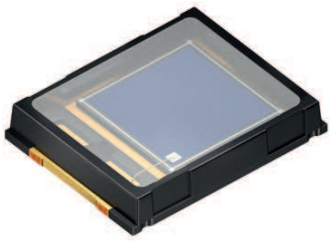
Silicon PIN Photodiode
Version 1.3

SFH 2200



Features:

- Suitable for reflow soldering
- Especially suitable for applications from 400 nm to 1100 nm
- small package: (WxDxH) 4 mm x 5.1 mm x 0.85mm
- Solder control structure

Applications

- Photointerrupters
- Industrial electronics
- Consumer electronics
- For control and drive circuits
- Remote control

Ordering Information

Type:	Photocurrent I_P [µA] E_v = 1000 lx, white LED, V_R = 5 V	Spectral sensitivity S [nA/lx] V_R = 5 V, Std. Light A, T = 2856 K	Ordering Code
SFH 2200	8 (≥ 5)	71	Q65112A0250

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Maximum Ratings (T_A = 25 °C)

Parameter	Symbol	Values	Unit
Operating and storage temperature range	T_{op}; T_{stg}	-40 ... 85	°C
Reverse voltage	V_R	20	V
Total Power dissipation	P_{tot}	150	mW
ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	V_{ESD}	2000	V
Thermal resistance for mounting on pcb	R_{thJA}	275	K/W

Characteristics (T_A = 25 °C)

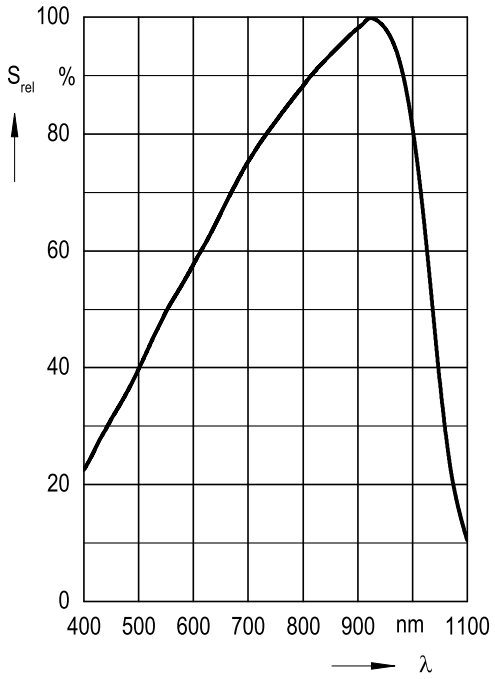
Parameter		Symbol	Values	Unit
Spectral sensitivity (V_R = 5 V, Std. Light A, T = 2856 K)	(typ (min))	S	71	nA/lx
Photocurrent (E_v = 1000 lx, white LED, V_R = 5 V)	(typ (min))	I_P	8 (≥ 5)	µA
Wavelength of max. sensitivity	(typ)	$\lambda_{S\,max}$	940	nm
Spectral range of sensitivity	(typ)	$\lambda_{10\%}$	(typ) 300 ... 1100	nm
Radiant sensitive area	(typ)	A	7.02	mm^2
Dimensions of radiant sensitive area	(typ)	L x W	2.65 x 2.65	mm x mm
Half angle	(typ)	φ	± 60	°
Dark current (V_R = 10 V)	(typ (max))	I_R	1 (≤ 25)	nA
Spectral sensitivity of the chip (λ = 950 nm)	(typ)	$S_{\lambda\,typ}$	0.7	A / W
Quantum yield of the chip (λ = 950 nm)	(typ)	η	0.91	Electrons /Photon
Open-circuit voltage (E_v = 1000 lx, Std. Light A)	(typ (min))	V_O	365 (≥ 300)	mV
Short-circuit current (E_v = 1000 lx, Std. Light A)	(typ)	I_{SC}	71	µA
Rise and fall time (V_R = 5 V, R_L = 50 Ω, λ = 850 nm, I_P = 800 µA)	(typ)	t_r, t_f	0.04	µs
Forward voltage (I_F = 100 mA, E = 0)	(typ)	V_F	1	V
Capacitance (V_R = 0 V, f = 1 MHz, E = 0)	(typ)	C_0	60	pF

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Parameter		Symbol	Values	Unit
Temperature coefficient of V_O	(typ)	TC_V	-2.6	mV / K
Temperature coefficient of I_{SC} (E_v = 1000 lx, Std. Light A)	(typ)	TC_I	0.18	% / K
Noise equivalent power (V_R = 10 V, λ = 950 nm)	(typ)	NEP	0.026	pW / $Hz^{½}$
Detection limit (V_R = 10 V, λ = 950 nm)	(typ)	D^*	1.0e13	cm x $Hz^{½}$ / W

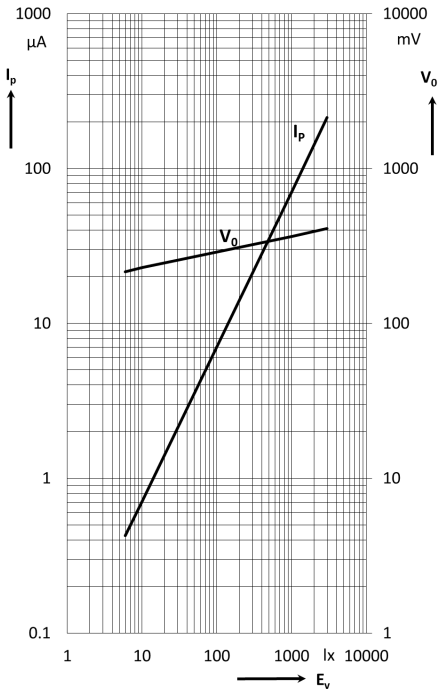
Relative Spectral Sensitivity 1) *page 12*

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



Photocurrent / Open-Circuit Voltage 1) *page 12*

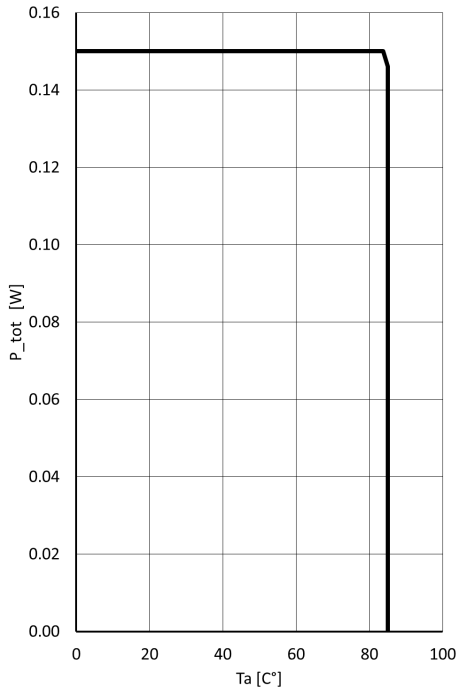
I_P (V_R = 5 V) / $V_O = f(E_V)$



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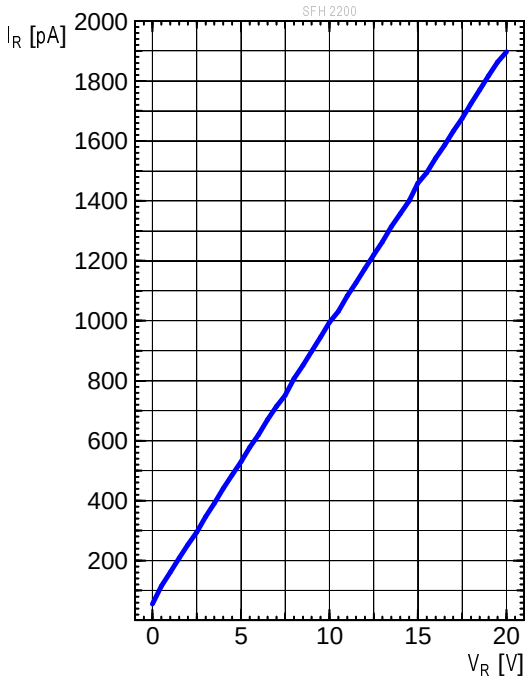
Power Consumption

$P_{tot} = f(T_A)$, R_{thJA} = 275 K/W



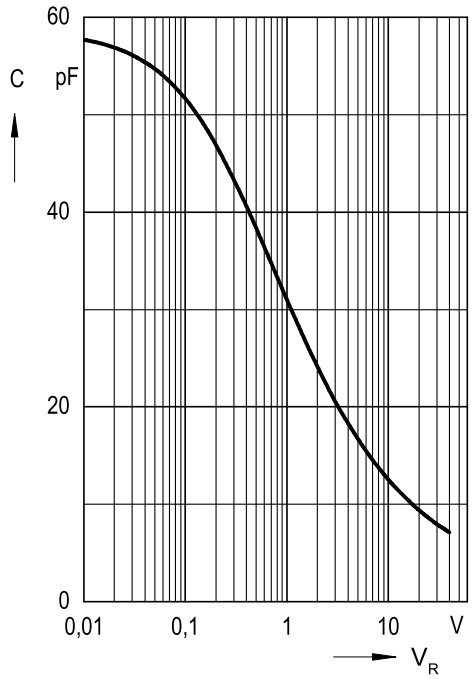
Dark Current [1] *page 12*

$I_R = f(V_R)$, E = 0



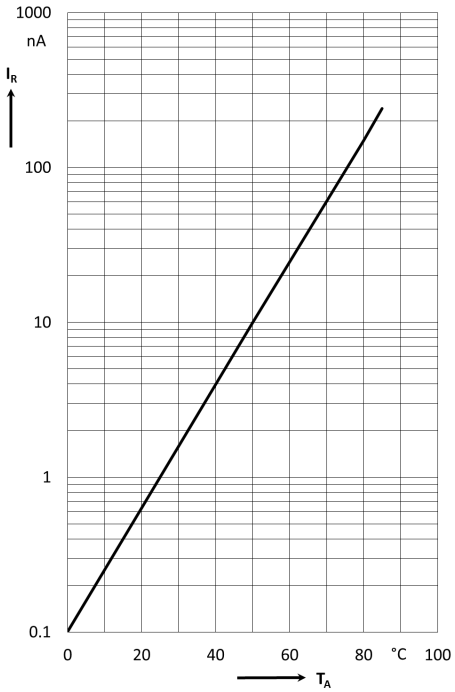
Capacitance [1] *page 12*

$C = f(V_R)$, f = 1 MHz, E = 0



Dark Current [1] *page 12*

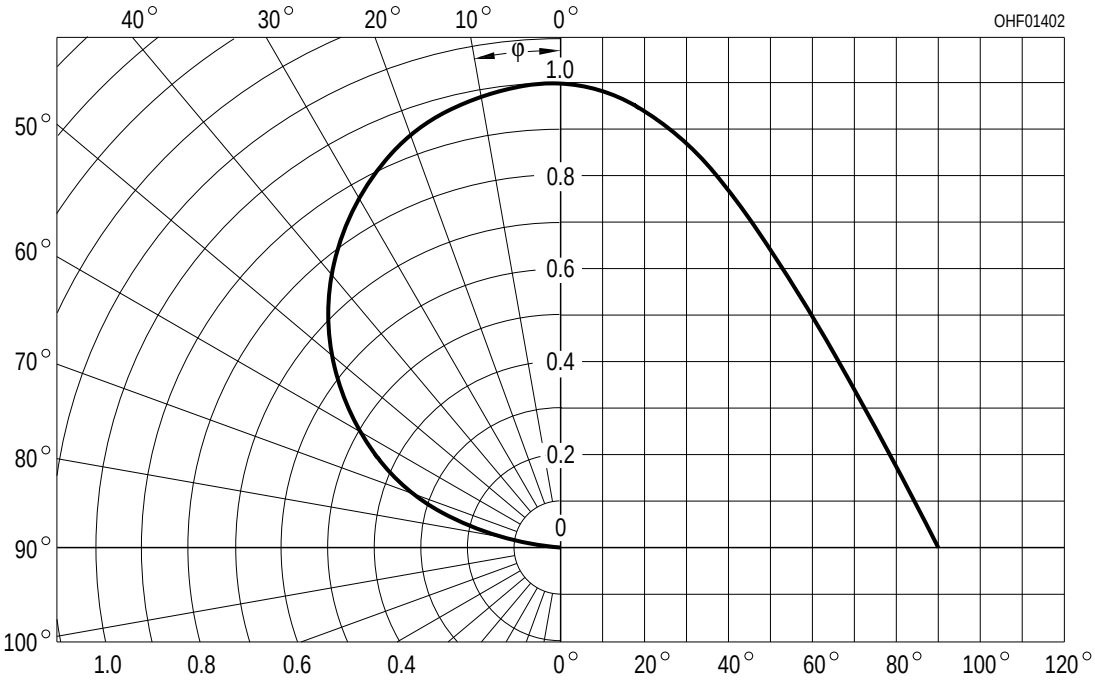
$I_R = f(T_A)$, V_R = 10 V, E = 0



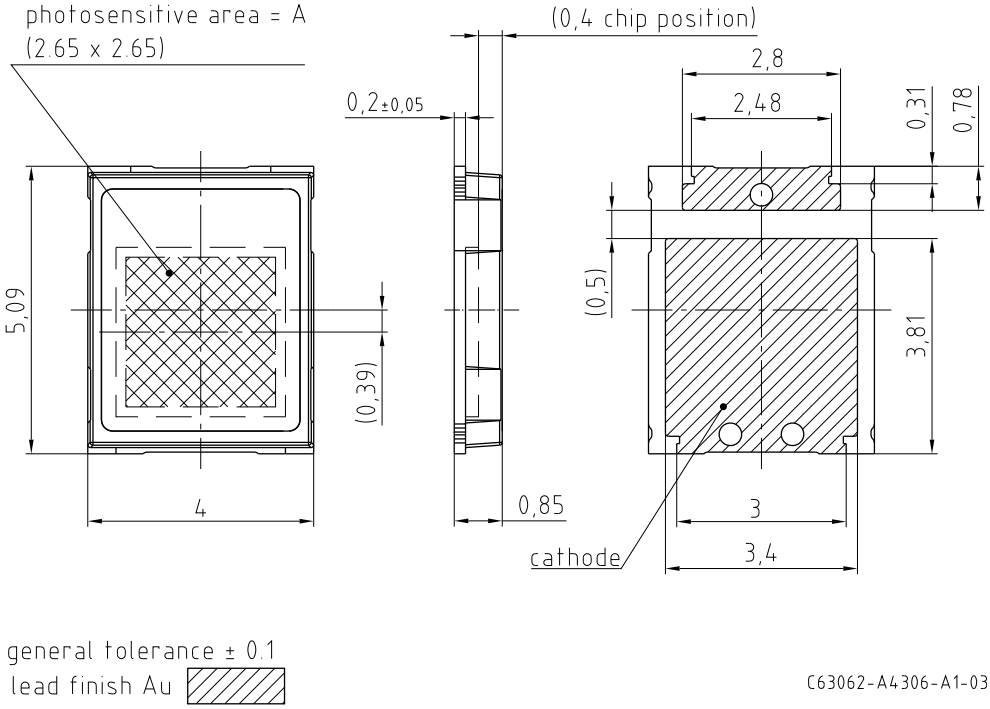
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Directional Characteristics [1] *page 12*

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



Package Outline



Dimensions in mm.

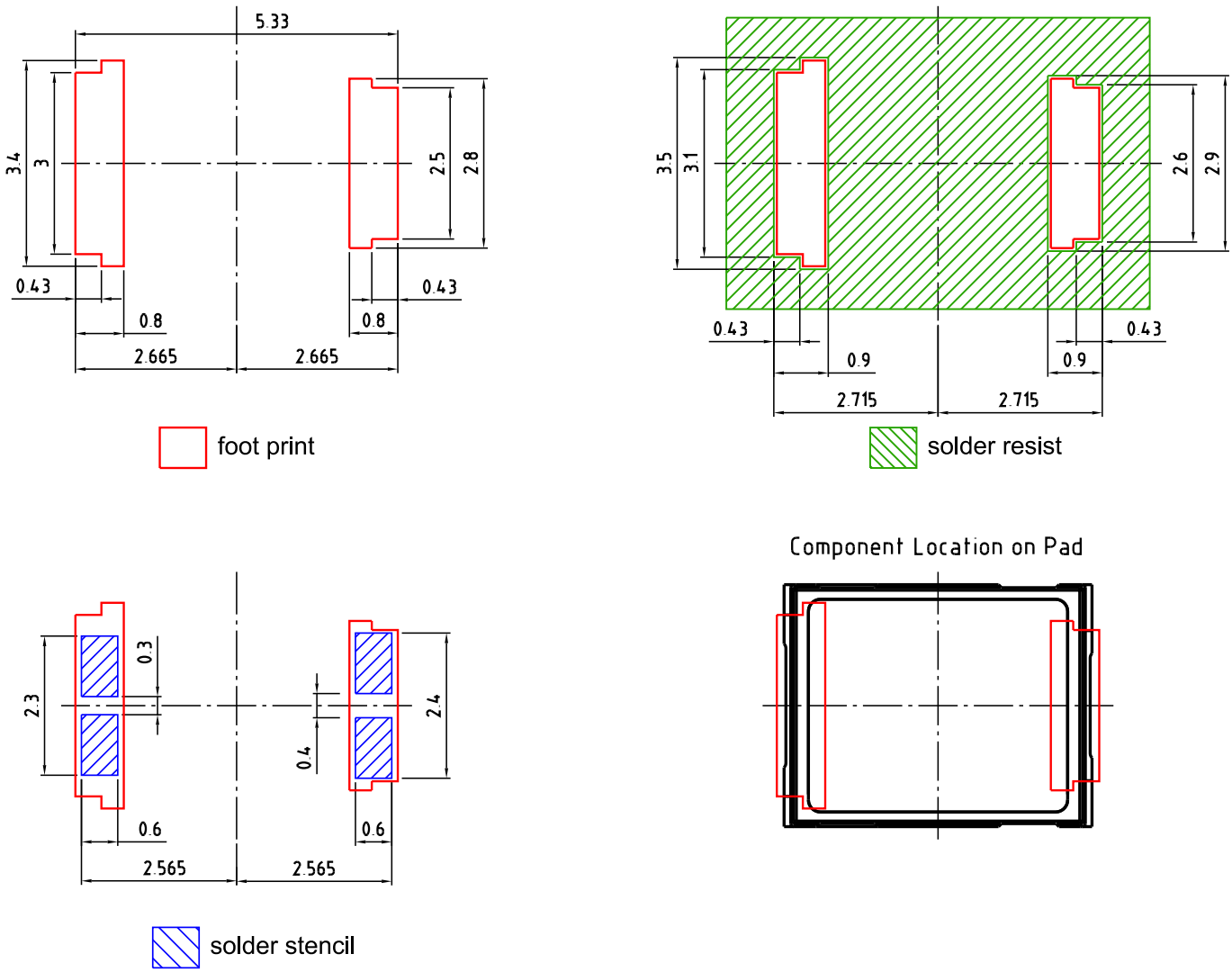
Package

TOPLED D5140, Silicone, colourless, clear

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Approximate Weight:
46 mg

Recommended Solder Pad



Dimensions in mm.

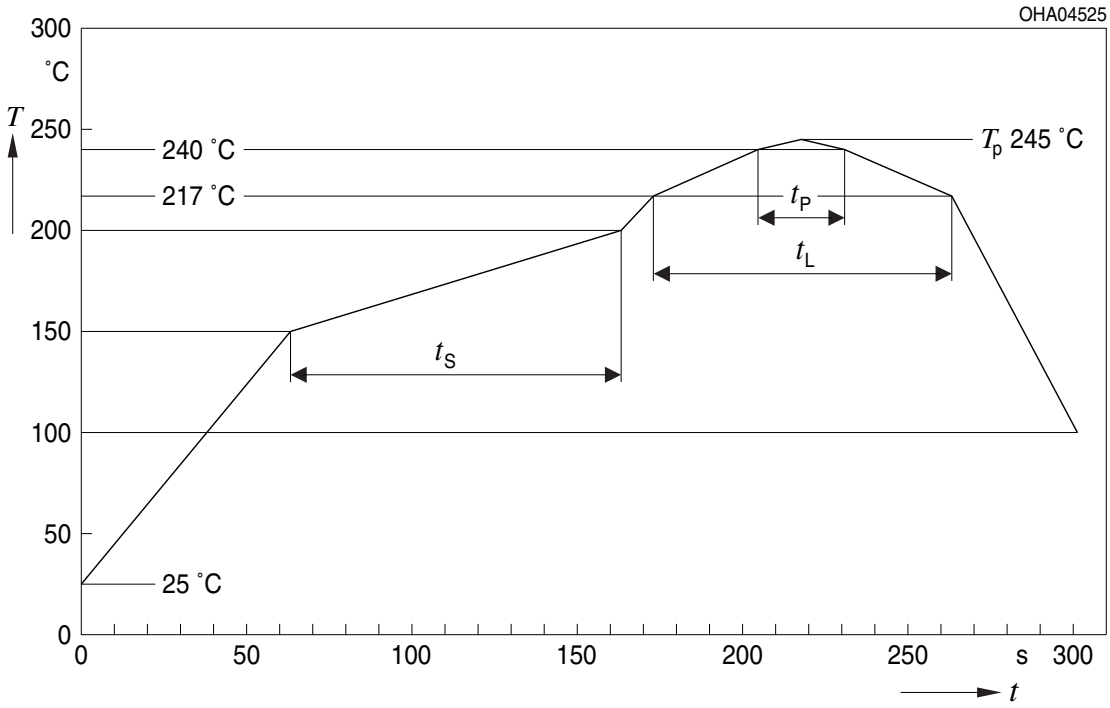
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Handling Indication

The package is casted with silicone. Mechanical stress at the silicone surface should be avoided. Pickup the device at the plastic frame.

Reflow Soldering Profile

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



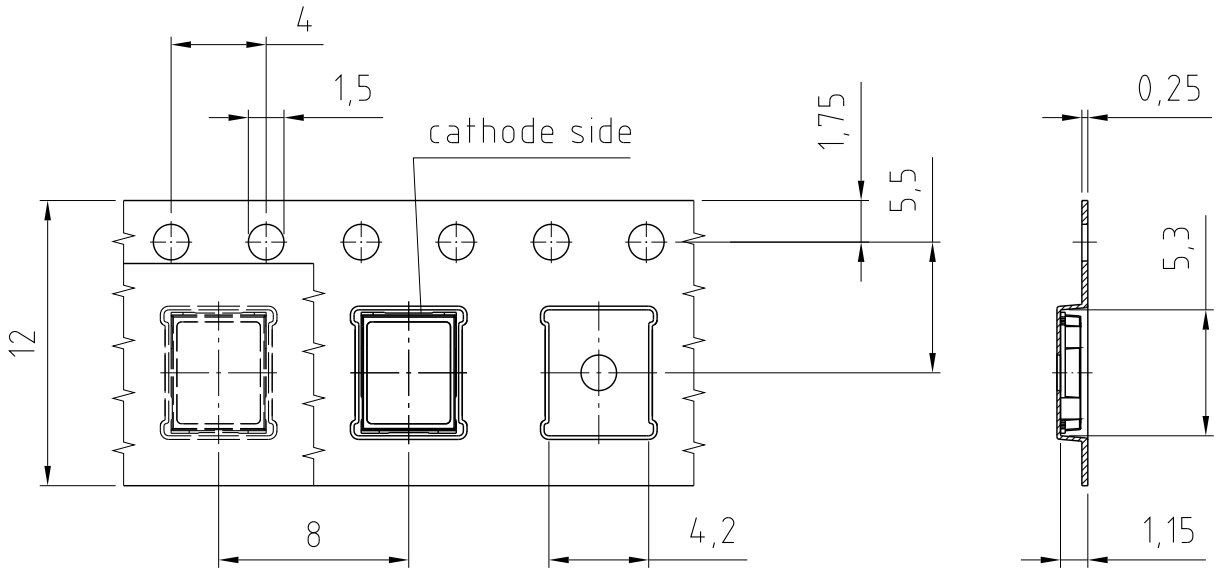
OHA04612

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

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Taping

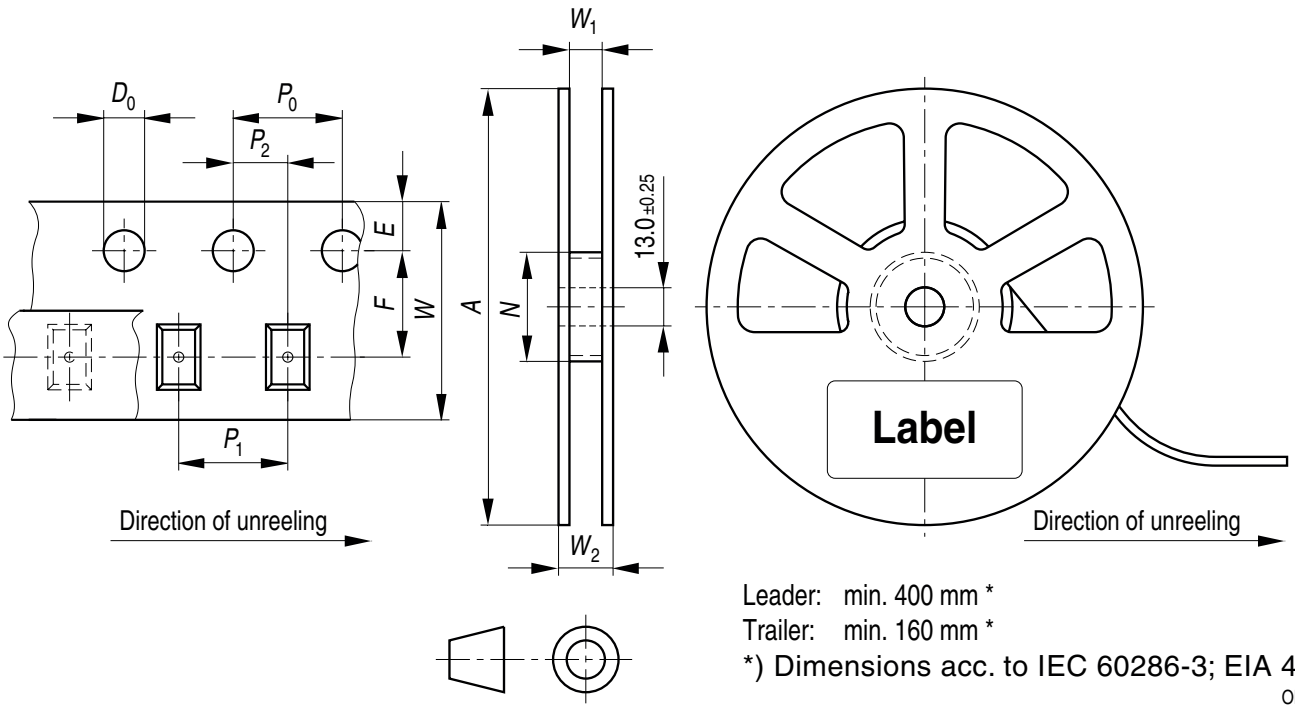


C63062-A4306-B1-01

Dimensions in mm.

Tape and Reel

12 mm tape with 1500 pcs. on ∅ 180 mm reel



Leader: min. 400 mm *
Trailer: min. 160 mm *
*) Dimensions acc. to IEC 60286-3; EIA 481-D

OHAY0324

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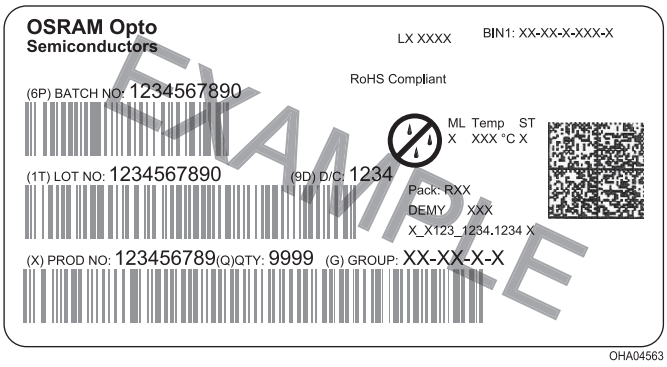
Tape dimensions [mm]

W	P_0	P_1	P_2	D_0	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

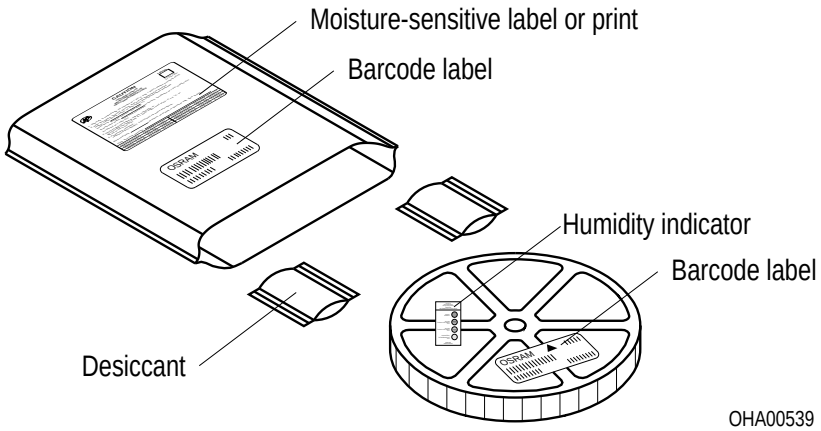
Reel dimensions [mm]

A	W	N_{min}	W_1	W_{2max}
180	12	60	12.4 + 2	18.4

Barcode-Product-Label (BPL)

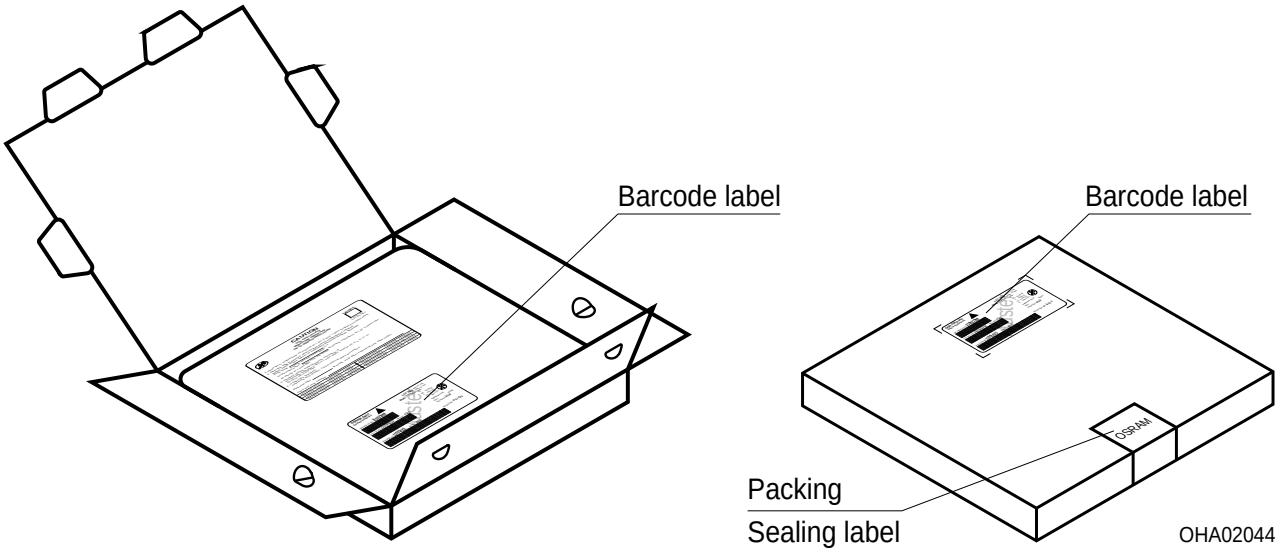


Dry Packing Process and Materials



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

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

[1] **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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