

DESCRIPTION

The AP62200 is a 2A, synchronous buck converter with a wide input voltage range of 4.2V to 18V. The device fully integrates a 90mΩ high-side power MOSFET and a 65mΩ low-side power MOSFET to provide high-efficiency step-down DC/DC conversion.

The AP62200 device is easily used by minimizing the external component count due to its adoption of Constant On-Time (COT) control to achieve fast transient response, easy loop stabilization, and low output voltage ripple.

The AP62200 design is optimized for Electromagnetic Interference (EMI) reduction. It has a proprietary gate driver scheme to resist switching node ringing without sacrificing MOSFET turn-on and turn-off times, which reduces high-frequency radiated EMI noise caused by MOSFET switching.

The AP62200 requires a minimal number of external components and are available in a space-saving TSOT26 package.

FEATURES

- V_{IN} Range: 4.2V -18V
- Output Voltage range: 0.8V to 7V
- 2A Continuous Output Current
- 135μA Low Quiescent Current
- 740kHz Switching Frequency
- Fully Integrated High-side/Low-side Power MOSFETs: 90mΩ/65mΩ
- Cycle-by-Cycle Current Limiting
- Internal Soft-Start Limits the inrush current: 2.5mS
- Available in a TSOT26 package
- Totally Lead-Free & Fully RoHS Compliant
- Halogen and Antimony Free. "Green" Device

APPLICATIONS

- Flat Screen TV Sets and Monitors
- Set Top Boxes
- Consumer Electronics
- Network Systems
- General Purposes

TYPICAL APPLICATIONS CIRCUIT

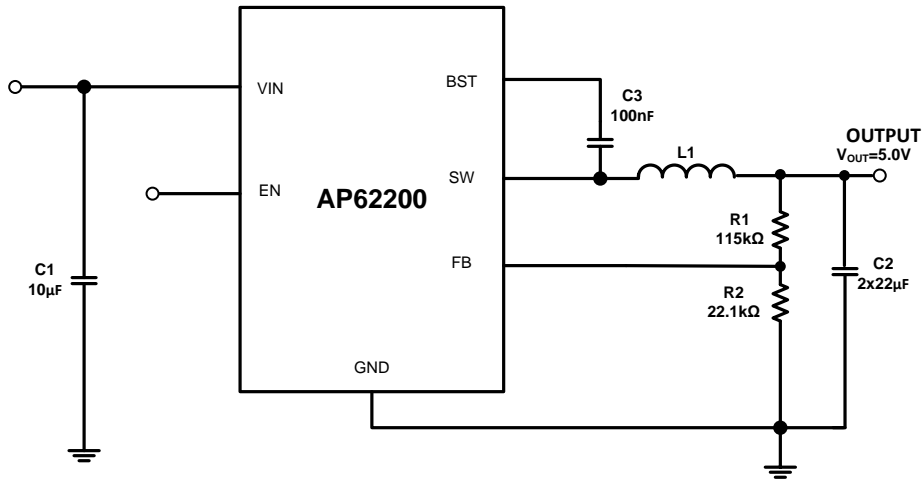


Figure 1. Typical Application Circuit

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Rating	Unit
V_{IN}	Supply Voltage	-0.3 to +20	V
V_{SW}	Switch Node Voltage	-1.0 to $V_{IN}+0.3$	V
V_{BST}	Bootstrap Voltage	$V_{SW}-0.3$ to $V_{SW}+6.0$	V
V_{FB}	Feedback Voltage	-0.3V to +6.0	V
V_{EN}	Enable/UVLO Voltage	-0.3V to +6.0	V
T_{ST}	Storage Temperature	-65 to +150	°C
T_J	Junction Temperature	+125	°C
T_L	Lead Temperature	+260	°C
ESD Susceptibility			
HBM	Human Body Mode	2000	V
CDM	Device Charged Model	500	V

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Rating	Unit
V_{IN}	Supply Voltage	4.2 to 18	V
V_{OUT}	Output Voltage Range	0.8 to 7	V
T_A	Operating Ambient Temperature	-40 to +85	°C
T_J	Operating Junction Temperature	-40 to +125	°C

SETTING OUTPUT VOLTAGE:

Table 1 shows a list of recommended component selections for common output voltages.

V _{OUT}	R1	R2	L1
1.0V	5.5KΩ	22.1KΩ	2.2μH
1.2V	11.0KΩ	22.1KΩ	2.2μH
1.5V	19.1KΩ	22.1KΩ	2.2μH
1.8V	27.4KΩ	22.1KΩ	3.3μH
2.5V	47.5KΩ	22.1KΩ	3.3μH
3.3V	69.8KΩ	22.1KΩ	3.3μH
5.0V	115KΩ	22.1KΩ	4.7μH

Table 1. Common Output Voltages

EVALUATION BOARD

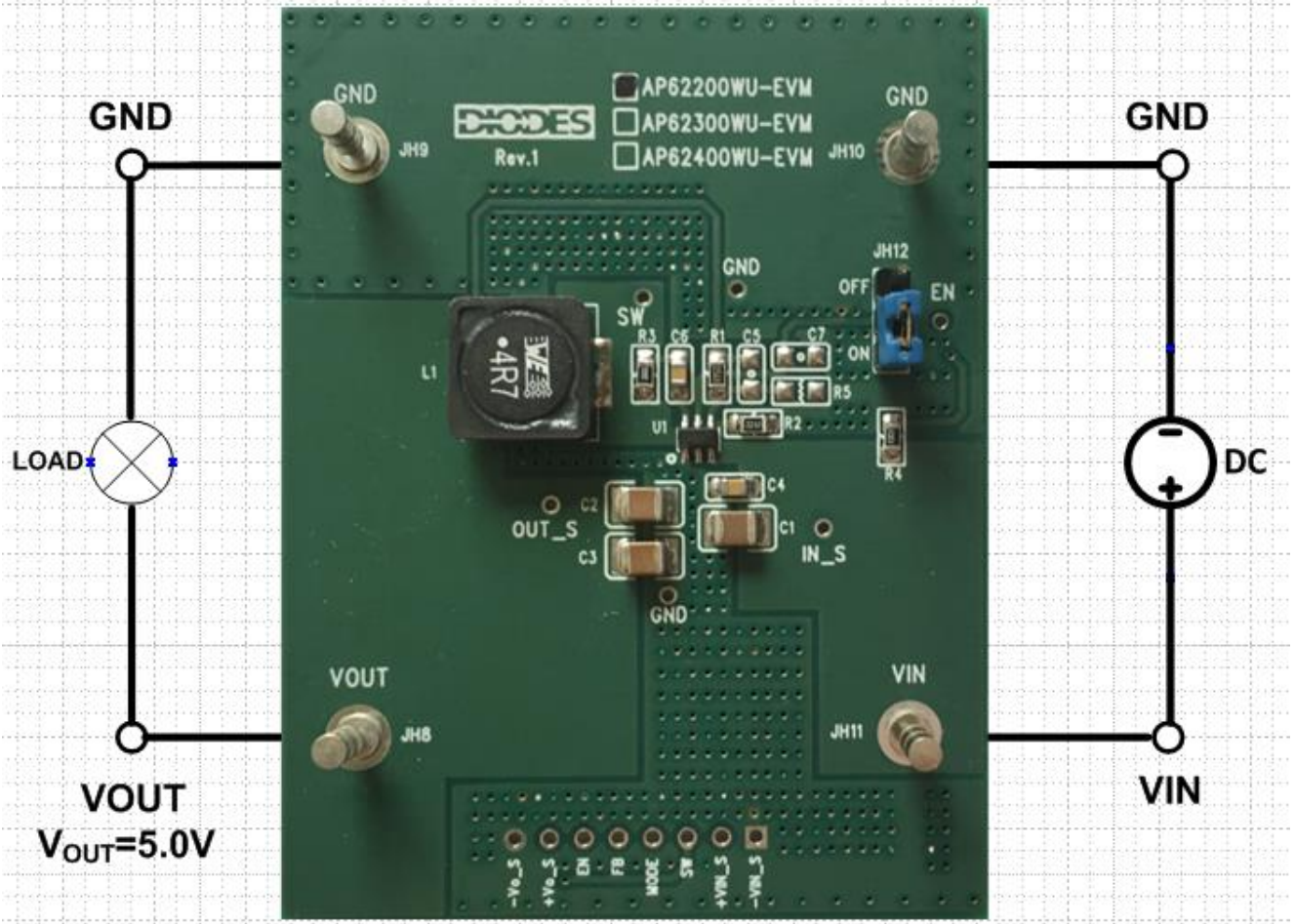


Figure 2. AP62200WU-EVM

QUICK START GUIDE

The AP62200WU-EVM has a simple layout and allows access to the appropriate signals through test points. To evaluate the performance of the AP62200WU, follow the procedure below:

1. Connect a power supply to the input terminals V_{IN} and GND. Set V_{IN} to 12V.
2. Connect the positive terminal of the electronic load to V_{OUT} and negative terminal to GND.
3. For Enable, place a jumper at JH12 to “ON” position to connect EN pin to V_{IN} through 100K Ω resistor to enable IC. Jump to “OFF” position to disable IC.
4. The evaluation board should now power up with a 5.0V output voltage.
5. Check for the proper output voltage of 5.0V ($\pm 1\%$) at the output terminals V_{OUT} and GND. Measurement can also be done with a multimeter with the positive and negative leads between V_{OUT} and GND.
6. Set the load to 2A through the electronic load. Check for the stable operation of the SW signal on the oscilloscope. Measure the switching frequency.

MEASUREMENT/PERFORMANCE GUIDELINES:

- 1) 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.
- 2) 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

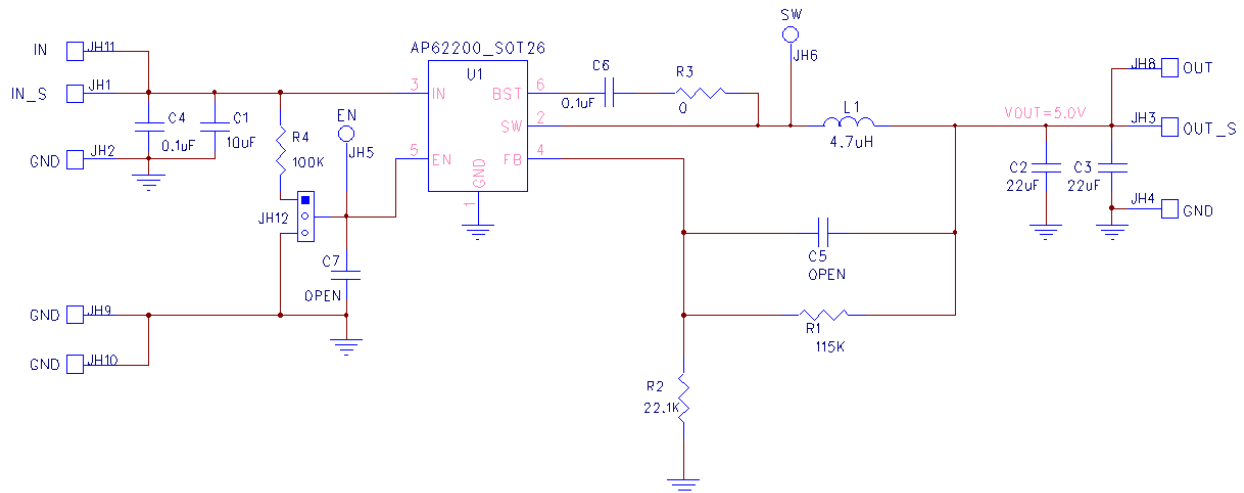


Figure 3. AP62200WU-EVM Schematic

PCB TOP LAYOUT

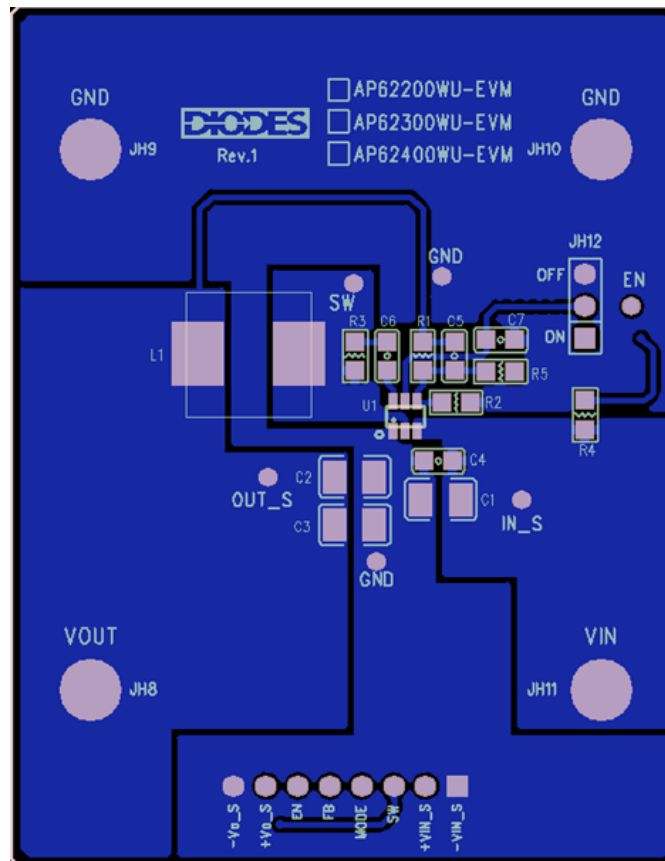


Figure 4. AP62200WU-EVM – Top Layer

PCB BOTTOM LAYOUT

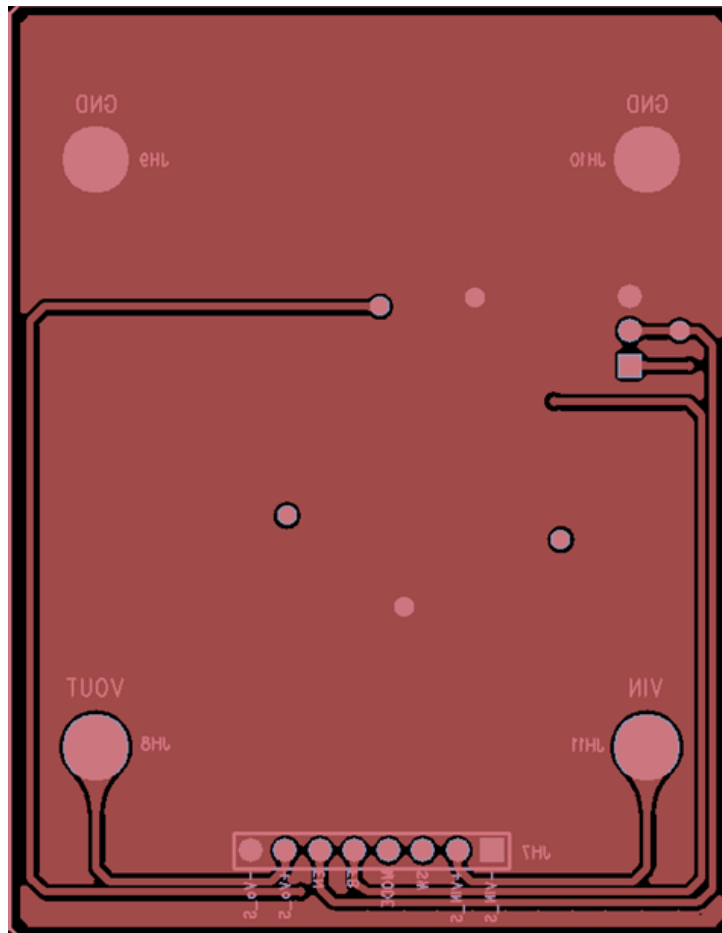
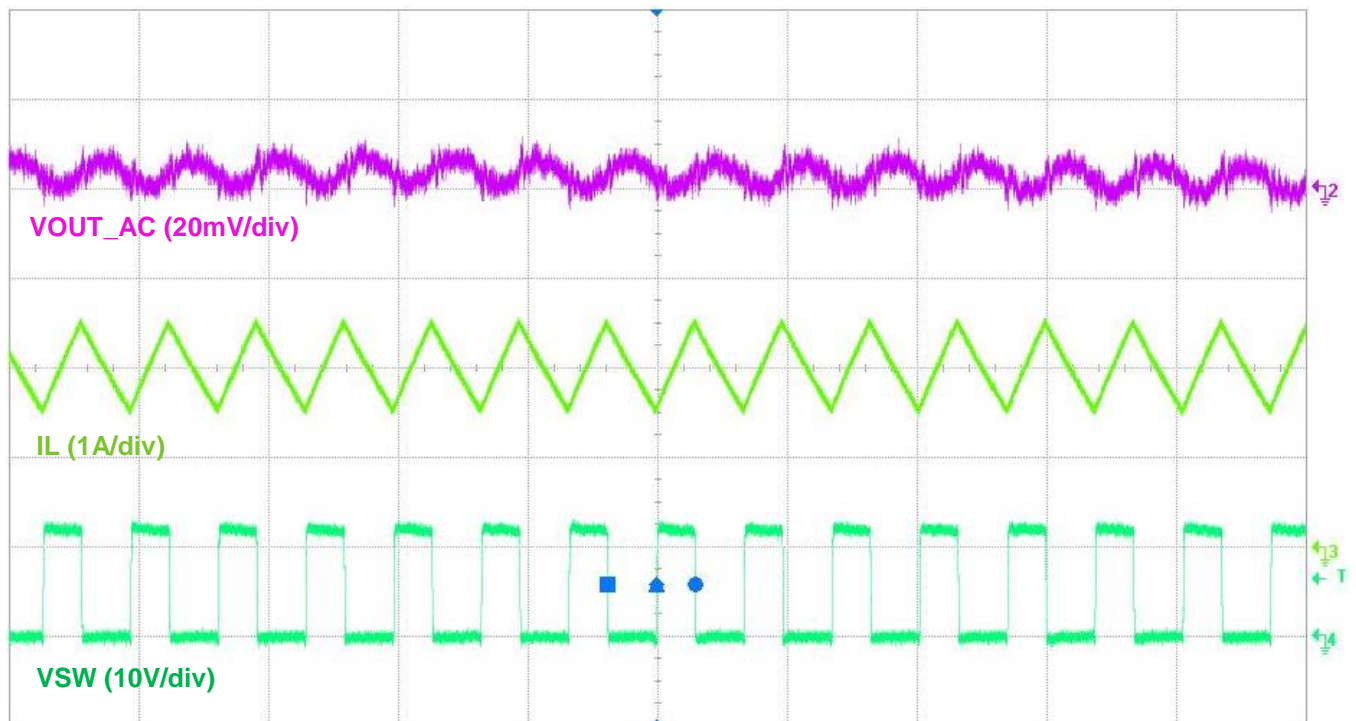
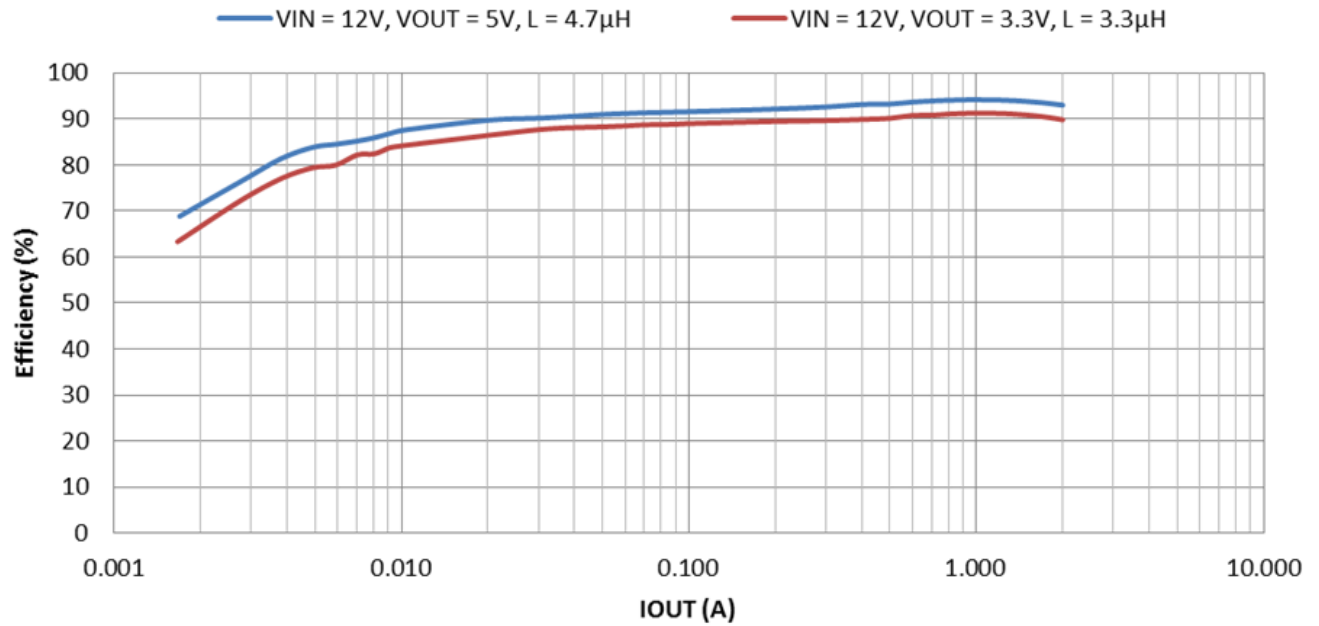


Figure 5. AP62200WU-EVM – Bottom Layer

BILL OF MATERIALS for AP62200WU-EVM for V_{OUT}=5V

Ref	Value	Description	Qty	Size	Vendor Name	Manufacturer PN
C1	10 μ F	Ceramic Capacitor, 25V, X5R	1	1210	Murata	GRM32DR61E106KA12L
C2, C3	22 μ F	Ceramic Capacitor, 25V, X5R	2	1210	AVX	12103D226KAT2A
C4, C6	0.1 μ F	Ceramic Capacitor, 25V, X7R, 10%	2	0805	Samsung	CL21B104KACNNNC
L1	4.7 μ H	DCR=19.5m Ω , Ir=6.2A	1	10.2X10.2x4.5mm	Würth Electronics	744779747
R1	115K Ω	Film Resistor, 1%	1	0805	Panasonic	ERJ-6ENF1153V
R2	22.1K Ω	Film Resistor, 1%	1	0805	Panasonic	ERJ-6ENF2212V
R3	0 Ω	Film Resistor, 1%	1	0805	Panasonic	ERJ-6GEY0R00V
R4	100K Ω	Film Resistor, 1%	1	0805	Panasonic	ERJ-6ENF1003V
JH8, JH9, JH10, JH11,	1598	Terminal Turret Triple 0.094" L (Test Points)	4	Through-Hole	Keystone Circuit	1598-2
JH12		PCB Header, 40 POS	1	1X3	3M	2340-611TG
U1	AP62200	DC/DC converter	1	TSOT26	Diodes Inc	AP62200WU

TYPICAL PERFORMANCE CHARACTERISTICS



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