

# FM501V-NL

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# FM501V-NL

## 100mA Surface Mount Small Signal Schottky Diode 40V

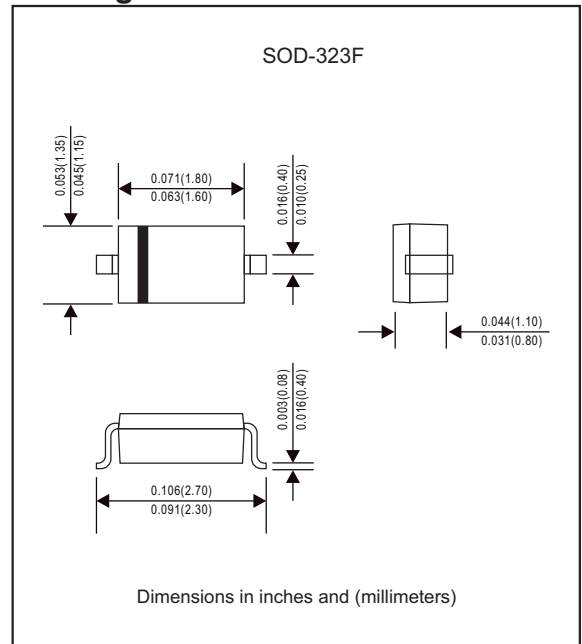
### Features

- Low current rectification and high speed switching
- Extremely small surface mount type
- Up to 100mA current capability
- Silicon epitaxial planar chip, metal silicon junction
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen free part, ex. FM501V-NL-H

### Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-323F
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.005 gram

### Package Outline



### Maximum ratings (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter                            | Conditions                               | Symbol    | MIN. | TYP. | MAX. | Unit               |
|--------------------------------------|------------------------------------------|-----------|------|------|------|--------------------|
| Repetitive peak reverse voltage      |                                          | $V_{RM}$  |      |      | 40   | V                  |
| Continuous reverse voltage           |                                          | $V_R$     |      |      | 40   | V                  |
| Average rectified forward current    |                                          | $I_o$     |      |      | 100  | mA                 |
| Peak forward surge current           | 60Hz for 1cycle                          | $I_{FSM}$ |      |      | 1000 | mA                 |
| Typical junction capacitance         | f=1MHz and applied 0V DC reverse voltage | $C_T$     |      | 20   |      | pF                 |
| Operating junction temperature range |                                          | $T_J$     | -40  |      | +125 | $^{\circ}\text{C}$ |
| Storage temperature range            |                                          | $T_{STG}$ | -40  |      | +125 | $^{\circ}\text{C}$ |

### Electrical characteristics (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter       | Conditions         | Symbol | MIN. | TYP. | MAX. | Unit          |
|-----------------|--------------------|--------|------|------|------|---------------|
| Forward voltage | $I_F=100\text{mA}$ | $V_F$  |      |      | 0.55 | V             |
| Reverse current | $V_R=10\text{V}$   | $I_R$  |      |      | 30   | $\mu\text{A}$ |

## Rating and characteristic curves (FM501V-NL)

FIG: 1 Forward characteristics

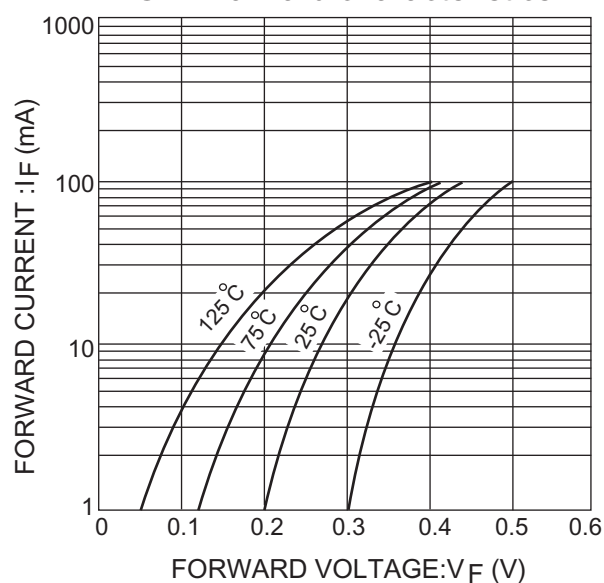


Fig.2 Reverse characteristics

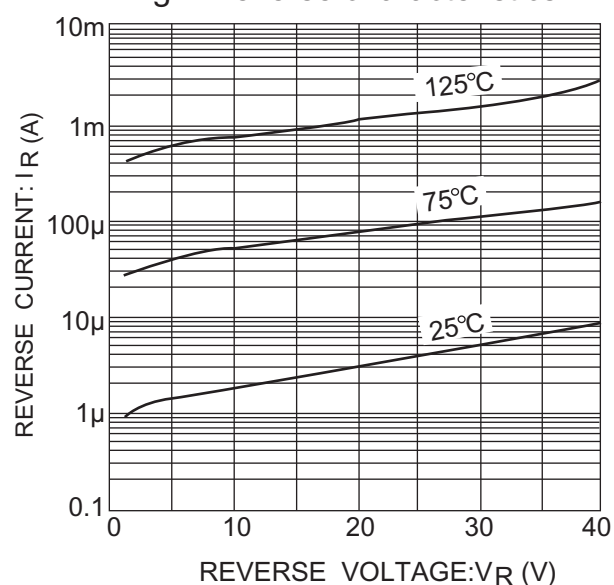


Fig. 4 Derating curve  
(mounting on glass epoxy PCBs)

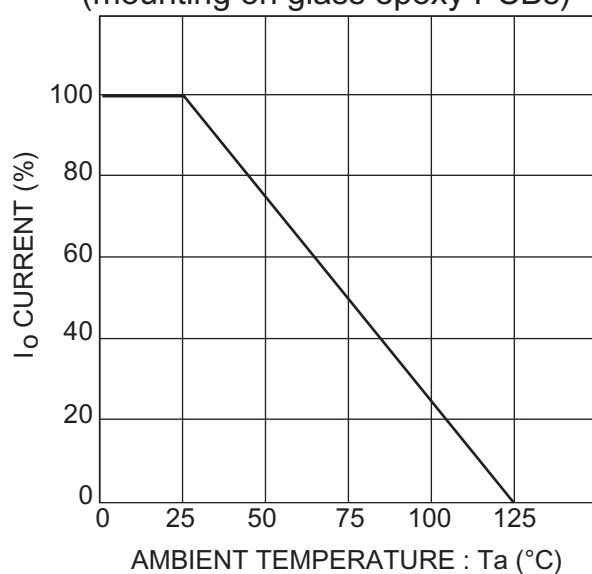
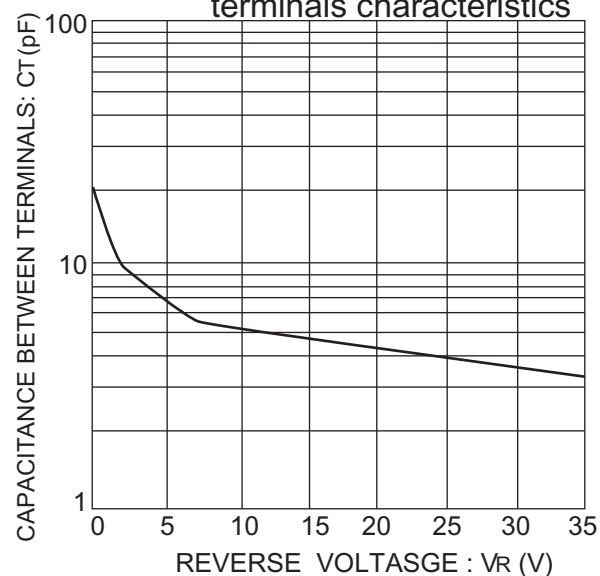


Fig.3 Capacitance between terminals characteristics



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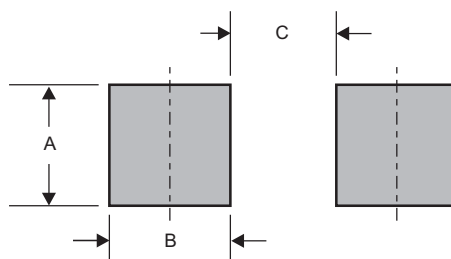
## Pinning information

| Pin                        | Simplified outline                                                                | Symbol                                                                              |
|----------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Pin1 cathode<br>Pin2 anode |  |  |

## Marking

| Type number | Marking code |
|-------------|--------------|
| FM501V-NL   | JV,S7        |

## Suggested solder pad layout

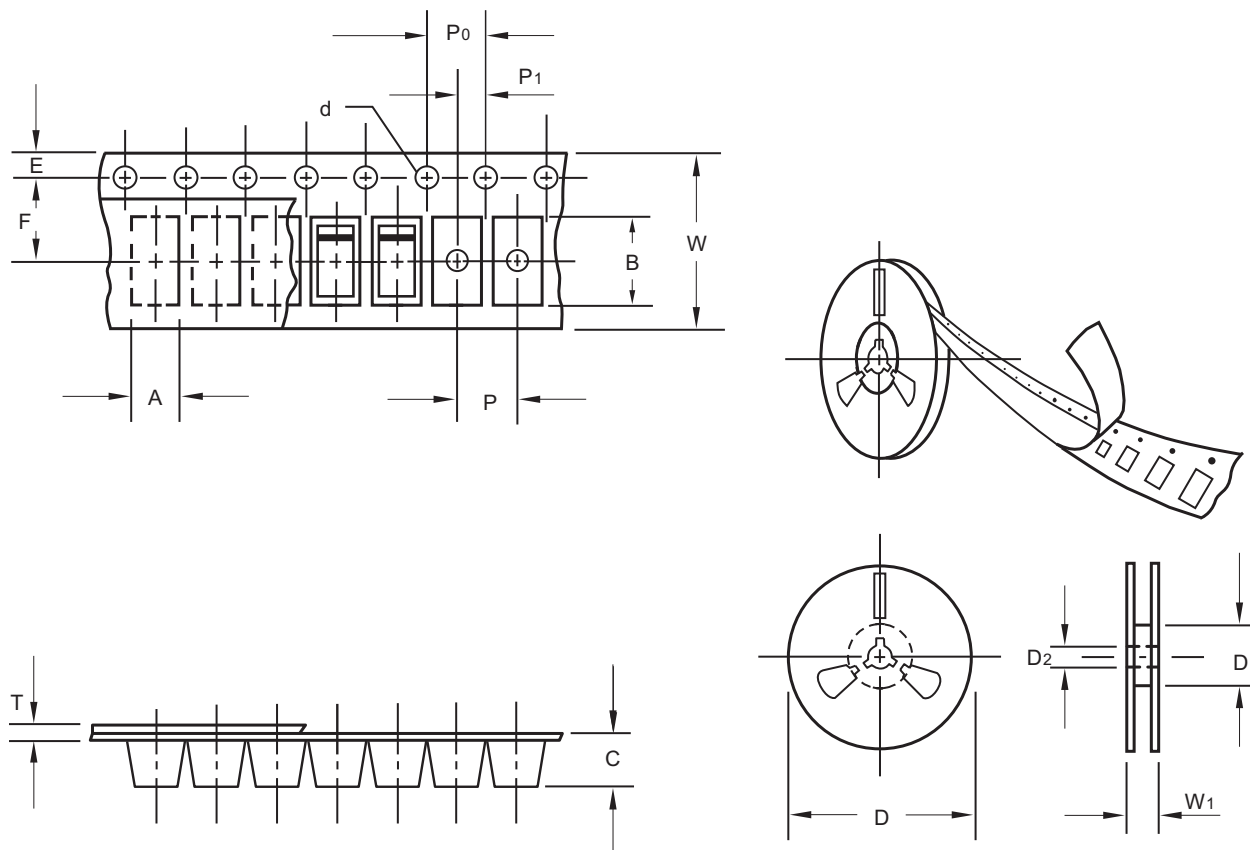


Dimensions in inches and (millimeters)

| PACKAGE  | A            | B            | C            |
|----------|--------------|--------------|--------------|
| SOD-323F | 0.033 (0.83) | 0.025 (0.63) | 0.063 (1.60) |

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## Packing information



unit:mm

| Item                      | Symbol | Tolerance | SOD-323F |
|---------------------------|--------|-----------|----------|
| Carrier width             | A      | 0.1       | 1.46     |
| Carrier length            | B      | 0.1       | 2.95     |
| Carrier depth             | C      | 0.1       | 1.25     |
| Sprocket hole             | d      | 0.1       | 1.50     |
| 13" Reel outside diameter | D      | 2.0       | -        |
| 13" Reel inner diameter   | D1     | min       | -        |
| 7" Reel outside diameter  | D      | 2.0       | 178.00   |
| 7" Reel inner diameter    | D1     | min       | 62.00    |
| Feed hole diameter        | D2     | 0.5       | 13.00    |
| Sprocket hole position    | E      | 0.1       | 1.75     |
| Punch hole position       | F      | 0.1       | 3.50     |
| Punch hole pitch          | P      | 0.1       | 4.00     |
| Sprocket hole pitch       | P0     | 0.1       | 4.00     |
| Embossment center         | P1     | 0.1       | 2.00     |
| Overall tape thickness    | T      | 0.1       | 0.23     |
| Tape width                | W      | 0.3       | 8.00     |
| Reel width                | W1     | 1.0       | 11.40    |

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

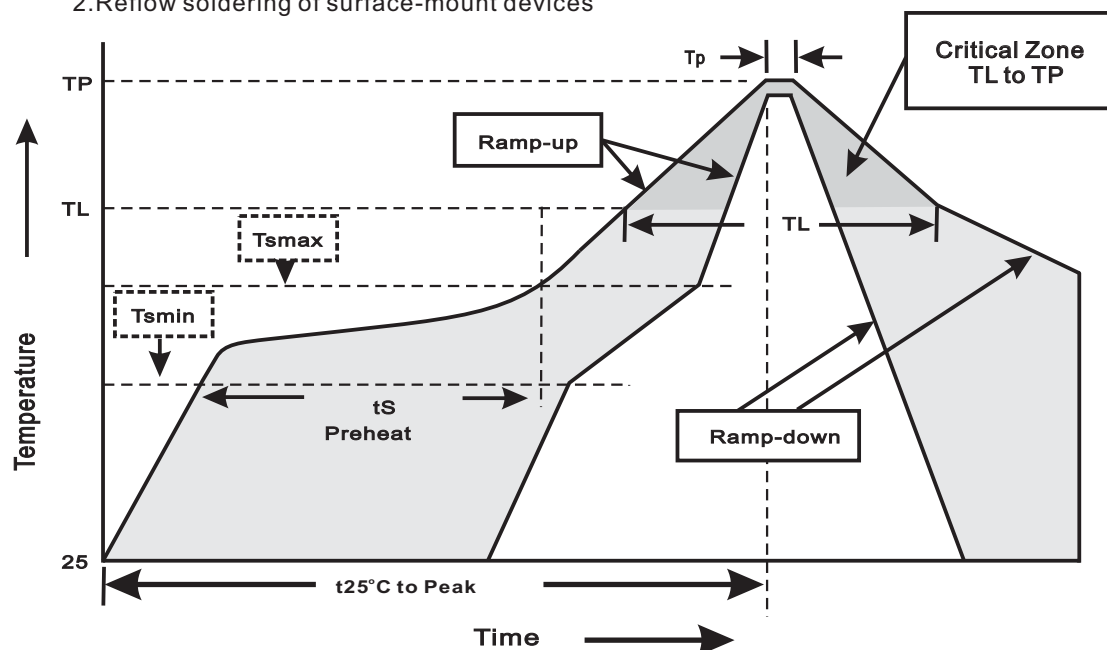
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## Reel packing

| PACKAGE  | REEL SIZE | REEL (pcs) | COMPONENT SPACING (m/m) | BOX (pcs) | INNER BOX (m/m) | REEL DIA, (m/m) | CARTON SIZE (m/m) | CARTON (pcs) | APPROX. GROSS WEIGHT (kg) |
|----------|-----------|------------|-------------------------|-----------|-----------------|-----------------|-------------------|--------------|---------------------------|
| SOD-323F | 7"        | 3,000      | 4.0                     | 30,000    | 183*123*183     | 178             | 382*257*387       | 240,000      | 8.0                       |

## Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



## 3.Reflow soldering

| Profile Feature                                                                                                                 | Soldering Condition         |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Average ramp-up rate(T <sub>L</sub> to T <sub>P</sub> )                                                                         | <3°C/sec                    |
| Preheat<br>-Temperature Min(T <sub>smmin</sub> )<br>-Temperature Max(T <sub>smmax</sub> )<br>-Time(min to max)(t <sub>s</sub> ) | 150°C<br>200°C<br>60~120sec |
| T <sub>smmax</sub> to T <sub>L</sub><br>-Ramp-upRate                                                                            | <3°C/sec                    |
| Time maintained above:<br>-Temperature(T <sub>L</sub> )<br>-Time(t <sub>L</sub> )                                               | 217°C<br>60~260sec          |
| Peak Temperature(T <sub>P</sub> )                                                                                               | 255°C-0/+5°C                |
| Time within 5°C of actual Peak Temperature(t <sub>P</sub> )                                                                     | 10~30sec                    |
| Ramp-down Rate                                                                                                                  | <6°C/sec                    |
| Time 25°C to Peak Temperature                                                                                                   | <6minutes                   |

**FM501V-NL****High reliability test capabilities**

| Item Test                         | Conditions                                                                                                                               | Reference                     |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. Solder Resistance              | at $260 \pm 5^\circ\text{C}$ for $10 \pm 2\text{sec.}$                                                                                   | MIL-STD-750D<br>METHOD-2031   |
| 2. Solderability                  | at $245 \pm 5^\circ\text{C}$ for 5 sec.                                                                                                  | MIL-STD-202F<br>METHOD-208    |
| 3. High Temperature Reverse Bias  | $V_R = 80\%$ rate at $T_J = 125^\circ\text{C}$ for 168 hrs.                                                                              | MIL-STD-750D<br>METHOD-1038   |
| 4. Forward Operation Life         | Rated average rectifier current at $T_A = 25^\circ\text{C}$ for 500hrs.                                                                  | MIL-STD-750D<br>METHOD-1027   |
| 5. Intermittent Operation Life    | $T_A = 25^\circ\text{C}$ , $I_F = I_O$<br>On state: power on for 5 min.<br>off state: power off for 5 min.<br>on and off for 500 cycles. | MIL-STD-750D<br>METHOD-1036   |
| 6. Pressure Cooker                | $15P_{SIG}$ at $T_A = 121^\circ\text{C}$ for 4 hrs.                                                                                      | JESD22-A102                   |
| 7. Temperature Cycling            | $-55^\circ\text{C}$ to $+125^\circ\text{C}$ dwelled for 30 min.<br>and transferred for 5min. total 10 cycles.                            | MIL-STD-750D<br>METHOD-1051   |
| 8. Forward Surge                  | 60Hz for 1cycle                                                                                                                          | MIL-STD-750D<br>METHOD-4066-2 |
| 9. Humidity                       | at $T_A = 85^\circ\text{C}$ , RH=85% for 1000hrs.                                                                                        | MIL-STD-750D<br>METHOD-1021   |
| 10. High Temperature Storage Life | at $175^\circ\text{C}$ for 1000 hrs.                                                                                                     | MIL-STD-750D<br>METHOD-1031   |