



Datasheet

DS000536

AS5900

26-Bit 128-Channel Low Noise Current-to-Digital Converter

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1 General Description

The AS5900 device is a low noise, 128 channel current to digital converter that enables the readout of photodiodes with highest sensitivity. Its 128 low noise and high linear converter channels provide an increased gray scale, improved contrast and reduce artifacts of 3D CT images. High-resolution CT imaging can be achieved based on the 26-bits resolution of the converters. The low power consumption of 1mW per channel reduces self-heating effects and the overall power consumption of the system. An integrated temperature sensor allows on demand the calibration of temperature drifts of the X-ray detector modules.

Full-scale range, resolution, integration time and the power mode of the device are configurable over SPI to achieve the optimized operation point dependent on the environment. It supports daisy-chain of several chips on a single three wire interface. The minimum and maximum integration time is related to the applied analog clock frequency and can be optimized down to 50 μ s.

The converted data of all channels is transferred through a power optimized LVDS data interface running with up to 80 Mbps.

1.1 Key Benefits & Features

The benefits and features of AS5900, 26-Bit 128-Channel Low Noise Current-to-Digital Converter, are listed below:

Figure 1:
Added Value of Using AS5900

Benefits	Features
Ultra-low noise down to 3200 electrons for a full-scale range up to 1 μ A	Flexible configuration to get the optimized operation point in your application
Very fast integration time down to 50 μ s	Adjustable full scale range, resolution, integration time and power consumption
High linearity of \pm 250ppm of reading \pm 1ppm of FSR	High speed LVDS data interface
Very low power dissipation down to 1mW/channel	On board voltage reference and temperature sensor
Up to 26 bit resolution	

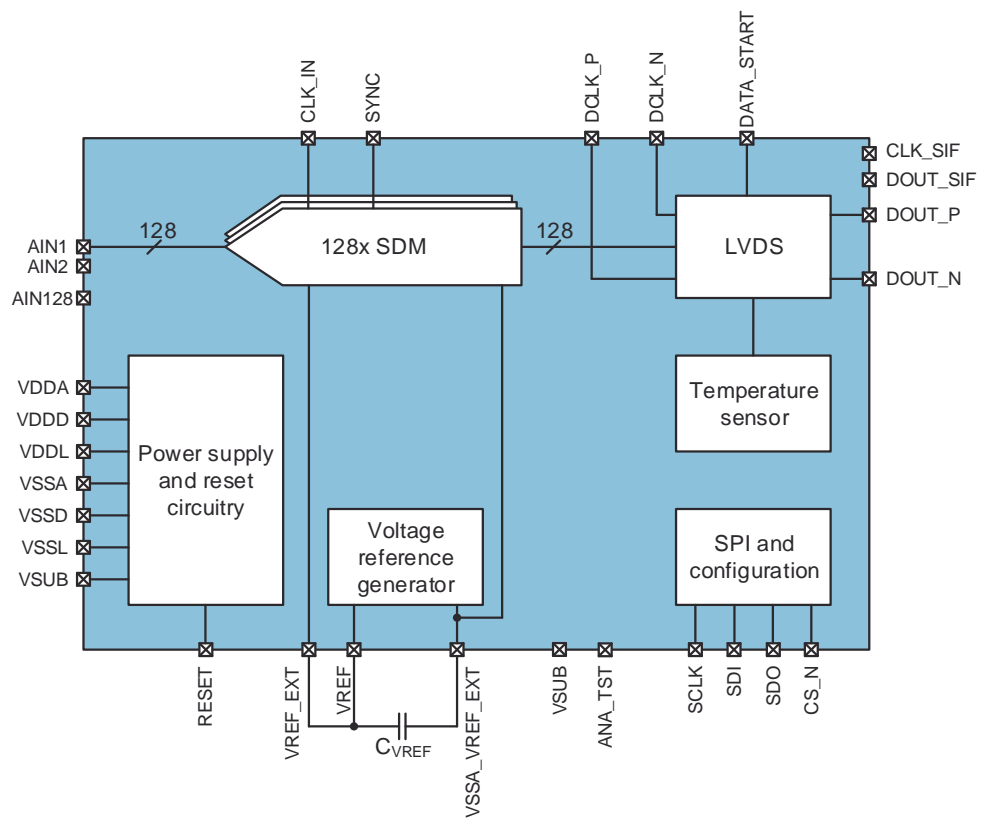
1.2 Applications

- Medical, industrial and security CT scanner data acquisition
- Multi-channel sensors with current output (i.e. photodiode arrays)
- DAS (Data Acquisition System) for current input

1.3 Block Diagram

The functional blocks of this device are shown below:

Figure 2 :
Functional Blocks of AS5900

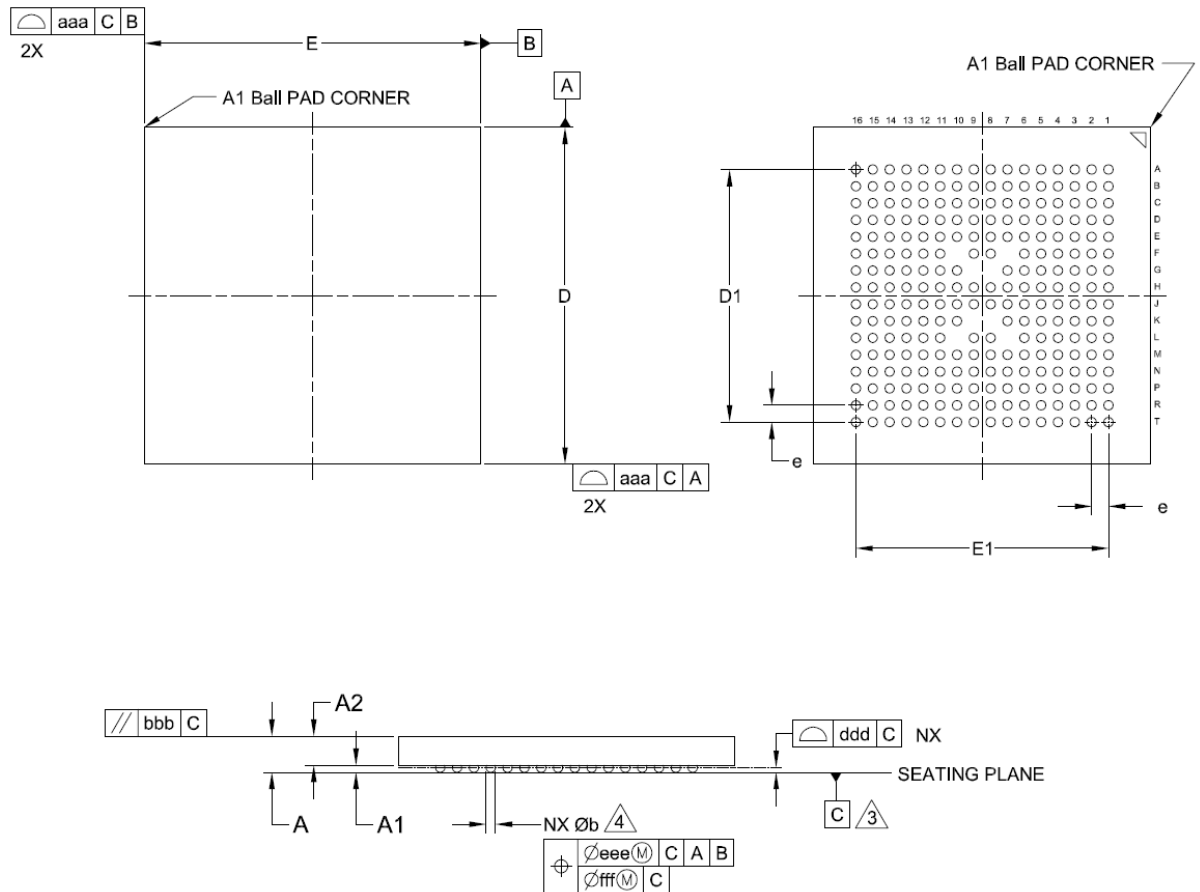


2 Ordering Information

Ordering Code	Package	Marking	Delivery Form	Delivery Quantity
AS5900-ZFBT	BGA 10mm×10mm	AS5900	Tape & Reel	1500 pcs/reel

3 Package Drawings & Markings

Figure 3:
FBGA248 Package Outline Drawing



- (1) All dimensions are in millimeters. Angles in degrees. See Figure 4
- (2) Dimensioning and tolerancing conform to ASME Y14.5M-1994.
- (3) N is the total number of terminals.
- (4) This package contains no lead (Pb).
- (5) This drawing is subject to change without notice.

Figure 4:
Mechanical Dimensions

REF	MIN	NOM	MAX
A			1.20
A1	0.15		
A2			1.00
b	0.25	0.30	0.35
e		0.50	
D		10.00	
E		10.00	
E1		7.50	
D1		7.50	
aaa		0.10	
bbb		0.10	
ddd		0.08	
eee		0.15	
fff		0.05	
N		248	

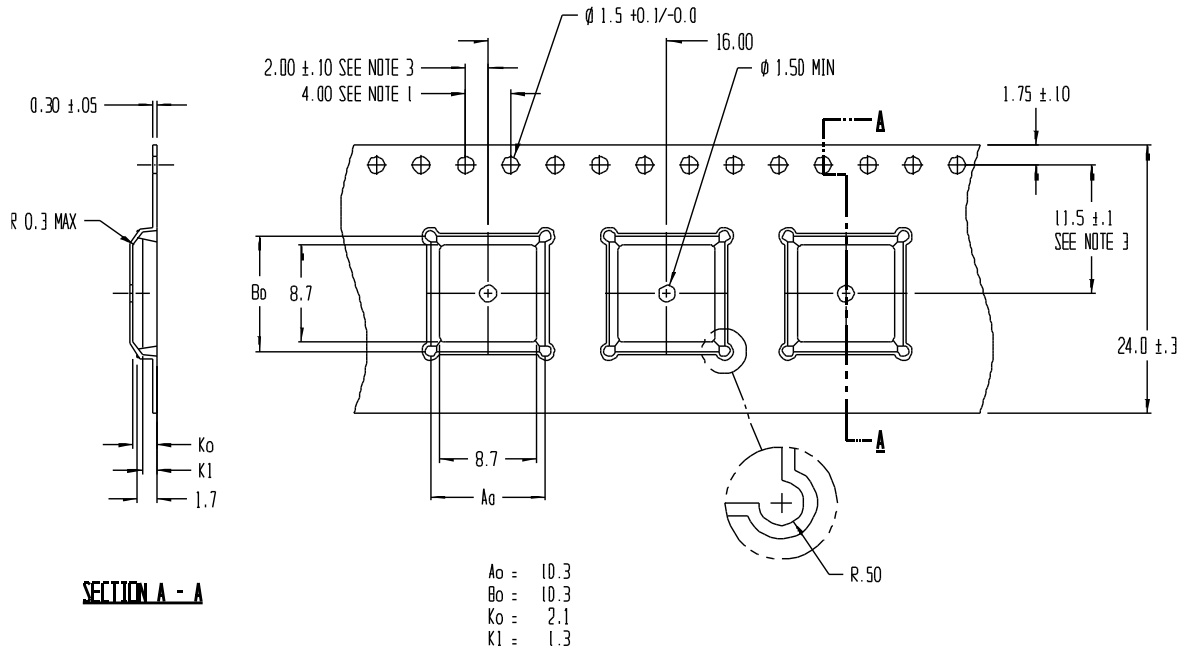
Figure 5:
FBGA248 Package Marking/Code



YY	Manufacturing Year
WW	Manufacturing Week
X	Assembly Plant Identifier
ZZ	Assembly Traceability Code
@	Sublot Identifier

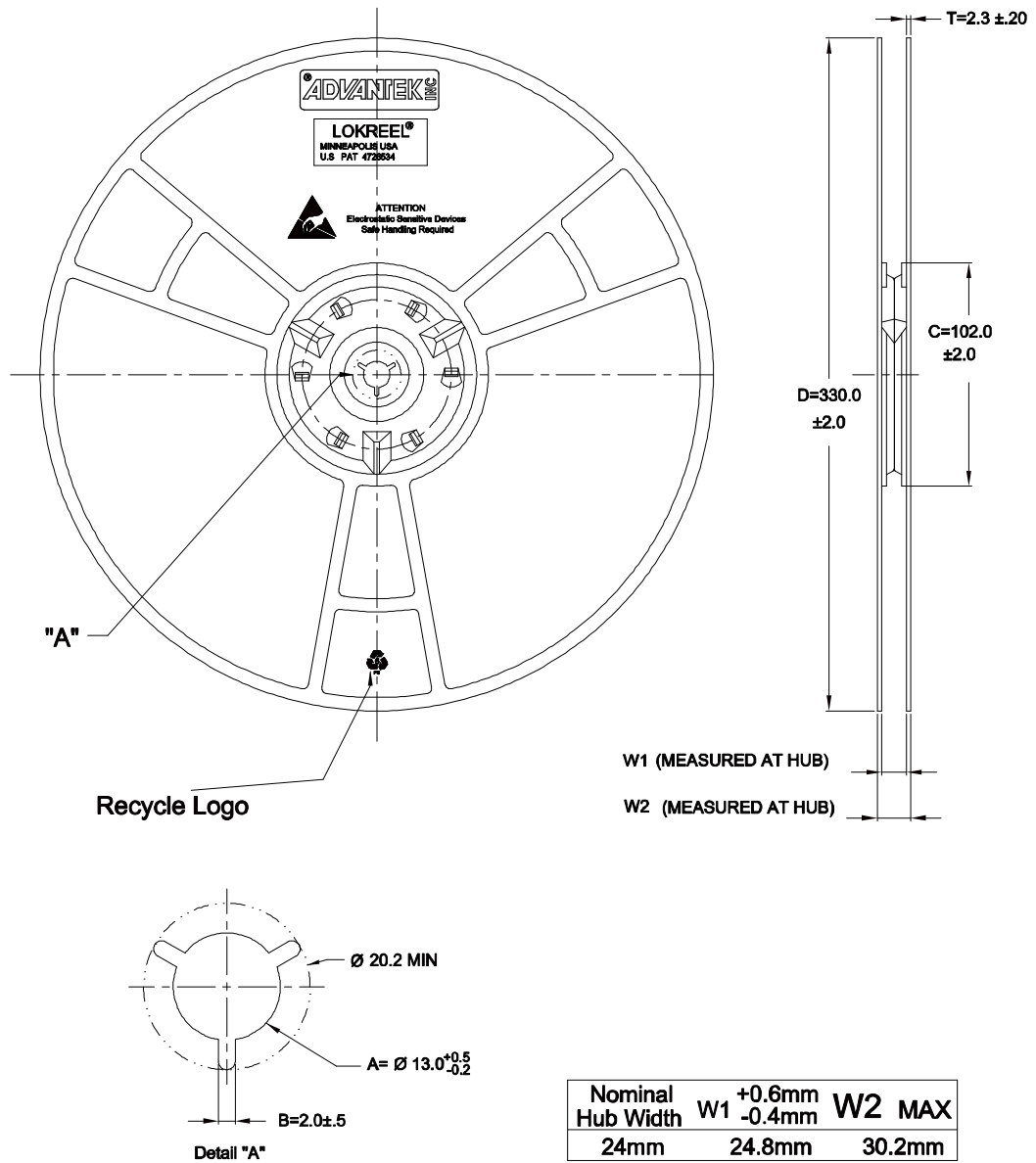
4 Tape & Reel Information

Figure 6:
BG1010-D Tape Dimensions⁽¹⁾



- (1) 10 Sprocket Hole Pitch Cumulative Tolerance ± 0.2
 Camper in compliance with EIA 481
 Pocket Position relative to Sprocket Hole Measured as True Position of Pocket, not Pocket Hole
 All Dimensions in Millimeters

Figure 7:
Reel Dimensions⁽¹⁾



(1) All Dimensions in Millimeters

5 Revision Information

Document Status	Product Status	Definition
Product Preview	Pre-Development	Information in this datasheet is based on product ideas in the planning phase of development. All specifications are design goals without any warranty and are subject to change without notice
Preliminary Datasheet	Pre-Production	Information in this datasheet is based on products in the design, validation or qualification phase of development. The performance and parameters shown in this document are preliminary without any warranty and are subject to change without notice
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Changes from previous version to current revision v1-00	Page
Initial version 1-00 (based on full AS5900 datasheet version 1-02)	

- Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.
- Correction of typographical errors is not explicitly mentioned.

6 Legal Information

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Headquarters

ams AG
Tobelbader Strasse 30
8141 Premstaetten
Austria, Europe
Tel: +43 (0) 3136 500 0

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