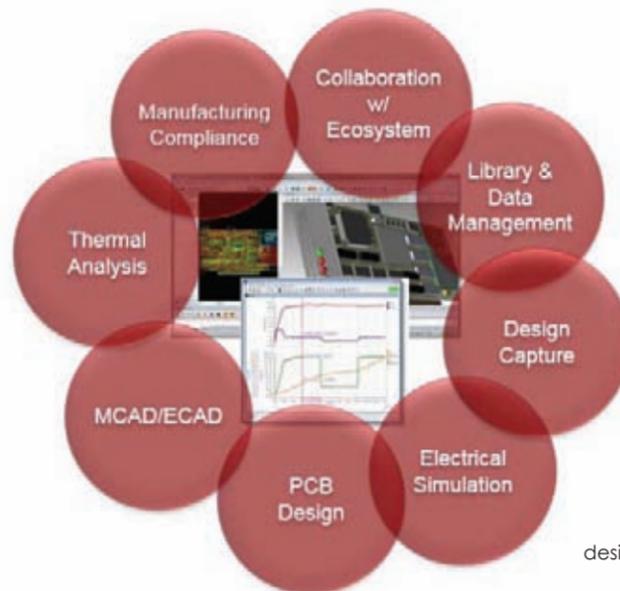
Yes, today's high-tech products are faster, smaller, and smarter than ever and the time-to-market demands to deliver high-quality products that are competitive, cheaper and faster means that design tools must be able to consider every aspect of the design throughout a product's creation, from functional specification to end-product performance. And with IoT, Bluetooth, WiFi, and RF technologies everywhere, design concerns related to mixed signals, power consumption and thermal analysis must be measured and addressed throughout every stage of the design, from the component level through to final assembly.

Unified tools

Managing the pcb design ecosystem from within a unified design tool enables engineers and pcb designers to leverage design IP with the final product in mind, analyzing and validating each aspect, effect, and impact encountered along the way. From part selection, design reuse, simulation, and early collaboration with MCAD, the design ecosystem can ensure end-product success.

Collaboration within the pcb design ecosystem

From the earliest stages of component selection, each critical parameter must be considered. Access to qualified components and component and symbol management are key within the ecosystem. Library databases must be kept in sync



and up-to-date to ensure that availability, manufacturability and inconsistency issues are avoided.

Having a single, integrated, centralized library, access to a qualified component portal for research and supply of qualified library symbols and a built-in synchronization mechanism that alerts you and makes necessary updates whenever a database mismatch occurs, are critical to creating and maintaining the component library in the ecosystem.

Constraints drive component placement and routing. From differential pairs to clock signals to transmit-and-receive lines, trace spacing and length rules must be understood, applied and adhered to. A design ecosystem that ensures constraints are maintained and stay synchronized through each step of the pcb design flow is essential.

Today, most pcbs have multiple FPGAs and more than 90% of nets have high-speed constraints. In the pcb ecosystem the importance of a unified constraint management system that spans both schematic and layout environments ensures

that design integrity is implemented, applied, and maintained throughout the design process.

Engineers also need to quickly assess voltage-drop issues of power delivery networks (PDNs). The ability to analyze and simulate power rails for FPGAs, ASICs and other components with tight tolerances throughout the pcb layout phase and within the design ecosystem, ensures clean power and reference voltage to active devices and prevents malfunctions or failures due to excessive voltage loss.

Thermal analysis is another important design element in the ecosystem. By exploring and accurately simulating the design space, pcb designers can consider the effects of all aspects of the design, including package selection, pcb layout, board structure, and the enclosure, to ensure that the most cost-effective cooling solution is chosen.

To be a true ecosystem, there must be collaboration between ECAD and MCAD. Communicating design intent between electrical and mechanical CAD systems through true, real-time MCAD collabora-

tion enables designers and engineers to import and collaborate on exact 3D models of the board outline, mechanical enclosure, mechanical components and even other pcb mezzanine or daughter cards at any time throughout the design process.

Though often thought of as a post-design process, design checks are an important part of the pcb design ecosystem that should be considered throughout the design flow. Design rule checks (DRC) and design for fabrication checks not only ensure that product performance is optimized, but that design integrity is not compromised during fabrication.

With built-in features like DFT (Design for Test), DFM (Design for Manufacturability) and DFA (Design for Assembly), you can ensure the lowest possible product cost, the fastest possible process cycle time, and the highest possible first-pass yield.

Putting it all together

Designing within the pcb design ecosystem on a single platform ensures that designs are robust, reliable and can achieve first-pass design success which results in meeting tight schedules by eliminating re-spins and keeping costs low. Pcb design tools that support an ecosystem approach also enable designers and engineers to address every aspect of product creation from beginning to end. From system simulation to design capture through to layout, DFM analysis, design archiving, and collaboration between and with each technology area of pcb design, PADS electronics product creation platform delivers a powerful and scalable ecosystem that enables individual engineers, designers, and small teams to design, lay out, and validate high-quality products, from concept to reality.

For more information on pcb design from Mentor Graphics Corp go to <http://ept.hotims.com/61397-85>

Bluetooth simplifies embedded system development

QNX SDK Bluetooth Connectivity software development kit simplifies the integration of Bluetooth connectivity into embedded devices for the medical, industrial and consumer appliance markets. The middleware solution is designed for flexibility and provides a dual-mode Bluetooth Smart Ready stack that supports classic Bluetooth connectivity, as well as connectivity to Bluetooth Low Energy devices. Product is also highly modular, allowing developers to create scalable, future-ready designs that can readily support new Bluetooth profiles. Developers can choose from a comprehensive set of pre-integrated profiles, including the classic PAN, SPP, HDP, HID, FTP, and OPP profiles, as well as the BAS, FMP, HRP, HOGP, and PXP Low Energy profiles. Product complies with the latest Bluetooth Core Specification, 4.2.

QNX SOFTWARE SYSTEMS

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3U cPCI computing solution maximizes MIL-STD-1553B

75PPC1-FT3-AR1 Quad Core Power PC, 3U cPCI COTS Single Board Computer (SBC) solution is targeted at military and avionics platforms that require high density communications and performance in SWaP-constrained environments. Product is powered by NXP's 1.2 GHz Quad QorIQ P2041 PowerPC processor, and is configured with quad channel, dual redundant, MIL-STD-1553B and 12-channel ARINC 429/575 Tx/Rx communications bus ports. The 3U cPCI rugged SBC leverages firm's modular COTS products built on an open systems architecture (COXA) allowing technology insertion and conforms to all open standards.

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Fanless mini PC comes with dual expansion slots

Model LPC-720F fanless mini industrial rugged PC includes built-in dual expansion slot capability designed for a large variety of demanding applications. Product can be configured with two PCI slots or two PCIe x1 expansion slots. Ideal applications would be for data acquisition, specialized graphics cards and expanded I/O cards. Optionally dual solid state drives (SSD) can also be configured to give expanded internal storage capacity. The powerful mini-computer operates without noisy cooling fans that could draw in dirt and dust potentially causing catastrophic failures. Unit is encapsulated in a rugged extruded aluminum chassis performing as a heat sink to dissipate heat build-up and provides noise free operation.

STEALTH

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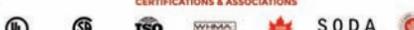
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products on review

Medical external power supplies deliver Class II input, level VI efficiency

DTM65-C8 series of medically certified external power supplies provides a class II input, thus does not require an earth ground connection and meets the stringent Level VI DoE standards for efficiency. Product is also certified to the IEC 60601-1 and 60601-1-11 medical standards, making it suitable for a variety of healthcare applications. Unit is housed in a rugged, vent-free IP21 rated enclosure, measuring 106 x 60 x 31mm. Ac is applied using a standard IEC60320-C8 cable and dc provided through a four pin Power-DIN connector.

TDK-LAMBDA



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650W front-end power supply is packed in 1U format

D1U54P-W-650-12-HBxC series of 650 Watt power supplies are packaged in an industry standard 1U format measuring 54.5 x 40mm, has a length of 228.6mm (9-inch) compared to the 12-inch length of other units. Delivering a power density of 21.4 Watts per cubic inch, the compact unit exceeds the 80 PLUS Platinum efficiency requirements. Featuring a single 12Vdc primary supply, product provides a standby 12Vdc/2A output. Hot pluggable units are capable of N+1 redundancy and feature an active current sharing (ORing FET) permitting connecting up to a maximum of eight in parallel.

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NTE

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LIN controller ICs are fully integrated, universally-useable

MLX81107/MLX81109 LIN Controller ICs combine high degrees of built-in functionality and low unit costs. Freely-programmable, monolithic devices are able to address growing demands within the automobile industry for LIN-based switches, actuators, drivers, sensor interfaces and LED lighting systems. Both devices incorporate a physical layer LIN transceiver, LIN controller, voltage regulator, 16-bit RISC-based microcontroller, 32kBytes of Flash memory and 20-channel analog-to-digital converter (ADC), as well as possessing 16-bit pulse width modulation (PWM) capabilities. Product is compliant with LIN 2.0, LIN 2.1 and LIN 2.2, as well as SAE J2602.

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