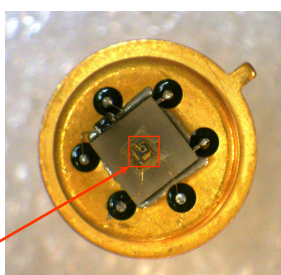


## Features

- High reliability
- Spectral Selectivity
- Easy to use in lock-in circuits
- Temperature stabilization
- Parabolic reflector with window



LED chip

## Description

Light emitting diode **LED38-TEC-PRW** demonstrates typical maximum of emitting wavelength of  $\lambda_p = 3.75 \mu\text{m}$  ( $I = 150 \text{ mA}$ ,  $f = 0.5 \text{ KHz}$ , duty cycle: 50%).

Light emitting diode **LED38-TEC-PRW** is equipped with sapphire window, thermo-electrical cooler (TEC) and thermistor for stabilizing of temperature.

The components is mounted in a standard 9.2 mm TO-5 package with parabolic reflector (PR).

LED heterostructure is grown on InAs substrate.

Related products: **LED38-TEC-PRW** can be used in optical pair with our [PD48-05-WS](#) photodiodes.

## Applications

- Measuring equipment
- Gas analysis ( $\text{C}_2\text{H}_2$ ,  $\text{H}_2\text{S}$ ,  $\text{HNO}_3$ )
- Analytical spectral devices

## Options

- Power supply: [LED Driver DLT-27M](#)
- Power supply: [LED Driver DLT-37M](#)

## General characteristics

| Package                 | Parameter                 | Symbol                   | Value       | Unit               |
|-------------------------|---------------------------|--------------------------|-------------|--------------------|
| TO-5<br>with<br>TEC-PRW | Maximum operating current | $I_{\text{QCW}}^*$       | 220         | mA                 |
|                         |                           | $I_{\text{Pulsed}}^{**}$ | 2000        |                    |
|                         | Soldering temperature     | $T_s$                    | + 230       | $^{\circ}\text{C}$ |
|                         | Operating temperature     | $T_{\text{opr}}$         | - 30...+ 50 | $^{\circ}\text{C}$ |
|                         | Storage temperature       | $T_{\text{stg}}$         | - 55...+ 60 | $^{\circ}\text{C}$ |
|                         | Weight                    | m                        | 3.65        | g                  |
|                         | Size                      | D                        | 15.0        | mm                 |
|                         |                           | H                        | 23.0        |                    |

\* Quasi-CW mode: Repetition rate: 0.5 kHz, pulse duration: 1 ms, duty cycle: 50%

\*\* Pulse mode: Repetition rate: 0.5 kHz, pulse duration: 2  $\mu\text{s}$ , duty cycle: 0.1%

## Electrical and optical characteristics

| Parameter                | Symbol            | Condition               | Min                    | Max  | Unit          |
|--------------------------|-------------------|-------------------------|------------------------|------|---------------|
| Peak emission wavelength | $\lambda_p$       | $I_F = 150 \text{ mA}$  | $\lambda_{typ} = 3.75$ |      | $\mu\text{m}$ |
|                          |                   |                         | 3.7                    | 3.85 |               |
| Spectral FWHM            | $\Delta\lambda$   | $I_F = 150 \text{ mA}$  | 500                    | 700  | nm            |
| Pulse optical power      | $P^*_{QCW}$       | $I_F = 200 \text{ mA}$  | 20                     | 40   | $\mu\text{W}$ |
|                          | $P^{**}_{Pulsed}$ | $I_F = 1000 \text{ mA}$ | 90                     | 180  |               |
| Forward voltage          | $V_F$             | (*)                     | 0.5                    | 0.8  | V             |
| Switching time           | $\tau$            |                         | 10                     | 30   | ns            |

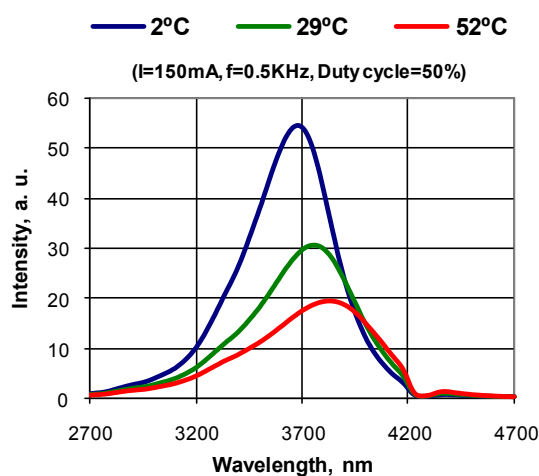
\* Quasi-CW mode: repetition rate: 0.5 kHz, pulse duration: 1 ms, duty cycle: 50%, current: 200 mA

\*\* Pulse mode: repetition rate: 0.5 kHz, pulse duration: 2  $\mu\text{s}$ , duty cycle: 0.1%, current: 1 A

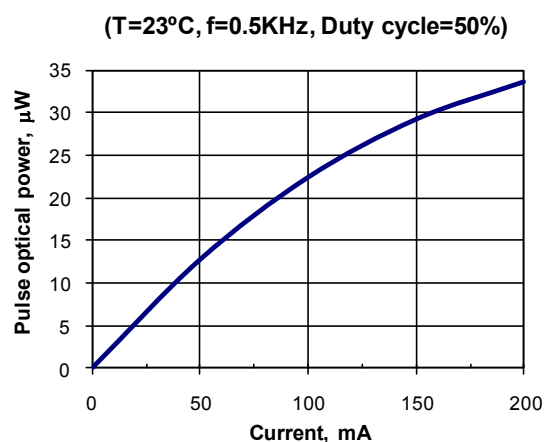
## TEC TO506.1MC0400710.TB103 parameters (without load)

| Parameter             | Symbol           | Condition                        | Value | Unit |
|-----------------------|------------------|----------------------------------|-------|------|
| Maximum Current       | $I_{max}$        | $\Delta T_{max}$                 | 1.50  | A    |
| Maximum Voltage       | $U_{max}$        | $\Delta T_{max}$                 | 0.80  | V    |
| Cooling power         | $q_{max}$        | -                                | 1.30  | W    |
| Temperature range     | $\Delta T_{max}$ | vacuum                           | 70    | K    |
| Thermistor resistance | $R_t$            | $T = +20 \text{ }^\circ\text{C}$ | 10.00 | kOhm |

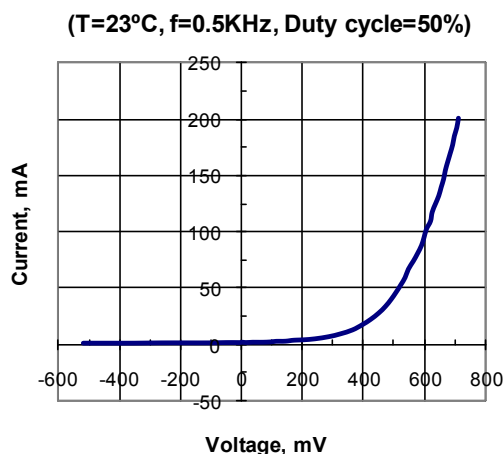
## Electroluminescence spectra



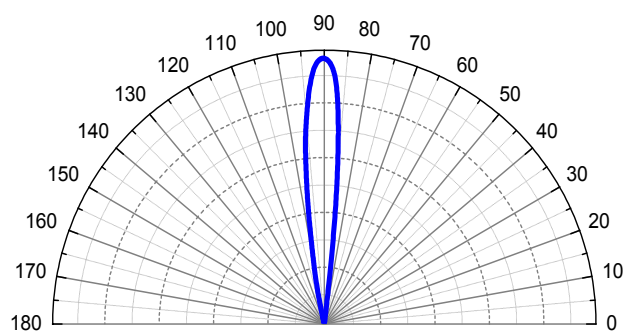
## Pulse optical power vs. current



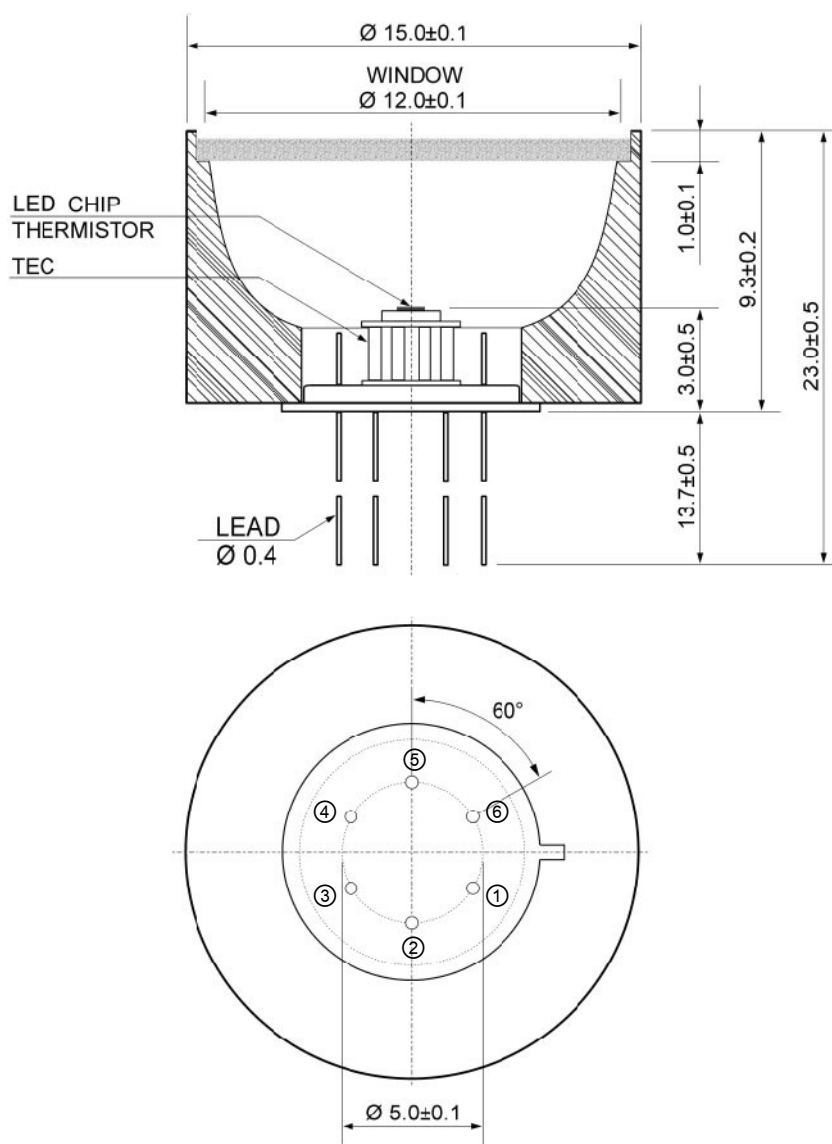
## Current vs. voltage



## Field pattern



TO-5 package with PR — dimensions (mm)



| Pin | Description      |
|-----|------------------|
| ①   | TEC (anode)      |
| ②   | Diode (anode)*   |
| ③   | Diode (cathode)* |
| ④   | Thermistor TC103 |
| ⑤   |                  |
| ⑥   | TEC (cathode)    |

\* **Attention:** Pin polarity can be changed on request.