PRECAUTIONS FOR USE

OPERATING TEMPERATURE

A detector should be operated at its optimal temperature given in the Final test report (delivered with every device).

MAXIMUM VOLTAGE

Do not operate the photovoltaic detector at higher bias voltages than suggested in the Final test report (delivered with every device).

Be careful using ohmmeters for photovoltaic detectors!

Standard ohmmeters may overbias and damage the detector. This is especially true for small physical area or SWIR photovoltaic detectors. A bias of 10 mV can be used for resistance measurements of any type of detector. Ask for conditions of I-V plot measurements!

USAGE

Devices can operate in the 10% to 80 % humidity, in the -20°C to 30°C ambient temperature range. Operation at >30°C may reduce the performance of the standard Peltier coolers.

Ask for devices that can operate in the 30°C to 80°C ambient temperature range.

STORAGE

The following conditions should be fulfilled for safe and reliable operation of the detector:

- Store in dark place, 10% to 90% humidity and -20°C to 50°C temperature,
- Avoid exposure to direct sunlight and strong UV/VIS light as this may result in degradation of the detector performance,
- Avoid electrostatic discharges at leads therefore, the devices should be stored having leads shorted.

HANDLING

Particular attention should be paid to not scratching the surface of the window. A damaged window may entirely degrade the detector's performance. Excessive mechanical stress applied to the package itself or to a device containing the package may result in permanent damage. The Peltier element inside thermoelectrically cooled detectors is susceptible to mechanical shocks. Great care should be taken when handling cooled detectors.

CLEANING THE WINDOW

Keep the window clean. Use a soft cotton cloth damped with isopropyl alcohol and wipe off the surface gently if necessary.

MECHANICAL SHOCKS

The Peltier elements may be damaged by excessive mechanical shock or vibration. Care is recommended during manipulations and normal use. Drop impacts against a hard surface are particularly dangerous.

MECHANICAL INSTALLATION

The maximum tightening torque of the TO8 detector header fixing screw is 0.3 Nm.

SHAPING LEADS

Avoid bending the leads at a distance less than 2 mm from the base of the package to prevent glass seal damage. When shaping the leads, a maximum of two right angle bends and three twists at a distance minimum of 6 mm from the base of the package.

Keep the leads of the detecting element shorted when shaping!

SOLDERING LEADS

IR detectors can be easily damaged by excessive heat. Special care should be taken when soldering the leads. Usage of heat sinks is highly recommended. Tweezers can be used for this purpose; when soldering, clamp a lead at a place between the soldering iron and the base of the package. To avoid the destructive influence of ESD and other accidental voltages (e.g. from a non-grounded soldering iron) rules for handling LSI integrated circuits should be applied to IR detectors too. Leads should be soldered at 370°C, below 5 s.

BEAM POWER LIMITATIONS

Damage thresholds, specified as integrated power of incoming radiation:

- For devices without immersion microlens irradiated with continuous wave (CW) or single pulses of more than 1 µs duration, irradiated power on the active area must not exceed 100 W/cm^2.The irradiance of a pulse shorter than 1 µs must not exceed 1 MW/cm^2.
- For optically immersed detectors irradiated with CW or single pulse longer than 1 µs irradiance on the apparent optical active area must not exceed

2.5 W/cm^2. The irradiance of the pulse shorter than 1 µs must not exceed 10 kW/cm^2.

- For repeated irradiation with pulses shorter than 1 µs, the equivalent CW irradiation, average power over the pulse-to-pulse period should be less than the CW damage threshold according to the equation:

$$\text{equivalent CW radiation power density} = \frac{\text{pulse peak power}}{\text{focus area}} \cdot \text{pulse duration} \cdot \text{repetition rate}$$

Saturation thresholds vary by detector type and can be provided upon request.