

SMPD... Power meets SMD

(Surface Mount Power Device)



May 2014

Overview:

The demand for higher power density in system design is continually driving innovation in semiconductor packaging technology. IXYS continues to be at the forefront of this development with its new isolated package family SMPD™ (Surface Mount Power Device). The IXYS design cornerstone of "MORE POWER – LESS PACKAGE" has resulted in the SMPD™ module range which efficiently provides solutions for applications where traditional offerings create problems such as larger module footprints, higher cost and longer cycle times in assembly and the problem that catalogue items rarely provide the best silicon content.

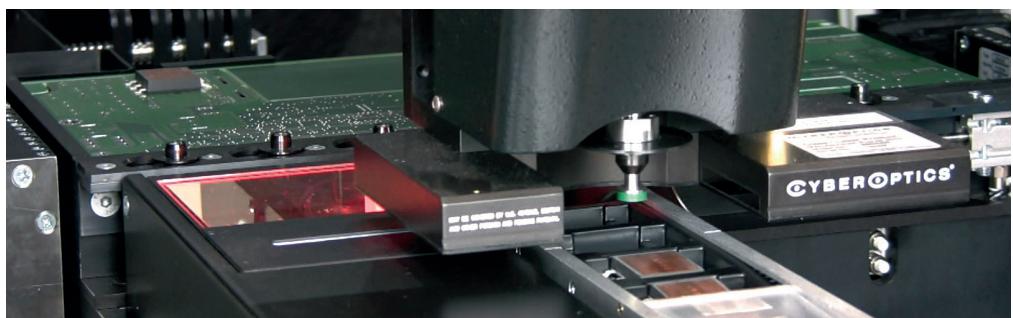
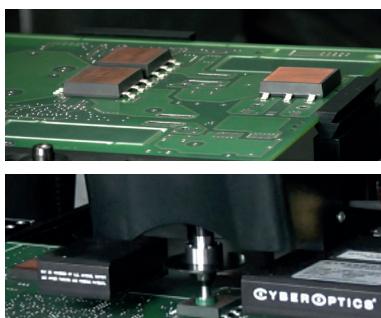
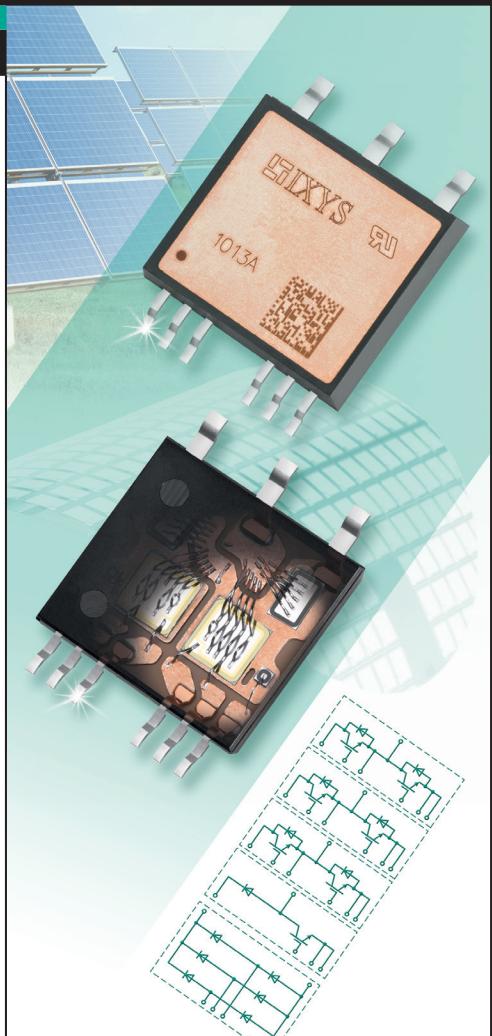
IXYS' ISOPLUS™ isolation technology has for many years provided a UL recognized rugged isolation platform for a wide range of leading power modules. The SMPD™ range now extends its ISOPLUS™ portfolio to include modules that can be assembled in standard surface mount (SMD) soldering processes and is pick-and-place ready to be assembled on customer's existing SMD assembly lines. The ISOPLUS™ advantage also includes:

- Isolated package using IXYS' own Direct Copper Bonded (DCB) substrates
- Voltage isolation up to 2500V (UL Recognized)
- Lower junction-to-heat sink thermal resistance
- Improved temperature and power cycling performance
- Higher reliability than copper based modules
- Very small coupling capacitance -> Reduced EMI
- Reduced parasitic inductance -> Optimized Switching Performance
- Replacement of multiple discrete reduces system size
- Shorter time to market in providing optimized silicon die content

The IXYS SMPD™ range provides not only a large array of standard options in terms of topology or silicon varieties. Its simplicity by design and optimized manufacturing process can allow fast time to market for customers that require differing die and circuit combinations effectively fast tracking product development. IXYS removes the need for more expensive competitive solutions and can successfully combine numerous discrete devices in one high reliability package that can then be easily assembled on current SMD assembly lines.

Added to this the IXYS SMPD™ provides the ideal modular circuit building blocks so that the designer can select the ideal solution. For instance one SMPD can provide a solution for each stage of a Motor Inverter – 1x SMPD™ for the three phase diode input rectifier, 1xSMPD™ for the Brake or PFC stage and 3xSMPD™ for the 3 phase IGBT inverter. The customer can then select where to position each stage to optimize his heat sink or cooling solution often downsizing materials.

The IXYS SMPD™ range provides a solution-scale package reducing material waste and lowering power footprint for all the power electronic applications of today and those of the future. Its platform flexibility and ease in assembly provides cost efficiency not just in terms of module cost but in the important processes of system design, time to market and product assembly.



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SUMMARY TABLE – SMPD

DIODE							IGBT							MOSFET							HV-IGBT/BIMOSFET														
Part Number	Pack.	V _{RRM} (V)	I _{DAV} (A)	Techn.	Config.		Part Number	Pack.	V _{RRM} (V)	I _{DAV} (A)	Techn.	Config.		Part Number	Pack.	V _{RRM} (V)	I _{DAV} (A)	Techn.	Config.		Part Number	Pack.	V _{CES} (V)	I _{C25} (A)	Techn.	Config.		Part Number	Pack.	V _{CES} (V)	I _{C25} (A)	Techn.	Config.		
DPG60B600LB	B	600	60	▲			DHG60U1200LB	B	1200	62	◆			DSA120X150LB	B	150	75	✗			IXA20RG1200DHGLB ³⁾	B	1200	32	▲◆										
DCG20B650LB	B	650	21	◆			DMA90U1800LB	B	1800	99	●			DSA120X200LB	B	200	75	✗			IXA30RG1200DHGLB ³⁾	B	1200	43	▲◆										
DLA100B800LB	B	800	124	●										DSA240X200LB	B	200	120	✗			IXA40RG1200DHGLB ³⁾	B	1200	61	▲◆										
DCG22B1200LB	B	1200	22	◆																															
DHG40B1200LB	B	1200	40	◆																															
DHG50B1200LB	B	1200	50	◆																															
DLA100B1200LB	B	1200	124	●																															
IGBT							IGBT							MOSFET							HV-IGBT/BIMOSFET														
Part Number	Pack.	V _{CES} (V)	I _{C25} (A)	Techn.	Config.		Part Number	Pack.	V _{CES} (V)	I _{C25} (A)	Techn.	Config.		Part Number	Pack.	V _{CES} (V)	I _{C25} (A)	Techn.	Config.		Part Number	Pack.	V _{CES} (V)	I _{C25} (A)	Techn.	Config.									
MMIX1X200N60B3	X	600	175	▲			MMIX2S50N60B4D1	X	600	50	■			IXA20RG1200DHGLB ³⁾	B	1200	32	▲◆																	
MMIX1G320N60B3	X	600	400	■			IXD35PF650LB	B	650	42	✗◆			IXA30RG1200DHGLB ³⁾	B	1200	43	▲◆																	
MMIX1G75N250	X	2500	110	❖			IXD55PF650LB	B	650	73	✗◆			IXA40RG1200DHGLB ³⁾	B	1200	61	▲◆																	
MMIX1X100N60B3H1	X	600	105	▲◆			IXA20PG1200DHGLB ³⁾	B	1200	32	▲◆			IXA20PT1200LB	B	1200	32	●▲◆																	
MMIX1X200N60B3H1	X	600	175	▲◆			IXA30PG1200DHGLB ³⁾	B	1200	43	▲◆																								
MMIX1Y82N120C3H1	X	1200	78	❖◆			IXA40PG1200DHGLB ³⁾	B	1200	61	▲◆																								
MMIX1Y100N120C3H1	X	1200	92	❖◆			ITF40PF1200DHGTLB ²⁾	B	1200	56	✗◆																								
MMIX1B20N300C ¹⁾	B	1200	40	❖																															
MOSFET							IGBT							MOSFET							HV-IGBT/BIMOSFET														
Part Number	Pack.	V _{DS} (V)	I _{D25} (A)	Techn.	Config.		Part Number	Pack.	V _{DS} (V)	I _{D25} (A)	Techn.	Config.		Part Number	Pack.	V _{DS} (V)	I _{D25} (A)	Techn.	Config.		Part Number	Pack.	V _{DS} (V)	I _{D25} (A)	Techn.	Config.									
MMIX1T600N04T2	X	40	600	✗			MKE38P600LB	B	600	50	◆			MMIX4G20N250 ⁴⁾	X	2500	23	❖																	
MMIX1T550N055T2	X	55	550	✗			MKH20P650LB	B	650	30	▼			MMIX4B12N300	X	3000	26	❖																	
MMIX1F520N075T2	X	75	500	✗			MKH40P650LB	B	650	54	▼			MMIX4B20N300	X	3000	34	❖																	
MMIX1F420N10T	X	100	334	❖			MKE38RK600DFELB	B	600	50	■◆																								
MMIX1F360N15T2	X	150	235	✗			MKG40RK600LB	B	600	54	❖◆																								
MMIX1F230N20T	X	200	168	❖			MKH17RP650DCGLB ⁵⁾	B	650	2x22	▼◆																								
MMIX1F180N25T	X	250	130	❖																															
MMIX1F160N30T	X	300	102	❖																															
MMIX1F210N30P3	X	300	108	▲																															
MMIX1F132N50P3	X	500	63	▲																															
MMIX1F44N100Q3	X	1000	24	●																															
MMIX1F40N110P	X	1100	30	■																															

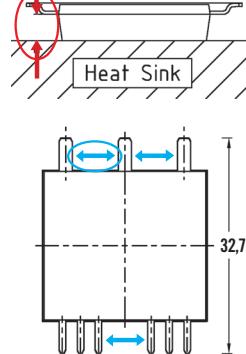
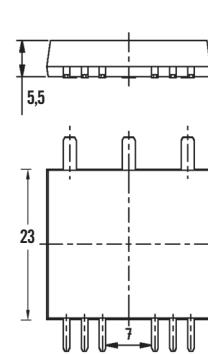
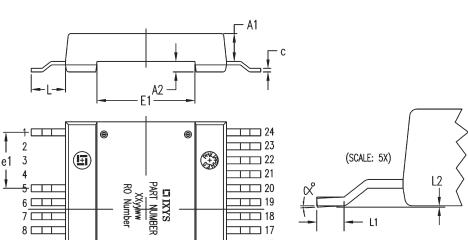
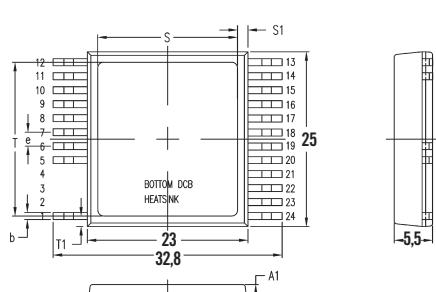
Technology:

- Rectifier
- Thyristor
- HiPerFET Q3
- FRED (fast)
- PT-IGBT
- Polar
- ▲ HiPerFRED (fast)
- ▲ XPT (SC rated)
- ▲ Polar3
- ◆ SONIC (fast, soft)
- ◆ XPT (fast)
- ◆ Trench MOSFET
- ◆ Schottky
- ◆ Trench IGBT
- ◆ HV BIMOS
- ◆ CoolMOS™ CP
- ◆ CoolMOS™ C6
- ◆ SiC (ultra fast)
- ◆ HV MOS
- ◆ CoolMOS™ CFD

- 1) BIMOS
- 2) with NTC
- 3) internal Vsat detection diode
- 4) without diode
- 5) double SiC boost

CoolMOS™ is a trademark of Infineon Technologies AG.

PACKAGE X



SMPD

- improved creepage and clearance distance
- Pin – Heat Sink: 4,0 mm min
- Pin – Pin: 7,0 mm min