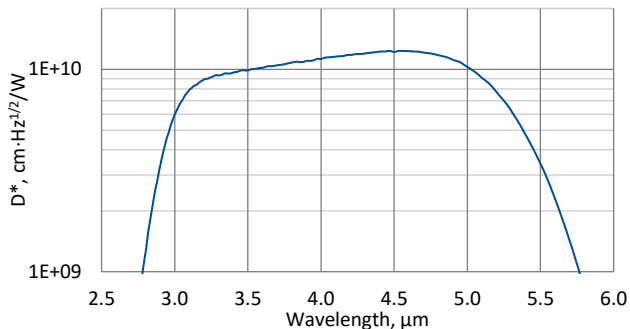


NIPM-I-5 – ENGINEERING SAMPLE

2.9 – 5.5 μm and over 1.8 MHz balanced / auto-balanced IR detection module with two HgCdTe thermoelectrically cooled, optically immersed photovoltaic detectors

NIPM-I-5 is an infrared detection module designed for differential optical signal detection. The device can operate in balanced and auto-balanced mode. This detection module uses two individual detectors based on HgCdTe heterostructure. These IR detectors (signal and reference) are precisely matched to achieve a very high Common Mode Rejection Ratio (CMRR). NIPM-I-5 is dedicated to operating in systems where excess noise of the laser dominates over fundamental noise of the detectors.

Spectral response ($T_a = 20^\circ\text{C}$, SIG and REF)



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



Specification ($T_a = 20^\circ\text{C}$, $V_b = 0\text{ mV}$)

Parameter	Typical value
Optical parameters	
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), μm	2.9 ± 1.0
Peak wavelength λ_{peak} , μm	4.2 ± 0.5
Optimum wavelength λ_{opt} , μm	5.0
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), μm	5.5 ± 0.3
Detectivity D^* (λ_{opt} , REF), $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 1.0 \times 10^{10}$
Detectivity D^* (λ_{opt} , SIG), $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 1.0 \times 10^{10}$
Output noise density v_n (100 kHz, $R_{\text{Load}} = 50\ \Omega$, REF), $\text{nV}/\text{Hz}^{1/2}$	≤ 100
Output noise density v_n (100 kHz, $R_{\text{Load}} = 50\ \Omega$, SIG), $\text{nV}/\text{Hz}^{1/2}$	≤ 100
Electrical parameters	
Voltage responsivity R_v (λ_{opt} , REF), V/W	$\geq 1.0 \times 10^4$
Voltage responsivity R_v (λ_{opt} , SIG), V/W	$\geq 1.0 \times 10^4$
Low cut-off frequency f_{lo} , Hz	DC
High cut-off frequency f_{hi} , MHz	≥ 1.8
Output impedance R_{out} (REF, SIG, BAL/A-BAL), Ω	50
Output voltage swing V_{out} ($R_{\text{Load}} = 50\ \Omega$), V	0.4
Output voltage offset V_{off} , mV_{DC}	± 30
CMRR balance / reference (100 kHz), dB	≤ -32
CMRR auto-balance / reference (100 kHz), dB	≤ -22
Power supply voltage V_{sup} , V_{DC}	+9
Power supply current I_{sup} , A	1.5
Other information	
Active element material (REF and SIG)	epitaxial HgCdTe heterostructure
Optical area A_o (REF and SIG), $\text{mm}\times\text{mm}$	1×1
Window (REF and SIG)	wAl_2O_3
Acceptance angle Φ (REF and SIG)	$\sim 36^\circ$
Ambient operating temperature T_a , $^\circ\text{C}$	5 to 25
Reference output socket (REF)	SMA
Signal output socket (SIG)	SMA
Balanced / auto-balanced output socket	SMA
Power supply socket	DC 2.1/5.5
Mounting hole	M6
Fan	yes (2 pcs)

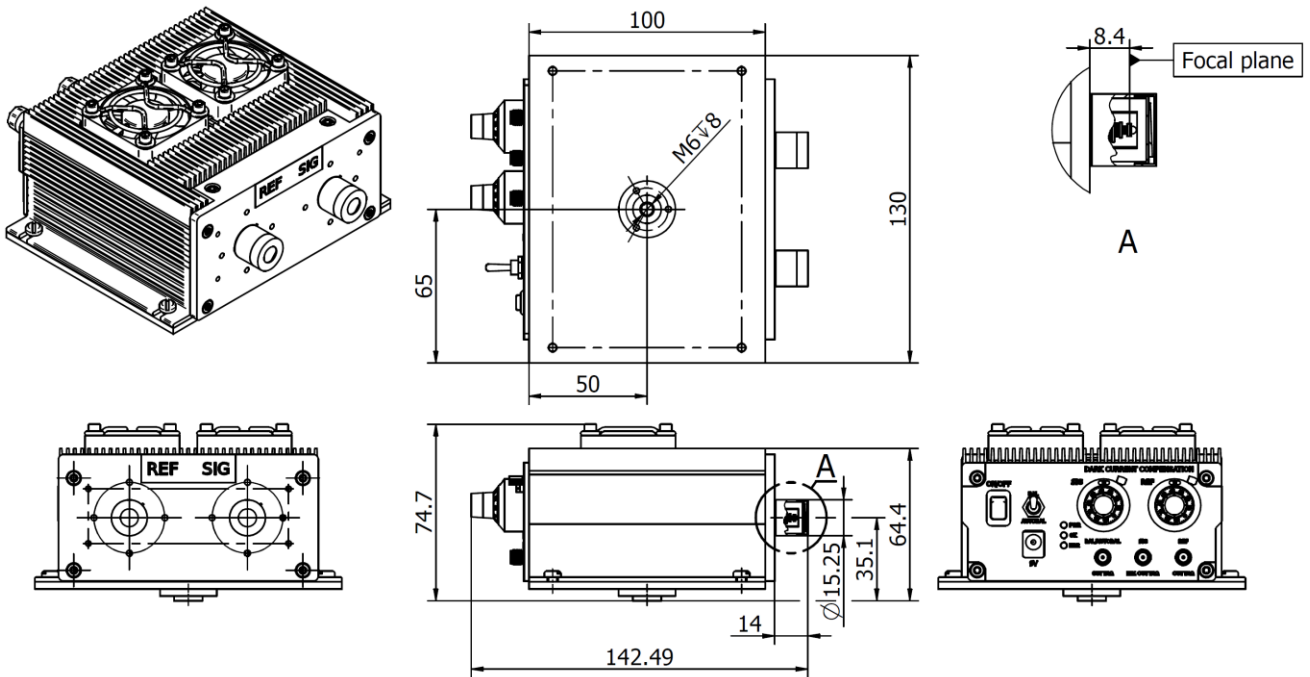
Features

- Two channels with similar spectral characteristics and frequencies
- Manual change balanced or auto-balanced mode
- Low noise operation and high detectivity (near BLIP limit)
- Integrated with fans and thermoelectric cooler controllers
- Single power supply
- Compatible with optical accessories
- Detectors type: PVI-4TE-5-1 \times 1-TO8-wAl₂O₃-36

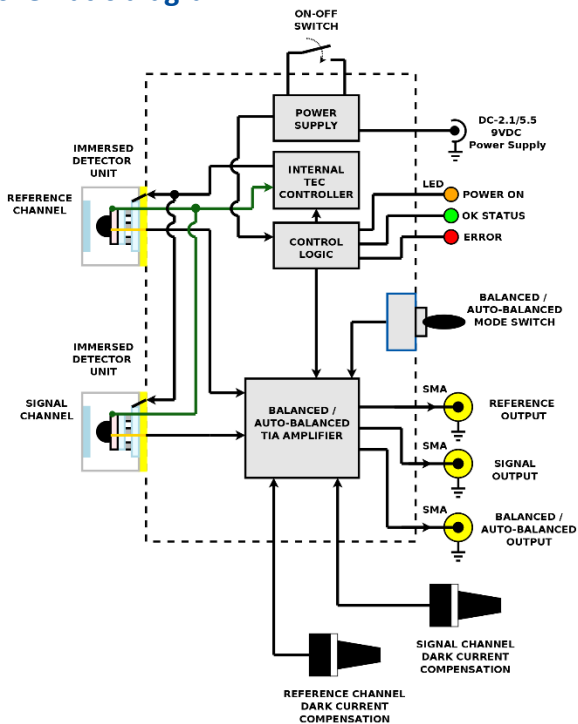
Applications

- QCL lasers excess noise suppression in gas analysis

Mechanical layout, mm



Schematic diagram



Included accessories

- 3×SMA-BNC cables, AC adaptor