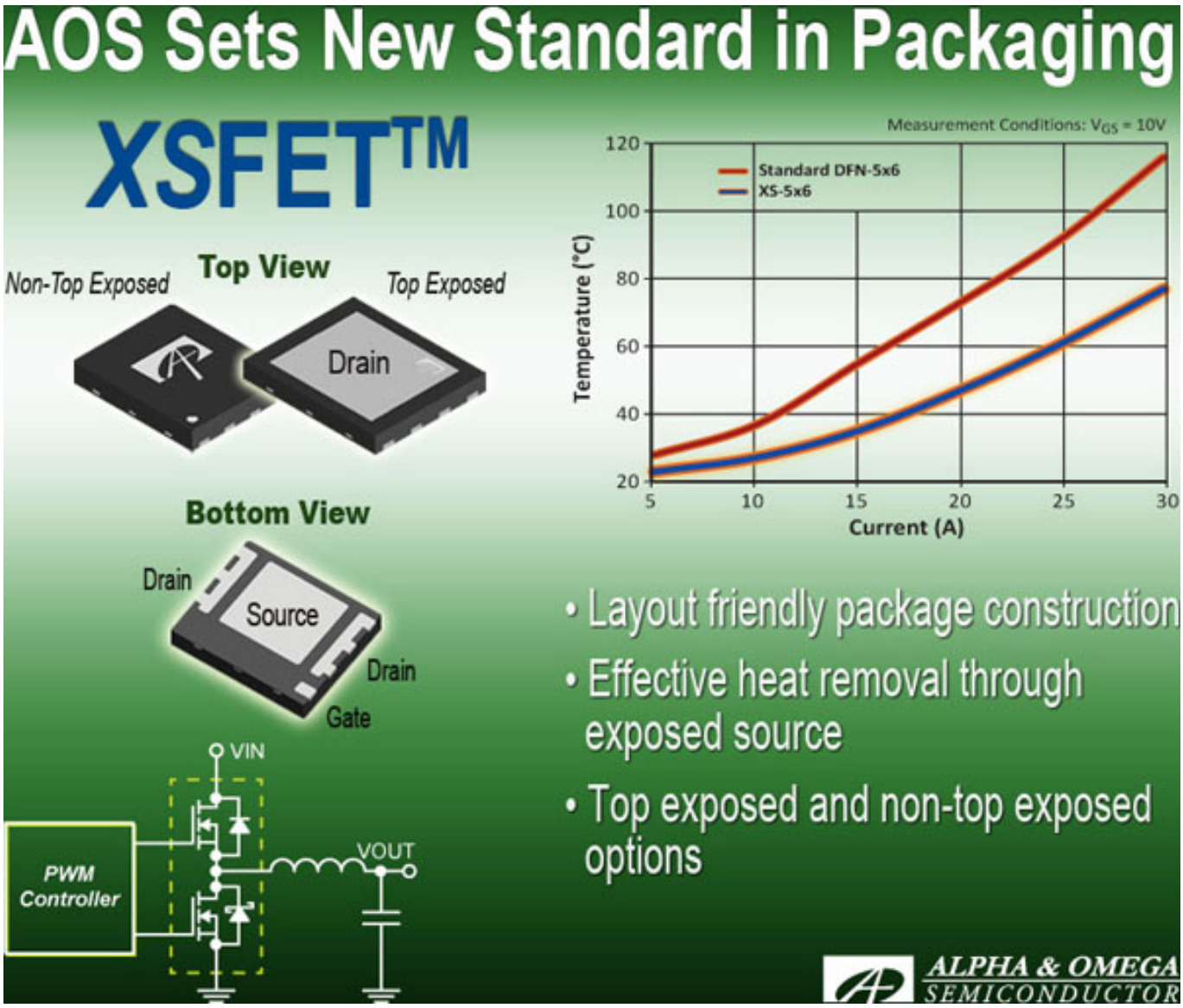
MOSFET packaging technology enables power designers to remove heat more effectively

Alpha and Omega Semiconductor Limited [1] set a new standard in power density and technology innovation for discrete power MOSFETs with exposed-source XSFET, a new patent-pending packaging technology. XSFET incorporates the packaging technology where the bottom of the package is the “source”, which enables power designers to remove heat more effectively to PCB ground plane. It features a large top heat slug which can be “top-exposed” or “non top-exposed” depending upon design criteria. The top-exposed version delivers a significant increase in heat transfer, which helps to reduce power losses in a system by keeping the die cooler.



[1]

Different from some of the existing double-sided cooling packaging options in the market today, AOS's new exposed-source packaging solution offers standard lead-frame based board mounting in a fully encapsulated DFN molded package, minimizing the thermal discrepancy between the device and the PCB while offering near zero parasitic inductance with its layout friendly footprint.

Utilizing AOS's new 30V AlphaMOS silicon technology together with exposed-source packaging, AOE6580 and AOE6580T (with top-exposed option) are the best-in-class 30V N-channel devices in the market today. Both devices are optimized for high performance demanding motor control, OR'ing, and E-fuse applications. Their very low on-resistance ($R_{DS(ON)}$ = 0.95mΩ max @10V_{GS}) in exposed-source DFN 5x6 package also make these devices very attractive for power supplies in computing, telecom, and high power density point-of-load sockets. Optimized for ultra-low conduction and switching losses, AOE6580 and AOE6580T minimize power losses in applications, thus providing power designers the flexibility in optimizing losses, performance, space, and cost.

AOE6770T and AOE6772T offer very high efficiency in server and high-end notebook applications by utilizing the combination of 25V AlphaMOS silicon technology and exposed-source packaging technology with the top-exposed option in industry standard DFN5x6 footprint. AOE7770T completes the solution as high-side MOSFET by combining exposed-source technology in compact DFN3x3 footprint with top-exposed option.

“AOS’s new XSFET packaging technology sets a new Industry standard for higher power density and performance. Our new devices with both “top-exposed” and “non top-exposed” versions enable power designers to reduce power losses and increase performance significantly.” said Yalcin Bulut, Vice President of Discrete Product Lines at AOS. “The exposed-source technology allows electronic designs to achieve higher current density while keeping components operating cooler. AOS tailored its technology to lead in innovation for solutions which make a difference in today’s demanding application requirements.”

AOE6770T, AOE6772T, AOE7770T, AOE6580, and AOE6580T are in halogen-free DFN packages and are MSL1 rated. They are all 100% UIS and Rg tested.

Device Specification Table

	Package	**Top Exposed**	**V_{DS}**	**V_{GS}**	**Typ $R_{DS(ON)}$ @ 10V**	**Typ $R_{DS(ON)}$ @ 4.5V**	**Typ Q_g @ 4.5V**		**I_D @**
AOE6770T	XS-5x6	Yes	25 V	±20 V	1.25 mOhm	1.95 mOhm	40 nC		145
AOE6772T	XS-5x6	Yes	25 V	±16 V	1.15 mOhm	1.6 mOhm	50 nC		145
AOE7770T	XS-3x3	Yes	30 V	±20 V	2.4 mOhm	3.4 mOhm	14 nC		76 A
AOE6580	XS-5x6	No	30 V	±20 V	0.78 mOhm	1.4 mOhm	34 nC		150
AOE6580T	XS-5x6	Yes	30 V	±20 V	0.78 mOhm	1.4 mOhm	34 nC		178

For more information, please visit www.aosmd.com [2].

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http://www.ecnmag.com/product-releases/2012/10/mosfet-packaging-technology-enables-power-designers-remove-heat-more-effectively?qt-most_popular=0

Links:
[1] http://www.aosmd.com/
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