



MIC5308 Evaluation Board

Low V_{IN}/V_{OUT} 150mA High PSRR ULDO™
with Ultra-Low IQ

General Description

The MIC5308 is a high performance, μ Cap low dropout regulator, offering ultra-low operating current while maintaining very fast transient response. The MIC5308 can source up to 150mA of output current and can regulate down from a low input supply voltage to increase system efficiency.

Ideal for battery operated applications; the MIC5308 offers extremely low dropout voltage 45mV typically @ 150mA, and low ground current at all load conditions (typically 23 μ A). The MIC5308 can also be put into a zero-off-mode current state, drawing virtually no current when disabled.

Requirements

The MIC5308 evaluation board requires two power supplies. The first supply must be able to provide a minimum of 150mA with a voltage range of 1.6V to 5.5V to the V_{IN} . Although typical V_{BIAS} current is 15 μ A in dropout conditions, V_{BIAS} current can reach as high as a few mA. The V_{BIAS} supply should be able to deliver a minimum of 100mA with a voltage range of 2.5V to 5.5V. The output load can be either an active or passive load.

Precautions

The evaluation board does not have reverse polarity protection. Applying a negative voltage to the V_{IN} terminal may damage the device.

Getting Started

1. **Connect an external supply to V_{BIAS} .** Apply a desired voltage to V_{BIAS} (J1) and ground terminal (J3), paying careful attention to polarity and supply voltage ($2.5V \leq V_{BIAS} \leq 5.5V$). An ammeter may be placed between the Bias supply and V_{BIAS} terminal to the evaluation board. The evaluation board has a 1 μ F capacitor connected from V_{BIAS} (J1) pin to GND (J3).
2. **Connect an external supply to V_{IN} .** Apply desired input voltage to the V_{IN} (J2) and ground terminal (J3) of the evaluation board, paying careful attention to polarity and supply voltage ($1.6V \leq V_{IN} \leq V_{BIAS}$). An ammeter may be placed between the input supply and the V_{IN} terminal to the evaluation board. Ammeter and/or power lead resistance can reduce the voltage supplied to the input.

Ensure that the supply voltage is monitored at the V_{IN} terminal. There is 1 μ F capacitor connected from V_{IN} (J2) to GND (J3).

3. **Enable/Disable the MIC5308.** The evaluation board is provided with 10k pull up resistors on enable pin (EN) to V_{IN} . To disable an output, simply jumper the EN terminal (J6) to the GND terminal (J3). The enable pin must be either pulled high or low. Removing the pull up resistors and leaving the pins floating will cause the regulators to operate in an indeterminate state.
4. **Connect the loads to the V_{OUT} terminal (J4) and ground terminal (J5).** The load can be either a passive (resistor) or active (electronic load). Be sure to monitor the output voltage at the V_{OUT} (J4) terminals. The evaluation board has a 1 μ F capacitor connected from V_{OUT} (J4) to GND (J5).
5. **Bypass/Adjust Pin.** The evaluation board provides 10nF capacitor connected from Bypass pin to GND to reduce the output voltage noise. The capacitor bypasses the internal reference. The bypass capacitor can be increased, further reducing noise and improving PSRR. Turn-on time increases slightly with respect to bypass capacitance. A unique, quick-start circuit allows the MIC5308 to drive a large capacitor on the bypass pin without significantly slowing turn-on time. The evaluation board also provides the footprint to place feedback resistor for adjustable output versions. The resistor values can be calculated by:

$$R1 = R2 \times \left(\frac{V_{OUT}}{0.775} - 1 \right)$$

Recommended Feedback Resistors

V_{OUT}	R1	R2
1.2V	5.49k Ω	10k Ω
1.5V	9.31k Ω	10k Ω
1.8V	13.3k Ω	10k Ω
2.8V	26.1k Ω	10k Ω

Ordering Information

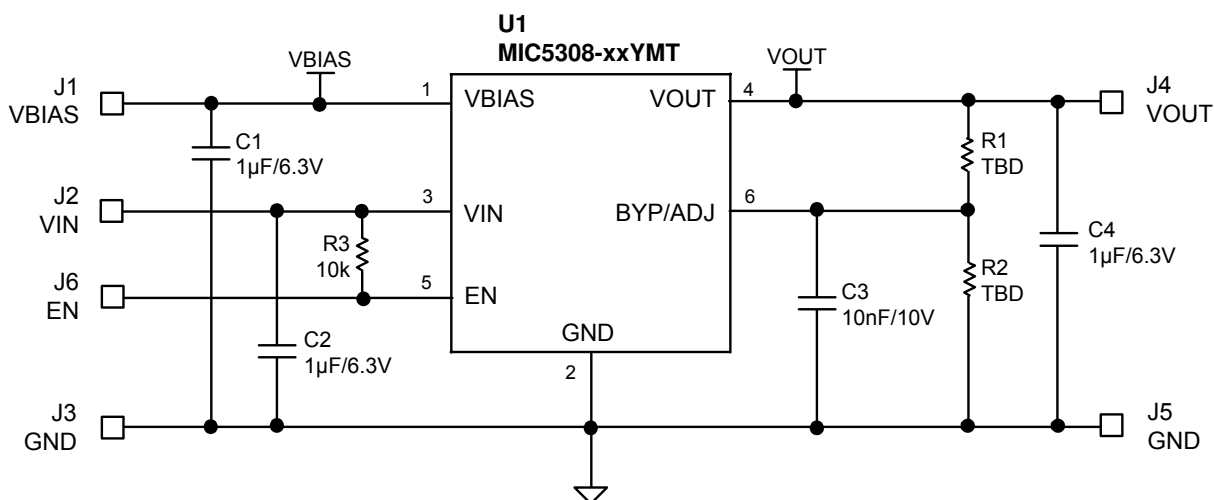
Part Number	Description
MIC5308-XXYMT EV	Evaluation board with the 150mA ULDO™ device

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Evaluation Board Schematic



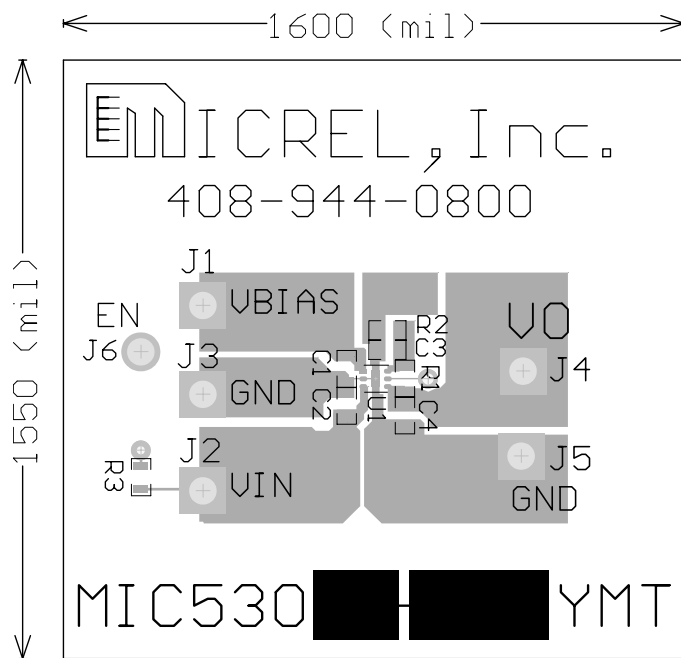
Bill of Materials

Item	Part Number	Manufacturer	Description	Qty
C1, C2, C4	C1608X5R0J105K	TDK ⁽¹⁾	Capacitor, 1µF Ceramic, 6.3V, X5R, Size 0603	3
C3	VJ0603Y103KXXAT	Vishay ⁽²⁾	Capacitor, 10nF Ceramic, 10V, X7R, Size 0603	1
R3	CRCW06031002FKEYE3	Vishay ⁽²⁾	Resistor, 10kΩ, 1%, 1/16W, Size 0603	1
U1	MIC5308-XXYMT	Micrel ⁽³⁾	ULDO, 150mA, 1.6mm x 1.6mm Thin MLF®	1

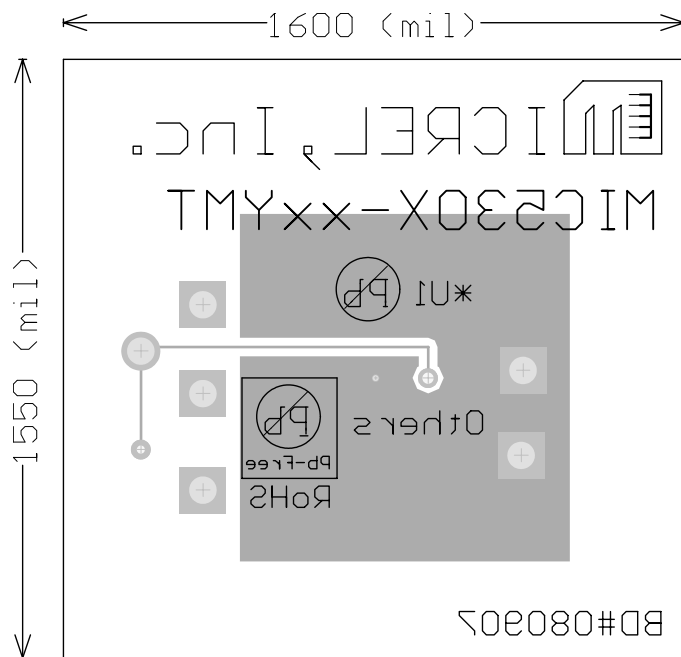
Notes:

1. TDK: www.tdk.com
2. Vishay: www.vishay.com
3. Micrel, Inc.: www.micrel.com

PCB Layout Recommendations



Top Layer



Bottom Layer

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