CNZ1021, CNZ1022, CNZ1023, CNA1009H
(ON1021, ON1022, ON1023, ON1024)

Photo Interrupters

### Overview

CNZ1021 series is a transmissive photosensor series in which a high efficiency GaAs infrared light emitting diode is used as the light emitting element, and a high sensitivity phototransistor is used as the light detecting element. The two elements are arranged so as to face each other, and objects passing between them are detected.

### Features

- **Position detection accuracy**: 0.25 mm
- **Gap width**: 3 mm (CNZ1021, CNZ1022, CNZ1023) 5 mm (CNA1009H)
- **The type directly attached to PCB**: CNZ1021
- **Screw-fastened type (both sides)**: CNZ1022
- **Screw-fastened type (one side)**: CNZ1023
- **The type directly attached to PCB**: CNA1009H (with a positioning pins)

(Note) 1. Tolerance unless otherwise specified is ±0.3.
2. ( ) Dimension is reference.

(Note) The part numbers in the parenthesis show conventional part number.

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**Maintenance/Discontinued**

Maintenance/Discontinued includes following four Product lifecycle stage.

1. Planned maintenance type
2. Maintenance type
3. Planned discontinued type
4. Discontinued type

Please visit following URL about latest information.

http://www.semicon.panasonic.co.jp/en/
-transmissive Photosensors (Photo Interrupters)  CNZ1021,CNZ1022,CNZ1023,CNA1009H

Absolute Maximum Ratings (Ta = 25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>min</th>
<th>typ</th>
<th>max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input (Light emitting diode)</td>
<td></td>
<td>Reverse voltage (DC)</td>
<td>$V_R$</td>
<td>5</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Forward current (DC)</td>
<td>$I_F$</td>
<td>50</td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Power dissipation</td>
<td>$P_D$</td>
<td>75</td>
<td></td>
<td>mW</td>
</tr>
<tr>
<td>Output (Photo transistor)</td>
<td></td>
<td>Collector current</td>
<td>$I_C$</td>
<td>20</td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collector to emitter voltage</td>
<td>$V_{CEO}$</td>
<td>30</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emitter to collector voltage</td>
<td>$V_{ECO}$</td>
<td>5</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collector power dissipation</td>
<td>$P_C$</td>
<td>100</td>
<td></td>
<td>mW</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td>Operating ambient temperature</td>
<td>$T_{opr}$</td>
<td>-25 to +85°C</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Storage temperature</td>
<td>$T_{Stg}$</td>
<td>-40 to +100°C</td>
<td></td>
<td>°C</td>
</tr>
</tbody>
</table>

1 Input power derating ratio is 1.0 mW/°C at Ta ≥ 25°C.
2 Output power derating ratio is 1.33 mW/°C at Ta ≥ 25°C.

Electrical Characteristics (Ta = 25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>min</th>
<th>typ</th>
<th>max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input characteristics</td>
<td></td>
<td>Forward voltage (DC)</td>
<td>$V_F$</td>
<td>$I_F = 20mA$</td>
<td>1.25</td>
<td>1.4 V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reverse current (DC)</td>
<td>$I_R$</td>
<td>$V_R = 3V$</td>
<td>10</td>
<td>µA</td>
</tr>
<tr>
<td>Output characteristics</td>
<td></td>
<td>Collector cutoff current</td>
<td>$I_{CEO}$</td>
<td>$V_{CE} = 10V$</td>
<td>10</td>
<td>200 nA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collector current</td>
<td>$I_C$</td>
<td>$V_{CC} = 5V, I_F = 20mA, R_L = 100Ω$</td>
<td>0.5</td>
<td>15 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collector to emitter saturation voltage</td>
<td>$V_{CE(sat)}$</td>
<td>$I_F = 40mA, I_C = 1mA$</td>
<td>0.4</td>
<td>V</td>
</tr>
<tr>
<td>Transfer characteristics</td>
<td></td>
<td>Response time</td>
<td>$t_r, t_f$</td>
<td>$V_{CC} = 5V, I_C = 1mA, R_L = 100Ω$</td>
<td>5</td>
<td>µs</td>
</tr>
</tbody>
</table>

* Switching time measurement circuit

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Transmissive Photosensors (Photo Interrupters)

- **I_F, I_C — Ta**
- **I_F — V_F**
- **V_F — Ta**
- **I_C — I_F**
- **I_C — V_CE**
- **I_C — Ta**
- **I CEO — Ta**
- **t_r — I_C**
- **I_C — d**
Caution for Safety

DANGER

This product contains Gallium Arsenide (GaAs).

GaAs powder and vapor are hazardous to human health if inhaled or ingested. Do not burn, destroy, cut, cleave off, or chemically dissolve the product. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.

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