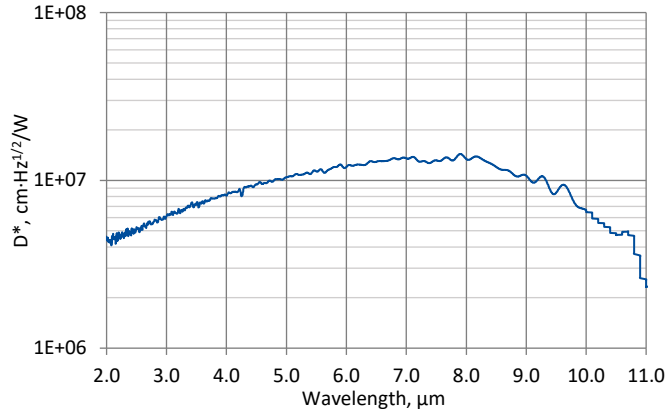
PC-9-AF1×1-TO39-NW-90 – ENGINEERING SAMPLE

HgCdTe ambient temperature photoconductive detector with anti-fringing technology

PC-9-AF1×1-TO39-NW-90 is uncooled IR photoconductive detector based on sophisticated HgCdTe heterostructure for the best performance and stability.
In order to make this detector immune to unwanted optical fringing effects, VIGO developed anti-fringing technology (internal modification of substrate's surface) and successfully applied it. This results in the fringing 10 – 40 times smaller compared to the standard IR detector. In order to minimize fringing it is recommended to work with detectors optimized for longer wavelengths and operate below λ_{peak}.

Spectral response (Typ., T_a = 20°C)



Exemplary spectral detectivity, the spectral response of delivered devices may differ.

Specification (Typ., T_a = 20°C)

Parameter	Detector type PC-9-AF1×1-TO39-NW-90
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	2.2±0.1
Peak wavelength λ_{peak}, µm	8.2±0.1
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	10.6±0.2
Detectivity D*(λ_{peak}, 20 kHz), cm·Hz$^{1/2}$/W	~1.4×10^7
Current responsivity R_i(λ_{peak}, 20 kHz), A/W	~0.0007
Time constant τ, ns	~2
Resistance R, Ω	~40
Bias voltage V_b, V	~0.4
1/f noise corner frequency f_c, Hz	~20k
Active area A, mm×mm	AF1×1
Package	TO39
Acceptance angle Φ	~90°
Window	none

Features

- Anti-fringing technology applied
- Significant fringing reduction for 2.2 – 8.2 µm spectral range
- Large active area
- Excellent linearity

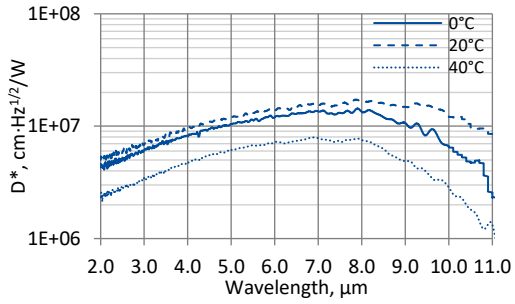
Applications

- CO_2 laser measurements
- Laser power monitoring and control
- Laser beam profiling and positioning
- Laser calibration

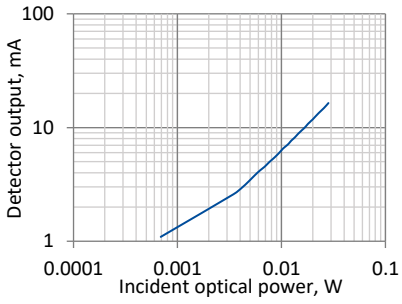
Related document

- Anti-fringing technology

Detectivity change vs. ambient temperature (Typ.)

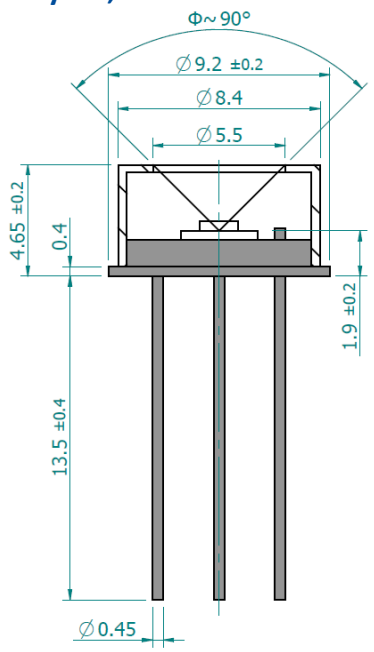


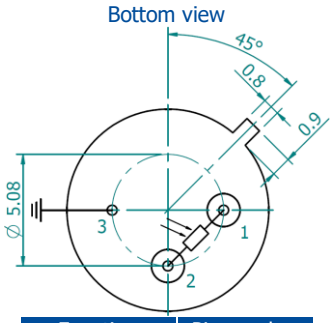
Linearity (Typ., T_{BB} = 1273 K)



T_{BB} – black body temperature

Mechanical layout, mm





Function	Pin number
Detector	1, 2
Chassis ground	3

Φ – acceptance angle

Dedicated preamplifier

small SIP-TO39

Precautions for use and storage

- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations:
  - irradiance with CW or single pulse longer than 1 µs irradiance on the apparent optical active area must not exceed 100 W/cm^2,
  - irradiance of the pulse shorter than 1 µs must not exceed 1 MW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.