

# Silicon NPN Phototransistor

## Version 1.3

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### BPY 62



#### Features:

- **Spectral range of sensitivity:** (typ) 400 ... 1100 nm
- **Package:** Metal Can (TO-18), hermetically sealed
- **Special:** Base connection
- Suitable up to 125 °C
- High photosensitivity
- Available in groups

#### Applications

- Photointerrupters
- Industrial electronics
- For control and drive circuits

#### Ordering Information

Type:	Photocurrent $I_{PCE}$ [ $\mu$ A] $\lambda = 950 \text{ nm}$ , $E_e = 0.5 \text{ mW/cm}^2$ , $V_{CE} = 5 \text{ V}$	Ordering Code
BPY 62	$\geq 500$	Q60215Y0062
BPY 62-3/4	800 ... 2500	Q62702P5198
BPY 62-4	1250 ... 2500	Q60215Y1113

*Note:* Only one bin within one packing unit (variation less than 2:1)

**Maximum Ratings** ( $T_A = 25\text{ °C}$ )

Parameter	Symbol	Values	Unit
Operating and storage temperature range	$T_{op}; T_{stg}$	-40 ... 125	°C
Collector-emitter voltage	$V_{CE}$	35	V
Collector current	$I_C$	100	mA
Collector surge current ( $\tau < 10\ \mu\text{s}$ )	$I_{CS}$	200	mA
Emitter-collector voltage	$V_{EC}$	7	V
Total Power dissipation	$P_{tot}$	200	mW
ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	$V_{ESD}$	2000	V

**Characteristics** ( $T_A = 25\text{ °C}$ )

Parameter		Symbol	Values	Unit
Wavelength of max. sensitivity	(typ)	$\lambda_{S\ max}$	830	nm
Spectral range of sensitivity	(typ)	$\lambda_{10\%}$	(typ) 400 ... 1100	nm
Radiant sensitive area	(typ)	A	0.11	mm <sup>2</sup>
Dimensions of chip area	(typ)	L x W	(typ) 0.55 x 0.55	mm x mm
Half angle	(typ)	$\varphi$	$\pm 8$	°
Photocurrent of collector-base photodiode ( $\lambda = 950\text{ nm}$ , $E_e = 0.5\text{ mW/cm}^2$ , $V_{CB} = 5\text{ V}$ )	(typ)	$I_{PCB}$	5.5	$\mu\text{A}$
Photocurrent of collector-base photodiode ( $E_V = 1000\text{ lx}$ , Std. Light A, $V_{CB} = 5\text{ V}$ )	(typ)	$I_{PCB}$	17	$\mu\text{A}$
Capacitance ( $V_{CE} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ )	(typ)	$C_{CE}$	7.5	pF
Capacitance ( $V_{CB} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ )	(typ)	$C_{CB}$	14	pF
Capacitance ( $V_{EB} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ )	(typ)	$C_{EB}$	19	pF
Dark current ( $V_{CE} = 20\text{ V}$ , $E = 0$ )	(typ (max))	$I_{CE0}$	1 ( $\leq 50$ )	nA

Grouping ( $T_A = 25\text{ °C}$ ,  $\lambda = 950\text{ nm}$ )

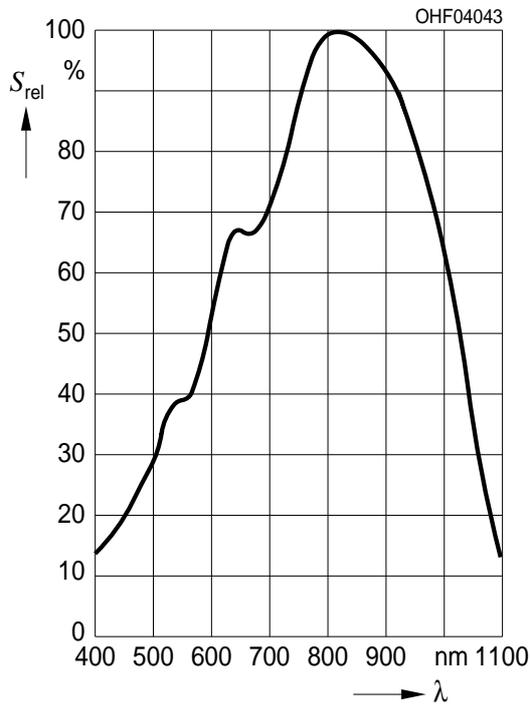
Group	Min Photocurrent $E_e = 0.5\text{ mW/cm}^2$ , $V_{CE} = 5\text{ V}$ $I_{PCE, min}\text{ }[\mu\text{A}]$	Max Photocurrent $E_e = 0.5\text{ mW/cm}^2$ , $V_{CE} = 5\text{ V}$ $I_{PCE, max}\text{ }[\mu\text{A}]$	Typ Photocurrent $E_V = 1000\text{ lx, Std. Light A, } V_{CE} = 5\text{ V}$ $I_{PCE}\text{ }[\mu\text{A}]$	Rise and fall time $I_C = 1\text{ mA, } V_{CC} = 5\text{ V, } R_L = 1\text{ k}\Omega$ $t_r, t_f\text{ }[\mu\text{s}]$
BPY 62-2	500	1000	2400	5
BPY 62-3	800	1600	3800	7
BPY 62-4	1250	2500	5800	9
BPY 62-5	2000		9600	12

Group	Collector-emitter saturation voltage $I_C = I_{PCEmin} \times 0.3$ , $E_e = 0.5\text{ mW/cm}^2$ $V_{CEsat}\text{ }[\text{mV}]$	Current gain $E_e = 0.5\text{ mW/cm}^2, V_{CE} = 5\text{ V}$ $I_{PCE} / I_{PCB}$
BPY 62-2	150	140
BPY 62-3	150	220
BPY 62-4	160	340
BPY 62-5	180	550

Note.:  $I_{PCEmin}$  is the min. photocurrent of the specified group.

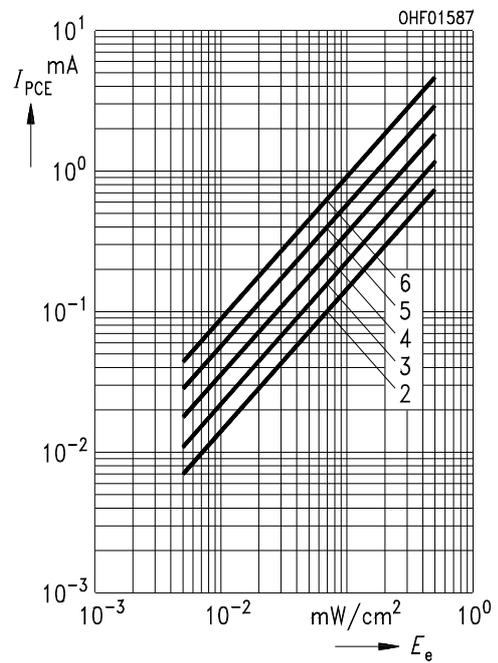
**Relative Spectral Sensitivity** <sup>1) page 9</sup>

$S_{rel} = f(\lambda)$



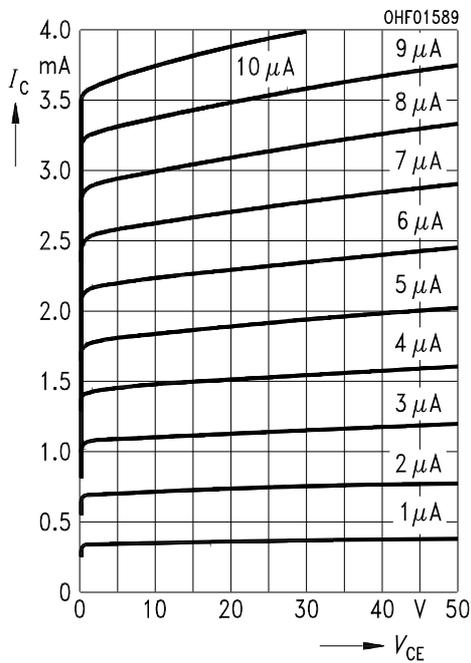
**Photocurrent** <sup>1) page 9</sup>

$I_{PCE} = f(E_e), V_{CE} = 5 V$



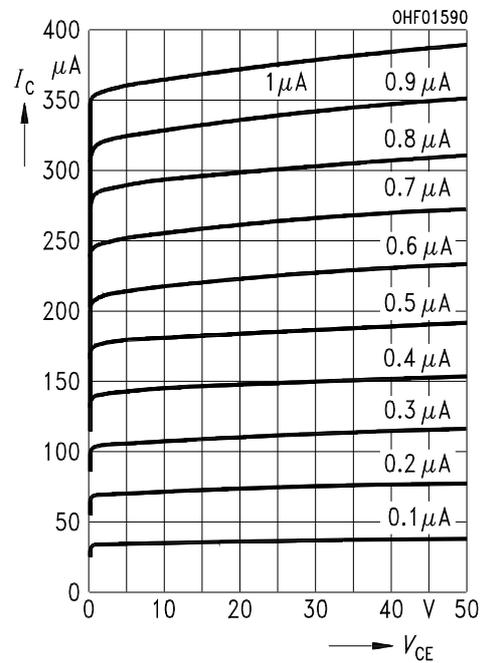
**Collector Current** <sup>1) page 9</sup>

$I_C = f(V_{CE}), I_B = \text{Parameter}$



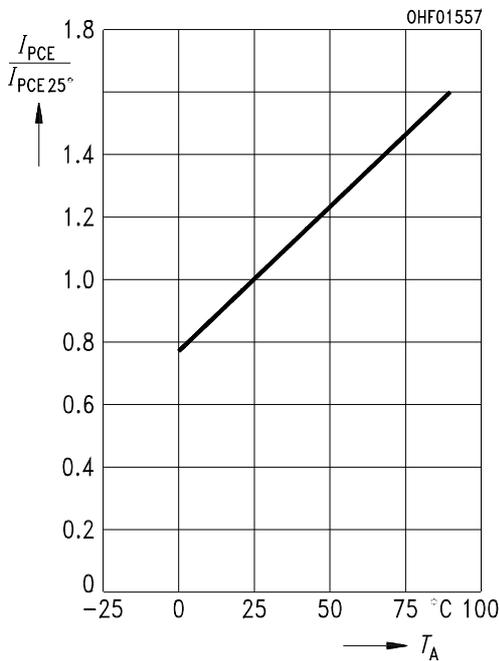
**Collector Current** <sup>1) page 9</sup>

$I_C = f(V_{CE}), I_B = \text{Parameter}$



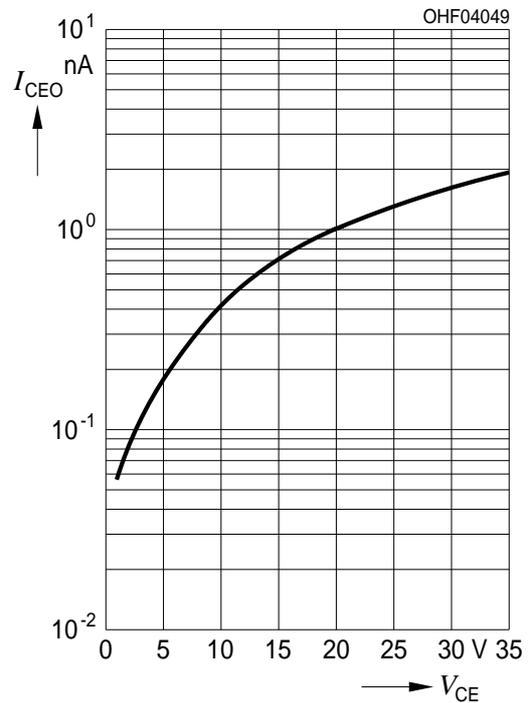
**Photocurrent** <sup>1) page 9</sup>

$I_{PCE} / I_{PCE}(25^{\circ}C) = f(T_A), V_{CE} = 5 V$



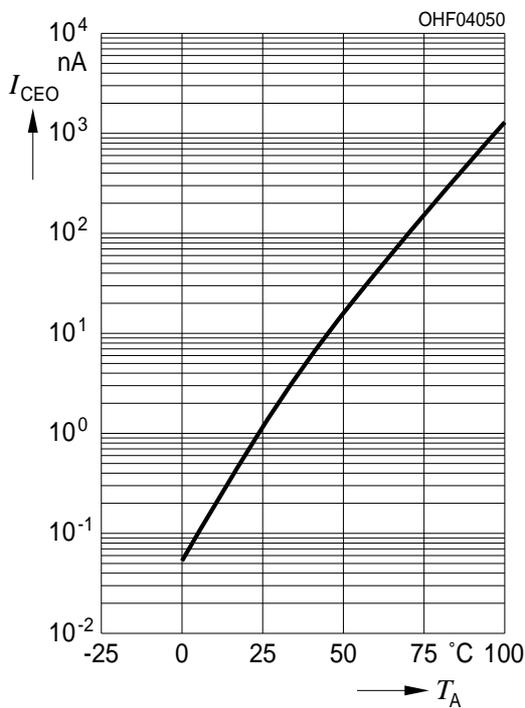
**Dark Current** <sup>1) page 9</sup>

$I_{CEO} = f(V_{CE}), E = 0$



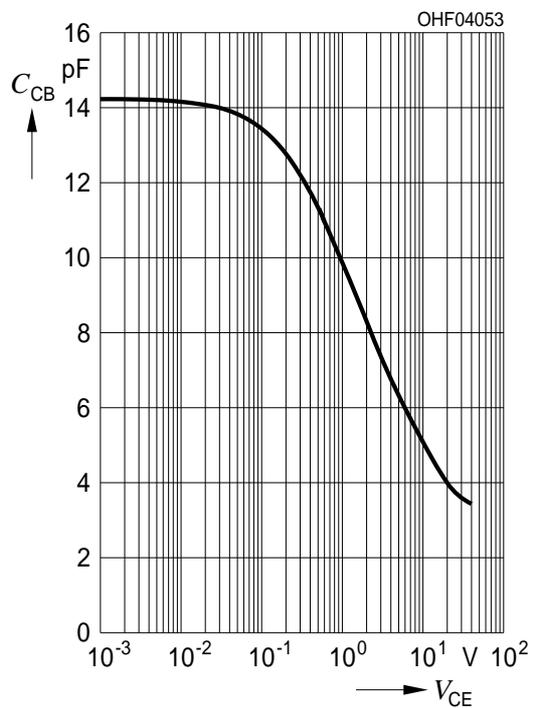
**Dark Current** <sup>1) page 9</sup>

$I_{CEO} = f(T_A), E = 0$



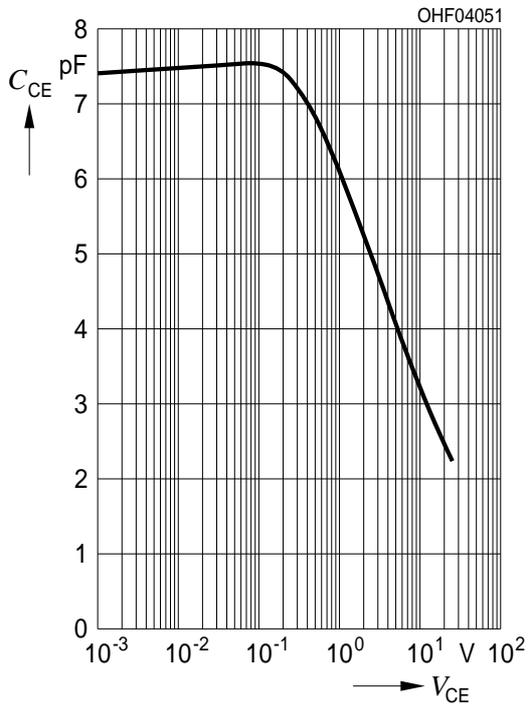
**Collector-Base Capacitance** <sup>1) page 9</sup>

$C_{CB} = f(V_{CB}), f = 1 \text{ MHz}, E = 0$



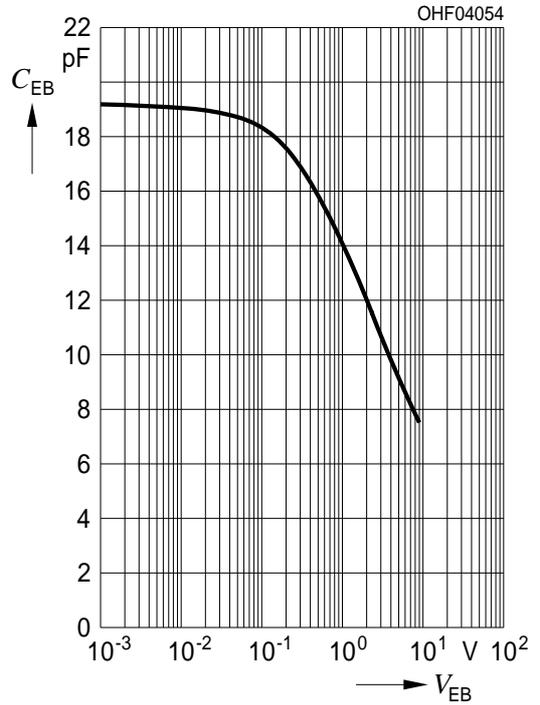
**Collector-Emitter Capacitance** <sup>1) page 9</sup>

$C_{CE} = f(V_{CE}), f = 1 \text{ MHz}, E = 0$



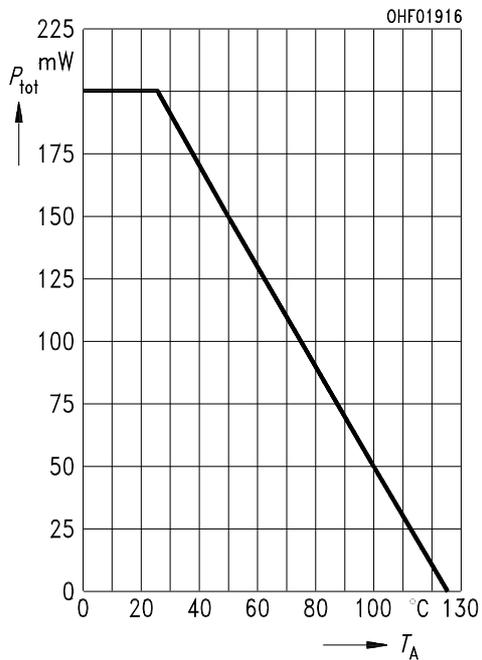
**Emitter-Base Capacitance** <sup>1) page 9</sup>

$C_{EB} = f(V_{EB}), f = 1 \text{ MHz}, E = 0$



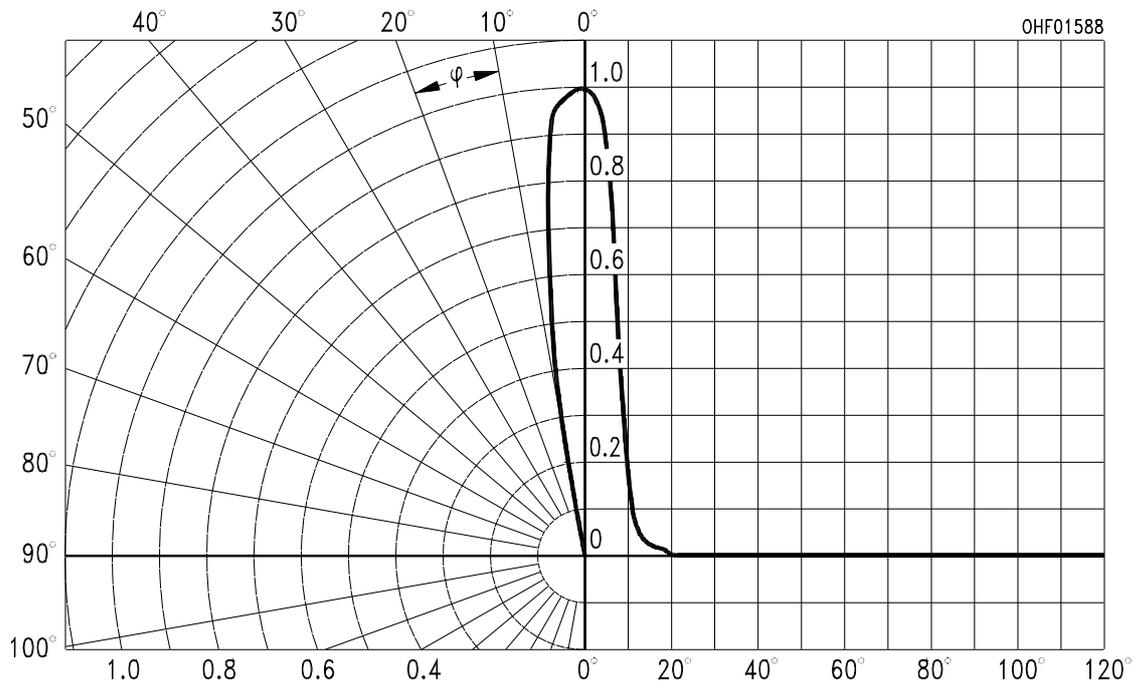
**Power Consumption**

$P_{tot} = f(T_A)$

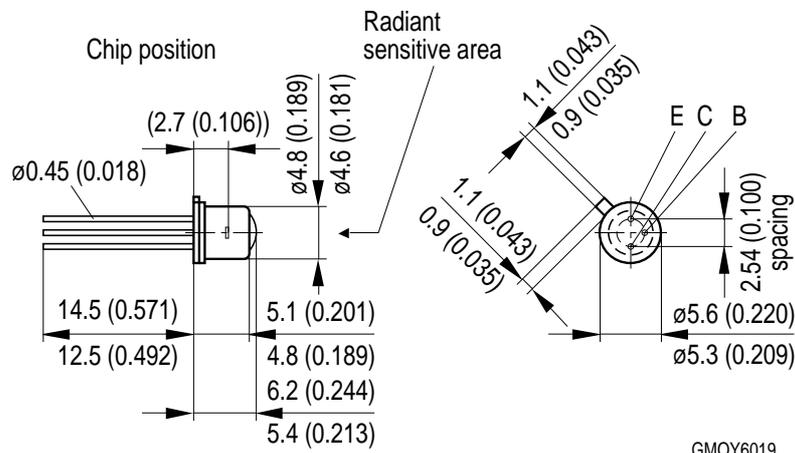


**Directional Characteristics** <sup>1) page 9</sup>

$S_{rel} = f(\phi)$



**Package Outline**



*Dimensions in mm (inch).*

**Package**

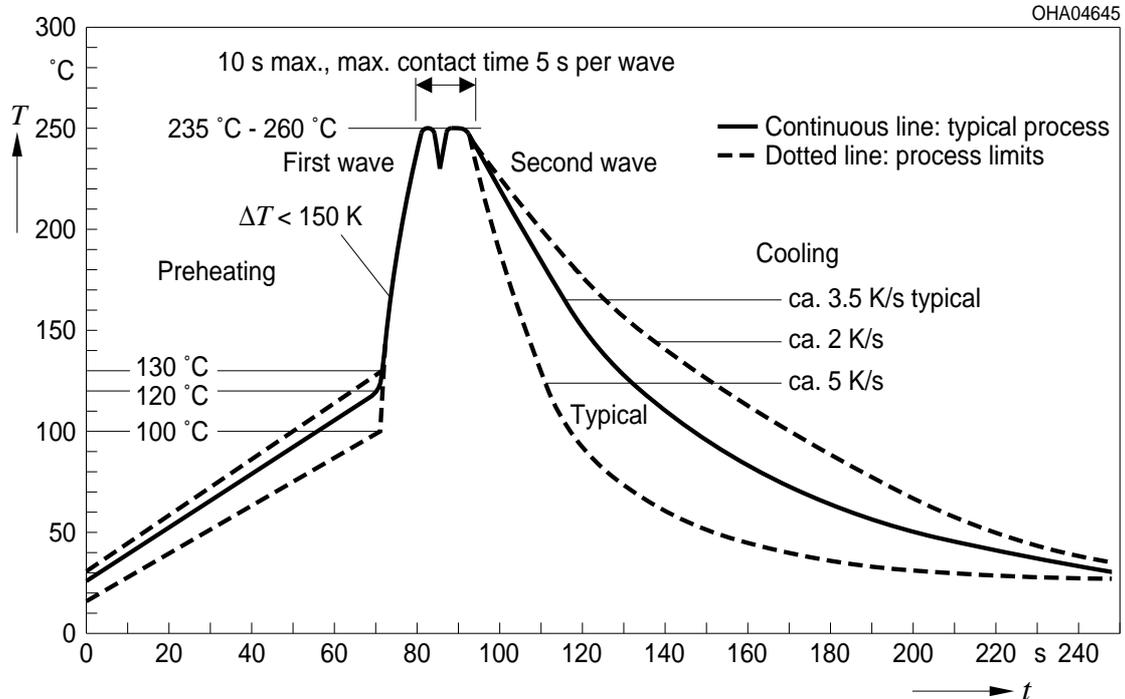
Metal Can (TO-18), hermetically sealed

**Approximate Weight:**

0.3 g

**TTW Soldering**

IEC-61760-1 TTW

**Disclaimer**

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

**Attention please!**

The information describes the type of component and shall not be considered as assured characteristics.

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**Glossary**

- <sup>1)</sup> **Typical Values:** Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

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