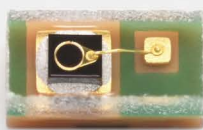


InGaAs APD

G15978-0020P



Surface mount type COB package near-infrared detector

The G15978-0020P is an InGaAs APD available in a surface mount type COB package. It is much smaller than the previous metal package type (G14858-0020AA), making it suitable for inclusion in compact and mobile equipment.

Features

- Low dark current
- Low capacitance
- High sensitivity
- Small size: 1.6 mm × 0.8 mm × 0.7 mm
- Compatible lead-free reflow soldering

Applications

- Distance measurement
- Low-light-level detection

Structure

Parameter	Specification	Unit
Package	Glass epoxy	-
Window material	Silicone resin	-
Photosensitive area	φ0.2	mm

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

Parameter	Symbol	Specification	Unit
Reverse current	IR max	2	mA
Forward current	IF max	10	mA
Operating temperature*1	Topr	-40 to +60	°C
Storage temperature*1	Tstg	-40 to +125	°C
Soldering temperature*2	Tsol	260 (3 times)	°C

*1: No due condensation

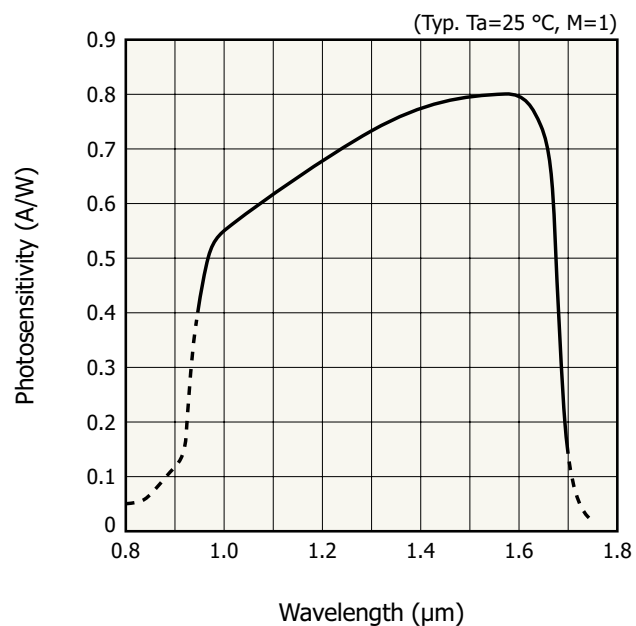
*2: Reflow soldering, JEDEC J-STD-020 MSL 2, see P.4

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.

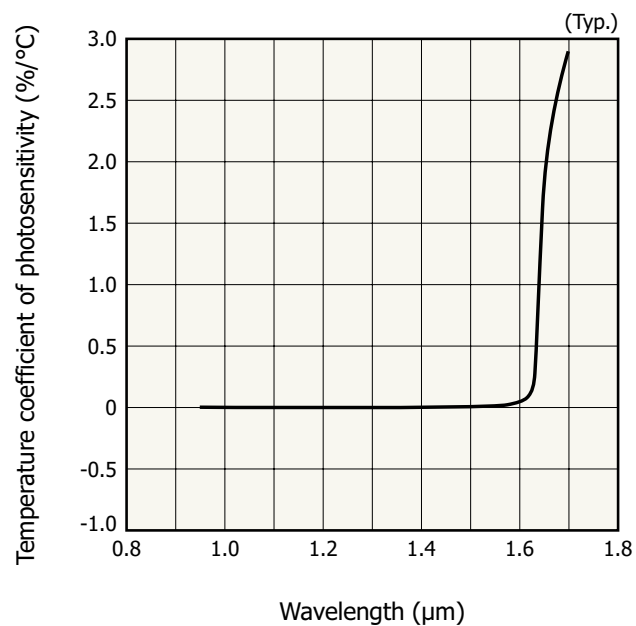
Electrical characteristics (Typ. Ta=25 °C, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	0.95 to 1.7	-	μm
Peak sensitivity wavelength	λp		-	1.55	-	μm
Photosensitivity	S	λ=1.55 μm, M=1	0.65	0.8	-	A/W
Dark current	ID	VR=VBR × 0.95	-	20	50	nA
Temperature coefficient of dark current	ΔTID	VR=VBR × 0.95	-	1.07	-	times/°C
Terminal capacitance	Ct	VR=VBR × 0.95, f=1 MHz	-	2.0	-	pF
Cutoff frequency	fc	M=10, RL=50 Ω	-	0.9	-	GHz
Breakdown voltage	VBR	ID=100 μA	50	65	80	V
Temperature coefficient of breakdown voltage	Γ	-40 to +60 °C	-	0.1	-	V/°C
Gain	M	λ=1.55 μm, -30 dBm	-	30	-	-

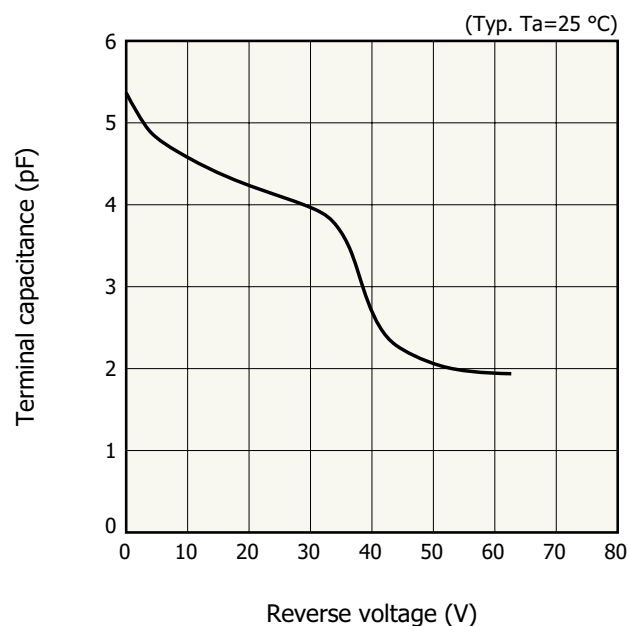
Spectral response



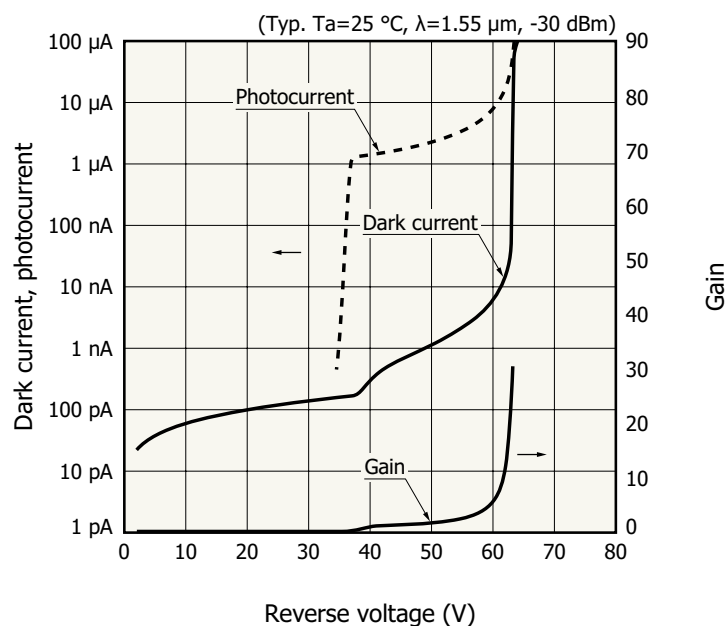
Photosensitivity temperature characteristics



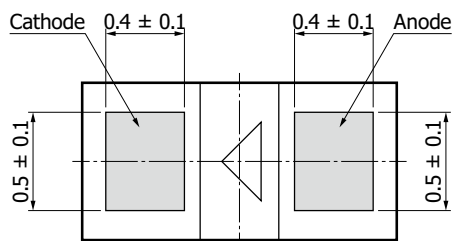
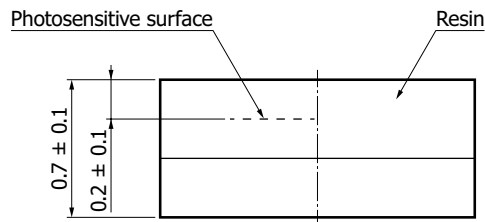
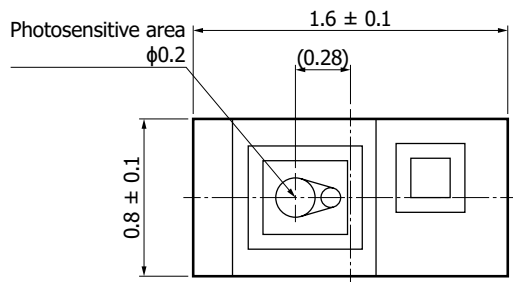
Terminal capacitance vs. reverse voltage



Dark current, photocurrent, gain vs. reverse voltage



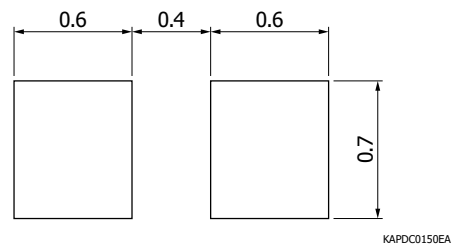
Dimensional outline (unit: mm)



Distance from photosensitive area center to package center
 $-0.43 \leq X \leq -0.13$
 $-0.15 \leq Y \leq +0.15$
 Values in parentheses indicate reference values.

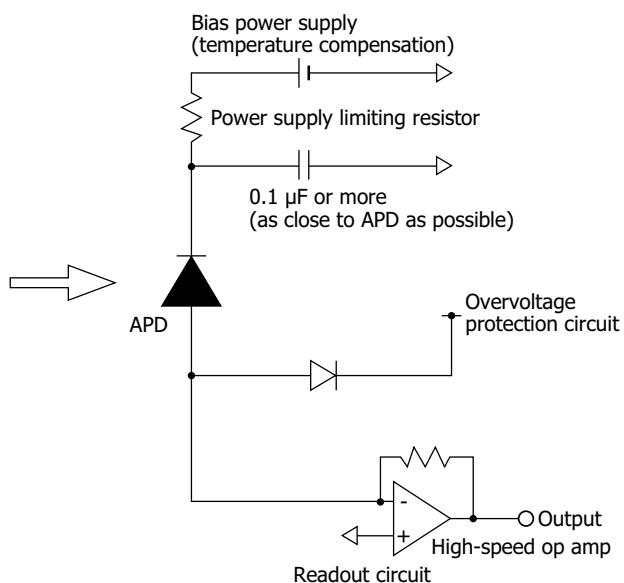
KAPDA0235EA

Recommended land pattern



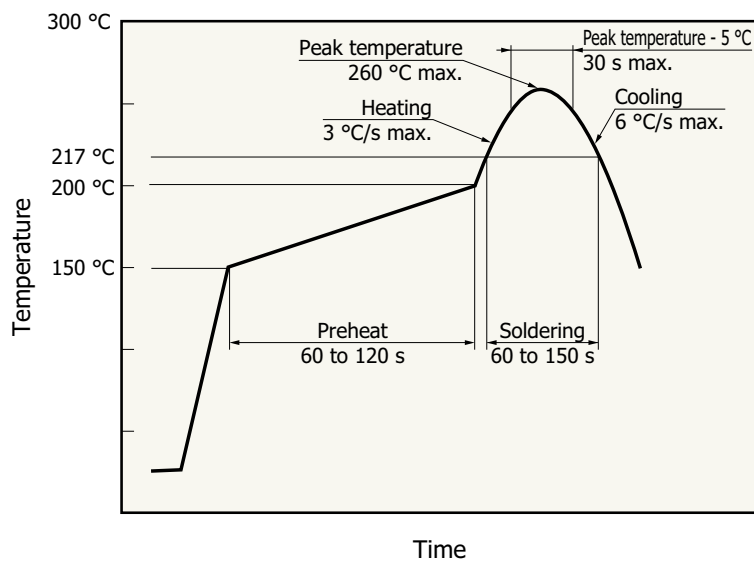
KAPDC0150EA

APD peripheral circuit example



KAPDC0005EC

Recommended reflow soldering conditions



- After unpacking, store it in an environment at a temperature range of 15 to 30 °C, and a humidity of 60% or less, and perform reflow soldering within 1 year.
- The effect that the product receives during reflow soldering varies depending on the circuit board and 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.

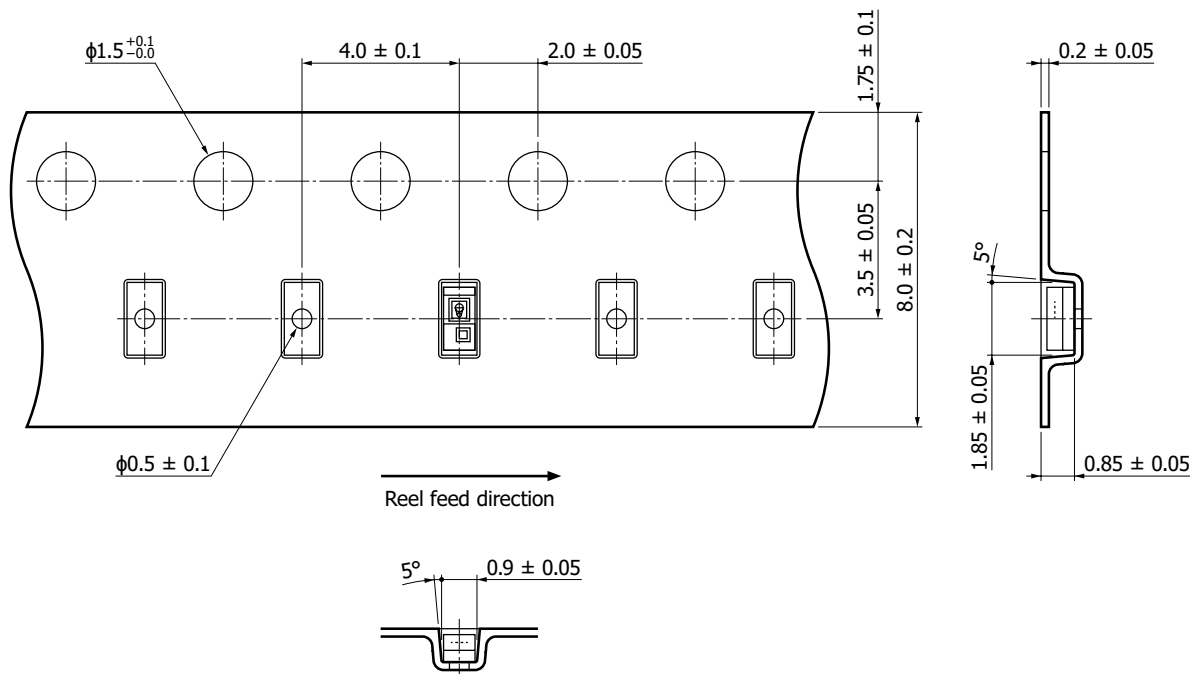
KMPDB040SEC

Standard packing specifications

- Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
φ180 mm	φ60 mm	8 mm	PS	Conductive

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



KAPDC0151EA

- Packing quantity
500 pcs/reel
- Packing state
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

Related information

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

■ Precautions

- Disclaimer
- Safety considerations / Opto-semiconductor products
- Precautions / Compound opto-semiconductors (photosensors, light emitters)
- Precautions / Surface mount type products

■ Catalogs

- Selection guide / Infrared detectors
- Technical note / Compound semiconductor photosensors

The content of this document is current as of May 2025.

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