

## 4 PIN SOP, 1.0 $\Omega$ LOW ON-STATE RESISTANCE 1-CH OPTICAL COUPLED MOSFET

# PS7214-1A

### FEATURES

- **LOW ON-STATE RESISTANCE:**  
R<sub>ON</sub> = 1.0  $\Omega$  TYP
- **LARGE CONTINUOUS LOAD CURRENT:**  
I<sub>L</sub> = 400 mA
- **1 CHANNEL TYPE:**  
1a output
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL AND THIN PACKAGE:**  
4 pin SOP, Height = 2.1 mm
- **HIGH ISOLATION VOLTAGE:**  
(BV = 1500 Vr.m.s.)
- **LOW OFFSET VOLTAGE**
- **SURFACE MOUNT TYPE LEAD:**  
PS7214-1A-E3, E4, F3, F4

### DESCRIPTION

The PS7214-1A is a low on-state resistance solid state relay containing GaAs LEDs on the light emitting side (input side) and MOS FETs on the output side.

It is suitable for PLC, etc. because of its large continuous load current and low on-state resistance.

### APPLICATIONS

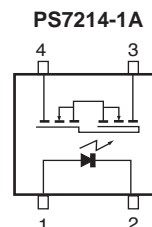
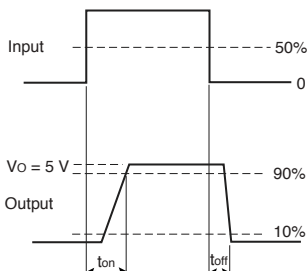
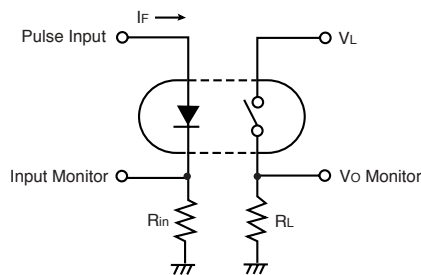
- MEASUREMENT EQUIPMENT
- FA EQUIPMENT

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

PART NUMBER			PS7214-1A			
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	$\mu$ A		5.0	
MOS FET	I <sub>LOFF</sub>	Off-State Leakage Current, V <sub>D</sub> = 100 V	$\mu$ A		1.0	
	C <sub>OUT</sub>	Output Capacitance, V <sub>D</sub> = 0 V, f = 1 MHz	pF	120		
Coupled	I <sub>Fon</sub>	LED On-State Current, I <sub>L</sub> = 400 mA	mA		2.0	
	R <sub>on</sub>	On-state Resistance, I <sub>F</sub> = 10 mA, I <sub>L</sub> = 400 mA, t <sub>s</sub> ≤ 10 ms	$\Omega$	1.0	1.2	
	t <sub>ON</sub>	Turn-on Time <sup>1</sup> , I <sub>F</sub> = 10 mA, V <sub>O</sub> = 5 V, R <sub>L</sub> = 500 $\Omega$ , PW ≥ 10 ms	ms		1.3	2.0
	t <sub>OFF</sub>	Turn-off Time <sup>1</sup> , I <sub>F</sub> = 10 mA, V <sub>O</sub> = 5 V, R <sub>L</sub> = 500 $\Omega$ , PW ≥ 10 ms	ms		0.1	1.0
	R <sub>I-O</sub>	Isolation Resistance, V <sub>I-O</sub> = 1.0 kVDC	$\Omega$	10 <sup>9</sup>		
	C <sub>I-O</sub>	Isolation Capacitance, V = 0 V, f = 1 MHz	pF		0.5	

Note:

1. Test circuit for Switching Time:



# PS7214-1A

## 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	5.0
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	mA	400
I <sub>LP</sub>	Pulse Load Current <sup>3</sup> (AC/DC Connection)	A	0.8
P <sub>D</sub>	Power Dissipation	mW	300
Coupled			
BV	Isolation Voltage <sup>4</sup>	Vr.m.s.	1500
P <sub>T</sub>	Total Power Dissipation	mW	350
T <sub>A</sub>	Operating Ambient Temp.	°C	-40 to +85
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 %
- PW = 100 ms, 1 shot
- AC voltage for 1 minute at T<sub>A</sub> = 25 °C, RH = 60 % between input and output.

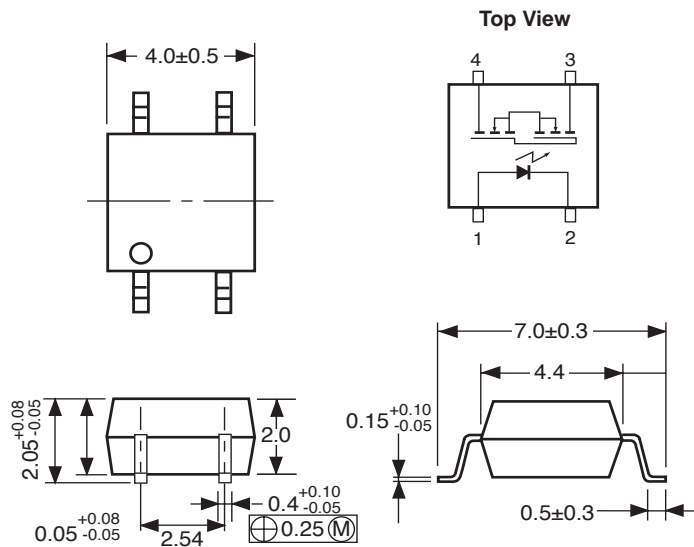
## RECOMMENDED OPERATING CONDITIONS (T<sub>A</sub> = 25°C)

PART NUMBER		PS7214-1A			
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

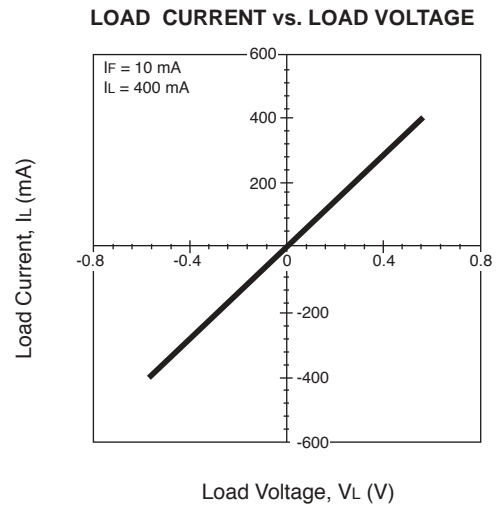
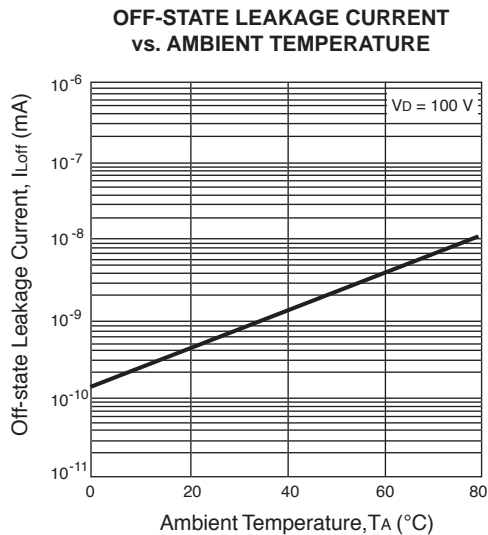
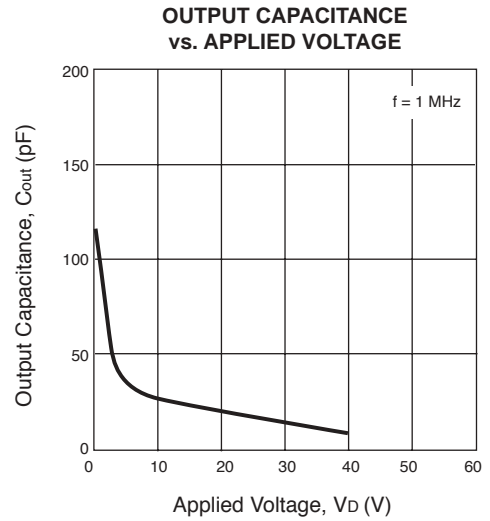
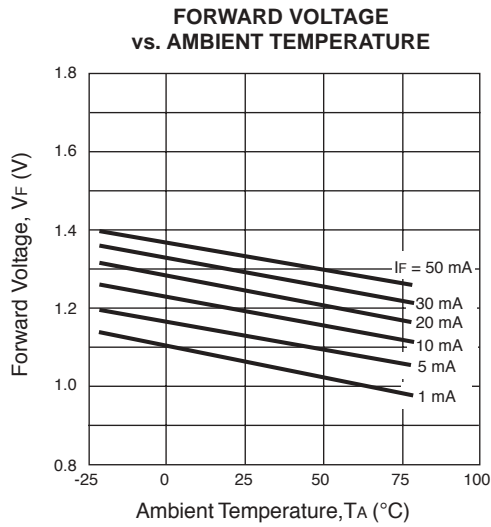
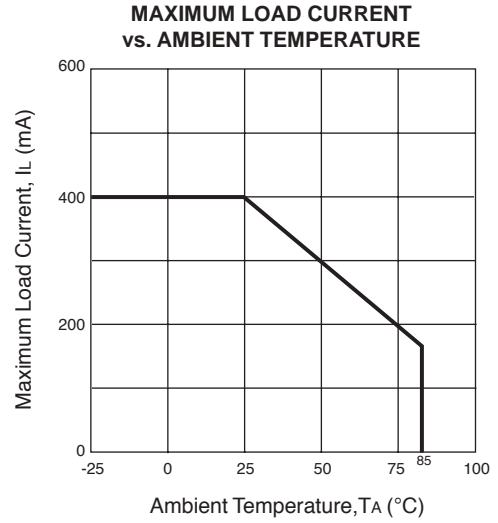
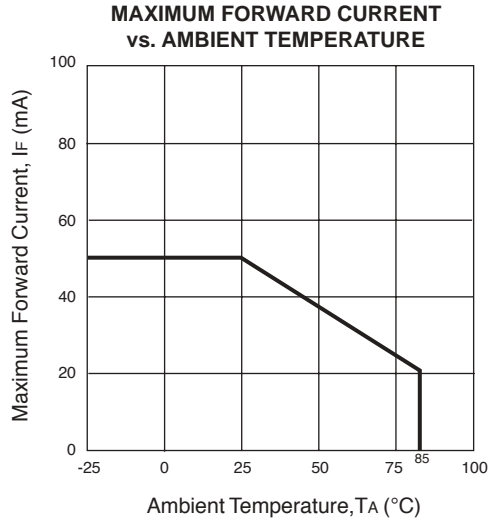
PART NUMBER	PACKING STYLE
PS7214-1A	Magazine case 100 pcs
PS7214-1A-E3	Embossed tape 900 pcs/reel
PS7214-1A-E4	
PS7214-1A-F3	Embossed tape 3500 pcs/reel
PS7214-1A-F4	

## OUTLINE DIMENSIONS (Units in mm)



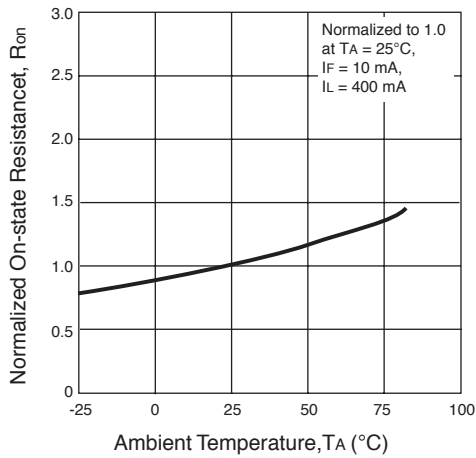
- LED Anode
- LED Cathode
- MOS FET
- MOS FET

TYPICAL PERFORMANCE CURVES (T<sub>A</sub> = 25°C)

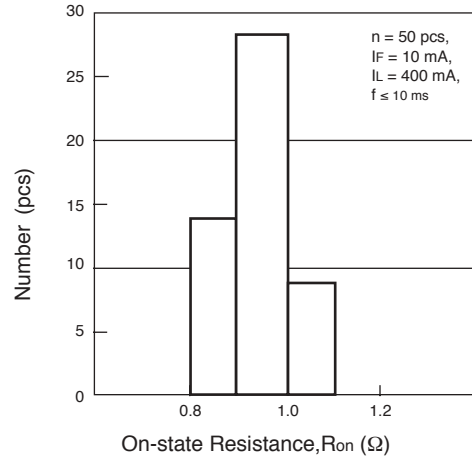


**TYPICAL PERFORMANCE CURVES** ( $T_A = 25^\circ\text{C}$ )

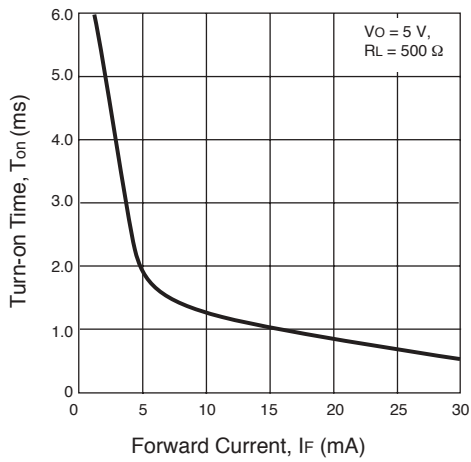
**NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE**



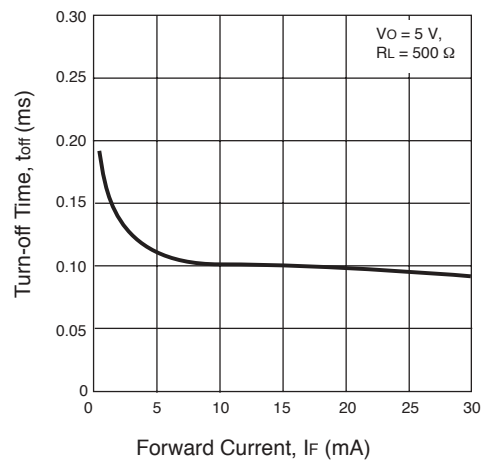
**ON-STATE RESISTANCE DISTRIBUTION**



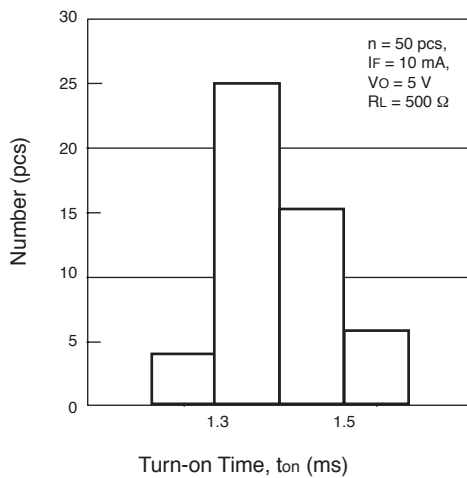
**TURN-ON TIME vs. FORWARD CURRENT**



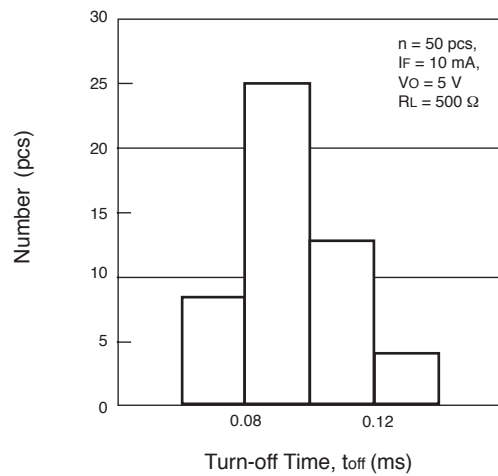
**TURN-OFF TIME vs. FORWARD CURRENT**



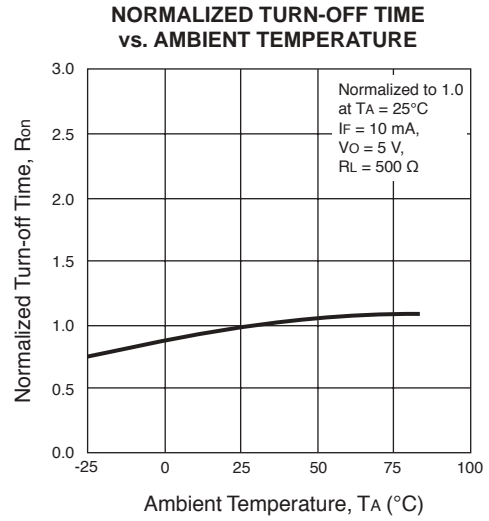
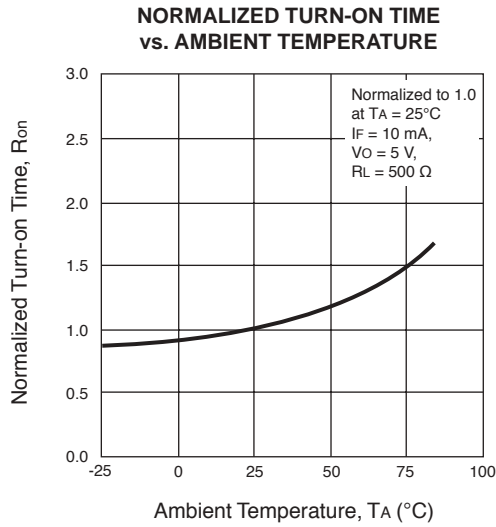
**TURN-ON TIME DISTRIBUTION**



**TURN-OFF TIME DISTRIBUTION**



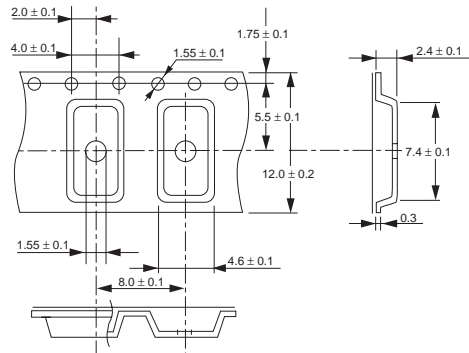
**TYPICAL PERFORMANCE CURVES** ( $T_A = 25^\circ\text{C}$ )



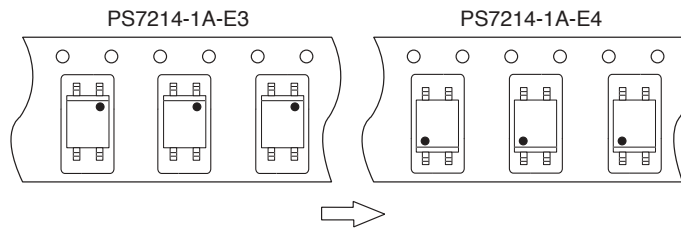
Remark: The graphs indicate nominal characteristics.

**TAPING SPECIFICATIONS**

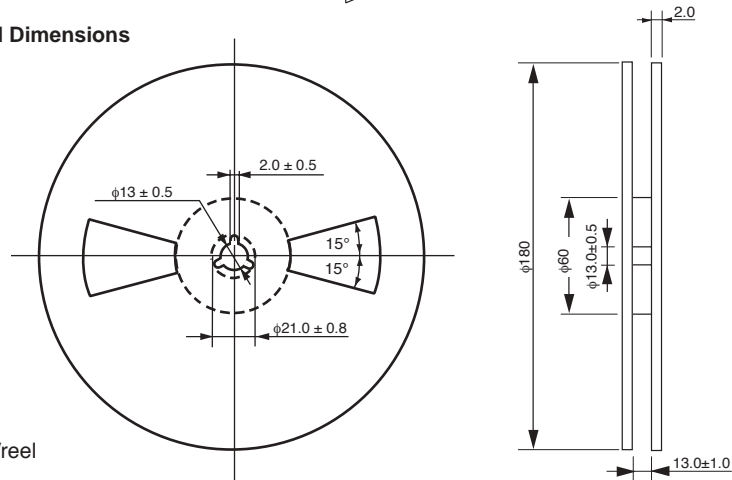
**Tape Outline and Dimensions**



**Tape Direction**



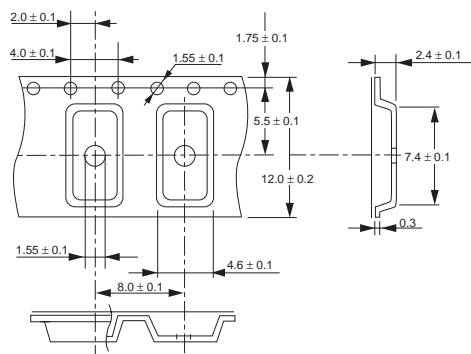
**Reel Outline and Dimensions**



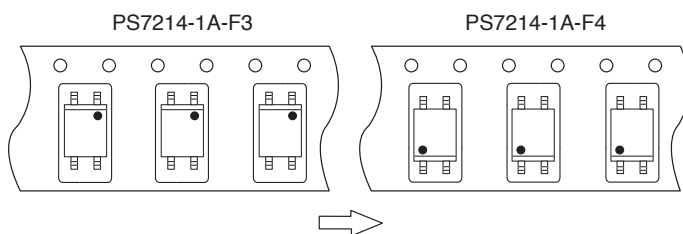
Packing: 900 pcs/reel

# TAPING SPECIFICATIONS

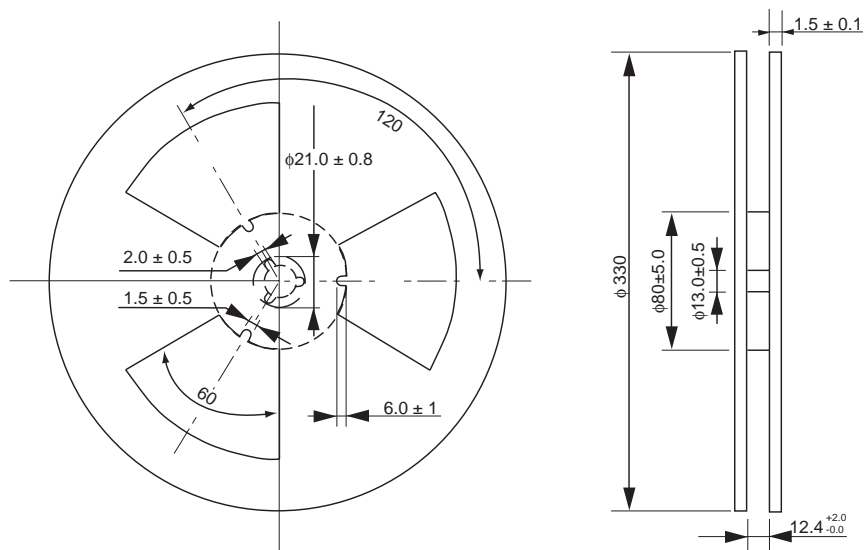
## Tape Outline and Dimensions



## Tape Direction



## Reel Outline and Dimensions

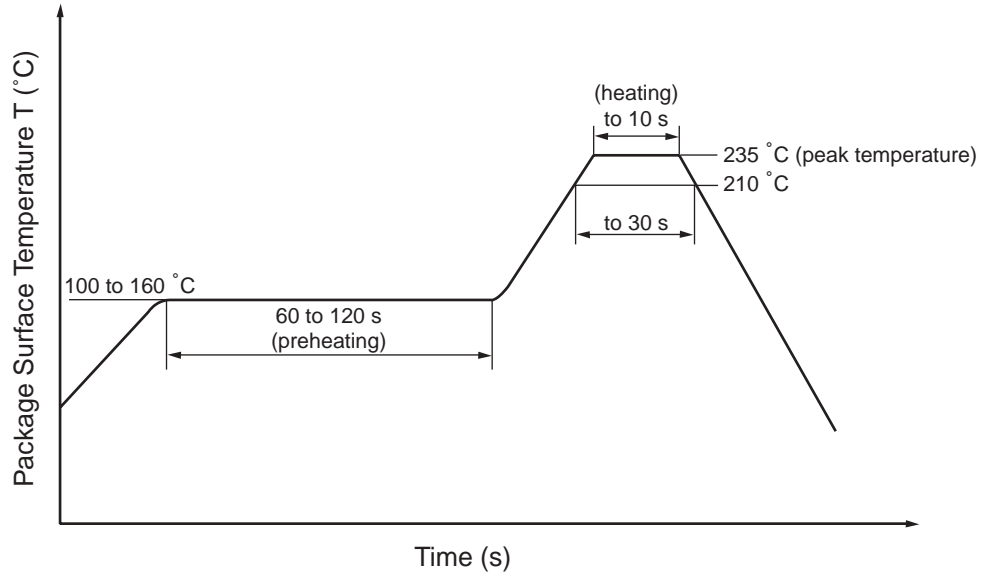


Packing: 3500 pcs/reel

## 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.)



### (2) Dip soldering

- Temperature 260° or below (package surface 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.

#### Life Support Applications

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