

Excellent Integrated System Limited

Stocking Distributor

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[OSRAM Opto Semiconductors, Inc.](#)
[SFH 4441](#)

For any questions, you can email us directly:

sales@integrated-circuit.com

Narrow beam LED in Mini MIDLED package (940 nm) Version 1.3

SFH 4441



Features:

- Highly Efficient Infrared LED
- Short switching times
- Narrow halfangle ($\pm 17^\circ$)
- Low profile component

Applications

- Sensor technology
- For control and drive circuits
- Proximity sensor
- Mobile devices

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	Ordering Code
	I_e [mW/sr] $I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	
SFH 4441	65 (≥ 25)	Q65111A4266

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

Version 1.3

SFH 4441

Maximum Ratings ($T_A = 25\text{ }^{\circ}\text{C}$)

Parameter	Symbol	Values	Unit
Operation and storage temperature range	$T_{op}; T_{stg}$	-40 ... 85	$^{\circ}\text{C}$
Reverse voltage	V_R	5	V
Forward current	I_F	100	mA
Surge current ($t_p = 300\text{ }\mu\text{s}$, $D = 0$)	I_{FSM}	1	A
Power consumption	P_{tot}	180	mW
ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	V_{ESD}	2	kV
Thermal resistance junction - ambient ^{1) page 13}	R_{thJA}	400	K / W
Thermal resistance junction - soldering point ^{2) page 13}	R_{thJS}	200	K / W

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

Parameter	Symbol	Values	Unit
Peak wavelength ($I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$)	λ_{peak}	950	nm
Centroid wavelength ($I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$)	$\lambda_{centroid}$	940	nm
Spectral bandwidth at 50% of I_{max} ($I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$)	$\Delta\lambda$	42	nm
Half angle	ϕ	± 17	$^{\circ}$
Dimensions of active chip area	L x W	0.3 x 0.3	mm x mm
Rise and fall time of I_e (10% and 90% of $I_{e\text{ max}}$) ($I_F = 100\text{ mA}$, $R_L = 50\text{ }\Omega$)	t_r, t_f	12	ns
Forward voltage ($I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$)	V_F	1.5 (≤ 1.8)	V
Forward voltage ($I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$)	V_F	2.3 (≤ 3)	V
Reverse current ($V_R = 5\text{ V}$)	I_R	not designed for reverse operation	μA
Total radiant flux ($I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$)	Φ_e	50	mW

Version 1.3

SFH 4441

Parameter	Symbol	Values	Unit
Temperature coefficient of I_e or Φ_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$)	TC_I	-0.5	% / K
Temperature coefficient of V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$)	TC_V	-1.3	mV / K
Temperature coefficient of wavelength ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$)	TC_λ	0.3	nm / K

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

Group	Min Radiant Intensity $I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$ $I_{e, \min}$ [mW / sr]	Max Radiant Intensity $I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$ $I_{e, \max}$ [mW / sr]	Typ Radiant Intensity $I_F = 1 \text{ A}$, $t_p = 25 \text{ } \mu\text{s}$ $I_{e, \text{typ}}$ [mW / sr]
SFH 4441-T	25	50	300
SFH 4441-U	40	80	480
SFH 4441-V	63	125	750
SFH 4441-AW	100	200	1200

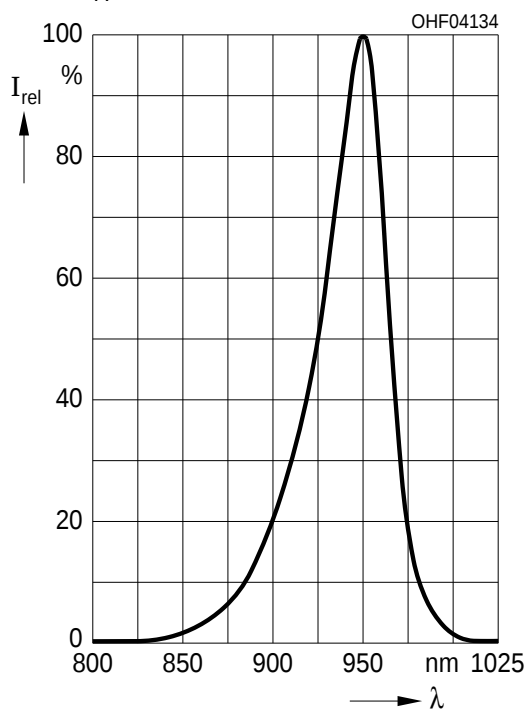
Note: measured at a solid angle of $\Omega = 0.01 \text{ sr}$
 Only one group in one packing unit (variation lower 2:1).

Version 1.3

SFH 4441

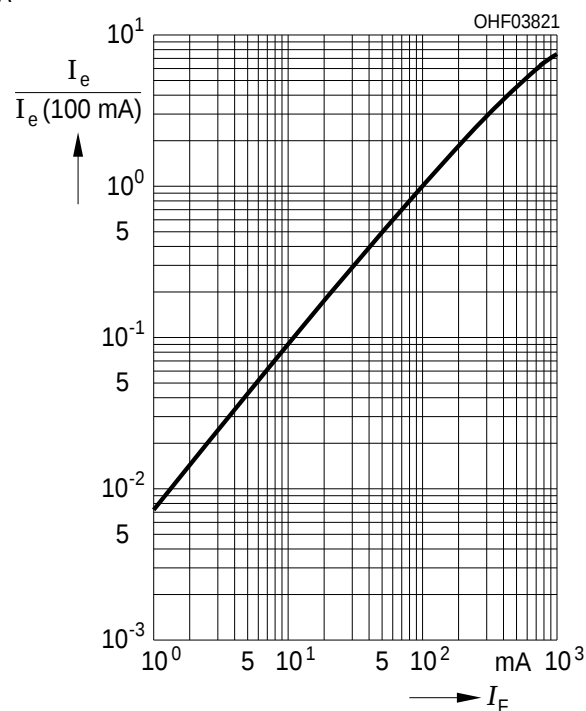
Relative Spectral Emission ^{3) page 13}

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



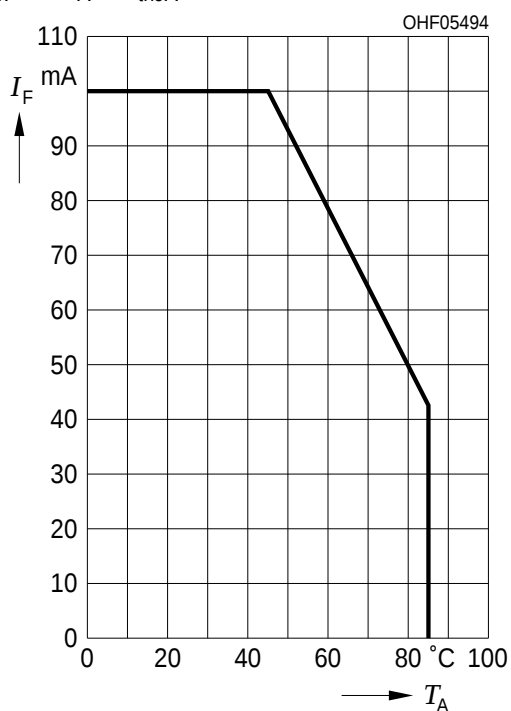
Radiant Intensity ^{3) page 13}

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



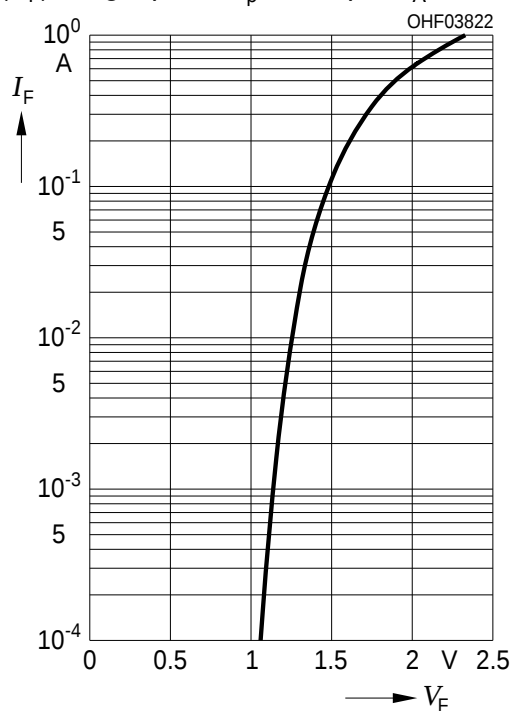
Max. Permissible Forward Current

$$I_{F, \text{max}} = f(T_A), R_{\text{thJA}} = 400 \text{ K/W}$$



Forward Current ^{3) page 13}

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

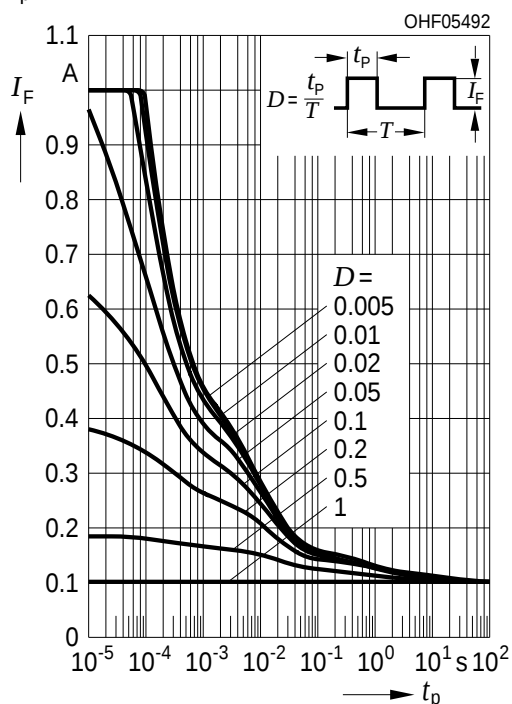


Version 1.3

SFH 4441

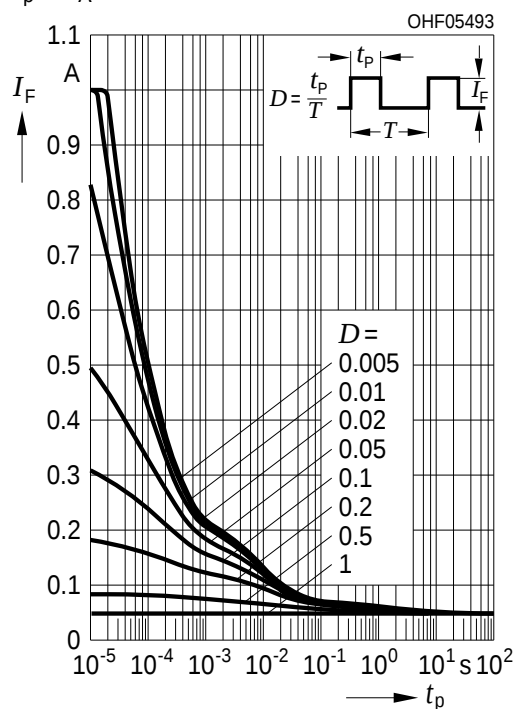
Permissible Pulse Handling Capability

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



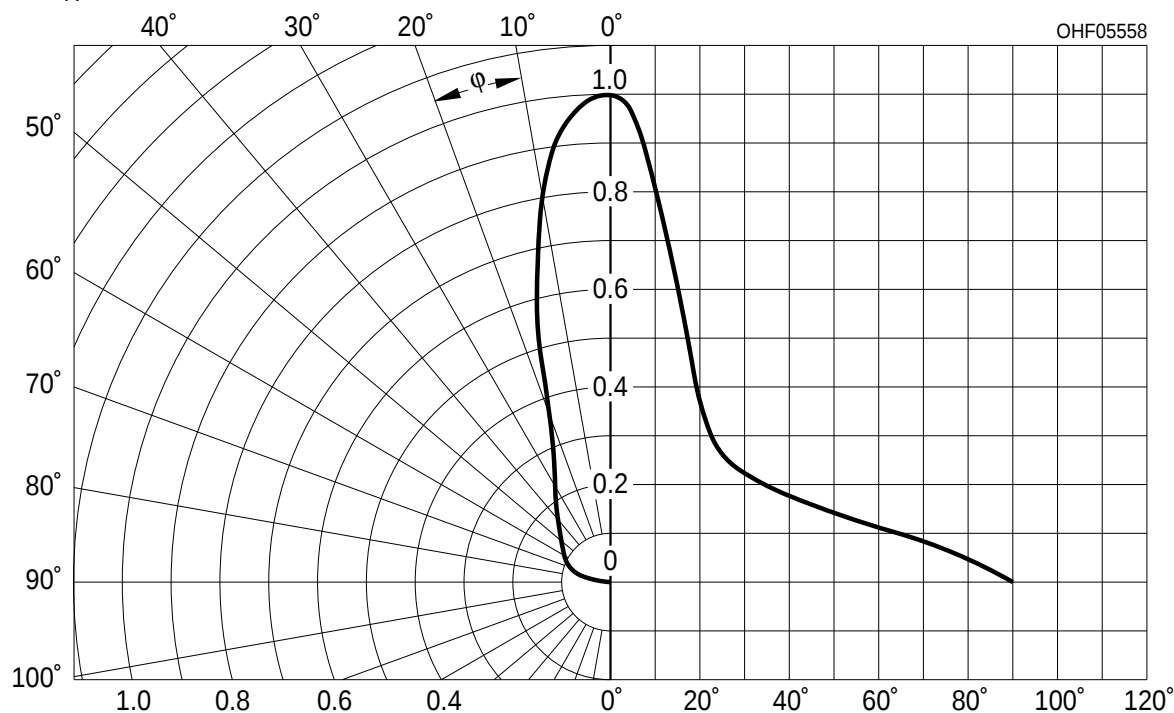
Permissible Pulse Handling Capability

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



Radiation Characteristics ^{3) page 13}

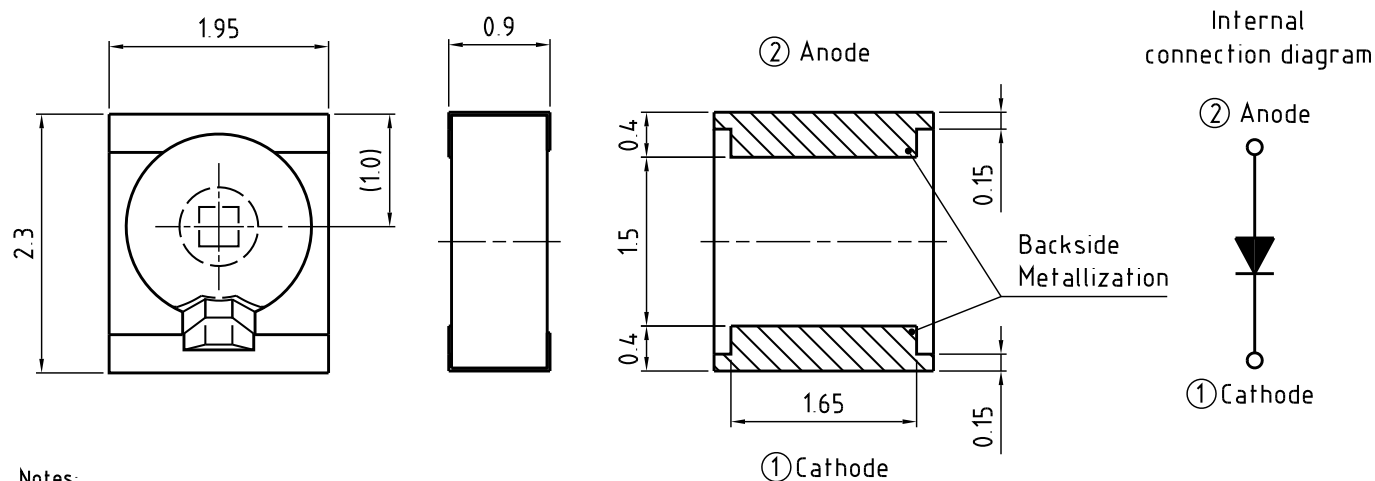
$I_{\text{rel}} = f(\phi)$, $T_A = 25^\circ\text{C}$



Version 1.3

SFH 4441

Package Outline



Notes:

1. Unspecified tolerance shall be ± 0.15
2. Dimension in parenthesis are shown for reference

C67062-A0032-A1-05

Dimensions in mm.

Package

Mini MIDLED, Silicone, colourless, clear

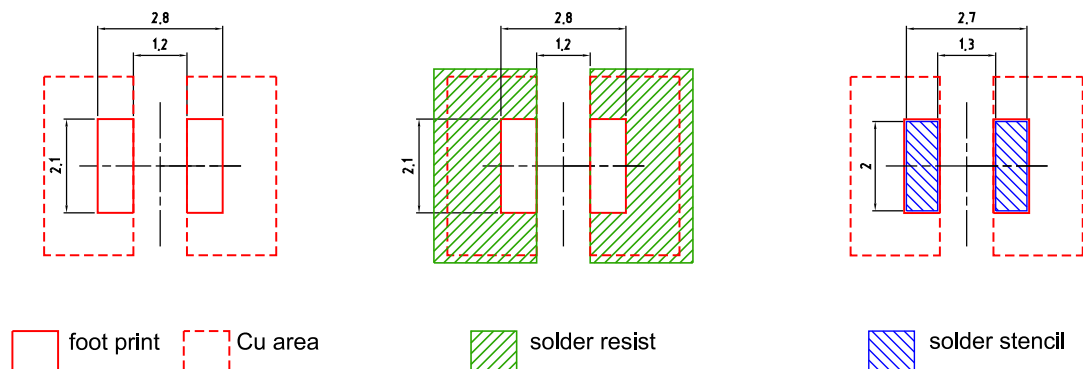
Approximate Weight:

10 mg

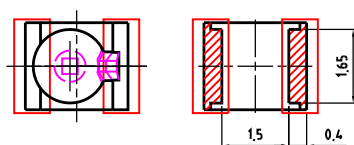
Version 1.3

SFH 4441

Recommended Solder Pad



Component Location on Pad



E062.3010.121 -02

Dimensions in mm (inch).

Handling indication

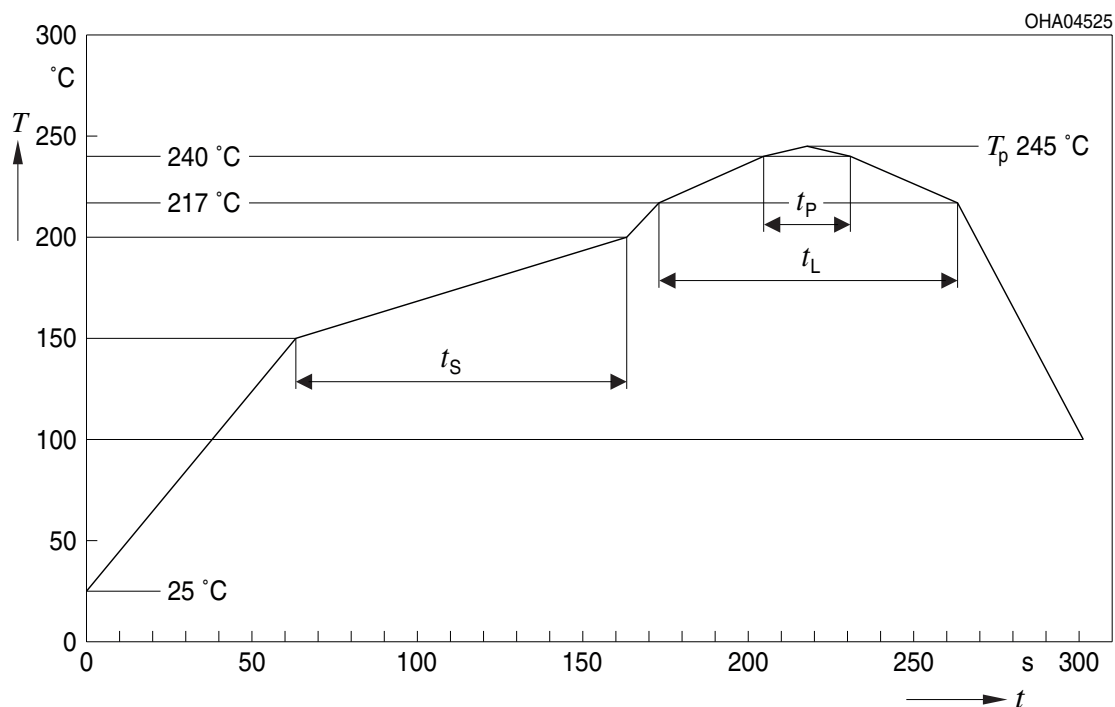
The package is casted with silicone. Mechanical stress at the surface of the unit should be as low as possible.

Version 1.3

SFH 4441

Reflow Soldering Profile

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



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

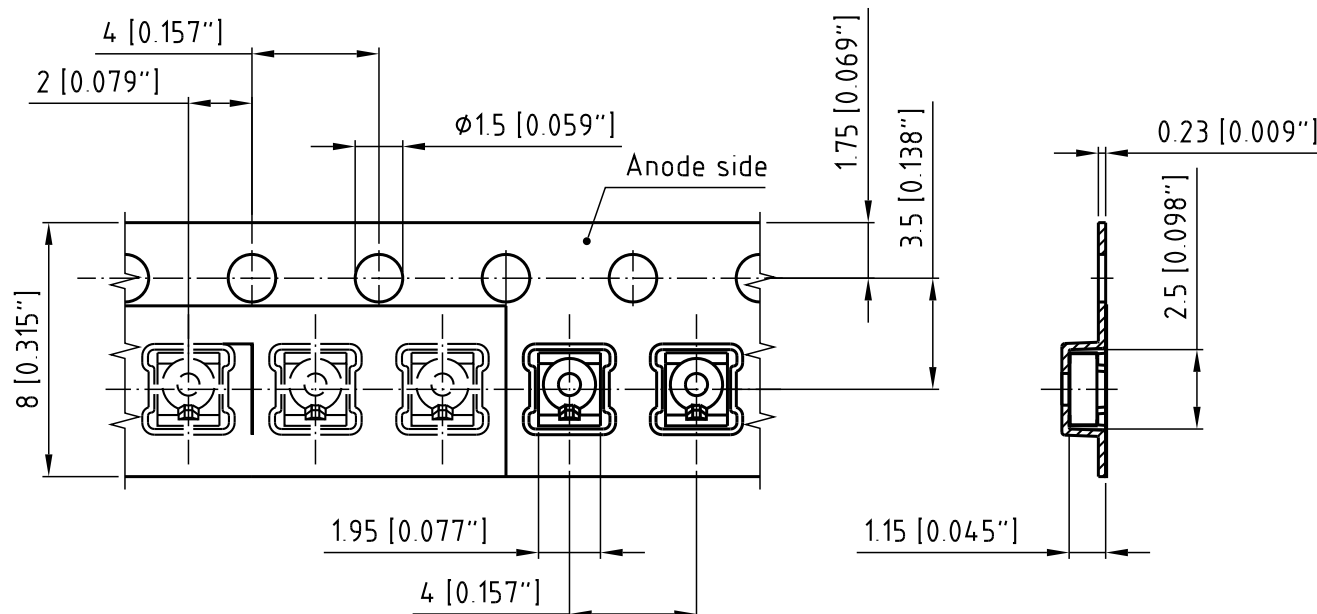
All temperatures refer to the center of the package, measured on the top of the component

* slope calculation DT/Dt: Dt max. 5 s; fulfillment for the whole T-range

Version 1.3

SFH 4441

Taping

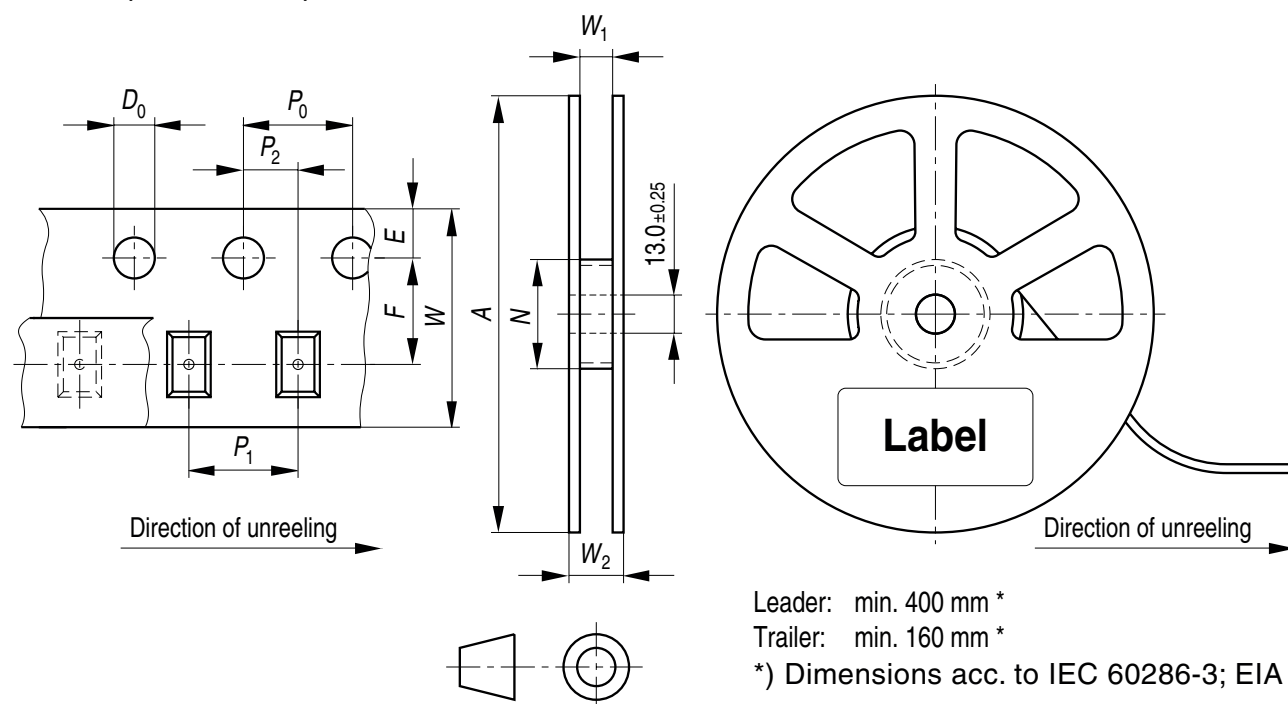


C67062-A0032-B6 -02

Dimensions in mm (inch).

Tape and Reel

8 mm tape with 3000 pcs. on $\phi 180$ mm reel



OHAY0324

Version 1.3

SFH 4441

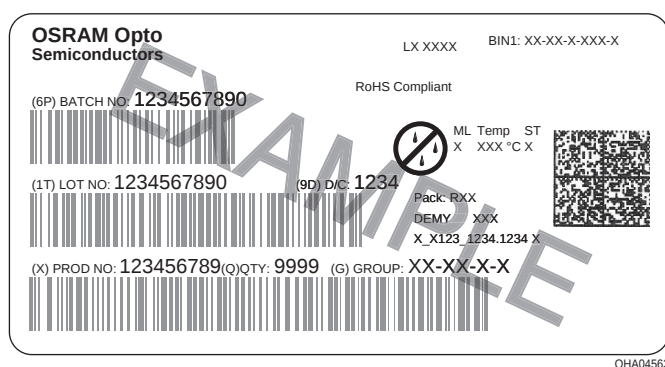
Tape dimensions [mm]

W	P ₀	P ₁	P ₂	D ₀	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

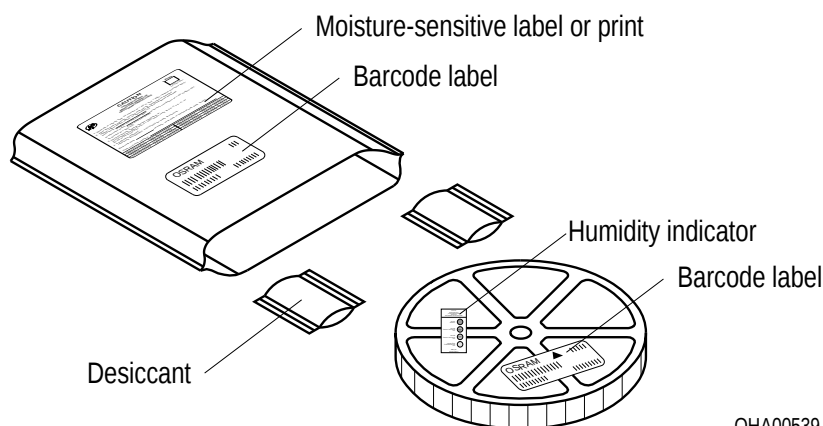
Reel dimensions [mm]

A	W	N _{min}	W ₁	W _{2max}
180	8	60	8.4 + 2	14.4

Barcode-Product-Label (BPL)



Dry Packing Process and Materials



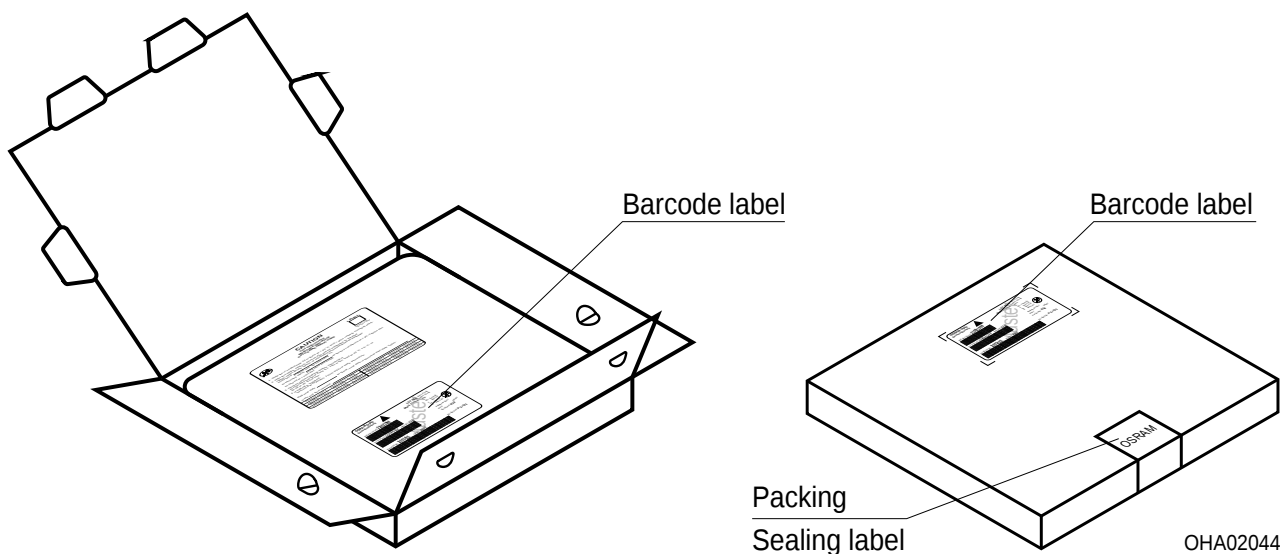
Note:

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.

Version 1.3

SFH 4441

Transportation Packing and Materials



Dimensions of transportation box in mm

Width	Length	Height
200 ± 5	195 ± 5	30 ± 5

Version 1.3

SFH 4441

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.

Version 1.3

SFH 4441

Glossary

- ¹⁾ **Thermal resistance:** junction -ambient, mounted on PC-board (FR4), padsize 16 mm² 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.

Version 1.3

SFH 4441

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