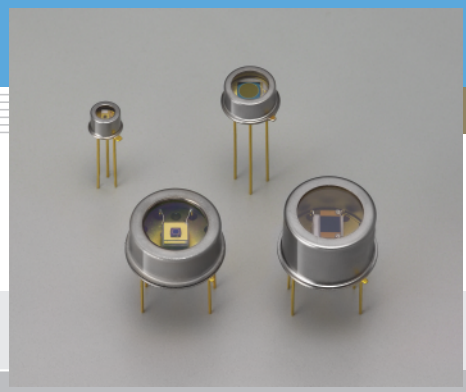


# InGaAs PIN photodiode G8423/G8373/G5853 series

Long wavelength type (up to 2.6  $\mu\text{m}$ )



## Features

- Long cut-off wavelength: 2.6  $\mu\text{m}$
- 3-pin TO-18 package: low price
- Thermoelectrically cooled TO-8 package: low dark current
- Active area:  $\phi 0.3$  to  $\phi 3$  mm

## Applications

- Gas analysis
- Spectrophotometer
- NIR (near infrared) photometry

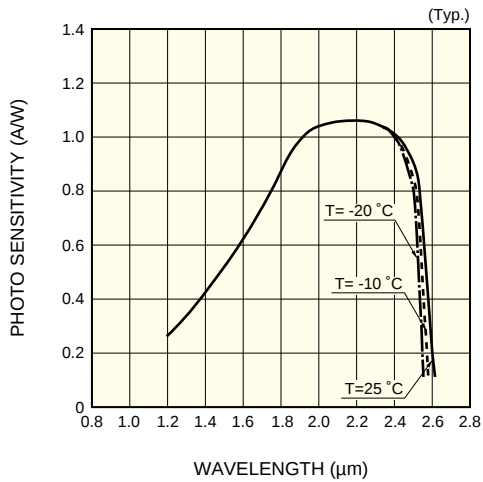
## Specifications / Absolute maximum ratings

| Type No.  | Dimensional outline | Package | Cooling             | Active area<br>(mm) | Absolute maximum ratings             |                                    |                              |                                                           |                                                         |
|-----------|---------------------|---------|---------------------|---------------------|--------------------------------------|------------------------------------|------------------------------|-----------------------------------------------------------|---------------------------------------------------------|
|           |                     |         |                     |                     | Thermistor power dissipation<br>(mW) | TE-cooler allowable current<br>(A) | Reverse voltage $V_R$<br>(V) | Operating temperature $T_{opr}$<br>( $^{\circ}\text{C}$ ) | Storage temperature $T_{stg}$<br>( $^{\circ}\text{C}$ ) |
| G8423-03  | ①                   | TO-18   | Non-cooled          | $\phi 0.3$          | -                                    | -                                  |                              | -40 to +85                                                | -55 to +125                                             |
| G8423-05  |                     |         |                     | $\phi 0.5$          |                                      |                                    |                              |                                                           |                                                         |
| G8373-01  |                     |         |                     | $\phi 1$            |                                      |                                    |                              |                                                           |                                                         |
| G8373-03  | ②                   | TO-5    |                     | $\phi 3$            |                                      |                                    |                              |                                                           |                                                         |
| G5853-103 | ③                   | TO-8    | One-stage TE-cooled | $\phi 0.3$          | 0.2                                  | 1.5                                | 2                            | -40 to +70                                                | -55 to +85                                              |
| G5853-11  |                     |         |                     | $\phi 1$            |                                      |                                    |                              |                                                           |                                                         |
| G5853-13  |                     |         |                     | $\phi 3$            |                                      |                                    |                              |                                                           |                                                         |
| G5853-203 | ④                   | TO-8    | Two-stage TE-cooled | $\phi 0.3$          | 0.2                                  | 1.0                                |                              | -40 to +70                                                | -55 to +85                                              |
| G5853-21  |                     |         |                     | $\phi 1$            |                                      |                                    |                              |                                                           |                                                         |
| G5853-23  |                     |         |                     | $\phi 3$            |                                      |                                    |                              |                                                           |                                                         |

## Electrical and optical characteristics (Typ. unless otherwise noted)

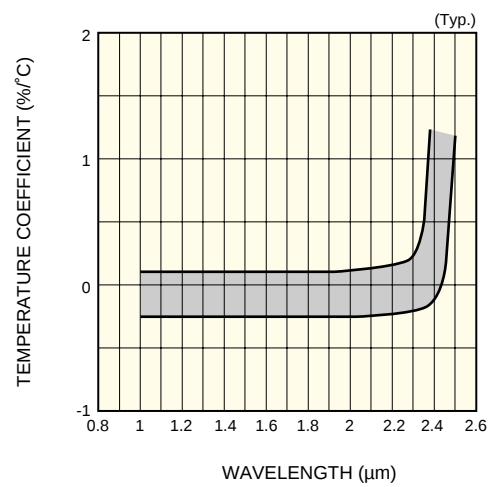
| Type No.  | Measurement condition  | Spectral response range $\lambda$ | Peak sensitivity wavelength $\lambda_p$ | Photo sensitivity $S$<br>$\lambda = \lambda_p$ | Dark current $I_D$<br>$V_R = 1 \text{ V}$ |                           | Cut-off frequency $f_c$<br>$V_R = 1 \text{ V}$<br>$R_L = 50 \Omega$ | Terminal capacitance $C_t$<br>$V_R = 1 \text{ V}$<br>$f = 1 \text{ MHz}$ | Shunt resistance $R_{sh}$<br>$V_R = 10 \text{ mV}$ | $D^*$<br>$\lambda = \lambda_p$                 | NEP<br>$\lambda = \lambda_p$   |
|-----------|------------------------|-----------------------------------|-----------------------------------------|------------------------------------------------|-------------------------------------------|---------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------|--------------------------------|
|           | Element temperature    |                                   |                                         |                                                |                                           |                           |                                                                     |                                                                          |                                                    |                                                |                                |
|           | ( $^{\circ}\text{C}$ ) | ( $\mu\text{m}$ )                 | ( $\mu\text{m}$ )                       | (A/W)                                          | Typ.<br>( $\mu\text{A}$ )                 | Max.<br>( $\mu\text{A}$ ) | -3 dB<br>(MHz)                                                      | (pF)                                                                     | (k $\Omega$ )                                      | ( $\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$ ) | ( $\text{W}/\text{Hz}^{1/2}$ ) |
| G8423-03  | 25                     | 1.2 to 2.6                        | 2.3                                     | 1.1                                            | 2                                         | 20                        | 60                                                                  | 40                                                                       | 30                                                 | $5 \times 10^{10}$                             | $7 \times 10^{-13}$            |
| G8423-05  |                        |                                   |                                         |                                                | 5                                         | 50                        | 50                                                                  | 60                                                                       | 15                                                 |                                                | $1 \times 10^{-12}$            |
| G8373-01  |                        |                                   |                                         |                                                | 15                                        | 75                        | 15                                                                  | 200                                                                      | 3                                                  |                                                | $2 \times 10^{-12}$            |
| G8373-03  |                        |                                   |                                         |                                                | 150                                       | 1500                      | 1.5                                                                 | 1800                                                                     | 0.3                                                |                                                | $8 \times 10^{-12}$            |
| G5853-103 | -10                    | 1.2 to 2.57                       | 2.3                                     | 1.1                                            | 0.2                                       | 2                         | 60                                                                  | 40                                                                       | 300                                                | $1 \times 10^{11}$                             | $3 \times 10^{-13}$            |
| G5853-11  |                        |                                   |                                         |                                                | 1.5                                       | 7.5                       | 15                                                                  | 200                                                                      | 30                                                 |                                                | $7 \times 10^{-13}$            |
| G5853-13  |                        |                                   |                                         |                                                | 15                                        | 150                       | 1.5                                                                 | 1800                                                                     | 3                                                  |                                                | $2 \times 10^{-12}$            |
| G5853-203 | -20                    | 1.2 to 2.55                       | 2.3                                     | 1.1                                            | 0.1                                       | 1                         | 60                                                                  | 40                                                                       | 600                                                | $2 \times 10^{11}$                             | $2 \times 10^{-13}$            |
| G5853-21  |                        |                                   |                                         |                                                | 0.8                                       | 4                         | 15                                                                  | 200                                                                      | 60                                                 |                                                | $5 \times 10^{-13}$            |
| G5853-23  |                        |                                   |                                         |                                                | 7.5                                       | 75                        | 1.5                                                                 | 1800                                                                     | 6                                                  |                                                | $1.8 \times 10^{-12}$          |

## Spectral response



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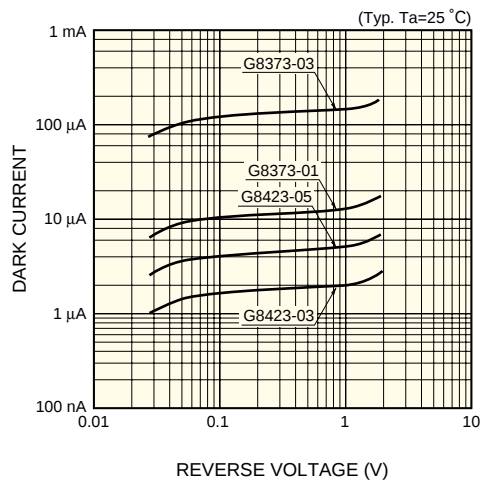
## Photo sensitivity temperature characteristic



KIRDB0206EA

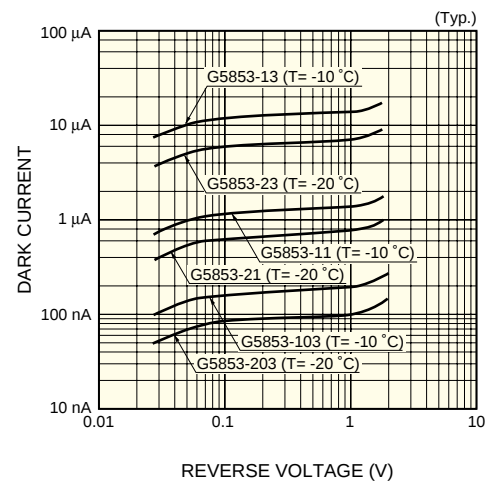
## Dark current vs. reverse voltage

### Non-cooled type



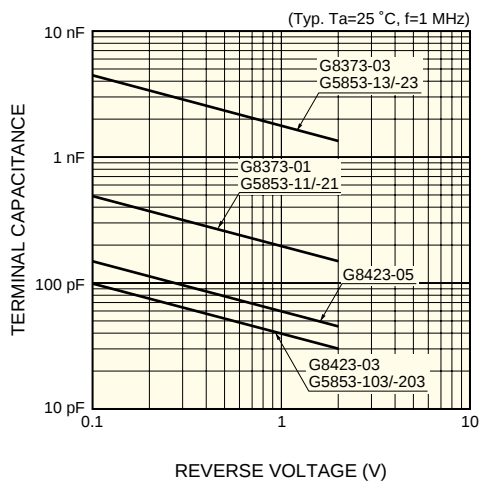
KIRDB0238EA

### TE-cooled type



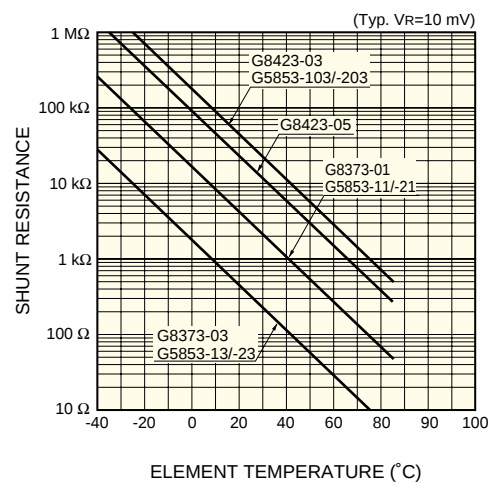
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## Terminal capacitance vs. reverse voltage



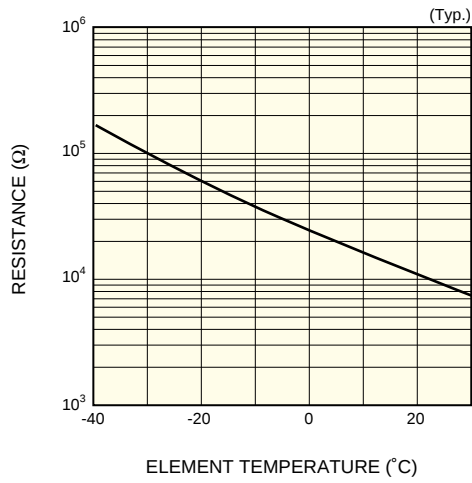
KIRDB0239EA

## Shunt resistance vs. element temperature



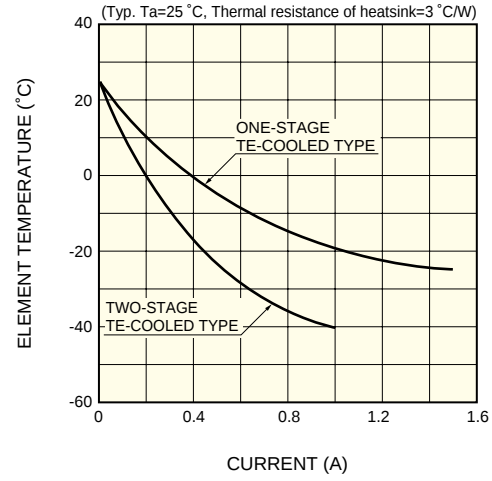
KIRDB0240EA

■ Thermistor temperature characteristic



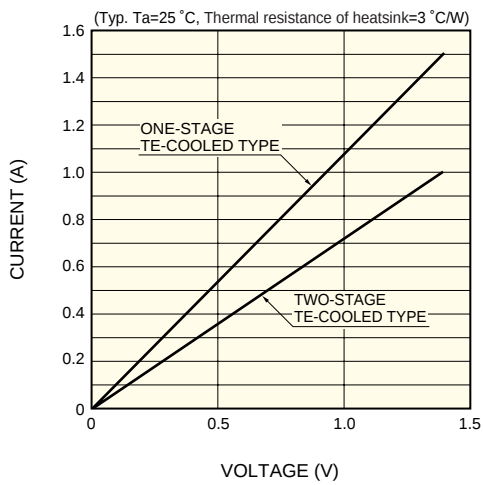
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■ Cooling characteristics of TE-cooler



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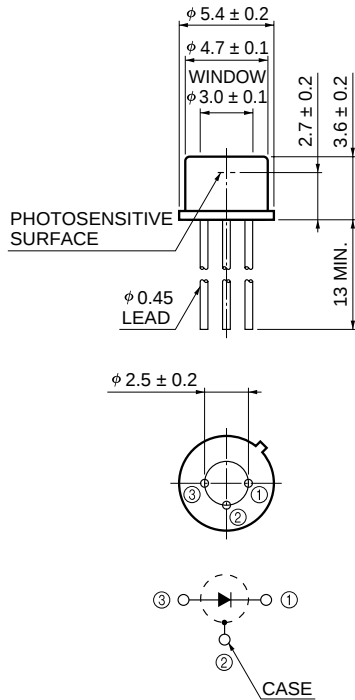
■ Current vs. voltage characteristics of TE-cooler



KIRDB0115EA

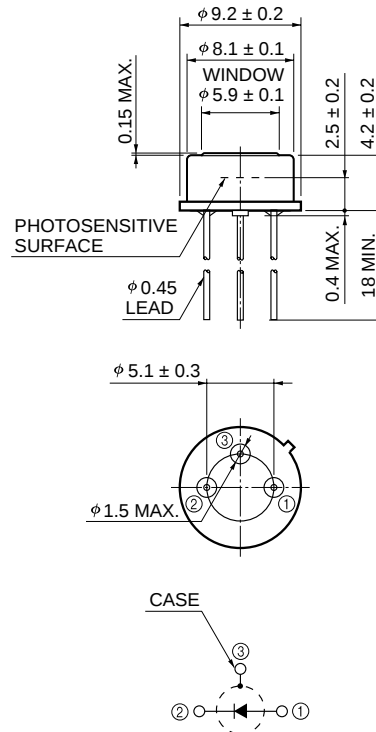
## ■ Dimensional outlines (unit: mm)

① G8423-03/-05, G8373-01



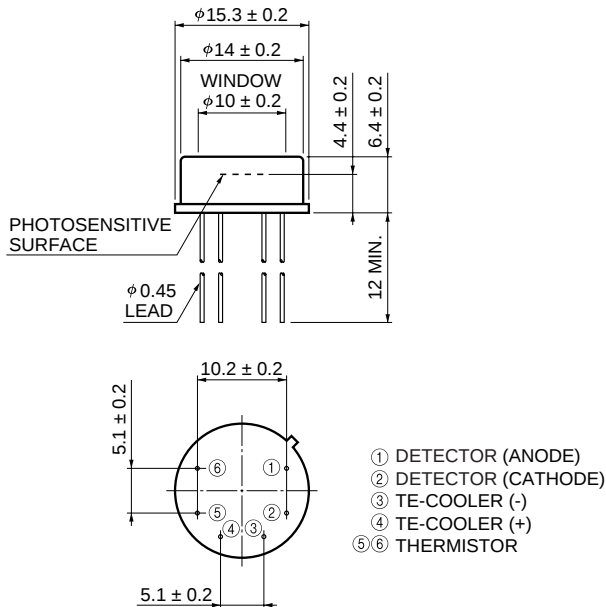
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② G8373-03



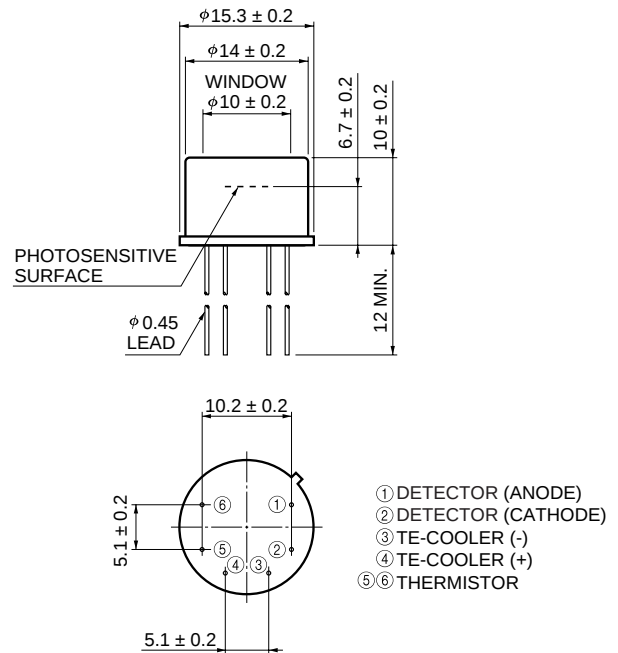
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③ G5853-103/-11/-13



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④ G5853-203/-21/-23



KIRDA0031EB

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