

# DEVICE SPECIFICATION FOR PYROELECTRIC IR-DETECTOR

CUSTOMER :  
TYPE : LHI 807 TC G3  
PART-NO. : 3607  
No. of samples :

Thermally compensated single detector with centred lithium-tantalate crystal as sensing element, FET in source follower configuration.

This specification is provided by

**PerkinElmer Optoelectronics GmbH & Co. KG, Wiesbaden.**

It covers the complete technical data of a pyroelectric IR detector. In case of samples attached to this paper, these have been taken randomly from normal production output. All detectors have met the requirements of PerkinElmer test-specifications and passed outgoing inspection.

**We kindly ask for approval with the return of a signed copy.**

Checked:

Date: 10.10.08

Customer approval:

Date:

**Electrical Configuration:**

One sensing and one compensating element are connected to built-in FET in source follower circuit, connections "Drain-Source-Ground". It is recommended to use a load resistor of 47kΩ.

**Electrical data:**

Unless specified differently, all data refer to 25°C:

**Responsivity:**      **min.: 2,2 kV/W**                      **typ.: 3,5 kV/W**

Responsivity is measured within spectral range 7 - 14 μm as per fig. 3 at 1Hz.  
 Temperature coefficient of responsivity typ.: -0.1 %/K.

**Noise:**                      **max.: 50 μV<sub>pp</sub>**                      **typ.: 15 μV<sub>pp</sub>**

After a 10 minute settling time, noise is monitored for the duration of 1500 sec. at a temperature of 25°C, shut from infrared energy, electrical bandwidth of 0.4 to 10Hz.

**Operating voltage:**       $V_{DD} = 2-12 \text{ V}$

**Source voltage:**               $V_S = 0.2-1.5 \text{ V}$

**Drain-source voltage:**       $V_{DS} = \text{min } 0.5 \text{ V}$

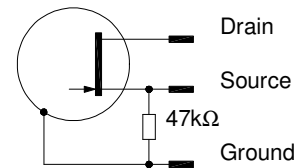


Fig.1: Test circuit

**Typical Responsivity vs. Frequency**

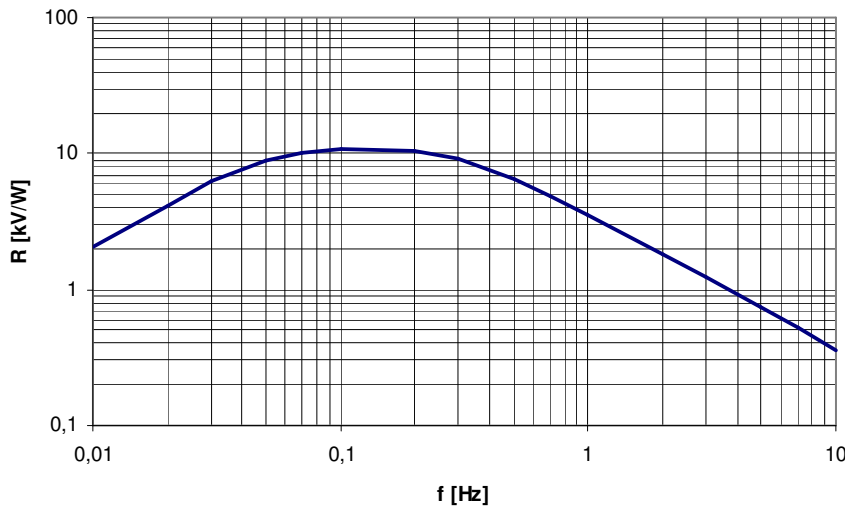
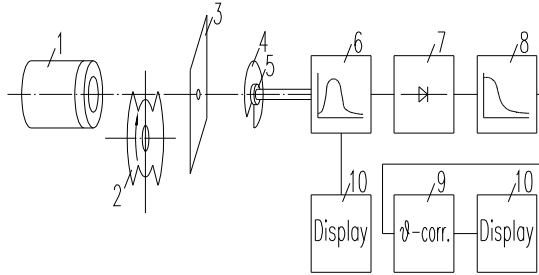


Fig.2: Frequency response

**Test Set up**



- 1: Black Body Radiator 373K = 100°C
- 2: 1 Hz Chopper
- 3: Aperture
- 4: Cover plate
- 5: Detector
- 6: Bandpass filter 1 Hz
- 7: Rectifier
- 8: Lowpass filter
- 9: Temperature compensation
- 10: Display

Fig.3: Test Set – up

**Spectral range:**

The spectral range of the detector is determined by filter built in (window).

**Substrate:** Silicon, multilayer coated

Application	Centre wave length (µm)	Half power bandwidth (µm)
CO; CO <sub>2</sub>	4.48 ± 0.07	0.62 ± 0.06

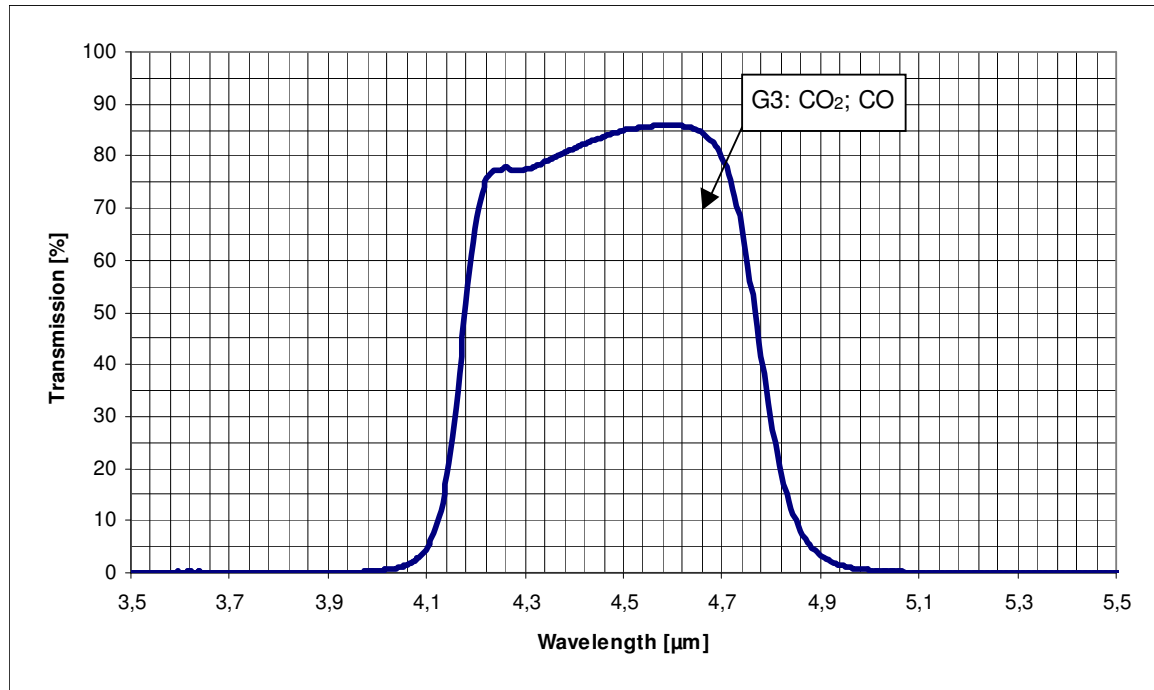


Fig.4: Filter Transmission

### **Configuration:**

**Housing:** TO- 5 metal housing with infrared transparent window

**Element size:** 1.5 x 1.5 mm<sup>2</sup>, see also drawing: 2/37448

**Connections:** Refer to drawing: 2/37448

### **Field of View**

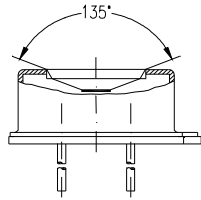


Fig.5: Field of View

**Operating temperature:** -40 °C to +85 °C

The electrical parameters may vary from specified values accordance with their temperature dependence.

**Storage temperature:** -40 °C to +85 °C

Avoid storage under high humid environment.

**Microphonic noise:** max: 30  $\mu V_{rms}$  /g

PerkinElmer IR-detectors covered herein have passed qualification test for microphonic noise in x-y-z axis, exciting frequencies from 5Hz to 2kHz.

### **Humidity:**

The IR-detector shall not increase noise or decrease responsivity when exposed to 95% r.H. at 30 °C. Operation below dew point might effect performance.

### **Hermetic seal:**

This IR-detector is sealed to pass a He-leakage test with maximum leak rate of 10<sup>-8</sup> mbar·l·s<sup>-1</sup>.

### **Quality:**

PerkinElmer is a QS 9000 certified manufacturer with established SPC and TQM. Detector out-going inspections include the parameters Responsivity, Match, Offset, Noise, Gross leak (Mil Std 883 method 1014C1) on 100%. Individual data are not stored, statistical details can be disclosed on request.

### **Handling:**

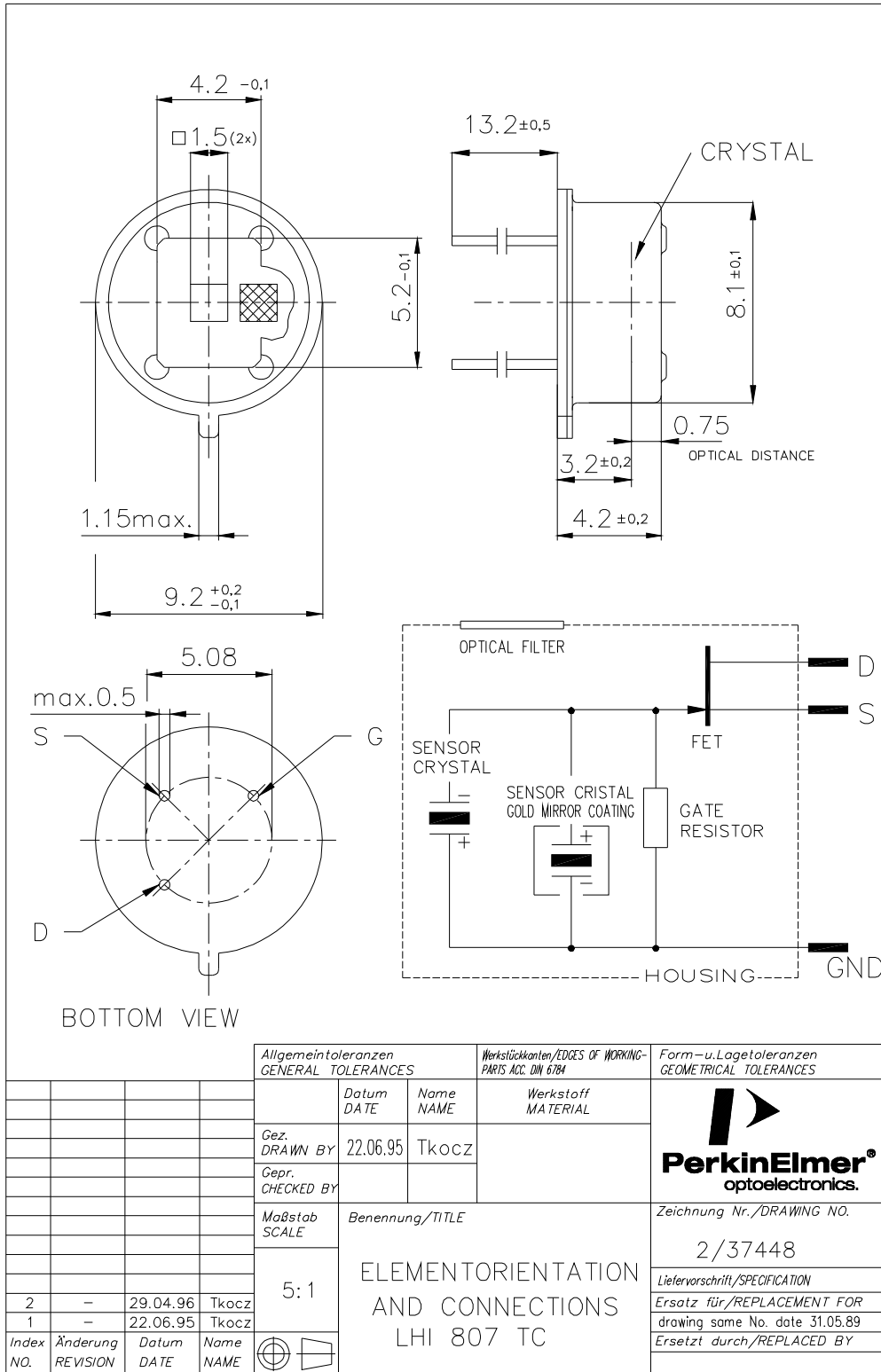
Electrostatic charges may destroy the detector. We recommend to apply precautions necessary for ESD devices to avoid damages. Do not apply physical force to detector leads. Do not expose detector to aggressive detergents such as freon, trichlorethylene, etc.

### **Solder conditions:**

Hand soldering and standard wave soldering process may be applied. Avoid heat exposure to the top and the window of the detector. Reflow soldering is not recommended.

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