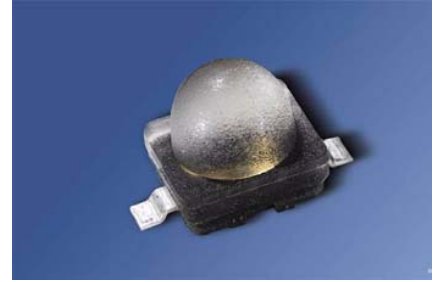


**IR-Lumineszenzdiode (940 nm) mit hoher Ausgangsleistung**  
**High Power Infrared Emitter (940 nm)**  
**Lead (Pb) Free Product - RoHS Compliant**  
**SFH 4239**



**Vorläufige Daten / Preliminary Data**

**Wesentliche Merkmale**

- max. Gleichstrom 1 A
- niedriger Wärmewiderstand (9 K/W)
- Schwerpunktwellenlänge 940 nm
- ESD-sicher bis 2 kV nach JESD22-A114-E
- Erweiterte Korrosionsfestigkeit (s.a. Abschnitt Maßzeichnung)

**Features**

- max. DC-current 1 A
- Low thermal resistance (9 K/W)
- Center of spectral emission at 940 nm
- ESD safe up to 2 kV acc. to JESD22-A114-E
- Superior Corrosion Robustness (see chapter package outlines)

**Anwendungen**

- Infrarotbeleuchtung für Kameras
- Überwachungssysteme
- Fahrer-Assistenz Systeme
- Beleuchtung für Bilderkennungssysteme

**Applications**

- Infrared Illumination for cameras
- Surveillance systems
- Driver assistance systems
- Machine vision systems

**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 Sicherheitsrichtlinien 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.

<b>Type</b> <b>Type</b>	<b>Bestellnummer</b> <b>Ordering Code</b>	<b>Strahlstärkegruppierung<sup>1)</sup></b> ( $I_F = 1 \text{ A}$ , $t_p = 100 \mu\text{s}$ ) <b>Radiant Intensity Grouping<sup>1)</sup></b> $I_e$ (mW/sr)
SFH 4239	Q65110A9549	> 250 (typ. 550)

<sup>1)</sup> gemessen bei einem Raumwinkel  $\Omega = 0.01 \text{ sr}$  / measured at a solid angle of  $\Omega = 0.01 \text{ sr}$

**Grenzwerte** ( $T_A = 25\text{ °C}$ )**Maximum Ratings**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}, T_{stg}$	- 40 ... + 125	°C
Sperrschichttemperatur Junction temperature	$T_J$	+ 145	°C
Sperrspannung Reverse voltage	$V_R$	1	V
Vorwärtsgleichstrom Forward current	$I_F$	1	A
Stoßstrom, $t_p < 200\ \mu\text{s}$ , $D = 0$ Surge current	$I_{FSM}$	5	A
Leistungsaufnahme Power consumption	$P_{tot}$	1.8	W
Wärmewiderstand Sperrschicht - Lötstelle Thermal resistance junction - soldering point	$R_{thJS}$	9	K/W

**Kennwerte** ( $T_A = 25\text{ °C}$ )**Characteristics**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der Strahlung Wavelength at peak emission $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$\lambda_{peak}$	950	nm
Centroid-Wellenlänge der Strahlung Centroid wavelength $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$\lambda_{centroid}$	940	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$\Delta\lambda$	35	nm
Abstrahlwinkel Half angle	$\varphi$	$\pm 20$	Grad deg.
Aktive Chipfläche Active chip area	$A$	1	mm <sup>2</sup>
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	$1 \times 1$	mm <sup>2</sup>

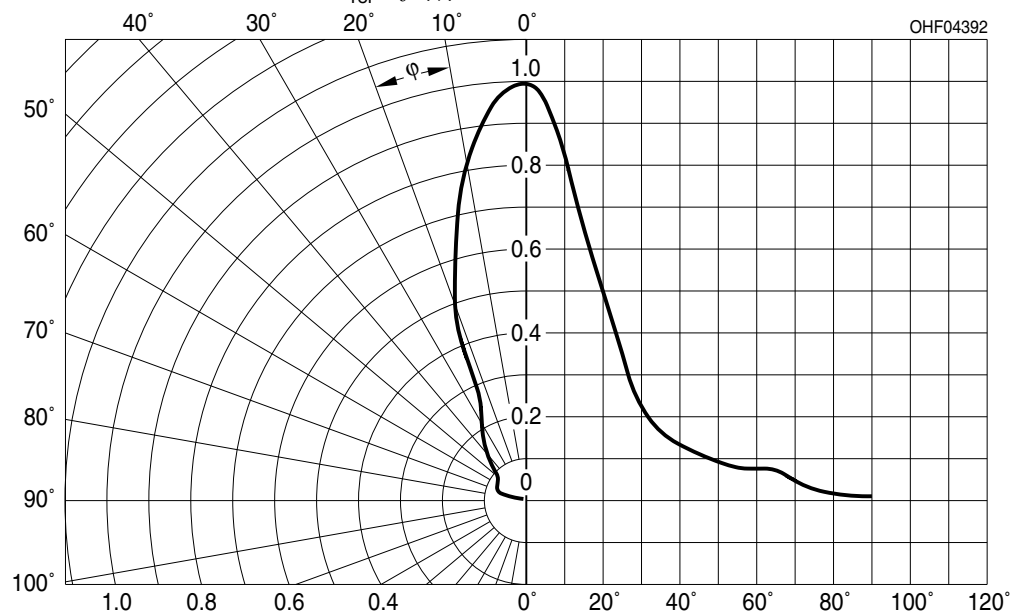
**Kennwerte** ( $T_A = 25\text{ °C}$ )  
**Characteristics** (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, $I_F = 5\text{ A}$ , $R_L = 50\ \Omega$ Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 5\text{ A}$ , $R_L = 50\ \Omega$	$t_r / t_f$	8 / 14	ns
Durchlassspannung Forward voltage $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$ $I_F = 5\text{ A}$ , $t_p = 100\ \mu\text{s}$	$V_F$ $V_F$	1.4 (< 1.8) 2.0 (< 2.9)	V V
Gesamtstrahlungsfluss Total radiant flux $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$	$\Phi_e$	460	mW
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ Temperature coefficient of $I_e$ or $\Phi_e$ $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$TC_I$	- 0.3	%/K
Temperaturkoeffizient von $V_F$ Temperature coefficient of $V_F$ $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$TC_V$	- 2	mV/K
Temperaturkoeffizient von $\lambda$ Temperature coefficient of $\lambda$ $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$TC_{\lambda, \text{centroid}}$	+ 0.3	nm/K

**Strahlstärke  $I_e$  in Achsrichtung<sup>1)</sup>**gemessen bei einem Raumwinkel  $\Omega = 0.01$  sr**Radiant Intensity  $I_e$  in Axial Direction**at a solid angle of  $\Omega = 0.01$  sr

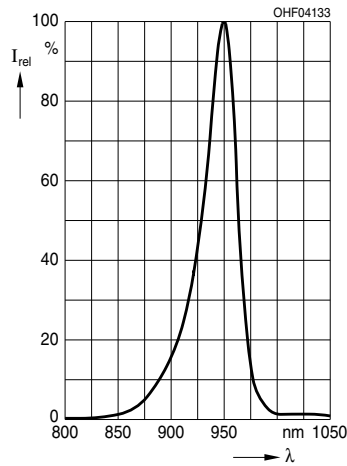
Bezeichnung Parameter	Symbol	Werte Values			Einheit Unit
		-CW	-DW	-EW	
Strahlstärke	$I_{e \text{ min}}$	250	400	630	mW/sr
Radiant intensity	$I_{e \text{ max}}$	500	800	1250	mW/sr
$I_F = 1$ A, $t_p = 10$ ms					

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

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

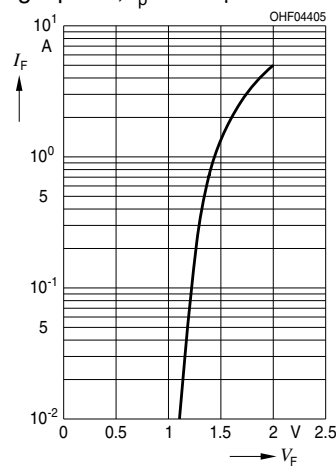
**Relative spektrale Emission**  
**Relative Spectral Emission**

$I_{rel} = f(\lambda)$



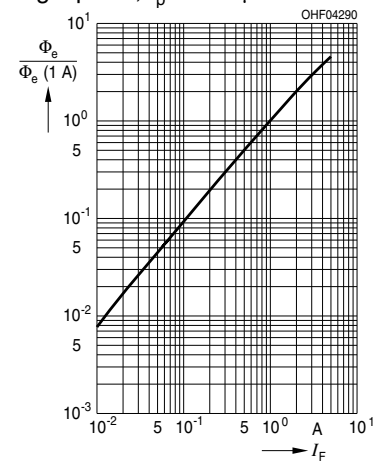
**Durchlassstrom**  
**Forward Current**

$I_F = f(V_F)$   
Single pulse,  $t_p = 100 \mu s$



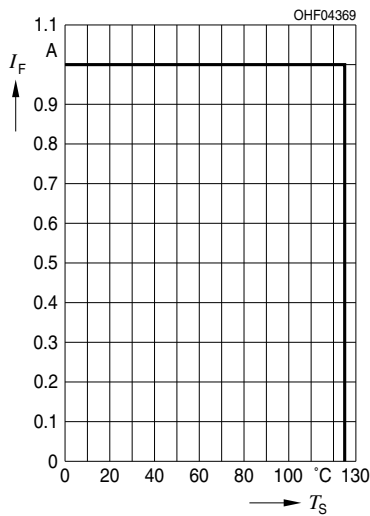
**Relativer Gesamtstrahlungsfluss**  
**Relative Total Radiant Flux**

$\Phi_e / \Phi_e(1000mA) = f(I_F)$   
Single pulse,  $t_p = 100 \mu s$

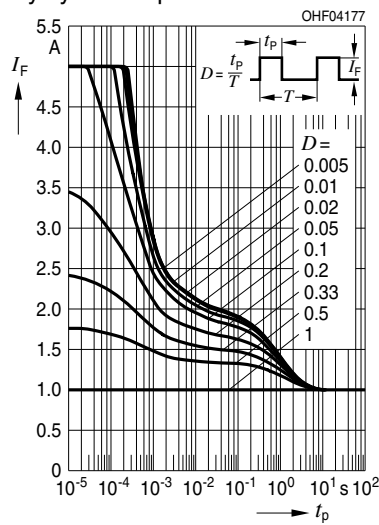


**Max. zulässiger Durchlassstrom**  
**Max. Permissible Forward Current**

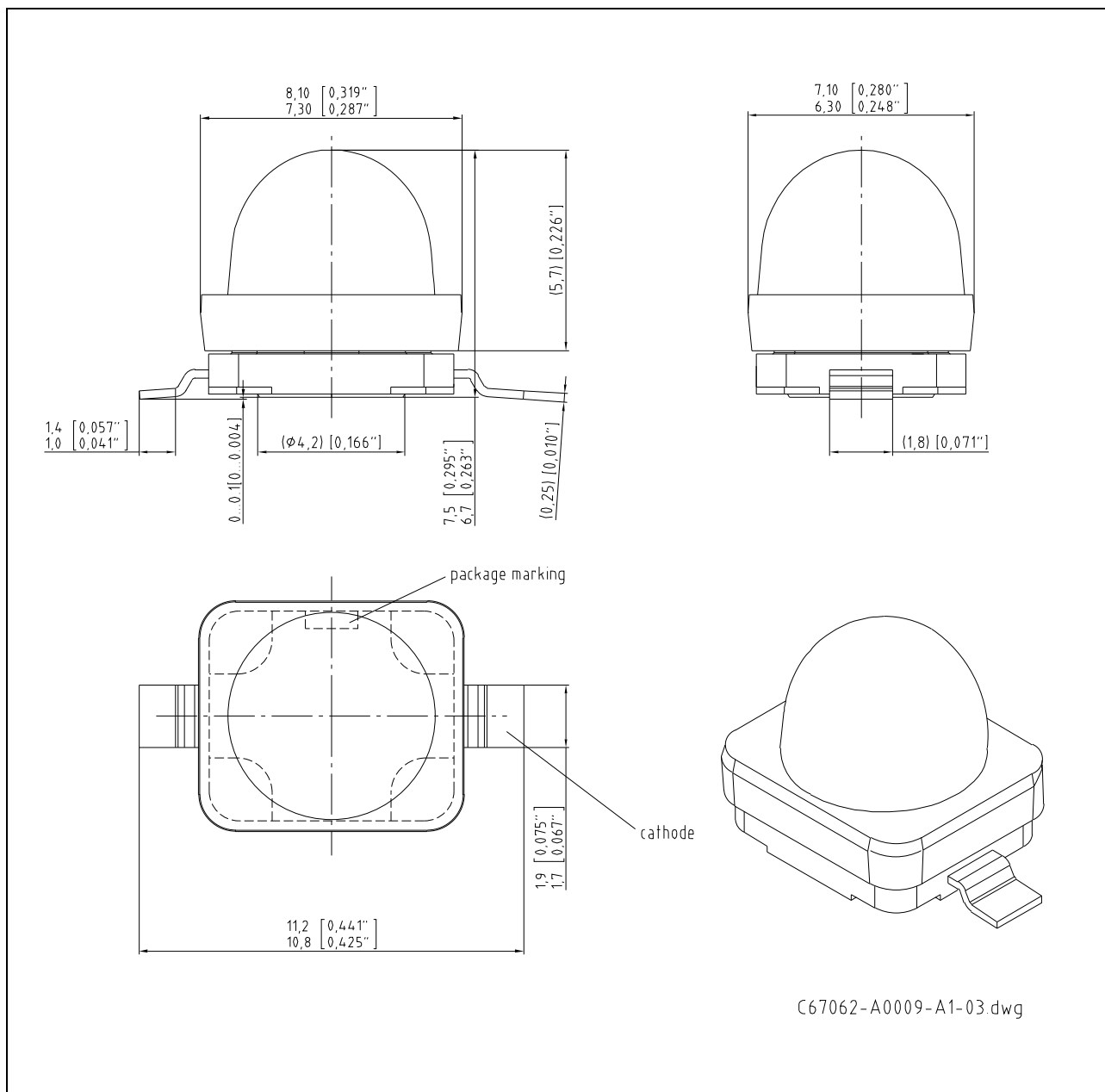
$I_F = f(T_A), R_{thJS} = 9 K/W$



**Zulässige Impulsbelastbarkeit**  
**Permissible Pulse Handling Capability**  
 $I_F = f(t_p), T_S = 85 \text{ °C}$ ,  
Duty cycle  $D = \text{parameter}$



## Maßzeichnung Package Outlines



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

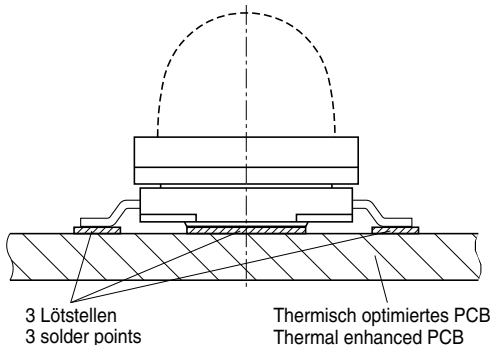
**Korrosionsfestigkeit besser als EN 60068-2-60 (method 4):**  
mit erweitertem Korrosionstest: 40°C / 90%rh / 15ppm H<sub>2</sub>S / 336h

**Corrosion robustness better than EN 60068-2-60 (method 4):**  
with enhanced corrosion test: 40°C / 90%rh / 15ppm H<sub>2</sub>S / 336h

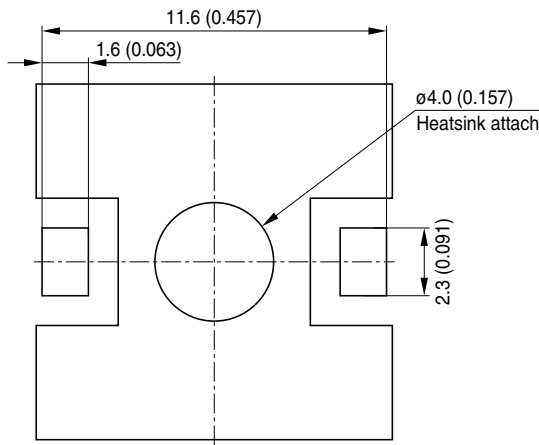
**Empfohlenes Lötpad Design**  
**Recommended Solder Pad Design**

**Achtung:**  
 Anode und Heatsink sind elektrisch verbunden

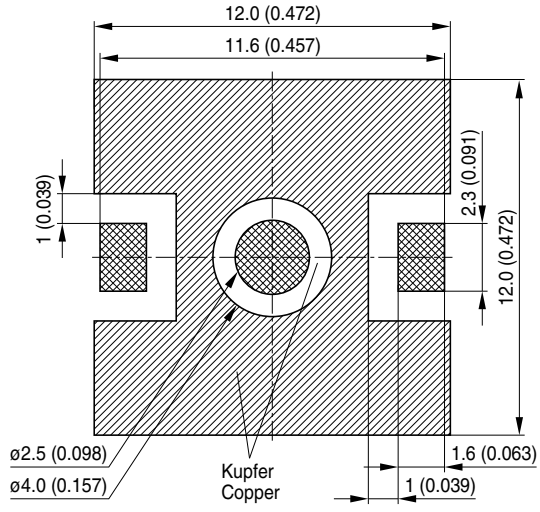
**Attention:**  
 Anode and Heatsink are electrically connected






Footprint



Empfohlene Padgeometrie  
 Recommended Solder Pad Design



-  Lötstopplack  
Solder resist
-  Lötpasten Schablone  
Solder paste stencil
-  Freies Kupfer  
Bare Copper

OHPY3638

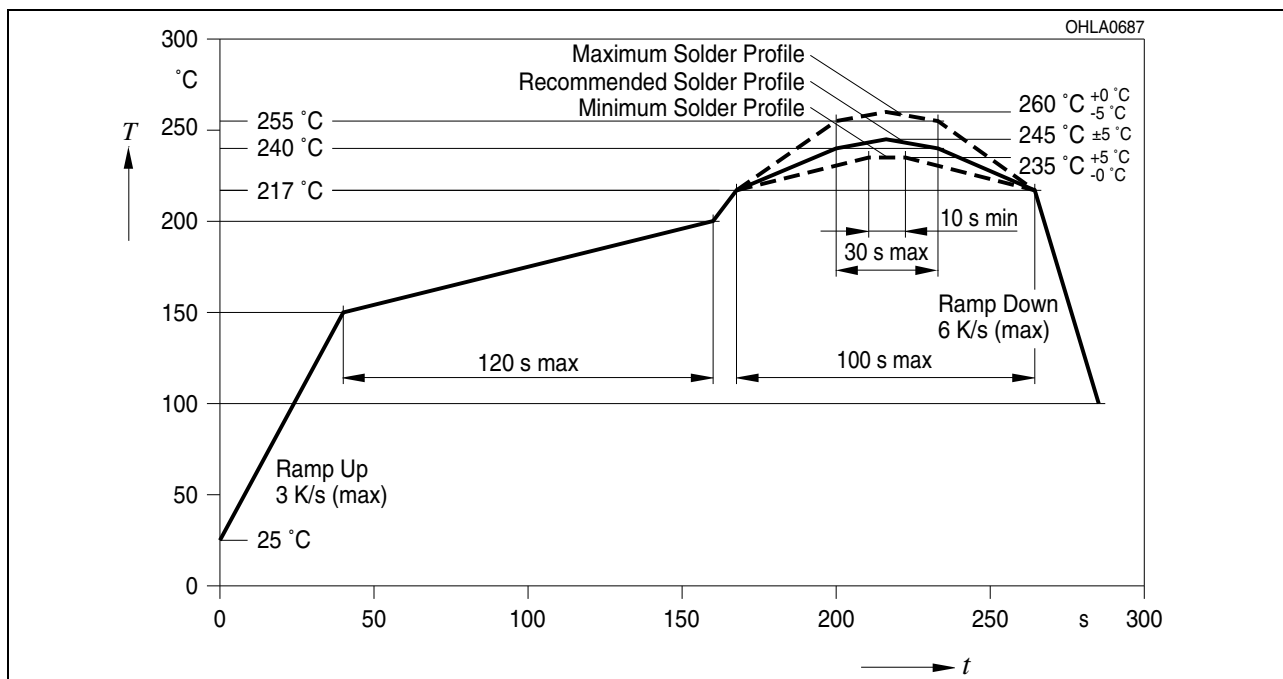
Maße in mm (inch) / Dimensions in mm (inch).

## 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)



Anm.: Das Gehäuse ist für Ultraschallreinigung nicht geeignet

Note: Package not suitable for ultra sonic cleaning

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<sup>1</sup> 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 effectiveness of that device or system.

<sup>2</sup> 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.

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