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Alpha and Omega Semiconductor Releases 600V 110mOhm and 140mOhm α MOS5™ Super Junction MOSFETs in DFN8x8 Package

Optimized for Low Profile Server Power, PV Micro Inverter, and Slim Adapters

SUNNYVALE, Calif., March 10, 2022 – [Alpha and Omega Semiconductor Limited](#) (AOS) (Nasdaq: AOSL), a designer, developer, and global supplier of a broad range of power semiconductors and power ICs, and digital power products, today announced the release of 600V 110mOhm and 140mOhm α MOS5™ Super Junction MOSFETs in DFN8x8 Package. α MOS5 is AOS's latest generation of high voltage MOSFET, designed to meet the high efficiency and high-density needs for Quick Charger, Adapter, PC Power, Server, Industrial Power, Telecom, and Hyperscale Datacenter applications.

Today's Server Power design is driven by two major differentiators – high efficiency and a slim form factor to accommodate 1U, 0.5U, or even thinner systems. As higher power output is required while board space is further reduced, there are no other ways but choosing components with lower losses and small dimensions. Given the large stray inductance (larger Eon losses) and unfit height, the traditional through-hole package types are no longer the options. Typical high-power PFC and LLC stages also use gate drivers to control MOSFETs. Packages with Kelvin Sources will allow separate power and drive source connections, thus suppressing di/dt induced Vgs transients and turn-on losses. To further reduce system losses, other than minimizing magnetic and switching losses by leveraging ZVS/ZCS topologies, an increasingly adopted solution is to replace the diode bridge with high voltage MOSFETs, which serves as an Active Bridge Rectifier through the control of a driver (e.g., AOS AOZ7200).

AOS's newly released [AONV110A60](#) and [AONV140A60](#) are two 600V low ohmic MOSFETs packaged in the 8mm x 8mm x 0.9mm DFN8x8 with Kelvin Source. Compared to other packages such as D2PAK, DPAK, or TO-220(F), DFN8x8 is a smaller package offering a well-balanced footprint and thermal dissipation. The 64mm² footprint makes AONV110A60 and AONV140A60 ideal for Active Bridge and high-density PFC/Flyback/LLC applications. In an internal benchmark, we compared 4 x AONV110A60 with the typical 8A GBU806 diode bridge under the 300W 90Vac scenario, the Active Bridge solution with AONV110A60 reduced the power loss by almost 50% (3.16W loss with Active Bridge vs. 6.12W loss with Diode Bridge) and increased the efficiency by 1.1%. The two DFN8x8 devices also find great fit in applications with only PFC and LLC stages, given 57% and 80% reduction in footprint and height, respectively, versus D2PAK.

Besides Server applications, AONV110A60 and AONV140A60 also target Solar Micro Inverter and Slim Adapter applications. Micro-Inverter design sees the trend of converting solar energy from two panels via one inverter, which means doubled power rating but not necessarily doubled the system size. DFN8x8 devices could help achieve this goal by paralleling and reducing effective R_{ds(on)}, and accordingly, power losses. DFN8x8's Kelvin Source would be much favored in a high F_{sw} inverter design, where switching losses are more significant and need to be minimized. In slim adapter designs, DFN8x8 devices, together with high F_{sw} controllers and planar transformers, could easily push the system density to 20W+/in³ and efficiency up to 93%+ (with Active Bridges).

“Years ago, we could hardly imagine high voltage DFN8x8 devices widely adopted for server systems above 400W, even limited in low power SMPS, since people are used to through-hole or larger packages such as TO-220(F) or D2PAK. The power design concept has changed tremendously and rapidly with more and more DFN8x8 devices used in Active-Bridge,

PFC, Half-Bridge, and Full-Bridge topologies. DFN8x8 devices' value proposition is clear, it is a high voltage SMD package that offers smaller form factor, better switching performance (Low Eon), higher system reliability (Low Gate Ringing), and easier board assembly. AOS will continue to provide our customers with differentiated solutions that best serve the application needs and mission profiles from low power universal charging to high power server, solar, and telecom rectifiers," said Richard Zhang, Director of High Voltage MOSFET Product Line at AOS.

Technical Highlights

- Low Ohmic devices packaged in 64mm² DFN8x8
- Package Thickness < 1mm
- Kelvin Source and Low Eon/Gate Oscillation
- Automated SMT assembly
- MSL Level 1

Pricing and Availability

The AONV110A60 (600V 110mOhm DFN8x8) and AONV140A60 (600V 140mOhm DFN8x8) are immediately available in production quantities with a lead-time of 24 weeks. The unit price in 1000-piece quantities is \$3.96 for AONV110A60 and \$3.36 for AONV140A60.

About AOS

Alpha and Omega Semiconductor Limited, or [AOS](http://www.aosmd.com), is a designer, developer, and global supplier of a broad range of power semiconductors, including a wide portfolio of [Power MOSFET](#), [IGBT](#), [IPM](#), [TVS](#), [HVIC](#), [GaN/SiC](#), [Power IC](#), and [Digital Power](#) products. AOS has developed extensive intellectual property and technical knowledge that encompasses the latest advancements in the power semiconductor industry, which enables us to introduce innovative products to address the increasingly complex power requirements of advanced electronics. AOS differentiates itself by integrating its Discrete and IC semiconductor process technology, product design, and advanced packaging know-how to develop high-performance power management solutions. AOS's portfolio of products targets high-volume applications, including portable computers, flat-panel TVs, LED lighting, smartphones, battery packs, consumer and industrial motor controls, automotive electronics, and power supplies for TVs, computers, servers, and telecommunications equipment. For more information, please visit www.aosmd.com.

Forward-Looking Statements

This press release contains forward-looking statements that are based on current expectations, estimates, forecasts, and projections of future performance based on management's judgment, beliefs, current trends, and anticipated product performance. These forward-looking statements include, without limitation, references to the efficiency and capability of new products and the potential to expand into new markets. Forward-looking statements involve risks and uncertainties that may cause actual results to differ materially from those contained in the forward-looking statements. These factors include but are not limited to the actual product performance in volume production, the quality and reliability of the product, our ability to achieve design wins, the general business and economic conditions, the state of the semiconductor industry, and other risks as described in the Company's annual report and other filings with the U.S. Securities and Exchange Commission. Although the Company believes that the expectations reflected in the forward-looking statements are reasonable, it cannot guarantee future results, level of activity, performance, or achievements. You should not place undue reliance on these forward-looking statements. All information provided in this press release is as of today's date unless otherwise stated, and AOS undertakes no duty to update such information, except as required under applicable law.

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