VCSEL-Laser
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SFH 4020

Vorläufige Daten / Preliminary Data

Wesentliche Merkmale

- Sehr kleines Gehäuse:
  (LxBxH) 1,7 mm x 0,8 mm x 0,65 mm
- Typische Peakwellenlänge 850nm
- Oberflächenstrahler mit kleinem Leuchtpunkt (Durchmesser 15 µm)
- Enge Strahlverteilung
- IR Reflow Löten geeignet
- Gegurtet lieferbar

Features

- Very small package:
  (LxWxH) 1.7 mm x 0.8 mm x 0.65 mm
- Typical Wavelength 850nm
- Top surface emitter with small emission area (diameter 15 µm)
- Narrow beam characteritics
- Suitable for IR reflow soldering
- Available on tape and reel

Anwendungen

- Miniaturlichtschranken Industrieelektronik
- „Messen/Steuern/Regeln“
- Sensorik
- Alarm- und Sicherungssysteme

Applications

- Miniature photointerrupters
- Industrial electronics
- For drive and control circuits
- Sensor technology

Beim Betrieb dieses Bauteils sind die Sicherheitsvorschriften für die Laserklasse 1M nach IEC 60825-1 Am. 2 zu beachten.

Operating this device the safety instructions for laser class 1M according to IEC 60825-1 Am. 2 have to be observed.

Typ **Type**	**Bestellnummer** **Ordering Code**	**Strahlstärkegruppierung** [1] (I_F = 8 mA, t_p = 20 ms) **Radiant intensity grouping** [1] I_e (mW/sr)
SFH 4020	on request	typ. 8

[1] gemessen bei einem Raumwinkel Ω = 0.01 sr / measured at a solid angle of Ω = 0.01 sr

Grenzwerte (T_A = 25 °C)
Maximum Ratings

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Betriebs- und Lagertemperatur Operating and storage temperature range	T_{op}; T_{stg}	– 40 … + 85	°C
Sperrspannung Reverse voltage	V_R	3	V
Durchlaßstrom Forward current	I_F	10	mA
Verlustleistung Power dissipation	P_{tot}	25	mW
Wärmewiderstand Sperrschicht - Umgebung bei Montage auf FR4 Platine, Padgröße je 16 mm^2 Thermal resistance junction - ambient mounted on PC-board (FR4), padsize 16 mm^2 each	R_{thJA}	1500	K/W

Kennwerte (T_A = 25 °C)
Characteristics

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Wellenlänge der Strahlung Wavelength at peak emission I_F = 8 mA, t_p = 20 ms	λ_{peak}	850	nm
Spektrale Bandbreite bei 50% von I_{max} Spectral bandwidth at 50% of I_{max} I_F = 8 mA	$\Delta\lambda$	1	nm
Abstrahlwinkel [1] Half angle [1] $I_F = I_{th}$ + 4 mA	φ	± 15	Grad deg.
Aktive Chipfläche Active chip area	A	175	µm^2
Durchmesser der aktiven Chipfläche Diameter of the active chip area	D	15	µm
Kapazität, Capacitance V_R = 0 V, f = 1 MHz	C_o	15	pF
Durchlaßspannung, Forward voltage I_F = 8 mA, t_p = 20 ms	V_F	1.8 (≤ 2.5)	V
Sperrstrom, Reverse current V_R = 3 V	I_R	0.01 (≤ 1)	µA
Gesamtstrahlungsfluß, Total radiant flux I_F = 8 mA, t_p = 20 ms	Φ_e	1.5	mW
Schwellstrom [2] Threshold current [2]	I_F	2.5 (<5)	mA

[1] Half angle increases with rising forward current.

[2] Device is not operating at forward currents below the threshold current.

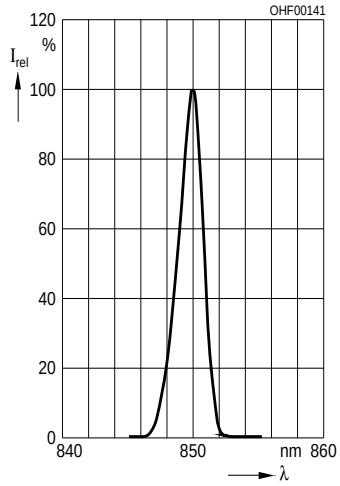
Strahlstärke I_e in Achsrichtung
gemessen bei einem Raumwinkel Ω = 0.01 sr
Radiant Intensity I_e in Axial Direction
at a solid angle of Ω = 0.01 sr

Bezeichnung **Parameter**	**Symbol**	**Werte** **Values**	**Einheit** **Unit**
Typische Strahlstärke [1] Typical radiant intensity I_F = 8 mA, t_p = 20 ms	$I_{e\,typ}$	8	mW/sr

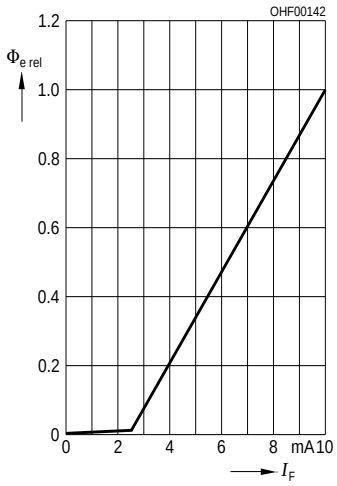
[1] Radiant intensity varies nonlinear over current and temperature.

Note: It is recomended to use the device at the specified current of about 8mA, as other operating currents lead to a large radiant intensity variation.
Changes in temperatures and operating current are having a bigger influence on the radiation characteristic as it is the case for standard emitters. It is recommended to use this emitter in applications that use all emitted light under an angle bigger or equal +/-10°. Having an application using light from a smaller angle may suffer from high variance in radiant intensity and radiation characteristics from one device to another as well as over tempertaure and forward current.

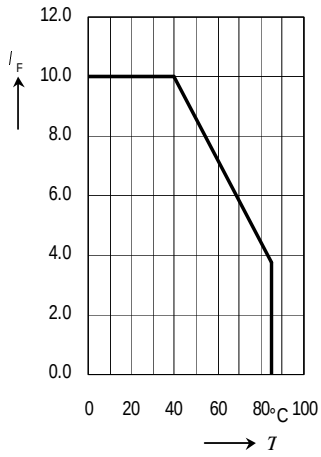
Relative Spectral Emission
$I_{rel} = f(\lambda)$



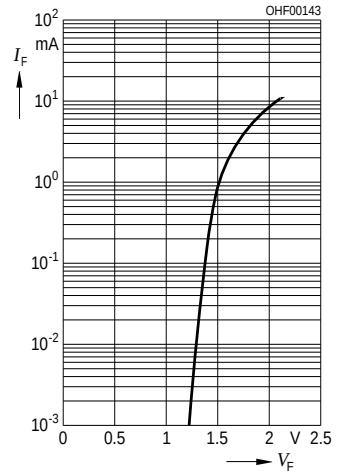
Optical Power $\frac{\Phi_e}{\Phi_e\ 10\ mA} = f(I_F)$



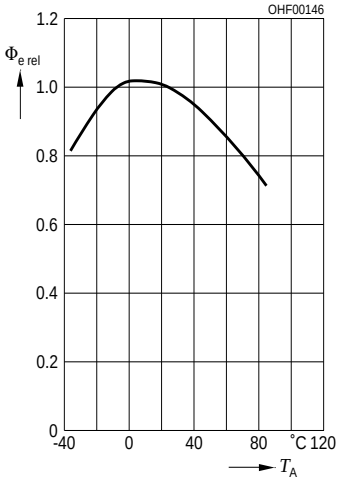
Max. Permissible Forward Current
$I_F = f(T_A)$



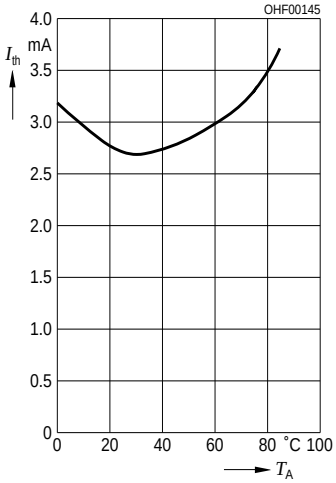
Forward Current
$I_F = f(V_F)$



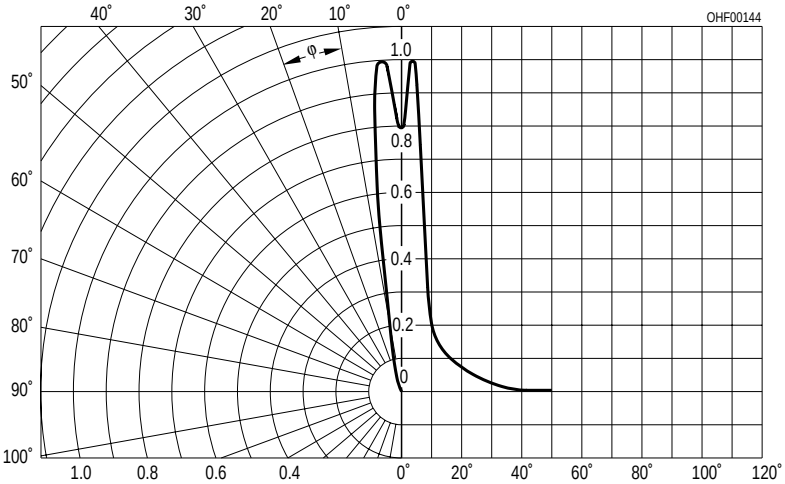
Optical power $\Phi_{rel} = f(T_A)$, I_f= 8 mA



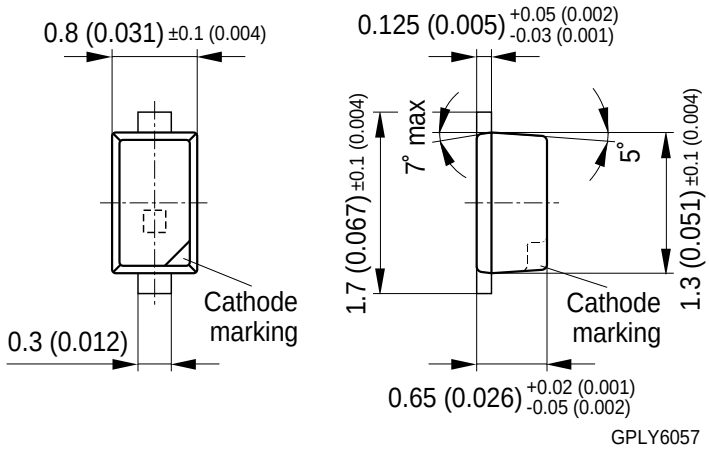
Threshold Current $I_{th} = f(T_A)$



Radiation characteristics $I_{rel} = f(\varphi)$

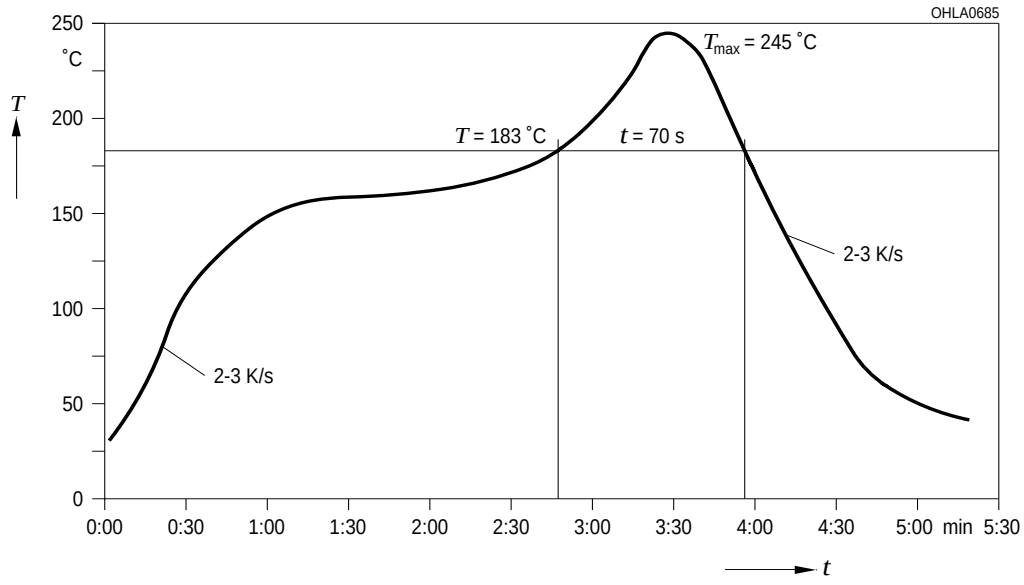


Maßzeichnung
Package Outlines



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

IR-Reflow Lötprofil (nach IPC 9501)
IR Reflow Soldering profile (acc. to IPC 9501)



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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 [1] , may only be used in life-support devices or systems [2] with the express written approval of OSRAM OS.
[1] A critical component is a component usedin 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 effectiveness of that device or system.
[2] 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 of the user may be endangered.