

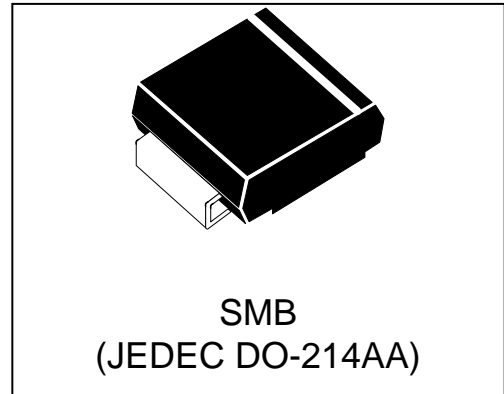


# WSxxP10SMB(-B)-AT

## Automotive Load Dump Protection TVS

### Features

- 1000 watts Peak Pulse Power (10/1000 $\mu$ s)
- Unidirectional and Bidirectional Protection
- Fast Response Time : Typically < 1ns
- Excellent Clamping Capability
- Built-in Strain relief
- Low inductance
- Low profile package
- High temperature solder:260°C/10 seconds at terminal
- AEC-Q101 compliant



### Mechanical Characteristics

- JEDEC DO-214AA package
- Molding compound flammability rating: UL 94V-0
- Marking : Marking Code
- Packaging : Tape and Reel per EIA 481
- RoHS Compliant

### Applications

- Auto power system
- Car audio and video
- Automotive instrument
- Car GPS
- Can-bus

### Absolute Maximum Rating

| Rating                                                                | Symbol           | Value                          | Units |
|-----------------------------------------------------------------------|------------------|--------------------------------|-------|
| Peak Pulse Power (tp =10/1000 $\mu$ s) (see Note1&2)                  | P <sub>PPM</sub> | 1000                           | Watts |
| Peak pulse current (10/1000 $\mu$ s) (see Note2)                      | I <sub>PPM</sub> | See Electrical Characteristics | A     |
| Power Dissipation on infinite heat sink T <sub>L</sub> = 50 °C (Fig4) | P <sub>D</sub>   | 6.5                            | W     |
| Operating Junction Temperature range                                  | T <sub>J</sub>   | -65 to + 150                   | °C    |
| Storage Temperature range                                             | T <sub>STG</sub> | -65 to + 150                   | °C    |

**Note1:** Peak Pulse Power Rating as Pulse Width ,per Fig1.

**Note2:** Peak Pulse Power or Current Derated above T<sub>A</sub>=25°C Per Fig. 2 and Non-Repetitive Current Pulse, Per Fig.3.

## Electrical Characteristics

| Part Number   |                 | Marking   |          | Reverse Stand off Voltage $V_{RWM}$ (Volts) | Breakdown Voltage $V_{BR}@I_T$ (Volts) |       | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_c@I_{FP}$ (Volts) | Maximum Peak Pulse Current $I_{PP}$ (Amps) | Maximum Reverse Leakage $I_R@V_{RWM}$ ( $\mu$ A) |
|---------------|-----------------|-----------|----------|---------------------------------------------|----------------------------------------|-------|-------------------------|-----------------------------------------------|--------------------------------------------|--------------------------------------------------|
| UNI-POLAR     | BI-POLAR        | UNI-POLAR | BI-POLAR |                                             | MIN                                    | MAX   |                         |                                               |                                            |                                                  |
| WS15P10SMB-AT | WS15P10SMB-B-AT | IYLP      | IZLP     | 15                                          | 16.70                                  | 18.50 | 1                       | 24.4                                          | 40.98                                      | 1                                                |
| WS16P10SMB-AT | WS16P10SMB-B-AT | IYLQ      | IZLQ     | 16                                          | 17.80                                  | 19.70 | 1                       | 26.0                                          | 38.46                                      | 1                                                |
| WS18P10SMB-AT | WS18P10SMB-B-AT | IYLS      | IZLS     | 18                                          | 20.00                                  | 22.10 | 1                       | 29.2                                          | 34.25                                      | 1                                                |
| WS20P10SMB-AT | WS20P10SMB-B-AT | IYMY      | IZMZ     | 20                                          | 22.20                                  | 24.50 | 1                       | 32.4                                          | 30.86                                      | 1                                                |
| WS22P10SMB-AT | WS22P10SMB-B-AT | IYMM      | IZMM     | 22                                          | 24.40                                  | 26.90 | 1                       | 35.5                                          | 28.17                                      | 1                                                |
| WS24P10SMB-AT | WS24P10SMB-B-AT | IYMO      | IZMO     | 24                                          | 26.70                                  | 29.50 | 1                       | 38.9                                          | 25.71                                      | 1                                                |
| WS26P10SMB-AT | WS26P10SMB-B-AT | IYMQ      | IZMQ     | 26                                          | 28.90                                  | 31.90 | 1                       | 42.1                                          | 23.75                                      | 1                                                |
| WS28P10SMB-AT | WS28P10SMB-B-AT | IYMS      | IZMS     | 28                                          | 31.10                                  | 34.40 | 1                       | 45.4                                          | 22.03                                      | 1                                                |
| WS30P10SMB-AT | WS30P10SMB-B-AT | IYNY      | IZNZ     | 30                                          | 33.30                                  | 36.80 | 1                       | 48.4                                          | 20.66                                      | 1                                                |
| WS33P10SMB-AT | WS33P10SMB-B-AT | IYNN      | IZNN     | 33                                          | 36.70                                  | 40.60 | 1                       | 53.3                                          | 18.76                                      | 1                                                |
| WS36P10SMB-AT | WS36P10SMB-B-AT | IYNQ      | IZNQ     | 36                                          | 40.00                                  | 44.20 | 1                       | 58.1                                          | 17.21                                      | 1                                                |
| WS40P10SMB-AT | WS40P10SMB-B-AT | IYOY      | IZOZ     | 40                                          | 44.40                                  | 49.10 | 1                       | 64.5                                          | 15.50                                      | 1                                                |
| WS43P10SMB-AT | WS43P10SMB-B-AT | IYON      | IZON     | 43                                          | 47.80                                  | 52.80 | 1                       | 69.4                                          | 14.41                                      | 1                                                |

Typical Characteristics

Figure 1: Peak Pulse Power Rating Curve

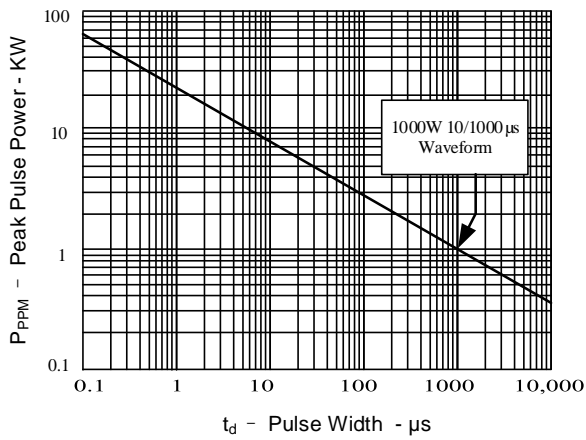


Figure 2: Pulse Derating Curve

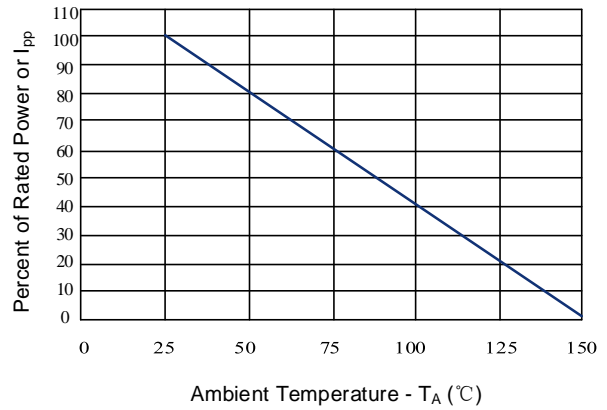


Figure 3: Pulse Waveform

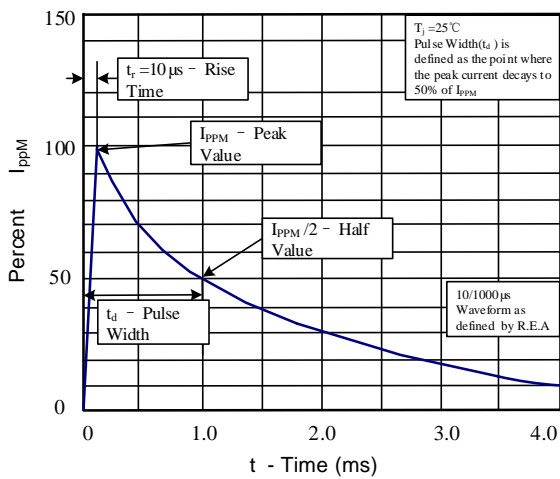
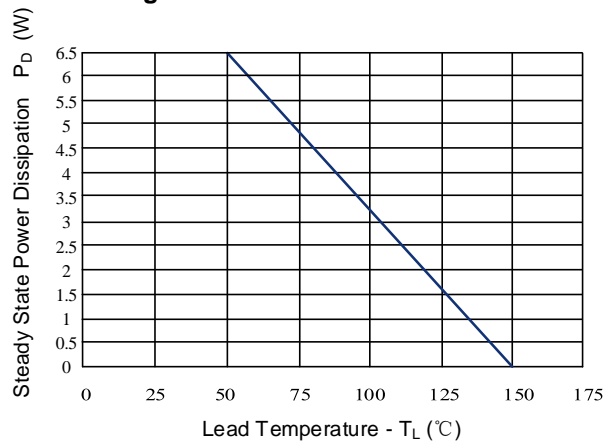
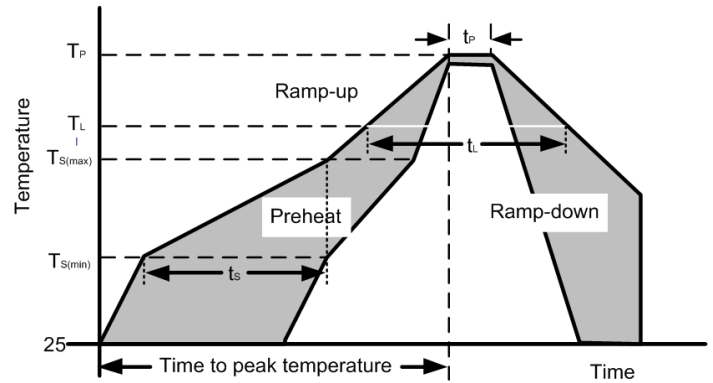


Figure 4: Steady State Power Dissipation Derating Curve



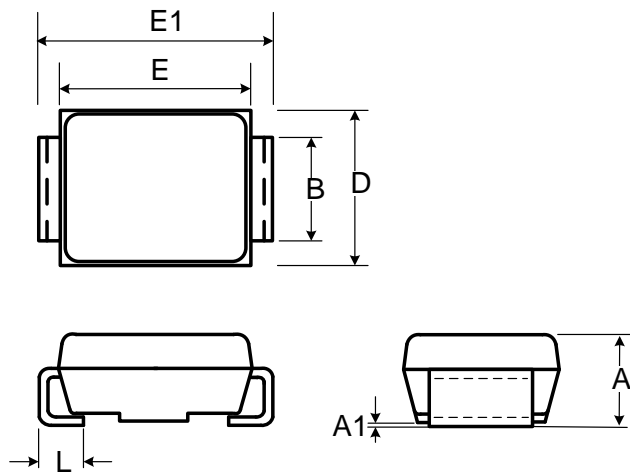
### Soldering Parameters

| Reflow Condition                                       |                                  |                         |
|--------------------------------------------------------|----------------------------------|-------------------------|
| Pre Heat                                               | Temperature min ( $T_{s(min)}$ ) | 150°C                   |
|                                                        | Temperature max ( $T_{s(max)}$ ) | 200°C                   |
|                                                        | Time (min to max) ( $t_s$ )      | 60-190 s                |
| Average ramp up rate (Liquidus Temp) ( $T_L$ ) to peak |                                  | 3°C/s max               |
| Ts(max) to $T_L$ - Ramp-up Rate                        |                                  | 3°C/s max               |
| Reflow                                                 | Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                        | Temperature ( $t_L$ )            | 60-150 s                |
| Peak Temperature ( $T_P$ )                             |                                  | 260 <sup>+0/-5</sup> °C |
| Time within actual peak Temperature ( $t_p$ )          |                                  | 20-40 s                 |
| Ramp-down Rate                                         |                                  | 5°C/s max               |
| Time 25°C to peak Temperature ( $T_P$ )                |                                  | 8 minutes max           |
| Do not exceed                                          |                                  | 260°C                   |

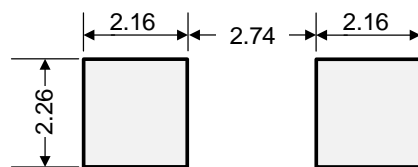


### Outline Drawing – SMB(DO-214AA)

| Ref. (mm) | Millimeters |       |
|-----------|-------------|-------|
|           | Min.        | Max.  |
| A         | 2.130       | 2.600 |
| A1        | -           | 0.300 |
| B         | 1.900       | 2.200 |
| E         | 4.100       | 4.750 |
| E1        | 5.210       | 5.590 |
| D         | 3.300       | 3.940 |
| L         | 0.760       | 1.520 |

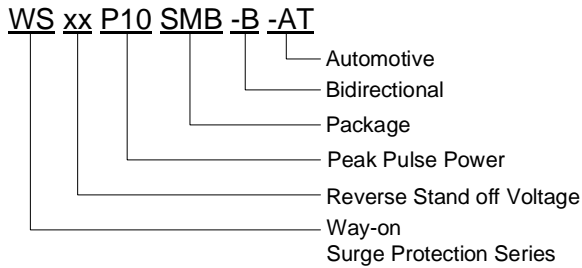


### Recommended Solder Pad Layout

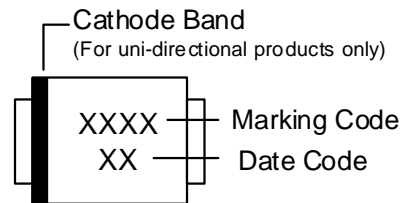


Dimensions in mm

## Part Numbering System



## Part Marking System



## Package Information

| Package Type  | Description                | Quantity (pcs) | Standard  |
|---------------|----------------------------|----------------|-----------|
| SMB(DO-214AA) | Tape & Reel -12mm/13" tape | 3000           | EIA-481-D |

## Contact Information

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*The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.*

*Users should verify actual device performance in their specific applications.*

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