

NEC

8 PIN DIP 250 V BREAKDOWN VOLTAGE TRANSFER TYPE 2-CH OPTICAL COUPLED MOSFET

PS7122A-1C PS7122AL-1C

FEATURES

- **2 CHANNEL TYPE:**
1a and 1b Output
- **LOW LED OPERATING CURRENT:**
 $I_F = 2 \text{ mA}$
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL PACKAGE:**
8 Pin DIP
- **LOW OFFSET VOLTAGE**
- **SURFACE MOUNT TYPE LEAD AVAILABLE:**
PS7122AL-1C

DESCRIPTION

PS7122A-1C and PS7122AL-1C are transfer type solid state relays containing normally open (N.O.) contact and normally closed (N.C.) contact on the output side.

They are suitable for analog signal control because of their low offset and high linearity.

APPLICATIONS

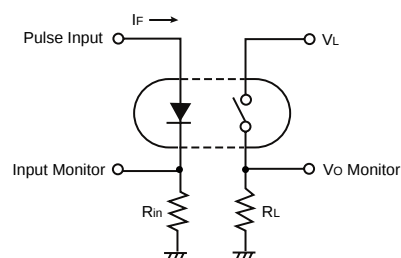
- EXCHANGE EQUIPMENT
- MEASUREMENT EQUIPMENT
- FA/OA EQUIPMENT

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

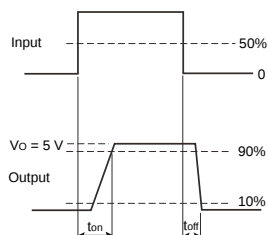
PART NUMBER				PS7122A-1C, PS7122AL-1C		
SYMBOLS		PARAMETERS		UNITS	MIN	MAX
Diode	V_F	Forward Voltage, $I_F = 10 \text{ mA}$		V		
	I_R	Reverse Current, $V_R = 5 \text{ V}$		μA		
MOSFET	I_{Loff}	Off-State Leakage Current,	N.O.: $I_F = 0 \text{ mA}$, $V_D = 250 \text{ V}$	μA		
			N.C.: $I_F = 10 \text{ mA}$, $V_D = 250 \text{ V}$			
	C_{OUT}	Output Capacitance,	N.O.: $V_D = 0 \text{ V}$, $f = 1 \text{ MHz}$	pF/ch		
			N.C.: $I_F = 10 \text{ mA}$, $V_D = 0 \text{ V}$, $f = 1 \text{ MHz}$	pF/ch		
Coupled	I_{Fon}	LED On-state Current, N.O.: $I_L = 200 \text{ mA}$		mA		
	I_{Foff}	LED Off-state Current, N.C.: $I_L = 200 \text{ mA}$		mA		
	R_{on1}	On-State Resistance,	N.O.: $I_F = 10 \text{ mA}$, $I_L = 10 \text{ mA}$	Ω		
			N.C.: $I_F = 0 \text{ mA}$, $I_L = 10 \text{ mA}$			
	R_{on2}		N.O.: $I_F = 10 \text{ mA}$, $I_L = 200 \text{ mA}$, $t \leq 10 \text{ ms}$			
			N.C.: $I_F = 0 \text{ mA}$, $I_L = 200 \text{ mA}$, $t \leq 10 \text{ ms}$			
	$t_{on} \text{ (N.O.)}$	Turn-On Time ¹ , $I_F = 10 \text{ mA}$, $V_O = 5 \text{ V}$, $PW \geq 10 \text{ ms}$		ms		
	$t_{on} \text{ (N.C.)}$					
	$t_{off} \text{ (N.O.)}$	Turn-Off Time ¹ , $I_F = 10 \text{ mA}$, $V_O = 5 \text{ V}$, $PW \geq 10 \text{ ms}$		ms		
	$t_{off} \text{ (N.C.)}$					
	R_{I-O}	Isolation Resistance, $V_{in-out} = 1.0 \text{ kVDC}$		Ω	10^9	
	C_{I-O}	Isolation Capacitance, $V = 0 \text{ V}$, $f = 1 \text{ MHz}$		pF/ch		

Note:

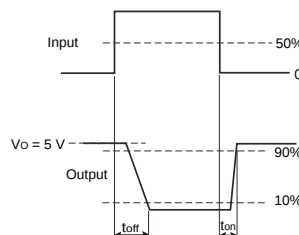
1. Test circuit for Switching Time



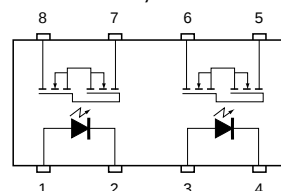
N.O. (Between pins 5 and 6)



N.C. (Between pins 7 and 8)



PS7122A-1C, PS7122AL-1C



PS7122A-1C, PS7122AL-1C

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25 °C)

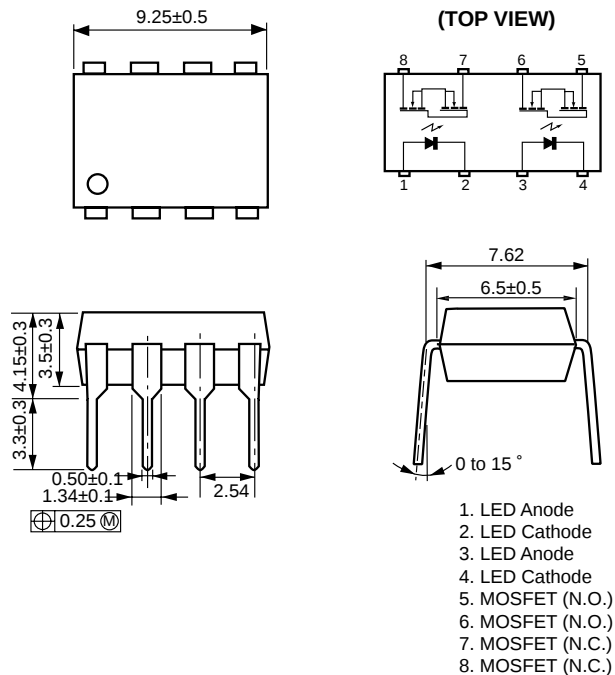
SYMBOLS	PARAMETERS	UNITS	RATINGS
			PS7122A-1C PS7122AL-1C
Diode			
V _R	Reverse Voltage	V	5
I _F	Forward Current (DC)	mA	50
P _D	Power Dissipation	mW/ch	50
I _{FP}	Peak Forward Current ²	A	1
MOSFET			
V _L	Break Down Voltage	V	250
I _L	Continuous Load Current	mA	200
I _{LP}	Pulse Load Current ³ (AC/DC Connection)	mA	400
P _D	Power Dissipation	mW/ch	375
Coupled			
BV	Isolation Voltage ⁴	Vr.m.s.	1500
P _T	Total Power Dissipation	mW	850
T _A	Operating Ambient Temp.	°C	-40 to +80
T _{STG}	Storage Temperature	°C	-40 to +100

Notes:

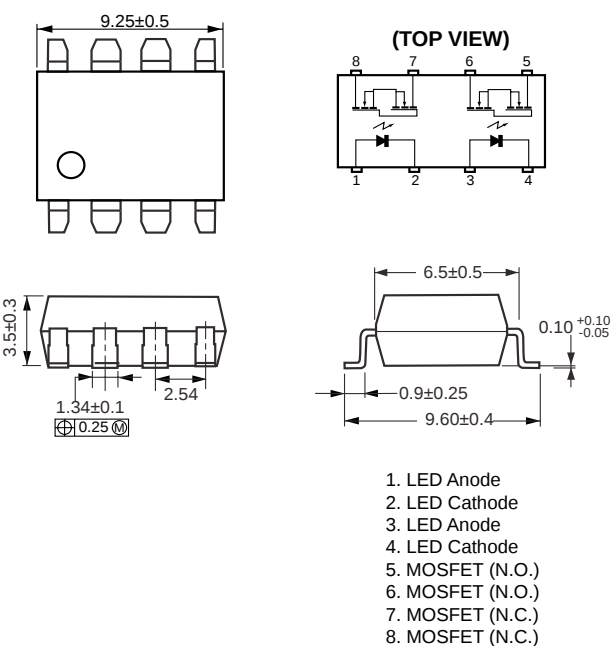
1. Operation in excess of any one of these parameters may result in permanent damage.
2. PW = 100 μs, Duty Cycle = 1%.
3. PW = 100 ms, 1 shot.
4. AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output.

OUTLINE DIMENSIONS (Units in mm)

PS7122A-1C

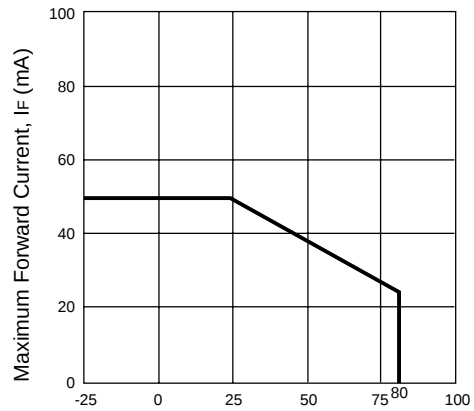


PS7122AL-1C



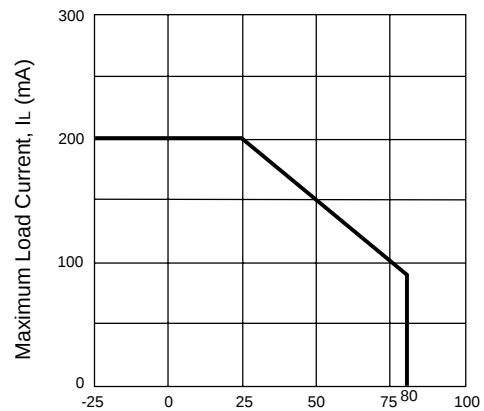
TYPICAL PERFORMANCE CURVES ($T_A = 25\text{ }^{\circ}\text{C}$)

MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



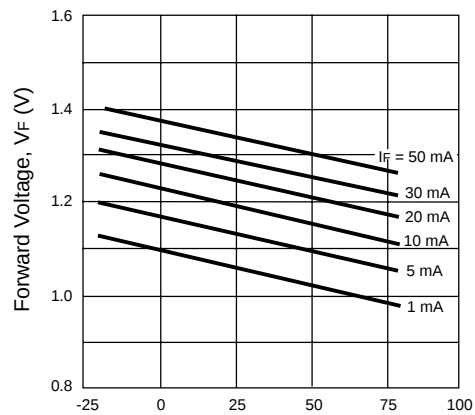
Ambient Temperature, T_A ($^{\circ}\text{C}$)

MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



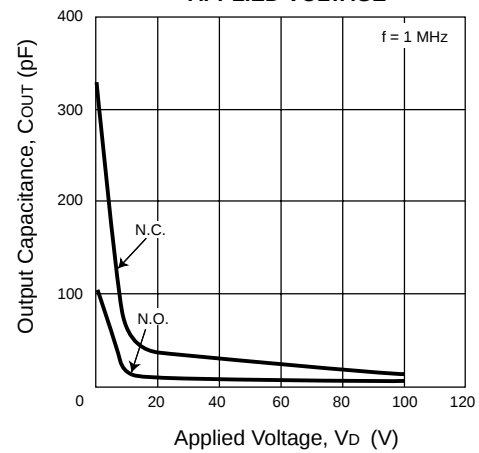
Ambient Temperature, T_A ($^{\circ}\text{C}$)

FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



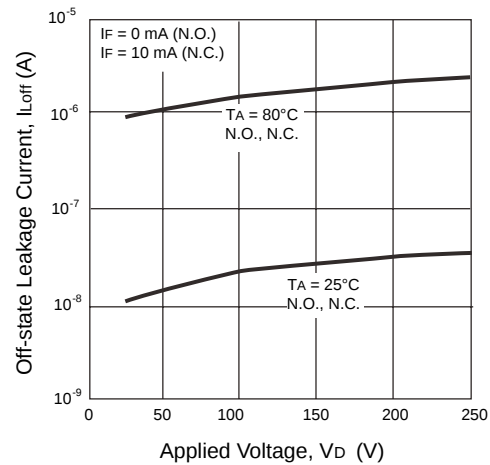
Ambient Temperature, T_A ($^{\circ}\text{C}$)

OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



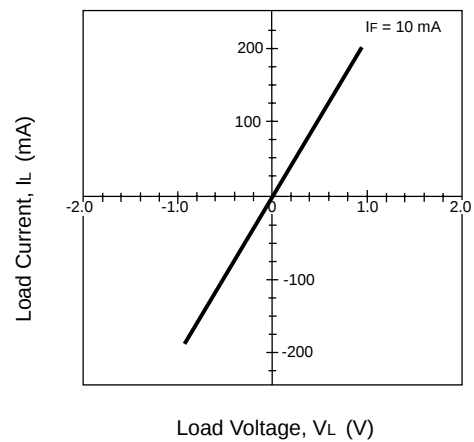
Applied Voltage, V_D (V)

OFF-STATE LEAKAGE CURRENT vs. APPLIED VOLTAGE

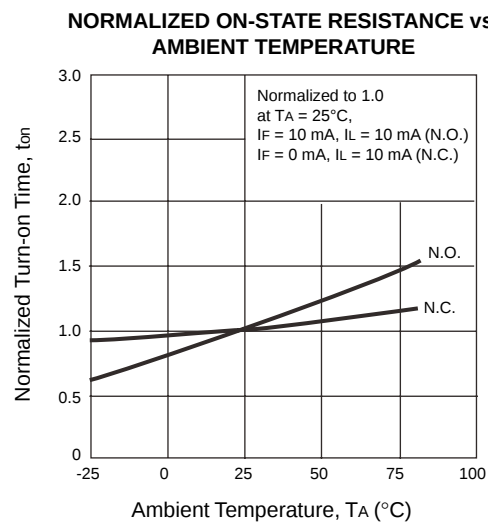
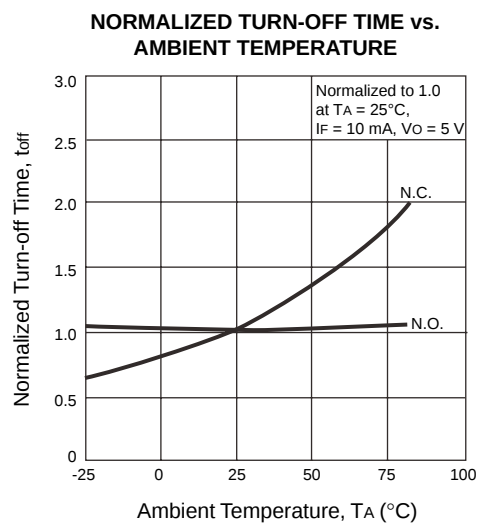
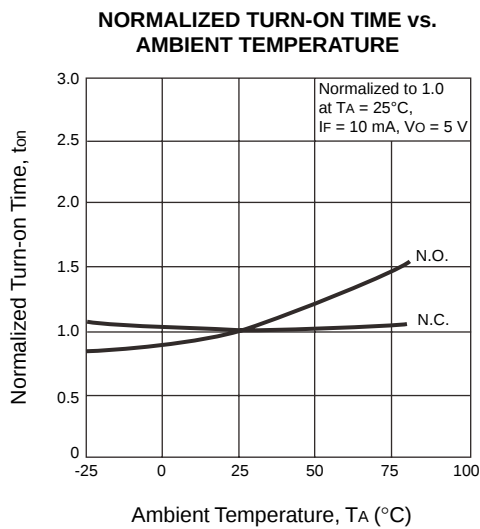
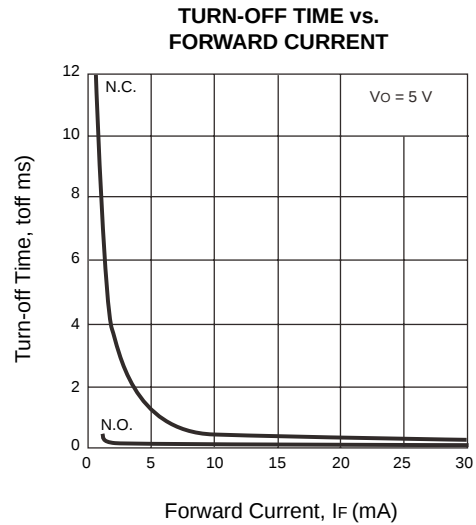
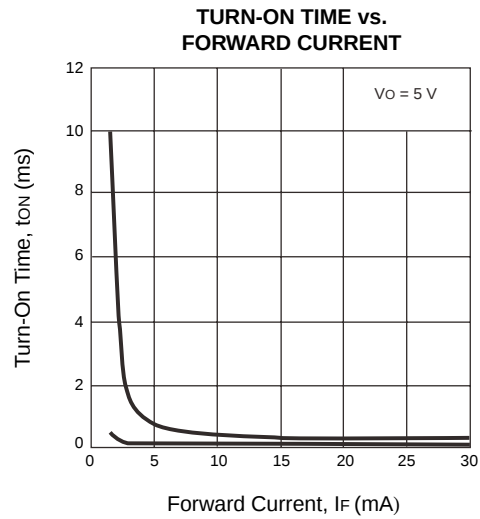


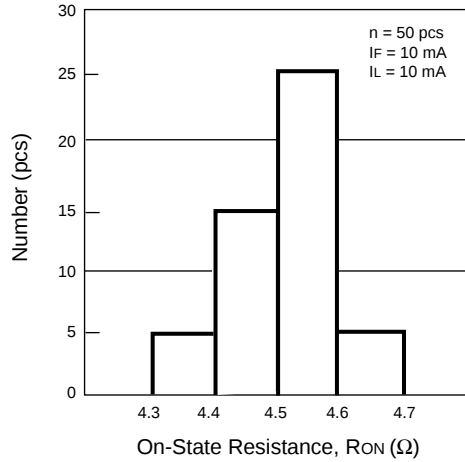
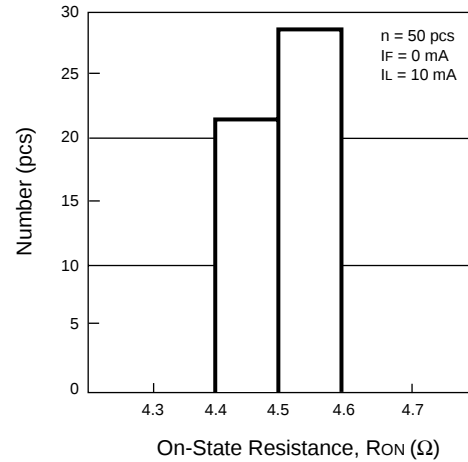
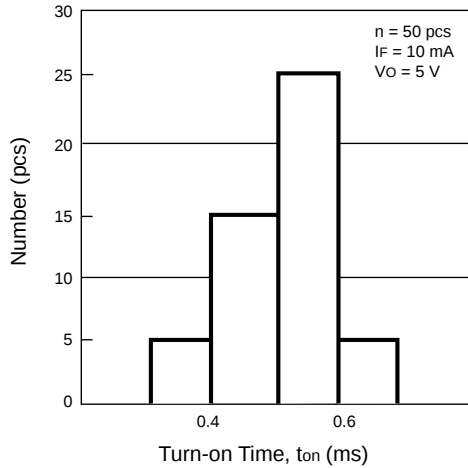
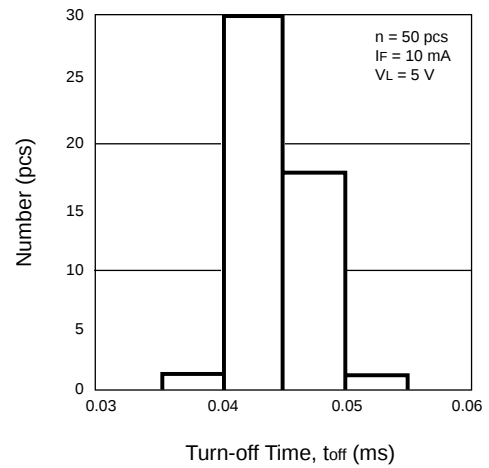
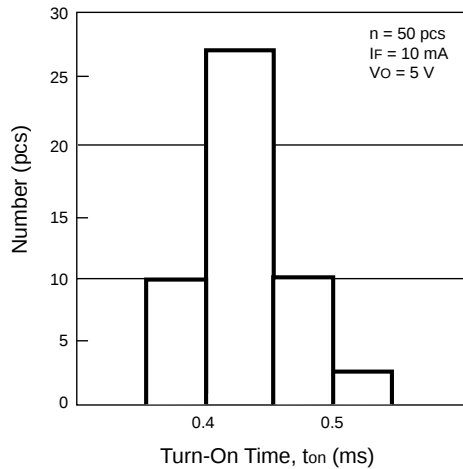
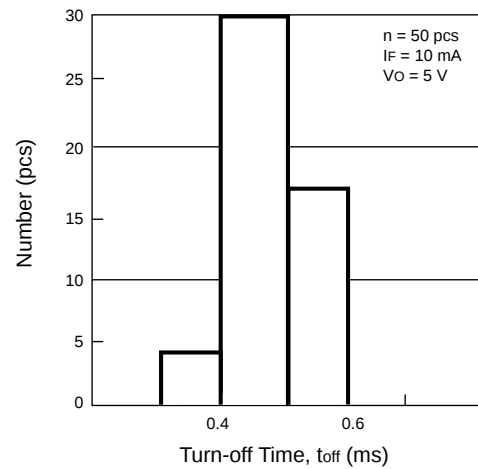
Applied Voltage, V_D (V)

LOAD CURRENT vs. LOAD VOLTAGE



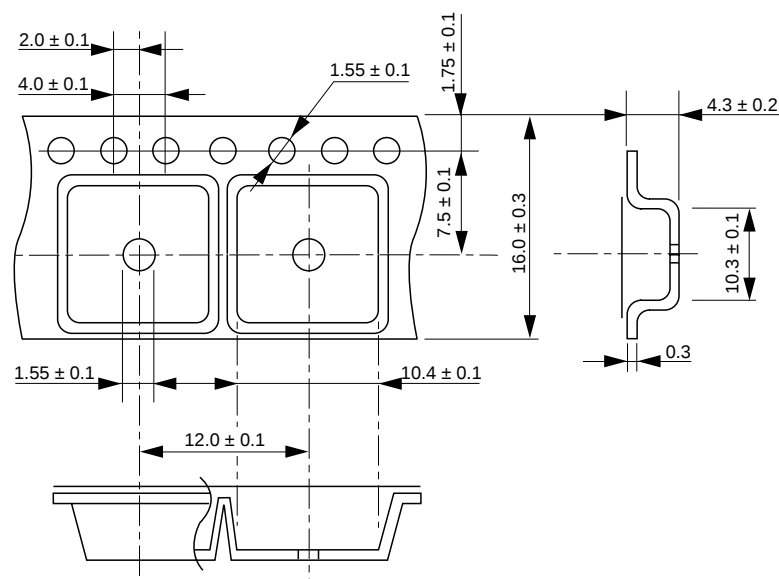
TYPICAL PERFORMANCE CURVES (TA = 25 °C)



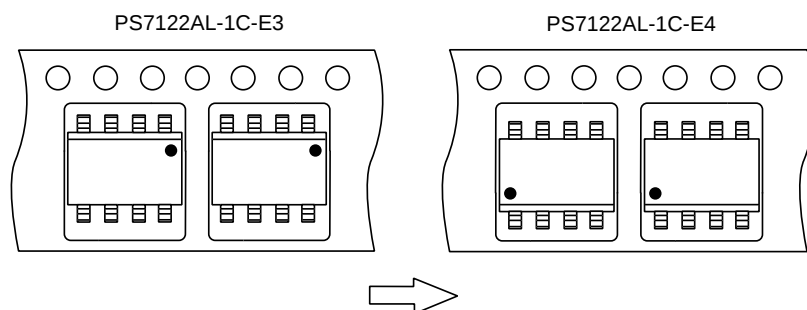
TYPICAL PERFORMANCE CURVES ($T_A = 25\text{ }^{\circ}\text{C}$)**ON-STATE RESISTANCE (N.O.)
DISTRIBUTION****ON-STATE RESISTANCE (N.C.)
DISTRIBUTION****TURN-ON TIME (N.O.) DISTRIBUTION****TURN-OFF TIME (N.O.) DISTRIBUTION****TURN-ON TIME (N.C.) DISTRIBUTION****TURN-OFF TIME (N.C.) DISTRIBUTION**

TAPING SPECIFICATIONS (Units in mm)

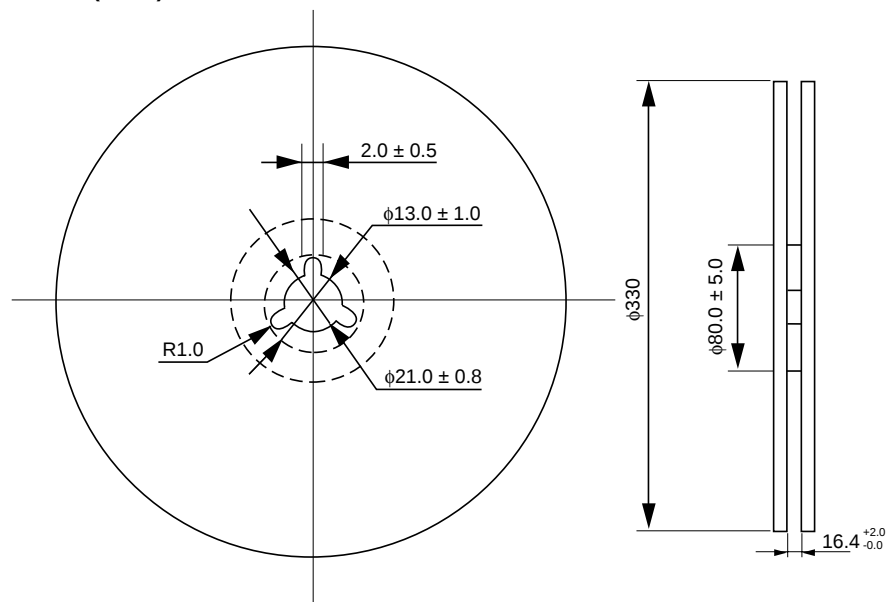
OUTLINE AND DIMENSIONS (TAPE)



TAPING DIRECTION



OUTLINE AND DIMENSIONS (REEL)



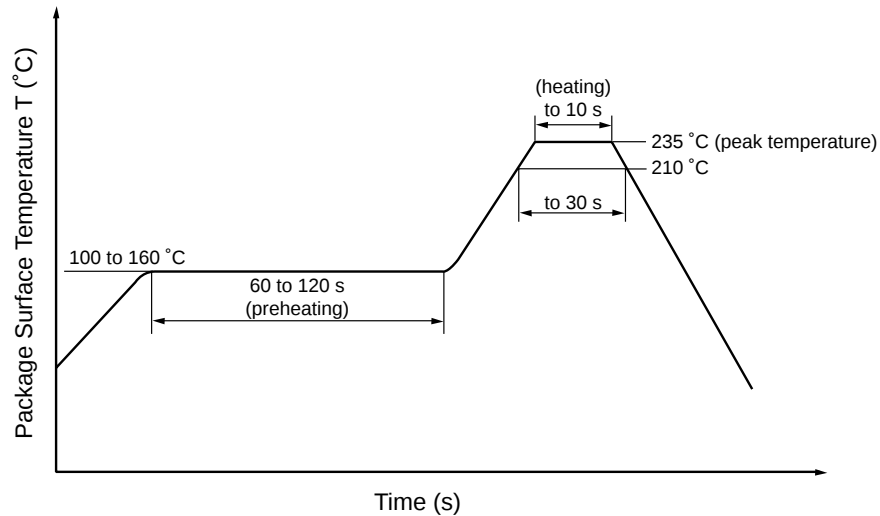
Packing : 1000 pcs/reel

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.