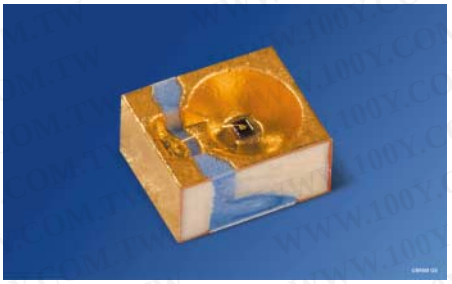
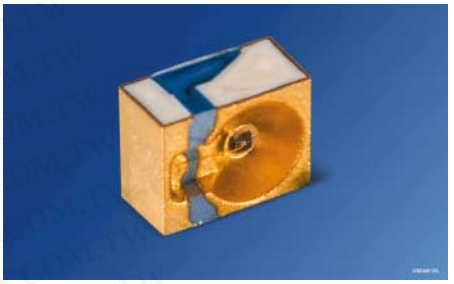
Engwinklige LED im MIDLED-Gehäuse (850 nm)
Narrow beam LED in MIDLED package (850 nm)

Lead (Pb) Free Product - RoHS Compliant

SFH 4651
SFH 4656



SFH 4651



SFH 4656

Wesentliche Merkmale

- Infrarot LED mit hoher Ausgangsleistung
- Kurze Schaltzeiten
- Enger Abstrahlwinkel (± 15°)
- Geringe Bauhöhe
- Als Toplooker und Sidelooker einsetzbar
- SFH 4651: Gurtung als Toplooker
  SFH 4656: Gurtung als Sidelooker

Features

- High Power Infrared LED
- Short switching times
- Narrow halfangle (± 15°)
- Low profile component
- Usable as top-looking and side-looking device
- SFH 4651: Taping as Toplooker
  SFH 4656: Taping as Sidelooker

Anwendungen

- Infrarotbeleuchtung für Kameras
- IR-Datenübertragung
- Sensorik in der Automobiltechnik
- Fernsteuerung

Applications

- Infrared Illumination for cameras
- IR Data Transmission
- Automotive sensors
- Remote controls

Sicherheitshinweise

Je nach Betriebsart emittieren diese Bauteile hochkonzentrierte, nicht sichtbare Infrarot-Strahlung, die gefährlich für das menschliche Auge sein kann. Produkte, die diese Bauteile enthalten, müssen gemäß den Sicherheits-richtlinien der IEC-Normen 60825-1 und 62471 behandelt werden.

Safety Advices

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.

Typ **Type**	**Bestellnummer** **Ordering Code**	**Strahlstärkegruppierung**[1] (I_F = 70 mA, t_p = 20 ms) **Radiant Intensity Grouping**[1] I_e (mW/sr)
SFH 4651	Q65110A8396	≥ 16 (typ. 40)
SFH 4656	Q65110A8395	≥ 16 (typ. 40)

[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 … + 100	°C
Sperrspannung Reverse voltage	V_R	5	V
Vorwärtsgleichstrom Forward current	I_F	70	mA
Stoßstrom, t_p = 20 µs, D = 0 Surge current	I_{FSM}	700	mA
Verlustleistung Power dissipation	P_{tot}	140	mW
Wärmewiderstand Sperrschicht - Umgebung bei Montage auf FR4 Platine, Padgröße je 16 mm² Thermal resistance junction - ambient mounted on PC-board (FR4), padsize 16 mm² each	R_{thJA}	380	K/W
Wärmewiderstand Sperrschicht - Lötstelle bei Montage auf Metall-Block Thermal resistance junction - soldering point, mounted on metal block	R_{thJS}	220	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 = 70 mA	λ_{peak}	860	nm
Centroid-Wellenlänge der Strahlung Centroid wavelength I_F = 70 mA	$\lambda_{centroid}$	850	nm
Spektrale Bandbreite bei 50% von I_{max} Spectral bandwidth at 50% of I_{max} I_F = 70 mA	$\Delta\lambda$	42	nm
Abstrahlwinkel Half angle	φ	± 15	Grad deg.
Aktive Chipfläche Active chip area	A	0.04	mm²

Kennwerte (T_A = 25 °C)
Characteristics (cont'd)

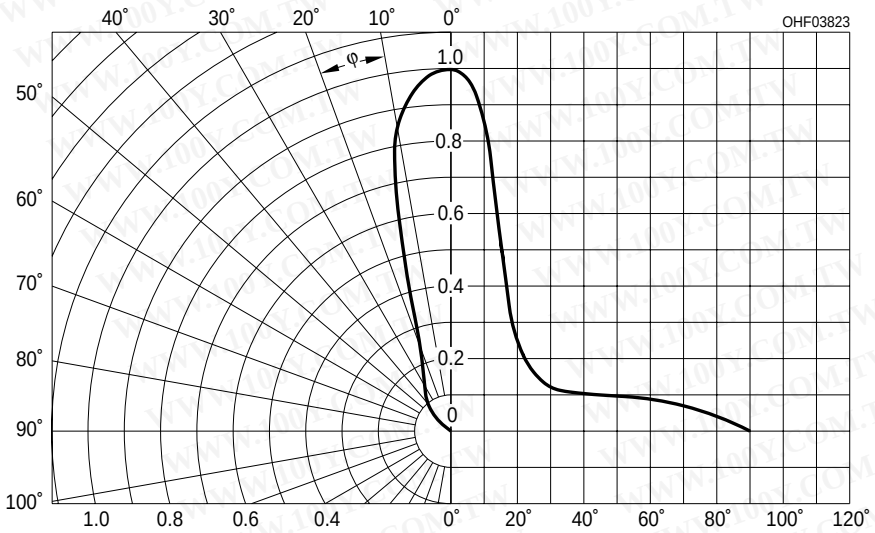
Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	0.2 × 0.2	mm²
Schaltzeiten, I_e von 10% auf 90% und von 90% auf 10%, bei I_F = 70 mA, R_L = 50 Ω Switching times, I_e from 10% to 90% and from 90% to 10%, I_F = 70 mA, R_L = 50 Ω	t_r, t_f	10	ns
Durchlassspannung Forward voltage I_F = 70 mA, t_p = 20 ms I_F = 500 mA, t_p = 100 µs	 V_F V_F	 1.6 (< 2.0) 2.4 (< 3.0)	 V V
Sperrstrom Reverse current	I_R	not designed for reverse operation	µA
Gesamtstrahlungsfluss Total radiant flux I_F = 70 mA, t_p = 20 ms	$\Phi_{e\,typ}$	33	mW
Temperaturkoeffizient von I_e bzw. Φ_e, I_F = 70 mA Temperature coefficient of I_e or Φ_e, I_F = 70 mA	TC_I	– 0.5	%/K
Temperaturkoeffizient von V_F, I_F = 70 mA Temperature coefficient of V_F, I_F = 70 mA	TC_V	– 0.7	mV/K
Temperaturkoeffizient von λ, I_F = 70 mA Temperature coefficient of λ, I_F = 70 mA	TC_λ	+ 0.3	nm/K

Strahlstärke I_e in Achsrichtung[1)]
gemessen bei einem Raumwinkel Ω = 0.01 sr
Radiant Intensity I_e in Axial Direction
at a solid angle of Ω = 0.01 sr

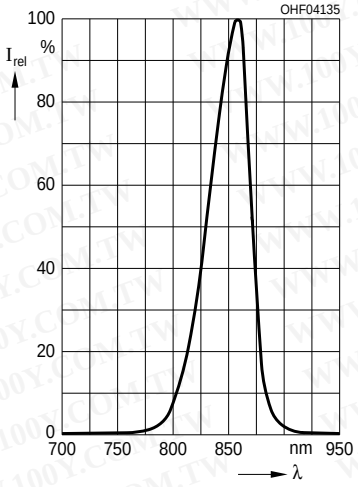
Bezeichnung Parameter	Symbol	Werte Values				Einheit Unit
		-S	-T	-U	-V	
Strahlstärke Radiant intensity I_F = 70 mA, t_p = 20 ms	$I_{e\ min}$ $I_{e\ max}$	16 32	25 50	40 80	63 125	mW/sr mW/sr
Strahlstärke Radiant intensity I_F = 500 mA, t_p = 25 µs	$I_{e\ typ}$	90	140	225	360	mW/sr

1) Nur eine Gruppe in einer Verpackungseinheit (Streuung kleiner 2:1) /
Only one bin in one packing unit (variation lower 2:1)

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

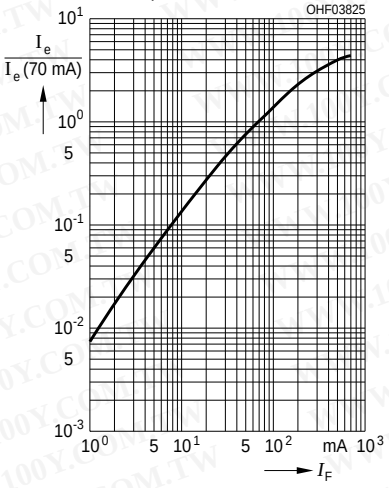


Relative Spectral Emission
$I_{rel} = f(\lambda)$



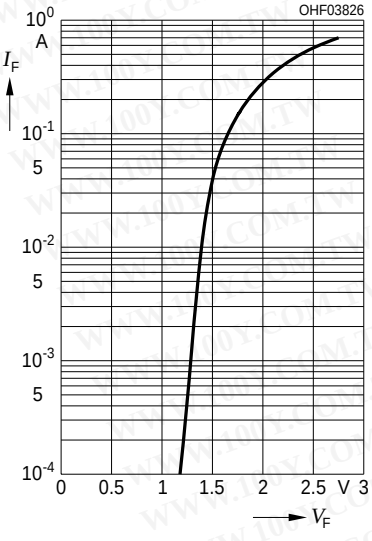
Radiant Intensity $\frac{I_e}{I_e\ 70\ mA} = f(I_F)$

Single pulse, t_p = 25 µs

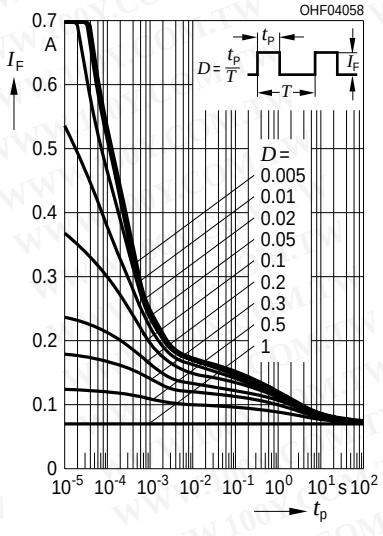


Max. Permissible Forward Current
$I_F = f(T_A)$, R_{thJA} = 380 K/W

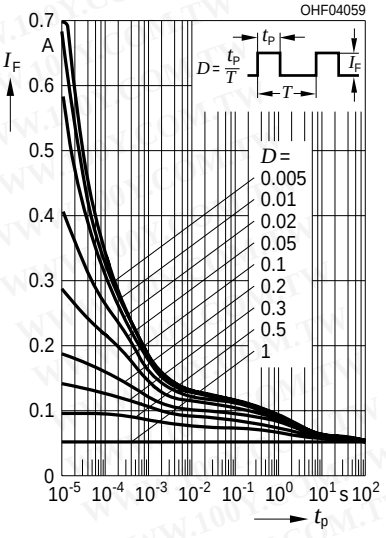
Forward Current $I_F = f(V_F)$
Single pulse, t_p = 100 µs



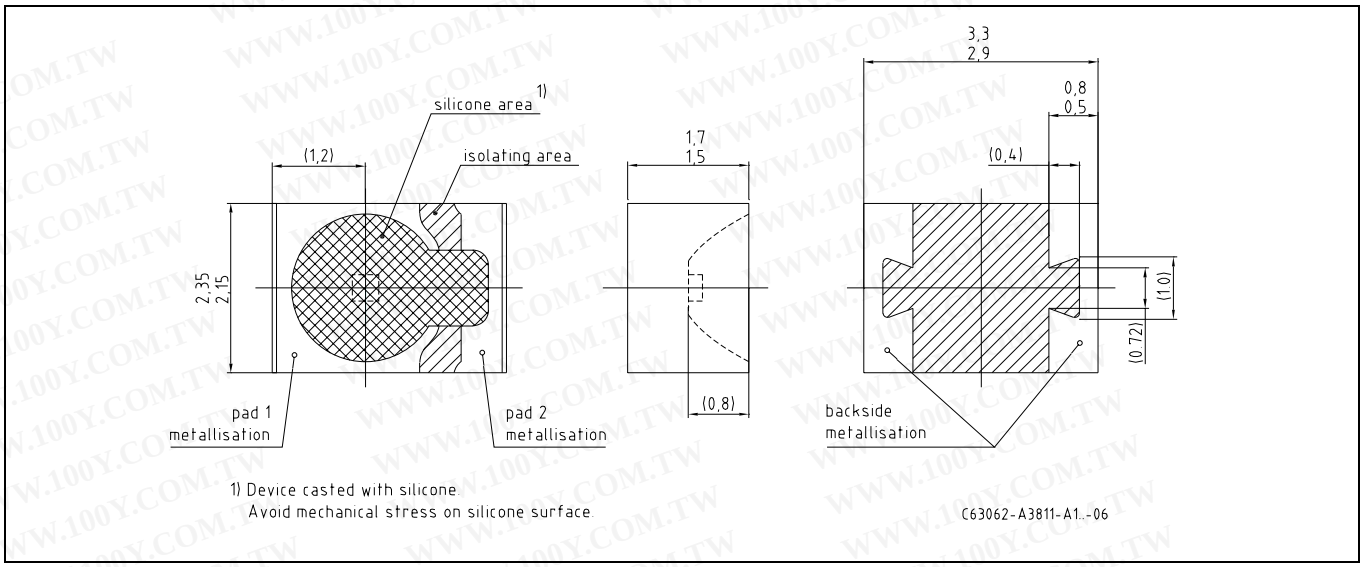
Permissible Pulse Handling Capability $I_F = f(\tau)$, T_A = 25 °C, duty cycle D = parameter



Permissible Pulse Handling Capability $I_F = f(\tau)$, T_A = 85 °C, duty cycle D = parameter



Maßzeichnung
Package Outlines



Maße in mm / Dimensions in mm.

Gehäuse / Package	MID mit klarem Silikonverguss / MID casted with clear Silicone
Anschlussbelegung Pin configuration	Pad 1 = Anode / anode Pad 2 = Kathode / cathode

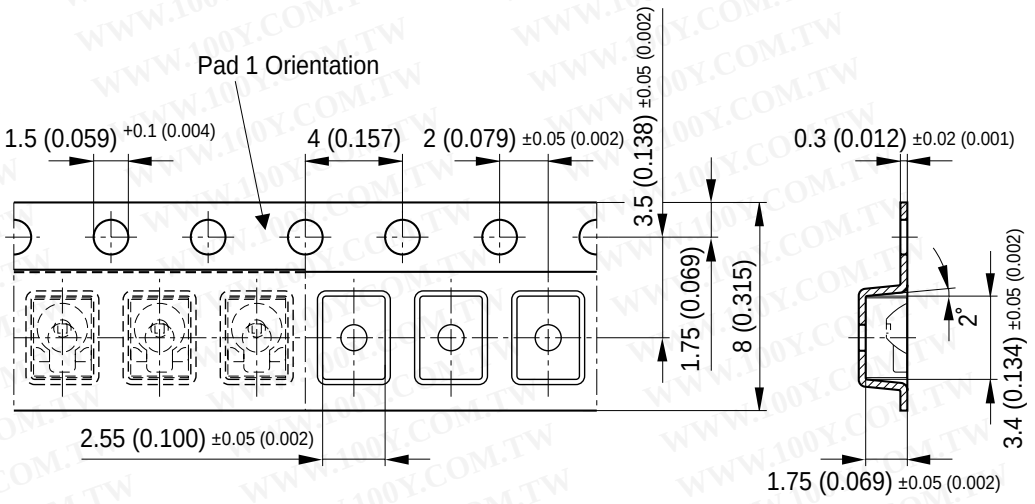
Gurtung / Polarität und Lage

Verpackungseinheit 2000/Rolle, ø180 mm oder 9000/Rolle, ø330 mm

Method of Taping / Polarity and Orientation

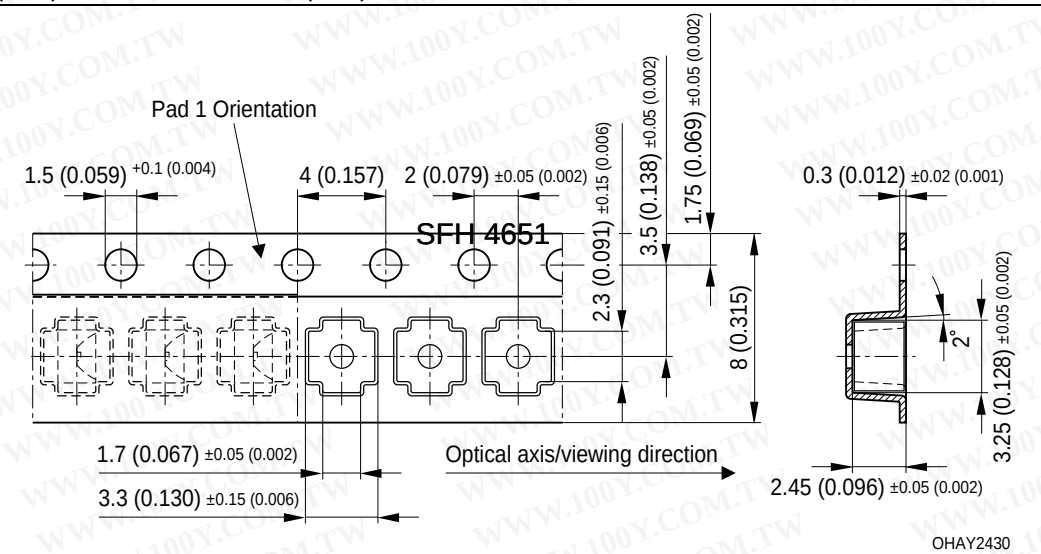
Packing unit 2000/reel, ø180 mm or 9000/reel, ø330 mm

SFH 4651



Maße in mm (inch) / Dimensions in mm (inch).

SFH 4656



Empfohlenes Lötpaddesign
Recommended Solder Pad Design

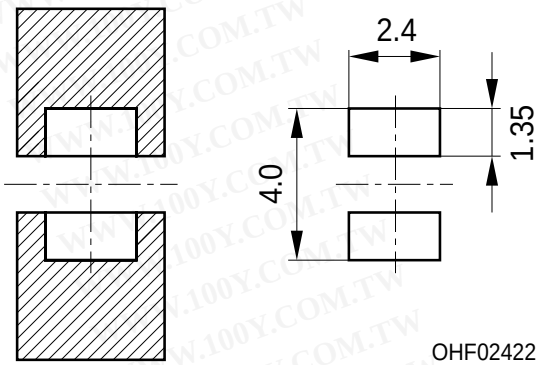
SFH 4651

Padgeometrie für verbesserte Wärmeableitung

Paddesign for improved heat dissipation

Cu-Fläche > 16 mm^2
Cu-area

Lötstopplack
Solder resist



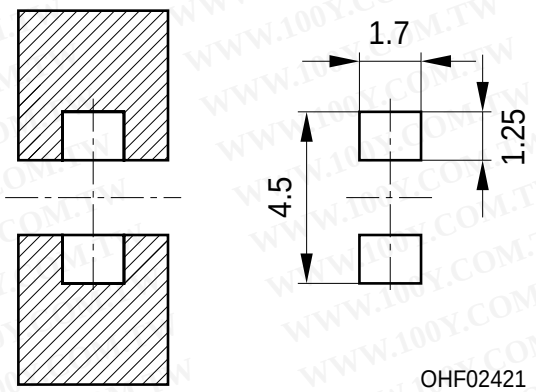
SFH 4656

Padgeometrie für verbesserte Wärmeableitung

Paddesign for improved heat dissipation

Cu-Fläche > 16 mm^2
Cu-area

Lötstopplack
Solder resist



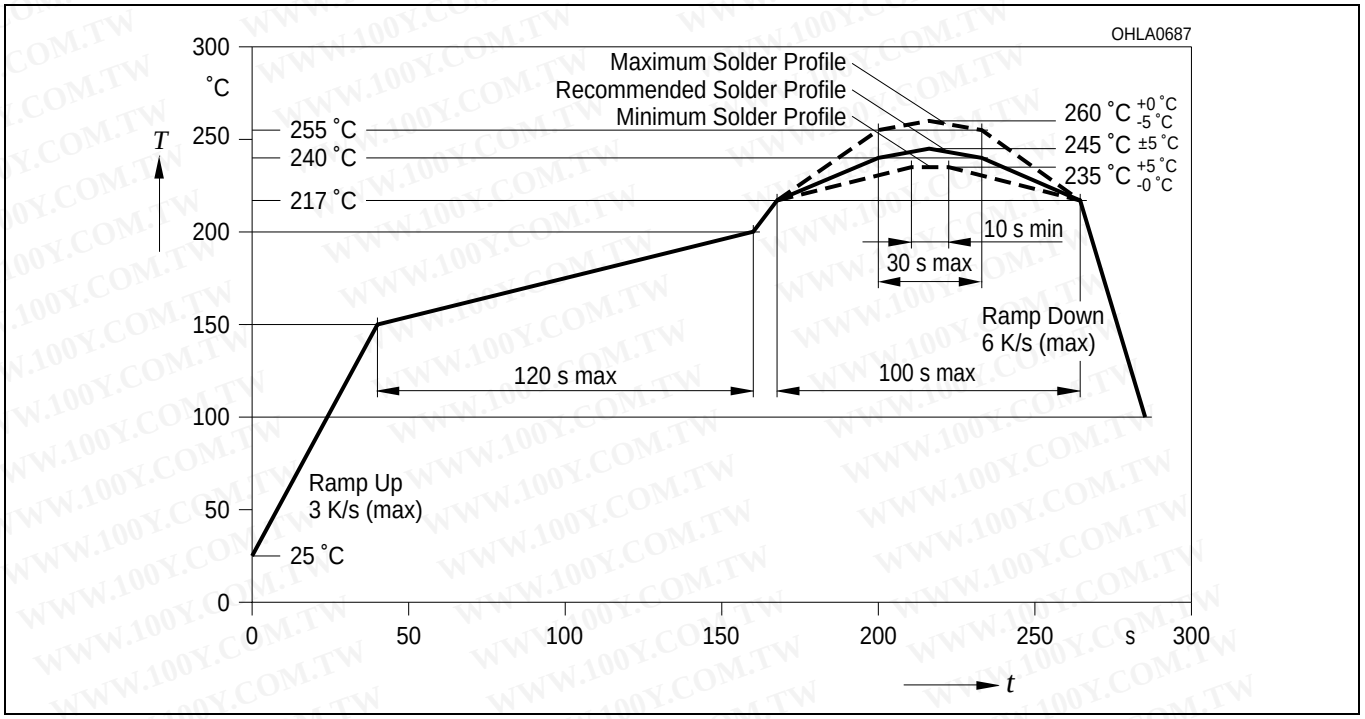
Maße in mm / Dimensions in mm.

Verarbeitungshinweis: **Das Gehäuse ist mit Silikon vergossen. Mechanischer Stress auf der Bauteiloberfläche sollte so gering wie möglich gehalten werden.**

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

Lötbedingungen
Soldering Conditions
Reflow Lötprofil für bleifreies Löten
Reflow Soldering Profile for lead free soldering

Vorbehandlung nach JEDEC Level 2
Preconditioning acc. to JEDEC Level 2
(nach J-STD-020C)
(acc. to J-STD-020C)



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[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.