# 1.3 W Surface Mount Glass Passivated Zener Diode

**DO-214AC (SMA)**

| Voltage | Power Dissipation |
|---|---|
| 6.2 to 240 V | 1.3 W |

HYPERECTIFIER®

**FEATURES**

- Low profile package
- Ideal for automated placement
- Low leakage current
- High surge current and zener capability
- Low differential resistance
- Tolerance series ± 5%
- Low forward voltage drop
- Solder dip 260ºC, 10s
- AEC-Q101 qualified
- Component in accordance to RoHS 2011/65/EU and WEEE 2002/96/EC
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260º C

AUTOMOTIVE GRADE Available

Pb

e3

RoHS COMPLIANT

**MECHANICAL DATA**

- **Case:** DO-214AC (SMA). Epoxy meets UL 94V-0 flammability rating.
- **Polarity:** Color band denotes cathode end.
- **Terminals:** Matte tin plated leads, solderable per MIL-STD-750 Method 2026, J-STD-002 and JESD22-B102. Consumer grade, meets JESD 201 class 1A whisker test.
- **HE3 suffix** for high reliability grade, meets JESD 201 class 2 whisker test.

**TYPICAL APPLICATIONS**

Used for basic regulation functions in most electronic applications, Zener diodes offer a cheaper alternative to IC solutions.

## Maximum Ratings and Electrical Characteristics at 25 ºC

| | | |
|---|---|---|
| $P_{tot}$ | Power dissipation at Tamb = 25 °C<br>$R_{th\ j\text{-}a}$ = 100 °C/W | 1.3 W |
| $P_{tot}$ | Power dissipation at Tamb = 25 °C<br>$R_{th\ j\text{-}a}$ = 25 °C/W | 3.25 W |
| $T_j$ | Operating temperature range | - 65 to + 150 °C |
| $T_{stg}$ | Storage temperature range | - 65 to + 150 °C |
| $V_F$ | Max. forward voltage drop at $I_F$ = 0.5 A | 1.0 V |
| $R_{th\ j\text{-}sp}$ | Max. Thermal Resistance junction to solder point | 20 °C/W |
| $R_{th\ j\text{-}a}$ | Max. Thermal Resistance junction to ambient<br>FR4 PCB standard foot print | 200 °C/W |
| | Max. Thermal Resistance junction to ambient<br>FR4 PCB mounting pad for cathode1cm$^2$ | 140 °C/W |

Other voltages upon request

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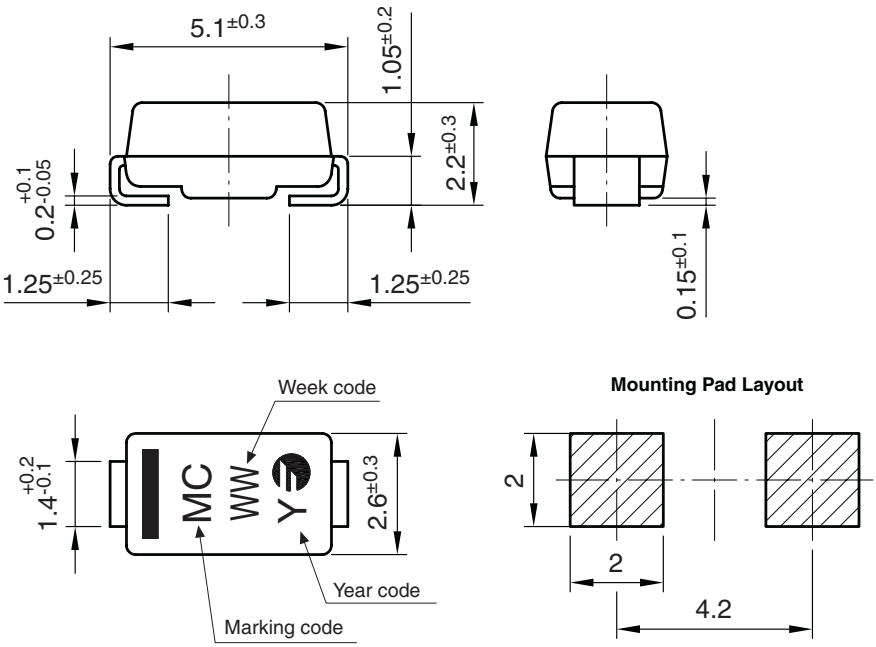
## Ordering information

| PREFERRED P/N | PACKAGE CODE | DELIVERY MODE | BASE QUANTITY | UNIT WEIGHT (g) |
|---|---|---|---|---|
| Z1SMA51 TRTB | TRTB | 13" diameter tape and reel | 7,500 | 0.060 |
| Z1SMA51 TRTS | TRTS | 7" diameter tape and reel | 1,500 | 0.060 |
| Z1SMA51 HE3 TRTB | TRTB | 13" diameter tape and reel | 7,500 | 0.060 |

## Package Outline Dimensions: (mm) DO-214AC (SMA)



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## Ratings and Characteristics (Ta 25 ºC unless otherwise noted)

| Type | Marking Code | Zener (1) Voltage Range $V_Z$ at $I_{ZT}$ | Maximum Zener Impedance $Z_{ZT}$ at $I_{ZT}$ | Typical Temperature Coeficient at $I_{ZT}$ | Test Current $I_{ZT}$ | Max Reverse Leakage Current $I_R$ @ $V_R$ | | Max Regulator Current at 45 °C $I_{ZM}$ |
|---|---|---|---|---|---|---|---|---|
| | | (V) | (Ω) | (% / ºC) | (mA) | (µA) | (V) | (mA) |
| **Z1SMA6V2** | EC | 5.8-6.6 | 2 | +0.025 | 100 | 10 | 3 | 161 |
| **Z1SMA6V8** | EE | 6.4-7.2 | 2.5 | +0.035 | 100 | 10 | 4 | 147 |
| **Z1SMA7V5** | ED | 7.0-7.9 | 3 | +0.035 | 100 | 10 | 5 | 133 |
| **Z1SMA8V2** | EF | 7.7-8.7 | 3.5 | +0.055 | 100 | 10 | 6 | 122 |
| **Z1SMA9V1** | EG | 8.5-9.6 | 4 | +0.055 | 50 | 10 | 7 | 110 |
| **Z1SMA10** | EH | 9.4-10.6 | 4 | +0.070 | 50 | 1 | 7.5 | 105 |
| **Z1SMA11** | EK | 10.4-11.6 | 7 | +0.075 | 50 | 1 | 8.2 | 97 |
| **Z1SMA12** | EL | 11.4-12.7 | 7 | +0.075 | 50 | 1 | 9.1 | 88 |
| **Z1SMA13** | EM | 12.4-14.1 | 10 | +0.075 | 50 | 1 | 10 | 79 |
| **Z1SMA15** | EN | 13.8-15.6 | 10 | +0.075 | 50 | 1 | 11 | 71 |
| **Z1SMA16** | EP | 15.3-17.1 | 15 | +0.085 | 25 | 1 | 12 | 66 |
| **Z1SMA18** | EQ | 16.8-19.1 | 15 | +0.085 | 25 | 1 | 13 | 62 |
| **Z1SMA20** | ER | 18.8-21.2 | 15 | +0.085 | 25 | 1 | 15 | 56 |
| **Z1SMA22** | ES | 20.8-23.3 | 15 | +0.085 | 25 | 1 | 16 | 52 |
| **Z1SMA24** | ET | 22.8-25.6 | 15 | +0.085 | 25 | 1 | 18 | 47 |
| **Z1SMA27** | EU | 25.1-28.9 | 15 | +0.085 | 25 | 1 | 20 | 41 |
| **Z1SMA30** | EV | 28-32 | 15 | +0.085 | 25 | 1 | 22 | 36 |
| **Z1SMA33** | EW | 31-35 | 15 | +0.085 | 25 | 1 | 24 | 33 |
| **Z1SMA36** | EX | 34-38 | 40 | +0.085 | 10 | 1 | 27 | 30 |
| **Z1SMA39** | EY | 37-41 | 40 | +0.085 | 10 | 1 | 30 | 28 |
| **Z1SMA43** | EZ | 40-46 | 45 | +0.095 | 10 | 1 | 33 | 26 |
| **Z1SMA47** | FD | 44-50 | 45 | +0.095 | 10 | 1 | 36 | 23 |
| **Z1SMA51** | FF | 48-54 | 60 | +0.095 | 10 | 1 | 39 | 21 |
| **Z1SMA56** | FG | 52-60 | 60 | +0.095 | 10 | 1 | 43 | 19 |
| **Z1SMA62** | FH | 58-66 | 80 | +0.105 | 10 | 1 | 47 | 16 |
| **Z1SMA68** | FK | 64-72 | 80 | +0.105 | 10 | 1 | 51 | 15 |
| **Z1SMA75** | FL | 70-80 | 100 | +0.105 | 10 | 1 | 56 | 14 |
| **Z1SMA82** | FM | 77-87 | 100 | +0.105 | 10 | 1 | 62 | 12 |
| **Z1SMA91** | FN | 85-96 | 200 | +0.110 | 5 | 1 | 68 | 10 |
| **Z1SMA100** | FP | 94-106 | 200 | +0.110 | 5 | 1 | 75 | 9.4 |
| **Z1SMA110** | FQ | 104-116 | 250 | +0.110 | 5 | 1 | 82 | 8.6 |
| **Z1SMA120** | FR | 114-127 | 250 | +0.110 | 5 | 1 | 91 | 7.8 |
| **Z1SMA130** | FS | 124-141 | 300 | +0.110 | 5 | 1 | 100 | 7.0 |
| **Z1SMA150** | FT | 138-156 | 300 | +0.110 | 5 | 1 | 110 | 6.4 |
| **Z1SMA160** | FU | 158-171 | 350 | +0.110 | 5 | 1 | 120 | 5.8 |
| **Z1SMA180** | FV | 168-191 | 500 | +0.110 | 5 | 1 | 130 | 5.2 |
| **Z1SMA200** | FW | 188-212 | 500 | +0.110 | 5 | 1 | 150 | 4.7 |
| **Z1SMA220** | FE | 208-233 | 2500 | +0.110 | 1 | 1 | 160 | 4.5 |
| **Z1SMA240** | FZ | 228-256 | 2550 | +0.110 | 1 | 1 | 180 | 4.2 |

(1) Tested with pulses.
Pulse test: tp ≤ 50 ms; δ < 2%

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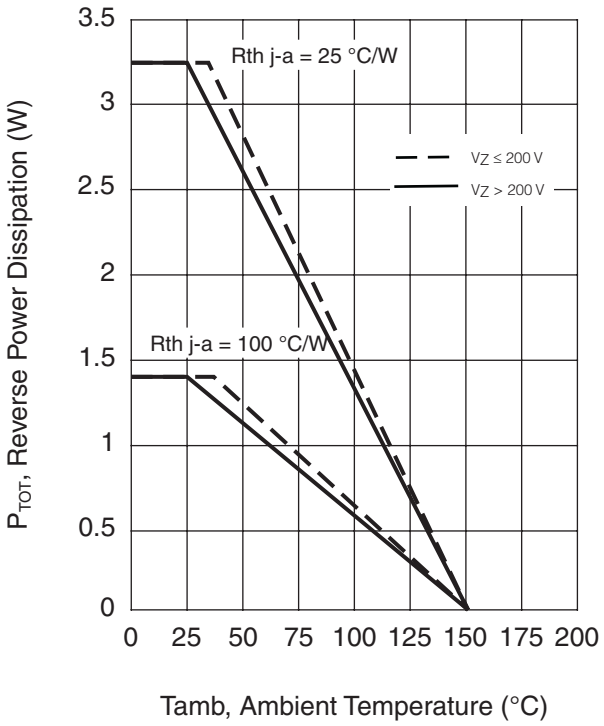
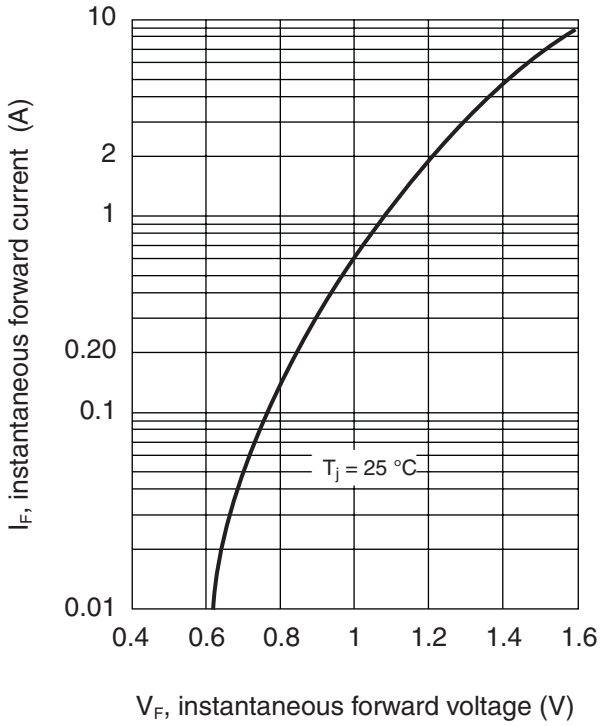
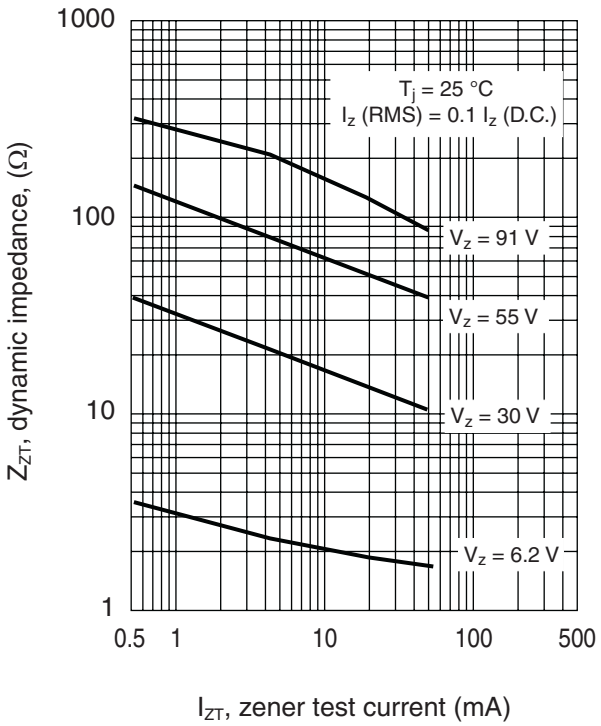
MAXIMUM CONTINUOUS POWER DISSIPATION



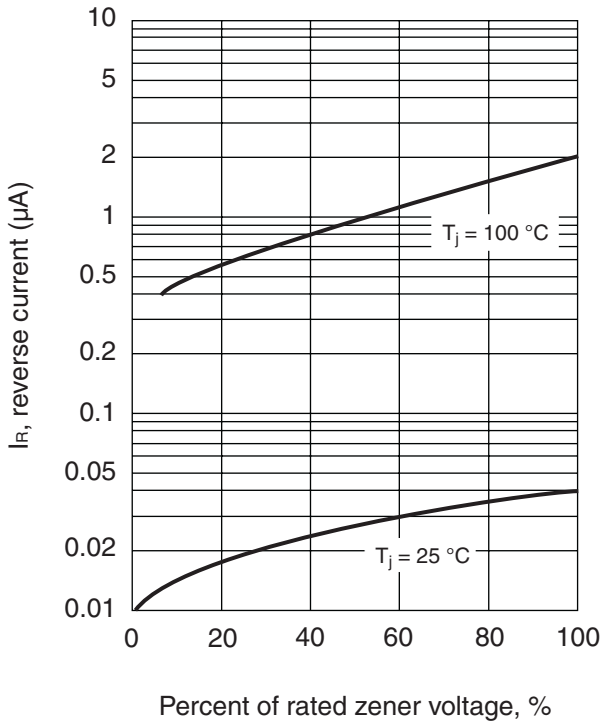

TYPICAL FORWARD CHARACTERISTIC




TYPICAL ZENER IMPEDANCE




TYPICAL REVERSE CHARACTERISTIC



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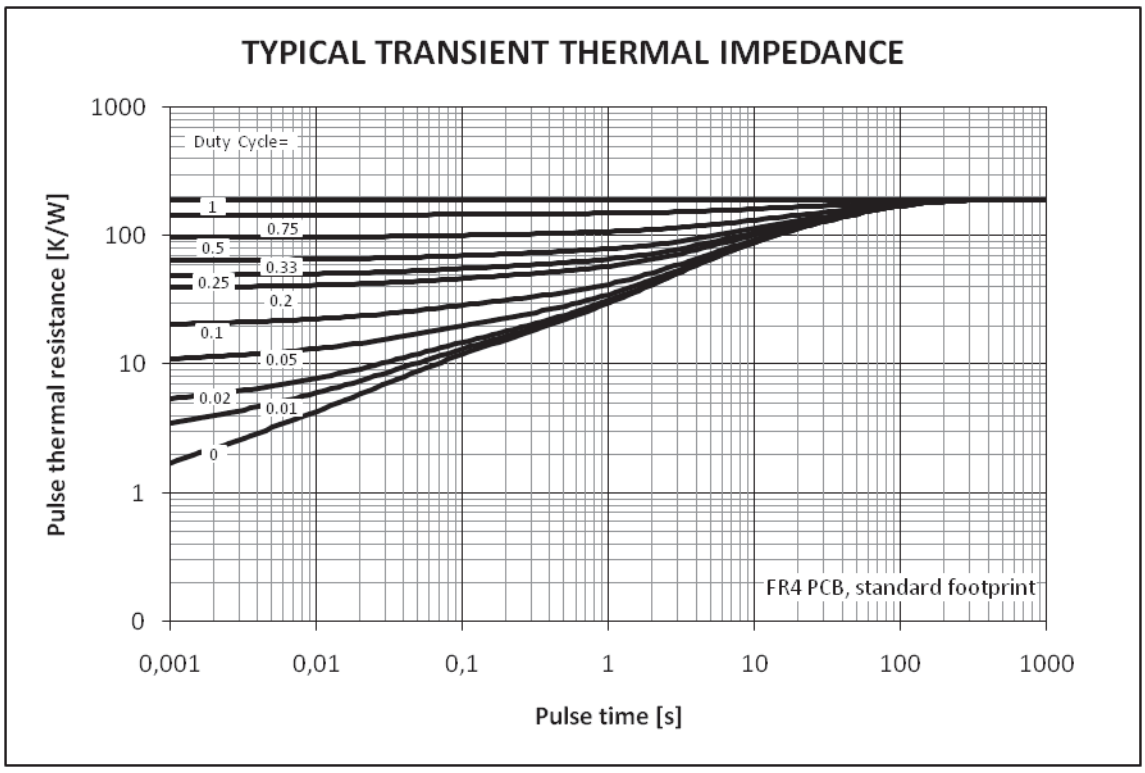


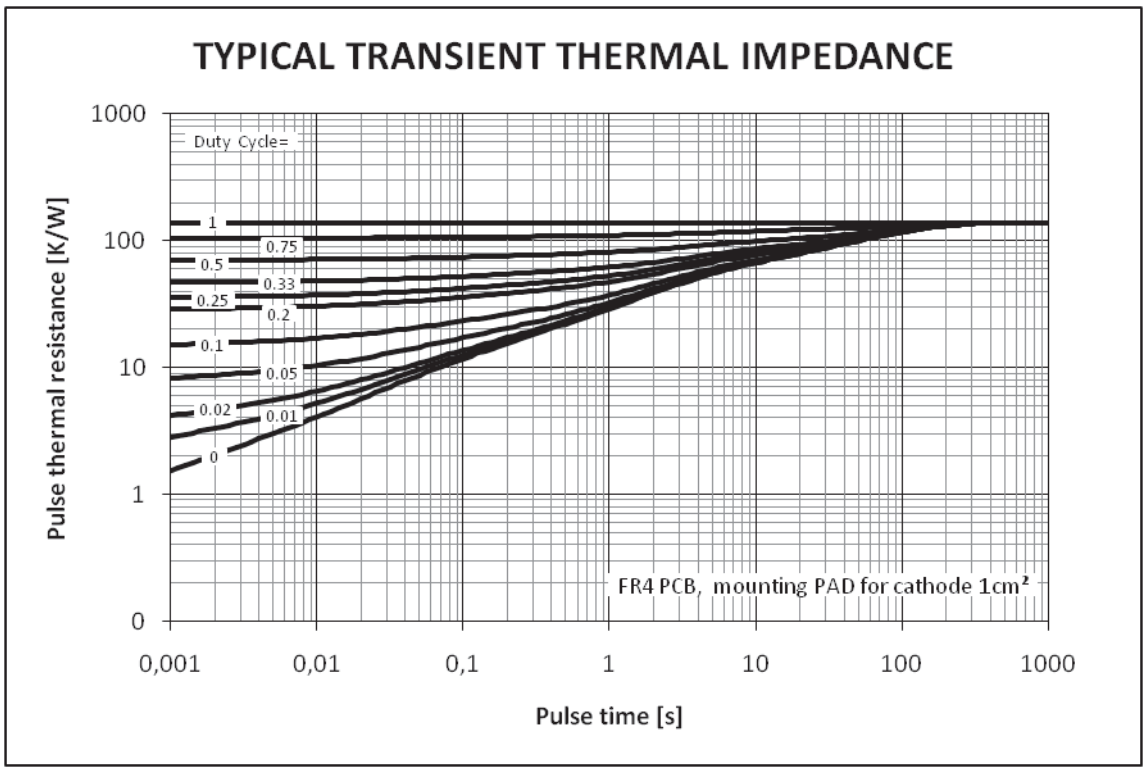

## 1.3 W Surface Mount Glass Passivated Zener Diode

**Revision History**

| Date | Revision | Description of Changes |
|---|---|---|
| 15-Apr-2013 | 0 | Original Data Sheet |
| 30-May-2014 | 1 | Update of Maximum Continous Power Dissipation Curve |
| 22-Apr-2016 | 2 | Transient Thermal Impedance |

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