



Solid State Relay  
OCMOS FET

# PS7342-1A, PS7342L-1A

6-PIN DIP, HIGH ISOLATION VOLTAGE  
1-ch Optical Coupled MOS FET

## DESCRIPTION

The PS7342-1A and PS7342L-1A are solid state relays containing GaAs LEDs 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 PS7342L-1A has a surface mount type lead.

## FEATURES

- High isolation voltage ( $BV = 3\,750\text{ V r.m.s.}$ )
- 1 channel type (1 a output)
- Low LED Operating Current ( $I_F = 2\text{ mA}$ )
- Designed for AC/DC switching line changer
- Small package (6-pin DIP)
- Low offset voltage
- PS7342L-1A: Surface mount type
- UL approved: File No. E72422 (S)
- BSI approved: No. 8252/8253
- CSA approved: No. CA 101391

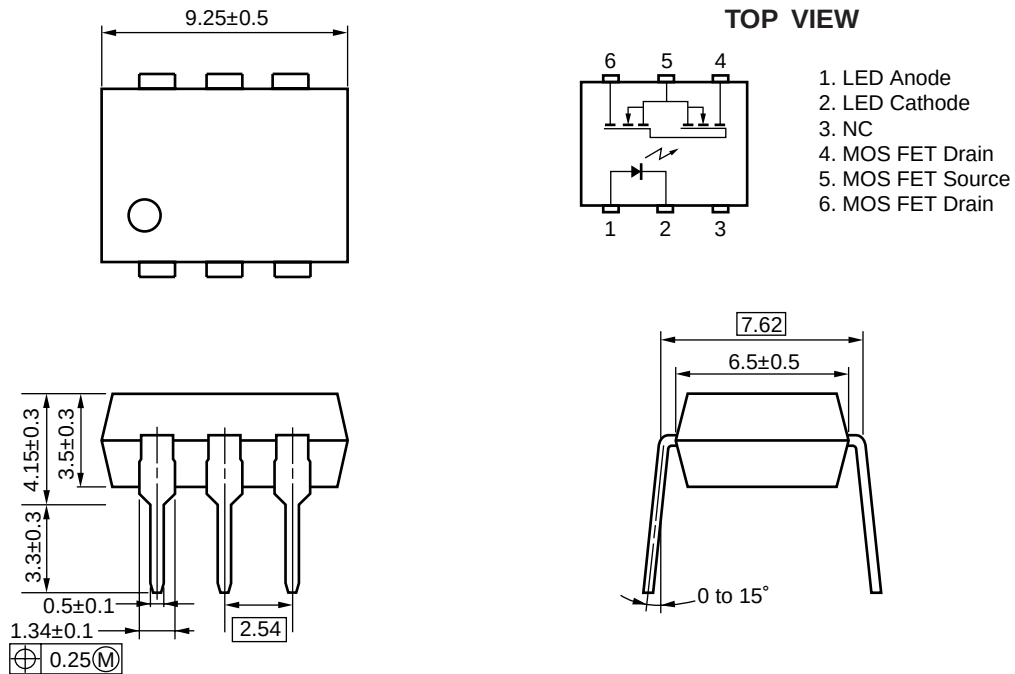
## APPLICATIONS

- Exchange equipment
- Measurement equipment
- FA/OA equipment

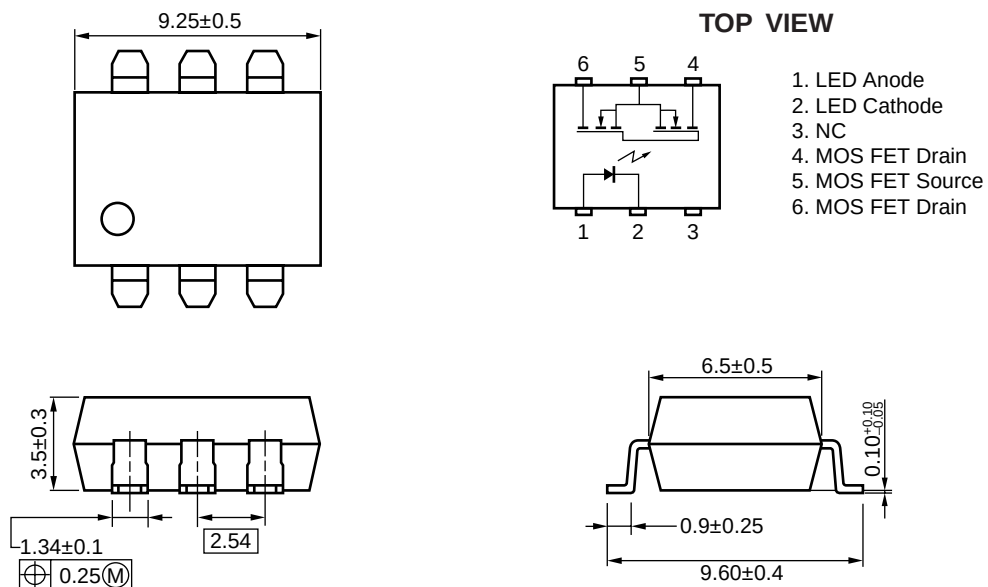
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**PACKAGE DIMENSIONS (in millimeters)**

**PS7342-1A**



**PS7342L-1A**



**ORDERING INFORMATION (Solder Contains Lead)**

| Part Number   | Package   | Packing Style                | Application Part Number *1 |
|---------------|-----------|------------------------------|----------------------------|
| PS7342-1A     | 6-pin DIP | Magazine case 50 pcs         | PS7342-1A                  |
| PS7342L-1A    |           |                              | PS7342L-1A                 |
| PS7342L-1A-E3 |           | Embossed Tape 1 000 pcs/reel |                            |
| PS7342L-1A-E4 |           |                              |                            |

**\*1** For the application of the Safety Standard, following part number should be used.

**ORDERING INFORMATION (Pb-Free)**

| Part Number     | Package   | Packing Style                | Application Part Number <sup>*1</sup> |
|-----------------|-----------|------------------------------|---------------------------------------|
| PS7342-1A-A     | 6-pin DIP | Magazine case 50 pcs         | PS7342-1A                             |
| PS7342L-1A-A    |           |                              | PS7342L-1A                            |
| PS7342L-1A-E3-A |           | Embossed Tape 1 000 pcs/reel |                                       |
| PS7342L-1A-E4-A |           |                              |                                       |

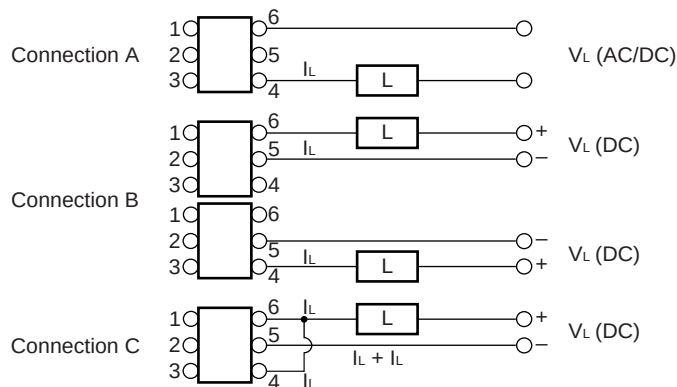
**\*1** For the application of the Safety Standard, following part number should be used.

**ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ }^{\circ}\text{C}$ , 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                                     | $V_L$        | 400         | V                  |
|                                 | Continuous Load Current <sup>*2</sup>                  | Connection A | $I_L$       | mA                 |
|                                 |                                                        | Connection B | 250         |                    |
|                                 |                                                        | Connection C | 400         |                    |
|                                 | Pulse Load Current <sup>*3</sup><br>(AC/DC Connection) | $I_{LP}$     | 400         | mA                 |
|                                 | Power Dissipation                                      | $P_D$        | 560         | mW                 |
| Isolation Voltage <sup>*4</sup> |                                                        | BV           | 3 750       | Vr.m.s.            |
| Total Power Dissipation         |                                                        | $P_T$        | 610         | mW                 |
| Operating Ambient Temperature   |                                                        | $T_A$        | -40 to +85  | $^{\circ}\text{C}$ |
| Storage Temperature             |                                                        | $T_{stg}$    | -40 to +125 | $^{\circ}\text{C}$ |

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

**\*2** Conditions:  $I_F \geq 2\text{ mA}$ . The following types of load connections are available.



**\*3**  $PW = 100\text{ ms}$ , 1 shot

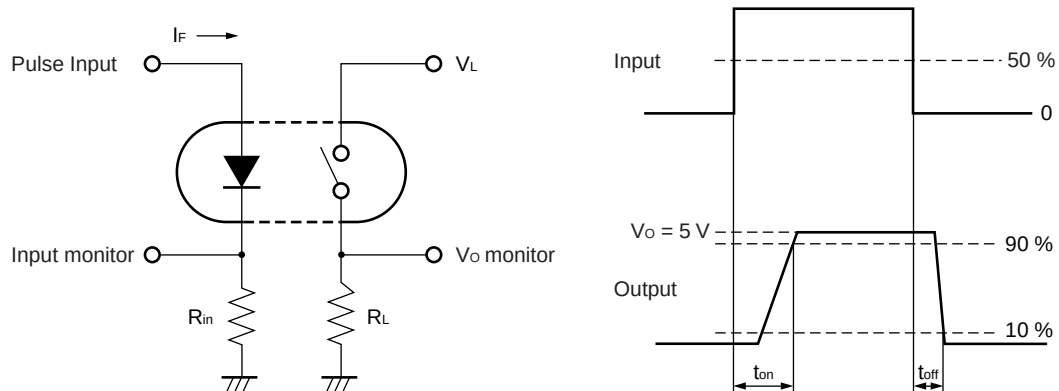
**\*4** AC voltage for 1 minute at  $T_A = 25\text{ }^{\circ}\text{C}$ ,  $RH = 60\text{ \%}$  between input and output

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

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

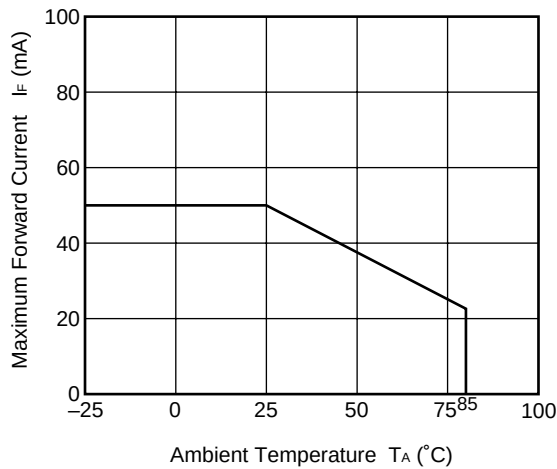
**ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ )**

| Parameter |                             | Symbol            | Conditions                                                                                 | MIN.   | TYP. | MAX. | Unit          |
|-----------|-----------------------------|-------------------|--------------------------------------------------------------------------------------------|--------|------|------|---------------|
| Diode     | Forward Voltage             | $V_F$             | $I_F = 10\text{ mA}$                                                                       |        | 1.2  | 1.4  | V             |
|           | Reverse Current             | $I_R$             | $V_R = 5\text{ V}$                                                                         |        |      | 5.0  | $\mu\text{A}$ |
| MOS FET   | Off-state Leakage Current   | $I_{\text{Leak}}$ | $V_D = 400\text{ V}$                                                                       |        | 0.03 | 1.0  | $\mu\text{A}$ |
|           | Output Capacitance          | $C_{\text{out}}$  | $V_D = 0\text{ V}, f = 1\text{ MHz}$                                                       |        | 225  |      | pF            |
| Coupled   | LED On-state Current        | $I_{\text{Fon}}$  | $I_L = 200\text{ mA}$                                                                      |        |      | 2.0  | mA            |
|           | On-state Resistance         | $R_{\text{on1}}$  | $I_F = 10\text{ mA}, I_L = 10\text{ mA}$                                                   |        | 6    | 10   | $\Omega$      |
|           |                             | $R_{\text{on2}}$  | $I_F = 10\text{ mA}, I_L = 200\text{ mA}, t \leq 10\text{ ms}$                             |        |      |      |               |
|           | Turn-on Time <sup>*1</sup>  | $t_{\text{on}}$   | $I_F = 10\text{ mA}, V_O = 5\text{ V}, R_L = 500\text{ }\Omega,$<br>$PW \geq 10\text{ ms}$ |        | 1.2  | 2.5  | ms            |
|           | Turn-off Time <sup>*1</sup> | $t_{\text{off}}$  |                                                                                            |        | 0.06 | 0.2  |               |
|           | Isolation Resistance        | $R_{\text{I-O}}$  | $V_{\text{I-O}} = 1.0\text{ kV}_{\text{DC}}$                                               | $10^9$ |      |      | $\Omega$      |
|           | Isolation Capacitance       | $C_{\text{I-O}}$  | $V = 0\text{ V}, f = 1\text{ MHz}$                                                         |        | 1.1  |      | pF            |

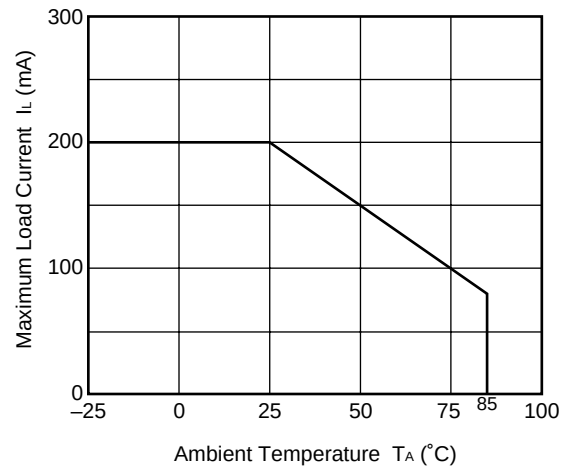
**\*1 Test Circuit for Switching Time**

★ TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

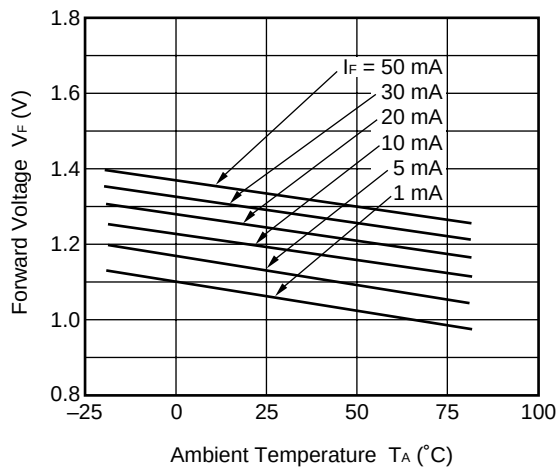
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



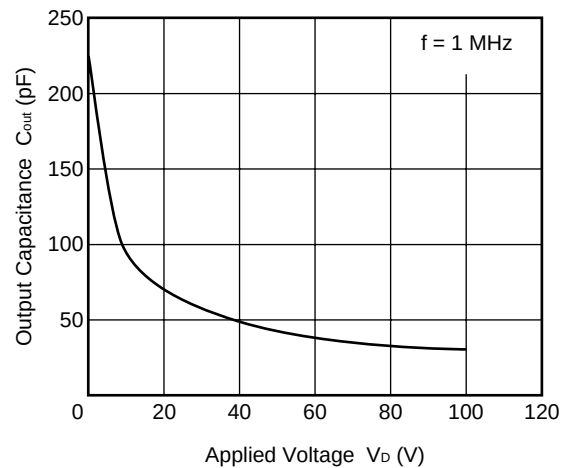
MAXIMUM LOAD CURRENT vs. AMBIENT TEMPERATURE



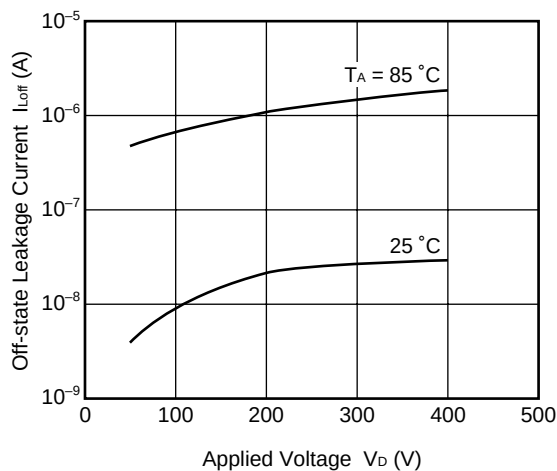
FORWARD VOLTAGE vs. AMBIENT TEMPERATURE



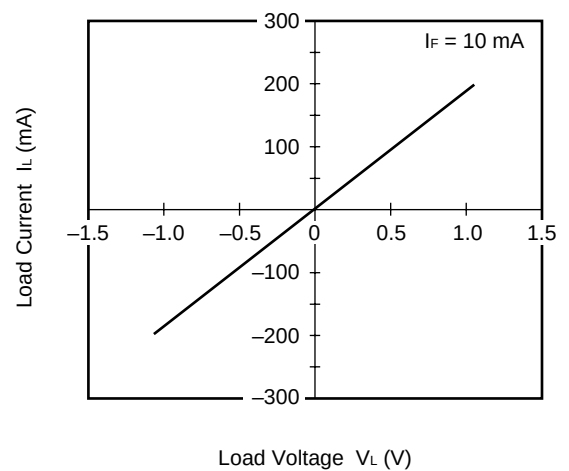
OUTPUT CAPACITANCE vs. APPLIED VOLTAGE



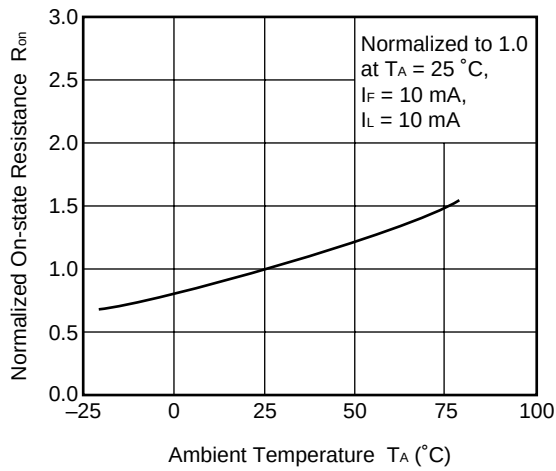
OFF-STATE LEAKAGE CURRENT vs. APPLIED VOLTAGE



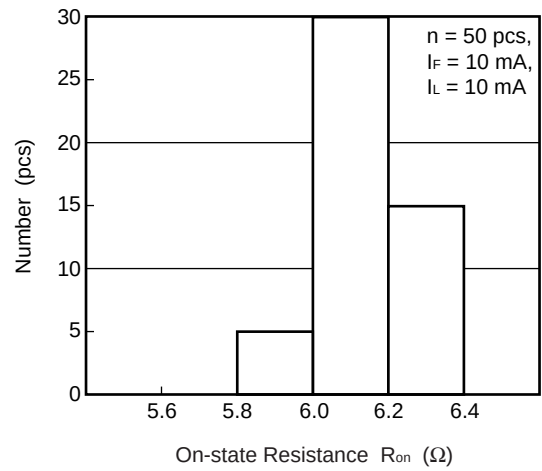
LORD CURRENT vs. LORD VOLTAGE



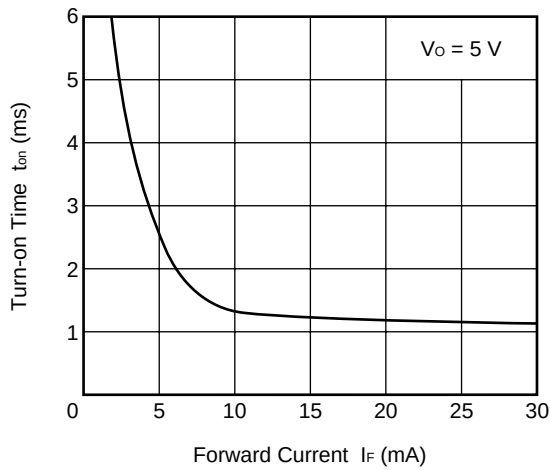
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



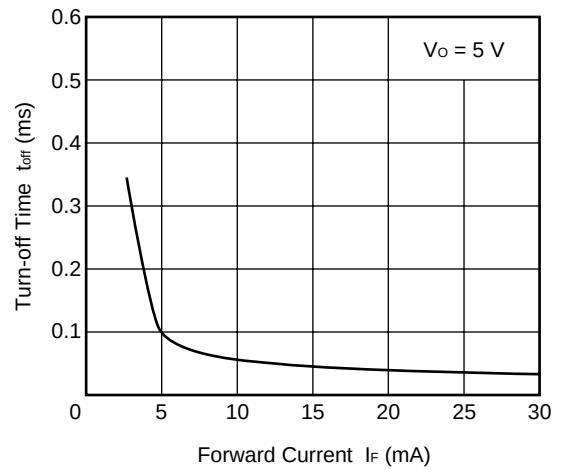
ON-STATE RESISTANCE DISTRIBUTION



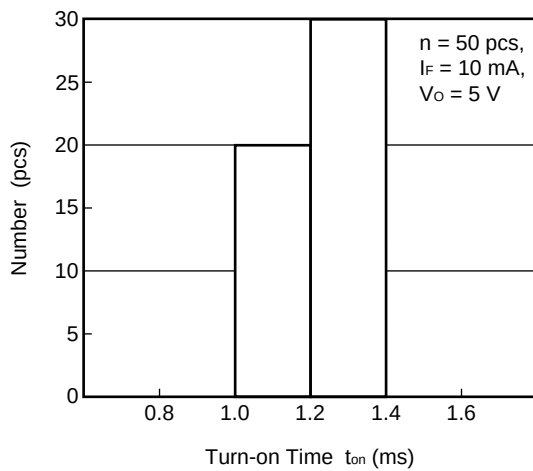
TURN-ON TIME vs. FORWARD CURRENT



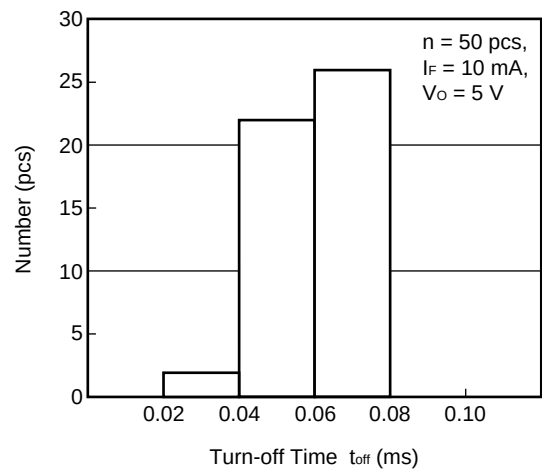
TURN-OFF TIME vs. FORWARD CURRENT

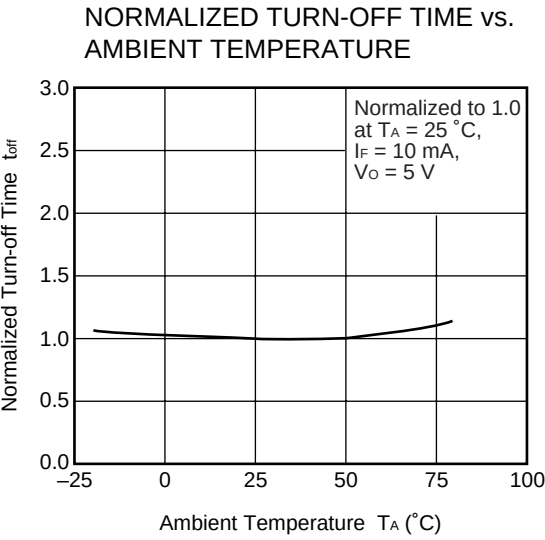
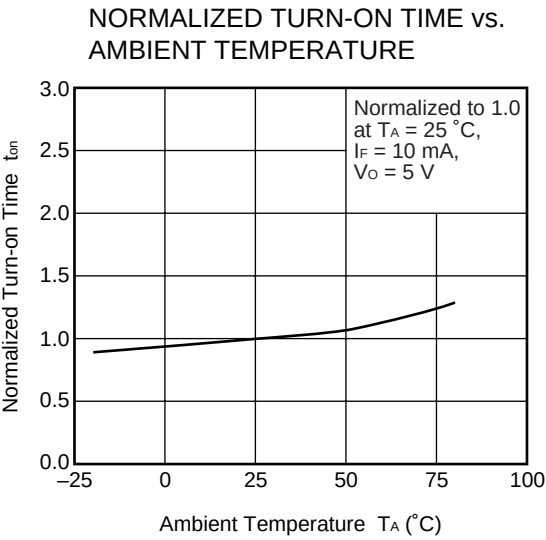


TURN-ON TIME DISTRIBUTION



TURN-OFF TIME DISTRIBUTION



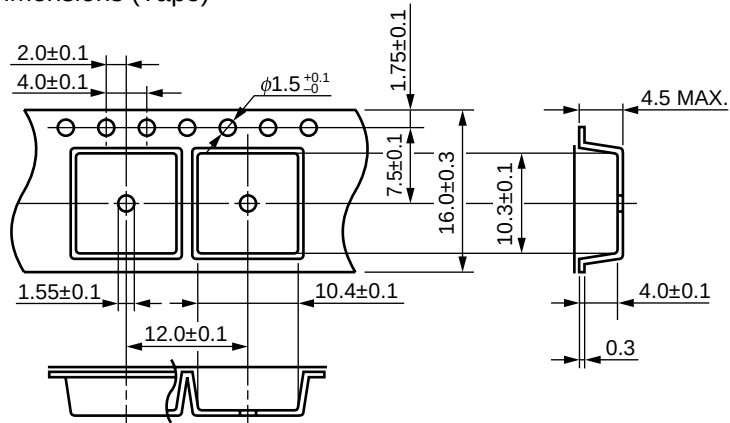


**Remark** The graphs indicate nominal characteristics.

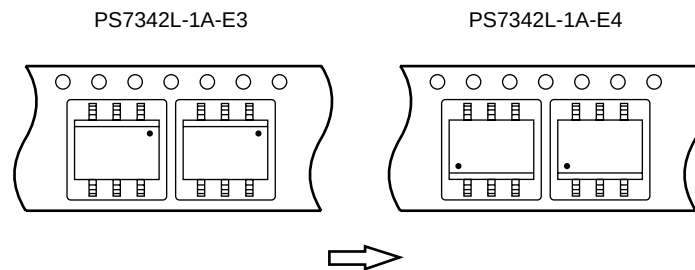


★ TAPING SPECIFICATIONS (in millimeters)

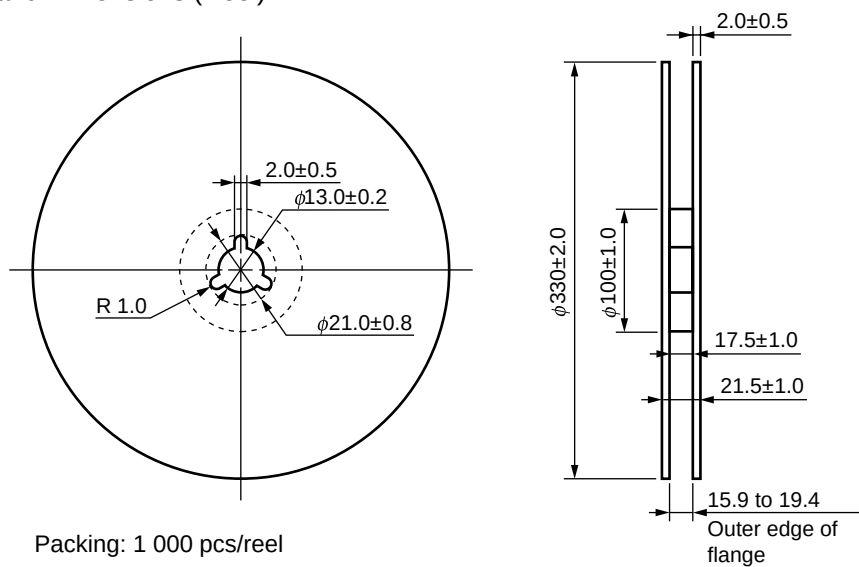
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)

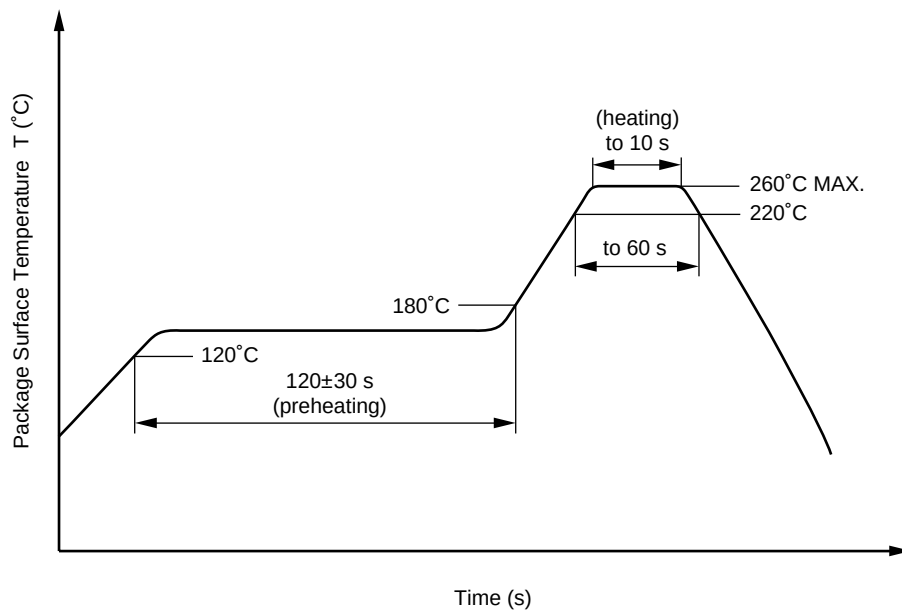


★ **RECOMMENDED SOLDERING CONDITIONS**

**(1) Infrared reflow soldering**

- |                                                 |                                                                                                                      |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| • Peak reflow temperature                       | 260°C or below (package surface temperature)                                                                         |
| • Time of peak reflow temperature               | 10 seconds or less                                                                                                   |
| • Time of temperature higher than 220°C         | 60 seconds or less                                                                                                   |
| • Time to preheat temperature from 120 to 180°C | 120±30 s                                                                                                             |
| • 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) Wave soldering**

- |                         |                                                                                                                      |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|
| • Temperature           | 260°C or below (molten solder temperature)                                                                           |
| • Time                  | 10 seconds or less                                                                                                   |
| • Preheating conditions | 120°C or below (package surface temperature)                                                                         |
| • 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 and chlorine-based cleaning solvent.