ORIENT

Photocoupler

Product Data Sheet

Name: ORPC-815

Customer:

Date:

Add：Block A 3rd Floor No.4 Building Tian An Cyber Park Huang Ge Rd, Long Gang Dist, Shenzhen, Guangdong, 518172

Web: www.orient-opto.com

1.Features

(1) High current transfer ratio (CTR : MIN. 600% at I_F = 1mA, V_{CE} = 2V)
(2) High input-output isolation voltage (Viso = 5,000Vrms)
(3) Response time (tr : TYP. 60μs at V_{CE} = 2V, I_C =10mA, R_L = 100Ω)
(4) Safety approval
UL approved (No.E323844)
VDE approved (No.40029733)
CQC approved (No.CQC09001029446 CQC13001086898)
CE approved (No.AC/0431008)
State Grid approved (No.SGCM013420170152)

2. Description

(1) The ORPC-815 series of devices each consist of an infrared emitting diodes, optically coupled to a photo Darlington detector.
(2) They are packaged in a 4-pin DIP package and available in wide-lead spacing and SMD option.

3. Applications

(1) Telephone set,telephone exchangers
(2) System appliances,measuring instruments
(3)Sequence controllers
(4)Signal transmission between circuits of different potentials and impedances

4.Absolute Maximum Ratings at Ta=25℃

Parameter		Symbol	Rated Value	Unit
Input	Forward Current	I_F	50	mA
	Peak forward current (1μs pulse)	V_R	6	V
	Reverse Voltage	P	70	mW
	Consume Power	I_{FP}	1	A
Output	Collector and emitter Voltage	V_{CEO}	80	V
	Emitter and collector Voltage	V_{ECO}	6	V
	Collector Current	I_C	80	mA
	Consume Power	P_C	150	mW
Total Consume Power		Ptot	200	mW
*1 Insulation Voltage		V_{iso}	5,000	Vrms
Max Insulation Voltage (Insulating oil test)		T_{OPR}	-55 ~ + 125	℃
Rated Impulse Insulation Voltage		T_{STG}	-55 ~ + 125	
Working 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 the secondary side.
(2) The isolation voltage tester with zero-cross circuit shall be used.
(3) The waveform of applied voltage shall be a sine wave.

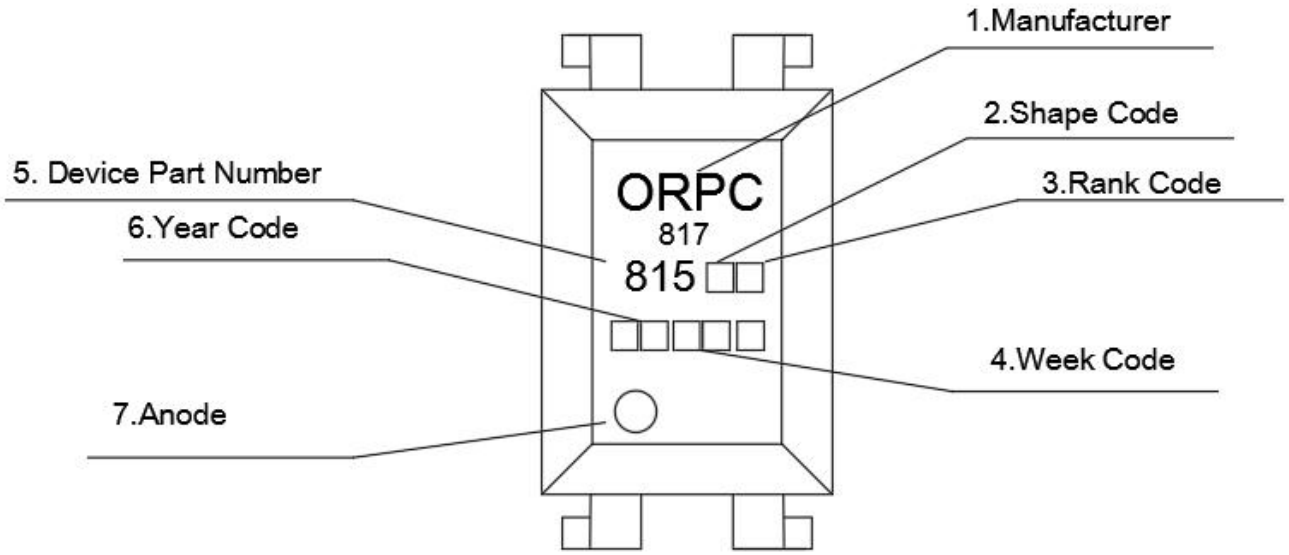
*2. Soldering time is 10 seconds

5. Electro-Optical Characteristics (Ta=25℃ unless specified otherwise)

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	μA
	Collector capacitance	C_t	V=0, f=1KHz	---	30	250	pF
Output	Collector to emitter Current	I_{CEO}	V_{CE}=10V, I_F=0mA	---	---	1	uA
	Collector and Emitter attenuation Voltage	BV_{CEO}	I_C=0.1mA I_F=0mA	80	---	---	V
	Emitter and Collector attenuation Voltage	BV_{ECO}	I_E=10uA I_F=0mA	6	---	---	V
Transforming Characteristics	*1 Current conversion ratio	CTR	IF=1mA VCE=2V	600	---	7500	%
	Collector Current	I_C		6	---	75	mA
	Collector and Emitter Saturation Voltage	$V_{CE(sat)}$	I_F=20mA I_C= 5mA	---	0.8	1	V
	Insulation Impedance	R_{iso}	DC500V 40~60%R.H.	5×10^{10}	1×10^{11}	---	Ω
	Floating Capacitance	C_f	V=0, f=1MHz	---	0.6	1.0	pF
	Cut-off Frequency	f_c	V_{CE}=5V, I_C=2mA R_L=100Ω, -3dB	1	6	---	kHz
	Rise Time	t_r	V_{CE}=2V, I_C=10mA R_L=100Ω	---	60	300	μs
	Descend Time	t_f		---	53	250	μs

*1Current Conversion Ratio = I_C / I_F × 100% , CTR Tolerance: ±3%.

6. Naming Rule



(1)ORPC denotes Shenzhen Orient Tech Ltd . Co ., Ltd.

(2) ⬚ denotes Shape Code.

(3) ⬚⬚ denotes Rank code.

(4) ⬚⬚ denotes Week code.

(5) ⬚⬚ denotes Device Part Number.

(6) ⬚ denotes Year Code

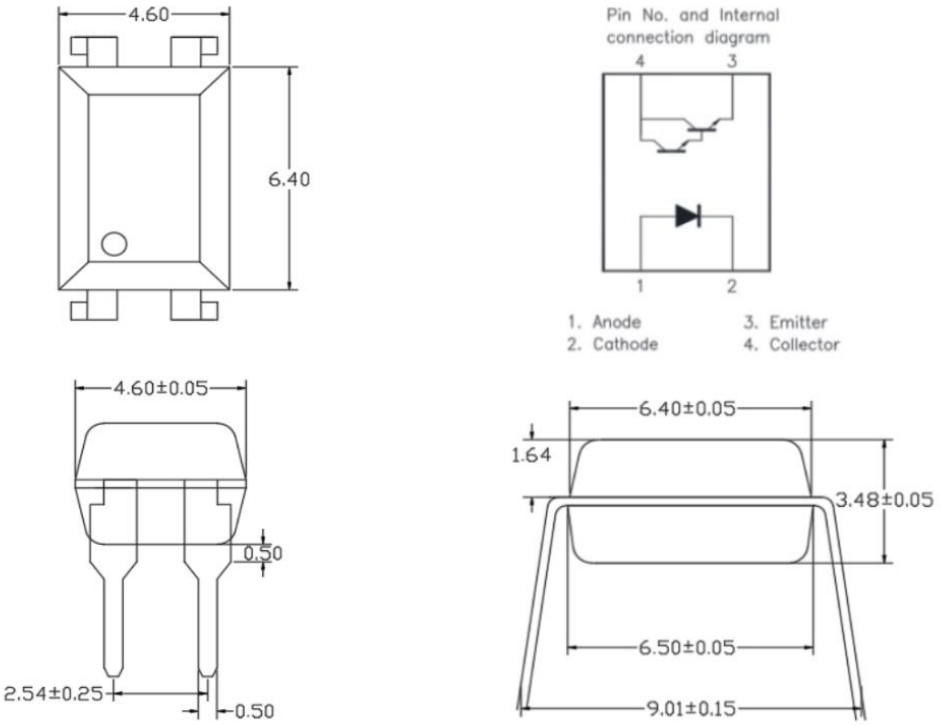
(7) Anode.

(8) Unit:mm

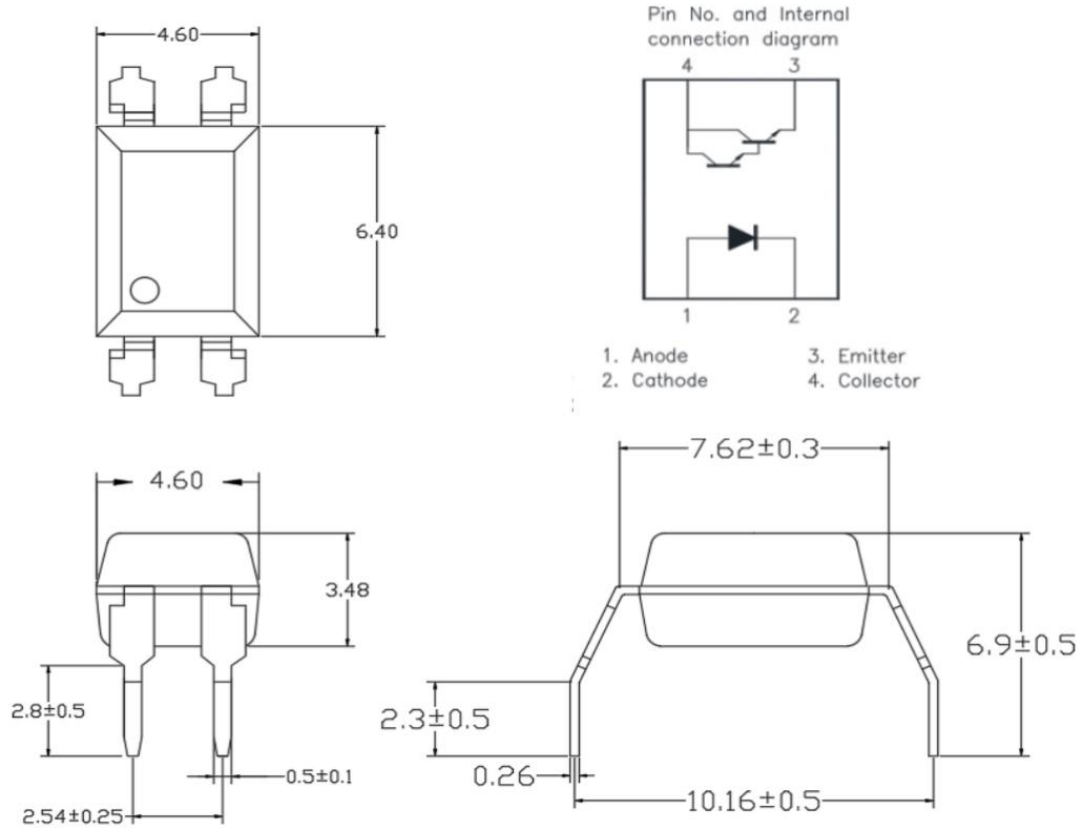
7.Recommended Foot Print Patterns (Mount Pad) (Unit：mm）

8. Package Dimension (Unit：mm）

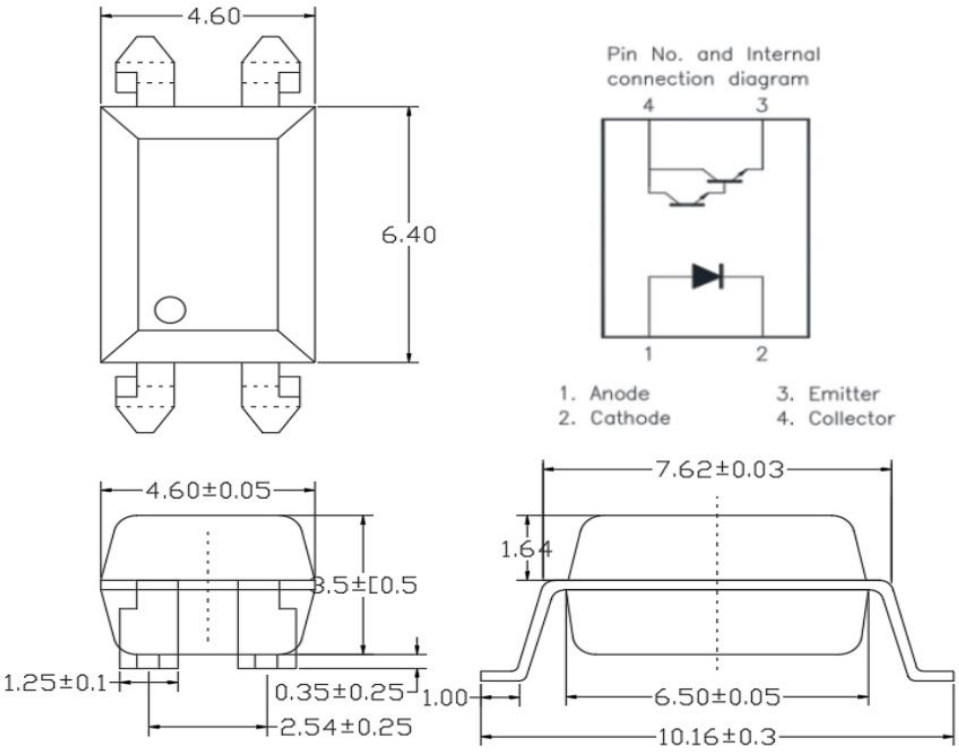
(1) ORPC-815



(2) ORPC-815M

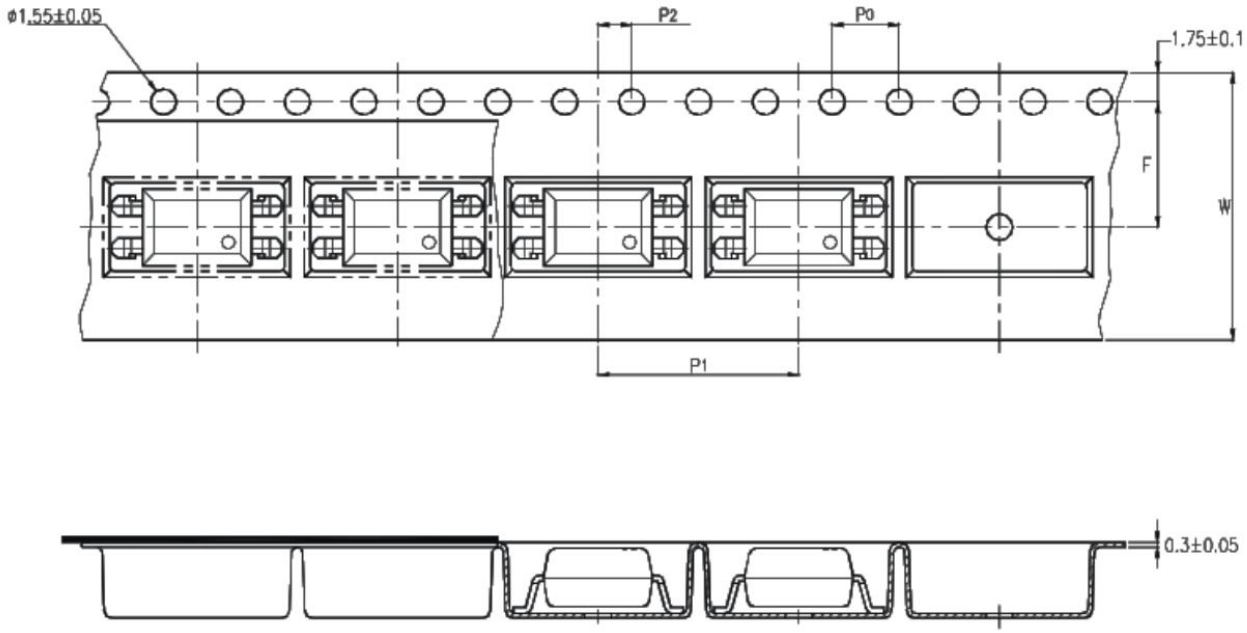


(3) ORPC-815S

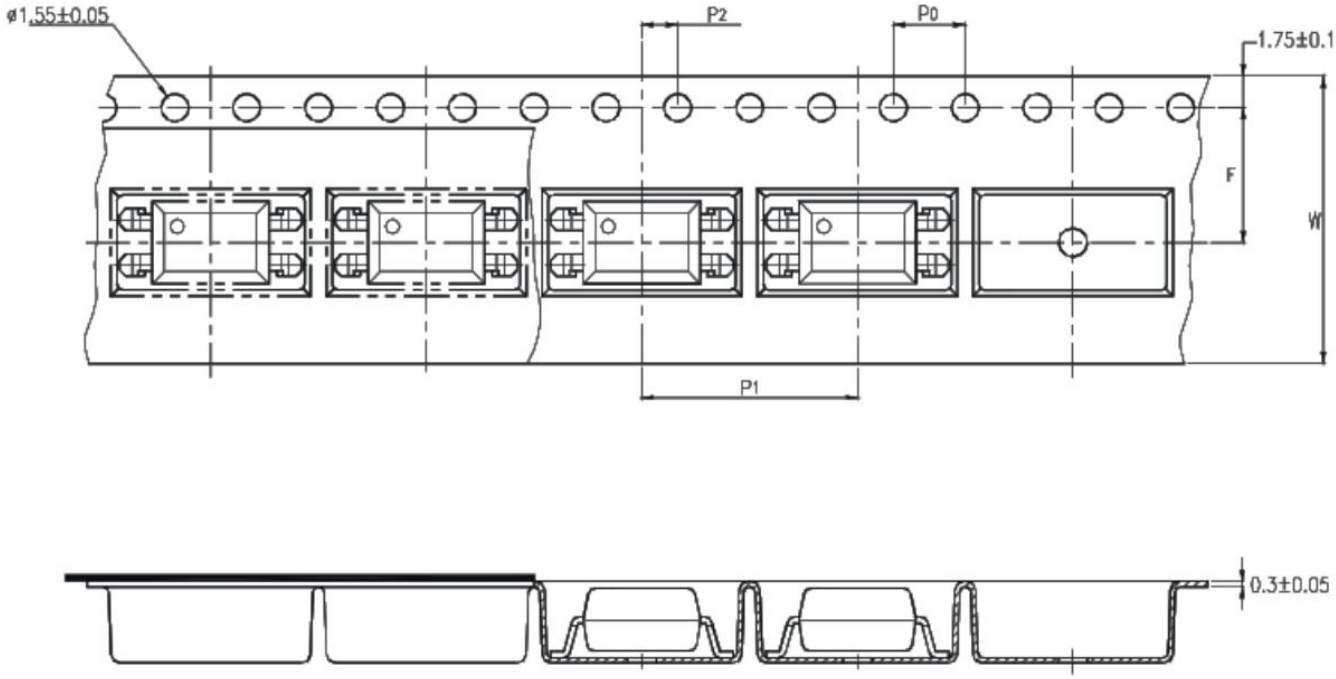


9.Taping Dimensions

(1) ORPC-815S-TA



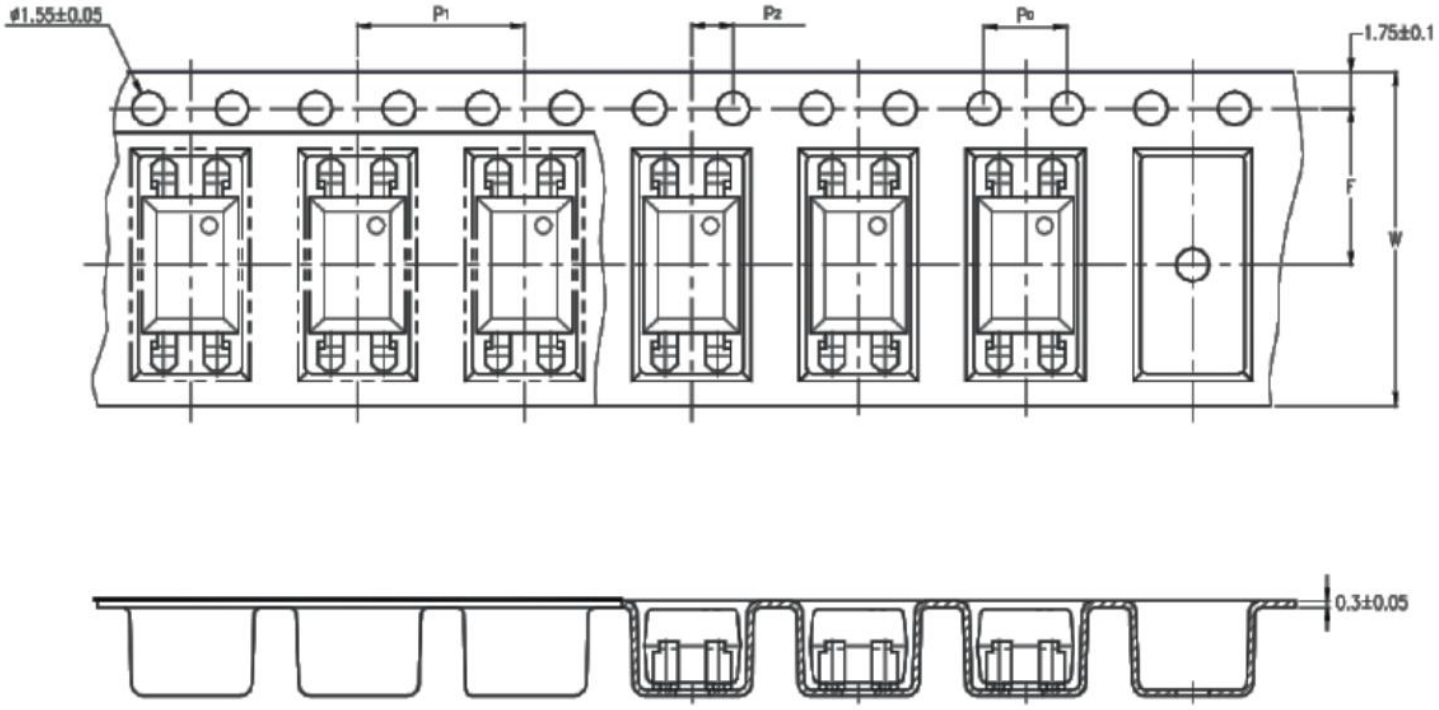
(2) ORPC-815S-TA1



Description	Symbol	Dimension in mm (inch)
Tape wide	W	16±0.3 (.63)
Pitch of sprocket holes	P_0	4±0.1 (.15)
Distance of compartment	F	7.5±0.1 (.295)
	P2	2±0.1 (.0079)
Distance of compartment to compartment	P1	12±0.1 (.472)

Package Type	TA/TA1
Quantities(pcs)	1000

(3) ORPC-815S-TP



Description	Symbol	Dimension in mm (inch)
Tape wide	W	16±0.3 (.63)
Pitch of sprocket holes	P_0	4±0.1 (.15)
Distance of compartment	F	7.5±0.1 (.295)
	P2	2±0.1 (.0079)
Distance of compartment to compartment	P1	8±0.1 (.472)

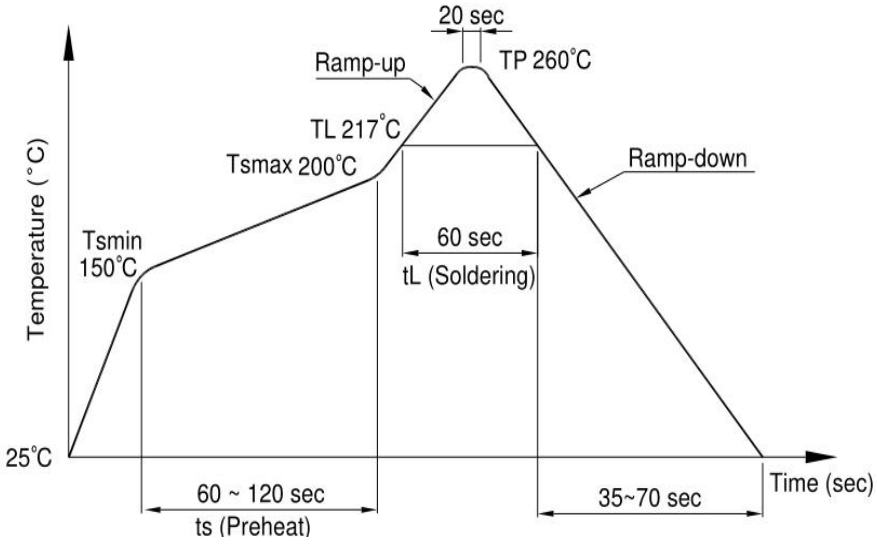
Package Type	TP
Quantities(pcs)	2000

10.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.

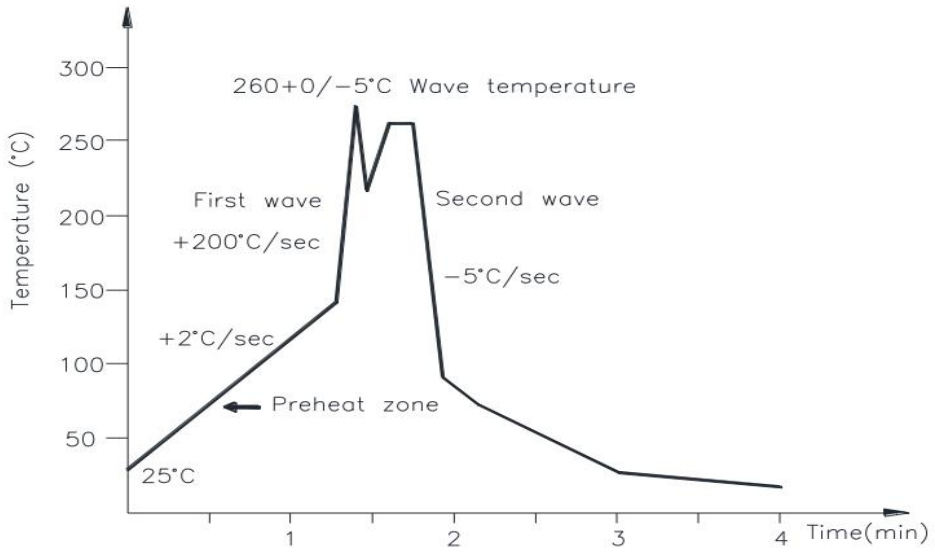
Profile item	Conditions
Preheat - Temperature Min (T_{Smin}) - Temperature Max (T_{Smax}) - Time (min to max) (ts)	 150˚C 200˚C 90±30 sec
Soldering zone - Temperature (TL) - Time (t_L)	 217˚C 60 sec
Peak Temperature(T_P)	260˚C
Ramp-up rate	3˚C / sec max.
Ramp-down rate	3~6˚C / sec



(2).Wave soldering (JEDEC22A111 compliant)

One time soldering is recommended within the condition of temperature.

Temperature Time	260+0/-5˚C 10 sec
Preheat temperature Preheat time	25 to 140˚C 30 to 80 sec



(3).Hand soldering by soldering iron

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

Temperature Time	380+0/-5˚C 3 sec max

11.Characteristics Curves

Fig.1 Forward Current vs. Ambient Temperature

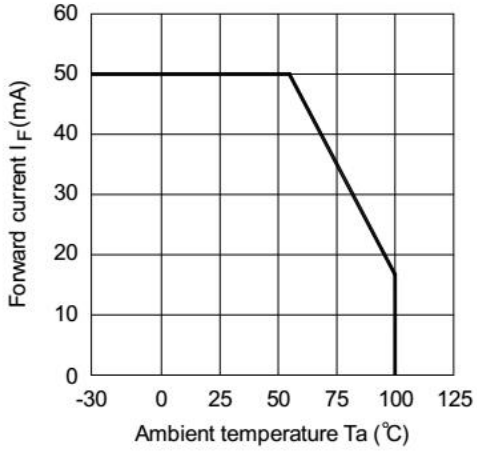


Fig.2 Collector Power Dissipation vs. Ambient Temperature

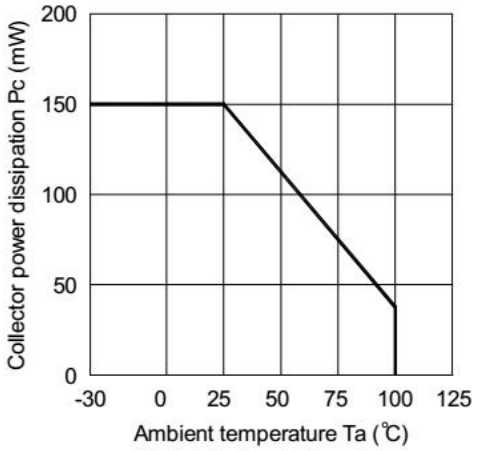


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

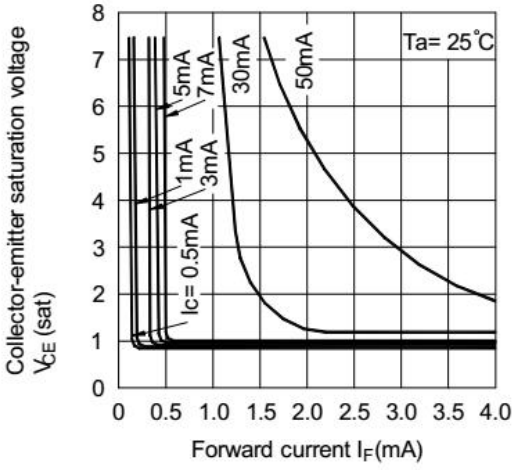


Fig.4 Forward Current vs. Forward Voltage

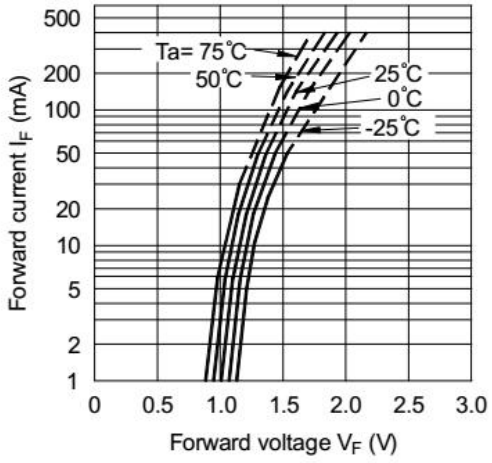


Fig.5 Current Transfer Ratio vs. Forward Current

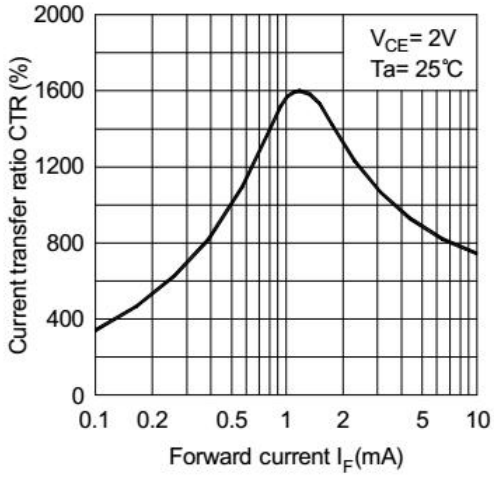


Fig.6 Collector Current vs. Collector-emitter Voltage

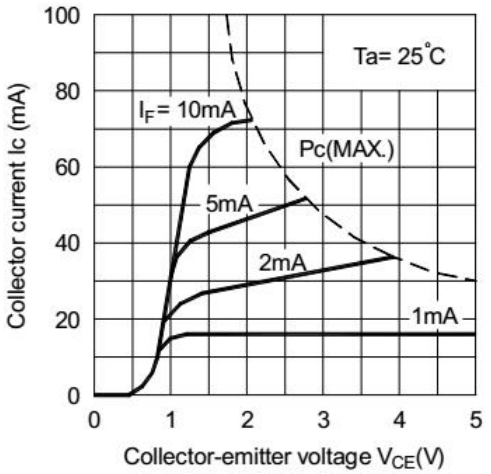


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

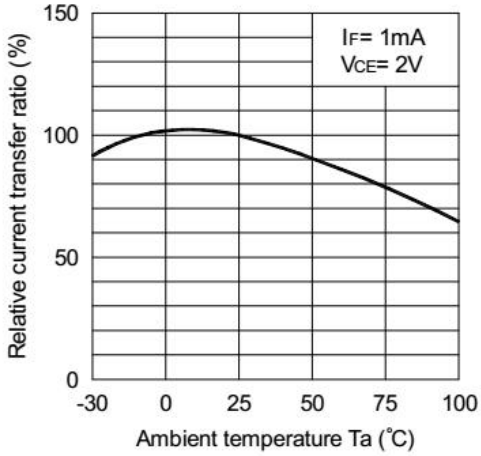


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

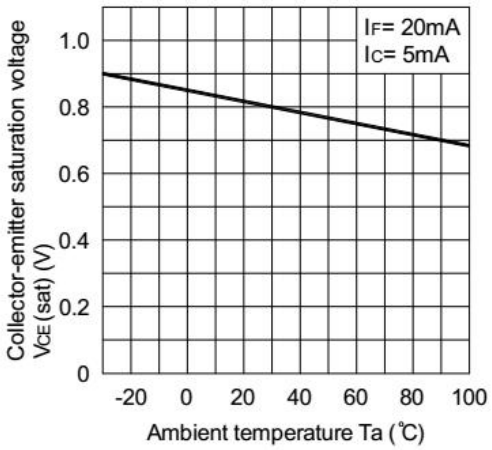


Fig.9 Collector Dark Current vs. Ambient Temperature

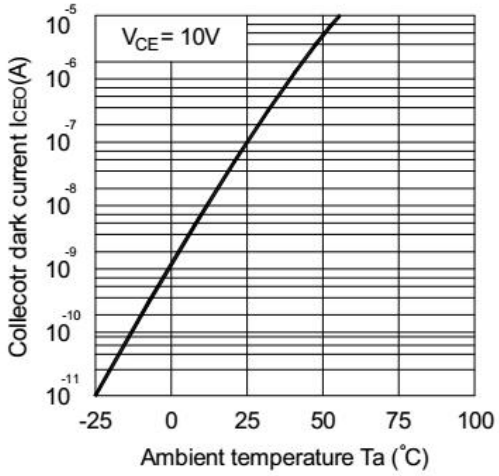


Fig.10 Response Time vs. Load Resistance

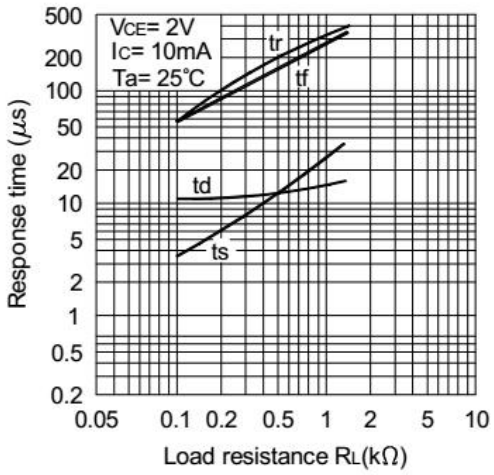
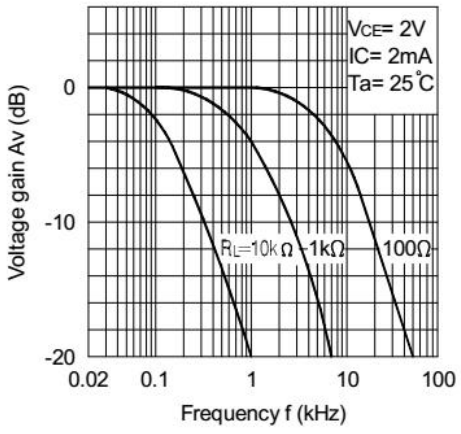
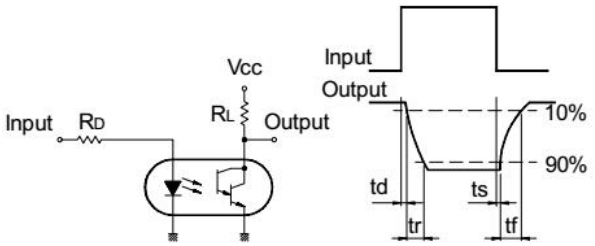


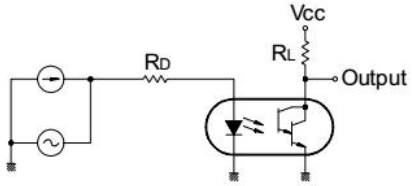
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response



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