

# **AFE58JD16 16-Channel Analog Front End Evaluation Module Overview (EVM Rev. B)**

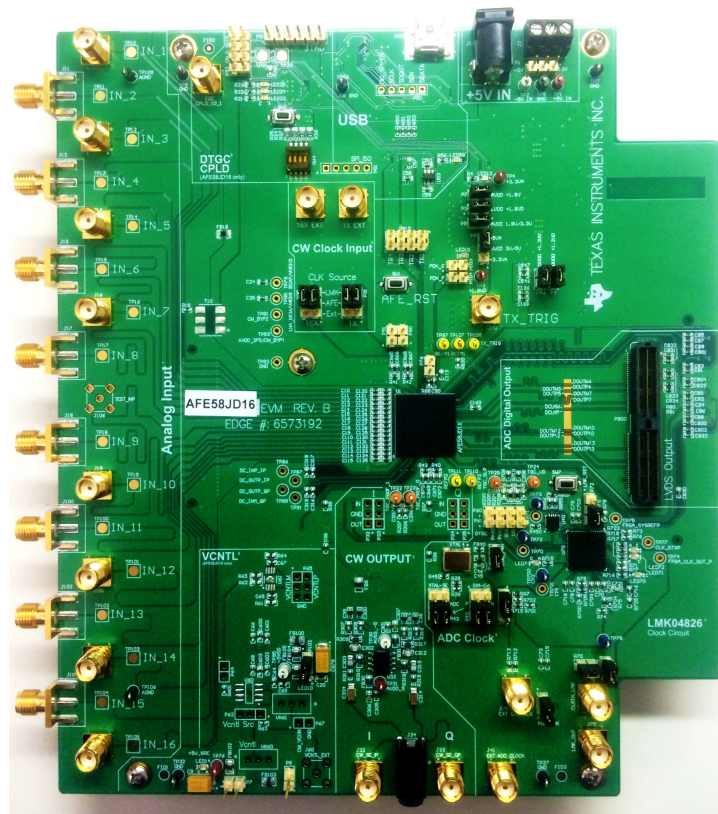
This user's guide provides an introduction to the evaluation module (EVM) for the AFE58JD16 from Texas Instruments.

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## 1 AFE58JD16 EVM Kit Contents

The AFE58JD16 EVM kit allows for quick and easy evaluation of the AFE58JD16, an analog front-end which can be configured to sample 16 channels and output the digital samples on an LVDS or JESD204B interface. The kit consists of (1) AFE58JD16EVM, (2) Power Cable, and (3) a USB cable for SPI communication to the software GUI. [Figure 1](#) shows an overview of the evaluation module with the AFE58JD16 EVM.



**Figure 1. AFE58JD16 EVM**

## 2 AFE58JD16 EVM Hardware Features

The AFE58JD16 EVM is a compact USB 2.0-based evaluation board for testing the AFE58JD16, an analog front-end with VCA, ADC, and I/Q Digital Demodulator. The EVM includes an FPGA Mezzanine Card (FMC) connector for connection to the FPGA-based capture card (TSW14J56) available from TI or for connection directly to FPGA vendors' development kits. A second connector on the EVM allows connection to the FPGA-based capture card (TSW1400) supporting an LVDS interface. Monitoring the power consumption the individual power supply pins of the AFE58JD16 is possible via headers. Finally, the EVM provides a full clocking solution with the LMK04826 device providing all sampling clocks, SYSREF clocks, and FPGA reference clocks using pre-defined scripts to configure all with a single button click within the GUI.

## 3 AFE58JD16 EVM Software Features

The AFE58JD16 GUI software is integrated into a software suite called Healthtech Multi-Channel Data Acquisition GUI, or HMC-DAQ, which supports a family of devices from Texas Instruments. The GUI allows for one-click auto configuration of the AFE58JD16, and LMK04826 clocking solution provided on the EVM, using one of several configuration files provided with the installer. Data capture and analysis are performed by software GUI *High Speed Data Converter Pro*, or *HSDC Pro* including fast-Fourier transform (FFT) analysis providing key parametric data such as SNR, SFDR, and Harmonic Distortion.

## 4 AFE58JD16 EVM Documentation

All relevant documentation including EVM schematics, Bill of Materials (BOM), Altium database, IBIS model and User's Guides are available for download. A comprehensive User's Guide explaining step-by-step software installation procedures as well as testing procedures is provided. A detailed explanation of all features of the GUI software is also given in this comprehensive User's Guide. Therefore, the AFE58JD16 EVM kit is a complete evaluation setup for the AFE58JD16. For more information on the AFE58JD16, or to begin evaluation, please write to [AFE5816-support@list.ti.com](mailto:AFE5816-support@list.ti.com).

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### CAUTION

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### FCC Interference Statement for Class A EVM devices

*NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

## FCC Interference Statement for Class B EVM devices

*NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### 3.2 Canada

3.2.1 For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210

#### Concerning EVMs Including Radio Transmitters:

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

#### Concernant les EVMs avec appareils radio:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

#### Concerning EVMs Including Detachable Antennas:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

#### Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

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3.3.1 *Notice for EVMs delivered in Japan:* Please see [http://www.tij.co.jp/lstds/ti\\_ja/general/eStore/notice\\_01.page](http://www.tij.co.jp/lstds/ti_ja/general/eStore/notice_01.page) 日本国内に輸入される評価用キット、ボードについては、次のところをご覧ください。  
[http://www.tij.co.jp/lstds/ti\\_ja/general/eStore/notice\\_01.page](http://www.tij.co.jp/lstds/ti_ja/general/eStore/notice_01.page)

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1. Use EVMs in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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|                               |  |
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