

LTM8047

725V Isolated DC/DC μModule Converter

DESCRIPTION

The demo circuit 1693A is an isolated flyback μModule[®] DC/DC converter featuring the [LTM8047](#). The demo circuit is designed for a 5V output from a 4.5V to 30V input. The typical current capability of the 5V output varies with input voltage from about 110mA at $V_{IN} = 4.5V$ to about 350mA at $V_{IN} = 30V$.

The LTM8047 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 1693A.

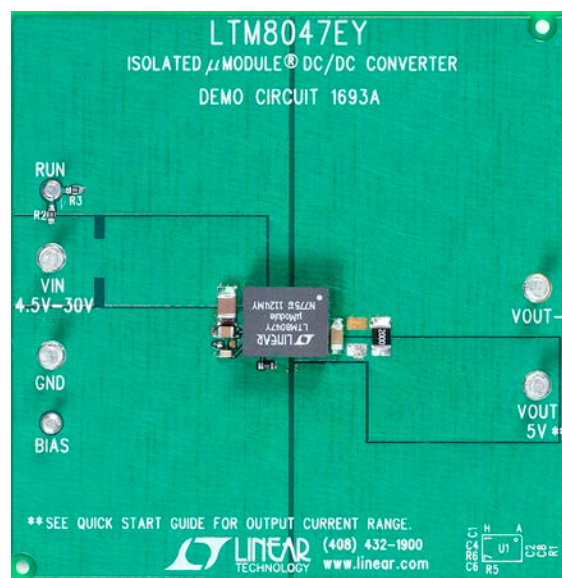
Design files for this circuit board are available at <http://www.linear.com/demo/DC1693A>

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PERFORMANCE SUMMARY ($T_A = 25^\circ C$)

| PARAMETER | CONDITIONS | VALUE |
|--------------------------|---------------------------------|-------------|
| Input Voltage Range | | 4.5V to 30V |
| Output Voltage V_{OUT} | $V_{IN} = 4.5V$ to 30V | 5.0V |
| Voltage Ripple V_{OUT} | $V_{IN} = 12V, I_{OUT} = 100mA$ | <20mV |

BOARD PHOTO



QUICK START PROCEDURE

Demo circuit 1693A is an easy way to evaluate the performance of the LTM8047. 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 V_{IN} or V_{OUT} and GND terminals. See Figure 4 for proper scope probe technique.

1. With power off, connect the input power supply to V_{IN} and GND.

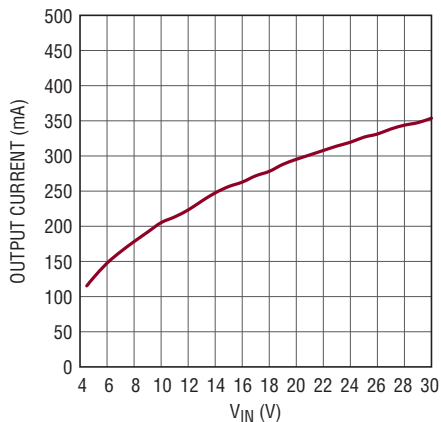
2. Turn on the power at the input.

NOTE: Make sure that the input voltage does not exceed 30V.

3. Check for the proper output voltage between V_{OUT} and V_{OUT}^- .

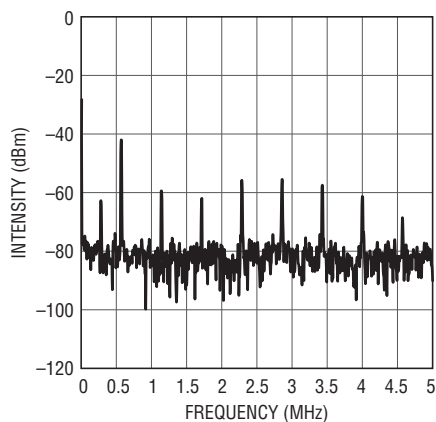
NOTE: If there is no output, temporarily disconnect the load to make sure that the load is not set too high.

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.



dc1693a F01

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



dc1693 F02

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

QUICK START PROCEDURE

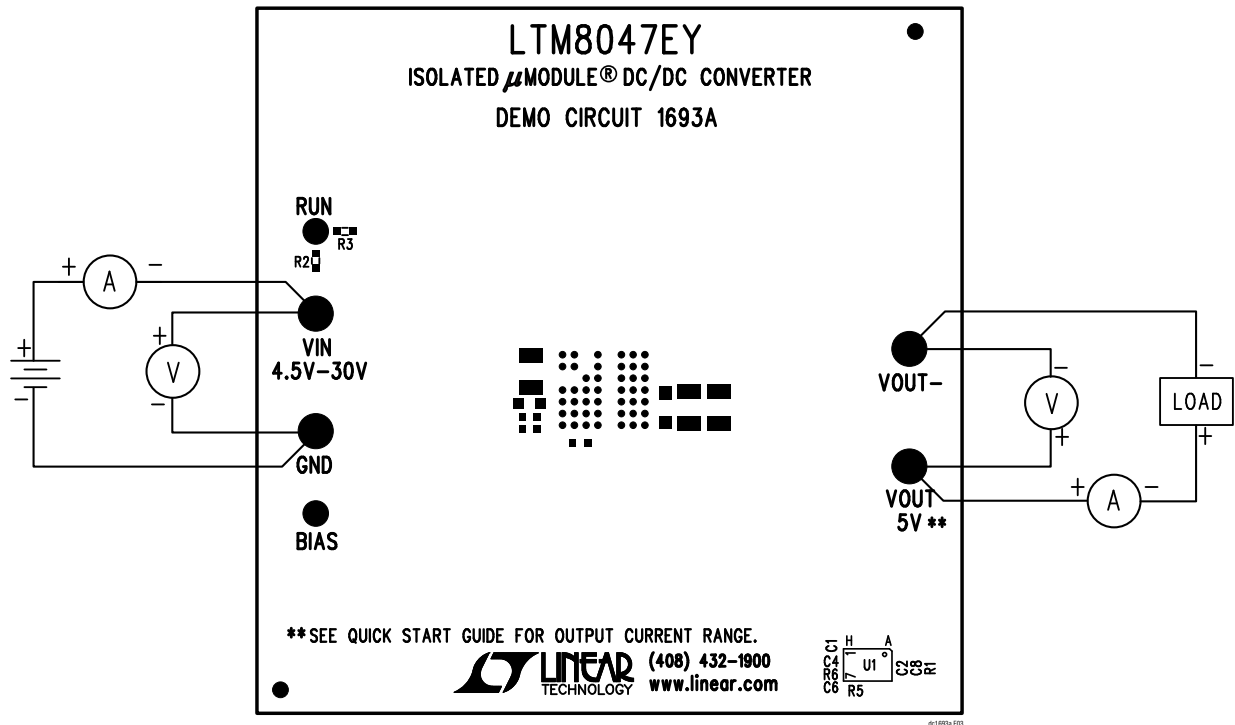


Figure 3. DC1693A Proper Equipment Setup

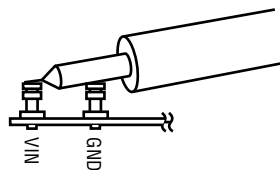


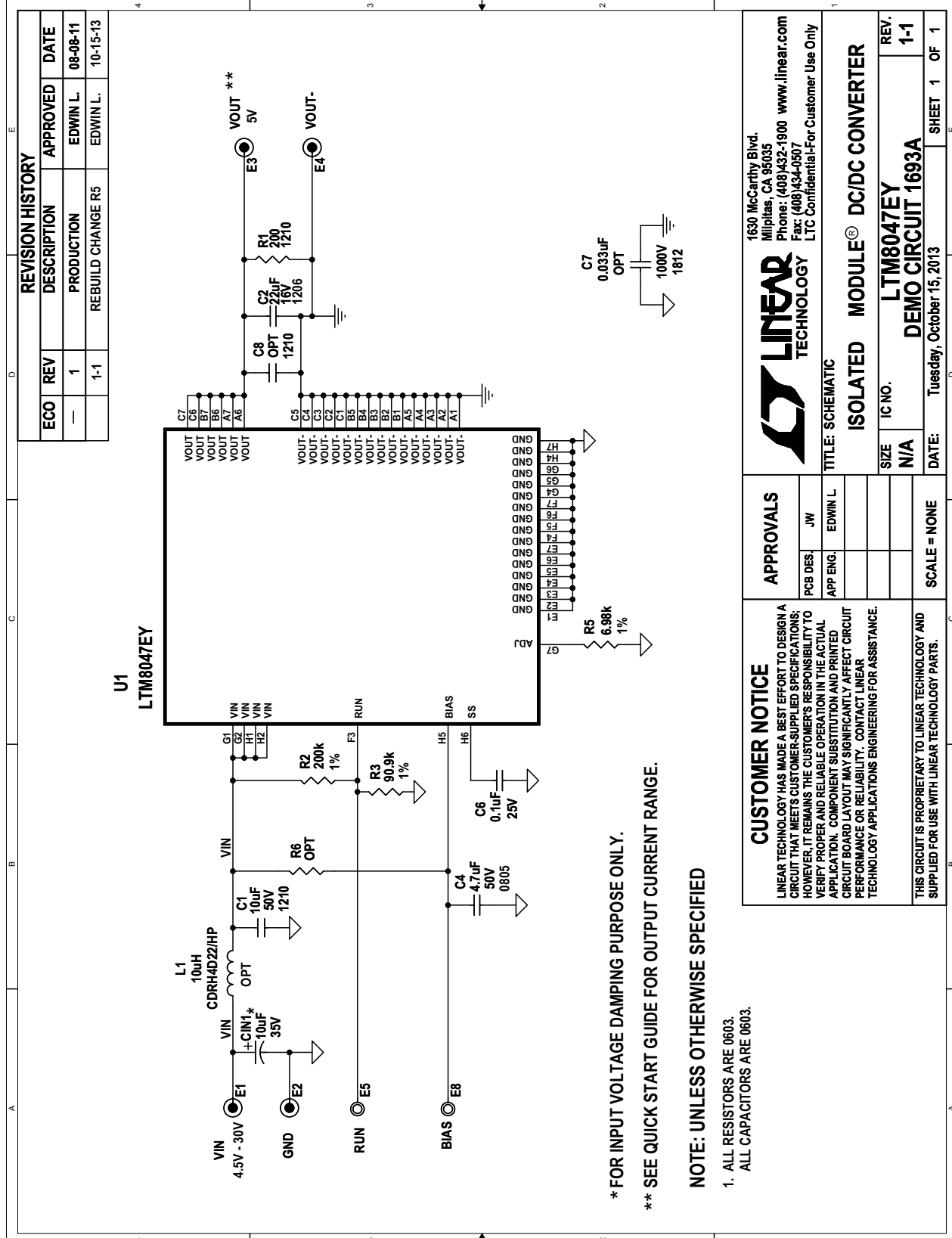
Figure 4. Measuring Input or Output Ripple

DEMO MANUAL DC1693A

PARTS LIST

| ITEM | QTY | REFERENCE | PART DESCRIPTION | MANUFACTURER/PART NUMBER |
|---|-----|-----------|--|----------------------------------|
| Required Circuit Components | | | | |
| 1 | 1 | C6 | CAP, CHIP X7R, 0.1 μ F, 25V, 10%, 0603 | AVX 06033C104KAT |
| 2 | 1 | C4 | CAP, CHIP X5R, 4.7 μ F, 50V, 10%, 0805 | TDK C2012X5R1H475K |
| 3 | 1 | C2 | CAP, CHIP X5R, 22 μ F, 16V, 10%, 1206 | AVX 1206YD226KAT2A |
| 4 | 1 | C1 | CAP, CHIP X5R, 10 μ F, 50V, 10%, 1210 | MURATA GRM32ER71H106KA12L |
| 5 | 1 | R1 | RES., CHIP 200, 1%, 1210 | VISHAY CRCW1210200RFKEA |
| 6 | 1 | R2 | RES., CHIP 200k, 1%, 0603 | VISHAY CRCW0603200KFKEA |
| 7 | 1 | R3 | RES., CHIP 90.9k, 1%, 0603 | VISHAY CRCW060390K9FKED |
| 8 | 1 | R5 | RES., CHIP 6.98k, 1/10W, 1%, 0603 | VISHAY CRCW06036K98FKEA |
| 9 | 1 | U1 | IC., LINEAR LTM8047EY#PBF | LINEAR TECH., LTM8047EY#PBF |
| Additional Demo Board Circuit Components | | | | |
| 1 | 0 | C8 | CAP, 1210, OPTION | |
| 2 | 1 | CIN1 | CAP, TANT., 10 μ F, 35V, CASE-C | AVX TAJC106K035R |
| 3 | 0 | C7 | CAP, 1812, OPTION | |
| 4 | 0 | L1 | OPTION | |
| 5 | 0 | R6 | RES., 0603, OPTION | |
| Hardware For Demo Board Only | | | | |
| 1 | 4 | E1-E4 | Testpoint, Turret,.094" | Mill-Max 2501-2-00-80-00-00-07-0 |
| 2 | 2 | E5, E8 | Testpoint, Turret,.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.

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| | | | |
|---|---------------------------|--|--------------|
|  | | 1630 McCarthy Blvd. Milpitas, CA 95035 Phone: (408)432-1900 www.linear.com Fax: (408)434-0607 LTC Confidential-For Customer Use Only | |
| | | TITLE: SCHEMATIC ISOLATED MODULE [®] DC/DC CONVERTER | |
| APPROVALS | PCB DES: JIW | APP ENG: EDWIN L. | SCALE = NONE |
| SIZE | IC NO. | REV. | |
| N/A | LTM8047EY | 1-1 | |
| DATE: | Tuesday, October 15, 2013 | SHEET | 1 OF 1 |

DEMO MANUAL DC1693A

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