

## DC207A – LT1308CS8 2A Single-Cell Boost DC/DC Converter

### 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  $V_{IN}$  pin of the DC207A as shown in Figure 1. Tie the  $\overline{\text{SHDN}}$  pin to the  $V_{IN}$  pin to enable the LT1308. The output will appear on the  $V_{OUT}$  pin.

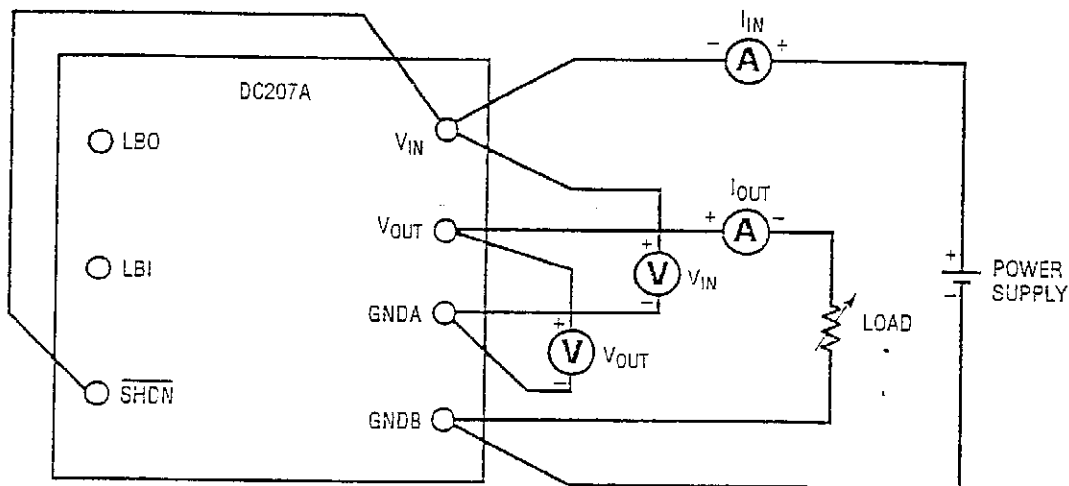
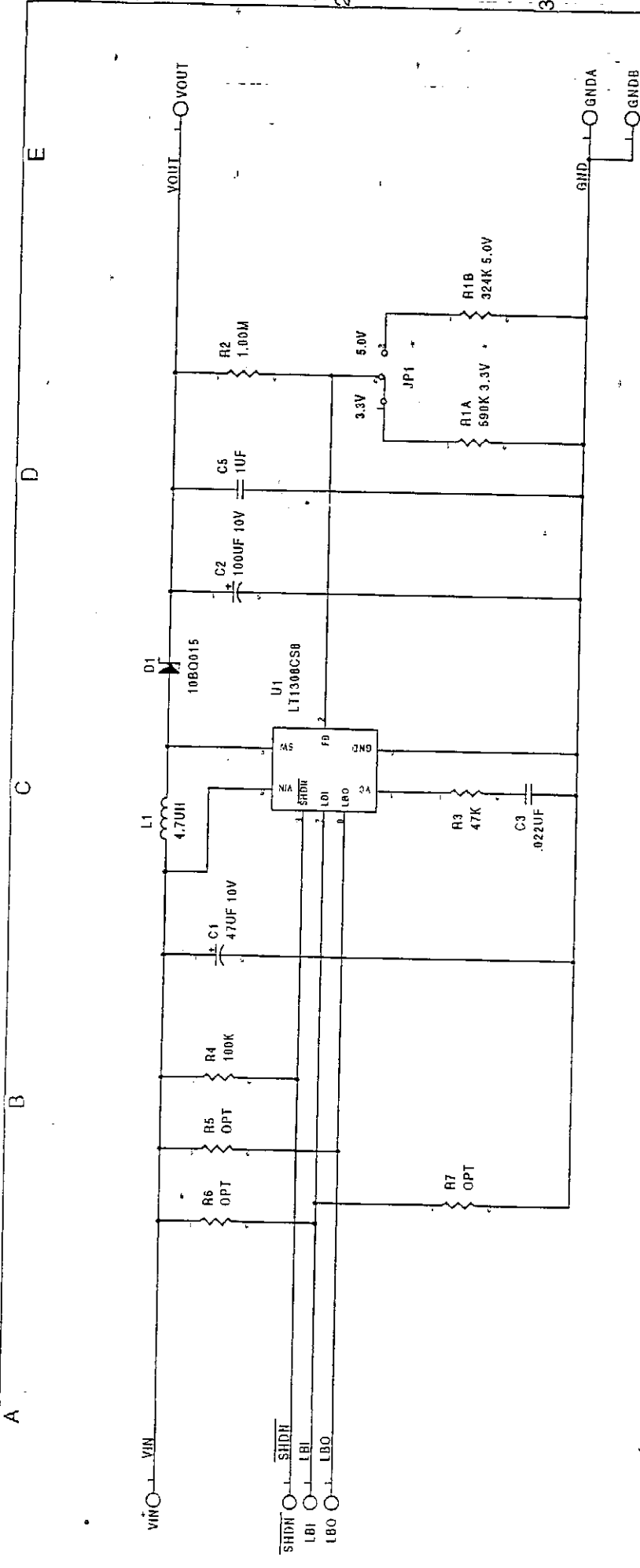


FIGURE 1. DC207A HOOKUP DIAGRAM

- Attach a suitable load between the  $V_{OUT}$  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 ( $V_{IN} = 1.2V$ ). It will deliver 850mA when converting 3.3V to 5.0V.
- The DC207A can be shut down by tying the  $\overline{\text{SHDN}}$  pin to ground. The LT1308 consumes less than 3 $\mu$ A when its  $\overline{\text{SHDN}}$  pin is grounded. However, note that there is

still a DC current path (through the inductor and diode) between  $V_{IN}$  and  $V_{OUT}$ , 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	LT1308CSB	OBSOLETE
-B	LT1308ACS8	AVAILABLE
-C	LT1308BCS8	AVAILABLE

**CONFIDENTIAL INFORMATION**

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**APPROVALS**

DESIGNED	DATE
CHECKED	
TESTED	
PROD. FILE	

NEW ASSEMBLY

**LINEAR TECHNOLOGY CORP.**  
 1630 MCCARTHY BLVD. MILPITAS, CA 95035  
 PH (408) 854-8100 FAX (408) 434-0307

**2A BOOST REGULATOR**

Document Number: DC207A-LT1308CS8

Size: B

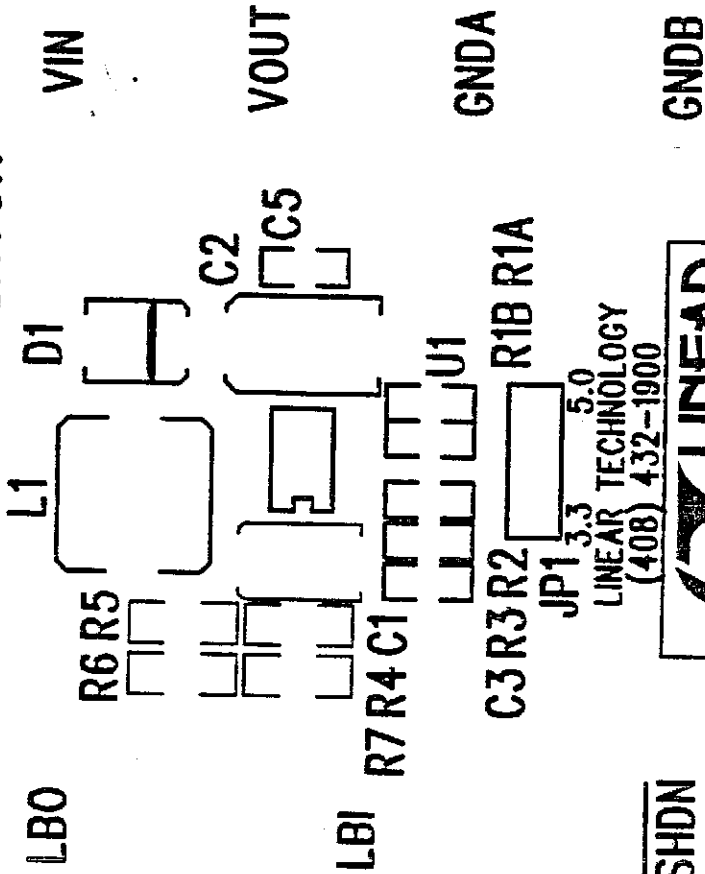
Sheet: 1 of 1

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

6/12/98  
 3:51 PM

Item	Qty	Ref. Des.	Part Description	Manufacture / Part.#	Kit Qty
1	1	C1	CAP, 47UF, 10V, 6032	AVX, TPSC476M010R0300	280
2	1	C2	CAP, 100UF, 10V, 7343	AVX, TPSD107M010R065	280
3	1	C3	CAP, .022UF, 16V, 10%, 0805	AVX, 0805YC223KATMA	560
4	1	C5	CAP, Y5V, 1UF, 16V, 0805	AVX, 0805YG105ZATMA	280
5	1	D1	RECT DIODE, 10BQ015	INT. RECT. INC., 10BQ015	280
6	7	LB0, LB1, VOUT, VIN, SHDN, GNDA, GNDB	TP, TERMINAL, 1 PIN	MILL-MAX 2501-2	1960
7	1	L1	IND, 4.7UH	TOKO, 636CY-4R7M	280
8	1	JP1	JMP, 3PINS, 100	COMM CONN, 3802S-03G2	280
9	1	R1A	RES, 590K, 1%, 0805	TAD, CR10-5902FM	280
10	1	R1B	RES, 324K, 1%, 0805	TAD, CR10-3243FM	280
11	1	R2	RES, 1.00M, 1%, 0805	TAD, CR10-1004FM	280
12	1	R3	RES, 47K, 5%, 0805	TAD, CR10-473JM	280
13	1	R4	RES, 100K, 5%, 1206	TAD, CR18-104JM	280
14	3	R5, R6, R7 (OPT)	RES, TBD, 5%, 1206	TAD, CR18-XXXJM	840
15	1	U1	IC, LT1308CS8, SO8	LINEAR TECH., LT1308CS8	280
<p><b>NOTES: UNLESS OTHERWISE SPECIFIED</b></p> <p>1 OPTIONAL ARE UNSTUFFED COMPONENTS.</p> <p>2 UNSTUFFED COMPONENTS SHOULD BE FREE OF SOLDER AFTER ASSEMBLY.</p> <p>3 ALLOW THE UNSTUFFED COMPONENTS AREAS TO HAVE PARTS INSTALLED LATER.</p> <p>4 BREAK BOARDS IN THE PANEL AFTER ASSEMBLY.</p> <p>5 FOR BOTH VERSIONS: INSTALL A SHUNT ON JP1 PIN 1 AND 2 (3.3V).</p>					

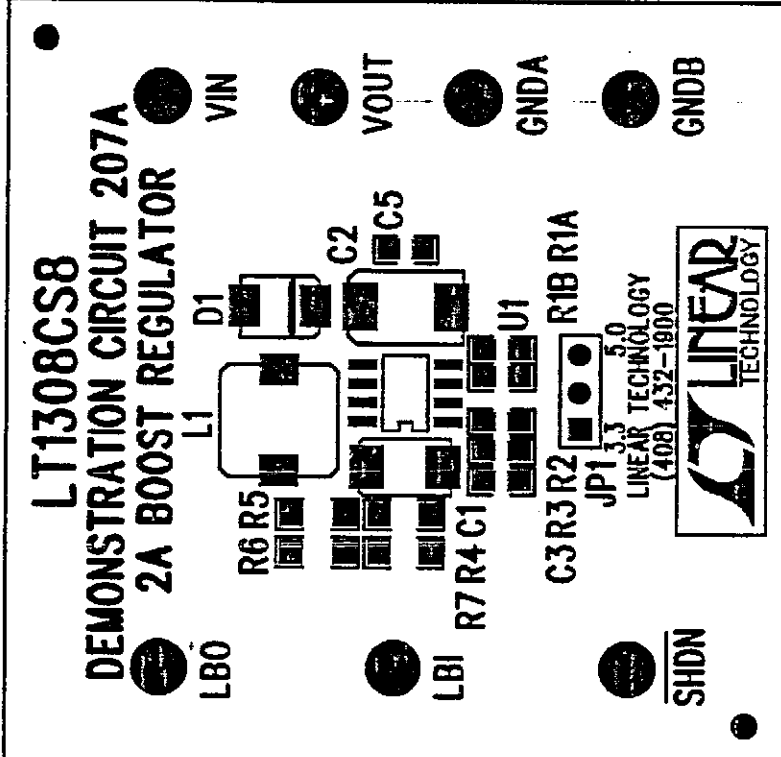
**LT1308CS8  
DEMONSTRATION CIRCUIT 207A  
2A BOOST REGULATOR**



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

REVISIONS

REV	DESCRIPTION	APPR	DATE
A	PROTOTYPE RELEASE		



- NOTES : Unless Otherwise Specified**
1. INSTALL SHUNT 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.

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

		183D McCarthy Blvd. Milpitas, CA 95035 PH: (408)432-1900	
TITLE: ASSEMBLY DRAWING		2A BOOST REGULATOR	
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SCALE: NONE		DES-0000 1 SHEET 1 of 1	

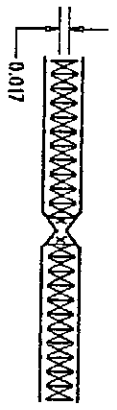
APPROVALS		DATE
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CHECK		
DESIGN	KT	04-09-98
ENGR	PK	04-09-98

REVISIONS			
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A	PROTOTYPE RELEASE		

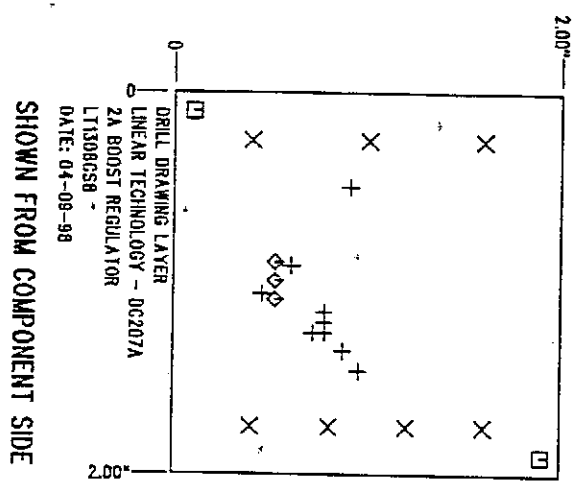
SIZE	QTY	SYM	PLTD
0.02	9	+	PLTD
0.094	7	X	PLTD
0.07	2	□	NPLTD
0.035	3	◇	PLTD

**NOTES : Unless Otherwise Specified**

- MATERIAL : FR4 OR EQUIVALENT EPOXY, 2 OZ. COPPER CLAD THICKNESS .062 +/- .008 TOTAL OF 2 LAYERS.
- FINISH : ALL PLATED HOLES .001 MIN. / .0015 MAX. COPPER PLATE ELECTRODEPOSITED TIN-LEAD COMPOSITION BEFORE REFLOW , SOLDER MASK OVER BARE COPPER (SMB03).
- SOLDER MASK : BOTH SIDES USING LPI OR EQUIVALENT.
- SILKSCREEN : USING WHITE NON-CONDUCTIVE EPOXY INK.
- UNUSED SMD COMPONENTS SHOULD BE FREE OF SOLDER.
- FILL UP ALL VIAS WITH SOLDER.
- SCORING:




8. PLEASE LOOK AT THE READ ME FILE FOR THE OTHER REQUIREMENTS.



SHOWN FROM COMPONENT SIDE

**APPROVALS**

CHK	DATE



**LINEAR TECHNOLOGY**

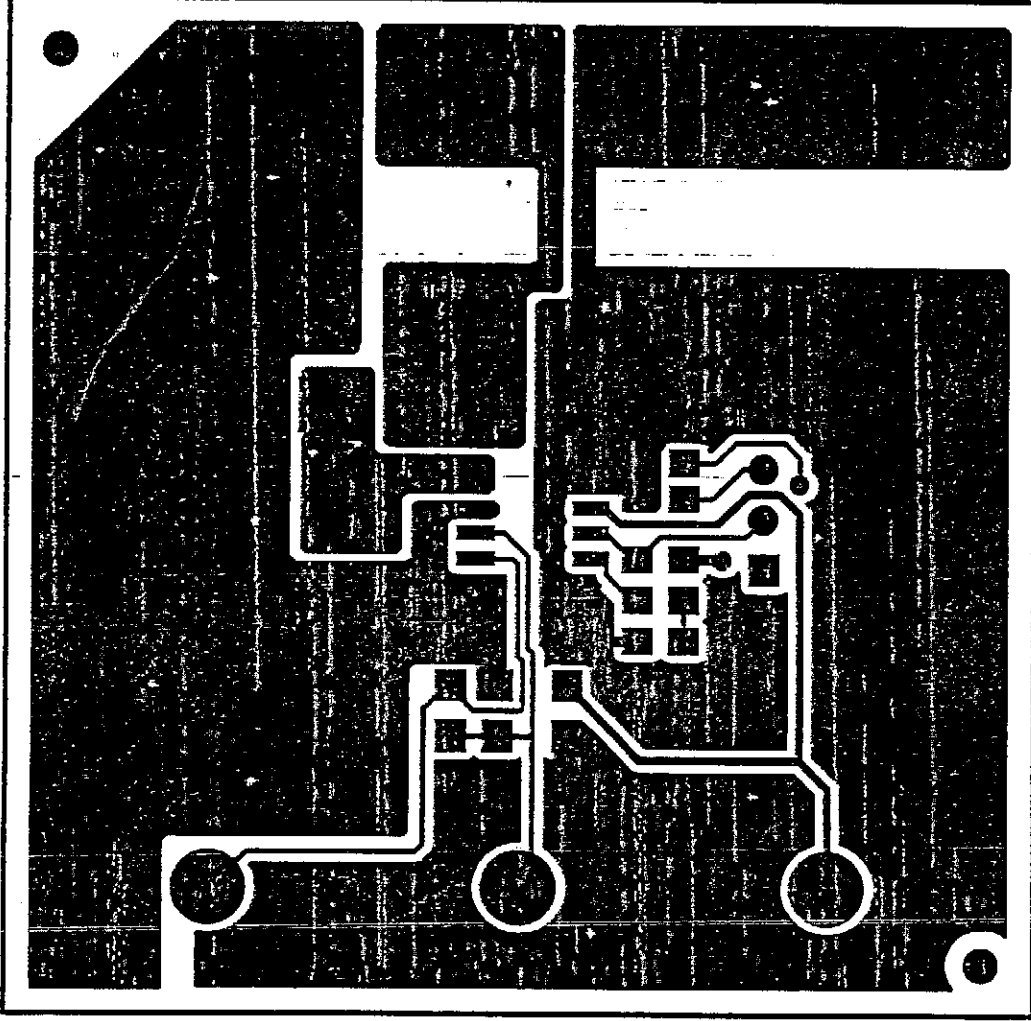
1630 McGowley Blvd.  
Milpitas, CA 95035  
PH: (408) 432-1900

TITLE: Fabrication Drawing  
**2A BOOST REGULATOR**

DESIGNER: JEFF W. DATE: 04-08-98

SIZE: A.1 DEVID DC207A-LT1308CS8 REV: A

SCALE = NONE DES: 0000 SMT 1 of 1



TOP LAYER

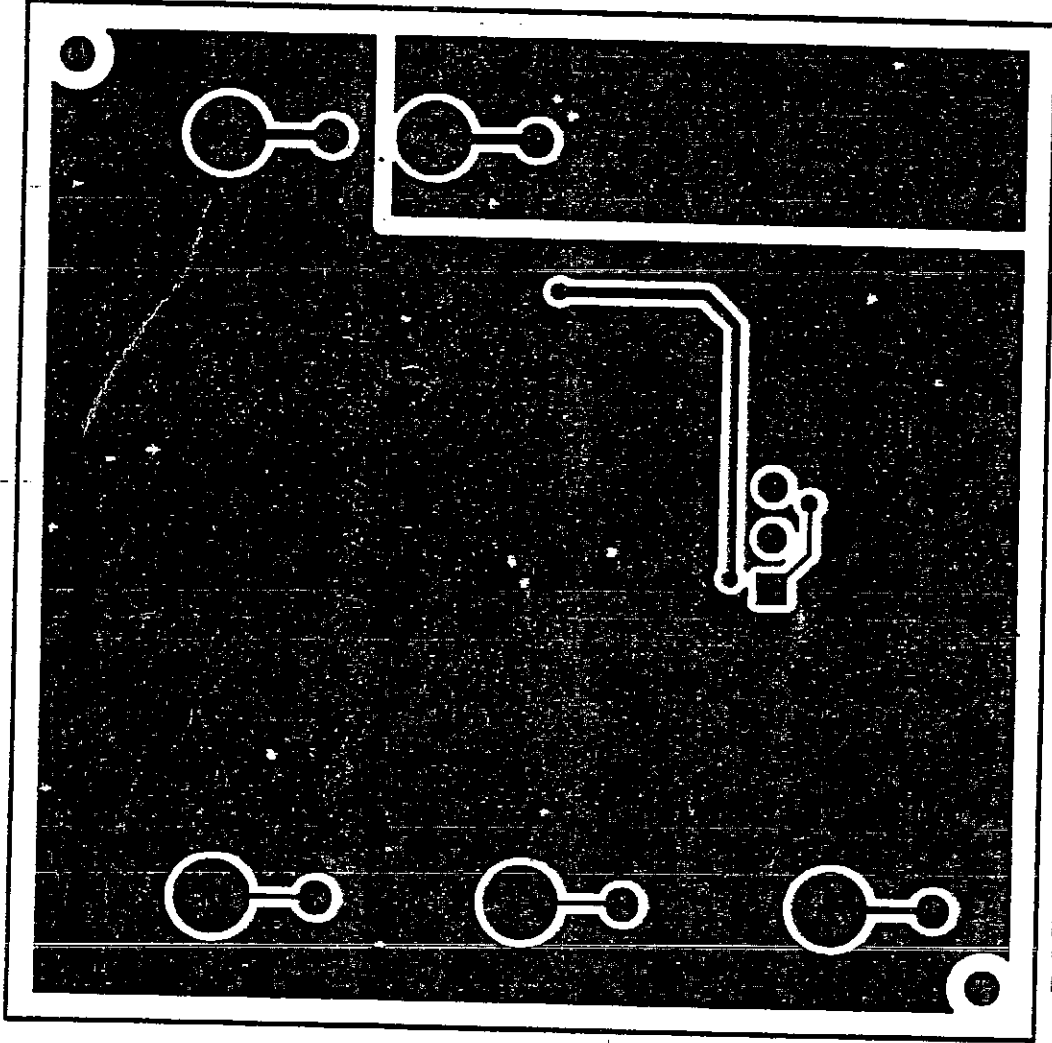
LINEAR TECHNOLOGY - DC207A

2A BOOST REGULATOR

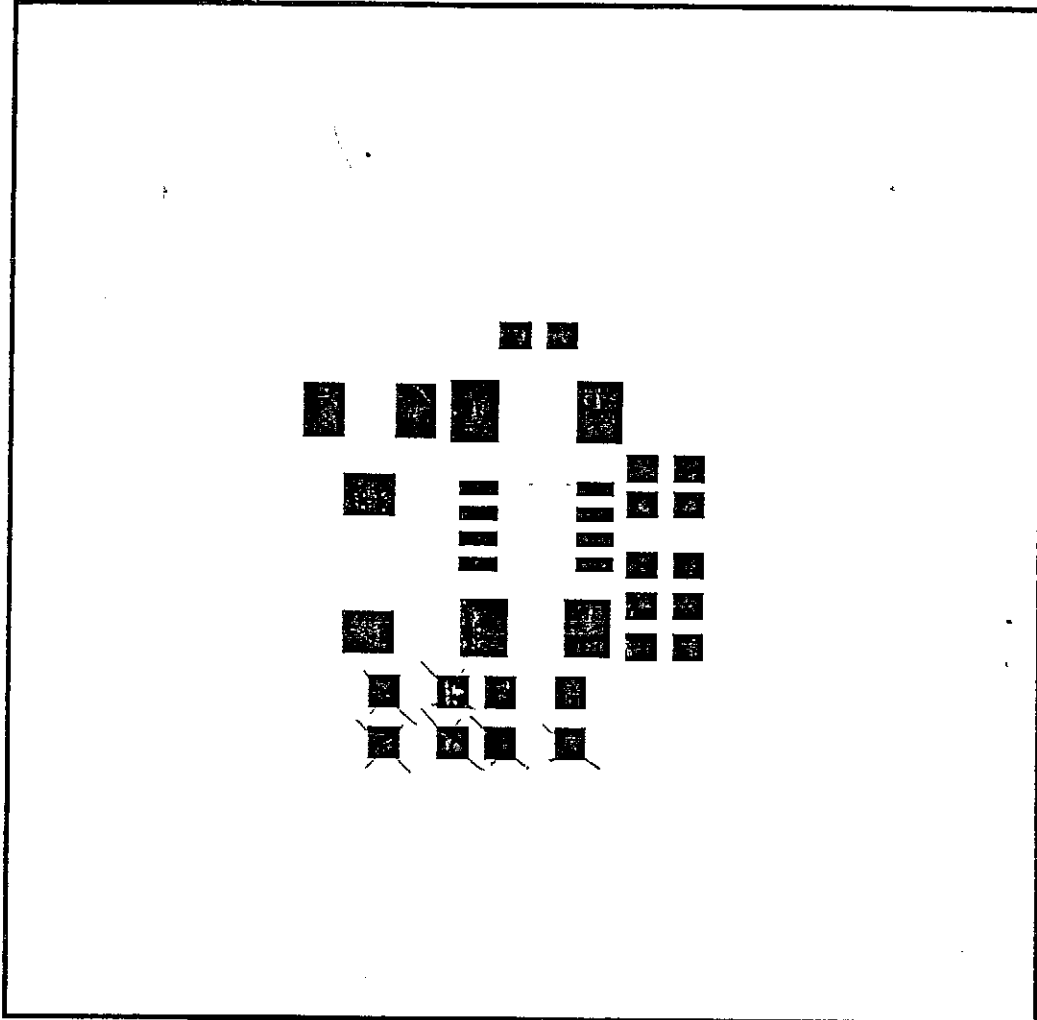
LT1308CS8

DATE: 04-09-98

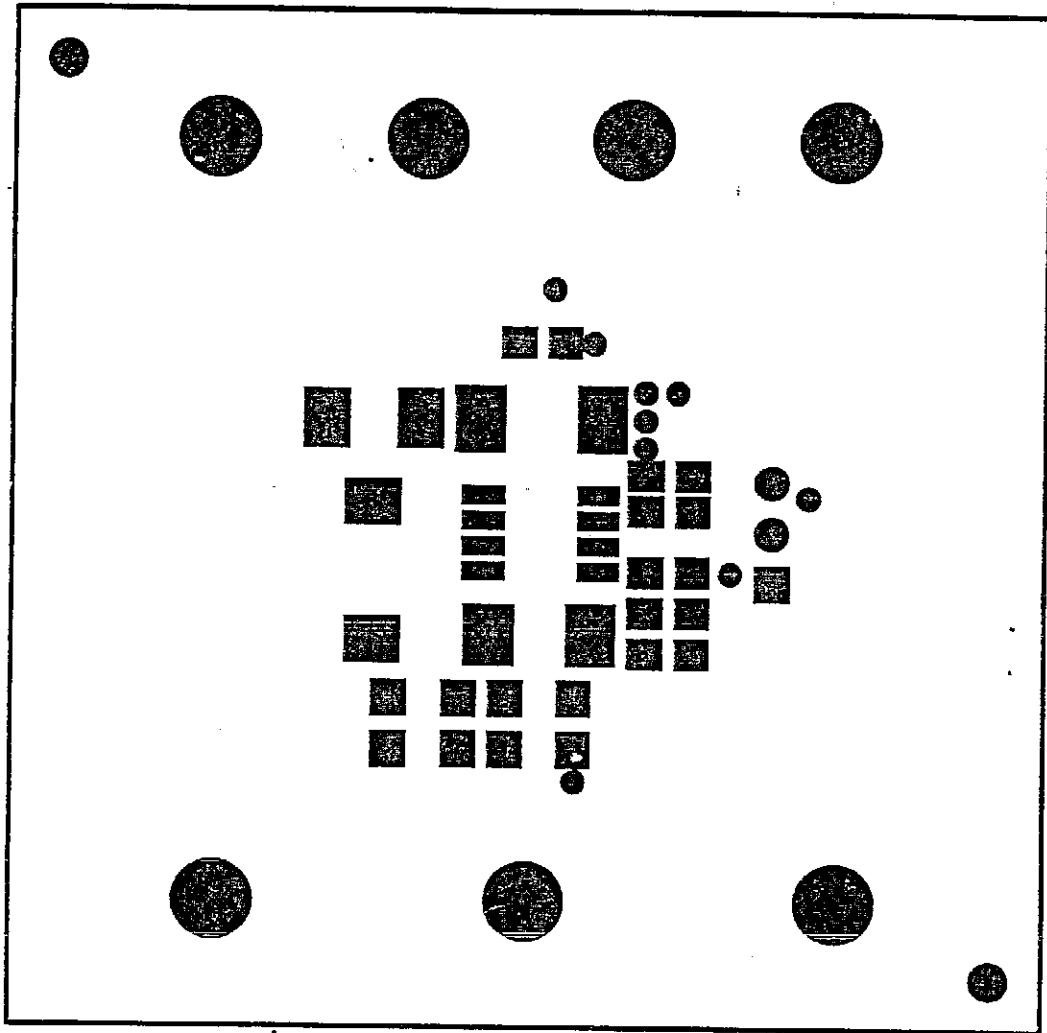




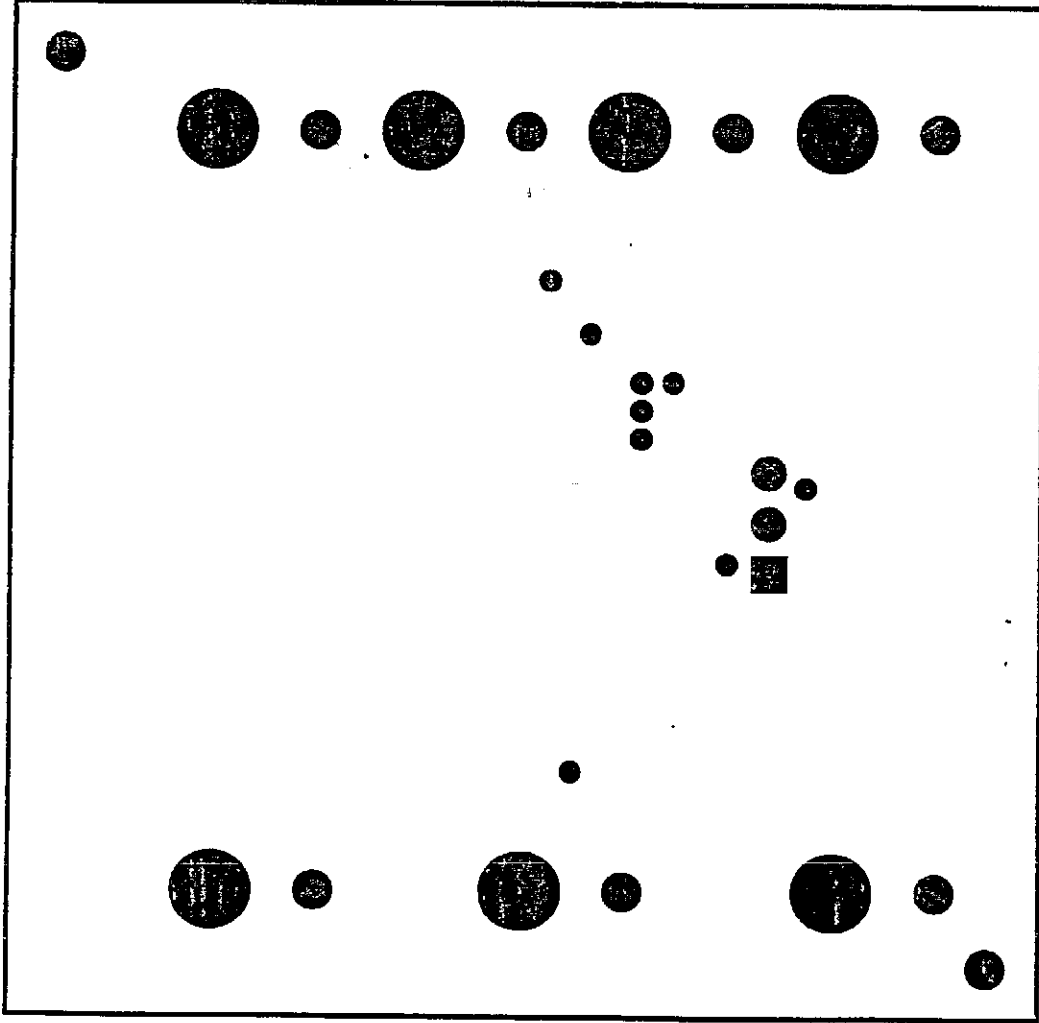
BOTTOM LAYER  
LINEAR TECHNOLOGY - DC207A  
2A BOOST REGULATOR  
LT1308CS8  
DATE: 04-09-98



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



TOP SOLDER MASK  
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<sup>®</sup>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.

 LTC and LT are registered trademarks of Linear Technology Corporation.

## 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.  $V_{IN} = 1.1V$ ,  $V_{SHDN} = V_{IN}$ ,  $T_A = 25^\circ C$  unless otherwise noted.

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

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

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
$I_B$	FB Pin Bias Current (Note 3)	$V_{FB} = V_{REF}$	●	27	80	nA
	Switch Current Limit (Note 4)	DC = 40%	●	2.0	2.5	A
		DC = 80%	●	1.6	2	A
	LBI Input Bias Current (Note 5)	$V_{LBI} = 150mV$	●	5	30	nA
	Reverse Battery Current	(Note 6)				

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.

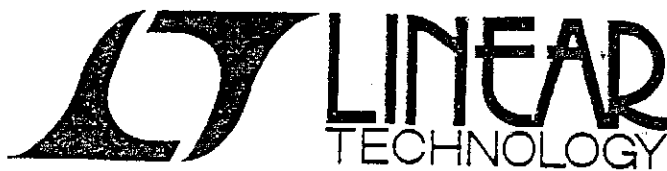
**Note 4:** Switch current limit guaranteed by design and/or correlation to static test. Duty cycle affects current limit due to ramp generator (see Block Diagram).

**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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