



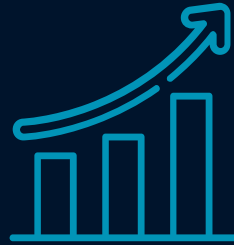
# Vision Connectivity



# 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

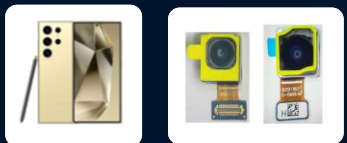
## Customer-tailored Design Capability

Designing and producing top-quality products that meet customer specifications

## Vision Technology

Extensive experience in camera module and 3D sensing technology

# Company Milestone



**SAMSUNG**

Started camera module supply  
NAMUGA's first TOF module developed



**SONY AIBO**

Supplied TOF module

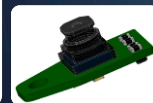


**SAMSUNG**

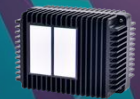
Started supplying 3D module  
to Robot Cleaner



Started supplying to WAYMO  
Extended R&D for Hybrid smallest OIS



**RealSense**



Stella120



Stella180

Supplied RealSense  
Launched LCM Series  
Launched Solid-State LiDAR series

2004

NAMUGA  
Founded

2010

Supplied 3D sensing module

2011



2017

Supplied TOF module

**SAMSUNG**



Galaxy S20

2019

2021

Best Innovation award by **SAMSUNG**  
Best quality award by **SAMSUNG**



2022

2023

Best Innovation award by **SAMSUNG**  
Launched 3D sensors for Robotics



2024



2025

Best Innovation award by **SAMSUNG**



# 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 (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 → 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
						

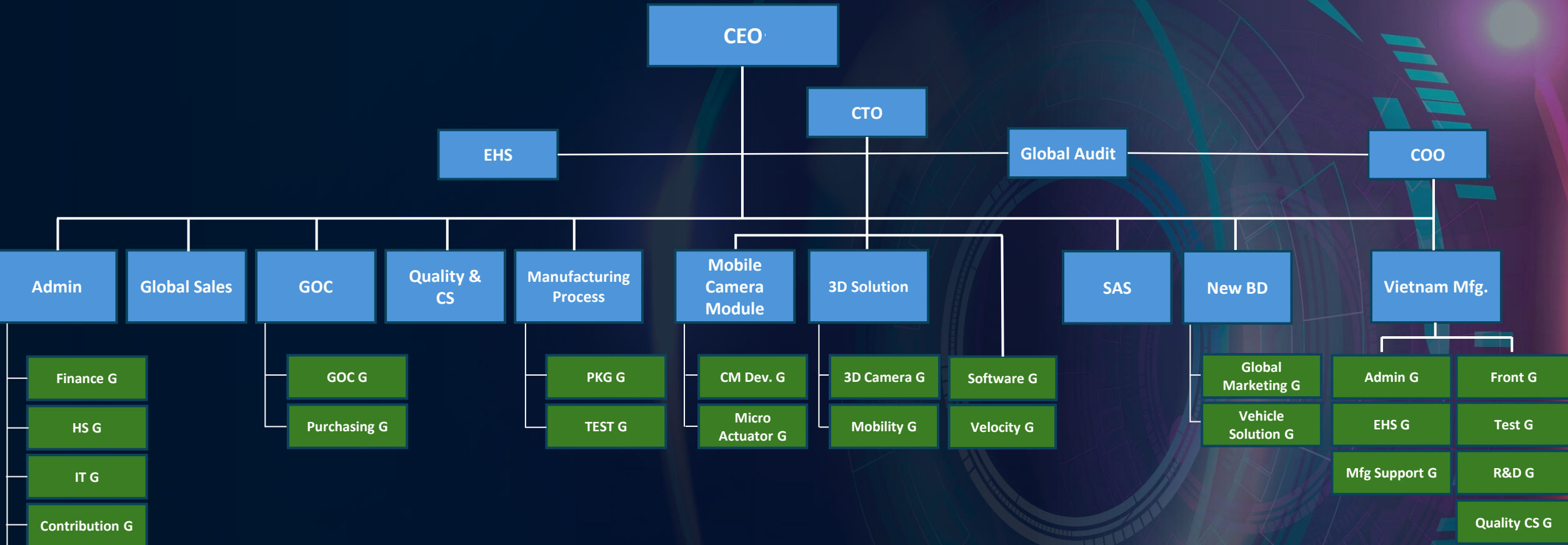
Maker	Name	Qty	Capa	
			UPH	Month
BESI ESEC	Die Attach	14	2,500	15,500,000
KNS	Wire Bonder	80	420	16,500,000
SSP	Housing Attach	16	1,250	15,500,000
ASM	Active Align	25	450	6,300,000
Total				15,500,000

## (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*

Min Lee  
SVP / New BD Leader

Jongsu Lim  
VP / VS Group

Nick Heo  
Senior Director/  
Global Marketing

Arthur Yoo  
Global Sales Manager

Vicki Nguyen  
Global Sales Staff

Eunbi Shikano  
Global Sales Staff

Alfred Oh  
SVP / SAS Leader

Wayne Kang  
VP / SAS



# 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

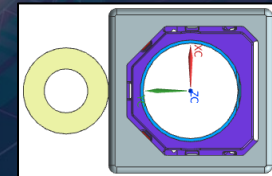
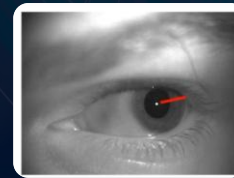
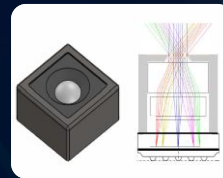
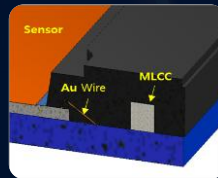
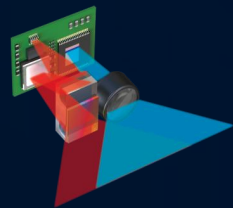
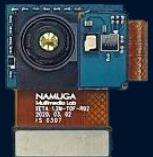
Solid State Lidar

Micro Scale Formfactor

Lower Power

Lower Magnetic Interfering

Slim Formfactor



# Mobile Phone Camera Module



## 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

### Multi Camera Module

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

### Active Align RGB Module

- 13M FOV79D
- 32M FOV80D

### IR Camera Module

- Infrared Recognition Camera

# Stereo & 3D ToF

## Embedded Sensor Modules

### Depth Sensing Module

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



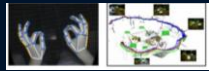
### World View Camera

- 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



3 Color images

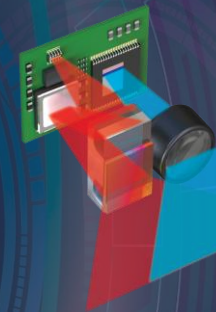
Multispectral images



Standard RGB Sensor



Multispectral Sensor

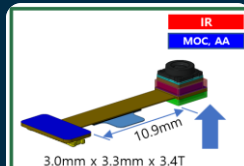
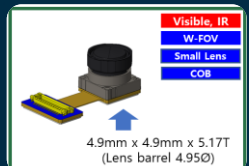
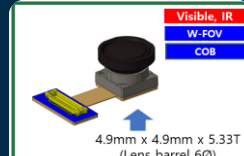
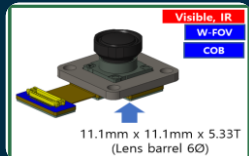
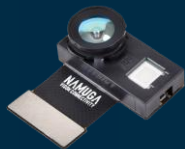


Stella120



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")

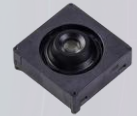
Control: Close-Loop (Internal Driver)



### 48(50)MP H-OISA-R1

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

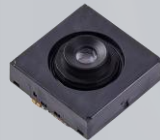
Control: Close-Loop (Internal Driver)



### 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**