QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 960
HIGH VOLTAGE, P-CH MOSFET STEP-DOWN CONTROLLER

LTC3824

DESCRIPTION

Demonstration Circuit 960 is a high voltage, current-mode DC/DC step-down converter featuring the LTC3824 in a small 10-pin MSOP package.

The board operates from a Vin range of 5.5V – 60V and outputs 5Vout @ 2A. The Converter uses a P-Ch MOSFET for the main switch resulting in a low parts count design. Operating frequency is set to 200kHz with the option to accept a synchronized external clock. A soft-start feature controls the output voltage slew rate at start-up, reducing current surges and voltage overshoots. Burst Mode operation that improves the efficiency at light loads can be enabled with a jumper. The demonstration board has been laid out with the option for adding a second switching MOSFET to facilitate higher output currents.

This board is suitable for a wide range of Industrial control systems and particularly suitable for 12V/42V Automotive applications and 48V Telecom power supplies.

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

QUICK START PROCEDURE

DC960 is easy to set up to evaluate the performance of the LTC3824. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Use a 65V/8A or better Bench Power Supply.
2. Set the Power supply voltage to somewhere between 5V and 60V.
3. Set the Load to somewhere between 0 – 2A.
4. Make sure the SHDN/RUN jumper is in the RUN position.

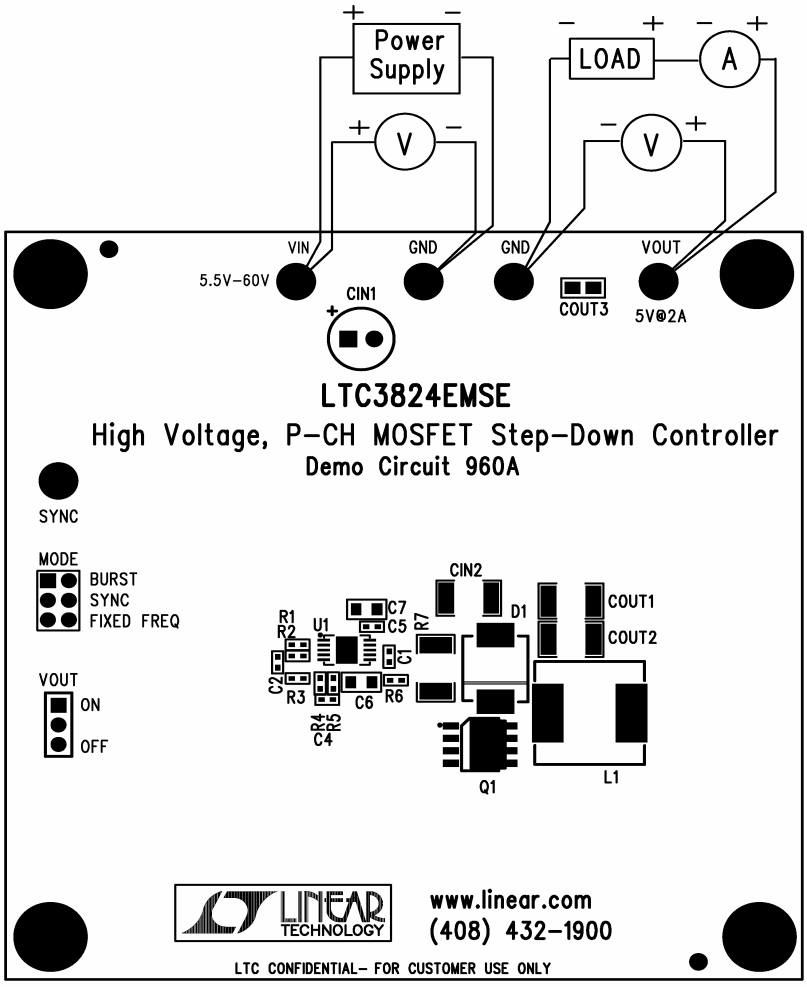
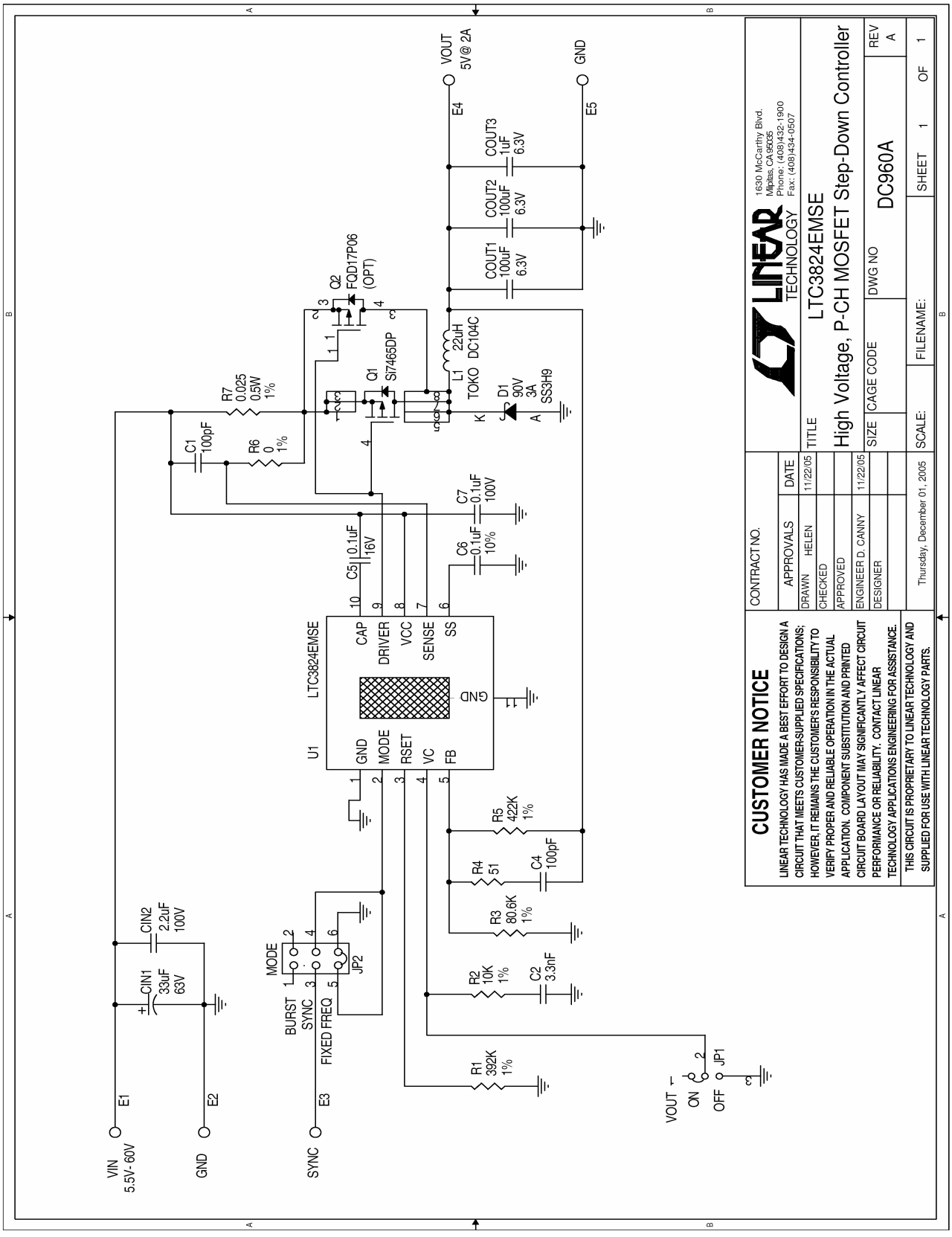


Figure 1. Proper Measurement Equipment Setup


VIN
5.5V- 60V
GND
SYNC
VOUT
5V@ 2A
GND
VOUT ←
ON
OFF
JP1
E1
E2
E3
E4
E5
CIN1
33uF
63V
CIN2
2.2uF
100V
MODE
BURST
SYNC
FIXED FREQ
JP2
R1
392K
1%
R2
10K
1%
C2
3.3nF
R3
80.6K
1%
R4
51
C4
100pF
R5
422K
1%
U1
LTC3824EMSE
GND
MODE
RSET
VC
FB
CAP
DRIVER
VCC
SENSE
SS
C5
0.1uF
16V
C6
0.1uF
10%
C7
0.1uF
100V
C1
100pF
R6
0
1%
R7
0.025
0.5W
1%
Q1
SI7465DP
Q2
FQD17P06
(OPT)
L1
22uH
TOKO DC104C
D1
90V
3A
SS3H9
K
A
COUT1
100uF
6.3V
COUT2
100uF
6.3V
COUT3
1uF
6.3V
CUSTOMER NOTICE
LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A CIRCUIT THAT MEETS CUSTOMER-SUPPLIED SPECIFICATIONS; HOWEVER, IT REMAINS THE CUSTOMER'S RESPONSIBILITY TO VERIFY PROPER AND RELIABLE OPERATION IN THE ACTUAL APPLICATION. COMPONENT SUBSTITUTION AND PRINTED CIRCUIT BOARD LAYOUT MAY SIGNIFICANTLY AFFECT CIRCUIT PERFORMANCE OR RELIABILITY. CONTACT LINEAR TECHNOLOGY APPLICATIONS ENGINEERING FOR ASSISTANCE.
THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.
CONTRACT NO.
APPROVALS
DATE
DRAWN HELEN
11/22/05
CHECKED
APPROVED
ENGINEER D. CANNY
11/22/05
DESIGNER
Thursday, December 01, 2005
LINEAR TECHNOLOGY
1630 McCarthy Blvd.
Milpitas, CA 95035
Phone: (408)432-1900
Fax: (408)434-0507
TITLE
LTC3824EMSE
High Voltage, P-CH MOSFET Step-Down Controller
SIZE
CAGE CODE
DWG NO
DC960A
REV
A
SCALE:
FILENAME:
SHEET 1 OF 1

Linear Technology Corporation

LTC3824EMSE#PBF

Bill Of Material
Demo Bd. #960A
4/25/2007

Item	*Qty*	*Reference*	*Part Description*	*Manufacturer / Part #*
		REQUIRED CIRCUIT COMPONENTS:		
1	1	CIN1	Cap., Alum,33uF,63V,20% (thru hole)	SANYO, 63ME33AX+TS
2	1	CIN2	Cap., X7R, 2.2uF,100V, 20%,1812	TDK, C4532X7R2A225M
3	2	COUT1,COUT2	CAP.,X5R, 100uF, 6.3V, 20%, 1812	TDK, C4532X5R0J107M
4	1	COUT3	CAP.,X5R, 1uF, 6.3V, 10%, 0603	AVX, 06036D105KAT
5	2	C1,C4	Cap., COG,100pF,50V,10%, 0402	AVX, 04025A101KAT
6	1	C2	Cap., X7R, 3.3nF, 50V,10%, 0402	AVX, 04025C332KAT
7	1	C5,	Cap., X7R, 0.1uF, 16V, 10%, 0402	TDK, C1005X7R1C104K
8	2	C6,C7	Cap., X7R, 0.1uF, 100V, 10%, 0805	TDK, C2012X7R2A104K
9	1	D1	SCHOTTKY DIODE 90V	VISHAY, SS3H9-E3
10	2	L1	INDUCTOR.,22uH	TOKO, #919AS-220M=P3
11	1	Q1	P-CHANNEL MOSFET,SO-8 POWERPAK	VISHAY, Si7465DP-T1-E3
12	0	R1	RES., CHIP, 392K, 1/16W, 1% ,0402	AAC, CR05-3923FM
13	1	R2	RES., CHIP, 10K, 1/16W, 1% ,0402	AAC, CR05-1002FM
14	1	R3	RES., CHIP, 80.6K, 1/16W, 1% ,0402	AAC, CR05-8062FM
15	1	R4	RES., CHIP, 51, 1/16W, 5% ,0402	AAC, CR05-510JM
16	1	R5	RES., CHIP, 422K, 1/16W, 1% ,0402	AAC, CR05-4223FM
17	1	R6	RES., CHIP, 0, 1/16W, 0402	VISHAY, CRCW0402000Z0ED
18	1	R7	RES., CHIP, 0.025, 0.5W, 1% ,2010	VISHAY, WSL2010R0250FEA
19	4	U1	I.C, LTC3824EMSE#PBF,10PIN MSOP	LINEAR TECH., LTC3824EMSE#PBF
		ADDITIONAL DEMO BOARD CIRCUIT COMPONENTS:		
1	1	Q2(OPT)	P-CHANNEL MOSFET,D-PAK	FAIRCHILD SEMICONDUCTOR, FQD17P06
		HARDWARE-FOR DEMO BOARD ONLY:		
1	1	JP1	0.079 SINGLE ROW HEADER, 3 PIN	SAMTEC, TMM-103-02-L-S
2	1	JP2	0.079 DOUBLE ROW HEADER, 6 PIN	SAMTEC, TMM-103-02-L-D
3	1	JP1,JP2	SHUNT,	SAMTEC, 2SN-BK-G
4	5	E1-E5	TESTPOINT, TURRET, .095"	MILL-MAX, 2501-2-00-80-00-00-07-0
5	4	(STAND-OFF)	STAND-OFF, NYLON 0.25" tall	KEYSTONE, 8831(SNAP ON)