



NEC's 4-PIN SOP
1.0 Ω ON-STATE RESISTANCE
1-ch OPTICAL COUPLED MOS FET

PS7214-1A

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
- **DESIGN FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL AND THIN PACKAGE:**
4-pin SOP, Height= 2.1 mm
- **HIGH ISOLATION VOLTAGE:**
 $BV = 1500$ Vr.m.s.
- **LOW OFFSET VOLTAGE**
- **ORDERING NUMBER OF TAPING PRODUCT:**
PS7214-1A-E3, E4, F3, F4

DESCRIPTION

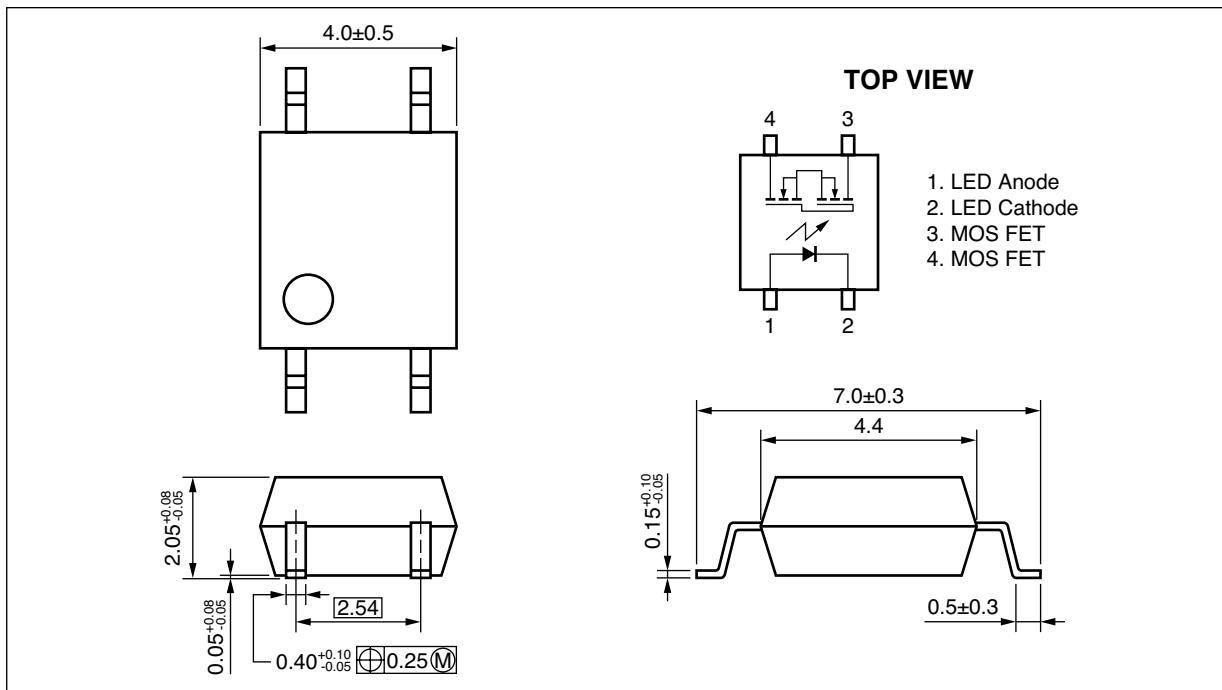
NEC's PS7214-1A is a low on-state resistance solid state relay containing a GaAs LED on the input side and MOS FETs on the output side.

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

APPLICATION

- Measurement equipment
- FA equipment

PACKAGE DIMENSIONS (UNIT: mm)



ORDERING INFORMATION

PART NUMBER	PACKAGE	PACKING STYLE	APPLICATION PART NUMBER ^{*1}
PS7214-1A	4-pin SOP	Magazine case 100 pcs	PS7214-1A
PS7214-1A-E3		Embossed Tape 900 pcs/reel	
PS7214-1A-E4			
PS7214-1A-F3		Embossed Tape 3 500 pcs/reel	
PS7214-1A-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	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

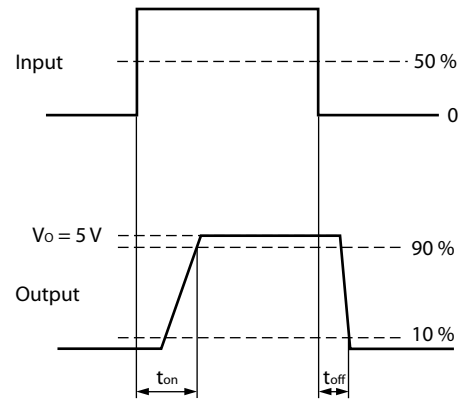
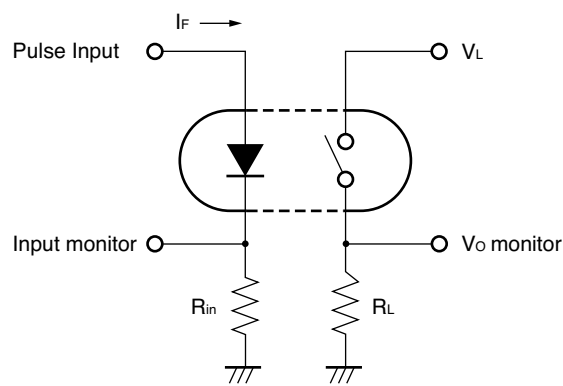
RECOMMENDED OPERATING CONDITIONS (TA = 25°C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
LED Operating Current	IF	2	10	20	mA
LED Off Voltage	VF	0		0.5	V

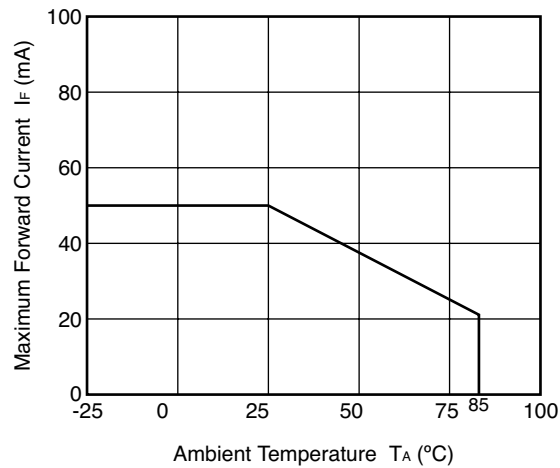
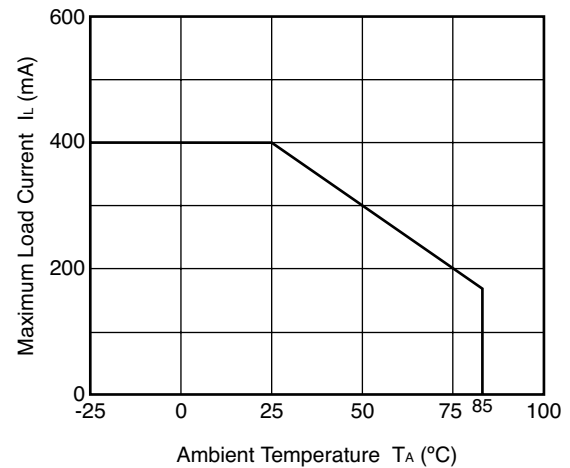
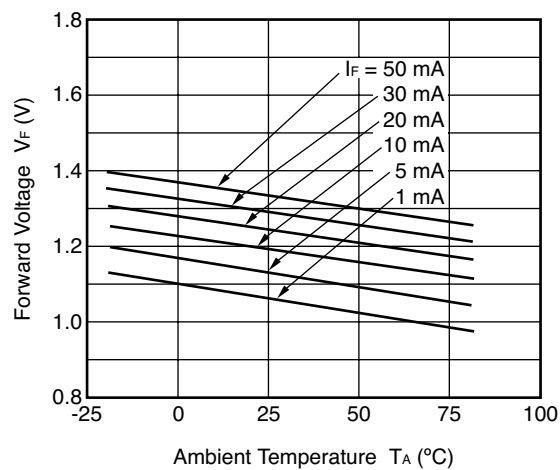
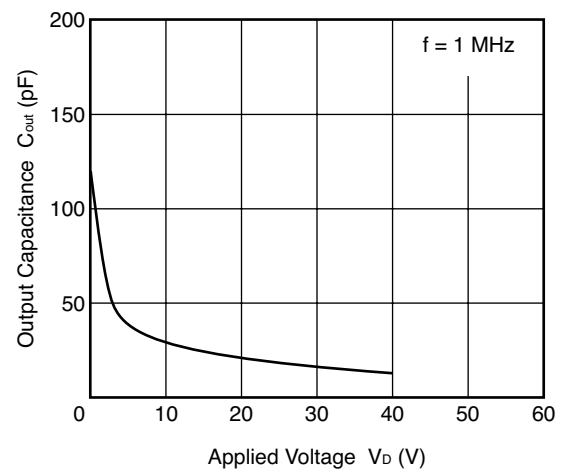
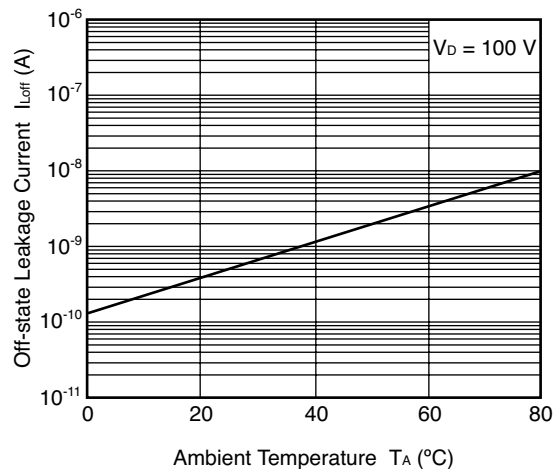
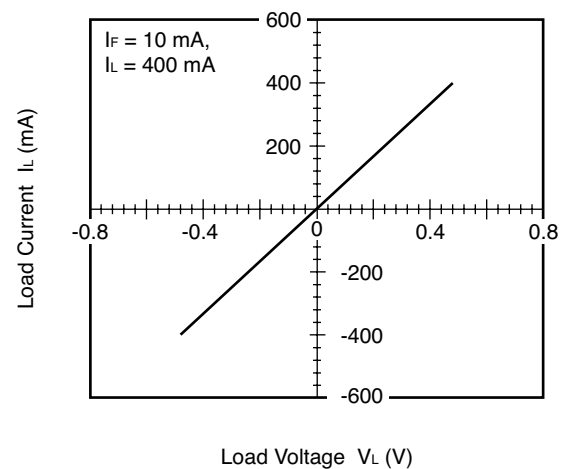
ELECTRICAL CHARACTERISTICS (TA = 25°C)

PARAMETER		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Diode	Forward Voltage	VF	IF = 10 mA		1.2	1.4	V
	Reverse Current	IR	VR = 5 V			5.0	μA
MOS FET	Off-state Leakage Current	ILoff	VD = 100 V			1.0	μA
	Output Capacitance	Cout	VD = 0 V, f = 1 MHz		120		pF
Coupled	LED On-state Current	IFon	IL = 400 mA			2.0	mA
	On-state Resistance	Ron	IF = 10 mA, IL = 400 mA, t ≤ 10 ms		1.0	1.2	Ω
	Turn-on Time*1	ton	IF = 10 mA, Vo = 5 V, RL = 500 Ω,		1.3	2.0	ms
	Turn-off Time*1	toff	PW ≥ 10 ms		0.1	1.0	
	Isolation Resistance	RI-O	VI-O = 1.0 kVDC	10 ⁹			Ω
	Isolation Capacitance	CI-O	V = 0 V, f = 1 MHz		0.5		pF

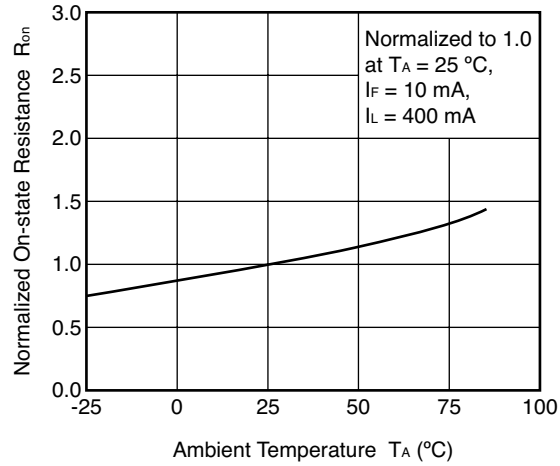
*1 Test Circuit for Switching Time



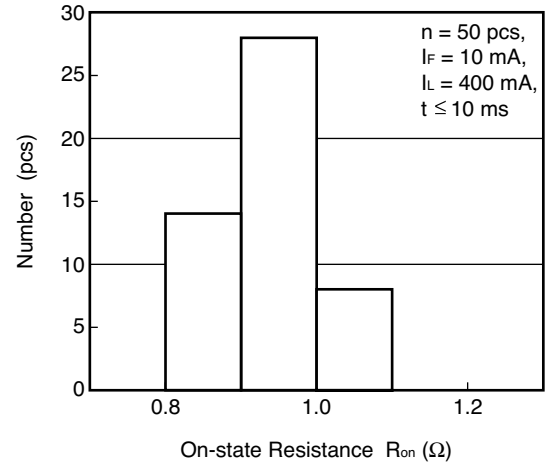
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

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


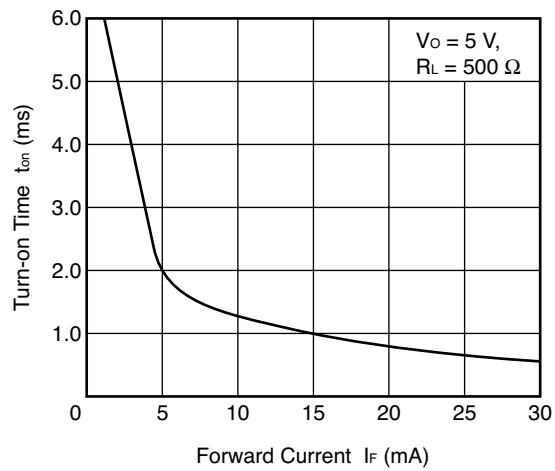
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



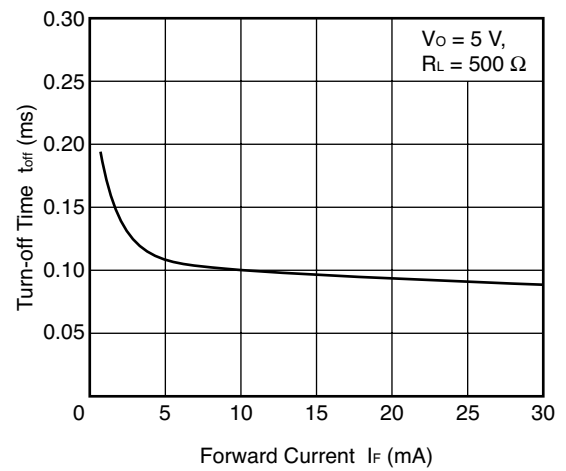
ON-STATE RESISTANCE DISTRIBUTION



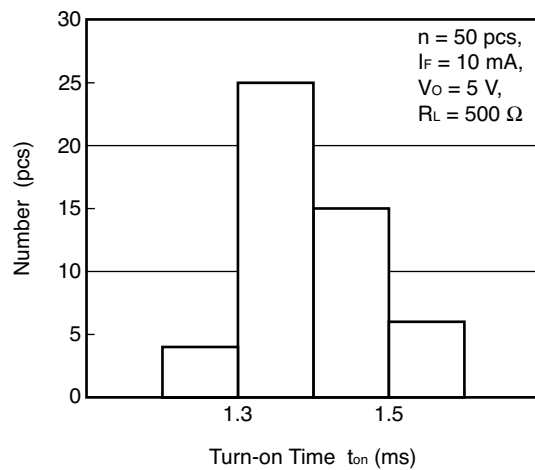
TURN-ON TIME vs. FORWARD CURRENT



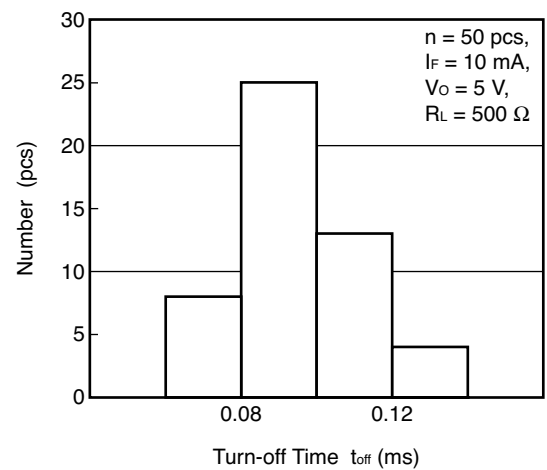
TURN-OFF TIME vs. FORWARD CURRENT

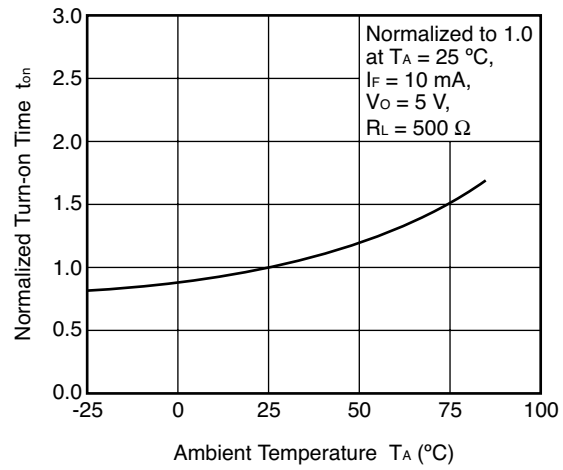
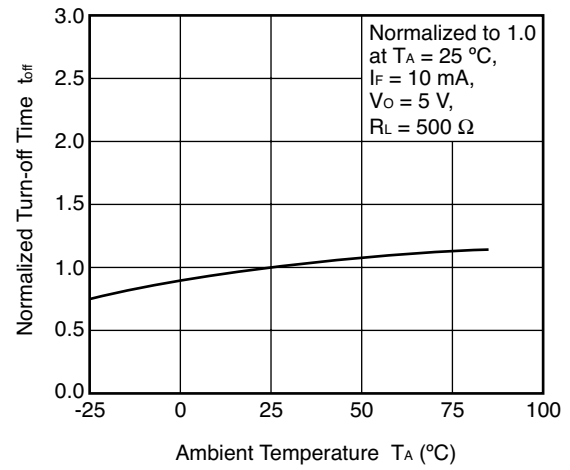


TURN-ON TIME DISTRIBUTION



TURN-OFF TIME DISTRIBUTION

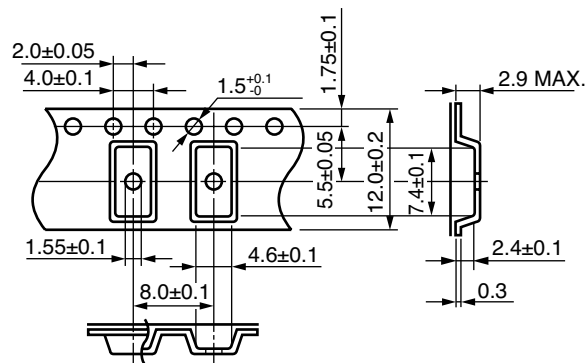


NORMALIZED TURN-ON TIME vs.
AMBIENT TEMPERATURENORMALIZED TURN-OFF TIME vs.
AMBIENT TEMPERATURE

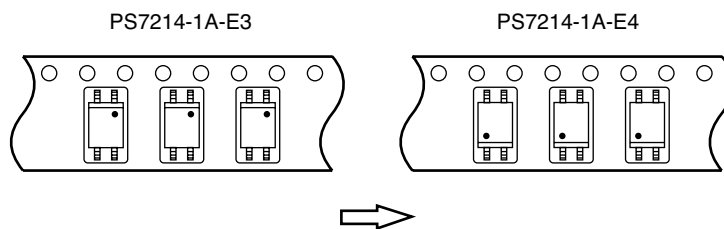
Remark The graphs indicate nominal characteristics.

TAPING SPECIFICATIONS (UNITS in mm)

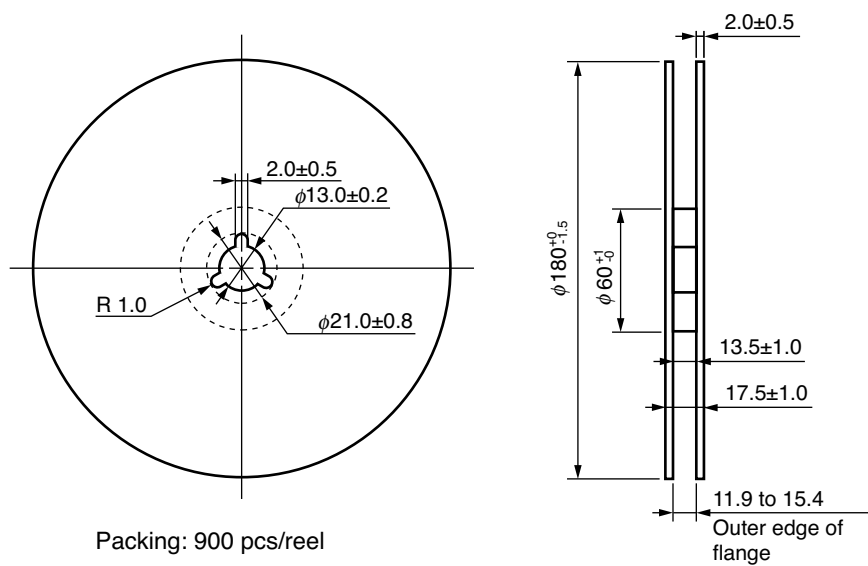
Outline and Dimensions (Tape)



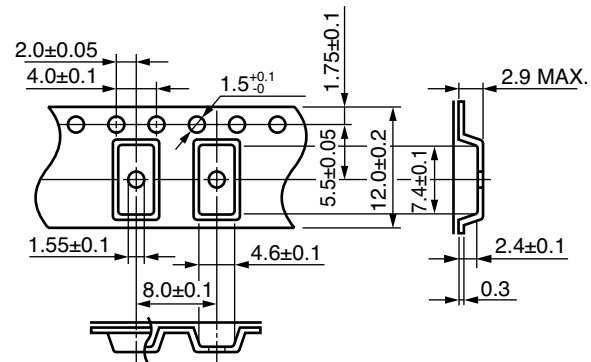
Tape Direction



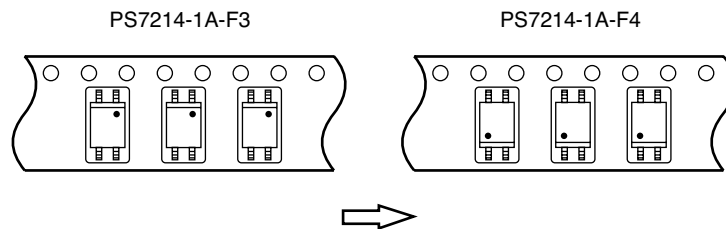
Outline and Dimensions (Reel)



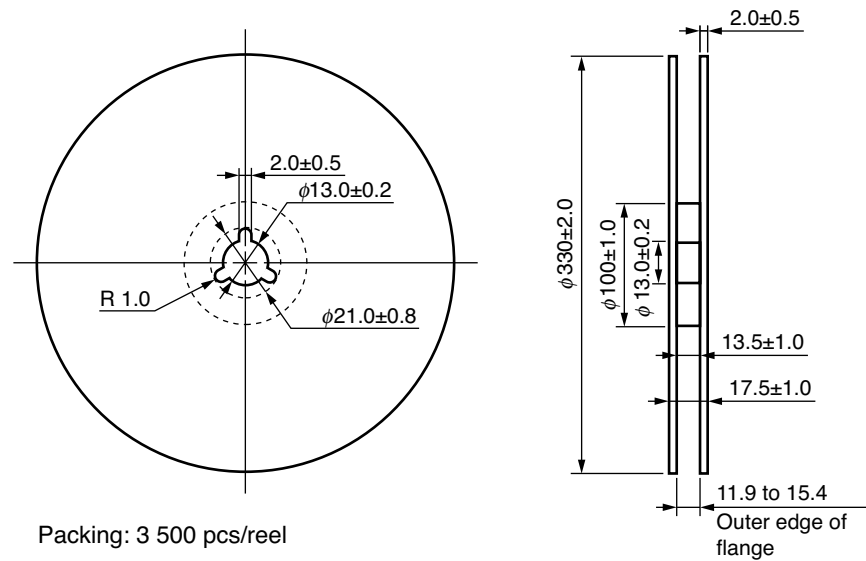
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)

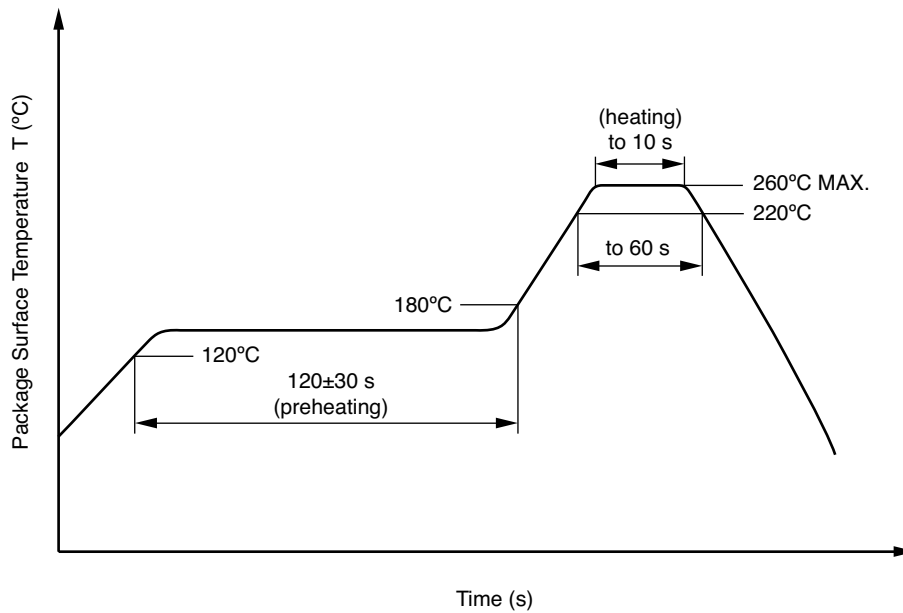


RECOMMENDED SOLDERING CONDITIONS

(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.)

(3) Cautions

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

Life Support Applications

These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.

CEL California Eastern Laboratories, Your source for NEC RF, Microwave, Optoelectronic, and Fiber Optic Semiconductor Devices.

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