

QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 392

HIGH EFFICIENCY DUAL REGULATOR

LTC1628 or LTC3728

DESCRIPTION

Demonstration circuit 392 is a dual output, step-down, synchronous buck converter featuring either the 150kHz to 300kHz LTC1628EUH controller (DC392A-A), the 250kHz to 550kHz LTC3728EUH (DC392A-B) or 250kHz to 550kHz LTC3728LUH (DC392A-C). All three ICs come in a 5mm×5mm QFN package with an exposed pad for

low thermal impedance. The input voltage is from 7V up to 24V. Output 1 is 5V with loads up to 4A and output 2 is 3.3V with loads up to 5A.

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

Table 1. Performance Summary

PARAMETER	CONDITION	VALUE
Minimum Input Voltage		7V
Maximum Input Voltage		24V
V _{OUT1}	V _{IN} = 7V to 24V, I _{OUT1} = 0A to 4A	5V ±1%
V _{OUT2}	V _{IN} = 7V to 24V, I _{OUT1} = 0A to 5A	3.3V ±1%
Switching Frequency (LTC1628) Switching Frequency (LTC3728)	Jumper selectable Jumper selectable	150kHz–300kHz 250kHz–550kHz

QUICK START PROCEDURE

Demonstration circuit 392 is easy to set up to evaluate the performance of the LTC1628 or LTC3728. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

NOTE: The input voltage range should be 7V–24V instead of 5V–24V as shown on the board.

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 Vin or Vout and GND terminals. See Figure 2 for proper scope probe technique.

1. With the power off, place the jumpers as shown in Figure 1.

NOTE: The STBY and FLTCPL jumpers apply only to demo circuit 392A-A (featuring the LTC1628). These jumpers are not used for the DC392A-B or DC392A-C which feature the LTC3728.

2. Connect the loads at Vout1 and Vout2. The loads can be up to 4A for Vout1 and 5A for Vout2. Pre-set the loads to 0A.

3. Set Vin to 12V (recommended). The rated input voltage range is from 7V to 24V.

4. Remove the RUN1 jumper to switch on the Vout1 channel. The nominal output voltage of Vout1 should be 5V ±0.1V.

Increase load current on Vout1 to 4A. At 12V input voltage, the input current should be less than 2A. Slowly increase the input voltage to 24V. At 24V input, the input current should be less than 1.1A.

5. Decrease the load current of Vout1 to 0A. Reduce the input voltage to 12V.

6. Remove the RUN2 jumper to switch on the Vout2 channel. The output voltage of Vout2 should be 3.3V ±0.05V.

7. Increase load current on Vout2 to 5A. At 12V input voltage, the input current should be less than 1.8A. Slowly increase the input voltage to 24V. At 24V input, the input current should be less than 1.0A.

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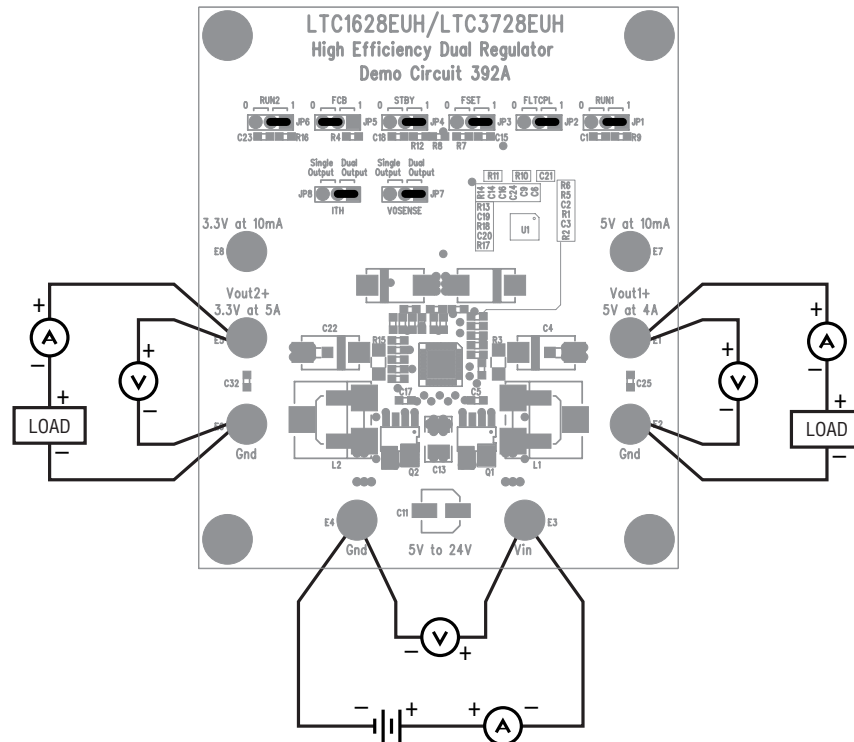


Figure 1. Proper Measurement Equipment Setup

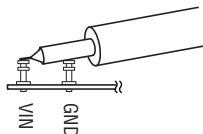


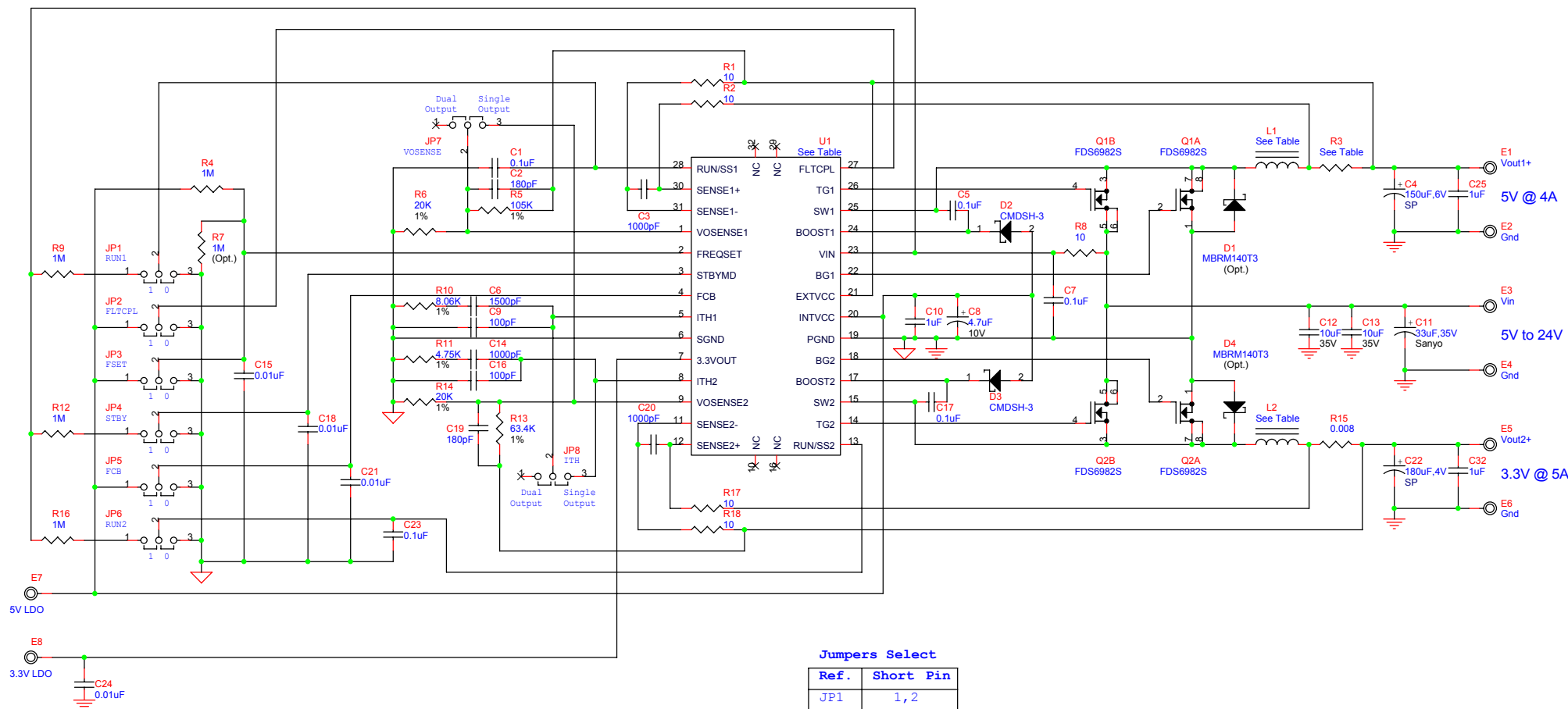
Figure 2. Scope Probe Placement for Measuring Input or Output Ripple



Table:

Jumpers Select

Ref.	Single Output	Dual Output
JP7	Short Pin 2,3	Short Pin 1,2
JP8	Short Pin 2,3	Short Pin 1,2



Jumpers Select

Ref.	Short Pin
JP1	1, 2
JP2	2, 3
JP3	1, 2
JP4	1, 2
JP5	1, 2
JP6	1, 2

Table:

ASSEMBLY	U1	L1	L2	R3
392A-A	LTC1628EUH	CDEP105-4R3MC-88	CDEP105-4R3MC-88	0.008 ohm
392A-B	LTC3728EUH	IHLP-2525CZ-01-2.2uH	IHLP-2525CZ-01-2.2uH	0.006 ohm
392A-C	LTC3728LUH	IHLP-2525CZ-01-2.2uH	IHLP-2525CZ-01-2.2uH	0.006 ohm

Jumpers Select

Ref.	Single Output	Dual Output
JP7	Short Pin 2, 3	Short Pin 1, 2
JP8	Short Pin 2, 3	Short Pin 1, 2

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Title
High Efficiency Dual Regulator

Size Document Number
DEMO 392A-A,B,C LTC1628EUH or LTC3728EUH

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Itm	Qty.	Reference	Part	Manufacture
1	2	C9,C16	CAP., NPO 100pF 50V	AVX, 06035A101JAT1A 0603
2	2	C2,C19	CAP., NPO 180pF 50V	AVX, 06035A181JAT1A 0603
3	3	C3,C20,C14	CAP., NPO 1000pF 25V	AVX, 06033A102JAT1A 0603
4	1	C6	CAP., X7R 1500pF 50V	AVX, 06035C152KAT1A 0603
5	4	C15,C18,C21,C24	CAP., X7R 0.01uF 10V	AVX, 0603ZC103KAT1A 0603
6	5	C1,C5,C7,C17,C23	CAP., X7R 0.1uF 10V	AVX, 0603ZC104MAT1A 0603
7	3	C10,C25,C32	CAP., X5R 1uF 6.3V	TAIYO YUDEN, JMK107BJ105MA 0603
8	1	C8	CAP., TANT 4.7uF 10V	AVX, TACR475M010R 0805
9	2	C12,C13	CAP., Y5V 10uF 35V	TAIYO YUDEN, GMK325F106ZH 1210
10	1	C11	CAP., SP 33uF 35V	SANYO, 35CV33BS
11	1	C4	CAP., SP 150uF 6.3V	PANASONIC, EEFUE0J151R CASE-D
12	1	C22	CAP., SP 180uF 4V	PANASONIC, EEFUE0G181R CASE-D
13	0	D1,D4 (OPTIONAL)	DIODE, SCHOTTKY 40V 1A	ON SEMI., MBRM140T3 POWERMITE
14	2	D2,D3	DIODE, SUPER MINI SCHOTTKY	CENTRAL SEMI., CMDSH-3 SOD323
15	2	L1,L2	INDUCTOR, SMT 2.2uH	VISHAY, IHLP-2525CZ-01-2.2uH
16	8	E1-E8	TESTPOINT, TURRET, .094"	MILL-MAX 2501-2
17	8	JP1-JP8	HEADER, 3PIN 1 ROW .079CC	COMM-CON 2802S-03-G1
18	8	FOR (JP1-JP8)	SHUNT, .079" CENTER	COMM-CON CCIJ2MM-138G
19	2	Q1,Q2	MOSFET FDS6982S	FAIRCHILD FDS6982S SO8
20	1	R3	RES., CHIP 0.006 1/4W 5%	IRC, LRF1206-01-R006-J 1206
21	1	R15	RES., CHIP 0.008 1/4W 5%	IRC, LRF1206-01-R008-J 1206
22	5	R1,R2,R8,R17,R18	RES., CHIP 10 1/16W 5%	AAC, CR16-100JM 0603
23	1	R11	RES., CHIP 4.75K 1/16W 1%	AAC, CR16-4751FM 0603
24	1	R10	RES., CHIP 8.06K 1/16W 1%	AAC, CR16-8061FM 0603
25	2	R6,R14	RES., CHIP 20.0K 1/16W 1%	AAC, CR16-2002FM 0603
26	1	R13	RES., CHIP 63.4K 1/16W 1%	AAC, CR16-6342FM 0603
27	4	R4,R9,R12,R16	RES., CHIP 1M 1/16W 5%	AAC, CR16-105JM 0603
28	0	R7 (OPTIONAL)	RES., CHIP 1M 1/16W 5%	AAC, CR16-105JM 0603
29	1	R5	RES., CHIP 105K 1/16W 1%	AAC, CR16-1053FM 0603
30	1	U1	I.C., LTC3728EUH	LINEAR, LTC3728EUH 32 PIN MLP
31	4		SCREW, #4-40, 1/4"	ANY
32	4		STANDOFF, #4-40 1/4"	MICRO PLASTICS 14HTSP101