

**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.

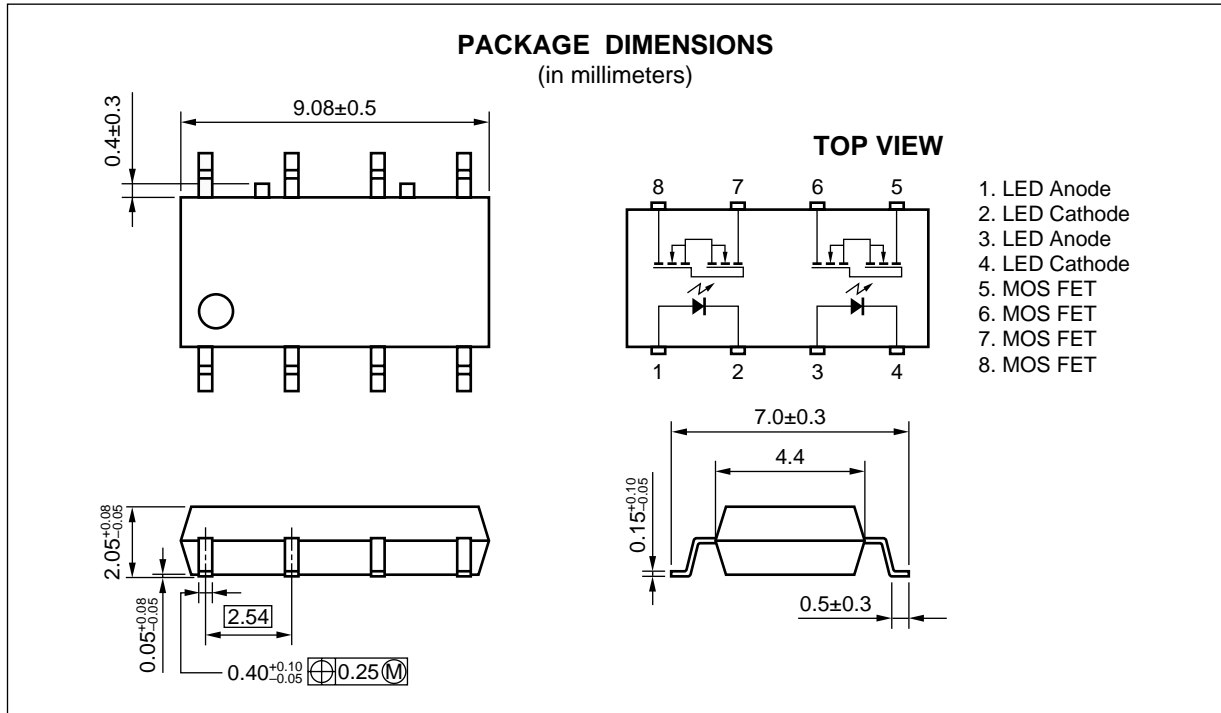
**FEATURES**

- 2 channel type (1 a + 1 a output)
- Low LED operating current ( $I_f = 1 \text{ mA}$ )
- 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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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 <sup>*1</sup>
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<sub>A</sub> = 25 °C, unless otherwise specified)**

Parameter		Symbol	Ratings	Unit
Diode	Forward Current (DC)	I <sub>F</sub>	50	mA
	Reverse Voltage	V <sub>R</sub>	5.0	V
	Power Dissipation	P <sub>D</sub>	50	mW/ch
	Peak Forward Current <sup>*1</sup>	I <sub>FP</sub>	1	A
MOS FET	Break Down Voltage	V <sub>L</sub>	260	V
	Continuous Load Current	I <sub>L</sub>	170	mA
	Pulse Load Current <sup>*2</sup> (AC/DC Connection)	I <sub>LP</sub>	300	mA
	Power Dissipation	P <sub>D</sub>	180	mW/ch
Isolation Voltage <sup>*3</sup>		BV	1 500	Vr.m.s.
Total Power Dissipation		P <sub>T</sub>	460	mW
Operating Ambient Temperature		T <sub>A</sub>	-40 to +80	°C
Storage Temperature		T <sub>stg</sub>	-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<sub>A</sub> = 25 °C, RH = 60 % between input and output

**RECOMMENDED OPERATING CONDITIONS (T<sub>A</sub> = 25 °C)**

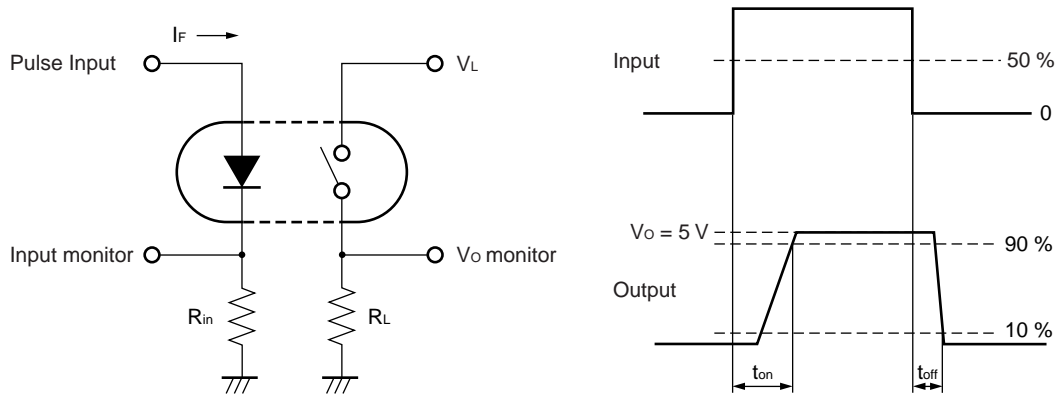
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
LED Operating Current	I <sub>F</sub>	1	10	20	mA
LED Off Voltage	V <sub>F</sub>	0		0.5	V

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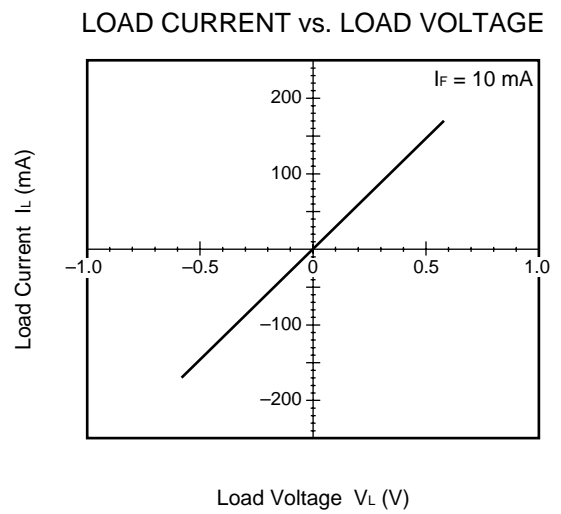
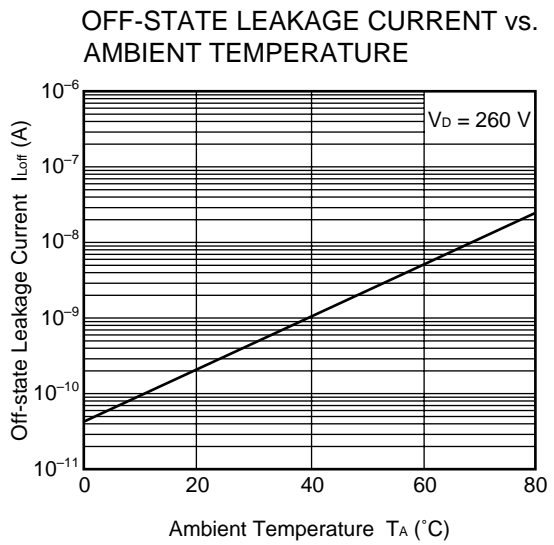
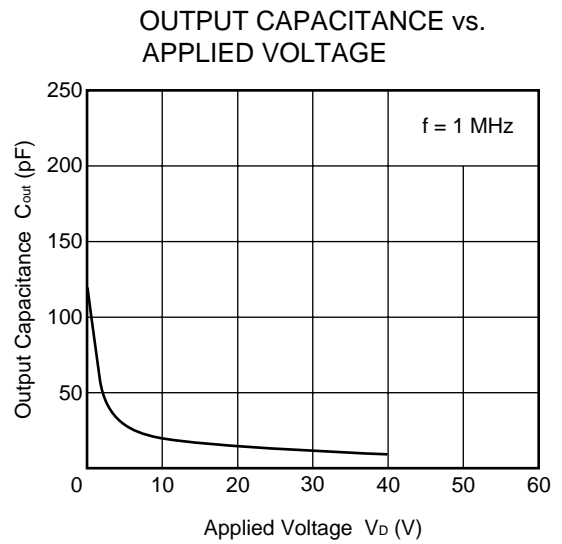
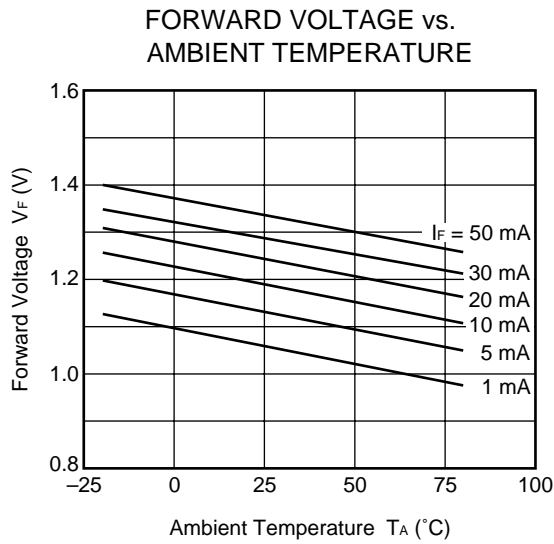
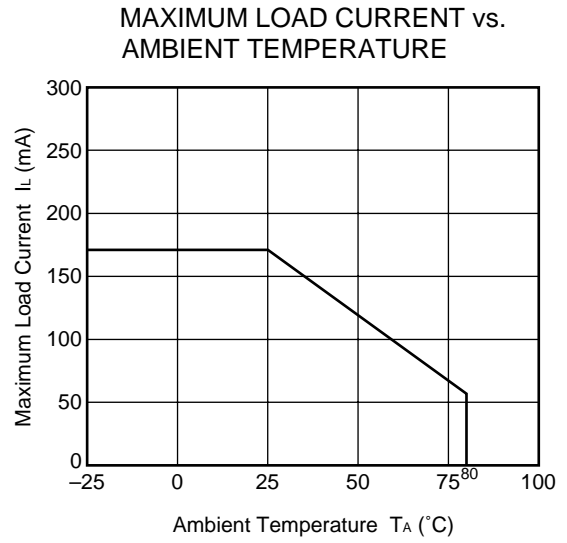
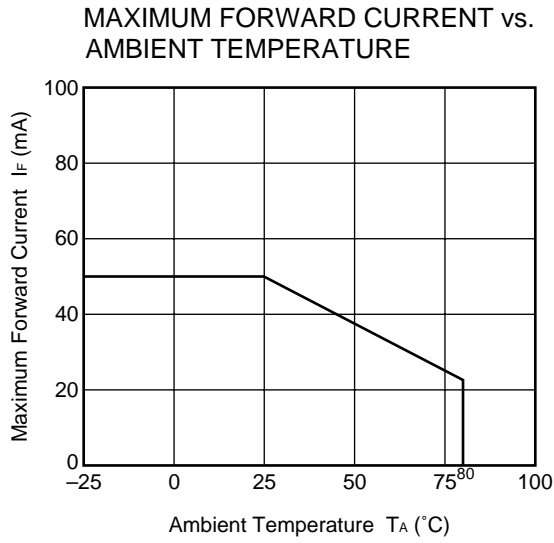
**★ ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 5 mA		1.1	1.4	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5 V			5.0	μA
MOS FET	Off-state Leakage Current	I <sub>Loff</sub>	V <sub>D</sub> = 260 V			1.0	μA
	Output Capacitance	C <sub>out</sub>	V <sub>D</sub> = 0 V, f = 1 MHz		122		pF/ch
Coupled	LED On-state Current	I <sub>Fon</sub>	I <sub>L</sub> = 170 mA			1.0	mA
	On-state Resistance	R <sub>on</sub>	I <sub>F</sub> = 10 mA, I <sub>L</sub> = 10 mA		3.4	10	Ω
	Turn-on Time *1	t <sub>on</sub>	I <sub>F</sub> = 10 mA, V <sub>O</sub> = 5 V, R <sub>L</sub> = 500 Ω,		0.4	1.0	ms
	Turn-off Time *1	t <sub>off</sub>	PW ≥ 10 ms		0.03	0.2	
	Isolation Resistance	R <sub>I-O</sub>	V <sub>I-O</sub> = 1.0 kV <sub>DC</sub>		10 <sup>9</sup>		Ω
	Isolation Capacitance	C <sub>I-O</sub>	V = 0 V, f = 1 MHz			0.4	pF/ch

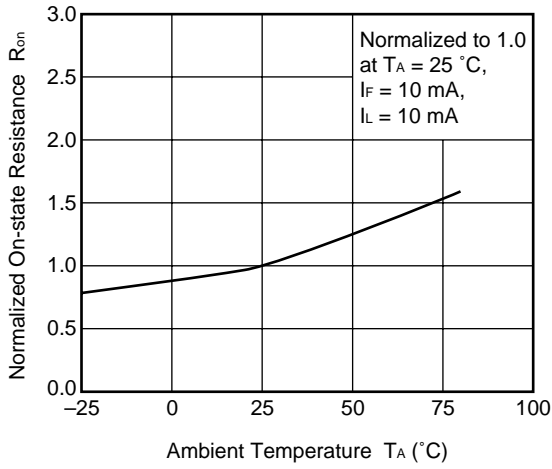
\*1 Test Circuit for Switching Time



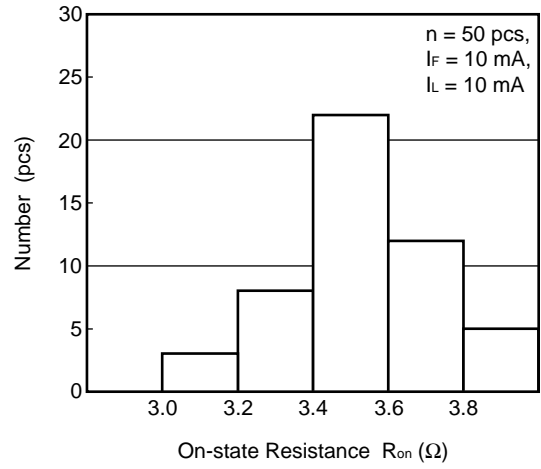
★ TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C, unless otherwise specified)



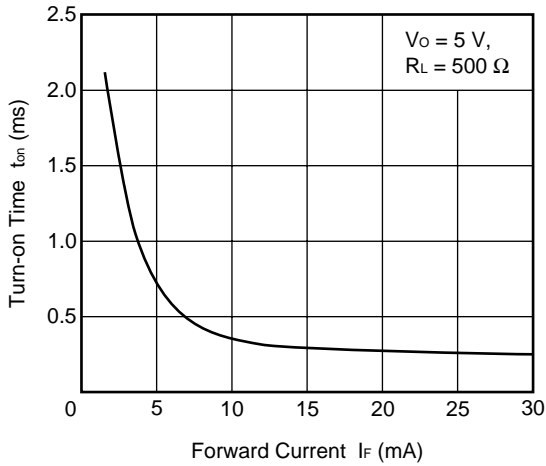
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



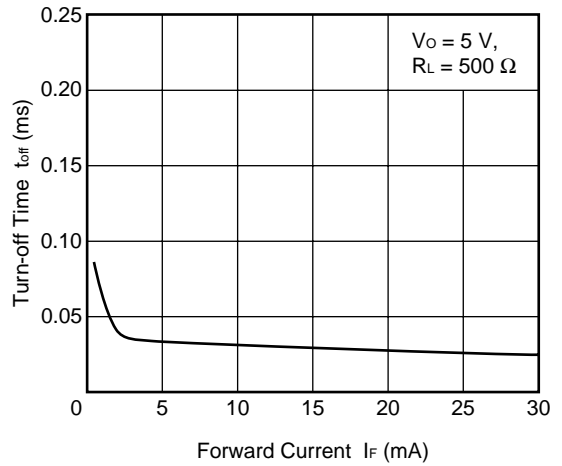
ON-STATE RESISTANCE DISTRIBUTION



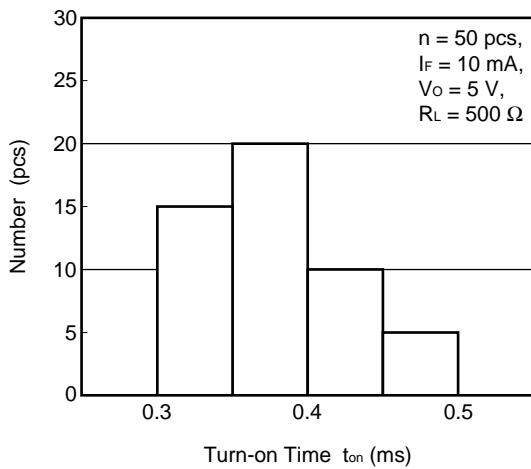
TURN-ON TIME vs. FORWARD CURRENT



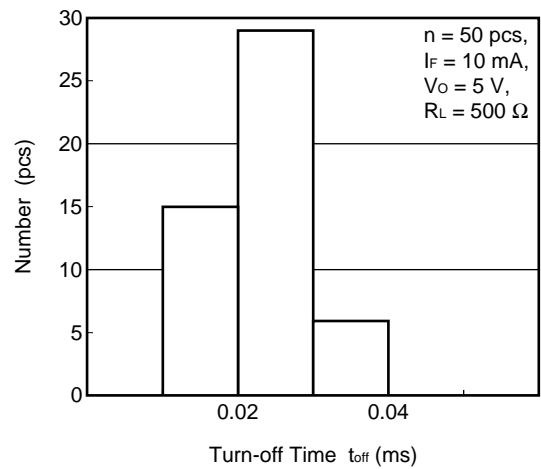
TURN-OFF TIME vs. FORWARD CURRENT



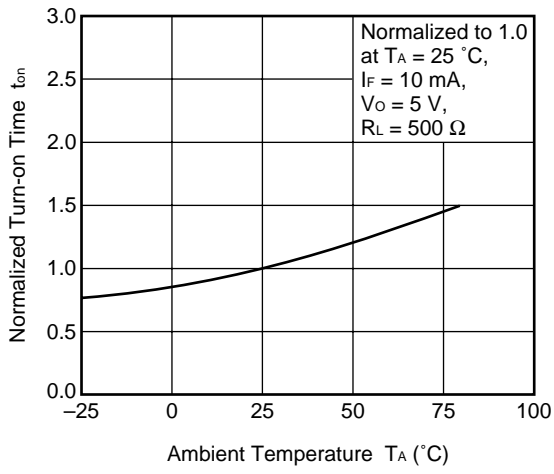
TURN-ON TIME DISTRIBUTION



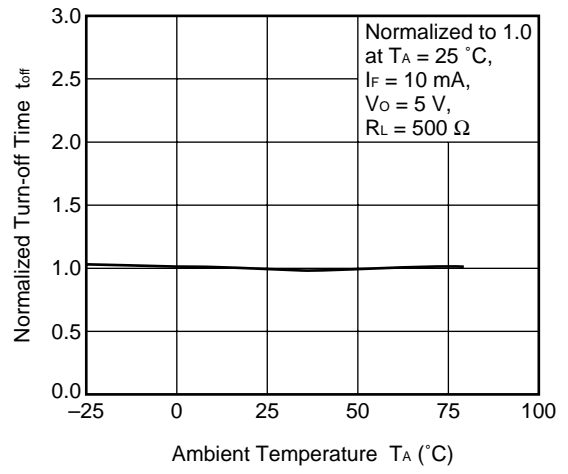
TURN-OFF TIME DISTRIBUTION



NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE



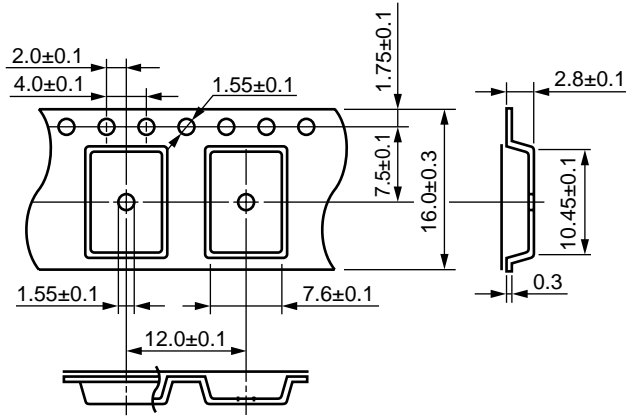
NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE



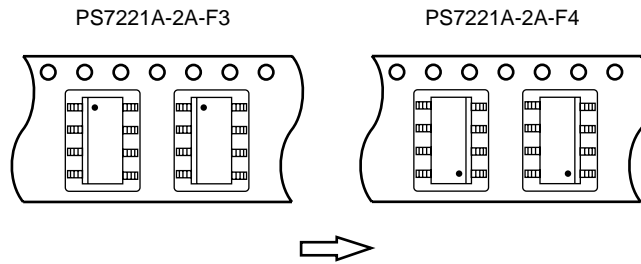
**Remark** The graphs indicate nominal characteristics.

★ TAPING SPECIFICATIONS (in millimeters)

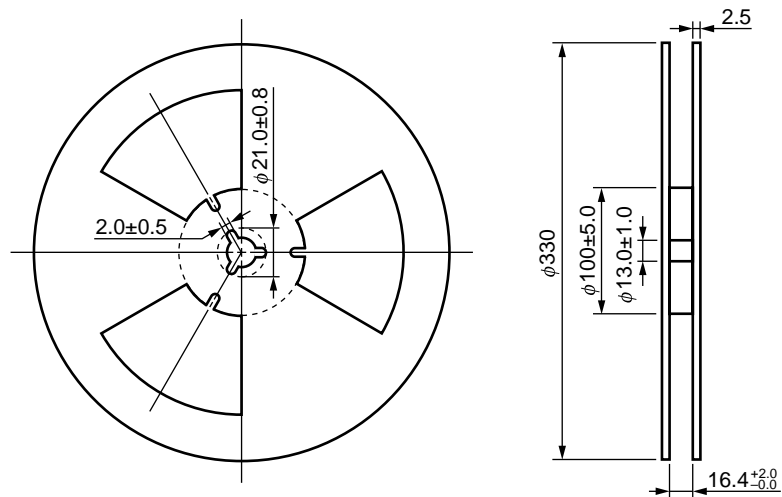
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



Packing: 1 500 pcs/reel

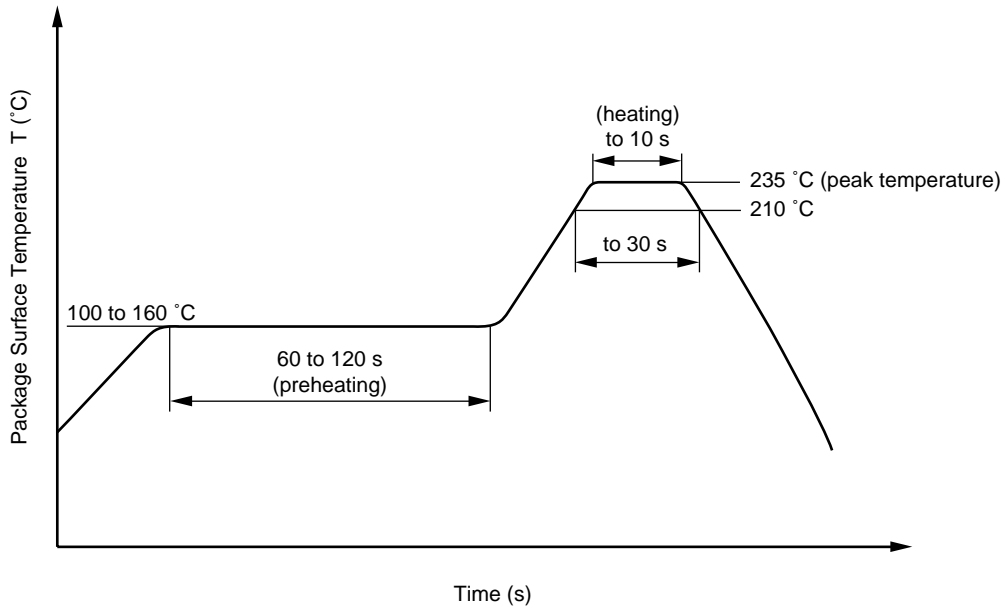


★ **RECOMMENDED SOLDERING CONDITIONS**

**(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

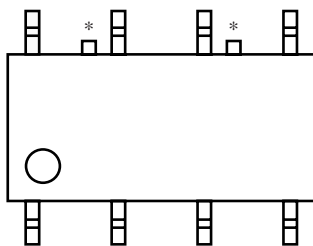


**(2) Dip soldering**

- 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

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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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