# DS100MB203EVK User's Guide

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## 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.

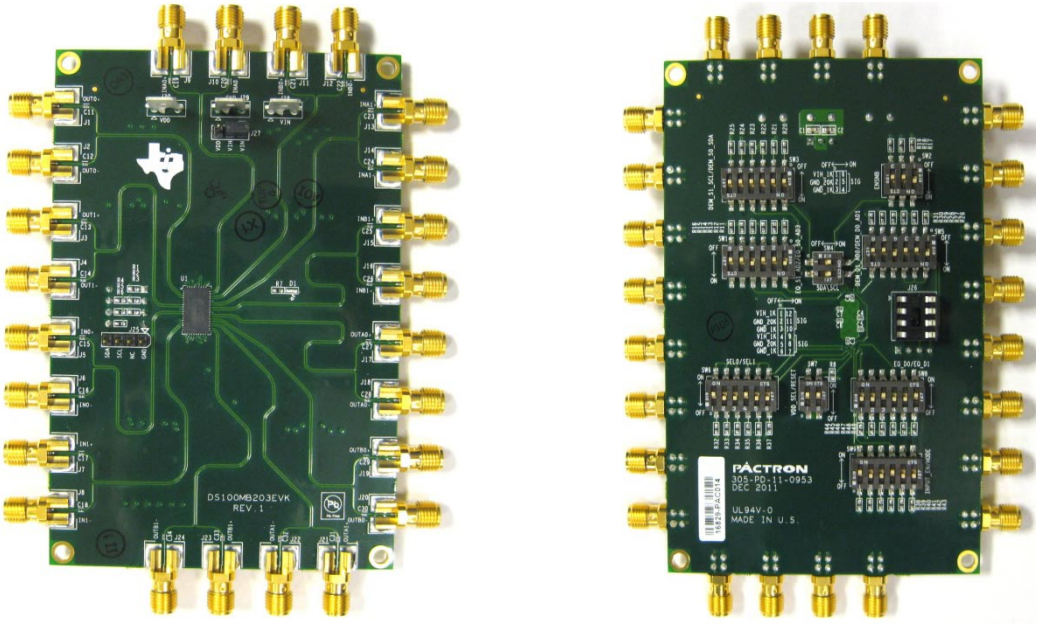



**Figure 1. DS100MB203EVK (TOP / BOTTOM VIEW)**

## 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<br><br>J5 to J8 | S_INA0, S_INB0, SINA1, S_INB1,<br><br>D_IN0, D_IN1 | High speed differential inputs. |
| J1 to J4<br><br>J17 to J24 | D_OUT0, D_OUT1,<br><br>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<br>SMBUS MODE – AD[3:2] device address bits |
| SW2 | ENSMB | ENSMB = 0 – PIN MODE<br>ENSMB = 1 – SMBUS (slave mode)<br>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<br>SMBUS MODE – AD[1:0] device address bits |
| SW6 | SEL0<br><br>SEL1 | SEL0 pin for Lane 0<br>0: selects input S_INB0+/-, output S_OUTB0+/-.<br>R: selects input S_INB0+/-, output S_OUTA0+/-.<br>F: selects input S_INA0+/-, output S_OUTB0+/-.<br>1: selects input S_INA0+/-, output S_OUTA0+/-.<br>SEL1 pin for Lane 1<br>0: selects input S_INB1+/-, output S_OUTB1+/-.<br>R: selects input S_INB1+/-, output S_OUTA1+/-.<br>F: selects input S_INA1+/-, output S_OUTB1+/-.<br>1: selects input S_INA1+/-, output S_OUTA1+/-. |
| SW7 | VDD_SEL<br><br>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).<br>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<br><br><br><br><br><br>MODE | INPUT_EN pin<br>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.<br>R: Reserved (DO NOT USE).<br>F: AUTO - Use RX Detect, SEL0/1 to determine which input or output to enable, FANOUT is disable<br>1: Normal Operation, FANOUT is enabled (both S_OUT0/1 are ON). Input always enabled with 50 ohms.<br>MODE pin<br>0: SATA/SAS, PCIe GEN 1/2 and 10GE<br>R: PCIe GEN 3<br>F: Auto Detect (PCIe GEN 1/2 or GEN 3)<br>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

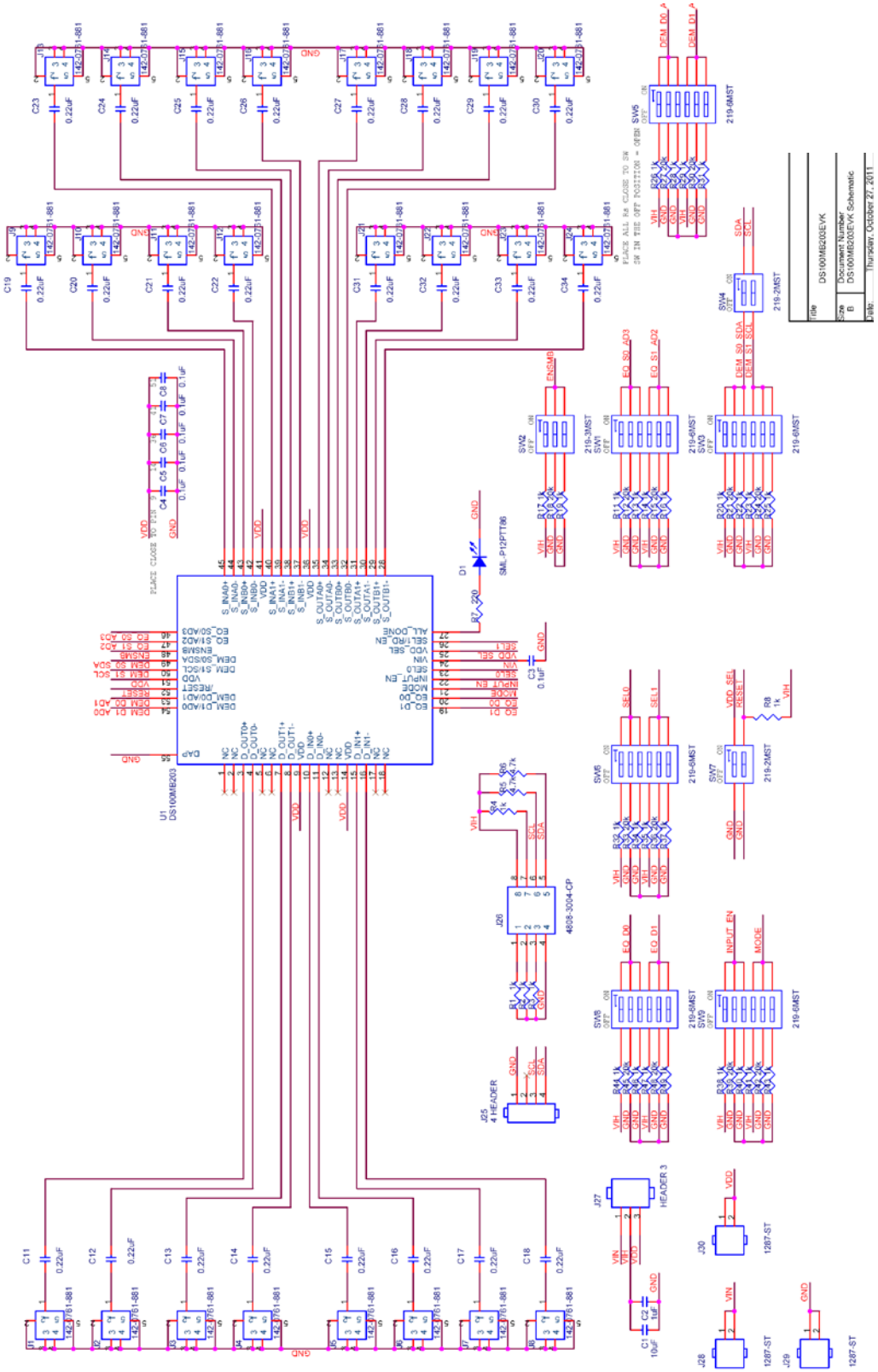


**Figure 2. DS100MB203EVK Schematic**

## 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.

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## 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.

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**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.

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