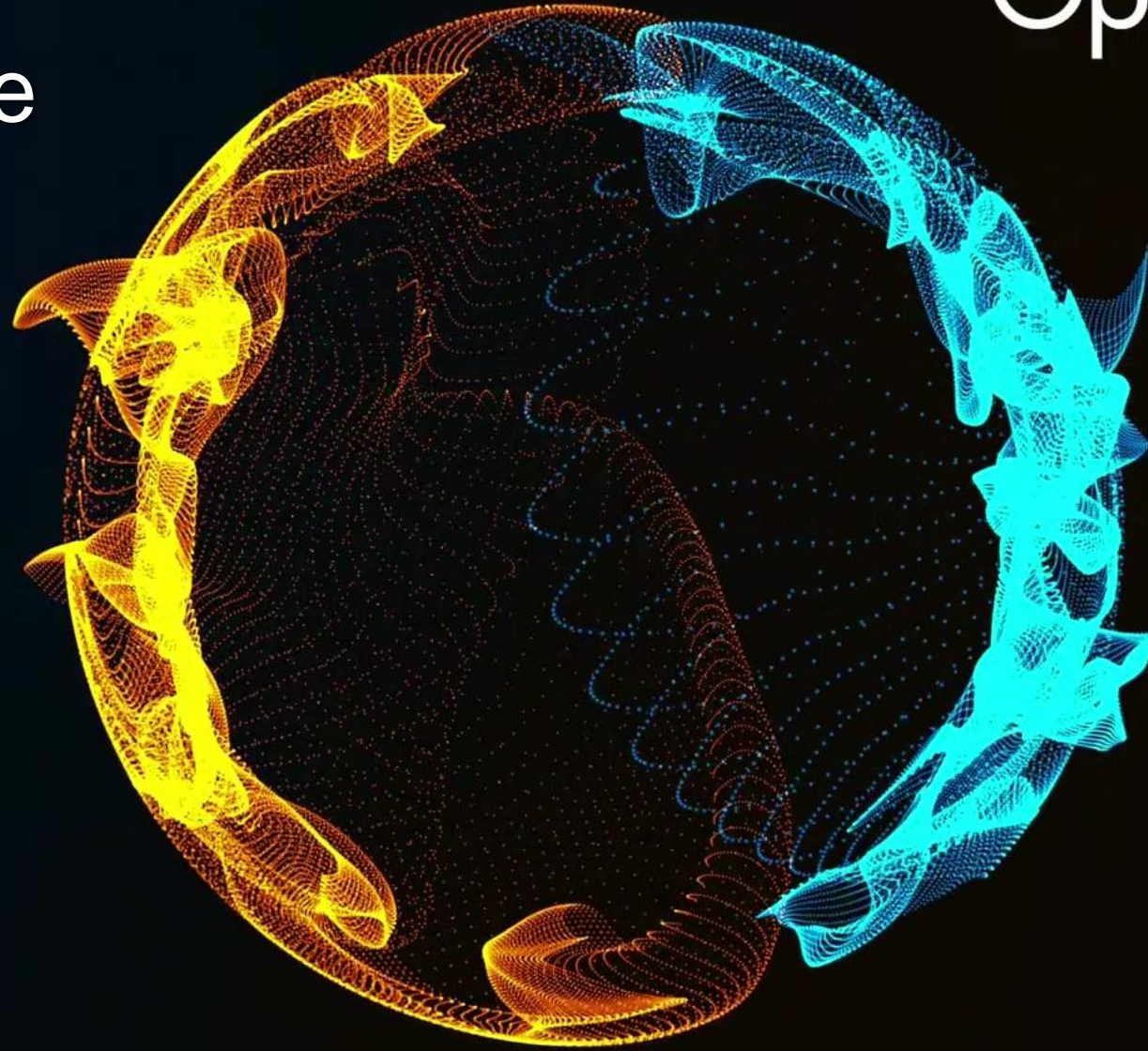


Custom AR
Glasses Made
Easy!

Optics by Epson



The future of visual communications

Alex Zaretsky
Epson Europe



most innovative company

Revenue
€8.6 billion

Number of employees
~80,000

Overseas **86%** Japan **14%**

as of March 2022



Epson Business

Printers



Since 1968



Also, No 1 POS printer manufacturer in Europe

Robotics



Since 1983

No 1 SCARA Robot manufacturer 32% share

Orient



Since 1956



Projectors



Since 1989

Global leader

AR Smart Glasses



Since 2011

Semiconductors



Since 1971

No 1 Crystal oscillators 17% share

EPSON[®]
EXCEED YOUR VISION

The undisputed world leader in projectors since 2001



43%

of the global
projector market¹

20%

of the global
display market¹

¹ April 2021 to March 2022, 500-lumen and above, excluding screenless TVs, Futuresource Consulting – Quarterly Projector Market Insights – Worldwide Analyzer CY22Q2.

The world's biggest projector factories



>30 years
of pioneering projection technology

EPSON[®]
EXCEED YOUR VISION

Moverio AR Smart Glasses Evolution by Epson

2009 **Connecting people and services since 2009**

2011 1st Generation
BT-100



2014 2nd Generation
BT-2xx Series



2016 3rd Generation
BT-3xx Series



2021 4th Generation
BT-4xx Series

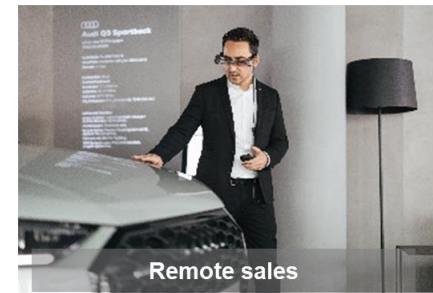
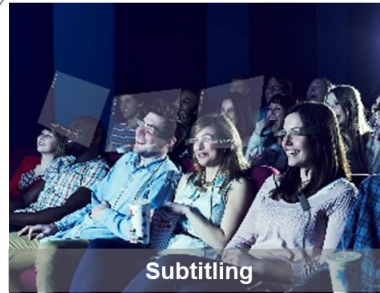


2022

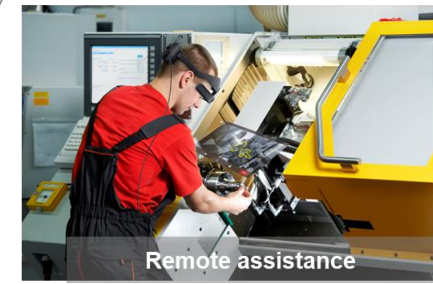


BT-45 Series

Commercial

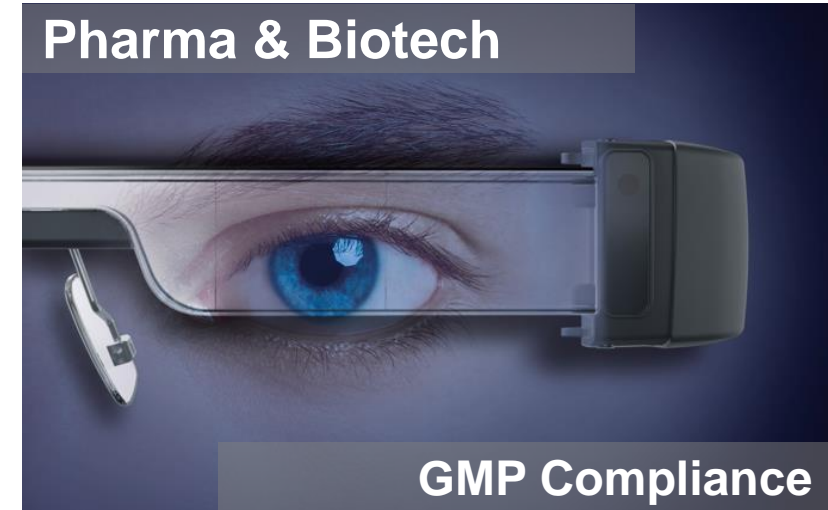
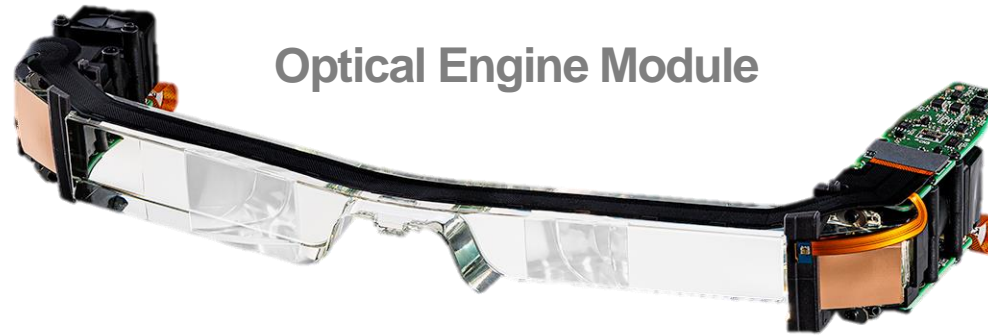


Industrial



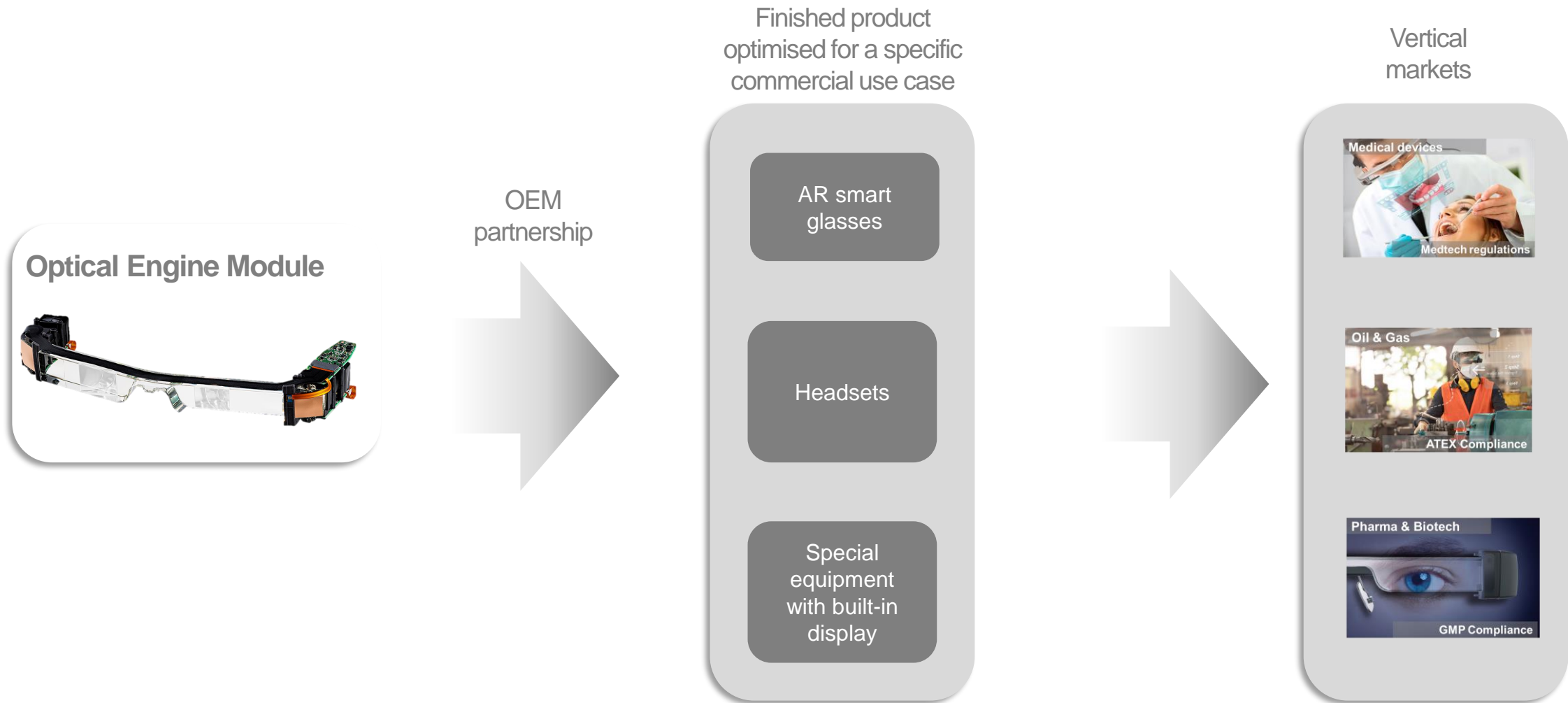
Solution for Binocular See-through AR Smart Glasses

Develop and commercialise custom-made smart glasses or head-mounted displays



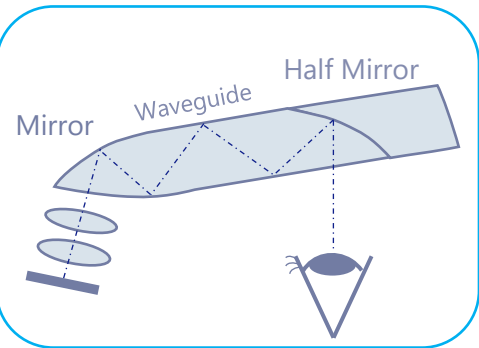
*Markets for example only

Enable AR ecosystem



Optical Engine Module

Extensive patent portfolio with 1100+ registered patents



Optics by Epson

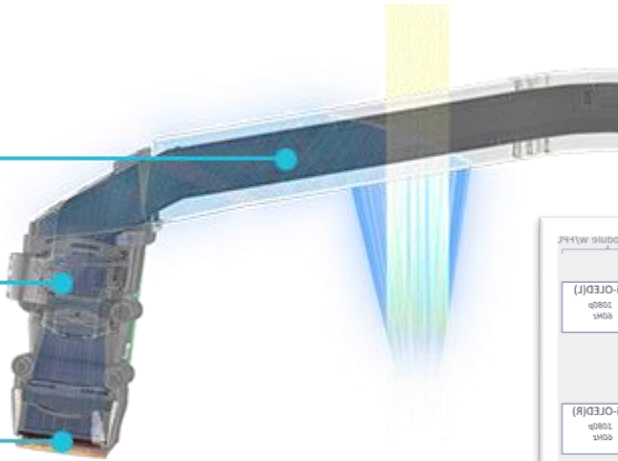
Micro Projection

Epson Si-OLED Micro display

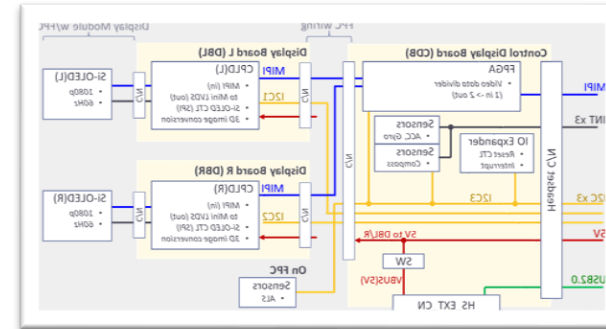


Self-illuminating Si-OLED panel

Integrated Driver IC



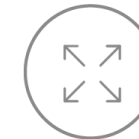
Embedded Control Circuit



Extension port USB 2.0



Built-in multi sensor



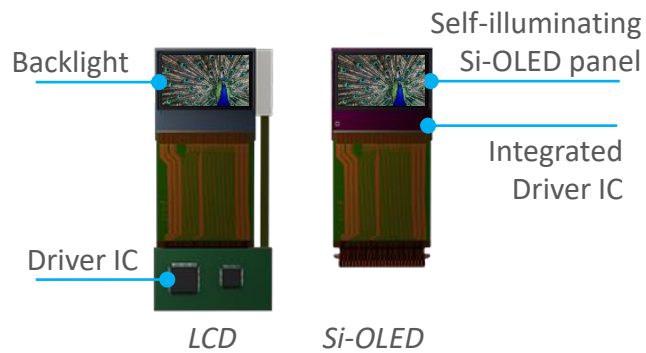
External board Interface

9 Axis Motion Sensor

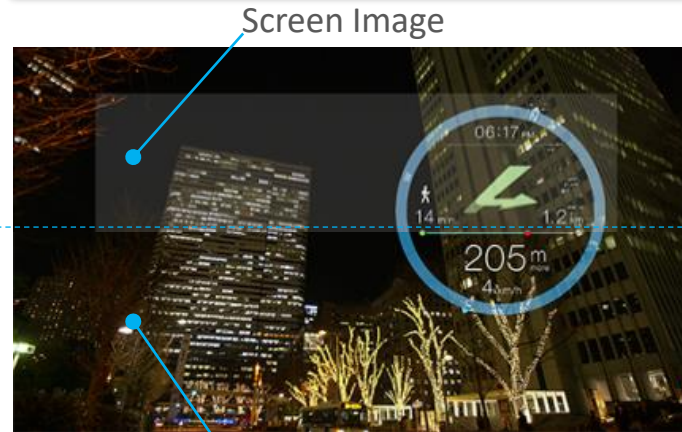
- Accelerometer
- Magnetometer
- Gyro Sensor
- Compass

High Image Quality

Si-OLED Micro Display Technology



Frameless rendering for seamless AR experience



High contrast ratio enables seamless merge of digital content and the real world

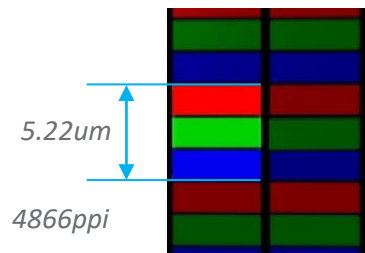
Low Contrast

High Contrast

Contrast ratio 500,000:1

Edgeless Image – high see-through transmittance

High-definition and high pixel density



Achieved 1080p in compact size by adopting 4866ppi panel.

Large display size

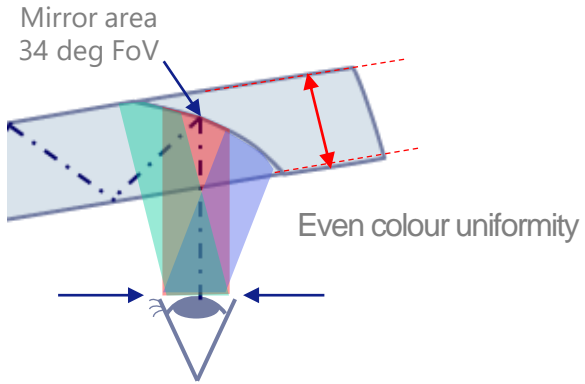


Virtual viewing distance 5m

120" display size perception

High transparency binocular see-through

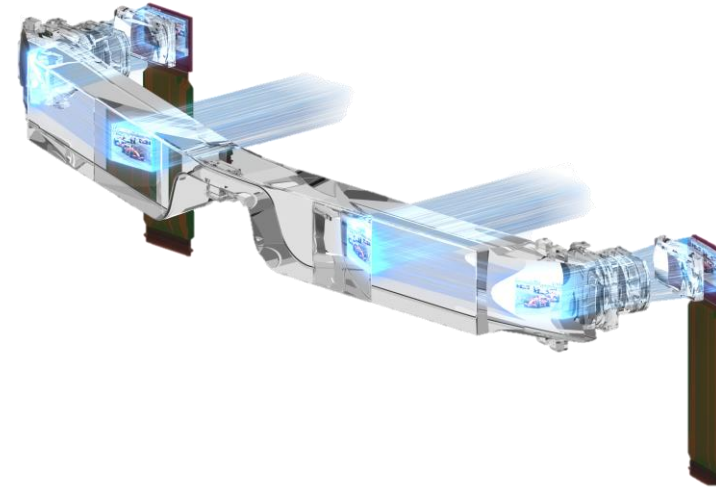
Single mirror free-form waveguide



- No ray replication
- High light utilization – high optics efficiency
- Colour and brightness uniformity
- High see-through transmittance

Plastic composite glasses

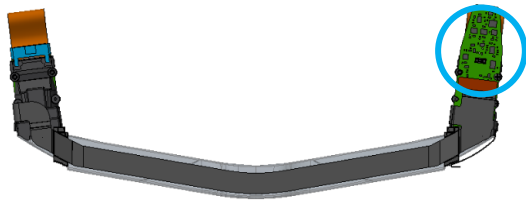
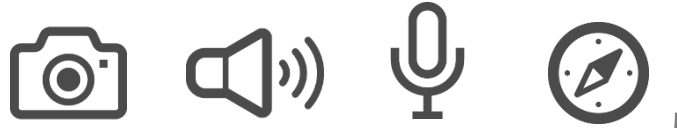
Safe, durable, scalable and cost efficient



*Material: plastic (cycloolefin polymers (COP) resin)
with Anti-Refraction coat*

Custom AR smart glasses made easy

Easy adding functionality

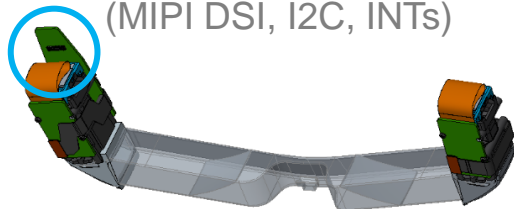


Additional devices connected over USB.20

Easy customisation

Direct SoC interfacing

(MIPI DSI, I2C, INTs)



Easy start

Development Kit



Access to assets

- Design files
- Schematics and 3D drawings
- Firmware, device drivers
- Display control application
- Sample projects for Android

Video tutorials



European technical support



Optical Engine Module

for Binocular See-through AR Smart Glasses

Contact

alex.zaretsky@epson.eu



The future of visual communications

EPSON[®]
EXCEED YOUR VISION

APPENDIX

Engine Module Specification

Micro display spec

Device Type	Si-OLED
Display Size	0.453 inch wide
Pixel size	5.22um x 5.22 um
Full HD Resolution RGB	1920 x 1080
Si-OLED Contrast	500,000 : 1
Refresh rate	60Hz

Optics spec

Field of View	34°
Virtual Display size (@5m)	120 inches
See through transparency	40%
Brightness	1000 cd/m2
Display distance	6.4m
Color Reproduction	24 bit-color NTSC 90%
Supported 3D Format	Side by Side format

Module spec

Video Interface	MIPI DSI
Control Interface	I2C x3
Sensor	Gyro, Compass, Accelerometer, Ambient light
Dimensions	188.5 x 74.0 x 24.5[mm]

Optional branded logo

Optics by Epson



Brand guidance to be provided

Partner Solutions

TECHNOLOGY

The logo for Ganzin Technology Inc. features a stylized circular icon on the left, followed by the word "Ganzin" in a bold, lowercase, sans-serif font.

Ganzin Technology Inc.,

Eye Tracking Solution AURORA II

Unlock the potential of eyes as the ultimate interface to the digital world.

MANUFACTURING

The logo for Jorjin Technologies features the word "JORJIN" in a bold, uppercase, sans-serif font. A red stylized graphic element is positioned between the "O" and "J". Below "JORJIN" is the word "TECHNOLOGIES" in a smaller, uppercase, sans-serif font, all contained within a grey rectangular box.

Making the Simple



PEGATRON

和碩聯合科技

LTE
Smartwatch



VR HMD



AR HMD



Design examples based on VM-40



Seiko Epson Corporation.
MOVERIO BT-40

A new way of seeing the world



Jorjin Technologies Inc.
J-Reality J7EF Plus

With built-in ToF (time-of-flight) sensor, J7EF Plus offers multiple gesture recognition, supports true touch-less control and enhances the user experience.



Xvisio Technology (Shanghai)
Co.,Ltd.
Xvisio SeerLens™ One

USB-C tethered cross-platform AR glasses with on-board 6DOF VSLAM and optional TOF camera

AR surgical helmet by CEiiA

Used in Medical/Dental surgery and Medicolegal autopsy

Epson's AR engine provides video feed into the practitioner's FoV, allowing complete focus on the subject and task at hand

Relevant data, like camera overlays, video calls, livestreaming and note-taking can be visualized seamlessly



Education

Live Video Classes



Functionalities

- Audio (headphones & external speaker)
- Video (External camera)
- Adjustable forced ventilation
- Pandemic filter (FFP3)

Connectivity

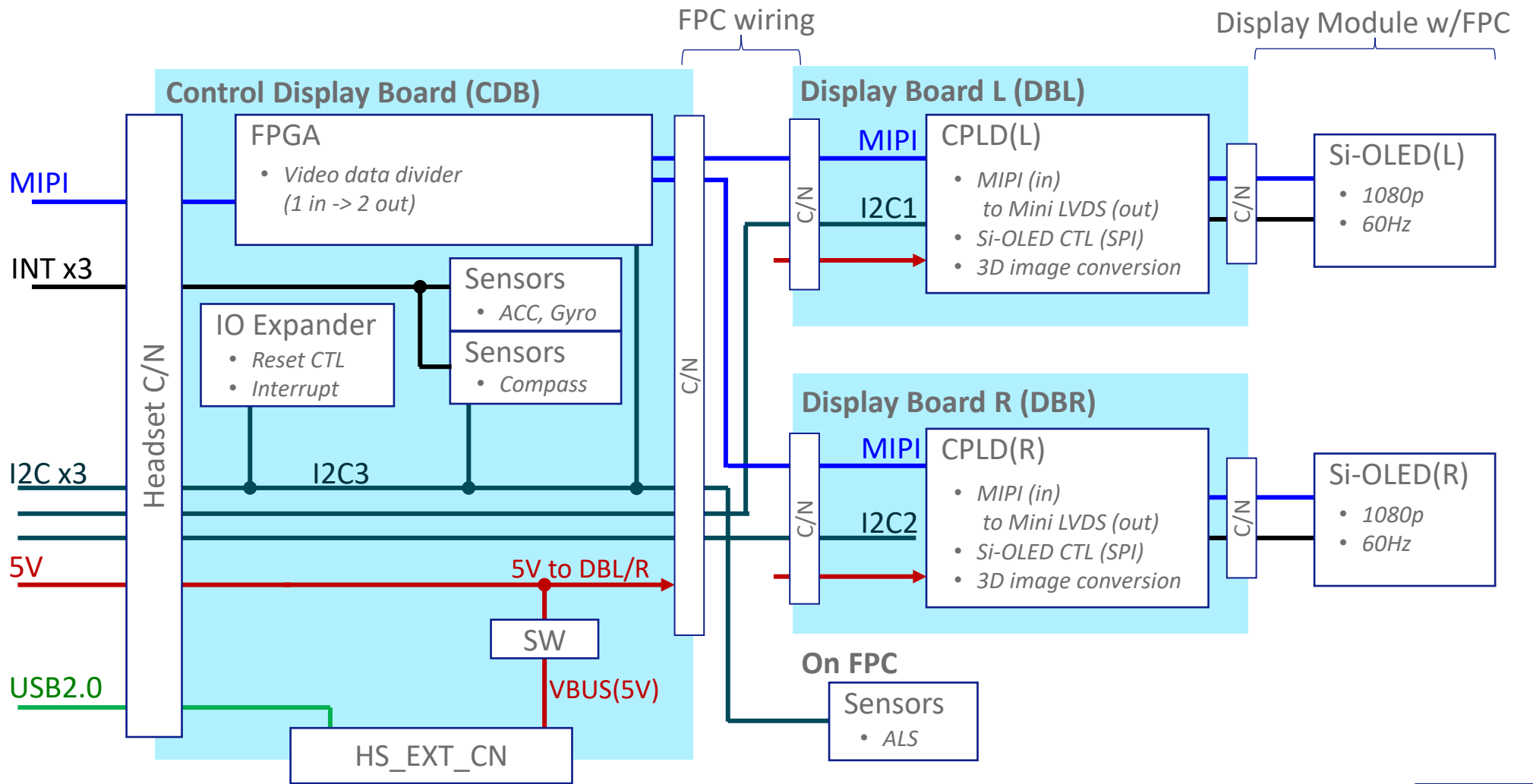
- Wi-Fi
- 5G / 4G
- Bluetooth
- Voice communication

Ceia design

EPSON
EXCEED YOUR VISION

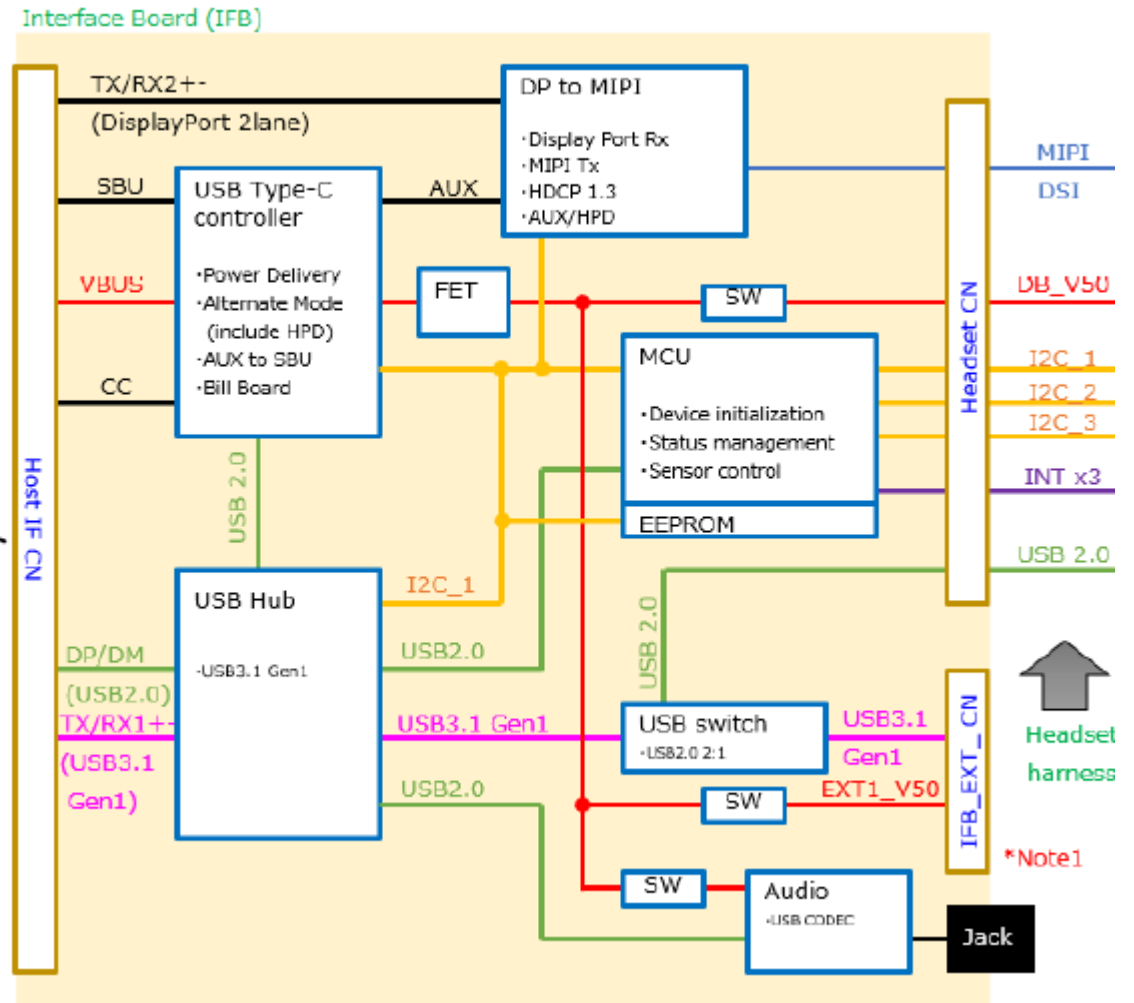
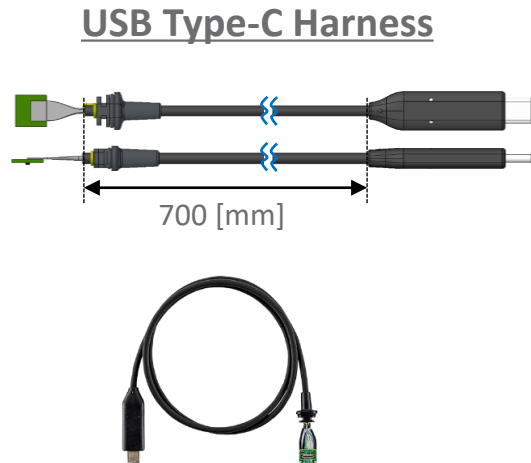
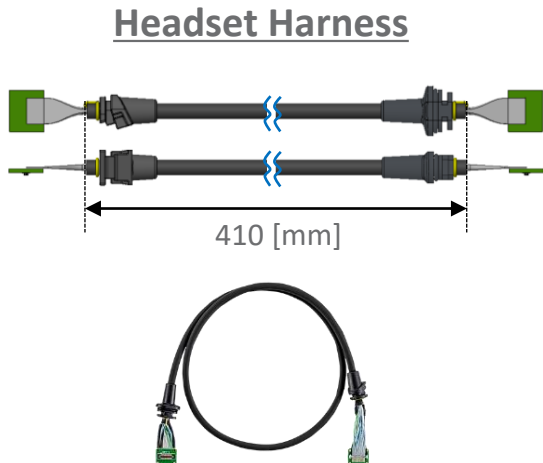
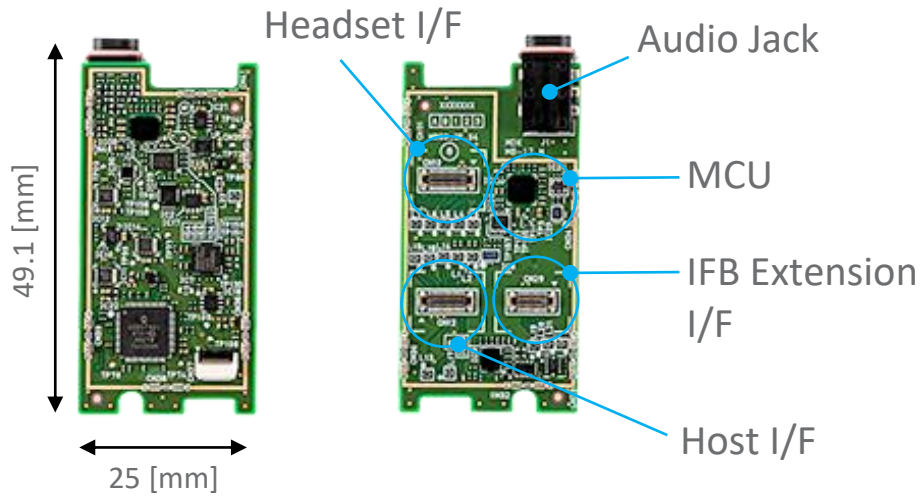
Display drive system for synchronous control of L/R display and support 2D/3D function

Host system connectivity



Additional devices interface

Interface Board VO-IF40



Competitive landscape – Industrial market

Heavy industry



Epson
Moverio BT-45
1350€ / 1800€ ex. VAT



Vuzix
M400
1800€ ex. VAT



Realwear
Navigator 500
2300€ ex. VAT



Iristick H1
Navigator 500
2275€ ex. VAT

Binocular

Monocular



Microsoft
HoloLens 2
3500€ - 5000€ ex. VAT



Magic Leap
ML 2
3299€ - 4999€ ex. VAT



Google
Glass Enterprise 2
1000€ ex. VAT

Light industry