

**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

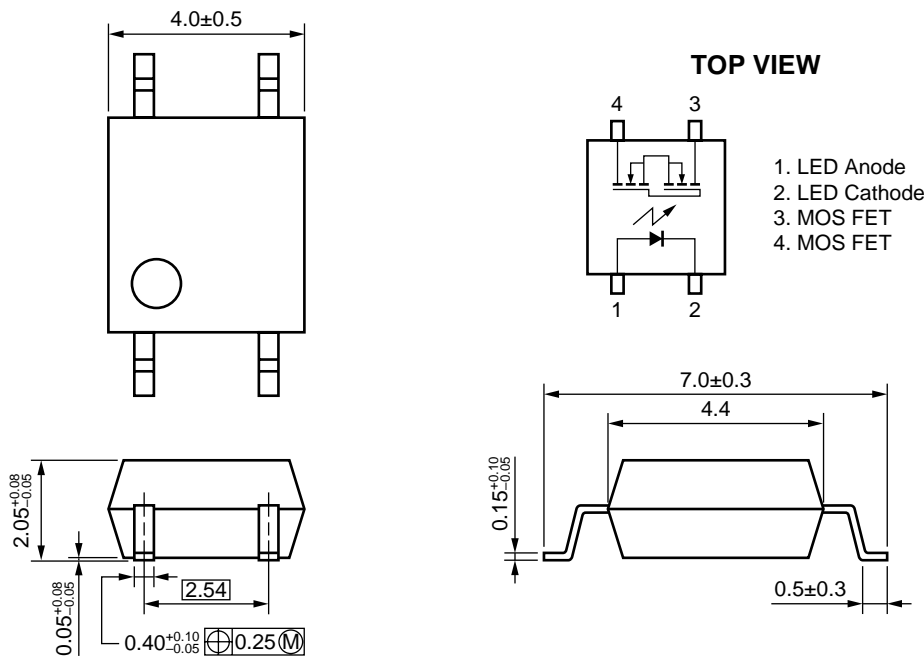
- Low $C \times R$ ($C \times R = 30 \text{ pF} \cdot \Omega$)
- Low output capacitance ($C_{\text{out}} = 3.0 \text{ pF TYP.}$)
- Low off-state leakage current ($I_{\text{Loff}} = 0.1 \text{ nA TYP.}$)
- High-speed turn-on time ($t_{\text{on}} = 0.01 \text{ ms TYP.}$)
- 1 channel type (1 a output)
- 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 ^{*1}
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_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	100	mA
	Pulse Load Current ^{*2} (AC/DC Connection)	I _{LP}	200	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 +80	°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

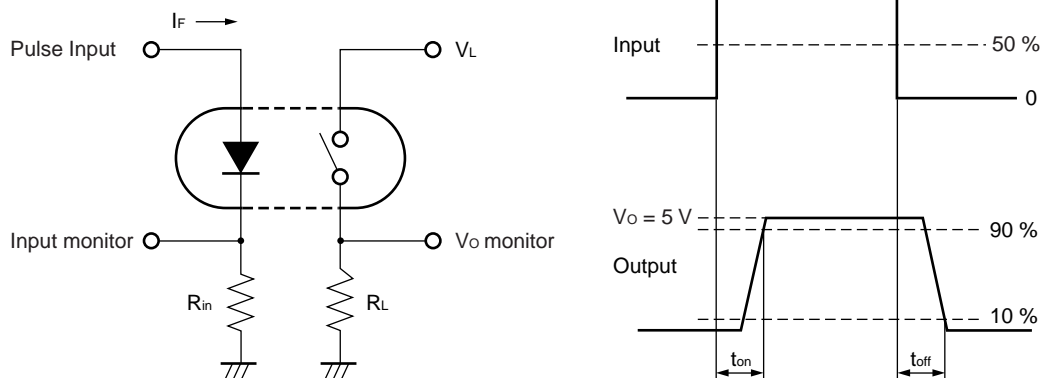
RECOMMENDED OPERATING CONDITIONS (T_A = 25 °C)

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)**

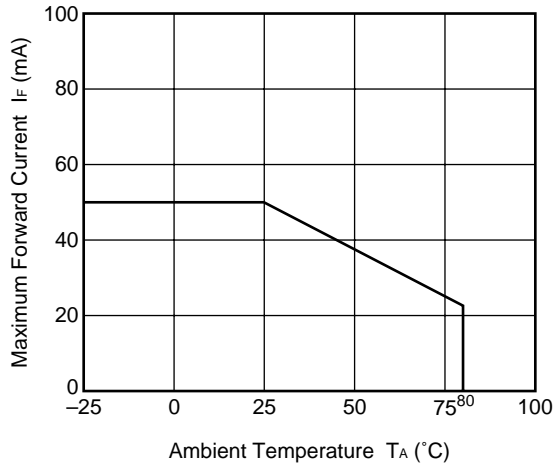
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V _F	I _F = 10 mA		1.2	1.4	V
	Reverse Current	I _R	V _R = 5 V			5.0	μA
MOS FET	Off-state Leakage Current	I _{Loff}	V _D = 40 V		0.1	100	nA
	Output Capacitance	C _{out}	V _D = 0 V, f = 1 MHz		3.0		pF
Coupled	LED On-state Current	I _{Fon}	I _L = 100 mA			2.0	mA
	On-state Resistance	R _{on1}	I _F = 10 mA, I _L = 10 mA		9.3	12	Ω
		R _{on2}	I _F = 10 mA, I _L = 100 mA, t ≤ 10 ms				
	Turn-on Time ^{*1}	t _{on}	I _F = 10 mA, V _O = 5 V, PW ≥ 10 ms		0.01	0.5	ms
	Turn-off Time ^{*1}	t _{off}			0.07	0.2	
	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		0.5		pF

*1 Test Circuit for Switching Time

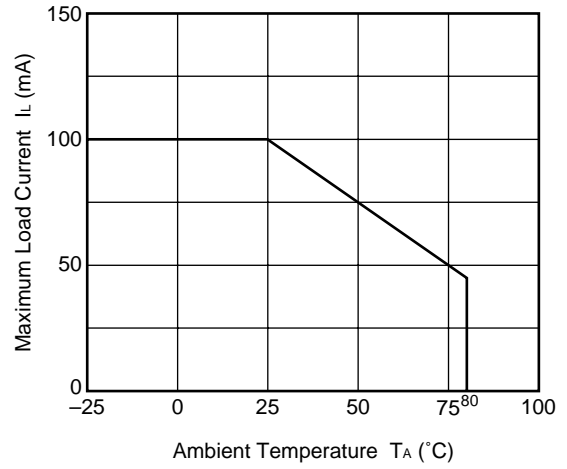


★ TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified)

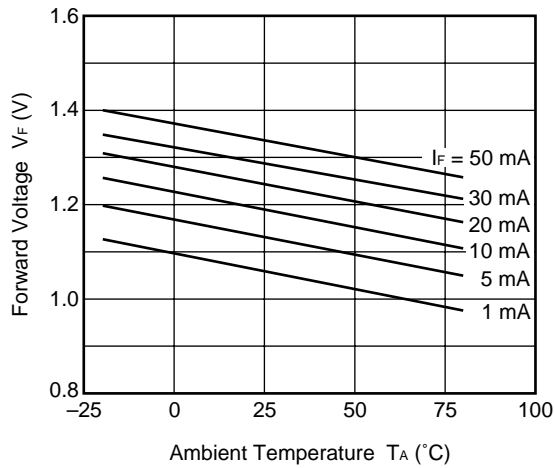
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



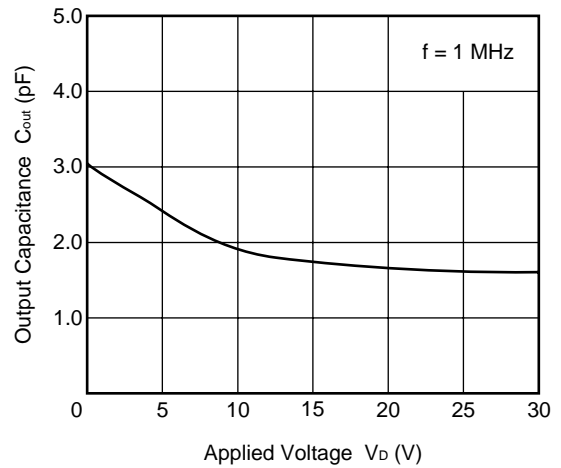
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



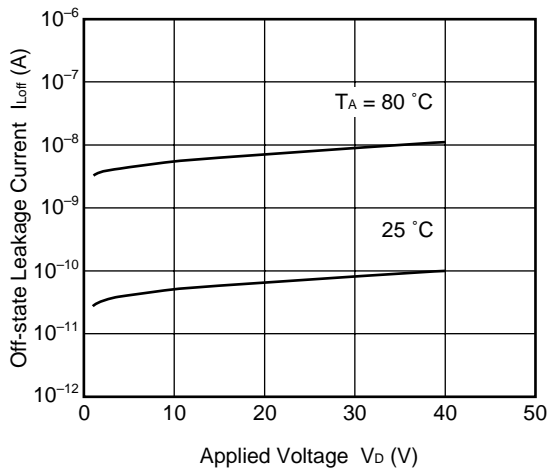
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



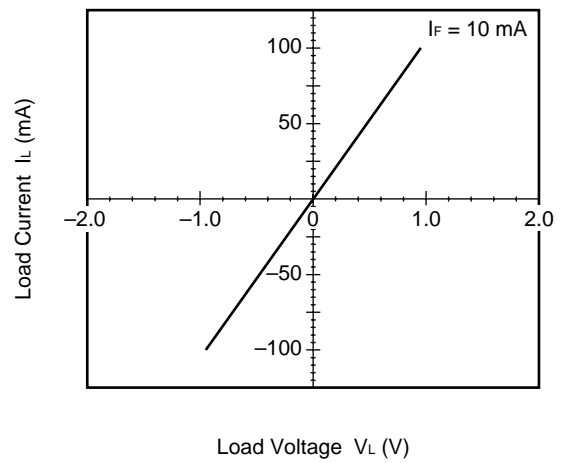
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



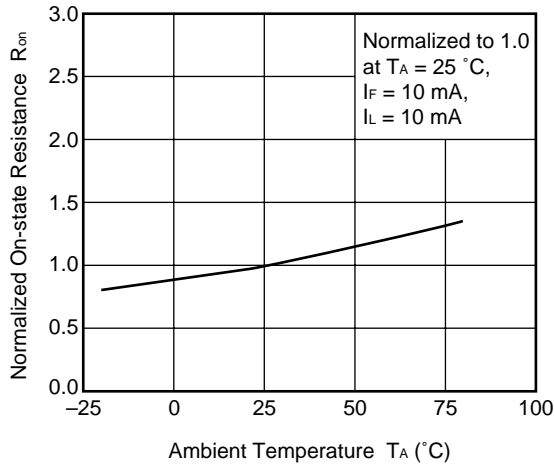
OFF-STATE LEAKAGE CURRENT vs. APPLIED VOLTAGE



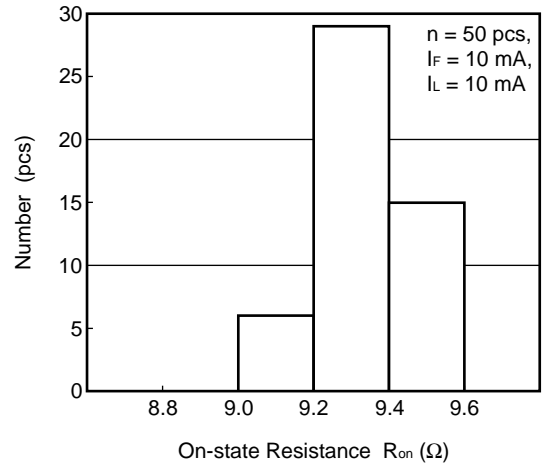
LOAD CURRENT vs. LOAD VOLTAGE



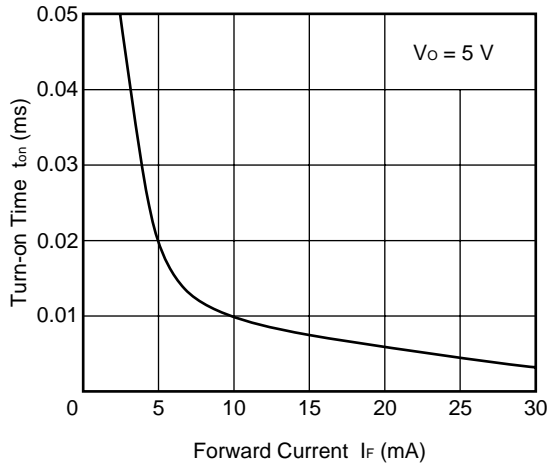
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



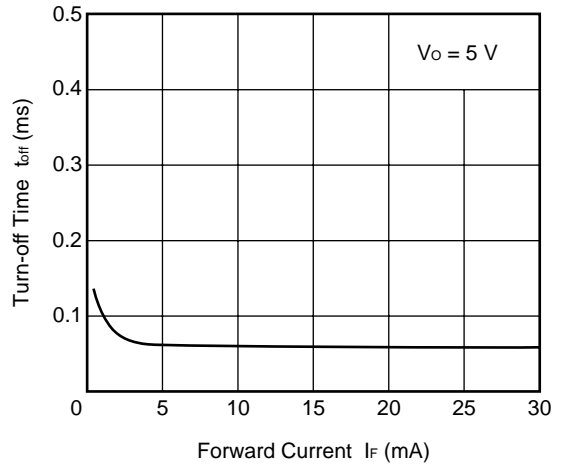
ON-STATE RESISTANCE DISTRIBUTION



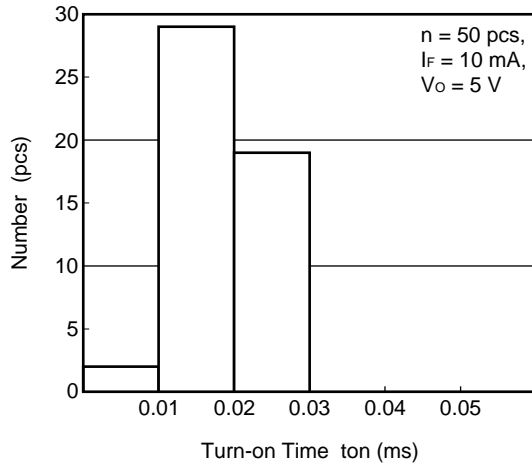
TURN-ON TIME vs. FORWARD CURRENT



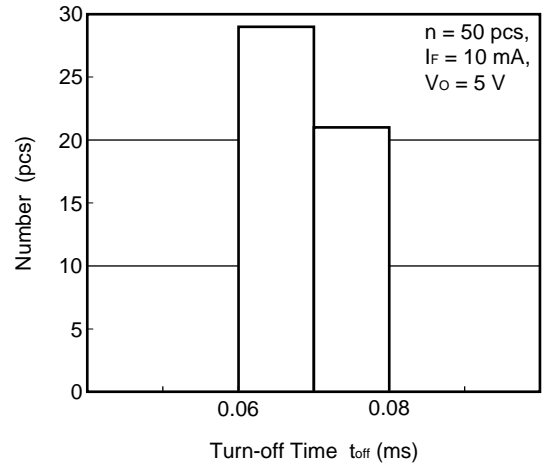
TURN-OFF TIME vs. FORWARD CURRENT



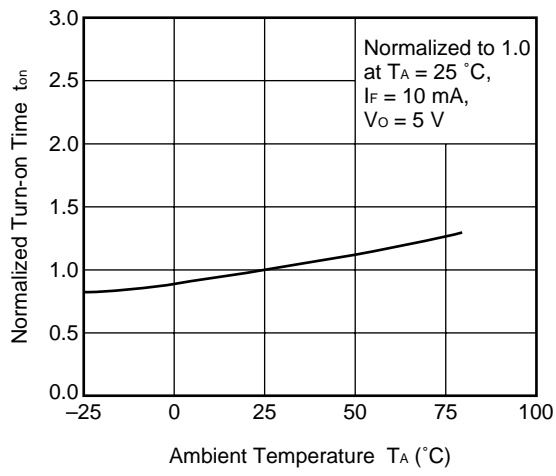
TURN-ON TIME DISTRIBUTION



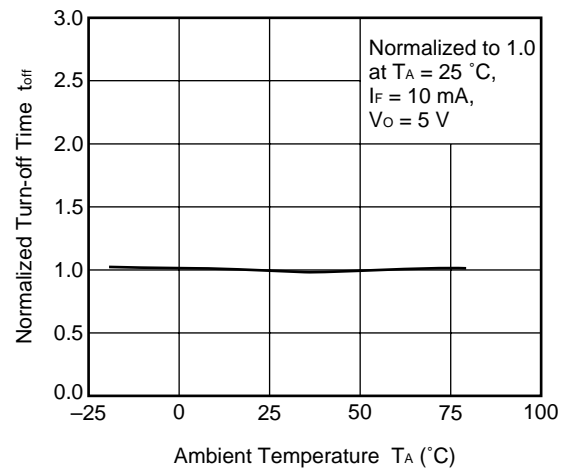
TURN-OFF TIME DISTRIBUTION



NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE



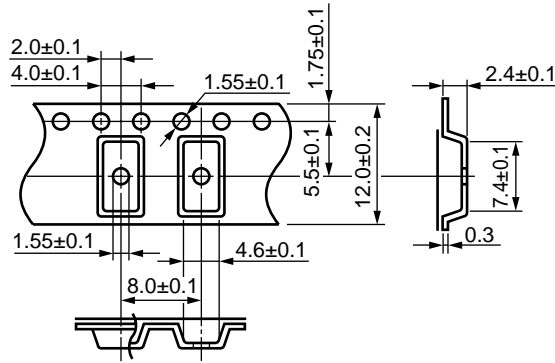
NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE



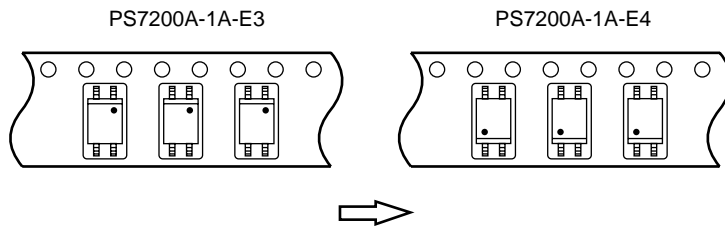
Remark The graphs indicate nominal characteristics.

★ TAPING SPECIFICATIONS (in millimeters)

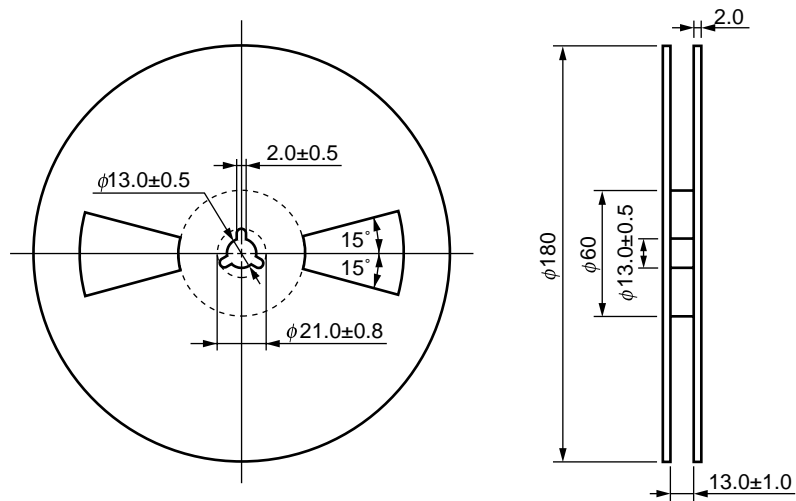
Outline and Dimensions (Tape)



Tape Direction

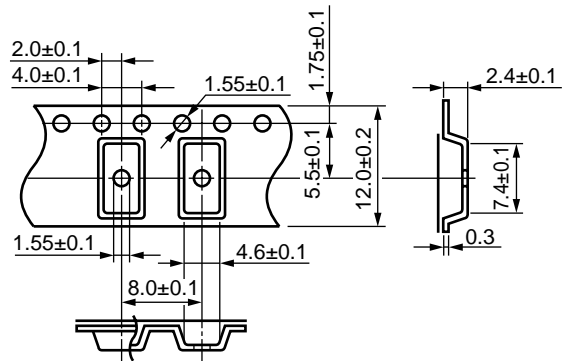


Outline and Dimensions (Reel)

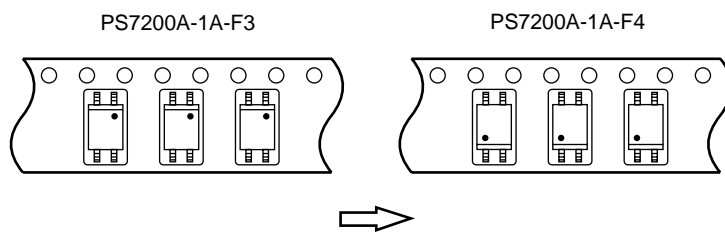


Packing: 900 pcs/reel

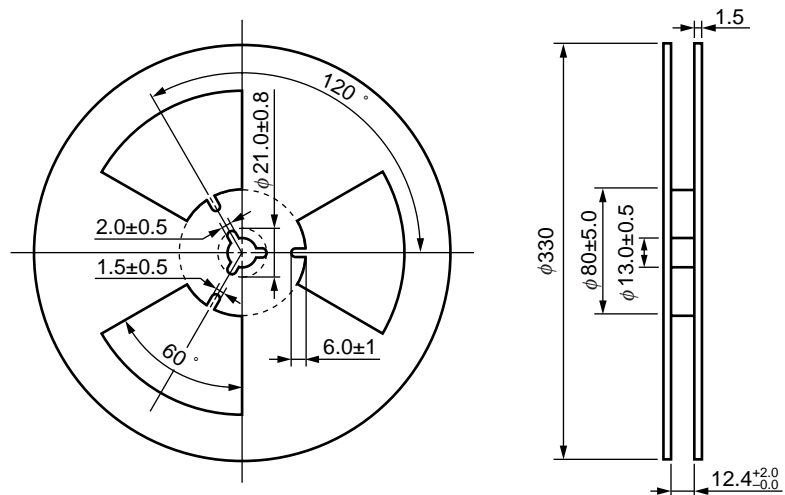
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



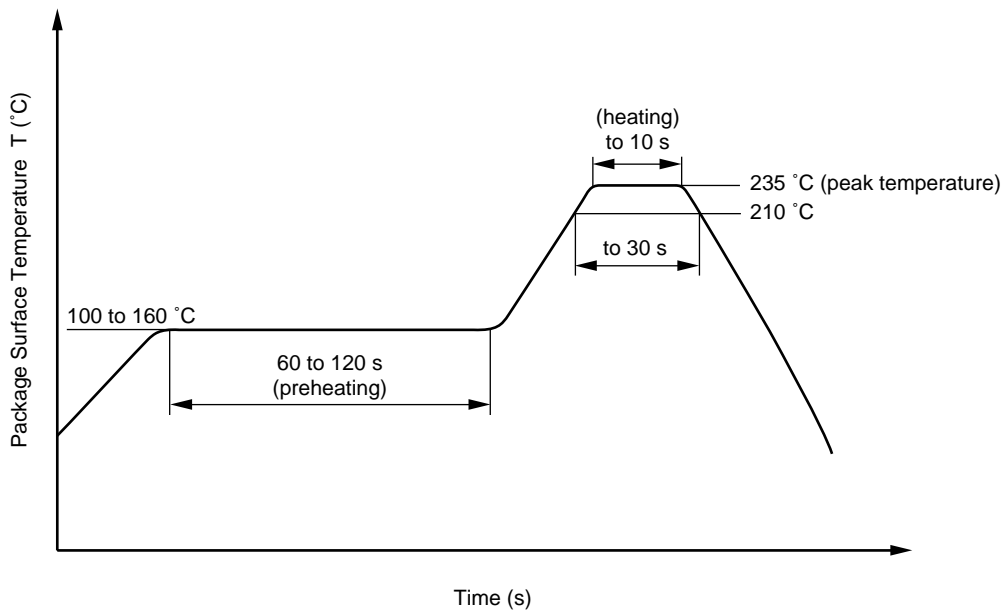
Packing: 3 500 pcs/reel

★ **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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