

With Its 500 Exhibitors, DMEMS 2018 Offered A Walking Tour Of The Electronics And Manufacturing Supply Chains

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Most of the electronics-oriented conferences and trade shows held in the U.S. tend to be highly specialized and focused on a particular tech area within electronics or on a specific industry or market. Many of these events are conferences first with an expo built around the conference. However, the Del Mar Electronics & Manufacturing Show (DMEMS) is different on both counts. DMEMS is first and foremost a broad electronics show with exhibitors that cut across many tech areas, markets and industry segments. It does offer a small series of free seminars by exhibitors on various topics. But it is really the extensive expo that is the main attraction.

In this article, I'll discuss the range of products and services on display at the latest edition of DMEMS, which was held May 1 and 2 at the Del Mar Fairgrounds in San Diego. This year's show drew approximately 4500 attendees to visit with 500 exhibitors showcasing 1700 unique product lines.

In writing about DMEMS 2018, my focus will mainly be on the exhibits relating to electronics design, particularly those with a connection to power electronics. In this regard, DMEMS is notable for its extensive collection of power supply and battery pack vendors—something you're unlikely to see to this degree at other conferences or expos in North America. I'll highlight those companies, while also giving an overview of the many component and service companies who exhibited at the recent DMEMS.

Practical And Wide Ranging

For engineers, DMEMS was a highly practical show because it offered a chance to see a wide range of electronic components, instruments and services required to design, build and qualify all types of electronic products and systems. In this Internet age, the ability to browse the wares of various vendors, may not be as critical as it was in the past since you can do an online search for just about anything. But the ability to speak one-on-one with the suppliers representing such a diverse range of products and services remains uniquely valuable.

For those working at larger companies, access to suppliers may just be a phone call away. As How2Power contributor Kevin Parmenter observes, suppliers who receive requests from larger customers usually have sales reps ready to "parachute in" to the customer's parking lot. But when fielding requests from small- to medium-sized companies, or startups, the response from suppliers is likely to be less enthusiastic.

DMEMS is the type of venue where engineers from different disciplines (electrical, mechanical, manufacturing, and others) can ask vendors questions on all types of issues. Challenges in sourcing components or meeting design or manufacturing requirements can be addressed by speaking with actual experts, or people knowledgeable enough to connect you with the experts. Naturally, when browsing such a diverse expo, you are likely to discover things you hadn't seen before—either new companies or products or services.

On the electronics side, the recent DMEMS show seemed particularly well equipped for those seeking to source power sources (power supplies and batteries), components (passives, interconnects, magnetics, and various electromechanical parts), and packaging-related products (enclosures, heatsinks, fans, shielding, potting, coating and various other materials). In addition to the suppliers showing their own wares, there were also many manufacturers' reps and distributors on hand, so DMEMS offered many opportunities to address supply chain issues.



The entrance to the Del Mar Electronics & Manufacturing Show (DMEMS), which was held May 1 and 2 at the Del Mar Fairgrounds in San Diego. Within its three expo halls, an assortment of manufacturers, reps and distributors showcased a wide ranging array of components, materials, instruments, equipment and services for electronic design and manufacturing.



A wide range of electronic components were on display at MEMS with exhibits by manufacturers, reps and distributors. Magnetics, passives, interconnects were especially well represented along many packaging-related components and materials.

One segment of the electronics supply chain that was only lightly represented at DMEMS 2018 was semiconductors. I didn't see the big chipmakers like TI or ADI with large booths. But there were some niche suppliers of discrete semiconductors, specialized chips and obsolete semiconductors. Also, the reps and distributors who exhibited, including some of the big names in distribution such as Mouser, Arrow, Avnet and Digi-Key, as well as many smaller distributors and reps, compensated by providing support of the semiconductor area.

According to show director Douglas Bodenstab, distributor participation at DMEMS has been growing. "Arrow had 20 booths and has already signed up for next year." He adds that other distributors have also expressed their appreciation of the show. Bodenstab also notes that DMEMS is the only trade show that allows exhibitors to list their product lines in the exhibitors list (i.e. the printed show guide printed show guide and the new smart phone app that will eventually replace the show guide with more extensive coverage).

Test equipment suppliers were here too, but mainly through the participation of the manufacturers' reps and equipment rental companies. Also those offering test equipment calibration services. And for those looking for help with compliance-related issues such as safety or EMC, there were firms here to address those issues as well.



If you came to DMEMS with compliance issues, there were vendors on hand to discuss EMI/EMC testing, environmental testing and other types. There were also some manufacturers offering test instruments or test instrument rentals.

Many PCB Manufacturers

While my focus in this article is mainly on the electronics side, DMEMS is also a manufacturing show, which means there were many exhibitors showcasing equipment, instruments, materials and services relating to the manufacture of electronic equipment. Among these exhibitors, the PCB manufacturers stood out.

In discussing the PCB makers, I want to avoid pigeon holing them as being strictly part of the manufacturing side of DMEMS since many of these companies offer quick-turn services for design engineers who need PCB prototypes. And the PCB is an electronic component after all. But whether we categorize them as component providers or manufacturing service providers, there were many PCB manufacturers exhibiting at DMEMS. In addition there were contract manufacturers and others with manufacturing related products or services.



The second "M" in DMEMS is for "manufacturing" and a large number of exhibitors were on hand to promote related products and services. These three exhibitors were just a small sampling of the many PCB manufacturers participating in the expo. There were also contract manufacturers as well as some vendors offering design services.

With its diverse range of electronics and manufacturing related products and services, a trip to DMEMS was a convenient and low cost way for engineers and others in southern California to address a range of component, material, and equipment sourcing needs, as well as to find help with design or manufacturing related services. Given the scarcity of time and

budget for engineers to attend shows and conferences, the value of a local expo that is convenient, free and takes only a few hours to browse cannot be underestimated, especially when it provides opportunities to speak with suppliers knowledgeable on a wide range of issues. The regional aspect of the show is notable too because attendees are likely to meet local representatives of many exhibiting companies, and knowing these reps may prove helpful down the road

when other sourcing or technical issues arise.



While there are many aspects of the DMEMS expo that could be discussed in greater detail, I'd like to highlight one that should be relevant to the How2Power audience. The expo had particularly strong representation from power supply companies and battery pack vendors. Such companies, which are only lightly represented at power electronics conferences, were out in force at DMEMS 2018.

This makes sense since most OEMs who are not specifically in the power electronics field are not looking to design their own power supplies or power converters. The list of power supply companies at DMEMS was fairly long as shown in Table 1. A sampling of their exhibits are shown in the figure on the left.

A dozen or so power supply manufacturers, reps and distributors showcased a range of power supply products at the recent DMEMS (see Table 1).

And just as most equipment manufacturers lack the resources to design and build power supplies, most OEM companies do not have the skills or facilities for sourcing cells and building their own battery packs. So

numerous battery pack assemblers exist to help OEMs with pack design, assembly and testing. Several of these battery pack suppliers were at DMEMS as listed in Table 2. In addition to listing the power supply and battery pack vendors, Tables 1 and 2 provide brief descriptions of their offerings and names of company contacts for more information.



Rose Electronics was just one of the many battery pack makers displaying their product samples in the expo (see Table 2).

For those interested in other board-level components relevant in the design of power electronics, in table 3 I have compiled a list of other DMEMS exhibitors who showed magnetics, capacitors, filters, shielding, semiconductors and other parts. Notice that there are quite a few magnetics suppliers in this list.

This is a fairly long list and it likely contains a number of vendors that you've not heard of. Yet this list would be even longer if it included the many connector and cable vendors who exhibited at DMEMS as well as the thermal management product vendors. For a complete list of all the exhibitors, see the DMEMS [website](#).

Table 1. Power supply vendors who exhibited at DMEMS.

Power supply manufacturers and other suppliers	What they offer*	Contact
AC Power	Ac and dc power sources and static type frequency converters. Preen describes itself as a "leading manufacturer of large capacity power sources".	Brian Hsu 949-988-7799
Aegis Power Systems	The company's "USA-based engineering and manufacturing team delivers power solutions for telecommunications, defense, aircraft, robotics, embedded systems, rack mount and custom applications. [They] specialize in SWaP optimized designs capable of delivering clean power with high performance".	828-837-4029 sales@aeqispower.com
Aimtec	Isolated dc-dc switching power converters, ac-dc power converters, nonisolated dc-dc switching regulators, LED drivers.	Roberto Barajas 514-620-2722
Bel Fuse	"Bel designs, manufactures and markets a broad array of products that power, protect and connect electronic circuits".	201-432-0463 Bel.us.cs@belf.com
DComponents	Per the website, DComponents "is an online catalogue of electronic components and accessories." As per the DMEMS show guide, products include "Ac-dc and dc-dc power converters & LED drivers, switching regulators..."	Anne Renaud 802-752-4321
Excelsys Technologies	"Advanced Energy, along with its Excelsys, HiTek Power and UltraVolt product lines, offers high and low voltage power solutions for a wide range of	John Stevenson 972-771-4544

	standard and custom OEM applications.”	
Gaia Converter	“Complete power solution for aerospace/defense/naval, railway & hi-end industrial: dc-dc converters, ac-dc PFC front end, EMI filters, holdup modules, transient protection modules up to 800 W.”	Dale Johnson 626-355-5121
Marathon Power	“Marathon Power offers uninterruptible power supplies with a focus on OEM and niche markets, such as medical/healthcare, automation and process control, test and measurement and other applications that require a specialized product. In addition to a standard range of customizable models, the company offers unique products such as the battery-less Super capacitor UPS as well as various ruggedized units.”	Jim Munroe 310-689-2328
P-Duke Technology	“P-Duke Technology provides dc-dc converters (1 W to 300 W) and ac-dc power supplies (15 W to 450 W) with safety certification for ITE (UL60950), medical (60601-1) and railway (EN50155).	Hunter Ray 909-598-5000
TDK-Lambda Americas	“Genesys ac-dc power supplies provide high density, low ripple, complete user friendly interfaces. Outputs to 1500 V & 1000 A....Complete family with identical features & interfaces from 750 W to 15 kW.”	Bonnie West 732-922-9300
TRC Electronics	Company describes itself as “North America’s leading 100% power solution dedicated stocking distributor providing exclusive focus on best in-class power supply solutions.”	888-612-9514 sales@trcelectronics.com
Versatile Power	The company says it “has a long history of designing robust power supplies for military, industrial, commercial, laboratory and medical applications...[it] offers a line of standard power supplies as well as custom-design power solutions. All [their] products are designed and manufactured in the U.S.”	Mark Brown 408-341-4604

Table 2. Battery pack vendors who exhibited at DMEMS.

Battery pack assemblers	What they offer*	Contact
Expocell Group	“Expocell manufactures and markets a complete line of batteries, including alkaline, NiMH rechargeable, lithium, rechargeable and primary cells, button/coin cells, private label and custom battery design for OEMs.”	Alex Wong 909-923-0872
Fedco Batteries	The company describes itself as “a premier custom battery assembly manufacturer.”	Joel R. Petersen 920-922-6490

Hitachi Chemical Energy Technology (Americas)	"Valve-regulated lead acid (VRLA) battery manufacturer. [Their] products are utilized in applications such as telecommunications, UPS, solar, wind power, emergency lighting, security and other additional applications."	Eli McCabe 817-201-0929
House of Batteries	"Batteries & custom battery packs in every chemistry for every electronic application. [They have seven EEs on staff to assist [their] customers with their most complex designs and power solutions..."	Brion Munsey 800-432-3385
iTECH	"iTECH designs and manufactures mobile power products including batteries, chargers and docking stations serving the OEM/ODM market in handheld electronics, medical, security, intrinsic safety and communications."	Andrew Yurman 858-750-6114
Mobile Power Solutions	"Battery testing certification experts—globally trusted to any standard."	John Linzel 619-602-3533
Power-Sonic	The company describes itself as "a leader in the stored-energy market for standby and backup power. Portfolio includes seal lead acid, lithium (LiFEPO4), nickel cadmium and nickel metal hydride batteries and chargers."	Brian Crowe 619-661-2020
Rose Electronics	"Experts in batteries for OEMs in medical, GPS, instrumentation, and storage marketplaces...Proud to offer Enersys seal lead batteries."	Katherine Mack 408-943-0200
RRC Power Solutions	"RRC is offering portable power: batteries, chargers, dc adapters and wireless power. This includes their smart, off-the-shelf, standard battery solutions, which have extensive WW approvals."	Cheryl White 781-771-7090

Table 3. DMEMS exhibitors of magnetics, passives, shielding, semiconductors and other components of possible interest to power electronics engineers.

Company	What they offer*
ADMOR Technical Sales	"EMI/RFI shielding & gasketing, board-level shields,...cable ferrites, EMC filters, IEC inlet filters, single & three-phase filters..."
Area 51-ESG	"Over 155 authorized lines including products such as semiconductors, passives, crystals, fuses, batteries, connectors, electromechanical copponents, power supplies, circuit protection products,...."
AVX	A "manufacturer & supplier of electronic passive components and interconnect solutions..."
Central Semiconductor	"Manufacturer of standard, custom and upscreened surface mount and through-hole discrete semiconductors including transistors, MOSFETs, diodes and rectifiers, also available in bare die."
Chip One Exchange	"Distributor of Electronic Components serving all of the Americas."

Conquest Technical Sales	"Southern California's...professional sales representative firm with a focus on wire & cable, batteries-battery packs, power supplies, electromechanical, interconnect, cabinets, enclosures, cases, front panels and related products."
East Coast Shielding	"Supplier of RF/EMI shielding such as custom metal RF shields, conductive elastomers..."
Electrocube	"A manufacturer of high grade power electronic passive components...including film capacitors—high temp and dc link, RC networks...hi rel EMI filters, high freq foil transformers, TRUs and current transformers."
Emicon	"Custom coils, air wound coils, toroid coils, inductors, low pass filters, data filters, EMI filters, coax cable assembly, power line filters."
English Technical Sales	: "Specializing in value engineering solutions in Interconnect, power and signal integrity..."
Falcon Sales	"Audible devices, speakers, microphones...MOVs...resettable fuses, power and TVS diodes...thyristors..."
Ferrari Technical Sales	"Interconnect, power and RD solutions"
Good-Ark Semiconductor	"Products include diodes, rectifiers, bridge rectifiers, MOSFETs, TVSs, protection devices, transistors, thermistors, chip fuses & MEMS."
GEI	"... transformers and inductors"
Holy Stone Enterprise	A "manufacturer of application specific MLCCs and disc capacitors".
Interpower	"Supplier of international and North American power cords, inlets, filters, sockets, socket strips, and plugs. Test power supplies, power distribution units and accessory power strips. Power systems components. Power, voltage, and current monitoring components."
Johanson Dielectrics	"Power electronic solutions: capacitors (high voltage, High temp, with numerous leaded configurations & custom form factors), EMI filters, planar array filters, inductors and precision resistors".
Leader Tech	"EMI/RFI shielding and thermal solutions, circuit board shields, off the shelf or custom, from prototype to fully tooled, EMI conductive elastomers, thermal, absorbers, EMI/RFI cable ferrites".
Linear Integrated Systems	"A full service, small signal semiconductor company" including "JFETs and other transistors."
MPS Industries	A "manufacturer of magnetic components, specializing in custom transformers, inductors, current sensors, common mode chokes and filters".
NTE Electronics	"Supplier of the NTE and ECG brands of semiconductors, resistors, relays, capacitors, wire, circuit protection, interconnect products, and more."
Ohmega Technologies	"Manufacturers of Ohmegaply thin film resistive material...for both surface and embedded resistors as terminating resistors, power dividers, absorbers & R-cards, heater elements and RC filters."
Pacific Transformer	"A direct manufacturer of custom and standard transformers, from 1 W to 700 kVA, inductors, coils, chokes, toroids, wall adapters, S/M transformers,

	power transformers, class 2 transformers, audio transformers.”
Precision	A “designer and manufacturer of custom and standard magnetic components and assemblies”.
Premier Magnetics	A “manufacturer [of] passive components, transformers, inductors [and] coils...specializes in power transformers from 5 V up to 48 V out”.
Sager Electronics	“Providing technical support, value add and supply chain solutions for power, thermal, sensing, filtering, interconnects and other electromechanical products.”
SMC Diode Solutions	“[This company’s] products (formerly sold under the Sensitron Semiconductor brand name) are sold for a variety of applications in the commercial market including LCD displays, telecom equipment, power supplies, industrial and aircraft industries...”
Taiyo Yuden	An “electronic component manufacturer of capacitors, inductors, wireless modules, mobile communication devices (FBAR/SAW), energy devices and communication sensor devices”.
TAW Electronics	“A master distributor for WIMA film capacitors for high power converter technology with dc link capacitors...”
Price Electronics	“Distributor of passive, electromechanical, and interconnect products”.
RWP Electronic sales	“Custom single and three phase transformers, PCB transformers, RFID/NFC/LF antennnas, planar magnetic components, EMC filters, ac-dc power supplies, dc-ac inverters and dc-dc converters and electrical measurement instruments.”
Trigon Components	“Manufactures transformers, chokes and inductors....serve customers who design their own power supply, POE, Ethernet and dc-dc.”
TTI	“Interconnect, passive & electromechanical specialist.”
Viking Tech America	“Offering thick/thin film precision resistors, thin film inductors and ceramic capacitors...main products include thin film resistors, power resistors, low ohm resistors. Leaded resistors, current sensing resistors, RF inductors, chip beads, common mode filters and power inductors.”
Xtreme Semiconductor	“A solutions company for obsolete microelectronic products providing cost effective alternatives to redesign and assisting in maintaining production readiness of legacy systems.”

**Descriptions of exhibitor offerings are based on those provided in the printed DMEMS 2018 Show Guide.*