

PS7341-1A, PS7341L-1A

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

DESCRIPTION

The PS7341-1A and PS7341L-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 PS7341L-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
- PS7341L-1A: Surface mount type
- UL approved: File No. E72422 (S)
- BSI approved: No. 8252/8253
- CSA approved: No. CA 101391

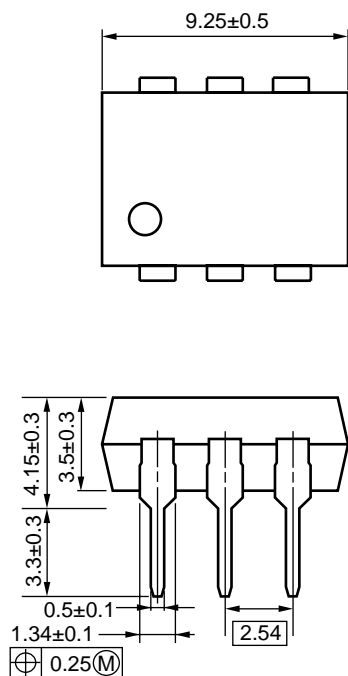
APPLICATIONS

- Exchange equipment
- Measurement equipment
- FA/OA equipment

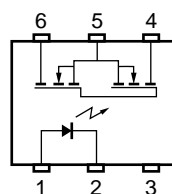
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PACKAGE DIMENSIONS (in millimeters)

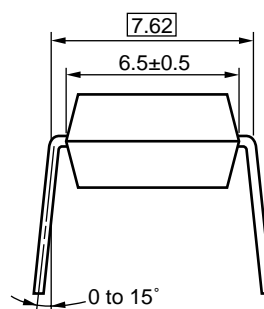
PS7341-1A



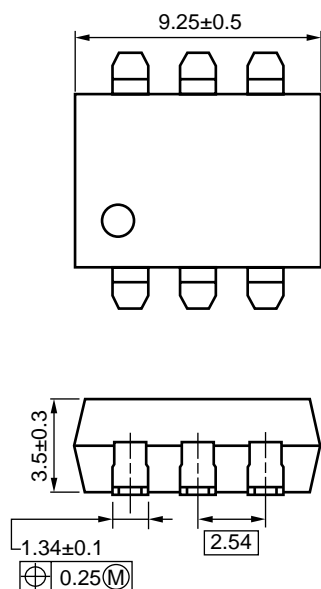
TOP VIEW



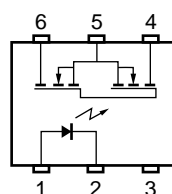
1. LED Anode
2. LED Cathode
3. NC
4. MOS FET Drain
5. MOS FET Source
6. MOS FET Drain



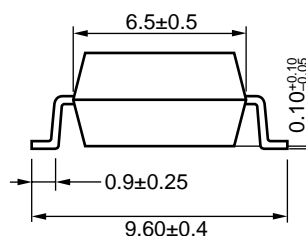
PS7341L-1A



TOP VIEW



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



ORDERING INFORMATION

| Part Number | Package | Packing Style | Application Part Number*1 |
|---------------|-----------|------------------------------|---------------------------|
| PS7341-1A | 6-pin DIP | Magazine case 50 pcs | PS7341-1A |
| PS7341L-1A | | | PS7341L-1A |
| PS7341L-1A-E3 | | Embossed Tape 1 000 pcs/reel | |
| PS7341L-1A-E4 | | | |

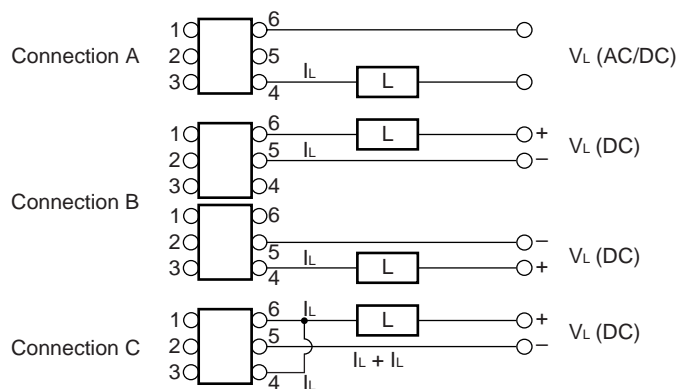
***1** For the application of the Safety Standard, following part number should be used.

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 ^{*1} | I_{FP} | 1 | A |
| MOS FET | Break Down Voltage | V_L | 400 | V |
| | Continuous Load Current ^{*2} | Connection A | I_L | mA |
| | | Connection B | 200 | |
| | | Connection C | 300 | |
| | Pulse Load Current ^{*3} (AC/DC Connection) | I_{LP} | 300 | mA |
| | Power Dissipation | P_D | 560 | mW |
| Isolation Voltage ^{*4} | | 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 % between input and output

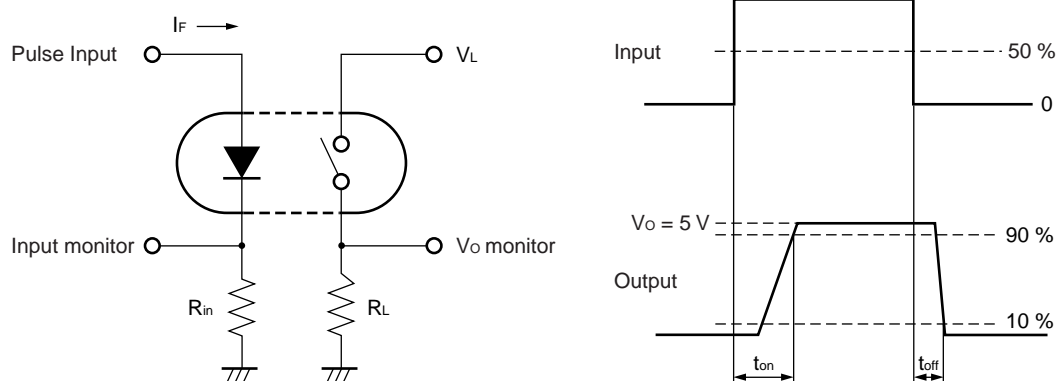
RECOMMENDED OPERATING CONDITIONS ($T_A = 25\text{ }^{\circ}\text{C}$)

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

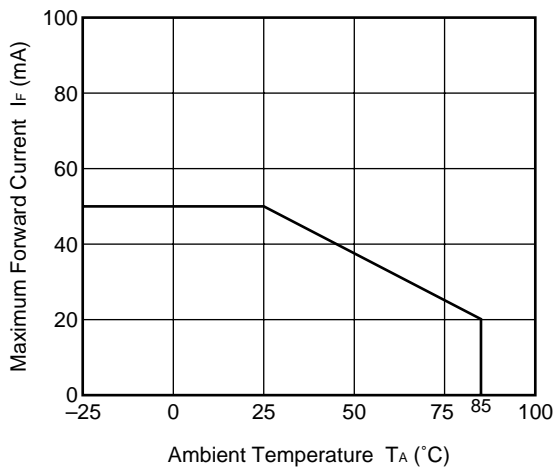
| Parameter | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|-----------|---------------------------|-------------------|--|--------|------|------|---------------|
| Diode | Forward Voltage | V_F | $I_F = 10\text{ mA}$ | | 1.2 | 1.4 | V |
| | Reverse Current | I_R | $V_R = 5\text{ V}$ | | | 5.0 | μA |
| MOS FET | Off-state Leakage Current | I_{Leak} | $V_D = 400\text{ V}$ | | 0.03 | 1.0 | μA |
| | Output Capacitance | C_{out} | $V_D = 0\text{ V}$, $f = 1\text{ MHz}$ | | 65 | | pF |
| Coupled | LED On-state Current | I_{Fon} | $I_L = 150\text{ mA}$ | | | 2.0 | mA |
| | On-state Resistance | R_{on1} | $I_F = 10\text{ mA}$, $I_L = 10\text{ mA}$ | | 20 | 30 | Ω |
| | | R_{on2} | $I_F = 10\text{ mA}$, $I_L = 150\text{ mA}$, $t \leq 10\text{ ms}$ | | 16 | 25 | |
| | Turn-on Time *1 | t_{on} | $I_F = 10\text{ mA}$, $V_O = 5\text{ V}$, $R_L = 2\text{ k}\Omega$, $PW \geq 10\text{ ms}$ | | 0.35 | 1.0 | ms |
| | Turn-off Time *1 | t_{off} | | | 0.03 | 0.2 | |
| | Isolation Resistance | $R_{\text{I-O}}$ | $V_{\text{I-O}} = 1.0\text{ kV}_{\text{DC}}$ | 10^9 | | | Ω |
| | Isolation Capacitance | $C_{\text{I-O}}$ | $V = 0\text{ V}$, $f = 1\text{ MHz}$ | | 1.1 | | pF |

*1 Test Circuit for Switching Time

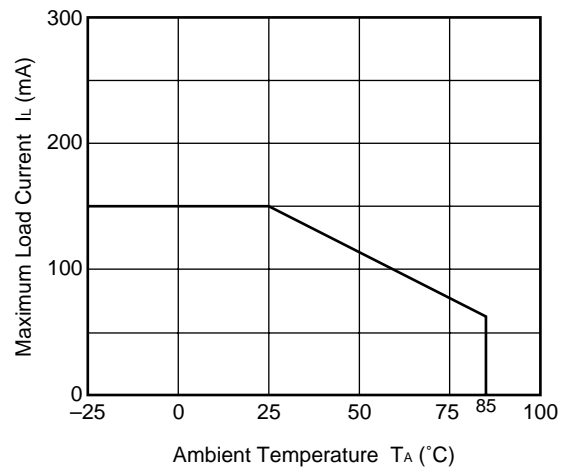


★ TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

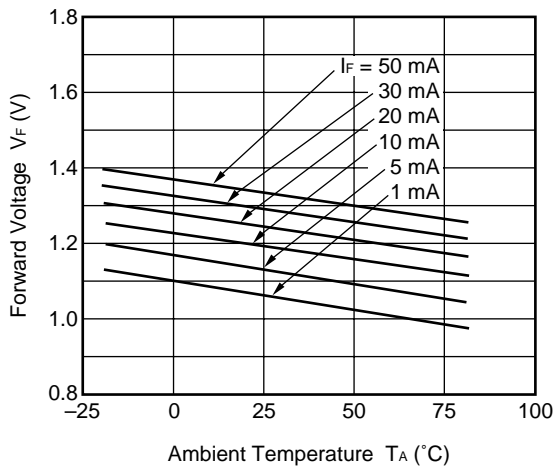
MAXIMUM FORWARD CURRENT vs.
AMBIENT TEMPERATURE



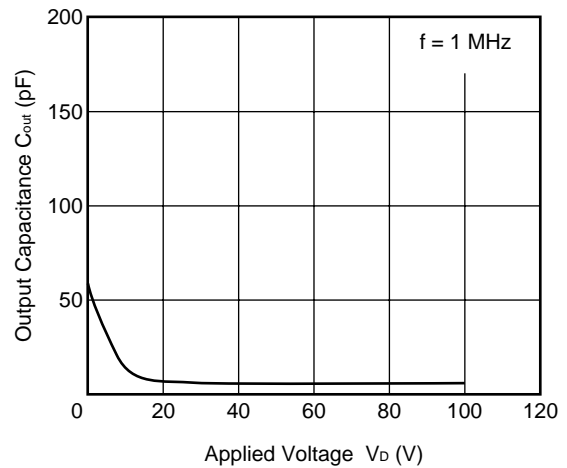
MAXIMUM LOAD CURRENT vs.
AMBIENT TEMPERATURE



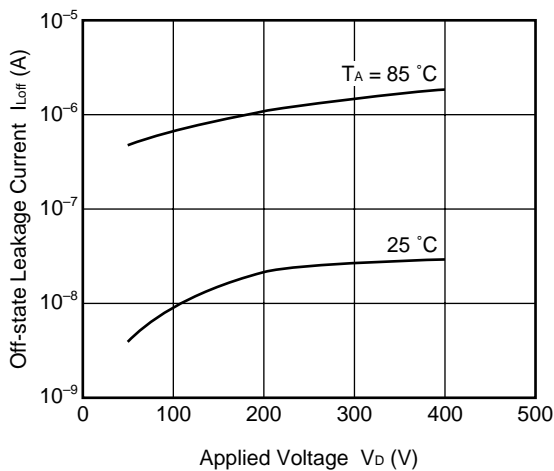
FORWARD VOLTAGE vs.
AMBIENT TEMPERATURE



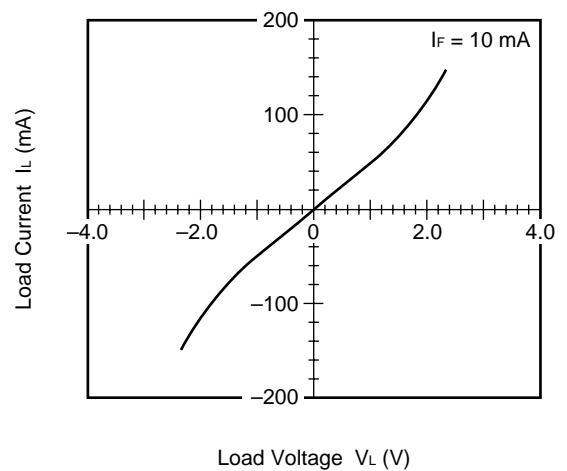
OUTPUT CAPACITANCE vs.
APPLIED VOLTAGE



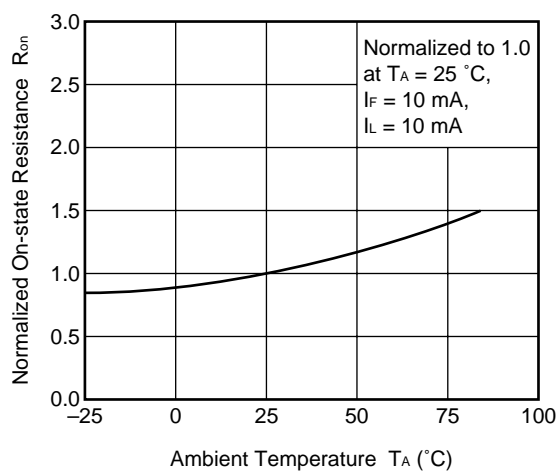
OFF-STATE LEAKAGE CURRENT vs.
APPLIED VOLTAGE



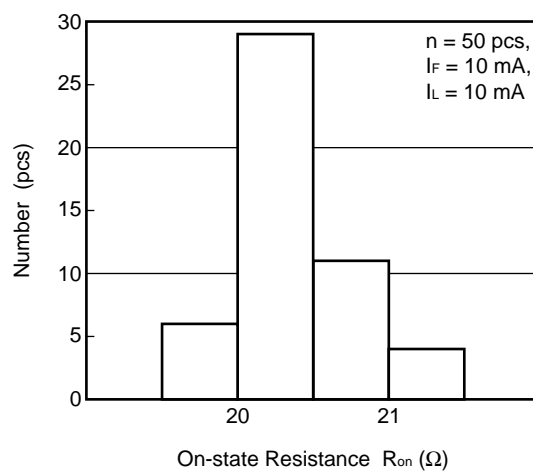
LOAD CURRENT vs. LOAD VOLTAGE



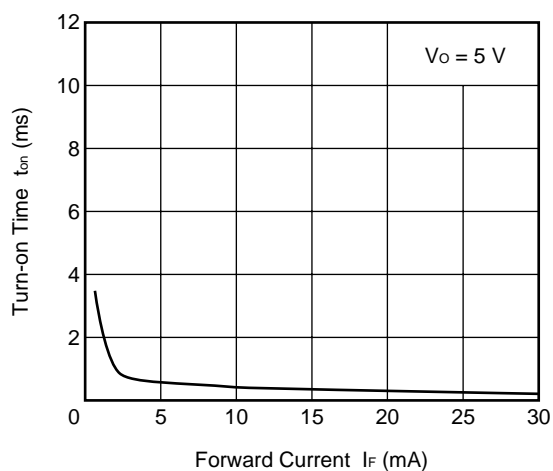
NORMALIZED ON-STATE RESISTANCE vs. AMBIENT TEMPERATURE



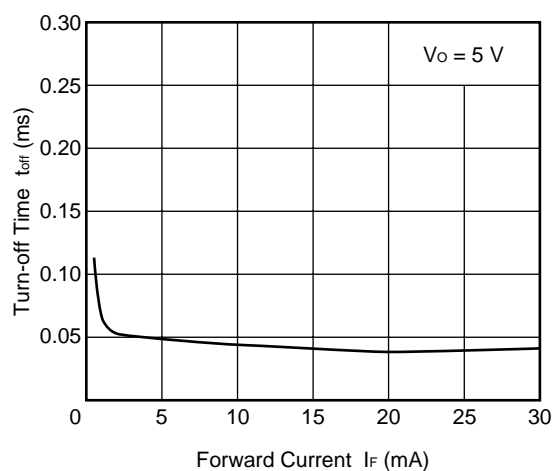
ON-STATE RESISTANCE DISTRIBUTION



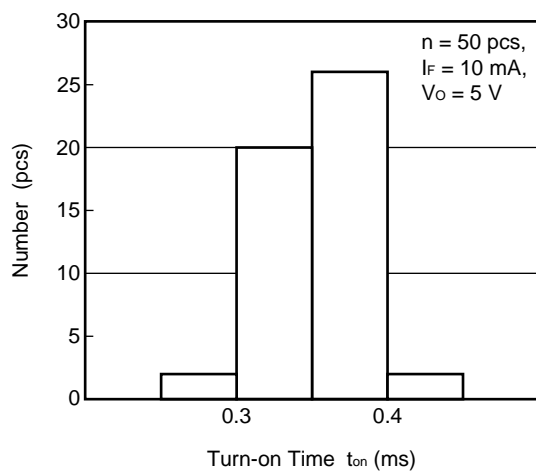
TURN-ON TIME vs. FORWARD CURRENT



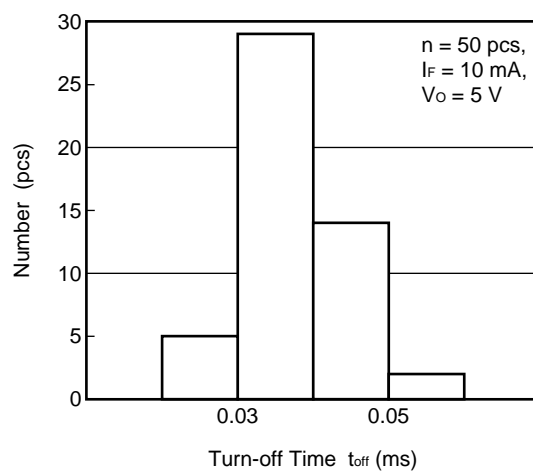
TURN-OFF TIME vs. FORWARD CURRENT



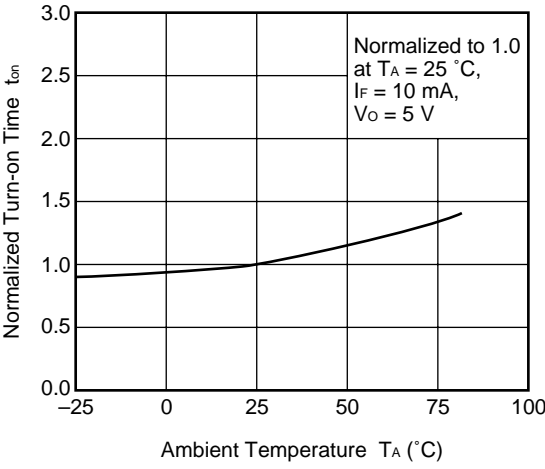
TURN-ON TIME DISTRIBUTION



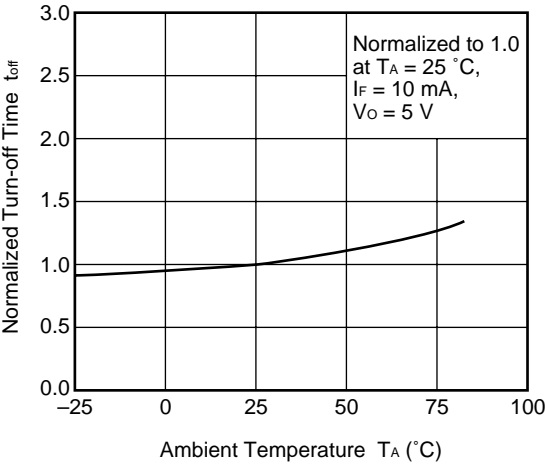
TURN-OFF TIME DISTRIBUTION



NORMALIZED TURN-ON TIME vs.
AMBIENT TEMPERATURE



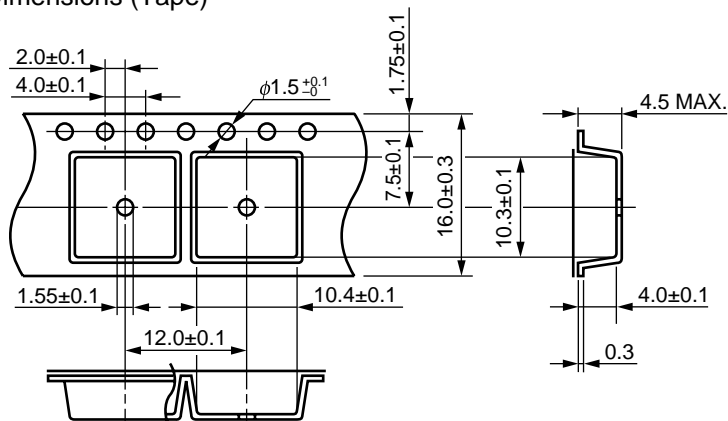
NORMALIZED TURN-OFF TIME vs.
AMBIENT TEMPERATURE



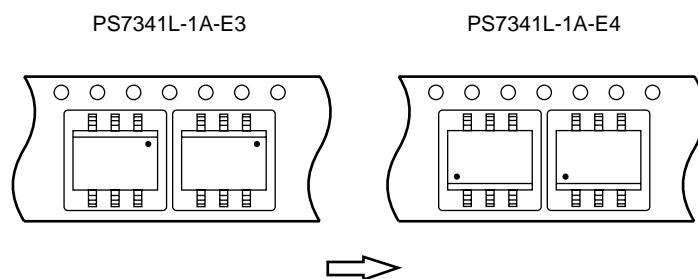
Remark The graphs indicate nominal characteristics.

★ TAPING SPECIFICATIONS (in millimeters)

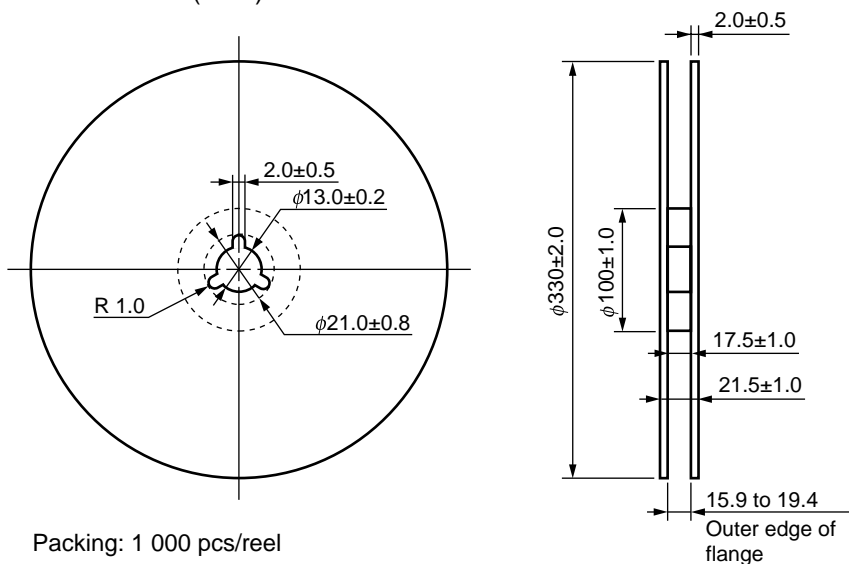
Outline and Dimensions (Tape)



Tape Direction



Outline and Dimensions (Reel)



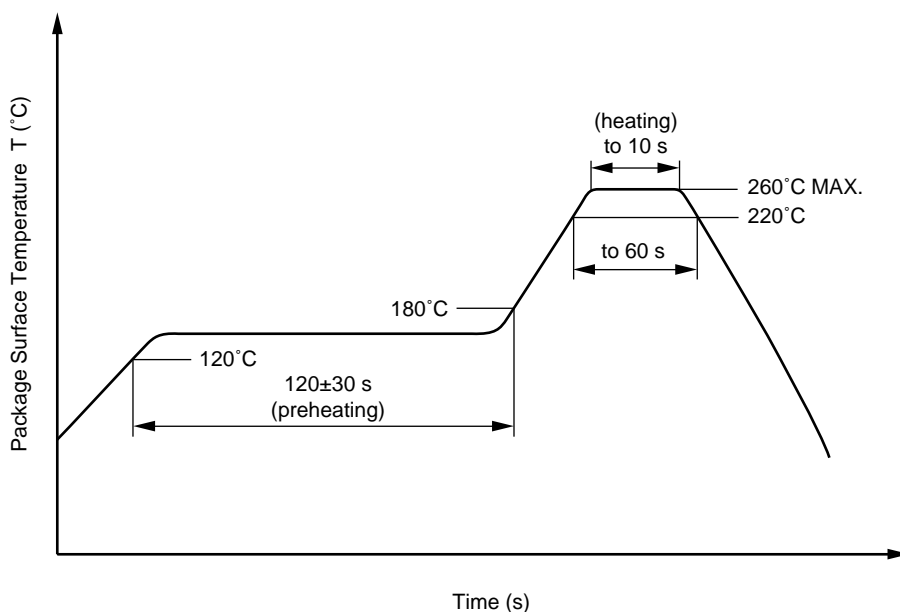
Packing: 1 000 pcs/reel

★ 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.

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M8E 00.4-0110

SAFETY INFORMATION ON THIS PRODUCT

| | |
|---|---|
| <div data-bbox="188 277 277 304">Caution</div> <div data-bbox="300 277 448 302">GaAs Products</div> | <p>The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested.</p> <ul style="list-style-type: none"> • Do not destroy or burn the product. • Do not cut or cleave off any part of the product. • Do not crush or chemically dissolve the product. • Do not put the product in the mouth. <p>Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.</p> |
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► For further information, please contact

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