# PC4H510NIP

## Mini Flat Half-pitch Type High Collector-Emitter Voltage Photocoupler

### ■ Features

1. High collector-emitter voltage
   Collector-emitter voltage:350V
2. Compact and thin package Half pitch, mini flat package
3. Recognized by UL, file No. E64380

### ■ Applications

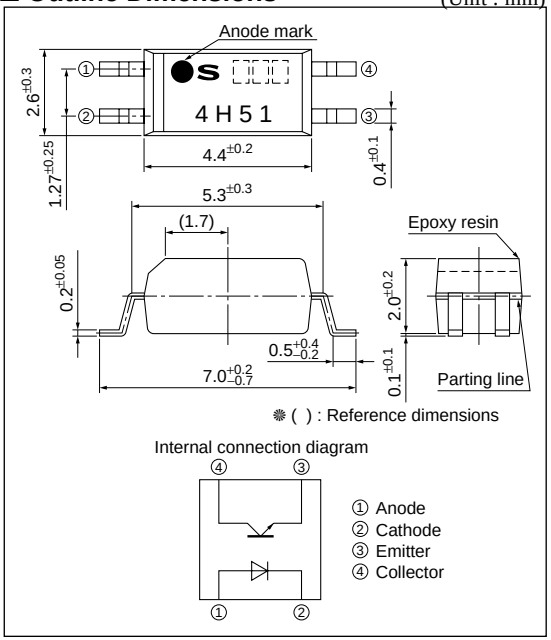
1. Modems

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

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Input | *1 Forward current | $I_F$ | 50 | mA |
| | *2 Peak forward current | $I_{FM}$ | 1 | A |
| | Reverse voltage | $V_R$ | 6 | V |
| | *1 Power dissipation | P | 70 | mW |
| Output | Collector-emitter voltage | $V_{CEO}$ | 350 | V |
| | Emitter-collector voltage | $V_{ECO}$ | 6 | V |
| | Collector current | $I_C$ | 50 | mA |
| | *1 Collector power dissipation | $P_C$ | 150 | mW |
| *1 Total power dissipation | | $P_{tot}$ | 170 | mW |
| Operating temperature | | $T_{opr}$ | −25 to +100 | °C |
| Storage temperature | | $T_{stg}$ | −55 to +125 | °C |
| *3 Isolation voltage | | $V_{iso\ (rms)}$ | 2.5 | kV |
| *4 Soldering 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=0.001(shown in Fig.6)
*3 40 to 60%RH, AC for 1 min, f=60Hz
*4 For 10 s

### ■ Outline Dimensions (Unit : mm)

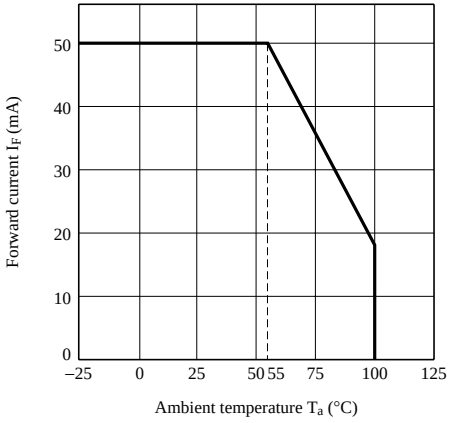


## ■ Electro-optical Characteristics

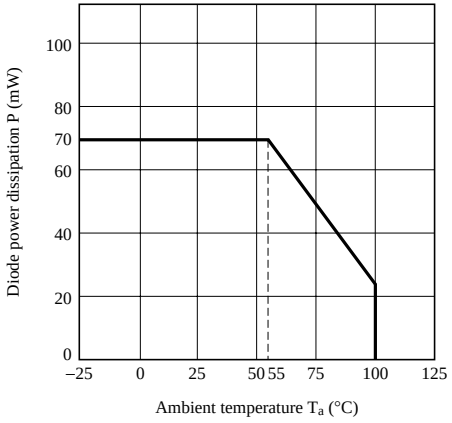
(Ta=25˚C)

| Parameter | | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|---|---|
| Input | Forward voltage | | $V_F$ | $I_F$=20mA | – | 1.2 | 1.4 | V |
| | Reverse current | | $I_R$ | $V_R$=4V | – | – | 10 | μA |
| | Terminal capacitance | | $C_t$ | V=0, f=1kHz | – | 30 | 250 | pF |
| Output | Collector dark current | | $I_{CEO}$ | $V_{CE}$=200V, $I_F$=0 | – | – | 1 | μA |
| | Collector-emitter breakdown voltage | | $BV_{CEO}$ | $I_C$=0.1mA, $I_F$=0 | 350 | – | – | V |
| | Emitter-collector breakdown voltage | | $BV_{ECO}$ | $I_E$=10μA, $I_F$=0 | 6 | – | – | V |
| Transfer characteristics | Collector current | | $I_C$ | $I_F$=5mA, $V_{CE}$=5V | 2.0 | 4.0 | 12.0 | mA |
| | Collector-emitter saturation voltage | | $V_{CE(sat)}$ | $I_F$=20mA, $I_C$=1mA | – | 0.1 | 0.3 | V |
| | Isolation resistance | | $R_{ISO}$ | DC500V, 40 to 60%RH | $5\times10^{10}$ | $10^{11}$ | – | Ω |
| | Floating capacitance | | $C_f$ | V=0, f=1MHz | – | 0.6 | 1.0 | pF |
| | Cut-off frequency | | $f_C$ | $V_{CE}$=5V, $I_C$=2mA, $R_L$=100Ω, –3dB | – | 50 | – | kHz |
| | Response time | Rise time | $t_r$ | $V_{CE}$=2V, $I_C$=2mA, $R_L$=100Ω | – | 4 | 10 | μs |
| | | Fall time | $t_f$ | | – | 5 | 12 | μs |

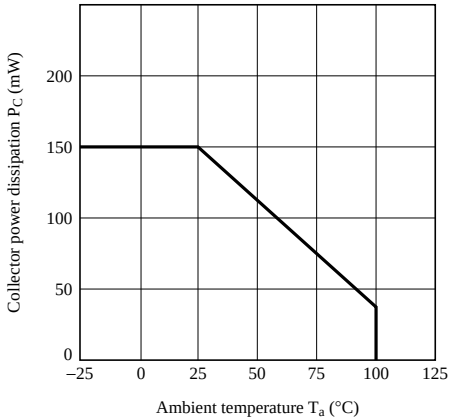
### Fig.1 Forward Current vs. Ambient Temperature



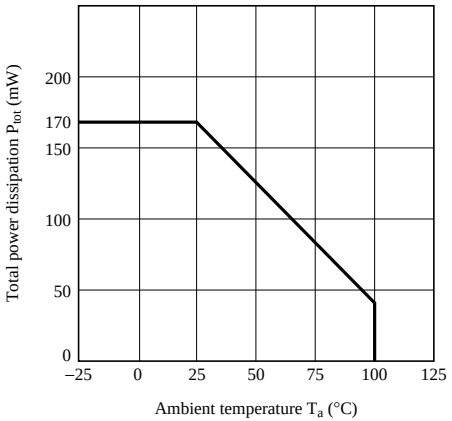

### Fig.2 Diode Power Dissipation vs. Ambient Temperature



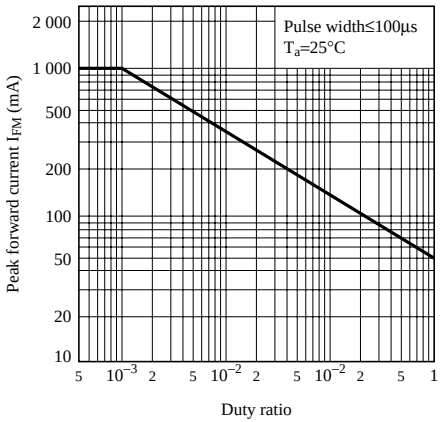
## Fig.3 Collector Power Dissipation vs. Ambient Temperature



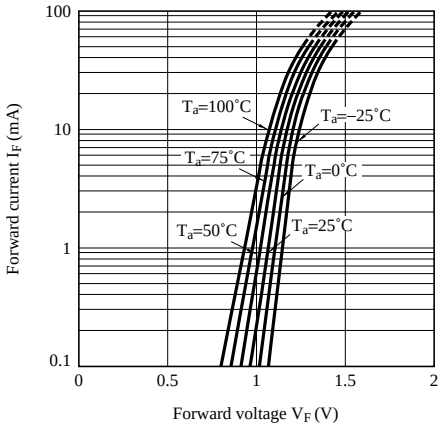

## Fig.4 Total Power Dissipation vs. Ambient Temperature



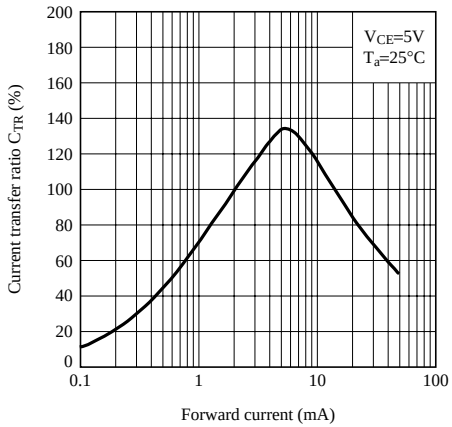

## Fig.5 Peak Forward Current vs. Duty Ratio



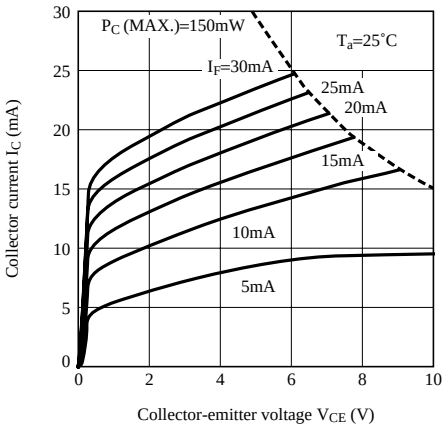

## Fig.6 Forward Current vs. Forward Voltage



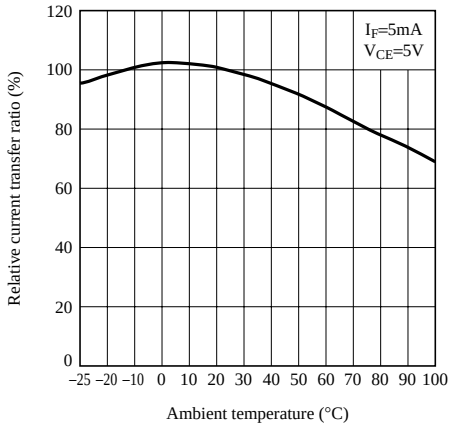

## Fig.7 Current Transfer Ratio vs. Forward Current



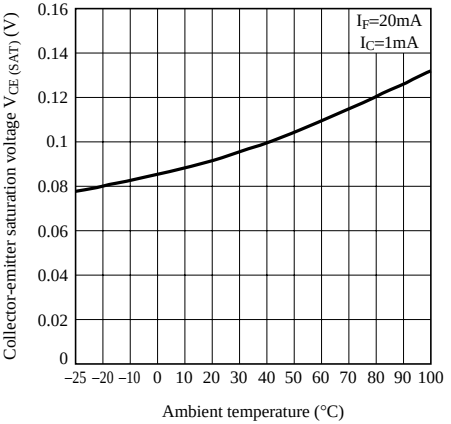

## Fig.8 Collector Current vs. Collector-emitter Voltage



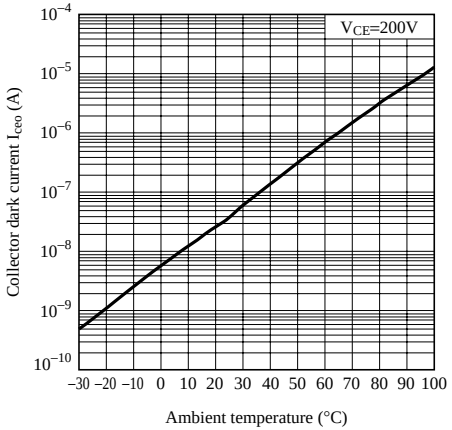
## Fig.9 Relative Current Transfer Ratio vs. Ambient Temperature



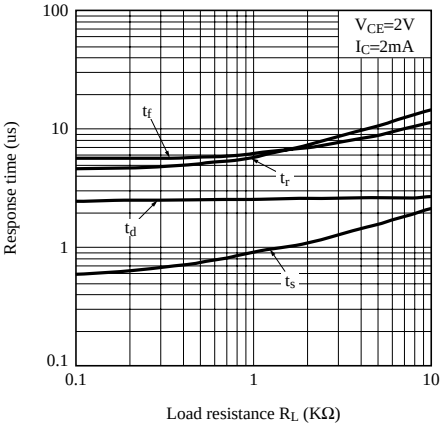

## Fig.10 Collector - emitter Saturation Voltage vs. Ambient Temperature



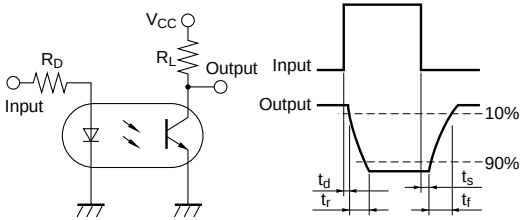

## Fig.11 Collector Dark Current vs. Ambient Temperature



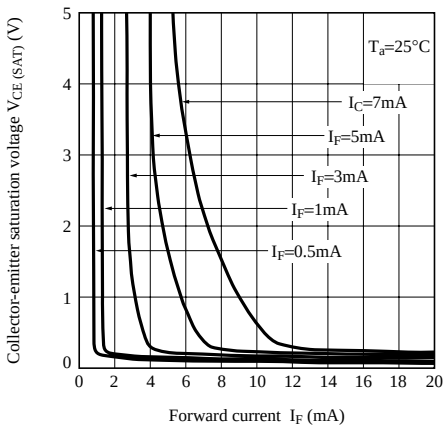

## Fig.12 Response Time vs. Load Resistance




## Fig.13 Test Circuit for Response Time

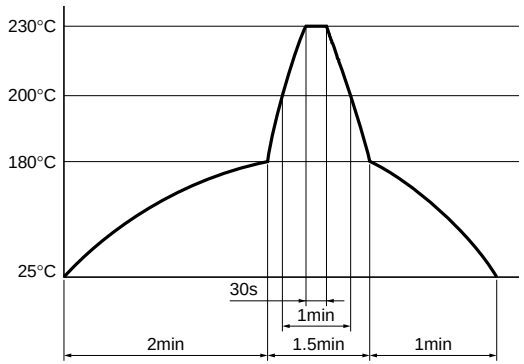



## Fig.14 Collector-emitter Saturation Voltage vs. Forward Current



## Fig.15 Reflow Soldering

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



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