

AFE8104, AFE8108 7.4GHz Transceiver With 12GSPS DACs and 6GSPS ADCs

1 Features

- Eight (AFE8108)/ four (AFE8104) RF sampling 12GSPS transmit DACs
- Eight (AFE8108)/ four (AFE8104) RF sampling 6GSPS receive ADCs
- Maximum RF signal bandwidth:
 - 8T8R: 800MHz.
 - 4T4R: 1600MHz
 - 2T2R: 2400MHz
- RF frequency range: up to 7.4GHz
- Single DUC/DDCs per chain
- Supports TDD operation with fast switching between TX and RX
- Internal PLL/VCO to generate DAC/ADC clocks
- Support for external clock at DAC or ADC rate
- Digital Data Interface:
 - JESD204B and JESD204C
 - 8 SerDes transceivers up to 32.5Gbps
 - 8b/10b and 64b/66b Encoding
 - 12-bit, 16-bit, 24-bit and 32-bit resolution
 - Subclass 1 multi-device synchronization
- Fast Boot Up time option: <500ms
- Package:
 - 17mm × 17mm FCBGA, 0.8mm pitch

2 Applications

- [Radar](#)
- [Seeker front end](#)
- [Software defined radio \(SDR\)](#)
- [Communications Testers](#)
- [EW](#)

3 Description

The AFE810x is a high performance, wide bandwidth multi-channels transceiver, integrating eight (AFE8108)/ four (AFE8104) RF sampling transmitter chains and eight (AFE8108)/ four (AFE8104) RF sampling receiver chains.

Each receiver chain includes a 6GSPS ADC (analog-to-digital converter), two digital peak detectors to assist an external autonomous automatic gain controller and RF overload detectors for device reliability protection. The single digital down converters (DDC) provides up to 800MHz of signal BW in 8 channels mode, 1600MHz in 4 channels and up to 2400MHz in 2 channels mode.

Each transmitter chain includes a digital up converters (DUCs) supporting up to 800MHz (8T), 1600MHz (4T) or 2400MHz (2T) of signal bandwidth. The output of the DUCs drives a 12GSPS DAC (digital to analog converter) with a mixed mode output option to enhance 2nd Nyquist operation.

Package Information

PART NUMBER	PACKAGE ⁽¹⁾	PACKAGE SIZE ⁽²⁾
AFE8104 AFE8108	ANG (FCBGA, 400)	17mm × 17mm
AFE8104 AFE8108	AQC (FCBGA, 400)	17mm × 17mm

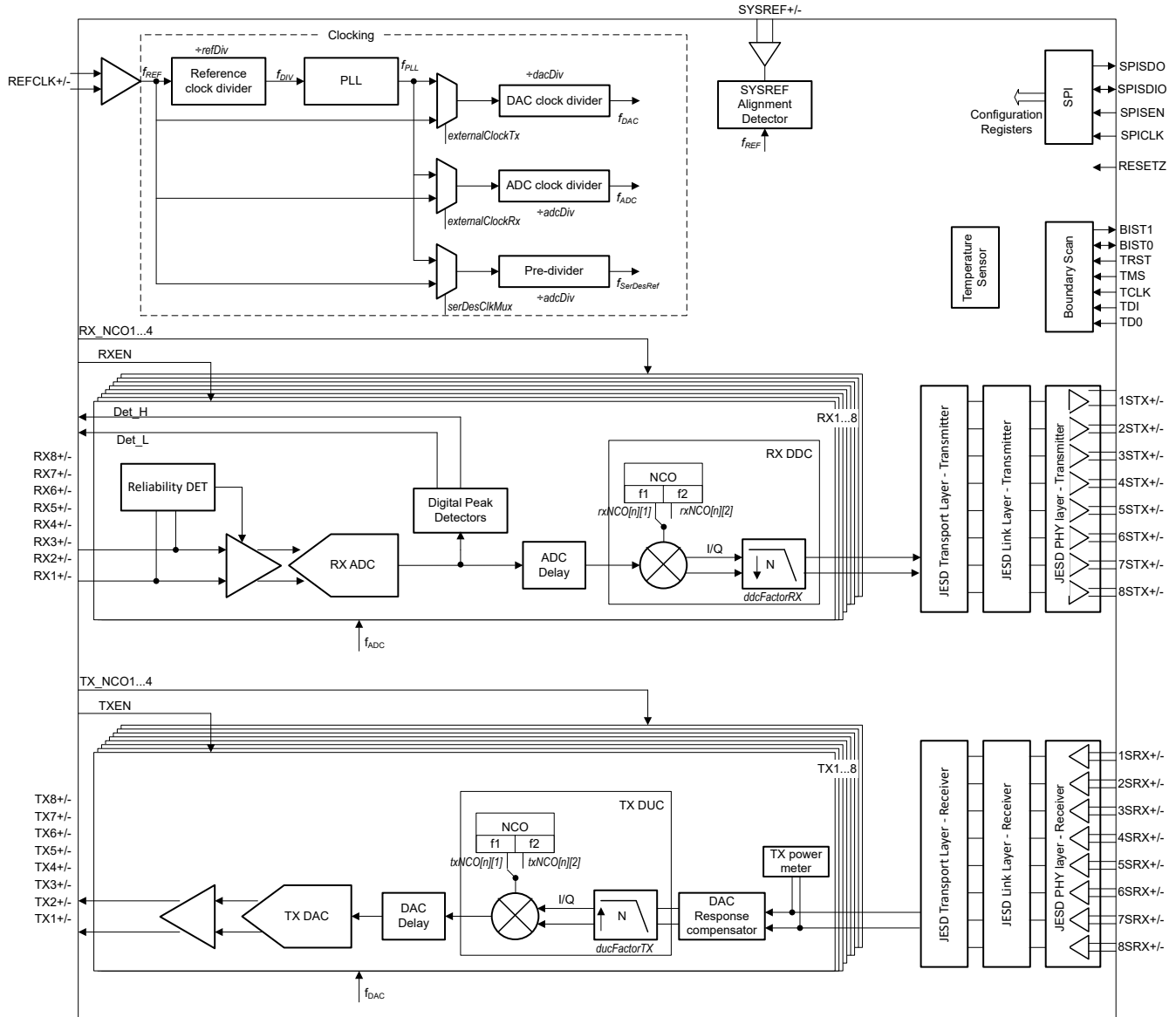
(1) For all available packages, see [Section 6](#).

(2) The package size (length × width) is a nominal value and includes pins, where applicable.

Device Information

PART NUMBER	STATUS	NUMBER OF TX CHAINS	NUMBER OF RX CHAINS	PACKAGE
AFE8108	Active	8	8	ANG
	Active	8	8	AQC
AFE8104	Preview	4	4	ANG
	Active	4	4	AQC





AFE8108 Functional Block Diagram

4 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

4.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

4.2 Support Resources

TI E2E™ [support forums](#) are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

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4.3 Trademarks

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4.4 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

4.5 Glossary

[TI Glossary](#) This glossary lists and explains terms, acronyms, and definitions.

5 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

DATE	REVISION	NOTES
May 2026	*	Initial Release

6 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
AFE8104AQC	Active	Production	FCBGA (AQC) 400	90 JEDEC TRAY (5+1)	-	Call TI	Call TI	-40 to 85	AFE8104 SNPB
AFE8108ANG	Active	Production	FCBGA (ANG) 400	90 JEDEC TRAY (5+1)	-	SNAGCU	Level-3-260C-168 HR	-40 to 85	AFE8108
AFE8108AQC	Active	Production	FCBGA (AQC) 400	90 JEDEC TRAY (5+1)	-	Call TI	Call TI	-40 to 85	AFE8108 SNPB

(1) **Status:** For more details on status, see our [product life cycle](#).

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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