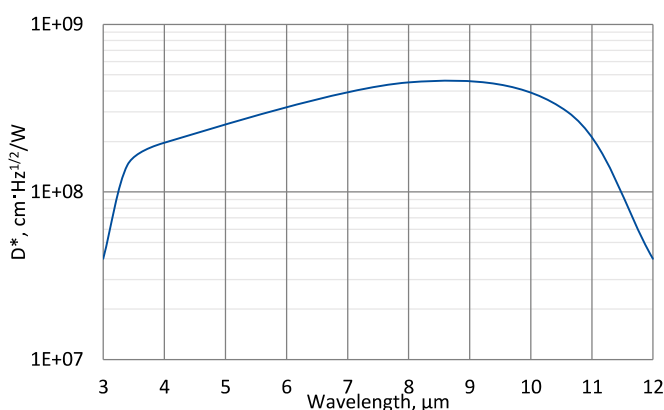


## UHSM-10.6

### 3 – 12 $\mu\text{m}$ and over 1GHz HgCdTe ultra high speed IR detection module with photovoltaic detector

**UHSM-10.6** is ultra high speed „all-in-one“ IR detection module. Thermoelectrically cooled, photovoltaic detector, based on HgCdTe heterostructure, is integrated with transimpedance, AC coupled preamplifier, a fan and a thermoelectric cooler controller in a compact housing.  $3^\circ$  wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects. UHSM-10.6 detection module is very convenient and user-friendly device, thus can be easily used in a variety of LWIR applications requiring wide frequency bandwidth.

#### 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 parameters</b>	
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	$\leq 3.0$
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	$8.0 \pm 1.0$
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 $D^*(\lambda_{\text{peak}}, 100 \text{ MHz})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 4.5 \times 10^8$
Detectivity $D^*(\lambda_{\text{opt}}, 100 \text{ MHz})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 3.0 \times 10^8$
Output noise density $v_n(100 \text{ MHz})$ , $\text{nV}/\text{Hz}^{1/2}$	$\leq 70$
<b>Electrical parameters (<math>R_L = 50 \Omega^*)</math></b>	
Voltage responsivity $R_v(\lambda_{\text{peak}})$ , $\text{V}/\text{W}$	$\geq 4.5 \times 10^3$
Voltage responsivity $R_v(\lambda_{\text{opt}})$ , $\text{V}/\text{W}$	$\geq 3.0 \times 10^3$
Low cut-off frequency $f_{\text{lo}}$ , $\text{Hz}$	300
High cut-off frequency $f_{\text{hi}}$ , $\text{Hz}$	$\geq 1.0\text{G}$
Output voltage swing $V_{\text{out}}$ , $\text{V}$	$\pm 1$
1/f noise corner frequency $f_c$ , $\text{Hz}$	$\leq 10\text{M}$
Power supply voltage $V_{\text{sup}}$ , $\text{V}$	+9
<b>DC monitor (approx. 1 V offset, <math>R_L = 100 \text{ k}\Omega^*)</math></b>	
Voltage responsivity $R_v(\lambda_{\text{peak}})$ , $\text{V}/\text{W}$	$\geq 1.7 \times 10^3$
Voltage responsivity $R_v(\lambda_{\text{opt}})$ , $\text{V}/\text{W}$	$\geq 1.1 \times 10^3$
Low cut-off frequency $f_{\text{lo}}$ , $\text{Hz}$	DC
High cut-off frequency $f_{\text{hi}}$ , $\text{Hz}$	260
<b>Other information</b>	
Active element material	epitaxial HgCdTe heterostructure
Active area A, $\text{mm}\times\text{mm}$	0.05 $\times$ 0.05
Window	wZnSeAR
Acceptance angle $\Phi$	$\sim 80^\circ$
Ambient operating temperature $T_a$ , $^\circ\text{C}$	10 to 30
Signal output socket (RF output)	SMA
DC monitor socket	SMA
Power supply socket	DC 2.1/5.5
Mounting hole	M4
Fan	yes

<sup>\*)</sup>  $R_L$  – load resistance

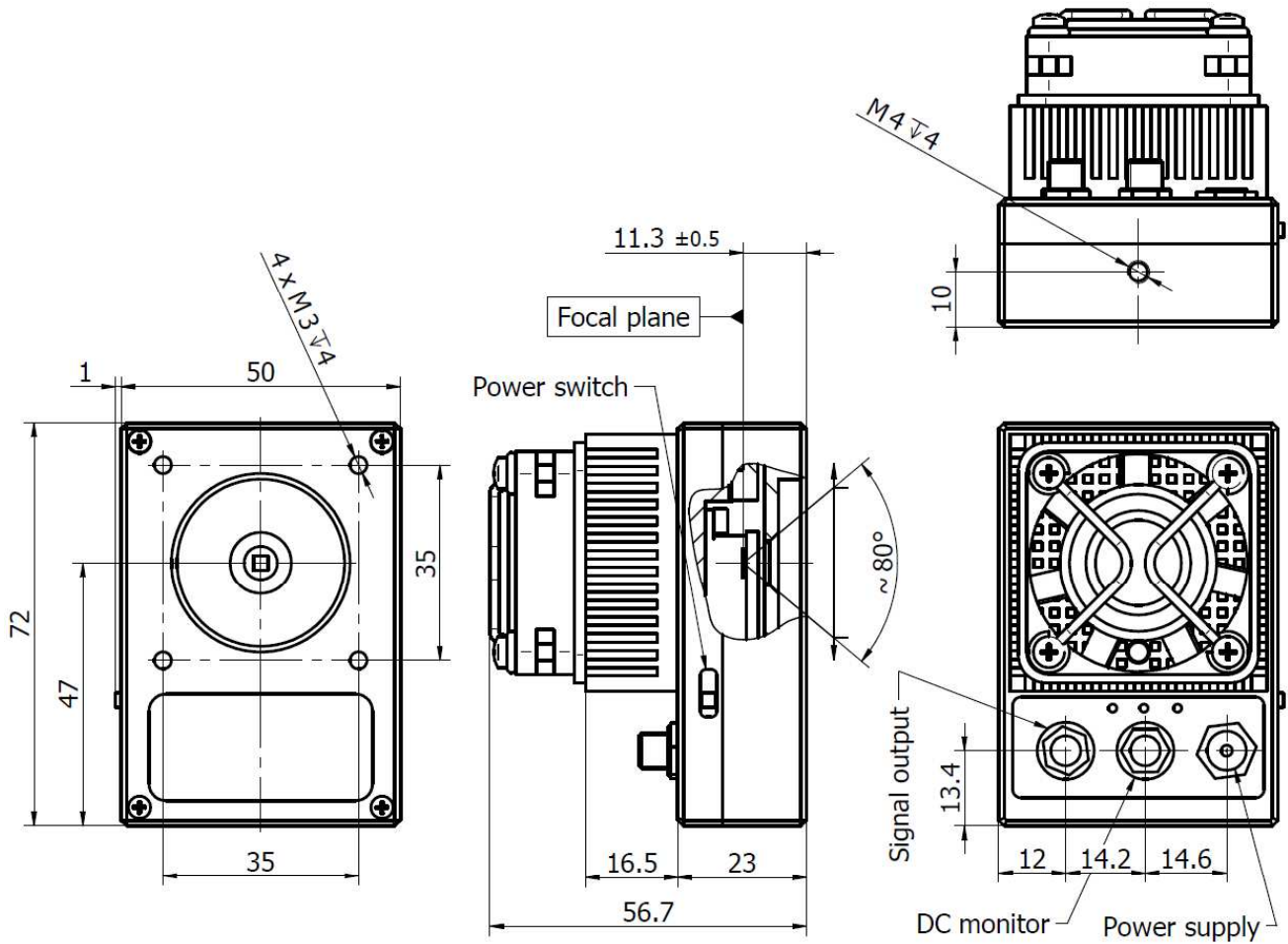
#### Features

- Wide frequency bandwidth over 1 GHz
- Integrated TEC controller and fan
- Single power supply
- DC monitor
- Optimised for effective heat dissipation
- Compatible with optical accessories
- Fast delivery

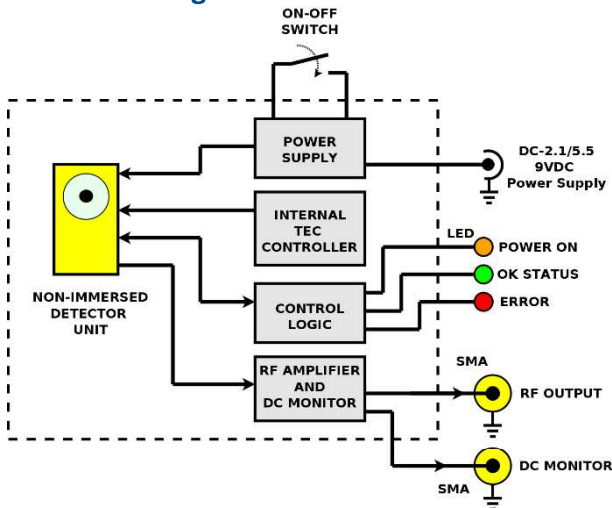
#### Applications

- Dual-comb spectroscopy
- Heterodyne detection
- Characterization of pulsed laser sources
- LIDAR
- Object scanners
- Time-resolved fluorescence spectroscopy systems
- Free-space optical communication

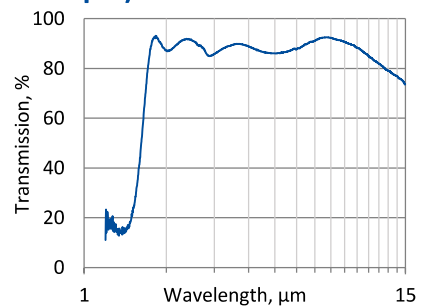
### Mechanical layout, mm



### 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