

DATA SHEET

NEC

**Solid State Relay
OCMOS FET**

PS7112-1A,PS7112L-1A

**6-PIN DIP, 200 mA CONTINUOUS LOAD CURRENT
1-ch Optical Coupled MOS FET**

DESCRIPTION

The PS7112-1A and PS7112L-1A are solid state relays containing GaAs LEDs on the light emitting side (input side) and MOS FETs on the output side.

They are suitable for analog signal control because of their low offset and high linearity.

The PS7112L-1A has a surface mount type lead.

★ FEATURES

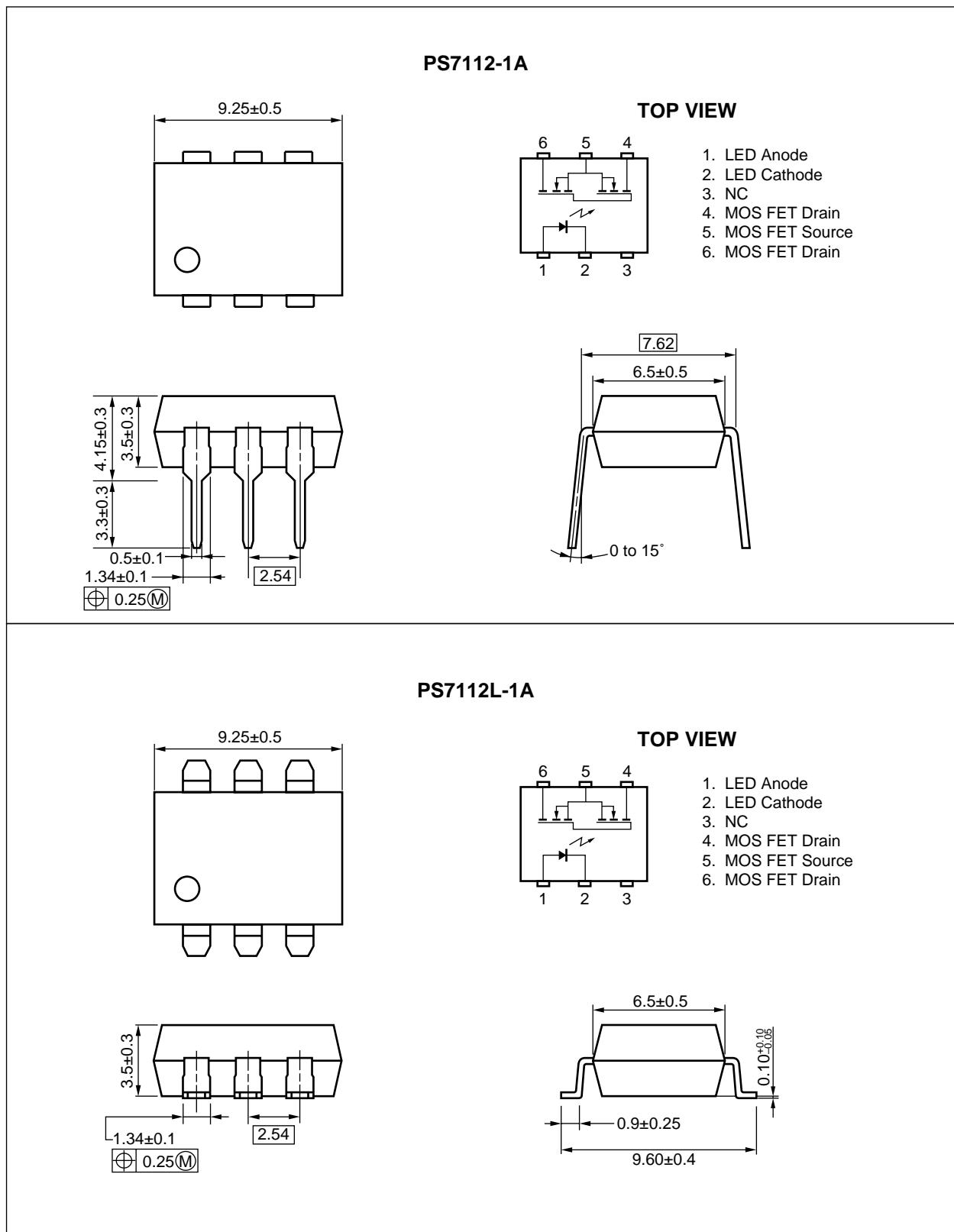
- 1 channel type (1 a output)
- Low LED operating current ($I_F = 2 \text{ mA}$)
- Designed for AC/DC switching line changer
- Small package (6-pin DIP)
- Low offset voltage
- PS7112L-1A: Surface mount type
- UL approved: File No. E72422 (S)
- BSI approved: No. 8245/8246
- CSA approved: No. CA 101391

APPLICATIONS

- Exchange equipment
- Measurement equipment
- FA/OA equipment

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.
Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

PACKAGE DIMENSIONS (in millimeters)



★ ORDERING INFORMATION

Part Number	Package	Packing Style	Application Part Number ^{*1}
PS7112-1A	6-pin DIP	Magazine case 50 pcs	PS7112-1A
PS7112L-1A		Embossed Tape 1 000 pcs/reel	PS7112L-1A
PS7112L-1A-E3			
PS7112L-1A-E4			

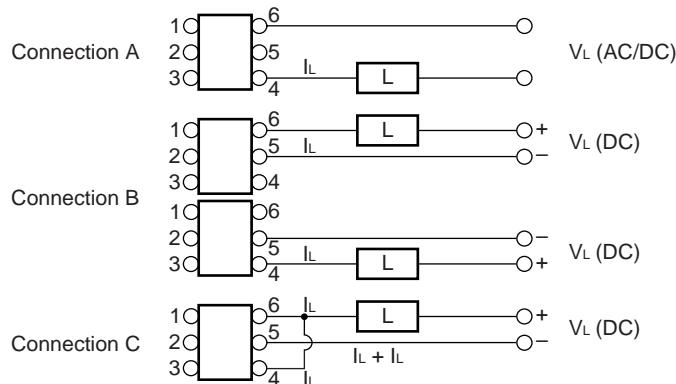
*1 For the application of the Safety Standard, following part number should be used.

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Diode	Forward Current (DC)	I_F	50	mA
	Reverse Voltage	V_R	5.0	V
	Power Dissipation	P_D	50	mW
	Peak Forward Current ¹	I_{FP}	1	A
★ MOS FET	Break Down Voltage	V_L	100	V
	Continuous Load Current ²	I_L	200	mA
			250	
			400	
	Pulse Load Current ³ (AC/DC Connection)	I_{LP}	400	mA
	Power Dissipation	P_D	560	mW
Isolation Voltage ⁴		BV	1 500	Vr.m.s.
Total Power Dissipation		P_T	610	mW
Operating Ambient Temperature		T_A	-40 to +80	°C
Storage Temperature		T_{stg}	-40 to +100	°C

*1 PW = 100 μs , Duty Cycle = 1 %

*2 Conditions: $I_F \geq 2$ mA. The following types of load connections are available.



*3 PW = 100 ms, 1 shot

*4 AC voltage for 1 minute at $T_A = 25^\circ\text{C}$, RH = 60 % between input and output

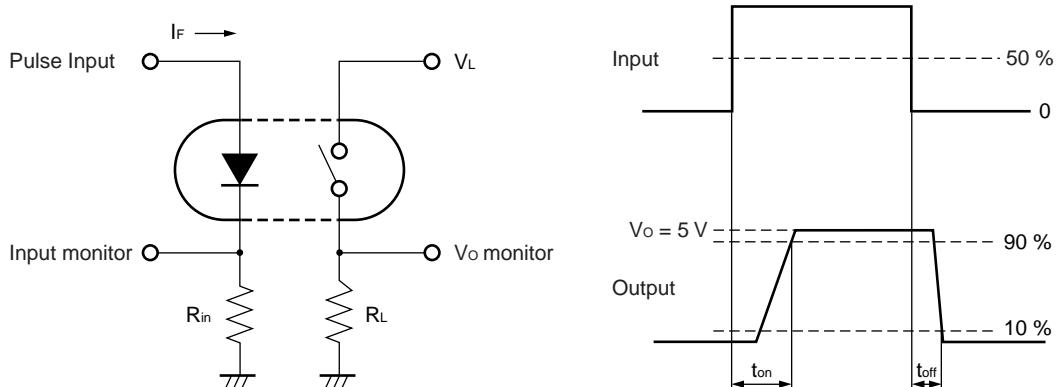
RECOMMENDED OPERATING CONDITIONS ($T_A = 25^\circ\text{C}$)

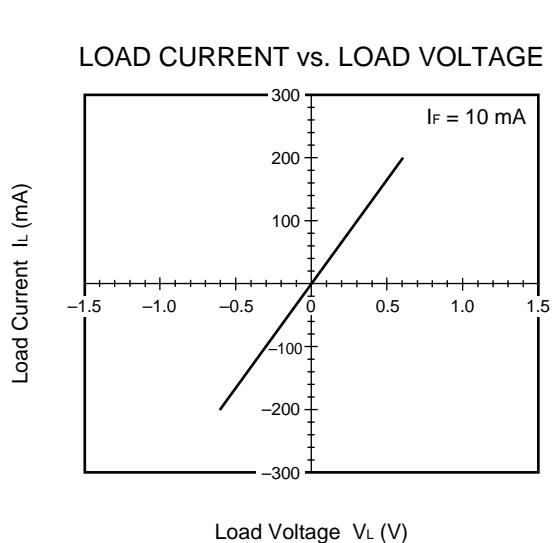
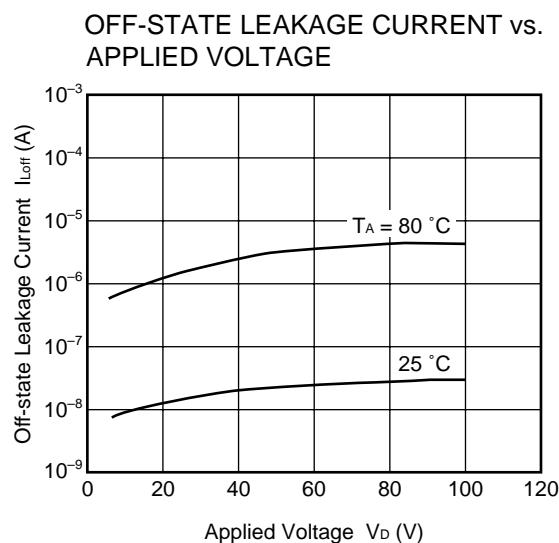
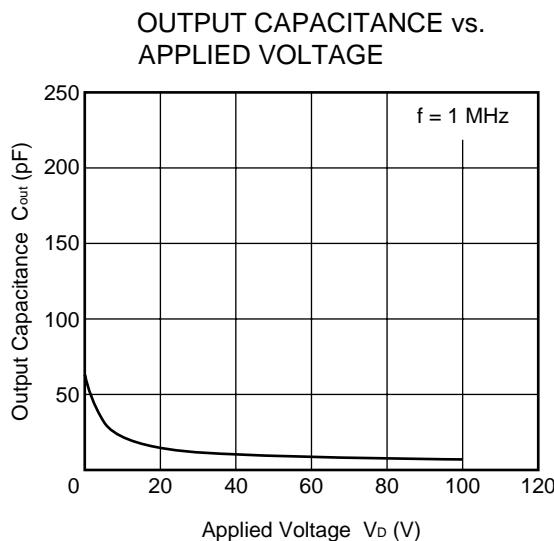
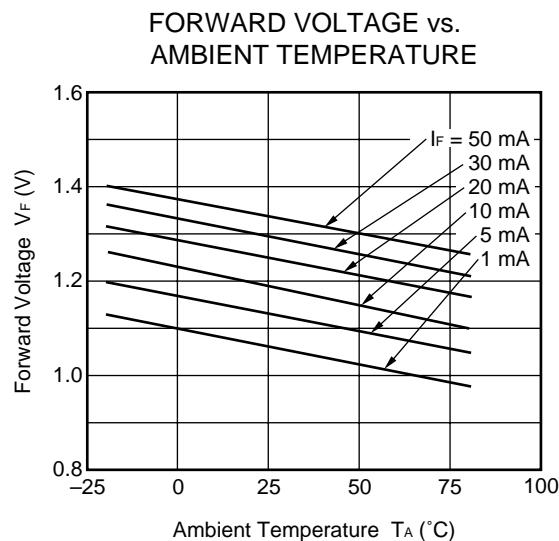
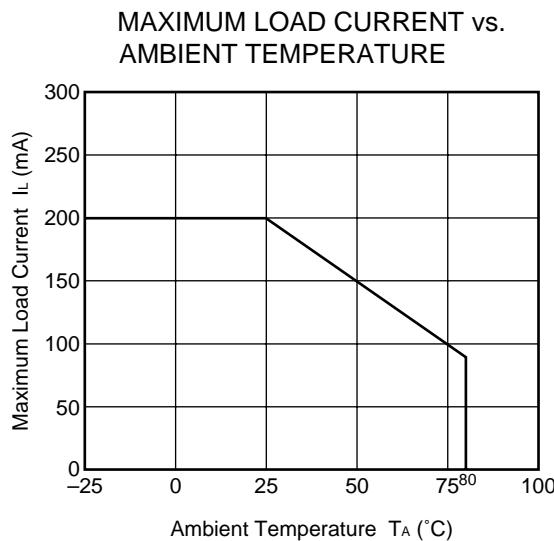
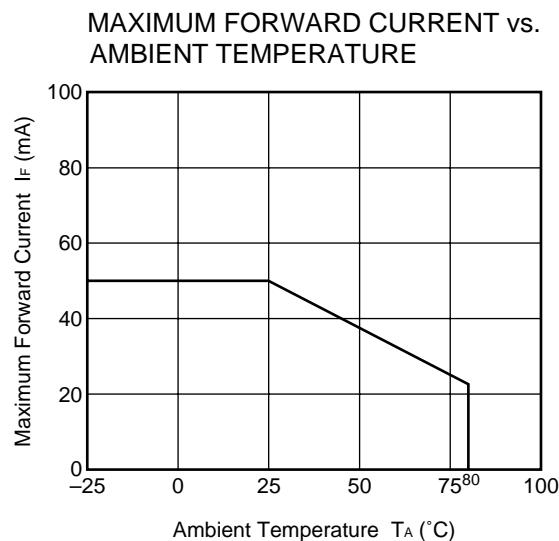
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
LED Operating Current	I_F	2	10	20	mA
LED Off Voltage	V_F	0		0.5	V

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

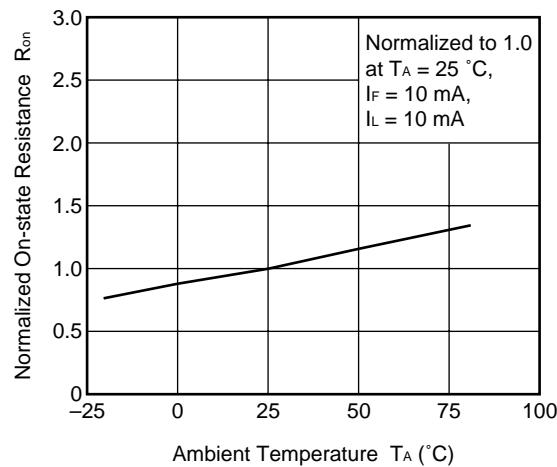
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V_F	$I_F = 10 \text{ mA}$		1.2	1.4	V
	Reverse Current	I_R	$V_R = 5 \text{ V}$			5.0	μA
MOS FET	Off-state Leakage Current	I_{loff}	$V_D = 100 \text{ V}$		0.03	1.0	μA
	Output Capacitance	C_{out}	$V_D = 0 \text{ V}, f = 1 \text{ MHz}$		57		pF
Coupled	LED On-state Current	I_{fon}	$I_L = 200 \text{ mA}$			2.0	mA
	On-state Resistance	R_{on1}	$I_F = 10 \text{ mA}, I_L = 10 \text{ mA}$		3.0	6.0	Ω
		R_{on2}	$I_F = 10 \text{ mA}, I_L = 200 \text{ mA}, t \leq 10 \text{ ms}$				
	Turn-on Time ¹	t_{on}	$I_F = 10 \text{ mA}, V_o = 5 \text{ V}, PW \geq 10 \text{ ms}$		0.1	0.4	ms
	Turn-off Time ¹	t_{off}			0.03	0.2	
	Isolation Resistance	$R_{\text{i-o}}$	$V_{\text{i-o}} = 1.0 \text{ kVDC}$	10^9			Ω
	Isolation Capacitance	$C_{\text{i-o}}$	$V = 0 \text{ V}, f = 1 \text{ MHz}$		1.1		pF

*1 Test Circuit for Switching Time

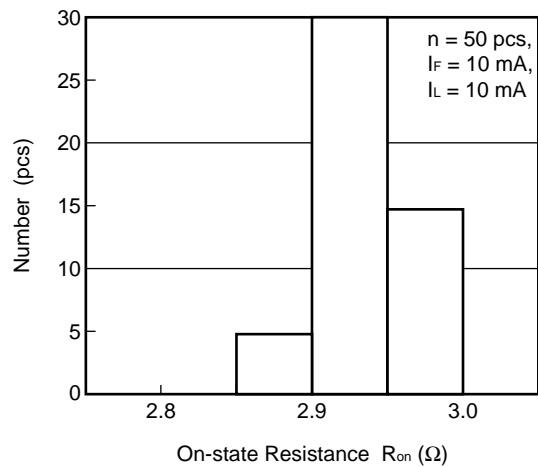


★ TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

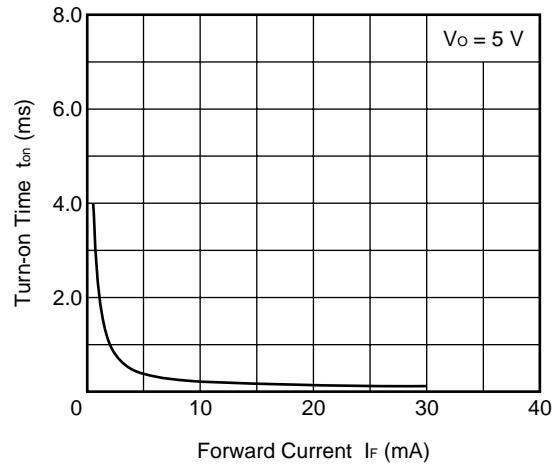
NORMALIZED ON-STATE RESISTANCE vs.
AMBIENT TEMPERATURE



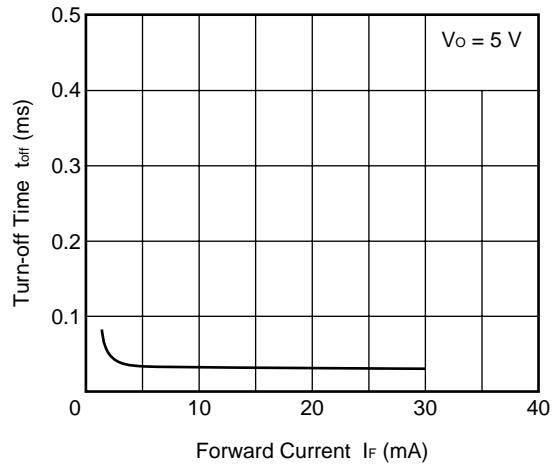
ON-STATE RESISTANCE DISTRIBUTION



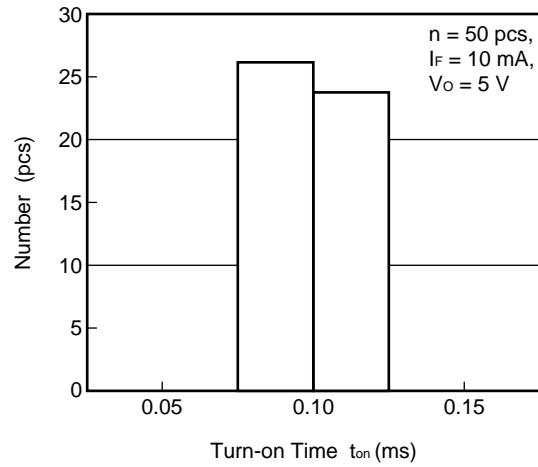
TURN-ON TIME vs. FORWARD CURRENT



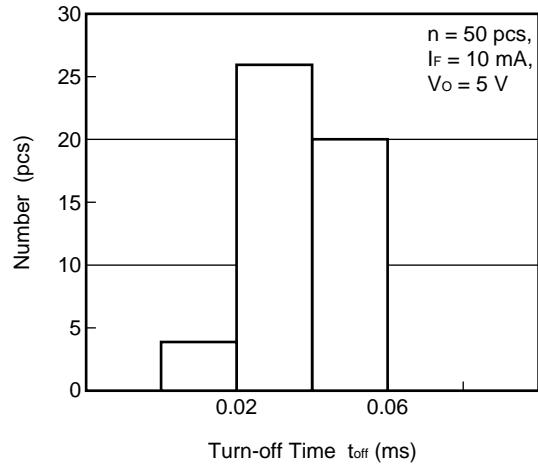
TURN-OFF TIME vs. FORWARD CURRENT

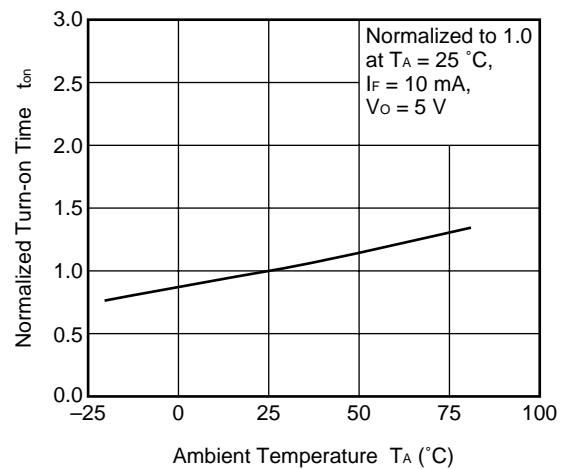
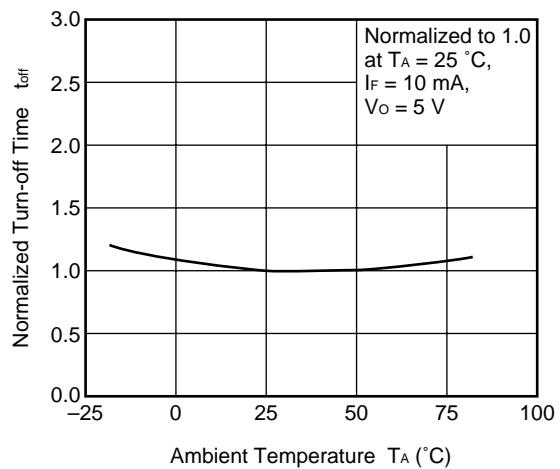


TURN-ON TIME DISTRIBUTION



TURN-OFF TIME DISTRIBUTION

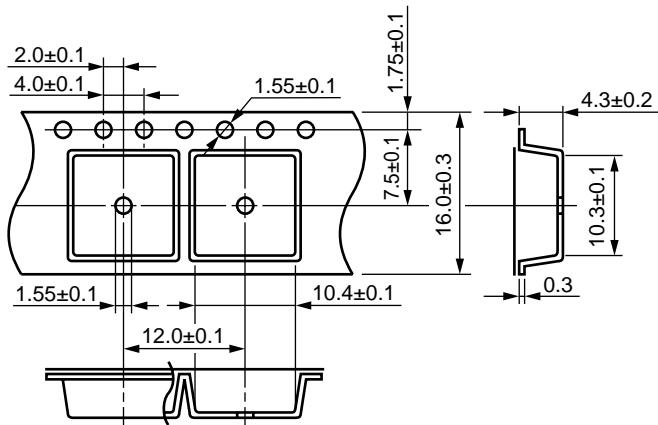


NORMALIZED TURN-ON TIME vs.
AMBIENT TEMPERATURENORMALIZED TURN-OFF TIME vs.
AMBIENT TEMPERATURE

Remark The graphs indicate nominal characteristics.

★ TAPING SPECIFICATIONS (in millimeters)

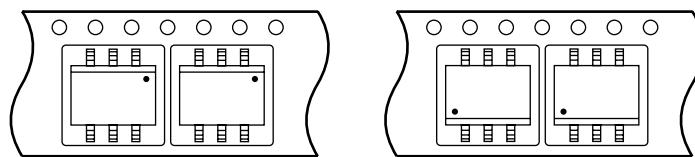
Outline and Dimensions (Tape)



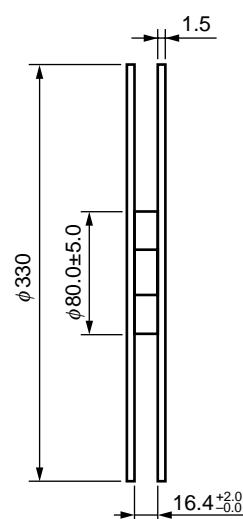
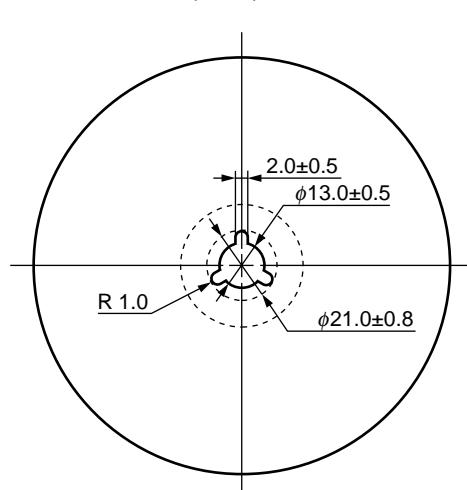
Tape Direction

PS7112L-1A-E3

PS7112L-1A-E4



Outline and Dimensions (Reel)



Packing: 1 000 pcs/reel

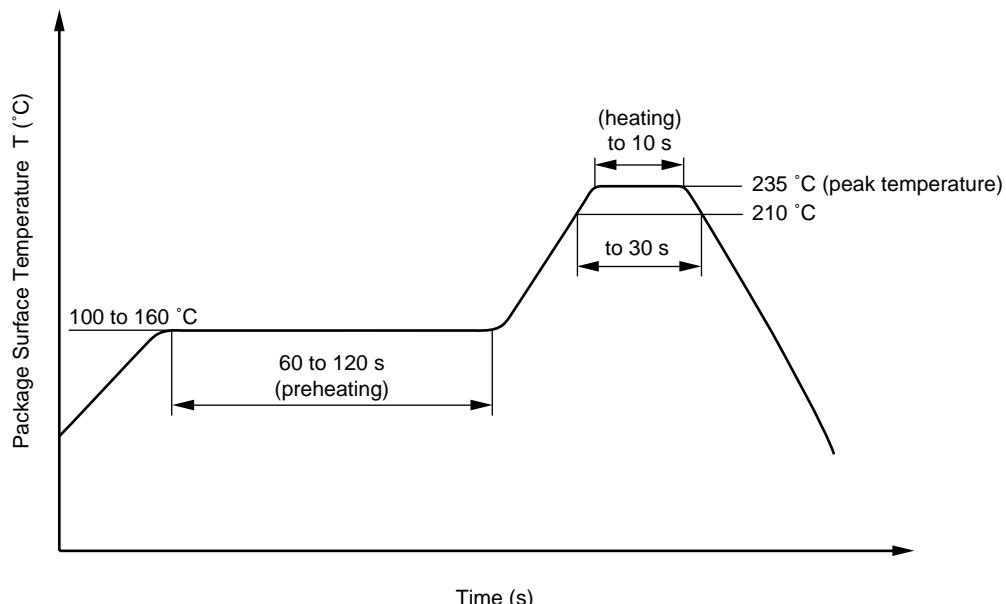
RECOMMENDED SOLDERING CONDITIONS

(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 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.

[MEMO]

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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Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

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