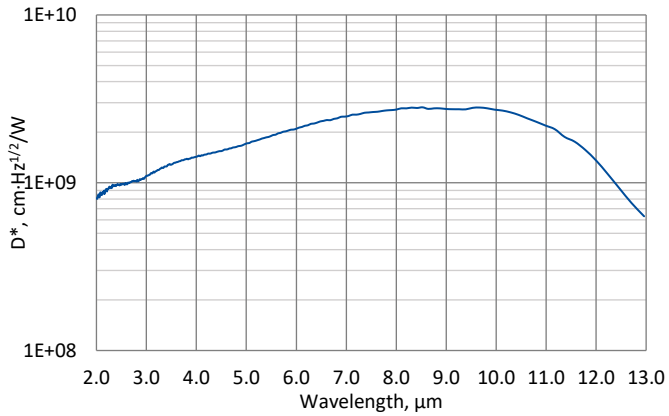
SM-I-12

2.0 – 14.0 µm and 10 Hz – 1 MHz HgCdTe small-size IR detection module with optically immersed photoconductive detector

SM-I-12 is an ultra-small IR detection module. Thermoelectrically cooled, optically immersed photoconductive detector, based on HgCdTe heterostructure (PCI-3TE-12-1×1-TO8-wZnSeAR-36) is integrated with transimpedance, AC coupled preamplifier. There is a possibility to manually adjust gain of the signal. 3° wedged zinc selenide anti-reflection coated window prevents unwanted interference effects. SM-I-12 is easy to assembly in space limited measuring systems of FTIR applications.

Spectral response (T_a = 20°C)



Exemplary spectral detectivity, the spectral response of delivered devices may differ.

Specification (T_a = 20°C)

Parameter	Typical value
Optical parameters	
Cut-on wavelength $\lambda_{cut\text{-}on}$ (10%), µm	≤2.0
Peak wavelength λ_{peak}, µm	10.0±0.2
Optimum wavelength λ_{opt}, µm	12.0
Cut-off wavelength $\lambda_{cut\text{-}off}$ (10%), µm	14.0±0.2
Detectivity D* (λ_{peak}, 20 kHz), cm·Hz$^{1/2}$/W	≥2.5×10^9
Detectivity D* (λ_{opt}, 20 kHz), cm·Hz$^{1/2}$/W	≥1.3×10^9
Output noise density v_n (20 kHz), µV/Hz$^{1/2}$	≤6
Electrical parameters	
Voltage responsivity R_v (λ_{peak}, 100 kV/A), V/W	≥1.35×10^5
Voltage responsivity R_v (λ_{opt}, 100 kV/A), V/W	≥6.30×10^4
Voltage responsivity R_v (λ_{peak}, 55 kV/A), V/W	≥7.45×10^4
Voltage responsivity R_v (λ_{opt}, 55 kV/A), V/W	≥3.45×10^4
Low cut-off frequency f_{lo}, Hz	10
High cut-off frequency f_{hi}, Hz	1M±0.1
Output impedance R_{out}, Ω	50
Output voltage swing V_{out}, V	10 (R_L = 1 MΩ*))
Output voltage offset V_{off}, mV	max ±20
Other information	
Active element material	epitaxial HgCdTe heterostructure
Optical area A_O, mm×mm	1×1
Window	wZnSeAR
Acceptance angle Φ	~36°
Ambient operating temperature T_a, °C	10 to 30
Signal output socket	MMCX
Power supply and TEC control socket	AMPMODU 2×4 (male)
Mounting hole	none
Fan	no (external heatsink necessary)

*) R_L – load resistance

Features

- Wide spectral range from 2.0 to 14.0 µm
- High responsivity
- Large dynamic range
- Very small size
- Convenient to use
- Quantity discounted price
- Fast delivery

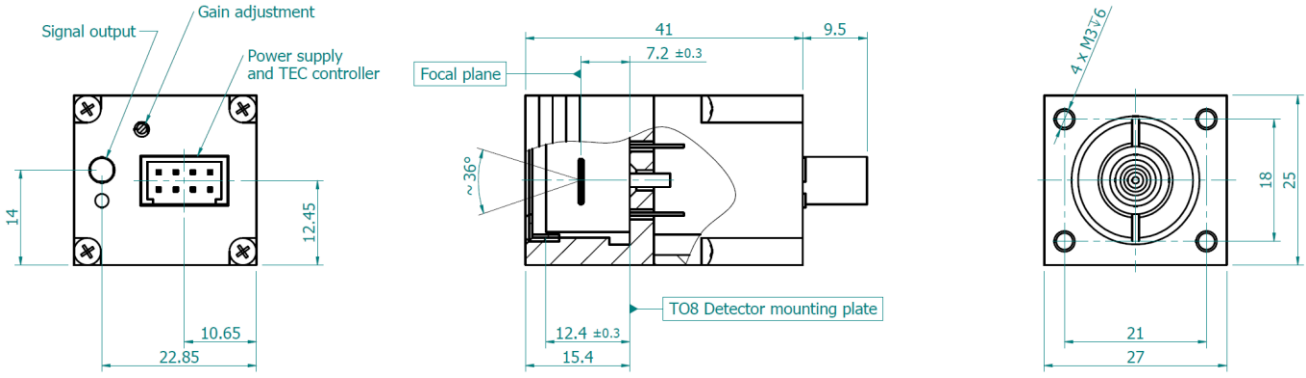
Applications

- FTIR spectroscopy and spectrometry

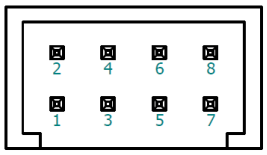
Ralated product

- PCI-3TE-12-1×1-TO8-wZnSeAR-36

Mechanical layout, mm

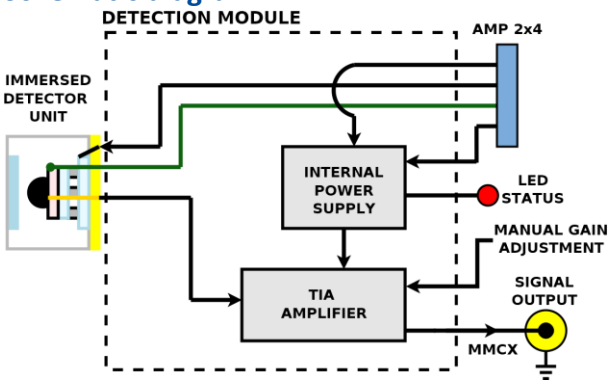


Power supply and TEC control socket AMPMODU 2×4 (male)



Function	Symbol	Pin number
Power supply input (–)	$-V_{sup}$	1
Thermistor output	TH2	2
Data pin	DATA	3
TEC supply input (–)	TEC–	4
Ground	GND	5
Thermistor output	TH1	6
Power supply input (+)	$+V_{sup}$	7
TEC supply input (+)	TEC+	8

Schematic diagram



Included accessories

- **MMCX-BNC**, **AMP2×4-DB9** cables

Dedicated accessories

- **PTCC-01-BAS** TEC controller + **USB: TypeA-MicroB** cable + **AC adaptor**
- **PTCC-01-ADV** TEC controller + **USB: TypeA-MicroB** cable + **AC adaptor**
- **PTCC-01-OEM** TEC controller + **USB: TypeA-MicroB**, **KK2-POWER** cables
- **MHS-2** heatsink