

Evaluating the EVAL-ADPD1080Z-PRX Long Range Proximity Sensor

FEATURES

Full configuration of the [ADPD1080](#)

Register level

Parameter level

Graph views

Time series view

Long range proximity view

UDP transfer capability

EVALUATION KIT CONTENTS

EVAL-ADPD1080Z-PRX standard evaluation board

USB-C cable

ADDITIONAL EQUIPMENT NEEDED

[EVAL-ADPDM3Z](#)

PC running Windows® 7 operating system

ONLINE RESOURCES

[ADPD1080](#) data sheet

[Applications Wavetool](#)

GENERAL DESCRIPTION

The EVAL-ADPD1080Z-PRX evaluation kit provides users with a simple means of connecting with the [ADPD1080](#) hardware, collecting data from the [ADPD1080](#), and evaluating long range

proximity capabilities. The [ADPD1080](#) hardware is configured with a large area, p-type, intrinsic, n-type (PIN) semiconductor photodiode as a proximity sensor. In this configuration, motion and proximity in front of the EVAL-ADPD1080Z-PRX are measured by detecting the amount of infrared (IR) light reflected off of objects and the change in IR light as objects move relative to the EVAL-ADPD1080Z-PRX.

The evaluation kit requires the [EVAL-ADPDM3Z](#) and the [Applications Wavetool](#), which can be downloaded from the EVAL-ADPD1080Z-PRX product page. The [Applications Wavetool](#) is a graphical user interface (GUI) that provides users with low level and high level configurability, real-time data analysis, and user datagram protocol (UDP) transfer capabilities so that the evaluation board can easily connect to a PC.

The USB port of the PC powers the [EVAL-ADPDM3Z](#) and the EVAL-ADPD1080Z-PRX. On-board voltage regulators provide voltage supplies for the [ADPD1080](#).

The evaluation board schematic indicates signal names for easy identification (see Figure 12).

Full specifications for the [ADPD1080](#) are available in the [ADPD1080](#) data sheet. Refer to both this data sheet and the EVAL-ADPD1080Z-PRX user guide when working with the evaluation board.

EVALUATION BOARD PHOTOGRAPH

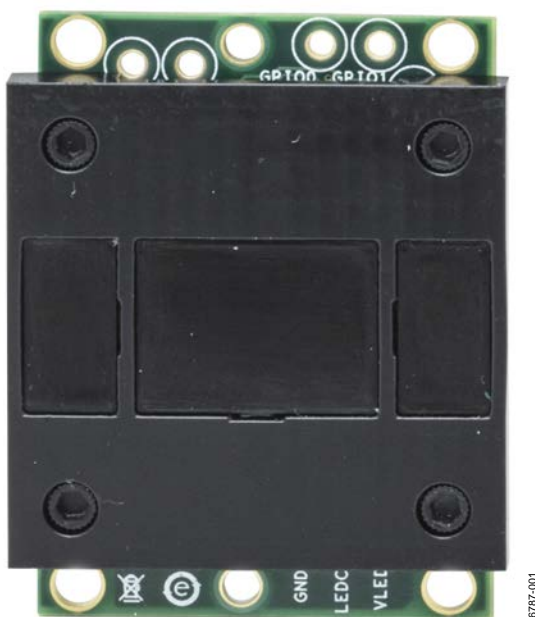


Figure 1.

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REVISION HISTORY

8/2018—Revision 0: Initial Version

EVALUATION BOARD SOFTWARE QUICK START PROCEDURES

INSTALLING THE APPLICATIONS WAVETOOL

Download the [Applications Wavetool](#) software package from the EVAL-ADPD1080Z-PRX product page. Unzip the downloaded software folder, run the enclosed **Applications Wavetool 183.exe** file, and follow the prompts for installing the [Applications Wavetool](#) software (see Figure 2). For further information, follow the installation guide included with the [Applications Wavetool](#) software in the downloaded folder.

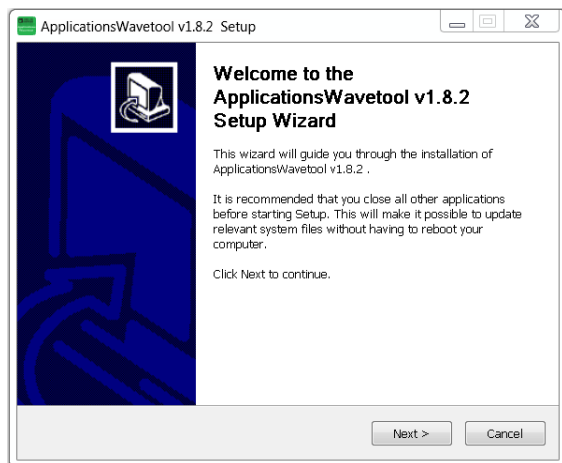


Figure 2. [Applications Wavetool](#) Setup

To start the [Applications Wavetool](#) application, navigate to **ApplicationsWavetool** from the **Start** menu and click the **Applications Wavetool** icon (see Figure 3).

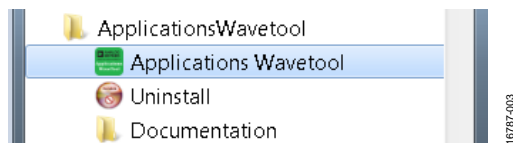


Figure 3. Navigate to **Applications Wavetool** from **Start** Menu

At startup, the [Applications Wavetool](#) application automatically checks if the installed [Applications Wavetool](#) software version is up to date. If there is a newer version available, the user is prompted to download the newest version.

EVALUATION BOARD USB CONNECTION

Prior to starting the [Applications Wavetool](#) application, connect the EVAL-ADPD1080Z-PRX to the [EVAL-ADPDM3Z](#) (see Figure 4). Connect the [EVAL-ADPDM3Z](#) evaluation board to a PC via the USB-C cable included with the evaluation kit. When the [EVAL-ADPDM3Z](#) evaluation board is connected, open the [Applications Wavetool](#) application (see Figure 5).

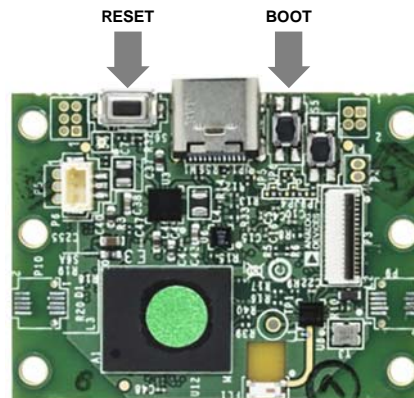


Figure 4. [EVAL-ADPDM3Z](#) Evaluation Board

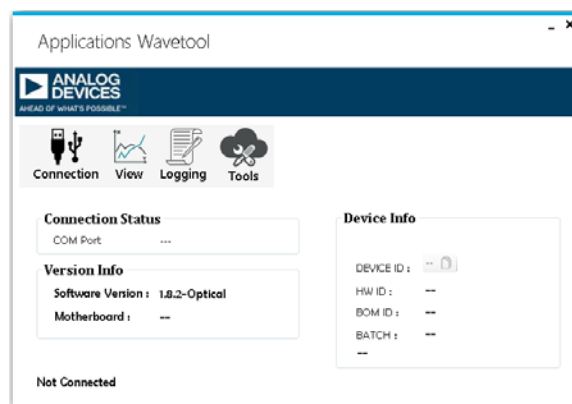


Figure 5. [Applications Wavetool](#) Application

After the [Applications Wavetool](#) application opens, click **File** > **Connection** > **UART Bridge** to open the **COM Port Selection** window. Choose the appropriate communication (COM) port from the **Connect** dropdown menu and click **Connect** (see Figure 6). The [Applications Wavetool](#) then acknowledges that the EVAL-ADPD1080Z-PRX evaluation board is connected.

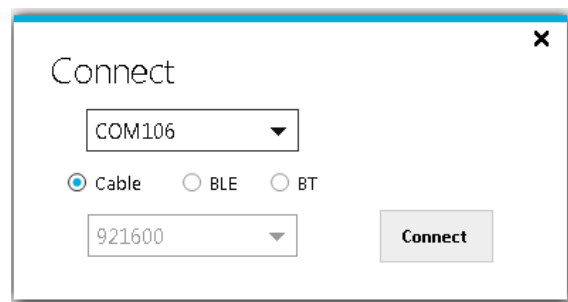


Figure 6. **COM Port Selection** Window

UPDATING THE EVAL-ADPDM3Z FIRMWARE

If the [EVAL-ADPDM3Z](#) firmware is out of date, the software displays the warning shown in Figure 7. If this occurs, click **Tools > Firmware Update** from the main window and click **OK** in the window that follows. Follow the instructions in Figure 8 to update the [EVAL-ADPDM3Z](#) firmware.

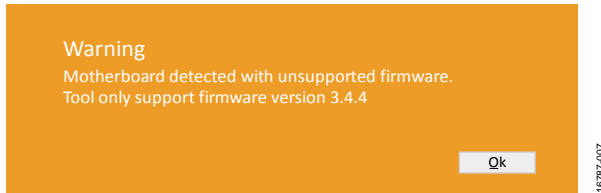


Figure 7. Unsupported Firmware Warning Message

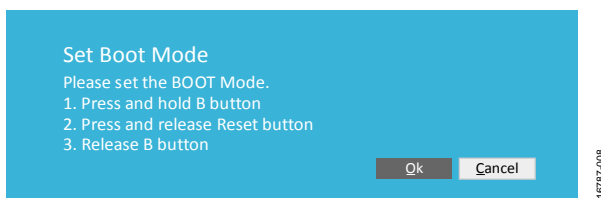


Figure 8. Updating the [EVAL-ADPDM3Z](#) Firmware

CONFIGURING THE EVAL-ADPD1080Z-PRX EVALUATION KIT

To operate the EVAL-ADPD1080Z-PRX, click **View > Long Range Proximity**. Click **ADPD Config** to open the **Gesture Config** window. Click **Load DCFG > ADPD1080Z-PRX_Proximity_LEDwaNominal_01.DCFG > Open** (see Figure 10).

After loading the configuration file, click **Power Calculation**, which opens a new window. Press M on the keyboard. In the new window, under **Boost Enable**, ensure that the **Boost Enable** check box is selected (see Figure 9). This check box is selected automatically when connecting the EVAL-ADPD1080Z-PRX and the [EVAL-ADPDM3Z](#) to the PC.

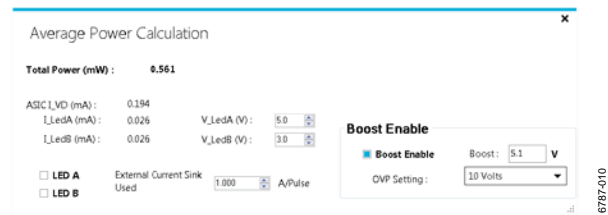


Figure 9. Boost Enable Selection

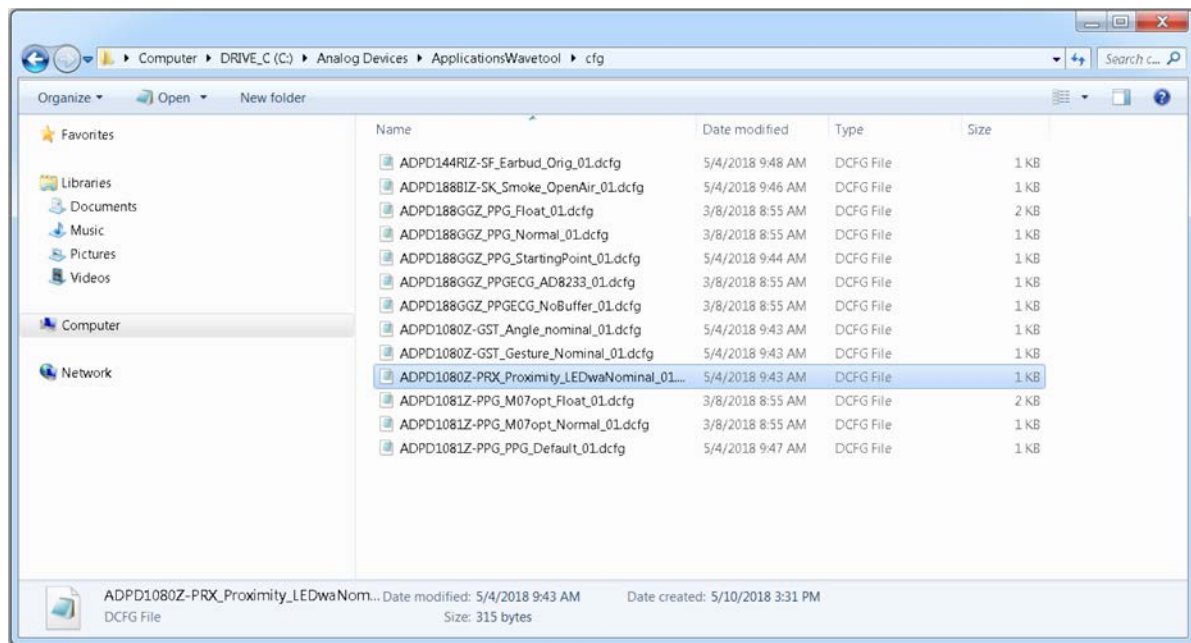


Figure 10. Loading the Configuration File

STREAMING DATA

Return to the **Long Range Proximity** window and click the **Play** icon to begin streaming data from the evaluation board. Place the EVAL-ADPD1080Z-PRX at a location where the board is unobstructed by nearby objects. Position an object or person within 1 m to 4 m in front of the EVAL-ADPD1080Z-PRX to see the corresponding output of the device on the graphs. The top left graph in the **Long Range Proximity** window shows the absolute returned IR light intensity, represented in analog-to-

digital converter (ADC) codes. The top right graph shows the relative returned IR light intensity with the baseline removed. Thresholds in the **Intensity** box and the **di/dt** box can be set to trigger motion and proximity events to occur at a range desired by the user.

For more detailed information on the [Applications Wavetool](#) and additional features of the software, see the [Applications Wavetool](#) user manual, which can be found in the **Help > Help Topics** menu.

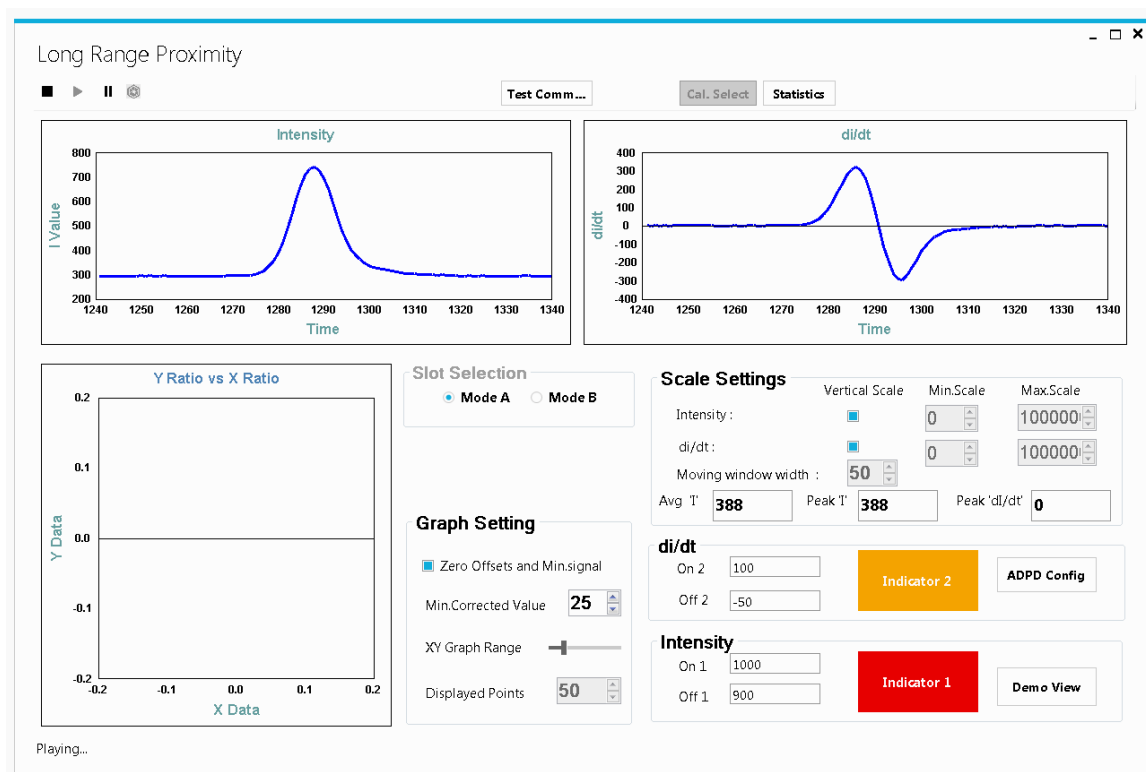


Figure 11. Long Range Proximity Window

PHOTODIODES

ADDP1080

ON-CHIP LED DRIVER

NARROW ANGLE 1A LED DRIVER

WIDE ANGLE 3A LED DRIVER

Q3A AND Q4A ARE LARGER PACKAGE ALTERNATE HIGHER POWER PNP DRIVERS FOR Q3 AND Q4. QX FITS INSIDE QXA'S PCB FOOTPRINT

CONNECTOR 1

VLD01/IOVDD	1
VLD02	3
VBOOST	5
GND_LOCAL	7
DUT_GPIO0	9
CONN1_SPH1_CS1/P2_11	11
DUT_SCL	13
DUT_MISO	15
CONN1_ADC0_VIN1/P2_4	17
CONN1_SPH1_CS3/P1_10	19

CONNECTOR 2

CONN2_ADXL364_ADC	1
VBUCK	3
CONN2_SPI2_CLK/P1_2	5
CONN2_SPI2_MISO/P1_4	7
VLD01/IOVDD	9
CONN2_BPR0_TONE_P/SPI2_CS1/P0_9	11
CONN2_BPR0_TONE_N/P0_8	13
CONN2_UART_RX	15
CONN2_SW_CLK	17
SYS_BMODE/P1_1	19

EEPROM

TEST POINTS

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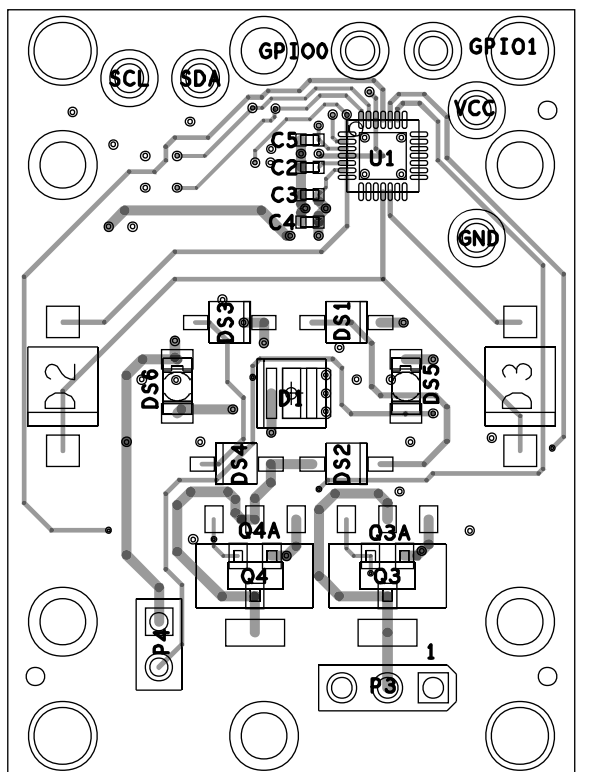


Figure 13. EVAL-ADPD1080Z-PRX Layout

**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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