



**THE DATASHEET OF
PS7214-1A**



**4-PIN SOP, 1.0 Ω LOW ON-STATE RESISTANCE
1-ch Optical Coupled MOS FET**

-NEPOC Series-

DESCRIPTION

The PS7214-1A is a low on-state resistance solid state relay containing a GaAs LED on the input side and MOS FETs on the output side.

It is suitable for PLC, etc. because of its large continuous load current and low on-state resistance.

FEATURES

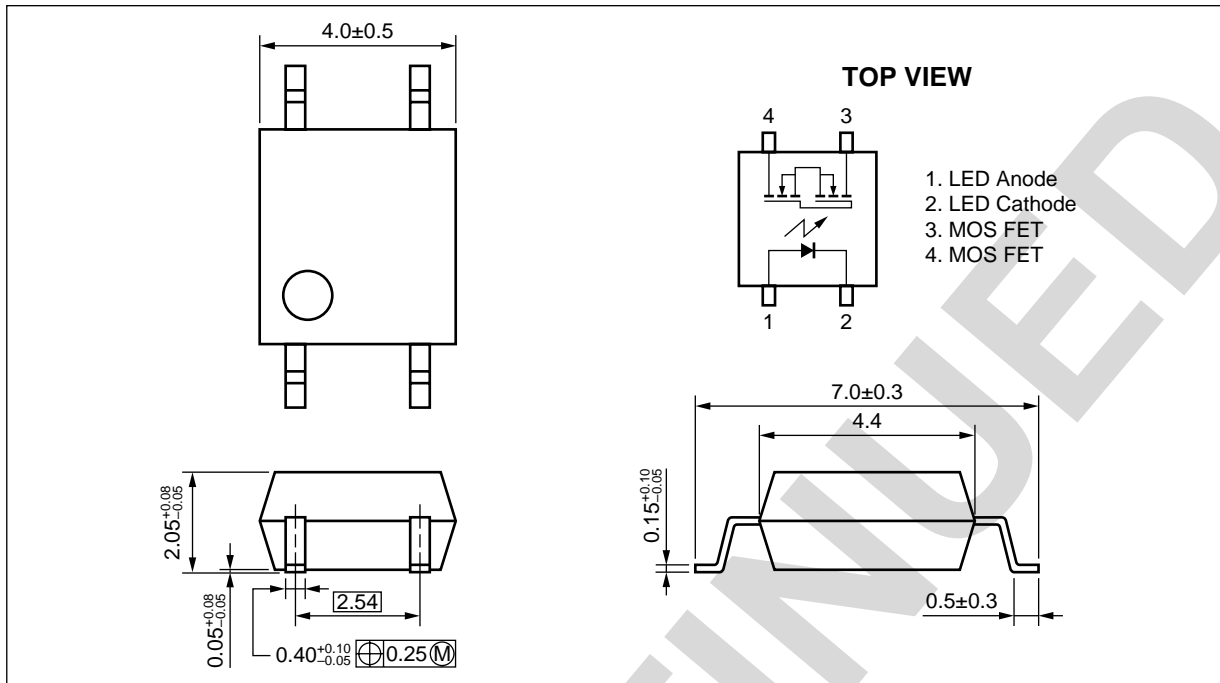
- Low on-state resistance ($R_{on} = 1.0 \Omega$ TYP.)
- Large continuous load current ($I_L = 400$ mA)
- 1 channel type (1 a output)
- Designed for AC/DC switching line changer
- Small and thin package (4-pin SOP, Height = 2.1 mm)
- High isolation voltage ($BV = 1\ 500$ Vr.m.s.)
- Low offset voltage
- Ordering number of taping product : PS7214-1A-E3, E4: 900 pcs/reel
: PS7214-1A-F3, F4: 3 500 pcs/reel
- <R> • Pb-Free product
- <R> • Safety standards
 - UL approved: File No. E72422
 - BSI approved: No. 8241/8242

APPLICATIONS

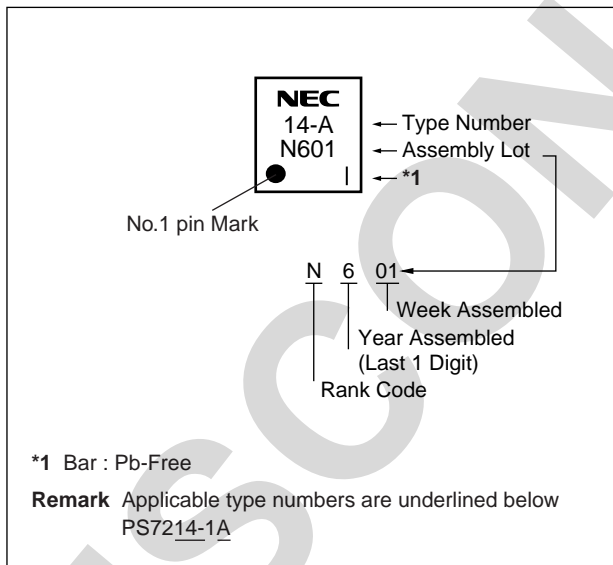
- Measurement equipment
- FA equipment

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PACKAGE DIMENSIONS (Unit: mm)



<R> MARKING EXAMPLE (LASER MARKING)



<R> **ORDERING INFORMATION**

Part Number	Order Number	Solder Plating Specification	Packing Style	Safety Standard Approval	Application Part Number ^{*1}
PS7214-1A	PS7214-1A-A	Pb-Free	Magazine case 100 pcs	Standard products (UL, BSI approved)	PS7214-1A
PS7214-1A-E3	PS7214-1A-E3-A		Embossed Tape 900 pcs/reel		
PS7214-1A-E4	PS7214-1A-E4-A				
PS7214-1A-F3	PS7214-1A-F3-A		Embossed Tape 3 500 pcs/reel		
PS7214-1A-F4	PS7214-1A-F4-A				

*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	100	V
	Continuous Load Current	I _L	400	mA
	Pulse Load Current ^{*2} (AC/DC Connection)	I _{LP}	0.8	A
	Power Dissipation	P _D	300	mW
Isolation Voltage ^{*3}		BV	1 500	Vr.m.s.
Total Power Dissipation		P _T	350	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
Pins 1-2 shorted together, 3-4 shorted together.

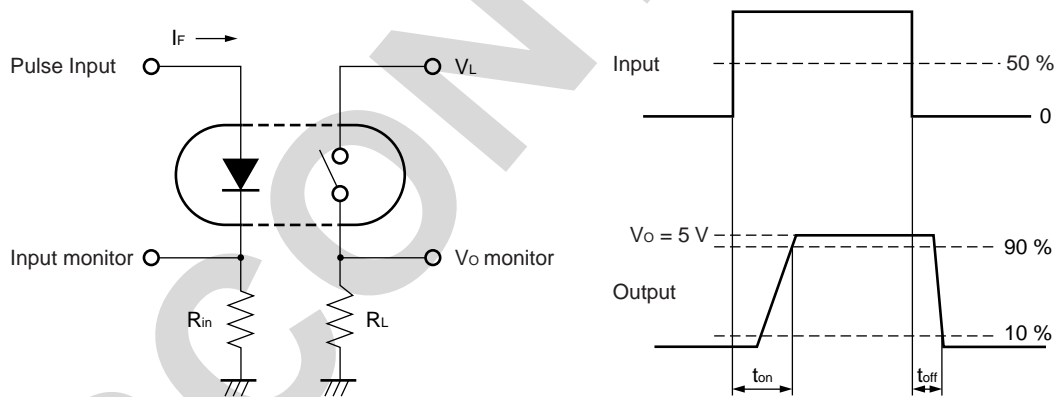
RECOMMENDED OPERATING CONDITIONS (T_A = 25°C)

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 = 100 V			1.0	μA
	Output Capacitance	C _{out}	V _D = 0 V, f = 1 MHz		120		pF
Coupled	LED On-state Current	I _{Fon}	I _L = 400 mA			2.0	mA
	On-state Resistance	R _{on}	I _F = 10 mA, I _L = 400 mA, t ≤ 10 ms		1.0	1.2	Ω
	Turn-on Time ^{*1, 2}	t _{on}	I _F = 10 mA, V _O = 5 V, R _L = 500 Ω,		1.3	2.0	ms
	Turn-off Time ^{*1, 2}	t _{off}	PW ≥ 10 ms		0.1	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

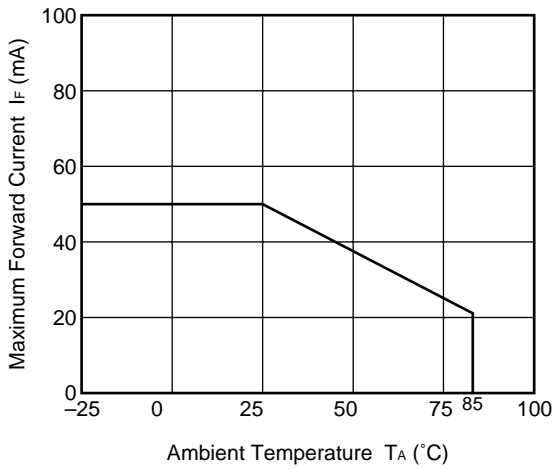
*1 Test Circuit for Switching Time



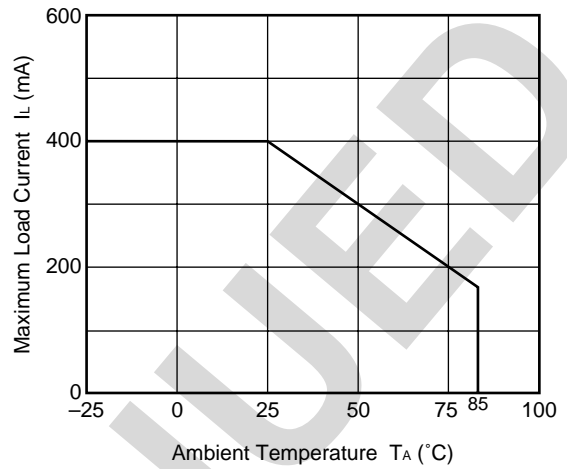
<R> *2 The turn-on time and turn-off time are specified as input-pulse width ≥ 10 ms. Be aware that when the device operates with an input-pulse width less than 10 ms, the turn-on time and turn-off time will increase.

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

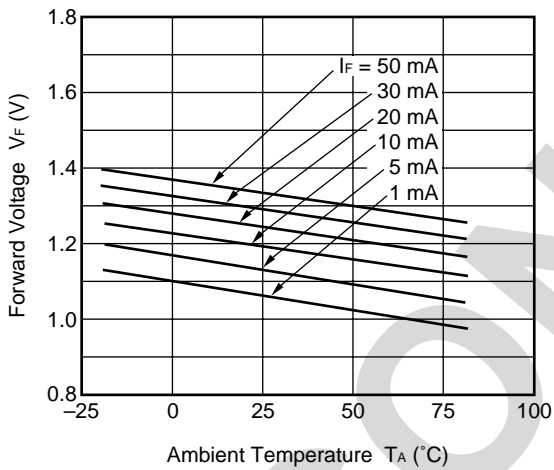
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



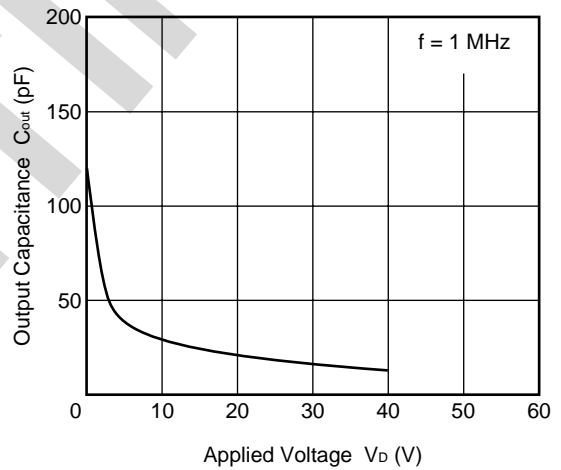
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



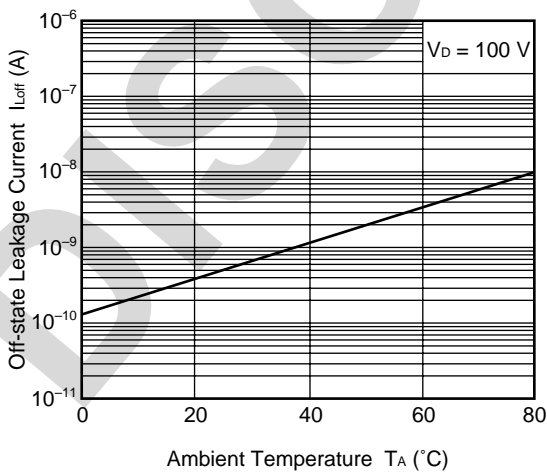
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



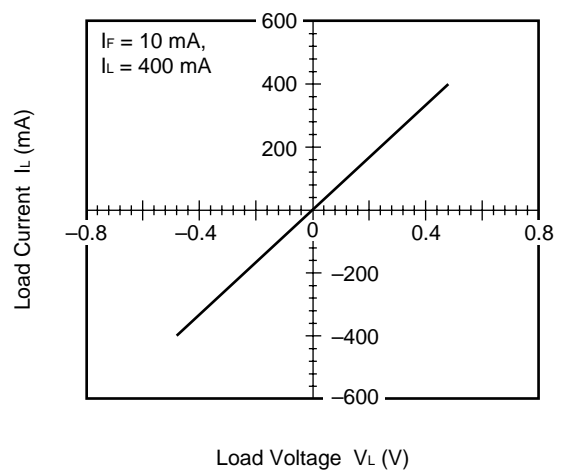
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



OFF-STATE LEAKAGE CURRENT vs. AMBIENT TEMPERATURE

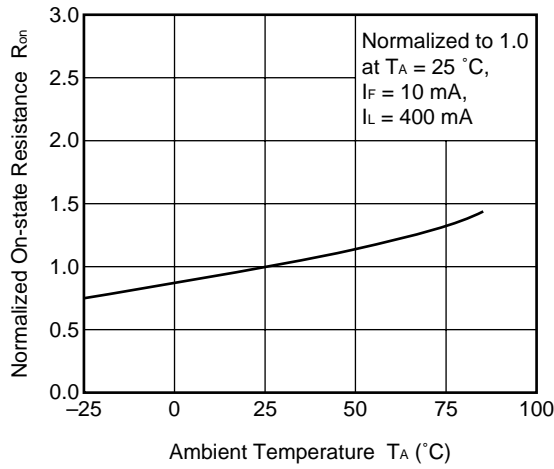


LOAD CURRENT vs. LOAD VOLTAGE

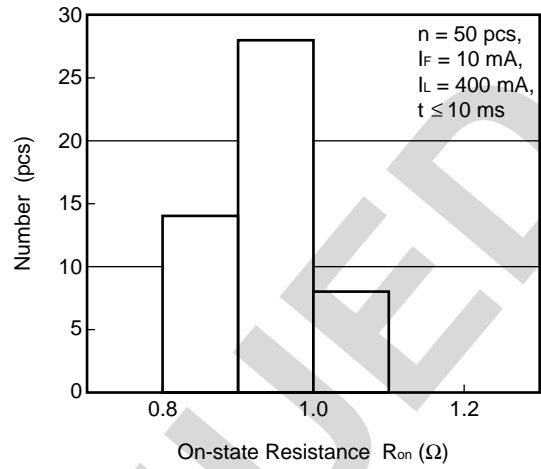


Remark The graphs indicate nominal characteristics.

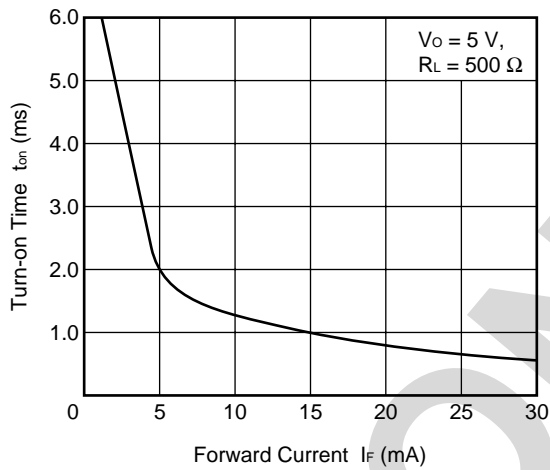
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



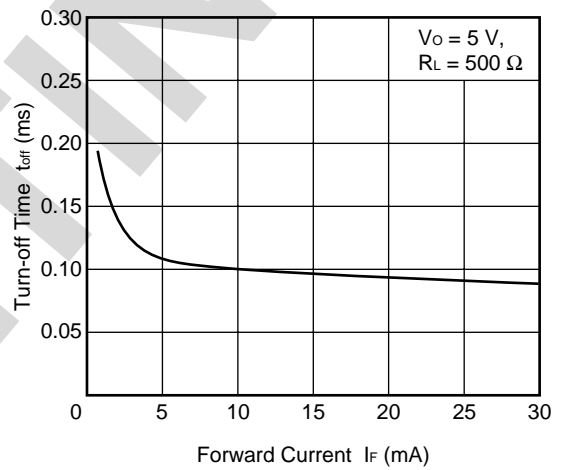
ON-STATE RESISTANCE DISTRIBUTION



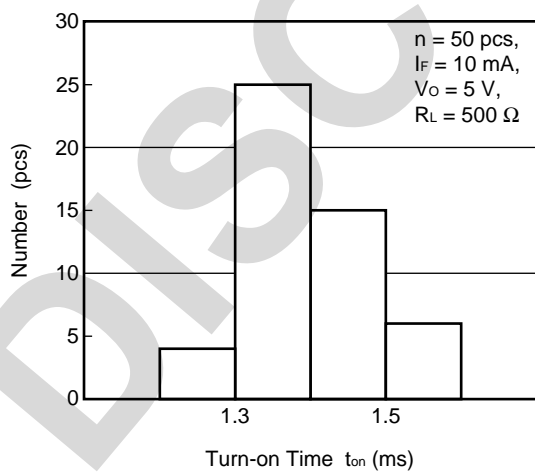
TURN-ON TIME vs. FORWARD CURRENT



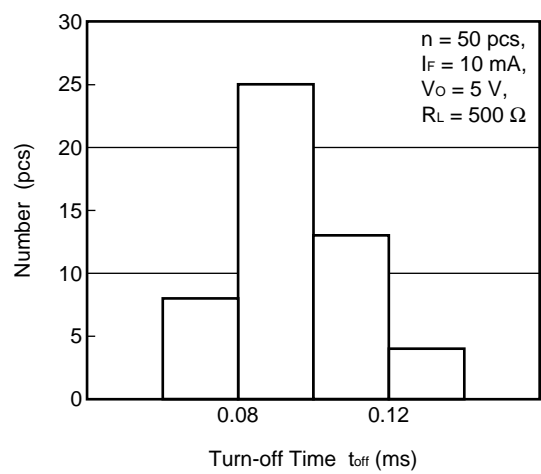
TURN-OFF TIME vs. FORWARD CURRENT



TURN-ON TIME DISTRIBUTION

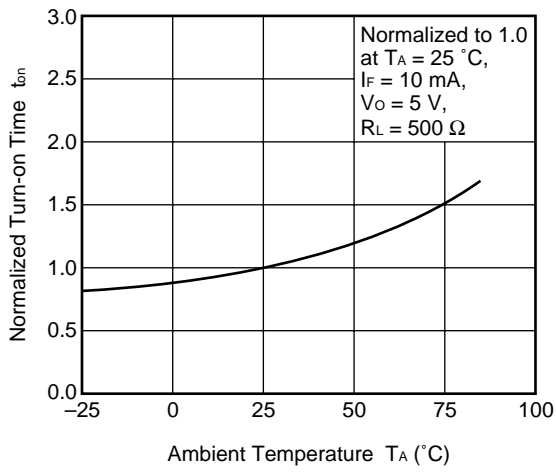


TURN-OFF TIME DISTRIBUTION

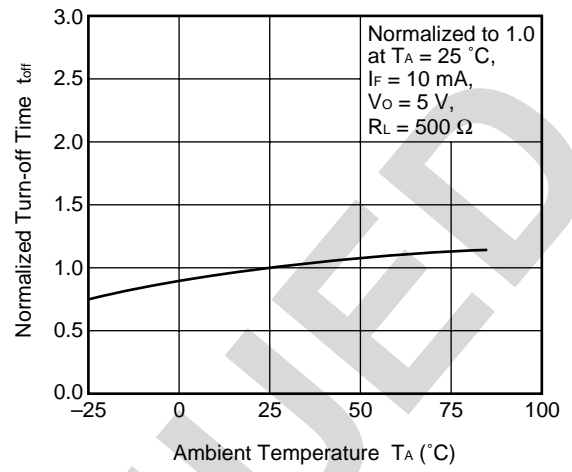


Remark The graphs indicate nominal characteristics.

NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE



NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE

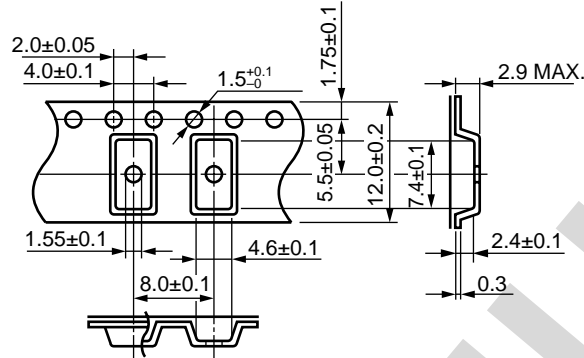


Remark The graphs indicate nominal characteristics.

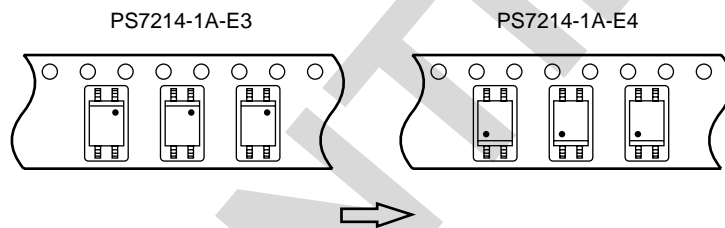
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TAPING SPECIFICATIONS (in millimeters)

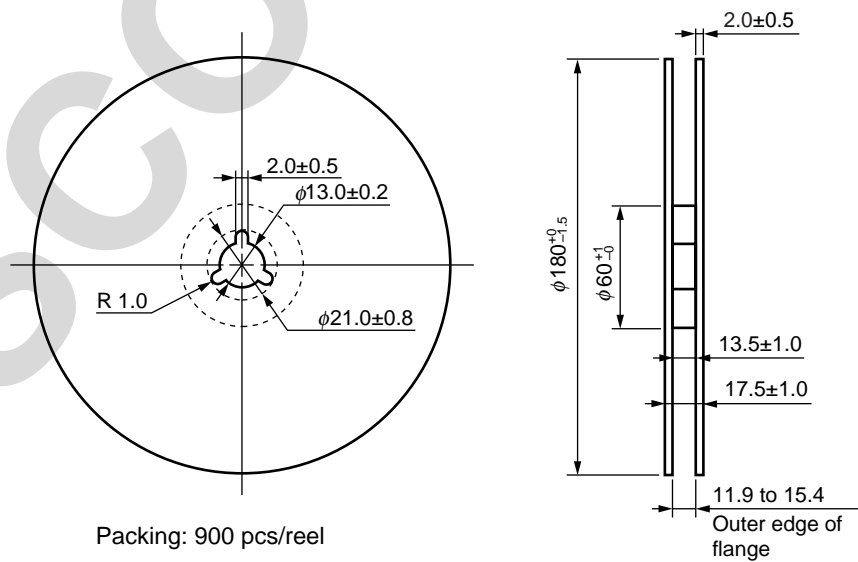
Outline and Dimensions (Tape)



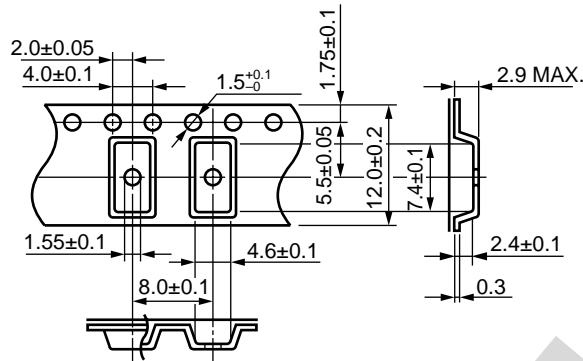
Tape Direction



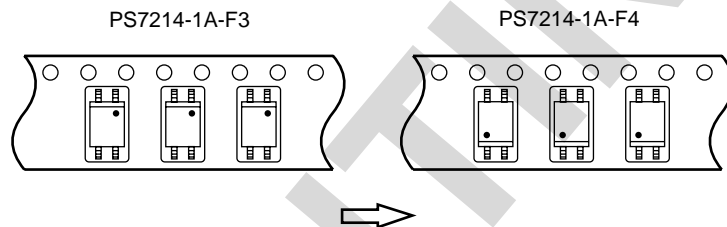
Outline and Dimensions (Reel)



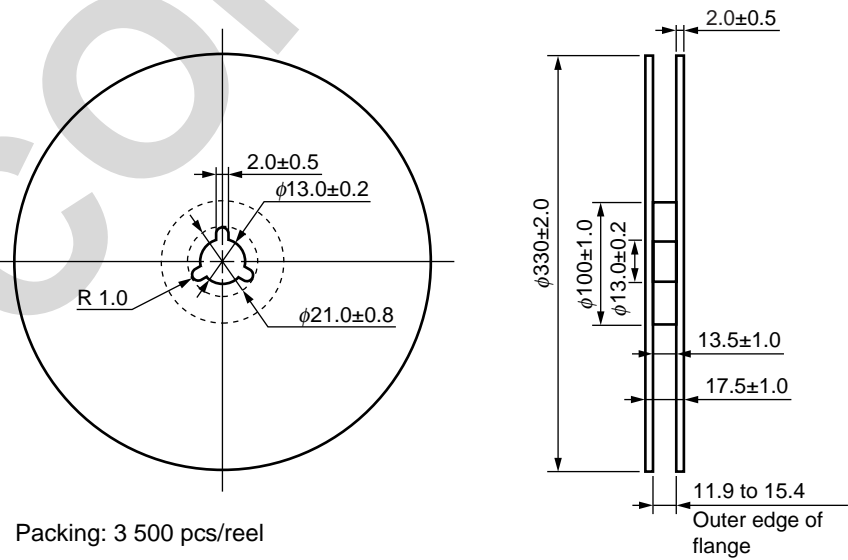
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



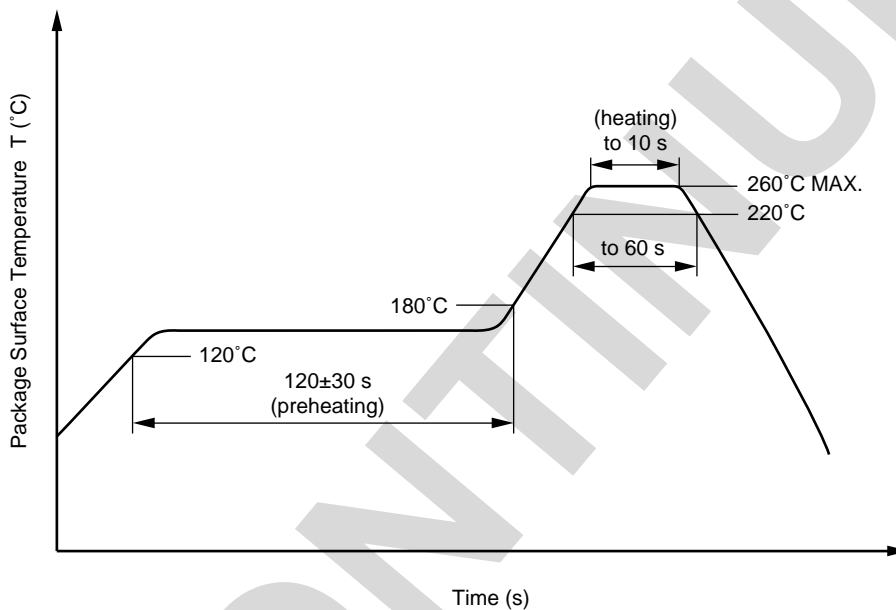
Packing: 3 500 pcs/reel

RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

- Peak reflow temperature 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
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

<R> **(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.

<R> **USAGE CAUTIONS**

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

DISCONTINUED

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► For further information, please contact

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