

**LARGE FORWARD INPUT TYPE
HIGH ISOLATION VOLTAGE
MULTI PHOTOCOUPLER SERIES**

-NEPOC Series-

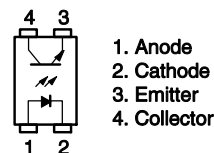
DESCRIPTION

The PS2521-1 and PS2521L-1 are optically coupled isolators containing a GaAs light emitting diode and an NPN silicon phototransistor.

The PS2521-1 is in a plastic DIP (Dual In-line Package) and the PS2521L-1 is lead bending type (Gull-wing) for surface mount.

FEATURES

- Large forward input current ($I_F = 150 \text{ mA}$)
- High Isolation voltage ($BV = 5\,000 \text{ Vr.m.s.}$)
- High collector to emitter voltage ($V_{CEO} = 80 \text{ V}$)
- High-speed switching ($t_r = 3 \mu\text{s TYP.}$, $t_f = 5 \mu\text{s TYP.}$)
- <R> • Ordering number of tape product: PS2521L-1-F3: 2 000 pcs/reel
- <R> • Safety standards
 - UL approved: No. E72422
 - CSA approved: No. CA 101391 (CA5A, CAN/CSA-C22.2 60065, 60950)

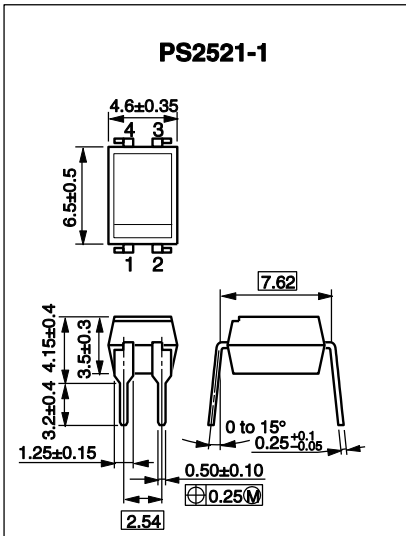
PIN CONNECTION
(Top View)**APPLICATIONS**

- Exchange equipment
- FAX/MODEM
- LCR adapter

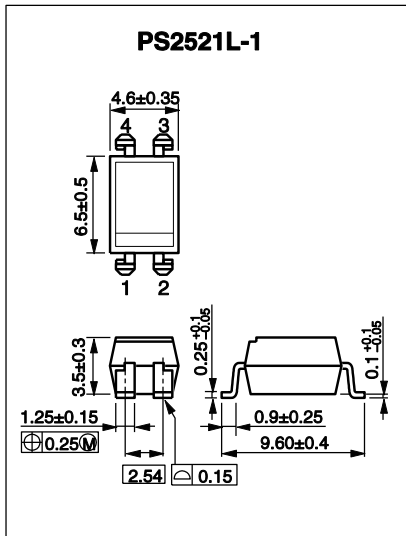
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<R> PACKAGE DIMENSIONS (Unit : mm)

DIP Type



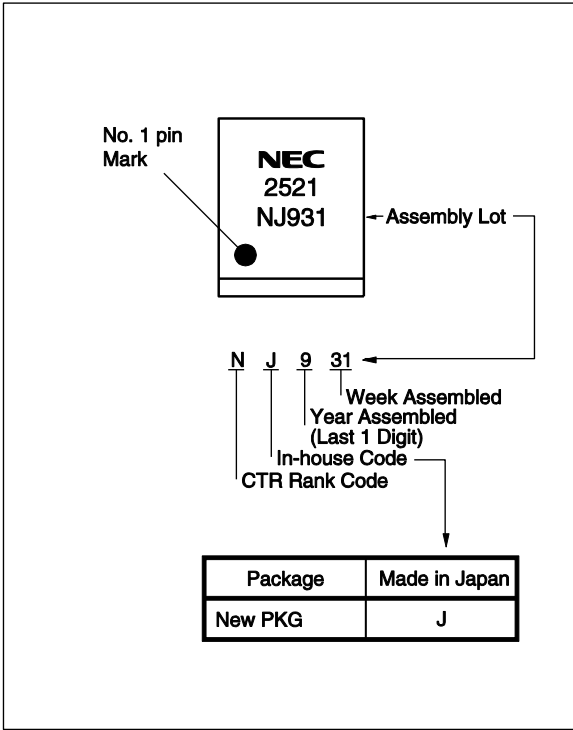
Lead Bending Type



<R> PHOTOCOPLER CONSTRUCTION

| Parameter | Unit (MIN.) |
|-------------------------|-------------|
| Air Distance | 7 mm |
| Outer Creepage Distance | 7 mm |
| Inner Creepage Distance | 4 mm |
| Isolation Thickness | 0.4 mm |

<R> MARKING EXAMPLE



<R> ORDERING INFORMATION

| Part Number | Order Number | Solder Plating Specification | Packing Style | Safety Standard Approval | Application Part Number ^{*1} |
|--------------|----------------|------------------------------|------------------------------|---|---------------------------------------|
| PS2521-1 | PS2521-1-A | Pb-Free | Magazine case 100 pcs | Standard products (UL, CSA Approved) | PS2521-1 |
| PS2521L-1 | PS2521L-1-A | | | | |
| PS2521L-1-F3 | PS2521L-1-F3-A | | Embossed Tape 2 000 pcs/reel | | |

*1 For the application of the Safety Standard, following part number should be used.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, unless otherwise specified)

| Parameter | | Symbol | Ratings | Unit |
|---------------------------------|------------------------------------|---------------------|-------------|---------|
| Diode | Forward Current (DC) | I _F | 150 | mA |
| | Reverse Voltage | V _R | 6.0 | V |
| | Power Dissipation Derating | ΔP _D /°C | 2.5 | mW/°C |
| | Power Dissipation | P _D | 250 | mW |
| | Peak Forward Current ^{*1} | I _{FP} | 1 | A |
| Transistor | Collector to Emitter Voltage | V _{CEO} | 80 | V |
| | Emitter to Collector Voltage | V _{ECO} | 6 | V |
| | Collector Current | I _C | 50 | mA |
| | Power Dissipation Derating | ΔP _C /°C | 1.5 | mW/°C |
| | Power Dissipation | P _C | 150 | mW |
| Isolation Voltage ^{*2} | | BV | 5 000 | Vr.m.s. |
| Operating Ambient Temperature | | T _A | -55 to +100 | °C |
| Storage Temperature | | T _{stg} | -55 to +150 | °C |

*1 PW = 100 μs, Duty Cycle = 1%

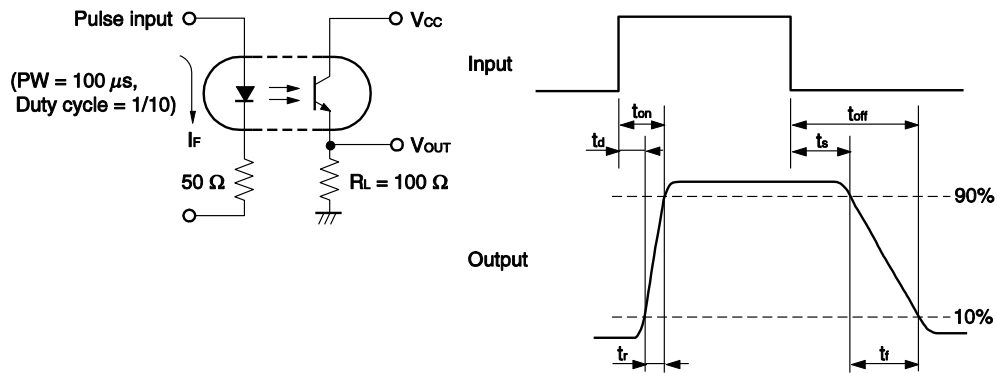
*2 AC voltage for 1 minute at T_A = 25°C, RH = 60% between input and output.

Pins 1-2 shorted together, 3-4 shorted together.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

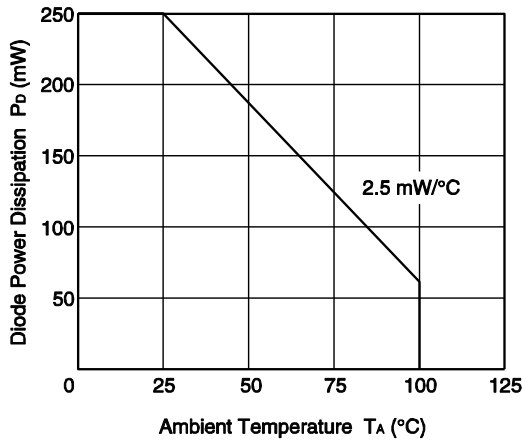
| Parameter | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|------------|--|----------------------|---|------------------|------|------|------|
| Diode | Forward Voltage | V _F | I _F = 100 mA | | 1.3 | 1.7 | V |
| | Reverse Current | I _R | V _R = 5 V | | | 5 | μA |
| | Terminal Capacitance | C _t | V = 0 V, f = 1.0 MHz | | 70 | | pF |
| Transistor | Collector to Emitter Dark Current | I _{CEO} | V _{CE} = 80 V, I _F = 0 mA | | | 100 | nA |
| Coupled | Current Transfer Ratio (I _c /I _F) | CTR | I _F = 100 mA, V _{CE} = 3 V | 20 | | 80 | % |
| | Collector Saturation Voltage | V _{CE(sat)} | I _F = 100 mA, I _c = 4 mA | | | 0.3 | V |
| | Isolation Resistance | R _{i-o} | V _{i-o} = 1.0 kV _{DC} | 10 ¹¹ | | | Ω |
| | Isolation Capacitance | C _{i-o} | V = 0 V, f = 1.0 MHz | | 0.6 | | pF |
| | Rise Time *1 | t _r | V _{CC} = 10 V, I _c = 2 mA, R _L = 100 Ω | | 3 | | μs |
| | Fall Time *1 | t _f | | | 5 | | |

*1 Test circuit for switching time

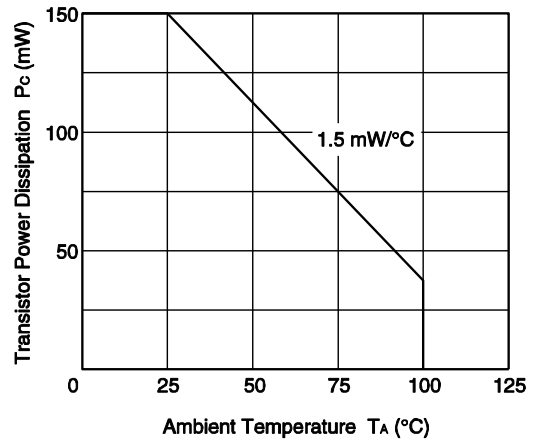


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

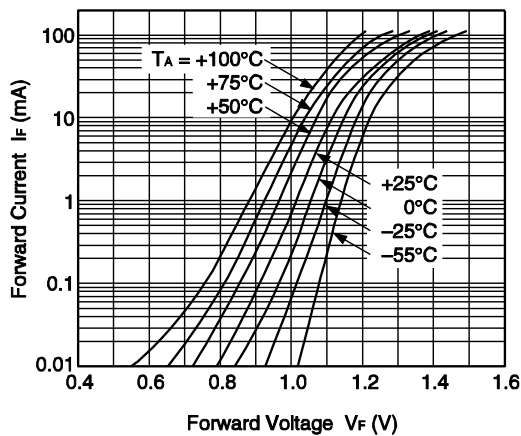
DIODE POWER DISSIPATION vs. AMBIENT TEMPERATURE



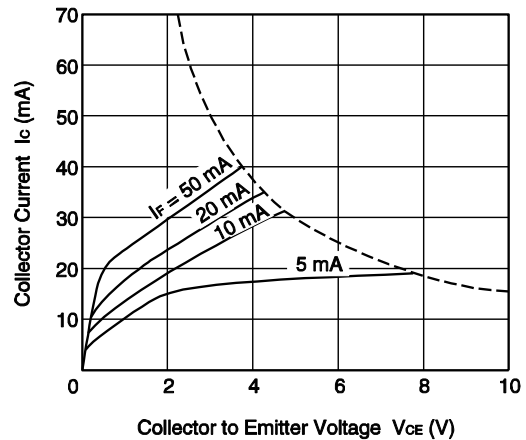
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



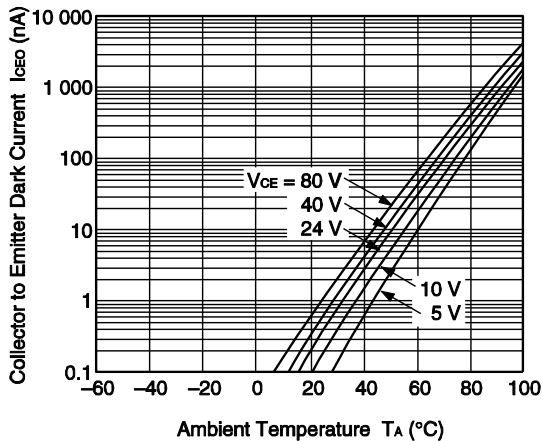
FORWARD CURRENT vs. FORWARD VOLTAGE



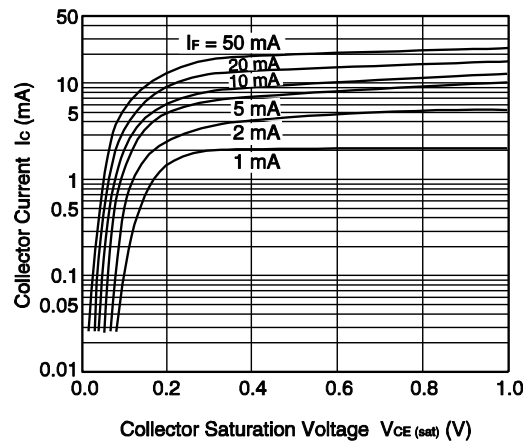
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



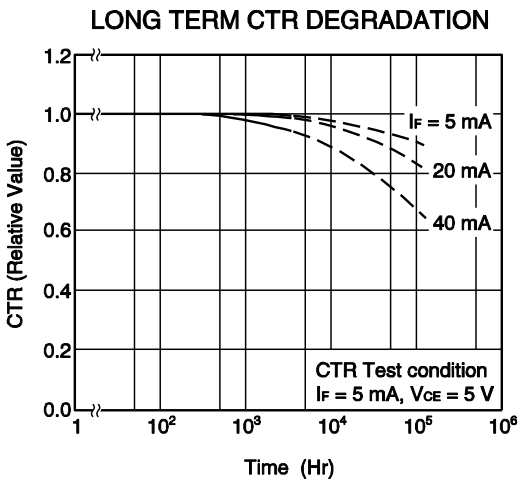
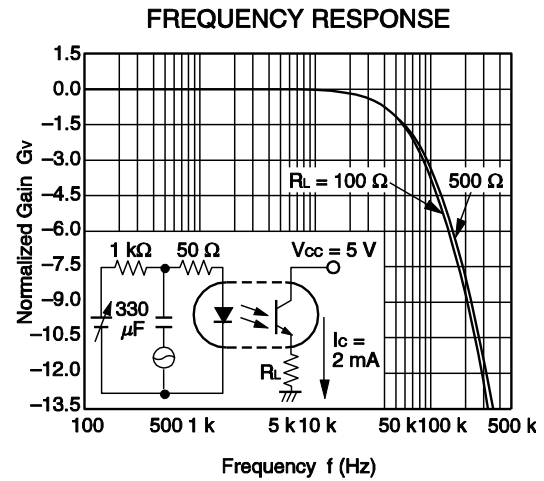
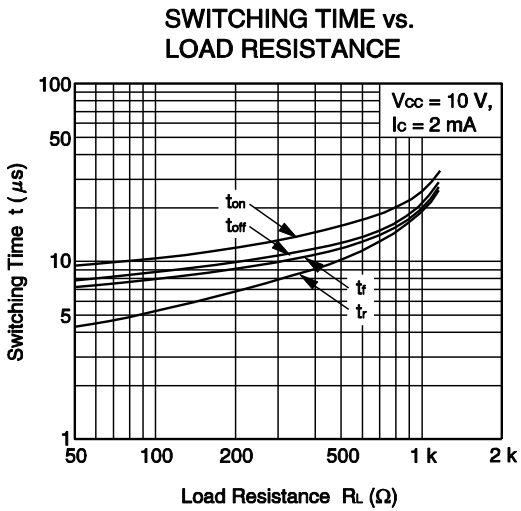
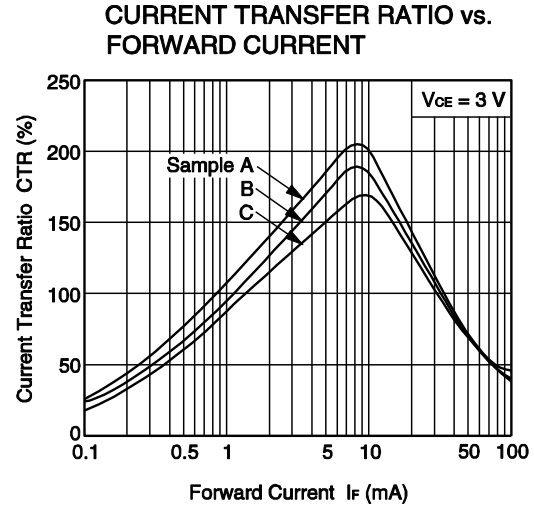
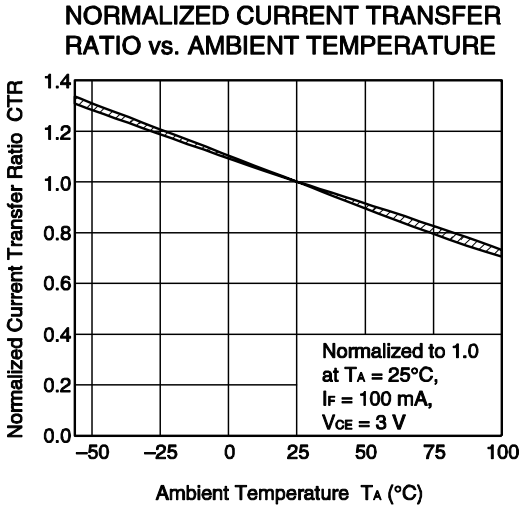
COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE



COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE

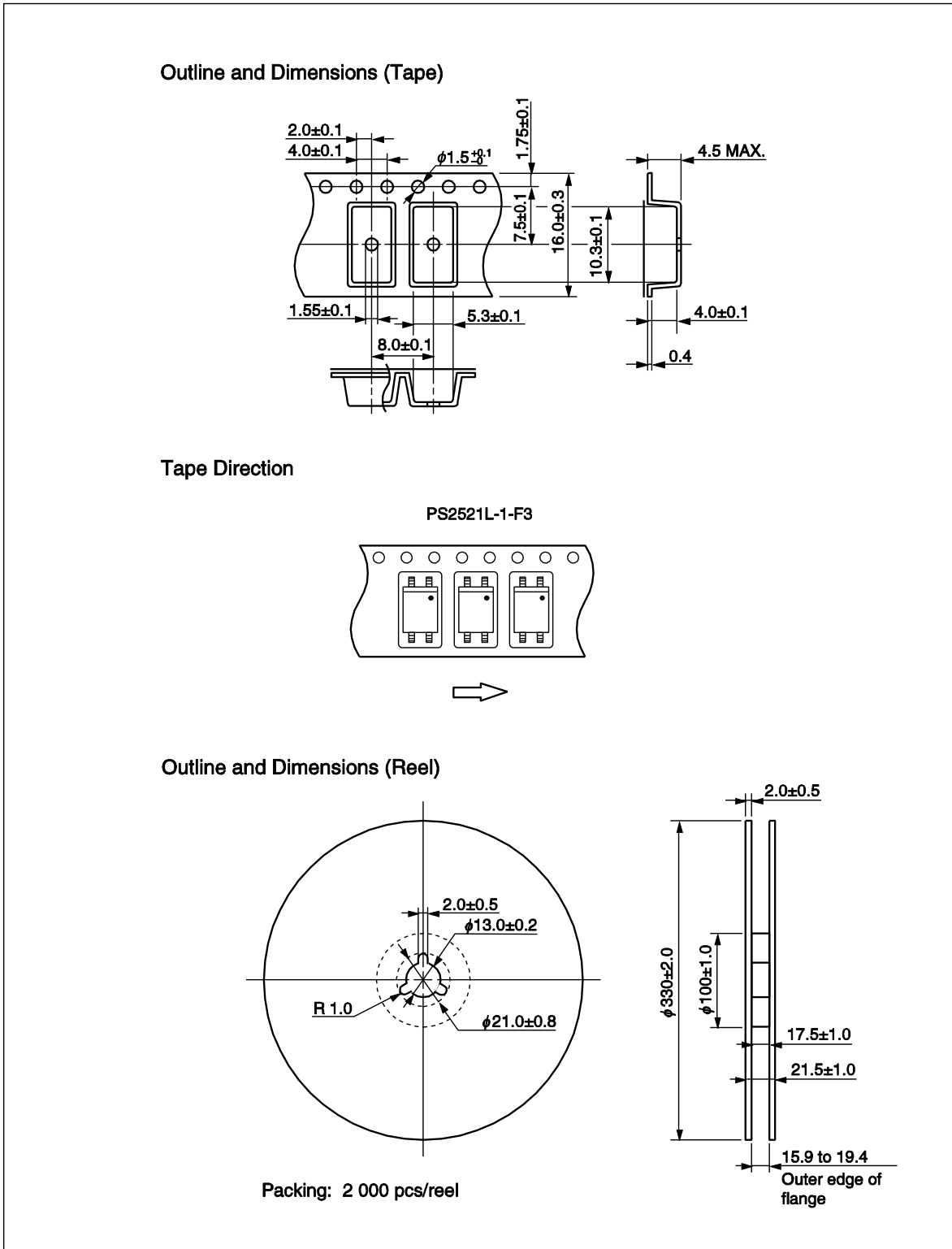


Remark The graphs indicate nominal characteristics.



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<R> TAPING SPECIFICATIONS (Unit : mm)



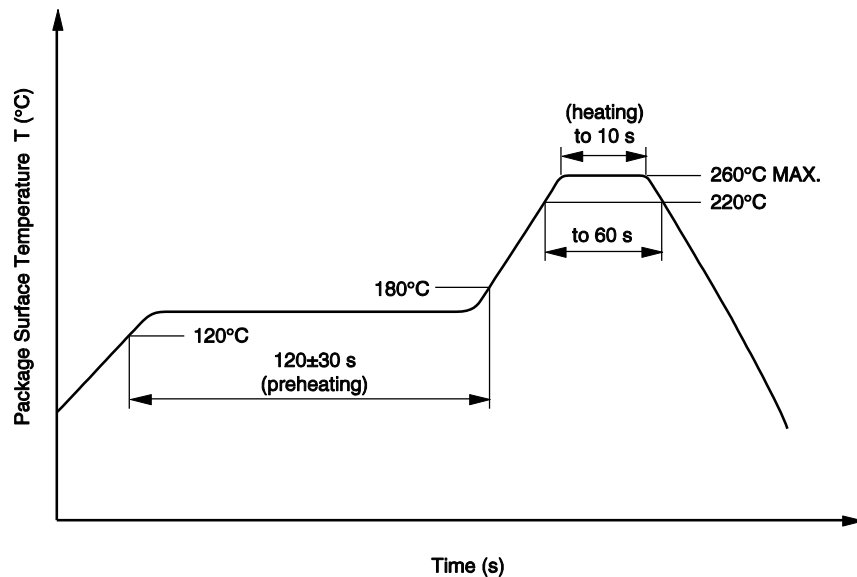
NOTES ON HANDLING

1. Recommended soldering conditions

(1) Infrared reflow soldering

- Peak reflow temperature 260°C or below (package surface temperature)
- Time of peak reflow temperature 10 seconds or less
- Time of temperature higher than 220°C 60 seconds or less
- Time to preheat temperature from 120 to 180°C 120±30 s
- Number of reflows Three
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

Recommended Temperature Profile of Infrared Reflow



(2) Wave soldering

- Temperature 260°C or below (molten solder temperature)
- Time 10 seconds or less
- Preheating conditions 120°C or below (package surface temperature)
- Number of times One (Allowed to be dipped in solder including plastic mold portion.)
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

(3) Soldering by soldering iron

- Peak temperature (lead part temperature) 350°C or below
- Time (each pins) 3 seconds or less
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

- (a) Soldering of leads should be made at the point 1.5 to 2.0 mm from the root of the lead.
 (b) Please be sure that the temperature of the package would not be heated over 100°C.

(4) Cautions

- Fluxes

Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.

2. Cautions regarding noise

Be aware that when voltage is applied suddenly between the photocoupler's input and output or between collector-emitters at startup, the output transistor may enter the on state, even if the voltage is within the absolute maximum ratings.

3. Measurement conditions of current transfer ratios (CTR), which differ according to photocoupler

Check the setting values before use, since the forward current conditions at CTR measurement differ according to product.

When using products other than at the specified forward current, the characteristics curves may differ from the standard curves due to CTR value variations or the like. Therefore, check the characteristics under the actual operating conditions and thoroughly take variations or the like into consideration before use.

USAGE CAUTIONS

1. Protect against static electricity when handling.
2. Avoid storage at a high temperature and high humidity.

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| | | |
|----------------|---------------|---|
| Caution | GaAs Products | <p>This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points.</p> <ul style="list-style-type: none">• Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below. <ol style="list-style-type: none">1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials.2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal. <ul style="list-style-type: none">• Do not burn, destroy, cut, crush, or chemically dissolve the product.• Do not lick the product or in any way allow it to enter the mouth. |
|----------------|---------------|---|