DS100MB203EVK User's Guide

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. Introduction:

The DS100MB203EVK is a dual Lane 2:1/1:2 Mux/Buffer SMA evaluation kit. It provides a complete high bandwidth platform to evaluate the signal integrity and signal conditioning features of the DS100MB203SQ – 10.3125 Gbps Dual Lane 2:1/1:2 Mux/Buffer with Equalization and De-Emphasis.

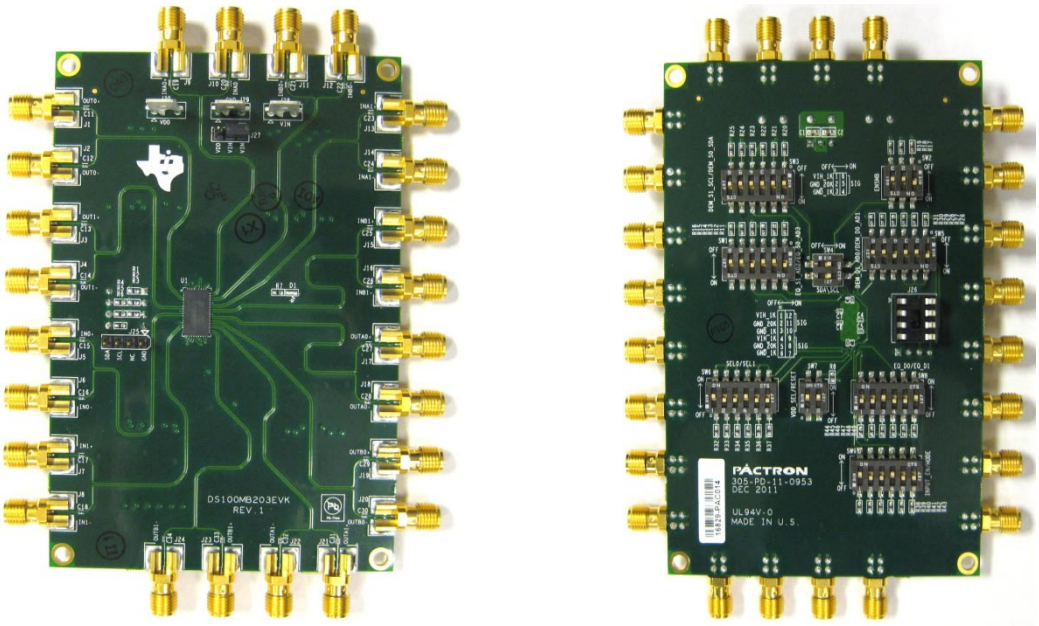

Figure 1. DS100MB203EVK (TOP / BOTTOM VIEW)

Table 1. Switches to set the 4-level input control pins

4 – level Input Settings	Setting for 3 pin switches (3-2-1)
0 – Tie 1k ohm to GND	**ON** – OFF – OFF
R – Tie 20k ohm to GND	OFF – **ON** – OFF
F – FLOAT (open)	OFF – OFF – OFF
1 – Tie 1k ohm to VIH	OFF – OFF – **ON**

The following switches are used to set the input condition for the 4-level inputs:
SW1, SW2, SW3, SW5, SW6, SW8, SW9.
There are 3 switches connected to an input signal pin. Each switch when set to the ON position sets the pin to one of the 4-level setting. The 6 pin switches are assigned similar to the 3 pin switches. The only difference is 2 signal pins are connected and thus 6-5-4 is for the one signal pin and 3-2-1 is for another signal pin. Please note only 1 switch at the ON position is allowed.

Table 2. Connection and Control Description

Component	Name	Function
J9 to J16 J5 to J8	S_INA0, S_INB0, SINA1, S_INB1, D_IN0, D_IN1	High speed differential inputs.
J1 to J4 J17 to J24	D_OUT0, D_OUT1, S_OUTA0, S_OUTB0, S_OUTA1, S_OUTB1	High speed differential outputs.
J28	VIN	DC Power – VIN = 3.3V
J29	GND	Ground
J30	VDD	DC Power – VDD = 2.5V
J27	VIN or VDD	Jumper – VIN or VDD to VIH power
J25	SDA, SCL	Optional SMBUS access 1x4 header pins
J26	EEPROM	Optional socket for EEPROM
SW1	EQ_S[1:0] or AD[3:2]	PIN MODE – EQ control for channel S inputs SMBUS MODE – AD[3:2] device address bits
SW2	ENSMB	ENSMB = 0 – PIN MODE ENSMB = 1 – SMBUS (slave mode) ENSMB = Float – SMBUS (master mode – load configuration from EEPROM)
SW3	DEM_S[1:0]	PIN MODE – DE control for channel S outputs
SW4	SDA/SCL	“ON” position connects SDA and SCL lines to the device pin.
SW5	DEM_D[1:0] or AD[1:0]	PIN MODE – DE control for channel D outputs SMBUS MODE – AD[1:0] device address bits
SW6	SEL0 SEL1	SEL0 pin for Lane 0 0: selects input S_INB0+/-, output S_OUTB0+/-. R: selects input S_INB0+/-, output S_OUTA0+/-. F: selects input S_INA0+/-, output S_OUTB0+/-. 1: selects input S_INA0+/-, output S_OUTA0+/-. SEL1 pin for Lane 1 0: selects input S_INB1+/-, output S_OUTB1+/-. R: selects input S_INB1+/-, output S_OUTA1+/-. F: selects input S_INA1+/-, output S_OUTB1+/-. 1: selects input S_INA1+/-, output S_OUTA1+/-.
SW7	VDD_SEL RESET	VDD_SEL – Enable or disable the internal 3.3V to 2.5V regulator (GND – enables the internal LDO for 3.3V to 2.5V). RESET – Enable or disable the device (GND – enables the device).
SW8	EQ_D[1:0]	PIN MODE – EQ control for channel D inputs

SW9	INPUT_EN MODE	INPUT_EN pin 0: Normal Operation, FANOUT is disabled, use SEL0/1 to select the A or B input/output (see SEL0/1 pin), input always enabled with 50 ohms. R: Reserved (DO NOT USE). F: AUTO - Use RX Detect, SEL0/1 to determine which input or output to enable, FANOUT is disable 1: Normal Operation, FANOUT is enabled (both S_OUT0/1 are ON). Input always enabled with 50 ohms. MODE pin 0: SATA/SAS, PCIe GEN 1/2 and 10GE R: PCIe GEN 3 F: Auto Detect (PCIe GEN 1/2 or GEN 3) 1: 10G-KR

2. Setup:

2.1. Connect J28, J29: VIN = 3.3V and GND.

For VIN = 3.3V:

Set SW7 pin1 (VDD_SEL) to the ON position (enable internal LDO regulator).
Do not connect VDD at J30.

2.2. Set jumper – J27 for VIH connection to VIN or VDD.

2.3. Connect 50 Ohm SMA cables to the board J1 to J24 SMA connectors.

2.4. Set the control pins to configure the device for desired operation.

SW7
RESET = 0: enables the device; set switch pin2 to the ON position to connect to GND.
SW9
INPUT_EN = 0: 50 ohm termination, 1:2 FANOUT is disabled; set switches (3-2-1) = (**ON**-OFF-OFF)
INPUT_EN = 1: 50 ohm termination, 1:2 FANOUT is enabled; set switches (3-2-1) = (OFF-OFF- **ON**)
SW9
MODE = 0: GEN 1,2 and 10GE mode; set switches (6-5-4) = (**ON**-OFF-OFF)
MODE = R: GEN 3 mode; set switches (6-5-4) = (OFF-**ON**-OFF)
MODE = 1: 10G-KR mode; set switches (6-5-4) = (OFF-OFF- **ON**)
SW6
SEL0 = 0: selects B channel; set switches (3-2-1) = (**ON**-OFF-OFF)
SEL0 = 1: selects A channel; set switches (3-2-1) = (OFF-OFF- **ON**)
SW6
SEL1 = 0: selects B channel; set switches (3-2-1) = (**ON**-OFF-OFF)
SEL1 = 1: selects A channel; set switches (3-2-1) = (OFF-OFF- **ON**)

2.5. Set the input equalization level.

For external pin mode control of the equalization level:

Set ENSMB = 0 (1kohm to GND) by using the SW2 (3-2-1) = (**ON**-OFF-OFF).
SW4 pin1,2 must be set to the OFF positions, so the SMBUS signals are disconnected.
Refer to Table 1 for information on the 3 switch settings for the 4 level input.

Example:
Set EQ_S[1:0] with SW1 for the S inputs (S_INA0, S_INB0, S_INA1, S_INB1).
SW1 (6-5-4), (3-2-1) = (OFF-**ON**-OFF), (OFF-**ON**-OFF) = EQ_S[1:0] = R,R = 16.6 dB at 5 GHz (level 6).
Set EQ_D1:0] with SW8 for the D inputs (D_IN0, D_IN1).
SW8 (6-5-4), (3-2-1) = (OFF-**ON**-OFF), (OFF-**ON**-OFF) = EQ_D[1:0] = R,R = 16.6 dB at 5 GHz (level 6).

Table 3: 16 EQ settings when in pin mode

Level	EQ_S[1:0] EQ_D[1:0]	SW1 – EQ_S[1:0] SW8 – EQ_D[1:0]						EQ (dB) at 4 GHz	EQ (dB) at 5 GHz
		6	5	4	3	2	1		
1	0, 0	**ON**	OFF	OFF	**ON**	OFF	OFF	4.9	5.3
2	0, R	**ON**	OFF	OFF	OFF	**ON**	OFF	7.9	8.7
3	0, F	**ON**	OFF	OFF	OFF	OFF	OFF	9.9	10.6
4	0, 1	**ON**	OFF	OFF	OFF	OFF	**ON**	11.0	11.7
5	R, 0	OFF	**ON**	OFF	**ON**	OFF	OFF	14.3	15.6
6	R, R	OFF	**ON**	OFF	OFF	**ON**	OFF	14.6	16.6
7	R, F	OFF	**ON**	OFF	OFF	OFF	OFF	17.0	18.3
8	R ,1	OFF	**ON**	OFF	OFF	OFF	**ON**	18.5	19.7
9	F ,0	OFF	OFF	OFF	**ON**	OFF	OFF	18.0	20.3
10	F, R	OFF	OFF	OFF	OFF	**ON**	OFF	22.0	23.6
11	F, F	OFF	OFF	OFF	OFF	OFF	OFF	24.4	25.8
12	F, 1	OFF	OFF	OFF	OFF	OFF	**ON**	25.8	27
13	1, 0	OFF	OFF	**ON**	**ON**	OFF	OFF	27.4	29.1
14	1, R	OFF	OFF	**ON**	OFF	**ON**	OFF	29.0	30.7
15	1, F	OFF	OFF	**ON**	OFF	OFF	OFF	31.4	32.7
16	1, 1	OFF	OFF	**ON**	OFF	OFF	**ON**	32.7	33.8

2.6. Set the output VOD and De-emphasis level.

For external pin mode control for the VOD and De-emphasis level:

Set ENSMB = 0 (1kohm to GND) by using the SW2 (3-2-1) = (**ON**-OFF-OFF).
SW4 pin1,2 must be set to the OFF positions, so the SMBUS signals are disconnected.
Refer to Table 1 for information on the 3 switch settings for the 4 level input.

Example:
Set DEM_S[1:0] with SW3 for the S outputs (S_OUTA0, S_OUTB0, S_OUTA1, S_OUTB1).
SW5 (6-5-4), (3-2-1) = (OFF-**ON**-OFF), (OFF-OFF-OFF) = DEM_D[1:0] = R,F (VOD=1.0V, DE=0 dB).
Set DEM_D[1:0] with SW5 for the D of outputs (D_OUT0, D_OUT1).
SW3 (6-5-4), (3-2-1) = (OFF-**ON**-OFF), (OFF-OFF-OFF) = DEM_S1:0] = R,F (VOD=1.0V, DE=0 dB).

Table 4: 16 settings of VOD and DE when in pin mode

Level	DEM_S[1:0] DEM_D[1:0]	SW3 – DEM_S[1:0] SW5 – DEM_D[1:0]							
		6	5	4	3	2	1	VOD (Vp-p)	DE (dB)
1	0, 0	**ON**	OFF	OFF	**ON**	OFF	OFF	0.6	0
2	0, R	**ON**	OFF	OFF	OFF	**ON**	OFF	0.8	0
3	0, F	**ON**	OFF	OFF	OFF	OFF	OFF	0.8	-3.5
4	0, 1	**ON**	OFF	OFF	OFF	OFF	**ON**	0.9	0
5	R, 0	OFF	**ON**	OFF	**ON**	OFF	OFF	0.9	-3.5
6	R, R	OFF	**ON**	OFF	OFF	**ON**	OFF	0.9	-6
7	R, F	OFF	**ON**	OFF	OFF	OFF	OFF	1	0
8	R ,1	OFF	**ON**	OFF	OFF	OFF	**ON**	1	-3.5
9	F ,0	OFF	OFF	OFF	**ON**	OFF	OFF	1	-6
10	F, R	OFF	OFF	OFF	OFF	**ON**	OFF	1.1	0
11	F, F	OFF	OFF	OFF	OFF	OFF	OFF	1.1	-3.5
12	F, 1	OFF	OFF	OFF	OFF	OFF	**ON**	1.1	-6
13	1, 0	OFF	OFF	**ON**	**ON**	OFF	OFF	1.2	0
14	1, R	OFF	OFF	**ON**	OFF	**ON**	OFF	1.2	-3.5
15	1, F	OFF	OFF	**ON**	OFF	OFF	OFF	1.2	-6
16	1, 1	OFF	OFF	**ON**	OFF	OFF	**ON**	1.2	-9

2.7. For SMBUS mode control of the EQ, VOD and De-emphasis level:

Set ENSMB = 1 (1kohm to VIH) by using the SW2 (3-2-1) = (OFF-OFF-**ON)**.
Set SW4 pin1,2 to the ON position so the SMBUS signals are connected.
Set SW3 pin1 thru pin6 switches to the OFF position so they do not connect to the SDA and SCL line.
Set the SW1 and SW5 for the AD[3:0] pins. AD[3:0]=0000 sets device slave address = B0'hex.
Connect SDA, SCL and GND to J25. Please refer to datasheet for register map for EQ, VOD and DEM.

Examples of register writes to configure the device:

0x06 0x18; disable CRC to allow control of register for EQ, VOD and DEM
0x0f 0x15; set EQ for S_INA0
0x16 0x15; set EQ for S_INB0
0x17 0xac; set D_OUT0 VOD to 1.0V
0x18 0x00; set D_OUT0 DEM to 0 dB
0x1d 0x15; set EQ for S_INA1
0x24 0x15; set EQ for S_INB1
0x25 0xac; set D_OUT1 VOD to 1.0V
0x26 0x00; set D_OUT1 DEM to 0 dB
0x2c 0x15; set EQ for D_IN0
0x2d 0xac; set S_OUTA0 VOD to 1.0V
0x2e 0x04; set S_OUTA0 DEM to -6dB
0x34 0xac; set S_OUTB0 VOD to 1.0V
0x35 0x04; set S_OUTB0 DEM to -6dB
0x3a 0x15; set EQ for D_IN1
0x3b 0xac; set S_OUTA1 VOD to 1.0V
0x3c 0x04; set S_OUTA1 DEM to -6dB
0x42 0xac; set S_OUTB1 VOD to 1.0V
0x43 0x04; set S_OUTB1 DEM to -6dB
0x5e 0x07; override SEL1, SEL0 and INPUT_EN pin and use Reg_0x5f
0x5f 0xf0; set SEL1, SEL0 to select input A and output A, 1:2 fan-out is disabled, so B outputs are disabled.

4. Bill of Materials for DS100MB203EVK:

Item	Qty	Reference	Digikey PN	Manufacture PN	Descriptions
1	1	C1	445-3448-1-ND	C1608Y5V0J106Z	CAP CER 10UF 6.3V Y5V 0603
2	1	C2	445-1322-1-ND	C1608X5R0J105K	CAP CER 1.0UF 6.3V X5R 10% 0603
3	6	C3,C4,C5,C6,C7,C8	445-4711-1-ND	C0603X5R0J104M	CAP CER .10UF 6.3V X5R 0201
4	24	C11,C12,C13,C14,C15,C16	587-2483-1-ND	LMK063BJ224MP-F	CAP CER .22UF 10V X5R 20% 0201
		C17,C18,C19,C20,C21,C22,			
		C23,C24,C25,C26,C27,C28			
		C29,C30,C31,C32,C33,C34			
5	1	D1	511-1592-1-ND	SML-P12PTT86	LED GREEN 0.2MM 13MCD 0402 SMD
6	24	J1,J2,J3,J4,J5,J6,J7,J8,	J801-ND	142-0761-881	SMA 10mil pitch 50 OHMS PC MOUNT
		J9,J10,J11,J12,J13,J14,			
		J15,J16,17,J18,J19,J20,			
		J21,J22,J23,J24			
7	1	J25	WM6504-ND	22-28-4043	CONN HEADER 4POS .100 VERT GOLD
8	1	J26	3M5473-ND	4808-3004-CP	SOCKET IC OPEN FRAME 8POS .3"
9	1	J27	WM6503-ND	22-28-4033	CONN HEADER 3POS .100 VERT GOLD
10	3	J28,J29,J30	1287-STK-ND	1287-ST	TERM QF .052"DIA .250" STURDY MT
11	31	R1,R2,R3,R4,R8,R11,R13,	P1.00KLCT-ND	ERJ-2RKF1001X	RES 1.00K OHM 1/10W 1% 0402 SMD
		R14,R16,R17,R19,R20,R22,			
		R23,R25,R26,R28,R29,R31,			
		R32,R34,R35,R37,R38,R40,			
		R41,R43,R44,R46,R47,R49			
12	2	R5,R6	P4.70KLCT-ND	ERJ-2RKF4701X	RES 4.70K OHM 1/10W 1% 0402 SMD
13	1	R7	P220LCT-ND	ERJ-2RKF2200X	RES 220 OHM 1/10W 1% 0402 SMD
14	13	R12,R15,R18,R21,R24,R27,	P20.0KLCT-ND	ERJ-2RKF2002X	RES 20.0K OHM 1/10W 1% 0402 SMD
		R30,R33,R36,R39,R42,R45,			
		R48			
15	6	SW1,SW3,SW5,SW6,SW8,SW9	CT2196MST-ND	219-6MST	SWITCH TAPE SEAL 6 POS SMD
16	1	SW2	CT2193MST-ND	219-3MST	SWITCH TAPE SEAL 3 POS SMD
17	2	SW4,SW7	CT2192MST-ND	219-2MST	SWITCH TAPE SEAL 2 POS SMD
18	1	U1	NA	DS100MB203SQ	1:2 and 2:1 MUX BUFFER

5. Schematic

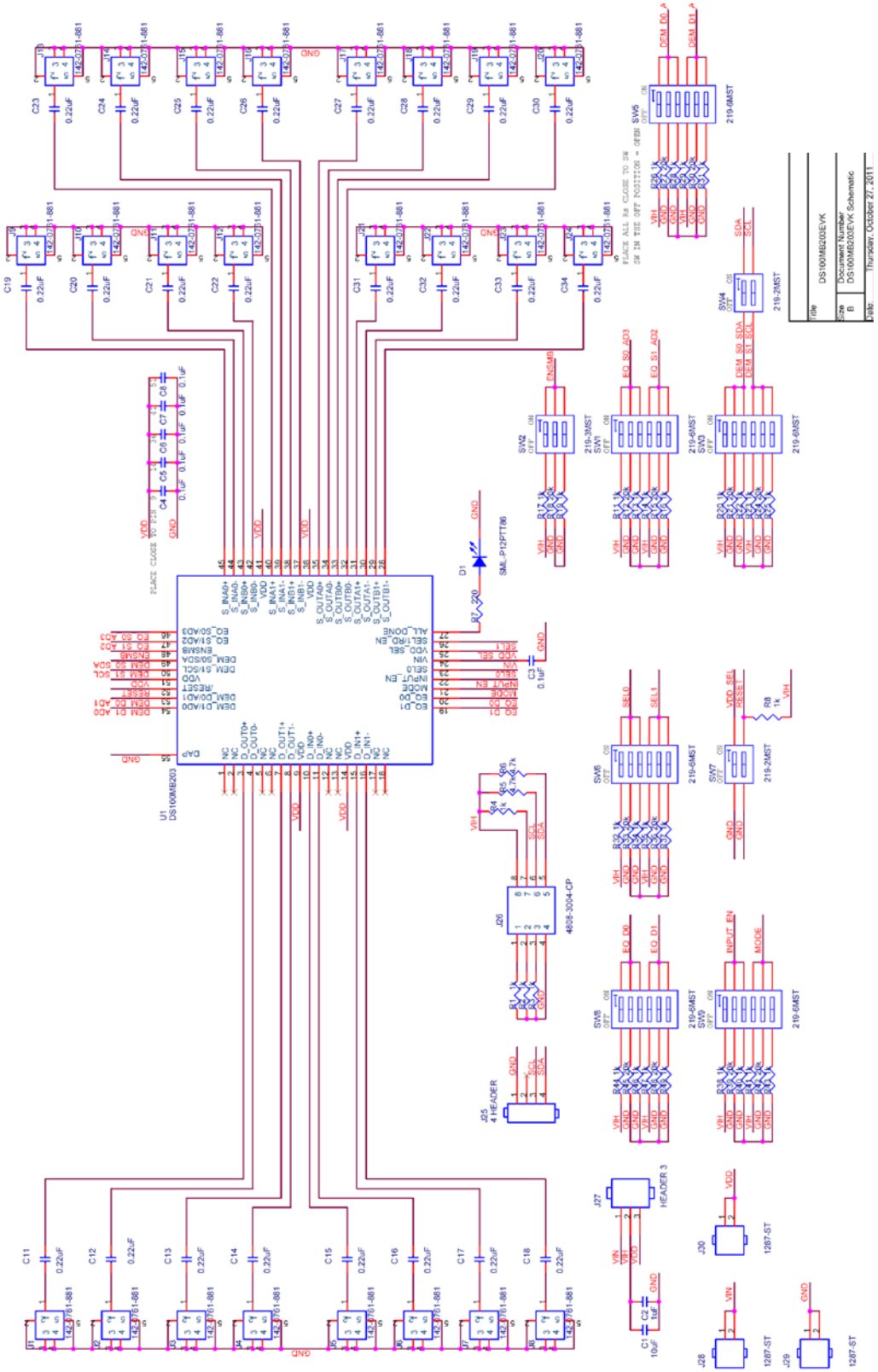

Figure 2. DS100MB203EVK Schematic

EVALUATION BOARD/KIT/MODULE (EVM) ADDITIONAL TERMS

Texas Instruments (TI) provides the enclosed Evaluation Board/Kit/Module (EVM) under the following conditions: The user assumes all responsibility and liability for proper and safe handling of the goods. Further, the user indemnifies TI from all claims arising from the handling or use of the goods.

Should this evaluation board/kit not meet the specifications indicated in the User's Guide, the board/kit may be returned within 30 days from the date of delivery for a full refund. THE FOREGOING LIMITED WARRANTY IS THE EXCLUSIVE WARRANTY MADE BY SELLER TO BUYER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. EXCEPT TO THE EXTENT OF THE INDEMNITY SET FORTH ABOVE, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

Please read the User's Guide and, specifically, the Warnings and Restrictions notice in the User's Guide prior to handling the product. This notice contains important safety information about temperatures and voltages. For additional information on TI's environmental and/or safety programs, please visit www.ti.com/esh or contact TI.

No license is granted under any patent right or other intellectual property right of TI covering or relating to any machine, process, or combination in which such TI products or services might be or are used. TI currently deals with a variety of customers for products, and therefore our arrangement with the user is not exclusive. TI assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or services described herein.

REGULATORY COMPLIANCE INFORMATION

As noted in the EVM User's Guide and/or EVM itself, this EVM and/or accompanying hardware may or may not be subject to the Federal Communications Commission (FCC) and Industry Canada (IC) rules.

For EVMs **not** subject to the above rules, this evaluation board/kit/module is intended for use for ENGINEERING DEVELOPMENT, DEMONSTRATION OR EVALUATION PURPOSES ONLY and is not considered by TI to be a finished end product fit for general consumer use. It generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC or ICES-003 rules, which are designed to provide reasonable protection against radio frequency interference. Operation of the equipment may cause interference with radio communications, in which case the user at his own expense will be required to take whatever measures may be required to correct this interference.

General Statement for EVMs including a radio

User Power/Frequency Use Obligations: This radio is intended for development/professional use only in legally allocated frequency and power limits. Any use of radio frequencies and/or power availability of this EVM and its development application(s) must comply with local laws governing radio spectrum allocation and power limits for this evaluation module. It is the user's sole responsibility to only operate this radio in legally acceptable frequency space and within legally mandated power limitations. Any exceptions to this are strictly prohibited and unauthorized by Texas Instruments unless user has obtained appropriate experimental/development licenses from local regulatory authorities, which is responsibility of user including its acceptable authorization.

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

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
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.

For EVMs annotated as IC – INDUSTRY CANADA Compliant
This Class A or B digital apparatus complies with Canadian ICES-003.

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

Concerning EVMs including radio transmitters
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.

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.

Cet appareil numérique de la classe A ou B est conforme à la norme NMB-003 du Canada.

Les changements ou les modifications pas expressément approuvés par la partie responsable de la conformité ont pu vider l'autorité de l'utilisateur pour actionner l'équipement.

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.

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.

【Important Notice for Users of this Product in Japan】

This development kit is NOT certified as Confirming to Technical Regulations of Radio Law of Japan

If you use this product in Japan, you are required by Radio Law of Japan to follow the instructions below with respect to this product:

1. Use this product 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 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. Also, please do not transfer this product, unless you give the same notice above to the transferee. Please note that if you could not follow the instructions above, you will be subject to penalties of Radio Law of Japan.

Texas Instruments Japan Limited
(address) 24-1, Nishi-Shinjuku 6 chome, Shinjuku-ku, Tokyo, Japan

http://www.tij.co.jp

【ご使用にあたっての注】

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

http://www.tij.co.jp

EVALUATION BOARD/KIT/MODULE (EVM)
WARNINGS, RESTRICTIONS AND DISCLAIMERS

For Feasibility Evaluation Only, in Laboratory/Development Environments. Unless otherwise indicated, this EVM is not a finished electrical equipment and not intended for consumer use. It is intended solely for use for preliminary feasibility evaluation in laboratory/development environments by technically qualified electronics experts who are familiar with the dangers and application risks associated with handling electrical mechanical components, systems and subsystems. It should not be used as all or part of a finished end product.

Your Sole Responsibility and Risk. You acknowledge, represent and agree that:

1. You have unique knowledge concerning Federal, State and local regulatory requirements (including but not limited to Food and Drug Administration regulations, if applicable) which relate to your products and which relate to your use (and/or that of your employees, affiliates, contractors or designees) of the EVM for evaluation, testing and other purposes.
2. You have full and exclusive responsibility to assure the safety and compliance of your products with all such laws and other applicable regulatory requirements, and also to assure the safety of any activities to be conducted by you and/or your employees, affiliates, contractors or designees, using the EVM. Further, you are responsible to assure 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.
3. You will employ reasonable safeguards to ensure that your use of the EVM will not result in any property damage, injury or death, even if the EVM should fail to perform as described or expected.
4. You will take care of proper disposal and recycling of the EVM's electronic components and packing materials.

Certain Instructions. It is important to operate this EVM within TI's recommended specifications and environmental considerations per the user guidelines. Exceeding the specified EVM ratings (including but not limited to input and output voltage, current, power, and environmental ranges) may cause property damage, personal injury or death. If there are questions concerning these ratings please 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 result in unintended and/or inaccurate operation and/or possible permanent damage to the EVM and/or interface electronics. Please consult the EVM User's 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, some circuit components may have case temperatures greater than 60°C as long as the input and output are maintained at a normal ambient operating temperature. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors which can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during normal operation, please be aware that these devices may be very warm to the touch. As with all electronic evaluation tools, only qualified personnel knowledgeable in electronic measurement and diagnostics normally found in development environments should use these EVMs.

Agreement to Defend, Indemnify and Hold Harmless. You agree to 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 use of the EVM that is not in accordance with the terms of the agreement. This obligation shall apply whether Claims arise under law of tort or contract or any other legal theory, and even if the EVM fails to perform as described or expected.

Safety-Critical or Life-Critical Applications. If you intend to evaluate the components for possible use in safety critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, such as devices which are classified as FDA Class III or similar classification, then you must specifically notify TI of such intent and enter into a separate Assurance and Indemnity Agreement.

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

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as “components”) are sold subject to TI’s terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI’s terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers’ products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers’ products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI’s goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or “enhanced plastic” are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have ***not*** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components which meet ISO/TS16949 requirements, mainly for automotive use. Components which have not been so designated are neither designed nor intended for automotive use; and TI will not be responsible for any failure of such components to meet such requirements.

Products		**Applications**	
Audio	www.ti.com/audio	Automotive and Transportation	www.ti.com/automotive
Amplifiers	amplifier.ti.com	Communications and Telecom	www.ti.com/communications
Data Converters	dataconverter.ti.com	Computers and Peripherals	www.ti.com/computers
DLP® Products	www.dlp.com	Consumer Electronics	www.ti.com/consumer-apps
DSP	dsp.ti.com	Energy and Lighting	www.ti.com/energy
Clocks and Timers	www.ti.com/clocks	Industrial	www.ti.com/industrial
Interface	interface.ti.com	Medical	www.ti.com/medical
Logic	logic.ti.com	Security	www.ti.com/security
Power Mgmt	power.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video
RFID	www.ti-rfid.com		
OMAP Applications Processors	www.ti.com/omap	**TI E2E Community**	e2e.ti.com
Wireless Connectivity	www.ti.com/wirelessconnectivity		

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