

General Description

The AOZ71036QI is a high performance digital & analog hybrid multiphase buck controller designed in compliance with Intel IMVP8, 9, and 9.1/9.2 platform specifications. It provides three output rails (up to 3 + 2 + 1) and supports 4 separate SVID domains: up to 3 phases for core voltage domain (IA); 2 phases for graphics voltage domain (GT); and 1 phase for Auxiliary domain (SA) as well as the PSYS domain's reporting functions, incorporated into a single SVID 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 optimized efficiency and power loss during light load with single phase DCM mode.

The AOZ71036QI is equipped with SMBus digital Interface enabling register programming for tuning and configuration to minimize the system components and eliminate the need for manual solder rework on system board. Programmability can be done either by AOS GUI or customized ECS into the controller's built-in RAM or MTP. The controller provides MTP to store register settings once the configuration is finalized and the configuration can be updated more than ten times. In production stage, an external resistor can be used for pin strap to choose 1 out of 6 config settings pre-programmed into the parts to achieve easy BOM management and minimize the number of part number and SKU.

Combined with AOS high performance SPS, the AOZ71036QI provides a complete power solution for Intel IMVP9.2 Meteor Lake UH SKU applications. AOZ71036QI comes in a 5mm x 5mm 40-pin QFN package.

The AOZ71036QI controller features very low power consumption while still enabling digital interface control. This unique "Hybrid Digital" control scheme enables low quiescent power consumption in all power states as defined by the Intel IMVP9.2 platform to enable long system run times in battery life workloads.

The AOZ71036QI provides complete protection and warning functions including UVP, OVP, OCP and OTP. Fault protection behavior can be easily programmed through SMBus. AOZ71036 also offers real time telemetry information via SMBus for V_{IN}, V_{OUT}, temperature, output currents, power states as well as PSYS/VSYS/IAUX pins reporting via SMBus.

Features

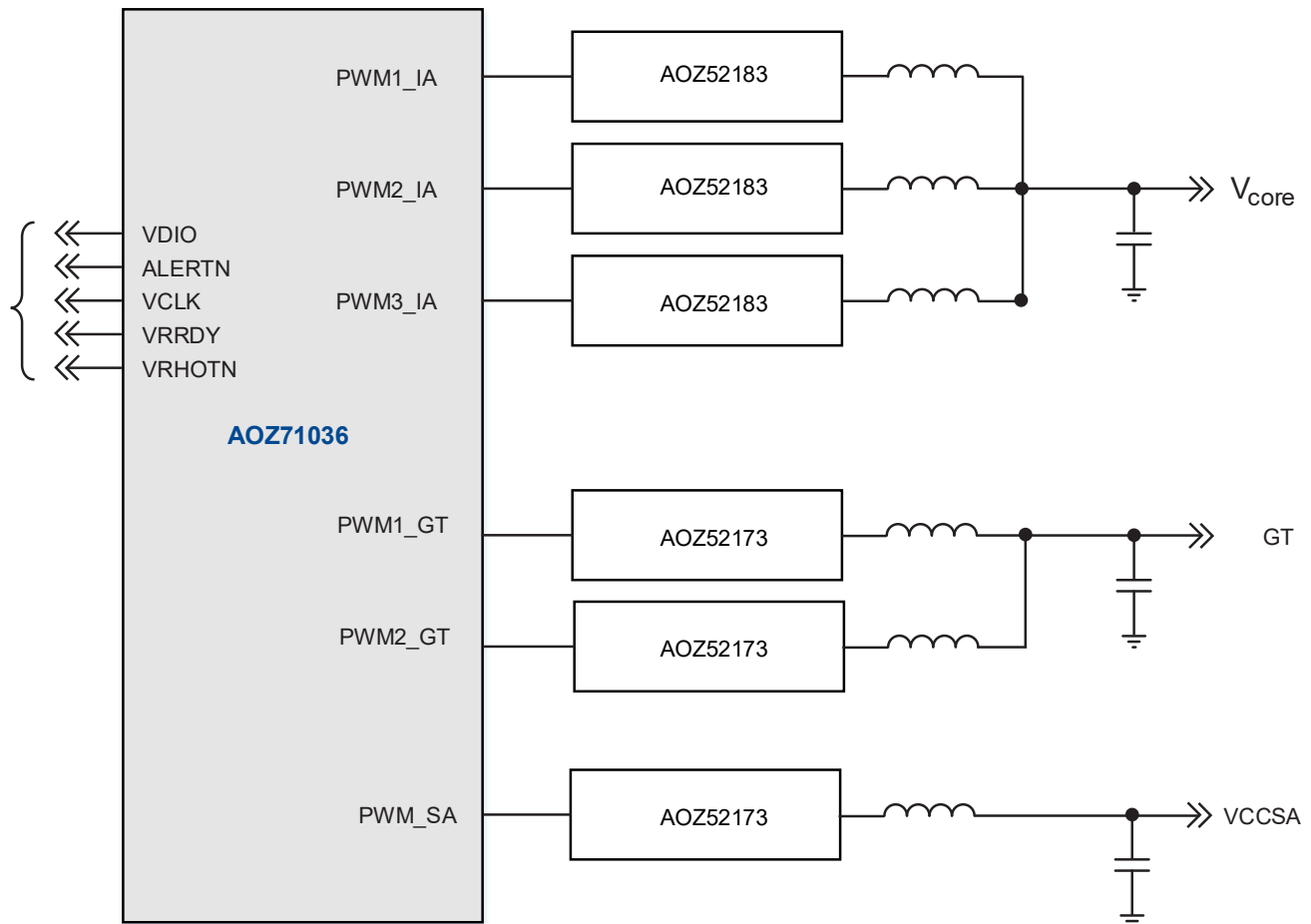
- 2.5V to 24V V_{IN} input supply voltage
- Triple output rails: 3/2/1 + 2/1 + 1 phase
- Meteor Lake UH Platform
- Autonomous Phase Management including phase shedding and auto DCM to optimize power loss
- Digital & analog hybrid controller with SMBus programmability and lowest power consumption
- SVID Interface to CPU compliant with IMVP8, 9, 9.1 and the latest 9.2 specifications
 - Support Fast V-Mode (FVM)
- Differential remote sensing to achieve 0.5% regulated V_{OUT} accuracy
- Low quiescent current: 3.7mA at PS0 for 2+1+1 configuration
- Supports multi-sourced industry standard SPS power stages with I_{mon} and T_{mon}
- User friendly GUI for compensation and configurations with minimal external RC components.
- ECS programmability for configurations with Built-in MTP and RAM with more than 10 times configuration changes
- Pin Strap for easy configuration with 6 configuration setting with same PN to minimize number of SKU
- Proprietary, high performance AOS Advanced Transient Modulator (A²TM) control scheme:
 - Variable frequency hysteretic peak current mode control gives fast transient response
 - Dynamic phase current balance
 - Excellent load-line control and phase current sensing
 - Seamless CCM to DCM control to maximize efficiency
- System Input Power Monitoring (both P_{sys} and V_{sys})
- 300kHz to 1.8MHz programmable switching frequency
- Acoustic Noise Suppression
- Output Under-Voltage Protection (UVP)
- Output Over-Voltage Protection (OVP)
- Over-Current Protection (OCP)
- Over-Temperature Protection (OTP)
- QFN5x5-40L package

Applications

- Meteor Lake Notebook
- Memory and graphic cards



Typical Application



Ordering Information

Part Number ⁽¹⁾	Ambient Temperature Range	Package	Environmental
AOZ71036QI-xxx ⁽²⁾	-40°C to +125°C	QFN5x5-40L	RoHS

Notes:

- For each customer, the full PN already created for order is on the last page of this DS. Please refer to last page for more information.
- "xxx" is the configuration code identifier (also called sub-part number) for the register settings stored in the internal non-volatile memory (NVM). Each "x" can be a value between 0 and 9 and A-Z (except I, J, O, Q). Please work with an AOS Sales/FAE to create this unique number. Each project or board might need to use different sub-PN as the register setting might be different.



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

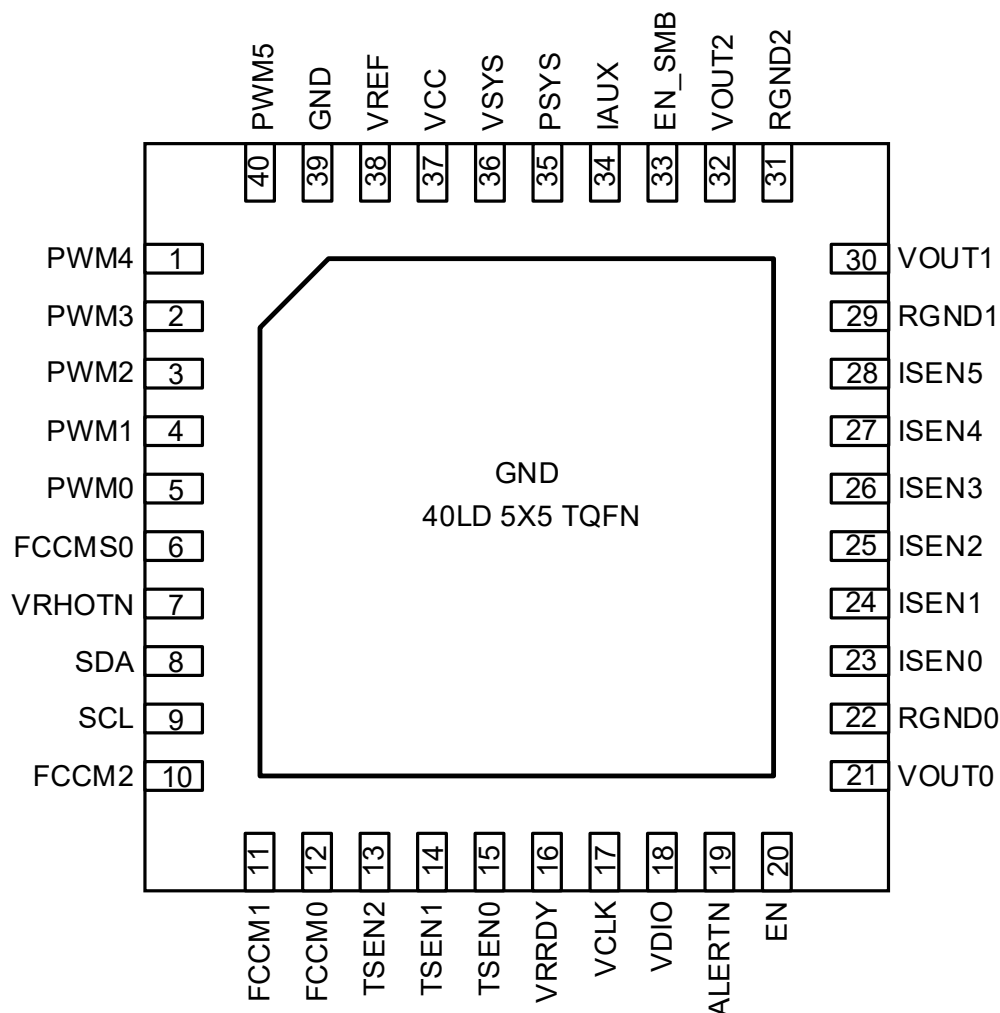
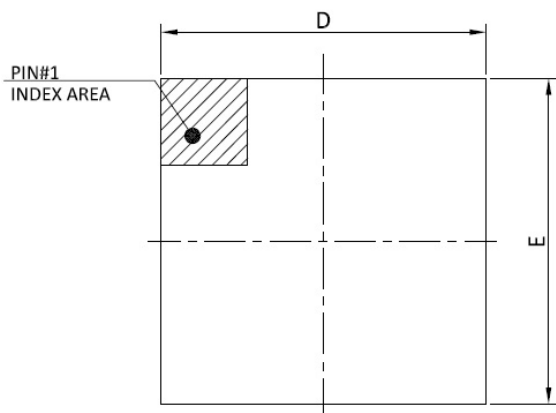
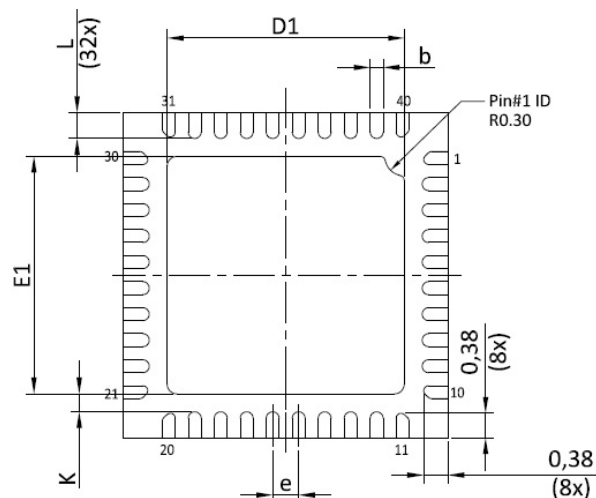


Figure 1. QFN 5x5-40L
(Top View)

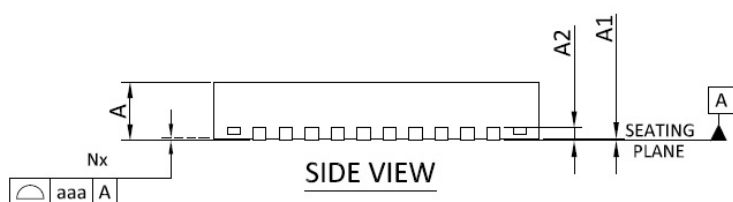
Package Dimensions, QFN5x5-40L



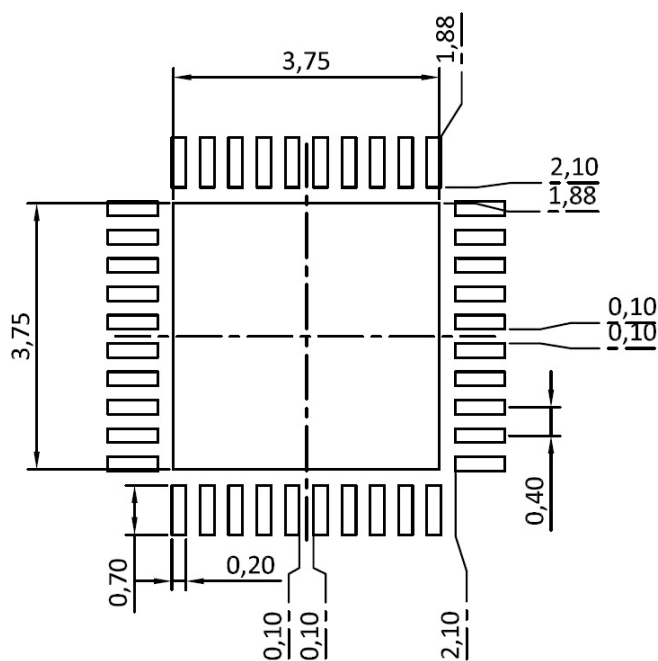
TOP VIEW



BOTTOM VIEW



RECOMMENDED LAND PATTERN



UNIT: mm

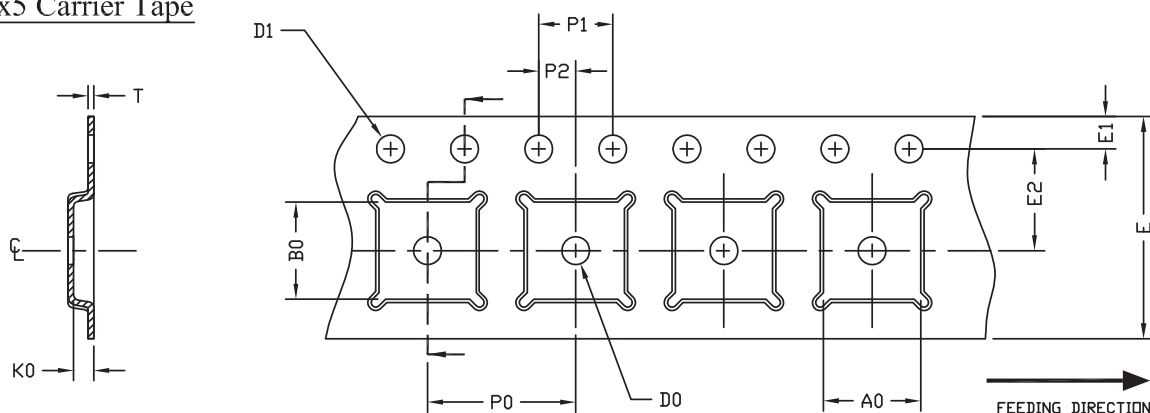
NOTE:

1. CONTROLLING DIMENSION IS MILLIMETER.
2. CO-PLANARITY APPLIES TO THE EXPOSED PAD AND THE LEADS.

SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.90	1.00	0.031	0.035	0.039
A1	0.00	0.02	0.05	0.000	0.001	0.002
A2	0.15	0.20	0.25	0.006	0.008	0.010
b	0.15	0.20	0.25	0.006	0.008	0.010
D	4.90	5.00	5.10	0.193	0.197	0.201
D1	3.50	3.65	3.75	0.138	0.144	0.148
E	4.90	5.00	5.10	0.193	0.197	0.201
E1	3.50	3.65	3.75	0.138	0.144	0.148
e	0.40 BSC			0.016 BSC		
K	0.20	---	---	0.008	----	----
L	0.30	0.40	0.50	0.012	0.016	0.020
aaa	0.08			0.003		

Tape and Reel Dimensions, QFN5x5-40L

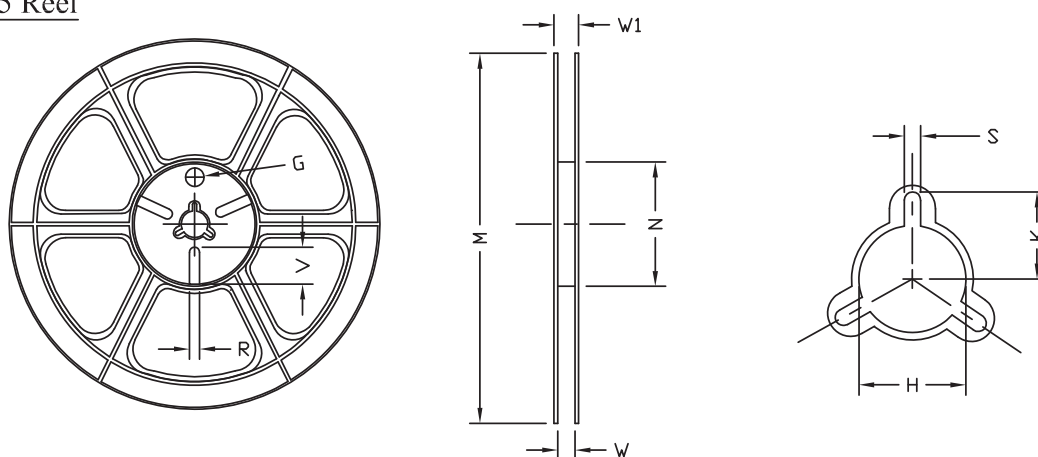
QFN5x5 Carrier Tape



UNIT: MM

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
QFN5x5 (12 mm)	5.25 ±0.10	5.25 ±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

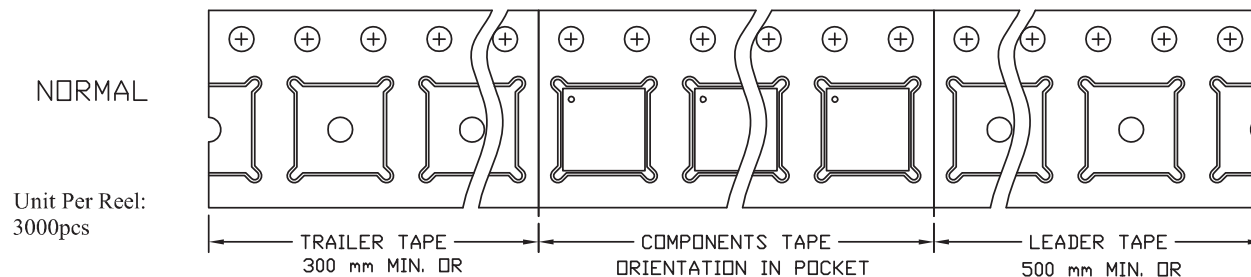
QFN5x5 Reel



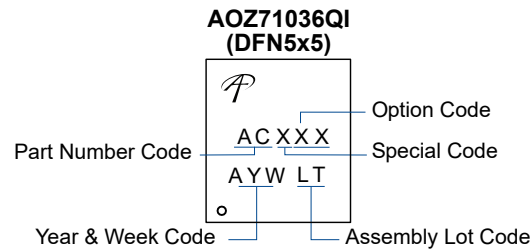
UNIT: MM

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 mm	φ330	φ330.0 ±2.0	φ79.0 ±1.0	12.4 +2.0 -0.0	17.0 +2.6 -1.2	φ13.0 ±0.5	10.5 ±0.2	2.0 ±0.5	---	---	---

Leader / Trailer
& Orientation



Part Marking



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