OSRAM SFH 7061

Datasheet

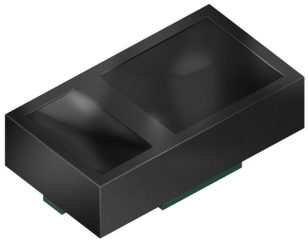
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Optical Force

SFH 7061

Optical Force and Proximity Sensing



Ultra-slim and small Optical Frontend (OFE) for Optical Force Sensing (OFS).
The device integrates an infrared emitter (940 nm IR LED), a photo diode (sensitive to 940nm), as well as a light barrier to block optical crosstalk in a tiny 1.8 x 1.0 x 0.5mm package.

Features

- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Light Barrier to block optical crosstalk
- Small package
- Package size (WxDxH): 1.8mm x 1.0 mm x 0.5 mm
- Multi chip package featuring 1 emitter and one detector

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Ordering Information

Type	Ordering Code
SFH 7061	Q65115A2090
● infrared (940 nm)	
■ photodiode	

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Maximum Ratings

T_A = 25 °C

Parameter	Symbol		Values
Operating temperature range	T_{op}	min.	-40 °C
		max.	85 °C
Storage temperature range	T_{stg}	min.	-40 °C
		max.	85 °C
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 - HBM	V_{ESD}	max.	2 kV
Infrared Emitter			
Forward current	$I_{F\ (DC)}$	min.	1 mA
		max.	100 mA
Forward current pulsed $t_p \leq 50$ µs; D = 0.005	$I_{F\ pulse}$	max.	700 mA
Reverse voltage [5)]	V_R	max.	5 V
Photodiode			
Reverse voltage	V_R	max.	6 V

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Characteristics

T_A = 25 °C

Parameter	Symbol		Values
Infrared Emitter			
Peak wavelength I_F = 20 mA; t_p = 20 ms	λ_{peak}	typ.	950 nm
Centroid Wavelength [6] I_F = 20 mA; t_p = 20 ms	$\lambda_{centroid}$	min. typ. max.	920 nm 940 nm 950 nm
Spectral bandwidth at 50% $I_{rel,max}$ (FWHM) I_F = 20 mA; t_p = 20 ms	$\Delta\lambda$	typ.	29 nm
Half angle	Φ	typ.	± 60 °
Rise time (10%/ 90%) I_F = 10 mA; R_L = 50 Ω	t_r	typ.	8 ns
Fall time (10%/ 90%) I_F = 10 mA; R_L = 50 Ω	t_f	typ.	8 ns
Forward voltage [8] I_F = 20 mA; t_p = 20 ms	V_F	typ. max.	1.3 V 1.5 V
Forward voltage [8] I_F = 500 mA; t_p = 100 µs	V_F	typ. max.	2.4 V 2.9 V
Reverse current V_R = 5 V	I_R		Not designed for reverse operation
Radiant intensity I_F = 20 mA; t_p = 20 ms	I_e	typ.	2 mW / sr
Total radiant flux I_F = 20 mA; t_p = 20 ms	Φ_e	typ.	5.6 mW
Thermal resistance junction solderpoint real	Rth_{js}	typ. max.	120 K/W 145 K/W

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Characteristics

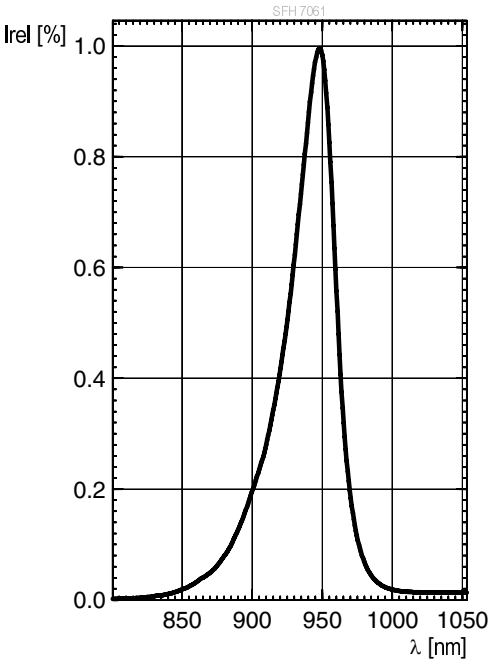
T_A = 25 °C

Parameter	Symbol		Values
Photodiode			
Wavelength of max. sensitivity	$\lambda_{S\ max}$	typ.	910 nm
Spectral range of sensitivity	$\lambda_{10\%}$	typ.	820 … 1100 nm
Photocurrent E_e = 0.1 mW/cm²; λ = 940 nm; VR = 1 V	I_P	typ.	90 nA
Photocurrent E_e = 0.1 mW/cm²; λ = 940 nm; VR = 5 V	I_P	typ.	100 nA
Radiant sensitive area	A	typ.	0.121 mm²
Dimensions of active chip area	L x W	typ.	0.348 x 0.348 mm x mm
Dark current V_R = 1 V; E = 0	I_R	typ. max.	0.1 nA 4 nA
Dark current V_R = 5 V; E = 0	I_R	typ. max.	0.4 nA 5 nA
Open-circuit voltage E_e = 0.1 mW/cm²; λ = 940nm	V_O	typ.	225 mV
Rise time (10%/ 90%) V_R = 0 V; R_L = 50 Ω; λ = 940 nm	t_r	typ.	2.2 µs
Fall time (10%/ 90%) V_R = 0 V; R_L = 50 Ω; λ = 940 nm	t_f	typ.	2.1 µs
Rise time (10%/ 90%) V_R = 5 V; R_L = 50 Ω; λ = 940 nm	t_r	typ.	0.8 µs
Fall time (10%/ 90%) V_R = 5 V; R_L = 50 Ω; λ = 940 nm	t_f	typ.	0.75 µs
Forward voltage I_F = 10 mA; E = 0	V_F	typ..	0.9 V
Capacitance V_R = 0 V; f = 1 MHz; E = 0	C_0	typ.	2 pF
Capacitance V_R = 5 V; f = 1 MHz; E = 0	C_0	typ.	1.1 pF

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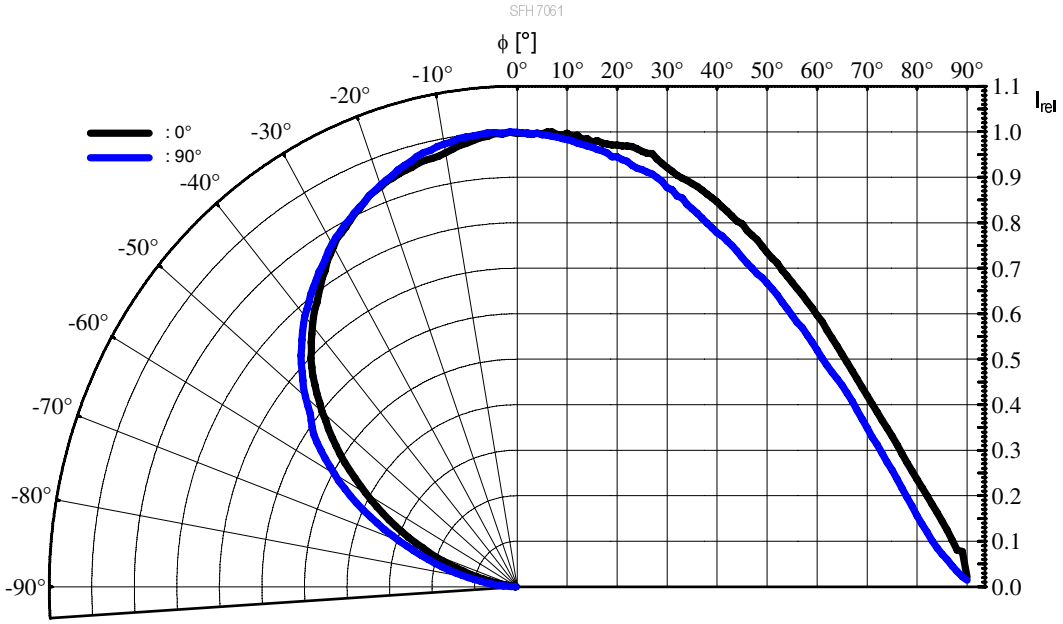
Relative Spectral Emission [1], [2]

- infrared (940 nm): $I_{e,rel} = f(\lambda)$; I_F = 20 mA; t_p = 20 ms



Radiation Characteristics [1], [2]

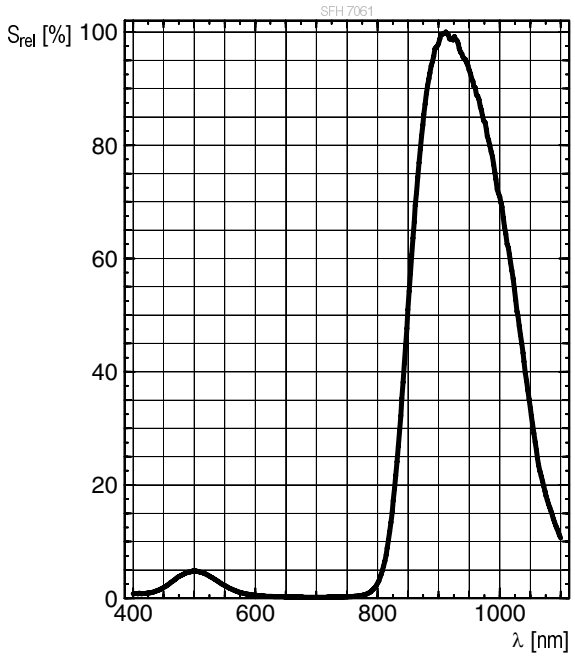
- infrared (940 nm): $I_{e,rel} = f(\varphi)$



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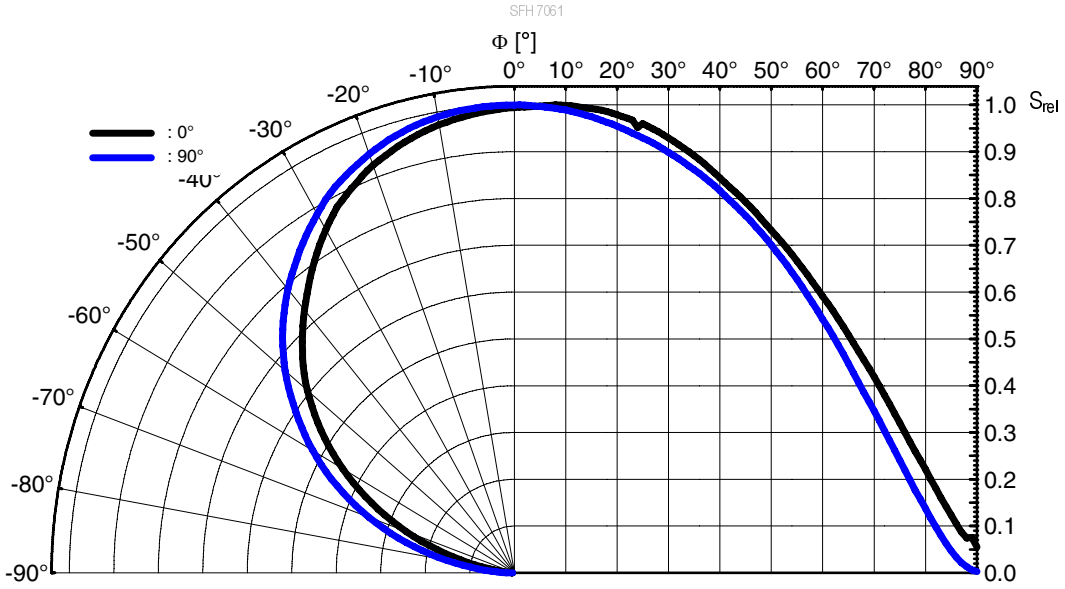
Relative Spectral Sensitivity [1], [2]

- photodiode: $S_{rel} = f(\lambda)$



Directional Characteristics [1], [2]

- photodiode: $S_{rel} = f(\varphi)$

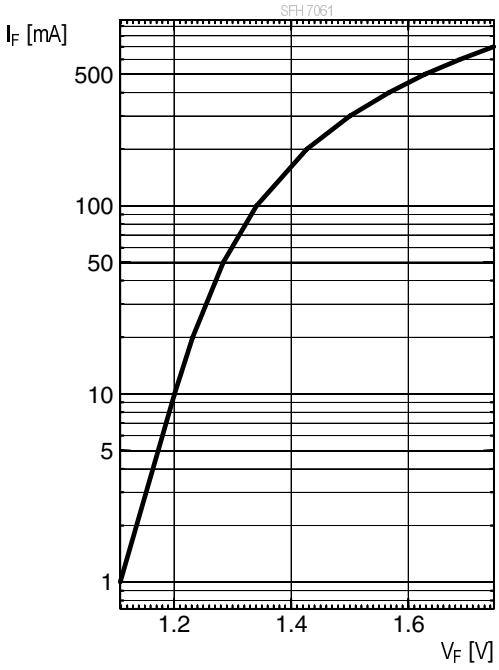


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Forward current [1), 2)]

- infrared (940 nm): $I_F = f(V_F)$;

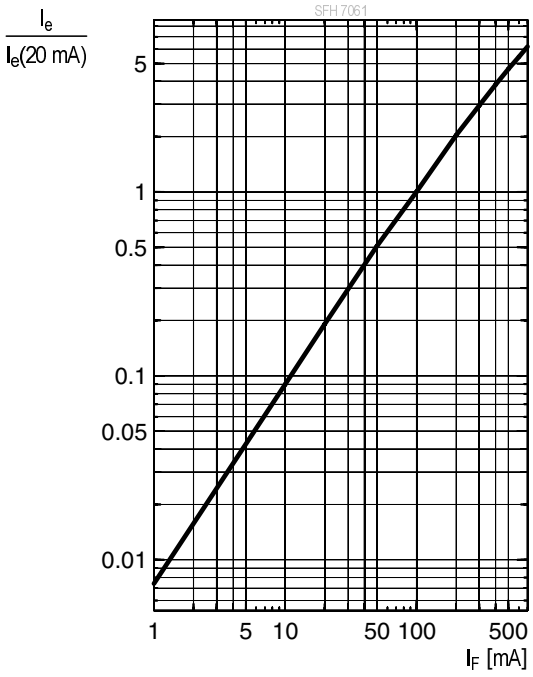
single pulse; $t_p = 100\ \mu s$



Relative Radiant Intensity [1), 2)]

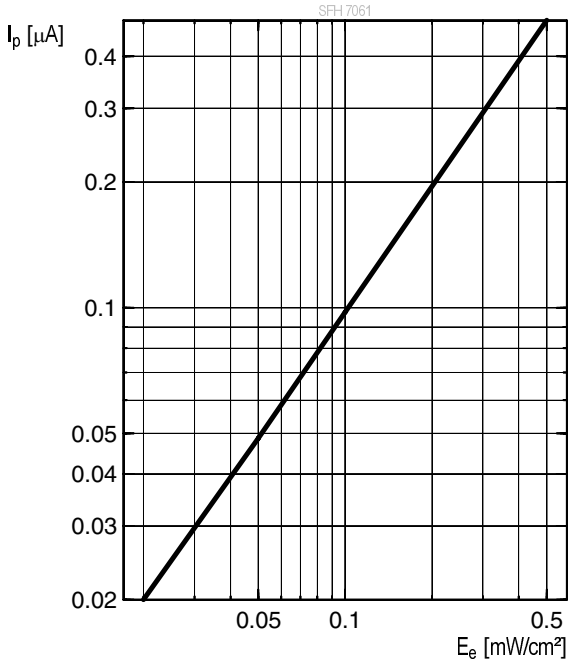
- infrared (940 nm): $I_e/I_e(20mA) = f(I_F)$;

single pulse; $t_p = 100\ \mu s$



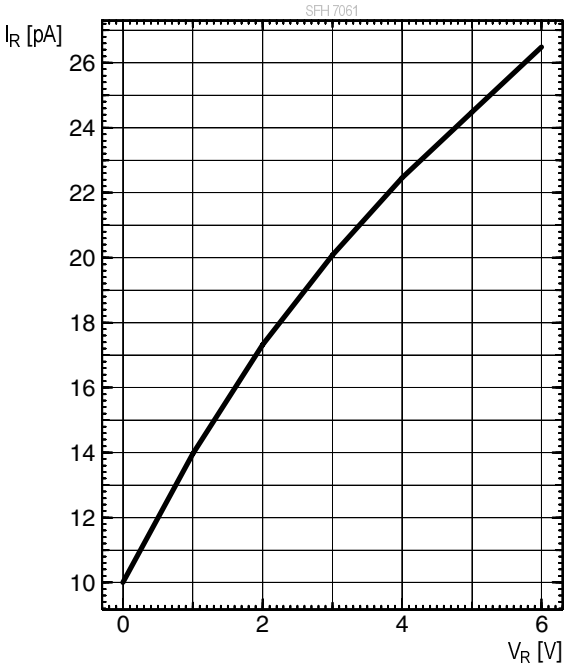
Photocurrent [1), 2)]

- photodiode: $I_P = f(E_e)$; $V_R = 5\ V$



Dark Current [1), 2)]

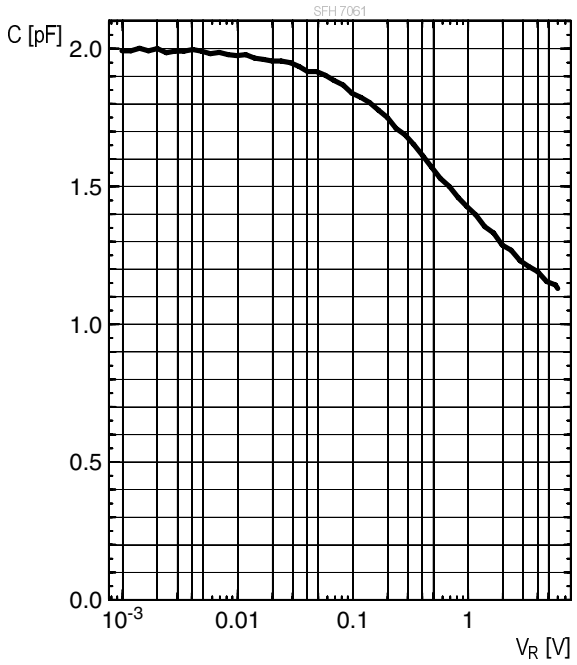
- photodiode: $I_R = f(V_R)$; $E = 0$



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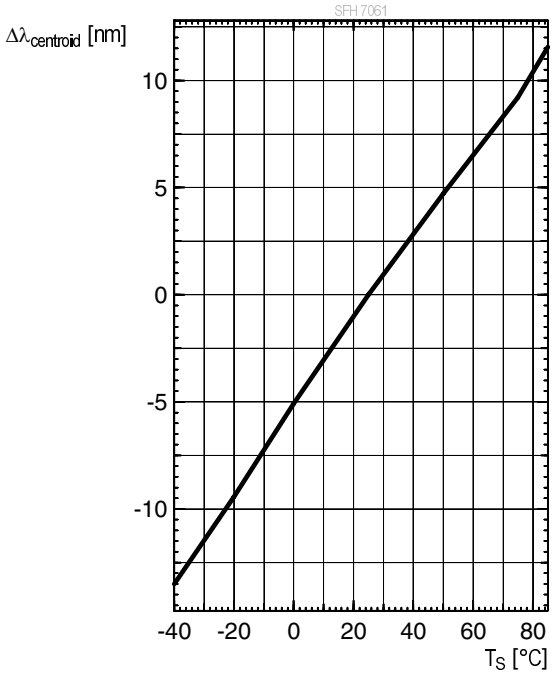
Capacitance [1], [2]

■ photodiode: C = f (V_R); f = 1MHz; E = 0; T_A = 25°C



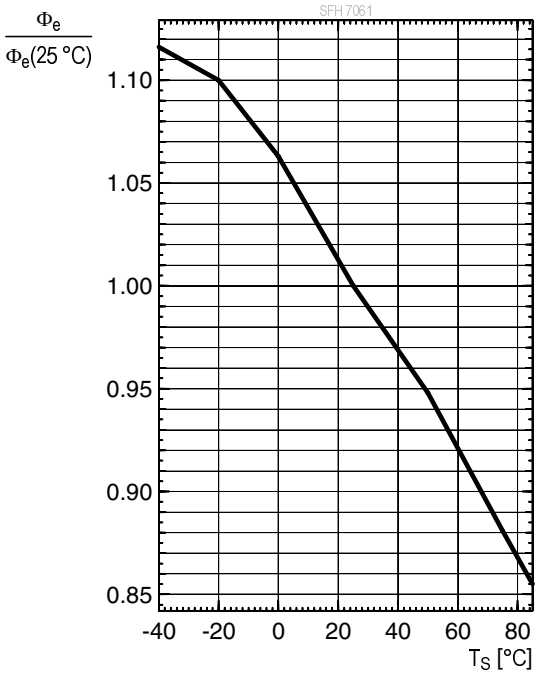
Centroid Wavelength [1]

● infrared (940 nm): $\lambda_{centroid}$ = f(T_S); I_F = 20mA; t_p = 20ms



Relative Total Radiant Flux [1]

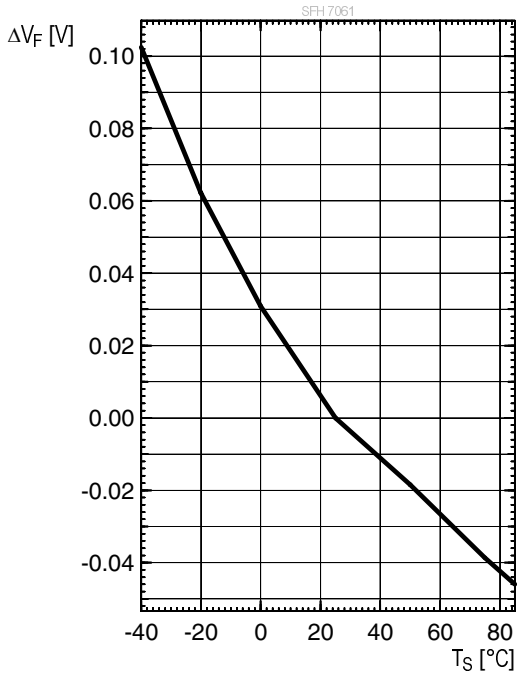
● infrared (940 nm): Φ_{rel} = f(T_S); I_F = 20mA; t_p = 20ms



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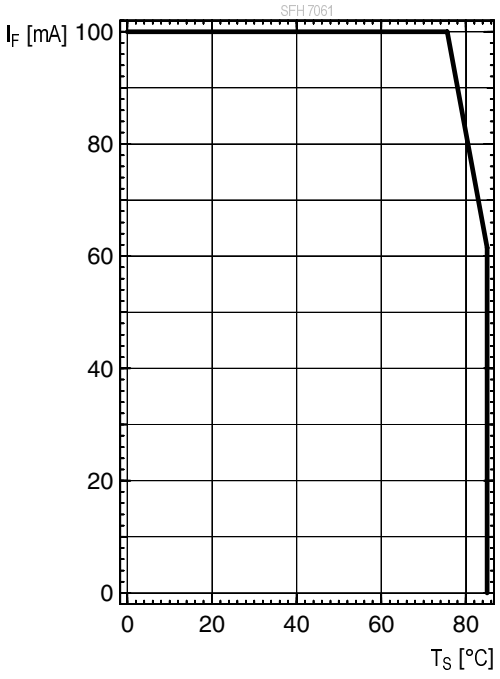
Forward Voltage [1)]

- infrared (940 nm): $V_F = f(T_S)$; I_F = 20mA; t_p = 20ms



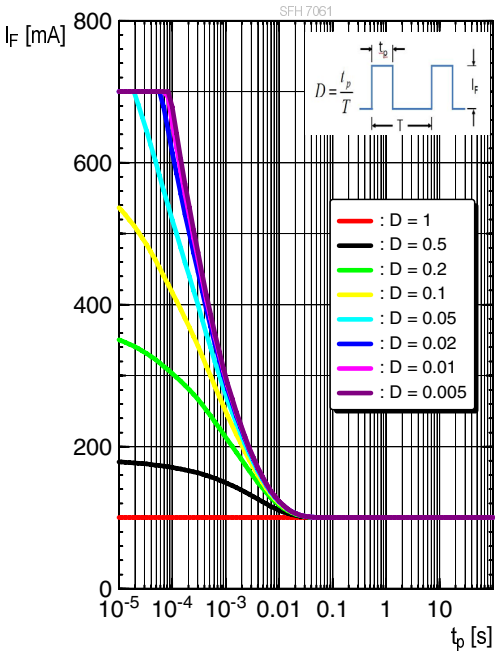
Max. Permissible Forward Current

- infrared (940 nm): $I_F = f(T_S)$; Rth_{js} = 145 K / W



Permissible Pulse Handling Capability

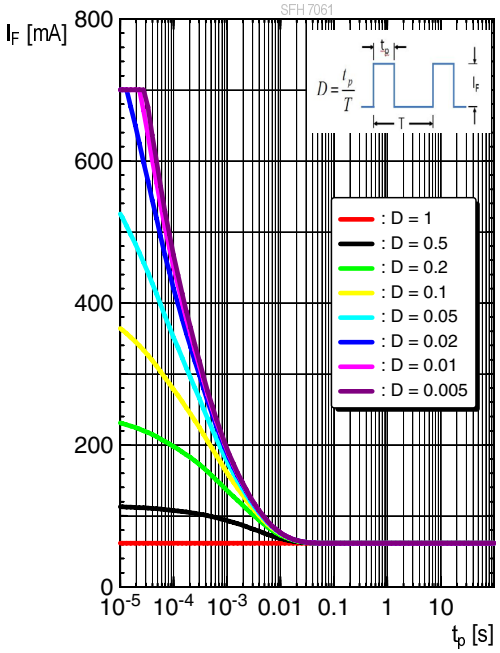
- infrared (940 nm): $I_F = f(t_p)$; D = parameter; T_S = 25 °C



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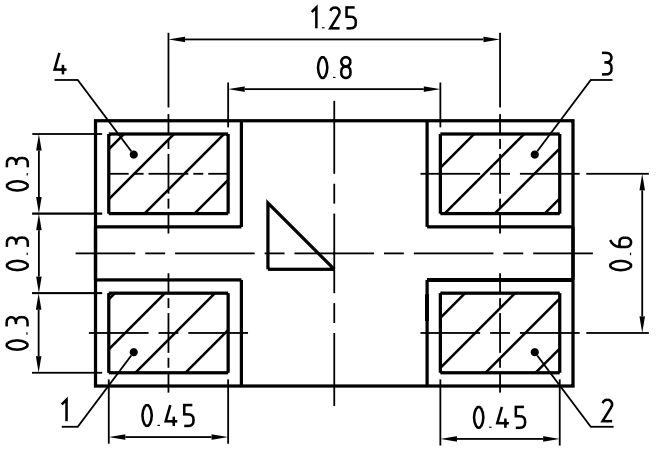
Permissible Pulse Handling Capability

- infrared (940 nm): $I_F = f(t_p)$; D = parameter; T_S = 85 °C

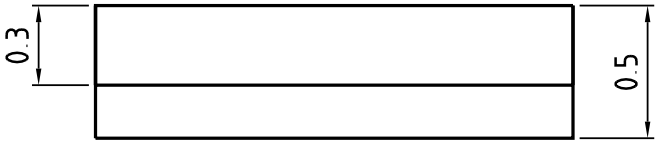


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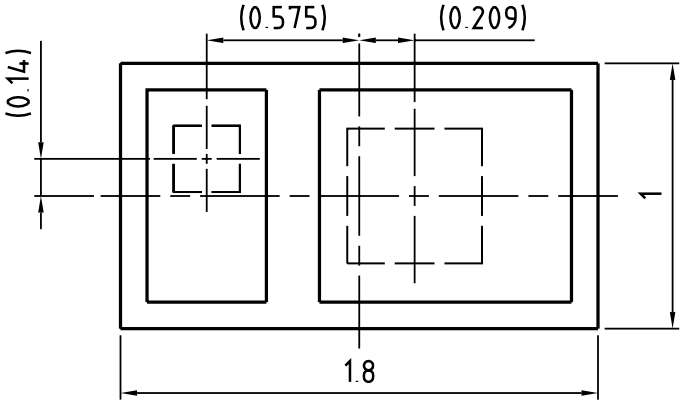
Dimensional Drawing [3)]



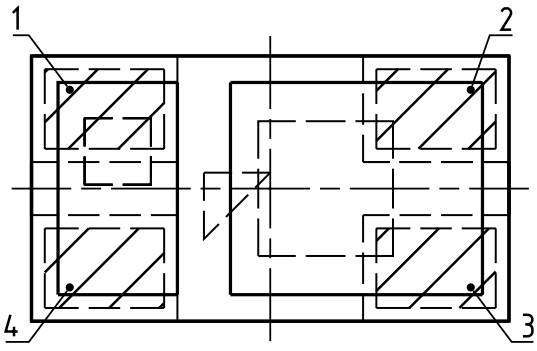
BOTTOM VIEW
(view from bottom)



SIDE VIEW



TOP VIEW

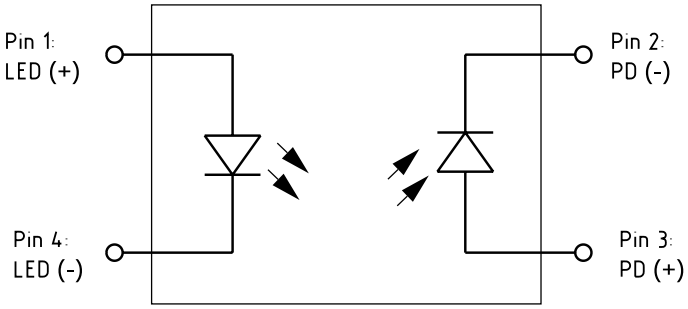


TOP VIEW /
Pad Info

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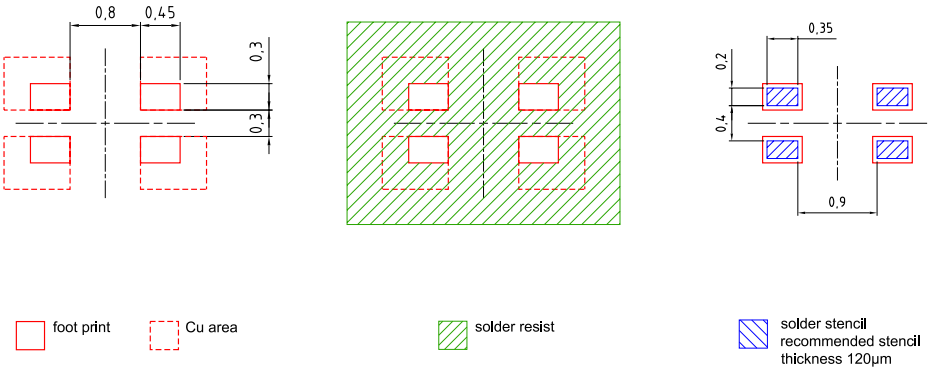
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Electrical Internal Circuit

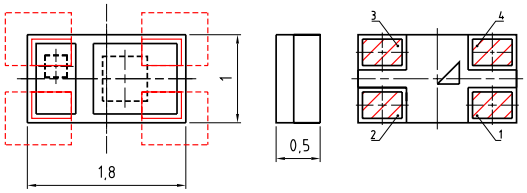


Pin	Description
1	LED (Anode)
2	PD (Cathode)
3	PD (Anode)
4	LED (Cathode)

Recommended Solder Pad [3)]



Component Location on Pad

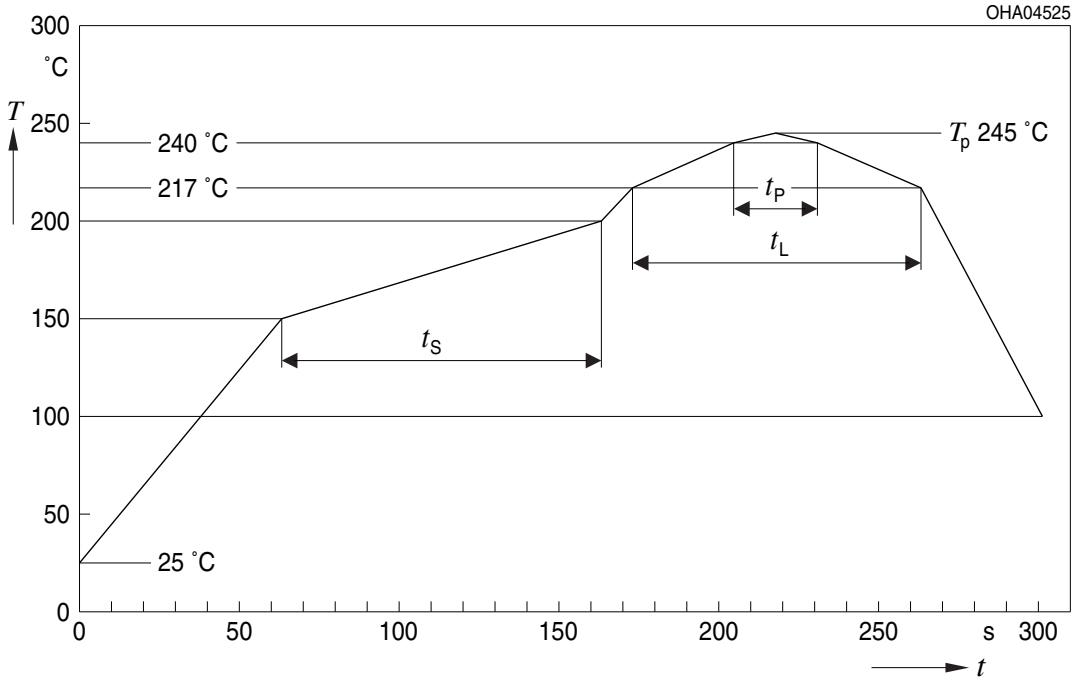


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Reflow Soldering Profile

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

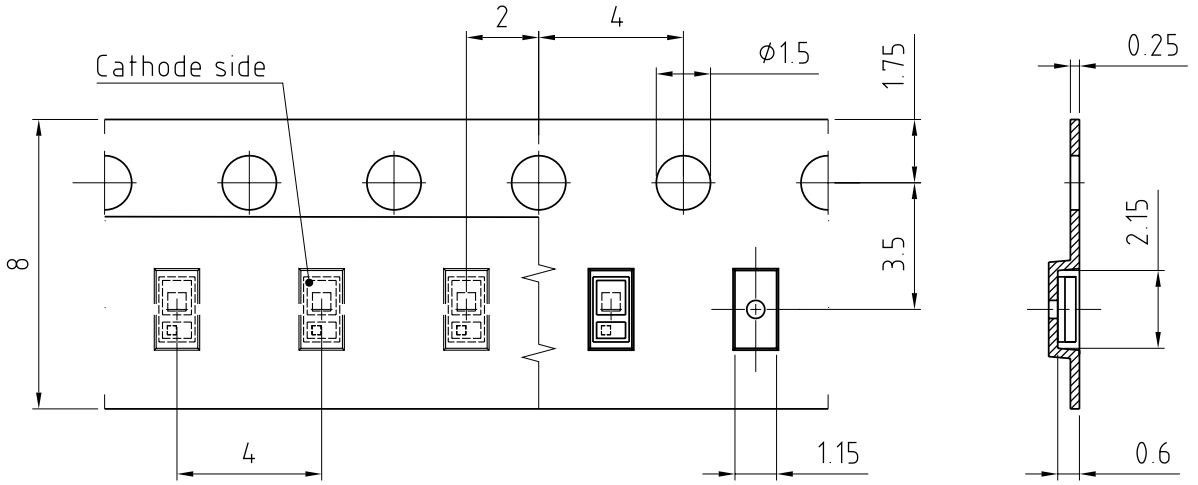


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time t_S T_{Smin} to T_{Smax}	t_S	60	100	120	s
Ramp-up rate to peak*) T_{Smax} to T_P			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature	t_L		80	100	s
Peak temperature	T_P		245	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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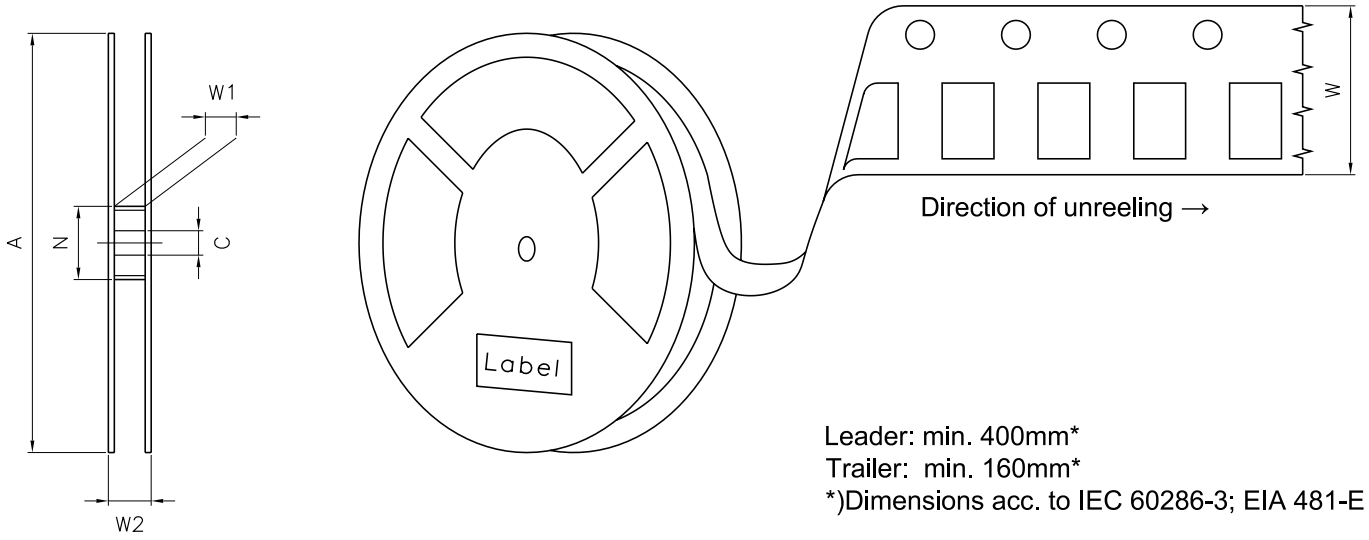
Taping [3)]



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Tape and Reel [4)]



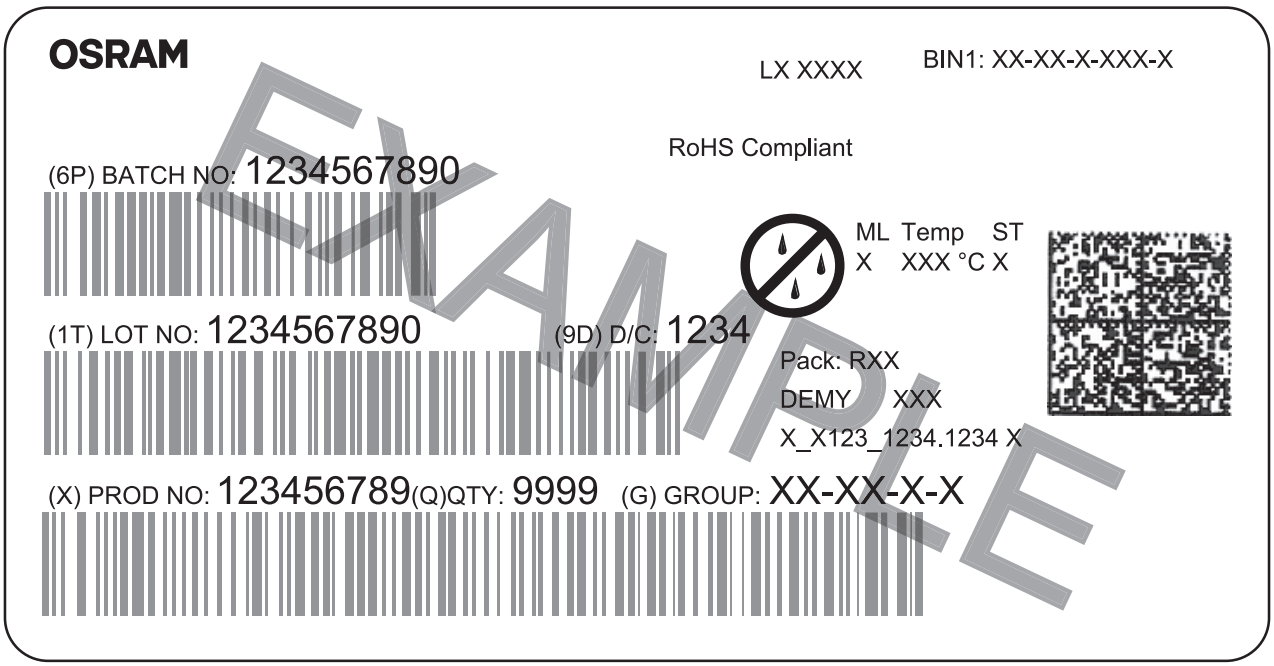
Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

Reel Dimensions

A	W	N_{min}	W_1	$W_{2\,max}$	Pieces per PU
180 mm	12 + 0.3 / - 0.1 mm	60 mm	12.4 + 2 mm	18.4 mm	3000

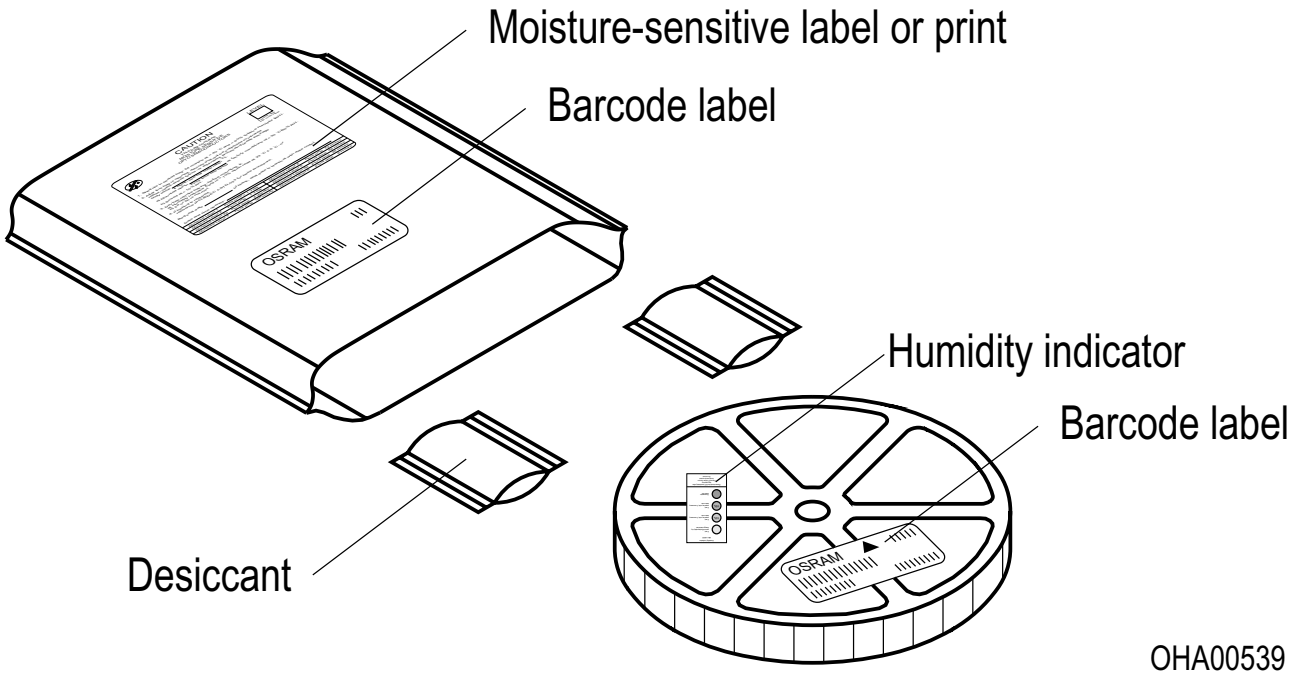
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Barcode-Product-Label (BPL)



OHA04563

Dry Packing Process and Materials [3)]



OHA00539

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Disclaimer

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 on our website.

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.

Product and functional safety devices/applications or medical devices/applications

Our components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.
Our products are not qualified at module and system level for such application.

In case buyer – or customer supplied by buyer – considers using our components in product safety devices/ applications or medical devices/applications, buyer and/or customer has to inform our local sales partner immediately and we and buyer and /or customer will analyze and coordinate the customer-specific request between us and buyer and/or customer.

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Glossary

1) **Typical Values**: Due to the special conditions of the manufacturing processes of semiconductor devices, 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.
2) **Testing temperature**: T_A = 25°C (unless otherwise specified)
3) **Tolerance of Measure**: Unless otherwise noted in drawing, tolerances are specified with ±0.1 and dimensions are specified in mm.
4) **Tape and Reel**: All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.
5) **Reverse Operation**: This product is intended to be operated applying a forward current within the specified range. Applying any continuous reverse bias or forward bias below the voltage range of light emission shall be avoided because it may cause migration which can change the electro-optical characteristics or damage the LED.
6) **Wavelength**: The wavelengths are measured with a tolerance of ±1 nm.
7) **Brightness**: The brightness values are measured with a tolerance of ±11%.
8) **Forward Voltage**: The forward voltages are measured with a tolerance of ±0.1 V.

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Revision History

Version	Date	Change
1.0	2025-12-05	Initial Version
1.1	2025-12-17	Brand
1.2	2025-12-19	Characteristics

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EU RoHS and China RoHS compliant product
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按照中国的相关法规和标准，
不含有毒有害物质或元素。

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