

LT3757AEDD

High Efficiency Boost Converter

DESCRIPTION

Demonstration circuit 1547B features the **LT[®]3757AEDD** in a 400kHz BOOST converter circuit, designed for a 12V output from a 3.1V to 9V input voltage range.

The LT3757A operates over an input range of 2.9V to 40V, suitable for applications from single-cell lithium-ion battery portable electronics up to high voltage automotive and industrial power supplies. It also exhibits low shut-down quiescent current of 1 μ A, making them an ideal fit for battery-operated systems. Thanks to a novel FBX pin architecture, the LT3757A can be connected directly to a divider from either the positive output or the negative output to ground. It also packs many popular features

such as soft-start, input undervoltage lockout, adjustable frequency and synchronization in a small 10-lead MSOP package or a 3mm \times 3mm QFN package.

The LT3757A data sheet gives a complete description of the part, operation and application information. The data sheet must be read in conjunction with this quick start guide for demo circuit 1547B.

Design files for this circuit board are available at <http://www.linear.com/demo/DC1547B>

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PERFORMANCE SUMMARY

Specifications are at $T_A = 25^\circ\text{C}$

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage Range		3.1		9	V
Output Voltage		11.64	12	12.36	V
Maximum Output Current		1.5			A
Switching Frequency		360	400	440	kHz

QUICK START PROCEDURE

Demonstration circuit 1547B is easy to set up to evaluate the performance of the LT3757AEDD. 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 V_{IN} or V_{OUT} and GND terminals. See Figure 2 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.

NOTE. Make sure that the input voltage does not exceed the maximum input voltage.

4. Check for the proper output voltages.

NOTE. If there is no output, temporarily disconnect the load to make sure that the load is not set too high.

Once the proper output voltages are established, adjust the loads within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.

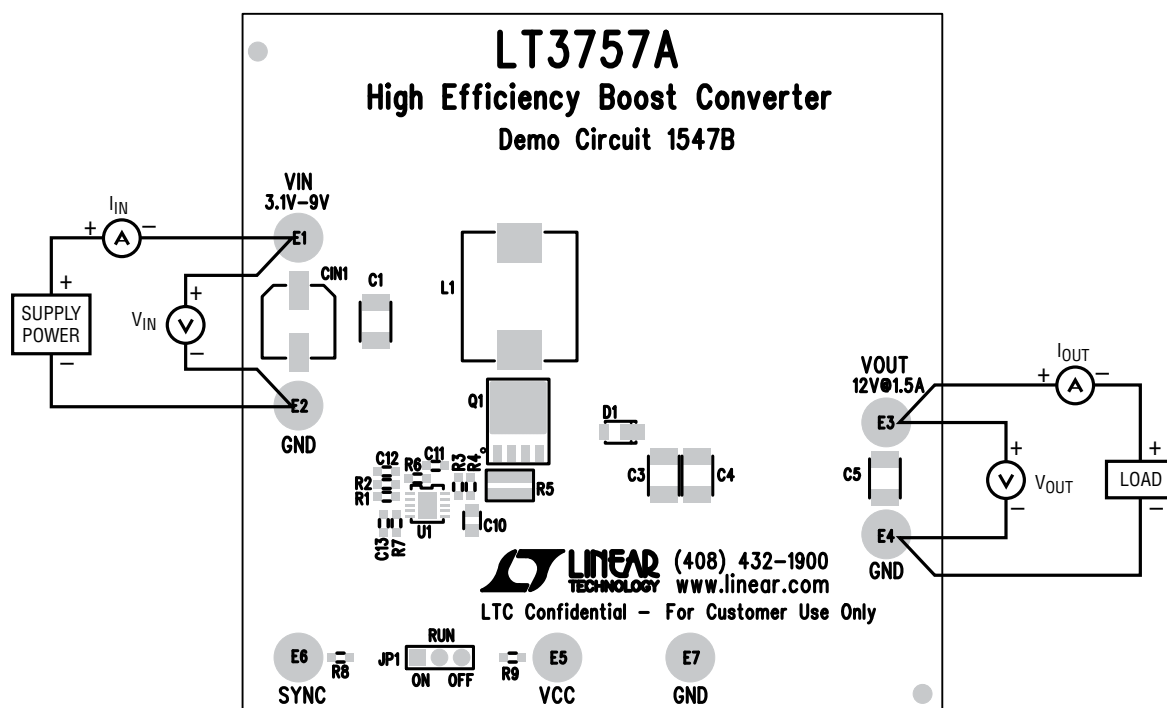


Figure 1. Proper Measurement Equipment Setup

QUICK START PROCEDURE

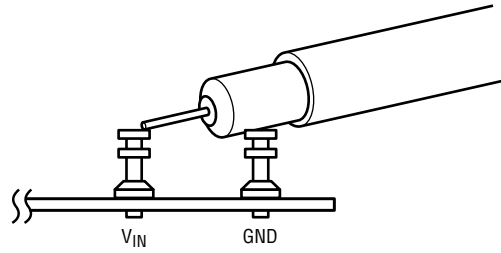


Figure 2. Measuring Input or Output Ripple

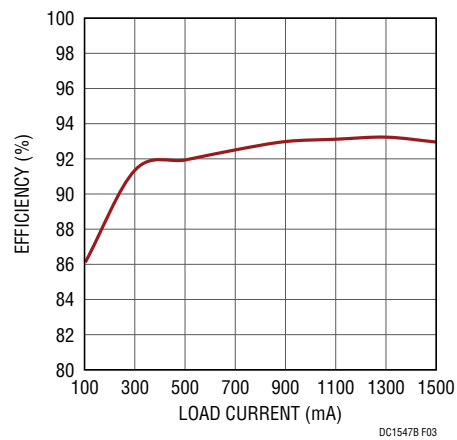


Figure 3. Boost Converter Efficiency at $5V_{IN}$

DEMO MANUAL DC1547B

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	4	C1, C3, C4, C5	CAP., X5R, 22 μ F, 16V, 20%, 1210	Murata, GRM32ER61C226KE20L
2	1	C10	CAP., X5R, 4.7 μ F, 10V, 20%, 0805	Taiyo Yuden, LMK212BJ475MG-T
3	1	C11	CAP., X7R, 4.7nF, 50V, 10%, 0603	TDK, C1608X7R1H472K080AD
4	1	C12	CAP., C0G, 100pF, 50V, 5%, 0603	TDK, C1608C0G1H101J080AA
5	1	C13	CAP., X7R, 0.1 μ F, 25V, 10%, 0603	TDK, C1608X7R1E104K080AA
6	1	D1	DIODE, 2A SMT SCHOTTKY BARRIER PowerDI123	DIODES INC., DFSL220L-7
7	1	L1	INDUCTOR, 2.2 μ H 20%	VISHAY, IHLP4040DZER2R2M01
8	1	Q1	SILICON N-CHANNEL POWER MOS FET, LPAK	RENESAS., RJK0328DPB-01#J0
9	1	R1	RES., CHIP, 130k, 1/10W, 1%, 0603	VISHAY, CRCW0603130KFKEA
10	2	R2, R6	RES., CHIP, 20.0k, 1/10W, 1%, 0603	VISHAY, CRCW060320K0FKEA
11	2	R3, R4	RES., CHIP, 100k, 1/10W, 1%, 0603	VISHAY, CRCW0603100KFKEA
12	1	R5	RES., CHIP, 0.008 Ω , 1W, 1%, 0815	THIN FILM, RL3720WT-R008-F
13	1	R7	RES., CHIP, 30.9k, 1/10W, 1%, 0603	VISHAY, CRCW060330K9FKEA
14	1	R8	RES., CHIP, 10k, 1/10W, 5%, 0603	VISHAY, CRCW060310K0JNEA
15	1	R9	RES., CHIP, 0 Ω , 1/16W, 0603	VISHAY, CRCW06030000Z0EA
16	1	U1	I.C., LT3757AEDD, DFN 10 (3mm X 3mm)	LINEAR TECH., LT3757AEDD#PBF
Additional Demo Board Circuit Components				
1	1	CIN1	CAP., CE-LX, 100 μ F, 16V, SIZE 6.6 X 6.6	SUN ELECTRONIC, 16CE100LX
Hardware: For Demo Board Only				
1	7	E1-E7	TESTPOINT, TURRET, .094", PBF	MILL-MAX, 2501-2-00-80-00-00-07-0
2	1	JP1	3 PIN 0.079 SINGLE ROW HEADER	SULLINS, NRPN031PAEN-RC
3	1	XJP1	SHUNT, .079" CENTER	SAMTEC, 2SN-BK-G

SCHEMATIC DIAGRAM

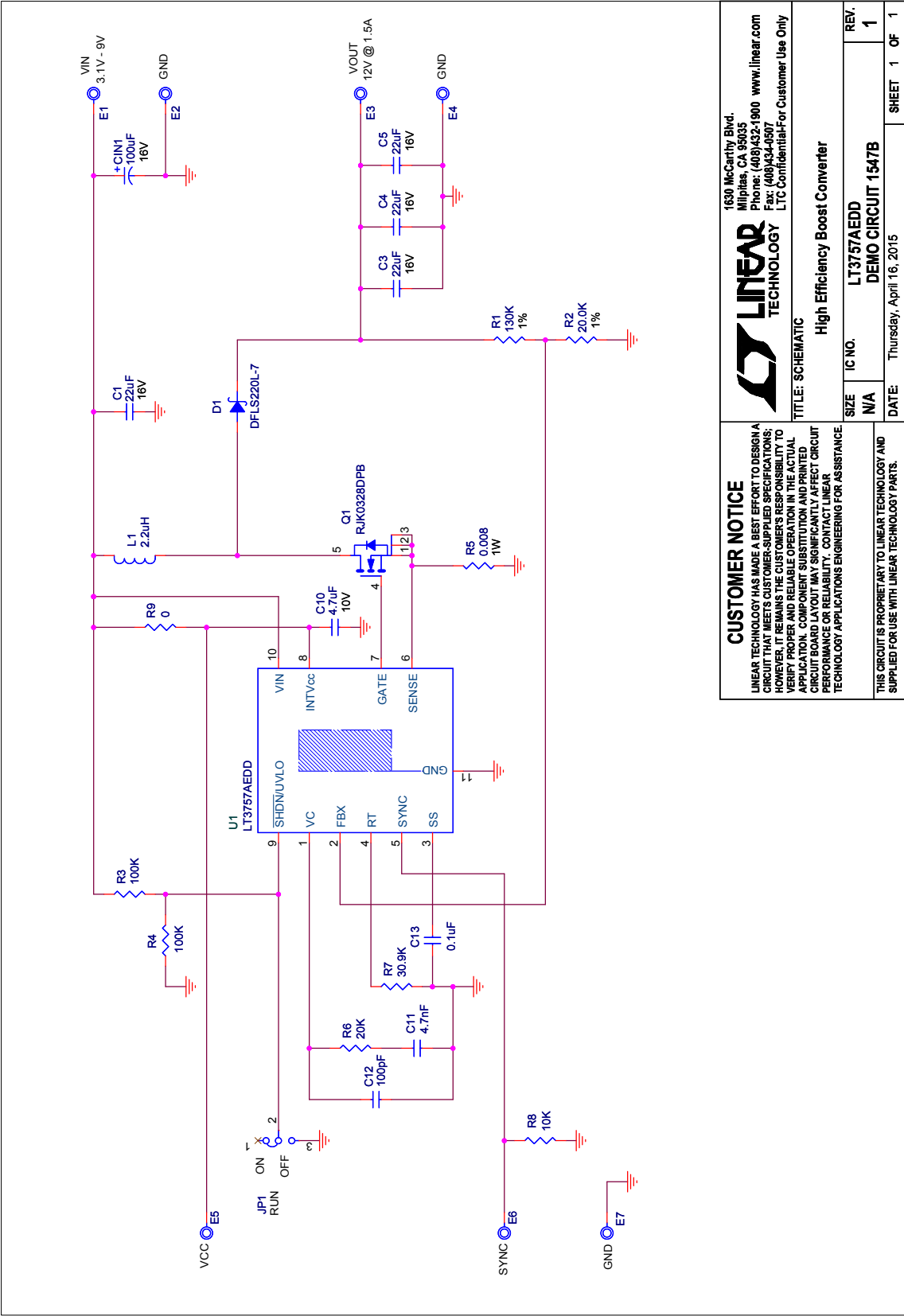


Figure 4. DC1547B Demo Circuit Schematic

DEMO MANUAL DC1547B

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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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