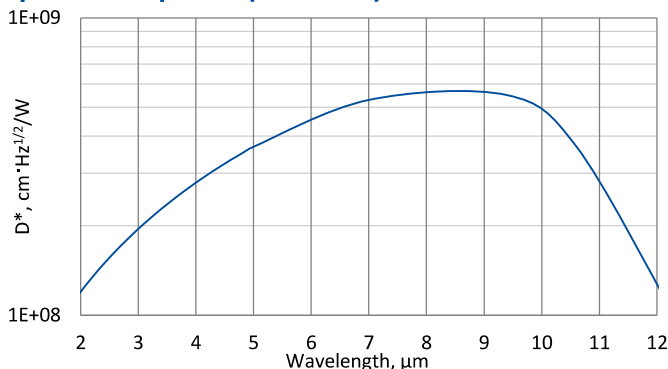


## UM-I-10.6

### 2 – 12 $\mu\text{m}$ and DC – 100 MHz HgCdTe universal IR detection module with optically immersed photovoltaic multiple junction detector

**UM-I-10.6** is universal „all-in-one“ IR detection module. Thermoelectrically cooled, optically immersed photovoltaic detector, based on HgCdTe heterostructure, is integrated with transimpedance, DC coupled preamplifier, a fan and a thermoelectric cooler controller in a compact housing. 3° wedged zinc selenide anti-reflection coated window prevents unwanted interference effects. UM-I-10.6 detection module is very convenient and user-friendly device, thus can be easily used in a variety of LWIR applications.

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



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



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

Parameter	Typical value
<b>Optical characteristics</b>	
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	$\leq 2.0$
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	$8.5 \pm 1.5$
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 $D^*(\lambda_{\text{peak}})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 5.5 \times 10^8$
Detectivity $D^*(\lambda_{\text{opt}})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 3.7 \times 10^8$
Output noise density $v_n$ (averaged over 1 MHz to $f_{\text{hi}}$ ), $\text{nV}/\text{Hz}^{1/2}$	$\leq 330$
<b>Electrical parameters</b>	
Voltage responsivity $R_v(\lambda_{\text{peak}})$ , $\text{V}/\text{W}$	$\geq 9.7 \times 10^2$
Voltage responsivity $R_v(\lambda_{\text{opt}})$ , $\text{V}/\text{W}$	$\geq 6.5 \times 10^2$
Low cut-off frequency $f_{\text{lo}}$ , Hz	DC
High cut-off frequency $f_{\text{hi}}$ , Hz	$\geq 100\text{M}$
Output impedance $R_{\text{out}}$ , $\Omega$	50
Output voltage swing $V_{\text{out}}$ , V	$\pm 1$ ( $R_L = 50 \Omega^*$ )
Output voltage offset $V_{\text{off}}$ , mV	max $\pm 20$
Power supply voltage $V_{\text{sup}}$ , V	+5
<b>DC monitor (approx. 0 V offset)</b>	
Voltage responsivity $R_v(\lambda_{\text{peak}})$ , $\text{V}/\text{W}$	$\geq 2.2 \times 10^2$
Voltage responsivity $R_v(\lambda_{\text{opt}})$ , $\text{V}/\text{W}$	$\geq 1.5 \times 10^2$
Low cut-off frequency $f_{\text{lo}}$ , Hz	DC
High cut-off frequency $f_{\text{hi}}$ , Hz	150k
<b>Other information</b>	
Active element material	epitaxial HgCdTe heterostructure
Optical area $A_o$ , $\text{mm}\times\text{mm}$	1x1
Window	wedged zinc selenide AR coated (wZnSeAR)
Acceptance angle $\Phi$	$\sim 36^\circ$
Ambient operating temperature $T_a$ , $^\circ\text{C}$	10 to 30
Signal output socket	SMA
DC monitor socket	SMA
Power supply socket	DC 2.5/5.5
Mounting hole	M4
Fan	yes

#### Features

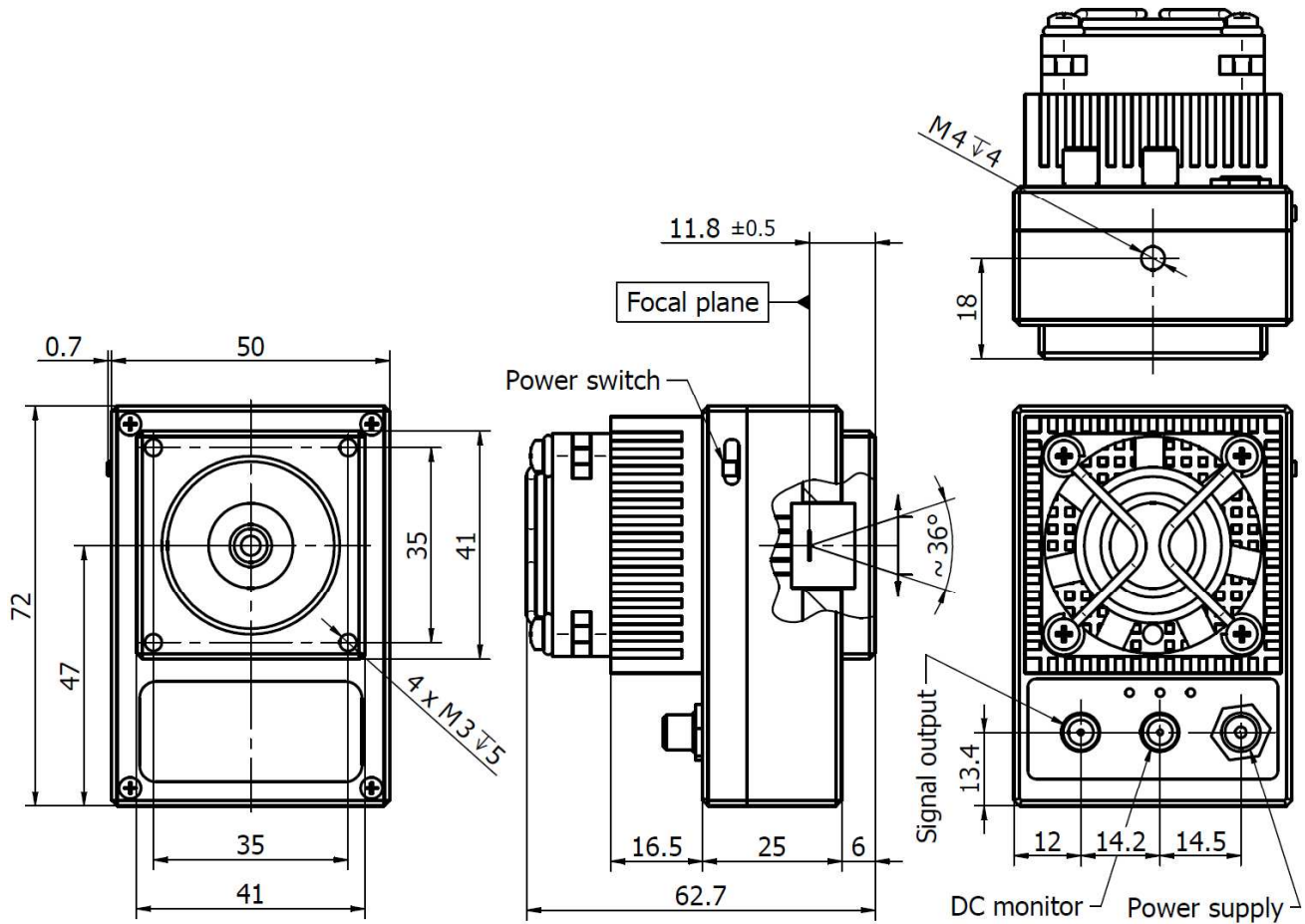
- Integrated TEC controller and fan
- Single power supply
- DC monitor
- Sensitive to IR radiation polarisation
- Optimised for effective heat dissipation
- Compatible with optical accessories
- Cost effective OEM version available
- Universal and flexible
- Quantity discounted price
- Fast delivery

#### Applications

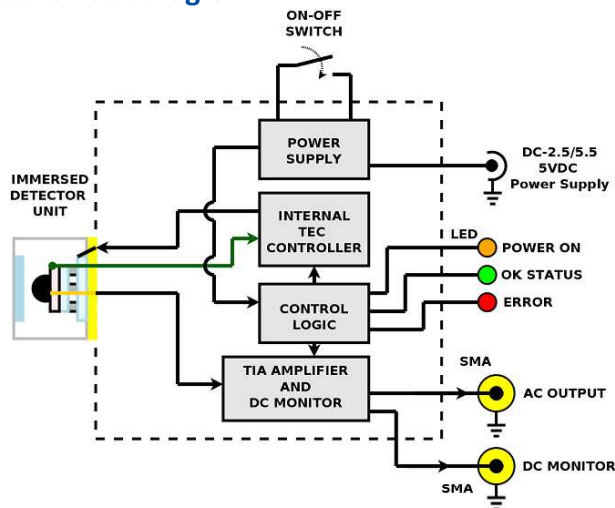
- Gas detection, monitoring and analysis
- $\text{CO}_2$  laser (10.6  $\mu\text{m}$ ) measurements
- Laser power monitoring and control
- Laser beam profiling and positioning
- Laser calibration

\* )  $R_L$  – load resistance

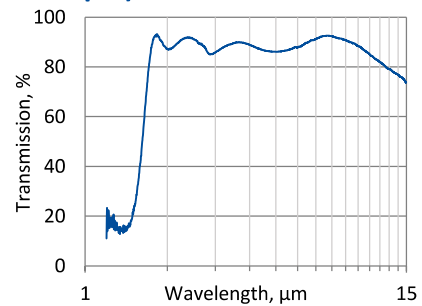
### Mechanical layout, mm



### Schematic diagram



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



### Included accessories

- 2x SMA-BNC cables + AC adaptor

### Dedicated accessories

- [OTA](#) optical threaded adapter
- [DRB-2](#) base mounting system