NEC

HIGH LOAD CURRENT 4 PIN SOP LOW ON-STATE RESISTANCE 1-CH OPTICAL COUPLED MOSFET

PS7206-1A

FEATURES

- **LOW ON-STATE RESISTANCE:**
  R_{ON} = 0.6 Ω TYP
- **LARGE CONTINUOUS LOAD CURRENT:**
  I_L = 600 mA
- **1 CHANNEL TYPE:**
  1a 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:**
- **SURFACE MOUNT TYPE LEAD:**
  PS7206-1A-E3, E4, F3, F4

DESCRIPTION

The PS7206-1A is a low on-state resistance solid state relay containing GaAs LEDs on the light emitting side (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.

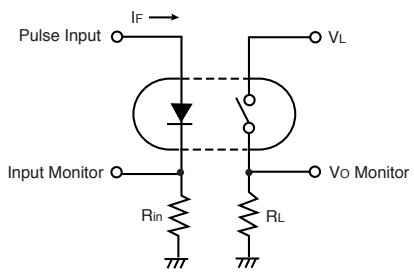
APPLICATIONS

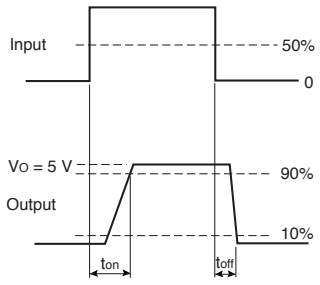
- **MEASUREMENT EQUIPMENT**
- **FA EQUIPMENT**

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

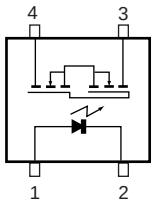
PART NUMBER				PS7206-1A		
	SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V_F	Forward Voltage, I_F = 10 mA	V		1.2	1.4
	I_R	Reverse Current, V_R = 5 V	μA			5.0
MOS FET	I_{LOFF}	Off-State Leakage Current, V_D = 60 V	μA			1.0
	C_{OUT}	Output Capacitance, V_D = 0 V, f = 1 MHz	pF		70	
Coupled	I_{Fon}	LED On-State Current, I_L = 600 mA	mA			2.0
	R_{on}	On-state Resistance, I_F = 10 mA, I_L = 600 mA, t ≤10 ms	Ω		0.6	0.8
	t_{ON}	Turn-on Time, I_F = 10 mA, V_O = 5 V, R_L = 500 Ω, PW ≥ 10 ms	ms		0.4	2.0
	t_{OFF}	Turn-off Time, I_F = 10 mA, V_O = 5 V, R_L = 500 Ω, PW ≥ 10 ms	ms		0.08	0.5
	R_{I-O}	Isolation Resistance, V_{I-O} = 1.0 kV_{DC}	Ω	10^9		
	C_{I-O}	Isolation Capacitance, V = 0 V, f = 1 MHz	pF		0.5	

Note:
1. Test Circuit fior Switching Time





PS7206-1A



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

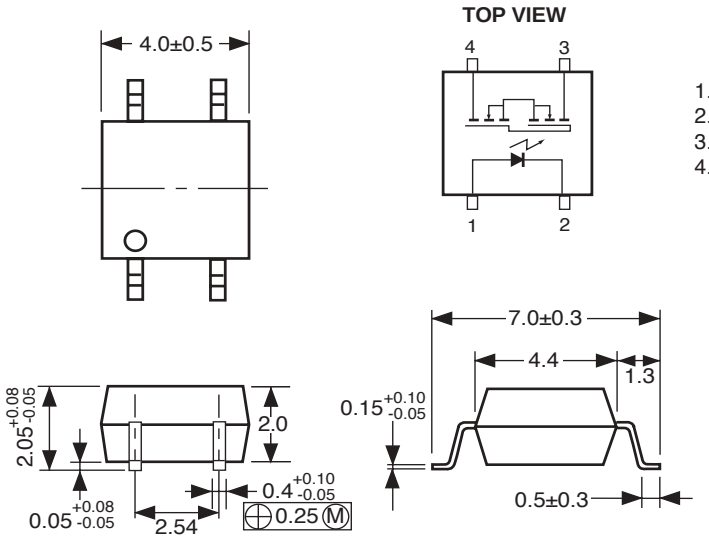
SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
I_F	Forward Current (DC)	mA	50
V_R	Reverse Voltage	V	5.0
P_D	Power Dissipation	mW	50
I_{FP}	Peak Foward Current[2]	A	1
MOSFET			
V_L	Break Down Voltage	V	60
I_L	Continuous Load Current	mA	600
I_{LP}	Pulse Load Current[3] (AC/DC Connection)	A	1.2
P_D	Power Dissipation	mW/ch	300
Coupled			
BV	Isolation Voltage[4]	Vr.m.s.	1500
P_T	Total Power Dissipation	mW	350
T_A	Operating Ambient Temp.	°C	-40 to +85
T_{STG}	Storage Temperature	°C	-40 to +100

RECOMMENDED OPERATING CONDITIONS (T_A = 25°C)

PART NUMBER		PS7206-1A			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
I_F	LED Operating Current	mA	2	10	20
V_F	LED Off Voltage	V	0		0.5

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

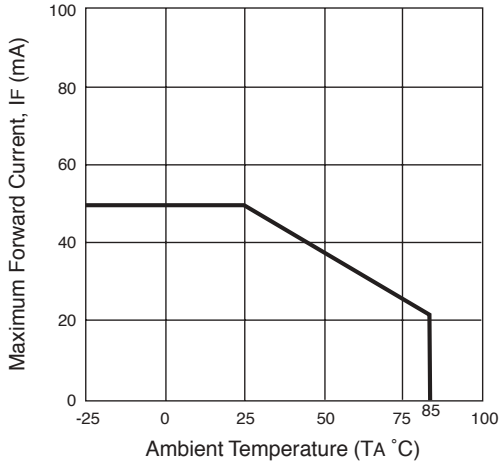
OUTLINE DIMENSIONS (Units in mm)



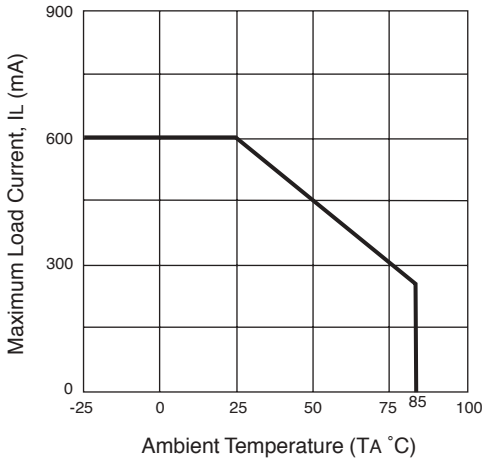
1. LED Anode
2. LED Cathode
3. MOS FET
4. MOS FET

TYPICAL PERFORMANCES CURVES (T_A = 25˚C)

MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE

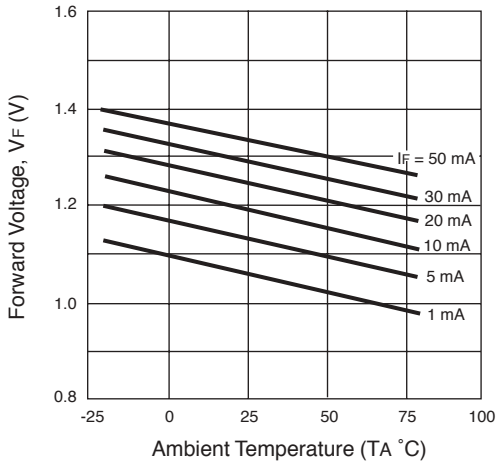


MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE

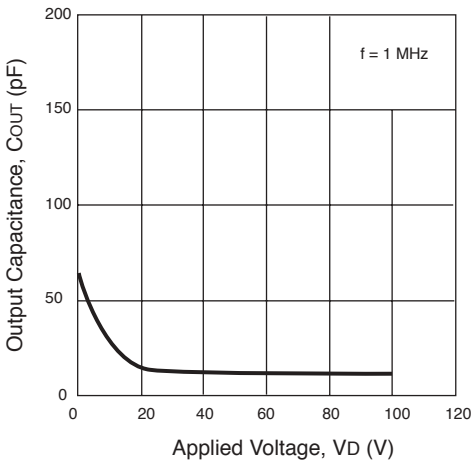


TYPICAL PERFORMANCE CURVES (TA = 25˚C)

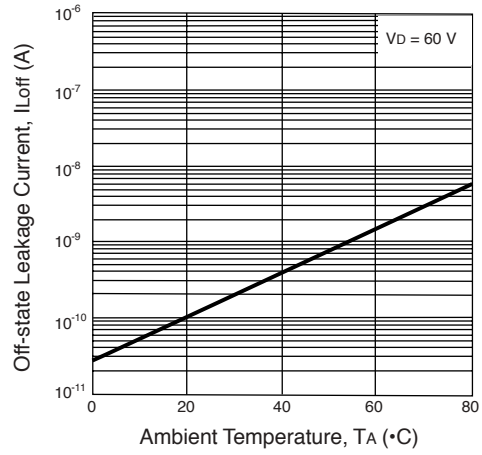
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



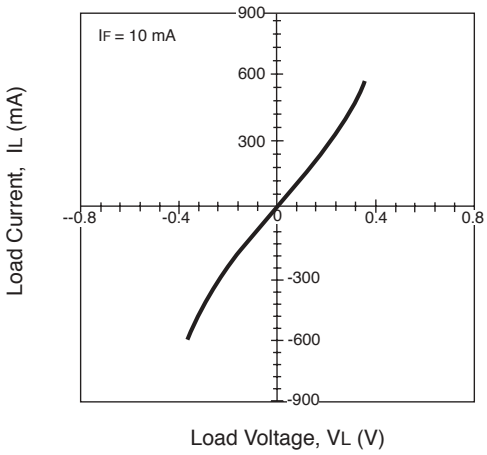
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



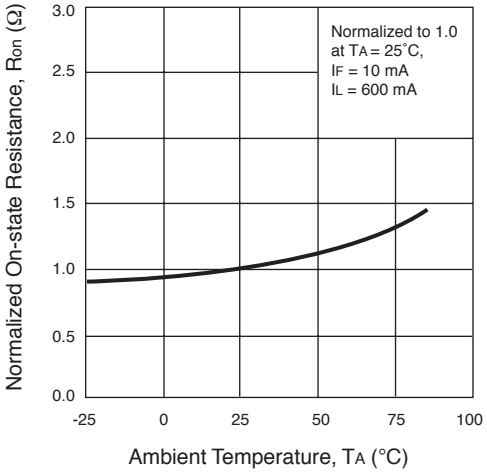
OFF-STATE LEAKAGE CURRENT vs. AMBIENT TEMPERATURE



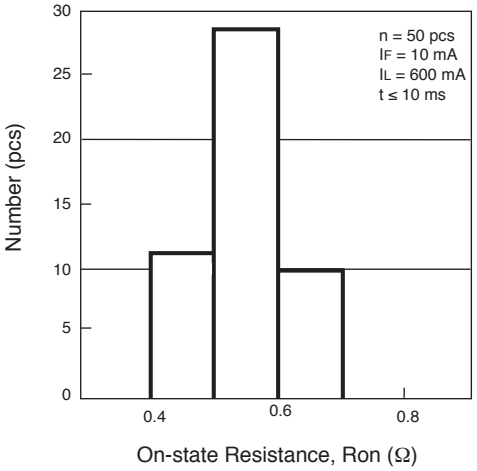
LOAD CURRENT vs. LOAD VOLTAGE



NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE

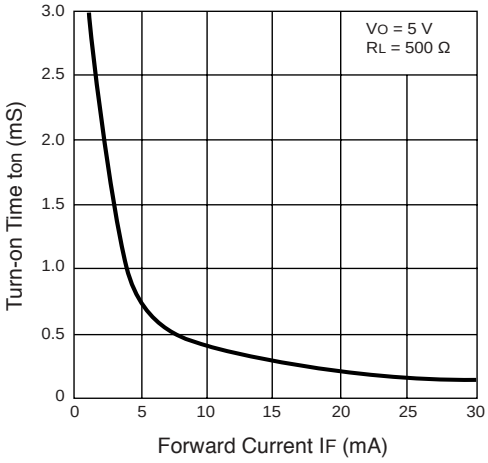


ON-STATE RESISTANCE DISTRIBUTION

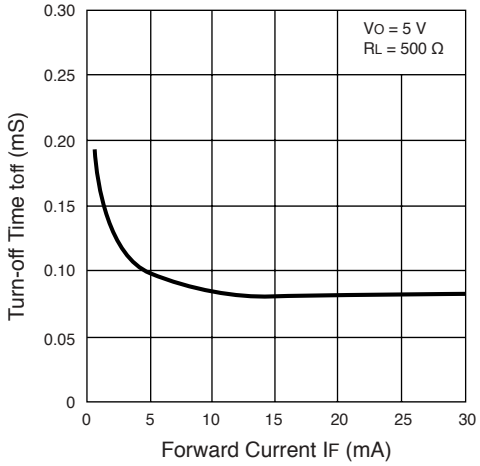


TYPICAL PERFORMANCE CURVES (T_A = 25°C)

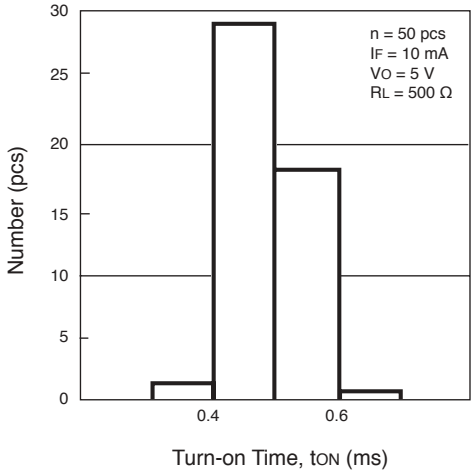
TURN-ON TIME vs. FORWARD CURRENT



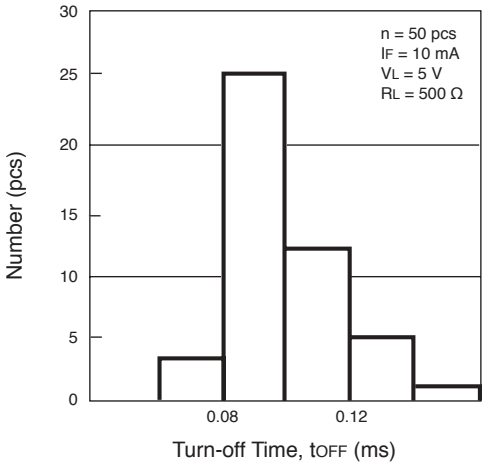
TURN-OFF TIME vs. FORWARD CURRENT



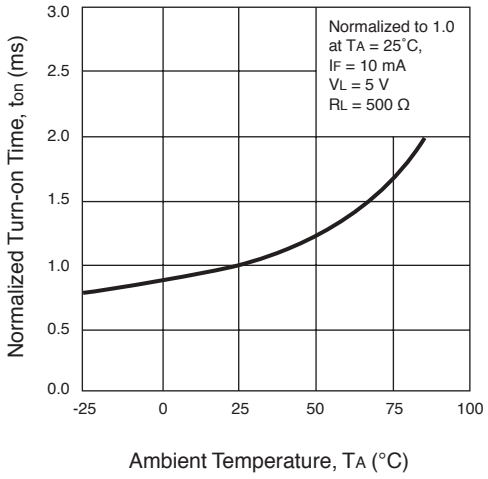
TURN-ON TIME DISTRIBUTION



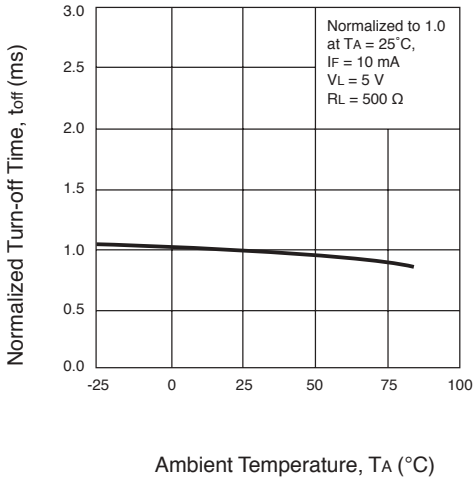
TURN-OFF TIME DISTRIBUTION



NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE

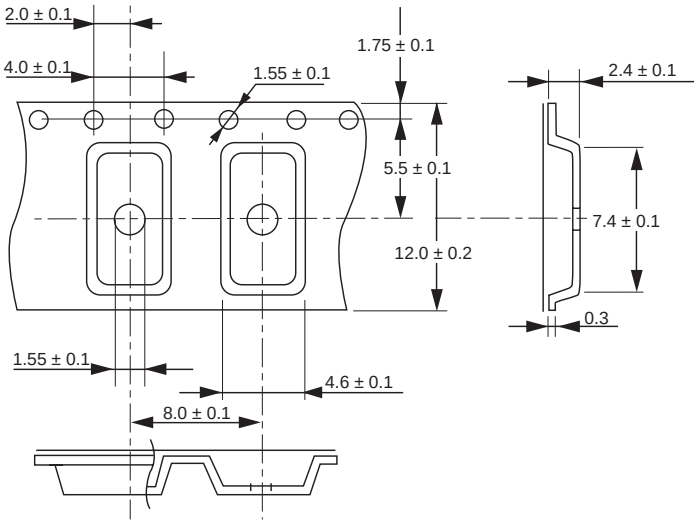


NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE

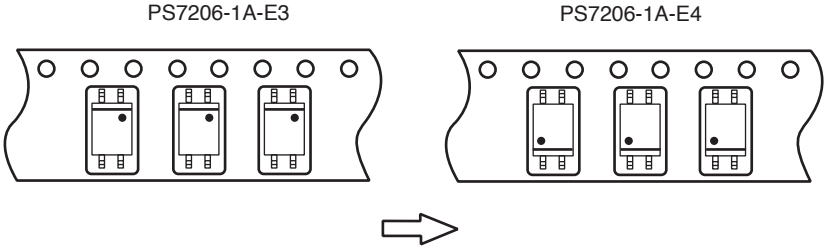


TAPING SPECIFICATIONS (Units in mm)

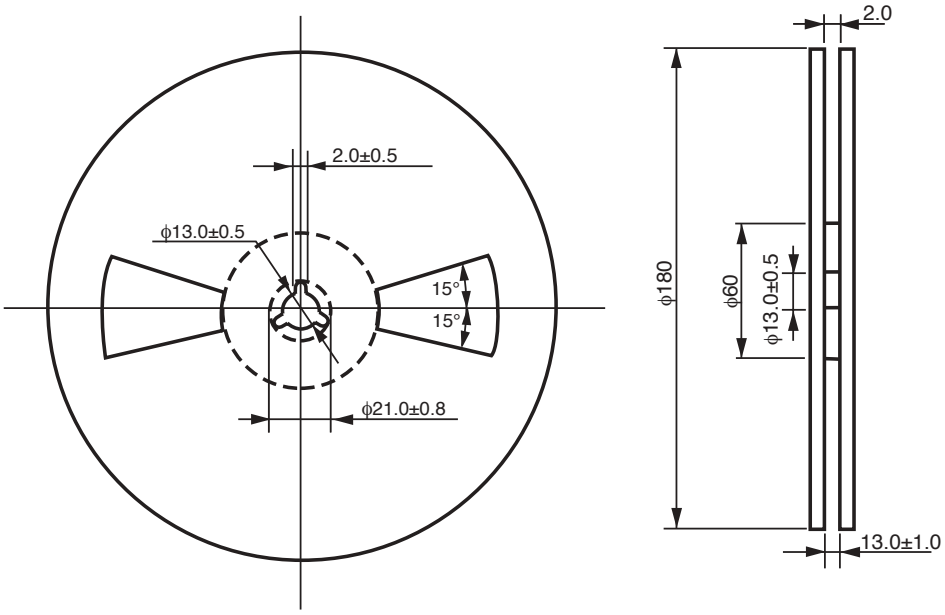
OUTLINE AND DIMENSIONS (TAPE)



TAPE DIRECTION



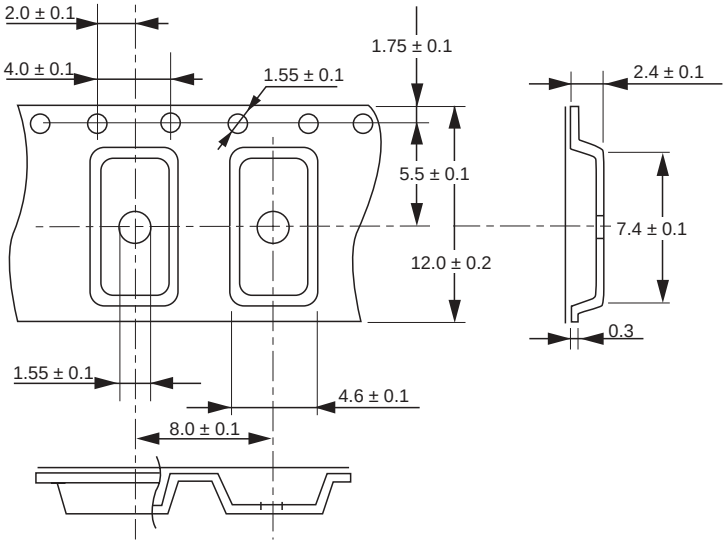
OUTLINE AND DIMENSIONS (REEL)



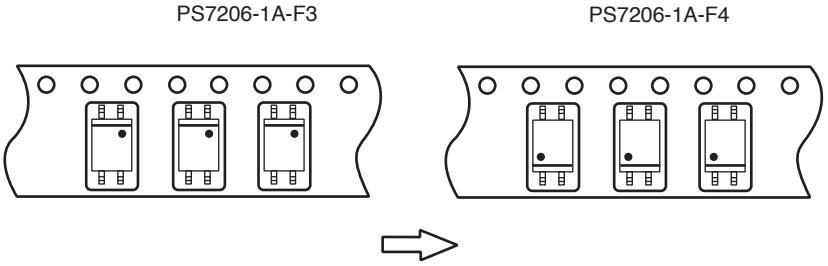
Packing: 900 pcs/reel

TAPING SPECIFICATIONS (Units in mm)

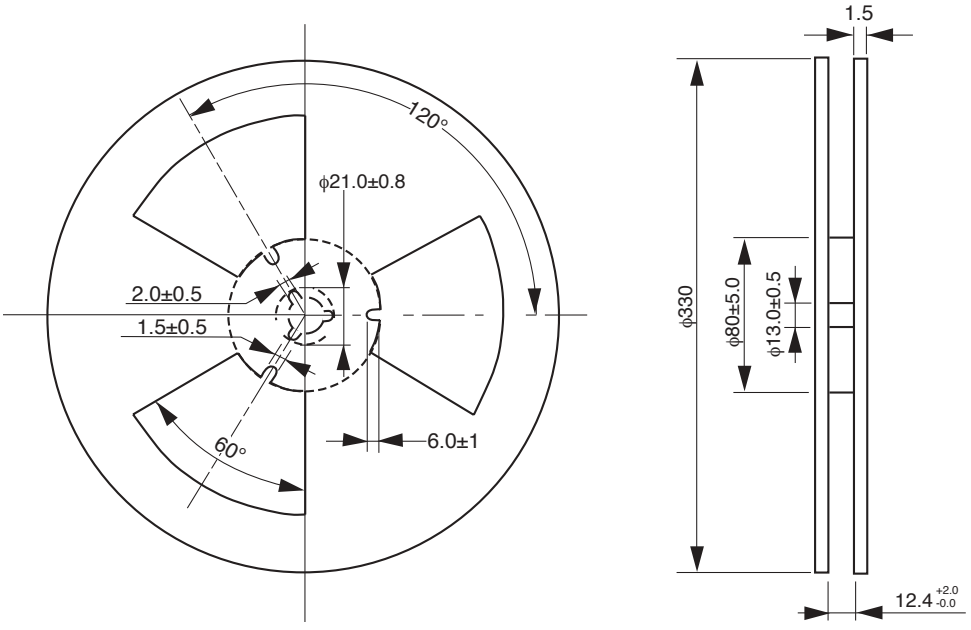
OUTLINE AND DIMENSIONS (TAPE)



TAPE DIRECTION



OUTLINE AND DIMENSIONS (REEL)



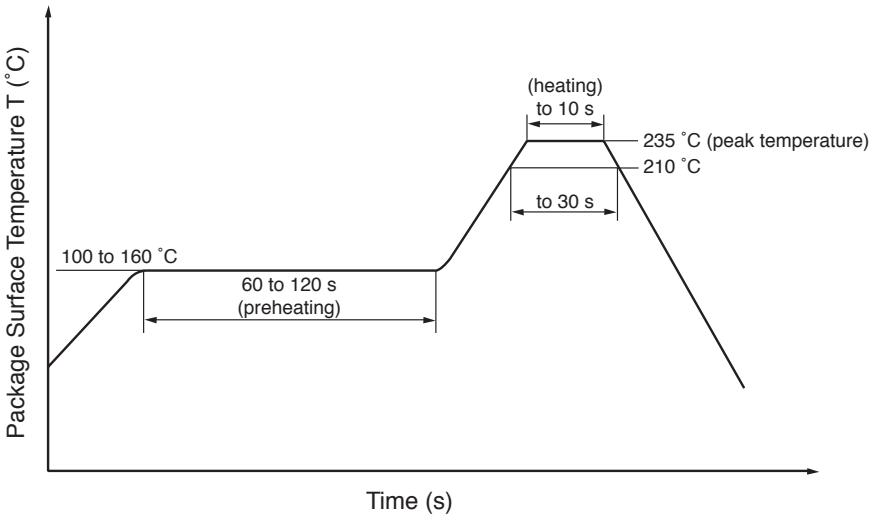
Packing: 3500 pcs/reel

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.