LTM4630EV
High Efficiency Dual 18A or Single 36A µModule Regulator

DESCRIPTION

Demonstration circuit 2081A-A features the LTM®4630EV, the high efficiency, high density, dual 18A, switch mode step-down µModule® regulator. The input voltage is from 4.5V to 15V. The output voltage is programmable from 0.6V to 1.8V. DC2081A-A is configured as dual-phase, single-output, which can deliver up to 36A maximum. The board designs with minimum components to demonstrate this high efficiency, high density µModule. As explained in the data sheet, output current de-rating is necessary for certain V_{IN}, V_{OUT}, and thermal conditions.

These features and the availability of the LTM4630EV in a compact 16mm × 16mm × 4.41mm LGA package make it ideal for use in many high-density point-of-load applications. The LTM4630 data sheet must be read in conjunction with this demo manual for working on or modifying the demo circuit DC2081A-A.

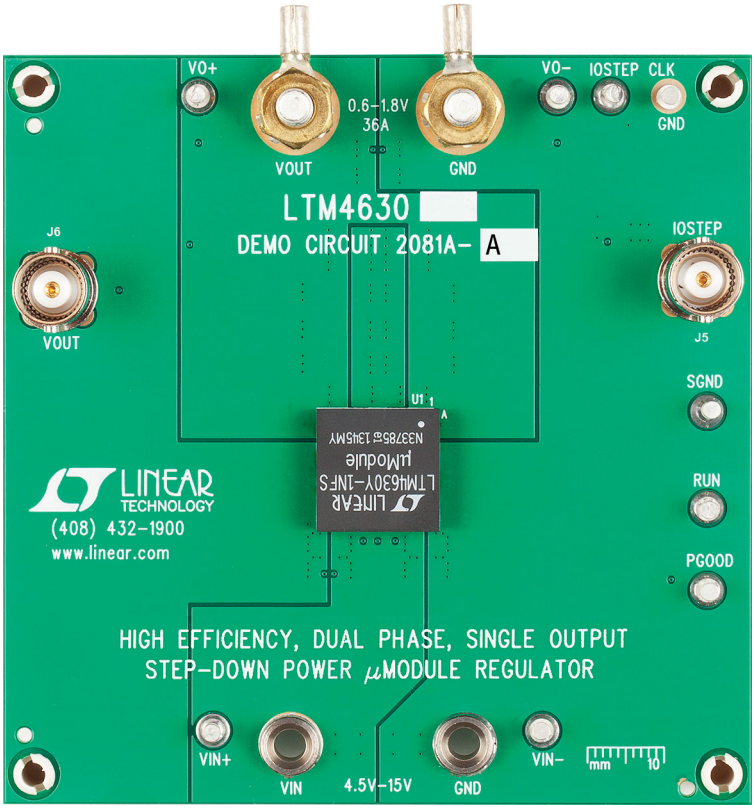
Design files for this circuit board are available at http://www.linear.com/demo/DC2081A-A

PERFORMANCE SUMMARY

Specifications are at T_A = 25°C

PARAMETER	CONDITIONS	VALUE
Input Voltage Range		4.5V ~ 15V
Output Voltage V_{OUT}	V_{IN} = 4.5 ~ 15V, I_{OUT} = 0 ~ 36A	1.0V ± 1.5% (0.985V ~ 1.015V)
Maximum Continuous Output Current	De-rating is Necessary for Certain V_{IN}, V_{OUT} and Thermal Conditions, See Data Sheet for Detail	36A
Default Operating Frequency		400kHz
Efficiency	V_{IN} = 5V, V_{OUT} = 1.0V, I_{OUT} = 36A, f_{SW} = 400kHz	85.7%, See Figure 2
Load Transient	V_{IN} = 12V, V_{OUT} = 1.0V, I_{STEP} = 0 ~ 9A	< 62.5mV_{P-P}, See Figure 3

DC2081A-A BOARD PHOTO



QUICK START PROCEDURE

Demonstration circuit DC2081A-A is easy to set up to evaluate the performance of the LTM4630EV. Please refer to Figure 1 for proper measurement setup and follow the procedure below:

1. With power off, connect the input power supply, load and meters as shown in Figure 1. Preset the load to 0A and V_{IN} supply to 12V.
2. Turn on the power supply at the input. The output voltage should be 1.0V ± 1.5% (0.985V ~ 1.015V).
3. Once the proper output voltage is established, adjust the load within the operating range and observe the output voltage regulation, output voltage ripple, efficiency and other parameters. Output ripple can be measured at J6 with BNC cables.
4. (Optional) For optional load transient test, apply an adjustable pulse signal between "IOSTEP CLK" and "GND" test point. Pulse amplitude (3V ~ 3.5V) sets the load step current amplitude. The output transient current can be monitored at the BNC connector J5 (15mV/A). The pulse signal should have very small duty cycle (< 10%) to limit the thermal stress on the transient load circuit.

QUICK START PROCEDURE

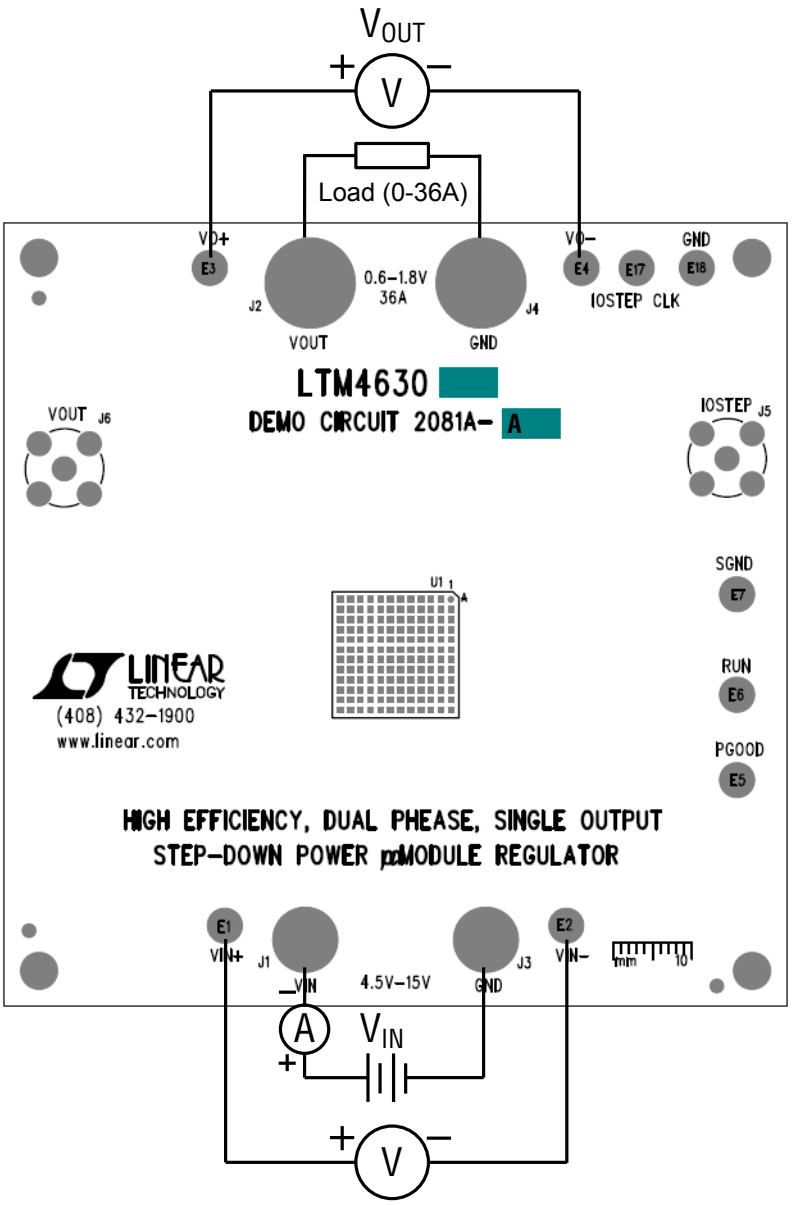


Figure 1. Test Setup of DC2081A-A

QUICK START PROCEDURE

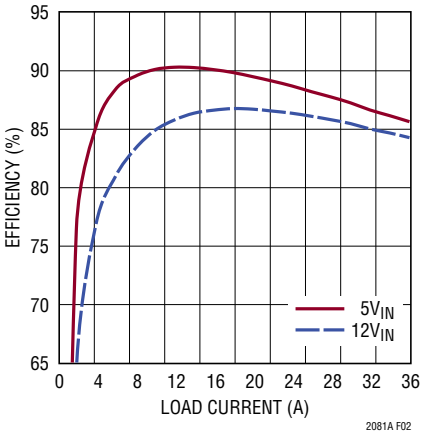


Figure 2. Measured LTM4630 Efficiency (V_{OUT} = 1.0V, f_{sw} = 400kHz)

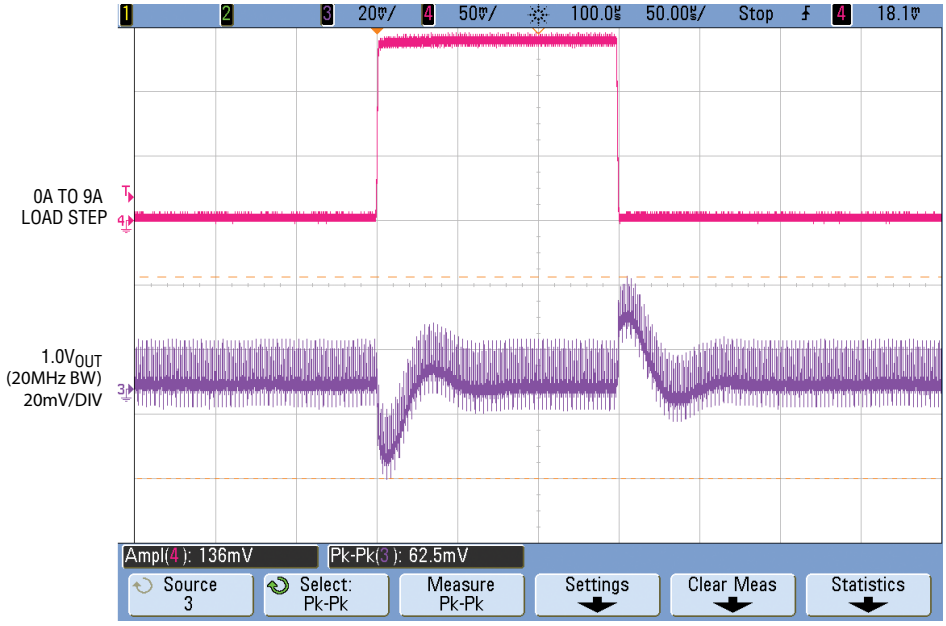


Figure 3. Measured LTM4630 0A – 9A Load Transient (V_{IN}=12V, V_{OUT} = 1.0V, f_{sw} = 400kHz)

QUICK START PROCEDURE

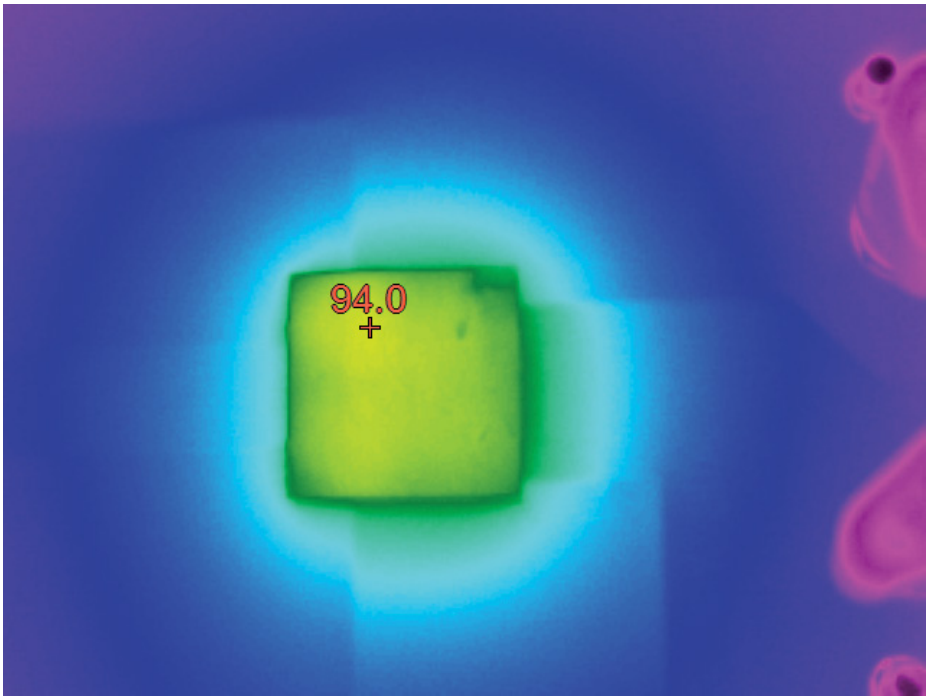
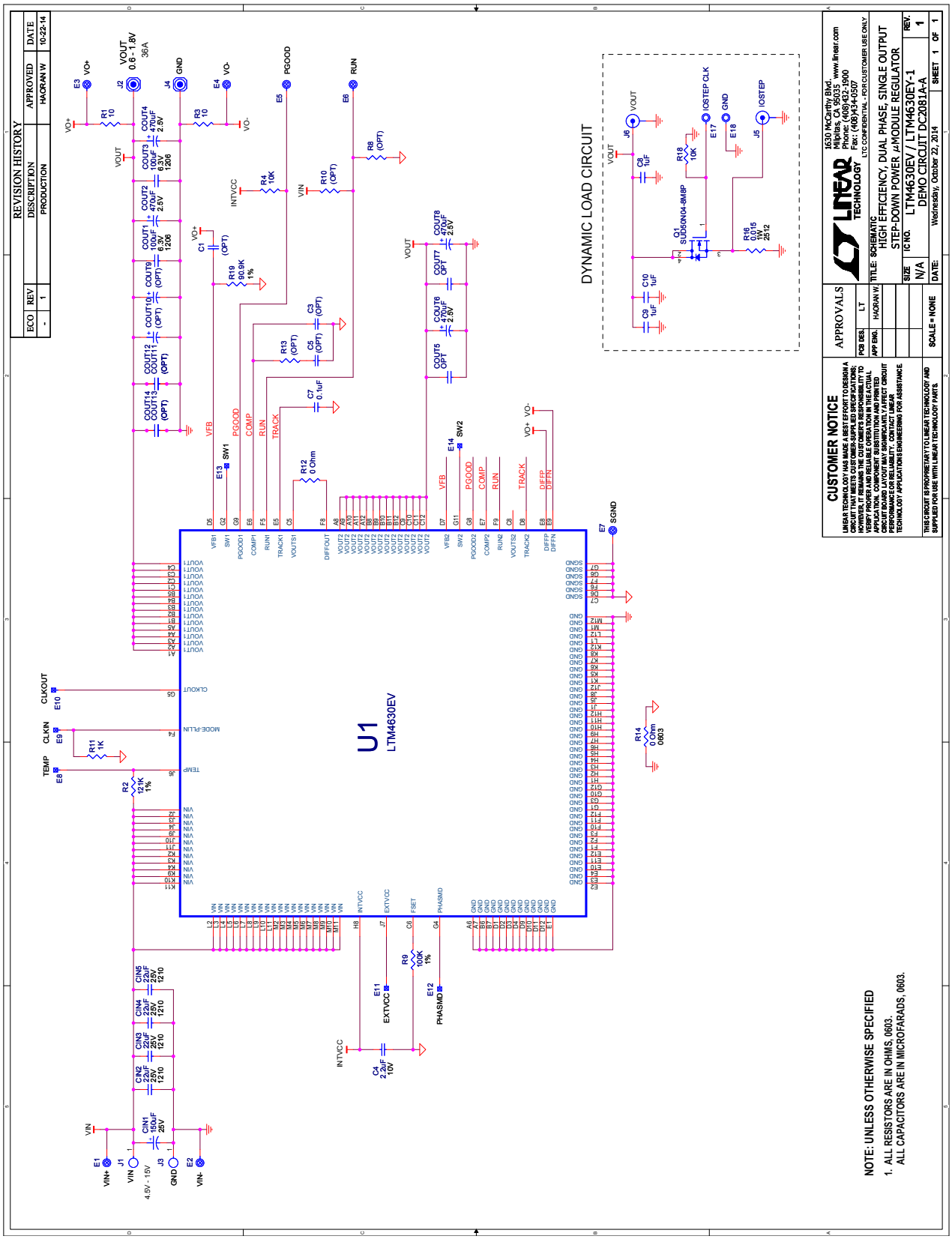


Figure 4. LTM4630 Thermal Capture (V_{IN}=12V, V_{OUT} = 1.0V/36A, f_{sw}=400kHz, T_A = 25°C, No Airflow and No Heat Sink)

DC2081A-A PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	1	CIN1	CAP., ALUM., 150µF, 25V, 20%	SUN ELECT., 25CE150AX
2	4	CIN2, CIN3, CIN4, CIN5	CAP., CER., 22µF, X5R, 25V, 10%, 1210	MURATA, GRM32ER61E226KE15L
3	2	COUT1, COUT3	CAP., CER., 100µF, X5R, 6.3V, 20%, 1206	AVX, 12066D107MAT2A
4	4	COUT2, COUT4, COUT6, COUT8	CAP., POSCAP, 470µF, 2.5V, F8, D4D	PANASONIC, 2R5TPF470M6L
5	1	C4	CAP., CER., 2.2µF, X5R, 10V, 10% 0603	MURATA, GRM188R61A225KE34D
6	1	C7	CAP., CER., 0.1µF, X5R, 25V, 10% 0603	AVX, 06033D104KAT2A
7	3	C8, C9, C10	CAP., CER., 1µF, X7R, 10V, 10%, 0603	AVX, 0603ZC105KAT2A
8	1	Q1	XSTR., SUD50N04-8M8P-4GE3 MOSFET	VISHAY, SUD50N04-8M8P-4GE3
9	2	R1, R3	RES., 10Ω, 1/10W, 1%, 0603	VISHAY, CRCW060310R0FKEA
10	1	R2	RES., 121k, 1/10W, 1%, 0603	VISHAY, CRCW0603121KFKEA
11	2	R4, R18	RES., 10k, 1/10W, 1%, 0603	VISHAY, CRCW060310K0FKEA
12	1	R9	RES., 100k, 1/10W, 1%, 0603	VISHAY, CRCW0603100KFKEA
13	1	R11	RES., 1k, 1/10W, 1%, 0603	VISHAY, CRCW06031K00FKEA
14	1	R16	RES., SENSE, 0.015Ω, 1W, 2512	VISHAY, WSL2512R0150FEA
15	1	R19	RES., 90.9k, 1/10W, 1%, 0603	VISHAY, CRCW060390K9FKEA
16	1	U1	I.C., LTM4630EV#PBF, 16X16X4.41-LGA	LINEAR TECH., LTM4630EV#PBF
Additional Demo Board Circuit Components				
1	0	COUT9, COUT10	OPT., SANYO-D4D	OPT.
2	0	COUT5, COUT7, COUT11, COUT12, COUT13, COUT14	OPT. 1210	OPT.
3	0	C1, C3, C5	OPT. 0603	OPT.
4	0	R8, R10, R13	OPT 0603	OPT
5	2	R12, R14	RES., 0Ω, 1/10W, 0603	VISHAY, CRCW06030000Z0EA
Hardware				
1	9	E1-E7, E17, E18	TEST POINT, TURRET, .094" MTG. HOLE	MILL-MAX, 2501-2-00-80-00-00-07-0
2	0	E8-E14 (OPT)	TESTPAD SMD	TESTPAD SMD
3	2	J1, J3	JACK, BANANA	KEYSTONE, 575-4
4	2	J2, J4	STUD, TESTPIN	PEM, KFH-032-10
5	4	J2, J4 (X2)	NUT, BRASS 10-32	ANY #10-32
6	2	J2, J4	RING, LUG #10	KEYSTONE #10
7	2	J2, J4	WASHER, TIN PLATED BRASS	ANY #10
8	2	J5, J6	CONN., BNC, 5 PINS	CONNEX, 112404
9	4	(STAND-OFF)	STANDOFF, NYLON, SNAP-ON, .500" TALL	KEYSTONE, 8833

DC2081A-A 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

LifeElectronics
Живое партнерство

ООО «ЛайфЭлектроникс» **“LifeElectronics” LLC**

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- *Конкурентоспособные цены и скидки постоянным клиентам.*
- *Специальные условия для постоянных клиентов.*
- *Подбор аналогов.*
- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

- *Приемлемые сроки поставки, возможна ускоренная поставка.*
- *Доставку товара в любую точку России и стран СНГ.*
- *Комплексную поставку.*
- *Работу по проектам и поставку образцов.*
- *Формирование склада под заказчика.*

- *Сертификаты соответствия на поставляемую продукцию (по желанию клиента).*
- *Тестирование поставляемой продукции.*
- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru

www.lifeelectronics.ru