

Description

The AP6503 is a 340kHz switching frequency external compensated synchronous DCDC buck converter. It has integrated low R_{DS(on)} high and low side MOSFETs.

The AP6503 is available in a standard Green SO-8EP package with exposed PAD for improved thermal performance and is RoHS compliant.

The AP6503 enables continuous load current of up to 3A with efficiency as high as 95%. The AP6503 features current mode control operation, which enables fast transient response times and easy loop stabilization.

- Gaming Consoles
- TV sets and Monitors
- Set Top Boxes
- Distributed power systems
- Home Audio
- Consumer electronics

Performance Spec of AP6503SPG-EVM

Parameter	Conditions	Performance Value
Input voltage	Range 4.75V to 23V	12V
Output Current		3A
Output Voltage		3.3V
Output Voltage Ripple		20mVp-p
Transient Response	Peak Deviation Load step 1.5A/us to 3A/us	190mV
Switching Frequency		340kHz
Efficiency		90%

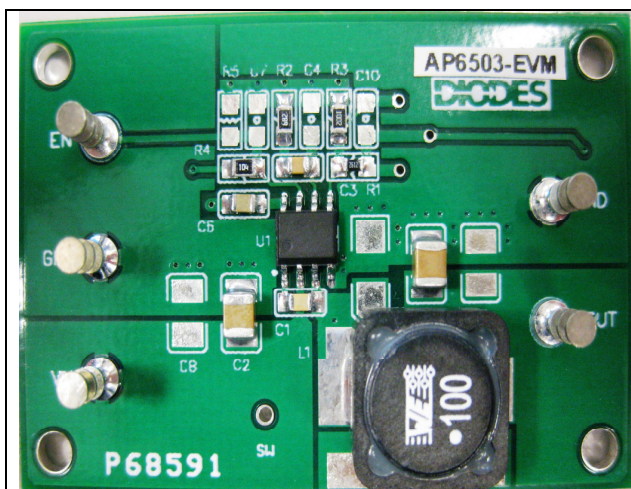


Figure 1. Evaluation Board

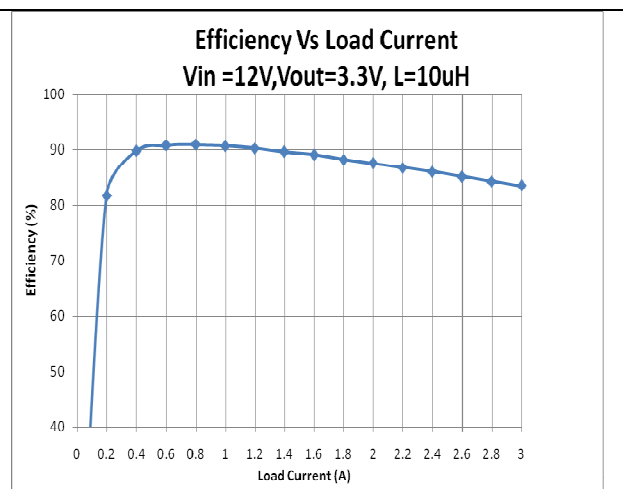


Figure 2. Efficiency vs Load Current

Quick Start Guide

The AP6503-EVM has a simple layout and allows access to the appropriate signals through test points. To evaluate the performance of the AP6503, follow the procedure below:

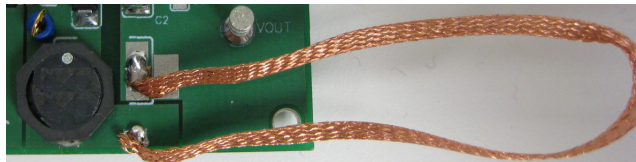
1. Connect a power supply to the input terminals Vin and GND. Set Vin to 12V.
2. Connect the positive terminal of the electronic load to Vout and negative terminal to GND.
3. EN has a positive voltage through a 100K pull-up to Vin. No supply input is required for EN.

Note: To use the EN function drive EN above 1.3V to start the converter and below 0.4V to stop the converter.

4. The evaluation board should now power up with a 3.3V output voltage.
5. Check for the proper output voltage of 3.3V(+/-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.
6. 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.

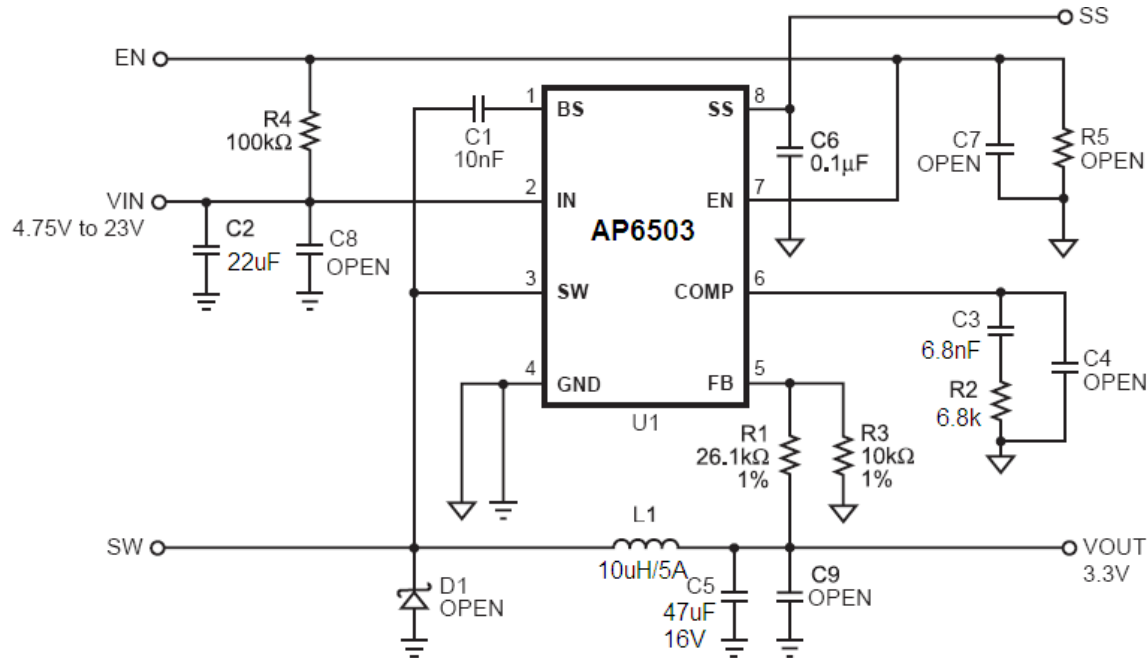
Measurement/Performance Guidelines:

- 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.



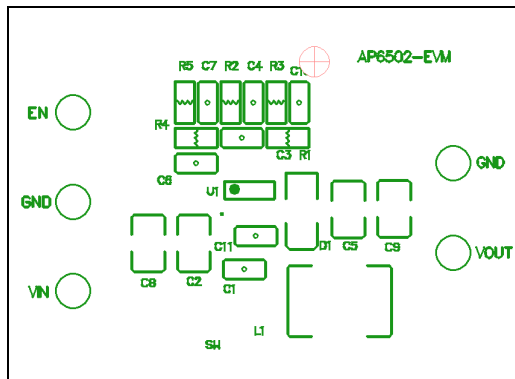
- 2) When measuring the output voltage ripple, maintain the shortest possible ground lengths on the oscilloscope probe. Long ground leads can erroneously inject high frequency noise into the measured ripple.
- 3) For efficiency measurements, connect an ammeter in series with the input supply to measure the input current. Connect an electronic load to the output for output current.

EVALUATION BOARD SCHEMATIC

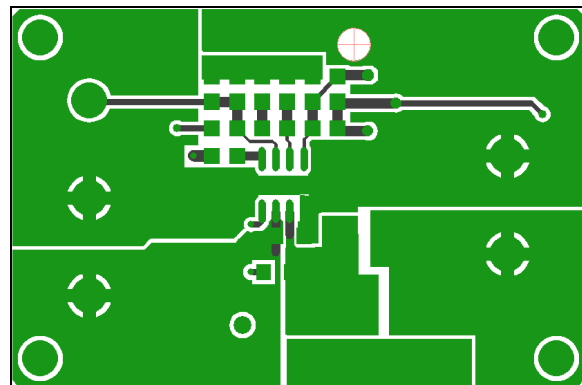


BILL OF MATERIALS

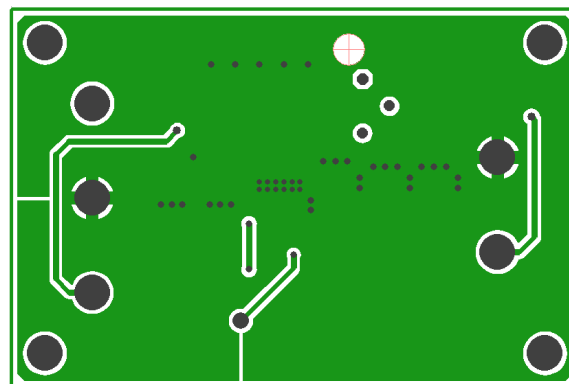
QTY	REF	VALUE	DESCRIPTION	PACKAGE	MANUFACTURER	MANUFACTURER P/N
1	C1	10nF	Ceramic Capacitor, 25V,X5R	SM0805	AVX	08055C103KAT2A
2	C2	22uF	Ceramic Cap, 16V, X5R	1210	AVX	1210YD226KAT2A
3	C3	6.8nF	Ceramic Cap, 50V, X7R	SM0805	AVX	08055C682KAT2A
4	C5	47uF	Ceramic Capacitor, 10V, X5R	1210	AVX	GRM32ER61A476 KE20L
5	C6	0.1uF	Ceramic Cap, 50V, X7R	0805	AVX	08055C104KAT2A
6	L1	10μh	Inductor, 5.0A	SMD	Würth Electronics	74477110
7	R1	26.1K	Resistor, 1%	0603	Panasonic	CRCW060326K1FK EA
8	R2	6.8KΩ	Resistor, 1%	0603	Panasonic	ERJ-6GEYJ682V
9	R3	10.0k	Resistor, 1%	0603	Panasonic	ERJ-6ENF1002V
10	R4	100k	Resistor, 1%	0603	Panasonic	ERJ-6GEYJ104V
11	U1		DC/DC Converter	SOP-8L-EP	Diodes Inc	AP6503



TOP SILK LAYER



TOP LAYER



BOTTOM LAYER