

**4-PIN SOP 400 V BREAK DOWN VOLTAGE
1-ch Optical Coupled MOS FET**

DESCRIPTION

The PS7241E-1A is an optically coupled element 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 element 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.

FEATURES

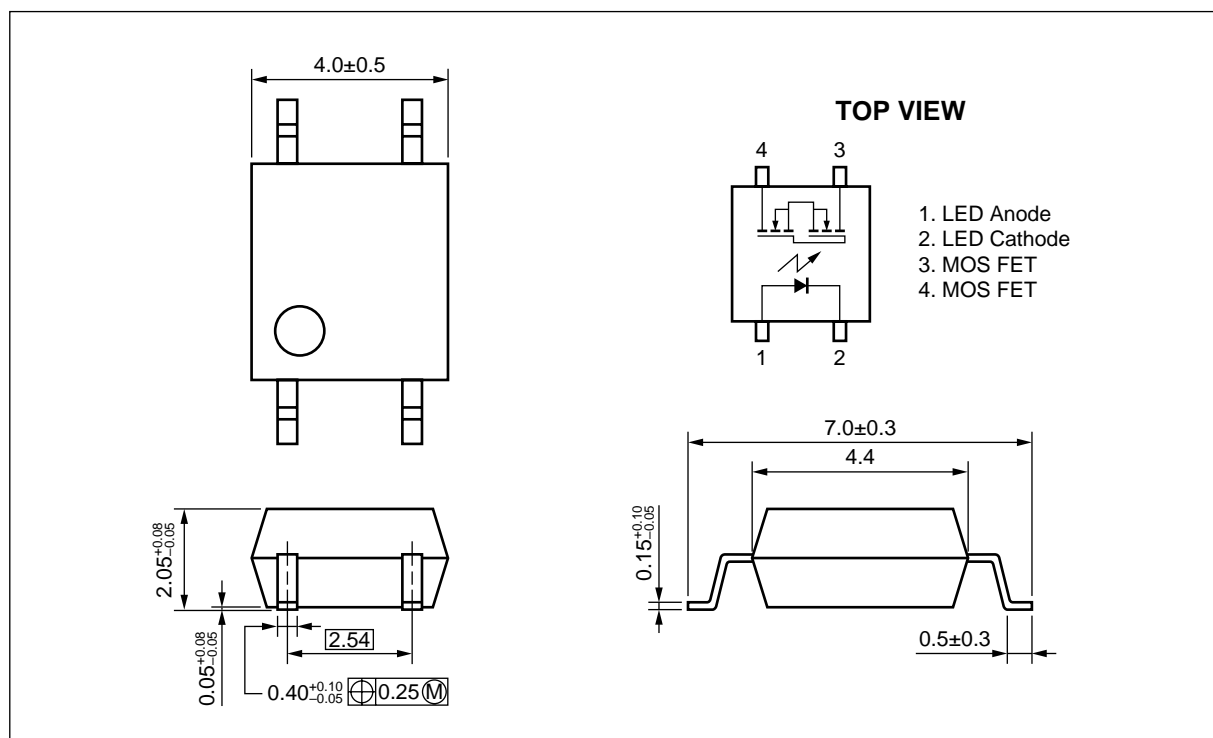
- Small and thin package (4-pin SOP, Height = 2.1 mm)
- 1 channel type (1 a output)
- Designed for AC/DC switching line changer
- Low offset voltage
- Ordering number of taping product: PS7241E-1A-E3, E4, F3, F4
- UL awaiting approval
- BSI awaiting approval

APPLICATIONS

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

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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

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

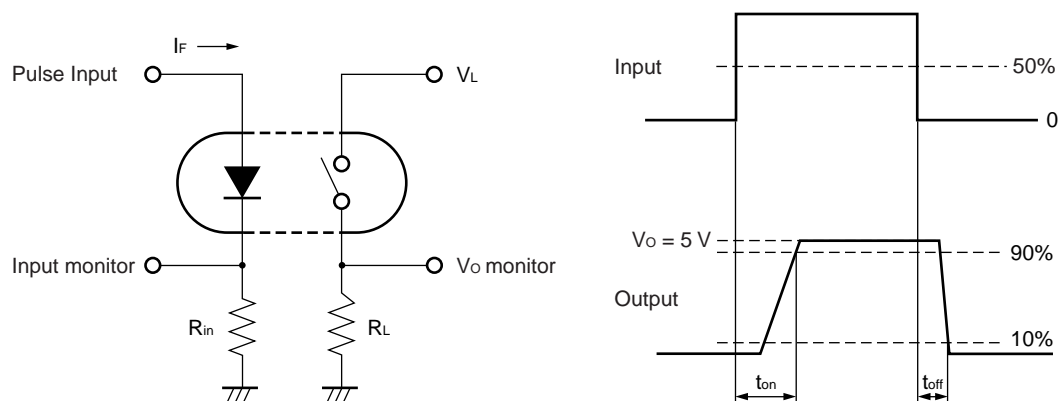
RECOMMENDED OPERATING CONDITIONS ($T_A = 25^\circ\text{C}$)

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

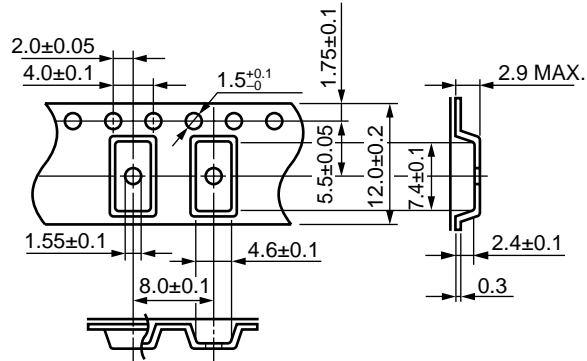
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	$I_F = 10\text{ mA}$		1.2	1.4	V
	Reverse Current	I_R	$V_R = 5\text{ V}$			5.0	μA
MOS FET	Off-state Leakage Current	I_{Loff}	$V_D = 400\text{ V}$			1.0	μA
	Output Capacitance	C_{out}	$V_D = 0\text{ V}, f = 1\text{ MHz}$		18		pF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

*1 Test Circuit for Switching Time

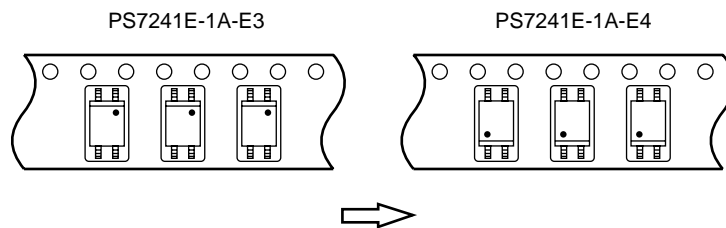


TAPING SPECIFICATIONS (in millimeters)

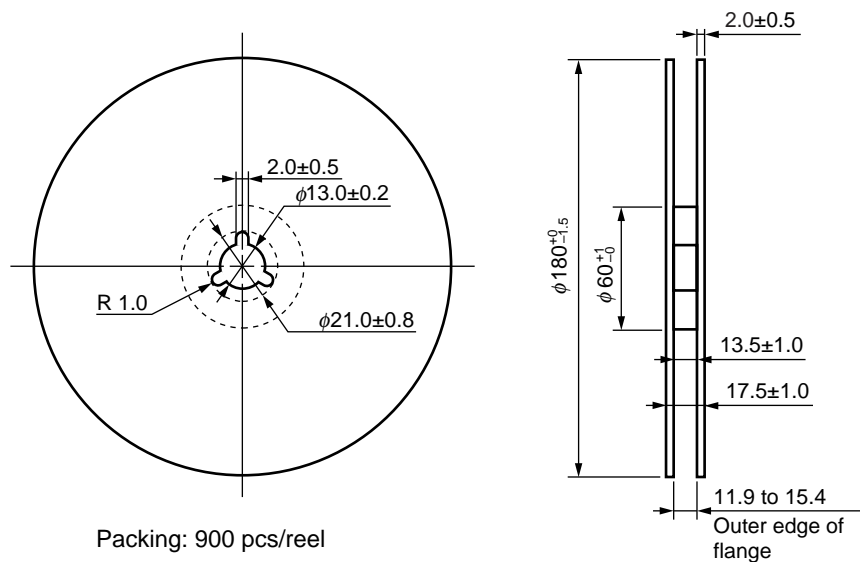
Outline and Dimensions (Tape)



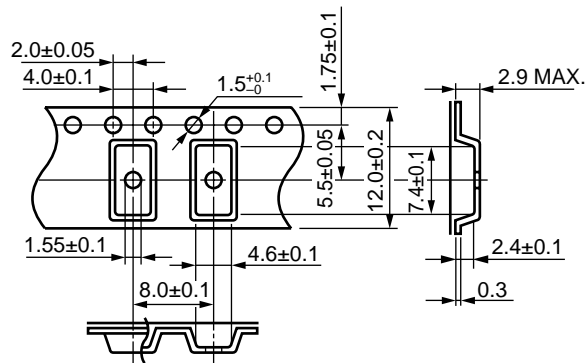
Tape Direction



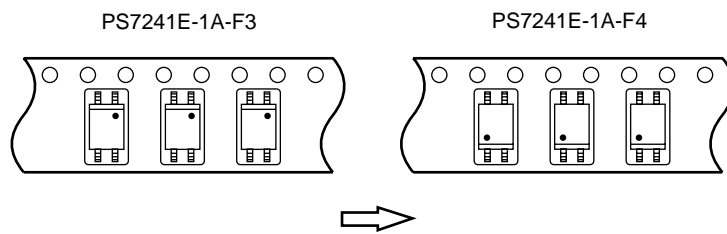
Outline and Dimensions (Reel)



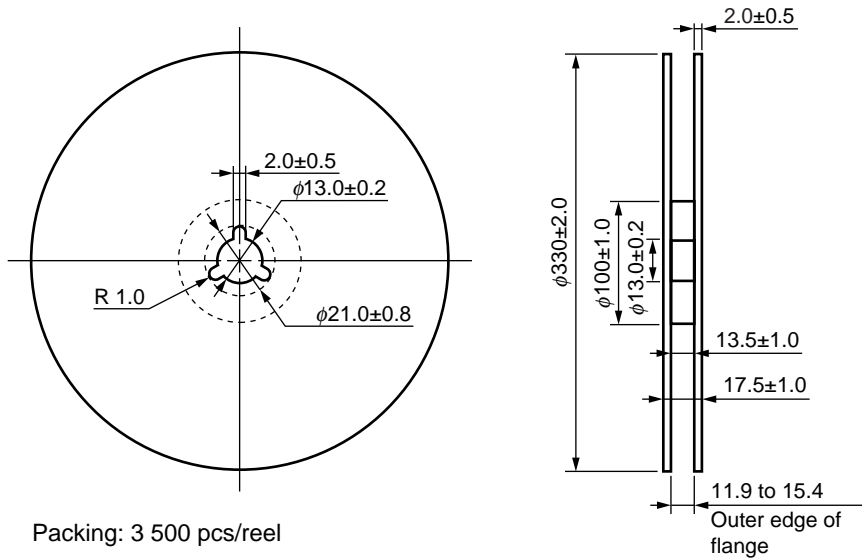
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)

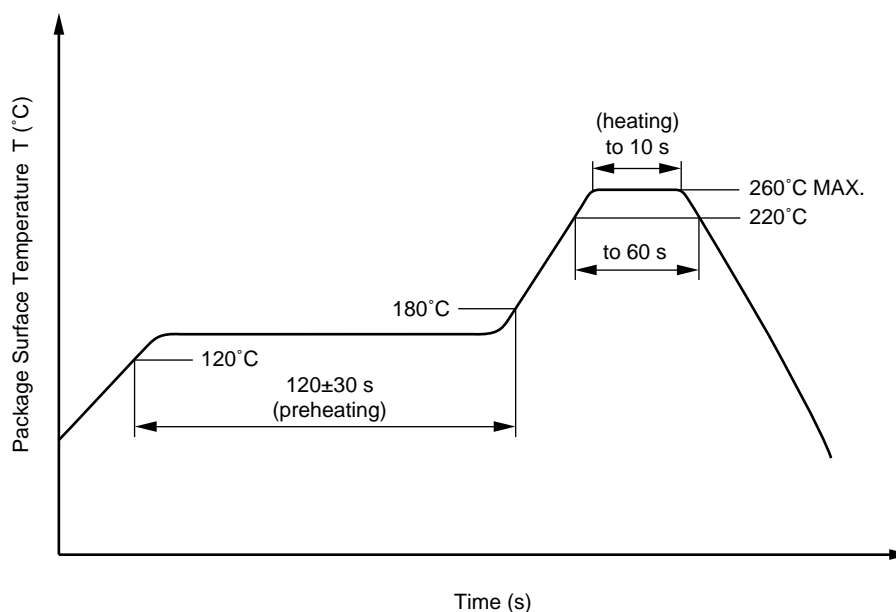


RECOMMENDED SOLDERING CONDITIONS

(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.

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M8E 00.4-0110

Caution	GaAs Products	<p>This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points.</p> <ul style="list-style-type: none"> • Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below. <ol style="list-style-type: none"> 1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials. 2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal. • Do not burn, destroy, cut, crush, or chemically dissolve the product. • Do not lick the product or in any way allow it to enter the mouth.
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