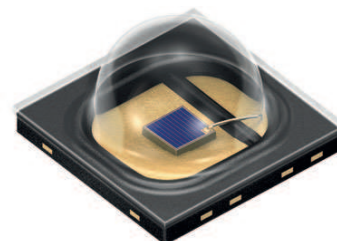


# OSLON Black Series (810 nm) - 80° Preliminary Version 0.0

## SFH 4703AS



### Features:

- IR lightsource with high efficiency
- Double stack emitter
- Low thermal resistance (Max. 16 K/W)
- Centroid wavelength 810 nm
- Superior Corrosion Robustness (see chapter package outlines)

### Applications

- Infrared Illumination for cameras
- Surveillance systems
- Machine vision systems
- Eye tracking systems
- Iris Scanning

### Notes

Depending on the mode of operation, these devices emit highly concentrated non visible infrared light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1 and IEC 62471.

### Ordering Information

| Type:      | Radiant Intensity<br>$I_e$ [mW/sr]<br>$I_F = 1 \text{ A}, t_p = 10 \text{ ms}$ | Ordering Code |
|------------|--|---------------|
| SFH 4703AS | 630 ( $\geq 500$ )   | Q65112A1370   |

Note: measured at a solid angle of  $\Omega = 0.01 \text{ sr}$

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

| Parameter   | Symbol     | Values      | Unit  |
|---|------------|-------------|-------|
| Operating temperature range                                       | $T_{op}$   | -40 ... 125 | °C    |
| Storage temperature range   | $T_{stg}$  | -40 ... 125 | °C    |
| Junction temperature  | $T_j$      | 145         | °C    |
| Reverse voltage   | $V_R$      | 5           | V     |
| Forward current   | $I_F$      | 1000        | mA    |
| Surge current<br>( $t_p \leq 200\ \mu\text{s}$ , $D = 0$ )        | $I_{FSM}$  | 2           | A     |
| Power consumption   | $P_{tot}$  | 4           | W     |
| Thermal resistance junction - solder point                        | $R_{thJS}$ | 16          | K / W |
| ESD withstand voltage<br>(acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM) | $V_{ESD}$  | 2           | kV    |

*Note:* For the forward current and power consumption please see "maximum permissible forward current" diagram

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

| Parameter  | Symbol                     | Values                             | Unit          |
|--|----------------------------|------------------------------------|---------------|
| Peak wavelength<br>( $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$ )   | (typ) $\lambda_{peak}$     | 820                                | nm            |
| Centroid wavelength<br>( $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$ )                                       | (typ) $\lambda_{centroid}$ | 810                                | nm            |
| Spectral bandwidth at 50% of $I_{max}$<br>( $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$ )                    | (typ) $\Delta\lambda$      | 30                                 | nm            |
| Half angle   | (typ) $\varphi$            | $\pm 40$                           | °             |
| Dimensions of active chip area   | (typ) L x W                | 0.75 x 0.75                        | mm x mm       |
| Rise and fall times of $I_e$ ( 10% and 90% of $I_{e,max}$ )<br>( $I_F = 1\text{ A}$ , $R_L = 50\ \Omega$ ) | (typ) $t_r / t_f$          | 8 / 14                             | ns            |
| Forward voltage<br>( $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$ )   | (typ (max)) $V_F$          | 3.55 ( $\leq 4$ )                  | V             |
| Forward voltage<br>( $I_F = 2\text{ A}$ , $t_p = 100\ \mu\text{s}$ )                                       | (typ (max)) $V_F$          | 4 ( $\leq 4.9$ )                   | V             |
| Reverse current<br>( $V_R = 5\text{ V}$ )  | $I_R$                      | not designed for reverse operation | $\mu\text{A}$ |
| Total radiant flux<br>( $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$ )                                    | (typ) $\Phi_e$             | 1040                               | mW            |

| Parameter   |       | Symbol       | Values | Unit   |
|---|-------|--------------|--------|--------|
| Total radiant flux<br>( $I_F = 1 \text{ A}$ , $t_p = 10 \text{ ms}$ )                           | (typ) | $\Phi_e$     | 1000   | mW     |
| Temperature coefficient of $I_e$ or $\Phi_e$<br>( $I_F = 1 \text{ A}$ , $t_p = 10 \text{ ms}$ ) | (typ) | $TC_I$       | -0.3   | % / K  |
| Temperature coefficient of $V_F$<br>( $I_F = 1 \text{ A}$ , $t_p = 10 \text{ ms}$ )             | (typ) | $TC_V$       | -2     | mV / K |
| Temperature coefficient of wavelength<br>( $I_F = 1 \text{ A}$ , $t_p = 10 \text{ ms}$ )        | (typ) | $TC_\lambda$ | 0.3    | nm / K |

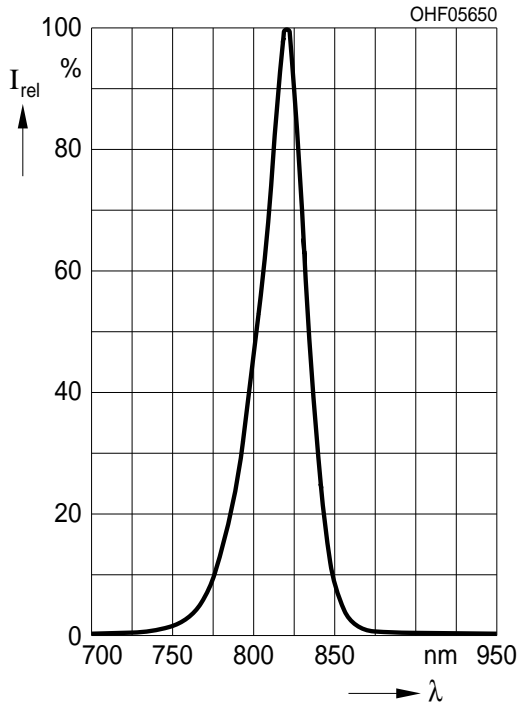
**Grouping** ( $T_A = 25 \text{ °C}$ )

| Group          | Min Radiant Intensity  | Max Radiant Intensity  |
|----------------|--|--|
|                | $I_F = 1 \text{ A}$ , $t_p = 10 \text{ ms}$<br>$I_{e, \min}$ [mW / sr] | $I_F = 1 \text{ A}$ , $t_p = 10 \text{ ms}$<br>$I_{e, \max}$ [mW / sr] |
| SFH4703AS - DB | 500  | 800  |
| SFH4703AS - EA | 630  | 1000   |

*Note:* measured at a solid angle of  $\Omega = 0.01 \text{ sr}$   
Only one group in one packing unit (variation lower 1.6:1).

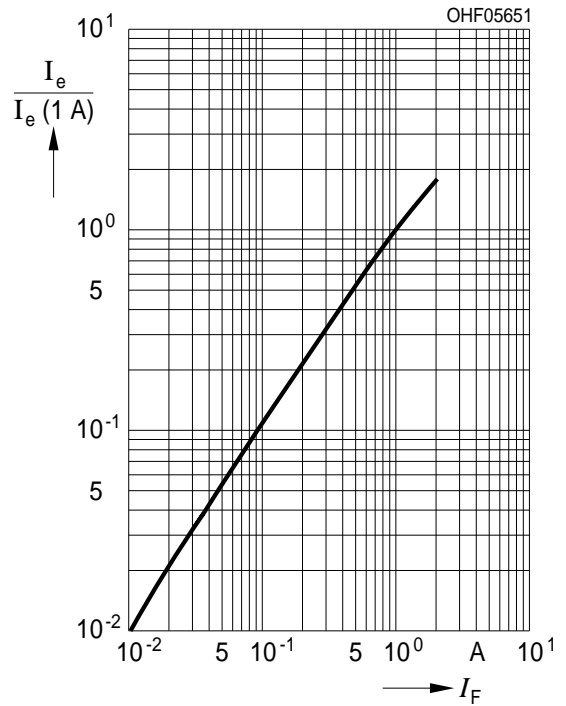
**Relative Spectral Emission** <sup>1) page 13</sup>

$I_{rel} = f(\lambda)$ ,  $T_A = 25\text{ }^\circ\text{C}$ ,  $I_F = 1\text{ A}$ ,  $t_p = 10\text{ ms}$



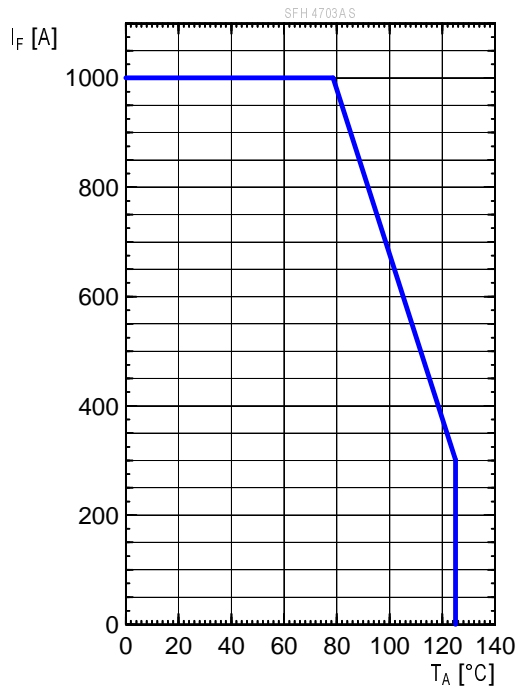
**Radiant Intensity** <sup>1) page 13</sup>

$I_e / I_e(1\text{ A}) = f(I_F)$ , single pulse,  $t_p = 100\text{ }\mu\text{s}$ ,  $T_A = 25\text{ }^\circ\text{C}$



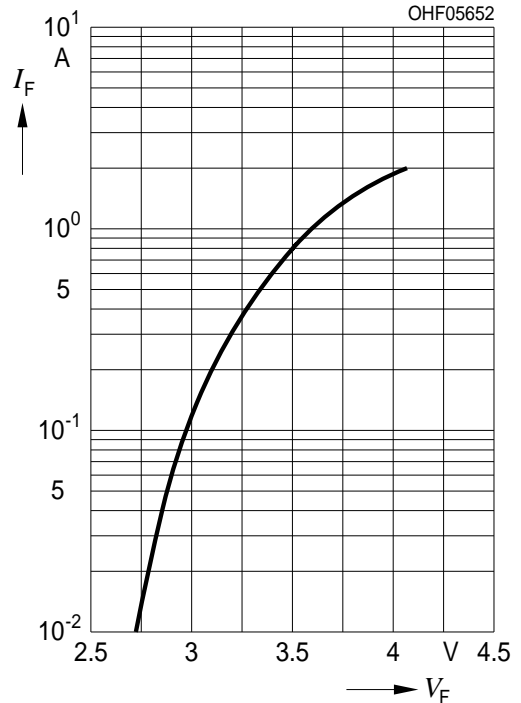
**Max. Permissible Forward Current**

$I_F = f(T_S)$ ,  $R_{thJS} = 16\text{ K/W}$



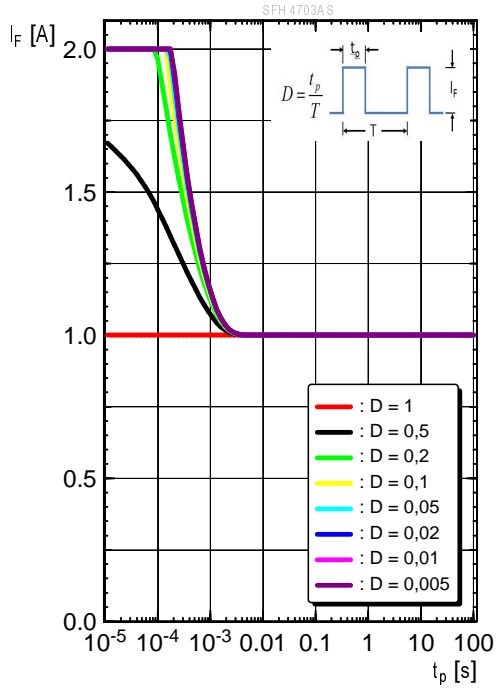
**Forward Current** <sup>1) page 13</sup>

$I_F = f(V_F)$ , single pulse,  $t_p = 100\text{ }\mu\text{s}$ ,  $T_A = 25\text{ }^\circ\text{C}$



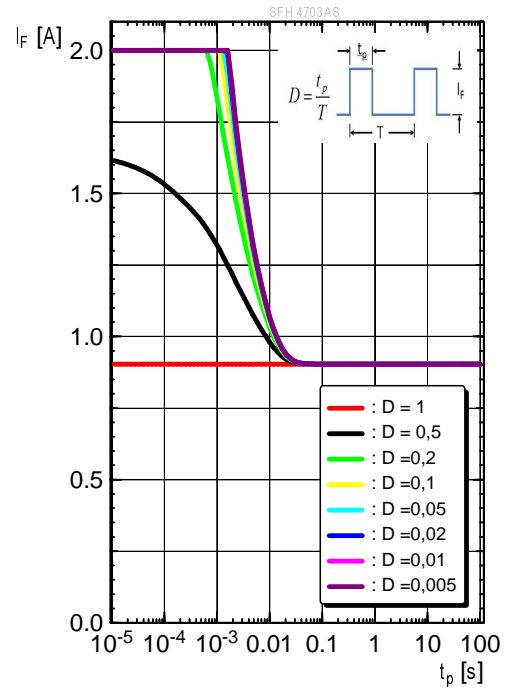
**Permissible Pulse Handling Capability**

$I_F = f(t_p)$ ,  $T_S = 25\text{ °C}$ , Duty cycle  $D = \text{parameter}$



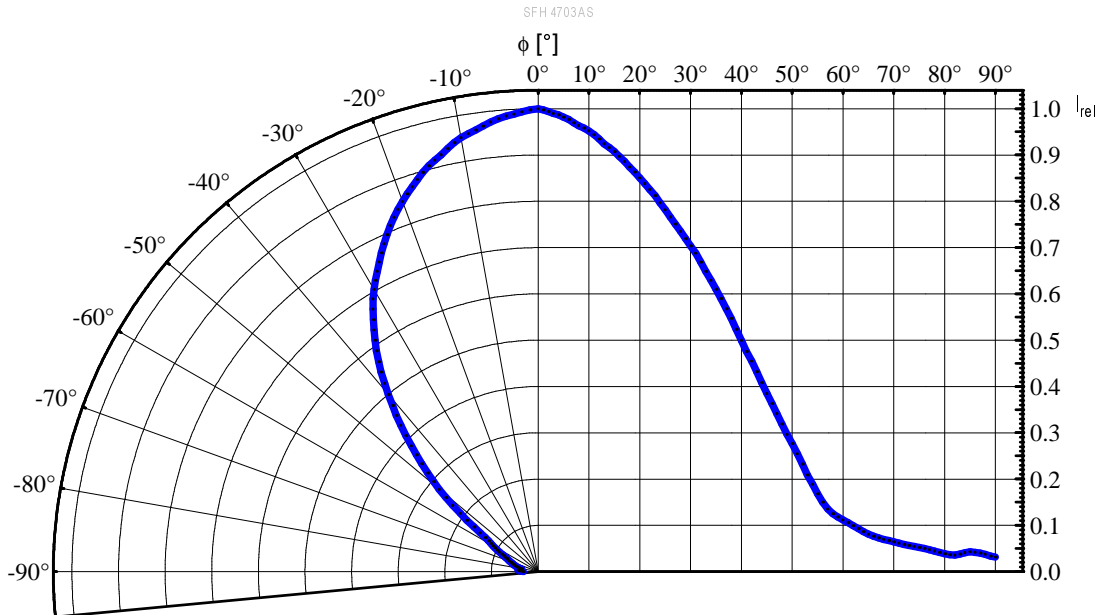
**Permissible Pulse Handling Capability**

$I_F = f(t_p)$ ,  $T_S = 85\text{ °C}$ , duty cycle  $D = \text{parameter}$

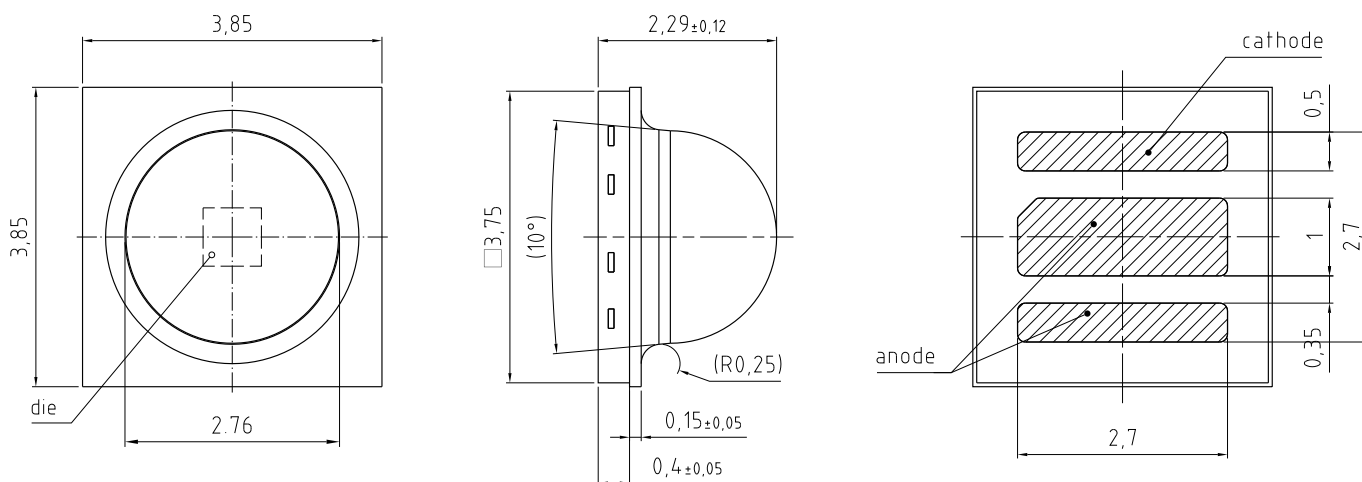


**Radiation Characteristics** <sup>1) page 13</sup>

$I_{rel} = f(\phi)$ ,  $T_A = 25\text{ °C}$



Package Outline



general tolerance  $\pm 0.1$   
 lead finish Au

C63062-A4141-A9 -02

Dimensions in mm.

**Package**

OSLON Black Series

**Approximate Weight:**

31 mg

**Note:**

Package is not suitable for ultra sonic cleaning.

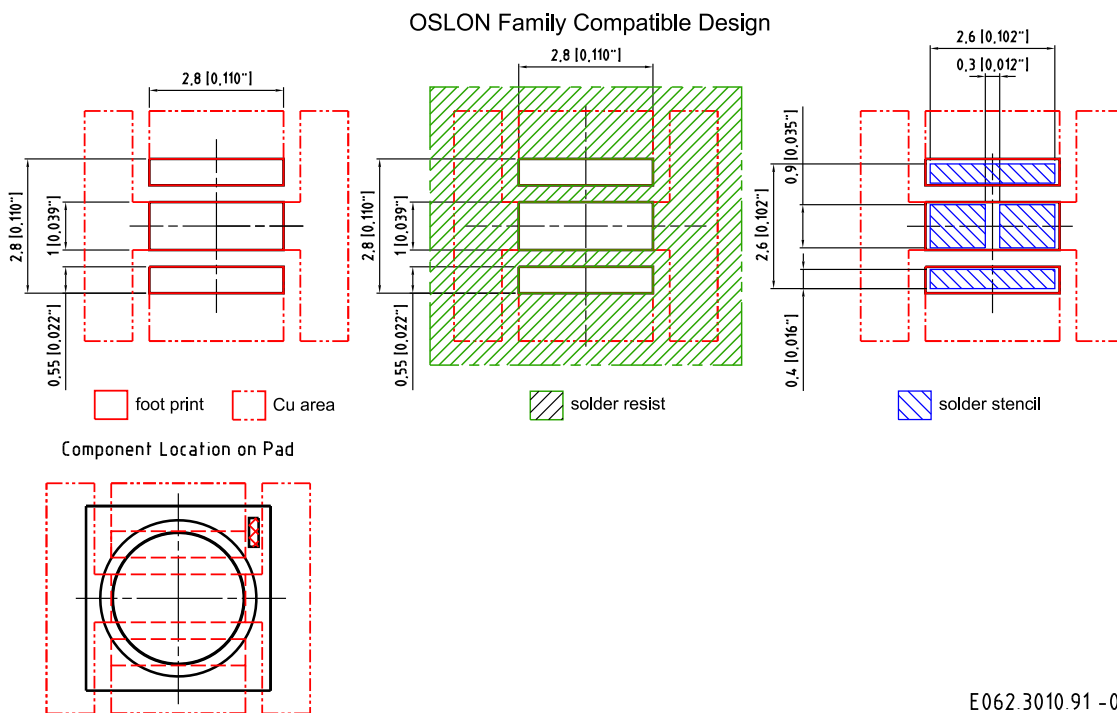
**Note:**

**Corrosion robustness better than EN 60068-2-60 (method 4):** with enhanced corrosion test: 40°C / 90%rh / 15ppm H<sub>2</sub>S / 336h

**Note:**

**Anode mark:** Anode pad has chamfered edge, which points to cathode

Recommended Solder Pad



E062.3010.91 -05

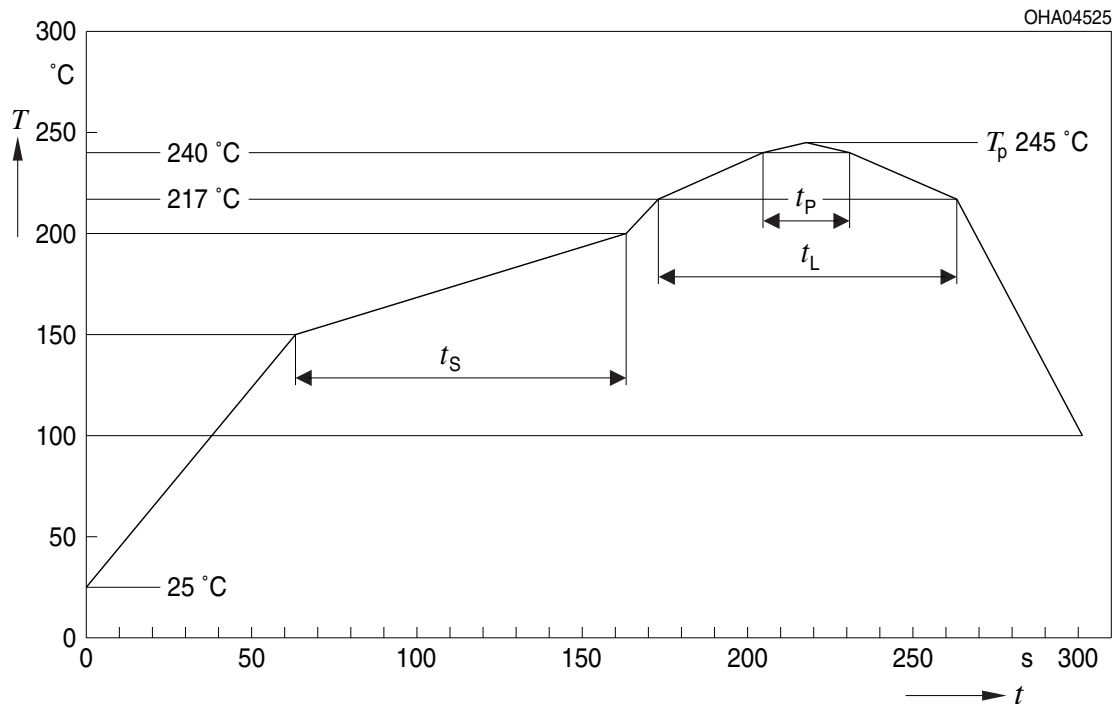
Dimensions in mm [inch].

Note:

For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere.

**Reflow Soldering Profile**

Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



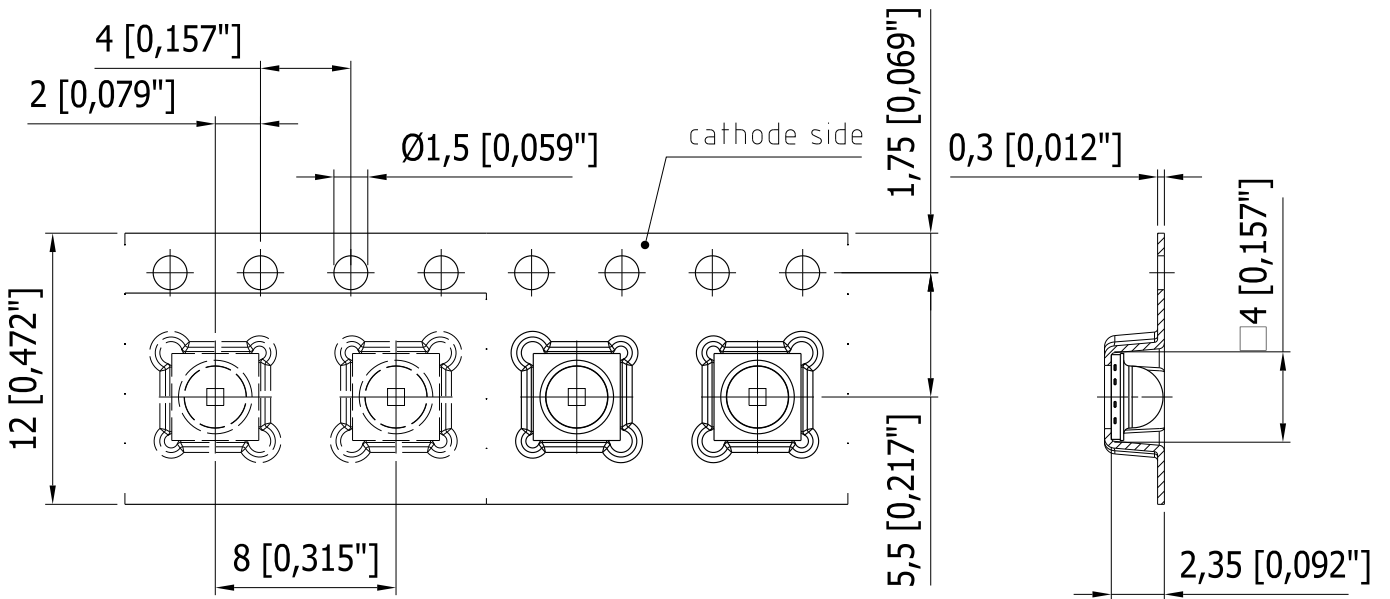
OHA04612

| Profile Feature<br>Profil-Charakteristik                       | Symbol<br>Symbol | Pb-Free (SnAgCu) Assembly |                |         | Unit<br>Einheit |
|--|------------------|---------------------------|----------------|---------|-----------------|
|  |                  | Minimum                   | Recommendation | Maximum |                 |
| Ramp-up rate to preheat*)<br>25 °C to 150 °C                   |                  |                           | 2              | 3       | K/s             |
| Time $t_s$<br>$T_{Smin}$ to $T_{Smax}$                         | $t_s$            | 60                        | 100            | 120     | s               |
| Ramp-up rate to peak*)<br>$T_{Smax}$ 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*<br>$T_p$ to 100 °C                             |                  |                           | 3              | 6       | K/s             |
| Time<br>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**

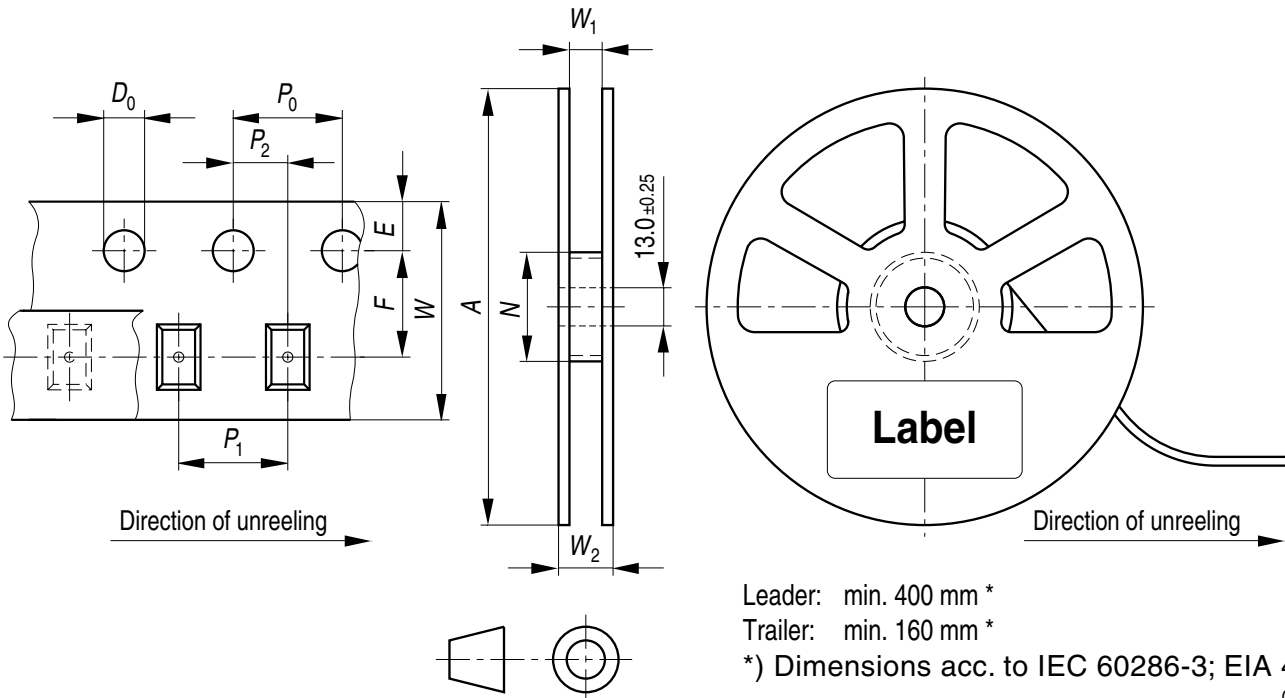


C63062-A4068-B12 -02

*Dimensions in mm [inch].*

**Tape and Reel**

12 mm tape with 600 pcs. on Ø 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          |
|------------------|----------------|--------------------------|----------------|----------------|------------|------------|
| 12 + 0.3 / - 0.1 | 4 ± 0.1        | 4 ± 0.1<br>or<br>8 ± 0.1 | 2 ± 0.05       | 1.5 ± 0.1      | 1.75 ± 0.1 | 5.5 ± 0.05 |

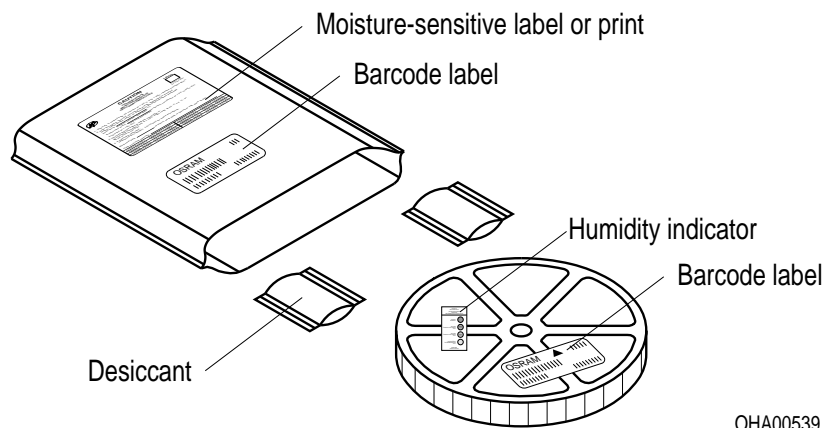
Reel dimensions [mm]

| A   | W  | N <sub>min</sub> | W <sub>1</sub> | W <sub>2max</sub> |
|-----|----|------------------|----------------|-------------------|
| 180 | 12 | 60               | 12.4 + 2       | 18.4              |

Barcode-Product-Label (BPL)



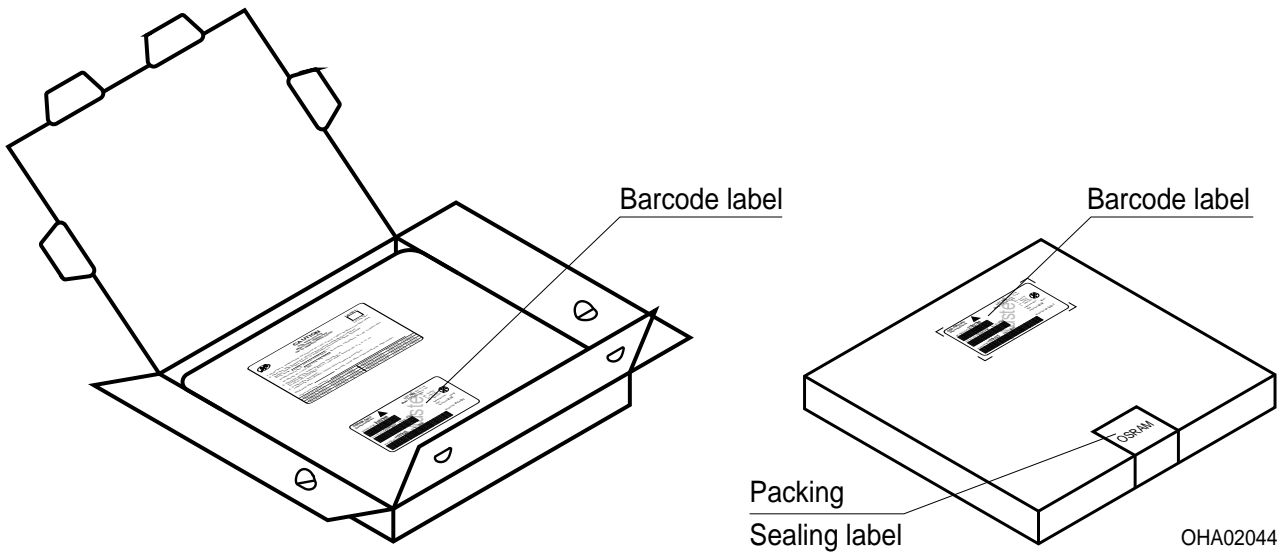
Dry Packing Process and Materials



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 |
|---------|---------|--------|
| 195 ± 5 | 195 ± 5 | 30 ± 5 |

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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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EU RoHS and China RoHS compliant product



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