

Surface Mount Power Device (SMPD) Technology that delivers Record Maximum Power in Surface Mount Devices (SMD)

IXYS Corporation announces the expansion of its discrete ISOPLUS™ technology to introduce power modules as Surface Mount Devices (SMD). The IXYS ISOPLUS™ devices provided isolated package solutions for the power electronic industry for over 10 years with better thermal conductivity, lower weight and better power cycling when compared to copper based leadframe devices.

The newly developed Surface Mount Power Device (SMPD) uses the ISOPLUS™ principle to create a power module replacement with a DCB leadframe and plastic molded structure. The SMPD is UL recognized with 2.5KV terminal to base isolation and is suitable for SMD automated assembly processes. By utilizing the DCB leadframe concept, IXYS is able to provide the equivalent of any 'screw-type' power module in an SMPD version that can be easily mounted, in a low-cost reflow soldering process, onto any PCB-like standard discrete or IC devices.

"We see the SMPD as a revolutionary package which simplifies the way power system designers address their power semiconductor system integration and assembly. Now these customers can integrate high power modules in the same PCB reflow process as they use for low power surface mount ICs in one step, thus reducing cost, increasing yields, and creating lighter and thinner high power products," commented Bradley Green, President of IXYS Europe. "The SMPD, as we designed it, can accommodate our large area power semiconductors in multi chip configurations with solderable leads that have significantly

lower cost than the use of screw terminal or clip mounted products."

The SMPD technology delivers to the designer a transfer molded package with integrated Direct Copper Bonded (DCB) isolation. The DCB provides low thermal impedance

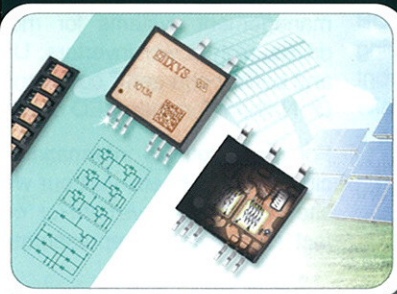
The SMPD package is mounted onto the customers' printed circuit boards just like any standard SMD package via a pick and place machine; thereby successfully removing manual or specialized power module mounting procedures which often dominate assembly costs using traditional technology. Both power and control terminal positions are separated to provide natural isolation and prevent complicated PCB designs.

"With the flexibility and its ease of mounting, IXYS' SMPD can provide the customer with the off-the-shelf building blocks to make any power electronic system. For instance, one SMPD takes care of the input rectifier whether it is a single or three phase design. One SMPD can provide a PFC or brake chopper stage, and up to three SMPD for the

complete converter/inverter stage, thereby allowing the customer to distribute his power dissipation rather than be limited by the increased material or co-located heat dissipation of a traditional module," continued Mr. Green.

IXYS offers flexible SMPD in various topologies including the IXA68PF650LB which is an example of a dual IGBT of 68A, 1200V including anti-parallel diodes, DMA90U1800LB, an example of a three phase diode rectifier providing 99A of DC current at a case temperature of 90°C with 1800V blocking voltage. Alternatively, the MMIX1F520N075T2 contains a single die 75V trench MOSFET with a rated 500A at 25°C case temperature. Although the range is extensive, IXYS can readily produce any customer-specific configuration for custom products.

IXYS 1200V XPT-IGBT in SMPD package technology



In Tape and Reel

Features

- Surface Mount Power Device
- 2500V ceramic isolation (DCB)
- UL recognized
- Multi chip packaging
- Very high power cycling capability
- Low weight
- High power density

Applications

- AC/DC drives
- Switch reluctance drives
- SMPS

Building Blocks

- 3 phase input rectifier
- Single phase bridge rectifier
- Brake (Boost)
- Phaseleg

Examples

- DMA90U1800LB
- IXA68PF650LB
- IXA68PF650LB
- IXA68PF650LB

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Customized configurations possible!

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email marcom@ixys.de
or call Petra Gerson: +49 6206 503249

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and best in class reliability under power and temperature cycling. Added to this, the new module includes IXYS' proven ISOPLUS™ advantage – the energy efficient and cost controlling inclusion of multiple die on a single substrate that facilitates topologies such as phase leg, buck or boost chopper, Power Factor Correction (PFC) or even three phase rectifiers in a single package allowing a single SMD package replacement of various discrete packages. Traditional power semiconductor modules are the heaviest semiconductor component in present power systems. The weight reduction, which implies also reduced material cost and waste, is one of the key "Green" initiatives of IXYS Corporation in developing new products for the "Cleantech" industry. Lower weight products reduce the CO₂ footprint of shipping and handling these products.

IXYS Improves Efficiency of its Motor Control Module Series with Integrated Brake Using XPT IGBT Technology

IXYS Corporation announced today a new group of three phase rectifier products with integrated brake stage based on IXYS' latest XPT IGBT technology.

"Since the inception of compact power integrated modules for motor control applications, IXYS has served the market with innovative designs and has been at the forefront of industrial reliability requirements," commented Bradley Green, President of IXYS Europe. "This latest range of power modules for motor control applications takes advantage of our latest IGBT technology in order to provide the designer improved efficiency without compromising IXYS' inherent designed-in reliability."

For higher power motor control applications the integration of the front end rectifier, brake chopper and three phase inverter stages in one module is not possible. Therefore, IXYS provides a mo-

dule series to include the three phase input rectifier and brake stages which when combined with an existing IXYS XPT three phase IGBT inverter module can provide the module pair to complete the topology required for high power motor drive systems.

With the new development of the XPT IGBT, IXYS is now able to offer its customers an all IXYS silicon solution reducing dependencies in any external supply chain and optimizing cost.

The IXYS three phase rectifier with brake part numbers start with VUB with the VUB145-16NOXT being an example of a 145A, 1600V front end rectifier including the Brake XPT IGBT and diode and integrated thermal sensor for control system feedback. Electrical current versions for the VUB are available from 72A to 160A.

The IXYS half controlled three

phase rectifier with brake part numbers start with VVZB and the VVZB135-16NOXT being an example of a 135A, 1600V half controlled rectifier for surge current protection and integrated thermal sensor. Electrical current versions for the VVZB module are available from 120A to 170A.

"It becomes clear to our customers, that with our numerous driver ICs, including the isolated driver, IX3120, and our line of Zilog Microcontrollers, that we offer a complete solution for designing energy efficient and reliable power management systems for motor drives, high power inverters, UPS and battery chargers," commented Dr. Nathan Zommer, CEO of IXYS.

For more detailed information including data sheets, visit our website under www.ixys.com or contact your local sales representative.

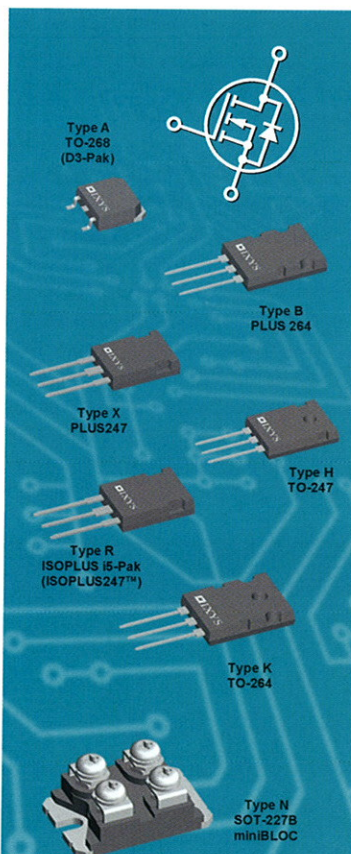
tion-to-case thermal resistances (R_{thJC} as low as $0.08^{\circ}\text{C}/\text{watt}$), high avalanche energy (E_{AS}) capabilities, and high threshold voltages (V_{th}) for improved noise immunity. These devices are capable of sustaining hard switching operation in high frequency applications and 4-27 MHz for radio frequency applications.

High frequency (HF) switching applications such as plasma generators, radio frequency switch-mode power supplies and HF DC-DC converters will greatly benefit by using the Q3-Class MOSFETs. Industrial power supplies for plasma heating, steel sheet heating, hardening, and seam welding are prime examples of industrial applications that can take full advantage of the superior switching performance, energy savings, and high noise immunity that these new products have to offer. Additionally, the enhanced dV/dt ratings and high avalanche energy capabilities provide for additional safety margins for stresses encountered in industrial high voltage switching applications, thereby improving upon the long-term reliability of these systems.

New Q3-Class HiPerFET Fast and Efficient Power MOSFET Family

IXYS Corporation announces the launch of its latest generation of Q-Class products with the introduction of its new Q3-Class HiPerFET Power MOSFET family. Available with drain-to-source voltage ratings of 200V – 1000V and drain current ratings of 10A – 100A respectively, the devices provide the end customer with a broad selection range of power switching solutions that demonstrate exceptional power switching performance, enhanced device ruggedness, and high energy efficiency. The superior performance and energy savings of these new devices allow for the development of more energy efficient and reliable power subsystems in high-power, high-performance applications such as industrial switch-mode power supplies, DC-DC converters, power factor correction circuits, server and telecom power systems, solar inverters, arc welding, plasma cutting, battery chargers and induction heating.

The new Q3-Class is a direct result of advancing IXYS' latest PolarHV technology platform to deliver to market power switching



solutions that exhibit benchmark electrical and thermal characteristics. These devices feature an optimized combination of low on-state resistance ($R_{DS(on)}$) and gate charge (Q_G) resulting in a substantial reduction in the conduction and switching loss of the device. In addition, these devices have lower gate-to-drain charge and lower gate resistance, thereby reducing switching losses with faster switching, and lower gate drive power consumption.

Power switching capabilities and device ruggedness of these devices are further enhanced through the utilization of IXYS' proven HiPerFET process, yielding a device with a fast intrinsic rectifier which provides for low reverse recovery charge (Q_{rr}) while enhancing the commutating dV/dt ratings (up to $50\text{V}/\text{ns}$) of the device. These featured diode properties play a pivotal role in overall device performance by providing faster transient response, increased power efficiency, improved ruggedness and enabling higher operating frequencies. Additional product features include low junc-

IXYS offers a full range of discrete industry standard packages regarding the release its new Q3-Class HiPerFET Power MOSFETs. These packages include the TO-247, PLUS247, TO-264, PLUS264, TO-268, and SOT-227. In addition, Q3-Class versions are offered in IXYS' proprietary ISOPLUS package (ISOPLUS247) offering UL recognized 2500V isolation and unsurpassed thermal performance and temperature cycling capabilities. Some part number examples are:

IXFH70N20Q3

($V_{DSS} = 200\text{V}$, $I_{D25} = 70\text{A}$, TO-247),

IXFT50N30Q3

($V_{DSS} = 300\text{V}$, $I_{D25} = 50\text{A}$, TO-268),

IXFB100N50Q3

($V_{DSS} = 500\text{V}$, $I_{D25} = 100\text{A}$, PLUS264),

IXFK64N60Q3

($V_{DSS} = 600\text{V}$, $I_{D25} = 64\text{A}$, TO-264),

IXFN62N80Q3

($V_{DSS} = 800\text{V}$, $I_{D25} = 49\text{A}$, SOT-227),

IXFB44N100Q3

($V_{DSS} = 1000\text{V}$, $I_{D25} = 44\text{A}$, PLUS264).

Additional product information may be obtained by visiting IXYS' website at

<http://www.ixys.com>

or contact the company directly.