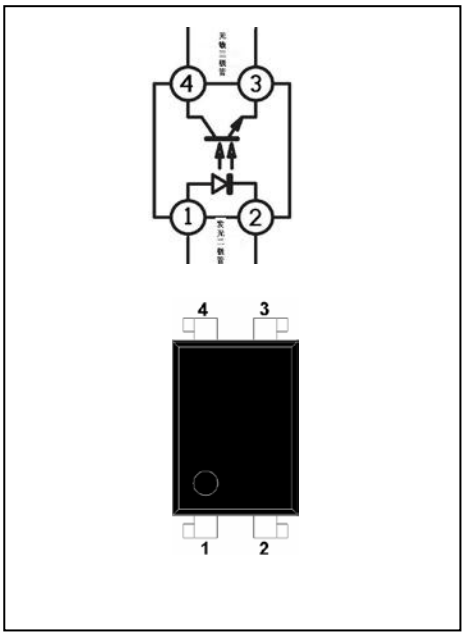
# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER PC817 Series

## FEATURES

HF

- Current transfer ratio
  （CTR：50%-600% at $I_F$=5mA,$V_{CE}$=5V）
- High isolation voltage between inputc
  and output （Viso=5000V rms）
- Creepage distance＞7.62mm
- Pb free and ROHS compliant
- UL/CUL Approved (File No. E340048)




## Description

The PC817 series of devices each consist of an infrared Emitting diodes, optically coupled to a phototransistor detector. They are packaged in a 4-pin DIP package and available in Wide-lead spacing and SMD option.

## APPLICATIONS

- Programmable controllers
- System appliances,measuring instruments
- Telecommunication equipments
- Home appliances,such as fan heaters,etc
- Signal transmission between circuits of different potentials And impedances

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## MAXIMUM RATING @ Ta=25℃ unless otherwise specified

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Input | Forward voltage | $I_F$ | 50 | mA |
| | Reverse Voltage | $V_R$ | 6 | V |
| | Power dissipation | P | 70 | mW |
| Output | Collector-Emitter voltage | $V_{CEO}$ | 80 | V |
| | Emitter- Collector voltage | $V_{ECO}$ | 6 | V |
| | Collector Current | Ic | 50 | mA |
| | Collector Power dissipation | $P_C$ | 150 | mW |
| Total Power dissipation | | $P_{tot}$ | 200 | mW |
| Isolation voltage | | Viso | 5000 | V rms |
| Rated impulse isolation voltage | | $V_{IOTM}$ | 6000 | V |
| Rated repetitive peak isolation voltage | | $V_{IORM}$ | 630 | V |
| Thermal resistance,junction to ambient air | | $R_{\theta jA}$ | 430 | ℃/W |
| Thermal Resistance Junction-to-Case | | $R_{\theta jC}$ | 350 | ℃/W |
| Operating temperature | | Topr | -30~+100 | ℃ |
| Storage temperature | | Tstg | -55~+125 | ℃ |
| Solding temperature | | Tsol | 260 | ℃ |
| Junction temperature | | $T_j$ | 125 | ℃ |

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## ELECTRICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

| Parameter | | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| INPUT | Forward current | $V_F$ | $I_F$=20mA | - | 1.2 | 1.4 | V |
| | Reverse Current | $I_R$ | $V_R$=4V | - | - | 10 | uA |
| | Terminal capacitance | $C_t$ | V=0,f=1KHz | - | 30 | 250 | pF |
| OUTPUT | Collector Dark Current | $I_{CEO}$ | $V_{CE}$=20V,$I_F$=0 | - | - | 100 | nA |
| | Collector-Emitter breakdown voltage | $BV_{CEO}$ | Ic=0.1mA,$I_F$=0 | 80 | - | - | V |
| | Emitter–Collector breakdown voltage | $BV_{ECO}$ | $I_E$=10uA,$I_F$=0 | 6 | - | - | V |
| TRANSFER CHARACTERISTICS | Collector Current | Ic | $I_F$=5mA, $V_{CE}$=5V | 2.5 | - | 30 | mA |
| | Current Transfer ratio | CTR | | 50 | - | 600 | % |
| | Collector-emitter saturation voltage | $V_{CE(Sat)}$ | $I_F$=20mA $I_C$=1mA | - | 0.1 | 0.2 | V |
| | Isolation resistance | $R_{iso}$ | DC500V, 40~60%R.H | $5X10^{10}$ | $1X10^{11}$ | - | Ω |
| | Floating capacitance | $C_f$ | V= 0, f = 1MHz | - | 0.6 | 1 | pF |
| | Cut-off frequency | fc | $V_{CE}$=5V, $I_C$=2 mA, $R_L$=100Ω, -3dB | - | 80 | - | kHz |
| | Rise time | Tr | $V_{CE}$=2V $I_C$=2mA $R_L$=100Ω | - | 4 | 18 | us |
| | Fall Time | Tf | | - | 3 | 18 | us |

### Rank Table of Current Transfer Ratio CTR

| Rank Mark | 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 |

**Notes:**

1. Conditions:IF=5mA, VCE=5V,Ta=25℃

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## TYPICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

Fig.1 Forword Current vs. Ambient Temperatute

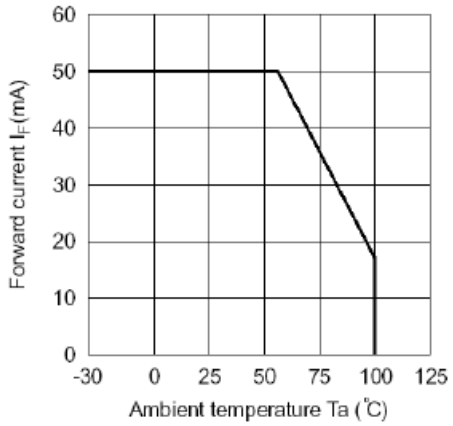



Fig.2 Collector Power Dissiption vs. Ambient Temperature

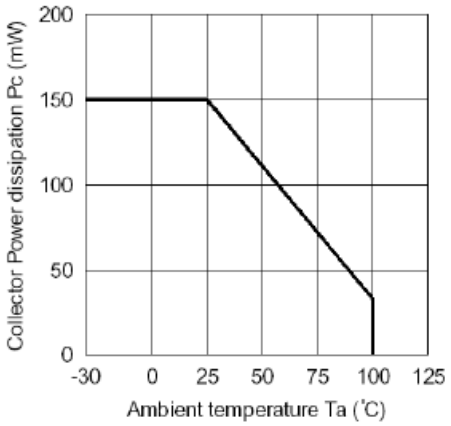



Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

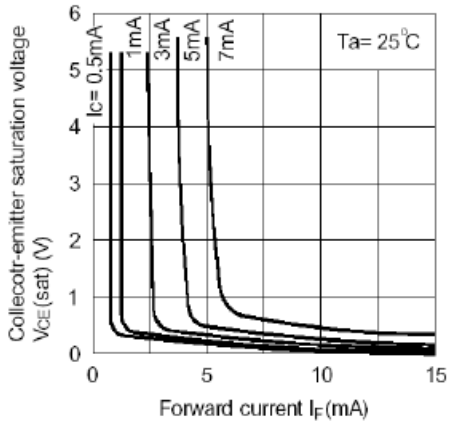



Fig.4 Forward Current vs. Forward Voltage

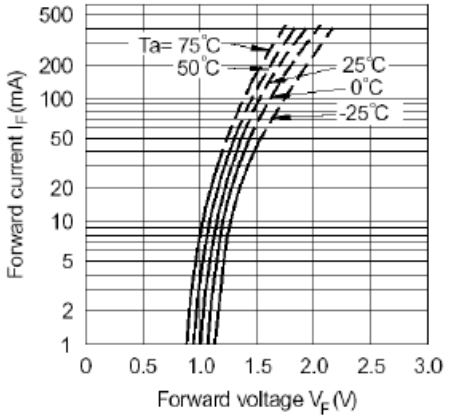



Fig.5 Current Transfer Ratio vs. Forward Current

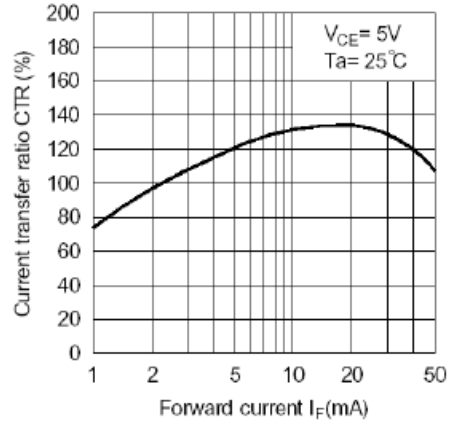
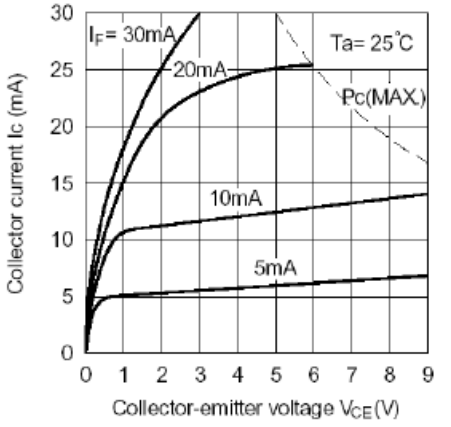



Fig.6 Collector Current vs. Collector-emitter Voltage



# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER PC817 Series

## TYPICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

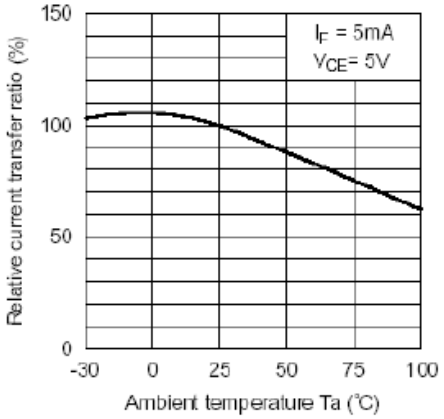



Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

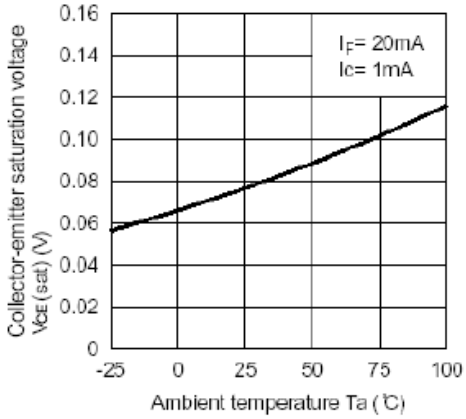



Fig.9 Collector Dark Current vs. Ambient Temperature

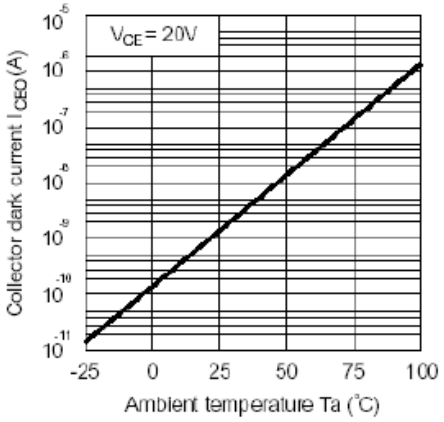



Fig.10 Response Time vs. Load Resistance

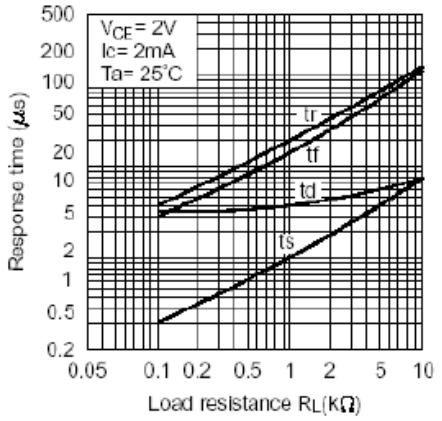
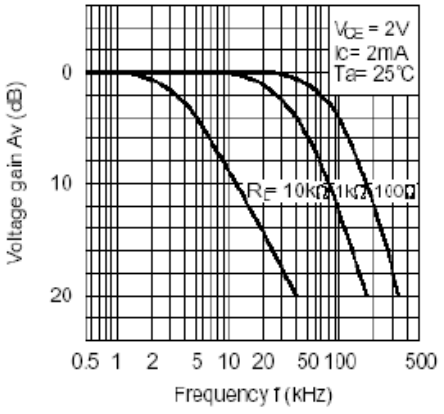
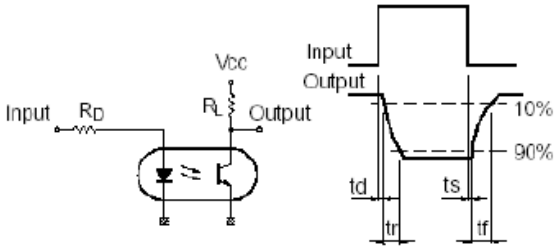


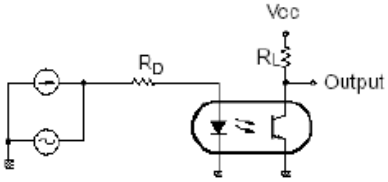

Fig.11 Frequency Response




Test Circuit for Response Time




Test Circuit for Frequency Response



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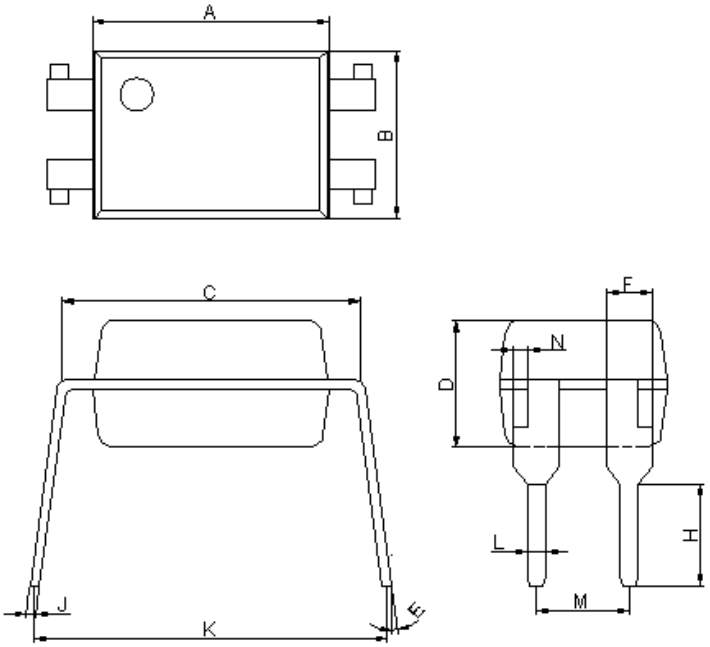
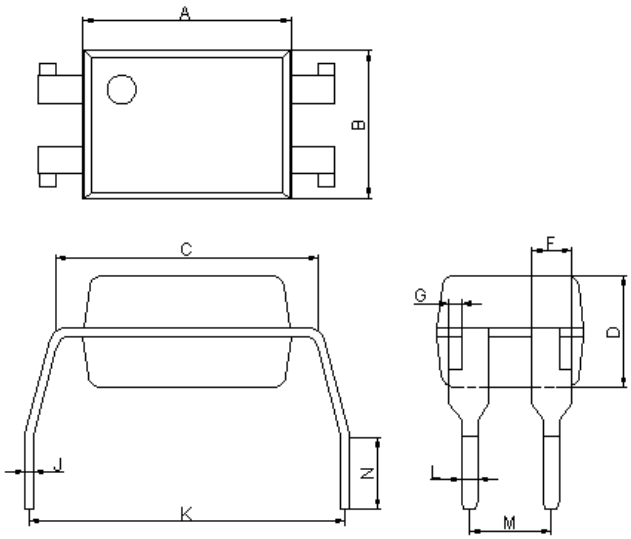
## Package Dimensions（All Dimensions in mm）

### PC817




| Dim | Min | Max |
|---|---|---|
| A | 6.40 | 6.60 |
| B | 4.50 | 4.70 |
| C | 7.90 | 8.30 |
| D | 3.28 | 3.68 |
| E | 2° | 8° |
| F | 1.15 | 1.35 |
| H | 2.70 | 2.90 |
| J | 0.20 | 0.30 |
| K | 8.86 | 9.31 |
| L | 0.40 | 0.60 |
| M | 2.44 | 2.64 |
| N | 0.30 | 0.50 |

### PC817M




| Dim | Min | Max |
|---|---|---|
| A | 6.40 | 6.60 |
| B | 4.50 | 4.70 |
| C | 7.90 | 8.30 |
| D | 3.28 | 3.68 |
| F | 1.15 | 1.35 |
| G | 0.30 | 0.50 |
| J | 0.20 | 0.30 |
| K | 9.86 | 10.46 |
| L | 0.40 | 0.60 |
| M | 2.44 | 2.64 |
| N | 2.40 | 2.90 |

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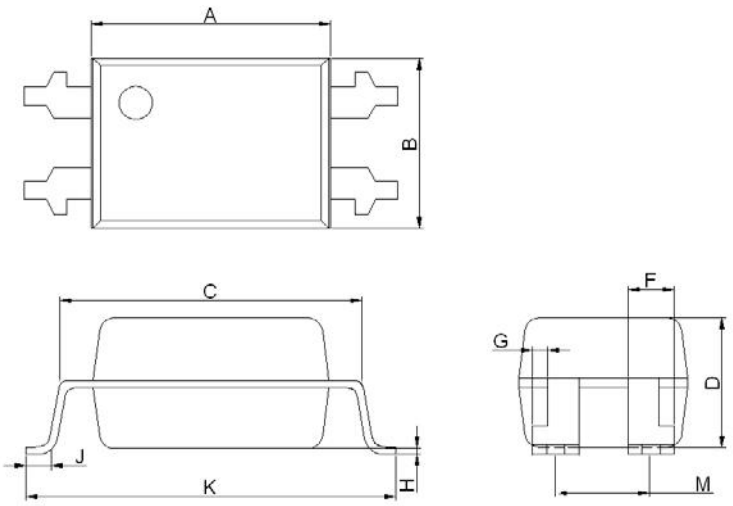
## PC817S

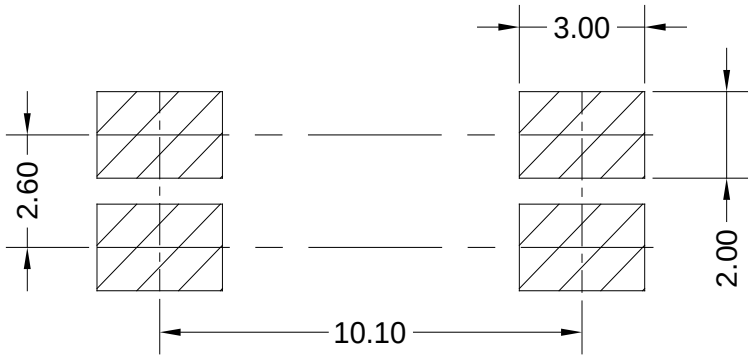



| Dim | Min | Max |
|---|---|---|
| A | 6.40 | 6.60 |
| B | 4.50 | 4.70 |
| C | 7.90 | 8.30 |
| D | 3.28 | 3.68 |
| F | 1.15 | 1.35 |
| G | 0.30 | 0.50 |
| H | 0.00 | 0.20 |
| J | 0.9 | 1.2 |
| K | 9.80 | 10.30 |
| M | 2.49 | 2.69 |

## Ordering Information

| Part Number | Package | Application part number |
|---|---|---|
| PC817 | 4-pin DIP | |
| PC817M | 4-pin（leads with 0.4” spacing） | PC817 |
| PC817S | 4-pin（tape and reel packaging） | |

## SOLDERING FOOTPRINT




UNIT:mm