

### FEATURES

- **2 CHANNEL TYPE**  
(1 A + 1 A Output)
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL PACKAGE**  
(8 pin DIP)
- **LOW OFFSET VOLTAGE**
- **PS7142L-2A: SURFACE MOUNT TYPE**
- **UL BSI APPROVED**

### DESCRIPTION

PS7142-2A and PS7142L-2A are solid state relays containing GaAs LED on the light emitting side (input side) and MOSFETs on the output side.

### APPLICATIONS

- TELECOMMUNICATIONS EQUIPMENT
- MEASUREMENT EQUIPMENT
- FA/OA EQUIPMENT

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

PART NUMBER			PS7142-2A, PS7142L-2A			
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> = 400 V	μA	0.05	1.0	
	C <sub>out</sub>	Output Capacitance, V = 0 V, f = 1 MHz	pF/ch	140		
Coupled	R <sub>on1</sub>	On-State Resistance, I <sub>F</sub> = 10 mA, I <sub>L</sub> = 10 mA	Ω	7.5	12	
	R <sub>on2</sub>	On-State Resistance, I <sub>F</sub> = 10 mA, I <sub>L</sub> = 200 mA	Ω	7.0	10	
	t <sub>on</sub>	Turn-On Time	I <sub>F</sub> = 10 mA, V <sub>L</sub> = 5 V, R <sub>L</sub> = 500 Ω	ms	0.5	2.0
	t <sub>off</sub>	Turn-Off Time		ms	0.03	0.2
	R <sub>I-O</sub>	Isolation Resistance, V <sub>in-out</sub> = 1.0 kVDC	Ω	10 <sup>9</sup>		
	C <sub>I-O</sub>	Isolation Capacitance, V = 0 V, f = 1 MHz	pF/ch		1.1	

# PS7142-2A, PS7142L-2A

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

SYMBOLS	PARAMETERS	UNITS	RATINGS
			PS7142-2A PS7142L-2A
Diode			
V <sub>R</sub>	Reverse Voltage	V	5
I <sub>F</sub>	Forward Current (DC)	mA	50
P <sub>D</sub>	Power Dissipation	mW/ch	50
I <sub>F (Peak)</sub>	Peak Forward Current <sup>2</sup>	A	1
MOSFET			
V <sub>L</sub>	Break Down Voltage	V	400
I <sub>L</sub>	Continuous Load Current	mA	200
P <sub>D</sub>	Power Dissipation	mW/ch	375
Coupled			
BV	Isolation Voltage <sup>3</sup>	V <sub>RMS</sub>	1500
P <sub>T</sub>	Total Power Dissipation	mW	850
T <sub>STG</sub>	Storage Temperature	°C	-40 to +100
T <sub>A</sub>	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. AC voltage for 1 minute at T<sub>A</sub> = 25 °C, RH = 60 % between input and output.

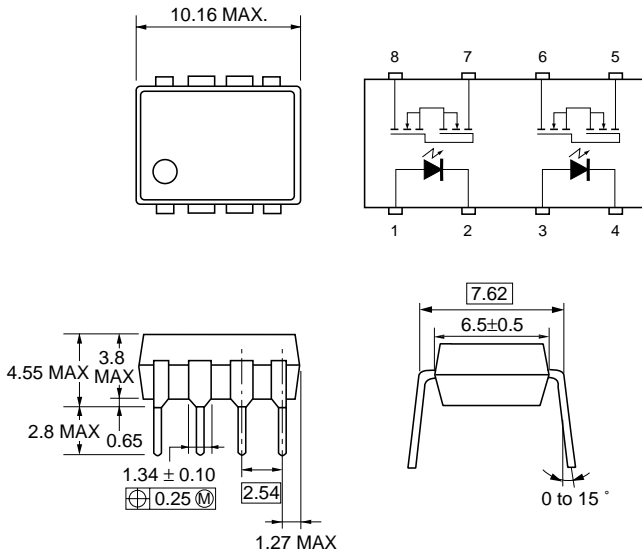
## RECOMMENDED OPERATING CONDITIONS (T<sub>A</sub> = 25 °C)

SYMBOL	PARAMETER	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

## OUTLINE DIMENSIONS (Units in mm)

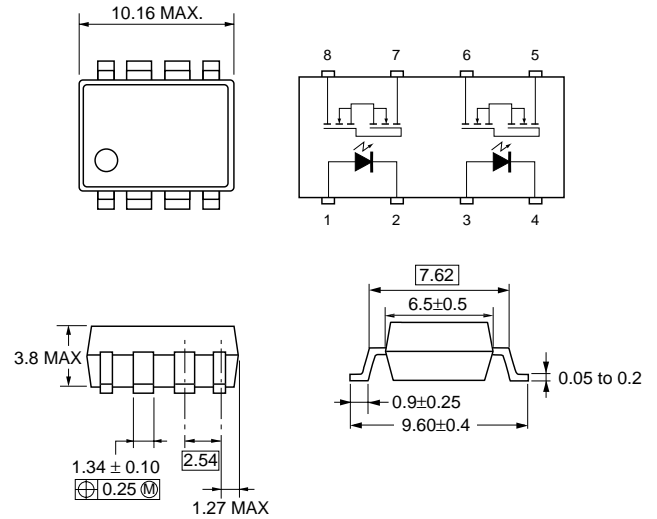
### PS7142-2A

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

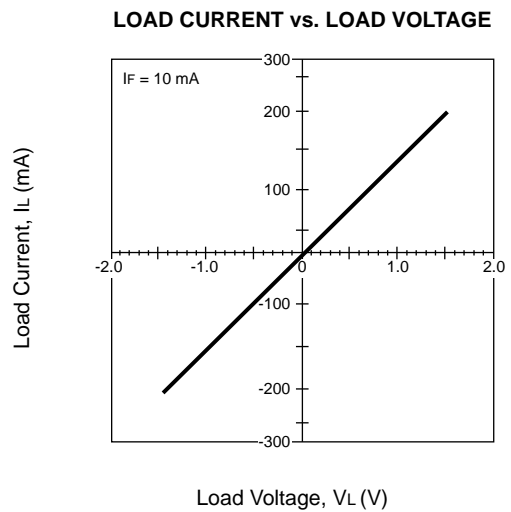
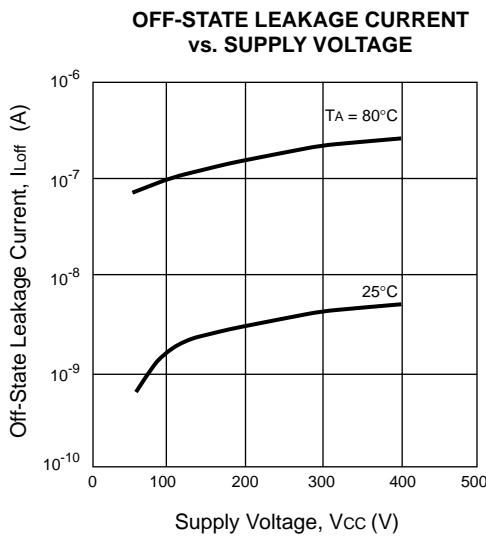
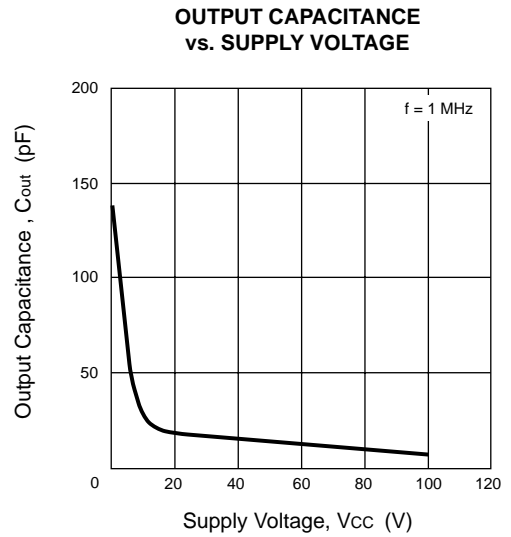
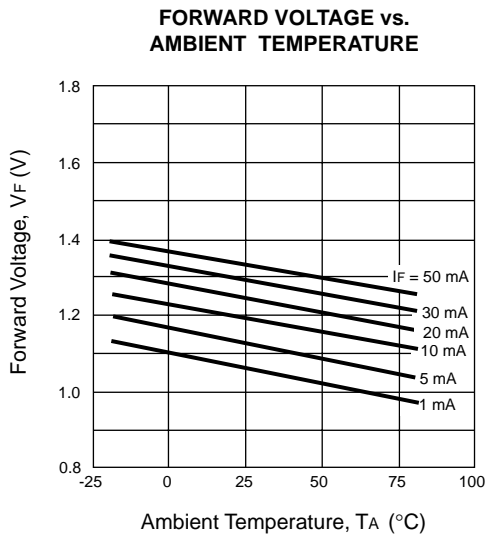
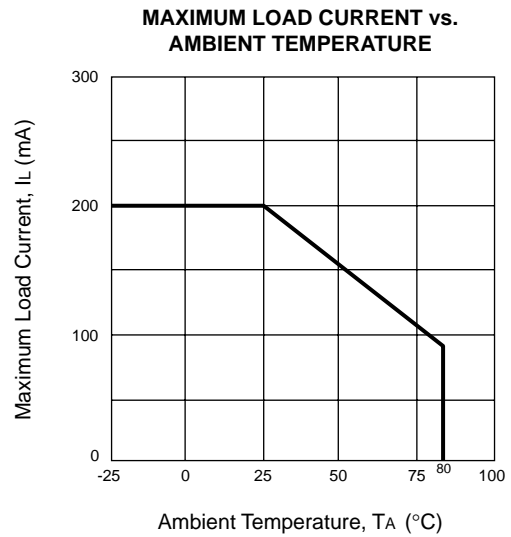
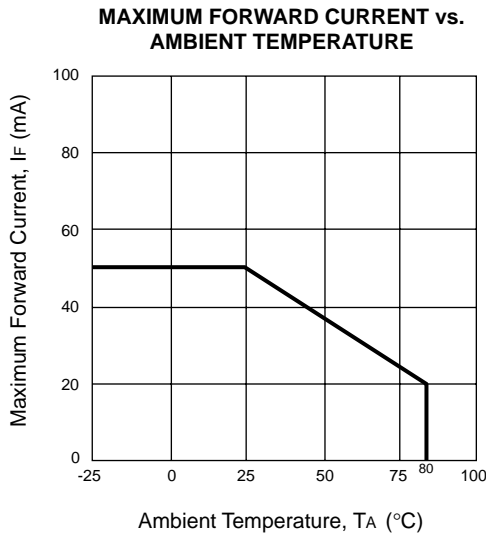


### PS7142L-2A

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

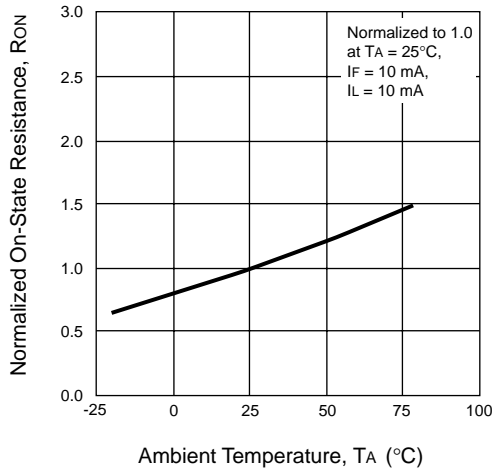


**TYPICAL PERFORMANCE CURVES** ( $T_A = 25^\circ\text{C}$ )

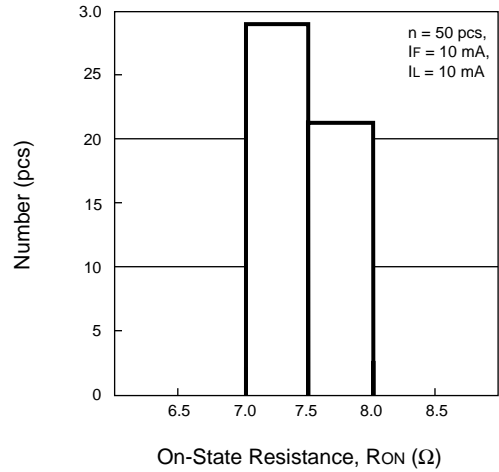


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

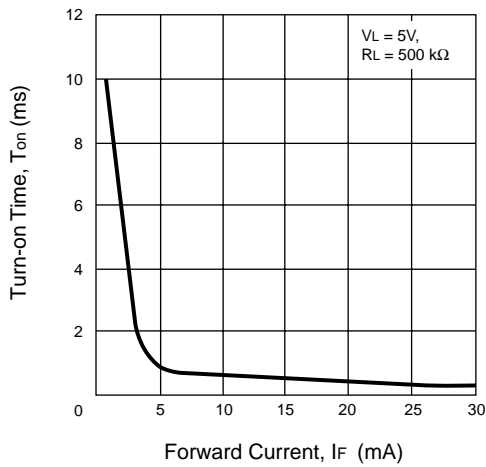
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



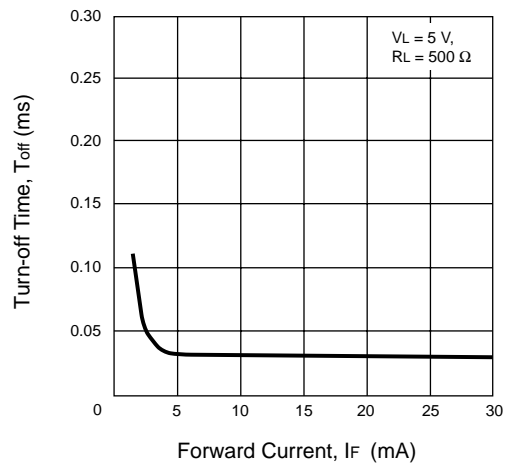
ON-STATE RESISTANCE DISTRIBUTION



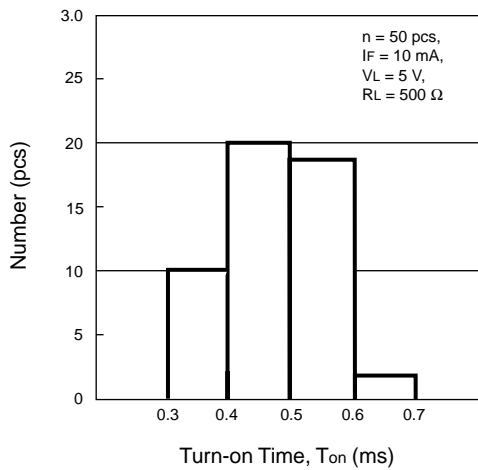
TURN-ON TIME vs. FORWARD CURRENT



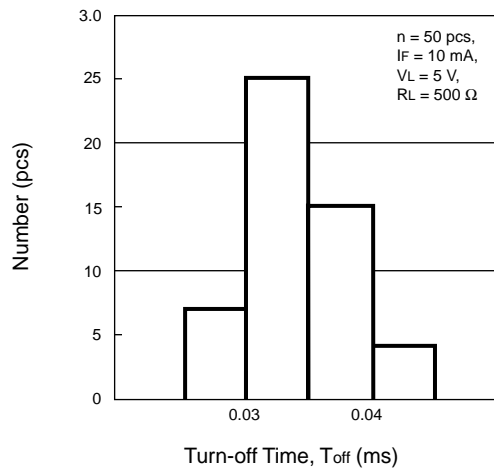
TURN-OFF TIME vs. FORWARD CURRENT

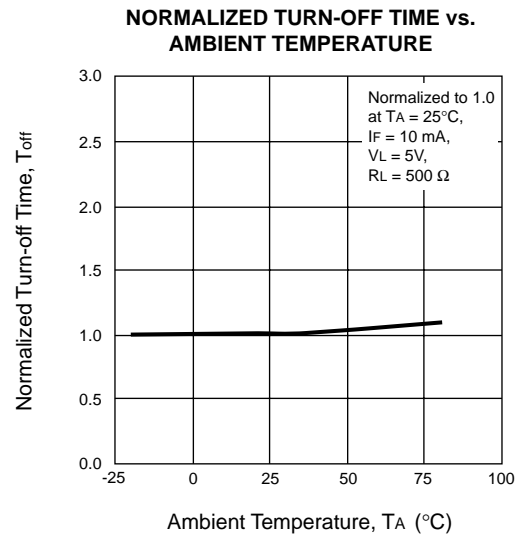
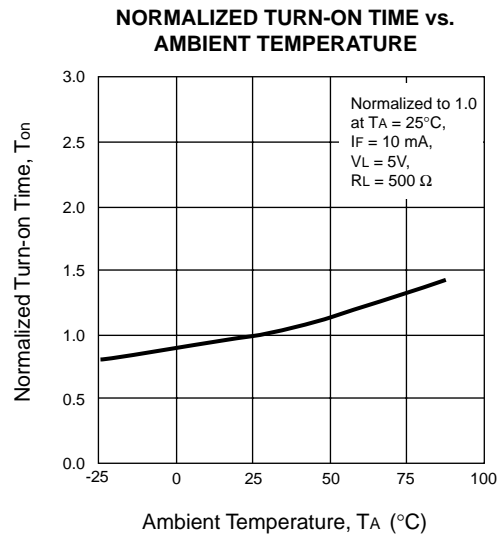


TURN-ON TIME DISTRIBUTION



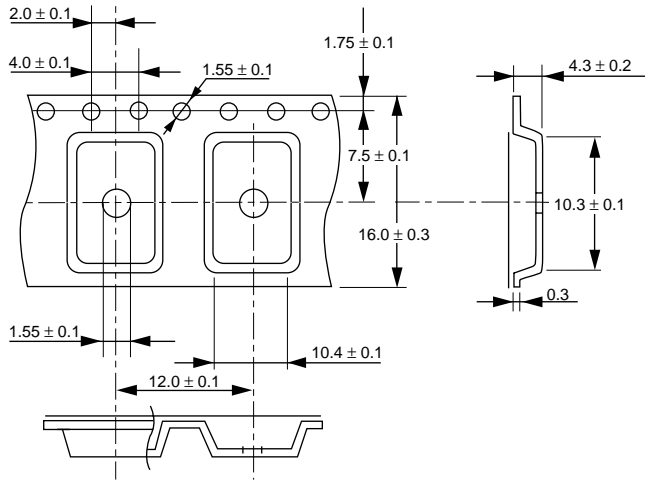
TURN-OFF TIME DISTRIBUTION



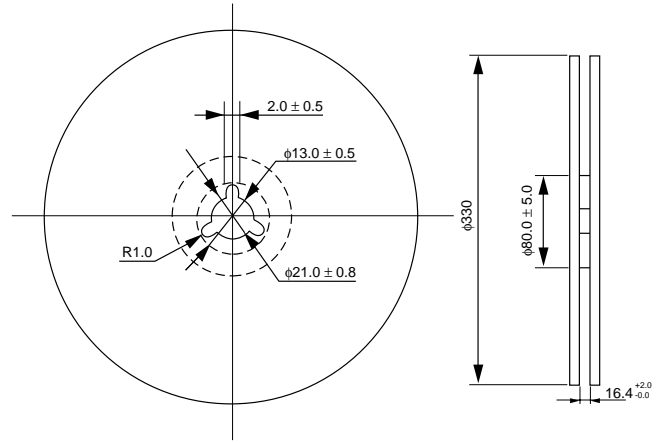
**TYPICAL PERFORMANCE CURVES** ( $T_A = 25\text{ }^\circ\text{C}$ )

**TAPING SPECIFICATIONS** (Units in mm)

**OUTLINE AND DIMENSIONS (TAPE)**



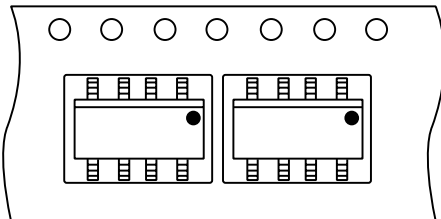
**OUTLINE AND DIMENSIONS (REEL)**



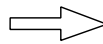
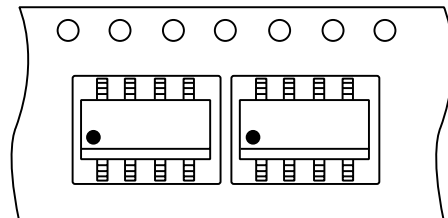
Notes:  
1. Packing : 1000 pcs/reel

**TAPE DIRECTION**

**PS7142L-2A-E3**



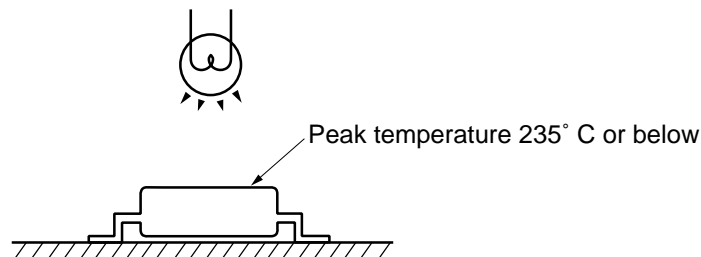
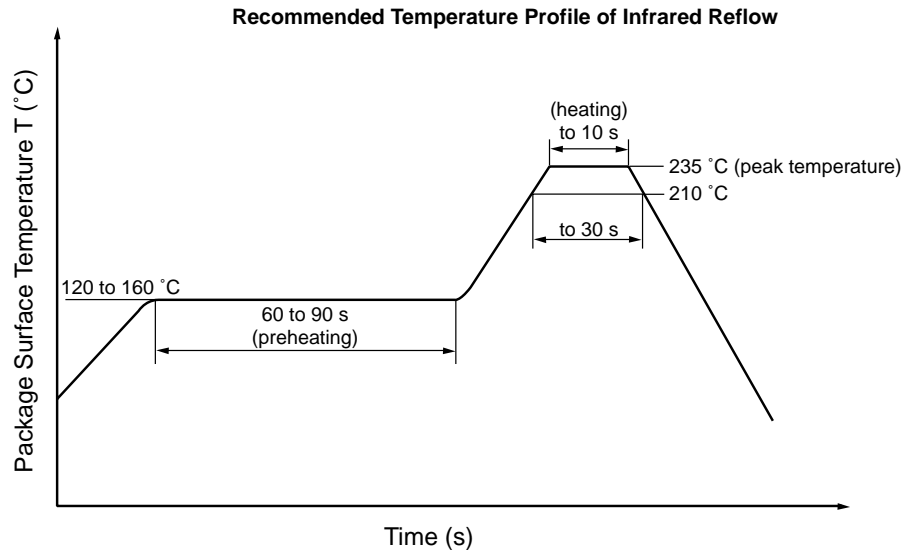
**PS7142L-2A-E4**



## 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 maximum chlorine content of 0.2 Wt % is recommended).



### (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).

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