

SM-I-12

DATASHEET

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



FEATURES

- Spectral range: 2.0 to 13.8 μm
- Frequency bandwidth: 10 Hz to 1 MHz
- Adjustable gain
- Small size
- Quantity discounted price
- Fast delivery
- No minimum order quantity required

APPLICATIONS

- FTIR spectroscopy

INCLUDED ACCESSORIES

- 1 pc of MMCX-SMA cable
- 1 pc of AMP2×4-DB9 cable

DEDICATED ACCESSORIES

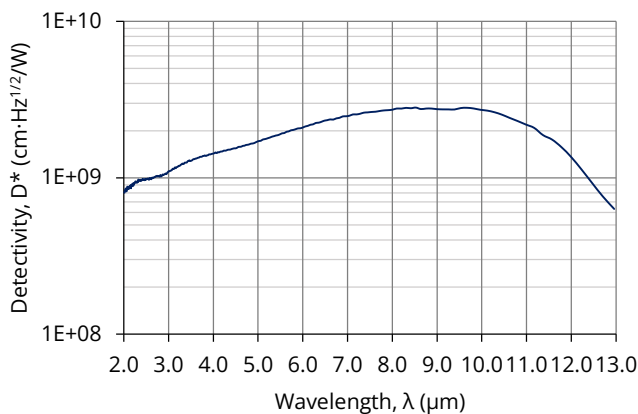
- [PTCC-01 series TEC controller](#)
- [Smart Manager Software](#) (freeware)
- [MHS-2 heatsink](#)

DETECTION MODULE CONFIGURATION

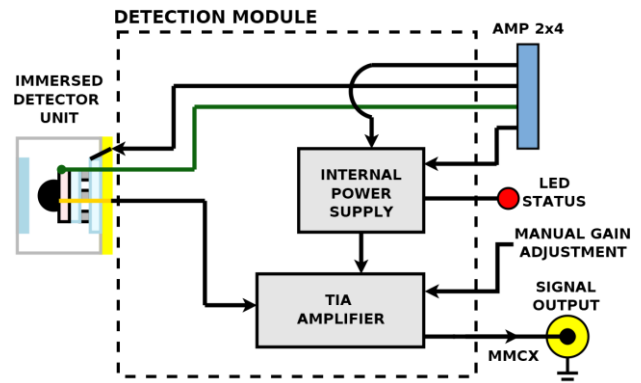
Detection module symbol	SM-I-12
Detector symbol	PCI-3TE-12-1×1-TO8-wZnSeAR-36
Detector type	photoconductive
Active element material	epitaxial HgCdTe heterostructure
Optical area, A_0	1 mm × 1 mm
Immersion	hyperhemisphere
Cooling	3TE
Acceptance angle, Φ	~36 deg.
Window	wZnSeAR (3 deg. wedged zinc selenide, anti-reflection coating)
Preamplifier symbol	SIP
Preamplifier type	transimpedance
Signal output socket	MMCX
Power supply and TEC control socket	AMP2×4 (part No. 280389-2)
Mounting hole	no
Built-in fan	no (external heatsink necessary)
Built-in TEC controller	no

SPECIFICATION ($T_{\text{amb}} = 293 \text{ K}$, $R_{\text{load}} = 50 \Omega$, unless otherwise noted)

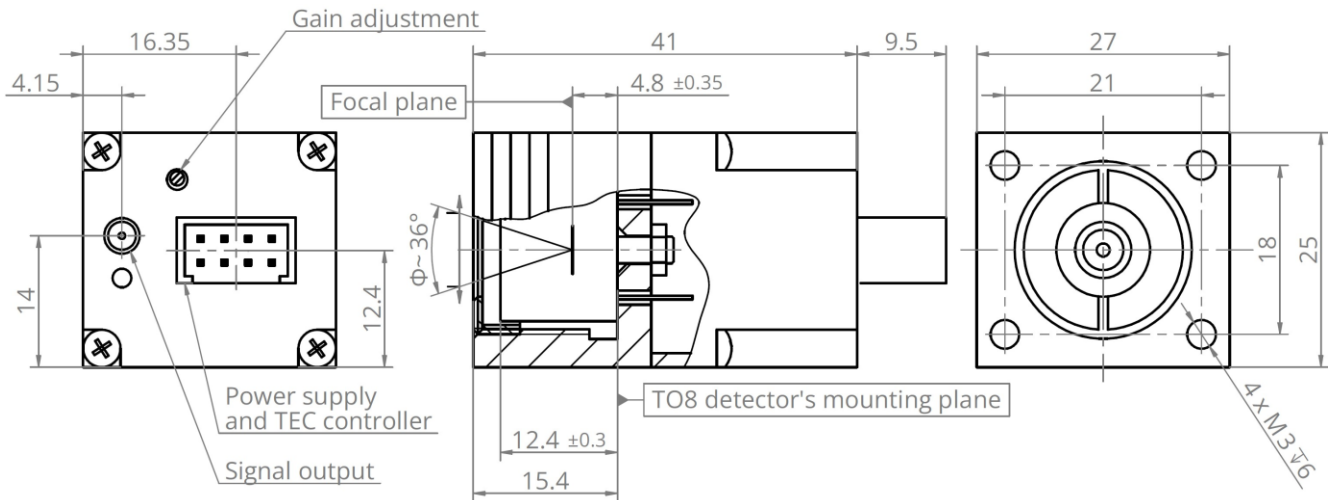
Parameter	Test conditions/remarks	Value			Unit
		Min.	Typ.	Max.	
Active element temperature, T_{chip}		-	210	-	K
Cut-on wavelength, $\lambda_{\text{cut-on}}$ (10%)	At 10% of peak responsivity	-	-	2.0	μm
Peak wavelength, λ_{peak}		9.2	10.0	10.2	μm
Optimum wavelength, λ_{opt}		-	12.0	-	μm
Cut-off wavelength, $\lambda_{\text{cut-off}}$ (10%)	At 10% of peak responsivity	13.8	-	-	μm
Detectivity, D^*	At $\lambda = \lambda_{\text{peak}}$, $f = 20 \text{ kHz}$	2.5×10^9	-	-	$\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$
	At $\lambda = \lambda_{\text{opt}}$, $f = 20 \text{ kHz}$	1.3×10^9	-	-	$\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$
Output noise voltage density, v_n	At $f = 20 \text{ kHz}$	-	-	6	$\mu\text{V} / \text{Hz}^{1/2}$
Voltage responsivity, R_v	At $\lambda = \lambda_{\text{peak}}$, $K_i = 100 \text{ kV/A}$	1.35×10^5	-	-	V/W
	At $\lambda = \lambda_{\text{opt}}$, $K_i = 100 \text{ kV/A}$	6.30×10^4	-	-	V/W
	At $\lambda = \lambda_{\text{peak}}$, $K_i = 55 \text{ kV/A}$	7.45×10^4	-	-	V/W
	At $\lambda = \lambda_{\text{opt}}$, $K_i = 55 \text{ kV/A}$	3.45×10^4	-	-	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}	$R_{\text{load}} = 1 \text{ M}\Omega$	-10	-	+10	V
Output voltage offset, V_{off}		-	-	± 20	mV
Module power supply voltage (positive), $+V_{\text{sup}}$	Current consumption $\leq 50 \text{ mA}$	-	+15	-	V
Module power supply voltage (negative), $-V_{\text{sup}}$	Current consumption $\leq 50 \text{ mA}$	-	-15	-	V

SPECTRAL RESPONSE (Typ., $T_{\text{amb}} = 293 \text{ K}$)

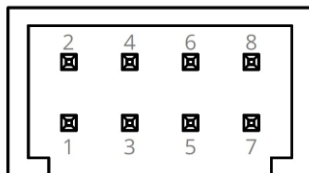
SCHEMATIC DIAGRAM



MECHANICAL LAYOUT (Unit: mm)



POWER SUPPLY AND TEC CONTROL SOCKET AMP2×4 (male)



Pin No.	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 (+)

ABSOLUTE MAXIMUM RATINGS

Parameter	Test conditions/remarks	Value	Unit
Maximum incident optical power density	Continuous wave (CW) or single pulses >1 μs duration Single pulses <1 μs duration	2.5 10	W/cm ² kW/cm ²
Ambient operating temperature, T _{amb}		10 to 30	°C
Storage temperature, T _{stg}		-20 to 85	°C
Humidity	No dew condensation	10 to 90	%

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.