NEC

Solid State Relay
OCMOS FET

PS7221A-2A

8-PIN SOP, 260 V BREAK DOWN VOLTAGE
2-ch Optical Coupled MOS FET

DESCRIPTION

The PS7221A-2A is a 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 its low offset and high linearity.

FEATURES

- 2 channel type (1 a + 1 a output)
- Low LED operating current (I_F = 1 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: PS7221A-2A-F3, F4

APPLICATIONS

- Exchange equipment (FAX, MODEM, OCU + SLIC, etc.)
- Measurement equipment
- FA/OA equipment

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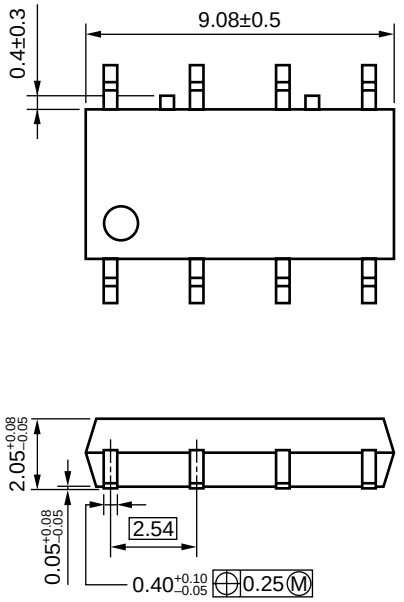
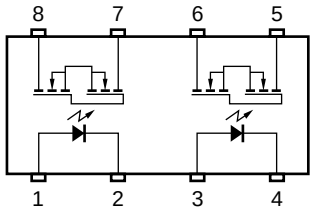
The mark ★ shows major revised points.

PACKAGE DIMENSIONS

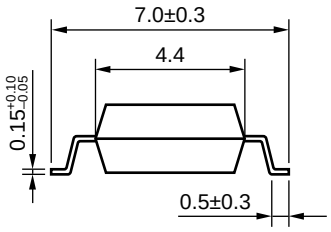
(in millimeters)



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



★ ORDERING INFORMATION

Part Number	Package	Packing Style	Application Part Number*1
PS7221A-2A	8-pin SOP	Magazine case 45 pcs	PS7221A-2A
PS7221A-2A -F3		Embossed Tape 1 500 pcs/reel	
PS7221A-2A -F4			

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

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/ch
	Peak Forward Current*1	I_{FP}	1	A
MOS FET	Break Down Voltage	V_L	260	V
	Continuous Load Current	I_L	170	mA
	Pulse Load Current*2 (AC/DC Connection)	I_{LP}	300	mA
	Power Dissipation	P_D	180	mW/ch
Isolation Voltage*3		BV	1 500	Vr.m.s.
Total Power Dissipation		P_T	460	mW
Operating Ambient Temperature		T_A	–40 to +80	°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

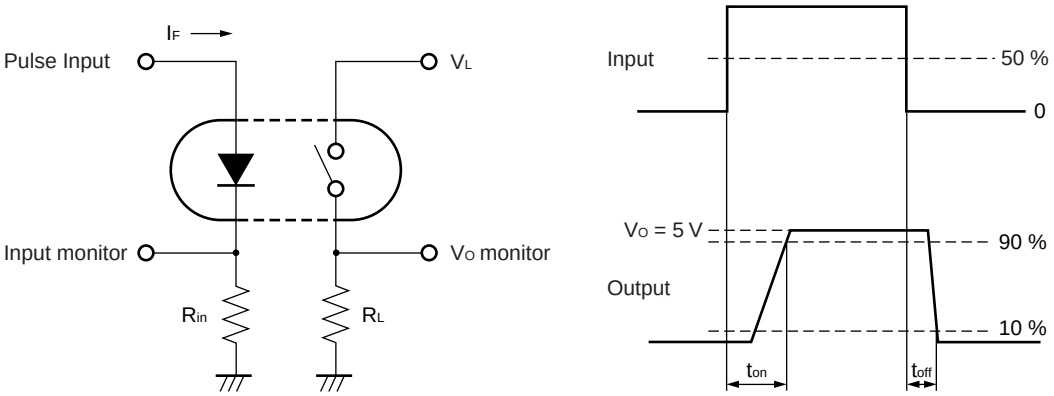
RECOMMENDED OPERATING CONDITIONS (T_A = 25 °C)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
★ LED Operating Current	I_F	1	10	20	mA
LED Off Voltage	V_F	0		0.5	V

★ ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

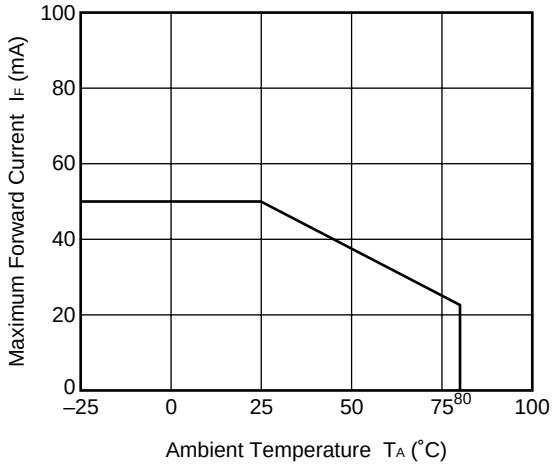
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	I_F = 5 mA		1.1	1.4	V
	Reverse Current	I_R	V_R = 5 V			5.0	μA
MOS FET	Off-state Leakage Current	I_{Loff}	V_D = 260 V			1.0	μA
	Output Capacitance	C_{out}	V_D = 0 V, f = 1 MHz		122		pF/ch
Coupled	LED On-state Current	I_{Fon}	I_L = 170 mA			1.0	mA
	On-state Resistance	R_{on}	I_F = 10 mA, I_L = 10 mA		3.4	10	Ω
	Turn-on Time *1	t_{on}	I_F = 10 mA, V_O = 5 V, R_L = 500 Ω,		0.4	1.0	ms
	Turn-off Time *1	t_{off}	PW ≥ 10 ms		0.03	0.2	
	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		0.4		pF/ch

***1** Test Circuit for Switching Time

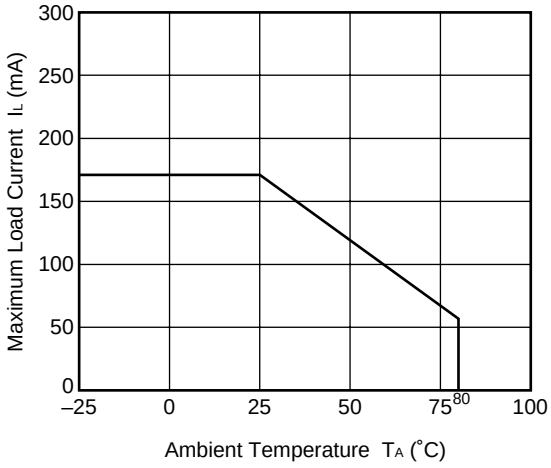


★ **TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise specified)**

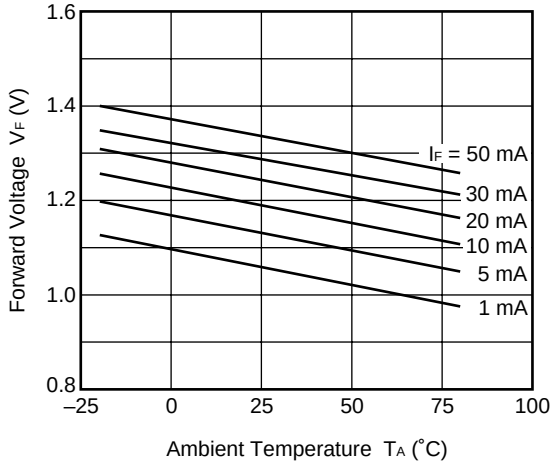
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



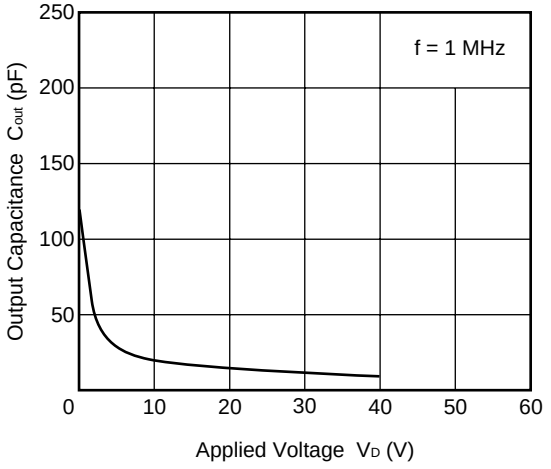
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



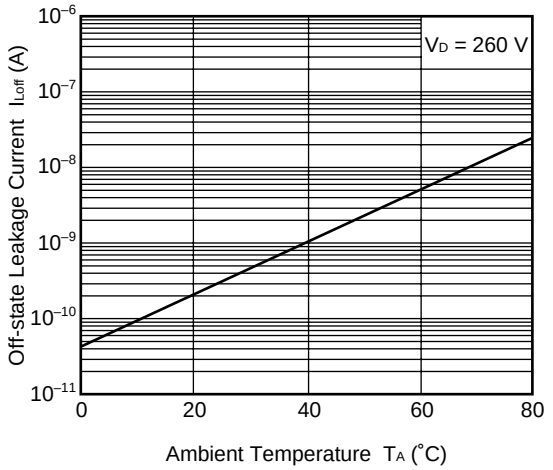
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



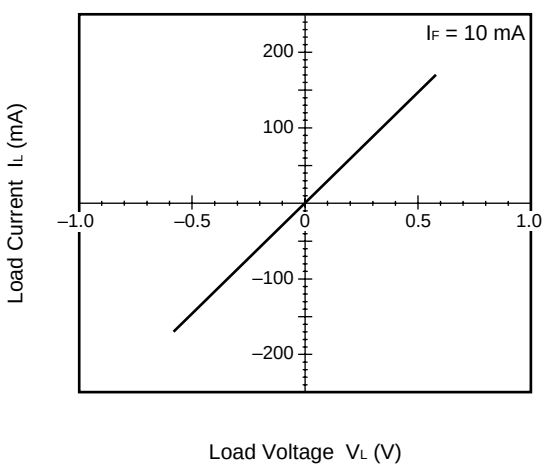
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



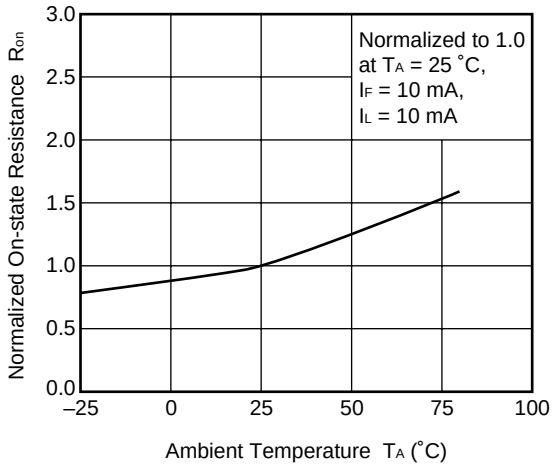
OFF-STATE LEAKAGE CURRENT vs. AMBIENT TEMPERATURE



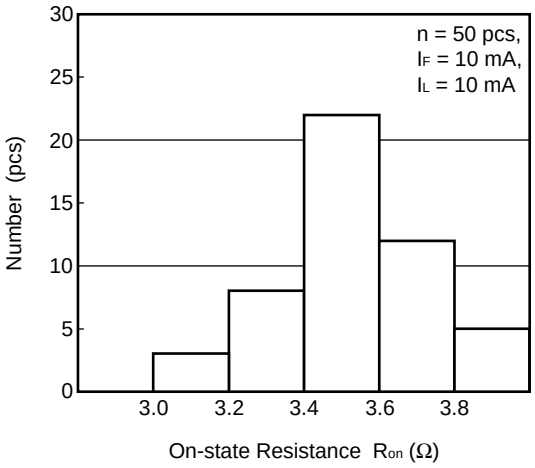
LOAD CURRENT vs. LOAD VOLTAGE



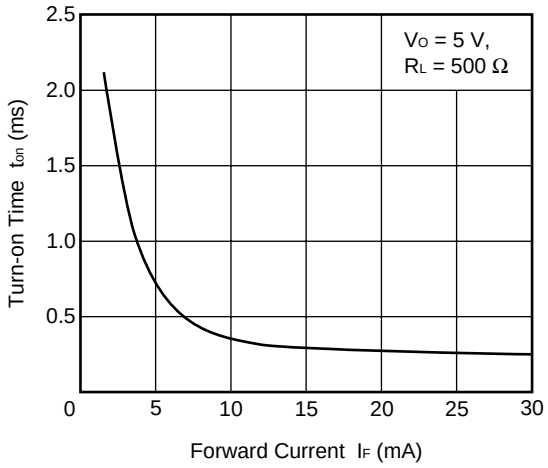
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



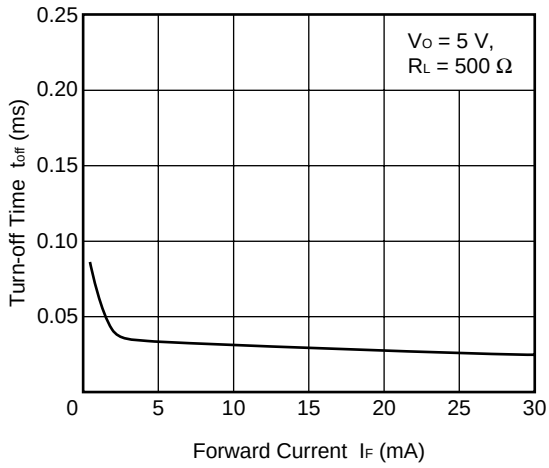
ON-STATE RESISTANCE DISTRIBUTION



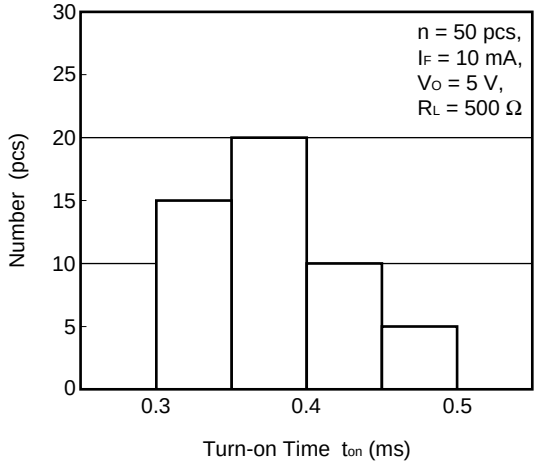
TURN-ON TIME vs. FORWARD CURRENT



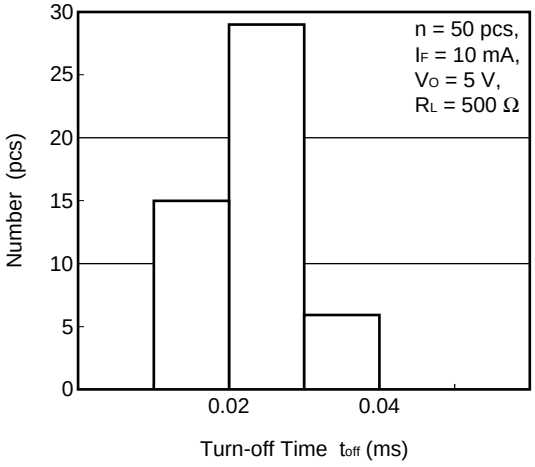
TURN-OFF TIME vs. FORWARD CURRENT



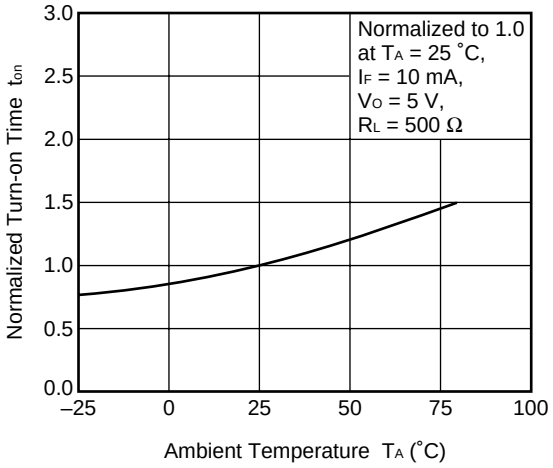
TURN-ON TIME DISTRIBUTION



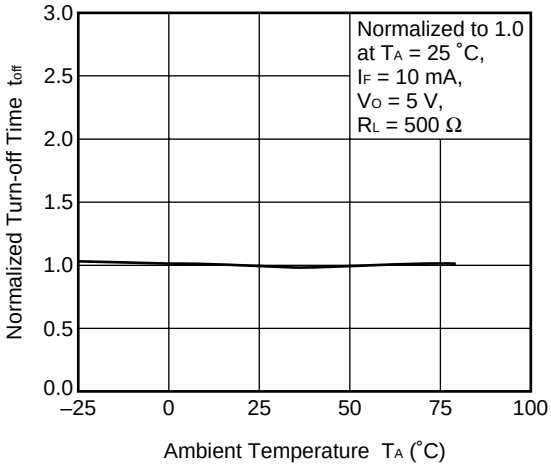
TURN-OFF TIME DISTRIBUTION



NORMALIZED TURN-ON TIME vs.
AMBIENT TEMPERATURE



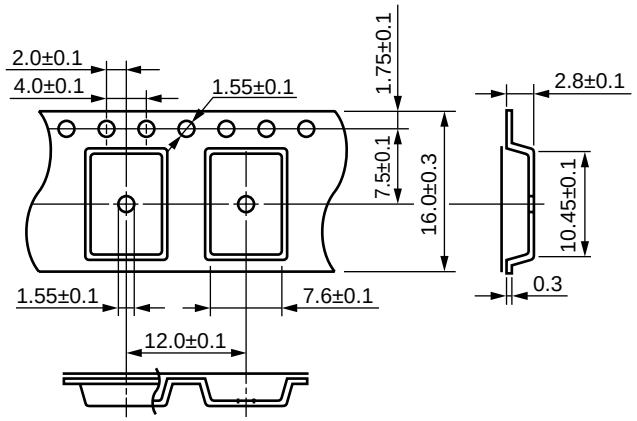
NORMALIZED TURN-OFF TIME vs.
AMBIENT TEMPERATURE



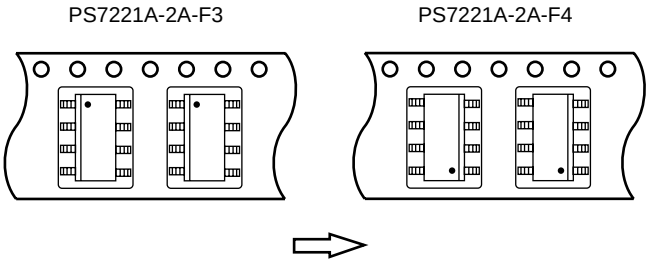
Remark The graphs indicate nominal characteristics.

★ **TAPING SPECIFICATIONS (in millimeters)**

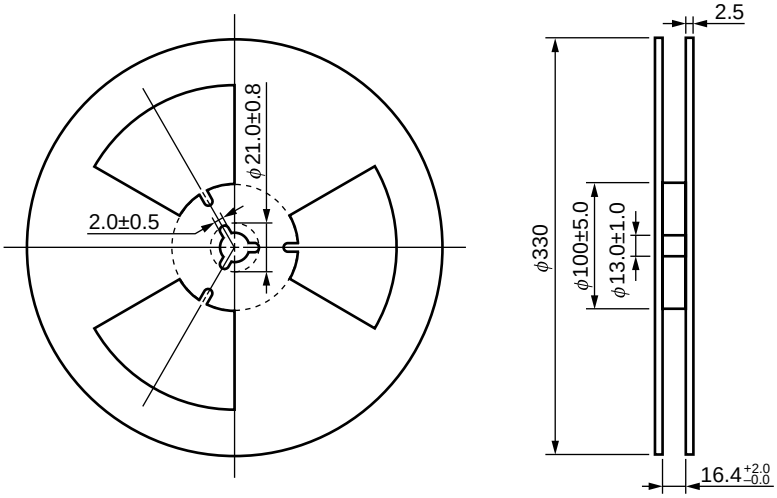
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



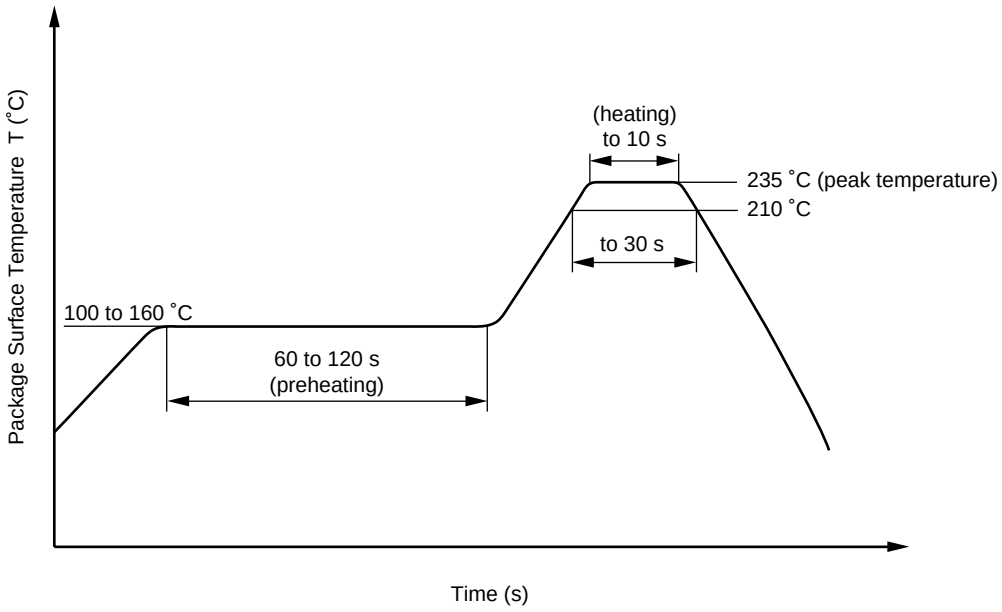
Packing: 1 500 pcs/reel

★ 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

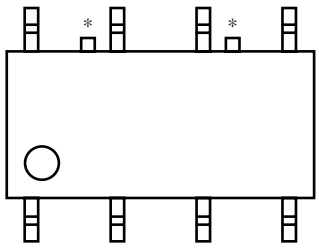


(2) Dip soldering

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



∗ : Portion of frame

[MEMO]

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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.