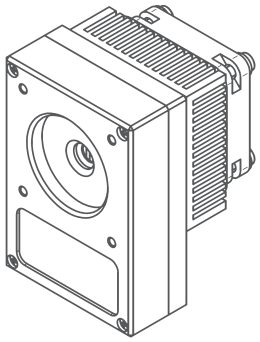
UHSM-I-10.6



Ultra-high-speed IR detection module based on HgCdTe TE 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 (p. 155)
- DRB-2 base mounting system (p. 152)

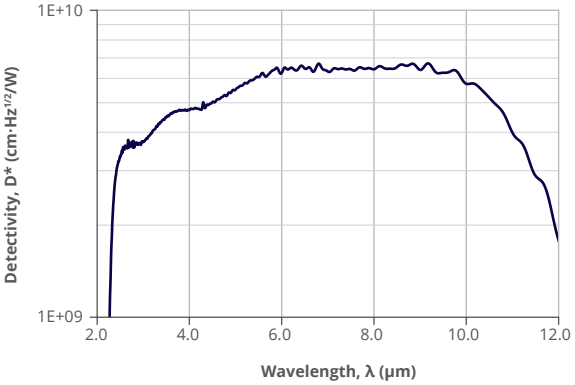
DETECTION MODULE CONFIGURATION

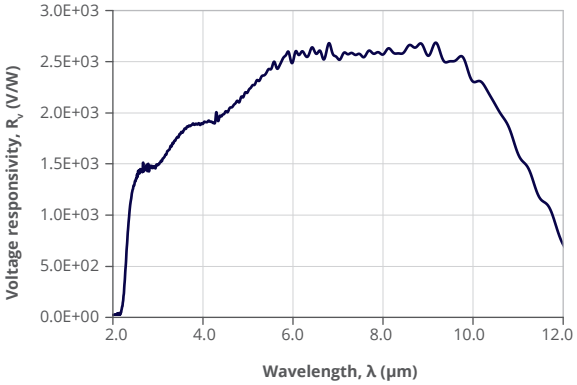
Detection module symbol	UHSM-I-10.6
Detector type	photovoltaic
Active element material	epitaxial HgCdTe heterostructure
Optical area, A_o	1 mm × 1 mm
Immersion	hyperhemisphere
Cooling	4TE
Acceptance angle, Φ	~36 deg.
Window	wZnSeAR (3 deg. wedged zinc selenide, anti-reflection coating)
Preamplifier type	transimpedance
Signal output socket	SMA
DC monitor output socket	SMA
Power supply socket	DC 2.1/5.5

SPECIFICATION (T_{amb} = 293 K, R_{load} = 50 Ω, unless otherwise noted)

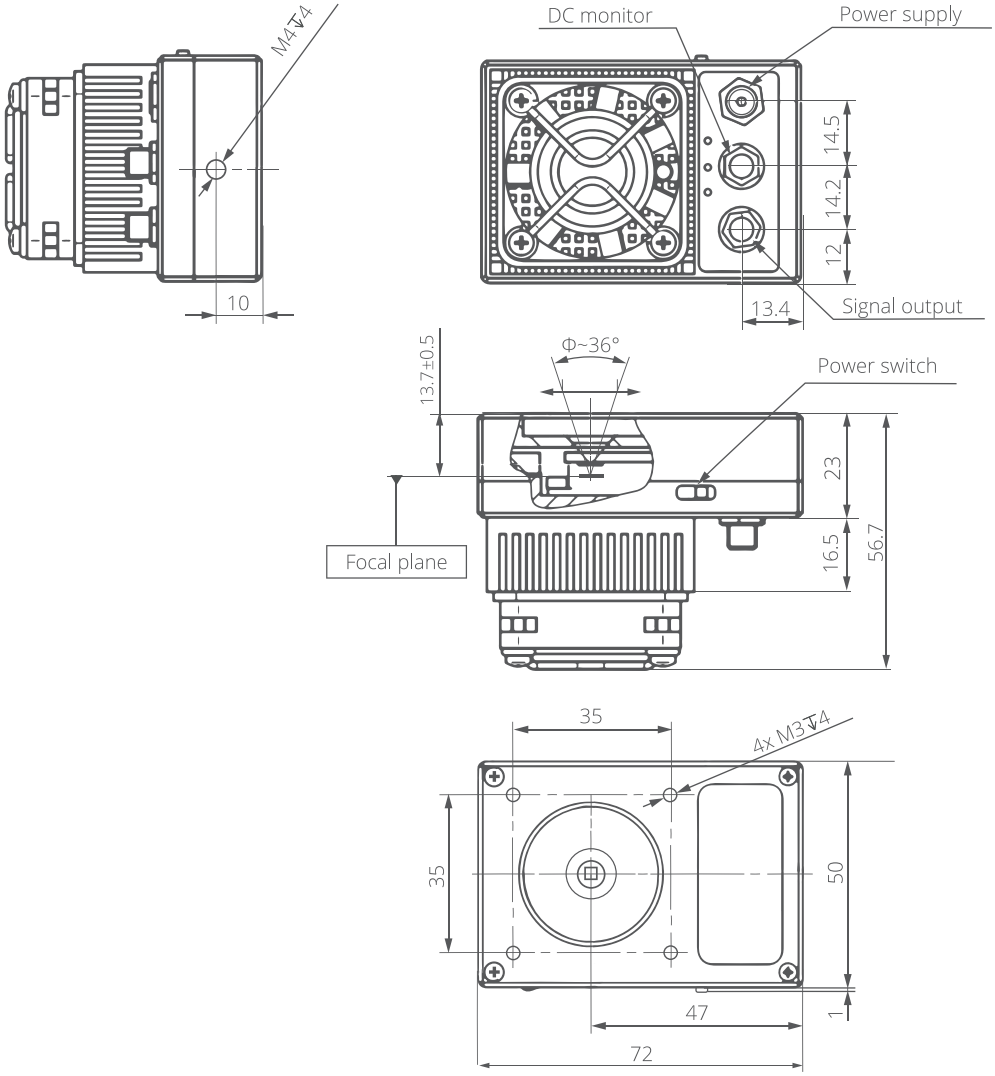
Parameter	Test conditions/remarks	Value			Unit
		Min.	Typ.	Max.	
Active element temperature, T_{chip}		-	215	-	K
Cut-on wavelength, $\lambda_{cut\text{-}on}$ (10%)	At 10% of peak responsivity	-	3.0	-	µm
Peak wavelength, λ_{peak}		7.0	8.0	9.0	µm
Specific wavelength, λ_{spec}		-	10.6	-	µm
Cut-off wavelength, $\lambda_{cut\text{-}off}$ (10%)	At 10% of peak responsivity	-	12.0	-	µm
Detectivity, D*	At $\lambda = \lambda_{peak}$, f = 100 MHz	-	6.7×10^{9}	-	cm·Hz$^{1/2}$/W
	At $\lambda = \lambda_{spec}$, f = 100 MHz	2.0×10^{9}	5.0×10^{9}	-	cm·Hz$^{1/2}$/W
Output noise voltage density, v_n	At f = 100 MHz	-	-	70	nV/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}	-	V/W
Low cut-off frequency, f_{lo}		-	300	-	Hz
High cut-off frequency, f_{hi}		0.7	0.9	-	GHz
Output impedance, R_{out}		-	50	-	Ω
Output voltage swing, V_{out}		-	-	±1	V
1/f corner frequency,f_c		-	-	10	MHz
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}	-	-	V/W
Low cut-off frequency, f_{lo}	DC monitor	-	0	-	Hz
High cut-off frequency, f_{hi}	DC monitor	-	260	-	Hz
Output voltage offset, V_{off}		-	-	±20	mV
Power supply voltage, V_{sup}		-	9	-	V
Power supply current consumption, I_{sup}		-	-	1.2	A
Weight Value		-	235	-	g

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

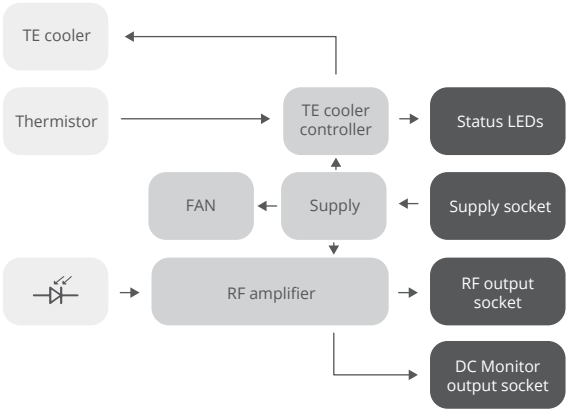




MECHANICAL LAYOUT (Unit: mm)



SCHEMATIC DIAGRAM



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 µs duration	2.5	W/cm²
	Single pulses <1 µs duration	10	kW/cm²

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.