

# LTM8031: Ultralow Noise, EMC 36V, 1A DC/DC $\mu$ Module<sup>®</sup> Regulator

## DESCRIPTION

Demonstration circuit DC1597A features the LTM<sup>®</sup>8031, a step-down converter certified to meet the EN55022 radiated emissions standard. The LTM8031 is configured to deliver a 3.3V output from a 5V to 36V input with a 750kHz operating frequency. The wide input range supports a variety of input sources, such as automotive batteries, wall adaptors and industrial supplies. Under light load conditions, the LTM8031 enters Burst Mode<sup>®</sup> operation

to deliver high efficiency over a broad current range and maintain low output ripple.

The LTM8031 data sheet must be read in conjunction with this demo manual prior to working on or modifying demo circuit 1597A.

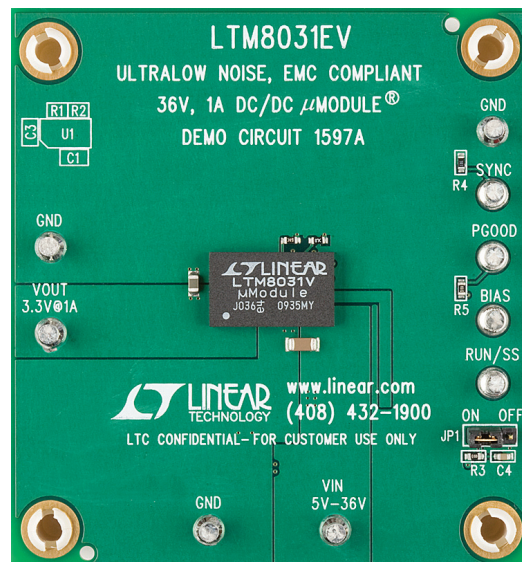
**Design files for this circuit board are available at <http://www.linear.com/demo>**

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## PERFORMANCE SUMMARY (T<sub>A</sub> = 25°C)

PARAMETER	CONDITIONS
Input Voltage Range	5V to 36V
Output Voltage V <sub>OUT</sub>	3.3V $\pm$ 3%
Maximum Output Current	1A
Typical Switching Frequency	750kHz

## BOARD PHOTO



## QUICK START PROCEDURE

Demonstration circuit 1597A is an easy way to evaluate the performance of the LTM8031. Refer to Figure 1 for proper measurement equipment set-up, and follow the procedure below.

1. Place JP1 on the ON position.
2. Preset the power supply within the input voltage range of LTM8031.
3. With the power supply off, connect the input power supply to  $V_{IN}$  and GND.
4. Turn on the input power supply.
5. Check for the proper output voltage.

NOTE: If there is no output, temporarily disconnect the load to make sure that the load is not set too high.

6. Once the proper output voltage is established, adjust the loads within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.

When measuring the input or output voltage ripple, care must be taken to avoid a long ground lead on the oscilloscope probe. Measure the input or output voltage ripple by touching the probe tip directly across the  $V_{IN}$  or  $V_{OUT}$  and GND terminals. See Figure 2 for the proper scope probe technique.

**QUICK START PROCEDURE**

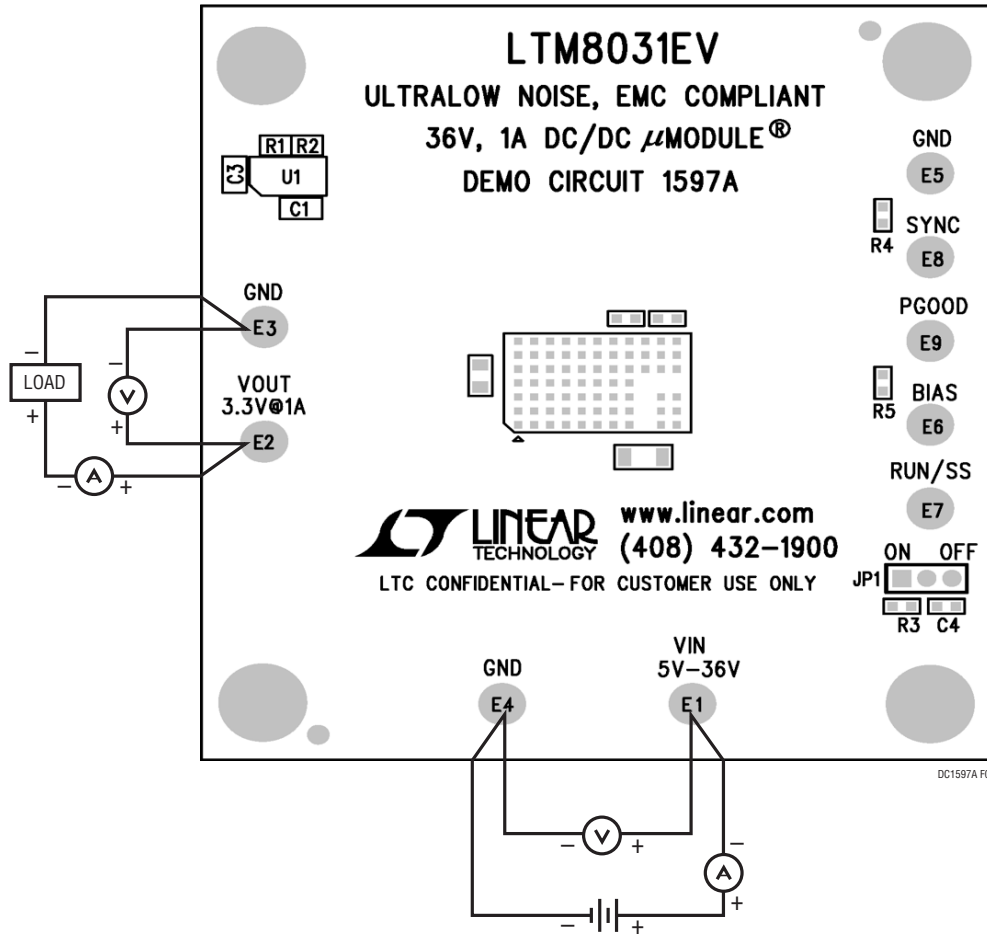


Figure 1. Proper Measurement Equipment Set-Up

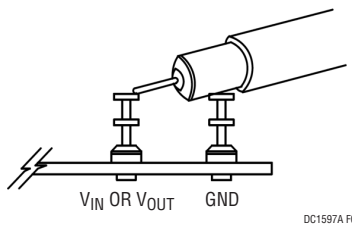


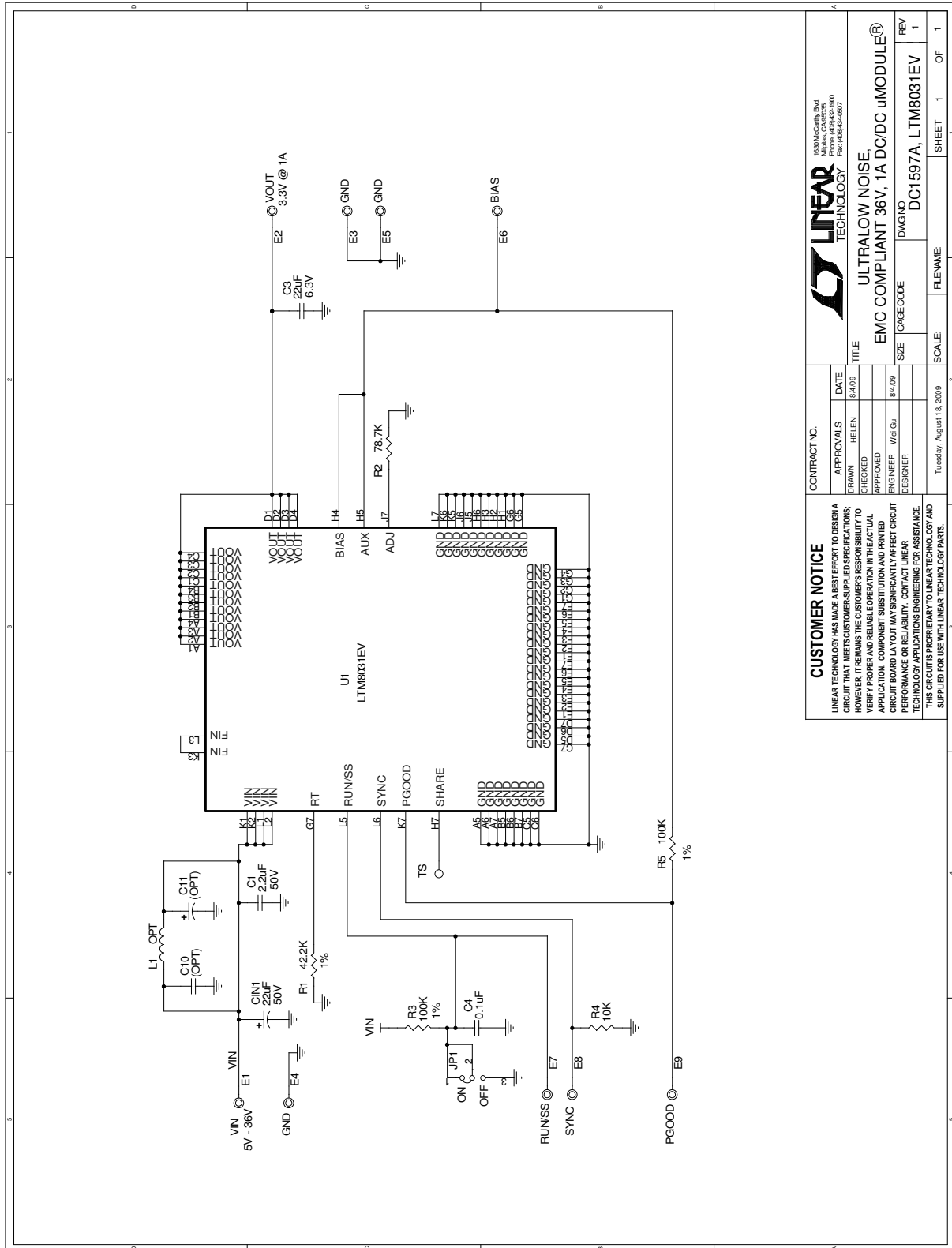
Figure 2. Measuring Input or Output Ripple

# DEMO MANUAL DC1597A

## PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
<b>Required Circuit Components</b>				
1	1	C1	Cap., X7R, 2.2 $\mu$ F, 50V, 10%, 1206	Murata, GRM31CR71H225KA88L
2	1	C3	Cap., X5R, 22 $\mu$ F, 6.3V, 20%, 0805	Taiyo Yuden, JMK212BJ226KG-T
3	1	C4	Cap., X7R, 0.1 $\mu$ F, 50V, 10%, 0603	AVX, 06035C104KAT2A
4	1	R1	Res., 42.2k, 1%, 1/16W, 0603	NIC, NRC06F4222TRF
5	1	R2	Res., 78.7k, 1%, 1/16W, 0603	NIC, NRC06F7872TRF
6	2	R3, R5	Res., 100k, 1%, 1/16W, 0603	NIC, NRC06F1003TRF
7	1	R4	Res., 10k, 5%, 1/16W, 0603	NIC, NRC06J103TRF
8	1	U1	IC, LTM8031EV, $\mu$ Module	Linear Technology, LTM8031EV#PBF
<b>Additional Demo Board Circuit Components</b>				
1	1	C <sub>IN1</sub>	Cap., 22 $\mu$ F, 50V	Suncon, 50CE22BS
2	0	C10 (Opt.)	Cap., 1206	
3	0	C11 (Opt.)	Cap., 22 $\mu$ F, 50V	
4	0	L1 (Opt.)	Ind., High Current, Size 2525	
<b>Hardware/Components (For Demo Board Only)</b>				
1	9	E1 to E9	Turret	Mill-Max, 2501-2-00-80-00-00-07-0
2	1	JP1	Header, 3-Pin, 2mm	Samtec, TMM-103-02-L-S
3	1	Shunt	Shunt, 2mm	Samtec, 2SN-BK-G
4	4	Stand-Off	Stand-Off, Nylon, 0.50" Tall	Keystone, 8833 (Snap On)

**SCHEMATIC DIAGRAM**



<b>CUSTOMER NOTICE</b>		<b>CONTRACT NO.</b>	
LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A CIRCUIT THAT MEETS CUSTOMER-SUPPLIED SPECIFICATIONS; HOWEVER, IT REMAINS THE CUSTOMER'S RESPONSIBILITY TO VERIFY PROPER AND RELIABLE OPERATION IN THE ACTUAL APPLICATION. COMPONENT SUBSTITUTION AND PRINTED CIRCUIT BOARD LAYOUT MAY SIGNIFICANTLY AFFECT CIRCUIT PERFORMANCE OR RELIABILITY. CONTACT LINEAR TECHNOLOGY APPLICATIONS ENGINEERING FOR ASSISTANCE. THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.			
APPROVALS	DATE	TITLE	
DESIGNED BY: HELEN	8/4/09	ULTRALOW NOISE, EMC COMPLIANT 36V, 1A DC/DC uMODULE®	
CHECKED:		SIZE	CAGE CODE
APPROVED:			
ENGINEER: WES GU	8/4/09	DMG NO	DC1597A, LTM8031EV
DESIGNER:		SCALE	FILENAME:
	Tuesday, August 18, 2009	SHEET	1 OF 1

# DEMO MANUAL DC1597A

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**Please read the DEMO BOARD manual prior to handling the product.** Persons handling this product must have electronics training and observe good laboratory practice standards. **Common sense is encouraged.**

This notice contains important safety information about temperatures and voltages. For further safety concerns, please contact a LTC application engineer.

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