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EV2560DN-00B

2.5A, 42V, 4MHz

Step-Down Converter Evaluation Board

DESCRIPTION

The EV2560DN-00B is an evaluation board for the MP2560, a high frequency step-down regulator with an integrated power MOSFET.

The MP2560 integrates a 220mΩ MOSFET that provides 2.5A load current over a wide operating input voltage of 6V to 42V.

Current mode control provides fast transient response and eases loop stabilization. An internal soft-start prevents inrush current at turn-on.

The EV2560DN-00B is a fully assembled and tested PCB. It generates a +3.3V output voltage at load current up to 2.5A from an 8V to 42V input range. Switching frequency is set at 500KHz.

FEATURES

- 2.5A Output Current
- Programmable Switching Frequency up to 4MHz
- Wide 8V to 42V Operating Input Range
- Adjustable Output from 0.8V

APPLICATIONS

- Game Machines
- Automotive Systems
- Industrial Power Systems
- Distributed Power Systems
- Printer Systems
- Battery Powered Systems

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ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	8 – 42	V
Output Voltage	V_{OUT}	3.3	V
Output Current	I_{OUT}	2.5	A

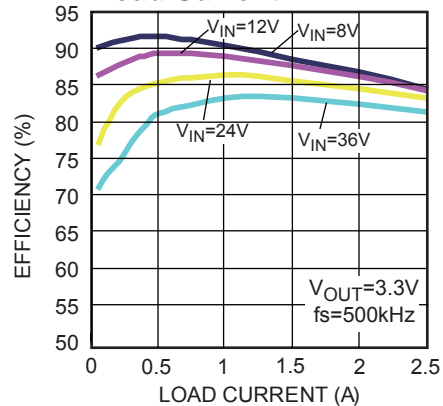
EV2560DN-00B EVALUATION BOARD



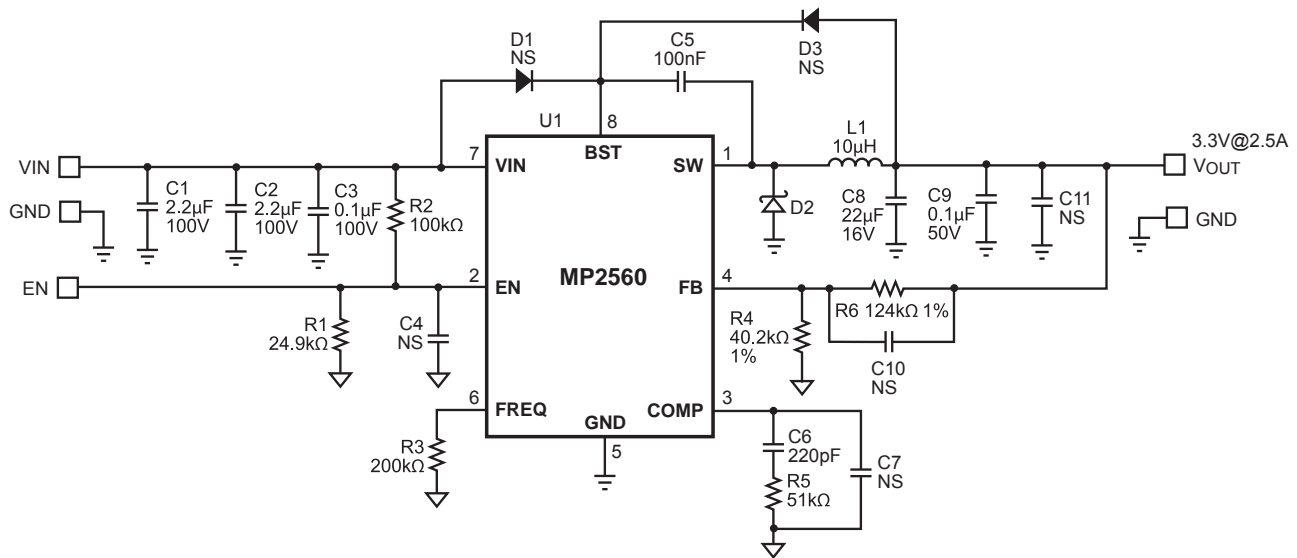
(L x W x H) 2.5" x 2.5" x 0.4"
(6.35cm x 6.35cm x 1.0cm)

Board Number	MPS IC Number
EV2560DN-00B	MP2560DN

Efficiency vs. Load Current



EVALUATION BOARD SCHEMATIC



EV2560DN-00B BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
2	C1, C2	2.2uF	Ceramic Cap, 100V, X7R	1210	Murata	GRM32ER72A225KA35L
1	C3	0.1uF	Ceramic Cap, 100V, X7R	0805	TDK	C2012X7R2A104K
4	C4, C7 C10, C11		Do Not Stuff			
1	C5	100nF	Ceramic Cap, 50V, X7R	0603	TDK	C1608X7R1H104K
1	C6	220pF	Ceramic Cap, 50V,X7R	0603	TDK	C1608X7R1H221J
1	C8	22uF	Ceramic Cap, 16V, X7R	1210	Murata	GRM32ER71C226ME18L
1	C9	0.1uF	Ceramic Cap, 50V, X7R	0805	Murata	GRM21BR71H104KA01L
2	D1, D3		Do Not Stuff			
1	D2		Diode Schottky, 90V, 3A	SMC	Diodes Inc	B390-13-F
			Diode Schottky, 100V, 3A	SMC	Diodes Inc	B3100-13-F
1	R1	24.9k	Film Res., 1%	0603	Yageo	RC0603FR-0724K9L
1	R2	100k	Film Res., 5%	0603	ANY	
1	R3	200k	Film Res., 5%	0603	ANY	
1	R4	40.2k	Film Res., 1%	0603	Yageo	RC0603FR-0740K2L
1	R5	51k	Film Res., 5%	0603	ANY	
1	R6	124k	Film Res., 1%	0603	Yageo	RC0603FR-0712K4L
1	L1	10uH	Inductor, 4.3A	SMD	TOKO	D104C-919AS-100M
			Inductor, 4A	SMD	Cooper	SD8350-100-R
1	U1		Step-Down Regulator	SO-8	MPS	MP2560DN

PRINTED CIRCUIT BOARD LAYOUT

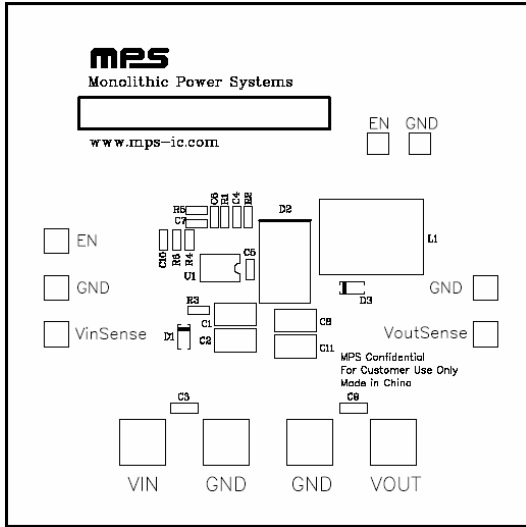


Figure 1—Top Silk Layer

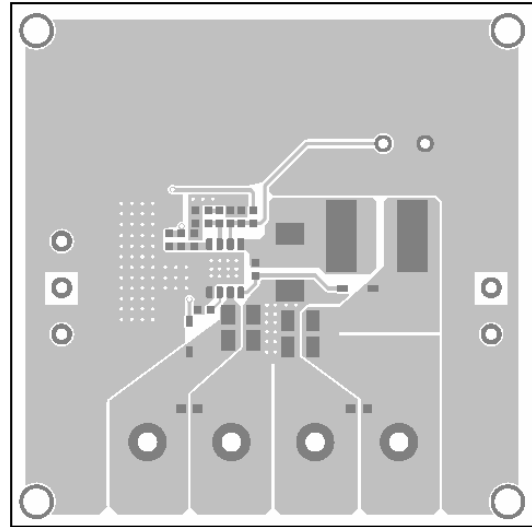


Figure 2—Top Layer

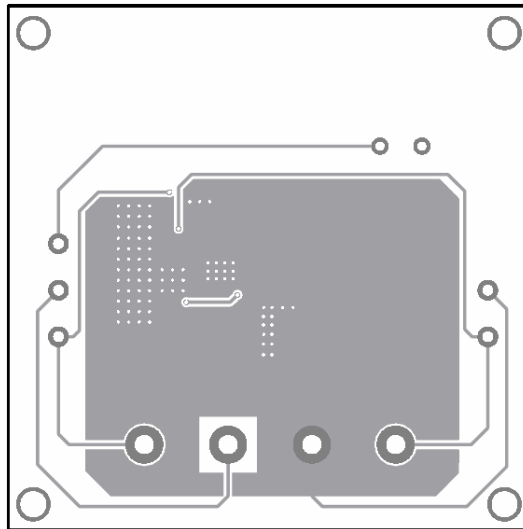


Figure 3—Bottom Layer

QUICK START GUIDE

1. Connect the positive and negative terminals of the load to the VOUT and GND pins, respectively.
2. Preset the power supply output to between 8V and 42V, then turn it off.
3. Connect the positive and negative terminals of the power supply output to the VIN and GND pins, respectively.
4. Turn the power supply on. The EV2560DN will automatically startup.
5. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 1.6V to turn on the regulator, drive EN less than 1.2V to turn it off.
6. An input under voltage lockout (UVLO) function is implemented by the addition of a resistor divider R1 and R2. The EN threshold is 1.2V (falling edge), so V_{IN} UVLO falling threshold is $1.2V \times \left(1 + \frac{R2}{R1}\right)$. It is preset to 6V on this board.
7. Use R4 and R6 to set the output voltage with $V_{FB} = 0.8V$. For $R4 = 40.2k\Omega$, R6 can be determined by: $R6 = 50.25 \times (V_{OUT} - 0.8)$ (k Ω). Follow the Application Information section in the device datasheet to recalculate the compensation, inductor and output capacitor values when output voltage is changed.

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