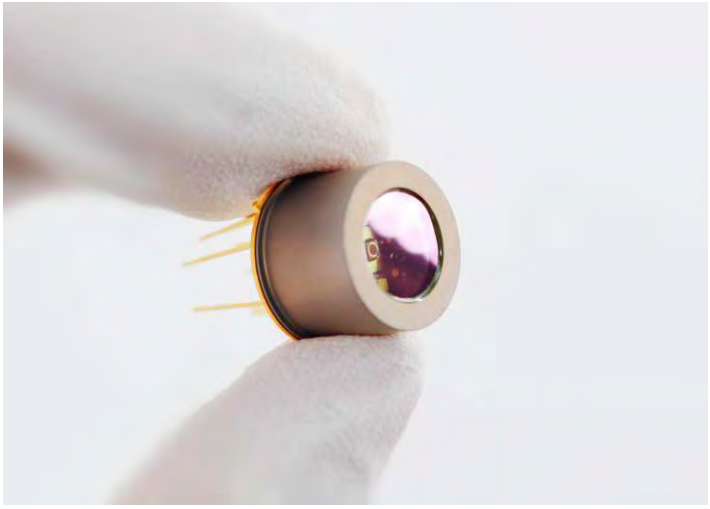
# 1mm 900-2700nm two Stage TEC, TO8 package InGaAs Photodiode



## Descriptions

GESTIN-2TE-TO8 series unit InGaAs detector is mainly composed of P-I-N structure InGaAs photosensitive chip, transition electrode plate, temperature sensor and Two Stage thermoelectric cooler (2TE), in the form of TO package. This user manual only describes the product series.

## Feature

- Chip active diameters from 300μm to 3000 μm
- Spectral response from 900nm to 2700 nm
- High shunt resistance for high sensitivity
- TEC Built Inside

## Applications

- NIR senGESTINg/radiometry
- LED/LD characterization
- Spectroscopy
- Medical diagnostics
- Spectroscopy

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# E/O Characteristics

## Structure Parameters

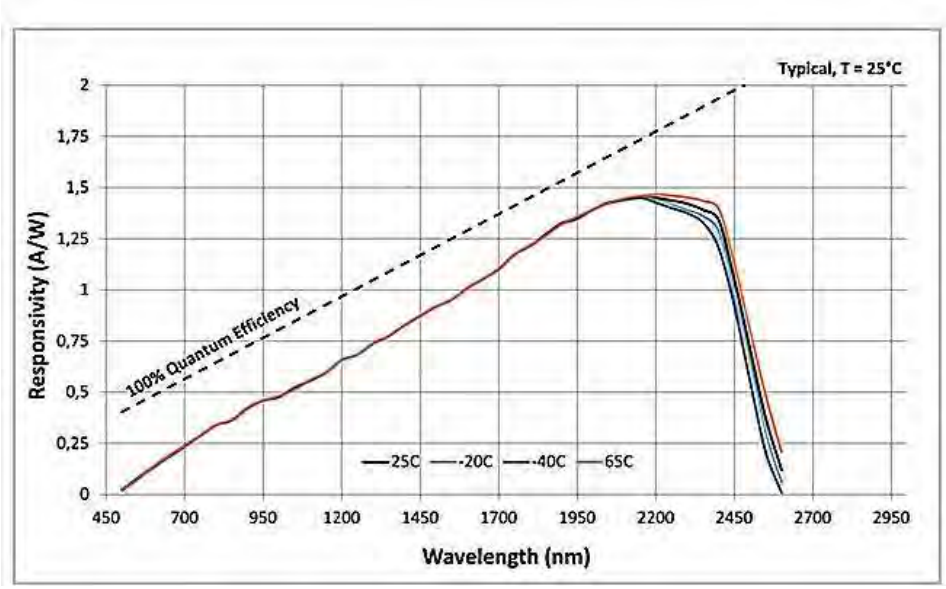
| Part Number | Package | Cooling | Active Area | Chip size | Electrode Size |
|---|---|---|---|---|---|
| GESTIN-2TE-TO8-0300 | TO-8 | 2TE | Φ300μm | 850×850um | 140×180um |
| GESTIN-2TE-TO8-0500 | | | Φ500μm | 1000×1000um | 140×180um |
| GESTIN-2TE-TO8-1000 | | | Φ1000μm | 1410×1410um | 140×180um |
| GESTIN-2TE-TO8-2000 | | | Φ2000μm | 2560×2560um | 280×360um |
| GESTIN-2TE-TO8-3000 | | | Φ3000μm | 3560×3560um | 320×480um |

## EO Parameters

| Part Number | Test Temp Tch(℃) | Spectral λ (nm) | Dark Current ID(μA) | | Junction Capacity C(f=1MHz, VR=0V) (pF) |
|---|---|---|---|---|---|
| | | | VR=0.01V | VR=0.5V | |
| GESTIN-2TE-TO8-0300 | 25 | 900-2700 | 0.1 | 0.5 | 50 |
| GESTIN-2TE-TO8-0500 | | | 0.2 | 1 | 100 |
| GESTIN-2TE-TO8-1000 | | | 1 | 4 | 300 |
| GESTIN-2TE-TO8-2000 | | | 4 | 10 | 800 |
| GESTIN-2TE-TO8-3000 | | | 10 | 40 | 2000 |


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## Response Cure



# TEC Parameters

## Operating Environment

| Parameter | Typ |
|---|---|
| Operating temperature(℃) | -45~+55 |
| Storage temperature(℃) | -50~+60 |

## Characteristics of thermoelectric coolers

The detector integrates a two-stage thermoelectric cooler (TEC), and the center of the cooling surface is the center of the lower surface of the detector, and the cooling area should be ≥6mm×6mm, and its performance parameters are shown in the following table:

| Performance index | Value |
|---|---|
| Maximum thermal load power（Qmax/W） | 0.93W |
| Maximum load current allowed（ITEC-max/A） | 1A |
| The maximum load voltage allowed（VTEC-max/V） | 2V |

## Temperature monitoring module characteristics

This detector uses the thermistor as the temperature monitoring module. The mapping between the resistance value and the temperature in the working temperature is shown in the following table:

| Temperature(℃) | Resistance（kΩ) | Temperature(℃) | Resistance（kΩ) |
|---|---|---|---|
| -65 | 94.270 | -15 | 6.909 |
| -60 | 69.290 | -10 | 5.587 |
| -55 | 51.500 | -5 | 4.549 |
| -50 | 38.700 | 0 | 3.729 |
| -45 | 29.400 | 5 | 3.075 |
| -40 | 22.560 | 10 | 2.55 |
| -35 | 17.490 | 15 | 2.126 |
| -30 | 13.690 | 20 | 1.782 |
| -25 | 10.810 | 25 | 1.5 |
| -20 | 8.608 | 30 | 1.268 |

## The corresponding relationship between thermistor value and temperature is as follows:

$$\frac{1}{(T1+273.15)}=\frac{\ln\left(\frac{R1}{R2}\right)}{B}+\frac{1}{(T2+273.15)}$$

T1：Test target temperature, unit: ℃;
T2：Reference point temperature, unit: ℃, The typical value of the reference temperature within -20~70℃ is 10 or 40℃, and the reference temperature close to the target temperature should be selected.
R1：T1 corresponding thermistor resistance value, unit: kΩ;
R2：T2 corresponding thermistor resistance value, unit: kΩ;
B：T2 corresponding thermistor resistance value, unit: kΩ;
B：Between-20~70deg,the typical B value is 3019.6±60.
Notice:
a) During TEC installation, pay attention to the new resistance introduced by the external electrical structure. If the new resistance exceeds
When TEC resistance is 10%, the I-V curve needs to be recalibrated.
b) It is recommended to switch on TEC in a way with small connection resistance. If welding is required, short circuit is required
Grounding protection, welding temperature ≤250℃, welding duration < 10s;

## Dimensions and Pin definitions

