

### **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

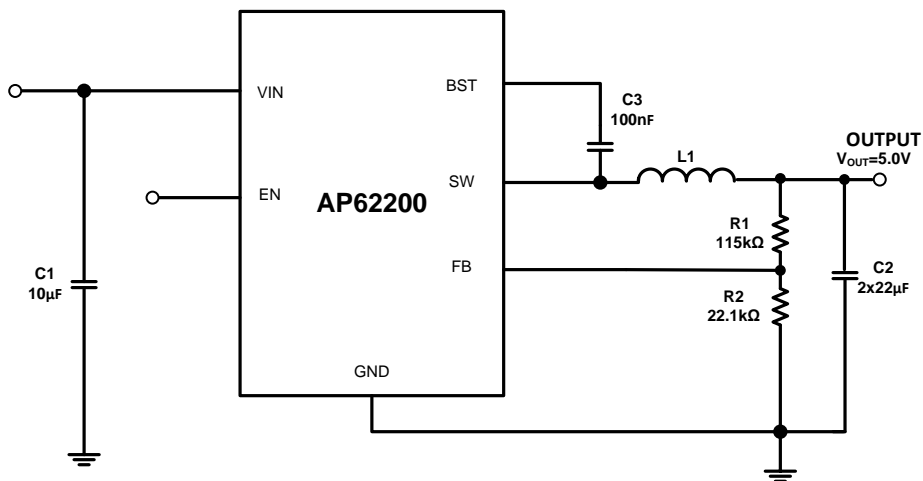


Figure 1. Typical Application Circuit

### 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
<b>ESD Susceptibility</b>			
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

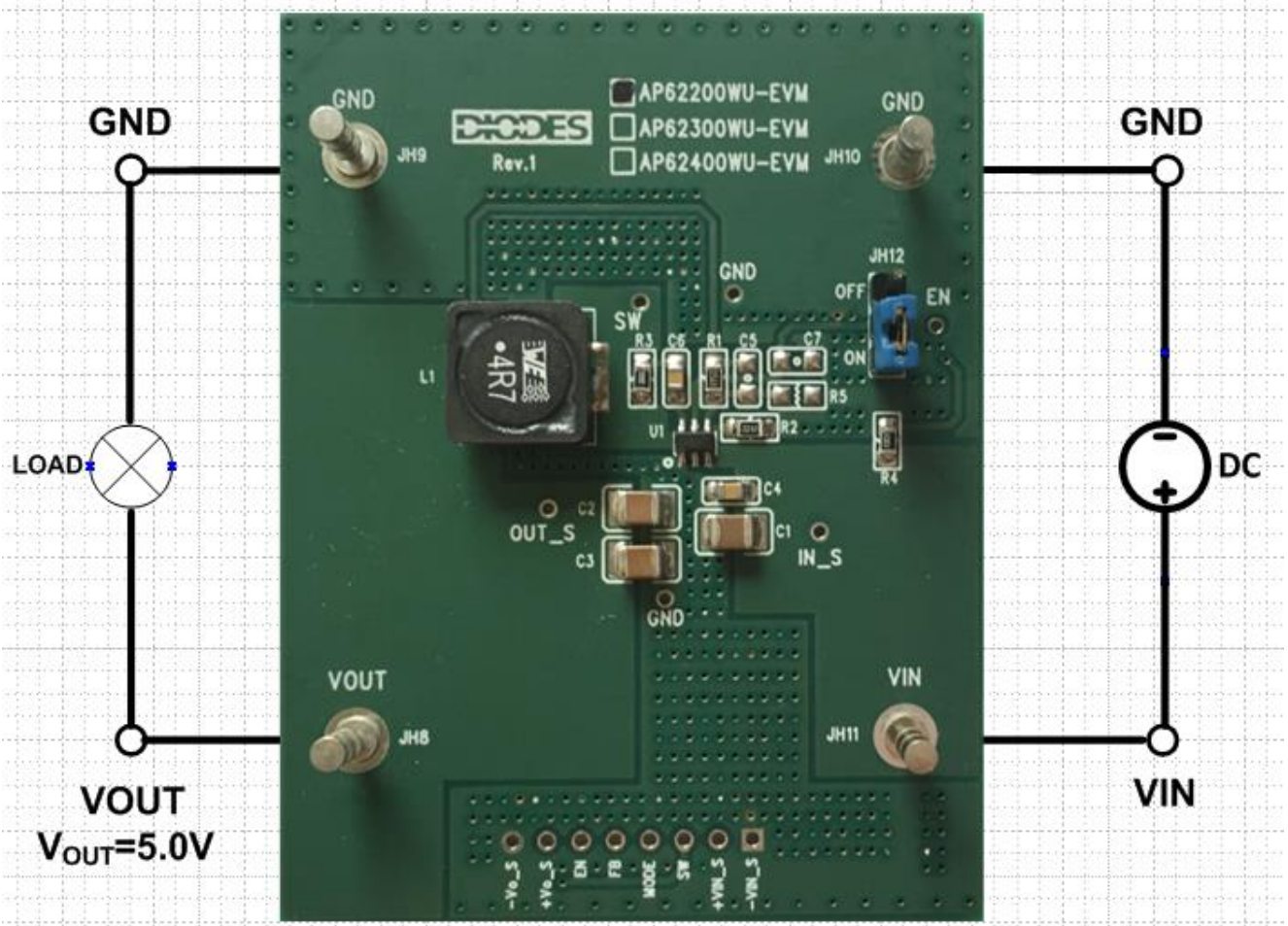
### SETTING OUTPUT VOLTAGE:

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

V <sub>OUT</sub>	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 $\Omega$  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**

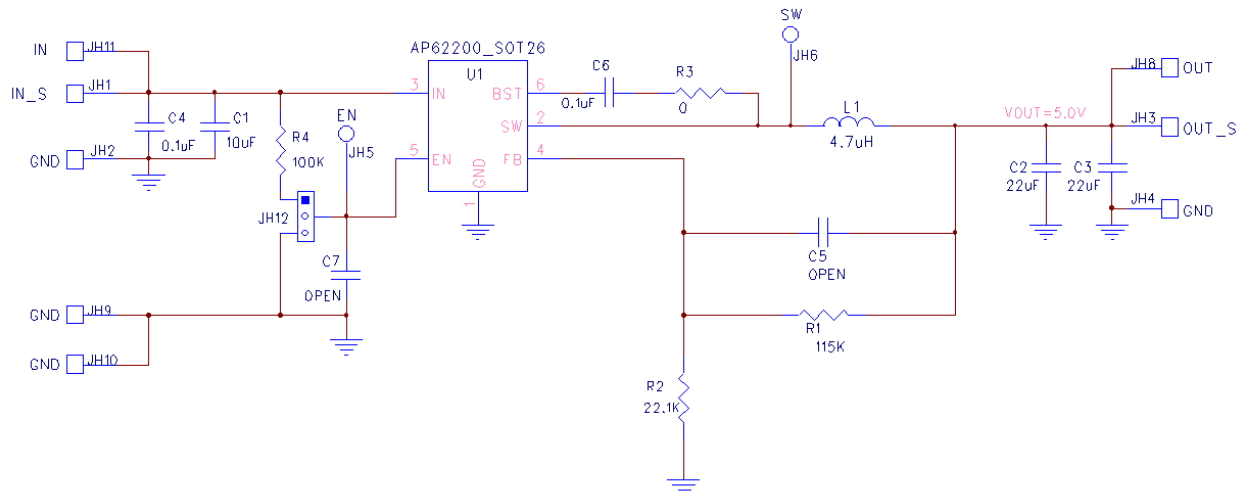


Figure 3. AP62200WU-EVM Schematic

**PCB TOP LAYOUT**

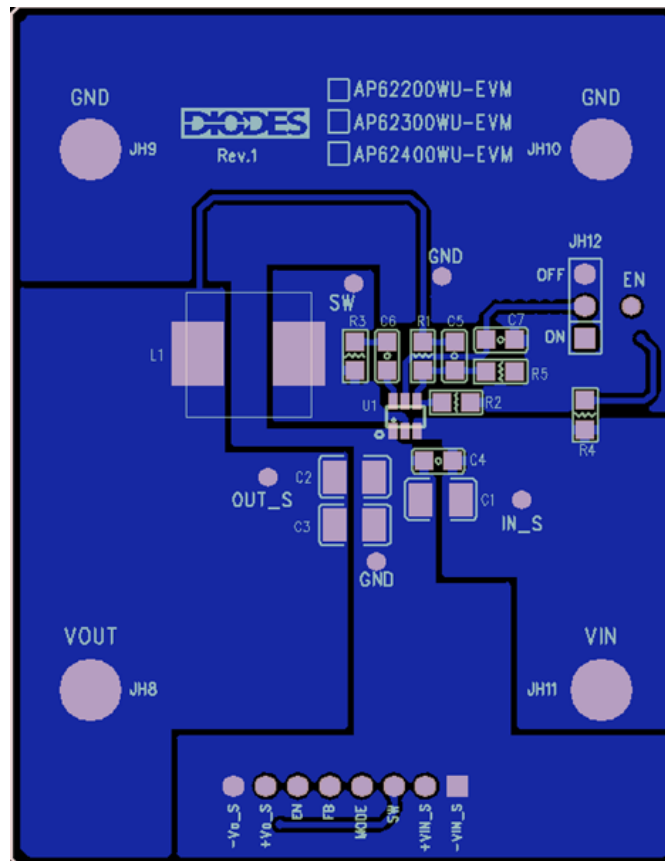
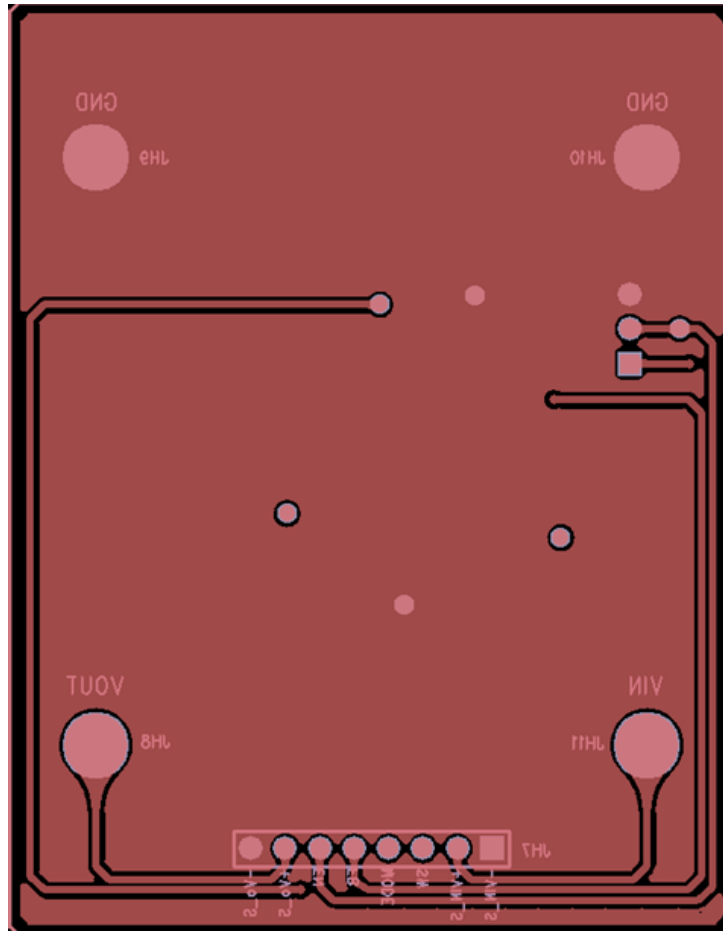


Figure 4. AP62200WU-EVM – Top Layer

**PCB BOTTOM LAYOUT**

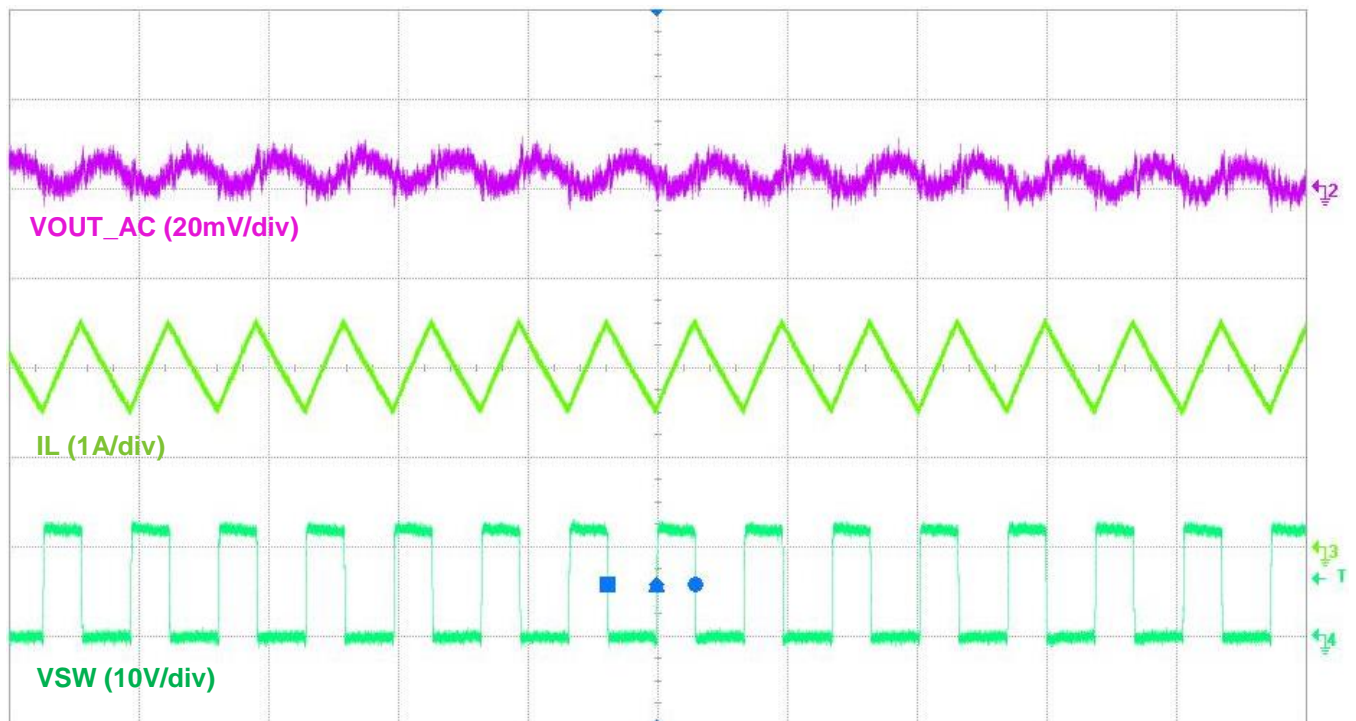
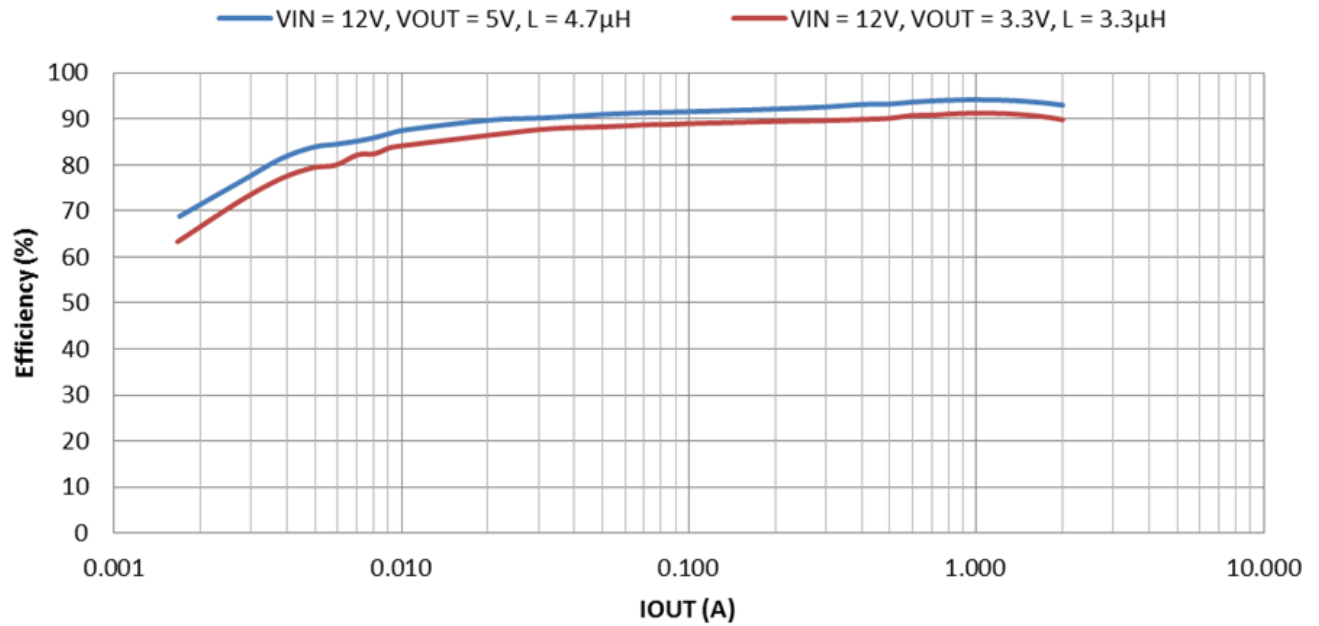


**Figure 5. AP62200WU-EVM – Bottom Layer**

### BILL OF MATERIALS for AP62200WU-EVM for V<sub>OUT</sub>=5V

Ref	Value	Description	Qty	Size	Vendor Name	Manufacturer PN
C1	10 $\mu$ F	Ceramic Capacitor, 25V, X5R	1	1210	Murata	GRM32DR61E106KA12L
C2, C3	22 $\mu$ F	Ceramic Capacitor, 25V, X5R	2	1210	AVX	12103D226KAT2A
C4, C6	0.1 $\mu$ F	Ceramic Capacitor, 25V, X7R, 10%	2	0805	Samsung	CL21B104KACNNNC
L1	4.7 $\mu$ H	DCR=19.5m $\Omega$ , Ir=6.2A	1	10.2X10.2x4.5mm	Würth Electronics	744779747
R1	115K $\Omega$	Film Resistor, 1%	1	0805	Panasonic	ERJ-6ENF1153V
R2	22.1K $\Omega$	Film Resistor, 1%	1	0805	Panasonic	ERJ-6ENF2212V
R3	0 $\Omega$	Film Resistor, 1%	1	0805	Panasonic	ERJ-6GEY0R00V
R4	100K $\Omega$	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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