DATA SHEET

NEC

OCMOS FET™

PS7142-1A,PS7142L-1A

6-PIN DIP OCMOS FET
(1-ch OCMOS FET)

DESCRIPTION

The PS7142-1A and PS7142L-1A are solid state relays containing a GaAs LED 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 PS7142L-1A has a surface mount type lead.

FEATURES

- 1 channel type (1 a output)
- Designed for AC/DC switching line changer
- Small package (6-pin DIP)
- Low offset voltage
- PS7142L-1A: Surface mount type

APPLICATIONS

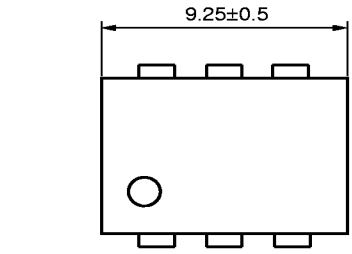
- Exchange equipment
- Measurement equipment
- FA/OA equipment

Document No. P11559EJ6V0DS00 (6th edition)
Date Published March 1999 NS CP(K)
Printed in Japan

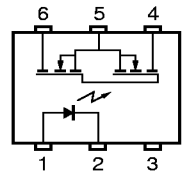
The mark ★ shows major revised points.

★ **PACKAGE DIMENSIONS (in millimeters)**

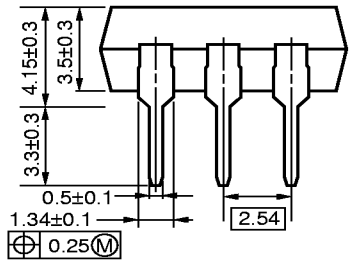
PS7142-1A

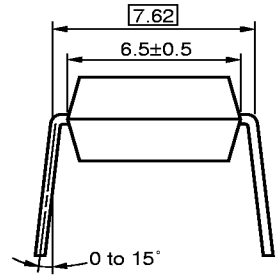


TOP VIEW

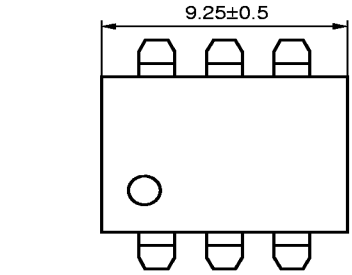


1. LED Anode
2. LED Cathode
3. NC
4. MOS FET Drain
5. MOS FET Source
6. MOS FET Drain

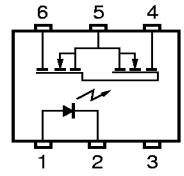




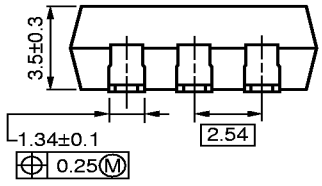
PS7142L-1A

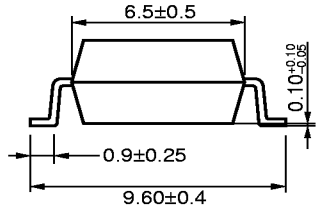


TOP VIEW



1. LED Anode
2. LED Cathode
3. NC
4. MOS FET Drain
5. MOS FET Source
6. MOS FET Drain





ABSOLUTE MAXIMUM RATINGS (T_A = 25 °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	400	V
	Continuous Load Current	I_L	200	mA
	Power Dissipation	P_D	560	mW
Isolation Voltage *2		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** AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output

RECOMMENDED OPERATING CONDITIONS (T_A = 25 °C)

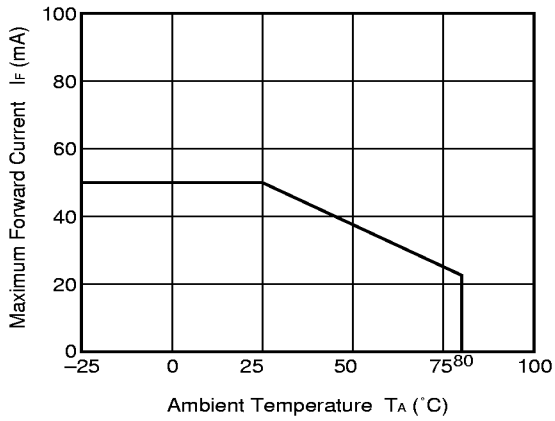
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
LED Operating Current	I_F	2	10	20	mA
LED Off Voltage	V_F	0		0.5	V

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

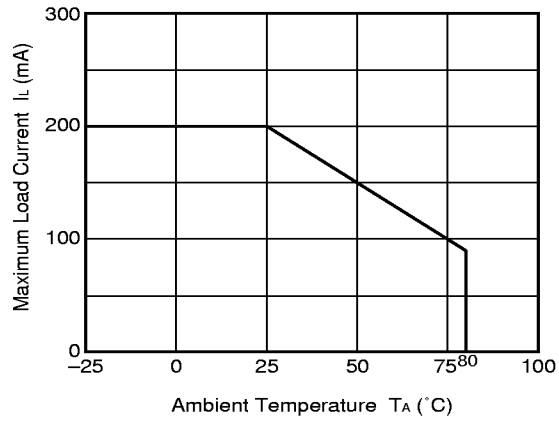
	Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
	Diode	Forward Voltage	V_F	I_F = 10 mA		1.1	1.5	V
		Reverse Current	I_R	V_R = 5 V			5.0	μA
	MOS FET	Off-state Leakage Current	I_{Loff}	V_D = 400 V		0.03	1.0	μA
★		Output Capacitance	C_{out}	V = 0 V, f = 1 MHz		225		pF
	Coupled	On-state Resistance	R_{on}	I_F = 5 mA, I_L = 1 mA		6.0	10	Ω
		Turn-on Time	t_{on}	I_F = 10 mA, V_L = 5 V, R_L = 500 Ω,		0.8	5.0	ms
		Turn-off Time	t_{off}	PW ≥ 10 ms		0.02	0.2	
		Isolation Resistance	R_{I-O}	V_{I-O} = 1.0 kV_{DC}	10^9			Ω
		Isolation Capacitance	C_{I-O}	V = 0 V, f = 1 MHz		1.1		pF

TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise specified)

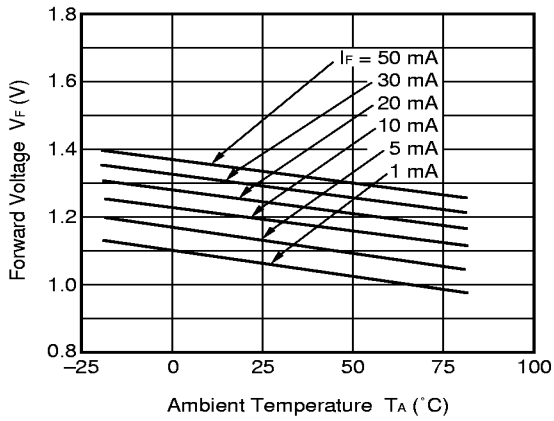
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



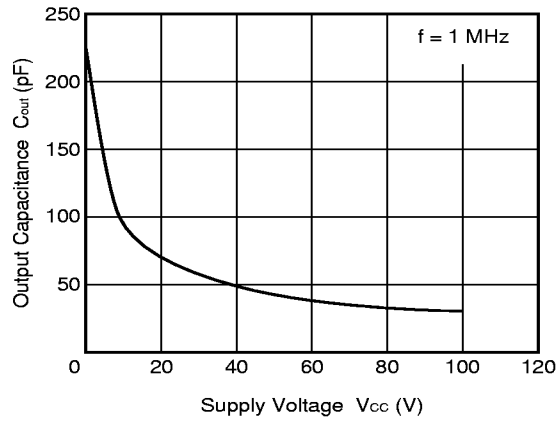
MAXIMUM LORD CURRENT vs. AMBIENT TEMPERATURE



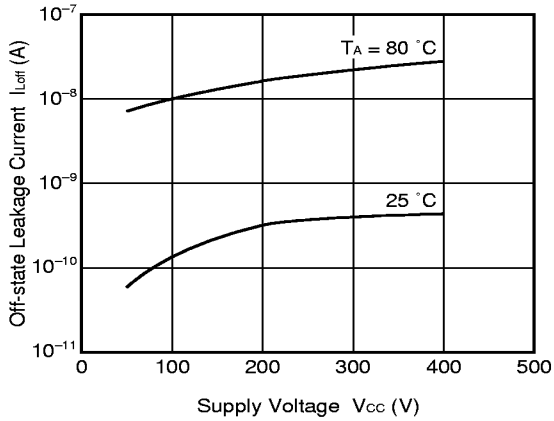
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



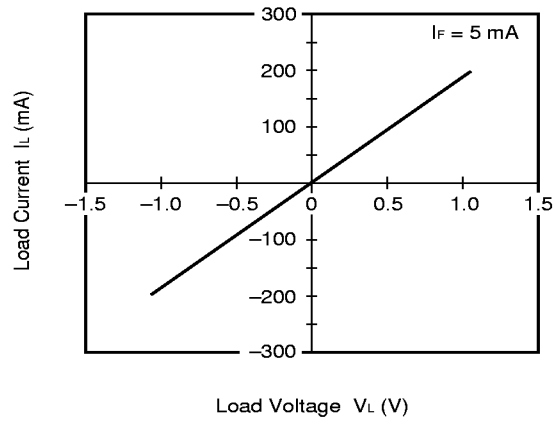
OUTPUT CAPACITANCE vs. SUPPLY VOLTAGE



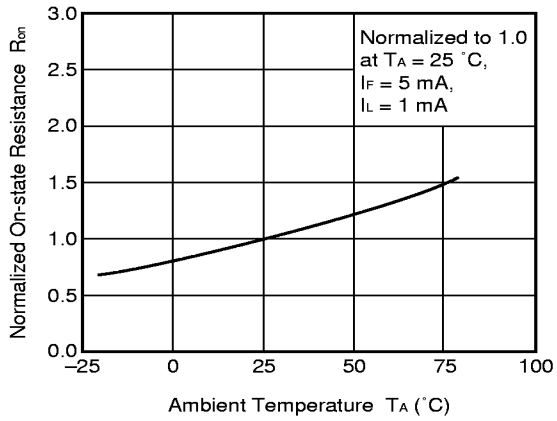
OFF-STATE LEAKAGE CURRENT vs. SUPPLY VOLTAGE



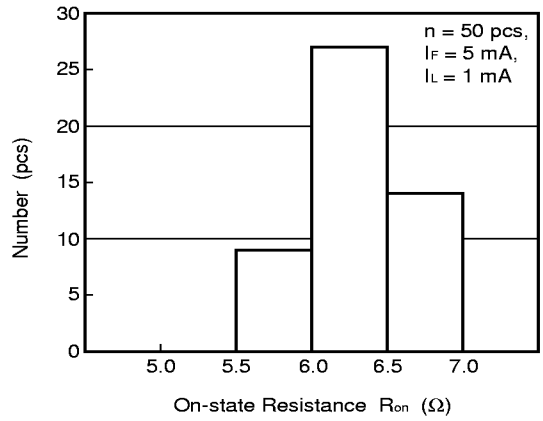
LORD CURRENT vs. LORD VOLTAGE



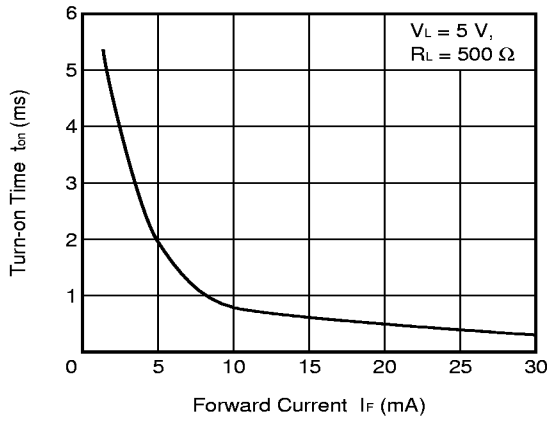
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



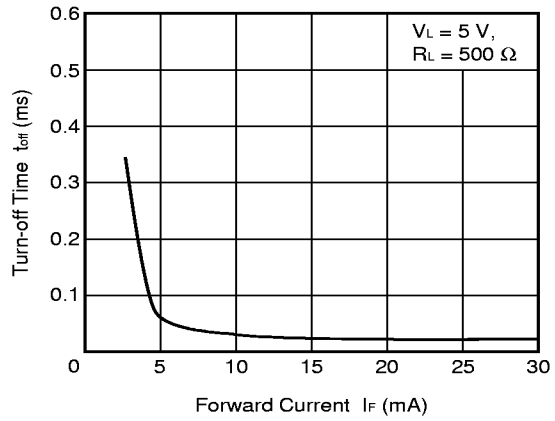
ON-STATE RESISTANCE DISTRIBUTION



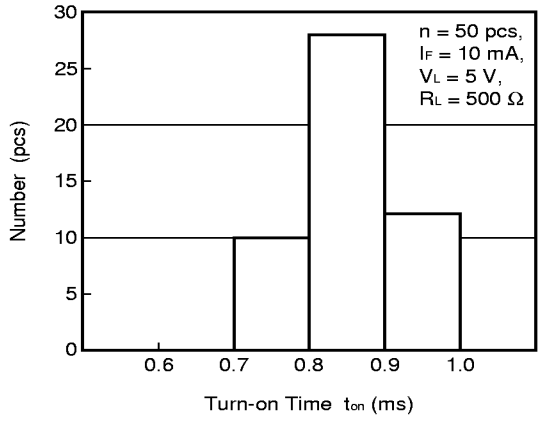
TURN-ON TIME vs. FORWARD CURRENT



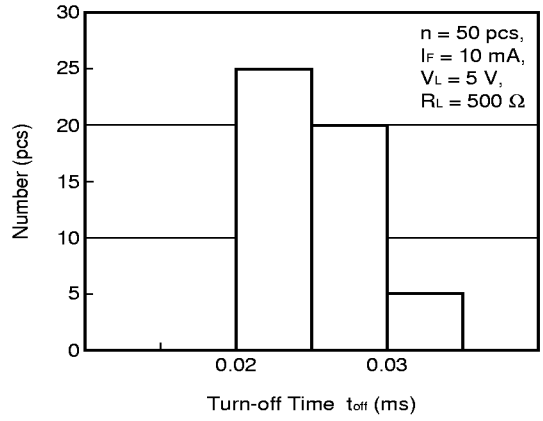
TURN-OFF TIME vs. FORWARD CURRENT



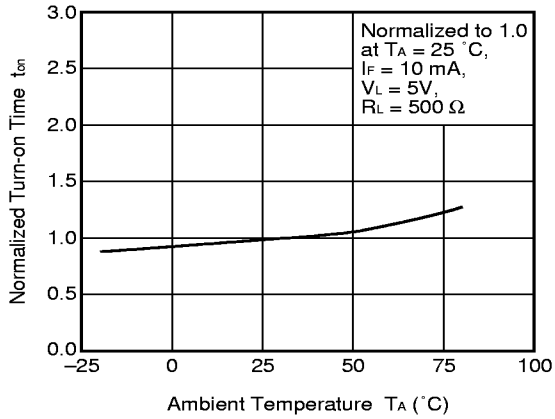
TURN-ON TIME DISTRIBUTION



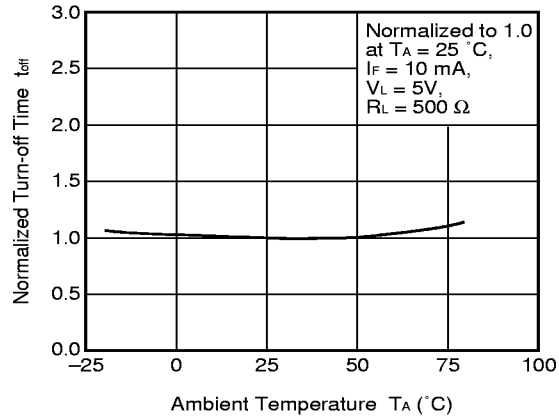
TURN-OFF TIME DISTRIBUTION



NORMALIZED TURN-ON TIME vs. AMBIENT TEMPERATURE



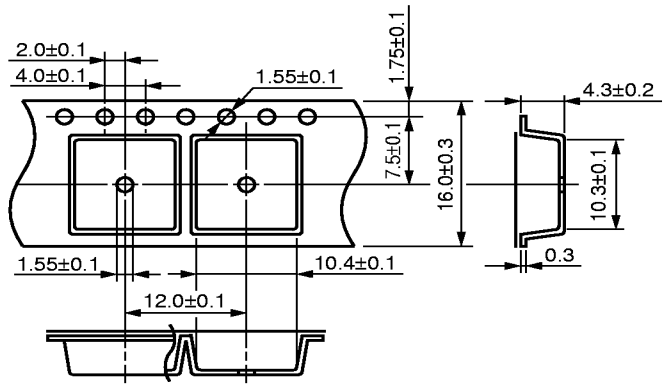
NORMALIZED TURN-OFF TIME vs. AMBIENT TEMPERATURE



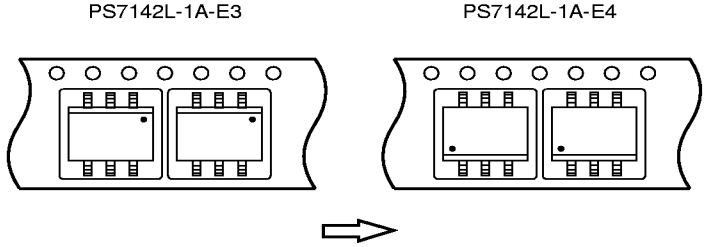
Remark The graphs indicate nominal characteristics.

TAPING SPECIFICATIONS (in millimeters)

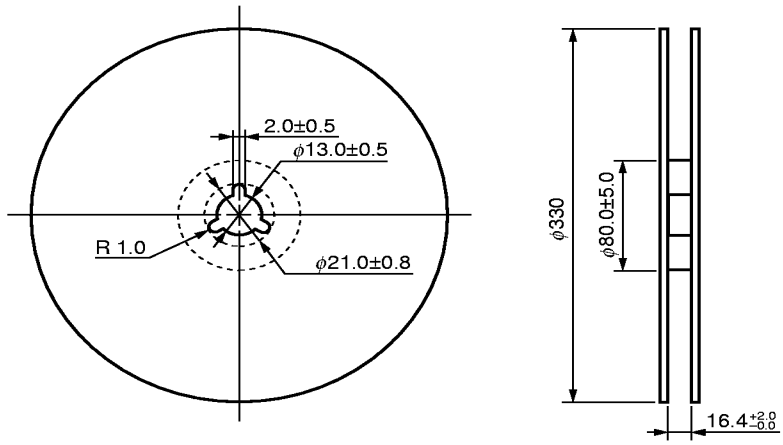
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



Packing: 1 000 pcs/reel