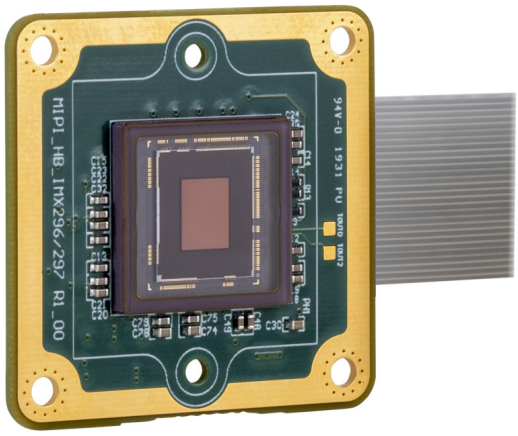
Technical Details



DFM 36MR0234-ML

THE IMAGINGSOURCE
TECHNOLOGY BASED ON STANDARDS

Table of Contents

1 Quick Facts

General	
Dynamic Range	10 bit
Resolution	1920x1200
Frame Rate at Full Resolution	120
Pixel Formats	10-Bit Bayer (GR)

Optical Interface	
Sensor Type	ON Semiconductor AR0234CS
Shutter Type	Global
Sensor Format	1/2.6 inch
Pixel Size	3.0 µm

Electrical Interface	
Interface	The Imaging Source MIPI CSI-2 Sensor Board Connector
Number of active CSI lanes	4
Supply voltage	5V (±10%)
Current consumption	approx 85 mA @ 5 VDC

Mechanical Data	
Dimensions	H: 30 mm, W: 30 mm, L: 5.45 mm
Mass	4 g

Adjustments	
Shutter	15 µs to 0.25 s
Gain	0 dB to 19,2 dB

Environmental	
Temperature (operating)	-5 °C to 45 °C
Temperature (storage)	-20 °C to 60 °C
Humidity (operating)	20 % to 80 % (non-condensing)
Humidity (storage)	20 % to 95 % (non-condensing)

2 Electrical Characteristics

2.1 Absolute Maximum Ratings

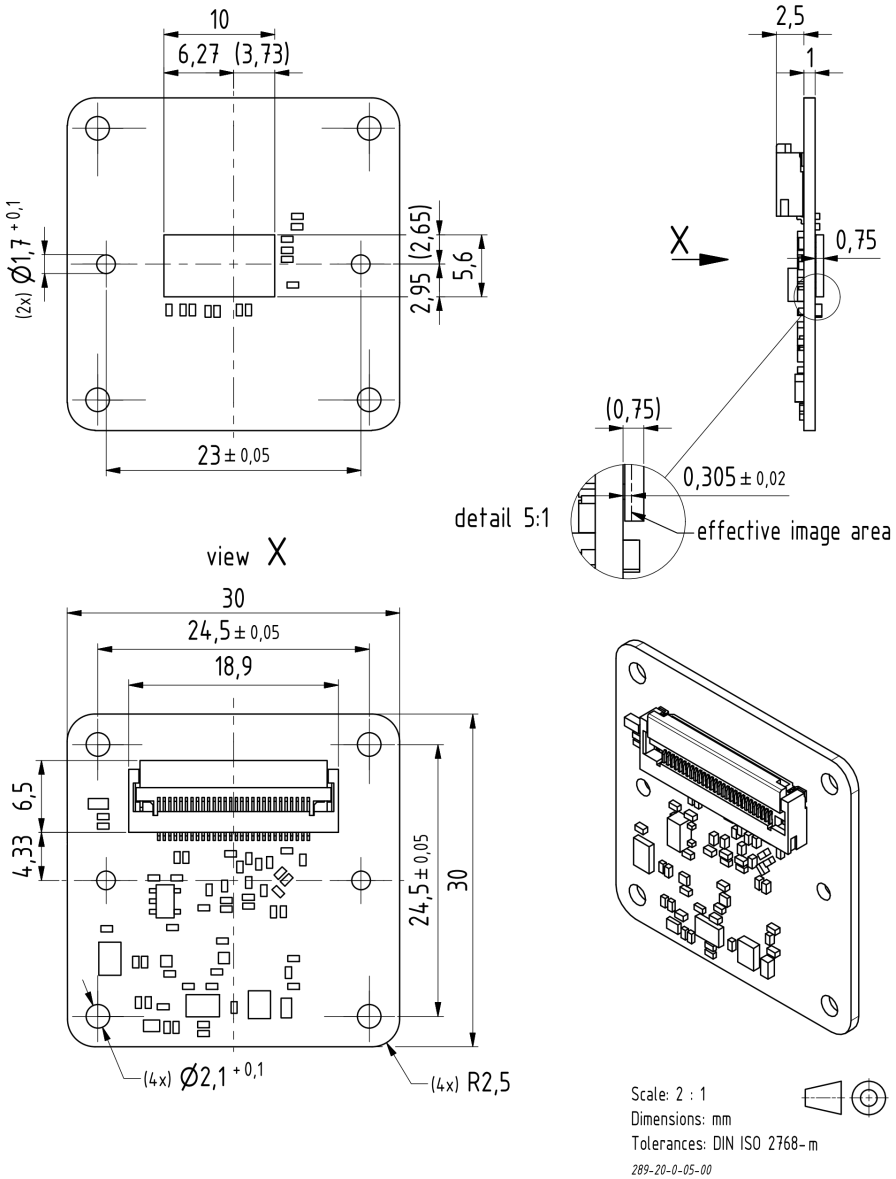
Item	Symbol	Pins	Min	Max	Unit
Supply voltage	V_IN	+5V_VDD	-0.3	+6.0	V
I/O voltage	V_IO	CAM_PWR RESET CLK STROBE TRIGGER	-0.3	+2.1	V
I2C voltage	V_I2C	I2C_SCL I2C_SDA	-0.3	+2.1	V

2.2 Recommended Operating Conditions

Item	Symbol	Pins	Min	Typ	Max	Unit
Supply voltage	V_IN	+5V_VDD	4.5	5.0	5.5	V
I/O voltage	V_IO	CAM_PWR RESET CLK STROBE TRIGGER	1.7	1.8	1.9	V
I2C voltage	V_I2C	I2C_SCL I2C_SDA	1.7	1.8	1.9	V

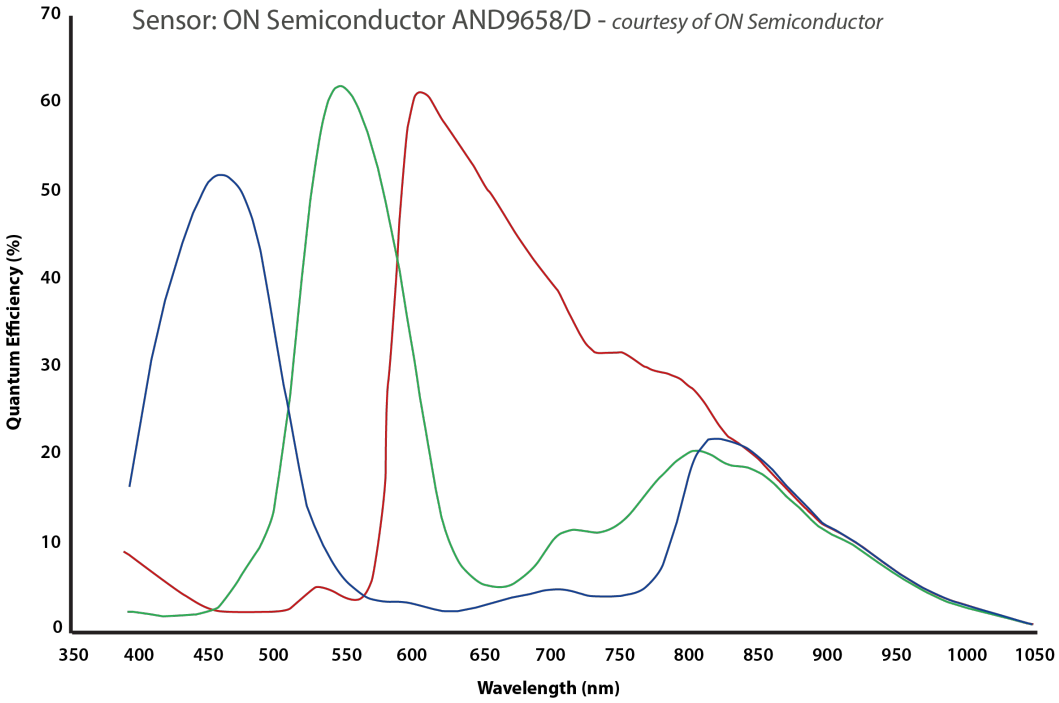
3 Dimensional Diagrams

3.1 DFM 36MR0234-ML Board Camera



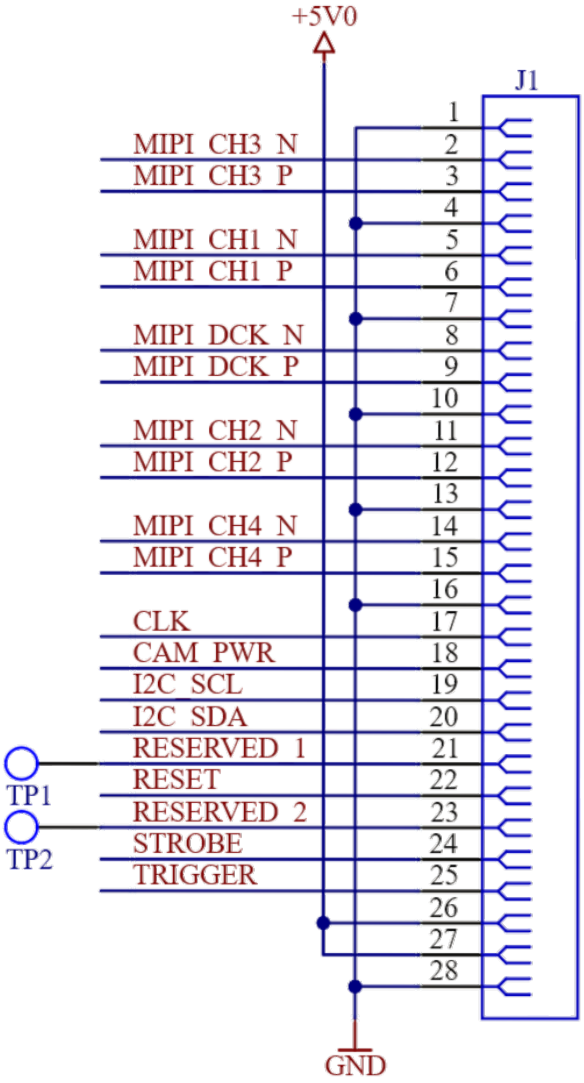
4 Spectral Characteristics

4.1 Spectral Sensitivity - AR0234CS



5 Connector Description

The DFM 36MR0234-ML sensor board is connected to the system via the *The Imaging Source MIPI CSI-2 Sensor Board Connector*.



#	Name	Type	Description
1	GND	GND	Ground
2	MIPI_CH3_N	O	MIPI CSI-2 output
3	MIPI_CH3_P	O	MIPI CSI-2 output
4	GND	GND	Ground
5	MIPI_CH1_N	O	MIPI CSI-2 output
6	MIPI_CH1_P	O	MIPI CSI-2 output
7	GND	GND	Ground
8	MIPI_DCK_N	O	MIPI CSI-2 clock
9	MIPI_DCK_P	O	MIPI CSI-2 clock
10	GND	GND	Ground
11	MIPI_CH2_N	O	MIPI CSI-2 output
12	MIPI_CH2_P	O	MIPI CSI-2 output
13	GND	GND	Ground
14	MIPI_CH4_N	O	MIPI CSI-2 output
15	MIPI_CH4_P	O	MIPI CSI-2 output
16	GND	GND	Ground
17	CLK	I	Reference clock input (with 1k pull-down/termination resistor on sensor board)
18	CAM_PWR	I	High active camera power enable signal (10k pull-down on sensor board)
19	I2C_SCL	I/O	I2C serial clock
20	I2C_SDA	I/O	I2C serial data
21	RESERVED_1	I	Do not use
22	RESET	I	Reset sensor to default state when low (2.2k pull-down on sensor board)
23	RESERVED_2	I	Do not use
24	STROBE	O	Strobe output
25	TRIGGER	I	Trigger input (10k pulldown on sensor board)
26	+5V_VDD	PWR	5V (±10%) power supply
27	+5V_VDD	PWR	5V (±10%) power supply
28	GND	GND	Ground

All I/Os have the same I/O voltage of 1.8V. The manufacturer part number of the Hirose connector is FH28D-28S-0.5SH(98).

6 CSI Lane Configurations

The DFM 36MR0234-ML sensor board can be operated with 2 or 4 CSI lanes connected.

The following table shows the relationship between used CSI lanes and maximum frame rate:

No of CSI Lanes	Bits Per Pixel	Maximum Frame Rate at Full Resolution
4	10	120
2	10	60

7 I2C Devices

There are multiple I2C devices on the DFM 36MR0234-ML sensor board. The following table describes the parts and their I2C addresses:

Address (7-bit)	Device	Description
0x10	AR0234CS	Image Sensor
0x50	AT24C256C	EEPROM
0x57	AT24C02C	EEPROM

8 Programming the Image Sensor

The data sheet for the AR0234CS image sensor is not publicly available.

8.1 Input Clock

The CLK pin has to be connected to a clock source. The following table lists the ranges of clock frequencies that are supported by the image sensor:

Minimum	Typical	Maximum	Unit
6	27	64	Hz

The driver provided by The Imaging Source assumes a CLK frequency of **27 MHz**. For quick integration with existing software, using this frequency is recommended.

8.2 Power-up Sequence

Delay	Action
-	Set RESET to high
-	Set CAM_PWR to Hi-Z
-	Supply 5V to 5V_VDD
-	Supply input clock to CLK
1 µs	Set CAM_PWR to high
35 ms	Set RESET to low
1.5 µs	Set RESET to high
1.5 µs	Write sensor registers

8.3 Further Assistance

For more detailed information, register settings and assistance integrating the sensor board into your product, please contact The Imaging Source support.

DFM 36MR0234-ML

Last update: September 2021

All weights and dimensions are approximate. Unless otherwise specified, the lenses shown in the context of cameras are not shipped with these cameras.

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