EV28114DG-00A

600mA Synchronous Buck Step-Down Converter

The Future of Analog IC Technology

DESCRIPTION

The EV28114 evaluation board is designed for low dropout step down converter applications. It implements the MP28114 1.7MHz Fixed Frequency, Current Mode, PWM step-down converter. The device integrates a main switch and a synchronous rectifier for high efficiency without an external Schottky diode. It is ideal for powering portable equipments that runs from a single cell Lithium-Ion (Li+) Battery. It can supply 600mA of load current from a 2.5V to 6V input voltage. The output voltage can be regulated as low as 0.6V. In 100% Duty Cycle Dropout operation, it works with minimum input voltage as low as output voltage.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage Range	V_{IN}	2.5 – 6.0	V
Output Voltage	V_{OUT}	1.8	V
Load Max	I_{OUT}	600	mA

FEATURES

- High Efficiency: Up to 95%
- 600mA Available Load Current
- 2.5V to 6V Input Voltage Range
- Output Voltage as Low as 0.6V
- 100% Duty Cycle in Dropout
- Short Circuit Protection
- Thermal Fault Protection
- <0.1μA Shutdown Current
- Programmable Enable Control

APPLICATIONS

- Cellular and Smart Phones
- Microprocessors/DSP Core Supplies
- PDAs
- MP3 Players
- Digital Still and Video Cameras
- Portable Instruments

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EV28114DG-00A EVALUATION BOARD

Dimensions (2.5"X x 2.5"Y x 0.5"Z)	
Board Number	**MPS IC Number**
EV28114DG-00A	MP28114DG

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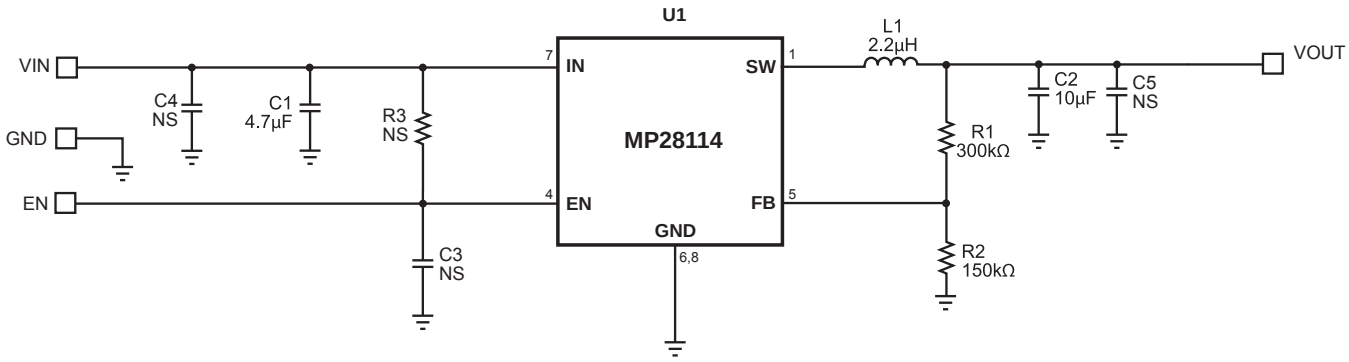
EVALUATION BOARD SCHEMATIC



EV28114DG-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	4.7uF	Ceramic Cap., 10V, X5R	SM0805	TDK	C2012X5R1A475K
1	C2	10uF	Ceramic Cap., 6.3V, X5R	SM0805	KYOCERA	CM21X5R106K06AT
3	C3,C4, C5		Do Not Stuff			
1	L1	2.2uH	1.63A	SMD	TOKO	D52LC-#A914BYW-2R2M
1	R1	300kΩ	Film Res., 1%	SM0603	Yageo	RC0603FR-07300KL
1	R2	150kΩ	Film Res., 1%	SM0603	Yageo	RC0603FR-07150KL
1	R3		Do Not Stuff			
1	U1		DC-DC Converter	QFN8	MPS	MP28114DG

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PRINTED CIRCUIT BOARD LAYOUT

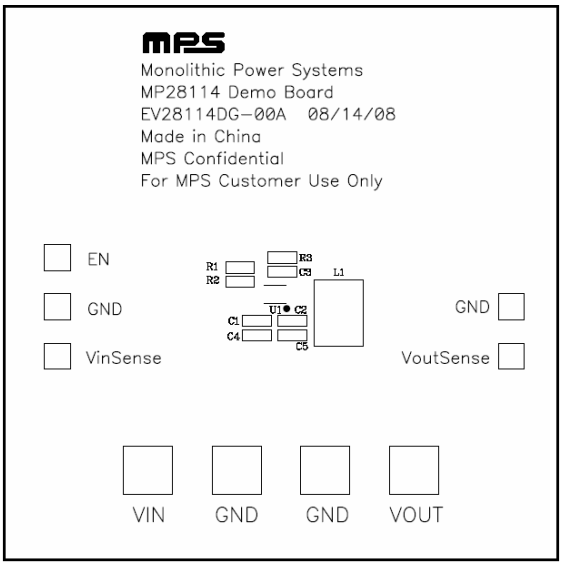

Figure 1—Top Silk Layer

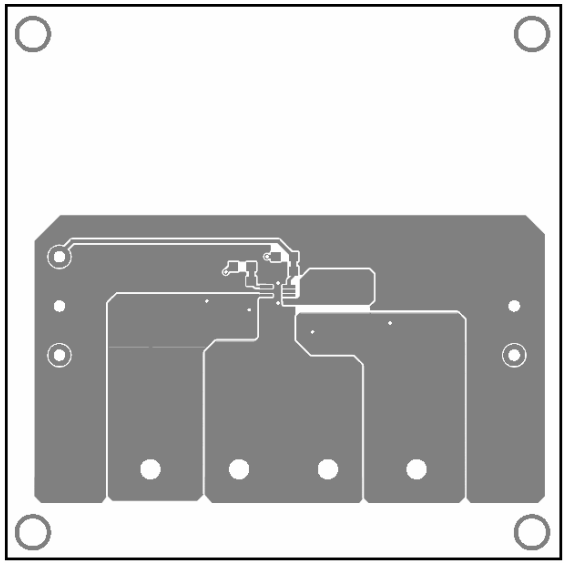

Figure 2—Top Layer

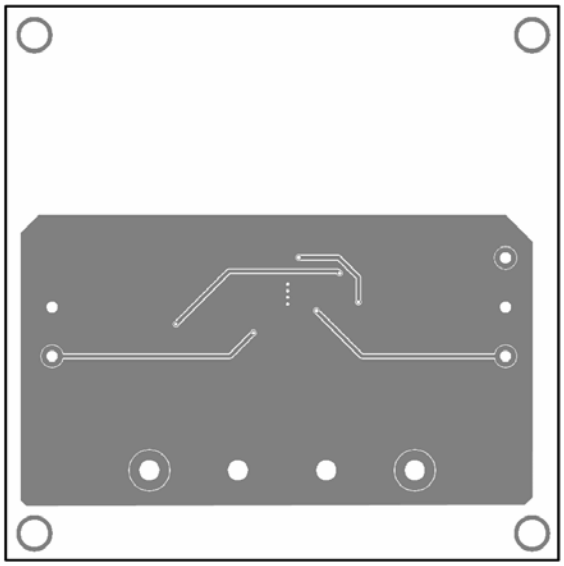

Figure 3—Bottom Layer

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QUICK START GUIDE (ADJUSTABLE OUTPUT)

The default output voltage of this board is set to 1.8V.

The board layout accommodates most commonly used inductors and output capacitors.

1. Attach the positive and negative ends of the load to the VOUT and GND pins, respectively.
2. Attach the Input Voltage ($2.5V \le V_{IN} \le 6V$) and Input Ground to the VIN and GND pins, respectively.
3. To enable the MP28114 apply a voltage, $1.5V \le V_{EN} \le 6V$, to the EN pin. To disable the MP28114 apply a voltage, $V_{EN} < 0.3V$, to the EN pin. A 100KΩ resistor can be set in R3 to connect the EN pin to the IN pin, so the part will operate without applying any external voltage to the EN pin.
4. The Output Voltage V_{OUT} can be changed by varying R2. Calculate the new value by formula:

$$R2 = \frac{R1}{\left(\frac{V_{OUT}}{V_{FB}}\right) - 1}$$

Where V_{FB} = 0.6V and R1 = 300kΩ.

Example:

For V_{OUT} = 1.8V:

$$R2 = \frac{300k\Omega}{\left(\frac{1.8V}{0.6V}\right) - 1} = 150k\Omega$$

Therefore, use a 150kΩ standard 1% value.

QUICK START GUIDE (MODIFICATION FOR FIXED OUTPUT)

For modifying the EV28114DG-00A to accommodate a fixed output voltage version of the MP28114:

1. Verify that a fixed output version of the MP28114 chip is on the evaluation board. Refer to MP28114 datasheet for fixed voltage package codes.
2. Remove both R1 and R2.
3. Short R1 while leaving R2 open.
4. Attach the positive and negative ends of the load to the VOUT and GND pins, respectively.
5. Attach the Input Voltage ($2.5V \le V_{IN} \le 6V$) and Input Ground to the VIN and GND pins, respectively.
6. To enable the MP28114 apply a voltage, $1.5V \le V_{EN} \le 6V$, to the EN pin. To disable the MP28114 apply a voltage, $V_{EN} < 0.3V$, to the EN pin. The default setting for the jumper J1 on the board connects V_{IN} to the EN pin. In this configuration, the part will operate without applying any external voltage to the EN pin.

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