

General Description

The AOZ2264QI-30 is a high-efficiency, easy-to-use DC/DC synchronous buck regulator that operates up to 28V. The device is capable of supplying 15A of continuous output current with an output voltage adjustable down to 0.6V $\pm 1\%$.

The AOZ2264QI-30 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 AOZ2264QI-30 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 AOZ2264QI-30 EVB demonstrates the COT buck converter design.

Features include: wide input voltage range -2.7V to 28V; 15A continuous output current; output voltage adjustable down to 0.6V ($\pm 1.0\%$); low $R_{DS(ON)}$ internal NFETs with 9m Ω high-side and 4m Ω low-side; constant on-time with input feed-forward; programmable on-time up to 2.6 μ s; selectable PFM light-load operation; ceramic capacitor stable; adjustable soft start; power good output; integrated bootstrap diode; cycle-by-cycle current limit; short-circuit protection; over voltage protection; thermal shutdown; 4mm x 4mm QFN-23L package..

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

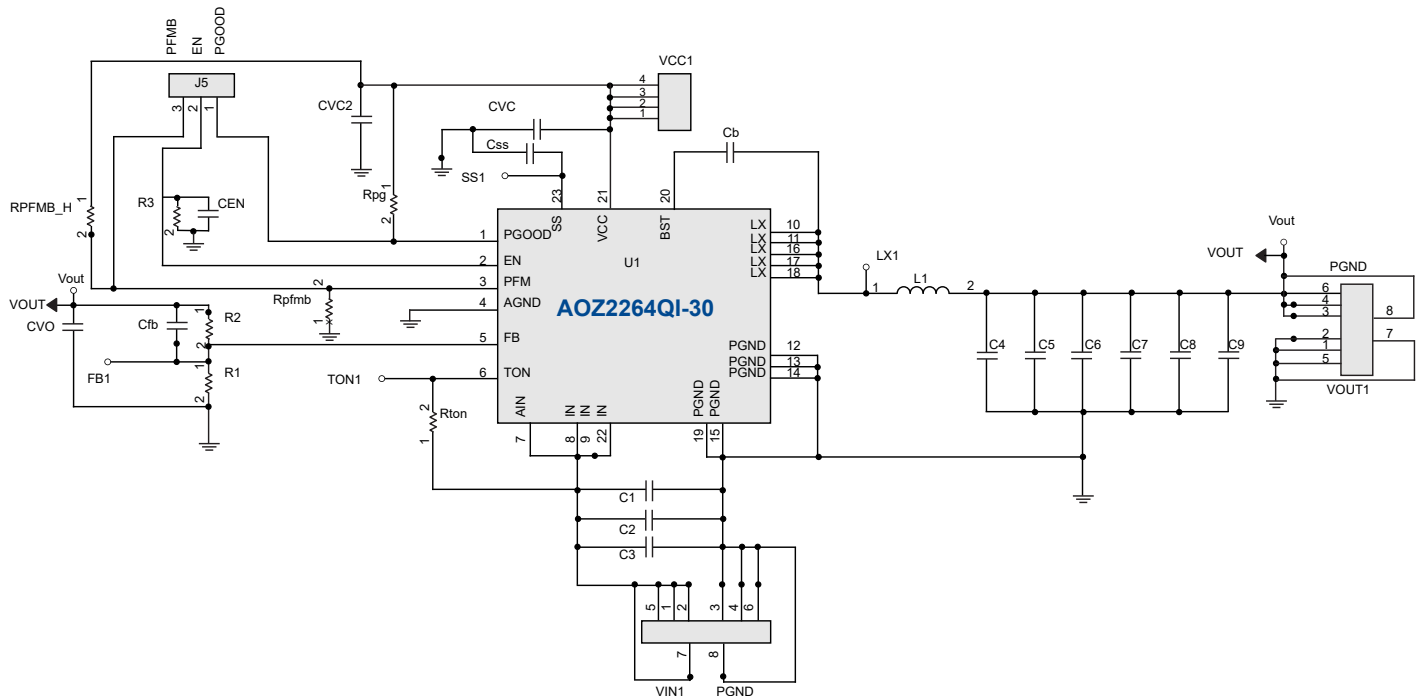


Table 1. AOZ2264QI-30 12Vin to 5Vout Component List

| Ref Designation | Part Number | Description |
|-----------------|--------------------|---------------------------------|
| CB | GRM188R71H104KA01D | Cap, 100nF, 0603, 50V, X7R, 10% |
| CEN | 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, CFB, CVC2 | | Open |
| C1 | | Open |
| C2,C3 | CL31A106KBHNNNE | Cap, 10µF, 1210, 50V, X5R, 10% |
| C4-C11 | 1206X226K250CT | Cap, 22µF, 1206, 25V, X5R, 10% |
| L1 | PI0040-2R2M | Inductor, 2.2µH |
| RPFMB, RPG, R3 | 100K | Res, 100kΩ, 0603, 1%, 1/10W |
| RS, CS | | Open |
| Rton | 470K | Res, 470K, 0603, 1%, 1/10W |
| R1 | 15K | Res, 15K, 0603, 1%, 1/10W |
| R2 | 110K | Res, 110K, 0603, 1%, 1/10W |
| U1 | AOZ2264QI-30 | IC, QFN4X4 |

Output voltage is set by R2: $R2 = R1 \cdot (V_{out} - 0.6) / 0.6$. Table 1 shows the value of the R2 typical output voltage.

Table 2. Option Table

| Part Number | All Protection | | Ripple Reduction | |
|--------------|----------------|-------|------------------|----|
| | Auto Restart | Latch | Yes | No |
| AOZ2264QI-30 | | V | | V |

PCB Layout

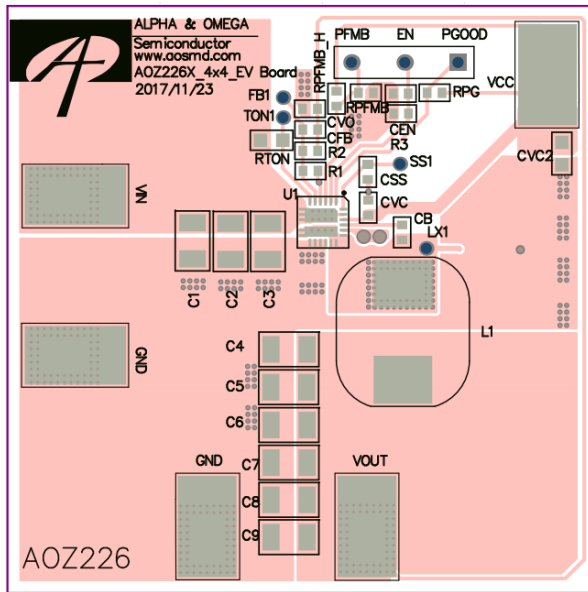


Figure 1. Top Layer

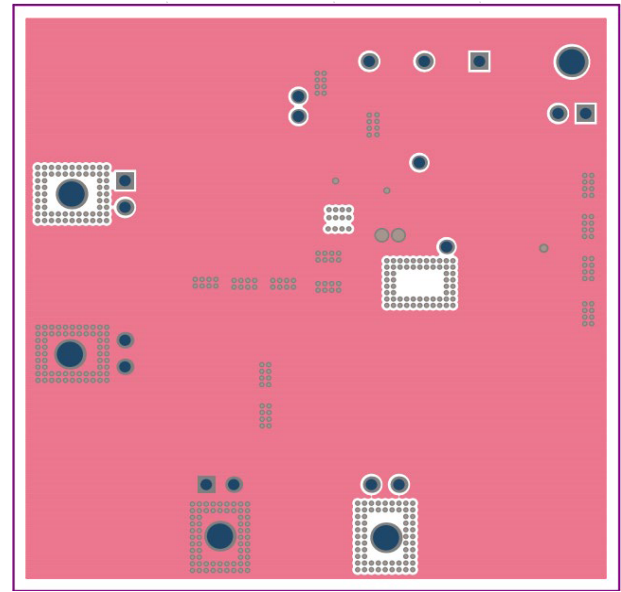


Figure 2. IN2-GND Layer

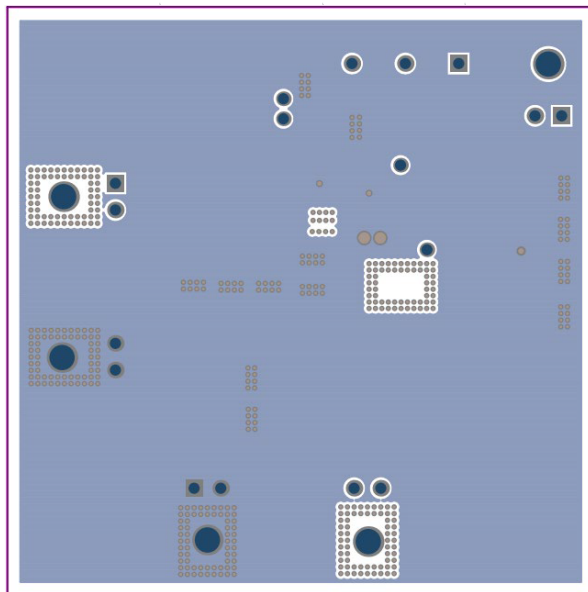


Figure 3. IN3-GND Layer

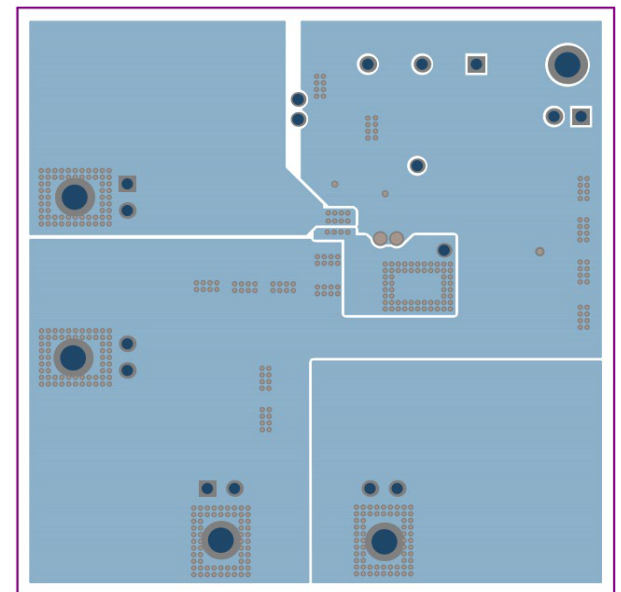


Figure 4. BOT Layer

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 2.7V ~ 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.

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's products are provided subject to AOS's 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 device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or provided in the labeling, can be reasonably expected to system, or to affect its safety or effectiveness. result in a significant injury of the user.
2. A critical component in any component of a life support,