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Alpha and Omega Semiconductor Unveils 16 Phase Controller that Supports Further AI Server and Graphic Card Innovation

Specifically designed to NVIDIA's latest OpenVreg16 Phase specifications, the AOZ73016QI delivers a highly efficient, flexible power solution when paired with AOS' power stages

SUNNYVALE, Calif., Jan. 07, 2025 – [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 unveiled its [AOZ73016QI](#), a 16-Phase, 2-rail controller specifically designed to the latest OpenVReg16 (OVR16) specifications from NVIDIA. The AOZ73016QI controller design is based on the company's high performance, proprietary AOS Advanced Transient Modulator (A²TM) control scheme. In addition to supporting all the basic requirements of the OVR16 specification, the new AOS controller offers value-added features such as RDS(on) and DCR sensing for current monitoring and current balance. These features enable AOS' controller to support both DrMOS and Smart Power Stages (SPS) to deliver a complete AI server and graphic card power solution along with increased design flexibility.

The AOZ73016QI control scheme offers excellent current balance at all load conditions as well as during fast load transients, which is a critical requirement for power-hungry AI and graphics SoCs that demand over several thousands of amperes of peak current. It also capably handles phase doubling or tripling without the addition of a phase doubler so a single controller can support up to a 48-phase design. When paired with AOS' high performance DrMOS and SPS power stages utilizing AOS' highly efficient and robust trench MOSFET, the AOS solution offers industry leading efficiency and thermals saving several hundred watts of power during high transient current events that can last for a few 100s of microseconds and up to 1 millisecond when the SoC draws peak power. In a head-to-head comparison against a leading competitor product, each of the AOS' 5 x 5 DrMOS power stages were shown to dissipate 14W lower power loss during these peak current events.

The AOZ73016QI supports an accurate RDS(on) sensing scheme, which uses power stage low side MOSFET RDS(on) sensing, thus enabling the use of low DCR inductors to help boost system efficiency. The device's automatic phase management (APM) and auto discontinuous mode (DCM) power saving features extend its usability to graphics cards and gaming laptops.

The AOZ73016QI offers full programmability via the PMBUS interface and is also AVS bus compliant. The device features digitally programmable voltage and current regulation loops minimizing the external components required to implement a solution. It supports electronic control system (ECS) programmability with ability to update configuration in the field, and to pre-program up to six configuration settings with a pin-strap selection.

"AOS has a long history of developing leading-edge personal computing, server and datacenter solutions. The launch of our successful AOZ73016QI 16-phase controller for OVR16-based designs is the culmination of several years of R&D investment in multiphase controllers. Developed in close collaboration with our customer's system architects, the AOZ73016QI is a robust, reliable power solution for more advanced AI servers. Plus, the design flexibility afforded by the AOZ73016QI helps lower TCO for next generation AI servers," said Ralph Monteiro, Sr. VP, Power IC and Discrete Product lines at AOS.

Technical Highlights

- NVIDIA OpenVRReg16 compliant
- Up to 16-phase single output rail or $N + M \leq 16$ phases dual output rails is configurable
- Supports PWMVID, PMBus and is AVSBus compliant
- Digital PWMVID architecture with differential remote sensing to achieve 0.5% regulated V_{OUT} accuracy
- User friendly GUI for compensation and configuration with minimal external RC components.
- Supports multi-sourced industry standard DrMOS and Smart Power Stage (SPS)
- ECS programmability with ability to update configuration in the field
- Supports Auto Phase Management (APM) and Discontinuous Mode (DCM) power saving features
 - Proprietary, high performance AOS A²TM control scheme
 - 200kHz to 1MHz programmable switching frequency
 - Hysteretic peak current mode control can vary frequency during transient for best-in-class response
- Excellent dynamic phase current balance
- Spread-spectrum Modulation (SSM)
- Output Under-Voltage Protection (UVP)
- Output Over-Voltage Protection (OVP)
- Over-Current Protection (OCP)
- Over-Temperature Protection (OTP)
- Over-Current Limit (OCL)
- QFN7x7-56L package

Pricing and Availability

The AOZ73016QI is immediately available in production quantities with a lead time of 12-16 weeks. The unit price for AOZ73016QI starts at \$4.00 in 1,000-piece quantities.

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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