

# LTM8032 Ultralow EMI, 36V, 2A DC/DC μModule Regulator

## DESCRIPTION

Demonstration circuit 1386 features the LTM<sup>®</sup>8032, a 2A EN55022 Class B certified step-down converter. This μModule<sup>®</sup> regulator is configured to deliver a 3.3V output from an input voltage between 5.5V to 36V at a switching frequency of 600kHz. The wide input range of the LTM8032 allows a variety of input sources. Under light load conditions, the available Burst Mode<sup>®</sup> operation supports high efficiency with low output ripple.

The LTM8032 data sheet gives a complete description of the part, operation and application information. The data sheet must be read in conjunction with this manual to modify demo circuit 1386.

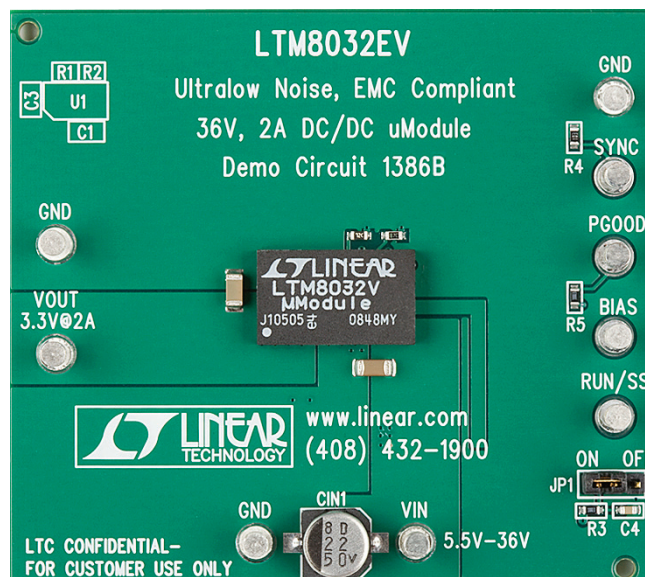
**Design files for this circuit board are available at <http://www.linear.com/demo>**

LT, LT, LTC, LTM, Linear Technology, Burst Mode, μModule and the Linear logo are registered trademarks of Linear Technology Corporation. All other trademarks are the property of their respective owners.

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

PARAMETER	CONDITION	VALUE
Input Voltage Range		5.5V to 36V
Output Voltage V <sub>OUT</sub>		3.3V
Maximum Output Current		2A
Typical Switching Frequency		600kHz

## BOARD PHOTO



## QUICK START PROCEDURE

Demonstration circuit 1386 is easy to set up to evaluate the performance of the LTM8032. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

NOTE. 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 proper scope probe technique.

1. Place JP1 on the ON position.
2. With power off, connect the input power supply to  $V_{IN}$  and GND.

3. Turn on the power at the input.

NOTE. Make sure that the input voltage does not exceed the maximum input voltage.

4. 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.

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

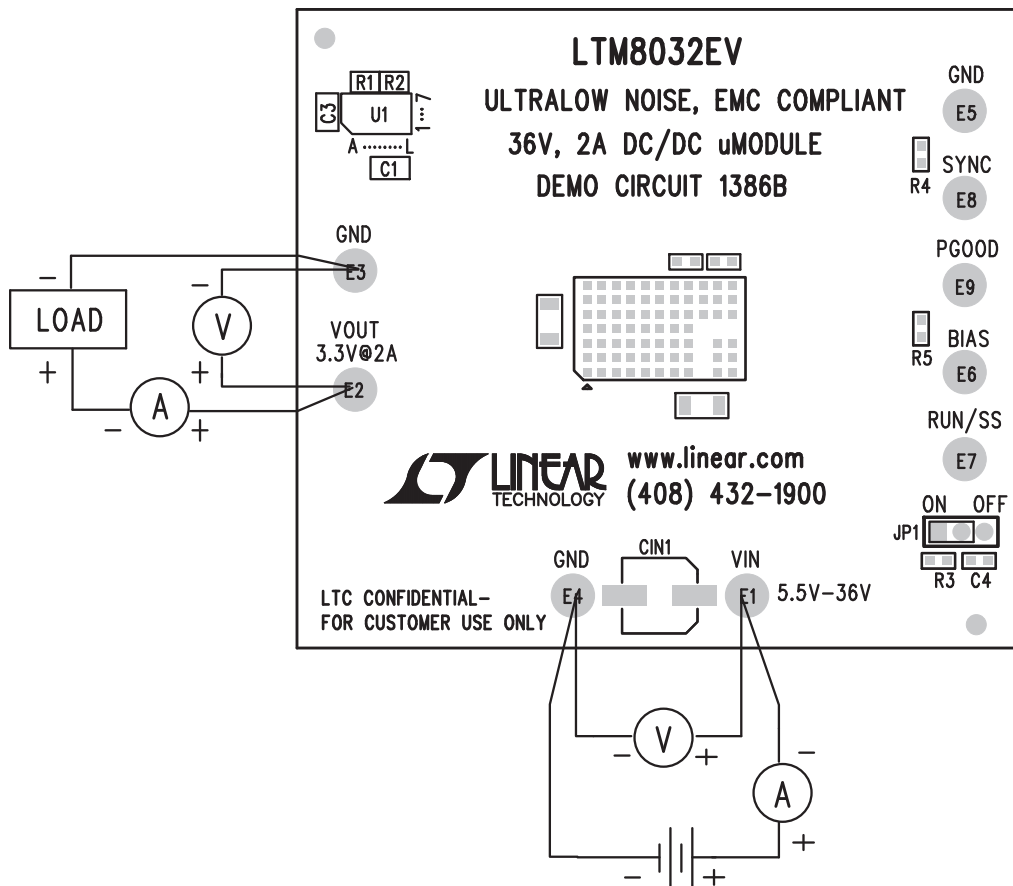


Figure 1. Proper Measurement Equipment Setup

## QUICK START PROCEDURE

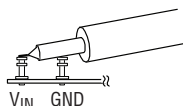


Figure 2. Measuring Input or Output Ripple

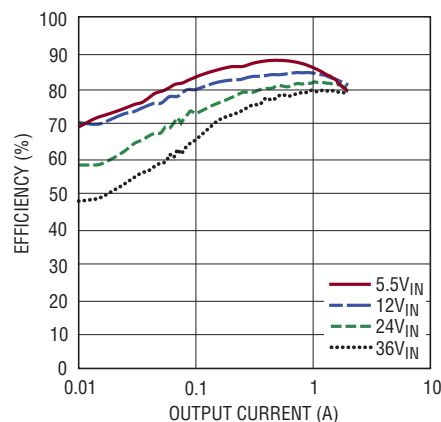


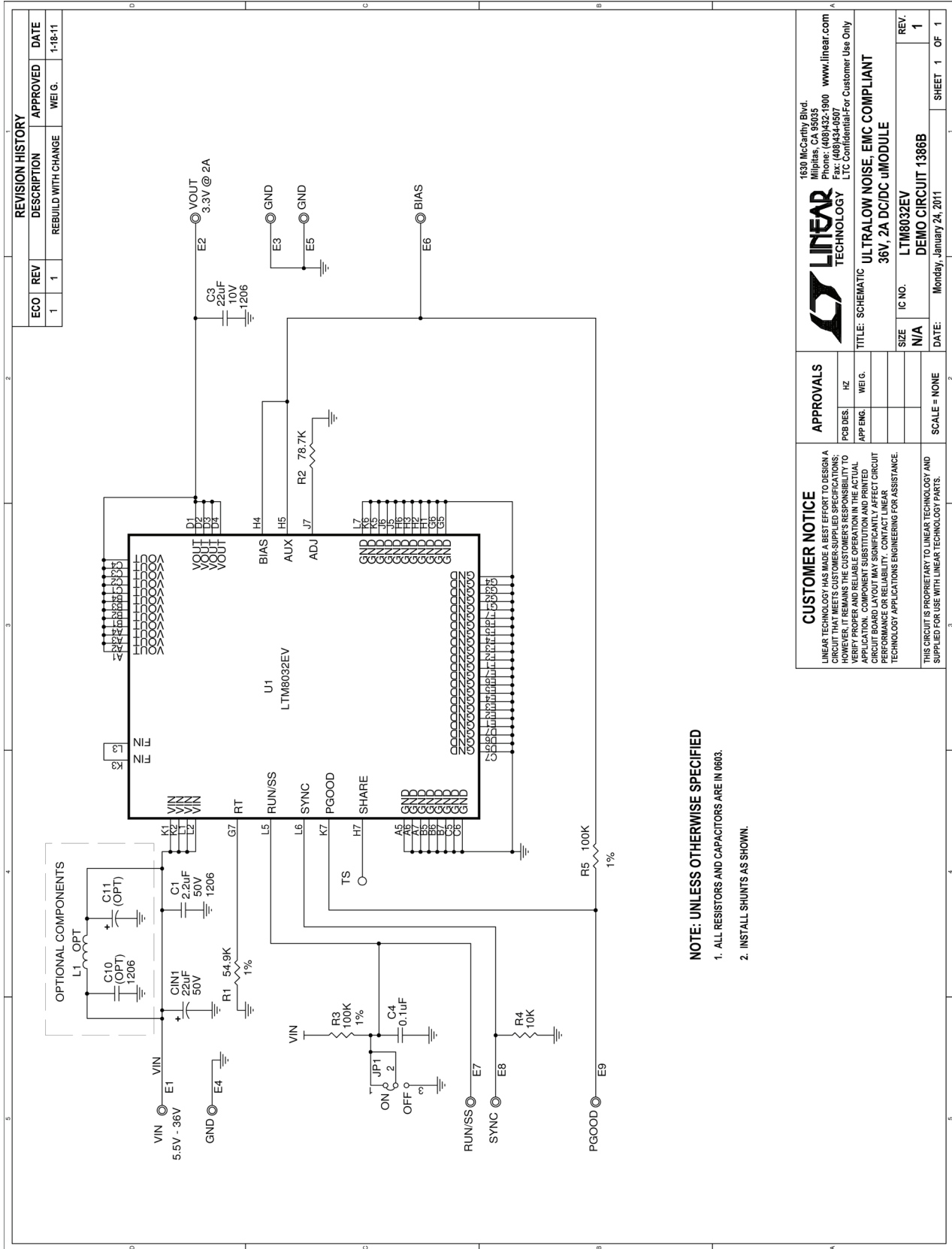
Figure 3. Efficiency

## PARTS LIST

ITEM	QUANTITY	REFERENCE-DESCRIPTION	DESCRIPTION	MANUFACTURER/PART NUMBER
<b>Required Circuit Components</b>				
1	1	C1	Cap, X7R, 2.2 $\mu$ F, 50V, 10%, 1206	Murata GCM31CR71H225KA55L
2	1	CIN1	Cap, 22 $\mu$ F, 50V	Sanyo 50CE22BS
3	1	C3	Cap, X5R, 22 $\mu$ F, 10V, 20%, 1206	AVX 1206ZD226MAT2A
4	1	C4	Cap, X7R, 0.1 $\mu$ F, 50V, 10%, 0603	AVX 06035C104KAT2A
5	1	R1	Res, 54.9k, 1%, 1/16W, 0603	Vishay CRCW060354K9FKEA
6	1	R2	Res, 78.7k, 1%, 1/16W, 0603	Vishay CRCW060378K7FKEA
7	2	R3, R5	Res, 100k, 1%, 1/16W, 0603	Vishay CRCW0603100KFKEA
8	1	R4	Res, 10k, 5%, 1/16W, 0603	Vishay CRCW060310K0JNED
9	1	U1	IC, LTM8032EV, $\mu$ Module	Linear Technology LTM8032EV#PBF
<b>Additional Demo Board Circuit Components</b>				
1	0	C10 (OPT)	Cap, 1206	
2	0	C11 (OPT)	Cap, 22 $\mu$ F, 50V	
3	0	L1 (OPT)	Ind, High Current, Size 2525	
<b>Hardware 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

# DEMO MANUAL DC1386B

## SCHEMATIC DIAGRAM



**NOTE: UNLESS OTHERWISE SPECIFIED**

1. ALL RESISTORS AND CAPACITORS ARE IN 0603.
2. INSTALL SHUNTS AS SHOWN.

REVISION HISTORY		
ECO	REV	DESCRIPTION
1	1	REBUILD WITH CHANGE

APPROVED	DATE
WEI G.	1-18-11

1630 McCarthy Blvd.  
Milpitas, CA 95035  
Phone: (408)432-1900 www.linear.com  
Fax: (408)434-0507  
LT Confidential-For Customer Use Only

**LINEAR TECHNOLOGY**

TITLE: SCHEMATIC  
ULTRALOW NOISE, EMC COMPLIANT  
38V, 2A DC/DC uMODULE

SIZE IC NO. LTM8032EV  
REV. 1

DATE: Monday, January 24, 2011  
SHEET 1 OF 1

APPROVALS

PCB DES.	HZ
APP ENG.	WEI G.

SCALE = NONE

**CUSTOMER NOTICE**  
LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A COMPLETELY EMC COMPLIANT BOARD. 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.

## REVISION HISTORY

REV	DATE	DESCRIPTION	PAGE NUMBER
A	04/11	Updated Board Photo	1
		Updated Figure 1	2
		Updated Schematic Diagram	4

# DEMO MANUAL DC1386B

---

## DEMONSTRATION BOARD IMPORTANT NOTICE

Linear Technology Corporation (LTC) provides the enclosed product(s) under the following **AS IS** conditions:

This demonstration board (DEMO BOARD) kit being sold or provided by Linear Technology is intended for use for **ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY** and is not provided by LTC for commercial use. As such, the DEMO BOARD herein may not be complete in terms of required design-, marketing-, and/or manufacturing-related protective considerations, including but not limited to product safety measures typically found in finished commercial goods. As a prototype, this product does not fall within the scope of the European Union directive on electromagnetic compatibility and therefore may or may not meet the technical requirements of the directive, or other regulations.

If this evaluation kit does not meet the specifications recited in the DEMO BOARD manual the kit may be returned within 30 days from the date of delivery for a full refund. **THE FOREGOING WARRANTY IS THE EXCLUSIVE WARRANTY MADE BY THE SELLER TO BUYER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. EXCEPT TO THE EXTENT OF THIS INDEMNITY, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.**

The user assumes all responsibility and liability for proper and safe handling of the goods. Further, the user releases LTC from all claims arising from the handling or use of the goods. Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge. Also be aware that the products herein may not be regulatory compliant or agency certified (FCC, UL, CE, etc.).

No License is granted under any patent right or other intellectual property whatsoever. **LTC assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or any other intellectual property rights of any kind.**

LTC currently services a variety of customers for products around the world, and therefore this transaction **is not exclusive**.

**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.

Mailing Address:

Linear Technology  
1630 McCarthy Blvd.  
Milpitas, CA 95035

Copyright © 2004, Linear Technology Corporation