

# OptoElectronics

Subsidiary of **TEXTRON** Defense Systems

## OTC-12-5/OTC-12-7

Series two stage thermoelectrically cooled lead selenide detectors

### SPECIAL FEATURES

Peak sensitivity comparable to devices operating at 77°K

Thermoelectrically cooled

Proven solid state stability

Hermetically sealed

Rugged, compact

Prompt delivery

Low cost

### BRIEF DESCRIPTION

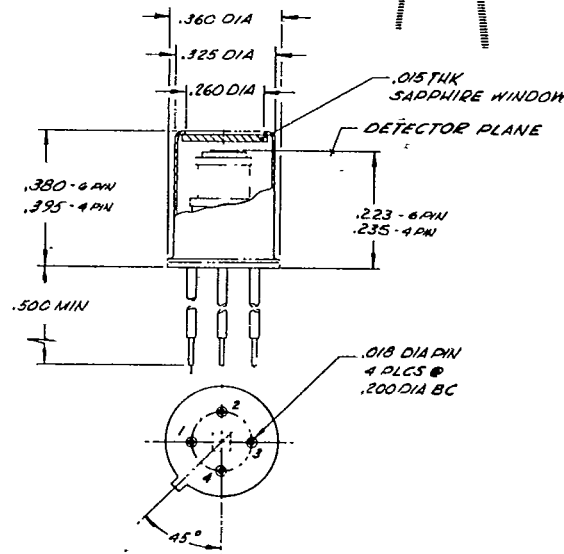
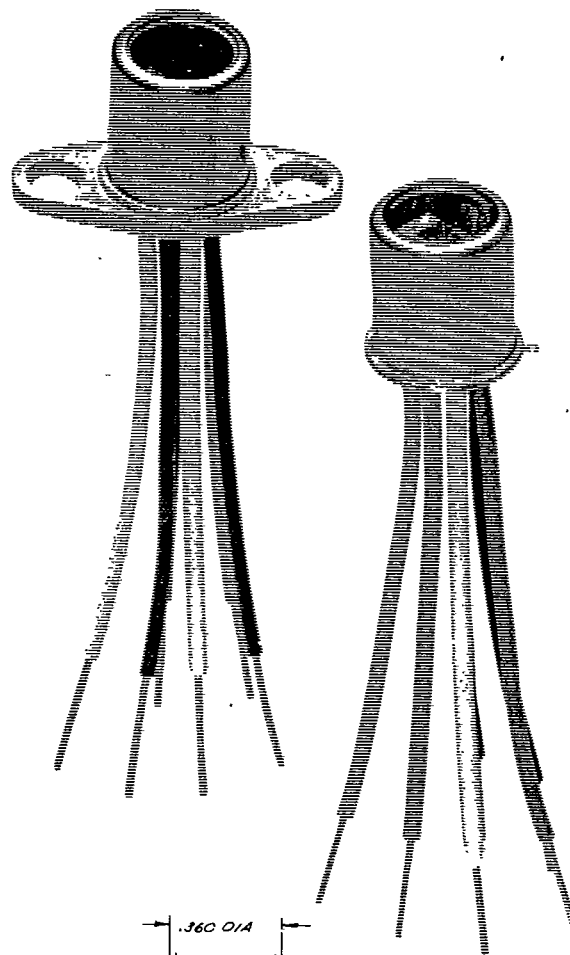
OTC-12-5 series infrared sensors are OPTOELECTRONICS lead selenide (PbSe) detectors mounted on two stage thermoelectric coolers and packaged in TO-5 cans.

Designed for use in applications requiring detectors with extremely high sensitivity in the 1 $\mu$ m to 5 $\mu$ m spectral region, these sensors offer an economical means for obtaining cooled photoconductive detector performance without the bulk and inconvenience of liquid cooling.

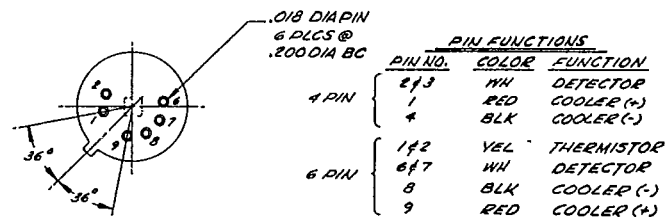
OTC-12-5 detector packages are hermetically sealed, incorporating advanced packaging concepts such as all fused and welded construction; in addition, the PbSe detector elements in these sensors are fully passivated with a protective overcoat. This passivation technique, developed by OPTOELECTRONICS, eliminates instabilities generally associated with PbSe detectors when they are subjected to visible and/or ultraviolet radiation.

Particularly suitable for use in high volume, low cost systems operating in the 1 $\mu$ m to 5 $\mu$ m spectral region, OTC-12 series detectors provide peak sensitivity, comparable to liquid nitrogen cooled (77°K) PbSe, and performance and reliability far exceeding that of any other previously available photodetector of comparable size and cost.

For mounting convenience and improved heat sinking, specify OTC-12-7 units (with integral TO-37 headers). OTC-12-7 units have an overall height of .425 and a detector plane height of .254.



UNITS WITH THERMISTORS (OPTIONAL)



# OTC-12-5/OTC-12-7

Series two stage thermoelectrically cooled lead selenide detectors

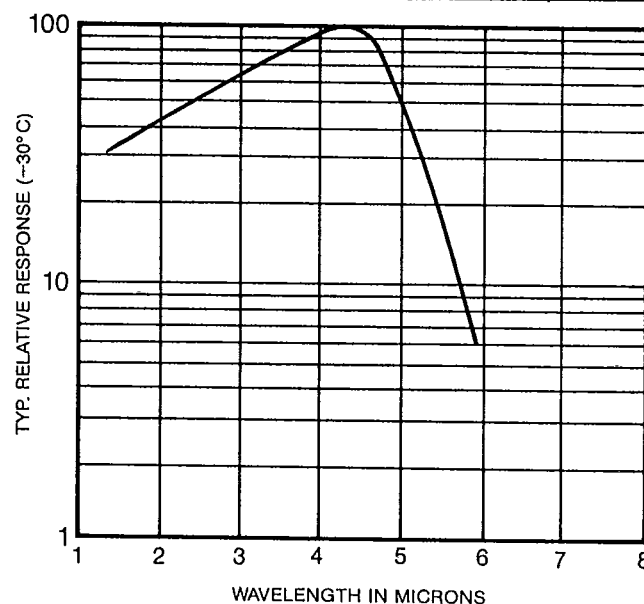
## SPECIFICATIONS

Characteristic	Operating Conditions	Performance			Units
		Minimum	Typical	Maximum	
Ambient temperature			+25	+65	°C
Element temperature	Package base at 25°C		-30		°C
D* (detectivity)	500°K, 1KHz, 1Hz	$1.1 \times 10^9$	$1.8 \times 10^9$		$\text{cmHz}^{1/2}\text{W}^{-1}$
D* (detectivity)	$\lambda\text{pk}$ , 1KHz, 1Hz	$7.5 \times 10^9$	$1.3 \times 10^{10}$		$\text{cmHz}^{1/2}\text{W}^{-1}$
Wavelength of max. response		4.2	4.4 to 4.6		$\mu\text{m}$
Element resistance (dark)		0.4	1.0 to 3.0	7.0	Meg ohms/ $\square$
Time constant	(not measured)		12	25	$\mu\text{sec}$
Cooler power required			1.25	1.70	Volts
			1.6	1.6	Amps
Power dissipation required			2		Watts
Responsivity	$\lambda\text{pk}$ , 1KHz				$\text{VW}^{-1}$
Element size 1mm x 1mm		9,000	13,000		
Element size 2mm x 2mm		4,500	8,000		
Element size 3mm x 3mm		3,000	5,000		
Optimum detector bias	With 1M $\Omega$ load resistor				Volts
Element size 1mm x 1mm			50	100	
Element size 2mm x 2mm			100	200	
Element size 3mm x 3mm			150	300	
Field of view		OTC-12-5	OTC-12-7		Degrees
Element size 1mm x 1mm		95	98		
Element size 2mm x 2mm		85	79		
Element size 3mm x 3mm		70	54		

When ordering standard detectors, specify:

Type	Element Size	Type
OTC-12-51	1mm x 1mm	OTC-12-71
OTC-12-52	2mm x 2mm	OTC-12-72
OTC-12-53	3mm x 3mm	OTC-12-73

1. Other element sizes available on special orders.
2. Refer to other data sheets for packages which will accommodate larger elements.
3. Optional: At a slight increase in cost, calibrated or uncalibrated thermistors may be installed at the detector for controlling detector temperature during operation. To specify units with thermistors, add the suffix -T to the basic part number for uncalibrated sensing; add the suffix -TC for calibrated thermistors. Note the six lead configuration for OTC-12 units with thermistors (reverse side).
4. OTC-12-7 units with integral TO-37 headers.



For price and delivery or additional information and application assistance, please contact: Marketing Department,

**OptoElectronics**

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