

General Description

The AOZ73004EQI is a high performance multiphase buck controller designed in compliance with OpenVReg specifications. It provides one output rail and supports PWMVID interface.

AOS offers a novel AOS Advanced Transient Modulator (A²TM). It combines an advanced variable frequency hysteretic peak current mode control with proprietary phase current sensing scheme for fast transient response and low system cost. The control loop enhances light-load efficiency by seamlessly entering DCM mode of operation. Autonomous Phase Management also assures the optimized efficiency and power loss during light load with single phase DCM mode.

The AOZ73004EQI provides complete protection including UVP, OVP, thermal warning, cycle-by-cycle current limit. AOZ73004EQI also offers real time telemetry information via IMON pin for output currents.

The AOZ73004EQI features an external reference input and PWMVID dynamic output voltage control, in which the output voltage is regulated and tracks the external input reference voltage. The PWMVID duty cycle determines the variable output voltage at REFIN, Vmin is the zero percent duty cycle voltage value. Vmax is the one hundred percent duty cycle voltage value.

AOZ73004EQI can be paired and supports multi-sourced industry standard DrMOS. AOZ73004EQI is offered in compact 4mm x 4mm 32-pin QFN package.

Features

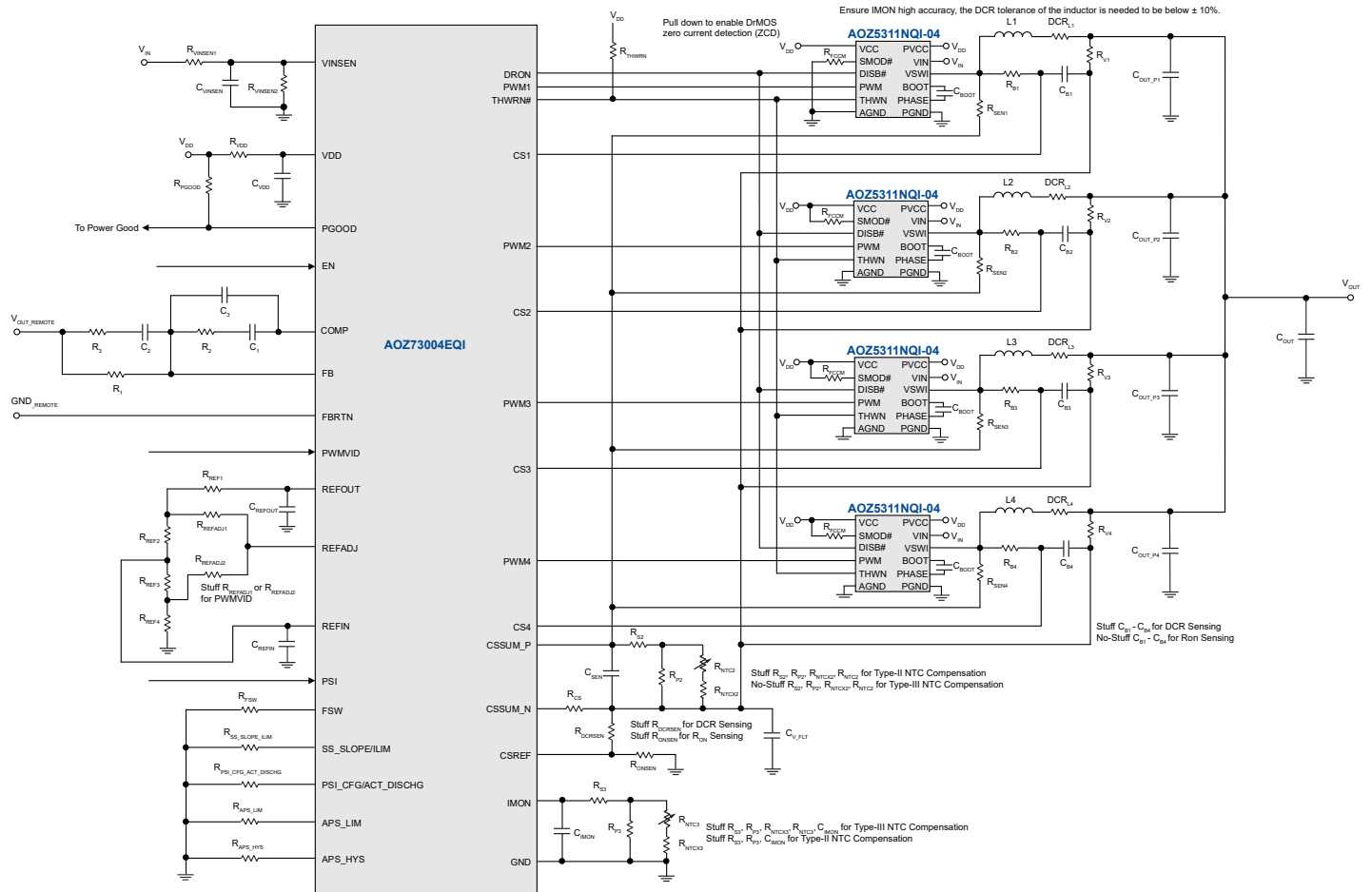
- Compliant with OVR-4-22 specifications
- Supports up to 4 phase
- 2.7V to 20V VIN input supply voltage
- 300kHz to 1MHz programmable switching frequency
- High performance operational error amplifier
- Differential remote sensing to achieve 1% regulated VOUT accuracy
- Supports multi-sourced industry standard DrMOS
- Proprietary, high performance AOS Advanced Transient Modulator (A²TM) control scheme:
 - A variable-frequency hysteretic peak current mode control, with a maximum frequency up to twice the configured value, provides fast transient response.
 - Dynamic phase-to-phase current balancing
 - Excellent phase current sensing
 - Seamless CCM to DCM control to maximize efficiency
- Supports DCR or R_{ON_LG} sensing current balance
- Automatic Phase Shedding (APS) with user settable thresholds
- Power Saving Interface (PSI)
- Supports Diode Emulation Mode (DEM)
- PWMVID interface
- Output Under-Voltage Protection (UVP)
- Output Over-Voltage Protection (OVP)
- Over-Current Limit (OCL) with reinforced recovery response
- Thermal Warning (THWRN)

Applications

- GPU and CPU power
- Graphic cards
- Desktop and notebook applications



Typical Application



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ73004EQI	-40°C to +125°C	QFN4x4-32L	Green

Contact local sales office for full product datasheet.



AOS products are offered in packages with Pb-free plating and compliant to RoHS standards. Please visit <https://aosmd.com/sites/default/files/media/AOSGreenPolicy.pdf> for additional information.

Pin Configuration

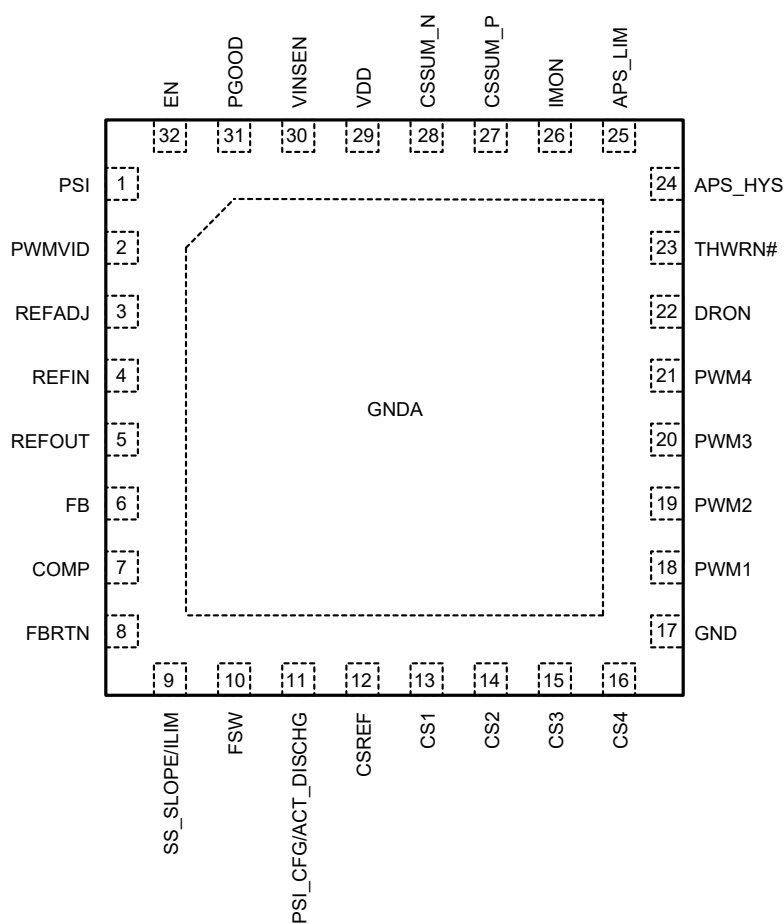
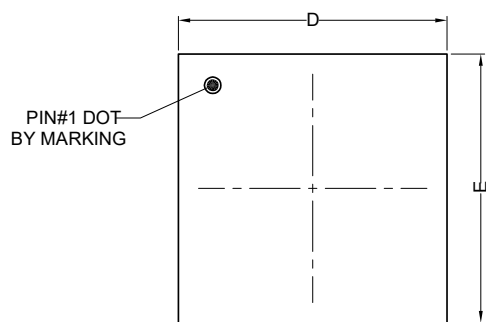
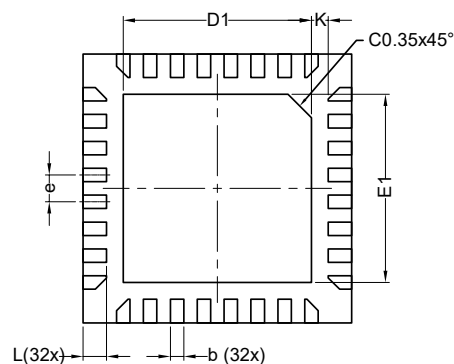


Figure 1. QFN4x4-32L

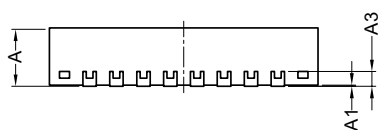
Package Dimensions, QFN4x4-32L



TOP VIEW

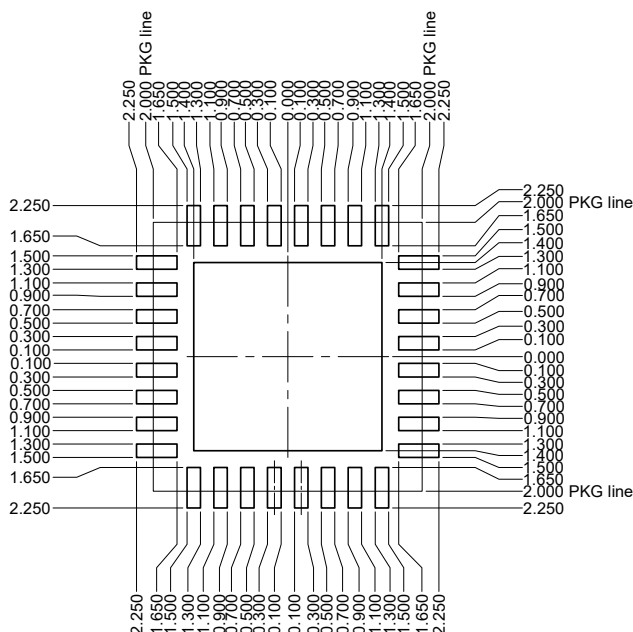


BOTTOM VIEW



SIDE VIEW

RECOMMENDED LAND PATTERN



UNIT: mm

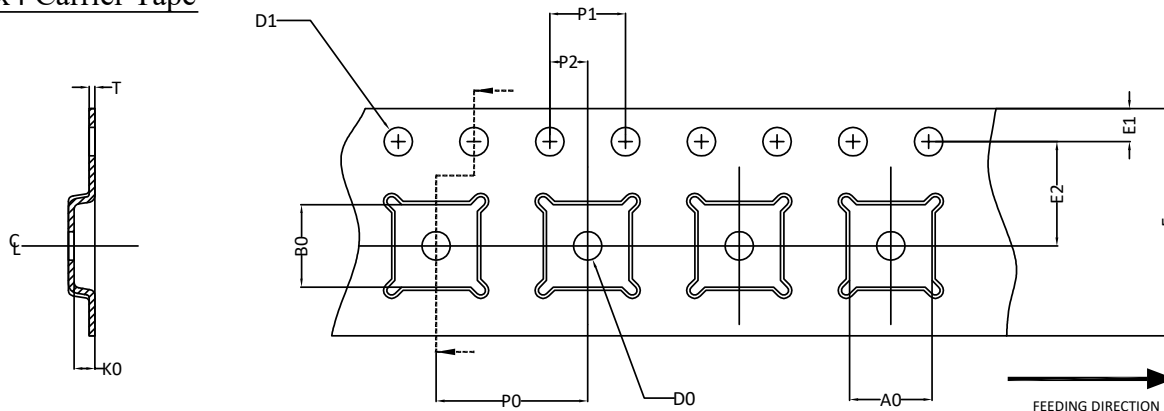
SYMBOLS	DIM. IN MILLIMETERS			DIM. IN INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.80	0.85	0.90	0.031	0.033	0.035
A1	0.00	-	0.05	0.000	-	0.002
A3	0.203 REF.			0.008 REF.		
b	0.15	0.20	0.25	0.006	0.008	0.010
D	3.90	4.00	4.10	0.154	0.157	0.161
D1	2.70	2.80	2.90	0.106	0.110	0.114
E	3.90	4.00	4.10	0.154	0.157	0.161
E1	2.70	2.80	2.90	0.106	0.110	0.114
e	0.40 BSC			0.016 BSC		
L	0.25	0.35	0.45	0.010	0.014	0.018
K	0.25 REF.			0.010 REF.		

NOTE:

1. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

Tape and Reel Dimensions, QFN4x4-32L

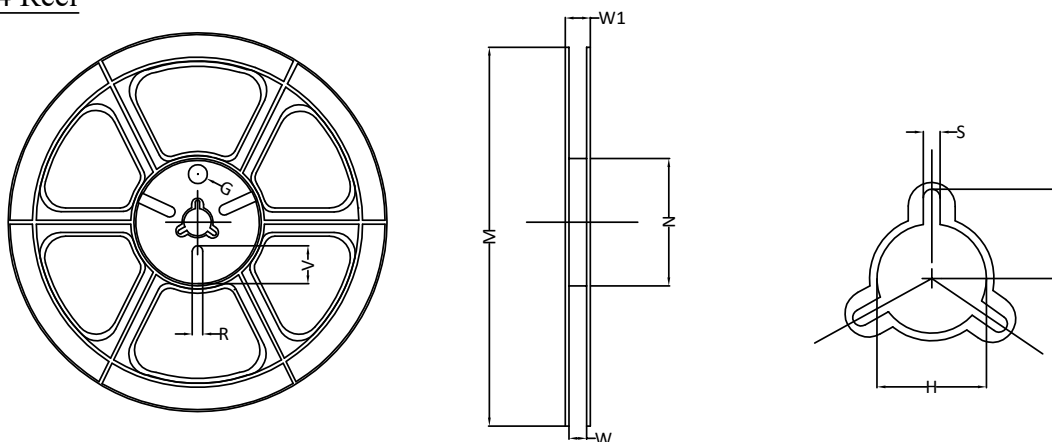
QFN4x4 Carrier Tape



UNIT: MM

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
QFN4x4 (12 mm)	4.35 ±0.10	4.35 ±0.10	1.10 ±0.10	1.50 MIN.	1.50 +0.1 -0.0	12.0 ±0.3	1.75 ±0.10	5.50 ±0.05	8.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.30 ±0.05

QFN4x4 Reel



UNIT: MM

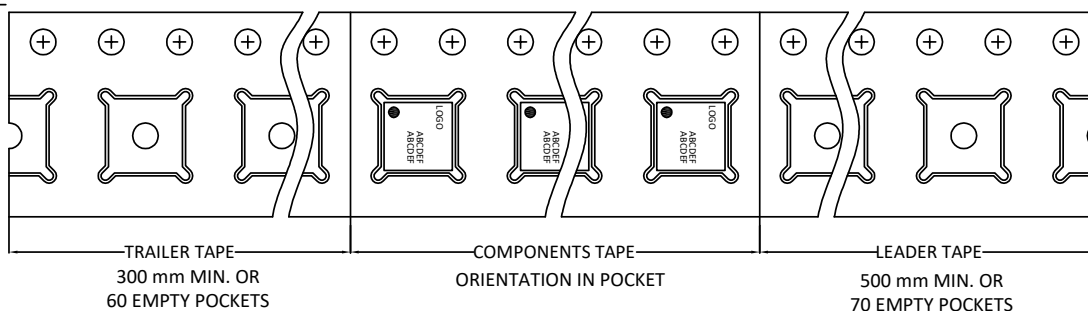
TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 mm	Ø330	Ø330.0 ±2.0	Ø79.0 ±1.0	12.4 +2.0 -0.0	17.0 +2.6 -1.2	Ø13.0 ±0.5	10.5 ±0.2	2.0 ±0.5	---	---	---

QFN4x4 Tape

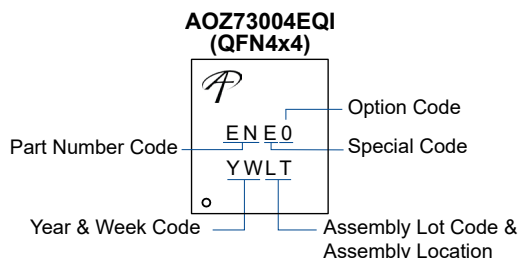
Leader / Trailer
& Orientation

Normal

Unit Per Reel:
3000pcs



Part Marking



Part Number	Description	Code
AOZ73004EQI	Green Product	ENE0

LEGAL DISCLAIMER

Applications or uses as critical components in life support devices or systems are not authorized. Alpha and Omega Semiconductor does not assume any liability arising out of such applications or uses of its products. AOS reserves the right to make changes to product specifications without notice. It is the responsibility of the customer to evaluate suitability of the product for their intended application. Customer shall comply with applicable legal requirements, including all applicable export control rules, regulations and limitations.

AOS' products are provided subject to AOS' terms and conditions of sale which are set forth at:

http://www.aosmd.com/terms_and_conditions_of_sale

LIFE SUPPORT POLICY

ALPHA AND OMEGA SEMICONDUCTOR PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.