



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

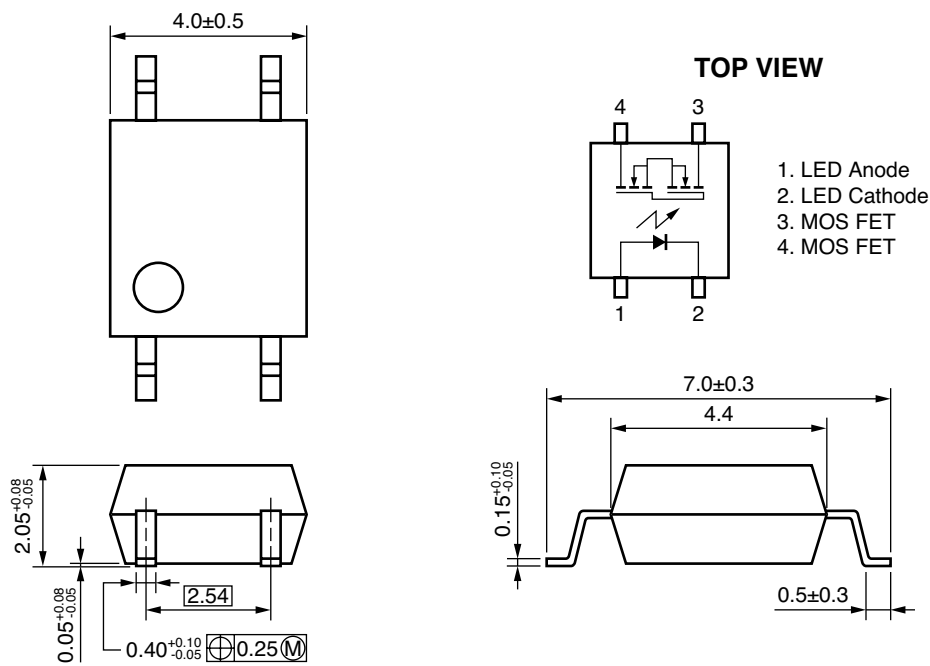
NEC's PS7241E-1A is an optically coupled solid state relay that combines a GaAs infrared LED on the input side with a normally-open MOS FET on the output side to realize an excellent cost performance.

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

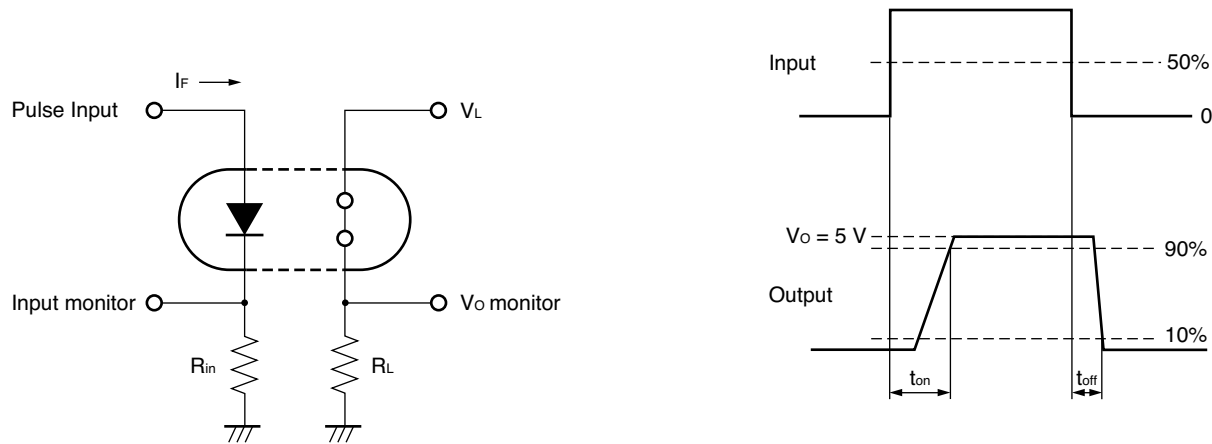
RECOMMENDED OPERATING CONDITIONS (TA = 25°C)

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

ELECTRICAL CHARACTERISTICS (TA = 25°C)

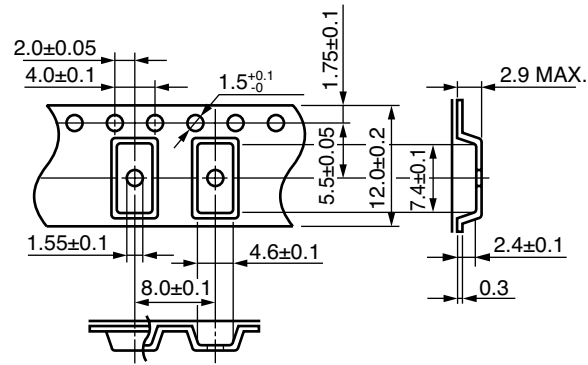
PARAMETER		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Diode	Forward Voltage	VF	IF = 10 mA		1.2	1.4	V
	Reverse Current	IR	VR = 5 V			5.0	μA
MOS FET	Off-state Leakage Current	ILoff	VD = 400 V			1.0	μA
	Output Capacitance	Cout	VD = 0 V, f = 1 MHz		18		pF
Coupled	LED On-state Current	IFon	IL = 120 mA			4.0	mA
	On-state Resistance	Ron1	IF = 10 mA, IL = 10 mA		22	35	Ω
		Ron2	IF = 10 mA, IL = 120 mA, t ≤ 10 ms		17	23	
	Turn-on Time*1	ton	IF = 10 mA, VO = 5 V, RL = 500 Ω,		0.5	1.0	ms
	Turn-off Time*1	toff	PW ≥ 10 ms		0.07	0.2	
	Isolation Resistance	RI-O	VI-O = 1.0 kVDC	10 ⁹			Ω
	Isolation Capacitance	CI-O	V = 0 V, f = 1 MHz		0.5		pF

*1 Test Circuit for Switching Time

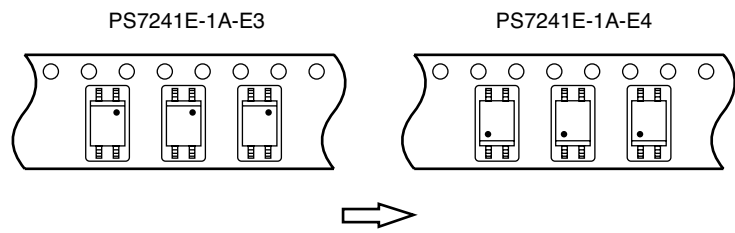


TAPING SPECIFICATIONS (Units in mm)

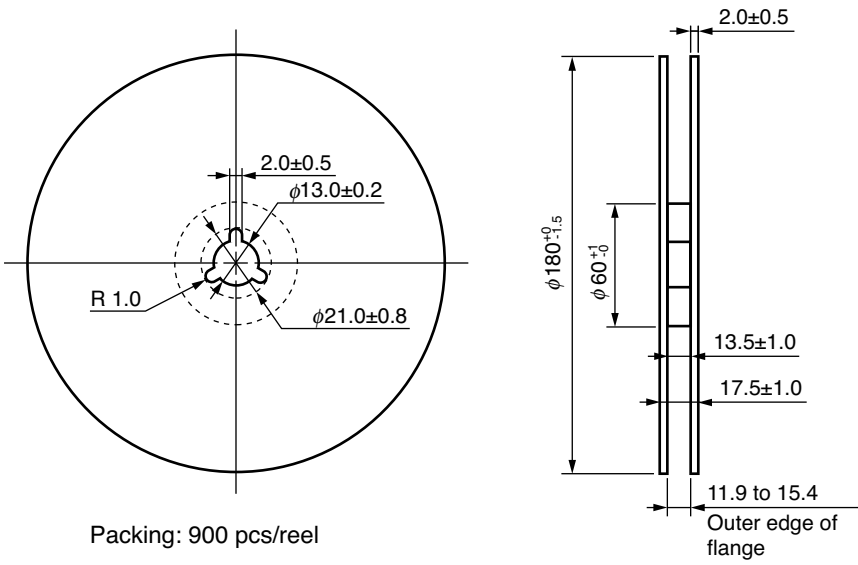
Outline and Dimensions (Tape)



Tape Direction

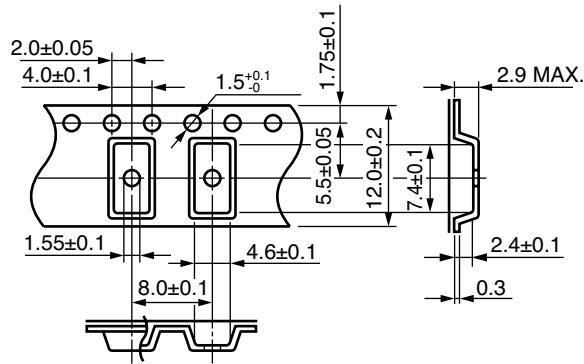


Outline and Dimensions (Reel)

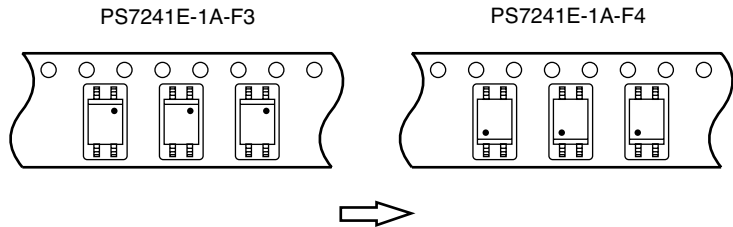


TAPING SPECIFICATIONS (Units in mm)

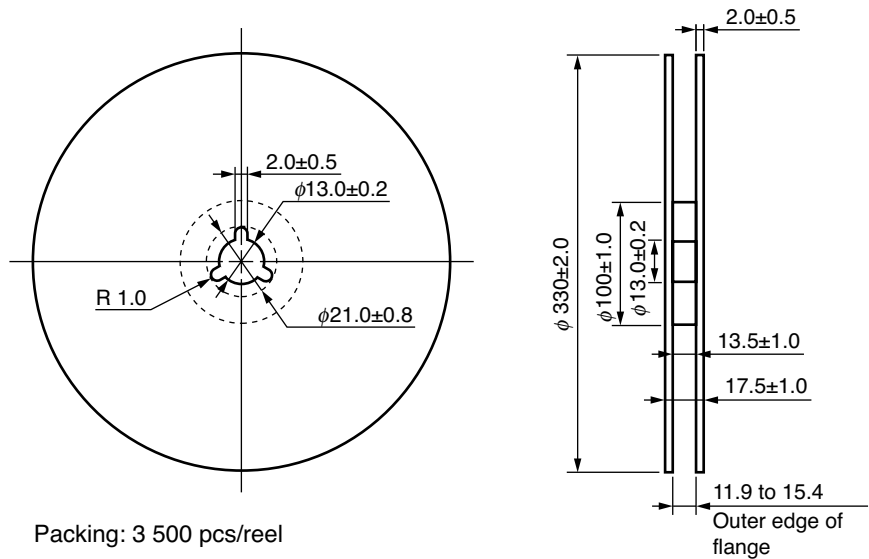
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)

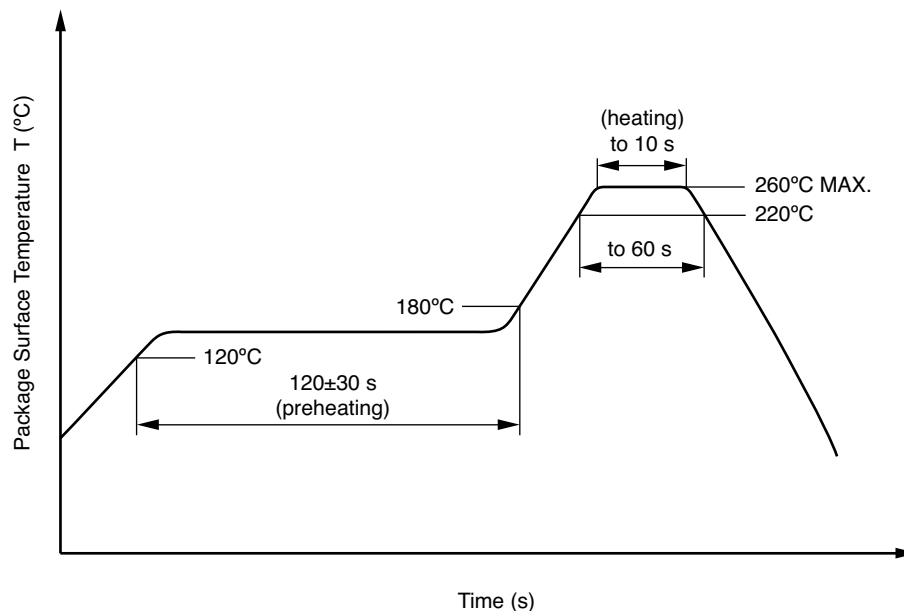


RECOMMENDED SOLDERING CONDITIONS

(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.

Life Support Applications

These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.

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