

DESCRIPTION

Demonstration Circuit DC425 is a constant-frequency synchronous Buck-Boost converter using the LTC3440. The input range is from 2.5V to 5.5V, making it ideal for single-cell lithium-ion or three-cell NiCd/NiMH battery applications. This converter provides up to 95% efficiency, much higher than traditional Buck-Boost converters. For 2.5V minimum input voltage, this converter can provide up to 500mA load current.

The output voltage is set at 3.3V. A different output voltage in the range

of 2.5V to 5.5V can be obtained by changing one of the feedback resistors. The frequency is set at 1MHz, which is a good trade-off between efficiency and size. The frequency can be modified by changing R6 or by synchronizing to an external clock. In shutdown, the board draws about 2.5 μ A, where 2 μ A goes through the 1M Ω pull up resistor (R4) and the IC itself draws less than 1 μ A. **Gerber files for this circuit board are available. Call the LTC factory.**

QUICK START GUIDE

Refer to Figure 1 for the connection diagram and follow the procedure below:

1. Apply a voltage source to the input of the circuit between the V_{IN} and GND terminals. The circuit will start up at input voltage higher than 2.5V.

NOTE Do not apply more than 5.5V to the input.

2. Attach a voltmeter or oscilloscope probe between the V_{OUT} and GND terminals of the circuit to monitor the output. To start the circuit, the shunt at JP1 needs to be put in RUN position.

3. Attach a load to the output. The available output current depends on the input voltage.

DEMO BOARD QUICK START GUIDE DC425

1MHz SYNCHRONOUS BUCK-BOOST CONVERTER

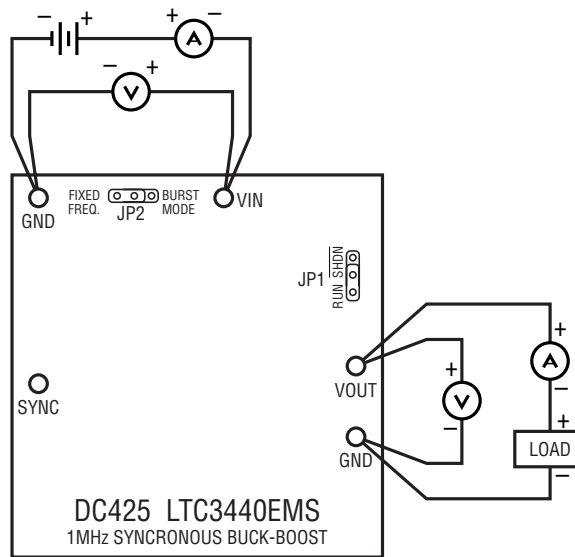


Figure 1. DC425 Hookup Diagram

DEMO BOARD QUICK START GUIDE DC425

1MHZ SYNCHRONOUS BUCK-BOOST CONVERTER

PERFORMANCE SUMMARY

PARAMETER	CONDITION	VALUE
Input Voltage Range		2.5V to 5.5V
Maximum Load Current, Min	$V_{OUT} = 3.3V, V_{IN} = 2.5V$	500mA
Typical Output Ripple	$V_{OUT} = 3.3V, I_{OUT} = 500mA$	13mV _{P-P}
Typical Operating Frequency	$R6 = 62K$	1MHz

TYPICAL PERFORMANCE CHARACTERISTICS

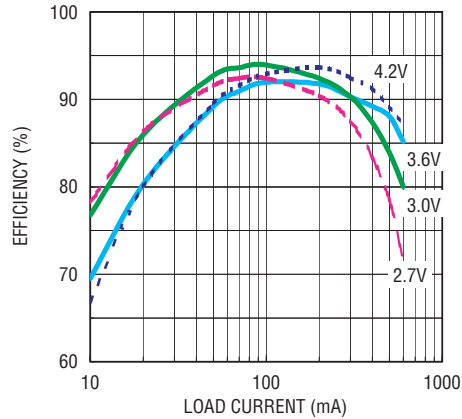
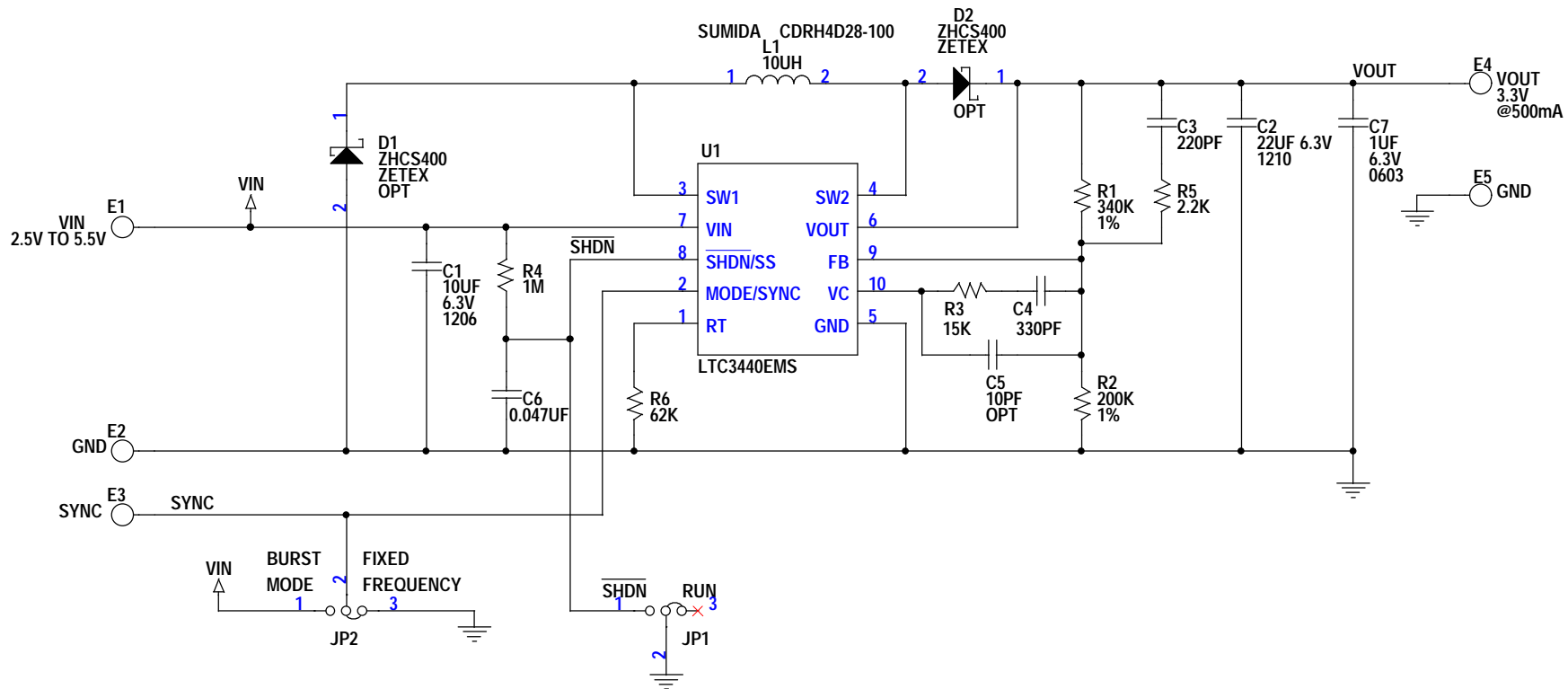


Figure 2. Efficiency vs. Load Current (without External Schottky Diodes)



NOTES: UNLESS OTHERWISE SPE CIFIED

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

LINEAR TECHNOLOGY C ORP

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Title

1MHz SYNCHRONOUS B UCK-BOOST

Size

Document Number

DC425A-2*LTC3440EMS

Rev

A

Date:

Thursday, November 29, 2001

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Item	Qty	Reference	Part Description	Manufacture / Part #
1	1	C1	CAP., X5R 10UF 6.3V,20%,1206	TAIYO YUDEN JMK316BJ106ML
2	1	C2	CAP., X5R 22UF 6.3V,1210	TAIYO YUDEN, JMK325BJ226MM
3	1	C3	CAP., NPO 220PF 25V	AVX 04023A221KAT1A
4	1	C4	CAP., X7R, 330PF 50V	AVX 04025C331MAT1A
5	0	C5	CAP., NPO 10PF 50V	OPT
6	1	C6	CAP., X5R, 0.047UF 10V	AVX 0402ZD473MAT1A
7	1	C7	CAP., X5R 1UF 6.3V,20%,0603	TAIYO YUDEN JMK107BJ105MA
8	0	D1,D2	DIODE, SCHOTTKY,SOD323	OPT ZETEX ZHCS400
9	5	E1-E5	TP, TURRET, .094"	MILL-MAX 2501-2
10	2	JP1,JP2	HEADER, 3PIN 1 ROW .079CC	COMM-CON 2802S-03-G1
11	2	SHUNTS FOR JP1,JP2	SHUNT, .079" CENTER	COMM-CON CCIJ2MM-138G
12	1	L1	IND, 10UH, L-CDRH4D28	SUMIDA CDRH4D28-100
13	1	R1	RES, CHIP 340K, 1%	AAC CR05-3403FM
14	1	R2	RES, CHIP 200K, 1%	AAC CR05-2003FM
15	1	R3	RES, CHIP 15K, 5%	AAC CR05-153JM
16	1	R4	RES, CHIP 1M, 5%	AAC CR05-106JM
17	1	R5	RES, CHIP 2.2K, 5%	AAC CR05-222JM
18	1	R6	RES, CHIP 62K, 5%	AAC CR05-623JM
19	1	U1	IC, LTC3440EMS, MSOP10	LINEAR TECH. LTC3440EMS