LM75AEB User's Guide

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1. Introduction

The Texas Instruments LM75AEB evaluation board (EB) helps designers evaluate the operation and performance of the LM75A, an industry-standard digital temperature sensor with an integrated Sigma-Delta analog-to-digital converter and I^2C interface. The LM75A provides 9-bit digital temperature readings with an accuracy of ±2°C from -25°C to 100°C and ±3°C over -55°C to 125°C.

The EVM contains one Digital Temperature Sensor (See Table 1).

Table 1: Device and Package Configurations

TEMP SENSOR	IC	PACKAGE
U6A1	LM75AIM	SOP-8

2. Setup

This section describes the jumpers and connectors on the LM75AEB as well and how to properly connect, set up and use the LM75AEB.

2.1. Input/Output Connector Description

JP2 – Output is a header that allows user to probe the LM75AIM's VDD, GND, A0, A1, A2, OS#, and I^2C pins.

JP4 – VDD is the power input terminal for the LM75AIM. The jumper terminal provides power to LM75AIM VDD pin.

JP5 – A0 is bit 0 of the three least significant bits of the I2C slave address. At default, this jumper is pulling high, and jumping the two terminals allows setting A0 low.

JP6 – A1 is bit 1 of the three least significant bits of the I2C slave address. At default, this jumper is pulling high, and jumping the two terminals allows setting A1 low.

JP7 – A2 is bit 2 of the three least significant bits of the I2C slave address. At default, this jumper is pulling high, and jumping the two terminals allows setting A2 low.

1	0	0	1	**A2**	**A1**	**A0**
MSB						LSB

Figure 1: 7-bit Slave Address

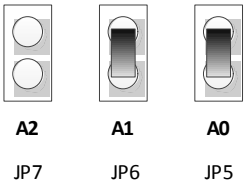


Figure 2: Three Significant Bits

A2	A1	A0
0	0	0
0	0	1
0	1	0
0	1	1
1	0	0
1	0	1
1	1	0
1	1	1

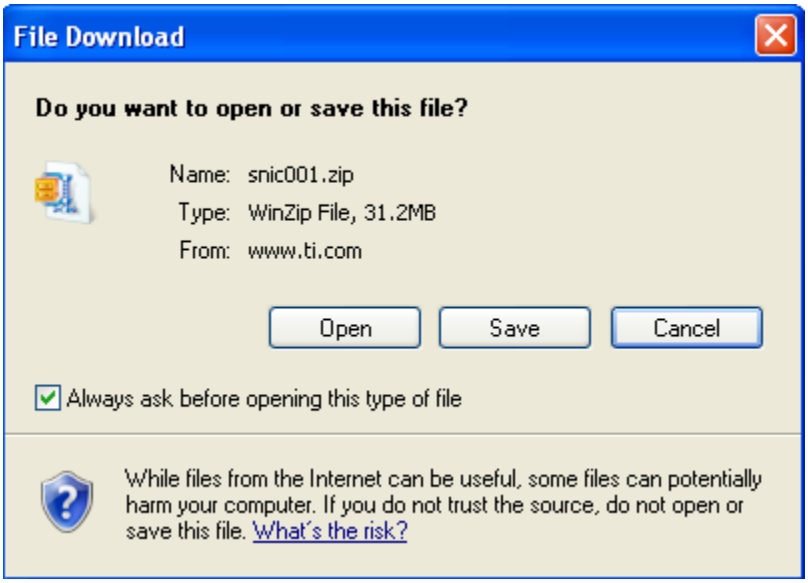
Table 1: I2C Address User Setting Input

2.2. Setup

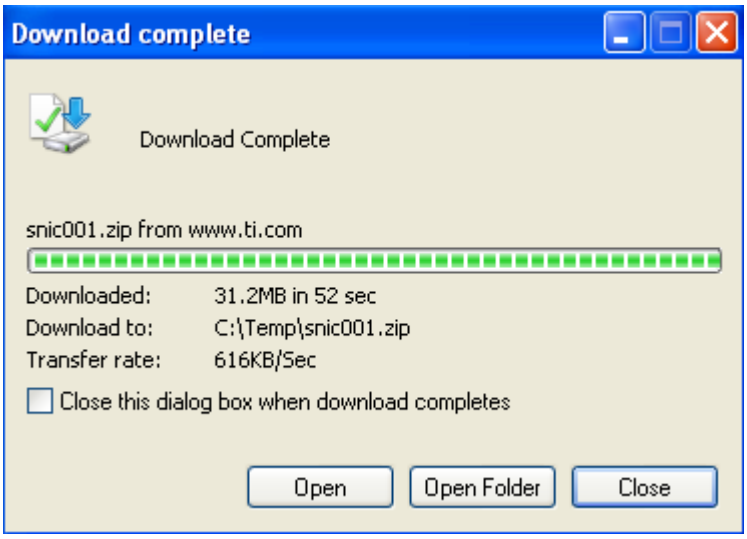
To ensure that you are using the latest version of SensorEval software, you can download from our website at http://www.ti.com/tool/sensoreval. You must install the SensorEval software, before you connect theLM75AEB to your PC.

To install the SensorEval Software:

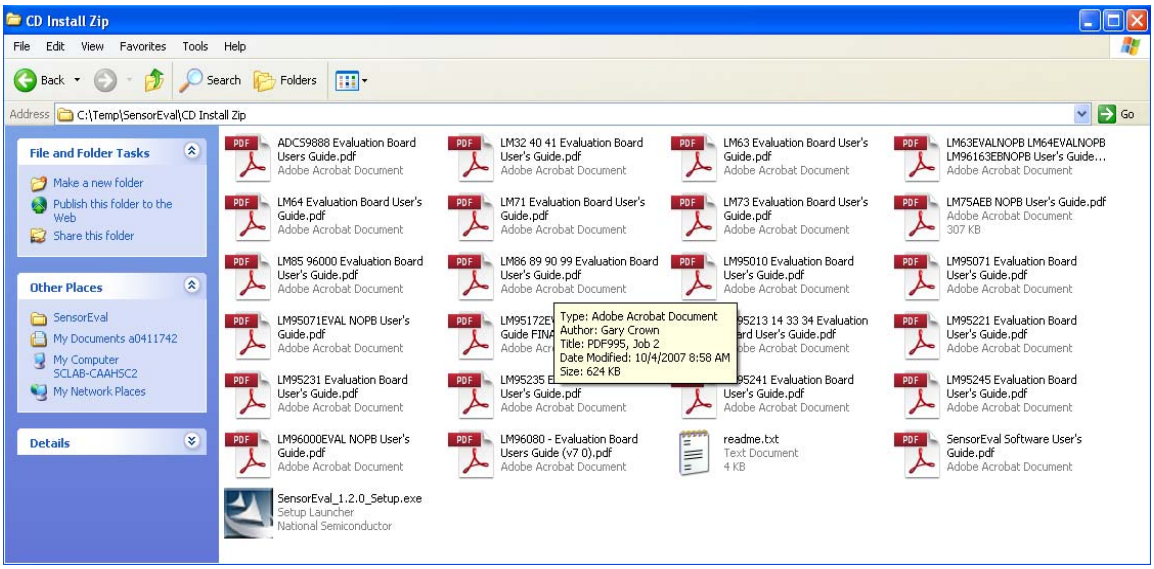
- Click this link http://www.ti.com/tool/sensoreval then click on the red “download” button and click the “Save” button to save the file to the known directory.



- To open the ZIP file you just download click on the “Open” button



- Uncompress the file that you downloaded into a known directory, and run the SensorEval_1.2.0_Setup.exe file



- When you see the Welcome screen as shown below, follow the instructions by clicking the “Next” button on the screen to install the software
- When you finish the installation, please click “Finish” button

- Before you launch the SensorEval software, connect LM75AEB device to one free USB port of your PC. The “New Hardware” screen appears and click the “Next” button.

- A warning sign appears. Click “Continue Anyway” button

2.3. Operation

For proper operation of the LM75AEB, JP4 should be jumpered. This will allow the LM75A's VDD to be sourced from an on-board 3.3V regulator. Jumping JP5 and JP6 will allow configuring the I2C slave address to 4Ch.

For this quick start, connect the following jumpers:

1. JP4 to short
2. JP5 to short
3. JP6 to short

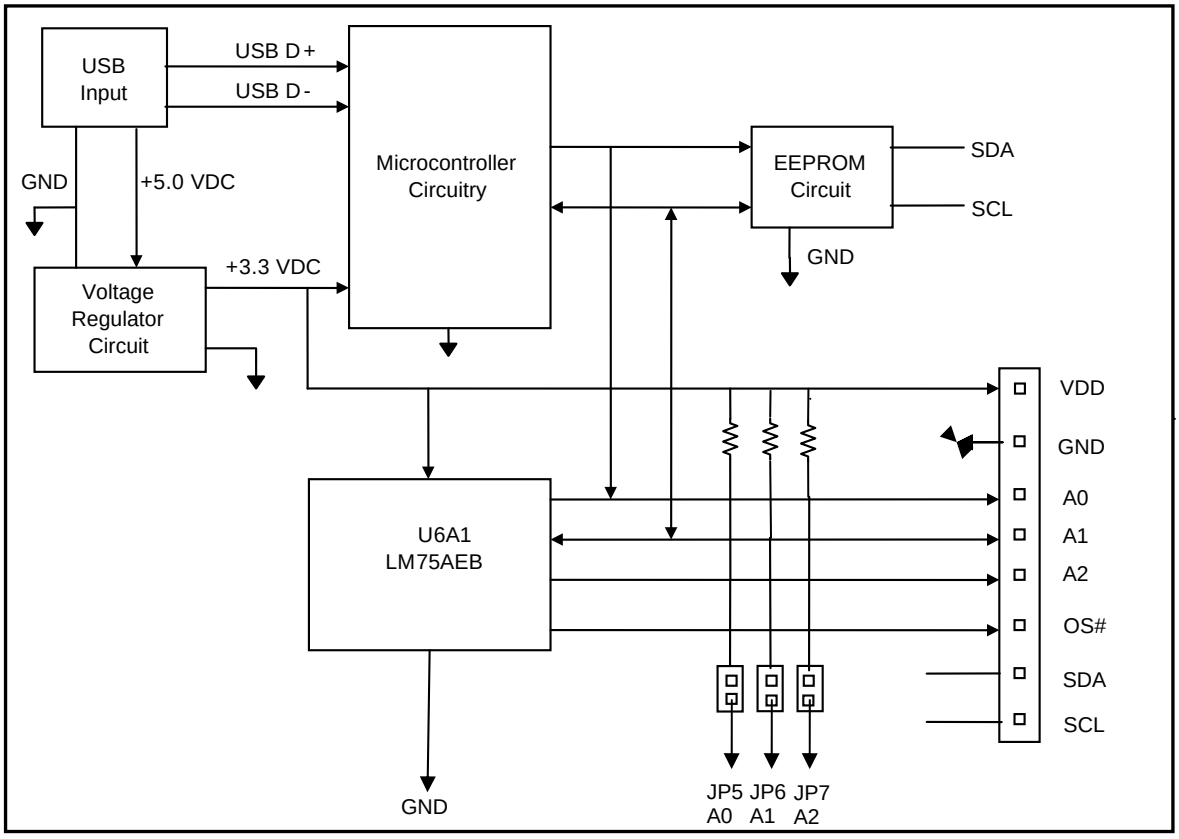
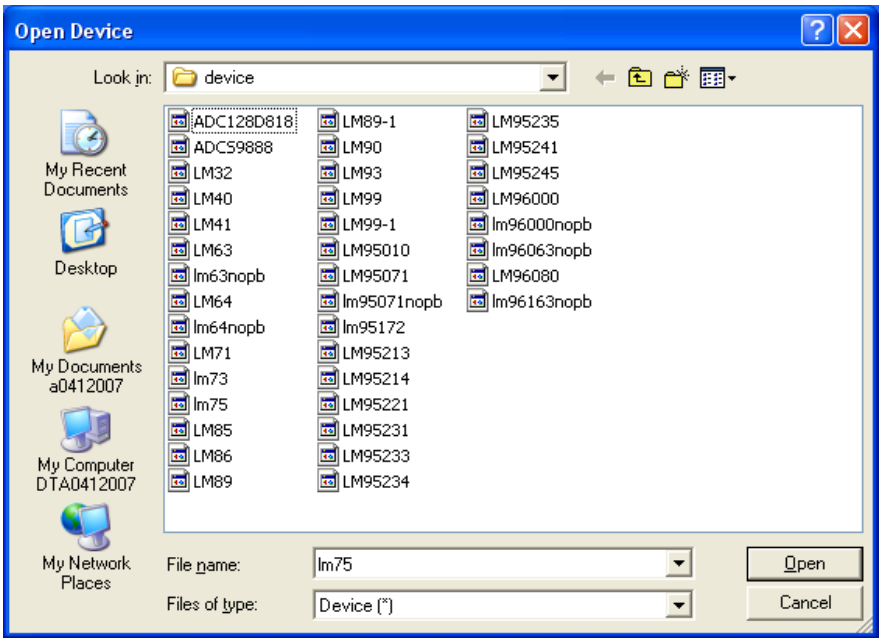
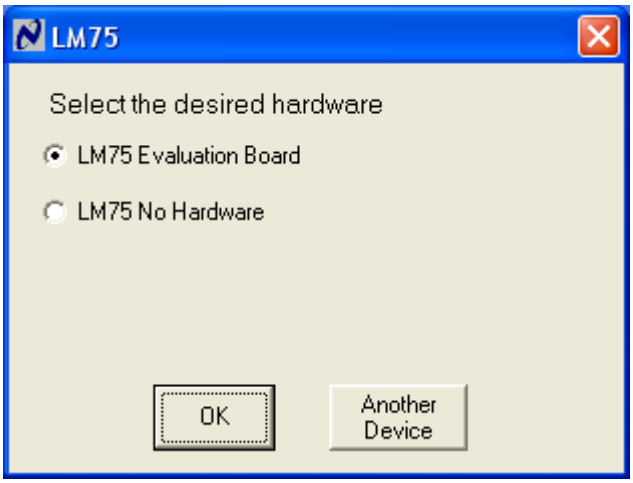


Figure 3: LM75AEB Board Block Diagram

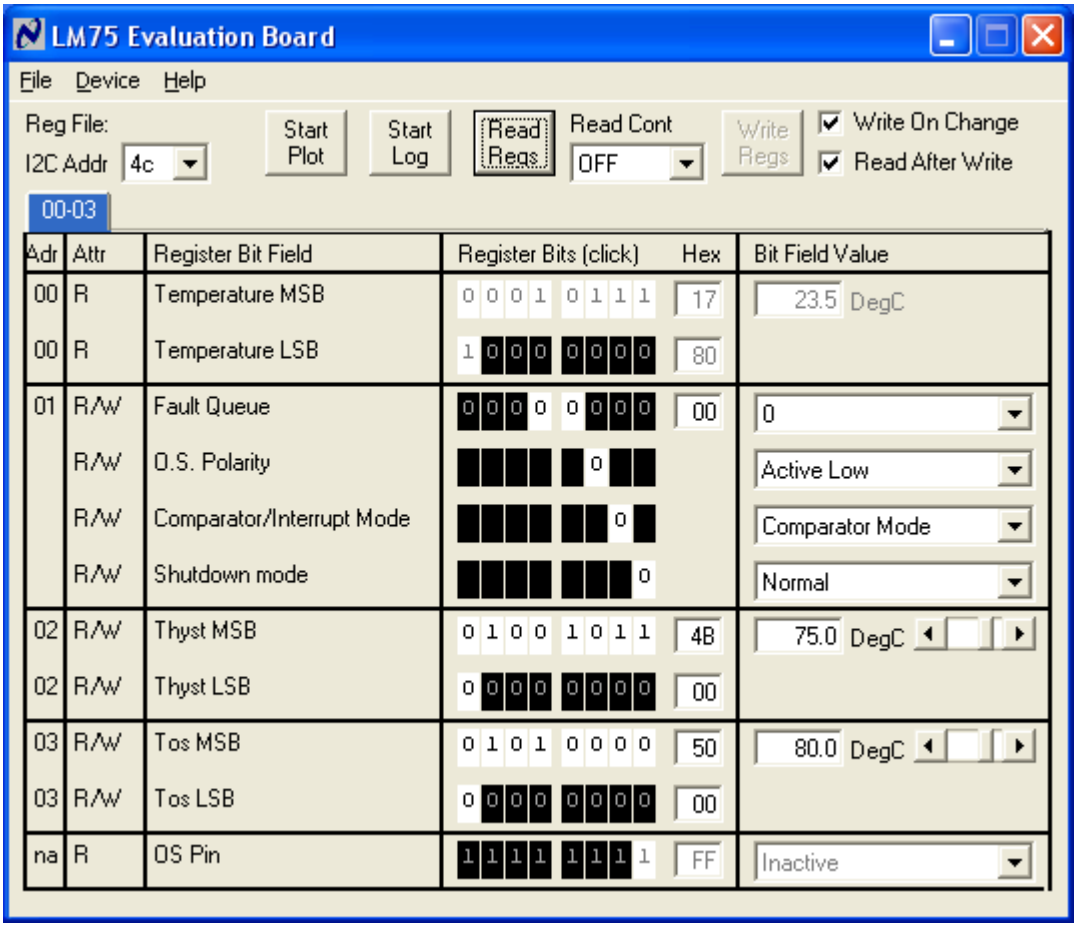
- To run the SensorEval software, click the icon on the desktop. The dialog box appears to select the definition file of LM75.



- A confirm screen appears. Click “OK” button.



- The SensorEval software will populated based on the LM75's definition file.



- Select the I2C Addr as "4c"
- Select the Read Cont as "All Regs". This will read the values continuously.
- Changing the value of LM75A's registers by clicking the white textbox on the Register Bits column

3. Board Layout

Figure 4, Figure 5, and Figure 6 show the board layout for the LM75AEB. The EVM offers resistors, capacitors, eeprom, microcontroller and jumpers to set three least significant bits of I2C slave address to run the LM75AIM temperature sensor.

The LM75AEB have two additional package footprints MSOP-8 and LLP-8.

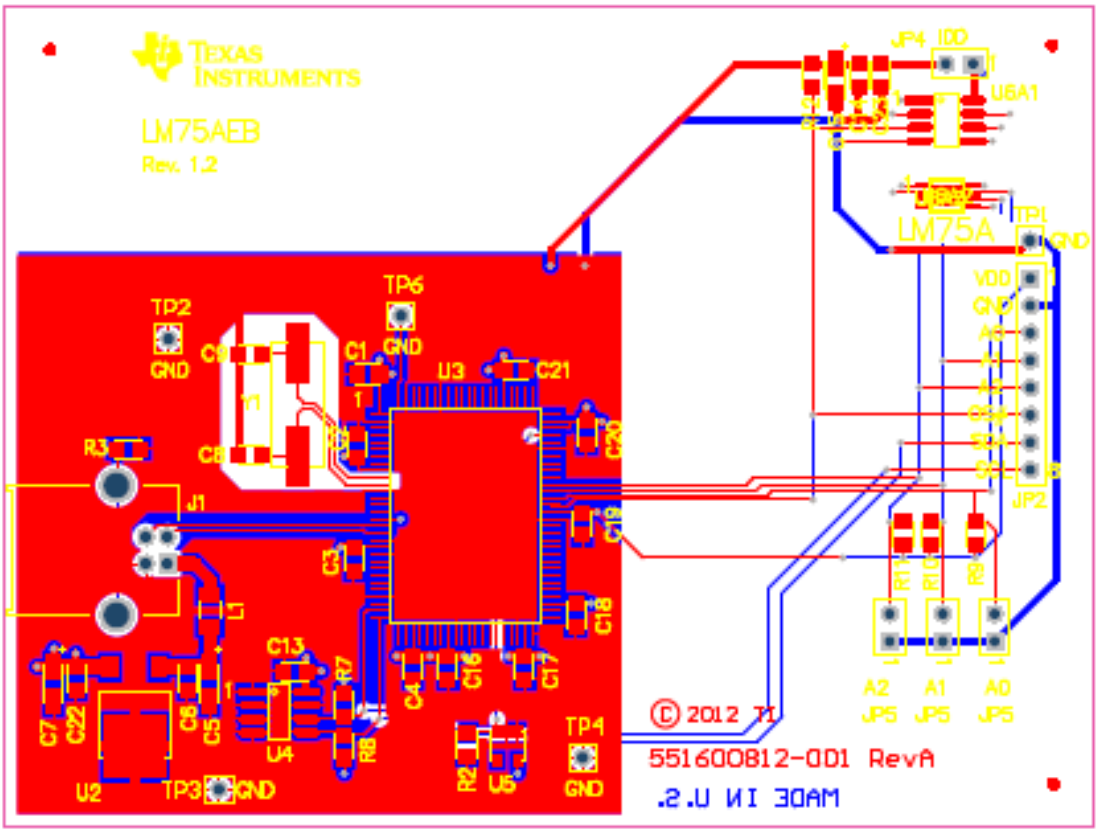


Figure 4: Top Assembly Layer

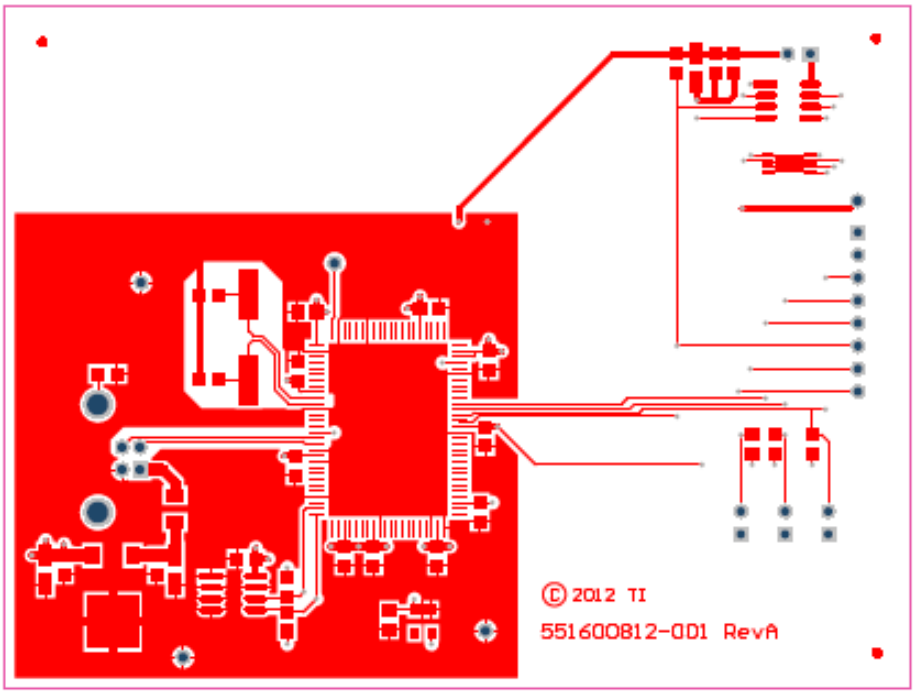


Figure 5: Top Layer Routing

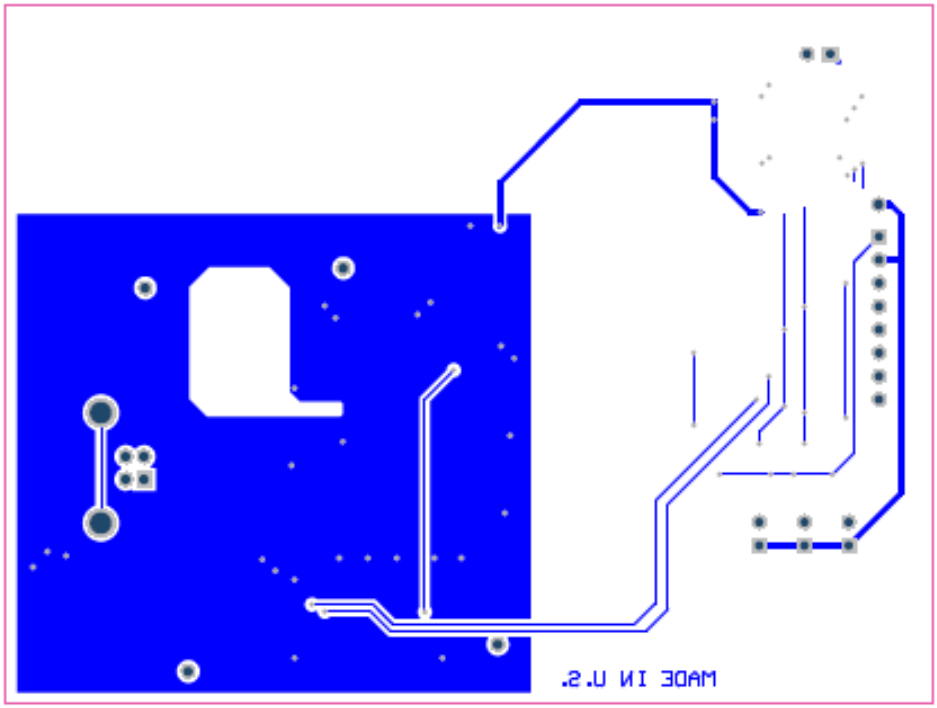


Figure 6: Bottom Layer Routing

4. Schematic

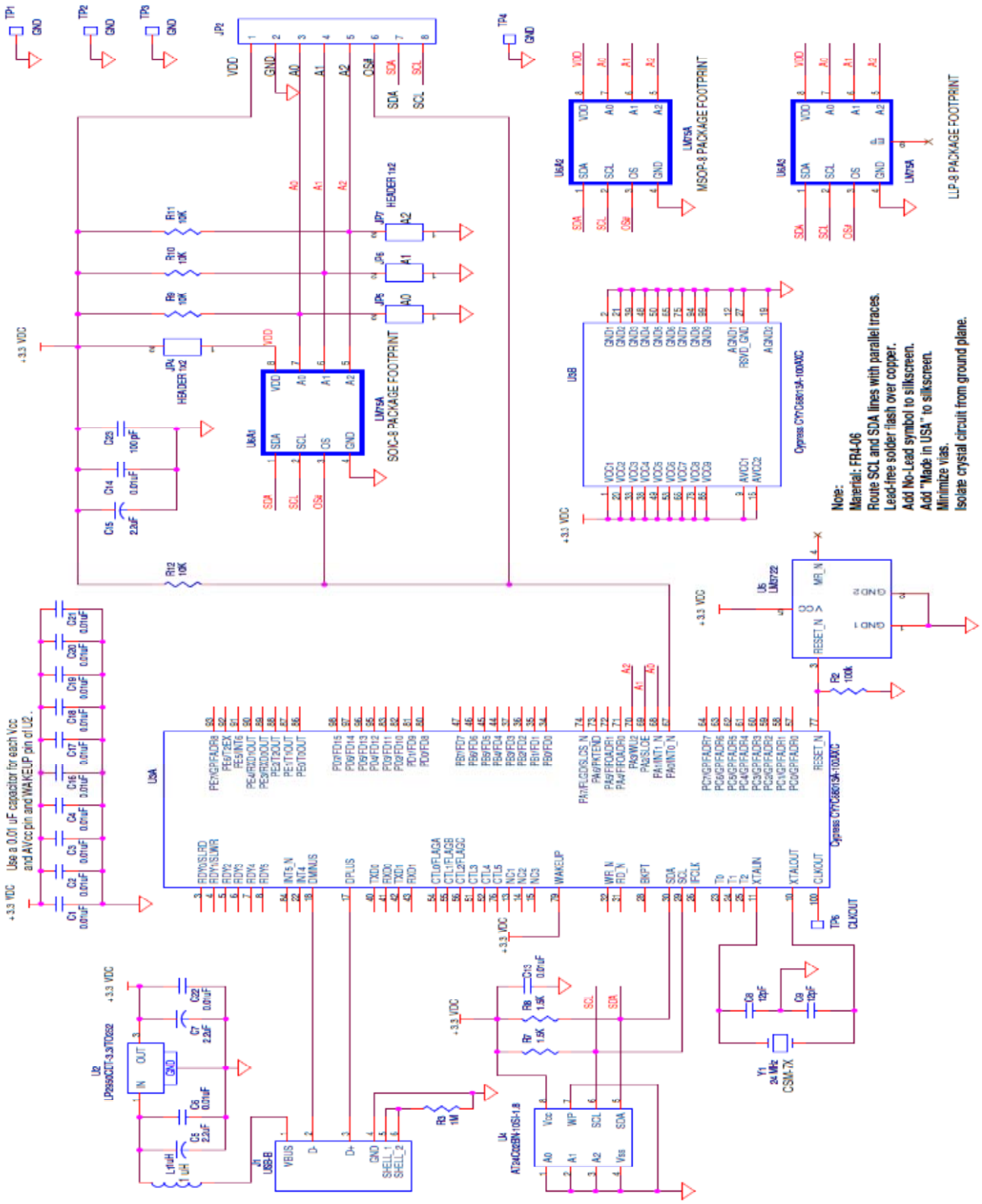


Figure 7: LM75AEB Schematic

Table 2: LM75AEB Bill of Materials

COUNT	REF DES	DESCRIPTION	SIZE	MFR	PART NUMBER
3	C5,C7,C15	Capacitor, tantalum,2.2Uf,10V	3216	Kemet	T491A225K010AT
14	C1,C2,C3,C4,C6,C13,C14,C16,C17,C18,C19,C20,C21,C22	Capacitor, ceramic, 10,000pF, 50V, 10%,X7R	0805	Murata	GRM216R71H103KA01D
1	C23	Capacitor, ceramic, 100pF, 50V, 5%,CGO	0805	TDK Corp	C2012C0G1H101J
2	C8,C9	Capacitor, ceramic, 12pF, 50V, 5%	0805	Kemet	C0805C120J5GACTU
1	J3	Connector,USB-B		TE Connectivity	292304-1
4	JP4,JP5,JP6,JP7	Conn,1x2 Header,.100 spacing	.100	Sullins	PEC36SAAN
1	JP2	Conn,1x2 Header,.100 spacing	.100	Sullins	PEC36SAAN
4	TP1,TP2,TP3,TP4,TP6	Test Point	.100	Keystone	5011K
1	L1	Choke 90 Ohms,Pcb	1206	Steward	MI1206K900R-10
3	R2,R15,R17	Res,100K Ohm,1/8W,1%,0805,SMD	0805	Panasonic	ERJ-6ENF1003V
4	R9,R10,R11,R12	Res,10K Ohm,1/8W,1%,0805,SMD	0805	Panasonic	ERJ-6ENF1002V
1	R12	Res,1M Ohm,1/8W,1%,0805,SMD	0805	Panasonic	ERJ-6ENF-1004V
2	R7,R8	Res,1.5K Ohm,1/8W,1%,0805,SMD	0805	Panasonic	ERJ-6ENF-1501V
1	U2	IC Reg,Simple Switcher,TO-263-7	TO-263	TI	LP2950CDT-3.3/NOPB
1	U3	USB Microcontroller FX2LP 100 Pin	TQFP	Cypress	CY7C68013A-100ACX
1	U6	LM75A Temperature Sensor	SOIC-8	TI	LM75AIM/NOPB
1	U4	IC Serial Eeprom 2K (256x8),1.8V	SOIC-8	On Semi	CAT24C02WI-GT3
1	U5	5-Pin Microprocessor Reset Circuit	SOT-23	TI	LM3722EM5-3.08/NOPB
1	PCB	PCB,FR4,62 Mils Thick	6.424x4.74	Gorilla Circuits	LM75AEB/NOPB
1	Y1	Crystal 24.0 MHZ,4 Pin	.449x189	ECS Inc.	XC1001CT-ND
4	F1,F2,F3,F4	Bump Hemisphere,Black	.440x.20	3M	SJ5003-0-ND

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.
~

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Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

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(2) Use this product only after you obtained the license of Test Radio Station as provided in Radio Law of Japan with respect to this product, or

(3) Use of this product only after you obtained the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to this product.

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