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MAX9278A/MAX9282A Evaluation Kits

Evaluate: MAX9278A/MAX9282A

General Description

The MAX9278A/MAX9282A coax evaluation kits (EV kit) provide a proven design to evaluate the MAX9278A/MAX9282A high-bandwidth gigabit multimedia serial link (GMSL) deserializers with spread spectrum and full-duplex control channel with the use of a standard FAKRA coaxial cable. The EV kit also includes Windows XP®-, Windows Vista®-, and Windows 7-compatible software that provides a simple graphical-user interface (GUI) for exercising the features of the device. The EV kit comes with a MAX9278AGTJ/V+ or MAX9282AGTJ/V+ installed.

For complete GMSL evaluation, using a standard FAKRA coaxial cable, order the MAX9278A/MAX9282A coax EV kit and a companion serializer board (MAX9275/MAX9279 coax EV kit referenced in this document). For evaluating with STP cable, also order the MAXCOAX2STP-HSD adapter kit and refer to its data sheet. Only one adapter kit is required per link, connecting the serializer and deserializer (SerDes) boards.

Ordering Information **appears at end of data sheet.**

Items Included in the EV Kit Package

DESCRIPTION	QTY
MAX9278A coax EV kit or MAX9282A coax EV kit board	1
USB cable	1

Features

- Accepts GMSL Serial Data through FAKRA Connectors and Provides LVDS and Parallel Outputs
- Windows XP-, Windows Vista-, and Windows 7-Compatible Software
- USB-PC Connection (Cable Included)
- USB Powered
- Proven PCB Layout
- Fully Assembled and Tested

Note: In the following sections, MAX9278A/80A and the term “deserializer” refer to the MAX9278A and MAX9282A ICs and MAX9275/79 and the term “serializer” refer to the MAX9275 and MAX9279 ICs. The term SerDes refers to serializer/deserializer.

Note: This document applies to both coax and STP EV kits. This document covers coax cables, but the information provided applies equally to STP cables.

MAX9278A/MAX9282A EV Kit Files

FILE	DESCRIPTION
MAXSerDesEV-D_Vxxxx_Install.EXE	Installs the EV kit files in your computer
MAXSerDesEV-D.EXE	Graphical user interface (GUI) application
CDM20600.EXE	Installs the USB device driver
USB_Driver_Help_200.PDF	USB driver installation help file

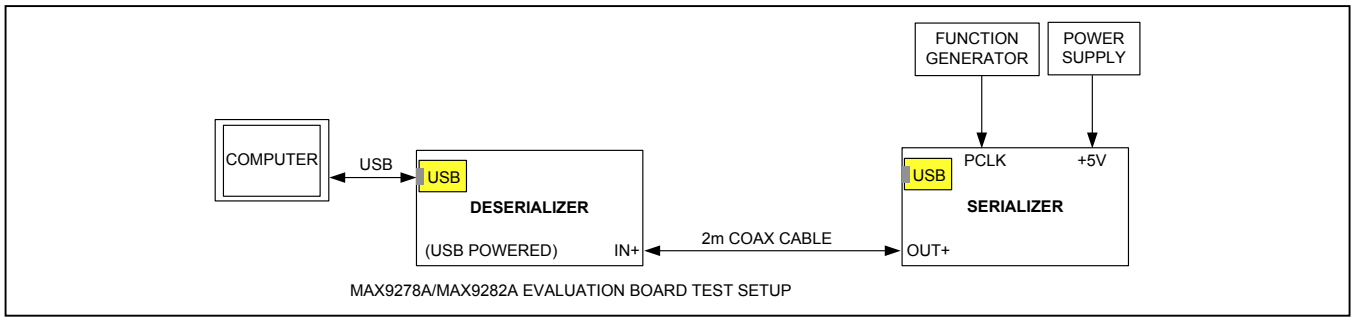

Figure 1. Deserializer Test Setup Block Diagram

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Quick Start

Required Equipment

- MAX9278A/MAX9282A coax EV kit
- MAX9275/MAX9279 coax EV kit
- 2m Rosenberger FAKRA cable assembly (included with the deserializer EV kit)
- Function generator
- User-supplied Windows XP, Windows Vista, or Windows 7 PC with a spare USB port (direct 500mA connection required; do not use a bus-powered hub)
- 5V DC, 500mA power supply

Note: In the following sections, software-related items are identified by bolding. Text in **bold** refers to items directly from the EV kit software. Text in **bold and underlined** refers to items from the Windows operating system.

Procedure

The EV kit is fully assembled and tested. Follow the steps below to verify board operation:

1) Download and install the latest version of the EV kit software from **www.maximintegrated.com**:
   - Search for **MAX9278**. Then select **MAX9278 | Design Resources | Software | GMSL SerDes Evaluation Kit Software-Dallas uC | MAXSerDesEV-D_Vxxxx_Install.zip**.
   - Connect the USB cable from the PC to the deserializer board. A Windows message appears when connecting the EV kit board to the PC for the first time. Each version of Windows has a slightly different message. If you see a Windows message stating **ready to use**, proceed to the next step; otherwise, open the USB driver installation help file PDF to verify that the USB driver was installed successfully.
2) Verify that jumpers on the deserializer board are in their default positions, as shown in Figure 12.
3) Verify that jumpers on the serializer board are in their default positions, as shown in Figure 13.
4) Complete system setup, as shown in Figure 1.
   - Connect FAKRA cable from OUT+ terminal on serializer board to IN+ terminal on deserializer board.
   - Connect function generator output to MAX9275/MAX9279 EV kit header H1_PCLK_IN.
   - Connect power supply to +5VIN/GND terminals on serializer board.
5) Turn on power supply and function generator.
6) Verify that LED_PWR on the EV kit turns on, indicating that deserializer board is powered.
7) Verify that LED_PWR on the MAX9275/MAX9279 EV kit turns on, indicating that serializer board is powered.
   - Verify that LED10 (LOCK) on the deserializer board turns on, indicating that the link has been successfully established. If LED_LOCK is off or LED_ERROR is on, go to the *Troubleshooting* section at the end of this document and fix the problem before continuing.
8) Start the EV kit software from **Start | Programs | Maxim Integrated | MAXSerDesEV-D | MAXSerDesEV-D**.
9) The **Configuration Settings** window opens (Figure 2) and the GUI automatically searches for any active listener in both I^2C and UART mode and identifies the valid GMSL products. Once any valid device is identified, the corresponding configuration jumpers are displayed to help users configure the SerDes.
10) If an operating evaluation board with a Dallas microcontroller is not found, a window opens warning as such (see Figure 3). Press **OK** to continue and start the GUI anyway, or press **Cancel** to terminate the application. See the *Troubleshooting* section at the end of this document to fix the problem before continuing. When an operating Dallas microcontroller is found, the GUI searches for active listeners with known **Device ID** code. If found, the GUI identifies the device under test (DUT) and displays the corresponding list of jumpers on the EV board that must be set for the board to operate as desired.
11) Jumper settings in the **Configuration Settings** window are for user reference as a guide to properly configure the evaluation board. Jumper selection on the GUI does not affect the board's operation.
12) While the **Configuration Settings** window is open, the **Identify Devices** button can be pressed to search for devices connected. If the devices cannot be identified, the most likely cause is an improper jumper setting. See the *Troubleshooting* section at the end of this document to fix the problem before continuing.
13) Press the **Connect** button to move on to the **Evaluation Kit** window (Figure 4).
14) Press the **Read All** button to read all registers on the SerDes.

Detailed Description of Software

To start the EV kit GUI, select **Start | Programs | Maxim Integrated | MAXSerDesEV-D | MAXSerDesEVGUI-D**.

Configuration Settings Window

The **Configuration Settings** window (Figure 2) is the first window that opens after program launch. It allows the user to specify evaluation board setup and mode of operation.

Controller Group Box

In the **Controller** group box, select **Coax** or **STP** from the **LinkType** drop-down list, **I2C** or **UART** from the **Bus** drop-down list, and whether the **Serializer** or **Deserializer** should connect to the USB controller. Upon changing any of these parameters, any conflicting jumper settings are highlighted, guiding the user to check and make the corresponding changes to the evaluation boards. Only **LinkType** and **Device Address** selections on the **Configuration Settings** window affect the EV kit operation. Other items, including jumper selection, are for user reference only.

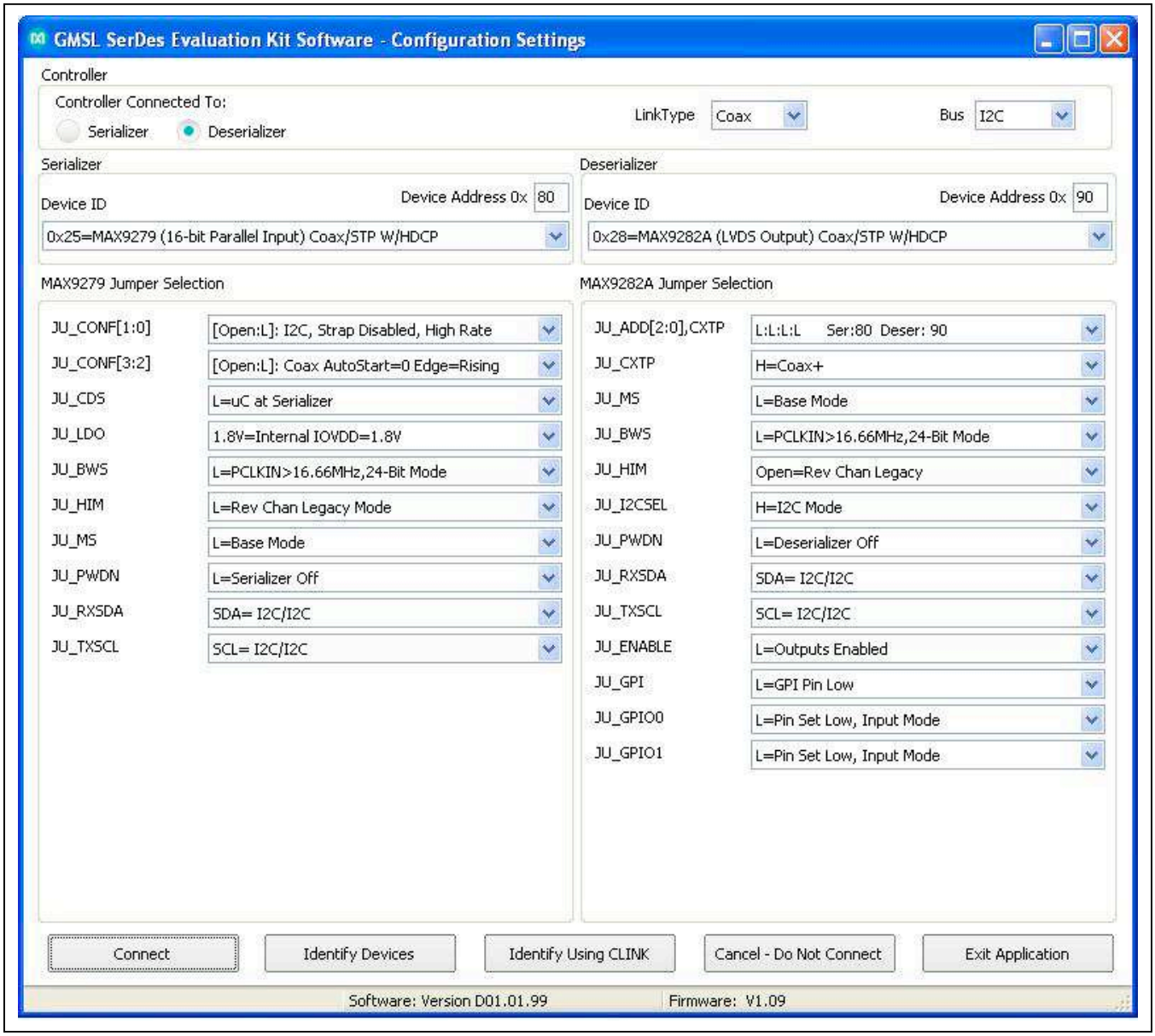

Figure 2. MAXSerDesEV-D Evaluation Kit Software (Configuration Settings Window)

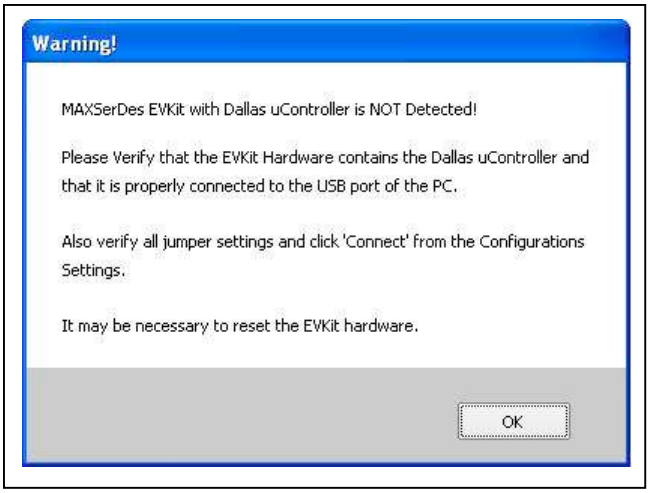

Figure 3. MAXSerDesEV-D Evaluation Kit Software (Warning!) No uC Found

Serializer and Deserializer Jumper Selection Blocks

The **Serializer Jumper Selection** and **Deserializer Jumper Selection** blocks list jumpers for the selected **Device ID**s and display the correct shunt positions based on the conditions selected in the **Controller** group box.

Identify Devices Button

The **Identify Devices** button causes the GUI to scan the system and hunt for slave addresses selectable by the SerDes input address pins. Upon successful communication, the identified **Device ID** and the corresponding jumper lists are displayed on the SerDes block. It is also possible to select a device from the list in the **Device ID** drop-down list and manually change the slave address in the **Device Address** edit box. It is a good practice to utilize the **Identify Devices** function and verify communication with the DUTs before attempting to **Connect**.

Figure 12 and Figure 13 show jumper settings on the SerDes PCBs for coax cable and I^2C communication with the USB controller connected to the deserializer board. Refer the respective deserializer IC data sheet for detailed configuration information. See Table 1 for PCB jumper descriptions.

Connect Button

The **Connect** button opens up the **Evaluation Kit** window. The GUI reads the SerDes registers and updates the register maps for both. Successful register map updates are indicated by green LED indicators. In case of a communication problem, the LED indicators turn red.

Cancel - Do not Connect Button

The **Cancel - Do not Connect** button opens the **Evaluation Kit** window without attempting to connect to the on-board microcontroller. Although there is no communication with the microcontroller, all functions and tabs corresponding to the selected **Device ID**s become active once there.

Evaluation Kit Window

The **Evaluation Kit** window shown in Figure 4 provides access to all internal functions of the DUTs by means of reading and writing registers through different tabs to allow the user to evaluate various functions of the SerDes.

The **Read All** button updates the SerDes' device maps by reading the internal registers of the DUTs.

The **Serializer** group box provides pushbuttons to update the serializer register map from the DUT using the **Read all MAX9279** button. The **Load** button reads and updates registers from a previously saved file. The **Save** button saves the current register contents into a new file for future reference.

The **Deserializer** group box provides pushbuttons to update the deserializer's register map from the DUT using the **Read All MAX9282A** button. The **Load** button reads and updates registers from a previously saved file. The **Save** button saves the current register contents into a new file for future reference.

The **Open Configuration** button opens the **Configuration Settings** window for any configuration change. Use the **Open Configuration** and **Connect** buttons to go back and forth between the **Configuration Settings** window and the **Evaluation Kit** window.

The **Wake Up** button applies the register write sequence described in the IC data sheets to wake the DUTs from sleep mode.

MAX9279 Tab

The **MAX9279** tab (Figure 4) lists the serializer's bitmaps. The **Read** and **Write** buttons in each register group box allow read/write access for each bit or group of bits that specify a function or condition, as defined in the serializer IC data sheet. The color of the small LED indicator next to the **Read/Write** buttons indicates the communication status. Green indicates successful communication and red indicates failed communication.

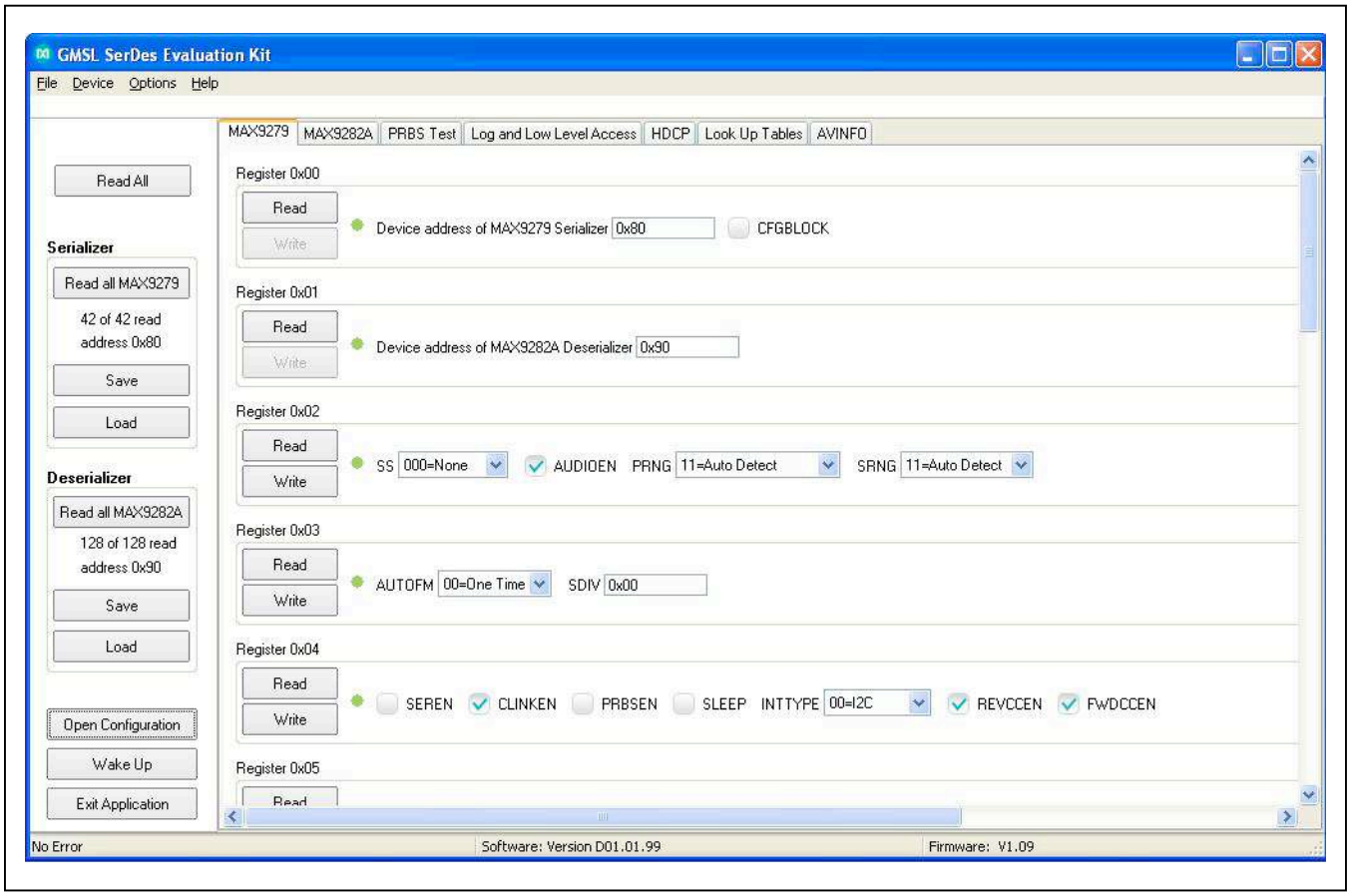

Figure 4. MAXSerDesEV-D Evaluation Kit Software (MAX9279 Tab)

MAX9282A Tab

The **MAX9282A** tab (Figure 5) lists the deserializer's registers and bitmaps. The **Read** and **Write** buttons in each register group box allow read/write access for each bit or group of bits that specify a function or condition, as defined in the deserializer IC data sheet. The color of the small LED indicator next to the **Read/Write** buttons indicates the communication status. Green indicates successful communication and red indicates failed communication.

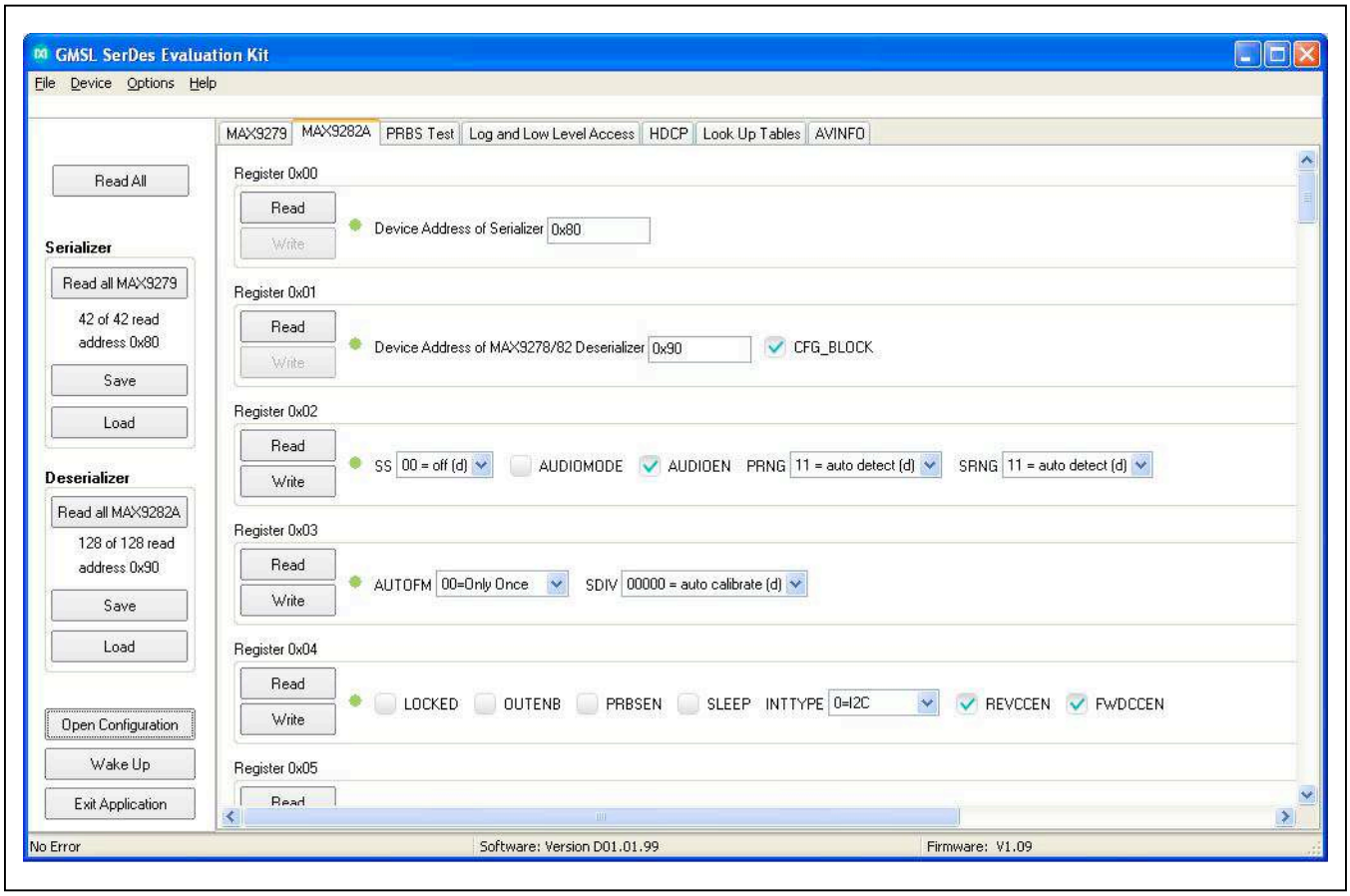

Figure 5. MAXSerDesEV-D Evaluation Kit Software (MAX9282A Tab)

PRBS Test Tab

The **PRBS Test** tab (Figure 6) facilitates pseudorandom-bit sequence (PRBS) testing. Upon pressing the **Start** button, the SerDes registers are programmed (per a defined sequence in the IC data sheets) to perform a PRBS error-rate test. Enter the test duration (maximum 32,767s = 9.1hrs) in the **Duration** edit box and press **Start** to begin the test. At the end of the specified elapse time, the number of bit errors are read from the **PRBSERR** register and displayed in the **PRBS Error Counter** box.

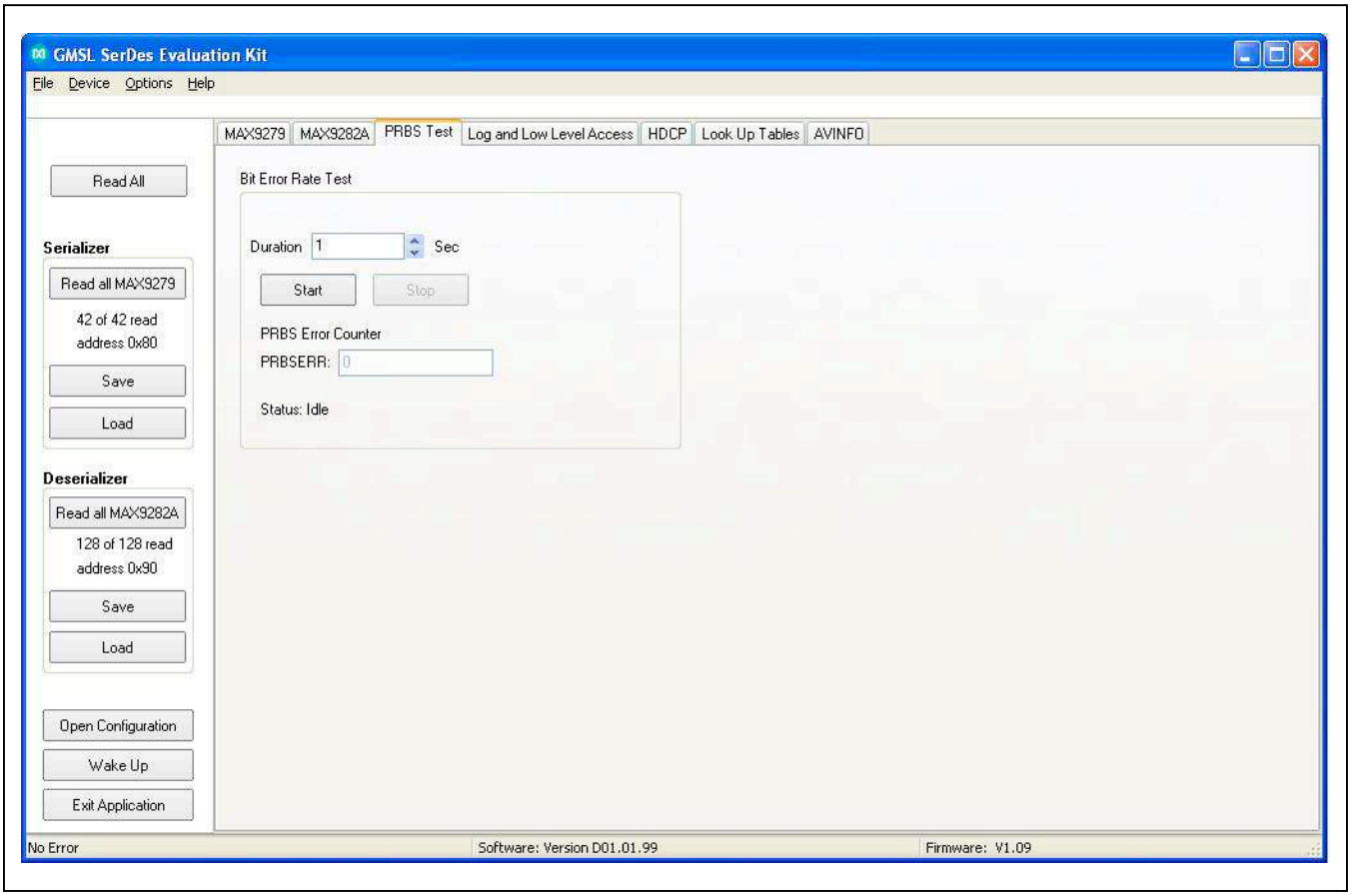

Figure 6. MAXSerDesEV-D Evaluation Kit Software (PRBS Test Tab)

Log and Low Level Access Tab

The **Log and Low Level Access** tab (Figure 7) logs all activities between the GUI and DUTs.

The **Register Access** group box allows 1-byte read or writes of the specified **Device Address** and **Register Address**. Press the **Send String to EVKIT** button to communicate with devices that are not register-based (such as the MAX7324). User-supplied devices requiring other interface protocols must use the **Raw TX byte codes** to communicate. Note that in bypass mode, raw data is passed to the user-supplied slave device directly without modification.

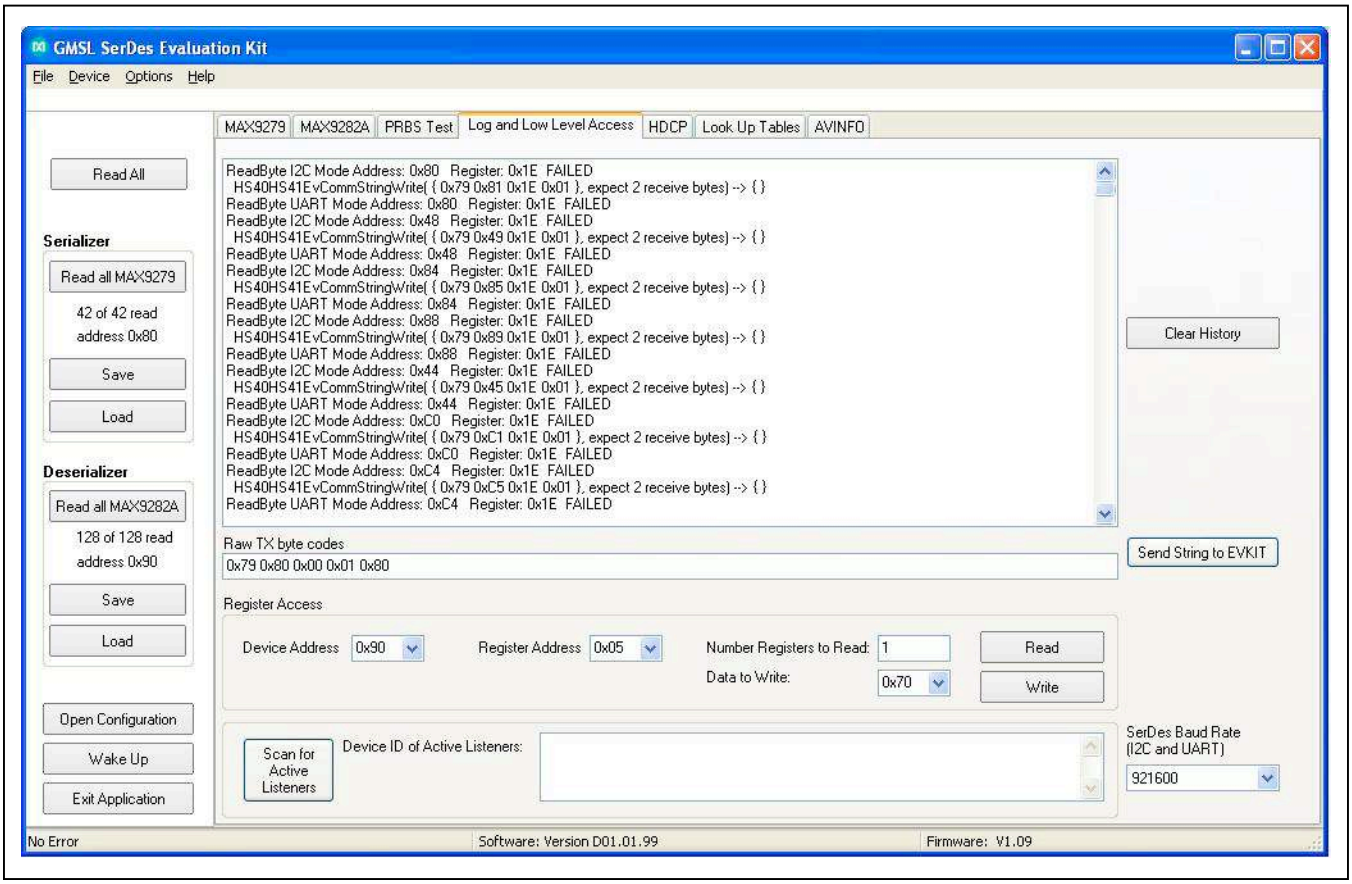

Figure 7. MAXSerDesEV-D Evaluation Kit Software (Log and Low Level Access Tab)

HDCP Tab

The **HDCP** tab (Figure 8) is viewable only for SerDes that support the HDCP function. The HDCP registers of both SerDes are listed side-by-side with **Read** and **Write** buttons for each register. **Authenticate** and **Enable Encryption** pushbuttons initiate the HDCP verification process. At the end of the operation, the color of the LED indicator turns green to indicate success or red to indicate failure of the function. **Note:** This tab is only functional for DUTs that support the HDCP function.

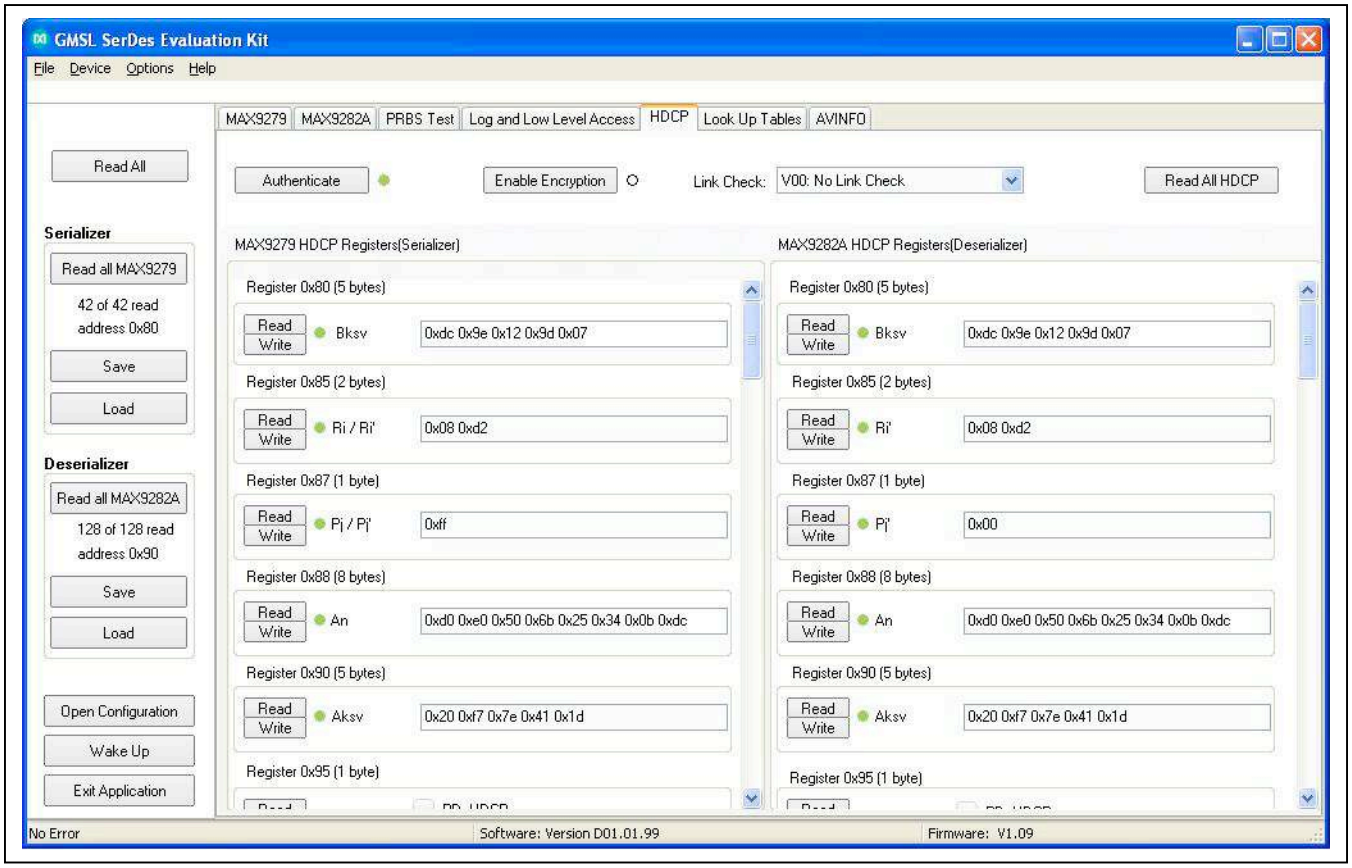

Figure 8. MAXSerDesEV-D Evaluation Kit Software (HDCP Tab)

Look Up Tables Tab

The **Look Up Tables** tab (Figure 9) provides access to the lookup tables (LUTs) of the deserializer. Use this tab to program, view, and edit the LUT settings of the red, green, and blue colors for color translation. LUT content edits can be performed on the entire 256 bytes of all three colors, of an individual color, or individual pixel of any color table.

The LUT contents can be saved in a .csv file to be used as a template or can be uploaded from an existing file. Sample LUT content is provided in the evaluation kit GUI.

If any of the **Save to File** or **Read from File** functions are executed, the operation progress is shown in the **Read/Write Progress Window** (Figure 10).

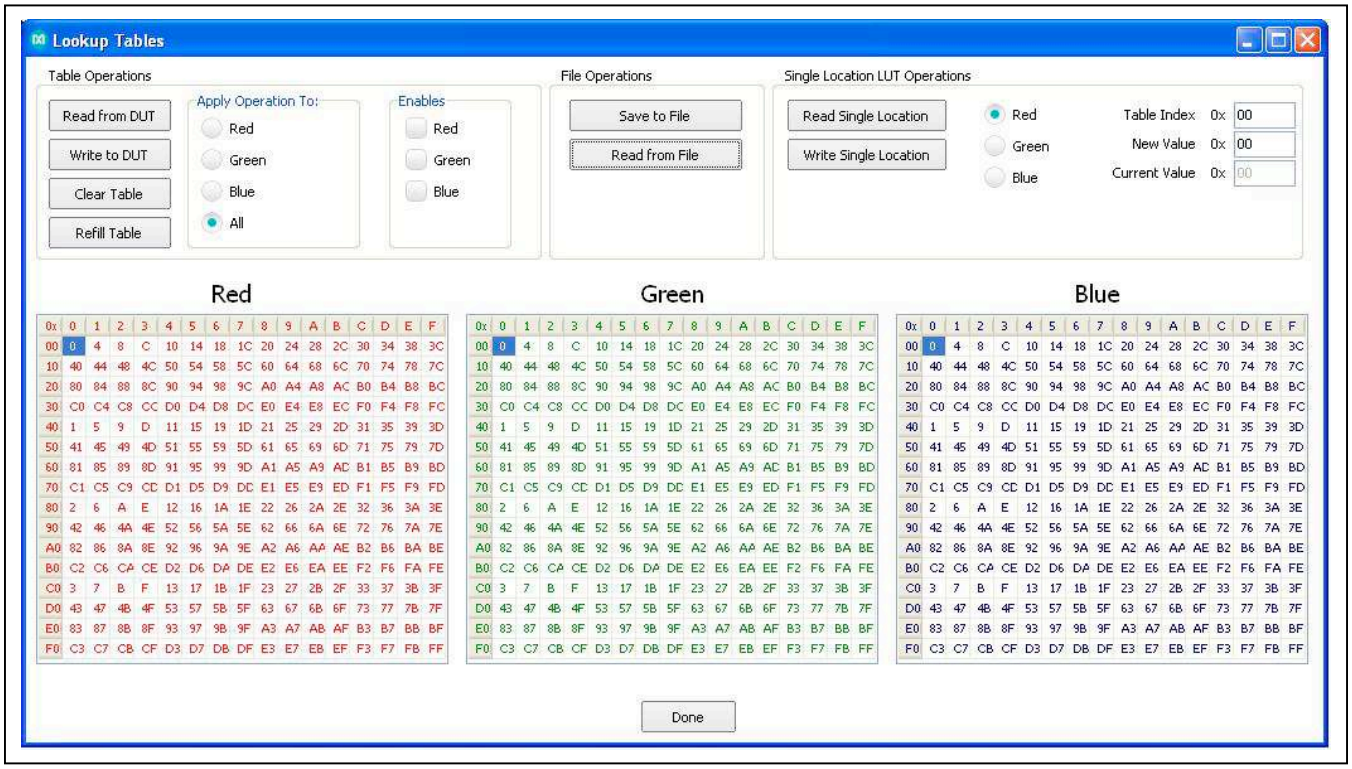

Figure 9. MAX9278A/MAX9282A Deserializers (Initial Jumper Settings for Coax Link and I²C Communication)

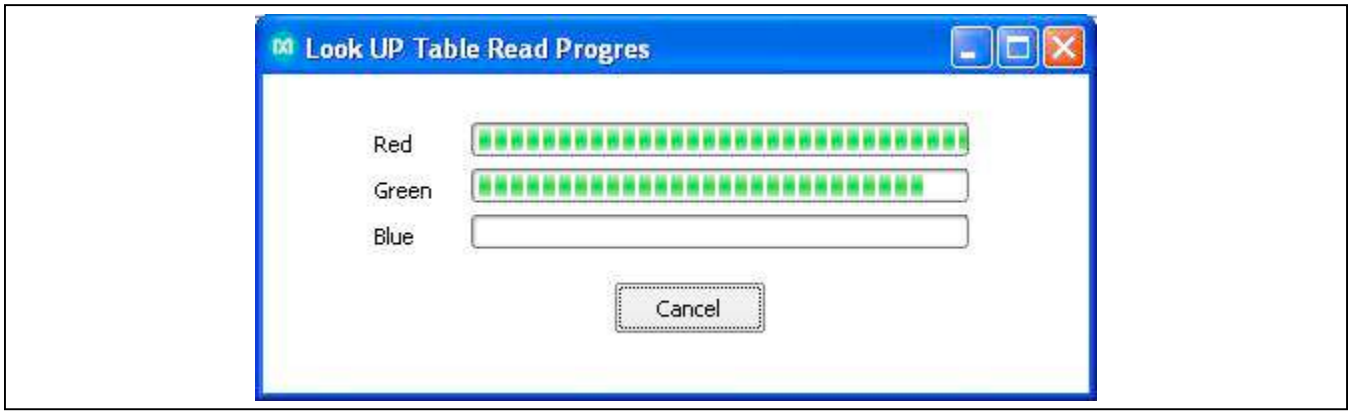

Figure 10. MAXSerDesEV-D Evaluation Kit Software (Look Up Tables Read/Wrote {Read/Write Progress Window—relevant only to deserializers with image-enhancing capability)

AVINFO Tab

The **AVINFO** tab (Figure 11) provides easy read/write access to the general-purpose registers for storing user information. These registers are not associated with any of the IC functions.

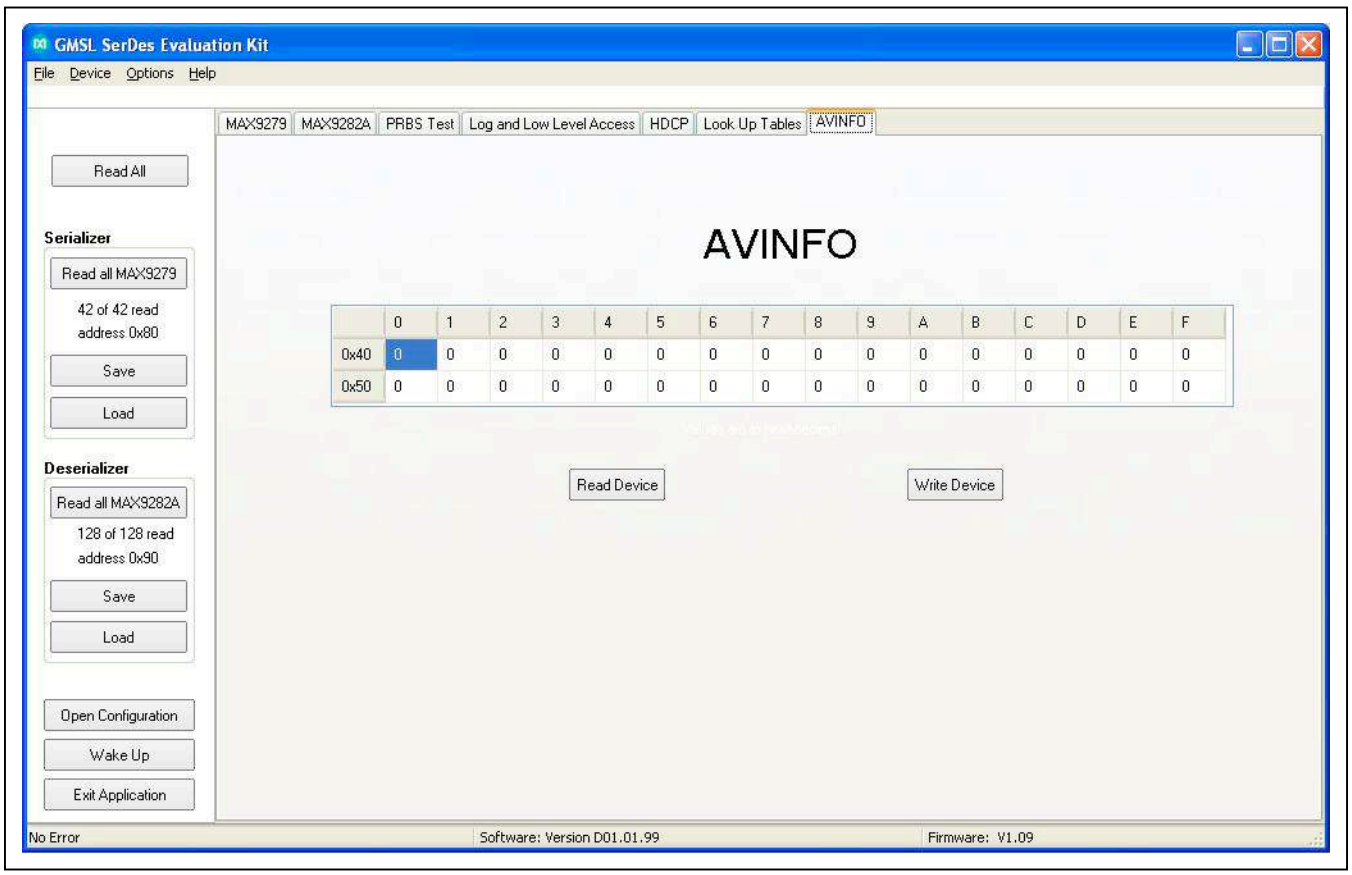

Figure 11. MAXSerDesEV-D Evaluation Kit Software (AVINFO Tab)

Detailed Description of Firmware

The DS89C450 microcontroller (U12) runs custom firmware that ensures reliable communication between the PC and DUTs. The firmware records 9-bit even-parity data received from the USB interface while RTS is set, and plays back the 9-bit data with 1.5 stop bits timing when RTS is cleared. Data received by the DUTs is immediately relayed to the USB port.

Detailed Description of Hardware

The MAX9278A/MAX9282A coax EV kit provides a proven design and layout for the GMSL deserializers with the use of a standard FAKRA coax cable. On-board level translators and an easy-to-use USB-PC connection are included on the EV kit.

The deserializer EV kit board layout is divided into three principal sections:

1) Power-supply circuitry (on-board LDO regulators U2 and U3 power the AVDD, DVDD, and IOVDD supplies from +5VIN)
2) MAX9278A/MAX9282A and support components
3) Microcontrollers (U10, U12) and support components

On-Board USB Interface

The EV kit board provides UART and I^2C interface (through U12 and U14), which is intended to operate while both SerDes boards are powered and properly configured.

User-Supplied Interface

To use the EV kit with a user-supplied interface, connect "external" controller signals to the corresponding pins on the EXT_UC (J12) header. If the signal level of the external controller is different from the on-board AVDD, then remove the J16 shunt and connect an external controller V_{DD} signal to the J16 header as well.

Power-Supply Block

The EV kit can be powered from the USB port, a 5V power supply, a 12V AC adapter jack, or dedicated power source for each of the AVDD, DVDD, and IOVDD signals. Header VIN selects between the 5V USB supply, +5VIN applied on the +5VIN (J39) wire loop, or the regulator (which is sourced from the 12V), and then the on-board LDOs generate the AVDD, DVDD, and IOVDD voltages required by the DUTs.

To test the DUTs with voltage levels different from the on-board-generated AVDD, DVDD, and IOVDD levels, move the shunts on the AVDD, DVDD, and IOVDD headers from the INT to EXT positions and apply the desired voltages on the corresponding AVDD_EXT, DVDD_EXT, and IOVDD_EXT terminals.

Table 1. Jumper Description

JUMPER	SIGNAL	SHUNT	FUNCTION
J1	IN+	—	GMSL positive input
J2	IN-	—	GMSL negative input
J4	UC_PWR	VIN	Power UC with the board power
		USB+5V	Power UC from USB power
J6	I_IOVDD	Short*	Connect ammeter to measure DUT IOVDD current
J7	12V jack	—	12V AC adapter jack
J9	ENABLE	Short*	Pull MAX9276 $\overline{\text{ENABLE}}$ pin high
J11	LFL-	Open*	Line fault checked by DUT (local) on IN-
J12	EXT_UC	—	External µC connections
J13	LFL+	Short*	Line fault checked by DUT (local) on IN+
J14	LVDS outputs	—	LVDS outputs header
J16	AVDD66	Short*	External UC signals level shifter V-high
J17	UCSDAPU	Short*	External UC SDA pullup
J22	TXSCLPU	Short*	DUTs TX/SCL pullup
J23	RXSDAPU	Short*	DUTs RX/SDA pullup

Table 1. Jumper Description (continued)

JUMPER	SIGNAL	SHUNT	FUNCTION
J24	AUTO571	Short*	Pull MAX9277 AUTOS pin high
J29	I_DVDD	Short*	Connect ammeter to measure DUT DVDD current
J30	I_AVDD	Short*	Connect ammeter to measure DUT AVDD current
J35	UCSCLPU	Short*	External UC SCL pullup
J36	GND	—	GND terminal
J37	AVDD_EXT	—	Terminal to apply external AVDD voltage
J38	DVDD_EXT	—	Terminal to apply external DVDD voltage
J39	+5VIN	—	+5VIN terminal
J40	IOVDD_EXT	—	Terminal to apply external IOVDD voltage
J47	H_BRIDGE	—	MAX9276/MAX9277 Control channel signals Bridge header
J49	P21	Open*	Pulls DS89C450 P2.1/A9 to GND
J50	P20	Open*	Pulls DS89C450 P2.0/A8 to GND
J53	PWDN76	—	Cut trace, 9276 $\overline{\text{PWDN}}$ pin connected to IOVDD_BR
J56	GPI61	Short*	Pull MAX9276 GPI pin high
J57	RX/SDA_BR	Open*	Connects application RX/SDA signals to MAX9276
J58	TX/SCL_BR	Open*	Connects application TX/SCL signals to MAX9276
J59	HIM61	Open*	Pull MAX9276 SD/HIM pin high
J61	LFR-	Open*	Line fault checked by serializer OUT-
J62	LFR+	Open*	Line fault checked by serializer OUT+
JU1	SSEN	H	High: LVDS output at 2% spread spectrum
		L*	Low: LVDS output with no spread spectrum
JU2	OEN	H*	OEN pin pulled high
		L	OEN pin pulled low
JU3	MCLK/LMN1	MCLK*	MCLK/LMN1 pin driven by the MCLK test point
		LMN1	MCLK/LMN1 pin driven by the LMN1, IN- line-fault signal
JU4	EQS	H	EQS pin pulled high
		L*	EQS pin pulled low
JU5	GPI	H	GPI pin pulled high
		L*	GPI pin pulled low
JU6	ADD0	H	DUT ADD0 pin pulled high (see Table 2)
		L*	DUT ADD0 pin pulled low (see Table 2)
JU7	ADD1	H	DUT ADD1 pin pulled high (see Table 2)
		L*	DUT ADD1 pin pulled low (see Table 2)
JU8	HIM	H	DUT HIM pin pulled high
		L*	DUT pin pulled low

Table 1. Jumper Description (continued)

JUMPER	SIGNAL	SHUNT	FUNCTION
JU9	GPIO1/LMN0	GPIO1	GPIO1/LMN0 pin driven by the GPIO1 (JU41) header
		LMN0*	GPIO1/LMN0 pin driven by the LMN0, IN+ line-fault signal
JU10	MS	L*	DUT MS pin pulled low
		H	DUT MS pin pulled high
JU11	TI	L	µC (U12) pin P3.5/TI is pulled low
		H	µC (U12) pin P3.5/TI is pulled high
		Open*	µC (U12) pin P3.5/TI is Open
JU13	CDS	L*	DUT CDS pin pulled low
		H	DUT CDS pin pulled high
JU14	VIN	+5V	DUT power levels supplied from 5V applied on +5VIN/GND terminals
		EXT	DUT power levels supplied from IOVDD_EXT, DVDD_EXT, and AVDD_EXT terminals
		USB*	DUT power levels supplied from USB port
JU15	DRS	L*	DUT DRS pin pulled low
		H	DUT DRS pin pulled high
JU16	GPIO0	L	DUT GPIO0 pin pulled low
		H	DUT GPIO0 pin pulled high
		Open*	DUT GPIO0 pin left unconnected
JU17	RXSDA	RX	UART-to-UART or UART-to-I^2C mode of communication
		SDA*	I^2C-to-I^2C mode of communication
JU18	I2CSEL	L	DUT in UART mode of communication
		H*	DUT in I^2C mode of communication
JU19	RXSDA	TX	UART-to-UART or UART-to-I^2C mode of communication
		SCL*	I^2C-to-I^2C mode of communication
JU21	CDS_571	H	MAX9277 CDS_571 pin is pulled high
		L	MAX9277 CDS_571 pin is pulled low
		CNTL3	MAX9277 CDS_571 pin is driven by CNTL3 pin of the DUT (MAX9278/MAX9282)
		Open*	MAX9277 CDS_571 pin left unconnected
JU22	MS_571	H	MAX9277 MS_571 pin is pulled high
		L	MAX9277 MS_571 pin is pulled low
		CNTL0	MAX9277 MS_571 pin is driven by CNTL0 pin of the DUT (MAX9278/MAX9282)
		Open*	MAX9277 MS_571 pin left unconnected

Table 1. Jumper Description (continued)

JUMPER	SIGNAL	SHUNT	FUNCTION
JU26	CONF1_571	H	MAX9277 CONF1 pin pulled high
		L	MAX9277 CONF1 pin pulled high
		Open*	MAX9277 CONF1 pin left unconnected
JU27	PWDN\	H*	DUT is powered up
		L	DUT is powered down
JU28	BWS	H	DUT BWS pin pulled high
		L*	DUT BWS pin pulled low
		Open	DUT BWS pin left unconnected
JU29	CONF0_571	H	MAX9277 CONF0pin pulled high
		L	MAX9277 CONF0 pin pulled high
		Open*	MAX9277 CONF0 pin left unconnected
JU30	ADD1_571	H	MAX9277 ADD1 pin pulled high
		L*	MAX9277 ADD1 pin pulled low
JU31	DVDD	INT*	DUT DVDD source is from on-board LDO
		EXT	DUT DVDD source is applied on DVDD_EXT terminal
JU32	AVDD	INT*	DUT AVDD, LVDSVDD, MAX9276 AVDD source is from on-board LDO
		EXT	DUT AVDD, LVDSVDD, MAX9276 AVDD source is applied on AVDD_EXT terminal
JU33	IOVDD	1.8V	DUT IOVDD = 1.8V source is from on-board LDO
		3.3V*	DUT IOVDD = 3.3V source is from on-board LDO
		EXT	DUT IOVDD source is applied on IOVDD_EXT terminal
JU34	CXTP	L	STP GMSL link (see Table 2)
		H*	Coax+ GMSL link (see Table 2)
		Open	Coax- GNSL link (see Table 2)
JU35	BWS_61	H	MAX9276 BWS pin pulled high
		L*	MAX9276 BWS pin pulled low
		Open	MAX9276 BWS pin left unconnected
JU37	BWS_571	H	MAX9277 BWS pin pulled high
		L*	MAX9277 BWS pin pulled low
		Open	MAX9277 BWS pin left unconnected
JU38	ADD0_571	H	MAX9277 ADD0 pin pulled high
		L*	MAX9277 ADD0 pin pulled low

Table 1. Jumper Description (continued)

JUMPER	SIGNAL	SHUNT	FUNCTION
JU39	T2EX	L	U12-41 to GND (factory use only)
		H	U12-41 to USB+5V (factory use only)
		Open*	U12-41 open (factory use only)
JU40	GPIO1	L	DUT GPIO1 pin pulled low
		H	DUT GPIO1 pin pulled high
		Open*	DUT GPIO1 pin left unconnected
JU51	ADD161	H	MAX9276 ADD1 pin pulled high
		L*	MAX9276 ADD1 pin pulled low
JU52	I2CSELBR	L	MAX9276 /MAX9277 in UART mode of communication
		H*	MAX9276 /MAX9277 in I^2C mode of communication
J53	MS61	L*	MAX9276 MS pin pulled low
		H	MAX9276 MS pin pulled high
JU54	ADD061	H*	MAX9276 ADD0 pin pulled high
		L	MAX9276 ADD0 pin pulled low
JU55	ADD261	H	MAX9276 ADD2 pin pulled high
		L*	MAX9276 ADD2 pin pulled low

**Default position (selected for coax link and I^2C communication).*

Table 2. Device Address Selection (register 0x00, 0x01)

PIN				DEVICE ADDRESS (bin)								DEVICE ADDRESS (hex)	
CX/TP*	ADD2	ADD1	ADD0	D7	D6	D5	D4	D3	D2	D1	D0	SERIALIZER	DESERIALIZER
High/Low	Low**	Low**	Low**	1	0	0	X	0	0	0	R/W	80	90
High/Low	Low	Low	High	1	0	0	X	0	1	0	R/W	84	94
High/Low	Low	High	Low	1	0	0	X	1	0	0	R/W	88	98
High/Low	Low	High	High	0	1	0	X	0	1	0	R/W	44	54
High/Low	High	Low	Low	1	1	0	X	0	0	0	R/W	C0	D0
High/Low	High	Low	High	1	1	0	X	0	1	0	R/W	C4	D4
High/Low	High	High	Low	1	1	0	X	1	0	0	R/W	C8	D8
High/Low	High	High	High	0	1	0	X	1	0	0	R/W	48	58
Open	Low	Low	Low	1	0	0	X	0	0	X	R/W	80	92
Open	Low	Low	High	1	0	0	X	0	1	X	R/W	84	96
Open	Low	High	Low	1	0	0	X	1	0	X	R/W	88	9A
Open	Low	High	High	0	1	0	X	0	1	X	R/W	44	56
Open	High	Low	Low	1	1	0	X	0	0	X	R/W	C0	D2
Open	High	Low	High	1	1	0	X	0	1	X	R/W	C4	D6
Open	High	High	Low	1	1	0	X	1	0	X	R/W	C8	DA
Open	High	High	High	0	1	0	X	1	0	X	R/W	48	5A

**CX/TP determines the serial cable type. CX/TP = open = addresses only for coax mode.*
***Default position.*
X = 0 for the serializer address; X = 1 for the deserializer address

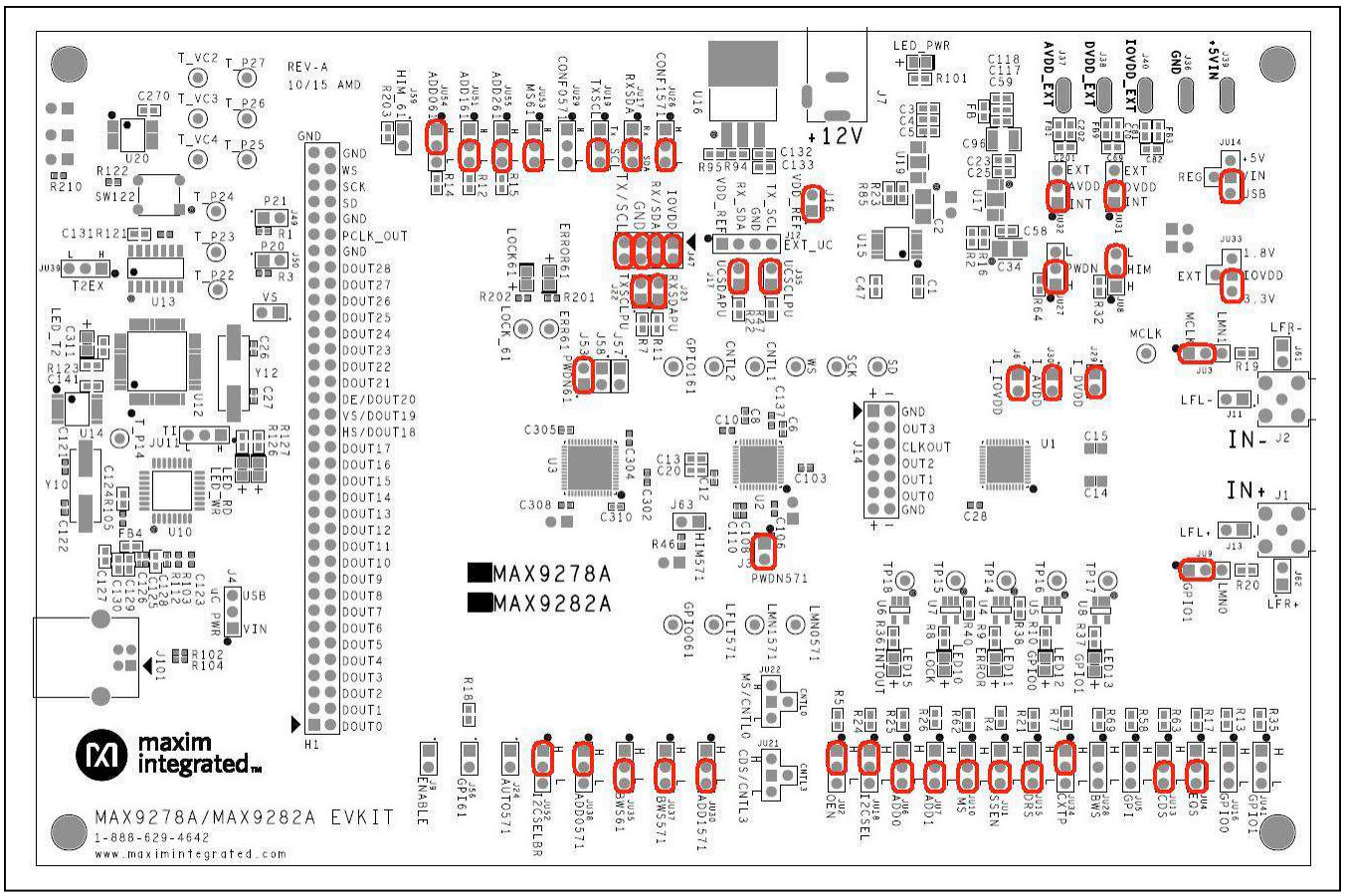

Figure 12. MAX9278A/MAX9282A Initial Jumper Settings for I²C-COAX Mode

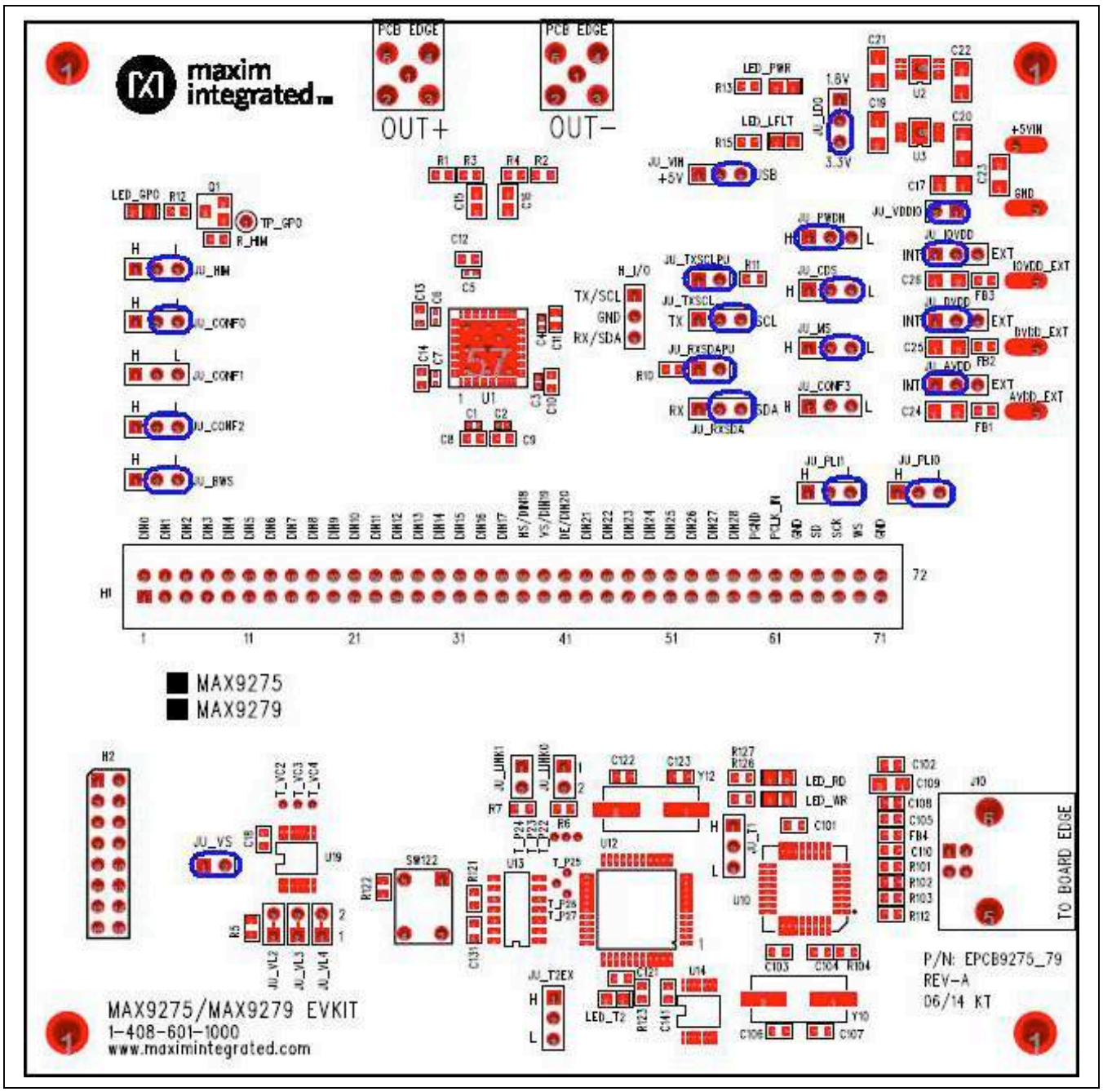

Figure 13. MAX9275/MAX9279 Initial Jumper Settings for I²C-COAX Mode

Troubleshooting

Possible causes of board test failure:

- Coax cable not properly connected between OUT+ of the serializer to IN+ of the deserializer.
- PCLKIN is not applied (e.g., FG output is disabled): Verify signal at the pins on the board.
- PCLKIN function generator output is not correct: Verify signal at the pins on the board.
- Incorrect jumper setting on the deserializer board: Reverify.
- Incorrect jumper setting on the serializer board: Reverify.
- Bus selection on the GUI is not consistent with jumpers' position on the boards: Check and verify that the USB cable has been properly connected.
- USB port has locked: Exit the application/GUI and remove the USB cable from the board and reinsert, then relaunch the GUI.
- Nuvoton µC is not communicating: Exit the application/GUI and remove the USB cable from the board and reinsert, then relaunch the GUI.
- Deserializer board is faulty: Try a different board (if available).
- Serializer board is faulty: Try a different board (if available).

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Amphenol RF	800-627-7100	www.amphenolrf.com
Hong Kong X'tals Ltd.	852-35112388	www.hongkongcrystal.com
Murata Americas	770-436-1300	www.murataamericas.com
ON Semiconductor	602-244-6600	www.onsemi.com
Rosenberger Hochfrequenztechnik GmbH	011-49-86 84-18-0	www.rosenberger.de
TDK Corp.	847-803-6100	www.component.tdk.com

Note: *Indicate that you are using the MAX9278A or MAX9282A when contacting these component suppliers.*

Component Lists, Schematics, and PCB Layout Diagrams

Click on the links below for component information, schematics, and PCB layout diagrams:

- **MAX9278A/MAX9282A EV Kit BOM**
- **MAX9278A/MAX9282A EV Kit Schematics**
- **MAX9278A/MAX9282A EV Kit PCB Layout**

Ordering Information

PART	TYPE
MAX9278ACOAXEVKIT#	EV Kit
MAX9282ACOAXEVKIT#	EV Kit
MAXCOAX2STP-HSD#	Adapter Kit

#Denotes RoHS compliant.

Note: *The MAX9278A and MAX9282A deserializer coax EV kits are normally ordered with a companion serializer board:*

- *MAX9275 EV kit (MAX9275COAXEVKIT#), or*
- *MAX9279 EV kit (MAX9279COAXEVKIT#)*

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	3/16	Initial release	—

TITLE: Bill of Materials
DATE: 3/4/16
DESIGN: max9278a_82a_evkit_a

QTY	REF_DES	VALUE	DNI/DNP	MFG PART #	DESCRIPTION	MANUFACTURER	COMMENTS
32	C1, C3, C5, C7, C9, C11, C23, C25, C47, C59, C104, C105, C107, C109, C116, C117, C120, C124, C127-C132, C141, C270, C301, C303, C306, C307, C309, C311	0.1UF	-	C0603C104K3RAC; GRM188R71E104KA01; C1608X7R1E104K	CAPACITOR; SMT; 0603; CERAMIC; 0.1uF; 25V; 10%; X7R; -55degC to + 125degC; +/- 15% from -55degC to +125degC;	KEMET/MURATA/TDK	
2	C2, C34	10UF	-	TAJB106M016RNJ	CAPACITOR; SMT (3528); TANTALUM CHIP; 10UF; 16V; TOL=20%; MODEL=TAJ SERIES	AVX	
3	C4, C118, C133	10UF	-	C1608JB1C106M080AB	CAPACITOR; SMT (0603); CERAMIC CHIP; 10UF; 16V; TOL=20%; TG=-25 DEGC TO +85 DEGC; TC=JB	TDK	
21	C6, C8, C10, C12, C65, C72-C76, C79, C103, C106, C108, C110, C137, C302, C304, C305, C308, C310	0.001UF	-	04022R102K9B20D	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.001UF; 50V; TOL=10%; MODEL=CC SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R	YAGEO PHYCOMP	
2	C13, C20	0.22UF	-	GRM188F51H224ZA01D	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.22UF; 50V; TOL=20%; MODEL=Y5V; TG=-55 DEGC TO +125 DEGC; TC=+	MURATA	

QTY	REF_DES	VALUE	DNI/DNP	MFG PART #	DESCRIPTION	MANUFACTURER	COMMENTS
2	C14, C15	0.22UF	-	C0805C224K5RAC;GRM21BR71H224KA;CGJ4J2X7R1H224K125AA	CAPACITOR; SMT; 0805; CERAMIC; 0.22uF; 50V; 10%; X7R; -55degC to + 125degC	KEMET/MURATA/TDK	
7	C16, C17, C19, C21, C22, C24, C49	0.1UF	-	C0402X7R160-104KNE; CL05B104KO5NNNC; GRM155R71C104KA88; C1005X7R1C104K; CC0402KRX7R7BB104; EMK105B7104KV	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.1UF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R;	VENKEL LTD./SAMSUNG ELECTRONICS/MURATA/ TDK/YAGEO PHICOMP/TAIYO YUDEN	
3	C18, C28, C53	3.3UF	-	AMK105BJ335MV-F	CAPACITOR; SMT (0402); CERAMIC CHIP; 3.3UF; 4V; TOL=20%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R	TAIYO YUDEN	
4	C26, C27, C121, C122	22PF	-	C0402C220J3GAC	CAPACITOR; SMT (0402); CERAMIC CHIP; 22PF; 25V; TOL=5%; MODEL=; TG=-55 DEGC TO +125 DEGC; TC=C0G	KEMET	
7	C58, C69, C70, C81, C82, C201, C202	4.7UF	-	C1608X5R0J475M080AB; GRM188R60J475ME19; JMK107BJ475MA-T	CAPACITOR; SMT (0603); CERAMIC; 4.7UF; 6.3V; TOL=20%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R	TDK/MURATA/TAIYO YUDEN	
1	C96	100UF	-	C3225Y5V0J107Z; GRM32EF50J107ZE20L	CAPACITOR; SMT (1210); CERAMIC CHIP; 100UF; 6.3V; TOL=+80%-20%; MODEL=C SERIES; TG=-30 DEGC TO +85 DEGC; TC=Y5V	TDK/MURATA	
1	C123	0.033UF	-	GRM155R71A333KA01	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.033UF; 10V; TOL=10%; MODEL=GRM SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R	MURATA	

QTY	REF_DES	VALUE	DNI/DNP	MFG PART #	DESCRIPTION	MANUFACTURER	COMMENTS
1	C125	1UF	-	C0402X5R100-105KNE; GRM155R61A105KE15	CAPACITOR; SMT (0402); CERAMIC CHIP; 1UF; 10V; TOL=10%; MODEL=; TG=-55 DEGC TO +85 DEGC; TC=X5R	VENKEL LTD./MURATA	
1	C126	10UF	-	CL05A106MP5NUNC	CAPACITOR; SMT (0402); CERAMIC CHIP; 10UF; 10V; TG=-55 DEGC TO +85 DEGC; TC=X5R	SAMSUNG ELECTRONICS	
28	SD, WS, SCK, MCLK, TP14-TP18, CNTL1, CNTL2, ERR61, T_P14, T_P22-T_P27, T_VC2-T_VC4, GPIO061, LMN0571, GPIO161, LFLT571, LMN1571, LOCK_61	N/A	-	5000	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	KEYSTONE	
9	LED11-LED13, LED15, LED_RD, LED_T2, LED_WR, ERROR61, LED_PWR	SML-210VTT86	-	SML-210VTT86	DIODE; LED; SML-21 SERIES; RED; SMT (0805); PIV=2V; IF=0.02A	ROHM	
5	FB, FB1, FB3, FB4, FB9	120	-	BLM18SG121TN1	INDUCTOR; SMT (0603); FERRITE-BEAD; 120; TOL=+/-25%; 3A	MURATA	
1	H1	PBC36DFBN	-	PBC36DFBN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 72PINS	SULLINS ELECTRONICS CORP.	
2	J1, J2	59S2AX-400A5-A	-	59S2AX-400A5-A	CONNECTOR; FEMALE; THROUGH HOLE; FAKRA-HF RIGHT ANGLE PLUG; RIGHT ANGLE; 5PINS	ROSENBERGER	

QTY	REF_DES	VALUE	DNI/DNP	MFG PART #	DESCRIPTION	MANUFACTURER	COMMENTS
1	J3	PBC02SAAN	-	PBC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS; -65 DEGC TO +125 DEGC	SULLINS ELECTRONICS CORP.	
36	J4, JU1-JU11, JU13, JU15-JU19, JU26-JU32, JU34, JU35, JU37-JU39, JU41, JU51-JU55	PCC03SAAN	-	PCC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 3PINS; -65 DEGC TO +125 DEGC	SULLINS	
17	J6, J9, VS, J11, J13, J16, J17, J22-J24, J29, J30, J35, J49, J50, J61, J62	PCC02SAAN	-	PCC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 2PINS; -65 DEGC TO +125 DEGC	SULLINS	
1	J7	PJ-002AH	-	PJ-002AH	CONNECTOR; MALE; THROUGH HOLE; DC POWER JACK; RIGHT ANGLE; 3PINS	CUI INC.	
1	J12	PBC04SAAN	-	PBC04SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 4PINS; -65 DEGC TO +125 DEGC	SULLINS ELECTRONICS CORP.	
1	J14	PEC07DAAN	-	PEC07DAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 14PINS	SULLINS ELECTRONICS CORP.	
5	J36-J40	MAXIMPAD	-	9020 BUSS	EVK KIT PARTS; MAXIM PAD; WIRE; NATURAL; SOLID; WEICO WIRE; SOFT DRAWN BUS TYPE-S; 20AWG	WEICO WIRE	

QTY	REF_DES	VALUE	DNI/DNP	MFG PART #	DESCRIPTION	MANUFACTURER	COMMENTS
1	J47	PEC04DAAN	-	PEC04DAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 8PINS	SULLINS ELECTRONICS CORP.	
6	J53, J56-J59, J63	PEC02SAAN	-	PEC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS	SULLINS	
1	J101	690-004-221-023	-	690-004-221-023	CONNECTOR; FEMALE; THROUGH HOLE; USB-B TYPE; SINGLE DECK; RIGHT ANGLE; 4PINS	EDAC	
4	JU14, JU21, JU22, JU33	PEC04SAAN	-	PEC04SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 4PINS	SULLINS ELECTRONICS CORP.	
2	LED10, LOCK61	SML-210MTT86	-	SML-210MTT86	DIODE; LED; SML-21 SERIES; GREEN; SMT (0805); PIV=2.2V; IF=0.02A	ROHM	
4	R1, R3, R122, R210	10K	-	ERJ-2RKF1002	RESISTOR; 0402; 10K OHM; 1%; 100PPM; 0.10W; THICK FILM	PANASONIC	
2	R2, R85	24.9K	-	CRCW060324K9FK	RESISTOR; 0603; 24.9K OHM; 1%; 100PPM; 0.10W; THICK FILM	VISHAY DALE	
32	R4, R5, R7-R11, R13, R17, R18, R21, R22, R24-R26, R32, R35-R38, R40, R47, R58, R62-R64, R69, R77, R101, R123, R126, R127	1K	-	CR0603-FX-1001ELF	RESISTOR; 0603; 1K OHM; 1%; 100PPM; 0.10W; THICK FILM	BOURNS	