EV4560DQ-00A

2A, 55V, 2MHz
Step-Down Converter Evaluation Board

The Future of Analog IC Technology

NOT RECOMMENDED FOR NEW DESIGNS, REFER TO EVBL4572-QB-00A

DESCRIPTION

The EV4560DQ-00A is an evaluation board for the MP4560, a high frequency step-down regulator with an integrated power MOSFET.

The MP4560 integrates a 250mΩ MOSFET that provides 2A load current over a wide operating input voltage of 4.5V to 55V.

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

The EV4560DQ-00A is a fully assembled and tested PCB. It generates a +3.3V output voltage at load current up to 2A from an 8V to 55V input range. Switching frequency is set at 500KHz.

FEATURES

- 2A Output Current
- Programmable Switching Frequency up to 2MHz
- Wide 8V to 55V Operating Input Range
- Adjustable Output from 0.8V
- Fully Assembled and Tested

APPLICATIONS

- High Voltage Power Conversion
- Game Machines
- Automotive Systems
- Industrial Power Systems
- Distributed Power Systems
- Printer Systems
- Battery Powered Systems

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	8 – 55	V
Output Voltage	V_{OUT}	3.3	V
Output Current	I_{OUT}	2	A

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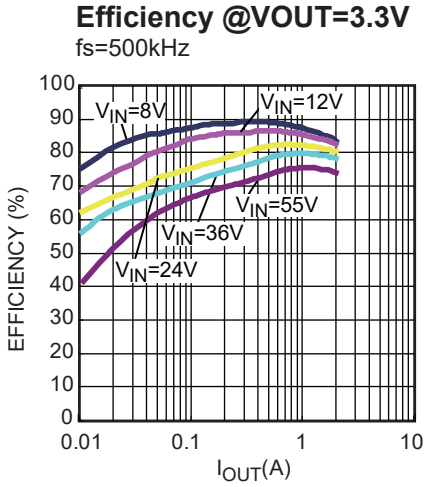
EV4560DQ-00A EVALUATION BOARD

(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
EV4560DQ-00A	MP4560DQ



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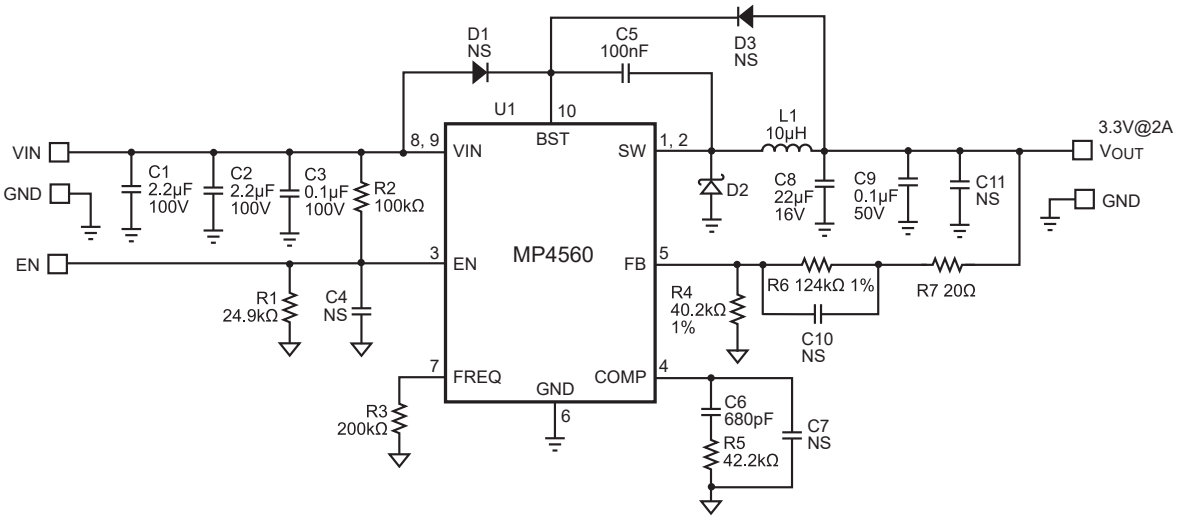
EVALUATION BOARD SCHEMATIC



EV4560DQ-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2	2.2µF	Ceramic Cap., 100V, X7R	1210	Murata	GRM32ER72A225KA35L
1	C3	0.1µF	Ceramic Cap., 100V, X7R	0805	TDK	C2012X7R2A104K
0	C4, C7, C10,C11	NS	Not Stuffed			
1	C5	100nF	Ceramic Cap., 50V, X7R	0603	TDK	C1608X7R1H104K
1	C6	680pF	Ceramic Cap., 50V, X7R	0603	TDK	C1608X7R1H681K
1	C8	22µF	Ceramic Cap., 16V, X7R	1210	Murata	GRM32ER71C226ME18L
1	C9	0.1µF	Ceramic Cap., 50V, X7R	0805	Murata	GRM21BR71H104KA01L
1	R1	24.9kΩ	Film Res., 1%	0603	Yageo	RC0603FR-0724K9L
1	R2	100kΩ	Film Res., 1%	0603	Yageo	RC0603FR-07100KL
1	R3	200kΩ	Film Res., 1%	0603	Yageo	RC0603FR-07200KL
1	R4	40.2kΩ	Film Res., 1%	0603	Yageo	RC0603FR-0740K2L
1	R5	42.2kΩ	Film Res., 1%	0603	Yageo	RC0603FR-0742K2L
1	R6	124kΩ	Film Res., 1%	0603	Yageo	RC0603FR-07124KL
1	R7	20Ω	Film Res., 1%	0603	Yageo	RC0603FR-0720RL
0	D1, D3	NS	Not Stuffed			
1	D2		Diode Schottky, 80V, 3A	SMC	Diodes Inc	B380-13-F
1	L1	10uH	Inductor, Isa=4A,Rdc=26.5mΩ	SMD	Toko	D104C-#919AS-100M
			Inductor, Isa=4A,Rdc=36mΩ	SMD	Cooper	SD8350-100-R
			Inductor, Isa=4A,Rdc=35mΩ	SMD	Wurth	744066100
1	U1		Step-Down Regulator	QFN10	MPS	MP4560DQ

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PRINTED CIRCUIT BOARD LAYOUT

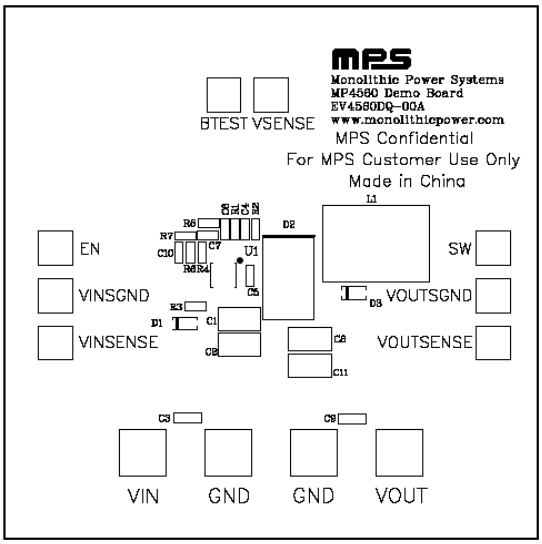

Figure 1—Top Silk Layer

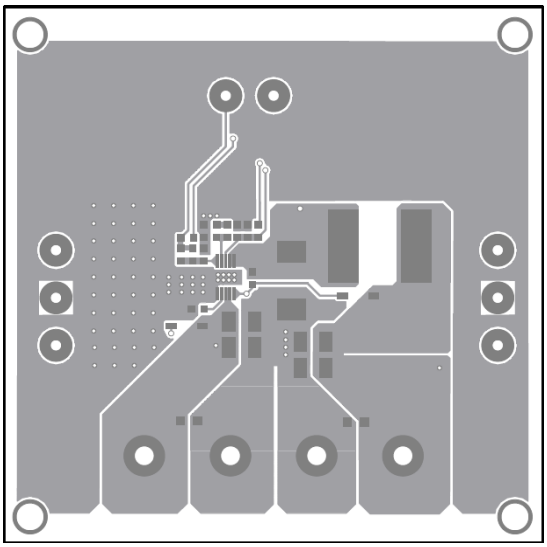

Figure 2—Top Layer

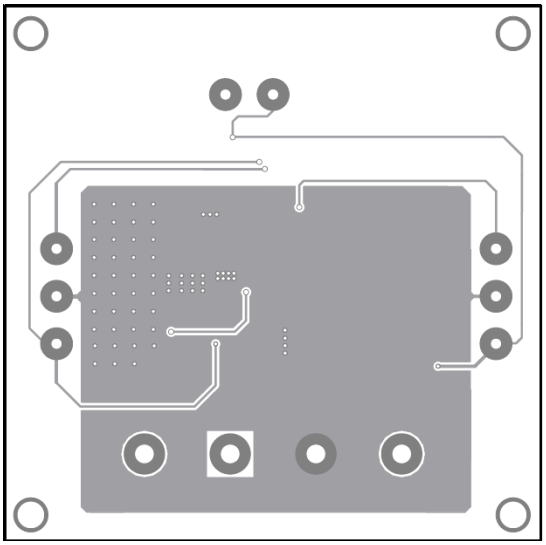

Figure 3—Bottom Layer

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QUICK START GUIDE

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 8 and 55V, and 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 EV4560DQ 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 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 = 40.2kΩ, R6 can be determined by: $R6 = 50.25 \times (V_{OUT} - 0.8)$ (kΩ). 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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