

**CYStech Electronics Corp.**

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## 200mW SOD-323 Zener Voltage Regulators

# ZD02V4S2 Series

### Description

The ZD02V4S2 series zener diodes are packaged in a SOD-323 surface mount package that has a power dissipation of 200mW. They are designed to provide voltage regulation protection and are especially attractive in situations where space is at a premium. They are well suited for applications such as cellular phones, hand held portables, and high density PC boards.

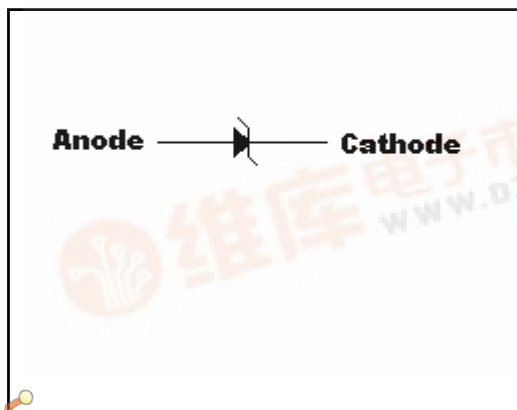
### Features

- Standard zener breakdown voltage range : 2.4V to 75V
- Steady state power rating of 200mW..
- Small body outline dimensions : 0.067 inches×0.049 inches (1.7mm×1.25mm)
- Low body height : 0.035 inches (0.9mm)
- Package weight : 4.507 mg/unit
- ESD rating of class 3 (>16kV) per human body model.

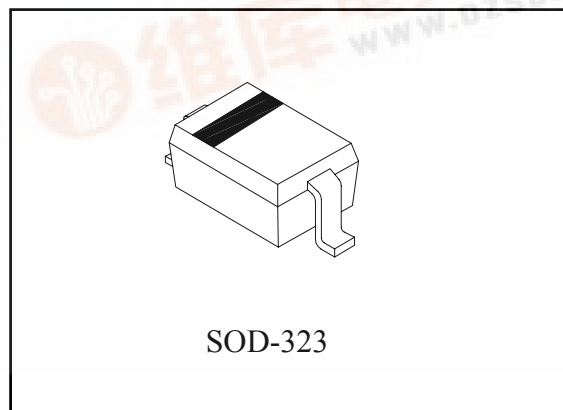
### Mechanical Data

- Case : Void free , transfer molded plastic.
- Finish : All external surfaces are corrosion resistant
- Maximum case temperature for soldering purposes : 260 °C for 10 seconds
- Polarity : Cathode indicated by polarity band.
- Leads : Plated with Sn/Pb for ease of solderability.
- Flammability rating : UL94 V-0
- Mounting position : Any

### Symbol



### Outline





**Absolute Maximum Ratings**( $T_a=25^{\circ}\text{C}$ , unless otherwise specified)

- Maximum Temperatures  
Storage Temperature  $T_{stg}$  .....  $-65\sim+150^{\circ}\text{C}$   
Junction Temperature  $T_j$ .....  $-65\sim+150^{\circ}\text{C}$
- Maximum Power Dissipation  
Total Power Dissipation  $P_{tot}$  (Note)..... 200 mW  
Derate above  $25^{\circ}\text{C}$  .....  $1.5\text{mW}/^{\circ}\text{C}$
- Thermal Resistance, Junction to Ambient Air  $R_{\theta JA}$ ..... $635^{\circ}\text{C}/\text{W}$

Note : Parts mounted on FR-5 board with minimum pad.

**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  unless otherwise noted,  $V_F=0.9\text{V}$  Max @ $I_F=10\text{mA}$  for all types.)

| Symbol        | Parameter                                                 |
|---------------|-----------------------------------------------------------|
| $V_Z$         | Reverse zener voltage @ $I_{ZT}$                          |
| $I_{ZT}$      | Reverse current                                           |
| $Z_{ZT}$      | Maximum zener impedance @ $I_{ZT}$                        |
| $I_{ZK}$      | Reverse current                                           |
| $Z_{ZK}$      | Maximum zener impedance @ $I_{ZK}$                        |
| $I_R$         | Reverse leakage current @ $V_R$                           |
| $V_R$         | Reverse voltage                                           |
| $I_F$         | Forward current                                           |
| $V_F$         | Forward voltage @ $I_F$                                   |
| $\ominus V_Z$ | Maximum temperature coefficient of $V_Z$                  |
| C             | Maximum capacitance @ $V_R=0\text{V}$ and $f=1\text{MHz}$ |

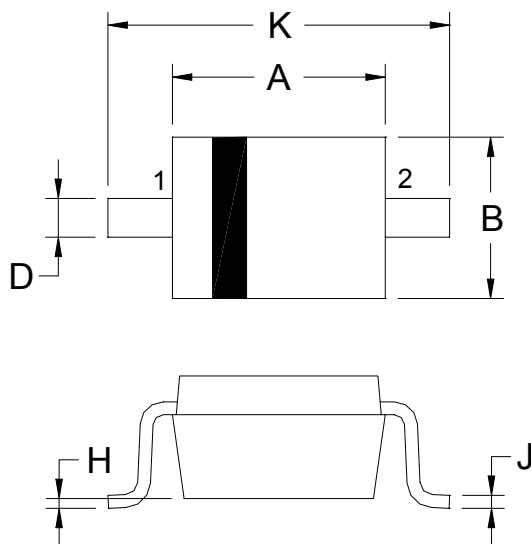


| Device | Marking Code | Zener voltage(Note 2)  |       |      |                  | Zener impedance                      |                                  |     | Leakage Current                |      | $\Theta_{V_Z}$<br>(mV/K)<br>@I <sub>ZT</sub> |      | C<br>@V <sub>R</sub> =0V<br>f=1MHz |
|--------|--------------|------------------------|-------|------|------------------|--------------------------------------|----------------------------------|-----|--------------------------------|------|----------------------------------------------|------|------------------------------------|
|        |              | V <sub>Z</sub> (volts) |       |      | @I <sub>ZT</sub> | Z <sub>ZT</sub> @<br>I <sub>ZT</sub> | Z <sub>ZK</sub> @I <sub>ZK</sub> |     | I <sub>R</sub> @V <sub>R</sub> |      | min                                          | max  | pF                                 |
|        |              | min                    | nom   | max  | mA               | Ω                                    | Ω                                | mA  | μA                             | V    |                                              |      |                                    |
| ZD02V4 | 00           | 2.2                    | 2.4   | 2.6  | 5                | 100                                  | 1000                             | 0.5 | 50                             | 1.0  | -3.5                                         | 0    | 450                                |
| ZD02V7 | 01           | 2.5                    | 2.7   | 2.9  | 5                | 100                                  | 1000                             | 0.5 | 20                             | 1.0  | -3.5                                         | 0    | 450                                |
| ZD03V0 | 02           | 2.8                    | 3.0   | 3.2  | 5                | 100                                  | 1000                             | 0.5 | 10                             | 1.0  | -3.5                                         | 0    | 450                                |
| ZD03V3 | 05           | 3.1                    | 3.3   | 3.5  | 5                | 95                                   | 1000                             | 0.5 | 5                              | 1.0  | -3.5                                         | 0    | 450                                |
| ZD03V6 | 06           | 3.4                    | 3.6   | 3.8  | 5                | 90                                   | 1000                             | 0.5 | 5                              | 1.0  | -3.5                                         | 0    | 450                                |
| ZD03V9 | 07           | 3.7                    | 3.9   | 4.1  | 5                | 90                                   | 1000                             | 0.5 | 3                              | 1.0  | -3.5                                         | -2.5 | 450                                |
| ZD04V3 | 08           | 4.0                    | 4.3   | 4.6  | 5                | 90                                   | 1000                             | 0.5 | 3                              | 1.0  | -3.5                                         | 0    | 450                                |
| ZD04V7 | 09           | 4.4                    | 4.7   | 5.0  | 5                | 80                                   | 800                              | 0.5 | 3                              | 2.0  | -3.5                                         | 0.2  | 260                                |
| ZD05V1 | 0A           | 4.8                    | 5.1   | 5.4  | 5                | 60                                   | 500                              | 0.5 | 2                              | 2.0  | -2.7                                         | 1.2  | 225                                |
| ZD05V6 | 0C           | 5.2                    | 5.6   | 6.0  | 5                | 40                                   | 200                              | 0.5 | 1                              | 2.0  | -2.0                                         | 2.5  | 200                                |
| ZD06V2 | 0E           | 5.8                    | 6.2   | 6.6  | 5                | 10                                   | 100                              | 0.5 | 3                              | 4.0  | 0.4                                          | 3.7  | 185                                |
| ZD06V8 | 0F           | 6.4                    | 6.8   | 7.2  | 5                | 15                                   | 160                              | 0.5 | 2                              | 4.0  | 1.2                                          | 4.5  | 155                                |
| ZD07V5 | 0G           | 7.0                    | 7.5   | 7.9  | 5                | 15                                   | 160                              | 0.5 | 1                              | 5.0  | 2.5                                          | 5.3  | 140                                |
| ZD08V2 | 0H           | 7.7                    | 8.2   | 8.7  | 5                | 15                                   | 160                              | 0.5 | 0.7                            | 5.0  | 3.2                                          | 6.2  | 135                                |
| ZD09V1 | 0K           | 8.5                    | 9.1   | 9.6  | 5                | 15                                   | 160                              | 0.5 | 0.2                            | 7.0  | 3.8                                          | 7.0  | 130                                |
| ZD10V0 | 0L           | 9.4                    | 10    | 10.6 | 5                | 20                                   | 160                              | 0.5 | 0.1                            | 8.0  | 4.5                                          | 8.0  | 130                                |
| ZD11V0 | 0M           | 10.4                   | 11    | 11.6 | 5                | 20                                   | 160                              | 0.5 | 0.1                            | 8.0  | 5.4                                          | 9.0  | 130                                |
| ZD12V0 | 0N           | 11.4                   | 12    | 12.7 | 5                | 25                                   | 80                               | 0.5 | 0.1                            | 8.0  | 6.0                                          | 10   | 130                                |
| ZD13V2 | 0P           | 12.4                   | 13.25 | 14.1 | 5                | 30                                   | 80                               | 0.5 | 0.1                            | 8.0  | 7.0                                          | 11   | 120                                |
| ZD15V0 | 0T           | 14.3                   | 15    | 15.8 | 5                | 30                                   | 80                               | 0.5 | 0.05                           | 10.5 | 9.2                                          | 13   | 110                                |
| ZD16V2 | 0U           | 15.3                   | 16.2  | 17.1 | 5                | 40                                   | 80                               | 0.5 | 0.05                           | 11.2 | 10.4                                         | 14   | 105                                |
| ZD18V0 | 0W           | 16.8                   | 18    | 19.1 | 5                | 45                                   | 80                               | 0.5 | 0.05                           | 12.6 | 12.4                                         | 16   | 100                                |
| ZD20V0 | 0Z           | 18.8                   | 20    | 21.2 | 5                | 55                                   | 100                              | 0.5 | 0.05                           | 14.0 | 14.4                                         | 18   | 85                                 |
| ZD22V0 | 10           | 20.8                   | 22    | 23.3 | 5                | 55                                   | 100                              | 0.5 | 0.05                           | 15.4 | 16.4                                         | 20   | 85                                 |
| ZD24V2 | 11           | 22.8                   | 24.2  | 25.6 | 5                | 70                                   | 120                              | 0.5 | 0.05                           | 16.8 | 18.4                                         | 22   | 80                                 |
| ZD27V0 | 12           | 25.1                   | 27    | 28.9 | 2                | 80                                   | 300                              | 0.5 | 0.05                           | 18.9 | 21.4                                         | 25.3 | 70                                 |
| ZD30V0 | 14           | 28                     | 30    | 32   | 2                | 80                                   | 300                              | 0.5 | 0.05                           | 21.0 | 24.4                                         | 29.4 | 70                                 |
| ZD33V0 | 18           | 31                     | 33    | 35   | 2                | 80                                   | 300                              | 0.5 | 0.05                           | 23.2 | 27.4                                         | 33.4 | 70                                 |
| ZD36V0 | 19           | 34                     | 36    | 38   | 2                | 90                                   | 500                              | 0.5 | 0.05                           | 25.2 | 30.4                                         | 37.4 | 70                                 |
| ZD39V0 | 20           | 37                     | 39    | 41   | 2                | 130                                  | 500                              | 0.5 | 0.05                           | 27.3 | 33.4                                         | 41.2 | 45                                 |
| ZD43V0 | 21           | 40                     | 43    | 46   | 2                | 150                                  | 500                              | 0.5 | 0.05                           | 30.1 | 37.6                                         | 46.6 | 40                                 |
| ZD47V0 | 1A           | 44                     | 47    | 50   | 2                | 170                                  | 500                              | 0.5 | 0.05                           | 32.9 | 42.0                                         | 51.8 | 40                                 |
| ZD51V0 | 1C           | 48                     | 51    | 54   | 2                | 180                                  | 500                              | 0.5 | 0.05                           | 35.7 | 46.6                                         | 57.2 | 40                                 |
| ZD56V0 | 1D           | 52                     | 56    | 60   | 2                | 200                                  | 500                              | 0.5 | 0.05                           | 39.2 | 52.2                                         | 63.8 | 40                                 |
| ZD62V0 | 1E           | 58                     | 62    | 66   | 2                | 215                                  | 500                              | 0.5 | 0.05                           | 43.4 | 58.8                                         | 71.6 | 35                                 |
| ZD68V0 | 1F           | 64                     | 68    | 72   | 2                | 240                                  | 500                              | 0.5 | 0.05                           | 47.6 | 65.6                                         | 79.8 | 35                                 |
| ZD75V0 | 1G           | 70                     | 75    | 79   | 2                | 255                                  | 500                              | 0.5 | 0.05                           | 52.5 | 73.4                                         | 88.6 | 35                                 |

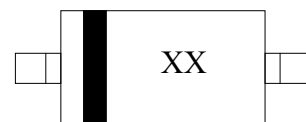
Note 2: Zener voltage is measured with a pulse test current I<sub>Z</sub> at an ambient temperature of 25°C.



## SOD-323 Dimension



Marking:



Style: Pin 1.Cathode 2.Anode

2-Lead SOD-323 Plastic  
Surface Mounted Package  
CYStek Package Code: S2

\*: Typical

| DIM | Inches |        | Millimeters |      | DIM | Inches |        | Millimeters |       |
|-----|--------|--------|-------------|------|-----|--------|--------|-------------|-------|
|     | Min.   | Max.   | Min.        | Max. |     | Min.   | Max.   | Min.        | Max.  |
| A   | 0.0630 | 0.0709 | 1.60        | 1.80 | E   | 0.0060 | -      | 0.15        | -     |
| B   | 0.0453 | 0.0531 | 1.15        | 1.35 | H   | 0.0000 | 0.0040 | 0.00        | 0.10  |
| C   | 0.0315 | 0.0394 | 0.80        | 1.00 | J   | 0.0035 | 0.0070 | 0.089       | 0.177 |
| D   | 0.0098 | 0.0157 | 0.25        | 0.40 | K   | 0.0906 | 0.1063 | 2.30        | 2.70  |

Notes: 1.Controlling dimension : millimeters.

2.Lead thickness specified per L/F drawing with solder plating.

3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

### Material:

- Lead: 42 Alloy ; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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