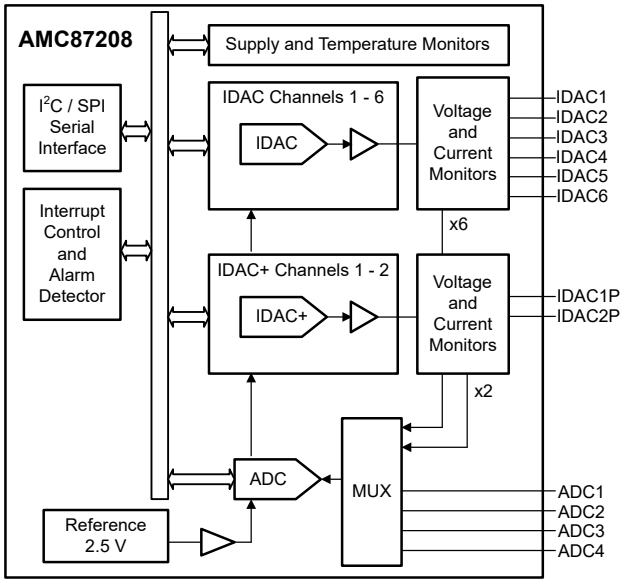
AMC87208 8-Channel, 16-Bit Analog Controller With Current-Output DACs and Multichannel ADC

1 Features

- Six 16-bit current output DACs (IDACs)
  - Programmable full-scale output ranges: 250mA, 150mA, 75mA
  - IDAC1 current sink option: –60mA
- Two 16-bit current output DACs optimized for high current generation (IDAC+)
  - IDAC internal mode with programmable full-scale ranges: 250mA, 150mA, 75mA
  - IDAC+ mode with external FET option for high current generation.
- 12-bit, 1MSPS SAR ADC
  - IDAC voltage and current monitoring
  - IDAC+ voltage and current monitoring
  - Six external inputs
  - Flexible sequencing
- Internal 2.5V reference: 25ppm/°C
- Temperature fault alarms
- Selectable SPI and I^2C interfaces: 1.1V to 1.95V operation
- Specified junction temperature: –40°C to +125°C

2 Applications

- Optical module



Simplified Schematic

3 Description

The AMC87208 is a highly integrated current-output controller optimized for optical networking applications.

The AMC87208 includes six dedicated 16-bit current-output digital-to-analog converters (IDACs), and two 16-bit IDACs that can be configured to control high-output current generation circuits (IDAC+). The AMC87208 also includes a 12-bit, 1MSPS analog-to-digital converter (ADC). This ADC is used for internal and external signal monitoring, and as a temperature alarm monitor. An integrated high-precision internal reference eliminates the need for an external reference in most applications.

The IDAC outputs support full-scale output ranges of 250mA, 150mA, and 75mA, as well as an output range of –60mA (sink mode) supported on IDAC1 only. The IDAC+ outputs in internal current-output mode also support full-scale output ranges of 250mA, 150mA, and 75mA. Additionally, the IDAC+ outputs can be configured to operate with an external FET and sense resistor to simplify the design of very high-current outputs.

The IDAC and IDAC+ outputs operate from independent power supplies with a 275mV minimum headroom for power-dissipation optimization.

Package Information

PART NUMBER	PACKAGE(1)	PACKAGE SIZE(2)
AMC87208	YBF (DSBGA, 60)	3.272mm × 3.272mm

(1) For more information, see Section 6.
(2) The package size (length × width) is a nominal value and includes pins, where applicable.

4 Device and Documentation Support

4.1 Documentation Support

Note

TI is transitioning to use more inclusive terminology. Some language can be different than what is expected for certain technology areas.

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

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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
September 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
AMC87208YBFR	ACTIVE	DSBGA	YBF	60	6000	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 125	AMC87208	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.

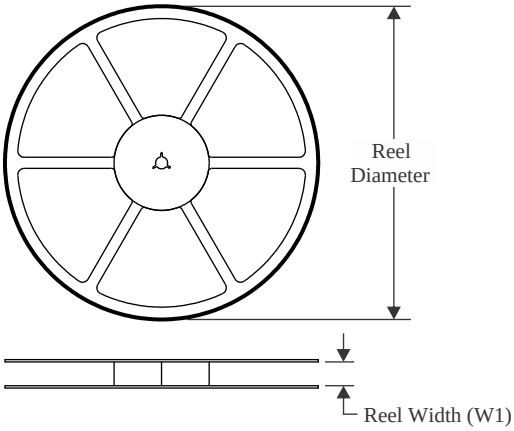
(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(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.

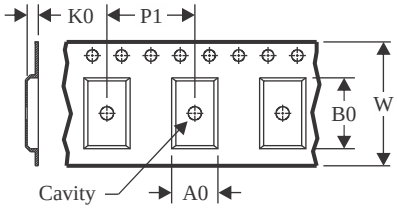
(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

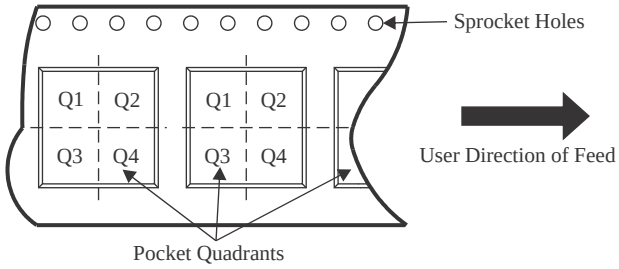


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

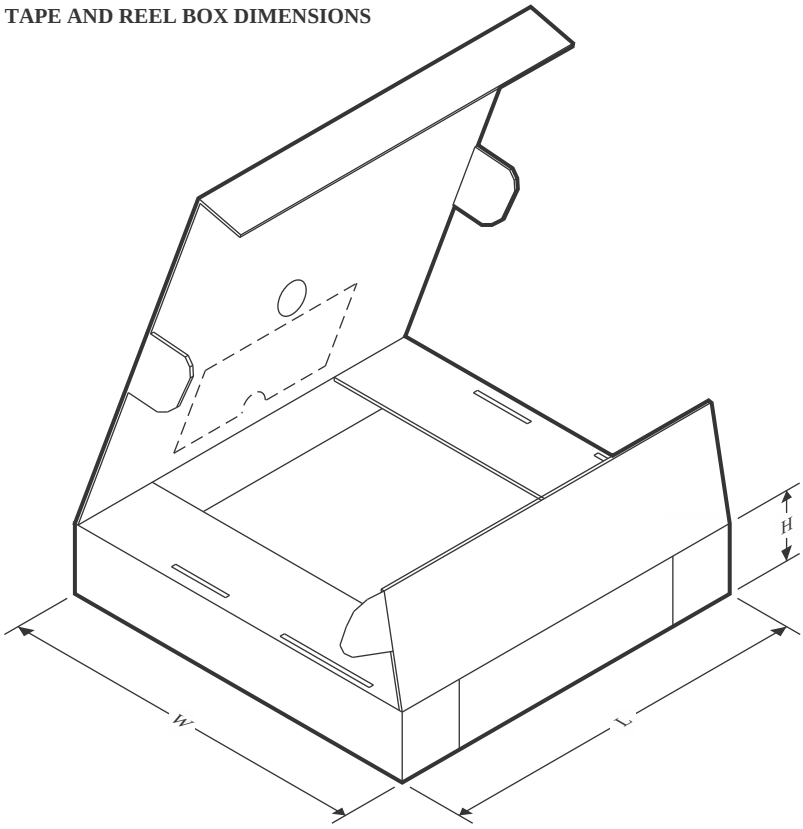
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
AMC87208YBFR	DSBGA	YBF	60	6000	330.0	12.4	3.48	3.48	0.7	8.0	12.0	Q1

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

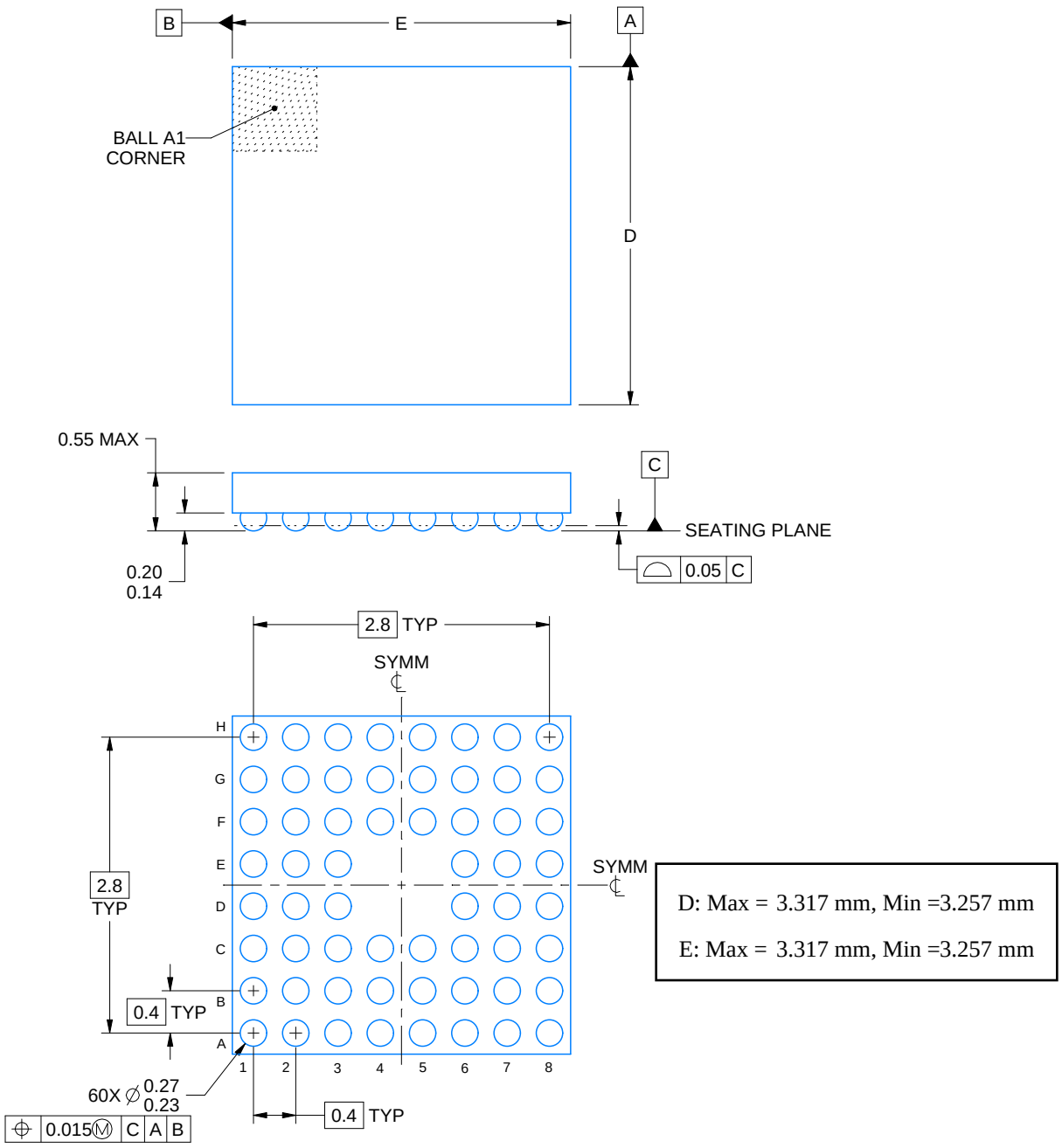
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
AMC87208YBFR	DSBGA	YBF	60	6000	367.0	367.0	35.0

YBF0060

PACKAGE OUTLINE

DSBGA - 0.55 mm max height

DIE SIZE BALL GRID ARRAY



NOTES:

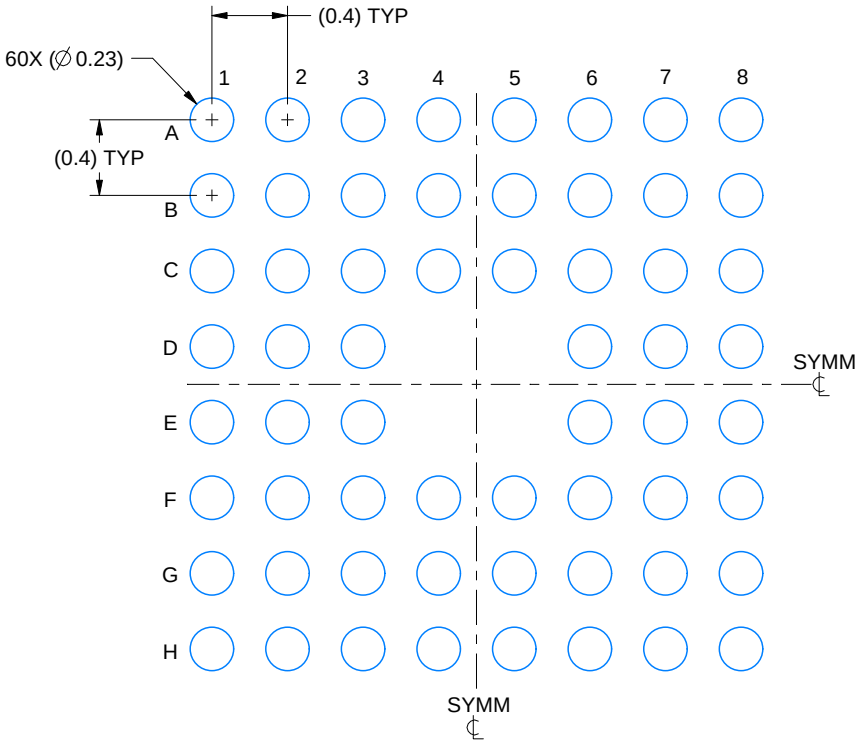
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.

EXAMPLE BOARD LAYOUT

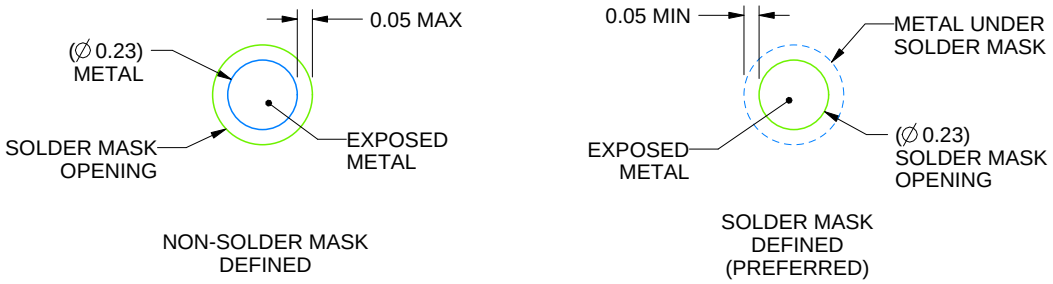
YBF0060

DSBGA - 0.55 mm max height

DIE SIZE BALL GRID ARRAY



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 25X



SOLDER MASK DETAILS
NOT TO SCALE

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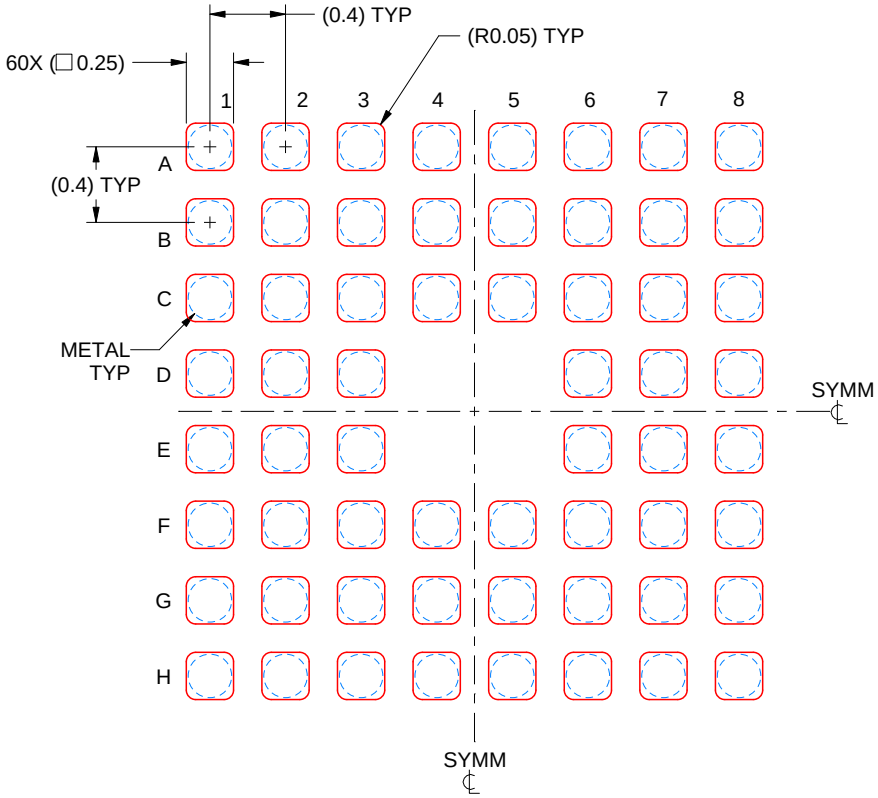
NOTES: (continued)

3. Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints.
   See Texas Instruments Literature No. SNVA009 (www.ti.com/lit/snva009).



SOLDER PASTE EXAMPLE
BASED ON 0.1 mm THICK STENCIL
SCALE: 25X

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NOTES: (continued)

4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release.

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