

LT3757A

High Efficiency SEPIC Converter

DESCRIPTION

Demonstration circuit 1341B features **LT[®]3757A** in a 300kHz SEPIC converter circuit, designed for a 5V at 3A output from a 4.5V to 36V 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 DC1341B.

Design files for this circuit board are available at <http://www.linear.com/demo/DC1341B>

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PERFORMANCE SUMMARY **300kHz SEPIC Regulator (T_A = 25°C)**

PARAMETER	CONDITION	VALUE
Minimum Input Voltage		4.5V
Maximum Input Voltage		36V
Output Voltage V _{OUT}		5V \pm 3%
Maximum Output Current		3A
Typical Switching Frequency		300kHz

QUICK START PROCEDURE

Demonstration circuit 1341B is easy to set up to evaluate the performance of the LT3757A. 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.

QUICK START PROCEDURE

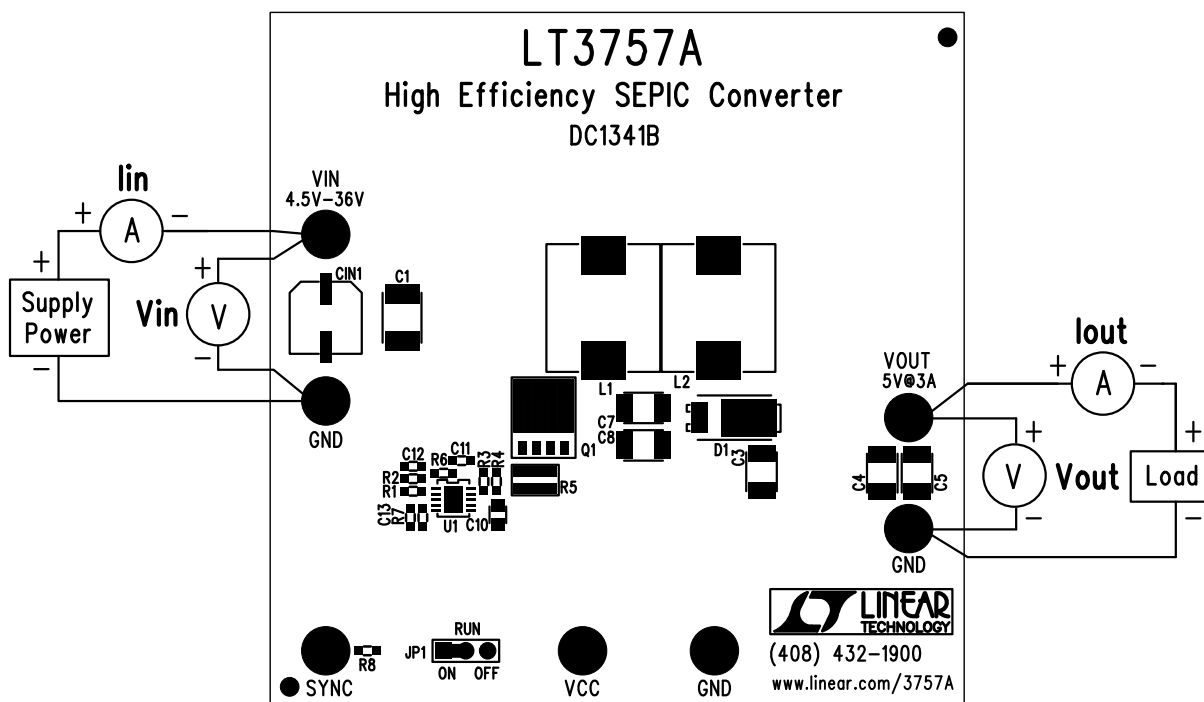


Figure 1. Proper Measurement Equipment Setup

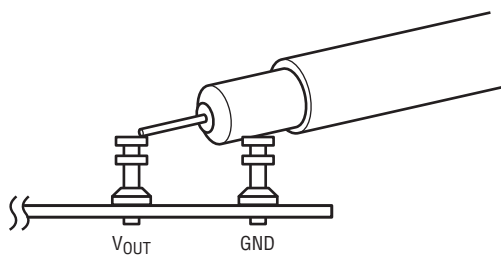


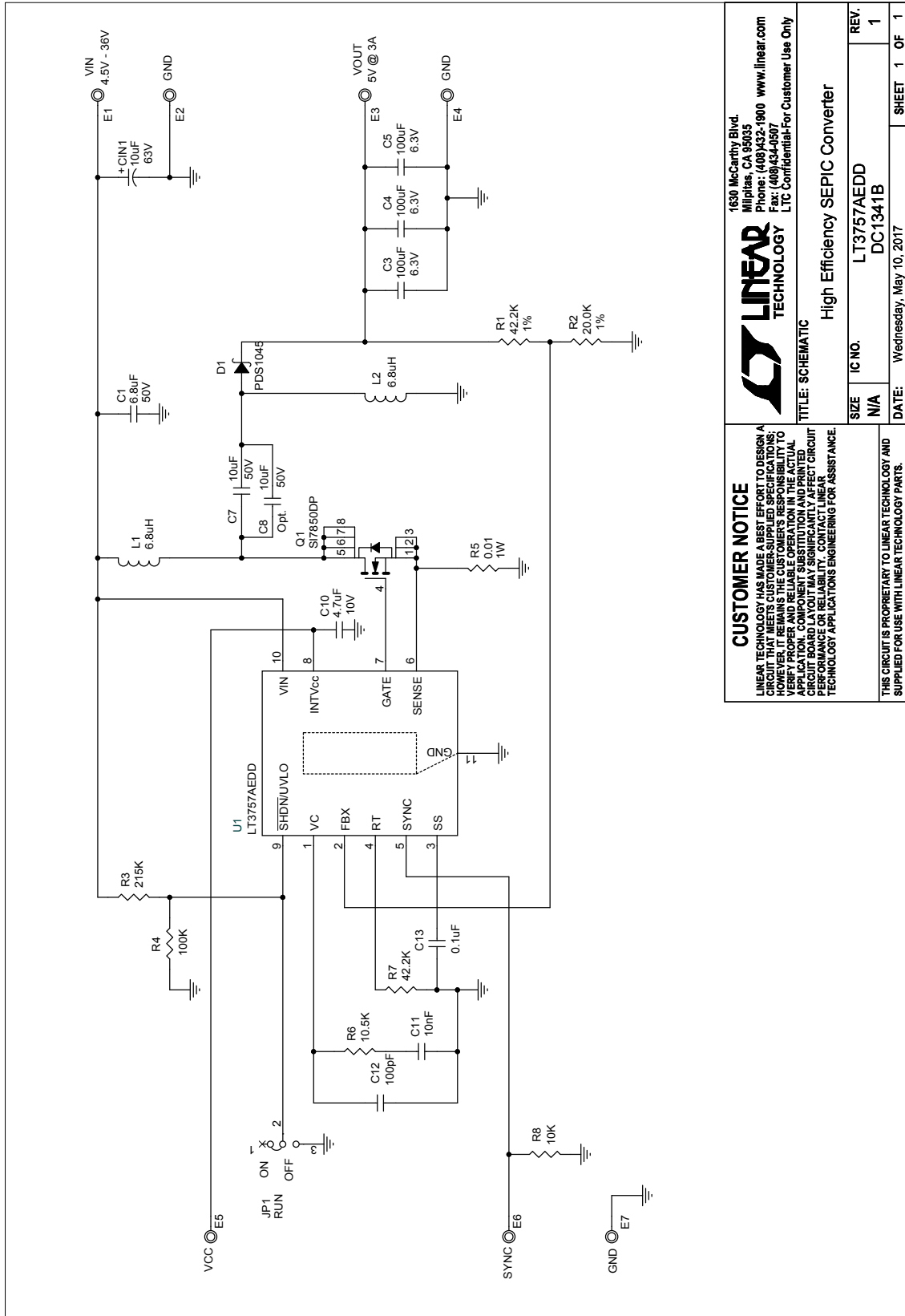
Figure 2. Measuring Input or Output Ripple

DEMO MANUAL DC1341B

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	1	C1	CAP, X7R, 6.8 μ F, 50V, 20% 1812	TDK, C4532X7R1H685M
2	3	C3, C4, C5	CAP, X5R, 100 μ F, 6.3V, 20% 1210	Murata, GRM32ER60J107ME20L
3	1	C7	CAP, X7S, 10 μ F, 50V, 20% 1210	TAIYO YUDEN, UMK325BJ106MM-T
4	1	C10	CAP, X5R, 4.7 μ F, 10V, 20% 0805	TAIYO YUDEN, LMK212BJ475MG-T
5	1	C11	CAP, X7R, 10nF, 50V, 10% 0603	TDK, C1608X7R1H103K
6	1	C12	CAP, C0G, 100pF, 50V, 5% 0603	TDK, C1608C0G1H101J
7	1	C13	CAP, X7R, 0.1 μ F, 25V, 10% 0603	TDK, C1608X7R1E104K
8	1	D1	DIODE, PDS1045, PowerDI-5	DIODES INC., PDS1045-13
9	2	L1, L2	INDUCTOR, 6.8 μ H 20%	VISHAY, IHLP4040DZER6R8M11
10	1	Q1	N-MOSFET, Si7850DP POWER-PAK SO-8	VISHAY, Si7850DP-T1-E3
11	2	R1, R7	RES., CHIP, 42.2k, 1/10W, 1% 0603	VISHAY, CRCW060342K2FKEA
12	1	R2	RES., CHIP, 20.0k, 1/10W, 1% 0603	VISHAY, CRCW060320K0FKEA
13	1	R3	RES., CHIP, 215k, 1/10W, 1% 0603	VISHAY, CRCW0603215KFKEA
14	1	R4	RES., CHIP, 100k, 1/10W, 1% 0603	VISHAY, CRCW0603100KFKEA
15	1	R5	RES., CHIP, 0.01 Ω , 1W, 1%, 0815	THIN FILM, RL3720WT-R010-F
16	1	R6	RES., CHIP, 10.5k, 1/10W, 1% 0603	VISHAY, CRCW060310K5FKEA
17	1	R8	RES., CHIP, 10k, 1/10W, 5% 0603	VISHAY, CRCW060310K0JNEA
18	1	U1	I.C., LT3757AEDD, DFN 10 (3 \times 3)	LINEAR TECH., LT3757AEDD#PBF
Additional Demo Board Circuit Components				
1	1	CIN1	CAP, CE-FS, 10 μ F, 63V, 6.3 \times 5.4 SIZE	SANYO, 63CE10FS
2	0	C8 (OPT.)	CAP, 1210	
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	SAMTEC, TMM103-02-L-S
3	1	XJP1	SHUNT, .079" CENTER	SAMTEC, 2SN-BK-G

SCHEMATIC DIAGRAM



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High Efficiency SEPIC Converter

SIZE	IC NO.	REV.
N/A	LT3757AEDD	1
DATE:	DC1341B	SHEET 1 OF 1
Wednesday, May 10, 2017		

DEMO MANUAL DC1341B

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