ADS52J90 10-Bit, 12-Bit, 14-Bit, Multichannel, Low-Power, High-Speed ADC

1 Features

- 16-Channel ADC Configurable to Convert 8, 16, or 32 Inputs
- 10-, 12-, and 14-Bit Resolution Modes
- Maximum ADC Conversion Rate:
  - 100 MSPS in 10-Bit Mode
  - 80 MSPS in 12-Bit Mode
  - 65 MSPS in 14-Bit Mode
- 16 ADCs Configurable to Convert:
  - 8 Inputs with a Sampling Rate of a 2X ADC Conversion Rate
  - 16 Inputs with a Sampling Rate of a 1X ADC Conversion Rate
  - 32 Inputs with a Sampling Rate of a 0.5X ADC Conversion Rate
- LVDS Outputs with 16X, 14X, 12X, and 10X Serialization
- Supplies: 1.2 V, 1.8 V
- 2-V_{PP} Differential Input, 0.8-V Common-Mode
- Differential or Single-Ended Input Clock
- Signal-to-Noise Ratio (SNR):
  - 61 dBFS in 10-Bit Mode
  - 70 dBFS in 12-Bit Mode
  - 73.5 dBFS in 14-Bit Mode
- Power at 100 MSPS: 41 mW/Channel
- Package: NFBGA-198 (9 mm × 15 mm)
- Pb-Free (RoHS Compliant) and Green

2 Applications

- Ultrasound Imaging
- Portable Instrumentation
- SONAR and RADAR
- High-Speed Multichannel Data Acquisition

3 Description

The ADS52J90 is a low-power, high-performance, 16-channel, analog-to-digital converter (ADC). The conversion rate of each ADC goes up to a maximum of 100 MSPS in 10-bit mode. The maximum conversion rate reduces when the ADC resolution is set to a higher value.

The device can be configured to accept 8, 16, or 32 inputs. In 32-input mode, each ADC alternately samples and converts two different inputs each at an effective sampling rate that is half of the ADC conversion rate. In 8-bit input mode, two ADCs convert the same input in an interleaved manner, resulting in an effective sampling rate that is twice the ADC conversion rate. The ADC is designed to scale its power with the conversion rate.

The ADC outputs are serialized and output through a low-voltage differential signaling (LVDS) interface along with a frame clock and a high-speed bit clock.

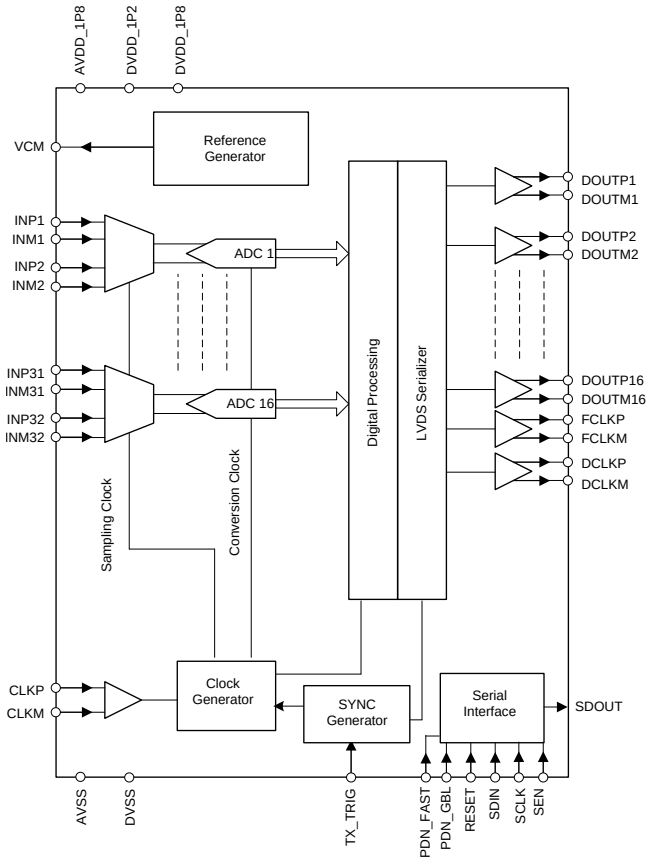
The ADS52J90 is available in a 9-mm × 15-mm, 0.8-mm pitch, NFBGA-198 package and is specified over a temperature range of –40°C to +85°C.

Device Information

PART NUMBER	PACKAGE	BODY SIZE (NOM)
ADS52J90	NFBGA (198)	9.00 mm × 15.00 mm

(1) For all available packages, see the orderable addendum at the end of the datasheet.

Simplified Schematic



4 Revision History

Changes from Original (May 2015) to Revision A	Page
• Released to production	1

5 Device and Documentation Support

5.1 Documentation Support

5.1.1 Related Documentation

CDCE72010 Data Sheet, SCAS858

CDCM7005 Data Sheet, SCAS793

LMK048X Data Sheet, SNAS605

SN74AUP1T04 Data Sheet, SCES800

Clocking High-Speed Data Converters, SLYT075

5.2 Trademarks

All trademarks are the property of their respective owners.

5.3 Electrostatic Discharge Caution

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

5.4 Glossary

SLYZ022 — *TI Glossary*.

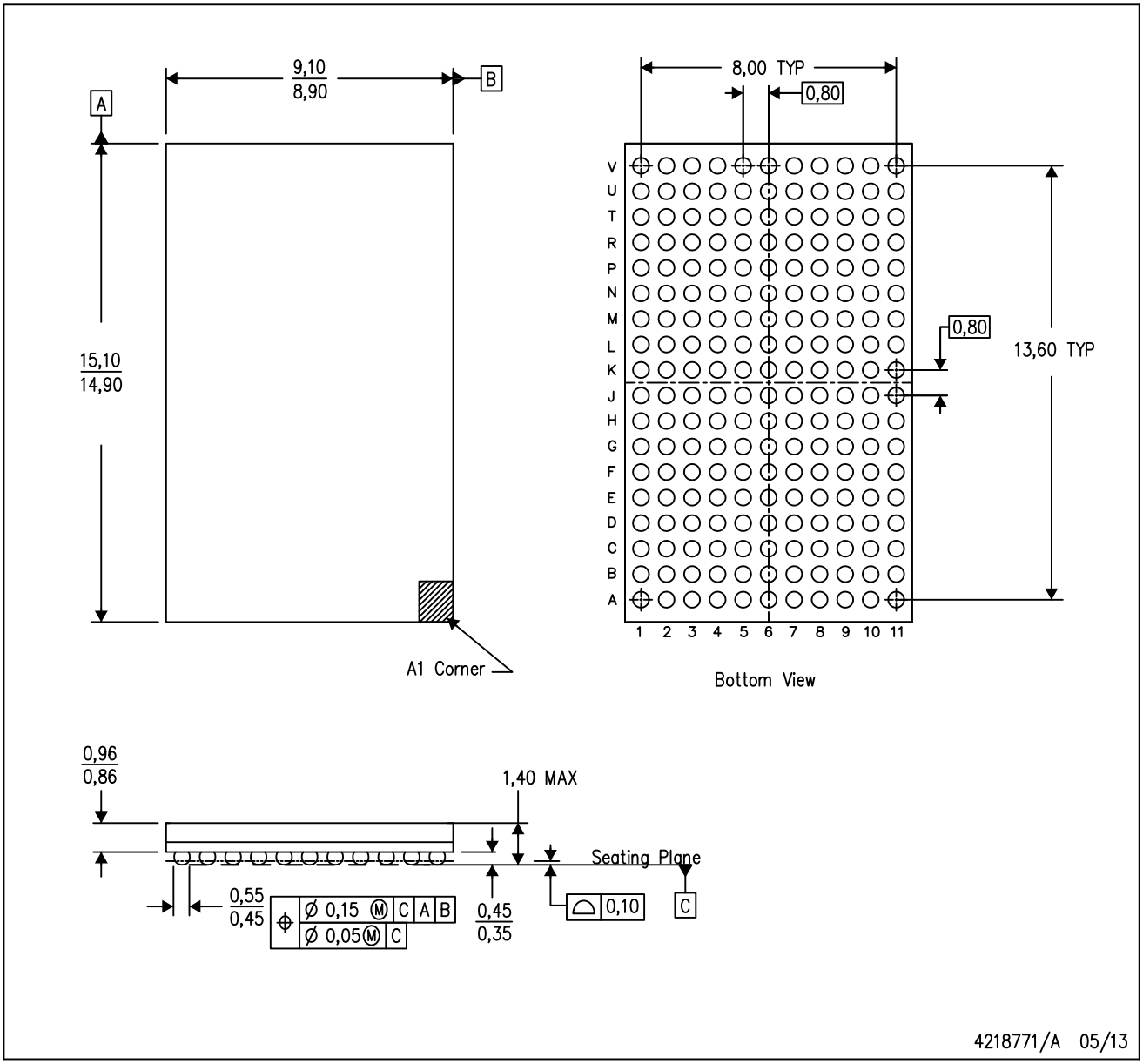
This glossary lists and explains terms, acronyms, and definitions.

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.

MECHANICAL DATA

ZZE (R–PBGA–N198) PLASTIC BALL GRID ARRAY



NOTES:
A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M–1994.
B. This drawing is subject to change without notice.
C. This is a Pb–free solder ball design.

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)
ADS52J90ZZE	Active	Production	NFBGA (ZZE) | 198	160 | JEDEC TRAY (5+1)	Yes	SNAGCU	Level-3-260C-168 HR	-40 to 85	ADS52J90
ADS52J90ZZE.A	Active	Production	NFBGA (ZZE) | 198	160 | JEDEC TRAY (5+1)	Yes	SNAGCU	Level-3-260C-168 HR	-40 to 85	ADS52J90

(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.

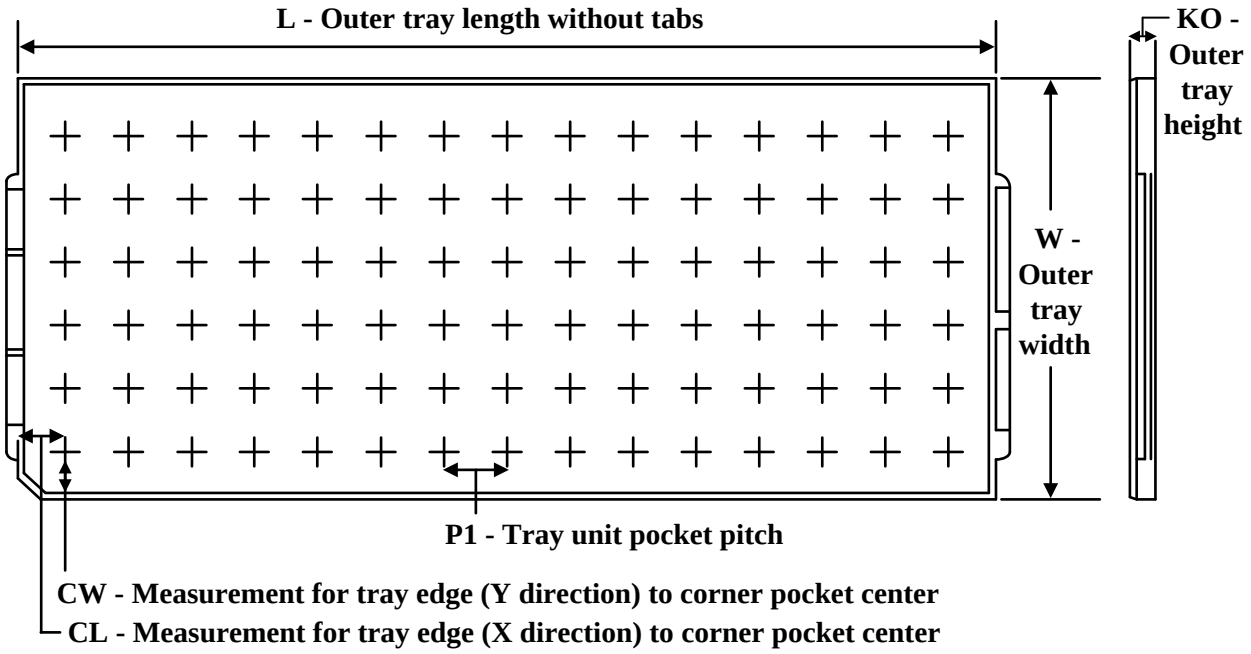
(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(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.

TRAY



Chamfer on Tray corner indicates Pin 1 orientation of packed units.

*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	Unit array matrix	Max temperature (°C)	L (mm)	W (mm)	K0 (µm)	P1 (mm)	CL (mm)	CW (mm)
ADS52J90ZZE	ZZE	NFBGA	198	160	10 x 16	150	315	135.9	7620	19.2	13.5	10.35
ADS52J90ZZE.A	ZZE	NFBGA	198	160	10 x 16	150	315	135.9	7620	19.2	13.5	10.35

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