

Product Document



Datasheet

DS000536

AS5900

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

v1-00 • 2017-Jul-05

Content Guide

1	General Description..... 3	4	Tape & Reel Information 8
1.1	Key Benefits & Features 3	5	Revision Information..... 10
1.2	Applications 4	6	Legal Information 11
1.3	Block Diagram 4		
2	Ordering Information..... 5		
3	Package Drawings & Markings..... 6		

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	

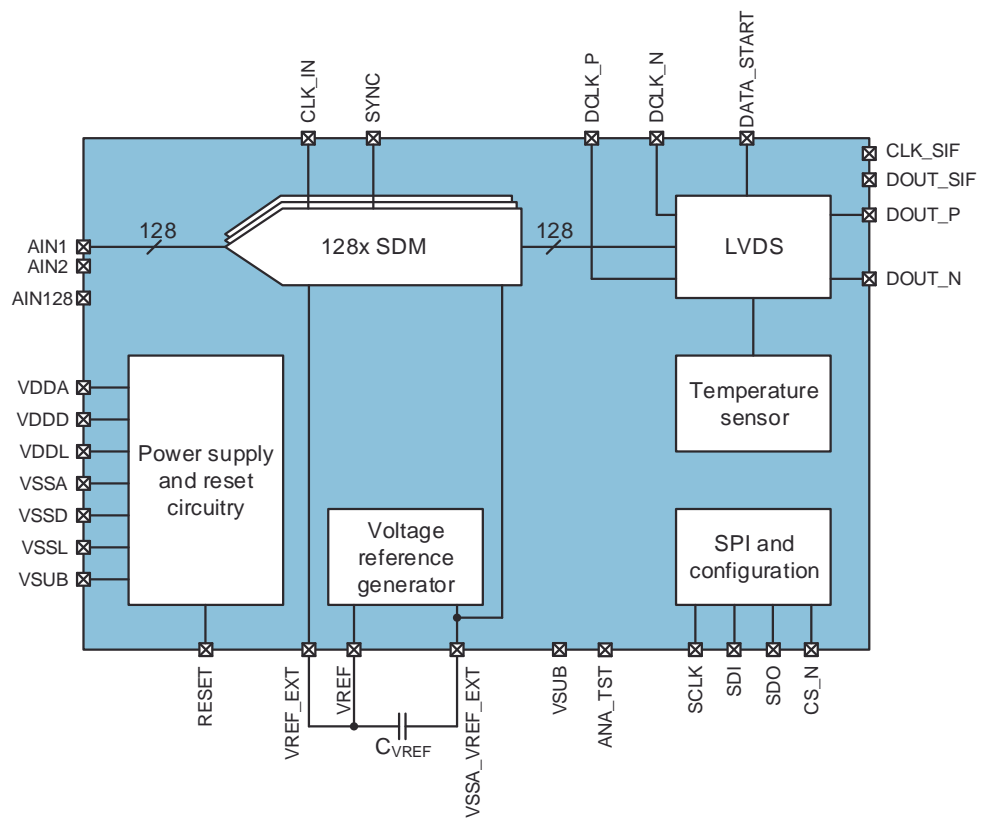
1.2 Applications

- 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

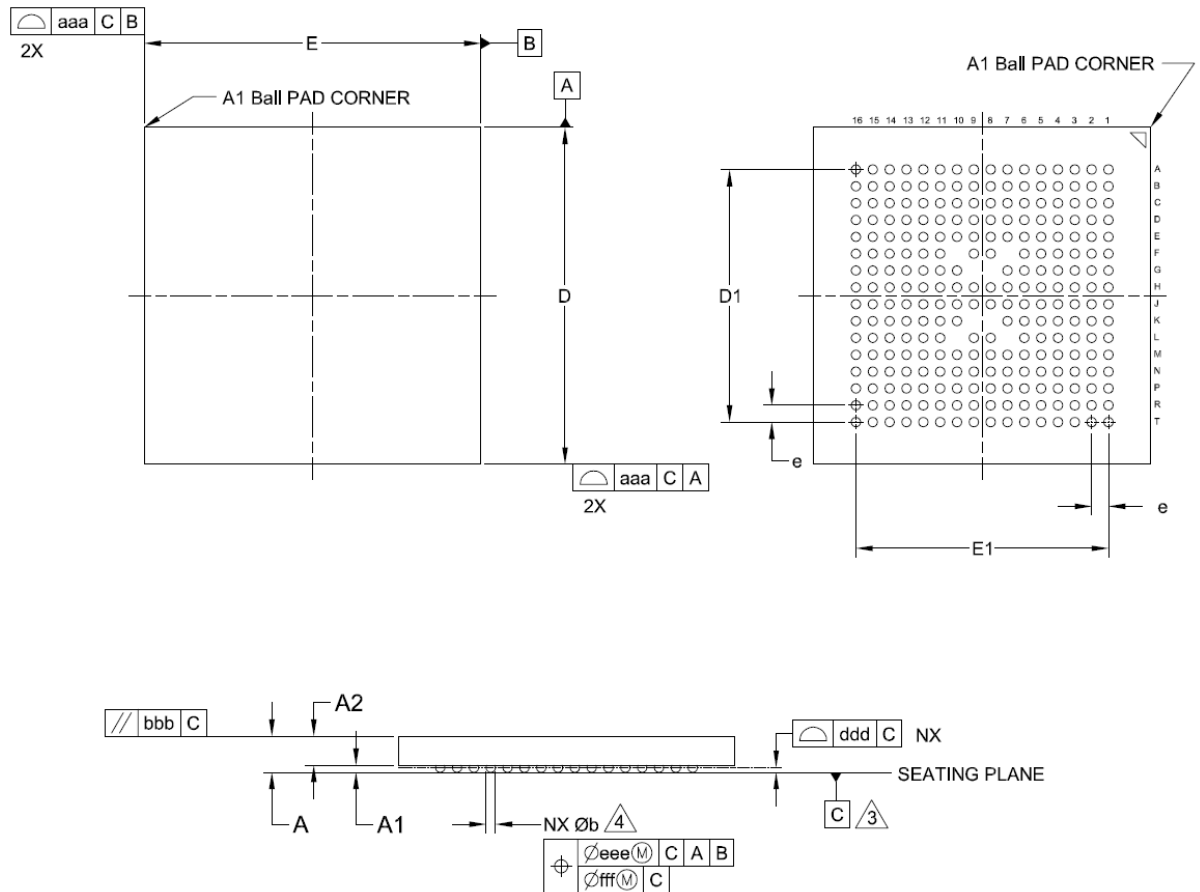


2 Ordering Information

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	

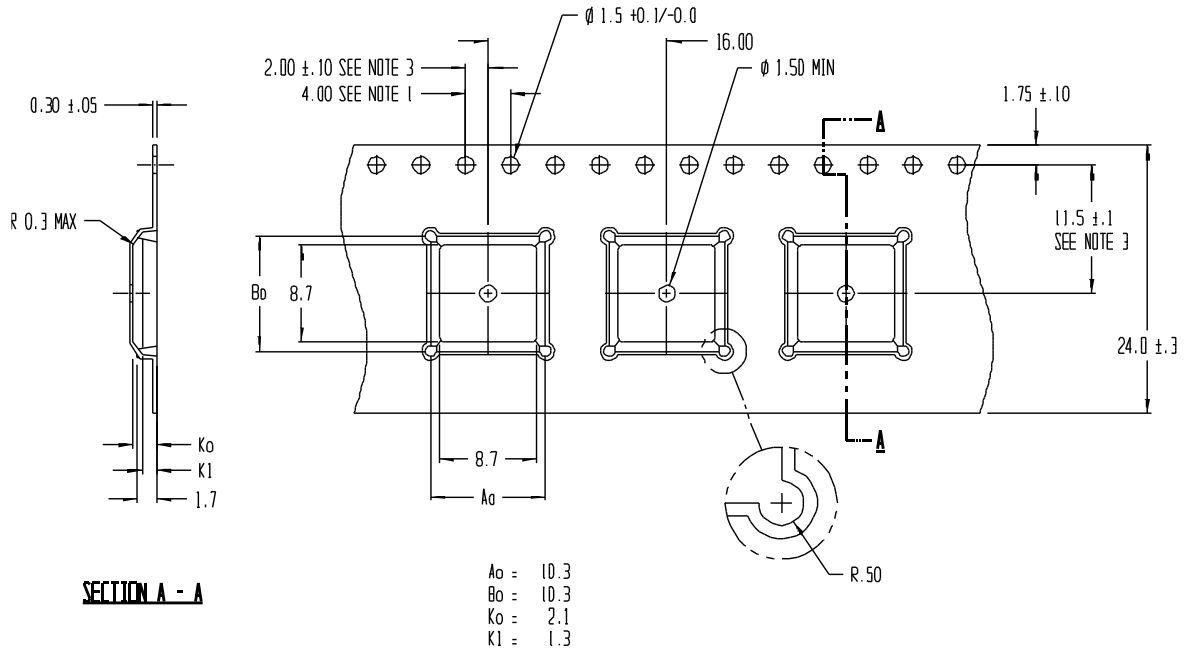
Figure 5:
FBGA248 Package Marking/Code



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

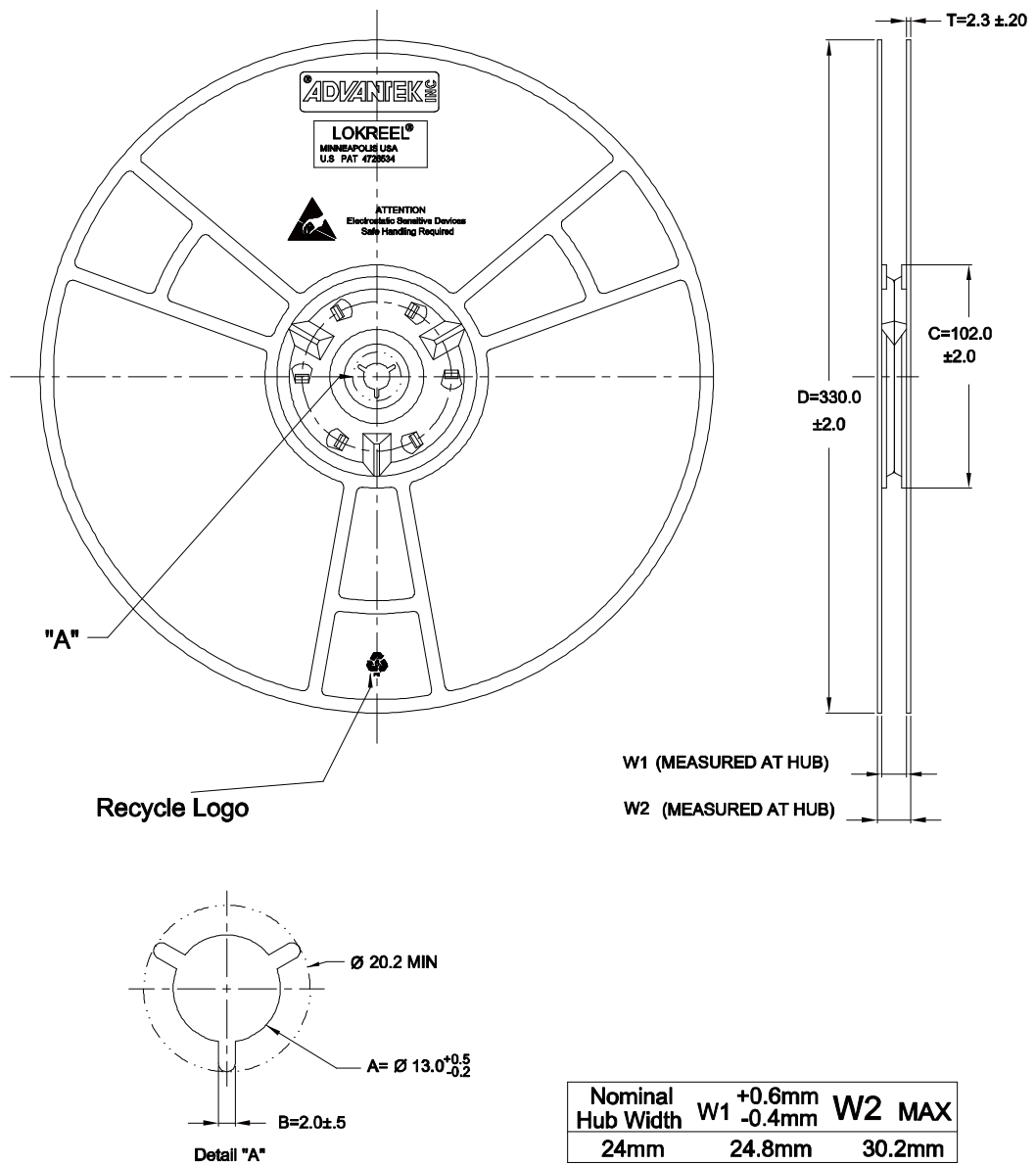
4 Tape & Reel Information

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
Datasheet	Production	Information in this datasheet is based on products in ramp-up to full production or full production which conform to specifications in accordance with the terms of ams AG standard warranty as given in the General Terms of Trade
Datasheet (discontinued)	Discontinued	Information in this datasheet is based on products which conform to specifications in accordance with the terms of ams AG standard warranty as given in the General Terms of Trade, but these products have been superseded and should not be used for new designs

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

Copyrights & Disclaimer

Copyright ams AG, Tobelbader Strasse 30, 8141 Premstaetten, Austria-Europe. Trademarks Registered. All rights reserved. The material herein may not be reproduced, adapted, merged, translated, stored, or used without the prior written consent of the copyright owner.

Devices sold by ams AG are covered by the warranty and patent indemnification provisions appearing in its General Terms of Trade. ams AG makes no warranty, express, statutory, implied, or by description regarding the information set forth herein. ams AG reserves the right to change specifications and prices at any time and without notice. Therefore, prior to designing this product into a system, it is necessary to check with ams AG for current information. This product is intended for use in commercial applications. Applications requiring extended temperature range, unusual environmental requirements, or high reliability applications, such as military, medical life-support or life-sustaining equipment are specifically not recommended without additional processing by ams AG for each application. This product is provided by ams AG "AS IS" and any express or implied warranties, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose are disclaimed.

ams AG shall not be liable to recipient or any third party for any damages, including but not limited to personal injury, property damage, loss of profits, loss of use, interruption of business or indirect, special, incidental or consequential damages, of any kind, in connection with or arising out of the furnishing, performance or use of the technical data herein. No obligation or liability to recipient or any third party shall arise or flow out of ams AG rendering of technical or other services.

RoHS Compliant & ams Green Statement

RoHS Compliant: The term RoHS compliant means that ams AG products fully comply with current RoHS directives. Our semiconductor products do not contain any chemicals for all 6 substance categories, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, RoHS compliant products are suitable for use in specified lead-free processes.

ams Green (RoHS compliant and no Sb/Br): ams Green defines that in addition to RoHS compliance, our products are free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material).

Important Information: The information provided in this statement represents ams AG knowledge and belief as of the date that it is provided. ams AG bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. ams AG has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. ams AG and ams AG suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

Headquarters

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

Please visit our website at www.ams.com

Buy our products or get free samples online at www.ams.com/ICdirect

Technical Support is available at www.ams.com/Technical-Support

Provide feedback about this document at www.ams.com/Document-Feedback

For sales offices, distributors and representatives go to www.ams.com/contact

For further information and requests, e-mail us at ams_sales@ams.com