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Alpha and Omega Semiconductor Announces XSPairFET™ Buck-Boost MOSFET for Higher Power USB PD 3.1 EPR Applications

Offering a compact footprint to streamline PCB design, the AONZ66412 XSPairFET™ helps improve power density while meeting high-efficiency Type C performance demands

SUNNYVALE, Calif., March 26, 2024 – [Alpha and Omega Semiconductor Limited](#) (AOS) (Nasdaq: AOSL), a designer, developer, and global supplier of a broad range of discrete power devices, wide bandgap power devices, power management ICs, and modules, today announced its [AONZ66412](#) XSPairFET™ MOSFET designed for Buck-Boost converters in USB PD 3.1 Extended Power Range (EPR) applications. The USB PD 3.1 EPR increases the USB-C maximum power up to 240W. AONZ66412 is defined to support the most commonly addressed power range of up to 140W at 28V, with two 40V N-Channel MOSFETs in a half-bridge configuration in a symmetric XSPairFET™ 5mmx6mm package.

The AONZ66412 can replace two single DFN5x6 MOSFETs, reducing the PCB area and simplifying the layout of the 4-switch buck-boost architecture while enabling a higher efficiency design. These benefits make the AONZ66412 ideal for buck-boost converters in Type-C USB 3.1 EPR applications, including notebook, USB hub, and power bank designs.

The AONZ66412 is an extension to the AOS XSPairFET™ lineup that features the latest bottom source packaging technology and lower parasitic inductance for reduced switch node ringing. Engineered with integrated high-side and low-side MOSFETs (3.8mOhms maximum on-resistance for each FET) within a DFN5x6 symmetric XSPairFET™ package, the low-side MOSFET source of the AONZ66412 is connected directly to a large paddle on the lead frame. This allows for improved thermals, as this paddle can be directly connected to the ground plane on the PCB. The improved package parasitics make 1MHz operation achievable, allowing inductor size and height to be reduced. AONZ66412 has been tested to achieve 97% efficiency @1MHz in typical USB PD 3.1 EPR conditions of 28V input, 17.6V output, and 8A load conditions.

“AOS specifically designed the AONZ66412 to meet EPR Type C PD application demands. AONZ66412 will reduce board space and improve power density to achieve the high-efficiency performance goals designers have set for this widely adopted USB-PD Type C application. AOS continues to be a leading innovator of buck-boost architecture solutions,” said Rack Tsai, Marketing Director of MOSFET product line at AOS.

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Technical Highlights

Part Number	Package		V _{IN} (V)	V _{GS} (±V)	R _{DS(ON)} (mΩ max) at V _{GS} =		V _{GS} (±V) (max V)	C _{iss} (pF)	C _{oss} (pF)	C _{rss} (pF)	Q _g (nC)	Q _{gd} (nC)
					10V	4.5V						
AONZ66412	DFN 5x6	High Side (Q1)	40	20	2.4	3.8	2.3	3100	560	45	18	2.8
		Low Side (Q2)	40	20	2.4	3.8	2.3	3100	560	45	18	2.8

Pricing and Availability

The AONZ66412 is immediately available in production quantities with a lead time of 16 weeks. The unit price in 1,000-piece quantities is \$1.56.

About AOS

Alpha and Omega Semiconductor Limited, or [AOS](#), is a designer, developer, and global supplier of a broad range of discrete power devices, wide band gap power devices, power management ICs, and modules, including a wide portfolio of [Power MOSFET](#), [SiC](#), [IGBT](#), [IPM](#), [TVS](#), [HV Gate Drivers](#), [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' 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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