ALPHA & OMEGA SEMICONDUCTOR

AOZ2262NQI-12

Evaluation Board User Guide

General Description

The AOZ2262NQI-12 is a high-efficiency, easy-to-use DC/DC synchronous buck regulator that operates up to 28V. The device is capable of supplying 10A of continuous output current with an output voltage adjustable down to 0.6V ±1.0%.

The AOZ2262NQI Evaluation Board (EVB) proprietary constant on-time PWM control with input feed-forward results in ultra-fast transient response while maintaining relatively constant switching frequency over the entire input voltage range.

The AOZ2262NQI EVB features multiple protection functions such as VCC under-voltage lockout, cycle-by-cycle current limit, output over-voltage protection, short-circuit protection, and thermal shutdown.

The AOZ2262NQI EVB demonstrates the COT buck converter design.

Features include: wide input voltage range 2V to 28V; 10A continuous output current; output voltage adjustable down to 0.6V (±1.0%); low $R_{DS(ON)}$ internal NFETs with 13mΩ high-side and 10mΩ low-side; constant on-time with input feed-forward; programmable on-time up to 2.6µs; selectable PFM light-load operation; ceramic capacitor stable; adjustable soft start; ripple reduction; discharge function; power good output; integrated bootstrap diode; adjustable cycle-by-cycle current limit; short-circuit protection; over voltage protection; and thermal shutdown.

Applications include: portable computers; compact desktop PCs; servers; graphics cards; set-top boxes; LCD TVs; cable modems; point-of-load DC/DC converters; and telecom/networking/datacom equipment.

Evaluation Board Schematic

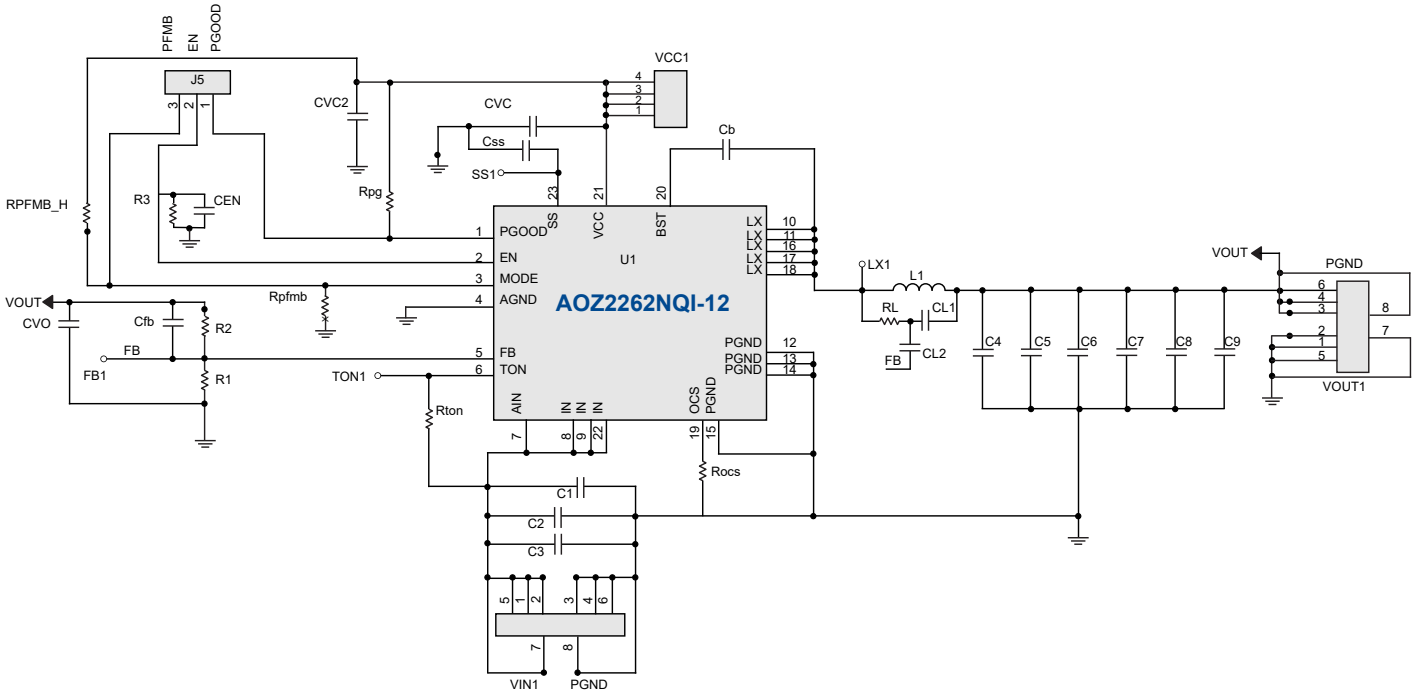

Table 1. AOZ2262NQI-12 24Vin to 0.85Vout Component List

Ref Designation	Part Number	Description
CEN, CB	GRM188R71H104KA01D	Cap, 100nF, 0603, 50V, X7R, 10%
CFB	GRM188R71H101KA01D	Cap, 100pF, 0603, 50V, X7R, 10%
CSS	GRM188R71H103KA01D	Cap, 10nF, 0603, 50V, X7R, 10%
CVC	GRM188R61H475KALD	Cap, 4.7µF, 0603, 50V, X5R, 10%
CVO, CL1, CL2, RPFMB_H, RL, CVC2		Open
C1, C2, C3, C3-1	CL31A106KBHNNNE	Cap, 10µF, 1210, 50V, X5R, 10%
C4-C7	CC5X226M8	Cap, 22µF, 1206, 25V, X5R, 10%
L1	PI10040-1R0M	Inductor,1.0µH
RPFMB, RPG, R3	100K	Res, 100kΩ,2 0603, 1%, 1/10W
ROCS	16K	Res, 16K, 0603, 1%, 1/10W
Rton	82K	Res, 82KΩ, 0603, 1%, 1/10W
R1	7.5K	Res, 7.5K, 0603, 1%, 1/10W
R2	3K	Res, 3K, 0603, 1%, 1/10W
U1	AOZ2262NQI-12	IC, QFN4X4

Output voltage is set by R2: R2 = R1*(Vout-0.6)/0.6. Table 1 shows the value of the R2 typical output voltage.

Table 2. Option Table

Part Number	All Protection		Ripple Reduction		Package 4mmx4mm	
	Auto Restart	Latch	Yes	No	QFN-22L	QFN-23L
AOZ2262NQI-12		V	V			V

PCB Layout

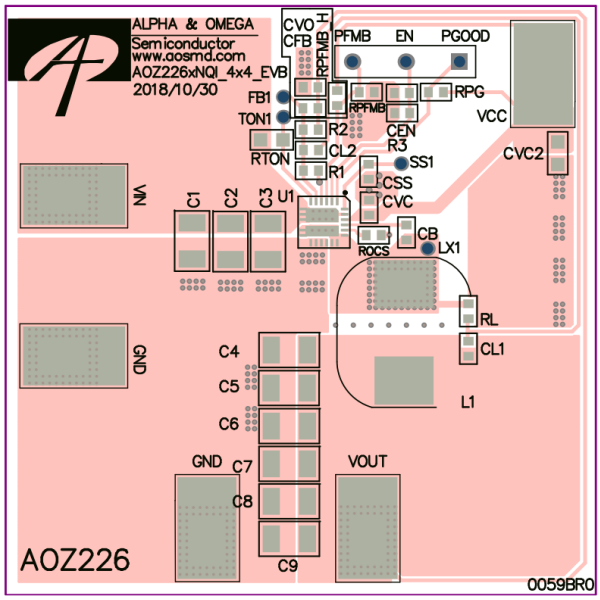

Figure 1. Top Layer

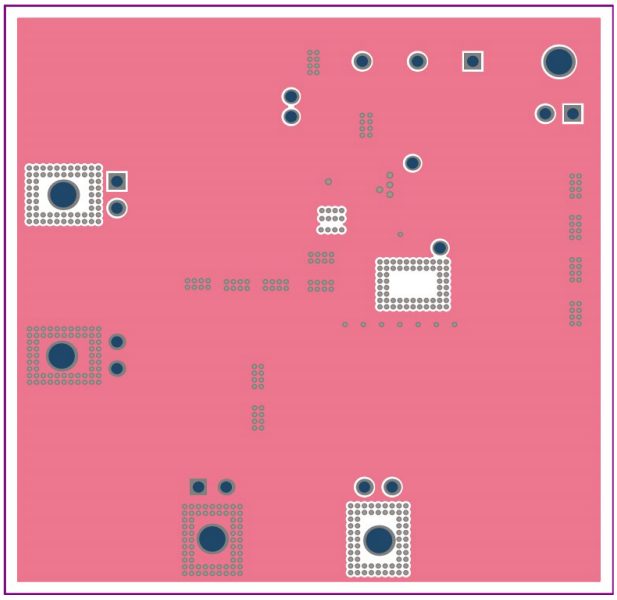

Figure 2. IN2-GND Layer

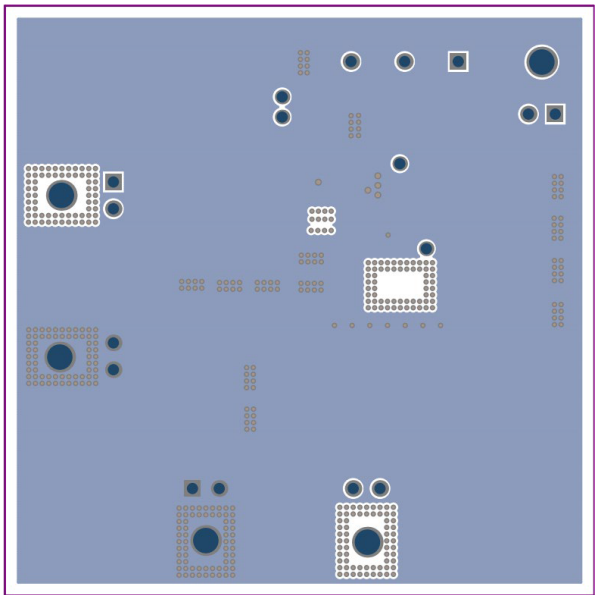

Figure 3. IN3-GND Layer

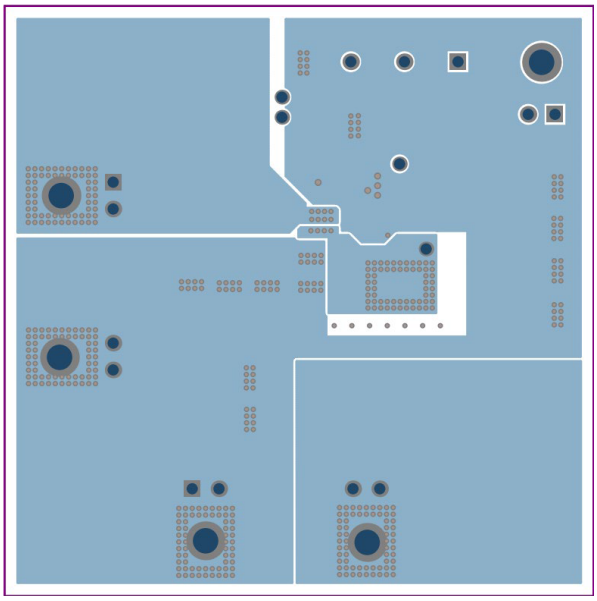

Figure 4. BOT Layer

Quick Start Guide

1. Connect the terminals of load to VOUT and GND connectors.
2. Connect the DC power supply to VIN and GND connects. Set the DC power supply voltage between the operating range of 2V and 28V.
3. Connect the DC power supply to VCC and GND connects. Set the DC power supply voltage between the operating range of 4.5V and 5.5V.
4. Connect the DC power supply to EN and GND connects. Set the DC power supply voltage between the operating range of 3.3V and 5.5V.
5. Measure input voltage at the Vin and GND connectors to eliminate the effect of voltage drop on wire between DC power supply and evaluation board.
6. Measure output voltage at the Vout and GND connectors to eliminate the effect of voltage drop on wire between load and evaluation board.
7. Use oscilloscope to monitor input ripple voltage across input capacitor C1.
8. Use oscilloscope to monitor output ripple voltage across output capacitor C7.
9. When monitoring the LX switching waveform, directly probe across the LX-PGND trace to minimize inductive ringing.

Note:

1. When testing the ripple voltage, remove the cap of the voltage probe and touch the probe tip directly across the Vin or Vout and GND terminals.