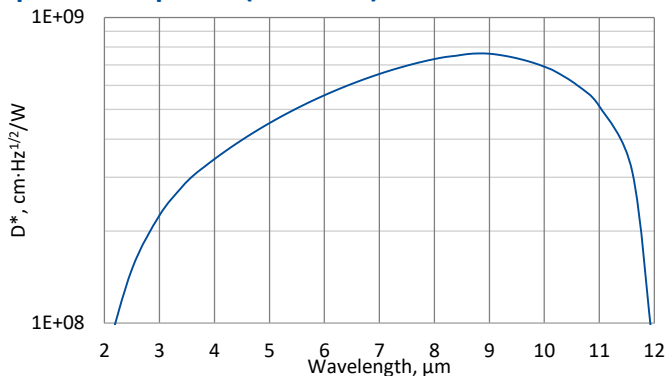


## LabM-I-10.6

### 2.0 – 12.0 $\mu\text{m}$ and DC – 100 MHz HgCdTe programmable, laboratory IR detection module with optically immersed photovoltaic detector

**LabM-I-10.6** is a laboratory IR detection module with optically immersed photovoltaic detector based on HgCdTe heterostructure, integrated with transimpedance, programmable preamplifier. 3° wedged zinc selenide anti-reflection coated window prevents unwanted interference effects. For proper operation programmable „smart“ VIGO thermoelectric cooler controller PTCC-01 (sold separately) and Smart Manager Software (freeware) are required. LabM-I-10.6 module comes complete with PTCC-01 and Smart Manager is the best solution for prototyping and R&D stage in a variety of LWIR applications. This set provides flexible approach to different needs of system designers.

#### Spectral response ( $T_a = 20^\circ\text{C}$ )



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



#### Specification ( $T_a = 20^\circ\text{C}$ , default module settings)

Parameter	Typical value
<b>Optical parameters</b>	
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	$\leq 2.0$
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	$9.5 \pm 0.5$
Optimum wavelength $\lambda_{\text{opt}}$ , $\mu\text{m}$	10.6
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	$\geq 12.0$
Detectivity $D^*(\lambda_{\text{peak}})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 7.2 \times 10^8$
Detectivity $D^*(\lambda_{\text{opt}})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 6.0 \times 10^8$
Output noise density $v_n$ (10 MHz), $\text{nV}/\text{Hz}^{1/2}$	$\leq 400$
<b>Electrical parameters</b>	
Voltage responsivity $R_v(\lambda_{\text{peak}})$ , $\text{V}/\text{W}$	$\geq 2.4 \times 10^3$
Voltage responsivity $R_v(\lambda_{\text{opt}})$ , $\text{V}/\text{W}$	$\geq 2.0 \times 10^3$
Low cut-off frequency $f_{\text{lo}}$ , Hz	DC
High cut-off frequency $f_{\text{hi}}$ , Hz	$\geq 100\text{M}$ (adjustable)
Output impedance $R_{\text{out}}$ , $\Omega$	50
Output voltage swing $V_{\text{out}}$ , V	$\pm 1$ ( $R_L = 1 \text{ M}\Omega^*$ )
Output voltage offset $V_{\text{off}}$ , mV	max $\pm 20$
<b>Other information</b>	
Active element material	epitaxial HgCdTe heterostructure
Optical area $A_o$ , $\text{mm}\times\text{mm}$	1x1
Window	wZnSeAR
Acceptance angle $\Phi$	$\sim 36^\circ$
Ambient operating temperature $T_a$ , $^\circ\text{C}$	10 to 30
Signal output socket	SMA
Power supply and TEC control socket	LEMO (female) ECG.0B.309.CLN
Mounting hole	M4
Fan	yes

\* $R_L$  – load resistance

#### Features

- Very high performance and reliability
- DC offset compensation
- Sensitive to IR radiation polarisation
- Compatible with optical accessories
- Versatility and flexibility
- Quantity discounted price
- Fast delivery

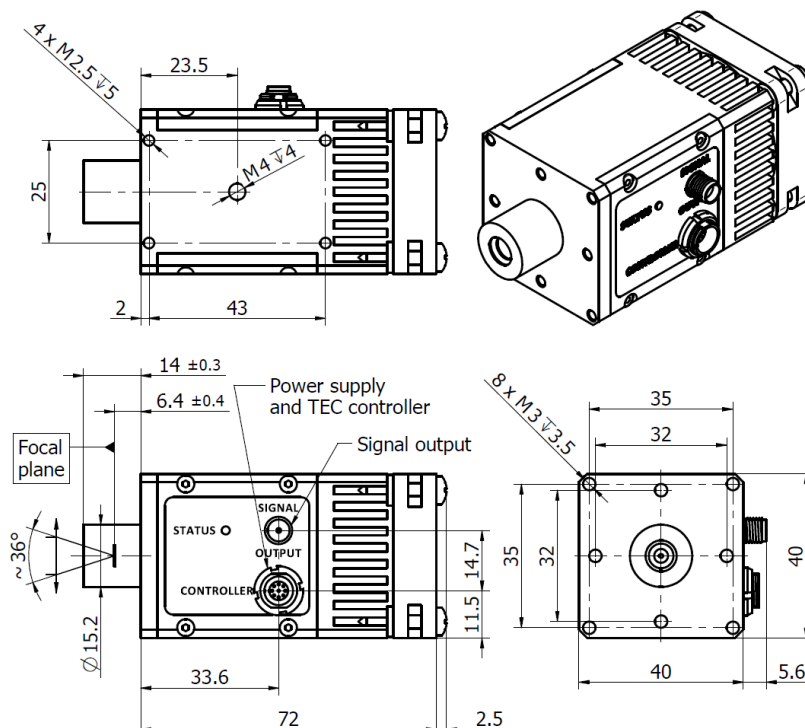
#### Parameters configurable by the user

- Output voltage offset
- Gain (in 40 dB range)
- Bandwidth (1.5 MHz/15 MHz/100 MHz)
- Coupling AC/DC
- Detector's parameters (temperature, reverse bias etc.)

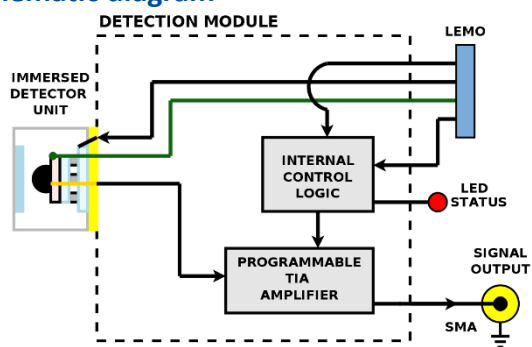
#### Applications

- Gas detection, monitoring and analysis
- $\text{CO}_2$  laser (10.6  $\mu\text{m}$ ) measurements
- Laser power monitoring and control
- Laser beam profiling and positioning
- Laser calibration
- Semiconductor manufacturing
- Glucose monitoring
- Dentistry

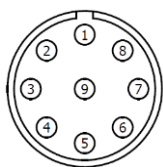
### Mechanical layout, mm



### Schematic diagram

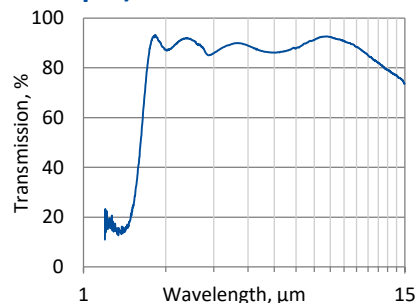


### Power supply and TEC control socket LEMO (female) ECG.0B.309.CLN



Function	Symbol	Pin number
Fan and programmable preamp internal logic auxiliary supply	FAN+	1
Thermistor output (2)	TH2	2
TEC supply input (-)	TEC-	3
Power supply input (-)	-V <sub>sup</sub>	4
Ground	GND	5
Power supply input (+)	+V <sub>sup</sub>	6
TEC supply input (+)	TEC+	7
Thermistor output (1)	TH1	8
Bidirectional data pin	DATA	9

### Spectral transmission of wZnSeAR window (typical example)



### Included accessories

- SMA-BNC, LEMO-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
- OTA optical threaded adapter
- DRB-2 base mounting system

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