

8 PIN SOP 200 V BREAK DOWN VOLTAGE 2-CH OPTICAL COUPLED MOSFET

PS7221-2A

FEATURES

- **2 CHANNEL TYPE:**
1a + 1a Output
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL PACKAGE:**
8 PIN SOP
- **HIGH ISOLATION VOLTAGE:**
BV: 1500 Vr.m.s. MIN.
- **LOW OFFSET VOLTAGE**
- **LOW LED OPERATING CURRENT:**
 $I_F = 2 \text{ mA}$
- **AVAILABLE IN TAPE AND REEL**

DESCRIPTION

PS7221-2A is a solid state relay containing a GaAs LED on the light emitting side (input side) and MOSFETs on the output side.

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

APPLICATIONS

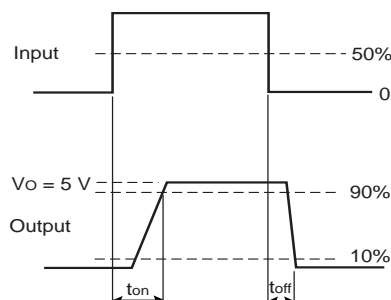
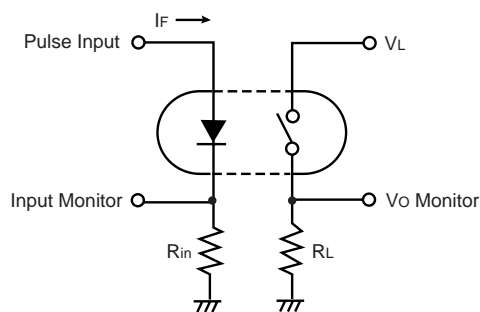
- **EXCHANGE EQUIPMENT**
- **MEASUREMENT EQUIPMENT**
- **FA/OA EQUIPMENT**

ELECTRICAL CHARACTERISTICS (TA = 25°C)

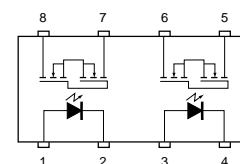
PART NUMBER			PS7221-2A		
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V _F	Forward Voltage, I _F = 10 mA	V	1.2	1.4
	I _R	Reverse Current, V _R = 5 V	μA		5.0
MOSFET	I _{Loff}	Off-State Leakage Current, V _D = 200 V	μA	0.03	1.0
	C _{OUT}	Output Capacitance, V _D = 0 V, f = 1 MHz	pF/ch	88	
Coupled	I _{Fon}	LED On-state Current, I _L = 150 mA	mA		2.0
	R _{on1}	On-State Resistance, I _F = 10 mA, I _L = 10 mA	Ω	4.0	8.0
		I _F = 10 mA, I _L = 150 mA, t ≤ 10 ms			
	R _{on2}				
	t _{on}	Turn-On Time ¹ , I _F = 10 mA, V _O = 5 V, P _W ≥ 10 ms	ms	0.16	1.0
	t _{off}	Turn-Off Time ¹ , I _F = 10 mA, V _O = 5 V, P _W ≥ 10 ms	ms	0.02	0.2
	R _{I-O}	Isolation Resistance, V _{in-out} = 1.0 kVDC	Ω	10 ⁹	
	C _{I-O}	Isolation Capacitance, V = 0 V, f = 1 MHz	pF/ch	0.4	

Notes:

1. Test Circuit for Switching Time:



PS7221-2A



ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25 °C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
V _R	Reverse Voltage	V	5.0
I _F	Forward Current (DC)	mA	50
P _D	Power Dissipation	mW/ch	50
I _F (Peak)	Peak Forward Current ²	A	1
MOSFET			
V _L	Break Down Voltage	V	200
I _L	Continuous Load Current	mA	150
I _{LP}	Pulse Load Current ³ AC/DC Connection	mA	400
P _D	Power Dissipation	mW/ch	180
Coupled			
BV	Isolation Voltage ⁴	Vr.m.s.	1500
P _T	Total Power Dissipation	mW	460
T _{STG}	Storage Temperature	°C	-40 to +100
T _A	Operating Ambient Temp.	°C	-40 to +80

Notes:

1. Operation in excess of any one of these parameters may result in permanent damage.
2. PW = 100 μs, Duty Cycle = 1 %
3. PW = 100 ms, 1 shot.
4. AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output.

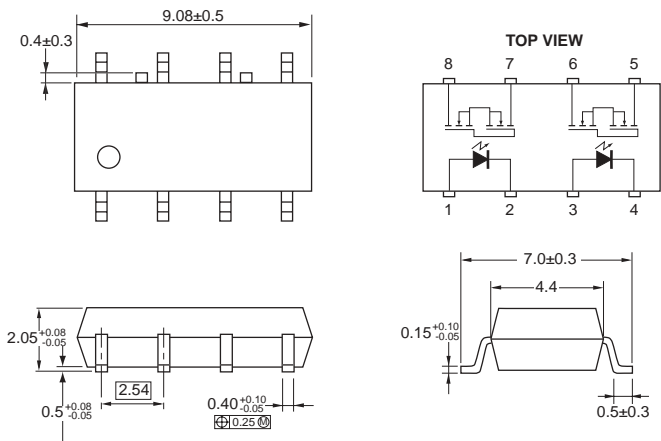
RECOMMENDED
OPERATING CONDITIONS (T_A = 25 °C)

SYMBOL	PARAMETER	UNITS	MIN	TYP	MAX
I _F	LED Operating Current	mA	2	10	20
V _F	LED Off Voltage	V	0		0.5

ORDERING INFORMATION

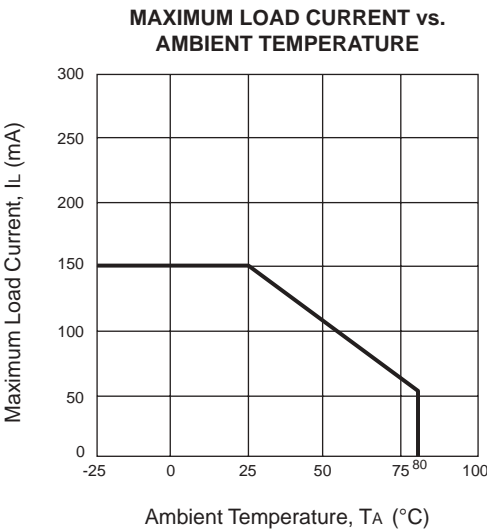
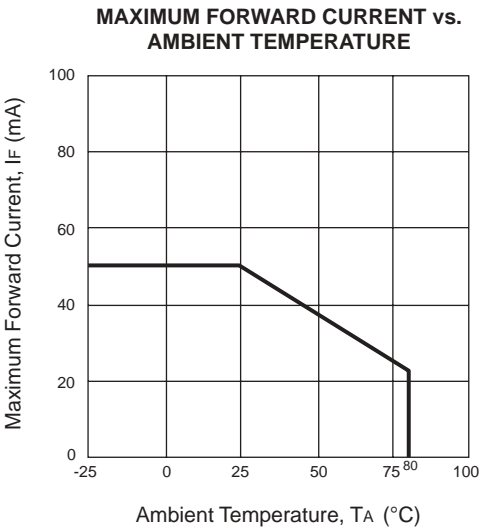
PART NUMBER	PACKAGE	PACKING STYLE
PS7221-2A	8-pin SOP	Magazine case 45 pcs
PS7221-2A-F3		Embossed Tape 1500 pcs/reel
PS7221-2A-F4		

OUTLINE DIMENSIONS (Units in mm)



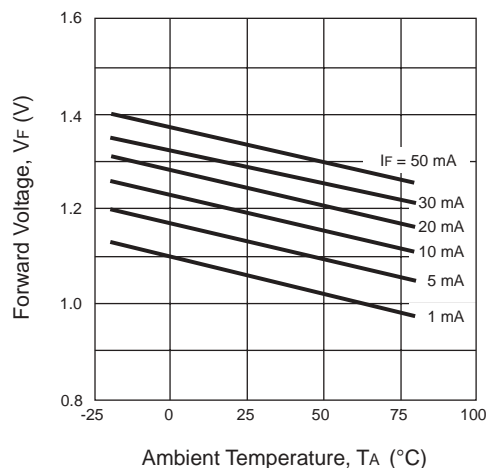
- 1. LED Anode 1
- 2. LED Cathode 1
- 3. LED Anode 2
- 4. LED Cathode 2
- 5. MOSFET 2
- 6. MOSFET 2
- 7. MOSFET 1
- 8. MOSFET 1

TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

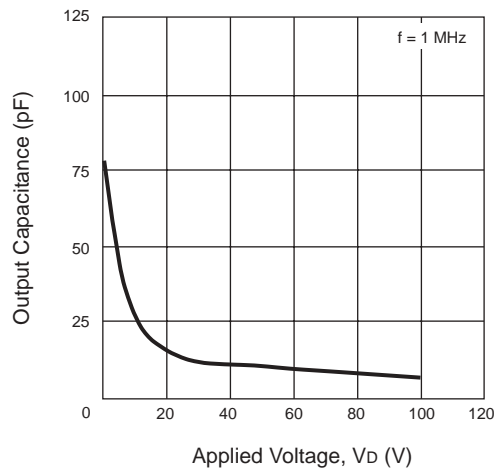


TYPICAL PERFORMANCE CURVES (T_A = 25 °C)

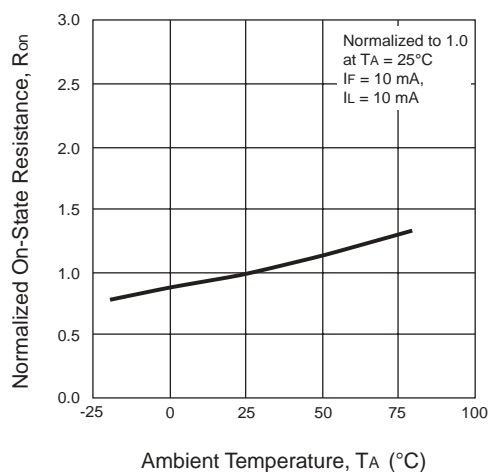
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



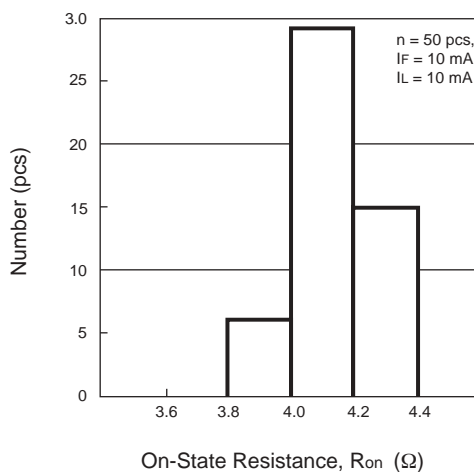
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



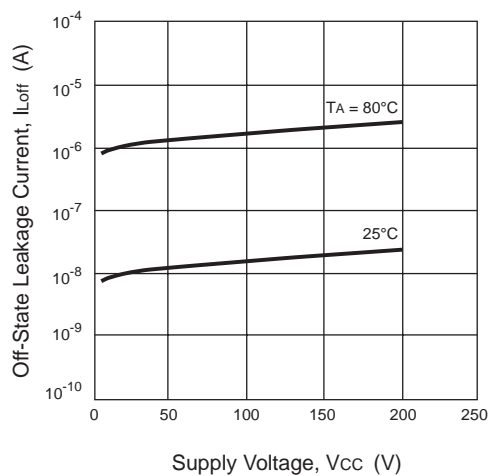
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



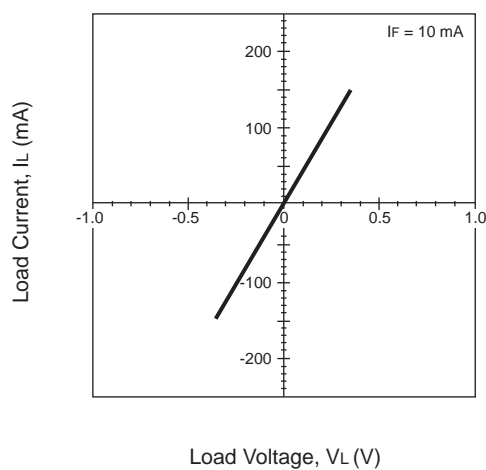
ON-STATE RESISTANCE DISTRIBUTION

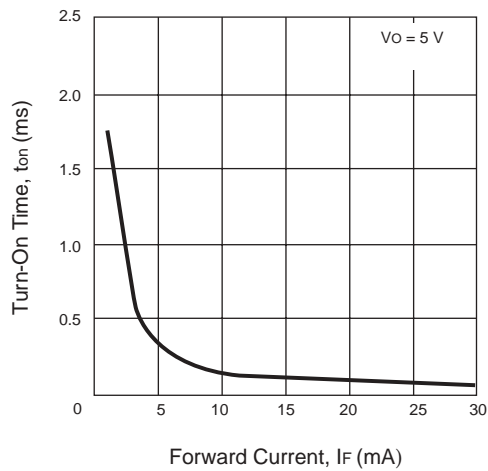
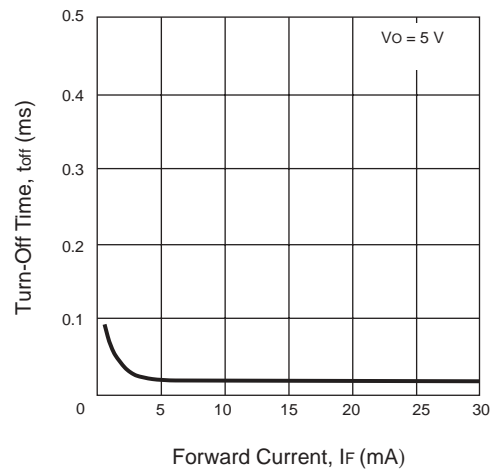


OFF-STATE LEAKAGE CURRENT vs. SUPPLY VOLTAGE

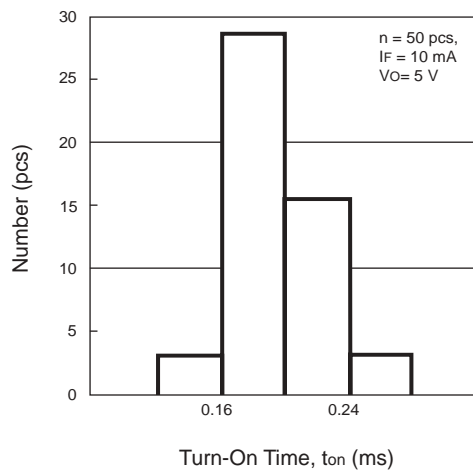


LOAD CURRENT vs. LOAD VOLTAGE

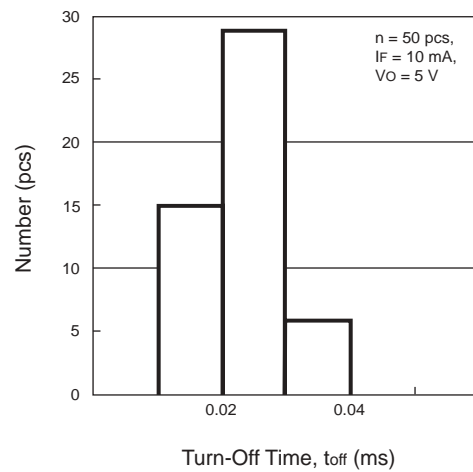
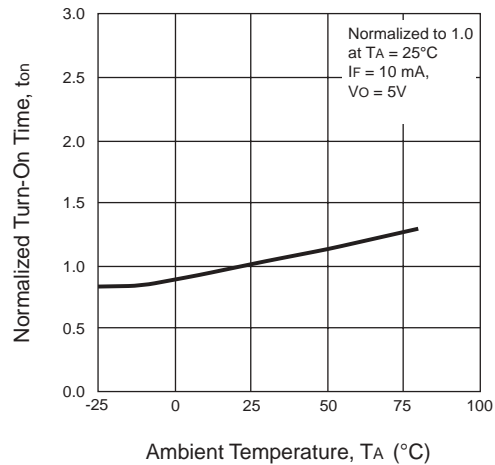
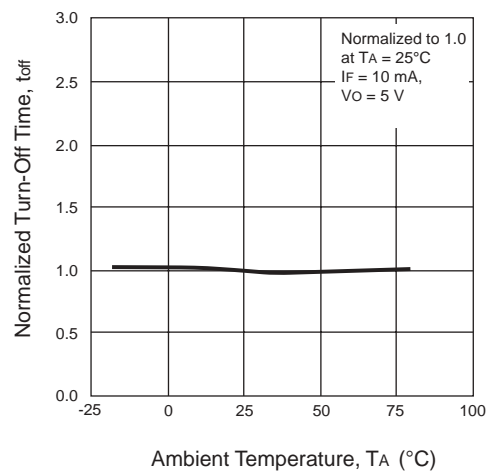


TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)TURN-ON TIME vs.
FORWARD CURRENTTURN-OFF TIME vs.
FORWARD CURRENT

TURN-ON TIME DISTRIBUTION

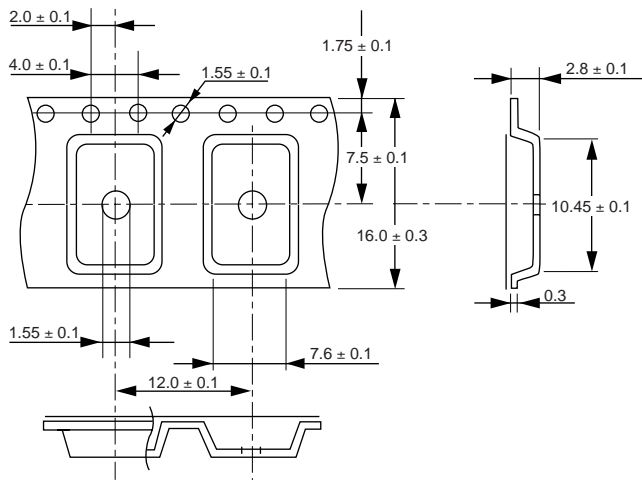


TURN-OFF TIME DISTRIBUTION

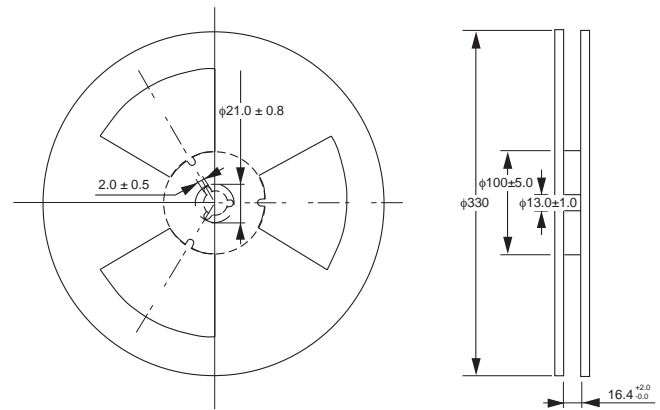
NORMALIZED TURN-ON TIME vs.
AMBIENT TEMPERATURENORMALIZED TURN-OFF TIME vs.
AMBIENT TEMPERATURE

TAPING SPECIFICATIONS (Units in mm)

OUTLINE AND DIMENSIONS (TAPE)

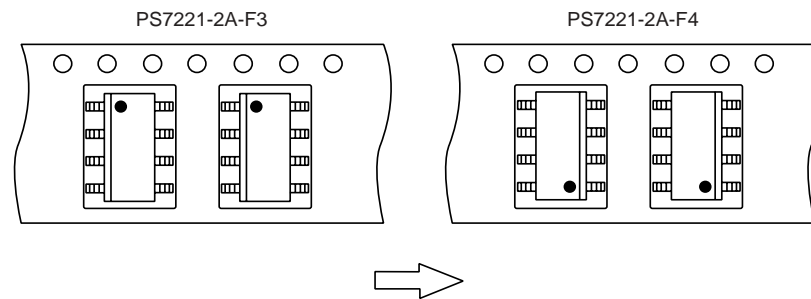


OUTLINE AND DIMENSIONS (REEL)



Packing : 500 pcs/reel

TAPING DIRECTION

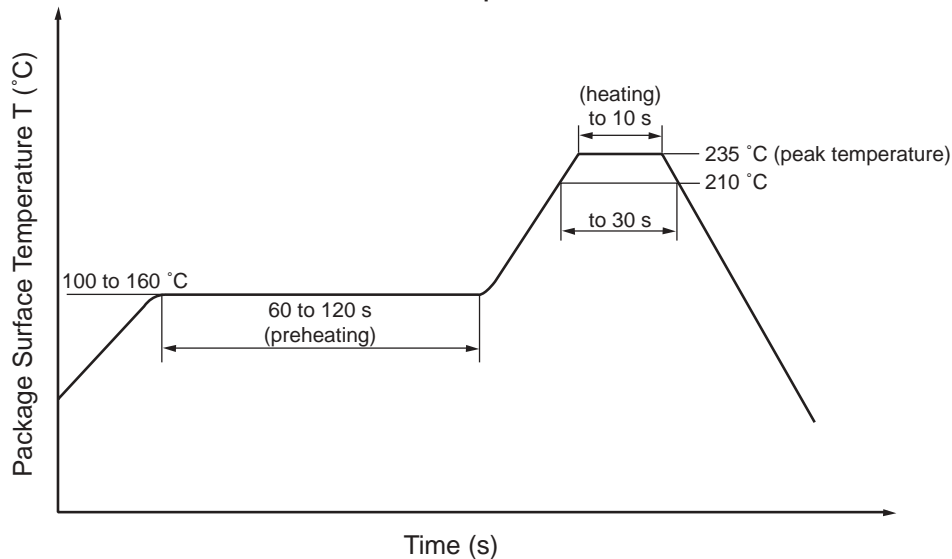


RECOMMENDED SOLDERING CONDITIONS

(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** Three
- **Flux** Rosin flux containing small amount of chlorine (The flux with a max. chlorine content of 0.2 Wt % is recommended)

Recommended Temperature Profile of Infrared Reflow

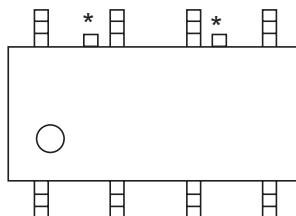


(2) Dip soldering

- **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 max. 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.**



*: Portion of frame