

## 6, 8 PIN DIP SLOW SWITCHING TYPE 1-CH, 2-CH OPTICAL COUPLED MOSFET

**PS7522-1A**  
**PS7522-2A**  
**PS7522L-1A**  
**PS7522L-2A**

### FEATURES

- **1 CHANNEL TYPE:**  
1a output
- **OR 2 CHANNEL TYPE:**  
1a + 1a output
- **LOW LED OPERATING CURRENT:**  
 $I_F = 1 \text{ mA}$
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL PACKAGE:**  
6, 8 Pin DIP
- **SLOW TURN-ON TIME, SLOW TURN-OFF TIME:**  
( $t_{on} = 12 \text{ ms MAX}$ ,  $t_{off} = 6.5 \text{ ms MAX}$ )
- **LOW OFFSET VOLTAGE**
- **SURFACE MOUNT TYPE LEAD AVAILABLE:**  
PS7522L-1A, 2A

### DESCRIPTION

PS7522-1A,-2A and PS7522L-1A,-2A are solid state relays containing GaAs LEDs on the light emitting side (input side) and MOSFETs on the output side.

They are suitable for analog signal control because of their slow switching speed at turn-on or turn-off.

### APPLICATIONS

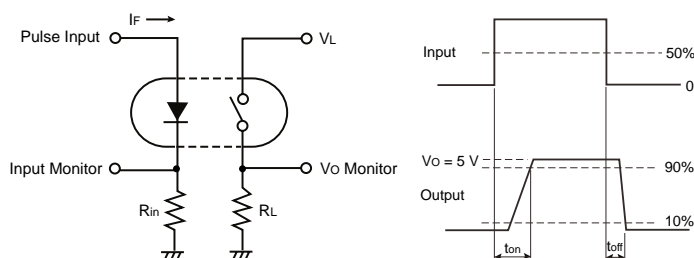
- EXCHANGE EQUIPMENT
- MEASUREMENT EQUIPMENT
- FA/OA EQUIPMENT

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

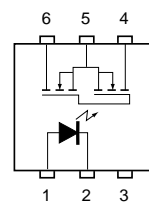
PART NUMBER			PS7522-1A, 2A, PS7522L-1A, 2A			
SYMBOLS		PARAMETERS	UNITS	MIN	TYP	MAX
Diode	$V_F$	Forward Voltage, $I_F = 1.4 \text{ mA}$	V		1.1	1.4
	$I_R$	Reverse Current, $V_R = 5 \text{ V}$	$\mu\text{A}$			5.0
MOSFET	$I_{Loff}$	Off-State Leakage Current, $V_D = 200 \text{ V}$	$\mu\text{A}$		0.03	1.0
	$C_{OUT}$	Output Capacitance, $V_D = 0 \text{ V}$ , $f = 1 \text{ MHz}$	pF/ch		165	
Coupled	$I_{Foff}$	LED On-state Current, $I_L = 200 \text{ mA}$	mA			1.0
	$R_{on1}$	On-State Resistance, $I_F = 1.4 \text{ mA}$ , $I_L = 10 \text{ mA}$	$\Omega$		3.0	5.0
	$t_{on}$	Turn-On Time <sup>1</sup> , $I_F = 1.4 \text{ mA}$ , $V_o = 60 \text{ V}$ , $PW \geq 50 \text{ ms}$	ms		8.5	12
	$t_{off}$	Turn-Off Time <sup>1</sup> , $I_F = 1.4 \text{ mA}$ , $V_o = 60 \text{ V}$ , $PW \geq 50 \text{ ms}$	ms		3.0	6.5
	$t_r$	Rise time, $I_F = 1.4 \text{ mA}$ , $V_o = 60 \text{ V}$ , $PW \geq 50 \text{ ms}$	ms	0.80	2.78	
	$t_f$	Fall time, $I_F = 1.4 \text{ mA}$ , $V_o = 60 \text{ V}$ , $PW \geq 50 \text{ ms}$	ms	0.4	0.8	
	$R_{I-O}$	Isolation Resistance, $V_{in-out} = 1.0 \text{ kVDC}$	$\Omega$	$10^9$		
$C_{I-O}$	Isolation Capacitance, $V = 0 \text{ V}$ , $f = 1 \text{ MHz}$	pF/ch		1.1		

Note:

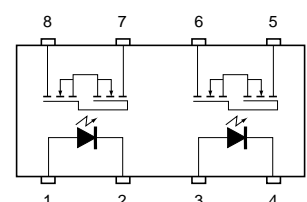
#### 1. Test circuit for Switching Time



PS7522-1A, PS7522L-1A



PS7522-2A, PS7522L-2A



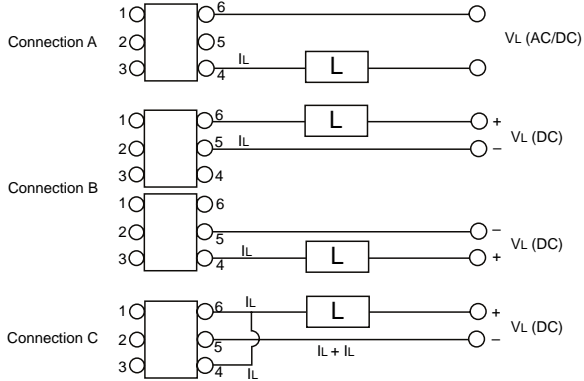
# PS7522-1A, -2A, PS7522L-1A, -2A

## ABSOLUTE MAXIMUM RATINGS<sup>1</sup> (T<sub>A</sub> = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS	
			PS7522-1A PS7522L-1A	PS7522-2A PS7522L-2A
Diode				
V <sub>R</sub>	Reverse Voltage	V	5	
I <sub>F</sub>	Forward Current (DC)	mA	50	
P <sub>D</sub>	Power Dissipation	mW/ch	50	
I <sub>FP</sub>	Peak Forward Current <sup>2</sup>	A	1	
MOSFET				
V <sub>L</sub>	Break Down Voltage	V	200	
I <sub>L</sub>	Continuous Load Current <sup>3</sup>	Connection A	200	
		Connection B	350	–
		Connection C	400	–
I <sub>LP</sub>	Pulse Load Current <sup>4</sup> (AC/DC Connection)	mA	400	
P <sub>D</sub>	Power Dissipation	mW/ch	560	375
Coupled				
BV	Isolation Voltage <sup>5</sup>	Vr.m.s.	1500	
P <sub>T</sub>	Total Power Dissipation	mW	610	850
T <sub>A</sub>	Operating Ambient Temp.	°C	-40 to +80	
T <sub>STG</sub>	Storage Temperature	°C	-40 to +100	

### Notes:

- Operation in excess of any one of these parameters may result in permanent damage.
- PW = 100 μs, Duty Cycle = 1%.
- Conditions: I<sub>F</sub> ≥ 2 mA. The following types of load connections are available.



- PW = 100 ms, 1 shot.
- AC voltage for 1 minute at T<sub>A</sub> = 25 °C, RH = 60 % between input and output.

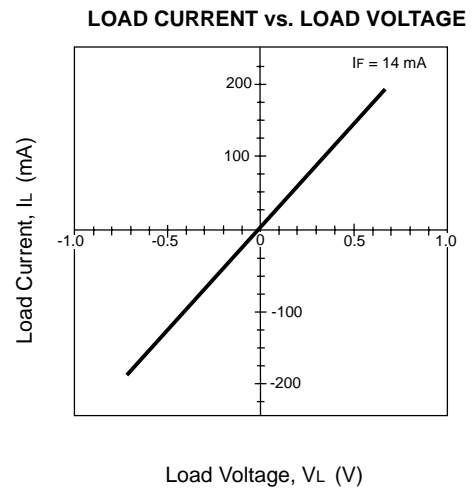
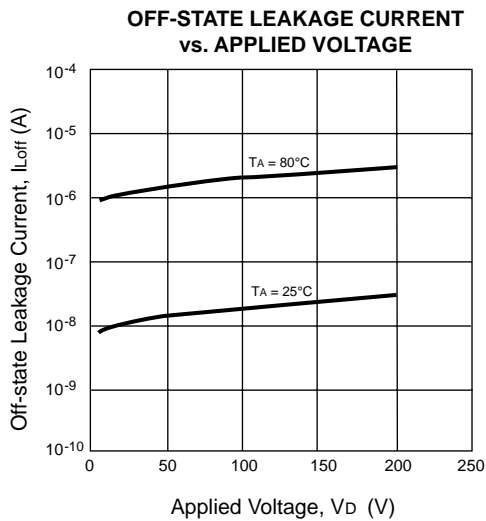
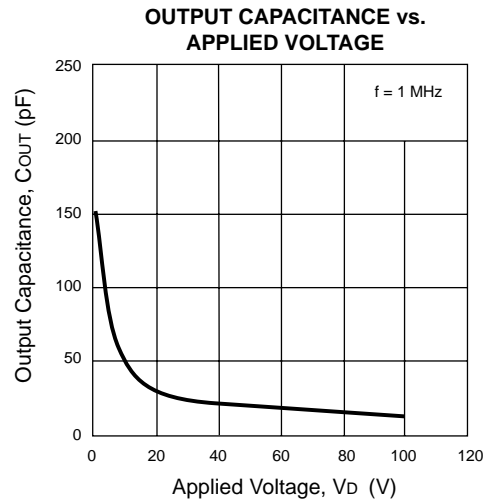
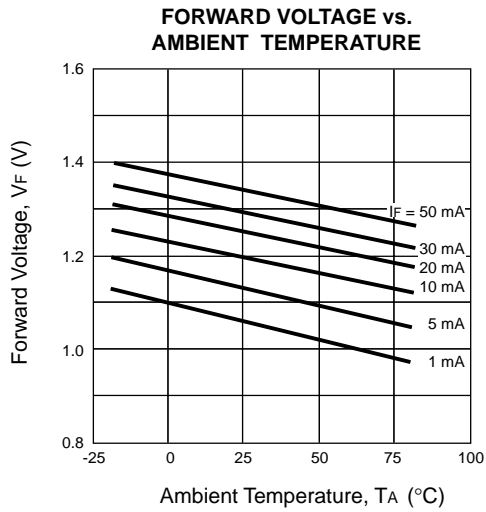
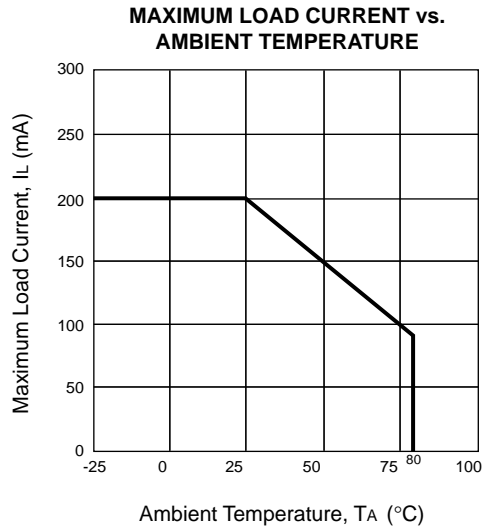
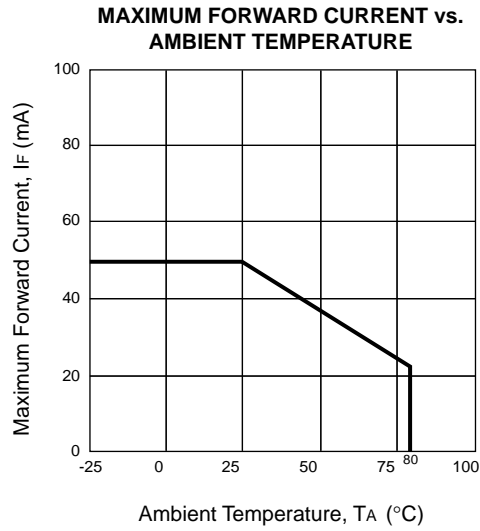
## RECOMMENDED OPERATING CONDITIONS (T<sub>A</sub> = 25 °C)

SYMBOL	PARAMETER	UNITS	MIN	TYP	MAX
I <sub>F</sub>	LED Operating Current	mA	1	10	20
V <sub>F</sub>	LED Off Voltage	V	0		0.5

## ORDERING INFORMATION

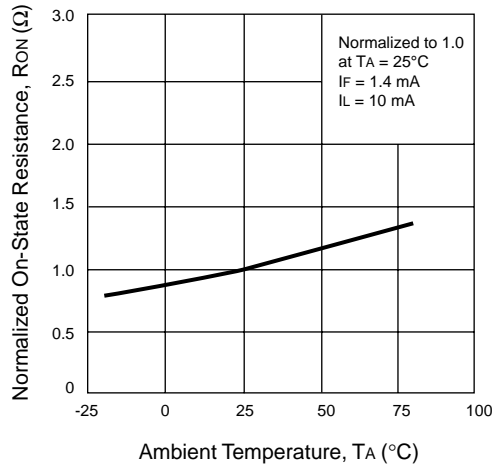
PART NUMBER	PACKAGE	PACKING STYLE
PS7522-1A	6 Pin DIP	Magazine case, 50 pcs
PS7522L-1A		Embossed Tape, 1000 pcs/reel
PS7522L-1A-E3		
PS7522L-1A-E4		
PS7522-2A	8 Pin DIP	Magazine case, 50 pcs
PS7522L-2A		Embossed Tape, 1000 pcs/reel
PS7522L-2A-E3		
PS7522L-2A-E4		

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

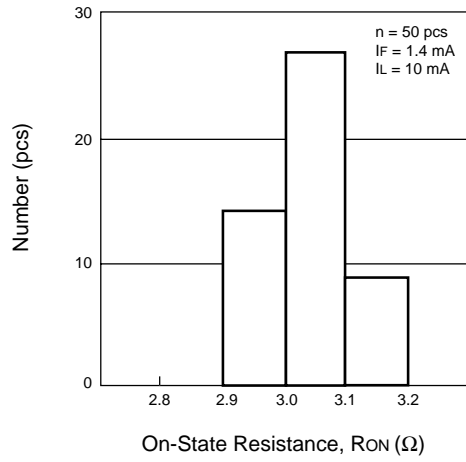


**TYPICAL PERFORMANCE CURVES** ( $T_A = 25\text{ }^\circ\text{C}$ )

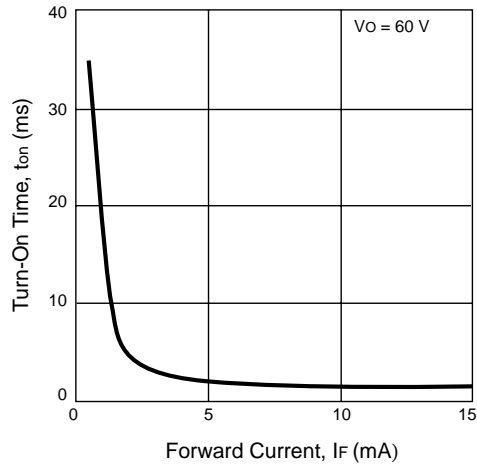
**NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE**



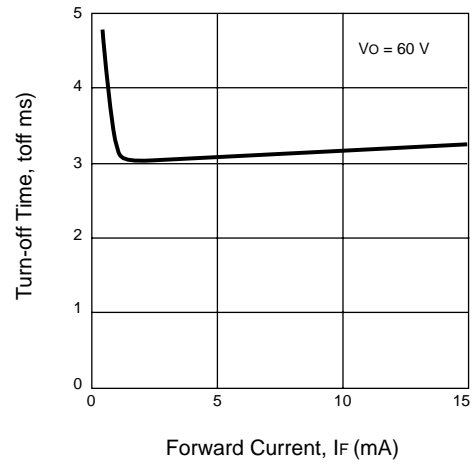
**ON-STATE RESISTANCE DISTRIBUTION**



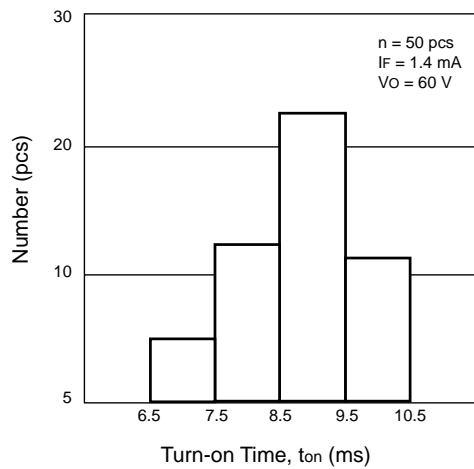
**TURN-ON TIME vs. FORWARD CURRENT**



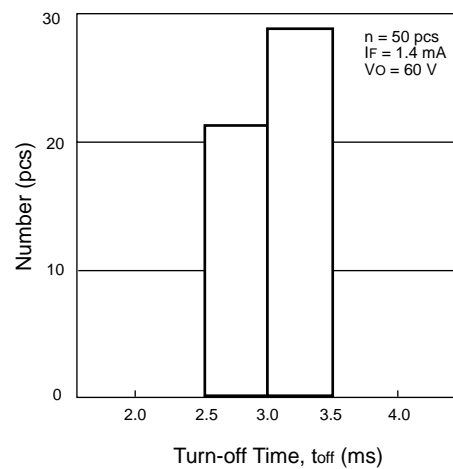
**TURN-OFF TIME vs. FORWARD CURRENT**



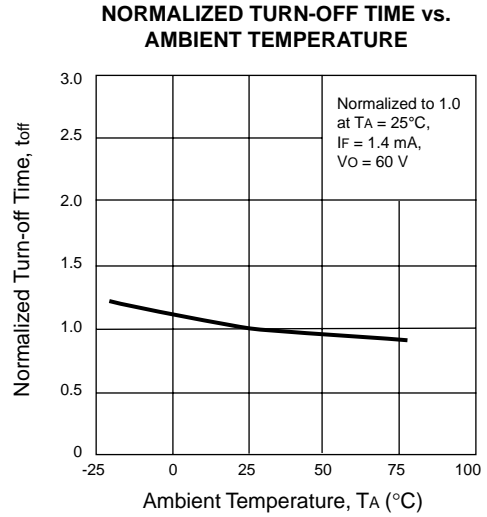
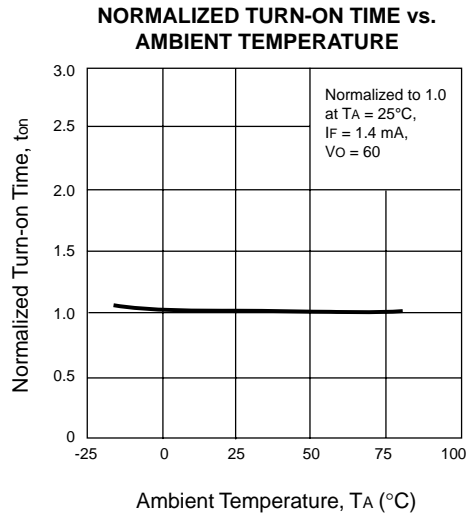
**TURN-ON TIME DISTRIBUTION**



**TURN-OFF TIME DISTRIBUTION**

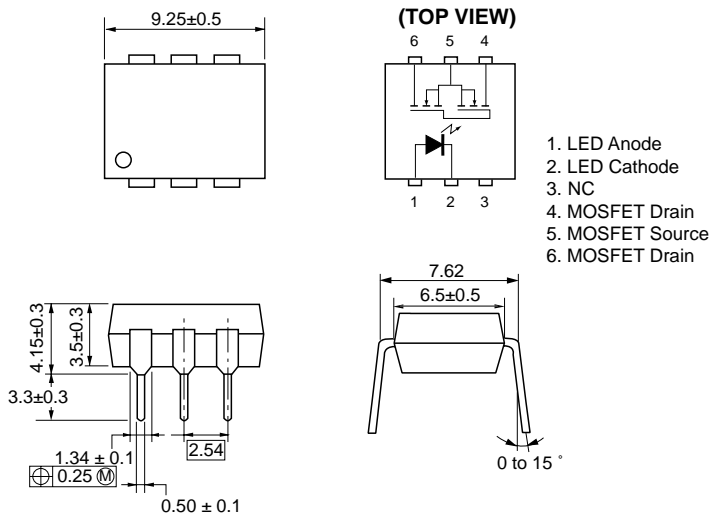


**TYPICAL PERFORMANCE CURVES** (TA = 25 °C)

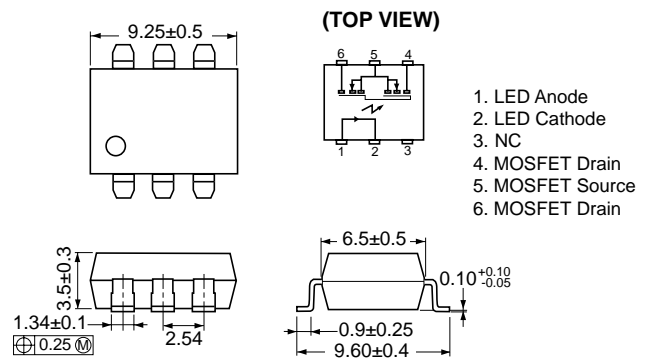


**OUTLINE DIMENSIONS** (Units in mm)

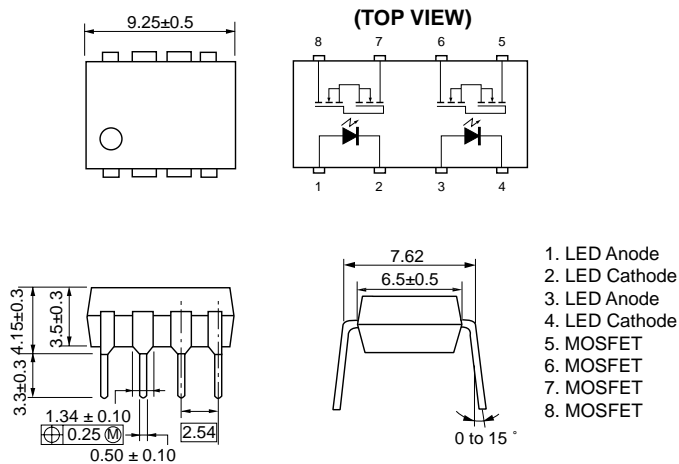
**PS7522-1A**



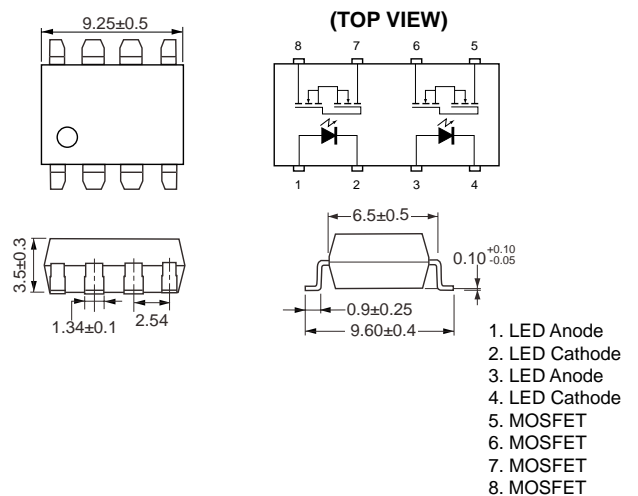
**PS7522L-1A**



**PS7522-2A**

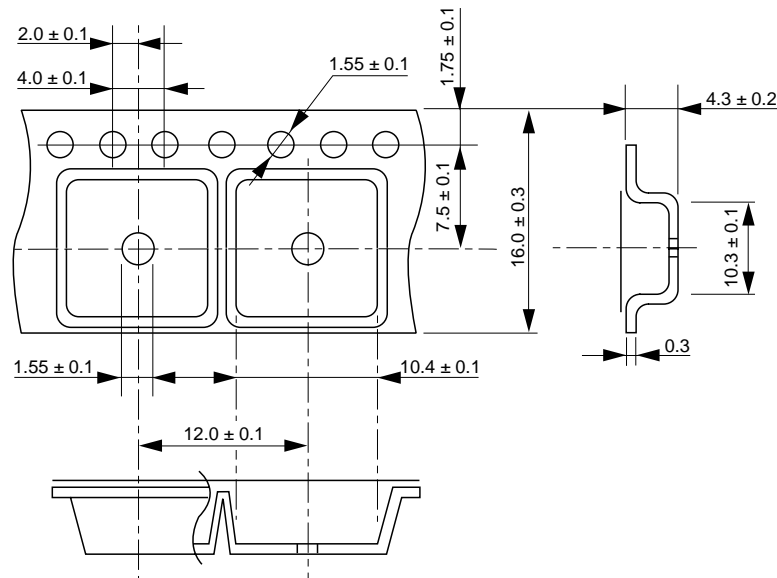


**PS7522L-2A**

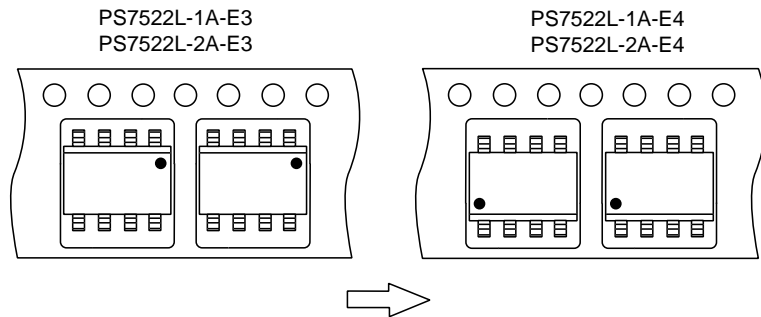


**TAPING SPECIFICATIONS** (Units in mm)

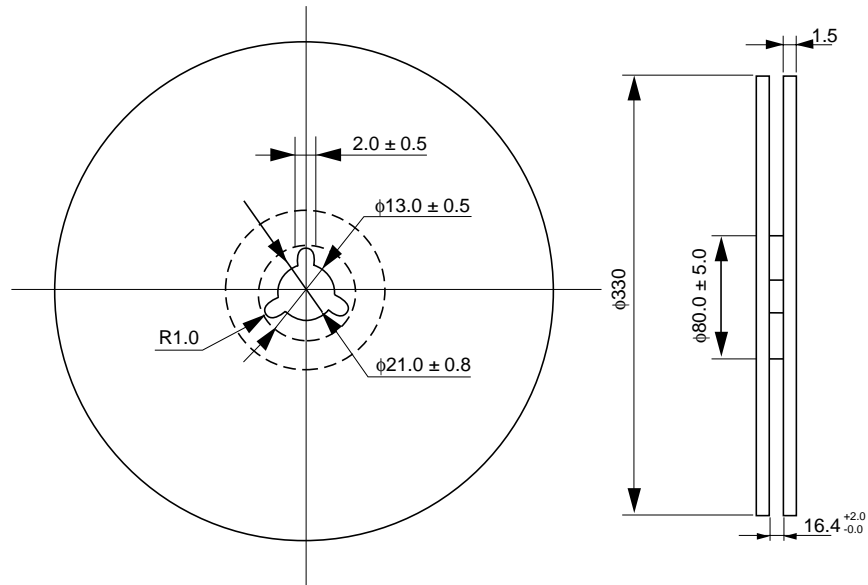
**OUTLINE AND DIMENSIONS (TAPE)**



**TAPING DIRECTION**



**OUTLINE AND DIMENSIONS (REEL)**



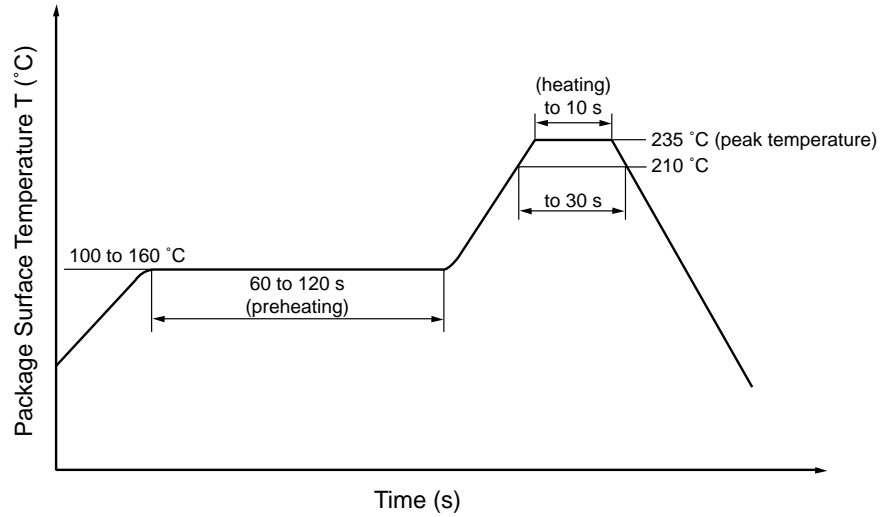
Packing : 1000 pcs/reel

## 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.