




**SPECIFICATION SHEET**

|   |  |  |
|---|--|--|
| <b>SPECIFICATION SHEET NO.</b>          | Q1105-MM1W240S000FPL   |  |
| <b>DATE</b>                             | Nov. 05, 2023  |  |
| <b>REVISION</b>                         | A0   | Updated With Most Recent Data - Official First Release |
| <b>DESCRIPTION AND MAIN PARAMETRICS</b> | <p>SMD Zener Diodes, MM1W series, Case SOD-123, 2 Pads<br/> MM1W240V Type,<br/> Voltage - Zener (Nom) (Vz): 240V, Peak Pulse Power: 1.0 Watts<br/> Operating Temp. Range -55°C ~+150°C<br/> Package in Tape/Reel, 3000pcs/Reel<br/> RoHS III/REACH Compliant and Halogen Free (HF)</p> |  |
| <b>CUSTOMER</b>                         |  |  |
| <b>CUSTOMER PART NO.</b>                |  |  |
| <b>CROSS REF. PART NO.</b>              |  |  |
| <b>ORIGINAL MFG/PART NO.</b>            | MDD/MM1W240V   |  |
| <b>PART CODE</b>                        | MM1W240S000FPL   |  |

|                         |   |  |
|-------------------------|---|--|
| <b>VENDOR APPROVE</b>   |   |  |
| Issued/Checked/Approved |    |  |
|                         |  |  |
| DATE: Nov. 05, 2023     |   |  |

|                         |  |
|-------------------------|--|
| <b>CUSTOMER APPROVE</b> |  |
|                         |  |
| DATE:                   |  |

**SMD ZENER DIODES MM1W SERIES**

**MAIN FEATURE**

- Small Plastic Package Suitable For Surface Mounted Design.
- Wide Zener Reverse Voltage Range 3.3V To 330V.
- Glass Passivated Junction
- Tolerance Approximately  $\pm 5\%$
- 1.0W Max. Peak Pulse Power
- High Temperature Soldering Guaranteed: 260°C/10 Seconds At Terminals
- REACH/RoHS III Complaint And Halogen Free
- Cross Main Competitor Parts In Market



**APPLICATION**

- For SMD Application

**RFQ**

[Request For Quotation](#)

**PART CODE GUIDE**

| MM1W | 240V | S | 000FPL |
|------|------|---|--------|
| 1    | 2    | 3 | 4      |

1. MM1W: SMD Zener SERIES Diodes, Package Case SOD-123, MM1W series Code
2. 240V: Specification code for Voltage - Zener (Nom) (Vz): 240V
3. S: Package code, Tape/Reel
4. 000FPL: Marking code for "FPL" on the case surface, Different Marking for different specification

**ELECTRICAL CHARACTERISTICS**

See Page 5 ~ Page 7 For Different Part Code

**HOW TO ORDER**

Please indicate part code and send us your RFQ by E-mail, [sales@nextgencomponent.com](mailto:sales@nextgencomponent.com)

**SMD ZENER DIODES MM1W SERIES**

**DIMENSION** - Unit: Inch/mm

Image for reference

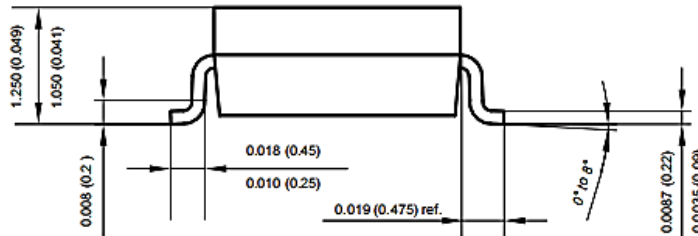
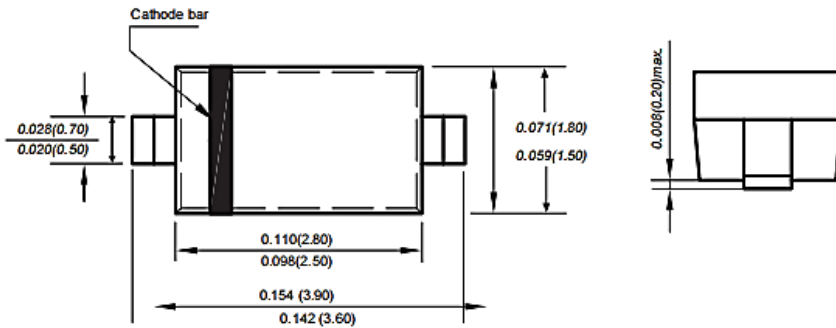


**Marking:** Standard

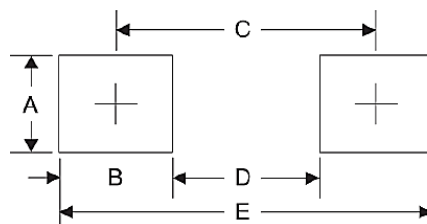
- See Marking Code
- List at Page 5~ Page 7

**Case Dimensic**

SOD-123



**Recommend Pad Layout**



| Symbol | Unit (Inch) | Unit (mm) |
|--------|-------------|-----------|
| A      | 0.047       | 1.20      |
| B      | 0.047       | 1.20      |
| C      | 0.126       | 3.20      |
| D      | 0.079       | 2.00      |
| E      | 0.173       | 4.40      |

**SMD ZENER DIODES MM1W SERIES**

**MECHANICAL DATA**

| Case                                    | Terminals                                     | Polarity                           | Mounting Position | Marking                                     | Weight per piece             |
|---|---|------------------------------------|-------------------|---|------------------------------|
| JEDEC SOD-123<br>molded plastic<br>body | Solderable per<br>MIL-STD-750,<br>Method 2026 | Polarity symbol<br>marking on body | ANY               | See Marking<br>Code List<br>(Page 5~Page 7) | 0.00056 ounce<br>0.016 grams |

**MAX. RATING & CHARACTERISTICS** - Ratings at 25°C Ambient Temperature Unless Otherwise Specified.

| Parameter   | SYMBOLS          | VALUE      | UNITS |
|---|------------------|------------|-------|
| Forward Voltage @ I <sub>FSM</sub> = 10mA               | V <sub>F</sub>   | 1.2        | V     |
| Peak Pulse Power Dissipation                            | P <sub>D</sub>   | 1.0        | W     |
| Typical Thermal Resistance Junction To Ambient (Note 1) | R <sub>θJA</sub> | 300        | °C/W  |
| Peak Forward Surge Current                              | I <sub>FSM</sub> | 10.0       | mA    |
| Operating Junction Temperature Range                    | T <sub>J</sub>   | -55 ~ +150 | °C    |
| Storage Temperature Range                               | T <sub>stg</sub> | -55 ~ +150 | °C    |

Notes

1. Thermal resistance from junction to ambient at P.C.B. mounted with 2.0" X 2.0" (5 X 5 cm) copper areas pads.

**SMD ZENER DIODES MM1W SERIES**
**ELECTRICAL CHARACTERISTICS UNIDIRECTIONAL TYPE - Ta = 25°C**

| Part Code      | Zener Voltage Range<br>(See Note 1)<br>V <sub>ZT</sub> @ I <sub>ZT</sub><br>(V) |     |      | Test Current<br>I <sub>ZT</sub><br>(mA) | Dynamic Impedance<br>Max. Z <sub>DT</sub><br>@ I <sub>ZT</sub><br>(Ω) | Reverse Current             |                         | Admissible Zener Current<br>I <sub>ZM</sub><br>(mA) | Marking Code |
|----------------|---|-----|------|---|---|-----------------------------|-------------------------|---|--------------|
|                | Min.  | Nom | Max. |   |   | Max. I <sub>R</sub><br>(μA) | @ V <sub>R</sub><br>(V) |   |              |
| MM1W3V3S000FHD | 3.1   | 3.3 | 3.5  | 75                                      | 10  | 100                         | 1                       | 285   | FHD          |
| MM1W3V6S000FHE | 3.4   | 3.6 | 3.8  | 69                                      | 10  | 100                         | 1                       | 263   | FHE          |
| MM1W3V9S000FHF | 3.7   | 3.9 | 4.1  | 64                                      | 9   | 50                          | 1                       | 243   | FHF          |
| MM1W4V3S000FHG | 4.06  | 4.3 | 4.56 | 58                                      | 9   | 25                          | 1                       | 219   | FHG          |
| MM1W4V7S000FHJ | 4.5   | 4.7 | 4.93 | 53                                      | 8   | 10                          | 1                       | 203   | FHJ          |
| MM1W5V1S000FHK | 4.84  | 5.1 | 5.36 | 49                                      | 7   | 10                          | 1                       | 186   | FHK          |
| MM1W5V6S000FHL | 5.32  | 5.6 | 5.92 | 45                                      | 5   | 10                          | 2                       | 170   | FHL          |
| MM1W6V2S000FHN | 5.86  | 6.2 | 6.51 | 41                                      | 2   | 10                          | 3                       | 154   | FHN          |
| MM1W6V8S000FHO | 6.46  | 6.8 | 7.18 | 37                                      | 3.5   | 10                          | 4                       | 140   | FHO          |
| MM1W7V5S000FHQ | 7.12  | 7.5 | 7.88 | 34                                      | 4   | 10                          | 5                       | 127   | FHQ          |
| MM1W8V2S000FHR | 7.79  | 8.2 | 8.67 | 31                                      | 4.5   | 10                          | 6                       | 116   | FHR          |
| MM1W9V1S000FHT | 8.6   | 9.1 | 9.59 | 28                                      | 5   | 10                          | 7                       | 104   | FHT          |
| MM1W10S0000FHU | 9.5   | 10  | 10.5 | 25                                      | 7   | 10                          | 7                       | 95  | FHU          |
| MM1W11S0000FHV | 10.4  | 11  | 11.6 | 23                                      | 8   | 5                           | 8                       | 86  | FHV          |
| MM1W12S0000FHW | 11.4  | 12  | 12.6 | 21                                      | 9   | 5                           | 9                       | 79  | FHW          |
| MM1W13S0000FHX | 12.4  | 13  | 14.1 | 19                                      | 10  | 5                           | 10                      | 71  | FHX          |
| MM1W15S0000FHZ | 13.8  | 15  | 15.8 | 17                                      | 14  | 5                           | 11                      | 63  | FHZ          |
| MM1W16S0000FJA | 15.2  | 16  | 17.1 | 16                                      | 16  | 5                           | 12                      | 58  | FJA          |
| MM1W18S0000FJF | 16.8  | 18  | 19.2 | 14                                      | 20  | 5                           | 13                      | 52  | FJF          |
| MM1W20S0000FJG | 19  | 20  | 21.2 | 13                                      | 22  | 5                           | 15                      | 47  | FJG          |
| MM1W22S0000FJK | 20.8  | 22  | 23.3 | 12                                      | 23  | 5                           | 17                      | 43  | FJK          |

**SMD ZENER DIODES MM1W SERIES**
**ELECTRICAL CHARACTERISTICS UNIDIRECTIONAL TYPE - Ta = 25°C**

| Part Code      | Zener Voltage Range<br>(See Note 1)<br>V <sub>ZT</sub> @ I <sub>ZT</sub><br>(V) |     |      | Test Current<br>I <sub>ZT</sub><br>(mA) | Dynamic Impedance<br>Max. Z <sub>ZT</sub><br>@ I <sub>ZT</sub><br>(Ω) | Reverse Current             |                         | Admissible Zener Current<br>I <sub>ZM</sub><br>(mA) | Marking Code |
|----------------|---|-----|------|---|---|-----------------------------|-------------------------|---|--------------|
|                | Min.  | Nom | Max. |   |   | Max. I <sub>R</sub><br>(μA) | @ V <sub>R</sub><br>(V) |   |              |
| MM1W24S0000FJL | 22.8  | 24  | 26   | 11                                      | 25  | 5                           | 18                      | 38  | FJL          |
| MM1W27S0000FJN | 25.3  | 27  | 28.9 | 9.5                                     | 35  | 5                           | 21                      | 35  | FJN          |
| MM1W30S0000FJQ | 28.2  | 30  | 32   | 8.5                                     | 40  | 5                           | 23                      | 31  | FJQ          |
| MM1W33S0000FJR | 31.3  | 33  | 34.9 | 7.5                                     | 45  | 5                           | 25                      | 28  | FJR          |
| MM1W36S0000FJS | 34.2  | 36  | 37.9 | 7                                       | 50  | 5                           | 27                      | 26  | FJS          |
| MM1W39S0000FJT | 37.2  | 39  | 41.5 | 6.5                                     | 60  | 5                           | 30                      | 24  | FJT          |
| MM1W43S0000FLG | 40.9  | 43  | 45.6 | 6                                       | 70  | 1                           | 32                      | 22  | FLG          |
| MM1W47S0000FLJ | 44.9  | 47  | 49.8 | 5.5                                     | 80  | 1                           | 35                      | 20  | FLJ          |
| MM1W51S0000FLK | 48.6  | 51  | 54   | 5                                       | 95  | 1                           | 38                      | 18  | FLK          |
| MM1W56S0000FLL | 53.6  | 56  | 58.8 | 4.5                                     | 110   | 1                           | 42                      | 17  | FLL          |
| MM1W62S0000FLN | 58.9  | 62  | 65.6 | 4                                       | 125   | 1                           | 47                      | 15  | FLN          |
| MM1W68S0000FLO | 64.6  | 68  | 71.7 | 3.7                                     | 150   | 1                           | 52                      | 14  | FLO          |
| MM1W75S0000FLQ | 71.2  | 75  | 78.8 | 3.3                                     | 175   | 1                           | 56                      | 12  | FLQ          |
| MM1W82S0000FLR | 77.9  | 82  | 87   | 3                                       | 200   | 1                           | 62                      | 11  | FLR          |
| MM1W91S0000FLT | 86  | 91  | 96   | 2.8                                     | 250   | 1                           | 69                      | 10  | FLT          |
| MM1W100S000FLU | 95  | 100 | 105  | 2.5                                     | 350   | 1                           | 76                      | 9.5   | FLU          |
| MM1W110S000FLV | 104   | 110 | 116  | 2.3                                     | 450   | 1                           | 84                      | 8.6   | FLV          |
| MM1W120S000FLW | 114   | 120 | 127  | 2                                       | 550   | 1                           | 91                      | 7.8   | FLW          |
| MM1W135S000FLX | 125   | 135 | 142  | 1.9                                     | 700   | 1                           | 100                     | 7   | FLX          |
| MM1W150S000FLZ | 140   | 150 | 157  | 1.7                                     | 900   | 1                           | 110                     | 6.3   | FLZ          |
| MM1W165S000FAF | 155   | 165 | 172  | 1.6                                     | 1100  | 1                           | 120                     | 5.8   | FPA          |

**SMD ZENER DIODES MM1W SERIES**

**ELECTRICAL CHARACTERISTICS UNIDIRECTIONAL TYPE - Ta = 25°C**

| Part Code             | Zener Voltage Range<br>(See Note 1)<br>V <sub>ZT</sub> @ I <sub>ZT</sub><br>(V) |            |            | Test Current<br>I <sub>ZT</sub><br>(mA) | Dynamic Impedance<br>Max. Z <sub>DT</sub><br>@ I <sub>ZT</sub><br>(Ω) | Reverse Current             |                         | Admissible Zener Current<br>I <sub>ZM</sub><br>(mA) | Marking Code |
|-----------------------|---|------------|------------|---|---|-----------------------------|-------------------------|---|--------------|
|                       | Min.  | Nom        | Max.       |   |   | Max. I <sub>R</sub><br>(μA) | @ V <sub>R</sub><br>(V) |   |              |
| MM1W180S000FPF        | 170   | 180        | 191        | 1.4                                     | 1200  | 1                           | 135                     | 5.2   | FPF          |
| MM1W200S000FPG        | 189   | 200        | 211        | 1.2                                     | 1400  | 1                           | 150                     | 4.7   | FPG          |
| MM1W220S000FPK        | 209   | 220        | 231        | 1                                       | 1600  | 1                           | 165                     | 4.3   | FPK          |
| <b>MM1W240S000FPL</b> | <b>229</b>  | <b>240</b> | <b>251</b> | <b>1</b>                                | <b>1800</b>   | <b>1</b>                    | <b>180</b>              | <b>3.9</b>  | <b>FPL</b>   |
| MM1W260S000FPM        | 249   | 260        | 271        | 1                                       | 2000  | 1                           | 190                     | 3.7   | FPM          |
| MM1W280S000FPN        | 269   | 280        | 291        | 1                                       | 2100  | 1                           | 205                     | 3.4   | FPN          |
| MM1W300S000FPQ        | 289   | 300        | 315        | 1                                       | 2300  | 1                           | 230                     | 3.1   | FPQ          |
| MM1W330S000FPR        | 313   | 330        | 346        | 1                                       | 2500  | 1                           | 250                     | 2.8   | FPR          |

Notes 1: V<sub>ZT</sub> is tested with pulses (20 ms)

**RATINGS AND CHARACTERISTIC CURVES** (For Reference Only) -  $T_a = 25^\circ\text{C}$  Unless Otherwise Specified

Figure 1. Maximum Continuous Power Derating Curve

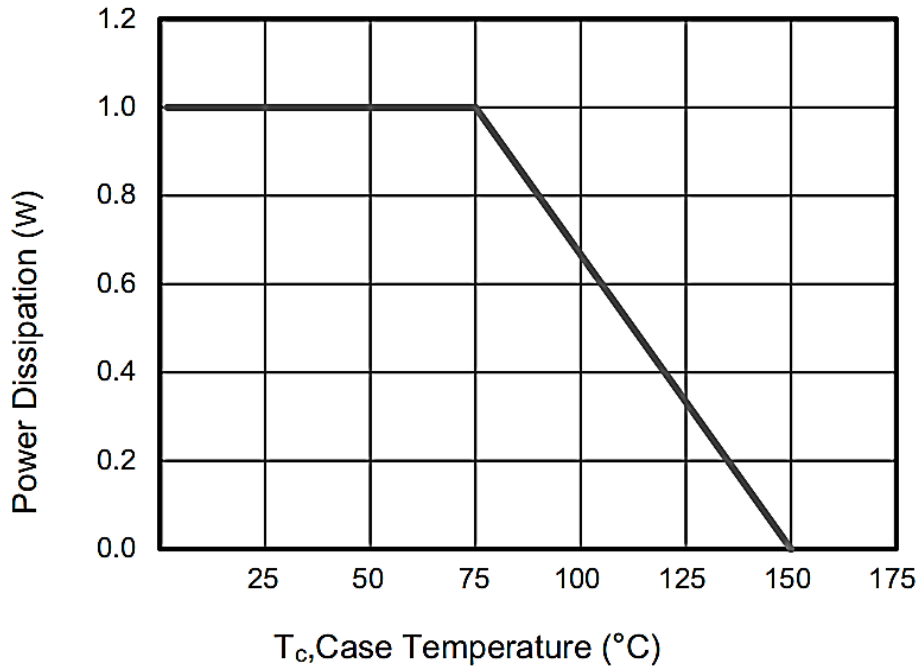
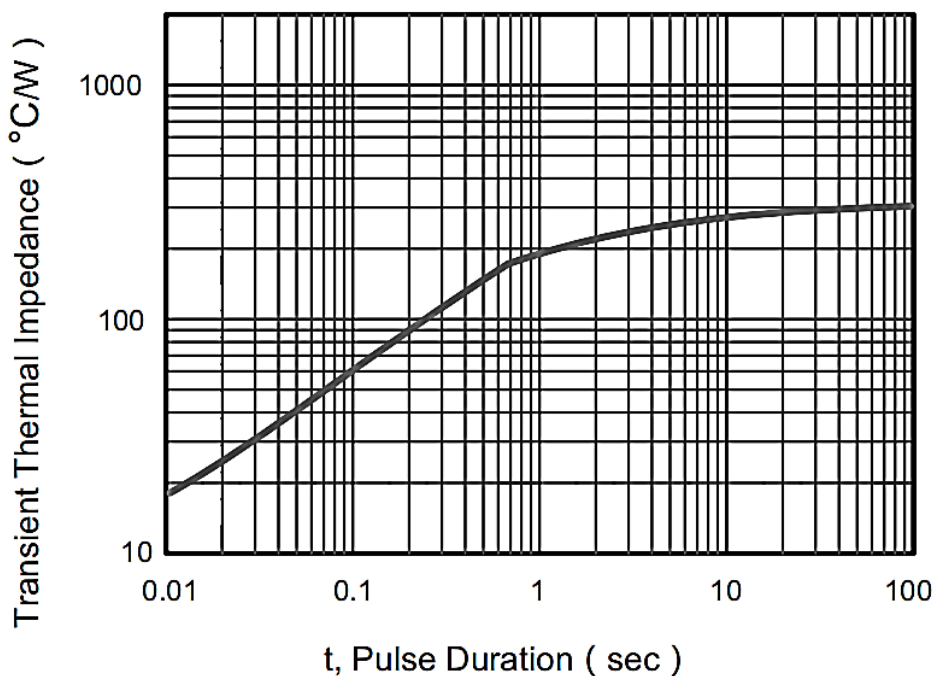


Figure 2. Typical Transient Thermal Impedance Curve





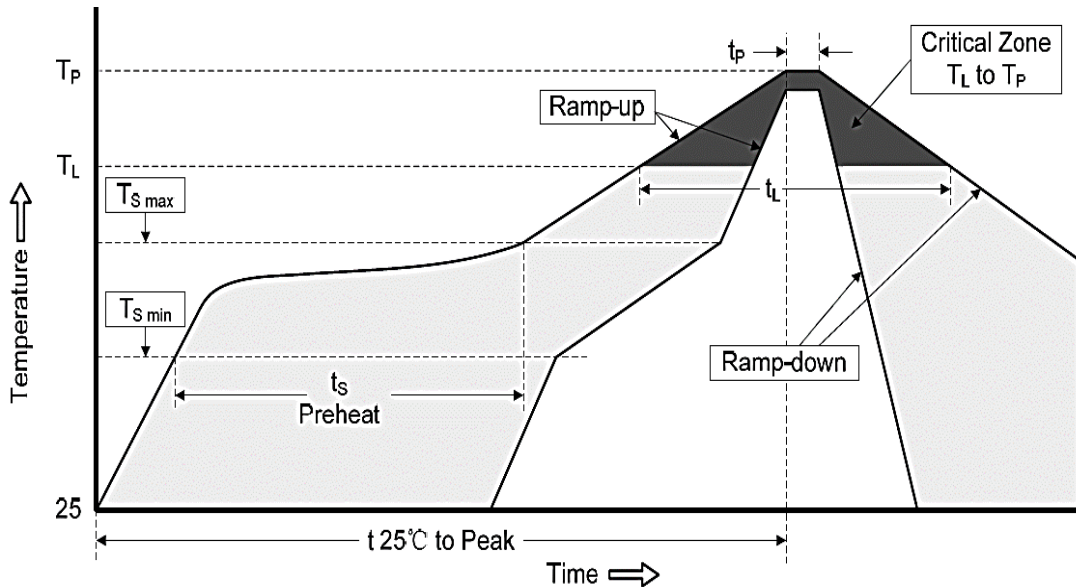
**SMD ZENER DIODES MM1W SERIES**

**RELIABILITY**

| Number | Experiment Items                   | Experiment Method And Conditions   | Reference Documents             |
|--------|------------------------------------|--|---------------------------------|
| 1      | Solder Resistance Test             | Test 260°C± 5°C for 10 ± 2 sec.<br>Immerse body into solder 1/16" ± 1/32"                                      | MIL-STD-750D<br>METHOD-2031.2   |
| 2      | Solderability Test                 | 230°C ±5°C for 5 sec.  | MIL-STD-750D<br>METHOD-2026.1 0 |
| 3      | Pull Test                          | 1 kg in axial lead direction for 10 sec.   | MIL-STD-750D<br>METHOD-2036.4   |
| 4      | Bend Test                          | 0.5Kg Weight Applied To Each Lead,<br>Bending Arcs 90 °C ± 5 °C For 3 Times                                    | MIL-STD-750D<br>METHOD-2036.4   |
| 5      | High Temperature Reverse Bias Test | TA=100°C for 1000 Hours at VR=80%<br>Rated VR  | MIL-STD-750D<br>METHOD-1038.4   |
| 6      | Forward Operation Life Test        | TA=25°C Rated Average Rectified<br>Current   | MIL-STD-750D<br>METHOD-1027.3   |
| 7      | Intermittent Operation Life Test   | On state: 5 min with rated IRMS Power<br>Off state: 5 min with Cool Forced Air.<br>On and off for 1000 cycles. | MIL-STD-750D<br>METHOD-1036.3   |
| 8      | Pressure Cooker Test               | 15 PSIG, TA=121°C, 4 hours   | MIL-S-19500<br>APPENOIXC        |
| 9      | Temperature Cycling Test           | -55°C~+125°C; 30 Minutes For Dwelled<br>Time 5 minutes for transferred time.<br>Total: 10 cycles.              | MIL-STD-750D<br>METHOD-1051.7   |
| 10     | Thermal Shock Test                 | 0°C for 5 minutes., 100°C for 5minutes,<br>Total: 10 cycles  | MIL-STD-750D<br>METHOD-1056.7   |
| 11     | Forward Surge Test                 | 8.3ms Single Sale Sine-wave One Surge.   | MIL-STD-750D<br>METHOD-4066.4   |
| 12     | Humidity Test                      | TA=65°C, RH=98% for 1000 hours.  | MIL-STD-750D<br>METHOD-1021.3   |
| 13     | High Temperature Storage life Test | 150°C for 1000 Hours   | MIL-STD-750D<br>METHOD-1031.5   |

**SMD ZENER DIODES MM1W SERIES**

**SUGGESTED REFLOW PROFILE - For Reference Only**

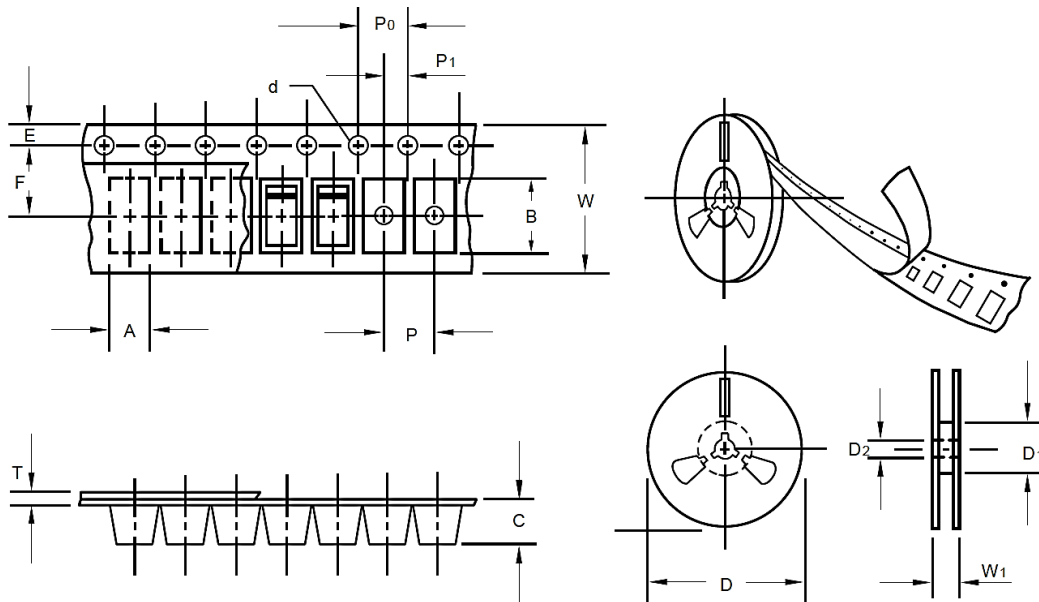


|   |                           |                   |
|---|---------------------------|-------------------|
| Profile Feature                                 |                           | Pb-Free Assembly  |
| Average Ramp-up Rate (Ts Max to Tp)             |                           | 3°C/second Max    |
| Preheat   | Temperature Min (Ts Min.) | 150°C             |
|   | Temperature Max (Ts Max.) | 200°C             |
|   | Time (ts Min. to ts Max.) | 60 ~ 180 seconds  |
| Time maintained above                           | Temperature (Tl)          | 217°C             |
|   | Time (tl)                 | 60 ~ 150 seconds  |
| Peak/Classification Temperature (Tp)            |                           | 260 °C            |
| Time within 5°C of actual Peak Temperature (tp) |                           | 20 ~ 40 seconds   |
| Ramp-down rate                                  |                           | 6 °C /Second Max. |
| Time 25 °C to Peak Temperature                  |                           | 8 minutes Max.    |
| Suggest reflow times                            |                           | 3 Times Max.      |

**SMD ZENER DIODES MM1W SERIES**

**TAPE/REEL (Unit: mm)**

All Devices are packed in accordance with EIA standard RS-481-A and Tape 12mm, Component Spacing 4.0mm



| Item                     | Symbol | Tolerance | Case SOD-123 |
|--------------------------|--------|-----------|--------------|
| Carrier width            | A      | 0.1       | 2.10         |
| Carrier Length           | B      | 0.1       | 4.00         |
| Carrier Depth            | C      | 0.1       | 1.60         |
| Sprocket hole            | d      | 0.05      | 1.55         |
| 13"Reel outside diameter | -      | -         | -            |
| 13"Reel inner diameter   | -      | -         | -            |
| 7"Reel outside diameter  | D      | 2.0       | 178.00       |
| 7"Reel inner diameter    | D1     | Min.      | 50.00        |
| Feed hole diameter       | D2     | 0.5       | 13.00        |
| Sprocket hole position   | E      | 0.1       | 1.75         |
| Punch hole position      | F      | 0.1       | 3.50         |
| Punch hole pitch         | P      | 0.1       | 4.00         |
| Sprocket hole pitch      | P0     | 0.1       | 4.00         |
| Embossment center        | P1     | 0.1       | 2.00         |
| Overall tape thickness   | T      | 0.1       | 0.25         |
| Tape width               | W      | 0.3       | 8.15         |
| Reel width               | W1     | 1.0       | 10.50        |

### **ROHS COMPLIANCE**

- The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained can be obtained at Download Center.

### **REACH COMPLIANCE**

- REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained can be obtained at Download Center.

### **IMPORTANT NOTES AND DISCLAIMER**

1. All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
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