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LTC2995 Temperature Sensor and Dual Voltage Monitor with Alert Outputs

DESCRIPTION

Demonstration circuit 1871A features the LTC2995, a high performance temperature and voltage monitor that has resistor configurable alert levels.

DC1871A is designed to allow easy evaluation of the LTC2995 and may be connected directly to the target appli-

cation's analog and digital signals to measure performance.

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

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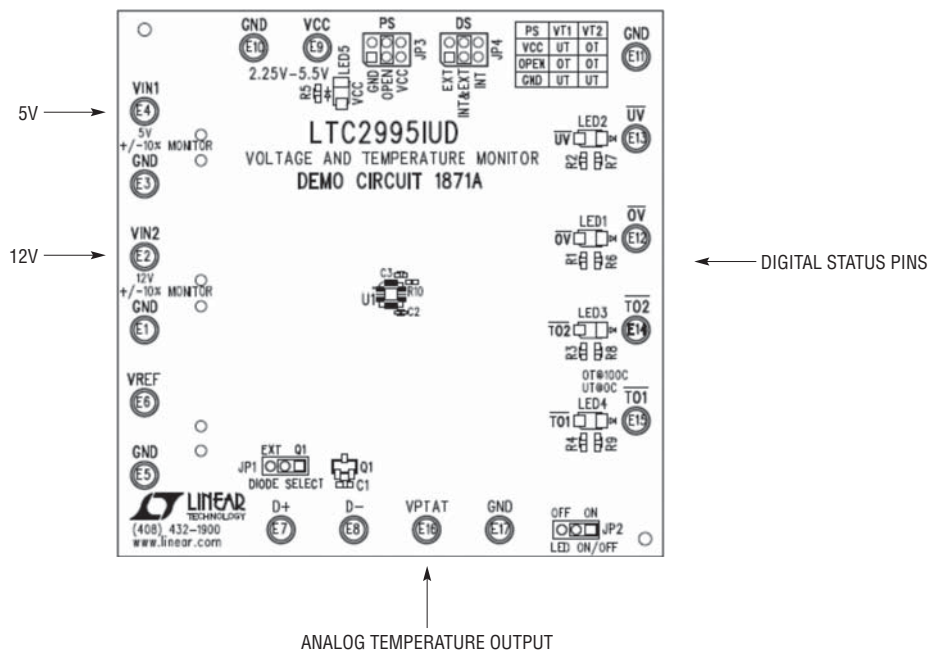


Figure 1. Proper Measurement Equipment Setup

QUICK START PROCEDURE

Jumper Settings

DS: This jumper allows the user to set the LTC2995 to use the internal temp sensor, an external temp sensor, or alternate between the two choices. When set to INT&EXT, VPTAT changes every 3.5ms from the voltage corresponding to the temperature of the internal sensor to the voltage corresponding to the temperature of the external temperature.

PS: This jumper selects the polarity of the VT1/VT2 pins. Depending on the position of this jumper, the VT1 and VT2 pins can either be used to indicate OT or UT.

PS	VT1	VT2
V _{CC}	UT	OT
Open	OT	OT
GND	UT	UT

DIODE SELECT: Allows the user to either select the on board FM3904 (Q1) or attach their own diode through the D+/D- turrets.

LED ON/OFF: Turns on or off the digital indicator lights that reflect the status of \overline{OV} , \overline{UV} , T02, T01.

Analog Connections

Analog signal connections are made via the row of turret posts along the edge of the board.

GND: (6 turrets) These turrets are connected directly to the internal ground planes.

V_{CC}: User should connect a 2.25V to 5.5V power supply to this turret.

V_{IN1}: This is set up to be a 5V \pm 10% monitor input. This, however, can be adjusted by changing the VH1/VL1 resistors (RA1, RB1, RC1). Please refer to the LTC2995 manual for resistor value formulas.

V_{IN2}: This is set up to be a 12V \pm 10% monitor input. This, however, can be adjusted by changing the VH2/VL2 resistors (RA2, RB2, RC2). Please refer to the LTC2995 manual for resistor value formulas.

V_{REF}: OUTPUT ONLY. This nominally outputs 1.8V that can drive up to \pm 200 μ A of load.

VPTAT: The voltage on this turret is proportional to the sensor's absolute temperature, with a slope of 4mV/k. VPTAT can drive up to a \pm 200 μ A load and up to 1000pF capacitive load.

QUICK START PROCEDURE

Digital Connections

\overline{UV} : Status of the LTC2995 \overline{UV} pin can be read at this turret. If a UV fault is triggered the LED will also light up.

\overline{OV} : Status of the LTC2995 \overline{OV} pin can be read at this turret. If a OV fault is triggered the LED will also light up.

$\overline{TO2}$: Status of the LTC2995 $\overline{TO2}$ pin can be read at this turret. If a T02 fault is triggered the LED will also light up. The function of the T02 fault is determined by the PS jumper and the state of the VT2 pin.

$\overline{TO1}$: Status of the LTC2995 $\overline{TO1}$ pin can be read at this turret. If a T01 fault is triggered the LED will also light up. The function of the T01 fault is determined by the PS jumper and the state of the VT1 pin.

DEMO MANUAL DC1871A

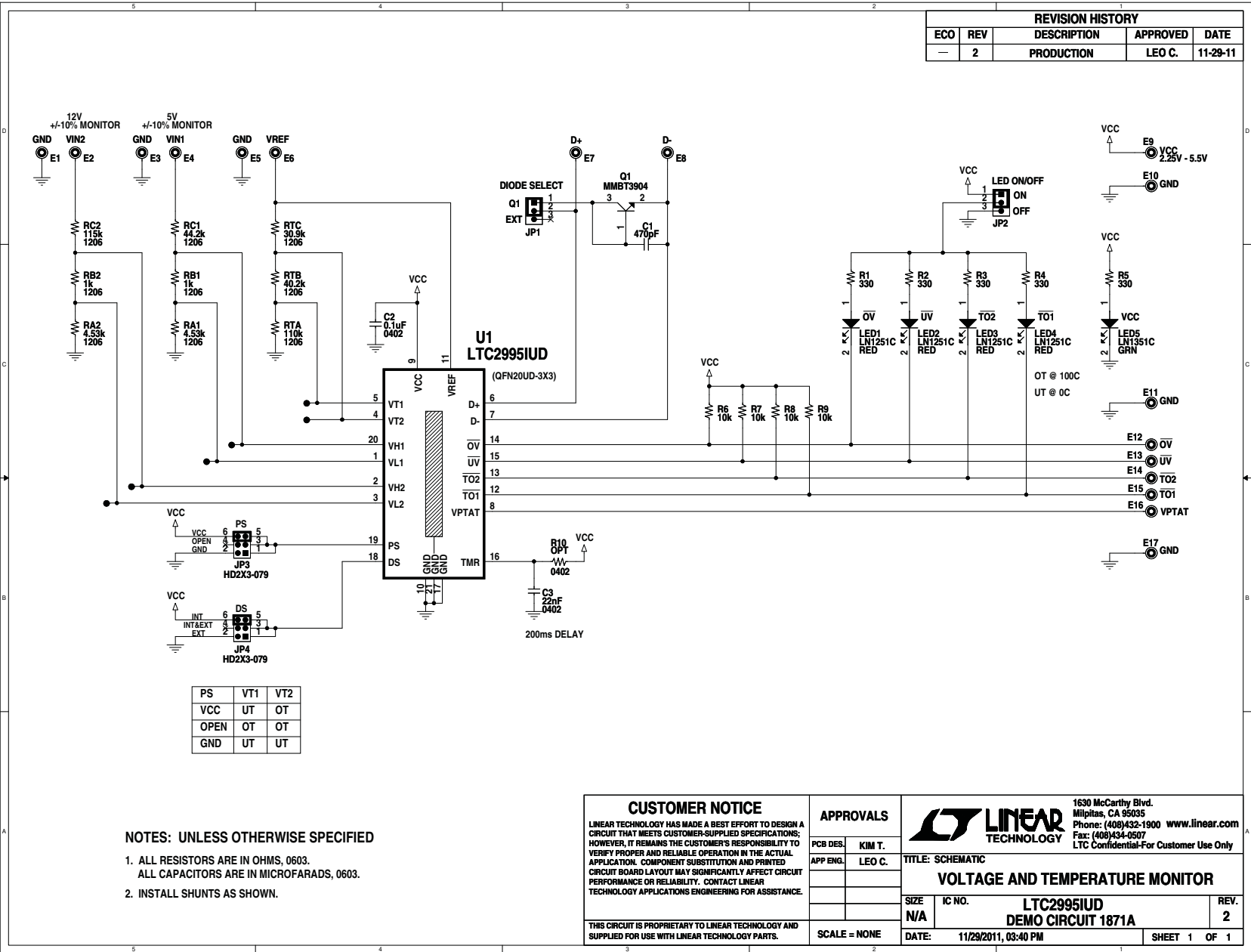
PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	1	C1	CAP., COG 470pF 50V 5% 0603	AVX, 06035A471JAT2A
2	1	C2	CAP., X7R 0.1 μ F 16V 10% 0402	AVX, 0402YC104KAT2A
3	1	C3	CAP., X7R 22nF 50V 5% 0402	AVX, 04025C222JAT2A
4	17	E1-E17	TESTPOINT, TURRET .094"	MILL-MAX, 2501-2-00-80-00-00-07-0
5	2	JP1, JP2	HEADER, 3 PIN 0.079 SINGLE ROW	SAMTEC, TMM-103-02-L-S
6	2	JP3, JP4	HEADER, 12 PIN 0.079 DOUBLE ROW	SAMTEC, TMM-106-02-L-D
7	4	LED1, LED2, LED3, LED4	LED, RED J-TYPE SMD 1206	PANASONIC, LN1251CTR
8	1	LED5	LED, GRN, J-TYPE	PANASONIC, LN1351CTR
9	1	Q1	TRANS., NPN, SOT23-3	DIODE/ZETEX, MMBT3904-7-F
10	2	RA1, RA2	RES., CHIP, 4.53k, 1/16W, 1%, 1206	YAGEO, RC1206FR-074K53L
11	2	RB1, RB2	RES., CHIP, 1k, 1/16W, 5%, 1206	YAGEO, RC1206JR-071KL
12	1	RC1	RES., CHIP, 44.2k, 1/16W, 1%, 1206	YAGEO, RC1206FR-0744K2L
13	1	RC2	RES., CHIP, 115k, 1/16W, 1%, 1206	YAGEO, RC1206FR-07115KL
14	1	RTA	RES., CHIP, 110k, 1/16W, 5%, 1206	YAGEO, RC1206JR-07110KL
15	1	RTB	RES., CHIP, 40.2k, 1/16W, 1%, 1206	YAGEO, RC1206FR-0740K2L
16	1	RTC	RES., CHIP, 30.9k, 1/16W, 1%, 1206	YAGEO, RC1206FR-0730K9L
17	5	R1, R2, R3, R4, R5	RES., CHIP, 330 Ω , 1/16W, 1%, 0603	YAGEO, RC0603FR-07330RL
18	4	R6, R7, R8, R9	RES., CHIP, 10k, 1/16W, 5%, 0603	YAGEO, RC0603JR-0710KL
19	0	R10	RES., CHIP, 0402	OPT
20	1	U1	I.C., LTC2995IUD, QFN20UD-3X3	LINEAR TECH., LTC2995IUD#TRPBF
21	4		SHUNT, .079" CENTER	SAMTEC, 2SN-BK-G
22	1	SHOWN ON ASSY DWG	FAB, PRINTED CIRCUIT BOARD	DEMO CIRCUIT 1871A
23	2	STENCIL BOTH SIDES	STENCIL (TOP & BOTTOM)	STENCIL DC1871A

SCHEMATIC DIAGRAM

DEMO MANUAL DC1871A

REVISION HISTORY				
ECO	REV	DESCRIPTION	APPROVED	DATE
-	2	PRODUCTION	LEO C.	11-29-11



PS	VT1	VT2
VCC	UT	OT
OPEN	OT	OT
GND	UT	UT

- NOTES: UNLESS OTHERWISE SPECIFIED**
- ALL RESISTORS ARE IN OHMS, 0603.
 - ALL CAPACITORS ARE IN MICROFARADS, 0603.

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<p>TITLE: SCHEMATIC</p> <p>VOLTAGE AND TEMPERATURE MONITOR</p>					
<p>SIZE N/A</p>		<p>IC NO. LTC2995IU</p>		<p>REV. 2</p>	
<p>SCALE = NONE</p>		<p>DATE: 11/29/2011, 03:40 PM</p>		<p>SHEET 1 OF 1</p>	
<p>THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.</p>					

DEMO MANUAL DC1871A

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