

**4-PIN SOP, 2.2 Ω LOW ON-STATE RESISTANCE
1-ch Optical Coupled MOS FET****DESCRIPTION**

The PS7200H-1A is a low on-state capacitance solid state relay containing a GaAs LED on the light emitting side (input side) and MOS FETs on the output side.

It is suitable for high-frequency signal control, due to its low $C \times R$, low on-state resistance, and low off-state leakage current.

FEATURES

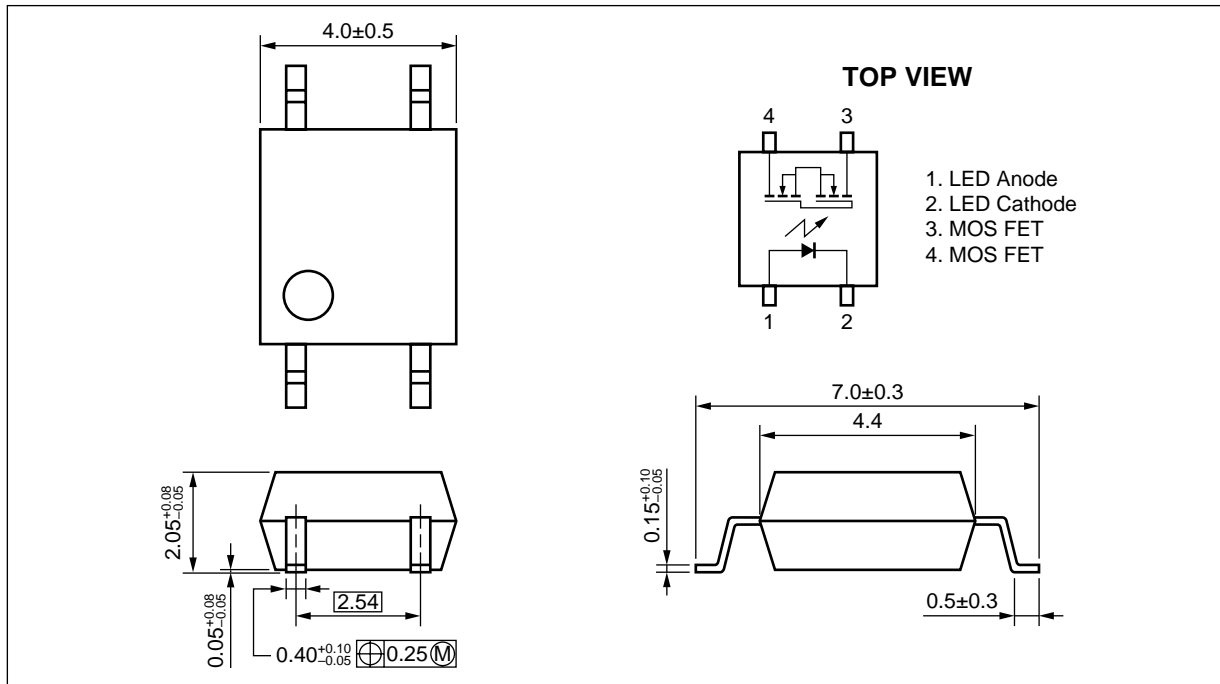
- Low $C \times R$ ($C \times R = 9.2 \text{ pF} \cdot \Omega$)
- Low on-state resistance ($R_{\text{on}} = 2.2 \Omega$ TYP.)
- Low output capacitance ($C_{\text{out}} = 4.2 \text{ pF}$ TYP.)
- Low off-state leakage current ($I_{\text{off}} = 0.03 \text{ nA}$ TYP.)
- High-speed turn-on time ($t_{\text{on}} = 0.04 \text{ ms}$ TYP.)
- 1 channel type (1 a output)
- Designed for AC/DC switching line changer
- Small and thin package (4-pin SOP, Height = 2.1 mm)
- High isolation voltage ($BV = 1\,500 \text{ Vr.m.s.}$)
- Low offset voltage
- Ordering number of taping product: PS7200H-1A-E3, E4, F3, F4

APPLICATIONS

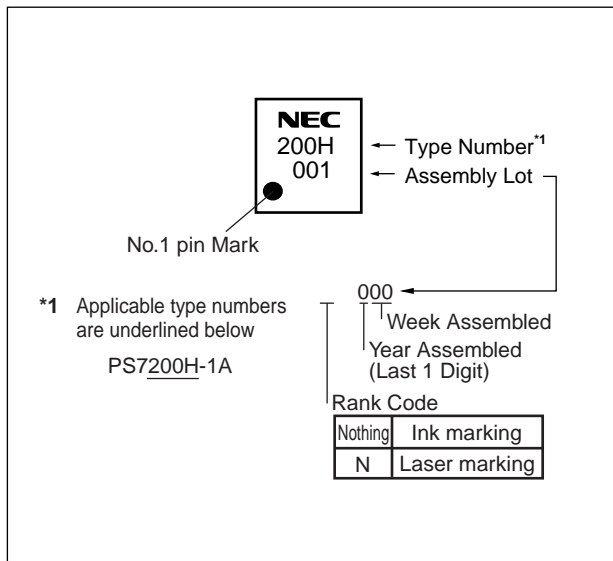
- Measurement equipment

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PACKAGE DIMENSIONS (UNIT: mm)



MARKING EXAMPLE



★ ORDERING INFORMATION

| Part Number | Package | Packing Style | Application Part Number ^{*1} |
|---------------|-----------|------------------------------|---------------------------------------|
| PS7200H-1A | 4-pin SOP | Magazine case 100 pcs | PS7200H-1A |
| PS7200H-1A-E3 | | Embossed Tape 900 pcs/reel | |
| PS7200H-1A-E4 | | | |
| PS7200H-1A-F3 | | Embossed Tape 3 500 pcs/reel | |
| PS7200H-1A-F4 | | | |

*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 | 50 | mA |
| | Reverse Voltage | V _R | 5.0 | V |
| | Power Dissipation | P _D | 50 | mW |
| | Peak Forward Current ^{*1} | I _{FP} | 1 | A |
| MOS FET | Break Down Voltage | V _L | 40 | V |
| | Continuous Load Current | I _L | 160 | mA |
| | Pulse Load Current ^{*2} (AC/DC Connection) | I _{LP} | 320 | mA |
| | Power Dissipation | P _D | 100 | mW |
| Isolation Voltage ^{*3} | | BV | 1 500 | Vr.m.s. |
| Total Power Dissipation | | P _T | 150 | mW |
| Operating Ambient Temperature | | T _A | -40 to +85 | °C |
| Storage Temperature | | T _{stg} | -40 to +100 | °C |

*1 PW = 100 μs, Duty Cycle = 1%

*2 PW = 100 ms, 1 shot

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

RECOMMENDED OPERATING CONDITIONS (T_A = 25°C)

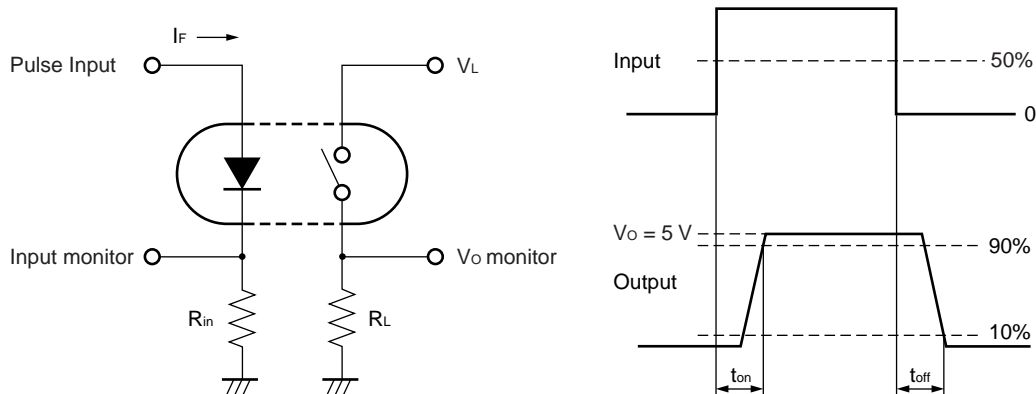
| Parameter | Symbol | MIN. | TYP. | MAX. | Unit |
|-----------------------|----------------|------|------|------|------|
| LED Operating Current | I _F | 2 | 10 | 20 | mA |
| LED Off Voltage | V _F | 0 | | 0.5 | V |

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

| Parameter | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|-----------|-------------------------------|-------------------|---|------|-----------------|------|------|
| Diode | Forward Voltage | V _F | I _F = 10 mA | | 1.2 | 1.4 | V |
| | Reverse Current | I _R | V _R = 5 V | | | 5.0 | μA |
| MOS FET | Off-state Leakage Current | I _{Loff} | V _D = 40 V | | 0.03 | 10 | nA |
| | Output Capacitance | C _{out} | V _D = 0 V, f = 1 MHz | | 4.2 | | pF |
| Coupled | LED On-state Current | I _{Fon} | I _L = 160 mA | | | 2.0 | mA |
| | On-state Resistance | R _{on1} | I _F = 10 mA, I _L = 50 mA | | 2.2 | 3.5 | Ω |
| | | R _{on2} | I _F = 10 mA, I _L = 160 mA, t ≤ 10 ms | | 2.2 | 3.5 | |
| | Turn-on Time ^{*1,2} | t _{on} | I _F = 10 mA, V _O = 5 V, R _L = 500 Ω, PW ≥ 10 ms | | 0.04 | 0.5 | ms |
| | Turn-off Time ^{*1,2} | t _{off} | | | 0.25 | 1.0 | |
| | Isolation Resistance | R _{I-O} | V _{I-O} = 1.0 kV _{DC} | | 10 ⁹ | | Ω |
| | Isolation Capacitance | C _{I-O} | V = 0 V, f = 1 MHz | | | 0.4 | pF |

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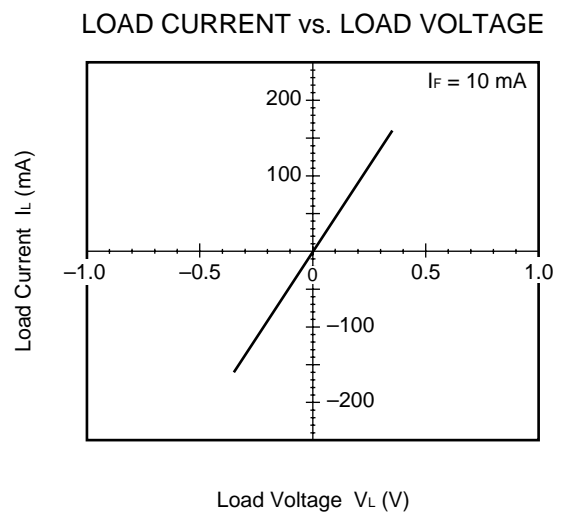
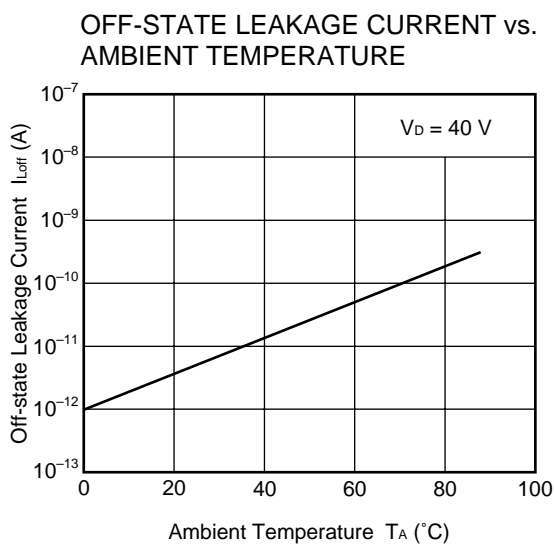
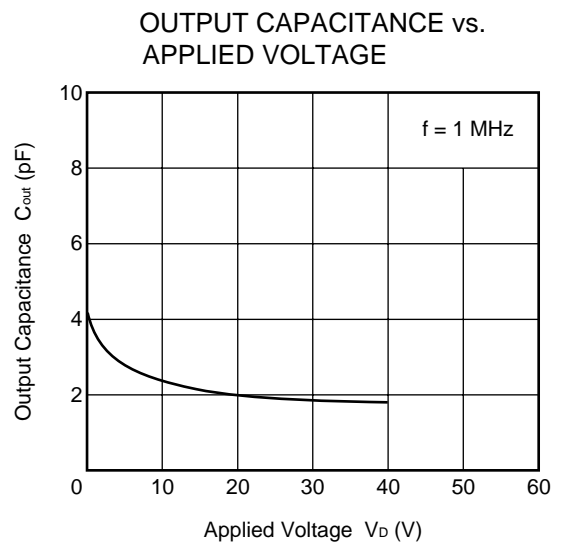
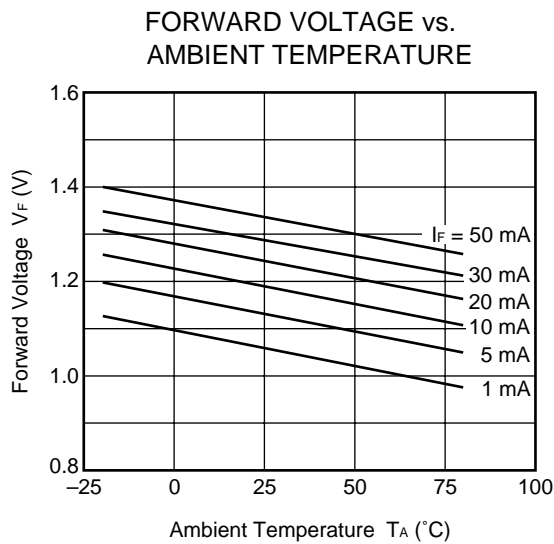
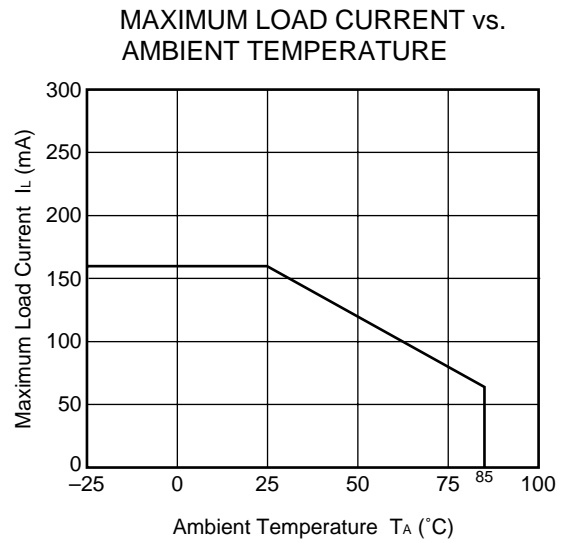
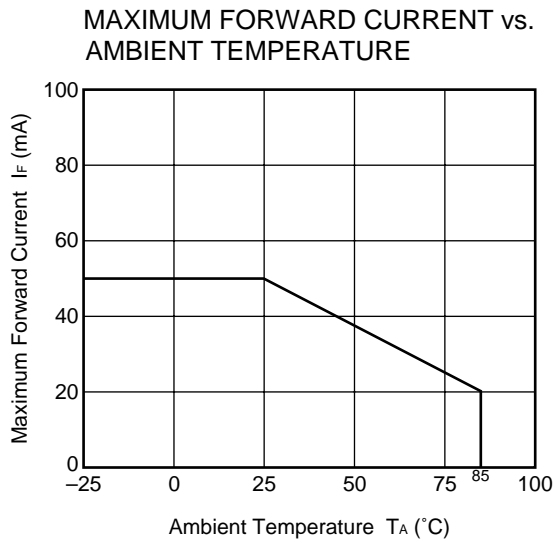
*1 Test Circuit for Switching Time



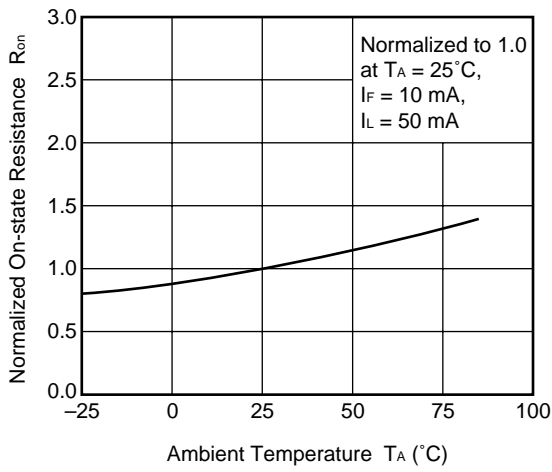
*2 The turn-on time and turn-off time are specified as input-pulse width ≥ 10 ms.

Be aware that when the device operates with an input-pulse width of under 10 ms, the turn-on time and turn-off time will increase.

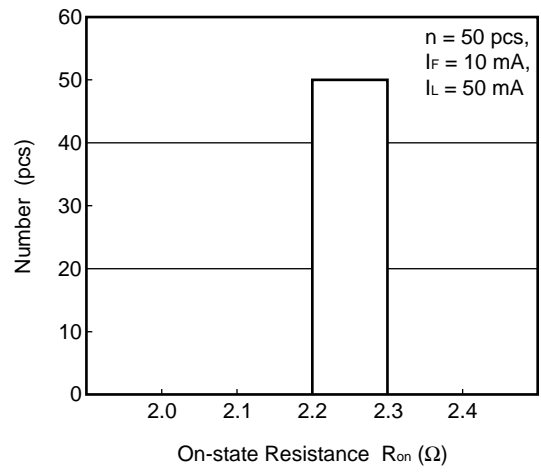
★ TYPICAL CHARACTERISTICS (T_A = 25°C, unless otherwise specified)



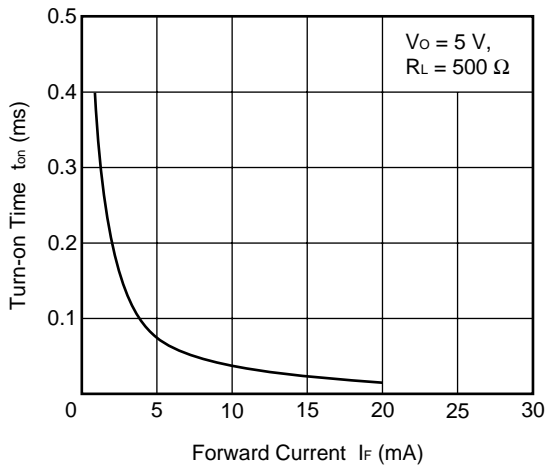
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



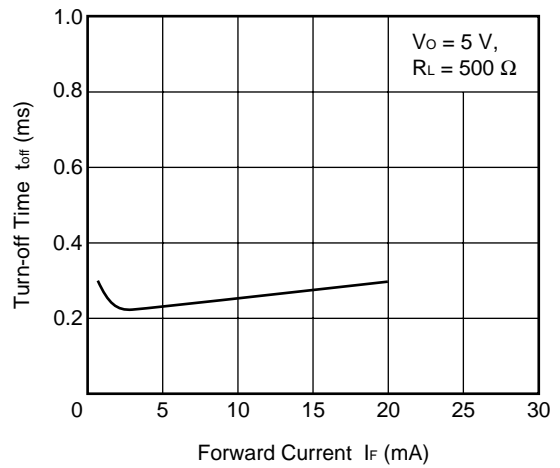
ON-STATE RESISTANCE DISTRIBUTION



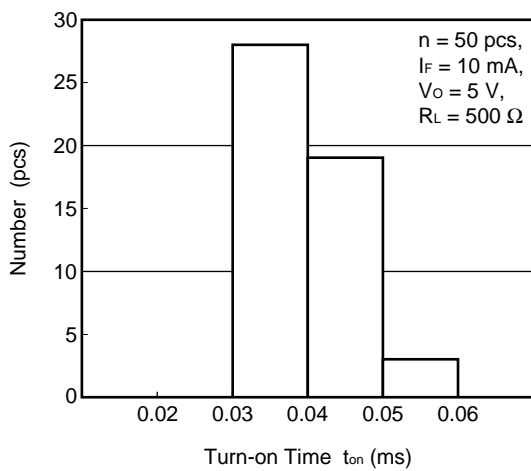
TURN-ON TIME vs. FORWARD CURRENT



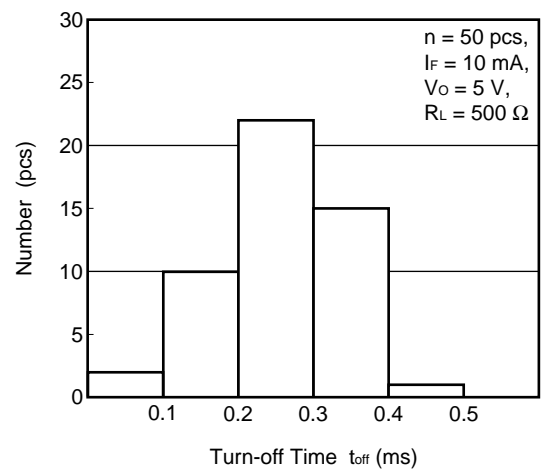
TURN-OFF TIME vs. FORWARD CURRENT



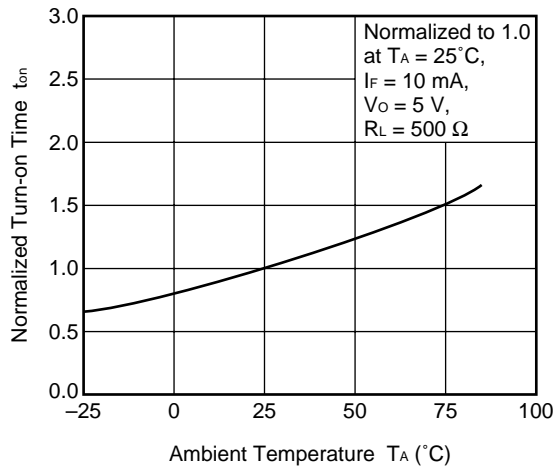
TURN-ON TIME DISTRIBUTION



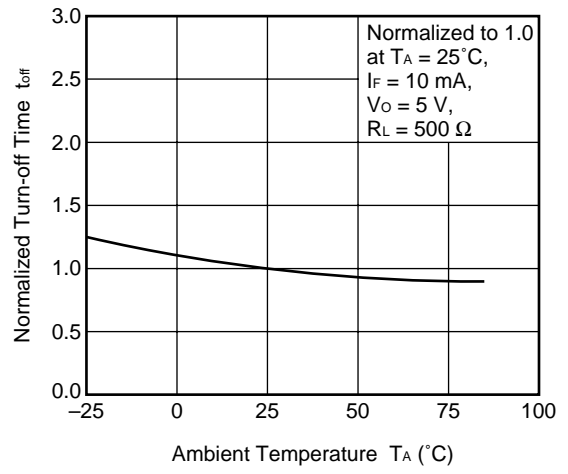
TURN-OFF TIME DISTRIBUTION



NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE



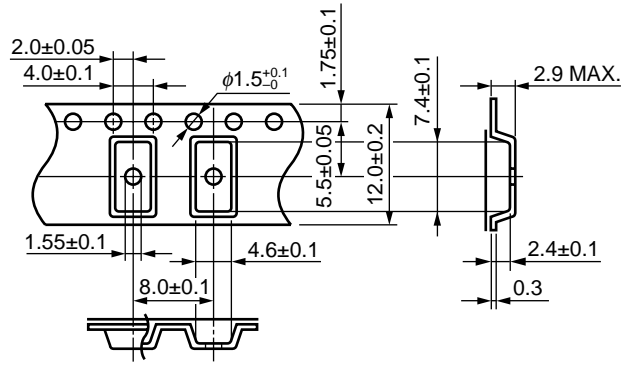
NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE



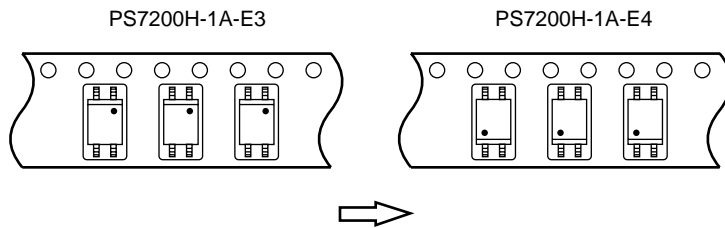
Remark The graphs indicate nominal characteristics.

★ TAPING SPECIFICATIONS (UNIT: mm)

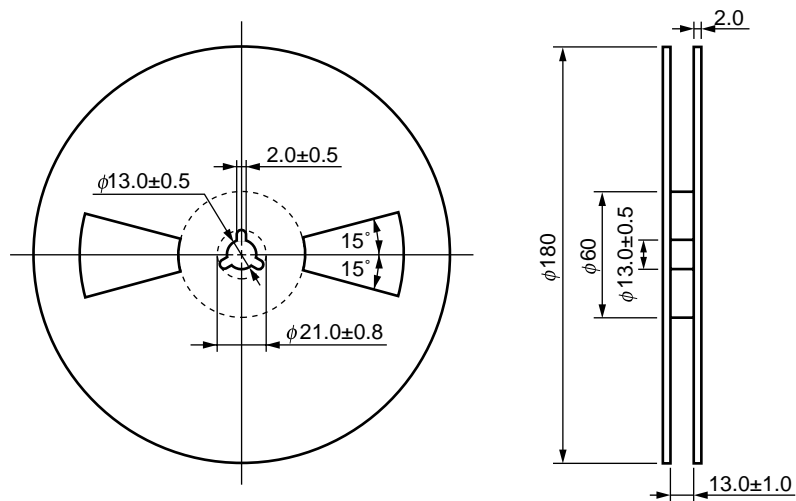
Outline and Dimensions (Tape)



Tape Direction

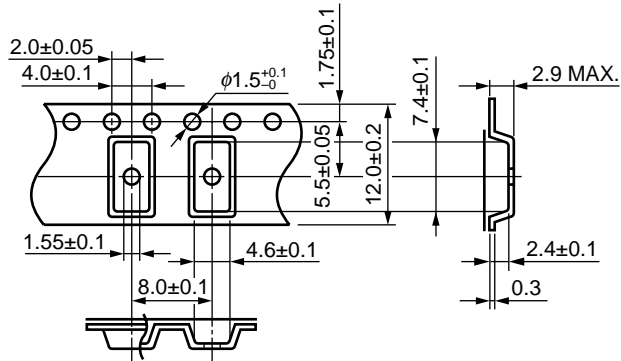


Outline and Dimensions (Reel)

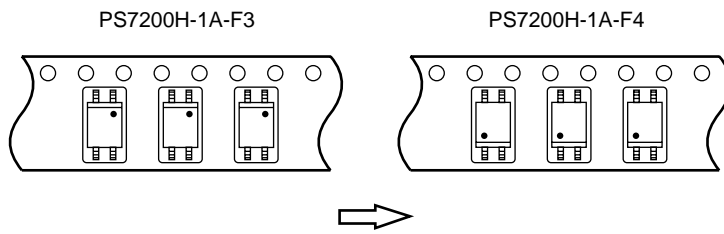


Packing: 900 pcs/reel

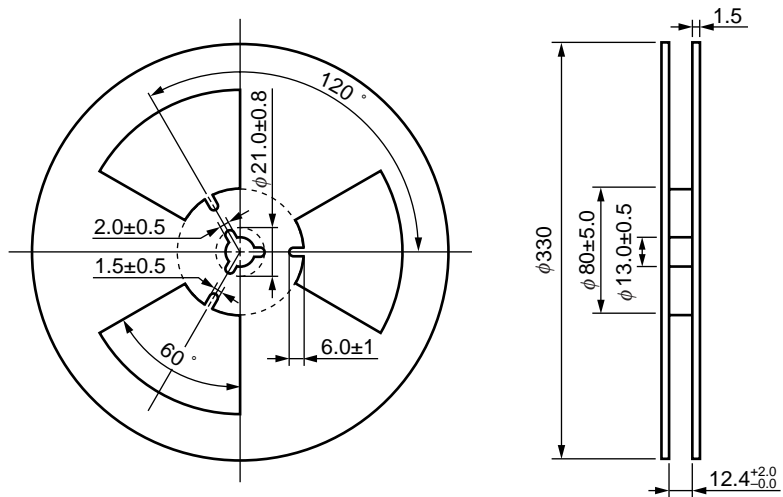
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



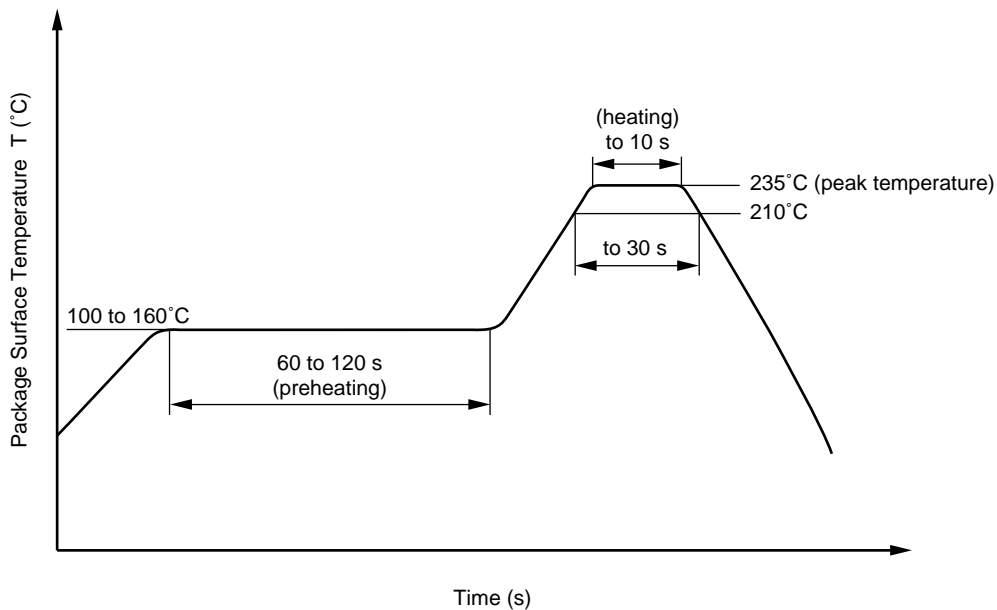
Packing: 3 500 pcs/reel

★ **RECOMMENDED SOLDERING CONDITIONS**

(1) Infrared reflow soldering

- Peak reflow temperature 235°C or below (package surface temperature)
- Time of temperature higher than 210°C 30 seconds or less
- Number of reflows Two
- 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 100°C or below (package surface temperature)
- Number of times One
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt % is recommended.)

(3) Cautions

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

[MEMO]

SAFETY INFORMATION ON THIS PRODUCT

| | | |
|-----------------------|----------------------|---|
| <p>Caution</p> | <p>GaAs Products</p> | <p>The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested.</p> <ul style="list-style-type: none"> • Do not destroy or burn the product. • Do not cut or cleave off any part of the product. • Do not crush or chemically dissolve the product. • Do not put the product in the mouth. <p>Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.</p> |
|-----------------------|----------------------|---|

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M8E 00.4