DC349B Quick Start Guide

DESCRIPTION

Demonstration Circuit DC349B demonstrates a synchronous step-up DC/DC converter using the LTC1700 controller.

The LTC1700 is a current mode No R_{SENSE}™ synchronous step-up controller with up to 95% efficiency. Applications include 2.5V to 3.3V or 5V converters, 2.5V to 5V converters, single-cell Li-Ion to 5V applications or two cell AA to 3.3V or 5V applications.

The LTC1700's 550kHz operating frequency allows the use of small inductors and capacitors. The device can also be synchronized to frequencies between 400kHz to 750kHz. Burst Mode™ operation is disabled when the device is synchronized or the SYNC/MODE pin is pulled low to reduce noise.

To prevent inductor current runaway, the duty cycle is limited to 90%. Overvoltage protection turns both external MOSFETs off when the output rises about 5% above the regulated value.

DC349B provides output voltages of 3.3V or 5V (jumper selectable).

QUICK START GUIDE

1. Proper setup is essential for accurate and meaningful evaluation of efficiency and regulation. Figure 1 shows the appropriate arrangement of supply, load, ammeters and voltmeters.
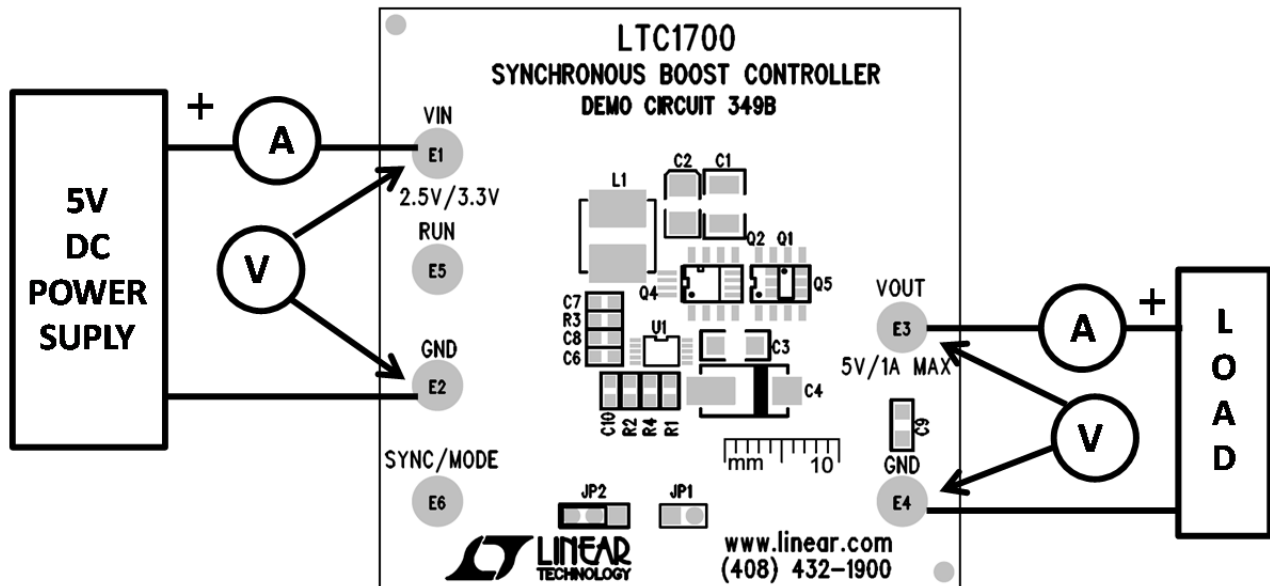

Figure 1. DC349B Test and Measurement Setup

2. Apply a voltage source to the input of the circuit between the VIN and GND terminals. The circuit will operate from an input voltage as low as 1.8V. Do not apply more than 4V to the input.

3. Select the appropriate position of jumper JP1 for the output voltage (open for 5V, closed for 3.3V).

4. Refer to Figure 4 in the data sheet to apply an appropriate load current between the VOUT and GND terminals at start-up.

5. The RUN terminal can be left unconnected. To shut down the LTC1700, connect this terminal to GND.

6. Connect the SYNC/MODE terminal to the VIN terminal to enable Burst Mode operation at low load currents or connect it to GND or an external clock to defeat Burst Mode operation. Do not attempt to synchronize to a clock below 400kHz or above 750kHz.

PERFORMANCE SUMMARY

PARAMETER	CONDITION	VALUE
Maximum Load Current (Min) (Note 1)	V_{IN} = 2.5V, V_{OUT} = 3.3V	1A
	V_{IN} = 2.5V, V_{OUT} = 5.0V	0.7A
	V_{IN} = 3.3V, V_{OUT} = 5.0V	1A

Note 1: This limit is based on the DC349B circuit. The LTC1700 can provide higher output currents.

PARTS LIST

Item	Qty	Reference	Part Description	Manufacture / Part #
		Passive Comp.		
1	1	C1	CAP, X5R, 22uF, 6.3V, 20%, 1210	TAIYO YUDEN JMK325BJ226MM-T
2	1	C2	CAP, TANT, 68uF, 6.3V, 10% , 1210	AVX, TAJB686K006RNJ
3	1	C3	CAP, X5R,10uF, 6.3V, 20%, 1206	TAIYO YUDEN JMK316BJ106ML-T
4	1	C4	CAP, POSCAP, 330uF, 6.3V, 7343	PANASONIC 6TPB330M
5	1	C6	CAP, X7R, 0.1uF, 16V, 10%, 0603	AVX 0603YC104KAT2A
6	1	C7	CAP, X7R, 220pF, 25V, 10%, 0603	AVX 06033C221KAT2A
7	1	C8	CAP, X7R, 100pF, 25V, 10%, 0603	AVX 06033C101KAT2A
8	1	C9	CAP, X5R, 4.7uF, 6.3V, 20%, 0805	TAIYO YUDEN JMK212BJ475MG-T
9	1	R1	RES., CHIP 392K 1/16W 1% 0603	VISHAY CRCW0603392KFKEA
10	1	R2	RES., CHIP 316K 1/16W 1% 0603	VISHAY CRCW0603316KFKEA
11	1	R3	RES., CHIP 2.2K 1/16W 5% 0603	VISHAY CRCW06032K20JNEA
12	1	R4	RES., CHIP 100K 1/16W 1% 0603	VISHAY CRCW0603100KFKEA
13	1	L1	INDUCTOR, 1.5UH	MURATA LQH66SN1R5M03
		Active comp.		
1	1	Q1	P-MOSFET, AO4419, SO-08	ALPHA&OMEGA, AO4419
2	1	Q2	N-MOSFET, AO4202, SO-08	ALPHA&OMEGA, AO4202

3	1	U1	I.C., LTC1700EMS MSOP10	LINEAR LTC1700EMS#PBF
		Hardware		
1	6	E1-E6	TURRET,	MILL-MAX 2501-2
2	1	JP1	0.079 SINGLE ROW HEADER, 2 pin	COMM CON 2802S-02-G1
3	1	JP2	0.079 SINGLE ROW HEADER, 3 pin	COMM CON 2802S-03-G1
4	2	XJP1, XJP2	SHUNT, .079" CENTER	SAMTEC, 2SN-BK-G
5	1		PRINTED CIRCUIT BOARDS	DEMO BOARD 349B

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