

概述

PC817是一款由一个发光二极管和一个光电晶体管组成的光电耦合器。四引脚封装，三种形式（DIP、DIP-M、SMD）。

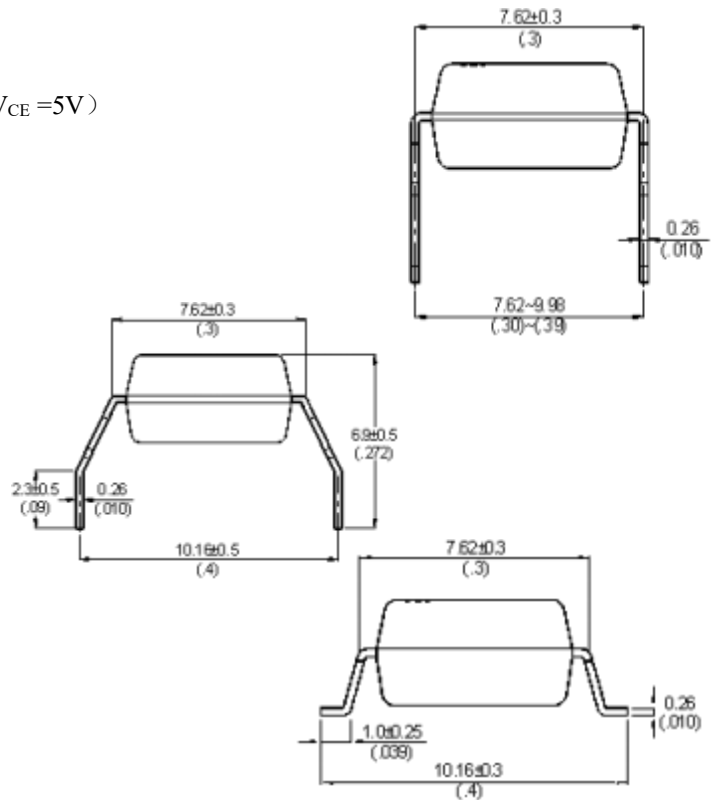
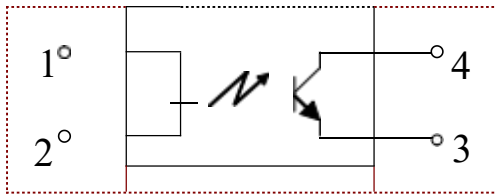
特性

- 电流转换比 (CTR)范围: 80~600% ($I_F=5\text{mA}, V_{CE}=5\text{V}$)
- 输入-输出隔离电压 ($V_{iso}=5000\text{Vrms}$)
- 集电极-发射极击穿电压 $BV_{CEO} \geq 80\text{V}$

Applications

- 开关电源，智能电表
- 工业控制，测量仪器
- 办公设备，比如复印机
- 家用电器，比如空调、风扇、热水器等

结构原理图和封装



Absolute Maximum Ratings (Ta=25. C)

| 参数 | | 符号 | 额定值 | 单位 |
|------|---------------------------------------|-------------|-----------------|----------------------------|
| 输入 | 正向电流 | I_F | 50 | mA |
| | 反向电压 | V_R | 6 | V |
| | 功耗 | P | 70 | mW |
| | 额定值降低因子(在 $T_a=100^\circ\text{C}$ 以上) | P_{DD} | 2.9 | $\text{mW}/^\circ\text{C}$ |
| | 热阻(结-环境) | R_{thJ-A} | 325 | $^\circ\text{C}/\text{W}$ |
| | 热阻(结-壳) | R_{thJ-C} | 200 | $^\circ\text{C}/\text{W}$ |
| 输出 | 集电极功耗 | P_C | 150 | mW |
| | 集电极电流 | I_C | 50 | mA |
| | 集电极-发射极电压 | V_{CEO} | 80 | V |
| | 发射极-集电极电压 | V_{ECO} | 6 | V |
| 总功耗 | | P_{tot} | 200 | mW |
| 隔离电压 | | V_{iso} | 5000 | V_{rms} |
| 工作温度 | | T_{opr} | $-55 \sim +110$ | $^\circ\text{C}$ |
| 储存温度 | | T_{stg} | $-55 \sim +125$ | $^\circ\text{C}$ |
| 焊接温度 | | T_{sol} | 260 | $^\circ\text{C}$ |

光电特性 (Ta=25, C)

| Parameter | | Symbol | Condition | Min. | Typ. | Max. | Unit |
|-----------|-------------|---------------|--|--------------------|--------------------|------|----------|
| 输入 | 正向电压 | V_F | $I_F=20mA$ | - | 1.2 | 1.4 | V |
| | 反向电流 | I_R | $V_R=4V$ | - | - | 10 | μA |
| | 终端电容 | C_t | $V=0, f=1kHz$ | - | 30 | 250 | pF |
| 输出 | 集电极暗电流 | I_{CEO} | $V_{CE}=20V$ | - | - | 100 | nA |
| | 集电极-发射极击穿电压 | BV_{CEO} | $I_C=0.1mA, I_F=0$ | 80 | - | - | V |
| | 发射极-集电极击穿电压 | BV_{ECO} | $I_E=10\mu A, I_F=0$ | 6 | - | - | V |
| 传输特性 | 电流转换比 | CTR | $I_F=5mA, V_{CE}=5V$ | 80 | - | 600 | % |
| | 集电极-发射极饱和压降 | $V_{CE(sat)}$ | $I_F=2mA, I_C=5mA$ | - | 0.1 | 0.2 | V |
| | 隔离电阻 | R_{ISO} | DC500V, 40~60%R.H. | 5×10^{10} | 1×10^{11} | - | Ω |
| | 隔离电容 | C_f | $V=0, f=1MHz$ | - | 0.6 | 1.0 | pF |
| | 截止频率 | F_c | $V_{CE}=5V, I_C=2mA,$ $R_L=100\Omega, -3dB$ | - | 80 | - | kHz |
| 开关时间 | 上升时间 | T_r | $V_{CE}=2V, I_C=2mA,$ $R_L=100\Omega$ | - | 4 | 18 | μs |
| | 下降时间 | T_f | | - | 3 | 18 | μs |

* $CTR=I_C/I_F \times 100\%$

CTR 分级表

| 型号 | CTR 分级标准 | 电流转换率(%) (I_C/I_F) | | 标志分类 |
|------------|----------|--|-----|------|
| | | $I_F = 5mA, V_{CE} = 5V, T_a = 25^\circ C$ | | |
| | | Min | Max | |
| PC817 | A | 80 | 160 | |
| | B | 130 | 260 | |
| | C | 200 | 400 | |
| | D | 300 | 600 | |
| | A or B | 80 | 260 | |
| | B or C | 130 | 400 | |
| | C or D | 200 | 600 | |
| | A,B or C | 80 | 800 | |
| | B,C or D | 130 | 600 | |
| A,B,C or D | 80 | 600 | | |

Fig.1 Peak Forward Current vs. Duty Ratio

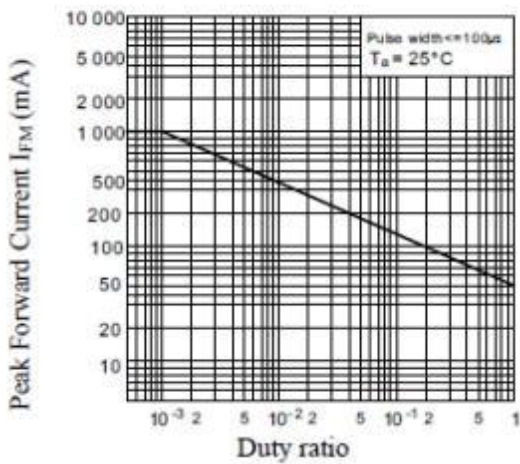


Fig.2 Current Transfer Ratio vs. Forward Current

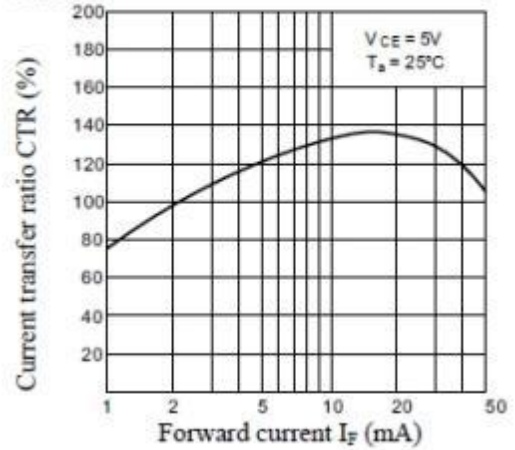


Fig.3 Forward Current vs. Forward Voltage

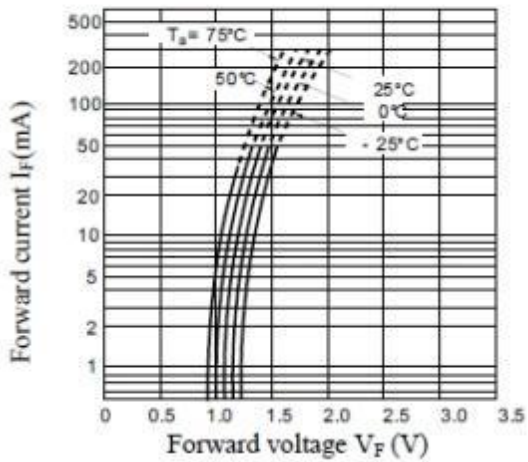


Fig.4 Collector Current vs. Collector-emitter Voltage

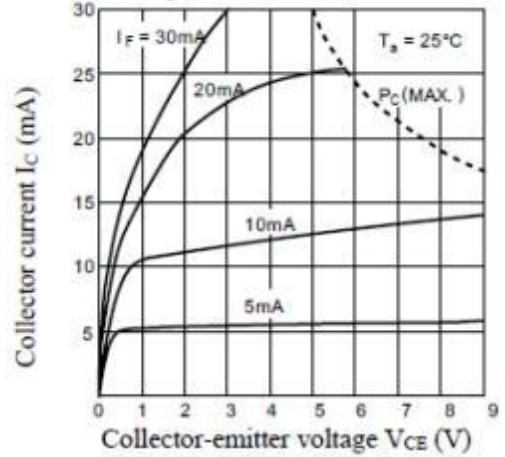


Fig.5 Relative Current Transfer Ratio vs. Ambient Temperature

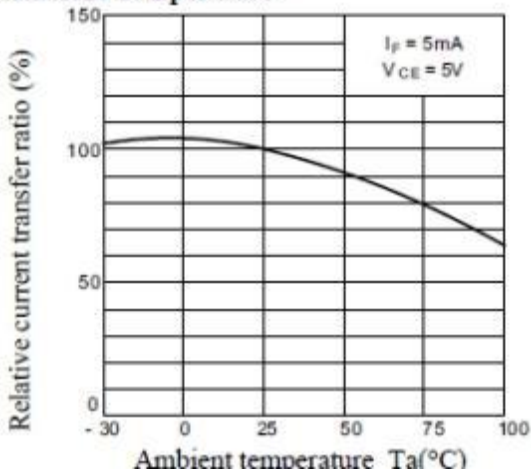


Fig.6 Collector-emitter Saturation Voltage vs. Ambient Temperature

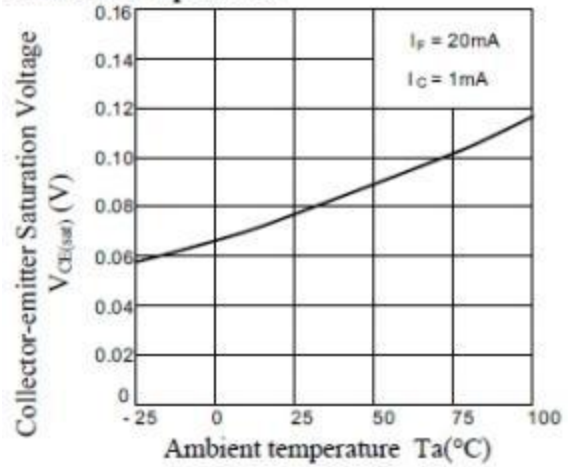


Fig.7 Collector Dark Current vs. Ambient Temperature

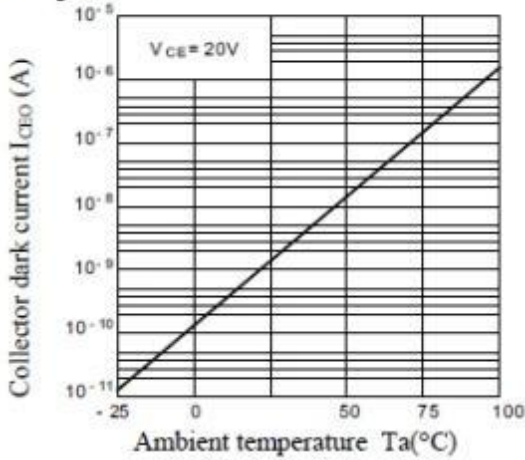


Fig.8 Response Time vs. Load Resistance

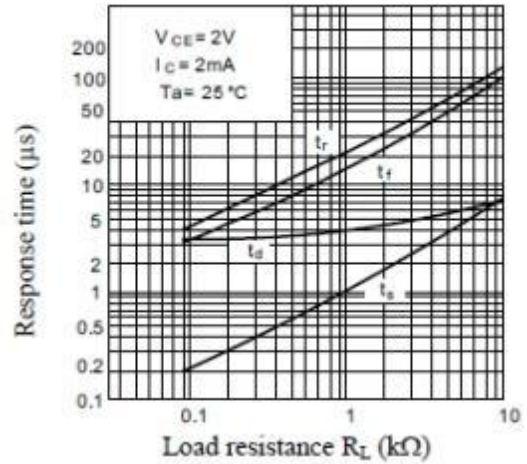


Fig.9 Frequency Response

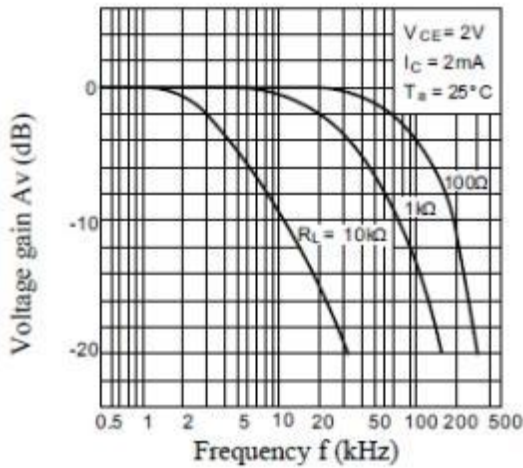
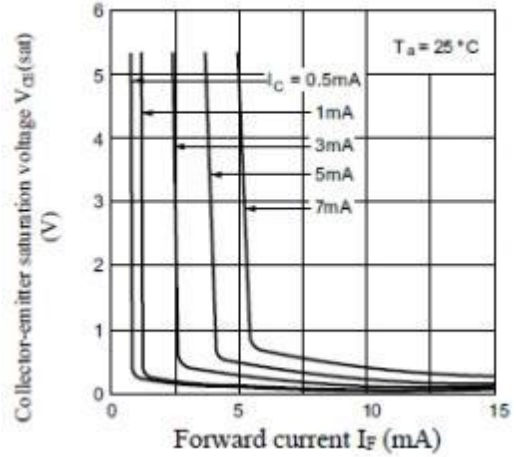
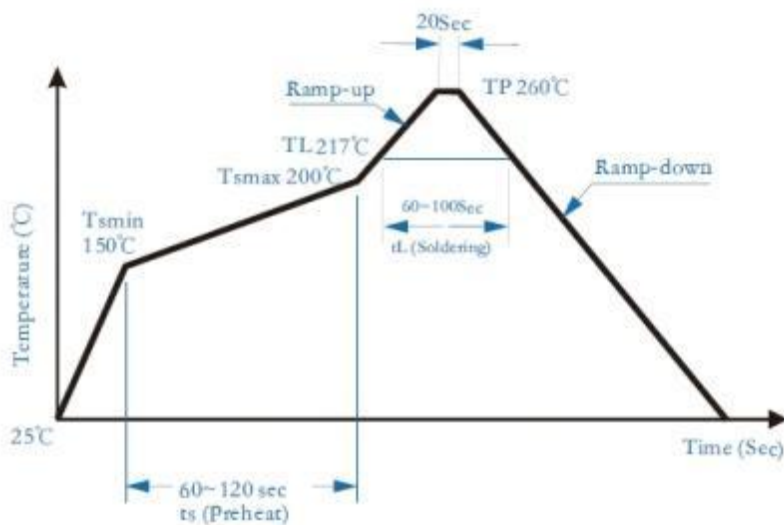


Fig.10 Collector-emitter Saturation Voltage vs. Forward Current

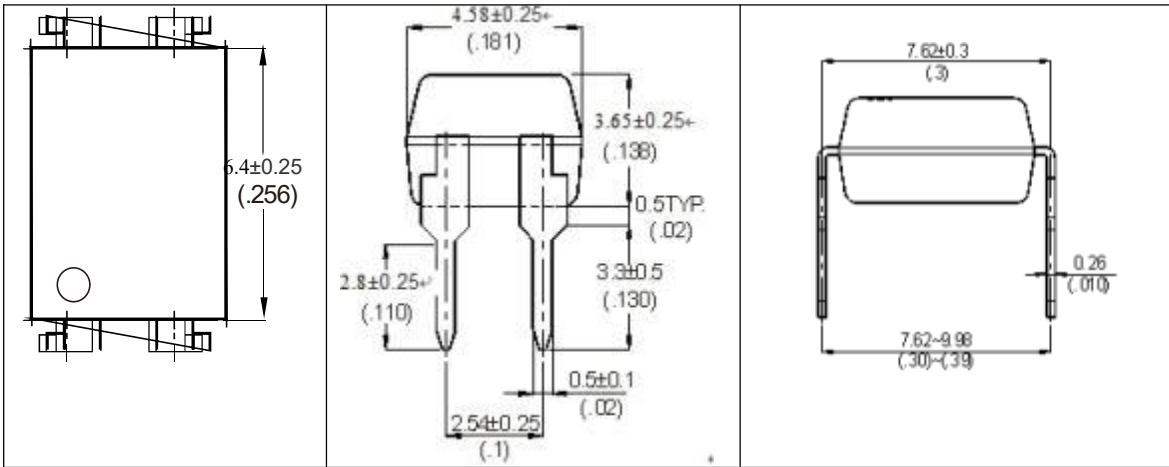


Solder Reflow Profile

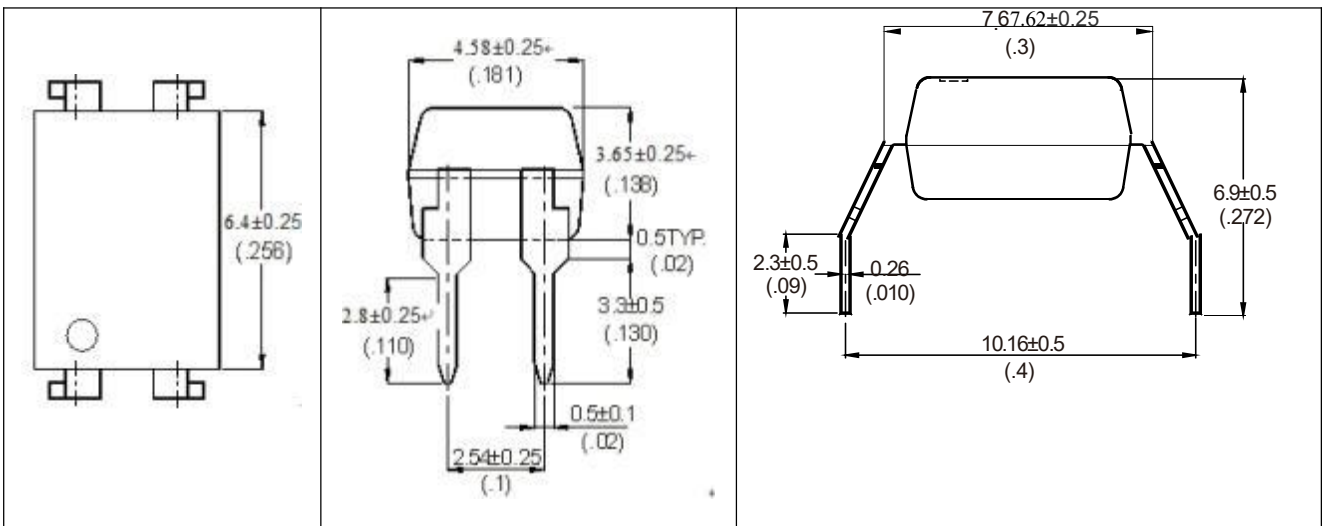


外形尺寸

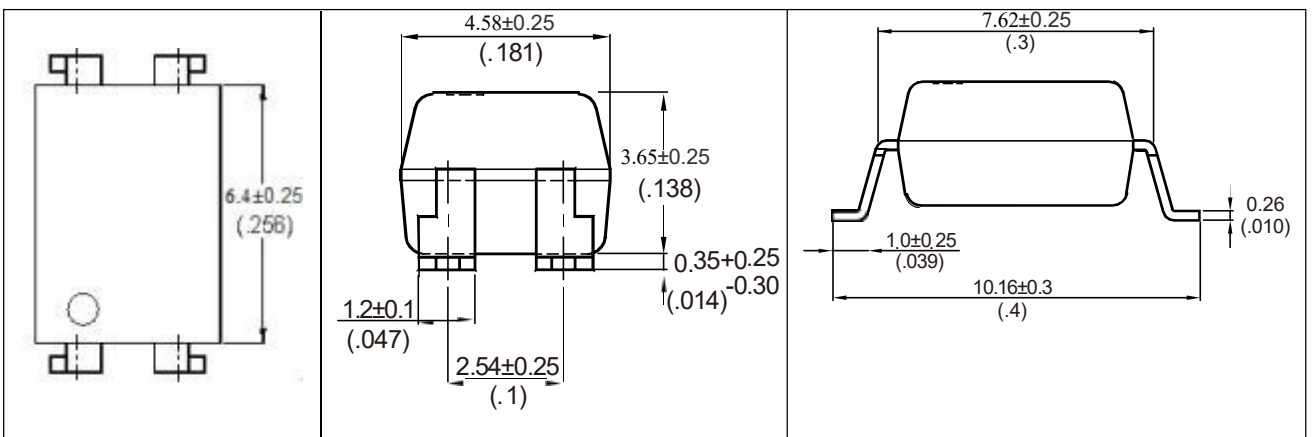
Unit: mm (inch)



4-pin DIP



4-pin DIP (M Type)



4-pin SMD