

1/2.8-inch 2 MP CMOS Digital Image Sensor with Global Shutter AR0235CS

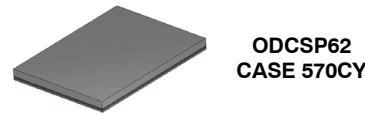
Description

The AR0235CS is a 1/2.8-inch CMOS digital image sensor with an active-pixel array of 1920 (H) x 1200 (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 and both video and single frame modes. It is programmable through a simple two-wire serial interface. The AR0235CS 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 | 1/2.8-inch (6.34 mm) |
| Active Pixels | 1920 (H) x 1200 (V) not including 8 border pixels on each side |
| Pixel Size | 2.8 μ m |
| Color Filter Array | RGB Bayer, 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, 2, or 4-lane |
| Output Data Rate | Maximum Serial Output Data Rate 850 Mbps/lane |
| Frame Rate Full Resolution | 120 fps (10-bit) |
| Responsivity | 41.9 ke-/lux*s (Monochrome) TBD (RGB) |
| SNR _{MAX} | 37 dB |
| Dynamic Range | 65.3 dB |
| Supply Voltage I/O Digital Analog | 1.8 V 1.25 V 2.8 V |
| Power Consumption | 252 mW, at 120 FPS, Full Resolution |
| Operating Temperature | (-30°C < T _J < +85°C) |
| Optimal Performance Temperature Range | (0°C < T _J < +60°C) |
| Package Options | 7.66 x 5.64 mm 62-ball CSP θ _{JA} : 32°C/W (Note 1) θ _{JB} : 11°C/W Bare Die |

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



ODCSP62
CASE 570CY

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
- 8-bit/10-bit MIPI, 1/2/4-lane MIPI
- Automatic Black Level Calibration (ABLC)
- Horizontal and Vertical Mirroring, Windowing and Pixel Binning
- 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
- 1056 Bytes One-time Programmable Memory (OTPM)
- Simple Two-wire Fast-mode + Serial Interface

Applications

- Bar Code Scanner
- Factory Automation
- Autonomous Mobile Robot (AMR)
- Machine Vision
- 3D Scanning
- Biometrics

ORDERING INFORMATION

Table 2. AVAILABLE PART NUMBERS

| Part Number | Product Description | Product Attribute Description |
|-------------------------|---------------------|---|
| AR0235CSSM00SMKA0-CP | Mono, 0° CRA | CSP with Protective Film |
| AR0235CSSM00SMKA0-CP2 | Mono, 0° CRA | CSP with Protective Film, MOQ 50 Pieces |
| AR0235CSSM00SMKA0-CR | Mono, 0° CRA | CSP without Protective Film |
| AR0235CSSM00SMKAH3-GEVB | Mono, 0° CRA | Demo Board |

| | | |
|-------------------------------|---------------|---|
| AR0235CSSM28SMKA0-CP | Mono, 28° CRA | CSP with Protective Film |
| AR0235CSSM28SMKA0-CP2 | Mono, 28° CRA | CSP Chip Tray with Protective Film, MOQ 50 Pieces |
| AR0235CSSM28SMKA0-CR | Mono, 28° CRA | CSP without Protective Film |
| AR0235CSSM28SMKAH3-GEVB | Mono, 28° CRA | Demo Board |
| PRISM1M-AR0235CSSM130110-GEVB | Mono, 28° CRA | Premier Reference Image Sensor Module (PRISM) |

| | | |
|-------------------------|-------------|-----------------------------------|
| AR0235CS1C00SMKA0-CP-E | RGB, 0° CRA | CSP, with Protective Film, Sample |
| AR0235CSSC00SMKA0-CP | RGB, 0° CRA | CSP, with Protective Film |
| AR0235CSSC00SMKA0-CP2 | RGB, 0° CRA | CSP, with Protective Film, MOQ 50 |
| AR0235CSSC00SMKA0-CR | RGB, 0° CRA | CSP, without Protective Film |
| AR0235CSSC00SMKAH3-GEVB | RGB, 0° CRA | Demo Board |

| | | |
|-------------------------------|--------------|---|
| AR0235CS1C28SMKA0-CP-E | RGB, 28° CRA | CSP, with Protective Film, Sample |
| AR0235CSSC28SMKA0-CP | RGB, 28° CRA | CSP, with Protective Film |
| AR0235CSSC28SMKA0-CP2 | RGB, 28° CRA | CSP, with Protective Film, MOQ 50 |
| AR0235CSSC28SMKA0-CR | RGB, 28° CRA | CSP, without Protective Film |
| AR0235CSSC28SMKAH3-GEVB | RGB, 28° CRA | Demo Board |
| PRISM1M-AR0235CSSC130110-GEVB | RGB, 28° CRA | Premier Reference Image Sensor Module (PRISM) |

NOTE: Refer to AR0235 Die Data Sheet for Die Part Numbers and Ordering Information.

Table 3. FRAME RATE OF DIFFERENT MODES OF OPERATION

| Resolution | Mode | Frame Rate (frames per sec) |
|--------------------------------|---|--|
| Full_Resolution 1920 x 1200 | Master | 120 |
| | Slave Integration Start | 90 |
| | Slave Integration Time | 90 |
| | Slave Integration Start and Readout Start | 90 |
| | Slave Integration Start and Integration | depends on exp (not constant frame rate) |
| 2x2 Subsampling 960 x 600 | Master | 245 |
| | Slave Integration Start | 160 |
| | Slave Integration Time | 160 |
| | Slave Integration Start and Readout Start | 160 |
| | Slave Integration Start and Integration | depends on exp (not constant frame rate) |

AR0235CS

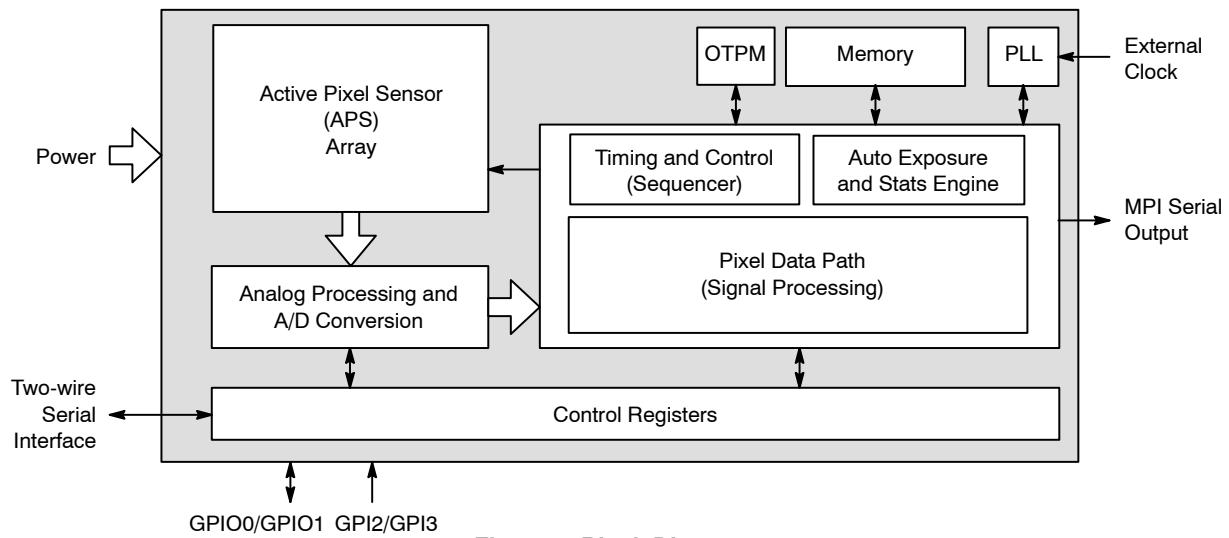
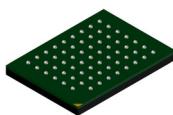


Figure 1. Block Diagram

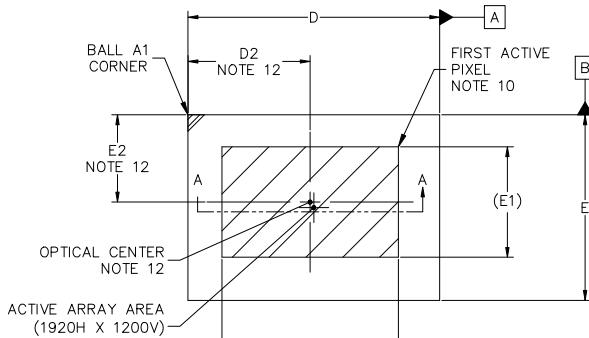


ODCSP62 7.66x5.65x0.62, 0.70P

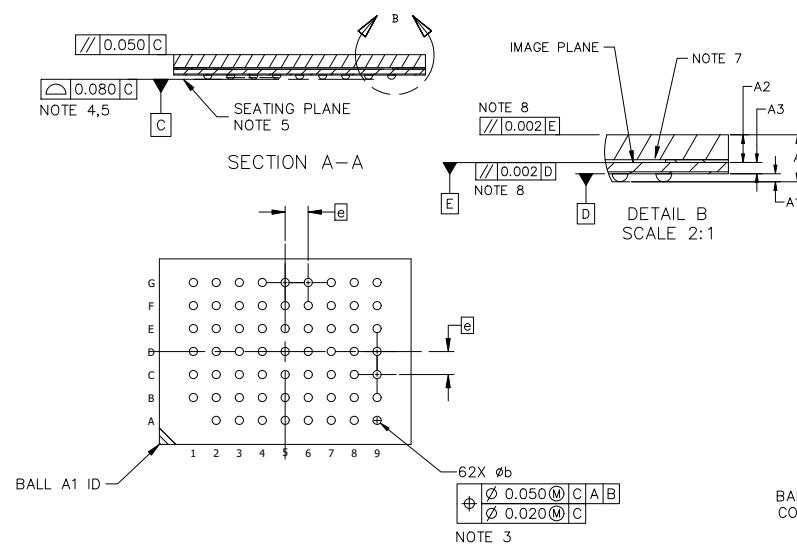
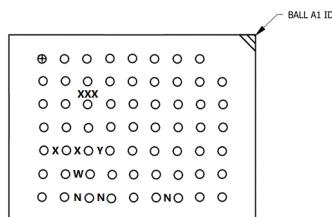
CASE 570CY

ISSUE B

DATE 09 DEC 2024



TOP VIEW

GENERIC
MARKING DIAGRAM*

XXX = Specific Device Code

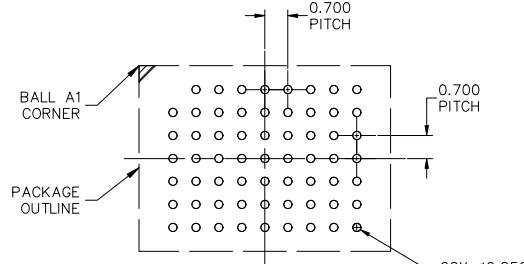
Y = Year Code

W = Work Week Code

NNN = Serial Number

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "■", may or may not be present. Some products may not follow the Generic Marking.

| DIM | MILLIMETERS | | |
|-----|-------------|-------|-------|
| | MIN. | NOM. | MAX |
| A | ----- | ----- | 0.821 |
| A1 | 0.085 | 0.128 | 0.171 |
| A2 | 0.430 | 0.445 | 0.460 |
| A3 | 0.138 | 0.180 | 0.222 |
| b | 0.220 | 0.250 | 0.280 |
| D | 7.642 | 7.667 | 7.692 |
| D1 | 5.376 REF. | | |
| D2 | 3.692 | 3.717 | 3.742 |
| E | 5.626 | 5.651 | 5.676 |
| E1 | 3.360 REF. | | |
| E2 | 2.631 | 2.656 | 2.681 |
| e | 0.700 BSC | | |



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

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