

InGaAs PIN photodiode arrays

G12430 series

16/32/46 element InGaAs array for near IR detection

The G12430 series is one-dimensional InGaAs PIN photodiode array in a ceramic DIP (dual inline package). It can be used to perform simple spectroscopic analysis.

Features

- 16, 32, or 46 element array
- Designed for simple measurement
- Large photosensitive area size

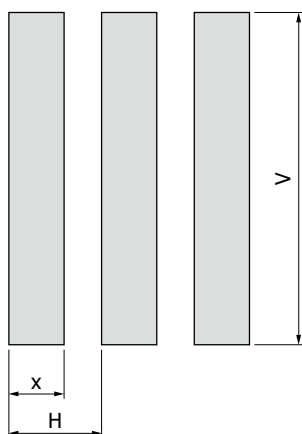
Applications

- NIR spectrophotometers

Structure

Parameter	G12430-016D	G12430-032D	G12430-046D	Unit
Cooling	Room temperature type			-
Number of elements	16	32	46	elements
Elements size	0.45 × 1	0.2 × 1		mm
Element pitch	0.5	0.25		mm
Package	18-pin ceramic DIP	40-pin ceramic DIP	48-pin ceramic DIP	-
Window material	Borosilicate glass			-

Details of photosensitive area



Number of elements	x	H	V	Unit
16	0.45	0.5	1	mm
32	0.2	0.25		
46				

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Static electricity can damage or degrade the G12430 series. Use caution when handling.

Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Reverse voltage	V _R max.	5	V
Operating temperature	T _{opr}	-20 to +70*	°C
Storage temperature	T _{stg}	-20 to +85*	°C
Soldering conditions	-	260 °C or less, within 5 s	-

* No dew condensation

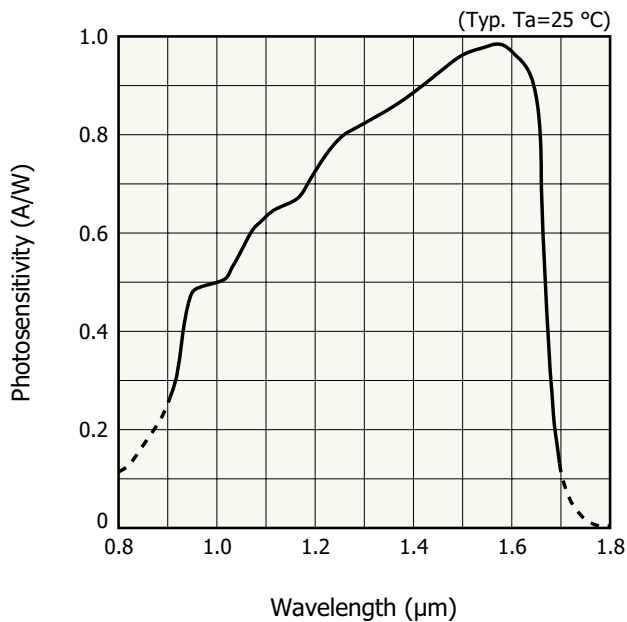
When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

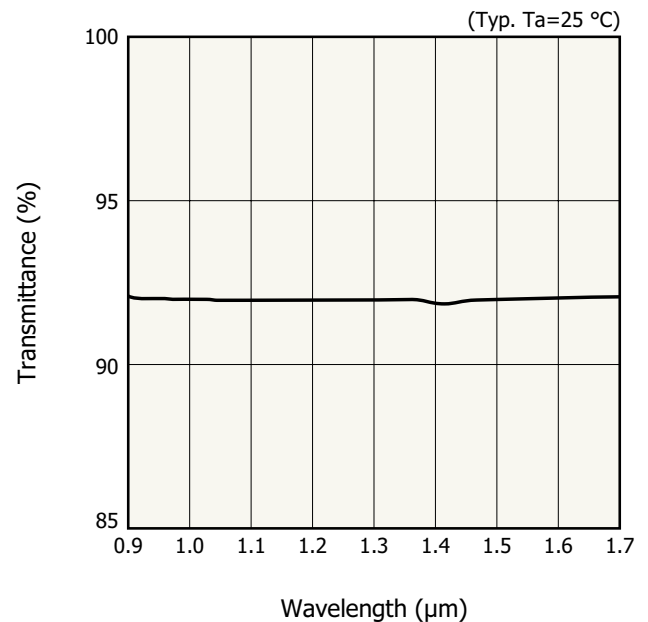
Electrical and optical characteristics (Ta=25 °C, per element)

Parameter	Symbol	Condition	G12430-016D			G12430-032D			G12430-046D			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	λ		-	0.9 to 1.7	-	-	0.9 to 1.7	-	-	0.9 to 1.7	-	μm
Peak sensitivity wavelength	λ_p		-	1.55	-	-	1.55	-	-	1.55	-	μm
Photosensitivity	S	$\lambda = \lambda_p$	0.85	0.95	-	0.85	0.95	-	0.85	0.95	-	A/W
Dark current	I _D	V _R =1 V	-	500	2500	-	250	1250	-	250	1250	pA
Dark current temperature coefficient	ΔT_{ID}	V _R =10 mV	-	1.1	-	-	1.1	-	-	1.1	-	times/°C
Cutoff frequency	f _c	V _R =1 V, R _L =50 Ω λ =1.3 μm , -3 dB	15	30	-	25	60	-	25	60	-	MHz
Terminal capacitance	C _t	V _R =1 V, f=1 MHz	-	60	100	-	35	60	-	35	60	pF
Shunt resistance	R _{sh}	V _R =10 mV	20	100	-	40	200	-	40	200	-	M Ω
Detectivity	D*	$\lambda = \lambda_p$	1×10^{12}	5×10^{12}	-	1×10^{12}	5×10^{12}	-	1×10^{12}	5×10^{12}	-	cm $\cdot\text{Hz}^{1/2}/\text{W}$
Noise equivalent power	NEP	$\lambda = \lambda_p$	-	2×10^{-14}	4×10^{-14}	-	1×10^{-14}	3×10^{-14}	-	1×10^{-14}	3×10^{-14}	W/Hz $^{1/2}$

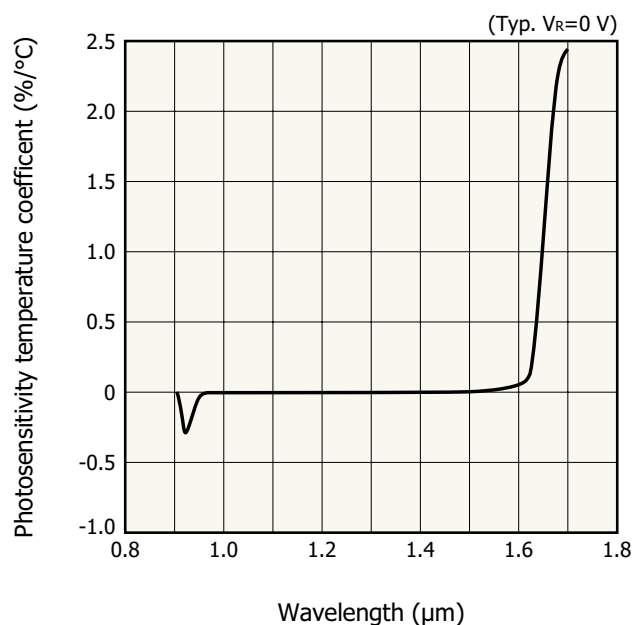
Spectral response



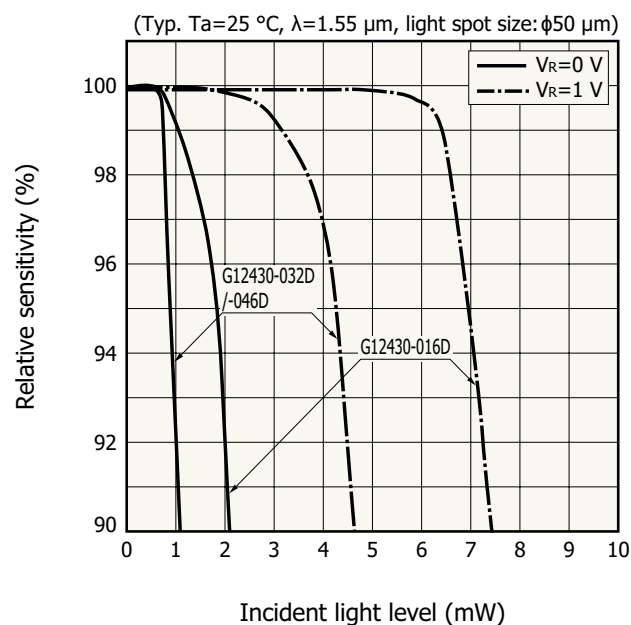
Spectral transmittance of window material



Photosensitivity temperature characteristics

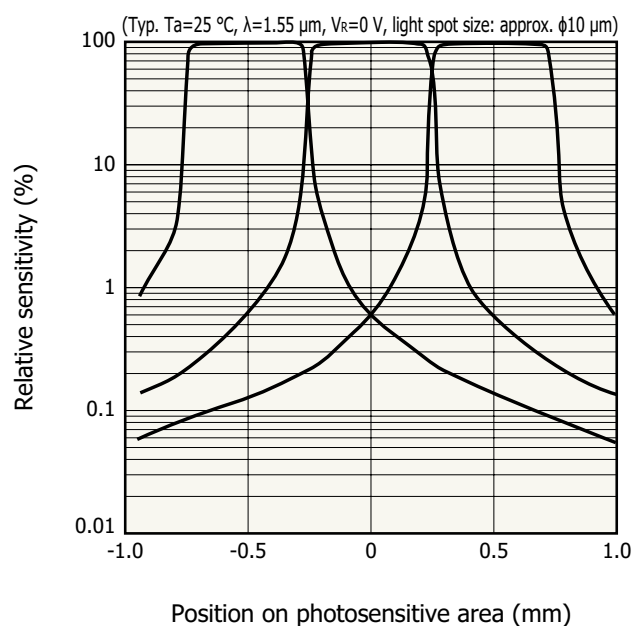


Linearity

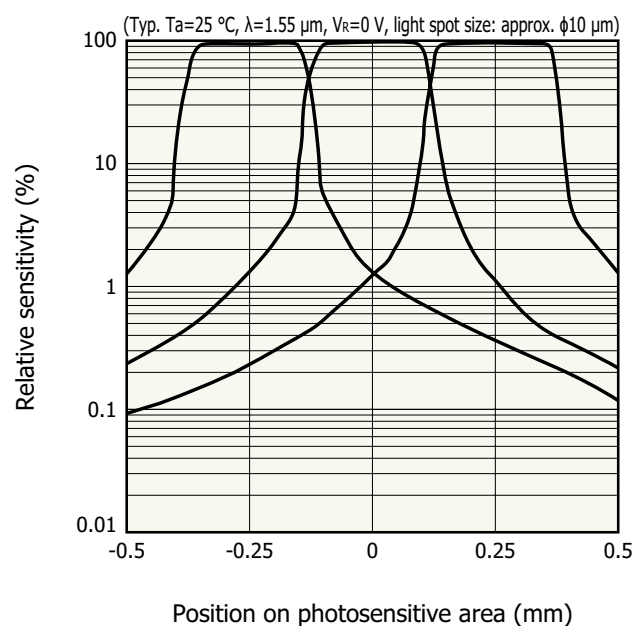


Cross-talk characteristics

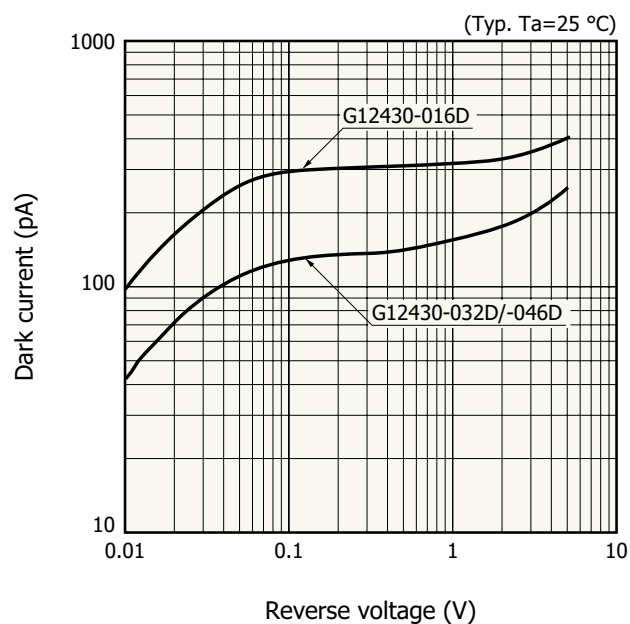
G12430-016D



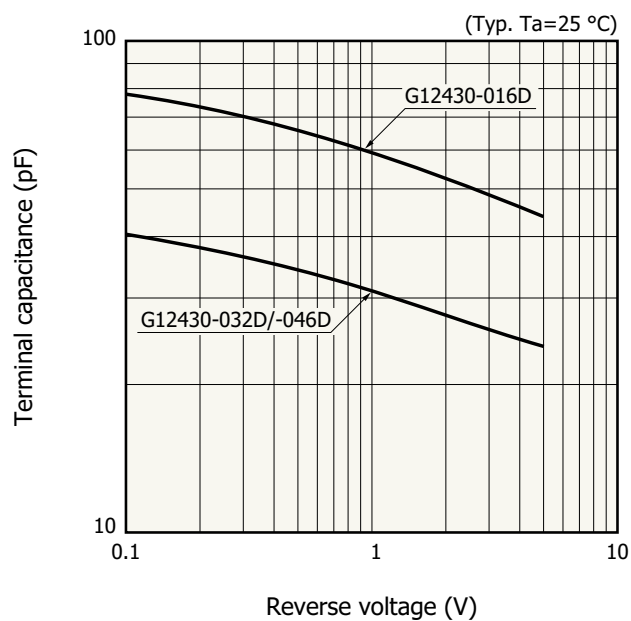
G12430-032D/-046D



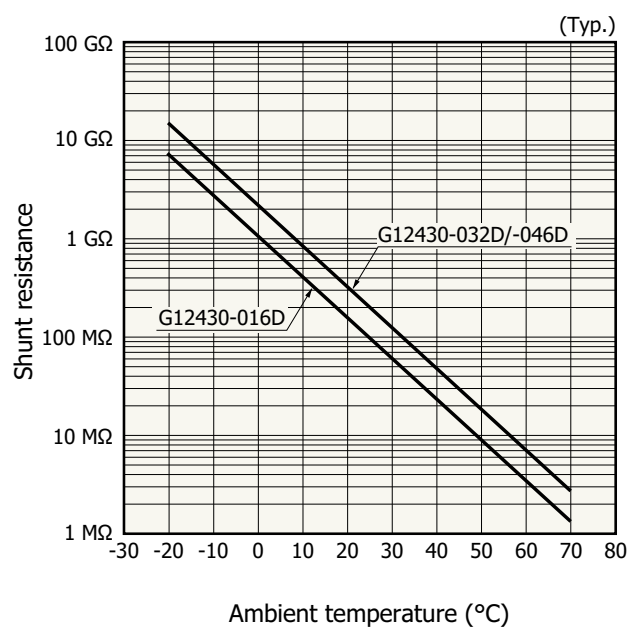
Dark current vs. reverse voltage



Terminal capacitance vs. reverse voltage

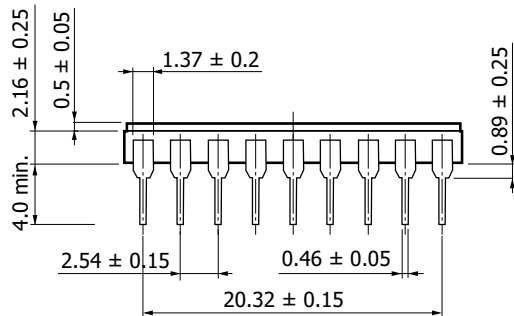
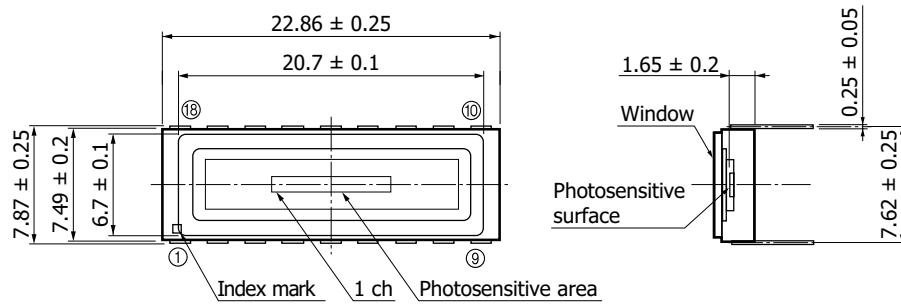


Shunt resistance vs. ambient temperature



Dimensional outlines (unit: mm)

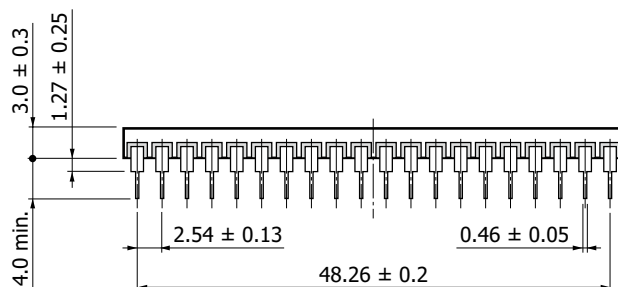
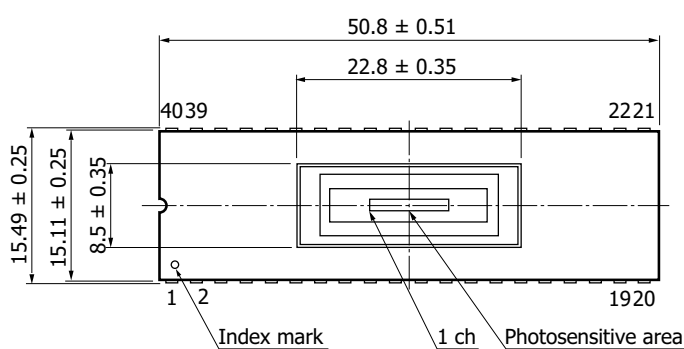
G12430-016D



Package material: Ceramic
 Lead treatment: Ni/Au plating
 Lead material: FeNi alloy
 Reflective index of window material: 1.47
 Window thickness: 0.5 ± 0.05
 AR coat: None
 Window sealing method: Resin sealing
 Position accuracy of photosensitive area center:
 $-0.3 \leq X \leq +0.3$
 $-0.3 \leq Y \leq +0.3$
 Position accuracy of photosensitive area inclination:
 $-5^\circ \leq \theta \leq +5^\circ$

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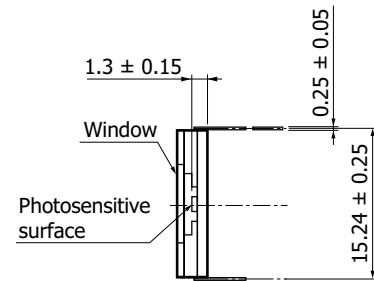
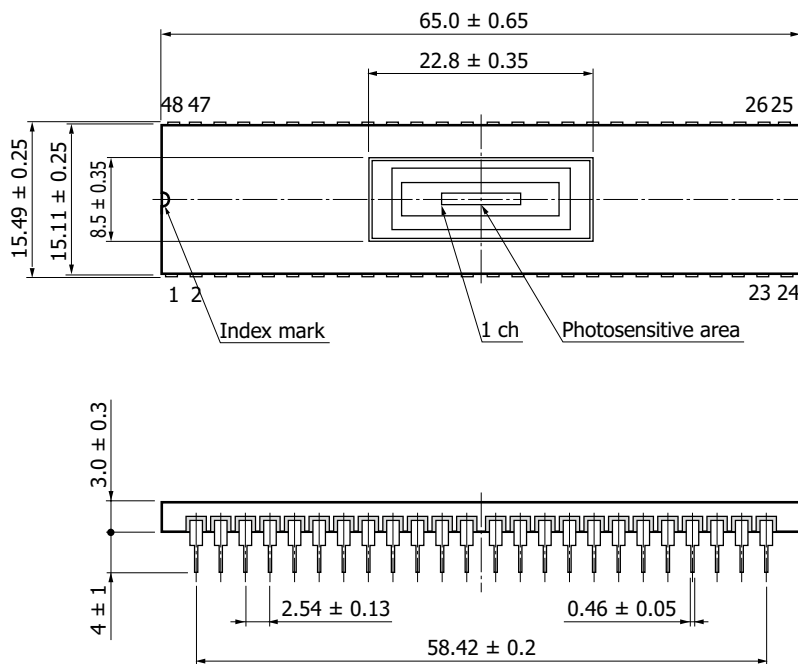
G12430-032D



Package material: Ceramic
 Lead treatment: Ni/Au plating
 Lead material: FeNi alloy
 Reflective index of window material: 1.47
 Window thickness: 0.75 ± 0.05
 AR coat: None
 Window sealing method: Resin sealing
 Position accuracy of photosensitive area center:
 $-0.3 \leq X \leq +0.3$
 $-0.3 \leq Y \leq +0.3$
 Position accuracy of photosensitive area inclination:
 $-5^\circ \leq \theta \leq +5^\circ$

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G12430-046D



Package material: Ceramic
 Lead treatment: Ni/Au plating
 Lead material: FeNi alloy
 Reflective index of window material: 1.47
 Window thickness: 0.75 ± 0.05
 AR coat: None
 Window sealing method: Resin sealing
 Position accuracy of photosensitive area center:
 $-0.3 \leq X \leq +0.3$
 $-0.3 \leq Y \leq +0.3$
 Position accuracy of photosensitive area inclination:
 $-5^\circ \leq \theta \leq +5^\circ$

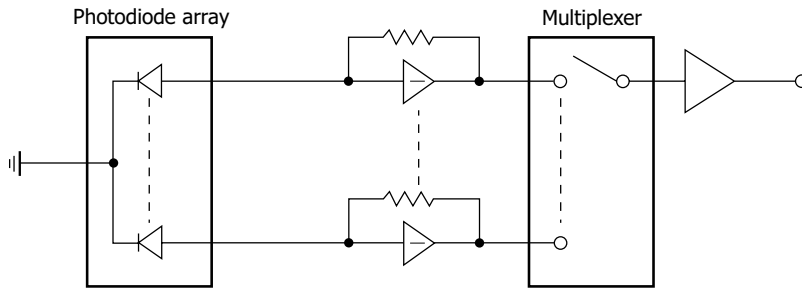
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Pin connections

Pin no.	G12430-016D	G12430-032D	G12430-046D	Pin no.	G12430-016D	G12430-032D	G12430-046D
1	KC	KC	KC	25	-	27	KC
2	2	NC	2	26	-	25	45
3	4	2	4	27	-	23	43
4	6	4	6	28	-	21	41
5	8	6	8	29	-	19	39
6	10	8	10	30	-	17	37
7	12	10	12	31	-	15	35
8	14	12	14	32	-	13	33
9	16	14	16	33	-	11	31
10	KC	16	18	34	-	9	29
11	15	18	20	35	-	7	27
12	13	20	22	36	-	5	25
13	11	22	24	37	-	3	23
14	9	24	26	38	-	1	21
15	7	26	28	39	-	NC	19
16	5	28	30	40	-	NC	17
17	3	30	32	41	-	-	15
18	1	32	34	42	-	-	13
19	-	NC	36	43	-	-	11
20	-	NC	38	44	-	-	9
21	-	KC	40	45	-	-	7
22	-	NC	42	46	-	-	5
23	-	31	44	47	-	-	3
24	-	29	46	48	-	-	1

Operating circuit

In the most generally used circuit, op amplifiers are connected to each channel to read the output in real time. The output of an op amplifier is of low impedance and thus can be easily multiplexed.



KMPDC0001EA

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions

- Disclaimer
- Safety consideration
- Metal, ceramic, plastic package products / Precautions

■ Technical information

- Compound semiconductor photosensors

Information described in this material is current as of April 2024.

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