



# Vision Connectivity



# Company at a glance



Est. 2004



Listed 2015  
(KOSDAQ)



Annual Revenue  
Approx. USD 400M  
(3 Year Average)



CEO  
Don Lee



 NAMUGA Global Office

 Distribution Partner

# Core Company Competencies

## Stable Financial Position

Expanding the scale of investment every year through efficient business operations

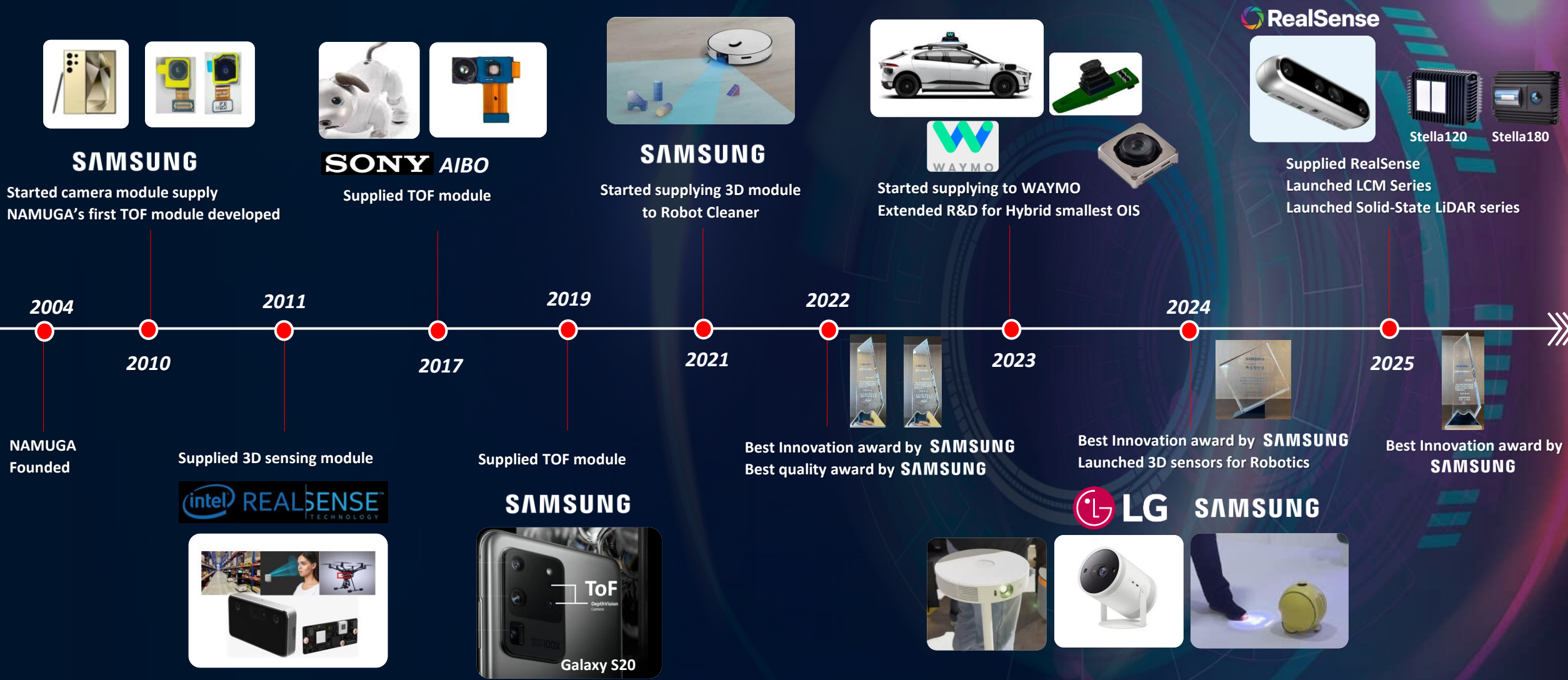
## Customer-tailored Design Capability

Designing and producing top-quality products that meet customer specifications

## Vision Technology

Extensive experience in camera module and 3D sensing technology

# Company Milestone



# NAMUGA Factory in Vietnam

## Advanced SM Production Facility in Phu Tho, Vietnam

- Over 99.5% Yield for All Types of Sensor Modules
- 100% On-time Delivery to Customers

|                        |                                                                                                                                                                |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location               | Phu Tho, Vietnam<br>(1hr distance from Hanoi Airport)                                                                                                          |
| # of Employee          | About 1,200                                                                                                                                                    |
| Established (Yr)       | 2014                                                                                                                                                           |
| Manufacturing Area     | <ul style="list-style-type: none"><li>▪ Lot Area: 57,800m<sup>2</sup></li><li>▪ Facility Area: 38,000m<sup>2</sup></li></ul>                                   |
| Manufacturing Capacity | 15 Million modules per month<br>→ Factory expendable to 20M modules in 4 months                                                                                |
| Size of Plant          | <ul style="list-style-type: none"><li>▪ Plant 1 : 8,000m<sup>2</sup></li><li>▪ Plant 2 : 10,000m<sup>2</sup></li><li>▪ Plant 3 : 20,000m<sup>2</sup></li></ul> |



# NAMUGA Factory in Vietnam

NAMUGA is the only Korean company having full-scale 10 Class cleanroom semiconductor facility in Vietnam

- **World-class cleanroom facility operation**

## Cleanroom -10 Class

Scale : 4,916m<sup>2</sup>

Process : Front - Packaging / Active align



## Cleanroom -1,000 & 10,000 Class

Scale : 10,550m<sup>2</sup>

Process : Front - Packaging / End - Test



## Cleanroom -100,000 Class

Scale : 5,337m<sup>2</sup>

Process : SMT/ End - Test

# NAMUGA Factory in Vietnam

## (1) SMT Process (100K Class)

| Screen Print                                                                      | SPI                                                                               | Chip Mounter                                                                      | Multi Mounter                                                                     | AOI (Inline)                                                                       | Reflow                                                                              | AOI (offline)                                                                       |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |

| Maker     | Name             | Qty | Capa  |            |
|-----------|------------------|-----|-------|------------|
|           |                  |     | UPH   | Month      |
| JUKI      | Mounter          | 7   | 3,200 | 11,000,000 |
| Koh Young | 3D SPI           | 7   | 3,500 | 12,422,000 |
| Koh Young | 3D AOI           | 6   | 3,750 | 13,308,700 |
| Techwin   | 10Zone N2 Reflow | 6   | 6,000 | 18,252,000 |
| Total     |                  |     |       | 11,000,000 |

## (2) PKG Process (10 Class)

| Cleaning                                                                          | Die Attach                                                                        | Oven Cure                                                                         | Wire Bonding                                                                      | Lens Assy                                                                          | IR Attach                                                                           | Housing Attach                                                                      |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |

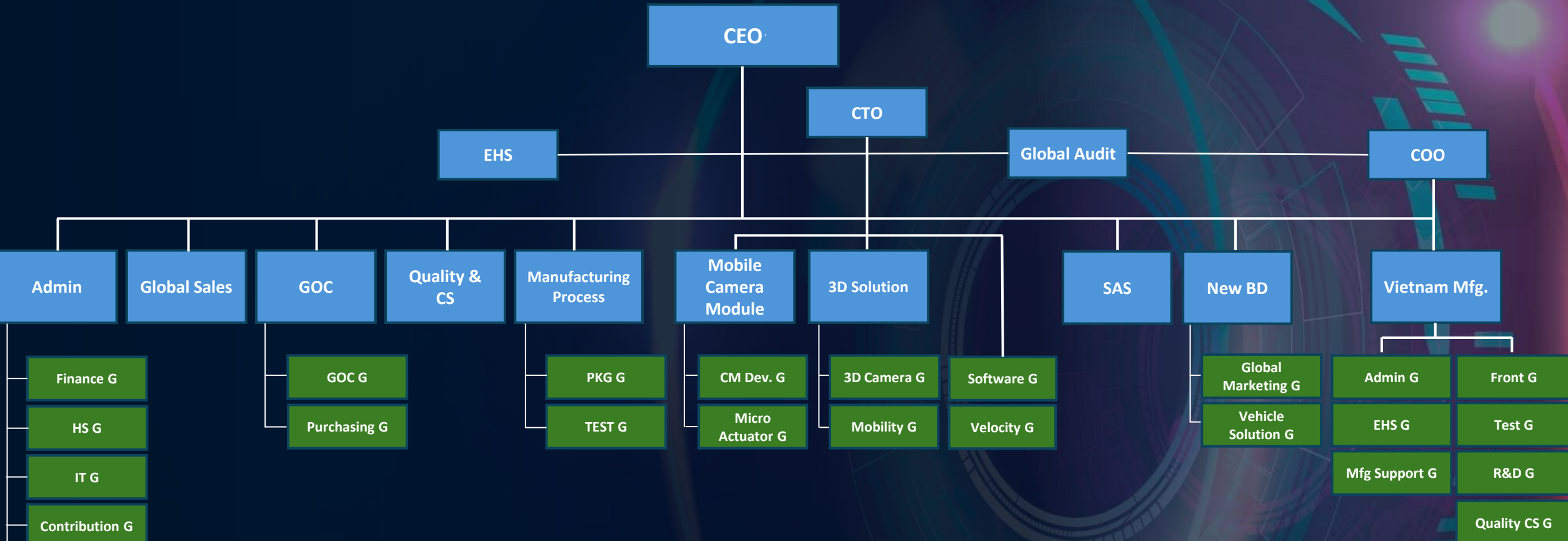
| Maker     | Name           | Qty | Capa  |            |
|-----------|----------------|-----|-------|------------|
|           |                |     | UPH   | Month      |
| BESI ESEC | Die Attach     | 14  | 2,500 | 15,500,000 |
| KNS       | Wire Bonder    | 80  | 420   | 16,500,000 |
| SSP       | Housing Attach | 16  | 1,250 | 15,500,000 |
| ASM       | Active Align   | 25  | 450   | 6,300,000  |
| Total     |                |     |       | 15,500,000 |

## (3) TEST Process (10K Class / 1K Class)

| VCM Soldering                                                                       | Laser Cutting                                                                       | Function Test                                                                       | Final Test                                                                          | EVI                                                                                  | Marking                                                                               | OQC                                                                                   |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |

| Fixel       | Type | Name               | Qty | Capa |            |
|-------------|------|--------------------|-----|------|------------|
|             |      |                    |     | UPH  | Month      |
| Low (8M↓)   | AF   | Focus Eye, Matrix  | 440 | -    | 3,000,000  |
|             | FF   | Matrix, BB, Manual |     | -    | 4,000,000  |
| High (13M↑) | AF   | Matrix, Hyvision   |     | -    | 4,000,000  |
|             | FF   | IsMedia, Matrix    |     | -    | 4,000,000  |
| Total       |      |                    |     |      | 15,000,000 |

# Organization



*Business Development Team Leaders*

*SAS Leaders*

|                                                                                                                            |                                                                                                                                               |                                                                                                                                 |                                                                                                                                      |                                                                                                                                   |                                                                                                                             |                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <p>Min Lee<br/>SVP / New BD Leader</p>  | <p>Nick Heo<br/>Senior Director/<br/>Global Marketing</p>  | <p>Arthur Yoo<br/>Global Sales Manager</p>  | <p>Vicki Nguyen<br/>Global Marketing Staff</p>  | <p>Eunbi Shikano<br/>Global Sales Staff</p>  | <p>Alfred Oh<br/>SVP / SAS Leader</p>  | <p>Jay Park<br/>SAS Manager</p>  |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|

# R&D

3D Sensing & Lidar



IR & RGB Camera



OIS Actuator



World's Top Class Experts with 20+ Years of Experiences in Optical / Mechanical / Software / Process / Test in Vision & Sensing Engineering



Various 3D Sensors

Solid State Lidar



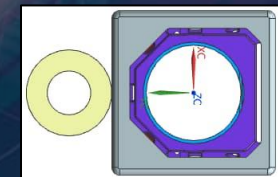
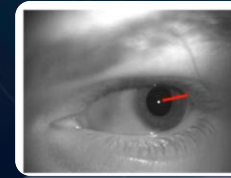
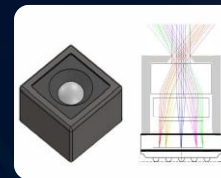
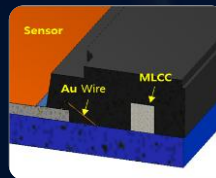
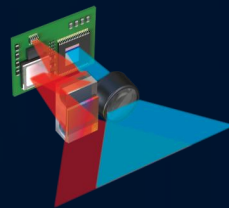
Micro Scale Formfactor

Lower Power



Lower Magnetic Interfering

Slim Formfactor



# Mobile Phone Camera Module



Galaxy S25 Ultra



Galaxy Z Fold7



## Mobile Phone Camera Module

Since 2004



Application for Samsung Mobile Phone

### Sensitive High Resolution RGB Module

- 40M AF FOV80D
- 12M UW AF FOV120D
- 50M AF FOV77D
- 108M Bi-Direction AF FOV85D

### Active Align RGB Module

- 13M FOV79D
- 32M FOV80D

### Multi Camera Module

- Dual : 13M AF + 5M UW & others
- Triple : 48M AF + 8M UW + 5M Bokeh & others

### IR Camera Module

- Infrared Recognition Camera

# Stereo & 3D ToF

## Embedded Sensor Modules

### Depth Sensing Module

- 3D TOF Solution
- System in Package
- Spot/Flood Illumination



### World View Camera

- Bigger pixel wide view
- Small Foot-print



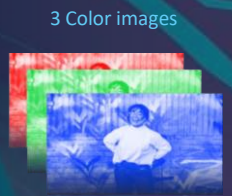
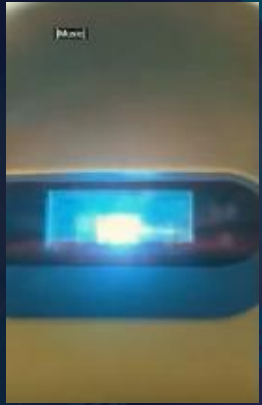
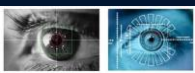
### Hand Tracking Camera

- Global Shutter
- Wide FOV
- Near IR



### Eye Tracking Camera

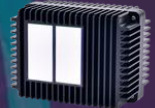
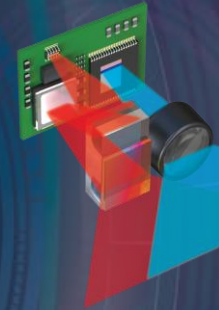
- Chip Scale Sensor Package
- Global Shutter
- Near IR



Standard RGB Sensor



Multispectral Sensor

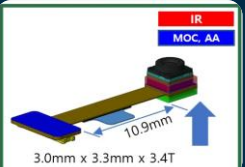
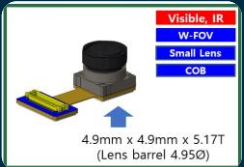
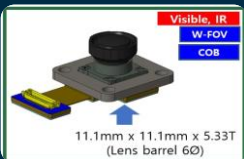
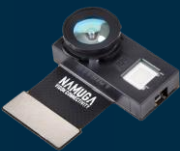


Stella120



Stella180

Since 2010



## TOF Camera Module

- QVGA ~ VGA FOV100D, 0.3m ~ 5m @error 2%↓
- QVGA ~ VGA FOV120D, 0.3m ~ 5m @error 2%↓
- Low Latency & Low Power Consumption
- Eye Safety Class 1

## IR Camera

- VGA Global Shutter, FOV160D, RGB ~ IR
- VGA Global Shutter, FOV150D, RGB ~ IR
- MOC / COB / Mini COB Applicable

## Multi Spectral Camera

- 0.55M 400nm ~ 850nm, 16CH
- World's Smallest Formfactor

## Lidar

- 120(H) x 90(V) , Up to 80m (72m@10%)
- 180(H) x 140(V), Ultra Wide Lidar
- HDR & Accurate Multi-Interference Avoidance

# Micro Actuator Technology

## Product Line-Up

- Diversified product line-up for various embedded camera modules
- Ensures compatibility with specific image sensors, lenses and control driver required by customer

### ■ 200MP H-OISA-A1

Image Sensor: 200MP 1/1.4" (~1.0")

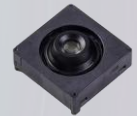
Control: Close-Loop (Internal Driver)



### ■ 48(50)MP H-OISA-R1

Image Sensor: 48(~50)MP 1/2.x"

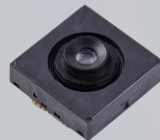
Control: Close-Loop (Internal Driver)



### ■ 64MP H-OISA-NX

Image Sensor: 64MP 1/1.7x"

Control: Close-Loop (External Driver)



### ■ TX Shutter Actuator for ToF Module

Ultra Low Power Consumption

Compact Size: 5.5X3.6X3.7mm



# Manufacturing Capability

- **Pilot-Line (Seongnam, Korea)**

Pilot production line set up at Korea HQ with automated processes for R&D activities, process improvements, and prompt response to customers' sample requests & production validation.

- Dedicated R&D and process engineering team supports and monitors the MP line



- **Mass Production Line (Phu Tho, Vietnam)**

Mass production line set up at Vietnam Factory.

- Automated main assembly line with 10 Class clean room environment



# Strategic Target Market

## VX



## Vision Connectivity

## Security



## Mobility



## Biomedical





# Thank You