LT8620
65V, 2A Micropower Synchronous Monolithic Step-Down Regulator

DESCRIPTION

Demonstration circuit 1992A is a 65V, 2A micropower synchronous monolithic step-down regulator featuring the LT®8620. The LT8620 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 5V. Top and bottom power switches, compensation components and other necessary circuits are inside of the LT8620 to minimize external components and simplify design.

The SYNC pin on the demo board is grounded by default for low ripple Burst Mode® operation. To synchronous 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 pulse skipping operation. Figure 1 shows the efficiency of the circuit at 12V input.

The demo board has an EMI filter installed. The board and the IC are designed to minimize conducted and radiated EMI. The radiated EMI performances of the board are shown on Figure 2 to Figure 4. The limits on those figures are CISPR25, Class 5 peak limits. It shows the circuit passes the test with a wide margin.

The LT8620 data sheet 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 1992A.

Design files for this circuit board are available at http://www.linear.com/demo/DC1992A

PERFORMANCE SUMMARY

Specifications are at T_A = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V_{IN}	Input Supply Range		5.5		65	V
V_{OUT}	Output Voltage		4.8	5	5.2	V
I_{OUT}	Maximum Output Current		2			A
f_{SW}	Switching Frequency		1.85	2	2.15	MHz
EFE	Efficiency at DC	I_{OUT} = 1A		92		%

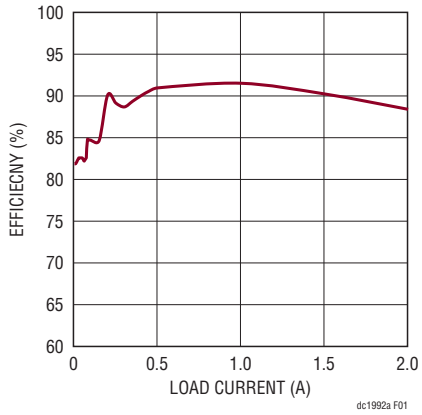


Figure 1. LT8620 $12V_{IN}$ to $5V_{OUT}$ Efficiency at 2MHz Switching Frequency

DESCRIPTION

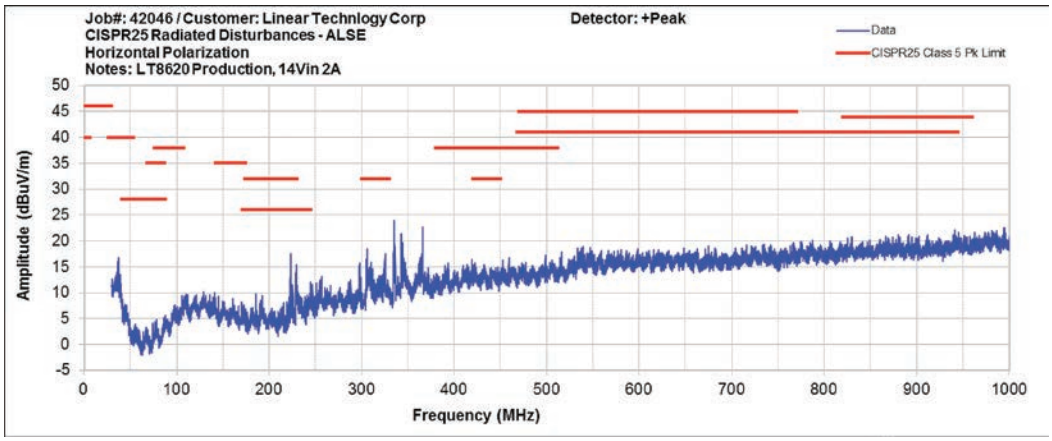


Figure 2. 30MHz to 1GHz Radiated EMI Performance. V_{IN} = 12V, V_{OUT} = 5V, I_{OUT} = 2A Antenna Polarization: Horizontal; Switching Frequency: 2MHz

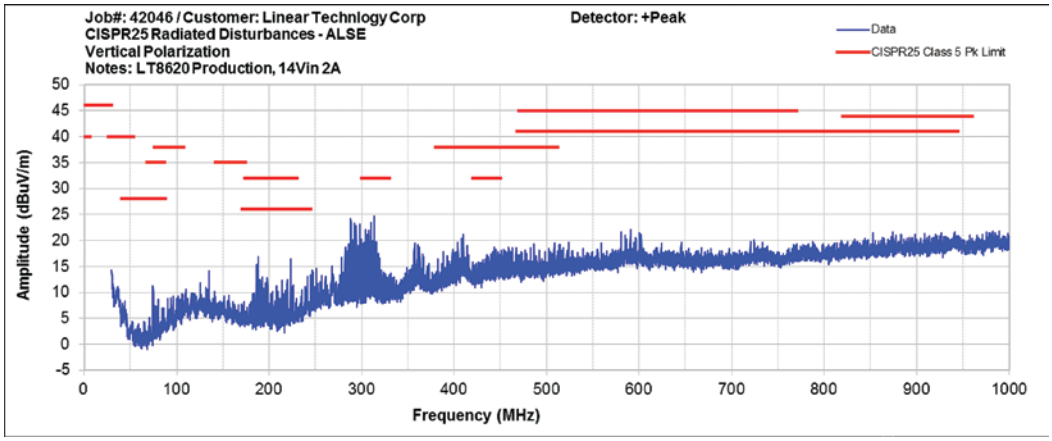


Figure 3. 30MHz to 1GHz Radiated EMI Performance. V_{IN} = 12V, V_{OUT} = 5V, I_{OUT} = 2A Antenna Polarization: Vertical; Switching Frequency: 2MHz

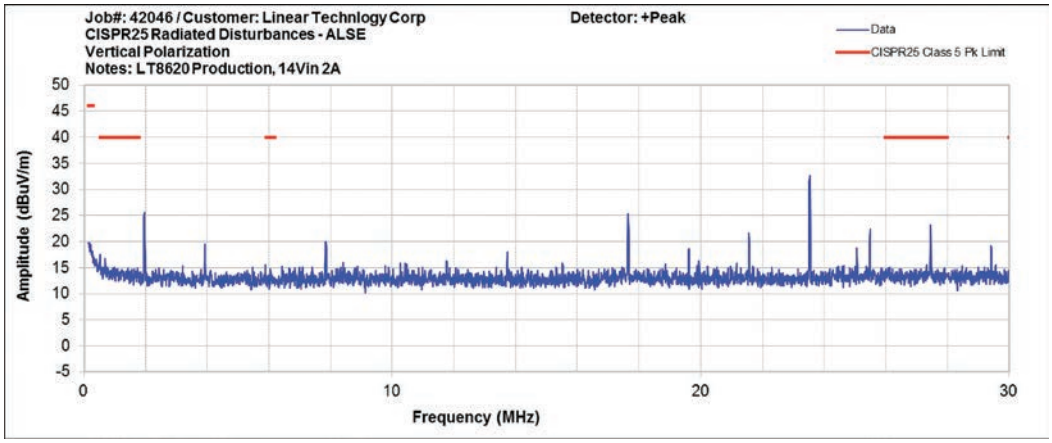


Figure 4. 150kHz to 30MHz Radiated EMI Performance. V_{IN} = 12V, V_{OUT} = 5V, I_{OUT} = 2A Antenna Polarization: Vertical; Switching Frequency: 2MHz (In the Frequency Range Between 150kHz and 30MHz, Only Vertical Polarization Is Required)

QUICK START PROCEDURE

Demonstration circuit 1992A is easy to set up to evaluate the performance of the LT8620. Refer to Figure 5 and Figure 6 for proper measurement equipment setup and follow the procedure below:

1. With power off, connect the input power supply to V_{IN} 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.

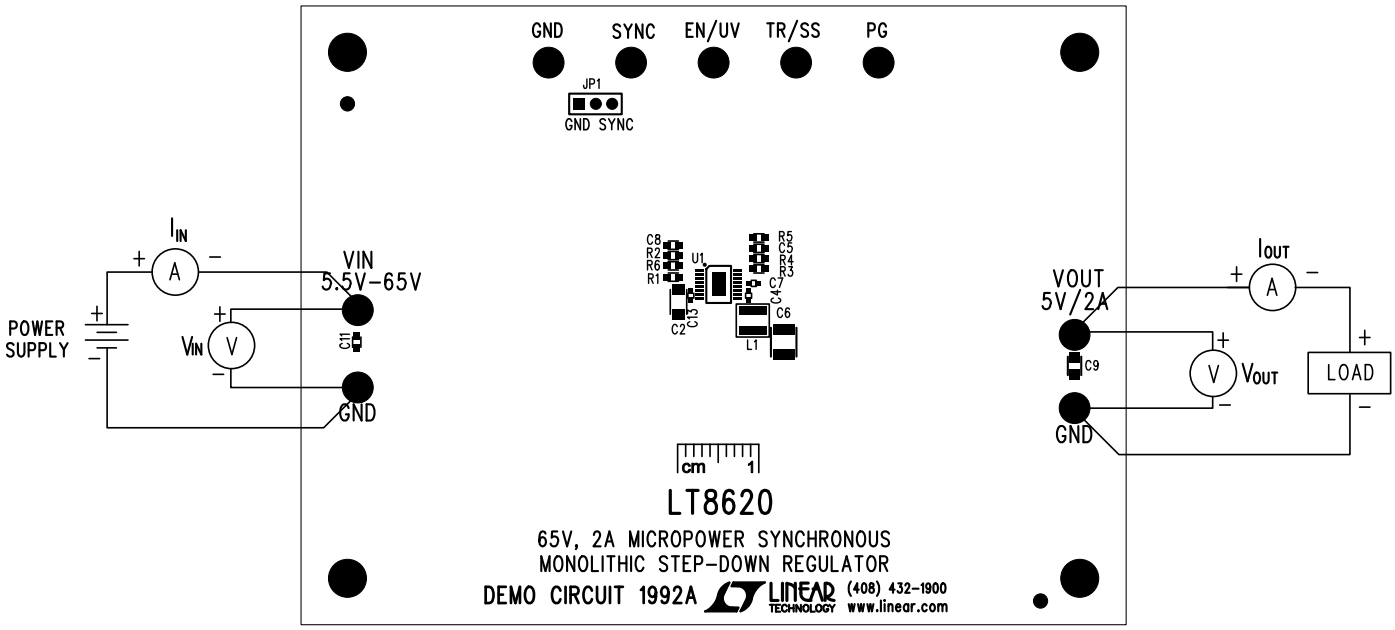


Figure 5. Proper Measurement Equipment Setup

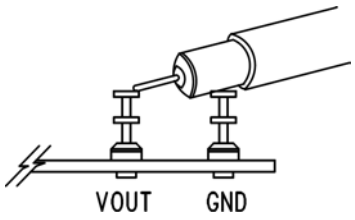
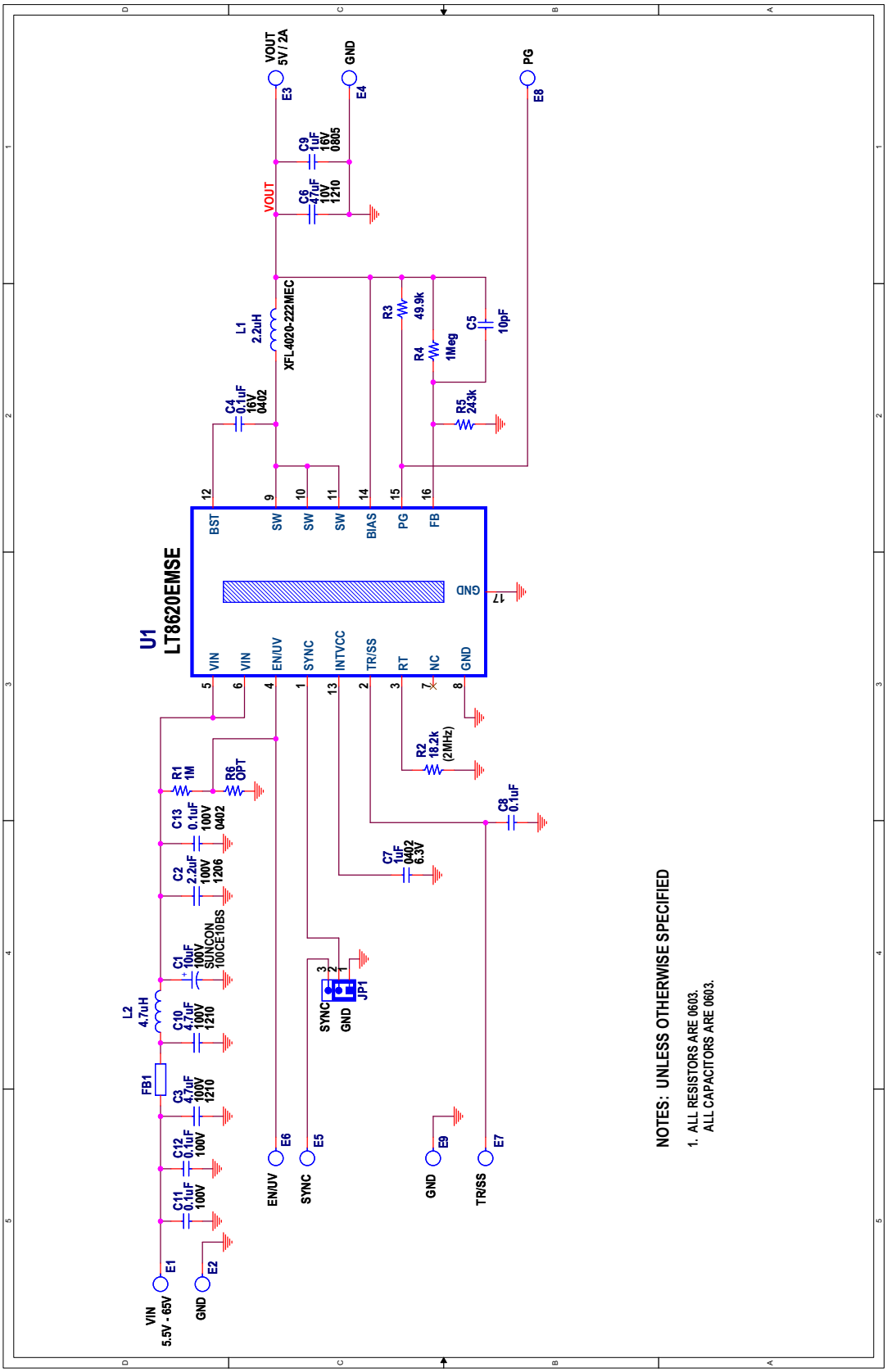


Figure 6. Measure Output Ripple

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	1	C2	CAP., X7R, 2.2µF, 100V, 10%, 1206	MURATA, GRM31CR72A225K
2	1	C4	CAP., X7R, 0.1µF, 16V, 10%, 0402	MURATA, GRM155R71C104KA88D
3	1	C5	CAP., C0G, 10pF, 25V, 10%, 0603	AVX, 06033A100KAT2A
4	1	C6	CAP., X7R, 47µF, 10V, 10%, 1210	MURATA, GRM32ER71A476KE2015L
5	1	C7	CAP., X5R, 1.0µF, 10V, 10%, 0402	MURATA, GRM155R61A105K
6	1	C8	CAP., X7R, 0.1µF, 16V, 10%, 0603	MURATA, GRM188R71C104K
7	1	L1	IND, 2.2µH XFL4020	COILCRAFT, XFL4020-222MEC
8	1	R2	RES., CHIP, 18.2k, 1/10W, 1%, 0603	VISHAY, CRCW060318K2FKED
9	1	R3	RES., CHIP, 49.9k, 1/16W, 1%, 0603	VISHAY, CRCW060349K9FKED
10	2	R1, R4	RES., CHIP, 1M, 1/16W, 1%, 0603	VISHAY, CRCW06031M00FKED
11	1	R5	RES., CHIP, 243k, 1/16W, 1%, 0603	VISHAY, CRCW0603243KFKED
12	1	U1	IC, LT8620EMSE, MSE16	LINEAR TECH. CORP., LT8620EMSE#PBF
Additional Demo Board Circuit Components				
1	1	C1	CAP., ALUM, 10µF, 100V	SUN ELECT, 100CE10BS
2	2	C3, C10	CAP., X7S, 4.7µF, 100V, 10%, 1210	TDK, C3225X7S2A475K
3	1	C9	CAP., X7R, 1.0µF, 16V, 10%, 0805	AVX, 0805YC105KAT2A
4	2	C11, C12	CAP., X7R, 0.1µF, 100V, 10%, 0603	MURATA, GRM188R72A104K
5	1	C13	CAP., X5R, 0.1µF, 100V, 10%, 0402	MURATA, GRM155R62A104K
6	1	FB1	FERRITE BEAD 0805	TDK, MPZ2012S221A
7	1	L2	IND, 4.7µH IHLP2020BZ-01	VISHAY, IHLP2020BZ-ER4R7M01
8	0	R6 (OPT)	RES., 0603	
Hardware: For Demo Board Only				
1	9	E1-E9	TESTPOINT, TURRET, 0.094" PBF	MILL-MAX, 2501-2-00-80-00-00-07-0
2	1	JP1	3 PIN 0.079" SINGLE ROW HEADER	SULLIN, NRPN031PAEN-RC
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)

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 0614 • PRINTED IN USA

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Power Management IC Development Tools ***category:***

Click to view products by Analog Devices ***manufacturer:***

Other Similar products are found below :

EVAL-ADM1168LQEBZ EVB-EP5348UI MIC23451-AAAYFL EV MIC5281YMME EV DA9063-EVAL ADP122-3.3-EVALZ ADP130-0.8-EVALZ ADP130-1.2-EVALZ ADP130-1.5-EVALZ ADP130-1.8-EVALZ ADP1714-3.3-EVALZ ADP1716-2.5-EVALZ ADP1740-1.5-EVALZ ADP1752-1.5-EVALZ ADP1828LC-EVALZ ADP1870-0.3-EVALZ ADP1871-0.6-EVALZ ADP1873-0.6-EVALZ ADP1874-0.3-EVALZ ADP1882-1.0-EVALZ ADP199CB-EVALZ ADP2102-1.25-EVALZ ADP2102-1.875EVALZ ADP2102-1.8-EVALZ ADP2102-2-EVALZ ADP2102-3-EVALZ ADP2102-4-EVALZ ADP2106-1.8-EVALZ ADP2147CB-110EVALZ AS3606-DB BQ24010EVM BQ24075TEVM BQ24155EVM BQ24157EVM-697 BQ24160EVM-742 BQ24296MEVM-655 BQ25010EVM BQ3055EVM NCV891330PD50GEVB ISLUSBI2CKIT1Z LM2744EVAL LM2854EVAL LM3658SD-AEV/NOPB LM3658SDEV/NOPB LM3691TL-1.8EV/NOPB LM4510SDEV/NOPB LM5033SD-EVAL LP38512TS-1.8EV EVAL-ADM1186-1MBZ EVAL-ADM1186-2MBZ