

DESCRIPTION

Demonstration circuit 687 is a low input voltage and ultra-low dropout voltage supply using the LT3020 linear regulator, which comes in a small 8-Pin DFN package. The DC687 has an input voltage range from 1V to 10V, an output voltage range between 0.2V and 10V minus the dropout voltage, and is capable of delivering 100mA max. Due to the 0.2V reference of the LT3020, the DC687 is capable of supplying power to

very low voltage applications, such as (relatively) high current voltage references. DC687 uses ceramic capacitors because of the LT3020 ability to maintain stability even with the low ESR of ceramic output capacitors.

Gerber files for this circuit are available. Call the LTC Factory.

QUICK START PROCEDURE

The DC687 is easy to set up to evaluate the performance of the LT3020. For proper measurement equipment configuration, set up the circuit according to the diagram in **Figure 1**.

Please follow the procedure outlined below for proper operation.

1. Before proceeding to test, insert jumper JP1 into the OFF position, and insert jumper JP2 into the 1V option.
2. Apply 1.3V across V_{in} (to Gnd). Insert jumper JP1 into the ON position. Draw 10mA of load current. Measure V_{out} ; it should be 1V +/- 2% (0.98V to 1.02V).
3. Vary the input voltage from 1.3V to 10V and the load current from no load to 100mA. V_{out} should measure 1V +/- 4% (0.96V to 1.04V).
4. Insert jumper JP1 into the OFF position and move jumper JP2 into any of the remaining output voltage options: 1.2V, 1.5V, or 1.8V. Re-insert jumper JP1 into the ON position. Just as in the 1V out test, the output voltage should read V_{out} +/- 2% tolerance under static line and load conditions, and +/- 4% tolerance under dynamic line and load conditions.
5. When finished evaluating, insert jumper JP1 into the OFF position.

Warning - if long leads are used to power the demo circuit, the input voltage at the part could “ring”. This ringing could affect the operation of the circuit or even exceed the maximum voltage rating of the IC. To eliminate this, insert a small tantalum capacitor (for instance, an AVX part # TAJW226M010R) on the pads between the input power and return terminals on the bottom of the demo board. The (greater) ESR of the tantalum will dampen the (possible) ringing voltage due to the use of long input leads. On a normal, typical PCB, with short traces, the capacitor is not needed.

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 687

LOW VOLTAGE VLDO LINEAR REGULATOR

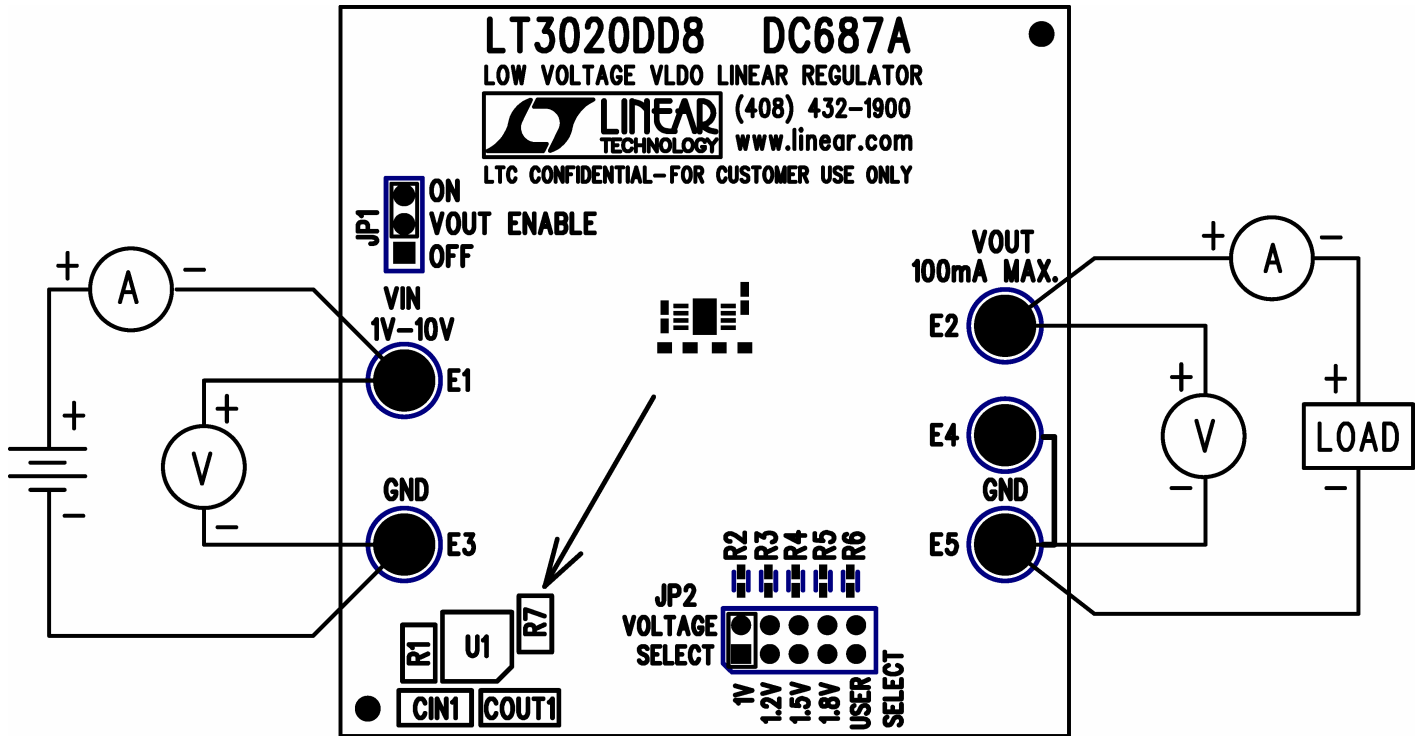


Figure1. Proper Measurement Equipment Setup

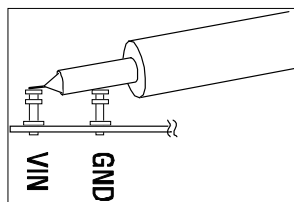
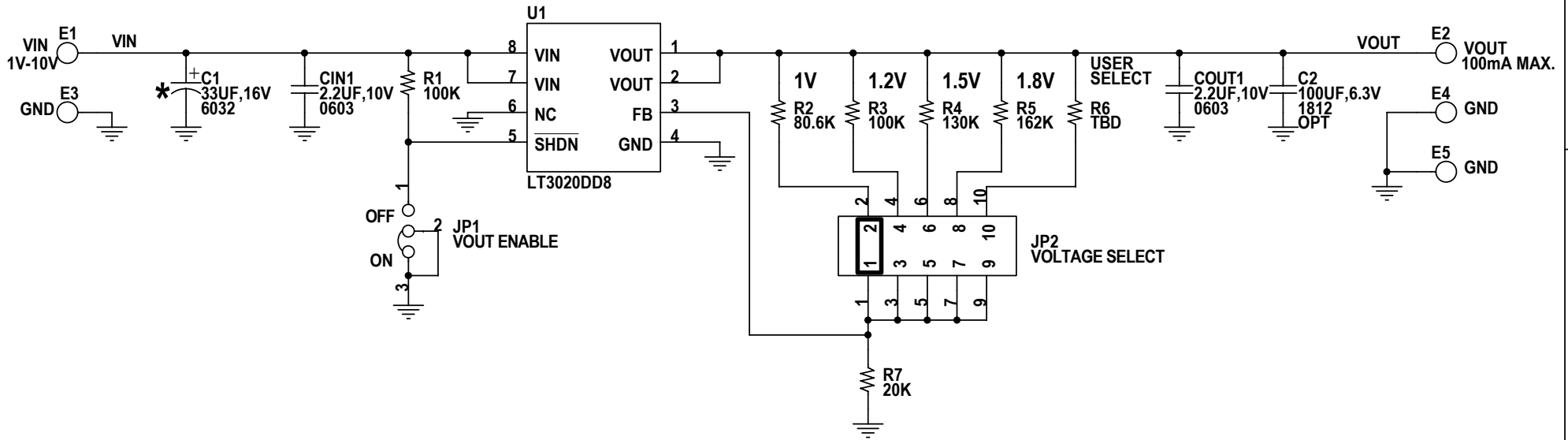



Figure 2. Measuring Input or Output Ripple



NOTES: UNLESS OTHERWISE SPECIFIED

- 1. ALL RESISTORS ARE IN OHMS, 0402.
- 2. INSTALL SHUNTS ON JP1 PIN 2 AND 3, JP2 PIN 1 AND 2.

* C1 IS AN OPTIONAL PART. IT IS INSERTED ON THE DC687A TO DAMPEN THE (POSSIBLE) RINGING VOLTAGE, DUE TO THE INDUCTANCE OF LONG INPUT CABLES. ON NORMAL, TYPICAL PCBS, WITH SHORT TRACES, C1 IS NOT NEEDED.

<p>CUSTOMER NOTICE</p> <p>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.</p> <p>THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.</p>	CONTRACT NO.	 <p>1630 McCarthy Blvd. Milpitas, CA 95035 Phone: (408)432-1900 Fax: (408)434-0507 LTC Confidential-For Customer Use Only</p>	
	APPROVALS		
	DRAWN: KIM T.		
	CHECKED:		
	APPROVED:		
ENGINEER: TOM G.	TITLE: SCHEMATIC		
DESIGNER:	LOW VOLTAGE VLDO LINEAR REGULATOR		
	SIZE A	DWG NO. DC687A-1 * LT3020DD8	REV A
	DATE: Tuesday, June 15, 2004	SHEET 1 OF 1	

Linear Technology Corporation

LT3020DD8

LOW VOLTAGE VLDO LINEAR REGULATOR

ENG: TOM GROSS (23-30)

BILL OF MATERIALS

DC687A-1

6/20/2005

9:10 AM

Item	Qty	Reference	Part Description	Manufacture / Part #
1	2	CIN1,COU1	CAP., X5R 2.2UF 10V 10%,0603	TDK C1608X5R1A225MA
2	1	C1	CAP., TANT, 33UF 16V, 20%, 6032	AVX, TAJW336M016R
3	0	C2	CAP., 100UF 6.3V, 1812	OPT
4	5	E1,E2,E3,E4,E5	TESTPOINT, TURRET, .094"	MILL-MAX, 2501-2
5	1	JP1	JMP, 3PIN 1 ROW .079CC	COMM-CON, 2802S-03-G1
6	1	JP2	JMP, 2X5, .079CC	COMM-CON, 2202S-10-G2
7	2	SHUNTS FOR JP1 (2&3) AND JP2 (1&2)	SHUNT, .079" CENTER	COMM-CON CCIJ2MM-138W
8	2	R3,R1	RES., CHIP 100K 1/16W 1%,0402	AAC, CR05-1003FM
9	1	R2	RES., CHIP 80.6K 1/16W 1%,0402	AAC, CR05-8062FM
10	1	R4	RES., CHIP 130K 1/16W 1%,0402	AAC, CR05-1303FM
11	1	R5	RES., CHIP 162K 1/16W 1%,0402	AAC, CR05-1623FM
12	0	R6	RES., CHIP, 0402	TBD
13	1	R7	RES., CHIP 20K 1/16W 1%,0402	AAC, CR05-2002FM
14	1	U1	I.C., LT3020DD8, DFN8DD	LINEAR TECH., LT3020DD8