

# High Power Infrared Emitter (850 nm) Preliminary Version 0.0

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## SFH 4279S



### Features:

- High Power Infrared LED
- Double Stack emitter
- Half angle:  $\pm 25^\circ$
- High forward current allowed at high temperature

### Applications

- Industrial applications
- Infrared Illumination for cameras
- IR data transmission
- Sensor technology

### 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 $I_e$ [mW/sr] $I_F=100$ mA, $t_p=20$ ms	Ordering Code
SFH 4279S	75 ( $\geq 40$ )	Q65112A0074

Note: Measured at a solid angle of  $\Omega = 0.01$  sr

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

Parameter	Symbol	Values	Unit
Operation and storage temperature range	$T_{op}; T_{stg}$	-40 ... 100	°C
Reverse voltage	$V_R$	5	V
Forward current	$I_F$	100	mA
Surge current ( $t_p \leq 300\ \mu\text{s}$ , $D = 0$ )	$I_{FSM}$	0.7	A
Power consumption	$P_{tot}$	245	mW
ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	$V_{ESD}$	2	kV
Thermal resistance junction - ambient <sup>1) page 12</sup>	$R_{thJA}$	300	K / W
Thermal resistance junction - soldering point <sup>2) page 12</sup>	$R_{thJS}$	140	K / W

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

Parameter	Symbol	Values	Unit
Peak wavelength ( $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ) $\lambda_{peak}$	860	nm
Centroid wavelength ( $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ) $\lambda_{centroid}$	850	nm
Spectral bandwidth at 50% of $I_{max}$ ( $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ) $\Delta\lambda$	30	nm
Half angle	(typ) $\varphi$	$\pm 25$	°
Dimensions of active chip area	(typ) L x W	0.3 x 0.3	mm x mm
Rise and fall time of $I_e$ ( 10% and 90% of $I_{e\ max}$ ) ( $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$ )	(typ) $t_r, t_f$	15	ns
Forward voltage ( $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ (max)) $V_F$	3.1 ( $\leq 3.6$ )	V
Forward voltage ( $I_F = 700\text{ mA}$ , $t_p = 100\ \mu\text{s}$ )	(typ (max)) $V_F$	4 ( $\leq 5.2$ )	V
Reverse current ( $V_R = 5\text{ V}$ )	$I_R$	not designed for reverse operation	$\mu\text{A}$
Total radiant flux ( $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ) $\Phi_e$	95	mW

Parameter		Symbol	Values	Unit
Temperature coefficient of $I_e$ or $\Phi_e$ ( $I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$ )	(typ)	$TC_I$	-0.5	% / K
Temperature coefficient of $V_F$ ( $I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$ )	(typ)	$TC_V$	-2	mV / K
Temperature coefficient of wavelength ( $I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$ )	(typ)	$TC_\lambda$	0.3	nm / K

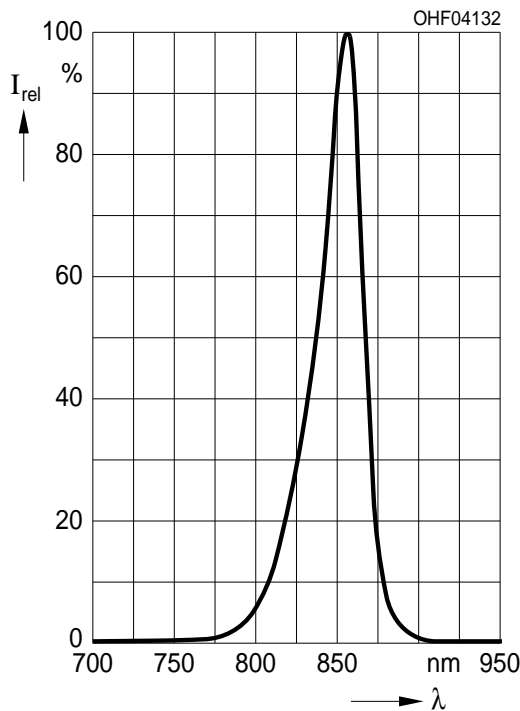
**Grouping** ( $T_A = 25 \text{ }^\circ\text{C}$ )

Group	Min Radiant Intensity $I_F=100 \text{ mA}$ , $t_p=20 \text{ ms}$	Max Radiant Intensity $I_F=100 \text{ mA}$ , $t_p=20 \text{ ms}$	Typ Radiant Intensity $I_F = 700 \text{ mA}$ , $t_p = 25 \text{ }\mu\text{s}$
	$I_{e, \text{min}}$ [mW / sr]	$I_{e, \text{max}}$ [mW / sr]	$I_{e, \text{typ}}$ [mW / sr]
SFH 4279S-U	40	80	315
SFH 4279S-V	63	125	495
SFH 4279S-AW	100	200	795

Note: measured at a solid angle of  $\Omega = 0.01 \text{ sr}$   
 Only one group in one packing unit (variation lower 2:1).

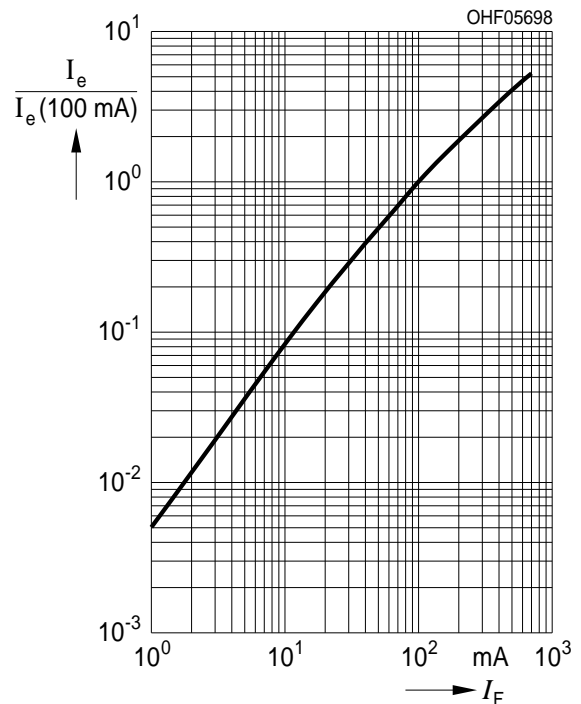
**Relative Spectral Emission** <sup>3) page 12</sup>

$I_{\text{rel}} = f(\lambda)$ ,  $T_A = 25^\circ\text{C}$



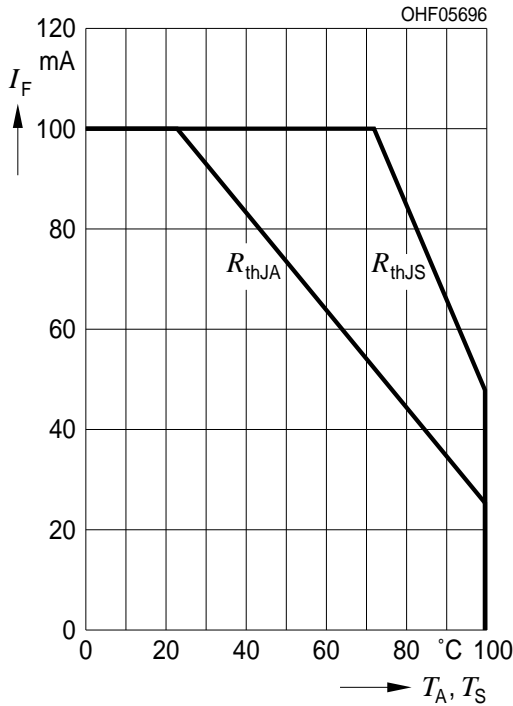
**Radiant Intensity** <sup>3) page 12</sup>

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



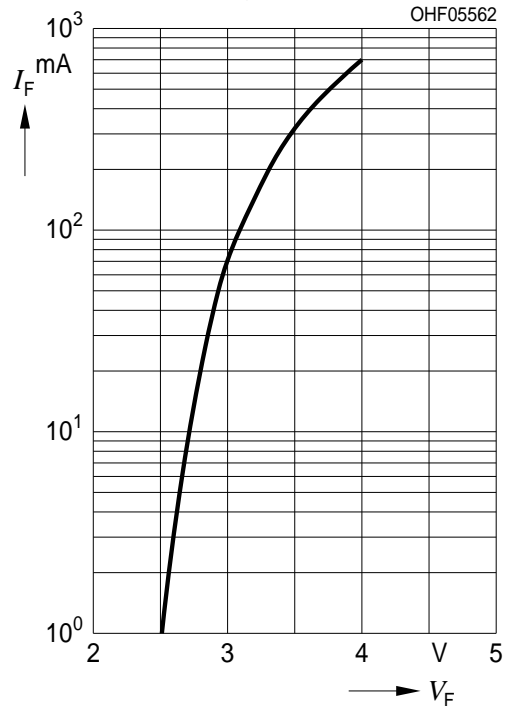
**Max. Permissible Forward Current**

$I_{F, max} = f(T_A), R_{thJA} = 300 \text{ K/W}, R_{thJS} = 140 \text{ K/W}$



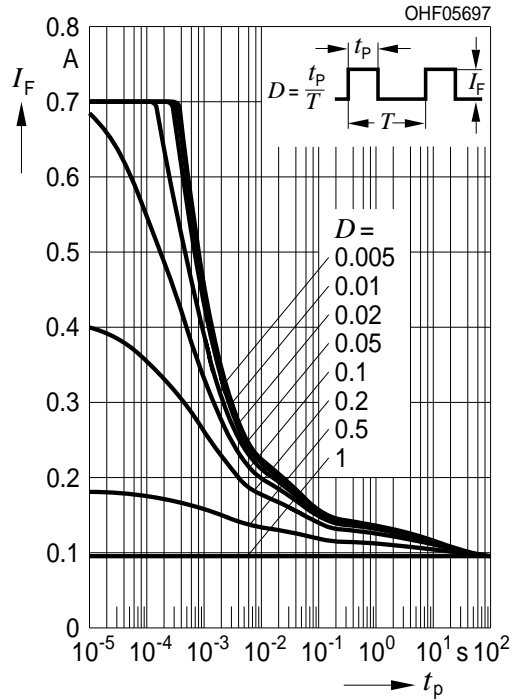
**Forward Current** <sup>3) page 12</sup>

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



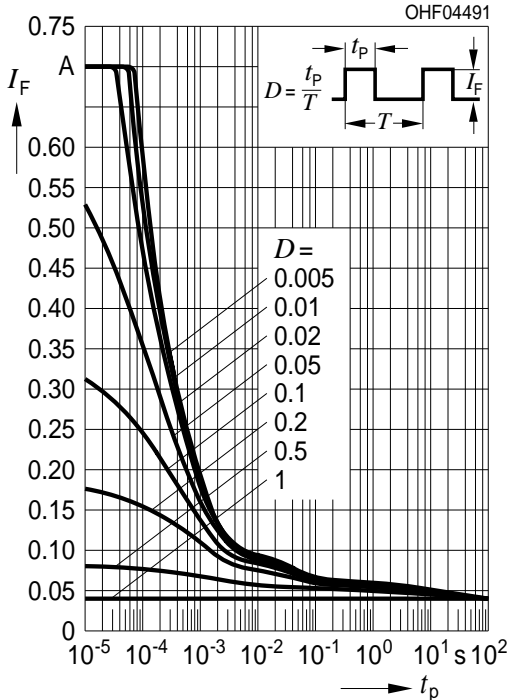
**Permissible Pulse Handling Capability**

$I_F = f(t_p), T_A = 25^\circ\text{C}, \text{ duty cycle } D = \text{parameter}$



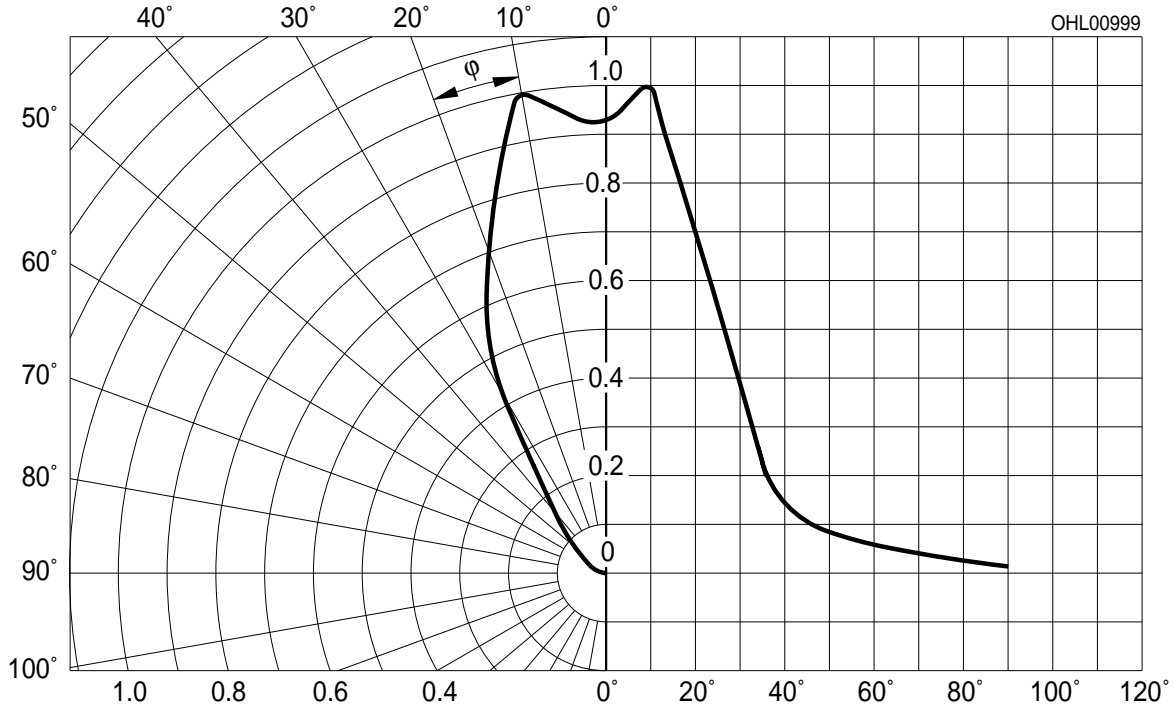
**Permissible Pulse Handling Capability**

$I_F = f(t_p), T_A = 85^\circ\text{C}, \text{ duty cycle } D = \text{parameter}$

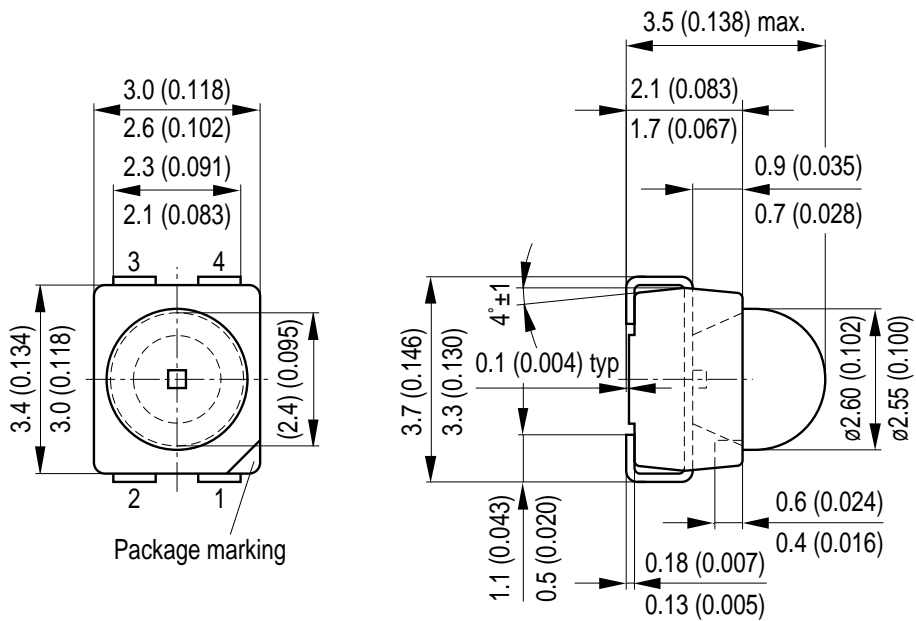


**Radiation Characteristics** <sup>3) page 12</sup>

$I_{rel} = f(\phi), T_A = 25^\circ C$



**Package Outline**



GPLY6128

*Dimensions in mm (inch).*

**Pinning**

Pin	Description
1	Cathode
2	Anode
3	Anode
4	Anode

**Package**

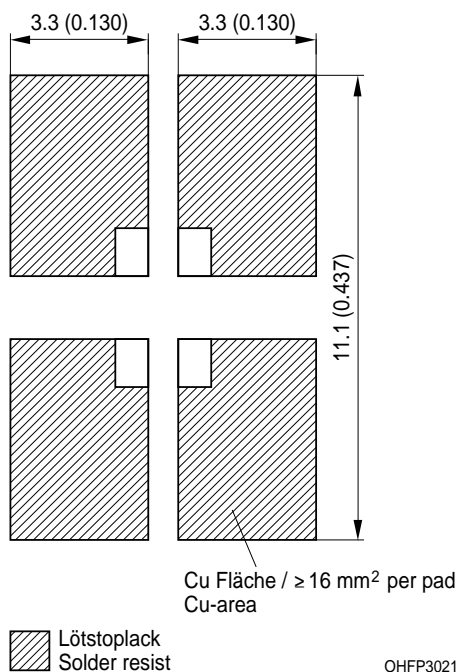
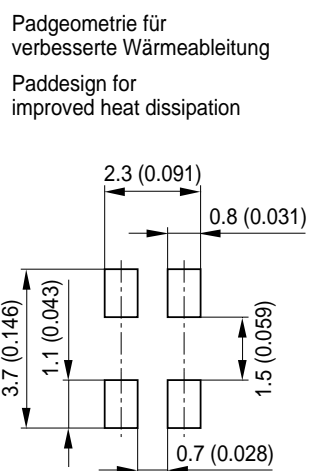
Power TOPLED with Lens

**Approximate Weight:**

37 mg

**Recommended Solder Pad**

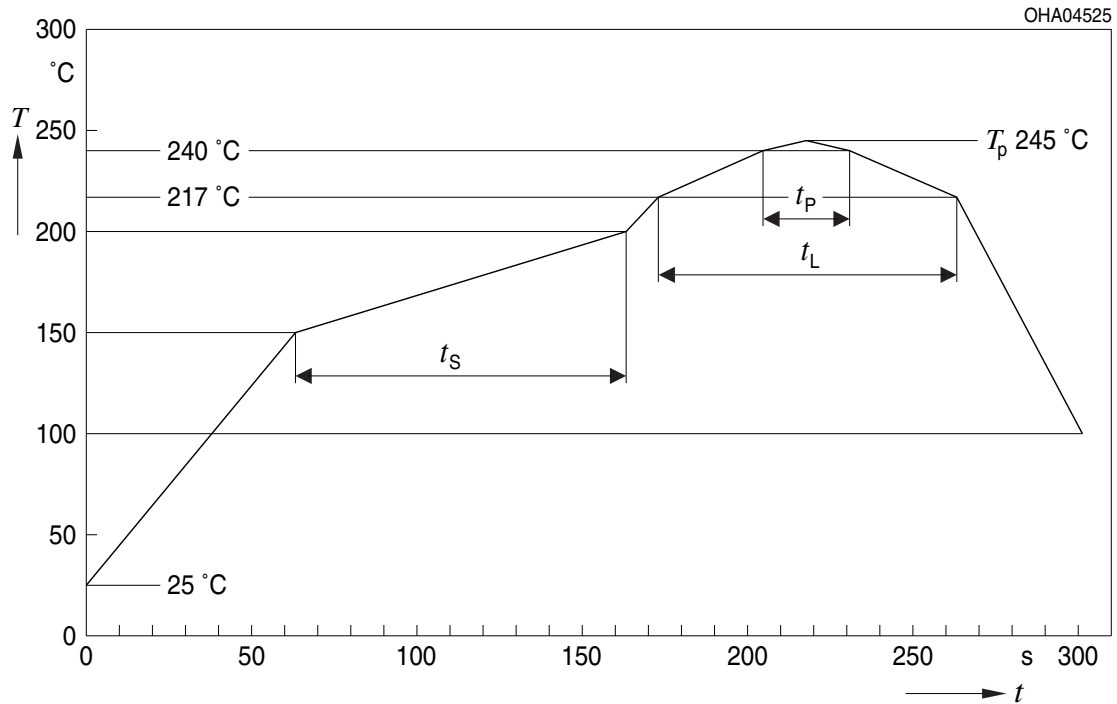
Reflow Soldering



*Dimensions in mm (inch).*

**Reflow Soldering Profile**

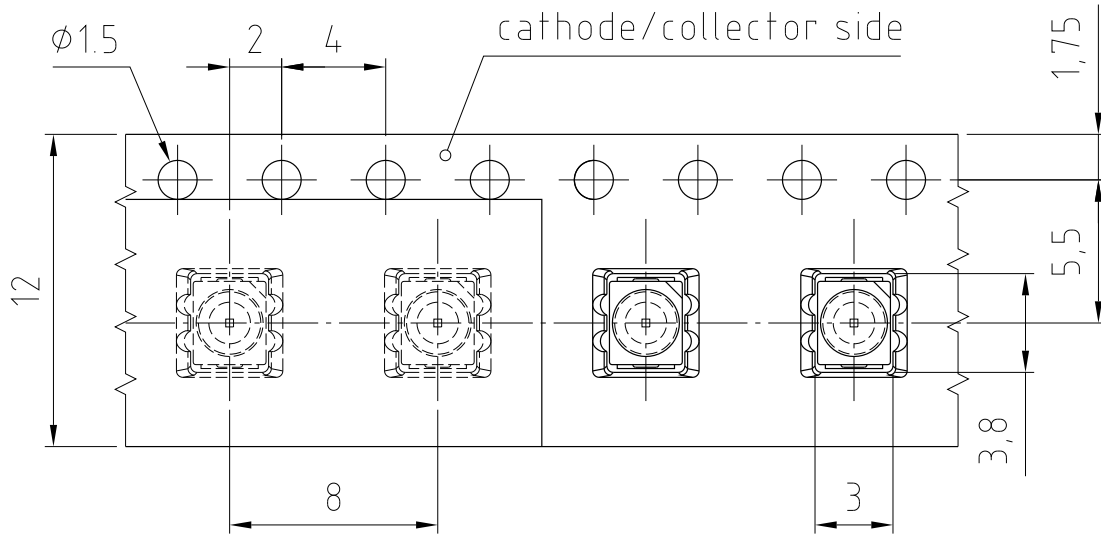
Product complies to MSL Level 2 acc. to JEDEC J-STD-020D.01



Profil-Charakteristik Profile Feature	Symbol Symbol	Pb-Free (SnAgCu) Assembly			Einheit Unit
		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			°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	4	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

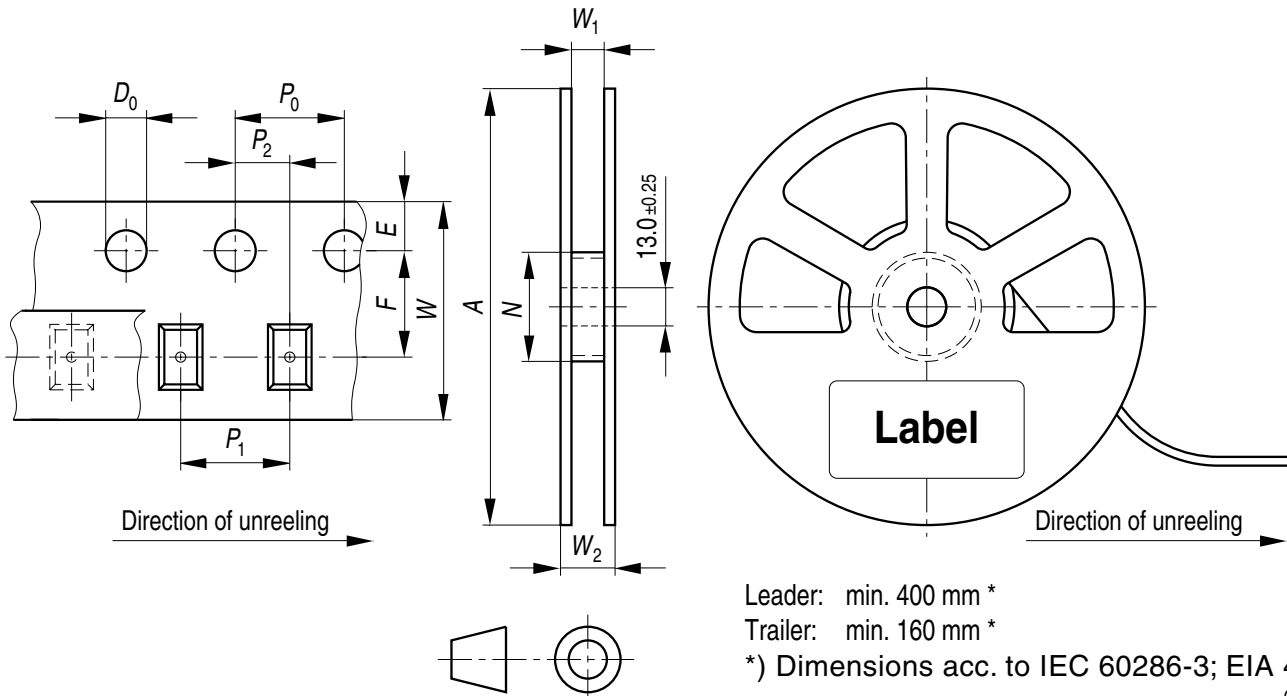


C63062-A3636-B4-03

Dimensions in mm.

Tape and Reel

12 mm tape with 2000 pcs. on  $\phi 180$  mm reel



Leader: min. 400 mm \*

Trailer: min. 160 mm \*

\*) Dimensions acc. to IEC 60286-3; EIA 481-D

OHAY0324

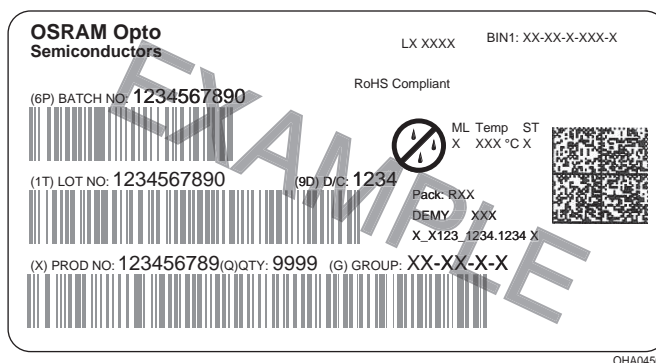
Tape dimensions [mm]

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 or 8 ± 0.1	2 ± 0.05	1.5 ± 0.1	1.75 ± 0.1	5.5 ± 0.05

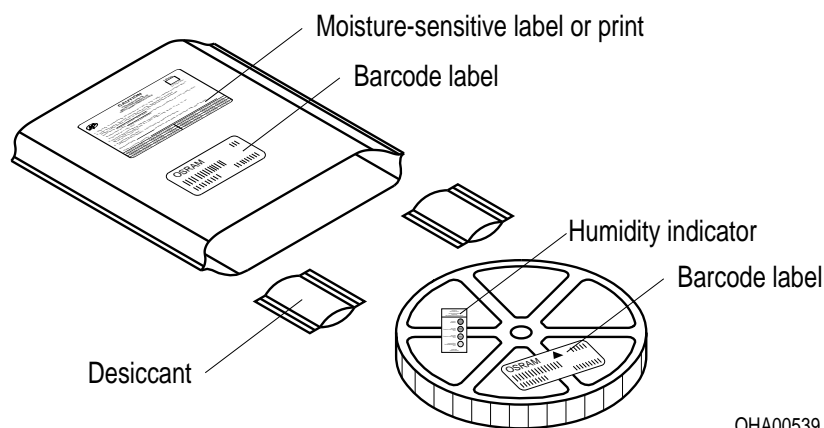
Reel dimensions [mm]

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)



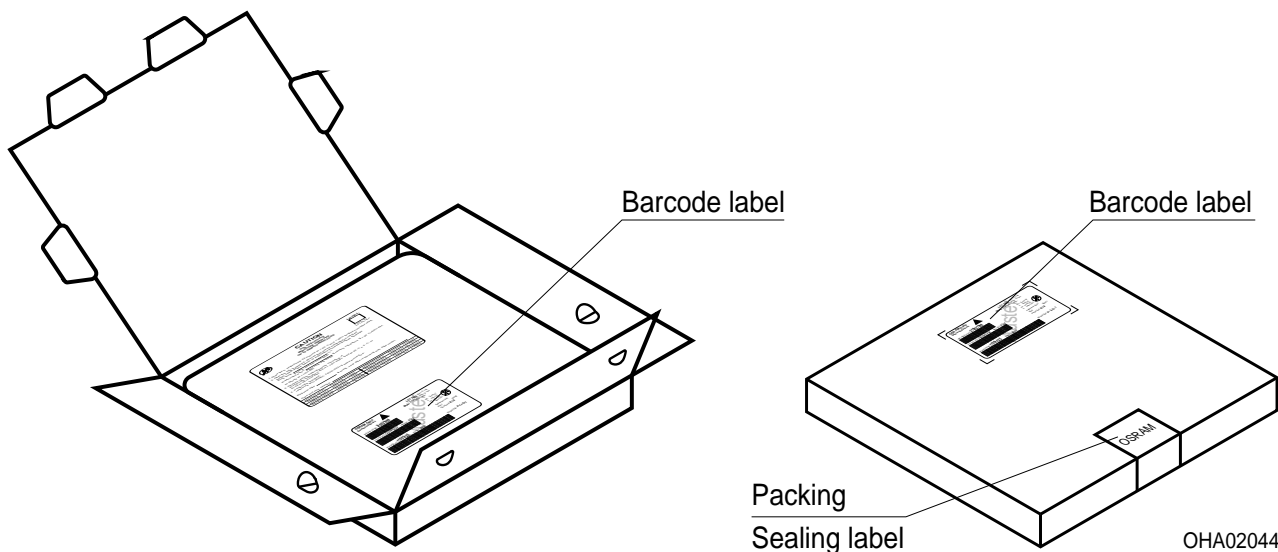
Dry Packing Process and Materials



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**

- 1) **Thermal resistance:** junction -ambient, mounted on PC-board (FR4), padsize 16 mm<sup>2</sup> each
- 2) **Thermal resistance:** junction - soldering point, of the device only, mounted on an ideal heatsink (e.g. metal block)
- 3) **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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