

LTM8023 36V, 2A DC/DC μModule® Regulator

DESCRIPTION

Demonstration circuit 1195 features the LTM®8023, a step-down regulator preconfigured to deliver 3.3V at up to 2A from a 5V to 36V input supply. The LTM8023 is a step-down converter, so minimum amount of headroom is required to keep the output in regulation. In addition, the input voltage required to turn on is higher than that required to run (see Minimum Input Voltage section in the data sheet for detail). The optional Burst Mode® operation of LTM8023 supports high efficiency and low output ripple at light load conditions.

The LTM8023 data sheet gives a complete description of the part, operation and application information. The LTM8023 data sheet must be read in conjunction with this manual to operate or modify demo circuit 1195.

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

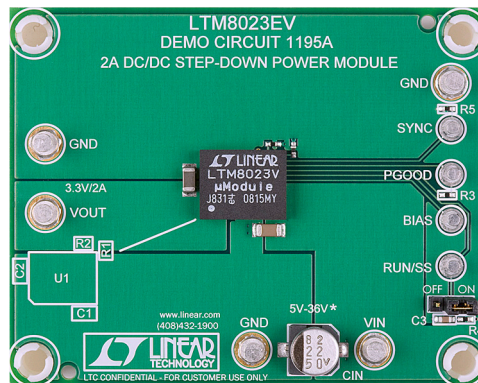
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PERFORMANCE SUMMARY (T_A = 25°C)

| PARAMETER | CONDITION | VALUE |
|---------------------------------|-----------|--------------------|
| Input Voltage Range | | 5V (Note 1) to 36V |
| Output Voltage V _{OUT} | | 3.3V |
| Maximum Output Current | | 2A |
| Typical Switching Frequency | | 600kHz |

Note 1: The circuit requires more than 5V to run at full load. See Figure 1 and the data sheet for detail.

BOARD PHOTO



QUICK START PROCEDURE

Demonstration circuit 1195 is a simple way to evaluate the performance of the LTM8023. Refer to Figure 2 and 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 3 for proper scope probe technique.

1. Place JP1 on the ON position.
2. With power off, connect the input power supply to V_{IN} and GND.

3. Turn on the power at the input. The output voltage should rise to 3.3V.
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.

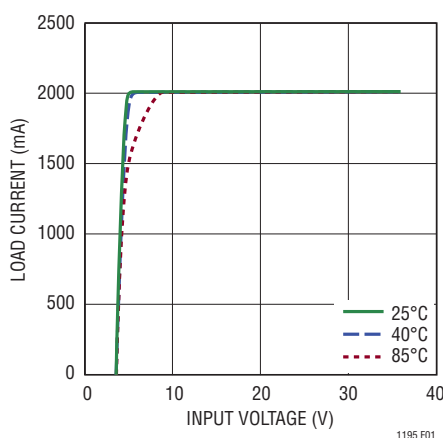


Figure 1. Load Current vs Input Voltage ($3.3V_{OUT}$)

QUICK START PROCEDURE

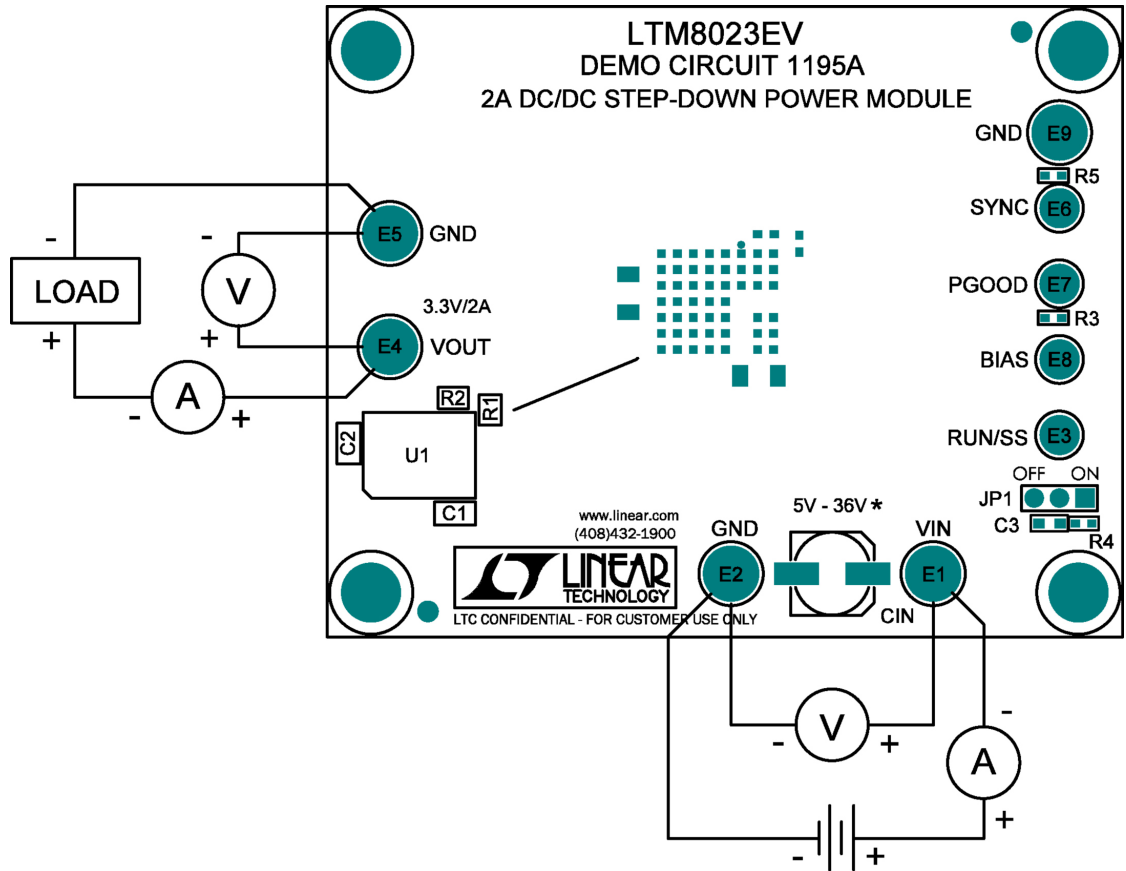


Figure 2. Proper Measurement Equipment Setup

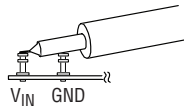


Figure 3. Measuring Input or Output Ripple

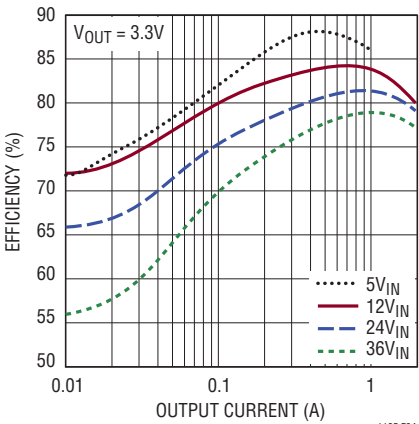


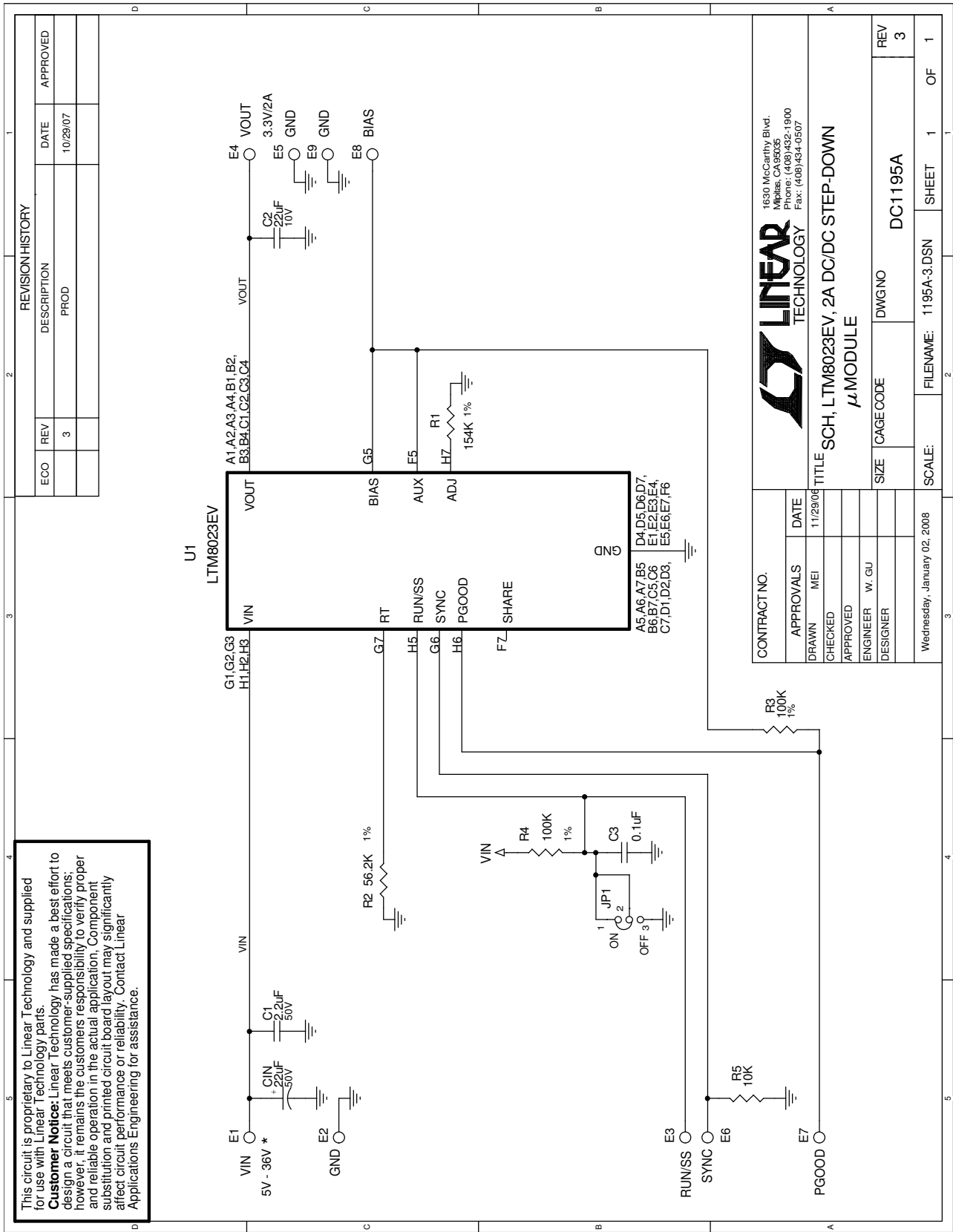
Figure 4. Efficiency

DEMO MANUAL DC1195A

PARTS LIST

| ITEM | QUANTITY | REFERENCE-DESCRIPTION | DESCRIPTION | MANUFACTURER'S PART NUMBER |
|------|----------|-----------------------|------------------------------------|----------------------------------|
| 1 | 1 | CIN | Cap, 22 μ F 20% 50V Alum | Sanyo 50CE22BS |
| 2 | 1 | C1 | Cap, 2.2 μ F 10% 50V X7R, 1206 | Murata GRM31CR71H225KA88L |
| 3 | 1 | C2 | Cap, 22 μ F 20% 10V X5R, 1206 | Taiyo Yuden LMK316BJ226ML-T |
| 4 | 1 | C3 | Cap, 0.1 μ F 10% 50V X7R, 0603 | TDK C1608X7R1H104K |
| 5 | 5 | E1, E2, E4, E5, E9 | Turret | Mill-Max 2501-2-00-80-00-00-07-0 |
| 6 | 4 | E3, E6, E7, E8 | Turret | Mill-Max 2308-2-00-80-00-00-07-0 |
| 7 | 1 | JP1 | Header, 3 Pin, 2mm | Samtec TMM-103-02-L-S |
| 8 | 1 | R1 | Res, 154k 1% 1/16W, 0402 | Vishay CRCW0402154KFKEA |
| 9 | 1 | R2 | Res, 56.2k 1% 1/16W, 0402 | Vishay CRCW040256K2FKED |
| 10 | 2 | R4, R3 | Res, 100k 1% 1/16W, 0402 | Vishay CRCW0402100KFKEA |
| 11 | 1 | R5 | Res, 10k 5% 1/16W, 0402 | Vishay CRCW040210K0JNED |
| 12 | 1 | U1 | IC, Module | Linear Technology LTM8023EV |
| 13 | 4 | | Standoff, Snap On | Keystone 8831 |
| 14 | 1 | XJP1 | Shunt, 2mm | Samtec 2SN-BK-G |

SCHEMATIC DIAGRAM



DEMO MANUAL DC1195A

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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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