To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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Solid State Relay
OCMOS FET

PS7200J-1A

4-PIN SOP 1.7 pF LOW OUTPUT CAPACITANCE 1-ch Optical Coupled MOS FET

DESCRIPTION

The PS7200J-1A is a low output capacitance solid state relay containing a 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 × R, low output capacitance, and low off-state leakage current.

★ FEATURES

- Low C × R (C × R = 15 pF • Ω)
- Low output capacitance (C_{out} = 1.7 pF TYP.)
- Low off-state leakage current (I_{Loff} = 0.02 nA TYP.)
- High-speed turn-on time (t_{on} = 20 μs TYP.)
- 1 channel type (1 a output)
- Low LED operating current (I_F = 2 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: PS7200J-1A-E3, E4, F3, F4
- UL approved: File No. E72422 (S)
- BSI approved: No. 8241/8242
- CSA approved: CA 101391

APPLICATIONS

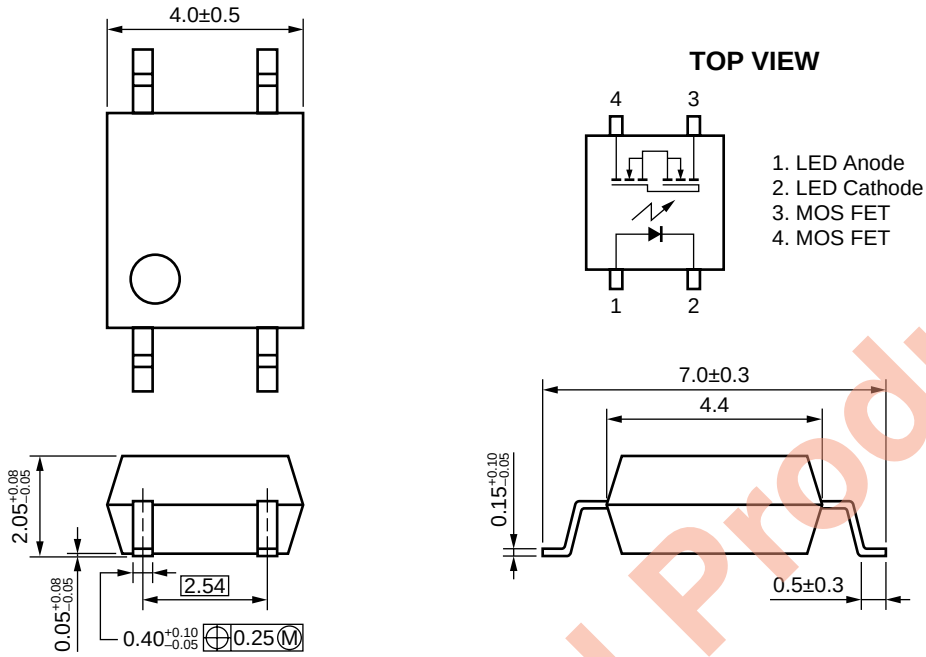
- Measurement equipment

Document No. P13561EJ7V0DS00 (7th edition)
Date Published October 1999 NS CP(K)
Printed in Japan

The mark ★ shows major revised points.

★

PACKAGE DIMENSIONS
in millimeters



★ ORDERING INFORMATION

Part Number	Package	Packing Style	Application Part Number*1
PS7200J-1A	4-pin SOP	Magazine case 100 pcs	PS7200J-1A
PS7200J-1A-E3		Embossed Tape 900 pcs/reel	
PS7200J-1A-E4			
PS7200J-1A-F3		Embossed Tape 3 500 pcs/reel	
PS7200J-1A-F4			

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

ABSOLUTE MAXIMUM RATINGS (TA = 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

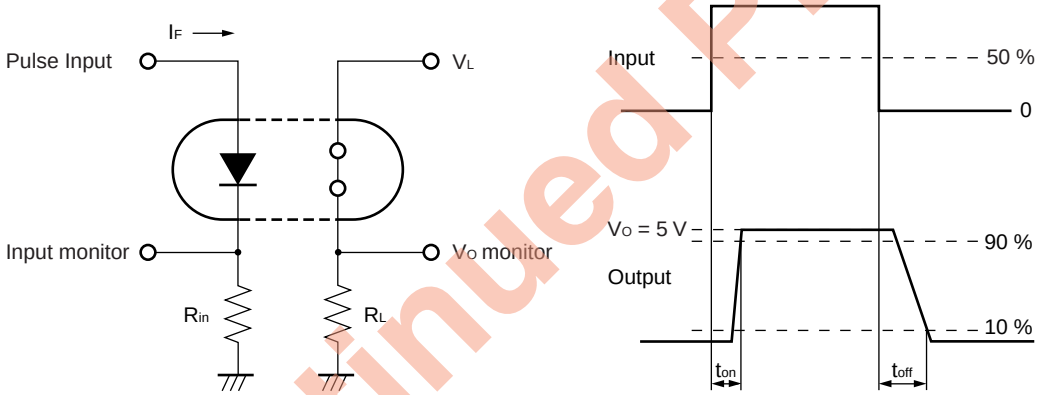
RECOMMENDED OPERATING CONDITIONS (T_A = 25 °C)

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)

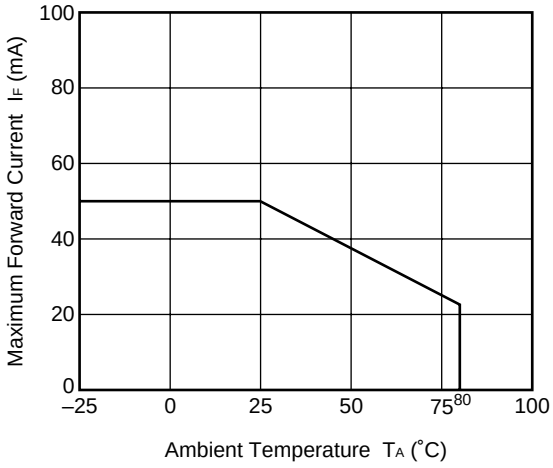
	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 10 mA		1.2	1.4	V
	Reverse Current	I_R	V_R = 5 V			5.0	μA
MOS FET	Off-state Leakage Current	I_{Loff}	V_D = 40 V		0.02	100	nA
	Output Capacitance	C_{out}	V_D = 0 V, f = 1 MHz		1.7		pF
Coupled	LED On-state Current	I_{Fon}	I_L = 100 mA			2.0	mA
	On-state Resistance	R_{on1}	I_F = 10 mA, I_L = 10 mA		8.5	15	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		0.02	1.0	ms
	Turn-off Time *1	t_{off}			0.3	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		0.5		pF

***1** Test Circuit for Switching Time

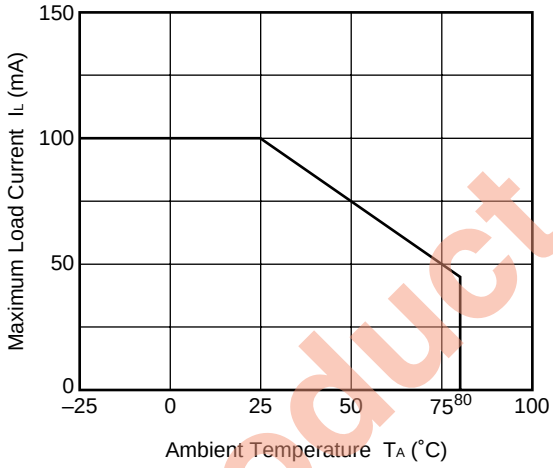


★ TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise specified)

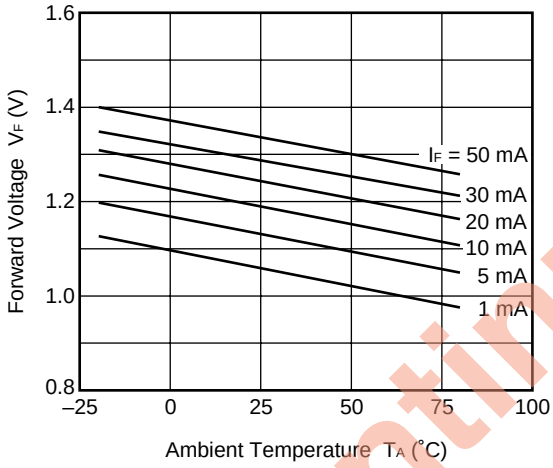
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



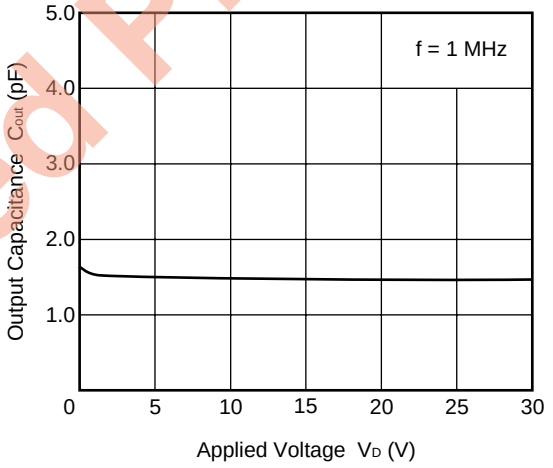
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



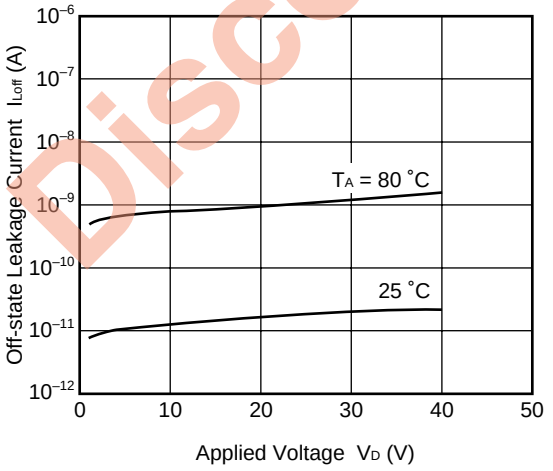
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



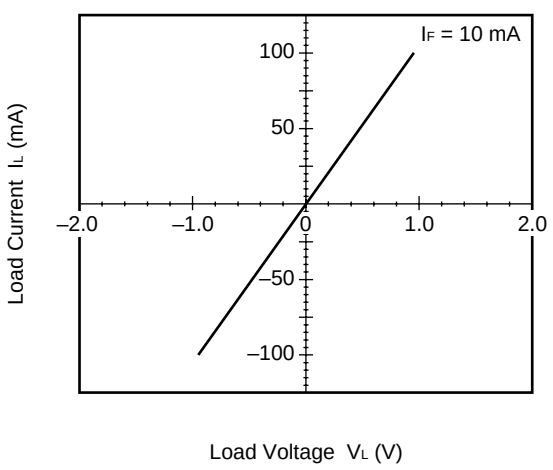
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



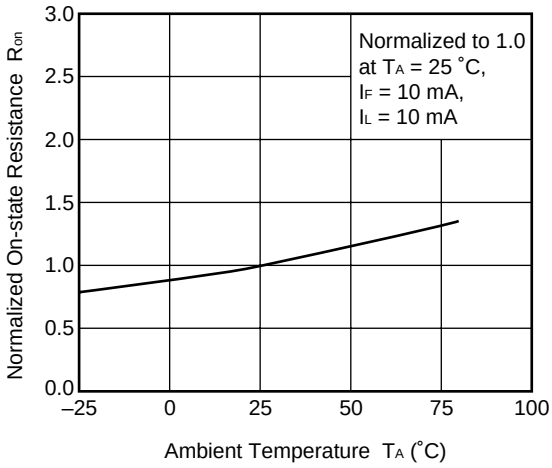
OFF-STATE LEAKAGE CURRENT vs. APPLIED VOLTAGE



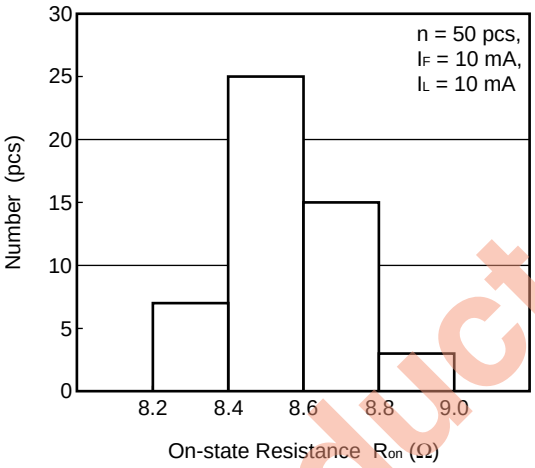
LOAD CURRENT vs. LOAD VOLTAGE



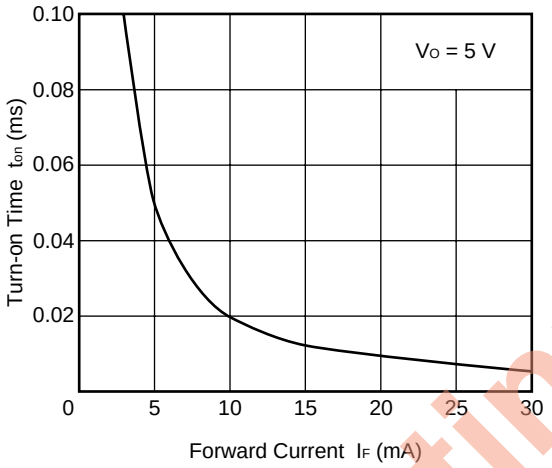
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



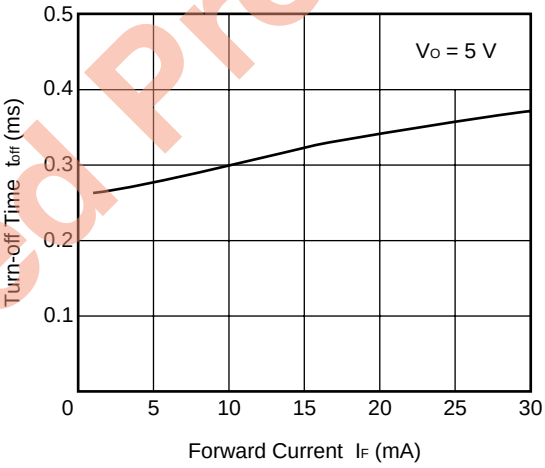
ON-STATE RESISTANCE DISTRIBUTION



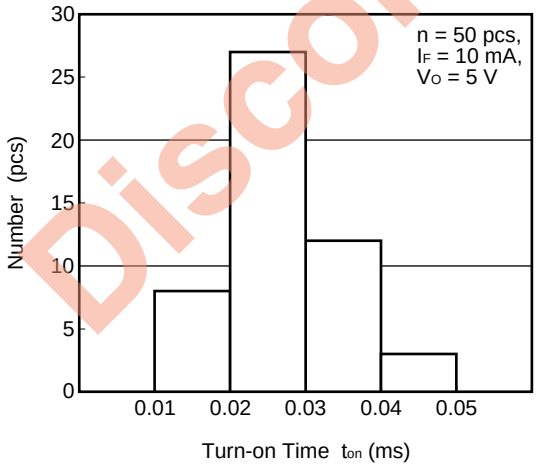
TURN-ON TIME vs. FORWARD CURRENT



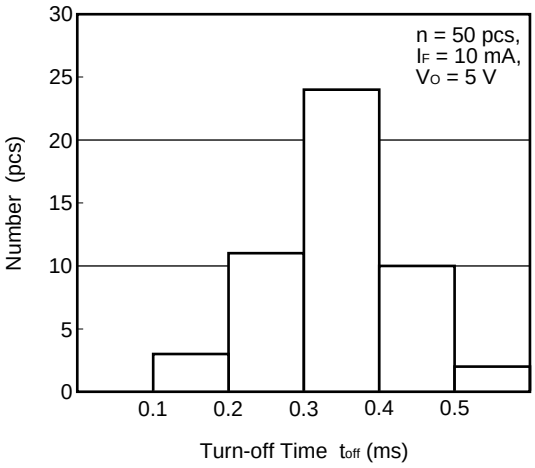
TURN-OFF TIME vs. FORWARD CURRENT



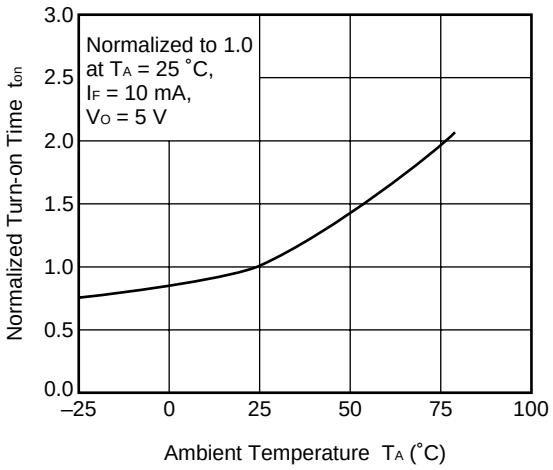
TURN-ON TIME DISTRIBUTION



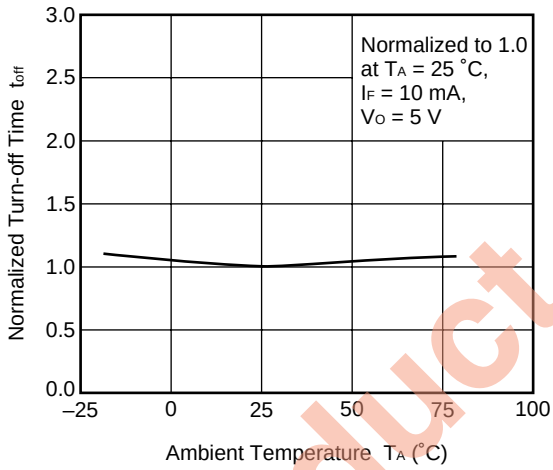
TURN-OFF TIME DISTRIBUTION



NORMALIZED TURN-ON TIME vs.
AMBIENT TEMPERATURE



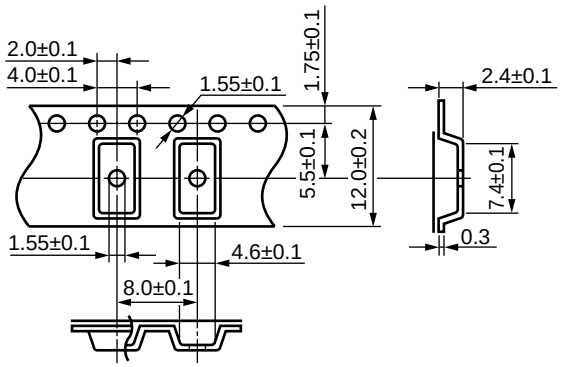
NORMALIZED TURN-OFF TIME vs.
AMBIENT TEMPERATURE



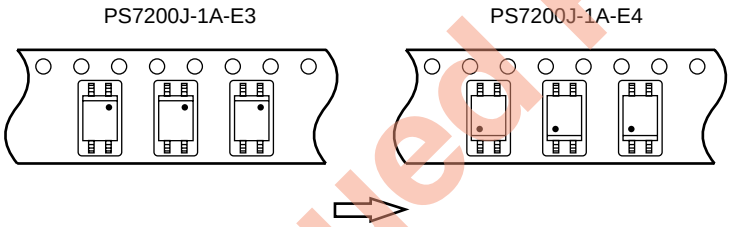
Remark The graphs indicate nominal characteristics.

★ **TAPING SPECIFICATIONS (in millimeters)**

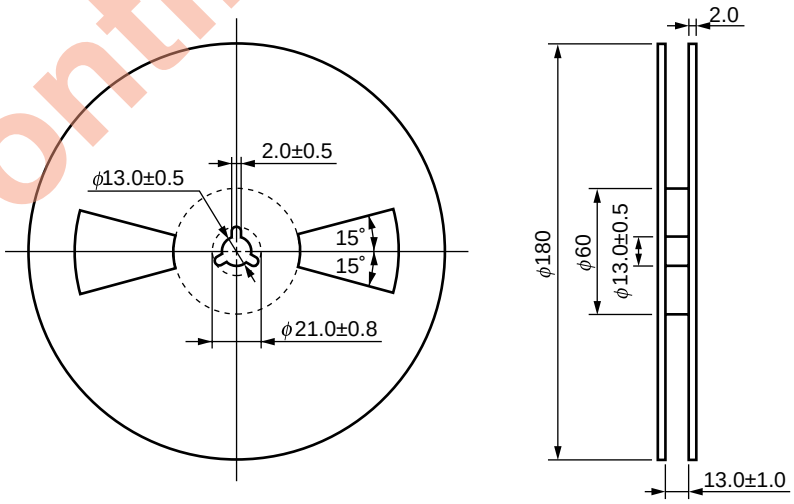
Outline and Dimensions (Tape)



Tape Direction

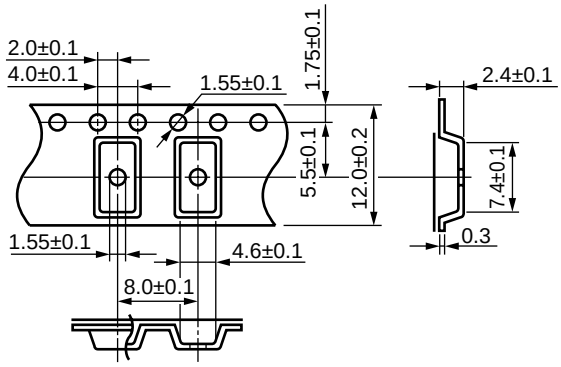


Outline and Dimensions (Reel)

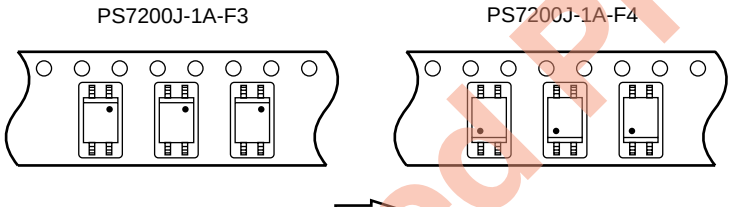


Packing: 900 pcs/reel

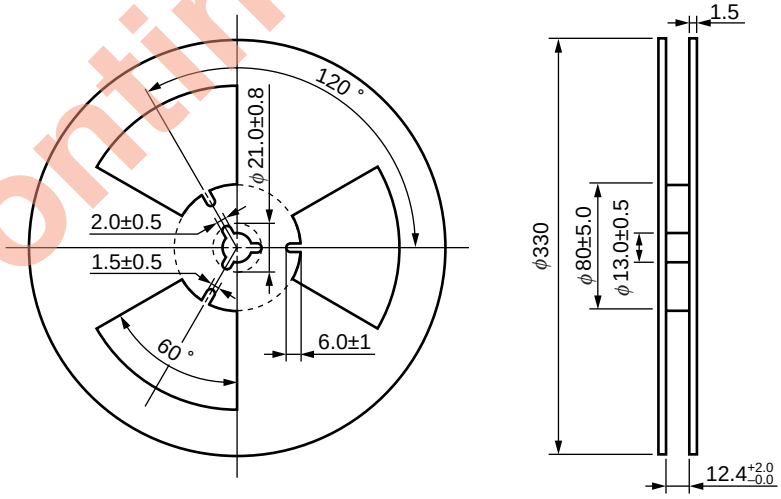
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



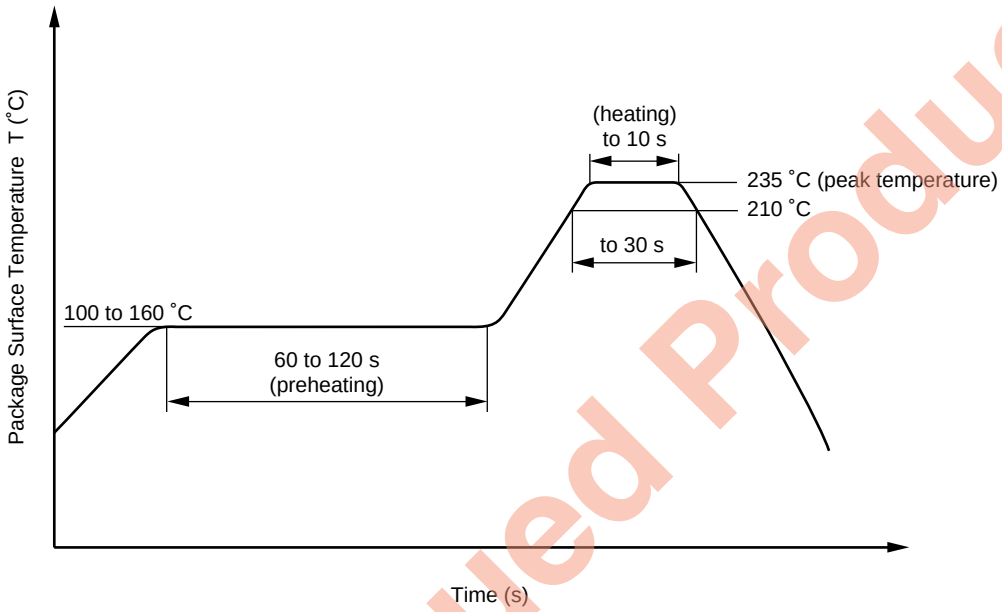
Packing: 3 500 pcs/reel

★ 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) Caution

- 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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  - Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)
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M7 98.8