LTC3883EUH
Programming Board for Single Phase Step-Down DC/DC Controller with Digital Power Management

DESCRIPTION

Demonstration circuit 1890A contains the circuitry needed to program and verify the EEPROM of the LTC®3883 and LTC3883-1. That is its only purpose. The DC1890A is shipped with a LTC3883 installed 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 or DC1427A.

DEMO SYSTEM REQUIRED HARDWARE

- Windows PC
- USB to I²C/SMBUS/PMBUS Controller, DC1613A or DC1427A
- DC1890A

DEMO SYSTEM REQUIRED SOFTWARE

- LTpowerPlay

LTC3883 FEATURES

- PMBus/I²C compliant serial interface
- Telemetry readback includes V_{IN}, I_{IN}, V_{OUT}, I_{OUT}, temperature and faults
- Programmable voltage, current limit, digital soft-start/stop, sequencing, margining, OV/UV/OC and frequency synchronization (250kHz to 1MHz)
- ±0.5% output voltage accuracy over temperature
- Integrated 16-bit ADC
- Integrated high side current sense amplifier
- Internal EEPROM and fault logging
- Integrated powerful N-channel MOSFET gate drivers
- Wide V_{IN} range: 4.5V to 24V
- V_{OUT} range: 0.5V to 5.4V
- Analog current mode control loop
- Accurate PolyPhase® current sharing
- Auto calibration of inductor DCR
- Available in a 32-pin (5mm × 5mm) QFN package

Design files for this circuit board are available at http://www.linear.com/demo/DC1890A

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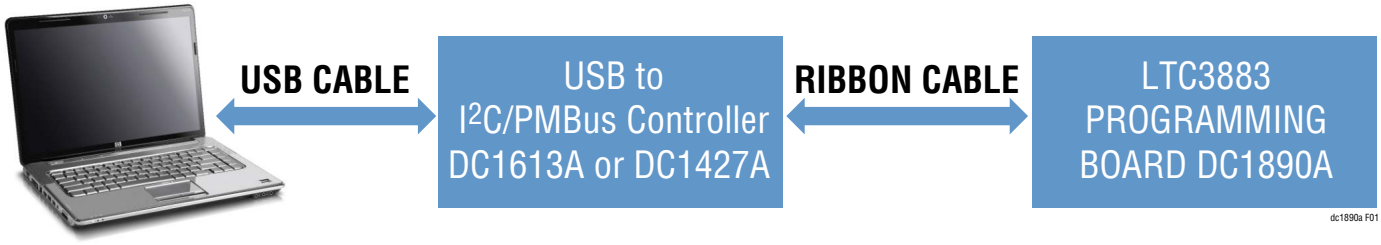


Figure 1. LTC3883 Programming Setup Using DC1890A

QUICK START PROCEDURE

Demonstration circuit 1890A makes it easy to program and verify the EEPROM contents of the LTC3883.

1. Make sure jumpers are in the following positions:

JUMPER	POSITION	FUNCTION
JP1	OFF	Write Protection of LTC3883
JP2	ON	Write Protection of Identification EEPROM

2. Open the lid of the socket SKT1. Verify there is an IC inside. 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 I^2C/SMBUS/PMBUS controller.
5. If you have a DC1427A, plug the ribbon cable into J1. See Figure 3. If you have a DC1613A, plug the ribbon cable into J2. See Figure 3 and Figure 4.
6. On your PC, launch LTpowerPlay. LTpowerPlay will identify the DC1890A and launch the appropriate GUI. See Figure 5.

   NOTE. You will see a undertemperature (UT) fault. This is normal since the temperature sensing pin is grounded. 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.

QUICK START PROCEDURE

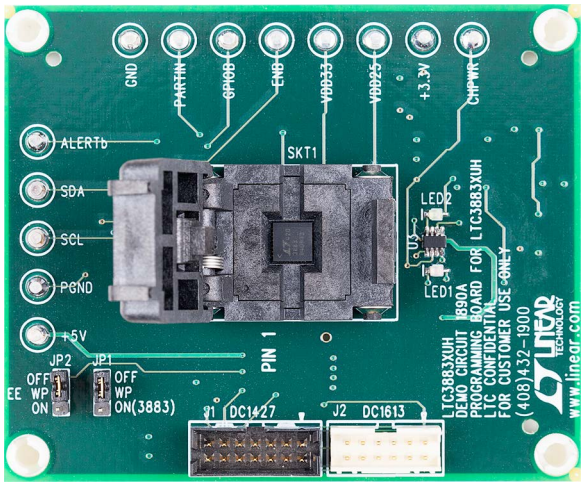


Figure 2. Open Shell. Verify IC Installed

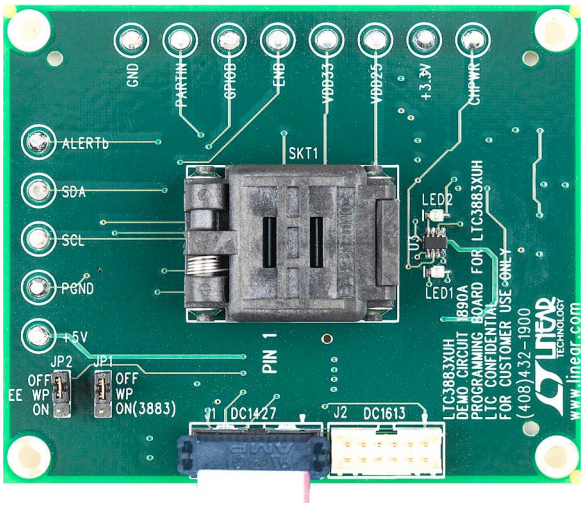


Figure 3. DC1427A Ribbon Cable Installation

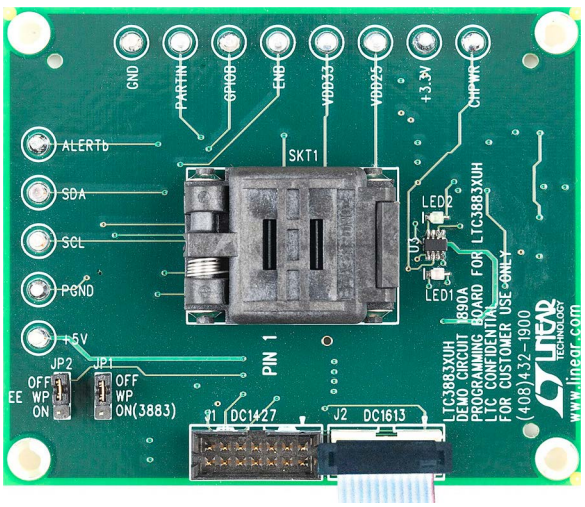


Figure 4. DC1613A Ribbon Cable Installation

QUICK START PROCEDURE

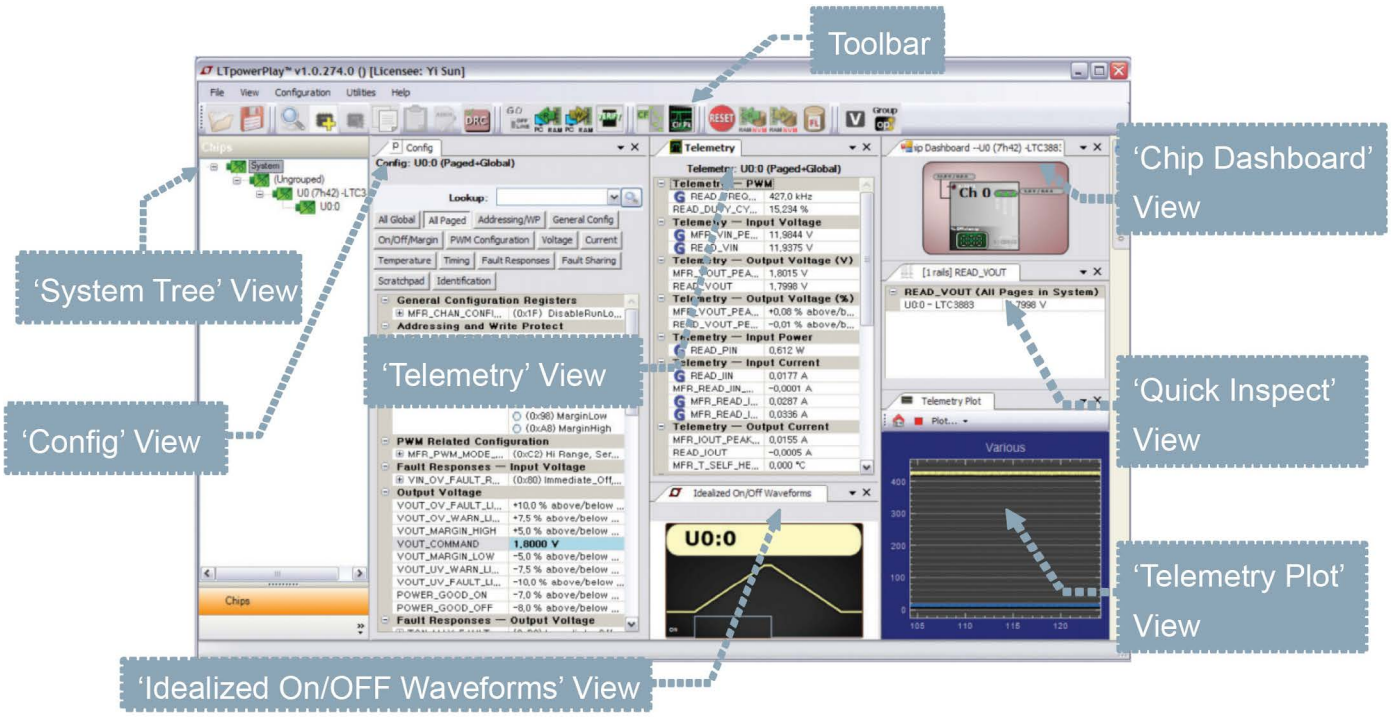


Figure 5. LTpowerPlay Interface of Programming the LTC3883

POWERING DOWN THE BOARD BETWEEN PROGRAMMING OPERATIONS

Disconnect the USB cable from the DC1427A/DC1613A before removing or inserting a LTC3883 into the programming socket.

WHAT YOU CAN DO WITH THE DC1890A

1. Compare the contents of the EEPROM in the LTC3883 against your project or hex file.
2. Reprogram the contents of the EEPROM in the LTC3883 using your project or hex File.
3. Verify the EEPROM within the DC1890A contains the factory defaults.

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

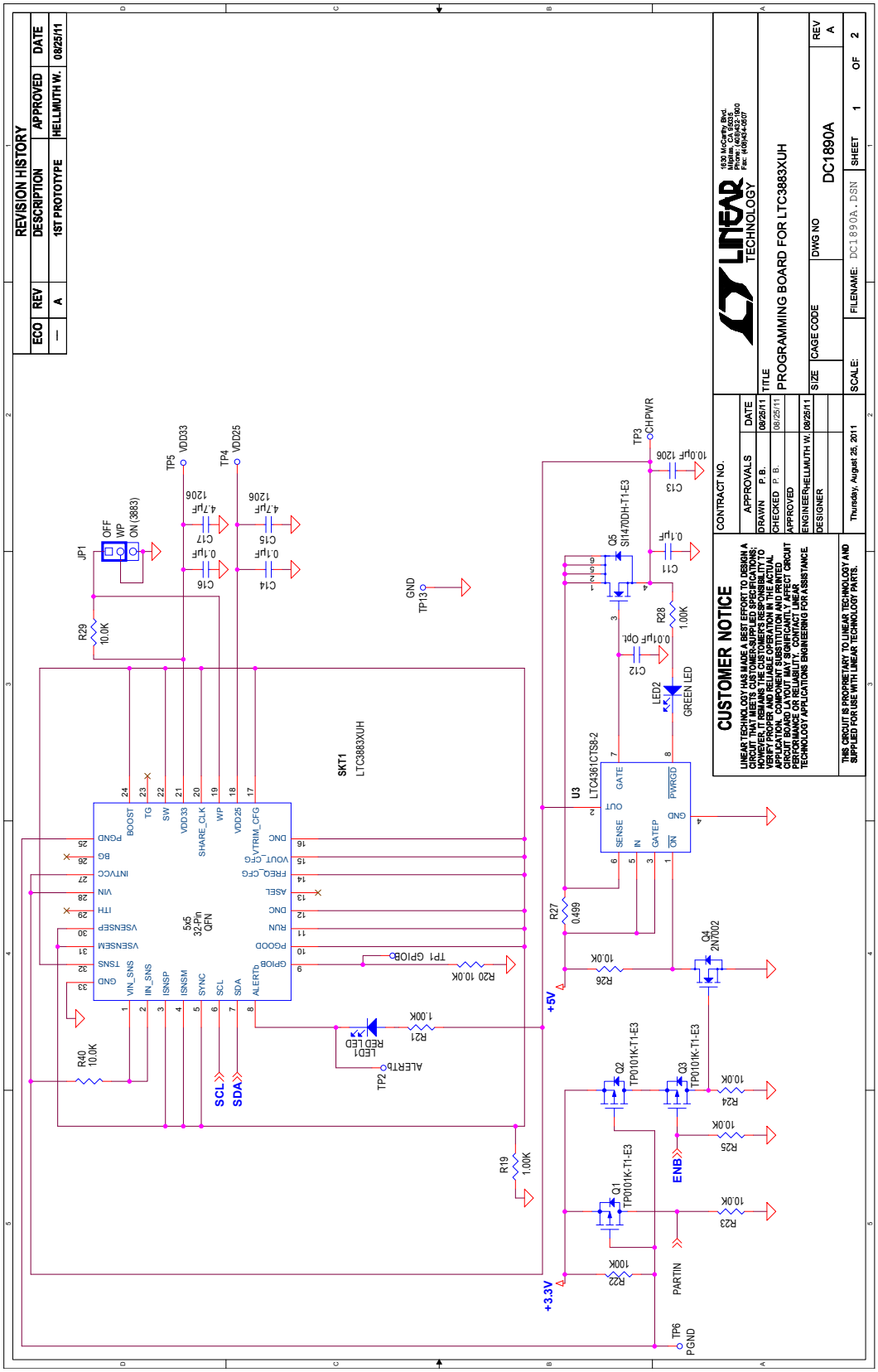
C:\Program Files\Linear Technology\LTpowerPlay\project files\democricuits\LTC3883_datasheet_defaults.proj

b. Click the Verify button.

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	4	C11, C14, C16, C20	CAP, 0.1µF, X7R, 16V, 10%, 0603	AVX, 0603YC104KAT2A|NIC, NMC0603X7R104K16TRPF
2	1	C13	CAP, 10µF, X5R, 6.3V, 10%, 1206	AVX, 12066D106KAT2A
3	2	C15, C17	CAP, 4.7µF, X5R, 6.3V, 10%, 1206	AVX, 12066D475KAT2A
4	2	C18, C19	CAP, 1µF, TANT, 50V, 10%, 2312	AVX, TAJC105K050RNJ
5	1	LED1	LED, RED, COLORLESS DIFFUSED, 0603	OSRAM, LS L29K-H1J2-1-Z
6	1	LED2	LED, GREEN, COLORLESS DIFFUSED, 0603	OSRAM, LG L29K-G2J1-24-Z
7	3	Q1, Q2, Q3	XSTR, MOSFET, P-CH, 20V, 5.9A, SOT-23, TO-236	VISHAY, SI2365EDS-T1-GE3
8	1	Q4	XSTR, MOSFET N-CHAN, 60V, 115mA, SOT-23	FAIRCHILD SEMI, 2N7002
9	1	Q5	XSTR, MOSFET, N-CH, 30V, SOT-363	VISHAY, SI1416EDH-T1-GE3
10	3	R19, R21, R28	RES, 1kΩ, 1%, 1/8W, 0805, AEC-Q200	PANASONIC, ERJ-6ENF1001V
11	9	R20, R23, R24, R25, R26, R29, R31, R33, R40	RES, 10kΩ, 1%, 1/8W, 0805	PANASONIC, ERJ6ENF1002V|VISHAY, CRCW080510K0FKEA
12	1	R22	RES, 100kΩ, 1%, 1/8W, 0805, AEC-Q200	PANASONIC, ERJ-6ENF1003V
13	1	R27	RES, 0.499Ω, 1%, 1/8W, 0805, AEC-Q200	STACKPOLE ELECTRONICS, RMCF0805FTR499
14	3	R30, R34, R39	RES, 1Ω, 1%, 1/8W, 0805	PANASONIC, ERJ-6RQF1R0V
15	3	R35, R36, R37	RES, 4.99kΩ, 1%, 1/8W, 0805	PANASONIC, ERJ-6ENF4991V
16	1	SKT1	CONN, TEST AND BURN IN SOCKET, MALE, 6.04mm × 2.03mm, 0.50mm	LORANGER, 03714 411 6218D
17	1	U2	IC, MEMORY, EEPROM, 2Kb (256x8), TSSOP-8, 400kHz	MICROCHIP, 24LC025-I/ST
18	1	U3	IC, OVERVOLTAGE/OVERCURRENT PROTEC, TSOT-23 8-PIN	LINEAR TECHNOLOGY, LTC4361CTS8-2#PBF|LINEAR TECHNOLOGY, LTC4361CTS8-2#TRPBF
Additional Demo Board Circuit Components				
19	0	R32, R38	RES, OPTION, 0805	
20	0	C12	CAP, 0603, OPTION	
Hardware: For Demo Board Only				
21	1	J1	CONN, HDR, MALE, 2x7, 2mm, THT, VERT, SHROUDED	MOLEX, 87831-1420
22	1	J2	CONN, HDR, SHROUDED, 2x6, 2mm, THT, VERT	FCI, 98414-G06-12ULF
23	2	JP1, JP2	CONN, HDR, MALE, 1x3, 2mm, THT, STR	SAMTEC, TMM-103-02-L-S
24	4	MH1, MH2, MH3, MH4	STANDOFF, NYLON, SNAP-ON, 0.250"	KEYSTONE, 8831|WURTH ELEKTRONIK, 702931000
25	2	SH1, SH2	CONN, SHUNT, FEMALE, 2 POS, 2mm	SAMTEC, 2SN-BK-G
26	13	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13	TEST POINT, TURRET, 0.064", MTG. HOLE	MILL-MAX, 2308-2-00-80-00-00-07-0

SCHEMATIC DIAGRAM



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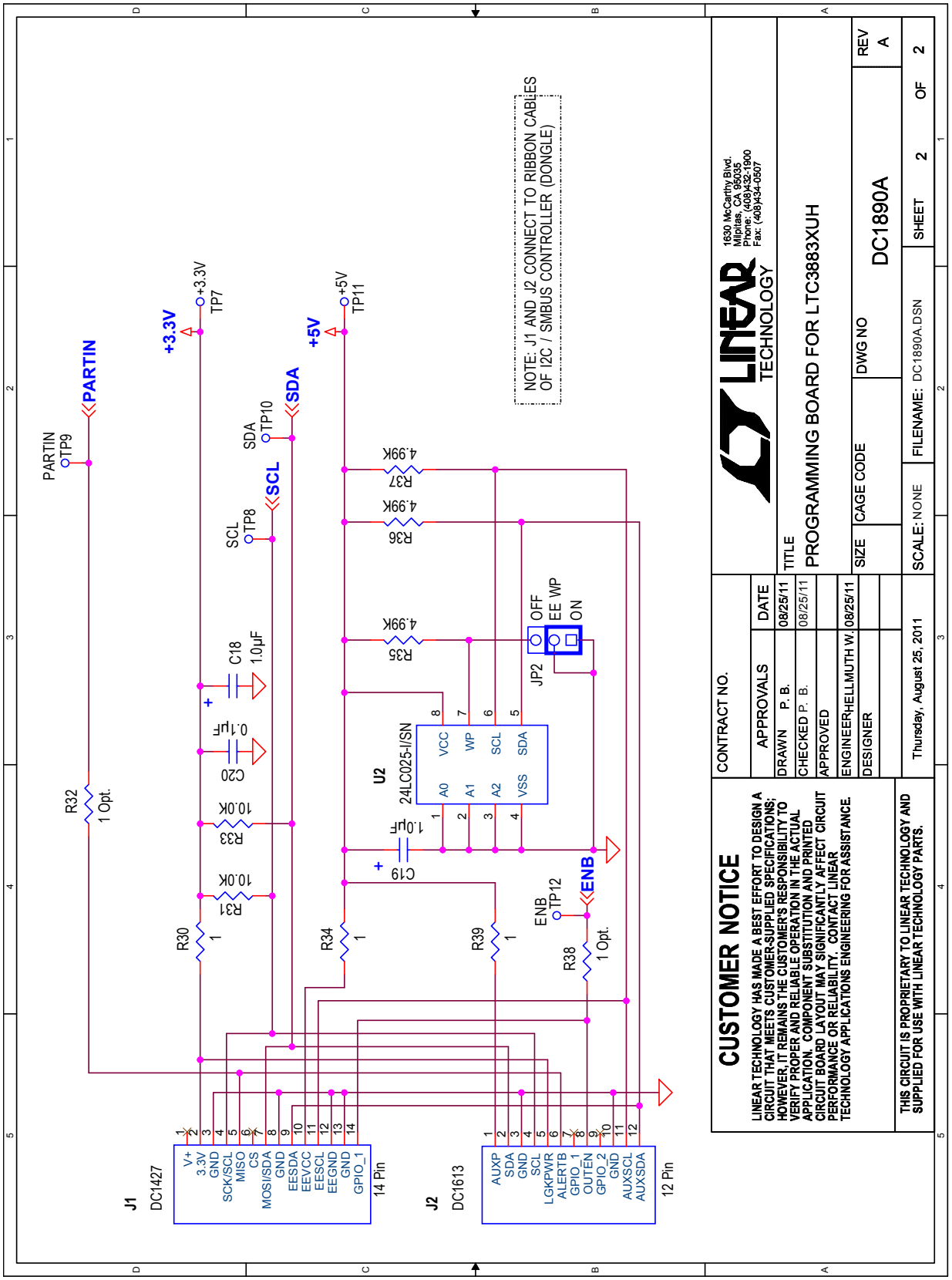

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This notice contains important safety information about temperatures and voltages. For further safety concerns, please contact a LTC application engineer.

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