

ORIENT

Photocoupler

Product Data Sheet

Name: ORPC-817SC-H

Customer: _____

Date: _____

SHENZHEN ORIENT COMPONENTS CO., LTD



(3)Computer

1.Features

- (1) Current transfer ratio (CTR : MIN. 300% at I_F = 5mA, V_{CE} = 5V)
- (2) High input-output isolation voltage (Viso = 5,000Vrms)
- (3) Response time (tr : TYP. 2.9 μs at V_{CE} = 10V, I_C = 2mA, R_L = 100\Omega)
- (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-SC-H 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
- (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°C

	Parameter	Symbol	Rated Value	Unit	
	Forward Current	I _F	50	mA	
Input	Peak forward current (100µs pulse, 100Hz frequency)	I _{FP}	1	А	
·	Reverse Voltage	V _R	6	V	
	Consume Power	Р	70	mW	
	Collector and emitter Voltage	V _{CEO}	80	V	
Output	Emitter and collector Voltage	V _{ECO}	6	v	
	Collector Current	I _C	50	mA	
	Consume Power	Pc	150	mW	
Total Consume Power		P _{tot}	200	mW	
*1 Insulation Voltage		V _{iso}	5,000	Vrms	
Max Insulation Voltage (Insulating oil test)		VIOTM	10,000	V	
Rated Impulse Insulation Voltage		VIORM	630	V	
Working Temperature		Topr	-55 to + 110		
Deposit Temperature		T _{stg}	-55 to + 125	°C	
*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°C unless specified otherwise)

Parameter		Symbol	Condition	Min	Typ.*	Max	Unit
	Forward Current	$V_{\rm F}$	I _F =10mA	1.0		1.3	V
Input	Reverse Voltage	I _R	V _R =5V			10	μΑ
	Collector capacitance	Ct	V=0, f=1KHz		30	250	pF
	Collector to emitter Current	I _{CEO}	$V_{CE}=24V, I_{F}=0mA$			200	nA
Output	Collector and Emitter attenuation Voltage	$\mathrm{BV}_{\mathrm{CEO}}$	$I_{c}=0.1$ mA $I_{F}=0$ mA	80			v
	Emitter and Collector attenuation Voltage	$\mathrm{BV}_{\mathrm{ECO}}$	$I_{E} = 100A$ $I_{F} = 0mA$	7			v
	*1 Current conversion ratio	CTR		300		600	%
	Collector Current	I _C	I _F =5mA V _{CE} =5V	15		30	mA
	*2 Current conversion ratio	CTR		230		600	%
	Collector Current	I _C	I _F =2mA V _{CE} =5V	4.6		12	mA
Transforming Characteristics	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
	Floating Capacitance	C _f	V=0, f=1MHz		0.6	1.0	pF
	Cut-off Frequency	f_c	$V_{CE}=5V,$ $I_{C}=2mA$ $R_{L}=100\Omega, -3dB$		80		kHz
	Rise Time	t _r			2.9	10	μs
	Descend Time	t _f	$V_{CC}=10V,$ $I_{C}=2mA$		4.5	10	μs
	Turn-on Time	t _{on}	R _L =100 Ω		6.3	10	μs
	Turn-off Time	$t_{\rm off}$			7.1	10	μs

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

*2 Current Conversion Ratio must be greater than 230% when $I_{\rm F}{=}2mA~V_{\rm CE}{=}5V.$



6. Rank Table of Current Transfer Ratio

Grade Sign	Min (%)	Max (%)
C3	300	450
D	300	600
D1	300	500
D2	400	600

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

7. Order Information

Part Number

ORPC-817SC-H-(X)(Y)(Z)-F(V)-(G)

Note

- X = CTR Rank (C3, D, D1, D2 or none)
- Y = Lead form option (S, M ,or None)
- Z = Tape and reel option (TP, TA, TA1 or none).
- F = Lead frame option (F: Iron, C:copper)

V = VDE safety (optional).

G = Halogen free(optional).

Option	Description	Packing quantity
S(TP)	Surface mount lead form (low profile) + TP tape & reel option	2000 units per reel
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)ORPC denotes Shenzhen Orient Tech Ltd . Co ., Ltd.

- (2) 817SC denotes Device Part Number.
- (3) denotes Rank Code.
- (4) denotes Leadframe Code.
- (5) denotes Year Code.
- (6) denotes Week Code.
- (7) denotes Day Code.
- (8) denotes VDE Code.
- (9) G denotes Halogen Free.
- (10) H denotes High Speed Code.
- (11) Anode.



9. Package Dimension (Unit: mm)

(1) ORPC-817-SC-H (DIP)





(2) ORPC-817-SC-H (M)





(3) **ORPC-817-SC-H** (SOP)



10. Taping Dimensions

(1) ORPC-817-SC-H-TA





(2) ORPC-817-SC-H-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)
Distance of compartment	P2	2±0.1 (.0079)
Distance of compartment to compartment	P1	12±0.1 (.472)

Package Type	TA/TA1
Quantities(pcs)	1000



(3) ORPC-817-SC-H-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)
Distance of compartment	P2	2±0.1 (.0079)
Distance of compartment to compartment	P1	8±0.1 (.472)

Package Type	TP
Quantities(pcs)	2000

11. Recommended Foot Print Patterns (Mount Pad)





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12. 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(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	260+0/-5°C
Time	10 sec
Preheat temperature	25 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



13. Characteristics Curves



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













Fig.6 Collector Current vs.

Collector-emitter Voltage









Fig.9 Collector Dark Current vs. Ambient Temperature



Fig.11 Frequency Response





Fig.8 Collector-emitter Saturation Voltage

Fig.10 Response Time vs. Load

Resistance



Test Circuit for Response Time



Test Circuit for Frequency Response

