

### FEATURES

- DESIGNED FOR AC/DC SWITCHING APPLICATIONS
- IDEAL FOR ANALOG SIGNAL CONTROL APPLICATIONS
- LOW LED OPERATING CURRENT:  
 $I_F = 2 \text{ mA}$
- LOW OFFSET VOLTAGE
- SMALL PACKAGE:  
6 Pin DIP

### DESCRIPTION

PS7112-1A and PS7112L-1A are solid state relays containing a GaAs LED on the light emitting side (input side) and MOSFETs on the output side.

### APPLICATIONS

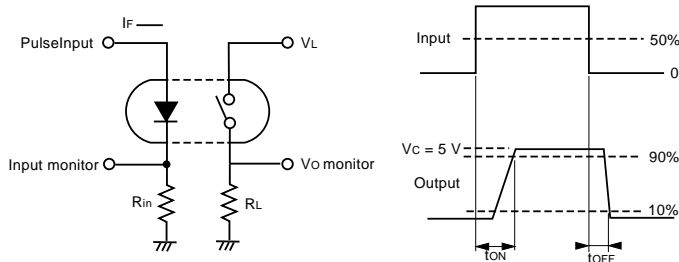
- VOICE TELEPHONY
- AUDIO EQUIPMENT
- AUDIO INSTRUMENTATION

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

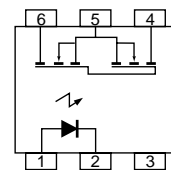
PART NUMBER			PS7112-1A, PS7112L-1A			
	SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V <sub>F</sub>	Forward Voltage, I <sub>F</sub> = 10 mA	V		1.2	1.4
	I <sub>R</sub>	Reverse Current, V <sub>R</sub> = 5 V	μA			5.0
MOSFET	I <sub>LOFF</sub>	Off-State Leakage Current, V <sub>D</sub> = 100 V	μA		0.03	1
	C <sub>OUT</sub>	Output Capacitance, V <sub>D</sub> = 0 V, f = 1 MHz			57	
Coupled	I <sub>Fon</sub>	LED On-state Current, I <sub>L</sub> = 200 mA	mA			2.0
	RON1	On-State Resistance, I <sub>F</sub> = 10 mA, I <sub>L</sub> = 10 mA	Ω		3.0	6.0
	RON2					
	t <sub>ON</sub>	Turn-on Time I <sub>F</sub> = 10 mA, V <sub>O</sub> = 5 V, PW ≥ 10 ms	ms		0.1	0.4
	t <sub>OFF</sub>	Turn-off Time I <sub>F</sub> = 10 mA, V <sub>O</sub> = 5 V, PW ≥ 10 ms	ms		0.03	0.2
	R <sub>I-O</sub>	Isolation Resistance, V <sub>I-O</sub> = 1.0 kVDC	Ω	10 <sup>9</sup>		
	C <sub>I-O</sub>	Isolation Capacitance, V = 0 V, f = 1 MHz	pF		1.1	

Note:

1. Test Circuit for Switching Time:



PS7112-1A, PS7112L-1A



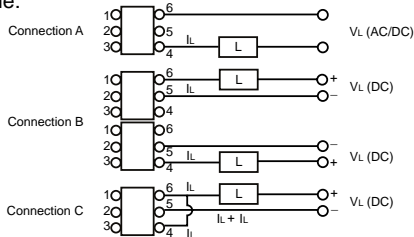
# PS7112-1A, PS7112L-1A

## ABSOLUTE MAXIMUM RATINGS<sup>1</sup> (T<sub>A</sub> = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
I <sub>F</sub>	Forward Current (DC)	mA	50
V <sub>R</sub>	Reverse Voltage	V	5
P <sub>D</sub>	Power Dissipation	mW	50
I <sub>FP</sub>	Peak Forward Current <sup>2</sup>	A	1
MOSFET			
V <sub>L</sub>	Break Down Voltage	V	100
I <sub>L</sub>	Continuous Load Current <sup>3</sup>	mA	200
	Connection A		
	Connection B		
	Connection C		400
I <sub>LP</sub>	Pulse Load Current <sup>4</sup> (AC/DC Connection)	mA	400
P <sub>D</sub>	Power Dissipation	mW	560
Coupled			
BV	Isolation Voltage <sup>5</sup>	V <sub>R.M.S.</sub>	1500
P <sub>T</sub>	Total Power Dissipation	mW	610
T <sub>OP</sub>	Operating Temperature	°C	-40 to +80
T <sub>STG</sub>	Storage Temperature	°C	-40 to +100

### Notes:

- Operation in excess of any one of these parameters may result in permanent damage.
- PW = 100 μs, Duty Cycle = 1 %
- Conditions: I<sub>F</sub> ≥ 2 mA. The following types of load connections are available:



- PW = 100 ms, 1 shot.
- AC voltage for 1 minute at T<sub>A</sub> = 25 °C, RH = 60 % between input and output.

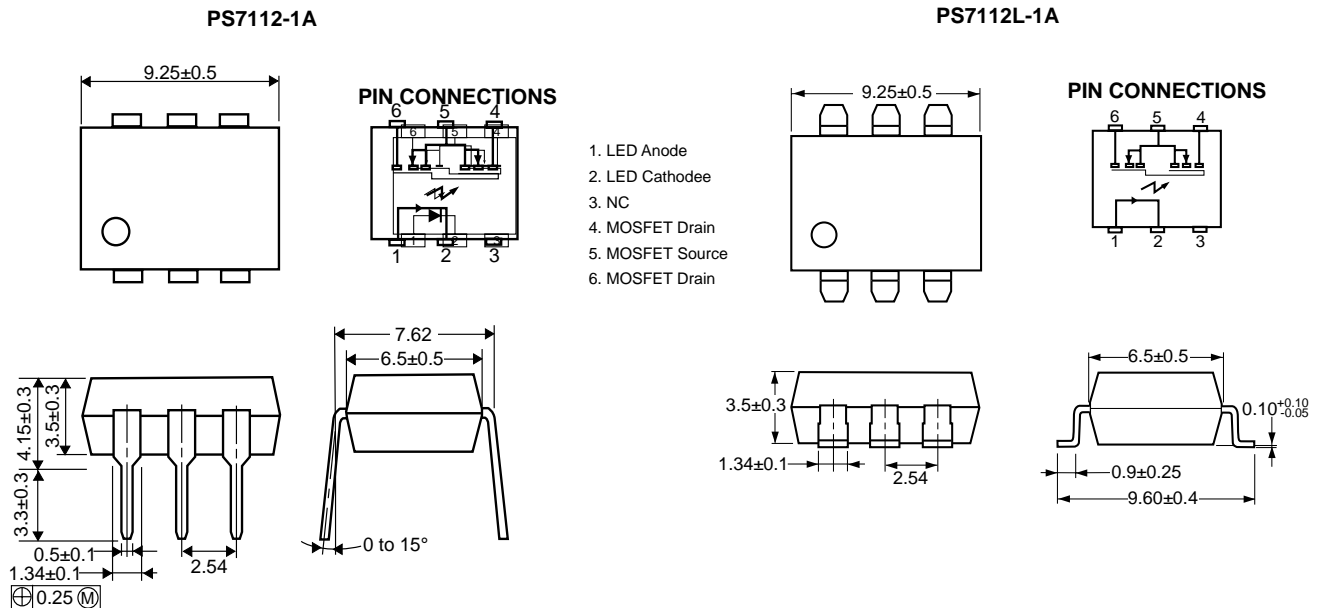
## RECOMMENDED OPERATING CONDITIONS (T<sub>A</sub> = 25°C)

PART NUMBER		PS7112-1A, PS7112L-1A			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
I <sub>F</sub>	LED Operating Current	mA	2	10	20
V <sub>F</sub>	LED Off Voltage	V	0		0.5

## ORDERING INFORMATION

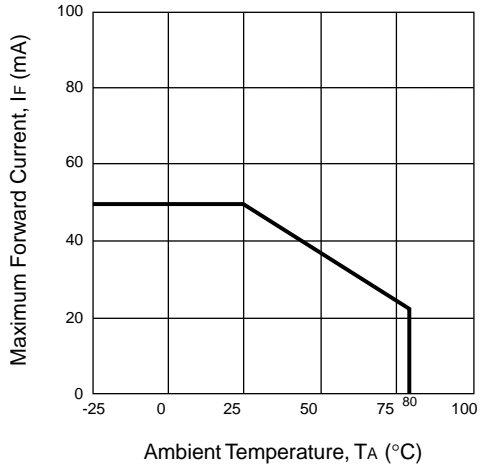
PART NUMBER	PACKAGE	PACKING STYLE
PS7112-1A	6-pin DIP	Magazine case 50 pcs
PS7112L-1A		
PS7112L-1A-E3		Embossed Tape 1000 pcs/reel
PS7112L-1A-E4		

## OUTLINE DIMENSIONS (Units in mm)

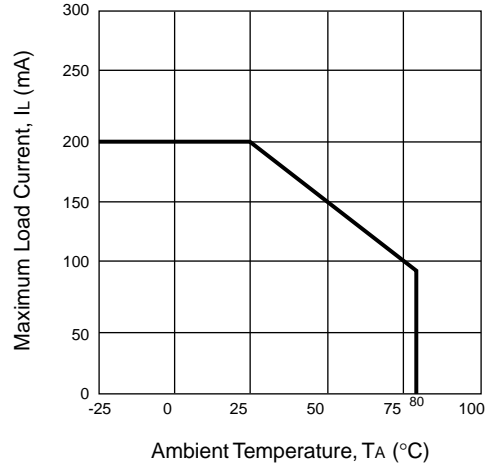


**TYPICAL PERFORMANCE CURVES** ( $T_A = 25^\circ\text{C}$ )

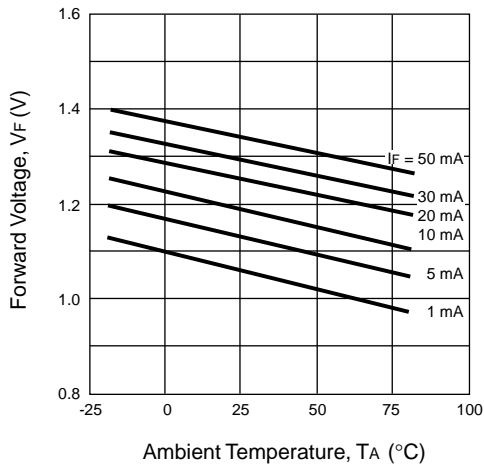
**MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE**



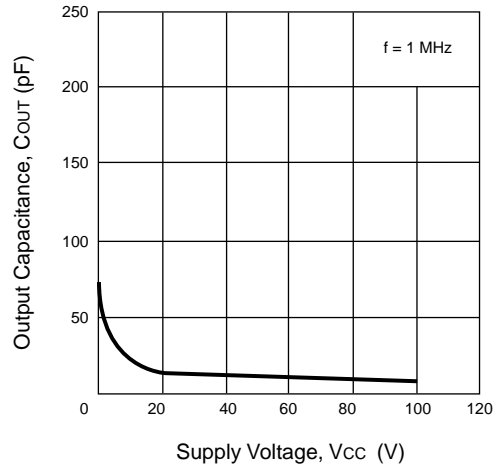
**MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE**



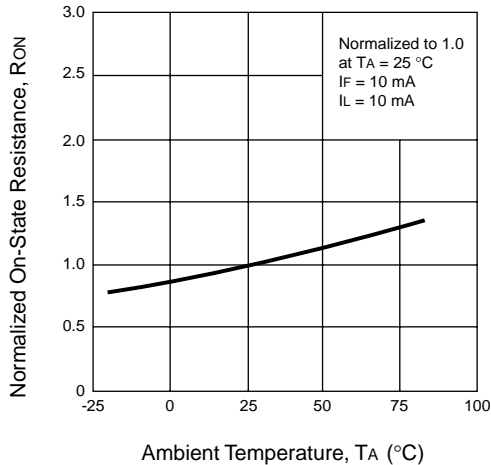
**FORWARD VOLTAGE vs. AMBIENT TEMPERATURE**



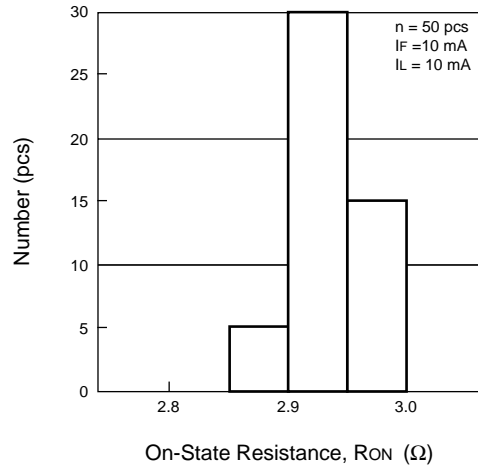
**OUTPUT CAPACITANCE vs. SUPPLY VOLTAGE**



**NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE**

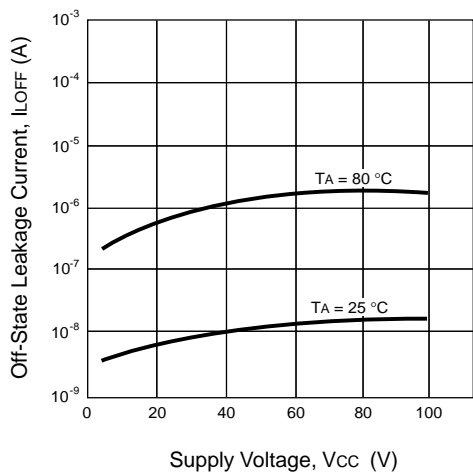


**ON-STATE RESISTANCE DISTRIBUTION**

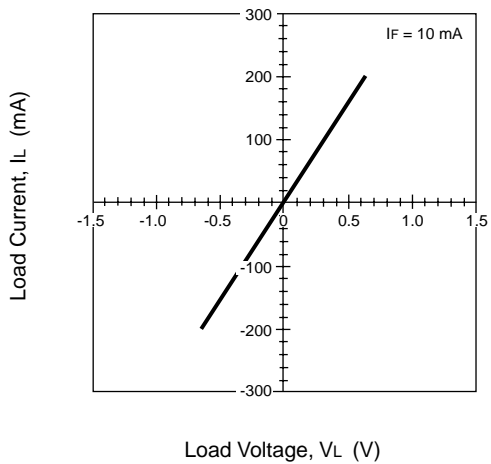


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

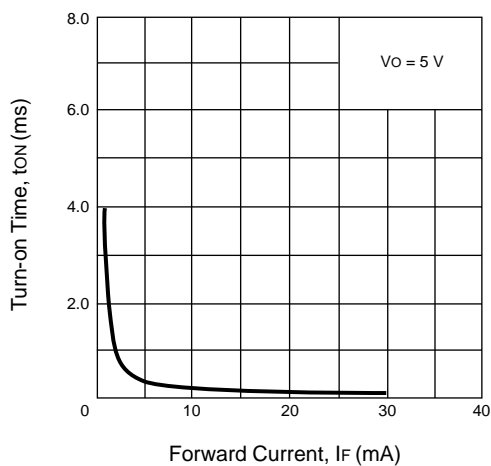
OFF-STATE LEAKAGE CURRENT vs. SUPPLY VOLTAGE



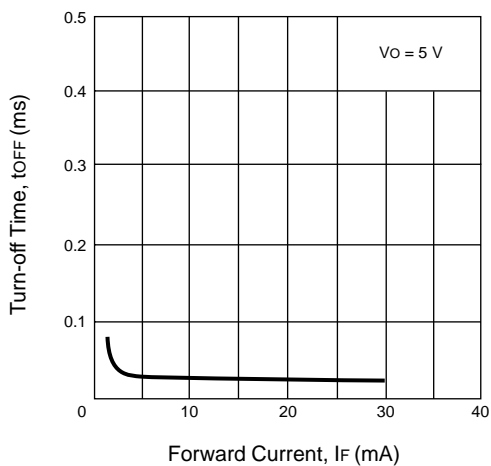
LOAD CURRENT vs. LOAD VOLTAGE



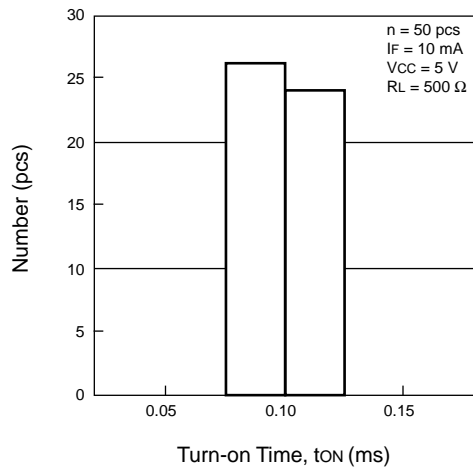
TURN-ON TIME vs. FORWARD CURRENT



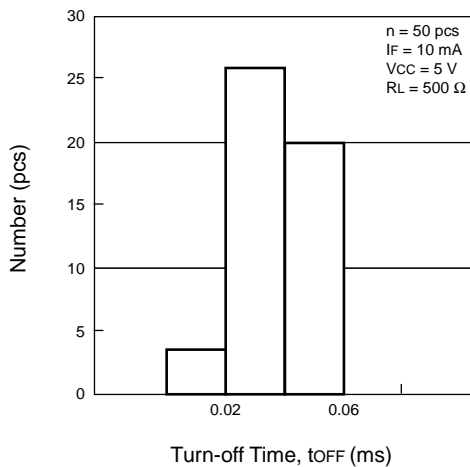
TURN-OFF TIME vs. FORWARD CURRENT



TURN-ON TIME DISTRIBUTION

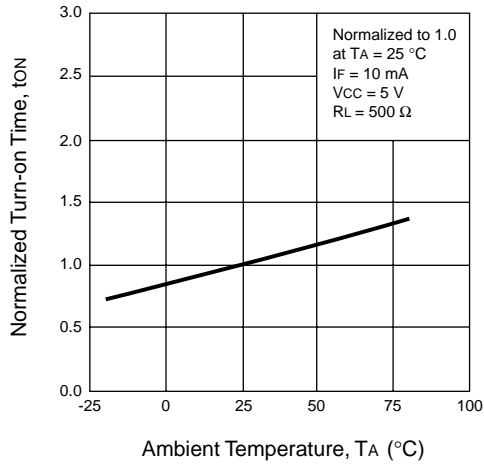


TURN-OFF TIME DISTRIBUTION

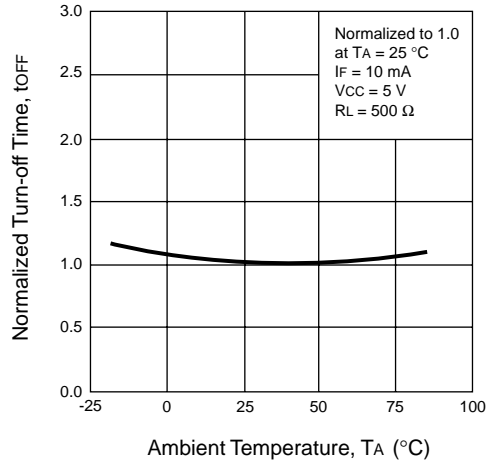


**TYPICAL PERFORMANCE CURVES** ( $T_A = 25\text{ }^\circ\text{C}$ )

**NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE**

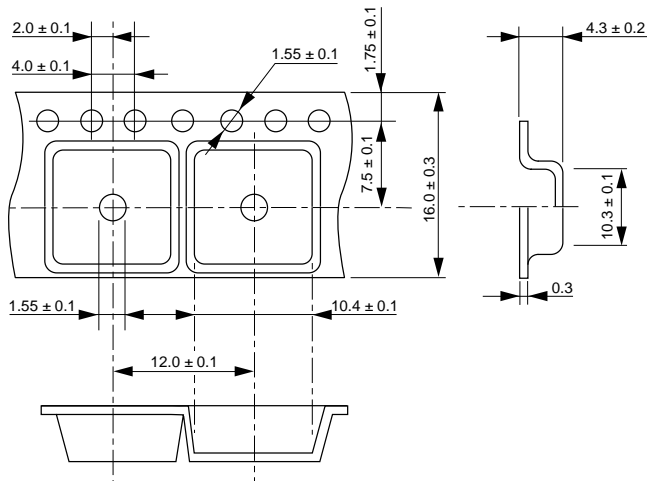


**NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE**

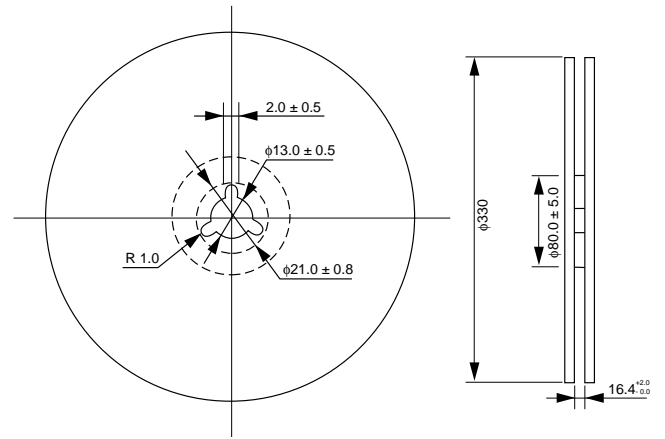


**TAPING SPECIFICATIONS** (Units in mm)

**OUTLINE AND DIMENSIONS (TAPE)**

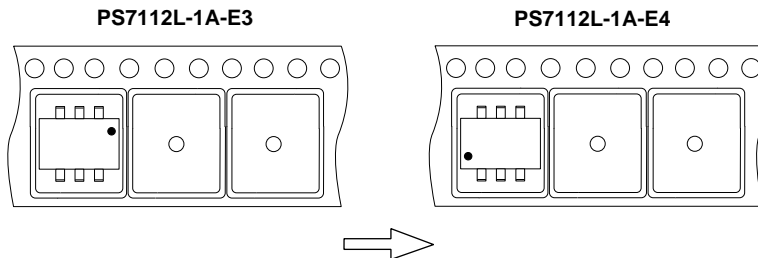


**OUTLINE AND DIMENSIONS (REEL)**



Packaging : 1000 pcs/reel

**TAPING DIRECTION**

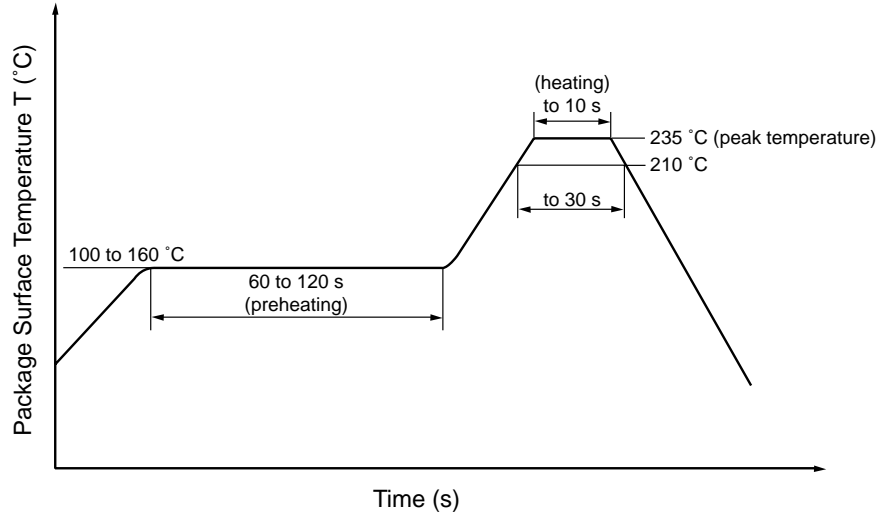


## RECOMMENDED SOLDERING CONDITIONS

### (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.

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