

AMC7908 8-Channel Power-Amplifier Monitor and Controller

1 Features

- Eight analog outputs
 - Eight monotonic DACs: 1.22mV resolution
 - Automatically configured output ranges:
 - Positive output voltage: 0V to 10V
 - Negative output voltage: –10V to 0V
 - High current drive capability
 - High capacitive load tolerance
- Output on and off control switches
 - Fast switching time
 - Low resistance
- Multichannel ADC monitor
 - Two high-voltage external inputs: 0V to 85V
 - Two high-side current-sense amplifiers: up to 85V common-mode range
 - Local temperature sensor: $\pm 2.5^{\circ}\text{C}$ accuracy
- Output sequence control for start-up and shutdown events
- Internal 2.5V reference
- SPI and I²C interface: 1.65V to 3.6V operation
 - SPI: 4-wire interface
 - I²C: 16 target addresses
- Specified temperature range: -40°C to $+125^{\circ}\text{C}$
- Operating temperature range: -40°C to $+150^{\circ}\text{C}$

2 Applications

- [Macro remote radio unit \(RRU\)](#)
- [Active antenna system mMIMO \(AAS\)](#)
- [Outdoor backhaul unit](#)
- [Radar](#)

3 Description

The AMC7908 is a highly integrated power-amplifier (PA) monitor and control device capable of temperature, current, and voltage supervision.

The AMC7908 bias controller is based around eight digital-to-analog converters (DAC) with programmable output ranges. The eight gate bias outputs are switched on and off through dedicated control pins. The gate bias switches are designed for fast response and enable correct power sequencing and protection of depletion-mode transistors, such as GaAs and GaN.

The AMC7908 supervisor is based around an accurate multichannel analog-to-digital converter (ADC). The device integrates two high-voltage inputs, two high-side current-sense amplifiers and an accurate on-chip temperature sensor.

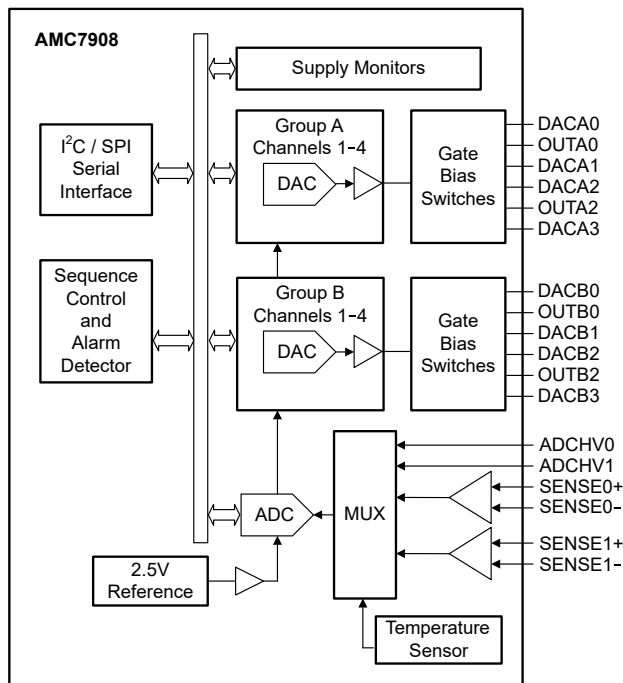
The function integration and wide operating temperature range make the AMC7908 an excellent choice as an all-in-one, bias control circuit for the power amplifiers found in RF communication systems. The flexible DAC output ranges and built-in sequencing features let the device be used as a biasing controller for a large variety of transistor technologies, such as LDMOS, GaAs, and GaN.

Package Information

PART NUMBER	PACKAGE ⁽¹⁾	PACKAGE SIZE ⁽²⁾
AMC7908	RHB (VQFN, 32)	5mm × 5mm

(1) For more information, see [Section 6](#).

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



Simplified Block Diagram



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4 Device and Documentation Support

4.1 Documentation Support

4.1.1 Related Documentation

For related documentation see the following:

- Texas Instruments, [AMC7908EVM User's Guide](#)

4.2 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.

4.3 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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4.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.

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4.5 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.

4.6 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
August 2024	*	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 Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
AMC7908RHBR	ACTIVE	VQFN	RHB	32	3000	RoHS & Green	NIPDAUAG	Level-3-260C-168 HR	-40 to 125	AMC 7908	Samples

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

⁽³⁾ MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

⁽⁴⁾ There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

⁽⁵⁾ Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

⁽⁶⁾ Lead finish/Ball material - Orderable Devices 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.

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