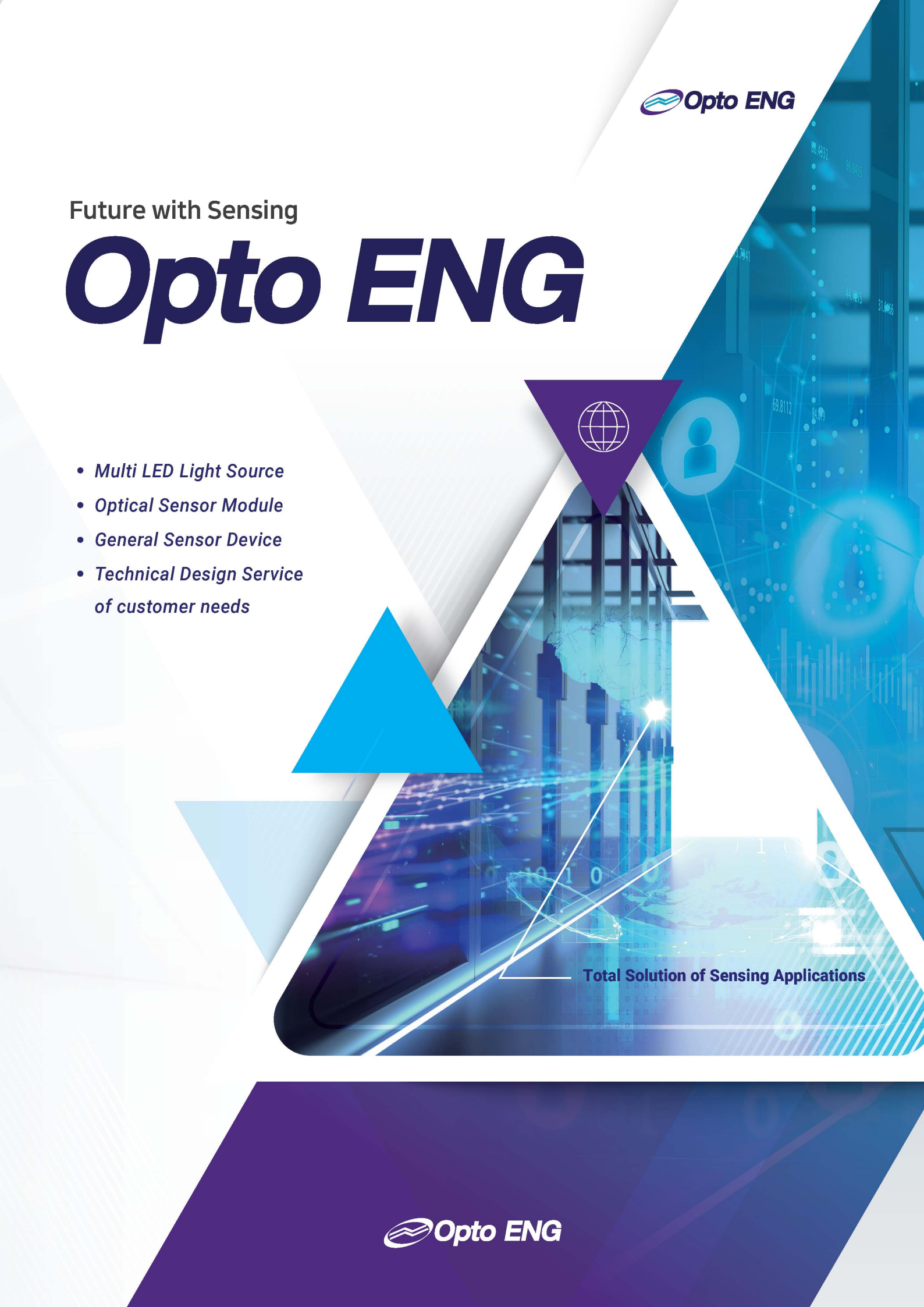


Future with Sensing

Opto ENG

- *Multi LED Light Source*
- *Optical Sensor Module*
- *General Sensor Device*
- *Technical Design Service of customer needs*

The background features a large, abstract composition of overlapping triangles in shades of blue, purple, and white. A central, large triangle contains a detailed image of a server rack with glowing blue lights and data patterns. To the right of this central triangle, there is a smaller purple triangle containing a white globe icon, and another light blue triangle containing a white person icon. The overall aesthetic is high-tech and futuristic.

Total Solution of Sensing Applications

Opto ENG Inc.

“ Optoelectronics and Sensing fields ”

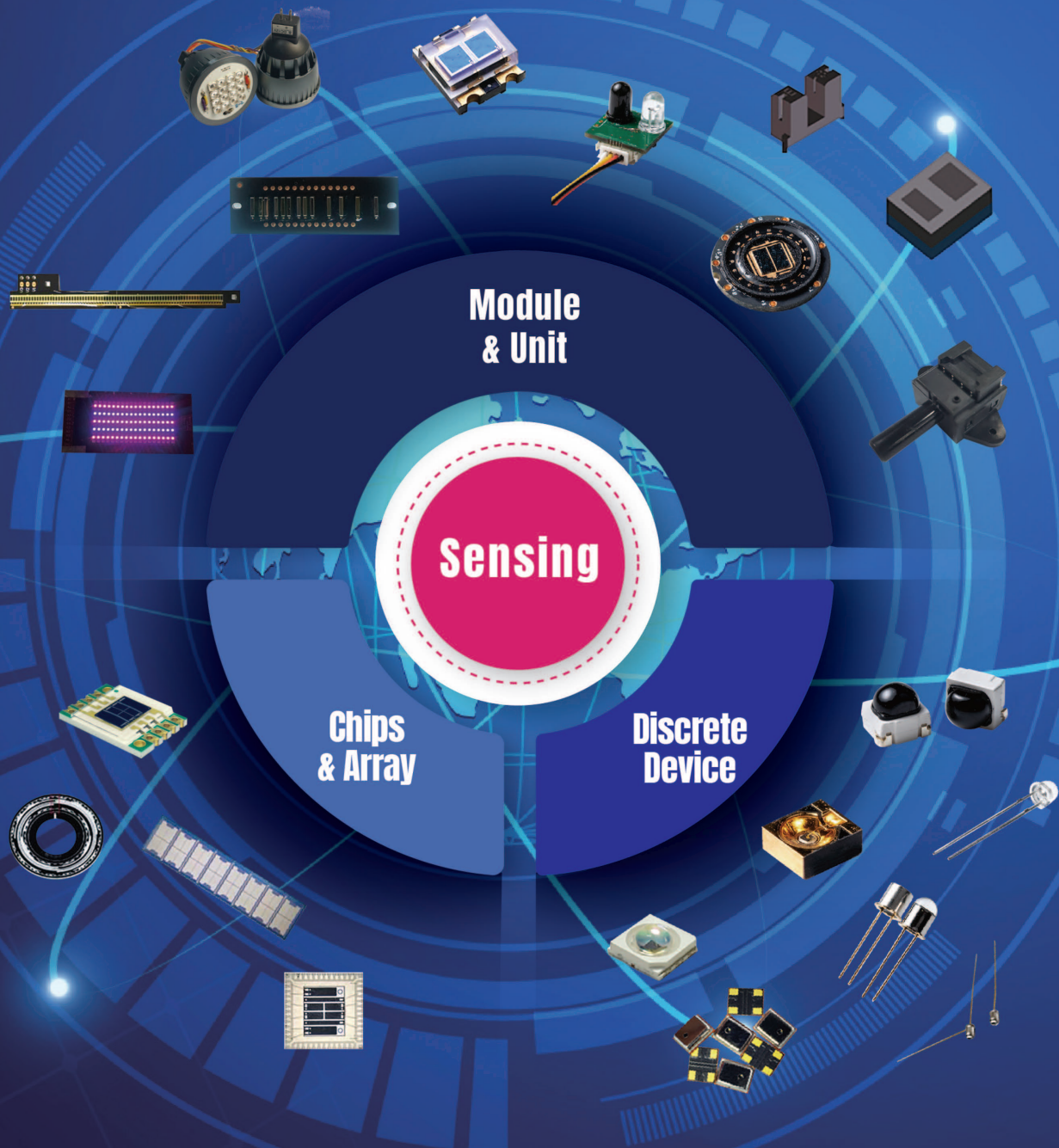
Opto ENG Inc., was established for the purpose of providing the differentiated products of Multi LED light source with Ultraviolet, Visible, Infrared rays and Opto Sensor modules of optoelectronics for customer needs, and a variety of sensors of consumer/industrial sensing fields.

Our company are supporting a variety of services reaching to the customer design and development, manufacturing and application technology service in regard to multi-convergence fields –

Medical and Healthcare,
IoT & ICT Application Solution,
Smart and Portable,
Agro-Fisheries and Industrial,
and New Application Appliances with Eco-friendly.

Our company will continuously provide new technologies and products responding to changes in customer and market trend requirements.

Yong-Min Chung | CEO



Optical Sensing Device & Module

- Multi LED Light Source
- Emitter & Detector for Sensing
- Photo Interrupters
- Optical Rotary Encoders
(Emitter, Photodiode Array, Photo ICs)
- Optical Chips & Array
(Photo Device Chips & Array, Modules)

General Sensing Device & Module

- Vibration-Water Level Combo Sensor
- Humidity, Pressure & Temperature Sensor
- Gas sensor
- MEMS MIC
- AFE & Format Converter
- Switching ICs

Multi LED Light Source

UV LED : UV C/B/A(250~400nm), Visible LED : 400 ~ 700nm, Infrared LED(700 ~ 1700nm)

Package Types

Plastic, SMD, Metal Can, Customer Package

Applications

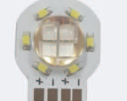
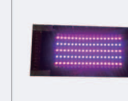
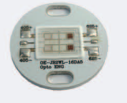
Sterilization & Disinfection, Money Counter & Counterfeit Detectors, Irradiator, Whitening Teeth for Dental, Pattern Recognition, Medical Fluorescent Imaging, Wearable, Agriculture and Fisheries, Human Blood Flow, Touch Panel, Pattern Recognition, Smoke Detection, Robot, Banking, Industrial, Safety & Security, Consumer Appliances

Line Up

Discrete

									
1608 405nm 2mW	2014 405nm 3mW	2835 405nm 80mW	3535 405nm 90mW	Φ5, Metal 365nm 4mW	Φ5, Plastic 385nm 1.7mW	2835 460nm 80mW	3628 660nm 15mW	5050 660nm 20mW	5050 R,G,B 0.5W
									
2.3x1.95 Dimple 850nm	7x6 High Power 860nm	Φ3, Φ5 Plastic 850~1700nm	Φ5 Metal 310~1700nm	2014 UV~IR	3020 UV~IR 0.5W	2835 High Power UV~IR	3528 UV~IR	5050 High Power UV~IR	

LED Array

							
5050, 6Pin 6WL SW +/-	Φ13 B+W 20W	22x8 405, 460nm 6W	70x13 460nm 10W	4x5, 6P High-D 4WL Each 30mW	Flexible PCB 3WL	50x50 4WL Each 1W	MR16 4WL AC/DC12V
							
Φ16 5WL, 4PD High-D	(CP)Metal 405nm /625nm	(CP)Metal 405nm x 4 (20W)	(CP)Metal 405, 430, 460nm	Φ5, White 3.5~6.5K/CCT	Φ12, White 3.5~6.5K/CC	Φ10 660+W High Power	

Emitter & Detector for Sensing

PLCC & COB Types

Device	Type	Package	Half Angle [deg.]	Remark
OE-LT9440	IRET	PLCC	$\pm 32/12^\circ$	SMD, Side-View/Top-View
OE-DT1040	Photodiode	PLCC	$\pm 40/35^\circ$	SMD, Side-View/Top-View
OE-L1206C-L110	IRET	COB	$\pm 10^\circ$	SMD, Top-View
OE-D1206B-L110	Photo TR	COB	$\pm 10^\circ$	SMD, Top-View

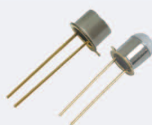
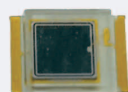


Side View Types

Device	Type	Package	Half Angle [deg.]	Remark
OE-LT9413	IRET	Side View	$\pm 10^\circ$	Normal, Clear EMC
OE-DT2013	Photo TR	Side View	$\pm 10^\circ$	Normal, Clear EMC
OE_LT9423	IRET	Side View	$\pm 10^\circ$	Normal , Hoa=2.9mm
OE-DT2023(B/C)	Photo TR	Side View	$\pm 10^\circ$	Normal , Hoa=2.9mm
OE-DT5123	Photo IC	Side View	$\pm 20^\circ$	
OE-DT5923	Photo IC	Side View	$\pm 20^\circ$	
OE-DT2086-8B	Dual Photo TR	Side View		Dual P-Tr , Vertical, Pitch=0.62mm
OE-DT2086H-8B	Dual Photo TR	Side View		Dual P-Tr, Horizontal, Pitch=0.62mm

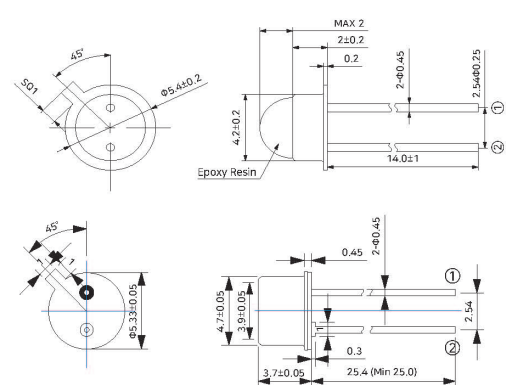
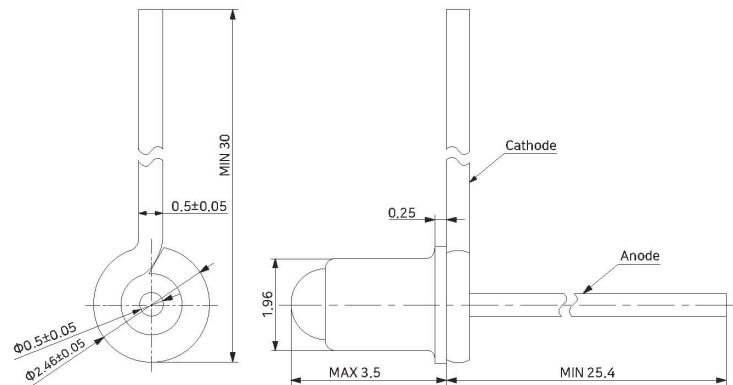
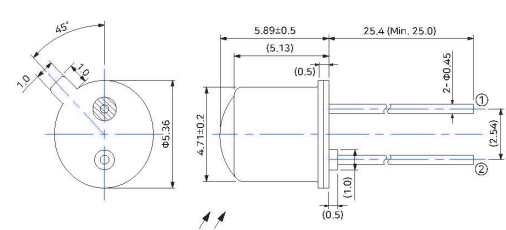
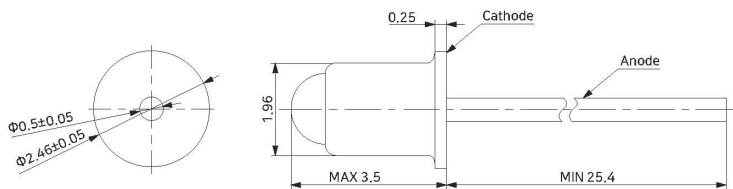


Photo Detectors

				
$\Phi 3, \Phi 5$ Plastic, PD, PTR 450~1050nm	$\Phi 3, \Phi 5$ Plastic, PD, PTR 700~1050nm	$\Phi 5$, Metal PD, PTR 450~1650nm	5.4x4.2 SMD High S.PD 450~1050nm	5.4x4.2 SMD High S.PD 700~1050nm

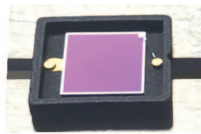
Metal Can Types

Device	Type	Package	Half Angle [deg.]	Remark
OE-NL8570	IRED	Metal CAN	$\pm 25^\circ$	Mini Package
OE-NL8570L	IRED	Metal CAN	$\pm 25^\circ$	Mini Package, L-type Electrode
OE-D1070	Photodiode	Metal CAN	$\pm 25^\circ$	Mini Package
OE-D1070L	Photodiode	Metal CAN	$\pm 25^\circ$	Mini Package, L-type Electrode
OE-D2070	Photo TR	Metal CAN	$\pm 25^\circ$	Mini Package
OE-D2070L	Photo TR	Metal CAN	$\pm 25^\circ$	Mini Package, L-type Electrode
OE-L9410	IRED	Metal CAN	$\pm 30^\circ$	
OE-L8503	IRED	Metal CAN	$\pm 5^\circ$	Narrow Beam
OE-L6631	RED	Metal CAN	$\pm 2^\circ$	Supper Narrow , Red
OE-L4631	BLUE	Metal CAN	$\pm 2^\circ$	Supper Narrow , Blue
OE-L4630	BLUE	Flat CAN	$\pm 50^\circ$	Blue Lighting



Wide Photodiode Types

Device	Type	Package	Remark
OE-D1045	Photodiode	Metal	Active Area: 4.5 x 4.5mm
OE-D1055	Photodiode	Metal	Active Area: $\varnothing=5.0\text{mm}$
OE-D1033	Photodiode	Metal	Active Area: 3.0 x 3.0mm
OE-D1033H	Photodiode	Metal	Active Area: 3.0 x 3.0mm
OE-D1510	Photodiode	Ceramic	Active Area: 6.0 x 6.0mm
OE-D1566	Photodiode	Ceramic	Active Area: 4.8 x 9.8mm



Detector Types (PSD & Dual Photodiode, APD, LTV)

Device	Type	Package	Remark
OE-PD0248, OE-PD0248H	PSD	COB	Super Mini Package, PSD
OE-D1211C-1019	Photodiode	COB	Dual PDs, Small Size
OE-PD3220-FT	Photodiode	COB	Large PDs
OE-DT4001	APD	COB	Gain=100, SMD , Top-View
OE-DT4002	APD	Metal Can	Gain=100, Under Development
OE-DT4003	APD	Ceramic	Gain=100, Under Development
OE-D5010-G	LTV	Metal Can	Spectral Responsivity=300~1100nm
OE-D5010-F	LTV	Metal Can	Spectral Responsivity=450~550nm
OE-D5010-UV	LTV	Metal Can	Spectral Responsivity=330~410nm

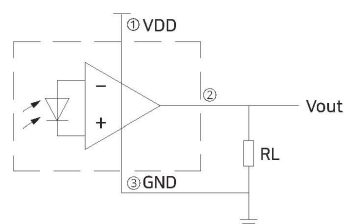
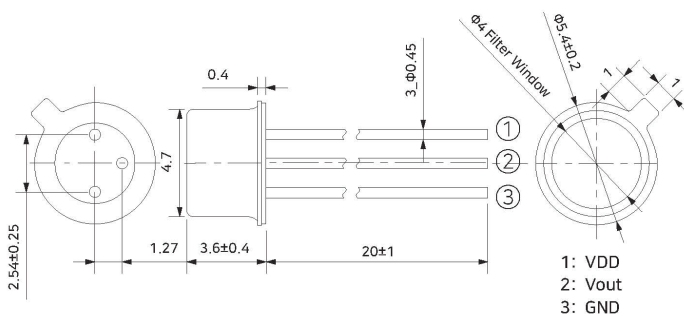
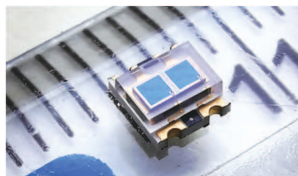
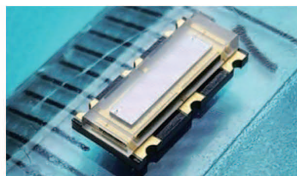
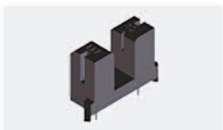


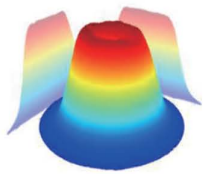
Photo Interrupters

Device	Type	Photo	Gap	Remark
OE-IR1102BC	Reflector		-	Ceramic
OE-IR2001S	Reflector		-	Supper Small Size ; Reflow
OE-IR3027	Reflector		-	Small Size
OE-IR3220	Reflector		-	Low Cost
OE-IR1024F	Transmitter		2.0mm	F Type
OE-IR2106D	Transmitter		5.0mm	With Holding Ball
OE-IR3001	Transmitter		5.0mm	Waterproof
OE-IR3002F	Transmitter		2.3mm	F Type
OE-IR3010	Transmitter		10.0mm	Wide Gap
OE-IR3403	Transmitter		3.0mm	Small Size

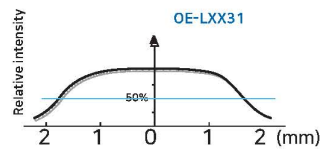
Optical Rotary Encoders

LEDs

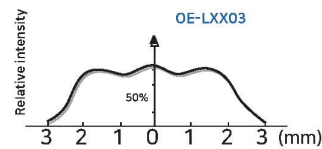
Device	λ_p (nm)	Po (mW)	Half Angle [deg.]	Remark
OE-L8503	850	3.9	$\pm 5^\circ$	Near parallel light 4.5mm spot
OE-L6631	660	2.7	$\pm 2^\circ$	Parallel light 3.5mm spot
OE-L4631	460	2.6	$\pm 2^\circ$	Parallel light 3.5mm spot Ultra high brightness, High reliability
OE-L4631H	460	1.5	$\pm 2^\circ$	Super parallel light 3.5mm spot



Radiant pattern

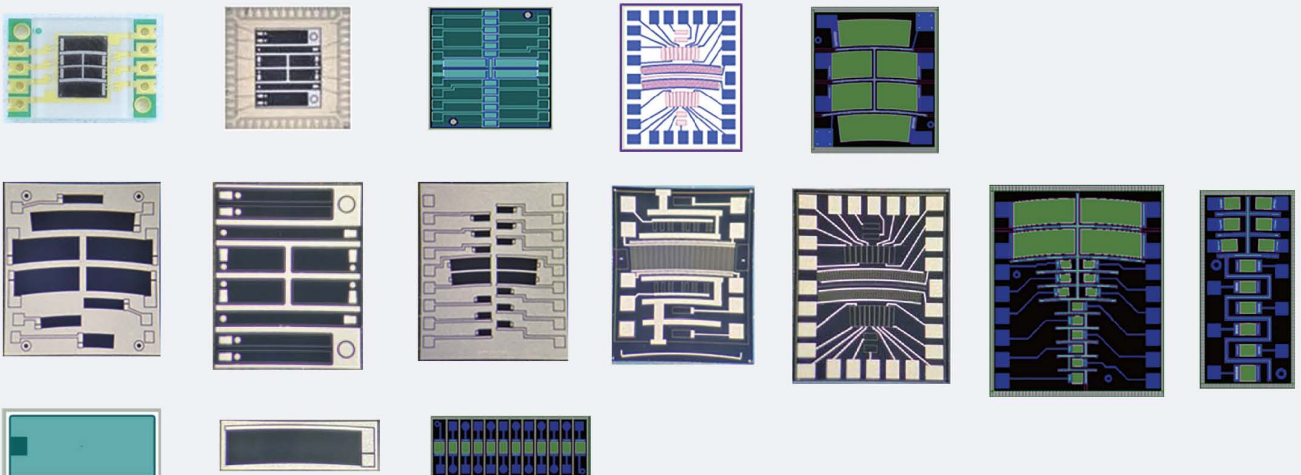


Radiant pattern



Photodiode Arrays (Chips)

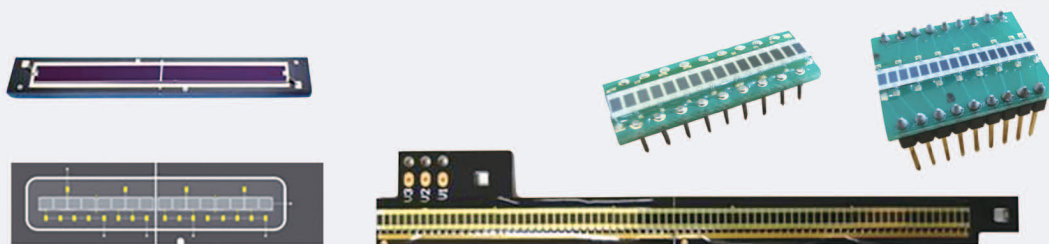
Device	Cell	Chip size	Features	Light Source
OE-PD6311	6 Cells	4.0*4.0mm	Universal , abz	OE-L8503, OE-L6631
OE-PD6312	6 Cells	4.5*4.5mm	Universal , abz	OE-L8503, OE-L6631
OE-PD-SM01	10 Cells	4.6*4.9mm	Servo, abz, uwv, Ref	OE-L8503
OE-PD-ET06	6 Cells	0.62mm * 6	6-PTR, Straight line	OE-L8503
OE-PD-ET10	10 Cells	0.62mm * 10	10-PTR, Straight line	OE-L8503
OE-PD-M512	-	mm	Absolute	OE-L8503



Optical Chips & Array Module

LEDs

Device	Cell	Size	Remark
OE-PD3220-FT	2 cells	40mm	2-channel symmetry
OE-PD1601-BD	16 cells	40mm	4-channel symmetry (3 + 5 Vs 5 + 3 parallel)
OE-PD1625-BD	16 cells	25mm	16 channels of individual control, support for digital output
OE-PD1640-BD	16 cells	40mm	2-channel symmetry (8PDs per channel in parallel)
OE-PD8012-BD	80 cells	120mm	2-channel symmetry (40PDs per channel in parallel)

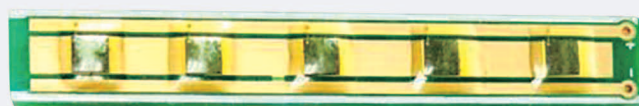


Photodiode Array Module

Device	Cell	Active Size	Remark
OE-PD4650	1 cell	4.6 x 50 mm	Customer Design Package



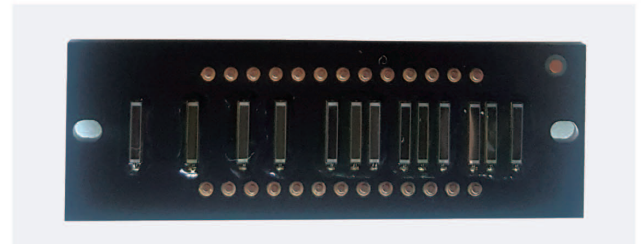
OE-PD0510	5 Cells	3 x 3 mm 5 Ponit	Pitch = 9.2mm
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General Chips & Array Module

Spectrum Analyzer Sensor Module

UV enhanced Silicon Photo Diode Array module mounted on PCB Ass'y for Biochemical Analyzer through Spectrum Analysis.



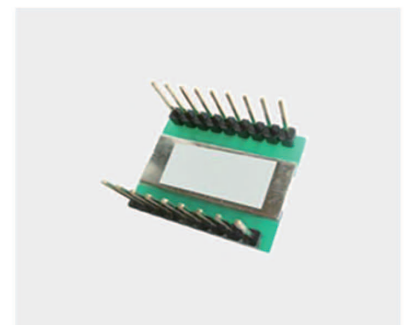
Parameter	Symbol	Condition	Min	Typ	Max	Units
Active Area	S		--	1.1 x 5.9		mm
Spectral Sensivity	λ		--	280 - 1100		nm
Sensivity 1	S1	$\lambda=340\text{nm}$	0.15	0.17		A/W
Reak Wavelength	λ_p		--	680		nm
Sensivity 2	S2	$\lambda=680\text{nm}$	0.5	0.55		A/W
Short Circuit Current	Isc	100lx, 2856K	4	5		μA
Dark Current	Id	$V_R=10\text{V}$	--	---	75	pA
Rise Time	tr	$V_R=0\text{V}, R_L=1\text{K}\Omega$ $\lambda_p=680\text{nm}$	--	0.2		μs
Terminal Capacitance	Ct	f=10kHz	--	70	110	pF

X-Ray Detecting Sensor Module

X-ray detecting module, combined by an array of 16 elements high sensitive, high speed and low dark current, good uniformity silicon photodiodes and scintillator, mounted on PCB

Features

- 16 silicon photodiodes array
- Active cell area : .02mm×1.30mm
- Pitch of active cell : 1.575mm
- Spectral sensitivity: 330~1100nm
- Peak wavelength: 550nm
- Supports dual energy imaging



Ice Cube Sensor Module

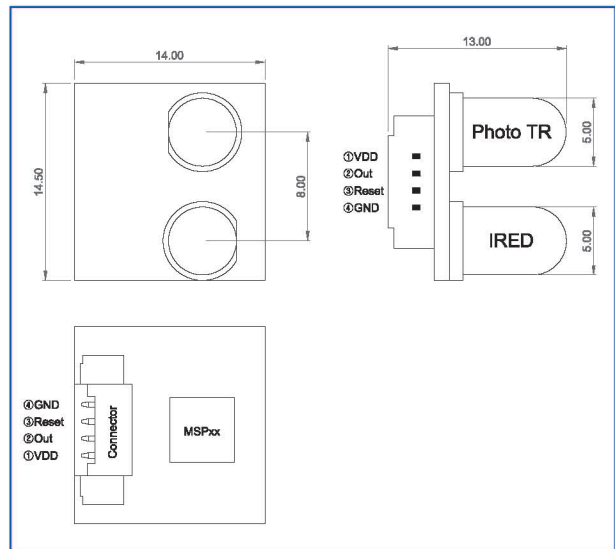
Composite opto sensor module applied $\Phi 5\text{mm(T-13/4)}$ of infrared LED and photo transistor, MSP of signal processing for detecting ice cube quantity in the tray.

Applications

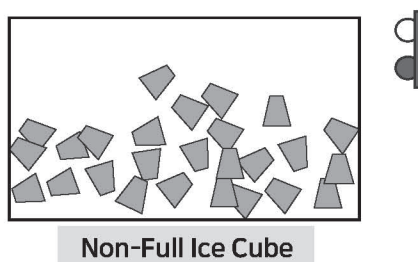
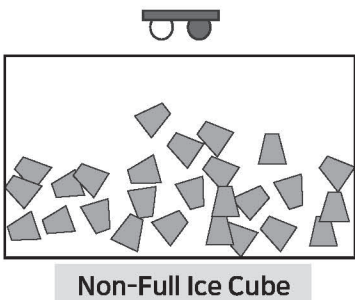
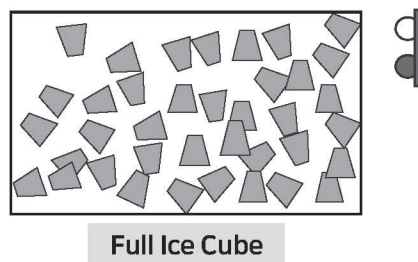
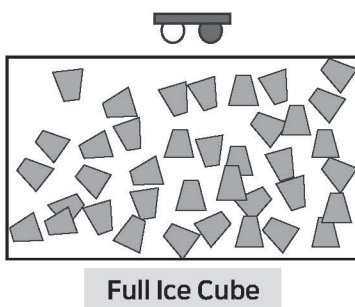
- Refrigerator, Water Purifier
- Object Detection
- FA & Security, Medical Appliances



- ① VDD (1.8 ~ 3.6V) ② OUT : Active 'Low'
③ Reset : Active 'Low' ④ GND



Items	Symbol	Condition	Min.	Max.	Unit
Supply Voltage	VCC		1.8	3.6	V
Detection Distance	L		3	100	mm



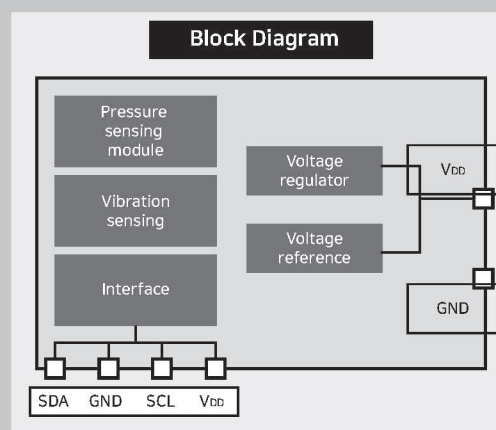
Vibration-Water Level Composite Sensor

OKS-M201

OKS-M201 is a semiconductor digital sensor module consisting of sensors that can detect vibration and pressure. Conventional mechanical water level sensors simply measure the level of the top, middle, and bottom of the washing machine tank, while semiconductor water level sensors have high level detection precision of within 2mm. In case of washing machines, water usage can be optimized according to the amount of laundry through the installed level sensor. In addition, the washing machine can detect vibrations in the event of a laundry tank vibration to minimize impact inside the washing machine, thus saving water, improving energy efficiency, and improving durability.

General Design Features

- Module Size : 16 x 38 x 28.7 mm³
- Supply Voltage : Typ. 5.0V (4.5 ~ 5.5V)
- Digital interface : I²C Compatible
- Operation Range
 - Temperature : -40 ~ 85°C
- Vibration performance
 - Range : Accel.[±2~16g],
Gyro[±125~2,000DPS]
 - Resolution : 16 bit
- Pressure performance
 - Range : 0 ~ 1,000mmH₂O
 - Resolution : 16 bit
 - Accuracy : ±2mmH₂O



Typical Applications

- Consumer electronics : Wash machine, Wash Dry machine, Air-con, etc

※ Products cooperated with OKINS Electronics Co.

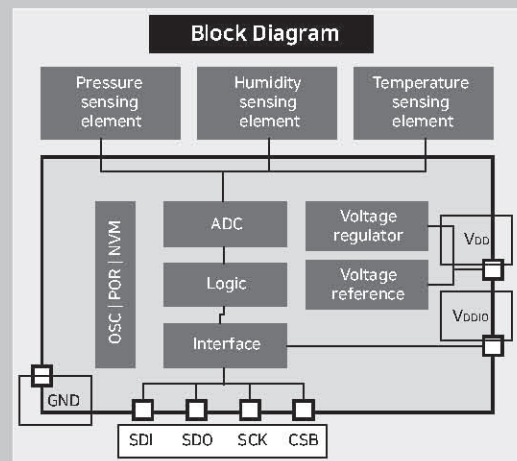
Humidity, Pressure & Temperature Sensor Module

| OKS-M301

OKS-M301 is a digital sensor module consisting of humidity, pressure and temperature sensors. The humidity sensor in this sensor module provides information with fast response and high accuracy over a wide range of temperatures. The pressure sensor is an absolute barometric pressure sensor with excellent absolute accuracy and resolution and low noise. The temperature sensor is optimized for the lowest noise and highest resolution, it is used for temperature compensation for pressure and humidity sensors, and can also be used for ambient temperature measurement. Depending on the purpose of use, humidity sensors and pressure sensors can be activated and deactivated independently.

General Design Features

- Module Size : 25 x 10 mm (PCB Based)
- Supply Voltage : Typ. 5.0V (4.5 ~ 5.5V)
- Digital interface : I²C (up to 3.4MHz)
- Operation Range
 - Temperature : -40 ~ 85°C
 - Humidity : 0 ~ 100% Rel. Humidity
 - Pressure : 300 ~ 1100hPa
- Humidity Sensor
 - Response time : 1sec
 - Accuracy tolerance : ±3% Relative humidity
 - Hysteresis : ±1% Relative humidity
- Pressure Sensor
 - Accuracy : ±1.0 hPa(Absolute, 300...1100hPa, 0...65°C)
±0.12 hPa(Relative, 700...900hPa, 25...40°C, V_{DD}=3.3V)
 - RMS Noise : 0.2Pa, equiv. to 1.7cm
 - Offset temperature coefficient : ±1.5pa/K, equiv. to ±12.6cm at 1°C temperature change
- Temperature Sensor
 - Accuracy temperature : ±0.5°C (@ 25°C),
±1.0°C (@ 0...65°C)
 - Output resolution : 0.01°C (API output resolution)



Typical Applications

- Consumer electronics : Wash machine, Wash Dry machine, Air-con, Air cleaner, etc
- Home automation control : Control Heating, Venting, Air conditioning (HVAC)

※ Products cooperated with OKINS Electronics Co.

Gas Sensor

Based on Metal Oxide semiconductor and MEMS Technology

INOZ-A400



Compact / High sensitivity / Low power consumption, MEMS MOS TVOCs

INOZ-A400 is a gas sensor based on MOS(Metal Oxide Semiconductor) and MEMS technologies. It is an ultra-low power analog sensor for monitoring indoor air quality including VOCs(Volatile Organic Compounds) associated with harmful chemicals.

General Design Features

- Sub-ppm(ppb) range
- Power consumption
- Small package

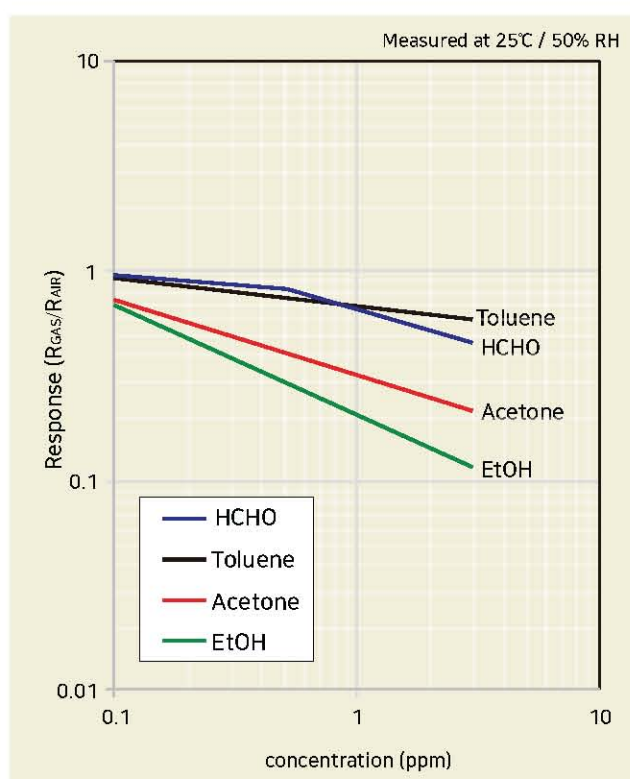
** Package type(size, material...) can be changed according customer needs.

Detecting Gases

- VOCs
- Formaldehyde(HCHO) : 0.1 ~ 100 ppm
- Toluene(C_7H_8) : 0.1 ~ 100 ppm
- Acetone(CH_3COCH_3) : 0.1 ~ 100 ppm
- Ethanol(C_2H_5OH) : 0.1 ~ 100 ppm

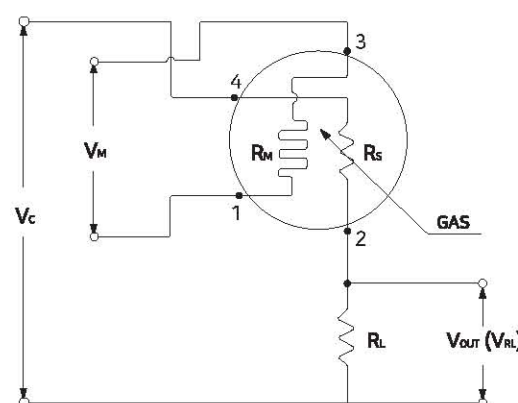
Typical Applications

- Indoor AQM(Air Quality Monitoring)
- Air cleaner / Air Purifier
- T-VOCs monitoring



Specifications

- Heater Voltage (V_H) : $1.8V \pm 2\%$
- Circuit Voltage (V_C) : $2.5V \pm 2\%$
- Load Resistance (R_L) : Variables($2k\Omega \sim 10k\Omega$)
- Heater Resistance (R_H) : $\sim 90\Omega \pm 5\%$
- Sensor Resistance (R_S) : $10 \sim 500k\Omega$ in air
- Heater Current (I_H) : 10mA
- Heater power Consumption (P_H) : 18mW
- Operation Temperature range ($^{\circ}C$) : $-10 \sim 50$
- Operation Humidity range (RH%) : $10 \sim 90$
- Storage Condition ($^{\circ}C$) : $-40 \sim 85$



※ Products cooperated with OKINS Electronics Co.

Opto ENG Inc.

HQ / Factory

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20-13 Cheomdan Venture so-ro 38beon-gil, Buk-gu, Gwangju, Korea 61007

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