

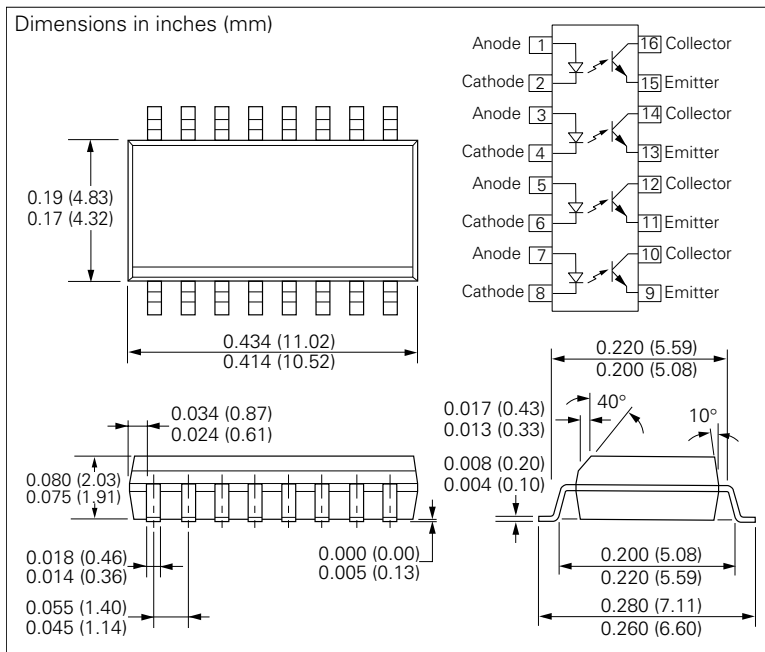
FEATURES

- **Current Transfer Ratio**
 - SFH6916, 50%–300%
- **SOP (Small Outline Package)**
- **Isolation Test Voltage, 3750 V_{RMS} (1.0 s)**
- **High Collector-Emitter Voltage, V_{CEO}=70 V**
- **Low Saturation Voltage**
- **Fast Switching Times**
- **Field-Effect Stable by TRIOS (TRansparent IOn Shield)**
- **Temperature Stable**
- **Low Coupling Capacitance**
- **End-Stackable, 0.050" (1.27 mm) Spacing**
- **Underwriters Lab File #52744**

DESCRIPTION

The SFH6916 family has a GaAs infrared emitting diode emitter, which is optically coupled to a silicon planar phototransistor detector, and is incorporated in a 16 pin 50 mil lead pitch miniflat package. It features a high current transfer ratio, low coupling capacitance, and high isolation voltage.

The coupling devices are designed for signal transmission between two electrically separated circuits.



Absolute Maximum Ratings, T_A=25°C (except where noted)

Emitter

Reverse Voltage	6.0 V
DC Forward Current	50 mA
Surge Forward Current (t _P ≤10 μs)	2.5 A
Total Power Dissipation per channel	80 mW

Detector

Collector-Emitter Voltage	70 V
Emitter-Collector Voltage	7.0 V
Collector Current	50 mA
Collector Current (t _P ≤1.0 ms)	100 mA
Total Power Dissipation per channel	150 mW

Package

Isolation Test Voltage between Emitter and	
Detector (1.0 s)	3750 V _{RMS}
Creepage	≥5.33 mm
Clearance	≥5.08 mm
Comparative Tracking Index	
per DIN IEC 112/VDE0 303, part 1	≥175
Isolation Resistance	
V _{IO} =500 V, T _A =25°C	≥10 ¹² Ω
V _{IO} =500 V, T _A =100°C	≥10 ¹¹ Ω
Storage Temperature Range	–55 to +125°C
Ambient Temperature Range	–55 to +100°C
Junction Temperature	100°C
Soldering Temperature (max. 10 s Dip Soldering	
Distance to Seating Plane ≥1.5 mm)	260°C
Total Power Dissipation	70 mW

Table 1. Electrical Characteristics, $T_A=25^\circ\text{C}$ (except where noted)

Description	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter (IR GaAs)						
Forward Voltage	V_F	—	1.15	1.4	V	$I_F=5\text{ mA}$
Reverse Current	I_R	—	0.01	10	μA	$V_R=6.0\text{ V}$
Capacitance	C_O	—	14	—	pF	$V_R=0.0\text{ V}$, $f=1.0\text{ MHz}$
Thermal Resistance	R_{thJA}	—	1000	—	K/W	—
Detector (Si Phototransistor)						
Leakage Current, Collector-Emitter	I_{CEO}	—	—	100	nA	$V_{CE}=20\text{ V}$
Capacitance	C_{CE}	—	2.8	—	pF	$V_{CE}=5.0\text{ V}$, $f=1.0\text{ MHz}$
Thermal Resistance	R_{thJA}	—	500	—	K/W	—
Package						
Collector-Emitter Saturation Voltage	V_{CESAT}	—	0.1	0.4	V	$I_F=20\text{ mA}$, $I_C=1.0\text{ mA}$
Coupling Capacitance	C_C	—	1.0	—	pF	$f=1.0\text{ MHz}$
Current Transfer Ratio	CTR	50	—	300	%	$I_F=5.0\text{ mA}$, $V_{CC}=5.0\text{ V}$

Switching Times (Typical)

Figure 1. Switching Operation (without saturation)

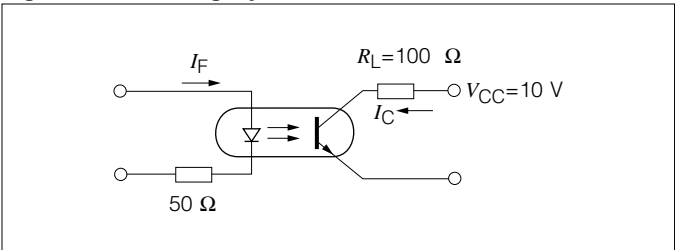


Figure 2. Switching Operation (with saturation)

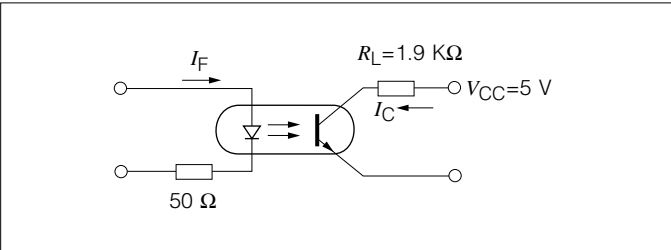


Table 2. $I_C=2.0\text{ mA}$, $V_{CC}=10\text{ V}$, $T_A=25^\circ\text{C}$

Parameter	Symbol	Value	Unit
Load Resistance	R_L	100	Ω
Rise Time	t_r	4.0	μs
Fall Time	t_f	3.0	
Turn on Time	t_{ON}	5.0	
Turn off Time	t_{OFF}	4.0	

Table 3. $I_F=16.0\text{ mA}$, $V_{CC}=5.0\text{ V}$, $T_A=25^\circ\text{C}$

Parameter	Symbol	Value	Unit
Load Resistance	R_L	1.9	k Ω
Rise Time	t_r	15	μs
Fall Time	t_f	0.5	
Turn on Time	t_{ON}	1.0	
Turn off Time	t_{OFF}	30	

Figure 3. Diode Forward Voltage vs. Forward Current

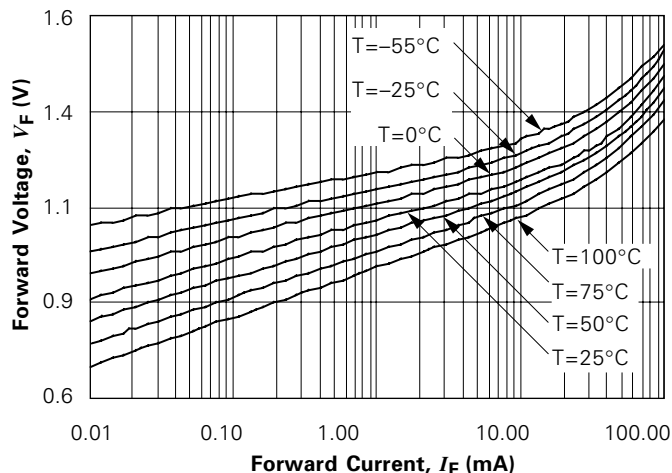


Figure 6. Collector Current vs. Collector-Emitter Saturation Voltage

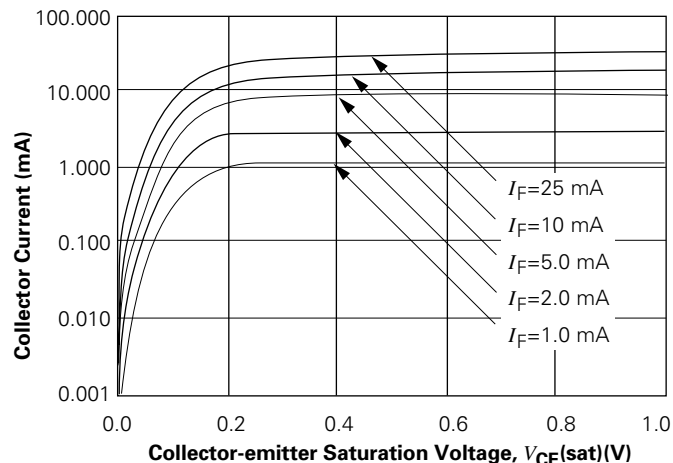


Figure 4. Collector Current vs. Collector Emitter Voltage

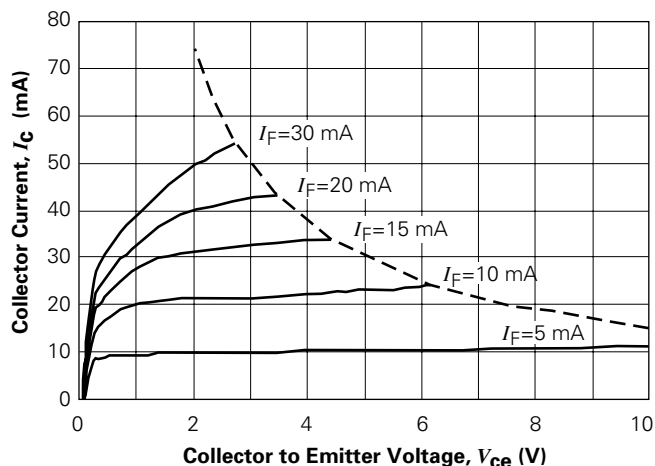


Figure 7. Normalized Output Current vs. Ambient Temperature

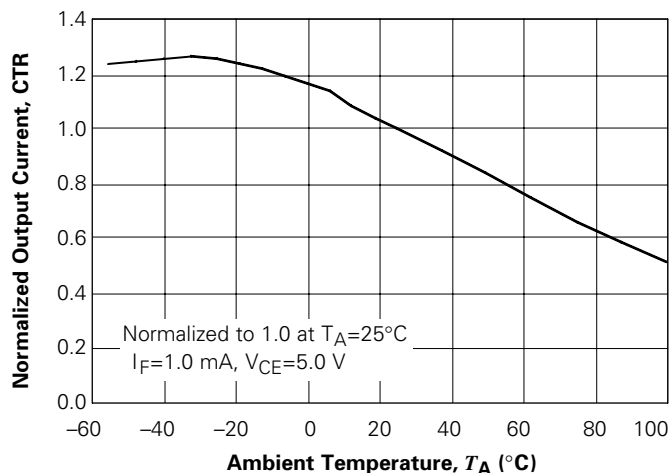


Figure 5. Collector to Emitter Dark Current vs. Ambient Temperature

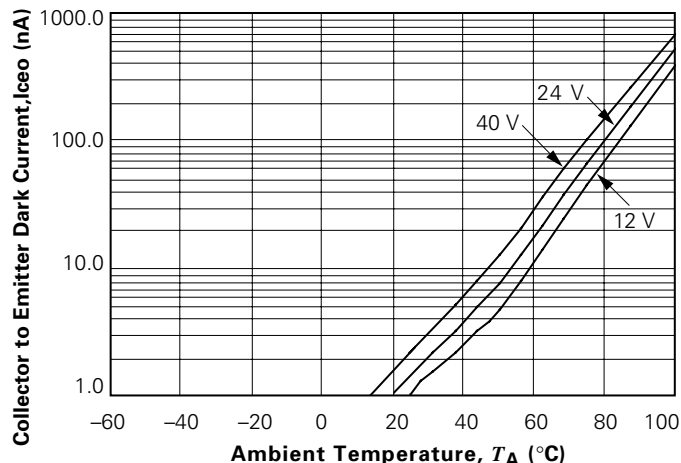


Figure 8. Normalized Output Current vs. Ambient Temperature

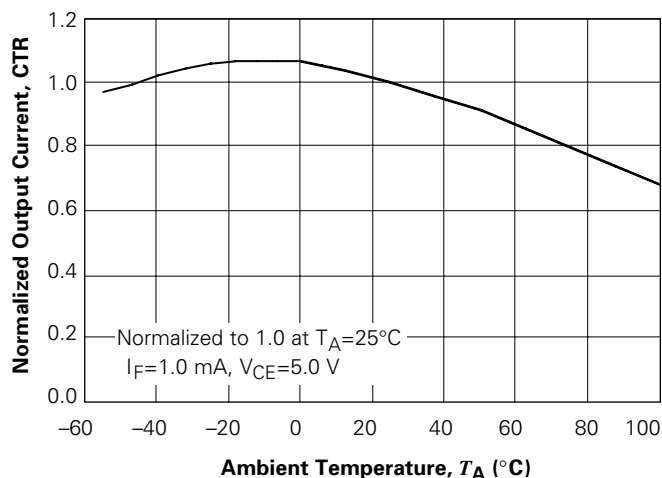


Figure 9. Current Transfer Ratio vs. Forward Current

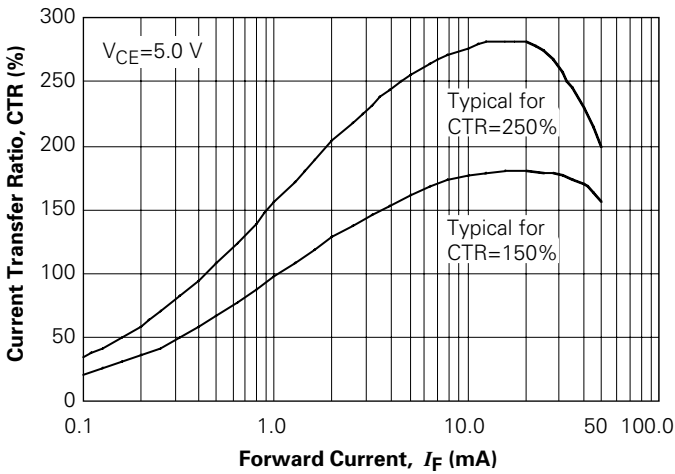


Figure 12. Switching Time Measurement

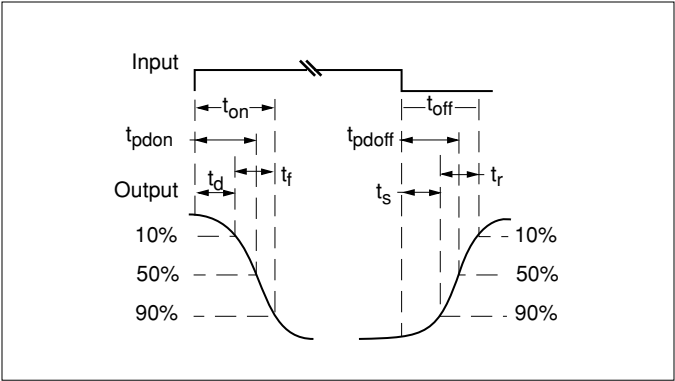


Figure 10. Switching Time vs. Load Resistance

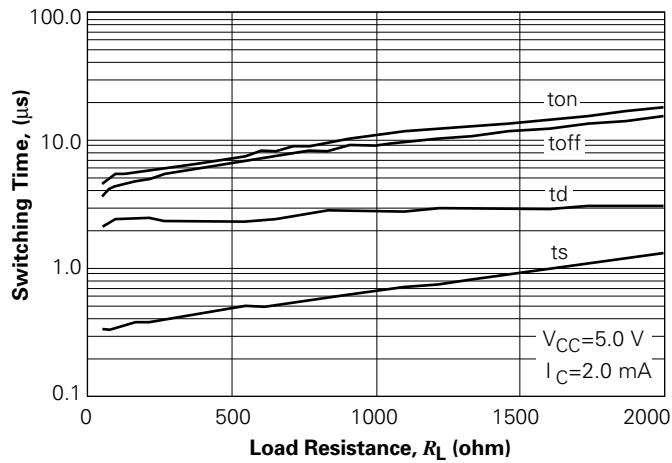


Figure 11. Switching Time vs. Load Resistance

