

General Description

The AOZ1016 evaluation board is a fully assembled and tested circuit board built with the AOZ1016 buck regulator IC. It outputs a preset or adjustable voltage at 3.3V and up to 2A of continuous current. The evaluation board requires an input voltage from 4.5V to 16V. The output voltage is preset and can be adjusted from 0.8V to $V_{IN}-0.4V$.

The AOZ1016-EVA circuit features include; current limit, short circuit protection, input under voltage lock out, internal soft start and thermal shut down. It operates at a fixed 500kHz switching frequency. The integrated internal MOSFET minimize component count, board area and total cost.

The AOZ1016-EVA demonstrates the simple buck converter design. Only one resistor value change is required for different output voltages while inductor, capacitor and compensation resistor values are unchanged. The AOZ1016-EVA also supports the simple-layer board design with all ceramic output capacitors.

Features

- 4.5V to 16V operating input voltage range
- Output voltage is preset to 3.3V and adjustable down to 0.8V
- 2A continuous output current
- Fixed 500kHz PWM operation
- Internal soft start
- Cycle-by-cycle current limit
- Short-circuit protection
- Thermal shutdown
- Enables single layer board with all ceramic output capacitors design

Applications

- Point of load DC/DC conversion
- PCIe graphics cards
- Set top boxes
- DVD drives and HDD
- LCD panels
- Cable modems
- Telecom/networking/datacom equipment

Evaluation Board Schematic

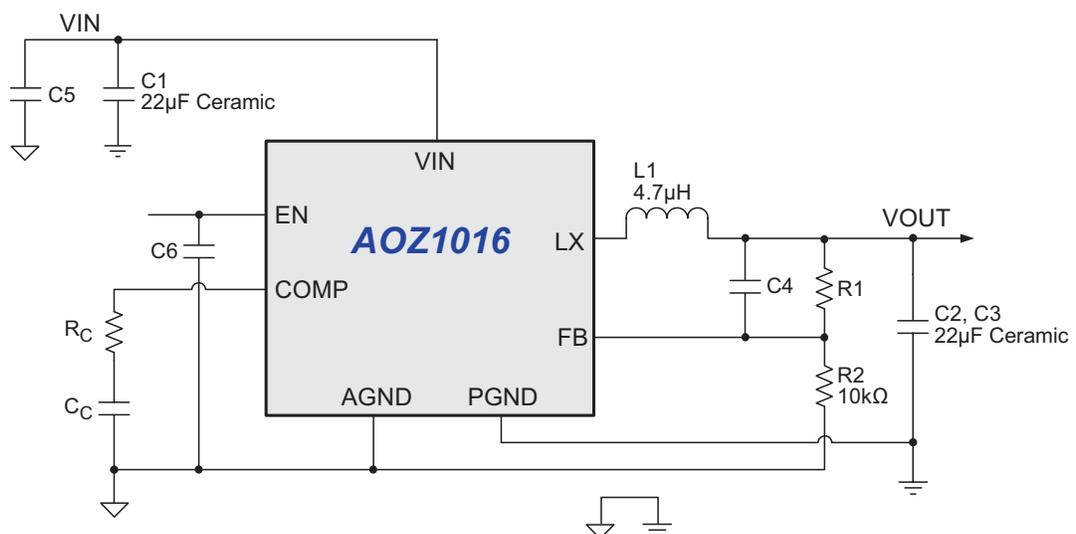


Figure 1.

Component List

Ref Designation	Value	Description	Manufacturer Part Number	Manufacturer
C1	22 μ F	Ceramic Cap, 22 μ F, 25V, 1210, X5R	GRM32ER61E226KE15L	Murata
C2	22 μ F	Ceramic Cap, 22 μ F, 25V, 1210, X5R	GRM32ER61E226KE15L	
C3	22 μ F	Ceramic Cap, 22 μ F, 25V, 1210, X5R	GRM32ER61E226KE15L	
C4	NU			
C5	1 μ F	Ceramic Cap, 1 μ F, 25V, 0603, X5R	GRM188R61E105KA12D	
C6	1000pF	Ceramic Cap, 1000pF, 50V, 0603, X7R	GRM188R71E102K	
C _C	1000pF	Ceramic Cap, 1000pF, 50V, 0603, X7R	GRM188R71E102K	
R _C	20k Ω	Thick Film Res, 1%, 31.6k, 0603	CRCW060320K6FKTAP	DALE
R1 ⁽¹⁾	31.6k Ω	Thick Film Res, 1%, 31.6k, 0603	CRCW060331K6FKTAP	
R2	10k Ω	Thick Film Res, 1%, 10k, 0603	CRCW060310K0FKTAP	
L1	4.7 μ H	Inductor, 4.7 μ H, 2.9A	LQH55DN4R7M03	Murata
U1	AOZ1016AI	Buck Regulator IC, 2A, 16V	AOZ1016AI	AOS

Note:

1. Output voltage is set by R1; $R1 = \frac{8 + (10 \times V_O)}{0.8}$ kohm. Table 1 shows that the value of R1 with typical output voltages.

Table 1.

V _o (V)	R1 (k Ω)
1.2	4.99
1.8	12.7
2.5	21.5
3.3	31.6
5.0	52.3

PCB Layout

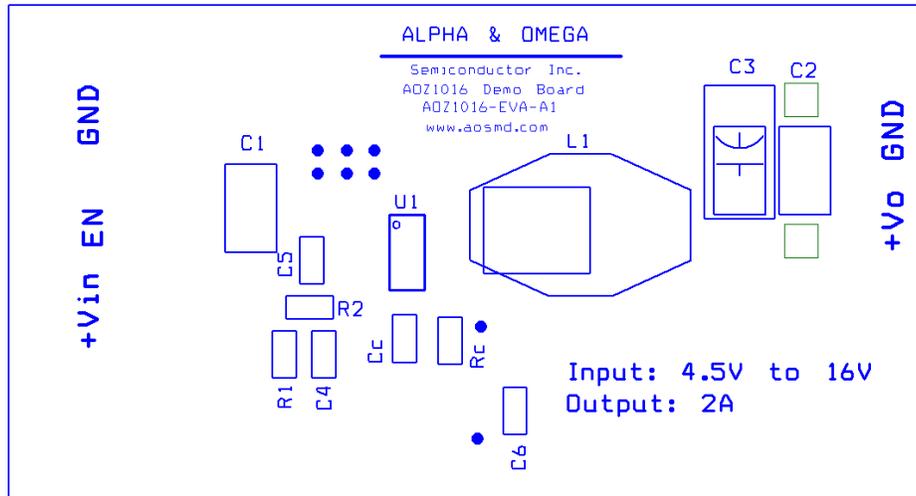


Figure 1. Top Silk Screen

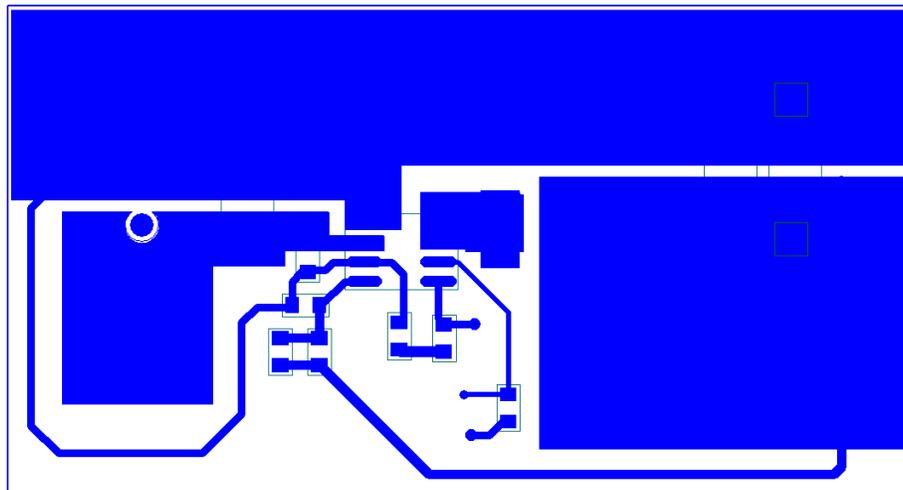


Figure 2. Top Layer

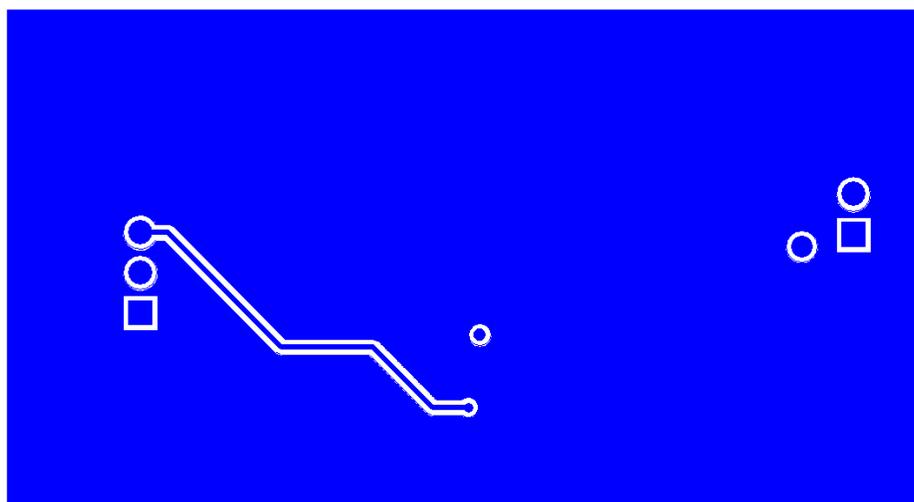


Figure 3. Bottom Layer

Quick Start Guide

1. Connect the terminals of load to +V_{OUT} pins and GND pins. Set load current to between 0A and 2A.
2. Connect the DC power supply to +V_{IN} pin and GND pins. Set DC power supply voltage to between 4.5V and 16V.
3. Connect EN pin to +V_{IN} or any voltage source which is higher than 2V and less than 16V.
4. Turn on DC power supply and evaluation circuit will start.
5. Measure input voltage at the +V_{IN} pin and GND pins to eliminate the effect of voltage drop on wire between DC power supply and evaluation board.
6. Measure output voltage at the +V_{OUT} pin and GND pins to eliminate the effect of voltage drop on wire between load and evaluation board.
7. Use an oscilloscope to monitor input ripple voltage right across input capacitor C1.
8. Use an oscilloscope to monitor output ripple voltage right across output capacitor C2.

This datasheet contains preliminary data; supplementary data may be published at a later date. Alpha & Omega Semiconductor reserves the right to make changes at any time without notice.

LIFE SUPPORT POLICY

ALPHA & 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.