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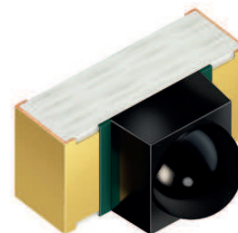


# Silicon NPN Phototransistor

## Version 1.4

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### SFH 3015 FA



#### Features:

- **Spectral range of sensitivity:** (typ) 770 ... 1090 nm
- **Package:** Chiplid
- Narrow angle ( $\pm 13^\circ$ )
- Low profile sidelooper (1.6mm)
- Emitter in similar package available: SFH 4045N

#### Applications

- Interrupters, Lightcurtains
- Sensor Technology
- Proximity sensor
- Touchscreen

#### Ordering Information

Type:	Photocurrent $I_{PCE}$ [ $\mu A$ ] $\lambda = 950 \text{ nm}$ , $E_e = 0.1 \text{ mW/cm}^2$ , $V_{CE} = 5 \text{ V}$	Ordering Code
SFH 3015 FA	160 ... 800	Q65110A9730

*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 temperature range	$T_{op}$	-25 ... 85	°C
Storage temperature range	$T_{stg}$	-40 ... 85	°C
Collector-emitter voltage	$V_{CE}$	15	V
Collector-emitter voltage ( $t < 2\text{ min}$ )	$V_{CE}$	30	V
Collector current	$I_C$	15	mA
Collector surge current ( $\tau < 10\text{ }\mu\text{s}$ )	$I_{CS}$	75	mA
Emitter-collector voltage	$V_{EC}$	7	V
Electrostatic discharge (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	$V_{ESD}$	2000	V

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

Parameter		Symbol	Values	Unit
Wavelength of max. sensitivity	(typ)	$\lambda_{S\text{ max}}$	870	nm
Spectral range of sensitivity	(typ)	$\lambda_{10\%}$	(typ) 770 ... 1090	nm
Radiant sensitive area	(typ)	A	0.04	mm <sup>2</sup>
Dimensions of chip area	(typ)	L x W	(typ) 0.35 x 0.35	mm x mm
Half angle	(typ)	$\phi$	$\pm 13$	°
Capacitance ( $V_{CE} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ )	(typ)	$C_{CE}$	2.4	pF
Photocurrent ( $\lambda = 950\text{ nm}$ , $E_e = 0.1\text{ mW/cm}^2$ , $V_{CE} = 5\text{ V}$ )		$I_{PCE}$	160 ... 800	$\mu\text{A}$
Rise and fall time ( $I_C = 1\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $R_L = 1\text{ k}\Omega$ )	(typ)	$t_r, t_f$	7	$\mu\text{s}$

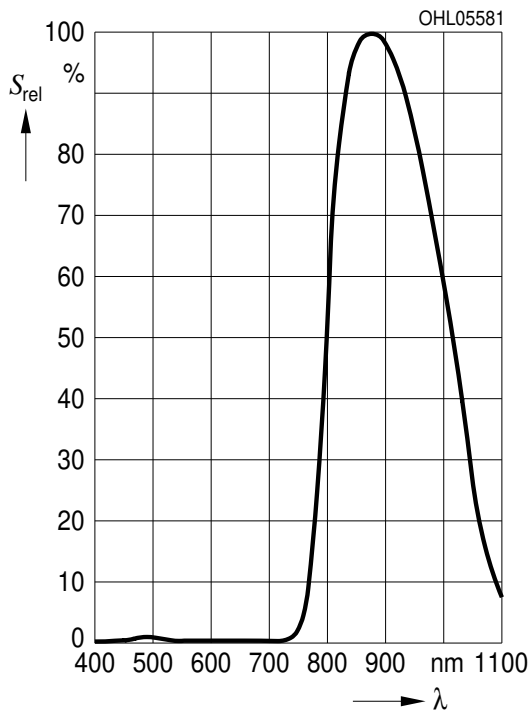
Grouping ( $T_A = 25\text{ °C}$ ,  $\lambda = 950\text{ nm}$ )

Group	Min Photocurrent $E_e = 0.1\text{ mW/cm}^2$ , $V_{CE} = 5\text{ V}$ $I_{PCE, min}$ [ $\mu\text{A}$ ]	Max Photocurrent $E_e = 0.1\text{ mW/cm}^2$ , $V_{CE} = 5\text{ V}$ $I_{PCE, max}$ [ $\mu\text{A}$ ]	Collector-emitter saturation voltage $I_C = I_{PCEmin} \times 0.3$ , $E_e = 0.1\text{ mW/cm}^2$ $V_{CEsat}$ [mV]
SFH 3015FA -2	160	320	170
SFH 3015FA -3	250	500	170
SFH 3015FA -4	400	800	170

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

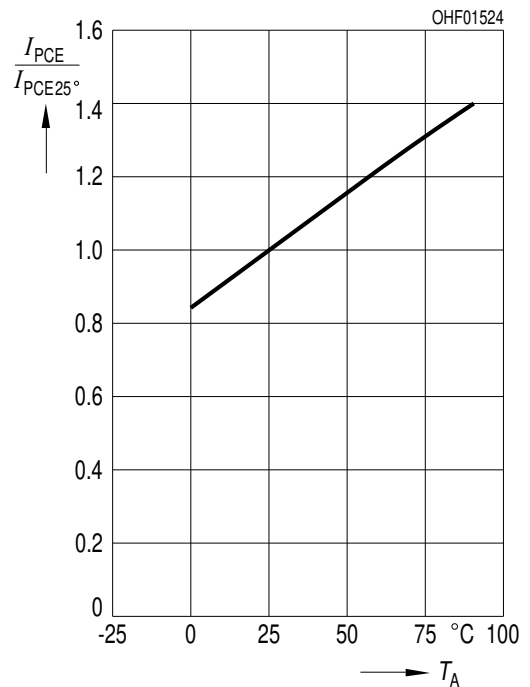
### Relative Spectral Sensitivity <sup>1) page 13</sup>

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



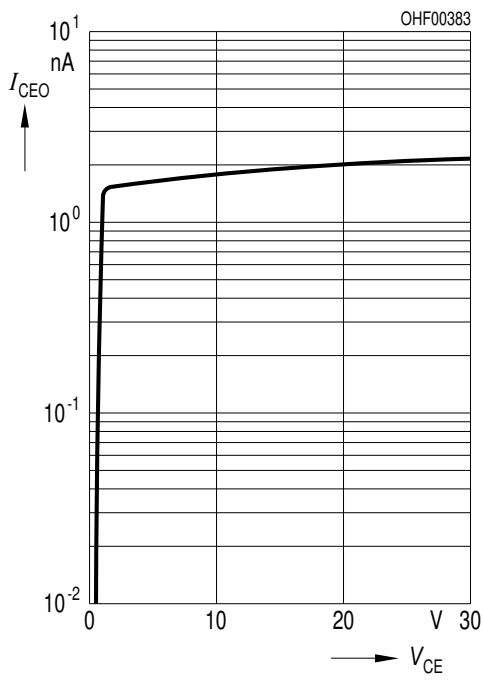
### Photocurrent <sup>1) page 13</sup>

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



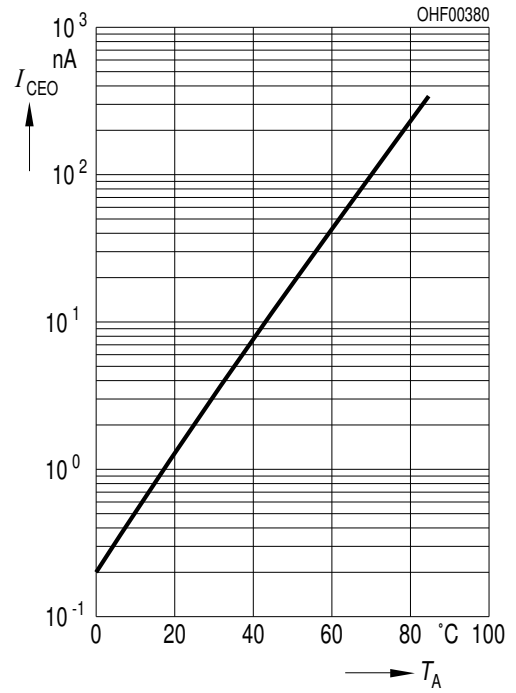
**Dark Current** <sup>1) page 13</sup>

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



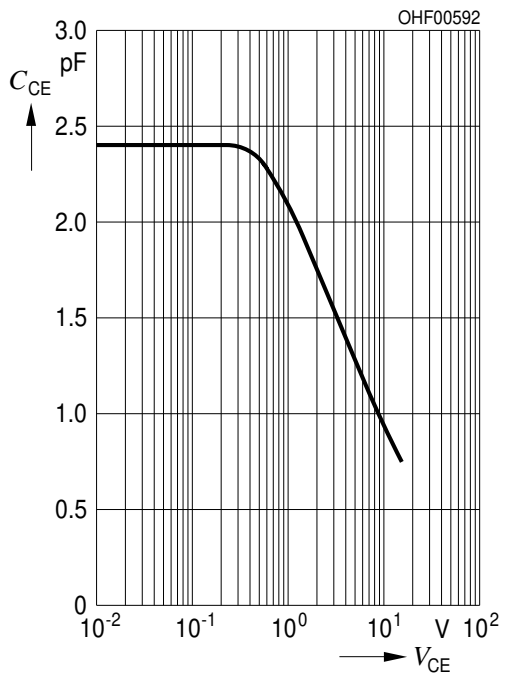
**Dark Current** <sup>1) page 13</sup>

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



**Collector-Emitter Capacitance** <sup>1) page 13</sup>

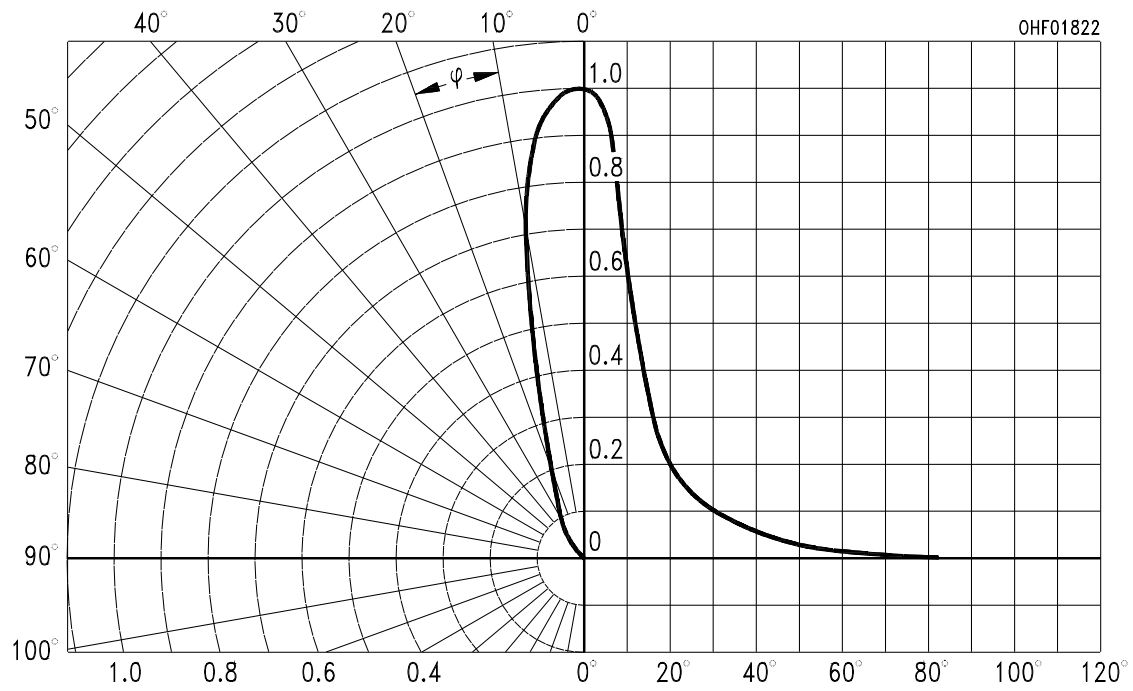
$C_{CE} = f(V_{CE}), f = 1 \text{ MHz}, E = 0$



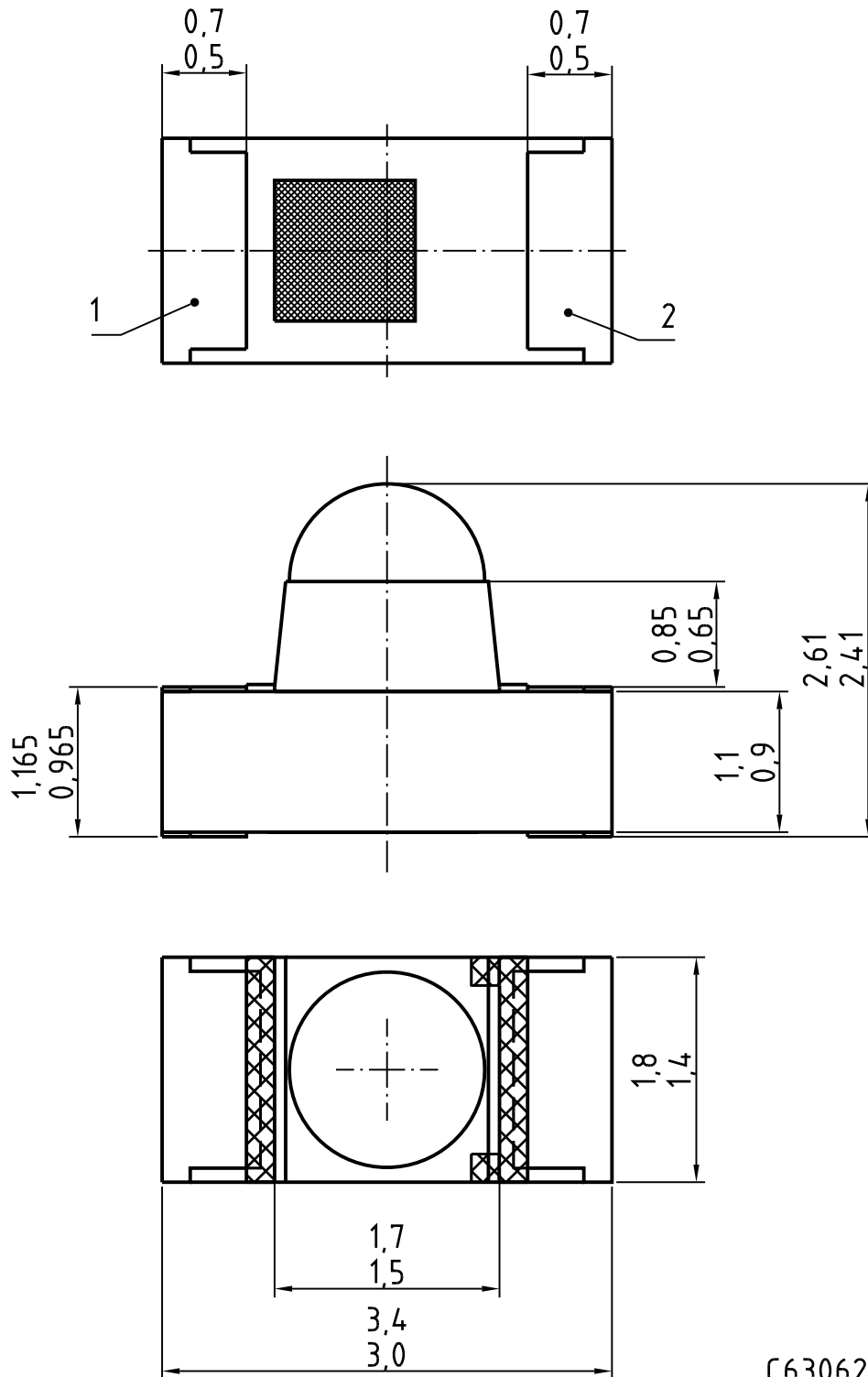


Directional Characteristics <sup>1) page 13</sup>

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



Package Outline



Dimensions in mm.

C63062-A4082-A1..-04

**Additional Information**

Information	
Package	Sideloooker with lens
Colour	black
Package marking	1 = emitter / 2 = collector

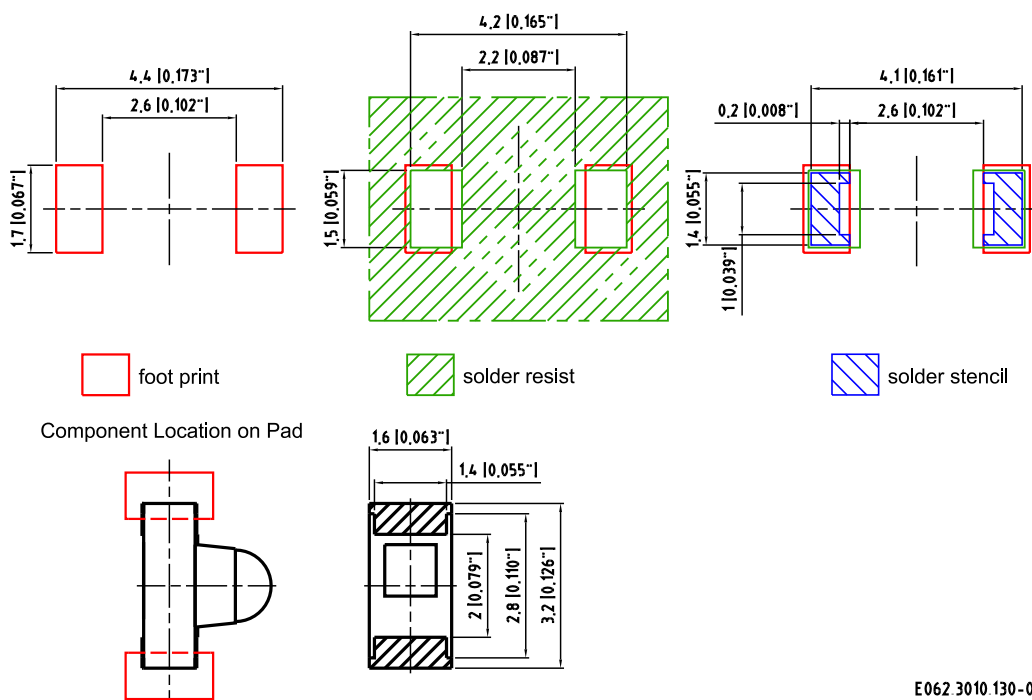
**Package**

Chipped

**Approximate Weight:**

0.1 g

**Recommended Solder Pad**



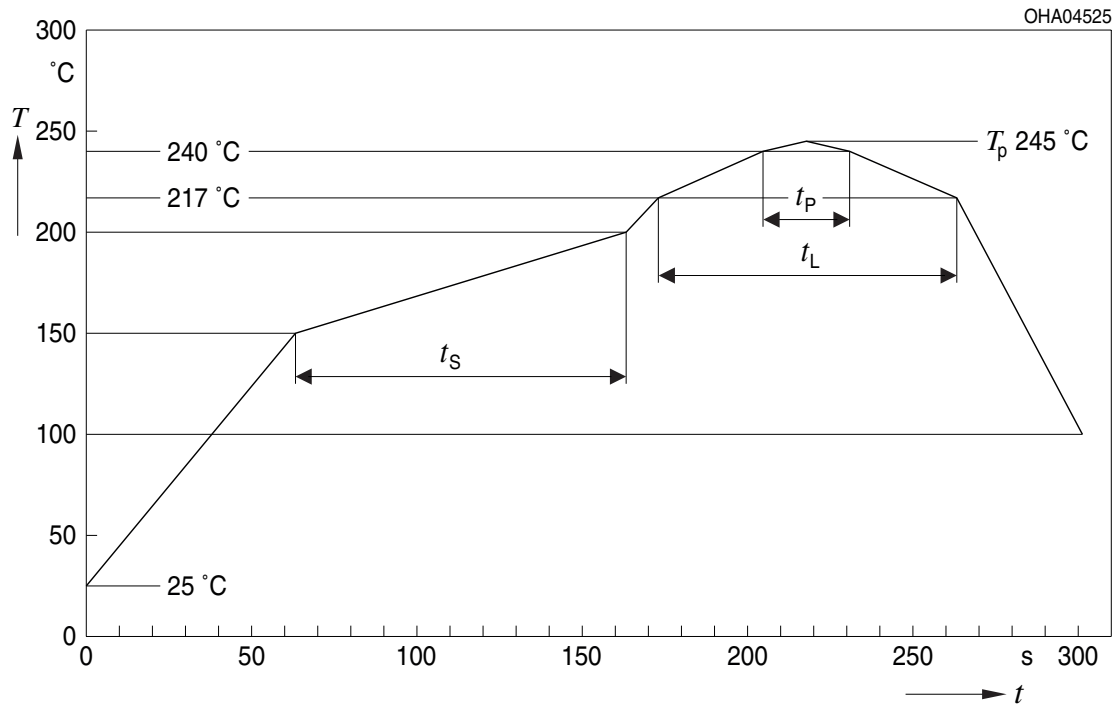
*Dimensions in mm (inch).*

E062 3010.130-03



### Reflow Soldering Profile

Product complies to MSL Level 3 acc. to JEDEC J-STD-020D.01



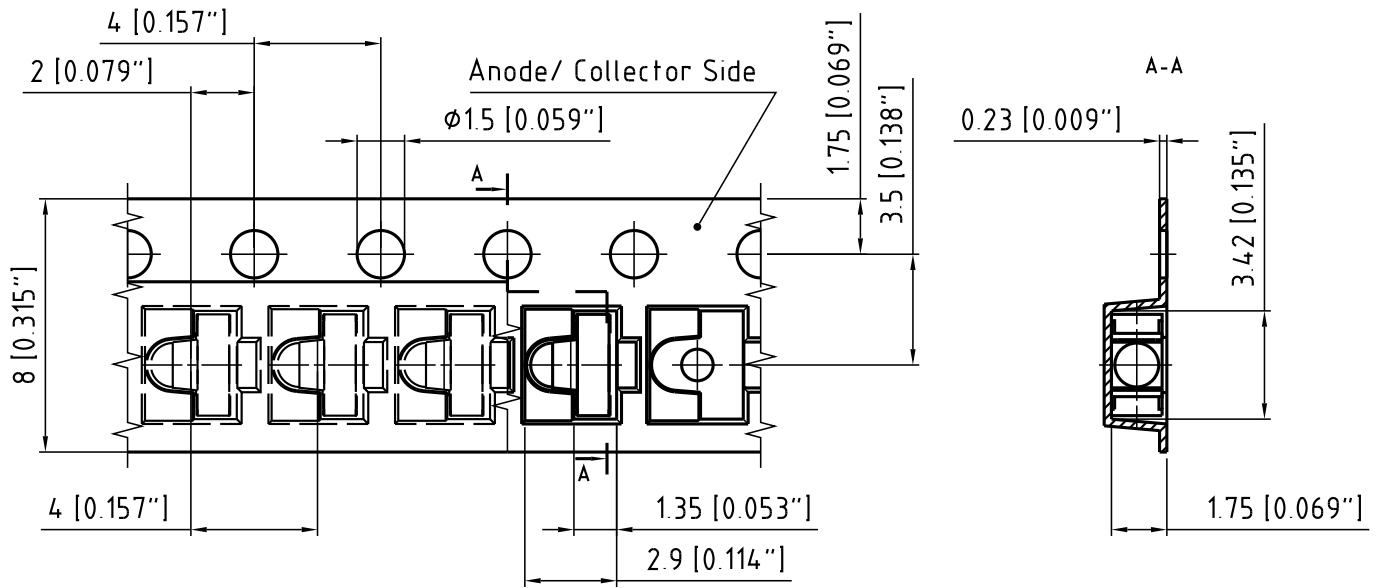
OHA04612

Profile Feature Profil-Charakteristik	Symbol Symbol	Pb-Free (SnAgCu) Assembly			Unit Einheit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time $t_S$ $T_{Smin}$ to $T_{Smax}$	$t_S$	60	100	120	s
Ramp-up rate to peak*) $T_{Smax}$ to $T_P$			2	3	K/s
Liquidus temperature	$T_L$	217			°C
Time above liquidus temperature	$t_L$		80	100	s
Peak temperature	$T_P$		245	260	°C
Time within 5 °C of the specified peak temperature $T_P - 5$ K	$t_P$	10	20	30	s
Ramp-down rate* $T_P$ to 100 °C			3	6	K/s
Time 25 °C to $T_P$				480	s

All temperatures refer to the center of the package, measured on the top of the component

\* slope calculation  $DT/Dt$ :  $Dt$  max. 5 s; fulfillment for the whole T-range

**Taping**

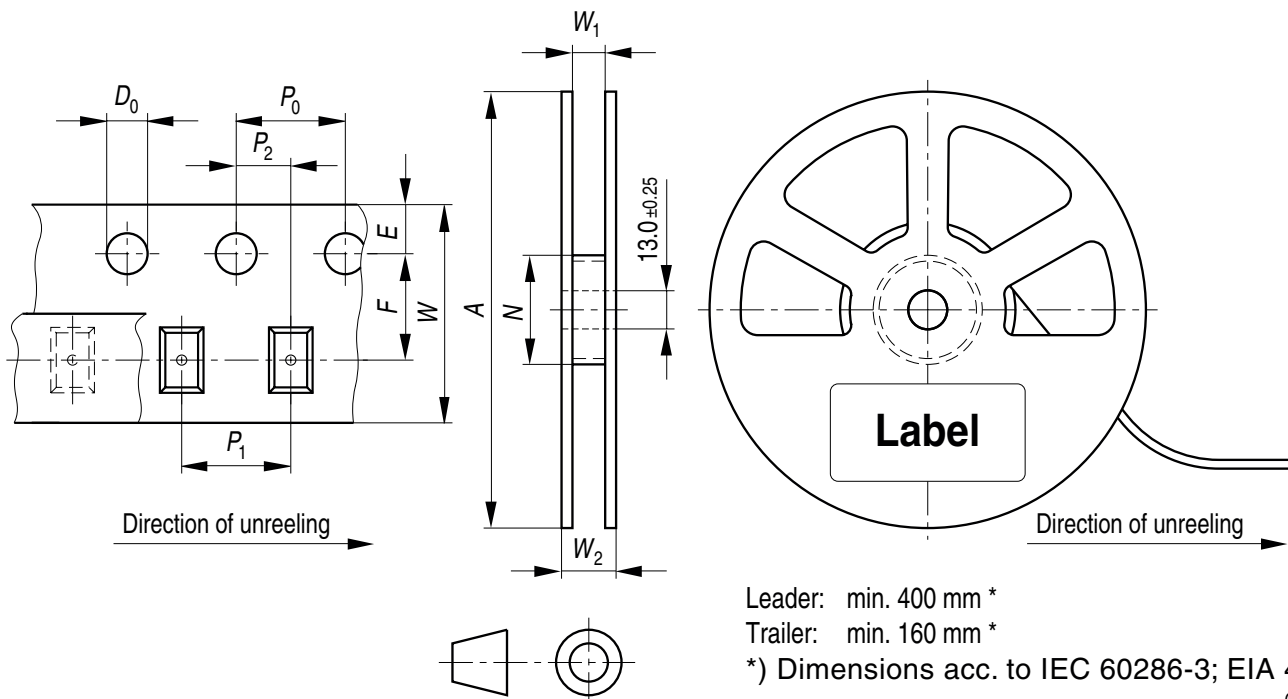


C63062-A4082-B1-02

*Dimensions in mm (inch).*

**Tape and Reel**

8 mm tape with 1500 pcs. on  $\phi 180$  mm reel



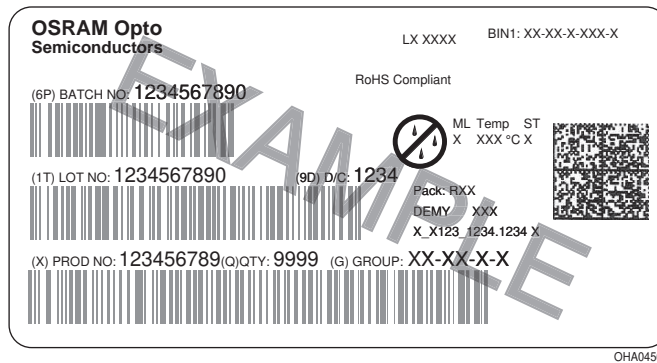
**Tape dimensions [mm]**

W	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	D <sub>0</sub>	E	F
8 + 0.3 / -0.1	4 ± 0.1	2 ± 0.05 or 4 ± 0.1	2 ± 0.05	1.5 ± 0.1	1.75 ± 0.1	3.5 ± 0.05

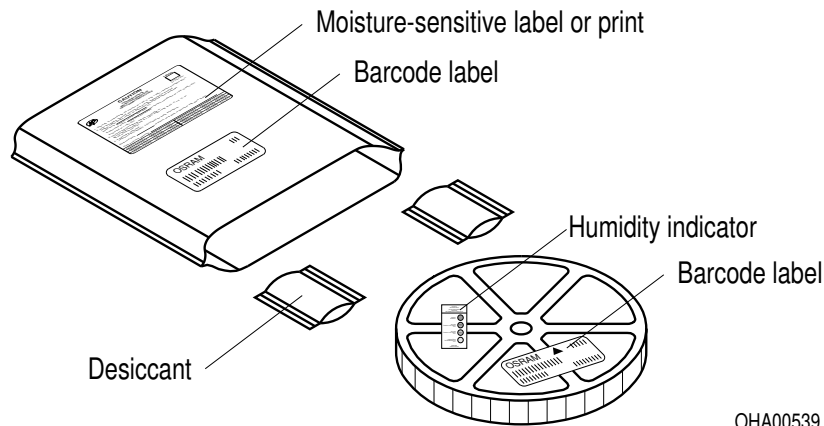
**Reel dimensions [mm]**

A	W	N <sub>min</sub>	W <sub>1</sub>	W <sub>2max</sub>
180	8	60	8.4 + 2	14.4

**Barcode-Product-Label (BPL)**



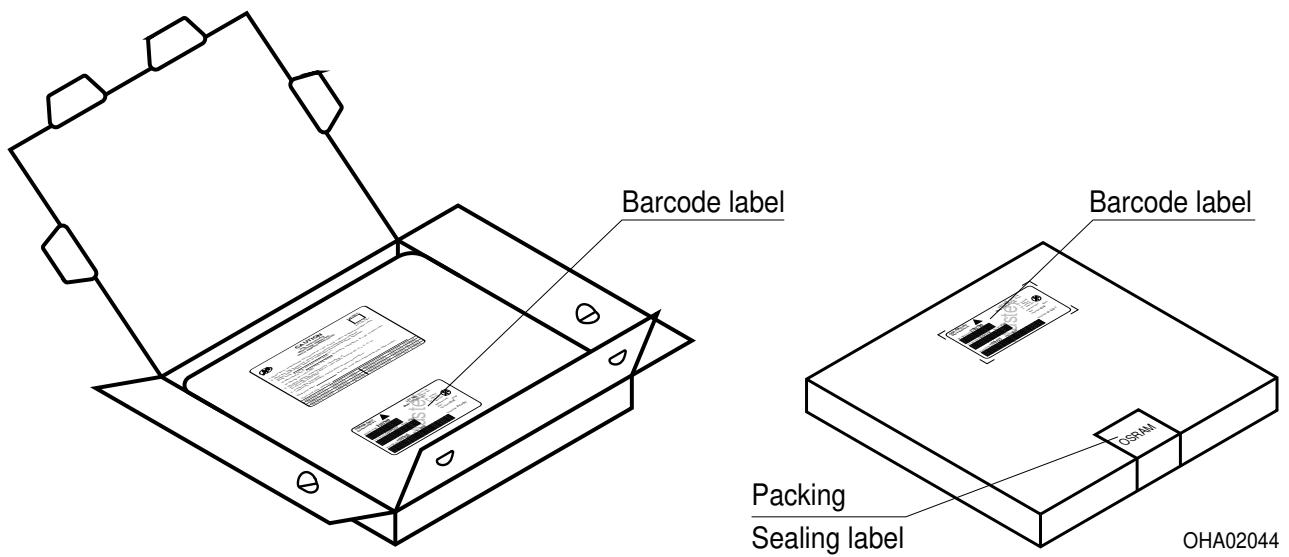
**Dry Packing Process and Materials**



**Note:**

Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card. Regarding dry pack you will find further information in the internet. Here you will also find the normative references like JEDEC.

## Transportation Packing and Materials



## Dimensions of transportation box in mm

Width	Length	Height
200 ± 5	195 ± 5	30 ± 5

**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.

Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances.

For information on the types in question please contact our Sales Organization.

If printed or downloaded, please find the latest version in the Internet.

**Packing**

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office.

By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

**Components used in life-support devices or systems must be expressly authorized for such purpose!**

Critical components\* may only be used in life-support devices\*\* or systems with the express written approval of OSRAM OS.

\*) A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.

\*\*) Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health and the life of the user may be endangered.

**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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