



The Future of Analog IC Technology®

EV2380DN-00B

5A, 21V, 600KHz Step-Down Converter Evaluation Board

DESCRIPTION

The EV2380DN-00B is an evaluation board for the MP2380, a 600KHz step-down regulator.

The MP2380 features an integrated 45mΩ power MOSFET to provide 5A continuous load current over a wide operating input voltage of 9V to 21V.

Current mode control provides fast transient response and reliable over-current protection.

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

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	V _{IN}	9 - 21	V
Output Voltage	V _{OUT}	3.3	V
Output Current	I _{OUT}	5	A

FEATURES

- 5A Output Current
- Wide 9V to 21V Input Range
- Synchronizable to > 1MHz External Clock
- Adjustable Output from 0.8V to 15V
- Fully Assembled and Tested

APPLICATIONS

- Distributed Power Systems
- Battery Charger
- Pre-Regulator for Linear Regulators

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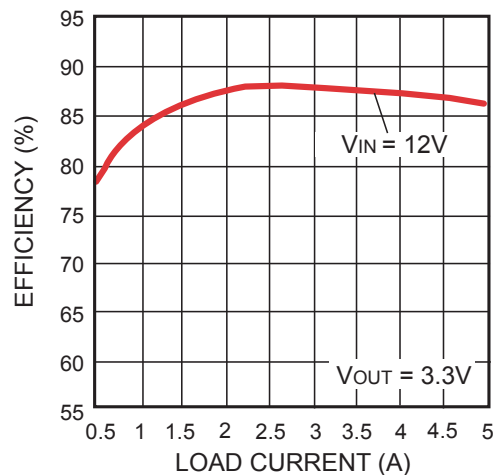
EV2380DN-00B EVALUATION BOARD



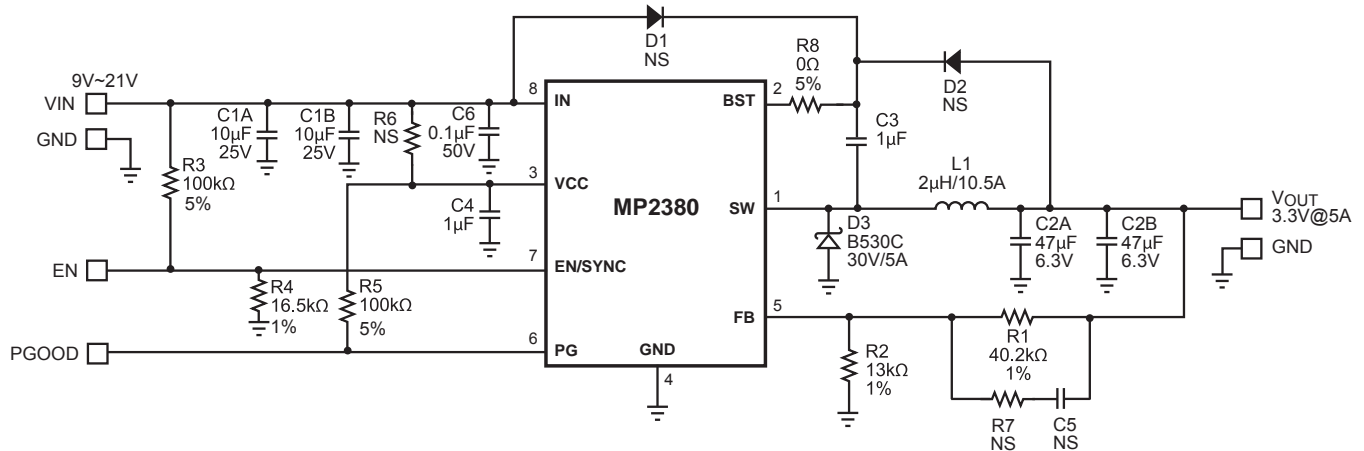
(L x W x H) 2.0" x 2.0" x 0.25"
(5.0cm x 5.0cm x 0.6cm)

Board Number	MPS IC Number
EV2380DN-00B	MP2380DN

Efficiency vs Load Current



EVALUATION BOARD SCHEMATIC



EV2380DN-00B BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part #
1	R1	40.2kΩ	Film Res, 1%	603	Panasonic	ERJ-3EKF4022V
1	R2	13kΩ	Film Res, 1%	603	Panasonic	ERJ-3EKF1302V
1	R3	100kΩ	Film Res, 5%	603	Panasonic	ERJ-3GEYJ104V
1	R4	16.5kΩ	Film Res, 1%	603	Panasonic	ERJ-3EKF1652V
1	R5	100kΩ	Film Res, 5%	603	Panasonic	ERJ-3GEYJ104V
1	R6	NS	Not Stuffed			
1	R7	NS	Not Stuffed			
1	R8	0Ω	Film Res, 5%	603	Panasonic	ERJ-3GEY0R00V
2	C1A, C1B	10μF	Ceramic Cap, 25V, X7R	1210	TDK	C3225X7R1E106M
2	C2A, C2B	47μF	Ceramic Cap, 6.3V, X5R	1210	TDK	C3225X5R0J476M
1	C3	1μF	Ceramic Cap, 16V, X7R	603	TDK	C1608X7R1C105K
1	C4	1μF	Ceramic Cap, 16V, X7R	603	TDK	C1608X7R1C105K
1	C5	NS	Not Stuffed			
1	C6	0.1μF	Ceramic Cap, 50V, X7R	805	TDK	C2012X7R1H104K
1	L1	2.0μH	Inductor, 10.5A	SMD	Würth Elektronik	744314200
Optional	L1	2.2μH	Inductor, 7A	SMD	Sumida	CDEP85ND-2R2
2	D1, D2	NS	Not Stuffed			
1	D3		Diode Schottky 30V 5A	SMC	Diodes Inc.	B530C-13-F
1	U1		MP2380DN	SO8	MPS	MP2380DN

PRINTED CIRCUIT BOARD LAYOUT

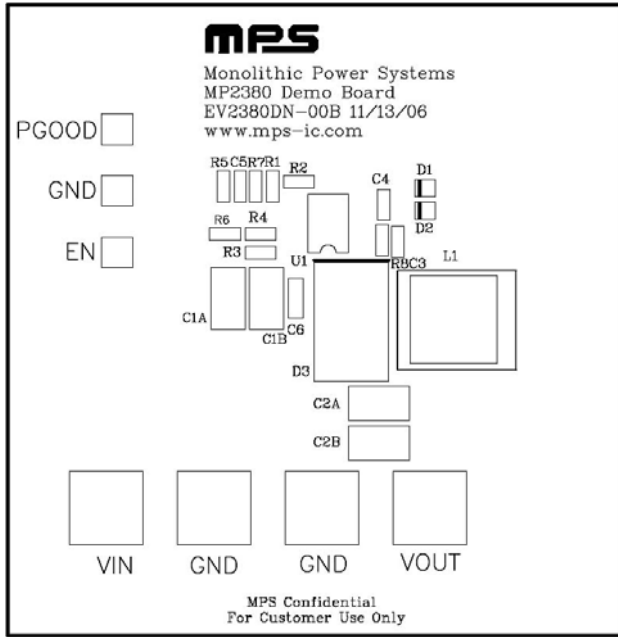


Figure 1—Top Silk Layer

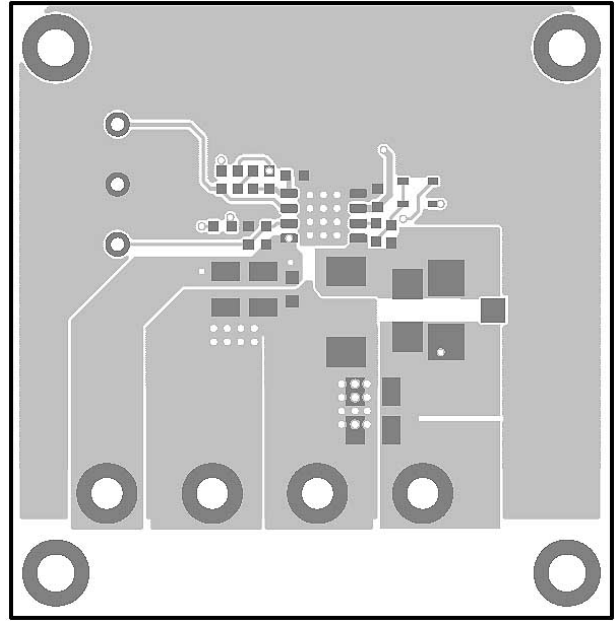


Figure 2—Top Layer

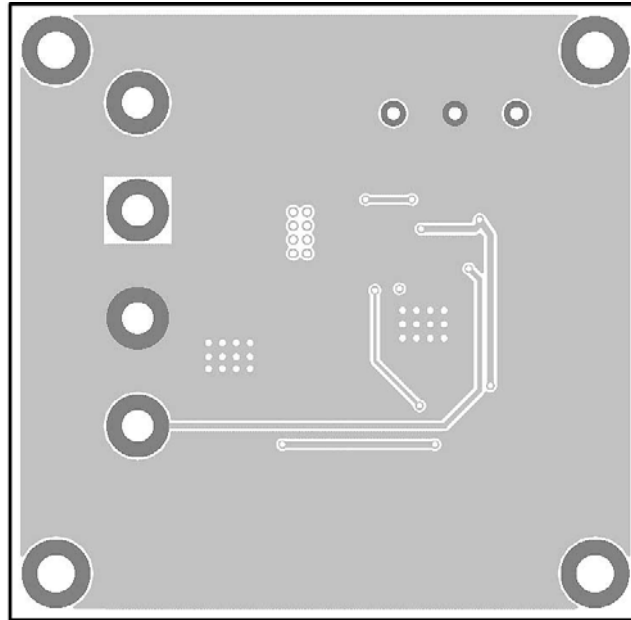


Figure 3—Bottom Layer

QUICK START GUIDE

1. Connect the positive and negative terminals of the load to VOUT and GND pins, respectively.
2. Preset the power supply output to 9V – 21V and turn off the power supply.
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 board will automatically startup.
5. To use the Enable function, apply a digital input to EN pin. Drive EN higher than 1.2V to turn on the regulator, drive EN less than 0.4V to turn it off.
6. The output voltage V_{OUT} can be changed by varying R2. Calculate the new value using the formula:

$$R2 = \frac{R1}{\frac{V_{OUT}}{V_{FB}} - 1}$$

Where $V_{FB}=0.8V$ and $R1=40.2k\Omega$

For example, for $V_{OUT}=1.2V$

$$R2 = \frac{40.2k\Omega}{\frac{1.2V}{0.8V} - 1} = 80.4k\Omega$$

Therefore use an 80.6k Ω standard 1% value.

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