

Description

The AP6508 is a 500kHz switching frequency internal compensated synchronous DC/DC buck converter. It has integrated compensation, and low $R_{\text{DS(ON)}}$ high- and low-side MOSFETs.

The AP6508 features current-mode control operation, which enables fast transient response times and easy loop stabilization.

- Gaming Consoles
- TV sets and Monitors
- Set Top Boxes

The AP6508 has external programmable Softstart and a Power Good indicator.

The AP6508 is available in a standard Green DFN4030-14 with exposed pad for improved thermal performance and is RoHS compliant.

- Distributed power systems
- Home Audio
- Consumer electronics

Performance Spec of AP6508FEG-EVM

Parameter	Conditions	Performance Value
Input voltage	Range 4.75V to 21V	12V
Output Current		3A
Output Voltage		1.2V
Output Voltage Ripple		20mVp-p
Transient Response	Peak Deviation Load step 1.5 A/ μ s to 3A/ μ s	70mV
Switching Frequency		500kHz
Efficiency		90%

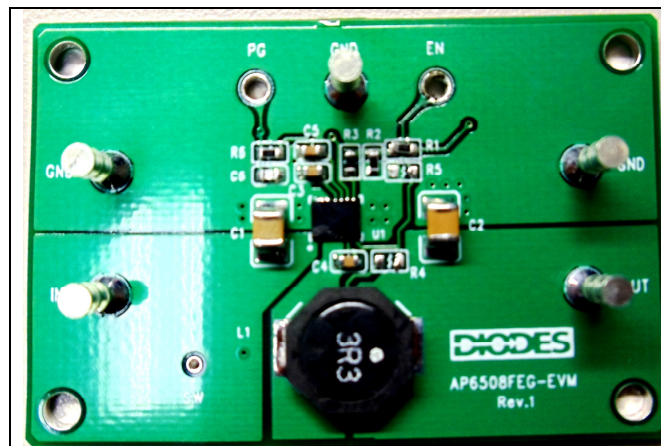


Figure 1. Evaluation Board

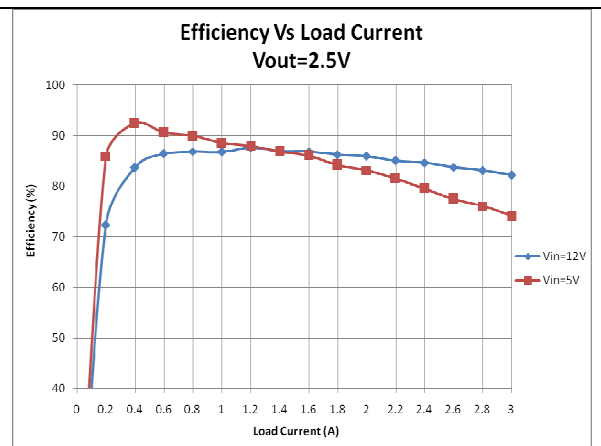


Figure 2. Efficiency vs Load Current

Quick Start Guide

The AP6508FEG-EVM has a simple layout and allows access to the appropriate signals through test points. To evaluate the performance of the AP6508, follow the procedure below:

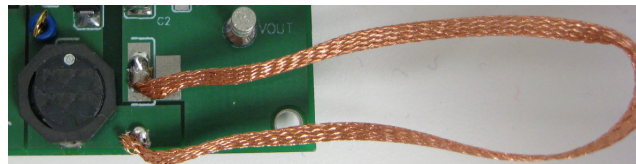
1. Connect a power supply to the input terminals Vin and GND. Set Vin to 12V.
2. Connect the positive terminal of the electronic load to Vout and negative terminal to GND.
3. AP6508 will automatically power up through the resistor divider that connects EN to Vin. This is only valid when Vin =6.5V to 21V.
4. For Vin =4.5V to 6.5V, Connect a power supply to EN and GND. Set EN=3V.

***DO NOT increase the voltage to EN > 5V, as it will damage the part.**

- a. To use the EN function drive EN above 1.3V to start the converter and below 0.4V to stop the converter.
5. The evaluation board will power up with a 1.2V output voltage.
 6. Check for the proper output voltage of 1.2V(+/-1%) at the output terminals Vout and GND. Measurement can also be done with a multimeter with the positive and negative leads between Vout and GND.
 7. Set the load to 1.5A through the electronic load. Check for the stable operation of the SW signal on the oscilloscope. Measure the switching frequency. A test point is conveniently located at the head of the inductor.

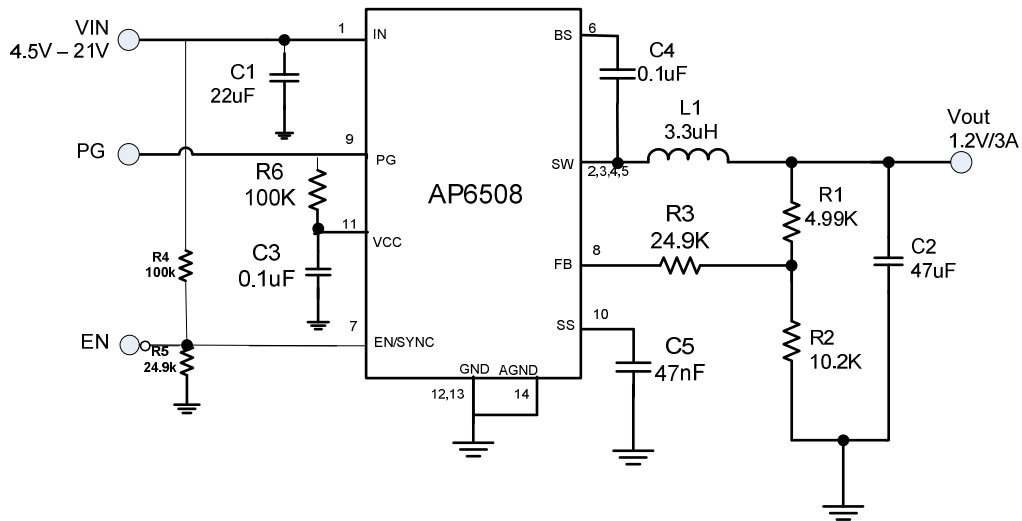
Measurement/Performance Guidelines

- 1) The evaluation board has the inductor pad spaced for easy access to measure the inductor current. As shown in the picture, a current probe can be connected to the wire loop to measure the inductor current.



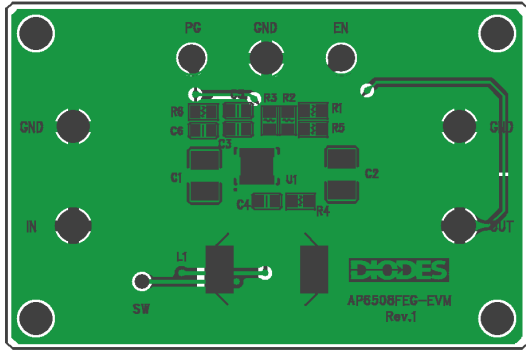
- 2) When measuring the output voltage ripple, avoid long ground leads on the oscilloscope probe.
- 3) For efficiency measurements, connect an ammeter in series with the input supply to measure the input current. Connect an electronic load to the output for output current.

EVALUATION BOARD SCHEMATIC

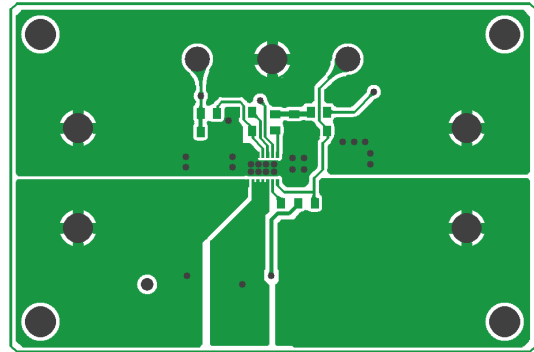


BILL OF MATERIALS

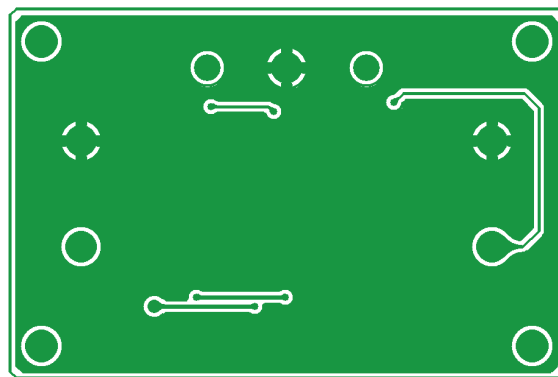
QTY	REF	VALUE	DESCRIPTION	PACKAGE	MANUFACTURER	MANUFACTURER P/N
1	C1	22uF	Ceramic Capacitor, 25V, X5R	1210	AVX	12103D226KAT2A
2	C2	47uF	Ceramic Capacitor, 10V, X5R	1210	AVX	GRM32ER61A476K E20L
3	C3, C4	0.1uF	Ceramic Capacitor, 50V, X7R	0603	TDK	C1608X7R1H104M
4	C5	47nF	Ceramic Capacitor, 16V, X7R	0603	TDK	C1608X7R1C473M
5	C6	DNP				
6	L1	3.3uH	Inductor, 5.3A	SMD	Würth Electronics	7440650033
7	R1	4.99k	Resistor, 1%	0603	Panasonic	ERJ-3EKF4991V
8	R2	10.2k	Resistor, 1%	0603	Panasonic	ERJ-3EKF1022V
9	R3, R5	24.9k	Resistor, 1%	0603	Panasonic	ERJ-3EKF2492V
10	R4, R6	100k	Resistor, 1%	0603	Panasonic	ERJ-3EKF1003V
11	U1		DC/DC Converter	DFN4030-14	Diodes Inc	AP6508



TOP SILK LAYER



TOP LAYER



BOTTOM LAYER