NEC

Solid State Relay
OCMOS FET

PS7241E-1B

4-PIN SOP 400 V BREAK DOWN VOLTAGE NORMALLY CLOSE TYPE 1-ch Optical Coupled MOS FET

DESCRIPTION

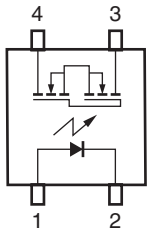
The PS7241E-1B is an optically coupled element that combines a GaAs infrared LED on the input side with a normally close MOS FET on the output side to realize an excellent cost performance.

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 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 b output)
- Designed for AC/DC switching line changer
- Low offset voltage
- Ordering number of taping product: PS7241E-1B-E3, E4, F3, F4
- Pb-Free product
- UL awaiting approval
- BSI awaiting approval

PIN CONNECTION
(Top View)



1. LED Anode
2. LED Cathode
3. MOS FET
4. MOS FET

APPLICATIONS

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

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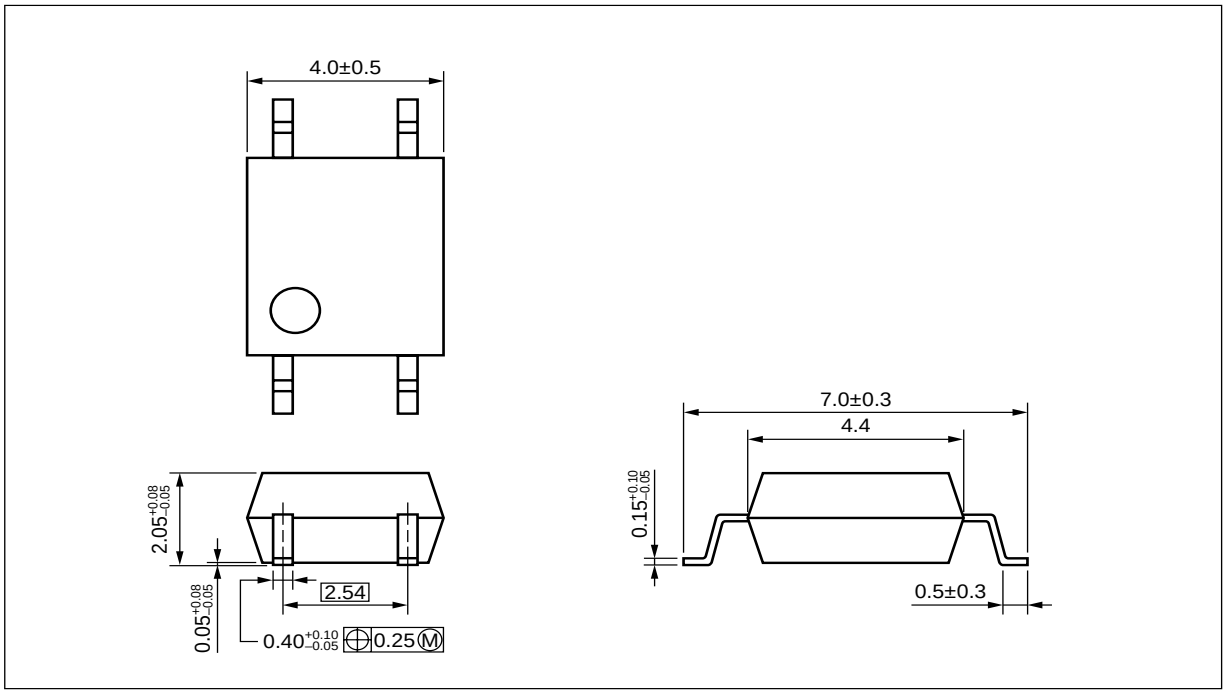
PACKAGE DIMENSIONS (UNIT: mm)



ORDERING INFORMATION

Part Number	Order Number	Solder Plating Specification	Packing Style	Safety Standard Approval	Application Part Number*1
PS7241E-1B	PS7241E-1B-A	Pb-Free*2	Magazine case 100 pcs	UL and BSI	PS7241E-1B
PS7241E-1B-E3	PS7241E-1B-E3-A		Embossed Tape 900 pcs/reel	awaiting approval	
PS7241E-1B-E4	PS7241E-1B-E4-A				
PS7241E-1B-F3	PS7241E-1B-F3-A		Embossed Tape 3 500 cs/reel		
PS7241E-1B-F4	PS7241E-1B-F4-A				

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

***2** With regards to terminal solder (the solder contains lead) plated products (conventionally plated), contact your nearby sales office.

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
Pins 1-2 shorted together, 3-4 shorted together.

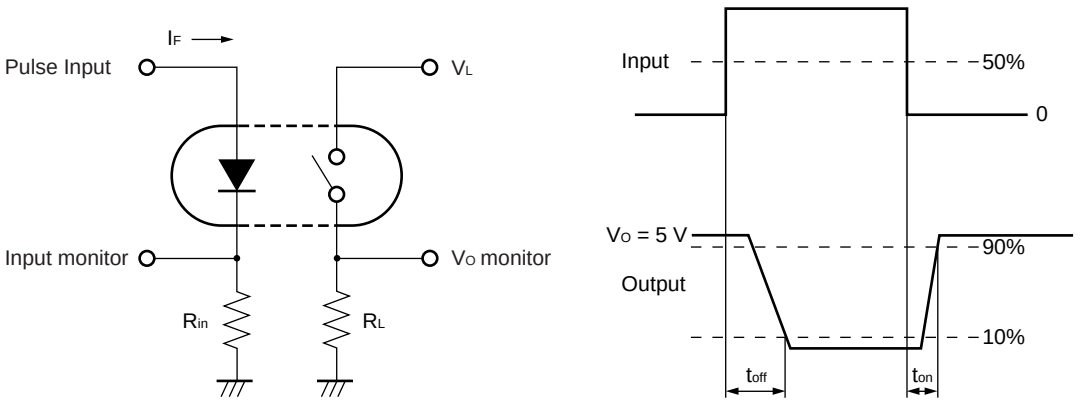
RECOMMENDED OPERATING CONDITIONS (T_A = 25°C)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
LED Operating Current	I_F	3	10	20	mA
LED Off Voltage	V_F	0		0.5	V

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

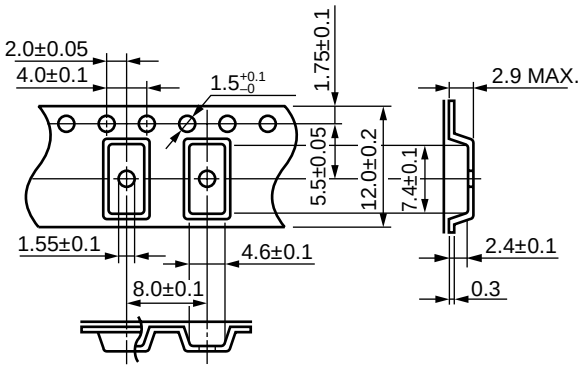
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 10 mA		1.2	1.4	V
	Reverse Current	I_R	V_R = 5 V			5.0	μA
MOS FET	Off-state Leakage Current	I_{Loff}	I_F = 10 mA, V_D = 400 V			1.0	μA
	Output Capacitance	C_{out}	I_F = 10 mA, V_D = 0 V, f = 1 MHz		206		pF
Coupled	LED Off-state Current	I_{Foff}	I_L = 120 mA			3.0	mA
	On-state Resistance	R_{on1}	I_F = 0 mA, I_L = 10 mA		22	35	Ω
		R_{on2}	I_F = 0 mA, I_L = 120 mA, t ≤ 10 ms		17	24	
	Turn-on Time*1	t_{on}	I_F = 10 mA, V_O = 5 V, R_L = 500 Ω,		0.07	0.2	ms
	Turn-off Time*1	t_{off}	PW ≥ 10 ms		1.0	3.0	
	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

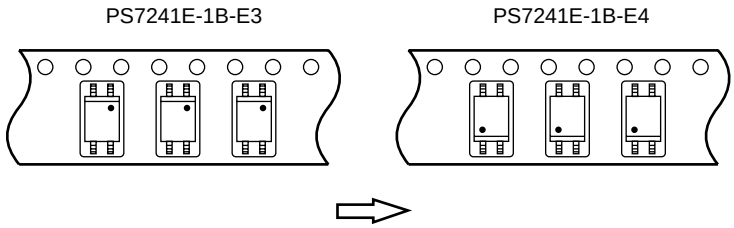


TAPING SPECIFICATIONS (in millimeters)

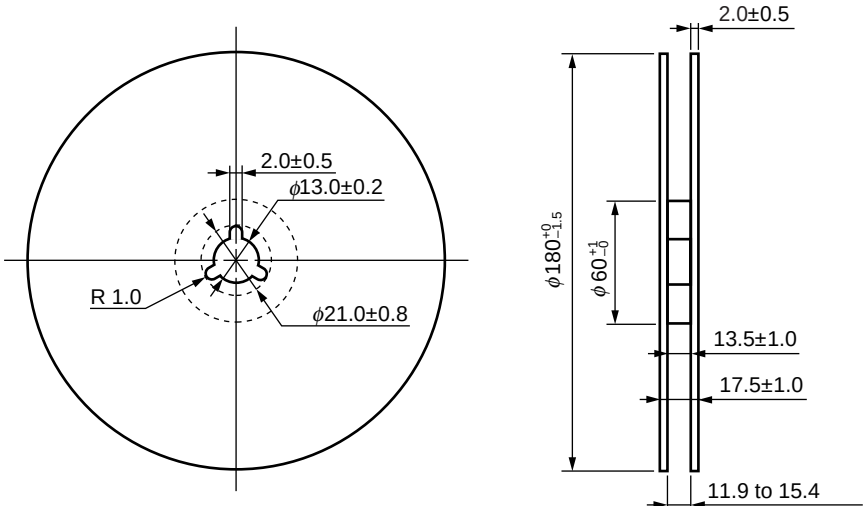
Outline and Dimensions (Tape)



Tape Direction

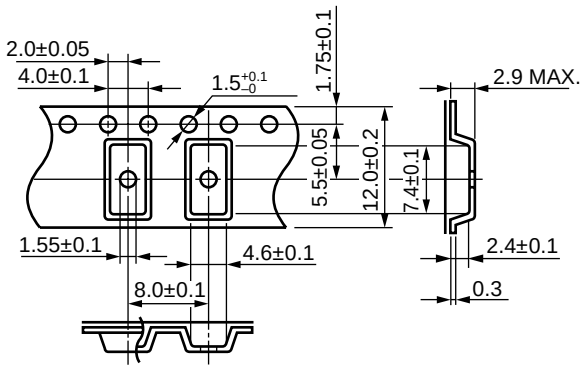


Outline and Dimensions (Reel)

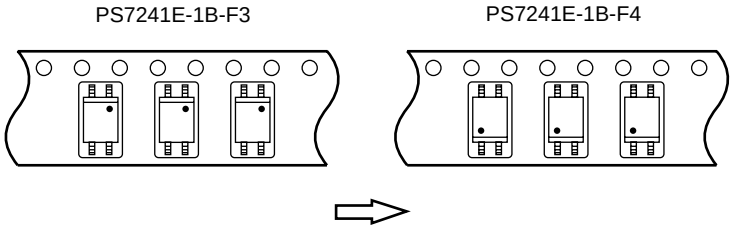


Packing: 900 pcs/reel

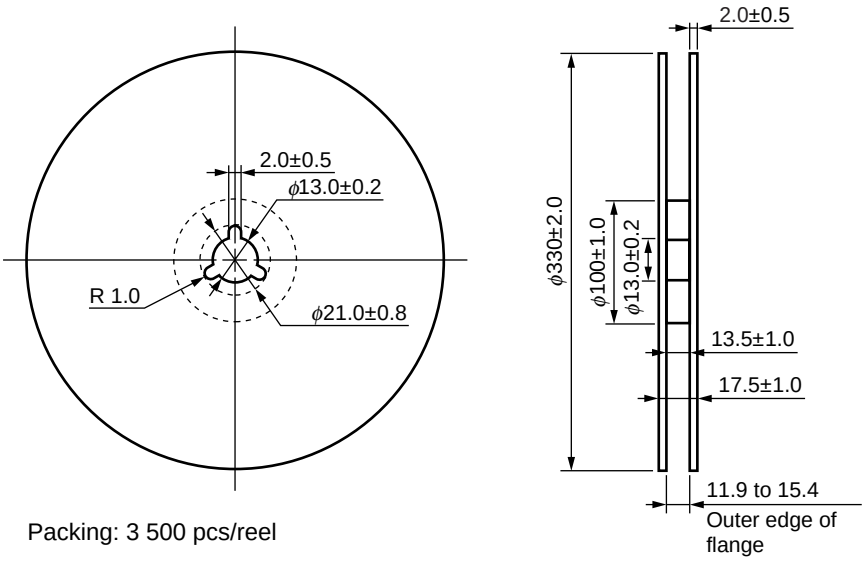
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



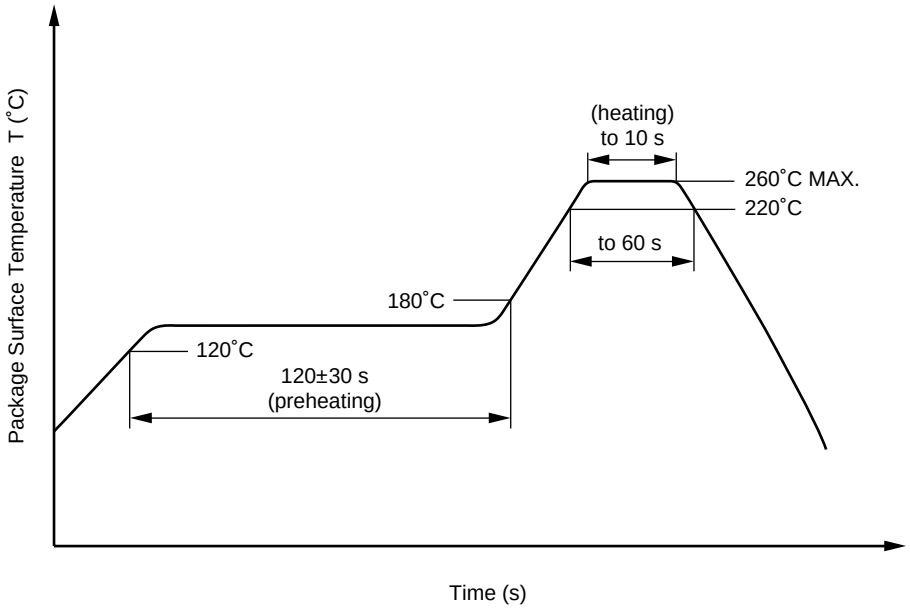
Packing: 3 500 pcs/reel

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.

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  "Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.

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  (Note)

  (1) "NEC" as used in this statement means NEC Corporation, NEC Compound Semiconductor Devices, Ltd. and also includes its majority-owned subsidiaries.

  (2) "NEC semiconductor products" means any semiconductor product developed or manufactured by or for NEC (as defined above).

M8E 00.4-0110

Caution GaAs Products	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. • 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. 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.

►For further information, please contact

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