DEMO MANUAL DC1623A

LTM8033:
36V_{IN}, 3A Low EMI Step-Down µModule Regulator

DESCRIPTION

Demonstration circuit DC1623A features the LTM®8033, a low-EMI EN55022 Class B certified step-down µModule® regulator, pre-configured for a 3.3V output from a 5.5V to 36V input. The circuit supports other features of the LTM8033 including synchronization to an external clock, current sharing with another LTM8033 µModule regulator, and burst mode operation for improved efficiency at light loads. The LTM8033 data sheet must be read in conjunction with this quick start guide prior to working on or modifying demo circuit DC1623A.

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

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage Range</td>
<td></td>
<td>5.5V to 36V</td>
</tr>
<tr>
<td>Output Voltage V_{OUT}</td>
<td></td>
<td>3.3V ±3%</td>
</tr>
<tr>
<td>Maximum Output Current</td>
<td>R2 = 93.1k</td>
<td>3A</td>
</tr>
<tr>
<td>Typical Switching Frequency</td>
<td></td>
<td>425kHz</td>
</tr>
</tbody>
</table>

BOARD PHOTOS
QUICK START PROCEDURE

Demonstration circuit DC1623A is an easy way to evaluate the performance of the LTM8033. Refer to Figure 1 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 terminals of the input or output capacitors. See Figure 2 for proper scope probe technique.

1. Place JP1 in the ON position.
2. With power off, preset the input power supply within the operating input voltage range and connect to V\textsubscript{IN} and GND.
3. Turn on the power at the input.
4. Check for the proper output voltage.
   NOTE: If there is no output, temporarily disconnect the load to make sure that the load is not set too high or is shorted.
5. Once the proper output voltage is established, adjust the loads within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.
6. An external clock can be added to the SYNC pin when SYNC function is used. See the Synchronization section in the data sheet for details.
QUICK START PROCEDURE

Figure 1. Measurement Equipment Setup

Figure 2. Measuring Input or Output Ripple
### PARTS LIST

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QTY</th>
<th>REFERENCE</th>
<th>PART DESCRIPTION</th>
<th>MANUFACTURER/PART NUMBER</th>
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<tbody>
<tr>
<td><strong>Required Circuit Components</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>C3</td>
<td>CAP, 0805, 0.22μF 50V X5R</td>
<td>TAIYO YUDEN, UMK212BJ224MG-T</td>
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<tr>
<td>2</td>
<td>1</td>
<td>C2</td>
<td>CAP, 1210, 100μF 10V X5R</td>
<td>TAIYO YUDEN, LMK325BJ107MM-T</td>
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<td>3</td>
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<td>C1</td>
<td>CAP, 1206, 4.7μF 50V X5R</td>
<td>TAIYO YUDEN UMK316BJ475KL-T</td>
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<td>4</td>
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<td>5</td>
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<td>R5</td>
<td>RES, 0603, 10k 5% 1/10W</td>
<td>VISHAY CRCW060310K0JNEA</td>
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<tr>
<td>6</td>
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<td>R1,R4</td>
<td>RES, 0603, 100k 1% 1/10W</td>
<td>VISHAY CRCW0603100KFNEA</td>
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<td>7</td>
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<td>R2</td>
<td>RES, 0603, 93.1k 1% 1/10W</td>
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<td>8</td>
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<td>RES, 0603, 154k 1% 1/10W</td>
<td>VISHAY CRCW0603154KFKED</td>
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<td>IC, LTM8033EV</td>
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<td><strong>Additional Demo Board Circuit Components</strong></td>
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<td><strong>Hardware—For Demo Board Only</strong></td>
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<td>1</td>
<td>10</td>
<td>E1-E10</td>
<td>TURRET</td>
<td>MILL-MAX 2501-2-00-80-00-00-07-0</td>
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<td>J1-J4</td>
<td>JACK, BANANA</td>
<td>KEYSTONE 575-4</td>
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<td>3</td>
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<td>JP1,JP2</td>
<td>HEADER, 1×3 PINS, 2MM</td>
<td>SAMTEC TMM-103-01-L-S</td>
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<td>2</td>
<td>JP1,JP2</td>
<td>SHUNT, 2 PINS, 2MM</td>
<td>SAMTEC 2SN-BK-G</td>
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</tbody>
</table>
Optional Circuit

- **L1 OPT**: Inductor
- **C1**: Capacitor 100µF
- **C2**: Capacitor 100µF
- **R1**: Resistor 10kΩ
- **R2**: Resistor 93.1kΩ
- **R3**: Resistor 154kΩ
- **GND**: Ground
- **VIN**: Input Voltage
- **VOUT**: Output Voltage
- **SYNC**: Sync Signal
- **RUN**: Run Signal
- **OFF**: Off Signal
- **ON**: On Signal
- **SHARE**: Share Signal

### Revision History

<table>
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<tr>
<th>ECO</th>
<th>REV</th>
<th>DESCRIPTION</th>
<th>APPROVED</th>
<th>DATE</th>
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<td>EDWIN L.</td>
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### Notes:
1. All capacitors and resistors are 0603.

### Customer Notice

Linear Technology has made a best effort to design a circuit that meets customer-supplied specifications; however, it remains the customer's responsibility to verify proper and reliable operation in the actual application. Component substitution and printed circuit board layout may significantly affect circuit performance or reliability. Contact Linear Technology Applications Engineering for assistance.

### Contract No.

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### Title: Schematic

Ultra Low Noise, EMC Compliant

36V, 3A DC/DC µModule

### Size

N/A

### IC No.

LTM8033EV

### DEMO CIRCUIT 1623A

### Date

Friday, June 25, 2010
DEMO MANUAL DC1623A

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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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