EV20045DQ-00A

Low Noise, High PSRR, 1A Linear Regulator EV Board

DESCRIPTION

The EV20045DQ-00A evaluation board demonstrates the performance of MP20045, a low noise, low dropout and high PSRR linear regulator. It operates from a 2.5V to 5.5V input voltage and the output voltage can be set externally which ranges from 1.5V to 5V.

The EV20045DQ-00A can supply up to 1A of load current, and features current limiting, over temperature protection and power-good status.

An internal PMOS pass element is used to allow a low 110uA ground current, marking the MP20045 suitable for battery-power devices.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	3.5 – 5.5	V
Output Voltage	V_{OUT}	3	V
Load Current	I_{OUT}	1	A

FEATURES

- Up to 1A Output Current
- Low 140mV Dropout at 1A
- Adjustable Output
- 56dB PSRR at 1kHz
- 13μV_{RMS} Low Noise Output
- Open Drain Power-Good Status Output
- Very Fast Transient Responses
- Current Limit and Thermal Protection

APPLICATIONS

- Notebook Computers
- Cordless Telephones
- Cellular Phones
- Modems
- Hand-Held Instruments
- PDA and Palmtop Computers

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EV20045DQ-00A EVALUATION BOARD

(L x W x H) 2.5" x 2.5" x 0.4"
(6.35cm x 6.35cm x 1.1cm)

Board Number	MPS IC Number
EV20045DQ-00A	MP20045DQ

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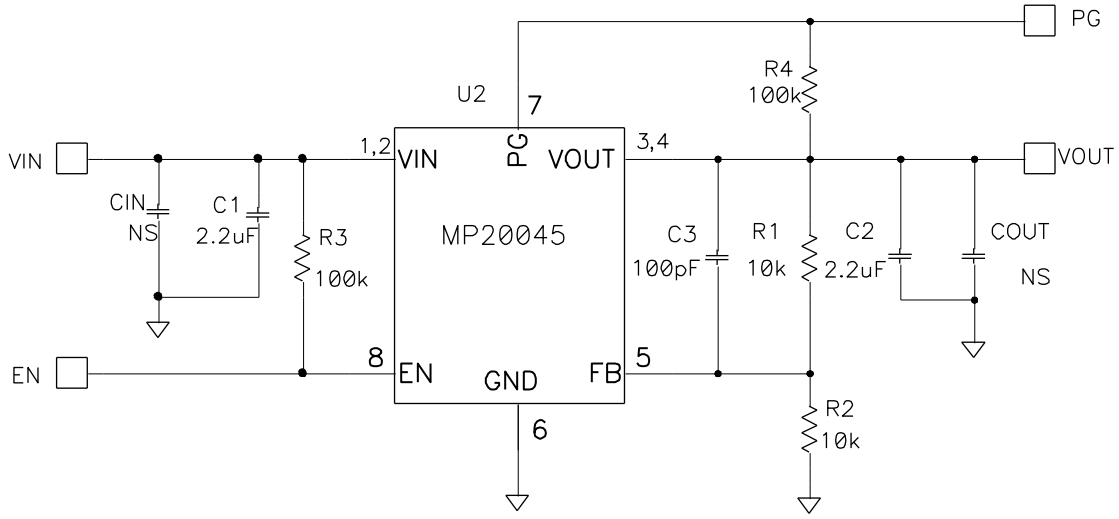
EVALUATION BOARD SCHEMATIC



EV20045DQ-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
2	C1,C2	2.2uF	Ceramic Capacitor,X7R,16V	0805	TDK	C2012X7R1C225K
1	C3	100pF	Ceramic Capacitor,COG,50V	0603	TDK	C1608COG1H101J
2	CIN,COUT	NS				
2	R1,R2	10kΩ	Film Res, 1%	0603	Yageo	RC0603FR-0710KL
2	R3,R4	100kΩ	Film Res, 5%	0603	Any	
1	U1		LDO Regulator	QFN8 (3mm*3mm)	MPS	MP20045DQ

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PRINTED CIRCUIT BOARD LAYOUT

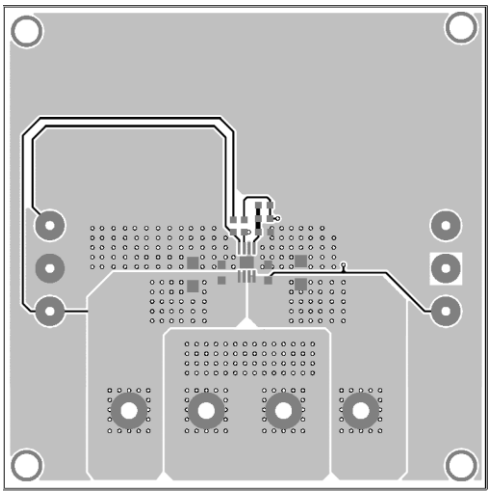

Figure 1—Top Layer

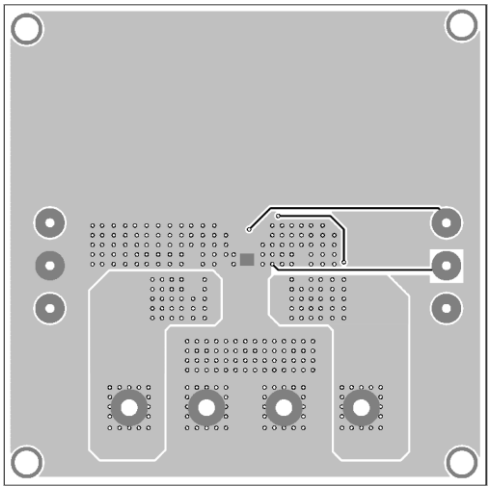

Figure 2—Bottom Layer

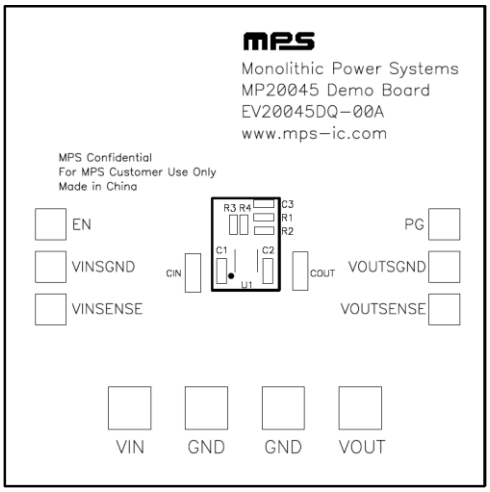

Figure 3—Top Silk Layer

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QUICK START GUIDE (ADJUSTABLE OUTPUT)

The output voltage of this board is set externally which ranges from 1.5V to 5V by operating from +2.5V to +5.5V input as the figure 4. The default output voltage of this board is set to 3.0V.

The board layout accommodates most commonly used resistors and capacitors.

1. Attach the positive and negative ends of the load to the VOUT and GND pins, respectively.
2. Attach the Input Voltage (3.5V $\leqslant$ V_{IN} $\leqslant$ 5.5V) and Input Ground to the VIN and GND pins, respectively.
3. To enable the MP20045 apply a voltage, 1.5V $\leqslant$ V_{EN} $\leqslant$ 5.5V, to the EN pin. To disable the MP20045 apply a voltage, V_{EN} < 0.4V, to the EN pin. The EN pin can be connected to V_{IN} with a 100kΩ resistor for automatic startup.
4. The Output Voltage V_{OUT} can be changed by varying R2. Calculate the new value by formula:

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

Where VFB = 1.5V and R1 = 10kΩ.

Example:

For V_{OUT} = 3.0V:

$$R2 = \frac{10k\Omega}{(\frac{3.0}{1.5}) - 1} = 10k\Omega$$

Therefore, use a 10kΩ standard 1% value.

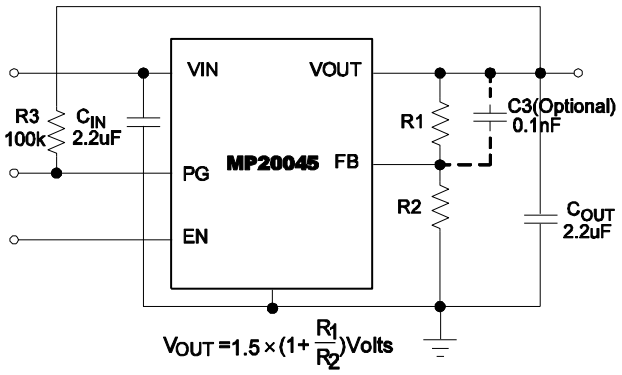

Figure 4—Adjust Version

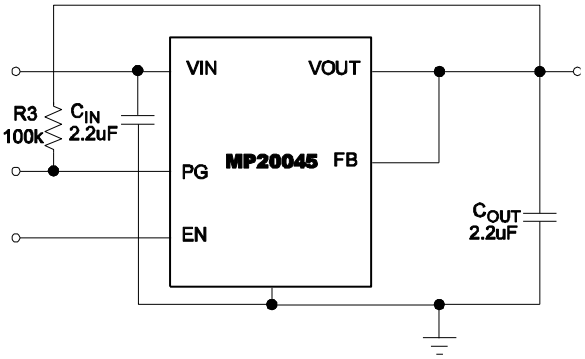

Figure 5—Fixed Version

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QUICK START GUIDE (MODIFICATION FOR FIXED OUTPUT)

For modifying the EV20045DQ-00A to accommodate a fixed output voltage version of the MP20045 as the figure 5:

1. Carefully remove the IC(U1) and replace it with the corresponding fixed output version of the MP20045 chip.
2. Remove both R1 and R2.
3. Short R1 while leaving R2 open.
4. Attach the positive and negative ends of the load to the VOUT and GND pins, respectively.
5. Attach the Input Voltage ($3.5V \leqslant V_{IN} \leqslant 5.5V$) and Input Ground to the VIN and GND pins, respectively.
6. To enable the MP20045 apply a voltage, $1.5V \leqslant V_{EN} \leqslant 5.5V$, to the EN pin. To disable the MP20045 apply a voltage, $V_{EN} < 0.4V$, to the EN pin. The EN pin can be connected to V_{IN} with a 100kΩ resistor for automatic startup.

Please refer to the datasheet for the detailed information of the different output voltage option of MP20045.

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