Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

LTM4614EV: Dual 4A Step-Down µModule® Regulator

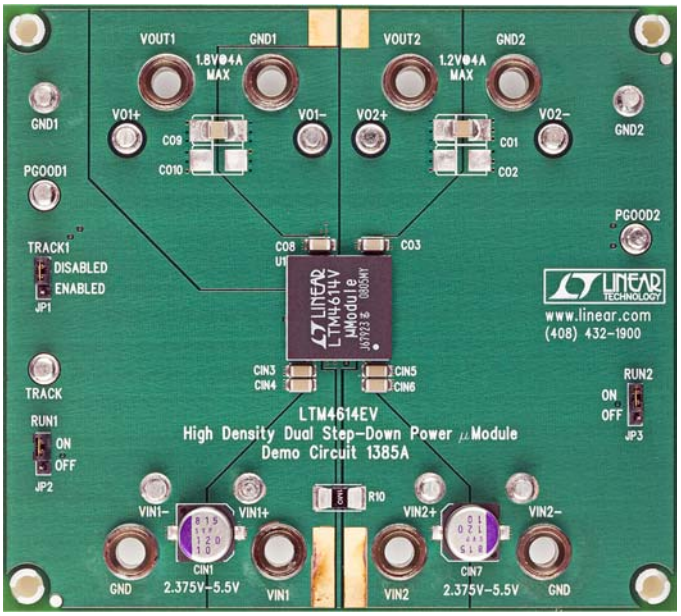
DESCRIPTION

Demonstration circuit DC1385A features the LTM®4614EV, the high efficiency, high density power module with dual 4A switch mode outputs. Derating is necessary for certain V_{IN}, V_{OUT}, and thermal conditions. In the default configuration, the two outputs share the same input supply, however each regulator may have its own input supply simply by removing a resistor. By enabling the tracking feature, the outputs coincidentally follow another supply rail. The LTM4614 data sheet must be read in conjunction with this demo board prior to working on or modifying demo circuit DC1477A. **Design files for this circuit board are available at http://www.linear.com/demo**

PERFORMANCE SUMMARY (T_A = 25°C)

PARAMETER	CONDITIONS	VALUE
Input Voltage Range	V_{IN1} and V_{IN2}	2.375V to 5.5V
Output Voltage V_{OUT1}, V_{OUT2}	V_{IN} = 5V_{DC}, I_{OUT1}, I_{OUT2} = 4A.	V_{OUT1} = 1.8V ±2%, V_{OUT2} = 1.2V ±2%
Maximum Continuous Output Current	Derating is Necessary for Certain V_{IN}, V_{OUT}, and Thermal Conditions, See Data Sheet for Details	4A_{DC} for V_{OUT1}, V_{OUT2}
Default Operating Frequency		1.25MHz
Efficiency of Channel 1	V_{IN1} = 5V, V_{OUT1} = 1.8V, I_{OUT1} = 4A	81.5%, See Figure 3
Efficiency of Channel 2	V_{IN2} = 5V, V_{OUT2} = 1.2V, I_{OUT2} = 4A	75.4%, See Figure 3

BOARD PHOTO



QUICK START PROCEDURE

Demonstration circuit DC1385A is an easy way to evaluate the performance of the LTM4614EV. Please refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Place jumpers in the following positions for a typical 1.8V and 1.2V application:

TRACK1	RUN1	RUN2
DISABLED	ON	ON

2. With the power off, connect the input power supply, load and meters as shown in Figure 1. Preset the loads to 0A and V_{IN} supply to be less than 5.5V.
3. Turn on the power at the input. The output voltage between $VO1^+$ and $VO1^-$ should be 1.8V ± 2%, and the voltage between $VO2^+$ and $VO2^-$ should be 1.2V ±2%.
4. Once the proper output voltage is established, adjust the load within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters. To measure input and output ripple, please refer to Figure 2 for proper setup.
5. Channel 1 can track another supply by connecting TP17, TRACK to another supply and setting JP1 to ENABLED. Resistors R8 and R9 are set up for coincidental tracking. Channel 2 is set up to coincidentally track the output of channel 1 by resistor R6 and R7. Please refer to the circuit schematic and data sheet.
6. Because DC1385A is assembled in a way that V_{OUT2} tracks V_{OUT1} automatically, placing the JP2 (RUN1) to OFF position turns off both outputs. To disable tracking function of V_{OUT2}, please remove R6 and R7 and connect TRACK2 to V_{IN2}.
7. V_{IN1} and V_{IN2} are shorted on DC1385A through a 1mohm resistor, R10. If desired, remove R10 and different supplies can be applied to V_{IN1} and V_{IN2} of this demo circuit.

QUICK START PROCEDURE

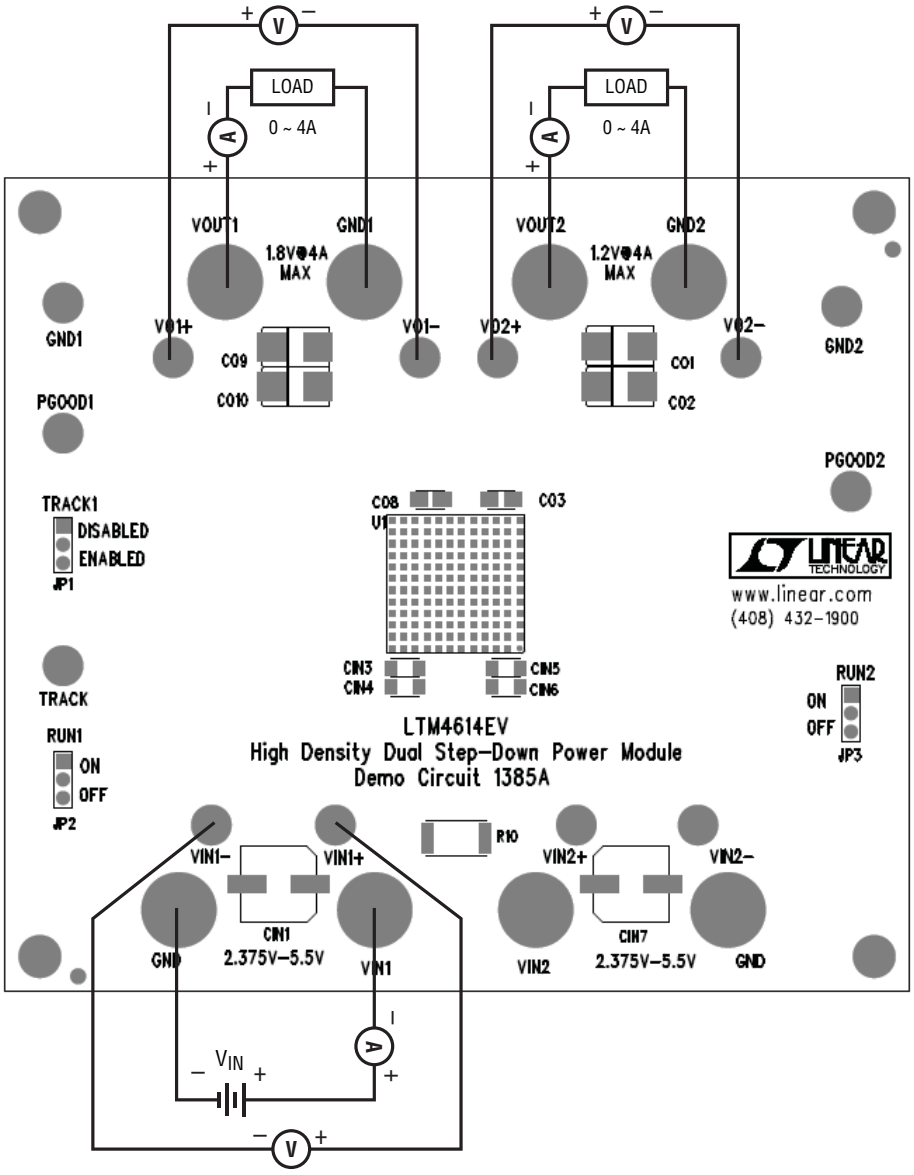


Figure 1. Test Setup of DC1385A

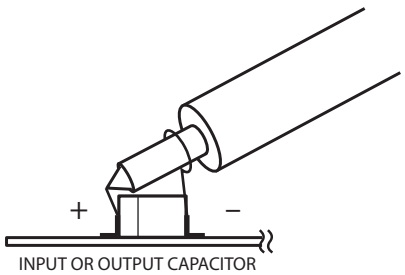


Figure 2. Proper Scope Probe Placement for Measuring Input or Output Ripple

QUICK START PROCEDURE

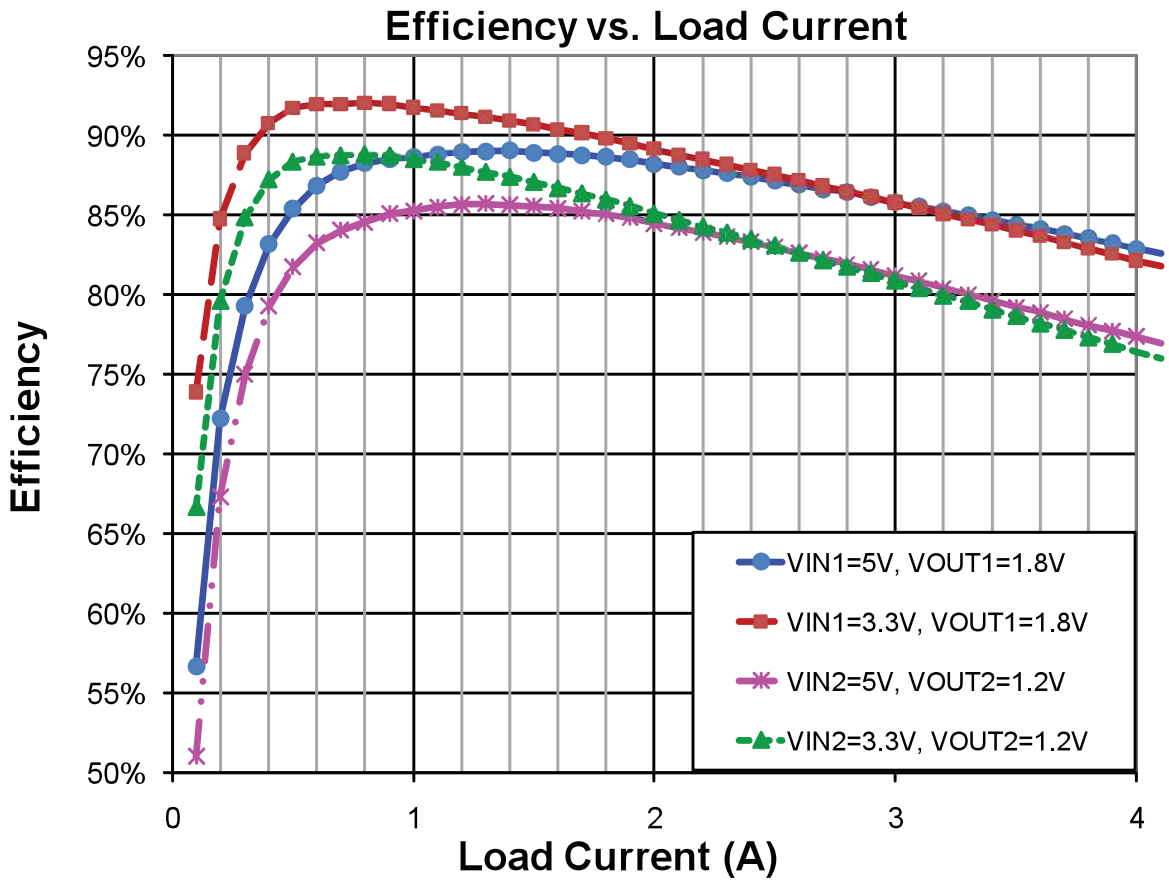
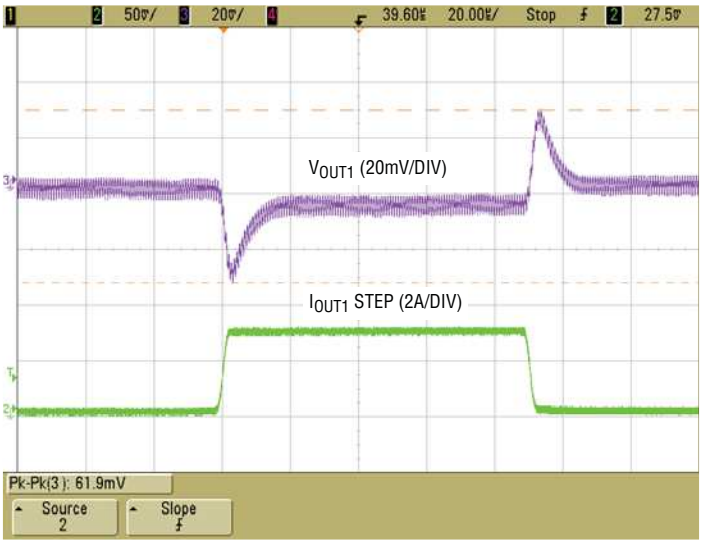


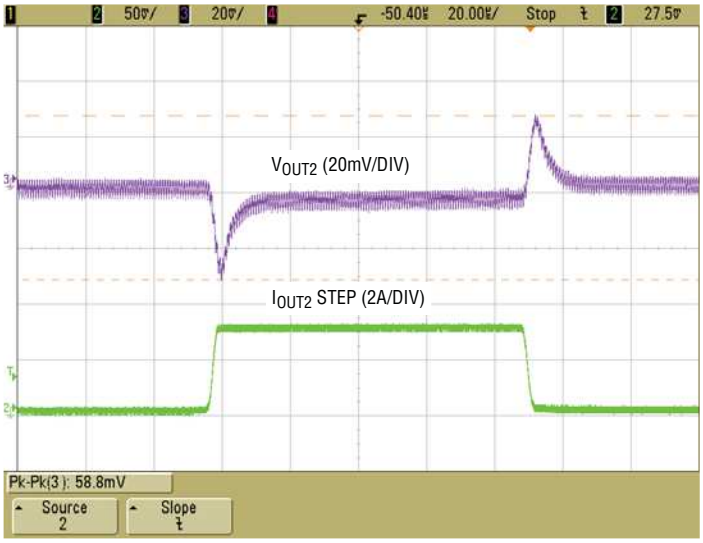
Figure 3. Measured Efficiency for Different Channels

QUICK START PROCEDURE



V_{IN1} = 5V
V_{OUT1} =1.8V
CONTINUOUS CURRENT MODE (CCM)
1A TO 4A LOAD STEP ON V_{OUT1}
C_{OUT1} = 100µF CERAMIC (1210, X5R, 6.3V) + 22µF CERAMIC (1206, X5R, 6.3V)

Figure 4. Measured Load Transient Response for V_{OUT1}



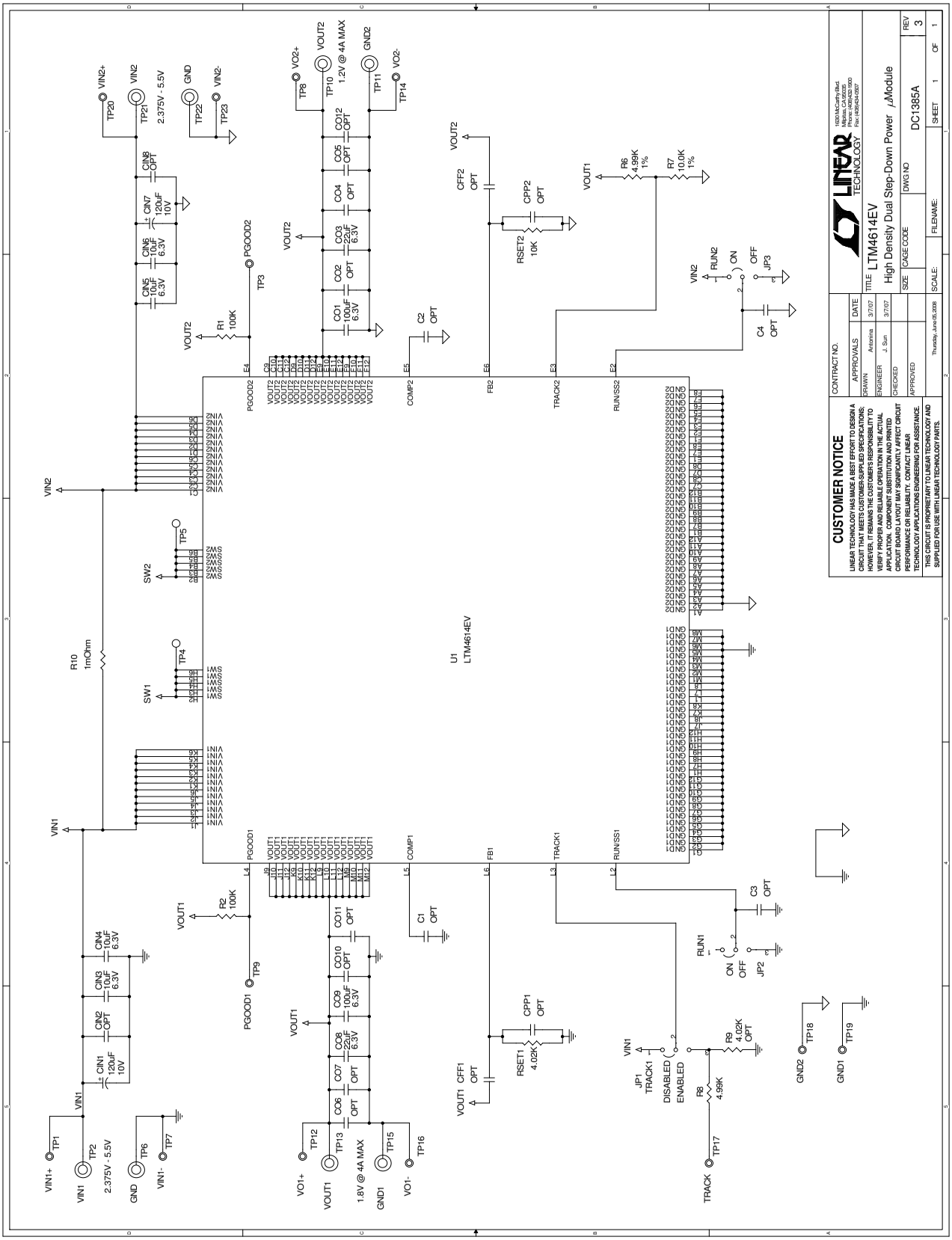
V_{IN2} = 5V
V_{OUT2} =1.2V
CONTINUOUS CURRENT MODE (CCM)
1A TO 4A LOAD STEP ON V_{OUT2}
C_{OUT2} = 100µF CERAMIC (1210, X5R, 6.3V) + 22µF CERAMIC (1206, X5R, 6.3V)

Figure 5. Measured Load Transient Response for V_{OUT2}

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	2	CIN1, CIN7	CAP., OSCON 120uF, 10V, E7	SANYO, 10SVP120M
2	4	CIN3, CIN4, CIN5, CIN6	CAP., X5R, 10µF, 6.3V, 20%, 1206	AVX, 12066D106MAT2A
3	2	CO3, CO8	CAP., X5R, 22µF, 6.3V, 20%, 1206	AVX, 12066D226MAT2A
4	2	CO1, CO9	CAP., X5R, 100µF, 6.3V, 20%, 1210	AVX, 12106D107MAT2A
5	1	RSET1	RES., CHIP, 4.02k, 1/16W, 1%, 0402	VISHAY, CRCW04024K02FKED
6	1	RSET2	RES., CHIP, 10.0k, 1/16W, 1%, 0402	VISHAY, CRCW040210K0FKED
7	2	R2, R1	RES., CHIP, 100k, 1/16W, 1%, 0402	VISHAY, CRCW0402100KFKED
8	1	U1	I.C. LTM4614EV 144 PIN LGA	LINEAR TECH., LTM4614EV
Additional Demo Board Circuit Components				
1	0	CPP1, CFF1, CPP2, CFF2	CAP., 0402, OPT	
2	0	CIN2, CIN8, CO11, CO12	CAP., 1206, OPT	
3	0	CO2, CO4, CO5, CO6, CO7, CO10	CAP., 7343, OPT	CAP7343
4	0	C1, C2, C3, C4	CAP., 0402, OPT	
5	1	R9	RES., CHIP, 4.02k, 1/16W, 1%, 0402	VISHAY, CRCW04024K02FKED
6	1	R7	RES., CHIP, 10.0k, 1/16W, 1%, 0402	VISHAY, CRCW040210K0FKED
7	2	R8, R6	RES., CHIP, 4.99k, 1/16W, 1%, 0402	VISHAY, CRCW04024K99FKED
8	1	R10	RES., CHIP, 1mΩ, 1W, 5%, 2512	PANASONIC, ERJM1WTJ1M0V
Hardware-For Demo Board Only				
1	3	JP1, JP2, JP3	HEADER 3 PIN 0.079 SINGLE ROW	SAMTEC, TMM103-02-L-S
2	3	JPX1, JPX2, JPX3	SHUNT, 0.079" CENTER	SAMTEC, 2SN-BK-G
3	13	TP1, TP3, TP7-9, TP12,	TESTPOINT, TURRET, 0.094" PBF	MILL-MAX, 2501-2-00-80-00-00-07-0
		TP14, TP16-20, TP23		
4	8	TP2, TP6, TP10, TP11, TP13,	JACK BANANA	KEYSTONE, 575-4
		TP15, TP21, TP22		
5	4	(STAND-OFF)	STAND-OFF, NYLON 0.50"	KEYSTONE, 8833(SNAP ON)

SCHEMATIC DIAGRAM



DEMONSTRATION BOARD IMPORTANT NOTICE

Linear Technology Corporation (LTC) provides the enclosed product(s) under the following **AS IS** conditions:

This demonstration board (DEMO BOARD) kit being sold or provided by Linear Technology is intended for use for **ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY** and is not provided by LTC for commercial use. As such, the DEMO BOARD herein may not be complete in terms of required design-, marketing-, and/or manufacturing-related protective considerations, including but not limited to product safety measures typically found in finished commercial goods. As a prototype, this product does not fall within the scope of the European Union directive on electromagnetic compatibility and therefore may or may not meet the technical requirements of the directive, or other regulations.

If this evaluation kit does not meet the specifications recited in the DEMO BOARD manual the kit may be returned within 30 days from the date of delivery for a full refund. THE FOREGOING WARRANTY IS THE EXCLUSIVE WARRANTY MADE BY THE SELLER TO BUYER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. EXCEPT TO THE EXTENT OF THIS INDEMNITY, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

The user assumes all responsibility and liability for proper and safe handling of the goods. Further, the user releases LTC from all claims arising from the handling or use of the goods. Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge. Also be aware that the products herein may not be regulatory compliant or agency certified (FCC, UL, CE, etc.).

No License is granted under any patent right or other intellectual property whatsoever. **LTC assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or any other intellectual property rights of any kind.**

LTC currently services a variety of customers for products around the world, and therefore this transaction **is not exclusive**.

Please read the DEMO BOARD manual prior to handling the product. Persons handling this product must have electronics training and observe good laboratory practice standards. **Common sense is encouraged**.

This notice contains important safety information about temperatures and voltages. For further safety concerns, please contact a LTC application engineer.

Mailing Address:

Linear Technology
1630 McCarthy Blvd.
Milpitas, CA 95035

Linear Technology Corporation
1630 McCarthy Blvd., Milpitas, CA 95035-7417
(408) 432-1900 • FAX: (408) 434-0507 • www.linear.com

LT 0211 • PRINTED IN USA