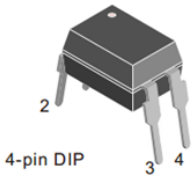
说明 (Instructions)

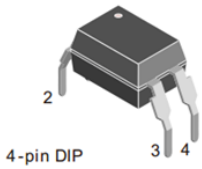
1. PC817 系列光耦合器的组成是：由一个 GaAs 的发射管和一个 NPN 的晶体管组成
   PC817 photocoupler consist of one piece of GaAs emitter and one piece of NPN transistor
2. PC817 的引脚中心距是 2.54mm Pin pitch of PC817 is 2.54mm



4-pin DIP

特点(Features):

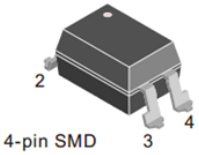
1. 电流转换比(CTR: 最小100% 工作条件 I_F=5mA, V_{CE}=5V)
   Current conversion ratio (Min 100% Working condition I_F=5mA, V_{CE}=5V)
2. 绝缘电压：(V_{ISO}=5,000Vrms) Insulation Voltage = 5,000Vrms
3. 响应时间 (tr: TYP. 6μs；tf: TYP. 5μs)工作条件 V_{CE}=2V, I_C=2mA, R_L=100 Ω)
   Response Time (tr: TYP. 6μs；tf: TYP. 5μs)working condition V_{CE}=2V, I_C=2mA, R_L=100 Ω)
4. ESD：HBM8000V&MM2000V



4-pin DIP
(M Type)

应用范围 (Application Range)

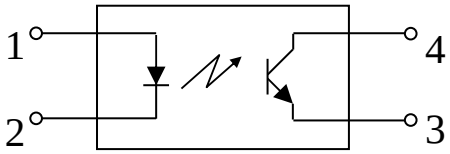
1. 开关电源.Switching power supply
2. 电表.Ammeter
3. 电脑. Computer
4. 器具的应用，测量机. Instrumental application, measurement machine
5. 贮存器，复印机，自动售货机. Imbursement equipments, duplicating machine, automat
6. 家用电器，如风扇等. Family-use electric equipments, such as fans
7. 信号传输系统. Signal transforming systems



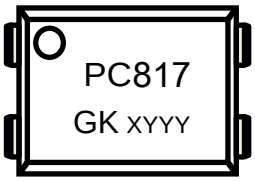
4-pin SMD

框架结构

Block Diagram and Package



Marking



- The "X" in the printed word represents the product segment: A、B、C、D or others

  印字中的“X”代表产品 CTR 分档：A、B、C、D 等

- The"YYY" represents the traceability code

  印字中 “ YYY ” 代表溯源码

- The "GK" in the printed word represents the product brand

  印字中的“GK”代表产品品牌

最大绝对额定值 (常温=25°C) Max Absolute rated Value (Normal Temperature=25°C)

参数 Parameter		符号 Symbol	额定值 Rated Value	单位 Unit
输入 Inout	顺向电流 Forward Current	I_F	50	mA
	逆向电压 Reverse Voltage	V_R	6	V
	功消耗率 Consume Power	P	70	mW
输出 Output	集极与射极电压 Collector and emitter Voltage	V_{CEO}	35	V
	射极与集极电压 Emitter and collector Voltage	V_{ECO}	6	
	集极电流 Collector Current	I_C	50	mA
	消耗功率 Consume Power	P_C	150	mW
总功率消耗 Total Consume Power		P_{tot}	200	mW
*1 绝缘电压 Insulation Voltage		V_{iso}	5,000	Vrms
最大绝缘电压 Max Insulation Voltage		V_{IOTM}	6,000	V
额定脉冲绝缘电压 Rated Impulse Insulation Voltage		V_{IORM}	630	V
工作温度 Working Temperature		T_{opr}	-55 to + 110	℃
存贮温度 Deposit Temperature		T_{stg}	-55 to + 125	
*2 焊锡温度 Soldering Temperature		T_{sol}	260	

*1. 交流测试，时间 1 分钟，湿度. =40~60% AC Test, 1 minute, humidity = 40~60%
如下是绝缘测试的方法. Insulation test method as below:
(1) 将产品的两端短路。 Short circuit both terminals of photocoupler
(2) 测试绝缘电压时无电流通过。No Current when testing insulation voltage
(3) 测试时加正弦波形电压。Adding sine wave voltage when testing

*2. 锡焊时间为 10 秒 soldering time is 10 seconds

光电特性(常温=25℃) Opto-electronic Characteristics

参数 Parameter		符号 Symbol	条件 Condition	最小 Min	中.Medium	最 大 Max	单位 Unit
输入 Input	顺向电压 Forward Current	V_F	I_F=20mA	---	1.20	1.40	V
	逆向电流 Reverse Voltage	I_R	V_R=5V	---	---	5	uA
	集极电容 Collector capacitance	C_t	V=0, f=1MHz	---	30	250	pF
输出 Output	集极至射极电流 Collector to emitter Current	I_{CEO}	V_{CE}=70V, I_F=0mA	---	---	150	nA
	集极与射极衰减电压 Collector and Emitter attenuation Voltage	BV_{CEO}	I_C=0.1mA I_F=0mA	70	---	---	V
	射极与集极衰减电压 Emitter and Collector attenuation Voltage	BV_{ECO}	I_E=10μA I_F=0mA	6	---	---	V

光电特性(常温=25℃) Opto-electronic Characteristics

传输特性 Transforming Characteristics	*1 电流转换比 Current conversion ratio	CTR	IF=5mA VCE=5V	50	---	600	%
	集极与射极饱和电压 Collector and Emitter Saturation Voltage	$V_{CE(sat)}$	I_F=20mA I_C= 1mA	---	0.1	0.2	V
	绝缘阻抗 Insulation Impedance	R_{iso}	DC500V 40~60%R.H.	5×10^{10}	1×10^{11}	---	Ω
	电容量 capacotance	C_f	V=0, f=1MHz	---	0.6	1	pF
	转换频率 Transforming Frequency	f_c	V_{CE}=5V, I_C=2mA R_L=100Ω, -3dB	---	80	---	kHz
	上升时间 Rise time	t_r	V_{CE}=2V, I_C=2mA R_L=100Ω	---	6	18	μs
	下降时间 Descend Time	t_f		---	5	18	μs

电流转换比（CTR）的等级分类

电流转换比 Current Conversion Ratio = I_C / I_F × 100%

等级标示 Grade Sign	最小.Min (%)	最大.Max (%)
A	100	160
B	130	260
C	200	400
D	300	600
A or B or C or D	50	600

说 明： 工作条件: I_F=5mA, V_{CE}=5V, T_a=25℃.

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

RATING AND CHARACTERISTIC CURVES

Fig.1 Forword Current vs. Ambient Temperatute

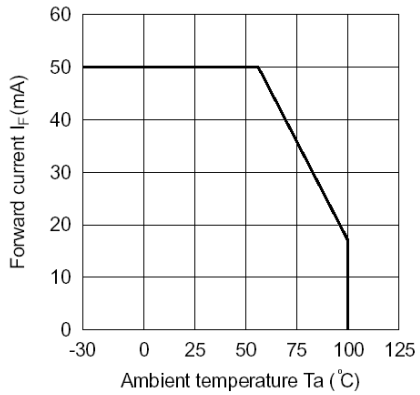


Fig.2 Collector Power Dissiption vs. Ambient Temperature

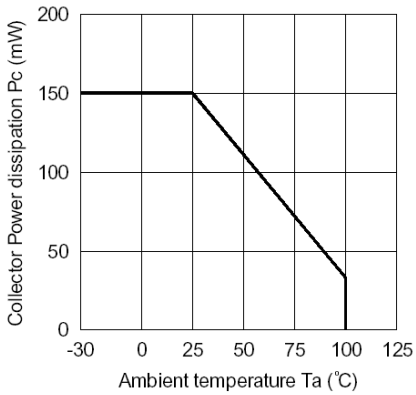


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

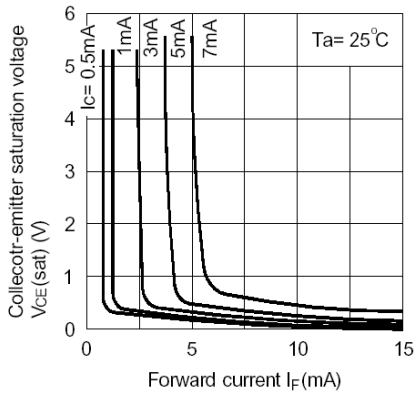


Fig.4 Forward Current vs. Forward Voltage

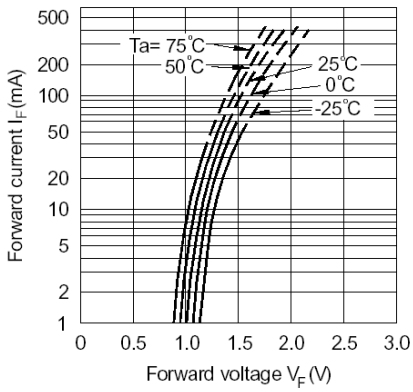


Fig.5 Current Transfer Ratio vs. Forward Current

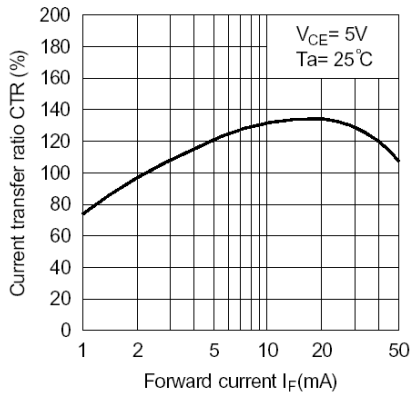
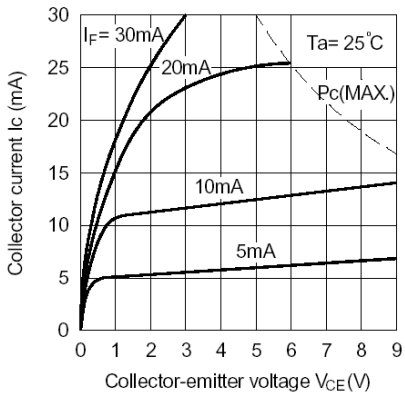


Fig.6 Collector Current vs. Collector-emitter Voltage



RATING AND CHARACTERISTIC CURVES

Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

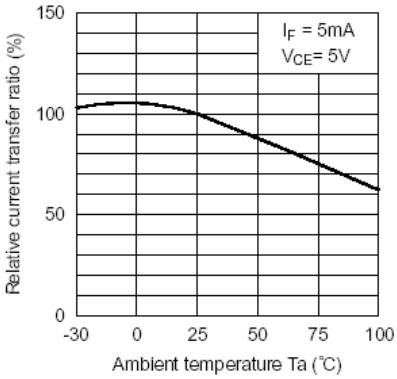


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

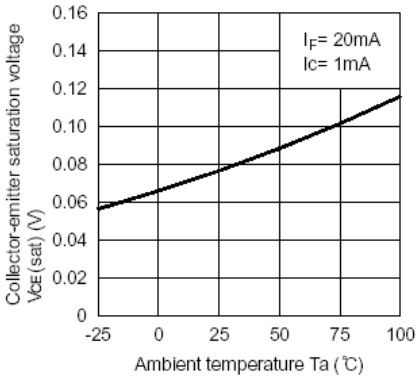


Fig.9 Collector Dark Current vs. Ambient Temperature

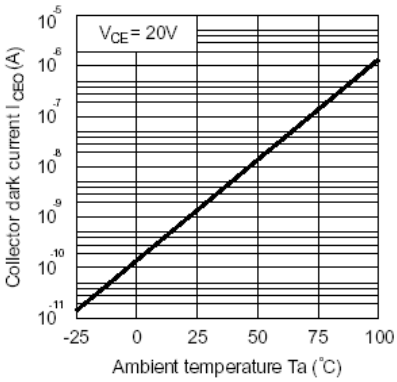


Fig.10 Response Time vs. Load Resistance

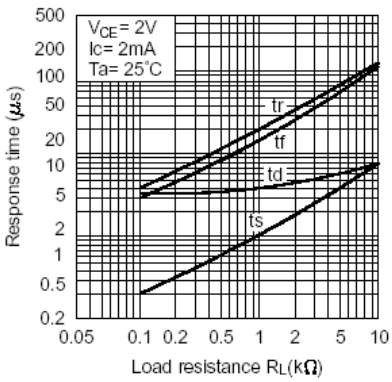
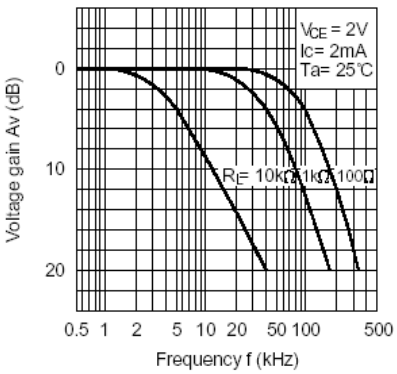
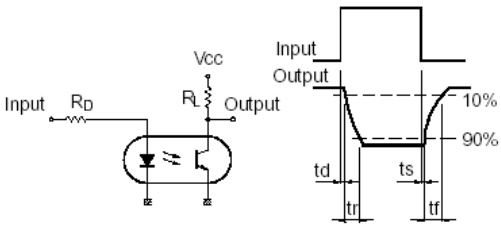


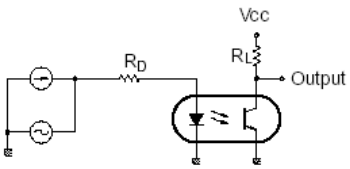
Fig.11 Frequency Response



Test Circuit for Response Time



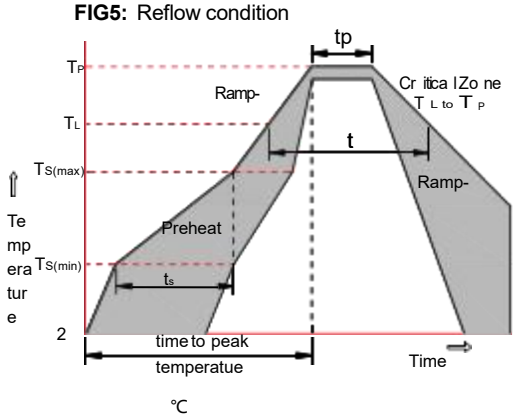
Test Circuit for Frequency Response



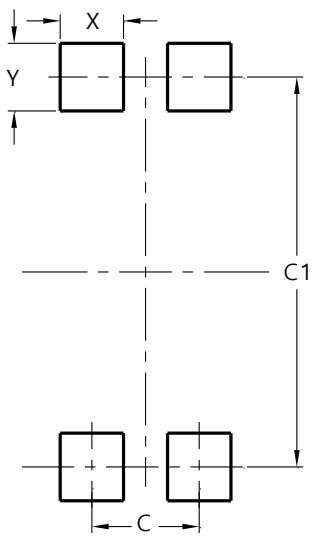
Soldering parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

FIG5: Reflow condition



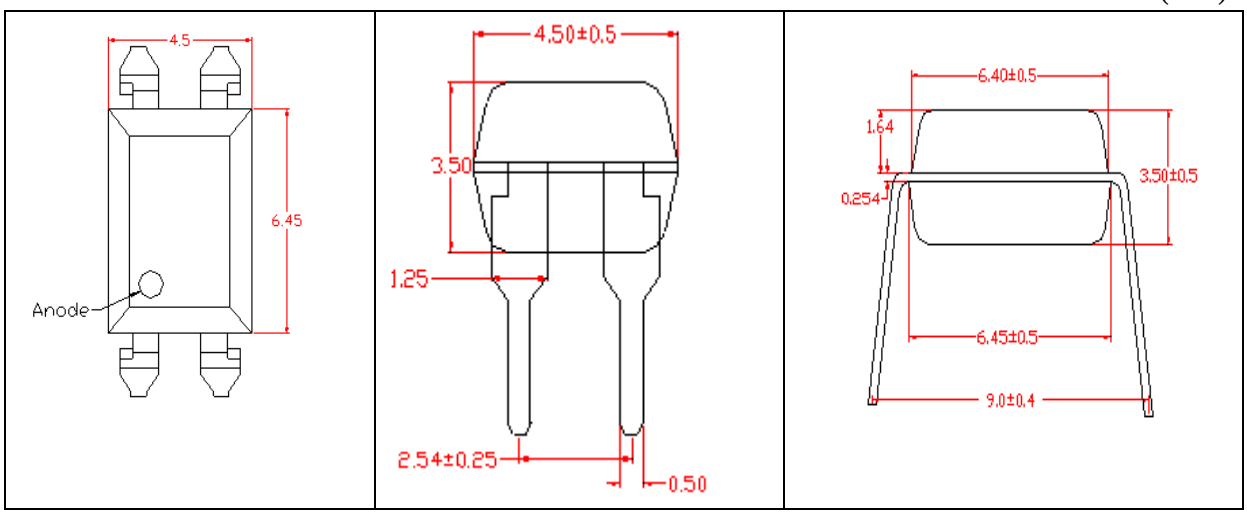
SMD4



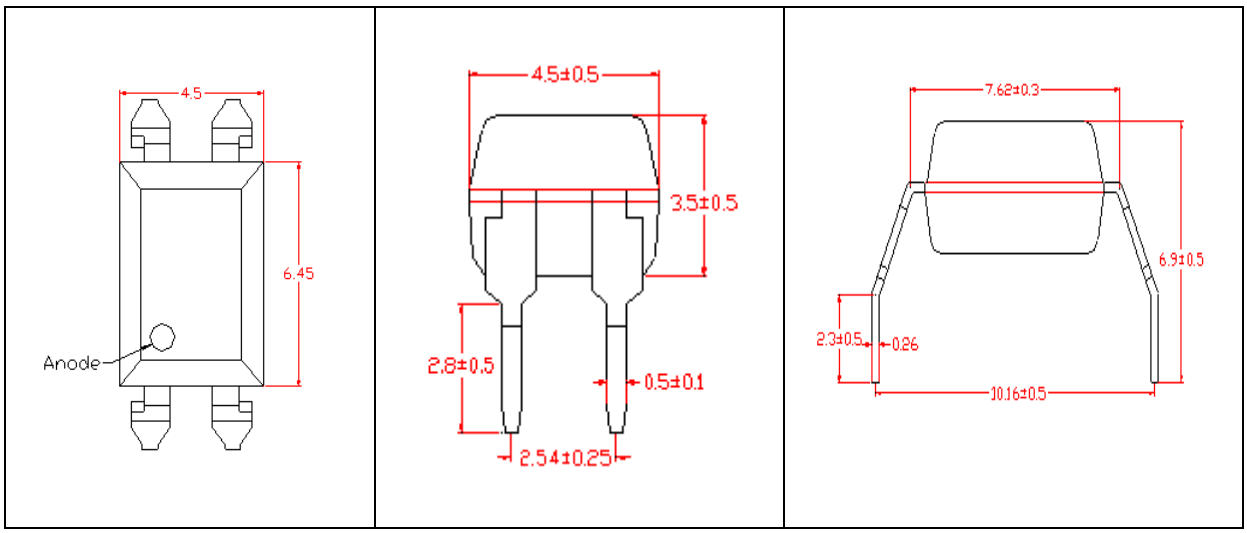
Dimensions	Value (in mm)
C	2.54
C1	9.20
X	1.50
Y	1.60

Outline Dimensions 外形尺寸

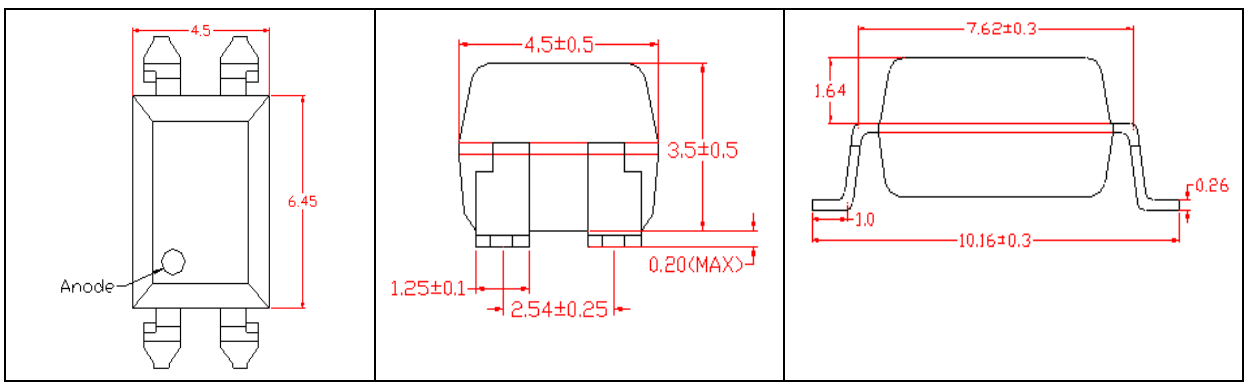
Unit: mm (inch)



4-pin DIP



4-pin DIP (M Type)



4-pin SMD