ORIENT

Photocoupler

Product Data Sheet

Name: ORPC-817

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) Current transfer ratio (CTR : MIN. 50% at I_F = 5mA, V_{CE} = 5V)
(2) High input-output isolation voltage (Viso = 5,000Vrms)
(3) Response time (tr : TYP. 4μs at V_{CE} = 2V, I_C = 2mA, 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) ORPC-817 photocoupler consist of one piece of GaAs emitter and one piece of NPN transistor.
(2) They are packaged in a 4-pin DIP package and available in wide-lead spacing and SMD option.

3. Applications

(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 at Ta=25℃

Parameter		Symbol	Rated Value	Unit
Input	Forward Current	I_F	60	mA
	Peak forward current (100μs pulse, 100Hz frequency)	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		Topr	-55 to + 110	℃
Deposit Temperature		T_{stg}	-55 to + 125	
*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 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}=20V, I_F=0mA	---	---	100	nA
	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=0.1mA I_F=0mA	6	---	---	V
Transforming Characteristics	*1 Current conversion ratio	CTR	IF=5mA VCE=5V	50	---	1000	%
	Collector Current	I_C		2.5	---	50	mA
	Collector and Emitter Saturation Voltage	$V_{CE(sat)}$	I_F=20mA I_C= 1mA	---	0.1	0.2	V
	Insulation Impedance	R_{iso}	DC500V 40~60%R.H.	---	1×10^{12}	---	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	---	80	---	kHz
	Rise Time	t_r	V_{CE}=2V, I_C=2mA R_L=100Ω	---	4	18	μs
	Descend Time	t_f		---	3	18	μs

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

6.Rank Table of Current Transfer Ratio

(1) ORPC-817

Grade Sign	Min (%)	Max (%)
ORPC-817A	80	160
ORPC-817B	130	260
ORPC-817C	200	400
ORPC-817D	300	600
ORPC-817E	50	80
ORPC-817F	80	100
ORPC-817G	100	120
ORPC-817H	600	1000
ORPC-817I	120	140
ORPC-817J	140	180
ORPC-817K	180	220
ORPC-817L	50	100
ORPC-817M	220	260
ORPC-817N	260	300
ORPC-817O	300	340
ORPC-817P	340	380
ORPC-817Q	380	420
ORPC-817R	420	440
ORPC-817S	440	460
ORPC-817T	460	480
ORPC-817U	480	500
ORPC-817V	500	520
ORPC-817W	520	540
ORPC-817X	540	560
ORPC-817Y	560	580
ORPC-817Z	580	600

Note: Working condition: I_F=5mA, V_{CE}=5V, T_a=25℃.

(2) ORPC-817M

Grade Sign	Min (%)	Max (%)
ORPC-817MA	80	160
ORPC-817MB	130	260
ORPC-817MC	200	400
ORPC-817MD	300	600
ORPC-817ME	50	80
ORPC-817MF	80	100
ORPC-817MG	100	120
ORPC-817MH	600	1000
ORPC-817MI	120	140
ORPC-817MJ	140	180
ORPC-817MK	180	220
ORPC-817ML	50	100
ORPC-817MM	220	260
ORPC-817MN	260	300
ORPC-817MO	300	340
ORPC-817MP	340	380
ORPC-817MQ	380	420
ORPC-817MR	420	440
ORPC-817MS	440	460
ORPC-817MT	460	480
ORPC-817MU	480	500
ORPC-817MV	500	520
ORPC-817MW	520	540
ORPC-817MX	540	560
ORPC-817MY	560	580
ORPC-817MZ	580	600

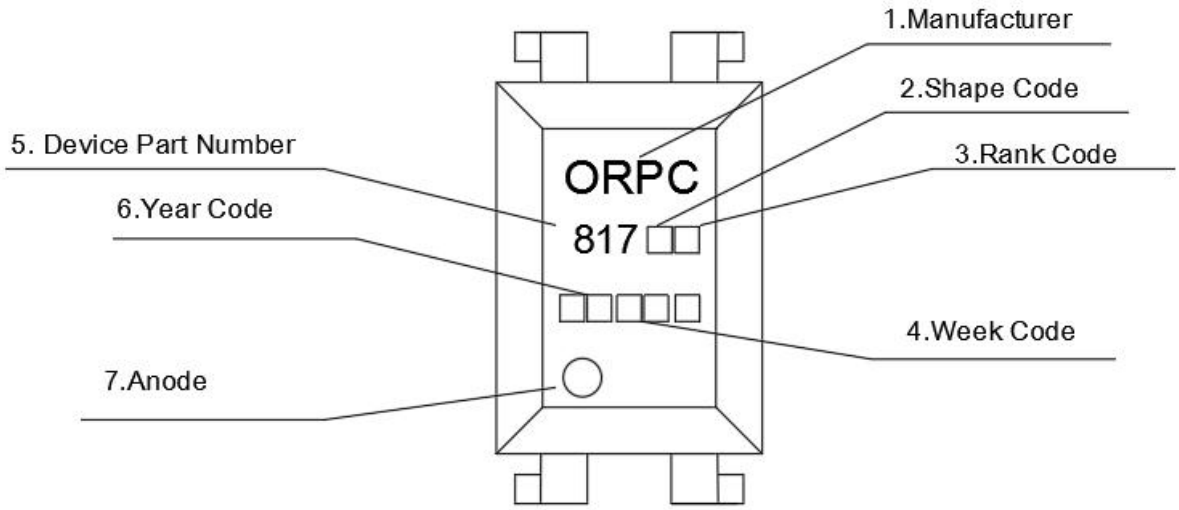
Note: Working condition: I_F=5mA, V_{CE}=5V, T_a=25℃.

(3) ORPC-817S

Grade Sign	Min (%)	Max (%)
ORPC-817SA	80	160
ORPC-817SB	130	260
ORPC-817SC	200	400
ORPC-817SD	300	600
ORPC-817SD3	300	450
ORPC-817SE	50	80
ORPC-817SF	80	100
ORPC-817SG	100	120
ORPC-817SH	600	1000
ORPC-817SI	120	140
ORPC-817SJ	140	180
ORPC-817SK	180	220
ORPC-817SL	50	100
ORPC-817SM	220	260
ORPC-817SN	260	300
ORPC-817SO	300	340
ORPC-817SP	340	380
ORPC-817SQ	380	420
ORPC-817SR	420	440
ORPC-817SS	440	460
ORPC-817ST	460	480
ORPC-817SU	480	500
ORPC-817SV	500	520
ORPC-817SW	520	540
ORPC-817SX	540	560
ORPC-817SY	560	580
ORPC-817SZ	580	600

Note: Working condition: I_F=5mA, V_{CE}=5V, T_a=25℃.

7. 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.

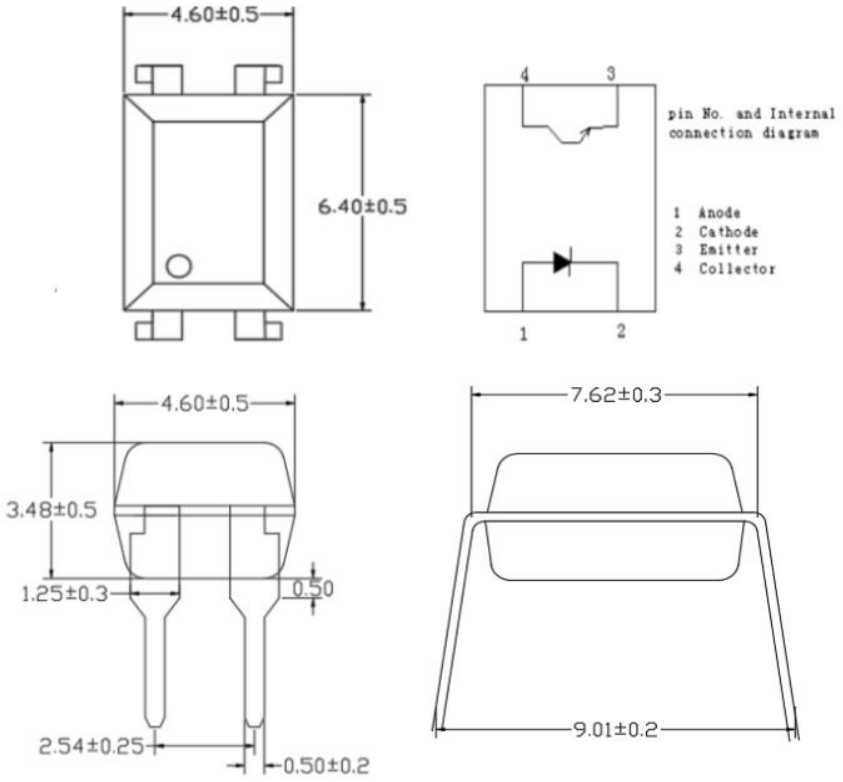
(6) □ denotes Year Code

(7) Anode.

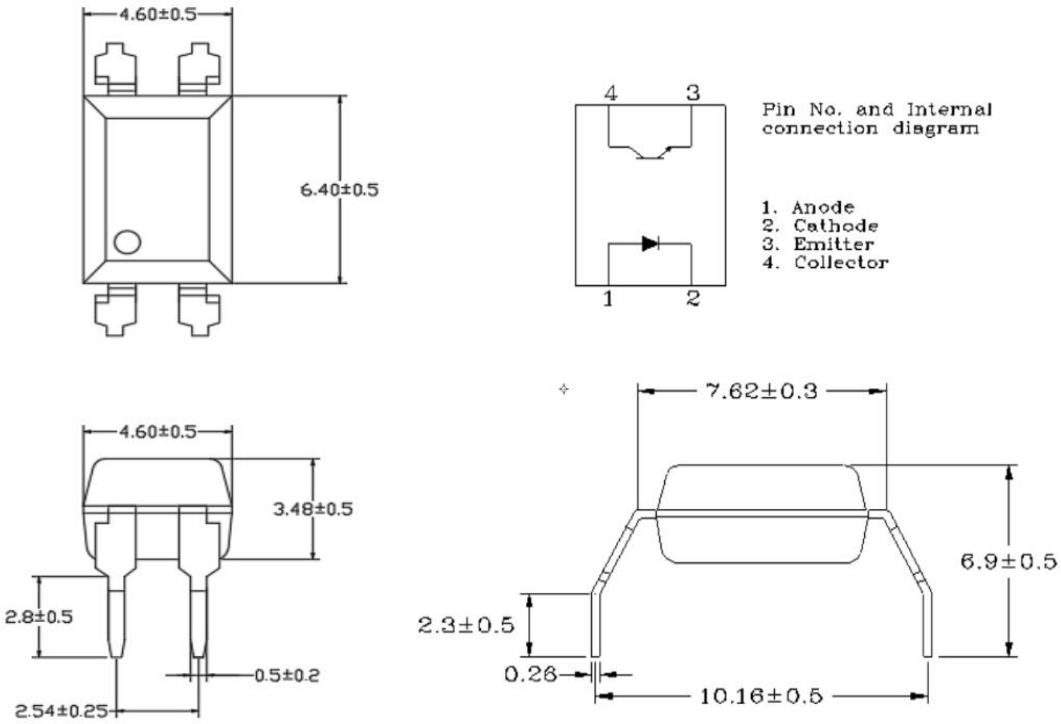
(8) Unit:mm

8. Package Dimension (Unit：mm）

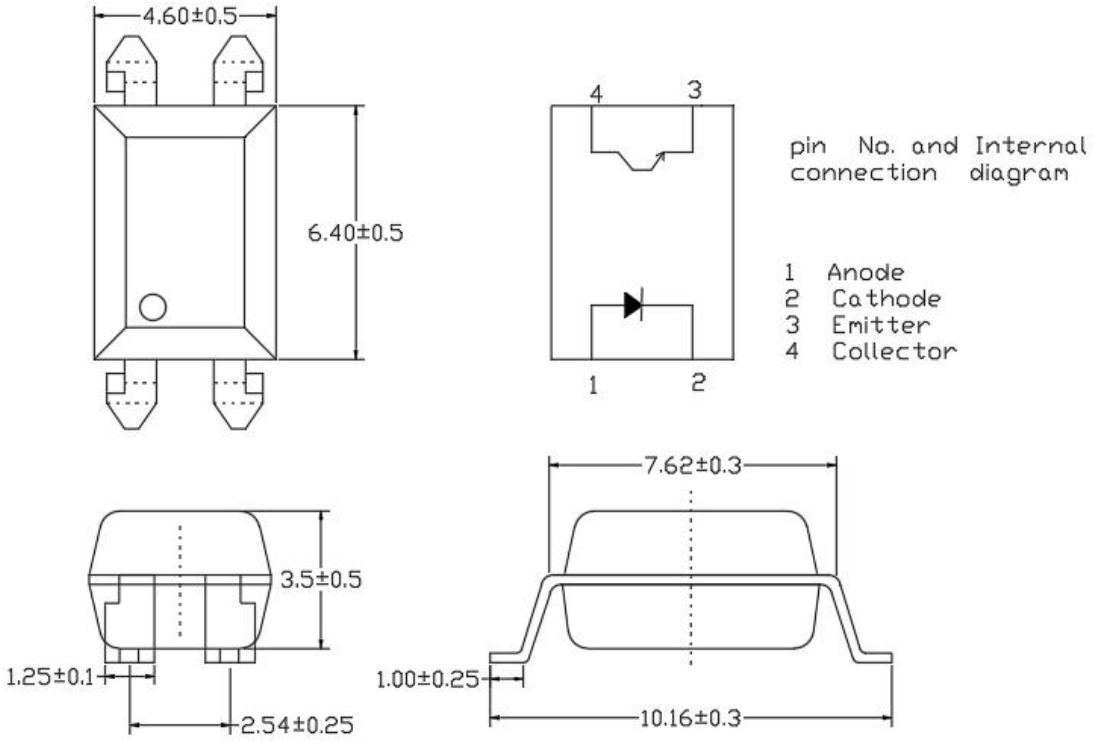
(1) ORPC-817



(2) ORPC-817M

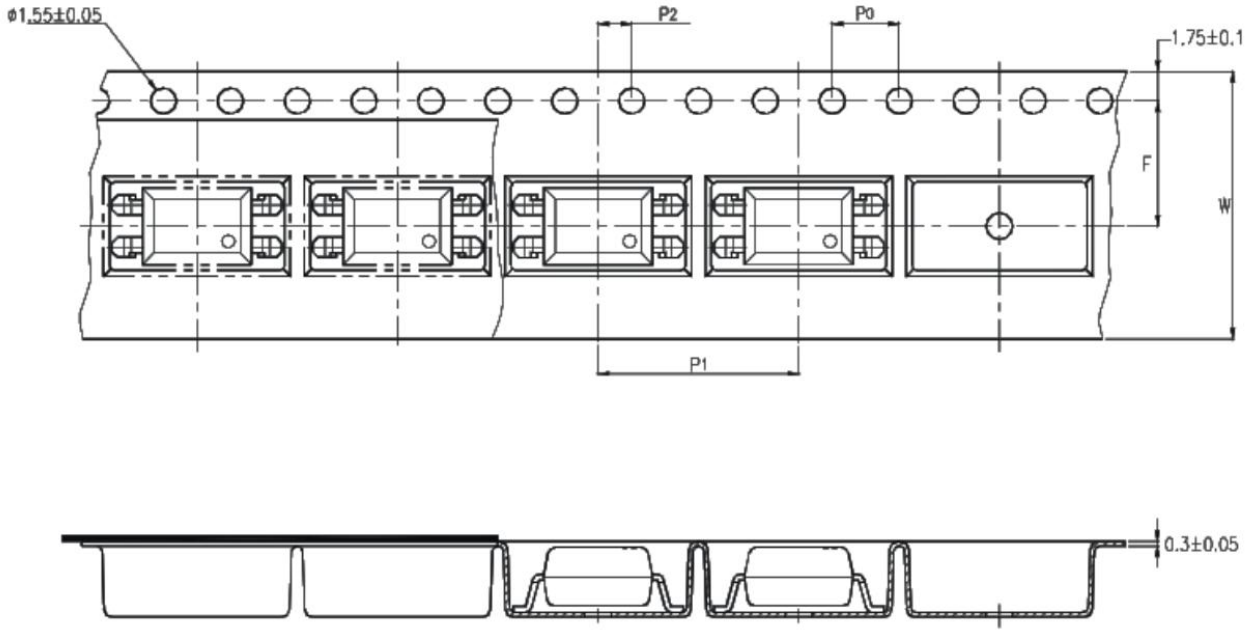


(3) ORPC-817S

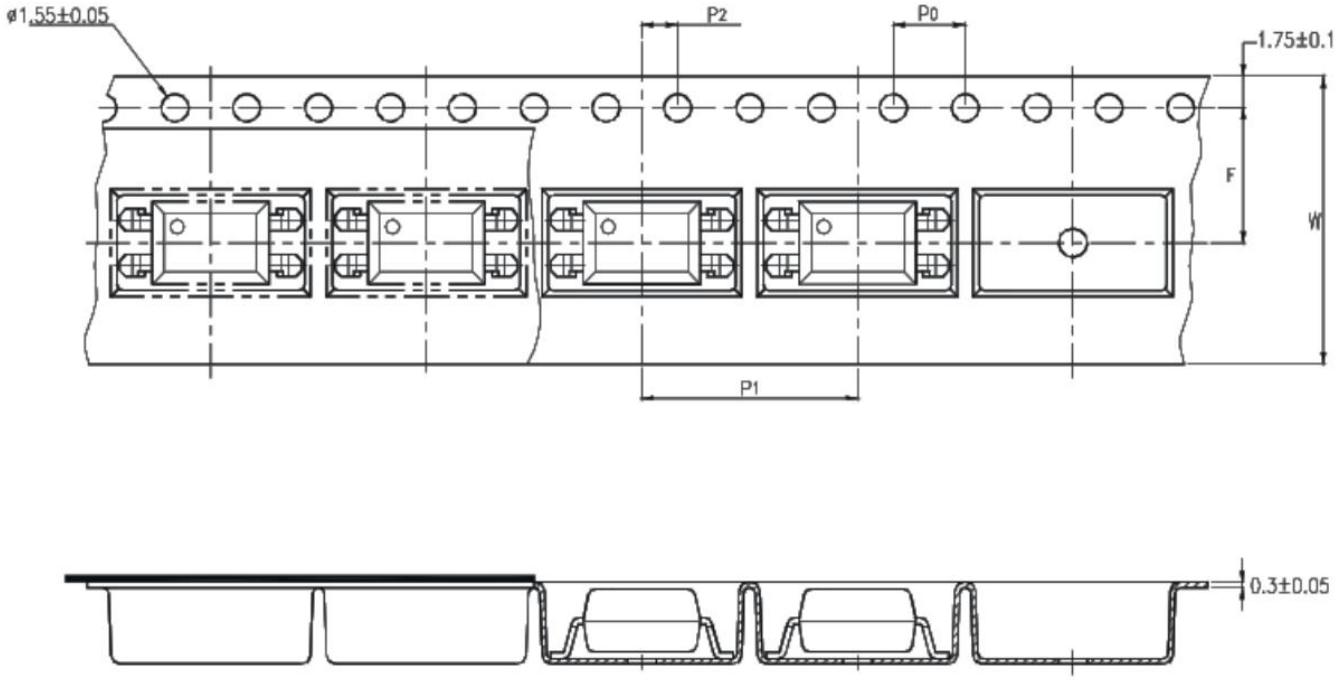


9.Taping Dimensions

(1) ORPC-817S-TA



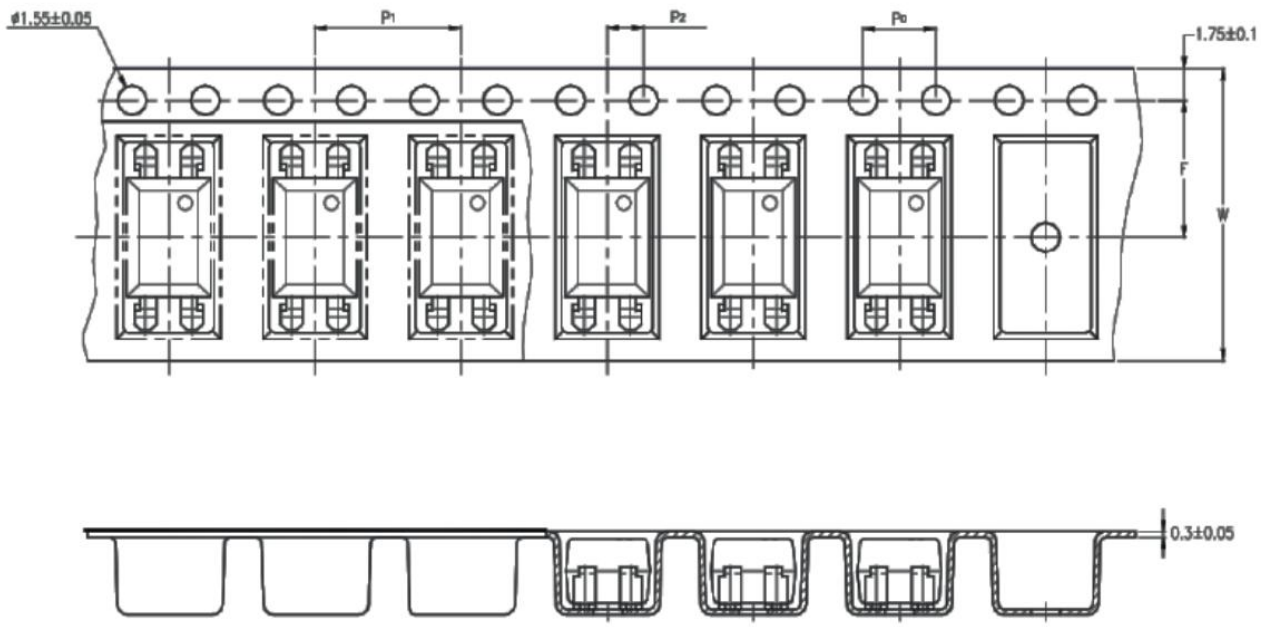
(2) ORPC-817S-TA1



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-817S-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)

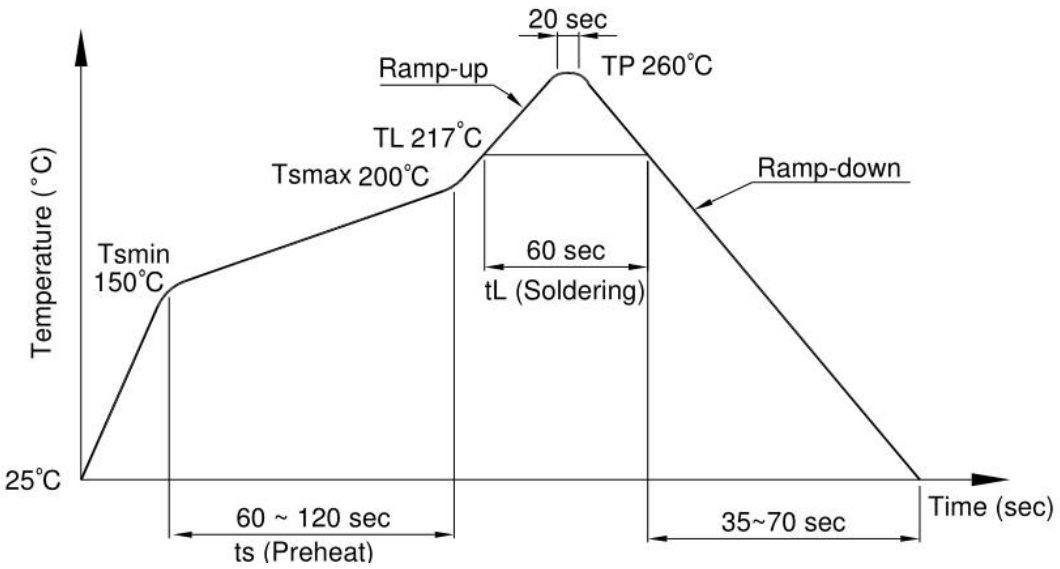
Package Type	TP
Quantities(pcs)	2000

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.

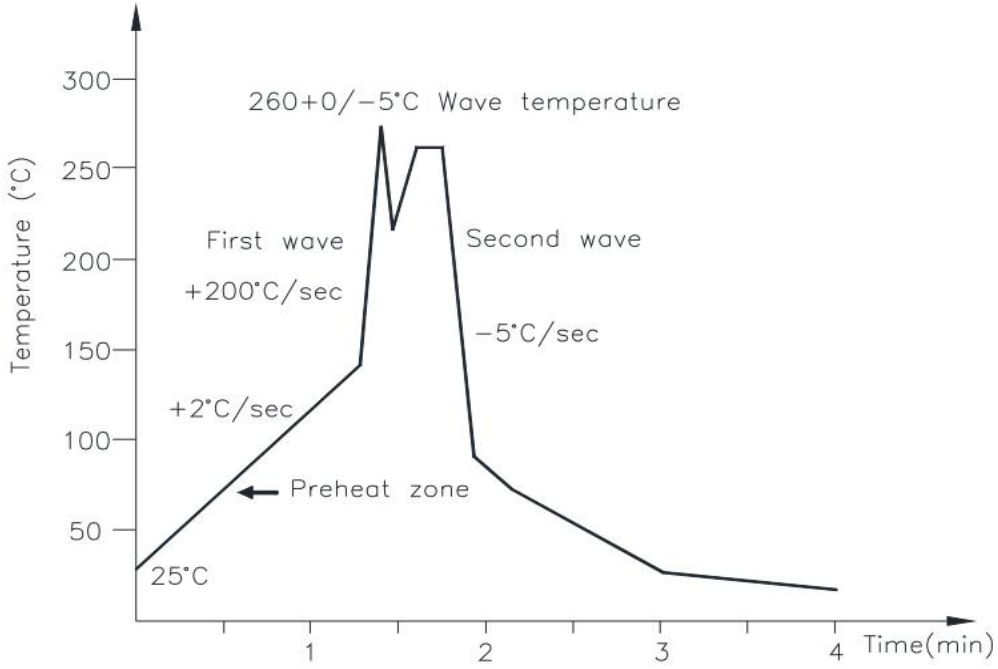
Profile item	Conditions
Preheat - Temperature Min (T_{Smin}) - Temperature Max (T_{Smax}) - Time (min to max) (ts)	 150˚C 200˚C 90±30 sec
Soldering zone - Temperature (TL) - Time (t_L)	 217˚C 60 sec
Peak Temperature(T_P)	260˚C
Ramp-up rate	3˚C / sec max.
Ramp-down rate	3~6˚C / sec



(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 Forword Current vs. Ambient Temperatute

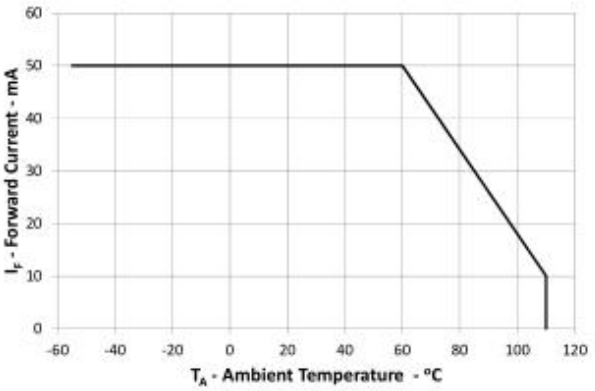


Fig.2 Collector Power Dissiption vs. Ambient Temperature

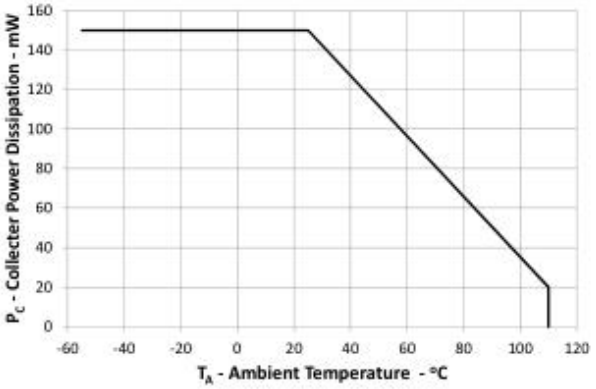


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

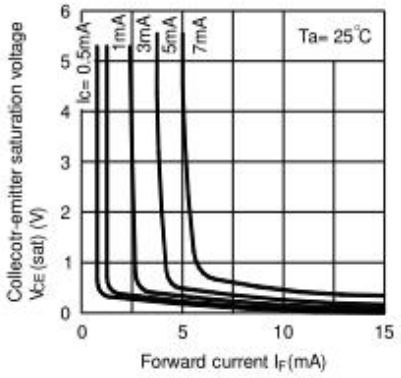


Fig.4 Forward Current vs. Forward Voltage

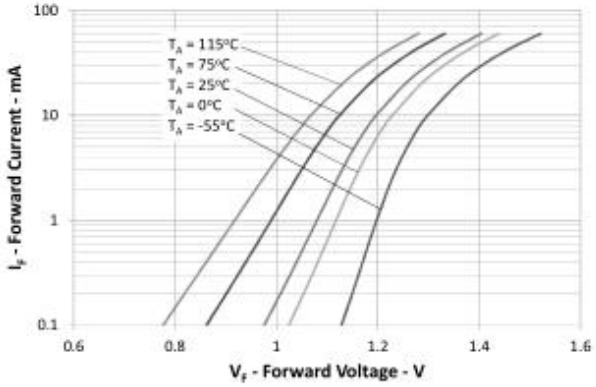


Fig.5 Current Transfer Ratio vs. Forward Current

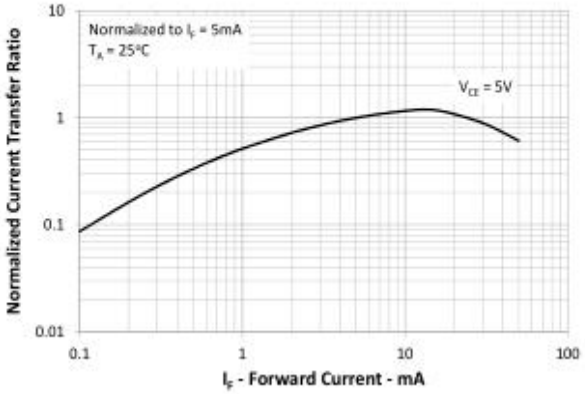


Fig.6 Collector Current vs. Collector-emitter Voltage

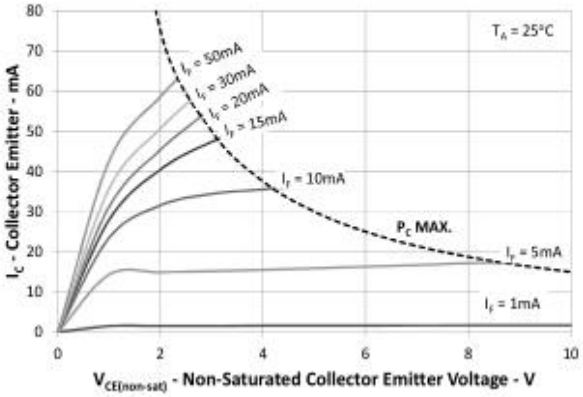


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

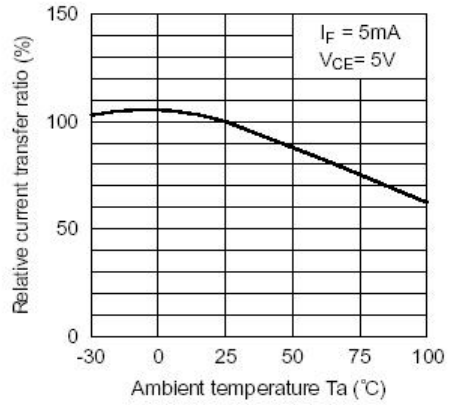


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

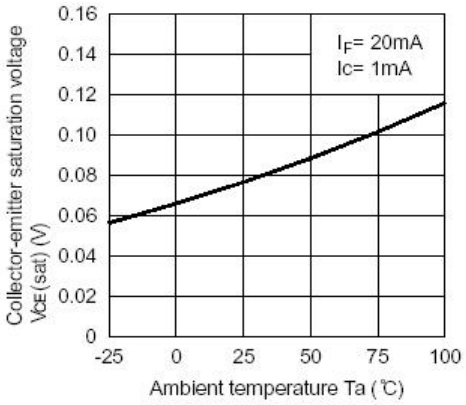


Fig.9 Collector Dark Current vs. Ambient Temperature

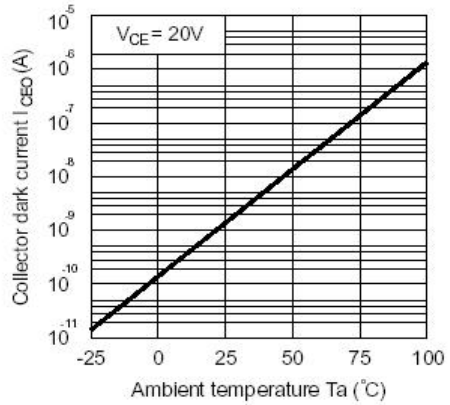


Fig.10 Response Time vs. Load Resistance

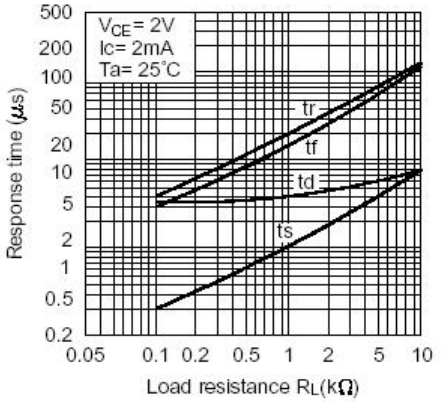
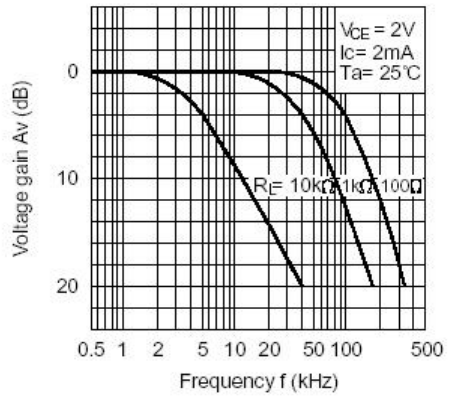
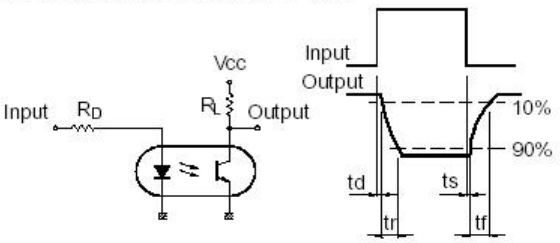


Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response