The Lens Disappears, now

Your Need is our Goal

YNG

Title : YNG Invitation

Date : June, 2020

Presenter : CEO Hoyoung Song

Invisible Optical Technology

- Micro & Nano Surface Optical Elements
  - HAIR™
  - NAIL™
- Multi Level Optical Stacking Modules
  - SKIN™
  - CELL™

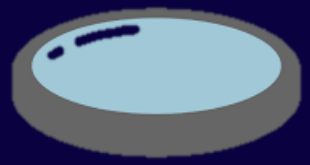
Visible Leading System

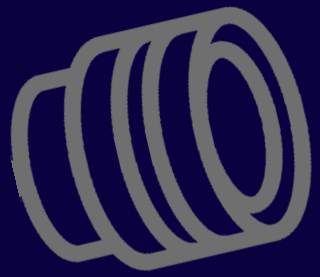
- Capabilities
- Adventures

Invisible Optical Technology

Conventional Optical Technology

Design	Geometry	Classical Method
Mold	Diamond Turning-Metal	Low Precision
Lens	Injection Molding	Low Productivity
Module	Single Lens Assay	Passive Function



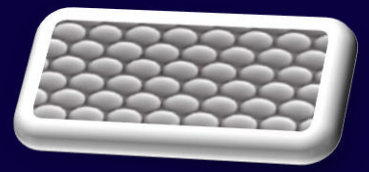


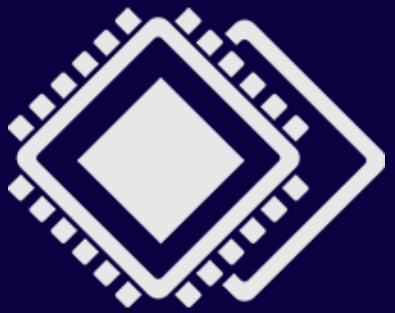
[Convenience]

- Thin
- Small
- Efficient
- Functional

Invisible Optical Technology

Geometry & Diffraction	Fusion Method
Photo Active-Polymer	High Precision
Imprint & Embossing	High Productivity
Level Stack & Integration	Active Function





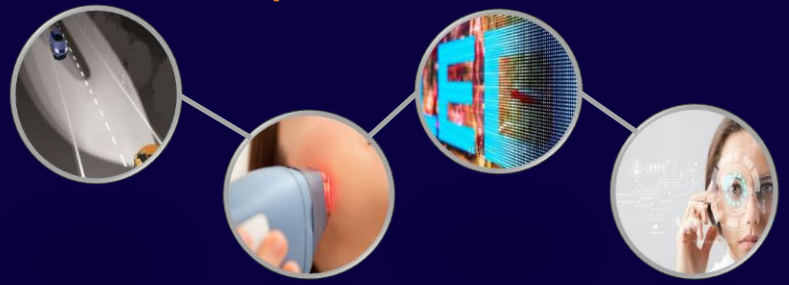
Invisible Optical Technology

Sensing

- Optical Camera
- Sensing Sys.
- Bio-medical Sys.

Lighting & Display

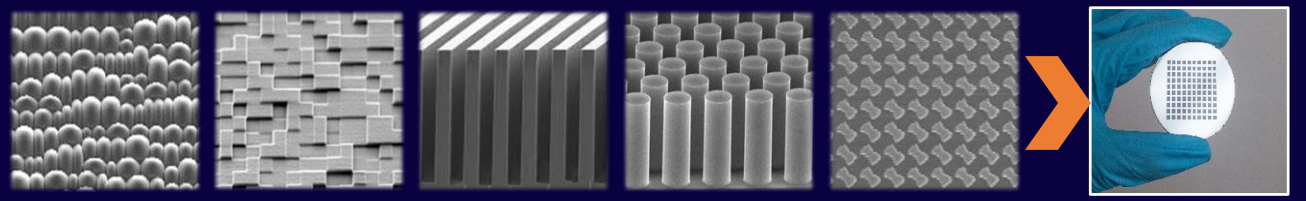
- LED & Laser illumination
- Next Gen. Display

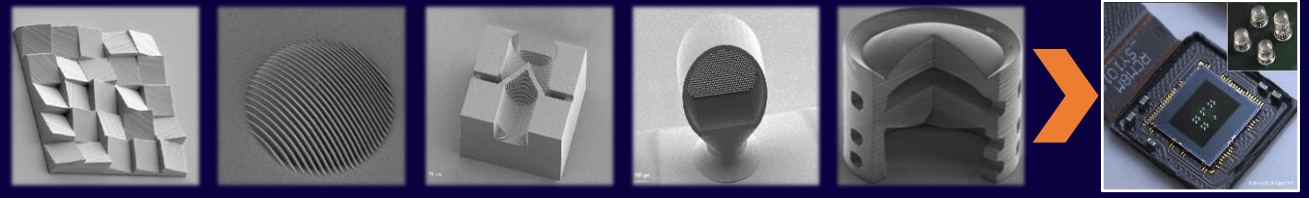


[Diversity]

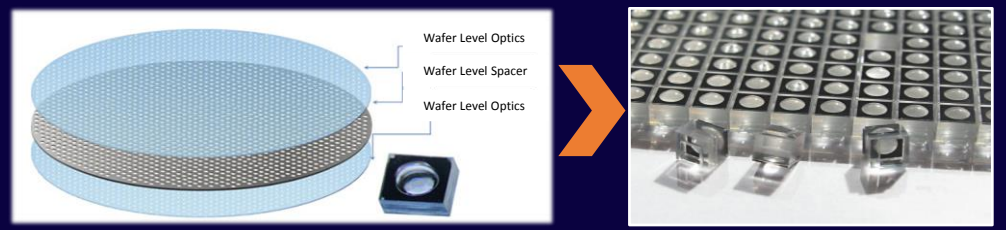
- Focusing
- Diffusing
- Filtering
- Splitting
- Shaping
- Collimating
- Reflection
- Dispersion

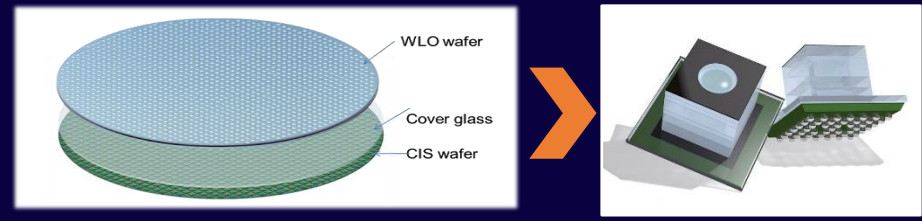
Micro & Nano Surface Optical Elements





Multi Level Optical Stacking Modules





Invisible Optical Technology

Scale
- Nano & Micro size

Process
- Chip/Wafer/Panel level
- UV Imprint & Hot Embossing

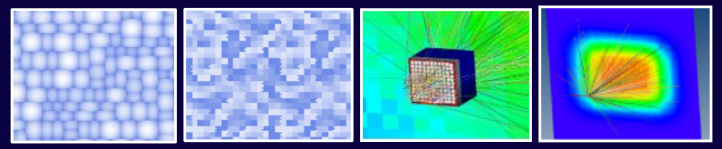
Material
- Polymer on Glass/Film…
- Polymer/Glass/Film /Compound…

Products
- Mold & Replication
- Discrete/Monolithic /Stack/Assay
- Single & Multi layer

[Innovation]
- Unique
- Quality
- Cost Priority

I. Surface Optical Elements Design

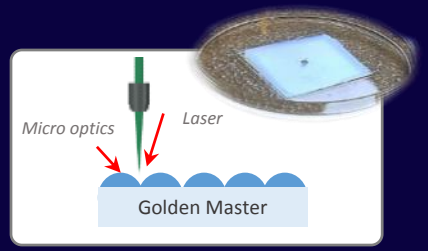
Unit Design/Randomizing
Shrinkage Modeling
Unit Array & Simulation



II. Golden Master Mold

Two Photon Polymerization
<100nm resolution

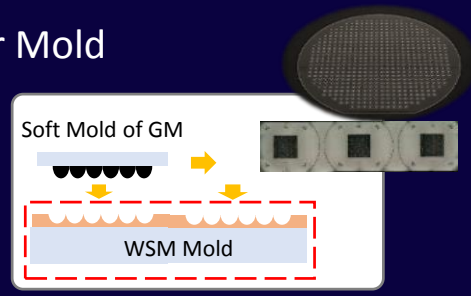
*Direct Writing on Wafer & Panel



III. Wafer Stamp Master Mold

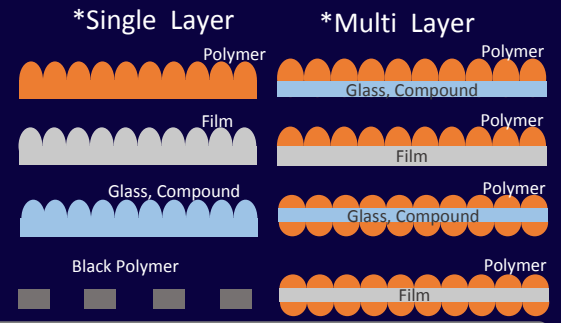
Step & Repeat
+/-5um pitch accuracy

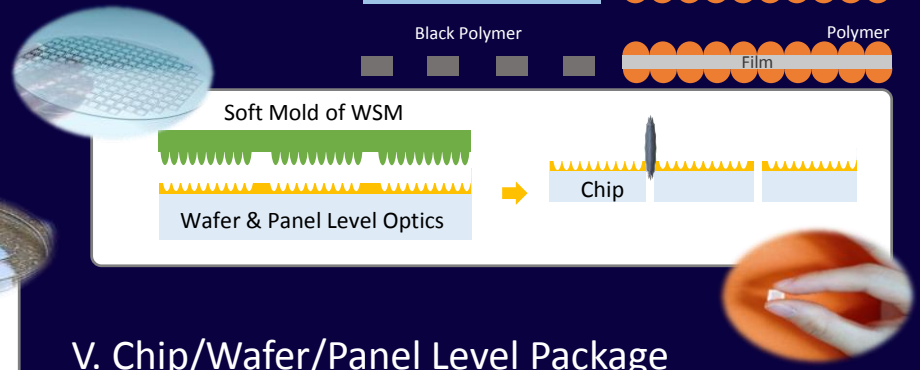
*Direct S&R on Wafer & Panel



IV. Wafer & Panel Level Optics

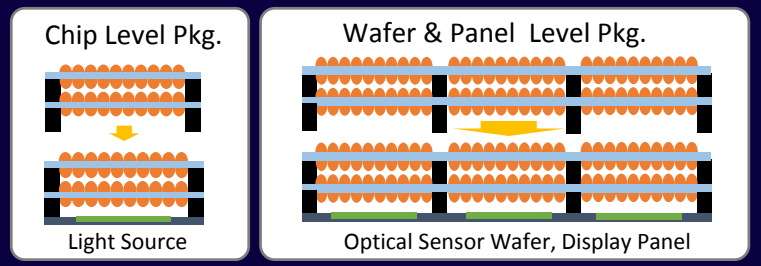
6 & 8inch size
UV imprint & Hot Embossing
Single & Multi Layer





V. Chip/Wafer/Panel Level Package

Align/Stack/Assay
Level Bonding Process
+/- 5um align accuracy

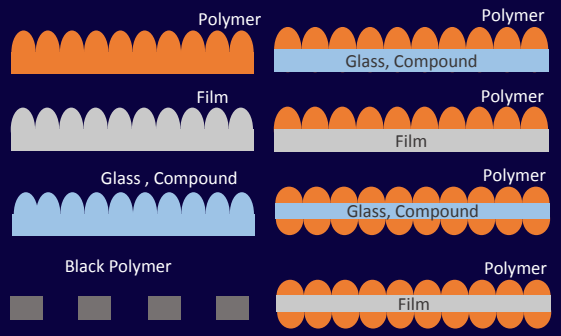


VI. Measurement & Shipment

Micro & Nano Surface Optical Elements

HAIR TM

Type : Discrete Devices



Feature :

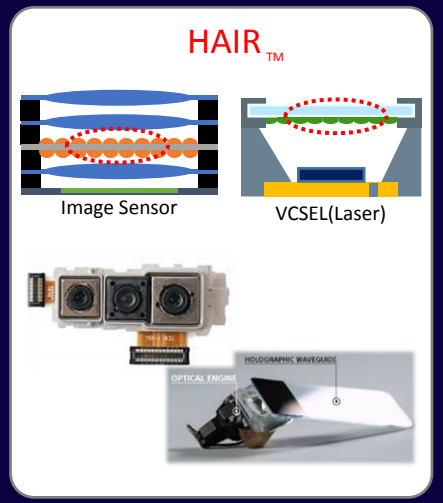
Array structure of optical units is available
Pseudo-random surface is available

Application :

Optics of Sensing receiver module
- Image & IR camera
- Bio-medical detector & Diagnosis sys.
- Various Optical Sensing sys.

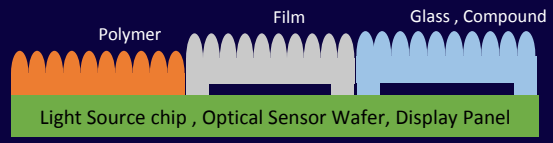
Optics of Lighting & Display module
- Face ID & 3D Sensing illuminator
- Wave guide of smart glass
- LED & Laser therapy sys.
- Head & Pattern lamp of automotive
- Various LED & LD Projection

Example :



NAIL TM

Type : Monolithic Devices



Feature :

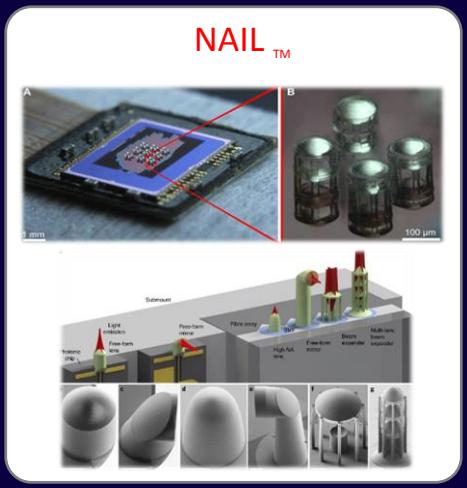
Array structure of optical units is available
Pseudo-random surface is available
Direct Writing or Bonding on Emitter & Receiver devices(Chip/Wafer/Panel) is available

Application :

Optics of Sensing receiver module
- Image & IR camera
- Bio-medical detector & Diagnosis sys.
- Various Optical Sensing sys.

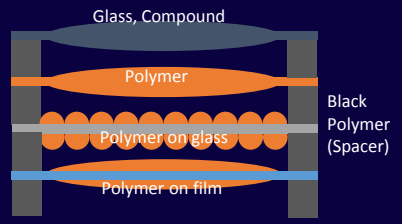
Optics of Lighting & Display module
- Face ID & 3D Sensing illuminator
- Wave guide of smart glass
- LED & Laser Therapy sys.
- Head & Pattern lamp of automotive
- Optical Communication
- Various LED & LD Projection

Example :



Multi Level Optical Stacking Modules

SKIN ™



Type : Discrete Modules

Feature :

Array structure of optical units is available
Pseudo-random surface is available
Multi Bonding & Stacking of Wafer(Panel) Level Optics is available

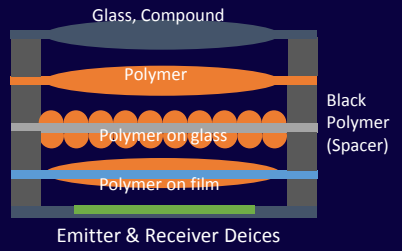
Application :

Optics of Sensing receiver module
- Image & IR camera
- Bio-medical detector & Diagnosis sys.
- Various Optical Sensing sys.

Optics of Lighting & Display module
- Face ID & 3D Sensing illuminator
- Wave guide of smart glass
- LED & Laser therapy sys.
- Head & Pattern lamp of automotive
- Various LED & LD Projection

Example :

CELL ™



Type : Integration Modules

Feature :

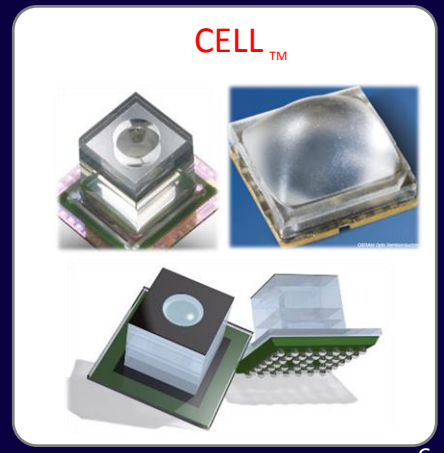
Array structure of optical units is available
Pseudo-random surface is available
Multi Bonding & Stacking of Wafer(Panel) Level Optics is available
Integration with Emitter & Receiver devices is available

Application :

Optics of Sensing receiver module
- Image & IR camera
- Bio-medical detector & Diagnosis sys.
- Various Optical Sensing sys.

Optics of Lighting & Display module
- Face ID & 3D Sensing illuminator
- Wave guide of smart glass
- LED & Laser therapy sys.
- Head & Pattern lamp of automotive
- Various LED & LD Projection

Example :



Visible Leading System

Capabilities

Cleanroom Facilities

- Area : 495m^2
- Line type : 6-8 inch
- Class 1,000 yellow room
- Product : HAIR, NAIL, SKIN, CELL
- Capacity : ~3,000 Wafer/Month

  3KK pcs/Month

YNG is a leading supplier of solutions for advanced optical components. Our main business is micro & nano optical design and simulation, prototyping, mastering, and mass production of optical components.

YNG has the experience and capability to design and fabricate custom orders, to prototyping and to mass production of micro and nano structured components.

YNG team have a highly skilled engineer to deliver high quality total solution.

Our main office located in Pyeong-taek city, Rep. of Korea.

Visible Leading System

Capabilities

Optical Simulation System 1

Micro optical element design

CPU: Xeon(R) E5-4669 v4 @ 2.20GHz

RAM: 1.0TB

Graphics: NVIDIA Quadro P5000

Optical Simulation System 2

Micro optical element design

CPU: Xeon(R) E5-4669 v4 @ 2.20GHz

RAM: 1.0TB

Graphics: AMD Radeon ™ Pro WX 7100

Optical Simulation System 3

Micro optical element design

CPU: Xeon(R) E5-4669 v4 @ 2.20GHz

RAM: 1.0TB

Graphics: AMD Radeon ™ Pro WX 9100

OpticStudio Zemax

Optics Studio 2013 (2 pcs)

Optical lens design (Geometrical)

Sequential ray tracing simulation

Illumination simulation

Optical performance verification

WYROWSKI VirtualLab FUSION FAST PHYSICAL OPTICS SOFTWARE

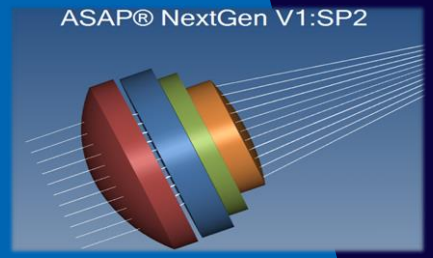
Virtual Lab Fusion (3 pcs)

Diffractive optical element design

Grating design and simulation

Diffraction based simulation

Optical performance verification



ASAP NextGen V1 (2 pcs)

Optical system simulation (Geometrical/Wave optics)

End-to-End performance verification

Stray-light/Ghost/Scattering analysis

SOLIDWORKS AUTODESK® NETFABB® MATLAB python™

Visible Leading System

Capabilities

Golden Master Mold : 2PP Machine

from Nano to Micro scale Fabrication

1inch ~ 4inch Si, Fused Silica, Glass Substrate

UV curable Special Material

Feature size: 100nm ~ 8mm

Wafer Stamp Master Mold : Step & Repeat Mach.

6inch, 8inch Wafer Mold Fabrication

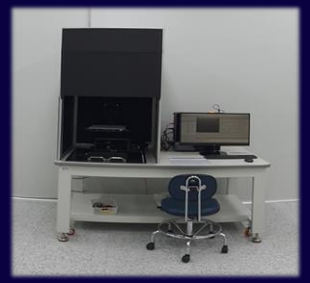
Stamp size: 6.25mm ~ 25mm sq.

QZ, Glass, Si substrate

XYZ linear stage & Vision Alignment accuracy +/-5um

Jetting type Dispenser: nL ~ uL dispensing

UV LED Light source / UV Curable material



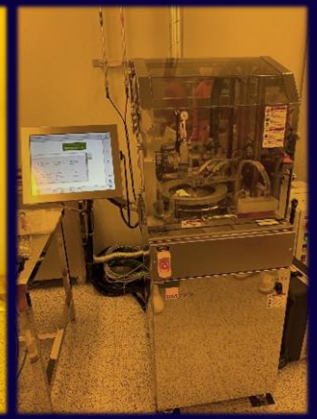
Measurement System

6-8inch Wafer level Tester

VCSEL, Laser source X-Y-Z axis

Field of View(FOV) H 120°, V 90 °

6inch ~ 8inch Wafer, PKG module



Wafer & Panel Level Optics : Micro & Nano Imprint Sys.

Mask Aligner (TSA/BSA): Alignment accuracy +/-1um

Residual layer thickness uniformity 5%

Wafer size up to 8inch, Qz, Glass, Si, Film Substrate

Spin coating system: Thickness uniformity < 3%

WEC(Wedge error compensation) function

/ Contact and proximity exposure

Soft stamp on glass/film carrier

UV LED 365nm 100mW / UV Curable Polymer

Visible Leading System

Adventures

Future

2023

G

Invisible
Camera sys.

? Pandora

YNG Identity

Visual Information

Recognition Data

2021

N

Advanced System Tech

Now

Multi Level
Optical Stacking Modules

SKIN™

CELL™

2017

Y

Applied Optical Module Tech

Micro & Nano
Surface Optical Elements

HAIR™

NAIL™

2010

Core Optical Device Tech

The Future is Now

Your Need is our Goal

YNG

Thank you!