

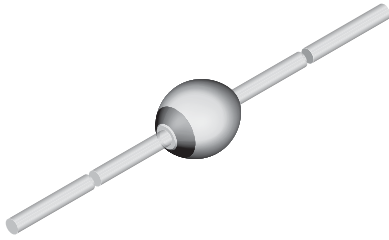


**THE DATASHEET OF  
BZT03C13-TAP**





# Zener Diodes with Surge Current Specification



949539

## FEATURES

- Glass passivated junction
- Hermetically sealed package
- Clamping time in picoseconds
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## APPLICATIONS

- Medium power voltage regulators and medium power transient suppression circuits

## ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS      |               |      |
|------------------------------|---------------|------|
| PARAMETER                    | VALUE         | UNIT |
| V <sub>Z</sub> range nom.    | 6.2 to 300    | V    |
| Test current I <sub>ZT</sub> | 2 to 100      | mA   |
| V <sub>Z</sub> specification | Pulse current |      |
| Circuit configuration        | Single        |      |

| ORDERING INFORMATION (Example) |               |                            |                        |
|--------------------------------|---------------|----------------------------|------------------------|
| DEVICE NAME                    | ORDERING CODE | TAPED UNITS                | MINIMUM ORDER QUANTITY |
| BZT03C6V2                      | BZT03C6V2-TR  | 5000 per 10" tape and reel | 25 000                 |
| BZT03C6V2                      | BZT03C6V2-TAP | 5000 per ammpack           | 25 000                 |

| PACKAGE      |        |                                      |                                   |                              |
|--------------|--------|--------------------------------------|-----------------------------------|------------------------------|
| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL        | SOLDERING CONDITIONS         |
| SOD-57       | 369 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | Peak temperature max. 260 °C |

| ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified) |   |                   |             |      |
|---|---|-------------------|-------------|------|
| PARAMETER   | TEST CONDITION                                  | SYMBOL            | VALUE       | UNIT |
| Power dissipation   | I = 10 mm, T <sub>L</sub> = 25 °C               | P <sub>tot</sub>  | 3250        | mW   |
|   | T <sub>amb</sub> = 25 °C                        | P <sub>tot</sub>  | 1300        |      |
| Repetitive peak reverse power dissipation                                       |   | P <sub>ZRM</sub>  | 10          | W    |
| Non repetitive peak surge power dissipation                                     | t <sub>p</sub> = 100 μs, T <sub>j</sub> = 25 °C | P <sub>ZSM</sub>  | 600         | W    |
| Junction to ambient air   | I = 10 mm, T <sub>L</sub> = constant            | R <sub>thJA</sub> | 46          | K/W  |
|   | On PC board with spacing 25 mm                  | R <sub>thJA</sub> | 100         |      |
| Junction temperature  |   | T <sub>j</sub>    | 175         | °C   |
| Storage temperature range   |   | T <sub>s</sub>    | -65 to +175 | °C   |
| Forward voltage (max.)  | I <sub>F</sub> = 0.5 A                          | V <sub>F</sub>    | 1.2         | V    |



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                    |      |      |                  |                                  |     |                                    |      |                                      |      |  |      |                                  |     |
|--|------------------------------------|------|------|------------------|----------------------------------|-----|------------------------------------|------|--------------------------------------|------|--|------|----------------------------------|-----|
| PART NUMBER  | ZENER VOLTAGE RANGE                |      |      | TEST CURRENT     | REVERSE LEAKAGE CURRENT          |     | DYNAMIC RESISTANCE                 |      | TEMPERATURE COEFFICIENT              |      | CLAMPING <sup>(1)</sup>                |      | STAND OFF <sup>(2)</sup>         |     |
|  | V <sub>Z</sub> at I <sub>ZT1</sub> |      |      | I <sub>ZT1</sub> | I <sub>R</sub> at V <sub>R</sub> |     | Z <sub>Z</sub> at I <sub>ZT1</sub> |      | TC <sub>VZ</sub> at I <sub>ZT1</sub> |      | V <sub>(CL)R</sub> at I <sub>RMS</sub> |      | I <sub>R</sub> at V <sub>R</sub> |     |
|  | V                                  |      |      | mA               | μA                               | V   | Ω                                  |      | % / K                                |      | V                                      | A    | μA                               | V   |
|  | MIN.                               | NOM. | MAX. |                  | MAX.                             |     | TYP.                               | MAX. | MIN.                                 | MAX. | MAX.                                   |      | MAX.                             |     |
| BZT03C6V2  | 5.8                                | 6.2  | 6.6  | 100              | 1500                             | 4.7 | 1                                  | 2    | 0                                    | 0.07 | 9.3                                    | 34   | 3000                             | 5.1 |
| BZT03C6V8  | 6.4                                | 6.8  | 7.2  | 100              | 1000                             | 5.1 | 1                                  | 2    | 0                                    | 0.07 | 10.2                                   | 31   | 2000                             | 5.6 |
| BZT03C7V5  | 7                                  | 7.5  | 7.9  | 100              | 750                              | 5.6 | 1                                  | 2    | 0                                    | 0.07 | 11.3                                   | 26.5 | 1500                             | 6.2 |
| BZT03C8V2  | 7.7                                | 8.2  | 8.7  | 100              | 600                              | 6.2 | 1                                  | 2    | 0.03                                 | 0.08 | 12.3                                   | 24.4 | 1200                             | 6.8 |
| BZT03C9V1  | 8.5                                | 9.1  | 9.6  | 50               | 20                               | 6.8 | 2                                  | 4    | 0.03                                 | 0.08 | 13.3                                   | 22.7 | 50                               | 7.5 |
| BZT03C10   | 9.4                                | 10   | 10.6 | 50               | 10                               | 7.5 | 2                                  | 4    | 0.05                                 | 0.09 | 14.8                                   | 20.3 | 20                               | 8.2 |
| BZT03C11   | 10.4                               | 11   | 11.6 | 50               | 4                                | 8.2 | 4                                  | 7    | 0.05                                 | 0.1  | 15.7                                   | 19.1 | 5                                | 9.1 |
| BZT03C12   | 11.4                               | 12   | 12.7 | 50               | 3                                | 9.1 | 4                                  | 7    | 0.05                                 | 0.1  | 17                                     | 17.7 | 5                                | 10  |
| BZT03C13   | 12.4                               | 13   | 14.1 | 50               | 2                                | 10  | 5                                  | 10   | 0.05                                 | 0.1  | 18.9                                   | 15.9 | 5                                | 11  |
| BZT03C15   | 13.8                               | 15   | 15.6 | 50               | 1                                | 11  | 5                                  | 10   | 0.05                                 | 0.1  | 20.9                                   | 14.4 | 5                                | 12  |
| BZT03C16   | 15.3                               | 16   | 17.1 | 25               | 1                                | 12  | 6                                  | 15   | 0.06                                 | 0.11 | 22.9                                   | 13.1 | 5                                | 13  |
| BZT03C18   | 16.8                               | 18   | 19.1 | 25               | 1                                | 13  | 6                                  | 15   | 0.06                                 | 0.11 | 25.6                                   | 11.7 | 5                                | 15  |
| BZT03C20   | 18.8                               | 20   | 21.2 | 25               | 1                                | 15  | 6                                  | 15   | 0.06                                 | 0.11 | 28.4                                   | 10.6 | 5                                | 16  |
| BZT03C22   | 20.8                               | 22   | 23.3 | 25               | 1                                | 16  | 6                                  | 15   | 0.06                                 | 0.11 | 31                                     | 9.7  | 5                                | 18  |
| BZT03C24   | 22.8                               | 24   | 25.6 | 25               | 1                                | 18  | 7                                  | 15   | 0.06                                 | 0.11 | 33.8                                   | 8.9  | 5                                | 20  |
| BZT03C27   | 25.1                               | 27   | 28.9 | 25               | 1                                | 20  | 7                                  | 15   | 0.06                                 | 0.11 | 38.1                                   | 7.9  | 5                                | 22  |
| BZT03C30   | 28                                 | 30   | 32   | 25               | 1                                | 22  | 8                                  | 15   | 0.06                                 | 0.11 | 42.2                                   | 7.1  | 5                                | 24  |
| BZT03C33   | 31                                 | 33   | 35   | 25               | 1                                | 24  | 8                                  | 15   | 0.06                                 | 0.11 | 46.2                                   | 6.5  | 5                                | 27  |
| BZT03C36   | 34                                 | 36   | 38   | 10               | 1                                | 27  | 21                                 | 40   | 0.06                                 | 0.11 | 50.1                                   | 6    | 5                                | 30  |
| BZT03C39   | 37                                 | 39   | 41   | 10               | 1                                | 30  | 21                                 | 40   | 0.06                                 | 0.11 | 54.1                                   | 5.5  | 5                                | 33  |
| BZT03C43   | 40                                 | 43   | 46   | 10               | 1                                | 33  | 24                                 | 45   | 0.07                                 | 0.12 | 60.7                                   | 4.9  | 5                                | 36  |
| BZT03C47   | 44                                 | 47   | 50   | 10               | 1                                | 36  | 24                                 | 45   | 0.07                                 | 0.12 | 65.5                                   | 4.6  | 5                                | 39  |
| BZT03C51   | 48                                 | 51   | 54   | 10               | 1                                | 39  | 25                                 | 60   | 0.07                                 | 0.12 | 70.8                                   | 4.2  | 5                                | 43  |
| BZT03C56   | 52                                 | 56   | 60   | 10               | 1                                | 43  | 25                                 | 60   | 0.07                                 | 0.12 | 78.6                                   | 3.8  | 5                                | 47  |
| BZT03C62   | 58                                 | 62   | 66   | 10               | 1                                | 47  | 25                                 | 80   | 0.08                                 | 0.13 | 86.5                                   | 3.5  | 5                                | 51  |
| BZT03C68   | 64                                 | 68   | 72   | 10               | 1                                | 51  | 25                                 | 80   | 0.08                                 | 0.13 | 94.4                                   | 3.2  | 5                                | 56  |
| BZT03C75   | 70                                 | 75   | 79   | 10               | 1                                | 56  | 30                                 | 100  | 0.08                                 | 0.13 | 103.5                                  | 2.9  | 5                                | 62  |
| BZT03C82   | 77                                 | 82   | 87   | 10               | 1                                | 62  | 30                                 | 100  | 0.08                                 | 0.13 | 114                                    | 2.6  | 5                                | 68  |
| BZT03C91   | 85                                 | 91   | 96   | 5                | 1                                | 68  | 60                                 | 200  | 0.09                                 | 0.13 | 126                                    | 2.4  | 5                                | 75  |
| BZT03C100  | 94                                 | 100  | 106  | 5                | 1                                | 75  | 60                                 | 200  | 0.09                                 | 0.13 | 139                                    | 2.2  | 5                                | 82  |
| BZT03C110  | 104                                | 110  | 116  | 5                | 1                                | 82  | 80                                 | 250  | 0.09                                 | 0.13 | 152                                    | 2    | 5                                | 91  |
| BZT03C120  | 114                                | 120  | 127  | 5                | 1                                | 91  | 80                                 | 250  | 0.09                                 | 0.13 | 167                                    | 1.8  | 5                                | 100 |
| BZT03C130  | 124                                | 130  | 141  | 5                | 1                                | 100 | 110                                | 300  | 0.09                                 | 0.13 | 185                                    | 1.6  | 5                                | 110 |
| BZT03C150  | 138                                | 150  | 156  | 5                | 1                                | 110 | 130                                | 300  | 0.09                                 | 0.13 | 204                                    | 1.5  | 5                                | 120 |
| BZT03C160  | 153                                | 160  | 171  | 5                | 1                                | 120 | 150                                | 350  | 0.09                                 | 0.13 | 224                                    | 1.3  | 5                                | 130 |
| BZT03C180  | 168                                | 180  | 191  | 5                | 1                                | 130 | 180                                | 400  | 0.09                                 | 0.13 | 249                                    | 1.2  | 5                                | 150 |
| BZT03C200  | 188                                | 200  | 212  | 5                | 1                                | 150 | 200                                | 500  | 0.09                                 | 0.13 | 276                                    | 1.1  | 5                                | 160 |
| BZT03C220  | 208                                | 220  | 233  | 2                | 1                                | 160 | 350                                | 750  | 0.09                                 | 0.13 | 305                                    | 1    | 5                                | 180 |
| BZT03C240  | 228                                | 240  | 256  | 2                | 1                                | 180 | 400                                | 850  | 0.09                                 | 0.13 | 336                                    | 0.9  | 5                                | 200 |
| BZT03C270  | 251                                | 270  | 289  | 2                | 1                                | 200 | 450                                | 1000 | 0.09                                 | 0.13 | 380                                    | 0.8  | 5                                | 220 |
| BZT03C300  | 280                                | 300  | 320  | 2                | 1                                | 220 | 450                                | 1000 | 0.09                                 | 0.13 | 419                                    | 0.72 | 5                                | 240 |

**Notes**

- (1) 10/1000 exp. falling pulse  $t_p = 1000\text{ }\mu\text{s}$  down to 50 %
- (2) Stand-off voltage = recommended supply voltage

**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

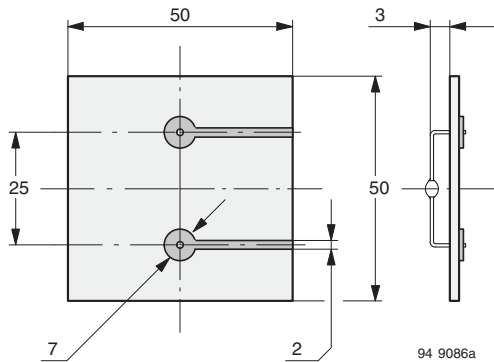


Fig. 1 - Epoxy Glass Hard Tissue, Board Thickness 1.5 mm,  $R_{thJA} \leq 100\text{ K/W}$

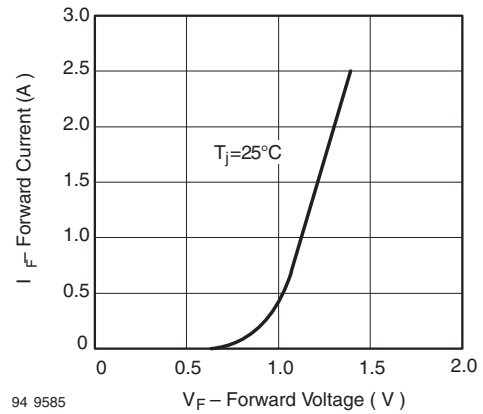


Fig. 3 - Forward Current vs. Forward Voltage

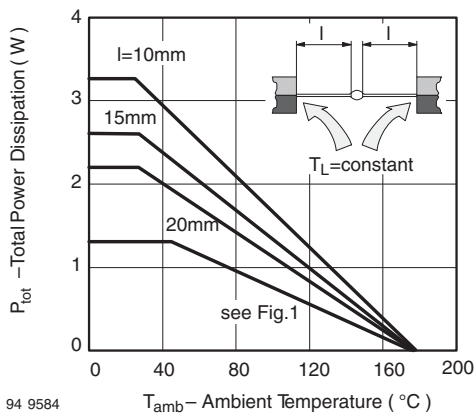


Fig. 2 - Total Power Dissipation vs. Ambient Temperature

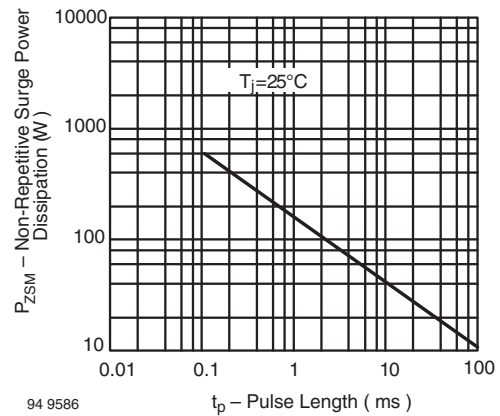
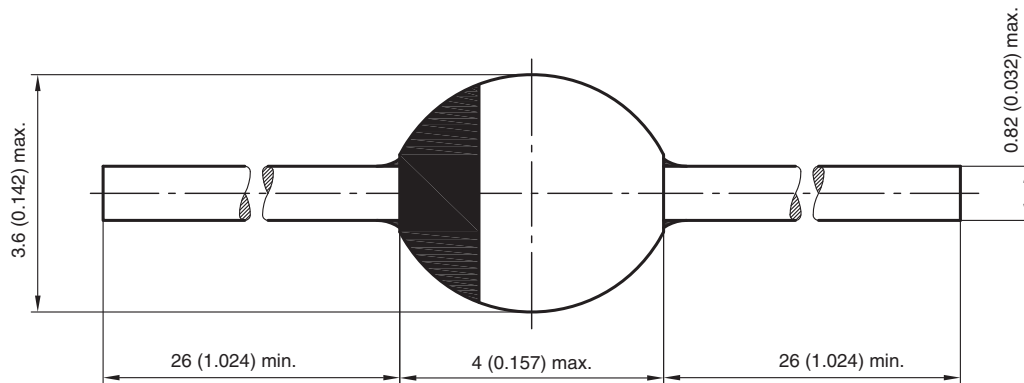


Fig. 4 - Non Repetitive Surge Power Dissipation vs. Pulse Length

**PACKAGE DIMENSIONS** in millimeters (inches): **SOD-57**



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