# PC3H3/PC3Q63

## High Resistance to Noise, AC Input Type Half Pitch Photocoupler

### ■ Features

1. Half pitch surface mount type for high density mounting (Lead pitch : 1.27 mm)
2. AC input type
3. High resistance to noise due to high common mode rejection voltage (CMR : MIN.10kV/μs)
4. Soldering reflow type (230°C, for 30s)
5. High temperature tested model
6. Taping package
   **PC3H3** (1ch)
   **PC3Q63** (4ch)
7. Recognized by UL, file No. E64380

### ■ Applications

1. Programmable controllers

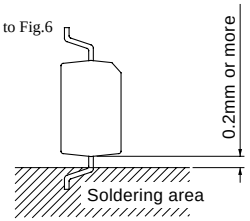
### ■ Package Specifications

| Model No. | Package specification |
|---|---|
| **PC3H3** | Taping reel diameter 330mm (3 000pcs) |
| **PC3Q63** | Taping reel diameter 330mm (1 000pcs) |

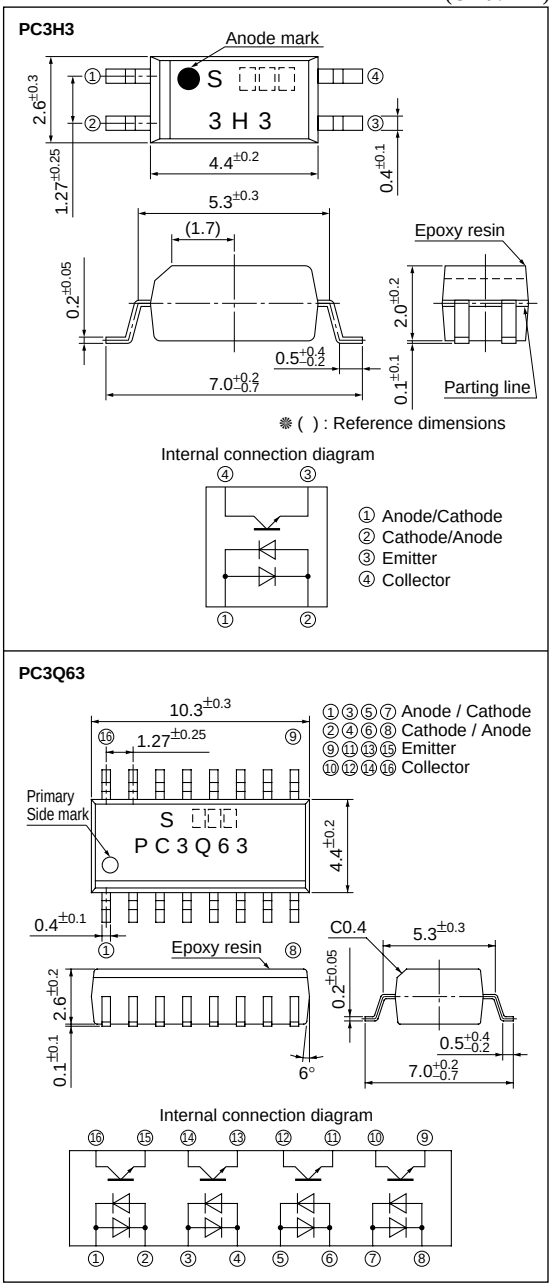
### ■ Absolute Maximum Ratings (Ta=25˚C)

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Input | *1Forward current | $I_F$ | ±50 | mA |
| | *2Peak forward current | $I_{FM}$ | ±1 | A |
| | *1Power dissipation | P | 70 | mW |
| Output | Collector-emitter voltage | $V_{CEO}$ | 70 | V |
| | Emitter-collector voltage | $V_{ECO}$ | 6 | V |
| | Collector current | $I_C$ | 50 | mA |
| | *1Collector power dissipation | $P_C$ | 150 | mW |
| *1Total power dissipation | | $P_{tot}$ | 170 | mW |
| Operating temperature | | $T_{opr}$ | –30 to +100 | ˚C |
| Storage temperature | | $T_{stg}$ | –40 to +125 | ˚C |
| *3Isolation voltage | | $V_{iso}$ | 2.5 | $kV_{rms}$ |
| *4Soldering temperature | | $T_{sol}$ | 260 | ˚C |

*1 The derating factors of absolute maximum ratings due to ambient temperature are shown in Fig.2 to 5
*2 Pulse width<=100μs, Duty ratio:0.01, Refer to Fig.6
*3 AC for 1min., 40 to 60% RH, f=60Hz
*4 For 10s




### ■ Outline Dimensions (Unit : mm)



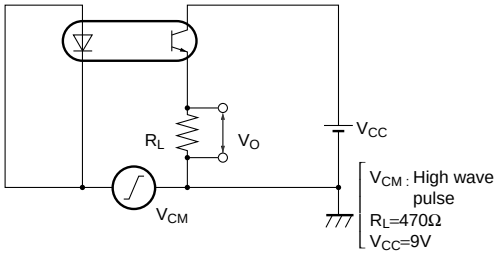
## ■ Electro-optical Characteristics

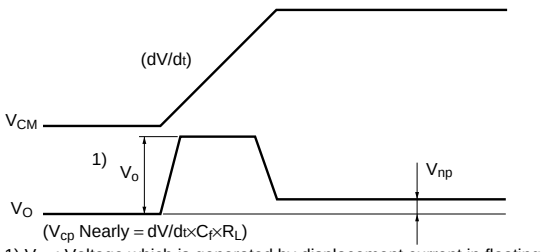
(Ta=25˚C)

| Parameter | | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|---|---|
| Input | Forward voltage | | $V_F$ | $I_F$=±20mA | – | 1.2 | 1.4 | V |
| | Terminal capacitance | | $C_t$ | V=0, f=1kHz | – | 30 | 250 | pF |
| Output | Collector dark current | **PC3H3** | $I_{CEO}$ | $V_{CE}$=50V, $I_F$=0 | – | – | 100 | nA |
| | | **PC3Q63** | | $V_{CE}$=20V, $I_F$=0 | | | | |
| | Collector-emitter breakdown voltage | | $BV_{CEO}$ | $I_C$=0.1mA $I_F$=0 | 70 | – | – | V |
| | Emitter-collector breakdown voltage | | $BV_{ECO}$ | $I_E$=10μA, $I_F$=0 | 6 | – | – | V |
| Transfer characteristics | Collector current | | $I_C$ | $I_F$=±1mA $V_{CE}$=5V | 0.2 | – | 4.0 | mA |
| | Collector-emitter saturation voltage | | $V_{CE(sat)}$ | $I_F$=±20mA $I_C$=1mA | – | 0.1 | 0.2 | V |
| | Isolation resistance | | $R_{ISO}$ | DC500V 40 to 60%RH | $5\times10^{10}$ | $1\times10^{11}$ | – | Ω |
| | Floating capacitance | | $C_f$ | V=0, f=1MHz | – | 0.6 | 1.0 | pF |
| | Response time | Rise time | $t_r$ | $V_{CE}$=2V $I_C$=2mA $R_L$=100Ω | – | 4 | 18 | μs |
| | | Fall time | $t_f$ | | – | 3 | 18 | μs |
| | *5 Common mode rejection voltage | | CMR | Ta=25˚C, $R_L$=470Ω $V_{CM}$=1.5kV(peak) $I_F$=0mA, $V_{CC}$=9V, Vnp=100mV | 10 | – | – | kV/μs |

*5 Refer to Fig.1

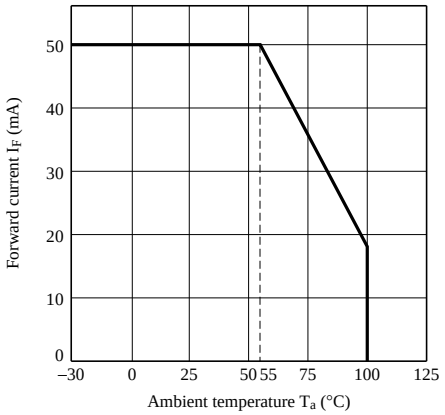
## Fig.1 Test Circuit for Common Mode Rejection Voltage



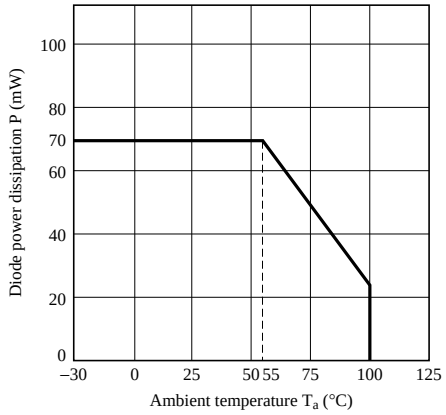




1) $V_{cp}$ : Voltage which is generated by displacement current in floating capacitance between primary and secondary side.

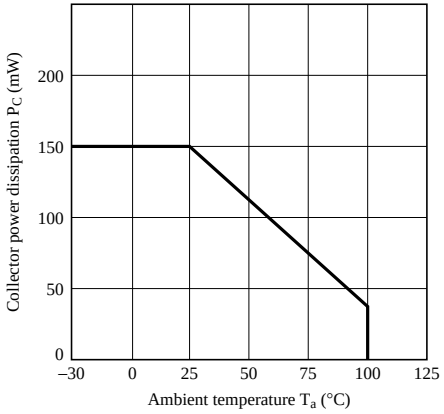
## Fig.2 Forward Current vs. Ambient Temperature



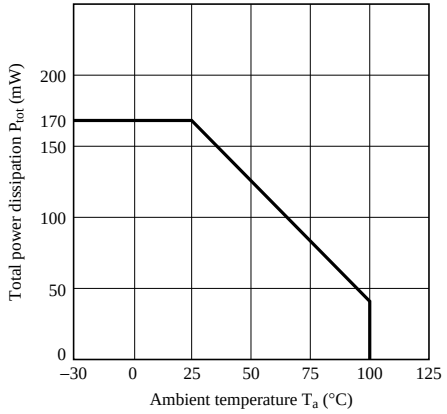

## Fig.3 Diode Power Dissipation vs. Ambient Temperature



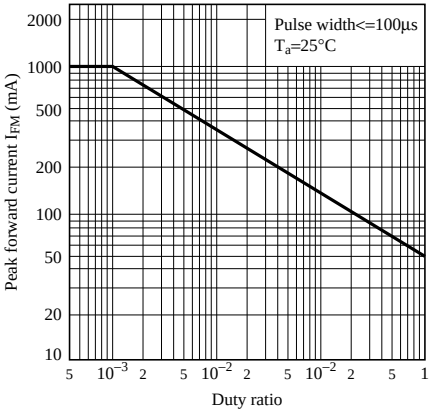

## Fig.4 Collector Power Dissipation vs. Ambient Temperature



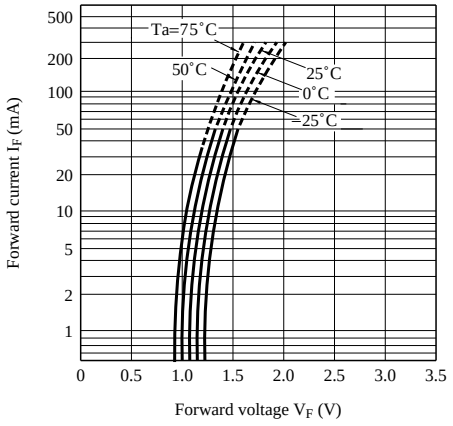

## Fig.5 Total Power Dissipation vs. Ambient Temperature



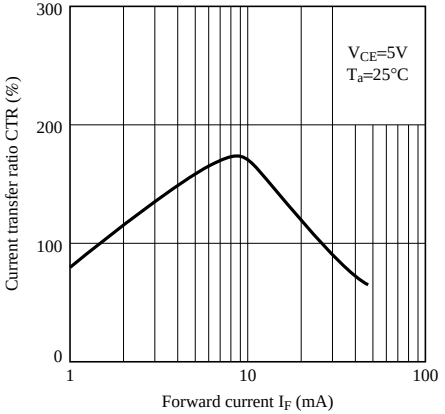

## Fig.6 Peak Forward Current vs. Duty Ratio



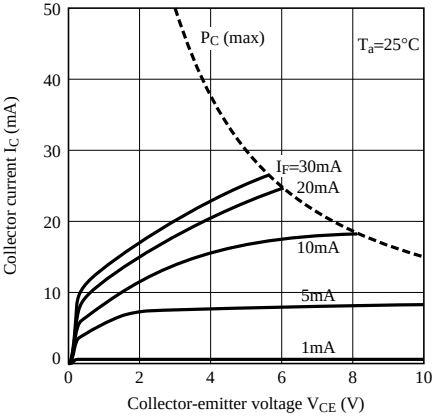

## Fig.7 Forward Current vs. Forward Voltage



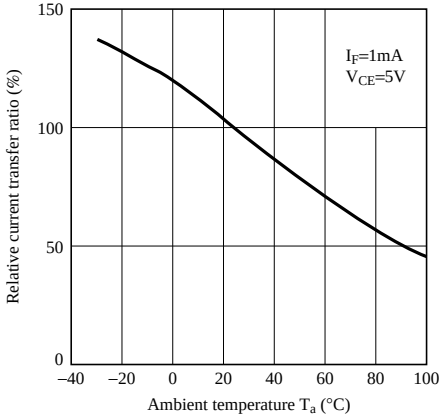
## Fig.8 Current Transfer Ratio vs. Forward Current



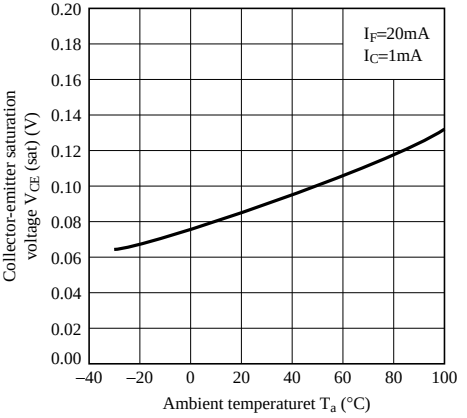

## Fig.9 Collector Current vs. Collector-emitter Voltage



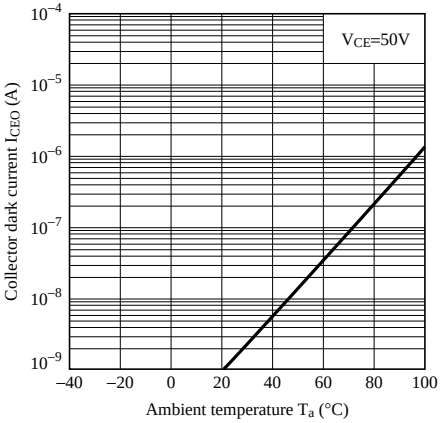

## Fig.10 Relative Current Transfer Ratio vs. Ambient Temperature



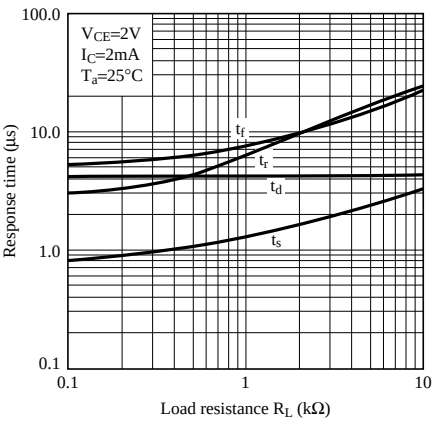

## Fig.11 Collector-emitter Saturation Voltage vs. Ambient Temperature



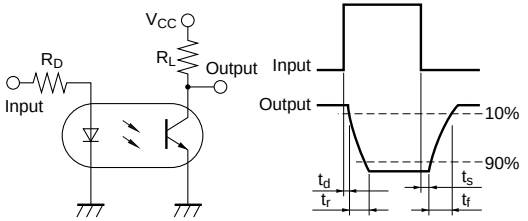

## Fig.12 Collector Dark Current vs. Ambient Temperature



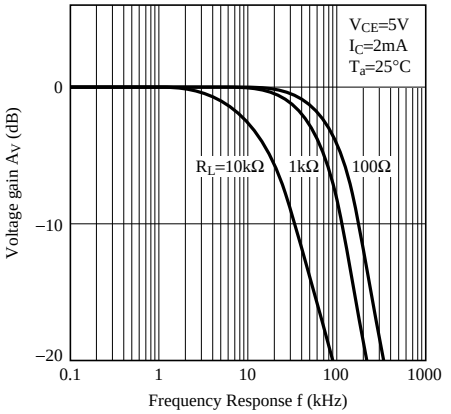

## Fig.13 Response Time vs. Load Resistance



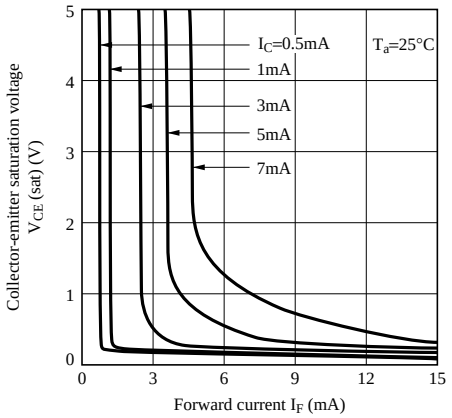
## Fig.14 Test Circuit For Response Time




## Fig.15 Voltage Gain vs Frequency

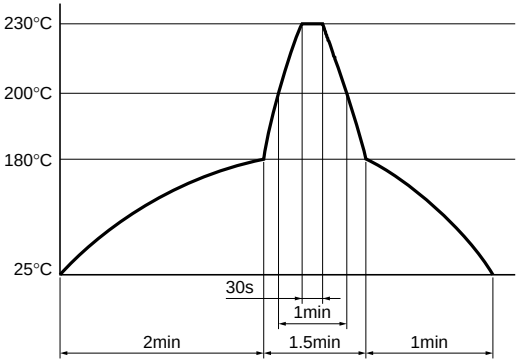



## Fig.16 Collector-emitter Saturation Voltage vs. Forward Current




## Fig.17 Reflow Soldering

Only one time soldering is recommended within the temperature profile shown below.



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