



ORIENT

Photo coupler

Product Data Sheet

Part Number: ORPC-827

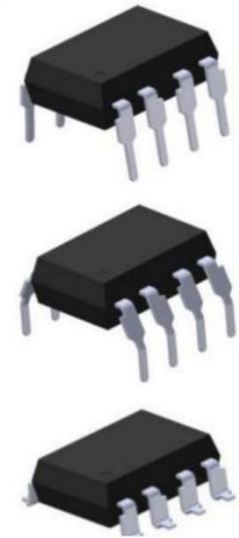
Customer: _____

Date: _____

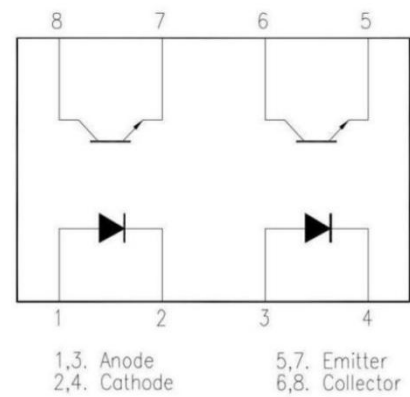
SHENZHEN ORIENT COMPONENTS CO., LTD

1. Features

- (1). Current conversion ratio (Min 50% Working condition $I_F=5mA$, $V_{CE}=5V$)
- (2). Insulation Voltage = 5,000Vrms
- (3). Response Time
(t_r : TYP. 4 μs ; t_f : TYP. 5 μs 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). MSL Class I
- (6). 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}	7	
	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	$V_R=5\text{V}$	---	---	5	μA
	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}	$I_E=0.1\text{mA}, I_F=0\text{mA}$	7	---	---	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 40~60%R.H.	---	1×10^{12}	---	Ω
	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	$V_{CE}=2\text{V}, I_C=2\text{mA}, R_L=100\Omega$	---	4	18	μs
	Descend Time	t_f		---	3	18	μs

*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. Order Information

Part Number

ORPC-827XY-Z-W

Note

X = Lead form option (S, M or none)

Y = CTR Rank (A, B, C, D,BC,CD or none)

Z = Tape and reel option (TA,TA1 or none).

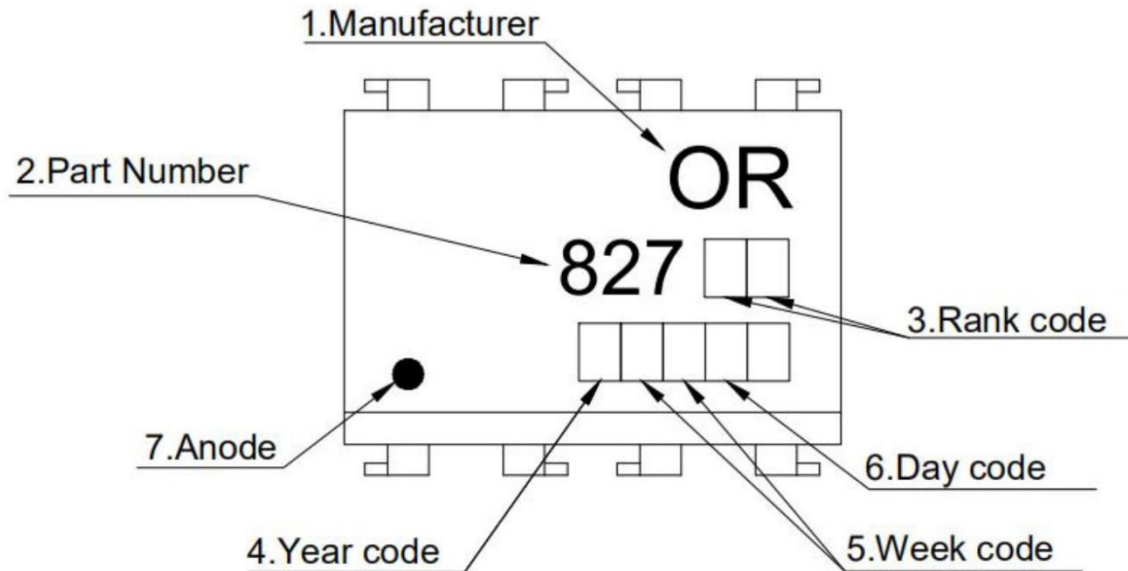
W = Lead frame option (F: Iron, C:copper)

* Halogen Free can be selected.

* VDE Code can be selected.

Option	Description	Packing quantity
None	Standard DIP-8	45 units per tube
M	Wide lead bend (0.4 inch spacing)	45 units per tube
S(TA)	Surface mount lead form (low profile) + TA tape & reel option	1000 units per reel
S(TA1)	Surface mount lead form (low profile) + TA1 tape & reel option	1000 units per reel

8. Naming Rule



(1) ORIENT.

(2) 827 denotes Part Number.

(3) denotes Rank code.

(4) denotes Year Code

(5) denotes Week Code

(6) denotes Day Code

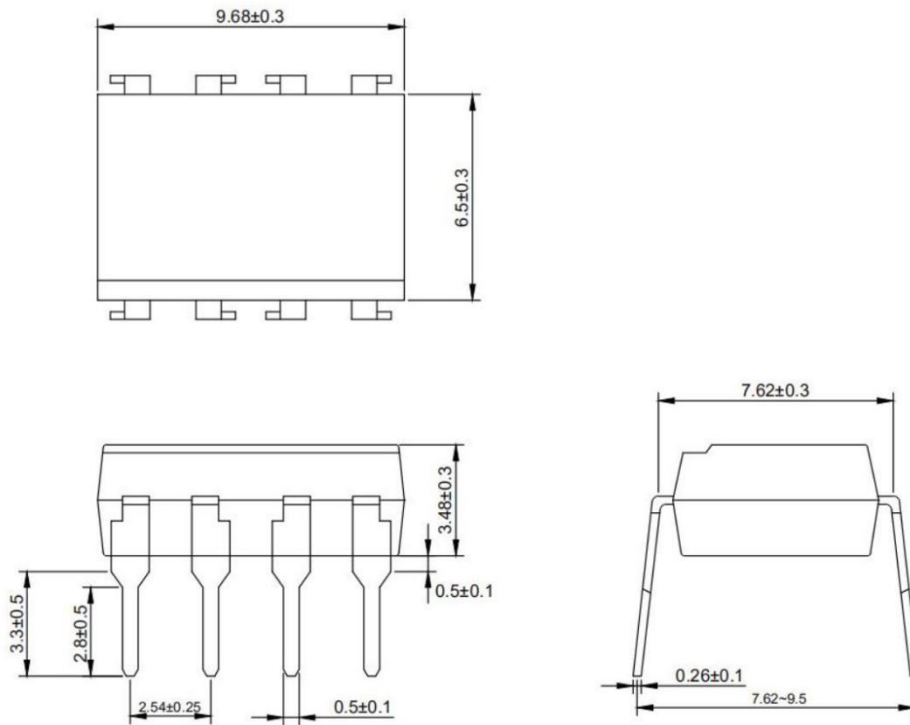
(7) Anode

* If the photo coupler is Free from Halogen, there will be a 'G' mark in the upper left corner.

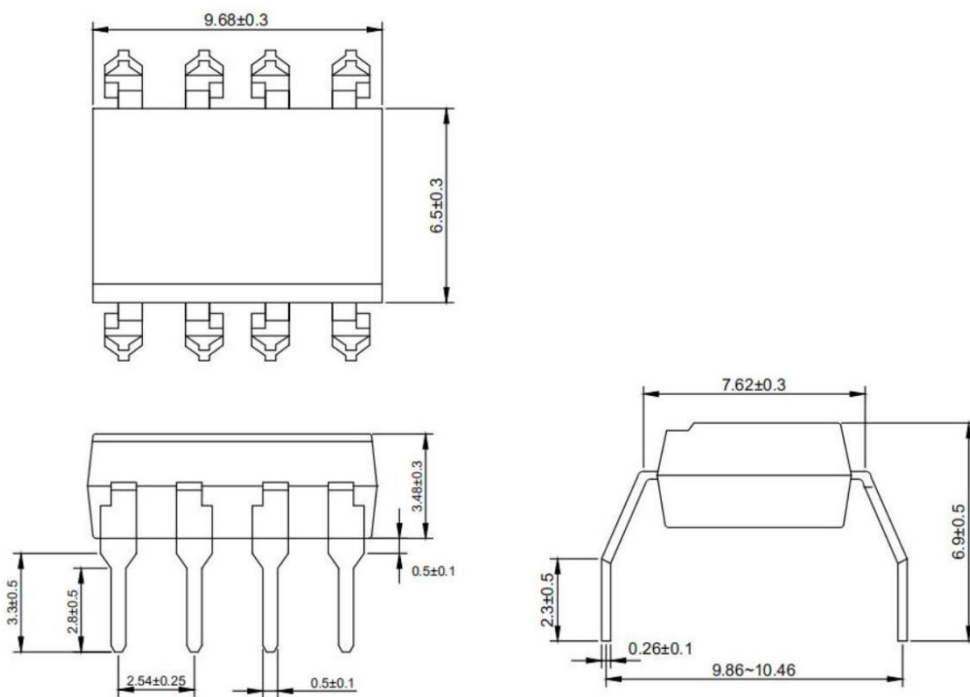
* VDE Code can be selected.

9. Outer Dimension (Unit: mm)

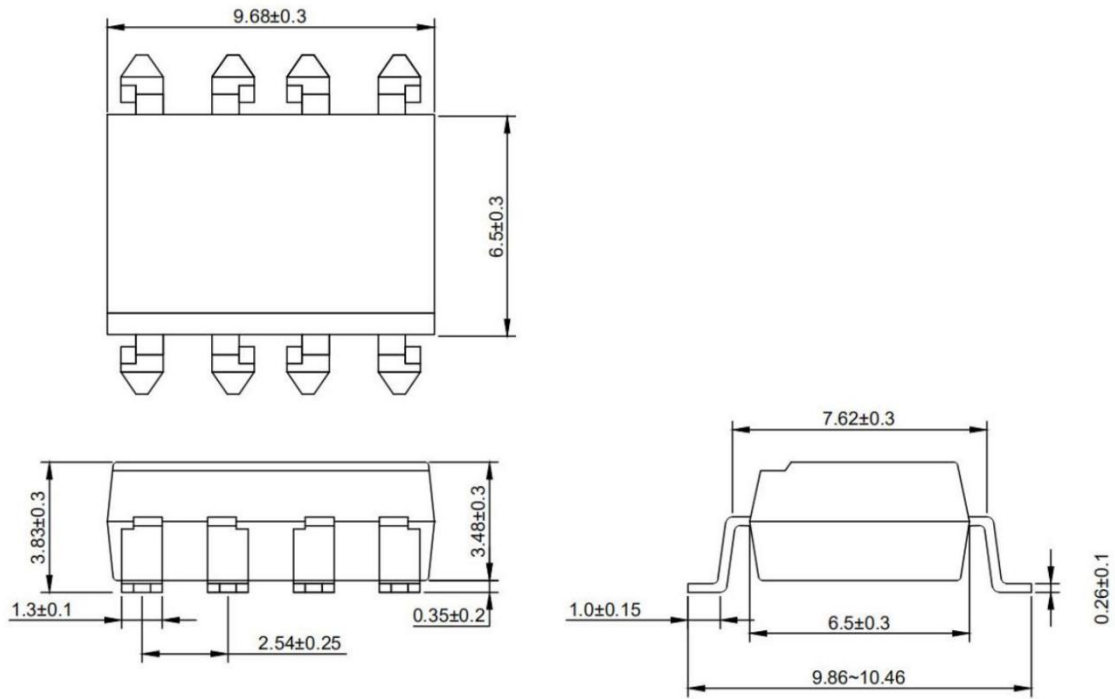
1. ORPC-827



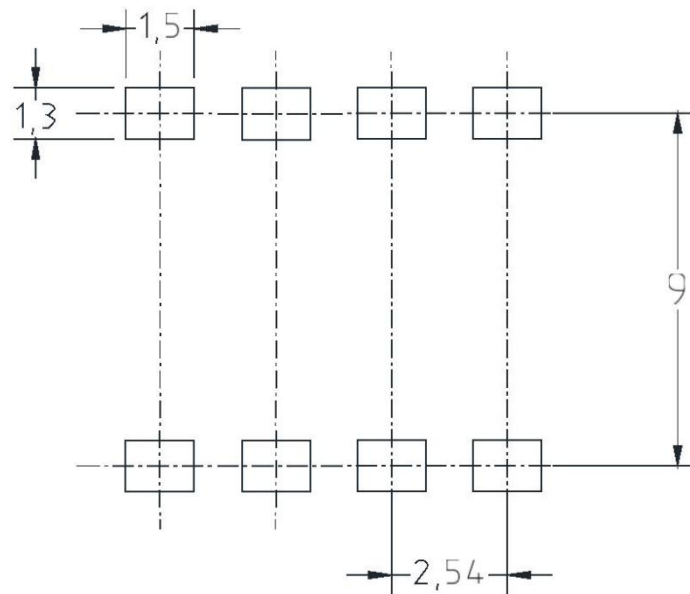
2. ORPC-827M



3.ORPC-827S



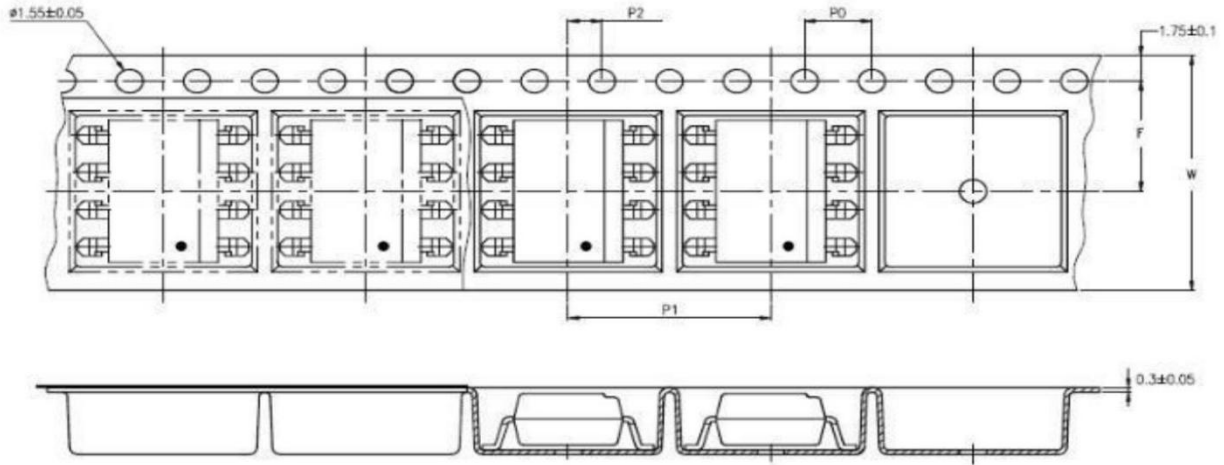
10. RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)



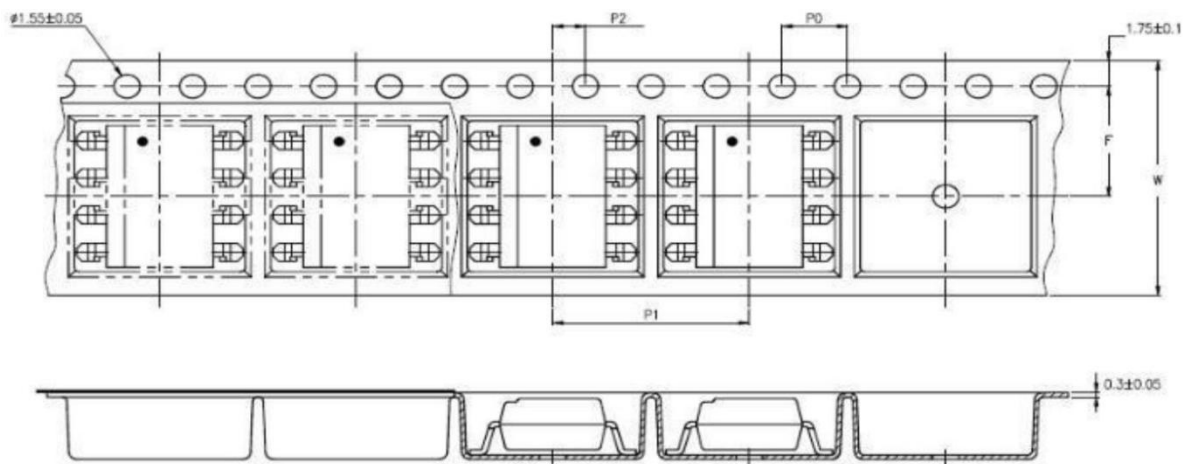
Unit: mm

11. 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

12. Package Dimension

(1) package dimension

DIP/M type

Packing Information	
Packing type	Tube(Plug)
Qty per Tube	45
Small box (inner) Dimenaion	525*132*60mm
Max qty per small box	2250
Large box (Outer) Dimenaion	530*290*335mm
Max qty per large box	18000

SOP type

Packing Information	
Packing type	Reel type
Tape Width	16mm
Qty per Reel	1000
Small box (inner) Dimenaion	345*345*60mm
Max qty per small box	2000
Large box (Outer) Dimenaion	620x360x360mm
Max qty per large box	20000

(2)Packing Label Sample



1. MTL NO:Contents with "Order Information" in the specification.
2. LOT NO:The production cycle of the product.
3. BATCH:The CTR RANK of the product.
4. Quantity:Product packaging quantity.
5. Product Data: The data when product be made.

13. Reliability Test

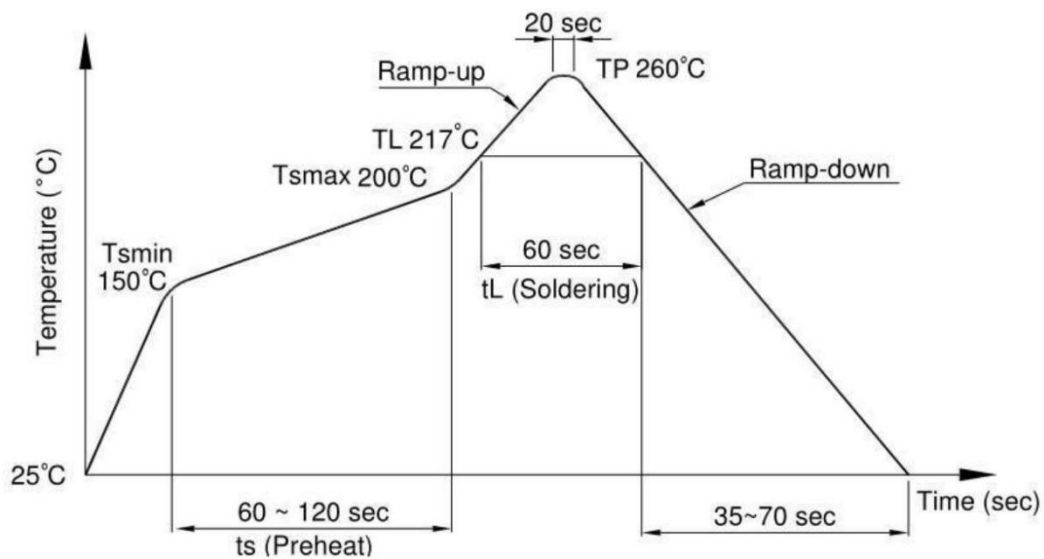
N0.	Item	Condition	Quantity	Cycle	Reference Standards
1	RSH, Resistance to Solder Heat	260±5°C, 10s/cycle	22	3cycles	JESC22A-106
2	SD, Solderability	260±5°C, 2-3s/cycle	22	1cycle	JESD22-B102
3	TC, Temperature Cycle	H: 125°C 15min ∫ 5min L: -55°C 15min	77	300cycles	JESC22A-104
4	TS, Thermal Shock	H:100°C 5min ∫ 15s L:-10°C 5min	77	300cycles	JESC22A-106
5	LTSL, Low Temperature Storage	T:-55°C	77	1000h	JESD22-A119
6	HTSL, High Temperature Storage	T:125°C	77	1000h	JESC22A-103
7	THB, High Temperature High Humidity	T:85°C RH: 85%	77	1000h	JESC22A-101
8	HTOL DC Operating Life	T: 110°C IF=10mA VCC=5V	77	1000h	MIL-STD-750 Method 1037
9	ESD-HBM Human Body Model ESD	Ta=25° C, Reference JESD22-A114	6	1cycle	JESD22-A114

14. 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.

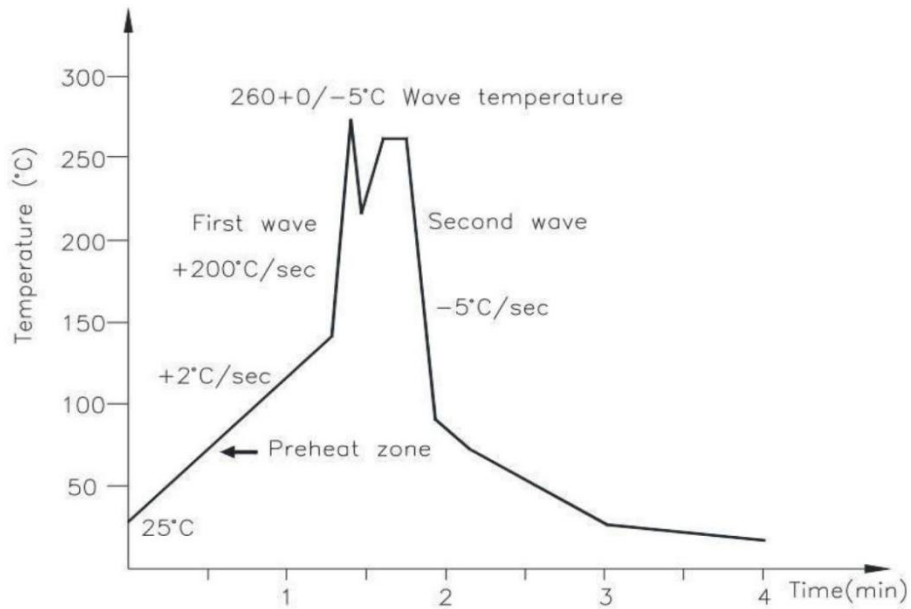
Profile item	Conditions
Preheat	
Temperature Min (T Smin)	150°C
Temperature Max (T Smax)	200°C
- Time (min to max) (ts)	90±30 sec
Soldering zone	
- Temperature (TL)	217°C
- Time (t L)	60 sec
Peak Temperature	260°C
Ramp-up rate	3°C / sec max.
3°C / sec max.	3~6°C / sec



(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

15. Characteristics Curve

Fig.1 Forward Current vs. Ambient Temperature

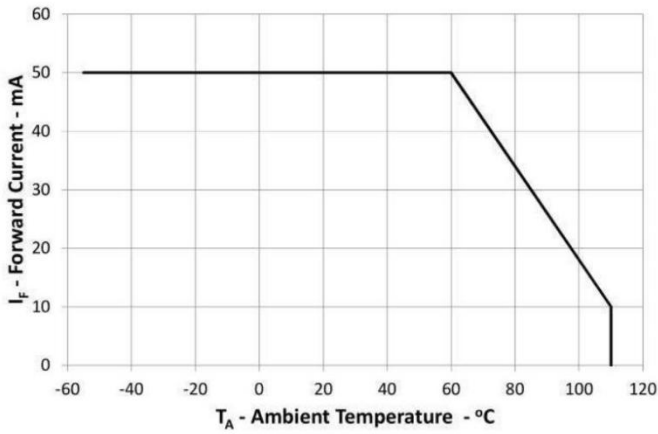


Fig.2 Collector Power Dissipation vs. Ambient Temperature

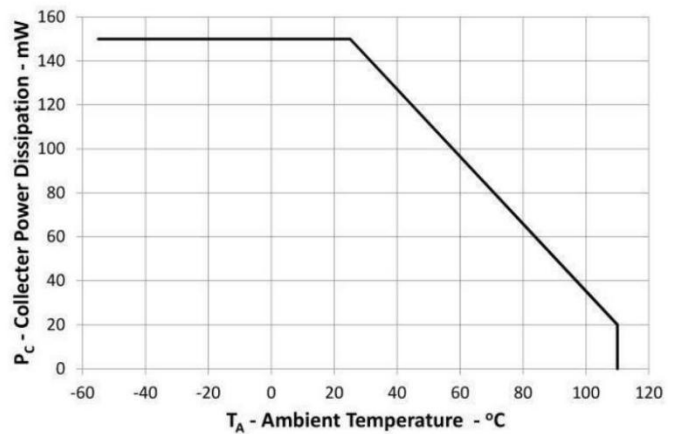


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

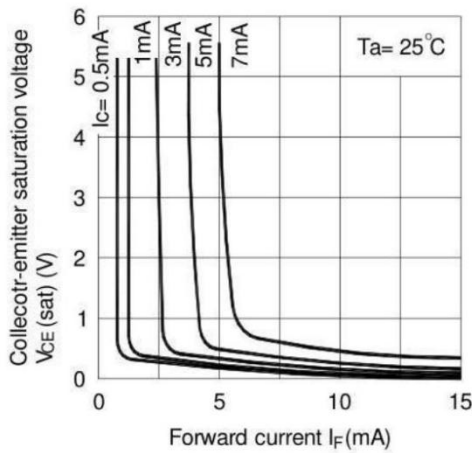


Fig.4 Forward Current vs. Forward Voltage

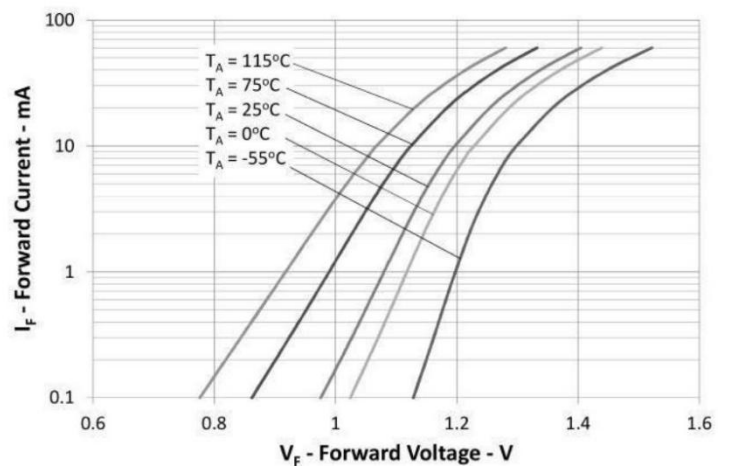


Fig.5 Current Transfer Ratio vs. Forward Current

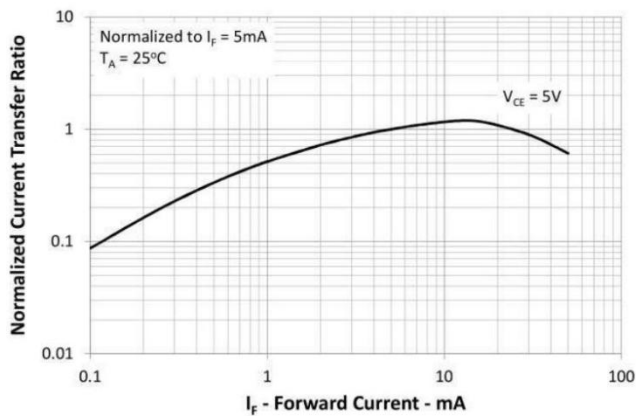


Fig.6 Collector Current vs. Collector-emitter Voltage

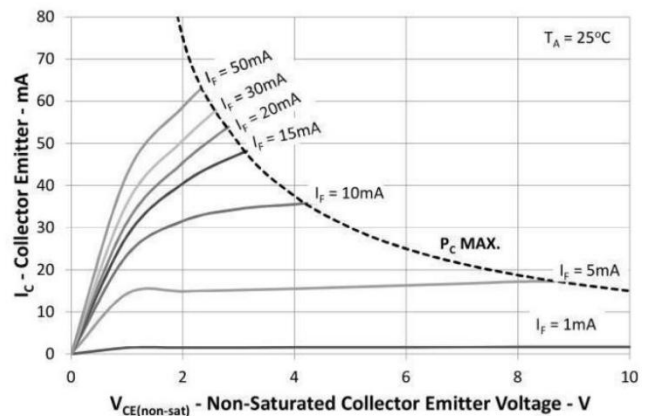


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

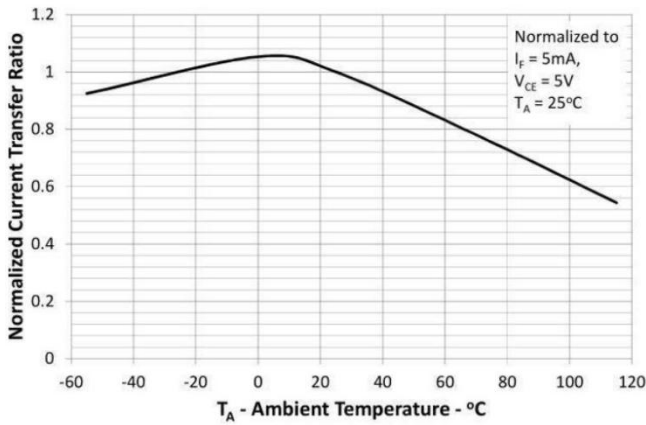


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

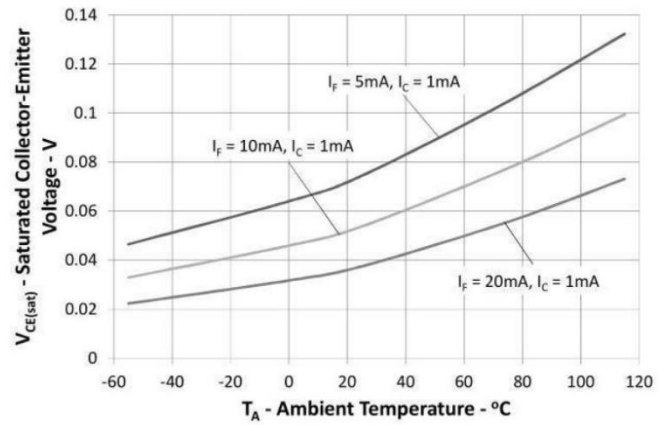


Fig.9 Collector Dark Current vs. Ambient Temperature

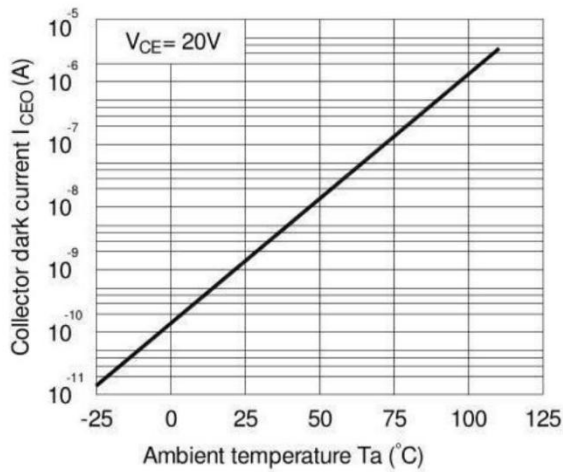


Fig.10 Response Time vs. Load Resistance

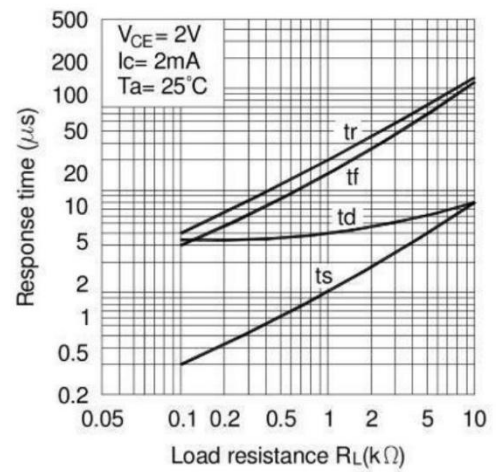
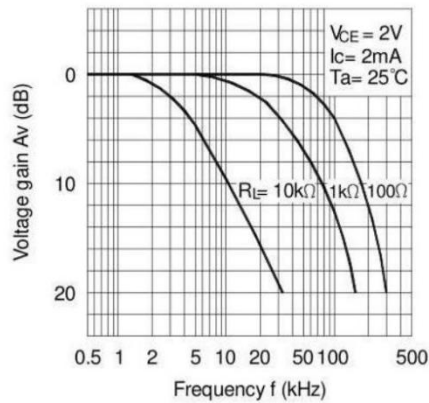
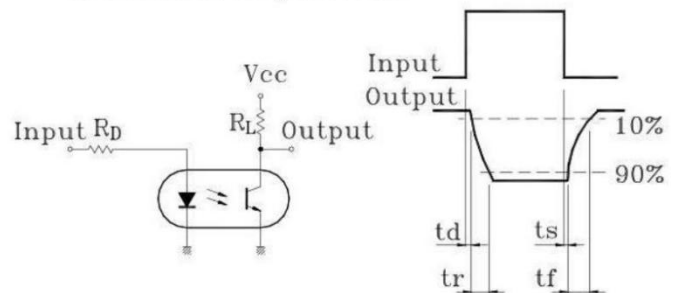


Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response

