

Programming Board for Dual Output DC/DC Voltage Mode Controller with Digital Power System Management

DESCRIPTION

Demonstration circuit 2252A-A is a lab tool to program and verify the EEPROM inside the [LTC®3882IC](#). The DC2252A-A is shipped with a LTC3882 placed in the clamshell style programming socket. The EEPROM contains the factory default configuration. The LTpowerPlay™ .proj file that corresponds to the factory default can be found in the GUI.

In order to properly verify the contents of the EEPROM, download and install the LTpowerPlay software (GUI). The software can be downloaded from:

<http://www.linear.com/ltpowerplay>

You also need a Linear Technology USB to I²C/SMBus/PMBus Controller, DC1613A.

DEMO SYSTEM REQUIRED HARDWARE

- Windows PC
- USB to I²C/SMBus/PMBus Controller, DC1613A
- DC2252A-A

DEMO SYSTEM REQUIRED SOFTWARE

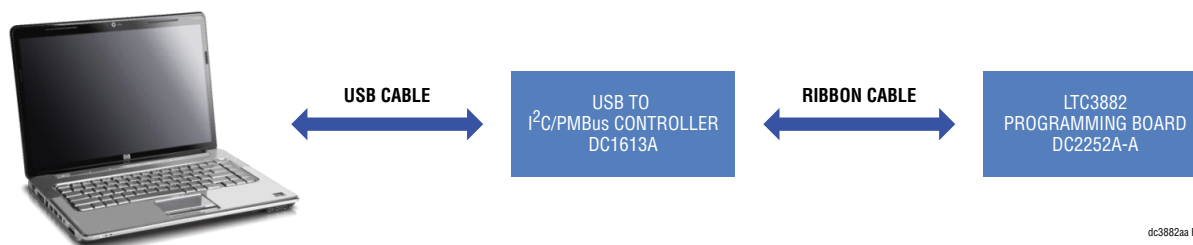
- LTpowerPlay

LTC3882 FEATURES

- PMBus/I²C Compliant Serial Interface
- Monitor Voltage, Current, Temperature and Faults
- Digitally Programmable Voltage, Current Limit, Soft-Start/Stop, Sequencing, Margining, AVP and UV/OV Thresholds
- Programmable PWM Frequency or External Clock Synchronization from 250kHz to 1.25MHz
- ±0.5% Output Voltage Accuracy
- Internal EEPROM with Fault Logging
- Wide V_{IN} Range: 3V to 38V
- V_{OUT} Range: 0.5V to 5.25V
- Analog Leading-Edge Voltage Mode Control Loop
- Accurate PolyPhase® Current Sharing
- Available in a 40-Pin (6mm × 6mm) QFN Package

Design files for this circuit board are available at <http://www.linear.com/demo/DC2252A-A>

LT, LTC, LTM, Linear Technology and the Linear logo are registered trademarks and LTpowerPlay is a trademark of Linear Technology Corporation. All other trademarks are the property of their respective owners.



dc3882aa F01

Figure 1. LTC3882 Programming Setup Using DC2252A-A

QUICK START PROCEDURE

Demonstration circuit 2252A-A makes it easy to program and verify the EEPROM contents of the LTC3882.

1. Make sure jumpers are in the following positions:

JUMPER	POSITION	FUNCTION
JP1	DISABLE	Disable Write Protection of LTC3882
SW1	ON	Provide 3.3V to LTC3882 VDD33 Pin

2. Open the lid of the socket SKT1. Verify there is an IC inside and in the correct direction (White dot on IC matches with PIN 1 on PCB silkscreen). See Figure 2.

3. Close the lid. It will snap into place.

NOTE. Removal and insertion of the IC should be done with either a tweezers or a vacuum suction device.

4. Plug one end of the USB cable to your PC. Plug other end of USB cable into the I²C/SMBus/PMBus controller.

5. Plug the ribbon cable of DC1613A into J2. See Figure 3.

6. On your PC, launch LTpowerPlay. LTpowerPlay will identify the DC2252A-A and launch the appropriate GUI. See Figure 4.

NOTE. You will see an Under Temperature (UT) Fault. This is normal since the temperature sensing pin is floating. Ignore this fault at the moment.

7. Change the GUI parameters according to your system requirements. Or, you can click  button to open an existing project file.

8. After you finish the design, click  to save the project file.

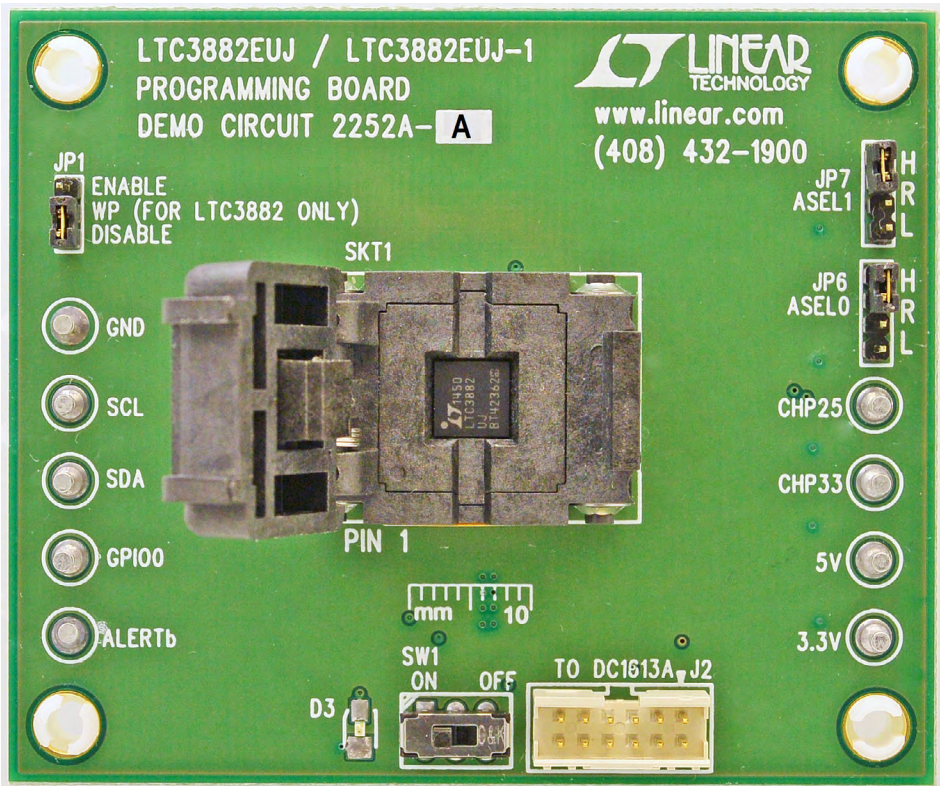


Figure 2. Open Shell. Verify IC Installed

QUICK START PROCEDURE



Figure 3. DC1613A Ribbon Cable Installation

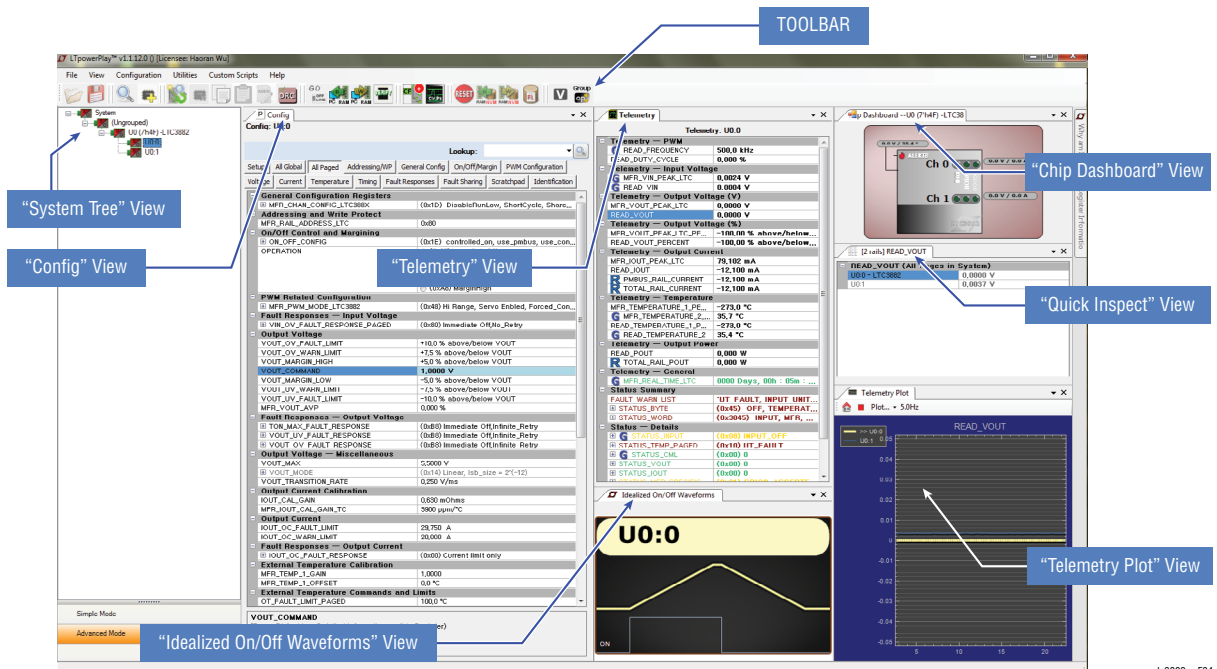


Figure 4. LTpowerPlay Interface of Programming the LTC3882

dc3882aa F04

DEMO MANUAL DC2252A-A

QUICK START PROCEDURE

POWERING DOWN THE BOARD BETWEEN PROGRAMMING OPERATIONS

Disconnect the USB cable from the DC1613A before removing or inserting a LTC3882 into the programming socket.

WHAT YOU CAN DO WITH THE DC2252A-A

1. Compare the contents of the EEPROM in the LTC3882 against your Project or Hex file.
2. Reprogram the contents of the EEPROM in the LTC3882 using your project or Hex File.

3. Verify the EEPROM within the DC2252A-A contains the factory defaults.

- a. From the LTpowerPlay, load the factory defaults project file. This file is located at:

<C:\Program Files\Linear Technology\LTpowerPlay\project files\democircuits\DC2252A>

- b. Click the Verify button.

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	1	SKT1	SOCKET, 6X6 QFN BGA FLAT LEAD LIDDED, THRU-HOLE	PLASTRONICS, 40QN50S16060-B
2	2	C14, C16	CAP., 0.10 μ F, X7R, 16V, 10%, 0603	AVX, 0603YC104KAT2A
3	2	C20, C21	CAP., 1 μ F, X7R, 16V, 10%, 0603	AVX, 0603YC105KAT2A
4	2	C15, C17	CAP., 4.7 μ F, X5R, 16V, 10%, 1206	TDK, C3216X5R1C475K115AA
5	1	D3	LED, GREEN, WATER CLEAR, 571nm @ 5mA, 4.5~28mcd @ 5 mA, 0603	LITE ON, LTST-C193KGKT-5A
6	1	R19	RES., 200 Ω , 1/8W, 1%, 0805	VISHAY, CRCW0805200RFKEA
7	4	R29, R31, R32, R33	RES., 10k, 1/8W, 1%, 0805	VISHAY, CRCW080510K0FKEA
8	2	R36, R37	RES., 4.99k, 1/8W, 1%, 0805	VISHAY, CRCW08054K99FKEA
9	1	R38	RES., 1k, 1/8W, 1%, 0805	VISHAY, CRCW08051K00FKEA
10	4	R41, R45, R47, R54	RES., 0 Ω , 1/8W, 0805	VISHAY, CRCW08050000Z0EA
11	0	R44, R46, R49, R50, R51, R52, R53, R55(OPT)	RES., OPTION, 0805	OPT.
13	1	U2	I.C., EEPROM, I ² C, 2kbit, 400kHz, 8-SOIC	MICROCHIP, 24LC025-I/SN
14	1	JP1	CONN., HEADER, 1X3, 2mm	SAMTEC, TMM-103-02-L-S
15	2	JP6, JP7	CONN., HEADER, 1X4, 2mm	SAMTEC, TMM-104-02-L-S
16	1	J2	CONN., HEADER, SHROUDED, 2X6, 2mm	FCI, 98414-G06-12ULF
17	3	JP1, JP6, JP7	SHUNT, 2mm	SAMTEC, 2SN-BK-G
18	1	SW1	SWITCH, SUB-MINIATURE SLIDE, DPDT, 6VDC, 0.3A, THRU-HOLE	C&K COMPONENTS, JS202011CQN
19	9	TP1, TP4, TP5, TP7, TP8, TP9, TP10, TP11, TP13	TEST POINT, TURRET, 0.064" MTG. HOLE	MILL-MAX, 2308-2-00-80-00-00-07-0
20	4	MH1, MH2, MH3, MH4	STANDOFF, NYLON, SNAP-ON, 0.250"	KEYSTONE, 8831
21	0	U1 TO BE INSTALLED DURING TEST	I.C., DUAL OUTPUT POLYPHASE STEP-DOWN DC/DC VOLTAGE MODE CONTROLLER WITH DIGITAL POWER SYSTEM MANAGEMENT, QFN40-UJ, 6mm x 6mm	LINEAR TECH, LTC3882EUJ#PBF
22	1		PCB, DC2252A	DEMO CIRCUIT 2252A
23	1		STENCIL, DC2252A (BOTTOM)	STENCIL DC2252A

dc2252aaf

SCHEMATIC DIAGRAM

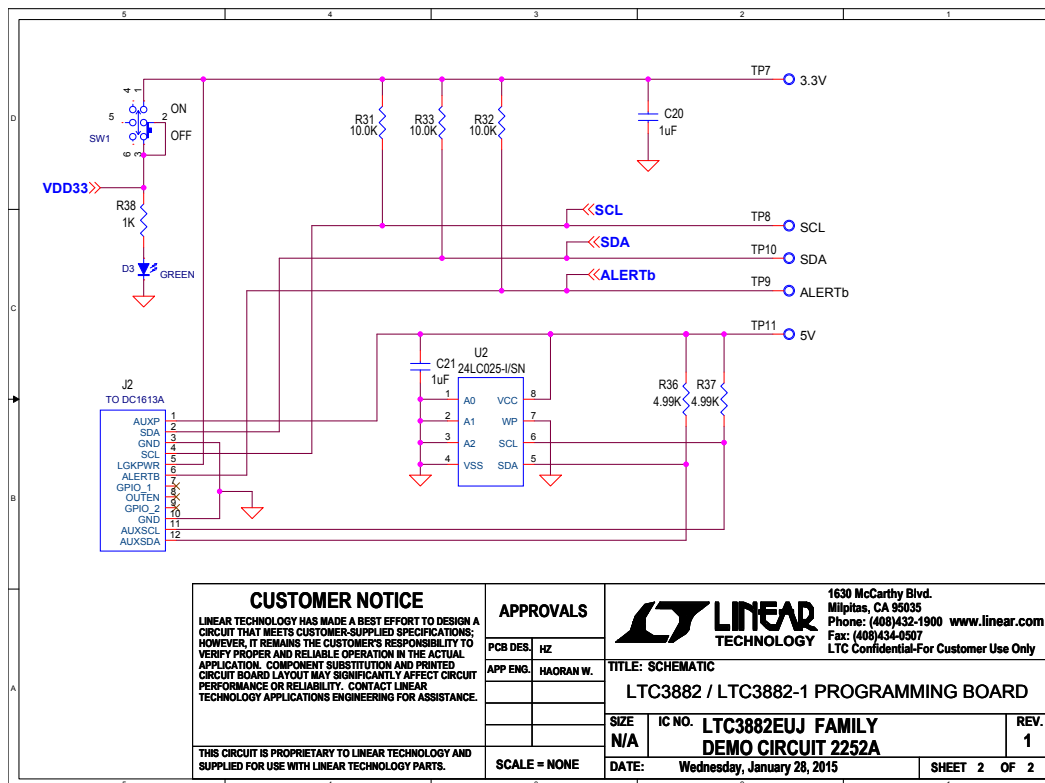
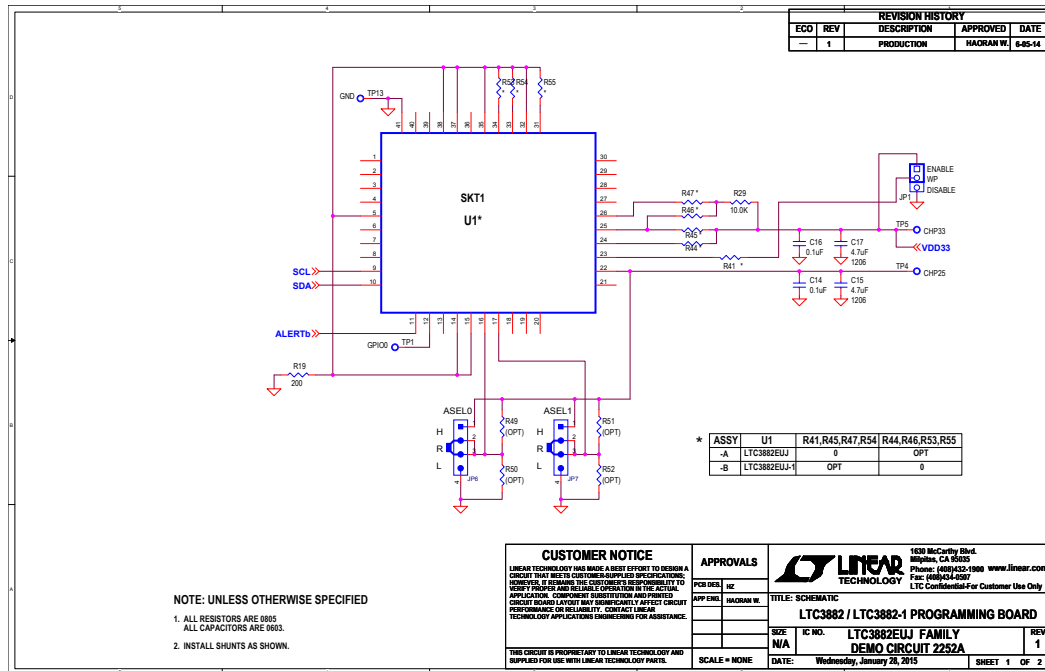


Figure 5. DC2252A-A Demo Circuit Schematic

DEMO MANUAL DC2252A-A

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

dc2252aaf