

# Infrared Emitter (850 nm) and green GaP-LED (570 nm) Version 1.3

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## SFH 7251



### Features:

- SMT package with IR emitter (850 nm) and green emitter (570 nm)
- Suitable for SMT assembly
- Available on tape and reel
- Emitter and detector can be controlled separately

### Applications

- Data transmission
- Remote control
- Infrared interface

### 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:	Package:	Ordering Code
SFH 7251	SMT Multi TOPLED®	Q65111A5040

**Maximum Ratings**

Parameter	Symbol	Values	Unit
Operating and storage temperature range	$T_{op}; T_{stg}$	-40 ... 100	°C
Reverse voltage	$V_R$	5	V
ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	$V_{ESD}$	2	kV
Thermal resistance junction - ambient, mounted on PC-board (FR4) <sup>1) page 14</sup>	$R_{thJA}$	700	K / W

**Emitter 1**

Forward current	$I_F$ (DC)	70	mA
Surge current ( $t_p \leq 10 \mu s$ , $D = 0$ )	$I_{FSM}$	0.7	A
Power consumption	$P_{tot}$	140	mW
Thermal resistance junction - ambient, mounted on PC-board (FR4) <sup>2) page 14</sup>	$R_{thJA}$	500	K / W

**Emitter 2**

Forward current	$I_F$ (DC)	50	mA
Surge current ( $t_p \leq 10 \mu s$ , $D = 0$ )	$I_{FSM}$	0.1	A
Power consumption	$P_{tot}$	135	mW
Thermal resistance junction - ambient, mounted on PC-board (FR4) <sup>2) page 14</sup>	$R_{thJA}$	500	K / W

**Note:** The stated maximum ratings refer to one chip, unless otherwise specified.

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

Parameter	Symbol	Values	Unit
<b>Emitter 1</b>			
Peak wavelength ( $I_F = 70 \text{ mA}$ , $t_p = 20 \text{ ms}$ )	(typ) $\lambda_{peak}$	860	nm
Centroid wavelength ( $I_F = 70 \text{ mA}$ , $t_p = 20 \text{ ms}$ )	(typ) $\lambda_{centroid}$	850	nm
Spectral bandwidth at 50% of $I_{max}$ ( $I_F = 70 \text{ mA}$ , $t_p = 20 \text{ ms}$ )	(typ) $\Delta\lambda$	30	nm
Half angle	(typ) $\varphi$	$\pm 60$	°

Parameter		Symbol	Values	Unit
Dimensions of active chip area	(typ)	L x W	0.2 x 0.2	mm x mm
Rise and fall time of $I_e$ ( 10% and 90% of $I_{e\max}$ ) ( $I_F = 70\text{ mA}$ , $R_L = 50\ \Omega$ )	(typ)	$t_r$ , $t_f$	12	ns
Forward voltage ( $I_F = 70\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ (max))	$V_F$	1.6 ( $\leq 2$ )	V
Forward voltage ( $I_F = 500\text{ mA}$ , $t_p = 100\ \mu\text{s}$ )	(typ (max))	$V_F$	2.4 ( $\leq 3$ )	V
Reverse current ( $V_R = 5\text{ V}$ )		$I_R$	not designed for reverse operation	$\mu\text{A}$
Total radiant flux ( $I_F = 70\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ)	$\Phi_e$	40	mW
Radiant intensity ( $I_F = 70\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ)	$I_{e, \text{typ}}$	12	mW/sr
Radiant intensity in axial direction ( $I_F = 70\text{ mA}$ , $t_p = 20\text{ ms}$ )	(min)	$I_{e, \text{min}}$	6.3	mW / sr
Temperature coefficient of $I_e$ or $\Phi_e$ ( $I_F = 70\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ)	$TC_I$	-0.5	% / K
Temperature coefficient of $V_F$ ( $I_F = 70\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ)	$TC_V$	-0.7	mV / K
Temperature coefficient of wavelength ( $I_F = 70\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ)	$TC_\lambda$	0.3	nm / K

## Emitter 2

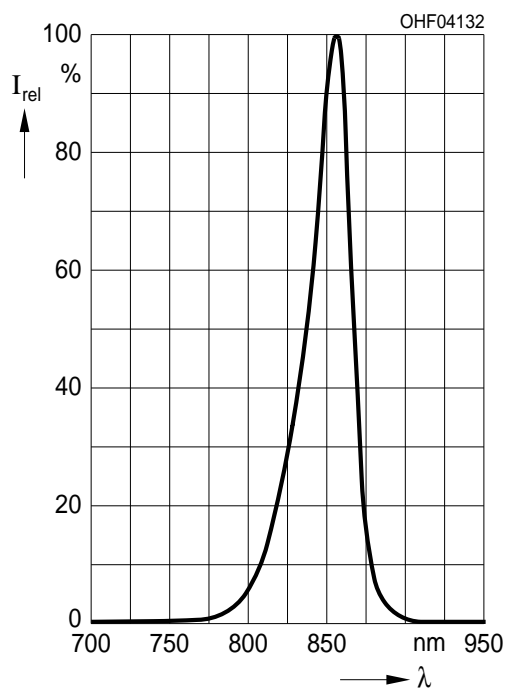
Peak emission wavelength ( $I_F = 20\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ)	$\lambda_{\text{peak}}$	572	nm
Dominant wavelength ( $I_F = 20\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ)	$\lambda_{\text{dom}}$	570	nm
Spectral bandwidth at 50% of $I_{\text{max}}$ ( $I_F = 20\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ)	$\Delta\lambda$	14	nm
Half angle	(typ)	$\varphi$	$\pm 60$	$^\circ$
Dimensions of active chip area	(typ)	L x W	0.3 x 0.3	mm x mm
Rise and fall times of $I_e$ ( 10% and 90% of $I_{e\max}$ ) ( $I_F = 20\text{ mA}$ , $R_L = 50\ \Omega$ )	(typ)	$t_r$ / $t_f$	400	ns
Forward voltage ( $I_F = 20\text{ mA}$ , $t_p = 20\text{ ms}$ )	(typ (max))	$V_F$	2.1 ( $\leq 2.5$ )	V
Reverse current ( $V_R = 12\text{ V}$ )	(typ (max))	$I_R$	0.2 ( $\leq 10$ )	$\mu\text{A}$

Parameter		Symbol	Values	Unit
Luminous intensity	(min)	$I_V$	> 63	mcd
Temperature coefficient of $I_e$ or $\Phi_e$ ( $I_F = 20$ mA, $t_p = 20$ ms)	(typ)	$TC_I$	-1.2	% / K
Temperature coefficient of $V_F$ ( $I_F = 20$ mA, $t_p = 20$ ms)	(typ)	$TC_V$	-1.3	mV / K
Temperature coefficient of wavelength ( $I_F = 20$ mA, $t_p = 20$ ms)	(typ)	$TC_\lambda$	0.3	nm / K
Temperature coefficient of $\lambda_{dom}$ ( $I_F = 20$ mA, $t_p = 20$ ms)	(typ)	$TC_{\lambda_{dom}}$	0.11	nm / K

## Diagrams Emitter 1

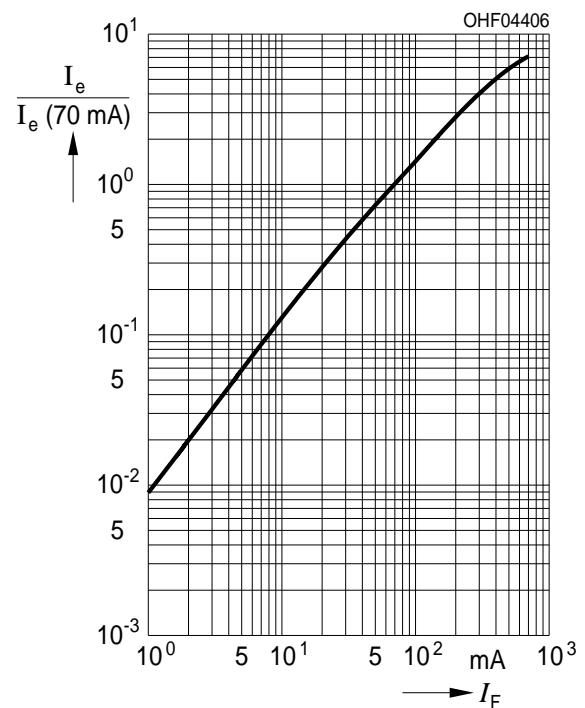
### Relative Spectral Emission <sup>3) page 14</sup>

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



### Radiant Intensity <sup>3) page 14</sup>

$I_e / I_e(70 \text{ mA}) = f(I_F)$ , single pulse,  $t_p = 25 \mu\text{s}$ ,  
 $T_A = 25^\circ\text{C}$



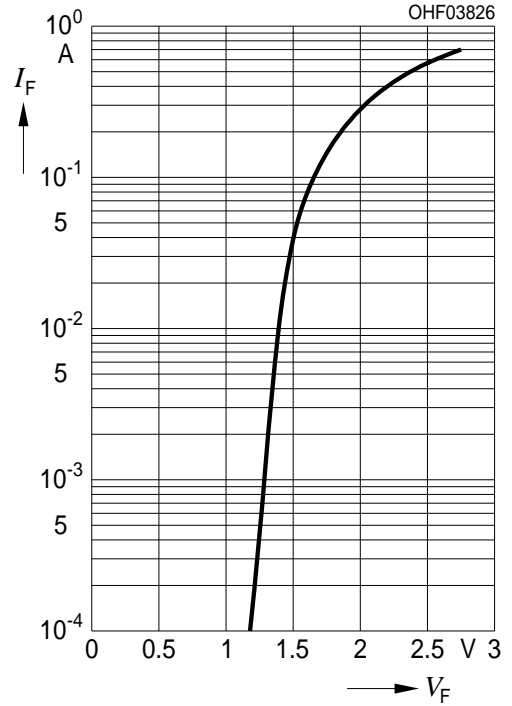
**Max. Permissible Forward Current**

$I_{F,max} = f(T_A)$



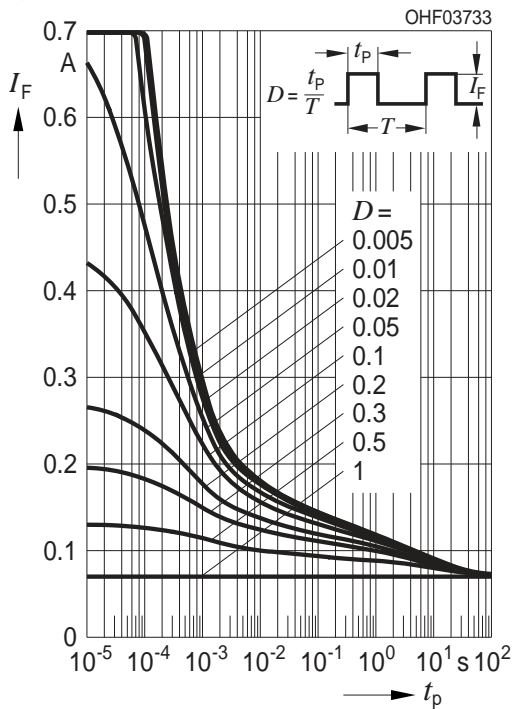
**Forward Current** <sup>3) page 14</sup>

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



**Permissible Pulse Handling Capability**

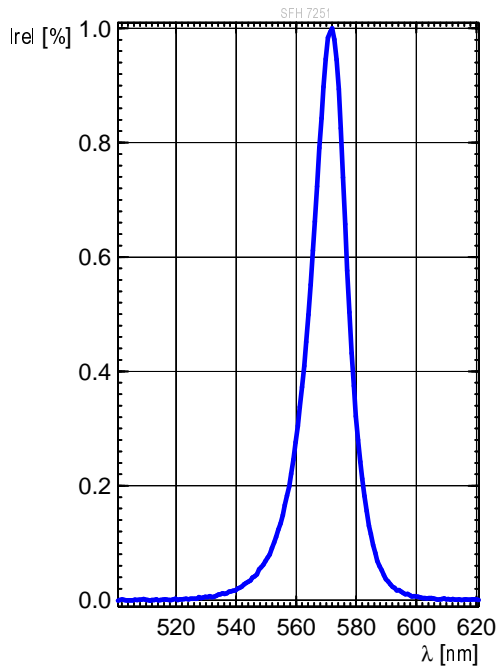
$I_F = f(t_p)$ ,  $T_A = 25^\circ C$ , duty cycle  $D =$  parameter



**Diagrams**  
**Emitter 2**

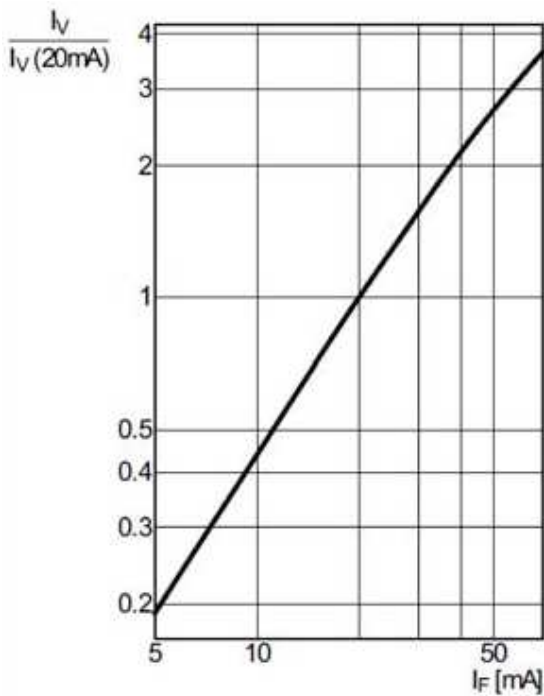
**Relative Spectral Emission** <sup>3) page 14</sup>

$I_{rel} = f(\lambda); T_A = 25\text{ °C}; I_F = 20\text{ mA}$



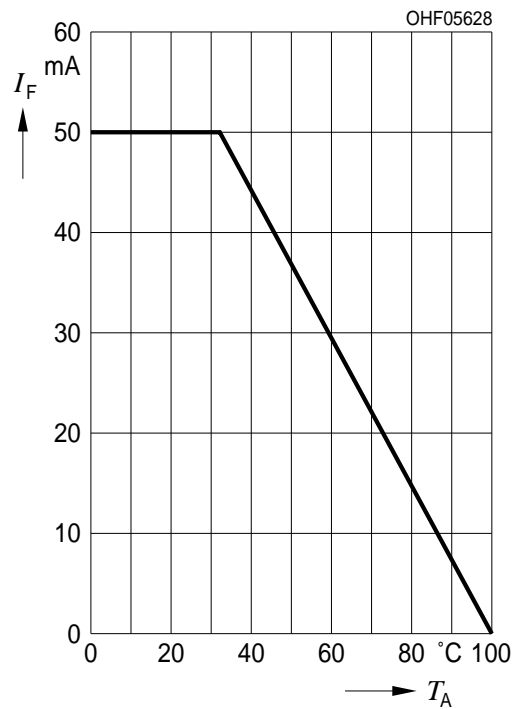
**Relative Luminous Intensity** <sup>3) page 14</sup>

$I_V / I_V(20\text{ mA}) = f(I_F), T_A = 25\text{ °C}$



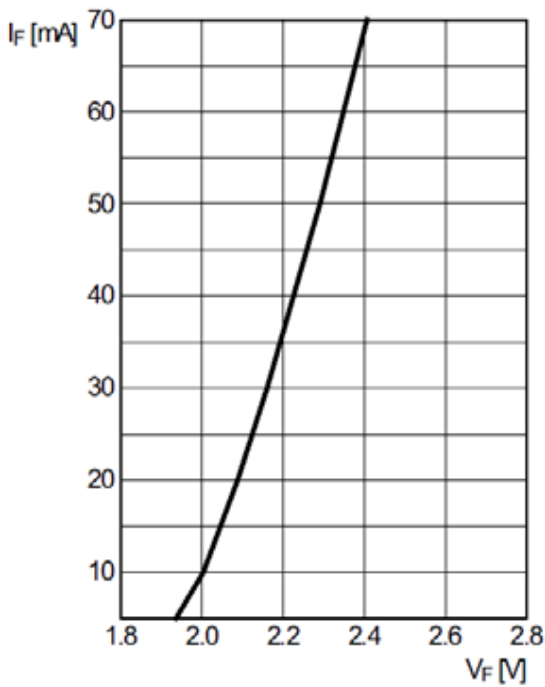
**Max. Permissible Forward Current**

$I_{F, max} = f(T_A)$



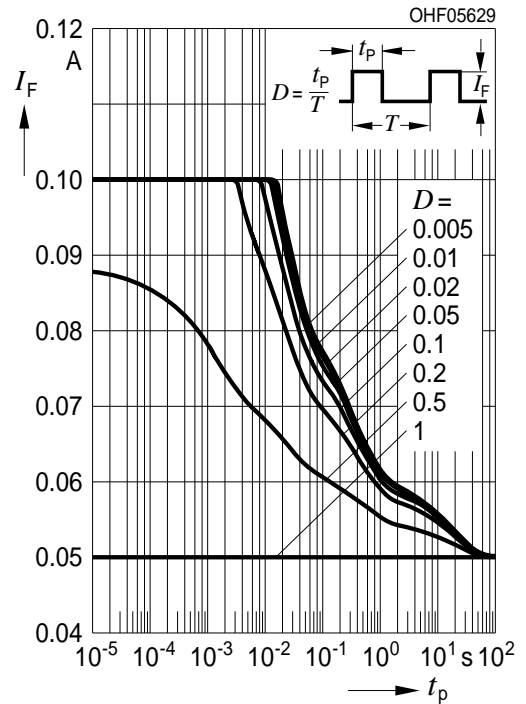
**Forward Current** <sup>3) page 14</sup>

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

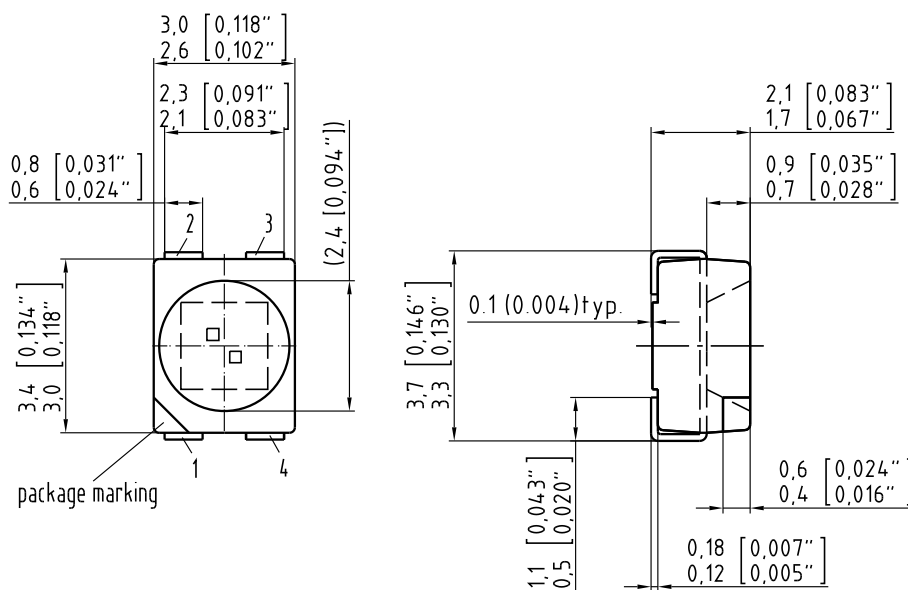


**Permissible Pulse Handling Capability**

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



**Package Outline**



Dimensions in mm (inch).

C63062-A4.175-A1-02

## Pinning

Pin	Description
1	Cathode Emitter 1 (850nm)
2	Anode Emitter 1 (850nm)
3	Cathode Emitter 2 (570nm)
4	Anode Emitter 2 (570nm)

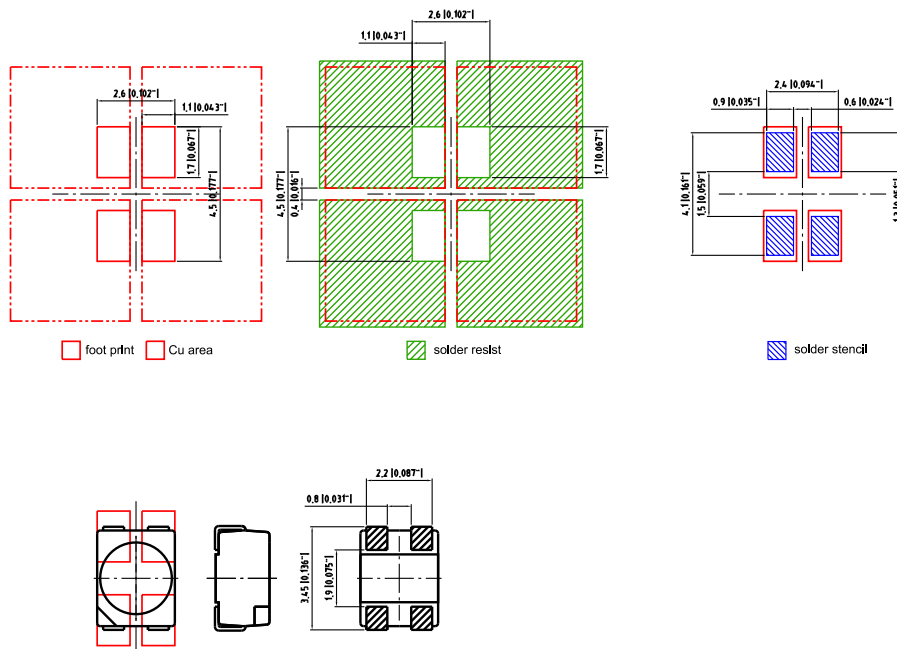
## Package

SMT Multi TOPLED

## Approximate Weight:

34 mg

## Recommended Solder Pad



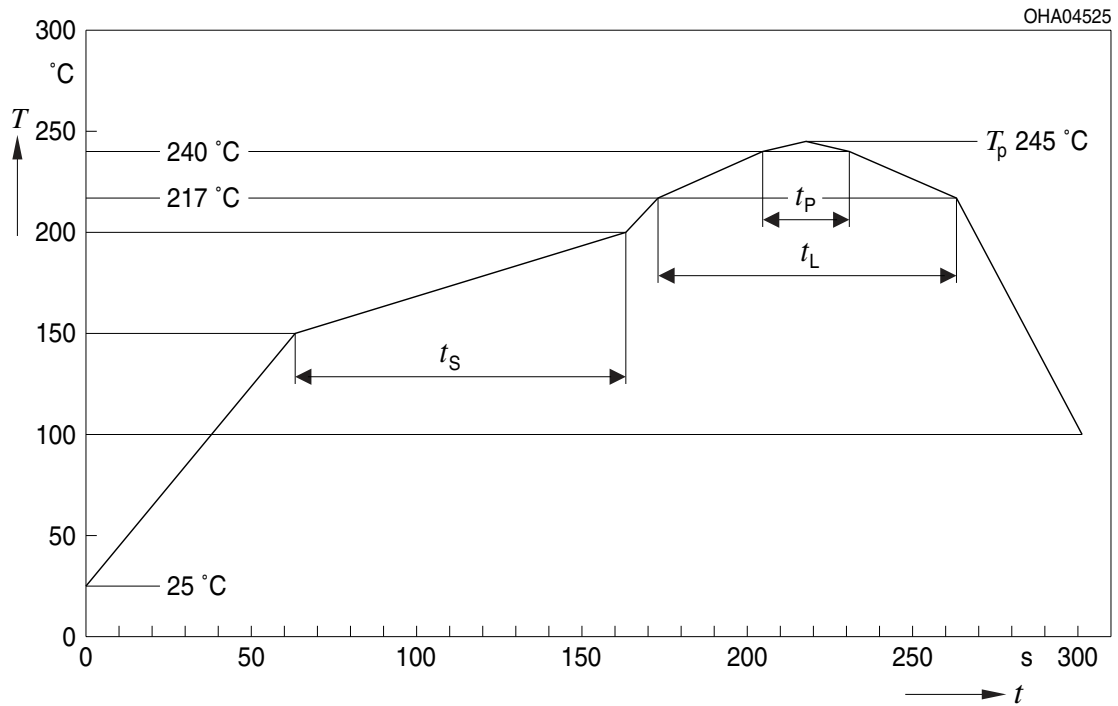
*Dimensions in mm (inch).*

E062.3010.14.8 -01



### Reflow Soldering Profile

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



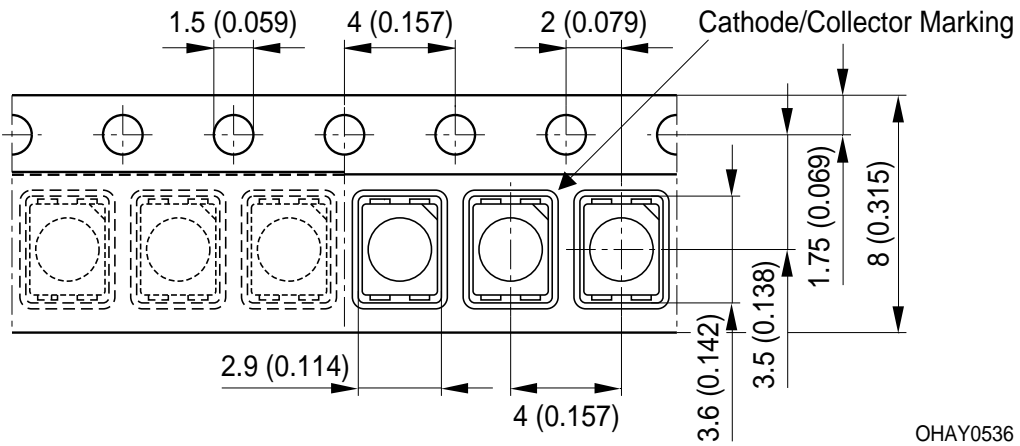
OHA04612

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

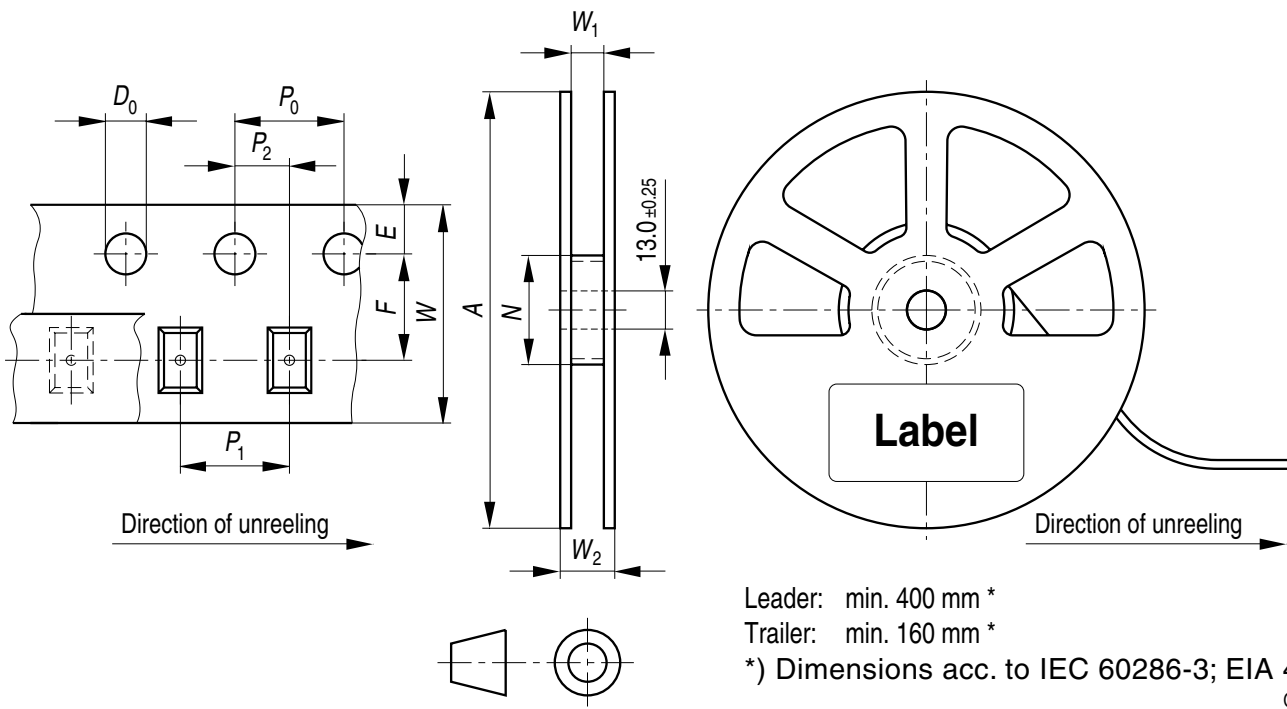


OHAY0536

Dimensions in mm (inch).

Tape and Reel

8 mm tape with 2000 pcs. on  $\varnothing$  180 mm reel, 8000 pcs. on  $\varnothing$  330 mm reel



Leader: min. 400 mm \*  
 Trailer: min. 160 mm \*  
 \*) Dimensions acc. to IEC 60286-3; EIA 481-D  
 OHAY0324

## Tape dimensions [mm]

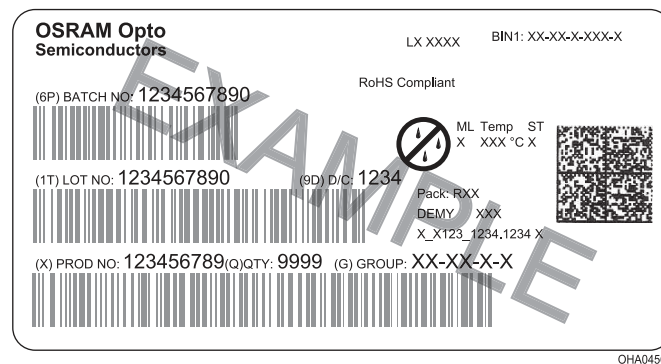
W	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	D <sub>0</sub>	E	F
8 + 0.3 / -0.1	4 ± 0.1	2 ± 0.05 or 4 ± 0.1	2 ± 0.05	1.5 ± 0.1	1.75 ± 0.1	3.5 ± 0.05

## Reel dimensions [mm]

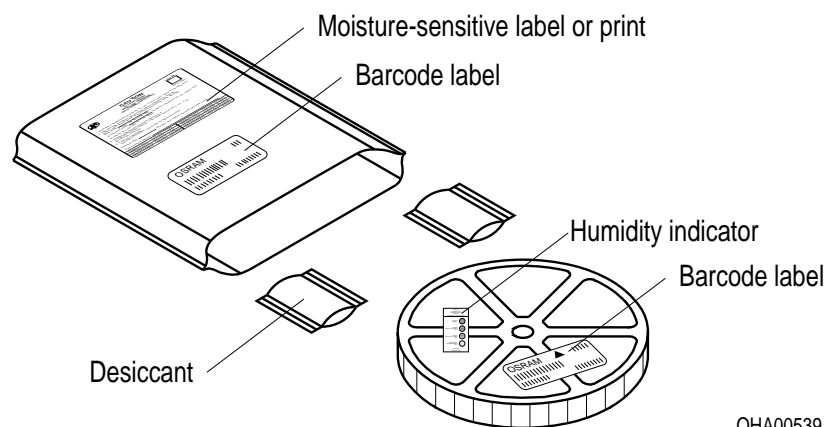
A	W	N <sub>min</sub>	W <sub>1</sub>	W <sub>2max</sub>
180	8	60	8.4 + 2	14.4

A	W	N <sub>min</sub>	W <sub>1</sub>	W <sub>2max</sub>
330	8	60	8.4 + 2	14.4

## Barcode-Product-Label (BPL)



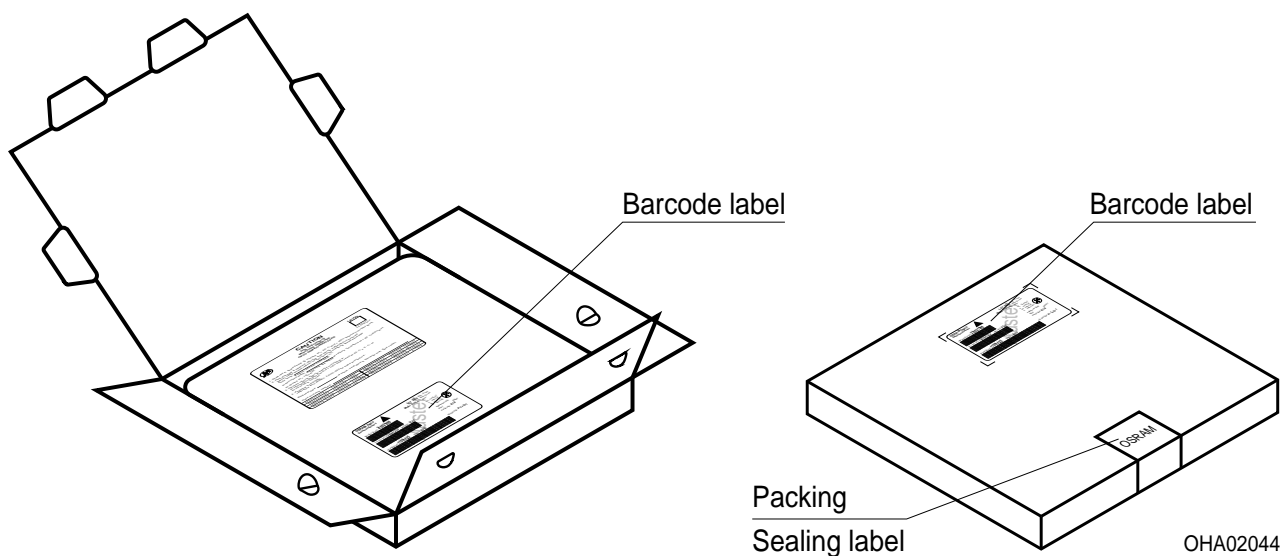
## Dry Packing Process and Materials



## 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.

## Transportation Packing and Materials



## Dimensions of transportation box in mm

Width	Length	Height
$200 \pm 5$ / $352 \pm 5$	$195 \pm 5$ / $352 \pm 5$	$30 \pm 5$ / $33 \pm 5$

**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) both chips on
- 2) only one chip on
- 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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