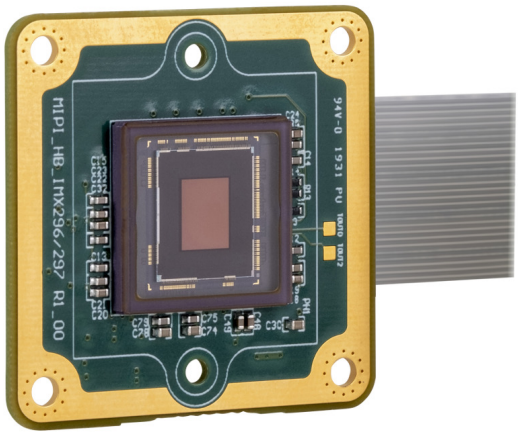
Technical Details



DFM 36SX296-ML
Technical Reference Manual

THE IMAGINGSOURCE
TECHNOLOGY BASED ON STANDARDS

Table of Contents

1 Quick Facts

General	
Dynamic Range	10 bit
Resolution	1440x1080
Frame Rate at Full Resolution	60
Pixel Formats	10-Bit Bayer (RG)

Optical Interface	
Sensor Type	Sony IMX296LQR-C
Shutter Type	Global
Sensor Format	1/2.9 inch
Pixel Size	3.45 µm

Electrical Interface	
Interface	22-Pin FFC Connector
Supply voltage	3.3V (±5%)
Current consumption	approx 300 mA @ 3.3 VDC

Mechanical Data	
Dimensions	H: 30 mm, W: 30 mm, L: 6 mm
Mass	4 g

Adjustments	
Shutter	1 µs to 1 s
Gain	0 dB to 48 dB

Environmental	
Device Temperature (operating) *	-30 °C to 85 °C
Sensor Temperature (operating, performance guarantee)	-10 °C to 60 °C
Temperature (storage)	-40 °C to 85 °C
Humidity (operating)	20 % to 80 % (non-condensing)
Humidity (storage)	20 % to 95 % (non-condensing)

*) See section Temperature Measurement Point for details.

2 Electrical Characteristics

2.1 Absolute Maximum Ratings

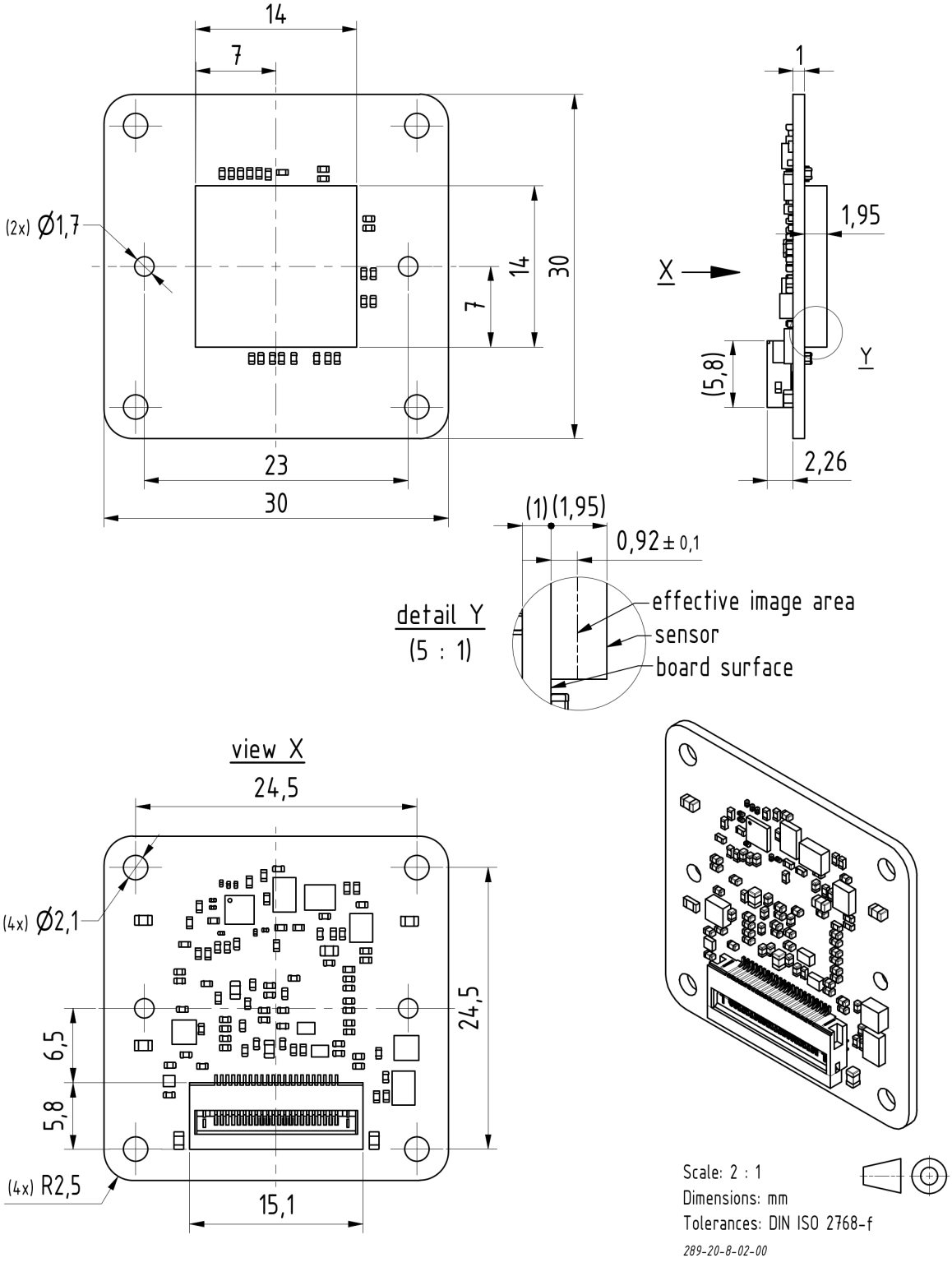
Item	Symbol	Pins	Min	Max	Unit
Supply voltage	+3V3_D (VCC)	22	-0.3	+5.5	V
I/O voltage	GPIO1 GPIO2	17 18	-0.3	VCC	V
I2C voltage	IC2_SCL I2C_SDA	20 21	-0.5	+3.8	V

2.2 Recommended Operating Conditions

Item	Symbol	Pins	Min	Typ	Max	Unit
Supply voltage	+3V3_D (VCC)	22	+3.1	+3.3	+3.5	V
I/O voltage	GPIO1 GPIO2	17 18	+2.9	+3.3	VCC	V
I2C voltage	IC2_SCL I2C_SDA	20 21	+2.9	+3.3	VCC	V

3 Dimensional Diagrams

3.1 DFM 36SX296-ML Board Camera

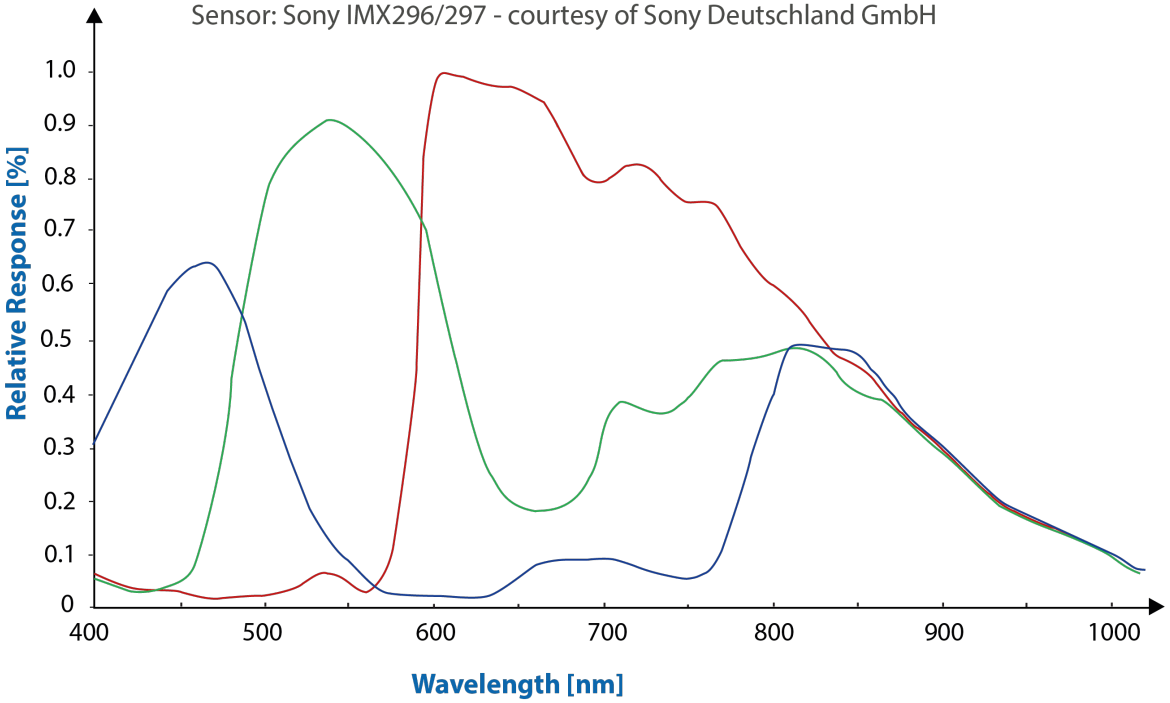


Scale: 2 : 1
Dimensions: mm
Tolerances: DIN ISO 2768-f

289-20-8-02-00

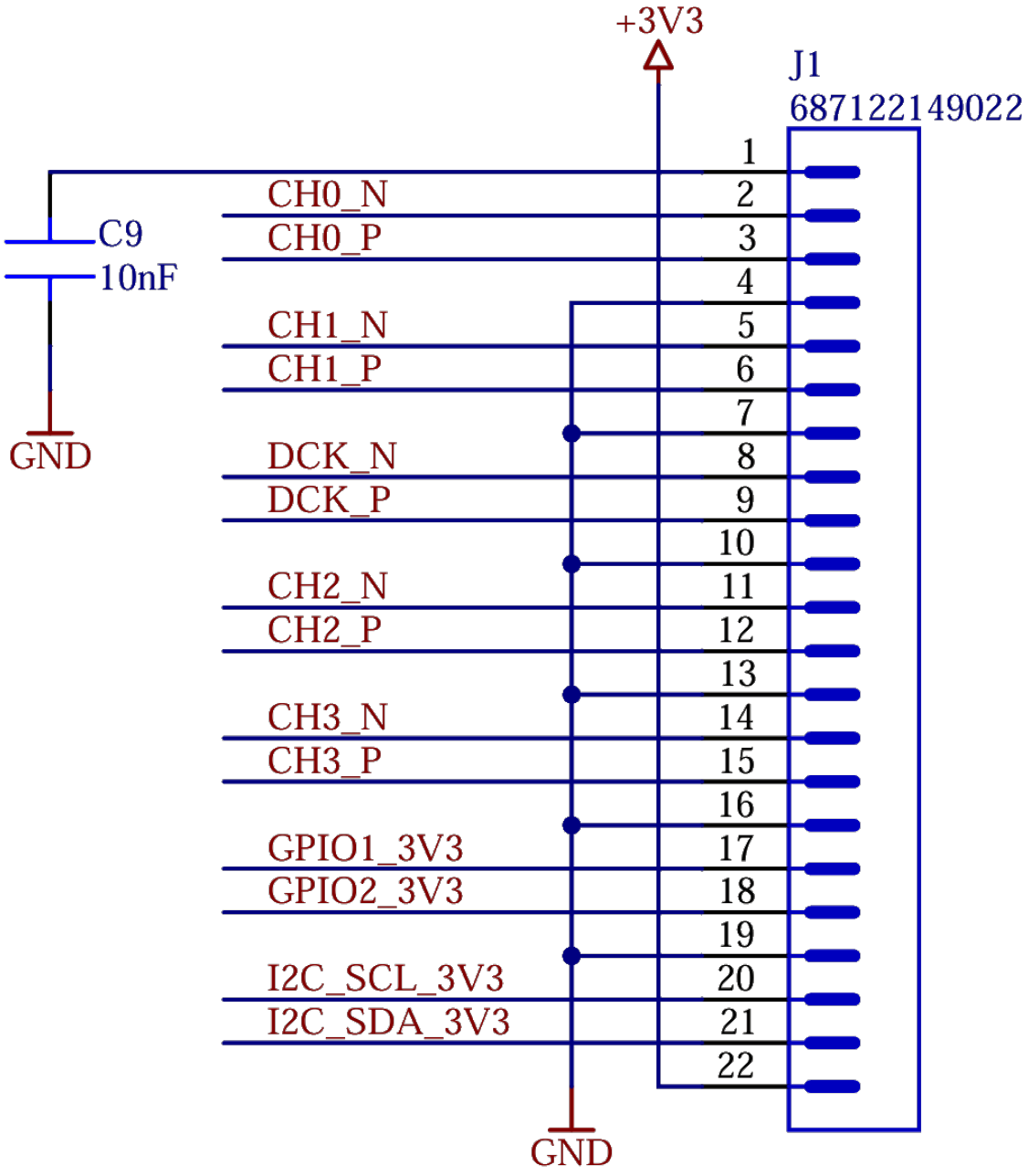
4 Spectral Characteristics

4.1 Spectral Sensitivity - IMX296LQR-C



5 22-Pin Camera Connector

The DFM 36SX296-ML sensor board is connected to the system via a 22-pin FFC connector that is compatible to the 22-pin Raspberry Pi MIPI Interface.



#	Name	Type	Description
1	(GND) capacitive coupled	GND	Ground
2	CH1 N	O	MIPI CSI-2 output
3	CH1 P	O	MIPI CSI-2 output
4	GND	GND	Ground
5	CH2 N	O	NC
6	CH2 P	O	NC
7	GND	GND	Ground
8	DCK N	O	MIPI CSI-2 output
9	DCK P	O	MIPI CSI-2 output
10	GND	GND	Ground
11	CH3 N	O	NC
12	CH3 P	O	NC
13	GND	GND	Ground
14	CH4 N	O	NC
15	CH4 P	O	NC
16	GND	GND	Ground
17	GPIO1_3V3	I/O	Trigger input
18	GPIO2_3V3	I/O	Strobe output
19	GND	GND	Ground
20	I2C_SCL_3V3	I/O	I2C serial clock
21	I2C_SDA_3V3	I/O	I2C serial data
22	+3V3	PWR	3.3 V (±5%) power supply

All I/Os have the same I/O voltage of 3.3 V. The part number of the FPC connector is Wuerth 687122149022. 22-pin 0.5 mm Pitch.

6 I2C Devices

There are multiple I2C devices on the DFM 36SX296-ML sensor board. The following table describes the parts and their I2C addresses:

Address (7-bit)	Device	Description
0x1A	IMX296LQR-C	Image Sensor
0x40	LCMXO3L-1300E	Trigger Control FPGA (configuration)
0x42	LCMXO3L-1300E	Trigger Control FPGA (control)
0x50	AT24C256C	EEPROM

7 Programming the Image Sensor

The data sheet for the IMX296LQR-C image sensor is not publicly available.

7.1 Input Clock

The sensor's INCK pin is connected to a clock source with a frequency of 37.5 MHz.

7.2 Power-up Sequence

Delay	Action
-	Supply 3.3V to +3V3_D (VDD)
350 ms	Write sensor registers

7.3 Further Assistance

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

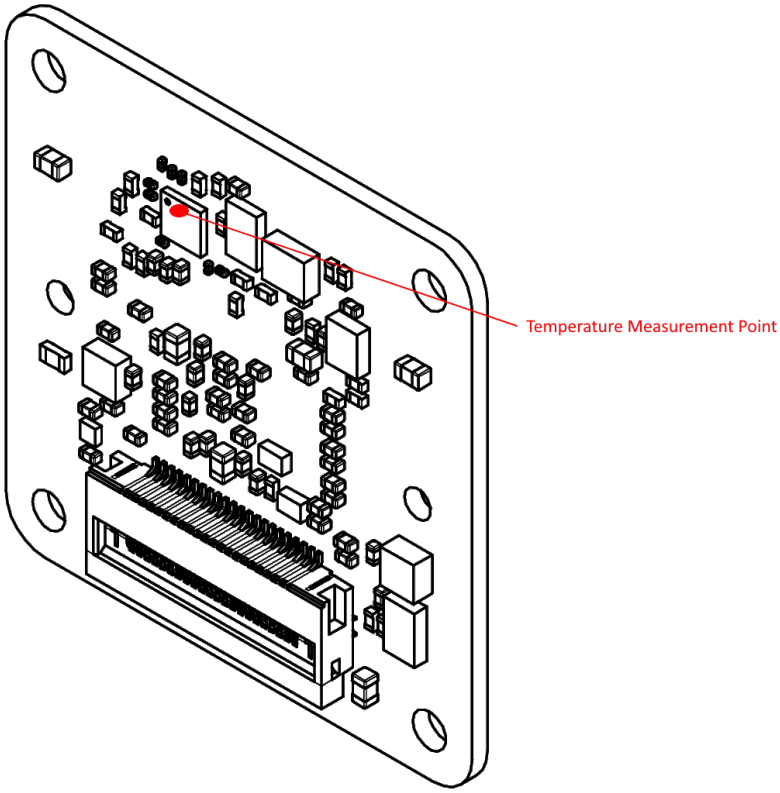
8 Trigger Control FPGA

In order to handle complex trigger/strobe functions of the image sensor, a FPGA is present on sensor board revision 2.00 and above.

A reference driver implementation is available upon request.

9 Temperature Measurement Point

Device temperature in operating state is measured on the back side of the circuit board:



DFM 36SX296-ML

Last update: December 2024

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

Headquarters:

The Imaging Source Europe GmbH
Überseetor 18, D-28217 Bremen, Germany
Phone: +49 421 33591-0

North & South America:

The Imaging Source, LLC
Suite 470, 4600 Park Road, Charlotte, NC 28209, United States
Phone: +1 877-462-4772

Asia Pacific:

The Imaging Source Asia Co., Ltd.
3F., No. 43-7/8, Zhongxing Road
Xizhi District, New Taipei City 221012, Taiwan
Phone: +886 2-2792-3153

www.theimagingsource.com