DATA SHEET



Solid State Relay OCMOS FET

PS7221-2A

8-PIN SOP 200 V BREAK DOWN VOLTAGE 2-ch Optical Coupled MOS FET

DESCRIPTION

The PS7221-2A is solid state relay containing GaAs LEDs on the light emitting side (input side) and MOS FETs on the output side.

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

★ FEATURES

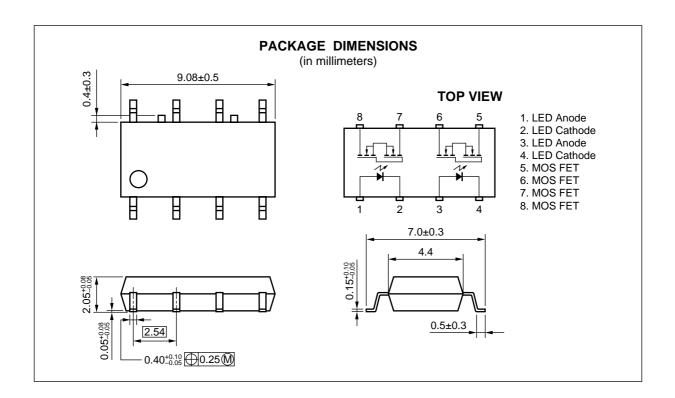
- 2 channel type (1 a + 1 a output)
- Low LED operating current (IF = 2 mA)
- · Designed for AC/DC switching line changer
- Small and thin package (8-pin SOP, Height = 2.1 mm)
- · Low offset voltage
- Ordering number of taping product: PS7221-2A-F3, F4
- UL approved: File No. E72422 (S)
- BSI approved: No. 8241/8242
- CSA approved: No. CA 101391

APPLICATIONS

- · Exchange equipment
- · Measurement equipment
- FA/OA equipment

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





★ ORDERING INFORMATION

Part Number	Package	Packing Style	Application Part Number*1
PS7221-2A	8-pin SOP	Magazine case 45 pcs	PS7221-2A
PS7221-2A -F3		Embossed Tape 1 500 pcs/reel	
PS7221-2A -F4			

^{*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	V
	Power Dissipation	PD	50	mW/ch
	Peak Forward Current ¹	IFP	1	Α
MOS FET	Break Down Voltage	VL	200	V
	Continuous Load Current	IL	150	mA
	Pulse Load Current ² (AC/DC Connection)	ILP	400	mA
	Power Dissipation	PD	180	mW/ch
Isolation Voltage ^{*3}		BV	1 500	Vr.m.s.
Total Power Dissipation		Рт	460	mW
Operating Ambient Temperature		TA	-40 to +80	°C
Storage Temperature		T _{stg}	-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

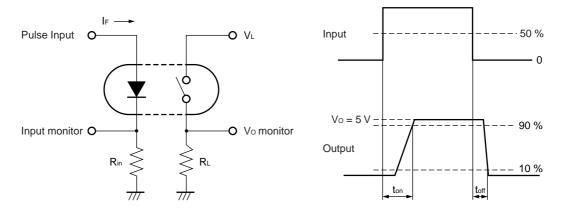
RECOMMENDED OPERATING CONDITIONS (TA = 25 °C)

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

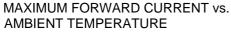
★ ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

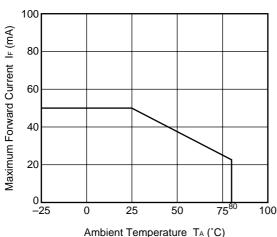
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Diode Forward Voltage		IF = 10 mA		1.2	1.4	V
	Reverse Current	lR	V _R = 5 V			5.0	μΑ
MOS FET	S FET Off-state Leakage Current ILoff VD = 200 V			0.03	1.0	μΑ	
	Output Capacitance	Cout	V _D = 0 V, f = 1 MHz		88		pF/ch
Coupled	LED On-state Current	I Fon	IL = 150 mA			2.0	mA
	On-state Resistance	Ron1	IF = 10 mA, IL = 10 mA		4.0	8.0	Ω
		Ron2	$I_F = 10 \text{ mA}, I_L = 150 \text{ mA}, t \le 10 \text{ ms}$				
	Turn-on Time [™]	ton	I _F = 10 mA, V _O = 5 V, PW ≥ 10 ms		0.16	1.0	ms
	Turn-off Time [™]	toff			0.02	0.2	
	Isolation Resistance	R _{I-O}	Vi-o = 1.0 kVpc	10°			Ω
	Isolation Capacitance	C _{I-O}	V = 0 V, f = 1 MHz		0.4		pF/ch

*1 Test Circuit for Switching Time

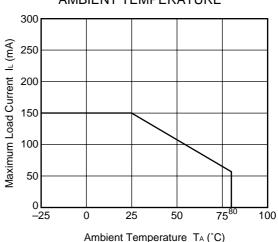


★ TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise specified)

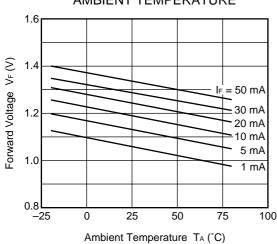




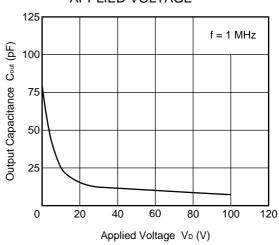
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



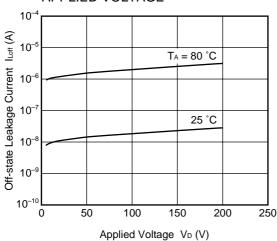
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



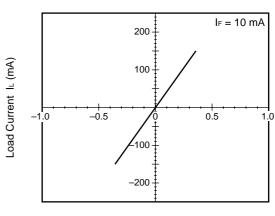
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



OFF-STATE LEAKAGE CURRENT vs. APPLIED VOLTAGE



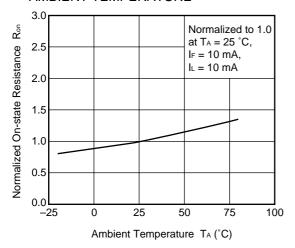
LOAD CURRENT vs. LOAD VOLTAGE



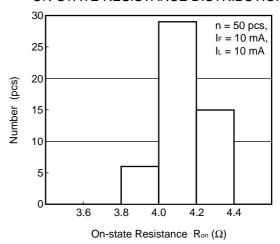
Load Voltage V_L (V)



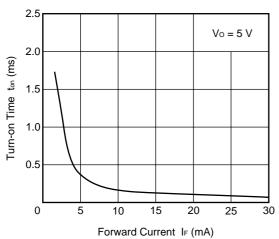
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



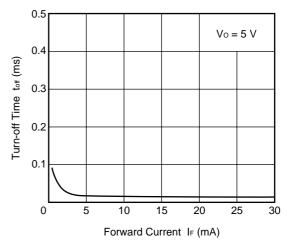
ON-STATE RESISTANCE DISTRIBUTION



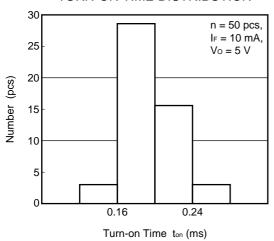
TURN-ON TIME vs. FORWARD CURRENT



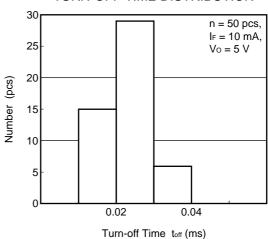
TURN-OFF TIME vs. FORWARD CURRENT



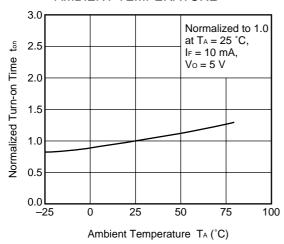
TURN-ON TIME DISTRIBUTION



TURN-OFF TIME DISTRIBUTION

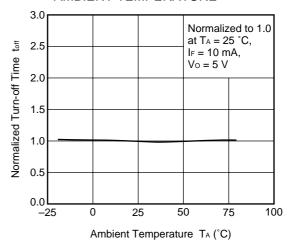


NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE

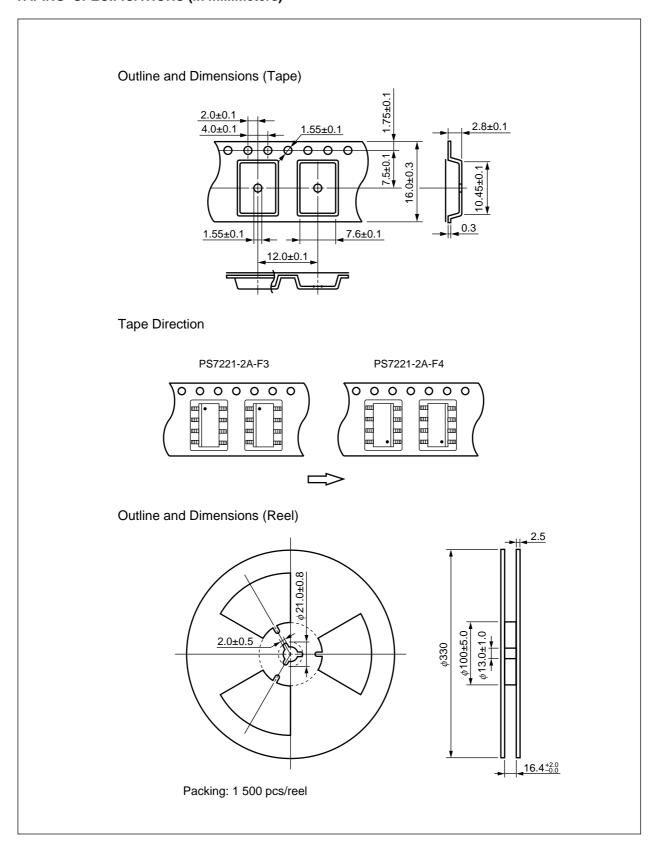


Remark The graphs indicate nominal characteristics.

NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE



★ TAPING SPECIFICATIONS (in millimeters)





* RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

• Peak reflow temperature 235 °C (package surface temperature)

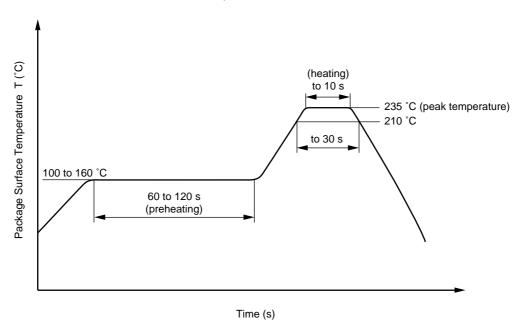
• Time of temperature higher than 210 °C 30 seconds or less

• Number of reflows Two

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) Dip soldering

• Temperature 260 °C or below (molten solder temperature)

• Time 10 seconds or less

• Number of times One

• Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of

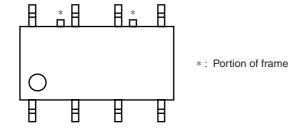
0.2 Wt % is recommended.)

(3) Cautions

Fluxes

Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.

Avoid shorting between portion of frame and leads.



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[MEMO]

NEC PS7221-2A

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CAUTION

Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.

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