



Specification Sheet

P/N: Photocoupler

Customer: _____

Mfg P/N: OR-3H4

Date: _____

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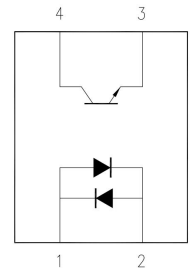
1、Features

- 1.Current transfer ratio(CTR) : MIN. 20% at $I_F = \pm 1\text{mA}$, $V_{CE} = 5\text{V}$, $T_a = 25^\circ\text{C}$
- 2.High input-output isolation voltage. ($V_{ISO} = 3,750\text{Vrms}$)
3. $V_{CEO} = 80\text{V}$
4. Operating temperature: -55°C to 115°C
5. Lead free, in compliance with RoHS standards



2、Instructions

The OR-3H4 series device contains two infrared led and a phototransistor detector. They are encapsulated in a 4-pin SOP, free of halogens and Sb2O3



1. Anode, Cathode 3. Emitter
2. Cathode, Anode 4. Collector

3、Application Range

- (1). Hybrid substrates that require high density mounting
- (2). Programmable controller
- (3). System apparatus , measuring instruments

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

Parameter		Symbol	Rated Value	Unit
Input	Forward Current	I_F	50	mA
	Peak forward current($t=10\mu\text{s}$)	I_{FM}	1	A
	Reverse Voltage	V_R	6	V
	Power Dissipation	P	65	mW
Output	Collector and emitter Voltage	V_{CEO}	80	V
	Emitter and collector Voltage	V_{ECO}	7	
	Collector Current	I_C	50	mA
	Power Dissipation	P_C	150	mW
Total Power Dissipation		P_{tot}	200	mW
*1 Insulation Voltage		V_{iso}	3750	Vrms
Operating Temperature		T_{opr}	-55 to +115	°C
Storage Temperature		T_{stg}	-55 to +150	
*2 Soldering Temperature		T_{sol}	260	

*1. AC For 1 Minute, R.H. = 40 ~ 60%

Isolation voltage shall be measured using the following method.

- (1) Short between anode and cathode on the primary side and between collector and emitter on thesecondary side
- (2) The isolation voltage tester with zero-cross circuit shall be used.
- (3) The waveform of applied voltage shall be a sine wave.

*2.soldering time is 10 seconds

5、 Opto-electronic Characteristics(Normal Temperature=25°C)

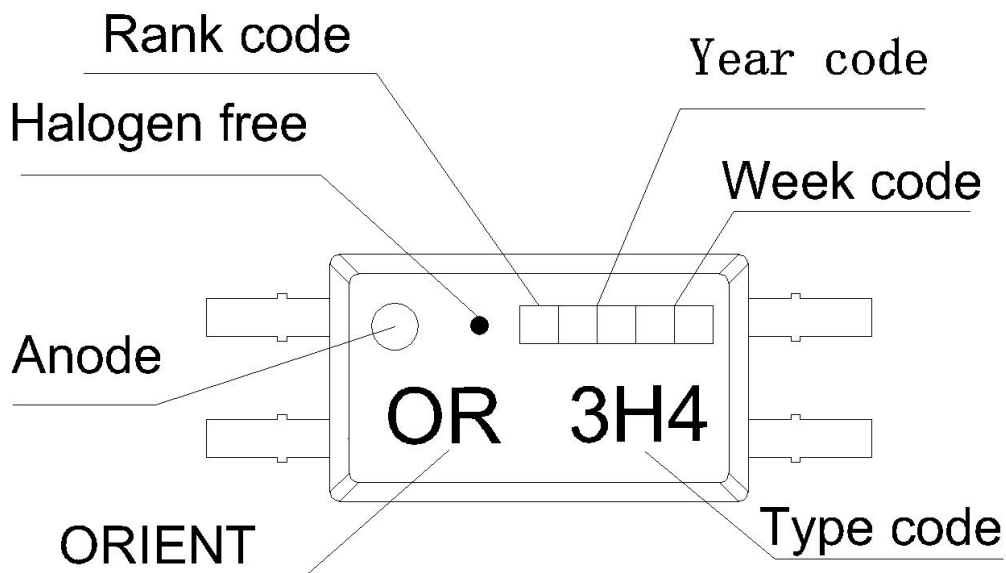
Parameter		Symbol	Condition	Min	Typ.*	Max	Unit
Input	Forward Current	V_F	$I_F=\pm 20\text{mA}$	---	1.2	1.4	V
	Terminal Capacitance	C_t	$V=0, f=1\text{KHz}$	---	60	---	pF
Output	Collector Dark Current	I_{CEO}	$V_{CE}=20\text{V}, I_F=0\text{mA}$	---	---	100	nA
	Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C=0.1\text{mA}$ $I_F=0\text{mA}$	80	---	---	V
	Emitter-Collector Breakdown Voltage	BV_{ECO}	$I_E=10\mu\text{A}$ $I_F=0\text{mA}$	7	---	---	V
(Transforming Characteristics)	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F=\pm 8\text{mA}$ $I_C=2.4\text{mA}$	---	---	0.4	V
	Insulation Impedance	R_{iso}	DC500V 40~60%R.H.	5×10^{10}	1×10^{11}	---	Ω
	Floating Capacitance	C_f	$V=0, f=1\text{MHz}$	---	0.8	1	pF
	Response Time	t_r	$V_{CE}=10\text{V},$ $I_C=\pm 2\text{mA}$	---	3	18	μs
	Descend Time	t_f	$R_L=100\Omega$ $f=100\text{Hz}$	---	4	18	μs

6、Rank table of current transfer ratio CTR

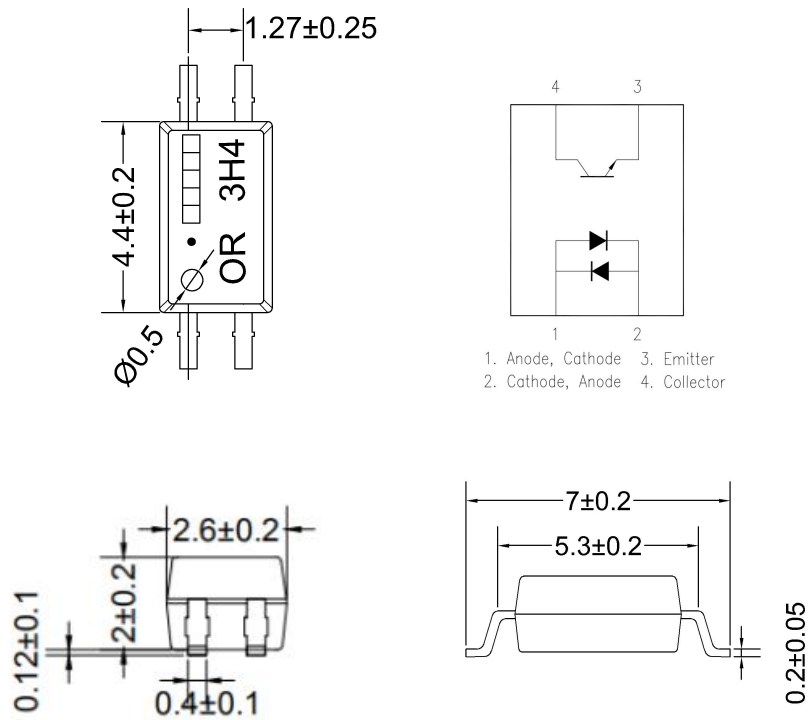
MODEL NO.	CTR Rank	Min.	Max.	Unit	Condition
OR-3H4	NO mark	20	400	%	IF=±1mA, V _{CE} =5V, Ta=25°C
	A	50	250		
	A1	100	200		
	B	100	400		
	GR	100	300		IF=±5mA, V _{CE} =5V, Ta=25°C

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

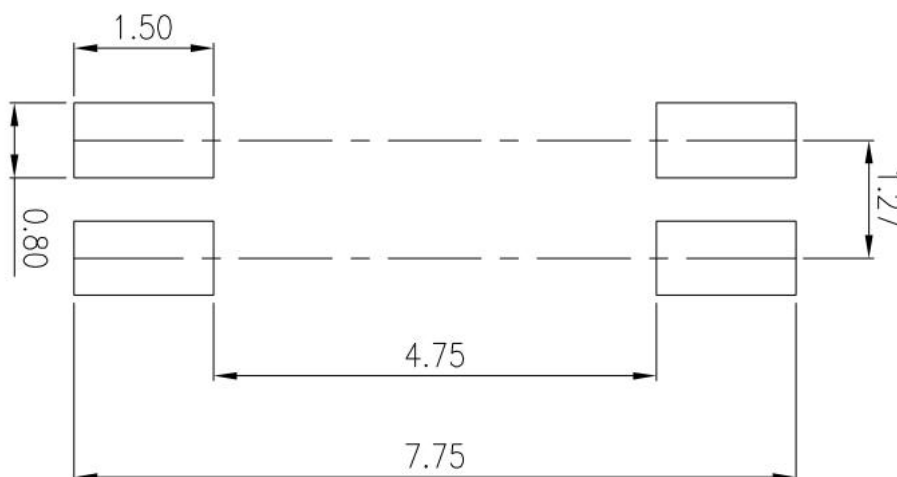
7、Naming Rule



8、Outer Dimension

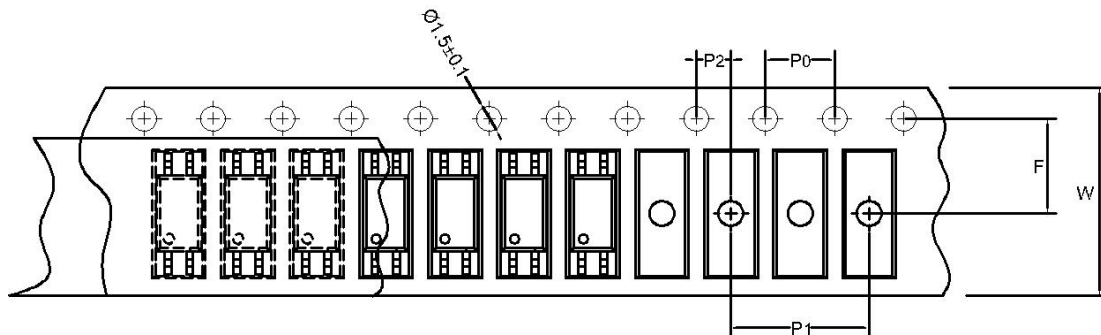


9、Recommended Foot Print Patterns (Mount Pad) (unit : mm)

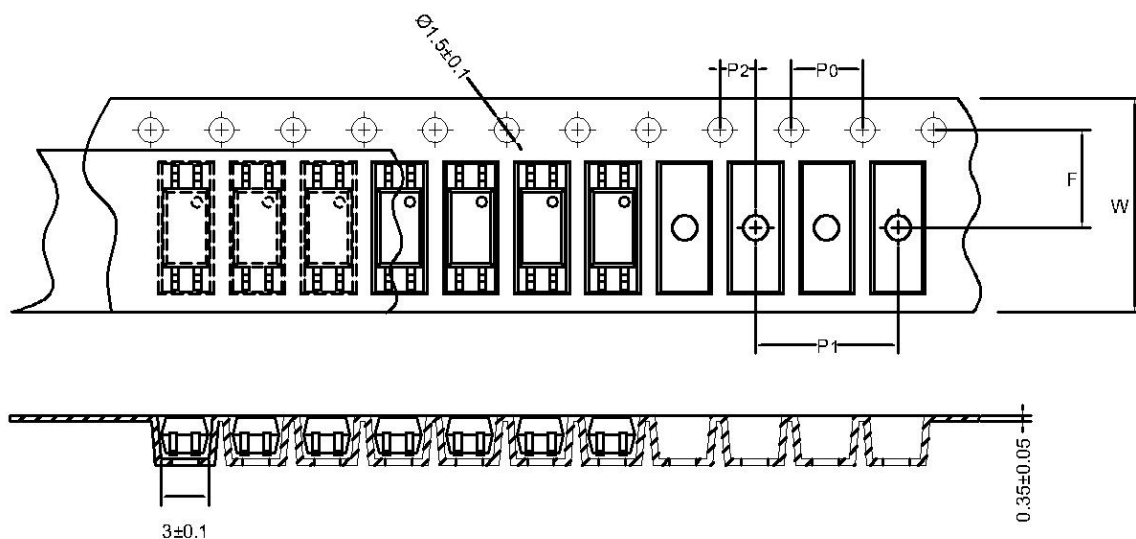


10. Taping Dimensions

(1) .OR-3H4-TP



(2) .OR-3H7-TP1



type	Symbol	Dimensions: mm (in.)
bandwidth	W	12 ± 0.3 (0.47)
pitch	P0	4 ± 0.1 (0.15)
pitch	F	5.5 ± 0.1 (0.217)
	P2	2 ± 0.1 (0.079)
interval	P1	8 ± 0.1 (0.315)

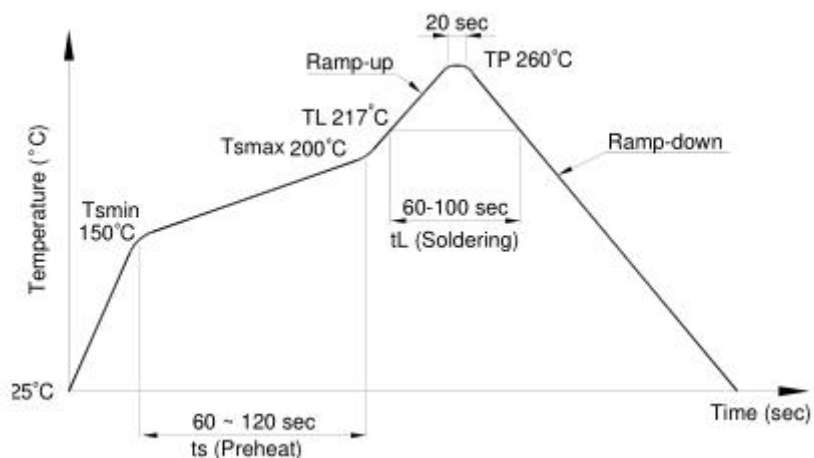
Encapsulation type	OR-3H4
Quantity (pieces)	3000

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.

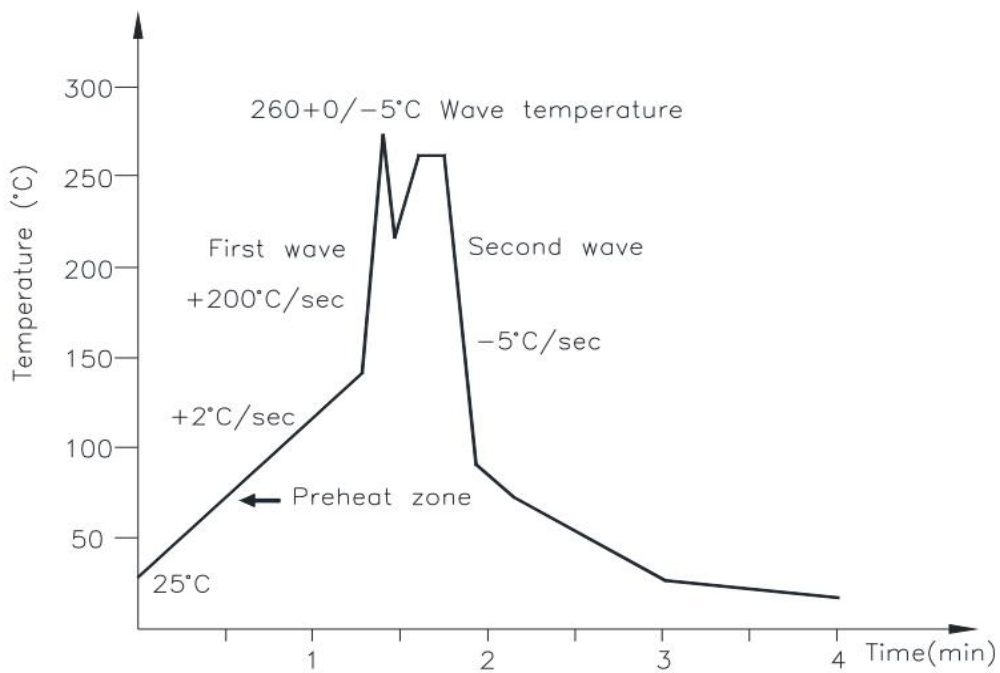
Profile item	Conditions
Preheat	
- Temperature Min (T _{Smin})	150°C
- Temperature Max (T _{Smax})	200°C
- Time (min to max) (t _s)	90±30 sec
Soldering zone	
- Temperature (T _L)	217°C
- Time (t _L)	60~100 sec
Peak Temperature	260°C
Ramp-up rate	3°C / sec max.
3°C / sec max.	3~6°C / sec



(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	25 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

Figure 1. Collector Power Dissipation vs. Ambient Temperature

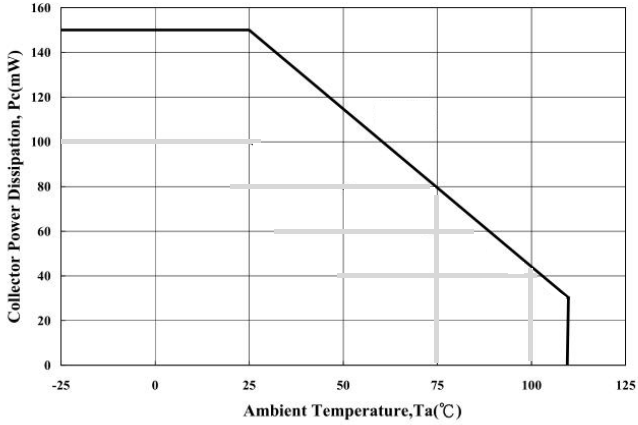


Figure 2. Forward Current vs. Ambient Temperature

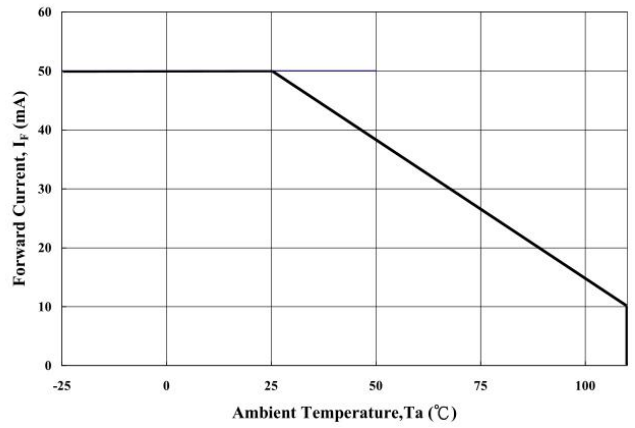


Figure 3. Forward Current vs. Forward Voltage

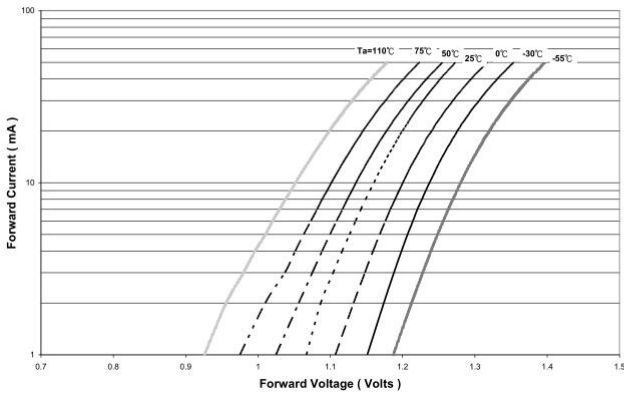


Figure 4. Forward Voltage Temperature Coefficient vs. Forward Current

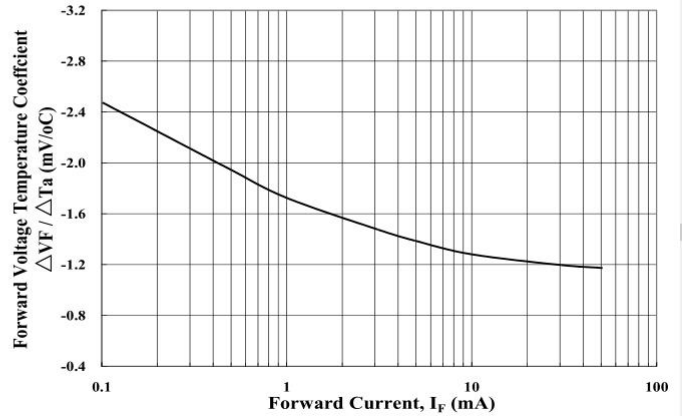


Figure 5. Pulse Forward Current vs. Duty Cycle Ratio

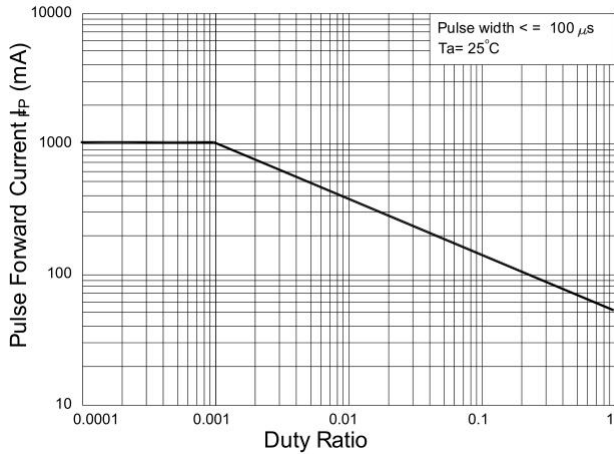


Figure 6. Pulse Forward Current vs. Pulse Forward

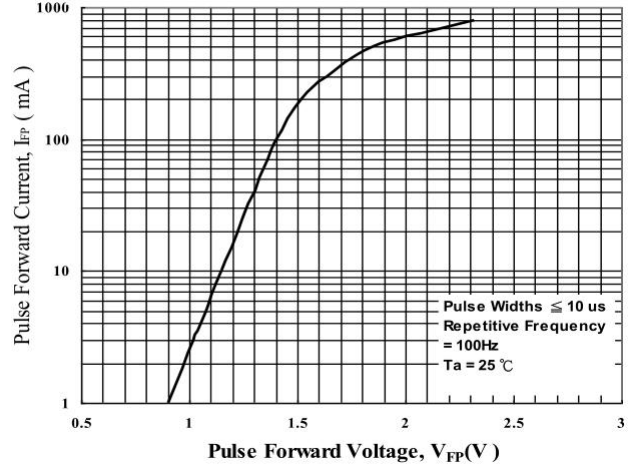


Figure 7. Collector-Emitter Saturation Voltage vs. Forward

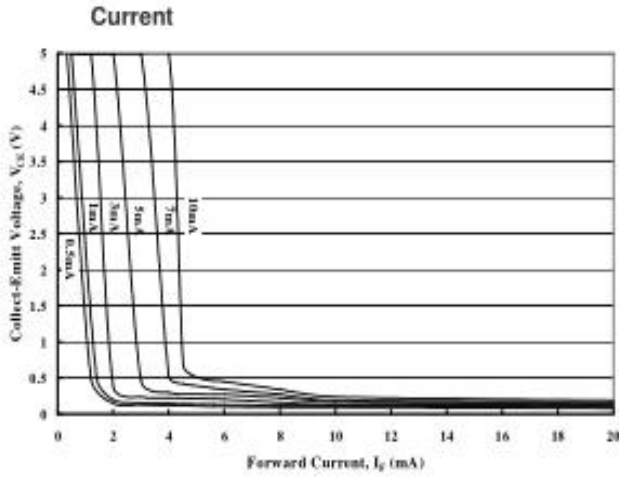


Figure 8. Collector Current vs. Collector-Emitter

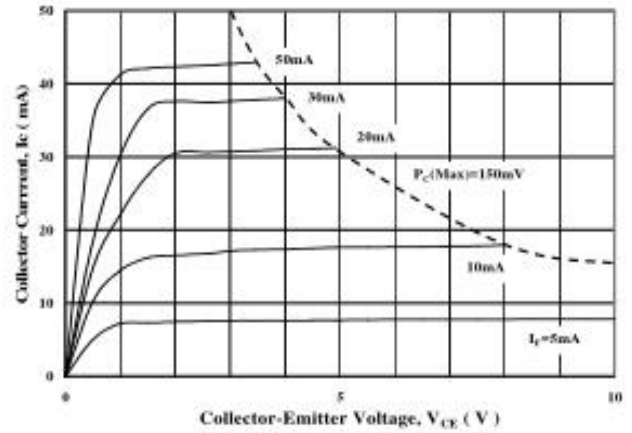


Figure 9. Collector Current vs. Small Collector-Emitter

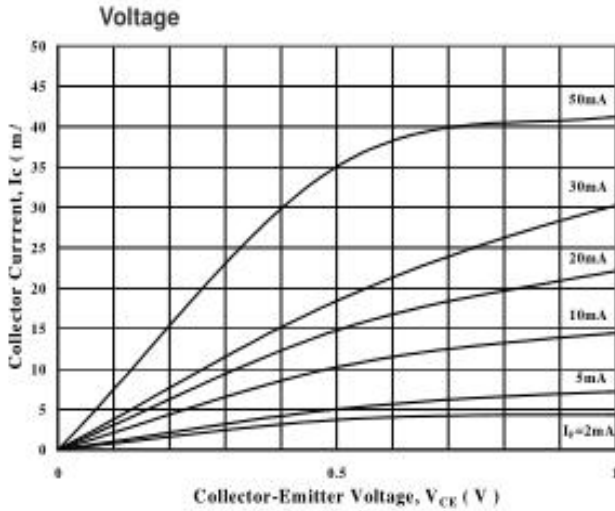


Figure 10. Normalized CTR vs. Forward Current

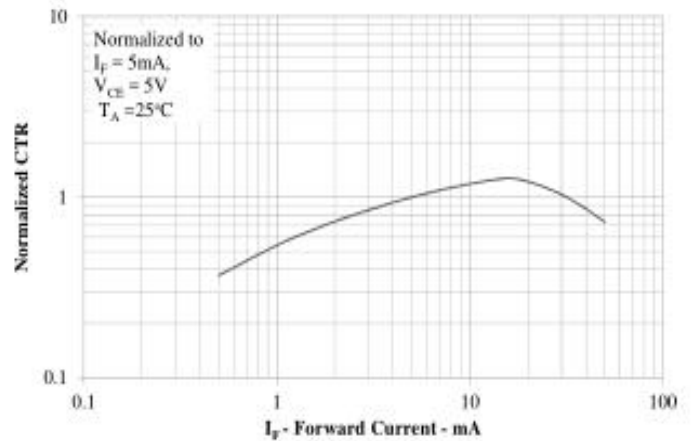


Figure 11. Collector Dark Current vs. Ambient Temperature

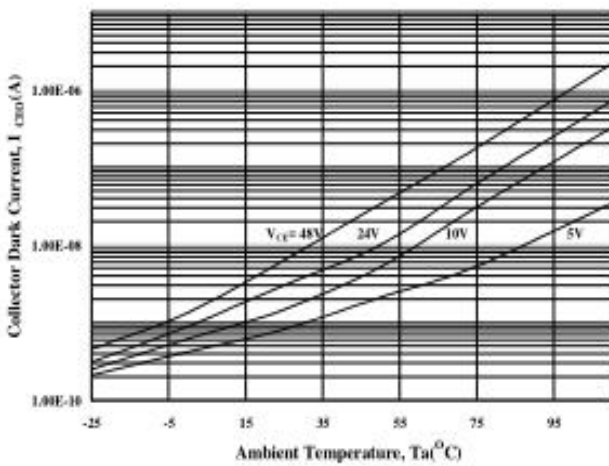


Figure 12. Current Transfer Ratio vs. Forward

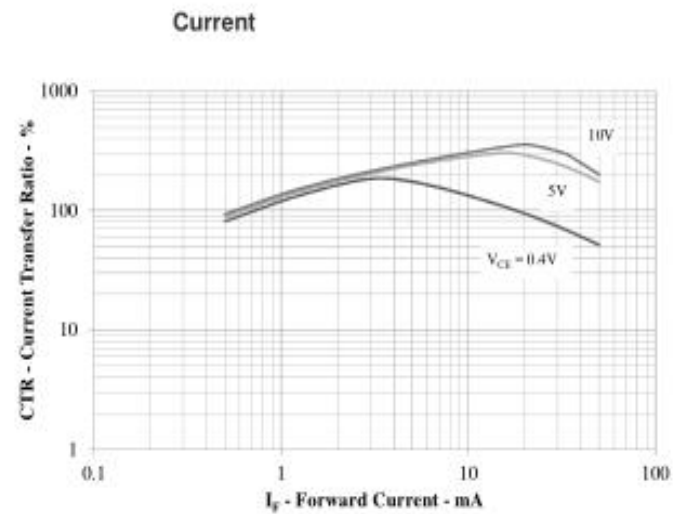


Figure 13. Normalized CTR vs. Ambient Temperature

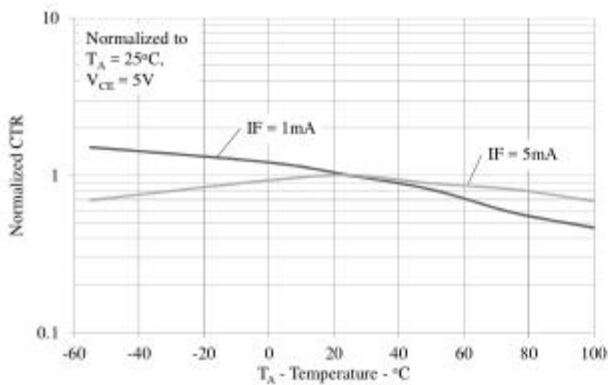


Figure 14. Collector-Emitter Saturation Voltage vs. Ambient Temperature

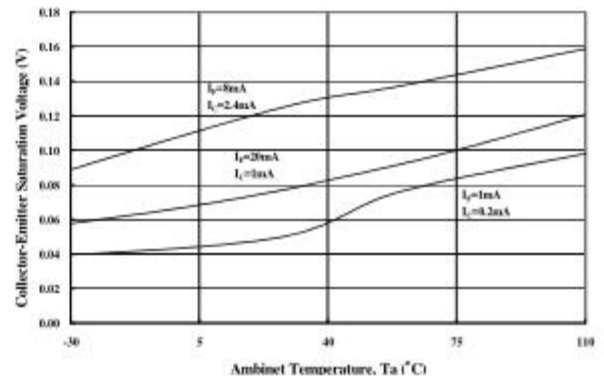


Figure 15. Collector Current vs. Ambient Temperature

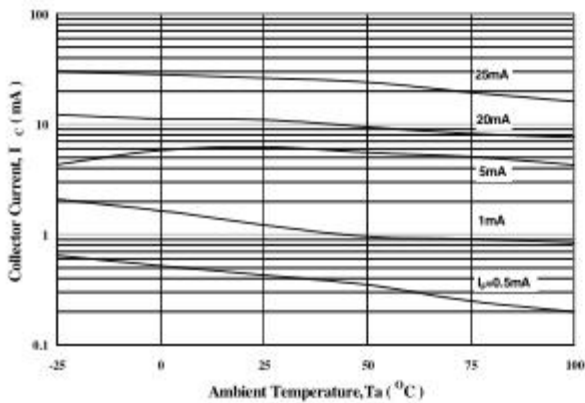


Figure 16. Switching Time vs. Load Resistance

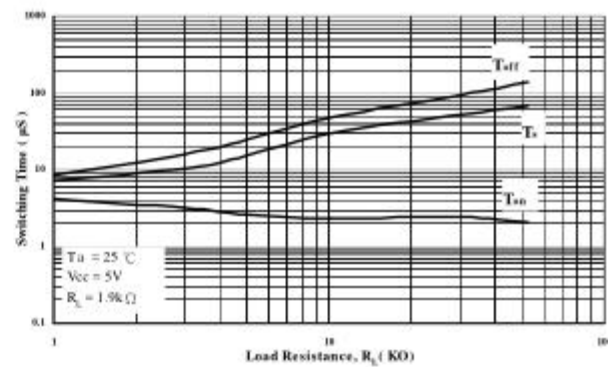


Figure 17. Switching Time vs. Ambient Temperature

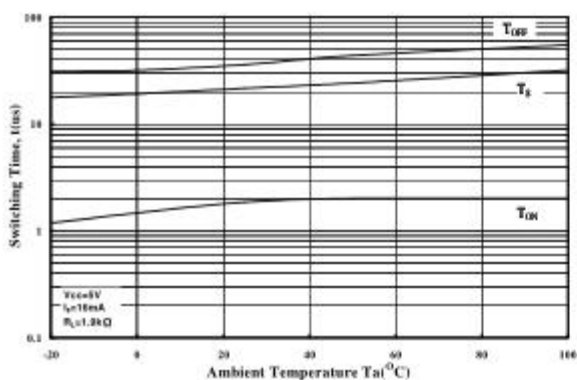


Figure 18. Frequency Response

