## Overview

PC817X is a photoelectric coupler product composed by a luminous diode and a photo transistor, with the input-output isolation voltage of 5000Vrms and the typical value of the response time tr of 4μs. The minimum CTR is 80% the at 2mA input current. SOP4 package is adopted for the product.

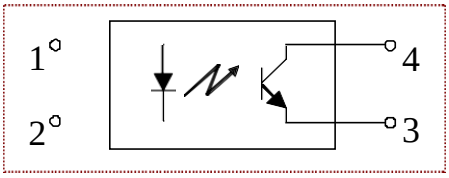
## Characteristics

- Current conversion ratio CTR (in condition of IF=5mA, VCE=5V, CTR: MIN. 50%)
- High input-output isolation voltage (Viso=5000 Vrms)
- Collector-emitter breakdown voltage BVCEO≥80V
- UL certification (dual-protection, No. E465130)
- VDE certification (No. 40039266)

## Applications

- Power supply feedback circuits
- System devices and measurement instruments
- Registers, copying machines and vending machines
- Household appliances, such as fans and water heaters

## Schematic diagram of structure and package





## Absolute parameters (Ta=25°C)

| Parameters | | Symbols | Rated value | Units |
|---|---|---|---|---|
| Input | Forward current | $I_F$ | 50 | mA |
| | Reverse voltage | $V_R$ | 6 | V |
| | Power consumption | P | 70 | mW |
| Output | Collector power consumption | $P_C$ | 150 | mW |
| | Collector current | $I_C$ | 50 | mA |
| | Collector-emitter voltage | $V_{CEO}$ | 70 | V |
| | Emitter-collector voltage | $V_{ECO}$ | 6 | V |
| Total power consumption | | Ptot | 200 | mW |
| Isolation voltage | | Viso | 5000 | Vrms |
| Working temperature | | Topr | -40~+100 | ℃ |
| Storage temperature | | Tstg | -55~+125 | ℃ |
| Welding temperature | | Tsol | 260 | ℃ |

**Current-illumination characteristics (Ta=25°C)**

| Parameters | | Symbols | Conditions | Min. | Typical | Max. | Units |
|---|---|---|---|---|---|---|---|
| Input | Forward voltage | $V_F$ | $I_F$=20mA | - | 1.2 | 1.4 | V |
| | Reverse current | $I_R$ | $V_R$= 4V | - | - | 10 | μA |
| | Terminal capacitor | Ct | V=0, f=1kHz | - | 30 | 250 | p F |
| Output | Collector dark current | $I_{CEO}$ | $V_{CE}$ = 20V | - | - | 100 | nA |
| | Collector-emitter breakdown voltage | $BV_{CEO}$ | $I_C$= 0.1 mA, $I_F$=0 | 35 | - | - | V |
| | Emitter-collector breakdown voltage | $BV_{ECO}$ | $I_E$=10μ A, $I_F$=0 | 6 | - | - | V |
| Transmission Characteristics | Current conversion ratio | CTR | $I_F$=5mA ,$V_{CE}$= 5V | 50 | - | 600 | % |
| | Collector-emitter saturation voltage drop | $V_{CE(sat)}$ | $I_F$=20mA, $I_C$ =1mA | - | 0.1 | 0.2 | V |
| | Isolation resistance | $R_{ISO}$ | DC500 V, 40~ 60% R.H. | $5\times10^{10}$ | $1\times10^{11}$ | - | Ω |
| | Floating capacitor | Cf | V=0, f=1MHz | - | 0.6 | 1.0 | p F |
| | Cut-off frequency | Fc | $V_{CE}$ =5 V, $I_C$= 2mA, $R_L$ =100Ω, -3dB | - | 80 | - | kHz |
| | Rise time | Tr | $V_{CE}$ =2 V, $I_C$=2mA, $R_L$ =100Ω | - | 4 | 18 | μ s |
| | Fall time | Tf | $V_{CE}$ =2 V, $I_C$=2mA, $R_L$ =100Ω | - | 3 | 18 | μ s |

* CTR=$I_C/I_F$ × 100%

## Table of CTR Grading

| Grading | A | B | C | D | L or A or B or D |
|---|---|---|---|---|---|
| CTR | 80~160 | 130~260 | 200~400 | 300~600 | 50~600 |

**Fig.1 Forward current vs environment temperature curve**

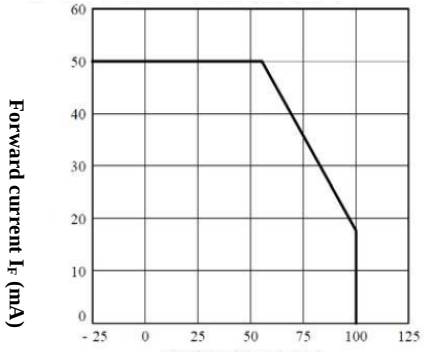



**Fig.2 Collector power consumption vs environment temperature curve**

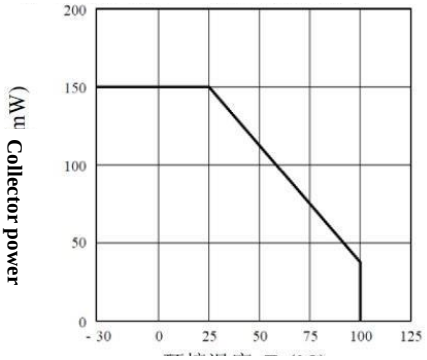



**Fig.3 Forward peak current vs duty ratio curve**

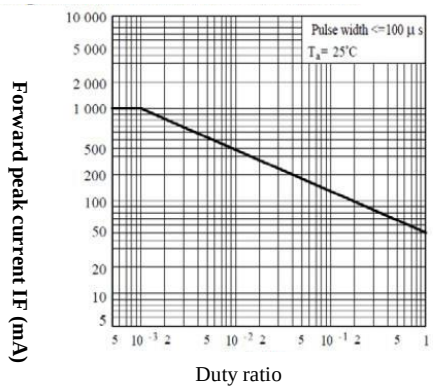



**Fig.4 Current conversion ratio vs forward current curve**

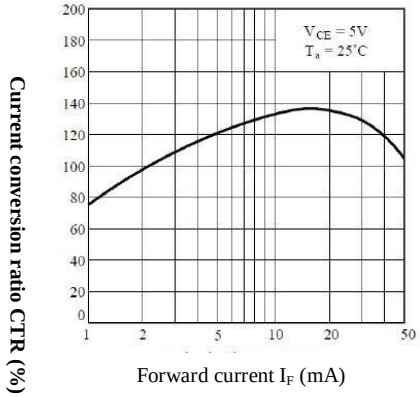



**Fig.5 Forward current vs forward voltage curve**

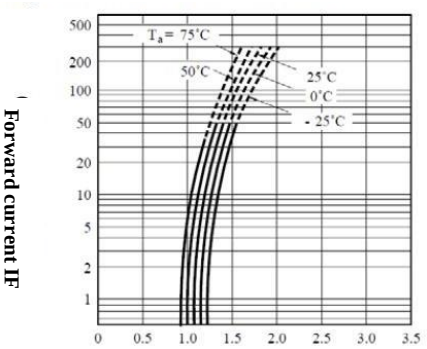



**Fig.6 Collector current vs collector-emitter voltage curve**

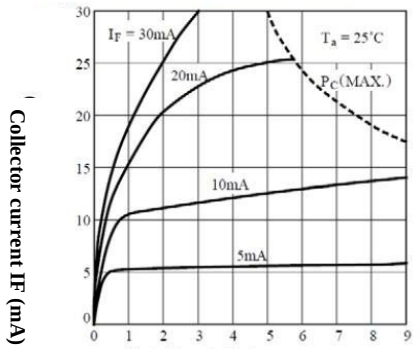


**Fig.7 Relative current conversion ratio vs environment temperature curve**

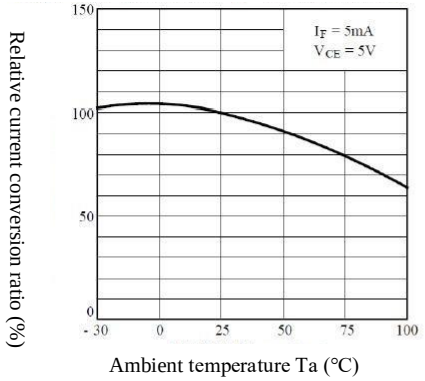



**Fig.8 Saturation voltage drop vs environment temperature curve**

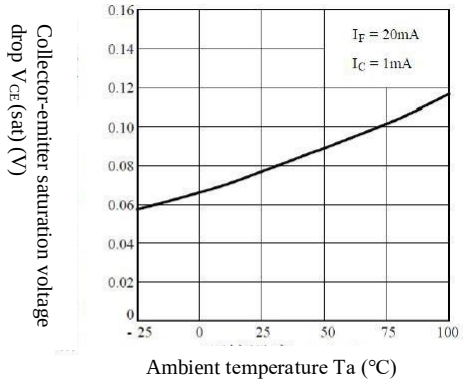



**Fig.9 Collector dark current vs environment temperature curve**

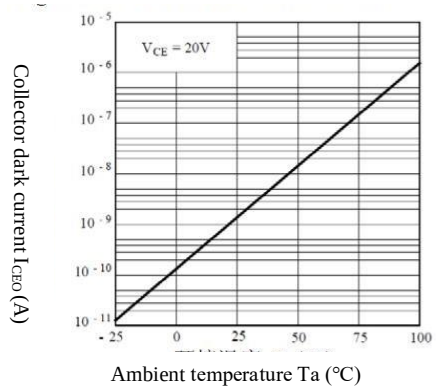



**Fig.10 Response time vs load resistance curve**

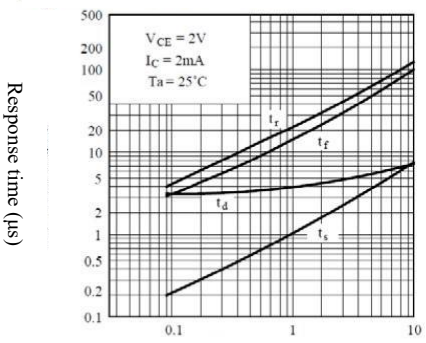



**Fig.11 Frequency response curve**

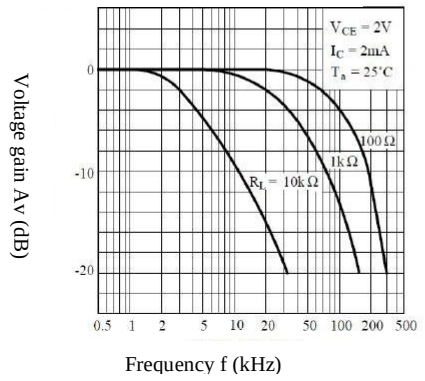



**Fig.12 Saturation voltage drop vs forward current curve**