

## Zener Diodes



### FEATURES

- High reliability
- Voltage range 10 V to 270 V
- Fits onto 5 mm SMD footpads
- Wave and reflow solderable
- AEC-Q101 qualified available
- Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade
- Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



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

### APPLICATIONS

- Voltage stabilization

| PRIMARY CHARACTERISTICS      |                 |      |
|------------------------------|-----------------|------|
| PARAMETER                    | VALUE           | UNIT |
| V <sub>Z</sub> range nom.    | 10 to 270       | V    |
| Test current I <sub>ZT</sub> | 2 to 50         | mA   |
| V <sub>BR</sub>              | 9.4 to 251      | V    |
| V <sub>WM</sub>              | 8.2 to 220      | V    |
| P <sub>PPM</sub>             | 300             | W    |
| T <sub>J</sub> max.          | 150             | °C   |
| V <sub>Z</sub> specification | Pulse current   |      |
| Circuit configuration        | Single          |      |
| Polarity                     | Uni-directional |      |

| ORDERING INFORMATION |                  |                      |                        |
|----------------------|------------------|----------------------|------------------------|
| DEVICE NAME          | ORDERING CODE    | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
| BZG03C-M-series      | BZG03Cxxx-M3-08  | 1500 (7" reel)       | 6000/box               |
| BZG03C-M-series      | BZG03Cxxx-M3-18  | 6000 (13" reel)      | 6000/box               |
| BZG03C-M-series      | BZG03Cxxx-HM3-08 | 1500 (7" reel)       | 6000/box               |
| BZG03C-M-series      | BZG03Cxxx-HM3-18 | 6000 (13" reel)      | 6000/box               |

| PACKAGE        |        |                                      |                                      |                          |
|----------------|--------|--------------------------------------|--------------------------------------|--------------------------|
| PACKAGE NAME   | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL           | SOLDERING CONDITIONS     |
| SMA (DO-214AC) | 73 mg  | UL 94 V-0                            | MSL level 1<br>(according J-STD-020) | 260 °C/10 s at terminals |

| ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified) |   |                   |             |      |
|---|---|-------------------|-------------|------|
| PARAMETER   | TEST CONDITION  | SYMBOL            | VALUE       | UNIT |
| Power dissipation   | R <sub>thJA</sub> < 25 K/W, T <sub>amb</sub> = 100 °C                   | P <sub>tot</sub>  | 3000        | mW   |
|   | R <sub>thJA</sub> < 100 K/W, T <sub>amb</sub> = 50 °C                   | P <sub>tot</sub>  | 1250        | mW   |
| Non repetitive peak surge power dissipation                                     | t <sub>p</sub> = 100 μs sq.pulse, T <sub>j</sub> = 25 °C prior to surge | P <sub>ZSM</sub>  | 600         | W    |
| Junction to lead  |   | R <sub>thJL</sub> | 25          | K/W  |
| Junction to ambient air   | Mounted on epoxy-glass hard tissue, fig. 1a                             | R <sub>thJA</sub> | 150         | K/W  |
|   | Mounted on epoxy-glass hard tissue, fig. 1b                             | R <sub>thJA</sub> | 125         | K/W  |
|   | Mounted on Al-oxide-ceramic (Al <sub>2</sub> O <sub>3</sub> ), fig. 1b  | R <sub>thJA</sub> | 100         | K/W  |
| Junction temperature  |   | T <sub>j</sub>    | 150         | °C   |
| Storage temperature range   |   | T <sub>stg</sub>  | -65 to +150 | °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 OF ZENER VOLTAGE |      |
|  | $V_Z$ at $I_{ZT1}$  |      |      | $I_{ZT1}$    | $I_R$ at $V_R$          |     | $Z_Z$ at $I_{ZT1}$ |      | $TK_{VZ}$ at $I_{ZT1}$                   |      |
|  | V                   |      |      | mA           | $\mu\text{A}$           | V   | $\Omega$           |      | %K                                       |      |
|  | MIN.                | NOM. | MAX. |              | MAX.                    |     | TYP.               | MAX. | MIN.                                     | MAX. |
| BZG03C10-M   | 9.4                 | 10   | 10.6 | 50           | 10                      | 7.5 | 2                  | 4    | 0.05                                     | 0.09 |
| BZG03C11-M   | 10.4                | 11   | 11.6 | 50           | 4                       | 8.2 | 4                  | 7    | 0.05                                     | 0.1  |
| BZG03C12-M   | 11.4                | 12   | 12.7 | 50           | 3                       | 9.1 | 4                  | 7    | 0.05                                     | 0.1  |
| BZG03C13-M   | 12.4                | 13   | 14.1 | 50           | 2                       | 10  | 5                  | 10   | 0.05                                     | 0.1  |
| BZG03C15-M   | 13.8                | 15   | 15.6 | 50           | 1                       | 11  | 5                  | 10   | 0.05                                     | 0.1  |
| BZG03C16-M   | 15.3                | 16   | 17.1 | 25           | 1                       | 12  | 6                  | 15   | 0.06                                     | 0.11 |
| BZG03C18-M   | 16.8                | 18   | 19.1 | 25           | 1                       | 13  | 6                  | 15   | 0.06                                     | 0.11 |
| BZG03C20-M   | 18.8                | 20   | 21.2 | 25           | 1                       | 15  | 6                  | 15   | 0.06                                     | 0.11 |
| BZG03C22-M   | 20.8                | 22   | 23.3 | 25           | 1                       | 16  | 6                  | 15   | 0.06                                     | 0.11 |
| BZG03C24-M   | 22.8                | 24   | 25.6 | 25           | 1                       | 18  | 7                  | 15   | 0.06                                     | 0.11 |
| BZG03C27-M   | 25.1                | 27   | 28.9 | 25           | 1                       | 20  | 7                  | 15   | 0.06                                     | 0.11 |
| BZG03C30-M   | 28                  | 30   | 32   | 25           | 1                       | 22  | 8                  | 15   | 0.06                                     | 0.11 |
| BZG03C33-M   | 31                  | 33   | 35   | 25           | 1                       | 24  | 8                  | 15   | 0.06                                     | 0.11 |
| BZG03C36-M   | 34                  | 36   | 38   | 10           | 1                       | 27  | 21                 | 40   | 0.06                                     | 0.11 |
| BZG03C39-M   | 37                  | 39   | 41   | 10           | 1                       | 30  | 21                 | 40   | 0.06                                     | 0.11 |
| BZG03C43-M   | 40                  | 43   | 46   | 10           | 1                       | 33  | 24                 | 45   | 0.07                                     | 0.12 |
| BZG03C47-M   | 44                  | 47   | 50   | 10           | 1                       | 36  | 24                 | 45   | 0.07                                     | 0.12 |
| BZG03C51-M   | 48                  | 51   | 54   | 10           | 1                       | 39  | 25                 | 60   | 0.07                                     | 0.12 |
| BZG03C56-M   | 52                  | 56   | 60   | 10           | 1                       | 43  | 25                 | 60   | 0.07                                     | 0.12 |
| BZG03C62-M   | 58                  | 62   | 66   | 10           | 1                       | 47  | 25                 | 80   | 0.08                                     | 0.13 |
| BZG03C68-M   | 64                  | 68   | 72   | 10           | 1                       | 51  | 25                 | 80   | 0.08                                     | 0.13 |
| BZG03C75-M   | 70                  | 75   | 79   | 10           | 1                       | 56  | 30                 | 100  | 0.08                                     | 0.13 |
| BZG03C82-M   | 77                  | 82   | 87   | 10           | 1                       | 62  | 30                 | 100  | 0.08                                     | 0.13 |
| BZG03C91-M   | 85                  | 91   | 96   | 5            | 1                       | 68  | 60                 | 200  | 0.09                                     | 0.13 |
| BZG03C100-M  | 94                  | 100  | 106  | 5            | 1                       | 75  | 60                 | 200  | 0.09                                     | 0.13 |
| BZG03C110-M  | 104                 | 110  | 116  | 5            | 1                       | 82  | 80                 | 250  | 0.09                                     | 0.13 |
| BZG03C120-M  | 114                 | 120  | 127  | 5            | 1                       | 91  | 80                 | 250  | 0.09                                     | 0.13 |
| BZG03C130-M  | 124                 | 130  | 141  | 5            | 1                       | 100 | 110                | 300  | 0.09                                     | 0.13 |
| BZG03C150-M  | 138                 | 150  | 156  | 5            | 1                       | 110 | 130                | 300  | 0.09                                     | 0.13 |
| BZG03C160-M  | 158                 | 160  | 171  | 5            | 1                       | 120 | 150                | 350  | 0.09                                     | 0.13 |
| BZG03C180-M  | 168                 | 180  | 191  | 5            | 1                       | 130 | 180                | 400  | 0.09                                     | 0.13 |
| BZG03C200-M  | 188                 | 200  | 212  | 5            | 1                       | 150 | 200                | 500  | 0.09                                     | 0.13 |
| BZG03C220-M  | 208                 | 220  | 233  | 2            | 1                       | 160 | 350                | 750  | 0.09                                     | 0.13 |
| BZG03C240-M  | 228                 | 240  | 256  | 2            | 1                       | 180 | 400                | 850  | 0.09                                     | 0.13 |
| BZG03C270-M  | 251                 | 270  | 289  | 2            | 1                       | 200 | 450                | 1000 | 0.09                                     | 0.13 |

## BASIC CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)



Fig. 1 - Boards for R<sub>thJA</sub> Definition (Copper Overlay 35 μ)

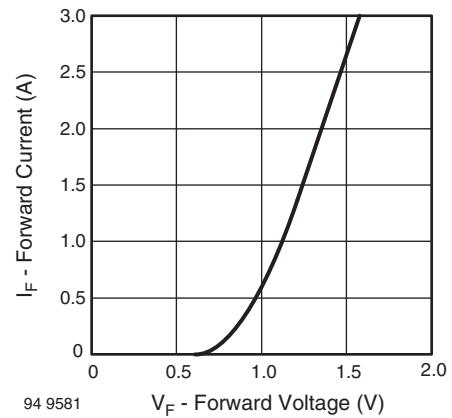


Fig. 3 - Forward Current vs. Forward Voltage



Fig. 2 - Total Power Dissipation vs. Ambient Temperature



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

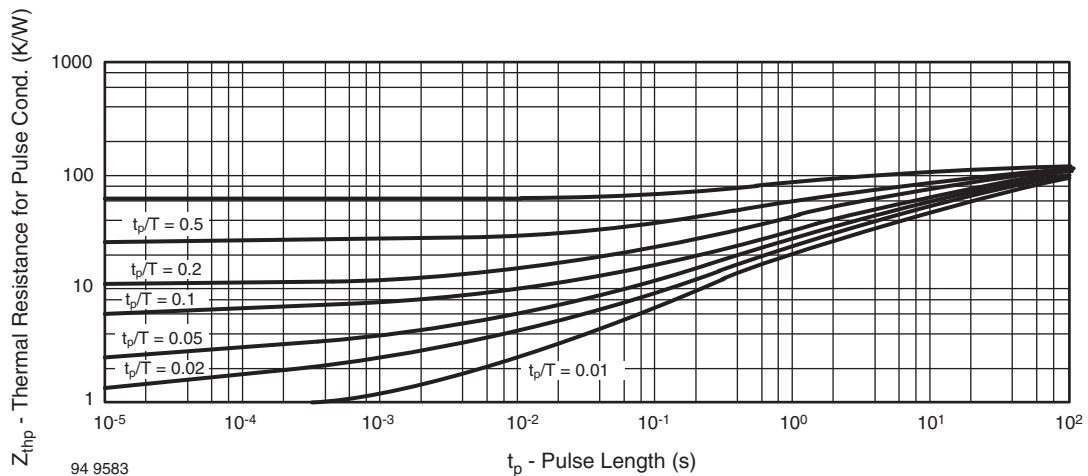


Fig. 5 - Thermal Response



**PACKAGE DIMENSIONS** in millimeters (inches): **SMA (DO-214AC)**



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