



**InfraRed** ASSOCIATES, Inc.

## Thermoelectric Cooled HgCdTe (MCT)

### TECHNICAL DATA & INFORMATION

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



#### Typical Applications:

(2 $\mu$ m-9 $\mu$ m)

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

They offer high performance, with ease of operation. **Standard detectors** are optimized in the 2 $\mu$ m to 5 $\mu$ m wavelength. **Extended range detectors** operate in the wavelength region beyond 5 $\mu$ 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.

They can be supplied with the following accessories: preamplifiers, power supplies, heat sinks and temperature controllers.

Other wavelengths cutoffs are available on a limited basis, [contact Infrared Associates, Inc.](#) with your specific requirements.

### Standard TE Cooled HgCdTe Detectors

Model Number	Element Size (mm)	Wave-length Peak $\lambda_p$ ( $\mu\text{m}$ )	Wavelength Response (20% $\lambda_{co}$ ) ( $\mu\text{m}$ )	D* ( $\lambda_p, 10000, 1$ ) Jones	Resistance ( $\Omega$ )	Time Constant ( $\mu\text{sec}$ )	Oper. Temp. * ( $^{\circ}\text{C}$ )	Std. Pkg.	Std. Window
<b>2 <math>\mu\text{m}</math> to 5 <math>\mu\text{m}</math></b>									
MCT-3.5-TE2-0.25	0.25 X 0.25	~3.0	$\geq 3.5$	$\geq 1.0\text{E}11$	100-1500			2-Stage TO-3 TO-8 TO-66	
MCT-3.5-TE2-1.00	1.00 X 1.00								
MCT-4.5-TE2-0.25	0.25 X 0.25	~4.0	$\geq 4.5$	$\geq 4.0\text{E}10$					
MCT-4.5-TE2-1.00	1.00 X 1.00								
MCT-5-TE2-0.10	0.10 X 0.10	~4.5	$\geq 5.0$	$\geq 2.0\text{E}10$	100-1500			Sapphire	
MCT-5-TE2-0.25	0.25 X 0.25								
MCT-5-TE2-0.50	0.50 X 0.50			$\geq 1.0\text{E}10$					
MCT-5-TE2-1.00	1.00 X 1.00								
MCT-5-TE2-2.00	2.00 X 2.00								
MCT-4.5-TE3-0.25	0.25 X 0.25			~4.0	$\geq 4.5$	$\geq 6.0\text{E}10$	100-1500		$\leq 2$
MCT-4.5-TE3-1.00	1.00 X 1.00								
MCT-5-TE3-0.10	0.10 X 0.10	~4.5	$\geq 5.0$	$\geq 4.0\text{E}10$	100-1500			3-Stage TO-3 TO-8 TO-66	
MCT-5-TE3-0.25	0.25 X 0.25								
MCT-5-TE3-0.50	0.50 X 0.50			$\geq 3.0\text{E}10$					
MCT-5-TE3-1.00	1.00 X 1.00								
MCT-5-TE3-2.00	2.00 X 2.00								
MCT-5-TE4-0.10	0.10 X 0.10			~4.5					$\geq 5.0$
MCT-5-TE4-0.25	0.25 X 0.25								
MCT-5-TE4-0.50	0.50 X 0.50	$\geq 4.0\text{E}10$							
MCT-5-TE4-1.00	1.00 X 1.00								
MCT-5-TE4-2.00	2.00 X 2.00								

\* Note: Heat Sink @ 30 Degrees Celsius

### Extended Range TE Cooled HgCdTe Detectors

Model Number	Element Size (mm)	Wave-length Peak $\lambda_p$ ( $\mu\text{m}$ )	Wavelength Response (20% $\lambda_{co}$ ) ( $\mu\text{m}$ )	D* ( $\lambda_p, 10000, 1$ ) Jones	Resistance ( $\Omega$ )	Time Constant ( $\mu\text{sec}$ )	Oper. Temp. * ( $^{\circ}\text{C}$ )	Std. Pkg.	Std. Window
<b>&gt; 5 <math>\mu\text{m}</math></b>									
MCT-6-TE3-0.25	0.25 X 0.25	~5.5	$\geq 6.0$	$\geq 2.0\text{E}10$	100-1500	$\leq 2$	-65	3-Stage TO-3 TO-66	AR Coated ZnSe
MCT-6-TE3-1.00	1.00 X 1.00								

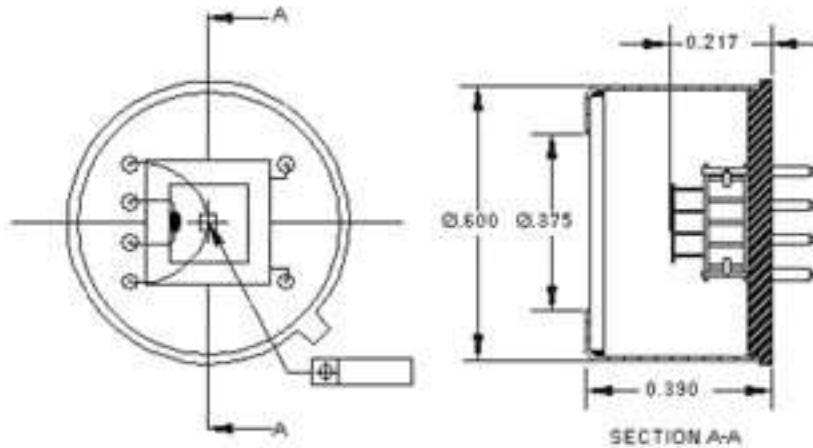
MCT-6-TE4-0.25 MCT-6-TE4-1.00	0.25 x 0.25 1.00 x 1.00			$\geq 3.0E10$			-75_	4-Stage TO-3 TO-66
MCT-7-TE3-0.25 MCT-7-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~6.0	$\geq 7.0$ _	$\geq 1.0E10$			-65_	3-Stage TO-3 TO-66
MCT-7-TE4-0.25 MCT-7-TE4-1.00	0.25 X 0.25 1.00 X 1.00			$\geq 1.5E10$			-75_	4-Stage TO-3 TO-66
MCT-8-TE3-0.25 MCT-8-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~7.0	$\geq 8.0$	$\geq 3.0E9$			-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			$\geq 6.0E9$			-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	~8.0	$\geq 9.0$	$\geq 1.5E9$			-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			$\geq 2.0E9$			-75_	4-Stage TO-3 TO-66

\* Note: Heat Sink @ 30 Degrees Celsius

### **Optically Enhanced TE Cooled HgCdTe Detectors**

Model Number	Element Size (mm)	Wave-length Peak $\lambda_p$ ( $\mu\text{m}$ )	Wavelength Response (20% $\lambda_{co}$ ) ( $\mu\text{m}$ )	D* ( $\lambda_p, 10000, 1$ ) Jones	Resistance ( $\Omega$ )	Time Constant ( $\mu\text{sec}$ )	Oper. Temp. * ( $^{\circ}\text{C}$ )	Std. Pkg.	Std. Window
$> 5 \mu\text{m}$									
OE-MCT-6-TE3-0.25 OE-MCT-6-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~5.5	$\geq 6.0$	$\geq 8.0E10$	100-1500	$\leq 2$	-55	3-Stage TO-3 TO-66	AR Coated ZnSe
OE-MCT-7.5-TE3-0.25 OE-MCT-7.5-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~6.5	$\geq 7.5$	$\geq 2.0E10$					
OE-MCT-8-TE3-0.25 OE-MCT-8-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~7.0	$\geq 8.0$	$\geq 8.0E9$					
OE-MCT-9-TE3-0.25 OE-MCT-9-TE3-1.00	0.25 X 0.25 1.00 X 1.00	~8.0	$\geq 9.0$	$\geq 4.0E9$					

\* Note: Heat Sink @ 30 Degrees Celsius



Typical Thermoelectric Cooled MCT (2-Stage)

**TE COOLED STANDARD PACKAGING**  
**TO-66**

PROPRIETARY NOTICE:  
THIS DOCUMENT AND THE ACCOMPANYING DATA ARE NOT TO BE REPRODUCED, USED BY,  
OR DISCLOSED TO ANYONE, IN WHOLE OR IN PART, WITHOUT THE EXPRESS CONSENT  
OF INFRARED ASSOCIATES, INC.

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
-	INITIAL RELEASE	10-1-78	
A	Completed pin packaging per model	8-18-78	
B	Completed pin length	1-18-79	

FUNCTION	PIN
output	1
output	2
reference	14
reference	15

Top View: Dimensions include RD.140, RD.340, 0.96, 0.105, 0.00, 0.00, 0.437, 0.15, and 0.08. Section line 'A-A' is shown.

SECTION A-A: Dimensions include 0.430, 0.45, 0.080, and DIM. 'A'. A note specifies: 2-Stage: 0.12, 3-Stage: 0.20.

Bottom View: Dimensions include 1.25 and 0.60. Note: 0.03 PINS ON 0.425 B.C. SPACED 30° APART.

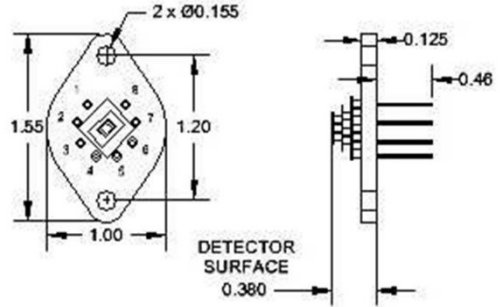
NOTES:  
1. PIN NUMBERS FOR REFERENCE ONLY  
Δ CAP NUMBER

PREPARED BY: _____ CHECKED BY: _____ ENGINEER: _____ DATE: _____	<b>DO NOT SCALE</b> INFRARED ASSOCIATES, Inc. Stuart, Florida 34997 <b>T.O. 66</b> <b>P.C. DETECTOR</b>
FINISH: _____ QUANTITY: _____ SCALE: _____	SIZE: A DRAWING NUMBER: 1800-0143 REV: B

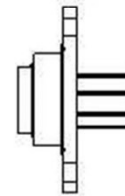
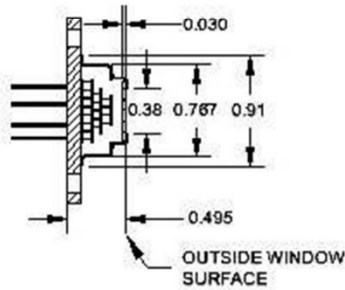
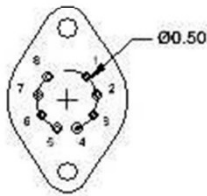
# TO-3

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 EXPRESS CONSENT OF INFRARED ASSOCIATES, INC.

SHOWN WITH CAP REMOVED



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

INFRARED ASSOCIATES, INC. (SEE DRAWING)  
 ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED  
 ARE IN INCHES  
 DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS  
 UNLESS OTHERWISE SPECIFIED  
 DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS  
 UNLESS OTHERWISE SPECIFIED

DO NOT SCALE



DESIGNED BY	B. THORP
CHECKED BY	
APPROVED BY	
DATE	
SCALE	1:1
SHEET OF	
DATE	
REV.	

**Infrared Associates, Inc.**  
 Stuart, Florida 34997

**DETECTOR ASSEMBLY  
 TO-3, 3 STAGE**

REV.	A	FROM NO.	15737	ISSUES NO.		REV.	-
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