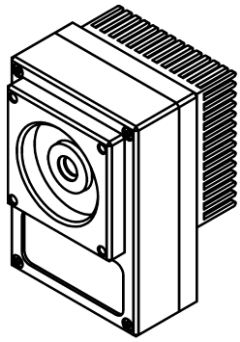
QM-10.6-01

PRELIMINARY DATASHEET

“All-in-one” four-channel IR detection module based on quadrant HgCdTe room-temperature photovoltaic multi-junction detector



FEATURES

- Spectral range: 2.0 to 12.0 µm
- Frequency bandwidth: DC to 1.0 MHz (typ.)
- Low crosstalk
- M4 mounting hole
- Single power supply
- Switchable offset calibration modes via protected hardware button (see Technical note: Offset calibration)
- Optional 0 to 3 V voltage swing modification available upon request for direct ADC compatibility
- Compatible with optical accessories
- Detector and detector chip options available for custom integration

DETECTION MODULE CONFIGURATION

Detection module symbol	QM-10.6-01
Detector symbol	PVMQ-10.6-1x1-TO8-NW-70
Detector type	photovoltaic, multi-junction
Active element material	epitaxial HgCdTe heterostructure
Active area of a single element, A	1 mm × 1 mm
Number of elements	4 (2 rows, 2 columns)
Active area pitch, mm	1.15 (horizontally) 1.20 (vertically
Optical immersion	no
Cooling	no
Temperature sensor	n/a
Acceptance angle, Φ	~70 deg.
Window	no
Amplifier type	four-channel, transimpedance
Signal output socket	4x MCX
Power supply socket	DC 2.1/5.5

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
- Dentistry

INCLUDED ACCESSORIES

- 4 pcs MCX-BNC cable
- 1 pc AC adaptor

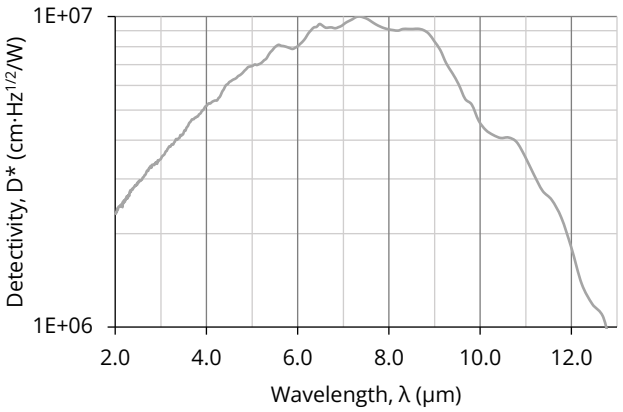
DEDICATED ACCESSORIES

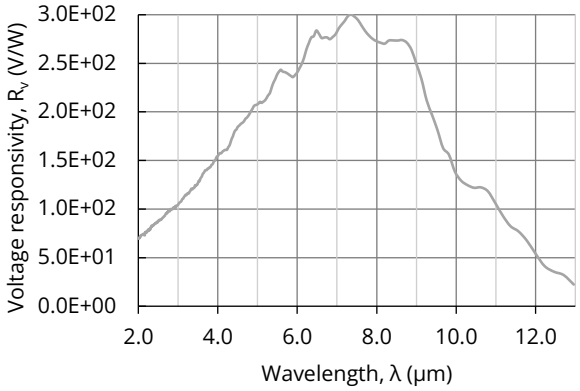
- OTA optical threaded adapter
- DRB-2 base mounting system

SPECIFICATION (T_{amb} = T_{chip} 293 K, R_{load} = 1 MΩ, each channel)

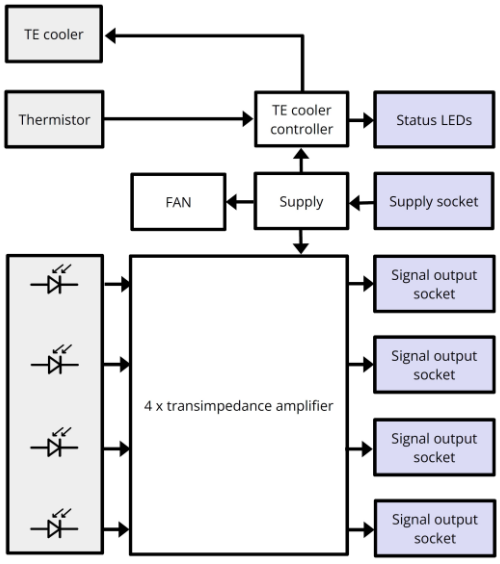
Parameter	Test conditions, remarks	Value			Unit
		Min.	Typ.	Max.	
Active element temperature, T_{chip}	T_{chip} = T_{amb}	-	~293	-	K
Cut-on wavelength, $\lambda_{cut\text{-}on}$ (10%)	At 10% of the peak responsivity	-	2.0	-	µm
Peak wavelength, λ_{peak}		-	8.5±1.0	-	µm
Specific wavelength, λ_{spec}		-	10.6	-	µm
Cut-off wavelength, $\lambda_{cut\text{-}off}$ (10%)	At 10% of the peak responsivity	-	12.0	-	µm
Detectivity, D*	At $\lambda = \lambda_{peak}$, f = 100 kHz	-	1.0×10^{7}	-	cm·Hz$^{1/2}$/W
	At $\lambda = \lambda_{spec}$, f = 100 kHz		8.0×10^{6}	-	
Output noise voltage density, v_n	At f = 100 kHz	-	-	4.5	µV/Hz$^{1/2}$
Voltage responsivity, R_v	At $\lambda = \lambda_{peak}$	-	3.0×10^{2}	-	V/W
	At $\lambda = \lambda_{spec}$	-	2.0×10^{2}	-	
Low cut-off frequency, f_{lo}	DC coupling	-	0	-	Hz
High cut-off frequency, f_{hi}		-	1.0	-	MHz
Output impedance, R_{out}		-	50	-	Ω
Output voltage swing, V_{out}		-	0-4		V
Output voltage offset, V_{off}		-	-	±20	mV
Power supply voltage, V_{sup}		+6	-	+12	V_{DC}
Power supply current consumption, I_{sup}		-	70	230	mA

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

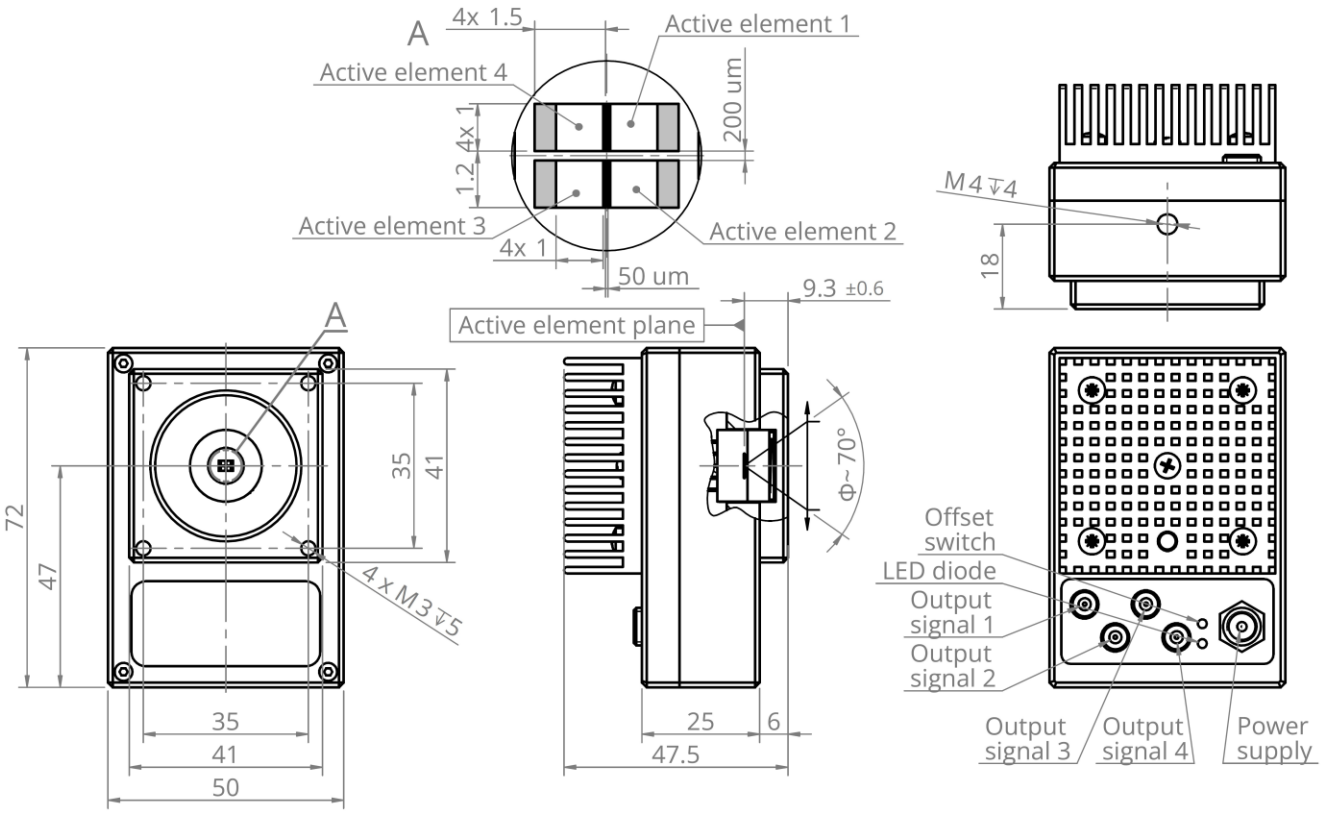




SCHEMATIC DIAGRAM



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 µs duration	100	W/cm^2
	Single pulses <1 µs duration	1	MW/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.