

**4-PIN SOP, 1.1 Ω LOW ON-STATE RESISTANCE
1-ch Optical Coupled MOS FET****DESCRIPTION**

The PS7200K-1A is a low output capacitance solid state relay containing a GaAs LED 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 on-state resistance, and low off-state leakage current.

FEATURES

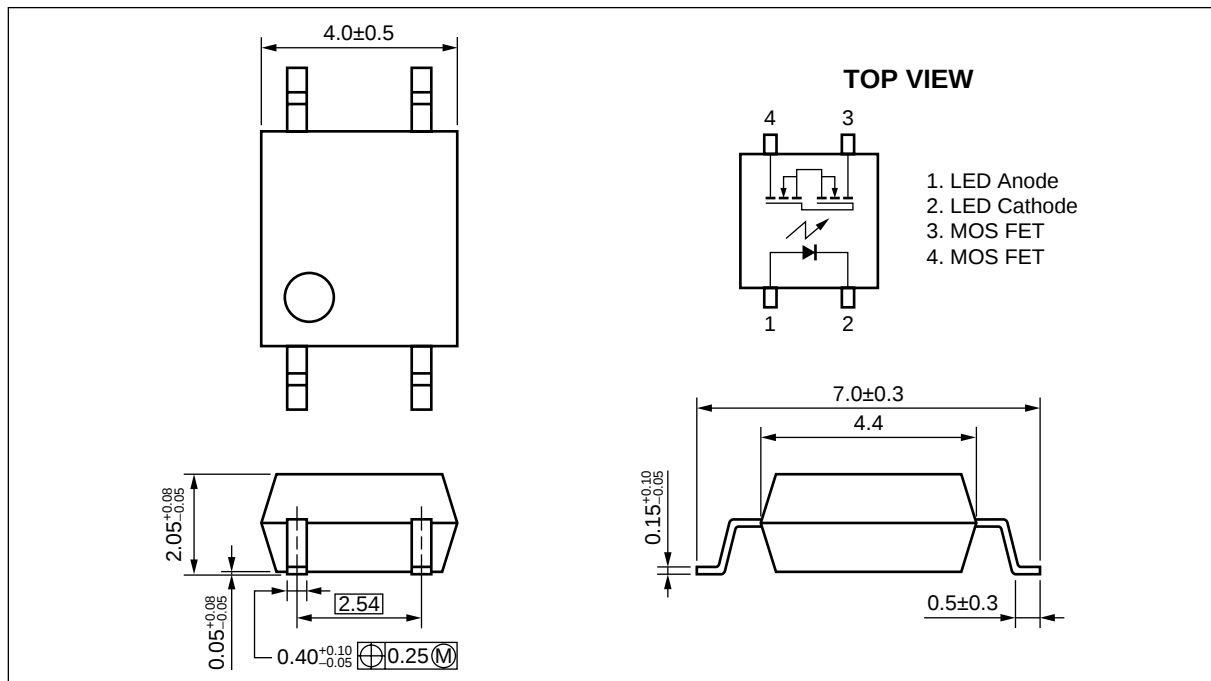
- Low $C \times R$ ($C \times R = 10.5 \text{ pF} \cdot \Omega$)
- Low on-state resistance ($R_{\text{on}} = 1.1 \Omega$ TYP.)
- Low off-state leakage current ($I_{\text{Loff}} = 0.03 \text{ nA}$ TYP.)
- High-speed turn-on time ($t_{\text{on}} = 0.1 \text{ ms}$ TYP.)
- 1 channel type (1 a output)
- Designed for AC/DC switching line changer
- Small and thin package (4-pin SOP, Height = 2.1 mm)
- High isolation voltage ($BV = 1\,500 \text{ Vr.m.s.}$)
- Low offset voltage
- Ordering number of taping product: PS7200K-1A-E3, E4, F3, F4

APPLICATIONS

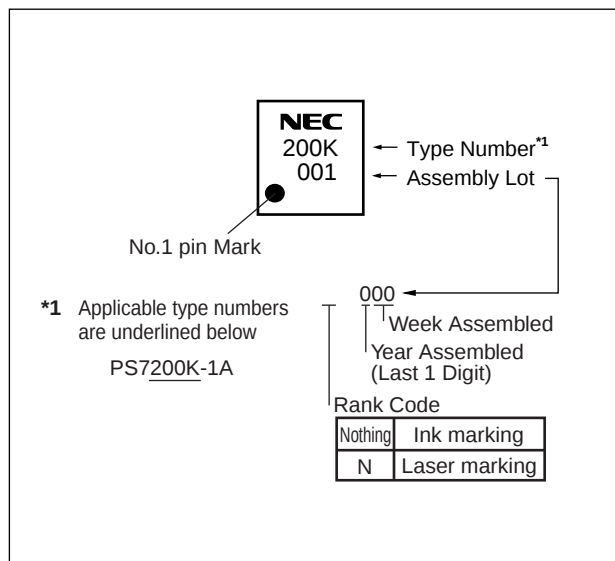
- Measurement equipment

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PACKAGE DIMENSIONS (UNIT: mm)



MARKING EXAMPLE



ORDERING INFORMATION

Part Number	Package	Packing Style	Application Part Number ^{*1}
PS7200K-1A	4-pin SOP	Magazine case 100 pcs	PS7200K-1A
PS7200K-1A-E3		Embossed Tape 900 pcs/reel	
PS7200K-1A-E4			
PS7200K-1A-F3		Embossed Tape 3 500 pcs/reel	
PS7200K-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	200	mA
	Pulse Load Current ^{*2} (AC/DC Connection)	I _{LP}	400	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 +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

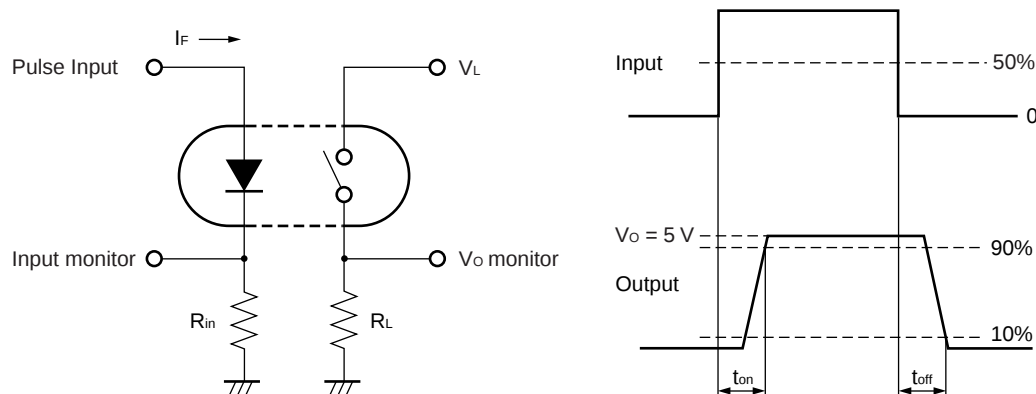
RECOMMENDED OPERATING CONDITIONS ($T_A = 25^\circ\text{C}$)

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 ($T_A = 25^\circ\text{C}$)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	$I_F = 10\text{ mA}$		1.2	1.4	V
	Reverse Current	I_R	$V_R = 5\text{ V}$			5.0	μA
MOS FET	Off-state Leakage Current	I_{Leak}	$V_D = 40\text{ V}$		0.03	10	nA
	Output Capacitance	C_{out}	$V_D = 0\text{ V}$, $f = 1\text{ MHz}$		9.6		pF
Coupled	LED On-state Current	I_{Fon}	$I_L = 200\text{ mA}$			2.0	mA
	On-state Resistance	R_{on1}	$I_F = 10\text{ mA}$, $I_L = 100\text{ mA}$		1.1	2.0	Ω
		R_{on2}	$I_F = 10\text{ mA}$, $I_L = 200\text{ mA}$, $t \leq 10\text{ ms}$		1.4	2.0	
	Turn-on Time ^{*1,2}	t_{on}	$I_F = 10\text{ mA}$, $V_O = 5\text{ V}$, $R_L = 500\ \Omega$, $PW \geq 10\text{ ms}$		0.1	0.5	ms
	Turn-off Time ^{*1,2}	t_{off}			0.1	1.0	
	Isolation Resistance	$R_{\text{I-O}}$	$V_{\text{I-O}} = 1.0\text{ kV}_{\text{DC}}$	10^9			Ω
	Isolation Capacitance	$C_{\text{I-O}}$	$V = 0\text{ V}$, $f = 1\text{ MHz}$		0.3		pF

*1 Test Circuit for Switching Time

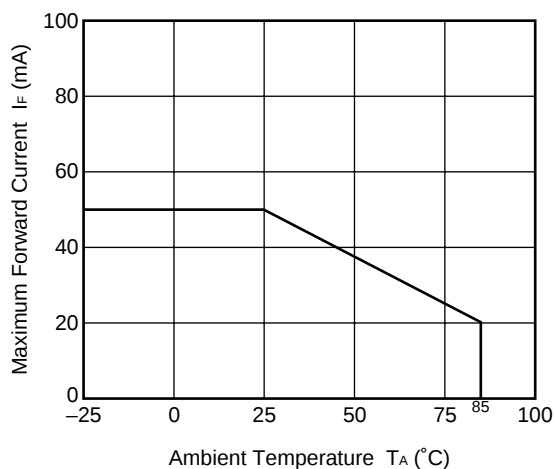


*2 The turn-on time and turn-off time are specified as input-pulse width $\geq 10\text{ ms}$.

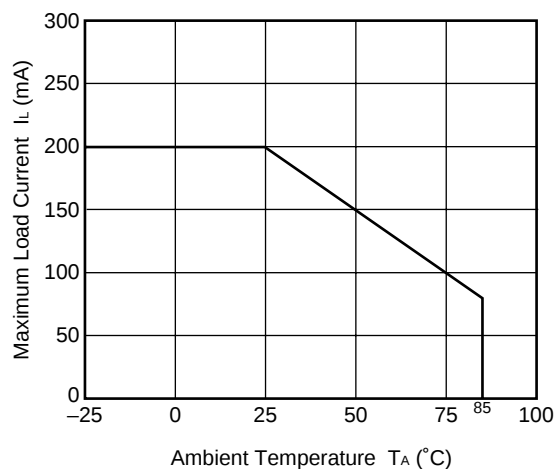
Be aware that when the device operates with an input-pulse width of under 10 ms, the turn-on time and turn-off time will increase.

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

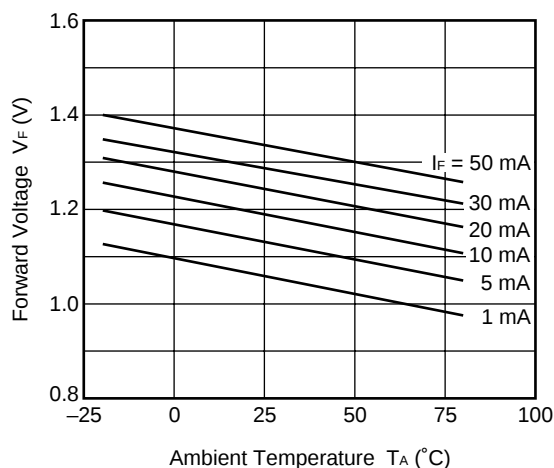
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



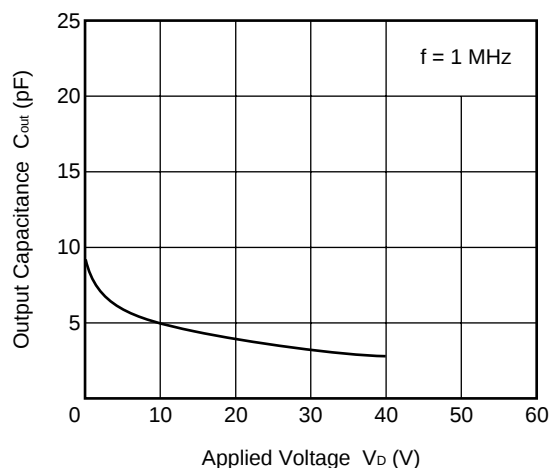
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



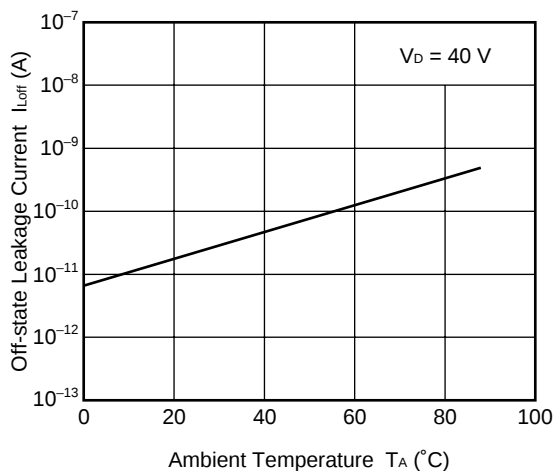
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



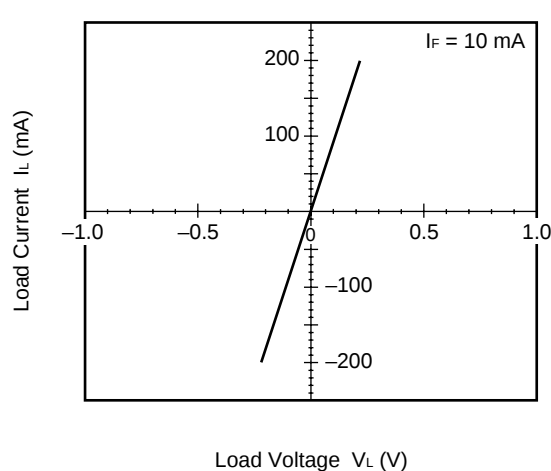
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



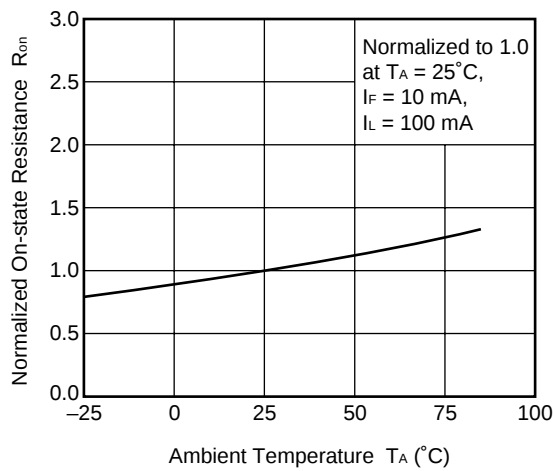
OFF-STATE LEAKAGE CURRENT vs. AMBIENT TEMPERATURE



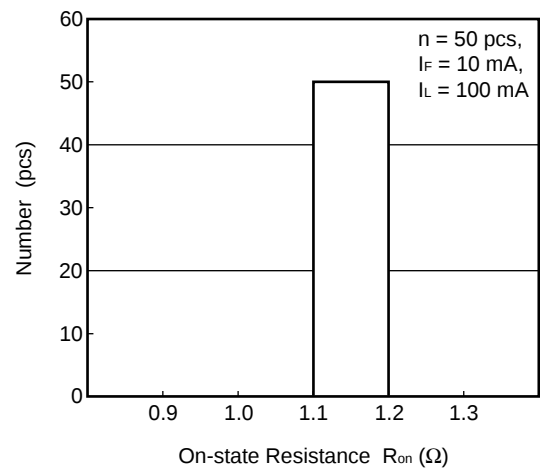
LOAD CURRENT vs. LOAD VOLTAGE



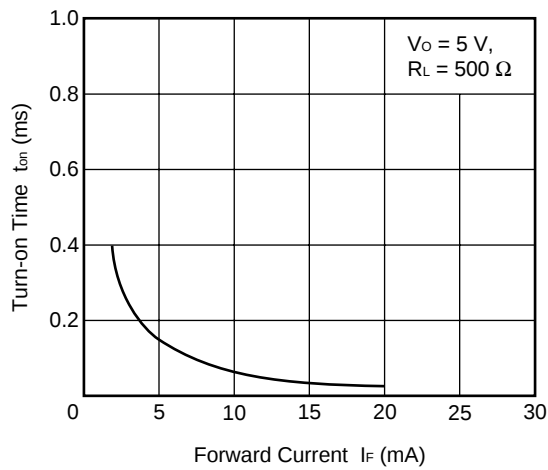
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



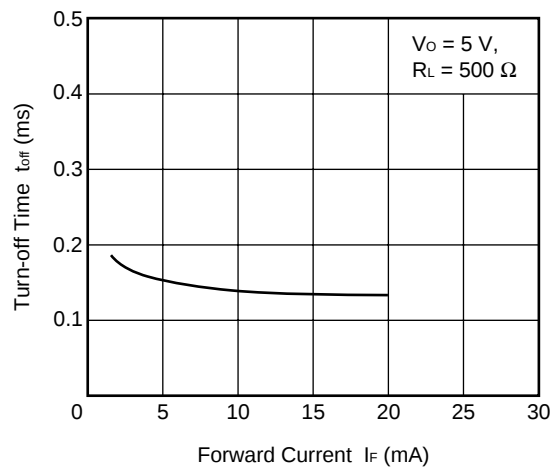
ON-STATE RESISTANCE DISTRIBUTION



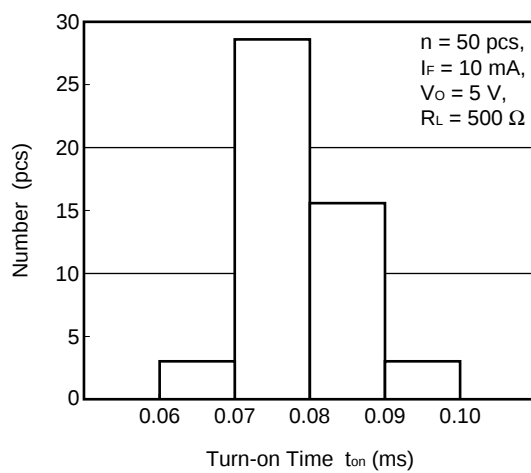
TURN-ON TIME vs. FORWARD CURRENT



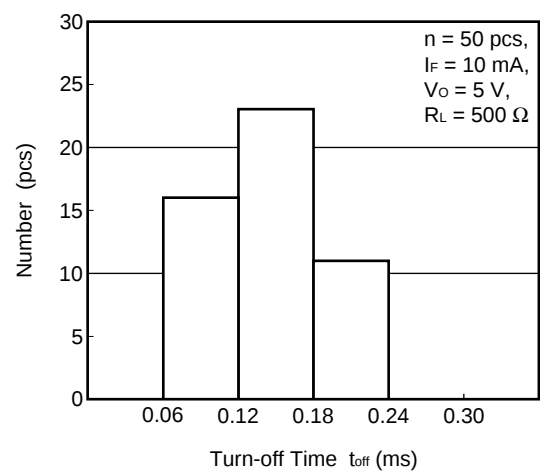
TURN-OFF TIME vs. FORWARD CURRENT

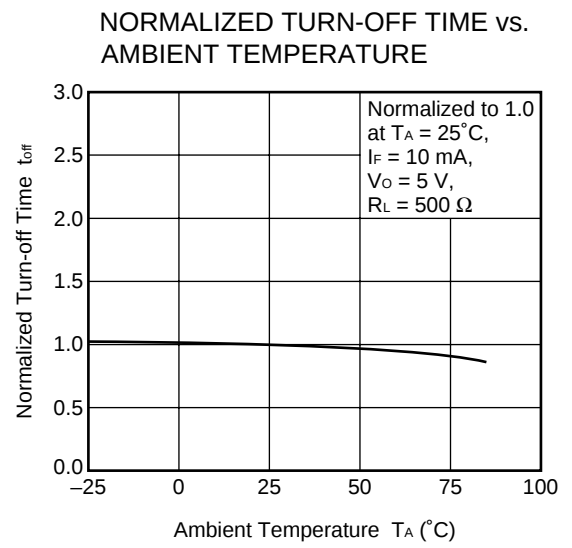
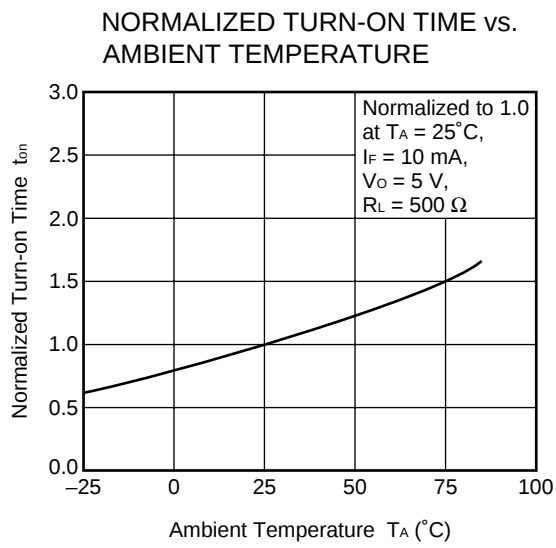


TURN-ON TIME DISTRIBUTION



TURN-OFF TIME DISTRIBUTION

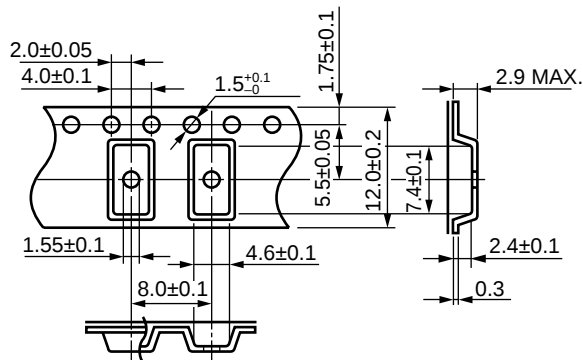




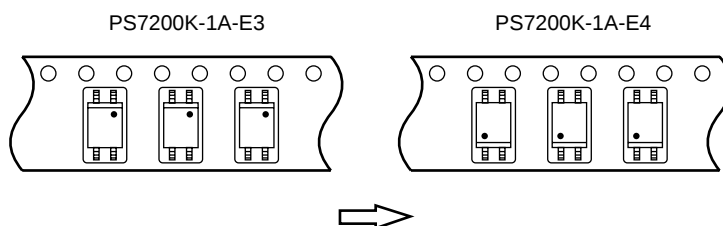
Remark The graphs indicate nominal characteristics.

★ TAPING SPECIFICATIONS (UNIT: mm)

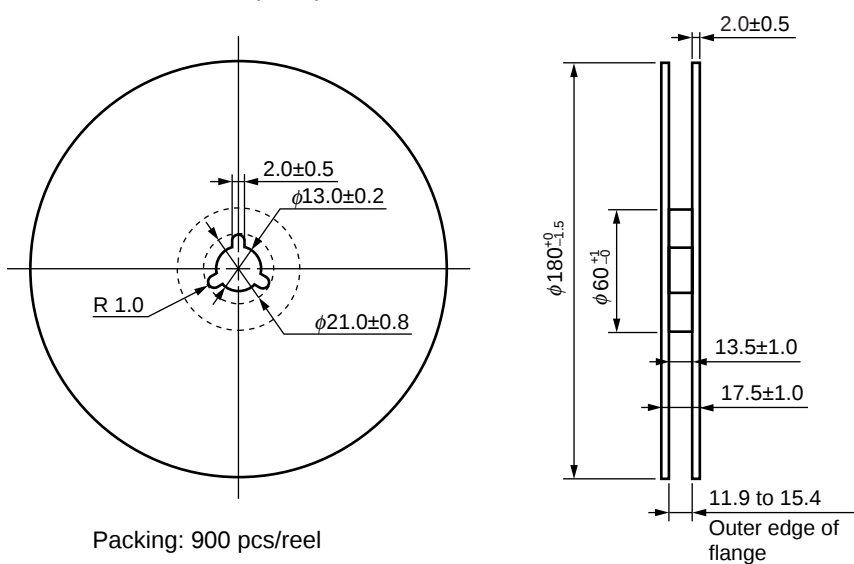
Outline and Dimensions (Tape)



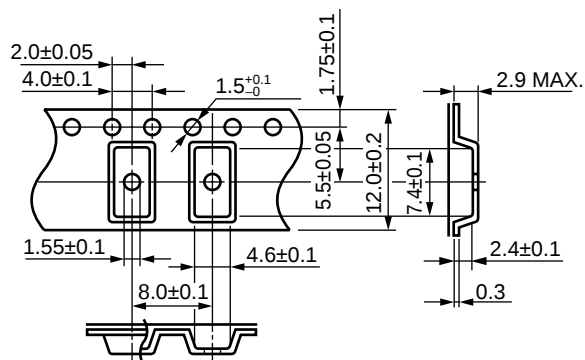
Tape Direction



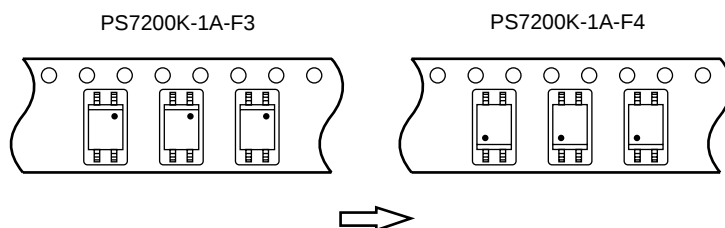
Outline and Dimensions (Reel)



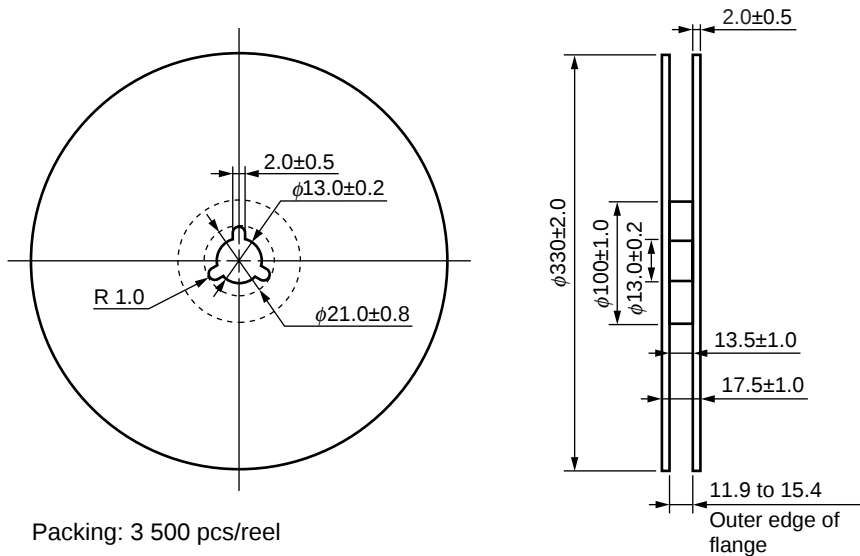
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



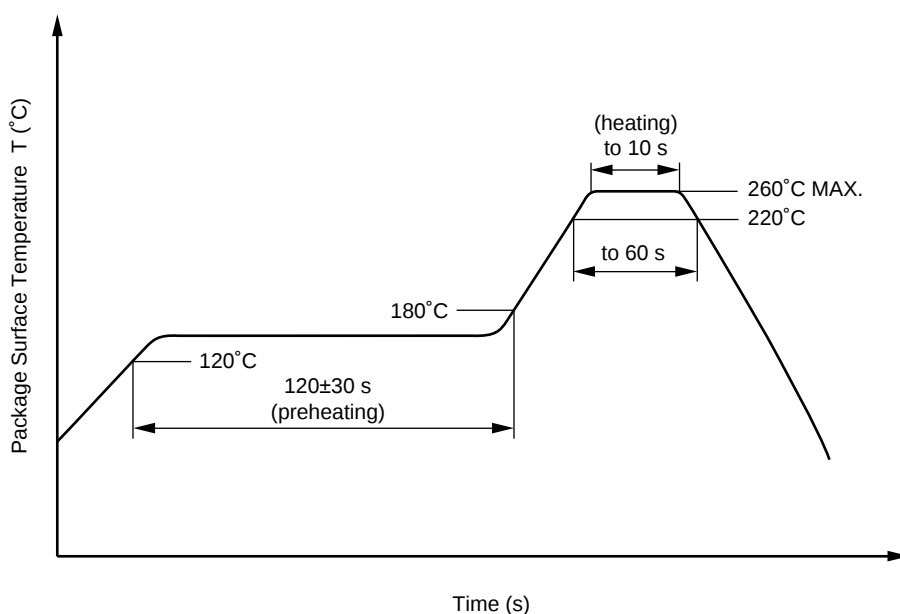
Packing: 3 500 pcs/reel

★ 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.)

(3) Cautions

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

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M8E 00.4-0110

SAFETY INFORMATION ON THIS PRODUCT

Caution	GaAs Products	The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested. • Do not destroy or burn the product. • Do not cut or cleave off any part of the product. • Do not crush or chemically dissolve the product. • Do not put the product in the mouth. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.
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► For further information, please contact

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