



# ORIENT

## Photocoupler

### Product Data Sheet

Name: ORPC-827

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

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

**SHENZHEN ORIENT COMPONENTS CO., LTD**

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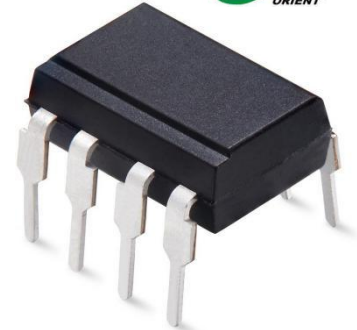
TEL: 0755-29681816

FAX: 0755-29681200

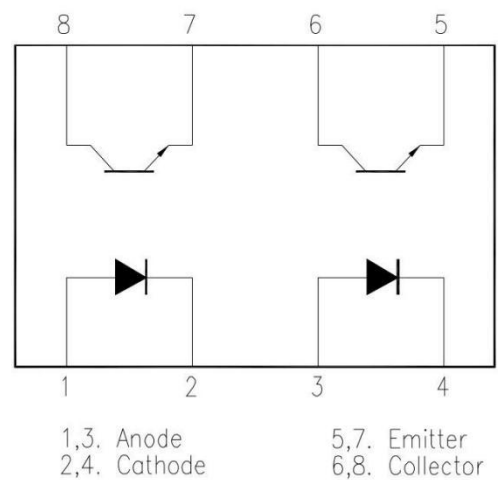
[www.orient-opto.com](http://www.orient-opto.com)

### 1. Features

- (1). Current conversion ratio (Min 50% Working condition  $I_F=5mA$ ,  $V_{CE}=5V$ )
- (2). Insulation Voltage = 5,000Vrms,
- (3). Response Time  
(tr: TYP. 4 $\mu$ s; tf: TYP. 5 $\mu$ s at  $V_{CE}=2V$ ,  $I_C=2mA$ ,  $R_L=100\ \Omega$ )
- (4). ORPC-827: 2-channel type  
ORPC-827M: 2-channel type  
ORPC-827S: 2-channel type
- (5). UL approved(No.E323844)  
VDE approved (No.40029733)  
CQC approved (No.CQC09001029446 CQC13001086898)  
CE approved (No.AC/0431008)  
State Grid approved (No.SGCM013420170152 )



Pin No. and Internal connection diagram



### 2. Instructions

- (1). ORPC-827 series optical coupler consists of two GaAs transmitting tubes and two NPN transistors
- (2). Pin pitch of ORPC-827 is 2.54mm

### 3. Application Range

- (1). Switching power supply
- (2). Ammeter
- (3). Computer
- (4). Instrumental application, measurement machine
- (5). Imbursement equipments, duplicating machine, automat
- (6). Family-use electric equipments, such as fans
- (7). Signal transforming systems

#### 4、Absolute Maximum Ratings (Ta=25°C)

| Parameter                                    |                                 | Symbol     | Rated Value  | Unit |
|--|---------------------------------|------------|--------------|------|
| Input  | Forward Current                 | $I_F$      | 60           | mA   |
|  | Peak forward current(1us pulse) | $I_{FP}$   | 1            | A    |
|  | Reverse Voltage                 | $V_R$      | 6            | V    |
|  | Consume Power                   | $P$        | 70           | mW   |
| Output                                       | Collector and emitter Voltage   | $V_{CEO}$  | 80           | V    |
|  | Emitter and collector Voltage   | $V_{ECO}$  | 6            |      |
|  | Collector Current               | $I_C$      | 50           | mA   |
|  | Consume Power                   | $P_C$      | 150          | mW   |
| Total Consume Power                          |                                 | $P_{tot}$  | 200          | mW   |
| *1 Insulation Voltage                        |                                 | $V_{iso}$  | 5,000        | Vrms |
| Max Insulation Voltage (Insulating oil test) |                                 | $V_{IOTM}$ | 10,000       | V    |
| Rated Impulse Insulation Voltage             |                                 | $V_{IORM}$ | 630          | V    |
| Working Temperature                          |                                 | $T_{opr}$  | -55 to + 110 | °C   |
| Deposit Temperature                          |                                 | $T_{stg}$  | -55 to + 125 |      |
| *2 Soldering Temperature                     |                                 | $T_{sol}$  | 260          |      |

\*1. AC Test, 1 minute, humidity = 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、Electrical optical characteristics at TA=25°C**

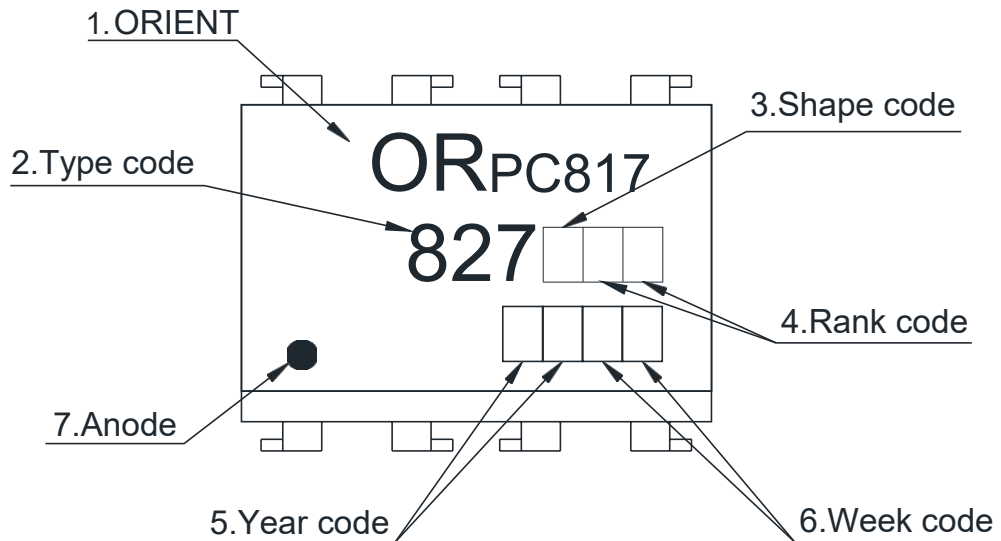
| Parameter                    |   | Symbol        | Condition  | Min | Typ.*              | Max | Unit          |
|------------------------------|---|---------------|--|-----|--------------------|-----|---------------|
| Input                        | Forward Current                           | $V_F$         | $I_F=20\text{mA}$  | --- | 1.2                | 1.4 | V             |
|                              | Reverse Voltage                           | $I_R$         | $V_R=4\text{V}$  | --- | ---                | 10  | $\mu\text{A}$ |
|                              | Collector capacitance                     | $C_t$         | $V=0, f=1\text{KHz}$   | --- | 30                 | 250 | pF            |
| Output                       | Collector to emitter Current              | $I_{CEO}$     | $V_{CE}=20\text{V}, I_F=0\text{mA}$                            | --- | ---                | 100 | nA            |
|                              | Collector and Emitter attenuation Voltage | $BV_{CEO}$    | $I_C=0.1\text{mA}, I_F=0\text{mA}$                             | 80  | ---                | --- | V             |
|                              | Emitter and Collector attenuation Voltage | $BV_{ECO}$    | $I_E=0.1\text{mA}, I_F=0\text{mA}$                             | 6   | ---                | --- | V             |
| Transforming Characteristics | *1Current conversion ratio                | CTR           | $I_F=5\text{mA}, V_{CE}=5\text{V}$                             | 50  | ---                | 600 | %             |
|                              | Collector Current                         | $I_C$         |  | 2.5 | ---                | 50  | mA            |
|                              | Collector and Emitter Saturation Voltage  | $V_{CE(sat)}$ | $I_F=20\text{mA}, I_C=1\text{mA}$                              | --- | 0.1                | 0.2 | V             |
|                              | Insulation Impedance                      | $R_{iso}$     | DC500V<br>40~60%R.H.   | --- | $1 \times 10^{12}$ | --- | $\Omega$      |
|                              | capacitance                               | $C_f$         | $V=0, f=1\text{MHz}$   | --- | 0.6                | 1.0 | pF            |
|                              | Transforming Frequency                    | $f_c$         | $V_{CE}=5\text{V}, I_C=2\text{mA}, R_L=100\Omega, -3\text{dB}$ | --- | 80                 | --- | kHz           |
|                              | Risetime                                  | $t_r$         | $V_{CE}=2\text{V}, I_C=2\text{mA}$                             | --- | 4                  | 18  | $\mu\text{s}$ |
|                              | Descend Time                              | $t_f$         | $R_L=100\Omega$  | --- | 3                  | 18  | $\mu\text{s}$ |

\*1 Current Conversion Ratio =  $I_C / I_F \times 100\%$

**6、Rank table of current transfer ratio (CTR)**

|          | CTR Rank | Min (%) | Max (%) | Condition  |
|----------|----------|---------|---------|--|
| ORPC-827 | NO BIN   | 50      | 600     | $I_F=5\text{mA}, V_{CE}=5\text{V}, T_a=25^\circ\text{C}$ |
|          | A        | 80      | 160     |  |
|          | B        | 130     | 260     |  |
|          | C        | 200     | 400     |  |
|          | D        | 300     | 600     |  |
|          | BC       | 130     | 400     |  |
|          | CD       | 200     | 600     |  |

## 7、 Naming Rule



(1) ORIENT

(2) denotes Type Code.

(3)  denotes Shape Code.

(4)  denotes Rank code..

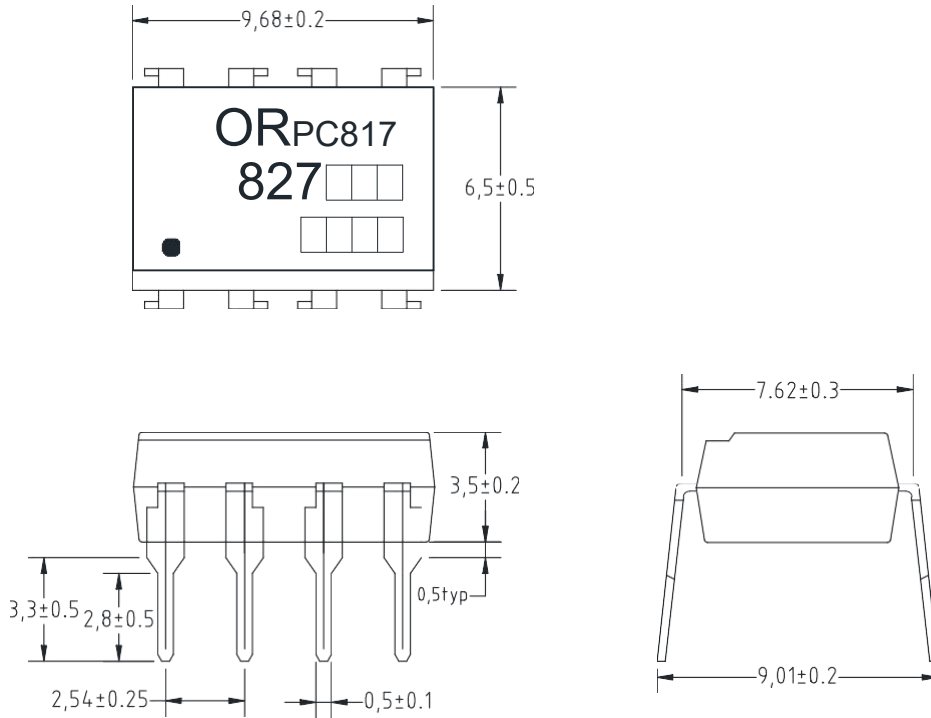
(5)  denotes Year Code

(6)  denotes Week Code

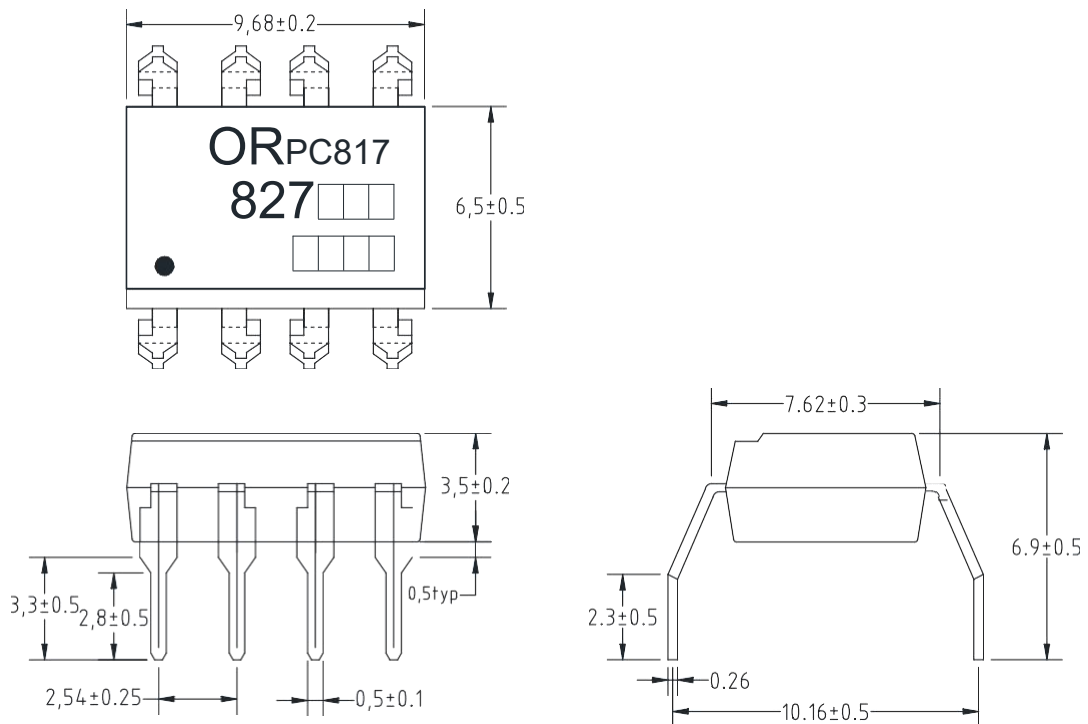
(7) Anode

## 8、Outer Dimension (Unit: mm)

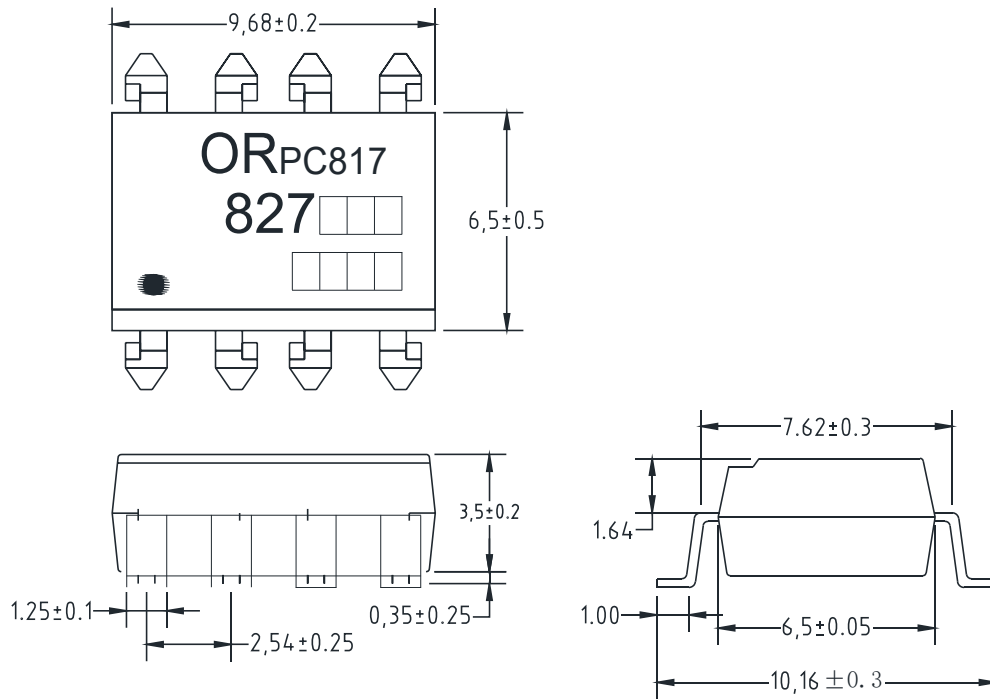
### 1. ORPC-827



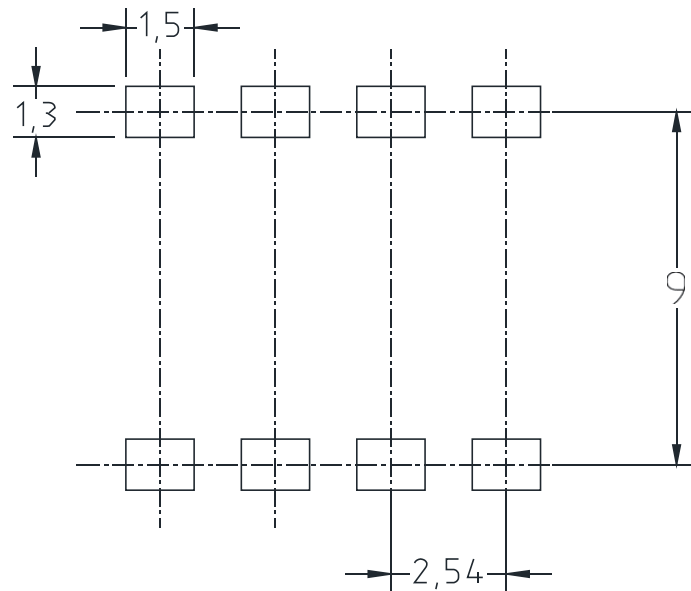
### 2. ORPC-827M



3. ORPC-827S



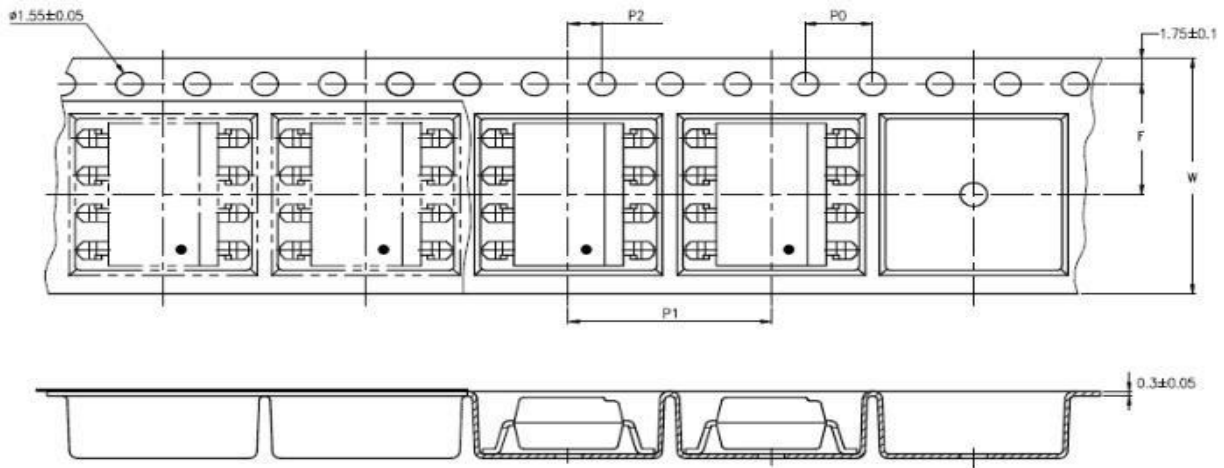
9. RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)



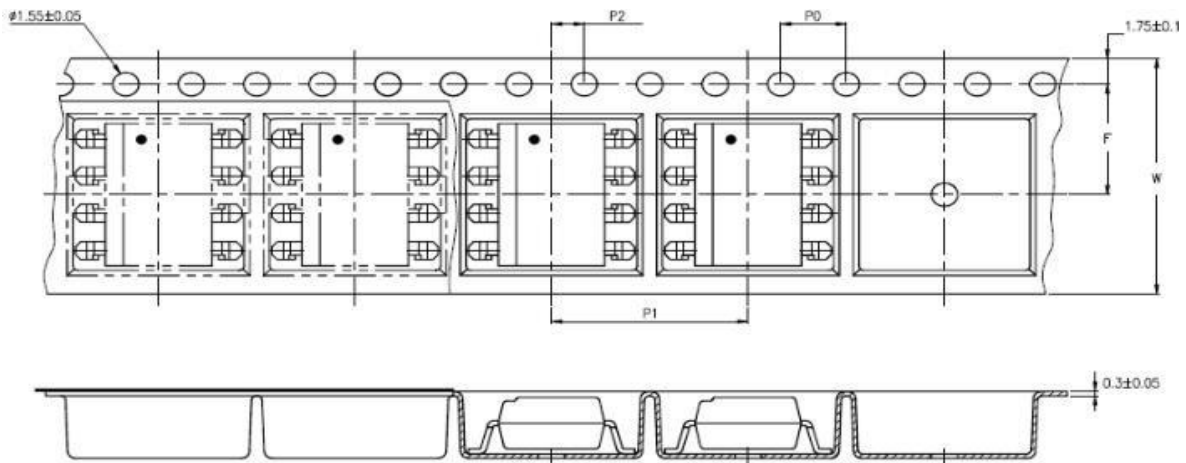
Unit: mm

## 10、Taping Dimensions

(1) ORPC-827-TA



(2) ORPC-827-TA1



| Description                            | Symbol | Dimension in mm(inch) |
|--|--------|-----------------------|
| Tape wide                              | W      | 16±0.3(0.63)          |
| Pitch of sprocket holes                | P0     | 4±0.1(0.15)           |
| Distance of compartment                | F      | 7.5±0.1(0.295)        |
|  | P2     | 2±0.1(0.079)          |
| Distance of compartment to compartment | P1     | 12±0.1(0.472)         |

| Package Type    | ORPC-827 series |
|-----------------|-----------------|
| Quantities(pcs) | 1000            |

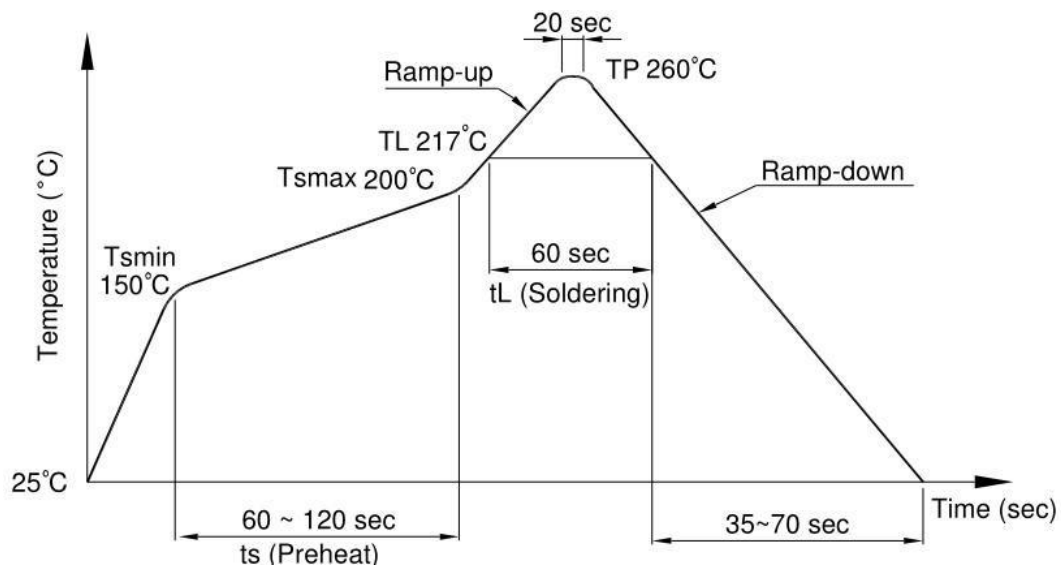


## 11 、 Temperature Profile Of Soldering

(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.

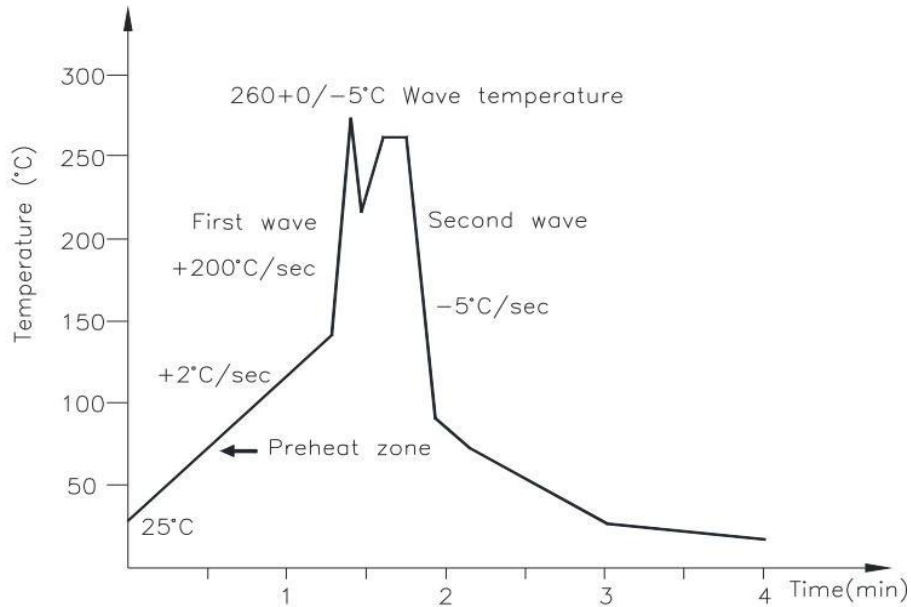
| Profile item                | Conditions     |
|-----------------------------|----------------|
| Preheat                     |                |
| - Temperature Min (T Smin ) | 150°C          |
| - Temperature Max (T Smax ) | 200°C          |
| - Time (min to max) (ts)    | 90±30 sec      |
| Soldering 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

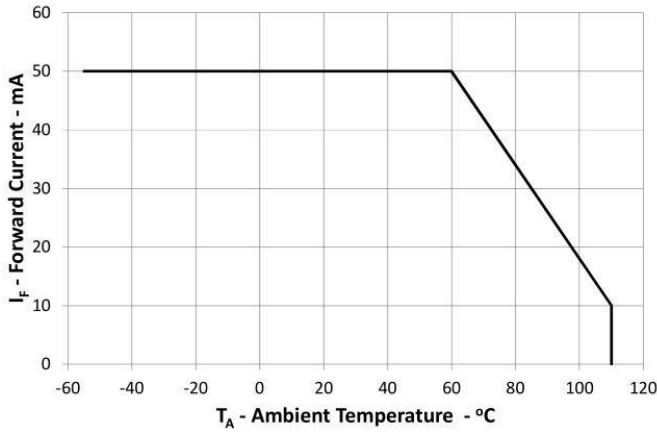


Fig.2 Collector Power Dissipation vs. Ambient Temperature

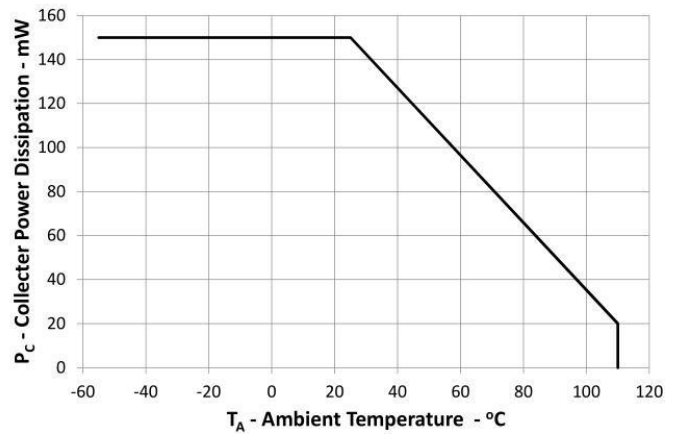


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

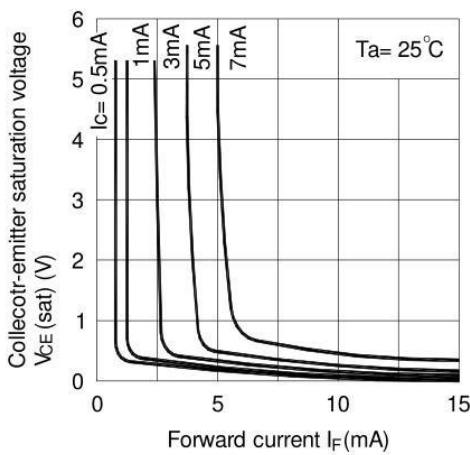


Fig.4 Forward Current vs. Forward Voltage

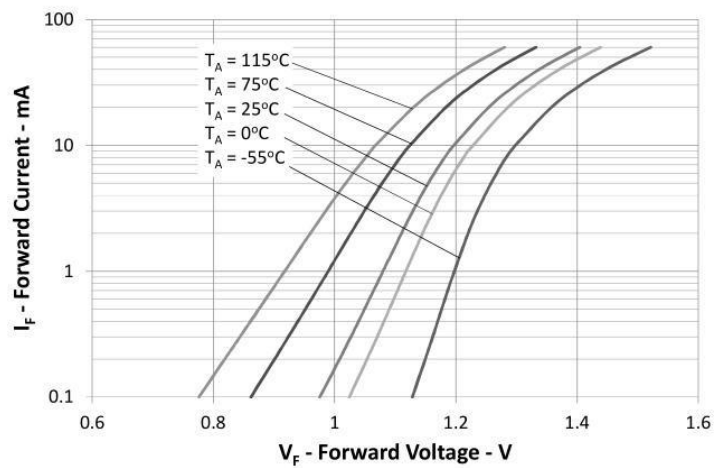


Fig.5 Current Transfer Ratio vs. Forward Current

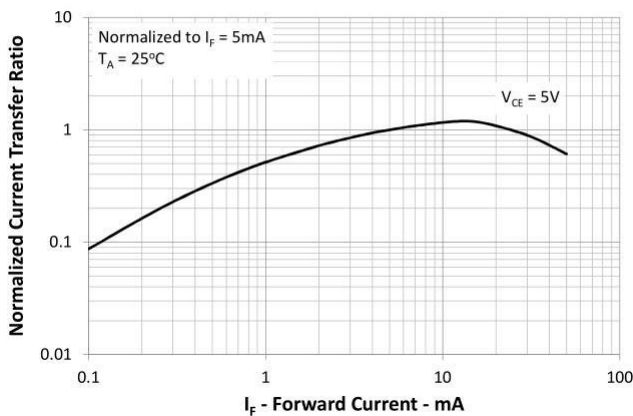


Fig.6 Collector Current vs. Collector-emitter Voltage

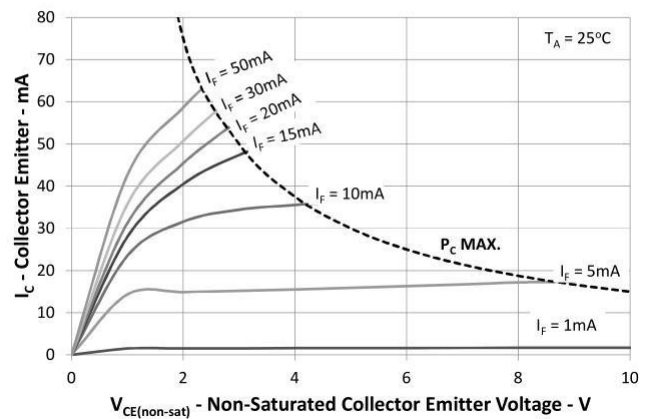


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

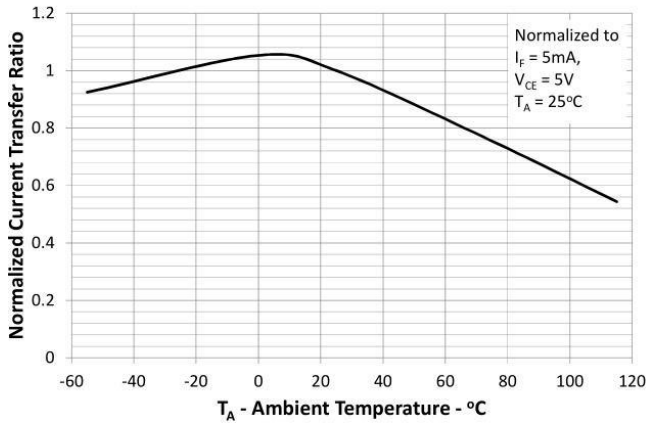


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

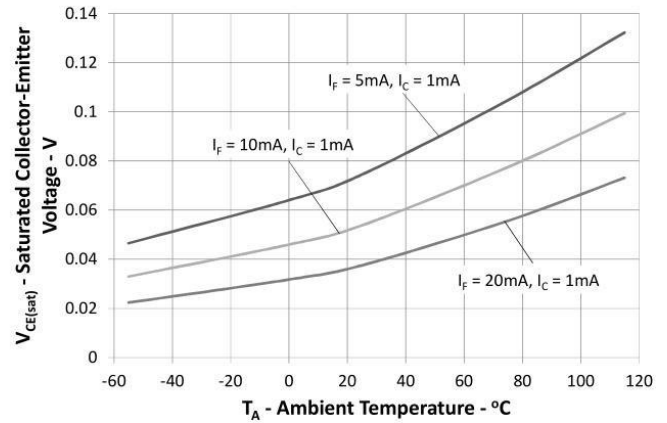


Fig.9 Collector Dark Current vs. Ambient Temperature

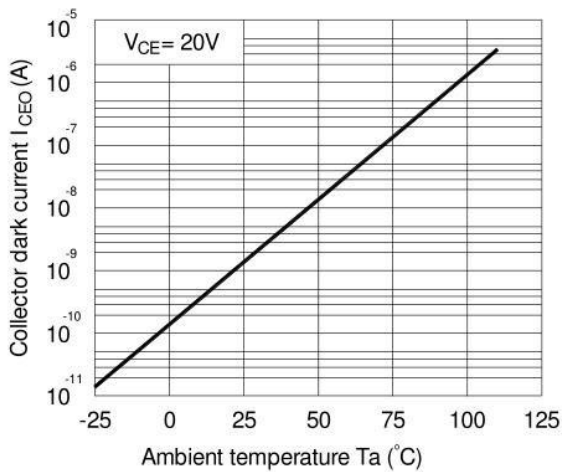


Fig.10 Response Time vs. Load Resistance

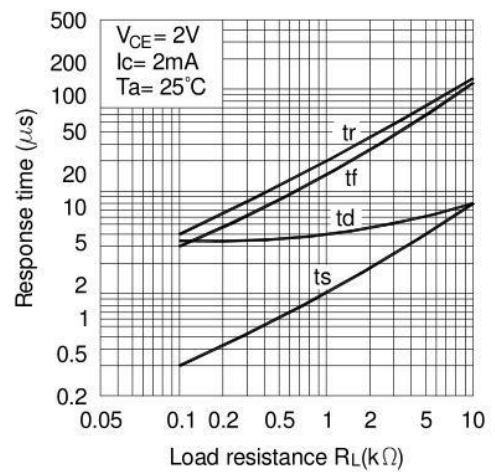
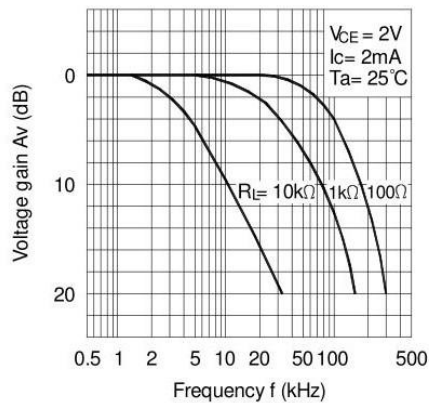
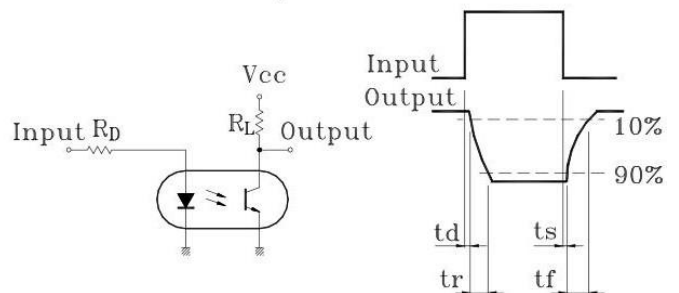


Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response

