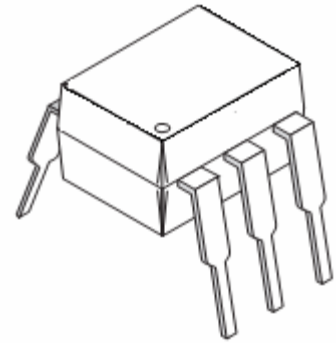


High Reliability Photo Coupler

Features

- High current transfer ratio
(CTR: MIN.500% at $I_F=1\text{mA}$, $V_{ce}=2\text{V}$)
- High isolation voltage between input and output
(Viso: 5000Vrms)
- Compact dual-in-line package



QRCTA16P



Applications

- System appliances, measuring instruments
- Industrial robots
- Copies, automatic vending machines
- Signal transmission between circuits of different potentials and impedances
- Telephone sets
- Copiers, facsimiles
- Interface with various power supply circuits, power distribution boards
- Numerical control machines

Absolute Maximum Ratings (Ta=25°C)

| Parameter | | Symbol | Rating | Unit |
|---------------------------------|-----------------------------|-------------|------------|------|
| Input | Forward Current | IF | 50 | mA |
| | Peak forward current | IFM | 1 | A |
| | Reverse voltage | VR | 6 | A |
| | Power dissipation | PD | 70 | mW |
| Output | Collector-emitter voltage | VCEO | 30 | V |
| | Collector-base voltage | VCBO | 30 | V |
| | Emitter-base voltage | VEBO | 6 | V |
| | Collector current | IC | 150 | mA |
| | Collector power dissipation | PC | 200 | mW |
| Total power dissipation | | Ptot | 200 | mW |
| Isolation voltage 1 minute | | Viso | 5000 | Vrms |
| Operating Temperature | | Topr | -55 ~ +115 | °C |
| Storage Temperature | | Tstg | -55 ~ +125 | °C |
| Soldering temperature 10 second | | Tsol | 260 | °C |

Electro-Optical Characteristics (Ta=25°C)

| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Condition |
|--------------------------|--------------------------------------|-----------------|--------------------|------|------|------|--------------------------------|
| Input | Forward Voltage | VF | ---- | 1.2 | 1.4 | V | IF =10mA |
| | Peak forward voltage | VFM | ---- | ---- | 3.5 | V | IFM =0.5A |
| | Reverse current | IR | ---- | ---- | 10 | uA | VR =4V |
| | Terminal capacitance | Ct | ---- | 30 | ---- | pF | V =0, f =1kHz |
| Output | Collector dark current | ICEO | ---- | ---- | 0.1 | uA | VCE =10V, IF =0 |
| Transfer Characteristics | Current transfer ratio | CTR | 500 | 4000 | ---- | % | IF =1mA, VCE =2V |
| | Collector-emitter saturation voltage | VCE(sat) | ---- | ---- | 1.0 | V | IF =8mA, IC =2mA |
| | Isolation resistance | Riso | 5x10 ¹⁰ | ---- | ---- | ohm | DC500V |
| | Floating capacitance | Cf | ---- | 0.6 | 1.0 | pF | V =0, f =1MHz |
| | Cut-off frequency | fc | ---- | 7 | ---- | kHz | VCC=5V, IC =2mA, RL=100ohm |
| | Response time (Rise) | tr | ---- | 5 | 40 | us | VCE=10V, IC =50mA RL=100ohm |
| Response time (Fall) | tf | ---- | 60 | 100 | us | | |

Typical Electro-Optical Characteristics Curves

Fig.1 Current Transfer Ratio vs. Forward Current

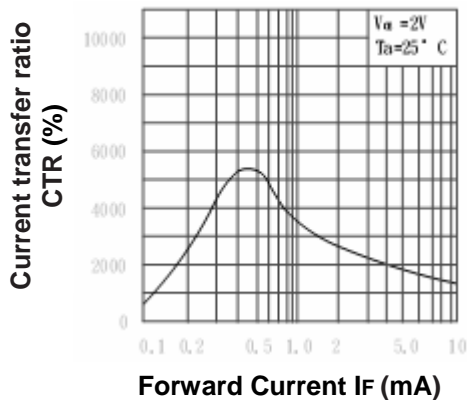


Fig.2 Collector Power Dissipation vs. Ambient Temperature

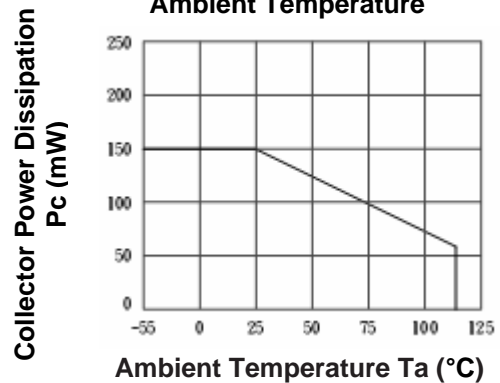


Fig.3 Collector Dark Current vs. Ambient Temperature

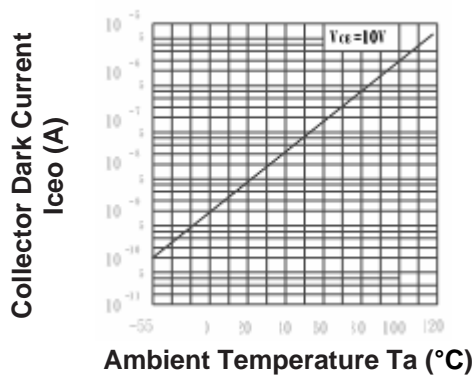


Fig.4 Forward Current vs. Ambient Temperature

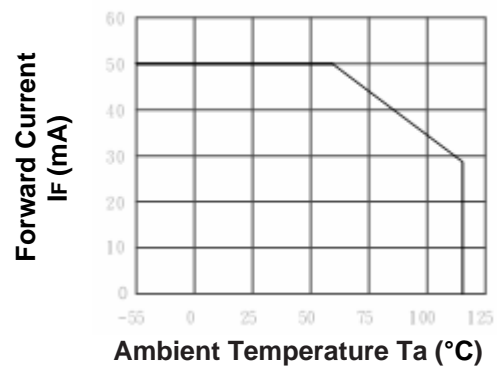


Fig.5 Forward Current vs. Forward Voltage

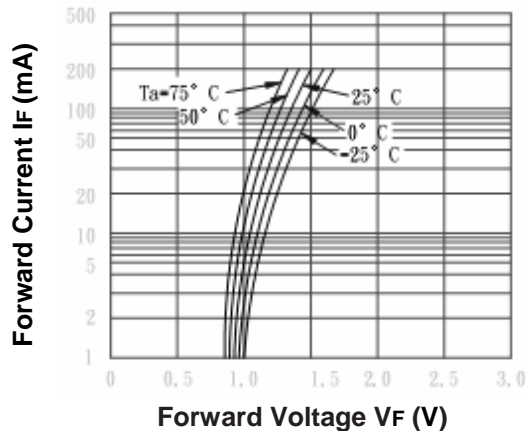


Fig.6 Collector Current vs. Collector Emitter Voltage

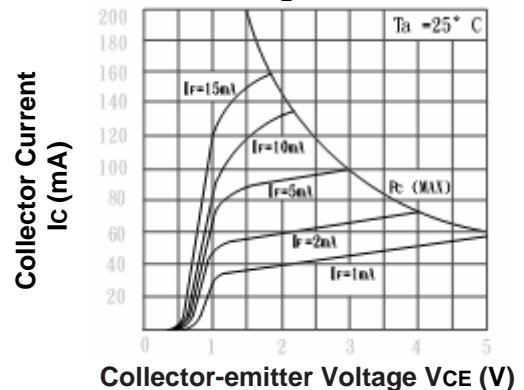


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

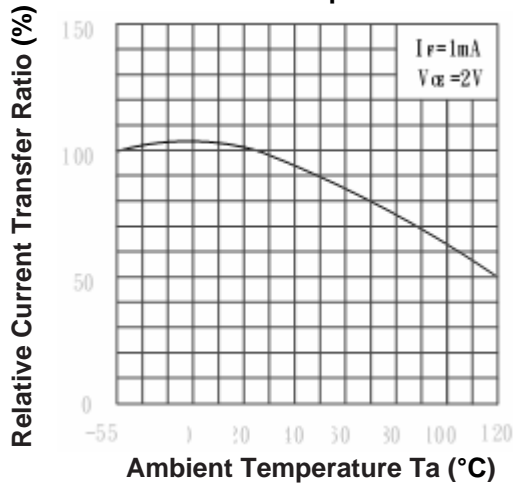


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

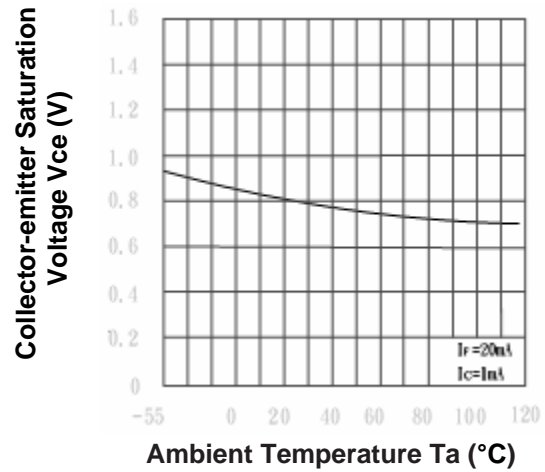


Fig.9 Collector-emitter Saturation Voltage vs. Forward Current

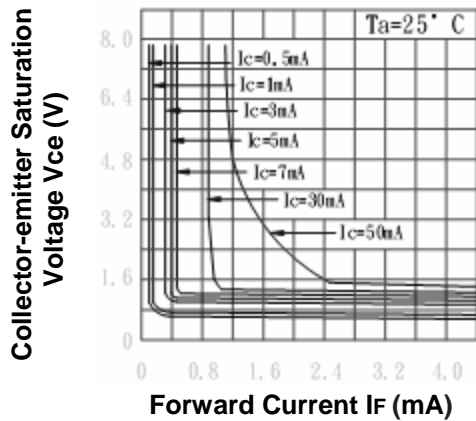


Fig.10 Response Time vs. Load Resistance

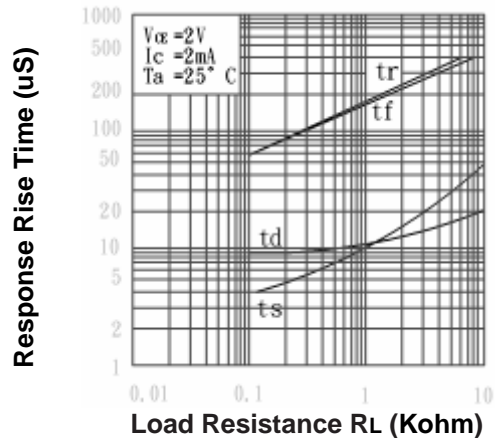
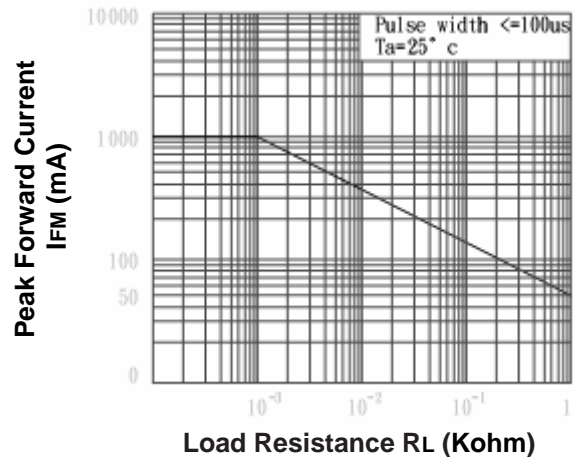
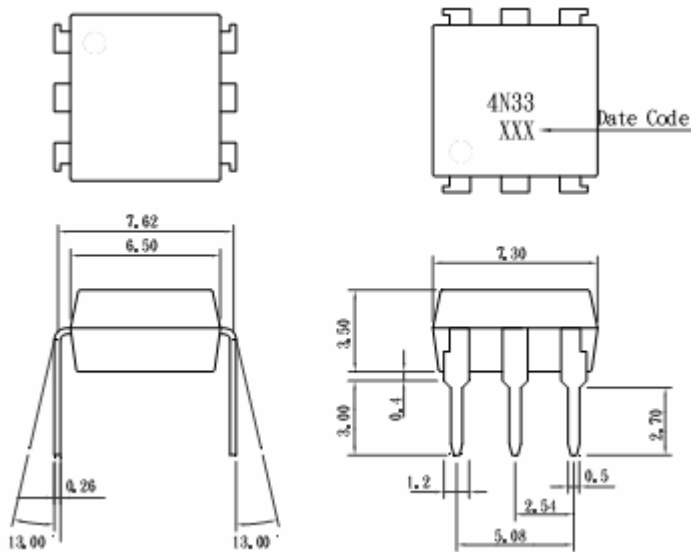


Fig.11 Peak Forward Current vs. Duty Ratio

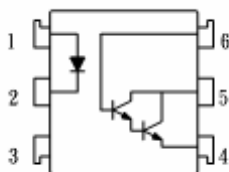


Package Dimensions (In mm)



- Note:** 1. Dimensions are in millimeters
2. Tolerances unless dimensions $\pm 0.2\text{mm}$

Schematic: Top View



- 1. Anode
- 2. Cathode
- 3. NC
- 4. Emitter
- 5. Collector
- 6. Base

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