

PS7241-1A

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

DESCRIPTION

The PS7241-1A is a solid state relay containing GaAs LEDs on the light emitting side (input side) and normally open (N.O.) contact MOS FETs on the output side.

It is suitable for analog signal control because of its low offset and high linearity.

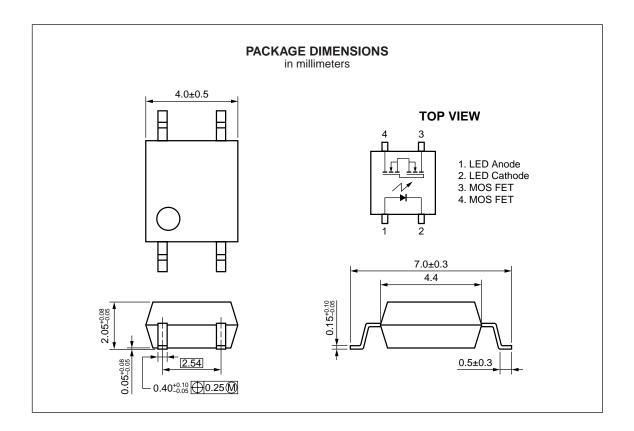
FEATURES

- Small and thin package (4-pin SOP, Height = 2.1 mm)
- 1 channel type (1 a output)
- Low LED operating current (IF = 2 mA)
- · Designed for AC/DC switching line changer
- · Low offset voltage
- Ordering number of taping product: PS7241-1A-E3, E4, E5, F3, F4
- UL approved: File No. E72422 (S)
- BSI approved: No. 8241/8242
- CSA approved: No. CA 101391
- VDE approved: No. 121302 ÜG

APPLICATIONS

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

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.



ORDERING INFORMATION (Solder Contains Lead)

Part Number	Package	Packing Style	Application Part Number *1
PS7241-1A	4-pin SOP	Magazine case 100 pcs	PS7241-1A
PS7241-1A-E3		Embossed Tape 900 pcs/reel	
PS7241-1A-E4			
PS7241-1A-E5		Embossed Tape 1 000 pcs/reel	
PS7241-1A-F3		Embossed Tape 3 500 pcs/reel	
PS7241-1A-F4			

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

ORDERING INFORMATION (Pb-Free)

Part Number	Package	Packing Style	Application Part Number *1
PS7241-1A-A	4-pin SOP	Magazine case 100 pcs	PS7241-1A
PS7241-1A-E3-A		Embossed Tape 900 pcs/reel	
PS7241-1A-E4-A			
PS7241-1A-E5-A		Embossed Tape 1 000 pcs/reel	
PS7241-1A-F3-A		Embossed Tape 3 500 pcs/reel	
PS7241-1A-F4-A			

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

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

Parameter		Symbol	Ratings	Unit
Diode	Forward Current (DC)	lf	50	mA
	Reverse Voltage	VR	5.0	٧
	Power Dissipation	Po	50	mW
	Peak Forward Current *1	IFP	1	Α
MOS FET	Break Down Voltage	VL	400	V
	Continuous Load Current	lι	120	mA
	Pulse Load Current*2 (AC/DC Connection)	ILP	240	mA
	Power Dissipation	Po	300	mW
Isolation Voltage *3		BV	1 500	Vr.m.s.
Total Power Dissipation		Рт	350	mW
Operating Ambient Temperature		TA	-40 to +85	°C
Storage Temperature		Tstg	-40 to +100	°C

^{*1} PW = 100 μ s, Duty Cycle = 1 %

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^{*2} PW = 100 ms, 1 shot

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

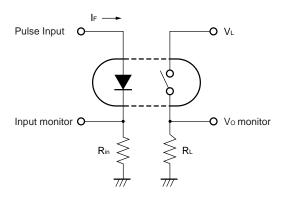
RECOMMENDED OPERATING CONDITIONS (TA = 25 °C)

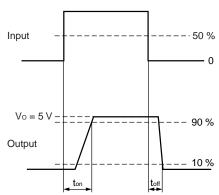
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
LED Operating Current	lF	2	10	20	mA
LED Off Voltage	VF	0		0.5	V

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	lr	V _R = 5 V			5.0	μА
MOS FET	S FET Off-state Leakage ILoff VD = 400 V Current			0.03	1.0	μΑ	
	Output Capacitance	Cout	V _D = 0 V, f = 1 MHz		54		pF
Coupled	LED On-state Current	I Fon	I _L = 120 mA			2.0	mA
	On-state Resistance	Ron1	IF = 10 mA, IL = 10 mA		18	30	Ω
		Ron2	$I_F = 10 \text{ mA}, I_L = 120 \text{ mA}, t \le 10 \text{ ms}$		15	25	
	Turn-on Time*1	ton	If = 10 mA, Vo = 5 V, RL = 500 Ω ,		0.5	2.0	ms
	Turn-off Time*1	toff	PW ≥ 10 ms		0.07	0.2	
	Isolation Resistance	R⊩o	Vi-o = 1.0 kVpc	10 ⁹			Ω
	Isolation Capacitance	CI-O	V = 0 V, f = 1 MHz		0.5		pF

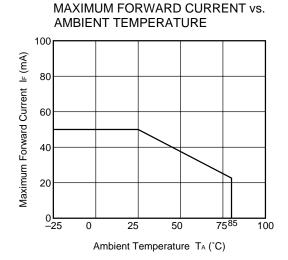
*1 Test Circuit for Switching Time



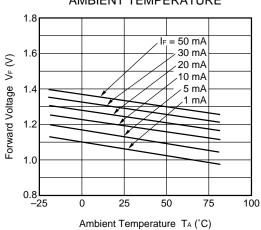


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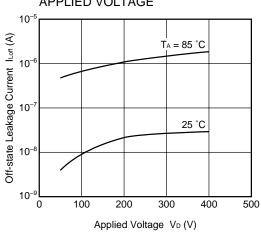
★ TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise specified)



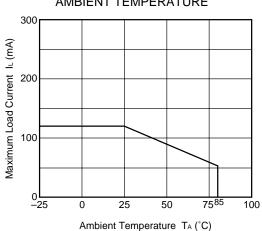




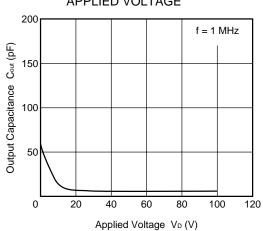
OFF-STATE LEAKAGE CURRENT vs. APPLIED VOLTAGE



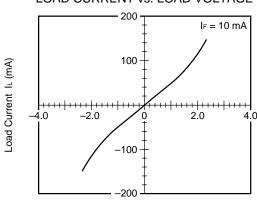
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



OUTPUT CAPACITANCE vs. APPLIED VOLTAGE

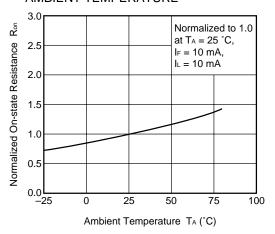


LOAD CURRENT vs. LOAD VOLTAGE

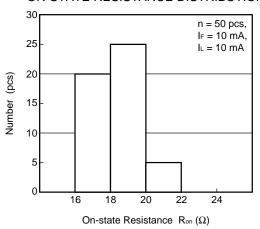


Load Voltage V_L (V)

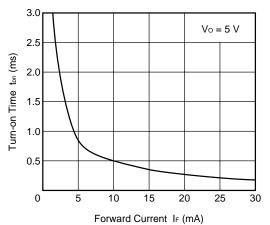
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



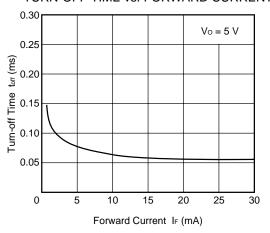
ON-STATE RESISTANCE DISTRIBUTION



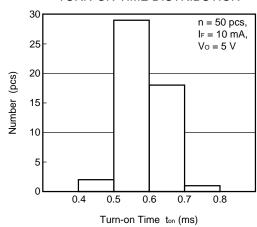
TURN-ON TIME vs. FORWARD CURRENT



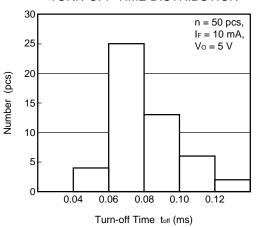
TURN-OFF TIME vs. FORWARD CURRENT



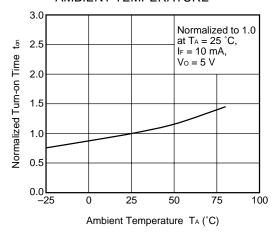
TURN-ON TIME DISTRIBUTION



TURN-OFF TIME DISTRIBUTION

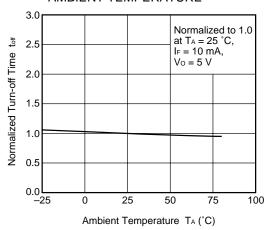


NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE

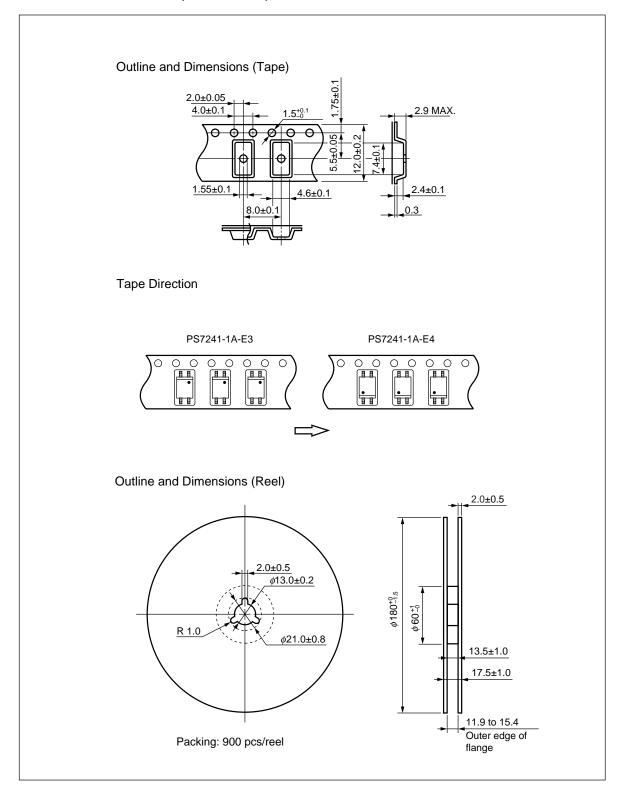


Remark The graphs indicate nominal characteristics.

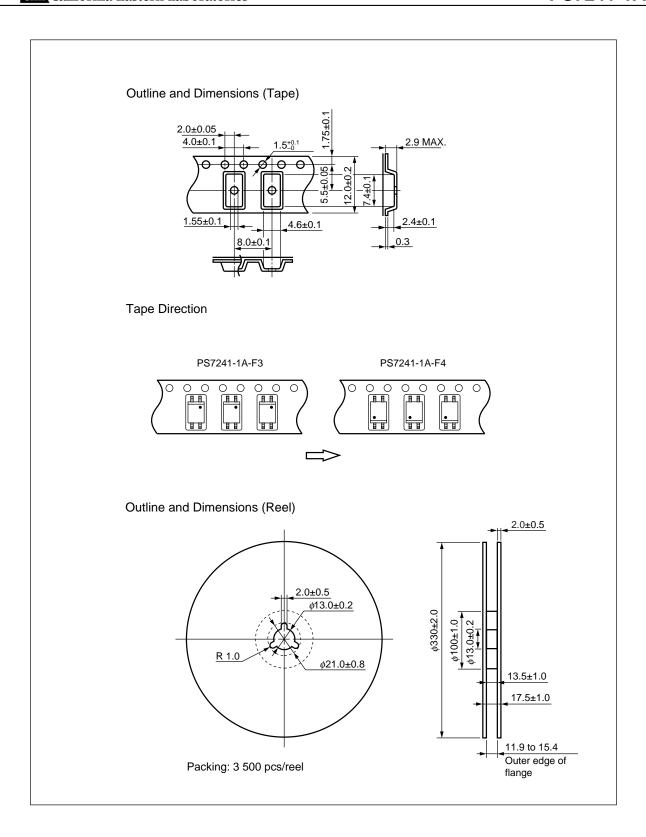
NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE



★ TAPING SPECIFICATIONS (in millimeters)



Outline and Dimensions (Tape) 2.0±0.1 2.4±0.3 1.55±0.05 7.4±0.1 1.6±0.1 12.0±0.3 **Tape Direction** PS7241-1A-E5 0 0 Outline and Dimensions (Reel) 60 φ13.0±0.5 $\phi 255\pm 2.0$ φ80±1.0 **13.5±1.0** Packing: 1 000 pcs/reel



★ RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

Peak reflow temperature
 260°C or below (package surface temperature)

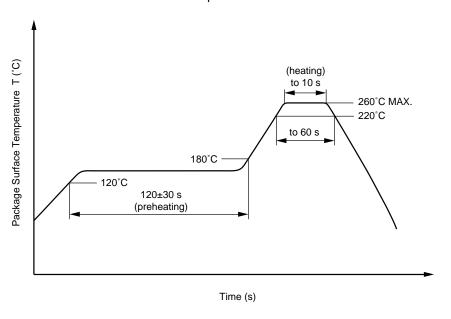
Time of peak reflow temperature
 Time of temperature higher than 220°C
 50 seconds or less
 60 seconds or less

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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Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration in CEL	on contained devices	
Lead (Pb)	< 1000 PPM	-A Not Detected	-AZ (*)	
Mercury	< 1000 PPM	Not Detected		
Cadmium	< 100 PPM	Not Detected		
Hexavalent Chromium	< 1000 PPM	Not Detected		
PBB	< 1000 PPM	Not Detected		
PBDE	< 1000 PPM	Not Detected		

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.

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