1/8-inch 0.3 MP CMOS Digital Image Sensor with Global Shutter

ARX383CS

Description

The ARX383CS is a 1/8−inch CMOS digital image sensor with an active−pixel array of 640 (H) x 480 (V). It incorporates a new innovative global shutter pixel design optimized for accurate and fast capture of moving scenes. The sensor produces clear, low noise images in both low−light and bright scenes. It includes sophisticated camera functions such as auto exposure control, windowing, row skip mode, column−skip mode, pixel−binning, pixel−summing and both video and single frame modes. It is programmable through a simple two−wire serial interface. The ARX383CS produces extraordinarily clear, sharp digital pictures, and its ability to capture both continuous video and single frames makes it the perfect choice for a wide range of applications, including scanning and industrial inspection.

Table 1. KEY PERFORMANCE PARAMETERS

Parameter	Typical Value
Optical Format	1/8−inch (2.24 mm)
Active Pixels	640 (H) x 480 (V), not including 8 border pixels on each side
Pixel Size	2.8 μm
Color Filter Array	Monochrome
Chief Ray Angle	0 or 28°
Shutter Type	Global Shutter
Input Clock Range	10−48 MHz
Output Interface	8−bit/10−bit MIPI, 1−lane
Output Data Rate	Maximum Serial Output Data Rate 480 Mbps/lane
Frame Rate Full Resolution	120 fps (10−bit)
Responsivity Monochrome	41.9 ke−/lux*s
SNR_{MAX}	37 dB
Dynamic Range	65.3 dB
Supply Voltage I/O Digital Analog	 1.8 V 1.2 V 2.8 V
Power Consumption (Typical)	80 mW, (640x480, 120 fps)
Operating Temperature	−30°C to + 85°C (Junction)
Optimal Performance Temperature	(0°C < T_J < +60°C)
Package Options	3.92 x 3.56 mm CSP−35 θ_{JA}: 49°C/W (Note 1) θ_{JB}: 17°C/W
	Bare Die

1. θ_{JA} is dependent on the customer module design and should not be used for calculating junction temperature.

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

Non−NDA Data Sheet

Interested in what you see? If you would like more detailed information, please request the full version of our data sheet.

Request Full Data Sheet

Features

- Superior Low−light and IR Performance
- 1−lane 8−bit/10−bit MIPI
- Automatic Black Level Calibration (ABLC)
- Horizontal and Vertical Mirroring, Windowing
- Subsampling: Vertical Summing, Horizontal Binning, Skipping
- 5 x 5 Statistics Engine for On−chip Auto Exposure Control for Any Programmable Region of Interest (ROI)
- Flexible Control for Row and Column Skip Mode
- On−chip Trigger Mode for Synchronization
- Built in Flash Control
- Two On Chip Phase Lock Loop (PLL)
- Context Switching
- 80 bytes One−time Programmable Memory (OTPM)

Applications

- Bar Code Scanner
- Gesture Recognition
- 3D Scanning
- Positional Tracking
- Iris Scanning
- Augmented Reality
- Virtual Reality
- Biometrics
- Machine Vision

ORDERING INFORMATION

Table 2. AVAILABLE PART NUMBERS

Product Id	Description	Orderable Part Attribute
ARX383CSSM00SMKA0−CR	Mono 0°CRA	CSP without Protective Film
ARX383CSSM00SMKA0−CP	Mono 0°CRA	CSP with Protective Film
ARX383CSSM00SMKA0−CP2	Mono 0°CRA	CSP with Protective Film, MOQ 50 Pieces
ARX383CSSM00SMKAH3−GEVB	Mono 0°CRA	Evaluation Board
ARX383CSSM28SMKA0−CR	Mono 28°CRA	CSP without Protective Film
ARX383CSSM28SMKA0−CP	Mono 28°CRA	CSP with Protective Film
ARX383CSSM28SMKA0−CP2	Mono 28°CRA	CSP with Protective Film, MOQ 50 Pieces
ARX383CSSM28SMKAH3−GEVB	Mono 28°CRA	Evaluation Board

NOTE: Refer to ARX383CS Die Data Sheet for Die Part Numbers and Ordering Information.

Table 3. FRAME RATE FOR ARX383 MODES OF OPERATION

Resolution	Mode	Frame Rate (frames per sec)
Full_Resolution 640x480	Master	120
	Slave Integration Start	90
	Slave Integration Time	90
	Slave Integration Start and Readout Start	90
	Slave Integration Start and Integration	depends on exposure (not constant frame rate)
2x2_Subsampling 320x240	Master	245
	Slave Integration Start	160
	Slave Integration Time	160
	Slave Integration Start and Readout Start	160
	Slave Integration Start and Integration	depends on exposure (not constant frame rate)

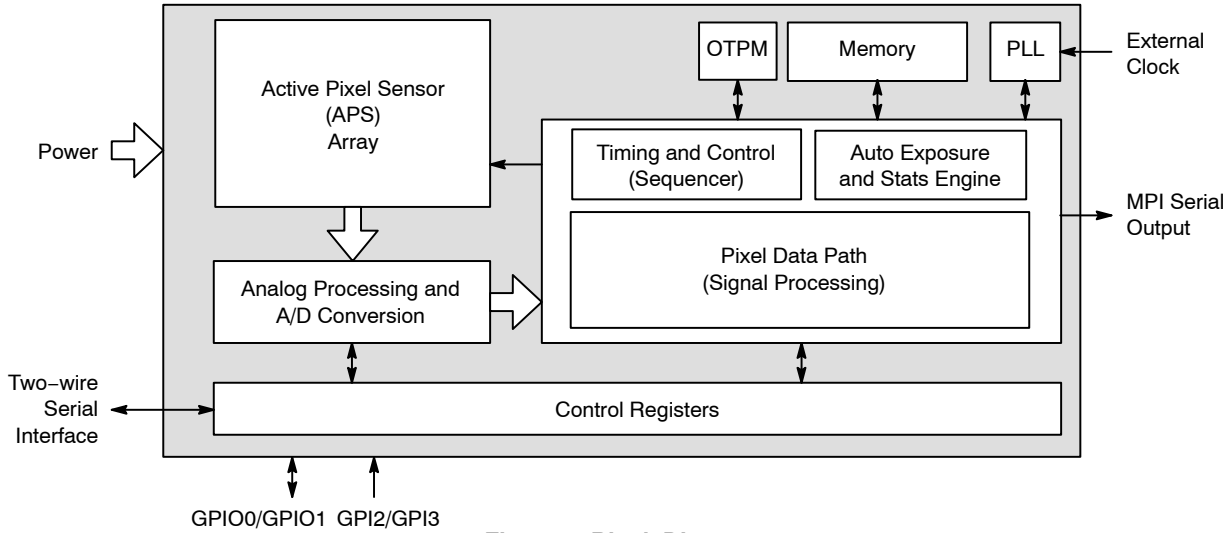
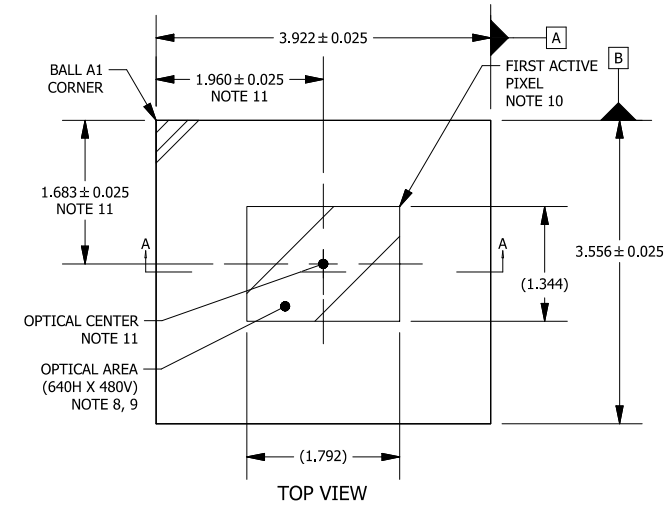


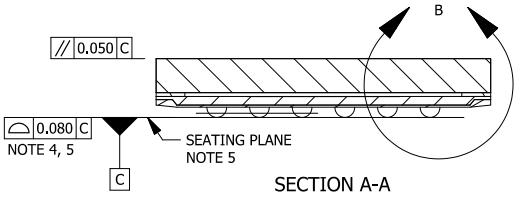
Figure 1. Block Diagram

ODCSP35 3.922x3.556
CASE 570CU
ISSUE O

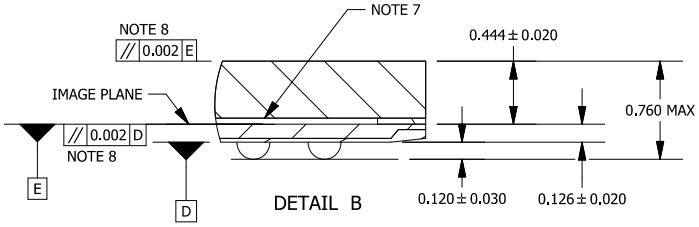
DATE 07 NOV 2019



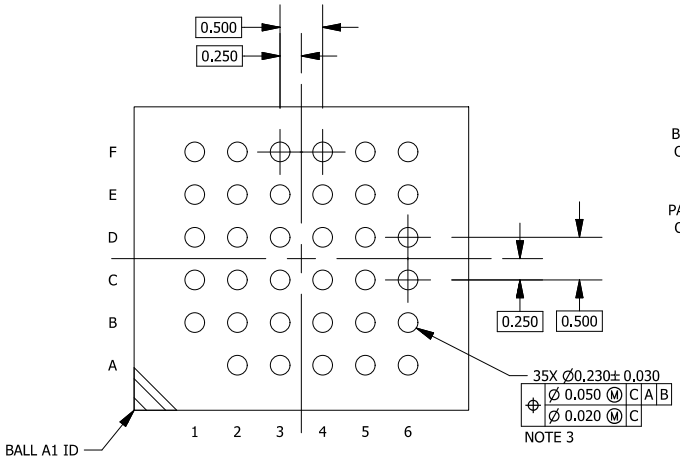
TOP VIEW



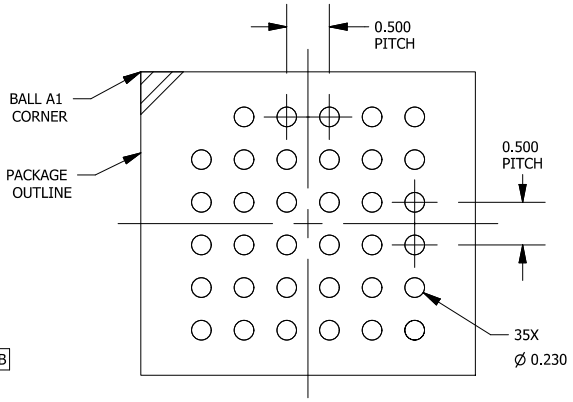
SECTION A-A



DETAIL B



BOTTOM VIEW



RECOMENDED MOUNTING FOOTPRINT*

*FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS [mm].
3. SOLDER BALL DIAMETER IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER PARALLEL TO DATUM C.
4. COPLANARITY APPLIES TO THE SPHERICAL CROWNS OF THE SOLDER BALLS.
5. DATUM C, THE SEATING PLANE IS DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.
6. GLASS: 0.400 [mm] THICKNESS; REFRACTIVE INDEX = 1.52.
7. AIR GAP BETWEEN GLASS AND PIXEL ARRAY: 0.044 THICKNESS.
8. PARALLELISM APPLIES ONLY TO THE ACTIVE ARRAY.
9. MAXIMUM ROTATION OF ACTIVE ARRAY RELATIVE TO DATUMS A AND B IS ± 0.1°.
10. REFER TO THE DEVICE DATA SHEET FOR TOTAL PIXEL ARRAY DEFINITIONS.
11. OPTICAL CENTER RELATIVE TO PACKAGE CENTER (X, Y) = (-0.001, 0.095).
12. PACKAGE CENTER (X, Y) = (0.000, 0.000).

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DESCRIPTION:	**ODCSP35 3.922x3.556**		**PAGE 1 OF 1**

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