

3.1 Mpixel ½-inch Color CMOS Active-Pixel Digital Image Sensor - MI-3100

Preliminary¹ Product Brief

Description

The MI-3100 is a $\frac{1}{2}$ inch color 2048(V) x 1536(H) CMOS low power progressive scan active pixel sensor that is designed specifically to meet the demands of Digital Still Cameras. The sensor utilizes 3.2μ m pixels in a Bayer RGB pattern resulting in a $\frac{1}{2}$ -inch optical format. The MI-3100 has on-chip timing and control, programmable gain and exposure control, auto black level calibration as well as snapshot mode (flash control) and viewfinder mode.

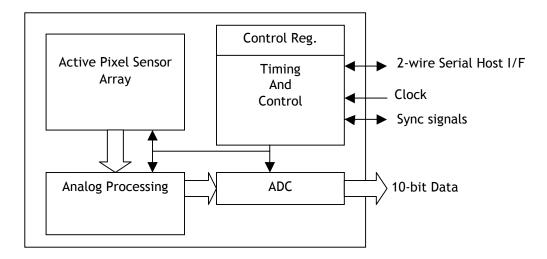
It is capable of both continuous video and single frame capture with sync input and strobe output as well as windowing, horizontal and vertical blanking control. The sensor can be operated in its default mode or programmed by the user over a two-wire serial host interface. The sensor output is 10 bits RGB at 12 frames per second.

Features

- Low power CMOS image sensor
- 3.1 Mpixel resolution (2048H x 1536V)
- ½-inch optical format
- Up to 12 frames per second progressive scan for high quality video
- Programmable gain and exposure control
- Auto black level calibration
- Viewfinder and Snapshot modes
- Auto focus and auto exposure modes
- Binning to XGA and VGA resolutions with improved
 image quality
- On-chip, 10-bit analog-to-digital converter
- Two-wire serial programming interface
- 10-bit parallel data output

Applications

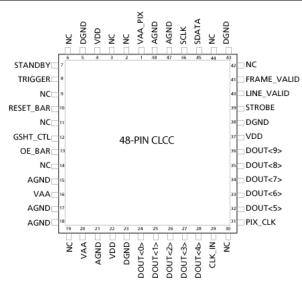
- Digital Still Cameras
- Digital Video Cameras
- PDAs



¹ - PRODUCTS AND SPECIFICATIONS DISCUSSED HEREIN ARE FOR EVALUATION AND REFERENCE PURPOSES AND ARE SUBJECT TO CHANGE BY MICRON WITHOUT NOTICE. PRODUCTS ARE ONLY WARRANTED BY MICRON TO MEET MICRON'S PRODUCTION DATASHEET SPECIFICATIONS. Micron Technology, Inc. WWW.micron.com Version 1.2- MI-3100 May 2003

Specifications

| Pixel Size and Type $3.2 \mu m x 3.2 \mu m Active Pinned-photodiodeArray Format (active)2048H x 1536VImaging Area6.553mm x 4.915mmColor Filter ArrayR. G. B primary color filters; Bayer patternOptical Format\% inch (8.19mm diagonal)Frame Rate12 fps with programmable blankingScan ModeProgressiveShutterElectronic Rolling Shutter and global resetProgrammable ControlsGain, horizontal and vertical blanking, windowing, sampling rates, autoblack level offset correctionSubsampling Modes (w/o binning)Full, 1/2, 1/3, 1/4, 1/8Subsampled Resolutions (w/binning)1024 x 768 (XGA) [Bayer] @ 30 fps default640 x 480 (VGA) [Bayer] @ 30 fps default640 x 480 (VGA) [Bayer] @ 30 fps defaultAuto Focus/Auto Exposure/Viewfinder Modes2048 x 512 @ 30 fpsGainMax. 128xADC10-bitData Rate48 MS/secExposure Control10 \mu s - 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)3.3 d BDynamic Range (analog)64 d RDark Current @ 20^{\circ}C20 e /secMaster Clock48 MHzSupply Voltage3.3 v \pm 0.3VPower Consumption240mW @ 12 fps (<100 µW standby)Operating Temp. Range0^{\circ}C to 125^{\circ}CPackage48 \circC to 125^{\circ}C$ | | |
|--|---|--|
| Imaging Area6.553mm x 4.915mmColor Filter ArrayR, G, B primary color filters; Bayer pattemOptical Format½ inch (8.19mm diagonal)Frame Rate12 fps with programmable blankingScan ModeProgressiveShutterElectronic Rolling Shutter and global resetProgrammable ControlsGain, horizontal and vertical blanking, windowing, sampling rates, auto black level offset correctionSubsampling Modes (w/o binning)Full. 1/2, 1/3, 1/4, 1/8Subsample Resolutions (w/binning)1024 x 768 (XGA) [Bayer] @ 30 fps default 640 x 480 (VGA) [Bayer] @ 30 fps defaultAuto Focus/Auto Exposure/Viewfinder Modes2048 x 512 @ 30 of ps 2048 x 512 @ 30 of psWindowingProgrammable to any sizeGainMax. 128xAuto Focus/Auto Exposure/Viewfinder Modes2048 x 526 @ 60 fps 2048 x 128 @ 120 fpsWindowingMax. 128xAuto Focus/Auto Exposure/Viewfinder Modes10.µs - 500ms: 1, 2, 4, 8, 16, 32 secondsExposure Control10.µs - 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e'secMaster Clock3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100µW standby) | Pixel Size and Type | 3.2µm x 3.2µm Active Pinned-photodiode |
| Color Filter ArrayR, G, B primary color filters; Bayer patternOptical Format½ inch (8.19mm diagonal)Frame Rate12 fps with programmable blankingScan ModeProgressiveShtterElectronic Rolling Shtter and global resetProgrammable ControlsGain, horizontal and vertical blanking, windowing, sampling rates, auto black level offset correctionSubsampling Modes (w/o binning)Full, 1/2, 1/3, 1/4, 1/8Subsampled Resolutions (w/binning)Full, 1/2, 1/3, 1/4, 1/8Auto Focus/Auto Exposure/Viewfinder Modes2048 x 512 @ 30 fps default 640 x 480 (VGA) [Bayer] @ 30 fps defaultAuto Focus/Auto Exposure/Viewfinder Modes2048 x 512 @ 100 fpsQuart AttaProgrammable to any sizeGainMax. 128xADC10-bitData Rate48 MS/secExposure Control10µs - 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e'/secMaster Clock8 MHzSupply Voltage3.3 V ± 0.3VPower Consumption240°C to ef0°CTemperature Storage Range0°C to ef0°CTemperature Storage Range0°C to ef0°C | Array Format (active) | 2048H x 1536V |
| Optical Format½ inch (8.19mn diagonal)Frame Rate12 fps with programmable blankingScan ModeProgressiveShutterElectronic Rolling Shutter and global resetProgrammable ControlsGain, horizontal and vertical blanking, windowing, sampling rates, auto black level offset correctionSubsampling Modes (w/o binning)Full, 1/2, 1/3, 1/4, 1/8Subsampled Resolutions (w/binning)1024 x 768 (XGA) [Bayer] @ 30 fps default 640 x 480 (VGA) [Bayer] @ 30 fps defaultAuto Focus/Auto Exposure/Viewfinder Modes2048 x 512 @ 30 fps 2048 x 256 @ 60 fps 2048 x 128 @ 120 fpsWindowingMax. 128xADC10-bitData Rate48 MS/secExposure Control10µs – 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e'/secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100µW standby) | Imaging Area | 6.553mm x 4.915mm |
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| Scan ModeProgressiveShutterElectronic Rolling Shutter and global resetProgrammable ControlsGain, horizontal and vertical blanking, windowing, sampling rates, auto black level offset correctionSubsampling Modes (w/o binning)Full, 1/2, 1/3, 1/4, 1/8Subsampled Resolutions (w/binning)1024 x 768 (XGA) [Bayer] @ 30 fps default 640×480 (VGA) [Bayer] @ 30 fps defaultAuto Focus/Auto Exposure/Viewfinder Modes2048 x 512 @ 30 fps 2048 x 256 @ 60 fps 2048 x 256 @ 60 fps 2048 x 128 @ 120 fpsWindowingProgrammable to any sizeGainMax. 128xADC10-bitData Rate48 MS/secExposure Control10 μ s – 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20° C20 e'/secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100\muW standby) | Optical Format | ½ inch (8.19mm diagonal) |
| ShutterElectronic Rolling Shutter and global resetProgrammable ControlsGain, horizontal and vertical blanking, windowing, sampling rates, auto black level offset correctionSubsampling Modes (w/o binning)Full, 1/2, 1/3, 1/4, 1/8Subsampled Resolutions (w/binning)1024 x 768 (XGA) [Bayer] @ 30 fps default 640 x 480 (YGA) [Bayer] @ 30 fps defaultAuto Focus/Auto Exposure/Viewfinder Modes2048 x 512 @ 30 fps 2048 x 256 @ 60 fps 2048 x 128 @ 120 fpsWindowingProgrammable to any sizeGainMax. 128xADC10-bitData Rate48 MS/secExposure Control10µs – 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e'/secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100µW standby) | Frame Rate | 12 fps with programmable blanking |
| Programmable ControlsGain, horizontal and vertical blanking, windowing, sampling rates, auto black level offset correctionSubsampling Modes (w/o binning)Full, 1/2, 1/3, 1/4, 1/8Subsampled Resolutions (w/binning)1024 x 768 (XGA) [Bayer] @ 30 fps default 640 x 480 (VGA) [Bayer] @ 30 fps defaultAuto Focus/Auto Exposure/Viewfinder Modes2048 x 512 @ 30 fps 2048 x 256 @ 60 fps 2048 x 128 @ 120 fpsWindowingProgrammable to any sizeGainMax. 128xADC10-bitData Rate48 MS/secExposure Control10µs - 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e'/secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100µW standby) | Scan Mode | Progressive |
| black level offset correctionSubsampling Modes (w/o binning)Full, 1/2, 1/3, 1/4, 1/8Subsampled Resolutions (w/binning)1024 x 768 (XGA) [Bayer] @ 30 fps default 640 x 480 (VGA) [Bayer] @ 30 fps default 64 dBDark Current @ 20°C Master Clock20 e'/secMaster Clock Master Clock48 MHzSupply Voltage Power Consumption3.3V ± 0.3VPower Consumption Operating Temp. Range O°C to 60°C Temperature Storage Range0°C to 60°C c 0°C to 4125°C | Shutter | Electronic Rolling Shutter and global reset |
| Subsampled Resolutions (w/binning) $1024 \times 768 (XGA) [Bayer] @ 30 fps default640 x 480 (VGA) [Bayer] @ 30 fps default640 x 480 (VGA) [Bayer] @ 30 fps default2048 x 512 @ 30 fps2048 x 256 @ 60 fps2048 x 128 @ 120 fpsWindowingProgrammable to any sizeGainMax. 128xADC10-bitData Rate48 MS/secExposure Control10\mus - 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e'/secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240 mW @ 12 fps (<100 \muW standby)$ | - | black level offset correction |
| Auto Focus/Auto Exposure/Viewfinder Modes640 x 480 (VGA) [Bayer] @ 30 fps defaultAuto Focus/Auto Exposure/Viewfinder Modes2048 x 512 @ 30 fps 2048 x 256 @ 60 fpsWindowingProgrammable to any sizeGainMax. 128xADC10-bitData Rate48 MS/secExposure Control10µs – 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e'secMaster Clock48 MHzSupply Vottage3.3V ± 0.3VPower Consumption0°C to 60°CTemperature Storage Range0°C to 6125°C | | |
| 2048 x 256 @ 60 fps 2048 x 128 @ 120 fpsWindowingProgrammable to any sizeGainMax. 128xADC10-bitData Rate48 MS/secExposure Control10µs – 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e'/secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100µW standby) | | 640 x 480 (VGA) [Bayer] @ 30 fps default |
| GainMax. 128xADC10-bitData Rate48 MS/secExposure Control10 μ s – 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e'/secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption0°C to 60°COperating Temp. Range0°C to +125°C | Auto Focus/Auto Exposure/Viewfinder Modes | 2048 x 256 @ 60 fps |
| ADC10-bitData Rate48 MS/secExposure Control10μs – 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e ⁷ /secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100μW standby) | Windowing | Programmable to any size |
| Data Rate48 MS/secExposure Control10μs – 500ms: 1, 2, 4, 8, 16, 32 secondsResponsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e ⁷ /secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100µW standby) | Gain | Max. 128x |
| Exposure Control $10\mu s - 500ms: 1, 2, 4, 8, 16, 32 seconds$ Responsivity (Green) $1.2 V/Lux$ -secSNR (max) $43 dB$ Dynamic Range (analog) $64 dB$ Dark Current @ 20°C $20 e^{7}sec$ Master Clock $48 MHz$ Supply Voltage $3.3V \pm 0.3V$ Power Consumption $240mW$ @ 12 fps (<100 μ W standby)Operating Temp. Range $0^{\circ}C to 60^{\circ}C$ Temperature Storage Range $-40^{\circ}C to +125^{\circ}C$ | ADC | 10-bit |
| Responsivity (Green)1.2 V/Lux-secSNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e'/secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100 µW standby) | Data Rate | 48 MS/sec |
| SNR (max)43 dBDynamic Range (analog)64 dBDark Current @ 20°C20 e'/secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100 µW standby) | Exposure Control | 10μs – 500ms: 1, 2, 4, 8, 16, 32 seconds |
| Dynamic Range (analog)64 dBDark Current @ 20°C20 e'/secMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100µW standby) | Responsivity (Green) | 1.2 V/Lux-sec |
| Dark Current @ 20°C $20 e^{/sec}$ Master Clock 48 MHz Supply Voltage $3.3V \pm 0.3V$ Power Consumption 240mW @ 12 fps (<100 μ W standby)Operating Temp. Range 0° C to 60° CTemperature Storage Range -40° C to $+125^{\circ}$ C | SNR (max) | 43 dB |
| Dark Current @ 20 °C48 MHzMaster Clock48 MHzSupply Voltage3.3V ± 0.3VPower Consumption240mW @ 12 fps (<100µW standby) | Dynamic Range (analog) | 64 dB |
| Supply Voltage $3.3V \pm 0.3V$ Power Consumption $240mW @ 12 fps (<100\muW standby)$ Operating Temp. Range $0^{\circ}C to 60^{\circ}C$ Temperature Storage Range $-40^{\circ}C to +125^{\circ}C$ | Dark Current @ 20°C | 20 e ⁻ /sec |
| Power Consumption240mW @ 12 fps (<100µW standby)Operating Temp. Range0°C to 60°CTemperature Storage Range-40°C to +125°C | Master Clock | 48 MHz |
| Operating Temp. Range0°C to 60°CTemperature Storage Range-40°C to +125°C | Supply Voltage | 3.3V ± 0.3V |
| Temperature Storage Range -40 °C to +125 °C | Power Consumption | 240mW @ 12 fps (<100μW standby) |
| | Operating Temp. Range | 0°C to 60°C |
| Package 48-pin PLCC | Temperature Storage Range | -40°C to +125°C |
| | Package | 48-pin PLCC |



Micron Technology Inc. - Confidential & Proprietary - Preliminary Information

| 1 VAAPIX 2 NC 3 NC 4 VDD 5 DGND 6 NC 7 STANDBY 8 TRIGGER 9 NC 10 RESET_BAR 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <7> | TYPE | DESCRIPTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 3 NC 4 VDD 5 DGND 6 NC 7 STANDBY 8 TRIGGER 9 NC 10 RESET_BAR 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <7> 35 DOUT <8> 36 DOUT <9> <td>Supply</td> <td>Analog Pixel Power: Provide power supply for pixel array, 3.3V± 0.3V</td> | Supply | Analog Pixel Power: Provide power supply for pixel array, 3.3V± 0.3V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 VDD 5 DGND 6 NC 7 STANDBY 8 TRIGGER 9 NC 10 RESET_BAR 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <5> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> | - | No Connect: These pins must be left unconnected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 DGND 6 NC 7 STANDBY 8 TRIGGER 9 NC 10 RESET_BAR 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <5> 33 DOUT <5> 33 DOUT <5> 34 DOUT <5> 35 DOUT <9>< | - | No Connect: These pins must be left unconnected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 NC 7 STANDBY 8 TRIGGER 9 NC 10 RESET_BAR 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND | Supply | Digital Power: Provide power supply for digital block, $3.3V \pm 0.3V$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 STANDBY 8 TRIGGER 9 NC 10 RESET_BAR 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <5> 33 DOUT <5> 34 DOUT <5> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 | Supply | Digital Ground: Provide isolated ground for digital block | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 TRIGGER 9 NC 10 RESET_BAR 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 D | - | No Connect: These pins must be left unconnected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 NC 10 RESET_BAR 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <5> 33 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 40 LINE_VALID 41 FRAME_VALID 42 NC <tr t=""> 43<td>Input</td><td>Standby: Activates (HIGH) standby mode, disables analog bias circuitry for power saving mode.</td></tr> <tr><td>10 RESET_BAR 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <5> 33 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42</td><td>Input</td><td>Trigger: Activates (HIGH) snapshot sequence.</td></tr> <tr><td>11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>-</td><td>No Connect: These pins must be left unconnected</td></tr> <tr><td>12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 <</td><td>R Input</td><td>Reset: Activates (LOW) asynchronous reset of sensor. All registers assume factory defaults.</td></tr> <tr><td>13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDA</td><td>-</td><td>No Connect: These pins must be left unconnected</td></tr> <tr><td>14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Input</td><td>Global Shutter Control pin</td></tr> <tr><td>15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Input</td><td>Output Enable: OE_BAR when high places outputs DOUT<0-9>, FRAME_VALID, LINE_VALID, PIX_CLK and STROBE into a tri-state configuration</td></tr> <tr><td>16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND</td><td>-</td><td>No Connect: These pins must be left unconnected</td></tr> <tr><td>17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Supply</td><td>Analog Ground: Provide isolated ground for analog block and pixel array</td></tr> <tr><td>18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 445 SDATA</td><td>Supply</td><td>Analog Power: Provide power supply for analog block, 3.3V ± 0.3V</td></tr> <tr><td>19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Supply</td><td>Analog Ground: Provide isolated ground for analog block and pixel array</td></tr> <tr><td>20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 445 SDATA</td><td>Supply</td><td>Analog Ground: Provide isolated ground for analog block and pixel array</td></tr> <tr><td>21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>-</td><td>No Connect: These pins must be left unconnected</td></tr> <tr><td>22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Supply</td><td>Analog Power: Provide power supply for analog block, 3.3V ±0.3V</td></tr> <tr><td>23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Supply</td><td>Analog Ground: Provide isolated ground for analog block and pixel array</td></tr> <tr><td>24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <9> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Supply</td><td>Digital Power: Provide power supply for digital block, 3.3V ±0.3V</td></tr> <tr><td>25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Supply</td><td>Digital Ground: Provide isolated ground for digital block</td></tr> <tr><td>26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Output</td><td>Data Out: Pixel data output bits 0, DOUT<9> (MSB), DOUT<0> (LSB)</td></tr> <tr><td>27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Output</td><td>Data Out: Pixel data output bits 1, DOUT<9> (MSB), DOUT<0> (LSB)</td></tr> <tr><td>27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Output</td><td>Data Out: Pixel data output bits 2, DOUT<9> (MSB), DOUT<0> (LSB)</td></tr> <tr><td>28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Output</td><td>Data Out: Pixel data output bits 3, DOUT<9> (MSB), DOUT<0> (LSB)</td></tr> <tr><td>29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Output</td><td>Data Out: Pixel data output bits 4, DOUT<9> (MSB), DOUT<0> (LSB)</td></tr> <tr><td>30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Input</td><td>Clock In: Master clock into sensor (48 MHz maximum)</td></tr> <tr><td>31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td></td><td>No Connect: These pins must be left unconnected</td></tr> <tr><td>33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Output</td><td>Pixel Clock: Pixel data outputs are valid during falling edge of this clock; Frequency = (Master Clock)</td></tr> <tr><td>34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Output</td><td>Data Out: Pixel data output bits 5, DOUT<9> (MSB), DOUT<0> (LSB)</td></tr> <tr><td>35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Output</td><td>Data Out: Pixel data output bits 6, DOUT<9> (MSB), DOUT<0> (LSB)</td></tr> <tr><td>36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA</td><td>Output</td><td>Data Out: Pixel data output bits 7, DOUT<9> (MSB), DOUT<0> (LSB)</td></tr> <tr><td>37VDD38DGND39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA</td><td>Output</td><td>Data Out: Pixel data output bits 8, DOUT<9> (MSB), DOUT<0> (LSB)</td></tr> <tr><td>38DGND39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA</td><td>Output</td><td>Data Out: Pixel data output bits 9, DOUT<9> (MSB), DOUT<0> (LSB)</td></tr> <tr><td>39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA</td><td>Supply</td><td>Digital Power: Provide power supply for digital block, 3.3V ±0.3V</td></tr> <tr><td>39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA</td><td>Supply</td><td>Digital Ground: Provide isolated ground for digital block</td></tr> <tr><td>40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA</td><td>Output</td><td>Strobe: Output is pulsed high to indicate sensor reset operation of pixel array has completed</td></tr> <tr><td>41FRAME_VALID42NC43DGND44NC45SDATA</td><td>·</td><td>Line Valid: Output is pulsed high during line of selectable valid pixel data (see Reg0x20 for options)</td></tr> <tr><td>42 NC 43 DGND 44 NC 45 SDATA</td><td>-</td><td>Frame Valid: Output is pulsed high during frame of valid pixel data</td></tr> <tr><td>43 DGND 44 NC 45 SDATA</td><td>-</td><td>No Connect: These pins must be left unconnected</td></tr> <tr><td>44 NC 45 SDATA</td><td>Supply</td><td>Digital Ground: Provide isolated ground for digital block</td></tr> <tr><td>45 SDATA</td><td></td><td>No Connect: These pins must be left unconnected</td></tr> <tr><td></td><td>Input/Output</td><td>Serial Data: Serial data bus, requires 1.5kohm resister to 3.3V for pullup</td></tr> <tr><td>40 50 6</td><td>Input</td><td>Serial Clock: Clock for serial interface</td></tr> <tr><td>46 SCLK 47 AGND</td><td>Supply</td><td>Analog Ground: Provide isolated ground for analog block and pixel array</td></tr> <tr><td>47 AGND 48 AGND</td><td>Supply</td><td>Analog Ground: Provide isolated ground for analog block and pixel array Analog Ground: Provide isolated ground for analog block and pixel array</td></tr> | Input | Standby: Activates (HIGH) standby mode, disables analog bias circuitry for power saving mode. | 10 RESET_BAR 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <5> 33 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 | Input | Trigger: Activates (HIGH) snapshot sequence. | 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | - | No Connect: These pins must be left unconnected | 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 < | R Input | Reset: Activates (LOW) asynchronous reset of sensor. All registers assume factory defaults. | 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDA | - | No Connect: These pins must be left unconnected | 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Input | Global Shutter Control pin | 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Input | Output Enable: OE_BAR when high places outputs DOUT<0-9>, FRAME_VALID, LINE_VALID, PIX_CLK and STROBE into a tri-state configuration | 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND | - | No Connect: These pins must be left unconnected | 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Analog Ground: Provide isolated ground for analog block and pixel array | 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 445 SDATA | Supply | Analog Power: Provide power supply for analog block, 3.3V ± 0.3V | 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Analog Ground: Provide isolated ground for analog block and pixel array | 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 445 SDATA | Supply | Analog Ground: Provide isolated ground for analog block and pixel array | 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | - | No Connect: These pins must be left unconnected | 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Analog Power: Provide power supply for analog block, 3.3V ±0.3V | 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Analog Ground: Provide isolated ground for analog block and pixel array | 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <9> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Digital Power: Provide power supply for digital block, 3.3V ±0.3V | 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Digital Ground: Provide isolated ground for digital block | 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 0, DOUT<9> (MSB), DOUT<0> (LSB) | 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 1, DOUT<9> (MSB), DOUT<0> (LSB) | 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 2, DOUT<9> (MSB), DOUT<0> (LSB) | 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 3, DOUT<9> (MSB), DOUT<0> (LSB) | 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 4, DOUT<9> (MSB), DOUT<0> (LSB) | 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Input | Clock In: Master clock into sensor (48 MHz maximum) | 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | | No Connect: These pins must be left unconnected | 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Pixel Clock: Pixel data outputs are valid during falling edge of this clock; Frequency = (Master Clock) | 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 5, DOUT<9> (MSB), DOUT<0> (LSB) | 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 6, DOUT<9> (MSB), DOUT<0> (LSB) | 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 7, DOUT<9> (MSB), DOUT<0> (LSB) | 37VDD38DGND39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA | Output | Data Out: Pixel data output bits 8, DOUT<9> (MSB), DOUT<0> (LSB) | 38DGND39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA | Output | Data Out: Pixel data output bits 9, DOUT<9> (MSB), DOUT<0> (LSB) | 39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA | Supply | Digital Power: Provide power supply for digital block, 3.3V ±0.3V | 39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA | Supply | Digital Ground: Provide isolated ground for digital block | 40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA | Output | Strobe: Output is pulsed high to indicate sensor reset operation of pixel array has completed | 41FRAME_VALID42NC43DGND44NC45SDATA | · | Line Valid: Output is pulsed high during line of selectable valid pixel data (see Reg0x20 for options) | 42 NC 43 DGND 44 NC 45 SDATA | - | Frame Valid: Output is pulsed high during frame of valid pixel data | 43 DGND 44 NC 45 SDATA | - | No Connect: These pins must be left unconnected | 44 NC 45 SDATA | Supply | Digital Ground: Provide isolated ground for digital block | 45 SDATA | | No Connect: These pins must be left unconnected | | Input/Output | Serial Data: Serial data bus, requires 1.5kohm resister to 3.3V for pullup | 40 50 6 | Input | Serial Clock: Clock for serial interface | 46 SCLK 47 AGND | Supply | Analog Ground: Provide isolated ground for analog block and pixel array | 47 AGND 48 AGND | Supply | Analog Ground: Provide isolated ground for analog block and pixel array Analog Ground: Provide isolated ground for analog block and pixel array |
| Input | Standby: Activates (HIGH) standby mode, disables analog bias circuitry for power saving mode. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 RESET_BAR 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <5> 33 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 | Input | Trigger: Activates (HIGH) snapshot sequence. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 NC 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | - | No Connect: These pins must be left unconnected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 GSHT_CTL 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 < | R Input | Reset: Activates (LOW) asynchronous reset of sensor. All registers assume factory defaults. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 OE_BAR 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDA | - | No Connect: These pins must be left unconnected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 NC 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Input | Global Shutter Control pin | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 AGND 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Input | Output Enable: OE_BAR when high places outputs DOUT<0-9>, FRAME_VALID, LINE_VALID, PIX_CLK and STROBE into a tri-state configuration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 VAA 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND | - | No Connect: These pins must be left unconnected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 AGND 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Analog Ground: Provide isolated ground for analog block and pixel array | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 AGND 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 445 SDATA | Supply | Analog Power: Provide power supply for analog block, 3.3V ± 0.3V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 NC 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Analog Ground: Provide isolated ground for analog block and pixel array | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 VAA 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 445 SDATA | Supply | Analog Ground: Provide isolated ground for analog block and pixel array | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 AGND 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | - | No Connect: These pins must be left unconnected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 VDD 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Analog Power: Provide power supply for analog block, 3.3V ±0.3V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 DGND 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Analog Ground: Provide isolated ground for analog block and pixel array | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 DOUT <0> 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <9> 35 DOUT <9> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Digital Power: Provide power supply for digital block, 3.3V ±0.3V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 DOUT <1> 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Supply | Digital Ground: Provide isolated ground for digital block | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 DOUT <2> 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 0, DOUT<9> (MSB), DOUT<0> (LSB) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 1, DOUT<9> (MSB), DOUT<0> (LSB) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 DOUT <3> 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 2, DOUT<9> (MSB), DOUT<0> (LSB) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 DOUT <4> 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 3, DOUT<9> (MSB), DOUT<0> (LSB) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 CLK_IN 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 4, DOUT<9> (MSB), DOUT<0> (LSB) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 NC 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Input | Clock In: Master clock into sensor (48 MHz maximum) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 PIX_CLK 32 DOUT <5> 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | | No Connect: These pins must be left unconnected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 DOUT <6> 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Pixel Clock: Pixel data outputs are valid during falling edge of this clock; Frequency = (Master Clock) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 DOUT <7> 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 5, DOUT<9> (MSB), DOUT<0> (LSB) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 DOUT <8> 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 6, DOUT<9> (MSB), DOUT<0> (LSB) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 DOUT <9> 37 VDD 38 DGND 39 STROBE 40 LINE_VALID 41 FRAME_VALID 42 NC 43 DGND 44 NC 45 SDATA | Output | Data Out: Pixel data output bits 7, DOUT<9> (MSB), DOUT<0> (LSB) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37VDD38DGND39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA | Output | Data Out: Pixel data output bits 8, DOUT<9> (MSB), DOUT<0> (LSB) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38DGND39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA | Output | Data Out: Pixel data output bits 9, DOUT<9> (MSB), DOUT<0> (LSB) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA | Supply | Digital Power: Provide power supply for digital block, 3.3V ±0.3V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39STROBE40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA | Supply | Digital Ground: Provide isolated ground for digital block | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40LINE_VALID41FRAME_VALID42NC43DGND44NC45SDATA | Output | Strobe: Output is pulsed high to indicate sensor reset operation of pixel array has completed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41FRAME_VALID42NC43DGND44NC45SDATA | · | Line Valid: Output is pulsed high during line of selectable valid pixel data (see Reg0x20 for options) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 NC 43 DGND 44 NC 45 SDATA | - | Frame Valid: Output is pulsed high during frame of valid pixel data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 DGND 44 NC 45 SDATA | - | No Connect: These pins must be left unconnected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 NC 45 SDATA | Supply | Digital Ground: Provide isolated ground for digital block | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 SDATA | | No Connect: These pins must be left unconnected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Input/Output | Serial Data: Serial data bus, requires 1.5kohm resister to 3.3V for pullup | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 50 6 | Input | Serial Clock: Clock for serial interface | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 SCLK 47 AGND | Supply | Analog Ground: Provide isolated ground for analog block and pixel array | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 AGND 48 AGND | Supply | Analog Ground: Provide isolated ground for analog block and pixel array Analog Ground: Provide isolated ground for analog block and pixel array | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |