

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

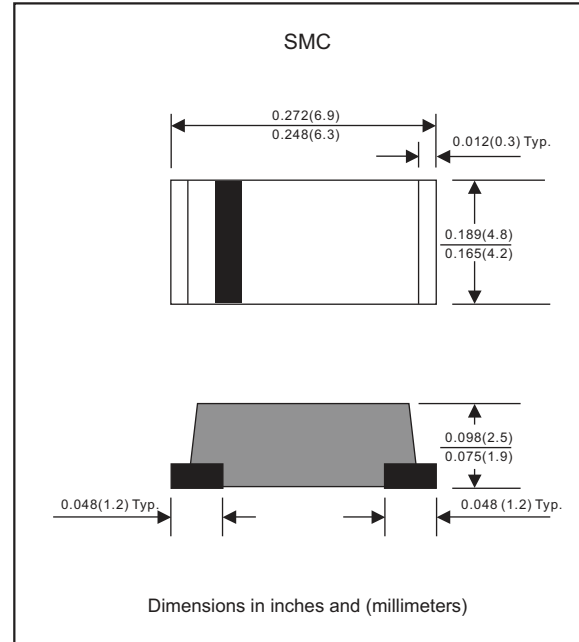
### Features

- Batch process design, excellent power dissipation offers better reverse leakage current and thermal resistance.
- Low profile surface mounted application in order to optimize board space.
- Low power loss, high efficiency.
- High current capability, low forward voltage drop.
- High surge capability.
- Guardring for overvoltage protection.
- Ultra high-speed switching.
- Silicon epitaxial planar chip, metal silicon junction.
- Lead-free parts meet environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free parts, ex. FM520-H.

### Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AB / SMC
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.19 gram

### Package outline



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

| PARAMETER                  | CONDITIONS                                      | Symbol          | MIN. | TYP. | MAX. | UNIT                 |
|----------------------------|---|-----------------|------|------|------|----------------------|
| Forward rectified current  | See Fig.1                                       | $I_O$           |      |      | 5.0  | A                    |
| Forward surge current      | 8.3ms single half sine-wave (JEDEC methode)     | $I_{FSM}$       |      |      | 150  | A                    |
| Reverse current            | $V_R = V_{RRM} \quad T_J = 25^{\circ}\text{C}$  | $I_R$           |      |      | 0.5  | mA                   |
|                            | $V_R = V_{RRM} \quad T_J = 100^{\circ}\text{C}$ |                 |      |      | 20   |                      |
| Thermal resistance         | Junction to ambient                             | $R_{\theta JA}$ |      | 32   |      | $^{\circ}\text{C/W}$ |
|                            | Junction to case                                | $R_{\theta JC}$ |      | 16   |      | $^{\circ}\text{C/W}$ |
| Diode junction capacitance | f=1MHz and applied 4V DC reverse voltage        | $C_J$           |      | 380  |      | pF                   |
| Storage temperature        |   | $T_{STG}$       | -65  |      | +175 | $^{\circ}\text{C}$   |

| SYMBOLS | $V_{RRM}^{*1}$<br>(V) | $V_{RMS}^{*2}$<br>(V) | $V_R^{*3}$<br>(V) | $V_F^{*4}$<br>(V) | Operating temperature<br>$T_J$ , ( $^{\circ}\text{C}$ ) |
|---------|-----------------------|-----------------------|-------------------|-------------------|---|
| SS52    | 20                    | 14                    | 20                | 0.55              | -55 to +125   |
| SS53    | 30                    | 21                    | 30                |                   |   |
| SS54    | 40                    | 28                    | 40                |                   |   |
| SS55    | 50                    | 35                    | 50                | 0.70              | -55 to +150   |
| SS56    | 60                    | 42                    | 60                |                   |   |
| SS58    | 80                    | 56                    | 80                | 0.85              |   |
| SS510   | 100                   | 70                    | 100               |                   |   |
| SS515   | 150                   | 105                   | 150               |                   |   |
| SS520   | 200                   | 140                   | 200               | 0.92              |   |

\*1 Repetitive peak reverse voltage

\*2 RMS voltage

\*3 Continuous reverse voltage

\*4 Maximum forward voltage@ $I_F=5.0\text{A}$

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

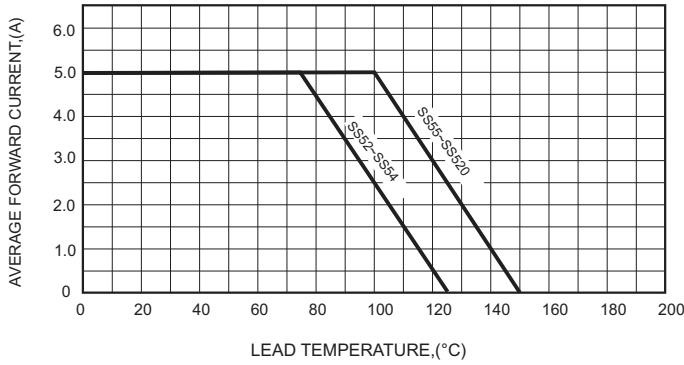


FIG.2-TYPICAL FORWARD CHARACTERISTICS

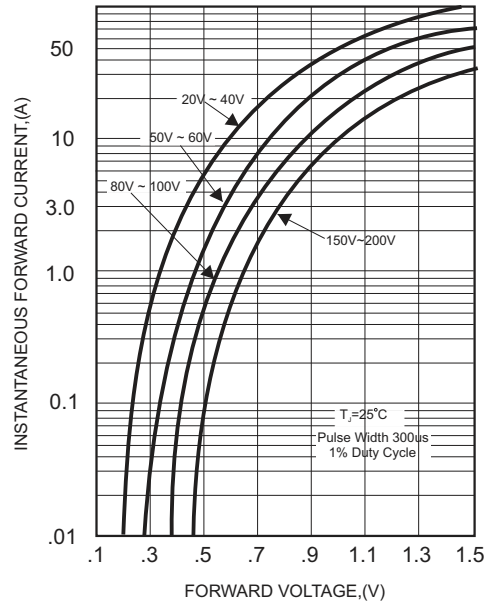


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

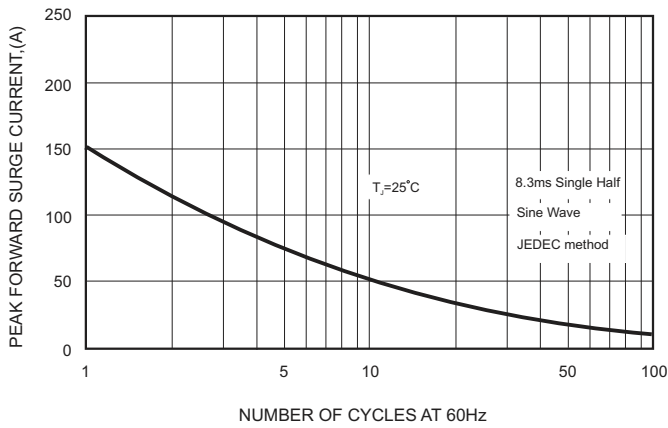


FIG.4-TYPICAL JUNCTION CAPACITANCE

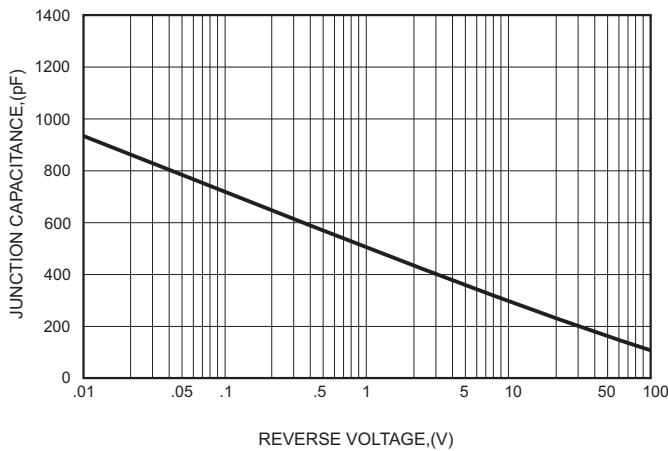
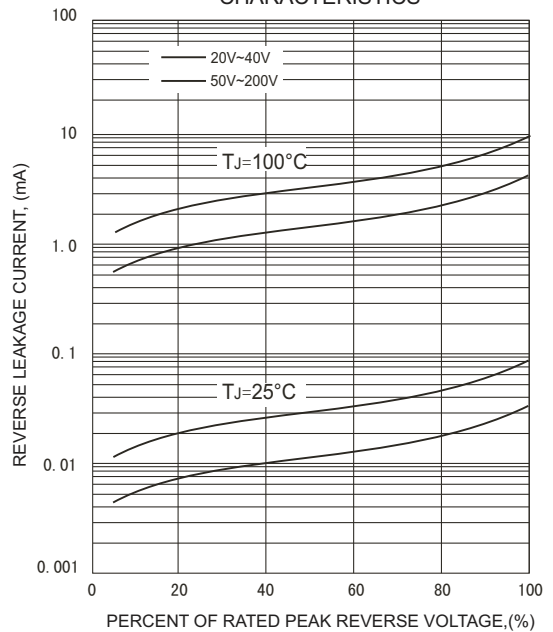
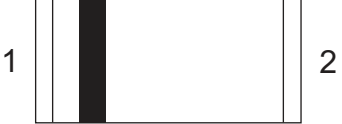



FIG.5 - TYPICAL REVERSE CHARACTERISTICS



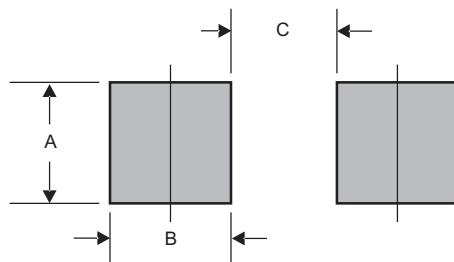
### Pinning information

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

### Marking

| Type number | Marking code |
|-------------|--------------|
| SS52        | SS52         |
| SS53        | SS53         |
| SS54        | SS54         |
| SS55        | SS55         |
| SS56        | SS56         |
| SS58        | SS58         |
| SS510       | S510         |
| SS515       | S515         |
| SS520       | S520         |

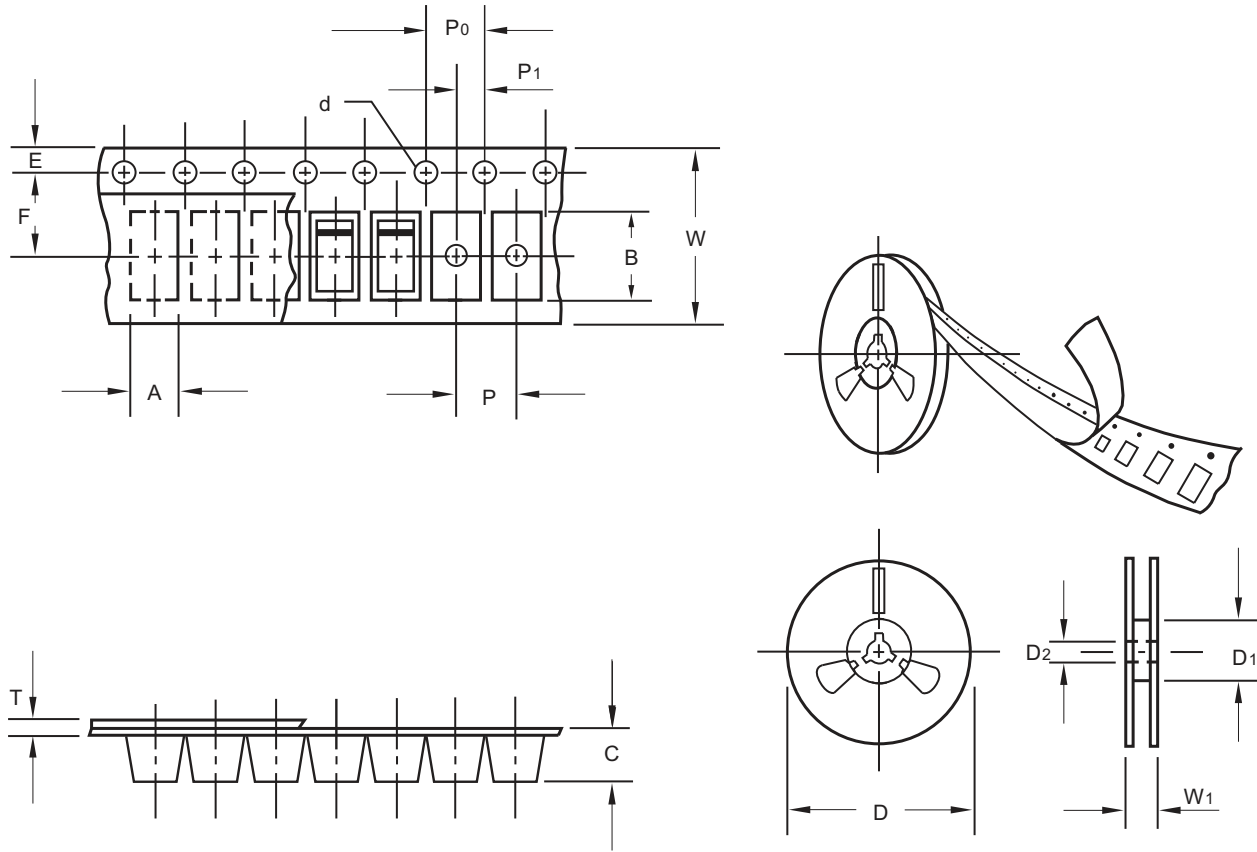
### Suggested solder pad layout



Dimensions in inches and (millimeters)

| PACKAGE | A            | B            | C            |
|---------|--------------|--------------|--------------|
| SMC     | 0.189 (4.80) | 0.063 (1.60) | 0.158 (4.00) |

## Packing information



unit:mm

| Item                      | Symbol | Tolerance | SMC    |
|---------------------------|--------|-----------|--------|
| Carrier width             | A      | 0.1       | 5.10   |
| Carrier length            | B      | 0.1       | 7.20   |
| Carrier depth             | C      | 0.1       | 2.50   |
| Sprocket hole             | d      | 0.1       | 1.50   |
| 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      | 0.1       | 0.23   |
| Tape width                | W      | 0.3       | 12.00  |
| Reel width                | W1     | 1.0       | 18.00  |

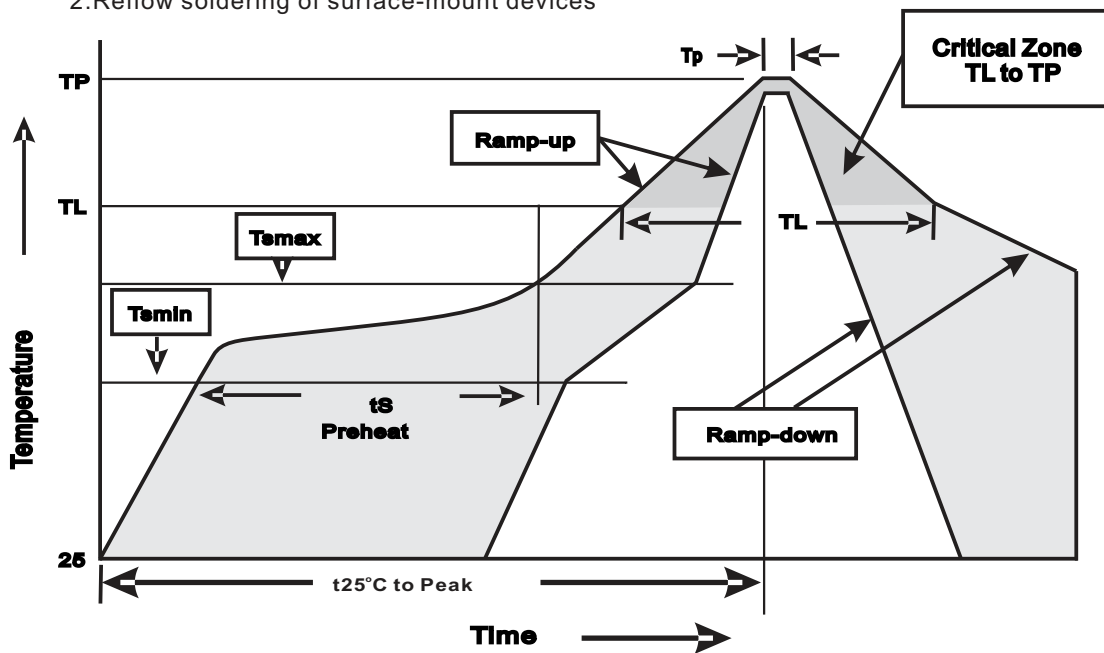
Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

## 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) |
|---------|-----------|------------|-------------------------|-----------|-----------------|-----------------|-------------------|--------------|---------------------------|
| SMC     | 13"       | 3,000      | 8.0                     | 6,000     | 337*337*37      | 330             | 350*330*360       | 48,000       | 17.2                      |

## 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>smin</sub> )<br>-Temperature Max(T <sub>smax</sub> )<br>-Time(min to max)(t <sub>s</sub> ) | 150°C<br>200°C<br>60~120sec |
| T <sub>smax</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                   |