



MIC38150 Evaluation Board

1.5A HELDO[®] High Efficiency Low Dropout Regulator

General Description

The MIC38150 is a 1.5A step down converter and the second device in a new generation of HELDO[™] (High Efficiency Low Dropout) regulators providing the benefits of LDOs. They are easy to use, feature fast transient performance, high PSRR and low noise while offering the efficiency of a switching regulator.

Requirements

The MIC38150 evaluation board requires an input power supply able to provide greater than 1.5A at 3V.

Precautions

The evaluation board does not have reverse polarity protection. Applying a negative voltage to the V_{IN} (J1) terminal may damage the device.

The MIC38150 evaluation board is tailored for a low voltage input supply range. It should not exceed 5.5V on the input.

Getting Started

1. **Connect an external supply to V_{IN} terminal.** Apply desired input voltage to the V_{IN} (J1) and ground terminal (J2) of the evaluation board, paying careful attention to polarity and supply voltage ($3.0V < V_{IN} < 5.5V$). An ammeter may be placed between the input supply and the V_{IN} terminal to the evaluation board. Ensure the supply voltage is monitored at the V_{IN} terminal. The ammeter and/or power lead resistance can reduce the voltage supplied to the input.

2. **Connect the load to the V_{OUT} and ground terminals.** The load can be either passive (resistive) or active (as in an electronic load). An ammeter can be placed between the load and the V_{OUT} terminal (J5). Ensure the output voltage is monitored at the V_{OUT} terminal. The default V_{OUT} is set to 1.8V. This can be adjusted by changing the feedback resistors. See "Output Voltage."

3. **Enable the MIC38150.** The enable pin (J3) is connected to V_{IN} through a pull-up resistor R4. The output of the MIC38150 turns on when V_{IN} exceeds the UVLO threshold at the V_{IN} pin. MIC38150 may be turned off by shorting the enable pin (J3) to ground or bringing the enable pin below the enable threshold.

Output Voltage

The output voltage on the MIC38150 evaluation board is adjustable. The output voltage is controlled by the feedback resistors (R1 and R2) and can be calculated as follows:

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

Where $V_{REF} = 1.0V$.

The evaluation board is preset at 1.8V output, but can easily be modified by removing R1 and replacing it with the value that yields the desired output voltage.

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

For $V_{REF} = 1.0V$, this reduces to:

$$R1 = R2 \times \left(\frac{V_{OUT}}{1.0V} - 1\right)$$

Ordering Information

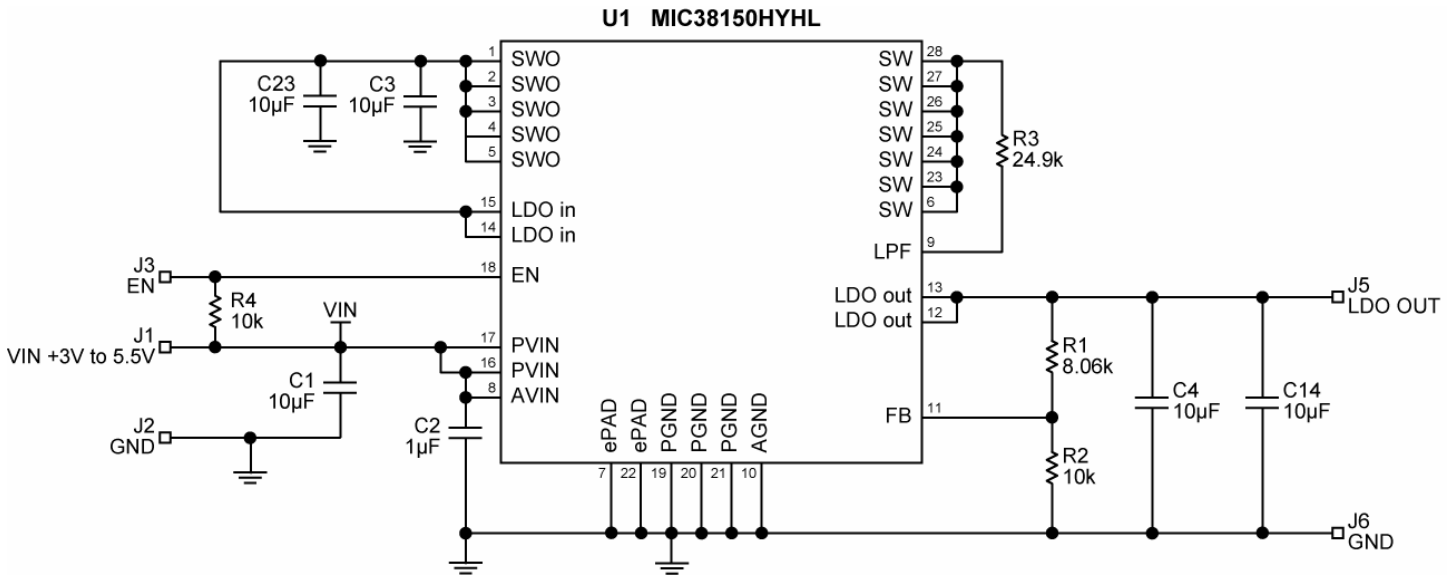
Part Number	Description	Package
MIC38150HYHL	IC	28-Pin 4x6 MLF [®]
MIC38150HYHL EV	Evaluation Board	28-Pin 4x6 MLF [®]

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MLF and *MicroLeadFrame* are registered trademark of Amkor Technology, Inc.

Micrel Inc. • 2180 Fortune Drive • San Jose, CA 95131 • USA • tel +1 (408) 944-0800 • fax + 1 (408) 474-1000 • <http://www.micrel.com>

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M9999-091109-A



Bill of Materials

Item	Part Number	Manufacturer	Description	Qty
C1, C3, C4, C14, C23	0805ZD106MAT2A	AVX ⁽¹⁾	10uF, 10V, X5R, 0805 Ceramic Capacitor	5
	LMK212BJ106KG-T	Taiyo Yuden ⁽²⁾		
	C2012X5R1A106K	TDK ⁽³⁾		
	GRM219R61A106KE44D	Murata ⁽⁴⁾		
C2	C2012X5R1A105K	TDK ⁽³⁾	1uF, 10V, X5R, 0805 Ceramic Capacitor	1
	0805ZD105KAT2A	AVX ⁽¹⁾		
	GRM219R61A105MA01D	Murata ⁽⁴⁾		
R1	CRCW06038061FRT1	Vishay ⁽⁵⁾	8.06k, 1%, 1/10W, 0603	1
R2, R4	CRCW06031002KEYE3	Vishay ⁽⁵⁾	10k, 1%, 1/10W, 0603	2
R3	CRCW06032492FRT1	Vishay ⁽⁵⁾	24.9k, 1%, 1/10W, 0603	1
U1	MIC38150-HYHL	Micrel, Inc.⁽⁶⁾	HELDO[®] 1.5A High Efficiency Low Dropout Regulator	1

Notes:

1. AVX: www.avx.com
2. Taiyo Yuden: www.t-yuden.com
3. TDK: www.tdk.com
4. Murata: www.murata.com
5. Vishay: www.vishay.com
6. **Micrel, Inc.:** www.micrel.com

Printed Circuit Board Layouts

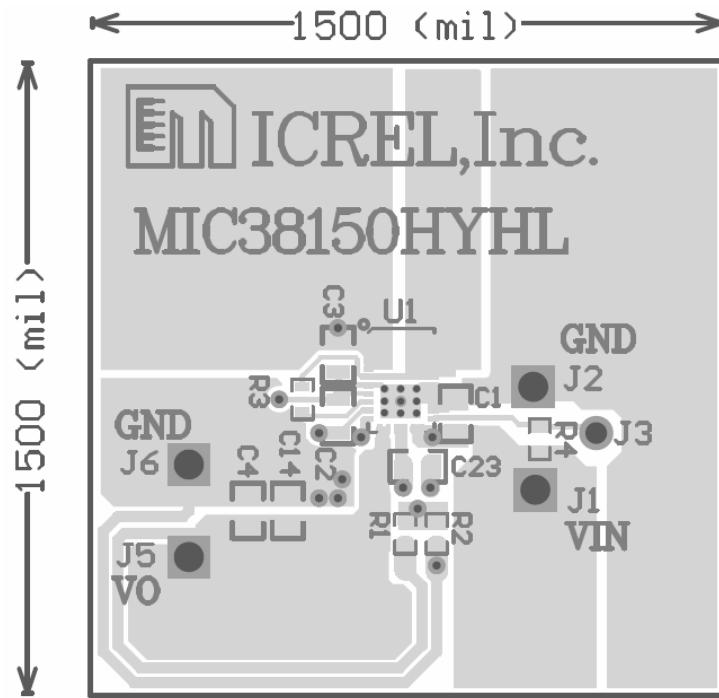


Figure 1a. Top Layer

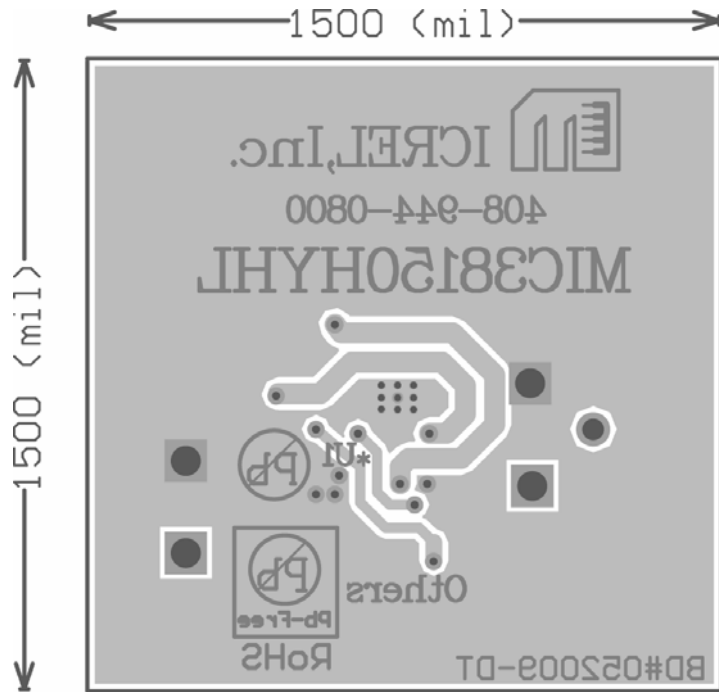


Figure 1b. Bottom Layer

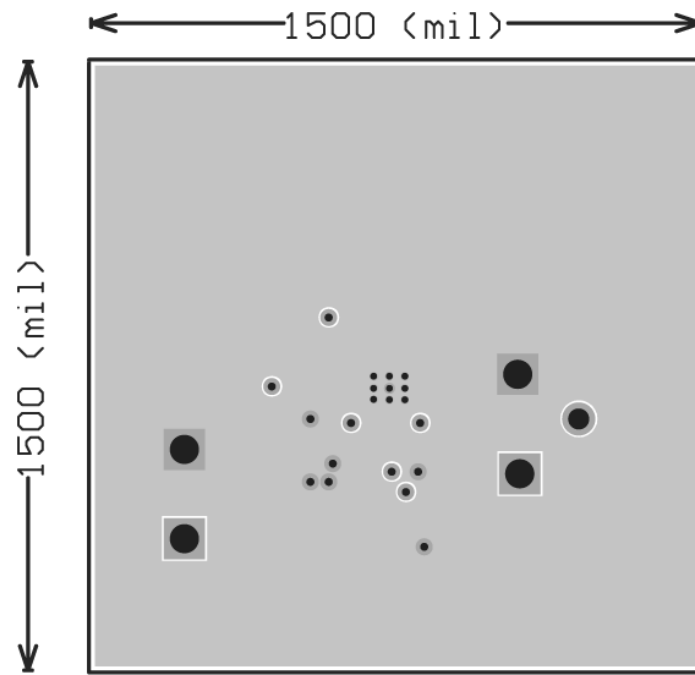


Figure 1c. Mid-Layer 1

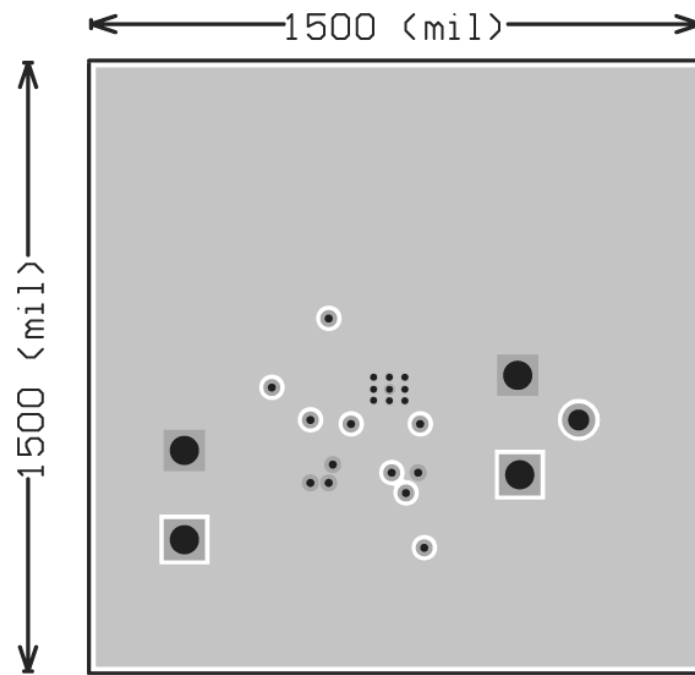


Figure 1d. Mid-Layer 2

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>

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Revision History

Date	Change Description/Edits by:	Rev.
6/18/08	Locked document. M.Mclean	15
5/28/09	Unlocked document, removed some styles, minor formatting. M.Galvan	16
6/3/09	Fixed EC table font from 10pt to 9pts, moved Typ. App. dwg to front page	17
6/9/09	Fixed EC table font from 10pt to 9pt. fixed a few minor font	18
9/11/09	Changed HELDO™ to ® and updated the Middle layout layers with Ying's inputs. M. Aparicio	19