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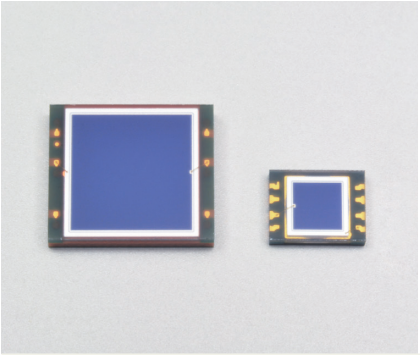
Si photodiodes

S16008 series



Si photodiodes for visible to near infrared region

The S16008 series is a surface mount type Si photodiode with high sensitivity in the visible to near infrared region. This provides higher sensitivity than the previous S2387 series.

Features

- **High sensitivity in visible to near infrared region**
- **Low dark current**
- **Superior linearity**
- **Compatible with lead-free solder reflow**

Applications

- **Analytical instrument**
- **Optical measurement equipment**
- **PCR testing equipment**

Structure

Parameter	S16008-33	NEW S16008-66	Unit
Photosensitive area	2.4 × 2.4	5.8 × 5.8	mm
Package	Glass epoxy		-
Window material	Silicone resin		-

Absolute maximum ratings (Ta=25 °C, unless otherwise noted)

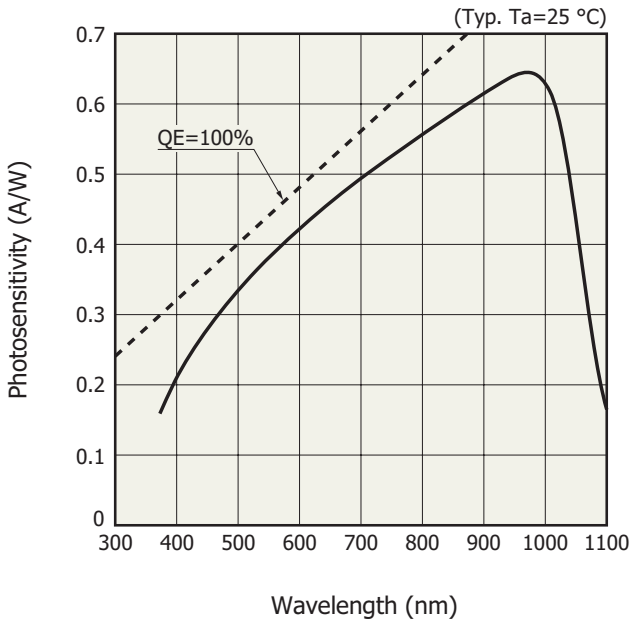
Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V_R		30	V
Operating temperature	Topr	No dew condensation*1	-40 to +100	°C
Storage temperature	Tstg	No dew condensation*1	-40 to +100	°C
Soldering temperature	Tsol		260 (3 times)*2	°C

*1: When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation may cause deterioration in characteristics and reliability.
*2: See reflow soldering conditions (P.5). S16008-33: JEDEC J-STD-020 MSL 2a, S16008-66: JEDEC J-STD-020 MSL 3
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)

Parameter	Symbol	Condition	S16008-33			NEW S16008-66			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	λ		-	380 to 1100	-	-	380 to 1100	-	nm
Peak sensitivity wavelength	λp		-	960	-	-	960	-	nm
Photosensitivity	S	λ=λp	-	640	-	-	640	-	mA/W
Dark current	I_D	V_R=10 mV	-	0.01	5	-	0.1	50	pA
Temperature coefficient of I_D	I_{CID}		-	1.12	-	-	1.12	-	times/°C
Rise time	tr	V_R=0 V, R_L=1 kΩ 10 to 90%	-	1.5	-	-	9.0	-	μs
Terminal capacitance	Ct	V_R=0 V, f=10 kHz	-	0.7	1.0	-	4.0	5.0	pF
Shunt resistance	Rsh	V_R=10 mV	2	50	-	0.2	10	-	GΩ
Noise equivalent power	NEP	V_R=0 V, λ=λp	-	9.0×10^{-12}	-	-	2.0×10^{-15}	-	$W/Hz^{1/2}$

Spectral response



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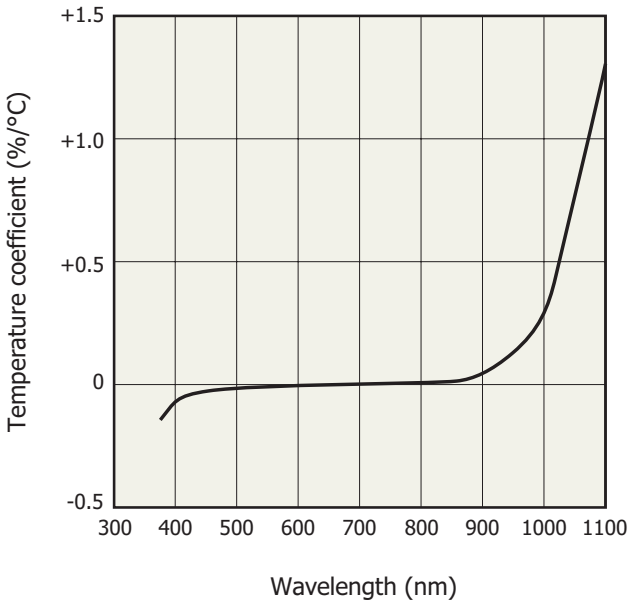
Photosensitivity temperature characteristics



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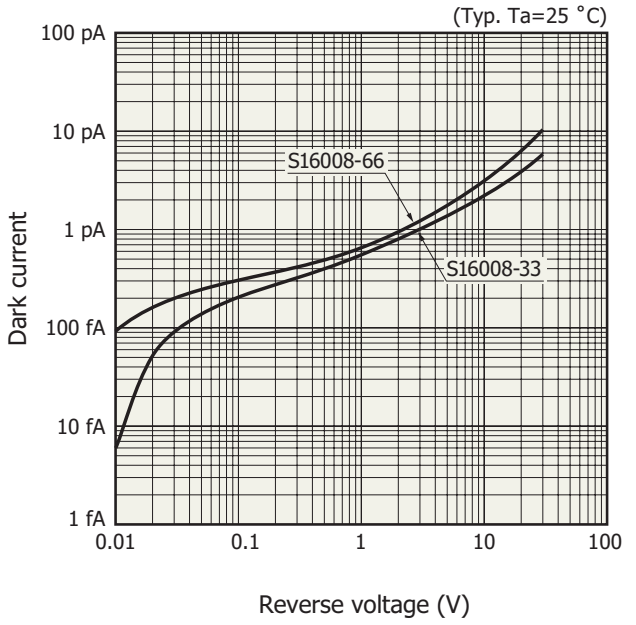
Dark current vs. reverse voltage



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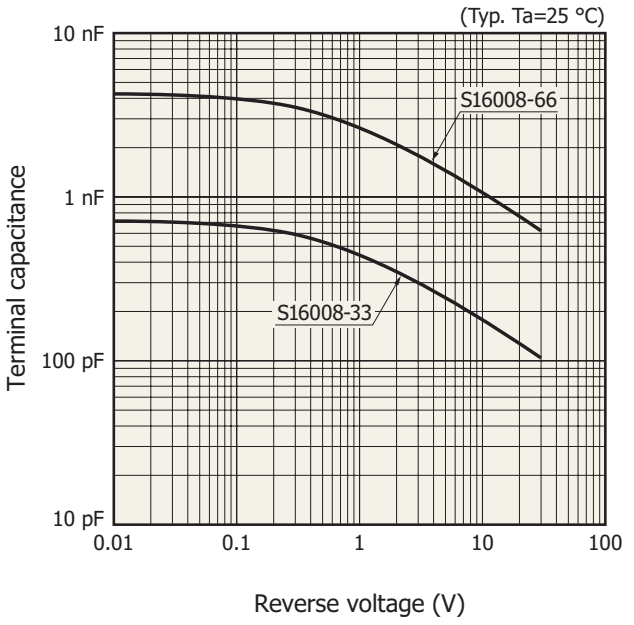
Terminal capacitance vs. reverse voltage



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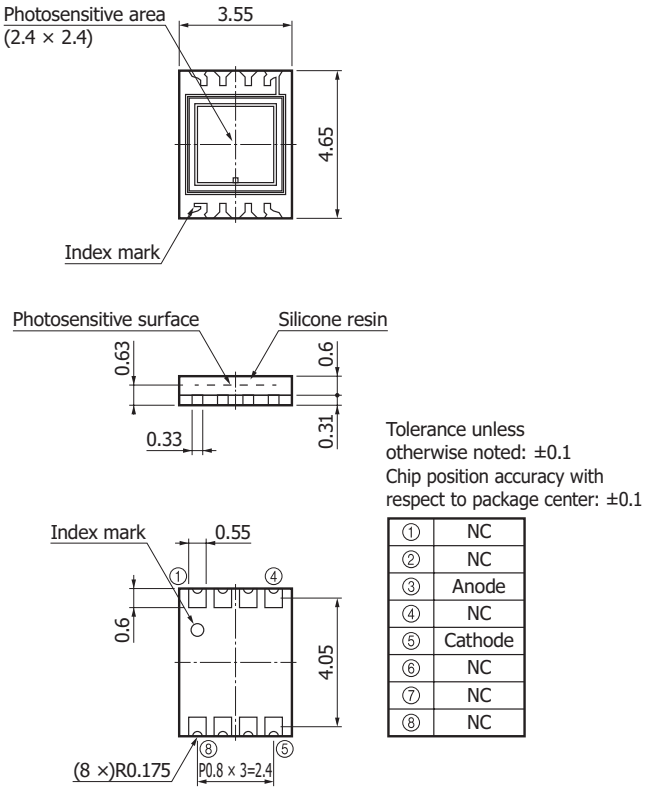
Dimensional outline (unit: mm)

S16008-33



Tolerance unless otherwise noted: ±0.1
Chip position accuracy with respect to package center: ±0.1

①	NC
②	NC
③	Anode
④	NC
⑤	Cathode
⑥	NC
⑦	NC
⑧	NC

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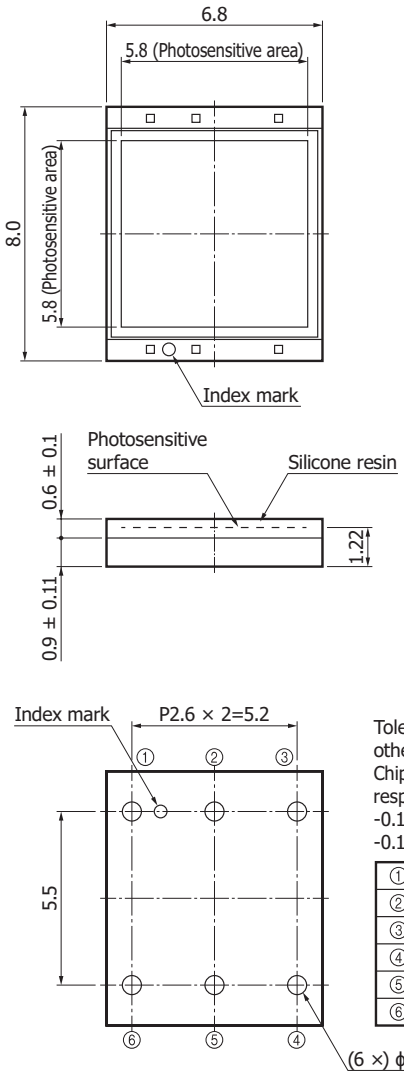
S16008-66



Tolerance unless otherwise noted: ±0.15
Chip position accuracy with respect to package center
-0.1 ≤ X ≤ +0.1
-0.1 ≤ Y ≤ +0.1

①	NC
②	Cathode
③	NC
④	NC
⑤	Anode
⑥	NC

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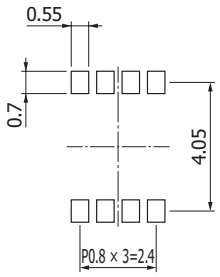
Recommended land pattern (unit: mm)

S16008-33



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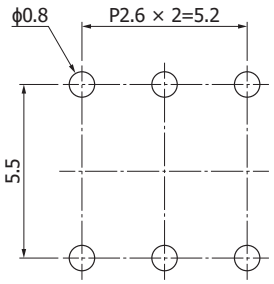
S16008-66



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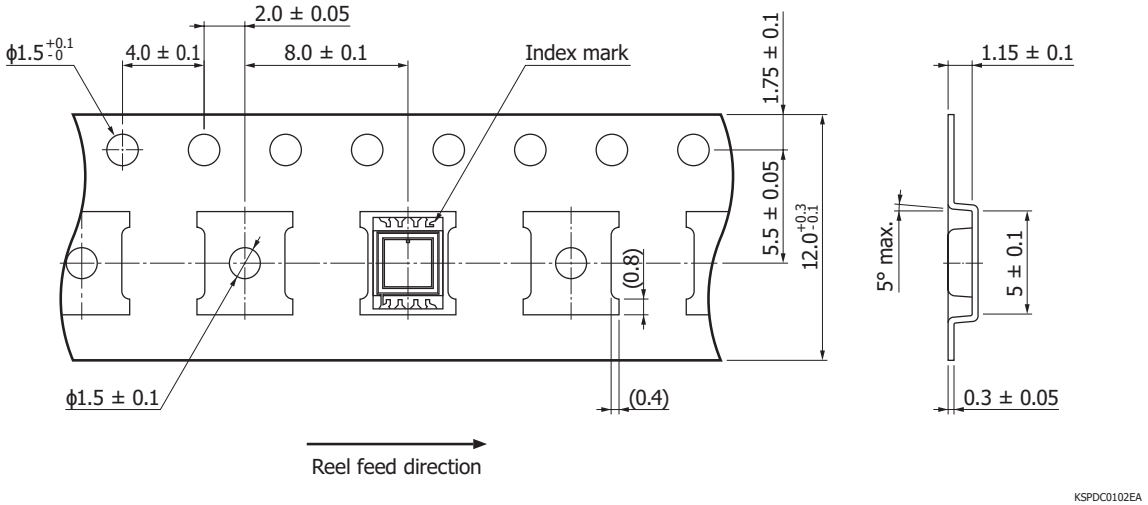
Standard packing specifications

S16008-33

■ Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
ϕ180 mm	ϕ60 mm	12 mm	PS	Conductive

■ Embossed tape (unit: mm, material: PS, conductive)



■ Packing quantity
1000 pcs/reel

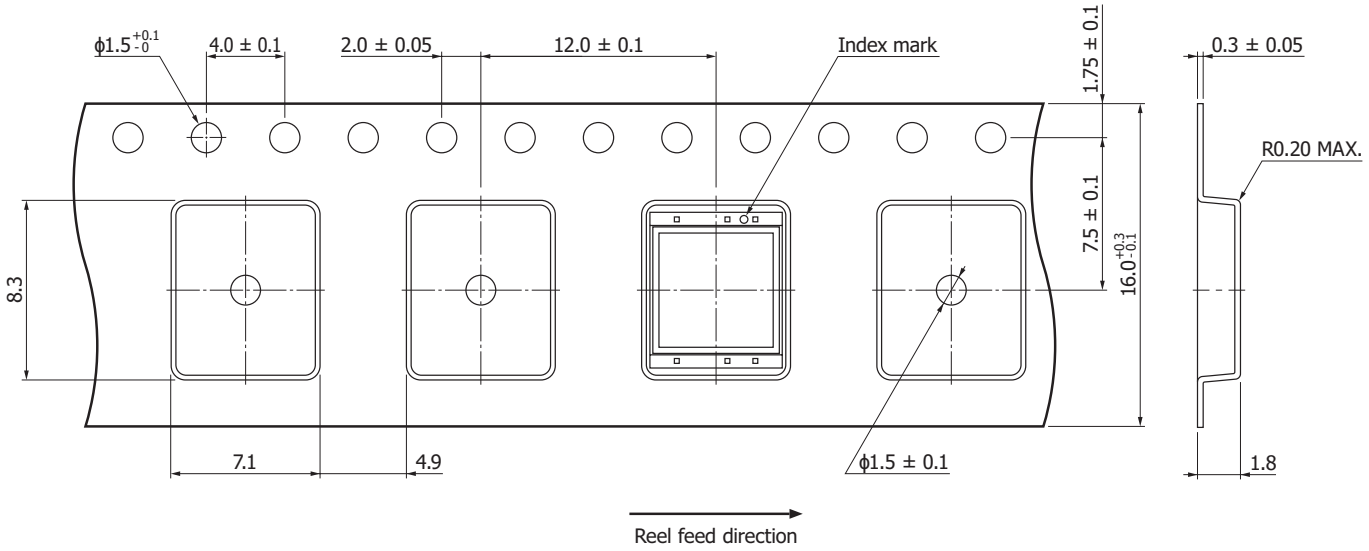
■ Packing state
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

S16008-66

■ Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
ϕ330 mm	ϕ100 mm	16 mm	PS	Conductive

■ Embossed tape (unit: mm, material: PS, conductive)



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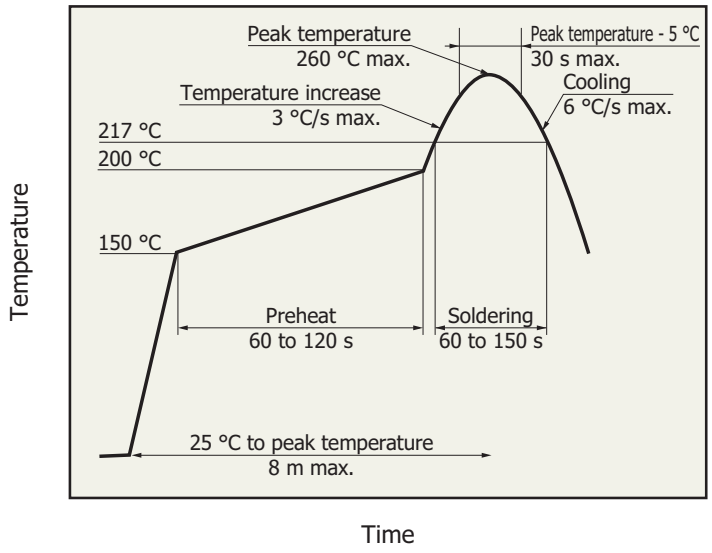
■ Packing quantity
500 pcs/reel

■ Packing state
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

Recommended reflow soldering conditions



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· After unpacking, store in an environment at a temperature of 30 °C or less and a humidity of 60% or less, and perform reflow soldering within the storage period of the device.

Type no.	Storage period
S16008-33	4 weeks
S16008-66	168 hours

· The effect that the product receives during reflow soldering varies depending on the circuit board and the reflow oven that are used. When you set reflow soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

Baking

If more than 3 months have passed in the unopened state, or storage conditions are exceeded after opening the package, baking is required to remove moisture before reflow soldering. For the baking, refer to the precautions "Surface mount type products."

■ Recommended baking conditions

Temperature: 120 °C, 3 hours, up to twice
Note: Before setting the baking conditions, perform experiments to confirm that no problems occur with the product.

Related information

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

■ Precautions
· Disclaimer
· Surface mount type products

■ Technical note
· Si photodiodes

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