



# Specification Sheet

P/N: Photocoupler

Customer: \_\_\_\_\_

Mfg P/N: OR-357

Date: \_\_\_\_\_

\_\_\_\_\_

**SHENZHEN ORIENT COMPONENTS CO.,LTD.**

Block A 3rd Floor No.4 Building, Tian'an Cyber Park, Huangge Rd, LongGang  
Dist, Shenzhen, GD

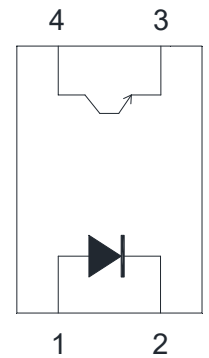
### 1. Features

- Current transfer ratio(CTR : MIN. 50% at  $I_F = 5\text{mA}$ ,  $V_{CE} = 5\text{V}$ ,  $T_a=25\text{ }^\circ\text{C}$ )
- High input -output isolation voltage ( $V_{ISO}=3,750\text{Vrms}$ )
- High collector-emitter voltage ( $V_{CEO} = 35\text{V}$ )
- SOP-4 package
- $-55\text{ }^\circ\text{C}$  to  $115\text{ }^\circ\text{C}$
- RoHS Compliance



### 2. Instructions

- The OR-357 series device consists of an infrared led, phototransistor detector. They are encapsulated in a 4 pin SOP encapsulation.
- Pin pitch of OR-357 is 2.54mm



1 Anode 2 Cathode  
3 Emitter 4 Collector

### 3. Application Range

- Hybrid substrates that require high density mounting.
- Programmable controllers
- System appliance, measuring instruments

### 4. Max Absolute rated Value (Normal Temperature=25°C)

Parameter		Symbol	Rated Value	Unit
Input	Forward Current	$I_F$	50	mA
	Junction Temperature	$T_J$	125	$^\circ\text{C}$
	Reverse Voltage	$V_R$	6	V
	Consume Power	$P$	100	mW
Output	Collector and emitter Voltage	$V_{CEO}$	35	V
	Emitter and collector Voltage	$V_{ECO}$	6	
	Collector Current	$I_C$	50	mA
	Consume Power	$P_C$	150	mW
Total Consume Power		$P_{tot}$	170	mW
*1 Insulation Voltage		$V_{iso}$	3750	Vrms
Working Temperature		$T_{opr}$	-55 to + 115	$^\circ\text{C}$
Deposit Temperature		$T_{stg}$	-55 to + 150	
*2 Soldering Temperature		$T_{sol}$	260	

- \*1. AC Test, 1 minute, humidity = 40~60%  
 Insulation test method as below:  
 (1) Short circuit both terminals of photocoupler.  
 (2) No Current when testing insulation voltage.  
 (3) Adding sine wave voltage when testing.

\*2. soldering time is 10 seconds.

### 5. Opto-electronic Characteristics

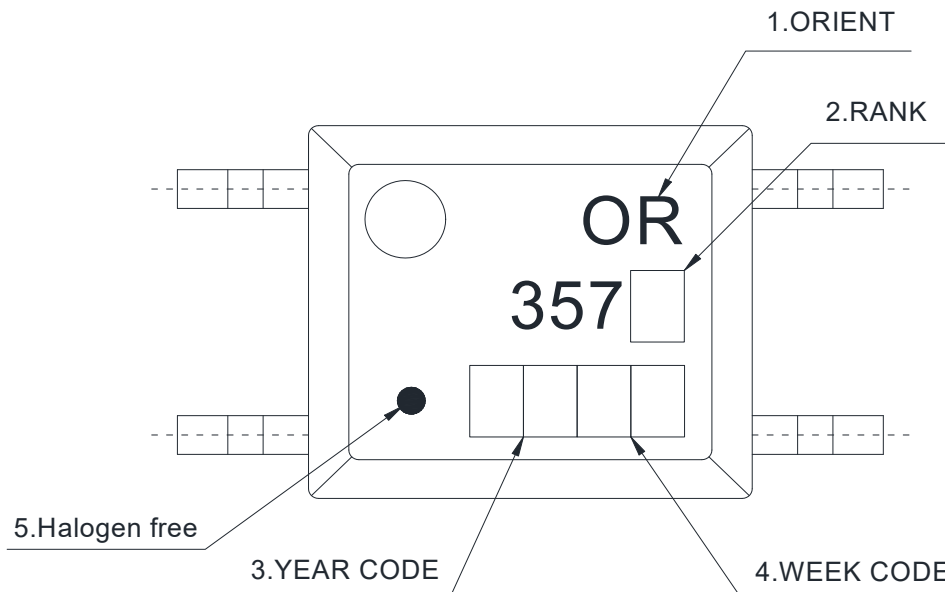
Parameter		Symbol	Condition	Min	Typ.*	Max	Unit
Input	Forward Current	$V_F$	$I_F=20mA$	---	1.2	1.4	V
	Reverse Voltage	$I_R$	$V_R=4V$	---	---	10	$\mu A$
	Collector capacitance	$C_t$	$V=0, f=1KHz$	---	30	250	pF
Output	Collector to emitter Current	$I_{CEO}$	$V_{CE}=20V, I_F=0mA$	---	---	100	nA
	Collector and Emitter attenuation Voltage	$BV_{CEO}$	$I_C=0.1mA, I_F=0mA$	35	---	---	V
	Emitter and Collector attenuation Voltage	$BV_{ECO}$	$I_E=0.01mA, I_F=0mA$	6	---	---	V
Transforming Characteristics	*1.Current conversion ratio	CTR	$I_F=5mA, V_{CE}=5V$	50	---	600	%
	Collector Current	$I_C$		2.5	---	30	mA
	Collector and Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F=20mA, I_C=1mA$	---	---	0.2	V
	Insulation Impedance	$R_{iso}$	DC500V 40~60%R.H.	$5 \times 10^{10}$	$1 \times 10^{11}$	---	$\Omega$
	Floating Capacitance	$C_f$	$V=0, f=1MHz$	---	0.6	1	pF
	Response Time	$t_r$	$V_{CC}=2V, I_C=2mA, R_L=100\Omega$	---	4	18	$\mu s$
	Descend Time	$t_f$		---	3	18	$\mu s$

- Current Conversion Ratio =  $I_C / I_F \times 100\%$

**6. Rank table of current transfer ratio CTR ( tolerance:±3% )**

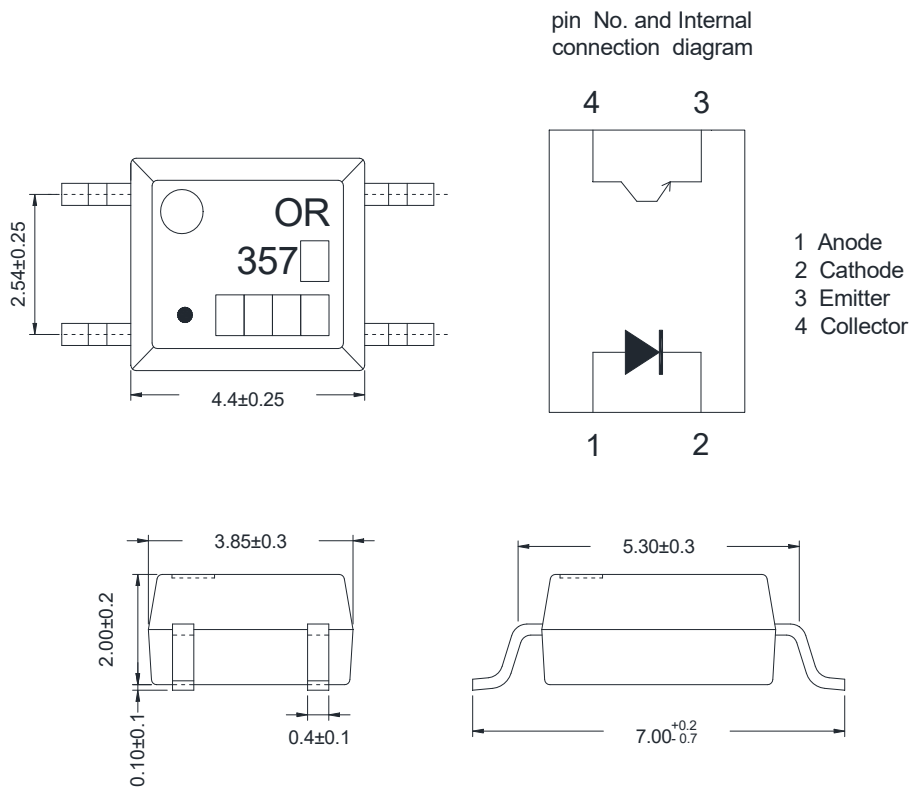
CTR Rank	Min.	Max.	Condition
A	80	160	$I_F=5mA, V_{CE}=5V, T_a=25^{\circ}C$
B	130	260	
C	200	400	
D	300	600	
E	50	150	
No mark	50	600	

**7. Naming Rule**

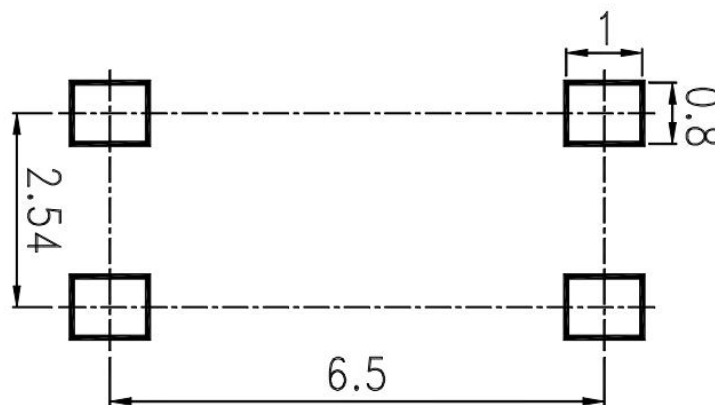


1. ORIENT
2. Rank shall be or shall not be marked.
3. Year Code, Example : 2010 = 10
4. Work Week Ranging from '01' to '53'
5. "●" indicates halogen free option.

### 8. Outer Dimension



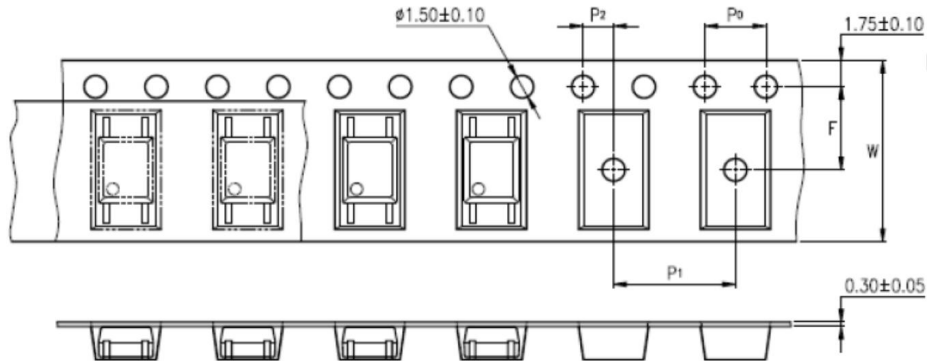
### 9. Recommended Foot Print Patterns (Mount Pad)



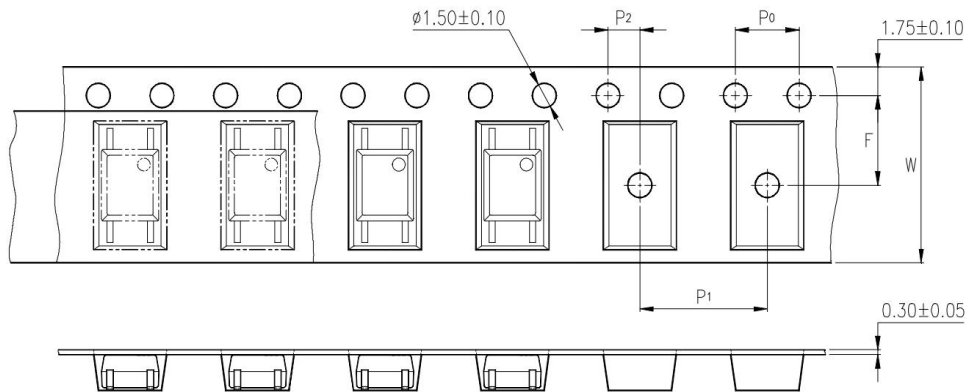
unit : mm

## 10. Taping Dimensions

### (1) OR-357-TP



### (2) OR-357-TP1



Description	Symbol	Dimension in mm(inch)
Tape wide	W	12±0.3 ( 0.472 )
Pitch of sprocket holes	P0	4±0.1 ( 0.157 )
Distance of compartment	F	5.5±0.1 ( 0.217 )
	P2	2±0.1 ( 0.079 )
Distance of compartment to compartment	P1	8±0.1 ( 0.315 )

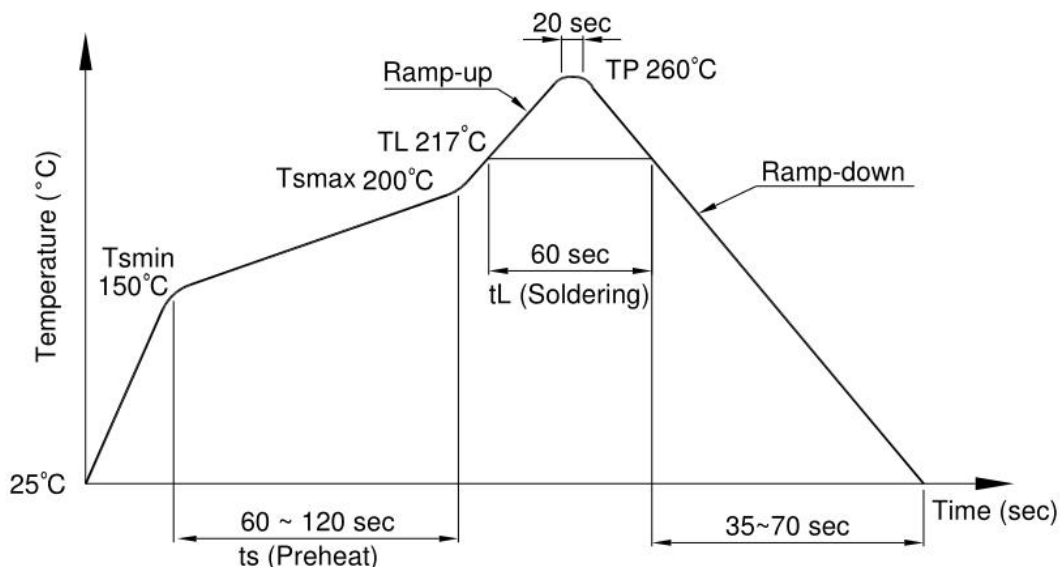
Package Type	OR-357 series
Quantities(pcs)	3000

### 11. Temperature Profile Of Soldering

( 1 ) IR Reflow soldering (JEDEC-STD-020C compliant)

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

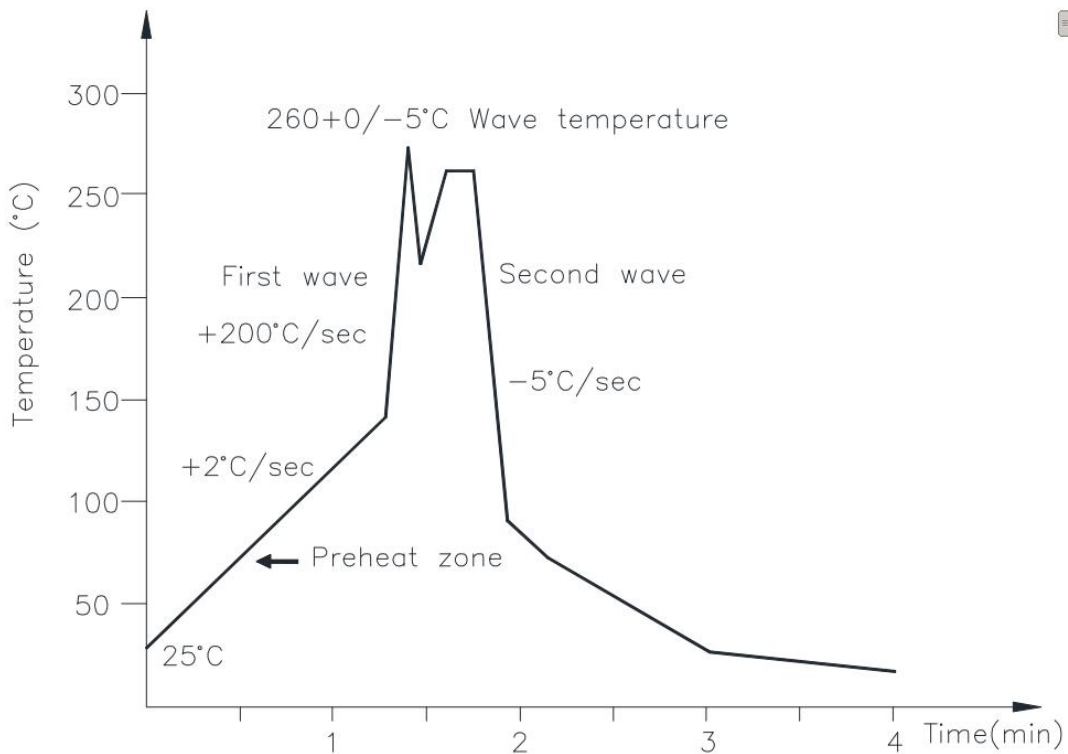
Profile item	Conditions
Preheat	
- Temperature Min ( T Smin )	150°C
- Temperature Max ( T Smax )	200°C
- Time (min to max) (ts)	90±30 sec
Soldering zone	
- Temperature ( TL )	217°C
- Time ( t L )	60 sec
Peak Temperature	260°C
Ramp-up rate	3°C / sec max.
3°C / sec max.	3~6°C / sec



(2) Wave soldering (JEDEC22A111 compliant)

One time soldering is recommended within the condition of temperature.

Temperature	260+0/-5°C
Time	10 sec
Preheat temperature	5 to 140°C
Preheat time	30 to 80 sec



(3) Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

Temperature	380+0/-5°C
Time	3 sec max



## 12. Characteristics Curve

Fig.1 Forward Current vs. Ambient Temperature

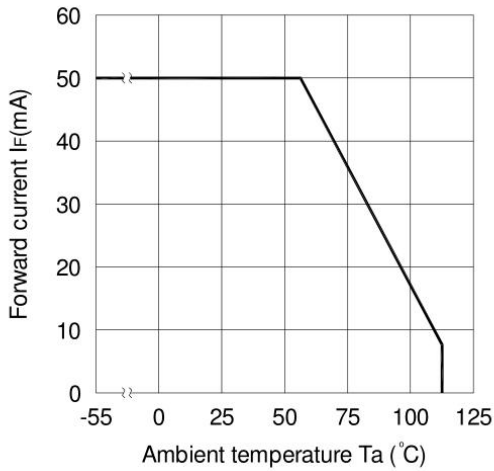


Fig.2 Collector Power Dissipation vs. Ambient Temperature

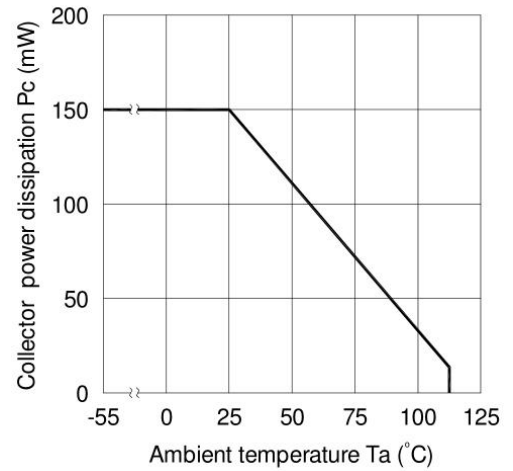


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

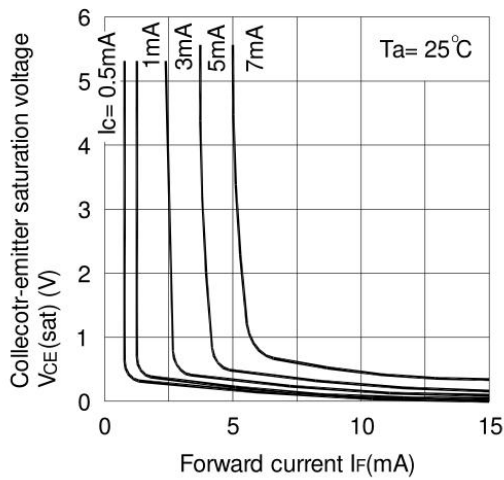


Fig.4 Forward Current vs. Forward Voltage

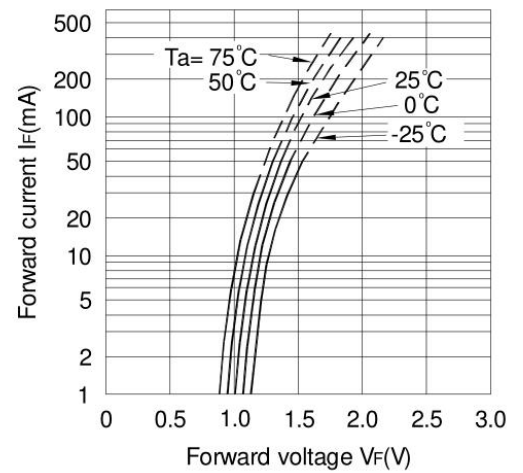


Fig.5 Current Transfer Ratio vs. Forward Current

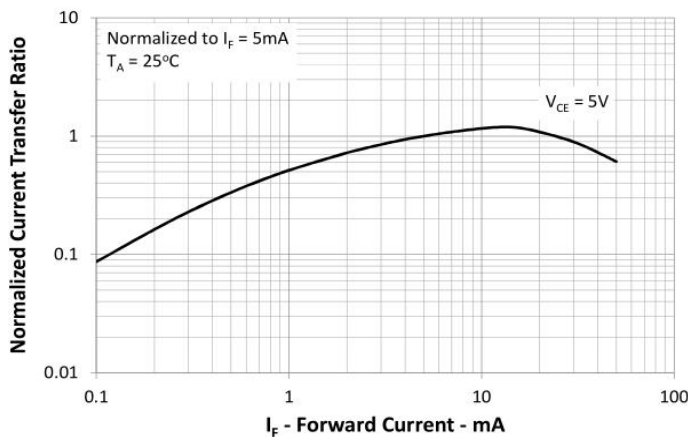


Fig.6 Collector Current vs. Collector-emitter Voltage

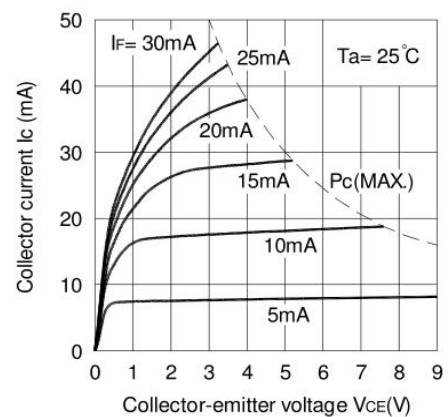


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

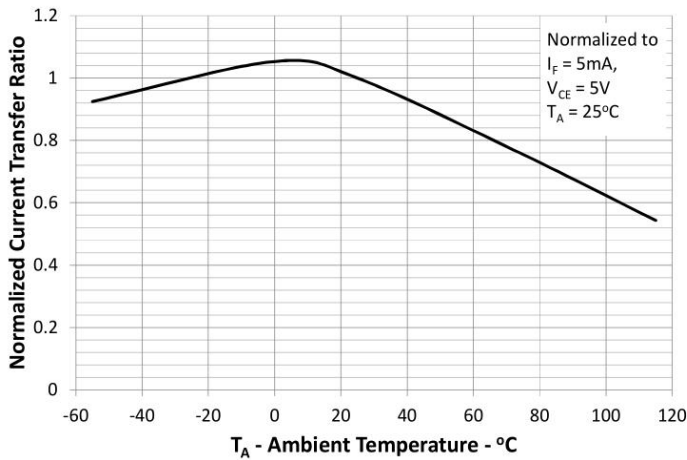


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

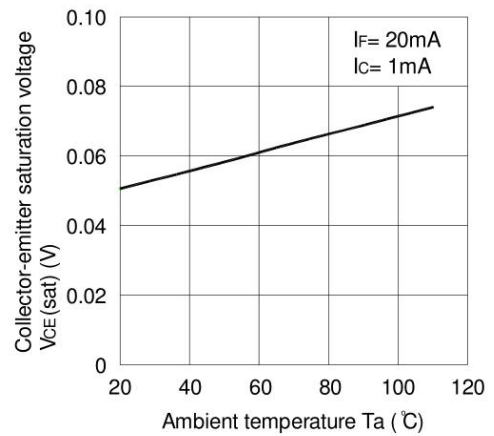


Fig.9 Collector Dark Current vs. Ambient Temperature

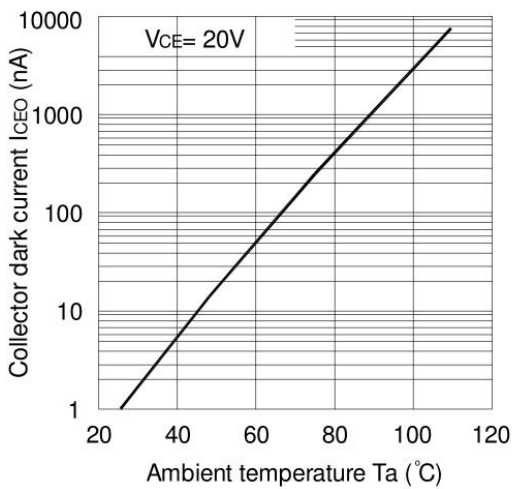


Fig.10 Response Time vs. Load Resistance

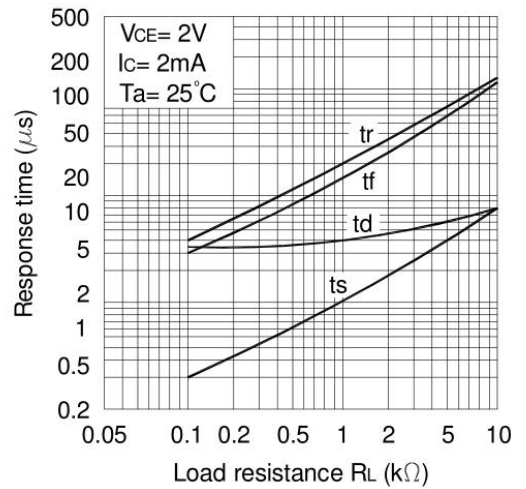
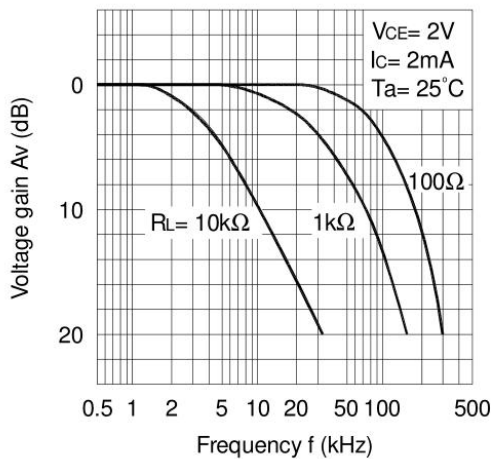
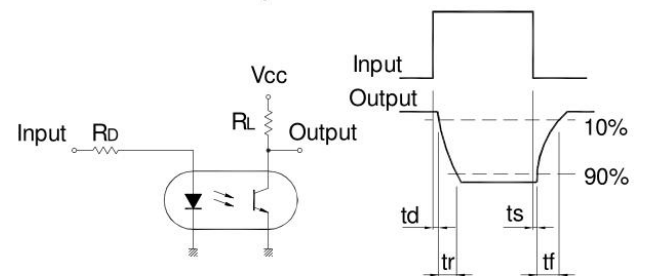


Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response

