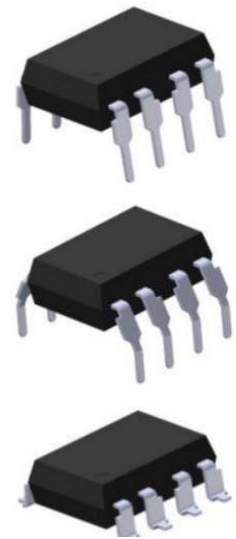


1. Features

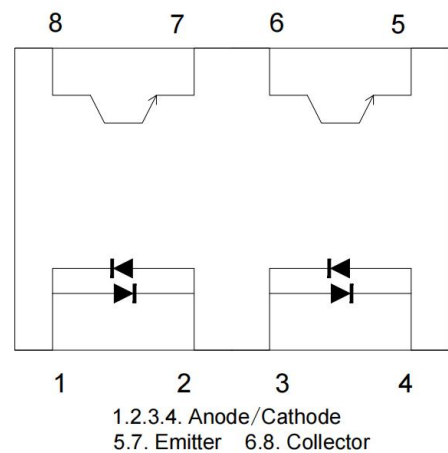
- (1) AC input response.
- (2) Current transfer ratio (CTR : MIN. 20% at IF = ±1mA, VCE = 5V)
- (3) Wide Operating temperature range -55~110°C
- (4) High input-output isolation voltage (V_{iso} = 5,000Vrms)
- (5) Response time (tr : TYP. 4us at V_{CE} = 2V, I_C = 2mA, R_L = 100)
- (6) High collector-emitter voltage (V_{CE} ≧ 80V)
- (7) ESD pass HBM 8000V/MM 2000V
- (8) ORPC-824: 2-channel type
 ORPC-824M: 2-channel type
 ORPC-824S: 2-channel type
- (9) In compliance with RoHS, REACH standards
- (10) MSL Class I
- (11) Safety approval
 UL approved (No.E323844)
 VDE approved (No.40029733)
 CQC approved (No.CQC19001231254)



2. Instructions

- (1). ORPC-824 series optical coupler consists of four GaAs transmitting tubes and two NPN transistors
- (2). Pin pitch of ORPC-824 is 2.54mm

Pin No. and Internal connection diagram



3. Application Range

- (1) AC line monitor
- (2) Programmable controllers
- (3) Telephone line interface
- (4) Unknown polarity DC sensor

4. Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rated Value	Unit
Input	Forward Current	I_F	± 50	mA
	Peak forward Current(1us pulse)	I_{FP}	1	A
	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	Min	Typ.*	Max	Unit	Condition
Input	Forward Voltage	V _F	---	1.2	1.4	V	I _F =±20mA
	Collector Capacitance	C _t	---	30	250	pF	V=0, f=1KHz
Output	Collector to Emitter Current	I _{CEO}	---	---	100	nA	V _{CE} =20V, I _F =0mA
	Collector and Emitter attenuation Voltage	BV _{CEO}	80	---	---	V	I _C =0.1mA I _F =0mA
	Emitter and Collector attenuation Voltage	BV _{ECO}	7	---	---	V	I _E =0.1mA I _F =0mA
Transforming Characteristics	*1 Current conversion ratio	CTR	20	---	300	%	I _F =±1mA V _{CE} =5V
	Collector Current	I _C	0.2	---	3	mA	
	Collector and Emitter Saturation Voltage	V _{CE(sat)}	---	0.1	0.2	V	I _F =±20mA I _C =1mA
	Insulation Impedance	R _{iso}	5×10 ¹⁰	1×10 ¹²	---	Ω	DC500V 40~60%R.H.
	Floating Capacitance	C _f	---	0.6	1.0	pF	V=0, f=1MHz
	Cut-off Frequency	f _c	---	80	---	kHz	V _{CE} =5V, I _C =2mA R _L =100Ω, -3dB
	Rise Time	t _r	---	4	18	μs	V _{CE} =2V, I _C =2mA R _L =100Ω
	Descend Time	t _f	---	3	18	μs	

*1 Current Conversion Ratio = I_C / I_F × 100%

6. Rank table of current transfer ratio (CTR)

Part Number	CTR Rank	Min (%)	Max (%)	Condition
ORPC-824	NO BIN	20	300	IF=±1mA, VCE=5V, Ta=25°C

7. Order Information

Part Number

ORPC-824X-T-W-Y-Z

Note

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

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

W = Lead frame option (C:copper)

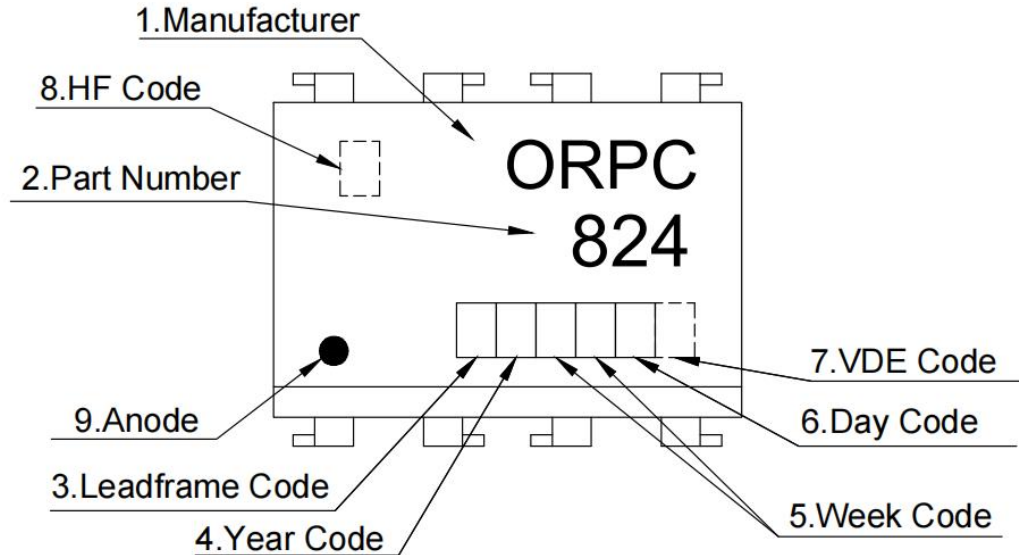
Y = 'V' code for VDE safety (This options is not necessary).

Z = 'G' code for Halogen free.

* 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

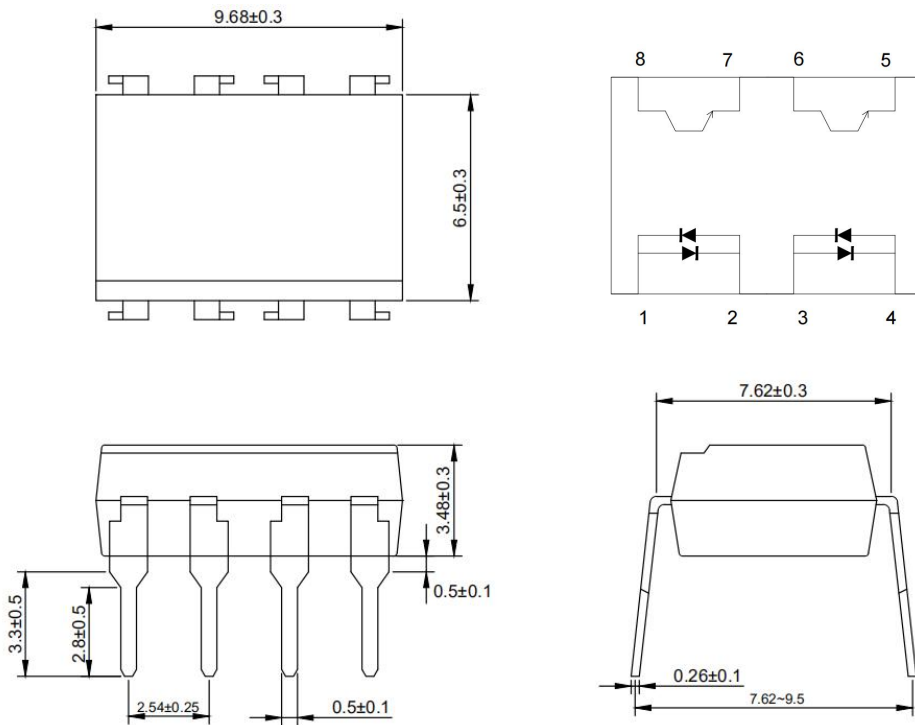


1. Manufacturer : ORIENT.
2. Part Number : 824.
3. Lead frame Code □: ‘F’ means Iron, ‘C’ means Copper.
4. Year Code □ : ‘1’ means ‘2021’ and so on.
5. Week Code □□: 01 means the first week, 02 means the second week and so on.
6. Day Code □: “A to G” means “Monday to Sunday”
7. VDE Code □□□. (Optional)
8. HF Code □□□: Halogen Free .
9. Anode.

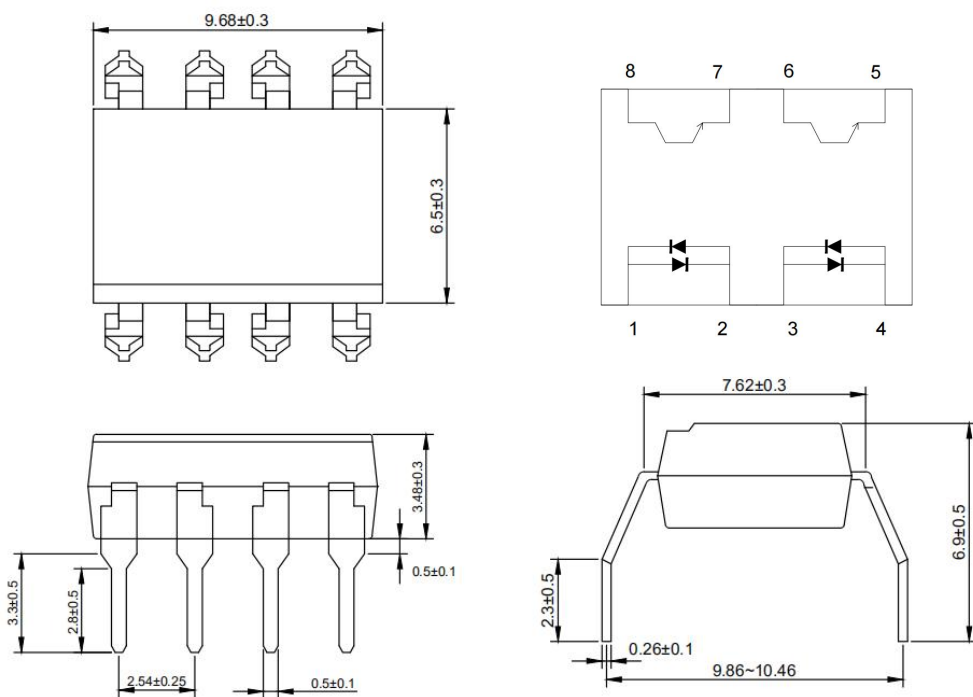
* VDE Mark can be selected.

9. Outer Dimension (Unit: mm)

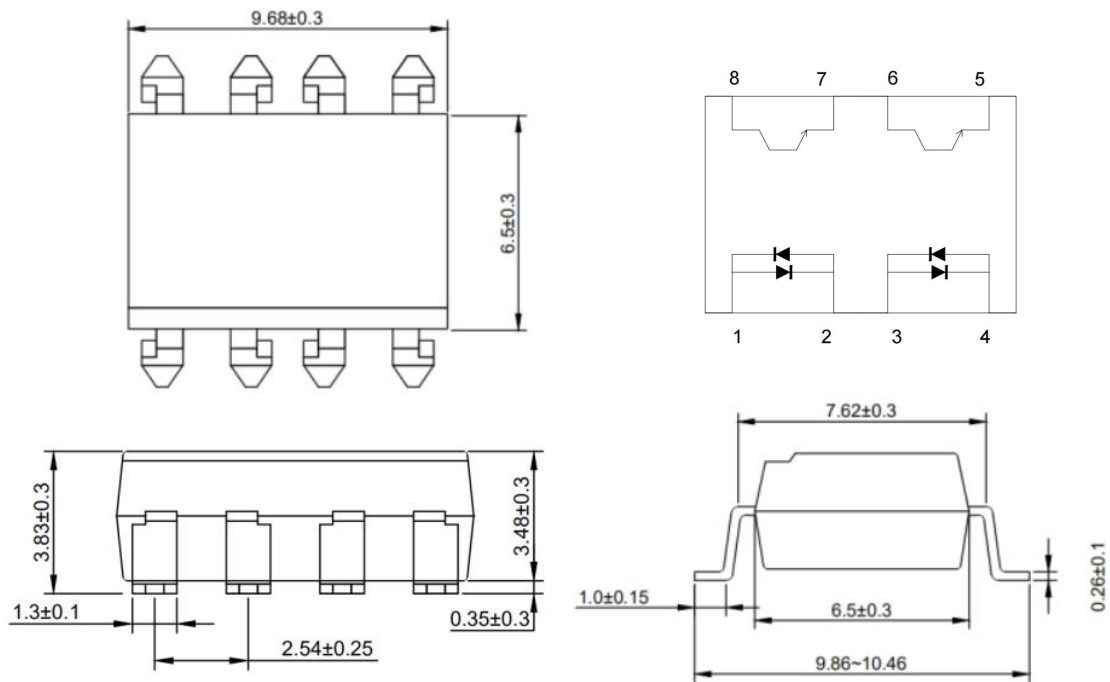
1. ORPC-824



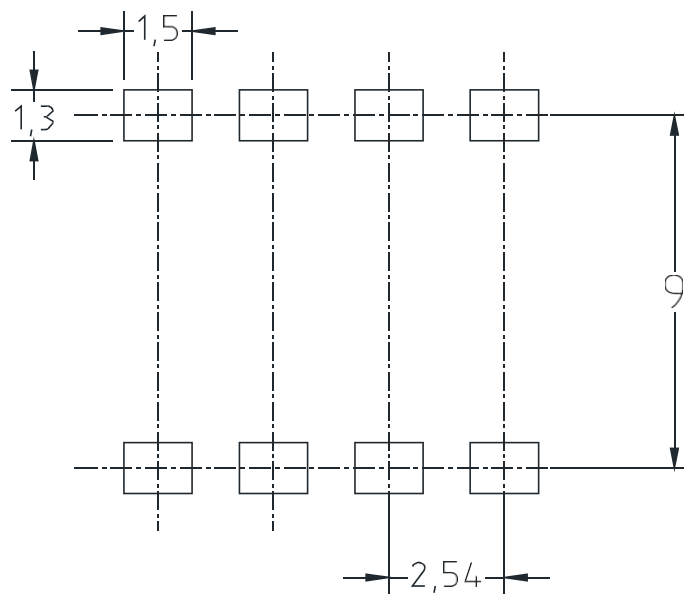
2. ORPC-824M



3. ORPC-824S



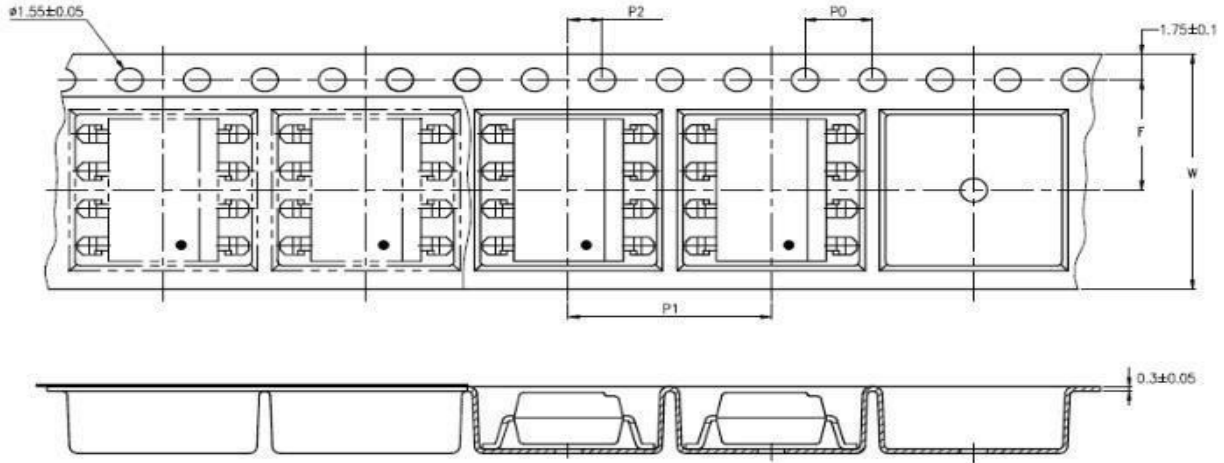
10. RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)



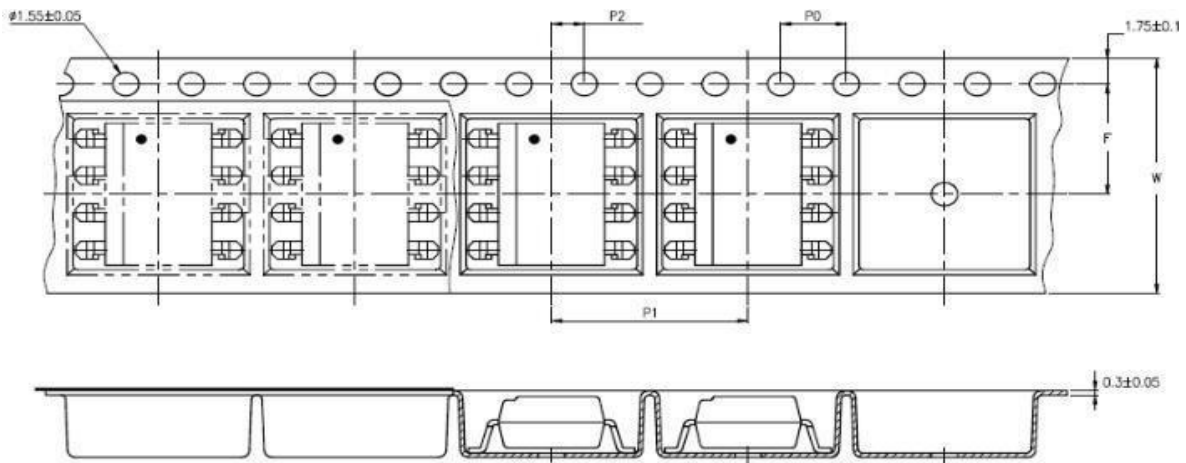
Unit: mm

11. Taping Dimensions

(1) ORPC-824-TA



(2) ORPC-824-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	TA/TA1
Quantities(pcs)	1000

12. Package Dimension

(1) package dimension


DIP Type

Packing Information	
Packing type	Tube
Qty per Tube	45pcs
Small box (Inner) Dimension	525*128*60mm
Large box (Outer) Dimension	545*290*335mm
The Amount per Inner Box	2,250pcs
The Amount per Outer Box	22,500pcs




SOP Type






Packing Information	
Packing type	Reel type
Tape Width	16mm
Qty per Reel	1,000pcs
Small box (inner) Dimension	345*345*58.5mm
Large box (Outer) Dimension	620x360x360mm
Max qty per small box	2,000pcs
Max qty per large box	20,000pcs

(2)Packing Label Sample



ORIENT
ShenZhen Orient
Components Co.,LTD

Material Code : 120PCXXXXXX

 P/N : OR-XXXXXX

 Lot No. : XXXXXX-XXXXX-TX-X

 D/C : XXXX

 Qty : XXXX PCS


内箱码

外箱码

“XXXXXXXXXXXXXXXX” (一体机序列码)
Made in China

Note:

1. Material Code :Product ID.
2. P/N :Contents with "Order Information" in the specification.
3. Lot No. :Product data.
4. D/C :Product weeks.
5. Quantity :Packaging quantity.

13. Reliability Test

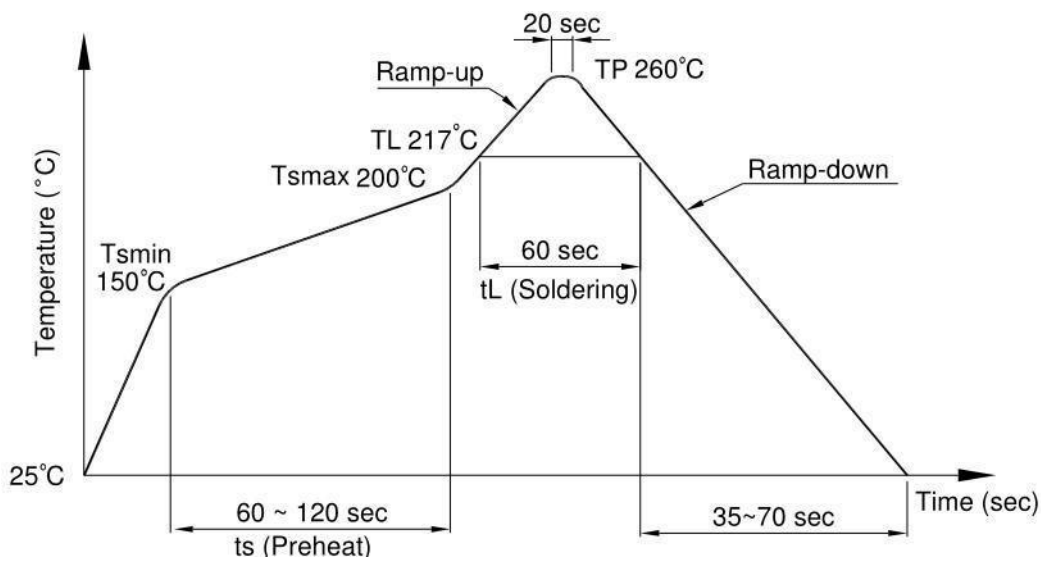
NO.	ITEMS	Reliability Testing				
		QTY. (Pcs)	Condition	Process	Device	Standard
1	RSH 耐焊接热	22	260±5℃	10s/3 次	锡炉	JESD22-A106
2	HTSL 高温存储	77	125℃	168 hrs	高温烤箱 测试仪	JESD22-A103
				500 hrs		
				1000 hrs		
3	LTSL 低温存储	77	-55℃	168 hrs	低温箱 测试仪	JESD22-A119
				500 hrs		
				1000 hrs		
4	TC 温度循环	77	H:125℃ 15min ∫ 5min L:-55℃ 15min	300 cycle	冷热冲击机	JESD22-A104
5	TS 温度冲击	77	H:100℃ 5min ∫ 15s L:-40℃ 5min	300 cycle	冷热冲击机	JESD22-A106
6	HTOL 高温操作	77	110℃ IF=10mA Vce=5V	168 hrs	高温烤箱 测试仪、老 化电路板	JESD22-A108
				500 hrs		
				1000 hrs		
7	ESD-HBM 人体模式	22	≥8KV 1Cycle	1次	ESD静电测 试仪	JESD22-A114
8	SD 可焊性	22	Pb-free 245±5℃	5S/1次	锡炉	JESD22-B102
9	HTRB 高温反向偏压	77	HTRB @125℃ Vce=80v	168 hrs	高温烤箱 ，测试仪	JESD22-A103
				500 hrs		
				1000 hrs		
10	H3TRB 温湿度反向偏 压，寿命试验	77	H3TRB 85℃,85%RH Vce=80v	168 hrs	恒温恒湿 机，测试仪	JESD22-A101
				500 hrs		
				1000 hrs		
11	Autoclave 压力锅	77	Ta=121 ℃,100%RH,2atm	96hrs	压力锅	JESD22-A102

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.

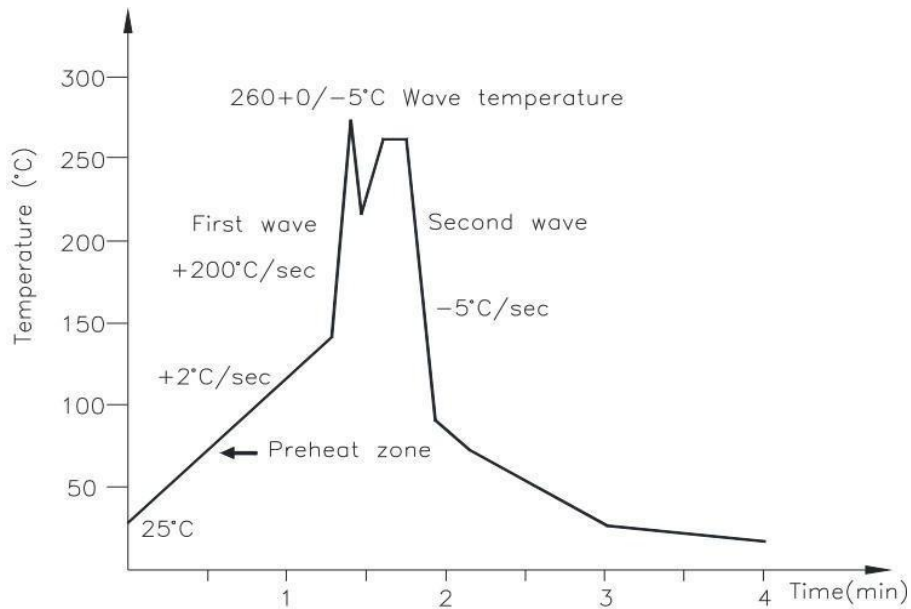
Profile item	Conditions
Preheat	
- Temperature Min (T Smin)	150°C
- Temperature Max (T Smax)	200°C
- Time (min to max) (ts)	90±30 sec
Soldering zone	
- Temperature (TL)	217°C
- Time (t L)	60 sec
Peak Temperature	260°C
Peak Temperature time	20 sec
Ramp-up rate	3°C / sec max.
Ramp-down rate from peak temperature	3~6°C / sec
Reflow times	≤3



(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 Curves

Fig.1 Forward current vs Ambient temperature

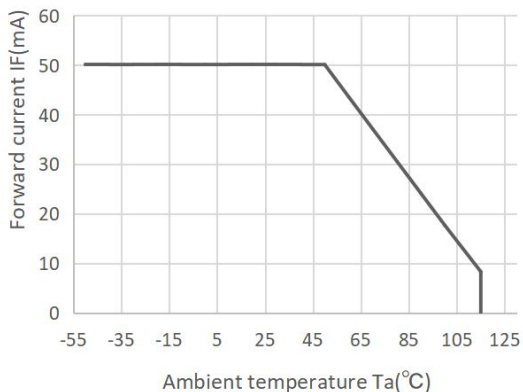


Fig.2 Collector Power Dissipation vs. Ambient temperature

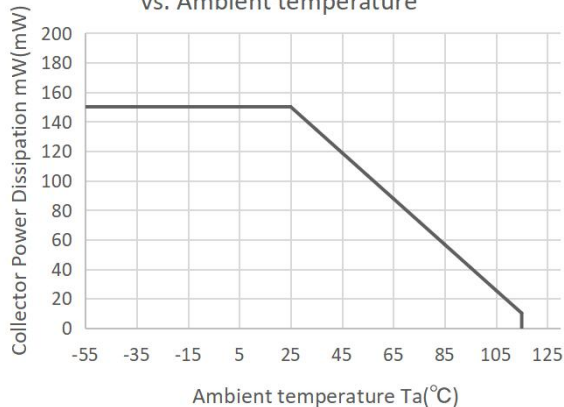


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

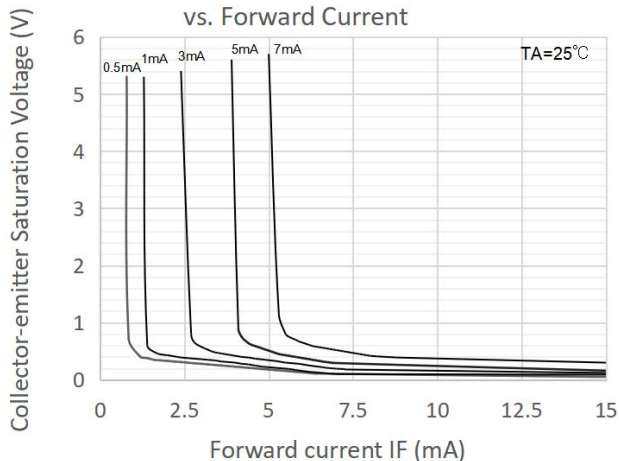


Fig.4 Forward Current vs. Forward Voltage

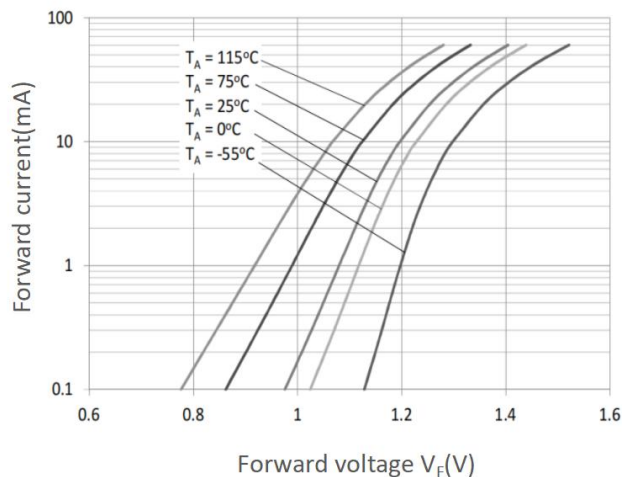


Fig.5 Forward Current vs. Current Transfer Ratio

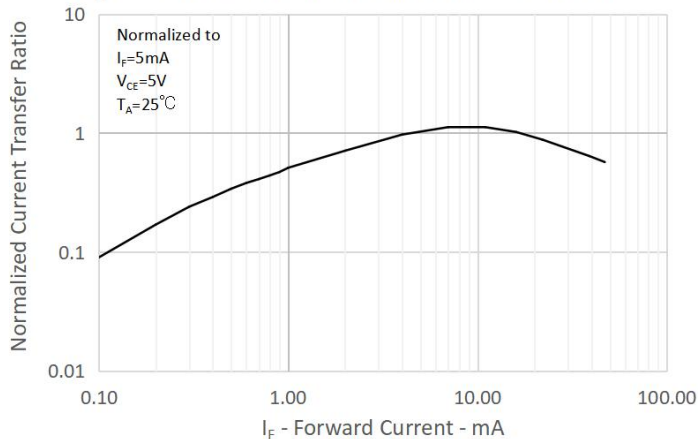


Fig.6 Collector Current vs. Collector-emitter Voltage

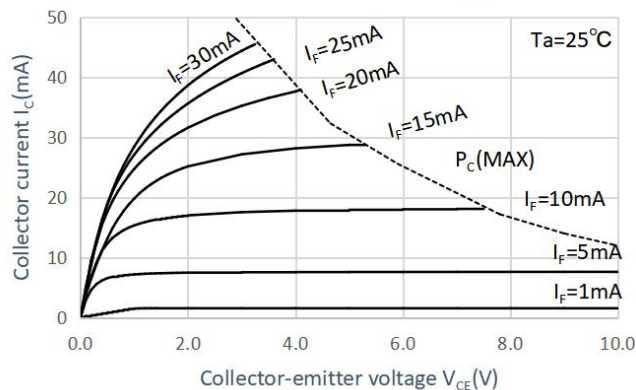


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

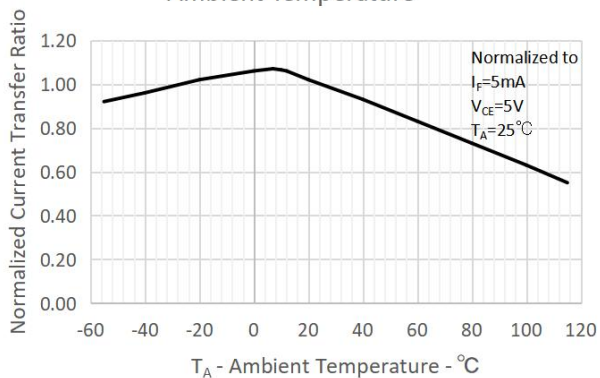


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

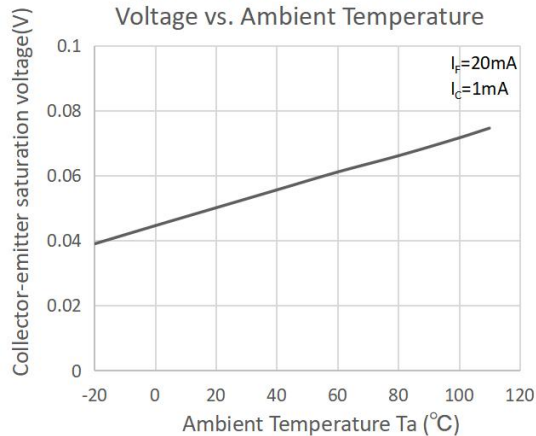


Fig.9 Collector Dark Current vs. Ambient Temperature

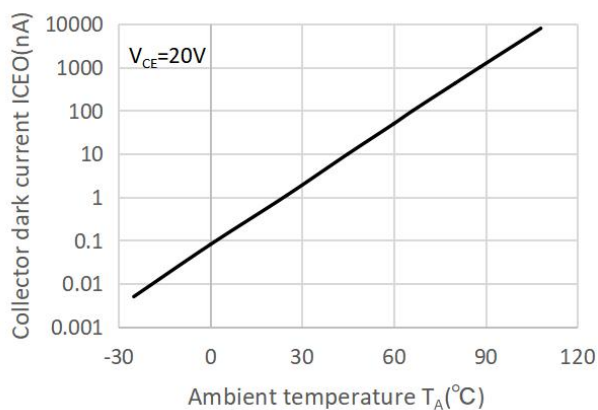


Fig.10 Respinse Time vs. Load Resistance

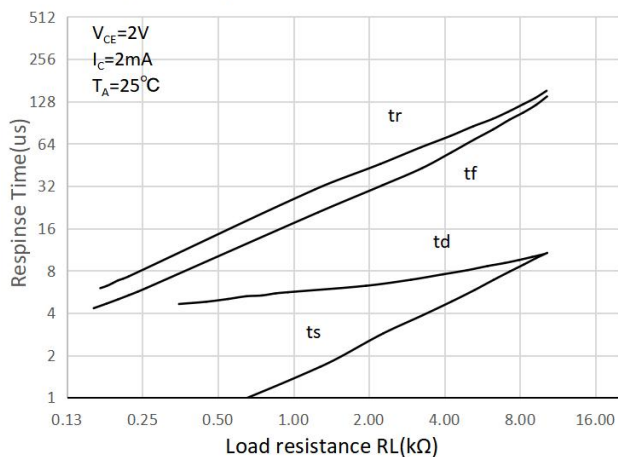
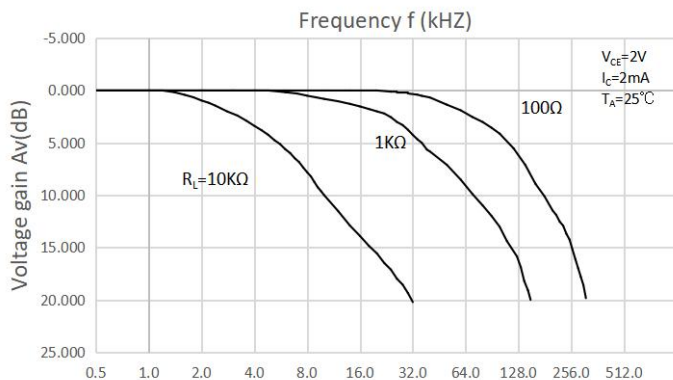
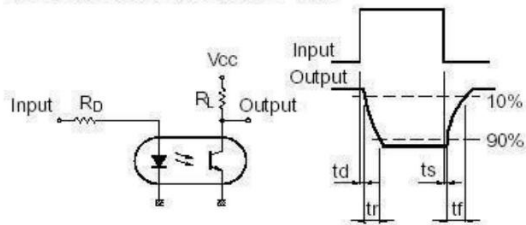


Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response

