

## SCHOTTKY BARRIER DIODE

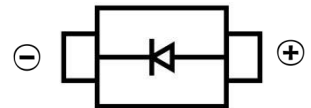
### FEATURES

- Small Surface Mount device
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability


**SMB**

### APPLICATIONS

- Disk drives
- Switching power supplies, converters, free-wheeling diodes
- Battery charging and reverse battery protection



### MECHANICAL DATA

- Case: SMB(DO-214AA)
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Weight: 0.088 grams (approximate)

### MAXIMUM RATINGS AND CHARACTERISTICS( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Parameter                                                                        |                         | Symbol          | Value     | Unit               |
|----------------------------------------------------------------------------------|-------------------------|-----------------|-----------|--------------------|
| Repetitive peak reverse voltage                                                  |                         | $V_{RRM}$       | 15        | V                  |
| DC Reverse Voltage                                                               |                         | $V_R$           | 15        | V                  |
| Non-Repetitive Peak Forward Surge Current                                        | $t = 5\mu\text{s sine}$ | $I_{FSM}$       | 140       | A                  |
|                                                                                  | $t = 10\text{ms sine}$  |                 | 40        |                    |
| Mean rectifying current                                                          |                         | $I_F$           | 1         | A                  |
| Repetitive Avalanche Current                                                     |                         | $I_{AR}$        | 0.2       | A                  |
| Non- Repetitive Avalanche Energy ( $I_{AS} = 0.2\text{A}$ , $L = 4.2\text{mH}$ ) |                         | $E_{AS}$        | 5.0       | mJ                 |
| Thermal Resistance From Junction To Ambient                                      |                         | $R_{\theta JA}$ | 140       | $^\circ\text{C/W}$ |
| Thermal Resistance From Junction To Lead                                         |                         | $R_{\theta JL}$ | 36        | $^\circ\text{C/W}$ |
| Junction and Storage Temperature                                                 |                         | $T_J, T_{STG}$  | -55 ~+150 | $^\circ\text{C}$   |

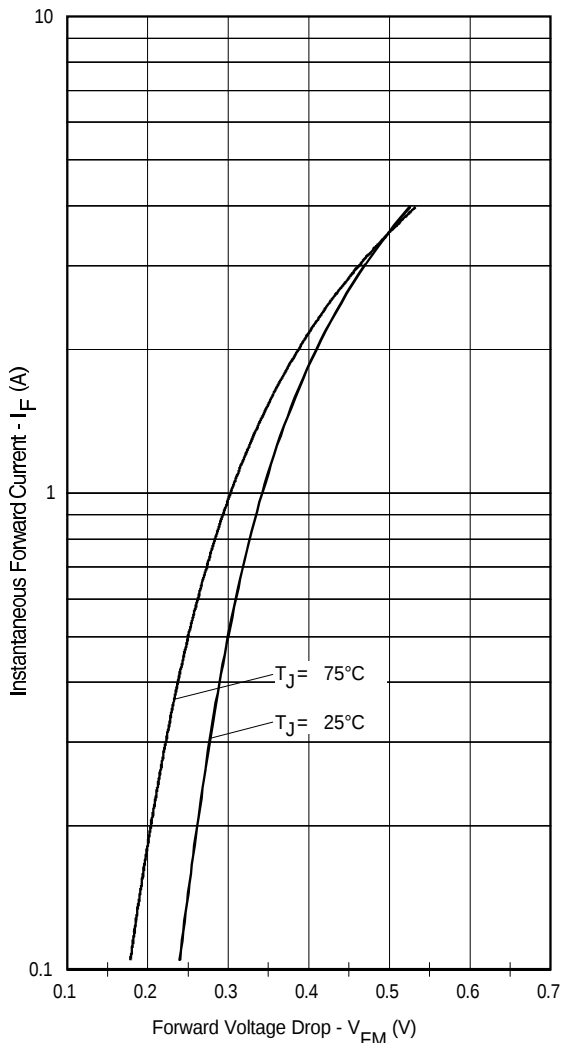
### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Parameter                 | Symbol  | Min | Typ | Max  | Unit             | Conditions                                                    |
|---------------------------|---------|-----|-----|------|------------------|---------------------------------------------------------------|
| Forward voltage (Note1)   | $V_F$   |     |     | 0.34 | V                | $I_F = 1\text{A}$ , $T_J = 25^\circ\text{C}$                  |
|                           |         |     |     | 0.40 |                  | $I_F = 2\text{A}$ , $T_J = 25^\circ\text{C}$                  |
|                           |         |     |     | 0.30 |                  | $I_F = 1\text{A}$ , $T_J = 75^\circ\text{C}$                  |
|                           |         |     |     | 0.38 |                  | $I_F = 2\text{A}$ , $T_J = 75^\circ\text{C}$                  |
| Reverse current (Note1)   | $I_R$   |     |     | 0.5  | mA               | $V_R = 15\text{V}$ , $T_J = 25^\circ\text{C}$                 |
|                           |         |     |     | 12   |                  | $V_R = 15\text{V}$ , $T_J = 100^\circ\text{C}$                |
| Junction capacitance      | $C_J$   |     | 390 |      | pF               | $V_R = 5\text{V}_{DC}$ , $f = 100\text{kHz} \sim 1\text{MHz}$ |
| Typical Series Inductance | $L_S$   |     | 2.0 |      | nH               |                                                               |
| Volatge Rate of Charge    | $dv/dt$ |     |     | 6000 | V/ $\mu\text{s}$ |                                                               |

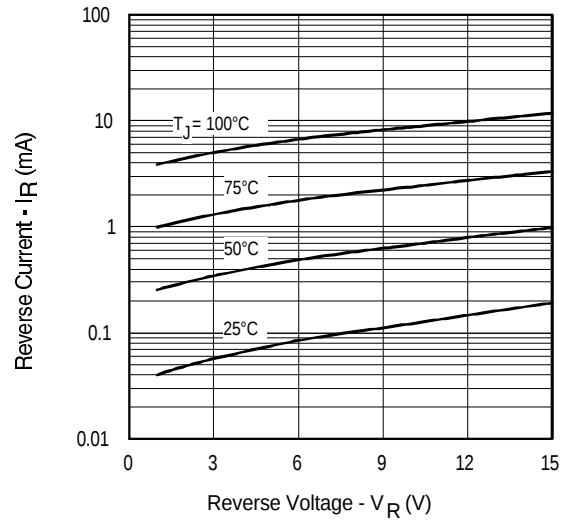
Notes: 1. Pulse with  $<300 \mu\text{s}$ , Duty Cycle $<2\%$

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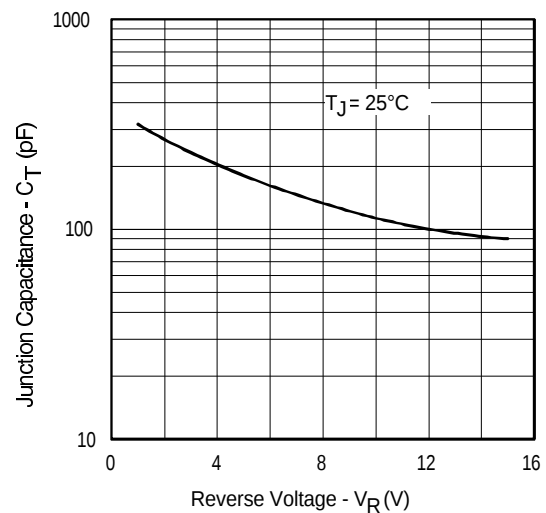
Typical Characteristics



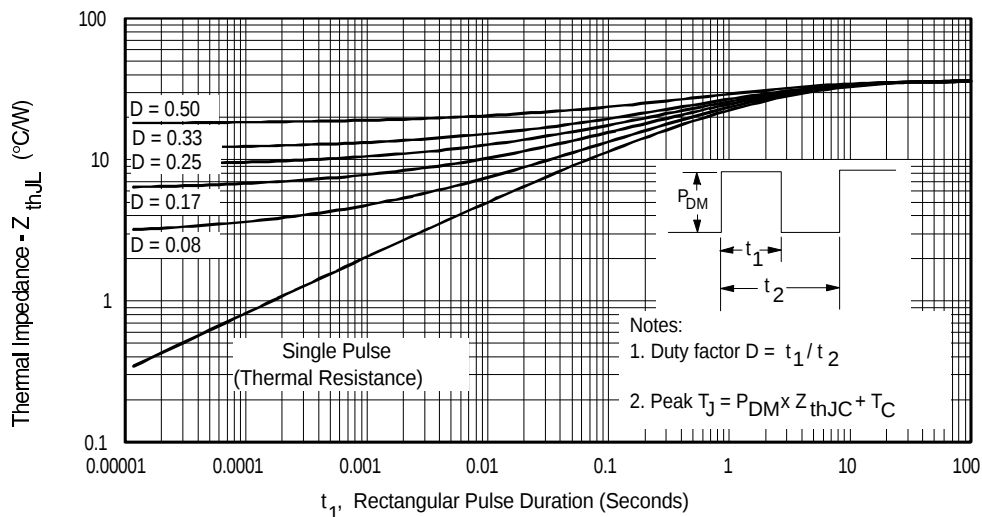
**Fig. 1** Max. Forward Voltage Drop Characteristics



**Fig. 2** Typical Values of Reverse Current Vs. Reverse Voltage

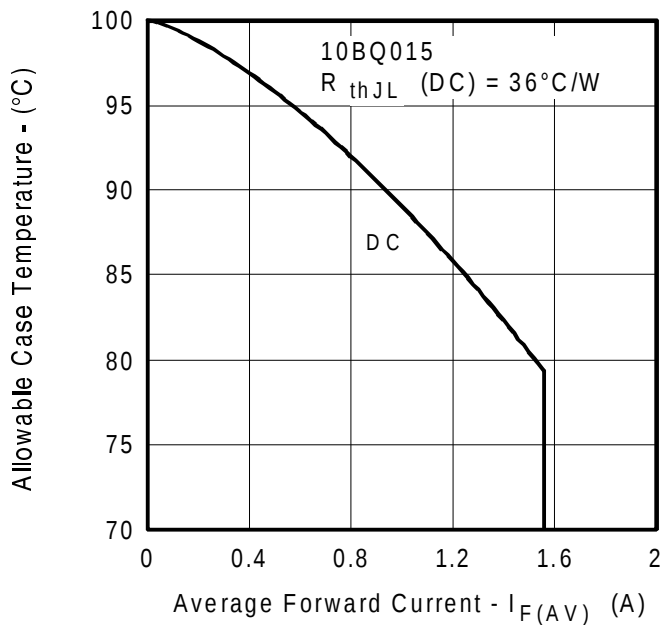


**Fig. 3** Typical Junction Capacitance Vs. Reverse Voltage

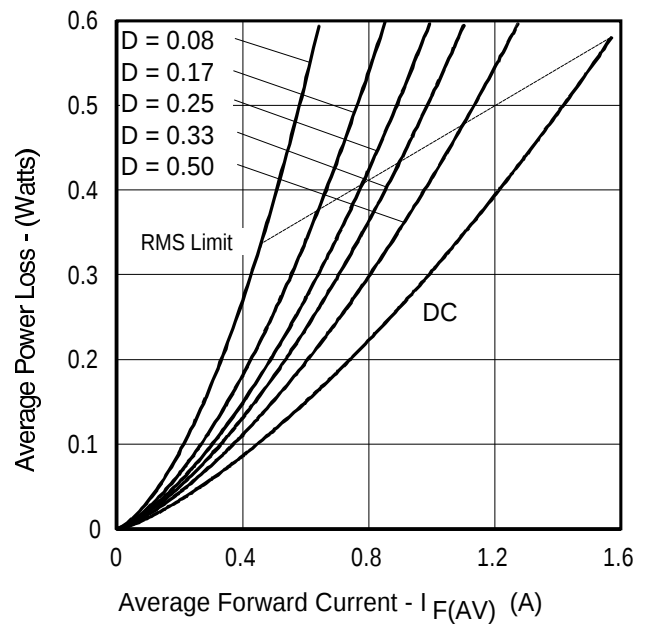


**Fig. 4** Max. Thermal Impedance  $Z_{thJL}$  Characteristics

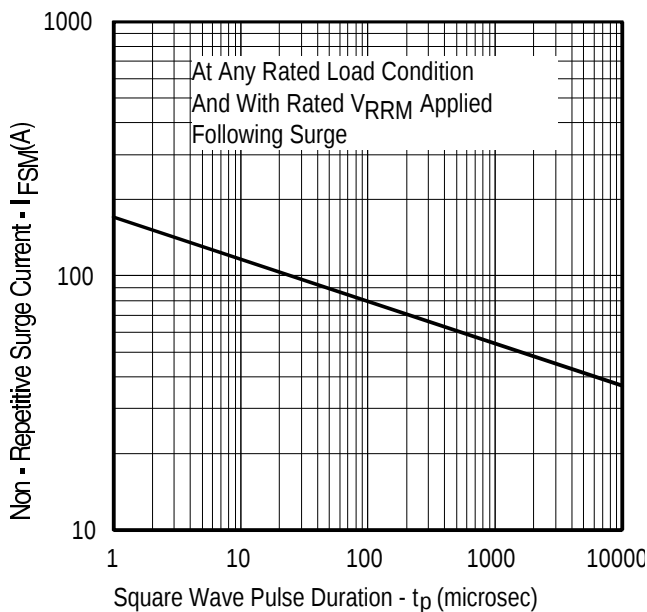
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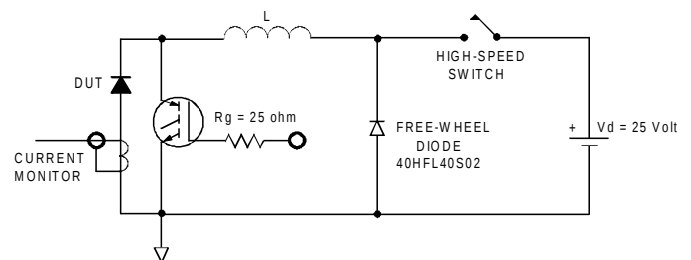
**Fig. 5** Max. Allowable Case Temperature Vs. Average Forward Current



**Fig. 6** Forward Power Loss Characteristics



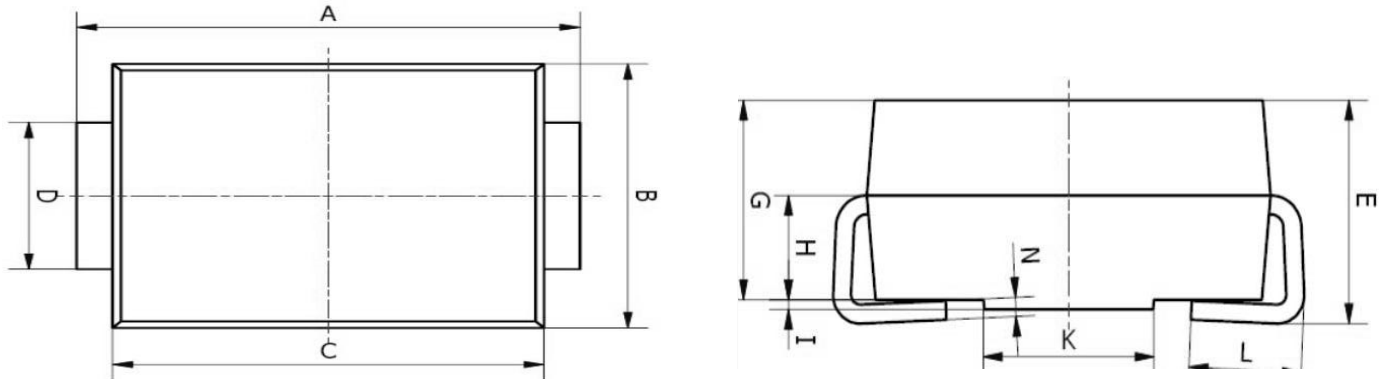
**Fig. 7** Max. Non-Repetitive Surge Current



**Fig. 8** Unclamped Inductive Test Circuit

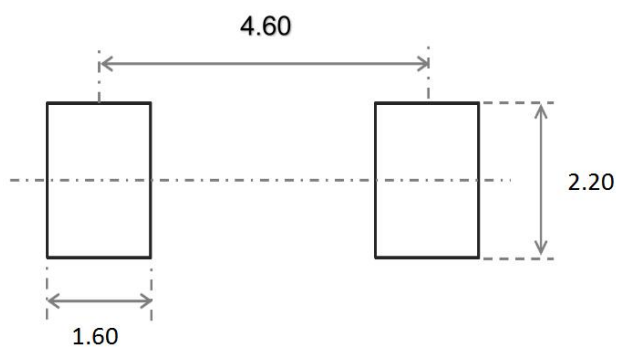
## SCHOTTKY BARRIER DIODE

### SMB Package Outline Dimensions



| Symbol | Dimensions In Millimeters |      | Dimensions In Inches |       |
|--------|---------------------------|------|----------------------|-------|
|        | Min.                      | Max. | Min.                 | Max.  |
| A      | 5.00                      | 5.45 | 0.197                | 0.215 |
| B      | 3.20                      | 4.00 | 0.126                | 0.157 |
| C      | 4.30                      | 4.70 | 0.169                | 0.185 |
| D      | 1.80                      | 2.20 | 0.071                | 0.087 |
| E      | 2.20                      | 2.50 | 0.087                | 0.098 |
| G      | 1.90                      | 2.30 | 0.075                | 0.090 |
| H      | 0.95                      | 1.25 | 0.037                | 0.049 |
| I      | 0.05                      | 0.15 | 0.002                | 0.006 |
| K      | 1.70                      | 2.10 | 0.067                | 0.083 |
| L      | 0.90                      | 1.60 | 0.035                | 0.063 |
| N      | 0.10                      | 0.30 | 0.004                | 0.012 |

### SMB Suggested Pad Layout



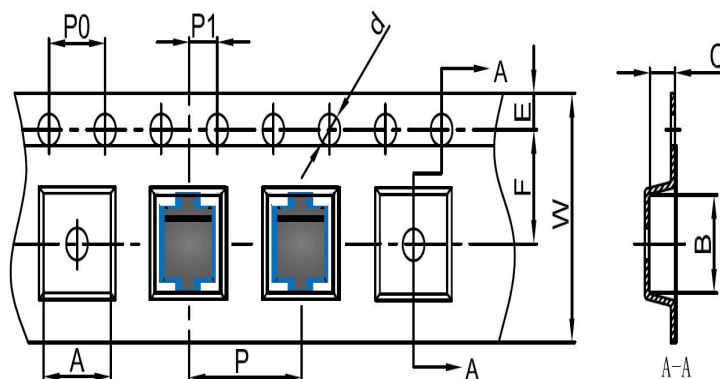
#### Note:

1. Controlling dimension: in millimeters
2. General tolerance:  $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only

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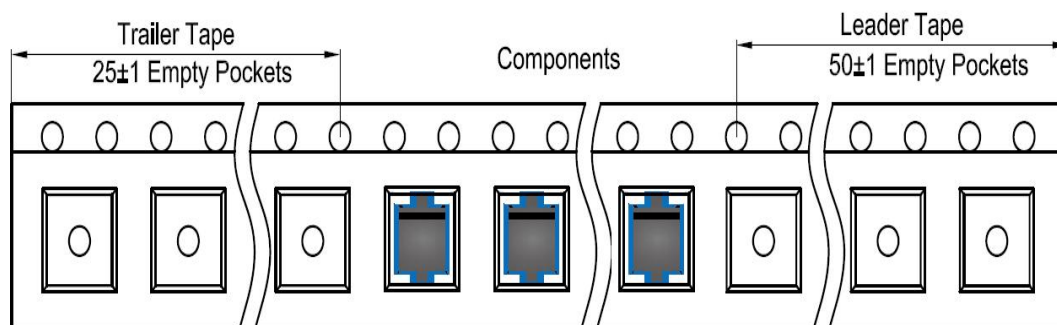
### SMB Tape and Reel

#### SMB Embossed Carrier Tape

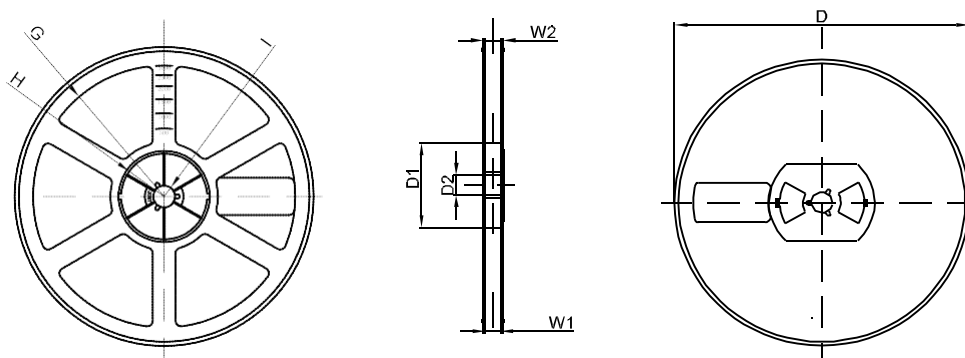


| DIMENSIONS ARE IN MILLIMETER |      |      |      |       |      |      |      |      |      |       |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| TYPE                         | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W     |
| SMB                          | 4.10 | 5.50 | 2.58 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |
| TOLERANCE                    | ±0.1 | ±0.1 | ±0.1 | ±0.1  | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1  |

#### SMB Tape Leader and Trailer



#### SMB Reel



| DIMENSIONS ARE IN MILLIMETER |      |      |       |      |        |       |       |       |
|------------------------------|------|------|-------|------|--------|-------|-------|-------|
| REEL OPTION                  | D    | D1   | D2    | G    | H      | I     | W1    | W2    |
| 13" DIA                      | Ø330 | 75.0 | 13.00 | R165 | R37.50 | R6.50 | 12.40 | 17.60 |
| TOLERANCE                    | ±2   | ±1   | ±1    | ±1   | ±1     | ±1    | ±1    | ±1    |