LTC2990 I²C Temperature Voltage and Current Monitor

DESCRIPTION

Demonstration circuit 1338A features the LTC®2990, a high performance temperature, voltage and current monitor that uses I²C for communication. It offers submillivolt resolution and 1% current and 1°C temperature measurement accuracy.

DC1338A is a member of Linear Technology's QuikEval™ family of demonstration boards. It is designed to allow easy evaluation of the LTC2990 and may be connected directly to the target application's analog signals while using the DC590 USB Serial Controller board and supplied software to measure performance. Exposed ground planes allow proper grounding to prototype circuitry. After evaluating with Linear Technology's software, the I²C lines can be connected to the end application's processor/controller for development of the serial interface.

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

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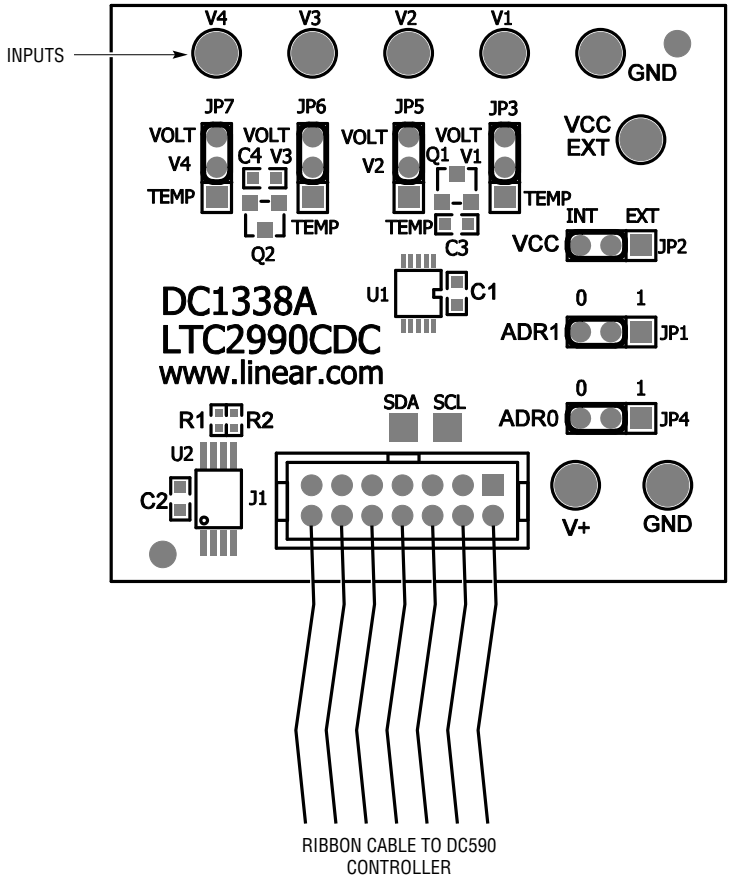


Figure 1. Proper Measurement Equipment Setup. Power Is Obtained from DC590

QUICK START PROCEDURE

Connect DC1338A to a DC590 USB serial controller using the supplied 14 conductor ribbon cable. Connect DC590 to host PC with a standard USB A/B cable. Run the evaluation software supplied with DC590 or downloaded from http://www.linear.com/software. The correct program will be loaded automatically. Click the COLLECT button to start reading the input voltage (COLLECT button becomes PAUSE after collection has been initiated). Details on software features are documented in the control panel's help menu.

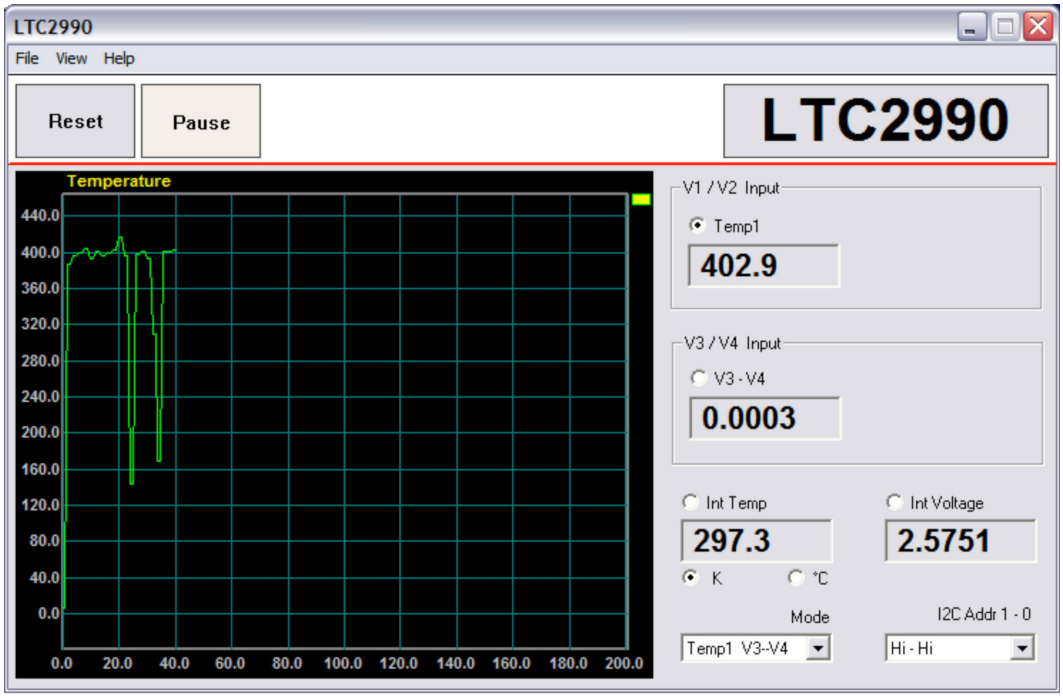


Figure 2. Software Screenshot

HARDWARE SETUP

Connection to DC590 Serial Controller

J1 is the power and digital interface connector. Connect to DC590 serial controller with supplied 14 conductor ribbon cable.

Jumper Settings

V1, V2, V3, V4: These jumpers can be toggled between VOLT and TEMP. VOLT connects the corresponding input on the LTC2990 with the corresponding turret for an external input. TEMP connects the corresponding input to the onboard FMMT3904 (V3 and V4) or the FMMT3906 (V1 and V2). Please note that the jumpers should be moved in pairs, V1 and V2 should both be connected either to VOLT or TEMP and V3 and V4 should also be both connected to either VOLT or TEMP. Once set, the proper selection should also be made inside the QuikEval software in the mode box to reflect any changes made.

V_{CC}: EXT allows the LTC2990 to be powered from an external supply of 2.9V to 5.5V, connected to the VCC EXT and GND turrets. If set to INT, the LTC2990 is powered by the attached DC590B.

ADR0, ADR1: These jumpers are used to select the I^2C address for the LTC2990. When used with QuikEval, the correct address should also be selected from within the software.

Analog Connections

Analog signal connections are made at turrets V1, V2, V3 and V4. Single-ended input range is 0 to V_{CC}, differential is ±300mV with a common mode range of 0 to V_{CC}. When connecting the board to an existing circuit the exposed ground planes along the edges of the board may be used to form a solid connection between grounds.

GND (2 locations): This turret is connected directly to the internal ground planes.

VCC EXT: This turret allows the user to provide V_{CC} to the LTC2990. (2.9V to 5.5V)

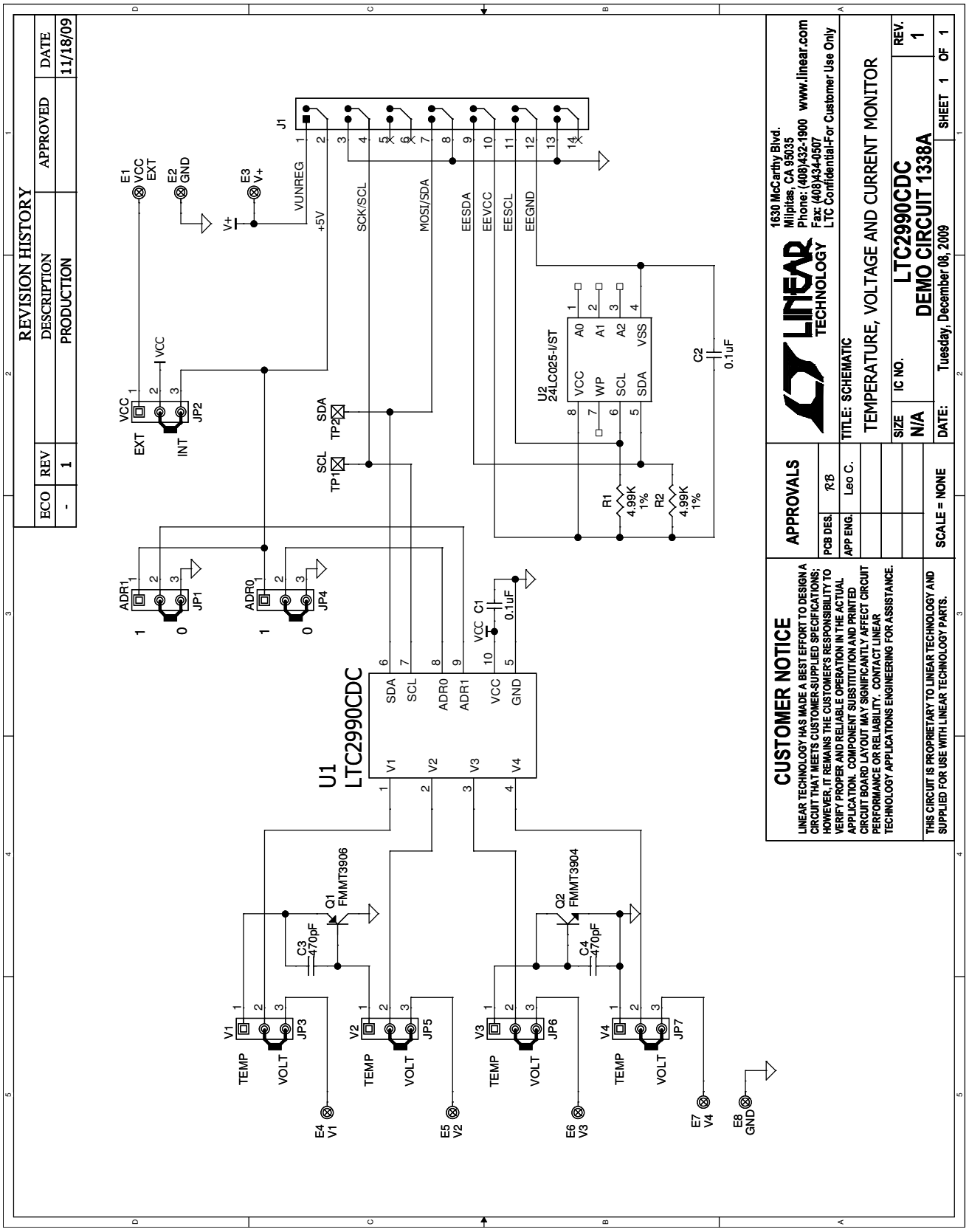
V1, V2, V3, V4: These turrets are used to provide input voltage to the monitor when the corresponding jumpers are set to the VOLT position.

V^+: Unregulated 10V coming from the DC590B. Turret provided for testing purposes only. Presence of 10V indicates proper connection of DC590B.

PARTS LIST

ITEM	QUANTITY	REFERENCE DESIGNATOR	DESCRIPTION	MANUFACTURER'S PART NUMBER
Required Circuit Components:				
1	2	C2, C1	CAP, X7R 0.1µF 25V 10%	AVX, 06033C104KAT2A
2	2	C4, C3	CAP, NPO 470pF 25V 10%	AVX, 06033A471KAT2A
3	8	E1, E2, E3, E4, E5, E6, E7, E8	TURRET, TESTPOINT	MILL MAX, 2308-2-00-80-00-00-07-0
4	7	JP1, JP2, JP3, JP4, JP5, JP6, JP7	HEADERS, 3 PINS 2mm CTRS	SAMTEC, TMM-103-02-L-S
5	1	J1	HEADERS, 14PIN 2mm CTRS	MOLEX, 87831-1420
6	1	Q1	TRANSISTOR, PNP	ZETEX, FMMT3906
7	1	Q2	TRANSISTOR, NPN	ZETEX, FMMT3904
8	2	R1, R2	RES, CHIP 4.99k 0.06W 1%	VISHAY, CRCW04024K99FKED
9	1	U1	IC, TEMP, VOLT, CURR MONITOR	LINEAR TECHNOLOGY, LTC2990CMS
10	1	U2	IC, SERIAL EEPROM	MICROCHIP, 24LC025-I/ST
11	7	XJP1, XJP2 ,XJP3, XJP4, XJP5 TO XJP7	SHUNT, 2mm CTRS	SAMTEC, 2SN-BK-G

SCHEMATIC DIAGRAM



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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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LT 1110 • PRINTED IN USA

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