CC3200MOD Launchpad (Evaluation board) User Guide

ECS Applications

Table 1.   Document Change Log

Date (Version)	Author	Approved by	Description
			Initial Release

Contents

Getting Started

1.1 Introduction

The CC3200MOD LaunchPad is an easy-to-use evaluation module for the CC3200 WIFI microcontroller Module. It contains everything needed to start developing on a low-power Arm Cortex M4F MCU, including onboard emulation for programming and debugging as well as onboard buttons and LEDs for quick integration of a simple user interface.

The CC3200 supports growing applications with increased CPU speed, memory, and 32-bit performance.

Rapid prototyping is a snap thanks to the 40-pin headers and a wide variety of BoosterPack plug-in modules that enable technologies such as , graphical displays, Audio codec, Antenna diversity, environmental sensing, and much more.

1.2 Key Features

- Low-Power ARM Cortex M4F CC3200MOD module with 802.11 bgn WIFI

- 40-pin LaunchPad standard that leverages the BoosterPack ecosystem

- FTDI based JTAG emulation with Serial port for flash programming.

- Two buttons and three LEDs for user interaction

- Backchannel UART through USB to PC.

- On-board chip antenna with U.FL for conducted testing.

- On-board Accelerometer and Temperature sensor for Out of Box demo.

- Micro USB connector for power and debug connections.

2   Hardware
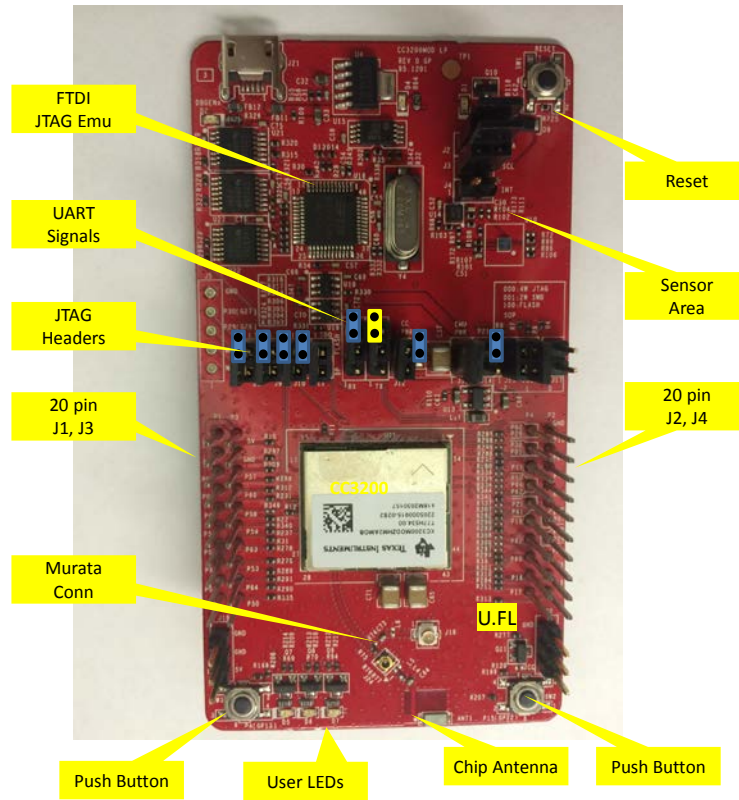
EVM Overview

2.1   Block Diagram

Block Diagram

2.2   Hardware features of the CC3200MOD Launchpad (Evaluation board)

- CC3200MOD Module with CC3200 device with RF filter, serial flash and crystal.
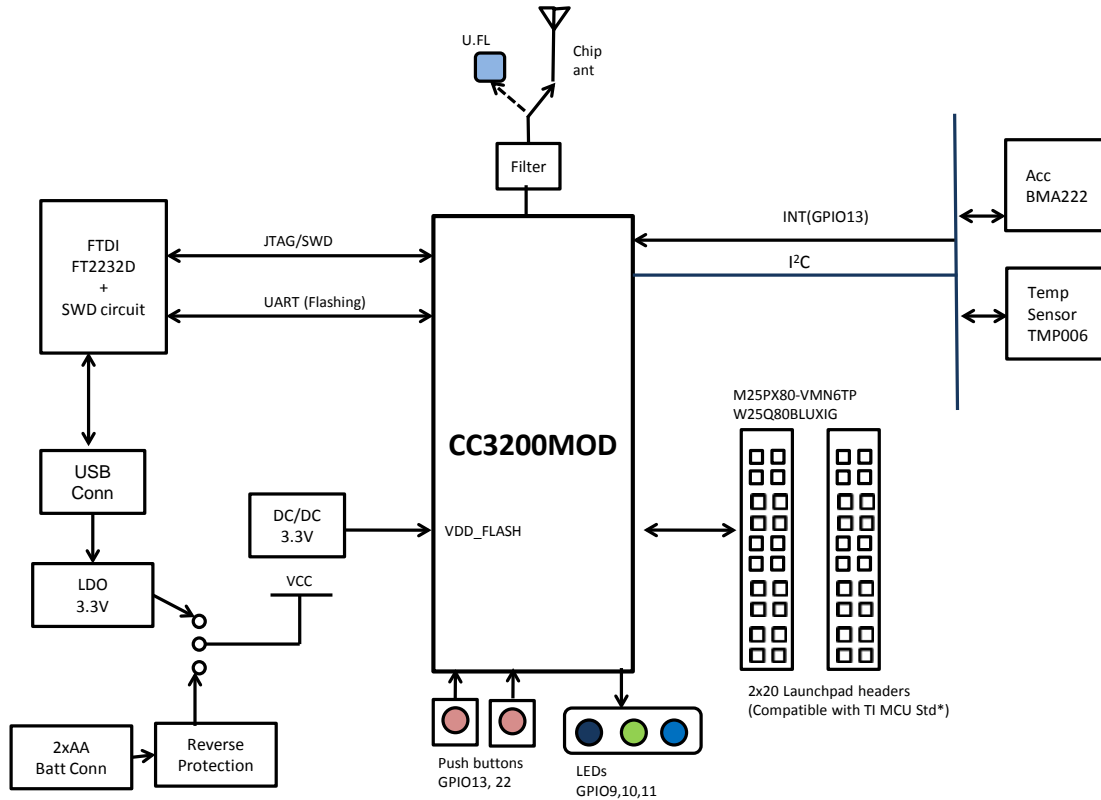
- Low-Power ARM Cortex M4 with 802.11 bgn WIFI

- 40-pin LaunchPad standard that leverages the BoosterPack ecosystem

- FTDI based JTAG emulation with Serial port for flash programming.

- Supports both 4 wire JTAG and 2 wire SWD

- Two buttons and three LEDs for user interaction

- Virtual COM port UART through USB on PC

- On-board chip antenna with U.FL for conducted testing.

- On-board Accelerometer and Temperature sensor for Out of Box demo with option to isolate them from the I2C bus.

- Micro USB connector for power and debug connections.

- Headers for current measurement and external JTAG connection.

- Bus powered device with no external power required for WIFI.

- Long range transmission with highly optimized antenna (200m Typical in open air with a 6dBi antenna AP)

- Can be powered with external 2xAA or 2xAAA alkaline batteries working down to 2.3V typ.

2.2.1 Power connections

The board can be powered by using the on-board micro USB connector. An on-board LDO provides 3.3V for the CC3200 and the rest of the board to operate. This supply can be isolated from the LDO using the jumpers on the board.

J12	Current measurement	Measure the current flowing into the CC3200 device.
J13	Board power	Short: Supply the board power from the on-board LDO. Open : Supply the board power from the J20 (battery connector)
J19	5V power	5V output from the USB VBUS (has a diode drop of up to 0.4V)
J20	3.3V power input	Can be used to power the board from an external 2XAA battery pack. It has in-built reverse voltage protection to prevent the battery from being plugged in the reverse manner.

Various powering options are discussed in subsequent sections.

2.2.2 2x20 pin connector assignment

The signal assignment on the 2x20 pin connector is shown below. The convention of J1..J4 is replaced with P1…P4 to avoid confusion with the actual board reference.

P1		Dev Pin#	Dev Pin#	P3	
Ref	Signal			Signal	
1	3.3V			5V	
2	ADC_CH1	58		GND	
3	UART0_RX	4	57	ADC_CH0	
4	UART0_TX	3	60	ADC_CH3	
5	GPIO	61	58*	ADC_CH1	
6	ADC_CH2	59	59*	ADC_CH2	
7	SPI_CLK	5	63	AUD_SYNC	
8	GPIO	62	53	AUD_CLK	
9	I2C_SCL	1	64	AUD_DOUT	
10	I2C_SDA	2	50	AUD_DIN	
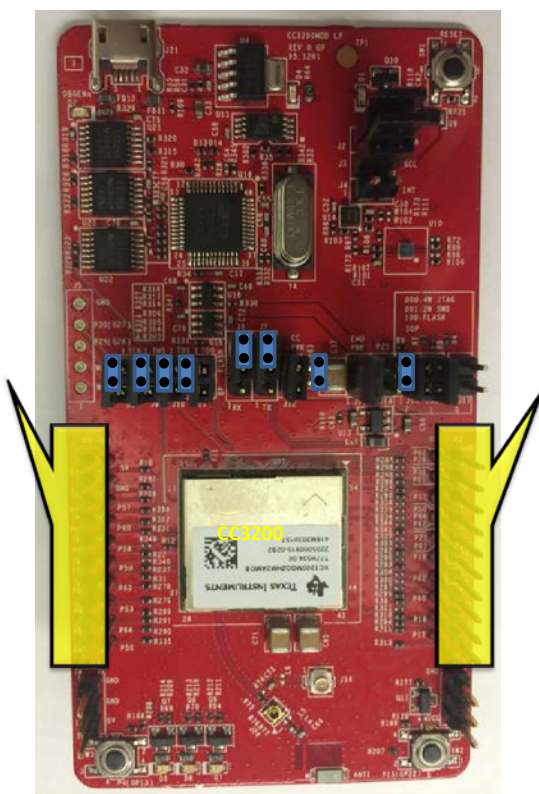
P4	Dev Pin#	Dev Pin#	P2	Ref
Signal			Signal	
PWM	2*		GND	1
PWM	1*	18	GPIO	2
PWM	17*	8	SPI_CS	3
PWM	64*	45	GPIO	4
CCAP/GPIO	21*		RESET_OUT	5
CCAP/GPIO	18*	7	SPI_DOUT	6
GPIO	62*	6	SPI_DIN	7
GPIO	60*	21	GPIO	8
GPIO	16	55	GPIO	9
GPIO	17	15	GPIO	10

The signal mappings are as per the table above. All the signals are referred by the pin-no in the SDK and the table above shows the default mappings. Note that some of the pins are repeated across the connector. For e.g. pin 62 is available on P1 and P4, but only P1 is connected by default. The signal on P4 is marked with a *(star) to signify that is not connected by default. It can be routed to the pin by using a 0 Ohm resistor in the path. Please refer to the schematics and placement diagram for the exact resistor placement.

2.3 Power

The Launchpad is designed to work from the USB provided power supply as it enumerates as a bus-powered device. Care has been taken in the design to ensure that the board does not violate the in-rush limits of the USB bus. The board can also be powered by an external 2xAA or 2xAAA battery which is connected on J20.
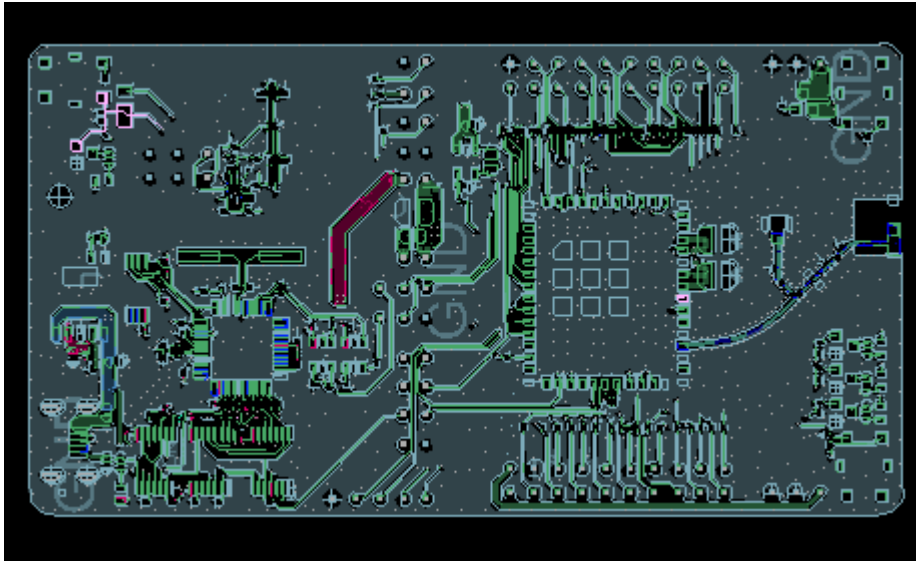
2.4   PCB Layout information

Figure 1 : TOP Layer
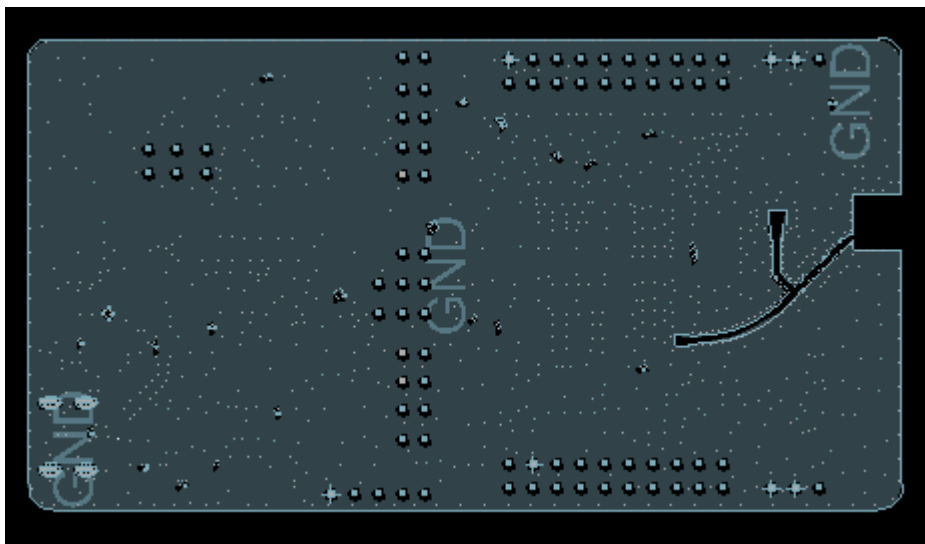
Figure 2 : Layer-2
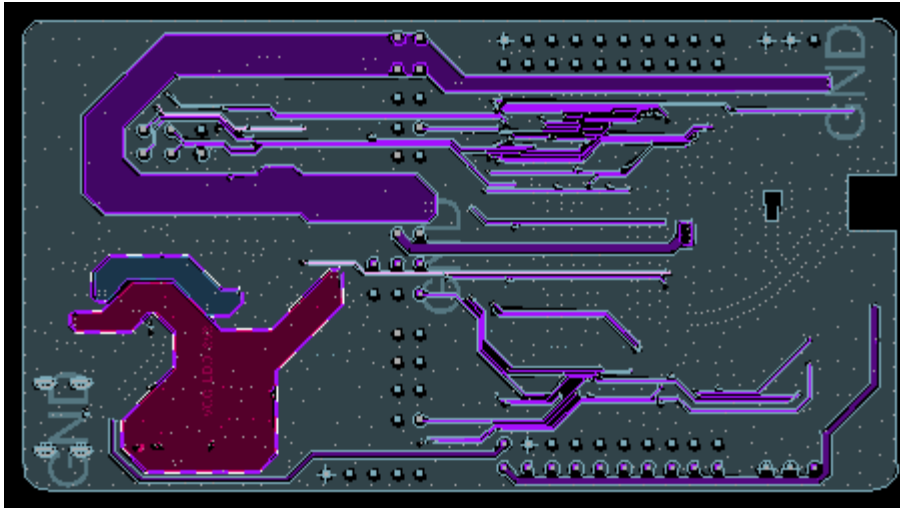
Figure 3 : Layer-3
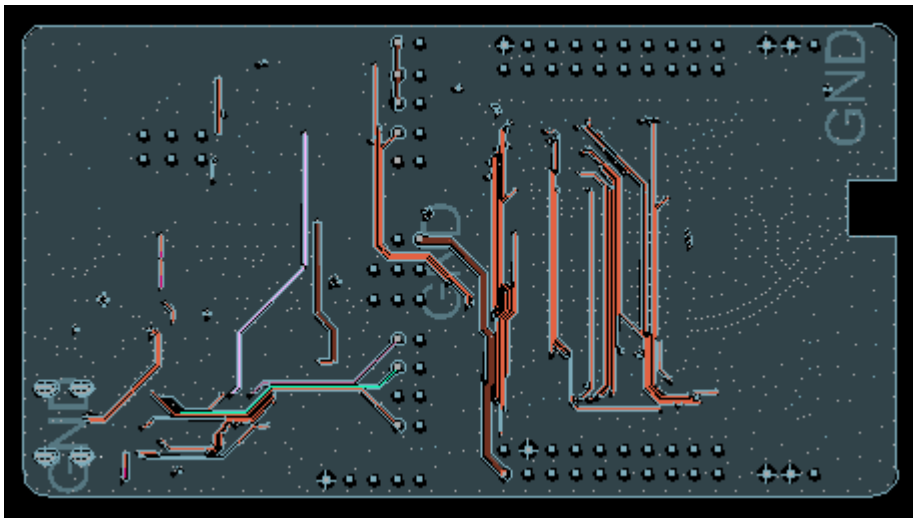
Figure 4 : Bottom Layer

2.5 **Schematics**

Temp Sensor

Isolate sensor I2C

Accelerometer

POWER MANAGEMENT

1A LDO

CC3101 can be powered
from Batt or 3.3V LDO

For current measurement

Near the module

BATT CONN

Reverse voltage
protection

For powering
external boards
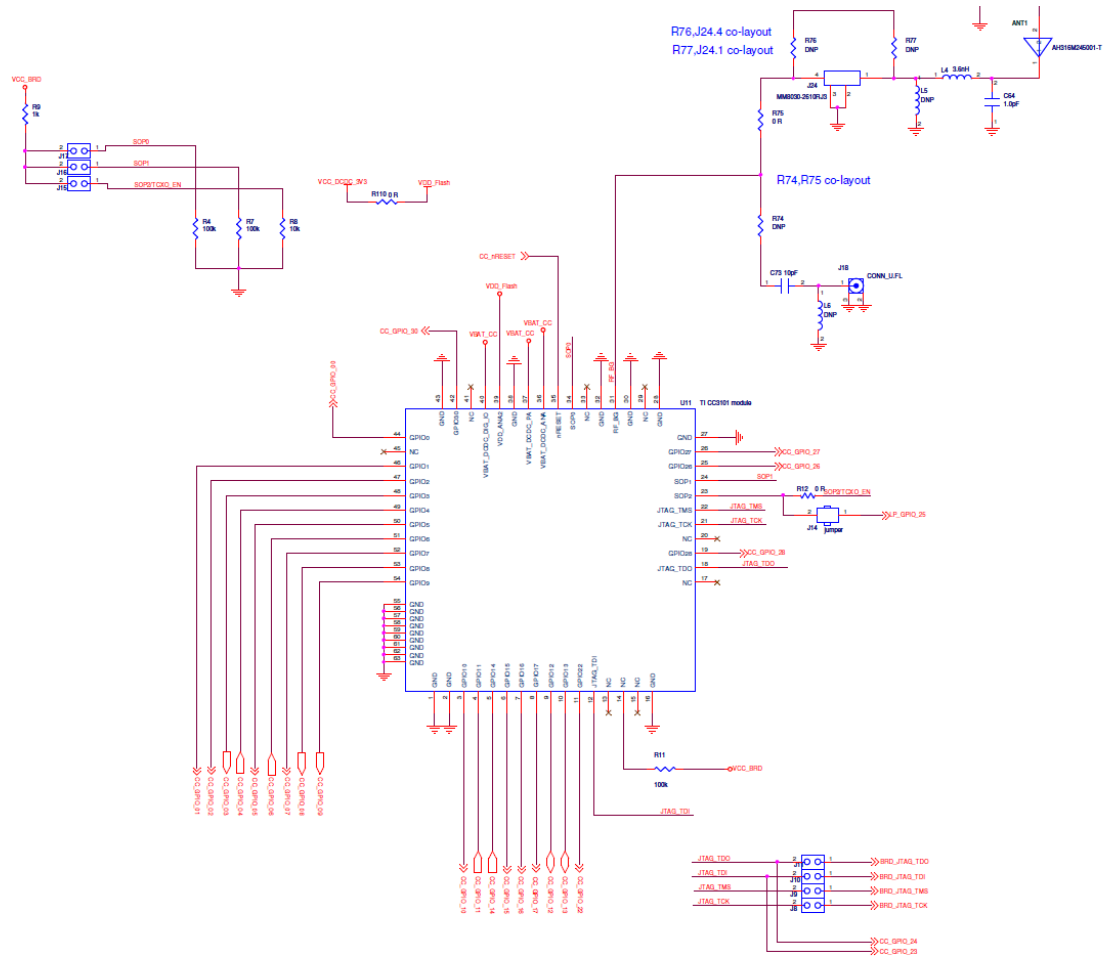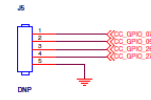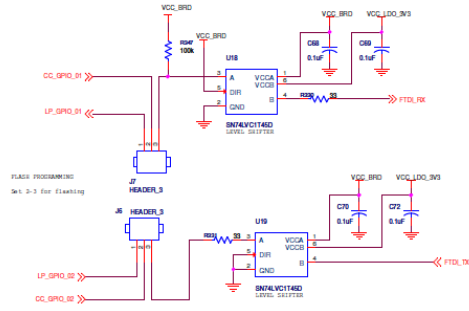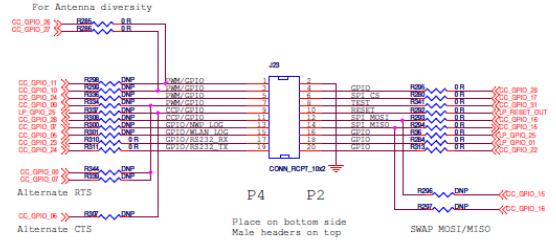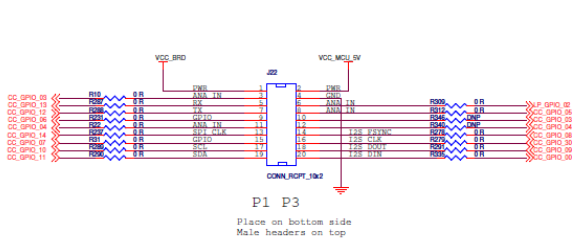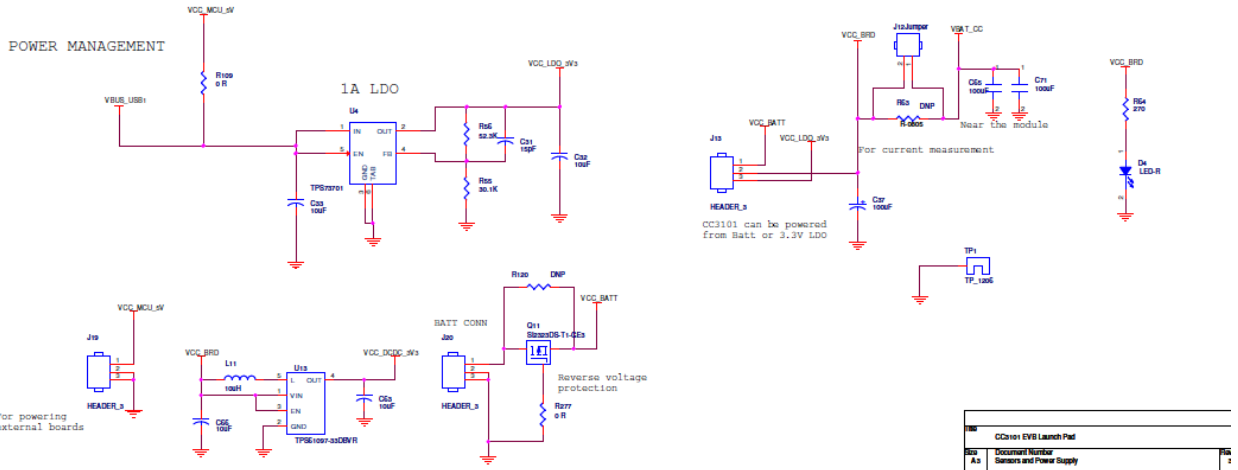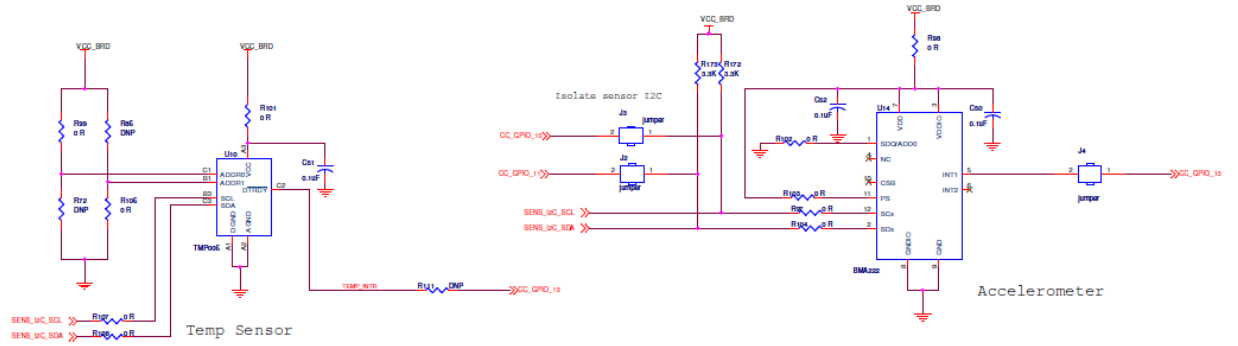
CC3101 EVB Launch Pad

Size	Document Number	Rev
A3	Sensors and Power Supply	2
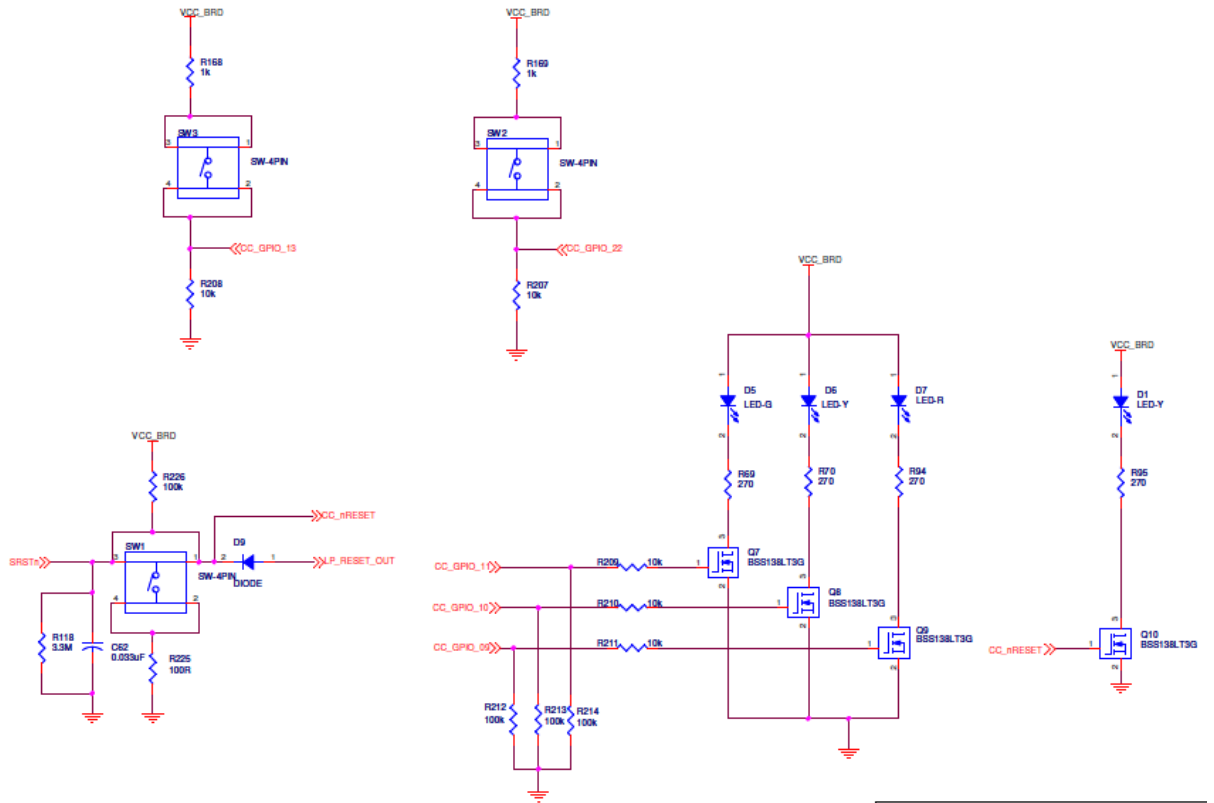
2.6 Bill of materials

NO.	Value	Qty	Description	PCB Footprint	Part Number	Manufacturer	Mfr. PN	Part Reference
1	0 R	43	RES C SMD 0402 0ohm 5% GP/HF	R-0402S0	251.00681.025	Yageo	RC0402JR-070RL	R10 R12 R22 R31 R36 R75 R97 R98 R99 R101 R102 R103 R104 R106 R107 R108 R109 R110 R231 R237 R277 R278 R279 R280 R284 R285 R286 R287 R288 R289 R290 R291 R292 R293 R294 R295 R309 R310 R311 R312 R313 R335 R341
2	33nF	2	CAP CER 33nF 10% 10V SMD 0402 GP/HF X7R T=0.5mm	C-0402S0	202.00095.005	MURATA	GRM155R71A333KA01D	C54 C62
3	0.1uF	14	CAP CER 100nF 10% 10V SMD 0402 GP/HF X5R 0.5mm	C-0402S0	202.00008.015	Murata	GRM155R61A104KA01D	C50 C51 C52 C55 C56 C57 C58 C68 C69 C70 C72 C75 C76 C77
4	1.0pF	1	CAP CER 1.0pF +-0.25pF 50V SMD 0402 GP/HF NPO T =0.55mm	C-0402S0	202.00021.005	WALSIN	0402N1R0C500LT	C64
5	1.5Kohm	1	RES C SMD 0402 1.5Kohm 5% GP/HF	R-0402S0	251.00675.015	YAGEO	RC0402JR-071K5L	R345
6	100uF	3	CAP CER 100uF 20% 6.3V SMD 1210 GP/HF X5R 2.5mm	C-1210	205.00025.005	MURATA	GRM32ER60J107ME20L	C37 C65 C71
7	100k	8	RES C SMD 0402 100Kohm 1% GP/HF	R-0402S0	261.00840.025	Yageo	RC0402FR-07100KL	R4 R7 R11 R212 R213 R214 R226 R347
8	100R	1	RES C SMD 0402 100ohm 5% GP/HF	R-0402S0	251.00004.025	Yageo	RC0402JR-07100RL	R225
9	10k	19	RES C SMD 0402 10Kohm 1% GP/HF	R-0402S0	261.00839.035	Yageo	RC0402FR-0710KL	R8 R30 R32 R34 R207 R208 R209 R210 R211 R302 R314 R315 R318 R319 R322 R325 R328 R329 R342
10	10pF	1	CAP CER 10pF +-0.25pF 50V SMD 0402 GP/HF NPO 0.5mm	C-0402S0	202.00035.005	WALSIN	0402N100C500LT	C73
11	10uF	4	CAP CER 10uF 20% 6.3V SMD 0603 GP/HF X5R T=0.8mm	C-0603S0	203.00919.005	TDK	C1608X5R0J106MT	C32 C33 C63 C66
12	10uH	1	IND C 10uH 20% 100mA 0.6ohm SMD 0805 GP/HF	L-0805	130.00108.005	MURATA	LQM21FN100M70L	L11
13	15pF	1	CAP CER 15pF 5% 25V SMD 0402 GP/HF NPO T =0.55mm	C-0402S0	202.00052.005	WALSIN	0402N150J250LT	C31
14	6MHz-XTAL-4	1	XTAL 6MHz 30ppm 20pF 150ohm SMD	O-SMD49S12X4_8S0	9C06000086	TXC		Y4
15	1K	3	RES C SMD 0402 1Kohm 1% GP/HF	R-0402S0	261.00835.025	Yageo	RC0402FR-071KL	R9 R168 R169
16	2.2K	1	RES C SMD 0402 2.2Kohm 5% GP/HF	R-0402S0	251.00014.025	WALSIN	WR04X222 JTL	R35
17	270	6	RES C SMD 0402 270ohm 5% GP/HF	R-0603S0	251.00025.025	Yageo/Phycomp.	RC0402JR-07270RL	R64 R69 R70 R94 R95 R326
18	30pF	2	CAP CER 30pF 5% 50V SMD 0402 GP/HF NPO T=0.5mm	C-0402S0	202.01156.015	WALSIN	0402N300J500CT	C59 C60
19	28ohm	2	RES C SMD 0402 28ohm 1% GP/HF	R-0402S0	261.00027.005	YAGEO	RC0402FR-0728RL	R28 R343
20	3.3K	2	RES C SMD 0402 3.3Kohm 5% GP/HF	R-0402S0	251.00027.005	TA-I	RM04JTN332	R172 R173
21	3.3M	1	RES C SMD 0402 3.3Mohm 5% GP/HF	R-0402S0	251.00689.005	TA-I	RM04JTN335	R118
22	3.6nH	1	IND C 3.6nH 0.3nH 300mA 0.2ohm Q=8 SMD 0402 GP/HF	I-0402s0	130.01491.005	TAIYO	HK10053N6S-T	L4
23	30.1K	1	RES C SMD 0402 30.1Kohm 1% GP/HF	R-0402S0	261.00915.005	YAGEO	RC0402FR-0730K1L	R55
24	33ohm	15	RES C SMD 0402 33ohm 5% GP/HF	R-0402S0	251.00657.015	Yageo	RC0402JR-0733RL	R303 R304 R305 R306 R316 R317 R320 R321 R323 R324 R327 R330 R331 R332 R333
25	470ohm	1	RES C SMD 0402 470ohm 5% GP/HF	R-0402S0	251.00034.005	Yageo	RC0402JR-07470RL	R338
26	52.3K	1	RES C SMD 0402 52.3Kohm 1% GP/HF	R-0402S0	261.00978.005	TA-I	RM04FTN5232	R56
27	60R	2	BEAD C 60ohm 25% 4A 0.02ohm SMD 0603 GP/HF	L-0603S0	151.00402.005	CHILISIN	UPB160808T-600Y-N	FB11 FB12
28	93LC46B-I/MS	1	Serial EEPROM 2.5-5.5V 16-bit word size SMD	MSOP-8A		Microchip	93LC46BT-I/ST	U15
29	AH316M245001-T	1	2.4G wifi ANT	ANT-S3_2X1_6-2A		Taiyo_Yuden	AH316M245001-T	ANT1
30	BMA222	1	3-AXIS ACCELEROMETER DIGITAL SMD	tlp-2x2-12	JSBMA220	Bosch	BMA222E	U14
31	BSS138LT3G	4	MOSFET N-CH 50V 200MA SOT-23	sot-23b		On Semi	BSS138LT3G/BSS138LT1G	Q7 Q8 Q9 Q10
32	CONN_MICRO_USB	1	CONN MICRO USB B 5PIN 0.65mm SMD FEMALE RT GP	CJ-USBSUA-160M3B-L2A	342.00757.005	POWERWAY	SUA-160M3B-L2E-TR1	J21
33	CONN_RCPT_10x2	2	CONN RCPT .100" 20POS DUAL TIN	cn-10x2-2_54c	261.00675.015	Samtec	SSQ-110-03-T-D	J22 J23
34	CONN_U.FL	1	HEADER RF 1*1PORT D0.5/D2.0mm SMD MALE ST GP/HF	CJ-RF-S3_1X3-3	341.00021.005	FOXCONN	KK23017-01-7F	J18
35	DIODE	1	DIODE SBD 30V 1.0A SMD POWER DI123 GP/HF	D-DFLT51AS0	112.00419.005	DIODES	DFLS130L-7	D9
36	FT2232D	1	IC PER 4.35~5.25V SMD LQFP48 GP USB CONTROLLER FT2232	TQFP-48S0	JSFT2232D	FTDI	FT2232D	U16
37	HEADER_3	5	HEADER PIN 3P 2.54mm DIP MALE ST GP	CN-3X1-2_54		CVILUX	CH31032V200	J6 J7 J13 J19 J20
38	JUMPER_MALE	12	HEADER PIN 1*2P 2.54mm DIP MALE ST GP	CN-D2X1-2_54S0	341.00391.005	CVILUX	CH31022V202	J2 J3 J4 J8 J9 J10 J11 J12 J14 J15 J16 J17
39	LED_G	2	LED CHIP 35mcd G 571nm 2P SMD 1.6*0.8mm GP/HF LTST-C190	LD-0603S0	123.00170.005	LITEON	LTST-C190KGKT	D2 D5
40	LED_R	2	LED CHIP 45~180mcd R 624~638nm 2P SMD 1.6*0.8mm GP/HF	LD-0603S0	123.00172.005	LITEON	LTST-C190KRKT	D4 D7
41	LED_Y	2	LED CHIP 60mcd Y 605nm 2P SMD 1.6*0.8mm GP/HF LTST-C190	LD-0603A	123.00171.005	LITEON	LTST-C190KFKT	D1 D6
42	MM8030-2610RJ3	1	HEADER RF 1*1PORT D=0.5/1.35mm SMD FEMALE ST GP	CN-MM8030S0	341.00454.005	MURATA	MM8030-2610RJ3	J24
43	SI2323DS-T1-GE3	1	MOSFET P-CH 20V 3.7A SOT-23-3	sot-23b		Vishay	SI2323DS-T1-GE3	Q11
44	SN74LVC125APWR	2	IC BUFFERS 1.65~3.6V SMD TSSOP14 GP/HF SN74LVC125APWR	SSOP-14S0	075.00394.005	TI	SN74LVC125APWRG4	U21 U23
45	SN74LVC126APWR	1	IC CMOS 1.65~3.6V SMD TSSOP14 GP/HF SN74LVC126APWR	SSOP-14S0	075.00289.005	TI	SN74LVC126APWR	U22
46	SN74LVC1T45D	2	IC TRANSCEIVER 1.65~5.5V SMD SOT23-6 GP/HF SN74LVC1T45	SOT-23-6	082.00020.005	TI	SN74LVC1T45DBVR	U18 U19
47	SW-4PIN	3	SW TACT 50mA 12V SMD ST GP/HF	SW-1BT002S1	182.00083.005	FOXCONN	1BT002-0120L-7H	SW1 SW2 SW3
48	TMP006	1	IC SENSOR THERMOPILE 8DSBGA	tbga-3x3-8c		TI	TMP006AIYZFR	U10
49	TPS61097-33DBVR	1	IC REG BST SYNC 3.3V .1A SOT23-5	SOT_23_5	027.01039.005	TI	TPS61097-33DBVT	U13
50	TPS73701	1	IC REG 1.2~5.5V 1A SMD SOT223-6 GP/HF TPS73701DCQR	sot-223-6	027.00812.005	TI	TPS73701DCQR	U4
51	V5.5MLA	2	VARISTOR 5.5V 20A 2P SMD 0402 GP	R-0402S0	170.00089.005	LITTELFUSE	V5.5MLA0402NR	D13 D14
52	PCB	1	81.3mm*50.3mm, 4 layers, through hole		308.01741.005	ZHENDING	308.01741.005	
53	Module	1	Module, 802.11bgn 1x1, 17.5mmx20.5mm	LGA	T77H534.00	FOXCONN	T77H534.00	U11

2.7 Antenna information

Appearance and coordinates definition

Measurement data of antenna

Frequency [MHz]		@2400	@2450	@2500
Peak gain	[dBi]			
3-plane	TX-H	-2.3	-1.1	-1.4
	TX-V	-2.9	-1.1	-1.6
		-2.3	-1.1	-1.4
Average gain	[dBi]			
XY-plane	TX-H	-6.8	-4.6	-4.5
	TX-V	-11.8	-10.5	-9.1
	Plus(H,V)	-5.6	-3.6	-3.2
YZ-plane	TX-H	-6.3	-4.7	-4.9
	TX-V	-7.5	-5.2	-5.0
	Plus(H,V)	-3.8	-1.9	-1.9
ZX-plane	TX-H	-16.1	-14.2	-14.0
	TX-V	-5.7	-3.5	-3.7
	Plus(H,V)	-5.3	-3.1	-3.3
3-plane	TX-H	-8.0	-6.2	-6.2
	TX-V	-7.7	-5.5	-5.4
		-4.8	-2.8	-2.8
Efficiency [dB]		-5.0	-2.8	-2.9
VSWR [:1]		2.8	1.3	2.3

*Note: Peak gain(3-plane)=Peak(XY[H],XY[V],YZ[H])YZ[V],ZX[H])ZX[V])

*Note:The value is average value in 1 round of each inclination direction angle.

*Note: Average gain(3-plane)=Average(XY[Plus(H,V)],YZ[Plus(H,V)],ZX[Plus(H,V)])

Matching circuit constant

Antenna   Feed

Span:1GHz   65MHz @ VSWR<2
100MHz /DIV   125MHz @ VSWR<3

Frequency characteristic

Radiation pattern

XY-plane @2450MHz

YZ-plane @2450MHz

ZX-plane @2450MHz

STANDARD TERMS AND CONDITIONS FOR EVALUATION MODULES

1. *Delivery:* TI delivers TI evaluation boards, kits, or modules, including any accompanying demonstration software, components, or documentation (collectively, an "EVM" or "EVMs") to the User ("User") in accordance with the terms and conditions set forth herein. Acceptance of the EVM is expressly subject to the following terms and conditions

1.1 EVMs are intended solely for product or software developers for use in a research and development setting to facilitate feasibility evaluation, experimentation, or scientific analysis of TI semiconductors products. EVMs have no direct function and are not finished products. EVMs shall not be directly or indirectly assembled as a part or subassembly in any finished product. For clarification, any software or software tools provided with the EVM ("Software") shall not be subject to the terms and conditions set forth herein but rather shall be subject to the applicable terms and conditions that accompany such Software

1.2 EVMs are not intended for consumer or household use. EVMs may not be sold, sublicensed, leased, rented, loaned, assigned, or otherwise distributed for commercial purposes by Users, in whole or in part, or used in any finished product or production system.

2 *Limited Warranty and Related Remedies/Disclaimers*:

2.1 These terms and conditions do not apply to Software. The warranty, if any, for Software is covered in the applicable Software License Agreement.

2.2 TI warrants that the TI EVM will conform to TI's published specifications for ninety (90) days after the date TI delivers such EVM to User. Notwithstanding the foregoing, TI shall not be liable for any defects that are caused by neglect, misuse or mistreatment by an entity other than TI, including improper installation or testing, or for any EVMs that have been altered or modified in any way by an entity other than TI. Moreover, TI shall not be liable for any defects that result from User's design, specifications or instructions for such EVMs. Testing and other quality control techniques are used to the extent TI deems necessary or as mandated by government requirements. TI does not test all parameters of each EVM.

2.3 If any EVM fails to conform to the warranty set forth above, TI's sole liability shall be at its option to repair or replace such EVM, or credit User's account for such EVM. TI's liability under this warranty shall be limited to EVMs that are returned during the warranty period to the address designated by TI and that are determined by TI not to conform to such warranty. If TI elects to repair or replace such EVM, TI shall have a reasonable time to repair such EVM or provide replacements. Repaired EVMs shall be warranted for the remainder of the original warranty period. Replaced EVMs shall be warranted for a new full ninety (90) day warranty period.

3 *Regulatory Notices:*

3.1 *United States*

3.1.1 *Notice applicable to EVMs not FCC-Approved:*

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.

3.1.2 *For EVMs annotated as FCC – FEDERAL COMMUNICATIONS COMMISSION Part 15 Compliant:*

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.

FCC Interference Statement for Class B EVM devices

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
• *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

3.3 *Japan*
3.3.1 *Notice for EVMs delivered in Japan:* Please see http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_01.page 日本国内に輸入される評価用キット、ボードについては、次のところをご覧ください。
http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_01.page
3.3.2 *Notice for Users of EVMs Considered "Radio Frequency Products" in Japan:* EVMs entering Japan are NOT certified by TI as conforming to Technical Regulations of Radio Law of Japan.
If User uses EVMs in Japan, User is required by Radio Law of Japan to follow the instructions below with respect to EVMs:
1. Use EVMs in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
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.

【無線電波を送信する製品の開発キットをお使いになる際の注意事項】
本開発キットは技術基準適合証明を受けておりません。
本製品のご使用に際しては、電波法遵守のため、以下のいずれかの措置を取っていただく必要がありますのでご注意ください。
1. 電波法施行規則第6条第1項第1号に基づく平成18年3月28日総務省告示第173号で定められた電波暗室等の試験設備でご使用いただく。
2. 実験局の免許を取得後ご使用いただく。
3. 技術基準適合証明を取得後ご使用いただく。
なお、本製品は、上記の「ご使用にあたっての注意」を譲渡先、移転先に通知しない限り、譲渡、移転できないものとします。
上記を遵守頂けない場合は、電波法の罰則が適用される可能性があることをご留意ください。
日本テキサス・インスツルメンツ株式会社
東京都新宿区西新宿６丁目２４番１号
西新宿三井ビル
3.3.3 *Notice for EVMs for Power Line Communication:* Please see http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_02.page
電力線搬送波通信についての開発キットをお使いになる際の注意事項については、次のところをご覧くださ
い。 http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_02.page

4 *EVM Use Restrictions and Warnings:*
4.1 EVMS ARE NOT FOR USE IN FUNCTIONAL SAFETY AND/OR SAFETY CRITICAL EVALUATIONS, INCLUDING BUT NOT LIMITED TO EVALUATIONS OF LIFE SUPPORT APPLICATIONS.
4.2 User must read and apply the user guide and other available documentation provided by TI regarding the EVM prior to handling

or using the EVM, including without limitation any warning or restriction notices. The notices contain important safety information related to, for example, temperatures and voltages.

4.3 *Safety-Related Warnings and Restrictions:*

4.3.1 User shall operate the EVM within TI's recommended specifications and environmental considerations stated in the user guide, other available documentation provided by TI, and any other applicable requirements and employ reasonable and customary safeguards. Exceeding the specified performance ratings and specifications (including but not limited to input and output voltage, current, power, and environmental ranges) for the EVM may cause personal injury or death, or property damage. If there are questions concerning performance ratings and specifications, User should contact a TI field representative prior to connecting interface electronics including input power and intended loads. Any loads applied outside of the specified output range may also result in unintended and/or inaccurate operation and/or possible permanent damage to the EVM and/or interface electronics. Please consult the EVM user guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative. During normal operation, even with the inputs and outputs kept within the specified allowable ranges, some circuit components may have elevated case temperatures. These components include but are not limited to linear regulators, switching transistors, pass transistors, current sense resistors, and heat sinks, which can be identified using the information in the associated documentation. When working with the EVM, please be aware that the EVM may become very warm.

4.3.2 EVMs are intended solely for use by technically qualified, professional electronics experts who are familiar with the dangers and application risks associated with handling electrical mechanical components, systems, and subsystems. User assumes all responsibility and liability for proper and safe handling and use of the EVM by User or its employees, affiliates, contractors or designees. User assumes all responsibility and liability to ensure that any interfaces (electronic and/or mechanical) between the EVM and any human body are designed with suitable isolation and means to safely limit accessible leakage currents to minimize the risk of electrical shock hazard. User assumes all responsibility and liability for any improper or unsafe handling or use of the EVM by User or its employees, affiliates, contractors or designees.

4.4 User assumes all responsibility and liability to determine whether the EVM is subject to any applicable international, federal, state, or local laws and regulations related to User's handling and use of the EVM and, if applicable, User assumes all responsibility and liability for compliance in all respects with such laws and regulations. User assumes all responsibility and liability for proper disposal and recycling of the EVM consistent with all applicable international, federal, state, and local requirements.

5. *Accuracy of Information:* To the extent TI provides information on the availability and function of EVMs, TI attempts to be as accurate as possible. However, TI does not warrant the accuracy of EVM descriptions, EVM availability or other information on its websites as
accurate, complete, reliable, current, or error-free.

6. *Disclaimers:*

6.1 EXCEPT AS SET FORTH ABOVE, EVMS AND ANY WRITTEN DESIGN MATERIALS PROVIDED WITH THE EVM (AND THE DESIGN OF THE EVM ITSELF) ARE PROVIDED "AS IS" AND "WITH ALL FAULTS." TI DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, REGARDING SUCH ITEMS, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF ANY THIRD PARTY PATENTS, COPYRIGHTS, TRADE SECRETS OR OTHER INTELLECTUAL PROPERTY RIGHTS.

6.2 EXCEPT FOR THE LIMITED RIGHT TO USE THE EVM SET FORTH HEREIN, NOTHING IN THESE TERMS AND CONDITIONS SHALL BE CONSTRUED AS GRANTING OR CONFERRING ANY RIGHTS BY LICENSE, PATENT, OR ANY OTHER INDUSTRIAL OR INTELLECTUAL PROPERTY RIGHT OF TI, ITS SUPPLIERS/LICENSORS OR ANY OTHER THIRD PARTY, TO USE THE EVM IN ANY FINISHED END-USER OR READY-TO-USE FINAL PRODUCT, OR FOR ANY INVENTION, DISCOVERY OR IMPROVEMENT MADE, CONCEIVED OR ACQUIRED PRIOR TO OR AFTER DELIVERY OF THE EVM.

7. *USER'S INDEMNITY OBLIGATIONS AND REPRESENTATIONS.* USER WILL DEFEND, INDEMNIFY AND HOLD TI, ITS LICENSORS AND THEIR REPRESENTATIVES HARMLESS FROM AND AGAINST ANY AND ALL CLAIMS, DAMAGES, LOSSES,
EXPENSES, COSTS AND LIABILITIES (COLLECTIVELY, "CLAIMS") ARISING OUT OF OR IN CONNECTION WITH ANY HANDLING OR USE OF THE EVM THAT IS NOT IN ACCORDANCE WITH THESE TERMS AND CONDITIONS. THIS OBLIGATION
SHALL APPLY WHETHER CLAIMS ARISE UNDER STATUTE, REGULATION, OR THE LAW OF TORT, CONTRACT OR ANY OTHER LEGAL THEORY, AND EVEN IF THE EVM FAILS TO PERFORM AS DESCRIBED OR EXPECTED.

8. *Limitations on Damages and Liability:*

8.1 *General Limitations.* IN NO EVENT SHALL TI BE LIABLE FOR ANY SPECIAL, COLLATERAL, INDIRECT, PUNITIVE, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES IN CONNECTION WITH OR ARISING OUT OF THESE TERMS ANDCONDITIONS OR THE USE OF THE EVMS PROVIDED HEREUNDER, REGARDLESS OF WHETHER TI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. EXCLUDED DAMAGES INCLUDE, BUT ARE NOT LIMITED TO, COST OF REMOVAL OR REINSTALLATION, ANCILLARY COSTS TO THE PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, RETESTING, OUTSIDE COMPUTER TIME, LABOR COSTS, LOSS OF GOODWILL, LOSS OF PROFITS, LOSS OF SAVINGS, LOSS OF USE, LOSS OF DATA, OR BUSINESS INTERRUPTION. NO CLAIM, SUIT OR ACTION SHALL BE BROUGHT AGAINST TI MORE THAN ONE YEAR AFTER THE RELATED CAUSE OF ACTION HAS OCCURRED.

8.2 *Specific Limitations.* IN NO EVENT SHALL TI'S AGGREGATE LIABILITY FROM ANY WARRANTY OR OTHER OBLIGATION ARISING OUT OF OR IN CONNECTION WITH THESE TERMS AND CONDITIONS, OR ANY USE OF ANY TI EVM

PROVIDED HEREUNDER, EXCEED THE TOTAL AMOUNT PAID TO TI FOR THE PARTICULAR UNITS SOLD UNDER THESE TERMS AND CONDITIONS WITH RESPECT TO WHICH LOSSES OR DAMAGES ARE CLAIMED. THE EXISTENCE OF MORE THAN ONE CLAIM AGAINST THE PARTICULAR UNITS SOLD TO USER UNDER THESE TERMS AND CONDITIONS SHALL NOT ENLARGE OR EXTEND THIS LIMIT.

9. *Return Policy.* Except as otherwise provided, TI does not offer any refunds, returns, or exchanges. Furthermore, no return of EVM(s)

will be accepted if the package has been opened and no return of the EVM(s) will be accepted if they are damaged or otherwise not in

a resalable condition. If User feels it has been incorrectly charged for the EVM(s) it ordered or that delivery violates the applicable order, User should contact TI. All refunds will be made in full within thirty (30) working days from the return of the components(s), excluding any postage or packaging costs.

10. *Governing Law:* These terms and conditions shall be governed by and interpreted in accordance with the laws of the State of Texas,

without reference to conflict-of-laws principles. User agrees that non-exclusive jurisdiction for any dispute arising out of or relating to these terms and conditions lies within courts located in the State of Texas and consents to venue in Dallas County, Texas. Notwithstanding the foregoing, any judgment may be enforced in any United States or foreign court, and TI may seek injunctive reliefin any United States or foreign court.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265

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