

TE-cooled Single-Pixel double encapsulated TO8-package

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Features

- Double encapsulation (thin-film + TO8 package)
- One or Two-Stage thermoelectric cooler (TEC)
- High durability for rugged operation
- Very high sensitivity
- Sapphire window
- Custom windows and filters available

Applications

- Flame monitoring
- Flame and spark detection
- Gas detection and analysis
- Spectroscopy
- Temperature measurement
- Moisture measurement

Overview PbS and PbSe detectors with TEC

	Type No.	Dimensional	Cooling	Active area	Replaces following	
		outline		[mm x mm]	Hamamatsu detector	
PbS	PbS050040TO8-	Type 1	One-stage		P2532-01	
	1TEC	Type I	TE-cooled	4x5		
	PbS050040TO8-	Type 2	Two-stage	485	P2682-01	
	2TEC	Type 2	TE-cooled		P2002-01	
	PbS050050TO8-	Type 1	One-stage			
	1TEC	Type I	TE-cooled	5x5		
	PbS050050TO8-	Type 2	Two-stage			
	2TEC	Type 2	TE-cooled			
PbSe	PbSe020020TO8-	Type 1	One-stage		P9696-102	
	1TEC	Type I	TE-cooled	2x2	P2038-02	
	PbSe020020TO8-	Type 2	Two-stage	ZXZ	P9696-202	
	2TEC	Type 2	TE-cooled		P2680-02	
	PbSe030030TO8-	Type 1	One-stage		P9696-103	
	1TEC	Type 1	TE-cooled	3x3	P2038-03	
	PbSe030030TO8-	Type 2	Two-stage	383	P9696-203	
	2TEC	Type 2	TE-cooled		P2680-03	

Storage

- Storage temperature: -55°C to +70°C
- Exposure to UV light results in permanent damage
- Prolonged exposure to visible light results in temporary low dark resistance

Handling

- Ensure dust-free environment for device handling
- Operating temperature: -30°C to +70°C



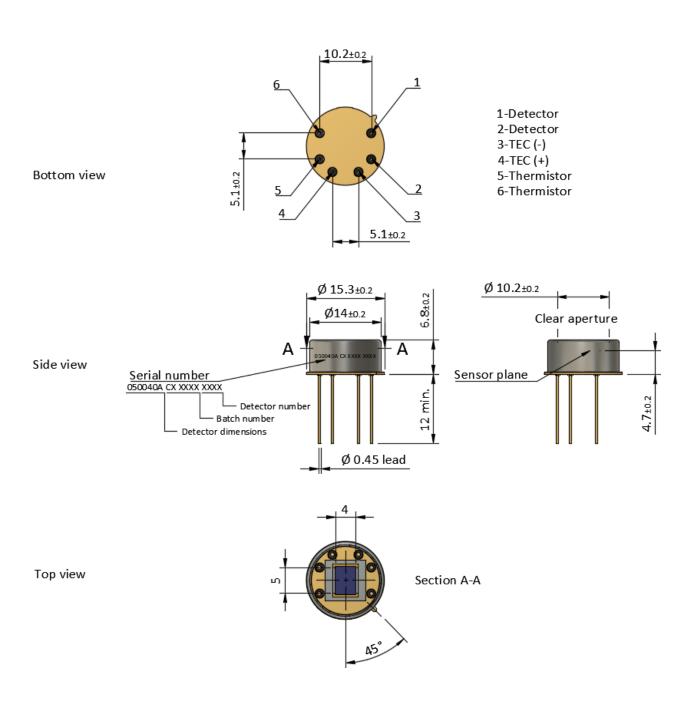


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Type 1 exemplary package outlines (mm)

PbS050040TO8-1TEC



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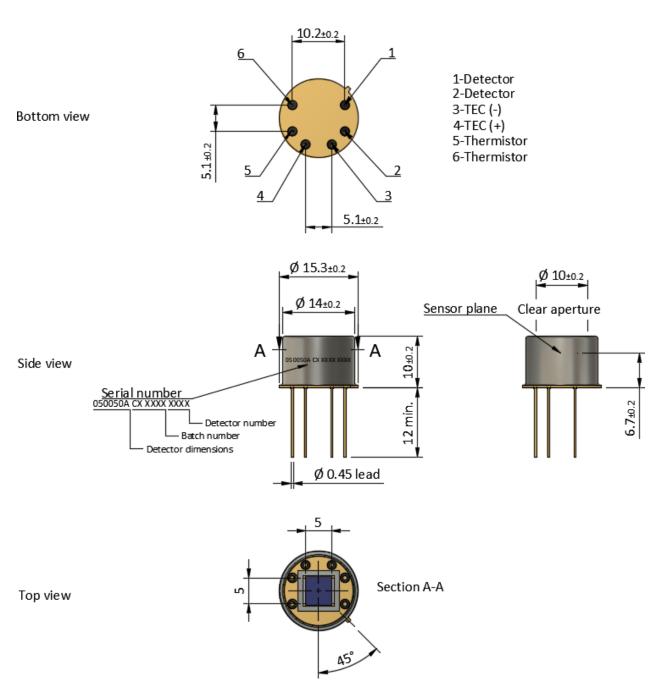


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Type 2 exemplary package outlines (mm)

PbS050050TO8-2TEC



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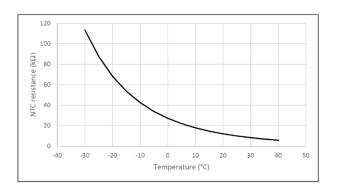
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Characteristics thermoelectric cooler (1TEC)

Single stage TEC U-I-curve

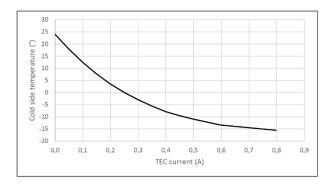
2,0 1,8 1,6 (a) 1,4 (b) 1,4 (c) 1,4 (d) 2,0 (d) 1,2 (e) 1,0 (e) 0,1 (e) 0,5 (f) 0,6 (f) 0,4 (f) 0,6 (f) 0,4 (f) 0,7 (f) 0,

NTC resistance curve

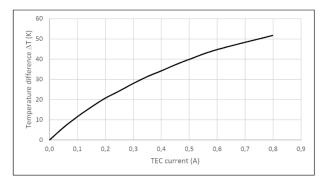


TEC cooling performance (absolute)

Ambient temperature +24°C, heat sink <7 K/W



TEC cooling performance (relative)



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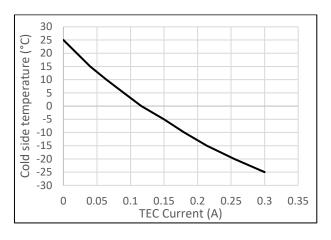


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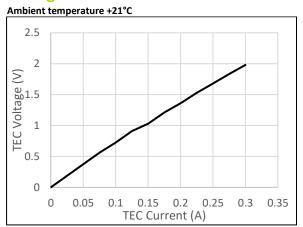
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Characteristics thermoelectric cooler (2TEC)

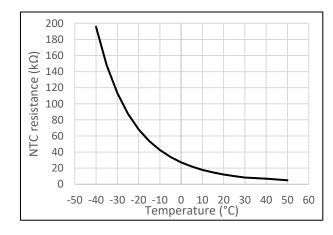
TEC cooling performance (absolute)



2-stage TEC U-I-curve



NTC resistance curve



NTC resistance at key temperatures

Temperature (°C)	NTC resistance (Ω)		
20	12.081k ±1%		
0	27.219k ±1%		
-10	42.506k ±1%		
-15	53.65k ±1%		
-20	68.237k ±1%		

Resistance (25°C) (ohm)	B-Constant (25-50°C) (K)	B-Constant (25-80°C) (Reference Value) (K)	B-Constant (25-85°C) (Reference Value) (K)	B-Constant (25-100°C) (Reference Value) (K)	Maximum Operating Current (25°C) (mA)	Maximum Voltage (V)	Typical Dissipation Constant (25°C) (mW/°C)
10k ±1%	3380 ±1%	3428	3434	3455	0.100	5	1

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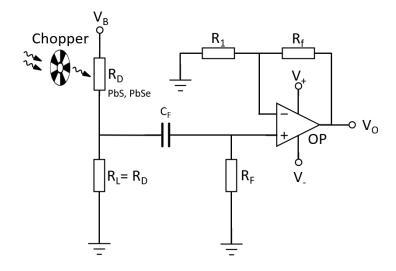
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Exemplary readout circuit



V_B: Bias voltageV_O: Output voltage

R_D: Dark resistance of the detector

R_L: Load resistor
 C_F: Filter capacitor
 R_F: Filter resistor
 R_f: Feedback resistor
 R₁: Gain resistor

Regulatory

For the use of Hertzstück™ PbS and PbSe infrared photodetectors in medical devices, monitoring and control instruments and consumer applications RoHS exemptions apply.

For automotive applications Hertzstück™ PbS and PbSe infrared photodetectors fall under ELV exemption.

