

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

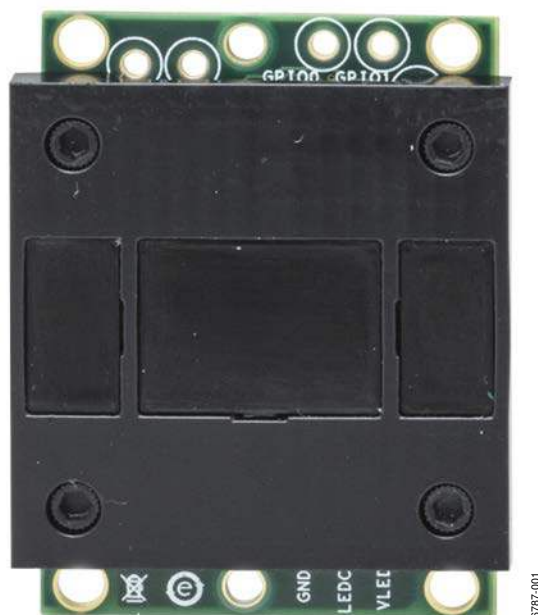


Figure 1.

TABLE OF CONTENTS

Features	1	Evaluation Board Software Quick Start Procedures	3
Evaluation Kit Contents.....	1	Installing the Applications Wavetool.....	3
Additional Equipment Needed.....	1	Evaluation Board USB Connection	3
Online Resources	1	Updating the EVAL-ADPDM3Z Firmware	4
General Description	1	Configuring the EVAL-ADPD1080Z-PRX Evaluation Kit	4
Evaluation Board Photograph.....	1	Streaming Data	5
Revision History	2	Evaluation Board Schematic and Artwork.....	6

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).

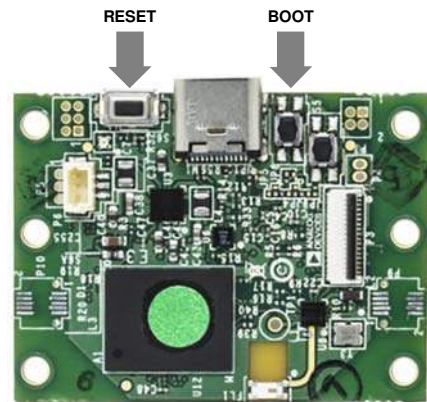


Figure 4. EVAL-ADPDM3Z Evaluation Board

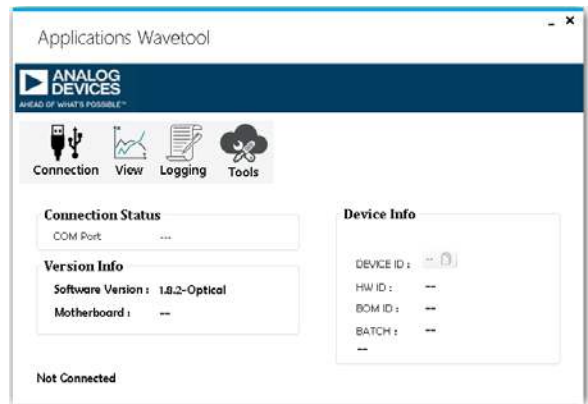


Figure 5. Applications Wavetool Application

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.

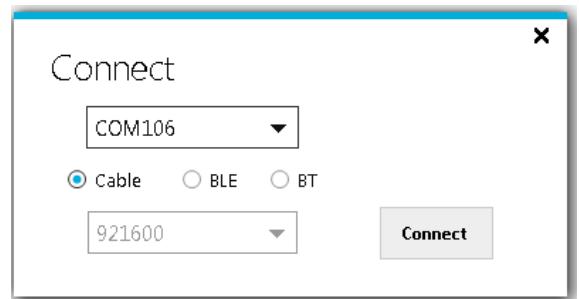


Figure 6. COM Port Selection Window

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.

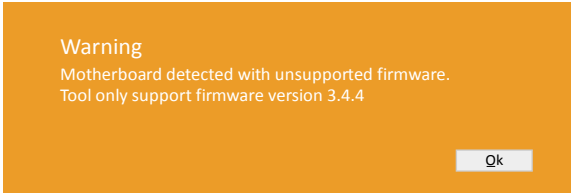


Figure 7. Unsupported Firmware Warning Message

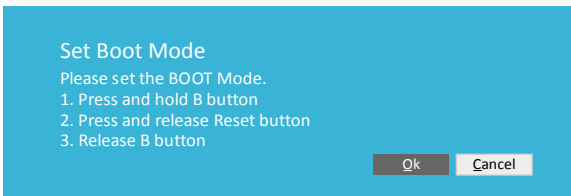


Figure 8. Updating the [EVAL-ADPDM3Z](#) Firmware

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

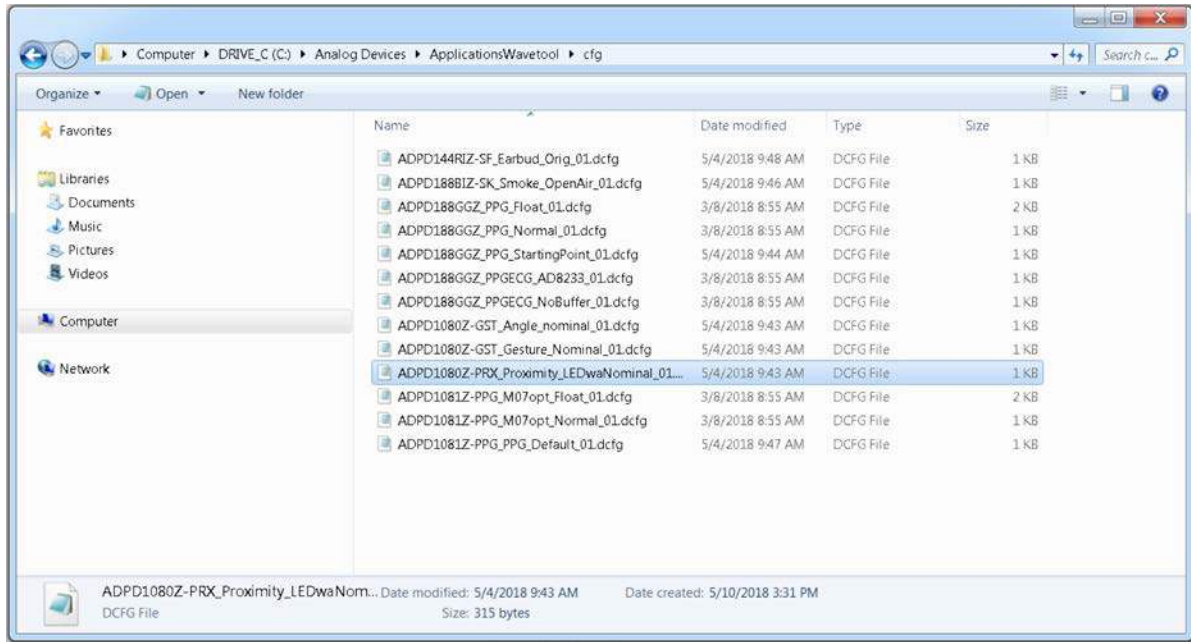


Figure 10. Loading the Configuration File

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.

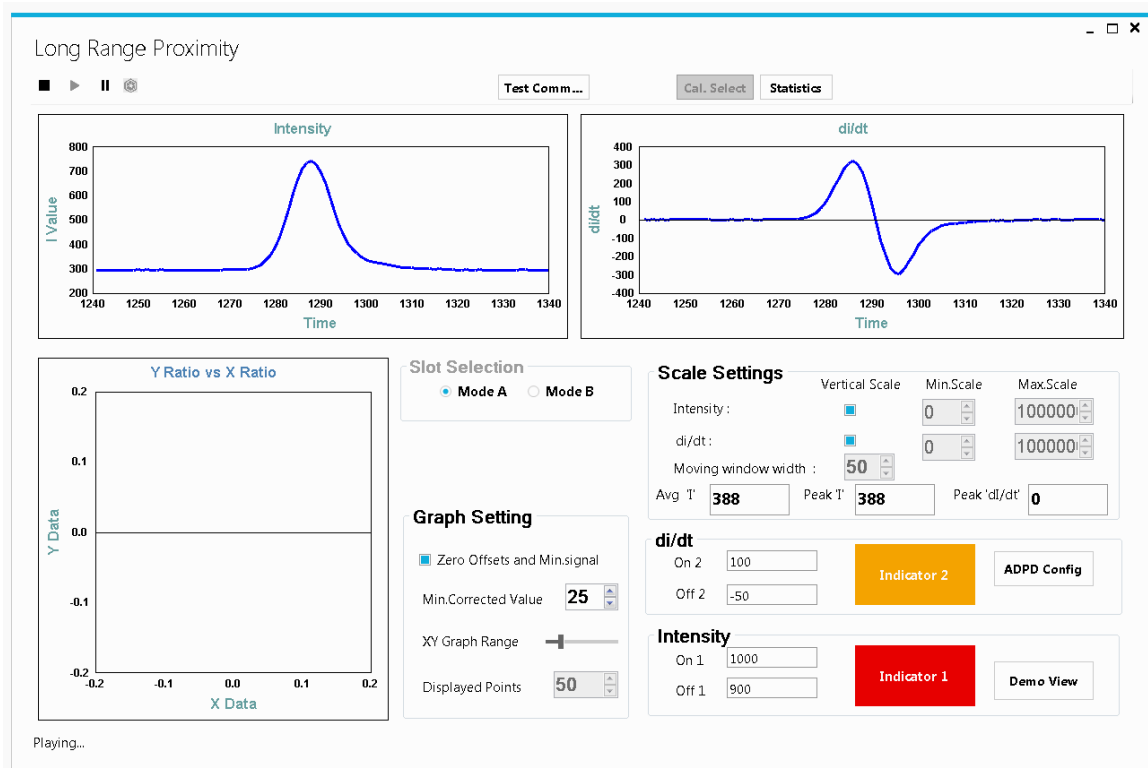


Figure 11. Long Range Proximity Window

EVALUATION BOARD SCHEMATIC AND ARTWORK

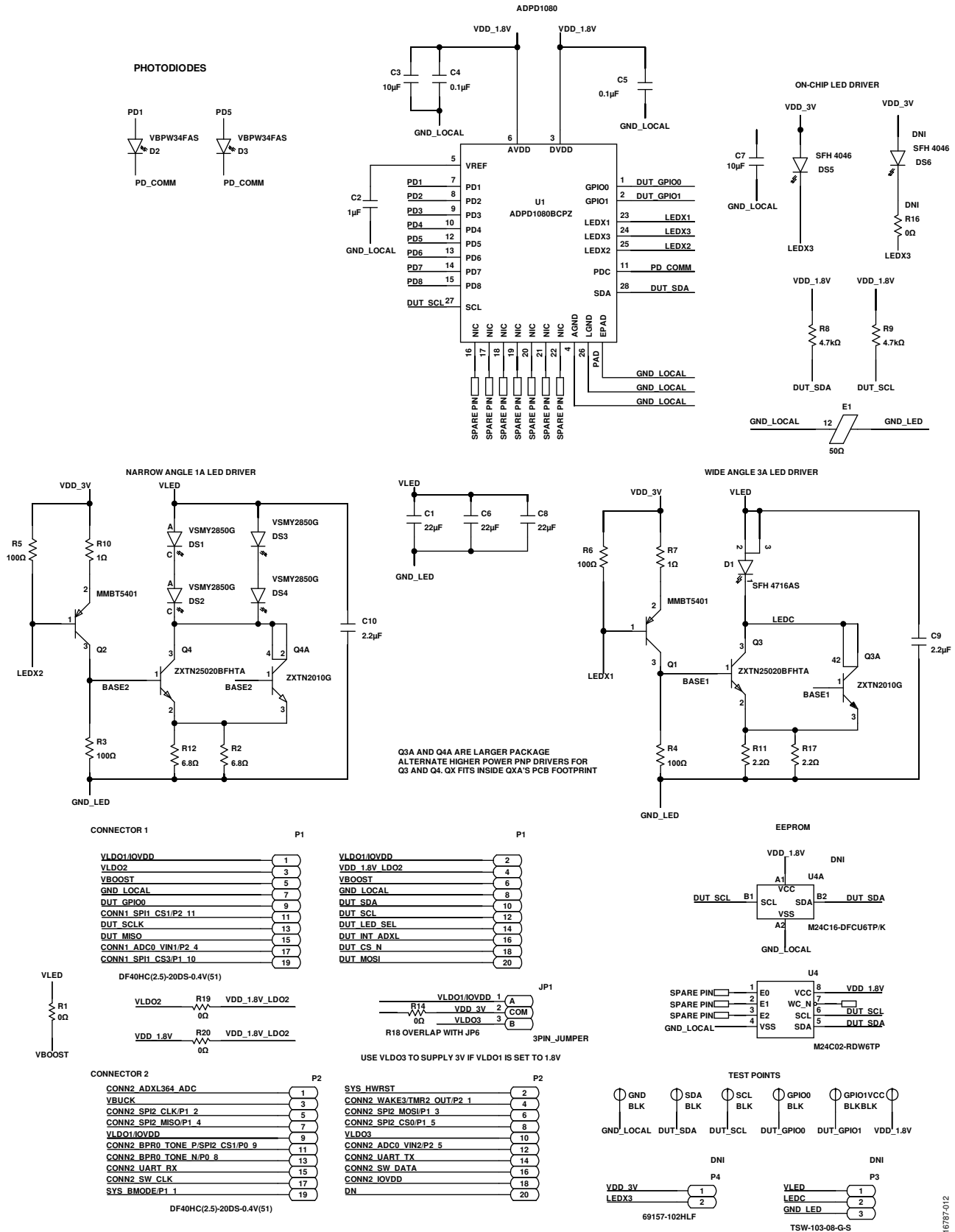


Figure 12. EVAL-ADPD1080Z-PRX Schematic

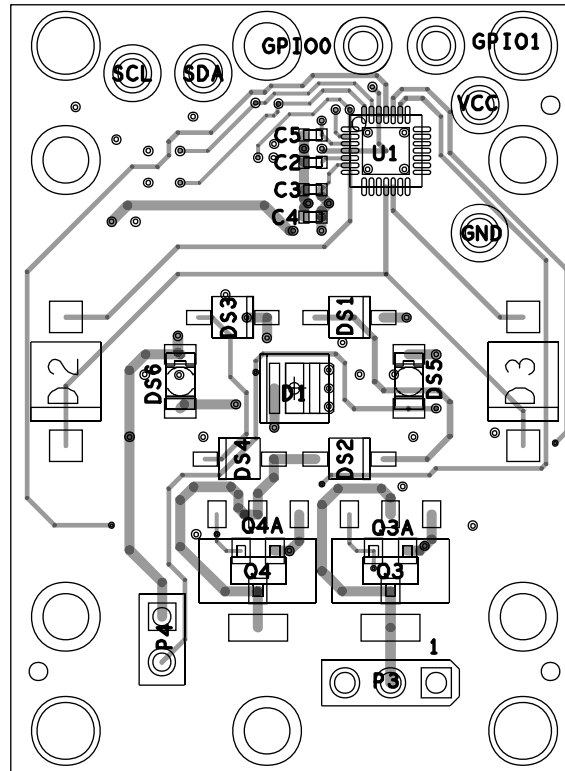


Figure 13. EVAL-ADPD1080Z-PRX Layout



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.

Legal Terms and Conditions

By using the evaluation board discussed herein (together with any tools, components documentation or support materials, the "Evaluation Board"), you are agreeing to be bound by the terms and conditions set forth below ("Agreement") unless you have purchased the Evaluation Board, in which case the Analog Devices Standard Terms and Conditions of Sale shall govern. Do not use the Evaluation Board until you have read and agreed to the Agreement. Your use of the Evaluation Board shall signify your acceptance of the Agreement. This Agreement is made by and between you ("Customer") and Analog Devices, Inc. ("ADI"), with its principal place of business at One Technology Way, Norwood, MA 02062, USA. Subject to the terms and conditions of the Agreement, ADI hereby grants to Customer a free, limited, personal, temporary, non-exclusive, non-sublicensable, non-transferable license to use the Evaluation Board FOR EVALUATION PURPOSES ONLY. Customer understands and agrees that the Evaluation Board is provided for the sole and exclusive purpose referenced above, and agrees not to use the Evaluation Board for any other purpose. Furthermore, the license granted is expressly made subject to the following additional limitations: Customer shall not (i) rent, lease, display, sell, transfer, assign, sublicense, or distribute the Evaluation Board; and (ii) permit any Third Party to access the Evaluation Board. As used herein, the term "Third Party" includes any entity other than ADI, Customer, their employees, affiliates and in-house consultants. The Evaluation Board is NOT sold to Customer; all rights not expressly granted herein, including ownership of the Evaluation Board, are reserved by ADI. CONFIDENTIALITY. This Agreement and the Evaluation Board shall all be considered the confidential and proprietary information of ADI. Customer may not disclose or transfer any portion of the Evaluation Board to any other party for any reason. Upon discontinuation of use of the Evaluation Board or termination of this Agreement, Customer agrees to promptly return the Evaluation Board to ADI. ADDITIONAL RESTRICTIONS. Customer may not disassemble, decompile or reverse engineer chips on the Evaluation Board. Customer shall inform ADI of any occurred damages or any modifications or alterations it makes to the Evaluation Board, including but not limited to soldering or any other activity that affects the material content of the Evaluation Board. Modifications to the Evaluation Board must comply with applicable law, including but not limited to the RoHS Directive. TERMINATION. ADI may terminate this Agreement at any time upon giving written notice to Customer. Customer agrees to return to ADI the Evaluation Board at that time. LIMITATION OF LIABILITY. THE EVALUATION BOARD PROVIDED HEREUNDER IS PROVIDED "AS IS" AND ADI MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND WITH RESPECT TO IT. ADI SPECIFICALLY DISCLAIMS ANY REPRESENTATIONS, ENDORSEMENTS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, RELATED TO THE EVALUATION BOARD INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. IN NO EVENT WILL ADI AND ITS LICENSORS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES RESULTING FROM CUSTOMER'S POSSESSION OR USE OF THE EVALUATION BOARD, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DELAY COSTS, LABOR COSTS OR LOSS OF GOODWILL. ADI'S TOTAL LIABILITY FROM ANY AND ALL CAUSES SHALL BE LIMITED TO THE AMOUNT OF ONE HUNDRED US DOLLARS (\$100.00). EXPORT. Customer agrees that it will not directly or indirectly export the Evaluation Board to another country, and that it will comply with all applicable United States federal laws and regulations relating to exports. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the substantive laws of the Commonwealth of Massachusetts (excluding conflict of law rules). Any legal action regarding this Agreement will be heard in the state or federal courts having jurisdiction in Suffolk County, Massachusetts, and Customer hereby submits to the personal jurisdiction and venue of such courts. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement and is expressly disclaimed.

©2018 Analog Devices, Inc. All rights reserved. Trademarks and registered trademarks are the property of their respective owners. UG16787-0-8/18(0)



www.analog.com