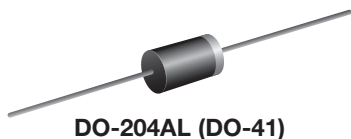


## Schottky Barrier Plastic Rectifier



### FEATURES

- Guardring for overvoltage protection
- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

### MECHANICAL DATA

**Case:** DO-204AL (DO-41)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS-compliant, commercial grade

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 1A whisker test

**Polarity:** Color band denotes the cathode end

### PRIMARY CHARACTERISTICS

|                  |                              |
|------------------|------------------------------|
| $I_{F(AV)}$      | 1.0 A                        |
| $V_{RRM}$        | 20 V, 30 V, 40 V, 50 V, 60 V |
| $I_{FSM}$        | 50 A                         |
| $V_F$            | 0.48 V, 0.65 V               |
| $T_J$ max.       | 125 °C, 150 °C               |
| Package          | DO-204AL                     |
| Diode variations | Single                       |

### MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)

| MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)                    |                    |               |       |       |               |       |      |
|------------------------------------------------------------------------------------|--------------------|---------------|-------|-------|---------------|-------|------|
| PARAMETER                                                                          | SYMBOL             | SB120         | SB130 | SB140 | SB150         | SB160 | UNIT |
| Maximum repetitive peak reverse voltage                                            | V <sub>RRM</sub>   | 20            | 30    | 40    | 50            | 60    | V    |
| Maximum RMS voltage                                                                | V <sub>RMS</sub>   | 14            | 21    | 28    | 35            | 42    | V    |
| Maximum DC blocking voltage                                                        | V <sub>DC</sub>    | 20            | 30    | 40    | 50            | 60    | V    |
| Maximum average forward rectified current at 0.375" (9.5 mm) lead length (fig. 1)  | I <sub>F(AV)</sub> | 1.0           |       |       |               |       | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I <sub>FSM</sub>   | 50            |       |       |               |       | A    |
| Voltage rate of change (rated V <sub>R</sub> )                                     | dV/dt              | 10 000        |       |       |               |       | V/μs |
| Operating junction temperature range                                               | T <sub>J</sub>     | - 65 to + 125 |       |       | - 65 to + 150 |       | °C   |
| Storage temperature range                                                          | T <sub>STG</sub>   | - 65 to + 150 |       |       |               |       | °C   |

### ELECTRICAL CHARACTERISTICS ( $T_A = 25$ °C unless otherwise noted)

| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                 |                         |                               |       |       |       |       |       |      |
|----------------------------------------------------------------------------|-----------------|-------------------------|-------------------------------|-------|-------|-------|-------|-------|------|
| PARAMETER                                                                  | TEST CONDITIONS |                         | SYMBOL                        | SB120 | SB130 | SB140 | SB150 | SB160 | UNIT |
| Maximum instantaneous forward voltage                                      | 1.0 A           |                         | V <sub>F</sub> <sup>(1)</sup> | 0.48  |       |       | 0.65  |       | V    |
| Maximum instantaneous reverse current at rated DC blocking voltage         |                 | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(1)</sup> | 0.50  |       |       |       |       | mA   |
|                                                                            |                 | T <sub>A</sub> = 100 °C |                               | 10    |       |       | 5.0   |       |      |

#### Note

<sup>(1)</sup> Pulse test: 300  $\mu$ s pulse width, 1 % duty cycle



| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                                 |       |       |       |       |       |      |
|-------------------------------------------------------------------------|---------------------------------|-------|-------|-------|-------|-------|------|
| PARAMETER                                                               | SYMBOL                          | SB120 | SB130 | SB140 | SB150 | SB160 | UNIT |
| Typical thermal resistance                                              | R <sub>θJA</sub> <sup>(1)</sup> | 50    |       |       |       |       | °C/W |
|                                                                         | R <sub>θJL</sub> <sup>(1)</sup> | 15    |       |       |       |       |      |

**Note**

(1) Thermal resistance junction to lead PCB mounted 0.375" (9.5 mm) lead length

| ORDERING INFORMATION (Example) |                 |                        |               |                                  |
|--------------------------------|-----------------|------------------------|---------------|----------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                    |
| SB140-E3/54                    | 0.35            | 54                     | 5500          | 13" diameter paper tape and reel |
| SB140-E3/73                    | 0.35            | 73                     | 3000          | Ammo pack packaging              |

## RATINGS AND CHARACTERISTICS CURVES

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

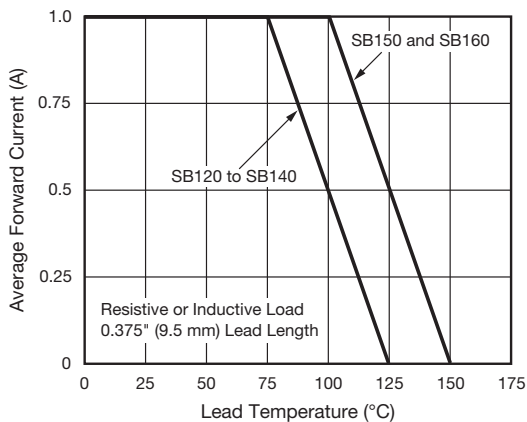


Fig. 1 - Forward Current Derating Curve

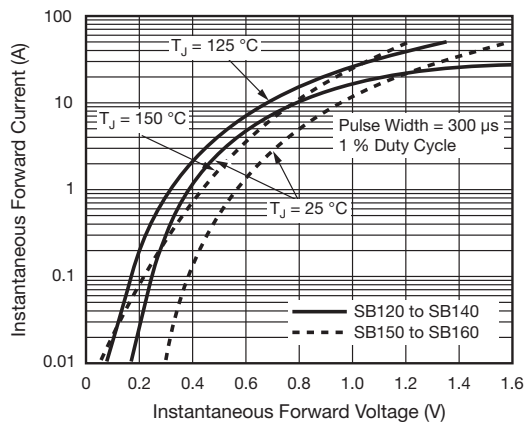


Fig. 3 - Typical Instantaneous Forward Characteristics

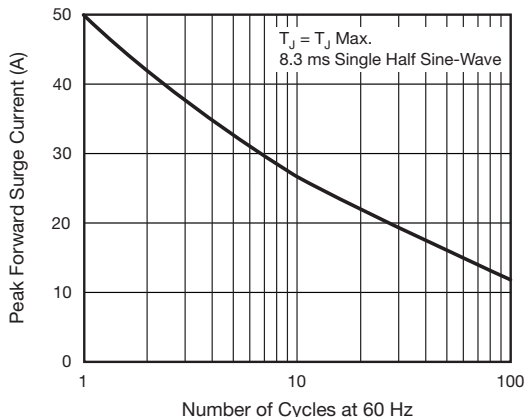


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

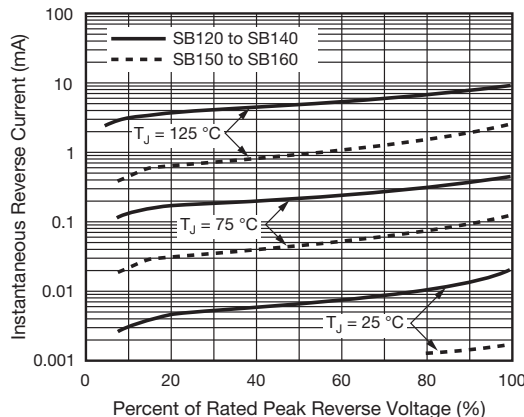


Fig. 4 - Typical Reverse Characteristics

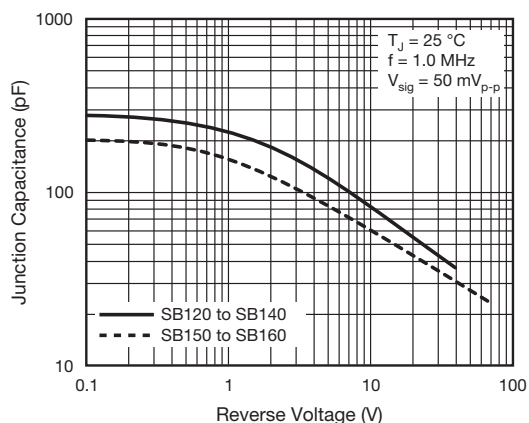


Fig. 5 - Typical Junction Capacitance

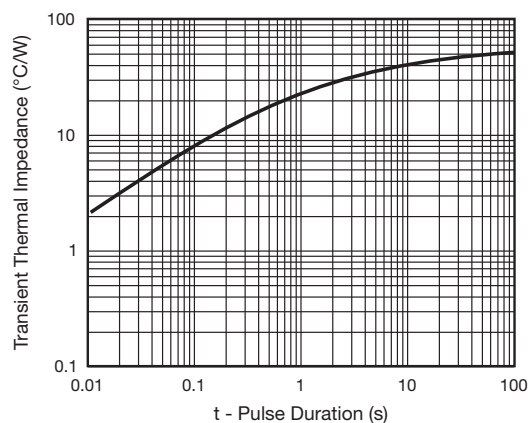
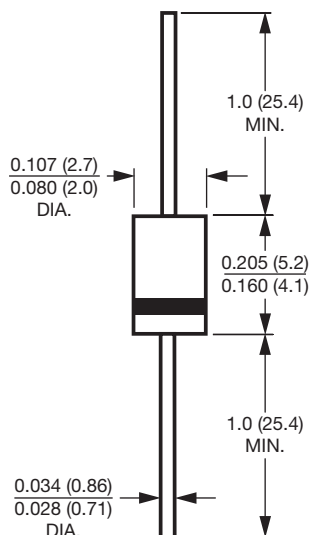


Fig. 6 - Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**DO-204AL (DO-41)**




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