

TIER IV

**AUTOMOTIVE
CAMERA
C2
SPECIFICATION**

V1.0



TIER IV

Table of Content

1 / Product Overview	02
2 / Product Features	03
3 / Applications	03
4 / Technical Specifications	04
5 / Mechanical Drawings	05
6 / Block Diagram	06
7 / Optional Accessories	07

Product Overview



The C2 camera is a GMSL (Gigabit Multimedia Serial Link) camera specifically designed for automotive applications. It has a resolution of 5.4 MP at 2880 x 1860 px.

Featuring Sony Semiconductor Solutions' IMX490 back-side illumination stacked CMOS image sensor SoC, this camera enables HDR imaging over 120dB, LED flicker mitigation (LFM), and motion artifact-free image capturing at a frame rate of up to 30fps. The C2 camera is suitable for a variety of applications, such as object recognition and signal recognition, thanks to its simultaneous high sensitivity and high resolution.

With a variety of lens options available, the C1 camera can be adapted to many applications. The lens undergoes a 6-axis active adjustment during installation, allowing it to achieve optimal sharpness even in harsh temperature environments.

Indie-semiconductor's GW5300 ISP (Image Signal Processor) built into the C2 camera's image sensor performs various image processing tasks, including lens distortion correction, to achieve optimal image quality for automotive applications. The C2 camera also supports an external triggering mechanism, which is essential to achieve capture synchronization with other sensor modalities such as LiDAR or RADAR, enabling sensor fusion.

Designed for automotive mass production, the C2 camera is ready-to-use. All key components comply with AEC-Q100 (Grade 2), Q101, and Q200 standards, and are designed to pass automotive-grade reliability tests.

C2カメラは5.4 MP, 2880 x 1860 pxの解像度を持つ車載アプリケーション向けGMSL(Gigabit Multimedia Serial Link)カメラです。

ソニーセミコンダクタソリューションズ製IMX490 裏面照射型積層CMOSセンサを搭載し、120dB相当のダイナミックレンジ、LEDフリッカー低減、モーションアーティファクト低減を最高30fpsのフレームレートで実現することが可能です。C2カメラは高感度と高解像度を両立し、物体認識、信号認識等各種アプリケーションに幅広く活用することができます。

多彩なレンズのオプションにより、様々なアプリケーションを実現することができます。レンズは6軸アクティブアライメントを行い取り付けられるので、過酷な温度環境下でも最適なシャープネスを実現することができます。

インディセミコンダクター製 GW5300 ISP(Image Signal Processor)はレンズ歪み補正を含む様々な画像処理を行い、車載アプリケーションに最適な画質を実現します。C2はLiDARやRADARといった他のセンサー類との同期を取るのに必須である外部トリガー機構をサポートし、センサーフュージョンを実現することも可能です。

C2カメラは車載向けアプリケーションの量産にそのまま適用することが可能です。主要な半導体は車載向け半導体の信頼性要件であるAEC-Q100 Grade2, Q101およびQ200に準拠しており、車載グレードの信頼性試験をクリアするよう設計されています。

Product Features

Autoware Compatibility

Fully compatible with Autoware, the world's leading open-source software project for autonomous driving

Autoware対応

世界初の自動運転用オープンソースソフトウェア「Autoware」対応

High Dynamic Range

With a dynamic range of 120dB, it can capture scenes with a large difference in brightness without crushing shadows or overexposing highlights.

ハイダイミックスレンジ

120dB相当のハイダイナミックレンジで、明暗差の大きな場面でも白飛び・黒つぶれのない映像が撮影可能

High Sensitivity, Low Noise & High Resolution

C2 camera maintains the same high sensitivity and low noise as C1, and extends its resolution up to 5.4Mpix, which enables object recognition at a farther distance or wider image capturing.

高感度・低ノイズ

C1カメラと同等の高感度・低ノイズ特性を維持しながら、解像度を5.4Mpixまで拡大し、より遠方の物体認識や、広角での撮影が可能

LED Flicker Mitigation

Flickering from LED light sources such as traffic signs, headlights, and taillights can be mitigated.

LEDフリッカー抑制

信号機、標識、ヘッドランプ、テールランプ等のLEDを用いた光源によるチラつきを抑制

GMSL2 Interface

The GMSL2 interface allows for long-distance signal transmission and power supply over a single cable connection.

GMSL2インタフェース対応

長距離(15mまで)の信号転送と電源供給を1本のケーブル接続で実現可能

Automotive Quality

The camera is designed for the temperature range from -40 degrees Celsius to 85 degrees Celsius, using automotive-grade components.

車載品質

車載グレードの部品を使用し、-40°C~85°Cまでの温度範囲で動作可能

Standard Compliance

CE, FCC, RoHS certified

各種認証への対応

CE、FCC、RoHSに対応

Applications

Autonomous driving

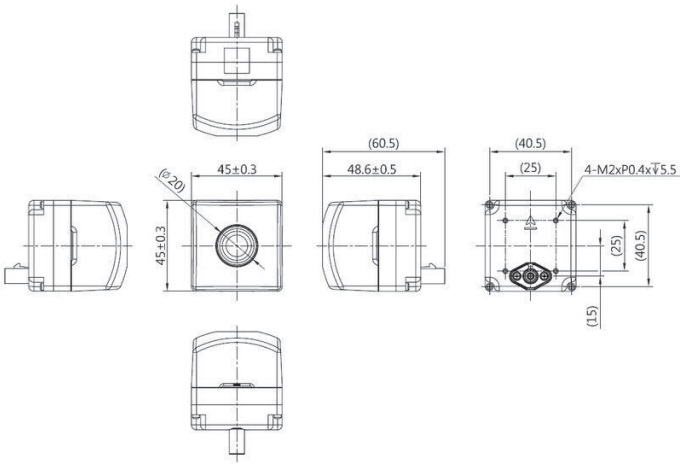
- Traffic light recognition
- Object recognition
- Remote monitoring
- Visual SLAM

Technical Specifications

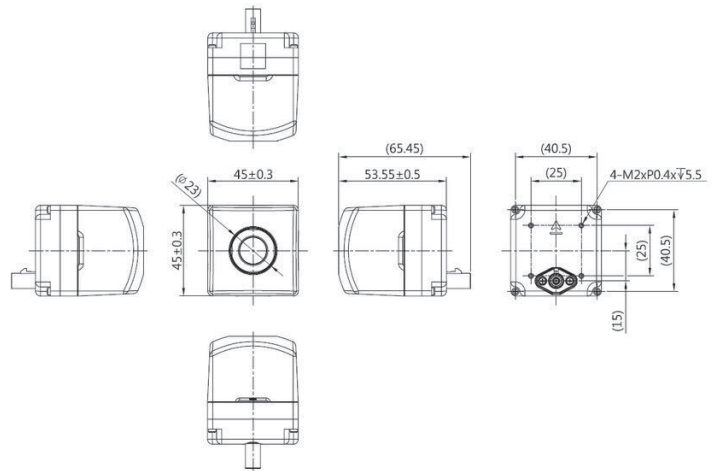
	C2-030	C2-062	C2-120	C2-176
Mechanical				
Camera Size	45mm x 45mm x 48.6mm	45mm x 45mm x 53.55mm	45mm x 45mm x 53.04mm	45mm x 45mm x 45.9mm
Connector	FAKRA Z code with metal shielding			
Lens				
Lens Mount	glued, active alignment applied			
Field of View (FoV) Without Lens Distortion Correction	LDC off 30deg / 19.3deg	LDC off 62.5deg / 40deg	LDC off 120deg / 72.2deg	LDC off 176.4deg / 105.8deg
F#	1.6	1.7	1.6	1.8
TTL	30.01mm	35mm	35mm	27.86mm
Image Circle	Φ 10.5mm	Φ 10.66mm	Φ 10.6mm Max	Φ 9.1mm Max
IRCF	650nm @ 50% transmission	650nm @ 50% transmission	650nm @ 50% transmission	650nm @ 50% transmission
Depth of Field	14m - Infinity Focus peaking distance: 28m	309cm - Infinity Focus peaking distance: 620cm	250cm - Infinity Focus peaking distance: 400cm	45cm - Infinity Focus peaking distance: 90cm
Power Supply				
Power Supply Method	Power Over Coax			
Power Supply Level	9-12V			
Power Consumption	4.6W @ 30fps			
Key Components				
Image Sensor	Sony Semiconductor Solutions IMX490			
Optical Format	diagonal 10.36mm, type 1/1.55"			
Pixel Size	3.0um			
High Dynamic Range	Available			
LED Flicker Mitigation	Available			
Serializer	Analog Devices MAX9295A			
ISP	Indie semiconductor GW5300			
Camera Function				
Output Interface	GMSL2, up to 6Gbps			
Output Framerate	Up to 30fps			
Output Image Format	YUV422 8bit			
Output Image Size	2880x1860			
Shutter Type	Rolling shutter			
Synchronization	HW/SW triggering over GMSL2			
ISP Function				
ISP Function	HDR composition, Demosaicing, Auto exposure, Auto white balance, IQ adjustment (Hue, Color saturation, Brightness, Contrast, Sharpness)			
Manual Exposure/Gain Control	Available			
Environmental				
Operating Temperature	From -40 To 85°C			
Storage Temperature	From -40 To 105°C			
EMI	CE, FCC, Can ICES-3, UKCA, and RCM			
Vibration	ISO 16750-3: 2012 : 4.1			
Shock	ISO 16750-3: 2012 : 4.2.2			
Safety	LVD			
RoHS	Compliant			
Ingress Protection	IP69K			
Software Support				
Driver	V4L2 Driver, ROS/ROS2 Driver			

Mechanical Drawing

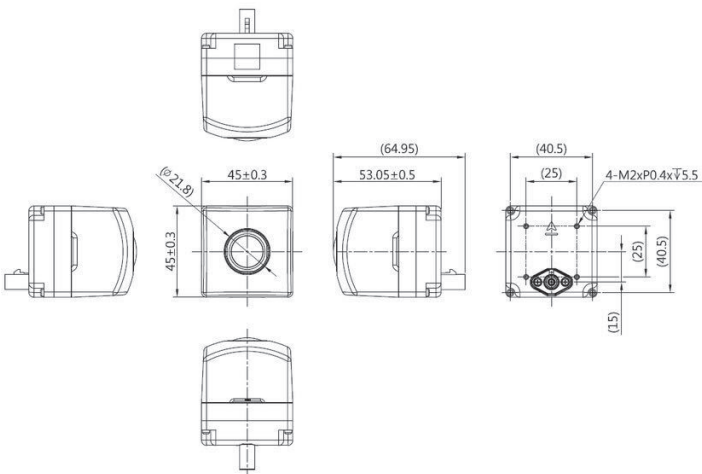
C2-030 (30deg)



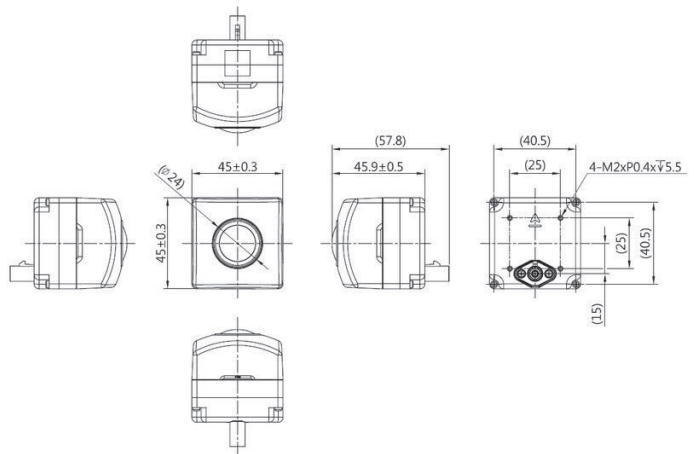
C2-062 (62.5deg)



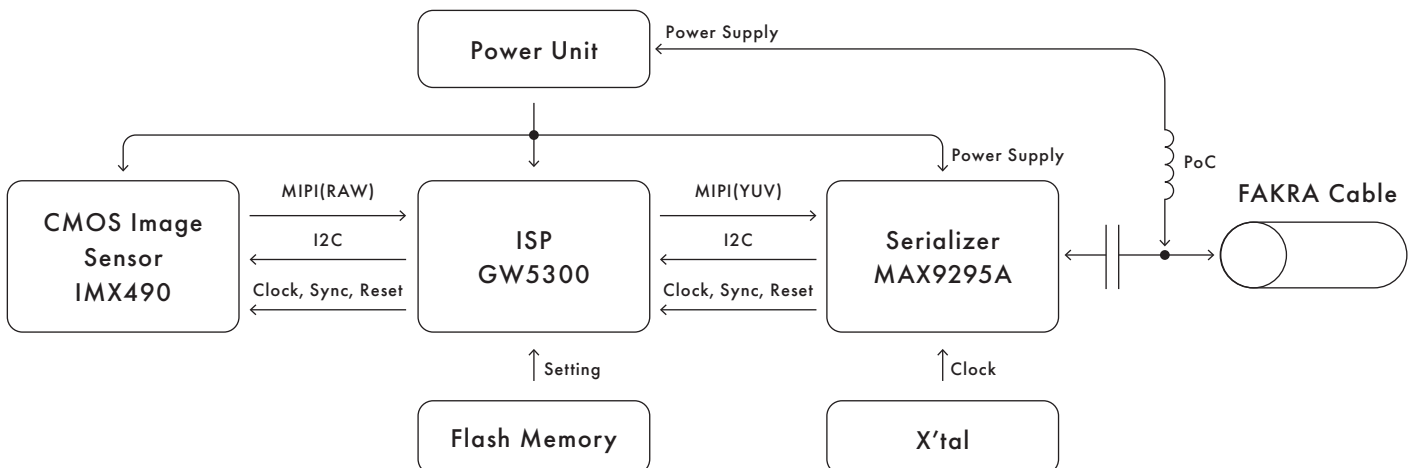
C2-120 (120deg)



C2-176 (176.4deg)



Block Diagram



Optional Accessories

GMSL2-USB3.0 Conversion Kit



Anti-Reflective & Anti-Condensation Housing

