Application Note
DSA/VGA/DVGA: Manual for USB Interface Board and Software

TriQuint SEMICONDUCTOR®

TQS-PCB Test Kit
The kit should contain
1. TriQuint-PCB (Evaluation Board –EVB)
2. Evaluation Host Board (EVH)
3. USB Cable
4. Extra 20-pin header

Introduction
This application note describes how to control the DSA/VGA/DVGA evaluation boards (EVB) using an Evaluation Host Interface Board (EVH). The EVH board, USB cable and EVH graphical user interface (EVH GUI) are supplied with each evaluation board. The EVH board and GUI are designed to control TriQuint components with a parallel, serial, or a direct voltage (+5V) control interface. Figure 1 shows the EVH board.
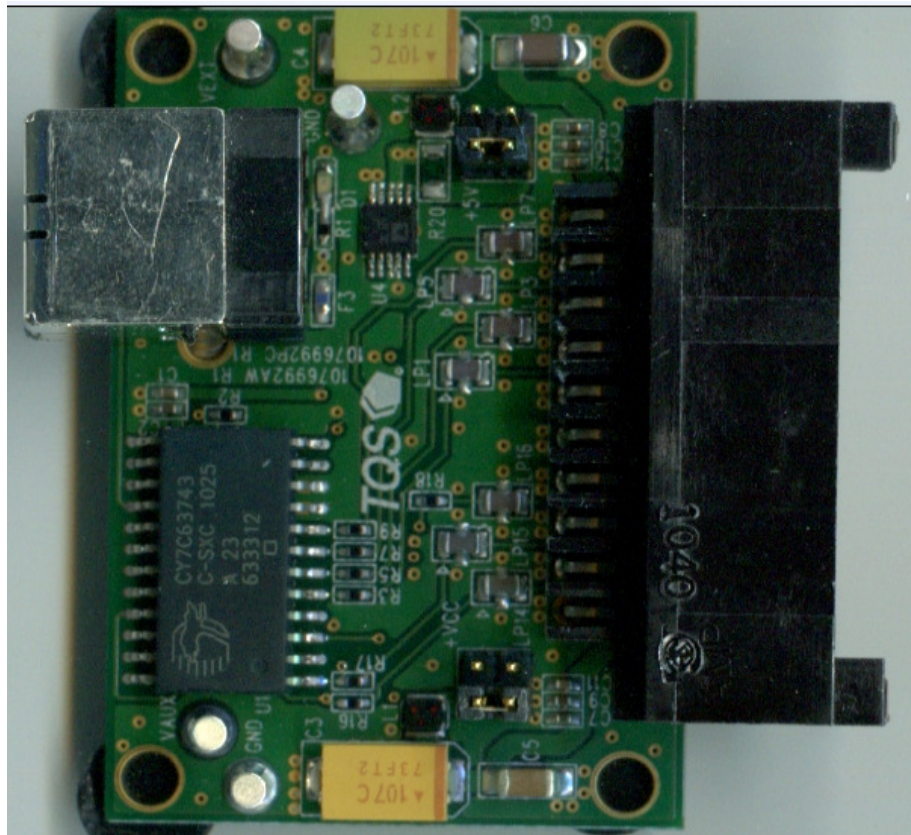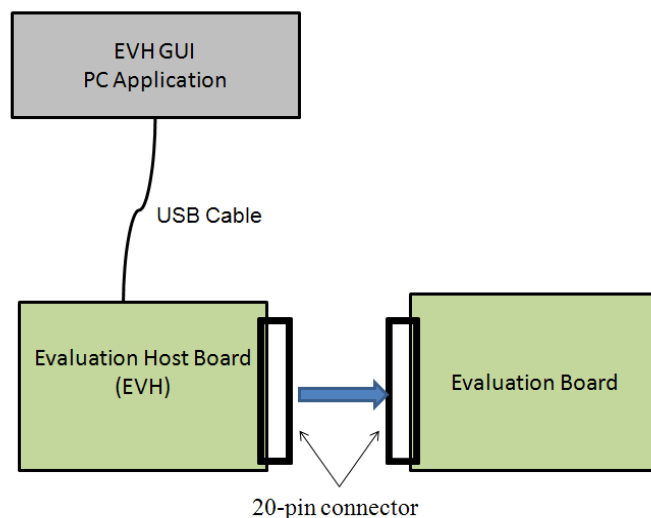

Figure 1: The EVH board

Evaluation Board (EVH)
The EVH board receives commands and reports status to the EVH GUI application running on the host PC. The Interface Board is responsible for interpreting commands from the USB and supplying the EVB with the appropriate control data on the 20-pin connector. The USB interface operates as a Human Interface Device (HID) and requires no extra drivers other than those already provided by Microsoft Windows. Control data may be supplied from the EVH to the EVB over a digital parallel interface consisting of up to 8 data bits, a digital serial link (SPI) using a programmable number of bits, I2C, or by commanding an on-board 12-bit DAC to source the appropriate control voltage.

Figure 2: Connection between EVB, EVH and EVH GUI

Jumper Locations on EVH

Jumpers (J2 and J6) provide flexibility of supplying voltage to the EVB either through USB or external power supply. Figure 3 shows the default orientation of the jumpers on EVH.

Jumper J6 in the position shown below provides 5V from the USB connector to the Pin 1 of the 20-pin connector.

Jumper J2 in the position shown below supplies the Vaux to Pin 19 of the 20-pin connector.

On the EVB, Pin 1 of the 20-pin connector supplies Vcc to the DSA and Pin 19 supplied Vcc to amplifier. Table 1, shows the list of the products supported by EVH and power supply requirements.
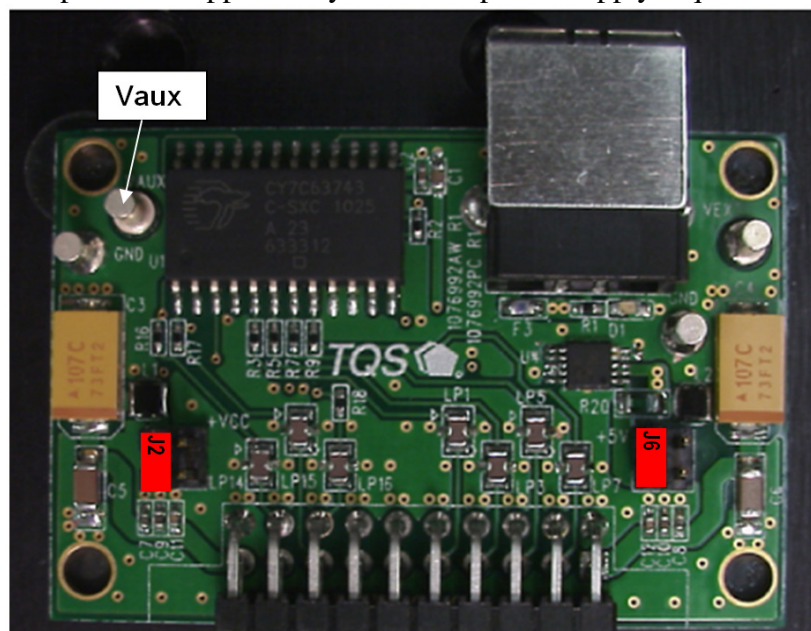

Figure 3: Default jumper location on EVH board

Table1: EVH supported products and corresponding supply requirements

Part Number	Part Description	Jumper J6 (USB 5V to Pin1)	Jumper J2 (Vaux to Pin 19)	Interface Type
TQP4M9071	High Linearity 6-bit 31.5 dB Digital Step Attenuator	Default, as in Figure 3.	N/A	Parallel
TQP4M9072	High Linearity 6-bit 31.5 dB Digital Step Attenuator	Default, as in Figure 3.	N/A	Serial (SPI)
TQP4M9083	High Linearity 7-bit 31.75 dB Digital Step Attenuator	Default, as in Figure 3.	N/A	Serial (SPI)
TQM829007	0.6-1GHz Digital Variable Gain Amplifier	Default, as in Figure 3	Default, as in Figure 3. Supply Vaux = 5V	Serial (SPI)
TQM879005	0.4-2.7 GHz Variable Gain Amplifier Module	Default, as in Figure 3	Default, as in Figure 3. Supply Vaux = 5V	Serial (SPI) or control voltage
TQM879006	1.8-2.7GHz Digital Variable Gain Amplifier	Default, as in Figure 3	Default, as in Figure 3. Supply Vaux = 5V	Serial (SPI)
TQM879008	2.3-2.7GHz Digital Variable Gain Amplifier	Default, as in Figure 3	Default, as in Figure 3. Supply Vaux = 5V	Serial (SPI)
TQM8M9075	0.05-4GHz Digital Variable Gain Amplifier	Default, as in Figure 3	Default, as in Figure 3. Supply Vaux = 5V	Serial (SPI)
TQM8M9076	0.05-4GHz Digital Variable Gain Amplifier	Default, as in Figure 3	Default, as in Figure 3. Supply Vaux = 5V	Serial (SPI)
TQM8M9077	0.05-4GHz Digital Variable Gain Amplifier	Default, as in Figure 3	Default, as in Figure 3. Supply Vaux = 5V	Serial (SPI)

TQS-PCB Turn-on Sequence

- Confirm the jumper settings on the EVH board are correct, as mentioned in earlier section.
- Connect EVH and EVB. EVH 20-pin Male Connector mates with the EVB 20-pin connector. This is a shrouded and keyed plug connector. The 20-pin female receptacle resides on the EVB and mates with the EVH Interface Board. Figure 4 shows an example of an Evaluation Host (left) connected to an Evaluation Board (right).
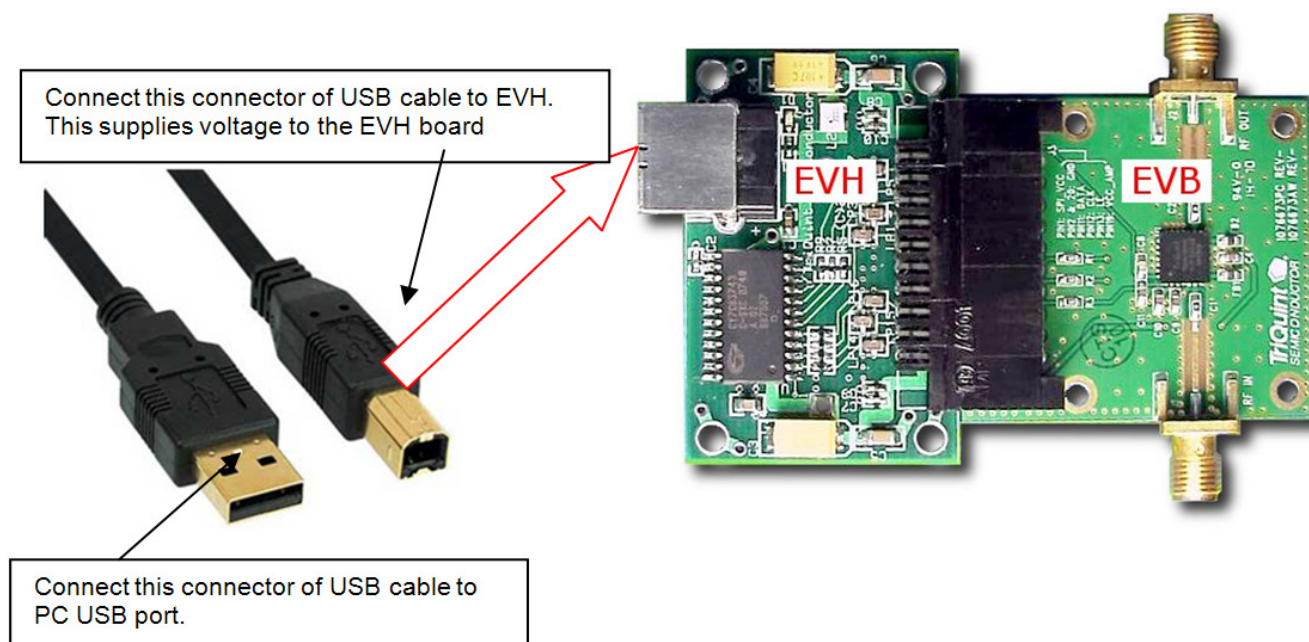

Figure 4: Connection between EVH –EVB and USB cable

- Once the USB cable is connected between the PC and EVH, green LED turns on the EVH board.
- Connect the USB cable between the EVH connector J1 and PC USB port. The green LED on the EVH turns on.
- Supply Vcc to the Vaux connector on the EVH using external power supply, if required. Refer to Table 1. This supply is passed through the EVH to the EVB.
- Start the EVH GUI and the device to be tested from the drop down list.

EVH Graphical User Interface (GUI)

The EVH GUI application runs on a MS-Windows compatible PC. Once software is downloaded on to the PC, make sure to unzip the folder and one must have two files (EVH Gui and PartNumbers) in the unzipped folder.

The latest version of EVH GUI software is available on TriQuint Website under specific product page.

Steps to follow for using the EVH GUI:

Step 1. To start the EVH GUI application, double click the EVH GUI application. The software reads a device definition file to determine the list of available TQS products to choose from.

Figure 5: Files in the EVH GUI folder

Step 2. Once the application has been started, the Evaluation Host Application window shows up. The status bar, displayed across the bottom, shows the number of parts loaded and instructs to select the device from drop down list. Messages button is available to show the status messages from the EVH GUI. This is useful for obtaining detailed status tracking information. USB communications status is shown on the right side of the status bar. General progress/error status information is shown on the left side of the status bar.
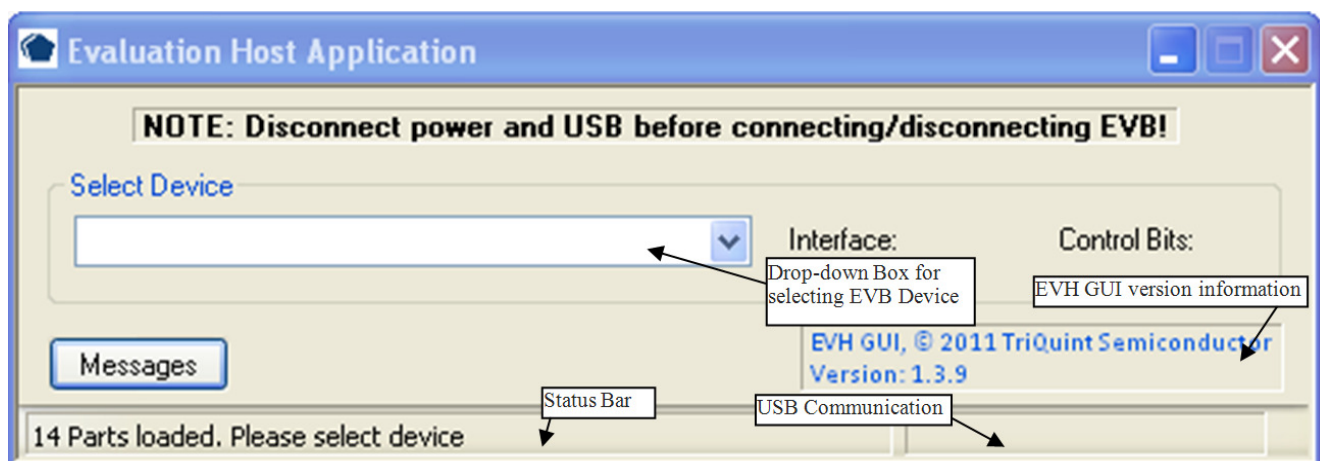

Figure 6: EVH GUI Window with menu bars highlighted

Step 3: Select the device to be tested from the drop down box. Once a device is selected, the GUI shows all the operational modes for the device under test. Once a device is selected, the slider limits and step size are configured to match the device specifications, as shown in Fig.5. The devices with digital attenuators are set to the default power-up state of the product until a new setting has been applied using the attenuation level slider.
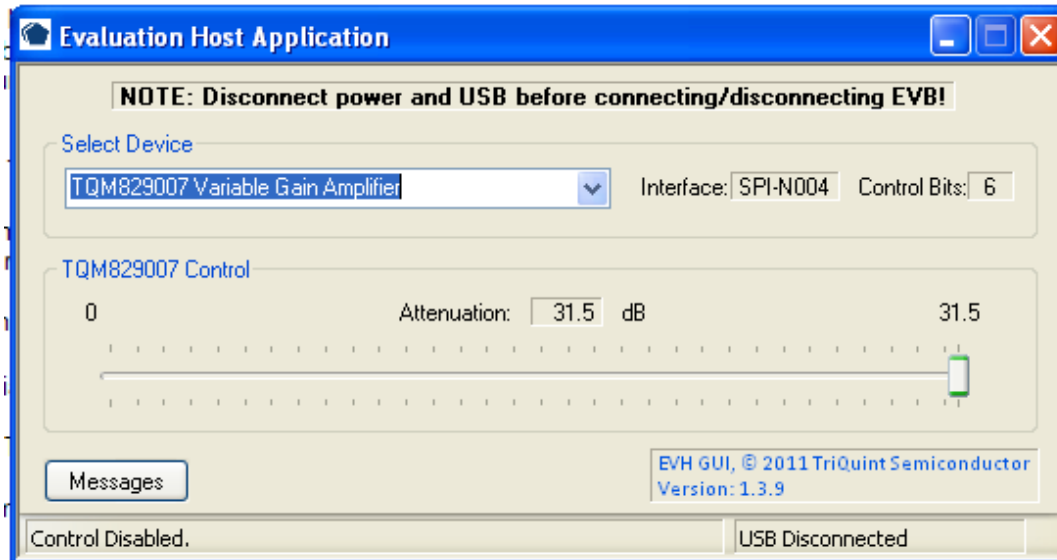

Figure 7: GUI shows all operational modes for device under test

Contact Information

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