MIC2811/21 Evaluation Board

Four Output Power Management IC with 2MHz, 600mA DC/DC and Triple 300mA LDOs

General Description

The MIC2811 and MIC2821 are high performance four output power management ICs with single 600mA DC/DC buck converter for high efficiency and three 300mA LDOs for low noise supplies. The PWM DC/DC converter operates at 2MHz switching frequency to allow use of a small 2.2µH inductor. LDO1 and LDO2 support independent input supplies which are capable of operating at input voltages as low as 1.65V. This conveniently allows for post regulation of the DC/DC converter for efficient ultra-low noise supplies. The MIC2811 supports the use of a bypass cap for improved noise performance on LDO1 and LDO2 while the MIC2821 offers a separate enable pin for LDO3.

Requirements

The MIC2811/21 Evaluation board requires at least one input power supply able to provide greater than 2A at 3V.

Precautions

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

The MIC2811 and MIC2821 input and enable voltages should never exceed DVIN (up to 5.5V).

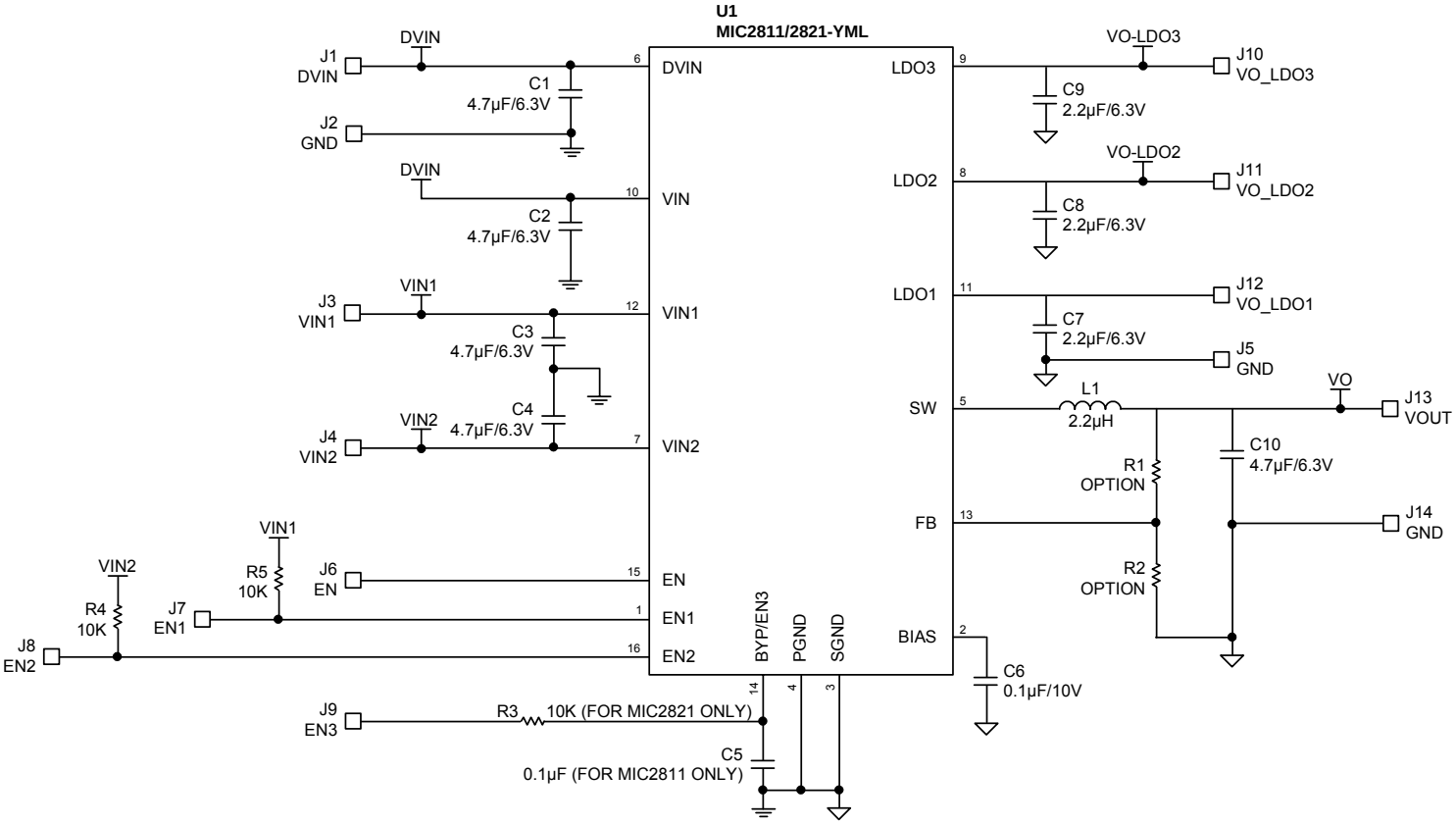
Getting Started

1. **Connect external supplies to the VINs.** Apply desired input voltage to the DVIN(J1) and ground(J2) terminals of the evaluation board, paying careful attention to polarity and supply voltage range (2.7V ≤ DV_{IN} ≤ 5.5V). DVIN(J1) supplies chip VCC as well as power to the DC/DC converter and LDO3. Therefore, DVIN is required for any of the four regulators to operate properly. VIN1(J3) and VIN2(J4) provides power to LDO1 and LDO2, respectively. Both VIN1(J3) and VIN2(J4) should not exceed the DVIN(J1) supply and be kept within the supply range of 1.65V ≤ VIN1/VIN2 ≤ DV_{IN}. An ammeter may be placed between the power supply and the input terminals of the evaluation board. Ensure that the supply voltage is monitored at the input terminals. The ammeter and/or power lead resistance can reduce the voltage supplied to the input.
2. **Enable/Disable the MIC2811 and MIC2821.** The MIC2811 evaluation board has three separate enable pins for the four different outputs. The DC/DC buck converter and LDO3 are controlled from the EN terminal. LDO1 and LDO2 are enabled from EN1 and EN2, respectively. The enable pins are connected to the pin terminals and must not be left floating. Disable the regulators by pulling their respective EN terminal to GND. Enable the regulators by pulling their respective EN terminal above 1.2V (not to exceed DVIN). The MIC2821 differs from the MIC2811 in that LDO3 is enabled from a separate enable pin labeled EN3.
3. **Connect loads to the output terminals (J10 for LDO3, J11 for LDO2, J12 for LDO1, J13 for the DC/DC converter) and GND pins (J5 and J14).** The load can be either passive (resistor) or active (electronic load). Be sure to monitor the output voltage at the output terminals (J10, J11, J12, and J13).

Ordering Information

Part Number	Description
MIC2811-4GJLYML EV	Evaluation board with the MIC2811-4GJLYML 1.2V/1.8V/2.5V/2.7V device
MIC2811-4GMSYML EV	Evaluation board with the MIC2811-4GMSYML 1.2V/1.8V/2.8V/3.3V device
MIC2821-4GJLYML EV	Evaluation board with the MIC2821-4GJLYML 1.2V/1.8V/2.5V/2.7V device
MIC2821-4GMSYML EV	Evaluation board with the MIC2821-4GMSYML 1.2V/1.8V/2.8V/3.3V device

Evaluation Board Schematic



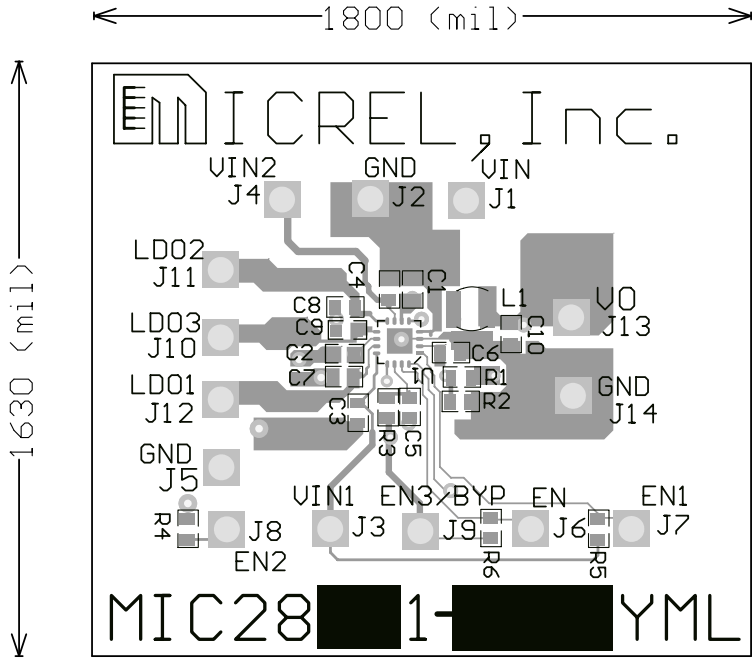
Bill of Materials

Item	Part Number	Manufacturer	Description	Qty.
C1, C2, C3, C4, C10	06036D475KAT2A	AVX[1]	4.7µF, 6.3V, 0603, X5R Ceramic Capacitor	5
	JMK107BJ475MA-T	Taiyo Yuden[2]		
	C1608X5R0J475K	TDK[3]		
	GRM188R60J475KE19D	Murata[4]		
C7, C8, C9	C1608X5R0J225K	TDK[3]	2.2µF, 6.3V, 0603, X5R Ceramic Capacitor	3
	06036D225KAT2A	AVX[1]		
	GRM188R60J225KE19D	Murata[4]		
C5, C6	C1005X7R1C104KT	TDK[3]	0.1µF, 10V, 0603, X5R Ceramic Capacitor (C5 for MIC2811 EV Board only)	2
	GRM21BR71H104KA01L	Murata[4]		
L1	CDRH2D11HPNP	Sumida[5]	2.2µH, 1.1A, 3.2x3.2x1.2mm Inductor	1
	ME3220-222-ML	Coilcraft[6]	2.2µH, 1.1A, 2.5x3.2x2mm Inductor	
R1	CRCW06030000Z0TA	Vishay[7]	0Ω, 0603, 1% resistor	1
R2			Open	0
R3, R4, R5	CRCW06031002FRT1	Vishay[7]	10kΩ, 0603, 1% resistor (R3 for MIC2821 EV Board only)	3
U1	**MIC2811**	**Micrel, Inc.[8]**	**Four Output Power Management IC with 2MHz, 600mA DC/DC and Triple 300mA LDOs (MIC2811 Evaluation Board Only)**	**1**
U1	**MIC2821**	**Micrel, Inc.[8]**	**Four Output Power Management IC with 2MHz, 600mA DC/DC and Triple 300mA LDOs (MIC2821 Evaluation Board Only)**	**1**

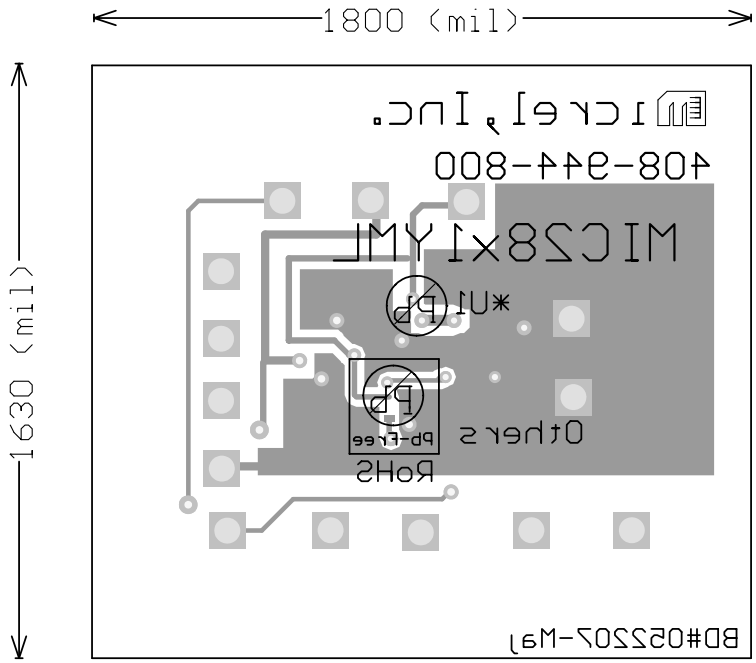
Notes:

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

PCB Layout Recommendations



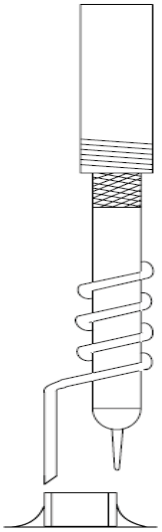
Top Layer



Bottom Layer

Ripple Measurements

To properly measure voltage ripple on either the input or output of any regulator with a switching regulator near by, a proper ring in tip measurement is required. Standard oscilliscope probes come with a grounding clip, or a long wire with an alligator clip. Unfortunately, for high frequency measurements, this ground clip can pick up high frequency noise and erroneously inject it into the measured output ripple.



The MIC2811 and MIC2821 evaluation boards accommodate a home made ring in tip measurement by probing across input and output capacitors. This requires the removing of the oscilloscope probe sheath and ground clip from a standard oscilloscope probe and wrapping a non-shielded bus wire around the oscilloscope probe (as shown on the left). If there does not happen to be any non-shielded bus wire immediately available, the leads from axial resistors will work. By maintaining the shortest possible ground lengths on the oscilloscope probe, true ripple measurements can be obtained.

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