

4 PIN SOP 3.0 pF LOW OUTPUT CAPACITANCE 1-CH OPTICAL COUPLED MOSFET

PS7200A-1A

FEATURES

- **LOW C X R:**
 $C \times R = 30 \text{ pF} \cdot \Omega$
- **LOW OUTPUT CAPACITANCE:**
 $C_{OUT} = 3.0 \text{ pF TYP}$
- **LOW OFF-STATE LEAKAGE CURRENT:**
 $I_{LOFF} = 0.1 \text{ nA TYP}$
- **HIGH SPEED TURN-ON TIME:**
 $t_{ON} = 0.01 \text{ ms TYP}$
- **1 CHANNEL TYPE:**
(1a output)
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL PACKAGE:**
4 pin SOP
- **HIGH ISOLATION VOLTAGE:**
($BV = 1500 \text{ Vr.m.s.}$)
- **LOW OFFSET VOLTAGE**
- **LOW LED OPERATING CURRENT:**
 $I_F = 2 \text{ mA}$
- **SURFACE MOUNT AVAILABLE**

DESCRIPTION

PS7200A-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 output capacitance, and low off-state leakage current.

APPLICATIONS

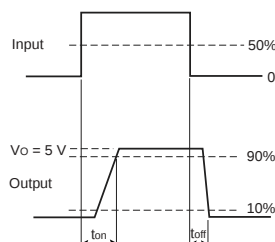
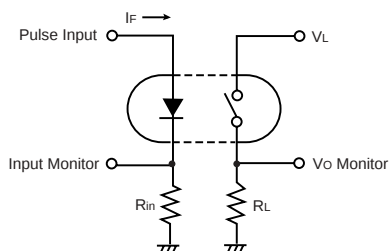
- **MEASUREMENT EQUIPMENT**

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

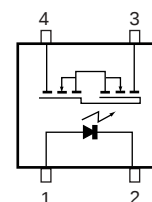
PART NUMBER					PS7200A-1A		
SYMBOLS		PARAMETERS		UNITS	MIN	TYP	MAX
Diode	V _F	Forward Voltage, I _F = 10 mA		V		1.2	1.4
	I _R	Reverse Current, V _R = 5 V		μA			5.0
MOS FET	I _{LOFF}	Off-State Leakage Current, V _D = 40 V		nA		0.1	100
	C _{OUT}	Output Capacitance, V = 0 V, f = 1 MHz		pF		3.0	
Coupled	I _{Fon}	LED On-state Current, I _L = 100 mA		mA			2.0
	R _{ON1}	On-State Resistance	I _F = 10 mA, I _L = 10 mA	Ω	9.3	12	
	R _{ON2}		I _F = 10 mA, I _L = 100 mA, t≤10 ms				
	t _{ON}	Turn-on Time ¹	I _F = 10 mA, V _O = 5 V, PW ≥ 10 ms	ms	0.01	0.5	
	t _{OFF}	Turn-off Time ¹		ms	0.07	0.2	
	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/ch		0.5	

Note:

1. Test Circuit for Switching Time:



PS7200A-1A



ABSOLUTE MAXIMUM RATINGS¹ ($T_A = 25^\circ\text{C}$)

SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
I_F	Forward Current (DC)	mA	50
V_R	Reverse Voltage	V	5.0
P_D	Power Dissipation	mW/ch	50
I_{FP}	Peak Forward Current ²	A	1
MOSFET			
V_L	Break Down Voltage	V	40
I_L	Continuous Load Current	mA	100
I_{LP}	Pulse Load Current ³ AC/DC Connection	mA	200
P_D	Power Dissipation	mW/ch	100
Coupled			
BV	Isolation Voltage ⁴	Vr.m.s.	1500
P_T	Total Power Dissipation	mW	150
T_{OP}	Operating Ambient Temp.	$^\circ\text{C}$	-40 to +80
T_{STG}	Storage Temperature	$^\circ\text{C}$	-40 to +100

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

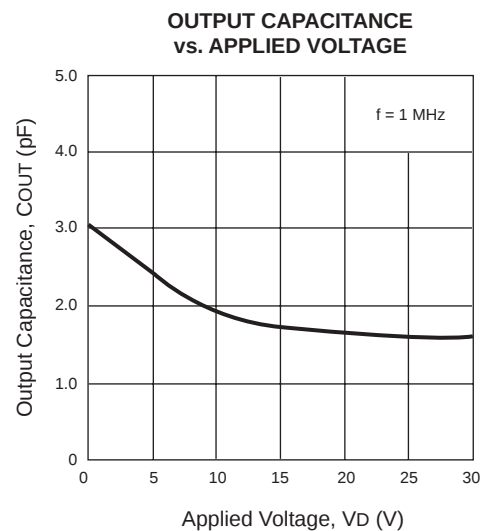
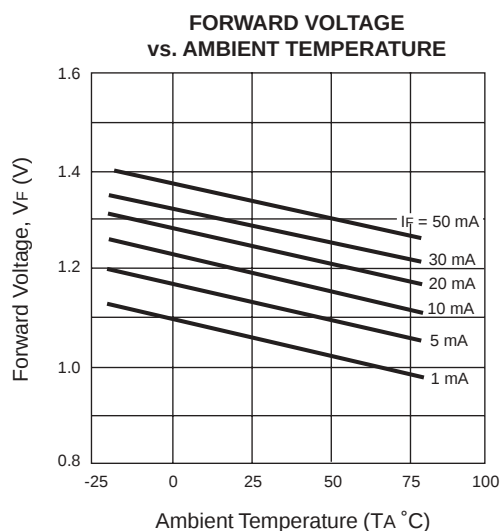
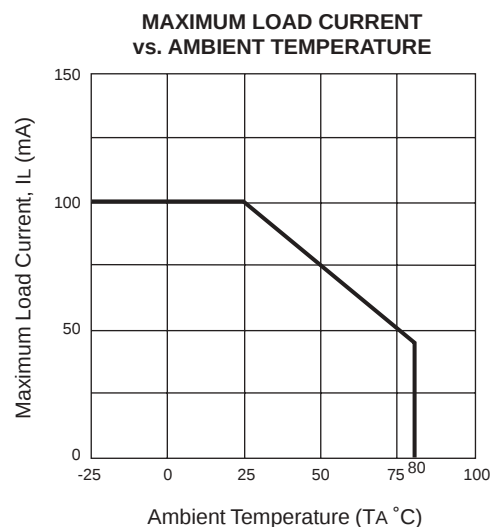
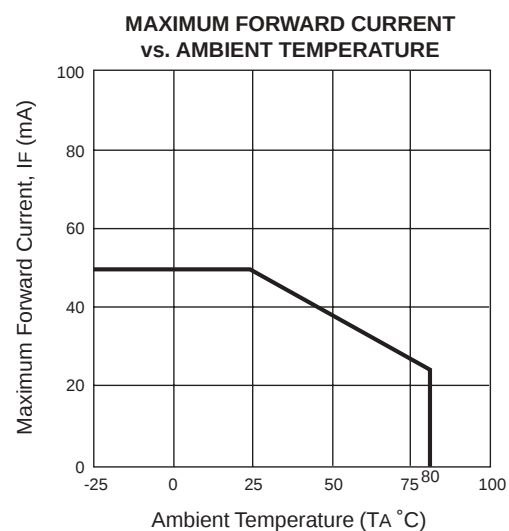
PART NUMBER		PS7200A-1A			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
I_F	LED Operating Current	mA	2	10	20
V_F	LED Off Voltage	V	0		0.5

ORDERING INFORMATION

PART NUMBER	PACKAGE	PACKING STYLE
PS7200A-1A	4-pin SOP	Magazine case 100 pcs
PS7200A-1A-E3		Embossed tape 900 pcs/reel
PS7200A-1A-E4		
PS7200A-1A-F3		Embossed tape 3500 pcs/reel
PS7200A-1A-F4		

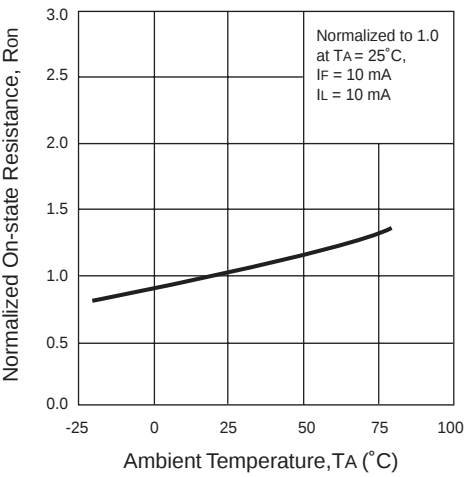
Notes:

- Operation in excess of any one of these parameters may result in permanent damage.
- $PW = 100\ \mu\text{s}$, Duty Cycle = 1 %
- $PW = 100\ \text{ms}$, 1 shot.
- AC voltage for 1 minute at $T_A = 25^\circ\text{C}$, RH = 60 % between input and output.

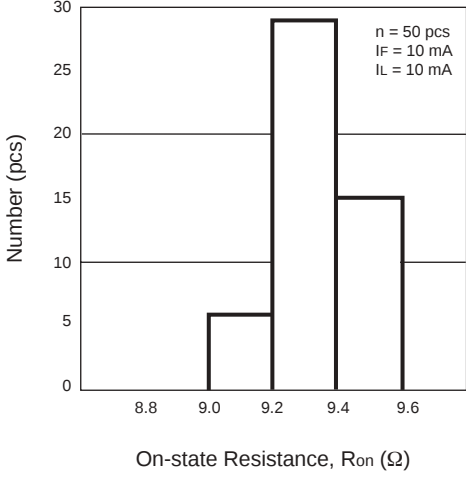
TYPICAL PERFORMANCES CURVES ($T_A = 25^\circ\text{C}$)

TYPICAL PERFORMANCE CURVES (TA = 25°C)

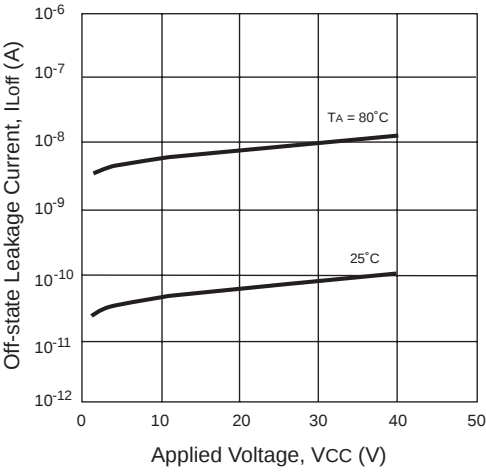
NORMALIZED ON-STATE RESISTANCE
vs. AMBIENT TEMPERATURE



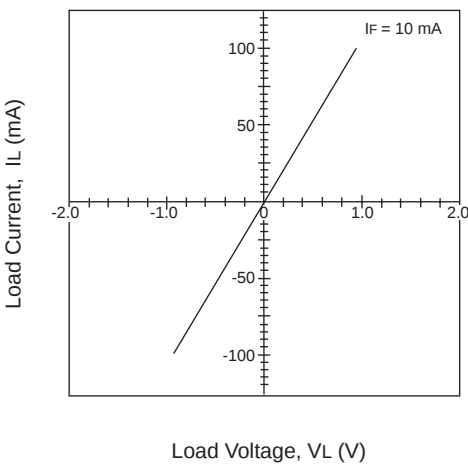
ON-STATE RESISTANCE DISTRIBUTION



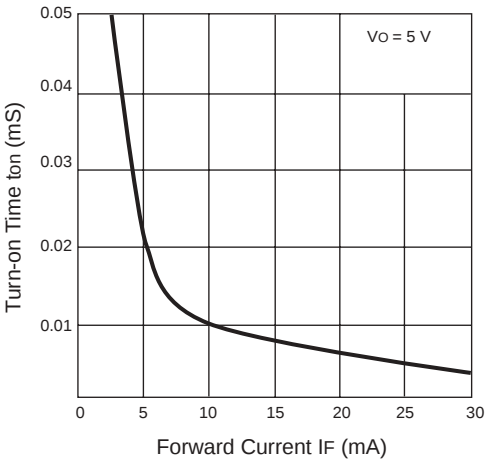
OFF-STATE LEAKAGE CURRENT
vs. APPLIED VOLTAGE



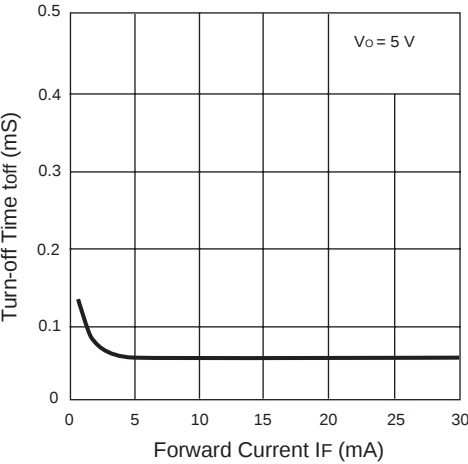
LOAD CURRENT vs. LOAD VOLTAGE



TURN-ON TIME vs. FORWARD CURRENT

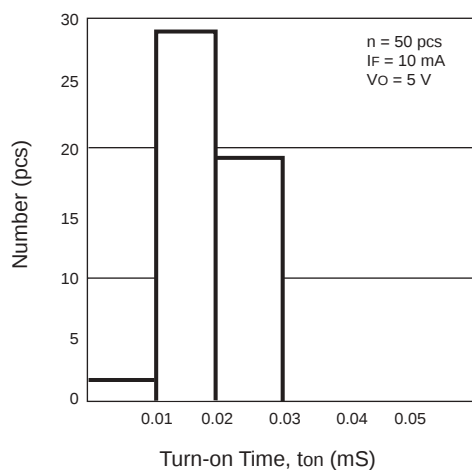


TURN-OFF TIME vs. FORWARD CURRENT

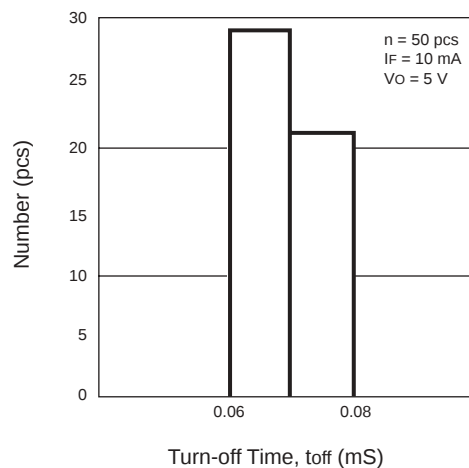


TYPICAL PERFORMANCE CURVES (TA = 25°C)

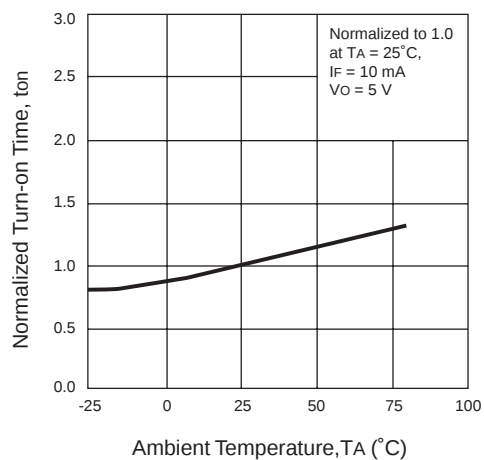
TURN-ON TIME DISTRIBUTION



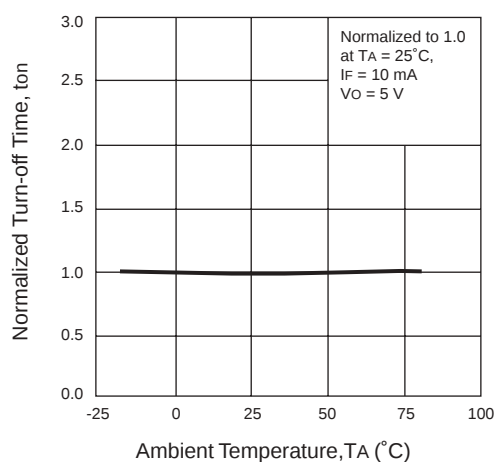
TURN-OFF TIME DISTRIBUTION



NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE

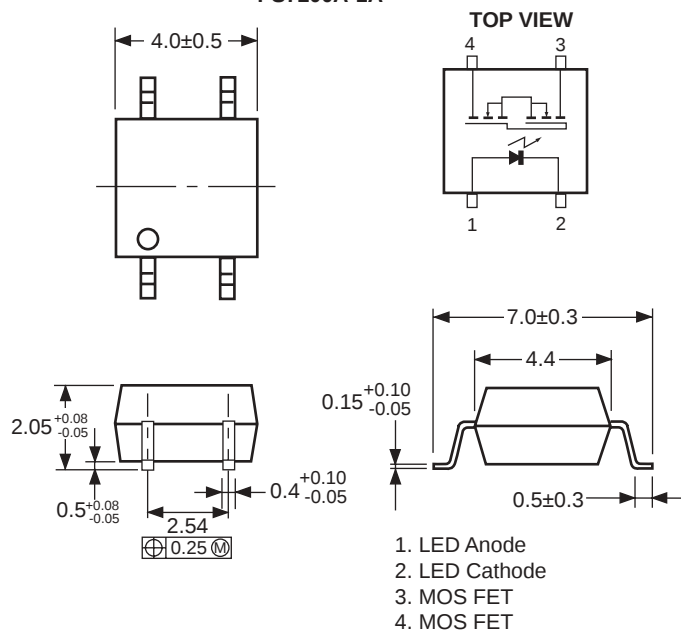


NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE



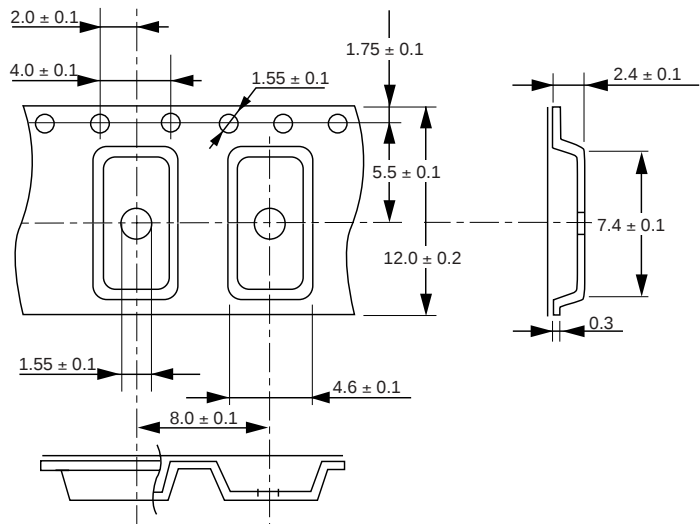
OUTLINE DIMENSIONS (Units in mm)

PS7200A-1A



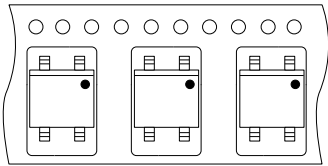
TAPING SPECIFICATIONS (Units in mm)

Tape Outline and Dimensions

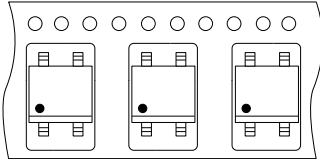


Tape Direction

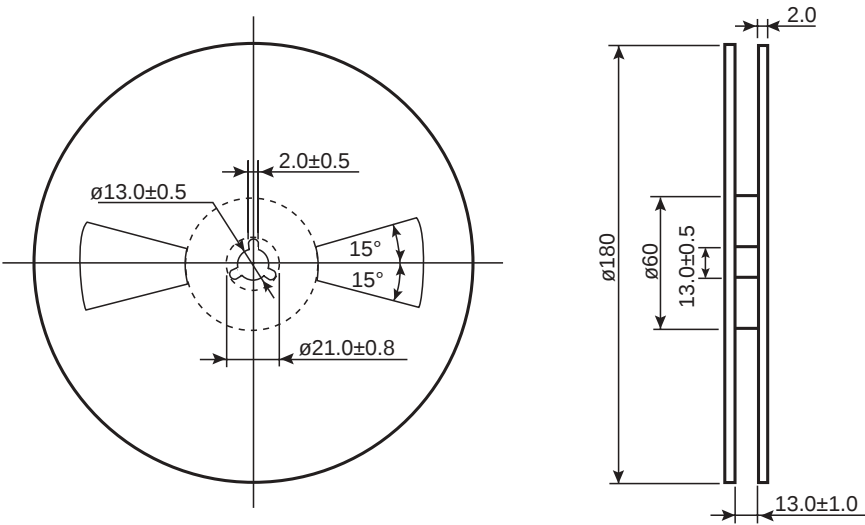
PS7200A-1A-E3



PS7200A-1A-E4



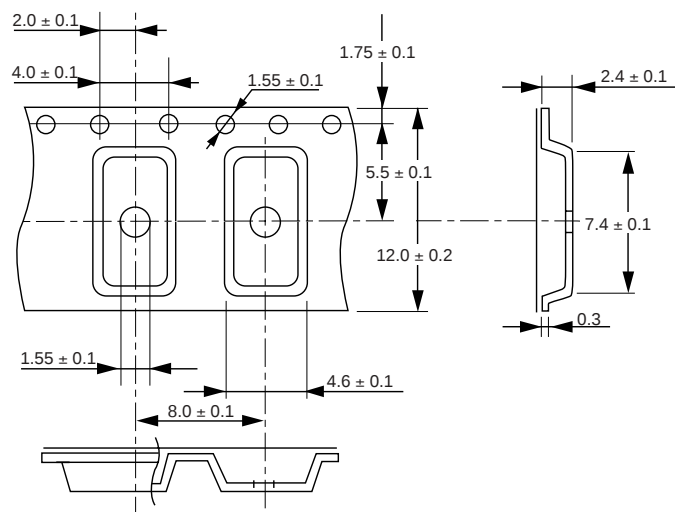
Reel Outline and Dimensions



Packing: 900 pcs/reel

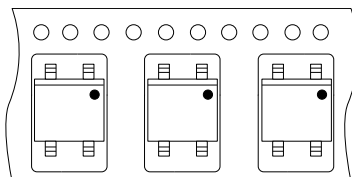
TAPING SPECIFICATIONS (Units in mm)

Tape Outline and Dimensions

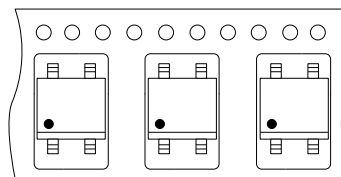


Tape Direction

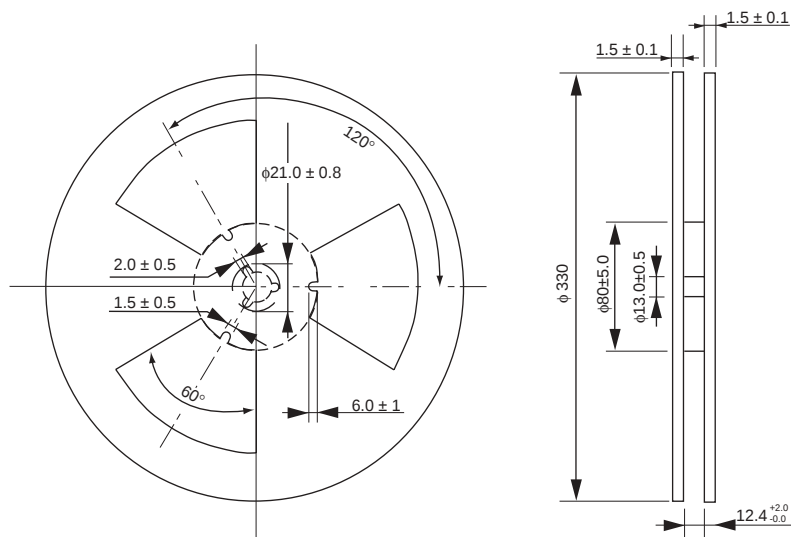
PS7200A-1A-F3



PS7200A-1A-F4



Reel Outline and Dimensions

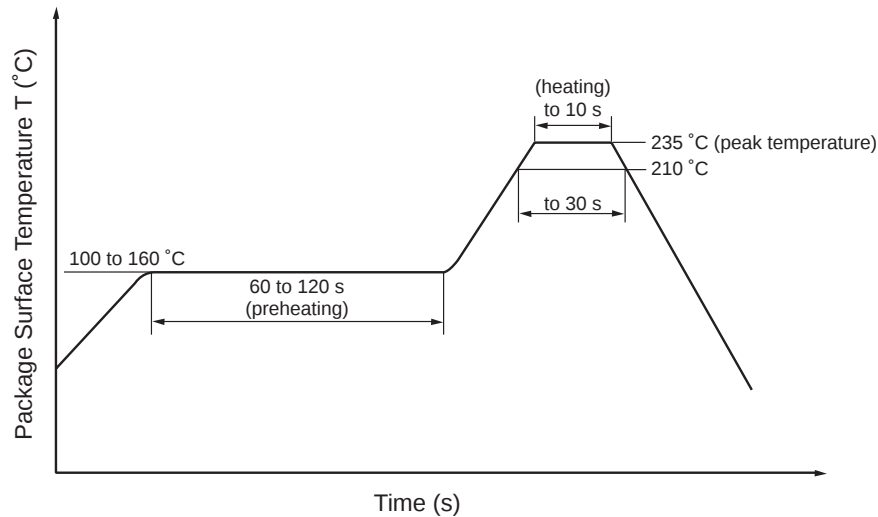


RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

- Peak reflow temperature 235 °C or below (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) Cautions

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

EXCLUSIVE NORTH AMERICAN AGENT FOR NEC RF, MICROWAVE & OPTOELECTRONIC SEMICONDUCTORS

CEL CALIFORNIA EASTERN LABORATORIES • Headquarters • 4590 Patrick Henry Drive • Santa Clara, CA 95054-1817 • (408) 988-3500 • Telex 34-6393 • FAX (408) 988-0279
DATA SUBJECT TO CHANGE WITHOUT NOTICE

Internet: <http://WWW.CEL.COM>

09/04/2001