

DESCRIPTION

The Demo circuit 1987A is a 2kV AC isolated flyback μ Module[®] DC/DC converter featuring the [LTM8057](#). The demo circuit is designed for a 5V flyback output from a 4.5V to 29V input. The typical current capability of the 5V flyback output varies with input voltage from about 110mA at 4.5V_{IN} to about 350mA at 29V_{IN}. Figure 1 shows the typical maximum output current on V_{OUT}. R1 provides the necessary minimum load current to keep the V_{OUT} in regulation throughout the entire input voltage range. Please see the typical performance characteristic curves

in the LTM8057 data sheet to determine the minimum load current for other input/output configurations.

The LTM8057 data sheet gives complete description of the device, operation and application information. The data sheet must be read in conjunction with this quick start guide prior to using demo circuit 1987A.

Design files for this circuit board are available at <http://www.linear.com/demo/DC1987A>

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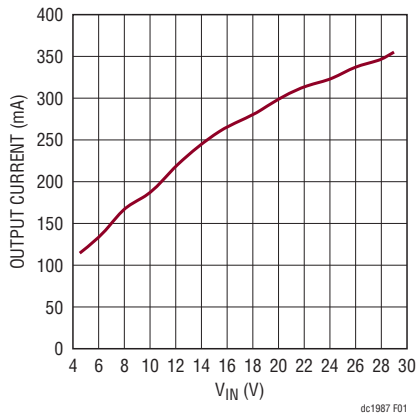


Figure 1. V_{OUT} Typical Maximum Output Current vs V_{IN}

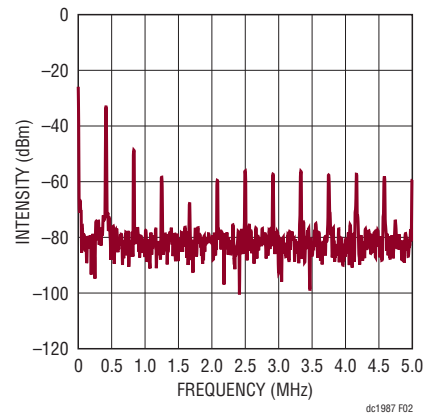
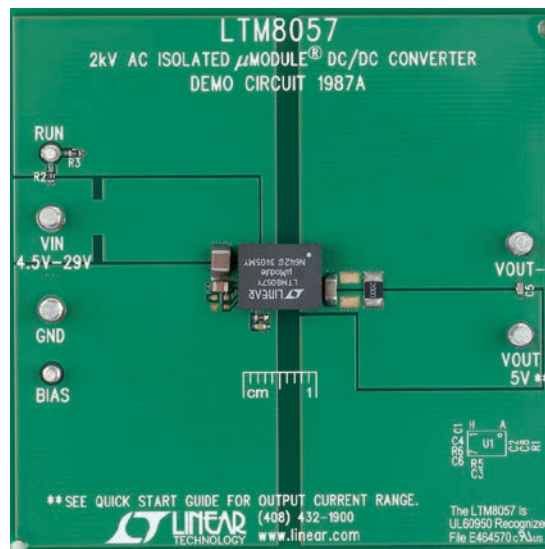


Figure 2. V_{OUT} Output Noise Spectrum with I_{OUT} at 100mA and V_{IN} at 12V

BOARD PHOTO



dc1987af

PERFORMANCE SUMMARY Specifications are at $T_A = 25^\circ\text{C}$

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|--------------------------|---|------|-----|------|-------|
| Minimum Input Voltage | | | | 4.5 | V |
| Maximum Input Voltage | | 29 | | | V |
| Output Voltage V_{OUT} | $V_{IN} = 4.5\text{V} - 29\text{V}$ | 4.75 | | 5.25 | V |
| Voltage Ripple V_{OUT} | $V_{IN} = 12\text{V}, I_{OUT} = 100\text{mA}$ | | 10 | | mV |

QUICK START PROCEDURE

Demo circuit 1987A provides an easy method to evaluate the performance of the LTM8057. 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 29V.

3. Check for the proper output voltage. (For V_{OUT} , check the 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 voltages are established, adjust the load within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.

QUICK START PROCEDURE

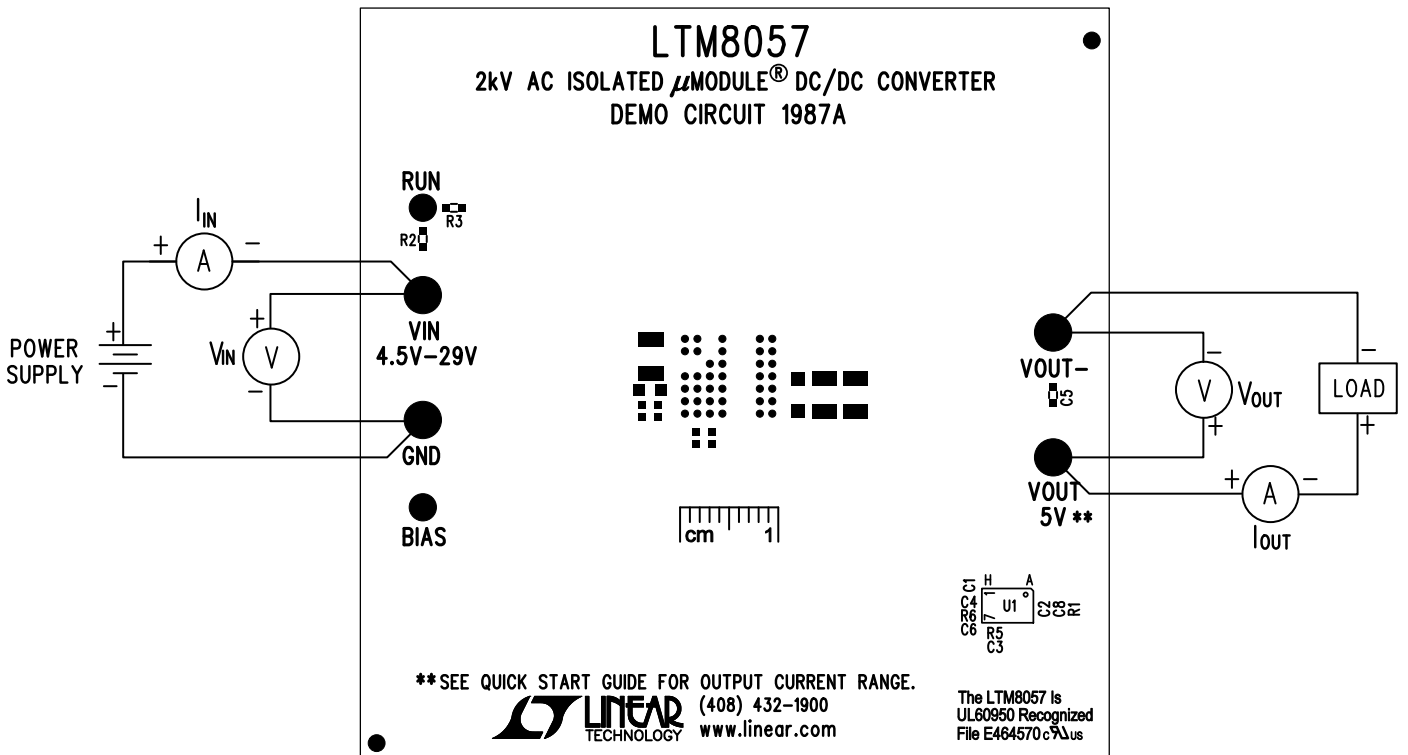


Figure 3. DC1987A Proper Equipment Setup

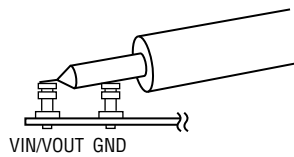


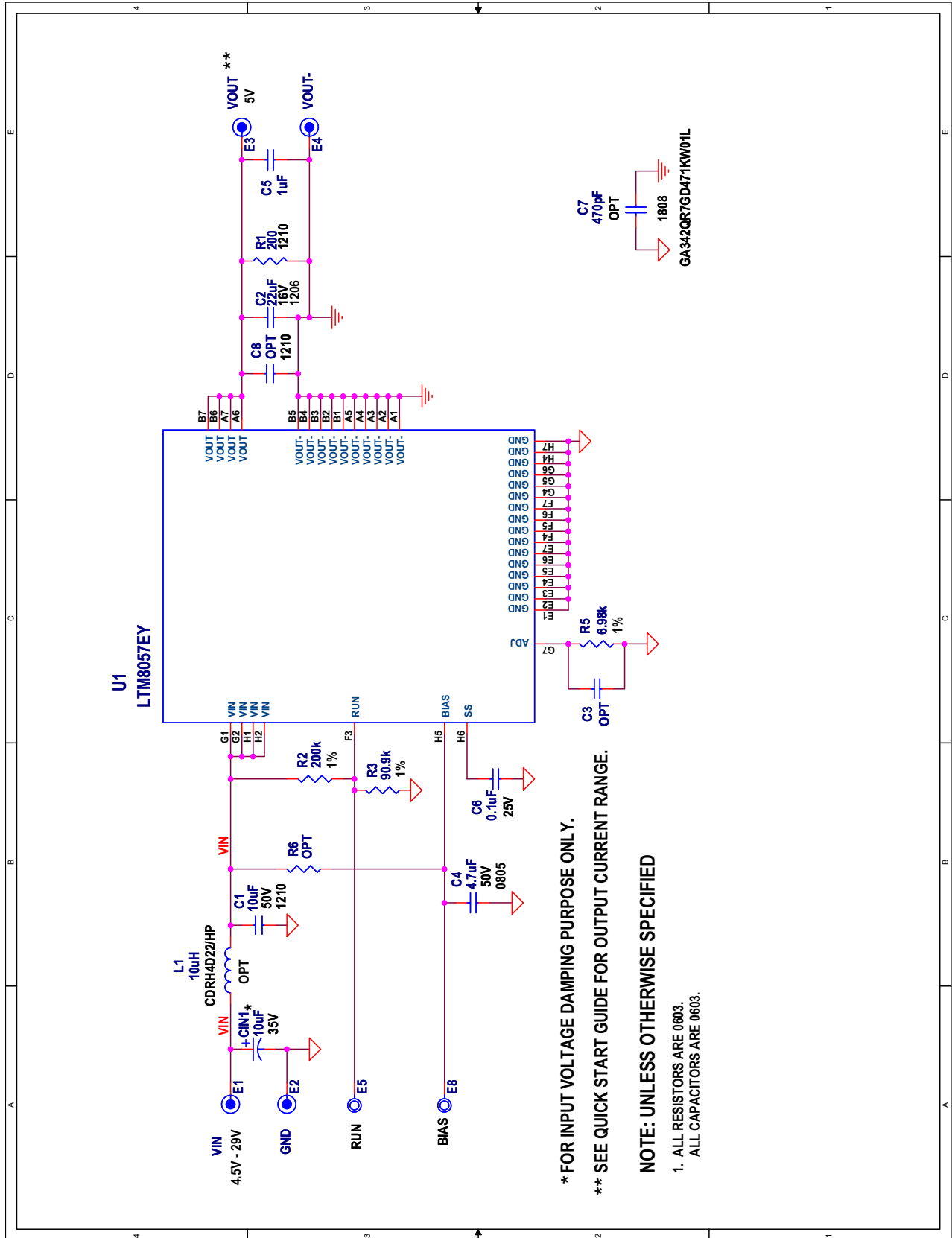
Figure 4. Measuring Input or Output Ripple

DEMO MANUAL DC1987A

PARTS LIST

| ITEM | QTY | REFERENCE | PART DESCRIPTION | MANUFACTURER/PART NUMBER |
|---|-----|-----------|---|----------------------------------|
| Required Circuit Components | | | | |
| 1 | 1 | C1 | CAP., CHIP, X5R, 10 μ F, 50V, 10% 1210 | MURATA, GRM32ER71H106KA12L |
| 2 | 1 | C2 | CAP., CHIP, X5R, 22 μ F, 16V, 10% 1206 | AVX, 1206YD226KAT2A |
| 3 | 1 | C4 | CAP., CHIP, X5R, 4.7 μ F, 50V, 20% 0805 | TDK, C2012X5R1H475M |
| 4 | 1 | C6 | CAP., CHIP, X7R, 0.1 μ F, 25V, 10% 0603 | AVX, 06033C104KAT2A |
| 5 | 1 | R1 | RES., CHIP, 200 Ω , 1W, 1% 1210 | VISHAY, CRCW1210200RFKEA |
| 6 | 1 | R2 | RES., CHIP, 200k, 1/10W, 1% 0603 | VISHAY, CRCW0603200KFKEA |
| 7 | 1 | R3 | RES., CHIP, 90.9k, 1/10W, 1% 0603 | VISHAY, CRCW060390K9FKEA |
| 8 | 1 | R5 | RES., CHIP, 6.98k, 1/10W, 1% 0603 | VISHAY, CRCW06036K98FKEA |
| 9 | 1 | U1 | IC., LINEAR LTM8057EY#PBF | LINEAR TECH., LTM8057EY#PBF |
| Additional Demo Board Circuit Components | | | | |
| 1 | 0 | C3 (OPT) | CAP., 0603 | |
| 2 | 1 | C5 | CAP., CHIP, X7R, 1 μ F, 16V, 10% 0603 | AVX, 0603YC105KAT2A |
| 3 | 0 | C8 (OPT) | CAP., 1210 | |
| 4 | 1 | CIN1 | CAP., TANT. 10 μ F, 35V, CASE-C | AVX, TAJC106K035R |
| 5 | 0 | C7 (OPT) | CAP., 1808 | |
| 6 | 0 | L1 | OPT. | |
| 7 | 0 | R6 | OPT. 0603 | |
| Hardware: For Demo Board Only | | | | |
| 1 | 4 | E1-E4 | TESTPOINT, TURRET, 0.094" | MILL-MAX 2501-2-00-80-00-00-07-0 |
| 1 | 2 | E5, E8 | TESTPOINT, TURRET, 0.064" | MILL-MAX 2308-2-00-80-00-00-07-0 |

SCHEMATIC DIAGRAM



* FOR INPUT VOLTAGE DAMPING PURPOSE ONLY.
 ** SEE QUICK START GUIDE FOR OUTPUT CURRENT RANGE.
NOTE: UNLESS OTHERWISE SPECIFIED
 1. ALL RESISTORS ARE 0603.
 ALL CAPACITORS ARE 0603.

DEMO MANUAL DC1987A

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This notice contains important safety information about temperatures and voltages. For further safety concerns, please contact a LTC application engineer.

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