MIC47100 Evaluation Board

1A Low Voltage LDO Regulator

General Description

The demonstration board can be used to evaluate the MIC47100. The MIC47100, a 1A, high speed, low dropout linear regulator, utilizes a split supply input to regulate low output voltages. It is offered in an 8-pin power MSOP and 2mm x 2mm MLF® packages. The MIC47100 is also offered in fixed and adjustable output versions. Please check the datasheet for all available variations. The evaluation board accommodates the adjustable version.

Requirements

The MIC47100 requires two power supplies, one to provide a minimum of 1A to the V_{IN} and the other to provide V_{BIAS} current. V_{BIAS}, requiring relatively light current, provides power to the control portion of the MIC47100. Bypassing on the BIAS pin is recommended to improve performance of the regulator during line and load transients. Small ceramic capacitors from V_{BIAS}-to-ground help reduce high frequency noise from being injected into the control circuitry from the bias and are good design practices.

Circuit Description

The MIC47100 high speed regulator is easy to use. It requires an output capacitor of 1µF or greater to maintain stability. The design is optimized for use with low ESR ceramic chip capacitors.

An input capacitor is required when the power supply is more than 4-inches away from the device. All evaluation boards include an input capacitor within 1-inch of the device. This is the maximum recommended distance from the device that the capacitor should be placed. The evaluation board has a 10µF ceramic on the V_{IN} pin. Although this is much larger than required for the device, this was designed to allow for the long inductive test leads that will be attached to the evaluation board.

The output can be selected by using the evaluation board jumper. The available output options on the evaluation board are 1.0V, 1.2V, 1.5V and 1.8V. Also, a 0.8V output can be obtained by removing the jumper altogether. Any of the four bottom feedback resistors can be substituted to obtain a different output voltage. The equation to set the output is as follows:

$$V_{OUT} = V_{REF}\left(\frac{R1}{R2} + 1\right)$$

$$V_{REF} = 0.7$$

R1 on the evaluation board is set to 1k. Due to the high bandwidth of the MIC47100, larger values of R1 and the parasitic capacitance of the feedback pin introduce an additional pole. For R1 values greater than 1k, a feed forward capacitor across R1 will help improve stability margin. Since R1 on the evaluation board is set to 1k, the formula for adjusting the output to the desired level is as following:

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

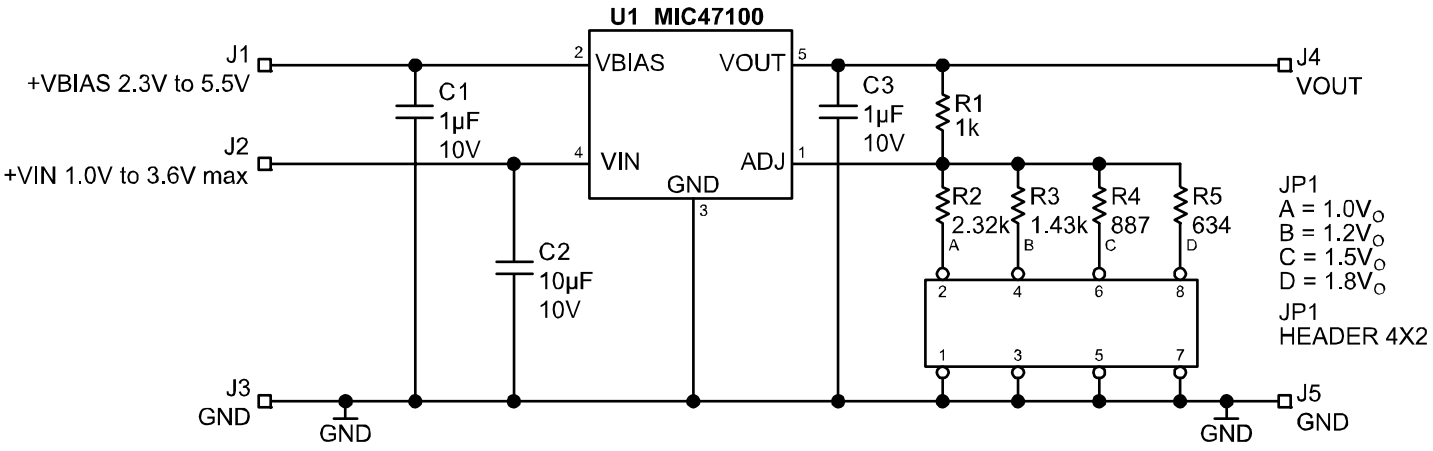
$$R2 = \left(\frac{0.7V}{V_{OUT}} - 0.7V\right) \times 1k$$

Ordering Information

Part Number	Description
MIC47100YML EV	Evaluation board for the MIC47100YML device

MLF and *Micro*LeadFrame are registered trademarks of Amkor Technology, Inc.

Evaluation Board Schematic



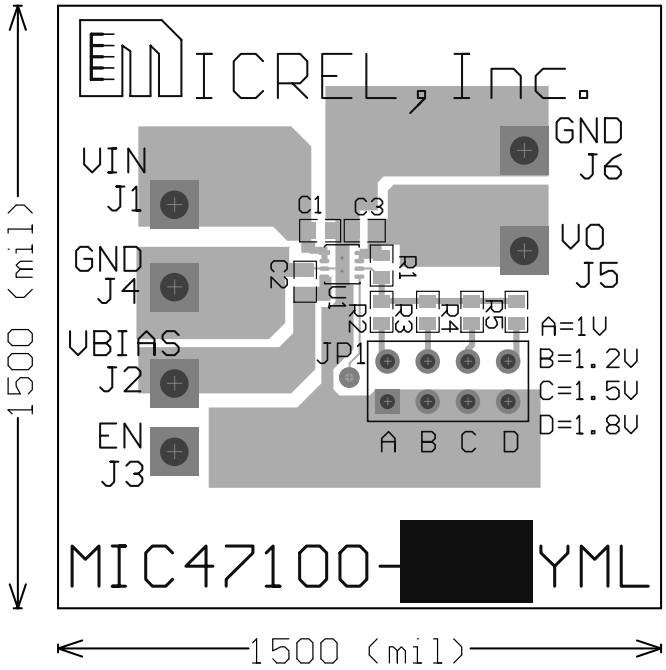
Bill of Materials

Item	Part Number	Manufacturer	Description	Qty.
C1, C3	GRM40 XR5 105K 10	Murata(1)	0.1µF, 10V capacitor	2
C2	GRM235Y5V106Z10	Murata(1)	10µF, 10V capacitor	1
R1	CRCW08051001FRT1	Vishay Dale(2)	1kΩ, 1%, 1/10W, 0805 resistor	1
R2	CRCW08052321FRT1	Vishay Dale(2)	2.32kΩ, 1%, 1/10W, 0805 resistor	1
R3	CRCW08051431FRT1	Vishay Dale(2)	1.43kΩ, 1%, 1/10W, 0805 resistor	1
R4	CRCW0805887FRT1	Vishay Dale(2)	887Ω, 1%, 1/10W, 0805 resistor	1
R5	CRCW08056340FRT1	Vishay Dale(2)	634Ω, 1%, 1/10W, 0805 resistor	1
U1	**MIC47100YML**	**Micrel, Inc.(3)**	**1A Low Voltage LDO Regulator**	**1**

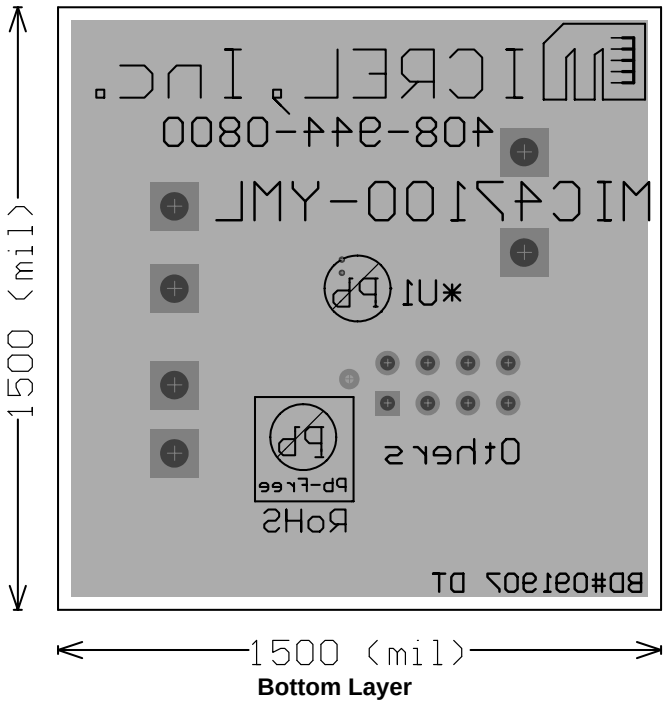
Notes:

1. Murata: www.murata.com
2. Vishay Dale: www.vishay.com
3. **Micrel, Inc.: www.micrel.com**

PCB Layout Recommendations



Top Layer



Bottom Layer

MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USA
TEL +1 (408) 944-0800 FAX +1 (408) 474-1000 WEB http://www.micrel.com