

# ZS100B THRU ZS330B

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**ZS100B THRU ZS330B**

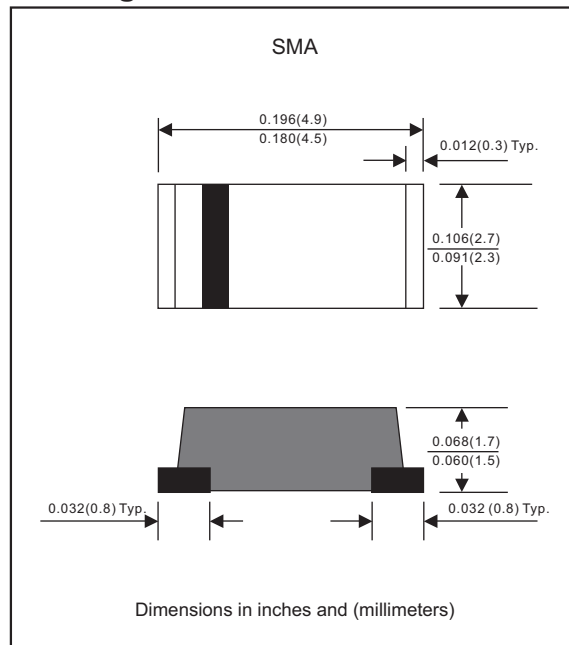
**1000mW Surface Mount Zener  
Diodes 100V-330V**

**Features**

- Batch process design, excellent power dissipation offers better reverse leakage current and thermal resistance
- Glass passivated chip junction
- Standard zener voltage tolerance  $\pm 5\%$
- Low inductance
- Low profile package
- Built-in strain relief
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen-free part, ex. ZS100B-H

**Mechanical data**

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, SMA
- Terminals :Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.05 gram

**Package outline****Maximum ratings** (at  $T_A=25^\circ\text{C}$  unless otherwise noted)

| Parameter                            | Conditions             | Symbol    | MIN. | TYP. | MAX. | Unit             |
|--------------------------------------|------------------------|-----------|------|------|------|------------------|
| Forward voltage                      | $I_F=200\text{mA}$     | $V_F$     |      |      | 1.20 | V                |
| Power dissipation                    | $T_L=75^\circ\text{C}$ | $P_D$     |      |      | 1000 | mW               |
| Operating junction temperature range |                        | $T_J$     | -55  |      | +150 | $^\circ\text{C}$ |
| Storage temperature range            |                        | $T_{STG}$ | -65  |      | +175 | $^\circ\text{C}$ |

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

| Part No. | Marking code | Zener voltage       |                     |                     | Test current<br>$I_{ZT}$ | Zener impedance   |                   |          | Leakage current      |       |
|----------|--------------|---------------------|---------------------|---------------------|--------------------------|-------------------|-------------------|----------|----------------------|-------|
|          |              | Min. $V_Z @ I_{ZT}$ | Nom. $V_Z @ I_{ZT}$ | Max. $V_Z @ I_{ZT}$ |                          | $Z_{ZT} @ I_{ZT}$ | $Z_{ZK} @ I_{ZK}$ | $I_{ZK}$ | $I_R$                | $V_R$ |
|          |              | Volts               | Volts               | Volts               |                          | ( $\Omega$ )Max   | ( $\Omega$ )Max   | mA       | ( $\mu\text{A}$ )Max | Volts |
| ZS100B   | Z100         | 95                  | 100                 | 105                 | 5.0                      | 750               | 5000              | 0.25     | 0.5                  | 75    |
| ZS110B   | Z110         | 104.5               | 110                 | 115.5               | 5.0                      | 750               | 5000              | 0.25     | 0.5                  | 80    |
| ZS120B   | Z120         | 114                 | 120                 | 126                 | 5.0                      | 850               | 5000              | 0.25     | 0.5                  | 90    |
| ZS130B   | Z130         | 123.5               | 130                 | 136.5               | 5.0                      | 1000              | 5000              | 0.25     | 0.5                  | 95    |
| ZS140B   | Z140         | 133                 | 140                 | 147                 | 5.0                      | 1200              | 5000              | 0.25     | 0.5                  | 105   |
| ZS150B   | Z150         | 142.5               | 150                 | 157.5               | 5.0                      | 1300              | 5000              | 0.25     | 0.5                  | 110   |
| ZS160B   | Z160         | 152                 | 160                 | 168                 | 5.0                      | 1500              | 5000              | 0.25     | 0.5                  | 120   |
| ZS170B   | Z170         | 161.5               | 170                 | 178.5               | 5.0                      | 2200              | 5000              | 0.25     | 0.5                  | 130   |
| ZS180B   | Z180         | 171                 | 180                 | 189                 | 5.0                      | 2200              | 5000              | 0.25     | 0.5                  | 140   |
| ZS190B   | Z190         | 180.5               | 190                 | 199.5               | 5.0                      | 2500              | 5000              | 0.25     | 0.5                  | 150   |
| ZS200B   | Z200         | 190                 | 200                 | 210                 | 5.0                      | 2500              | 8000              | 0.25     | 0.5                  | 165   |
| ZS210B   | Z210         | 199.5               | 210                 | 220.5               | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 165   |
| ZS220B   | Z220         | 209                 | 220                 | 231                 | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 170   |
| ZS230B   | Z230         | 218.5               | 230                 | 241.5               | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 175   |
| ZS240B   | Z240         | 228                 | 240                 | 252                 | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 180   |
| ZS250B   | Z250         | 237.5               | 250                 | 262.5               | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 190   |
| ZS260B   | Z260         | 247                 | 260                 | 273                 | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 195   |
| ZS270B   | Z270         | 256.5               | 270                 | 283.5               | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 200   |
| ZS280B   | Z280         | 266                 | 280                 | 294                 | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 210   |
| ZS290B   | Z290         | 275.5               | 290                 | 304.5               | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 215   |
| ZS300B   | Z300         | 285                 | 300                 | 315                 | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 220   |
| ZS310B   | Z310         | 294.5               | 310                 | 325.5               | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 225   |
| ZS320B   | Z320         | 304                 | 320                 | 336                 | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 233   |
| ZS330B   | Z330         | 313.5               | 330                 | 346.5               | 5.0                      | 5000              | 9000              | 0.25     | 0.5                  | 240   |

Note : 5% tolerance of Zener voltage for suffix "B" ex: ZS110B

## Rating and characteristic curves (ZS100B THRU ZS330B)

FIG.1-TOTAL POWER DISSIPATION vs.  
LEAD TEMPERATURE

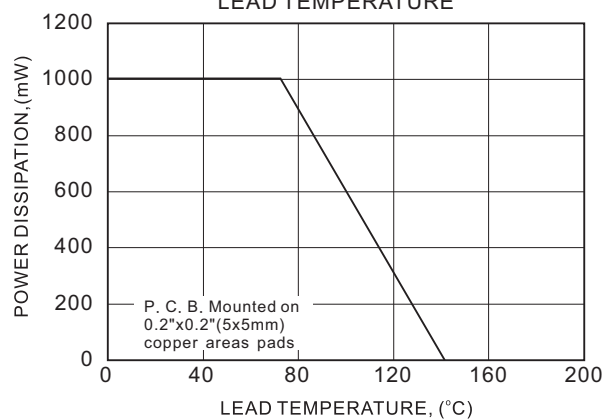


FIG.2-TYPICAL FORWARD  
CHARACTERISTICS

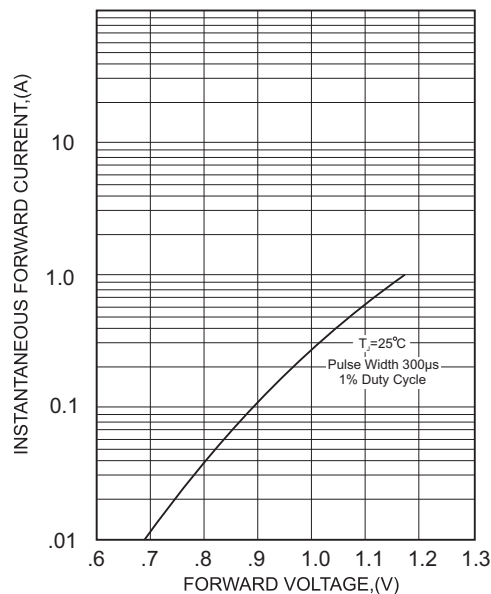


FIG.3 - TYPICAL REVERSE  
CHARACTERISTICS

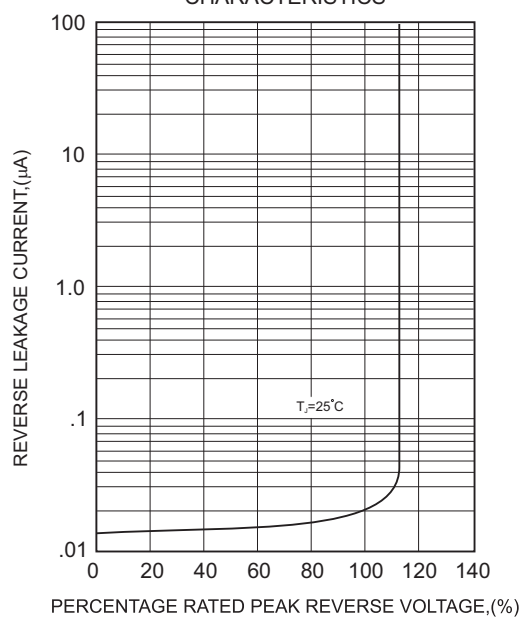
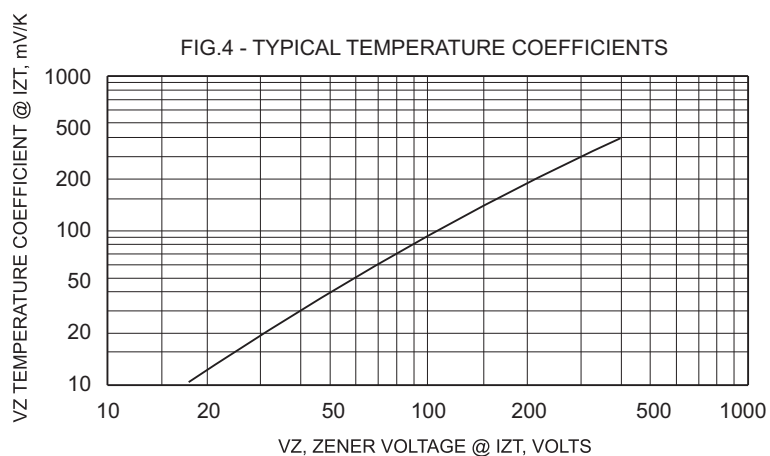


FIG.4 - TYPICAL TEMPERATURE COEFFICIENTS

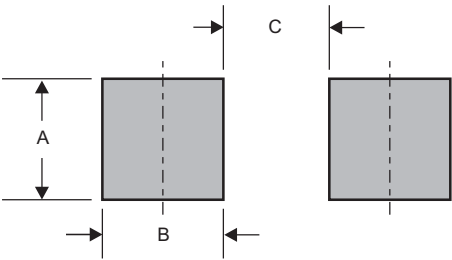


ZS100B THRU ZS330B

Pinning information

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

Suggested solder pad layout

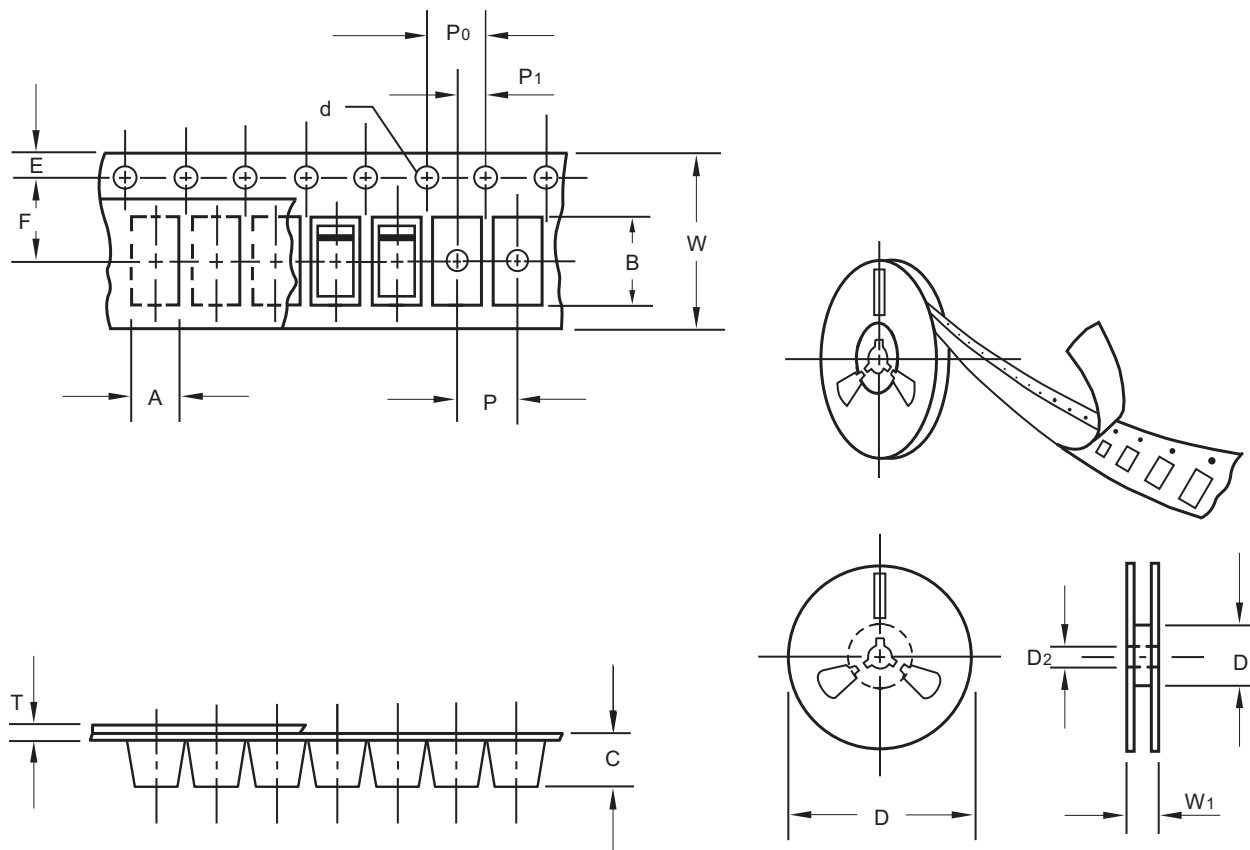


Dimensions in inches and (millimeters)

| PACKAGE | A            | B            | C            |
|---------|--------------|--------------|--------------|
| SMA     | 0.110 (2.80) | 0.063 (1.60) | 0.087 (2.20) |

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## Packing information



unit:mm

| Item                      | Symbol | Tolerance | SMA    |
|---------------------------|--------|-----------|--------|
| Carrier width             | A      | 0.1       | 2.80   |
| Carrier length            | B      | 0.1       | 5.00   |
| Carrier depth             | C      | 0.1       | 1.90   |
| 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       | 4.00   |
| 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.

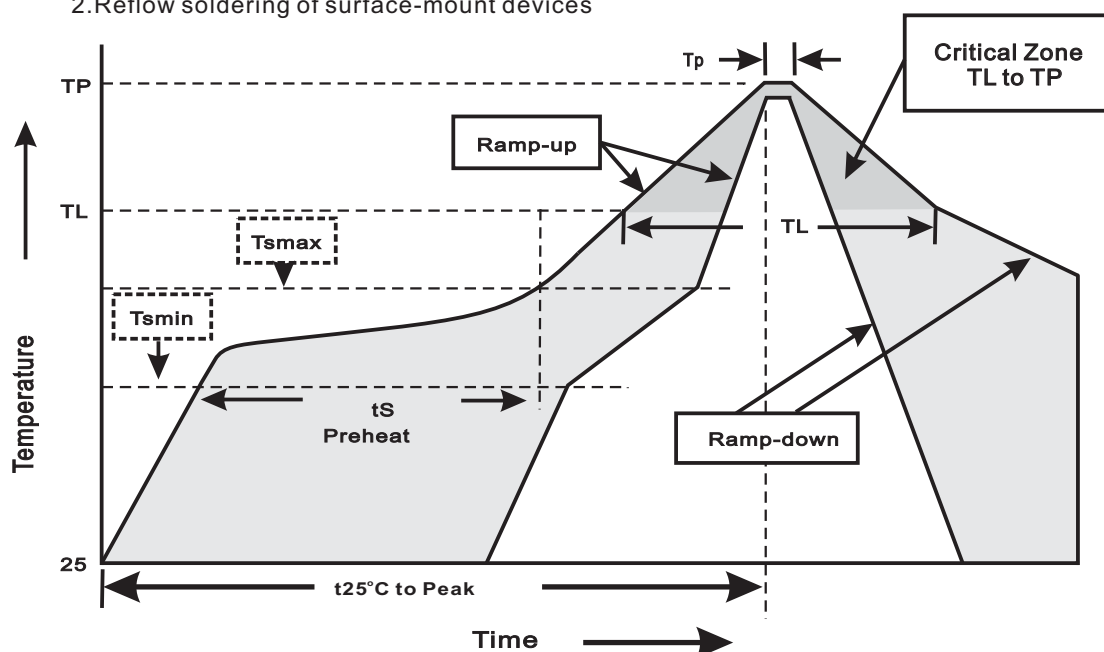
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## Reel packing

| 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) |
|---------|-----------|------------|-------------------------|-----------|-----------------|-----------------|-------------------|--------------|---------------------------|
| SMA     | 7"        | 2,000      | 4.0                     | 20,000    | 183*155*183     | 178             | 382*356*392       | 160,000      | 16.0                      |
| SMA     | 13"       | 7,500      | 4.0                     | 15,000    | 335*335*38      | 330             | 350*330*360       | 120,000      | 14.5                      |

## 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                   |

# ZS100B THRU ZS330B

## High reliability test capabilities

| Item Test                        | Conditions                                                                                                        | Reference                   |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------|
| 1. Solder Resistance             | at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 2\text{sec.}$                                                          | 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 | $V_z = V_{z,\text{Nom}} * 80\%$ at $T_j = 150^{\circ}\text{C}$ for 168 hrs.                                       | MIL-STD-750D<br>METHOD-1038 |
| 4. Pressure Cooker               | $15P_{\text{SIG}}$ at $T_A = 121^{\circ}\text{C}$ for 4 hrs.                                                      | JESD22-A102                 |
| 5. 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 |
| 6. Humidity                      | at $T_A = 85^{\circ}\text{C}$ , RH=85% for 1000hrs.                                                               | MIL-STD-750D<br>METHOD-1021 |
| 7. High Temperature Storage Life | at $175^{\circ}\text{C}$ for 1000 hrs.                                                                            | MIL-STD-750D<br>METHOD-1031 |