

# DFM 36LX290-ML

## Technical Reference Manual



<b>1. Quick Facts</b>	<b>3</b>
<b>2. Electrical Characteristics</b>	<b>5</b>
2.1 Absolute Maximum Ratings .....	5
2.2 Recommended Operating Conditions .....	5
<b>3. Dimensional Diagrams</b>	<b>6</b>
3.1 DFM 36LX290-ML Board Camera .....	6
<b>4. Spectral Characteristics</b>	<b>7</b>
4.1 Spectral Sensitivity - IMX290LQR-C .....	7
<b>5. 22-Pin Camera Connector</b>	<b>8</b>
<b>6. I2C Devices</b>	<b>10</b>
<b>7. Programming the Image Sensor</b>	<b>11</b>
7.1 Input Clock .....	11
7.2 Power-up Sequence .....	11
7.3 Further Assistance .....	11
<b>8. Temperature Measurement Point</b>	<b>12</b>

## 1 Quick Facts

General	
Dynamic Range	12 bit
Resolution	1920x1080
Frame Rate at Full Resolution	120
Pixel Formats	10-Bit Bayer (RG) 12-Bit Bayer (RG)
Optical Interface	
Sensor Type	Sony IMX290LQR-C
Shutter Type	Rolling
Sensor Format	1/2.8 inch
Pixel Size	2.9 $\mu\text{m}$
Electrical Interface	
Interface	22-Pin FFC Connector
Supply voltage	3.3V ( $\pm 5\%$ )
Current consumption	approx 160 mA @ 3.3 VDC
Mechanical Data	
Dimensions	H: 30 mm, W: 30 mm, L: 5.45 mm
Mass	4 g
Adjustments	
Shutter	15 $\mu\text{s}$ to 1 s
Gain	0 dB to 72 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

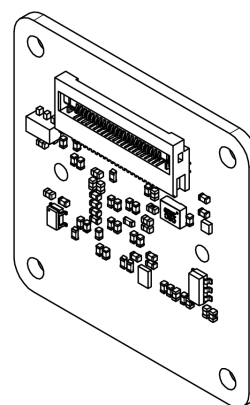
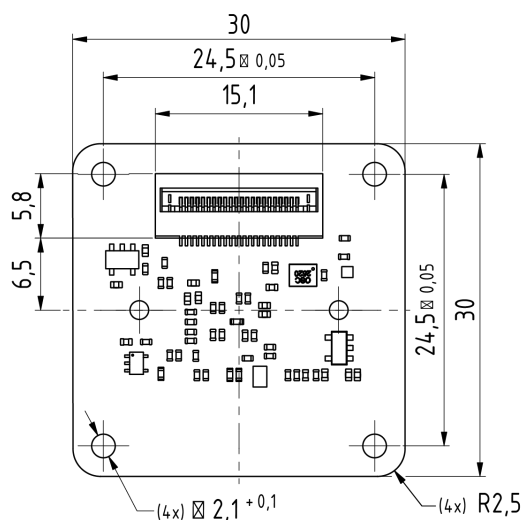
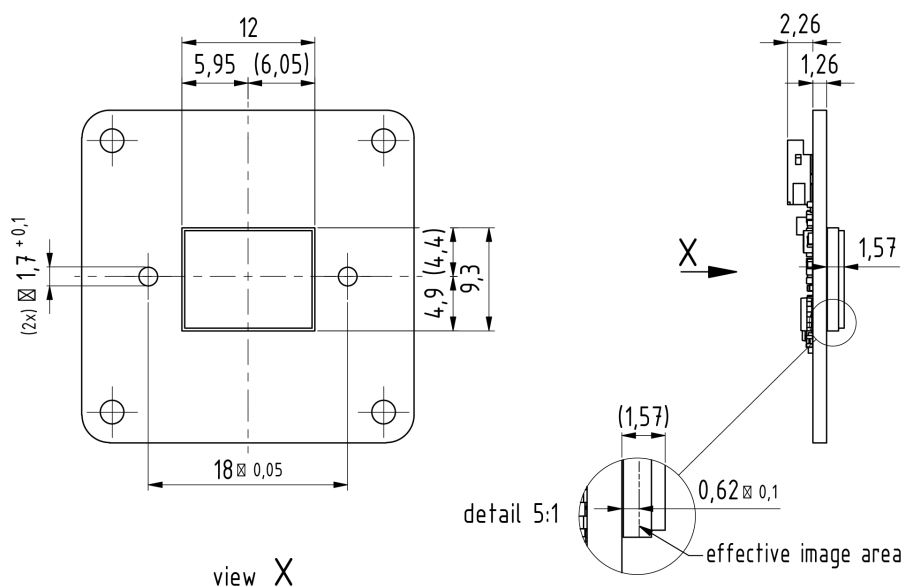
Item	Symbol	Pins	Min	Max	Unit
Supply voltage	+3V3_D (VCC)	22	-0.3	+5.5	V
I/O voltage	GPIO1 GPIO2	17 18	-0.3	VCC	V
I2C voltage	IC2_SCL I2C_SDA	20 21	-0.5	+3.8	V

### 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 36LX290-ML Board Camera

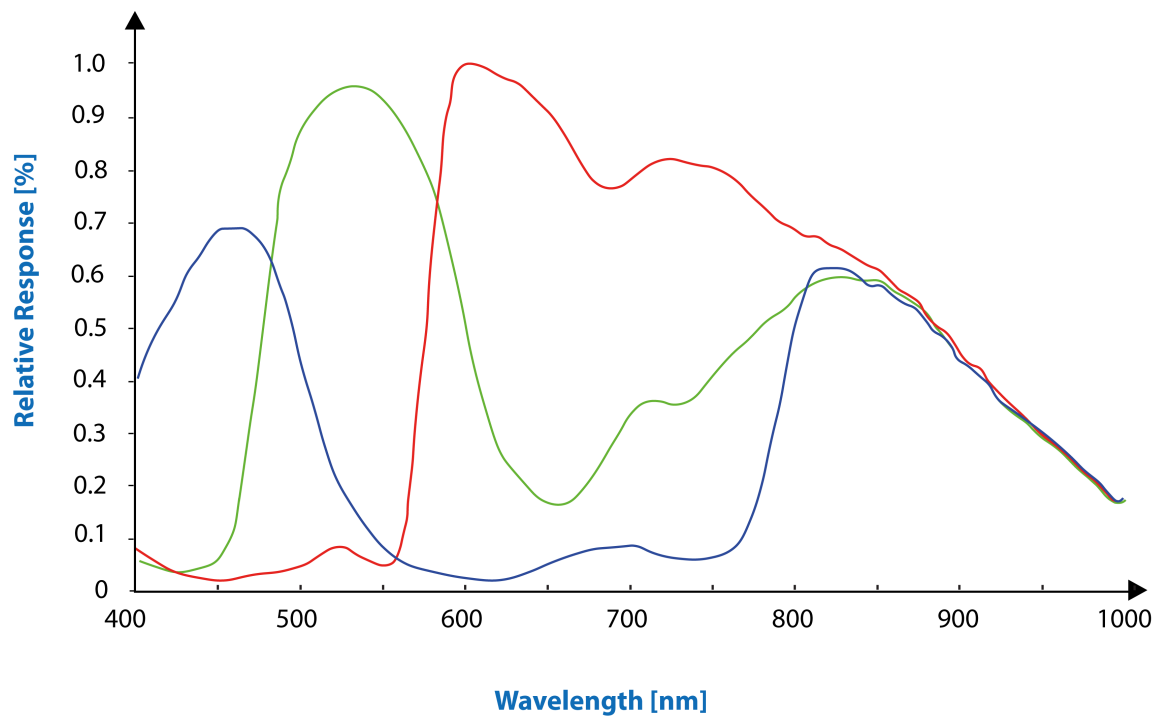


Scale: 2 : 1  
 Dimensions: mm  
 Tolerances: DIN ISO 2768-m  
 289-20-7-01-00

## 4 Spectral Characteristics

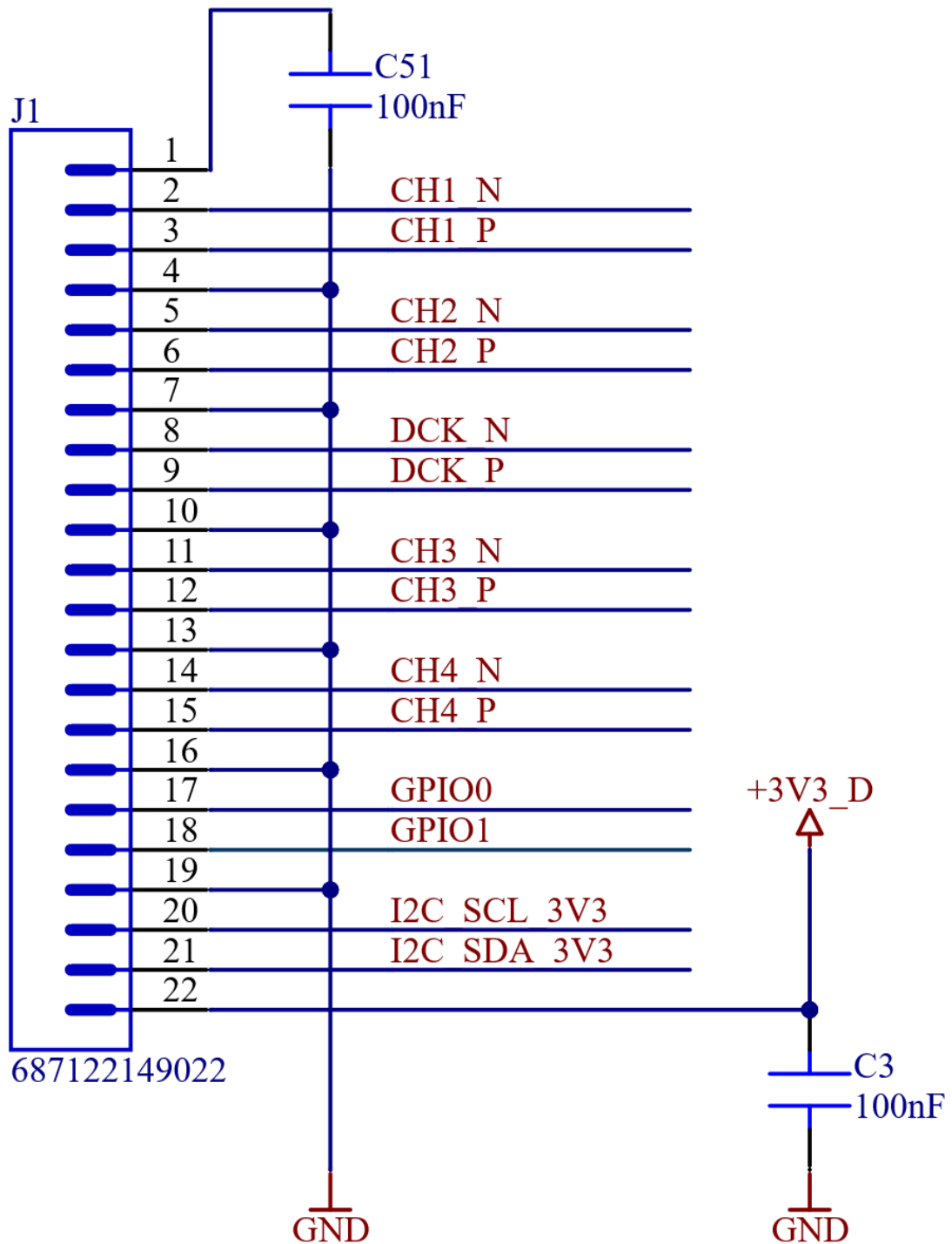
### 4.1 Spectral Sensitivity - IMX290LQR-C

Sensor: Sony IMX290 - courtesy of Sony Deutschland GmbH



## 5 22-Pin Camera Connector

The DFM 36LX290-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	CHI N	O	MIPI CSI-2 output
3	CHI P	O	MIPI CSI-2 output
4	GND	GND	Ground
5	CH2 N	O	MIPI CSI-2 output
6	CH2 P	O	MIPI CSI-2 output
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	MIPI CSI-2 output
12	CH3 P	O	MIPI CSI-2 output
13	GND	GND	Ground
14	CH4 N	O	MIPI CSI-2 output
15	CH4 P	O	MIPI CSI-2 output
16	GND	GND	Ground
17	GPIO0	I/O	Do not use
18	GPIO1	I/O	Do not use
19	GND	GND	Ground
20	I2C_SCL	I/O	I2C serial clock
21	I2C_SDA	I/O	I2C serial data
22	+3V3_D	PWR	3V3 ( $\pm 5\%$ ) power supply

All I/Os have the same I/O voltage of 3V3. The part number of the FPC connector is Wuerth 687122149022. 22 Pin 0,5mm Pitch.

## 6 I2C Devices

There are multiple I2C devices on the DFM 36LX290-ML sensor board. The following table describes the parts and their I2C addresses:

Address (7-bit)	Device	Description
0x1A	IMX290LQR-C	Image Sensor



## 7 Programming the Image Sensor

The data sheet for the IMX290LQR-C image sensor is not publicly available.

### 7.1 Input Clock

The sensor's INCK pin is connected to a quartz oscillator with a frequency of 37.125 MHz.

### 7.2 Power-up Sequence

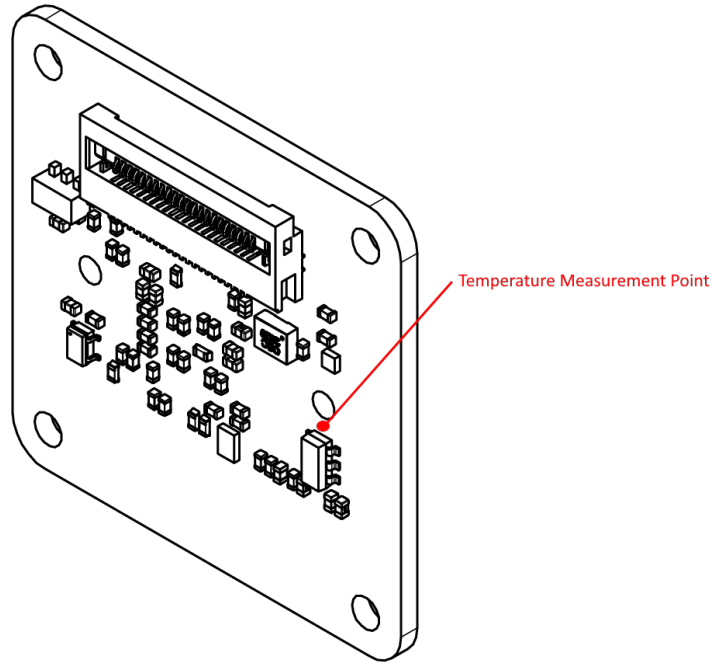
Delay	Action
-	Supply 3.3V to +3V3_D (VDD)
350 ms	Write sensor registers

### 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 Temperature Measurement Point

Device temperature in operating state is measured in the area of part U3 on the back side of the circuit board:





## DFM 36LX290-ML

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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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