

LT8611

42V, 2.5A Micropower Synchronous Step-Down Regulator with Current Sense

DESCRIPTION

Demonstration circuit 1750A is a 42V, 2.5A micropower synchronous step-down regulator with current sense featuring the LT®8611. The LT8611 is a compact, high efficiency, high speed synchronous monolithic step-down switching regulator that consumes only 2.5µA of quiescent current when output is regulated at 3.3V. Top and bottom power switches, compensation components and other necessary circuits are inside of the LT8611 to minimize external components and simplify design.

The demonstration circuit has output current limit set at 2.5A by default. The current limit can be moved to the input side for application where input supply current is limited, such as energy harvesting application. ICTRL and IMON on the board set and monitor the regulated current respectively. The SYNC pin on the demo board is grounded by default for low ripple Burst Mode® operation. To synchronize to an external clock, move JP1 to SYNC and apply the external

clock to the SYNC turret. Once JP1 is on SYNC position, a DC voltage of higher than 2V or INTV_{CC} can be applied to the SYNC turret for pulse skipping operation. Figure 1 shows the efficiency of the circuit at 12V input.

The demo board has an EMI filter installed. The EMI performance of the board is shown on Figure 2. Figure 3 shows the EMI performance of the board running at 1MHz switching frequency. The limit in Figure 2 and Figure 3 is EN55022 Class B. Both figures show the circuit passes the test with a wide margin. To use the EMI filter, the input should be tied to VEMI, not VIN.

The LT8611 datasheet gives a complete description of the part, operation and application information. The data sheet must be read in conjunction with this quick start guide for demo circuit 1750A.

LT, LT, LTC, LTM, Linear Technology, the Linear logo and Burst Mode are registered trademarks of Linear Technology Corporation. All other trademarks are the property of their respective owners.

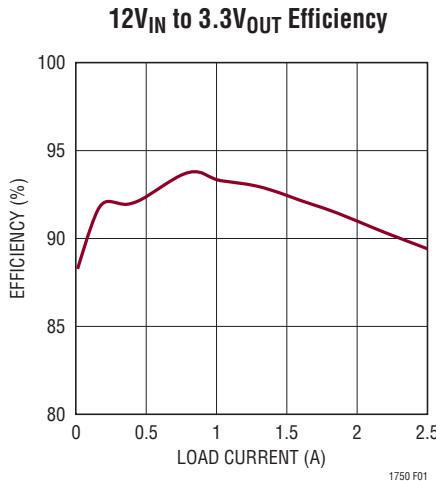


Figure 1. LT8611 Efficiency from 12V to 3.3V (R5 = 0)

DEMO MANUAL DC1750A

DESCRIPTION

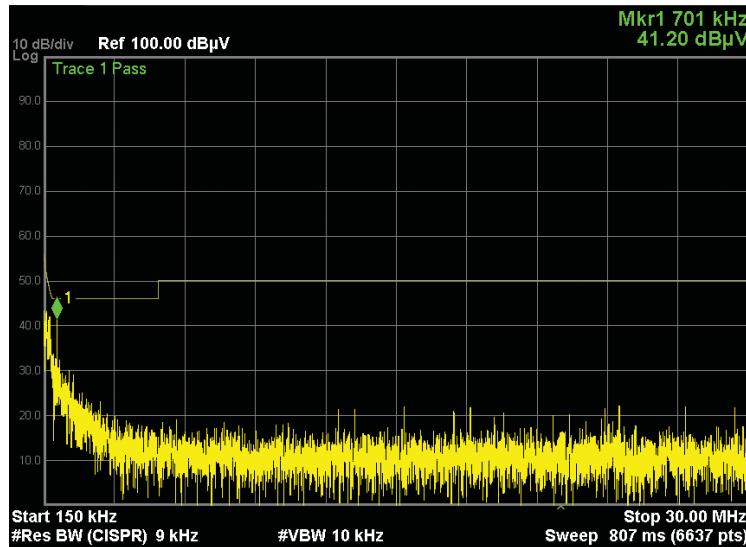


Figure 2. LT8611 Demo Circuit EMI Performance,
Switching Frequency = 700kHz

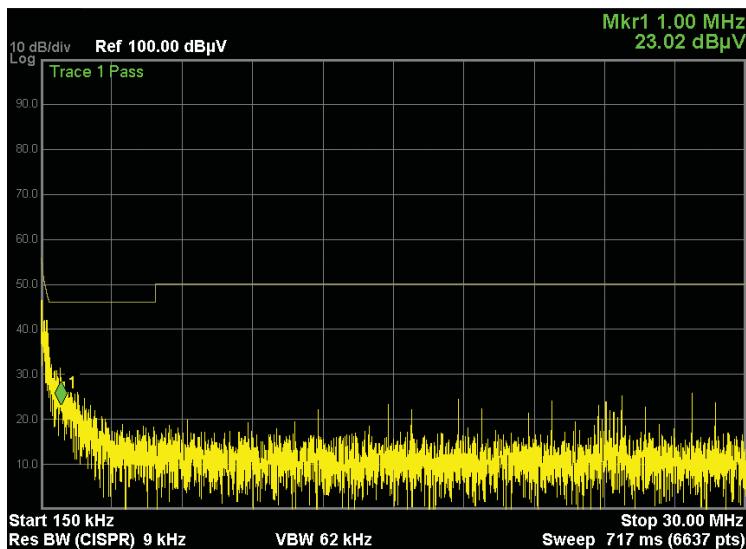


Figure 3. LT8611 Demo Circuit EMI Performance,
Switching Frequency = 1MHz

PERFORMANCE SUMMARY ($T_A = 25^\circ\text{C}$)

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
VIN	Input Supply Range		3.8	42		V
VOUT	Output Voltage		3.168	3.3	3.465	V
I _{OUT}	Maximum Output Current			2.5		A
F _{SW}	Switching Frequency		630	700	770	kHz
EFE	Efficiency at DC	I _{OUT} = 1A, R ₅ = 0		93		%

dc1750af

QUICK START PROCEDURE

Demonstration circuit 1750A is easy to set up to evaluate the performance of the LT8611. Refer to Figure 4 and Figure 5 for proper measurement equipment setup and follow the procedure below:

1. With power off, connect the input power supply to VIN and GND.
2. With power off, connect the load VOUT and GND.
3. Check JP1 setting
4. Turn on the power at the input.
5. Carefully evaluate other design parameters as needed.

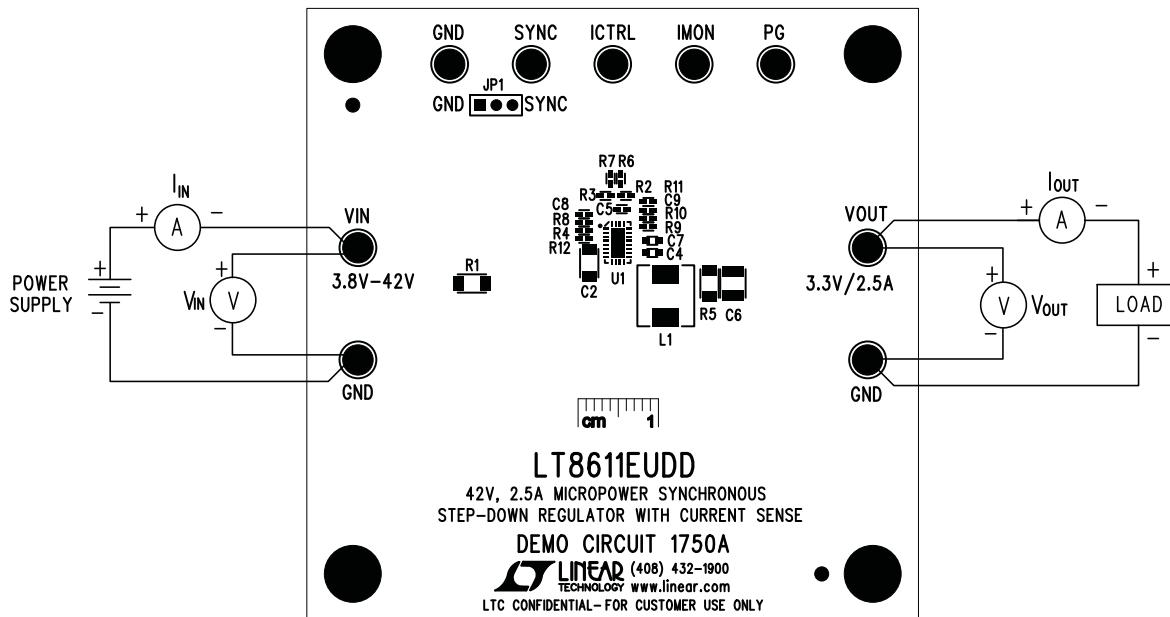


Figure 4. Proper Measurement Equipment Setup

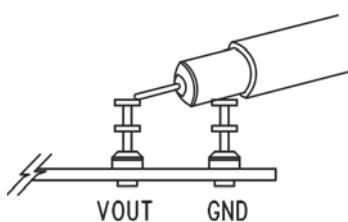


Figure 5. Measure Output Ripple

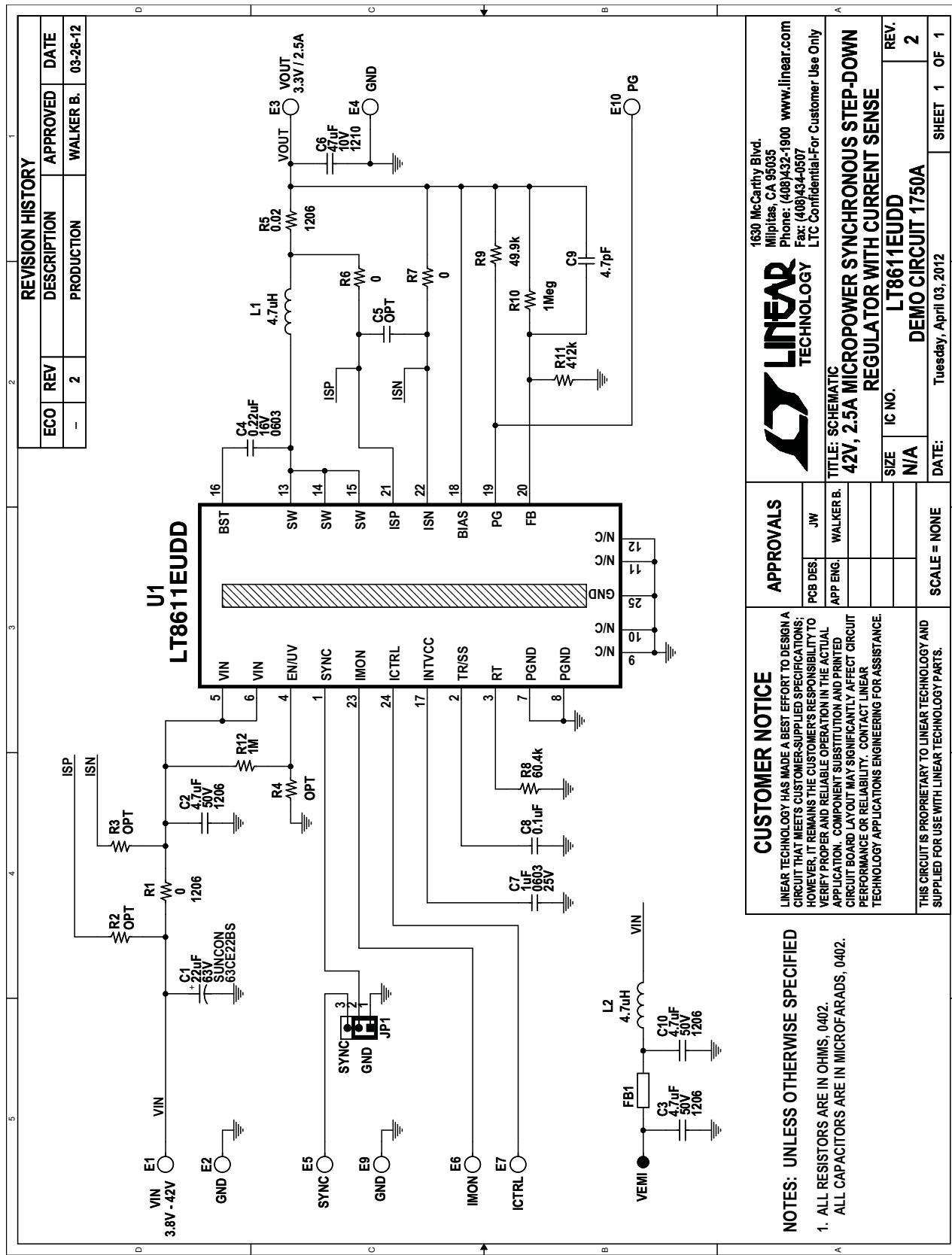
DEMO MANUAL DC1750A

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	1	C2	CAP, CER 4.7µF 50V 1206	TAIYO YUDEN UMK316BJ475KL
2	1	C4	CAP, CER 0.22µF 16V 0603	TAIYO YUDEN EMK107BJ224KA-T
3	1	C6	CAP, CER 47µF 10V 1210	MURATA, GRM32ER71A476K
4	1	C7	CAP, CER 1.0µF 25V 0603	MURATA GRM188R71E105K
5	1	C8	CAP, CER 0.1µF 0402	AVX, 0402YD104KAT2A
6	1	C9	CAP, CER 4.7pF 25V 0402	AVX, 04023A4R7CAT
7	1	L1	IND, 4.7µH	COILTRONICS HCM0703-4R7-R
8	1	R5	RES, 0.02Ω 1% 1206	VISHAY, WSL1206R0200FEA
9	1	R8	RES, 60.4k 1% 0402	VISHAY, CRCW040260K4FKED
10	1	R9	RES, 49.9k 1% 0402	VISHAY, CRCW040249K9FKED
11	2	R10, R12	RES, 1M 1% 0402	VISHAY, CRCW04021M00FKED
12	1	R11	RES, 412k 1% 0402	VISHAY, CRCW0402412KFKED
13	1	U1	IC, LT8611EUDD QFN24EUDD	LINEAR TECH.CORP. LT8611EUDD
Additional Demo Board Circuit Components				
1	1	C1	CAP, ALUM 22µF 63V	SUNCON 63CE22BS
2	1	C10	CAP, CER 4.7µF 50V 1206	TAIYO YUDEN UMK316BJ475KL
3	1	C3	CAP, CER 4.7µF 50V 1206	MURATA, GRM31CR71H475K
4	0	C5	CAP, OPT 0402	OPT
5	1	FB1	FERRITE BEAD 0805	TDK, MPZ2012S221A
6	1	L2	IND, 4.7µH	VISHAY, IHLP2020BZ-ER4R7M01
7	1	R1	RES, 0Ω 1206	AAC CJ18-000M
8	0	R2, R3, R4	RES, OPT 0402	OPT
9	2	R6, R7	RES, 0Ω 0402	AAC, CJ05-000M
Hardware/Components (For Demo Board Only)				
1	9	E1-E7, E9, E10	TESTPOINT TURRET 0.094"	MILL-MAX-2501-2
2	1	JP1	HEADER 1X3 0.079"	SAMTEC, TMM-103-02-L-S
3	1	XJP1	SHUNT, 0.079" CENTER	SAMTEC, 2SN-BK-G
4	4	MH1-MH4	STAND-OFF, NYLON 0.50" TALL	KEYSTONE, 8833 (SNAP ON)

DEMO MANUAL DC1750A

SCHEMATIC DIAGRAM



Information furnished by Linear Technology Corporation is believed to be accurate and reliable. However, no responsibility is assumed for its use. Linear Technology Corporation makes no representation that the interconnection of its circuits as described herein will not infringe on existing patent rights.

DEMO MANUAL DC1750A

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

Copyright © 2004, Linear Technology Corporation

dc1750af



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помошь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помошь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.