NEC

6 AND 8 PIN DIP, 200 V BREAK DOWN VOLTAGE 1-CH, 2-CH OPTICAL COUPLED MOSFET

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

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 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.

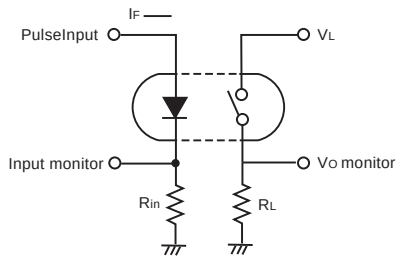
APPLICATIONS

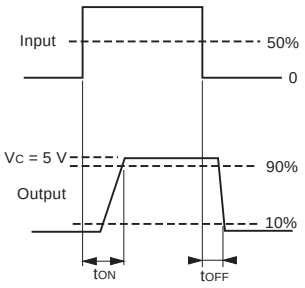
- **EXCHANGE EQUIPMENT**
- **MEASUREMENT EQUIPMENT**
- **FA/OA EQUIPMENT**

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

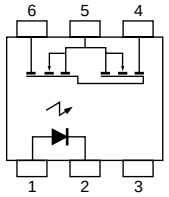
PART NUMBER				PS7122-1A,-2A, PS7122L-1A,-2A		
SYMBOLS		PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V_F	Forward Voltage, I_F = 10 mA	V		1.2	1.4
	I_R	Reverse Current, V_R = 5 V	μA			5.0
MOS FET	I_{LOFF}	Off-State Leakage Current, V_D = 200 V	μA		0.03	1.0
	Cout	Output Capacitance, V_D = 0 V, f = 1 MHz	pF/ch		165	
Coupled	I_{Fon}	LED On-state Current, I_L = 200 mA	mA			2.0
	R_{ON1}	On-State Resistance, I_F = 10 mA, I_L = 10 mA	Ω		3.0	5.0
	R_{ON2}	On-State Resistance, I_F = 10 mA, I_L = 200 mA, t≤10 ms	Ω			
	t_{ON}	Turn-on Time[1] I_F = 10 mA, V_L = 5 V, R_L = 500 Ω, PW ≥ 10 ms	ms		0.6	2.0
	t_{OFF}	Turn-off Time[1] I_F = 10 mA, V_L = 5 V, R_L = 500 Ω, PW ≥ 10 ms	ms		0.06	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		1.1	

Note:
1. Test Circuit for Switching Time

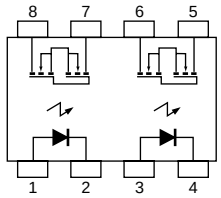




PS7122-1A, PS7122L-1A



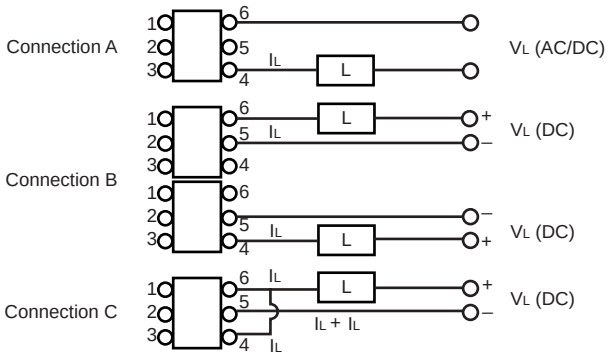
PS7122-2A, PS7122L-2A



ABSOLUTE MAXIMUM RATINGS[1] (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 Foward 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] AC/DC Connection	mA	400	
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: IF≥ 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)

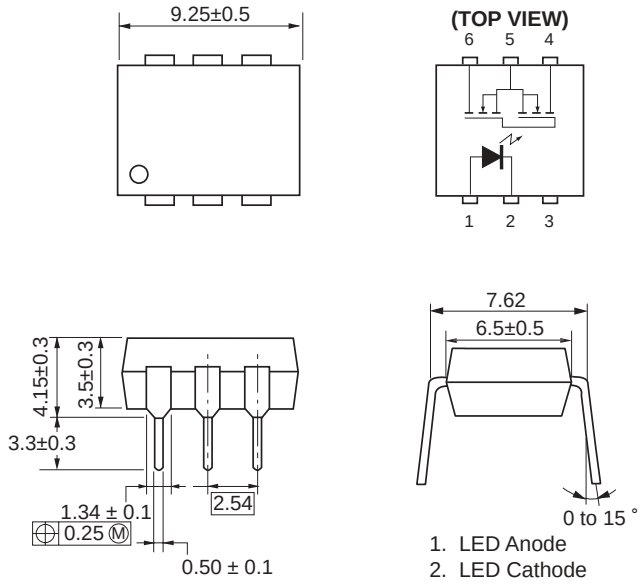
PART NUMBER		PS7122-1A,-2A, PS7122L-1A,-2A			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
I_F	LED Operating Current	mA	2	10	20
V_F	LED Off Voltage	V	0		0.5

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

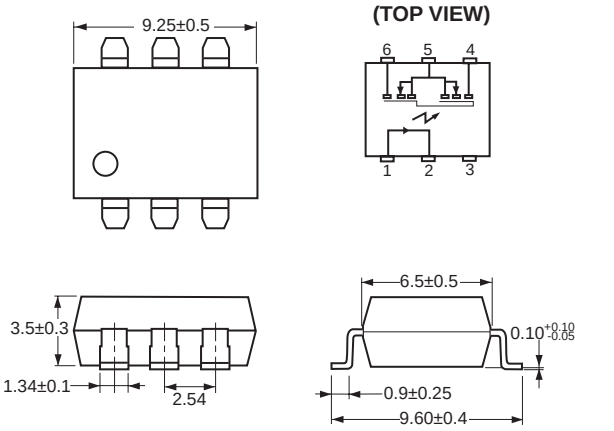
OUTLINE DIMENSIONS (Units in mm)

PS7122-1A



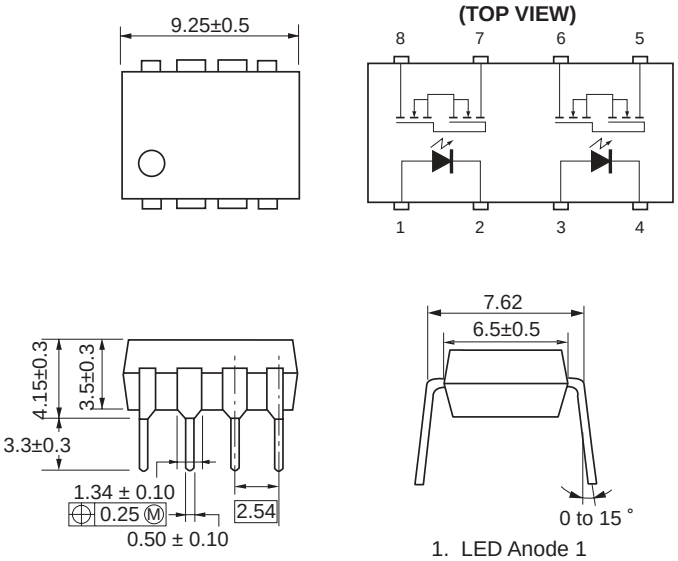
1. LED Anode
2. LED Cathode
3. NC
4. MOSFET Drain
5. MOSFET Source
6. MOSFET Drain

PS7122L-1A



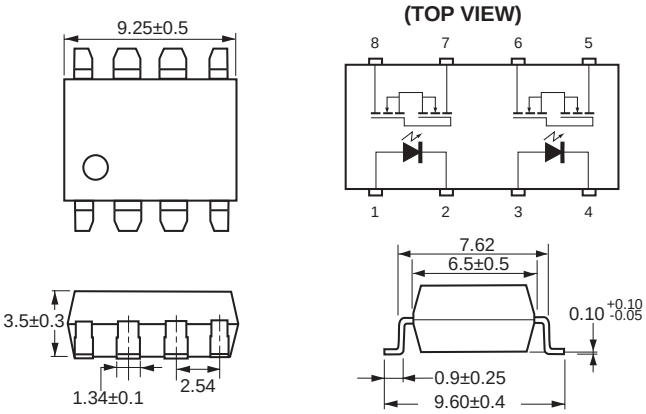
1. LED Anode
2. LED Cathode
3. NC
4. MOSFET Drain
5. MOSFET Source
6. MOSFET Drain

PS7122-2A



1. LED Anode 1
2. LED Cathode 1
3. LED Anode 2
4. LED Cathode 2
5. MOSFET 2
6. MOSFET 2
7. MOSFET 1
8. MOSFET 1

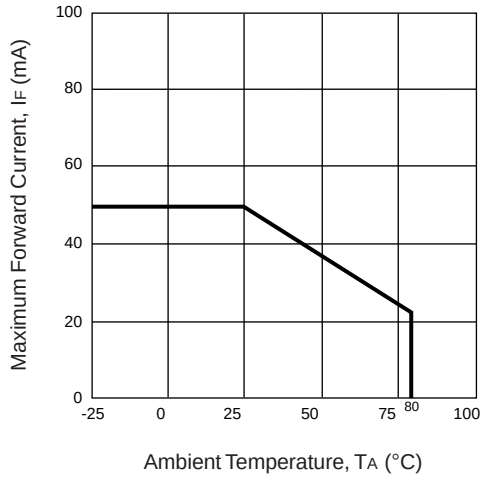
PS7122L-2A



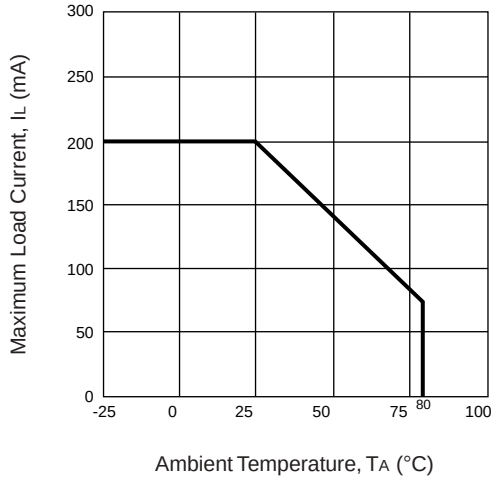
1. LED Anode 1
2. LED Cathode 1
3. LED Anode 2
4. LED Cathode 2
5. MOSFET 2
6. MOSFET 2
7. MOSFET 1
8. MOSFET 1

TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

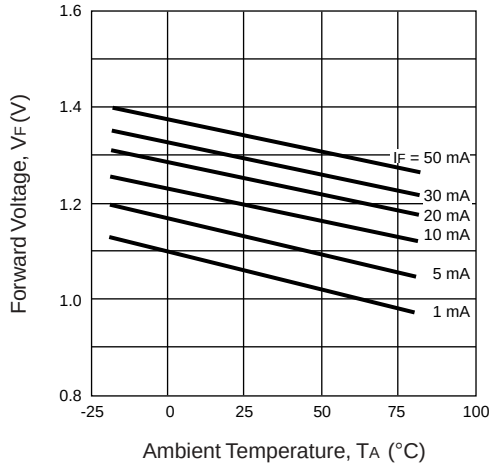
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



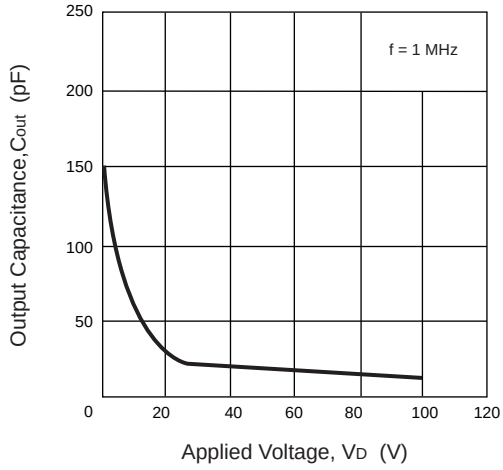
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



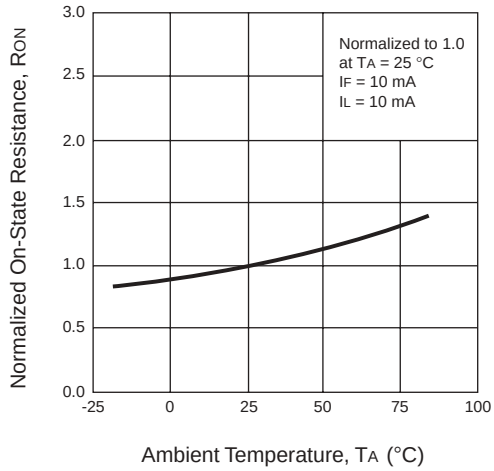
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



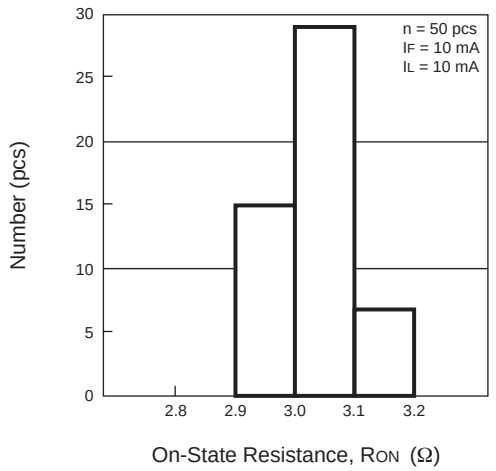
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE

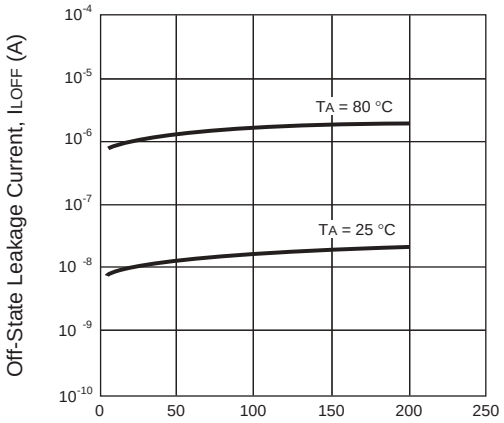


ON-STATE RESISTANCE DISTRIBUTION

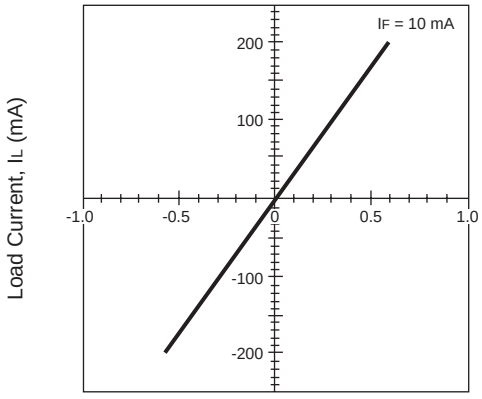


TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

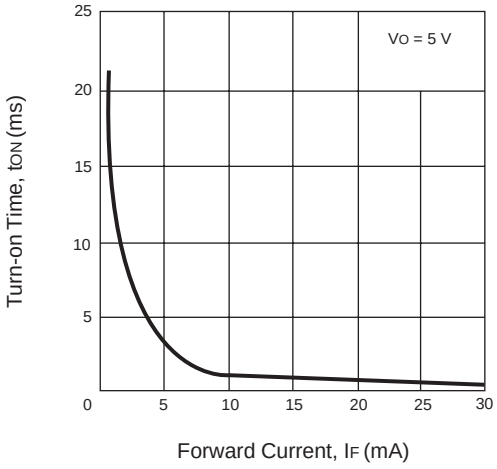
OFF-STATE LEAKAGE CURRENT vs. APPLIED VOLTAGE



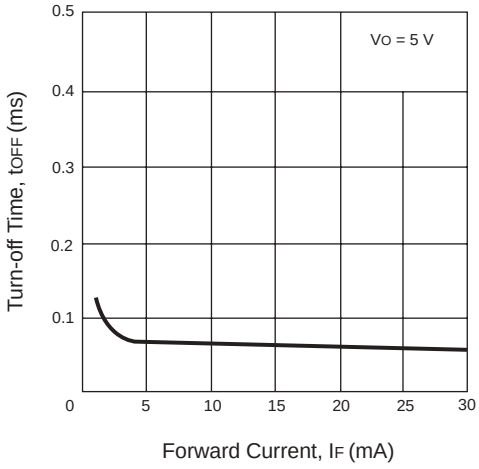
LOAD CURRENT vs. LOAD VOLTAGE



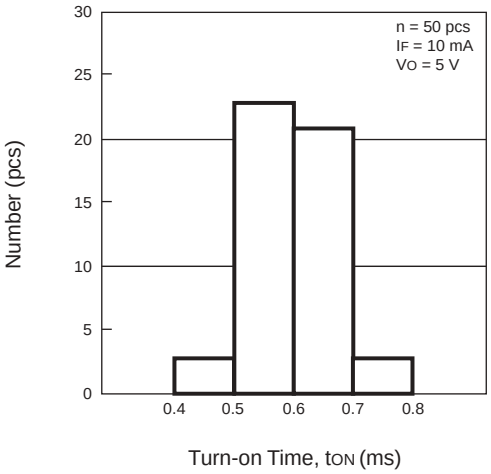
TURN-ON TIME VS. FORWARD CURRENT



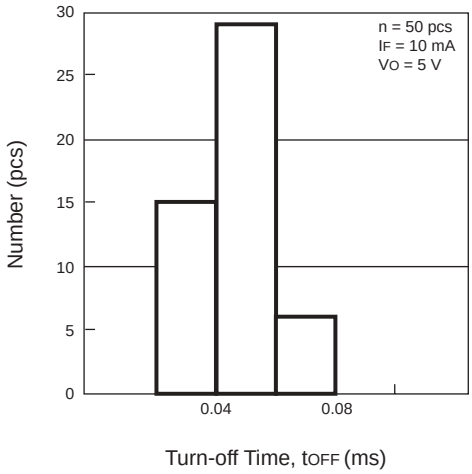
TURN-OFF TIME VS. FORWARD CURRENT



TURN-ON TIME DISTRIBUTION

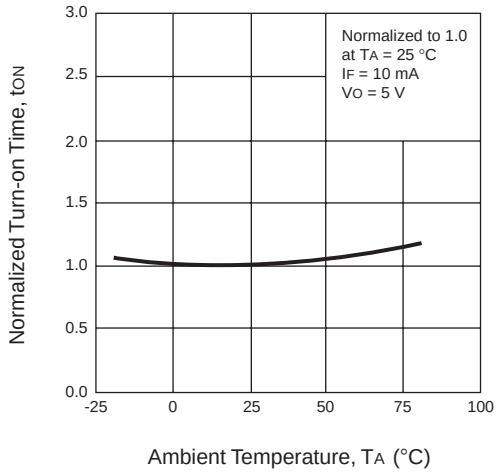


TURN-OFF TIME DISTRIBUTION

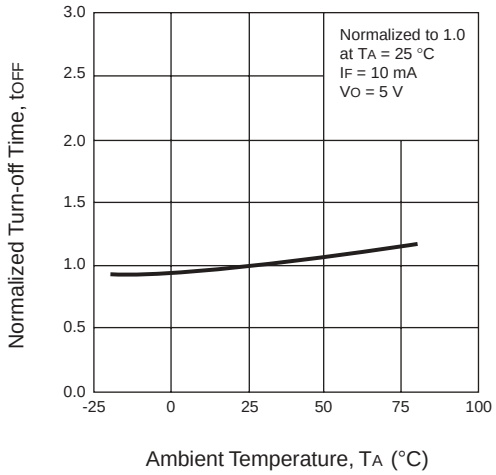


TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE

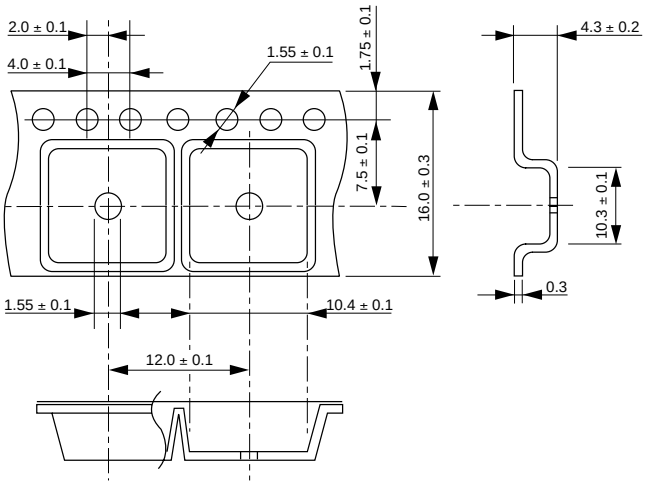


NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE

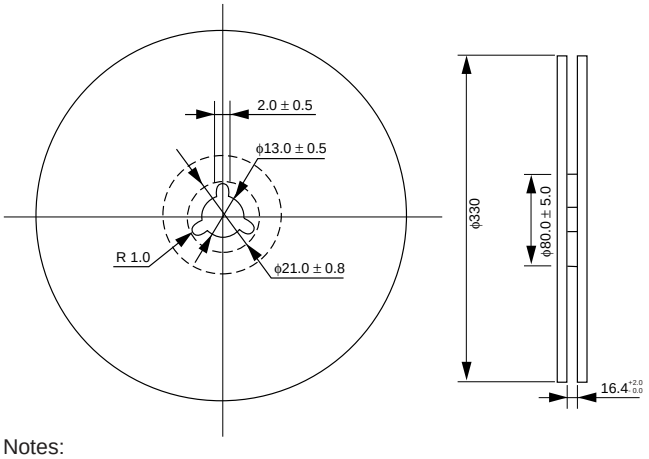


TAPING SPECIFICATIONS (Units in mm)

OUTLINE AND DIMENSIONS (TAPE)

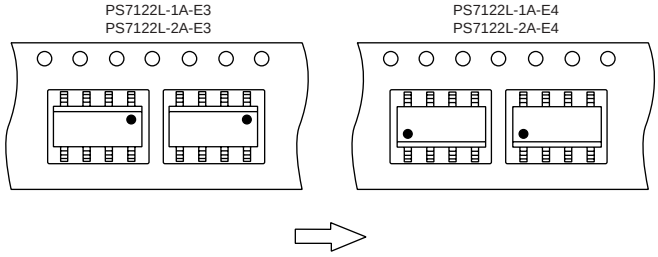


OUTLINE AND DIMENSIONS (REEL)



Notes:
1. Packaging : 1000 pcs/reel

TAPING DIRECTION

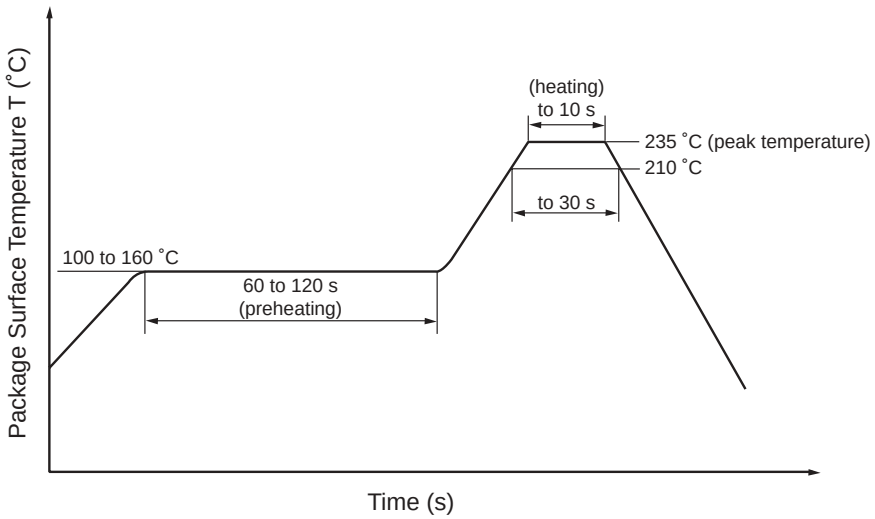


RECOMMENDED SOLDERING CONDITIONS

(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.