

# LTM8064 58V<sub>IN</sub>, 6A CVCC Step-Down μModule Regulator

## DESCRIPTION

Demonstration circuit 2237A is a 58V<sub>IN</sub>, 6A, CVCC Step-Down μModule® Regulator featuring the [LTM8064](#). The demo circuit is designed for a 5V output from an input voltage range of 7.5V to 58V. The output can source 7A (typical) or sink 9.1A (typical). The circuit can be operated in either constant voltage mode or constant current mode.

Two or more LTM8064s can be paralleled to share load current equally. In this configuration, a master part determines the output currents of the slave parts. The MODE pin of the master part should be floating and all MODE pins of slave parts should be grounded.

When the output sinks current, the circuit maintains its output voltage regulation by power conversion, not

power dissipation. This means that the energy provided to LTM8064 is in turn delivered to its input power bus. There must be something on the input power bus to accept or use the energy.

The LTM8064 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 demo circuit 2237A.

**Design files for this circuit board are available at <http://www.linear.com/demo/DC2237A>**

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## BOARD PHOTO

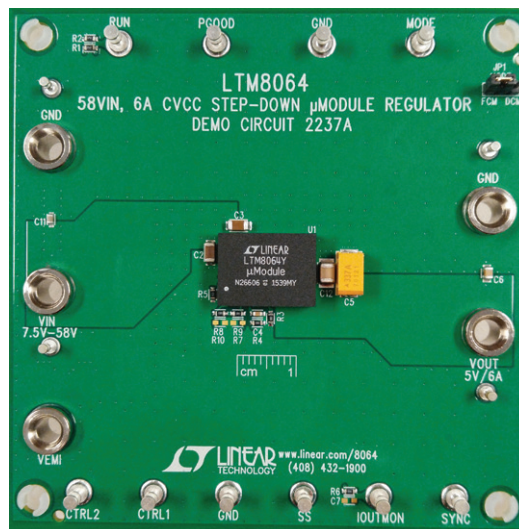


Figure 1. DC2237A Board Picture

# DEMO MANUAL DC2237A

## PERFORMANCE SUMMARY

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

| PARAMETER                    | CONDITIONS                               |             | UNITS |
|------------------------------|------------------------------------------|-------------|-------|
| Minimum Input Supply Voltage |                                          | 7.5         | V     |
| Maximum Input Supply Voltage |                                          | 58          | V     |
| Output Voltage               | Sourcing Current                         | $5 \pm 5\%$ | V     |
| Switching Frequency          |                                          | 325         | kHz   |
| Maximum Output Current       | Sourcing Current                         | 6           | A     |
| Efficiency                   | $V_{IN} = 12\text{V}, I_{OUT} 6\text{A}$ | 86          | %     |

## QUICK START PROCEDURE

Demonstration circuit 2237A is easy to set up to evaluate the performance of the LTM8064. 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  $V_{IN}$  and GND or  $V_{OUT}$  and GND terminals.

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

2. Connect a load to  $V_{OUT}$  and GND.
3. Turn on the power at the input.
4. Check for the proper output voltage and current.

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

5. Once the proper output voltage is established, adjust the load and input within the operating ranges and observe the output voltage regulation, output current regulation, ripple voltage, efficiency and other parameters.

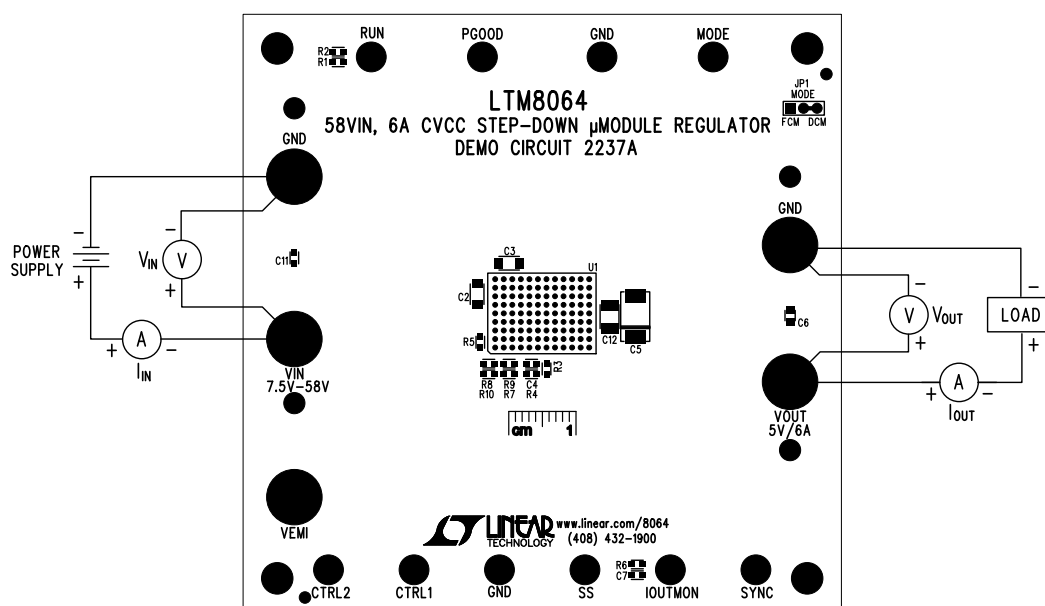


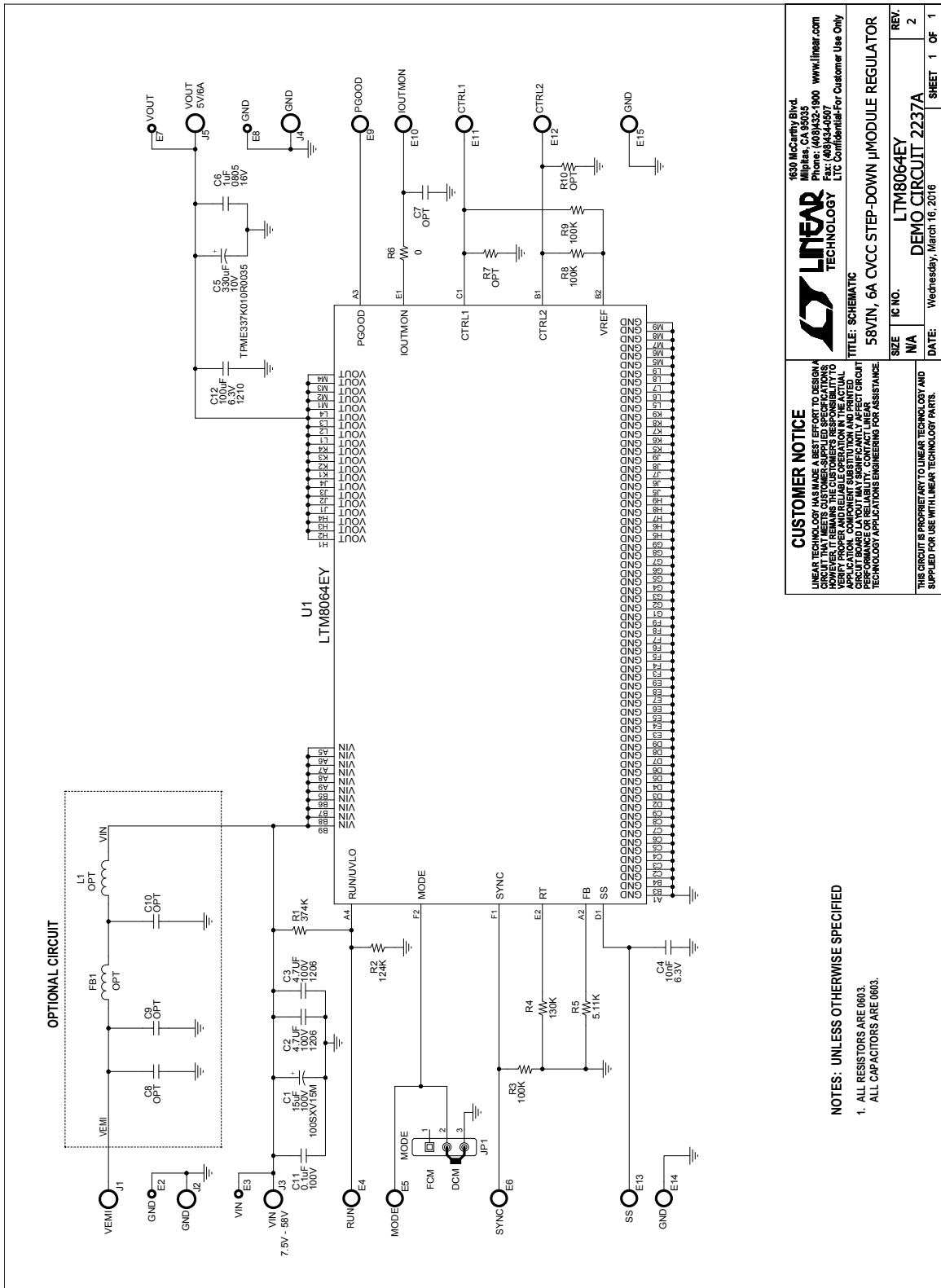
Figure 2. Proper Measurement Equipment Setup. Board Can Sink Current from the Load.

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## PARTS LIST

| ITEM                                            | QTY | REFERENCE      | PART DESCRIPTION                                        | MANUFACTURER/PART NUMBER          |
|-------------------------------------------------|-----|----------------|---------------------------------------------------------|-----------------------------------|
| <b>Required Circuit Components</b>              |     |                |                                                         |                                   |
| 1                                               | 1   | C1             | CAP POLYMER 15 $\mu$ F 20% 100V RAD                     | PANASONIC, 100SXV15M              |
| 2                                               | 2   | C2,C3          | CAP CER 4.7 $\mu$ F 100V X7S 1206                       | AVX, 12061Z475MAT2A               |
| 3                                               | 1   | C4             | CAP., X7R, 0.01 $\mu$ F, 6.3V, 10%, 0603                | MURATA, GRM188R70J103KA01D        |
| 4                                               | 1   | C5             | CAP TANT 330 $\mu$ F 10V 10% 2917                       | AVX, TPME337K010H0035             |
| 5                                               | 1   | C6             | CAP., X7R, 1 $\mu$ F, 16V, 10%, 0805                    | MURATA, GRM21BR71C105KA01L        |
| 8                                               | 1   | C11            | CAP., X7R, 0.1 $\mu$ F, 100V, 10%, 0603                 | MURATA, GRM188R72A104KA35D        |
| 9                                               | 1   | C12            | CAP CER 100 $\mu$ F 6.3V X5R 1210                       | MURATA, GRM32ER60J107ME20L        |
| 17                                              | 1   | R1             | RES., CHIP, 374k, 1/10W, 1%, 0603                       | VISHAY, CRCW0603374KFKEA          |
| 18                                              | 1   | R2             | RES., CHIP, 124k, 1/10W, 1%, 0603                       | VISHAY, CRCW0603124KFKEA          |
| 19                                              | 3   | R3,R8,R9       | RES., CHIP, 100k, 1/10W, 1%, 0603                       | VISHAY, CRCW0603100KFKEA          |
| 20                                              | 1   | R4             | RES., CHIP, 130k, 1/10W, 1%, 0603                       | VISHAY, CRCW0603130KFKEA          |
| 21                                              | 1   | R5             | RES., CHIP, 5.11k, 1/10W, 1%, 0603                      | VISHAY, CRCW06035K11FKEA          |
| 22                                              | 1   | R6             | RES., CHIP, 0 $\Omega$ , 1/10W, 0603                    | VISHAY, CRCW06030000Z0EA          |
| 24                                              | 1   | U1             | I.C., REGULATOR, BGA-108-16 $\times$ 11.9 $\times$ 5.01 | LINEAR TECHNOLOGY., LTM8064EY#PBF |
| <b>Additional Demo Board Circuit Components</b> |     |                |                                                         |                                   |
| 6                                               | 0   | C7, C8 (OPT)   | CAP., 0603                                              | OPTION                            |
| 7                                               | 0   | C9, C10 (OPT)  | CAP., 1210                                              | OPTION                            |
| 12                                              | 0   | FB1 (OPT)      | FERRITE CHIP 30 $\Omega$ 6A 0805                        | OPTION                            |
| 16                                              | 0   | L1 (OPT)       | IND., IHLP2525                                          | OPTION                            |
| 23                                              | 0   | R7, R10 (OPT)  | RES., CHIP, 0603                                        | OPTION                            |
| <b>Hardware for Demo Board Only</b>             |     |                |                                                         |                                   |
| 10                                              | 4   | E2, E3, E7, E8 | TESTPOINT, TURRET, 0.061" PBF                           | MILL-MAX, 2308-2-00-80-00-00-07-0 |
| 11                                              | 10  | E4-E6, E9-E15  | TESTPOINT, TURRET, 0.094" PBF                           | MILL-MAX, 2501-2-00-80-00-00-07-0 |
| 13                                              | 5   | J1-J5          | JACK BANANA                                             | KEYSTONE, 575-4                   |
| 14                                              | 1   | JP1            | HEADER 3-PIN 0.079" SINGLE ROW                          | WURTH ELEKTRONIK, 62000311121     |
| 15                                              | 1   | XJP1           | SHUNT, 0.079" CENTER                                    | WURTH ELEKTRONIK, 60800213421     |
| 25                                              | 4   | MH1-MH4        | STAND-OFF, NYLON 0.50"                                  | WURTH ELEKTRONIK, 702935000       |

## SCHEMATIC DIAGRAM



# DEMO MANUAL DC2237A

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