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# IR SYNIOS P2720 (940 nm) - 120° Preliminary Version 0.0

## SFH 4775S



### Features:

- IR lightsource with high efficiency
- Double Stack emitter
- Low thermal resistance (Max. 9 K/W)
- Centroid wavelength 940 nm
- Superior Corrosion Robustness (see chapter package outlines)

### Applications

- Infrared Illumination for cameras
- Eye tracking systems
- Not released for automotive applications

### 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:	Total Radiant Flux $\Phi_e$ [mW] $I_F = 1A, t_p = 10 ms$	Ordering Code
SFH 4775S	1150 ( $\geq 800$ )	Q65112A4691

Note: Measured with integrating sphere.

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

Parameter	Symbol	Values	Unit
Operating temperature range	$T_{op}$	-40 ... 100	°C
Storage temperature range	$T_{stg}$	-40 ... 100	°C
Junction temperature	$T_j$	145	°C
Forward current	$I_F$	1500	mA
Surge current ( $t_p \leq 1.5\text{ ms}$ , $D = 0.005$ )	$I_{FSM}$	3	A
Power consumption	$P_{tot}$	5800	mW
ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	$V_{ESD}$	2	kV
Thermal resistance junction - solder point	$R_{thJS}$	9	K / W

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 ( $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$ )	(typ) $\lambda_{peak}$	950	nm
Centroid wavelength ( $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$ )	(typ) $\lambda_{centroid}$	940	nm
Spectral bandwidth at 50% of $I_{max}$ ( $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$ )	(typ) $\Delta\lambda$	37	nm
Half angle	(typ) $\varphi$	$\pm 60$	°
Dimensions of active chip area	(typ) L x W	1 x 1	mm x mm
Rise and fall times of $I_e$ ( 10% and 90% of $I_{e,max}$ ) ( $I_F = 3\text{ A}$ , $R_L = 50\ \Omega$ )	(typ) $t_r / t_f$	11 / 14	ns
Forward voltage ( $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$ )	(typ (max)) $V_F$	2.8 ( $\leq 3.6$ )	V
Forward voltage ( $I_F = 1.5\text{ A}$ , $t_p = 100\ \mu\text{s}$ )	(typ (max)) $V_F$	2.95 ( $\leq 3.85$ )	V
Forward voltage ( $I_F = 3\text{ A}$ , $t_p = 100\ \mu\text{s}$ )	(typ) $V_F$	3.3 ( $\leq 4.7$ )	V
Reverse current ( $V_R = 5\text{ V}$ )	$I_R$	not designed for reverse operation	$\mu\text{A}$
Radiant intensity ( $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$ )	$I_{e, typ}$	360	mW/sr

Parameter	Symbol	Values	Unit
Radiant intensity ( $I_F = 1.5 \text{ A}$ , $t_p = 100 \mu\text{s}$ )	$I_{e, \text{typ}}$	545	mW/sr
Temperature coefficient of $I_e$ or $\Phi_e$ ( $I_F = 1 \text{ A}$ , $t_p = 10 \text{ ms}$ )	$TC_I$	-0.3	% / K
Temperature coefficient of $V_F$ ( $I_F = 1 \text{ A}$ , $t_p = 10 \text{ ms}$ )	$TC_V$	-2	mV / K
Temperature coefficient of wavelength ( $I_F = 1 \text{ A}$ , $t_p = 10 \text{ ms}$ )	$TC_{\lambda, \text{centroid}}$	0.3	nm / K

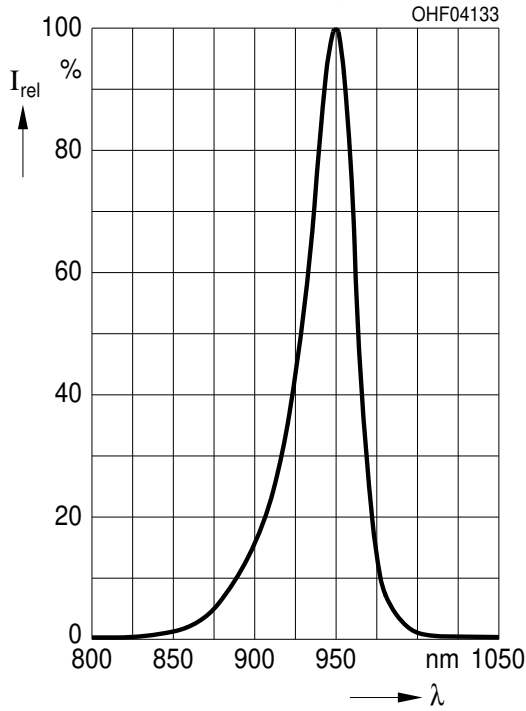
**Grouping** ( $T_A = 25 \text{ }^\circ\text{C}$ )

Group	Min Total Radiant Flux	Max Total Radiant Flux
	$I_F = 1 \text{ A}$ , $t_p = 10 \text{ ms}$ $\Phi_{e \text{ min}}$ [mW]	$I_F = 1 \text{ A}$ , $t_p = 10 \text{ ms}$ $\Phi_{e \text{ max}}$ [mW]
SFH 4775S - EB1	800	1120
SFH 4775S - EB2	900	1250
SFH 4775S - FA1	1000	1400
SFH 4775S - FA2	1120	1600

Note: Only one group in one packing unit (variation lower 1.6:1).

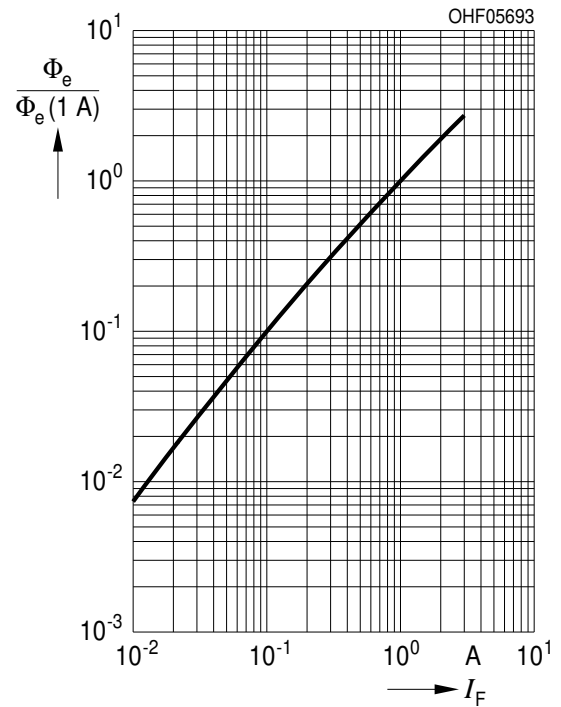
**Relative Spectral Emission** <sup>1) page 12</sup>

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



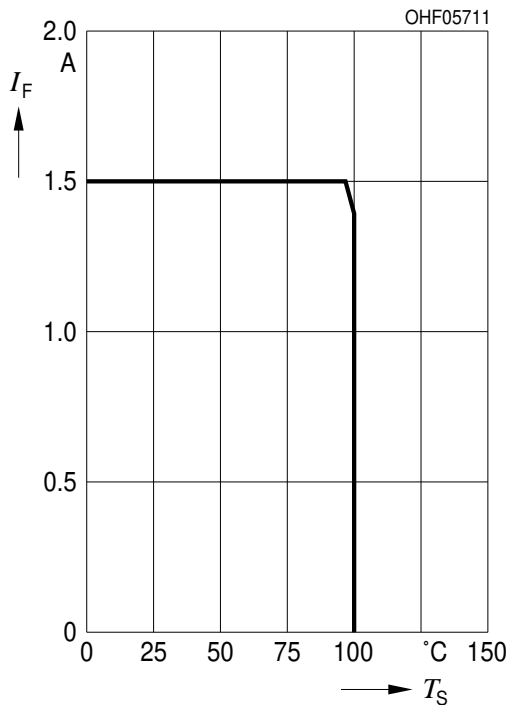
**Relative Total Radiant Flux** <sup>1) page 12</sup>

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



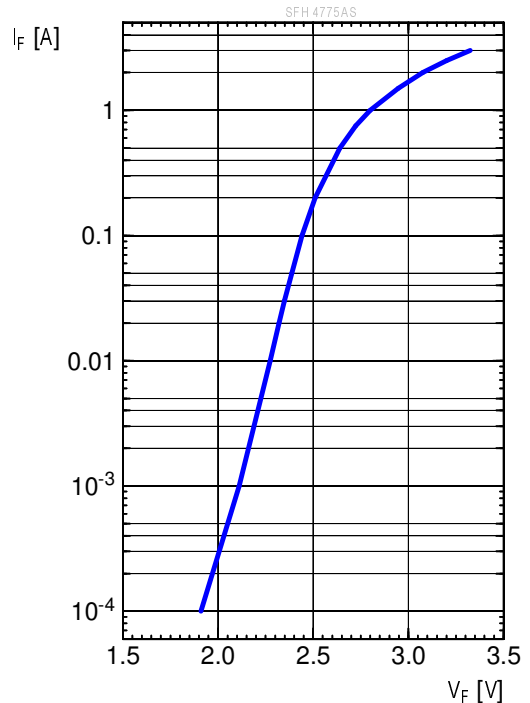
**Max. Permissible Forward Current**

$I_F = f(T_S), R_{thJS} = 9\text{ K/W}$



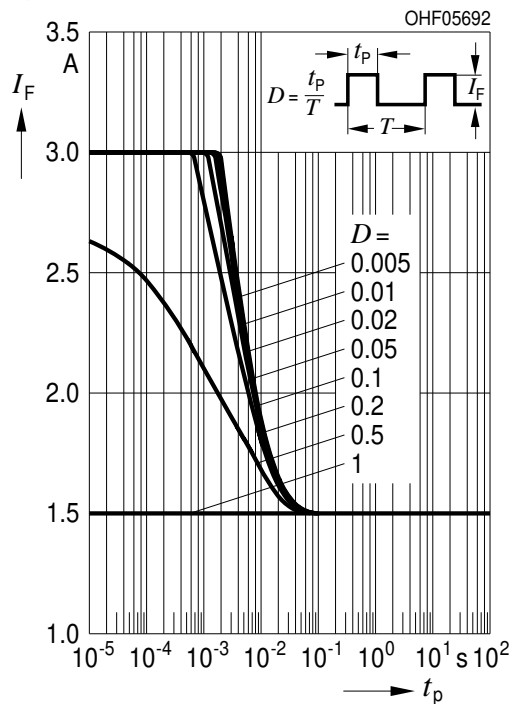
**Forward Current** <sup>1) page 12</sup>

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



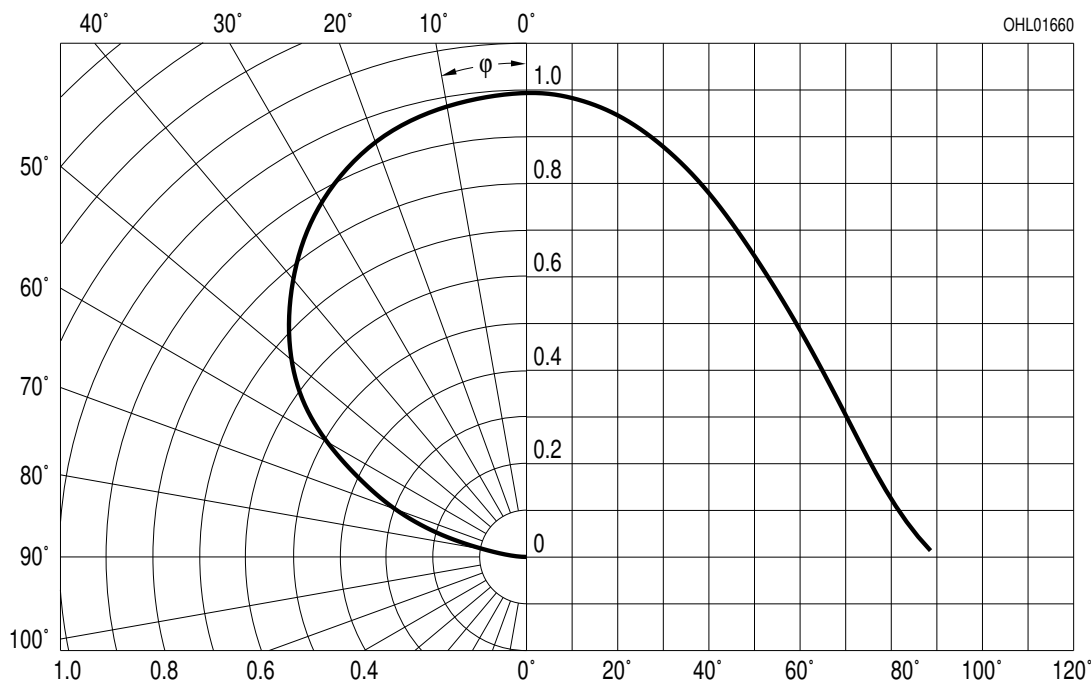
**Permissible Pulse Handling Capability**

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

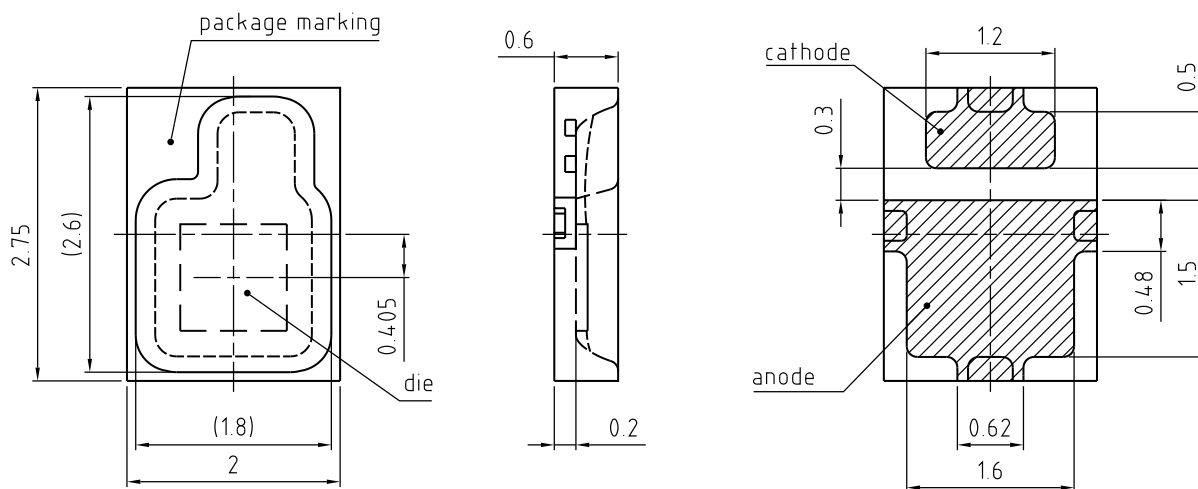


**Radiation Characteristics** <sup>1) page 12</sup>

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



**Package Outline**



General tolerance  $\pm 0.1$

Lead finish Au

C67062-A0183-A1-02

Dimensions in mm.

**Type:**

SFH 4775S

**Package**

IR SYNIOS P2720

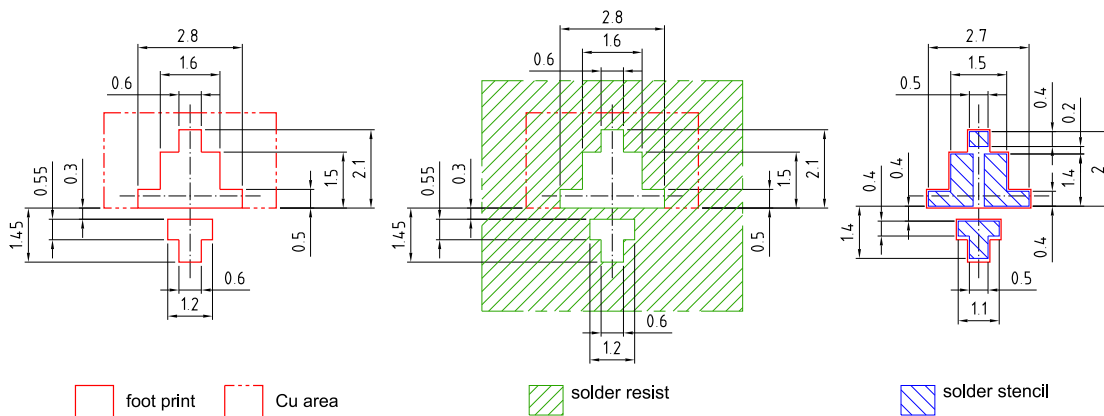
**Approximate Weight:**

12 mg

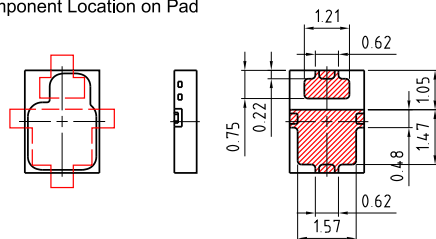
**Note:**

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

**Recommended Solder Pad**



Component Location on Pad

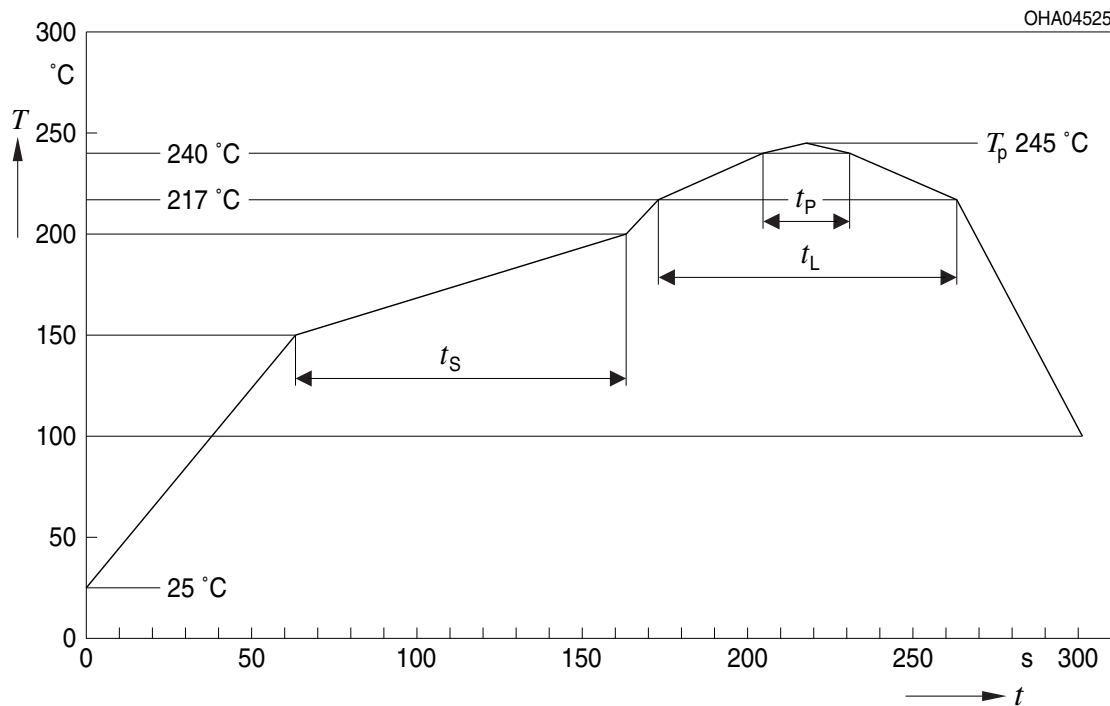


E062.3010.181 -02

Dimensions in mm.

**Reflow Soldering Profile**

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



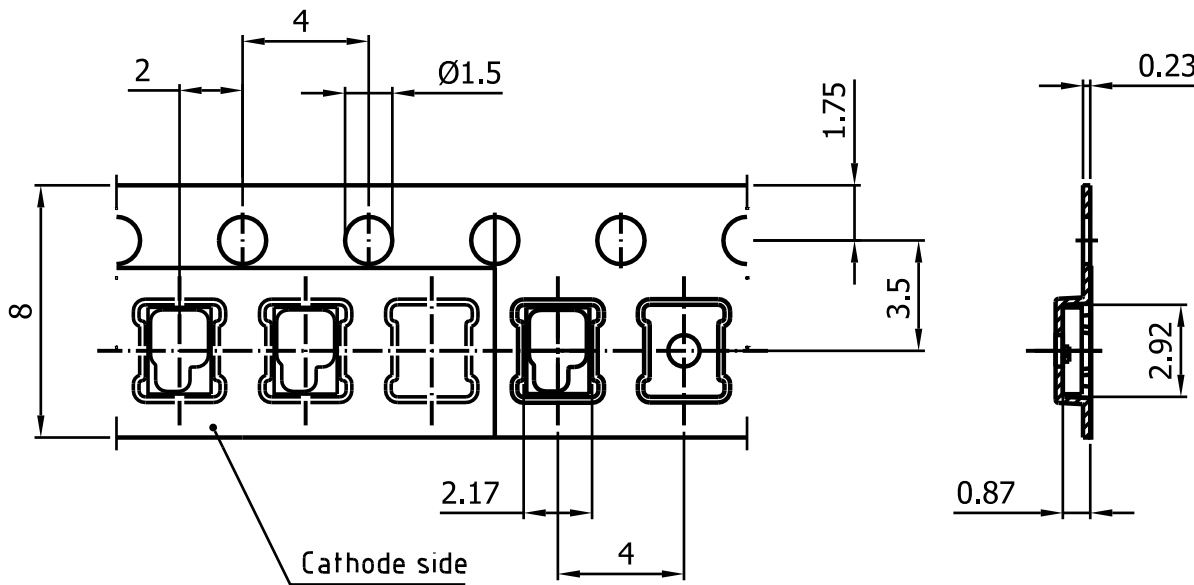


OHA04612

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**

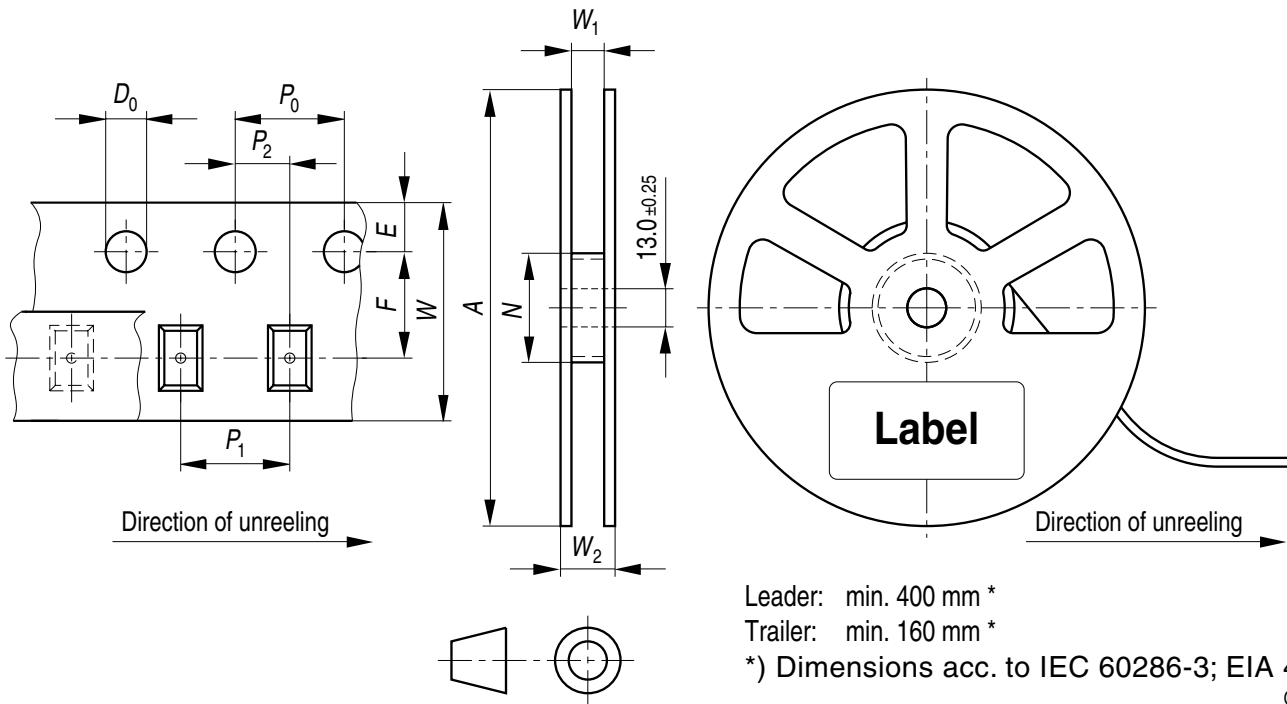


C67062-A0116-B14-04

Dimensions in mm.

**Tape and Reel**

8 mm tape with 2000 pcs. on  $\varnothing$  180 mm reel



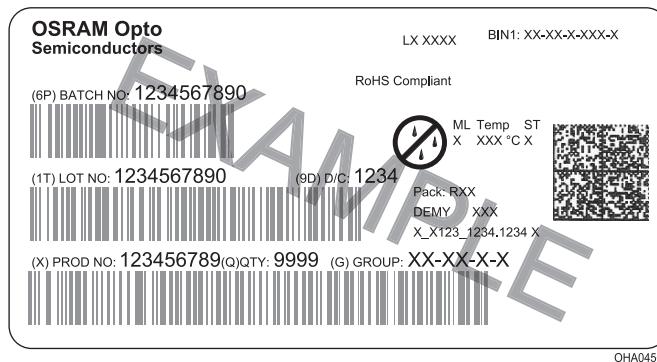
**Tape dimensions [mm]**

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

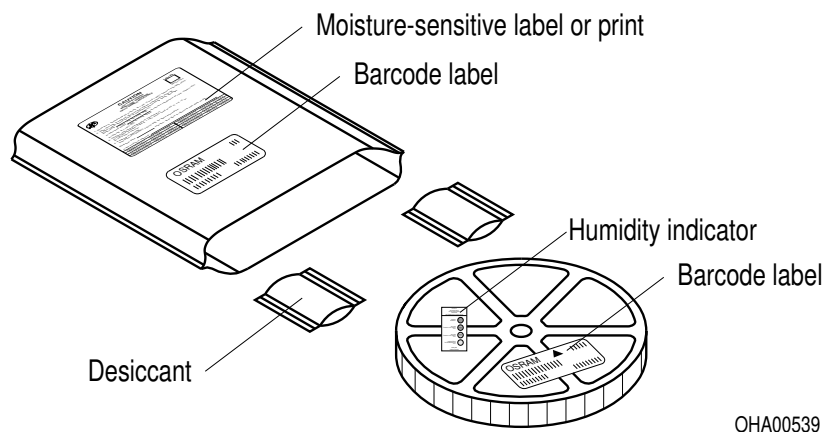
**Reel dimensions [mm]**

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**

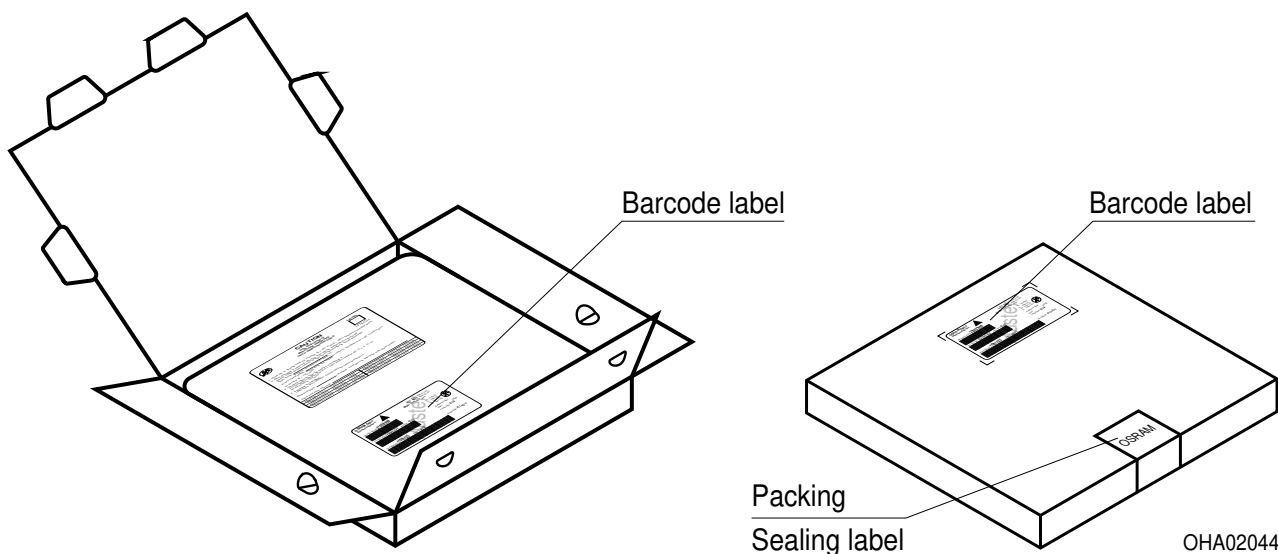


OHA00539

**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**



OHA02044

**Dimensions of transportation box in mm**

Width	Length	Height
200 ± 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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