



MIC47050 Evaluation Board

500mA ULDO™ with Low Input and Output Voltages

General Description

The MIC47050 is a high-speed, ultra-low dropout, dual-supply NMOS ULDO™ designed to take advantage of point-of-load applications that use multiple supply rails to generate a low-voltage, high-current power supply. The MIC47050 can source 500mA of output current while only requiring a 1μF ceramic output capacitor for stability. A 1.5% output voltage accuracy, low dropout voltage (44mV @ 500mA), and low ground current makes this device ideally suited for mobile applications.

The MIC47050 has an NMOS output stage offering very low output impedance. The NMOS output stage makes for a unique ability to respond very quickly to sudden load changes such as that required by a microprocessor, DSP or FPGA.

An input capacitor may be required when the power supply is more than 4-inches from the device. The evaluation board includes an input capacitor of 10μF to compensate for long inductive test leads.

Requirements

The MIC47050 evaluation board requires two power supplies, one to provide a minimum of 500mA to V_{IN} and the other to provide the V_{BIAS} voltage.

The BIAS pin, requiring relatively light current, provides power to the control portion of the MIC47050. The input voltage range for the BIAS pin is 2.3V to 5.5V. To avoid V_{BIAS} -to- V_{OUT} dropout, the minimum V_{BIAS} voltage should be 2.3V or 1.25V (typically) above V_{OUT} , whichever is greater. The evaluation board is provided with a 0.1μF capacitor from BIAS-to-ground to help reduce high frequency noise from being injected into the control circuitry.

Precautions

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

Getting Started

1. **Connect an external supply to V_{BIAS} .** Apply the (+) output of the bias power supply to the VBIAS (J3) terminal and the (-) output to the ground terminal (J2) of the evaluation board, paying careful attention to polarity and supply voltage ($2.3V \leq V_{BIAS} \leq 5.5V$). An ammeter may be placed between the input supply and the VBIAS terminal of the evaluation board. Ensure that the supply voltage is monitored at the VBIAS terminal.
2. **Connect an external supply to V_{IN} .** Apply the (+) output of the input power supply to the VIN (J1) terminal and the (-) output to the ground terminal (J2) of the evaluation board, paying careful attention to polarity and supply voltage ($1.0V \leq VIN \leq 3.6V$ and $VIN \leq V_{BIAS}$). An ammeter may be placed between the input supply and the VIN terminal of the evaluation board. Ensure that the supply voltage is monitored at the VIN terminal. The ammeter and power lead resistance can reduce the voltage supplied to the input.
3. **Enable/Disable the MIC47050.** The evaluation board is configured for "Default Enable" with a 20kΩ pull up resistor on the enable pin to VBIAS. To disable the MIC47050, apply a logic low voltage to the EN terminal (J6). The enable pin must be either pulled high or low for proper operation.
4. **Connect the load to the V_{OUT} terminals.** Apply the load across the VOUT (J4) and ground terminals (J5). The load can be either passive (resistor) or active (electronic load). Be sure to monitor the output voltage at the VOUT (J4) terminal.

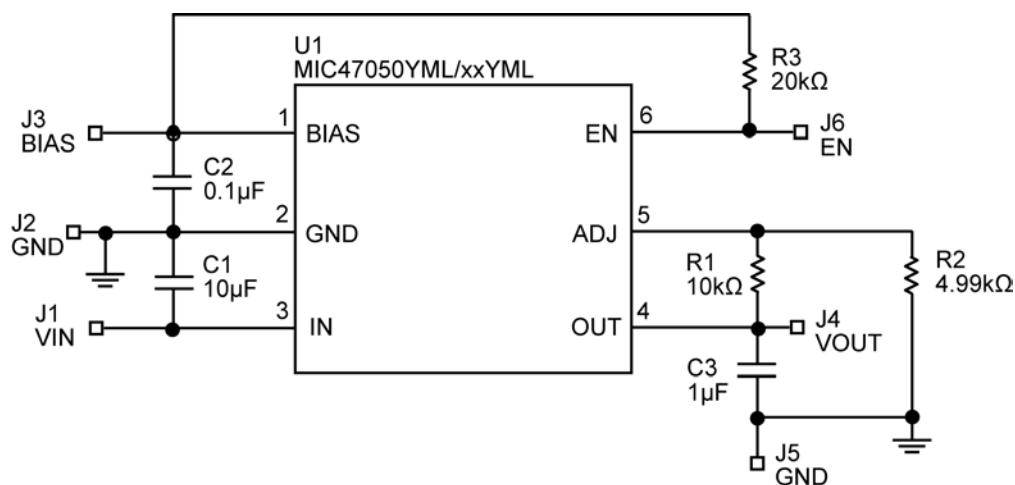
Ordering Information

Part Number	Description
MIC47050YML EV	Adjustable MIC47050 Evaluation Board
MIC47050YMT EV	Adjustable MIC47050 Evaluation Board

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Evaluation Board Schematic



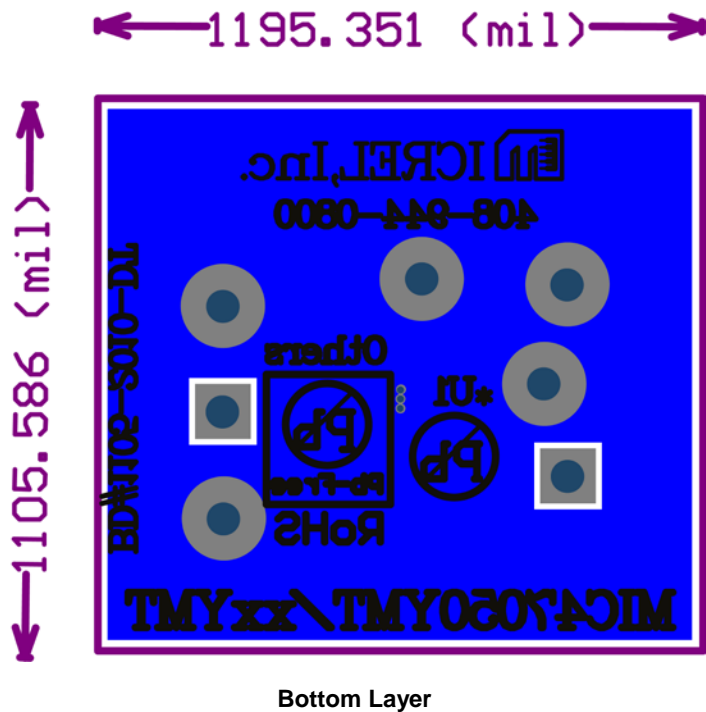
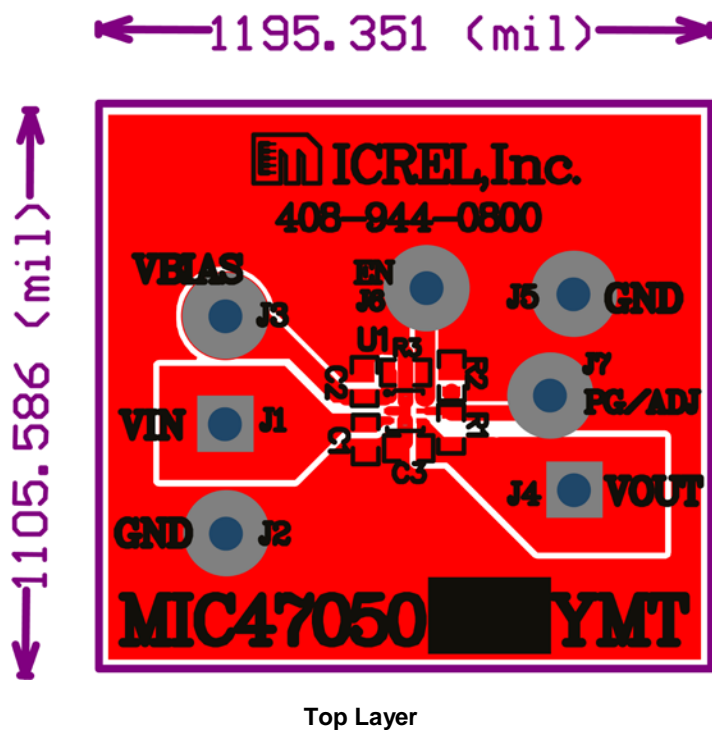
Bill of Materials

Item	Part Number	Manufacturer	Description	Qty.
C1	GRM188R60J106ME47D	Murata ⁽¹⁾	Capacitor, 10μF Ceramic, 6.3V, X5R, Size 0603	1
	C1608X5R0J106M	TDK ⁽²⁾	Capacitor, 10μF Ceramic, 6.3V, X5R, Size 0603	
	06036D106MAT2A	AVX ⁽³⁾	Capacitor, 10μF Ceramic, 10V, X5R, Size 0603	
C2	GRM188R61E104KA01D	Murata ⁽¹⁾	Capacitor, 0.1μF Ceramic, 25V, X5R, Size 0603	1
	C1608X5R1E104M	TDK ⁽²⁾	Capacitor, 0.1μF Ceramic, 25V, X5R, Size 0603	
	06033C104MAT	AVX ⁽³⁾	Capacitor, 0.1μF Ceramic, 25V, X7R, Size 0603	
C3	GRM188R60J105KE19D	Murata ⁽¹⁾	Capacitor, 1.0μF Ceramic, 6.3V, X5R, Size 0603	1
	C1608X5R0J105M	TDK ⁽²⁾	Capacitor, 1.0μF Ceramic, 6.3V, X5R, Size 0603	
	0603ZC105MAT	AVX ⁽³⁾	Capacitor, 1.0μF Ceramic, 10V, X5R, Size 0603	
R1	CRCW060310K0FKEYE3	Vishay ⁽⁴⁾	Resistor, 10kΩ, 1/16W, 1%, Size 0603	1
R2	CRCW06034K99FKEYE3	Vishay ⁽⁴⁾	Resistor, 4.99kΩ, 1/16W, 1%, Size 0603	1
R3	CRCW060320K0FKEYE3	Vishay ⁽⁴⁾	Resistor, 20kΩ, 1/16W, 1%, Size 0603	1
U1	MIC47050YML	Micrel ⁽⁵⁾	500mA ULDO™ Adjustable V _{OUT} , 2mm x 2mm MLF®	1

Notes:

1. Murata: www.murata.com.
2. TDK: www.tdk.com.
3. AVX: www.avx.com.
4. Vishay: www.vishay.com.
5. Micrel, Inc.: www.micrel.com.

PCB Layout Recommendations



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