

FEATURES

- DESIGNED FOR AC/DC SWITCHING APPLICATIONS
- IDEAL FOR ANALOG SIGNAL CONTROL APPLICATIONS
- LOW LED OPERATING CURRENT:
 $I_F = 2 \text{ mA}$
- 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

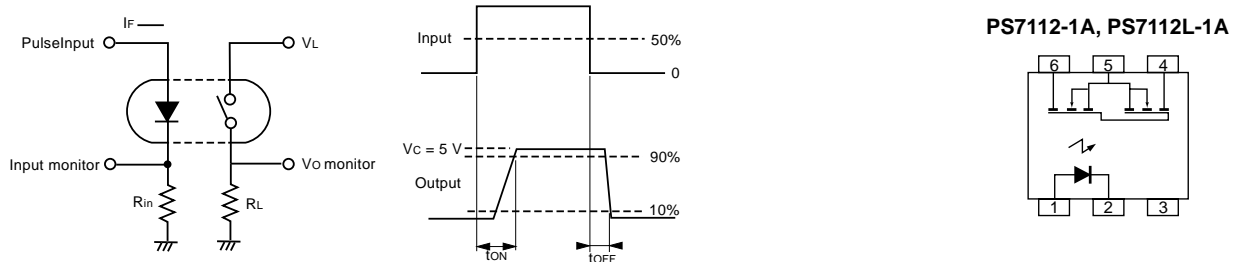
- VOICE TELEPHONY
- AUDIO EQUIPMENT
- AUDIO INSTRUMENTATION

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

PART NUMBER			PS7112-1A, PS7112L-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
MOSFET	I_{LOFF}	Off-State Leakage Current, $V_D = 100 \text{ V}$	μA		0.03	1
	C_{OUT}	Output Capacitance, $V_D = 0 \text{ V}$, $f = 1 \text{ MHz}$			57	
Coupled	I_{Fon}	LED On-state Current, $I_L = 200 \text{ mA}$	mA			2.0
	R_{ON1}	On-State Resistance, $I_F = 10 \text{ mA}$, $I_L = 10 \text{ mA}$	Ω		3.0	6.0
	R_{ON2}					
	t_{ON}	Turn-on Time $I_F = 10 \text{ mA}$, $V_O = 5 \text{ V}$, $PW \geq 10 \text{ ms}$	ms		0.1	0.4
	t_{OFF}	Turn-off Time $I_F = 10 \text{ mA}$, $V_O = 5 \text{ V}$, $PW \geq 10 \text{ ms}$	ms		0.03	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		1.1	

Note:

1. Test Circuit for Switching Time:



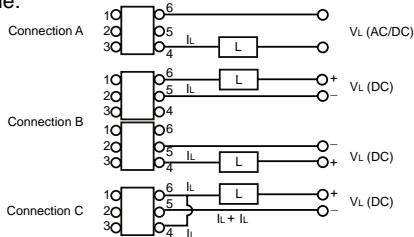
PS7112-1A, PS7112L-1A

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
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 ³	mA	200
	Connection A		
	Connection B		
	Connection C		400
I _{LP}	Pulse Load Current ⁴ (AC/DC Connection)	mA	400
P _D	Power Dissipation	mW	560
Coupled			
BV	Isolation Voltage ⁵	V _{R.M.S.}	1500
P _T	Total Power Dissipation	mW	610
T _{OP}	Operating Temperature	°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 %
- Conditions: I_F ≥ 2 mA. The following types of load connections are available:



- PW = 100 ms, 1 shot.
- AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output.

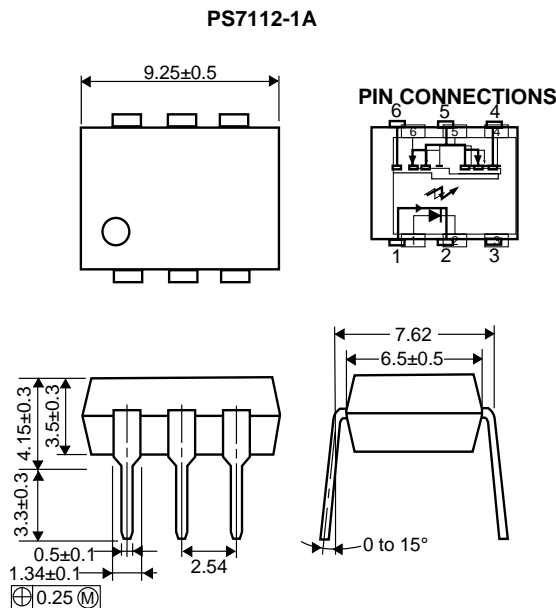
RECOMMENDED OPERATING CONDITIONS (T_A = 25°C)

PART NUMBER		PS7112-1A, PS7112L-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

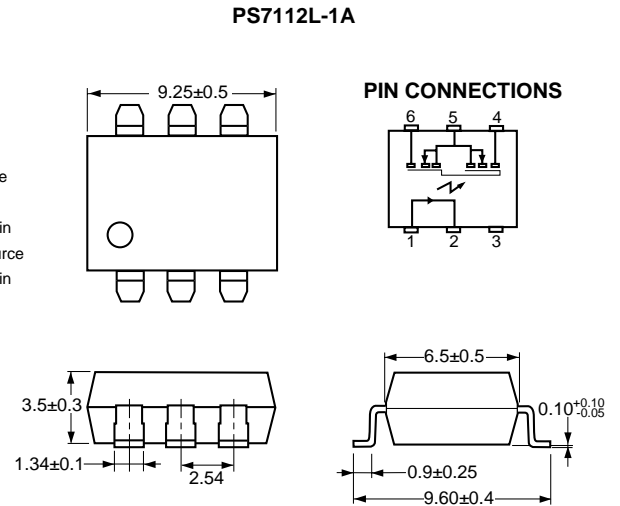
ORDERING INFORMATION

PART NUMBER	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

OUTLINE DIMENSIONS (Units in mm)

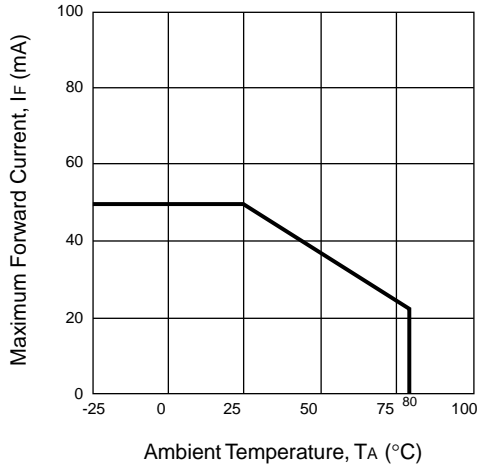


- LED Anode
- LED Cathode
- NC
- MOSFET Drain
- MOSFET Source
- MOSFET Drain

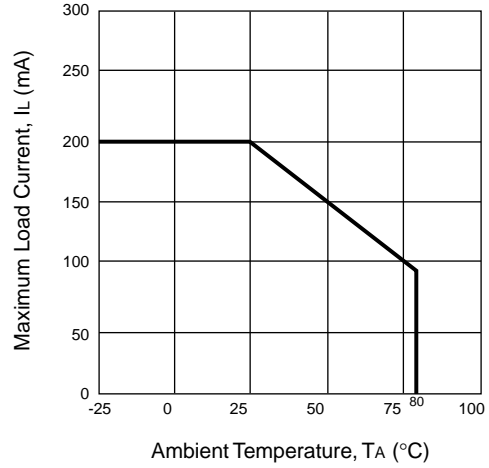


TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)

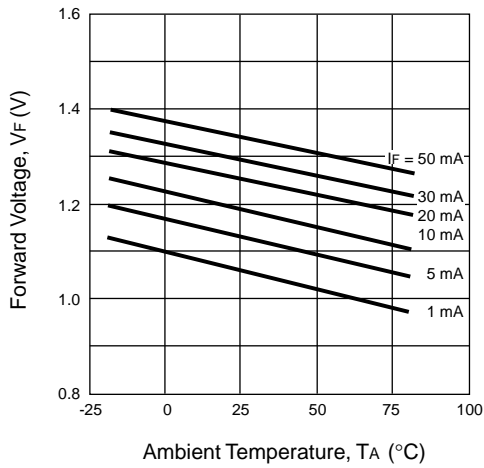
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



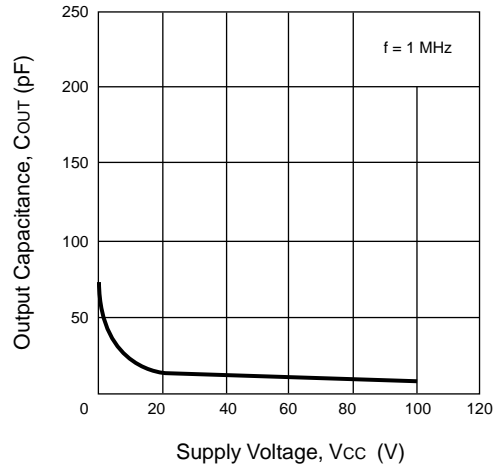
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



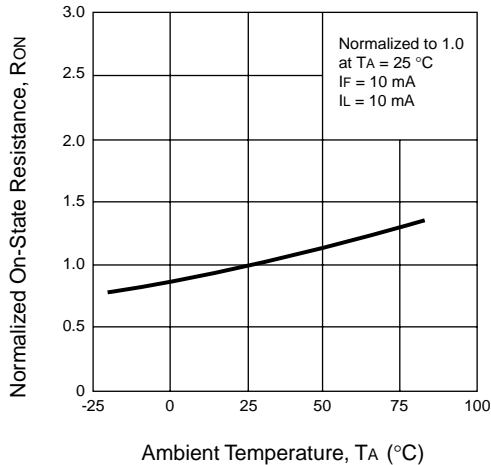
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



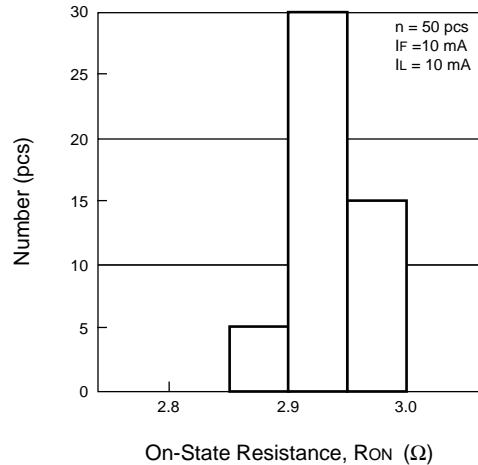
OUTPUT CAPACITANCE vs. SUPPLY VOLTAGE



NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE

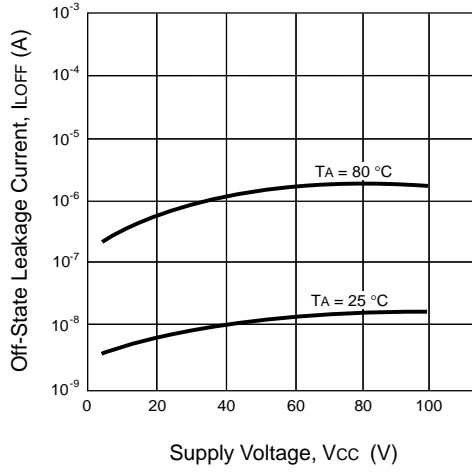


ON-STATE RESISTANCE DISTRIBUTION

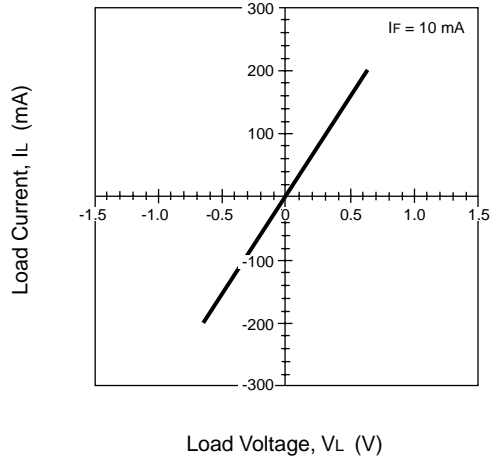


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

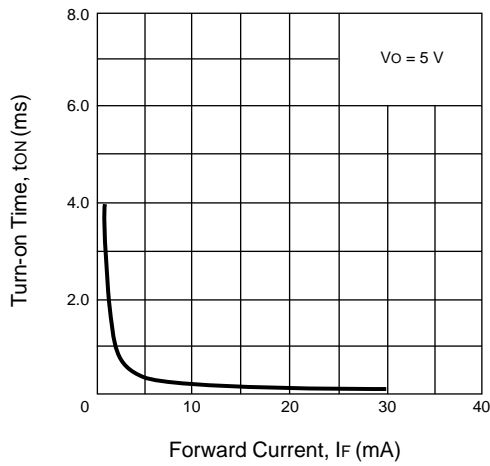
OFF-STATE LEAKAGE CURRENT vs. SUPPLY VOLTAGE



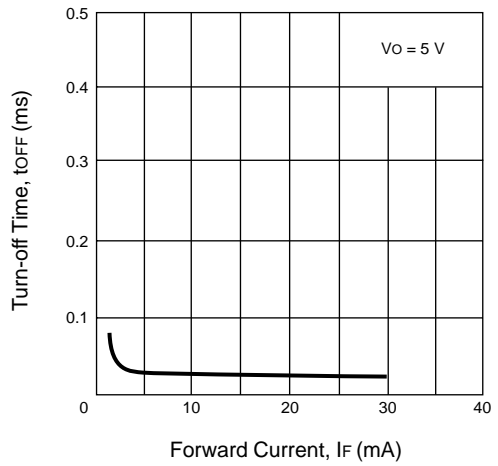
LOAD CURRENT vs. LOAD VOLTAGE



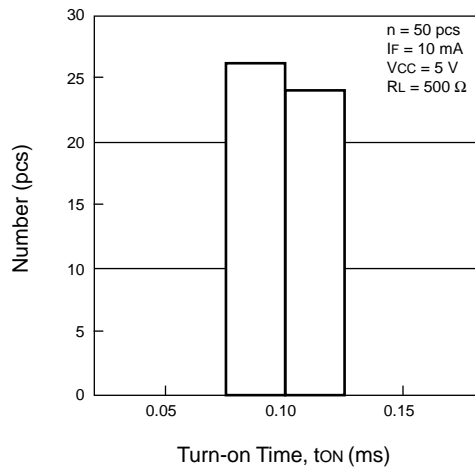
TURN-ON TIME vs. FORWARD CURRENT



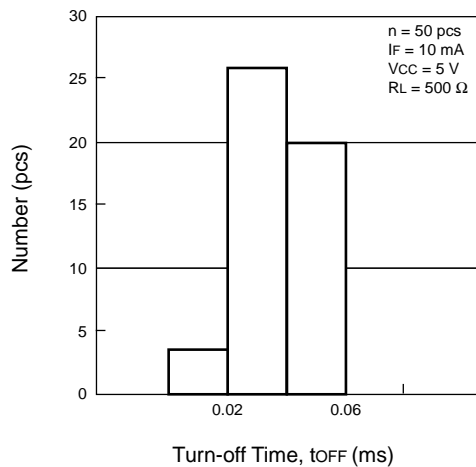
TURN-OFF TIME vs. FORWARD CURRENT



TURN-ON TIME DISTRIBUTION

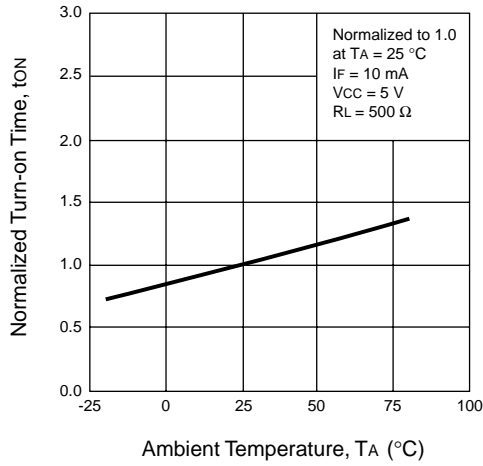


TURN-OFF TIME DISTRIBUTION

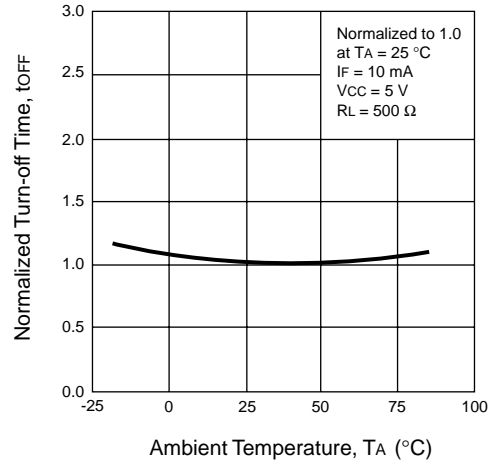


TYPICAL PERFORMANCE CURVES ($T_A = 25\text{ }^\circ\text{C}$)

NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE

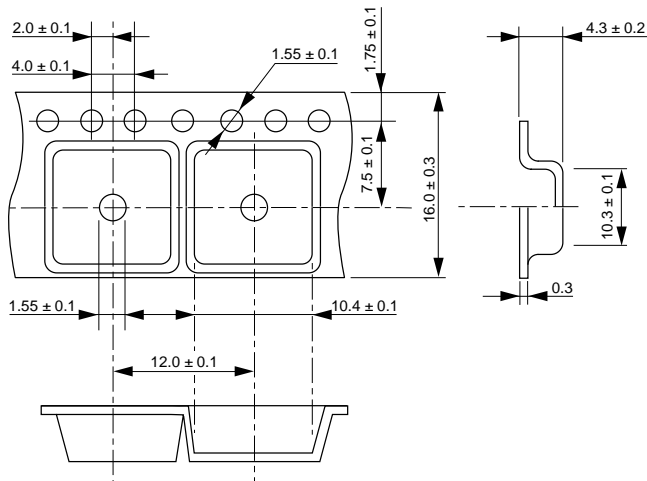


NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE

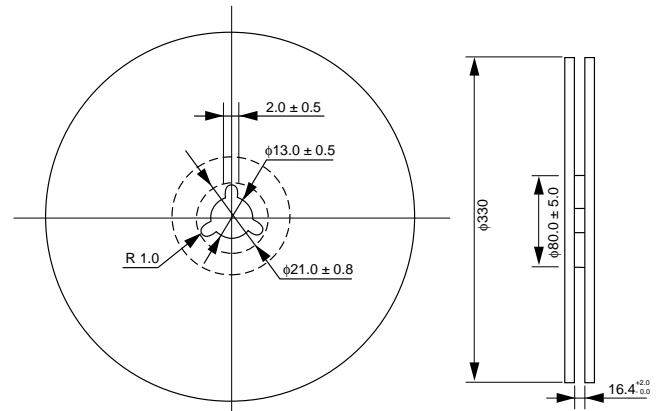


TAPING SPECIFICATIONS (Units in mm)

OUTLINE AND DIMENSIONS (TAPE)

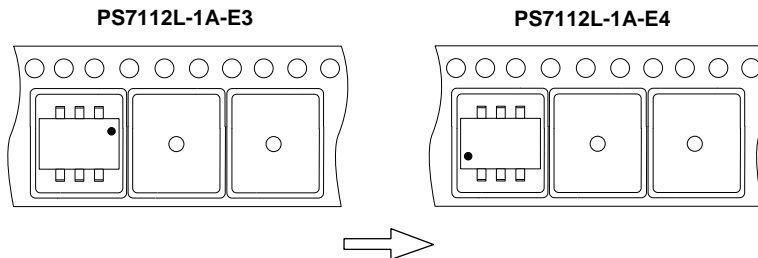


OUTLINE AND DIMENSIONS (REEL)



Packaging : 1000 pcs/reel

TAPING DIRECTION

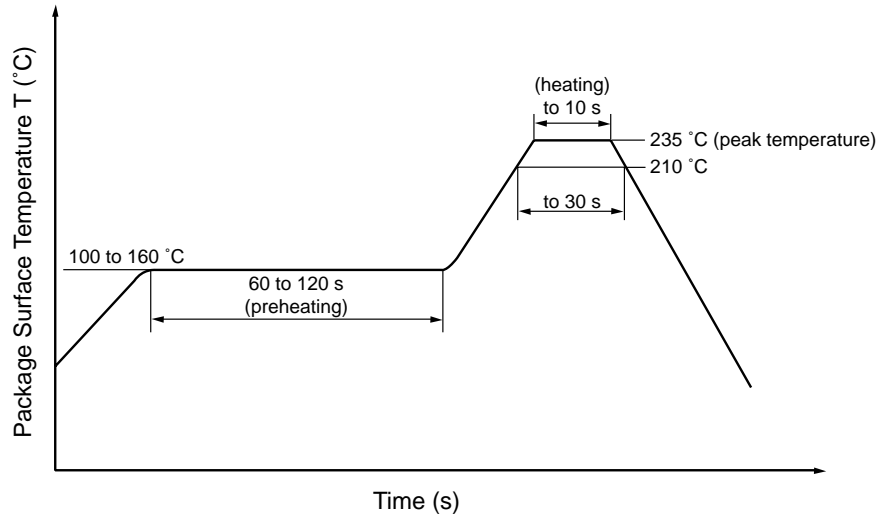


RECOMMENDED SOLDERING CONDITIONS

(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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