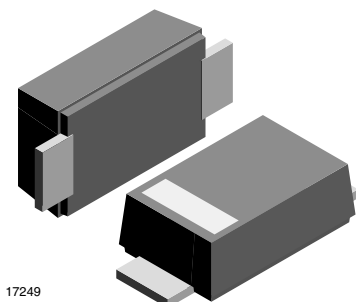


## Zener Diodes



17249

### LINKS TO ADDITIONAL RESOURCES



3D Models

### FEATURES

- Silicon planar Zener diodes
- Low profile surface-mount package
- Low leakage current
- Excellent stability
- High temperature soldering: 260 °C/10 s at terminals
- Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade
- Compatible to SOD-123W package case outline or SOD-123F and SOD-123FL
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


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

### PRIMARY CHARACTERISTICS

| PARAMETER                    | VALUE         | UNIT |
|------------------------------|---------------|------|
| V <sub>Z</sub> range nom.    | 3.6 to 200    | V    |
| Test current I <sub>ZT</sub> | 5 to 100      | mA   |
| V <sub>Z</sub> specification | Pulse current |      |
| Circuit configuration        | Single        |      |

### ORDERING INFORMATION

| DEVICE NAME    | ORDERING CODE                        | TAPED UNITS PER REEL            | MINIMUM ORDER QUANTITY |
|----------------|--------------------------------------|---------------------------------|------------------------|
| BZD17-M Series | BZD17C3V6P-M3-08 to BZD17C200P-M3-08 | 3000 per 7" reel (8 mm tape)    | 30 000/box             |
|                | BZD17C3V6P-M3-18 to BZD17C200P-M3-18 | 10 000 per 13" reel (8 mm tape) | 50 000/box             |

### PACKAGE

| PACKAGE NAME   | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL           | SOLDERING CONDITIONS     |
|----------------|--------|--------------------------------------|--------------------------------------|--------------------------|
| SMF (DO-219AB) | 15 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                                          | T <sub>L</sub> = 80 °C                                              | P <sub>tot</sub>  | 2300        | mW   |
|                                                            | T <sub>A</sub> = 25 °C <sup>(1)</sup>                               | P <sub>tot</sub>  | 800         | mW   |
| Non repetitive peak pulse power dissipation <sup>(2)</sup> | 100 µs square pulse                                                 | P <sub>ZSM</sub>  | 300         | W    |
| Junction to lead                                           |                                                                     | R <sub>thJL</sub> | 30          | K/W  |
| Junction to ambient air                                    | Mounted on epoxy-glass PCB with 3 mm x 3 mm Cu pads (≥ 40 µm thick) | R <sub>thJA</sub> | 180         | K/W  |
| Junction temperature                                       |                                                                     | T <sub>J</sub>    | 150         | °C   |
| Storage temperature range                                  |                                                                     | T <sub>stg</sub>  | -55 to +150 | °C   |
| Operating temperature range                                |                                                                     | T <sub>op</sub>   | -55 to +150 | °C   |

#### Notes

<sup>(1)</sup> Mounted on epoxy-glass PCB with 3 mm x 3 mm Cu pads (≥ 40 µm thick)

<sup>(2)</sup> T<sub>J</sub> = 25 °C prior to surge

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

| PART NUMBER  | MARKING CODE | ZENER VOLTAGE RANGE <sup>(1)</sup> |      |      | TEST CURRENT | REVERSE CURRENT |     | DYNAMIC RESISTANCE |      | TEMPERATURE COEFFICIENT    |       |
|--------------|--------------|------------------------------------|------|------|--------------|-----------------|-----|--------------------|------|----------------------------|-------|
|              |              | $V_Z$ at $I_{ZT1}$                 |      |      | $I_{ZT1}$    | $I_R$ at $V_R$  |     | $Z_Z$ at $I_{ZT1}$ |      | $\alpha_{VZ}$ at $I_{ZT1}$ |       |
|              |              | V                                  |      |      | mA           | $\mu\text{A}$   | V   | $\Omega$           |      | %/ $^{\circ}\text{C}$      |       |
|              |              | MIN.                               | NOM. | MAX. |              | MAX.            |     | TYP.               | MAX. | MIN.                       | MAX.  |
| BZD17C3V6P-M | V0           | 3.4                                | 3.6  | 3.8  | 100          | 100             | 1   | 4                  | 8    | -0.14                      | -0.04 |
| BZD17C3V9P-M | V1           | 3.7                                | 3.9  | 4.1  | 100          | 50              | 1   | 4                  | 8    | -0.14                      | -0.04 |
| BZD17C4V3P-M | V2           | 4                                  | 4.3  | 4.6  | 100          | 25              | 1   | 4                  | 7    | -0.12                      | -0.02 |
| BZD17C4V7P-M | V3           | 4.4                                | 4.7  | 5    | 100          | 10              | 1   | 3                  | 7    | -0.1                       | 0     |
| BZD17C5V1P-M | V4           | 4.8                                | 5.1  | 5.4  | 100          | 5               | 1   | 3                  | 6    | -0.08                      | 0.02  |
| BZD17C5V6P-M | V5           | 5.2                                | 5.6  | 6    | 100          | 10              | 2   | 2                  | 4    | -0.04                      | 0.04  |
| BZD17C6V2P-M | V6           | 5.8                                | 6.2  | 6.6  | 100          | 5               | 2   | 2                  | 3    | -0.01                      | 0.06  |
| BZD17C6V8P-M | V7           | 6.4                                | 6.8  | 7.2  | 100          | 10              | 3   | 1                  | 3    | 0                          | 0.07  |
| BZD17C7V5P-M | V8           | 7                                  | 7.5  | 7.9  | 100          | 50              | 3   | 1                  | 2    | 0                          | 0.07  |
| BZD17C8V2P-M | V9           | 7.7                                | 8.2  | 8.7  | 100          | 10              | 3   | 1                  | 2    | 0.03                       | 0.08  |
| BZD17C9V1P-M | VA           | 8.5                                | 9.1  | 9.6  | 50           | 10              | 5   | 2                  | 4    | 0.03                       | 0.08  |
| BZD17C10P-M  | VB           | 9.4                                | 10   | 10.6 | 50           | 7               | 7.5 | 2                  | 4    | 0.05                       | 0.09  |
| BZD17C11P-M  | VC           | 10.4                               | 11   | 11.6 | 50           | 4               | 8.2 | 4                  | 7    | 0.05                       | 0.1   |
| BZD17C12P-M  | VD           | 11.4                               | 12   | 12.7 | 50           | 3               | 9.1 | 4                  | 7    | 0.05                       | 0.1   |
| BZD17C13P-M  | VE           | 12.4                               | 13   | 14.1 | 50           | 2               | 10  | 5                  | 10   | 0.05                       | 0.1   |
| BZD17C15P-M  | VF           | 13.8                               | 15   | 15.6 | 50           | 1               | 11  | 5                  | 10   | 0.05                       | 0.1   |
| BZD17C16P-M  | VG           | 15.3                               | 16   | 17.1 | 25           | 1               | 12  | 6                  | 15   | 0.06                       | 0.11  |
| BZD17C18P-M  | VH           | 16.8                               | 18   | 19.1 | 25           | 1               | 13  | 6                  | 15   | 0.06                       | 0.11  |
| BZD17C20P-M  | VI           | 18.8                               | 20   | 21.2 | 25           | 1               | 15  | 6                  | 15   | 0.06                       | 0.11  |
| BZD17C22P-M  | VJ           | 20.8                               | 22   | 23.3 | 25           | 1               | 16  | 6                  | 15   | 0.06                       | 0.11  |
| BZD17C24P-M  | VK           | 22.8                               | 24   | 25.6 | 25           | 1               | 18  | 7                  | 15   | 0.06                       | 0.11  |
| BZD17C27P-M  | VL           | 25.1                               | 27   | 28.9 | 25           | 1               | 20  | 7                  | 15   | 0.06                       | 0.11  |
| BZD17C30P-M  | VM           | 28                                 | 30   | 32   | 25           | 1               | 22  | 8                  | 15   | 0.06                       | 0.11  |
| BZD17C33P-M  | VN           | 31                                 | 33   | 35   | 25           | 1               | 24  | 8                  | 15   | 0.06                       | 0.11  |
| BZD17C36P-M  | VO           | 34                                 | 36   | 38   | 10           | 1               | 27  | 21                 | 40   | 0.06                       | 0.11  |
| BZD17C39P-M  | VP           | 37                                 | 39   | 41   | 10           | 1               | 30  | 21                 | 40   | 0.06                       | 0.11  |
| BZD17C43P-M  | VQ           | 40                                 | 43   | 46   | 10           | 1               | 33  | 24                 | 45   | 0.07                       | 0.12  |
| BZD17C47P-M  | VR           | 44                                 | 47   | 50   | 10           | 1               | 36  | 24                 | 45   | 0.07                       | 0.12  |
| BZD17C51P-M  | VS           | 48                                 | 51   | 54   | 10           | 1               | 39  | 25                 | 60   | 0.07                       | 0.12  |
| BZD17C56P-M  | VT           | 52                                 | 56   | 60   | 10           | 1               | 43  | 25                 | 60   | 0.07                       | 0.12  |
| BZD17C62P-M  | VU           | 58                                 | 62   | 66   | 10           | 1               | 47  | 25                 | 80   | 0.08                       | 0.13  |
| BZD17C68P-M  | VV           | 64                                 | 68   | 72   | 10           | 1               | 51  | 25                 | 80   | 0.08                       | 0.13  |
| BZD17C75P-M  | VW           | 70                                 | 75   | 79   | 10           | 1               | 56  | 30                 | 100  | 0.08                       | 0.13  |
| BZD17C82P-M  | VX           | 77                                 | 82   | 87   | 10           | 1               | 62  | 30                 | 100  | 0.08                       | 0.13  |
| BZD17C91P-M  | VY           | 85                                 | 91   | 96   | 5            | 1               | 68  | 60                 | 200  | 0.08                       | 0.13  |
| BZD17C100P-M | VZ           | 94                                 | 100  | 106  | 5            | 1               | 75  | 60                 | 200  | 0.09                       | 0.13  |
| BZD17C110P-M | XA           | 104                                | 110  | 116  | 5            | 1               | 82  | 80                 | 250  | 0.09                       | 0.13  |
| BZD17C120P-M | XB           | 114                                | 120  | 127  | 5            | 1               | 91  | 80                 | 250  | 0.09                       | 0.13  |
| BZD17C130P-M | XC           | 124                                | 130  | 141  | 5            | 1               | 100 | 110                | 300  | 0.09                       | 0.13  |
| BZD17C150P-M | XD           | 138                                | 150  | 156  | 5            | 1               | 110 | 130                | 300  | 0.09                       | 0.13  |
| BZD17C160P-M | XE           | 153                                | 160  | 171  | 5            | 1               | 120 | 150                | 350  | 0.09                       | 0.13  |
| BZD17C180P-M | XF           | 168                                | 180  | 191  | 5            | 1               | 130 | 180                | 400  | 0.09                       | 0.13  |
| BZD17C200P-M | XG           | 188                                | 200  | 212  | 5            | 1               | 150 | 200                | 500  | 0.09                       | 0.13  |

**Notes**

- Electrical characteristics when used as regulator diodes
- Maximum  $V_F = 1.2\text{ V}$ , at  $I_F = 0.2\text{ A}$

<sup>(1)</sup> Pulse test:  $t_p \leq 5\text{ ms}$

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

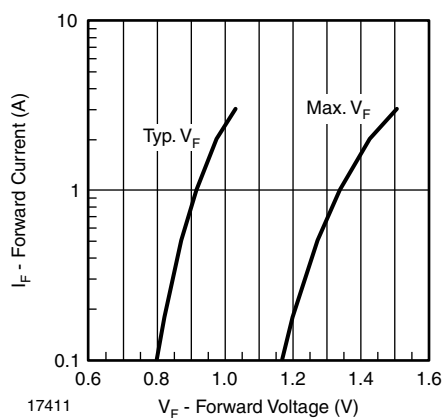


Fig. 1 - Forward Current vs. Forward Voltage

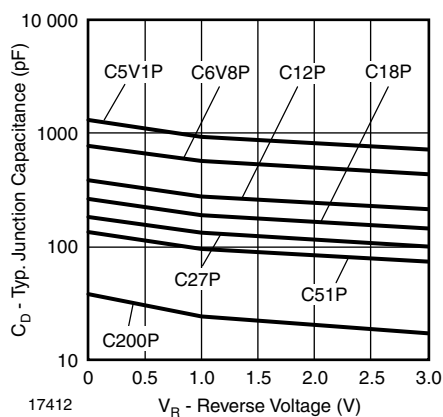


Fig. 2 - Typ. Diode Capacitance vs. Reverse Voltage

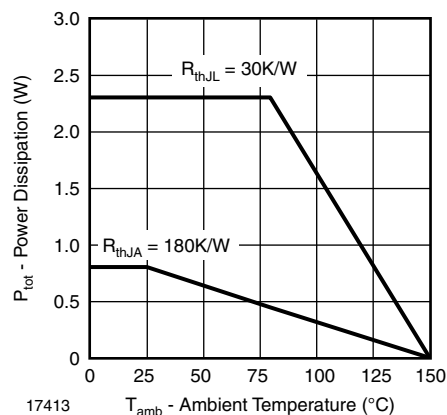
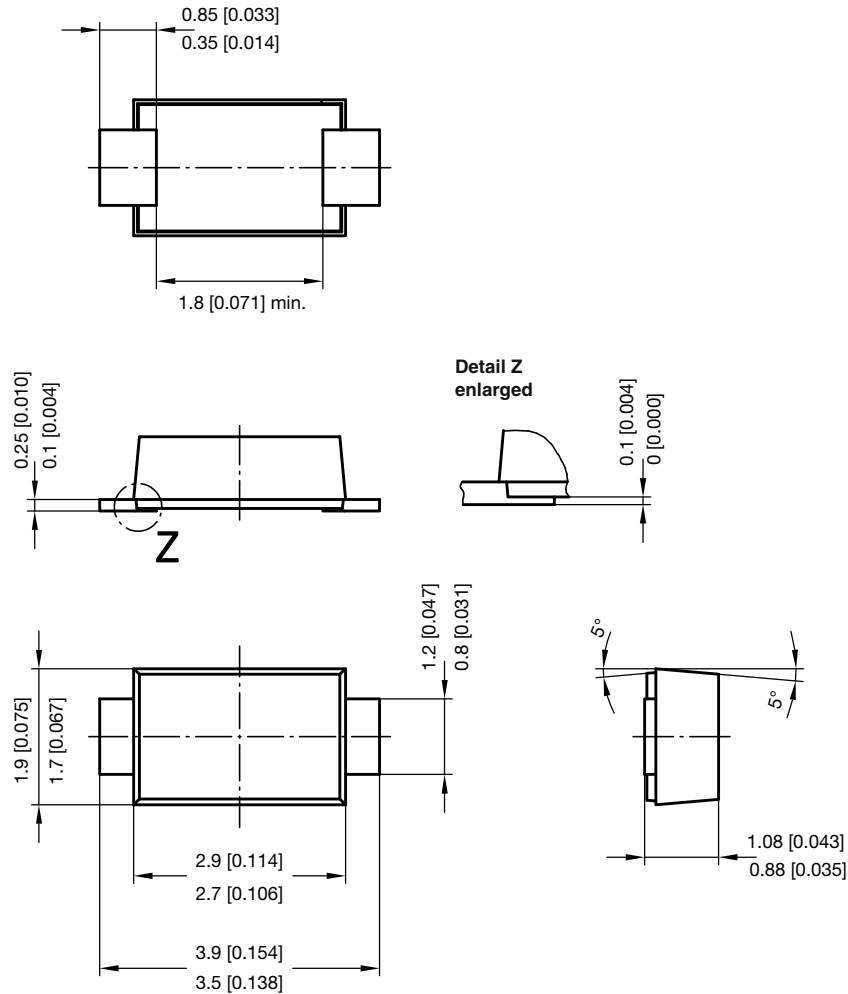
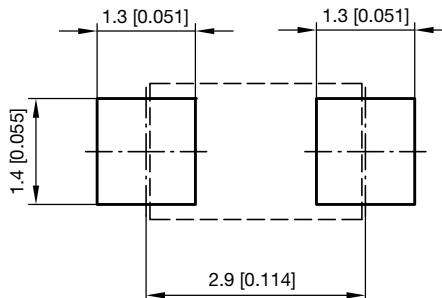


Fig. 3 - Power Dissipation vs. Ambient Temperature

**PACKAGE DIMENSIONS** in millimeters (inches): **SMF (DO-219AB)**


foot print recommendation:

Reflow soldering

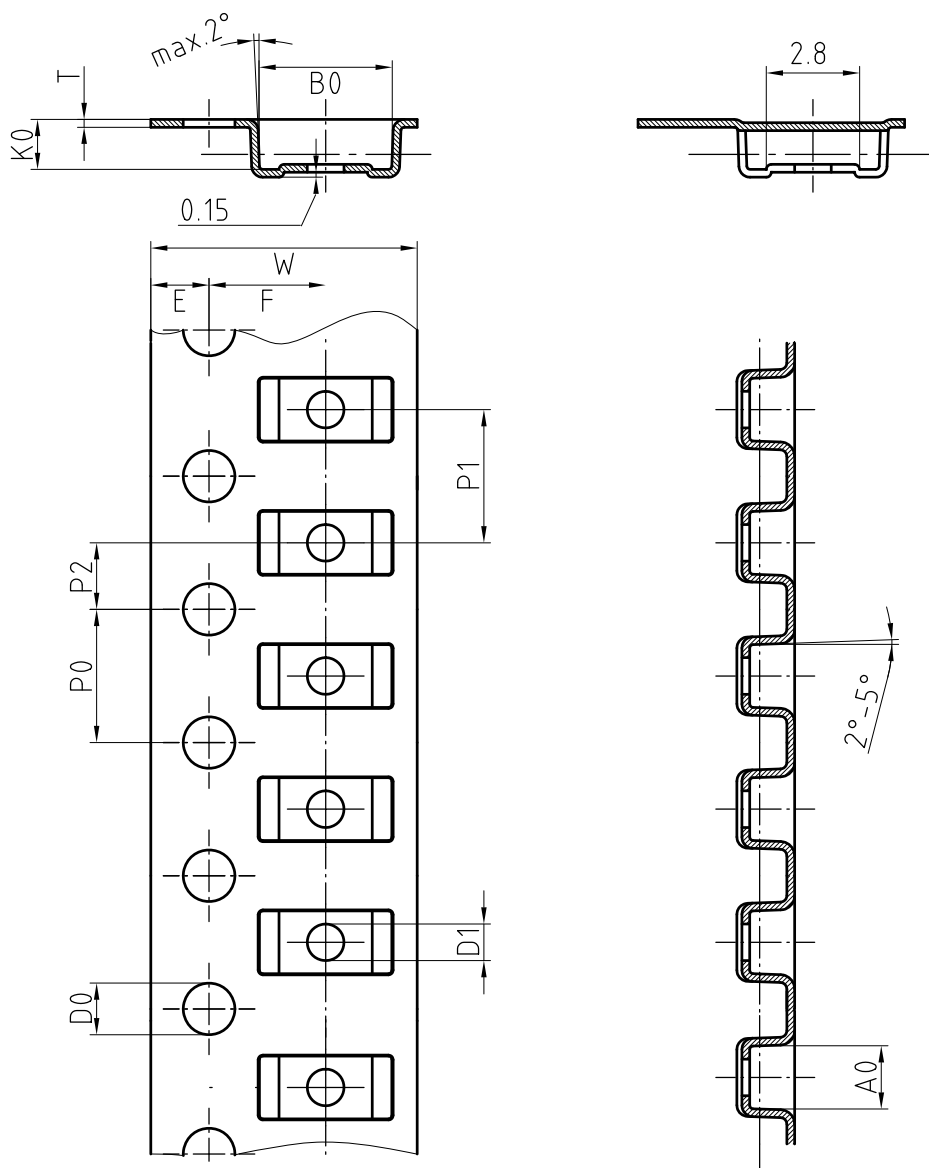


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**BLISTERTAPE DIMENSIONS FOR SMF in millimeters**


| Mat: | A0  | B0  | K0  | W   | T     | P0  | P2  | P1  | D0  | D1 | E    | F   |
|------|-----|-----|-----|-----|-------|-----|-----|-----|-----|----|------|-----|
| PS   | 1.9 | 4.0 | 1.5 | 8.0 | 0.235 | 4.0 | 2.0 | 4.0 | 1.5 | 1  | 1.75 | 3.5 |

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