Quick Start

- Demonstration Circuit 207A will generate 3.3V or 5V from an input voltage as low as 1V. The first step of operation is to select the output voltage by setting jumper JP1. The input voltage range of this circuit is 1V to 5V. When programmed to generate 3.3V, the output will be regulated over a more limited input range of 1V to 3.5V. Attach a power supply between ground (pin GNDA or GNDB) and the V\textsubscript{IN} pin of the DC207A as shown in Figure 1. Tie the SHDN pin to the V\textsubscript{IN} pin to enable the LT1308. The output will appear on the V\textsubscript{OUT} pin.

![DC207A Hookup Diagram](image)

- Attach a suitable load between the V\textsubscript{OUT} pin and ground. The amount of current that the DC207A will deliver depends on the input and output voltages. The circuit will deliver 300mA at 3.3V when powered from a NiCd cell (V\textsubscript{IN} = 1.2V). It will deliver 850mA when converting 3.3V to 5.0V.

- The DC207A can be shut down by tying the SHDN pin to ground. The LT1308 consumes less than 3\textmu A when its SHDN pin is grounded. However, note that there is
still a DC current path (through the inductor and diode) between \( V_{\text{in}} \) and \( V_{\text{out}} \), allowing the load to draw additional current from the input supply.

- When measuring the efficiency of the DC207A, be careful to arrange the circuit as shown in Figure 1. In particular, the input and output voltages should be measured at the pins of the DC207A, not at the input power source or the load. This will eliminate the voltage drop across the ammeters from the efficiency calculation.
NOTES: UNLESS OTHERWISE SPECIFIED
1. INSTALL A SHUNT ON JP1 PIN 1 AND 2 (3.3V).
2. ASSEMBLY TYPES:
   - A LT1398CS8 OBSOLETE
   - B LT1398AC58 AVAILABLE
   - C LT1398BC58 AVAILABLE
## LINEAR TECHNOLOGY

### BILL OF MATERIALS
**DEMO CIRCUIT 207A**  
**LT1308CS8**  
**2A BOOST REGULATOR**  
*(FOR 280 BOARDS)*

<table>
<thead>
<tr>
<th>Item</th>
<th>Qty</th>
<th>Ref. Des.</th>
<th>Part Description</th>
<th>Manufacture / Part.#</th>
<th>Kit Qty</th>
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<td>INT. RECT. INC., 10BQ015</td>
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### NOTES: UNLESS OTHERWISE SPECIFIED
1. OPTIONAL ARE UNSTUFFED COMPONENTS.
2. UNSTUFFED COMPONENTS SHOULD BE FREE OF SOLDER AFTER ASSEMBLY.
3. ALLOW THE UNSTUFFED COMPONENTS AREAS TO HAVE PARTS INSTALLED LATER.
4. BREAK BOARDS IN THE PANEL AFTER ASSEMBLY.
5. FOR BOTH VERSIONS: INSTALL A SHUNT ON JP1 PIN 1 AND 2 (3.3V).
LT1308CS8
DEMONSTRATION CIRCUIT 207A
2A BOOST REGULATOR

LBO
R6 R5
R7 R4 C1
C3 R3 R2
JP1 3.3 5.0
LINEAR TECHNOLOGY
(408) 432-1900

LBI
D1
C2
C5
U1
R1B R1A
SHDN

VIN
VOUT
GNDA
GNDB

TOP SILKSCREEN
LINEAR TECHNOLOGY - DC207A
2A BOOST REGULATOR
LT1308CS8
DATE: 04-09-98

s10126.pio - Thu Apr 09 16:33:48 1998
LT1308CS8
DEMONSTRATION CIRCUIT 207A
2A BOOST REGULATOR

LBO
LBI
R7 R4 C1
R6 R5
C3 R3 R2
C2
C5
U1

SHDN
vin
vout
gnada
gnadb

TOP SILKSCREEN
LINEAR TECHNOLOGY - DC207A
2A BOOST REGULATOR
LT1308CS8
DATE: 04-09-98

NOTES: Unless Otherwise Specified
1. INSTALL SMD UNIT ON PIN 1 AND 2 OF JP1 (3.3V).
2. NO SOLDER IS TO BE APPLIED AT ANY TIME TO THE TEST PADS ON THE BOTTOM SIDE.
3. ALL UNSTUFFED COMPONENTS SHOULD BE FREE OF SOLDER AFTER ASSEMBLY.
4. BREAK BOARDS IN THE PANEL WHEN FINISH ASSEMBLY.
A. Please look at the Read Me File for the other requirements.

**NOTES:** Unless otherwise specified.

<table>
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<tr>
<th>Layer</th>
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<tr>
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<th>Ref</th>
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TOP LAYER
LINEAR TECHNOLOGY - DC207A
2A BOOST REGULATOR
LT1308CS8
DATE: 04-09-98
BOTTOM SOLDER MASK
LINEAR TECHNOLOGY – DC207A
2A BOOST REGULATOR
LT1308CS8
DATE: 04-09-98
The specifications for the LT®1308 have been revised as shown in bold type below. For complete specifications, typical performance characteristics and applications information, please see the LT1308 data sheet.

### ABSOLUTE MAXIMUM RATINGS

Operating Temperature Range  
Commercial ........................................... -20°C to 70°C  
Extended Commercial (Note 1) ........ -40°C to 85°C  
Industrial (Note 2) ......................... -40°C to 85°C

### ELECTRICAL CHARACTERISTICS

#### Commercial Grade 0°C to 70°C, $V_{IN} = 1.1V$, $V_{SHDN} = V_{IN}$, $T_A = 25°C$ unless otherwise noted.

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNITS</th>
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<tr>
<td>$I_g$</td>
<td>FB Pin Bias Current (Note 3)</td>
<td>$V_{FB} = V_{REF}$</td>
<td>●</td>
<td>27</td>
<td>80</td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td>Switch Current Limit (Note 4)</td>
<td>DC = 40%</td>
<td>●</td>
<td>2.0</td>
<td>2.5</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DC = 80%</td>
<td></td>
<td>1.6</td>
<td>2</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>LBI Input Bias Current (Note 5)</td>
<td>$V_{LBI} = 150mV$</td>
<td>●</td>
<td>5</td>
<td>30</td>
<td>nA</td>
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<tr>
<td></td>
<td>Reverse Battery Current (Note 6)</td>
<td></td>
<td></td>
<td>750</td>
<td></td>
<td>mA</td>
</tr>
</tbody>
</table>

#### Industrial Grade -40°C to 85°C, $V_{IN} = 1.2V$, $V_{SHDN} = V_{IN}$, $T_A = 25°C$ unless otherwise noted.

<table>
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<tr>
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<td></td>
<td></td>
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<td>nA</td>
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<td></td>
<td></td>
<td>750</td>
<td></td>
<td>mA</td>
</tr>
</tbody>
</table>

The ● denotes specifications which apply over the full operating temperature range.

Note 1: C grade device specifications are guaranteed over the 0°C to 70°C temperature range (some parameters are also guaranteed to -20°C as denoted on the data sheet). In addition, C grade device specifications are assured over the -40°C to 85°C temperature range by design or correlation, but are not production tested.

Note 2: I grade specifications are guaranteed over the -40°C to 85°C temperature range.

Note 3: Bias current flows in to FB pin.

Note 4: Switch current limit guaranteed by design and/or correlation to static test. Duty cycle affects current limit due to ramp generator (see Block Diagram).

Note 5: Bias current flows out of LBI pin.

Note 6: The LT1308 will withstand continuous application of 1.6V applied to GND pin while $V_{IN}$ and SW are grounded.

For further information regarding this specification notice contact: Linear Technology Corporation  
1630 McCarthy Blvd.  
Milpitas, California 95035-7417  
Attn: Product Marketing Manager  
Phone: (408) 432-1900
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**ABSOLUTE MAXIMUM RATINGS**

Operating Temperature Range
- Commercial ................. -20°C to 70°C
- Extended Commercial (Note 1) ........ -40°C to 85°C
- Industrial (Note 2) .............. -40°C to 85°C

**ELECTRICAL CHARACTERISTICS**

Commercial Grade 0°C to 70°C, V<sub>IN</sub> = 1.1V, V<sub>SHDN</sub> = V<sub>IN</sub>, T<sub>A</sub> = 25°C unless otherwise noted.

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<td>FB Pin Bias Current (Note 3)</td>
<td>V&lt;sub&gt;FB&lt;/sub&gt; = V&lt;sub&gt;REF&lt;/sub&gt;</td>
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<td>750</td>
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<td>mA</td>
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Industrial Grade -40°C to 85°C, V<sub>IN</sub> = 1.2V, V<sub>SHDN</sub> = V<sub>IN</sub>, T<sub>A</sub> = 25°C unless otherwise noted.

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Note 1: C grade device specifications are guaranteed over the 0°C to 70°C temperature range (some parameters are also guaranteed to -20°C as denoted on the data sheet). In addition, C grade device specifications are assured over the -40°C to 85°C temperature range by design or correlation, but are not production tested.

Note 2: I grade specifications are guaranteed over the -40°C to 85°C temperature range.

Note 3: Bias current flows into FB pin.

Note 4: Switch current limit guaranteed by design and/or correlation to static test. Duty cycle affects current limit due to ramp generator (see Block Diagram).

Note 5: Bias current flows out of LBI pin.

Note 6: The LT1308 will withstand continuous application of 1.6V applied to GND pin while V<sub>IN</sub> and SW are grounded.

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