High Power Infrared Emitter (850 nm)
Version 1.4

SFH 4556

Features:
- High Power Infrared LED
- Short switching time

Applications
- Infrared Illumination for cameras
- Sensor technology
- Data transmission

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 mA, t_p= 20 ms**	**Ordering Code**
SFH 4556	145 (≥ 63)	Q65110A6087
SFH 4556-AW	100 ... 200	Q65111A9676
SFH 4556-VAW	63 ... 200	Q65110A9803

Note: *Measured at a solid angle of Ω = 0.01 sr*

Maximum Ratings (T_A = 25 °C)

Parameter	Symbol	Values	Unit
Operation and storage temperature range	T_{op}; T_{stg}	-40 ... 100	°C
Reverse voltage	V_R	5	V
Forward current	I_F	100	mA
Surge current (t_p ≤ 100 µs, 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 8*]	R_{thJA}	450	K / W

Characteristics (T_A = 25 °C)

Parameter		Symbol	Values	Unit
Peak wavelength (I_F = 100 mA, t_p = 20 ms)	(typ)	λ_{peak}	860	nm
Centroid wavelength (I_F = 100 mA, t_p = 20 ms)	(typ)	$\lambda_{centroid}$	850	nm
Spectral bandwidth at 50% of I_{max} (I_F = 100 mA, t_p = 20 ms)	(typ)	$\Delta\lambda$	30	nm
Half angle	(typ)	φ	± 20	°
Dimensions of active chip area	(typ)	L x W	0.3 x 0.3	mm x mm
Rise and fall time of I_e (10% and 90% of $I_{e\ max}$) (I_F = 100 mA, R_L = 50 Ω)	(typ)	t_r, t_f	12	ns
Forward voltage (I_F = 100 mA, t_p = 20 ms)	(typ (max))	V_F	1.5 (≤ 1.8)	V
Forward voltage (I_F = 1 A, t_p = 100 µs)	(typ (max))	V_F	2.4 (≤ 3)	V
Reverse current (V_R = 5 V)		I_R	not designed for reverse operation	µA
Total radiant flux (I_F= 100 mA, t_p= 20 ms)	(typ)	Φ_e	60	mW
Temperature coefficient of I_e or Φ_e (I_F = 100 mA, t_p = 20 ms)	(typ)	TC_I	-0.5	% / K
Temperature coefficient of V_F (I_F = 100 mA, t_p = 20 ms)	(typ)	TC_V	-0.7	mV / K
Temperature coefficient of wavelength (I_F = 100 mA, t_p = 20 ms)	(typ)	TC_λ	0.3	nm / K

Grouping (T_A = 25 °C)

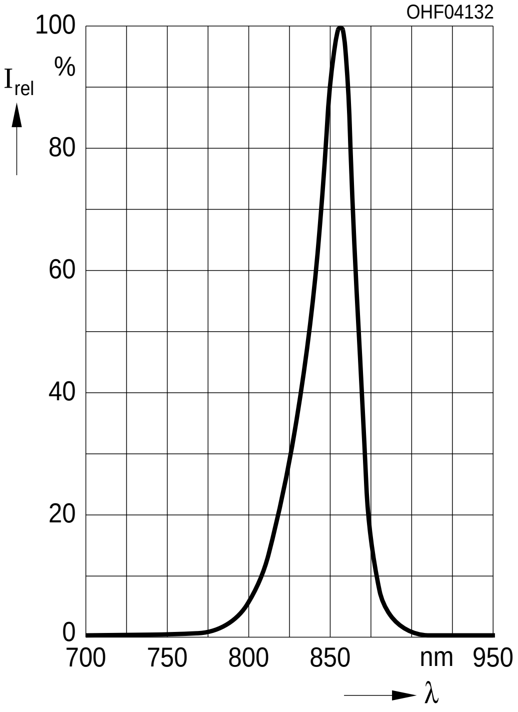
Group	**Min Radiant Intensity** **I_F= 100 mA, t_p= 20 ms** $I_{e, min}$ [mW / sr]	**Max Radiant Intensity** **I_F= 100 mA, t_p= 20 ms** $I_{e, max}$ [mW / sr]	**Typ Radiant Intensity** **I_F = 1 A, t_p = 25 µs** $I_{e, typ}$ [mW / sr]
SFH 4556-V	63	125	750
SFH 4556-AW	100	200	1200
SFH 4556-BW	160	320	1900

Note: *measured at a solid angle of Ω = 0.01 sr*

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

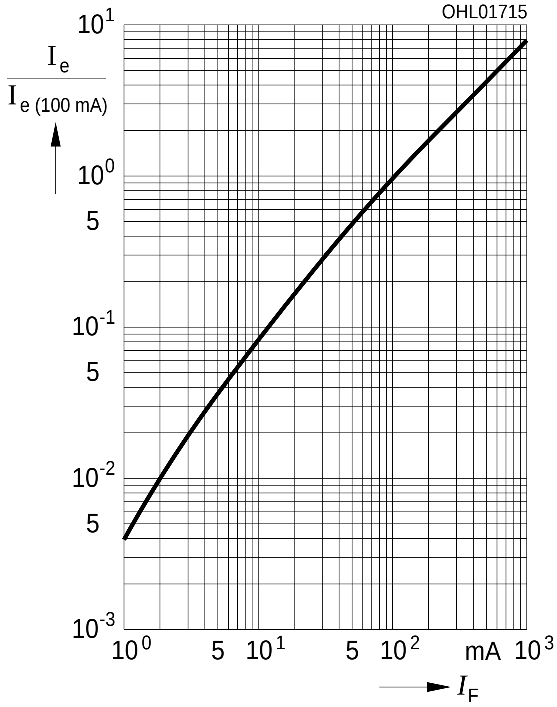
Relative Spectral Emission [2) page 8]

$I_{rel} = f(\lambda)$, T_A = 25°C



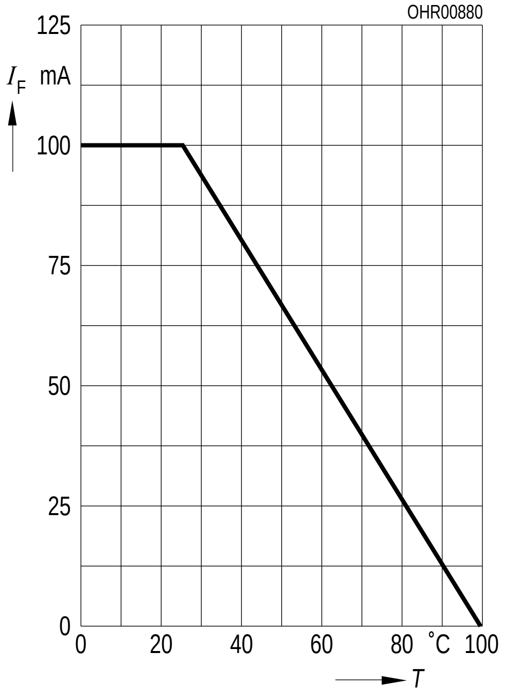
Radiant Intensity [2) page 8]

$I_e / I_e(100\text{ mA}) = f(I_F)$, single pulse, t_p = 25 µs, T_A= 25°C



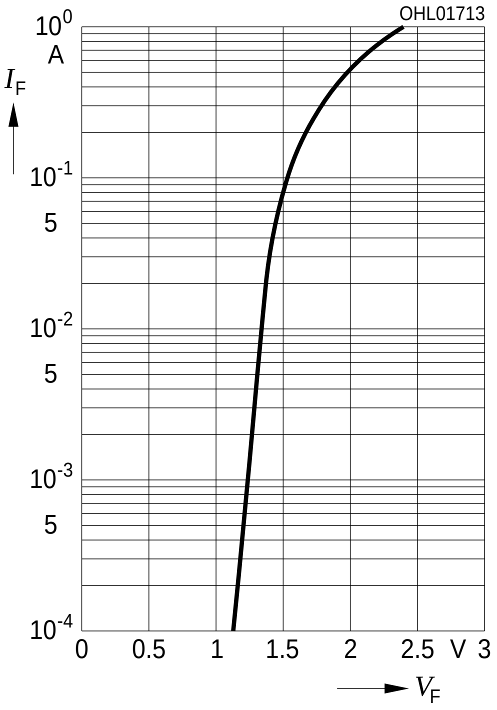
Max. Permissible Forward Current

$I_F = f(T_A)$, $R_{thJA} = 450$ K/W



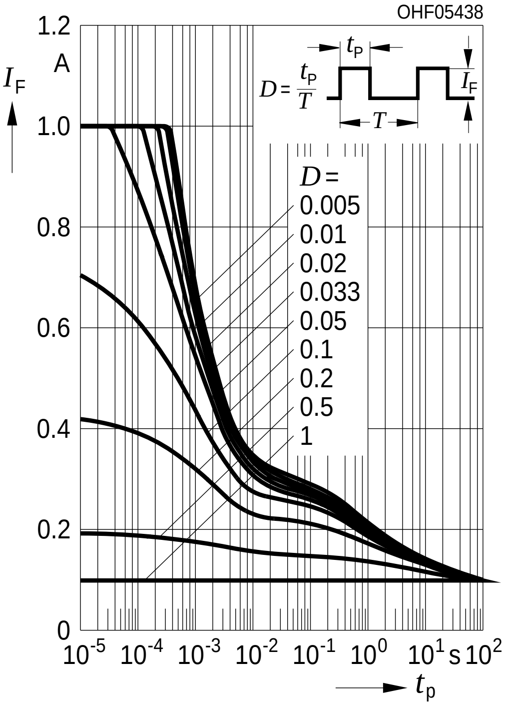
Forward Current [2) page 8]

$I_F = f(V_F)$, single pulse, $t_p = 100$ µs, $T_A = 25°C$



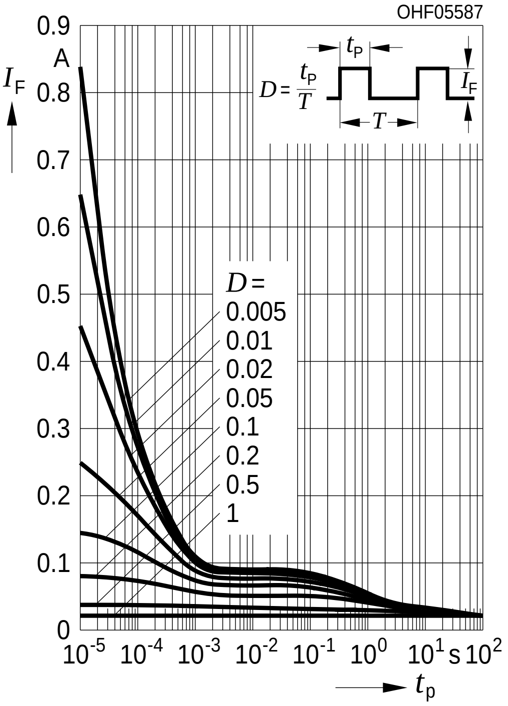
Permissible Pulse Handling Capability

$I_F = f(t_p)$, $T_A = 25$ °C, duty cycle D = parameter



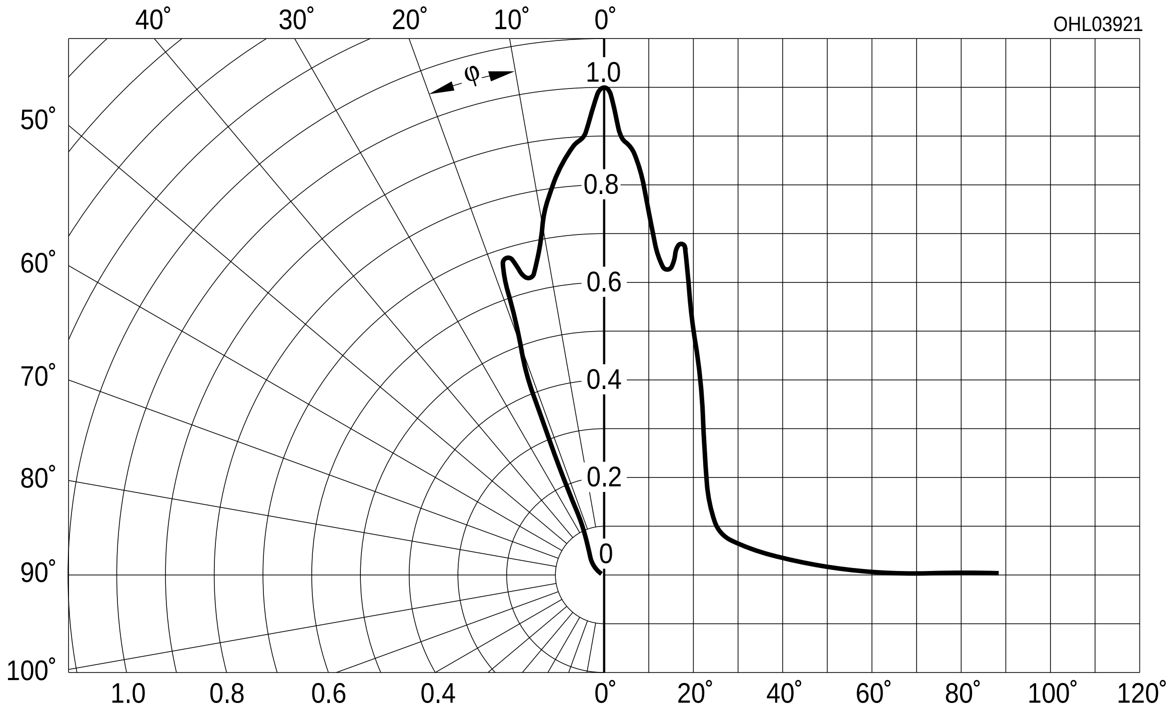
Permissible Pulse Handling Capability

$I_F = f(t_p)$, $T_A = 85$ °C, duty cycle D = parameter

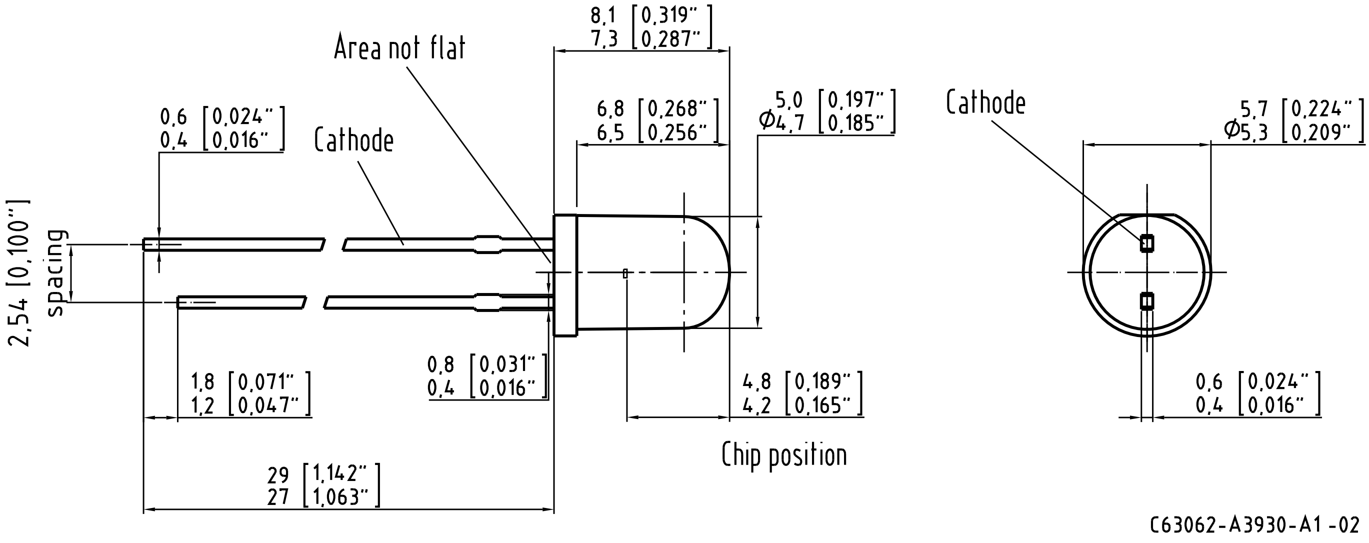


Radiation Characteristics [2) page 8]

$I_{rel} = f(\phi)$, $T_A = 25°C$



Package Outline



Dimensions in mm (inch).

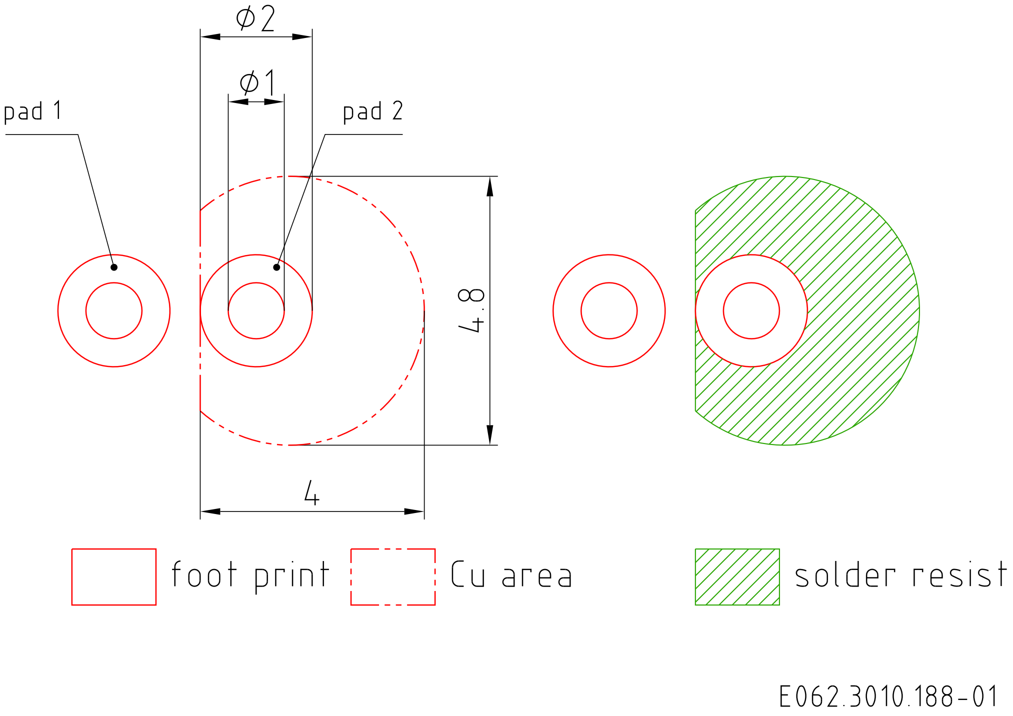
Package

5mm Radial (T 1 ¾), Epoxy

Approximate Weight:
0.3 g

Note
Packing information is available on the internet (online product catalog).

Recommended Solder Pad

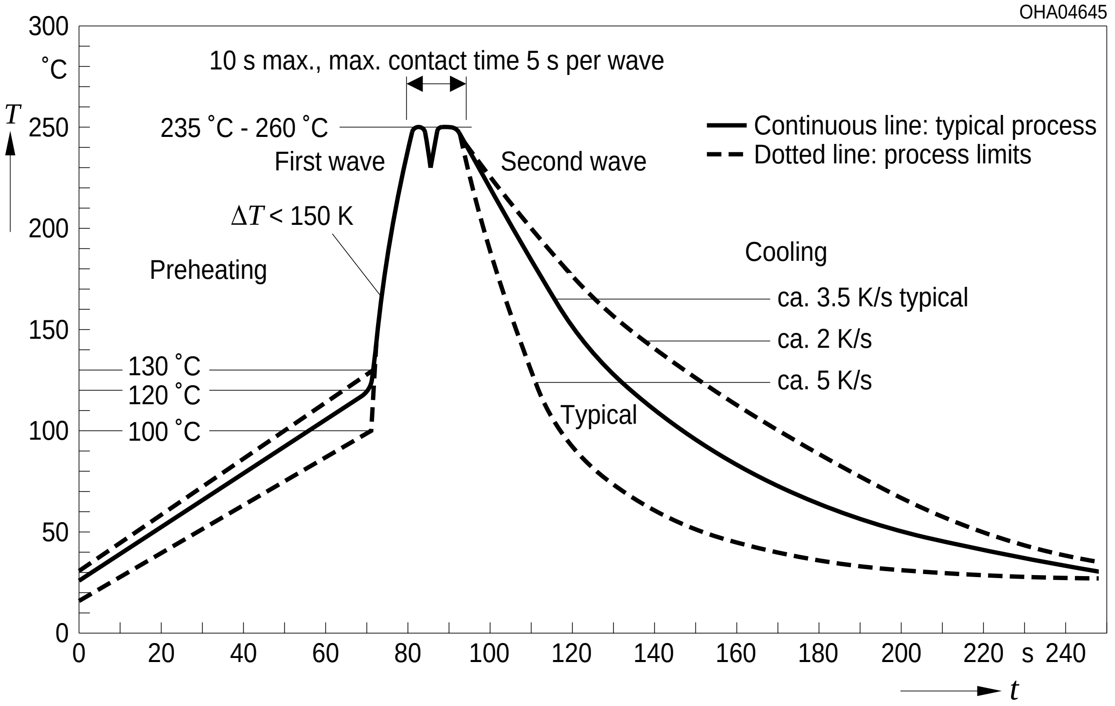


Dimensions in mm.

Note:
pad 1: cathode

TTW Soldering

IEC-61760-1 TTW



Disclaimer

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

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Glossary

[1] **Thermal resistance:** junction -ambient, mounted on PC-board (FR4), padsize 16 mm^2 each

[2] **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.

Published by OSRAM Opto Semiconductors GmbH
Leibnizstraße 4, D-93055 Regensburg
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