

# LTM8033: 36V<sub>IN</sub>, 3A Low EMI Step-Down μModule Regulator

## DESCRIPTION

Demonstration circuit DC1623A features the LTM<sup>®</sup>8033, a low-EMI EN55022 Class B certified step-down μModule<sup>®</sup> regulator, pre-configured for a 3.3V output from a 5.5V to 36V input. The circuit supports other features of the LTM8033 including synchronization to an external clock, current sharing with another LTM8033 μModule regulator, and burst mode operation for improved efficiency

at light loads. The LTM8033 data sheet must be read in conjunction with this quick start guide prior to working on or modifying demo circuit DC1623A.

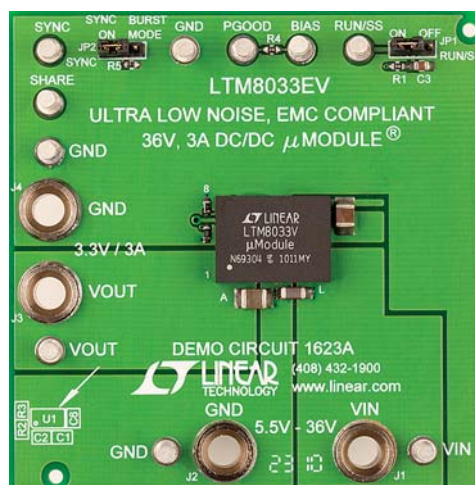
**Design files for this circuit board are available at <http://www.linear.com/demo>**

LT, LT, LTC, LTM, μModule, Linear Technology 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	CONDITIONS	VALUE
Input Voltage Range		5.5V to 36V
Output Voltage V <sub>OUT</sub>		3.3V ±3%
Maximum Output Current		3A
Typical Switching Frequency	R2 = 93.1k	425kHz

## BOARD PHOTO



## QUICK START PROCEDURE

Demonstration circuit DC1623A is an easy way to evaluate the performance of the LTM8033. 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 terminals of the input or output capacitors. See Figure 2 for proper scope probe technique.

1. Place JP1 in the ON position.
2. With power off, preset the input power supply within the operating input voltage range and connect to  $V_{IN}$  and GND.

3. Turn on the power at the input.

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 or is shorted.

5. 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.
6. An external clock can be added to the SYNC pin when SYNC function is used. See the Synchronization section in the data sheet for details.

**QUICK START PROCEDURE**

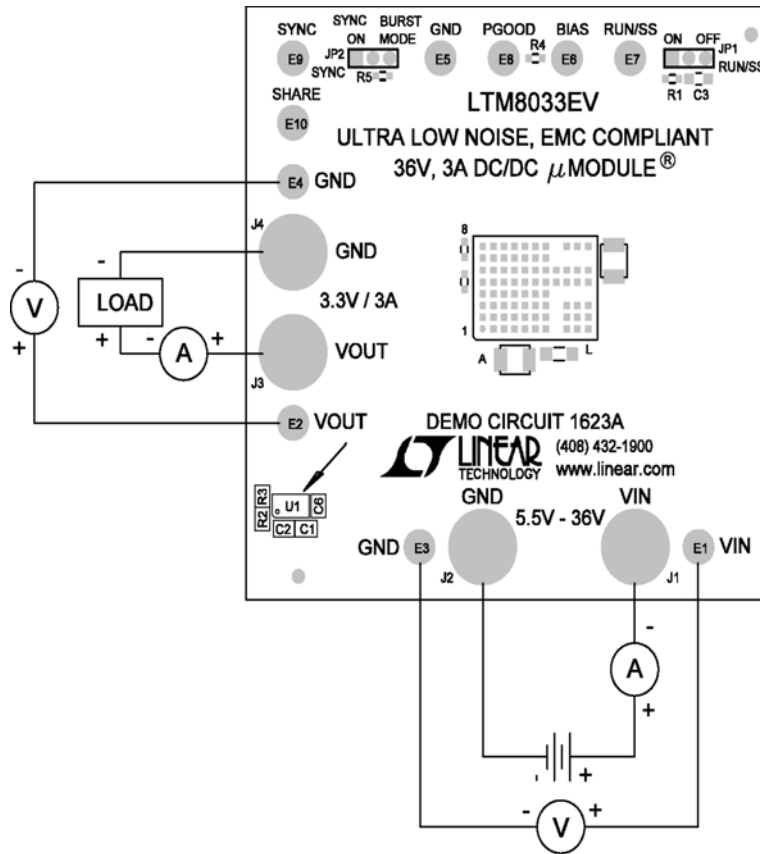


Figure 1. Measurement Equipment Setup

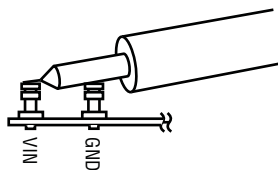


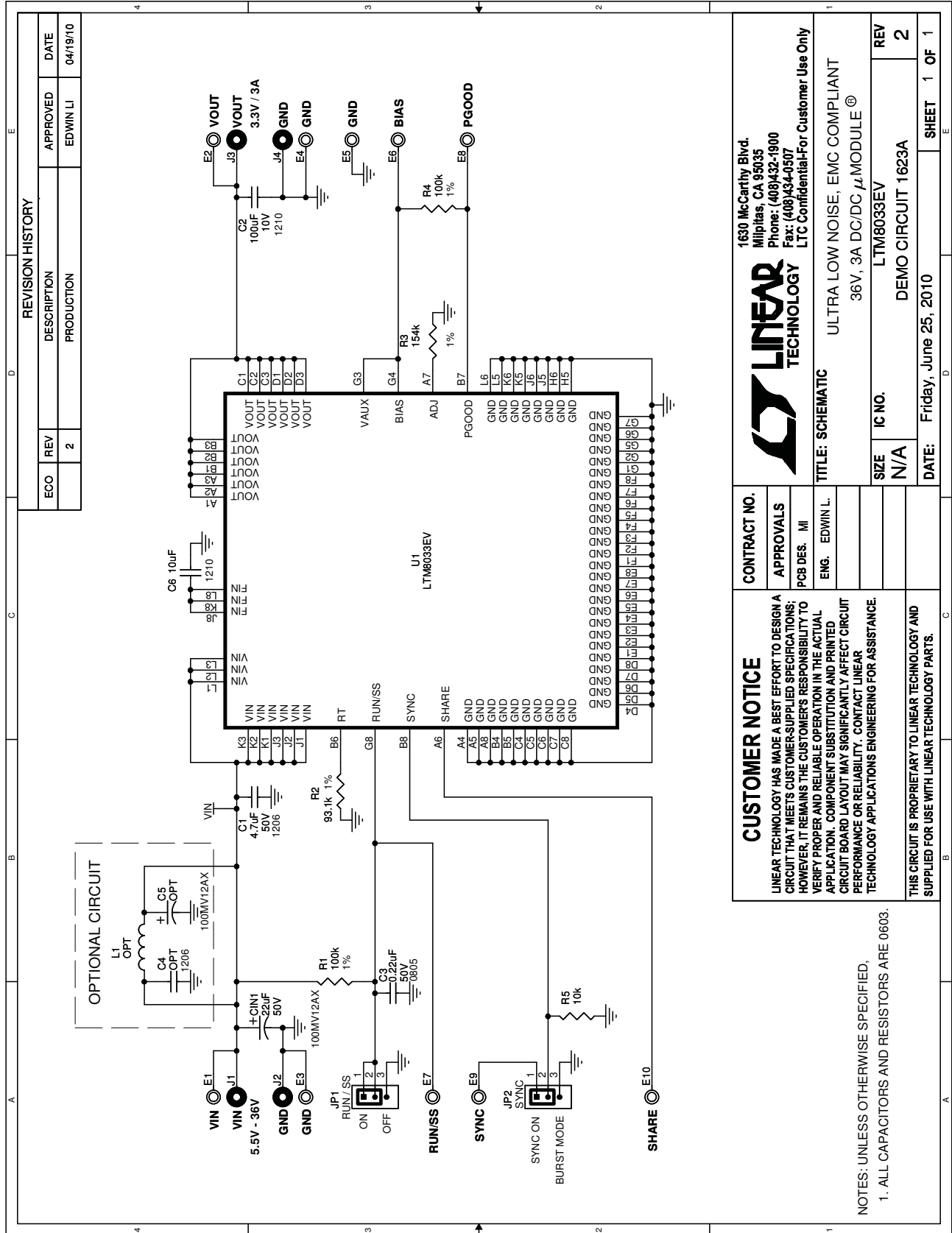
Figure 2. Measuring Input or Output Ripple

# DEMO MANUAL DC1623A

## PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
<b>Required Circuit Components</b>				
1	1	C3	CAP, 0805, 0.22 $\mu$ F 50V X5R	TAIYO YUDEN, UMK212BJ224MG-T
2	1	C2	CAP, 1210, 100 $\mu$ F 10V X5R	TAIYO YUDEN, LMK325BJ107MM-T
3	1	C1	CAP, 1206, 4.7 $\mu$ F 50V X5R	TAIYO YUDEN UMK316BJ475KL-T
4	1	C6	CAP, 1210, 10 $\mu$ F 10% 50V X7R	MURATA GRM32ER71H106K
5	1	R5	RES, 0603, 10k 5% 1/10W	VISHAY CRCW060310K0JNEA
6	2	R1,R4	RES, 0603, 100k 1% 1/10W	VISHAY CRCW0603100KFNEA
7	1	R2	RES, 0603, 93.1k 1% 1/10W	VISHAY CRCW060393K1FKEA
8	1	R3	RES, 0603, 154k 1% 1/10W	VISHAY CRCW0603154KFKED
9	1	U1	IC, LTM8033EV	LINEAR TECH. LTM8033EV
<b>Additional Demo Board Circuit Components</b>				
1	1	CIN1	CAP, 22 $\mu$ F 50V ALUMINUM ELEC.	SUN ELECT 50CE22BS
2	0	C4,C5	CAP, OPTION	OPTION
3	0	L1	OPTION	OPTION
<b>Hardware—For Demo Board Only</b>				
1	10	E1-E10	TURRET	MILL-MAX 2501-2-00-80-00-00-07-0
2	4	J1-J4	JACK, BANANA	KEYSTONE 575-4
3	2	JP1,JP2	HEADER, 1 $\times$ 3 PINS, 2MM	SAMTEC TMM-103-01-L-S
4	2	JP1,JP2	SHUNT, 2 PINS, 2MM	SAMTEC 2SN-BK-G

**SCHEMATIC DIAGRAM**



# DEMO MANUAL DC1623A

---

## 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