ANALOG DEVICES

EVAL-ADV7280AMEBZ User Guide
UG-1179

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Evaluation Board for the ADV7280A-M 10-Bit, 4× Oversampled SDTV Video Decoder with Deinterlacer

FEATURES

Eight video input ports capable of accepting any of the following formats: single-ended CVBS, S-video (Y/C), and component (YPbPr)
MIPI CSI-2 Tx output

EVALUATION BOARD KIT CONTENTS

EVAL-ADV7280AMEBZ evaluation board
7.5 V power supply block
USB cable

HARDWARE NEEDED

Source of one or more of the following video inputs: single-ended CVBS, S-Video (Y/C), and/or component (YPbPr)
PC
MIPI CSI-2 Tx analyzer
CVBS input cable(s)
S-Video cable(s)
Component cable(s)
SMA cables

SOFTWARE NEEDED

DVP Eval Software
ADV7280A-M script
Windows OS

GENERAL DESCRIPTION

The EVAL-ADV7280AMEBZ evaluation kit is the platform provided by Analog Devices, Inc., to evaluate the ADV7280A-M video decoder. The EVAL-ADV7280AMEBZ evaluation kit contains an EVAL-ADV7280AMEBZ evaluation board and all of its necessary peripherals.

This user guide provides a detailed overview of the EVAL-ADV7280AMEBZ evaluation board hardware and the software required to use it.

The ADV7280A data sheet and the ADV7280A/ADV7281A/ ADV7282A Device Manual should be consulted in conjunction with this user guide when using the EVAL-ADV7280AMEBZ evaluation board.

EngineerZone can be accessed to find additional information about the ADV7280A-M.
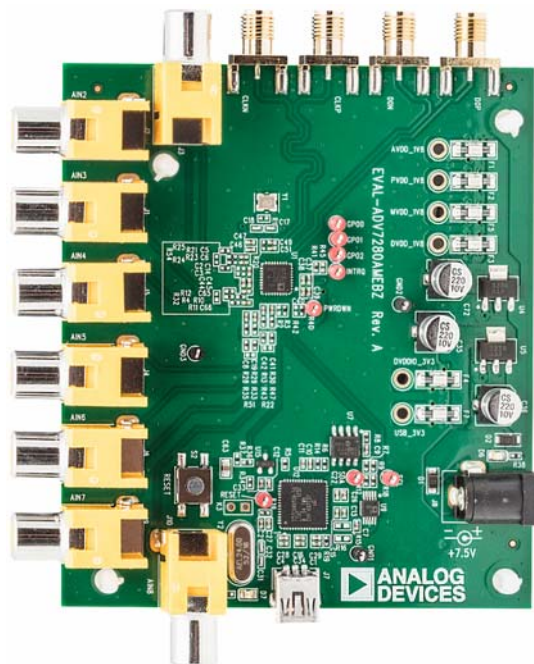
PHOTOGRAPH OF THE EVAL-ADV7280AMEBZ EVALUATION BOARD

Figure 1.

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REVISION HISTORY

9/2017—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

EVALUATION BOARD OVERVIEW

The EVAL-ADV7280AMEBZ evaluation board features an ADV7280A-M video decoder and a bank of subminiature version A (SMA) connectors. Eight analog video inputs ($A_{IN}1$ to $A_{IN}8$) are connected to the ADV7280A-M video decoder. The ADV7280A-M can receive analog video in several format configurations (see Table 1). The ADV7280A-M converts the analog video received into a mobile industry processor interface (MIPI®) CSI-2 Tx (MIPI Tx) digital stream. The ADV7280A-M MIPI Tx output consists of one differential data channel (D0P and D0N) and one differential clock channel (CLKP and CLKN); both channels are available at the SMA connectors on the evaluation board.

EVALUATION BOARD DESCRIPTION

This section outlines how to power up, communicate with, and use, the evaluation board. For an outline of the evaluation board connections, see Figure 2.

Power Supply

To power up the evaluation board, connect a mains cable to the 7.5 V power supply block included in the EVAL-ADV7280AMEBZ evaluation kit. Connect the output jack plug of the 7.5 V power supply block to the input power connector (J8) on the evaluation board. LED D6 illuminates when the power supply is enabled anduccessfully connects to the evaluation board.

Only use the 7.5 V power supply block provided with the evaluation kit to power the evaluation board.

Communicating with the Evaluation Board

To establish communication with the evaluation board, connect the USB cable included in the EVAL-ADV7280AMEBZ evaluation kit to a computer with DVP Eval Software installed. Connect the USB cable to the USB connector (J7) on the evaluation board. LED D7 illuminates when the USB cable successfully connects between an active USB port and the evaluation board.

Connecting Input Video

Connect an analog video input(s) to the desired analog input ($A_{IN}1$ to $A_{IN}8$) of the evaluation board. Refer to Table 1 to determine how different types of input (for example, single-ended CVBS and S-Video) connect to the evaluation board. Refer to the ADV7280A-M data sheet for more information on input muxing options.

Connecting Output Video

To observe the output of the evaluation board, connect the MIPI Tx output SMA connectors to a MIPI Tx compatible receiver.

Other Considerations

The 28.63636 MHz crystal (Y1) on the evaluation board does not oscillate until the ADV7280A-M is configured (see the Configuring the Evaluation Board section). The I²C master works independently of the crystal, using a ring oscillator in the ADV7280A-M.

Specific components on the evaluation board are outlined in Table 2 and highlighted in Figure 4. Additional details on components are outlined in Table 3.

Table 1. Analog Video Input Format Configurations for the EVAL-ADV7280AMEBZ Evaluation Board

| Configuration	$A_{IN}1$	$A_{IN}2$	$A_{IN}3$	$A_{IN}4$	$A_{IN}5$	$A_{IN}6$	$A_{IN}7$	$A_{IN}8$
Single-Ended CVBS	Single-Ended CVBS Input 1	Single-Ended CVBS Input 2	Single-Ended CVBS Input 3	Single-Ended CVBS Input 4	Single-Ended CVBS Input 5	Single-Ended CVBS Input 5	Single-Ended CVBS Input 7	Single-Ended CVBS Input 8
Differential CVBS	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
S-Video (Y/C)	S-Video Input 1 (Y channel)	S-Video Input 1 (C channel)	S-Video Input 2 (Y channel)	S-Video Input 2 (C channel)	S-Video Input 3 (Y channel)	S-Video Input 3 (C channel)	S-Video Input 4 (Y channel)	S-Video Input 4 (C channel)
YPrPb	YPbPr Input 1 (Y channel)	YPbPr1 Input 1 (Pb channel)	YPbPr1 Input 1 (Pr channel)	YPbPr2 Input 2 (Y channel)	YPbPr2 Input 2 (Pb channel)	YPbPr2 Input 2 (Pr channel)	Not applicable	Not applicable
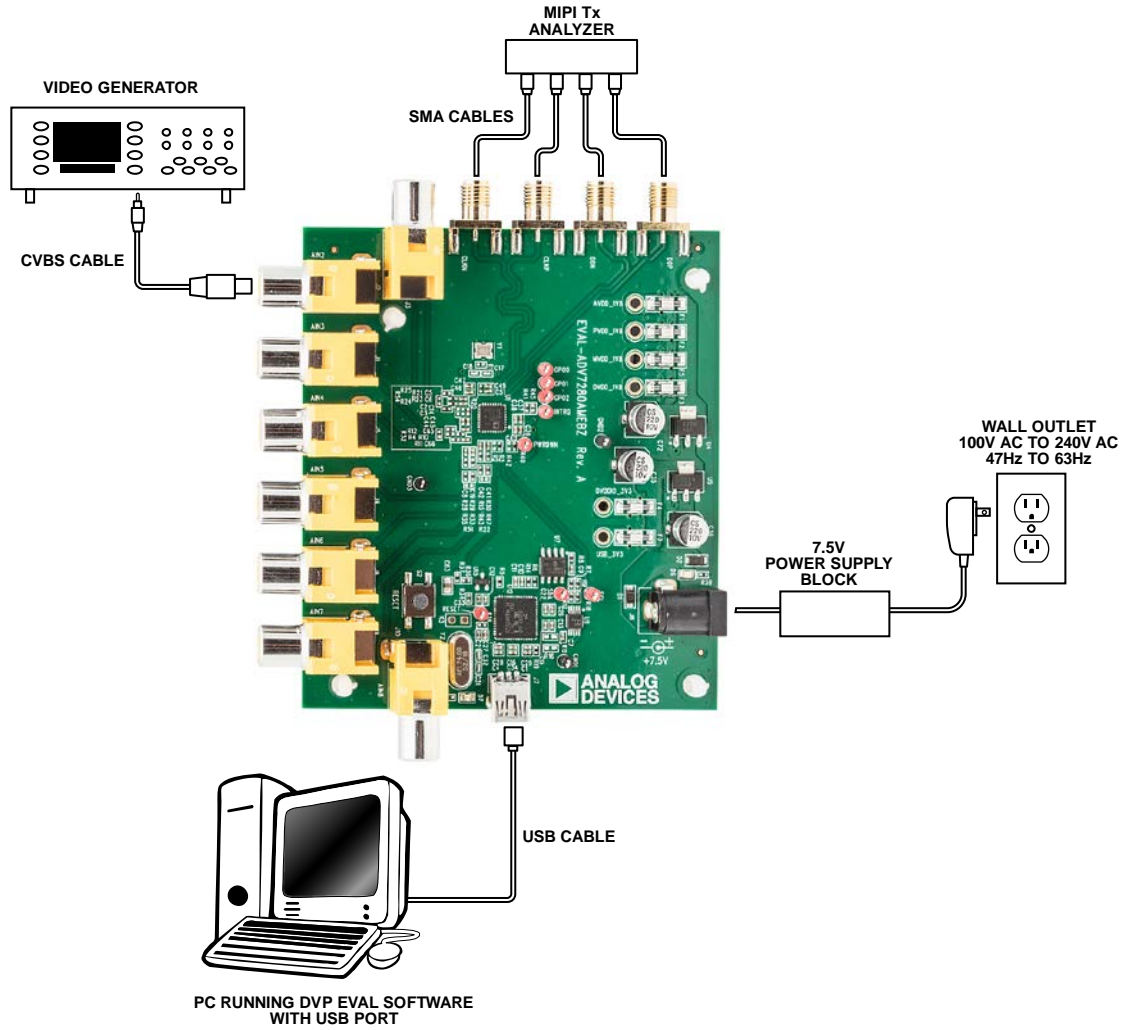
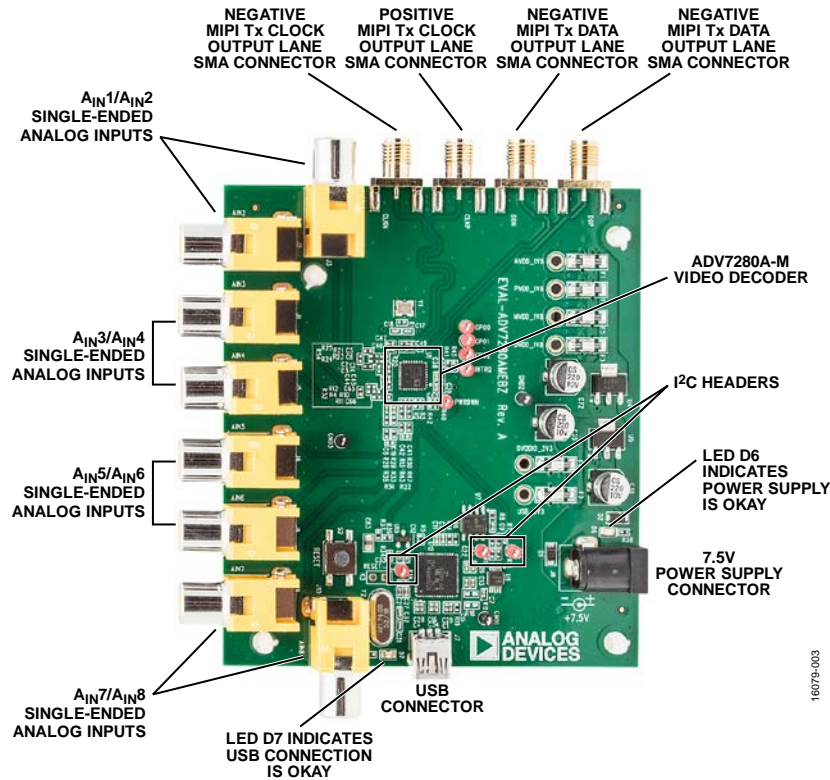*Figure 2. Outline of Evaluation Board Connections*

Figure 3. ADV7280A-M Evaluation Board

Table 2 Essential Evaluation Board Components

Reference Designator	Function	Description
J2 to J4, J6, J9, J10	Analog video inputs	Analog video inputs ($A_{IN}1$ to $A_{IN}8$) connected to the ADV7280A-M video decoder.
D0P, D0N, CLKP, CLKN	Video outputs	MIPI Tx data (D0P and D0N) and clock (CLKP and CLKN) outputs.
J8	Power	Connection for 7.5 V power supply. A 7.5 V power supply block is included in the EVAL-ADV7280AMEBZ evaluation kit.
D6	LED	Power enabled LED. This LED illuminates when the 7.5 V supply is connected and enabled.
J7	USB	Connecting a USB cable between this connector and a PC with DVP Eval Software and ADV7280A-M scripts[1] installed allows control of the evaluation board. See the Evaluation Board Software section for more information on DVP Eval Software and ADV7280A-M scripts.
D7	LED	USB connected LED. The LED illuminates when the USB cable is connected between an active USB port on a PC and the evaluation board.

[1] These scripts enable control of the ADV7280A-M video encoder

Table 3 Additional Evaluation Board Components

Reference Designator	Function	Description
INTRQ	INTRQ output	Interrupt output from the ADV7280A-M.
Reset and S2	Reset	The evaluation board can be reset by pressing and releasing the S2 push button. The evaluation board can also be reset by momentarily connecting the Reset test point to 0 V.
SDA and SCL	I²C communication bus	The SDA (I²C data) and SCL (I²C clock) test points provide access to the I²C communication bus on the evaluation board. This allows an external I²C master to be connected instead of using a PC to configure the evaluation board.
GPO0 to GP02	General purpose outputs	General purpose output test points
K3	EEPROM programming	Never short Jumper K3. K3 is only employed during initial programming and can disable the USB interface on the evaluation board.

EVALUATION BOARD SOFTWARE

SOFTWARE REQUIRED

To complete the initial setup of the evaluation board, it is necessary to download the following:

- ADV7280A-M script files
- DVP Eval Software

DOWNLOADING THE ADV7280A-M SCRIPT FILES

To download the ADV7280A-M script files, complete the following steps:

1. Go to the ADV7280A product page.
2. Download the **ADV7280AM_Cust.zip** file.
3. Unzip the **ADV7280AM_Cust.zip** file.

DOWNLOADING DVP EVAL SOFTWARE

To download the DVP Eval Software, complete the following steps:

1. Open the Install DVP Eval Software thread on EngineerZone.
2. Download the **Install DVP Eval Latest Source 10-14-11.exe.zip** file.
3. Unzip the **Install DVP Eval Latest Source 10-14-11.exe.zip** file.

INSTALLING DVP EVAL SOFTWARE

To install the DVP Eval Software, complete the following steps:

1. Run the executable file **Install DVP Eval Latest Source 10-14-11.exe.zip**.
2. Read the **Software License Agreement**. If in agreement, click the **I Agree** button.
3. Select the desired **Desktop** or **Start Menu** shortcuts and click the **Next** button.
4. Select an installation destination folder and click the **Install** button (see Figure 4). It is recommended to use the default destination folder. Selecting a different destination folder can cause compatibility issues with some versions of Windows® OS.
5. Restart the PC after installing the DVP Eval Software.

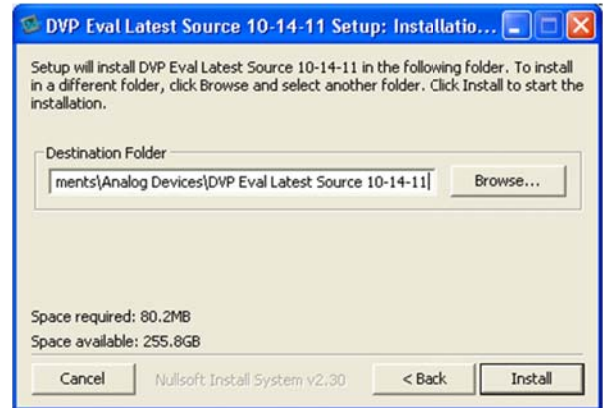*Figure 4. Installation Destination for DVP Eval Software*

LOADING THE ADV7280A-M SCRIPT FILES

This section describes how to combine the ADV7280A-M script files with the DVP Eval Software.

1. If possible, disconnect the PC from the internet, as some automatic backup agents can interfere with the script file loading process.
2. Copy the unzipped **ADV7280AM_Cust** folder to the following directory: C:\Documents and Settings\USER_NAME\My Documents\Analog Devices\DVP Eval Latest Source 10-14-11\xml\New Boards.
   The location of this folder is influenced by the install location of the DVP Eval Software and USER_NAME must be defined by the user.
3. Open the DVP Eval Software by selecting **Start** > **All Programs** > **Analog Devices** > **DVP Eval Latest Source 10-14-11**.
4. Select **File** > **Update Boards** to combine the ADV7280A-M script files with the DVP Eval Software (see Figure 5).
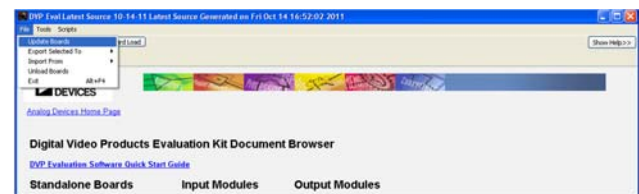

Figure 5. Update Board Files on the DVP Eval Software

5. After the **Update Boards** process completes, click **OK** on the **Update Boards Successful** window. The PC can now reconnect to the internet if it is disconnected.

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CONFIGURING THE EVALUATION BOARD

After connecting and powering up the hardware and downloading and installing the software, begin using the evaluation board.

To configure the evaluation board, complete the following steps:

1. Select **Start** > **All Programs** > **Analog Devices** > **DVP Eval Latest Source 10-14-11**.
2. Click the Choose Board button in the top left corner of the DVP Eval Software window to open the Board Selector window (see Figure 6).

Figure 6. Board Selector Window of DVP Eval Software

3. Select **ADV7280AM_CUST** in the **Rx** list box of the **Board Selector** window, select **None** in the **MotherBoard** list box, and select **None** in the **Tx** list box.
4. Click the **Load** button. A window similar to Figure 7 appears.
5. Select **Scripts** > **ADV7280AM_CUST** to select and run a script to configure the evaluation board (see Figure 8).
6. To monitor the registers of the ADV7280A-M, click the associated device tab within the DVP Eval Software (see Figure 8).
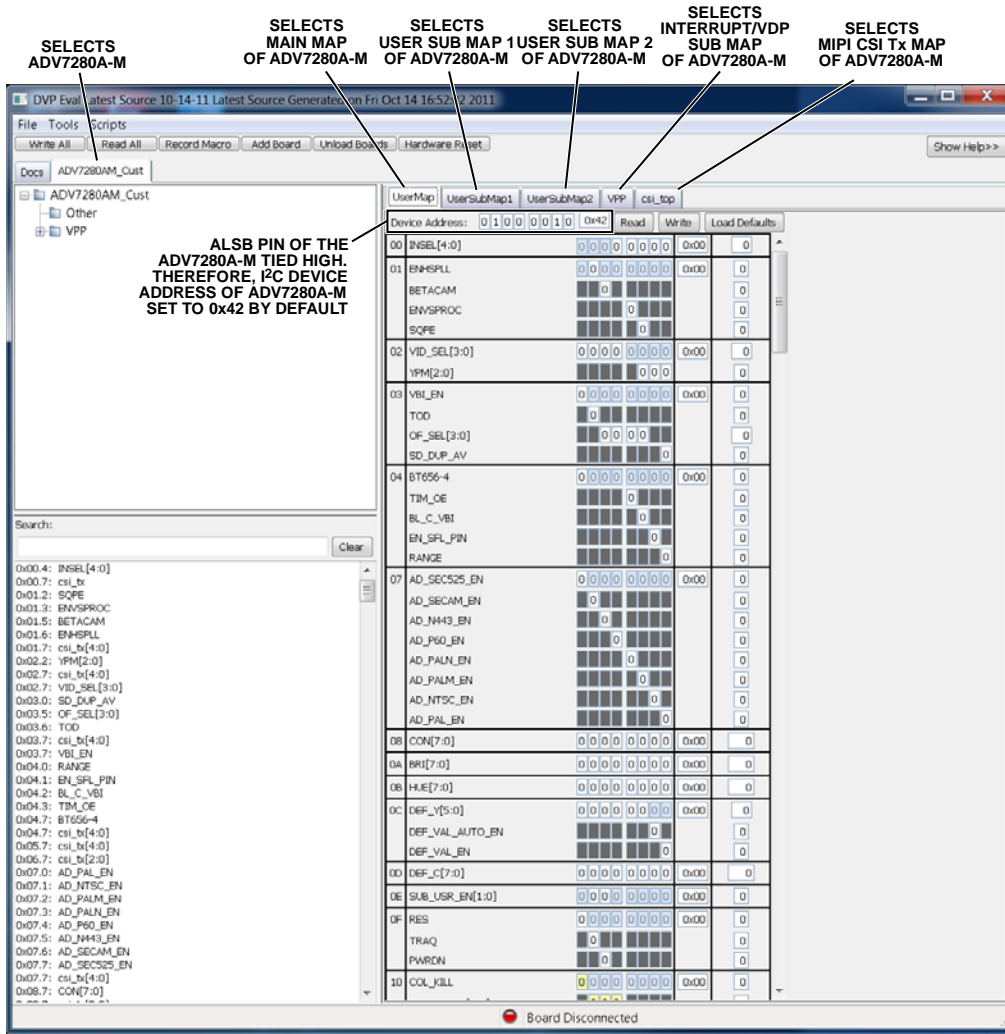
Figure 7. DVP Eval Software After Connecting the ADV7280A-M Evaluation Board
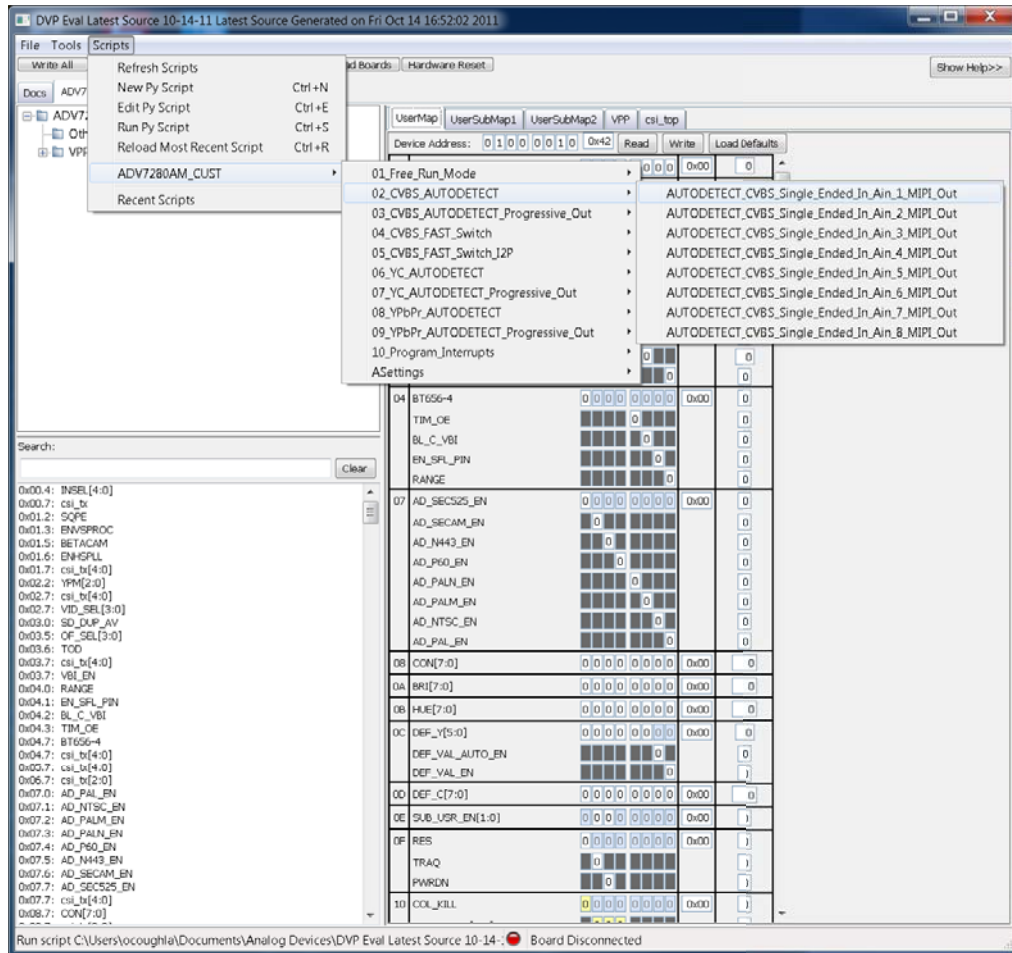
Figure 8 Running ADV7280A-M Script on DVP Eval Software

NOTES

ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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