

Product Document



Datasheet

DS001023

AS585xB

16-Bit 256-Channel Low Noise Charge-to-Digital Converters

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1 General Description

AS585xB is a family (AS5850B, AS5851B and AS5852B) of 16-bit, 256-channel low-noise charge-to-digital converters designed for digital X-Ray systems. It enables a wide range of applications for digital X-ray including static and dynamic Flat Panel Detectors (FPDs) used in radiographic imaging, digital mammography, fluoroscopy, surgery and industrial non-destructive testing.

Each of the devices consists of 256 analog Charge Sensitive Amplifiers (CSA) with a programmable full-scale range, a Correlated Double Sampler (CDS) for offset compensation with programmable time constant and 128 multiplexed Analog-to-Digital Converters (ADC) for the digital readout of each pixel. The device can be configured for electrons and holes polarity and includes a voltage reference and a temperature sensor. Built-in diagnostic modes enable error detection in the signal chain.

The converted channels are output on a single LVDS interface with a data rate up to 320 Mbps for optimized line time. The serial SPI interface allows the configuration of the analog frontend including timing and different power modes for low stand-by power consumptions and fast startup times.

The AS5850 device is a high-speed design optimized for line times down to 20 μ s for dynamic flat panel detectors. In a special low-OSR (the ADC OverSampling Ratio) mode, it can reach even shorter line times of 15 μ s. Additionally, it is possible to bin together adjacent channels; with this binning, the fastest achievable line time is 10 μ s.

The AS5851 and AS5852 are low-power versions of AS5850 for static, portable and battery supplied flat panels with minimum power dissipations down to 1.1 mW per channel.

AS585xB are the AS585x chips delivered on a Chip on Flex package to minimize sidewall distances and allow direct assembly on the X-ray panel. The Flex design can be customized according to customer requirements upon request. Alternatively, all devices can be delivered as die on foil.

1.1 Key Benefits & Features

The benefits and features of AS585xB, 16-Bit 256-Channel Low Noise Charge-to-Digital Converters are listed below:

Figure 1:
Added Value of Using AS585xB

Benefits	Features
256 Channels with 16-bit resolution	Flexible and simple configuration via SPI interface supporting daisy-chaining multiple devices
Ultra-low noise down to 500 electrons at 2 pC input range for hole and electron integration	Standard and customized flex delivery
Low power dissipation down to 1.1 mW per channel at 80 μ s line time	Different power-down modes down to 1 μ W per channel and fast start-up times

Benefits	Features
Line time down to 20 μs , 15 μs with low OSR or 10 μs with binning	LVDS data interface with data rate optimized readout modes including fully parallel pipeline mode
Adjustable full scale range from 0.5 pC to 16 pC	Correlated Double Sampling (CDS) operation for offset compensation with programmable time constant
On-chip voltage reference and temperature sensor	Built-in Diagnostic (anti-blooming circuit, charge injection mode, ADC test) for error detection

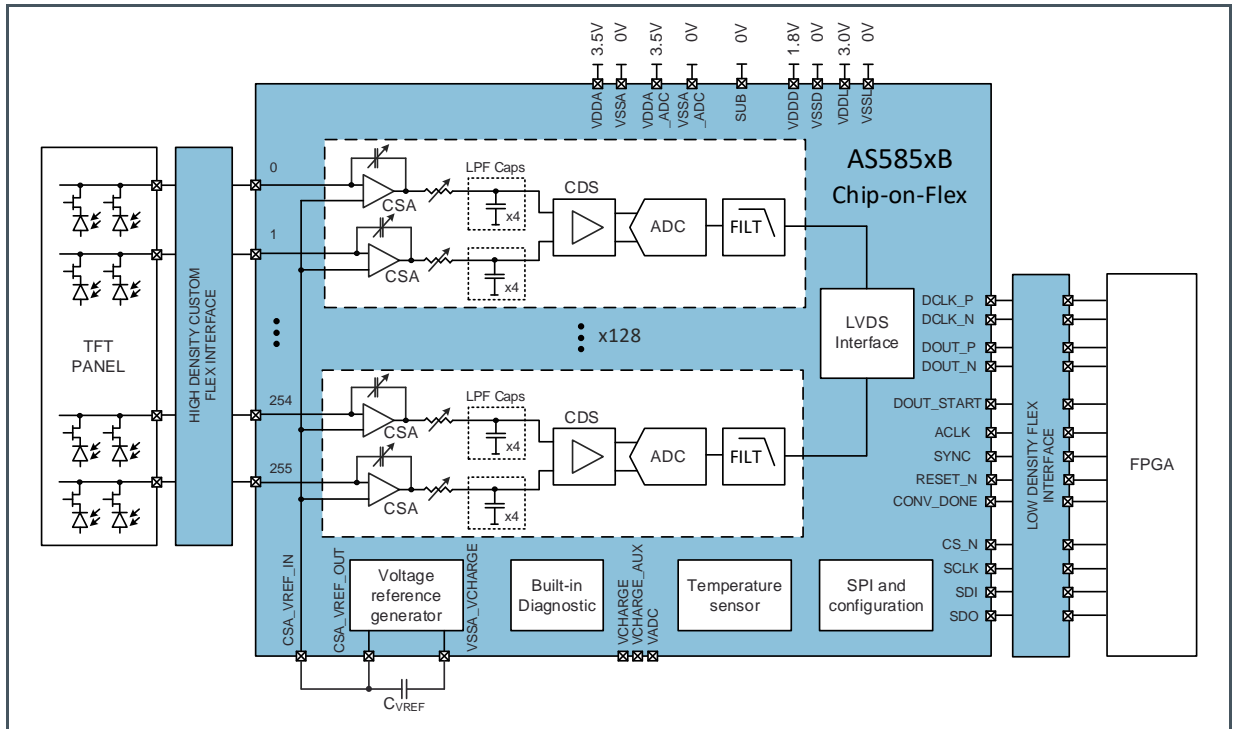
1.2 Applications

- X-ray Flat Panel Detectors
- Digital Radiography
- Fluoroscopy Panels and Dynamic X-ray Detectors
- Portable and Mobile X-ray Systems
- Mammography Panels
- Industrial and Security X-ray Scanners

1.3 Block Diagram

The functional blocks of this device are shown below:

Figure 2 :
Functional Blocks of AS585xB



2 Ordering Information

Ordering Code	Package	Marking	Delivery Form	Delivery Quantity
AS5850-CSDF-240 ⁽¹⁾	Die, 240 Channels Device	AS5850-CSDF-240	Die on Foil	8 inch wafer
AS5850-CSDF-256 ⁽¹⁾	Die, 256 Channels Device	AS5850-CSDF-256	Die on Foil	8 inch wafer
AS5850A-CCFT-240 ⁽¹⁾	A-type Chip on Flex (COF), 240 Channels	AS5850A-CCFT-240	Reel	1500 flex/reel
AS5850A-CCFT-256	A-type Chip on Flex (COF), 256 Channels	AS5850A-CCFT-256	Reel	1500 flex/reel
AS5850B-CCFR-256	B-type Chip on Flex (COF), 256 Channels	AS5850B-CCFR-256	Tray	240 flex/package
AS5851B-CCFR-256	B-type Chip on Flex (COF), 256 Channels	AS5851B-CCFR-256	Tray	240 flex/package
AS5852B-CCFR-256	B-type Chip on Flex (COF), 256 Channels	AS5852B-CCFR-256	Tray	240 flex/package

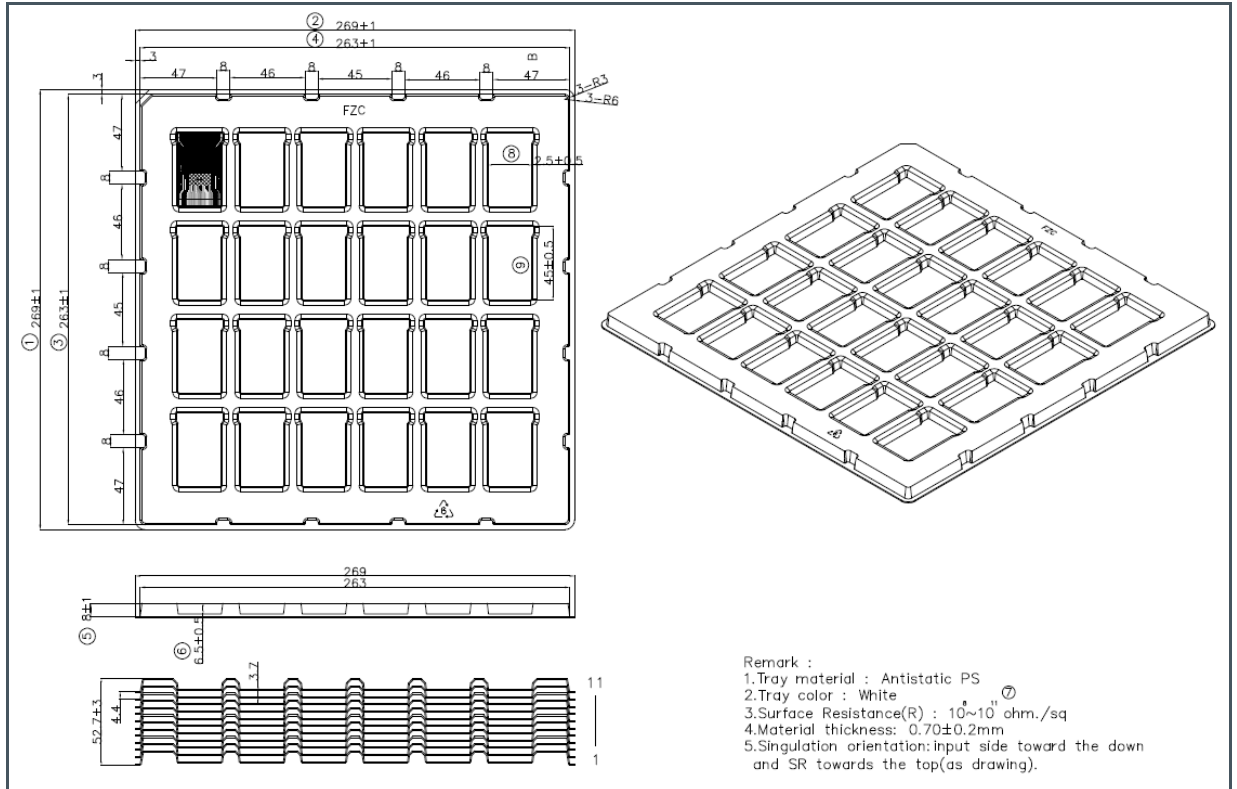
⁽¹⁾ Availability of these devices upon request, subject to **ams** approval.

The B-type Flex corresponds to the FZC design described in sections 9.3, 9.4 and chapter 10 of the full AS505xB datasheet.

The A-type Flex corresponds to the FUC design, not described in the AS505xB datasheet.

3 Tray Information

Figure 3:
Tray Dimensions



(1) All dimensions in mm

5 Legal Information

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