PHOTODIODE

Si photodiode

S2592/S3477 series

Thermoelectrically cooled photodiode for low-light-level detection in UV to near IR

S2592/S3477 series sensors combine a UV to near infrared Si photodiode with a thermoelectric cooler. A thermistor is also included in the same package to sense the Si photodiode chip temperature. This allows stable operation over long periods of time, making these sensors suitable for low-light-level detection where a high S/N is required.
S2592 series is hermetically sealed in a TO-8 package, and S3477 series in a TO-66 package. A dedicated temperature controller (C1103-04) and heatsink (A3179 series) are also available as options (sold separately).

Features

- High S/N
- High UV sensitivity
- Built-in thermistor allows stable operation

Applications

- Low-light-level detection

■ General ratings

Parameter	S2592-03	S3477-03	S2592-04	S3477-04	Unit
Built-in photodiode	S1336 series				-
Window material	Sapphire glass				-
Active area	2.4 × 2.4		5.8 × 5.8		mm
Package	TO-8	TO-66	TO-8	TO-66	

■ Absolute maximum ratings

Parameter	Symbol	Value	Unit
Reverse voltage	V_R	5	V
Operating temperature	Topr	-40 to +70	°C
Storage temperature	Tstg	-55 to +85	°C
Allowable current for thermoelectric cooler	Ite	1.5	A
Thermistor power dissipation	Pth	0.2	mW

■ Electrical and optical characteristics (Typ. Ta=25 °C)

Parameter	Symbol	Condition	S2592-03	S3477-03	S2592-04	S3477-04	Unit
Spectral response range	λ		190 to 1100				nm
Peak sensitivity wavelength	λp		960				nm
Photo sensitivity	S	$\lambda=\lambda p$	0.5				A/W
Short circuit current	Isc	100 *lx*, 2856 K	5		28		μA
Dark current	I_D	V_R=10 mV	10		25		pA
Temperature coefficient of dark current	T_{CID}		1.15				times/°C
Rise time	tr	V_R=0 V, R_L=1 kΩ	0.2		1		μs
Terminal capacitance	Ct	V_R=0 V	65		380		pF
Shunt resistance	Rsh	V_R=10 mV	1		0.4		GΩ
Noise equivalent power	NEP	V_R=0 V, $\lambda=\lambda p$	8.1×10^{-15}		1.3×10^{-14}		W/Hz$^{1/2}$
Cooling temperature	ΔT		35				°C

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Spectral response

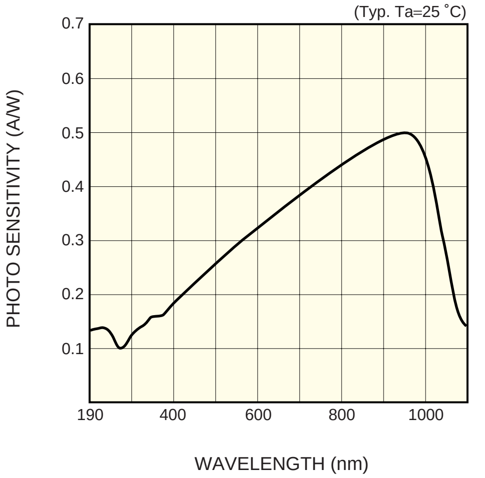

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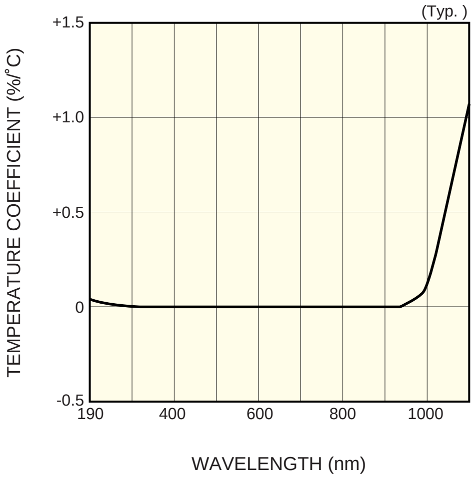
Photo sensitivity temperature characteristic



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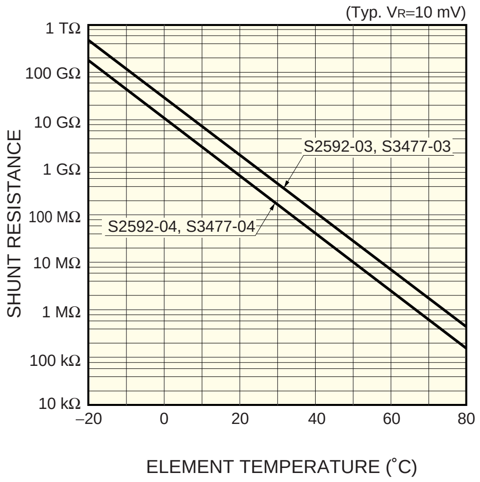
Shunt resistance vs. element temperature



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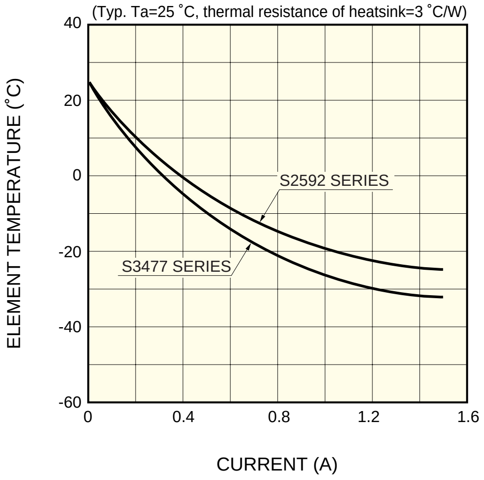
Cooling characteristics of TE-cooler



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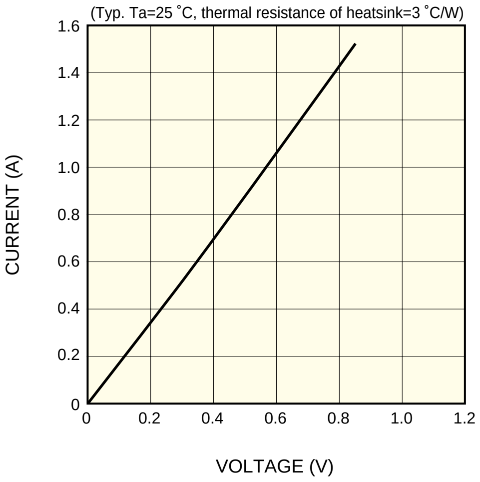
Current vs. voltage characteristic of TE-cooler



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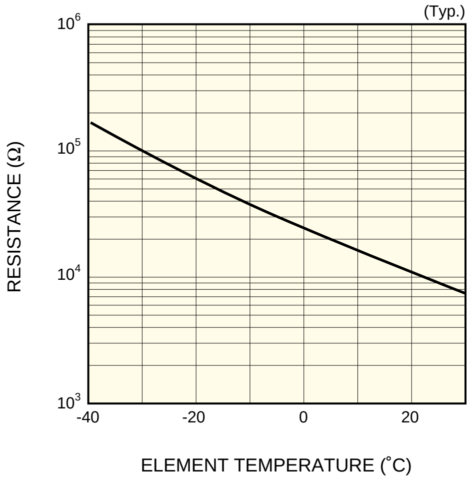
Thermistor temperature characteristic



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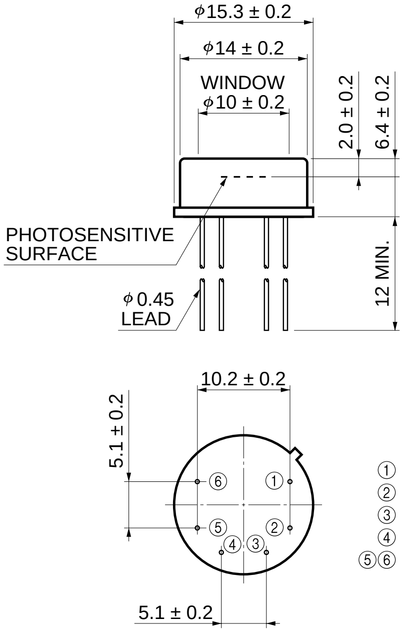
■ Dimensional outlines (unit: mm)

S2592 series



① DETECTOR (ANODE)
② DETECTOR (CATHODE)
③ TE-COOLER (-)
④ TE-COOLER (+)
⑤⑥ THERMISTOR

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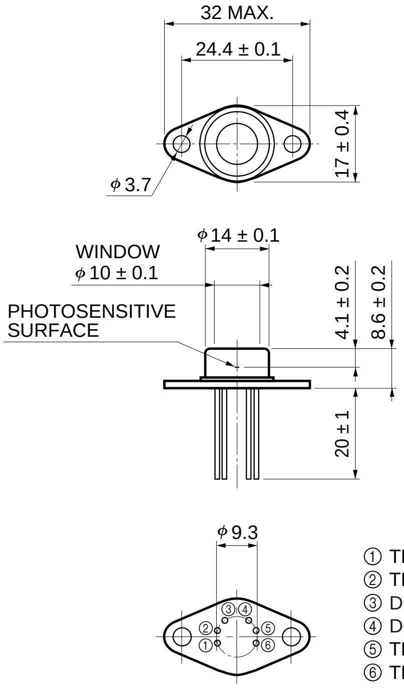
S3477 series



① THERMISTOR
② THERMISTOR
③ DETECTOR (ANODE)
④ DETECTOR (CATHODE)
⑤ TE-COOLER (-)
⑥ TE-COOLER (+)

KSPDA0134EC

Temperature controller for TE-cooled detector C1103-04

By adjusting the current flowing through the thermoelectric cooler in a one-stage or two-stage thermoelectrically cooled detector, C1103-04 maintains the detector element at a constant temperature. The cooling temperature can be easily set by using the control knob on the front panel.

■ Accessories

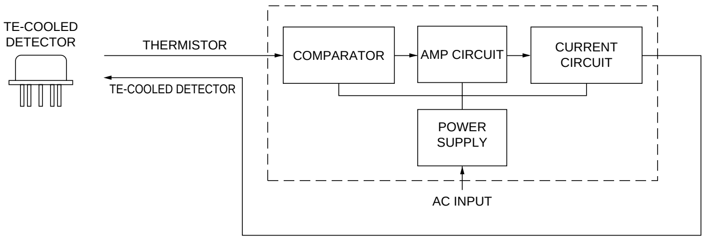
Instruction manual	
4-conductor cable (with a connector)	A4372-05

■ Specifications (common)

Setting element temperature	-30 to +20 °C
Applicable detectors	One-stage or two-stage thermoelectrically cooled detectors
Temperature stability	Within ±0.1 °C
Temperature control output current	1.2 A Max.
Power supply	100 V ± 10 % · 50/60 Hz *
Power consumption	30 VA
Dimensions and weight	108 (W) × 87 (H) × 190 (D) mm/1.9 kg approx.
Operating temperature	+10 to +40 °C
Operating humidity	Equal to or less than 90 %
Storage temperature	+10 to +40 °C

* Power requirement (AC line voltage) can be selected from among 100 V, 115 V and 230 V at the factory prior to shipping.

■ Block diagram



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C1103-04 conforms to European EMC directives (89/336/EEC) and LVD (73/23/EEC).

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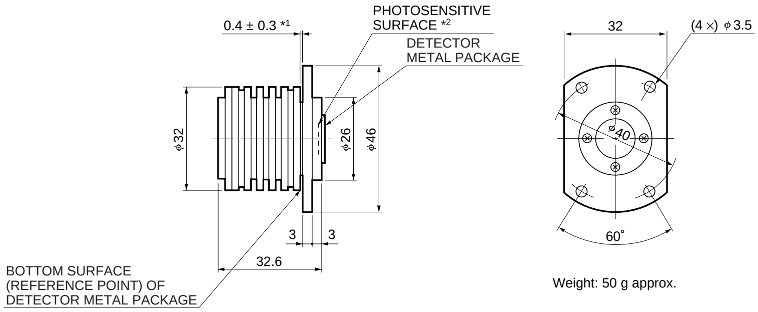
Heatsink for TE-cooled detector (TO-8 package) A3179

A3179 series heatsinks are designed for thermoelectrically cooled detectors having a 6-pin TO-8 package. Heat dissipation capacity for A3179 is about 35 °C versus the ambient temperature 25 ℃.

■ Dimensional outlines (unit: mm)



Weight: 50 g approx.

*1: When detector element is installed.
*2: The position of the photosensitive surface differs according to the detector element used.
Refer to the dimensional outline for the detector.

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