

4 PIN SOP, 100 V BREAKDOWN VOLTAGE 1-CH OPTICAL COUPLED MOSFET

PS7212-1A

FEATURES

- **SMALL AND THIN PACKAGE:**
4 pin SOP, Height = 2.1 mm
- **1 CHANNEL TYPE:**
1a output
- **LOW LED OPERATING CURRENT:**
 $I_F = 2 \text{ mA}$
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **LOW OFFSET VOLTAGE**
- **SURFACE MOUNT AVAILABLE:**
PS7212-1A-E3, E4, F3, F4

DESCRIPTION

The PS7212-1A is a solid state relay containing GaAs LEDs on the light emitting side (input side) and normally open (N.O.) MOS FETs on the output side.

It is suitable for analog control because of its low offset and high linearity.

APPLICATIONS

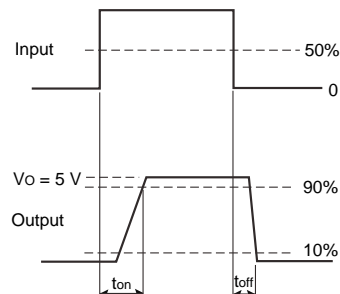
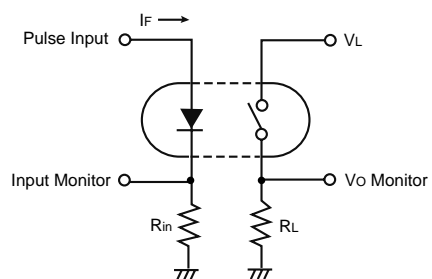
- LAPTOP PC, PDA
- MODEM, CARD
- TELEPHONE, FAX
- MEASUREMENT EQUIPMENT

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

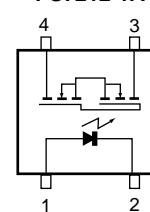
PART NUMBER			PS7214-1A			
SYMBOLS		PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V_F	Forward Voltage, $I_F = 10 \text{ mA}$	V		1.2	1.4
	I_R	Reverse Current, $V_R = 5 \text{ V}$	μA			5.0
MOS FET	I_{LOFF}	Off-State Leakage Current, $V_D = 100 \text{ V}$	μA		0.03	1.0
	C_{OUT}	Output Capacitance, $V_D = 0 \text{ V}$, $f = 1 \text{ MHz}$	pF		57	
Coupled	I_{Fon}	LED On-State Current, $I_L = 200 \text{ mA}$	mA			2.0
	R_{on}	On-state Resistance, $I_F = 10 \text{ mA}$, $I_L = 10 \text{ mA}$ $I_F = 10 \text{ mA}$, $I_L = 200 \text{ mA}$ $t \leq 10 \text{ ms}$	Ω		3.0	6.0
	t_{ON}	Turn-on Time ¹ , $I_F = 10 \text{ mA}$, $V_O = 5 \text{ V}$, $PW \geq 10 \text{ ms}$	ms		0.35	1.0
	t_{OFF}	Turn-off Time ¹ , $I_F = 10 \text{ mA}$, $V_O = 5 \text{ V}$, $PW \geq 10 \text{ ms}$	ms		0.08	0.2
	$R_{\text{I-O}}$	Isolation Resistance, $V_{\text{I-O}} = 1.0 \text{ kVdc}$	Ω	10^9		
$C_{\text{I-O}}$	Isolation Capacitance, $V = 0 \text{ V}$, $f = 1 \text{ MHz}$	pF		0.5		

Note:

1. Test Circuit for Switching Time



PS7212-1A



PS7212-1A

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
I _F	Forward Current (DC)	mA	50
V _R	Reverse Voltage	V	5.0
P _D	Power Dissipation	mW	50
I _{FP}	Peak Forward Current ²	A	1
MOSFET			
V _L	Break Down Voltage	V	100
I _L	Continuous Load Current	mA	200
I _{LP}	Pulse Load Current ³ (AC/DC Connection)	mA	400
P _D	Power Dissipation	mW	300
Coupled			
BV	Isolation Voltage ⁴	Vr.m.s.	1500
P _T	Total Power Dissipation	mW	350
T _A	Operating Ambient Temp.	°C	-40 to +80
T _{STG}	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_A = 25 °C, RH = 60 % between input and output.

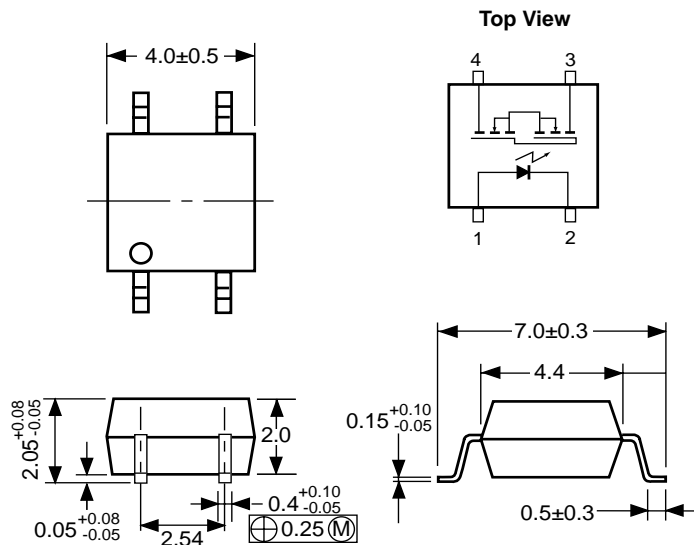
RECOMMENDED OPERATING CONDITIONS (T_A = 25°C)

PART NUMBER		PS7212-1A			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
I _F	LED Operating Current	mA	2	10	20
V _F	LED Off Voltage	V	0		0.5

ORDERING INFORMATION

PART NUMBER	PACKING STYLE
PS7212-1A	Magazine case, 100 pcs
PS7212-1A-E3	Embossed Tape, 900 pcs/reel
PS7212-1A-E4	
PS7212-1A-F3	Embossed Tape, 3500 pcs/reel
PS7212-1A-F4	

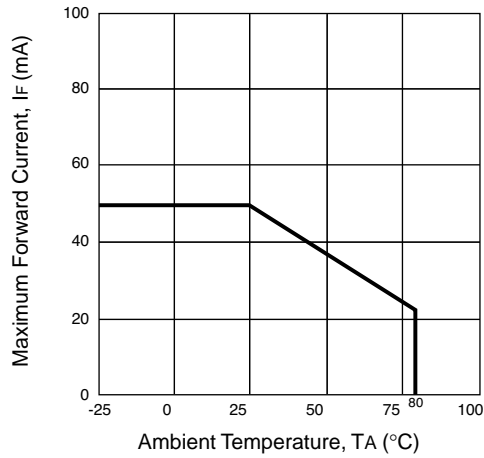
OUTLINE DIMENSIONS (Units in mm)



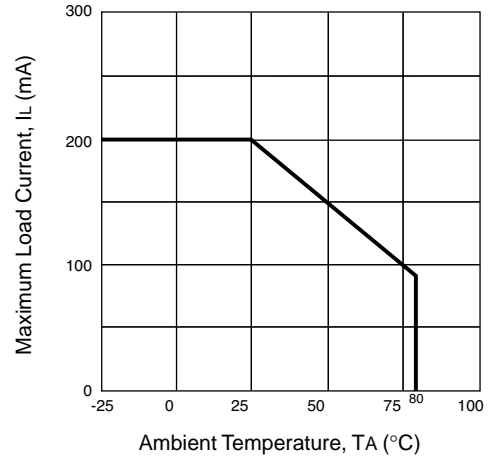
- LED Anode
- LED Cathode
- MOS FET
- MOS FET

TYPICAL PERFORMANCE CURVES (TA = 25°C)

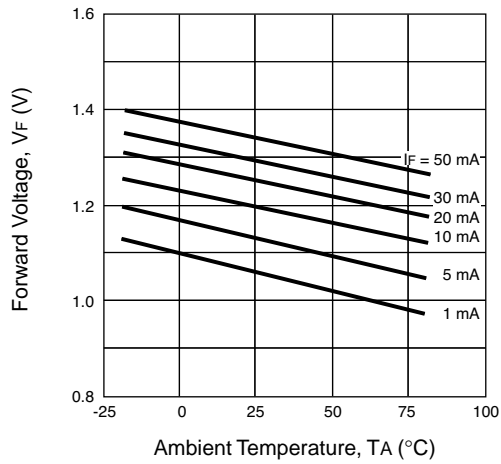
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



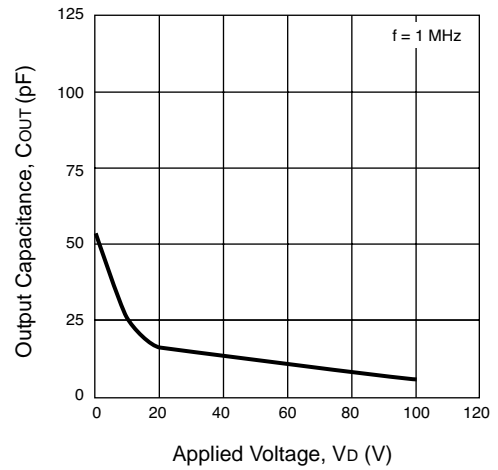
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



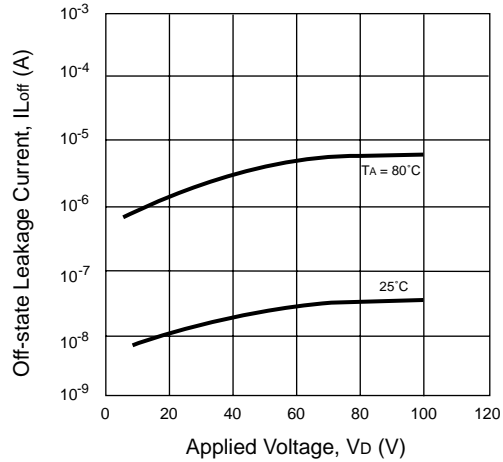
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



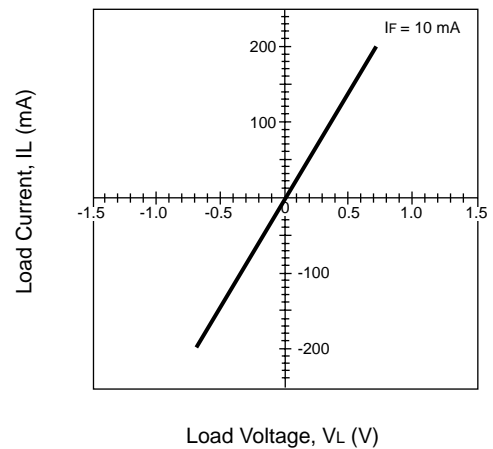
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



OFF-STATE LEAKAGE CURRENT vs. APPLIED VOLTAGE

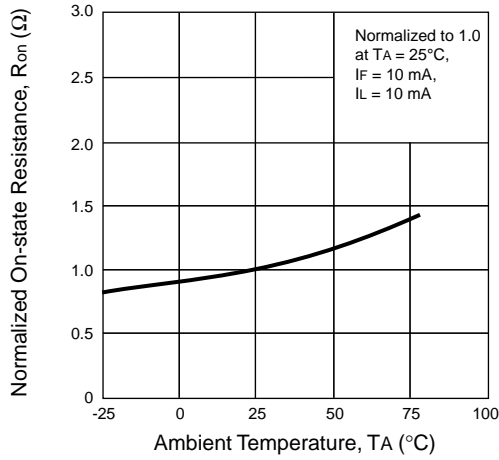


LOAD CURRENT vs. LOAD VOLTAGE

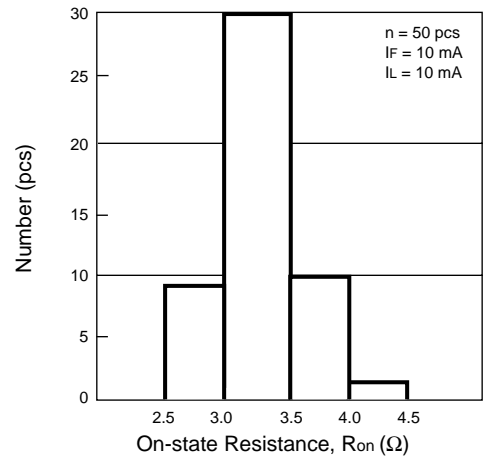


TYPICAL PERFORMANCE CURVES (TA = 25°C)

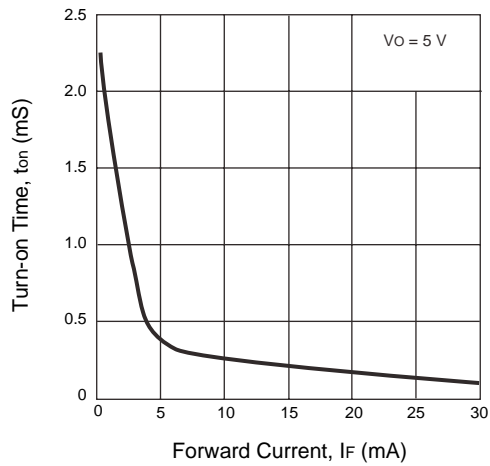
NORMALIZED ON-STATE RESISTANCE vs. APPLIED VOLTAGE



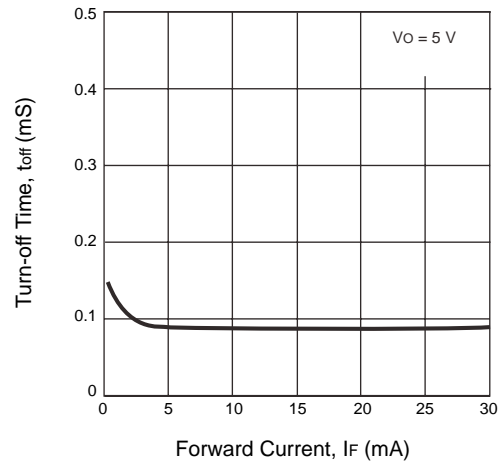
ON-STATE RESISTANCE DISTRIBUTION



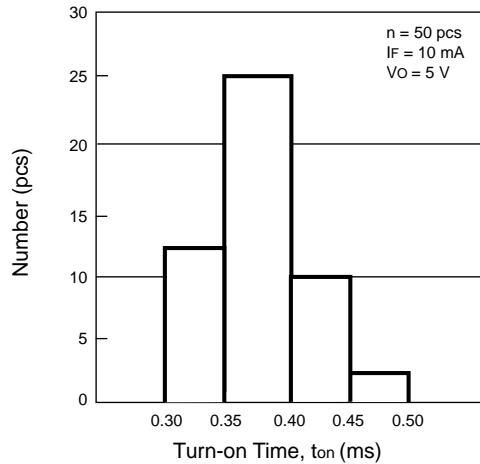
TURN-ON TIME vs. FORWARD CURRENT



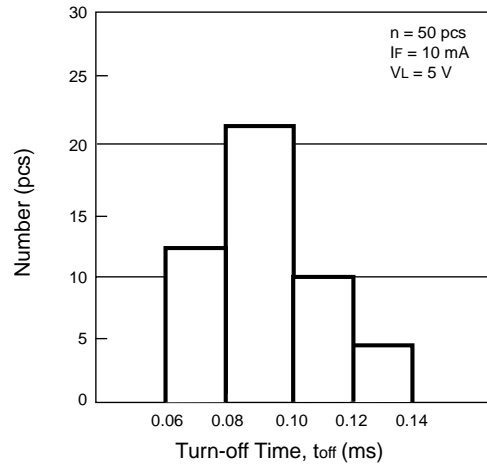
TURN-OFF TIME vs. FORWARD CURRENT



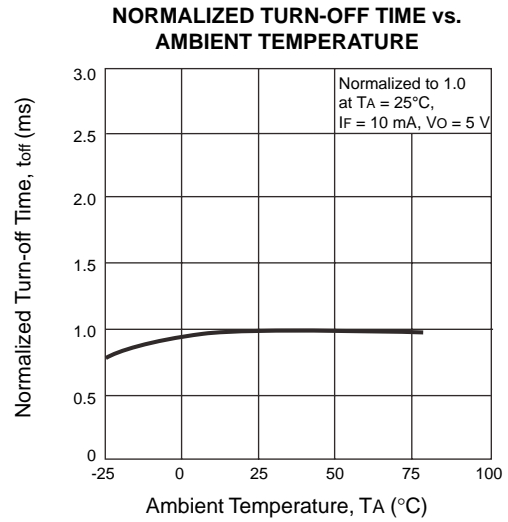
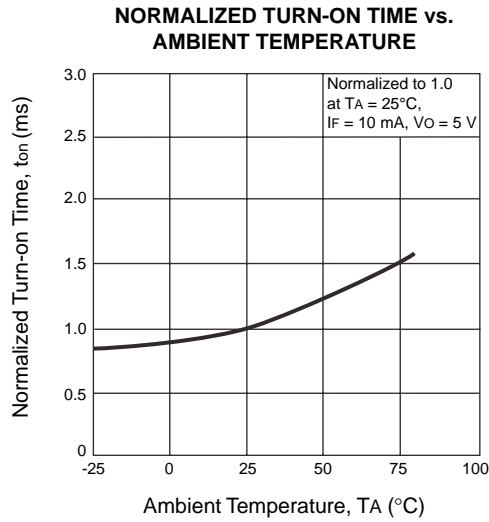
TURN-ON TIME DISTRIBUTION



TURN-OFF TIME DISTRIBUTION

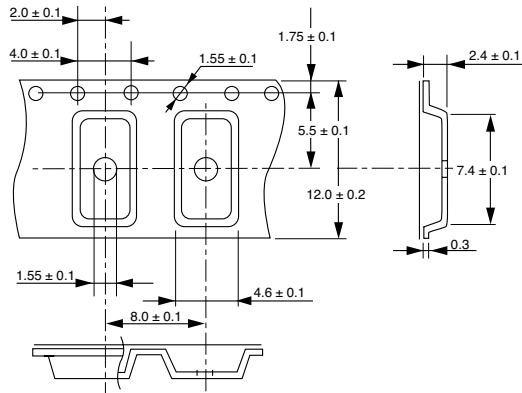


TYPICAL PERFORMANCE CURVES (TA = 25°C)

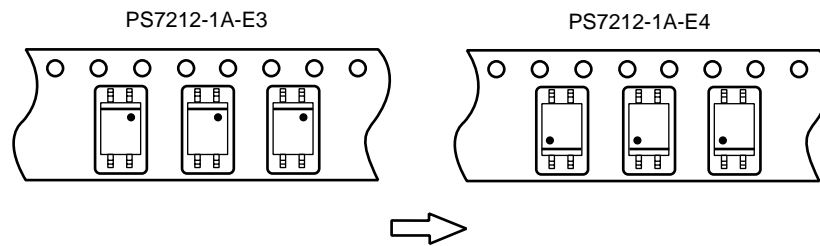


TAPING SPECIFICATIONS (Units in mm)

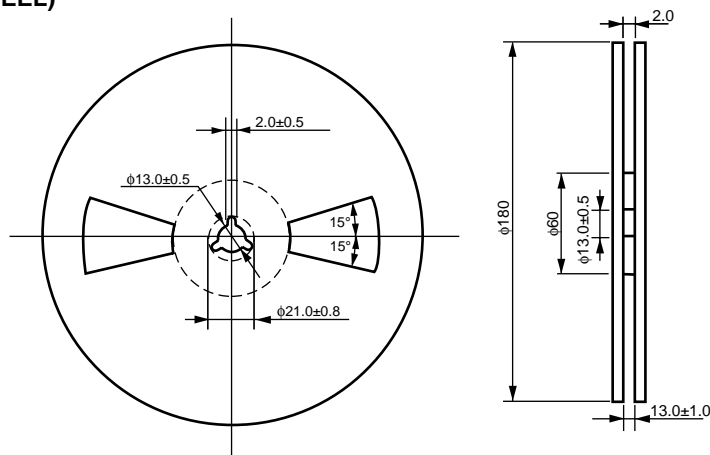
OUTLINE AND DIMENSIONS (TAPE)



TAPE DIRECTION



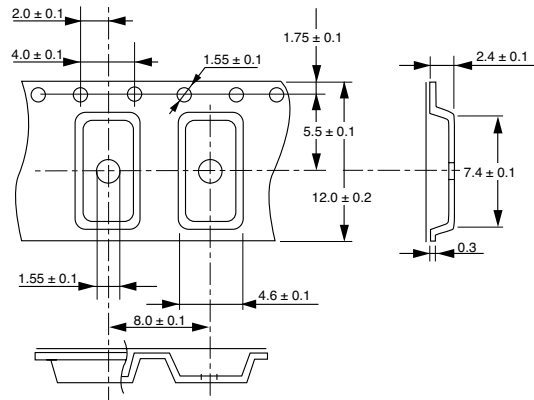
OUTLINE AND DIMENSIONS (REEL)



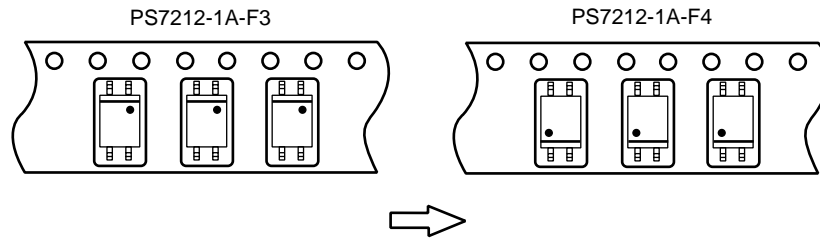
PS7212-1A

TAPING SPECIFICATIONS (Units in mm)

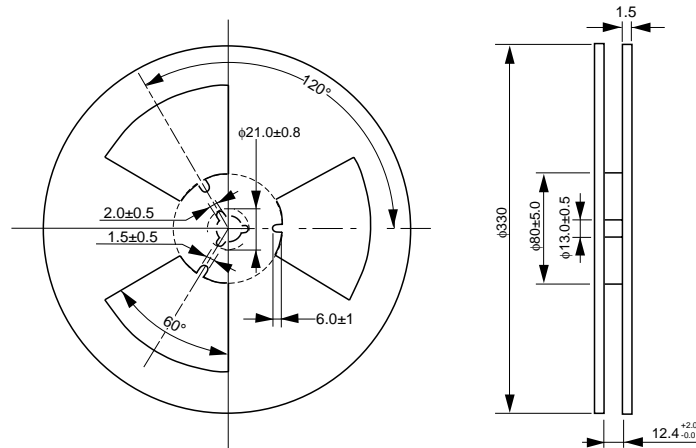
OUTLINE AND DIMENSIONS (TAPE)



TAPE DIRECTION



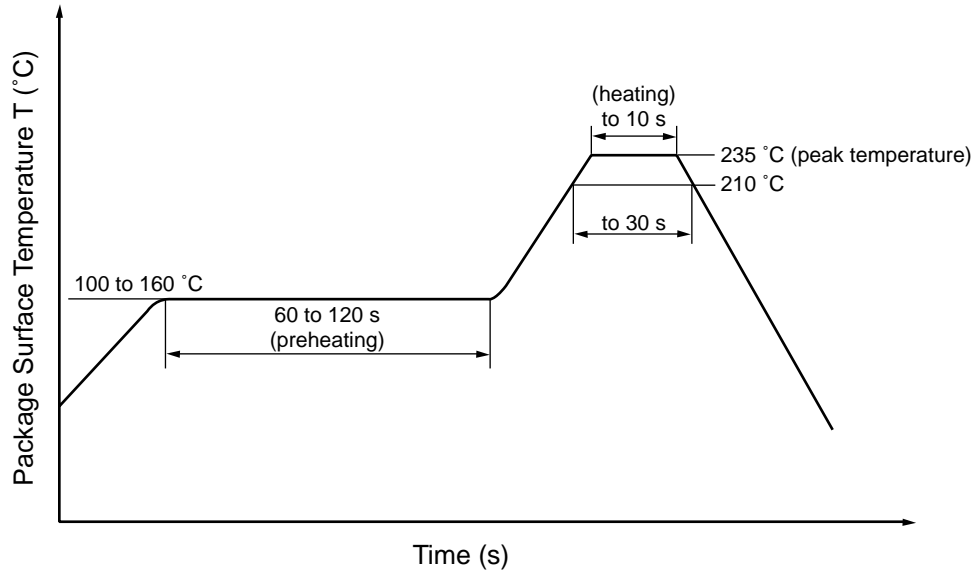
OUTLINE AND DIMENSIONS (REEL)



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 °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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06/04/2001