NEC

8 PIN SOP 400 V BREAKDOWN VOLTAGE 2-CH OPTICAL COUPLED MOSFET

PS7241-2A

FEATURES

- **2 CHANNEL TYPE:**
  1a + 1 a output
- **LOW LED OPERATING CURRENT:**
  I_F = 2 mA
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL AND THIN PACKAGE:**
  8 pin SOP, Height = 2.1 mm
- **LOW OFFSET VOLTAGE**
- **SURFACE MOUNT AVAILABLE**

DESCRIPTION

The PS7241-2A 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.

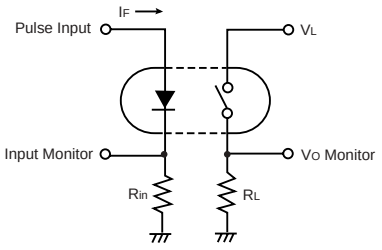
APPLICATIONS

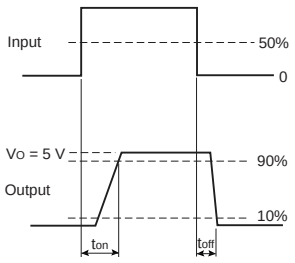
- **EXCHANGE EQUIPMENT**
- **MEASUREMENT EQUIPMENT**
- **FA/OA EQUIPMENT**

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

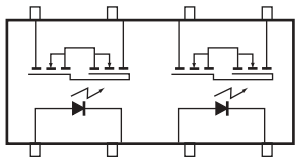
PART NUMBER				PS7241-2A		
	SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V_F	Forward Voltage, I_F = 10 mA	V		1.2	1.4
	I_R	Reverse Current, V_R = 5 V	μA			5.0
MOS FET	I_{LOFF}	Off-State Leakage Current, V_D = 400 V	μA		0.03	1.0
	C_{OUT}	Output Capacitance, V_D = 0 V, f = 1 MHz	pF/ch		65	
Coupled	I_{Fon}	LED On-State Current, I_L = 120 mA	mA			2.0
	R_{on1}	On-state Resistance, I_F = 10 mA, I_L = 10 mA	Ω		21	30
	R_{on2}	I_F = 10 mA, I_L = 120 mA, t ≤ 10 ms			16	25
	t_{ON}	Turn-on Time[1], I_F = 10 mA, V_O = 5 V, PW ≥ 10 ms	ms		0.2	1.0
	t_{OFF}	Turn-off Time[1], I_F = 10 mA, V_O = 5 V, PW ≥ 10 ms	ms		0.02	0.2
	R_{I-O}	Isolation Resistance, V_{I-O} = 1.0 kV_{DC}	Ω	10^9		
	C_{I-O}	Isolation Capacitance, V = 0 V, f = 1.0 MHz	pF/ch		0.4	

Note:
1. Test Circuit fior Switching Time





PS7241-2A



ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
I_F	Forward Current (DC)	mA	50
V_R	Reverse Voltage	V	5.0
P_D	Power Dissipation	mW/ch	50
I_{FP}	Peak Foward Current[2]	A	1
MOSFET			
V_L	Break Down Voltage	V	400
I_L	Continuous Load Current	mA	120
I_{LP}	Pulse Load Current[3] (AC/DC Connection)	mA	200
P_D	Power Dissipation	mW/ch	180
Coupled			
BV	Isolation Voltage[4]	Vr.m.s.	1500
P_T	Total Power Dissipation	mW	460
T_A	Operating Ambient Temp.	°C	-40 to +80
T_{STG}	Storage Temperature	°C	-40 to +100

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)

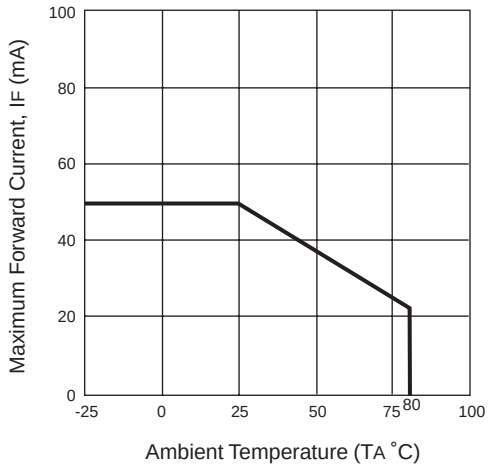
PART NUMBER		PS7241-2A			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
I_F	LED Operating Current	mA	2	10	20
V_F	LED Off Voltage	V	0		0.5

ORDERING INFORMATION

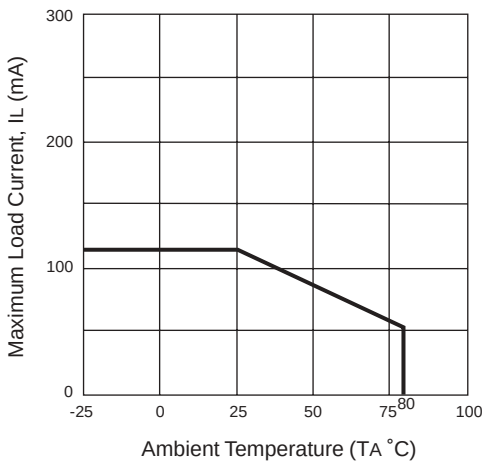
PART NUMBER	PACKING STYLE
PS7241-2A	Magazine case, 45 pcs
PS7241-2A-F3	Embossed Tape, 1500 pcs/reel
PS7241-2A-F4	

TYPICAL PERFORMANCES CURVES (T_A = 25°C)

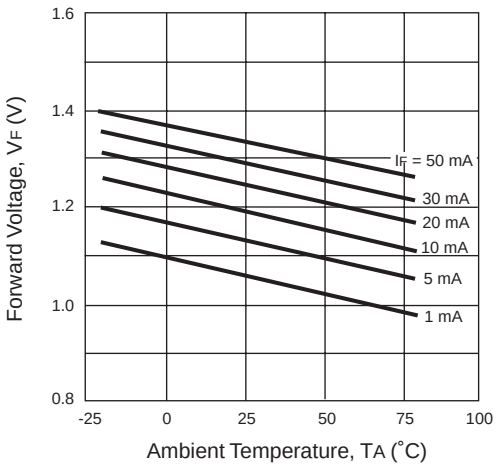
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



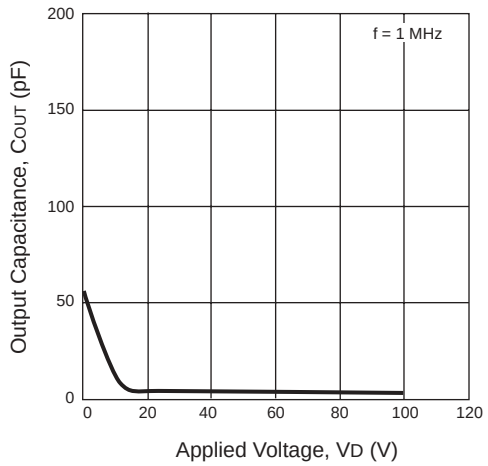
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



FORWARD VOLTAGE vs. AMBIENT TEMPERATURE

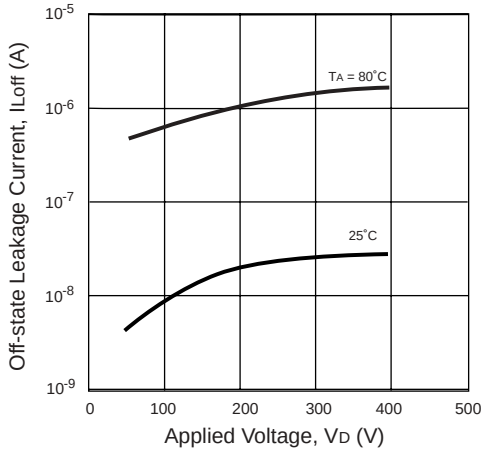


OUTPUT CAPACITANCE vs. APPLIED VOLTAGE

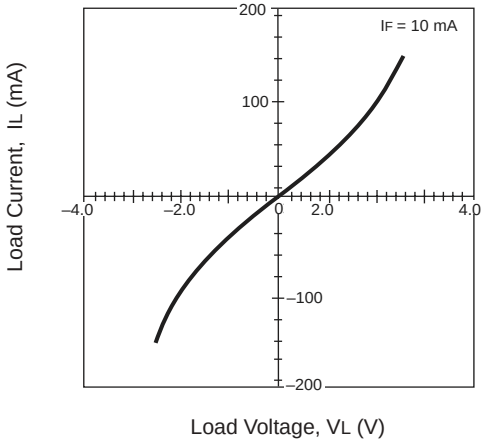


TYPICAL PERFORMANCE CURVES (TA = 25°C)

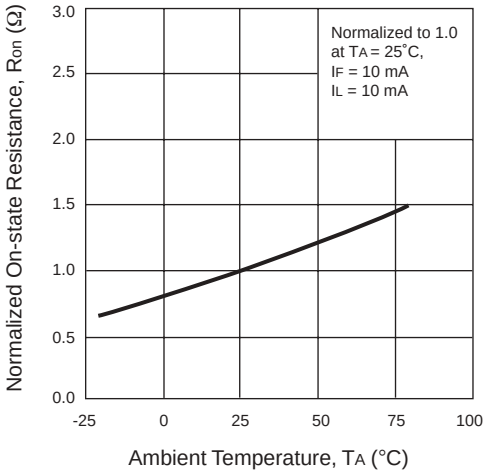
OFF-STATE LEAKAGE CURRENT vs. APPLIED VOLTAGE



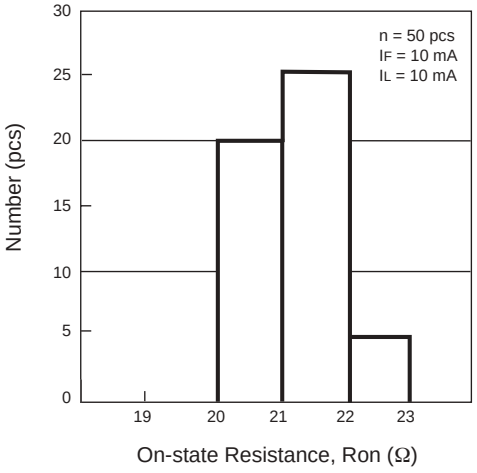
LOAD CURRENT vs. LOAD VOLTAGE



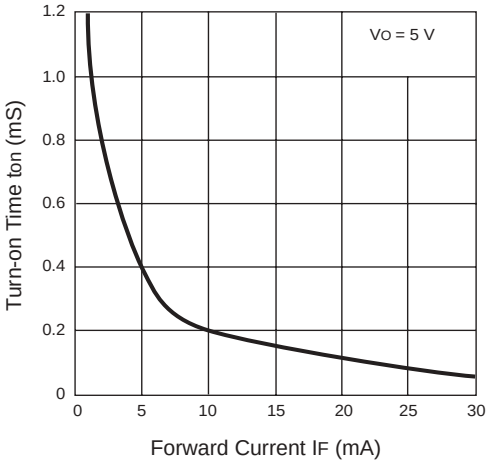
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



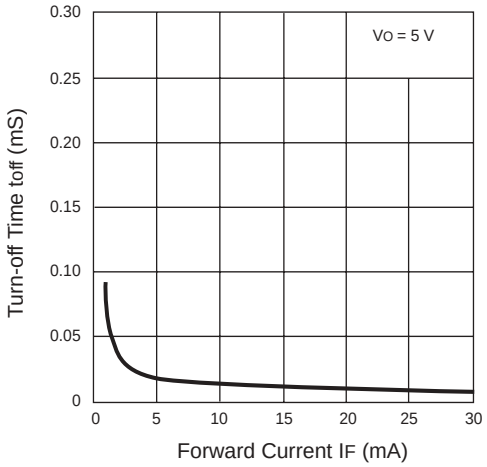
ON-STATE RESISTANCE DISTRIBUTION



TURN-ON TIME vs. FORWARD CURRENT

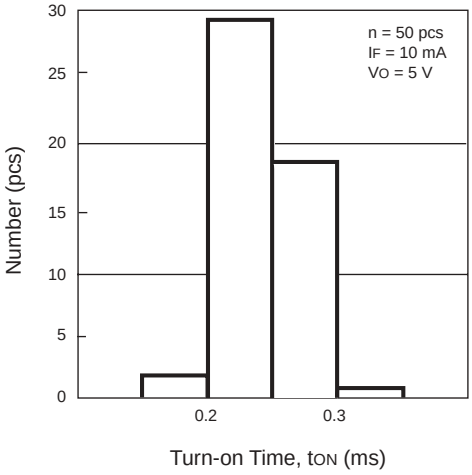


TURN-OFF TIME vs. FORWARD CURRENT

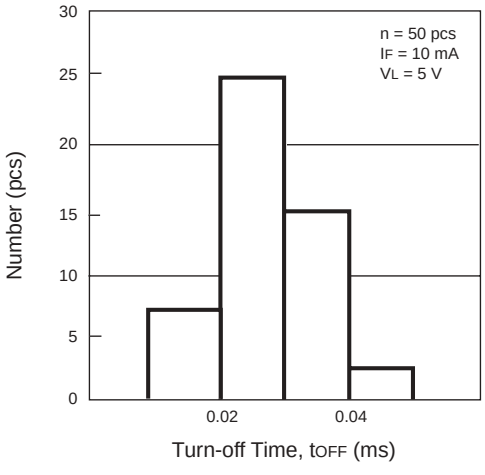


TYPICAL PERFORMANCE CURVES (TA = 25°C)

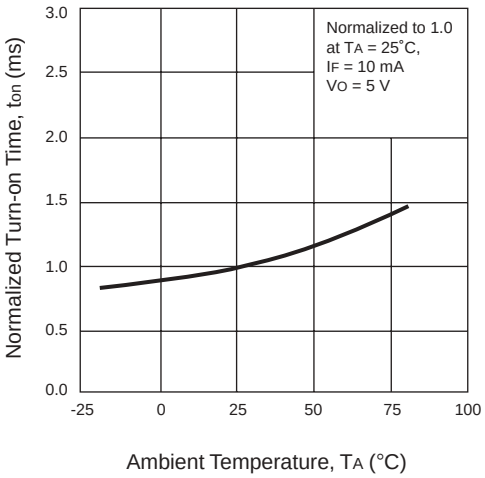
TURN-ON TIME DISTRIBUTION



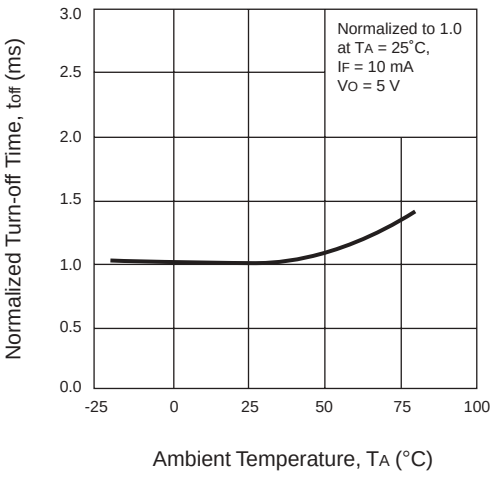
TURN-OFF TIME DISTRIBUTION



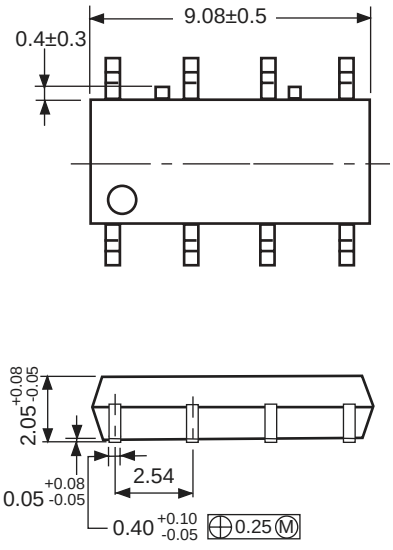
NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE



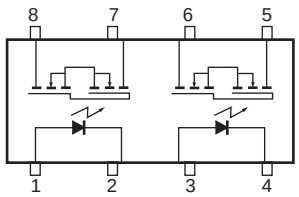
NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE



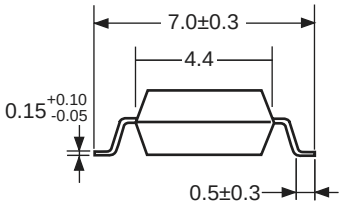
OUTLINE DIMENSIONS (Units in mm)



TOP VIEW

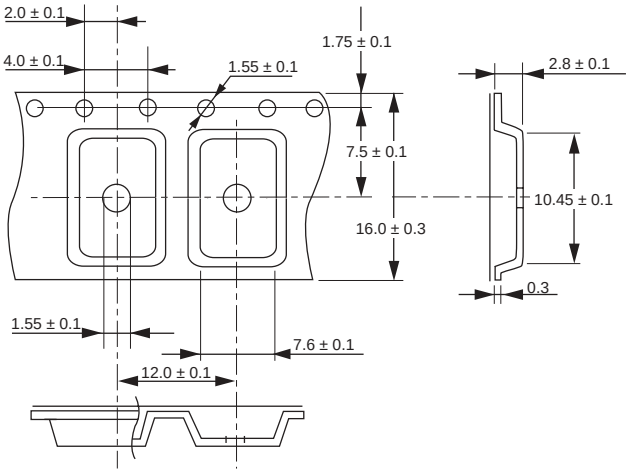


1. LED Anode
2. LED Cathode
3. LED Anode
4. LED Cathode
5. MOS FET
6. MOS FET
7. MOS FET
8. MOS FET

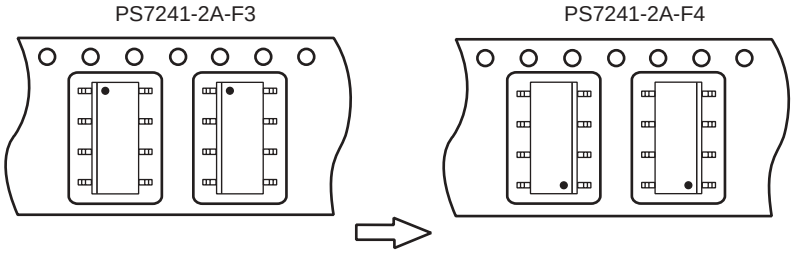


TAPING SPECIFICATIONS (Units in mm)

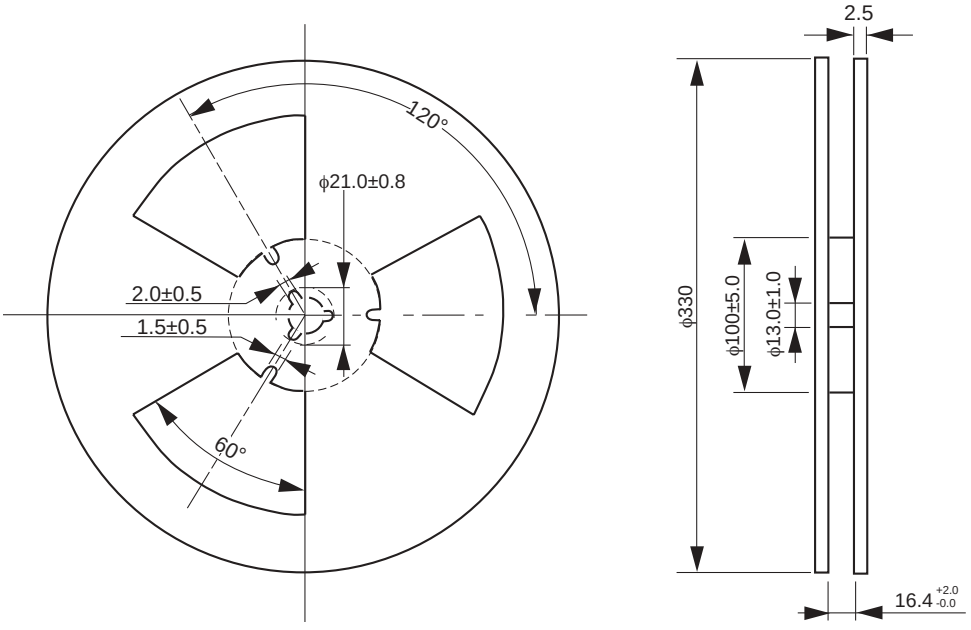
OUTLINE AND DIMENSIONS (TAPE)



TAPE DIRECTION



OUTLINE AND DIMENSIONS (REEL)



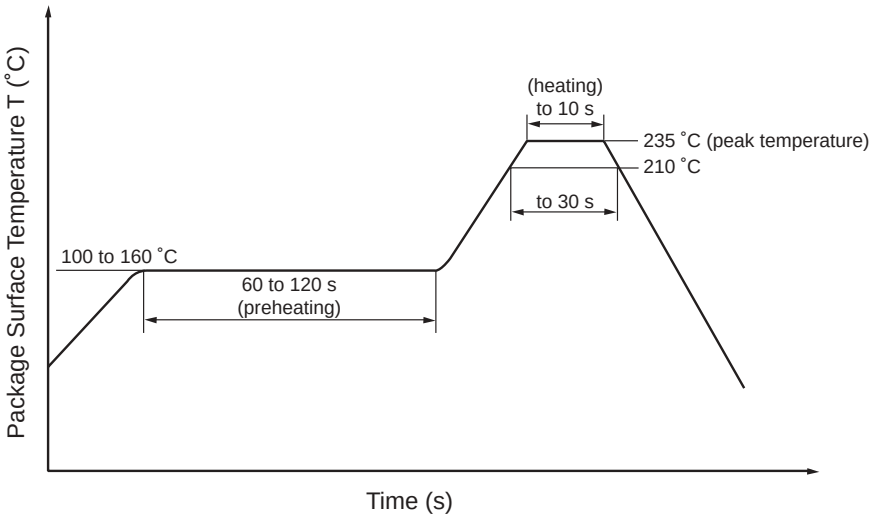
Packing: 1500 pcs/reel

RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

• Peak reflow temperature	235 °C or below (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

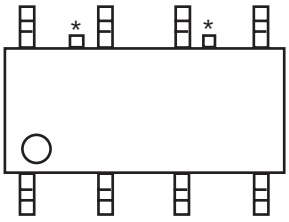


(2) Dip soldering

• 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 cleaning solvent.
- Avoid shorting between portion of frame and leads



* : Portion of frame