CEL

NEC's 4-PIN SOP 400 V BREAK DOWN VOLTAGE 1-CH OPTICALLY COUPLED MOS FET

PS7241E-1A

FEATURES

- **SMALL AND THIN PACKAGE:**
  4-pin SOP, Height = 2.1 mm
- **1 CHANNEL TYPE (1 A OUTPUT)**
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **LOW OFFSET VOLTAGE**
- **ORDERING NUMBER OF TAPING PRODUCT:**
  PS7241E-1A-E3, E4, F3, F4
- **UL AWAITING APPROVAL**
- **BSI AWAITING APPROVAL**

DESCRIPTION

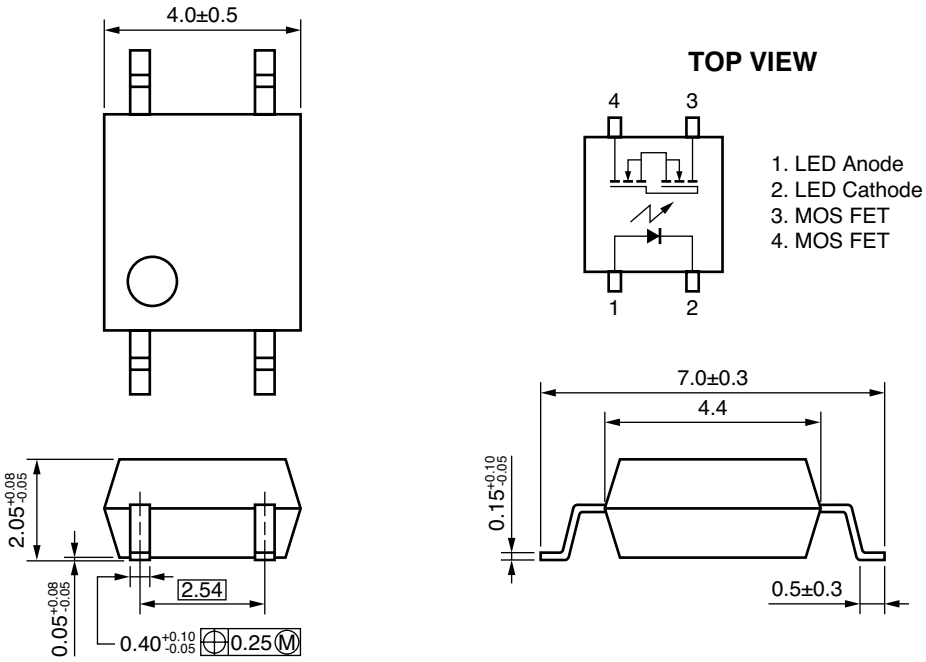
NEC's PS7241E-1A is an optically coupled solid state relay that combines a GaAs infrared LED on the input side with a normally-open MOS FET on the output side to realize an excellent cost performance.

The small, thin package and high sensitivity of this relay makes it ideal for battery-driven mobile devices, and its small offset voltage at power-on and good linearity are also make it suitable for controlling micro analog signals.

APPLICATIONS

- **Laptop PC, PDA**
- **Modem card**
- **Telephone, FAX**
- **Measurement equipment**

PACKAGE DIMENSIONS (UNIT: mm)



ORDERING INFORMATION

Part Number	Package	Packing Style	Application Part Number*1
PS7241E-1A	4-pin SOP	Magazine case 100 pcs	PS7241E-1A
PS7241E-1A-E3		Embossed Tape 900 pcs/reel	
PS7241E-1A-E4			
PS7241E-1A-F3		Embossed Tape 3 500 pcs/reel	
PS7241E-1A-F4			

***1** For the application of the Safety Standard, following part number should be used

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Diode	Forward Current (DC)	I_F	50	mA
	Reverse Voltage	V_R	5.0	V
	Power Dissipation	P_D	50	mW
	Peak Forward Current *1	I_{FP}	1	A
MOS FET	Break Down Voltage	V_L	400	V
	Continuous Load Current	I_L	120	mA
	Pulse Load Current*2 (AC/DC Connection)	I_{LP}	240	mA
	Power Dissipation	P_D	300	mW
Isolation Voltage *3		BV	1 500	Vr.m.s.
Total Power Dissipation		P_T	350	mW
Operating Ambient Temperature		T_A	–40 to +85	°C
Storage Temperature		T_{stg}	–40 to +100	°C

***1** PW = 100 μs, Duty Cycle = 1%

***2** PW = 100 ms, 1 shot

***3** AC voltage for 1 minute at T_A = 25°C, RH = 60% between input and output

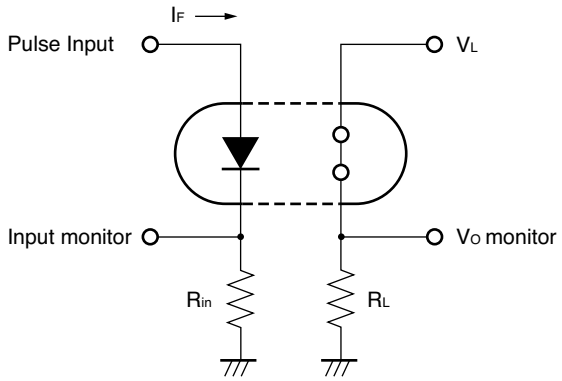
RECOMMENDED OPERATING CONDITIONS (T_A = 25°C)

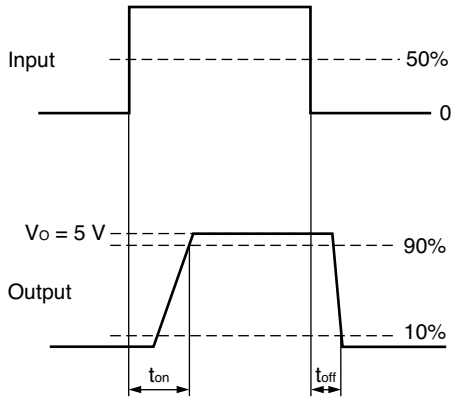
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
LED Operating Current	I_F	4	10	20	mA
LED Off Voltage	V_F	0		0.5	V

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PARAMETER		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Diode	Forward Voltage	V_F	I_F = 10 mA		1.2	1.4	V
	Reverse Current	I_R	V_R = 5 V			5.0	μA
MOS FET	Off-state Leakage Current	I_{Loff}	V_D = 400 V			1.0	μA
	Output Capacitance	C_{out}	V_D = 0 V, f = 1 MHz		18		pF
Coupled	LED On-state Current	I_{Fon}	I_L = 120 mA			4.0	mA
	On-state Resistance	R_{on1}	I_F = 10 mA, I_L = 10 mA		22	35	Ω
		R_{on2}	I_F = 10 mA, I_L = 120 mA, t ≤ 10 ms		17	23	
	Turn-on Time*1	t_{on}	I_F = 10 mA, V_O = 5 V, R_L = 500 Ω,		0.5	1.0	ms
	Turn-off Time*1	t_{off}	PW ≥ 10 ms		0.07	0.2	
	Isolation Resistance	R_{I-O}	V_{I-O} = 1.0 kV_{DC}	10^9			Ω
	Isolation Capacitance	C_{I-O}	V = 0 V, f = 1 MHz		0.5		pF

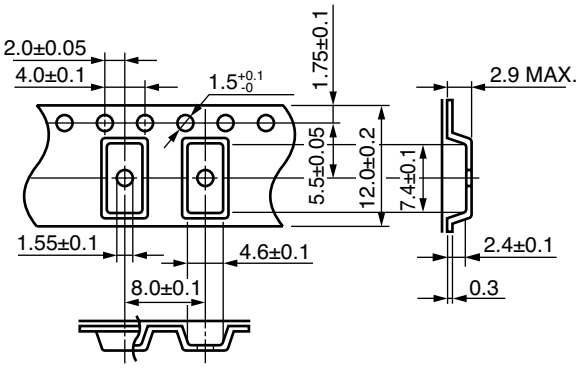
***1** Test Circuit for Switching Time



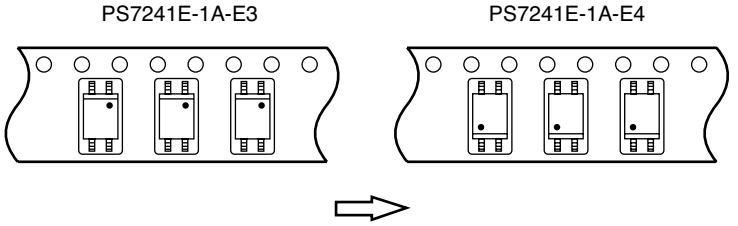


TAPING SPECIFICATIONS (Units in mm)

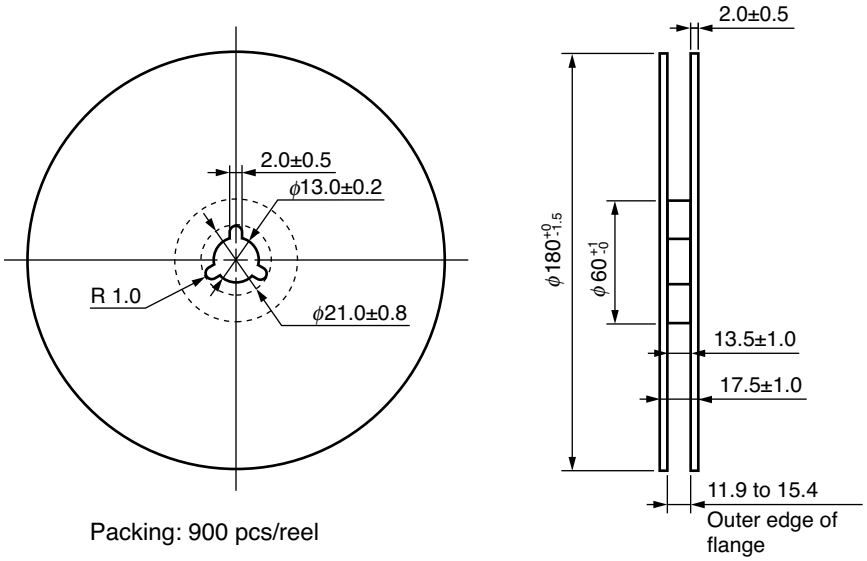
Outline and Dimensions (Tape)



Tape Direction



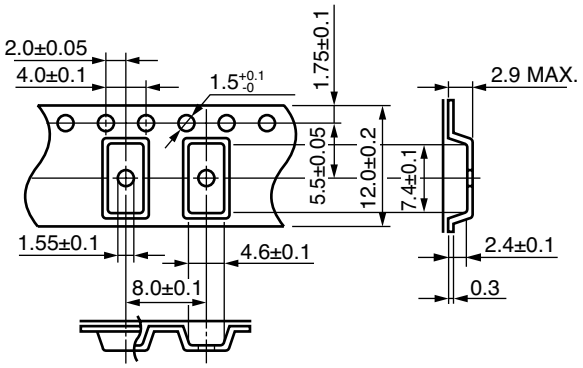
Outline and Dimensions (Reel)



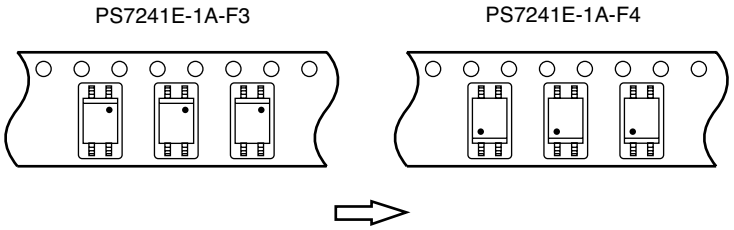
Packing: 900 pcs/reel

TAPING SPECIFICATIONS (Units in mm)

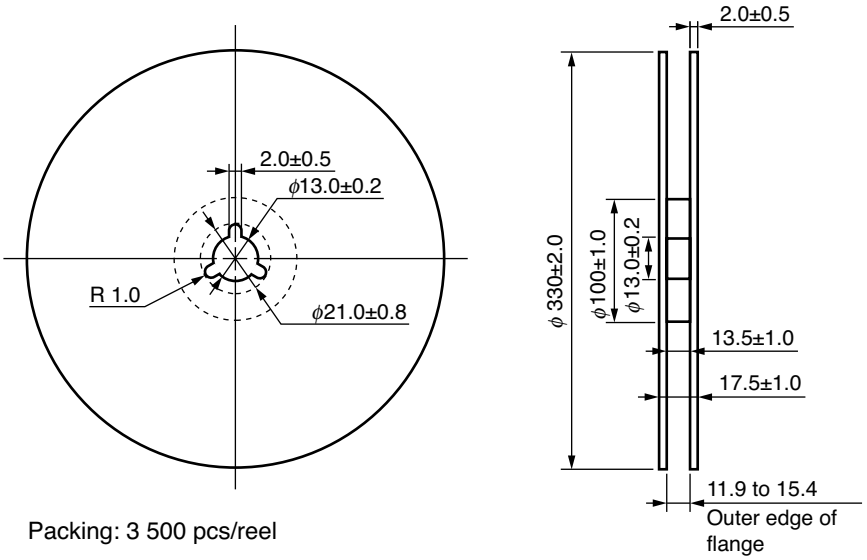
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



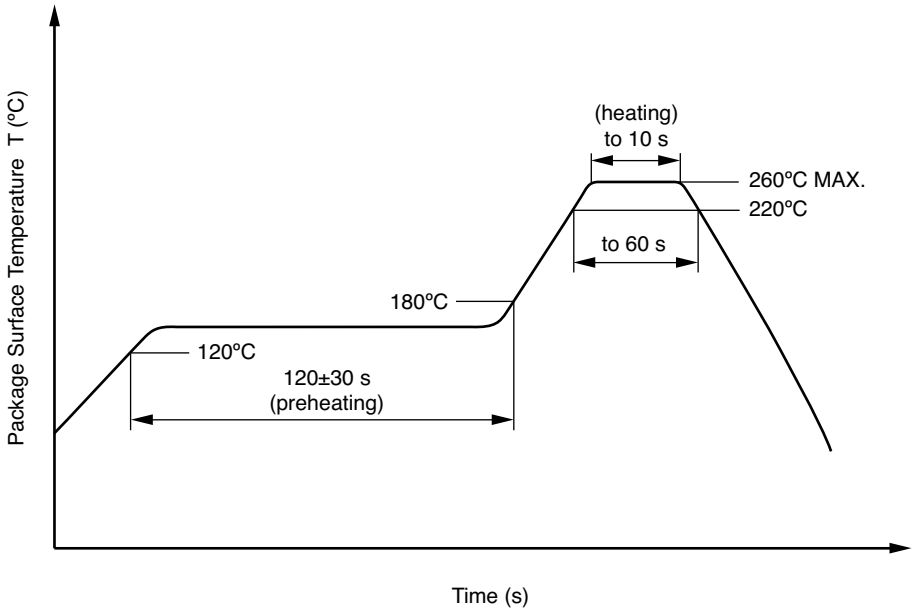
Packing: 3 500 pcs/reel

RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

• Peak reflow temperature	260°C or below (package surface temperature)
• Time of peak reflow temperature	10 seconds or less
• Time of temperature higher than 220°C	60 seconds or less
• Time to preheat temperature from 120 to 180°C	120±30 s
• Number of reflows	Three
• 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) Wave soldering

• Temperature	260°C or below (molten solder temperature)
• Time	10 seconds or less
• Preheating conditions	120°C or below (package surface temperature)
• 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 and chlorine-based cleaning solvent.