



Title of Change:	AR0220AT Datasheet Update.
Effective date:	2 October 2018
Contact information:	Contact your local ON Semiconductor Sales Office or <Lin.Lin@onsemi.com>
Type of notification:	This Product Bulletin is for notification purposes only. ON Semiconductor will proceed with implementation of this change upon publication of this Product Bulletin.
Change Category:	<input type="checkbox"/> Wafer Fab <input type="checkbox"/> Assembly Change <input type="checkbox"/> Test Change <input checked="" type="checkbox"/> Other <u>Documentation</u>

Change Sub-Category(s):	<input type="checkbox"/> Manufacturing Site Addition <input type="checkbox"/> Material Change <input checked="" type="checkbox"/> Datasheet/Product Doc change <input type="checkbox"/> Manufacturing Site Transfer <input type="checkbox"/> Product specific change <input type="checkbox"/> Shipping/Packaging/Marking <input type="checkbox"/> Manufacturing Process Change <input type="checkbox"/> Other: _____
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Sites Affected:	ON Semiconductor Sites: None	External Foundry/Subcon Sites: None
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Description and Purpose:

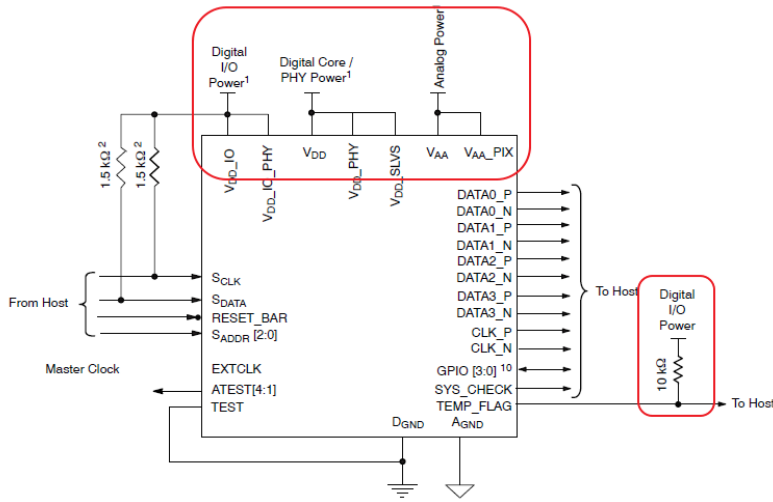
- These changes will not impact form, fit, or function of product.
- Simplify power supply drawing in typical configuration figure. (Figure 9, pg9)
- Pull up resistor added for TEMP_FLAG pin in typical configuration figure. (Figure 9, pg9)

Old Rev:

The diagram shows a chip with various power and signal pins. Power pins include V_{DD}, V_{DD_PHY}, V_{DD_SILV}, V_{AA}, and V_{AA_PIX}. Signal pins include SCLK, SDATA, RESET_N, SADDR[2:0], EXTCLK, ATEST[4:1], TEST, DATA0_P/N, DATA1_P/N, DATA2_P/N, DATA3_P/N, CLK_P/N, GPIO [3:0]¹⁰, SYS_CHECK, and TEMP_FLAG. Ground pins are D_GND and A_GND. Connections to a host are shown for DATA and CLK signals.



New Rev:



- Per customer request, update recommended power down sequence. (pg23)

Old Rev:

Typical Power Down Sequence:

1. De-assert Streaming: Set software standby mode (mode_select = 0) register.
 2. Wait till the end of the current frame (or end-of-line if so configured).
 3. **Configure I/O for "hold" if desired. "Hold" state requires maintaining VDD_IO; however.**
 4. Set RESET_N = 0. (Hard Standby, low-leakage state)
 5. Follow Power down sequence to remove supplies.
- For "hold" I/O state, do not power off VDD_IO supply.**

New Rev:

Typical Power Down Sequence:

1. **[Optional]** De-assert Streaming: Set software standby mode (mode_select = 0) register.
 2. **[Optional]** Wait till the end of the current frame (or end-of-line if so configured).
 3. **[Optional]** Set RESET_BAR = 0. (Hard Standby, **stopping EXTCLK is required for low-leakage state**)
 4. Follow Power down sequence to remove supplies.
- By following the "OPTIONAL" steps, data output will end on a row or frame boundary.

- Add EXTCLK frequency limitation on I2C fast mode plus statement in the footnote of **TWO-WIRE SERIAL BUS CHARACTERISTICS** table. (Note8, Table 3, Pg 16)

New Rev:

- 8. Fast Mode Plus operation is not supported with an EXTCLK frequency less than 16MHz.

- Format updates to align with new product datasheets.
 - Update Optical format number to 8.65mm, to match the actual die size. (Table 1, pg1)
 - Update Active pixels to 1.75M, to closer match actual pixel numbers. (Table1, pg1)
 - Replace key parameter "Output clock maximum" with "Output pixel rate maximum" to align with new datasheet format. (Table1, pg1); output clock is used with sensor with parallel interface output, replacing this parallel port MHz number with an equivalent number in units of pixels/sec for MIPI output product.

Old Rev:

Table 1. KEY PARAMETERS

Parameter	Typical Value
Optical format	1/1.8 inch (8.93 mm)
Active pixels	1820 x 940 = 1.7M
Pixel size	4.2 μm
Color filter array	RGB Bayer, RCCC, RCCB
Shutter type	Electronic rolling shutter
Input clock range	6 – 50 MHz
Output clock maximum	85.5 MHz

New Rev:

Table 1. KEY PARAMETERS

Parameter	Typical Value
Optical format	1/1.8 inch (8.65 mm)
Active pixels	1828 x 948 = 1.75M
Pixel size	4.2 μm
Color filter array	RGB Bayer, RCCC, RCCB
Shutter type	Electronic rolling shutter
Input clock range	6 – 50 MHz
Output pixel rate maximum	104 Mpixels/sec

- Update ORDERING INFORMATION table format to separate die and iBGA package. (ORDERING INFORMATION table, pg2). "Bare die" are not sold in the iBGA package, the package column is updated to be precise.

Old Rev:

ORDERING INFORMATION

Part number	Description	Orderable Product Attribute Description	Package
AR0220AT3R00XUEA0-DPBR	RCCC, 0°CRA, iBGA	Dry Pack with Protective Film, Double Side BBAR Glass	iBGA87 (Pb-free)
AR0220AT3R00XUEA0-DRBR	RCCC, 0°CRA, iBGA	Dry Pack without Protective Film, Double Side BBAR Glass	
AR0220AT3R00XUD20	RCCC, 0°CRA	Recon/Die	
AR0220AT3R00XUEAH3-GEVB	RCCC, 0°CRA	Demo3 Headboard	
MARS1-AR0220AT3R-GEVB	RCCC, 0°CRA	MARS Sensor Board	
AR0220AT3R00XUEA0-VL-TPBR	RCCC, 0°CRA, iBGA	Tape & Reel with corner tab Protective Film, Double Side BBAR Glass	
AR0220AT3R00XUEA0-VL-DPBR	RCCC, 0°CRA, iBGA	Dry Pack with corner tab Protective Film, Double Side BBAR Glass	
AR0220AT3C00XUEA0-DPBR	RGB, 0°CRA, iBGA	Dry Pack with Protective Film, Double Side BBAR Glass	
AR0220AT3C00XUEA0-DRBR	RGB, 0°CRA, iBGA	Dry Pack without Protective Film, Double Side BBAR Glass	
AR0220AT3C00XUD20	RGB, 0°CRA	Recon/Die	
AR0220AT3C00XUEAH3-GEVB	RGB, 0°CRA	Demo3 Headboard	
MARS1-AR0220AT3-GEVB	RGB, 0°CRA	MARS Sensor Board	
AR0220AT3B00XUEA0-DRBR	RCCB, 0°CRA, iBGA	Dry Pack without Protective Film, Double Side BBAR Glass	
AR0220AT3B00XUEA0-DPBR	RCCB, 0°CRA, iBGA	Dry Pack with Protective Film, Double Side BBAR Glass	
AR0220AT3B00XUD20	RCCB, 0°CRA	Recon/Die	
AR0220AT3B00XUEAH3-GEVB	RCCB, 0°CRA	Demo3 Headboard	

New Rev:

ORDERING INFORMATION

Part number	Description	Orderable Product Attribute Description	Package
AR0220AT3R00XUEA0-DPBR	RCCC, 0°CRA, iBGA	Dry Pack with Protective Film, Double Side BBAR Glass	iBGA87 (Pb-Free)
AR0220AT3R00XUEA0-DRBR	RCCC, 0°CRA, iBGA	Dry Pack without Protective Film, Double Side BBAR Glass	
AR0220AT3R00XUEAH3-GEVB	RCCC, 0°CRA	Demo3 Headboard	
MARS1-AR0220AT3R-GEVB	RCCC, 0°CRA	MARS Sensor Board	
AR0220AT3R00XUEA0-VL-TPBR	RCCC, 0°CRA, iBGA	Tape & Reel with corner tab Protective Film, Double Side BBAR Glass	
AR0220AT3R00XUEA0-VL-DPBR	RCCC, 0°CRA, iBGA	Dry Pack with corner tab Protective Film, Double Side BBAR Glass	
AR0220AT3C00XUEA0-DPBR	RGB, 0°CRA, iBGA	Dry Pack with Protective Film, Double Side BBAR Glass	
AR0220AT3C00XUEA0-DRBR	RGB, 0°CRA, iBGA	Dry Pack without Protective Film, Double Side BBAR Glass	
AR0220AT3C00XUEAH3-GEVB	RGB, 0°CRA	Demo3 Headboard	
MARS1-AR0220AT3-GEVB	RGB, 0°CRA	MARS Sensor Board	
AR0220AT3B00XUEA0-DRBR	RCCB, 0°CRA, iBGA	Dry Pack without Protective Film, Double Side BBAR Glass	
AR0220AT3B00XUEA0-DPBR	RCCB, 0°CRA, iBGA	Dry Pack with Protective Film, Double Side BBAR Glass	
AR0220AT3B00XUEAH3-GEVB	RCCB, 0°CRA	Demo3 Headboard	
AR0220AT3R00XUD20	RCCC, 0°CRA	Recon/Die	Die
AR0220AT3C00XUD20	RGB, 0°CRA	Recon/Die	
AR0220AT3B00XUD20	RCCB, 0°CRA	Recon/Die	

- Add ASIL / ISO26262 Support Features statement (pg4)

New Rev:

ASIL / ISO26262 Support Features

The AR0220AT incorporates many features assisting the achievement of ASIL-B system compliance by a system that integrates it. Please refer to the AR0220AT Safety Manual for more information.

- Change reset pin name from RESET_N to RESET_BAR across the document to align with new datasheet format. (Table 2, Figure9, 10, 18, 19)
- Place **TWO-WIRE SERIAL BUS CHARACTERISTICS** table before **TWO-WIRE SERIAL REGISTER INTERFACE ELECTRICAL CHARACTERISTICS** to align with new datasheet format. (Table 3, Table 4, pg16)
- Update red and blue channel legend to be consistent in the RCCB QE data figure. (figure22, pg24)

Old Rev:

New Rev:

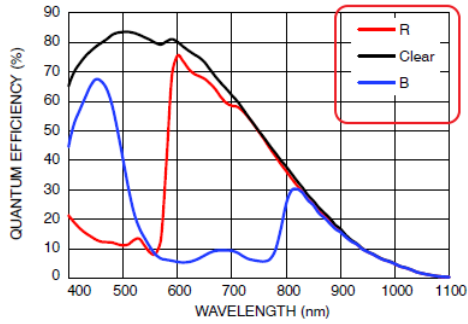


Figure 22. Quantum Efficiency - RCCB

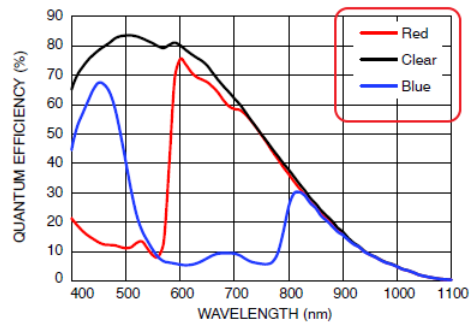


Figure 22. Quantum Efficiency - RCCB

List of Affected Parts:

- AR0220AT3R00XUEA0-DPBR
- AR0220AT3R00XUEA0-DRBR
- AR0220AT3R00XUD20
- AR0220AT3R00XUEA0-VL-TPBR
- AR0220AT3R00XUEA0-VL-DPBR
- AR0220AT3C00XUEA0-DPBR
- AR0220AT3C00XUEA0-DRBR
- AR0220AT3C00XUD20
- AR0220AT3B00XUEA0-DRBR
- AR0220AT3B00XUEA0-DPBR
- AR0220AT3B00XUD20
- AR0220AT3R00XUD20-E
- AR0220AT3C00XUEA0-DPBR-E
- AR0220AT3C00XUEA0-DRBR-E
- AR0220AT3C00XUD20-E
- AR0220AT3B00XUEA0-DRBR-E
- AR0220AT3B00XUD20-E

Appendix A: Changed Products

Product	Customer Part Number
AR0220AT3B00XUEA0-DPBR	
AR0220AT3B00XUEA0-DRBR	
AR0220AT3C00XUEA0-DPBR	
AR0220AT3C00XUEA0-DRBR	
AR0220AT3R00XUEA0-DPBR	
AR0220AT3R00XUEA0-DRBR	