CEL

4 PIN SOP, 0.8 Ω LOW ON-STATE RESISTANCE 1 CH OPTICAL COUPLED MOSFET

PS7200E-1A

FEATURES

- **LOW ERT**
  ERT = 78 ps TYP
- **LOW C X R**
  C X R = 27 pF • Ω
- **LOW ON-STATE RESISTANCE**
  R_{ON} = 0.8 Ω TYP
- **LOW OFF-STATE LEAKAGE CURRENT**
- **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 = 1500 Vr.m.s.
- **LOW OFFSET VOLTAGE**
- **AVAILABLE IN TAPE AND REEL**
  PS7200E-1A-E3, E4, F3, F4

DESCRIPTION

NEC's PS7200E-1A is a low on-state resistance solid state relay containing a GaAs LED on the light emitting side (input side) and MOSFETs on the output side.

It is suitable for high-frequency signal control, due to its low C x R, low output capacitance and low off-state leakage current.

APPLICATIONS

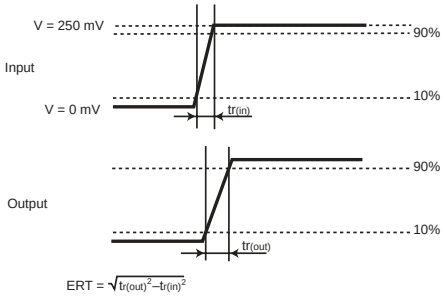
- **MEASUREMENT EQUIPMENT**

ELECTRICAL CHARACTERISTICS[1] (T_A = 25 °C)

PART NUMBER					PS7200E-1A		
	SYMBOLS	PARAMETERS		UNITS	MIN	TYP	MAX
Diode	V_F	Forward Voltage, I_F = 5 mA		V		1.1	1.4
	I_R	Reverse Current, V_R = 5 V		μA			5.0
MOS FET	I_{LOFF}	Off-State Leakage Current, V_D = 40 V		μA		0.1	10
	C_{OUT}	Output Capacitance, V = 0 V, f = 1 MHz		pF		33.5	
Coupled	I_{FON}	LED On-State Current, I_L = 250 mA		mA			2.0
	R_{ON1}	On-State Resistance,	I_F = 5 mA, I_L = 10 mA	Ω		0.8	1.6
	R_{ON2}		I_F = 5 mA, I_L = 250 mA, t ≤ 10 ms	Ω		0.8	1.6
	t_{ON}	Turn-on Time, I_F = 5 mA, V_O = 5 V, R_L = 500 Ω, PW ≥ 10 ms		ms		0.48	1.0
	t_{OFF}	Turn-off Time, I_F = 5 mA, V_O = 5 V, R_L = 500 Ω, PW ≥ 10 ms		ms		0.15	0.5
	R_{I-O}	Isolation Resistance, V_{I-O} = 1.0 kVDC		Ω	10^9		
	C_{I-O}	Isolation Capacitance, V = 0 V, f = 1 MHz		pF		0.5	
	ERT	Equivalent Rise Time2, I_F = 10 mA, $tr_{(in)}$ = 25 ps, V = 250 mV, 50 Ω termination.		ps		78	

Note:

1. 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 of under 10 ms, the turn-on time and turn-off time will increase.
2. ERT waveform and equation:



ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
I_F	Forward Current (DC)	mA	50
V_R	Reverse Voltage	V	5.0
P_D	Power Dissipation	mW	50
I_{FP}	Peak Foward Current[2]	A	1
MOSFET			
V_L	Break Down Voltage	V	40
I_L	Continuous Load Current	mA	250
P_D	Power Dissipation	mW	100
Coupled			
BV	Isolation Voltage[3]	Vr.m.s.	1500
P_T	Total Power Dissipation	mW	150
T_A	Operating Ambient Temp.	°C	-40 to +85
T_{STG}	Storage Temperature	°C	-40 to +100

Notes:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. PW = 100 μs, Duty Cycle = 1 %
3. AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output.

RECOMMENDED OPERATING CONDITIONS (T_A = 25°C)

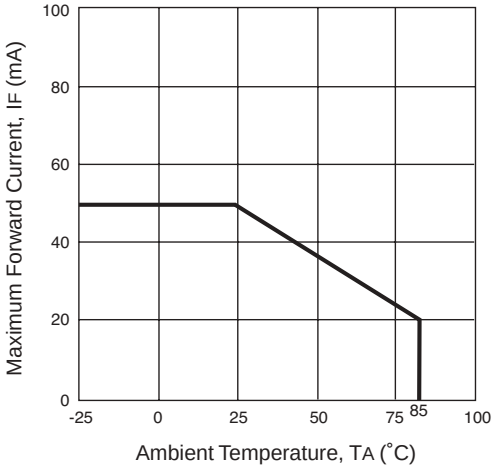
PART NUMBER		PS7200E-1A			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
I_F	LED Operating Current	mA	2	5	20
V_F	LED Off Voltage	V	0		0.5

ORDERING INFORMATION

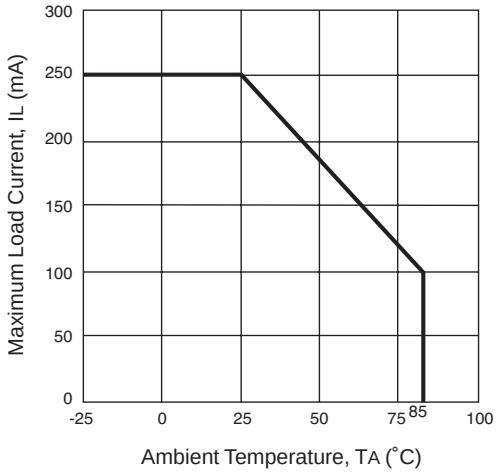
PART NUMBER	PACKING STYLE
PS7200E-1A	Magazine case 100 pcs
PS7200E-1A-E3	Embossed tape 900 pcs/reel
PS7200E-1A-E4	
PS7200E-1A-F3	Embossed tape 3500 pcs/reel
PS7200E-1A-F4	

TYPICAL PERFORMANCES CURVES (T_A = 25°C)

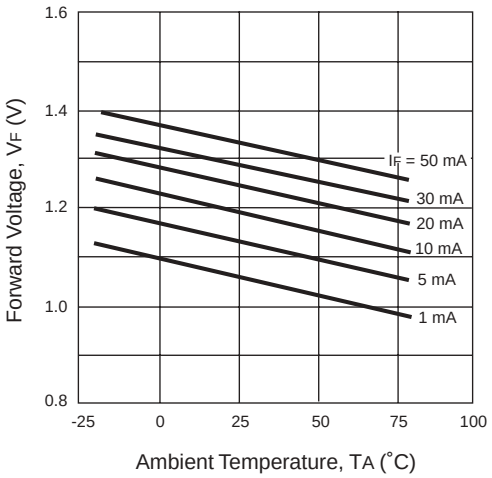
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



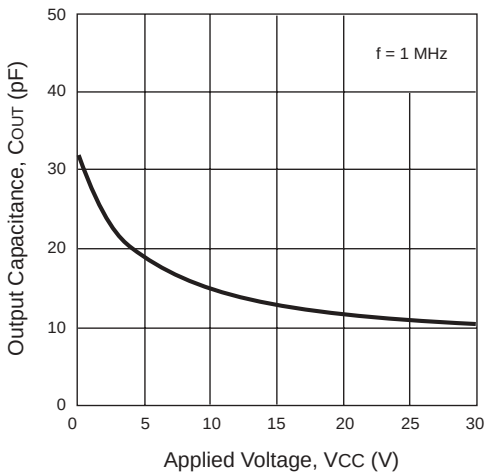
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



FORWARD VOLTAGE vs. AMBIENT TEMPERATURE

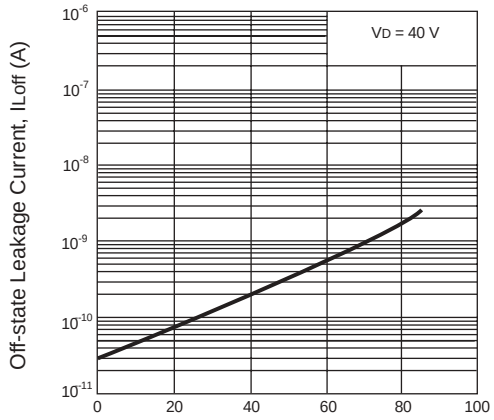


OUTPUT CAPACITANCE vs. APPLIED VOLTAGE

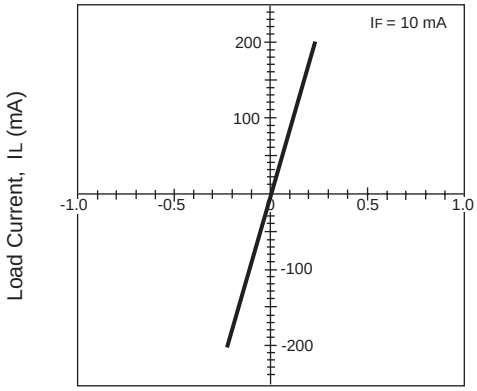


TYPICAL PERFORMANCE CURVES (TA = 25˚C)

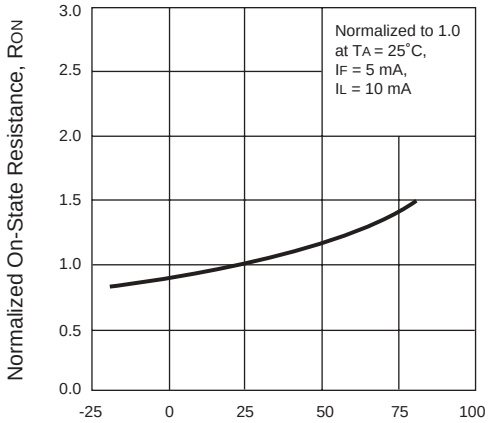
OFF-STATE LEAKAGE CURRENT vs. AMBIENT TEMPERATURE



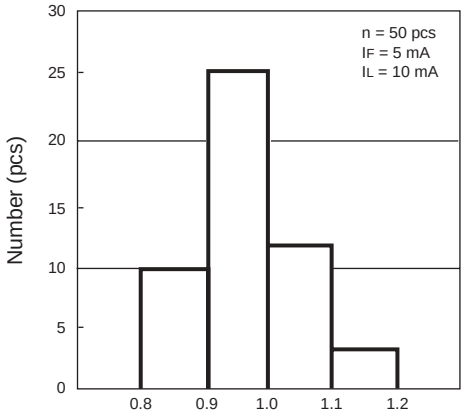
LOAD CURRENT vs. LOAD VOLTAGE



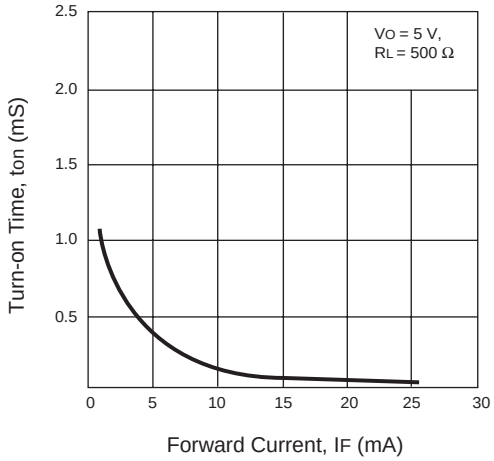
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



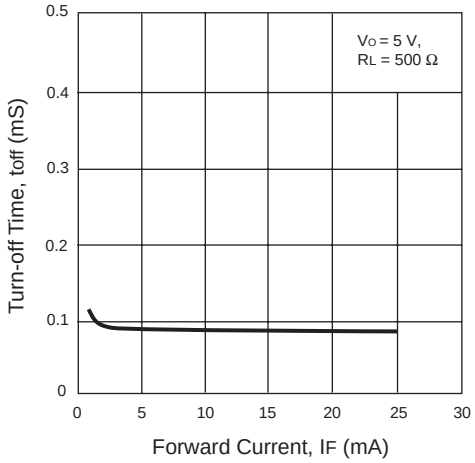
ON-STATE RESISTANCE DISTRIBUTION



TURN-ON TIME vs. FORWARD CURRENT

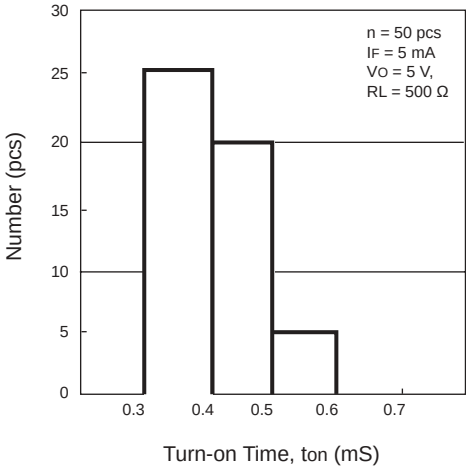


TURN-OFF TIME vs. FORWARD CURRENT

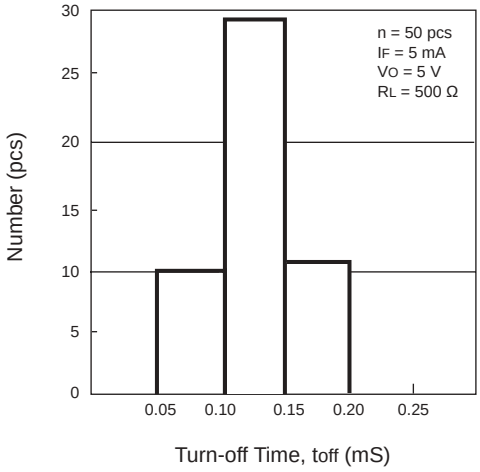


TYPICAL PERFORMANCE CURVES (T_A = 25°C)

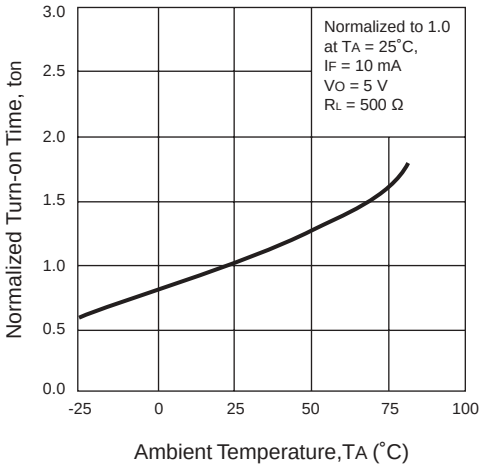
TURN-ON TIME DISTRIBUTION



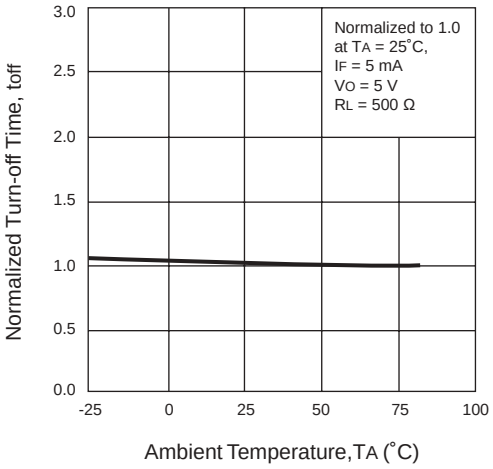
TURN-OFF TIME DISTRIBUTION



NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE

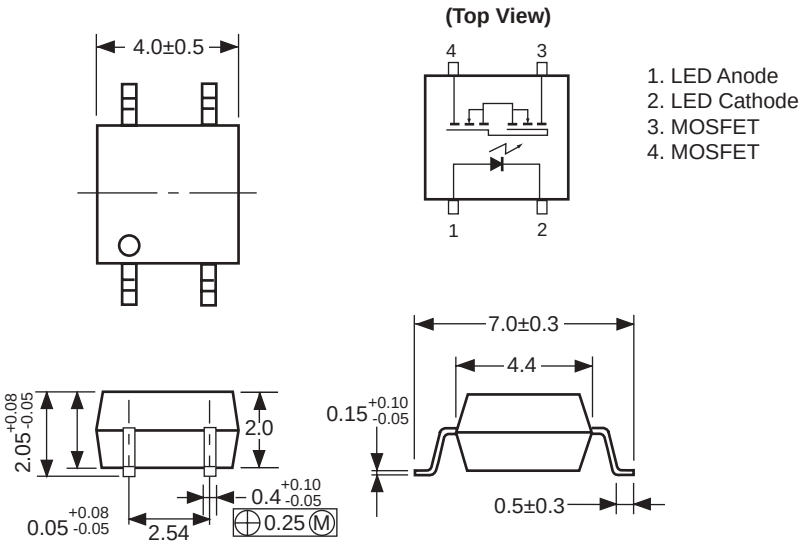


NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE

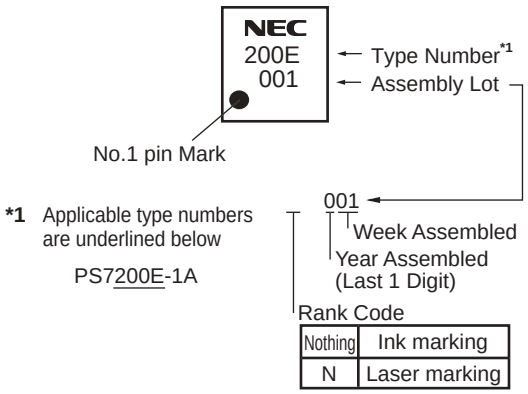


OUTLINE DIMENSIONS (Units in mm)

PS7200E-1A

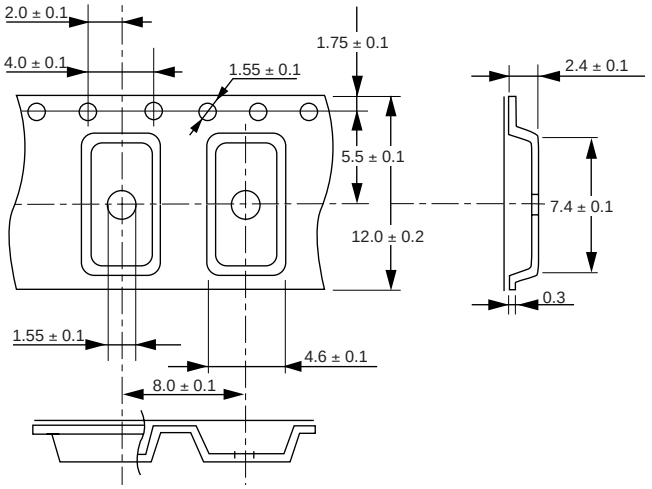


MARKING



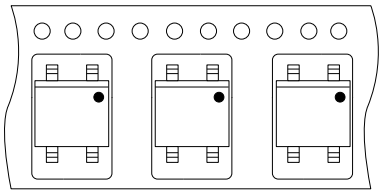
TAPING SPECIFICATIONS (Units in mm)

TAPE OUTLINE AND DIMENSIONS

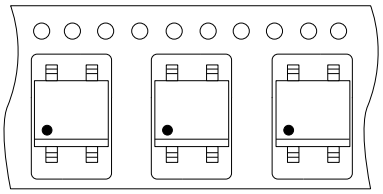


TAPE DIRECTION

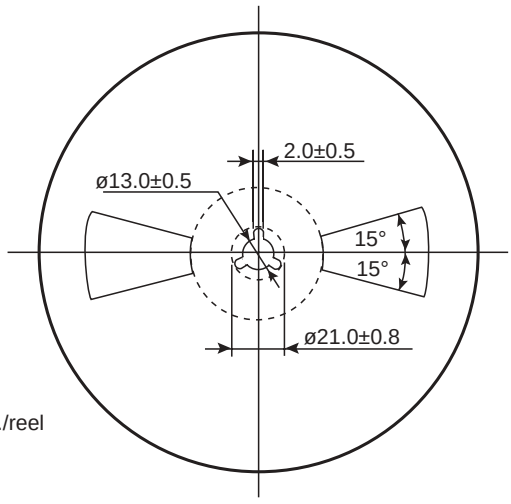
PS7200E-1A-E3

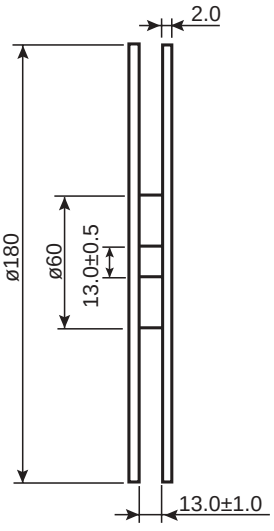


PS7200E-1A-E4



REEL OUTLINE AND DIMENSIONS

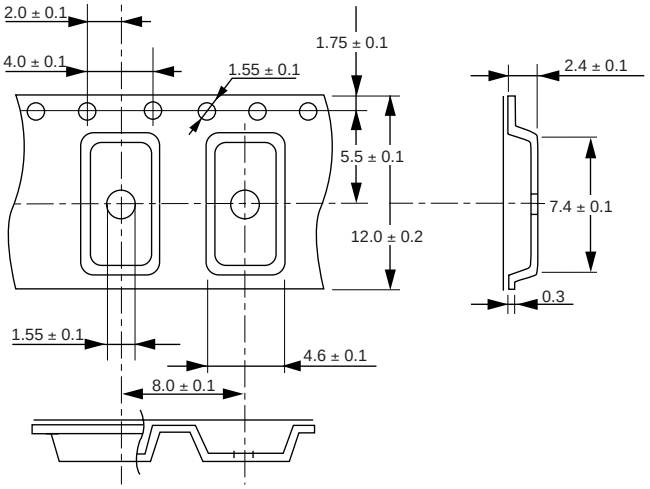




Packing: 900 pcs./reel

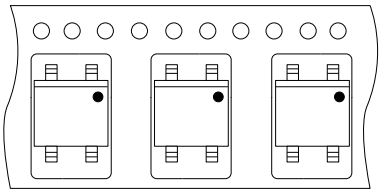
TAPING SPECIFICATIONS (Units in mm)

TAPE OUTLINE AND DIMENSIONS

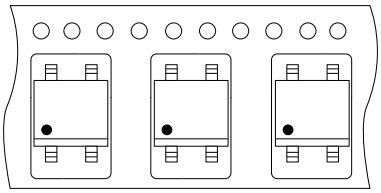


TAPE DIRECTION

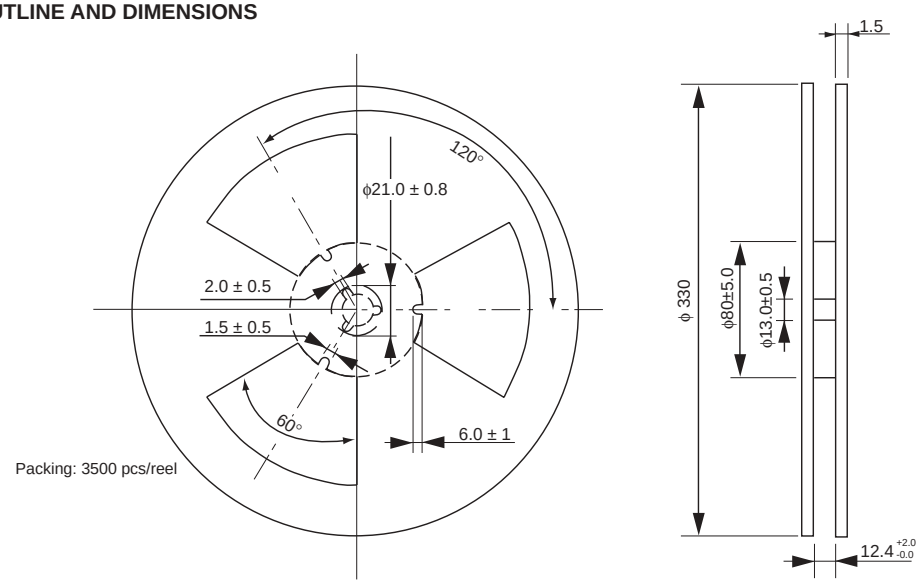
PS7200E-1A-F3



PS7200E-1A-F4



REEL OUTLINE AND DIMENSIONS



Packing: 3500 pcs/reel

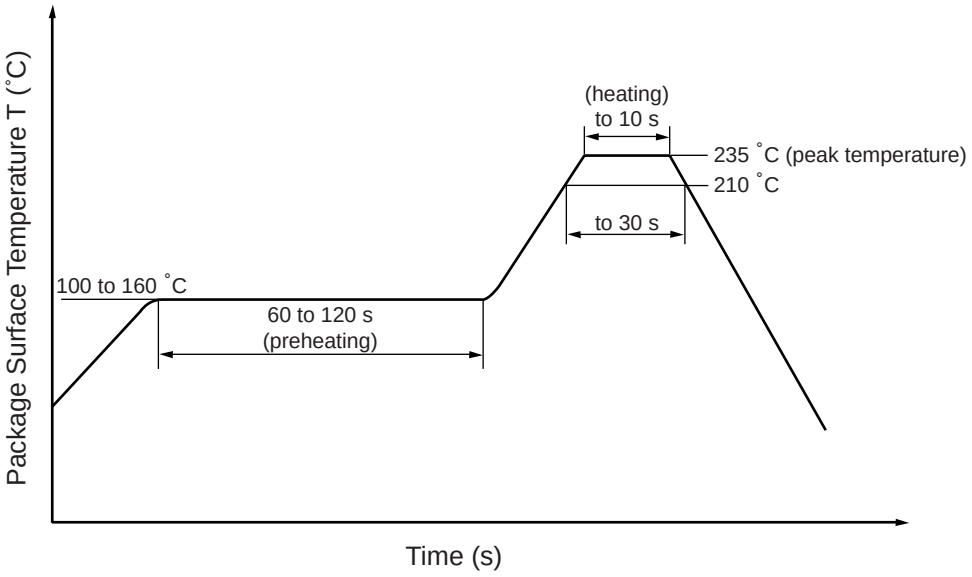
RECOMMENDED SOLDERING CONDITIONS

(1) Infrared Reflow Soldering

• Peak reflow temperature	235°C or below
• Time of temperature hicher 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.)

(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.