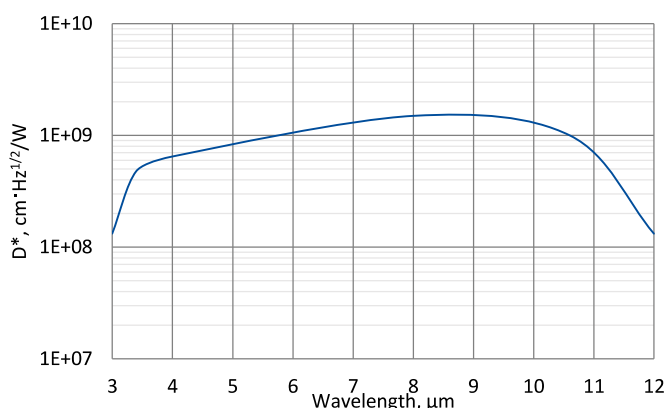


## UHSM-I-10.6

### 3 – 12 $\mu\text{m}$ and over 700 MHz HgCdTe ultra high speed IR detection module with optically immersed photovoltaic detector

**UHSM-I-10.6** is ultra high speed „all-on-one“ IR detection module. Thermoelectrically cooled, optically immersed 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° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects. UHSM-I-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 $\lambda_{\text{peak}}$ , $\mu\text{m}$	$8.5 \pm 0.5$
Optimum wavelength $\lambda_{\text{opt}}$ , $\mu\text{m}$	10.6
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	$12.5 \pm 0.3$
Detectivity $D^*(\lambda_{\text{peak}}, 100 \text{ MHz})$ , $\text{cm}^2 \cdot \text{Hz}^{1/2} / \text{W}$	$\geq 1.5 \times 10^9$
Detectivity $D^*(\lambda_{\text{opt}}, 100 \text{ MHz})$ , $\text{cm}^2 \cdot \text{Hz}^{1/2} / \text{W}$	$\geq 1.0 \times 10^9$
Output noise density $v_n(100 \text{ MHz})$ , $\text{nV} / \text{Hz}^{1/2}$	$\leq 90$
<b>Electrical parameters (<math>R_L = 50 \Omega</math>)</b>	
Voltage responsivity $R_v(\lambda_{\text{peak}})$ , $\text{V} / \text{W}$	$\geq 1.0 \times 10^3$
Voltage responsivity $R_v(\lambda_{\text{opt}})$ , $\text{V} / \text{W}$	$\geq 7.0 \times 10^2$
Low cut-off frequency $f_{\text{co}}$ , $\text{Hz}$	300
High cut-off frequency $f_{\text{hi}}$ , $\text{Hz}$	$\geq 700\text{M}$
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 = 1 \text{ M}\Omega</math>)</b>	
Voltage responsivity $R_v(\lambda_{\text{peak}})$ , $\text{V} / \text{W}$	$\geq 3.8 \times 10^3$
Voltage responsivity $R_v(\lambda_{\text{opt}})$ , $\text{V} / \text{W}$	$\geq 2.7 \times 10^2$
Low cut-off frequency $f_{\text{co}}$ , $\text{Hz}$	DC
High cut-off frequency $f_{\text{hi}}$ , $\text{Hz}$	260
<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 (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

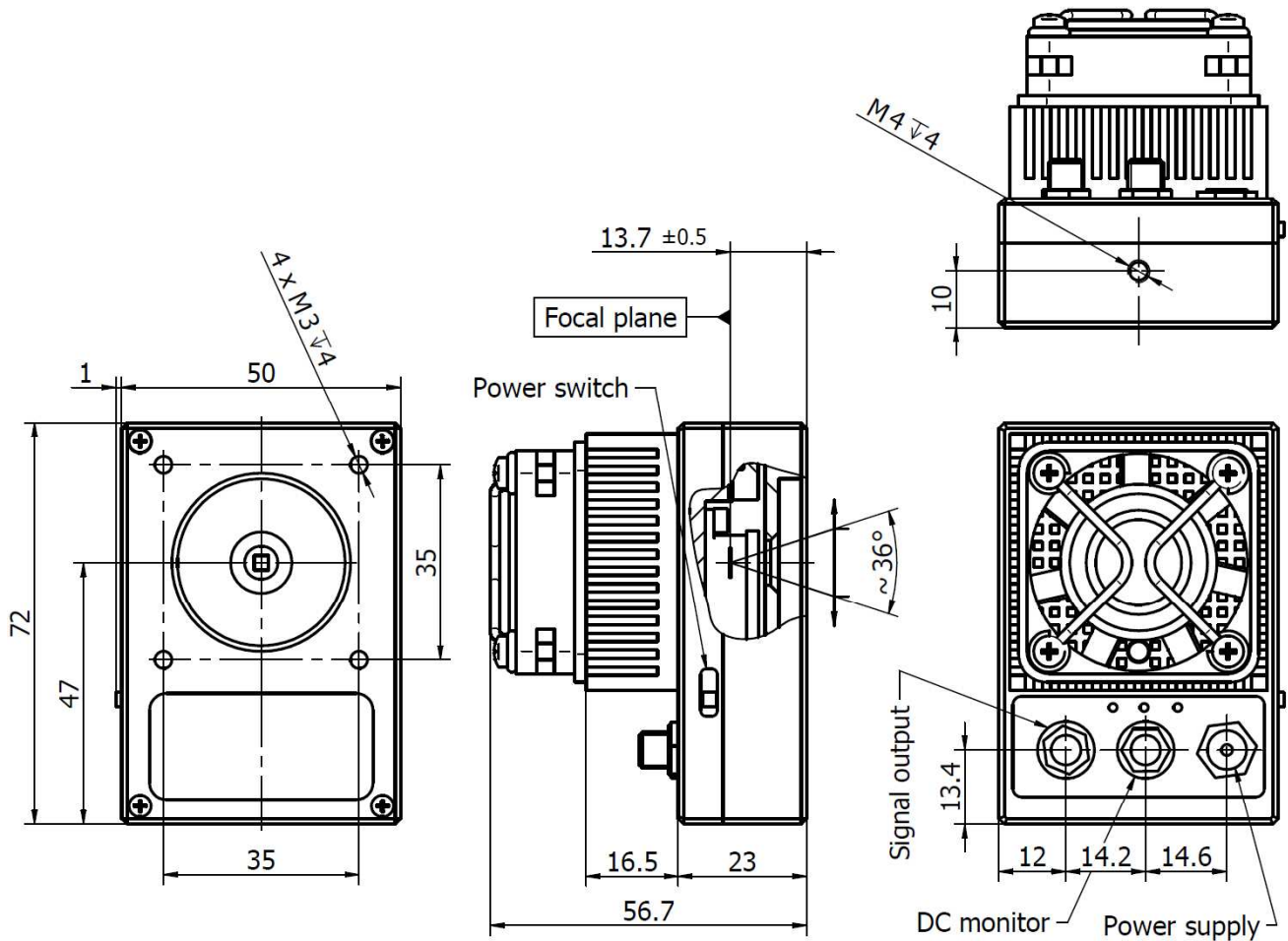
#### Features

- High S/N ratio
- Wide frequency bandwidth over 700 MHz
- Integrated TEC controller and fan
- Single power supply
- DC monitor
- Optimised for effective heat dissipation
- Compatible with optical accessories
- Fast delivery

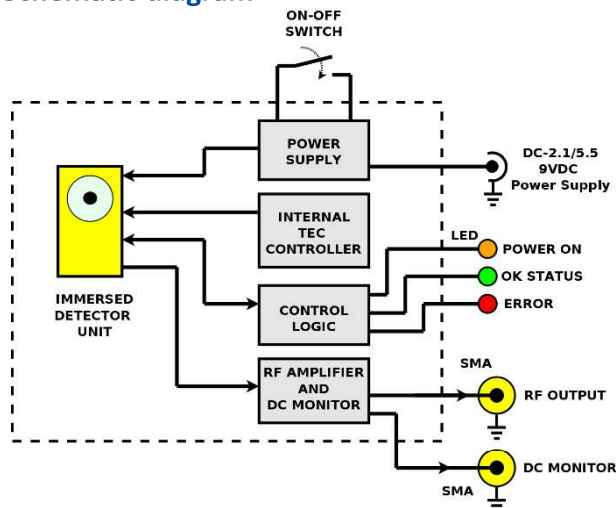
#### Applications

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

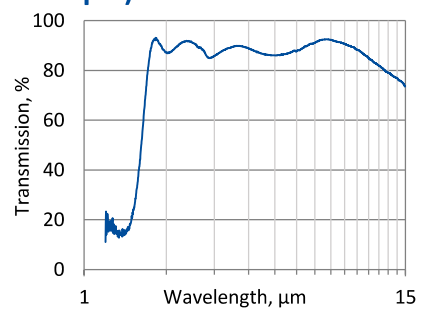
### Mechanical layout, mm



### 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