



## MIC38150 Evaluation Board

### 1.5A HELDO<sup>®</sup> 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<sup>™</sup> (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:

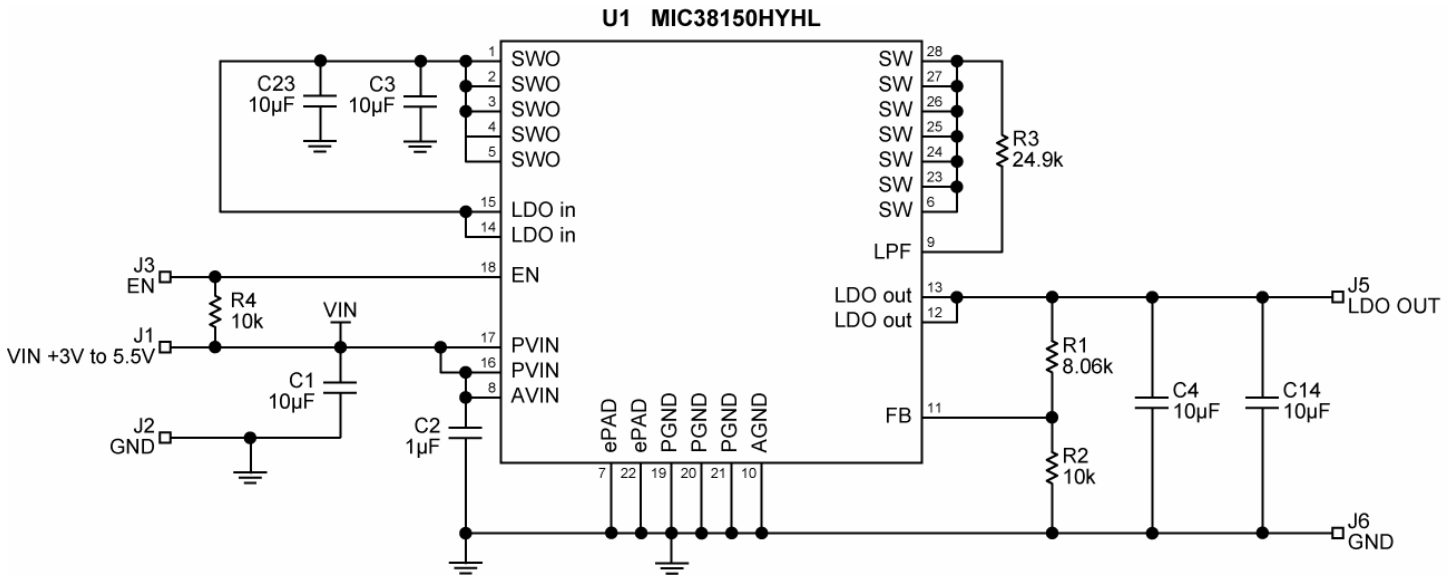
$$R1 = R2 \times \left(\frac{V_{OUT}}{1.0V} - 1\right)$$

## Ordering Information

Part Number	Description	Package
MIC38150HYHL	IC	28-Pin 4x6 MLF <sup>®</sup>
MIC38150HYHL EV	Evaluation Board	28-Pin 4x6 MLF <sup>®</sup>

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### Bill of Materials

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

**Notes:**

1. AVX: [www.avx.com](http://www.avx.com)
2. Taiyo Yuden: [www.t-yuden.com](http://www.t-yuden.com)
3. TDK: [www.tdk.com](http://www.tdk.com)
4. Murata: [www.murata.com](http://www.murata.com)
5. Vishay: [www.vishay.com](http://www.vishay.com)
6. Micrel, Inc.: [www.micrel.com](http://www.micrel.com)

### Printed Circuit Board Layouts

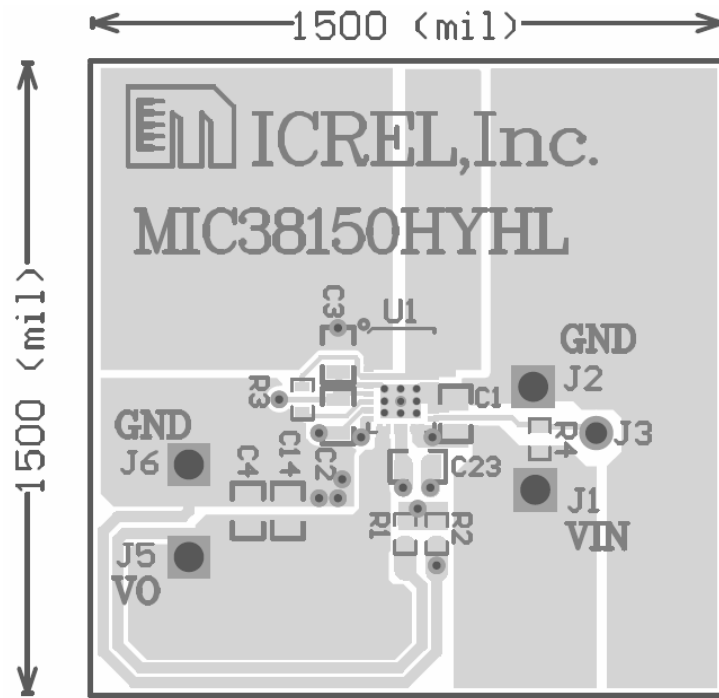


Figure 1a. Top Layer

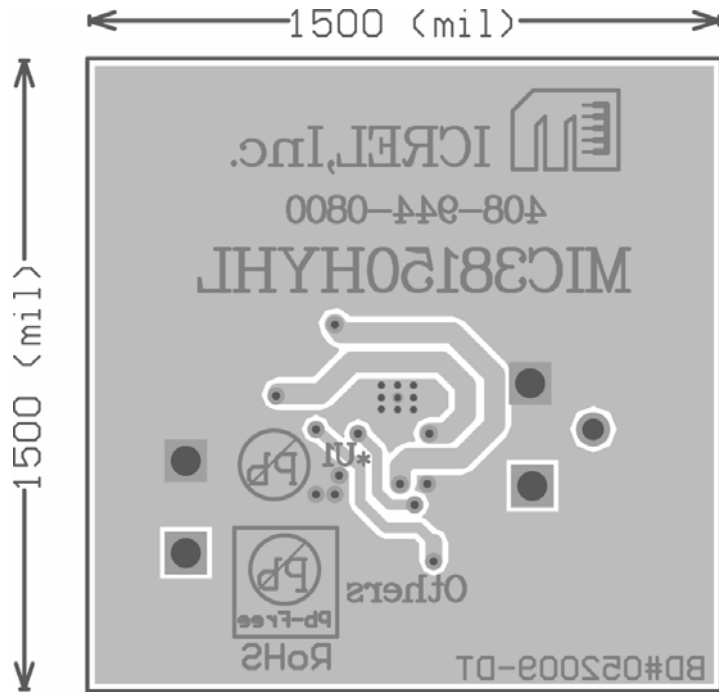


Figure 1b. Bottom Layer

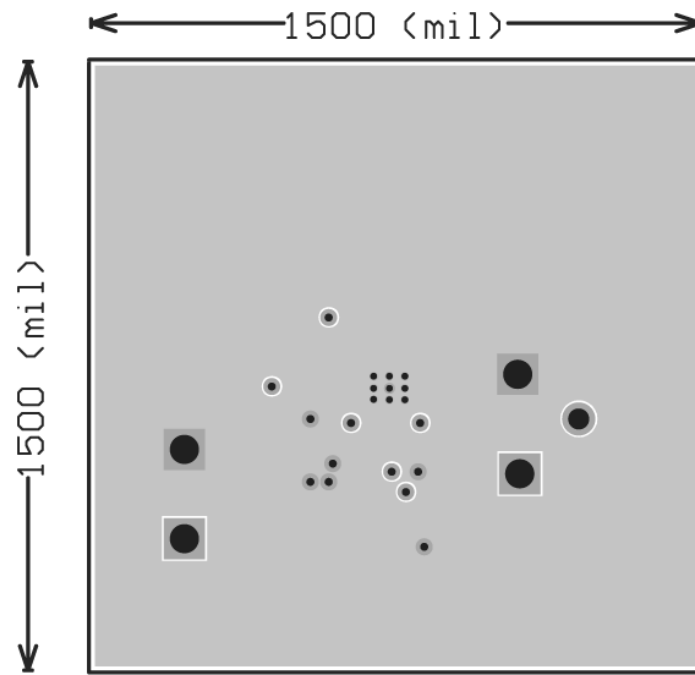


Figure 1c. Mid-Layer 1

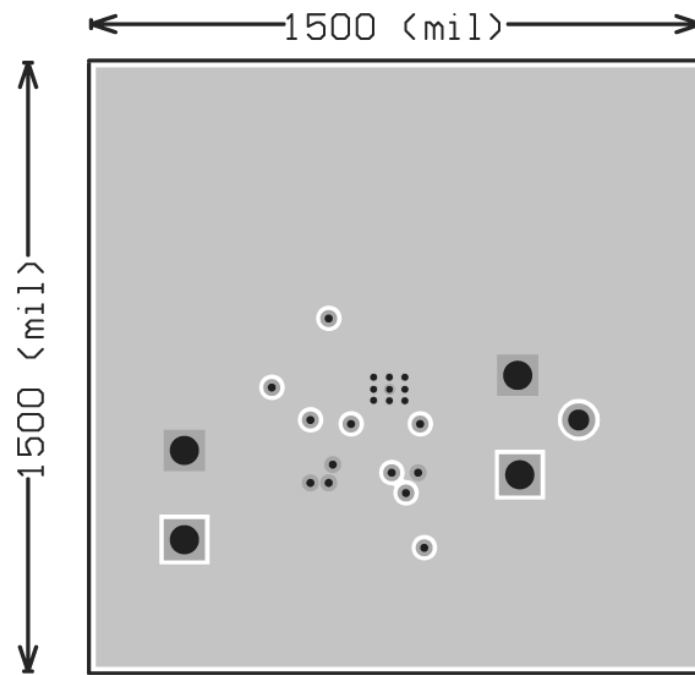


Figure 1d. Mid-Layer 2

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## Revision History

<b>Date</b>	<b>Change Description/Edits by:</b>	<b>Rev.</b>
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



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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Техническая поддержка проекта;
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