DESCRIPTION

Demonstration circuit 463 is a step-down (buck) regulator and a Low Drop Out (LDO) regulator using the LTC3700 in the 10-lead MSOP package. The buck regulator is capable of providing 1A at an output voltage of 3.3V from an input supply of 5V to 9V. The LDO can be powered from either the buck regulator output or a separated DC input, and produces an output up to 2.5V at 150mA. The combination of a buck regulator and a LDO, and the use of surface mount components result in a highly efficient application circuit in a very small board

space. The demo circuit highlights the capabilities of the LTC3700. A constant operating frequency of 550kHz makes the LTC3700 attractive for noise-sensitive applications while allowing for smaller external components such as output filter inductor and capacitor. In addition, high efficiency operation over a wide load current range makes the LTC3700 ideal for battery-powered applications.

Design files for this circuit board are available. Call the LTC factory.

Table 1. Performance Summary

PARAMETER	CONDITION	VALUE
Input Voltage Range of Buck regulator		5V to 9V
Input Voltage Range of LDO		3.3V to 5V
V_{OUT1}	V_{IN} = 5V to 9V, I_{OUT1} = 0A to 1A	3.3V ±3%
V_{OUT2}	V_{IN} = 3.3V to 5V, I_{OUT1} = 0A to 150mA	2.5V ±4%
Typical Output Ripple V_{OUT1}	V_{IN} = 5V, I_{OUT1} = 1A	$30mV_{P-P}$
Typical Output Ripple V_{OUT2}	V_{IN} = 3.3V, I_{OUT2} = 150mA	$5mV_{P-P}$
Nominal Switching Frequency	Buck Regulator	550kHz

QUICK START PROCEDURE

Demonstration circuit 463 is easy to set up to evaluate the performance of the LTC3700. 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 input or output and ground terminals. See Figure 2 for proper scope probe technique.

1. Connect a 5V to 9V power source to the Vin1 and GND terminals.

2. To operate the LDO circuit with a separate, second input, set JP1 to the Vin2 position. Connect a second 3.3V to 5V power source to the Vin2 and GND terminals.

3. Connect the loads.

4. For single source operation, set the input source selector Jumper JP1 to Vout1 position. Remove the connection of power source Vin2. The LDO will be powered from Vout1.
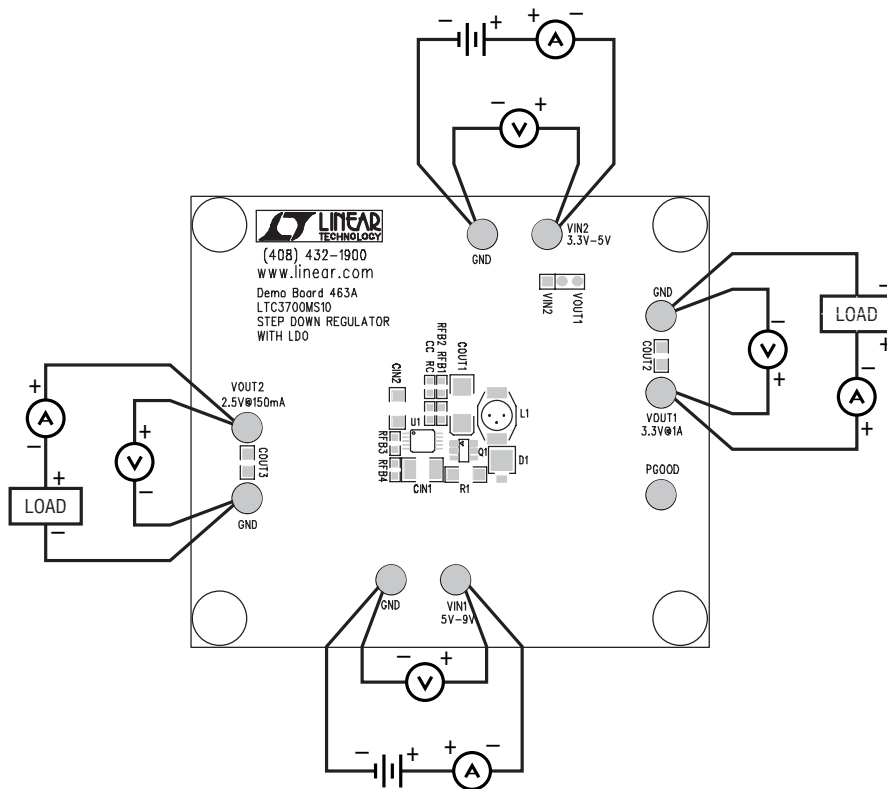
Figure 1. Proper Measurement Equipment Setup

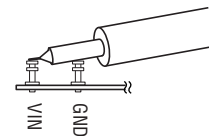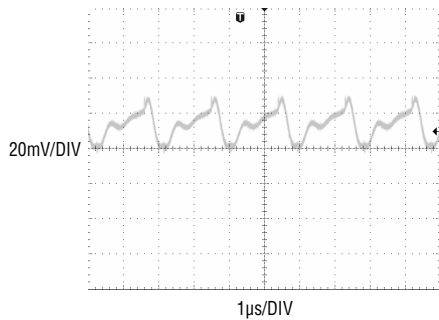

Figure 2. Measuring Input or Output Ripple

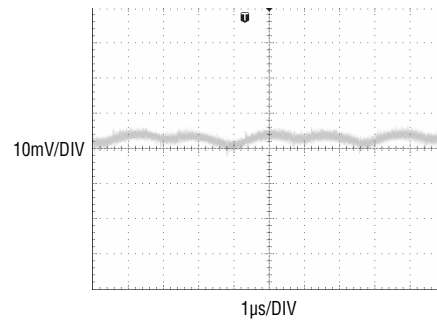Figure 3. 3.3V Buck Output Ripple
(V_{IN} = 5V, I_{OUT} = 1A)

Figure 4. 2.5V LDO Output Ripple
(V_{IN} = 3.3V, I_{OUT} = 150mA)

TP9
GND ◎

JP1

VIN2 ■ ● ● VOUT1

VIN2 TP2
3.3-5V ◎

CIN2
10uF
6.3V
X5R

U1
LTC3700EMS10

TP4
VOUT2 ◎
2.5V@150mA

COUT3
2.2uF
X5R

RFB3
169K
1%

1	VIN2	ITH/RUN	10
2	LDO	VFB	9
3	VFB2	SENSE-	8
4	PGOOD	VIN	7
5	GND	PGATE	6

CIN1
10uF
10V
X7R

R1
0.030
1%

FDC638P
Q1

RFB4
78.7K
1%

TP6
GND ◎

TP7
PGOOD ◎

RC
10K

RFB1
255K
1%

L1
4.7uH
DO1608C-472
COILCRAFT

CC
100pF

RFB2
80.6K
1%

D1
MBRM120LT3
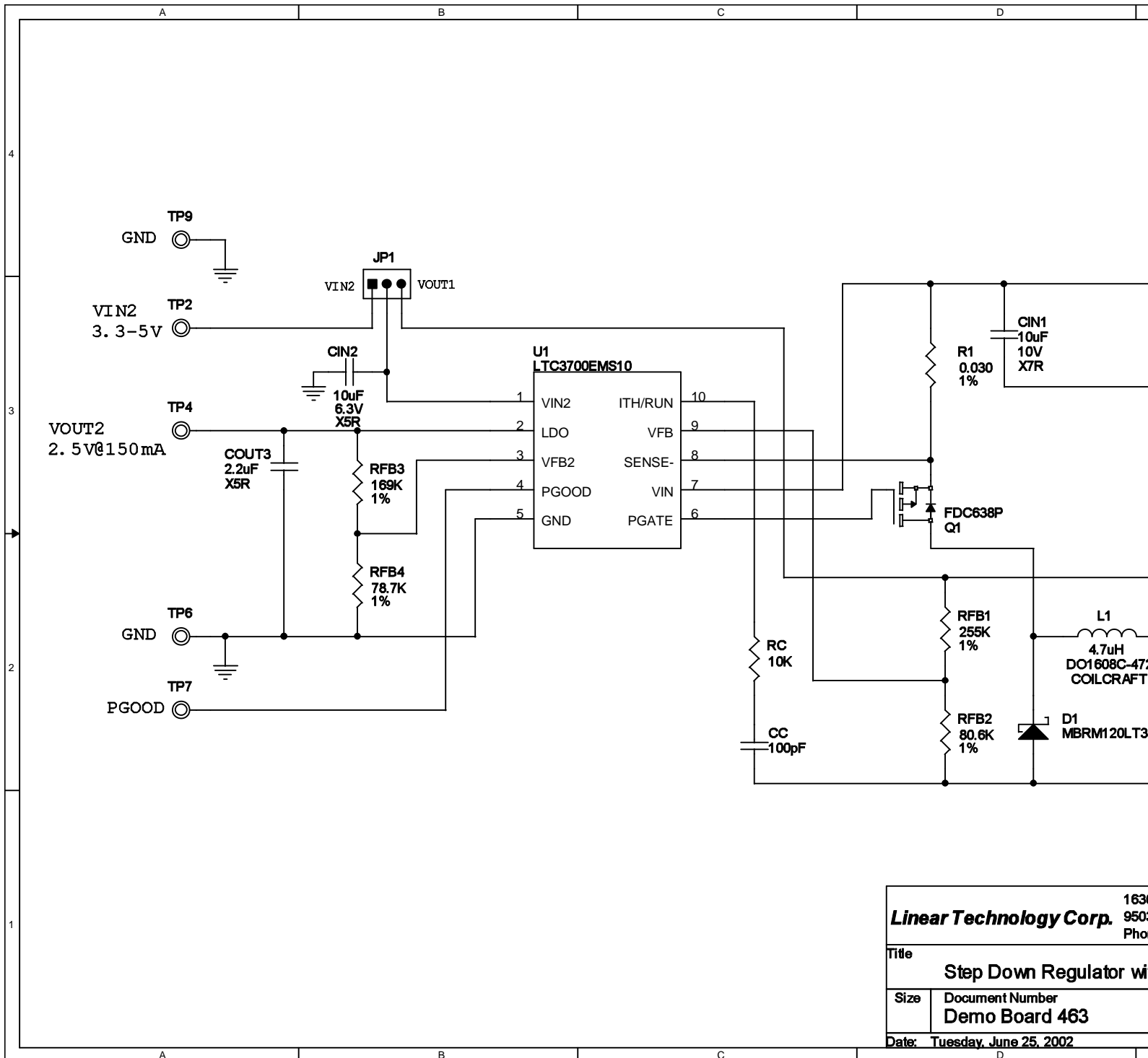
Linear Technology Corp.

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Step Down Regulator wi

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