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EV4460DQ-00A

2.5A, 4MHz, 36V

Step-Down Converter Evaluation Board

DESCRIPTION

The EV4460DQ-00A is an evaluation board for the MP4460, a high frequency step-down regulator with an integrated power MOSFET.

The wide 4.5V to 36V input range accommodates a variety of step-down applications, including those in an automotive input environment. A 100µA operational quiescent current makes it attentive for battery-powered applications.

The frequency foldback helps prevent inductor current runaway during startup, and thermal shutdown provides reliable, fault tolerant operation.

By switching at 4MHz, the MP4460 is able to prevent EMI (Electromagnetic Interference) noise problems, such as those found in AM radio and ADSL applications, Electrical specifications.

Parameter	Symbol	Value	Units
Input Voltage	V _{IN}	6 – 36	V
Output Voltage	V _{OUT}	3.3	V
Output Current	I _{OUT}	2.5	A

FEATURES

- 100µA Quiescent Current
- 3A Peak Switch Current
- 150mΩ Internal Power MOSFET
- Up to 4MHz Programmable Switching Frequency
- Ceramic Capacitor Stable
- Internal Soft-Start
- Internally Set Current Limit without a Current Sensing Resistor
- Up to 95% Efficiency
- Output Adjustable from 0.8V to 30V

APPLICATIONS

- High Voltage Power Conversion
- Automotive Systems
- Industrial Power Systems
- Distributed Power Systems
- Battery Powered Systems

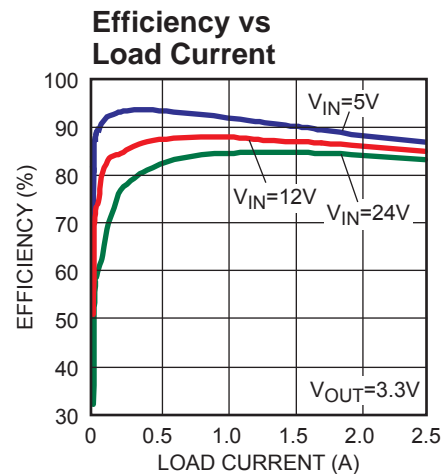
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EV4460DQ-00A EVALUATION BOARD

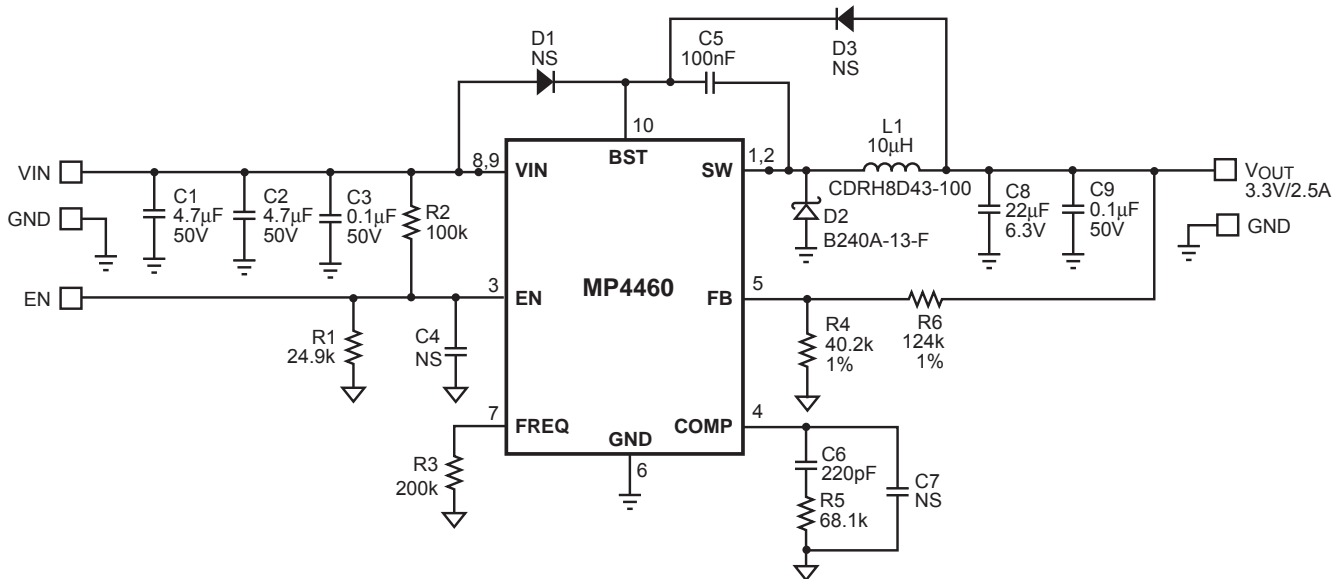


(L x W x H) 2.1" x 1.3" x 0.3"
(5.3cm x 3.3cm x 0.7cm)

Board Number	MPS IC Number
EV4460DQ-00A	MP4460DQ



EVALUATION BOARD SCHEMATIC



EV4460DQ-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
2	C1, C2	4.7µF	Ceramic Cap, 50V, X7R	1210	Murata	GRM32ER71H475KA88L
2	C3, C9	0.1µF	Ceramic Cap, 50V, X7R	805	TDK	C2012X7R1H104K
2	C4, C7		Do Not Stuff			
1	C5	100nF	Ceramic Cap, 50V, X7R	603	TDK	C1608X7R1H104K
1	C6	220pF	Ceramic Cap, 50V, C0G	603	TDK	C1608C0G1H221J
1	C8	22µF	Ceramic Cap, 6.3V, X5R	1210	TDK	C3225X5R0J226M
2	D1, D3		Do Not Stuff			
1	D2		Diode Schottky, 40V, 2A	SMA	Diodes Inc	B240A-13-F
1	R1	24.9k	Film Res, 1%	603	Panasonic	ERJ-3EKF2492V
1	R2	100k	Film Res, 5%	603	Panasonic	ERJ-3GEYJ104V
1	R3	200k	Film Res, 5%	603	Panasonic	ERJ-3GEYJ204V
1	R4	40.2k	Film Res, 1%	603	Panasonic	ERJ-3EKF4022V
1	R5	68.1k	Film Res, 1%	603	Panasonic	ERJ-3EKF6812V
1	R6	124k	Film Res, 1%	603	Panasonic	ERJ-3EKF1243V
1	L1	10µH	Inductor, 4.0A	SMD	Sumida	CDRH8D43-100
1	U1		Step-Down Regulator	QFN10	MPS	MP4460DQ

PRINTED CIRCUIT BOARD LAYOUT

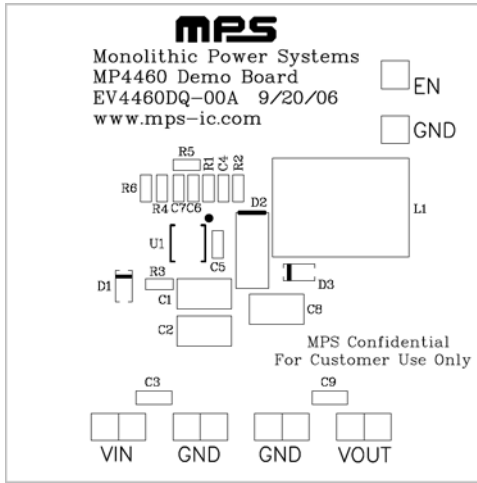


Figure 1—Top Silk Layer

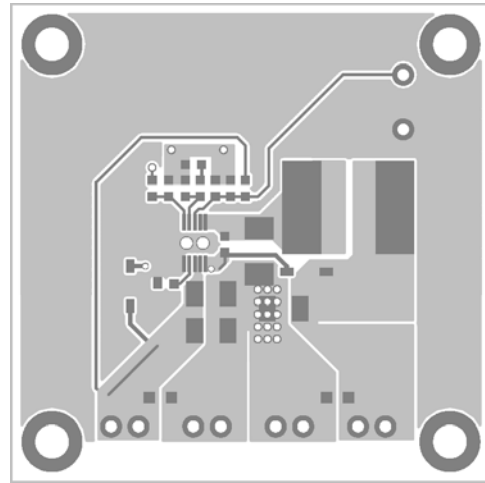


Figure 2—Top Layer

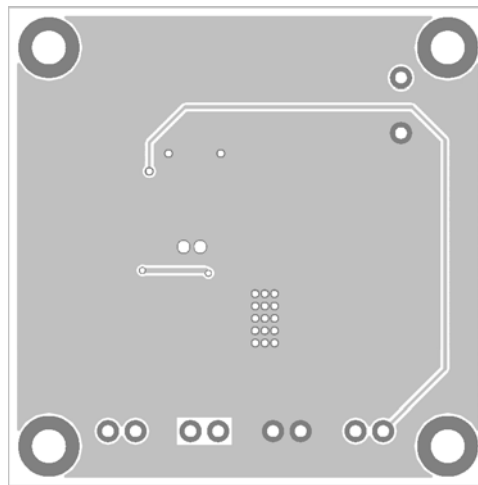


Figure 3—Bottom Layer

QUICK START GUIDE

1. Connect the positive terminal of the load to VOUT pins, and the negative terminal of the load to GND pins
2. Preset the power supply output to 12V and turn off the power supply.
3. Connect the positive terminal of the power supply output to the VIN pin and the negative terminal of the power supply output to the GND pin
4. Turn the power supply on. The EV4460 will automatically startup.
5. To use the Enable function, apply a digital input to 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 VIN UVLO threshold is $1.2V \times (1+R2/R1)$. It's preset to 6V on this board.
7. Use R3 to re-program switching frequency if needed, $f_s(\text{kHz}) = \frac{60000}{R3(\text{k}\Omega)^{0.91}}$. The switching frequency is preset to 500kHz on this board. Please note that an external bootstrap diode from 5Vsupply to BST pin is necessary to boost gate drive voltage if switching frequency is above 2MHz because the charge time is reduced at high switching frequency.
8. Use R4, R6 to set output voltage, $V_{fb}=0.8V$. For $R2= 40.2\text{k}\Omega$, R1 can be determined by: $R1 = 50.25 \times (V_{out} (V) - 0.8)(\text{k}\Omega)$. Please follow the application information on the datasheet to recalculate/or select compensation values, inductor value, and output capacitor value when the Vout is changed.

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