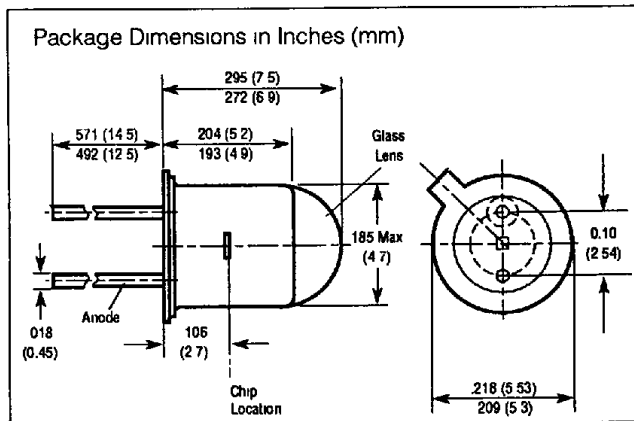
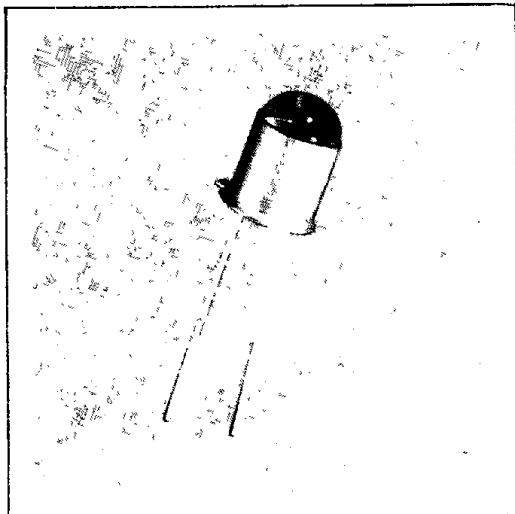


**SIEMENS**

**SFH480 SERIES**  
GaAlAs INFRARED EMITTER

T-41-13



**FEATURES**

- TO-18 Hermetic Package
- Round Glass Lens
- Very Narrow Beam, 12°
- Very High Power, 10 mW Typical at 100 mA
- Three Radiant Intensity Selections  
 SFH480-1,  $\geq 25$  mW/sr  
 SFH480-2,  $\geq 40$  mW/sr  
 SFH480-3,  $\geq 63$  mW/sr

**DESCRIPTION**

The SFH 480 series are infrared emitting diodes which emit radiation in the near infrared range (880 nm peak). The emitted radiation, which can be modulated, is generated by forward flowing current. The case (18A 2 DIN 41876—similar to TO-18) is topped by a glass lens. The cathode lead is nearest the tab on the rim of the case. The anode is electrically connected to the case.

**Maximum Ratings**

Reverse Voltage	$V_R$	5	V
Forward Current ( $T_c \leq 25^\circ\text{C}$ )	$I_F$	200	mA
Surge Current ( $\tau \leq 10\mu\text{s}$ )	$I_{FS}$	2.5	A
Junction Temperature	$T_J$	100	$^\circ\text{C}$
Storage Temperature	$T_S$	-55 to +100	$^\circ\text{C}$
Power Dissipation ( $T_c \leq 25^\circ\text{C}$ )	$P_{tot}$	470	mW
Thermal Resistance			
Junction to Air	$R_{thJamb}$	450	K/W
Junction to Case	$R_{thJC}$	160	K/W
Soldering Temperature			
(Distance from casing-solder tab $\geq 2$ mm)	$T_{SOLD}$	260	$^\circ\text{C}$
Dip Soldering Time $\leq 5$ sec	$T_{SOLD}$	300	$^\circ\text{C}$
Iron Soldering Time $\leq 3$ sec	$T_{SOLD}$		

**Characteristics ( $T_{amb} = 25^\circ\text{C}$ )**

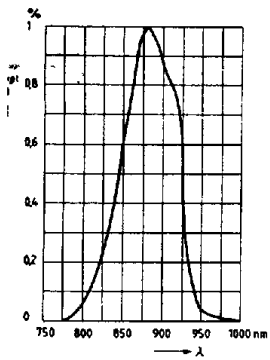
Wavelength at peak emission at $I_F = 10$ mA;	$\lambda_{peak}$	880	nm
Wavelength at peak emission at $I_F = 100$ mA, $t_{pulse} = 20$ ms. Duty cycle = 1/12	$\lambda_{peak}$	883	nm
Wavelength at peak emission at $I_F = 1$ A, $t_{pulse} = 100$ $\mu\text{s}$ . Duty cycle = 1/200	$\lambda_{peak}$	886	nm
Spectral bandwidth at 50% of $I_{max}$ at $I_F = 10$ mA	$\Delta\lambda$	80	nm
Half angle	$\varphi$	$\pm 6$	Deg
Active chip area	A	0.16	mm <sup>2</sup>
Dimensions of active chip area	L x W	0.4 x 0.4	mm
Distance chip surface to case surface	D	4.0 - 4.8	mm
Switching time ( $I_F$ from 10% to 90%, and from 90% to 10% $I_F = 100$ mA)	$t_r, t_f$	0.6/0.5	$\mu\text{s}$
Capacitance ( $V_R = 0$ V, $f = 1$ MHz)	$C_o$	25	pF
Forward voltage ( $I_F = 100$ mA, $t_{pulse} = 20$ ms)	$V_F$	1.5 ( $\leq 1.8$ )	V
( $I_F = 1$ A, $t_{pulse} = 100$ $\mu\text{s}$ )	$V_F$	3.0 ( $\leq 3.8$ )	V
Breakdown voltage ( $I_F = 10$ $\mu\text{A}$ )	$V_{BR}$	30 ( $\geq 5$ )	V
Reverse current ( $V_R = 5$ V)	$I_R$	0.01 ( $\leq 1$ )	$\mu\text{A}$
Temperature coefficient of $I_g$ or $\phi_e$	TC	-0.5	%/K
Temperature coefficient of $V_F$	TC	-0.2	%/K
Temperature coefficient of $\lambda_{peak}$	TC	0.25	nm/K
Typical Radiant Flux ( $I_F = 100$ mA $T_p = 20$ ms)	$\phi_E$	10	mW

**Radiant Intensity  $I_E$  in Axial Direction Measured at a Solid Angle of  $\Omega = 0.01$ sr**

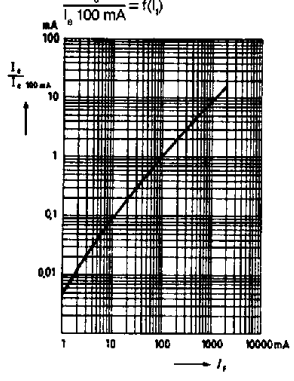
Group	SFH 480-1	SFH 480-2	SFH 480-3	
Radiant Intensity $I_E$ ( $I_F = 100$ mA $T_p = 20$ ms)	25-50	40-80	$\geq 63$	mW/sr
( $I_F = 1$ A, $T_p = 100$ $\mu\text{s}$ )	280	450	525	mW/sr

T-41-13

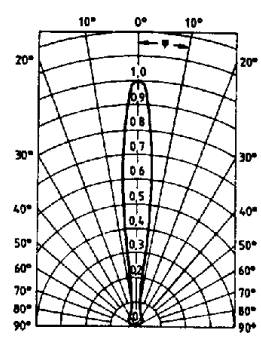
**Relative spectral emission**  
 $I_{rel} = f(\lambda)$



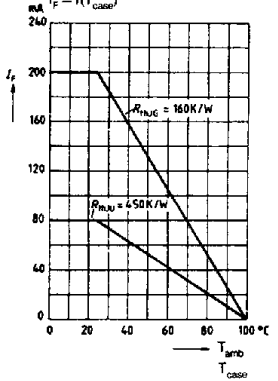
**Radiant intensity**  
 $I_o = f(I_f)$



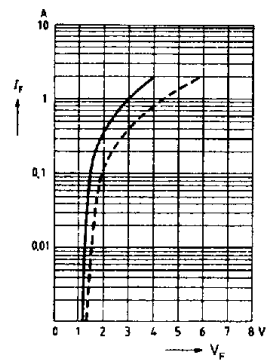
**Radiant characteristics**  
 $I_{rel} = f(\varphi)$



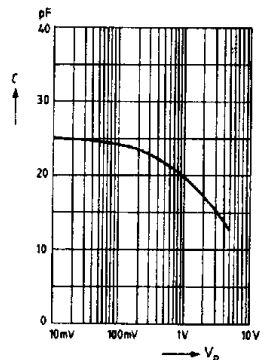
**Maximum permissible forward current**  
 $I_F = f(T_{amb})$   
 $I_F = f(T_{case})$



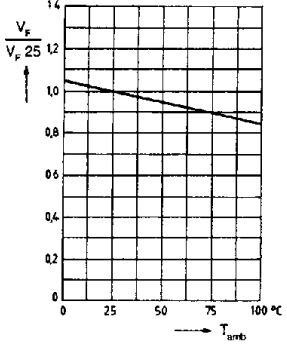
**Forward current**  
 $I_F = f(V_F)$



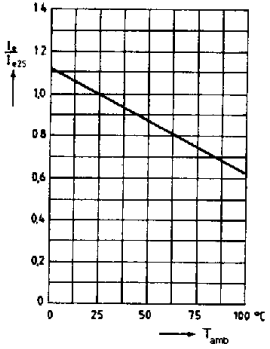
**Capacitance**  
 $C = f(V_R)$



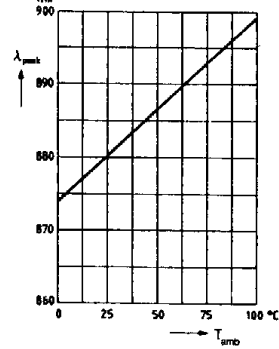
**Forward voltage**  
 $V_F / V_{F25} = f(T_{amb})$



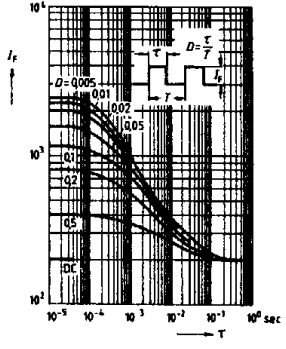
**Radiant intensity**  
 $I_o / I_o25 = f(T_{amb})$



**Wavelength at peak emission**  
 $\lambda_{peak} = f(T_{amb})$



**Permissible pulse load**  
 $I_F = f(t)$   
 Duty cycle D = Parameter



Infrared Emitters