



## **MWA4500 SERIES**

### **LITHIUM TANTALATE PYROELECTRIC DETECTOR**

#### **High Frequency Performance with Integrated Voltage Mode Amplifier**

#### **Description**

The MWA 4500 Series Lithium Tantalate Pyroelectric Detectors are new devices from our family of high performance IR detectors. The specially processed sensing element and the integrated voltage mode low noise JFET preamplifier all in a TO5 transistor package provide high voltage response with a high D\* especially at the higher frequencies as in FTIR applications.

The Lithium Tantalate crystal (LTO) with its very high Currie temperature (~600 C.) and low sensitivity to ambient temperature (<0.2%/ deg C.) allow operation over a wide temperature range without the need for temperature control. LTO is non hygroscopic and can thus be supplied and operated in a "windowless" configuration

The very wide spectral sensitivity (U.V. to 1,000 $\mu$ ) and high speed is achieved with a proprietary low thermal mass absorbing coating. (Spectral sensitivity is limited in practice by the window selection).

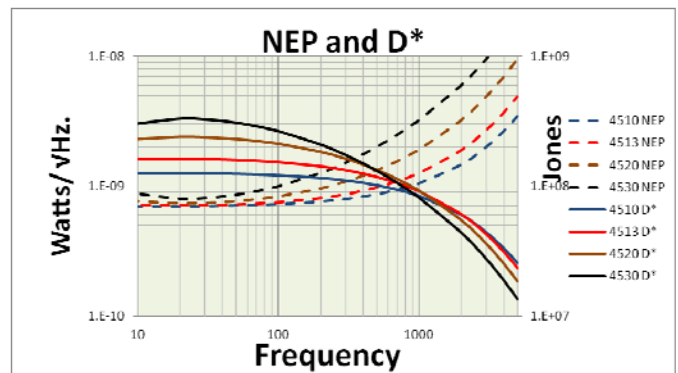
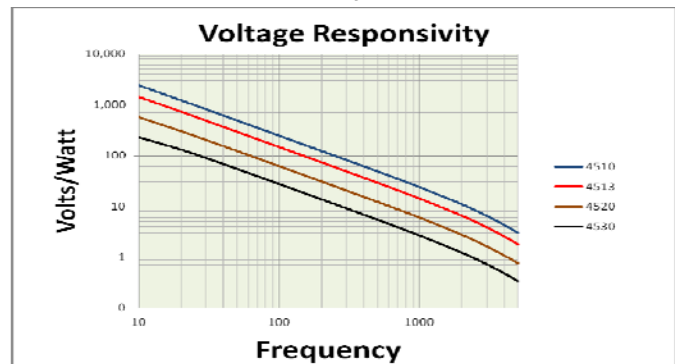
These devices can be supplied in many different configurations including element geometry and size and amplifier response characteristics. Other packages and configurations are available.

#### **Applications**

- High Speed Spectroscopy (FTIR)**
- NDIR Process Control**
- Interferometers**
- Gas Analysis**

#### **Features**

- Integrated Voltage Mode Preamp.**
- Large Voltage Responsivity**
- High D\* at higher frequencies**
- Wide Spectral Range: 0.1 - >1,000  $\mu$ m**
- Permanently Poled**
- Low Thermal Sensitivity**

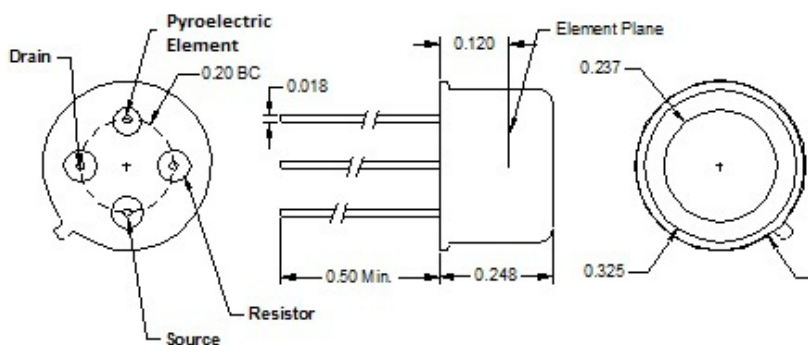


TYPICAL SERIES 4500 PERFORMANCE SPECIFICATIONS					
(Standard TO-5 Package with 1 x 10 <sup>10</sup> Ohms Load Resistor (RL) @ 1,000K BB)					
45XX		10	13	20	30
Element Dimensions	Dia. mm	1.0	1.3	2.0	3.0
Responsivity @ 100 Hz	V/W <sup>1</sup>	240	140	60	26
NEP (100, 1)	W/√Hz	7.3 x 10 <sup>-10</sup>	7.5 x 10 <sup>-10</sup>	8.3 x 10 <sup>-10</sup>	1.0 x 10 <sup>-9</sup>
D* (100, 1)	Jones	1.2 x 10 <sup>8</sup>	1.5 x 10 <sup>8</sup>	2.1 x 10 <sup>8</sup>	2.7 x 10 <sup>8</sup>
Responsivity @ 1k Hz	V/W <sup>1</sup>	24	14	6	2.6
NEP (1 kHz, 1)	W/√Hz	1.1 x 10 <sup>-9</sup>	1.3 x 10 <sup>-9</sup>	1.9 x 10 <sup>-9</sup>	3.3 x 10 <sup>-9</sup>
D* (1 kHz, 1)	Jones	8.4 x 10 <sup>7</sup>	9.1 x 10 <sup>7</sup>	9.2 x 10 <sup>7</sup>	8.2 x 10 <sup>7</sup>
Thermal Time Constant	ms	50	—————>		
Operating Voltage	VDC	+ 3 - +18	—————>		
Operating Current (Typical)	μA	1.0	—————>		
Recommended Operating Temperature	°C	-20 to 100	—————>		

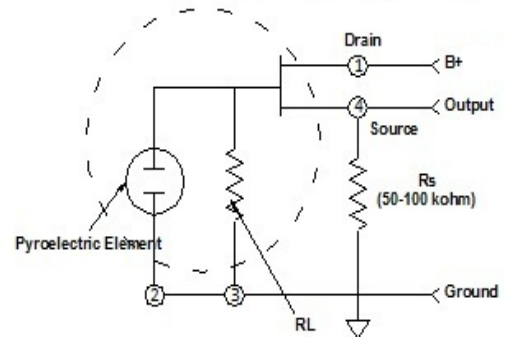
### Options

- Element Shape Circular, Square, Rectangular
- Windows KBr, CsI, Ge, BaF, ZnSe (Many others Window Materials and Filters Available)
- Other Standard Package Styles TO-37, TO-66 and many others
- Low Noise, Variable Gain Preamplifier (PYPA) and Power Supply (PYPS)
- Thermo Electric Cooling Available (45XXTE) (TO 99, TO37 & TO66 Package)
- Units with Thermal Compensation (45XXTC)
- Other Packages and Pinouts Available
- Non Standard Special Tests and Measurements

### Mechanical Data



### Circuit Diagram



Microwatt Applications LLC 529, SE Central Parkway, Stuart, FL 34994

Tel: 772 224 8300 Fax: 888 521 0761 email: [info@microwattonline.com](mailto:info@microwattonline.com) [www.microwattonline.com](http://www.microwattonline.com)