

**NEC**

Solid State Relay  
OCMOS FET

**PS7200A-1A**

**4-PIN SOP 3.0 pF LOW OUTPUT CAPACITANCE  
1-ch Optical Coupled MOS FET**

**DESCRIPTION**

The PS7200A-1A is a low output capacitance solid state relay containing GaAs LEDs 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 output capacitance, and low off-state leakage current.

★ **FEATURES**

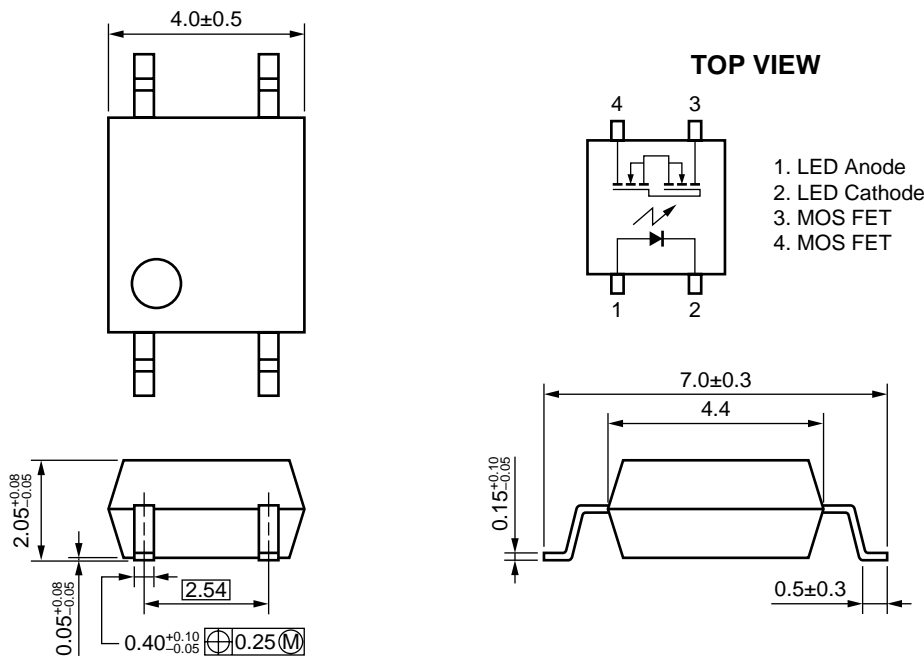
- Low  $C \times R$  ( $C \times R = 30 \text{ pF} \cdot \Omega$ )
- Low output capacitance ( $C_{\text{out}} = 3.0 \text{ pF TYP.}$ )
- Low off-state leakage current ( $I_{\text{Loff}} = 0.1 \text{ nA TYP.}$ )
- High-speed turn-on time ( $t_{\text{on}} = 0.01 \text{ ms TYP.}$ )
- 1 channel type (1 a output)
- Low LED operating current ( $I_{\text{F}} = 2 \text{ mA}$ )
- Designed for AC/DC switching line changer
- Small and thin package (4-pin SOP, Height = 2.1 mm)
- Low offset voltage
- Ordering number of taping product: PS7200A-1A-E3, E4, F3, F4
- UL approved: File No. E72422 (S)
- BSI approved: No. 8241/8242
- CSA approved: No. CA 101391

**APPLICATIONS**

- Measurement equipment

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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

**PACKAGE DIMENSIONS**  
in millimeters



★ ORDERING INFORMATION

Part Number	Package	Packing Style	Application Part Number <sup>*1</sup>
PS7200A-1A	4-pin SOP	Magazine case 100 pcs	PS7200A-1A
PS7200A-1A-E3		Embossed Tape 900 pcs/reel	
PS7200A-1A-E4			
PS7200A-1A-F3		Embossed Tape 3 500 pcs/reel	
PS7200A-1A-F4			

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

**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C, unless otherwise specified)**

Parameter		Symbol	Ratings	Unit
Diode	Forward Current (DC)	I <sub>F</sub>	50	mA
	Reverse Voltage	V <sub>R</sub>	5.0	V
	Power Dissipation	P <sub>D</sub>	50	mW
	Peak Forward Current <sup>*1</sup>	I <sub>FP</sub>	1	A
MOS FET	Break Down Voltage	V <sub>L</sub>	40	V
	Continuous Load Current	I <sub>L</sub>	100	mA
	Pulse Load Current <sup>*2</sup> (AC/DC Connection)	I <sub>LP</sub>	200	mA
	Power Dissipation	P <sub>D</sub>	100	mW
Isolation Voltage <sup>*3</sup>		BV	1 500	Vr.m.s.
Total Power Dissipation		P <sub>T</sub>	150	mW
Operating Ambient Temperature		T <sub>A</sub>	-40 to +80	°C
Storage Temperature		T <sub>stg</sub>	-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<sub>A</sub> = 25 °C, RH = 60 % between input and output

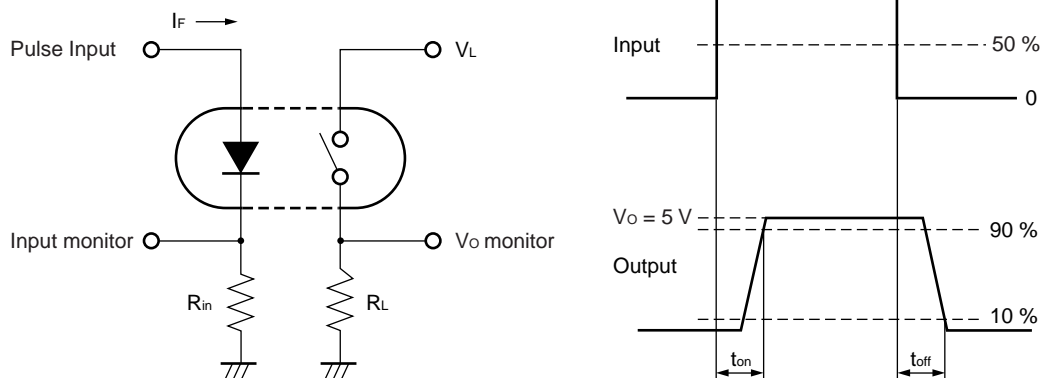
RECOMMENDED OPERATING CONDITIONS (T<sub>A</sub> = 25 °C)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
LED Operating Current	I <sub>F</sub>	2	10	20	mA
LED Off Voltage	V <sub>F</sub>	0		0.5	V

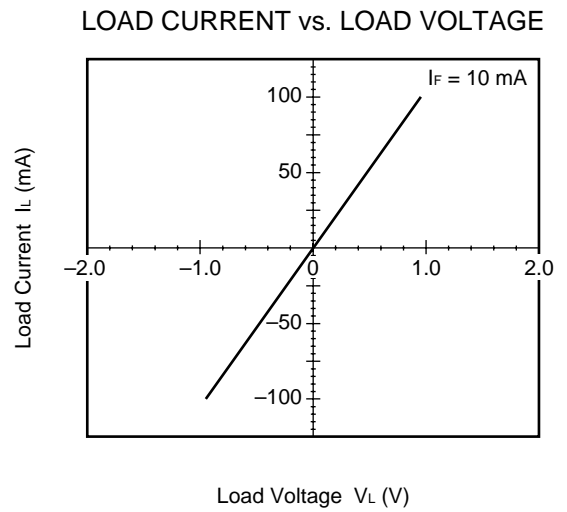
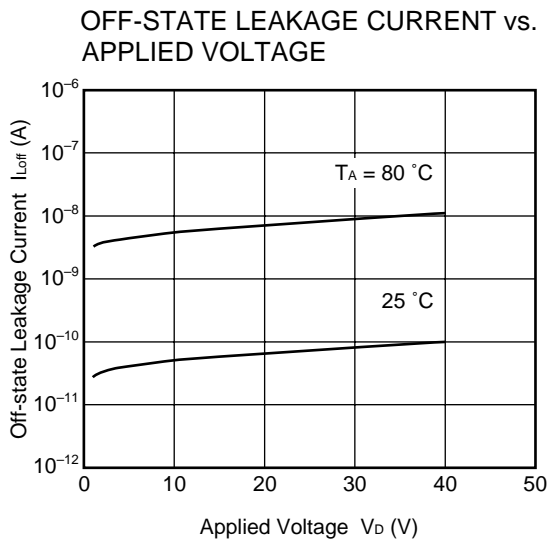
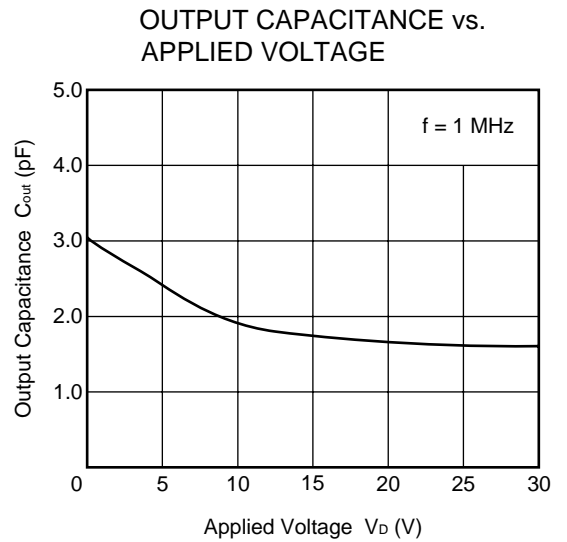
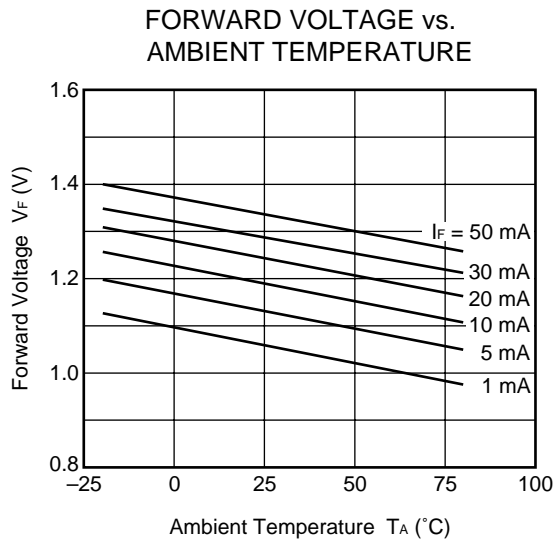
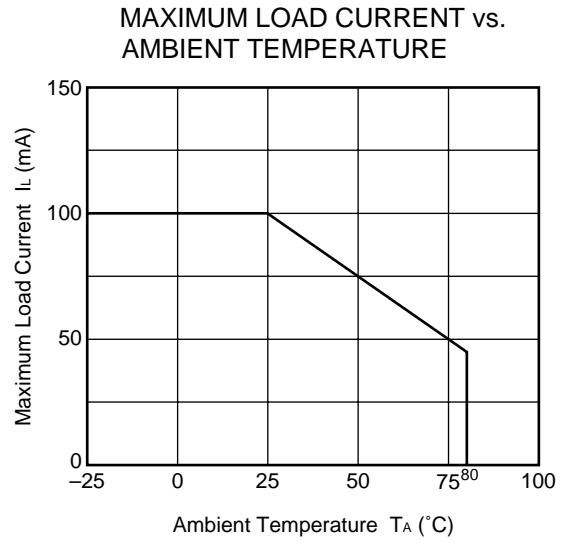
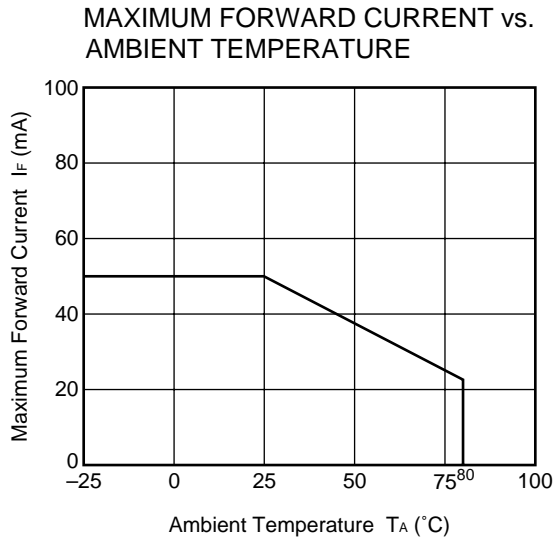
★ ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10 mA		1.2	1.4	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5 V			5.0	μA
MOS FET	Off-state Leakage Current	I <sub>Loff</sub>	V <sub>D</sub> = 40 V		0.1	100	nA
	Output Capacitance	C <sub>out</sub>	V <sub>D</sub> = 0 V, f = 1 MHz		3.0		pF
Coupled	LED On-state Current	I <sub>Fon</sub>	I <sub>L</sub> = 100 mA			2.0	mA
	On-state Resistance	R <sub>on1</sub>	I <sub>F</sub> = 10 mA, I <sub>L</sub> = 10 mA		9.3	12	Ω
		R <sub>on2</sub>	I <sub>F</sub> = 10 mA, I <sub>L</sub> = 100 mA, t ≤ 10 ms				
	Turn-on Time <sup>*1</sup>	t <sub>on</sub>	I <sub>F</sub> = 10 mA, V <sub>O</sub> = 5 V, PW ≥ 10 ms		0.01	0.5	ms
	Turn-off Time <sup>*1</sup>	t <sub>off</sub>			0.07	0.2	
	Isolation Resistance	R <sub>I-O</sub>	V <sub>I-O</sub> = 1.0 kV <sub>DC</sub>	10 <sup>9</sup>			Ω
Isolation Capacitance	C <sub>I-O</sub>	V = 0 V, f = 1 MHz		0.5		pF	

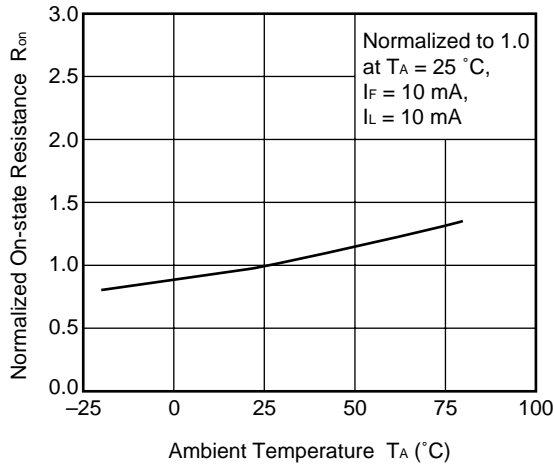
\*1 Test Circuit for Switching Time



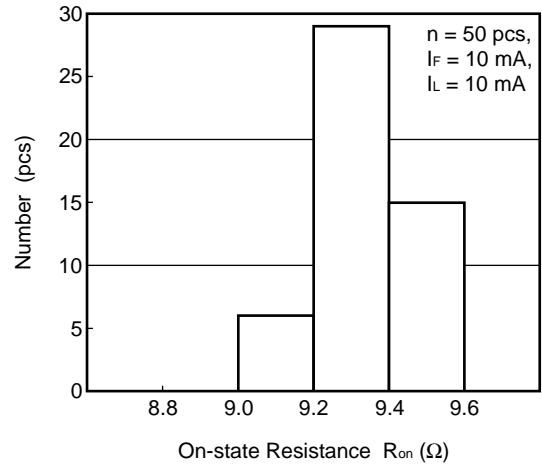
★ TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C, unless otherwise specified)



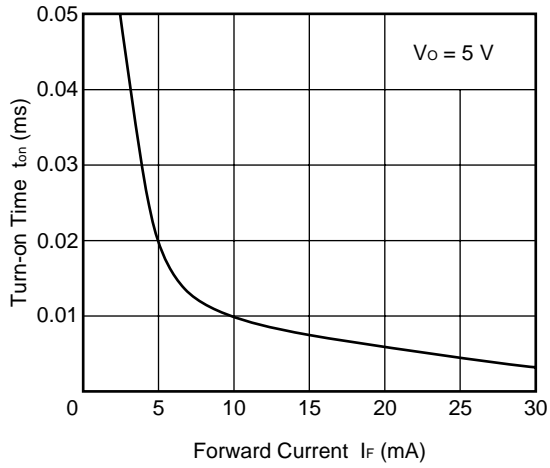
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



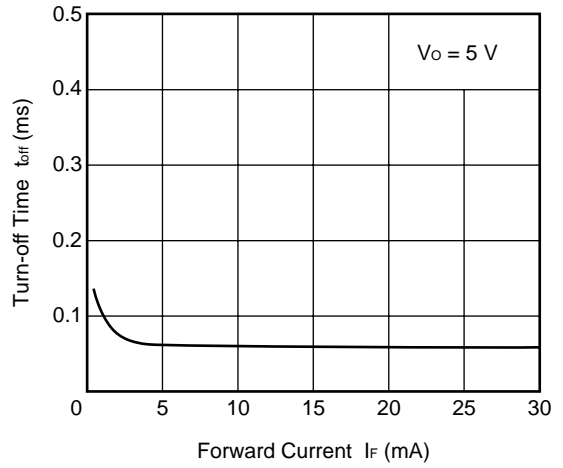
ON-STATE RESISTANCE DISTRIBUTION



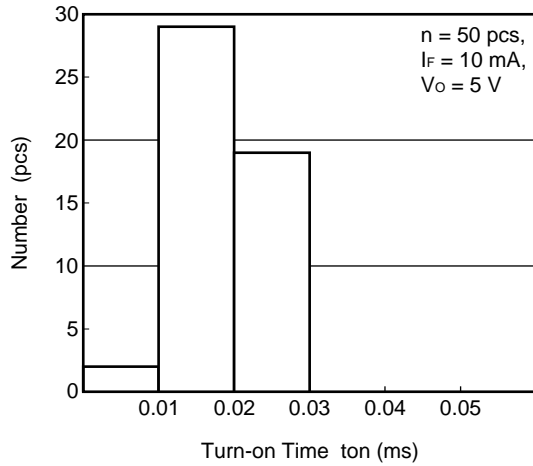
TURN-ON TIME vs. FORWARD CURRENT



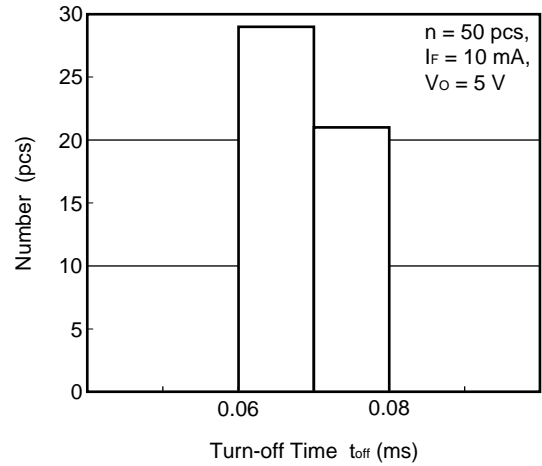
TURN-OFF TIME vs. FORWARD CURRENT



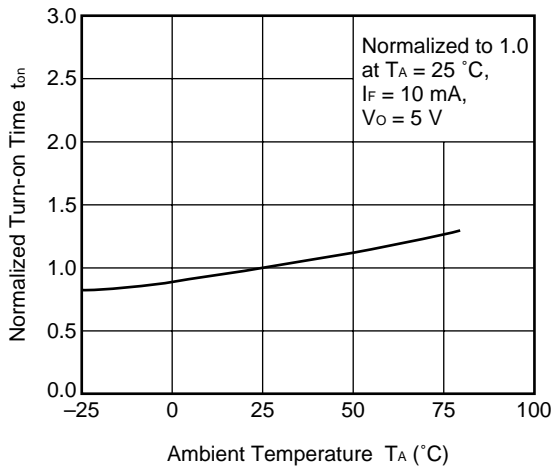
TURN-ON TIME DISTRIBUTION



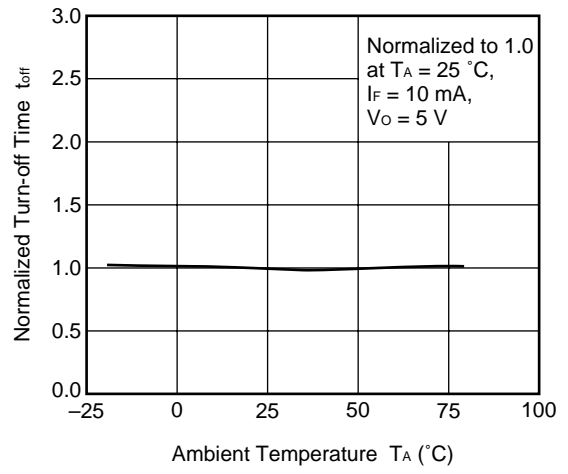
TURN-OFF TIME DISTRIBUTION



NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE



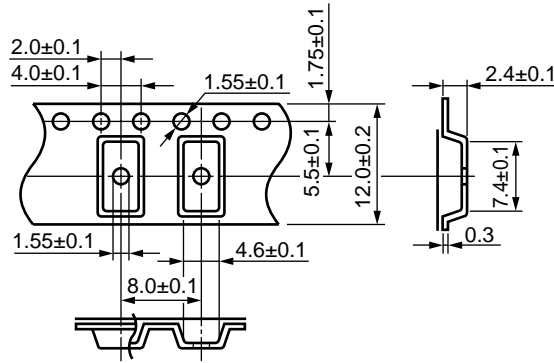
NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE



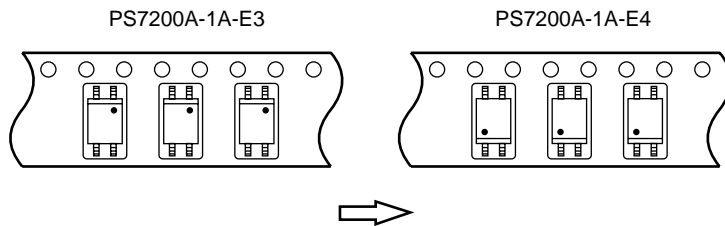
**Remark** The graphs indicate nominal characteristics.

★ TAPING SPECIFICATIONS (in millimeters)

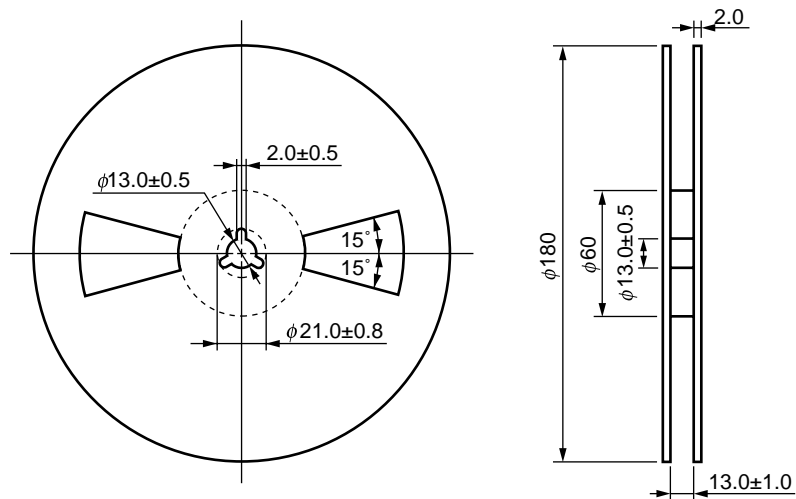
Outline and Dimensions (Tape)



Tape Direction



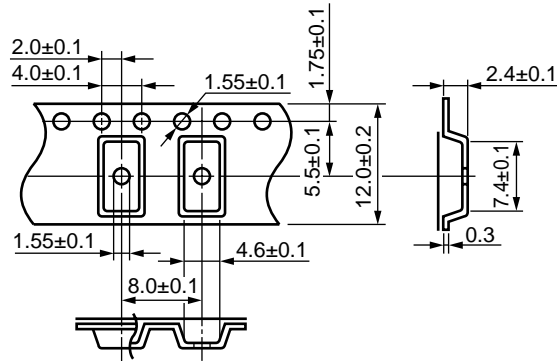
Outline and Dimensions (Reel)



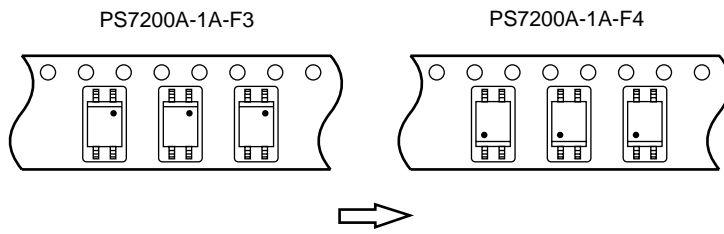
Packing: 900 pcs/reel



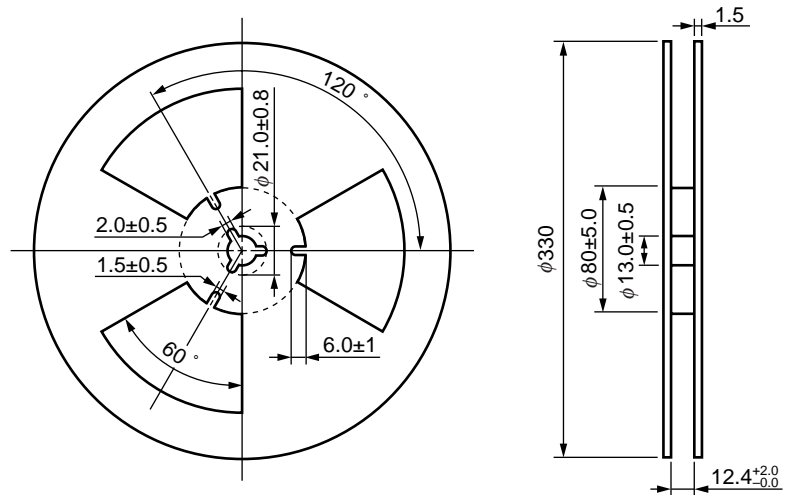
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



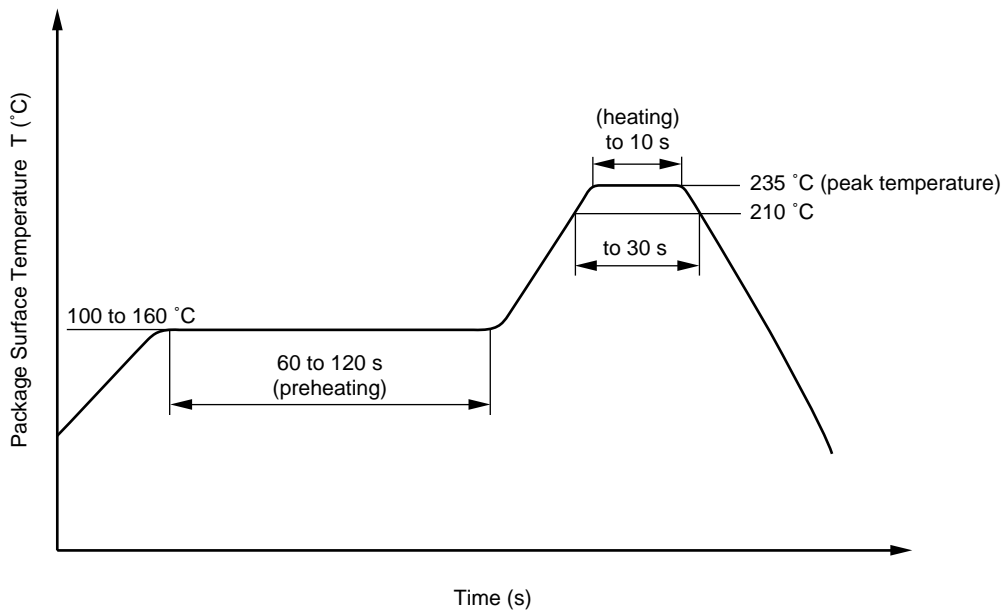
Packing: 3 500 pcs/reel

★ **RECOMMENDED SOLDERING CONDITIONS**

**(1) Infrared reflow soldering**

- Peak reflow temperature 235 °C (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) Dip soldering**

- Temperature 260 °C or below (molten solder temperature)
- Time 10 seconds or less
- 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]

## CAUTION

**Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.**

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