

LTM8046

3.1V_{IN} to 32V_{IN}, 2kV Isolated DC/DC μ Module Converter

DESCRIPTION

The demo circuit 1559A features the [LTM8046](#), a 2kVAC, 2.5W isolated flyback μ Module[®] converter. The demo circuit is designed for a 5V output from a 3.2V to 26V input. The typical current capability of the 5V output varies with input voltage from about 150mA at V_{IN} = 4V to about 550mA at V_{IN} = 26V. R2 provides the necessary minimum load current to keep the V_{OUT} in regulation throughout the entire input voltage range. Please see the Typical Performance Characteristics curves in the LTM8046 data sheet to determine the minimum load current for other input/output configurations.

The LTM8046 data sheet gives complete description of the device, operation and application information. The data sheet must be read in conjunction with this demo manual prior to working on or modifying demo circuit 1559A.

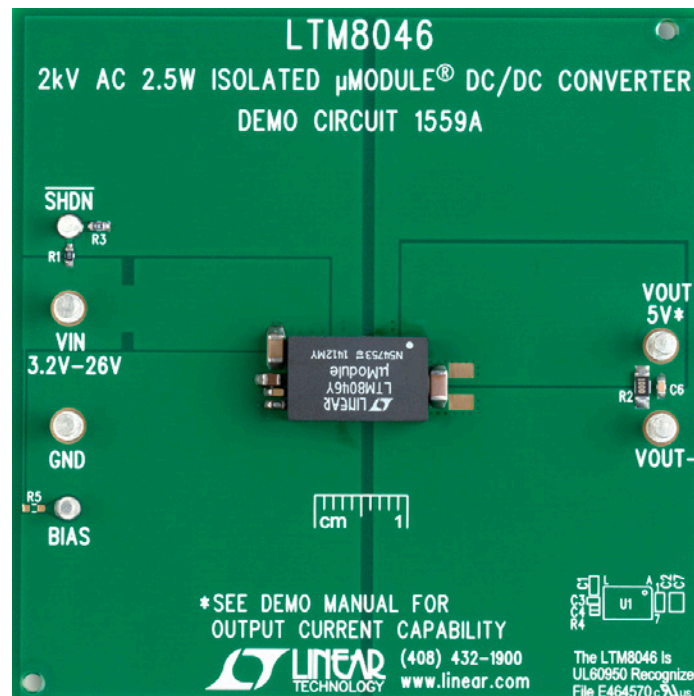
Design files for this circuit board are available at <http://www.linear.com/demo>

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PERFORMANCE SUMMARY

Specifications are at T_A = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V _{IN}	Input Supply Range		3.2		26	V
V _{OUT}	Output Voltage		4.75	5	5.25	V
V _{OUT(AC)}	Output Ripple	V _{IN} = 12V, I _{OUT} = 300mA			50	mV



dc1559af

QUICK START PROCEDURE

Demo circuit 1559A is an easy way to evaluate the performance of the LTM8046. Refer to Figure 3 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 VIN or VOUT and GND terminals. See Figure 4 for proper scope probe technique.

1. With power off, connect the input power supply to VIN and GND.
2. Turn on the power at the input.

Note: Make sure that the input voltage does not exceed 26V.

3. Check for the proper output voltage between VOUT and VOUT-.

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

4. 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.

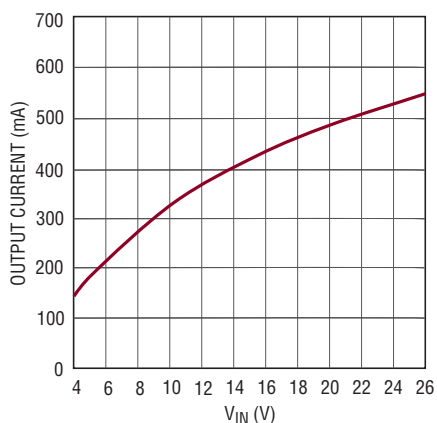


Figure 1. V_{OUT} Maximum Output Current vs V_{IN}

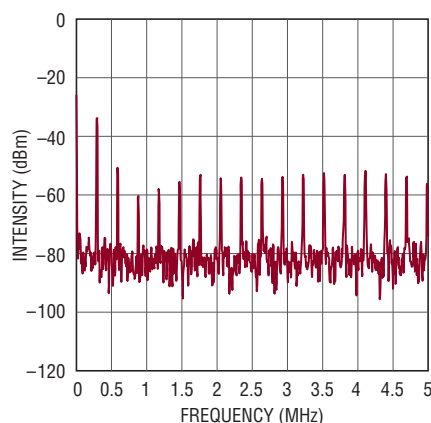


Figure 2. V_{OUT} Output Noise Spectrum with I_{OUT} at 300mA and V_{IN} at 12V

QUICK START PROCEDURE

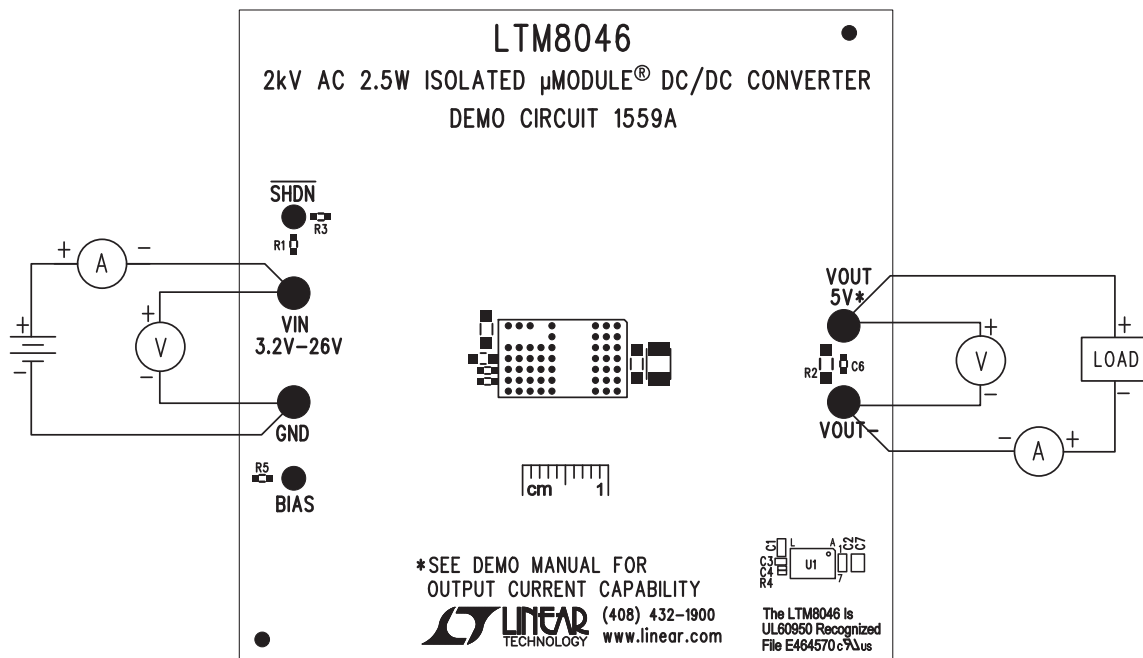


Figure 3. DC1559A Proper Equipment Setup

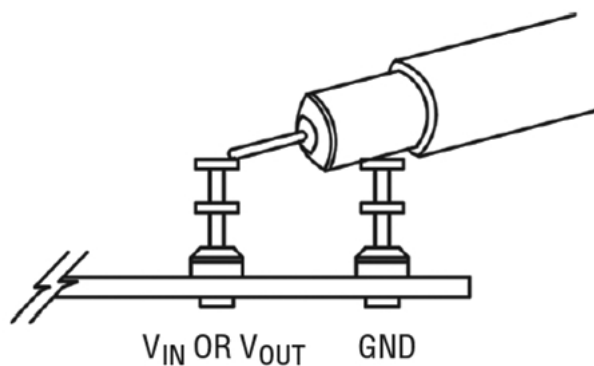


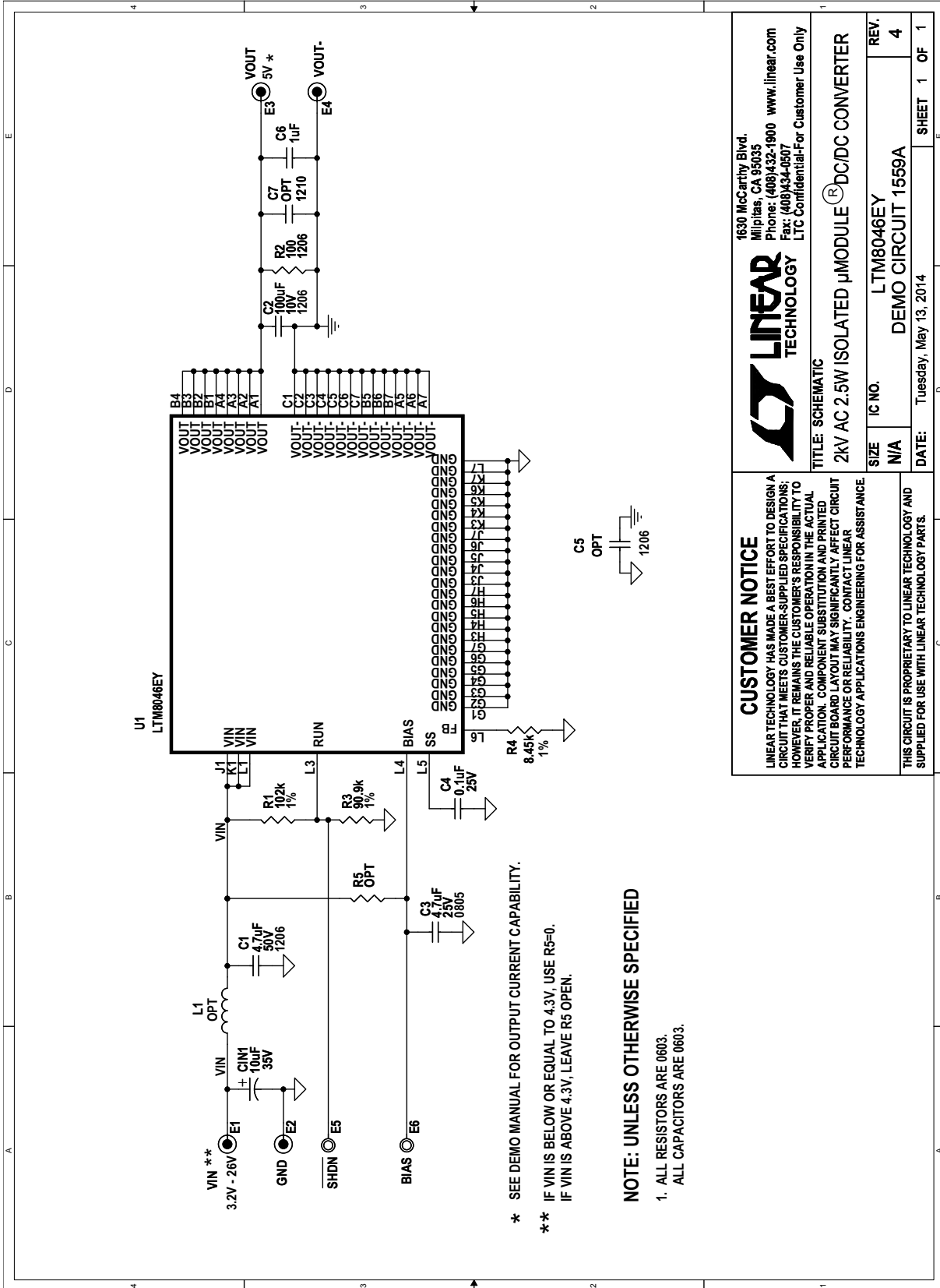
Figure 4. Measuring Input or Output Ripple

DEMO MANUAL DC1559 A

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	1	C1	CAP., CHIP, X7R, 4.7 μ F, 50V, 10%, 1206	Taiyo Yuden, UMK316BJ475KLT
2	1	C2	CAP., CHIP, X5R, 100 μ F, 10V, 20%, 1206	TDK, C3216X5R1A107M160AC
3	1	C3	CAP., CHIP, X7R, 4.7 μ F, 25V, 10%, 0805	TDK, C2012X7R1E475K125AB
4	1	C4	CAP., CHIP, X7R, 0.1 μ F, 25V, 10%, 0603	AVX, 06033C104KAT2A
5	1	C6	CAP., CHIP, X7R, 1 μ F, 10V, 10%, 0603	AVX, 0603ZC105KAT2A
6	1	R1	RES., CHIP, 102k, 1%, 1/10W 0603	YAGEO, RC0603FR-07102KL
7	1	R2	RES., CHIP, 100 Ω , 1/4W, 1%, 1206	YAGEO, RC1206FR-07100RL
8	1	R3	RES., CHIP, 90.9k, 1%, 1/10W, 1% 0603	YAGEO, RC0603FR-0790K9L
9	1	R4	RES., CHIP, 8.45k, 1%, 1/10W 0603	VISHAY, CRCW06038K45FKEA
10	1	U1	IC., LINEAR LTM8046EY#PBF	LINEAR TECH., LTM8046EY#PBF
Additional Demo Board Circuit Components				
1	1	CIN1	CAP., TANT, 10 μ F, 35V, CASE-C	AVX, TAJC106K035R
2	0	C5	OPT. 1206	
3	0	C7	OPT. 1210	
4	0	L1	OPT.	
Hardware-For Demo Board Only				
1	4	E1-E4	TESTPOINT, TURRET, 0.094"	MILL-MAX 2501-2-00-80-00-00-07-0
2	2	E5, E6	TESTPOINT, TURRET, 0.064"	MILL-MAX 2308-2-00-80-00-00-07-0

SCHEMATIC DIAGRAM



<p>LINEAR TECHNOLOGY</p> <p>1630 McCarthy Blvd. Milpitas, CA 95035 Phone: (408)432-1900 www.linear.com Fax: (408)434-0507 LTC Confidential-For Customer Use Only</p>	
<p>TITLE: SCHEMATIC</p> <p>2KV AC 2.5W ISOLATED µMODULE DC/DC CONVERTER</p>	
<p>SIZE</p> <p>N/A</p>	<p>IC NO.</p> <p>LTM8046EY</p>
<p>REV.</p> <p>4</p>	<p>DEMO CIRCUIT 1559A</p>
<p>DATE:</p> <p>Tuesday, May 13, 2014</p>	<p>SHEET 1 OF 1</p>
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