

High Power Infrared Emitter (940 nm)

Version 1.3

SFH 4140



Features:

- High Power Infrared LED (55mW)
- Halfangle ($\pm 25^\circ$)
- Low profile component
- Sidelooker
- to be recessed into PCB

Applications

- Data transmission
- Remote control
- Light barriers

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] $I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	Ordering Code
SFH 4140	50 (≥ 25)	Q65111A4190

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

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

Parameter	Symbol	Values	Unit
Operation and storage temperature range	$T_{\text{op}}; T_{\text{stg}}$	-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}	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	R_{thJA}	450	K / W
Thermal resistance junction - solder point	R_{thJS}	200	K / W
Thermal resistance junction - ambient ^{1) page 12}	R_{thJA}	450	K / W
Thermal resistance junction - soldering point ^{2) page 12}	R_{thJS}	200	K / W

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

Parameter	Symbol	Values	Unit
Peak wavelength ($I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$)	(typ)	λ_{peak}	950 nm
Centroid wavelength ($I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$)	(typ)	$\lambda_{\text{centroid}}$	940 nm
Spectral bandwidth at 50% of I_{max} ($I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$)	(typ)	$\Delta\lambda$	42 nm
Half angle	(typ)	Φ	± 25 °
Dimensions of active chip area	(typ)	L x W	0.3 x 0.3 mm x mm
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 $I_{e\text{ max}}$) ($I_F = 100 \text{ mA}, R_L = 50 \Omega$)	(typ)	t_r, t_f	12 ns
Forward voltage ($I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$)	(typ (max))	V_F	1.5 (≤ 1.8) V
Forward voltage ($I_F = 1 \text{ A}, t_p = 100 \mu\text{s}$)	(typ (max))	V_F	2.3 (≤ 3) V
Reverse current ($V_R = 5 \text{ V}$)	I_R	not designed for reverse operation	µA
Total radiant flux ($I_F=100 \text{ mA}, t_p=20 \text{ ms}$)	(typ)	Φ_e	55 mW

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

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

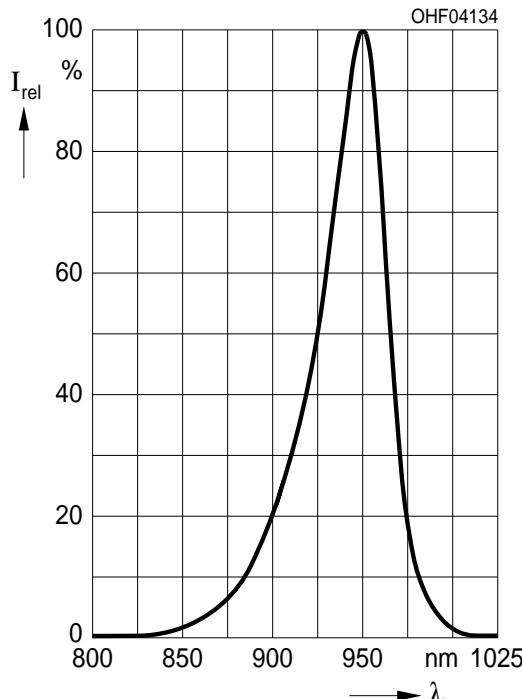
Group	Min Radiant Intensity $I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	Max Radiant Intensity $I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	Typ Radiant Intensity $I_F = 1 \text{ A}, t_p = 25 \mu\text{s}$
	$I_{e, \min} [\text{mW / sr}]$	$I_{e, \max} [\text{mW / sr}]$	$I_{e, \text{typ}} [\text{mW / sr}]$
SFH 4140-T	25	50	260
SFH 4140-U	40	80	420

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

Only one group in one packing unit (variation lower 2:1).

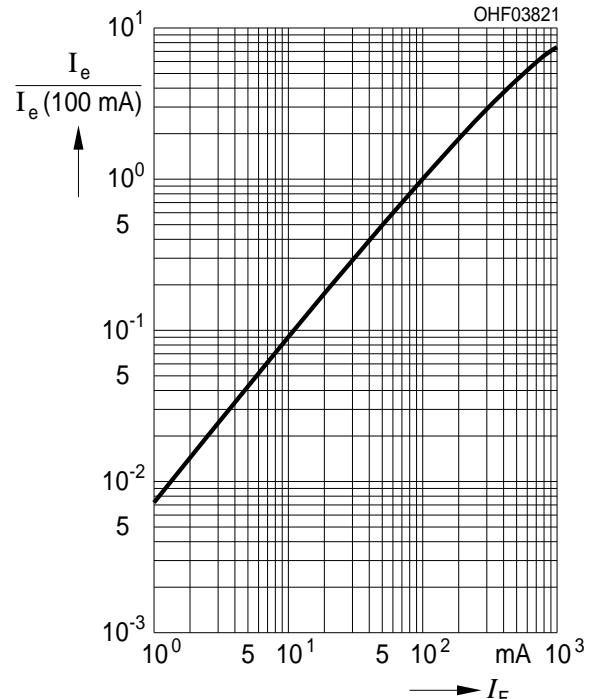
Relative Spectral Emission ^{3) page 12}

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



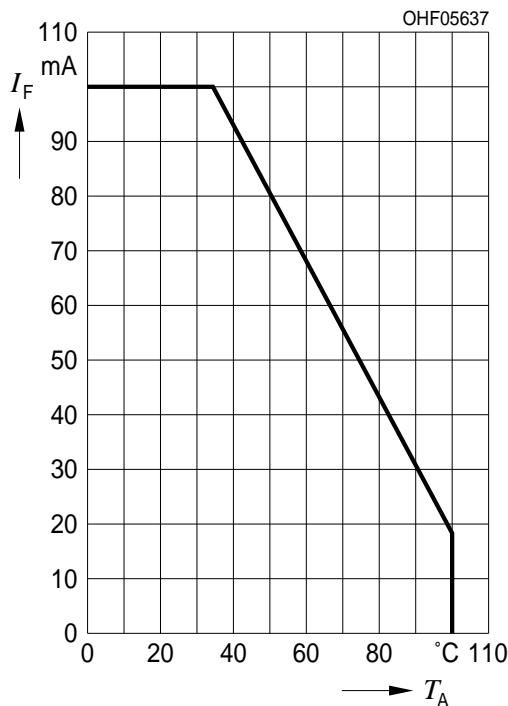
Radiant Intensity ^{3) page 12}

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

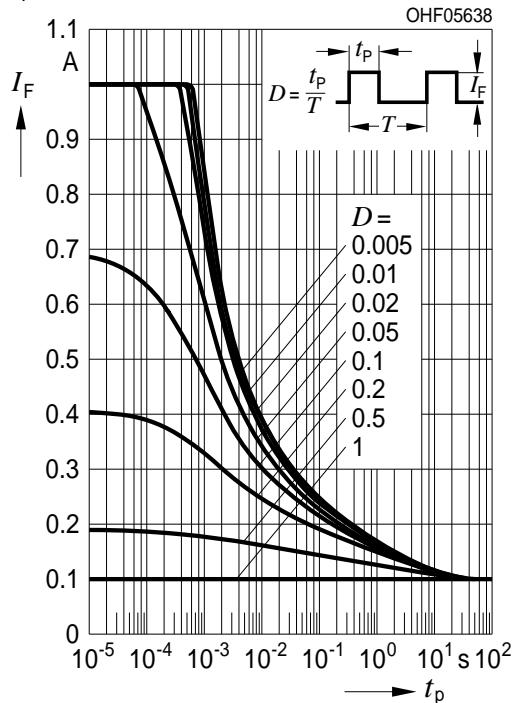


Max. Permissible Forward Current

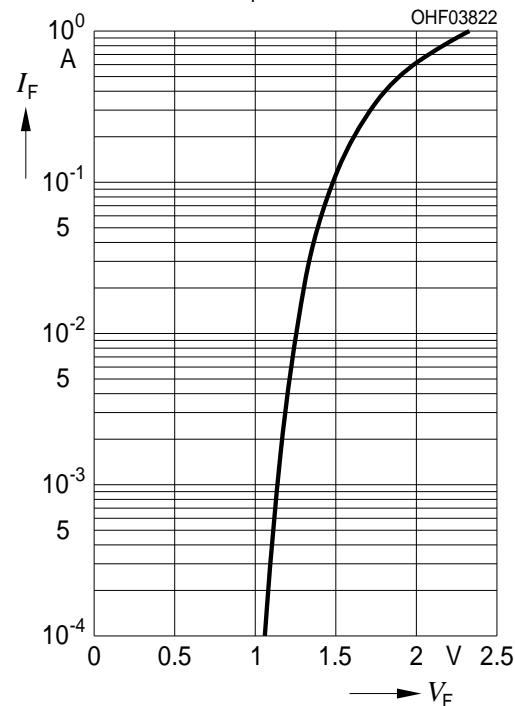
$$I_{F,\max} = f(T_A), R_{thJA} = 450 \text{ K / W}$$



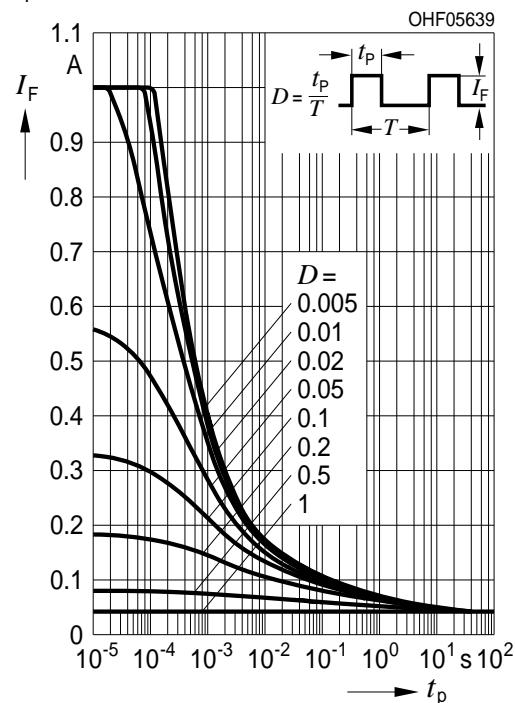
Permissible Pulse Handling Capability
 $I_F = f(t_p)$, $T_A = 25^\circ\text{C}$, duty cycle D = parameter

**Forward Current** ^{3) page 12}

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

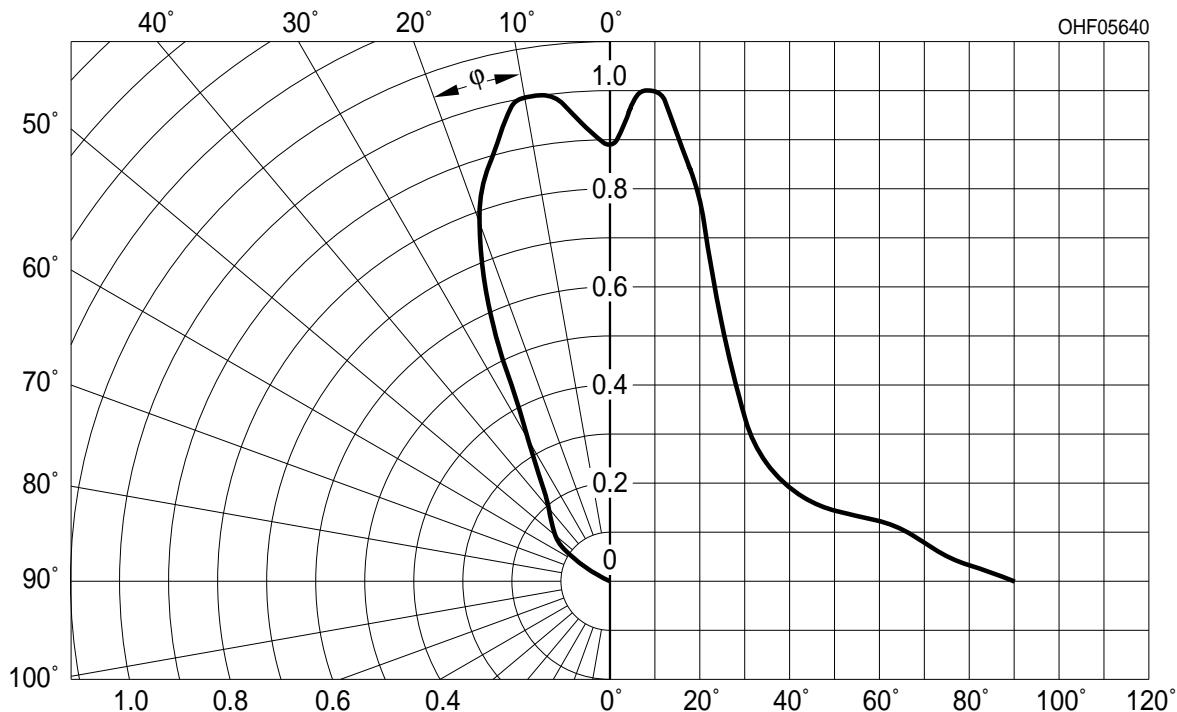
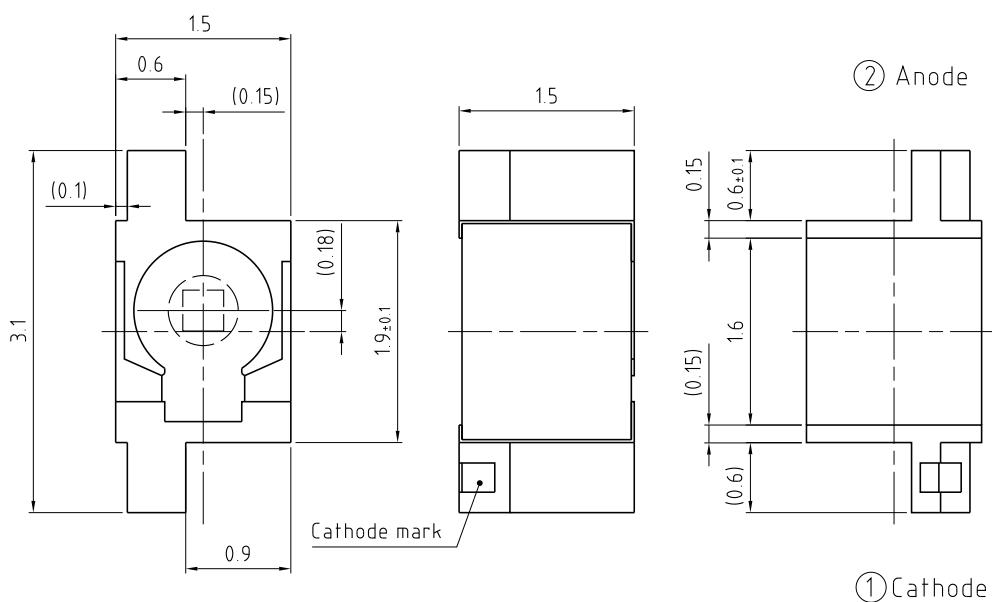


Permissible Pulse Handling Capability
 $I_F = f(t_p)$, $T_A = 85^\circ\text{C}$, duty cycle D = parameter



Radiation Characteristics 3) page 12

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

**Package Outline**

Notes:

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

C67062-A4196-A1-04

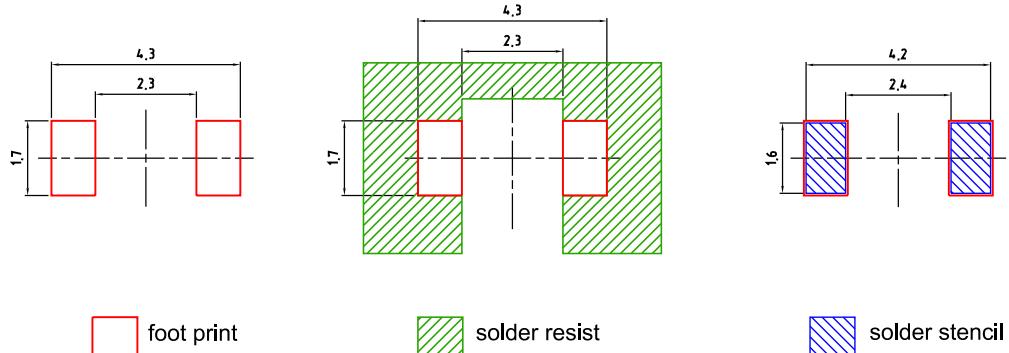
Dimensions in mm.

Package

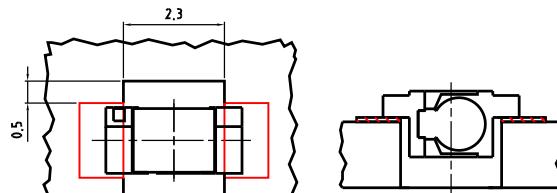
T-MIDLED, Silicone, colourless, clear

Approximate Weight:

10 mg

Recommended Solder Pad

Component Location on Pad



E062.3010.133 -04

*Dimensions in mm (inch).***Handling indication**

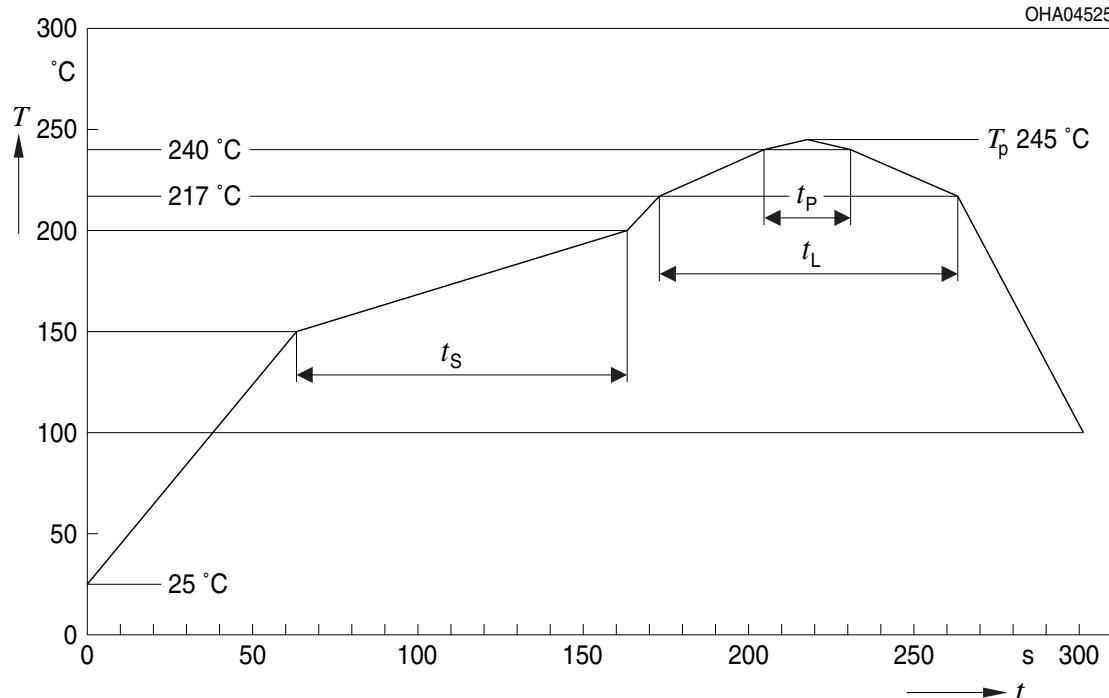
The package is casted with silicone. Mechanical stress at the surface of the unit should be avoided.

Note:

cathode marking: marking on bevelled T-wing

Reflow Soldering Profile

Product complies to MSL Level 3 acc. to JEDEC J-STD-020D.01

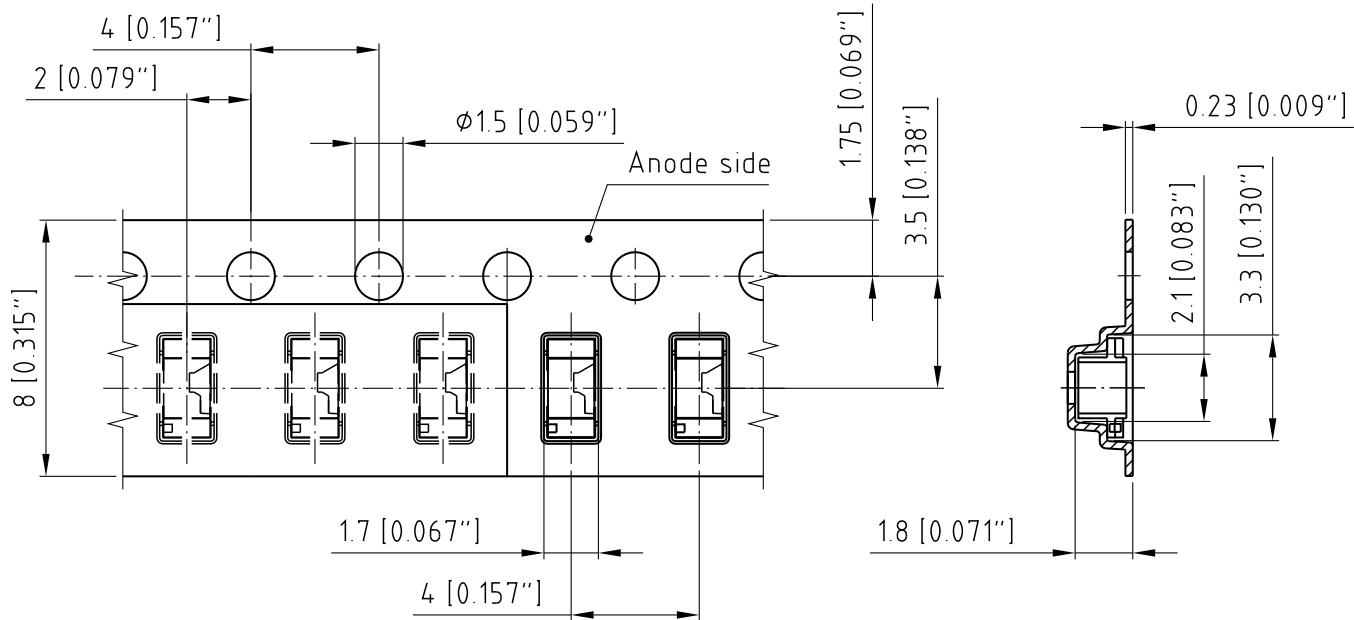


OHA04612

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 $T_{S\min}$ to $T_{S\max}$	t_S	60	100	120	s
Ramp-up rate to peak*) $T_{S\max}$ 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

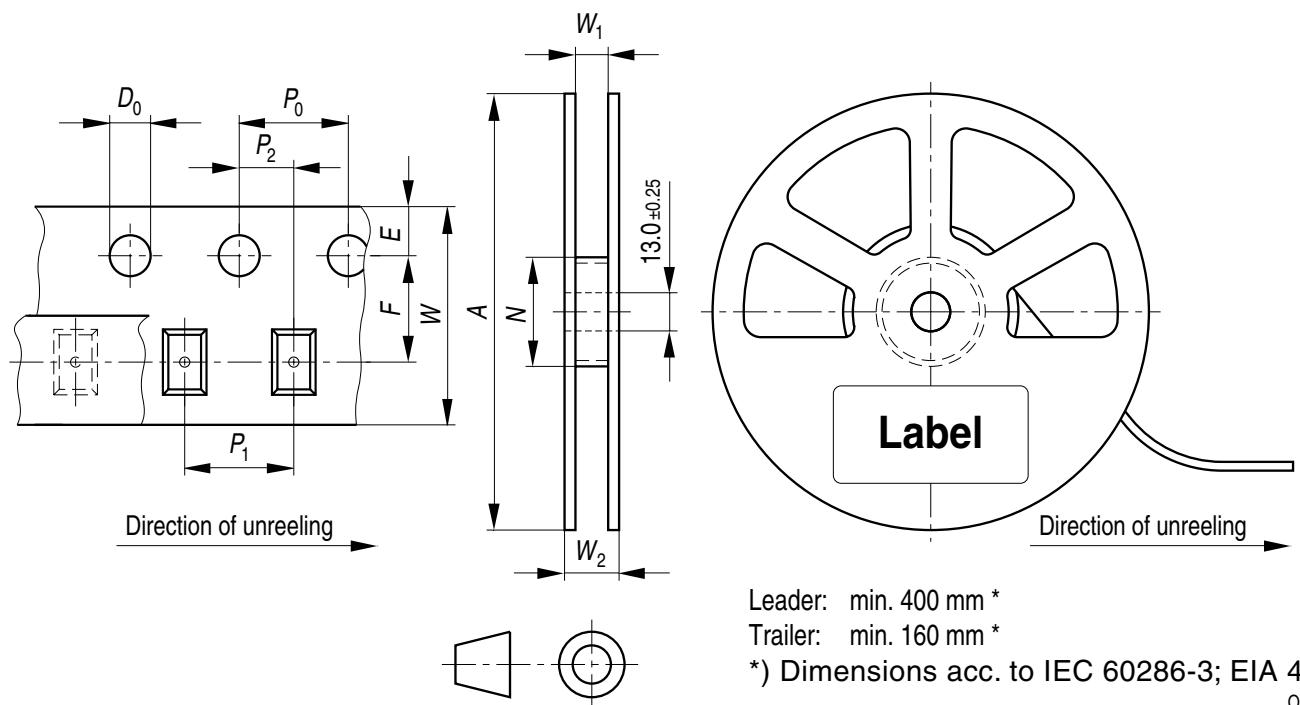
All temperatures refer to the center of the package, measured on the top of the component

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

Taping

C63062-A4196-B1-03

Dimensions in mm (inch).

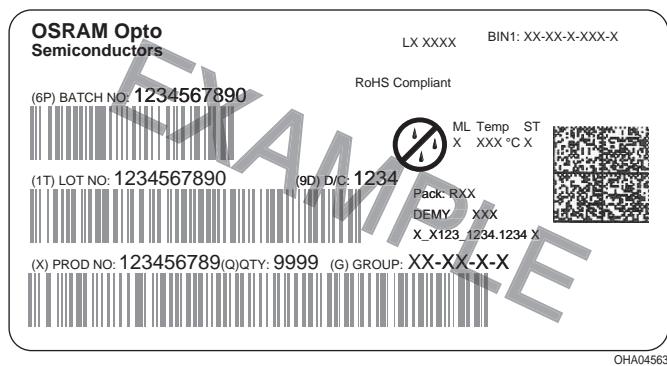
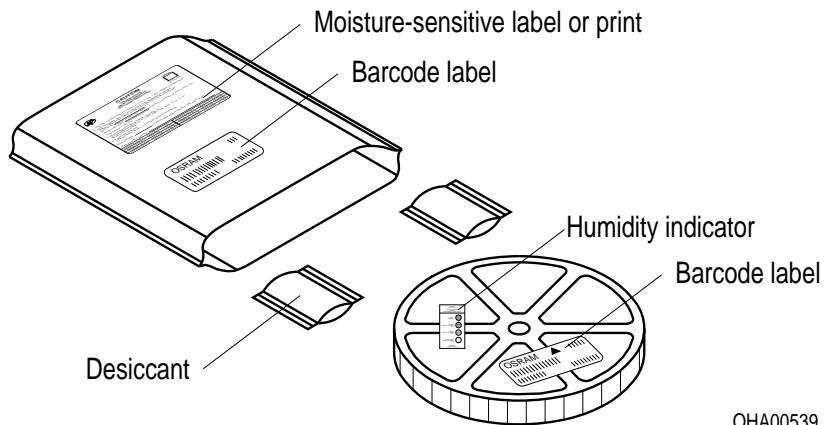
Tape and Reel8 mm tape with 2000 pcs. on \varnothing 180 mm reel

Tape dimensions [mm]

W	P₀	P₁	P₂	D₀	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

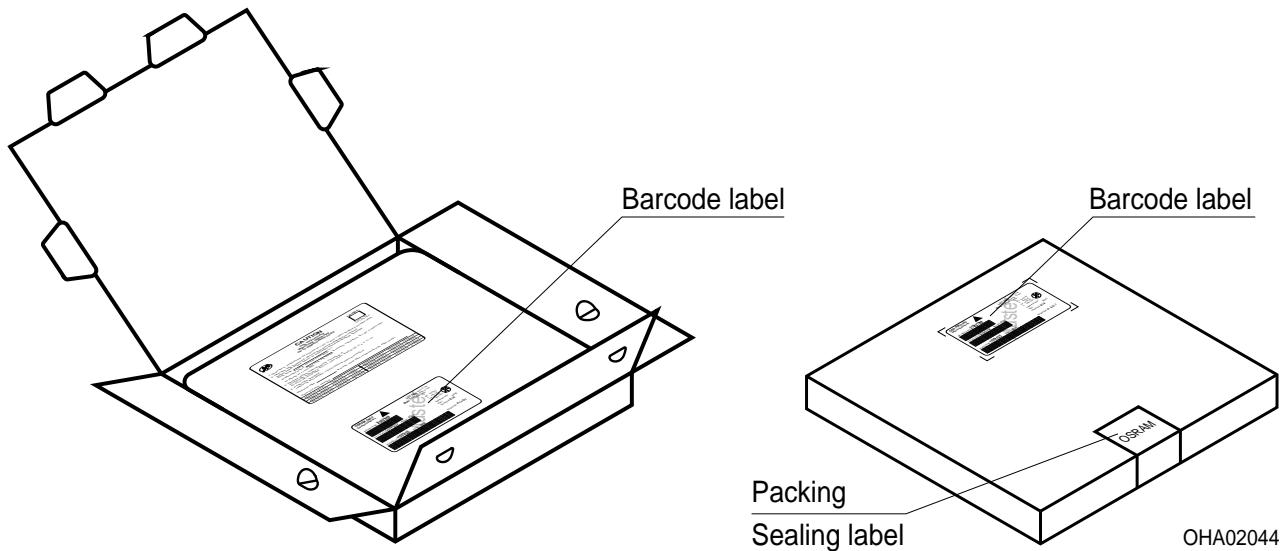
Reel dimensions [mm]

A	W	N_{min}	W₁	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.

Transportation Packing and Materials**Dimensions of transportation box in mm**

Width	Length	Height
200 ± 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) **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.

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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。

ООО "ЛайфЭлектроникс"

"LifeElectronics" LLC

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибуторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибуторских договоров

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- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
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- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помочь разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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