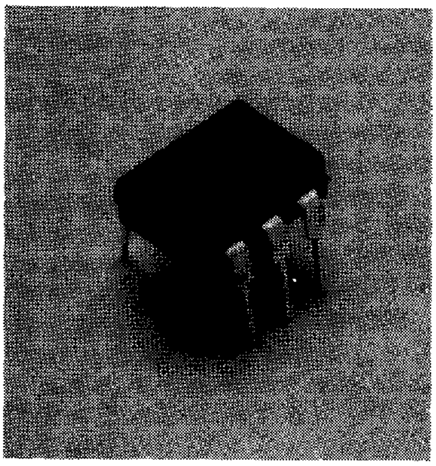
SIEMENS

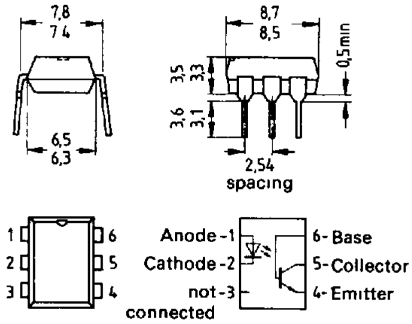
SFH 606

5.3 kV TRIOS*® OPTOCOUPLER HIGH REL/FAST TRANSISTOR

T-41-83



Package Dimensions mm



FEATURES

- Isolation Test Voltage: 5300 V
- High Current Transfer Ratios
  at 10 mA: 63-125%
  at 1 mA: >22%
- Fast Switching Times
- Minor CTR Degradation
- 100% Burn-In
- Field-Effect Stable by TRIOS
- Temperature Stable
- Good CTR Linearity Depending on Forward Current
- High Collector-Emitter Voltage V_{CEO}=70 V
- Low Saturation Voltage
- Low Coupling Capacitance
- External Base Wiring Possible
- UL Approval #52744
- VDE Approval 0883
- VDE Approval 0884 (Optional with Option 1, add -X001 suffix)

DESCRIPTION

The optically coupled isolator SFH 606 features a high current transfer ratio as well as a high isolation voltage. It employs a GaAs infrared emitting diode as emitter, which is optically coupled to a silicon planar phototransistor acting as detector. The component is incorporated in a plastic plug-in DIP-6 package.

The coupling device is suitable for signal transmission between two electrically separated circuits. The difference in potential between the circuits to be coupled must not exceed the maximum permissible reference voltages.

*TRansparent IOn Shield

T-41-83

Maximum Ratings

Emitter (GaAs Infrared Emitter)

Reverse Voltage	6 V
DC Forward Current	60 mA
Surge Forward Current (t≤10 µs)	2.5 A
Total Power Dissipation	100 mW

Detector (Silicon Phototransistor)

Collector-Emitter Voltage	70 V
Emitter-Base Voltage	7 V
Collector Current	50 mA
Collector Current (t ≤1 ms)	100 mA
Total Power Dissipation	150 mW

Optocoupler

Storage Temperature Range	-55°C to +150°C
Ambient Temperature Range	-55°C to +100°C
Junction Temperature	100°C
Soldering Temperature (max. 10 s)[1]	260°C
Isolation Test Voltage[2] (between emitter and detector referred to standard climate 23/50 DIN 50014)	5300 VDC
Leakage Path	≥8.2 mm
Air path	≥7.3 mm

Tracking Resistance

In Accordance with VDE 0110 §6, table 3, and DIN 53480/VDE 0303, part 1	≥100(group 3)
Isolation Resistance (V_{IO}=500 V)	10^{11} Ω

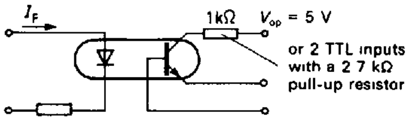
Notes:
1 Dip soldering Insertion depth ≤3.6 mm
2 DC test voltage in accordance with DIN 57883, draft 6/80

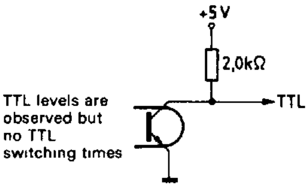
Characteristics (T_A=25°C)

Emitter (GaAs Infrared Emitter)			
Forward Voltage (I_F=60 mA)	V_F	1.25 (≤1.65)	V
Breakdown Voltage (I_R=10 µA)	BV	30 (≥6)	V
Reverse Current (V_R=6 V)	I_R	0.01 (≤10)	µA
Capacitance (V_R=0 V, f=1 MHz)	C_0	25	pF
Thermal Resistance	R_{THJA}	750	K/W
Detector (Silicon Phototransistor)			
Capacitance			
(V_{CE}=5 V, f=1 MHz)	C_{CE}	5.2	pF
(V_{CB}=5 V, f=1 MHz)	C_{CB}	6.5	pF
(V_{EB}=5 V, f=1 MHz)	C_{EB}	9.5	pF
Thermal Resistance	R_{THJA}	500	K/W
Optocoupler			
Collector-Emitter Saturation Voltage (I_F=10 mA, I_C=2.5 mA)	V_{CESAT}	0.25 (≤0.4)	V
Coupling Capacitance	C_K	0.5	pF
Current Transfer Ratio			
(I_F=10 mA)	I_C, I_F	63–125	%
(I_F=1 mA)	I_C, I_F	45 (>22)	%
Collector-Emitter Leakage Current (V_{CE}=10 V)	I_{CEO}	2 (≤35)	nA

SWITCHING TIME

Switching Operation (with saturation)





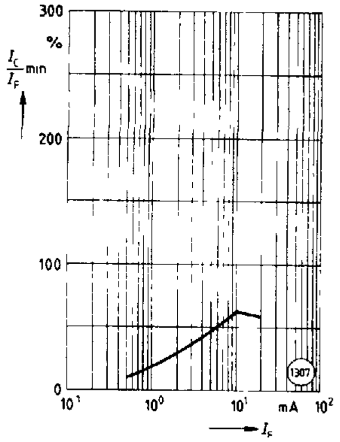
I_F=10 mA

Turn-On Time	t_{ON}	3.8 (≤4.5)	µs
Rise Time	t_R	2.5 (≤3.0)	µs
Turn-Off Time	t_{OFF}	11 (≤14)	µs
Fall Time	t_F	8 (≤10)	µs
	V_{CESAT}	≤0.4	V

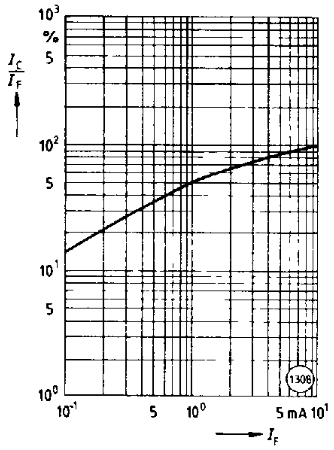
Optocouplers (Optoisolators)

SFH 606

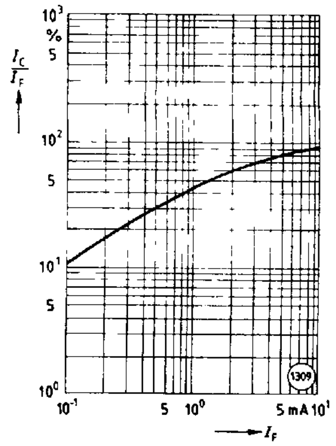
Minimum current transfer ratio versus diode forward current
(T_A=25°C, V_{CE}=5 V)



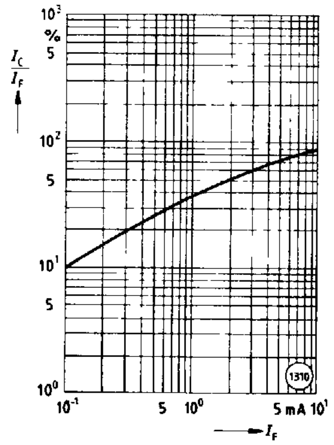
Current transfer ratio (typ.) versus diode forward current
(T_A=25°C, V_{CE}=5 V)



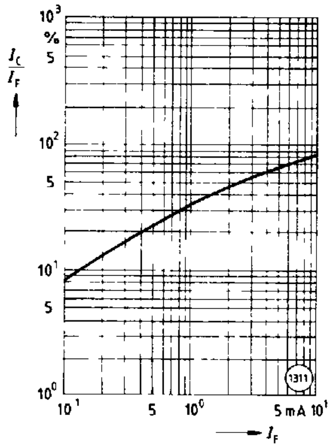
Current transfer ratio (typ.) versus diode forward current
(T_A=0°C, V_{CE}=5 V)



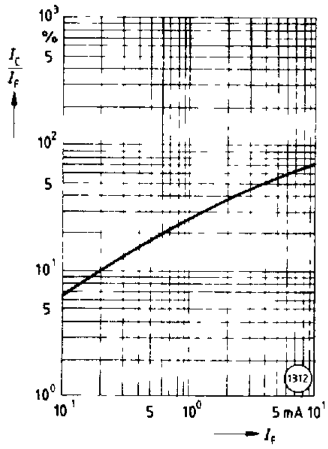
Current transfer ratio (typ.) versus diode forward current
(T_A=25°C, V_{CE}=5 V)



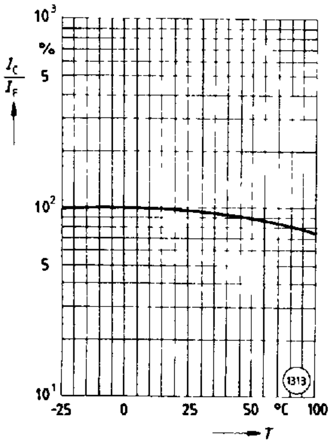
Current transfer ratio (typ.) versus diode forward current
(T_A=50°C, V_{CE}=5 V)



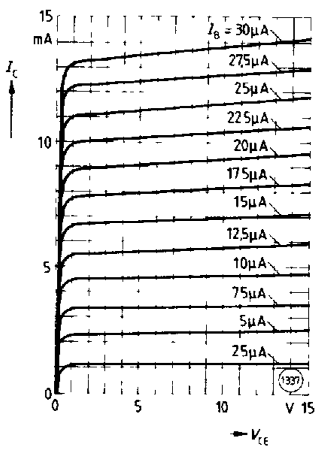
Current transfer ratio (typ.) versus diode forward current
(T_A=75°C, V_{CE}=5 V)



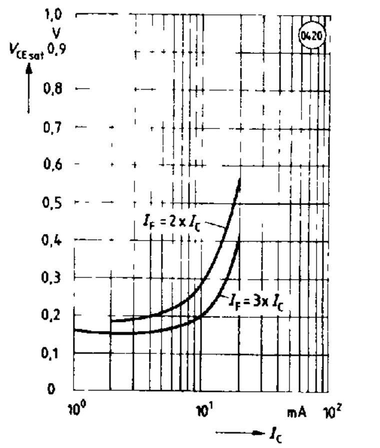
Current transfer ratio (typ.) versus temperature
(I_F= 10 mA, V_{CE}=5 V)



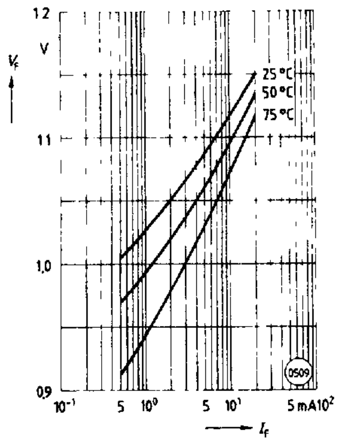
Collector current versus collector-emitter voltage
(Current gain B=550, T_A=25°C, V_F≤0 6 V)



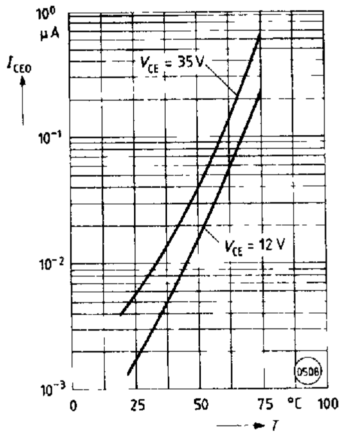
Collector-emitter saturation voltage (typ.) versus collector current and control range (T_A=25°C)



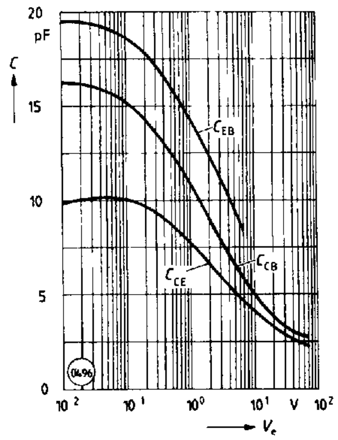
Diode forward voltage (typ.) versus forward current



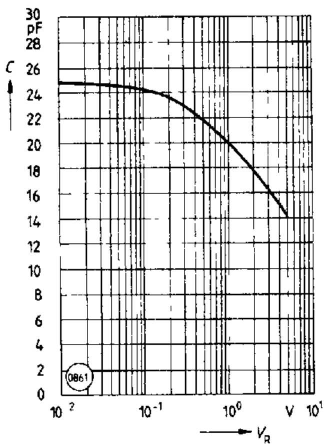
Collector-emitter leakage current (typ.) of the transistor versus temperature (I_F=0)



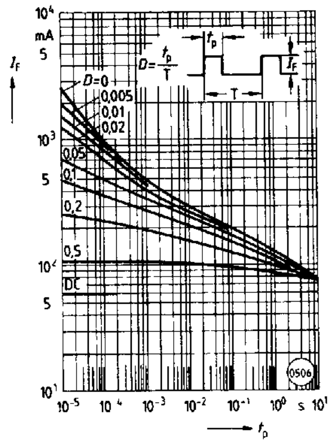
Transistor capacitance (typ.) versus emitter voltage
(T_A=25°C, f =1 MHz)



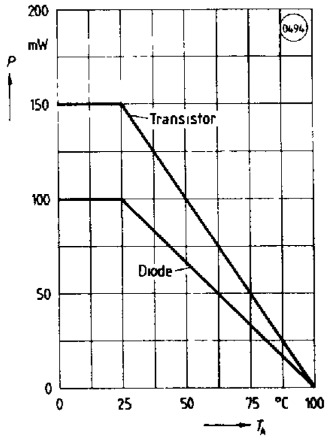
Diode capacitance (typ.) versus reverse voltage
(T_A=25°C, f =1 MHz)



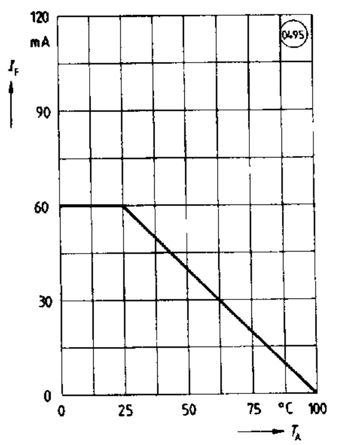
Permissible pulse handling capability Forward current versus pulse width
(D=parameter, T_A=25°C)



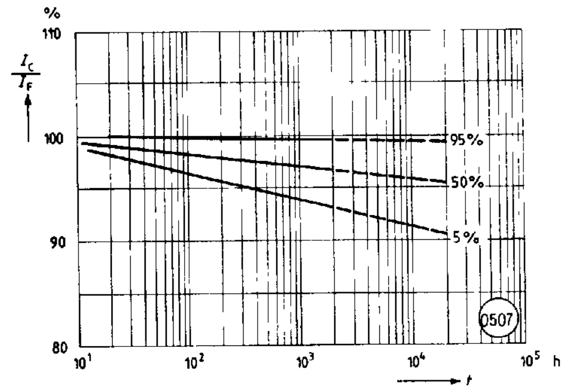
Permissible power dissipation for transistor and diode versus ambient temperature



Permissible forward current of the diode versus ambient temperature



Current transfer ratio versus load time
(V_{CE}=5 V, R_L=1 kΩ, T_A=60°C, I_F=60 mA, Measuring current=10 mA, Confidence coefficient S=60%)



Optocouplers (Optoisolators)