



Thermoelectric Cooled HgCdTe (MCT)

TECHNICAL DATA & INFORMATION

InfraRed Associates, Inc. offers high quality Thermoelectrically Cooled Photoconductive HgCdTe (MCT) detectors.



They offer high performance, with ease of operation. Standard detectors are optimized in the $2\mu\text{m}$ to $5\mu\text{m}$ wavelength. Extended range detectors operate in the wavelength region beyond $5\mu\text{m}$. Optically Enhanced detectors are available with both reflective and refractive optical elements to improve the collection efficiency of these devices. The apparent enhanced responsivity and D^* , of these detectors, relies on the ability of the optical components to refocus energy, which might not normally be incident, on the detector element. These devices are most suitable for applications in which the energy incident is either collimated or diverging. The optically enhanced detectors are, therefore, ideally suited for applications in which fiber optics are employed.

The detectors are mounted on two-stage, three-stage, or four-stage coolers in TO style packages as shown in the tables below. A calibrated thermistor is included in the package for accurate temperature monitoring and/or temperature control. Soldered windows and welded caps are used to hermetically seal the packages. The packages are backfilled with inert gas for more efficient cooler operation.

Typical Applications: ($2\mu\text{m}$ - $9\mu\text{m}$)

- Thermal Imaging
- Laser Detection
- Gas Analysis
- Railroad Hot Boxes
- Line Scanner

Standard TE Cooled HgCdTe Detectors

Model Number	Element Size (mm)	Wave-length Peak λ_p (μm)	Wavelength Response (20% λ_{co}) (μm)	D* ($\lambda_p, 1000, 1$) Jones	Resistance (Ω)	Time Constant (μsec)	Oper. Temp. * °C	Std. Pkg	Std. Window
2 μm to 5 μm									
MCT-3.5-TE2-0.25 MCT-3.5-TE2-1.00	0.25x0.25 1.00×1.00	~3.0	≥3.5	>1.0E11	100-1500	≤2	-40	2-Stage TO-3 TO-8 TO-66	Sapphire
MCT-4.5-TE2-0.25 MCT-4.5-TE2-1.00	0.25 X 0.25 1.00 X 1.00	~4.0	≥4.5	≥4.0E10					
MCT-5-TE2-0.10 MCT-5-TE2-0.25 MCT-5-TE2-0.50 MCT-5-TE2-1.00	0.10 X 0.10 0.25 X 0.25 0.50 X 0.50 1.00 X 1.00	~4.5	≥5.0	≥2.0E10	100-1500				
MCT-5-TE2-2.00	2.00 X 2.00			≥1.0E10					
MCT-4.5-TE3-0.25 MCT-4.5-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~4.0	≥4.5	≥6.0E10	100-1500		-65	3-Stage TO-3 TO-8 TO-66	
MCT-5-TE3-0.10 MCT-5-TE3-0.25 MCT-5-TE3-0.50 MCT-5-TE3-1.00	0.10 X 0.10 0.25 X 0.25 0.50 X 0.50 1.00 X 1.00	~4.5	≥5.0	≥4.0E10	100-1500				
MCT-5-TE3-2.00	2.00 X 2.00			≥3.0E10					
MCT-5-TE4-0.10 MCT-5-TE4-0.25 MCT-5-TE4-0.50 MCT-5-TE4-1.00	0.10 X 0.10 0.25 X 0.25 0.50 X 0.50 1.00 X 1.00			≥6.0E10			-75	4-Stage TO-3 TO-66	
MCT-5-TE4-2.00	2.00 X 2.00			≥4.0E10					

* Note: Heat Sink @ 30 Degrees Celsius

Extended Range TE Cooled HgCdTe Detectors

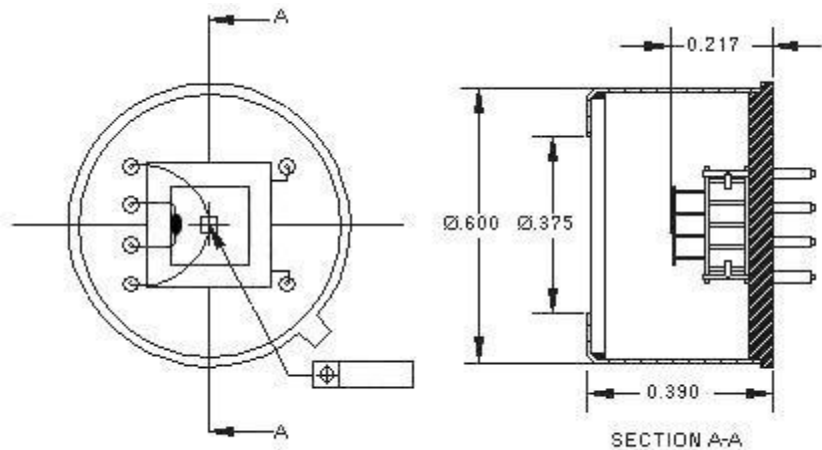
Model Number	Element Size (mm)	Wave-length Peak λ_p (μm)	Wavelength Response (20% λ_{co}) (μm)	D^* ($\lambda_p, 10000, 1$) Jones	Resistance (Ω)	Time Constant (μsec)	Oper. Temp. °C	Std. Pkg	Std. Window
> 5 μm									
MCT-6-TE3-0.25 MCT-6-TE3-1.00	0.25x0.25 1.00x1.00	~5.5	≥ 6.0	$\geq 2.0E10$	100-1500	≤ 2	-65	3-Stage TO-3 TO-66	AR Coated ZnSe
MCT-6-TE4-0.25 MCT-6-TE4-1.00	0.25x0.25 1.00x1.00			$\geq 3.0E10$			-75	4-Stage TO-3 TO-66	
MCT-7-TE3-0.25 MCT-7-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~6.0	≥ 7.0	$\geq 1.0E10$			-65	4-Stage TO-3 TO-66	
MCT-7-TE4-0.25 MCT-7-TE4-1.00	0.25 X 0.25 1.00 X 1.00			$\geq 1.5E10$			-75	3-Stage TO-3 TO-66	
MCT-8-TE3-0.25 MCT-8-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~7.0	≥ 8.0	$\geq 3.0E9$			-65	3-Stage TO-3 TO-66	
MCT-8-TE4-0.25 MCT-8-TE4-1.00	0.25 X 0.25 1.00 X 1.00			$\geq 6.E9$			-75	4-Stage TO-3 TO-66	
MCT-9-TE3-0.25 MCT-9-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~4.5	≥ 9.0	$\geq 1.5E9$			-65	3-Stage TO-3 TO-66	
MCT-9-TE4-0.25 MCT-9-TE4-1.00	0.25 X 0.25 1.00 X 1.00			$\geq 6.0E9$			-75	4-Stage TO-3 TO-66	

* Note: Heat Sink @ 30 Degrees Celsius

Extended Range TE Cooled HgCdTe Detectors

Model Number	Element Size (mm)	Wave-length Peak λ_p (μm)	Wavelength Response (20% λ_{co}) (μm)	D* ($\lambda_p, 10000, 1$) Jones	Resistance (Ω)	Time Constant (μsec)	Oper. Temp. °C	Std. Pkg	Std. Window
> 5 μm									
OE-MCT-6-TE3-0.25 OE-MCT-6-TE3-1.00	0.25x0.25 1.00x1.00	~5.5	≥ 6.0	$\geq 8.0\text{E}10$	100-1500	≤ 2	-55	3-Stage TO-3 TO-66	AR Coated ZnSe
OE-MCT-7.5-TE3-0.25 OE-MCT-7.5-TE3-1.00	0.25x0.25 1.00x1.00	~6.5	≥ 7.5	$\geq 2.0\text{E}10$					
OE-MCT-8-TE3-0.25 OE-MCT-8-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~7.0	≥ 7.0	$\geq 8.0\text{E}9$					
OE-MCT-9-TE3-0.25 OE-MCT-9-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~8.0	≥ 9.0	$\geq 4\text{E}9$					

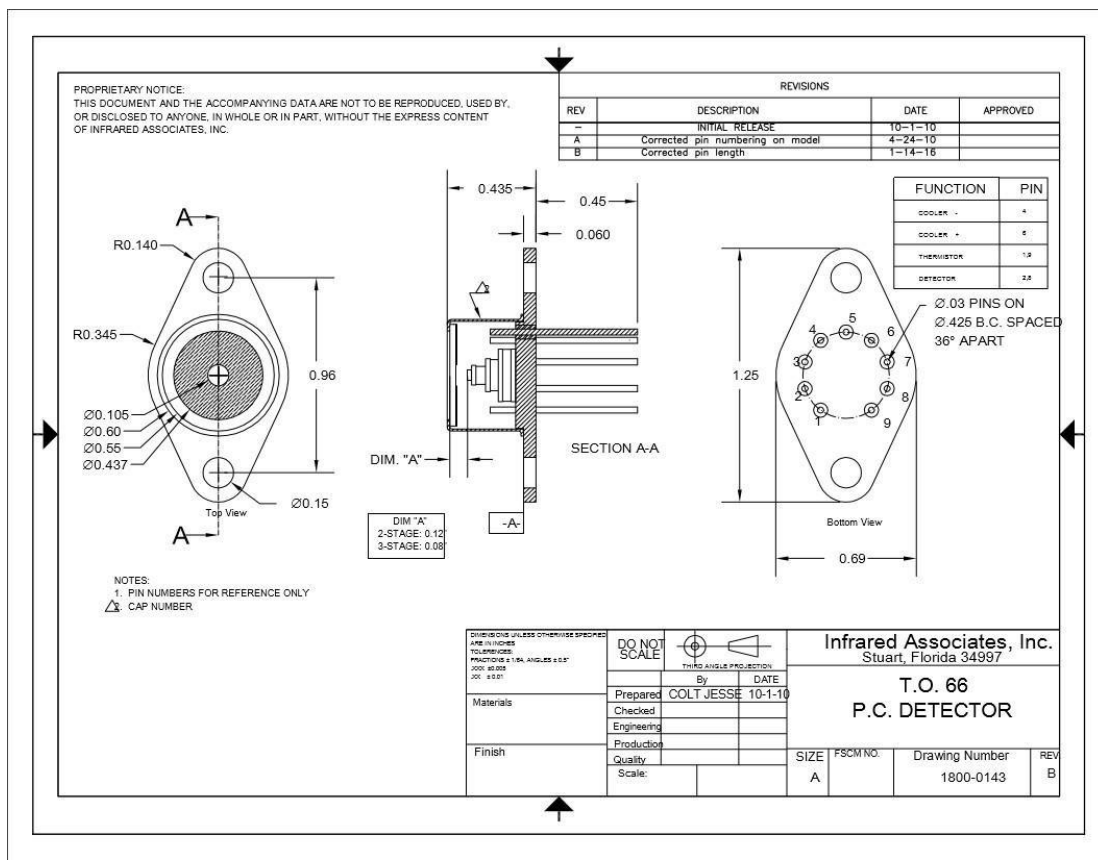
* Note: Heat Sink @ 30 Degrees Celsius



Typical Thermoelectric Cooled MCT (2-Stage)

TE COOLED STANDARD PACKAGING

TO-66

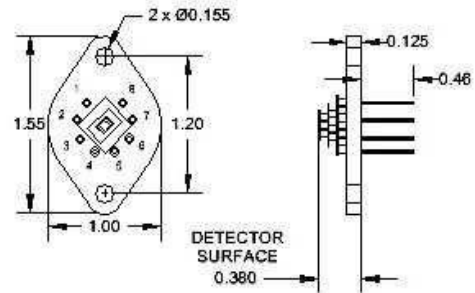


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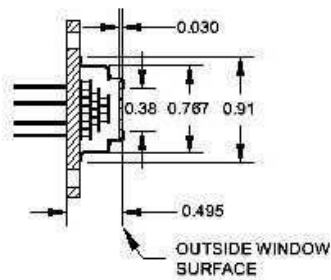
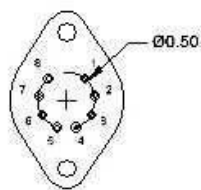
TO-3

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BOTTOM VIEW



PIN 1 => CASE GRD
PIN 2 => MCT
PIN 3 => COOLER (NEGATIVE)
PIN 4 => COOLER (POSITIVE)
PIN 5 => N/C
PIN 6 => MCT
PIN 7 => THERMISTOR
PIN 8 => THERMISTOR

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