Security B

VisEra Technologies Company Ltd.

TSE: 6789

Address: No. 12, Dusing Rd. 1, Hsinchu Science Park, Hsinchu City, Taiwan

Tel: +886-3-666-8788

http://www.viseratech.com/tw/

Safe Harbor Notice

- VisEra's statements of its current expectations are forward-looking statements subject to significant risks and uncertainties and actual results may differ materially from those contained in the forward-looking statements.
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Our Vision:

To be the First Class and Leading Wafer Level Optical Elements Foundry Services Provider in the Globe

Vision Era

Integrity | Practical | Innovation | Excellence

Core Value ◆ Striving for Sustainable Growth

Company Profile

Name

VisEra Technologies Company Ltd. (TSE: 6789)

Establishment

December 1st, 2003

Management

Robert Kuan *(Chairman & CEO)*

S.C. Hsin *(President)*

Employees

1,378 Personnel

Paid-in Capital

NT$2.93 Billion

Business

Professional Wafer Level Optical Elements Foundry Services

Locations

- Hsinchu, Taiwan HQ & Fab
- Zhongli, Taiwan Fab
- Longtan, Taiwan Fab(22Q4)

External Auditors

Deloitte & Touche

Underwriters

Yuanta Securities
KGI Securities

Board Members

Role
- Chairman

Robert Kuan

Professional Experience
- Factory Director, TSMC
- VP of Operations, SSMC

Role
- Director

George Liu

Professional Experience
- Senior Director, TSMC
- VP, VIS
- Director, Intel

Role
- Director

Diane Kao

Professional Experience
- Senior Director, TSMC

Role
- Independent Director

Laura Huang

Professional Experience
- MD, UBS
- MD, Merrill Lynch
- Senior VP, CDF

Role
- Independent Director

Emma Chang

Professional Experience
- Deputy Director of Legal, TSMC
- Head of Legal, MediaTek
- CLO, Standard Chartered

Role
- Independent Director

P.H. Chang

Professional Experience
- VP, TSMC
- Chairman, MOTECH
- VP, WSMC

Management Team

Robert Kuan

Role
- Chairman & CEO

Professional Experience
- Factory Director, TSMC
- VP of Operations, SSMC

S.C. Hsin

Role
- President

Professional Experience
- Director, TSMC
- Manager, Philips

Kevin Tsai

Role
- VP

Finance & Administration

Professional Experience
- Dept. Manager, TSMC
- CFO, Win Semi

H.J. Tsai

Role
- VP

Color Filter

Professional Experience
- Manager, TSMC
- Dept. Manager, Zhongwei Semi

K.P. Lin

Role
- VP

Business Development

Professional Experience
- Principal Engineer, TSMC

W.R. Huang

Role
- VP

Resource Planning

Professional Experience
- EBO Deputy Director, TSMC
- VP, HOYA

J.C. Hsieh

Role
- VP

Wafer Optical Organization

Professional Experience
- Project manager, TSMC

Ben Fun

Role
- VP

Quality Assurance & IT

Professional Experience
- Dept. Manager, TSMC
- Deputy VP, GlobalFoundies

C.C. Chen

Role
- Associate VP

Color Filter

Professional Experience
- Deputy Manager, TSMC
- Senior Manager, FuPo Electronics

Julia Lin

Role
- Director

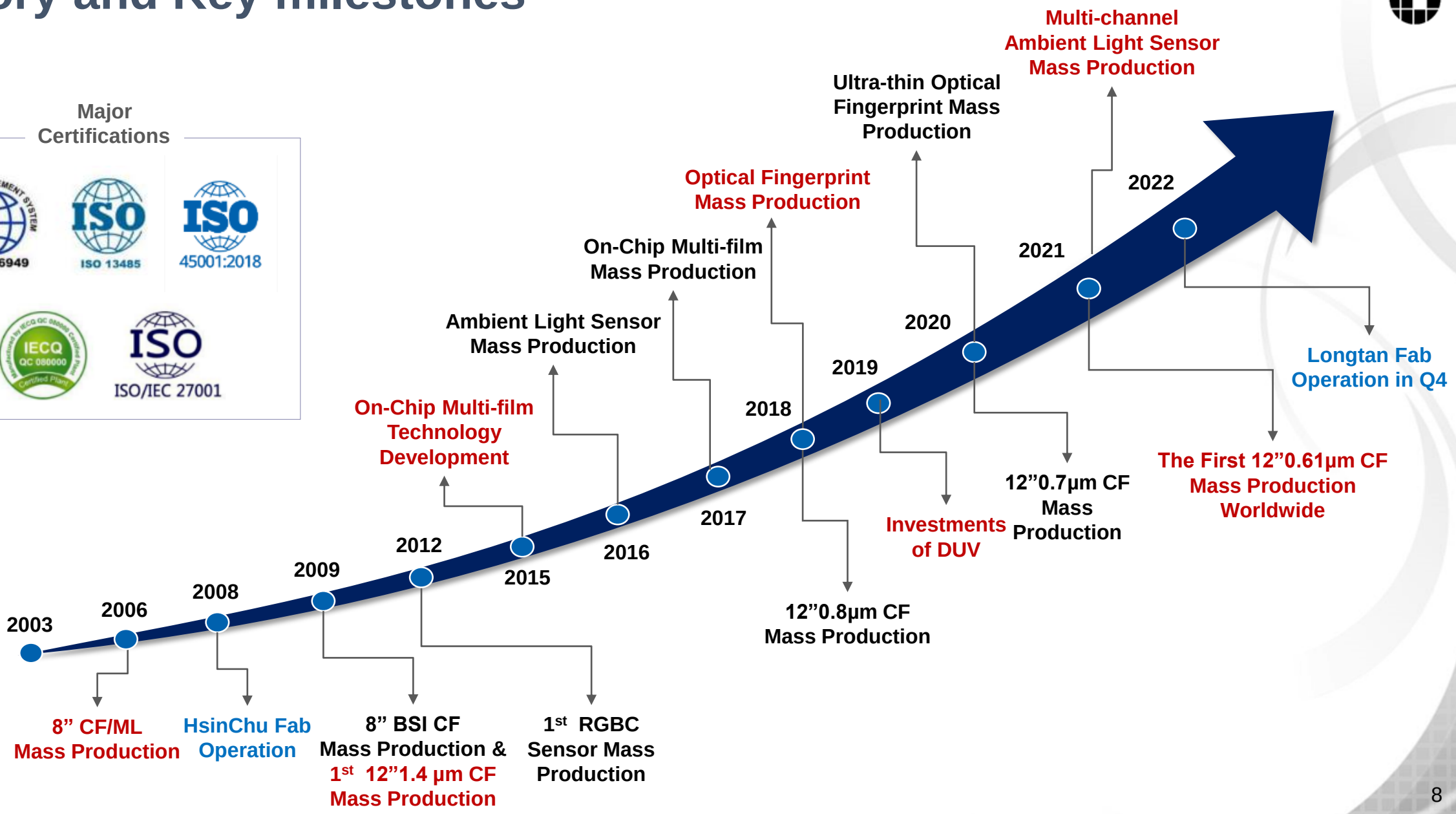
Legal & Corporate Governance Officer

Professional Experience
- Senior manager, FIH

History and Key milestones

Major Certifications

IATF 16949 · ISO 13485 · ISO 45001:2018 · IECQ QC 080000 · ISO/IEC 27001



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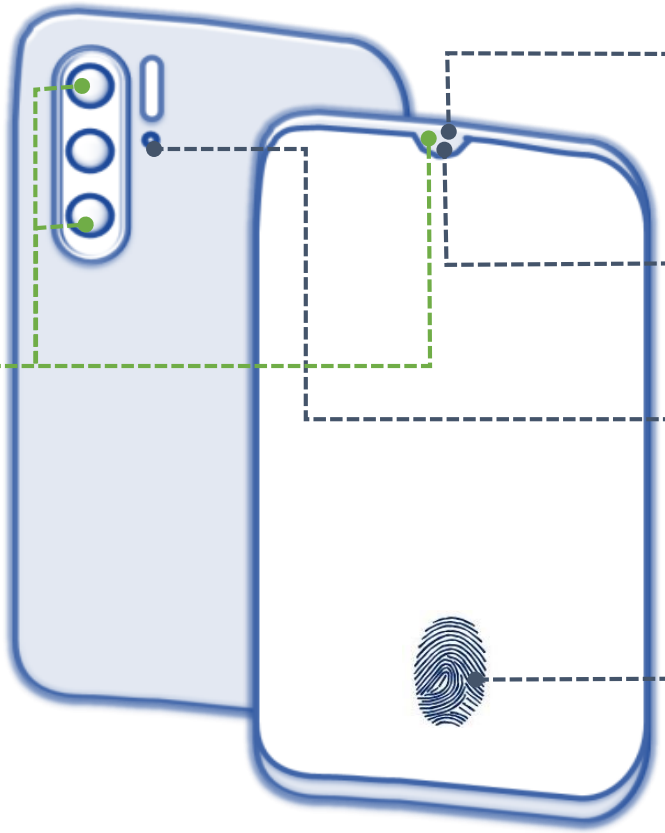
Application：Smartphone

CMOS Image Sensor (Image)

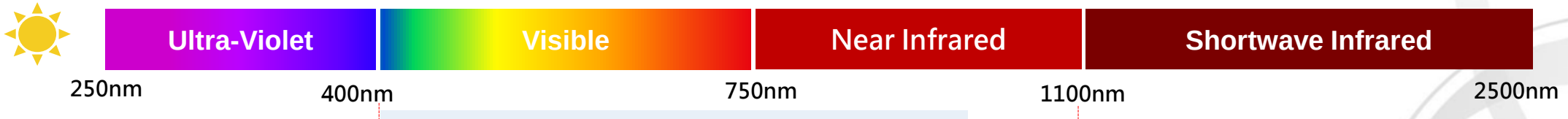
- CIS



Micro-optics Element (Sensing)

- 3D Biometric Sensor
- Ambient Light Sensor
  Proximity Light Sensor
- ToF / LiDAR
- Optical Fingerprint on Display

Technology and Product – Spectrum Applications



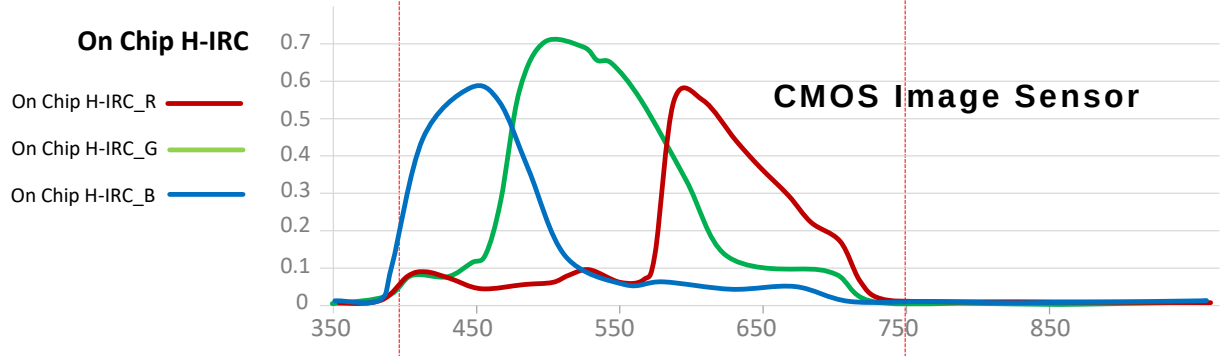
Technology

Color Filter & Micro Lens

Optical Multi Film Integration

Metalens

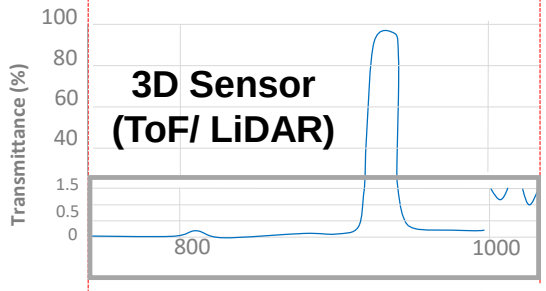
Product



Infrared Cut, allowing Visible light pass

+

RGB Absorption Filter

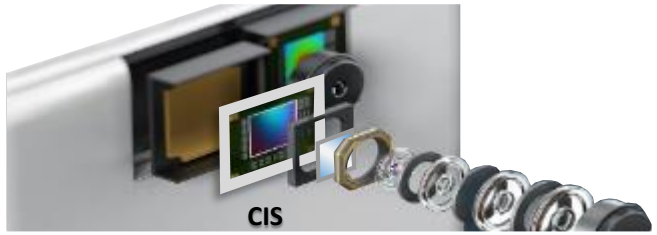


Infrared Narrow Band Pass Filter (NBPF)

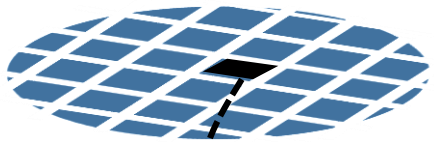
Diffraction Multi Film, only allowing light with certain wavelength pass

Main Process Technology: Color Filter & Micro Lens
Application: CMOS Image Sensor

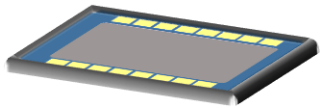
- Providing Color Information
- More Pixel and Higher Resolutions within Same Area
- Night Resolution Contrast and Sharpness
- Phase Detection Auto Focus Tech.



Black / White Image

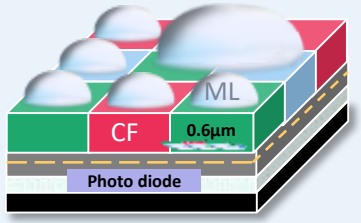


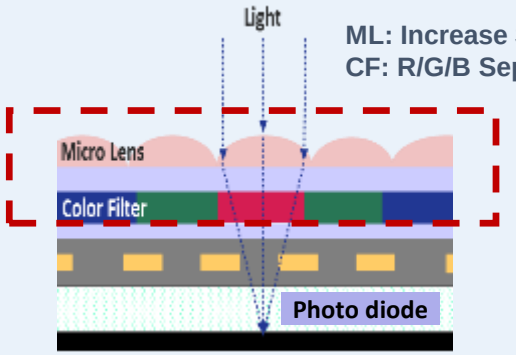
Silicon Wafer from Different Foundry or IDM Fab



CMOS Image Sensor (CIS)

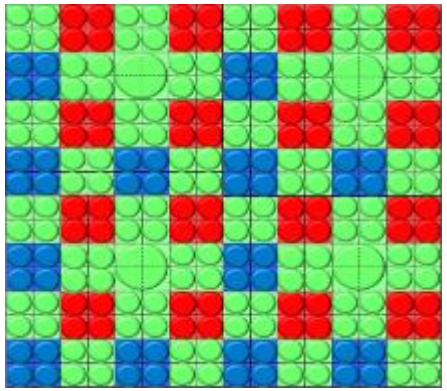
Color Filter & Micro Lens





ML: Increase Sensitivity
CF: R/G/B Separation

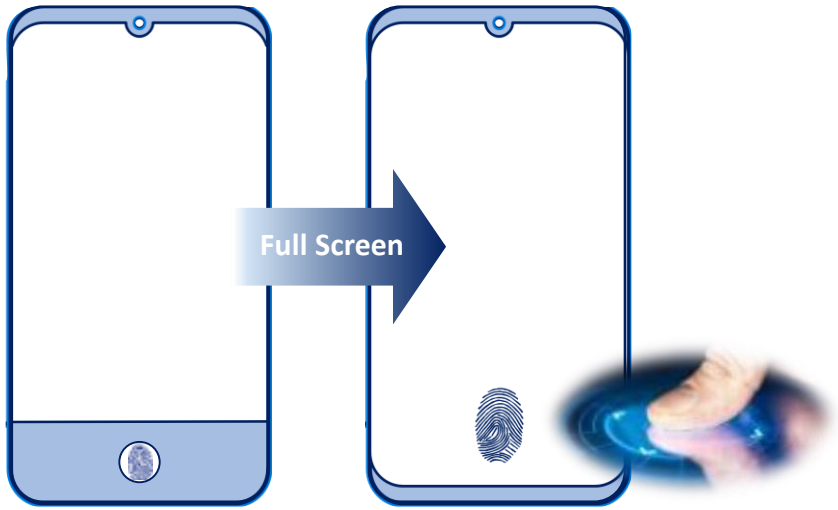
Color Image



Main Process Technology: Optical Multi Film Integration
Application: Optical Fingerprint

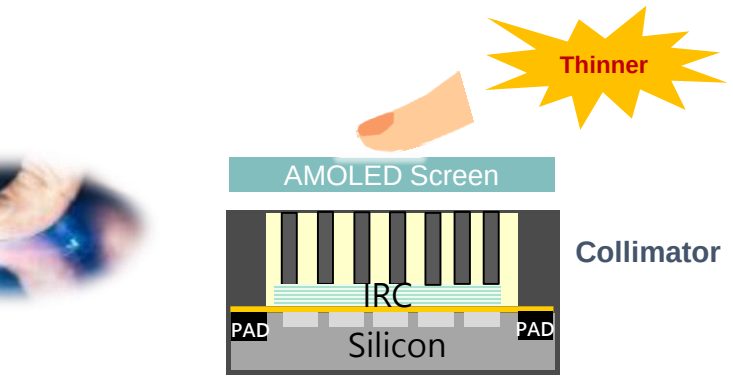
Integration Process Technology
The First Ultra-thin Optical Fingerprint
Mass Production Worldwide

Capacitive Fingerprint | **Optical Fingerprint on Display**



Optical Fingerprint (Ultra-thin)

Thickness<0.5mm

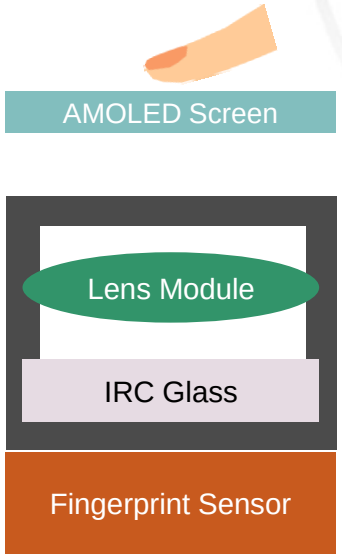


Lens Module → **Micro Lens + Collimator**

IRC Glass → **Light Filer**

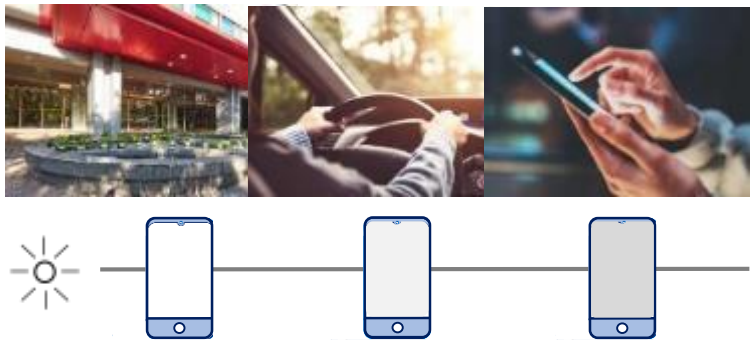
Optical Fingerprint (Lens type)

Thickness 3mm



Main Process Technology: Optical Multi Film Integration Application: Ambient Light Sensor

Combination of Multi Functions with Advantages in Cost Effectiveness and Module Shrinkage

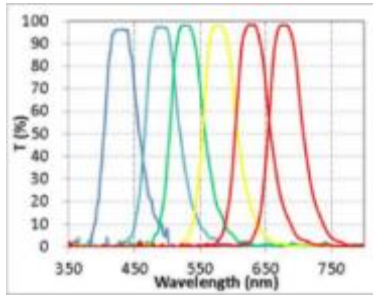


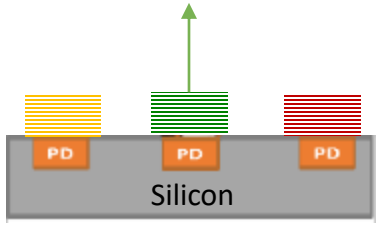
Brightness

Color Temperature

Multi-channel Ambient Light Sensor

Multi-channel Filter

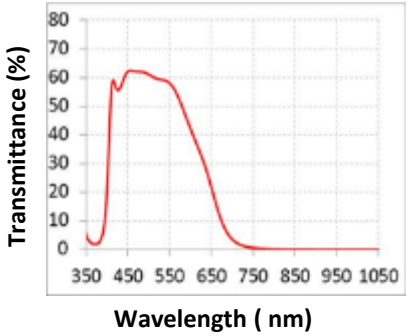


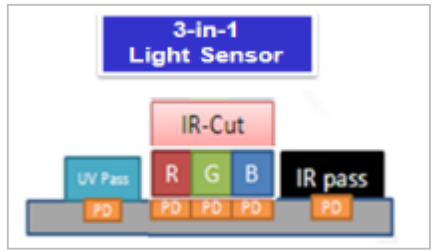


Ambient Light Sensor (Multi Functions in One Sensor)

(UV+ALS+PS/gesture)

IR-cut



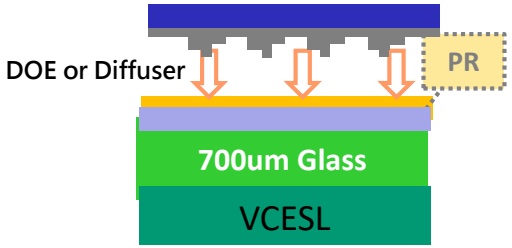


- **UV** Pass
- **ALS** : RGB + IRC
- **PS/gesture** : IR Pass

Main Process Technology: Optical Multi Film Integration
Application: 3D Sensor (ToF / LiDAR)

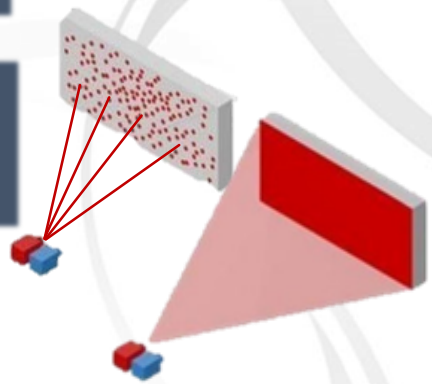
Distance Detection or Focus

IR Emitter, Tx



3D Sensing Comprehensive
Micro-optical Solutions
Micro-optics Sensors(Rx)
Infrared Transmitters(Tx)

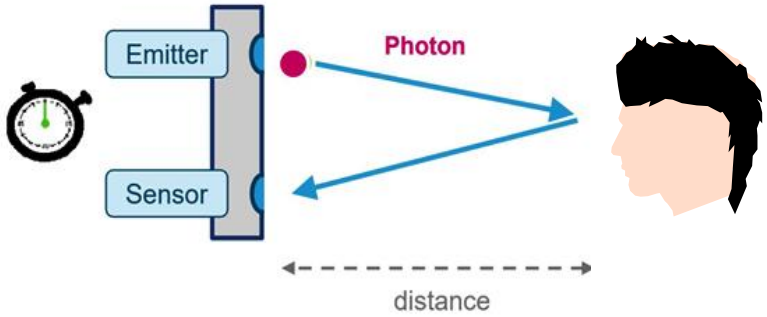
Lens-like Optical Elements
Allows Single Spot of IR
Transferring to 2D Image

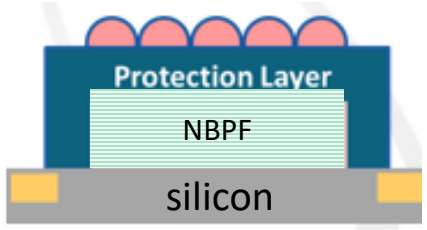


Micro-optics Sensors(Rx)

Infrared Transmitters(Tx)

Sensor, Rx





Process Technology Integration
Enables Module Shrinkage

(Micro-lens + NBPF on Silicon)

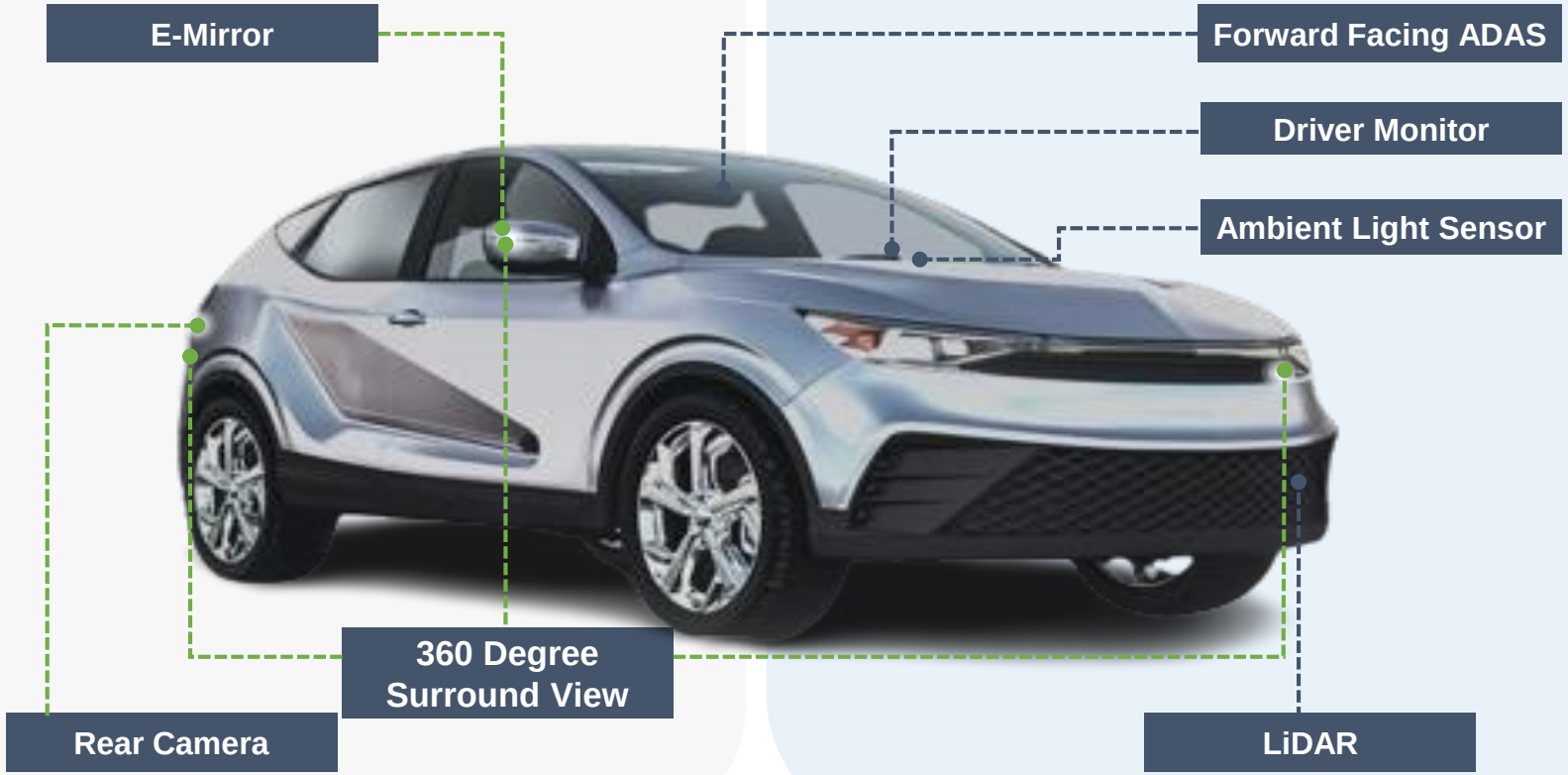
Application：Automotive

IATF16949 Certificated, High Reliability and Durability

- Providing Various Optimized Color Filter Array（CFA）
- High Dynamic Range（HDR）Design
- LED Flicker Mitigation（LFM）Technology
- Black Material Shielding with Low Reflection Rate Technology

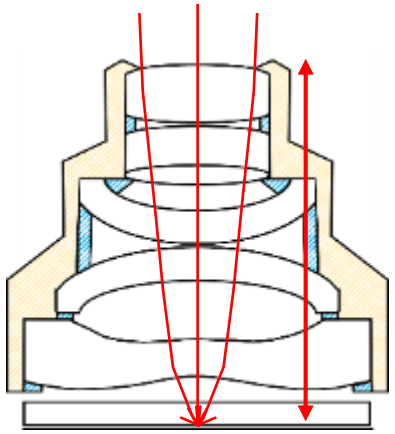
CIS (Image)

Micro-optics Element (Sensing)



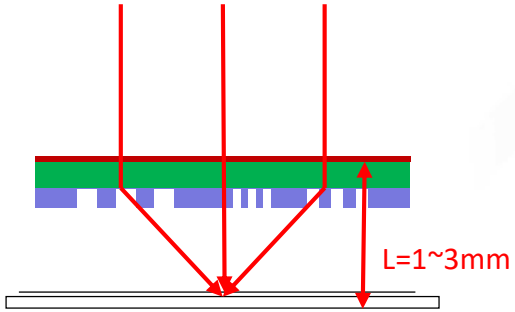
Main Process Technology: Matelens
Application: AR/VR, Mobile Devices, Auto LiDAR, Optimistics

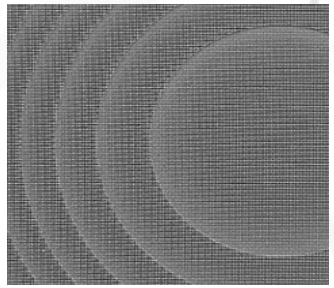
- **Semiconductor Nanometer-level Structure, Designed and Fabricated on Glass or Silicon Substrates**



Traditional Lens

V.S





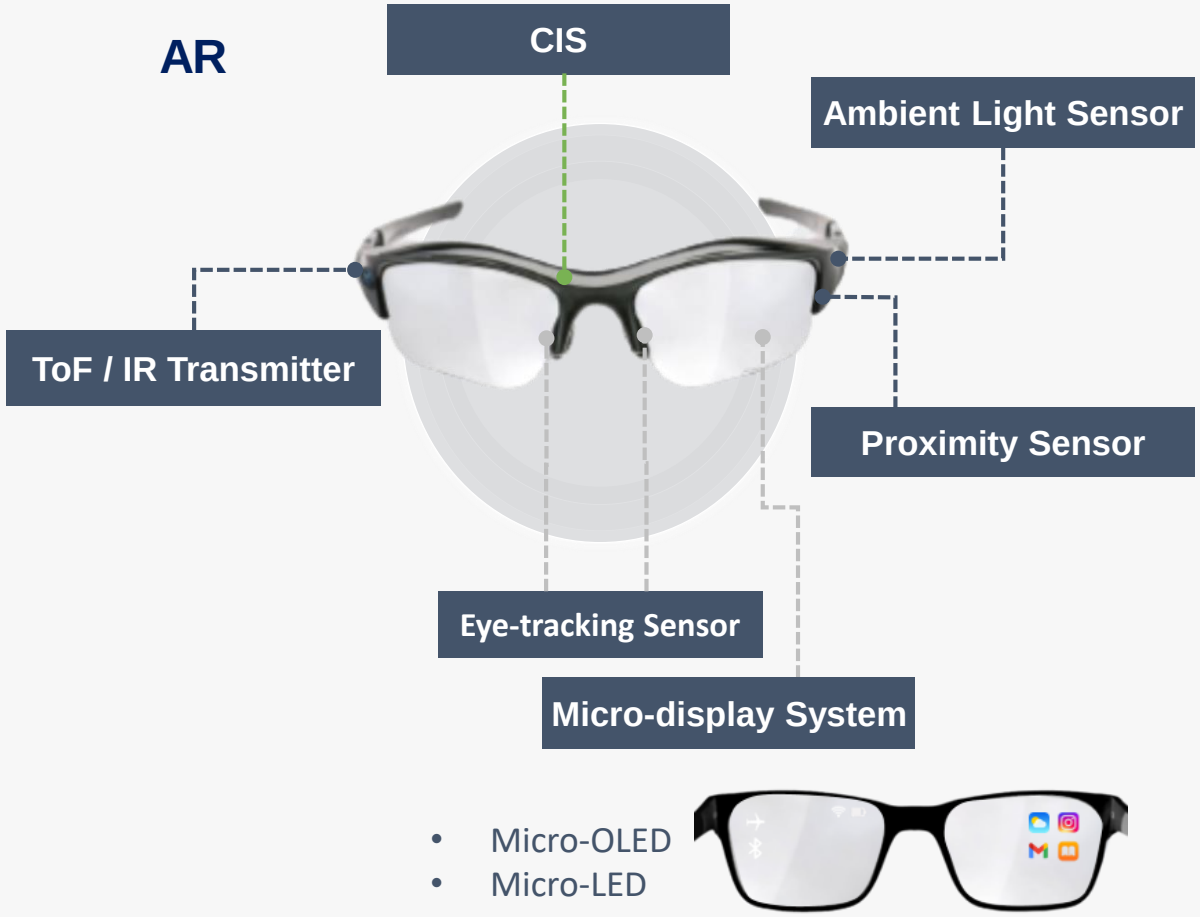
Metalens

Better

Traditional Lens	Metalens
Thicker Lens Height	Thin Film Module Height
Difficult Assembly	On-chip Solution
Inflexibility for Design	Flexibility for Design
Higher Cost	Lower Cost

Metalens Enables Thin Film Design for AR/VR End-market

Application: AR/MR



- **Sensor + Metalens : Thin Film Design**
- **Micro-display System**

  Wafer-level optical technology provides high resolution and high contrast (Black materials and Micro lens)

Opportunities of Micro-display

- ✓ *Display Tech. TFT → CMOS*
- ✓ *High Resolution(PPI) & Pixel Size Shrinkage Require Semiconductor Process Technology*
- ✓ *Micro-LED & Micro-OLED Color Transferring Needs*

→ *VisEra Provides Small Size Solution: Color Transferring and Micro Lens*

Source: Oculus/HTC

Market Trend – CMOS Image Sensor

CIS TAM continues to grow with a CAGR of 6.6%

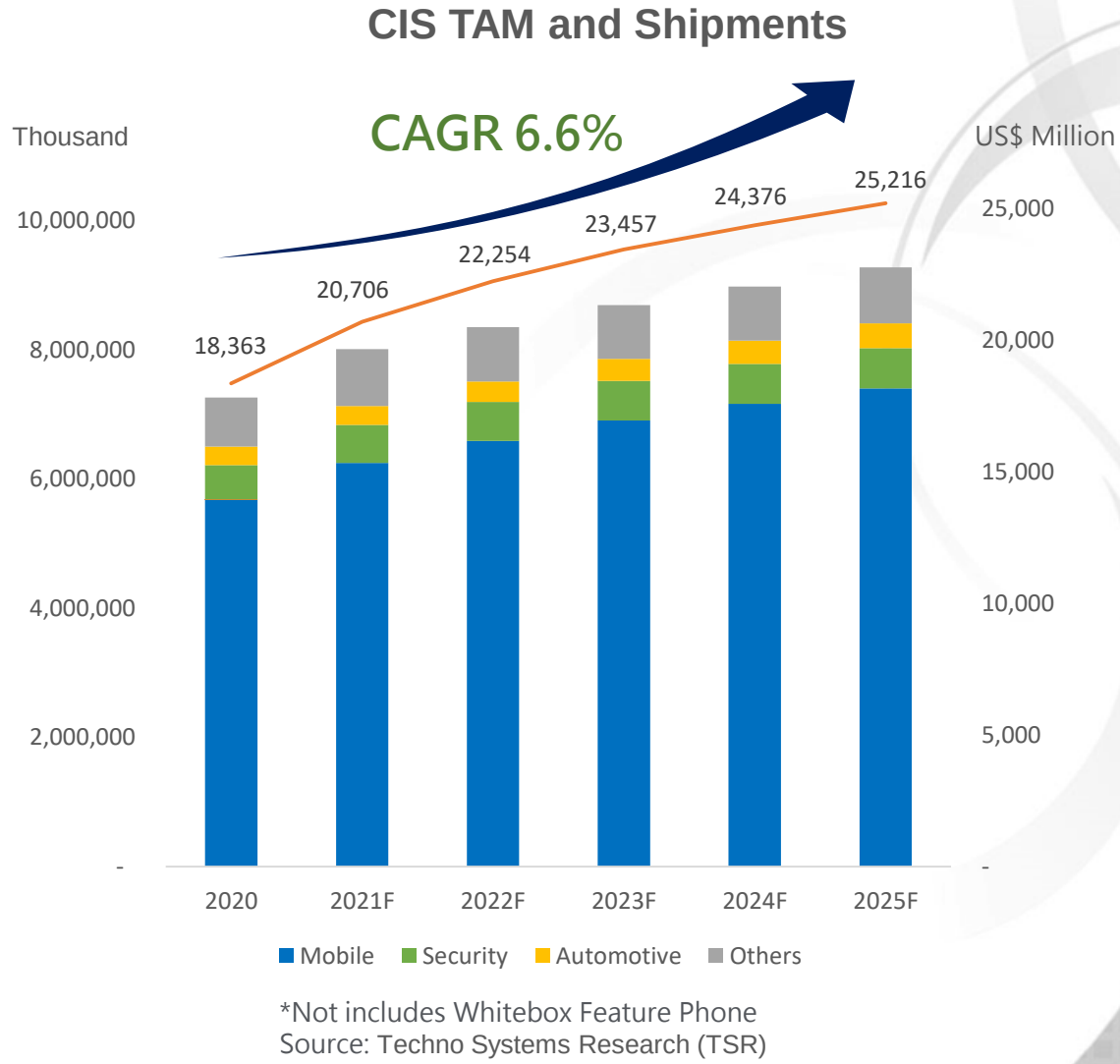
US$ 18.4 bln in 2020 → US$ 25.2 bln in 2025

Increasing demands for CIS driven by:

1. **Widely adopted for multiple Cameras in smart phones**
2. **Increasing Pixels (2M → 8M → 48M → 200M …)**
3. **ADAS and auto driving for Auto application**
4. **Security for smart city and smart home**

Markets for multiple Cameras in addition:

1. **Smart phone: 4~5**
2. **Auto sensors: L2 : > 5 ; >L3 : >10**
3. **AR/VR 2~4**



*Not includes Whitebox Feature Phone
Source: Techno Systems Research (TSR)

Market Trend – Micro-optics Element

Increasing TAM and Shipments, CAGR 14%

90 million Units (2020) → 1.9 billion Units (2025)

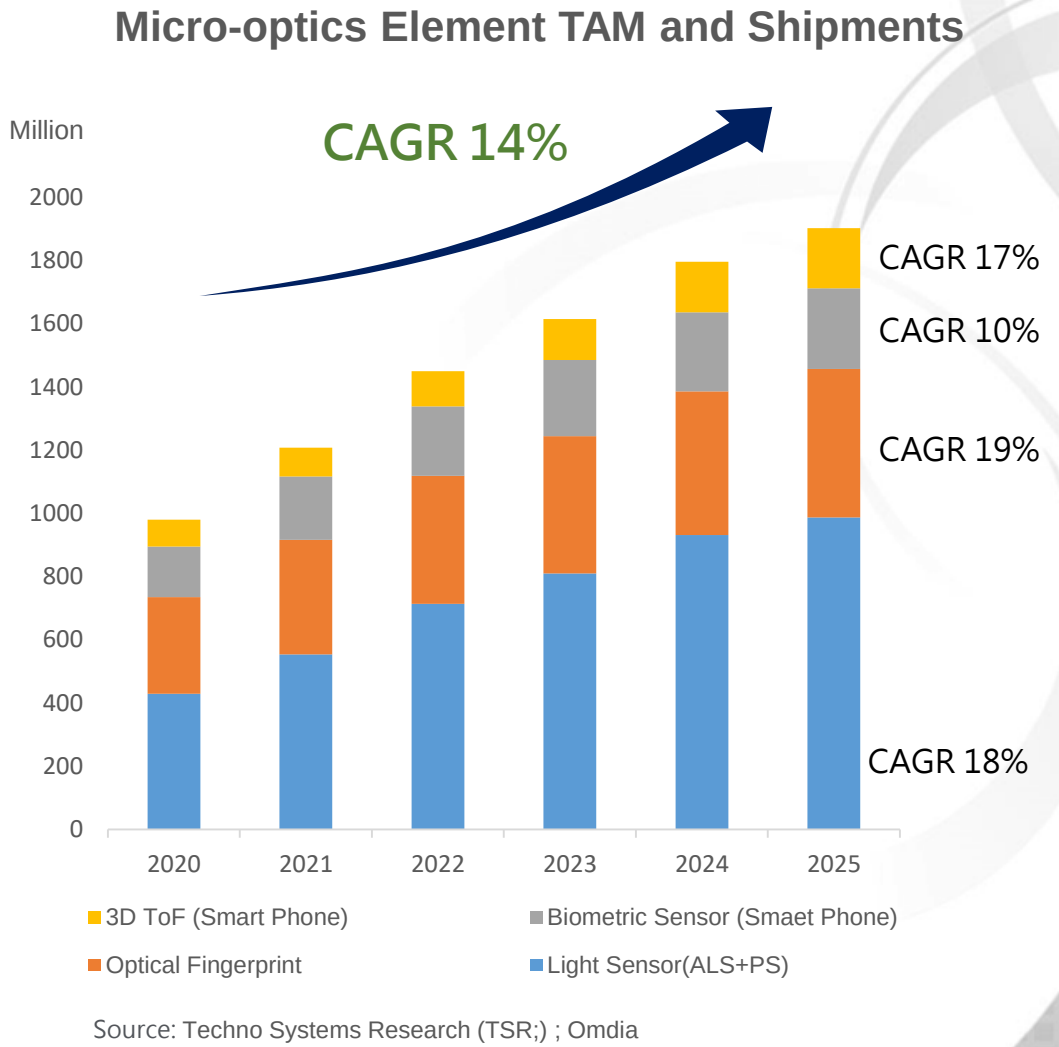
Key End-market Applications

1. **Smartphone is the main segment**
2. **Automotive, Smart Home, IoT, and Biometric applications are blooming**

VisEra Provides Comprehensive Optical Solutions in Micro-optics Sensing Market

Micro-optics Sensors(Rx)

Infrared Transmitters(Tx)



Source: Techno Systems Research (TSR;) ; Omdia

Market Trend – AR / VR

Explosive Volume Shipments, CAGR 30~72%

6.9mn Units (2020)→26mn~over100mn Units (2025)

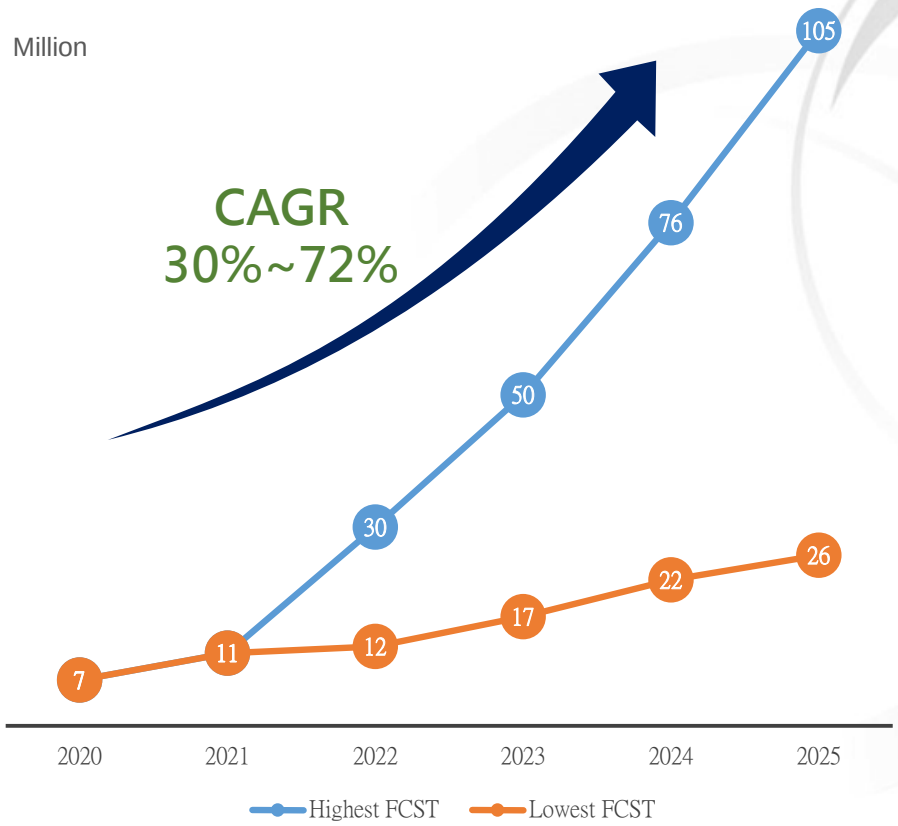
VisEra Superior Micro-optics Technologies for AR/VR Applications will Shine

1. CIS
2. Micro-optics Sensing / Transmitting Elements
3. Micro-optics Display Module

Average Optical Sensor/ Module per Device

1. CIS: 1~4 Units
2. Micro-optics Sensing / Transmitting Elements: 4~8 Units
1. Micro-optics Display Module: 2 Pieces

AR / VR Device TAM and Shipments



Source: Counterponit, Dec'21, Trendforce, Nov'21, Digitimes, Fbe22, TSR, June'21

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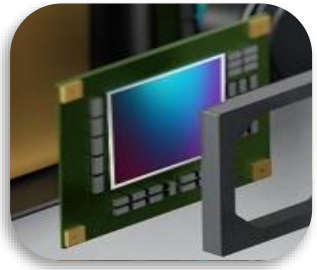
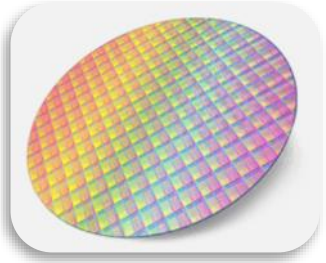
Competitive Advantages

Innovation



- Innovative business model; the only wafer level optical foundry service provider
- Innovative technology; customized technology for the most advanced products

Wafer level Optics



Combination of Optics and Semi, catching up the boom of thin film optical sensing applications

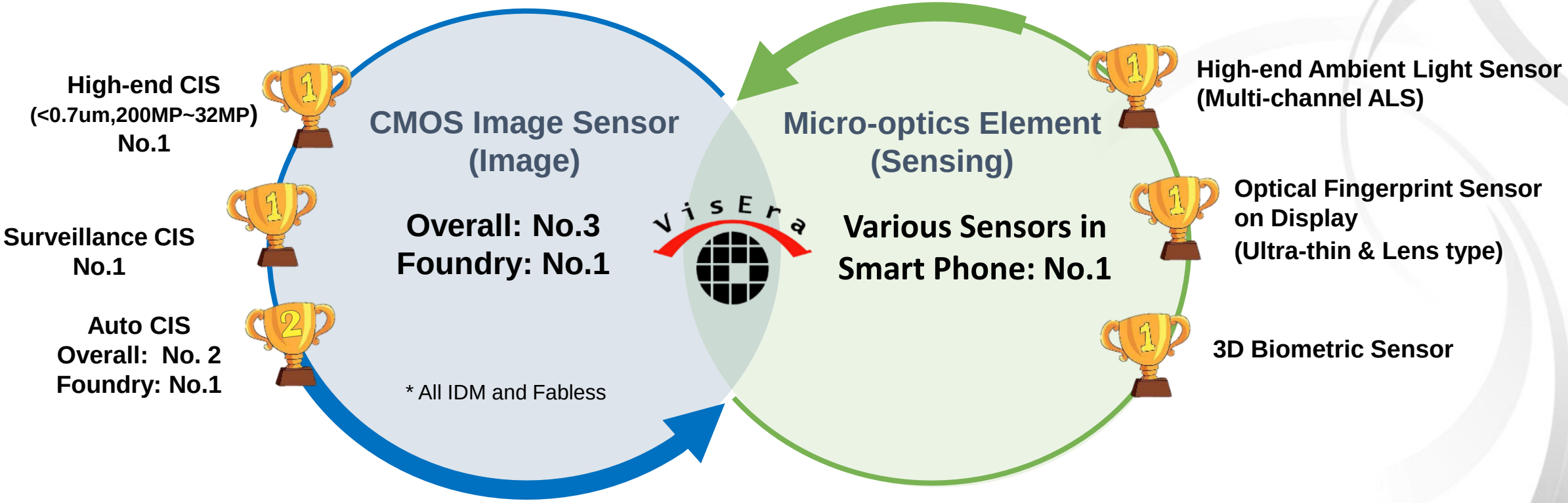
Total Solution

Providing total solutions, including optical simulation / structure design / semi process tech / wafer level testing, to accelerate product developments and mass productions for customers

TSMC Family

Inheriting TSMC's corporate culture and management philosophy with self-own RD and BD capabilities. Closely working with TSMC for co-developing technologies and market expansion

Main Products Global Market Share in 2021



Sufficient Capacity

1

Hsinchu Fab (64,652m²)

- 2,200k/ wpy (eq. 8”)
- 12”& 8”CF/ML & Multi film

2

Zhongli Fab (1,282m²)

- Project Lines
- 8”Multi film

3

Longtan Fab (64,192m²)

- Total 2,200k/ wpy (eq. 8”), increasing by Phases
- 12”& 8”CF/ML & Multi film & Metalens
- 2022Q1 equipments moved-in, Q2~Q3 pile-run & qualification, Q4 phase 1 mass production

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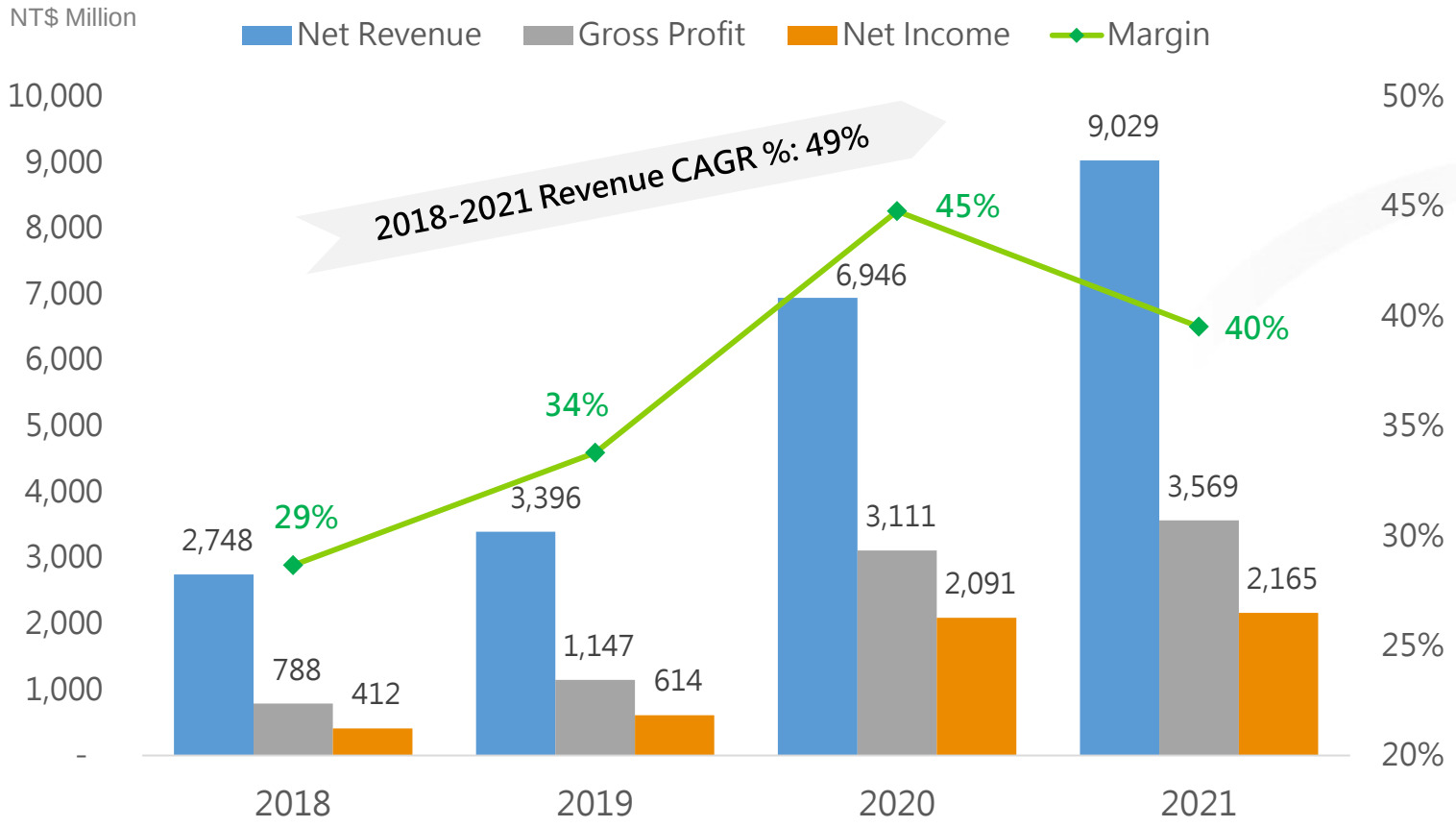
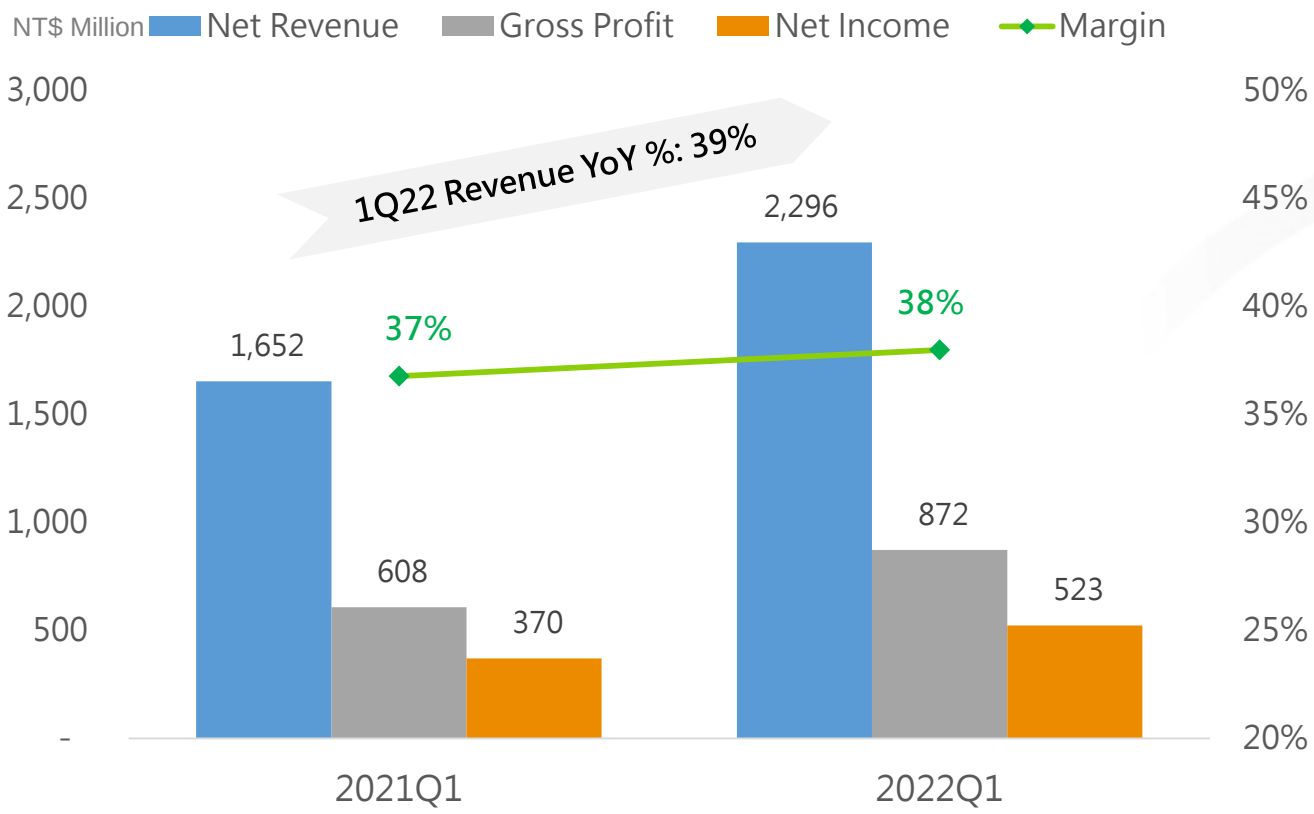
‘18 – ‘21 Financial Results



	2018	2019	2020	2021
EPS (NT$)	1.42	2.11	7.18	7.41
ROE	8%	12%	34%	27%

1Q22 Financial Results

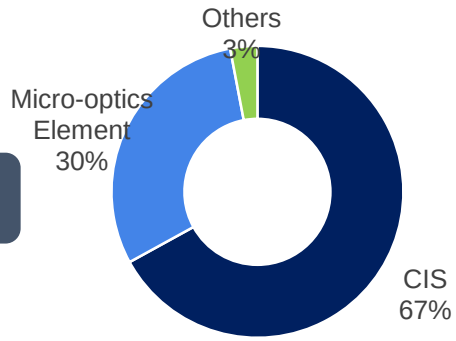


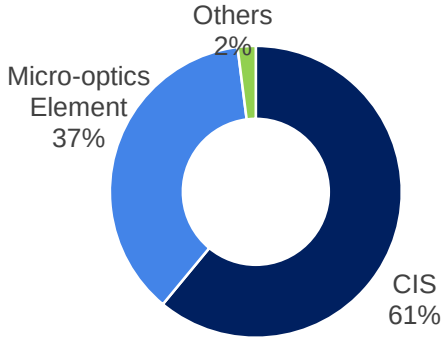
EPS (NT$)	1.27	1.78
ROE (Annualize)	20%	23%

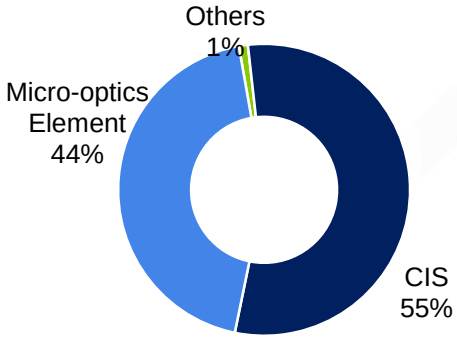
Revenue Breakdown

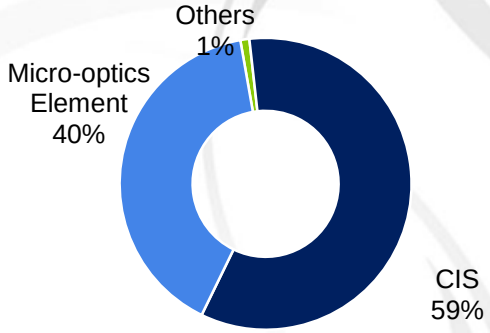
	2019	2020	2021	1Q22
	NT$3.4 Billion	NT$6.9 Billion	NT$9 Billion	NT$2.3Billion

By Product



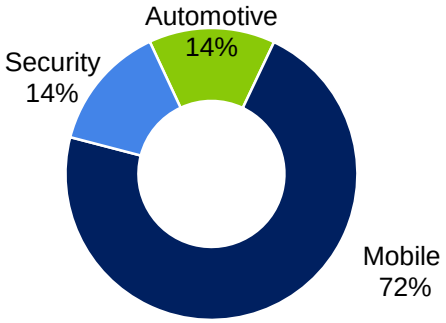


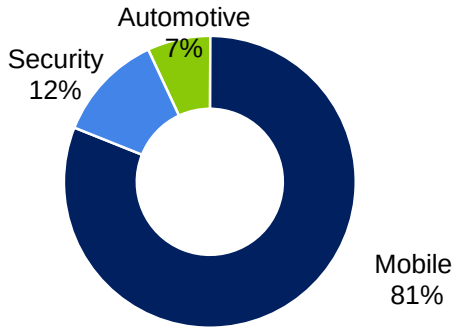


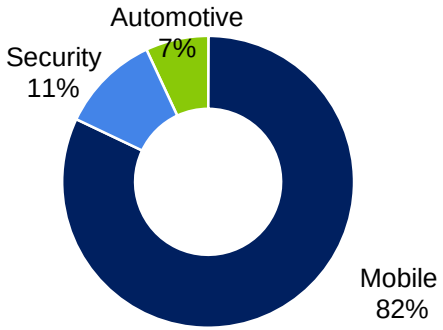


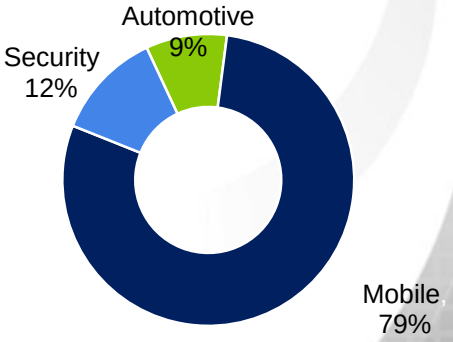
*Others refers to NRE and testing services, etc.

By Application









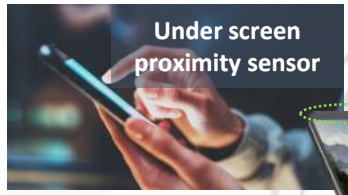
*Mobile includes smartphone, tablet, notebook, and wearable, etc.

Table of Contents

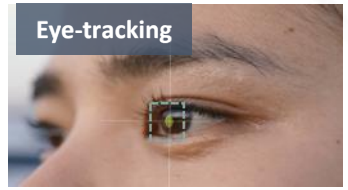
Technology Roadmap

	2021	2022	Future
CIS for Smart Phone	0.61μm Pixel Size >100MP	0.56μm Pixel Size >200MP; 0.61, 0.56μm Pixel Size Micro Lens PDAF	<0.56μm Pixel Size; Micro Lens PDAF
CIS for Automotive / Security	Near-Infrared Image Improvement	8MP / 0.7μm Pixel Size / Sensors for ADAS	SWIR and LiDAR; Narrow Band Pass Filter
3D Sensor	ToF; 940nm Narrow Band Pass Filter	1,300nm / 1,550nm (SWIR) Narrow Band Pass Filter	Diffraction Optical Elements; 3D Biometric Sensor on Display
Light Snesor	Single Channel or RGB Channel Spectrum; Multi Function in Single Chip	Ambient Light Sensor	SWIR on Display; Biometric Sensor for Wearable
Optical Fingerprint Sensor	Optical Fingerprint Integrated Process Technologies with Ultra-thin (Collimator) and Lens Types		Next Generation for Better Performance and Die Shrink
AR / VR	Metalens, including Visible , NIR, and SWIR		
BioSensor		Micro-optics Structure for DNA Sequencing	

Short to mid term



Mid to long term



Glucose sensing

Value Creation

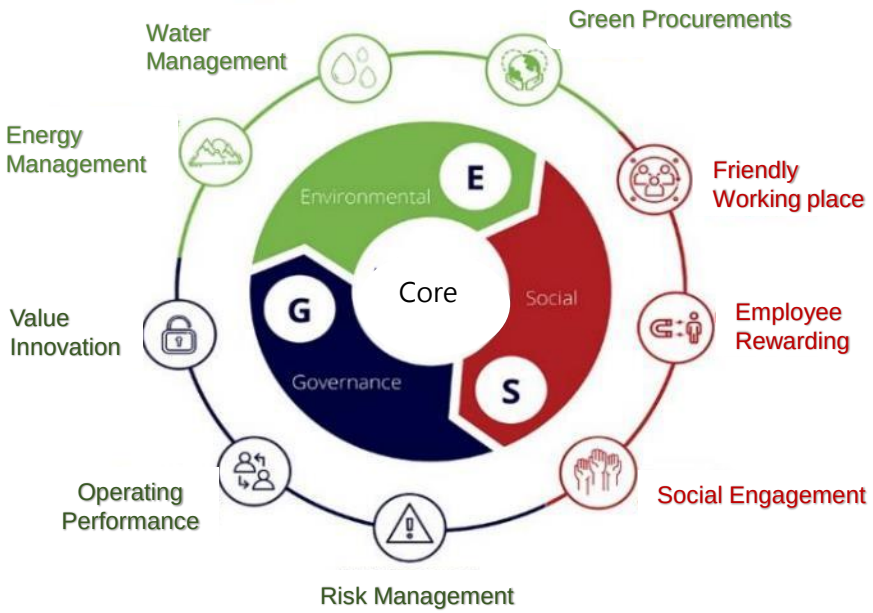
1. Delivering Truth, Goodness and Beauty Image
2. Exploring Safer Technology for Living
3. Developing Slim and Mineralization Products

- **Silicon Wafer**
- **Visible Light (Image)**
- **Sensor**

- Silicon + **Glass Wafer**
- Visible + **Invisible Light (Sensing)**
- Sensor + **Emitter**

- Silicon + Glass Wafer
- Visible + Invisible Light
- Sensor + Emitter **+ Micro-Display**

Strong Commitments for ESG



13 CLIMATE ACTION

Low-coal productions, reducing greenhouse gas exhaustion per unit product by 36.3%*

6 CLEAN WATER AND SANITATION

Diversifying water resources, recycling rate of polluted water from process tech by approx. 88%*

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Utilizing nature energy, reducing power per unit product by approx. 38%*

7 AFFORDABLE AND CLEAN ENERGY

11.5% of the power is used by green energy in 2021, targeting 20% in 2022

8 DECENT WORK AND ECONOMIC GROWTH

IS45001 Certified

ESG

ESG Committee

R

ESG Report will be published in June, 2022

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

RBA VAP Silver level Certified

8 DECENT WORK AND ECONOMIC GROWTH

Reforming salary structure, 20% top in the industry

4 QUALITY EDUCATION

Volunteer services for the social responsibilities

* vs. 2018

Original sources: HsinChu Wild Birds Associate; Paint of Tang, Yun Yan; Calligraphy of Tseng, Fong Shu