

### FEATURES

- **DESIGNED FOR AC/DC SWITCHING APPLICATIONS**
- **IDEAL FOR ANALOG SIGNAL CONTROL APPLICATIONS**
- **LOW LED OPERATING CURRENT:**  
IF = 2 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

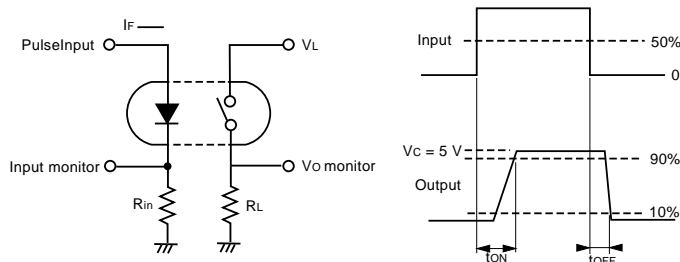
- **VOICE TELEPHONY**
- **AUDIO EQUIPMENT**
- **AUDIO INSTRUMENTATION**

### ELECTRICAL CHARACTERISTICS (TA = 25 °C)

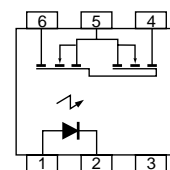
PART NUMBER			PS7112-1A, PS7112L-1A			
	SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	VF	Forward Voltage, IF = 10 mA	V		1.2	1.4
	IR	Reverse Current, VR = 5 V	μA			5.0
MOSFET	ILOFF	Off-State Leakage Current, VD = 100 V	μA		0.03	1
	COUT	Output Capacitance, VD = 0 V, f = 1 MHz			57	
Coupled	IFon	LED On-state Current, IL = 200 mA	mA			2.0
	RON1	On-State Resistance, IF = 10 mA, IL = 10 mA	Ω		3.0	6.0
	RON2					
	tON	Turn-on Time IF = 10 mA, VO = 5 V, PW ≥ 10 ms	ms		0.1	0.4
	tOFF	Turn-off Time IF = 10 mA, VO = 5 V, PW ≥ 10 ms	ms		0.03	0.2
	RI-O	Isolation Resistance, VI-O = 1.0 kVDC	Ω	10 <sup>9</sup>		
	CI-O	Isolation Capacitance, V = 0 V, f = 1 MHz	pF		1.1	

Note:

1. Test Circuit for Switching Time:



PS7112-1A, PS7112L-1A



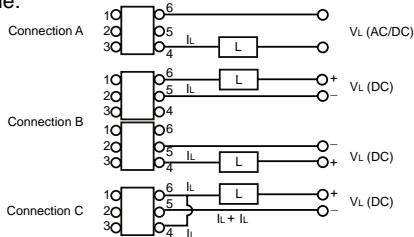
# PS7112-1A, PS7112L-1A

## 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

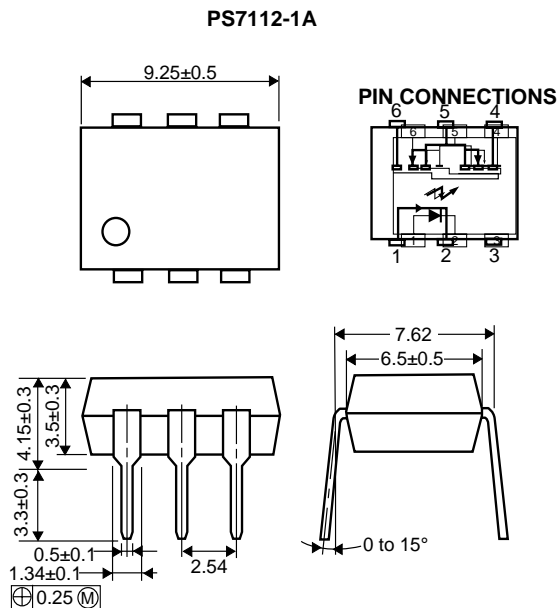
### Notes:

- 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.

## OUTLINE DIMENSIONS (Units in mm)



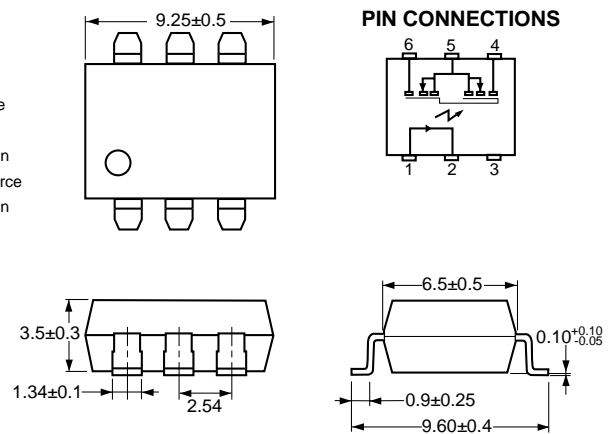
## RECOMMENDED OPERATING CONDITIONS (T<sub>A</sub> = 25°C)

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		
PS7112L-1A-E4		Embossed Tape 1000 pcs/reel

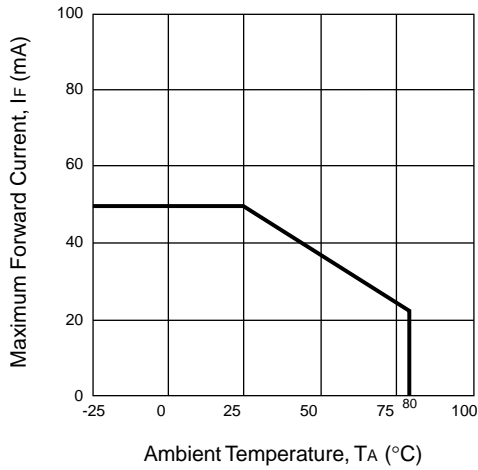
## PS7112L-1A



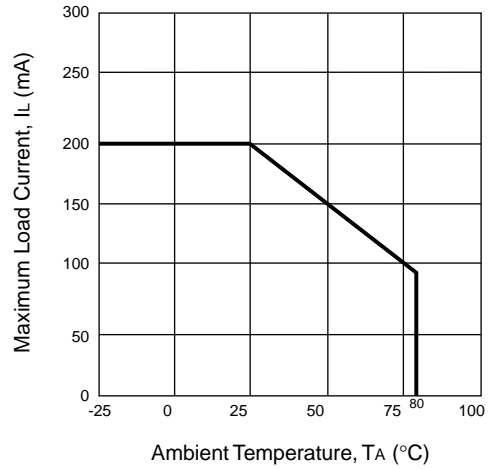
- LED Anode
- LED Cathode
- NC
- MOSFET Drain
- MOSFET Source
- MOSFET Drain

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

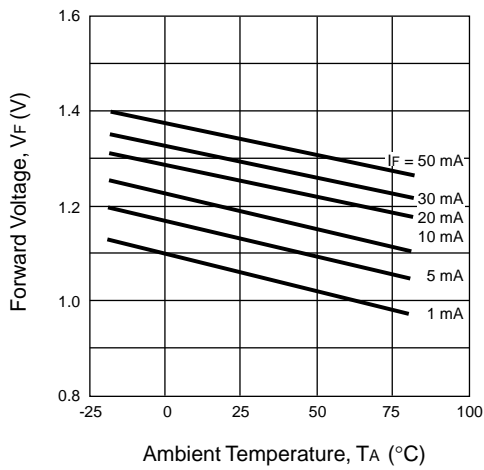
**MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE**



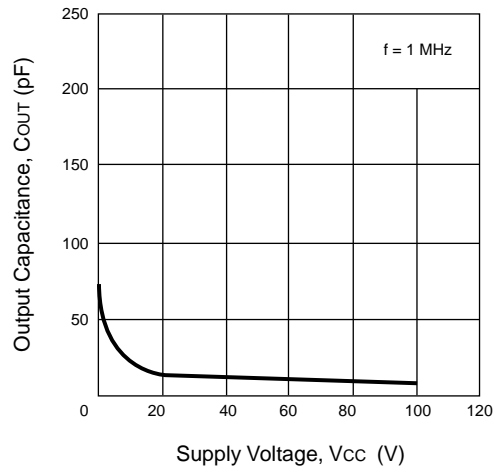
**MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE**



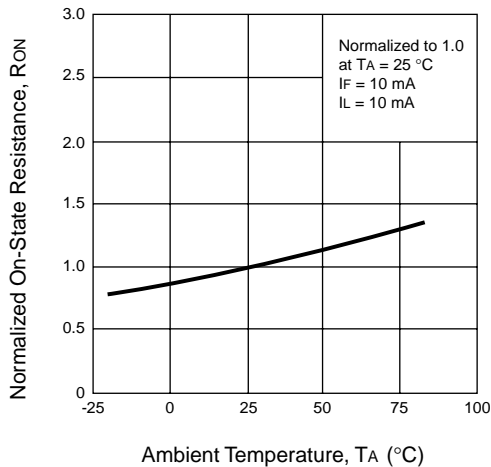
**FORWARD VOLTAGE vs. AMBIENT TEMPERATURE**



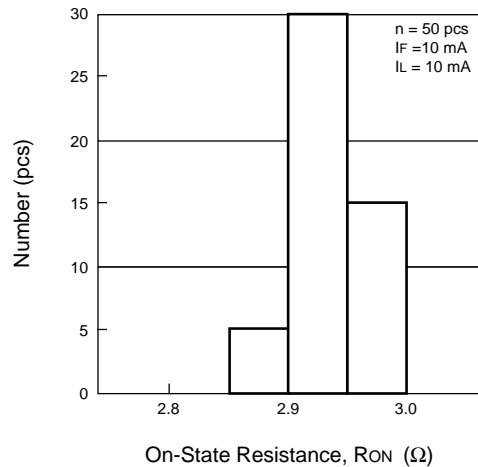
**OUTPUT CAPACITANCE vs. SUPPLY VOLTAGE**



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

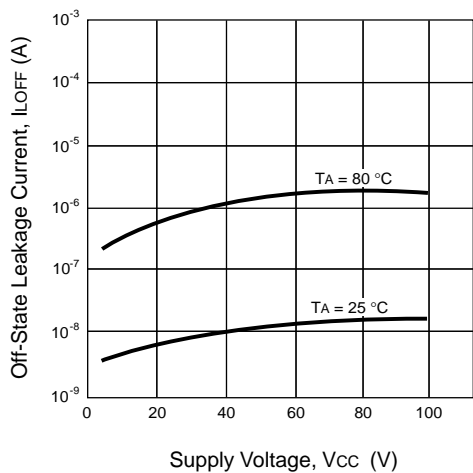


**ON-STATE RESISTANCE DISTRIBUTION**

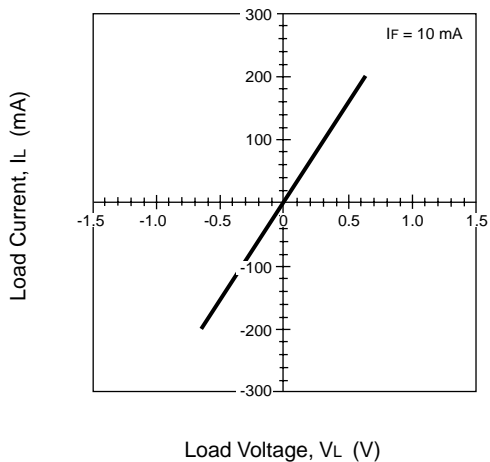


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

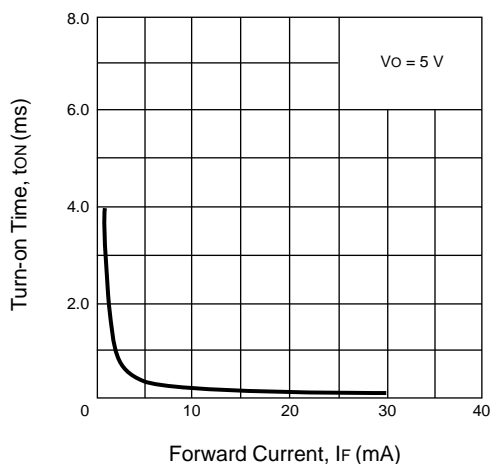
OFF-STATE LEAKAGE CURRENT vs. SUPPLY VOLTAGE



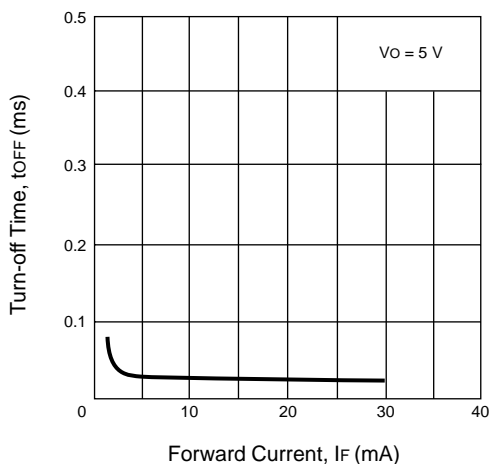
LOAD CURRENT vs. LOAD VOLTAGE



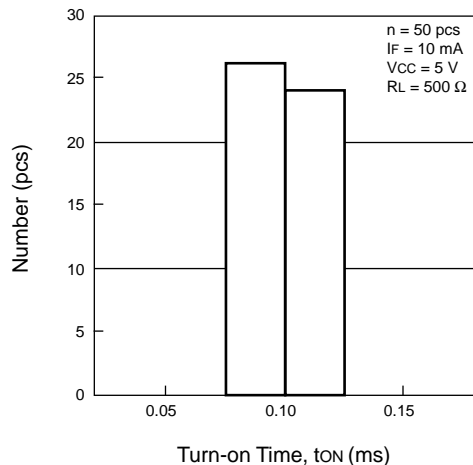
TURN-ON TIME vs. FORWARD CURRENT



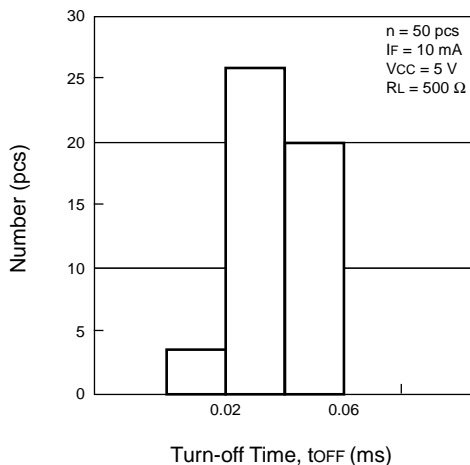
TURN-OFF TIME vs. FORWARD CURRENT



TURN-ON TIME DISTRIBUTION

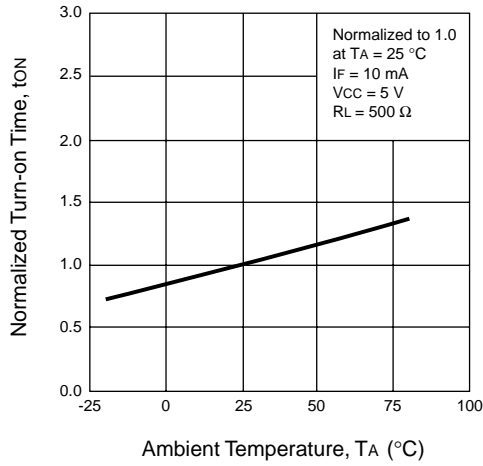


TURN-OFF TIME DISTRIBUTION

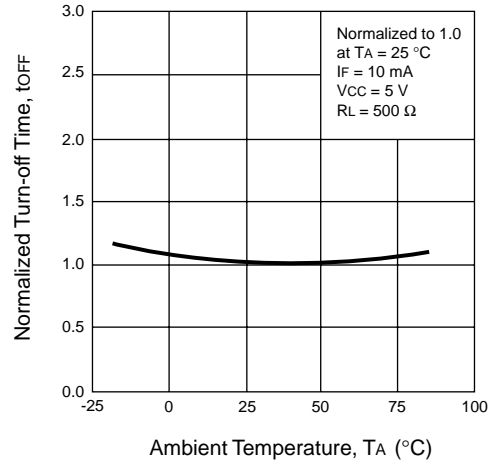


**TYPICAL PERFORMANCE CURVES** ( $T_A = 25\text{ }^\circ\text{C}$ )

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

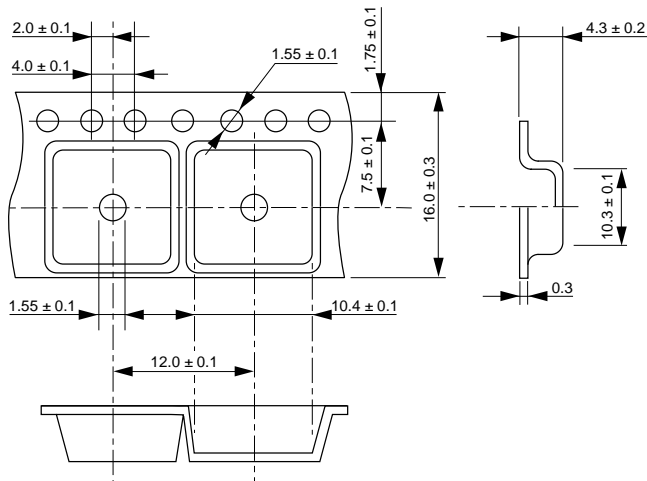


**NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE**

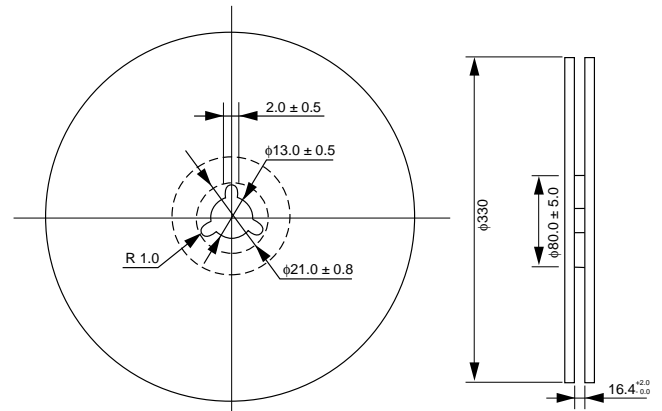


**TAPING SPECIFICATIONS** (Units in mm)

**OUTLINE AND DIMENSIONS (TAPE)**

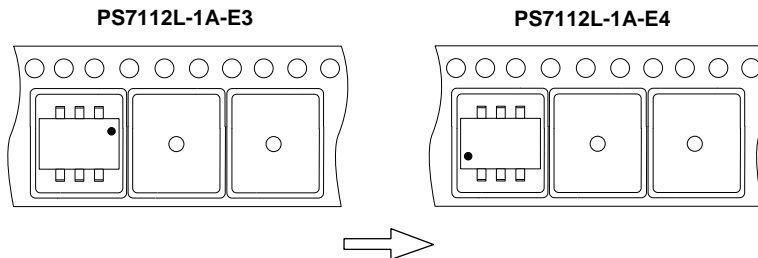


**OUTLINE AND DIMENSIONS (REEL)**



Packaging : 1000 pcs/reel

**TAPING DIRECTION**

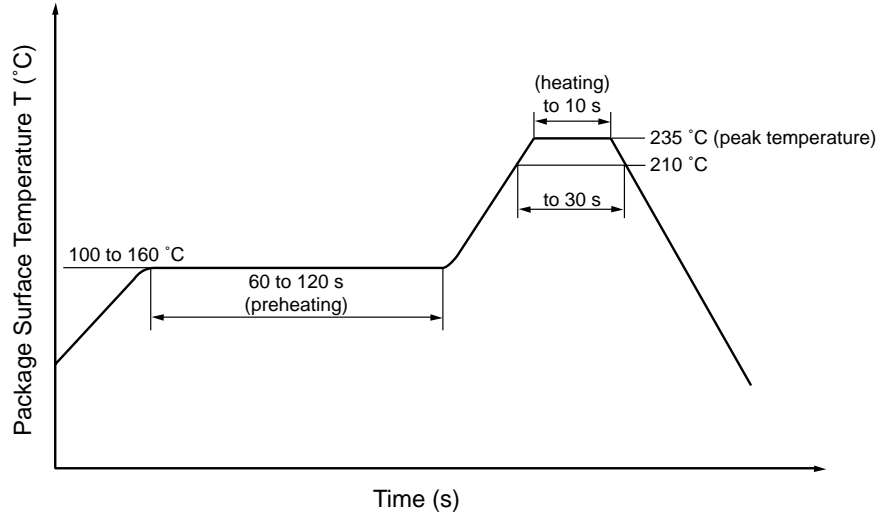


**RECOMMENDED SOLDERING CONDITIONS**

**(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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