

**FM520-BF THRU FM5200-BF****List**

|                                                         |   |
|---------------------------------------------------------|---|
| List.....                                               | 1 |
| Package outline.....                                    | 2 |
| Features.....                                           | 2 |
| Mechanical data.....                                    | 2 |
| Maximum ratings .....                                   | 2 |
| Electrical characteristics.....                         | 2 |
| Rating and characteristic curves.....                   | 3 |
| Pinning information.....                                | 4 |
| Marking.....                                            | 4 |
| Suggested solder pad layout.....                        | 4 |
| Packing information.....                                | 5 |
| Reel packing.....                                       | 6 |
| Suggested thermal profiles for soldering processes..... | 6 |
| High reliability test capabilities.....                 | 7 |

# FM520-BF THRU FM5200-BF

## 5.0A Surface Mount Schottky Barrier Rectifiers 20V-200V

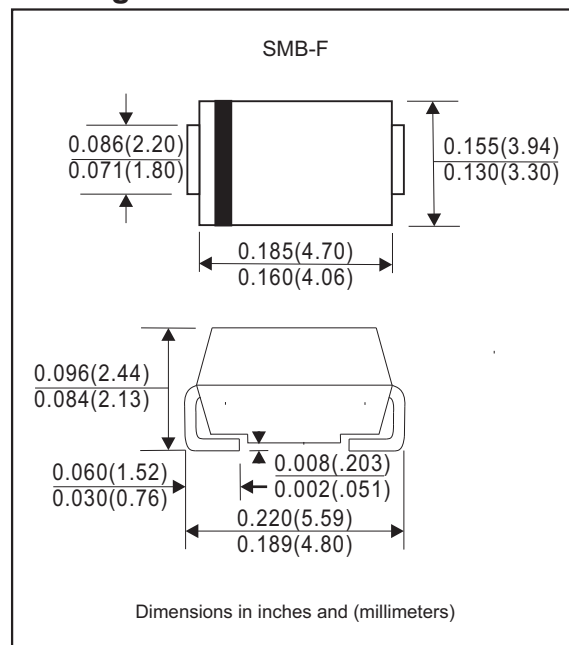
### Features

- Guardring Die Construction.
- Low Profile Package.
- Low Power Losses, High Efficiency Operation.
- High Current Capability.
- Low Forward Voltage Drop.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex. FM520-BF-H.

### Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AA / SMB-F
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.109gram

### Package outline



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

| PARAMETER                                                            | SYMBOLS          | FM520-BF    | FM540-BF | FM560-BF | FM580-BF    | FM5100-BF | FM5150-BF | FM5200-BF | UNIT |
|----------------------------------------------------------------------|------------------|-------------|----------|----------|-------------|-----------|-----------|-----------|------|
| Maximum repetitive peak reverse voltage                              | V <sub>RRM</sub> | 20          | 40       | 60       | 80          | 100       | 150       | 200       | V    |
| Maximum RMS voltage                                                  | V <sub>RMS</sub> | 14          | 28       | 42       | 56          | 70        | 105       | 140       | V    |
| Maximum DC blocking voltage                                          | V <sub>DC</sub>  | 20          | 40       | 60       | 80          | 100       | 150       | 200       | V    |
| Maximum average forward rectified current                            | I <sub>O</sub>   | 5.0         |          |          |             |           |           |           | A    |
| Peak forward surge current 8.3ms single half sine-wave(JEDEC method) | I <sub>FSM</sub> | 120         |          |          |             |           |           |           | A    |
| Operating junction temperature range                                 | T <sub>J</sub>   | -55 to +125 |          |          | -55 to +150 |           |           |           | °C   |
| Storage temperature range                                            | T <sub>STG</sub> | -55 to +150 |          |          |             |           |           |           | °C   |

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

| PARAMETER                                                                                                        | SYMBOLS | FM520-BF  | FM540-BF | FM560-BF | FM580-BF  | FM5100-BF | FM5150-BF | FM5200-BF | UNIT |
|------------------------------------------------------------------------------------------------------------------|---------|-----------|----------|----------|-----------|-----------|-----------|-----------|------|
| Maximum forward voltage at $I_F=5.0\text{A}$                                                                     | $V_F$   | 0.55      |          | 0.70     | 0.85      |           | 0.95      |           | V    |
| Maximum DC reverse current at $T_A=25^{\circ}\text{C}$ at rated DC blocking voltage at $T_A=100^{\circ}\text{C}$ | $I_R$   | 0.5<br>20 |          |          | 0.5<br>10 |           | 0.2<br>2  |           | mA   |

### Thermal Characteristics

| PARAMETER                                      | SYMBOLS         | FM520-BF | FM540-BF | FM560-BF | FM580-BF | FM5100-BF | FM5150-BF | FM5200-BF | UNIT                 |
|------------------------------------------------|-----------------|----------|----------|----------|----------|-----------|-----------|-----------|----------------------|
| Typical thermal resistance junction to ambient | $R_{\theta JA}$ | 50       |          |          |          |           |           |           | $^{\circ}\text{C/W}$ |

## Rating and characteristic curves (FM520-BF THRU FM5200-BF)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

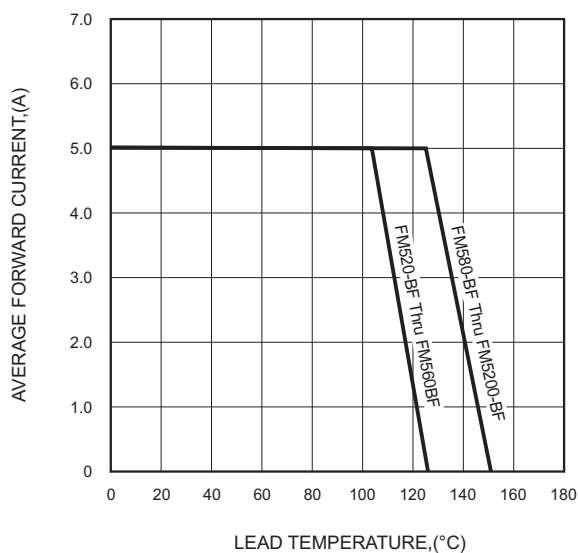


FIG.2-TYPICAL FORWARD CHARACTERISTICS

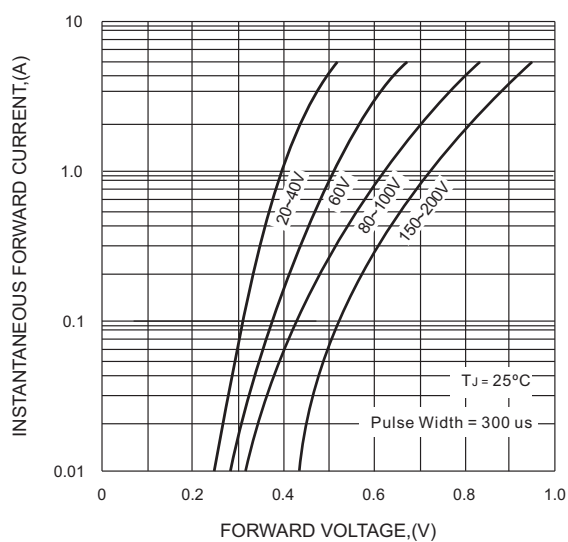


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

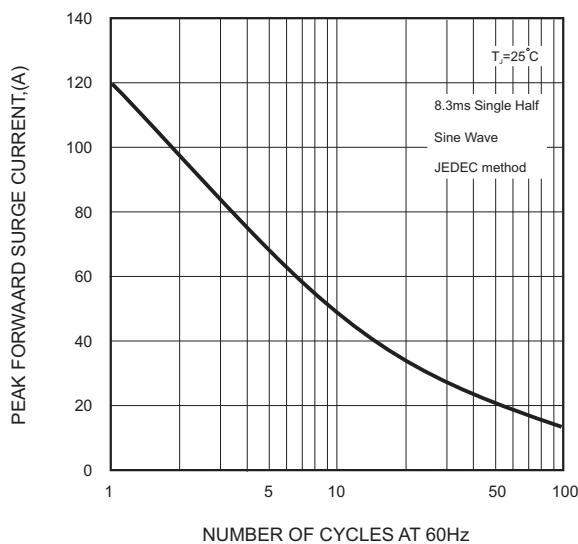
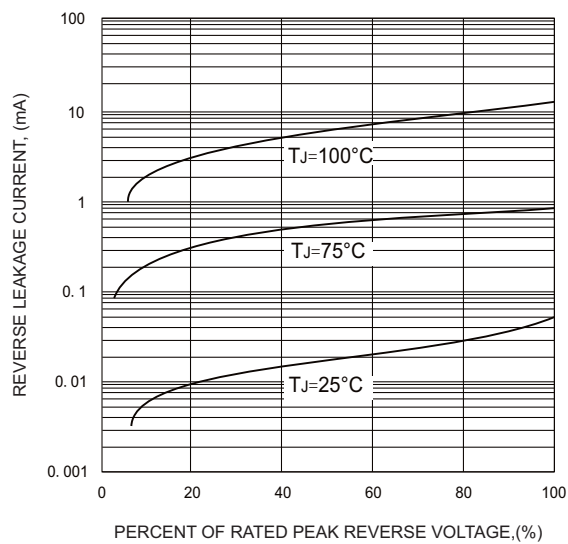


FIG.4-TYPICAL REVERSE CHARACTERISTICS



**FM520-BF THRU FM5200-BF**

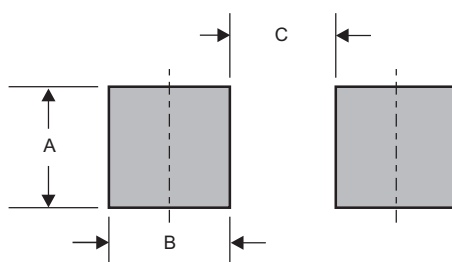
## Pinning information

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

## Marking

| Type number | Marking code |
|-------------|--------------|
| FM520-BF    | SS52         |
| FM540-BF    | SS54         |
| FM560-BF    | SS56         |
| FM580-BF    | SS58         |
| FM5100-BF   | SS510        |
| FM5150-BF   | SS515,SS5150 |
| FM5200-BF   | SS520,SS5200 |

## Suggested solder pad layout

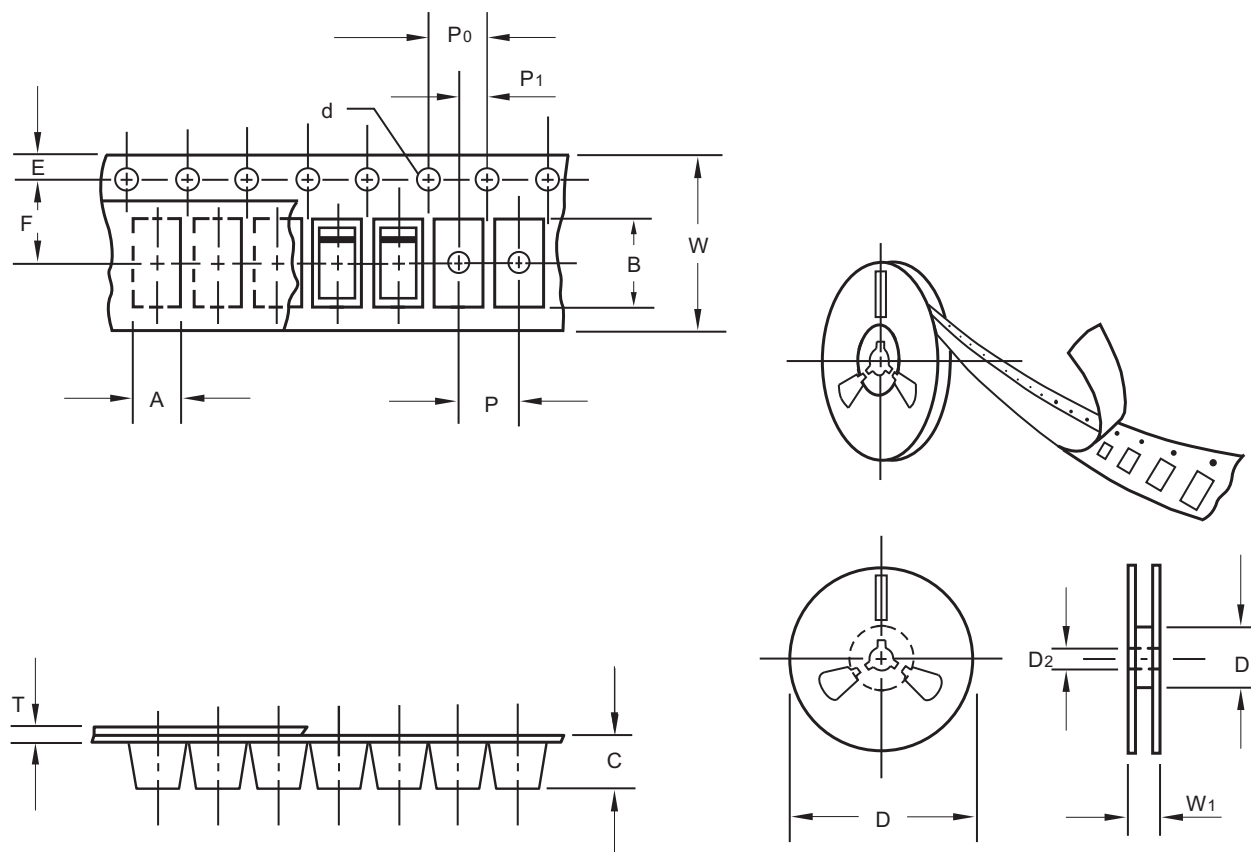


Dimensions in inches and (millimeters)

| PACKAGE | A            | B            | C            |
|---------|--------------|--------------|--------------|
| SMB-F   | 0.091 (2.30) | 0.098 (2.50) | 0.071 (1.80) |

## FM520-BF THRU FM5200-BF

## Packing information



unit:mm

| Item                      | Symbol | Tolerance | SMB-F  |
|---------------------------|--------|-----------|--------|
| Carrier width             | A      | 0.1       | 3.80   |
| Carrier length            | B      | 0.1       | 5.40   |
| Carrier depth             | C      | 0.1       | 2.45   |
| Sprocket hole             | d      | 0.1       | 1.55   |
| 13" Reel outside diameter | D      | 2.0       | 330.00 |
| 13" Reel inner diameter   | D1     | min       | 50.00  |
| 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       | 5.50   |
| Punch hole pitch          | P      | 0.1       | 8.00   |
| Sprocket hole pitch       | P0     | 0.1       | 4.00   |
| Embossment center         | P1     | 0.1       | 2.00   |
| Overall tape thickness    | T      | 0.015     | 0.40   |
| Tape width                | W      | 0.3       | 12.00  |
| Reel width                | W1     | 1.0       | 18.00  |

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

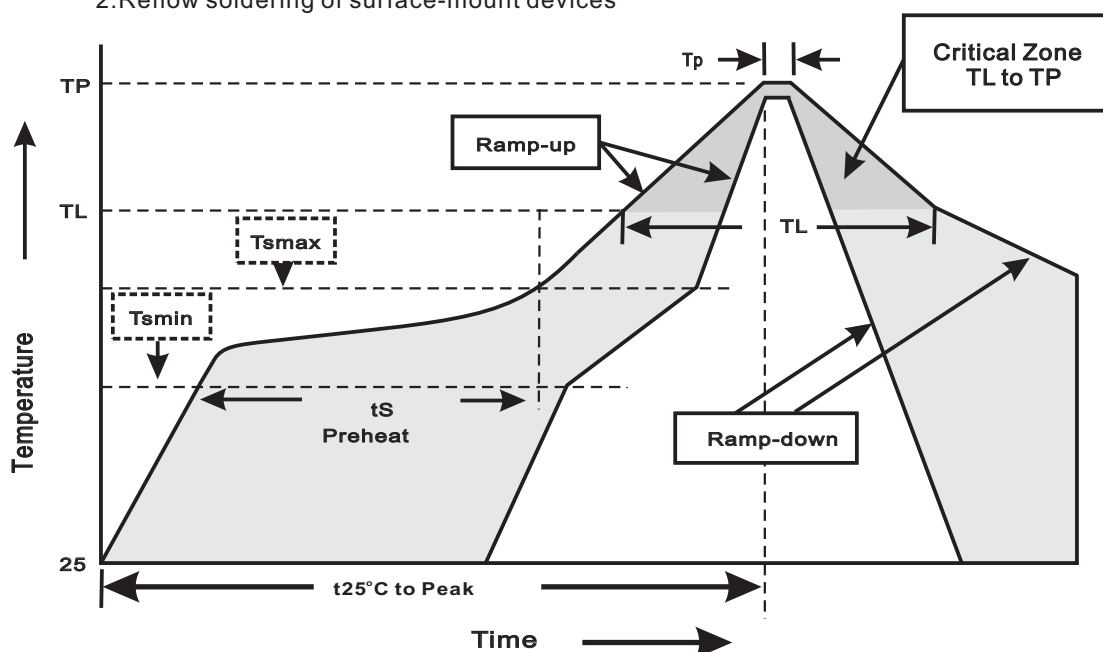
## FM520-BF THRU FM5200-BF

## 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) |
|---------|-----------|------------|-------------------------|-----------|-----------------|-----------------|-------------------|--------------|---------------------------|
| SMB-F   | 13"       | 3,000      | 8.0                     | 6,000     | 337*337*37      | 330             | 350*330*360       | 48,000       | 12.40                     |

## 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                   |

**FM520-BF THRU FM5200-BF****High reliability test capabilities**

| Item Test                         | Conditions                                                                                                                               | Reference                     |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. Solder Resistance              | at $260 \pm 5^\circ\text{C}$ for $10 \pm 2\text{sec.}$<br>immerse body into solder $1/16" \pm 1/32"$                                     | 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                  | 8.3ms single half sine-wave , one surge.                                                                                                 | 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 $150^\circ\text{C}$ for 1000 hrs.                                                                                                     | MIL-STD-750D<br>METHOD-1031   |