

FEATURES

- **2 CHANNEL TYPE**
(1 A + 1 A Output)
- **DESIGNED FOR AC/DC SWITCHING LINE CHANGER**
- **SMALL PACKAGE**
(8 pin DIP)
- **LOW OFFSET VOLTAGE**
- **PS7142L-2A: SURFACE MOUNT TYPE**
- **UL BSI APPROVED**

DESCRIPTION

PS7142-2A and PS7142L-2A are solid state relays containing GaAs LED on the light emitting side (input side) and MOSFETs on the output side.

APPLICATIONS

- **TELECOMMUNICATIONS EQUIPMENT**
- **MEASUREMENT EQUIPMENT**
- **FA/OA EQUIPMENT**

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PART NUMBER			PS7142-2A, PS7142L-2A			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX	
Diode	V _F	Forward Voltage, I _F = 10 mA	V	1.2	1.4	
	I _R	Reverse Current, V _R = 5 V	μA		5.0	
MOSFET	I _{Loff}	Off-State Leakage Current, V _D = 400 V	μA	0.05	1.0	
	C _{out}	Output Capacitance, V = 0 V, f = 1 MHz	pF/ch	140		
Coupled	R _{on1}	On-State Resistance, I _F = 10 mA, I _L = 10 mA	Ω	7.5	12	
	R _{on2}	On-State Resistance, I _F = 10 mA, I _L = 200 mA	Ω	7.0	10	
	t _{on}	Turn-On Time	I _F = 10 mA, V _L = 5 V, R _L = 500 Ω	ms	0.5	2.0
	t _{off}	Turn-Off Time	PW ≥ 10 ms	ms	0.03	0.2
	R _{I-O}	Isolation Resistance, V _{in-out} = 1.0 kVDC	Ω	10 ⁹		
	C _{I-O}	Isolation Capacitance, V = 0 V, f = 1 MHz	pF/ch		1.1	

PS7142-2A, PS7142L-2A

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
			PS7142-2A PS7142L-2A
Diode			
V _R	Reverse Voltage	V	5
I _F	Forward Current (DC)	mA	50
P _D	Power Dissipation	mW/ch	50
I _F (Peak)	Peak Forward Current ²	A	1
MOSFET			
V _L	Break Down Voltage	V	400
I _L	Continuous Load Current	mA	200
P _D	Power Dissipation	mW/ch	375
Coupled			
BV	Isolation Voltage ³	V _{RMS}	1500
P _T	Total Power Dissipation	mW	850
T _{STG}	Storage Temperature	°C	-40 to +100
T _A	Operating Ambient Temp.	°C	-40 to +80

Notes:

1. Operation in excess of any one of these parameters may result in permanent damage.
2. PW = 100 μs, Duty Cycle = 1 %
3. AC voltage for 1 minute at T_A = 25 °C, RH = 60 % between input and output.

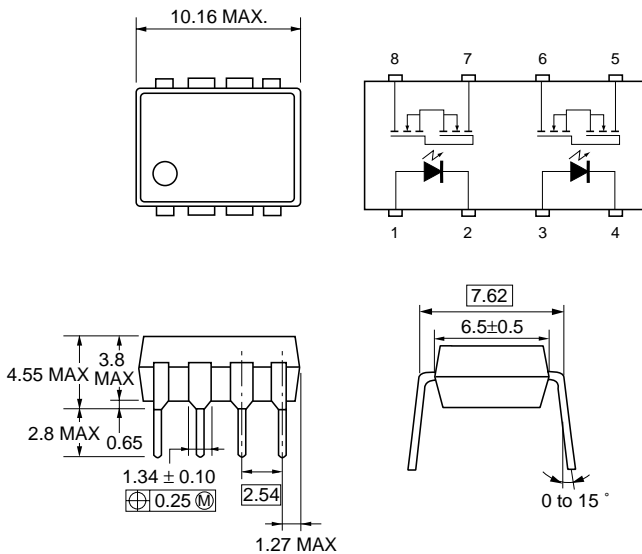
RECOMMENDED OPERATING CONDITIONS (T_A = 25 °C)

SYMBOL	PARAMETER	UNITS	MIN	TYP	MAX
I _F	LED Operating Current	mA	2	10	20
V _F	LED Off Voltage	V	0		0.5

OUTLINE DIMENSIONS (Units in mm)

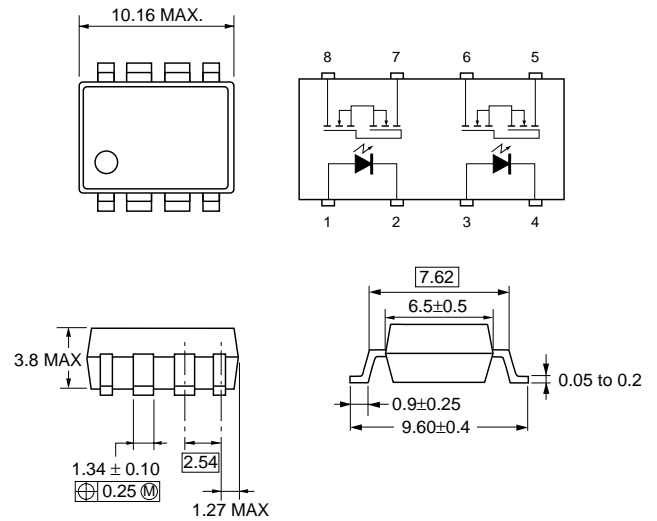
PS7142-2A

- | | |
|----------------|-----------|
| 1. LED Anode | 5. MOSFET |
| 2. LED Cathode | 6. MOSFET |
| 3. LED Anode | 7. MOSFET |
| 4. LED Cathode | 8. MOSFET |



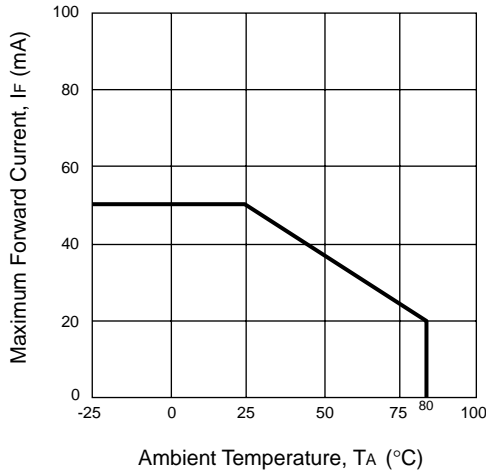
PS7142L-2A

- | | |
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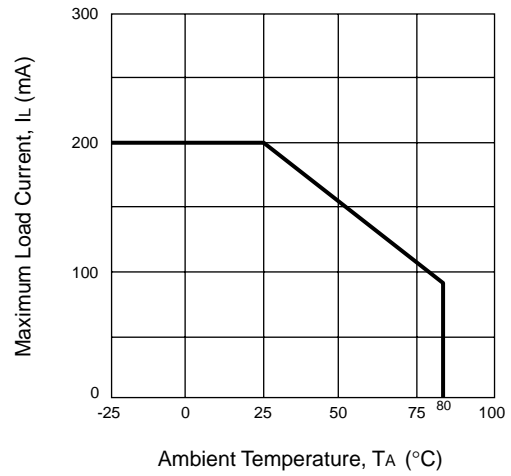


TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)

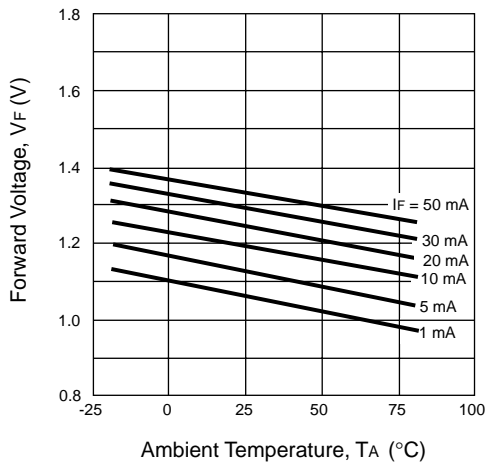
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



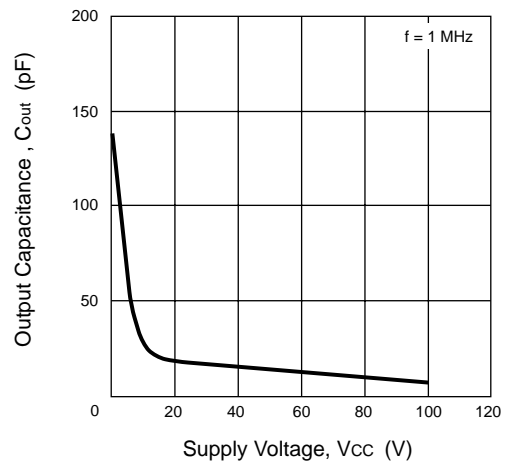
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



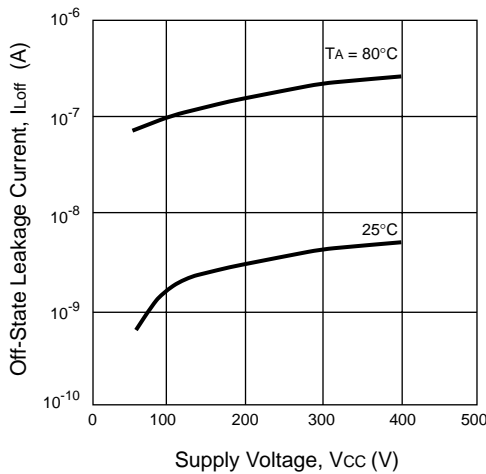
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



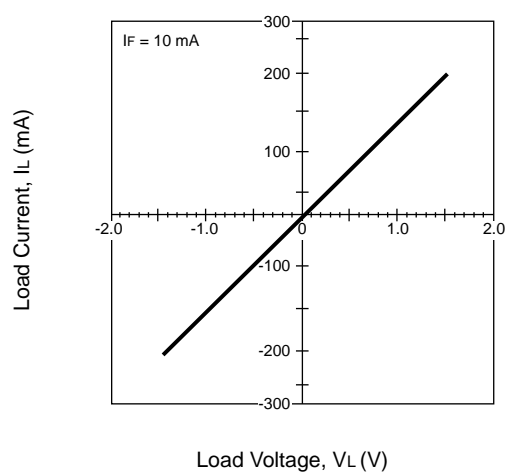
OUTPUT CAPACITANCE vs. SUPPLY VOLTAGE



OFF-STATE LEAKAGE CURRENT vs. SUPPLY VOLTAGE

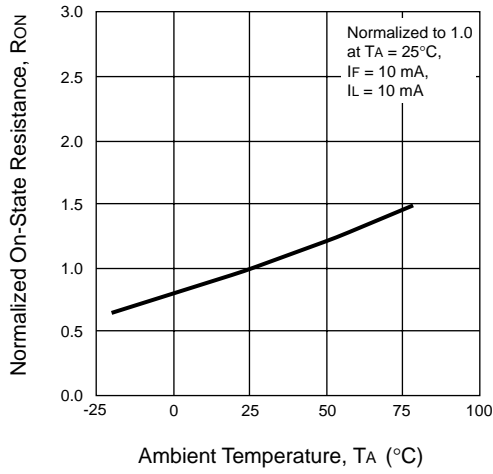


LOAD CURRENT vs. LOAD VOLTAGE

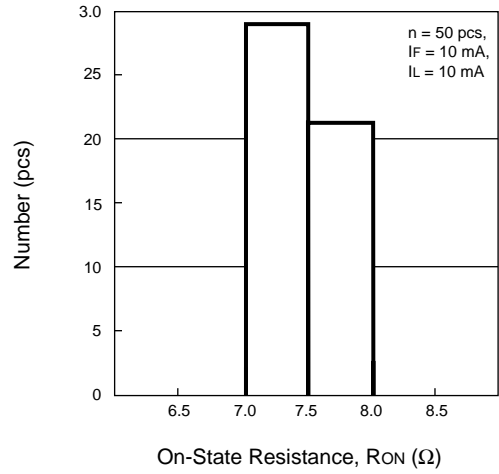


TYPICAL PERFORMANCE CURVES (TA = 25 °C)

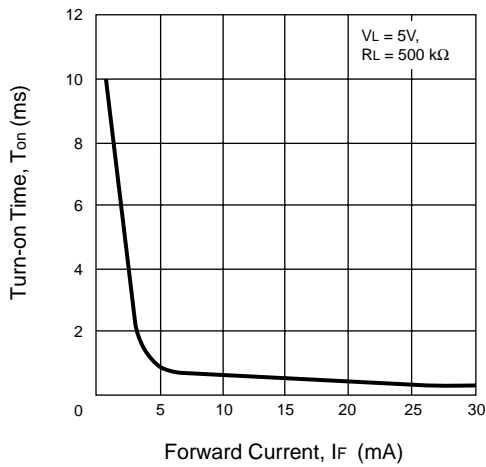
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



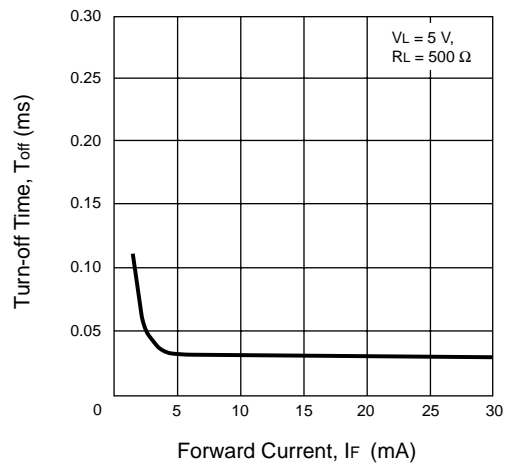
ON-STATE RESISTANCE DISTRIBUTION



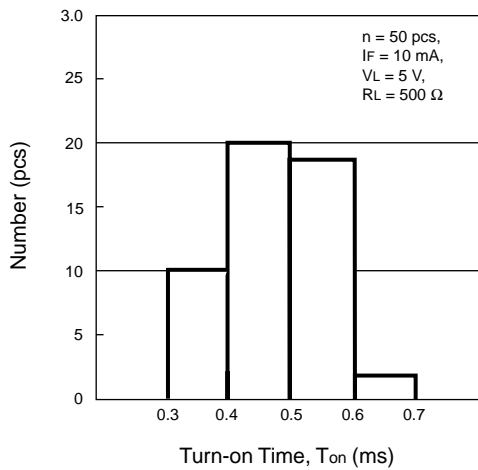
TURN-ON TIME vs. FORWARD CURRENT



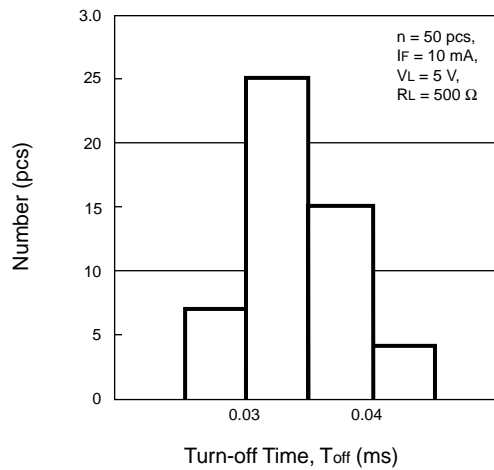
TURN-OFF TIME vs. FORWARD CURRENT



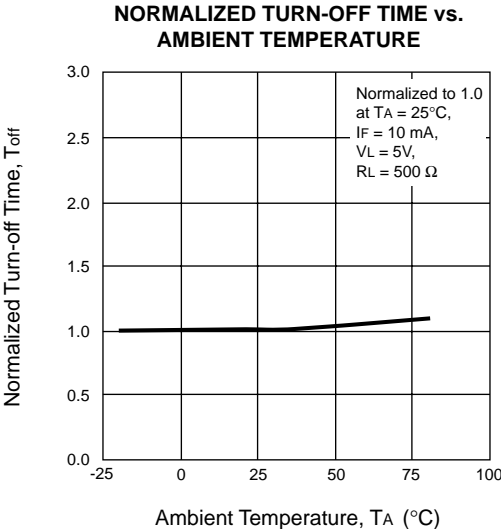
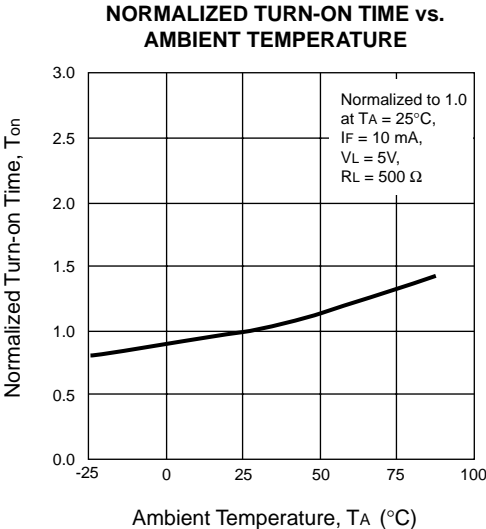
TURN-ON TIME DISTRIBUTION



TURN-OFF TIME DISTRIBUTION

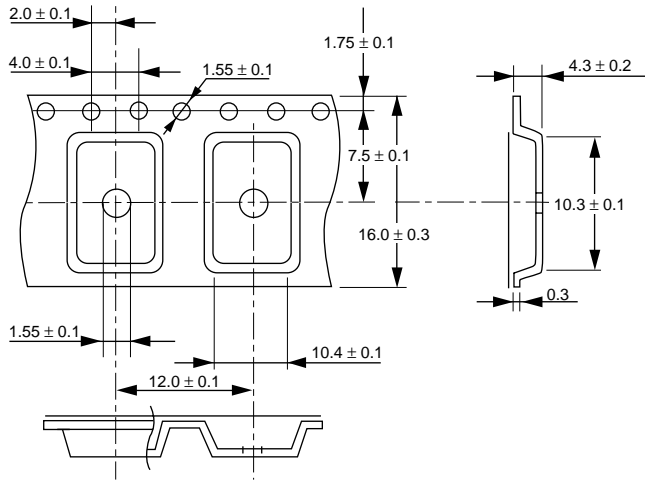


TYPICAL PERFORMANCE CURVES ($T_A = 25\text{ }^\circ\text{C}$)

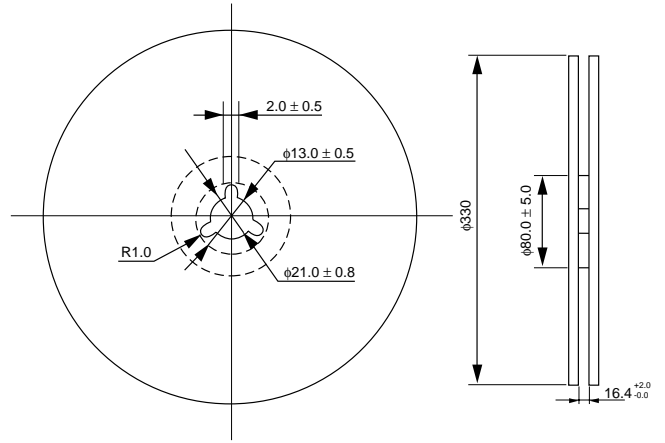


TAPING SPECIFICATIONS (Units in mm)

OUTLINE AND DIMENSIONS (TAPE)



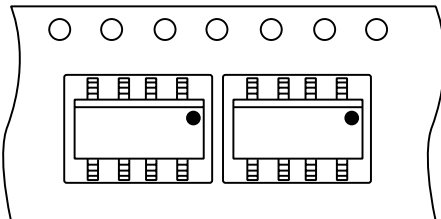
OUTLINE AND DIMENSIONS (REEL)



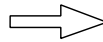
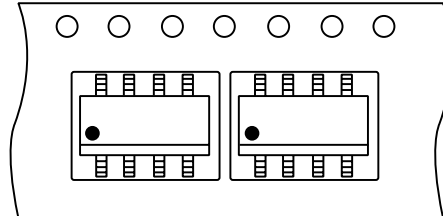
Notes:
1. Packing : 1000 pcs/reel

TAPE DIRECTION

PS7142L-2A-E3



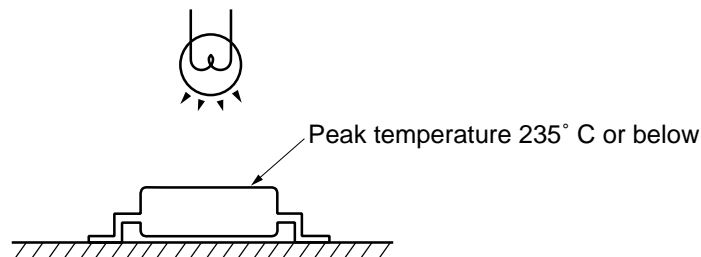
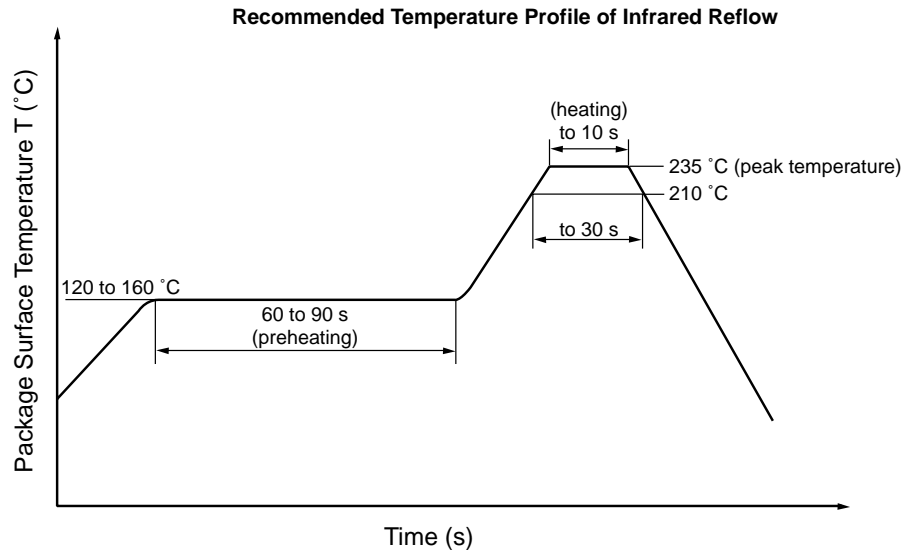
PS7142L-2A-E4



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**
Three
- **Flux**
Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt % is recommended).



(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).

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