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Alpha and Omega Semiconductor Announces Ideal Diode Protection Switch suitable for Type-C Power Delivery

Smart protection switch provides industry-leading performance, up to 28V absolute maximum voltage and Ideal Diode True Reverse Current Blocking for Type-C PD applications

SUNNYVALE, Calif., Aug. 26, 2021, [Alpha and Omega Semiconductor Limited](#) (AOS) (Nasdaq: AOSL), a designer, developer and global supplier of a broad range of power semiconductors and power ICs, announced today a new Type-C Power Delivery high voltage sink protection switch using ideal diode methodology for reverse current protection. [The AOZ13984DI-02](#) and [AOZ13987DI-02](#) are smart protection switches in a single small thermally enhanced 3mm x 3mm DFN package. The new products use AOS's advanced co-packaging technology, combining a high-performance IC with protection features and our latest high SOA Trench MOSFET. The new devices offer low $R_{DS(ON)}$ (20mohm) back-to-back MOSFETs to block any reverse current under fault conditions and are capable of up to 28V absolute maximum voltage.

Typically, a USB Type-C port adaptor supplies 5V at plug-in. Once plugged in, the client device negotiates a higher voltage for fast charging. The rise time for VBUS voltage from 5V to the final target value is very slow per the USB standard. Typical Type C protection switch designs that rely on a comparator to detect a voltage drop across the back-to-back power switches do not work with slow rising VBUS voltages and are susceptible to system-level faults. It's for this reason, robust system designs implement an ideal diode approach. Typically, such solutions were implemented discretely and require many external components and lack protection features that are possible with an integrated circuit-based approach.

AOZ13987DI-02 and AOZ13984DI-02 feature Ideal Diode True Reverse Current Blocking (IDTRCB), allowing no reverse current at any conditions. They also feature 28V absolute maximum voltage with startup SOA management and other protections.

"The thinner profile, higher power, and greater flexibility offered by USB Type-C and USB PD 3.0 standards have allowed many notebook computers to only use Type-C ports for both power delivery and as a high-speed interface. Thus, eliminating the need for a dedicated power connector. As multiple Type C ports have become ubiquitous in consumer and computing designs, AOS's new family of ideal diode-based protection switches offer a robust, reliable solution. And as always, AOS's ability to combine TrenchFET technology with leading IC design enables a compact, efficient solution," said Peter Cheng, Power IC Senior Marketing Director at AOS.

Technical Highlights

- Operating Range: 3.4V to 23V
- 28V Absolute Maximum rating
- On Resistance: 20mΩ for AOZ13987DI-02 and 33mΩ for AOZ13984DI-02 back-to-back MOSFETs

- Protection features: Ideal Diode True Reverse Current Blocking, Under-Voltage Lock-Out, Over-Voltage Protection, Thermal Shutdown Protection, Programmable Soft-Start, Startup SOA Management
- Package: 3mm x 3mm DFN-12L

Pricing and Availability

The AOZ13987DI-02 and AOZ13984DI-02 are immediately available in production quantities with a lead-time of 14 weeks. The unit price for AOZ13987DI-02 starts at \$0.95 in 1,000-unit quantities and \$0.84 for AOZ13984DI-02.

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](#), [SiC/GaN](#), [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 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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