

## Small Signal Zener Diodes



### FEATURES

- Silicon planar Zener diodes
- Standard Zener voltage tolerance is  $\pm 5\%$ .
- AEC-Q101 qualified available
- ESD capability according to AEC-Q101:  
Human body model > 8 kV  
Machine model > 800 V
- Base P/N-E3 - RoHS-compliant, commercial grade
- Base P/N-HE3 - RoHS-compliant, AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

 AUTOMOTIVE  
GRADE  
Available

**RoHS**  
COMPLIANT

| PRIMARY CHARACTERISTICS |               |      |
|-------------------------|---------------|------|
| PARAMETER               | VALUE         | UNIT |
| $V_Z$ range nom.        | 2.4 to 43     | V    |
| Test current $I_{ZT}$   | 0.05          | mA   |
| $V_Z$ specification     | Pulse current |      |
| Int. construction       | Single        |      |

| ORDERING INFORMATION    |                                    |                                |                        |
|-------------------------|------------------------------------|--------------------------------|------------------------|
| DEVICE NAME             | ORDERING CODE                      | TAPED UNITS PER REEL           | MINIMUM ORDER QUANTITY |
| MMBZ4681 to<br>MMBZ4717 | MMBZ4681-E3-08 to MMBZ4717-E3-08   | 3000 (8 mm tape on 7" reel)    | 15 000/box             |
|                         | MMBZ4681-HE3-08 to MMBZ4717-HE3-08 |                                |                        |
|                         | MMBZ4681-E3-18 to MMBZ4717-E3-18   | 10 000 (8 mm tape on 13" reel) | 10 000/box             |
|                         | MMBZ4681-HE3-18 to MMBZ4717-HE3-18 |                                |                        |

| PACKAGE      |        |   |                                      |                          |
|--------------|--------|---|--------------------------------------|--------------------------|
| PACKAGE NAME | WEIGHT | MOLDING COMPOUND<br>FLAMMABILITY RATING | MOISTURE SENSITIVITY<br>LEVEL        | SOLDERING CONDITIONS     |
| SOT-23       | 8.8 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   | On FR - 5 board using recommended solder pad layout | $P_{tot}$  | 350         | mW   |
| Zener current   | See table "Electrical Characteristics"              |            |             |      |
| Thermal resistance junction to ambient air  | On FR - 5 board using recommended solder pad layout | $R_{thJA}$ | 420         | K/W  |
| Junction temperature, maximum   |   | $T_j$      | 150         | °C   |
| Storage temperature range   |   | $T_{stg}$  | -55 to +150 | °C   |
| Operating temperature range   |   | $T_{op}$   | -55 to +150 | °C   |



| 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 |      | VOLTAGE CHANGE <sup>(2)</sup> |
|   |              | $V_Z$ at $I_{ZT1}$                 |      |      | $I_{ZT1}$    | $I_R$ at $V_R$  |      | $\Delta V_Z$                  |
|   |              | V                                  |      |      | mA           | $\mu\text{A}$   | V    | V                             |
|   |              | MIN.                               | NOM. | MAX. |              | MAX.            |      | MAX.                          |
| MMBZ4681  | CF           | 2.28                               | 2.4  | 2.52 | 0.05         | 2               | 1    | 0.8                           |
| MMBZ4682  | CH           | 2.57                               | 2.7  | 2.84 | 0.05         | 1               | 1    | 0.85                          |
| MMBZ4683  | CJ           | 2.85                               | 3    | 3.15 | 0.05         | 0.8             | 1    | 0.9                           |
| MMBZ4684  | CK           | 3.14                               | 3.3  | 3.47 | 0.05         | 7.5             | 1.5  | 0.95                          |
| MMBZ4685  | CM           | 3.42                               | 3.6  | 3.78 | 0.05         | 7.5             | 2    | 0.95                          |
| MMBZ4686  | CN           | 3.71                               | 3.9  | 4.1  | 0.05         | 5               | 2    | 0.97                          |
| MMBZ4687  | CP           | 4.09                               | 4.3  | 4.52 | 0.05         | 4               | 2    | 0.99                          |
| MMBZ4688  | CT           | 4.47                               | 4.7  | 4.94 | 0.05         | 10              | 3    | 0.99                          |
| MMBZ4689  | CU           | 4.85                               | 5.1  | 5.36 | 0.05         | 10              | 3    | 0.97                          |
| MMBZ4690  | CV           | 5.32                               | 5.6  | 5.88 | 0.05         | 10              | 4    | 0.96                          |
| MMBZ4691  | CA           | 5.89                               | 6.2  | 6.51 | 0.05         | 10              | 5    | 0.95                          |
| MMBZ4692  | CX           | 6.46                               | 6.8  | 7.14 | 0.05         | 10              | 5.1  | 0.9                           |
| MMBZ4693  | CY           | 7.13                               | 7.5  | 7.88 | 0.05         | 10              | 5.7  | 0.75                          |
| MMBZ4694  | CZ           | 7.79                               | 8.2  | 8.61 | 0.05         | 1               | 6.2  | 0.5                           |
| MMBZ4695  | DC           | 8.27                               | 8.7  | 9.14 | 0.05         | 1               | 6.6  | 0.1                           |
| MMBZ4696  | DD           | 8.65                               | 9.1  | 9.56 | 0.05         | 1               | 6.9  | 0.08                          |
| MMBZ4697  | DE           | 9.5                                | 10   | 10.5 | 0.05         | 1               | 7.6  | 0.1                           |
| MMBZ4698  | DF           | 10.5                               | 11   | 11.6 | 0.05         | 0.05            | 8.4  | 0.11                          |
| MMBZ4699  | DH           | 11.4                               | 12   | 12.6 | 0.05         | 0.05            | 9.1  | 0.12                          |
| MMBZ4700  | DJ           | 12.4                               | 13   | 13.7 | 0.05         | 0.05            | 9.8  | 0.13                          |
| MMBZ4701  | DK           | 13.3                               | 14   | 14.7 | 0.05         | 0.05            | 10.6 | 0.14                          |
| MMBZ4702  | DM           | 14.3                               | 15   | 15.8 | 0.05         | 0.05            | 11.4 | 0.15                          |
| MMBZ4703  | DN           | 15.2                               | 16   | 16.8 | 0.05         | 0.05            | 12.1 | 0.16                          |
| MMBZ4704  | DP           | 16.2                               | 17   | 17.9 | 0.05         | 0.05            | 12.9 | 0.17                          |
| MMBZ4705  | DT           | 17.1                               | 18   | 18.9 | 0.05         | 0.05            | 13.6 | 0.18                          |
| MMBZ4706  | DU           | 18.1                               | 19   | 20   | 0.05         | 0.05            | 14.4 | 0.19                          |
| MMBZ4707  | DV           | 19                                 | 20   | 21   | 0.05         | 0.01            | 15.2 | 0.2                           |
| MMBZ4708  | DA           | 20.9                               | 22   | 23.1 | 0.05         | 0.01            | 16.7 | 0.22                          |
| MMBZ4709  | DZ           | 22.8                               | 24   | 25.2 | 0.05         | 0.01            | 18.2 | 0.24                          |
| MMBZ4710  | DY           | 23.8                               | 25   | 26.3 | 0.05         | 0.01            | 19   | 0.25                          |
| MMBZ4711  | EA           | 25.7                               | 27   | 28.4 | 0.05         | 0.01            | 20.4 | 0.27                          |
| MMBZ4712  | EC           | 26.6                               | 28   | 29.4 | 0.05         | 0.01            | 21.2 | 0.28                          |
| MMBZ4713  | ED           | 28.5                               | 30   | 31.5 | 0.05         | 0.01            | 22.8 | 0.3                           |
| MMBZ4714  | EE           | 31.4                               | 33   | 34.7 | 0.05         | 0.01            | 25   | 0.33                          |
| MMBZ4715  | EF           | 34.2                               | 36   | 37.8 | 0.05         | 0.01            | 27.3 | 0.36                          |
| MMBZ4716  | EH           | 37.1                               | 39   | 41   | 0.05         | 0.01            | 29.6 | 0.39                          |
| MMBZ4717  | EJ           | 40.9                               | 43   | 45.2 | 0.05         | 0.01            | 32.6 | 0.43                          |

**Notes**

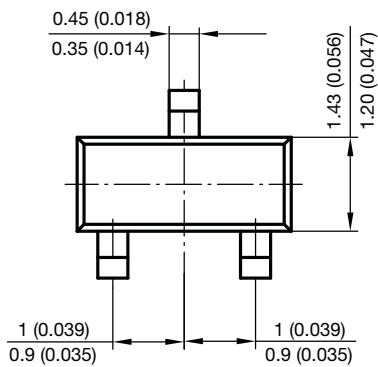
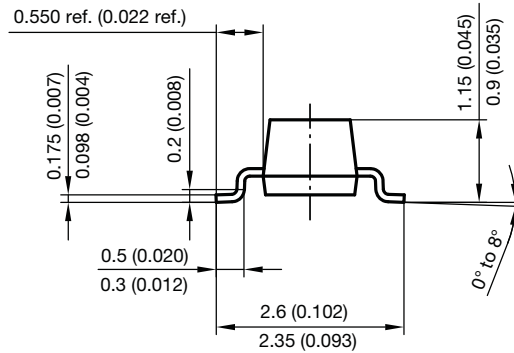
- Maximum  $V_F = 0.9\text{ V}$ , at  $I_F = 10\text{ mA}$

<sup>(1)</sup> Tested with pulse test current

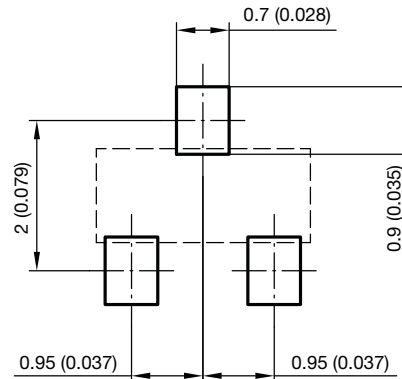
<sup>(2)</sup> Maximum voltage change ( $V_Z$ ). Voltage change is equal to the difference between  $V_Z$  at  $100\text{ }\mu\text{A}$  and  $V_Z$  at  $10\text{ }\mu\text{A}$ .



## PACKAGE DIMENSIONS in millimeters (inches): SOT-23



Foot print recommendation:



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