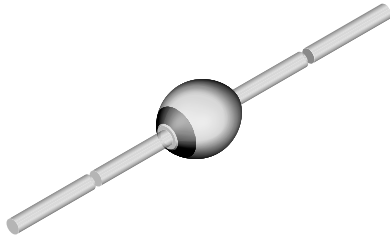


## Zener Diodes with Surge Current Specification



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

| PRIMARY CHARACTERISTICS |               |      |
|-------------------------|---------------|------|
| PARAMETER               | VALUE         | UNIT |
| $V_Z$ range nom.        | 6.2 to 300    | V    |
| Test current $I_{ZT}$   | 2 to 100      | mA   |
| $V_Z$ specification     | Pulse current |      |
| Int. construction       | 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<br>(according J-STD-020) | 260 °C/10 s at terminals |

| ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ °C}$ , unless otherwise specified) |   |            |               |      |
|---|---|------------|---------------|------|
| PARAMETER   | TEST CONDITION  | SYMBOL     | VALUE         | UNIT |
| Power dissipation   | $I = 10\text{ mm}$ , $T_L = 25\text{ °C}$             | $P_{tot}$  | 3250          | mW   |
|   | $T_{amb} = 25\text{ °C}$                              | $P_{tot}$  | 1300          |      |
| Repetitive peak reverse power dissipation   |   | $P_{ZRM}$  | 10            | W    |
| Non repetitive peak surge power dissipation                                       | $t_p = 100\text{ }\mu\text{s}$ , $T_j = 25\text{ °C}$ | $P_{ZSM}$  | 600           | W    |
| Junction to ambient air   | $I = 10\text{ mm}$ , $T_L = \text{constant}$          | $R_{thJA}$ | 46            | K/W  |
|   | On PC board with spacing 25 mm                        | $R_{thJA}$ | 100           |      |
| Junction temperature  |   | $T_j$      | 175           | °C   |
| Storage temperature range   |   | $T_S$      | - 65 to + 175 | °C   |
| Forward voltage (max.)  | $I_F = 0.5\text{ A}$                                  | $V_F$      | 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> |     |
|  | $V_Z$ at $I_{ZT1}$  |      |      | $I_{ZT1}$    | $I_R$ at $V_R$          |     | $Z_Z$ at $I_{ZT1}$ |      | $TC_{VZ}$ at $I_{ZT1}$  |      | $V_{(CL)R}$ at $I_{RMS}$ |      | $I_R$ at $V_R$           |     |
|  | V                   |      |      | mA           | $\mu\text{A}$           | V   | $\Omega$           |      | %/K                     |      | V                        | A    | $\mu\text{A}$            | 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



| <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> |      |
|  | $V_Z$ at $I_{ZT1}$  |      |      | $I_{ZT1}$    | $I_R$ at $V_R$          |      | $Z_Z$ at $I_{ZT1}$ |      | $TC_{VZ}$ at $I_{ZT1}$  |      | $V_{(CL)R}$ at $I_{RMS}$ |      | $I_R$ at $V_R$           |      |
|  | V                   |      |      | mA           | $\mu\text{A}$           | V    | $\Omega$           |      | %/K                     |      | V                        | A    | $\mu\text{A}$            | V    |
|  | MIN.                | NOM. | MAX. |              | MAX.                    |      | TYP.               | MAX. | MIN.                    | MAX. | MAX.                     |      | MAX.                     |      |
| BZT03D6V2  | 5.6                 | 6.2  | 6.8  | 100          | 1500                    | 4.4  | 1                  | 2    | 0                       | 0.07 | 9.5                      | 34   | 3000                     | 4.8  |
| BZT03D6V8  | 6.1                 | 6.8  | 7.5  | 100          | 1000                    | 4.8  | 1                  | 2    | 0                       | 0.07 | 10.5                     | 31   | 2000                     | 5.3  |
| BZT03D7V5  | 6.75                | 7.5  | 8.25 | 100          | 750                     | 5.3  | 1                  | 2    | 0                       | 0.07 | 11.6                     | 26.5 | 1500                     | 5.9  |
| BZT03D8V2  | 7.4                 | 8.2  | 9    | 100          | 600                     | 5.9  | 1                  | 2    | 0.03                    | 0.08 | 12.6                     | 24.4 | 1200                     | 6.5  |
| BZT03D9V1  | 8.2                 | 9.1  | 10   | 50           | 20                      | 6.5  | 2                  | 4    | 0.03                    | 0.08 | 13.7                     | 22.7 | 50                       | 7.1  |
| BZT03D10   | 9                   | 10   | 11   | 50           | 10                      | 7.1  | 2                  | 4    | 0.05                    | 0.09 | 15.2                     | 20.3 | 20                       | 7.9  |
| BZT03D11   | 9.9                 | 11   | 12.1 | 50           | 4                       | 7.9  | 4                  | 7    | 0.05                    | 0.1  | 16.2                     | 19.1 | 5                        | 8.6  |
| BZT03D12   | 10.8                | 12   | 13.2 | 50           | 3                       | 8.6  | 4                  | 7    | 0.05                    | 0.1  | 17.5                     | 17.7 | 5                        | 9.3  |
| BZT03D13   | 11.7                | 13   | 14.3 | 50           | 2                       | 9.3  | 5                  | 10   | 0.05                    | 0.1  | 19.1                     | 15.9 | 5                        | 10.6 |
| BZT03D15   | 13.5                | 15   | 16.5 | 50           | 1                       | 10.6 | 5                  | 10   | 0.05                    | 0.1  | 21.8                     | 14.4 | 5                        | 11.6 |
| BZT03D16   | 14.4                | 16   | 17.6 | 25           | 1                       | 11.6 | 6                  | 15   | 0.06                    | 0.11 | 23.4                     | 13.1 | 5                        | 12.6 |
| BZT03D18   | 16.2                | 18   | 19.8 | 25           | 1                       | 12.6 | 6                  | 15   | 0.06                    | 0.11 | 26.3                     | 11.7 | 5                        | 14.4 |
| BZT03D20   | 18                  | 20   | 22   | 25           | 1                       | 14.4 | 6                  | 15   | 0.06                    | 0.11 | 29.2                     | 10.6 | 5                        | 15.8 |
| BZT03D22   | 29.8                | 22   | 24.2 | 25           | 1                       | 15.8 | 6                  | 15   | 0.06                    | 0.11 | 31.9                     | 9.7  | 5                        | 17.2 |
| BZT03D24   | 21.6                | 24   | 26.4 | 25           | 1                       | 17.2 | 7                  | 15   | 0.06                    | 0.11 | 34.6                     | 8.9  | 5                        | 19.4 |
| BZT03D27   | 24.3                | 27   | 29.7 | 25           | 1                       | 19.4 | 7                  | 15   | 0.06                    | 0.11 | 39                       | 7.9  | 5                        | 21.5 |
| BZT03D30   | 27                  | 30   | 33   | 25           | 1                       | 21.5 | 8                  | 15   | 0.06                    | 0.11 | 43.5                     | 7.1  | 5                        | 23.5 |
| BZT03D33   | 29.7                | 33   | 36.3 | 25           | 1                       | 23.5 | 8                  | 15   | 0.06                    | 0.11 | 47.5                     | 6.5  | 5                        | 25.8 |
| BZT03D36   | 32.4                | 36   | 39.6 | 10           | 1                       | 25.8 | 21                 | 40   | 0.06                    | 0.11 | 51.5                     | 6    | 5                        | 28   |
| BZT03D39   | 35.1                | 39   | 42.9 | 10           | 1                       | 28   | 21                 | 40   | 0.06                    | 0.11 | 56                       | 5.5  | 5                        | 31   |
| BZT03D43   | 38.7                | 43   | 47.3 | 10           | 1                       | 31   | 24                 | 45   | 0.07                    | 0.12 | 62                       | 4.9  | 5                        | 33.5 |
| BZT03D47   | 42.3                | 47   | 51.7 | 10           | 1                       | 33.5 | 24                 | 45   | 0.07                    | 0.12 | 67.5                     | 4.6  | 5                        | 36.5 |
| BZT03D51   | 45.9                | 51   | 56.1 | 10           | 1                       | 36.5 | 25                 | 60   | 0.07                    | 0.12 | 73                       | 4.2  | 5                        | 40   |
| BZT03D56   | 50.4                | 56   | 61.6 | 10           | 1                       | 40   | 25                 | 60   | 0.07                    | 0.12 | 81                       | 3.8  | 5                        | 44.5 |
| BZT03D62   | 55.8                | 62   | 68.2 | 10           | 1                       | 44.5 | 25                 | 80   | 0.08                    | 0.13 | 89                       | 3.5  | 5                        | 49   |
| BZT03D68   | 61.2                | 68   | 74.8 | 10           | 1                       | 49   | 25                 | 80   | 0.08                    | 0.13 | 97                       | 3.2  | 5                        | 54   |
| BZT03D75   | 67.5                | 75   | 82.5 | 10           | 1                       | 54   | 30                 | 100  | 0.08                    | 0.13 | 107                      | 2.9  | 5                        | 59   |
| BZT03D82   | 73.8                | 82   | 90.2 | 10           | 1                       | 59   | 30                 | 100  | 0.08                    | 0.13 | 117                      | 2.6  | 5                        | 65   |
| BZT03D91   | 81.9                | 91   | 100  | 5            | 1                       | 65   | 60                 | 200  | 0.09                    | 0.13 | 130                      | 2.4  | 5                        | 71   |
| BZT03D100  | 90                  | 100  | 110  | 5            | 1                       | 71   | 60                 | 200  | 0.09                    | 0.13 | 143                      | 2.2  | 5                        | 79   |
| BZT03D110  | 99                  | 110  | 121  | 5            | 1                       | 79   | 80                 | 250  | 0.09                    | 0.13 | 157                      | 2    | 5                        | 86   |
| BZT03D120  | 108                 | 120  | 132  | 5            | 1                       | 86   | 80                 | 250  | 0.09                    | 0.13 | 172                      | 1.8  | 5                        | 93   |
| BZT03D130  | 117                 | 130  | 143  | 5            | 1                       | 93   | 110                | 300  | 0.09                    | 0.13 | 187                      | 1.6  | 5                        | 106  |
| BZT03D150  | 135                 | 150  | 165  | 5            | 1                       | 106  | 130                | 300  | 0.09                    | 0.13 | 213                      | 1.5  | 5                        | 116  |
| BZT03D160  | 144                 | 160  | 176  | 5            | 1                       | 116  | 150                | 350  | 0.09                    | 0.13 | 229                      | 1.3  | 5                        | 126  |
| BZT03D180  | 162                 | 180  | 198  | 5            | 1                       | 126  | 180                | 400  | 0.09                    | 0.13 | 256                      | 1.2  | 5                        | 144  |
| BZT03D200  | 180                 | 200  | 220  | 5            | 1                       | 144  | 200                | 500  | 0.09                    | 0.13 | 284                      | 1.1  | 5                        | 158  |
| BZT03D220  | 198                 | 220  | 242  | 2            | 1                       | 158  | 350                | 750  | 0.09                    | 0.13 | 314                      | 1    | 5                        | 172  |
| BZT03D240  | 216                 | 240  | 264  | 2            | 1                       | 172  | 400                | 850  | 0.09                    | 0.13 | 364                      | 0.9  | 5                        | 194  |
| BZT03D270  | 243                 | 270  | 297  | 2            | 1                       | 194  | 450                | 1000 | 0.09                    | 0.13 | 388                      | 0.8  | 5                        | 215  |

**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)

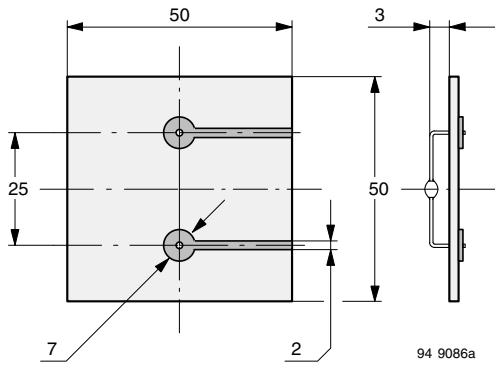


Fig. 1 - Epoxy Glass Hard Tissue, Board Thickness 1.5 mm,  $R_{thJA} \leq 100\text{ K/W}$

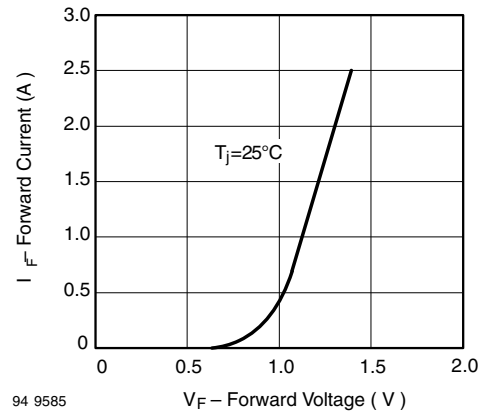


Fig. 3 - Forward Current vs. Forward Voltage

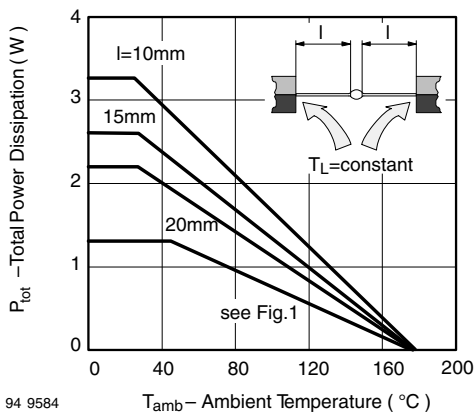
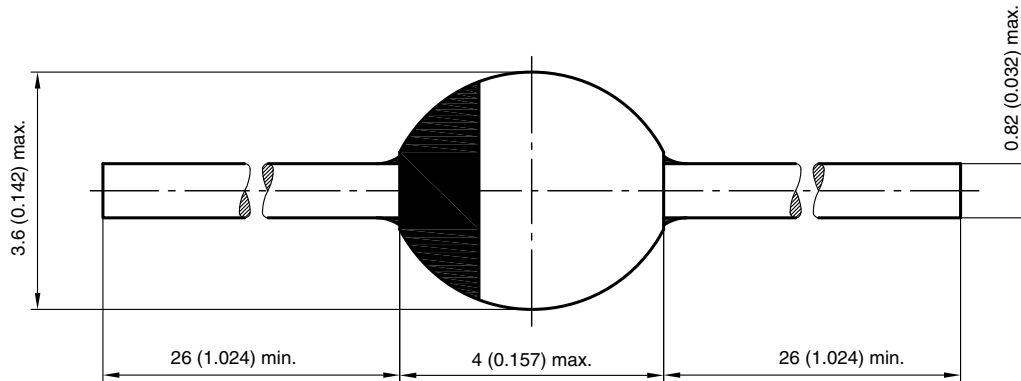


Fig. 2 - Total Power Dissipation vs. Ambient Temperature



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

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



20543  
Rev. 3 - Date: 09.February 2005  
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