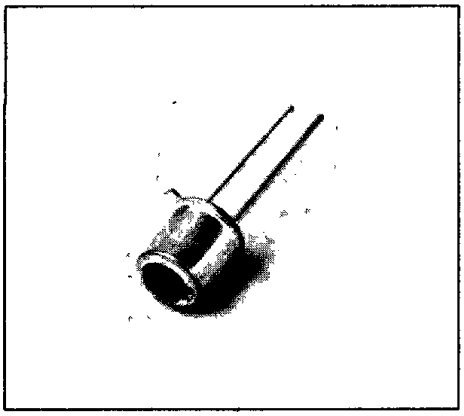
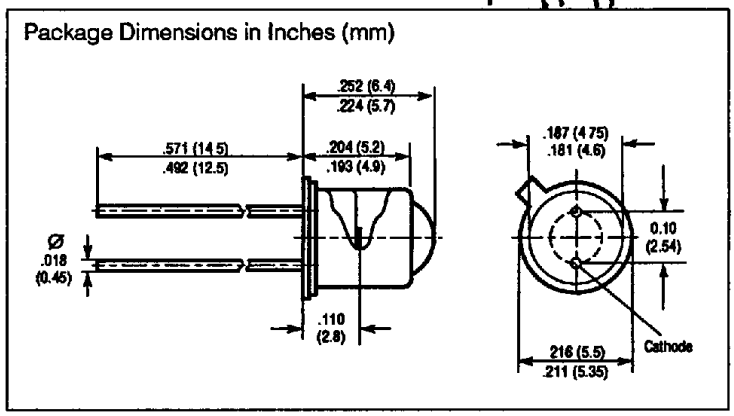
SIEMENS

SFH 401 SERIES

GaAs INFRARED EMITTER

T-41-11





FEATURES

- **Package: 18 A 3 DIN 41 876 (TO 18), Glass Lens, Hermetically Sealed, Solder Tabs, Lead Spacing 2.54 mm (1/10")**
- **Anode Marking: Tab at Case Bottom**
- **High Reliability**
- **Long Life**
- **Very High Radiant Intensity, Narrow Beam**
- **High Pulse Power**
- **Two Radiant Intensity Ranges**
- **Same Package as SFH 481**

DESCRIPTION

The GaAs infrared emitting diode SFH 401, fabricated in a liquid phase epitaxy process, features high efficiency and emits radiation at a wavelength in the near infrared range. The radiation is activated by dc or pulse operation in forward direction; simultaneous modulation is possible. The cathode is electrically connected to the case.

The applications include light-reflecting switches for steady and varying intensity, IR-remote control, industrial electronics, "measuring and controlling".

Maximum Ratings

Storage and Operating Temperature (T_{STG}, T_{OP}) ..... -55°C to +100°C
Soldering Temperature at Dip Soldering (≥2 mm distance from case bottom) (t ≤5 sec.) (T_S) ..... 260°C
Soldering Temperature at Iron Soldering (≥2 mm distance from case bottom) (t ≤ 3 sec.) (T_S) ..... 300°C
Junction Temperature (T_J) ..... 100°C
Reverse Voltage (V_R) ..... 5 V
Forward Current (I_F) T_C= 25°C ..... 300 mA
Surge Current (t ≤ 10 µs, D=0) (I_{FS}) ..... 3 A
Power Dissipation (P_{TOT}) T_C = 25°C ..... 470 mW
Thermal Resistance (R_{THJA}) ..... 450 K/W
(R_{THJC}) ..... 160 K/W

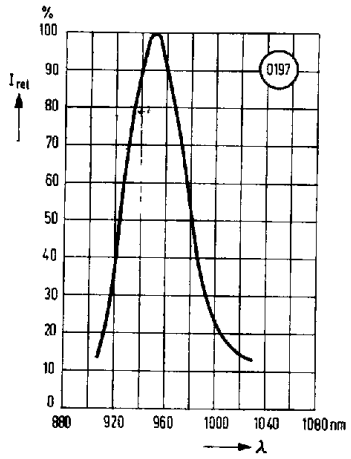
Characteristics (T_A=25°C)

Parameter	Symbol		Unit
Wavelength at Peak Emission (I_F=100 mA, t_p=20 ms)	λ_{PEAK}	950 ± 20	nm
Spectral Bandwidth at 50% of I_{MAX} (I_F=100 mA, t_p=20 ms)	$\Delta\lambda$	±55	nm
Half Angle	φ	±15	Deg.
Active Chip Area	A	0.25	mm²
Dimensions of Active Chip Area	L x W	0.5 x 0.5	mm
Distance Chip Surface to Case Surface	D	2.8 – 3.7	mm
Switching Times (I_E from 10% to 90%, and from 90% to 10%, I_F =100 mA)	t_R, t_F	1	µs
Capacitance (V_R=0 V, f=1 MHz)	C_0	40	pF
Forward Voltage (I_F=100 mA)	V_F	1.30 (≤1.5)	V
(I_F=1 A, t_p=100 µs)	V_F	1.9 (≤2.5)	V
Breakdown Voltage (I_R=10 µA)	V_{BR}	30 (≥5)	V
Reverse Current (V_R=5 V)	I_R	0.01 (≤1)	µA
Temperature Coefficient of I_E or Φ_E	TC_I	–0.55	%/K
Temperature Coefficient of V_F	TC_V	–1.5	mV/K
Temperature Coefficient of λ_{PEAK}	TC_λ	0.3	nm/K

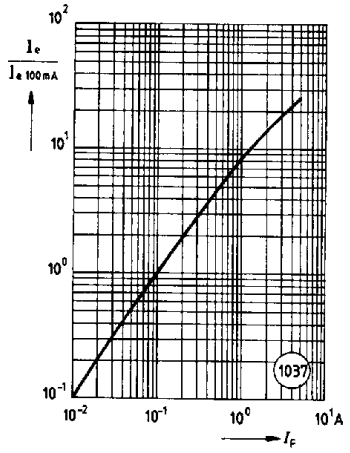
Radiant Intensity I_E in Axial Direction at a Steradian Ω ≥0.01 sr or 6.5 degrees

		SFH401-2	SFH401-3	SFH401-4	
(I_F=100 mA, t_p=20 ms)	I_E	10 – 20	16 – 32	>25	mW/sr
(I_F=1 A, t_p=100 µs)	I_E	100	120	225	mW/sr
Radiant Flux (total) (I_F=100 mA, t_p=20 ms)	Φ_E	5.5	7	8.5	mW

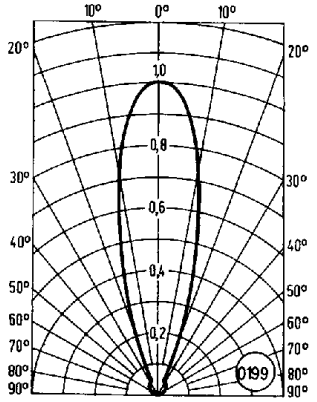
Relative spectral emission versus wavelength



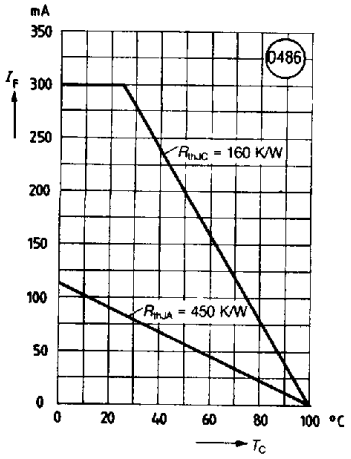
Radiant intensity versus forward current



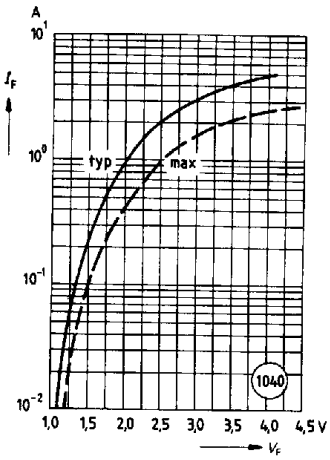
Radiation characteristic
Relative spectral emission versus half angle



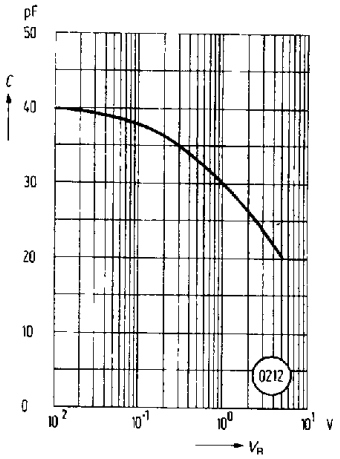
Forward current versus case temperature



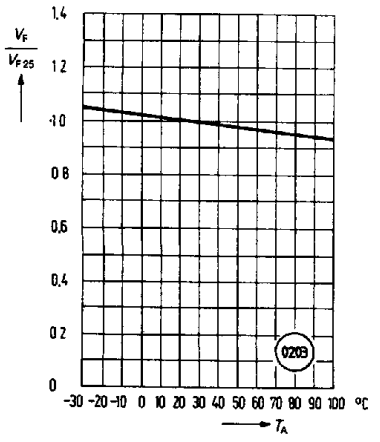
Forward current versus forward voltage



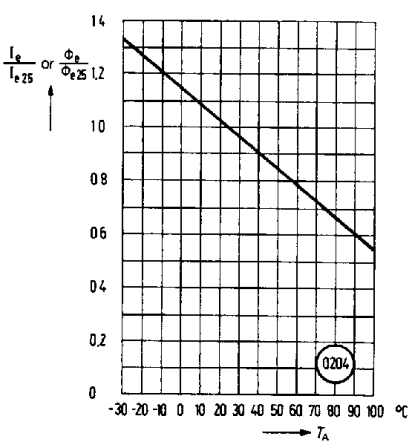
Capacitance versus reverse voltage



Forward voltage versus ambient temperature



Radiant intensity versus ambient temperature



Permissible pulse handling capability
Forward current versus cycle duration
(T_C=25°C, Duty cycle D = parameter)