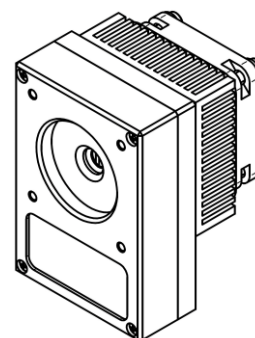


UHSM-I-10.6

DATASHEET

Ultra-high-speed IR detection module based on HgCdTe thermoelectrically cooled optically immersed photovoltaic detector



FEATURES

- Spectral range: 3.0 to 12.0 μm
- Frequency bandwidth: 300 Hz to 900 MHz (typ.)
- High performance and reliability
- DC monitor
- Single power supply
- Integrated TEC controller and fan
- M4 mounting hole
- Compatible with optical accessories
- Quantity discounted price
- Fast delivery
- No minimum order quantity required

APPLICATIONS

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

INCLUDED ACCESSORIES

- 2 pcs of SMA-BNC cable
- 1 pc of AC adaptor

DEDICATED ACCESSORIES

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

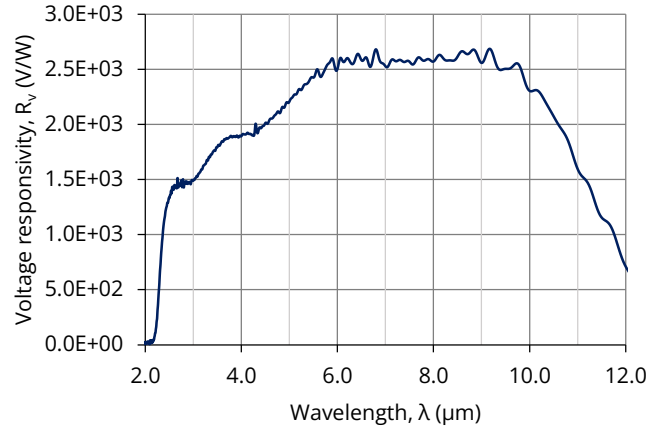
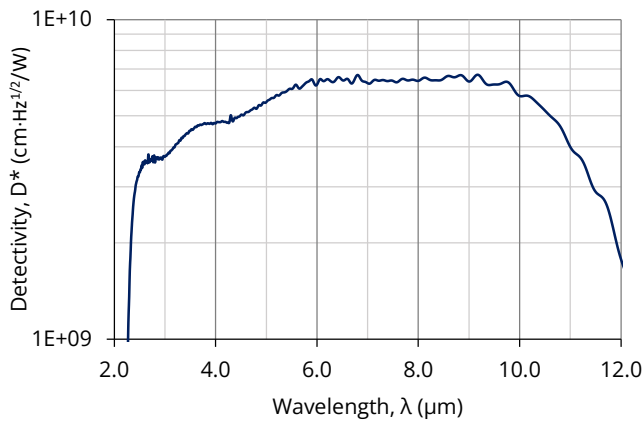
DETECTION MODULE CONFIGURATION

Detection module symbol	UHSM-I-10.6
Detector type	photovoltaic
Active element material	epitaxial HgCdTe heterostructure
Optical area, A_o	1 mm \times 1 mm
Optical immersion	hyperhemisphere
Cooling	4TE ($T_{\text{chip}} \cong 215\text{K}$)
Acceptance angle, Φ	~ 36 deg.
Window	wZnSeAR (3 deg. wedged zinc selenide, anti-reflection coating)
Amplifier type	ultra-high-speed, transimpedance
Signal output socket	SMA
DC monitor output socket	SMA
Power supply socket	DC 2.1/5.5

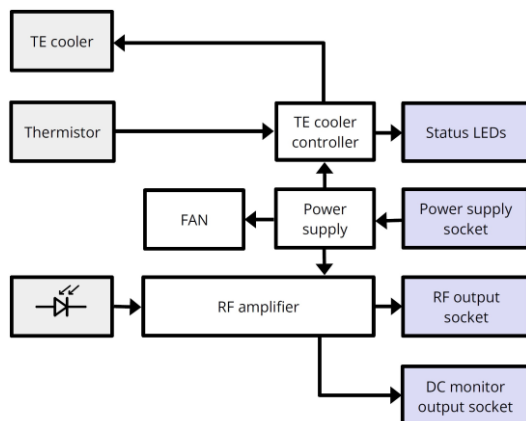
SPECIFICATION ($T_{amb} = 293\text{ K}$, $T_{chip} = 215\text{ K}$, $R_{load} = 50\ \Omega$, unless otherwise noted)

Parameter	Test conditions, remarks	Value			Unit
		Min.	Typ.	Max.	
Active element temperature, T_{chip}		-	215	-	K
Cut-on wavelength, λ_{cut-on} (10%)	At 10% of peak responsivity	-	3.0	-	μm
Peak wavelength, λ_{peak}		-	8.0 ± 1.0	-	μm
Specific wavelength, λ_{spec}		-	10.6	-	μm
Cut-off wavelength, $\lambda_{cut-off}$ (10%)	At 10% of peak responsivity	-	12.0	-	μm
Detectivity, D^*	At $\lambda = \lambda_{peak}$, $f = 100\text{ MHz}$	-	6.7×10^9	-	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$
	At $\lambda = \lambda_{spec}$, $f = 100\text{ MHz}$	2.0×10^9	5.0×10^9	-	
Output noise voltage density, v_n	At $f = 100\text{ MHz}$	-	-	70	$\text{nV}/\text{Hz}^{1/2}$
Voltage responsivity, R_v	At $\lambda = \lambda_{peak}$	-	2.7×10^3	-	V/W
	At $\lambda = \lambda_{spec}$	7.0×10^2	2.0×10^3	-	
Voltage responsivity, R_v	At $\lambda = \lambda_{peak}$, DC monitor	3.8×10^3	-	-	V/W
	At $\lambda = \lambda_{spec}$, DC monitor	2.7×10^2	-	-	
1/f corner frequency, f_c		-	-	10	MHz
Low cut-off frequency, f_{lo}		-	300	-	Hz
High cut-off frequency, f_{hi}		0.7	0.9	-	GHz
Low cut-off frequency, f_{lo}	DC monitor	-	0	-	Hz
High cut-off frequency, f_{hi}	DC monitor	-	260	-	Hz
Output impedance, R_{out}		-	50	-	Ω
Output voltage swing, V_{out}		-	-	± 1	V
Output voltage offset, V_{off}		-	-	± 20	mV
Power supply voltage, V_{sup}		-	9	-	V
Power supply current consumption, I_{sup}		-	-	1.2	A
Weight		-	235	-	g

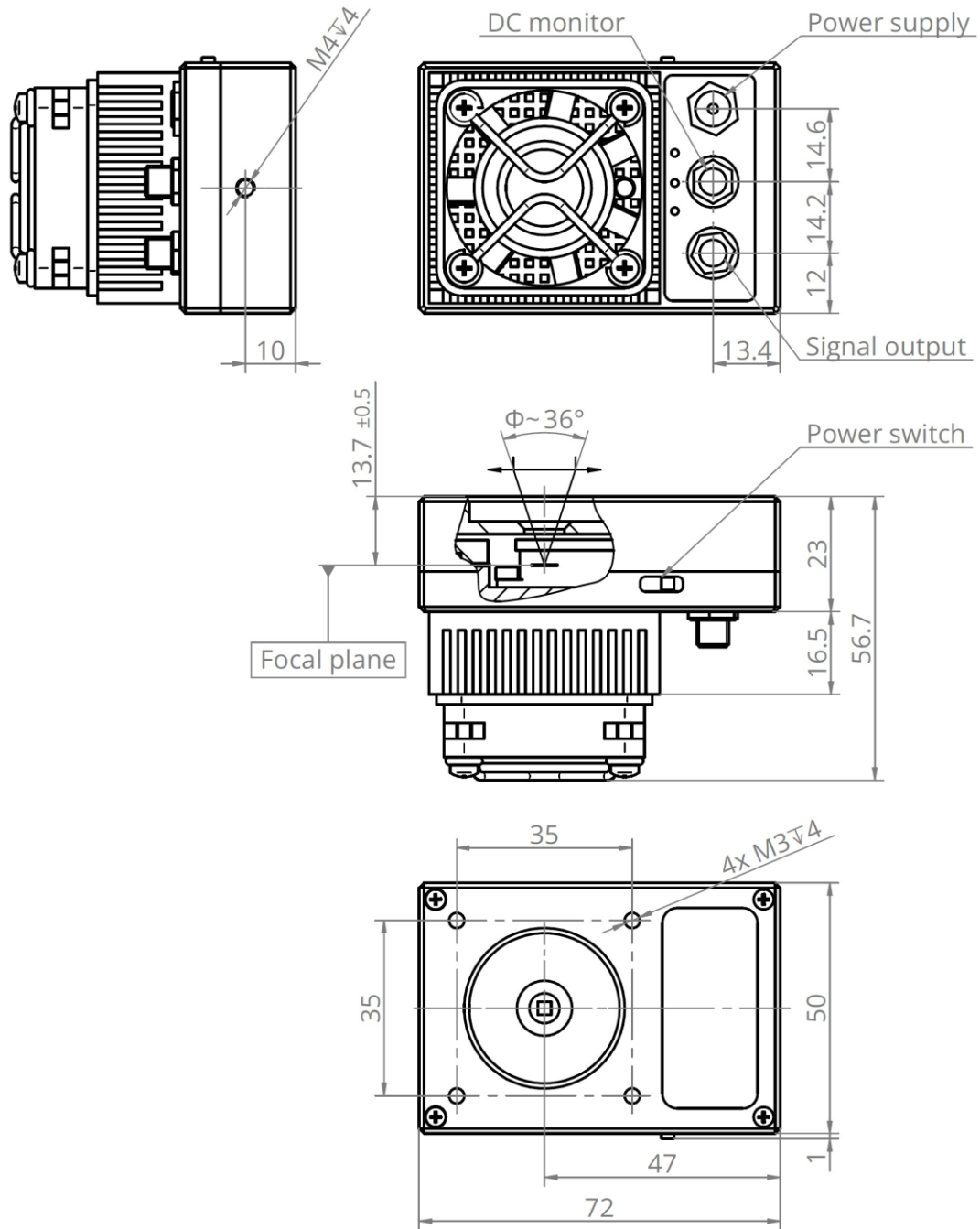
SPECTRAL RESPONSE (Typ., $T_{amb} = 293\text{ K}$, $T_{chip} = 215\text{ K}$)



SCHEMATIC DIAGRAM



MECHANICAL LAYOUT (Unit: mm)



ABSOLUTE MAXIMUM RATINGS

Parameter	Test conditions, remarks	Value	Unit
Ambient operating temperature, T_{amb}		10 to 30	°C
Storage temperature, T_{stg}		-20 to 50	°C
Humidity	No dew condensation	10 to 90	%
Maximum incident optical power density	Continuous wave (CW) or single pulses >1 μ s duration	2.5	W/cm ²
	Single pulses <1 μ s duration	10	kW/cm ²

Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. Constant or repeated exposure to absolute maximum rating conditions may affect the quality and reliability of the device.