

FEATURES

- **1 CHANNEL TYPE:**
1a output
- **2 CHANNEL TYPE:**
1a + 1a output
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL PACKAGE:**
6 and 8 pin DIP
- **LOW OFFSET VOLTAGE**
- **LOW LED OPERATING CURRENT:**
 $I_F = 2 \text{ mA}$
- **SURFACE MOUNT AVAILABLE**

DESCRIPTION

PS7122-1A,-2A and PS7122L-1A,-2A are solid state relays containing a GaAs LED on the light emitting side (input side) and MOSFETs on the output side. They are suitable for analog signal control because of their low offset and high linearity.

APPLICATIONS

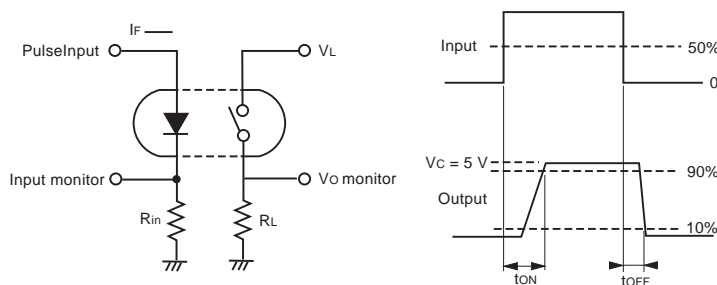
- **EXCHANGE EQUIPMENT**
- **MEASUREMENT EQUIPMENT**
- **FA/OA EQUIPMENT**

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

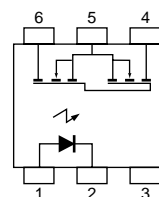
PART NUMBER			PS7122-1A,-2A, PS7122L-1A,-2A			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX	
Diode	V_F	Forward Voltage, $I_F = 10 \text{ mA}$	V	1.2	1.4	
	I_R	Reverse Current, $V_R = 5 \text{ V}$	μA		5.0	
MOS FET	I_{LOFF}	Off-State Leakage Current, $V_D = 200 \text{ V}$	μA	0.03	1.0	
	C_{out}	Output Capacitance, $V_D = 0 \text{ V}$, $f = 1 \text{ MHz}$	pF/ch	165		
Coupled	I_{Fon}	LED On-state Current, $I_L = 200 \text{ mA}$	mA		2.0	
	R_{ON1}	On-State Resistance, $I_F = 10 \text{ mA}$, $I_L = 10 \text{ mA}$	Ω	3.0	5.0	
	R_{ON2}					$I_F = 10 \text{ mA}$, $I_L = 200 \text{ mA}$, $t \leq 10 \text{ ms}$
	t_{ON}	Turn-on Time ¹ $I_F = 10 \text{ mA}$, $V_L = 5 \text{ V}$, $R_L = 500 \Omega$, $PW \geq 10 \text{ ms}$	ms		0.6	2.0
	t_{OFF}	Turn-off Time ¹ $I_F = 10 \text{ mA}$, $V_L = 5 \text{ V}$, $R_L = 500 \Omega$, $PW \geq 10 \text{ ms}$	ms		0.06	0.2
	Ri-o	Isolation Resistance, $V_{i-o} = 1.0 \text{ kVdc}$	Ω	10^9		
	Cl-o	Isolation Capacitance, $V = 0 \text{ V}$, $f = 1 \text{ MHz}$	pF/ch		1.1	

Note:

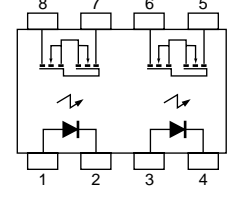
1. Test Circuit for Switching Time



PS7122-1A, PS7122L-1A



PS7122-2A, PS7122L-2A



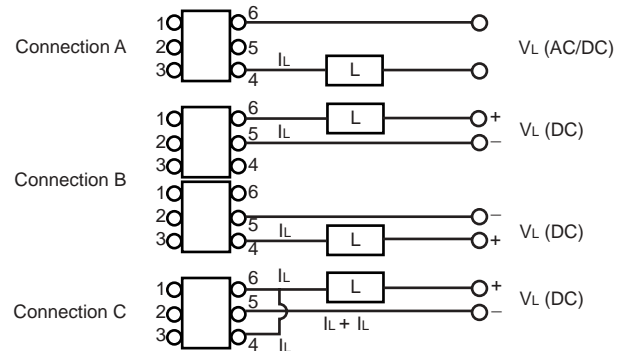
PS7122-1A,-2A, PS7122L-1A,-2A

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS	
			PS7122-1A PS7122L-1A	PS7122-2A PS7122L-2A
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	200	
I _L	Continuous Load Current ³			
	Connection A	mA	200	
	Connection B	mA	350	-
	Connection C	mA	500	-
I _{LP}	Pulse Load Current ⁴		400	
	AC/DC Connection	mA		
P _D	Power Dissipation	mW/ch	560	375
COUPLED				
BV	Isolation Voltage ⁵	Vr.m.s.	1500	
P _T	Total Power Dissipation	mW	610	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. Conditions: I_F ≥ 2 mA. The following types of load connections are available:



4. 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°C)

PART NUMBER		PS7122-1A,-2A, PS7122L-1A,-2A			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
I _F	LED Operating Current	mA	2	10	20
V _F	LED Off Voltage	V	0		0.5

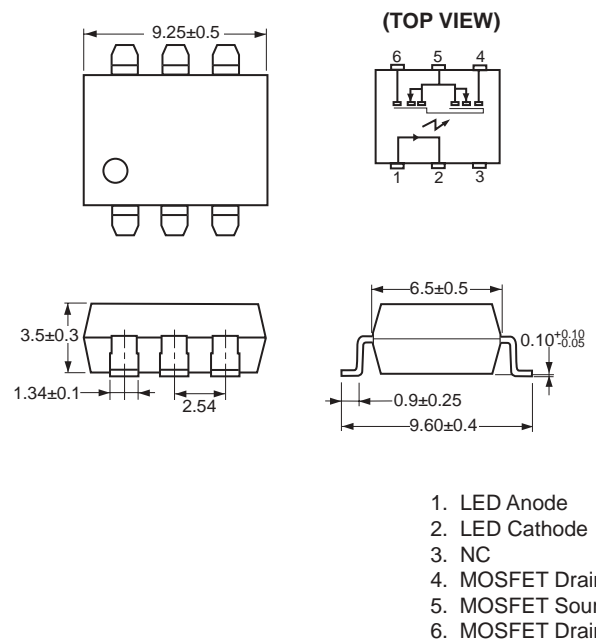
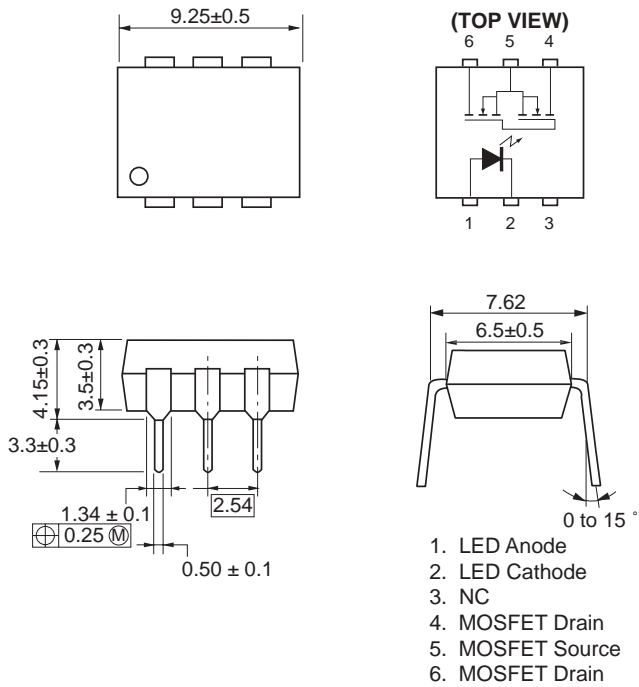
ORDERING INFORMATION

PART NUMBER	PACKAGE	PACKING STYLE
PS7122-1A PS7122L-1A	6-pin DIP	Magazine case 50 pcs
PS7122L-1A-E3 PS7122L-1A-E4		Embossed tape 1000 pcs/reel
PS7122-2A PS7122L-2A	8-pin DIP	Magazine case 50 pcs
PS7122L-2A-E3 PS7122L-2A-E4		Embossed tape 1000 pcs/reel

OUTLINE DIMENSIONS (Units in mm)

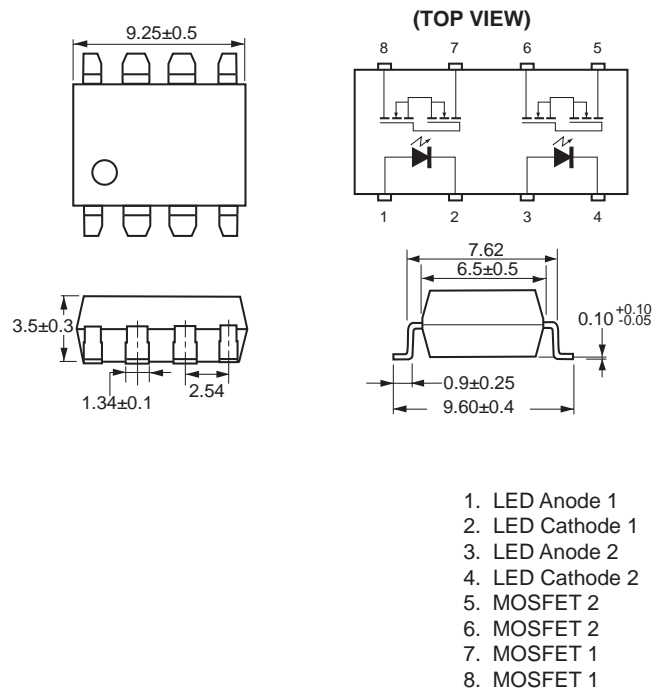
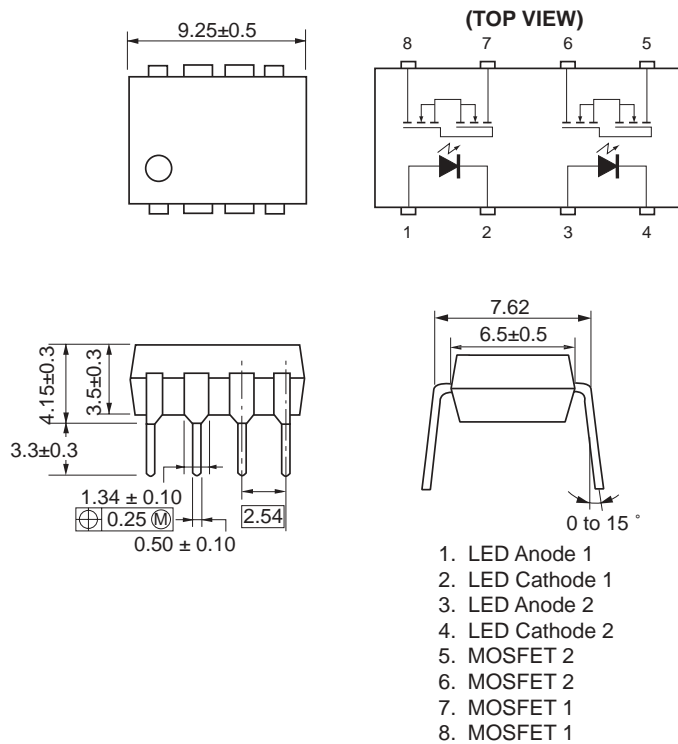
PS7122-1A

PS7122L-1A



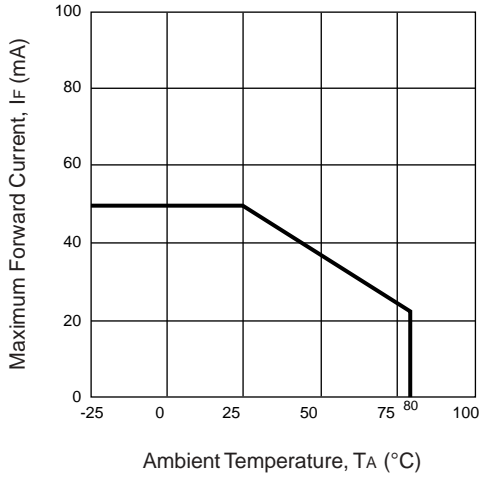
PS7122-2A

PS7122L-2A

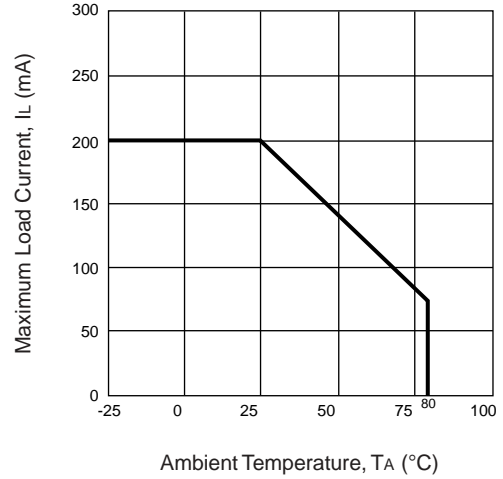


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

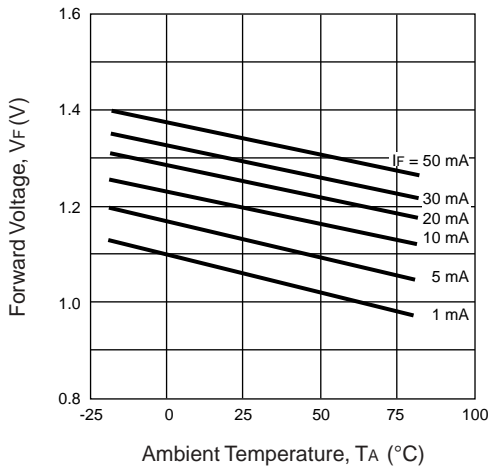
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



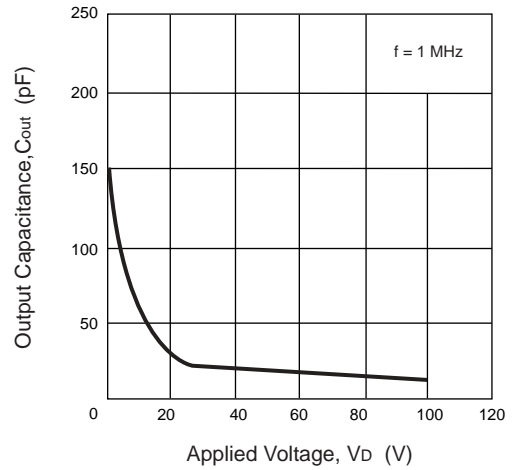
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



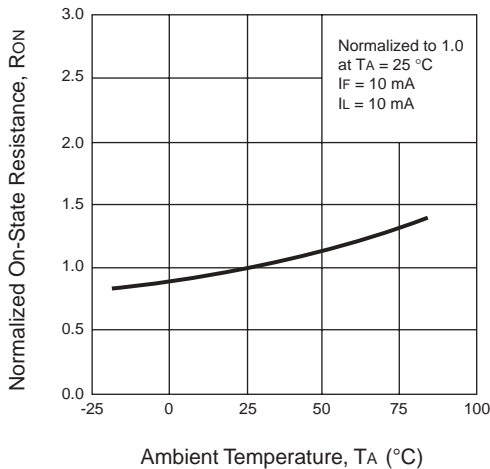
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



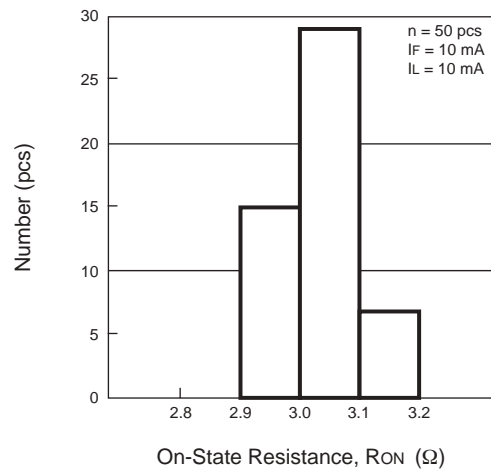
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE

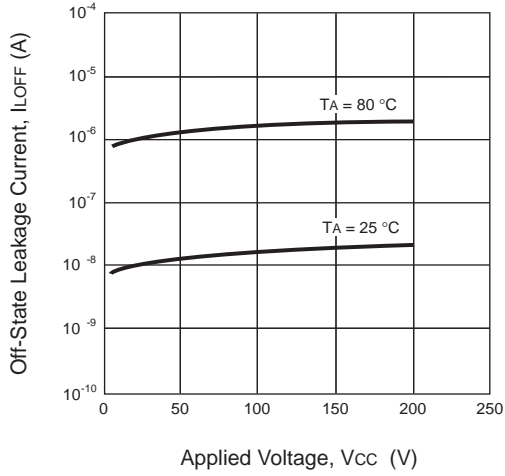


ON-STATE RESISTANCE DISTRIBUTION

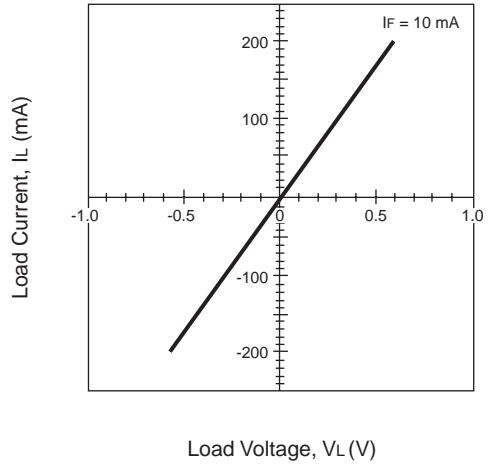


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

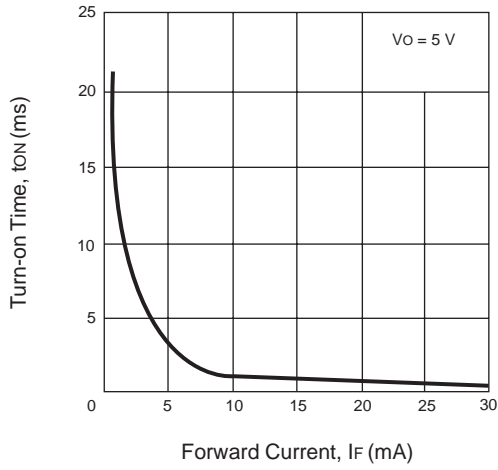
OFF-STATE LEAKAGE CURRENT vs. APPLIED VOLTAGE



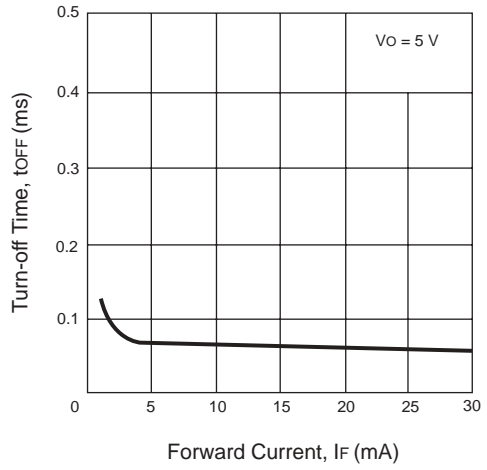
LOAD CURRENT vs. LOAD VOLTAGE



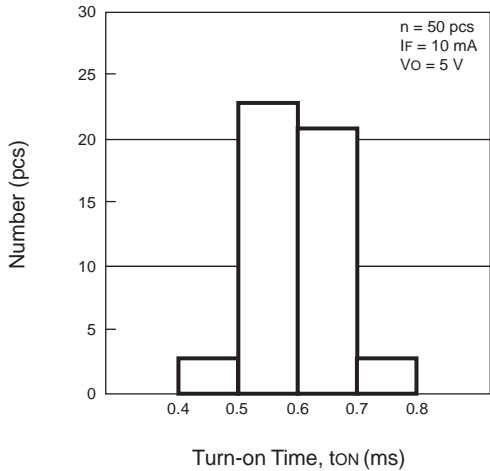
TURN-ON TIME VS. FORWARD CURRENT



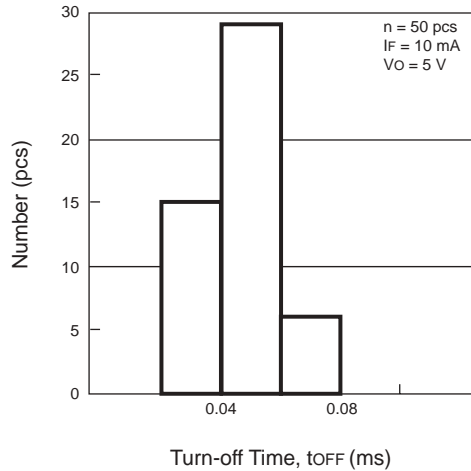
TURN-OFF TIME VS. FORWARD CURRENT



TURN-ON TIME DISTRIBUTION

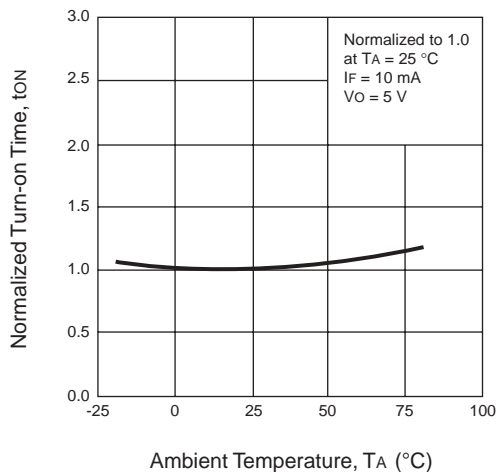


TURN-OFF TIME DISTRIBUTION

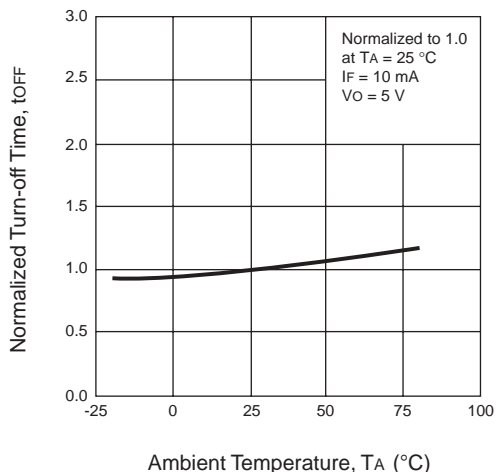


TYPICAL PERFORMANCE CURVES ($T_A = 25\text{ }^\circ\text{C}$)

NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE

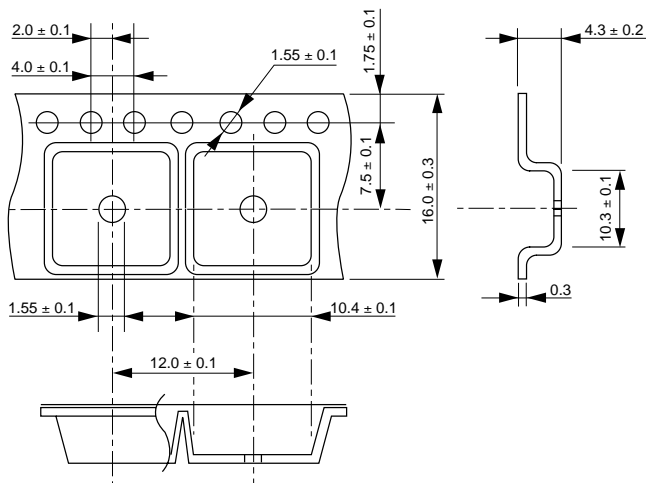


NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE

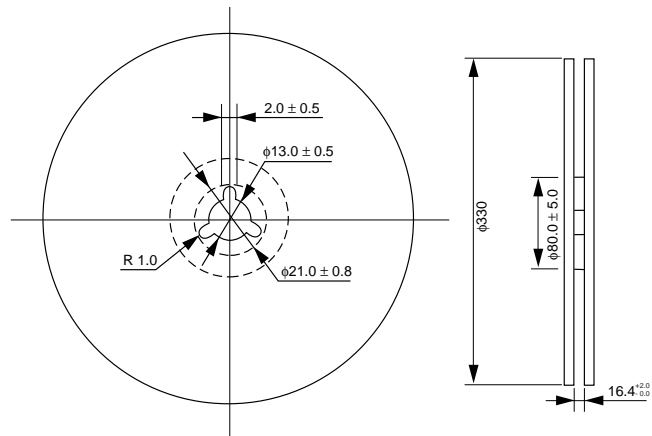


TAPING SPECIFICATIONS (Units in mm)

OUTLINE AND DIMENSIONS (TAPE)

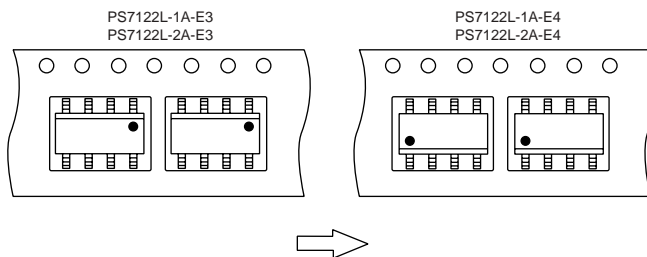


OUTLINE AND DIMENSIONS (REEL)



Notes:
1. Packaging : 1000 pcs/reel

TAPING DIRECTION

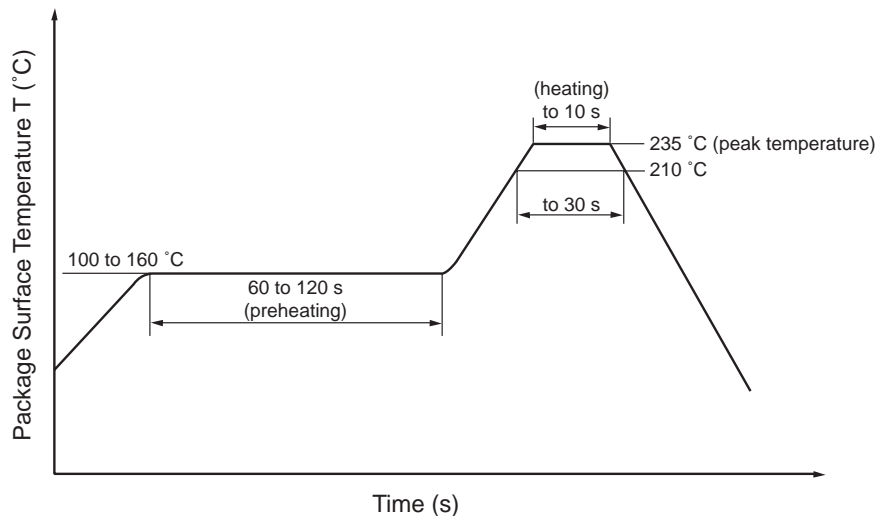


RECOMMENDED SOLDERING CONDITIONS

(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.

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