



The Future of Analog IC Technology™

EV2307DN-00A

3A, 23V, 340KHz

Synchronous Step-Down Converter

EVALUATION BOARD – INITIAL RELEASE

GENERAL DESCRIPTION

The MP2307 is a monolithic synchronous buck regulator. The device integrates 100mΩ MOSFETS that provide 3A continuous load current over a wide operating input voltage range of 4.75V to 23V. Current mode control provides fast transient response and cycle-by-cycle current limit.

An adjustable soft-start prevents inrush current at turn-on. In shutdown mode, the supply current drops to only 1μA.

This device, available in an 8-pin SOIC package, provides a very compact system solution with minimal reliance on external components.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Supply Voltage	V_{IN}	4.75 to 23	V
Output Voltage	V_{OUT}	3.3	V
Output Current	I_{OUT}	0 to 3	A

FEATURES

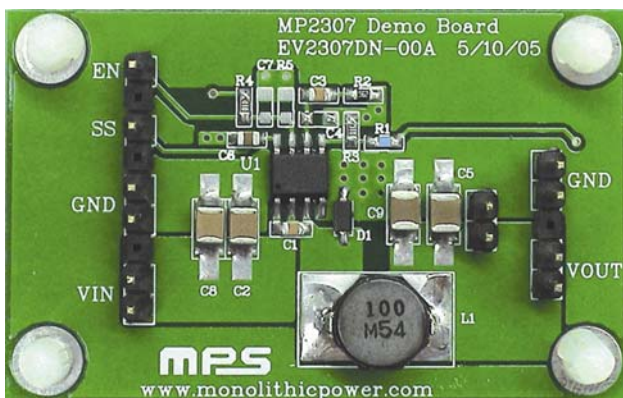
- Up to 3A Output Current
- Wide 4.75V to 23V Operating Input Range
- Monolithic Synchronous Buck with 100mΩ High-Side and Low-Side FETs
- Fixed 340KHz Frequency
- All Ceramic Input and Output Capacitors
- Programmable Soft-Start
- Programmable Input Under Voltage Lockout

APPLICATIONS

- Distributed Power Systems
- Networking Systems
- FPGA, DSP, ASIC Power Supplies
- Green Electronics/ Appliances
- Notebook Computers

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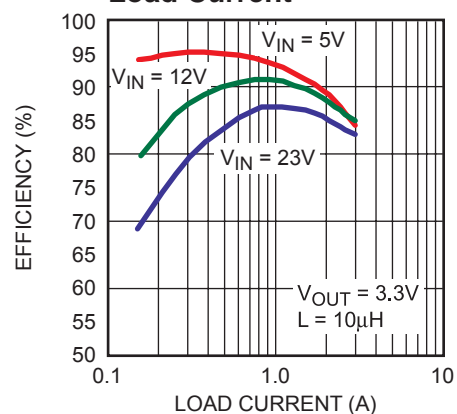
EV2307DN-00A EVALUATION BOARD



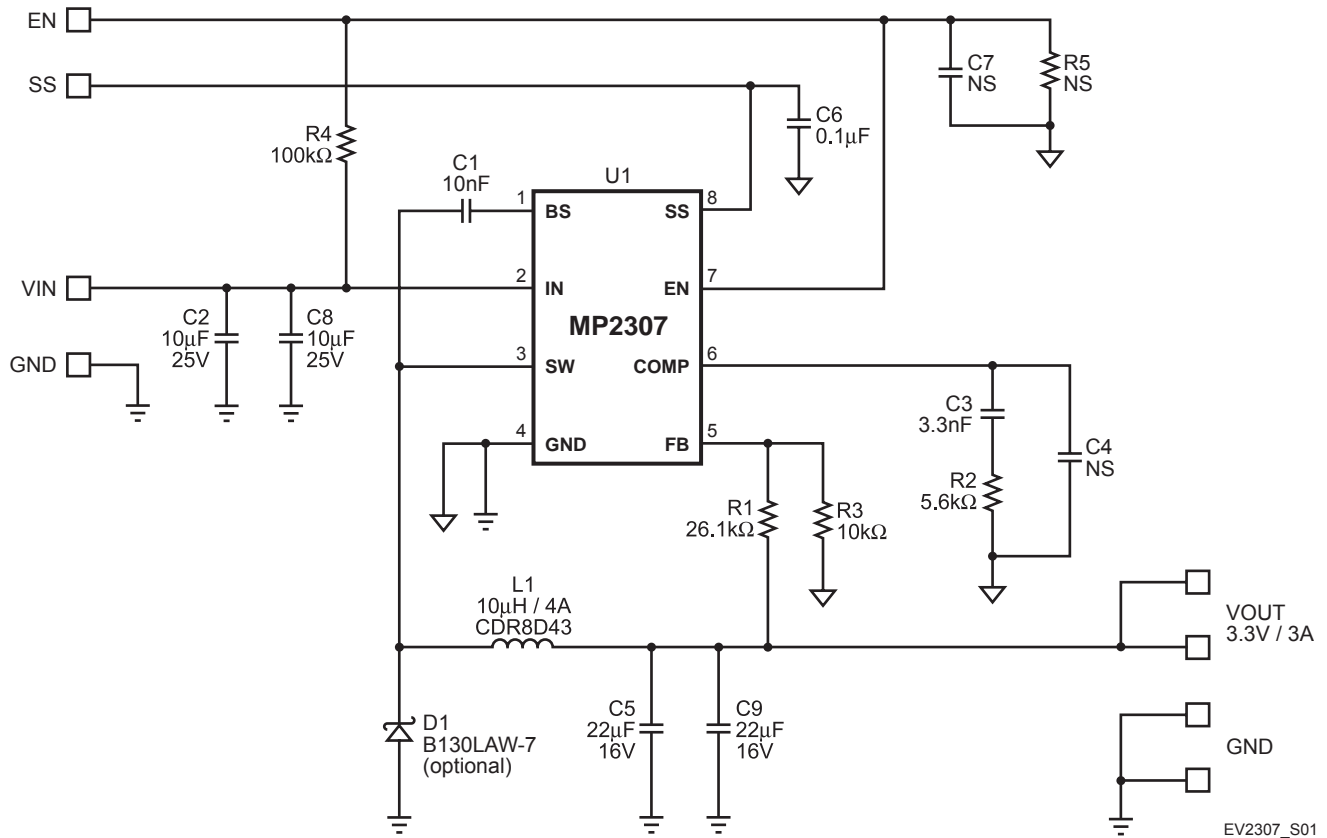
((L x W x H) 2.0" x 1.5" x 0.5"
(5.0cm x 3.8cm x 1.2cm))

Board Number	MPS IC Number
EV2307DN-00A	MP2307DN

Efficiency vs Load Current



MP2307_EC01

EVALUATION BOARD SCHEMATIC

EV2307DN-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	10nF	Ceramic Cap, 50V, X7R	SM0805	TDK	C2012X7R1H103K
2	C2, C8	10µF	Ceramic Cap, 25V, X7R	SM1210	TDK	C3225X7R1E106M
1	C3	3.3nF	Ceramic Cap, 50V, X7R	SM0805	Panasonic	ECJ-2VB1H332K
2	C4, C7	NS	Not Stuffed			
2	C5, C9	22µF	Ceramic Cap, 16V, X5R	SM1210	TDK	C3225X5R1C226M
1	C6	0.1µF	Ceramic Cap, 50V, X7R	SM0805	TDK	C2012X7R1H104K
1	D1		Diode Schottky, 30V, 1A	SOD-123	Diodes Inc	B130LAW-7
1	L1	10µH	Inductor, 4A	SMD	Sumida	CDR8D43
1	R1	26.1kΩ	Resistor, 1%	SM0805	Any	
1	R2	5.6kΩ	Resistor, 5%	SM0805	Any	
1	R3	10kΩ	Resistor, 1%	SM0805	Any	
1	R4	100kΩ	Resistor	SM0805	Any	
1	R5	NS	Not Stuffed			
1	U1		Step-Down Converter	SO8	MPS	MP2307DN

PRINTED CIRCUIT BOARD LAYOUT

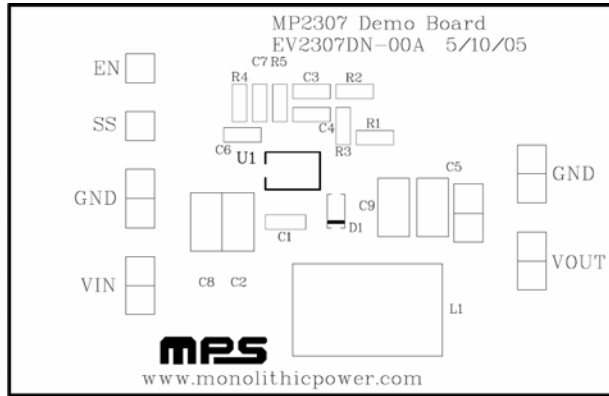


Figure 1—Top Silk Layer

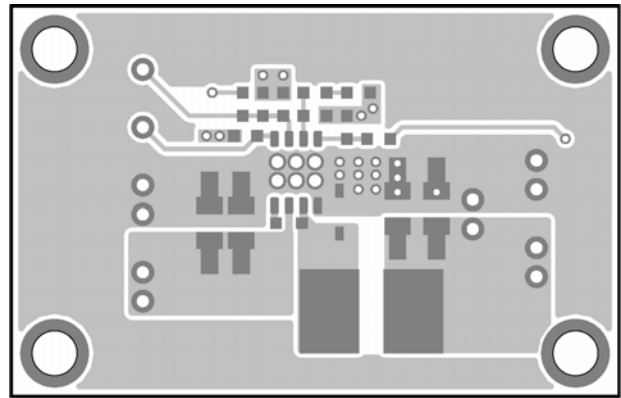


Figure 2—Top Layer

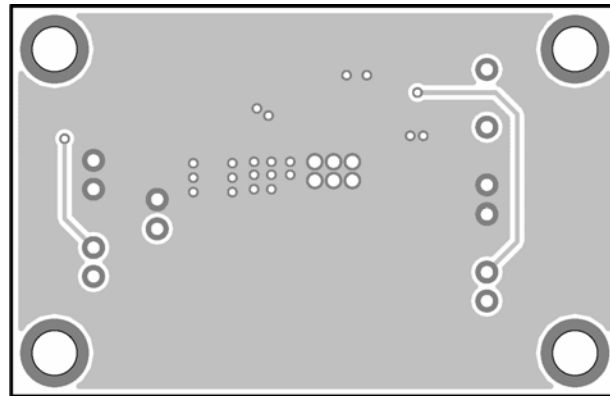


Figure 3—Bottom Layer

QUICK START GUIDE

1. Connect the positive terminal of the load to the VOUT pins and the negative terminal to the GND pins.
2. Preset the power supply output to 4.75V to 23V and turn it off.
3. Connect the positive terminal of the power supply output to the VIN pin and the negative terminal to the GND pin.
4. Turn on the power supply. The MP2307 will automatically startup.
5. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 2.5V to turn on the regulator or less than 0.7V to turn it off.
6. An under voltage lockout (UVLO) function can be implemented by the addition of a resistor divider (R4 and R5). The EN threshold is 2.5V, so the VIN UVLO threshold is: $\left(1 + \frac{R4}{R5}\right) \times 2.5V$.

RECOMMENDED COMPONENTS FOR STANDARD OUTPUT VOLTAGES

The output voltage of this board is set to 3.3V. This board is laid out to accommodate most commonly used inductors and output capacitors and to also be programmed for most standard output voltages. The following table lists recommended components for some standard output voltages. Listed compensation components (R2, C3) values are based on the output capacitor installed on this board. For other capacitors, refer to the Application Information section of the MP2307 datasheet.

VOUT	R1	R2	C3	L1
1.8V	9.53kΩ	4.42kΩ	6.8nF	4.7μH
2.5V	16.9kΩ	4.75kΩ	4.7nF	4.7μH to 6.8μH
3.3V	26.1kΩ	5.6kΩ	3.3nF	6.8μH to 10μH
5V	44.2Ω	7.5kΩ	3.3nF	10μH to 15μH
12V	121kΩ	10kΩ	1.2nF	15μH to 22μH

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