

# PS7904-1A

## Preliminary Data Sheet

Specifications in this document are tentative and subject to change.

OCMOS FET  
 4-PIN SMALL FLAT-LEAD, LOW ON-STATE RESISTANCE  
 1-ch Optical Coupled MOS FET

Mar 7, 2012

### DESCRIPTION

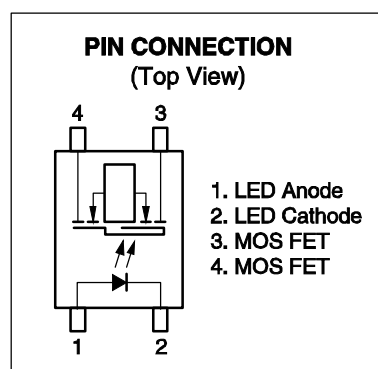
The PS7904-1A is a low output capacitance solid state relay containing a GaAs LED on the light emitting side (input side) and MOS FETs on the output side.

A small flat-lead package has been provided which realizes a reduction in mounting area of about 50% compared with the PS78xx series.

It is suitable for high-frequency signal control, due to its low  $C \times R$ , low output capacitance, and low off-state leakage current.

### FEATURES

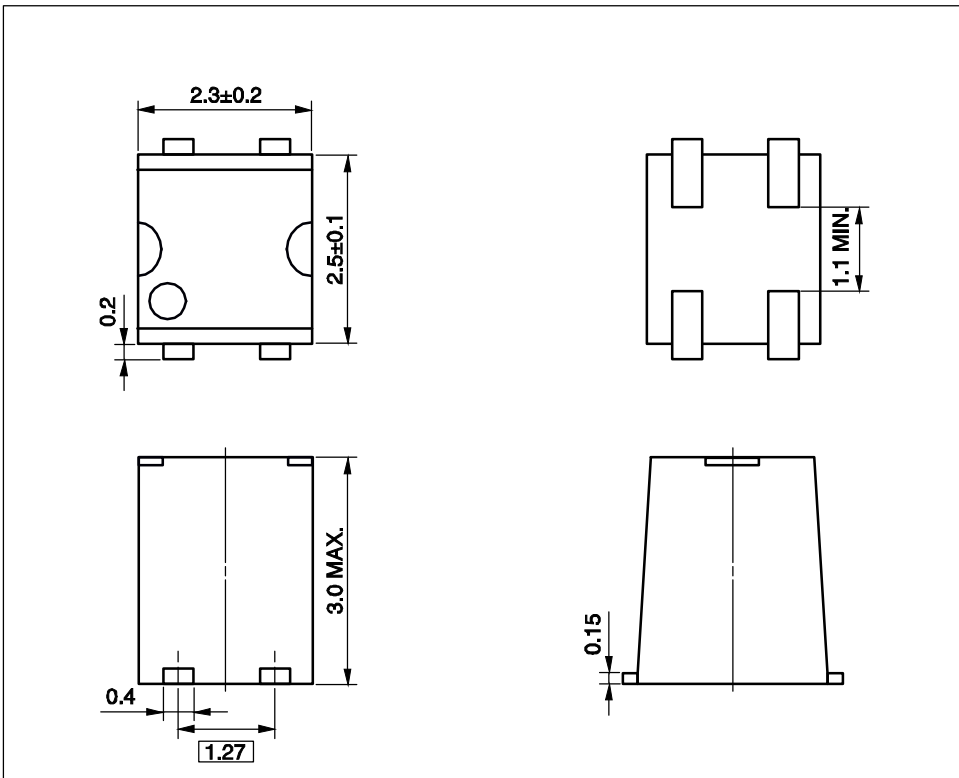
- ☒ Small flat-lead package (2.5 (L)  $\times$  2.3 (W)  $\times$  2.9 (H) mm)
- ☒ Low  $C \times R$  ( $C \times R = 29.7 \text{ pF} \cdot \Omega$ )
- ☒ Low on-state resistance ( $R_{on} = 1.1 \Omega$  TYP.)
- ☒ Large continuous load current ( $I_L = 400 \text{ mA}$ )
- ☒ 1 channel type (1 a output)
- ☒ Designed for AC/DC switching line changer
- ☒ Low offset voltage
- ☒ Embossed tape product : PS7904-1A-F3 : 3 500 pcs/reel
- ☒ Pb-Free product



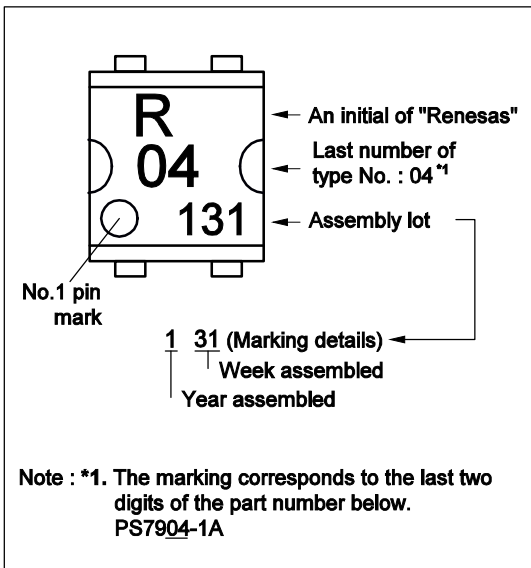
### APPLICATIONS

- ☒ Measurement equipment

## PACKAGE DIMENSIONS (UNIT: mm)



## MARKING EXAMPLE



## 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 <sup>*1</sup>	$I_{FP}$	1	A
MOS FET	Break Down Voltage	$V_L$	60	V
	Continuous Load Current	$I_L$	400	mA
	Pulse Load Current <sup>*2</sup> (AC/DC Connection)	$I_{LP}$	800	mA
	Power Dissipation <sup>*2</sup>	$P_D$	250	mW
Isolation Voltage <sup>*3</sup>	BV	500	Vr.m.s.	
Total Power Dissipation	$P_T$	300	mW	
Operating Ambient Temperature	$T_A$	$\ominus 40$ to $+85$	$^\circ\text{C}$	
Storage Temperature	$T_{stg}$	$\ominus 40$ to $+100$	$^\circ\text{C}$	

Notes: \*1. PW = 100  $\mu\text{s}$ , Duty Cycle = 1%

\*2. PW = 100 ms, 1 shot

\*3. AC voltage for 1 minute at  $T_A = 25^\circ\text{C}$ , RH = 60% between input and output.

Pins 1-2 shorted together, 3-4 shorted together.

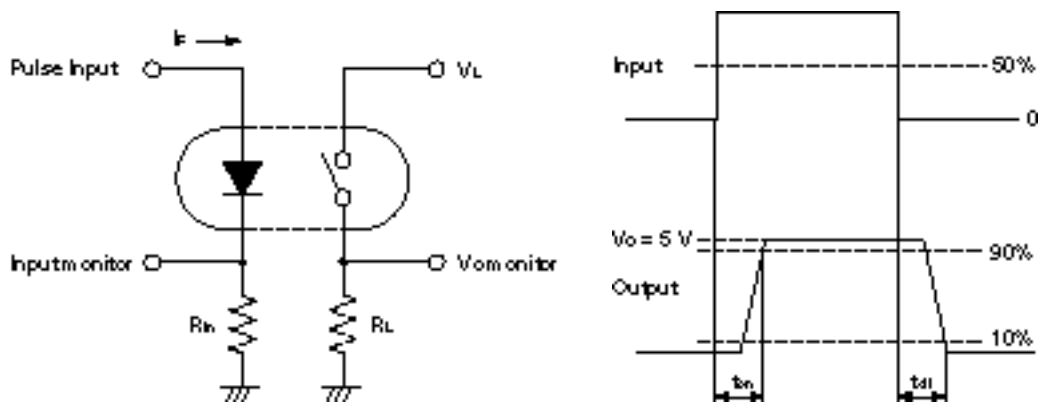
## RECOMMENDED OPERATING CONDITIONS ( $T_A = 25^\circ\text{C}$ )

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
LED Operating Current	$I_F$	4.5	5	20	mA
LED Off Current	$I_F$	0.1			mA

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

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Diode	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 5 mA		1.1	1.4	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5 V			5.0	μA
MOS FET	Off-state Leakage Current	I <sub>Loff</sub>	V <sub>L</sub> = 60 V		0.1	10	nA
	Output Capacitance	C <sub>out</sub>	V <sub>L</sub> = 0 V, f = 1 MHz		27	35	pF
Coupled	LED On-state Current	I <sub>Fon</sub>	I <sub>L</sub> = 400 mA			4.0	mA
	On-state Resistance	R <sub>on</sub>	I <sub>F</sub> = 5 mA, I <sub>L</sub> = 400 mA, t ≥ 10 ms		1.1	1.5	Ω
	Turn-on Time <sup>*1</sup>	t <sub>on</sub>	I <sub>F</sub> = 5 mA, V <sub>O</sub> = 5 V, R <sub>L</sub> = 500 Ω, PW ≥ 1 ms		0.15	0.5	ms
	Turn-off Time <sup>*1</sup>	t <sub>off</sub>			0.15	0.5	
	Isolation Resistance	R <sub>I-O</sub>	V <sub>I-O</sub> = 0.5 kV <sub>DC</sub>	10 <sup>9</sup>			Ω
Isolation Capacitance	C <sub>I-O</sub>	V = 0 V, f = 1 MHz		0.3		pF	

Notes: \*1. Test Circuit for Switching Time



## **USAGE CAUTIONS**

1. Protect against static electricity when handling.
2. Avoid storage at a high temperature and high humidity.

<p><b>Caution</b> GaAs Products</p>	<p>This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points.</p> <ul style="list-style-type: none"><li>• Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below.<ol style="list-style-type: none"><li>1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials.</li><li>2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal.</li></ol></li><li>• Do not burn, destroy, cut, crush, or chemically dissolve the product.</li><li>• Do not lick the product or in any way allow it to enter the mouth.</li></ul>
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