

# LTM8029

## 36V<sub>IN</sub>, 600mA Step-Down μModule Converter with 5μA Quiescent Current

### DESCRIPTION

DC1724A is a μModule® step-down converter, featuring the LTM8029, which consumes only 5μA of quiescent current. The demo circuit is designed for a 5V, 600mA output at an operating frequency of 600kHz. The input voltage range is from 5.6V to 36V. Equipped with an off-time skipping capability, the LTM8029 can operate at input voltages lower than other step-down regulators.

The wide input range of the LTM8029 allows a variety of input sources such as automotive batteries and industrial supplies. Its current mode control scheme creates fast transient response and good loop stability. At light loads, the LTM8029 operates in Burst Mode® operation to maintain high efficiency and low output ripple over a broad current

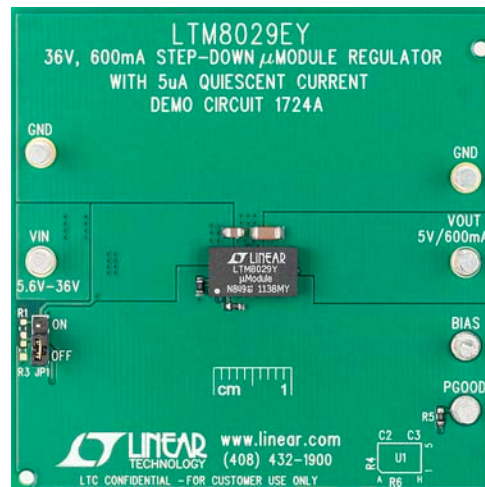
range. To provide a programmable undervoltage lockout, users can remove jumper JP1 and populate R1 and R3 on the RUN pin.

The LTM8029 data sheet gives a complete description of the part, operation and application information. The data sheet must be read in conjunction with this demo manual prior to working on or modifying demo circuit DC1724A.

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

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### BOARD PHOTO



# DEMO MANUAL DC1724A

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

PARAMETER	CONDITIONS	VALUE
Input Voltage Range	V <sub>OUT</sub> = 5V	5.6V to 36V
Output Voltage		5V
Maximum Output Current		600mA
Typical Switching Frequency		600kHz
Typical Efficiency	V <sub>IN</sub> = 12V, V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 600mA	85%

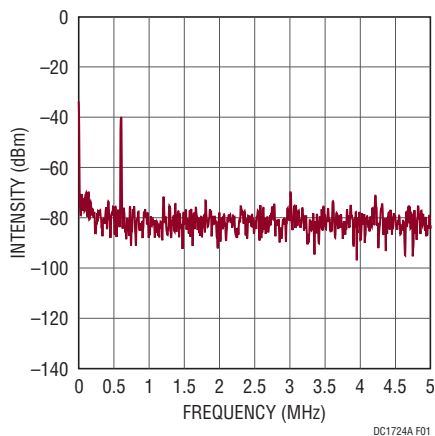


Figure 1. DC1724A Output Noise Spectrum  
(V<sub>IN</sub> = 12V, V<sub>OUT</sub> = 5V, I<sub>OUT</sub> = 600mA)

## QUICK START PROCEDURE

DC1724A provides an easy way to evaluate the performance of the LTM8029. Refer to Figure 2 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<sub>IN</sub> or V<sub>OUT</sub> and GND terminals. See Figure 3 for proper scope probe technique.

1. Place JP1 on the ON position.
2. With power off, connect the input power supply to V<sub>IN</sub> and GND.

3. Turn on the power at the input.

NOTE: Make sure that the input voltage does not exceed 36V.

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 load within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.

**QUICK START PROCEDURE**

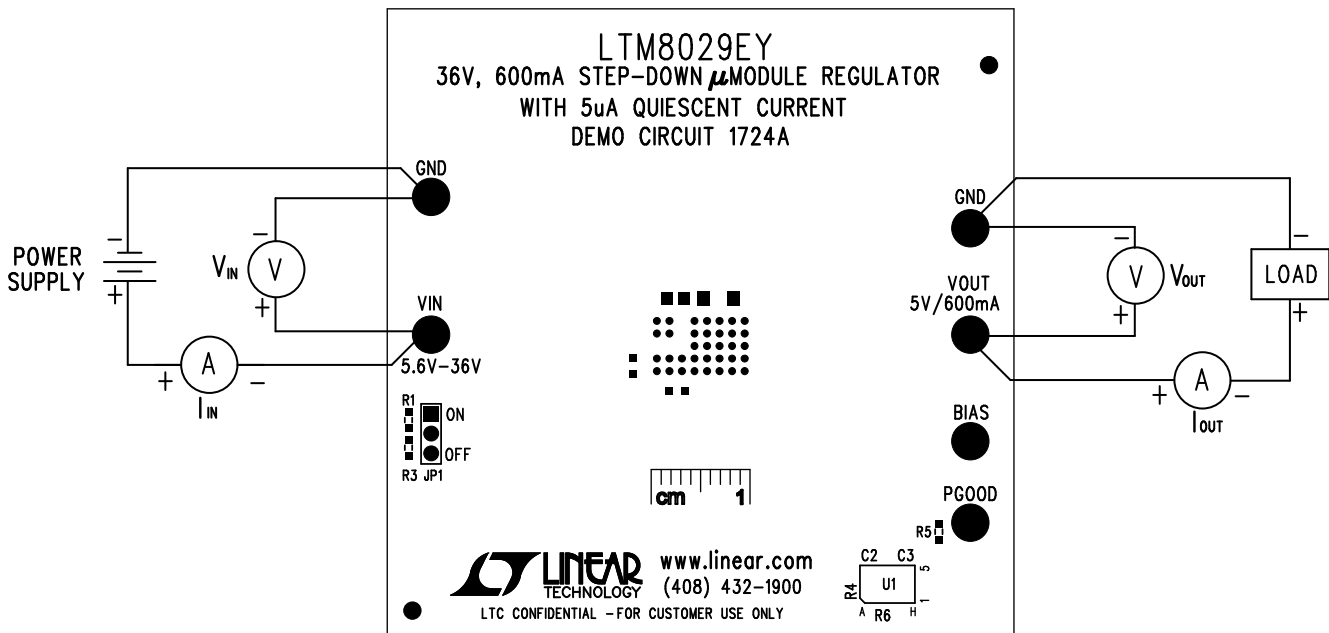


Figure 2. Proper Measurement Equipment Setup

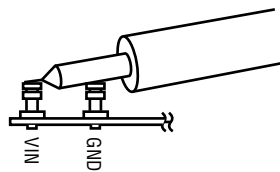


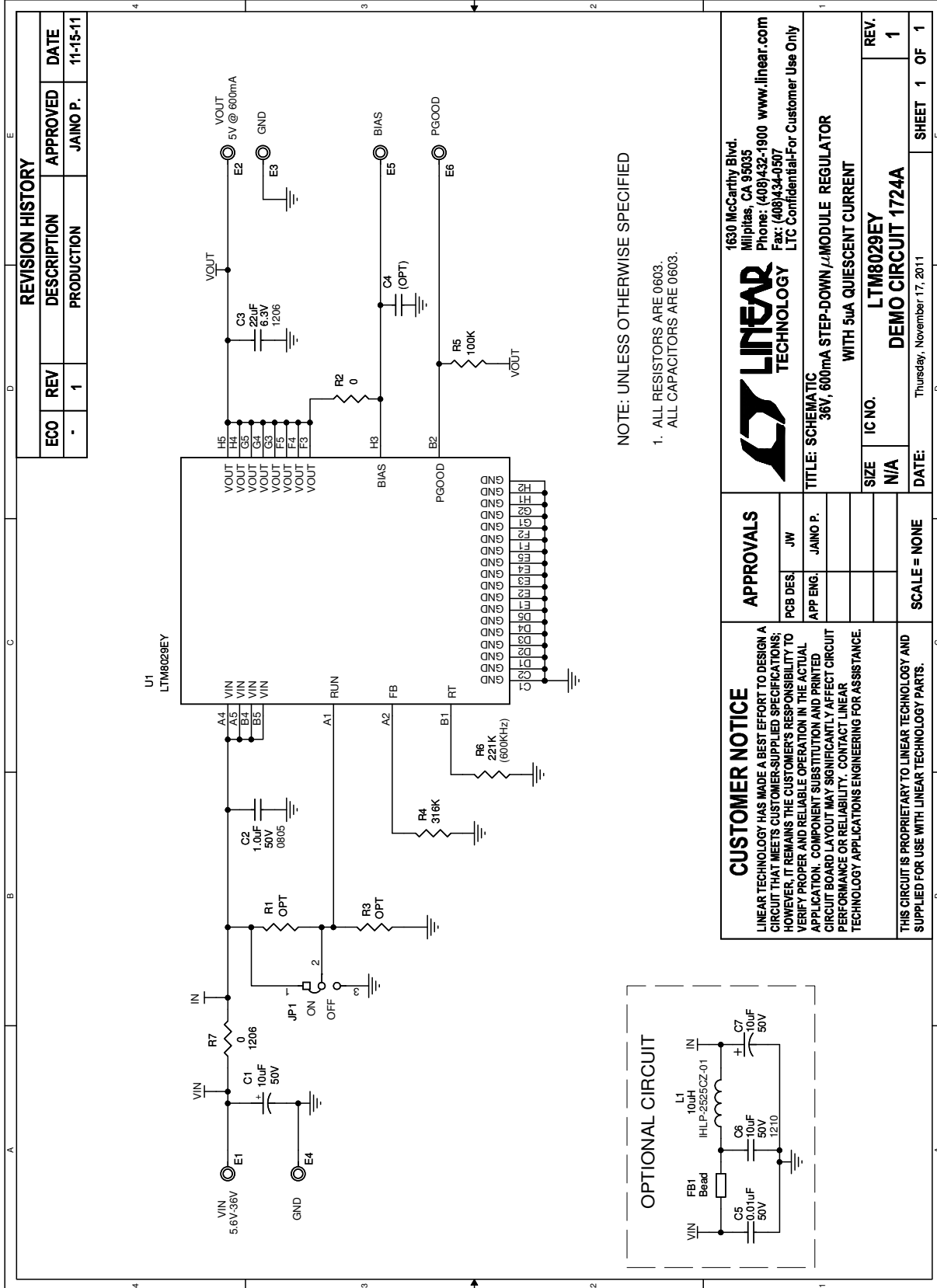
Figure 3. Measuring Input or Output Ripple

# DEMO MANUAL DC1724A

## PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
<b>Required Circuit Components</b>				
1	1	C2	CAP, X7R, 1.0 $\mu$ F, 50V, 10%, 0805	MURATA, GRM21BR71H105KA12L
2	1	C3	CAP, X5R, 22 $\mu$ F, 6.3V, 20%, 1206	TDK, C3216X5R0J226M
3	1	R2	RES., CHIP, 0 $\Omega$ , 1/16W, 0603	NIC, NRC06Z0TRF
4	1	R4	RES., CHIP, 316k, 1/10W, 1%, 0603	VISHAY, CRCW0603316KFKEA
5	1	R5	RES., CHIP, 100k, 1/10W, 1% 0603	VISHAY, CRCW0603100KFKEA
6	1	R6	RES., CHIP, 221k, 1/10W, 1% 0603	VISHAY, CRCW0603221KFKEA
7	1	R7	RES., CHIP, 0 $\Omega$ , 1/4W, 1% 1206	NIC, NRC12Z0TRF
8	1	U1	IC., MODULE REGULATOR, LTM8029EY BGA-35 LEAD	LINEAR TECH., LTM8029EV
<b>Additional Demo Board Circuit Components</b>				
1	1	C1	CAP, ALUM, 10 $\mu$ F, 50V	SUN ELECT., 50CE10BS
2	0	C4, C5 (OPT)	CAP, 0603	
3	0	C6 (OPT)	CAP, 1210	
4	0	C7 (OPT)	CAP, ALUM CAP	
5	0	R1, R3 (OPT)	RES., CHIP, 0603	
6	0	FB1 (OPT)	FERRITE BEAD, M TYPE	TAIYO YUDEN, FBMJ3216HS800T
7	0	L1 (OPT)	IND., 10 $\mu$ H	VISHAY, IHLP-2525CZ-01
<b>Hardware – For Demo Board Only</b>				
1	6	E1-E6	TEST POINT, TURRET, 0.094" PBF	MILL-MAX, 2501-2-00-80-00-00-07-0
2	1	JP1	3 PIN 0.079" SINGLE ROW HEADER	SAMTEC, TMM103-02-L-S
3	1	XJP1	SHUNT, 0.079" CENTER	SAMTEC, 2SN-BK-G
4	1	STENCIL		

**SCHEMATIC DIAGRAM**



NOTE: UNLESS OTHERWISE SPECIFIED

- 1. ALL RESISTORS ARE 0603.
- ALL CAPACITORS ARE 0603.


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**APPROVALS**

PCB DES.	JW
APP ENG.	JAINO P.

SCALE = NONE



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**TITLE: SCHEMATIC**  
38V, 600mA STEP-DOWN  $\mu$ MODULE REGULATOR  
WITH 5 $\mu$ A QUIESCENT CURRENT

SIZE: N/A IC NO.: LTM8029EY  
REV. 1  
DATE: Thursday, November 17, 2011



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# DEMO MANUAL DC1724A

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