

## 4 PIN SOP 400 V BREAKDOWN VOLTAGE NORMALLYCLOSED TYPE 1-CH OPTICAL COUPLED MOSFET

# PS7241-1B

### FEATURES

- **1 CHANNEL TYPE:**  
(1b output)
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL AND THIN PACKAGE:**  
4 pin SOP, HEIGHT = 2.1 mm
- **LOW OFFSET VOLTAGE**
- **LOW LED OPERATING CURRENT:**  
 $I_F = 2 \text{ mA}$
- **SURFACE MOUNT AVAILABLE**

### DESCRIPTION

PS7241-1B is a solid state relay containing a normally closed (N.C.) contact on the output side. It is suitable for analog signal control because of its low offset and high linearity.

### APPLICATIONS

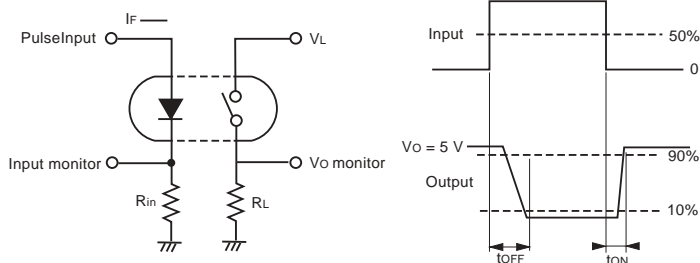
- EXCHANGE EQUIPMENT
- MEASUREMENT EQUIPMENT
- FA/OA EQUIPMENT

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

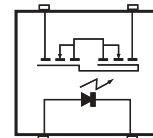
		PART NUMBER		PS7241-1B		
	SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	$V_F$	Forward Voltage, $I_F = 10 \text{ mA}$	V		1.2	1.4
	$I_R$	Reverse Current, $V_R = 5 \text{ V}$	$\mu\text{A}$			5.0
MOS FET	$I_{LOFF}$	Off-State Leakage Current, $I_F = 10 \text{ mA}$ , $V_D = 400 \text{ V}$	$\mu\text{A}$		0.03	1.0
	$C_{OUT}$	Output Capacitance, $I_F = 10 \text{ mA}$ , $V_D = 0 \text{ V}$ , $f = 1 \text{ MHz}$	pF		170	
Coupled	$I_{Foff}$	LED Off-state Current, $I_L = 120 \text{ mA}$	mA			2.0
	$R_{ON1}$	On-State Resistance, $I_F = 0 \text{ mA}$ , $I_L = 10 \text{ mA}$	$\Omega$		24	35
	$R_{ON2}$		$\Omega$		20	30
	$t_{ON}^1$	Turn-on Time, $I_F = 10 \text{ mA}$ , $V_O = 5 \text{ V}$ , $PW \geq 10 \text{ ms}$	ms		0.07	0.2
	$t_{OFF}^1$	Turn-off Time, $I_F = 10 \text{ mA}$ , $V_O = 5 \text{ V}$ , $PW \geq 10 \text{ ms}$	ms		0.8	2.0
	$R_{I-O}$	Isolation Resistance, $V_{I-O} = 1.0 \text{ kVDC}$	$\Omega$	$10^9$		
	$C_{I-O}$	Isolation Capacitance, $V = 0 \text{ V}$ , $f = 1 \text{ MHz}$	pF/ch		0.5	

Notes:

1. Test Circuit for Switching Time:



PS7241-1B



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

SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
I <sub>F</sub>	Forward Current (DC)	mA	50
V <sub>R</sub>	Reverse Voltage	V	5.0
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	400
I <sub>L</sub>	Continuous Load Current	mA	120
I <sub>LP</sub>	Pulse Load Current <sup>3</sup> (AC/DC Connection)	mA	240
P <sub>D</sub>	Power Dissipation	mW	300
Coupled			
BV	Isolation Voltage <sup>4</sup>	Vr.m.s.	1500
P <sub>T</sub>	Total Power Dissipation	mW	350
T <sub>A</sub>	Operating Ambient Temp.	°C	-40 to +80
T <sub>STG</sub>	Storage Temperature	°C	-40 to +100

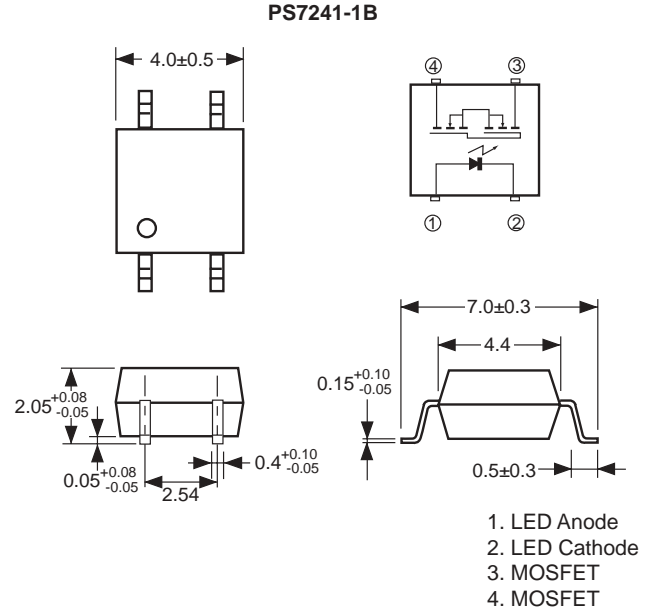
Notes:

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<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	2	10	20
V <sub>F</sub>	LED Off Voltage	V	0		0.5

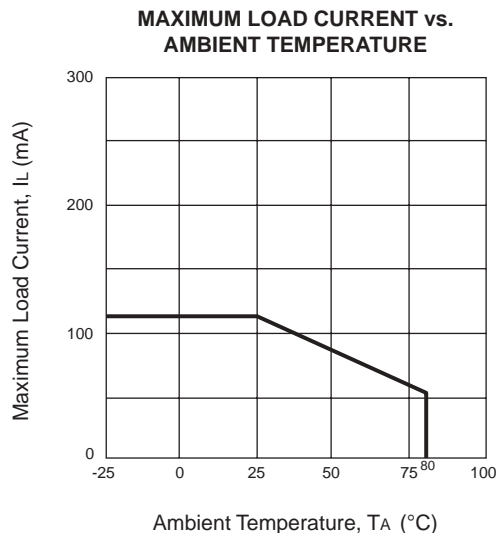
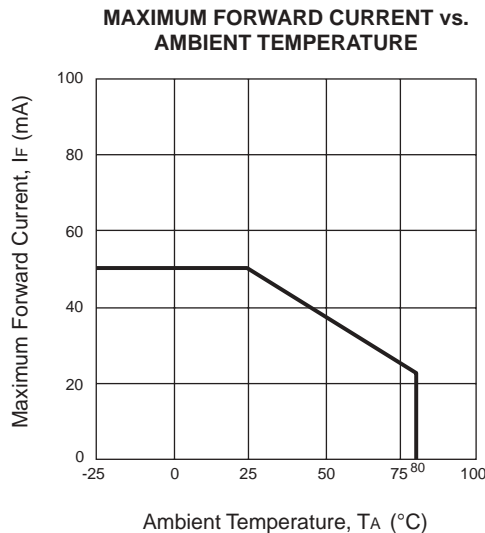
**OUTLINE DIMENSIONS** (Units in mm)



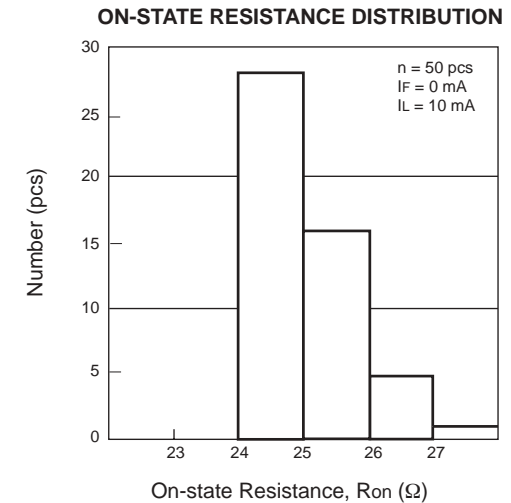
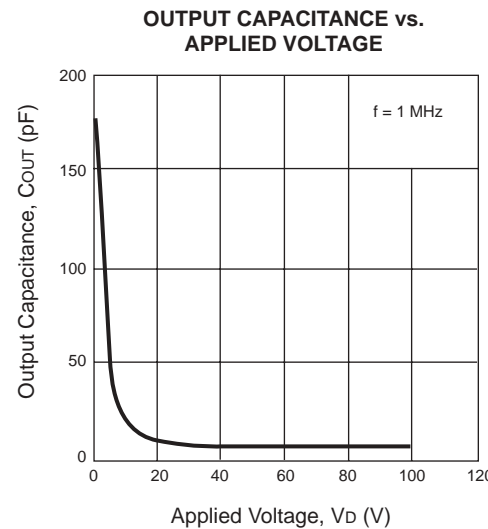
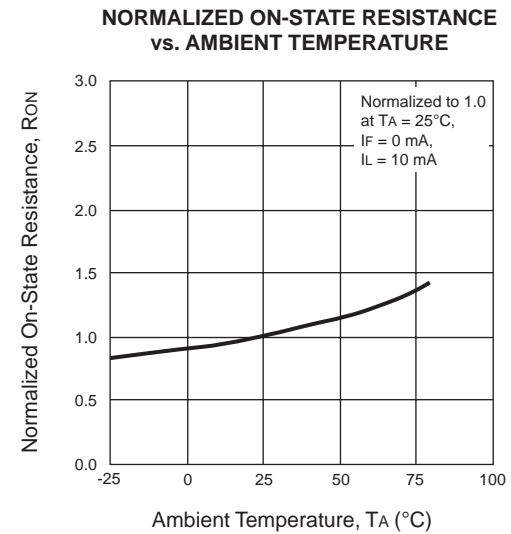
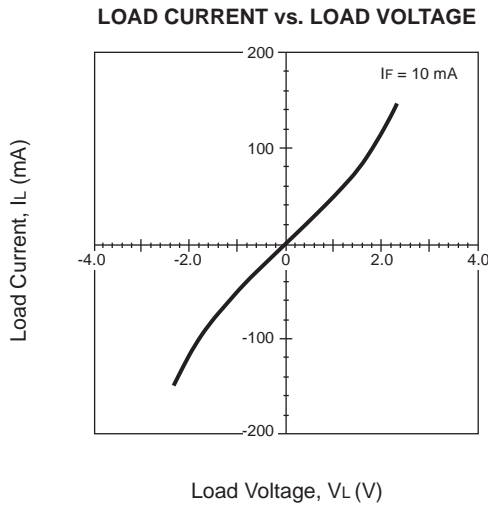
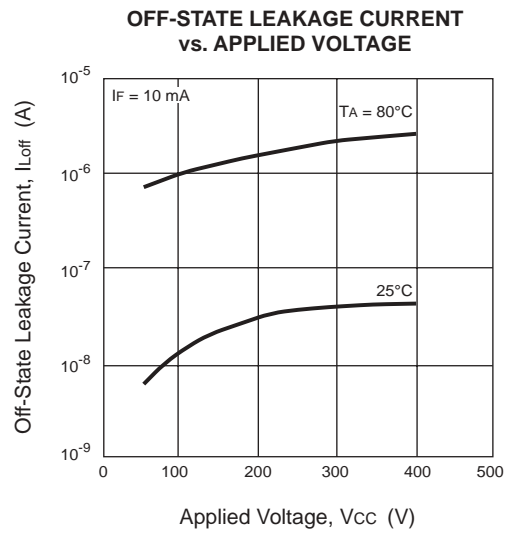
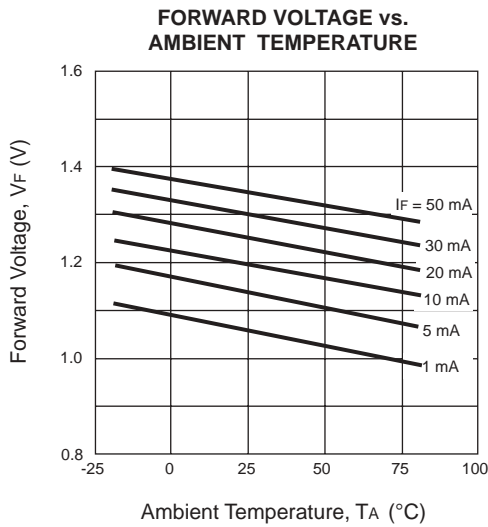
**ORDERING INFORMATION**

PART NUMBER	PACKAGE	PACKING STYLE
PS7241-1B	4-pin SOP	Magazine case 100 pcs
PS7241-1B-E3		Embossed Tape 900 pcs/reel
PS7241-1B-E4		
PS7241-1B-E5		Embossed Tape 1000 pcs/reel
PS7241-1B-F3		Embossed Tape 3500 pcs/reel
PS7241-1B-F4		

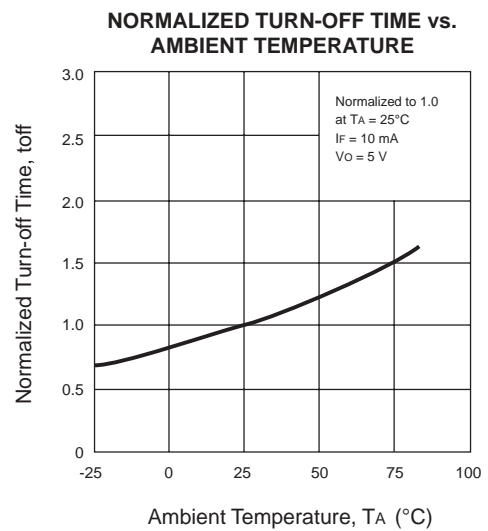
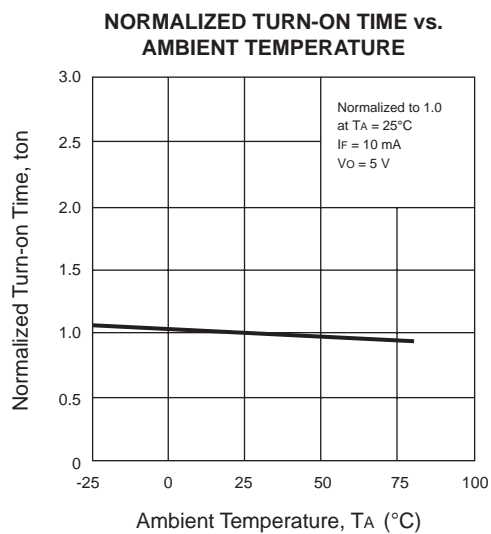
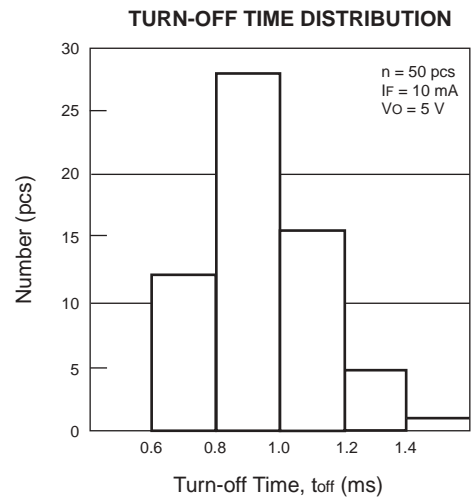
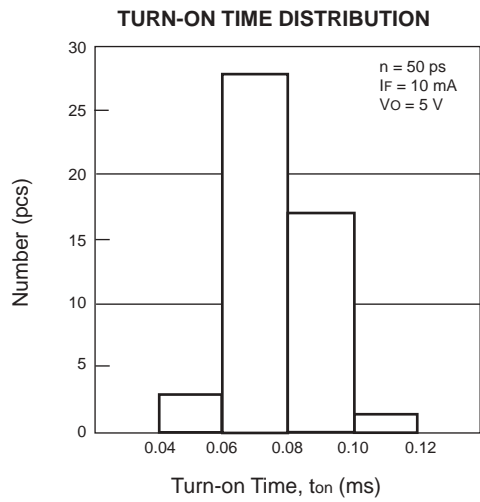
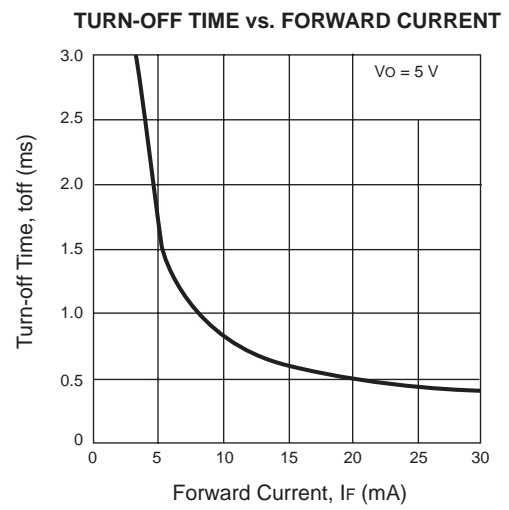
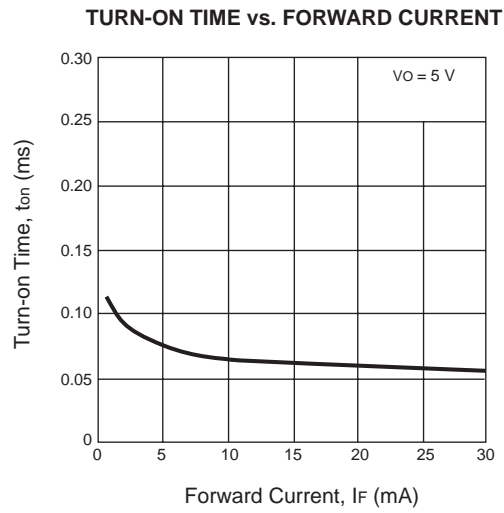
**TYPICAL PERFORMANCE CURVES** (T<sub>A</sub> = 25 °C)



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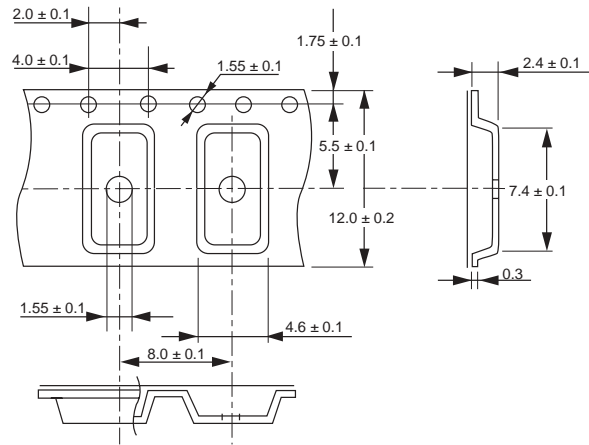


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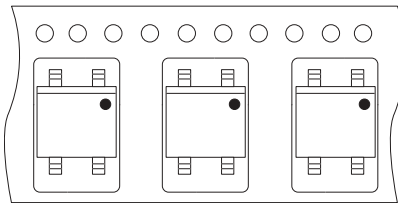
**TAPING SPECIFICATIONS** (Units in mm)

**OUTLINE AND DIMENSIONS (TAPE)**

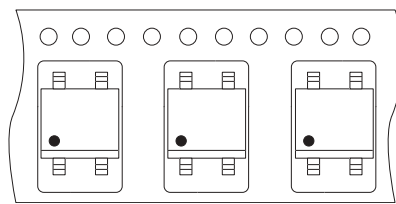


**TAPE DIRECTION**

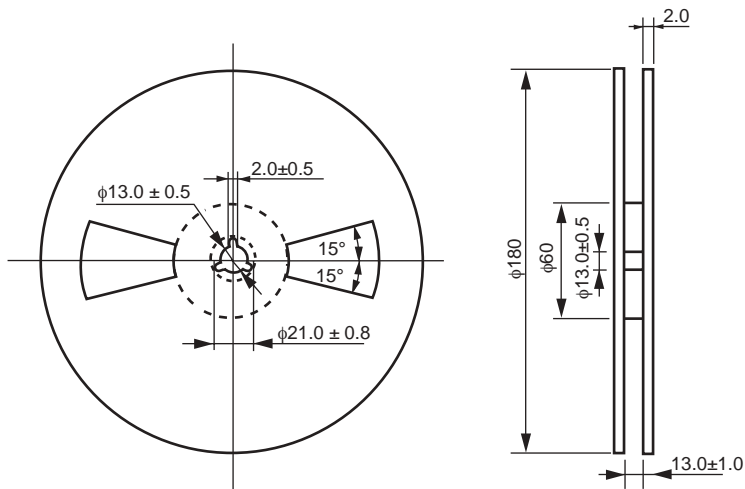
PS7241-1B-E3



PS7241-1B-E4



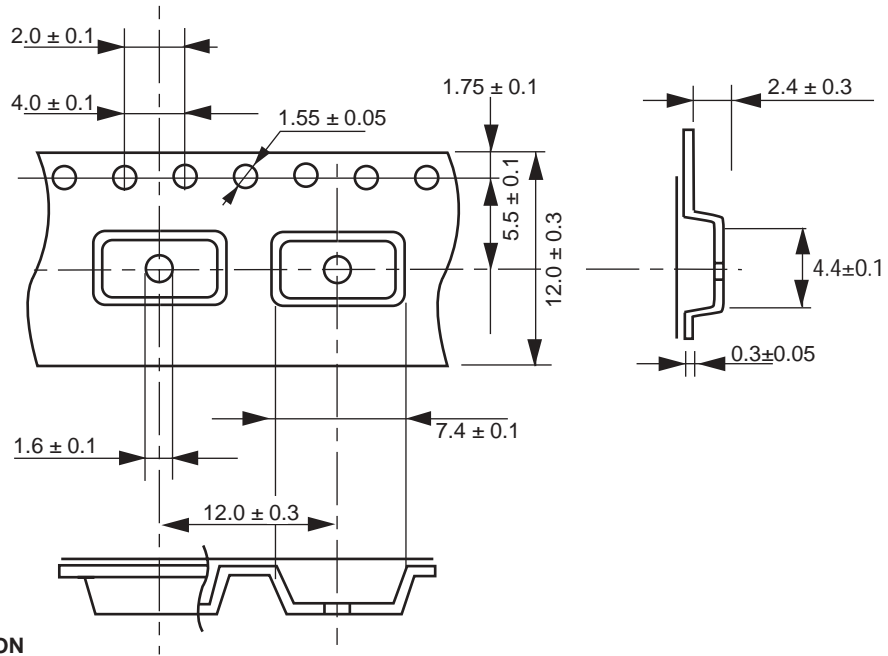
**OUTLINE AND DIMENSIONS (REEL)**



Note: Packing : 900 pcs/reel

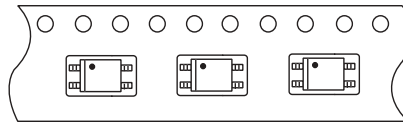
**TAPING SPECIFICATIONS** (Units in mm)

**OUTLINE AND DIMENSIONS (TAPE)**

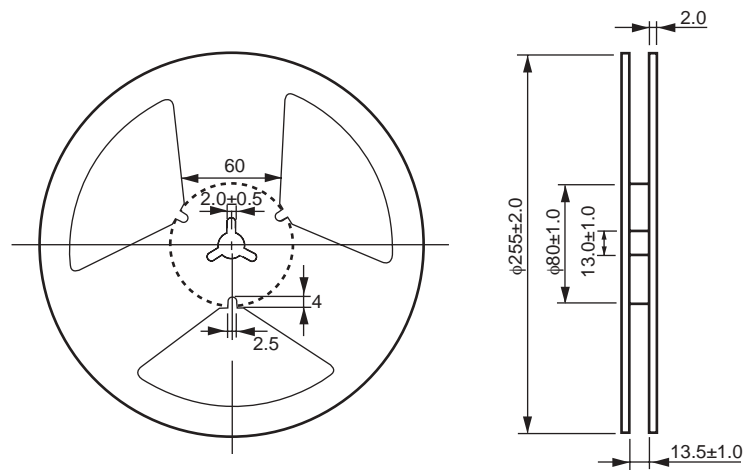


TAPE DIRECTION

**PS7241-1B-E5**



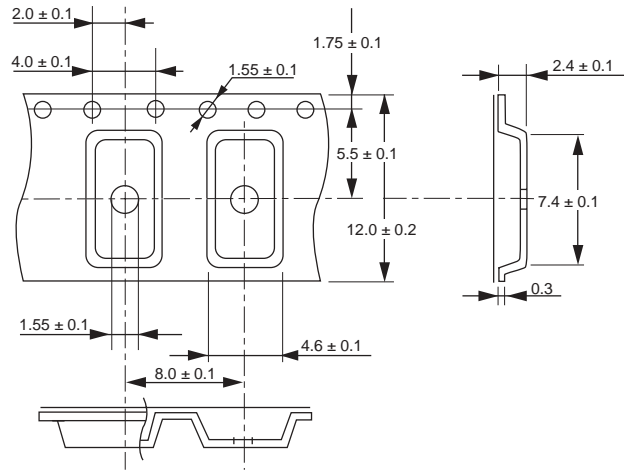
**OUTLINE AND DIMENSIONS (REEL)**



Note: Packing : 1000 pcs/reel

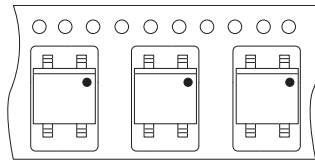
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**OUTLINE AND DIMENSIONS (TAPE)**

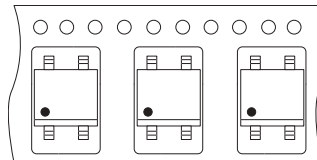


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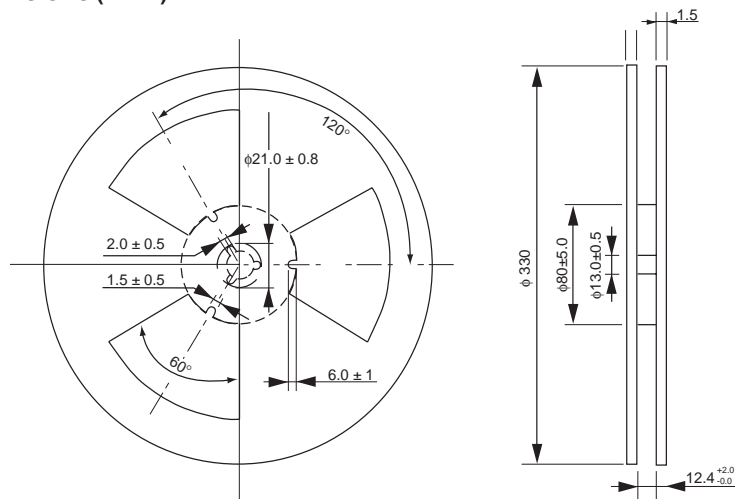
PS7241-1B-F3



PS7241-1B-F4



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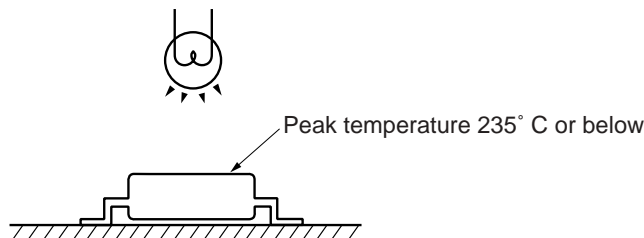
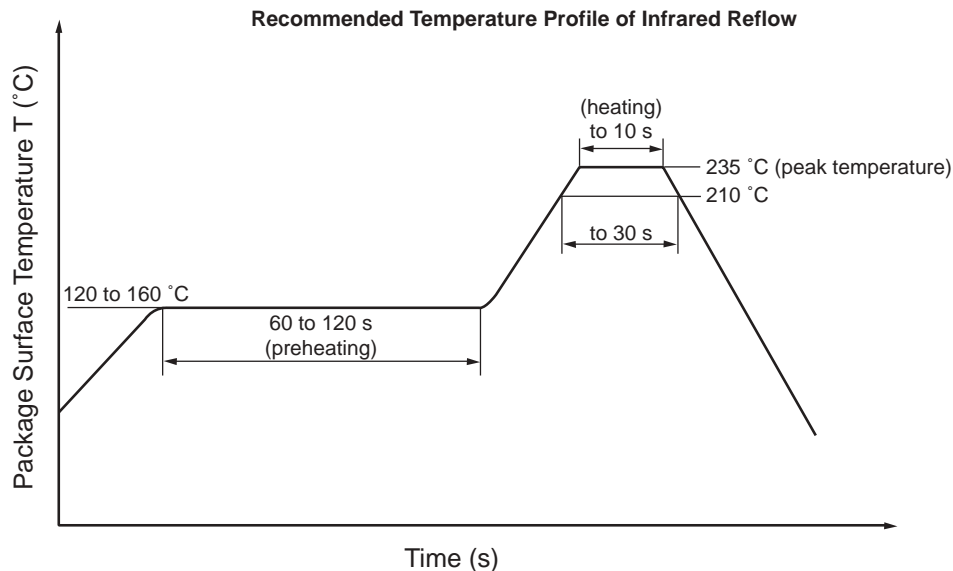


Note: Packing : 1000 pcs/reel

## RECOMMENDED SOLDERING CONDITIONS

### (1) Infrared reflow soldering

- **Peak reflow temperature**  
235 °C (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 max. chlorine content of 0.2 Wt % is recommended)



### (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 max. chlorine content of 0.2 Wt % is recommended)

### (3) Cautions

- **Fluxes**  
Avoid removing flux with freon based and chlorine-based cleaning solvents.

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