

# LTM8050

## 58V<sub>IN</sub>, 2A Step-Down μModule Regulator

### DESCRIPTION

Demo circuit DC1723A features the **LTM<sup>®</sup>8050**, a μModule<sup>®</sup> (micromodule) step-down converter that can deliver up to 2A of output current. DC1723A is designed for a 5V, 2A output from a 7.5V to 58V input at 400kHz. The wide input range of the LTM8050 allows a variety of input sources such as automotive batteries and industrial supplies. At light loads, the LTM8050 enters Burst Mode<sup>®</sup> operation to maintain high efficiency and low output ripple over a broad current range. The user adjustable features of the LTM8050 such as output voltage, switching frequency, soft-start, and power good can be changed on DC1723A

simply by modifying or installing the appropriate resistors and/or capacitors.

The LTM8050 data sheet gives a complete description of the part, operation and application information. The data sheet must be read in conjunction with this Quick Start Guide for the demo circuit 1723A.

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

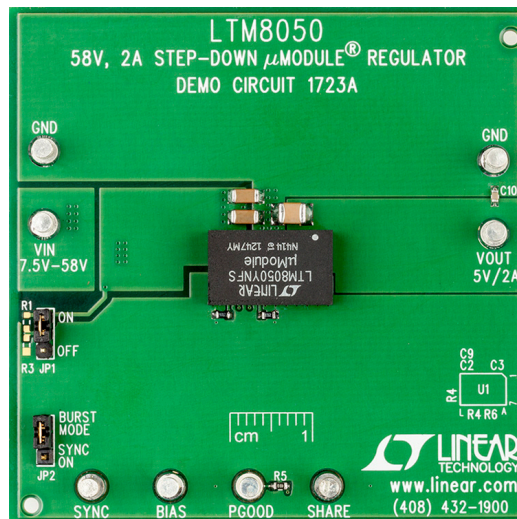
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### PERFORMANCE SUMMARY

Specifications are at T<sub>A</sub> = 25°C

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Minimum Input Voltage, V <sub>IN</sub>	V <sub>OUT</sub> = 5V			7.5	V
Maximum Input Voltage, V <sub>IN</sub>	V <sub>OUT</sub> = 5V	58			V
Output Voltage, V <sub>OUT</sub>	R4 = 93.1k	4.87	5.02	5.17	V
Maximum Output Current		2			A
Switching Frequency	R6 = 97.6k		400		kHz
Efficiency	V <sub>IN</sub> = 12V, I <sub>OUT</sub> = 2A		85		%

### BOARD PHOTO



dc1723af

## QUICK START PROCEDURE

Demonstration circuit 1723A is easy to set up to evaluate the performance of the LTM8050. 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, connect the input power supply to VIN and GND.
3. Turn on the power at the input.

**Note:** Make sure that the input voltage does not exceed 58V.

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.

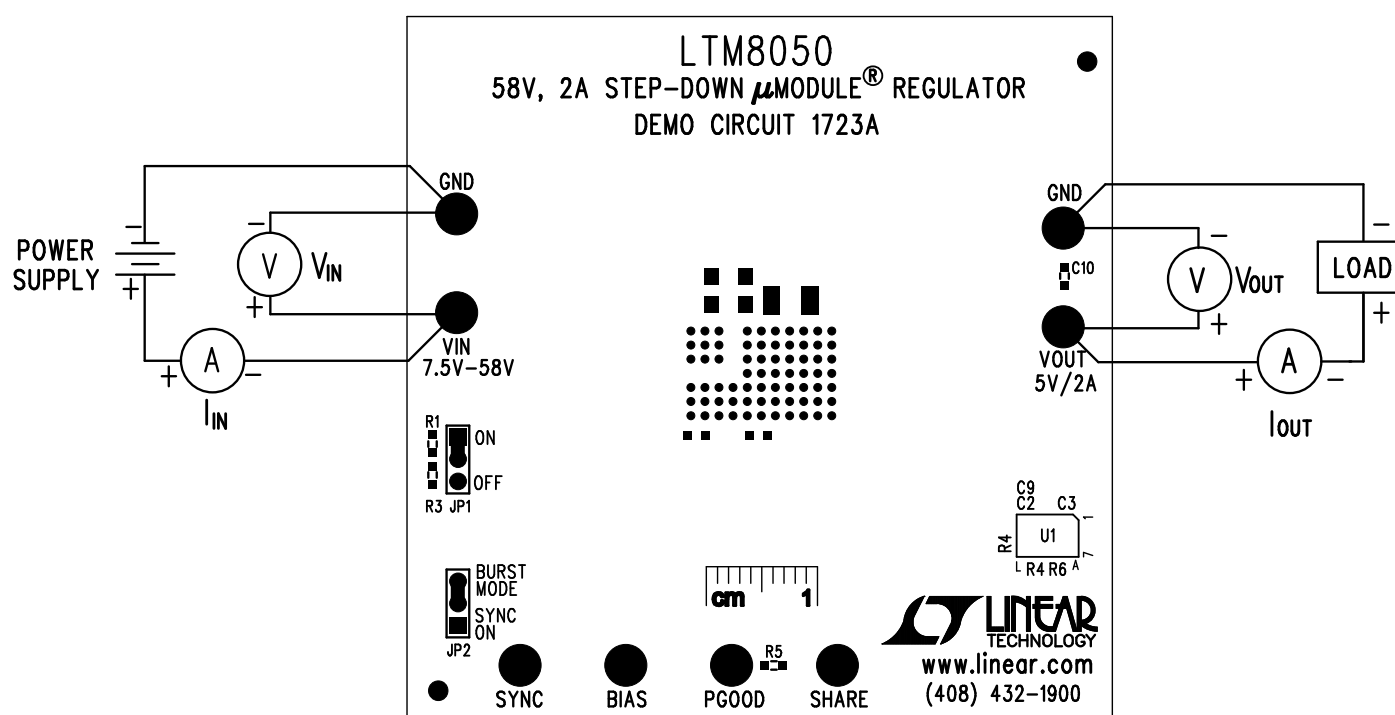


Figure 1. Measurement Equipment Setup

## QUICK START PROCEDURE

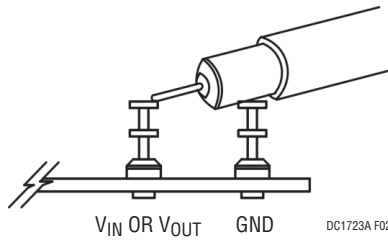


Figure 2. Measuring Input or Output Ripple

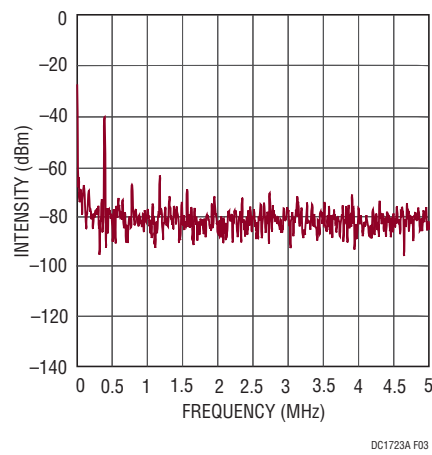


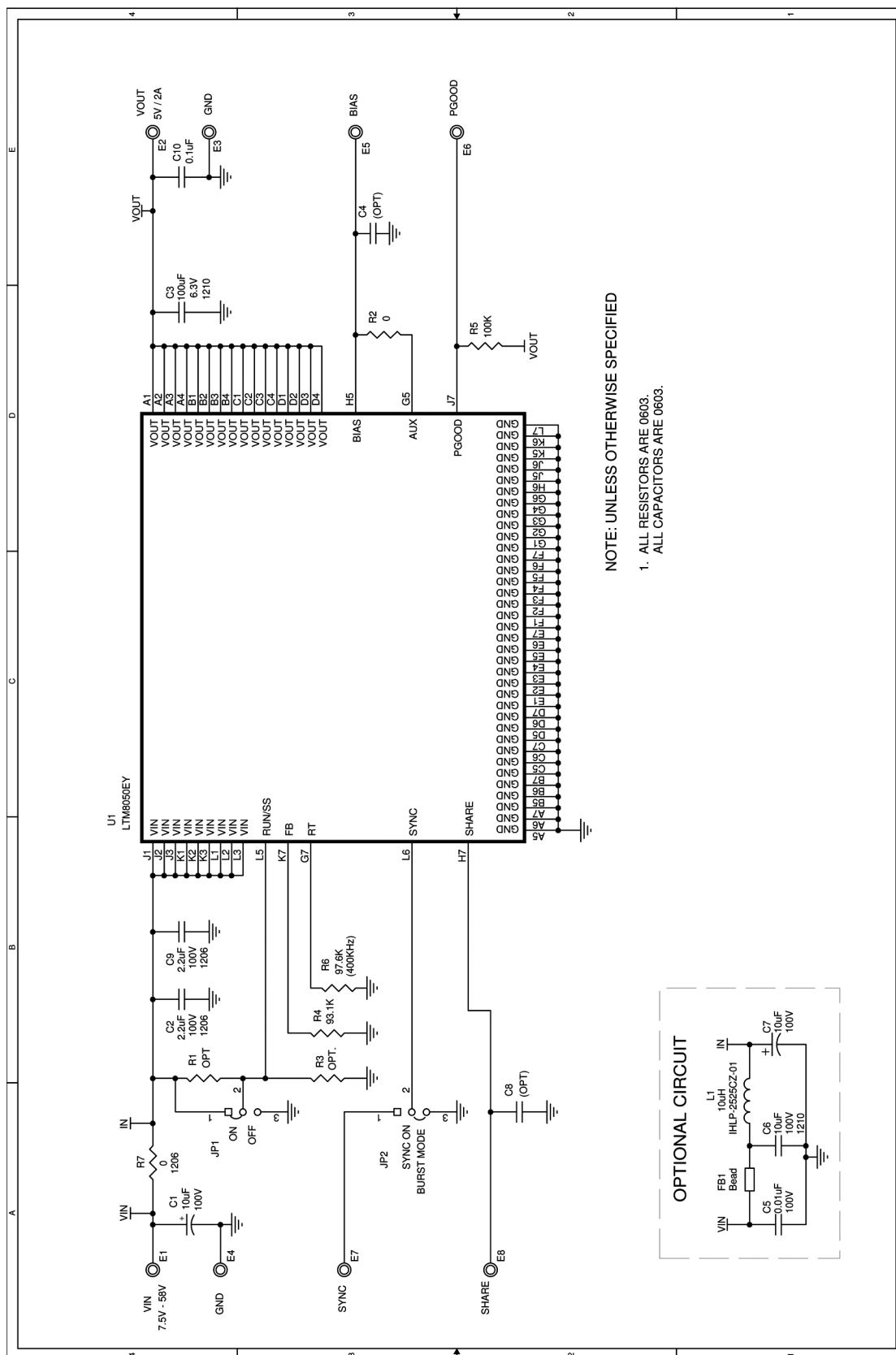
Figure 3. DC1723A Output Noise Spectrum ( $V_{IN} = 12V$ ,  $V_{OUT} = 5V$ ,  $I_{OUT} = 2A$ )

# DEMO MANUAL DC1723A

## PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
<b>Required Circuit Components</b>				
1	2	C2, C9	CAP., X7R, 2.2 $\mu$ F, 100V, 10%, 1206	MURATA, GRM31CR72A225KA73
2	1	C3	CAP., X5R, 100 $\mu$ F, 6.3V, 20%, 1210	MURATA, GRM32ER60J107ME20L
3	1	C10	CAP., X7R, 0.1 $\mu$ F, 10V, 10%, 0603	AVX, 0603ZC104KAT2A
4	1	R2	RES., CHIP, 0 $\Omega$ , 1/10W, 0603	NIC, NRC06Z0TRF
5	1	R4	RES., CHIP, 93.1k, 1/10W, 1% 0603	VISHAY, CRCW060393K1FKEA
6	1	R5	RES., CHIP, 100k, 1/10W, 1% 0603	NIC, NRC06F1003TRF
7	1	R6	RES., CHIP, 97.6k, 1/10W, 1% 0603	VISHAY, CRCW060397K6FKEA
8	1	R7	RES., CHIP, 0 $\Omega$ , 1/4W, 1% 1206	NIC, NRC12Z0TRF
9	1	U1	IC., MODULE REGULATOR, LTM8050EY BGA-70 LEAD	LINEAR TECH., LTM8050EY
<b>Additional Demo Board Circuit Components</b>				
1	1	C1	CAP., ELECTROLYTIC, 10 $\mu$ F, 100V	SUN ELECT., 100CE10BS
2	0	C4, C5, C8 (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	8	E1-E8	TESTPOINT, TURRET, 0.094" PBF	MILL-MAX, 2501-2-00-80-00-00-07-0
2	2	JP1-JP2	3 PIN 0.079" SINGLE ROW HEADER	SULLINS, NRPN031PAEN-RC
3	1	XJP1-XJP2	SHUNT, 0.079" CENTER	SAMTEC, 2SN-BK-G
4	1	Stencil		

## SCHEMATIC DIAGRAM



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# DEMO MANUAL DC1723A

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