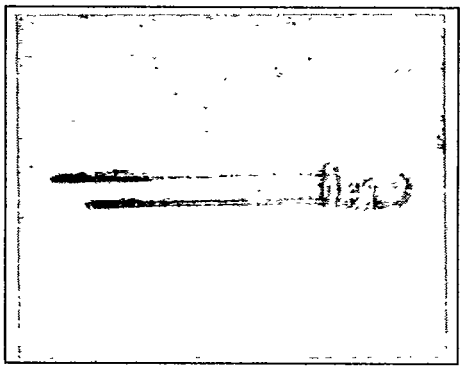
T-41-13

SIEMENS

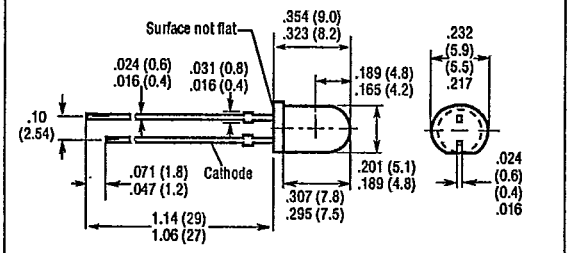
SFH474
SFH475
SFH476

High Speed GaAlAs Infrared Emitter

Preliminary Data Sheet



Package Dimensions in Inches (mm)



FEATURES

- **Very High Speed Response**
- **Narrow, Medium, and Wide Beam Choices**
- **T 1^3/$_4$ Plastic Package**
- **High Linearity**
- **Long Lifetime**
- **Withstands High Pulse Currents**

DESCRIPTION

The SFH 474/475/476 are fast IR emitters intended for use in high data rate remote transmission. These yellow lensed 5 mm devices are Zinc and Tellurium doped GaAlAs with a peak wavelength in the near infrared range (830 nm).

The emitters are offered with 3 angular characteristics–narrow, medium and wide beams–making them suitable for a variety of applications. Potential uses include wireless LANs, audio transmission and inter-office remote data transmission.

Maximum Ratings

Operating & Storage Temperature (T_{op}, $T_{s'g}$) .....-55 to +100°C
Soldering Temperature (>10 mm distance from package, solder time t ≤ 3 s) (T_S) .....260°C
Junction Temperature (T_j) .....100°C
Reverse Voltage (V_R) .....3 V
Continous Forward Current (I_F) .....100 mA
Pulse Current (t_p < 10 µs, D = 0) (I_{FSM}) .....3 A
Power Dissipation (P_{tot}) .....165 mW
Thermal Resistance (R_{thJA}) .....450 K/W

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Characteristics (T_{amb} = 25 °C)

Parameter		Symbol	Value	Unit
Wavelength @ Peak Emission (I_F = 100 mA, t_p = 20 ms)		λ	830	nm
Spectral Bandwidth @ 50% I_{emax} (I_F = 100 mA, t_p = 20 ms)		$\Delta\lambda$	60	nm
Half angle	SFH 474	φ	±11	Deg.
	SFH 475	φ	±17	Deg.
	SFH 476	φ	±28	Deg.
Active Chip Surface		A	0.16	mm²
Active Chip Dimensions		L x W	0.4 x 0.4	mm
Distance Chip Surface to Lens	SFH 474	H	5.1 to 5.7	mm
	SFH 475	H	4.2 to 4.8	mm
	SFH 476	H	3.4 to 4.0	mm
Response Time (@ I_e = 100 mA), I_e from 10%–90% and 90%–10%		t_r, t_f	100	ns
Capacitance (V_R = 0 V, f = 1 MHz)		C_0	120	pF
Forward Voltage (I_F = 100 mA, t_p = 20 ms)		V_F	1.4 typ., 1.7 max.	V
(I_F = 1 A, t_p = 100 µs)			2.2 typ., 2.8 max.	V
Breakdown Voltage (I_R = 10 µA)		V_{BR}	>3	V
Reverse Current (V_R = 3 V)		I_R	0.01 typ., 1 max.	µA
Radiant Flux (I_F = 100 mA, t_p = 20 ms)		Φ_e	10	mw
Temperature Coefficient of I_e or Φ_e		TC_I	-1	%/K
Temperature Coefficient of V_F		TC_V	-2	mV/K
Temperature Coefficient of λ		TC_λ	+0.3	nm/K

Radiant Intensity I_e in axial direction measured at a solid angle of Ω = 0.01 sr

I_F = 100 mA, t_p = 20 ms	SFH474	I_e	10 min.	mW/sr
	SFH475	I_e	6.3 min.	mW/sr
	SFH476	I_e	2.5 min.	mW/sr
I_F = 1 A, t_p = 100 µs	SFH474	I_e	180 typ.	mW/sr
	SFH475	I_e	110 typ.	mW/sr
	SFH476	I_e	45 typ.	mW/sr