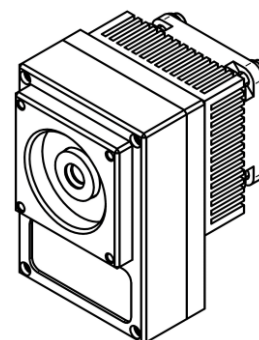


UM-I-10.6

DATASHEET

“All-in-one” IR detection module based on HgCdTe thermoelectrically cooled photovoltaic multi-junction optically immersed detector



FEATURES

- Spectral range: 2.0 to 13.0 μm
- Frequency bandwidth: DC to 100 MHz
- Integrated TEC controller and fan
- M4 mounting hole
- DC monitor
- Single power supply
- Compatible with optical accessories
- Quantity discounted price
- Fast delivery
- No minimum order quantity required

APPLICATIONS

- Gas detection, monitoring and analysis: SO_2 , NH_3 , SF_6
- CBRN threats detection
- CO_2 laser measurements: power monitoring and control, beam profiling and positioning, calibration
- Free-space optical communication
- FTIR spectroscopy
- Medical bacteria identification
- Dentistry
- Glucose sensing

INCLUDED ACCESSORIES

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

DEDICATED ACCESSORIES

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

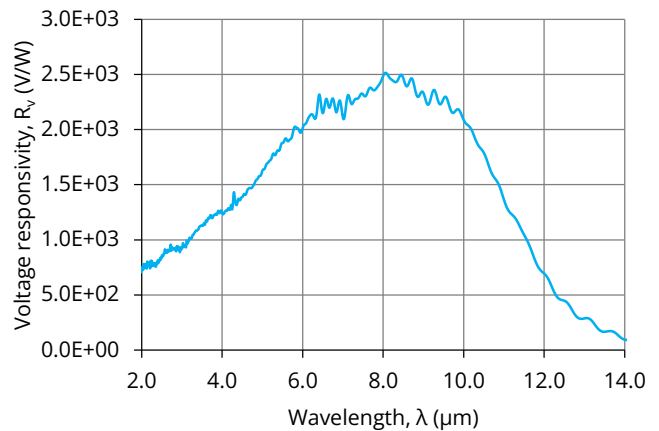
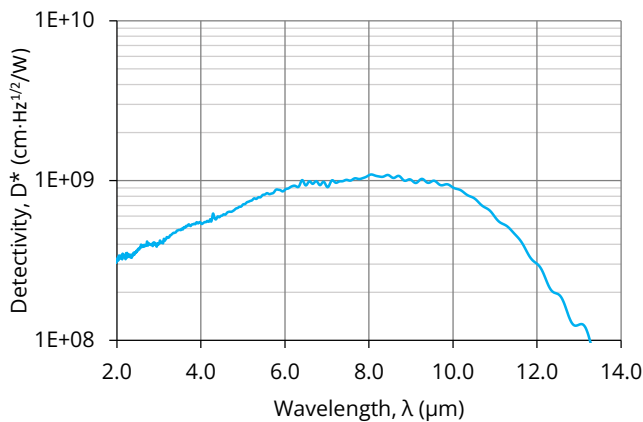
DETECTION MODULE CONFIGURATION

Detection module symbol	UM-I-10.6
Detector symbol	PVMI-2TE-10.6-1x1-TO8-wZnSeAR-36
Detector type	photovoltaic, multi-junction
Active element material	epitaxial HgCdTe heterostructure
Optical area, A_o	1 mm \times 1 mm
Optical immersion	hyperhemisphere
Cooling	2TE ($T_{\text{chip}} \cong 230\text{K}$)
Acceptance angle, Φ	~ 36 deg.
Window	wZnSeAR (3 deg. wedged zinc selenide, anti-reflection coating)
Amplifier symbol	AIP
Amplifier type	“all-in-one”, transimpedance
Signal output socket	SMA
DC monitor output socket	SMA
Power supply socket	DC 2.5/5.5

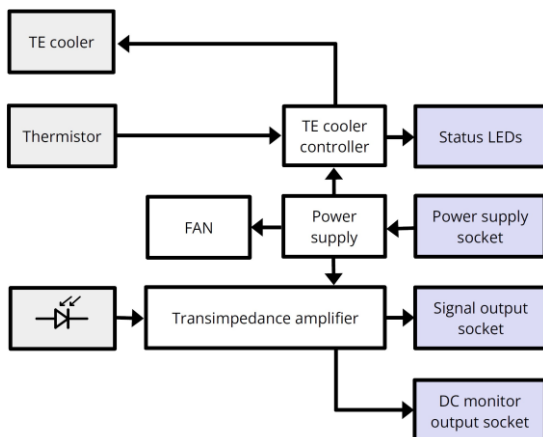
SPECIFICATION ($T_{amb} = 293\text{ K}$, $T_{chip} = 230\text{ K}$, $R_{load} = 50\ \Omega$, unless otherwise noted)

Parameter	Test conditions, remarks	Value			Unit
		Min.	Typ.	Max.	
Active element temperature, T_{chip}		-	230	-	K
Cut-on wavelength, λ_{cut-on} (10%)	At 10% of peak responsivity	-	2.0	-	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	-	13.0	-	μm
Detectivity, D^*	At $\lambda = \lambda_{peak}$, averaged over 1 MHz to f_{hi}	-	1.1×10^9	-	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$
	At $\lambda = \lambda_{spec}$, averaged over 1 MHz to f_{hi}	3.5×10^8	7.4×10^8	-	
Output noise voltage density, v_n	Averaged over 1 MHz to f_{hi}	-	-	350	$\text{nV}/\text{Hz}^{1/2}$
Voltage responsivity, R_v	At $\lambda = \lambda_{peak}$	-	2.5×10^3	-	V/W
	At $\lambda = \lambda_{spec}$	6.5×10^2	1.7×10^3	-	
Voltage responsivity, R_v	At $\lambda = \lambda_{peak}$, DC monitor	2.2×10^2	-	-	V/W
	At $\lambda = \lambda_{spec}$, DC monitor	1.5×10^2	-	-	
Low cut-off frequency, f_{lo}	DC coupling	-	0	-	Hz
High cut-off frequency, f_{hi}		100	-	-	MHz
Low cut-off frequency, f_{lo}	DC monitor	-	0	-	Hz
High cut-off frequency, f_{hi}	DC monitor	-	150	-	kHz
Output impedance, R_{out}		-	50	-	Ω
Output voltage swing, V_{out}		-	-	± 0.7	V
Output voltage offset, V_{off}		-	-	± 20	mV
Power supply voltage, V_{sup}		-	5	-	V
Power supply current consumption, I_{sup}		-	-	1.2	A
Weight		-	235	-	g

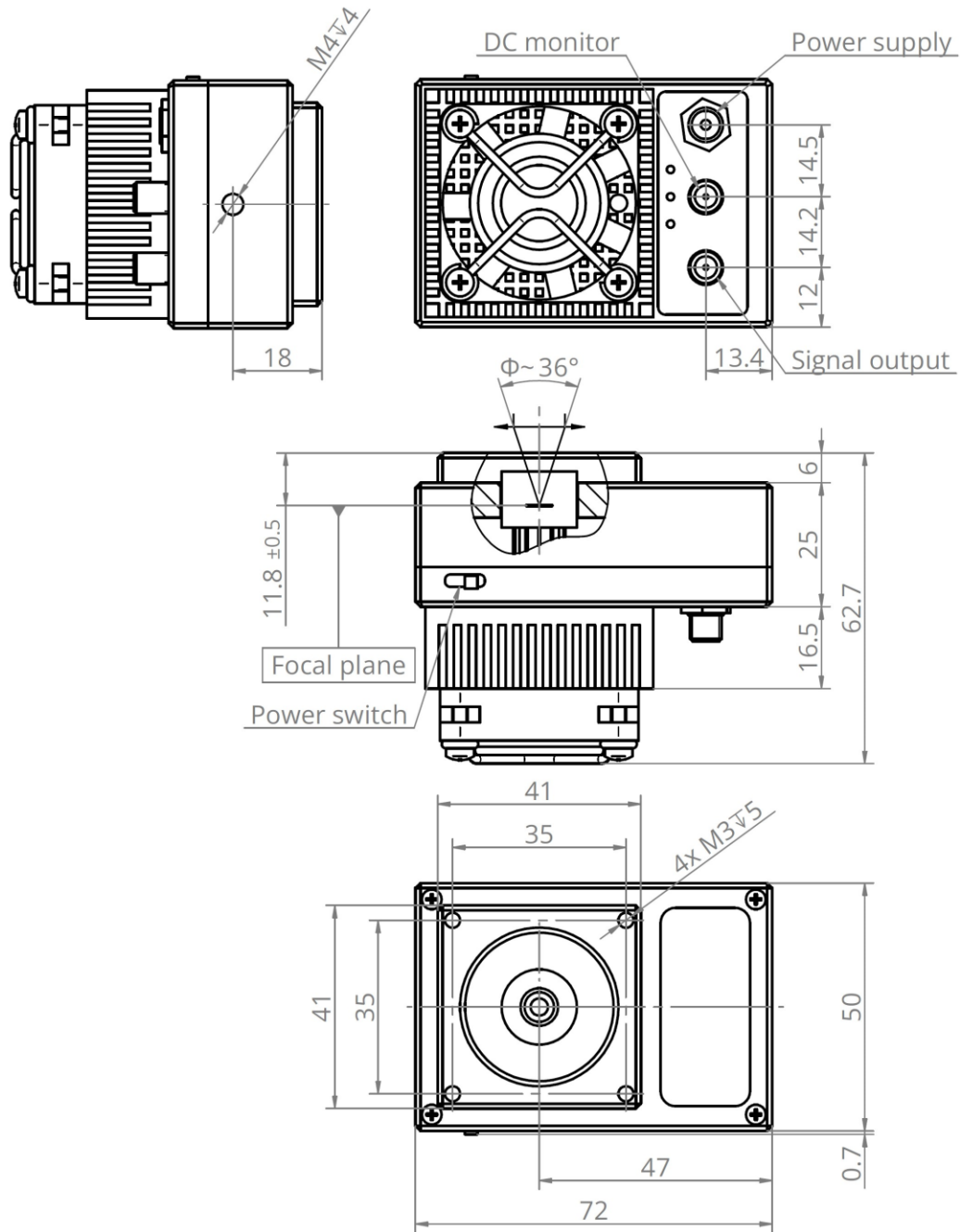
SPECTRAL RESPONSE (Typ., $T_{amb} = 293\text{ K}$, $T_{chip} = 230\text{ K}$)



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.