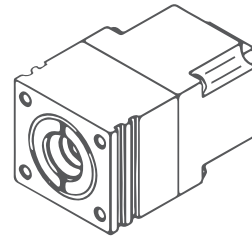


SM-I-12

Small-size IR detection module based on HgCdTe TE cooled optically immersed photoconductive detector



FEATURES

- Spectral range: up to 14.0 μm
- Frequency bandwidth: 10 Hz to 1 MHz
- Adjustable gain
- Small size
- Compatible with optical accessories
- External heatsink required
- External TEC controller required
- Quantity discounted price
- Fast delivery
- No minimum order quantity required

APPLICATIONS

- FTIR spectroscopy
- Gas detection, monitoring and analysis: C_2H_6 , NH_3
- Laser measurements: power monitoring and control, beam profiling and positioning, calibration

INCLUDED ACCESSORIES

- 1 pc of MMCX-SMA cable
- 1 pc of AMP2x4-DB9 cable

DEDICATED ACCESSORIES

- PTCC-01 series TEC controller (p. 145)
- Smart Manager software: freeware
- MHS-2 heatsink (p. 153)

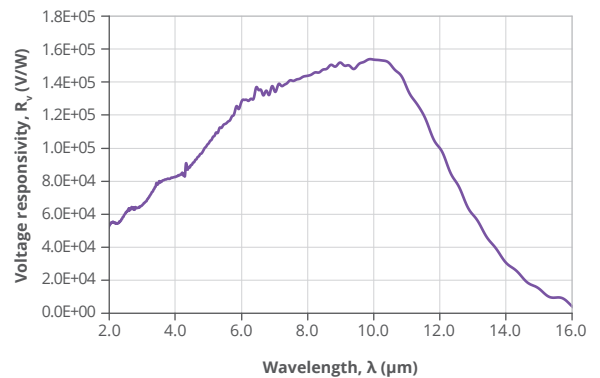
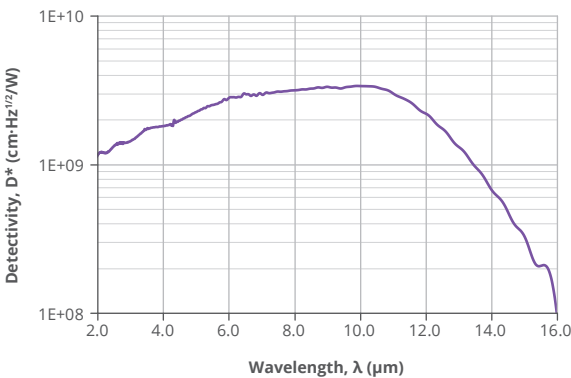
DETECTION MODULE CONFIGURATION

Detection module symbol	SM-I-12
Detector symbol	PCI-3TE-12-1x1-TO8-wZnSeAR-36 (p. 78)
Detector type	photoconductive
Active element material	epitaxial HgCdTe heterostructure
Optical area, A_o	1 mm \times 1 mm
Immersion	hyperhemisphere
Cooling	3TE
Acceptance angle, Φ	~ 36 deg.
Window	wZnSeAR (3 deg. wedged zinc selenide, anti-reflection coating)
Preamplifier symbol	SIP-TO8 (p. 135)
Preamplifier type	transimpedance
Signal output socket	MMCX
Power supply, TE cooler and thermistor socket	AMP2x4 (part No. 280389-2)

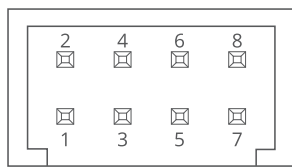
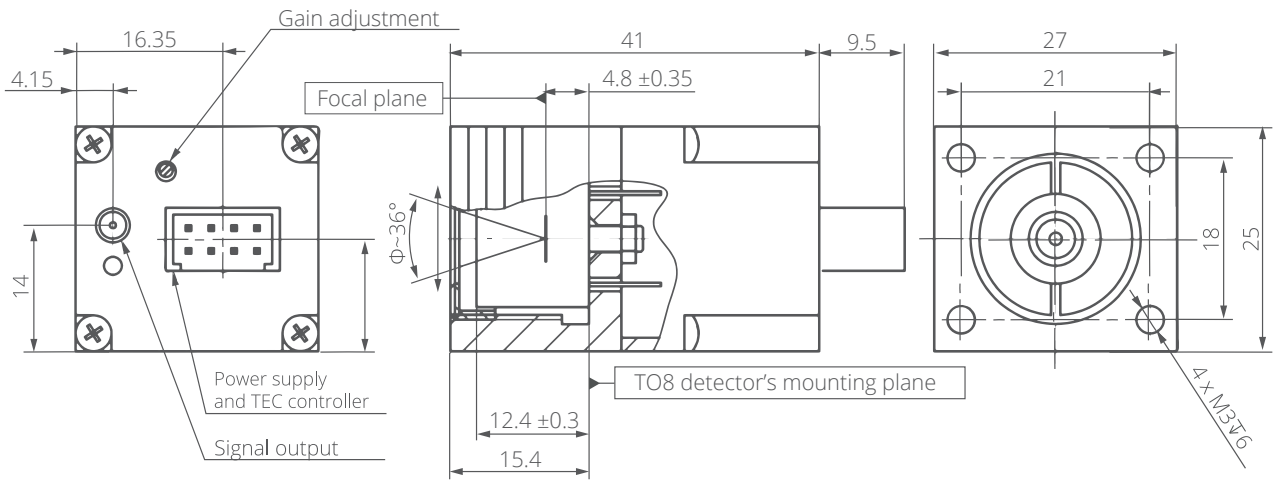
SPECIFICATION ($T_{amb} = 293\text{ K}$, $R_{load} = 1\text{ M}\Omega$, unless otherwise noted)

Parameter	Test conditions/remarks	Value			Unit
		Min.	Typ.	Max.	
Active element temperature, T_{chip}		-	210	-	K
Peak wavelength, λ_{peak}		9.5	10.0	10.5	μm
Specific wavelength, λ_{spec}		-	12.0	-	μm
Cut-off wavelength, $\lambda_{cut-off}$ (10%)	At 10% of peak responsivity	-	14.0	-	μm
Detectivity, D^*	At $\lambda = \lambda_{peak}$, $f = 100\text{ kHz}$	-	3.4×10^9	-	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$
	At $\lambda = \lambda_{spec}$, $f = 100\text{ kHz}$	1.2×10^9	2.2×10^9	-	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$
Output noise voltage density, v_n	At $f = 100\text{ kHz}$	-	-	8	$\mu\text{V}/\text{Hz}^{1/2}$
Voltage responsivity, R_v	At $\lambda = \lambda_{peak}$, $K_i = 100\text{ kV/A}$	-	1.5×10^5	-	V/W
	At $\lambda = \lambda_{spec}$, $K_i = 100\text{ kV/A}$	5.0×10^4	1.0×10^5	-	V/W
	At $\lambda = \lambda_{peak}$, $K_i = 55\text{ kV/A}$	-	8.3×10^4	-	V/W
	At $\lambda = \lambda_{spec}$, $K_i = 55\text{ kV/A}$	2.75×10^4	5.5×10^4	-	V/W
Low cut-off frequency, f_{lo}	AC coupling	-	10	-	Hz
High cut-off frequency, f_{hi}		1	-	-	MHz
Output impedance, R_{out}		-	50	-	Ω
Output voltage swing, V_{out}		-	-	± 10	V
Output voltage offset, V_{off}		-	-	± 20	mV
Power supply voltage (positive), $+V_{sup}$		-	+15	-	V
Power supply voltage (negative), $-V_{sup}$		-	-15	-	V
Power supply current consumption (positive), $+I_{sup}$		-	-	+50	mA
Power supply current consumption (negative), $-I_{sup}$		-	-	-50	mA
TEC voltage, V_{TEC}		-	-	3.6	V
TEC current, I_{TEC}		-	-	0.45	A
Weight		-	52	-	g

SPECTRAL RESPONSE (Typ., $T_{amb} = 293\text{ K}$, $T_{chip} = 210\text{ K}$, $K_i = 100\text{ kV/A}$)



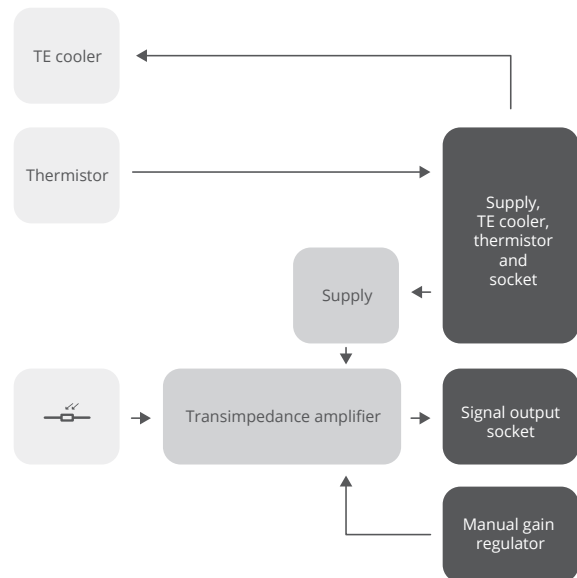
MECHANICAL LAYOUT (Unit: mm)



Power supply TEC and thermistor socket AMP2x4 (part No. 280389-2)

Pin number	Symbol	Function
1	-Vsup	Power supply input (-)
2	TH2	Thermistor output (2)
3	DATA	DATA pin
4	TEC-	TEC supply input (-)
5	GND	Ground
6	TH1	Thermistor output (1)
7	+Vsup	Power supply input (+)
8	TEC+	TEC supply input (+)

SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter	Test conditions/remarks	Value	Unit
Ambient operating temperature, T_{amb}		10 to 30	°C
Storage temperature, T_{stg}		-20 to 50	°C
Humidity	No dew condensation	10 to 90	%
Maximum incident optical power density	Continuous wave (CW) or single pulses >1 μ s duration	2.5	W/cm ²
	Single pulses <1 μ s duration	10	kW/cm ²

Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. Constant or repeated exposure to absolute maximum rating conditions may affect the quality and reliability of the device.