

# DEMO BOARD QUICK START GUIDE DC424

## 2-PHASE, DUAL-OUTPUT SWITCHING REGULATOR CONTROLLER

# LTC3701

### DESCRIPTION

Demonstration Circuit DC424 provides 2.5V/1.6A and 1.8V/1.6A using the LTC3701 2-phase, dual-output switching regulator controller. The input range is from 2.5V to 9.8V. Operating the two controller channels 180° out of phase significantly reduces peak input ripple current; thereby reducing radiated and conducted EMI. Output voltages can be externally set to as low as 0.8V. The board is optimized for small size and low cost. Higher output current can be easily achieved by changing external components. For example, maximum output current can be increased to 2A if Murata LQH55DN4R7M01 inductors are used at the L1 and L2 locations.

Switching frequency is internally set at 550kHz, allowing the use of small inductors and capacitors. For noise sensitive applications, an external clock can be applied to synchronize from 300kHz to 750kHz. The frequency can also be externally set by apply-

ing a voltage in the range from 0V to 2.4V to the PLLLPF pin.

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

**Table 1. Performance Summary**  
(Operating Temperature Range: -40°C to 85°C)

PARAMETER	CONDITION	VALUE
Input Voltage Range		2.5V to 9.8V
Outputs	V <sub>OUT1</sub> = 2.5V; 0 to 1.6A	2.5V±3%
	V <sub>OUT2</sub> = 1.8V; 0 to 1.6A	1.8V±3%
Typical Output Ripple	10MHz BW; 1.6A Load; V <sub>IN</sub> = 5V	26mV <sub>P-P</sub>
Typical Operating Frequency	PLLLPF Pin Floating	550kHz
Typical Shutdown Current	V <sub>IN</sub> = 5V	15µA
Typical Standby Current	V <sub>IN</sub> = 5V; RUN1 and RUN2 are on; No Load Current	310µA

### QUICK START PROCEDURE

Refer to Figure 1 for equipment requirements and proper setup.

1. Apply a voltage source to the input of the circuit between the Vin and GND terminals. The circuit will start up at input voltage higher than 2.5V. Do not apply more than 9.8V to the input.
2. Attach voltmeters or oscilloscope probes between V<sub>OUT1</sub>, V<sub>OUT2</sub> and their closest GND terminals to monitor the outputs. Switch on the desired channel(s) by setting JP1 and JP2 to the run position.
3. Connect the load at each output. The board can supply up to 1.6A for each output. Higher output currents are possible by changing external components.
4. Proper hook-up is essential for accurate and meaningful evaluation of efficiency and regulation. Figure 1 shows the appropriate arrangement of supply, loads, ammeters and voltmeters.

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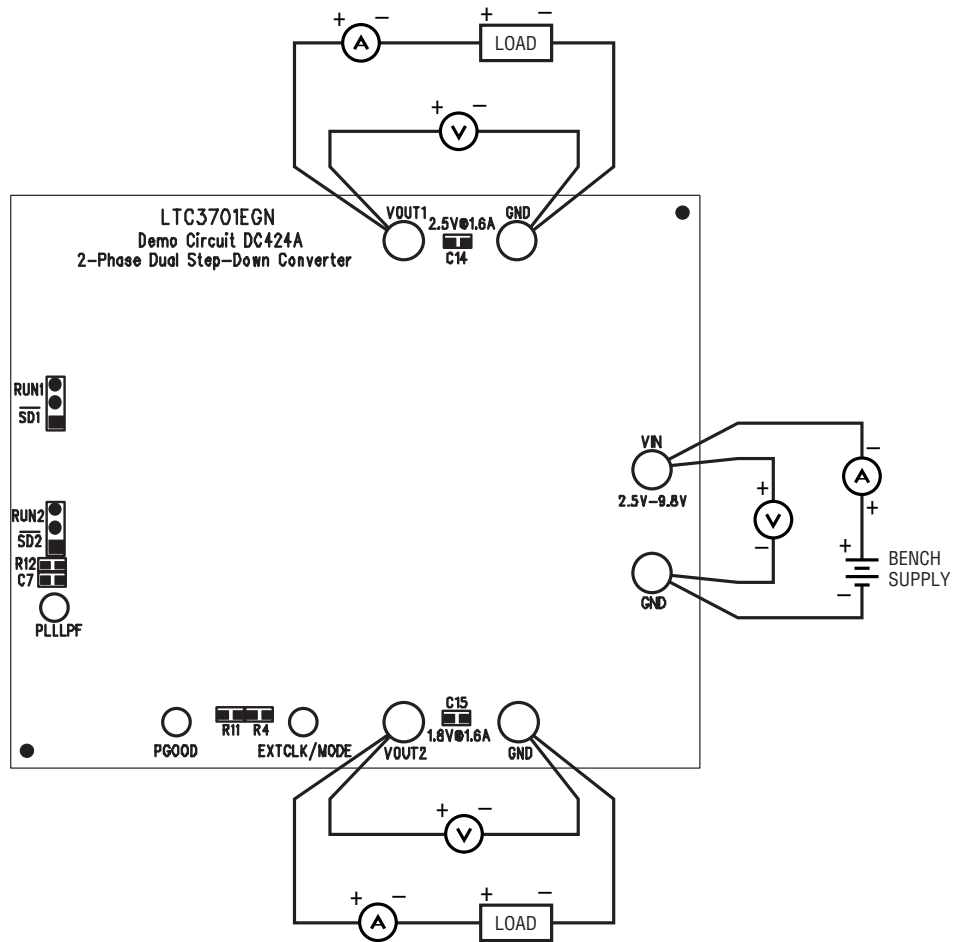
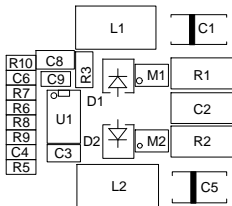
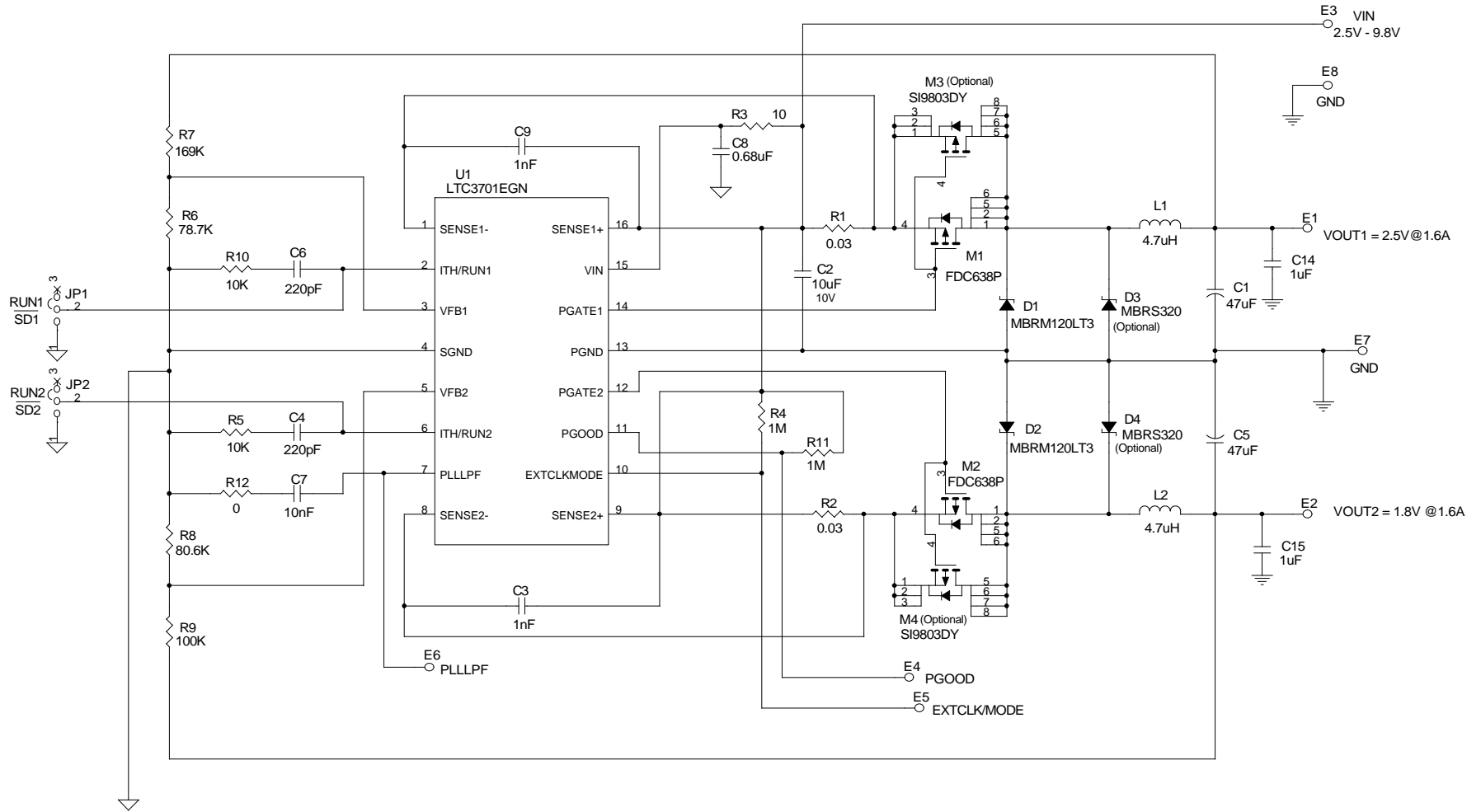



Figure 1. Proper Measurement Equipment Setup



PCB SILKSCREEN

CONTRACT NO.		 1630 McCarthy Blvd. Milpitas, CA 95035 Phone: (408)432-1900 Fax: (408)434-0507					
APPROVALS	DATE						
DRAWN June Wu	4/17/01	TITLE					
CHECKED		LTC3701EGN, 2-Phase Dual Step-Down Converter					
APPROVED							
ENGINEER Dongyan Zhou	4/17/01	SIZE	CAGE CODE	DWG NO	DC424A	REV	A
DESIGNER							
Friday, November 16, 2001		SCALE:	FILENAME:	SHEET	1	OF	1

Item	Qty	Reference	Part Description	Manufacture / Part #
1	2	C1,C5	CAP., POSCAP, 47uF, 6.3V, C SIZE	SANYO, 6TPA47M
2	1	C2	CAP., X7R, 10uF, 10V, 20%, 1210	TAIYO TUDEN, LMK325BJ106MN
3	2	C4,C6	CAP., X7R, 220pF, 50V, 20% 0402	AVX, 04025C221MAT
4	1	C7	CAP., X7R, 10nF, 50V, 20% 0603	AVX, 06035C103MAT
5	1	C8	CAP., 0.68uF, 10V, 20% 0603	TAIYO TUDEN, LMK107BJ684MA
6	2	C9,C3	CAP., X7R, 1nF, 50V, 20% 0402	AVX, 04025C102MAT
7	2	C14,C15	CAP., X5R, 1uF, 6.3V, 20%, 0603	TAIYO YUDEN, JMK107BJ105MA
8	2	D1,D2	DIODE, MBRM120LT3, POWERMITE	ON SEMI., MBRM120LT3
9	0	D3,D4 (OPT)	DIODE, MBRS320 SMC	OPTIONAL
10	3	E4-E6	TURRET, TEST PIN, .061	MILL-MAX 2308-2-00-44
11	6	E1-E3,E7-E9	TURRET, TEST PIN, .095	MILL-MAX 2501-2
12	2	JP1,JP2	JUMPER, 0.079, 3PIN	COMM CON, 2802S-03G1
13	2	JP1,JP2	SHUNT	COMM CON, CCIJ2MM-138G
14	2	L1,L2	INDUCTOR, 4.7uH,	TOKO, A915AY-4R7M
15	2	M2,M1	P-MOSFET, FDC638P, TSOP-6	FAIRCHILD, FDC638P
16	0	M3,M4 (OPT)	P-MOSFET, SI9803DY, SO-8	OPTIONAL
17	2	R1,R2	RES., CHIP, 0.03, 1/4W, 1% 1206	IRC, LR1206-01-R030-F
18	2	R5,R10	RES., CHIP, 10K, 1/16W, 5% 0402	AAC, CR05-103JM
19	2	R4,R11	RES., CHIP, 1M, 1/16W, 5% 0603	AAC, CR16-105JM
20	1	R12	RES., CHIP, 0, 1/16W, 0603	AAC, CJ06-000M
21	1	R6	RES., CHIP, 78.7K, 1/16W, 1% 0402	AAC, CR05-7872FM
22	1	R8	RES., CHIP, 80.6K, 1/16W, 1%, 0402	AAC, CR05-8062FM
23	1	R7	RES., CHIP, 169K, 1/16W, 1% 0402	AAC, CR05-1693FM
24	1	R9	RES., CHIP, 100K, 1/16W, 1% 0402	AAC, CR05-1003FM
25	1	R3	RES., CHIP, 10, 1/16W, 5% 0402	AAC, CR05-100JM
26	1	U1	I.C., LTC3701EGN, SSOP-16GN	LINEAR, LTC3701EGN
27	1		PRINTED CIRCUIT BOARDS	DEMO BOARD DC424A
28	1		STENCIL	STENCIL DC424A