Using the LM20X Evaluation Board

Contents

1 INTRODUCTION 2
2 SETUP 2
2.1 Input/Output Connector Description 2
2.2 Operation 3
3 BOARD LAYOUT 4
4 BILL OF MATERIALS 5
5 SCHEMATIC 6

List of Figures

1 Testpoint Terminal 2
2 LM20xEVM 3
3 Top Assembly Layer 4
4 Bottom Assembly Layer 4

List of Tables

1 Device and Package Configurations 2

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1 INTRODUCTION

The Texas Instruments LM20x evaluation module (EVM) helps designers learn about the operation, and evaluate the performance of the LM20x Analog Temperature Sensors chip. The LM20xEVM is in place of LM20B-EVAL, LM20C-EVAL, and LM20S-EVAL boards.

The EVM contains three Temperature Sensors (See Table 1).

Table 1. Device and Package Configurations

TEMP SENSOR	IC	PACKAGE
U1	LM20BIM7	SC-70
U2	LM20CIM7	SC-70
U3	LM20SITL	DSBGA

2 SETUP

2.1 Input/Output Connector Description

J1.P1 – Output is the output voltage terminal of the LM20B analog temperature sensor.

J1.P2 – Output is the output voltage terminal of the LM20C analog temperature sensor.

J1.P3 – Output is the output voltage terminal of the LM20S analog temperature sensor.

J1.P4 – Input is the ground terminal for all analog temperature sensors.

J1.P5 – Input is the power supply terminal for all analog temperature sensors.

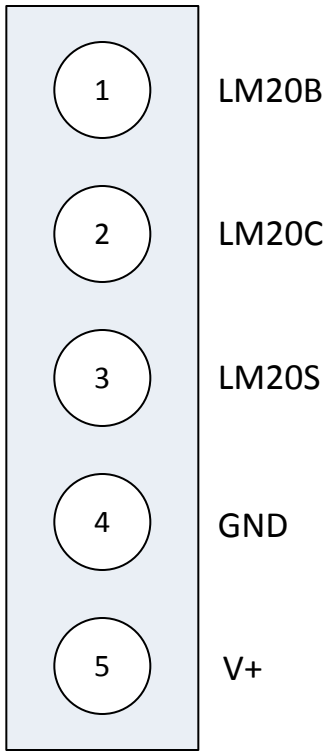


Figure 1. Testpoint Terminal

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2.2 Operation

Apply a voltage to V+ of J1 connector pin 5, and GND to J1 pin 4.

Measure the output voltage of the desired analog temperature sensors.

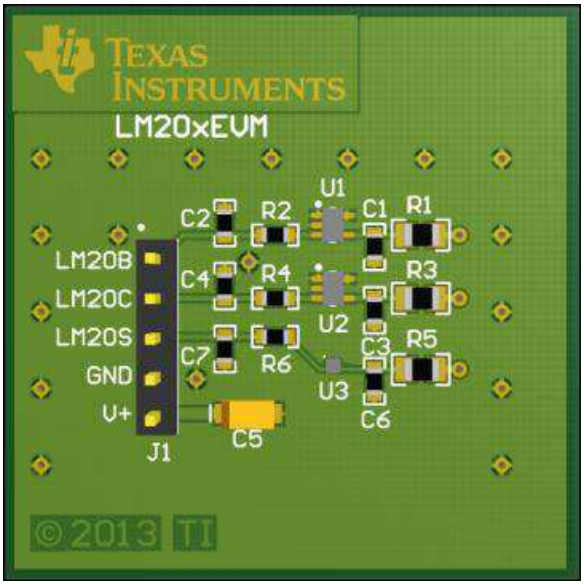


Figure 2. LM20xEVM

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3 BOARD LAYOUT

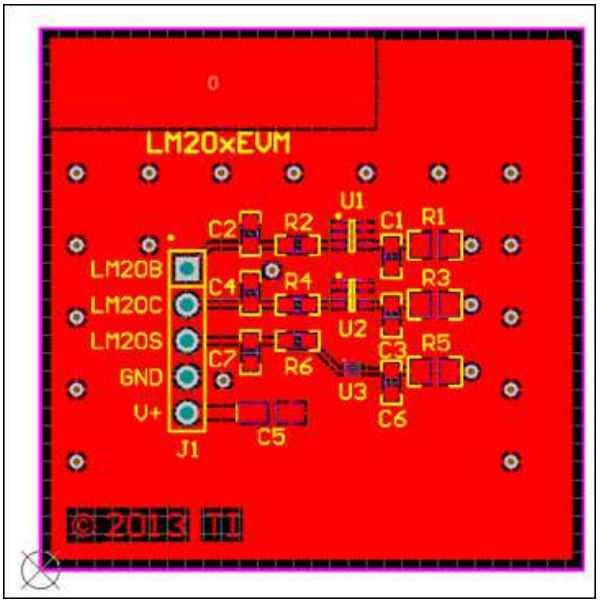


Figure 3. Top Assembly Layer

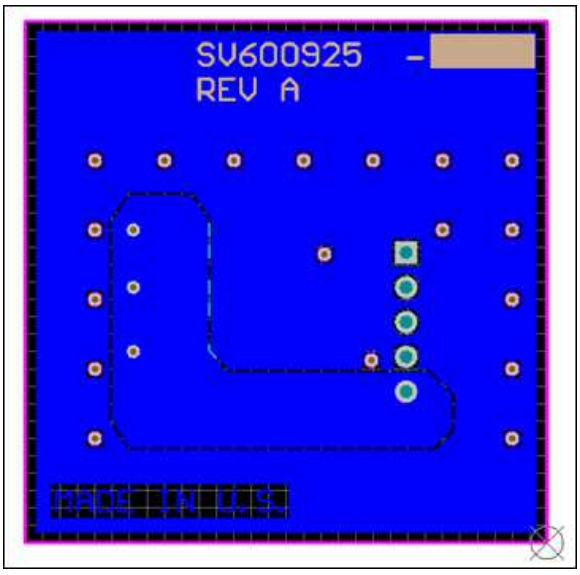


Figure 4. Bottom Assembly Layer

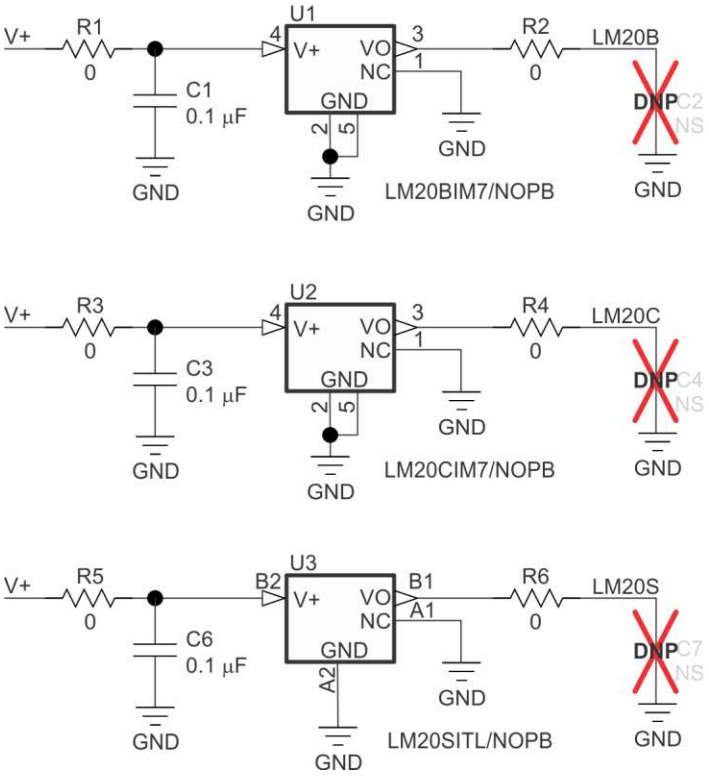
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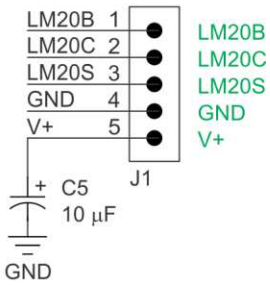
4 BILL OF MATERIALS

DESIGNATOR	QTY	VALUE	DESCRIPTION	PKG REF	PART NUMBER	MANUFACTURER
C1, C3, C6	3	0.1uF	CAP, CERM, 0.1uF, 16V, +/-5%, X7R, 0603	0603	0603YC104JAT2A	AVX
C5	1	10uF	CAP, TANT, 10uF, 10V, +/-20%, 1.8 ohm, 3216-18 SMD	3216-18	TPSA106M010R1800	AVX
J1	1		Header, TH, 100mil, 5x1, Gold plated, 230 mil above insulator	TSW-105-07-G-S	TSW-105-07-G-S	Samtec, Inc.
R1, R3, R5	3	0	RES, 0 ohm, 5%, 0.125W, 0805	0805	CRCW08050000Z0EA	Vishay-Dale
R2, R4, R6	3	0	RES, 0 ohm, 5%, 0.1W, 0603	0603	CRCW06030000Z0EA	Vishay-Dale
U1	1		2.4V, 10µA Temperature Sensor, 5-pin SC-70 Micro SMD, Pb-Free	MAA05A	LM20BIM7/NOPB	Texas Instruments
U2	1		2.4V, 10µA Temperature Sensor, 5-pin SC-70 Micro SMD, Pb-Free	MAA05A	LM20CIM7/NOPB	Texas Instruments
U3	1		2.4V, 10µA Temperature Sensor, 4-pin SC-70 Micro SMD, Pb-Free	TLA04ZZA	LM20SITL/NOPB	Texas Instruments
C2, C4, C7	0	0.1uF	CAP, CERM, 0.1uF, 16V, +/-5%, X7R, 0603	0603	0603YC104JAT2A	AVX

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5 SCHEMATIC





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      This kit is designed to allow product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and software developers to write software applications for use with the end product. This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the condition that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under part 15, part 18 or part 95 of this chapter, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under part 5 of this chapter.

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      CAUTION

      This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

      Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

      FCC Interference Statement for Class A EVM devices

      NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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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.*

3.2 *Canada*

3.2.1 *For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210*

Concerning EVMs Including Radio Transmitters:

This device complies with Industry Canada license-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.

Concernant les EVMs avec appareils radio:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Concerning EVMs Including Detachable Antennas:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. 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.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. 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 EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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