



Specification

PRODUCT NAME: Photocoupler
PART NO.: ORPC-817S

●Feature:

1. Current conversion ratio (Min 50% Working condition $I_F=5\text{mA}$, $V_{CE}=5\text{V}$)
2. Insulation Voltage= $5,000\text{Vrms}$
3. Response Time (tr: TYP. $4\mu\text{s}$, Operating condition: $V_{CE}=2\text{V}$, $I_C=2\text{mA}$, $R_L=100\ \Omega$)
4. CE Certificate (AC/0431008)
5. CQC Certificate (CQC09001029446)
6. UL Certificate (E323844)
7. VDE Certificate (40029733)

●Instruction

1. ORPC-817S photocoupler consist of one piece of GaAs emitter and one piece of NPN transistor
2. Bin width of ORPC-817 is 2.54mm

●Application Range

1. Computer
2. Instrument application, measurement machine
3. Imbursement equipments, duplicating machine, automat.
4. Family-use electric equipments, such as fans
5. Signal transforming systems

●Max Absolute rated Value(Normal Temperature= 25°C)

Parameter		Symbol	Rated Value	Unit
Input	Forward Current	I_F	50	mA
	Reverse Voltage	V_R	6	V
	Consume Power	P	70	mW
Output	Collector and emitter Voltage	V_{CEO}	35	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
Insulation Voltage		V_{iso}	5,000	Vrms
Max Insulation Voltage		V_{IOTM}	6,000	V
Rated Impulse Insulation Voltage		V_{IORM}	630	V
Working Temperature		T_{opr}	-30 to + 100	°C
Deposit Temperature		T_{stg}	-55 to + 125	
Soldering Temperature		T_{sol}	260	



- *1. AC Test,1 minute,humidity=40~60 %
Insulation test method as below:
(1) Short circuit both terminals of photocoupler
(2) No Current when testing insulation voltage
(3) Adding sine wave voltage when testing
- *2. soldering time is 10 seconds

●Opto-electronic Characteristics

Parameter		Symbol	Condition	Min.	Midium	Max	Unit
Input	Forward Current	VF	IF=20mA	---	1.2	1.4	V
	Reverse Voltage	IR	VR=4V	---	---	10	μA
	Collector capacitance	Ct	V=0, f=1KHz	---	30	250	pF
Output	Collector to emitter Current	ICEO	VCE=20V, IF=0	---	---	100	nA
	Collector and Emitter attenuation Voltage	BVCEO	IC=0.1mA IF=0	35	---	---	V
	Emitter and Collector attenuation Voltage	BVECO	IE=10μA IF=0	6	---	---	V
Transforming Characteristics	Collector Current	Ic	IF=5mA	2.5	---	30	mA
	Current conversion ratio	CTR	VCE=5V	50	---	600	%
	Collector and Emitter Saturation Voltage	VCE(sat)	IF=20mA IC= 1mA	---	0.1	0.2	V
	Insulation Impedance	Riso	DC500V 40~60%R.H.	5×10 ¹⁰	1×10 ¹¹	---	Ω
	capacitance	Cf	V=0, f=1MHz	---	0.6	1	pF
	Transforming Frequency	fc	VCE=5V, IC=2mA RL=100Ω, -3dB	---	80	---	kHz
	Rise Time	tr	VCE=2V, IC=2mA	---	4	18	μs
	Descend Time	tf	RL=100Ω	---	3	18	μs

*1 Current Conversion= IC / IF × 100%

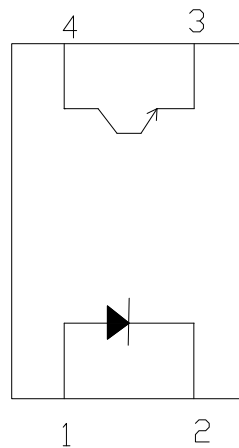
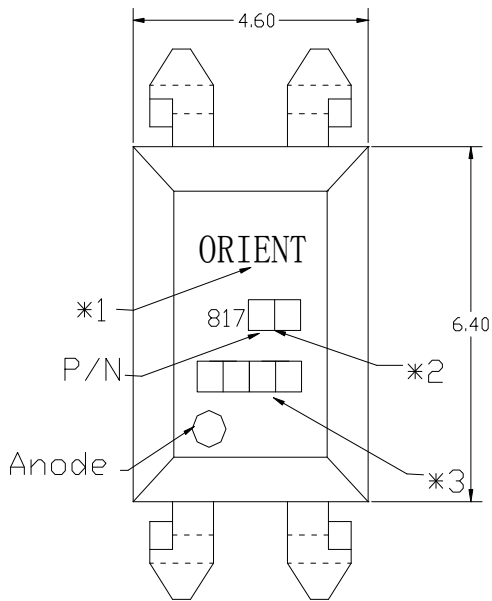


●Grades of Current conversion ratio

Grade Sign	Min (%)	Max (%)
L	50	100
A	80	160
B	130	260
C	200	400
D	300	600
L or A or B or C or D	50	600

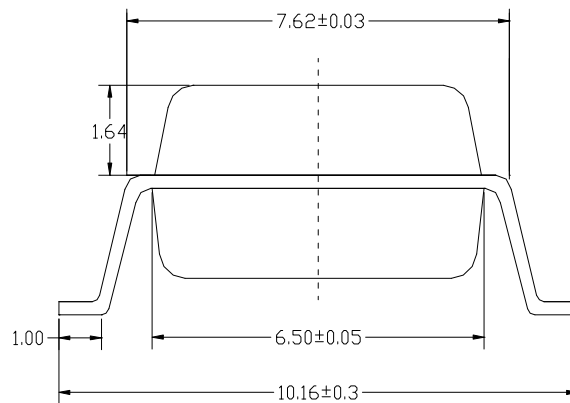
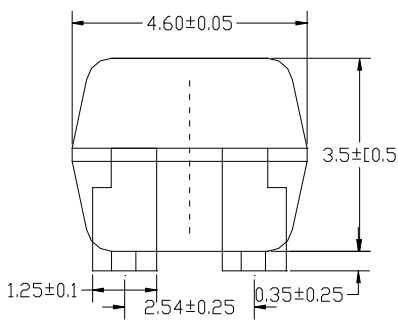
Note: Working condition: $I_F=5\text{mA}$, $V_{CE}=5\text{V}$, $T_a=25^\circ\text{C}$.

●Outer Dimension



pin No. and Internal connection diagram

- 1 Anode
- 2 Cathode
- 3 Emitter
- 4 Collector



●Note

- *1. Company name
- *2. Bin
- *3. Production period

• Characteristics Curve

Fig.1 Forward Current vs. Ambient Temperature

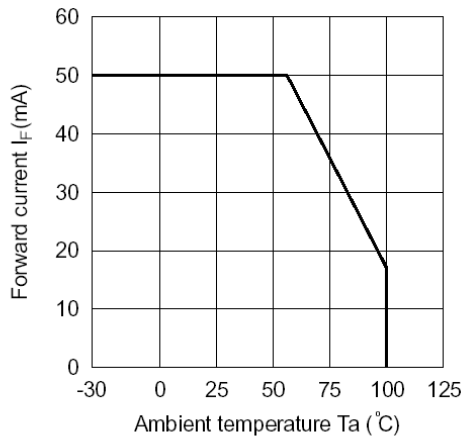


Fig.2 Collector Power Dissipation vs. Ambient Temperature

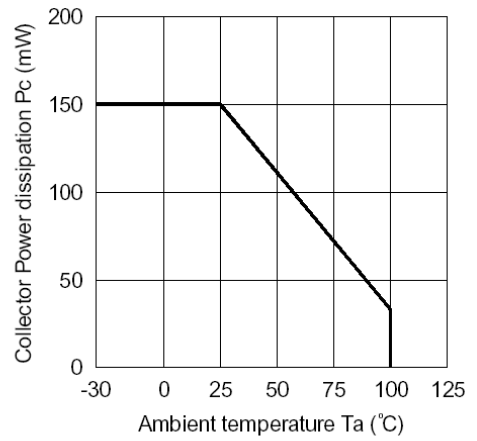


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

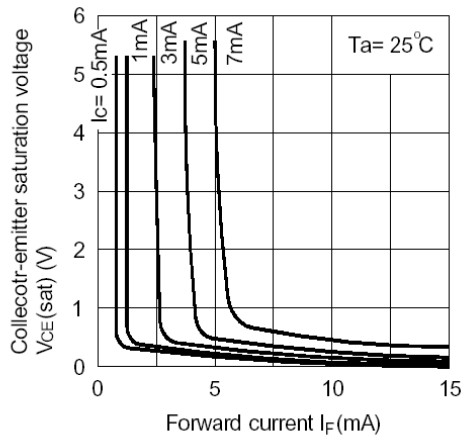


Fig.4 Forward Current vs. Forward Voltage

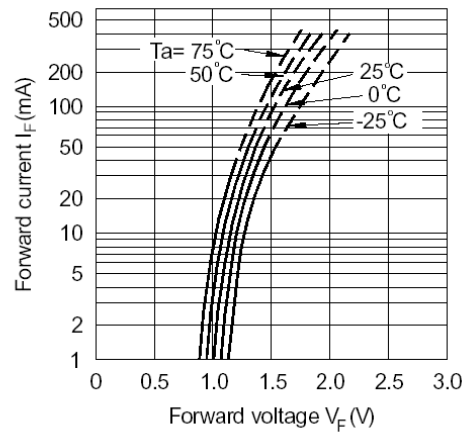


Fig.5 Current Transfer Ratio vs. Forward Current

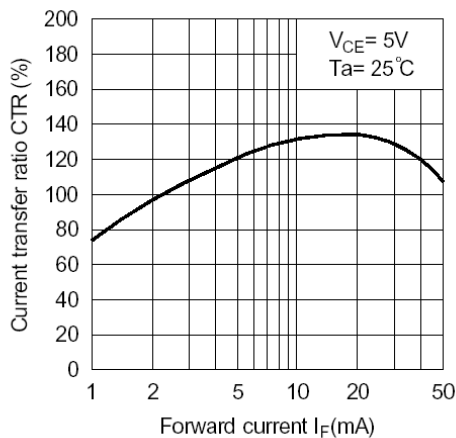
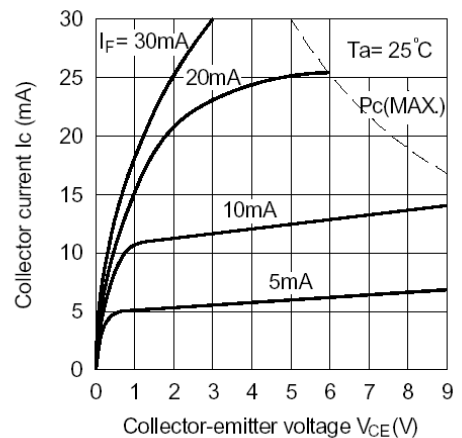


Fig.6 Collector Current vs. Collector-emitter Voltage



●Characteristics Curve

Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

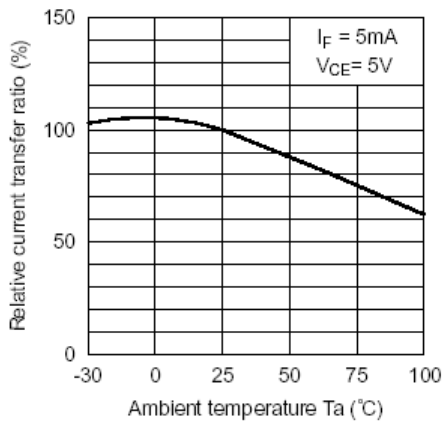


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

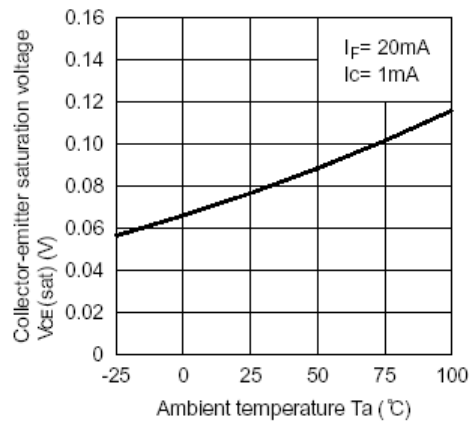


Fig.9 Collector Dark Current vs. Ambient Temperature

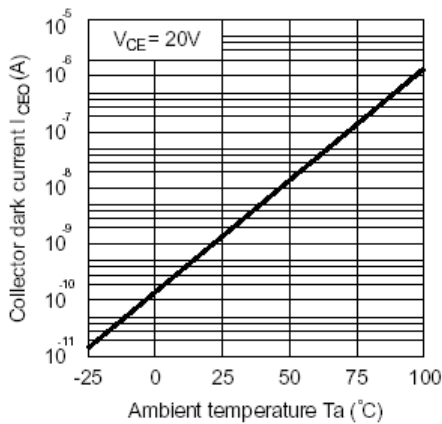


Fig.10 Response Time vs. Load Resistance

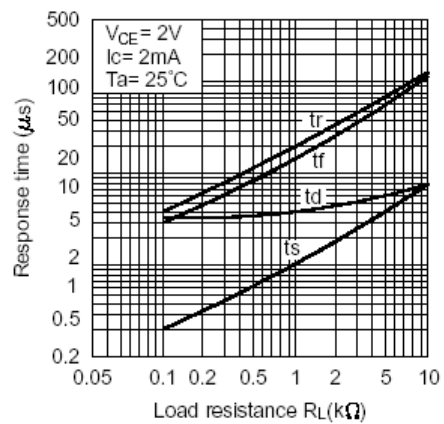
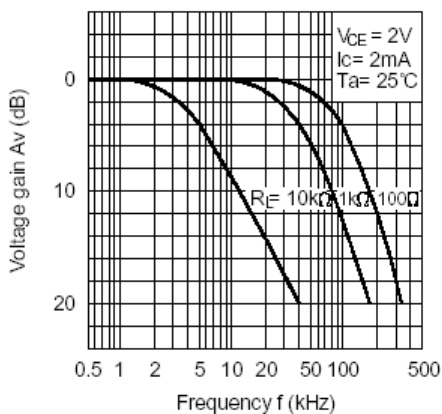
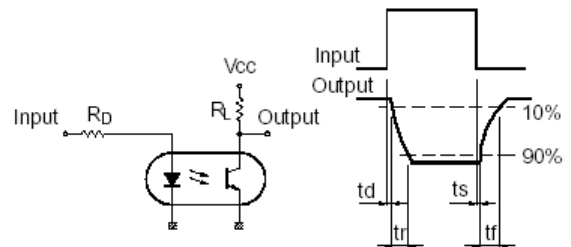


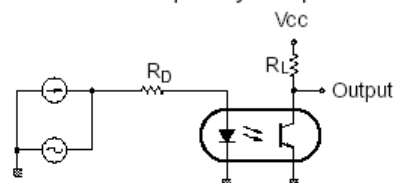
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response





●Reliability test

Classification	Testing Items	Standard	Condition	Result
Resistance test	Life span testing	MIL-STD-750:1026 MIL-STD-883:1005 JIS C 7021 :B-1	Connecting power: If=50mA Testing time =1000hours at room temperature	0/20
	Circulation at high temperature and high humidity	JIS C 7021 :B-11	Ta=+85°C±5°C, RH=85% PTR=VCE Maximum absolute ratings at 80% Testing time =1000hrs	0/20
	Circulation at high temperature	JIS C 7021 :B- 8	Ta=+105°C±5°C PTR=VCE Maximum absolute ratings Testing time =1000hrs	0/20
	Deposit at high temperature	MIL-STD-883:1008 JIS C 7021 :B-10	High temperature=+125°C±5°C Testing time=1,000hrs	0/20
	Deposit at low temperature	JIS-C-7021 :B-12	Low temperature=-55°C±5°C Testing time =1,000hrs	0/20
	Life span test at high accelerating pressure	JESD 22-A102-B	P=15PSIG, Ta=121°C Condition. =100%RH, 48hrs	0/20
Environment test	Temperature circulation	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS C 7021 :A-4	125°C ~ 25°C ~ -55°C ~ 25°C 30min 5min 30min 5min 测试时间 Testing time =20cycle	0/20
	Thermal shock	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011	125°C ~-55°C 20min 20min Testing time =20cycle	0/20
	Soldering test	MIL-STD-202:201A MIL-STD-750:2031 JIS C 7021 :A-1	Operating temperature: 260°C, within 10±1seconds.	0/20
	Wetting test	MIL-S-883:2003 JIS C 7021 :A-2	Wetting test:235°C ,within5±1 seconds	0/20



●Reliability judgment standard

Symbol	Condition	Invalidity standard
VF (V)	If=20mA	Over Ux1.0
Ir(uA)	Vr=4V	Over Ux1.0
CTR(%)	If=5mA, VCE=5V	Shift>1.2
VCE(sat)	IF=20mA, IC= 1mA	Over Ux1.0
BVCEO	IC=0.1mA, IF=0	Over Lx1.0
BVECO	IE=10μA, IF=0	Over Lx1.0