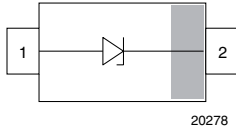
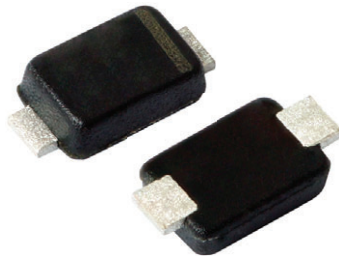


Zener Diodes Permitting 500 mW Power Dissipation



20278


FEATURES

- Silicon planar Zener diodes, ultra small
- Low profile DO-219AC (MicroSMF) package
- Low leakage current
- Excellent stability
- High temperature soldering: 260 °C / 10 s at terminals
- Wave and reflow solderable (reflow as per JPC / JEDEC® J-STD 020) (double wave as per IEC 61760-1)
- AEC-Q101 qualified available
- Base P/N-G3 - RoHS-compliant, green, industrial grade
- Base P/N-HG3 - RoHS-compliant, green, AEC-Q101 qualified
- ESD immunity acc. IEC 61000-4-2 acc. to part table
- Surge performance acc. to part table
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



| PRIMARY CHARACTERISTICS | | |
|-------------------------|---------------|------|
| PARAMETER | VALUE | UNIT |
| V_Z range nom. | 2.0 to 39 | V |
| Test current I_{ZT} | 5 to 20 | mA |
| V_Z specification | Pulse current | |
| Int. construction | Single | |

| ORDERING INFORMATION | | | |
|----------------------|-------------------|------------------------------|------------------------|
| DEVICE NAME | ORDERING CODE | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
| PLZ-Series | Part number-G3/H | 4500 per 7" reel (8 mm tape) | 22 500 / box |
| PLZ-Series | Part number-HG3/H | | |

| PACKAGE | | | | |
|---------------------|--------|--------------------------------------|-----------------------------------|----------------------------|
| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING CONDITIONS |
| DO-219AC (MicroSMF) | 4.8 mg | UL 94 V-0 | MSL level 1 (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 | Mounted on FR4 board 50 mm x 50 mm x 1.6 mm, solder land 10 mm x 10 mm, $T_{amb} = 85\text{ °C}$ | P_{tot} | 500 | mW |
| Power dissipation | Mounted on FR4 board 50 mm x 50 mm x 1.6 mm, solder land 10 mm x 10 mm, $T_{amb} = 25\text{ °C}$ | P_{tot} | 960 | |
| Power dissipation | Mounted on FR4 board with recommended soldering footpads (reflow) | P_{tot} | 340 | |
| Non-repetitive peak surge power dissipation | $t_p = 8/20\ \mu\text{s}$ acc. IEC 61000-4-5 (PLZ5V1A to PLZ39D) | P_{ZSM} | 100 | W |
| | $t_p = 8/20\ \mu\text{s}$ acc. IEC 61000-4-5 (PLZ2V0A to PLZ4V7C) | P_{ZSM} | 70 | W |
| Z-current | | I_Z | P_{tot}/V_Z | mA |
| Junction temperature | | T_j | 150 | °C |
| Storage temperature range | | T_{stg} | -55 to +150 | |

| THERMAL CHARACTERISTICS ($T_{amb} = 25\text{ °C}$, unless otherwise specified) | | | | |
|--|--|------------|-------|------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| Typ. thermal resistance junction to ambient air | Mounted on FR4 board 50 mm x 50 mm x 1.6 mm, solder land 10 mm x 10 mm | R_{thJA} | 130 | K/W |
| Typ. thermal resistance junction to lead | | R_{thJL} | 40 | K/W |

| ELECTRICAL SPECIFICATIONS ($T_{amb} = 25\text{ °C}$, unless otherwise specified) | | | | | | |
|--|----------------------|--------|------|------|------|------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward Voltage | $I_F = 10\text{ mA}$ | V_F | | 0.8 | 0.9 | V |



| ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) | | | | | | | | | | |
|---|--------------|------------------------------------|-------|------------------|----------------------------------|-----|-----------------------------------|-----------------------------------|--|-----------------------------|
| PART NUMBER | MARKING CODE | ZENER VOLTAGE RANGE ⁽¹⁾ | | TEST CURRENT | REVERSE CURRENT | | DYNAMIC RESISTANCE | PEAK PULSE CURRENT ⁽²⁾ | REVERSE CLAMPING VOLTAGE AT I _{PPM} | ESD IMMUNITY ⁽³⁾ |
| | | V _Z at I _{ZT} | | I _{ZT1} | I _R at V _R | | Z _Z at I _{ZT} | I _{PPM} | V _C | V _{ESD} |
| | | V | | mA | μA | V | Ω | A | V | kV |
| | | MIN. | MAX. | | MAX. | | MAX. | | MAX. | MAX. |
| PLZ2V0A | 2A0 | 1.88 | 2.10 | 20 | 120 | 0.5 | 140 | 12.4 | 5.65 | 20 |
| PLZ2V0B | 2B0 | 2.02 | 2.20 | 20 | | | | 12.2 | 5.71 | 20 |
| PLZ2V2A | 2A2 | 2.12 | 2.30 | 20 | 120 | 0.7 | 120 | 12.1 | 5.76 | 20 |
| PLZ2V2B | 2B2 | 2.22 | 2.41 | 20 | | | | 12.1 | 5.77 | 20 |
| PLZ2V4A | 2A4 | 2.33 | 2.52 | 20 | 120 | 1.0 | 100 | 12.1 | 5.78 | ≥ 30 |
| PLZ2V4B | 2B4 | 2.43 | 2.63 | 20 | | | | 12.1 | 5.79 | ≥ 30 |
| PLZ2V7A | 2A7 | 2.54 | 2.75 | 20 | 100 | 1.0 | 100 | 11.8 | 5.91 | ≥ 30 |
| PLZ2V7B | 2B7 | 2.69 | 2.91 | 20 | | | | 11.7 | 5.98 | ≥ 30 |
| PLZ3V0A | 3A0 | 2.85 | 3.07 | 20 | 20 | 1.0 | 80 | 11.6 | 6.02 | ≥ 30 |
| PLZ3V0B | 3B0 | 3.01 | 3.22 | 20 | | | | 11.3 | 6.18 | ≥ 30 |
| PLZ3V3A | 3A3 | 3.16 | 3.38 | 20 | 10 | 1.0 | 70 | 11.2 | 6.22 | ≥ 30 |
| PLZ3V3B | 3B3 | 3.32 | 3.53 | 20 | | | | 11.1 | 6.29 | ≥ 30 |
| PLZ3V6A | 3A6 | 3.455 | 3.695 | 20 | 5 | 1.0 | 60 | 10.9 | 6.40 | ≥ 30 |
| PLZ3V6B | 3B6 | 3.60 | 3.845 | 20 | | | | 10.8 | 6.47 | ≥ 30 |
| PLZ3V9A | 3A9 | 3.74 | 4.10 | 20 | 5 | 1.0 | 50 | 10.7 | 6.54 | ≥ 30 |
| PLZ3V9B | 3B9 | 3.89 | 4.16 | 20 | | | | 10.6 | 6.60 | ≥ 30 |
| PLZ4V3A | 4A3 | 4.04 | 4.29 | 20 | 5 | 1.0 | 40 | 10.5 | 6.66 | ≥ 30 |
| PLZ4V3B | 4B3 | 4.17 | 4.43 | 20 | | | | 10.4 | 6.73 | ≥ 30 |
| PLZ4V3C | 4C3 | 4.30 | 4.57 | 20 | | | | 10.3 | 6.80 | ≥ 30 |
| PLZ4V7A | 4A7 | 4.44 | 4.68 | 20 | 5 | 1.0 | 25 | 10.1 | 6.93 | ≥ 30 |
| PLZ4V7B | 4B7 | 4.55 | 4.80 | 20 | | | | 9.9 | 7.06 | ≥ 30 |
| PLZ4V7C | 4C7 | 4.68 | 4.93 | 20 | | | | 9.4 | 7.40 | ≥ 30 |
| PLZ5V1A | 5A1 | 4.81 | 5.07 | 20 | 5 | 1.5 | 20 | 12.3 | 8.14 | ≥ 30 |
| PLZ5V1B | 5B1 | 4.94 | 5.20 | 20 | | | | 12.1 | 8.23 | ≥ 30 |
| PLZ5V1C | 5C1 | 5.09 | 5.37 | 20 | | | | 11.9 | 8.40 | ≥ 30 |
| PLZ5V6A | 5A6 | 5.28 | 5.55 | 20 | 5 | 2.5 | 13 | 11.6 | 8.61 | ≥ 30 |
| PLZ5V6B | 5B6 | 5.45 | 5.73 | 20 | | | | 11.3 | 8.82 | ≥ 30 |
| PLZ5V6C | 5C6 | 5.61 | 5.91 | 20 | | | | 11.1 | 8.99 | ≥ 30 |
| PLZ6V2A | 6A2 | 5.78 | 6.09 | 20 | 5 | 3.0 | 10 | 10.7 | 9.32 | ≥ 30 |
| PLZ6V2B | 6B2 | 5.96 | 6.27 | 20 | | | | 10.5 | 9.45 | ≥ 30 |
| PLZ6V2C | 6C2 | 6.12 | 6.44 | 20 | | | | 10.3 | 9.66 | ≥ 30 |
| PLZ6V8A | 6A8 | 6.29 | 6.63 | 20 | 2 | 3.5 | 8 | 9.7 | 10.29 | ≥ 30 |
| PLZ6V8B | 6B8 | 6.49 | 6.83 | 20 | | | | 9.5 | 10.50 | ≥ 30 |
| PLZ6V8C | 6C8 | 6.66 | 7.01 | 20 | | | | 9.4 | 10.60 | ≥ 30 |
| PLZ7V5A | 7A5 | 6.85 | 7.22 | 20 | 0.5 | 4.0 | 8 | 9.0 | 11.06 | ≥ 30 |
| PLZ7V5B | 7B5 | 7.07 | 7.45 | 20 | | | | 8.8 | 11.34 | ≥ 30 |
| PLZ7V5C | 7C5 | 7.29 | 7.67 | 20 | | | | 8.6 | 11.54 | ≥ 30 |
| PLZ8V2A | 8A2 | 7.53 | 7.92 | 20 | 0.5 | 5.0 | 8 | 8.4 | 11.80 | ≥ 30 |
| PLZ8V2B | 8B2 | 7.78 | 8.19 | 20 | | | | 8.3 | 12.00 | ≥ 30 |
| PLZ8V2C | 8C2 | 8.03 | 8.45 | 20 | | | | 7.9 | 12.60 | ≥ 30 |
| PLZ9V1A | 9A1 | 8.29 | 8.73 | 20 | 0.5 | 6.0 | 8 | 7.8 | 12.86 | ≥ 30 |
| PLZ9V1B | 9B1 | 8.57 | 9.01 | 20 | | | | 7.6 | 13.17 | ≥ 30 |
| PLZ9V1C | 9C1 | 8.83 | 9.30 | 20 | | | | 7.4 | 13.55 | ≥ 30 |

Notes

- (1) Pulse test: t_p = 40 ms
- (2) Pulse test: t_p = 8/20 μs acc. IEC 61000-4-5
- (3) Contact and air discharge acc. IEC 61000-4-2



| ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) | | | | | | | | | | |
|---|--------------|------------------------------------|-------|------------------|----------------------------------|-----|-----------------------------------|-----------------------------------|--|-----------------------------|
| PART NUMBER | MARKING CODE | ZENER VOLTAGE RANGE ⁽¹⁾ | | TEST CURRENT | REVERSE CURRENT | | DYNAMIC RESISTANCE | PEAK PULSE CURRENT ⁽²⁾ | REVERSE CLAMPING VOLTAGE AT I _{PPM} | ESD IMMUNITY ⁽³⁾ |
| | | V _Z at I _{ZT} | | I _{ZT1} | I _R at V _R | | Z _Z at I _{ZT} | I _{PPM} | V _C | V _{ESD} |
| | | V | | mA | μA | V | Ω | A | V | kV |
| | | MIN. | MAX. | | MAX. | | MAX. | | MAX. | MAX. |
| PLZ10A | 10A | 9.12 | 9.59 | 20 | 0.2 | 7.0 | 8 | 7.09 | 14.1 | ≥ 30 |
| PLZ10B | 10B | 9.41 | 9.90 | 20 | | | | 6.90 | 14.5 | ≥ 30 |
| PLZ10C | 10C | 9.70 | 10.20 | 20 | | | | 6.75 | 14.8 | ≥ 30 |
| PLZ10D | 10D | 9.94 | 10.44 | 20 | | | | 6.58 | 15.2 | ≥ 30 |
| PLZ11A | 11A | 10.18 | 10.71 | 10 | 0.2 | 8.0 | 10 | 6.47 | 15.5 | ≥ 30 |
| PLZ11B | 11B | 10.50 | 11.05 | 10 | | | | 6.25 | 16.0 | ≥ 30 |
| PLZ11C | 11C | 10.82 | 11.38 | 10 | | | | 6.10 | 16.4 | ≥ 30 |
| PLZ12A | 12A | 11.13 | 11.71 | 10 | 0.2 | 9.0 | 12 | 5.95 | 16.8 | ≥ 30 |
| PLZ12B | 12B | 11.44 | 12.03 | 10 | | | | 5.80 | 17.2 | ≥ 30 |
| PLZ12C | 12C | 11.74 | 12.35 | 10 | | | | 5.43 | 18.4 | ≥ 30 |
| PLZ13A | 13A | 12.11 | 12.75 | 10 | 0.2 | 10 | 14 | 5.29 | 18.9 | ≥ 30 |
| PLZ13B | 13B | 12.55 | 13.21 | 10 | | | | 5.15 | 19.4 | ≥ 30 |
| PLZ13C | 13C | 12.99 | 13.66 | 10 | | | | 5.05 | 19.8 | ≥ 30 |
| PLZ15A | 15A | 13.44 | 14.13 | 10 | 0.2 | 11 | 16 | 4.93 | 20.3 | ≥ 30 |
| PLZ15B | 15B | 13.89 | 14.62 | 10 | | | | 4.76 | 21.0 | ≥ 30 |
| PLZ15C | 15C | 14.35 | 15.09 | 10 | | | | 4.50 | 22.0 | ≥ 30 |
| PLZ16A | 16A | 14.80 | 15.57 | 10 | 0.2 | 12 | 18 | 4.25 | 23.5 | ≥ 30 |
| PLZ16B | 16B | 15.25 | 16.04 | 10 | | | | 4.18 | 23.9 | ≥ 30 |
| PLZ16C | 16C | 15.69 | 16.51 | 10 | | | | 3.96 | 25.2 | ≥ 30 |
| PLZ18A | 18A | 16.22 | 17.06 | 10 | 0.2 | 13 | 23 | 3.95 | 25.3 | ≥ 30 |
| PLZ18B | 18B | 16.82 | 17.70 | 10 | | | | 3.77 | 26.5 | ≥ 30 |
| PLZ18C | 18C | 17.42 | 18.33 | 10 | | | | 3.69 | 27.1 | ≥ 30 |
| PLZ20A | 20A | 18.02 | 18.96 | 10 | 0.2 | 15 | 28 | 3.43 | 29.1 | ≥ 30 |
| PLZ20B | 20B | 18.63 | 19.59 | 10 | | | | 3.40 | 29.4 | ≥ 30 |
| PLZ20C | 20C | 19.23 | 20.22 | 10 | | | | 3.33 | 30.0 | ≥ 30 |
| PLZ20D | 20D | 19.72 | 20.72 | 10 | | | | 3.18 | 31.4 | ≥ 30 |
| PLZ22A | 22A | 20.15 | 21.20 | 5 | 0.2 | 17 | 30 | 3.13 | 31.9 | ≥ 30 |
| PLZ22B | 22B | 20.64 | 21.71 | 5 | | | | 3.07 | 32.6 | ≥ 30 |
| PLZ22C | 22C | 21.08 | 22.17 | 5 | | | | 2.82 | 35.4 | 25 |
| PLZ22D | 22D | 21.52 | 22.63 | 5 | | | | 2.80 | 35.6 | 25 |
| PLZ24A | 24A | 22.05 | 23.18 | 5 | 0.2 | 19 | 35 | 2.77 | 36.1 | 25 |
| PLZ24B | 24B | 22.61 | 23.77 | 5 | | | | 2.70 | 37.0 | 25 |
| PLZ24C | 24C | 23.12 | 24.31 | 5 | | | | 2.64 | 37.8 | 25 |
| PLZ24D | 24D | 23.63 | 24.85 | 5 | | | | 2.61 | 38.3 | 25 |
| PLZ27A | 27A | 24.26 | 25.52 | 5 | 0.2 | 21 | 45 | 2.55 | 39.2 | 25 |
| PLZ27B | 27B | 24.97 | 26.26 | 5 | | | | 2.49 | 40.1 | 25 |
| PLZ27C | 27C | 25.63 | 26.95 | 5 | | | | 2.32 | 43.0 | 20 |
| PLZ27D | 27D | 26.29 | 27.64 | 5 | | | | 2.30 | 43.5 | 20 |

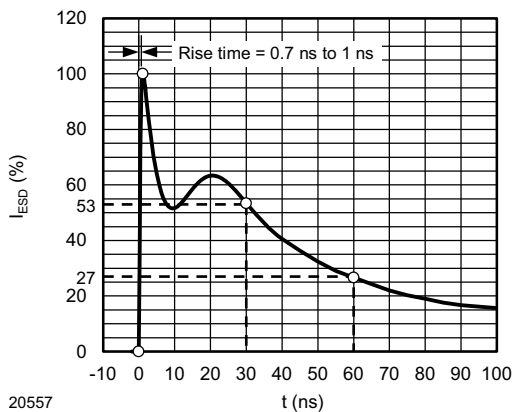
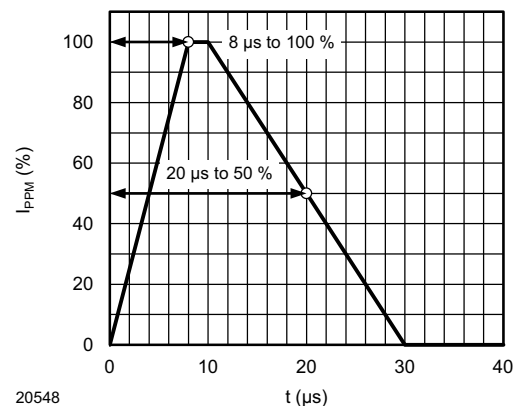
Notes

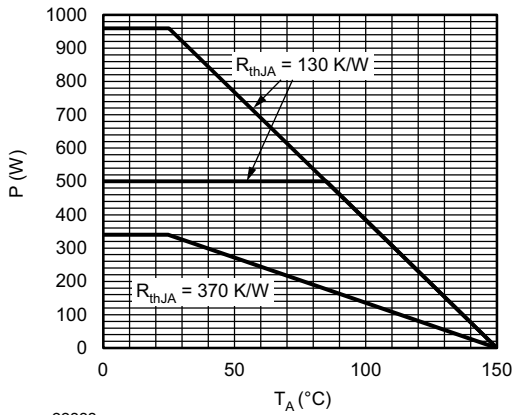
- (1) Pulse test: t_p = 40 ms
- (2) Pulse test: t_p = 8/20 μs acc. IEC 61000-4-5
- (3) Contact and air discharge acc. IEC 61000-4-2

| ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | | | | |
|---|--------------|------------------------------------|-------|--------------|-----------------|----|--------------------|-----------------------------------|---------------------------------------|-----------------------------|
| PART NUMBER | MARKING CODE | ZENER VOLTAGE RANGE ⁽¹⁾ | | TEST CURRENT | REVERSE CURRENT | | DYNAMIC RESISTANCE | PEAK PULSE CURRENT ⁽²⁾ | REVERSE CLAMPING VOLTAGE AT I_{PPM} | ESD IMMUNITY ⁽³⁾ |
| | | V_Z at I_{ZT} | | I_{ZT1} | I_R at V_R | | Z_Z at I_{ZT} | I_{PPM} | V_C | V_{ESD} |
| | | V | | mA | μA | V | Ω | A | V | kV |
| | | MIN. | MAX. | | MAX. | | MAX. | | MAX. | MAX. |
| PLZ30A | 30A | 26.99 | 28.39 | 5 | 0.2 | 23 | 55 | 2.28 | 43.7 | 20 |
| PLZ30B | 30B | 27.70 | 29.13 | 5 | | | | 2.21 | 45.2 | 20 |
| PLZ30C | 30C | 28.36 | 29.82 | 5 | | | | 2.21 | 45.5 | 20 |
| PLZ30D | 30D | 29.02 | 30.51 | 5 | | | | 2.20 | 46.3 | 20 |
| PLZ33A | 33A | 29.68 | 31.22 | 5 | 0.2 | 25 | 65 | 2.10 | 47.6 | 20 |
| PLZ33B | 33B | 30.32 | 31.88 | 5 | | | | 1.94 | 51.6 | 15 |
| PLZ33C | 33C | 30.90 | 32.50 | 5 | | | | 1.91 | 52.2 | 15 |
| PLZ33D | 33D | 31.49 | 33.11 | 5 | | | | 1.91 | 52.2 | 15 |
| PLZ36A | 36A | 32.14 | 33.79 | 5 | 0.2 | 27 | 75 | 1.88 | 53.1 | 15 |
| PLZ36B | 36B | 32.79 | 34.49 | 5 | | | | 1.78 | 55.9 | 15 |
| PLZ36C | 36C | 33.40 | 35.13 | 5 | | | | 1.76 | 56.7 | 15 |
| PLZ36D | 36D | 34.01 | 35.77 | 5 | | | | 1.75 | 56.9 | 15 |
| PLZ39A | 39A | 34.68 | 36.47 | 5 | 0.2 | 30 | 85 | 1.74 | 57.2 | 15 |
| PLZ39B | 39B | 35.36 | 37.19 | 5 | | | | 1.74 | 57.4 | 15 |
| PLZ39C | 39C | 36.00 | 37.85 | 5 | | | | 1.70 | 58.7 | 15 |
| PLZ39D | 39D | 36.63 | 38.20 | 5 | | | | 1.67 | 59.9 | 15 |

Notes

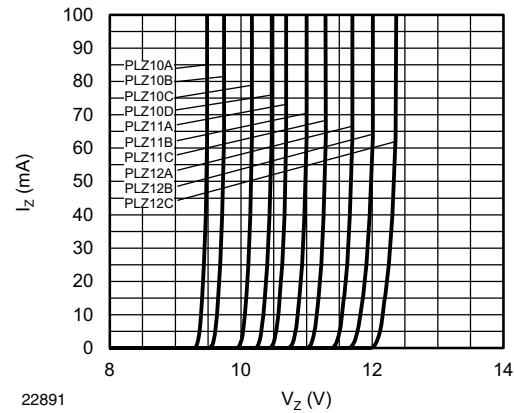
- (1) Pulse test: $t_p = 40\text{ ms}$
- (2) Pulse test: $t_p = 8/20\text{ }\mu\text{s acc. IEC 61000-4-5}$
- (3) Contact and air discharge acc. IEC 61000-4-2

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

 Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330 Ω / 150 pF)

 Fig. 2 - 8/20 μs Peak Pulse Current Wave Form acc. IEC 61000-4-5



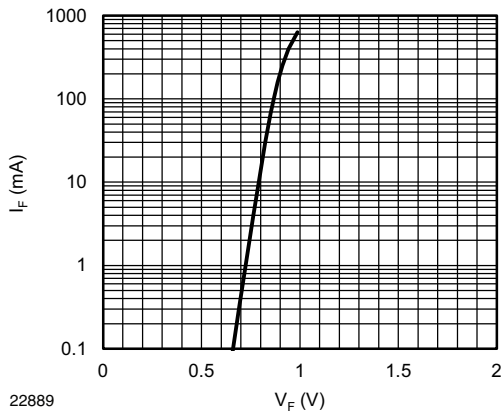
22888

Fig. 3 - Maximum Power Dissipation vs. Ambient Temperature



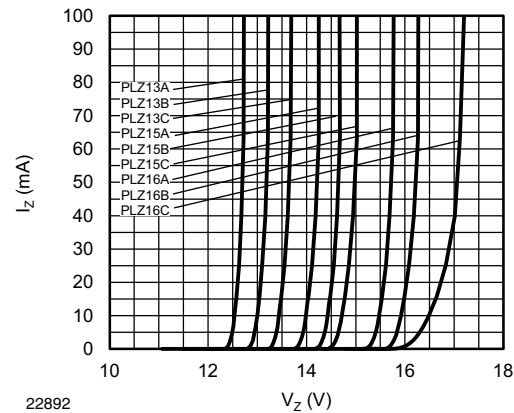
22891

Fig. 6 - Breakdown Characteristics



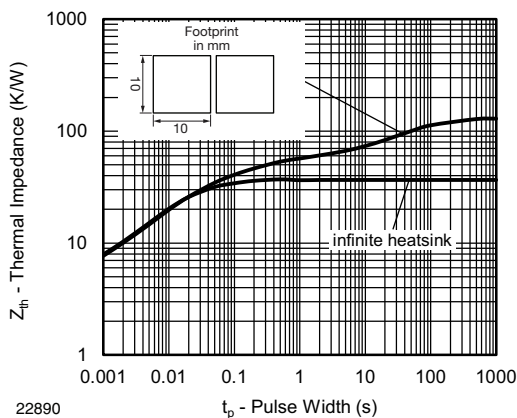
22889

Fig. 4 - Typical Forward Current vs. Forward Voltage



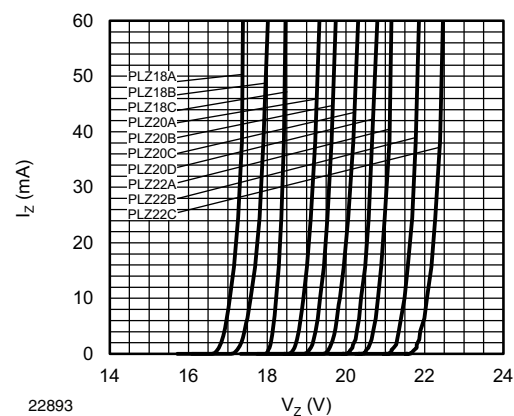
22892

Fig. 7 - Breakdown Characteristics



22890

Fig. 5 - Thermal Impedance vs. Time



22893

Fig. 8 - Breakdown Characteristics

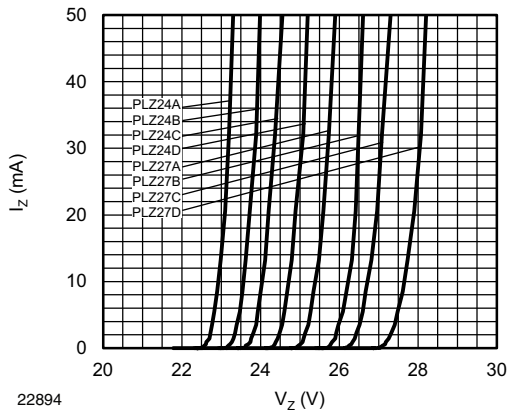


Fig. 9 - Breakdown Characteristics

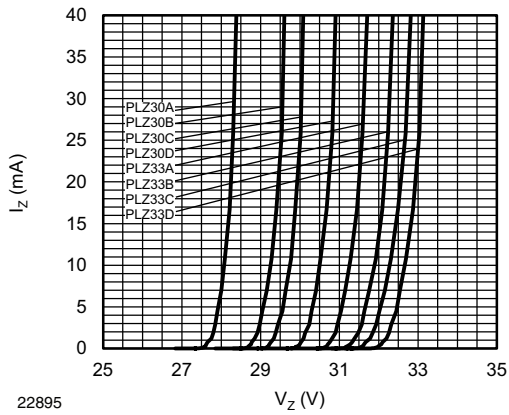


Fig. 10 - Breakdown Characteristics

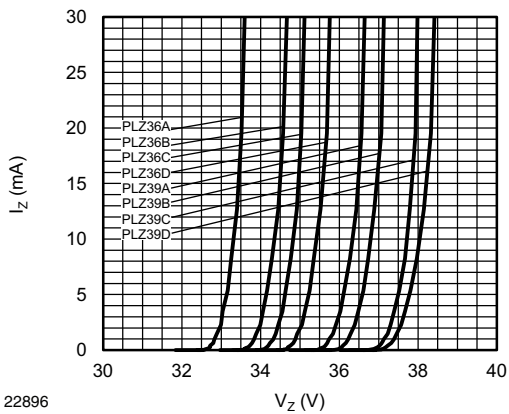
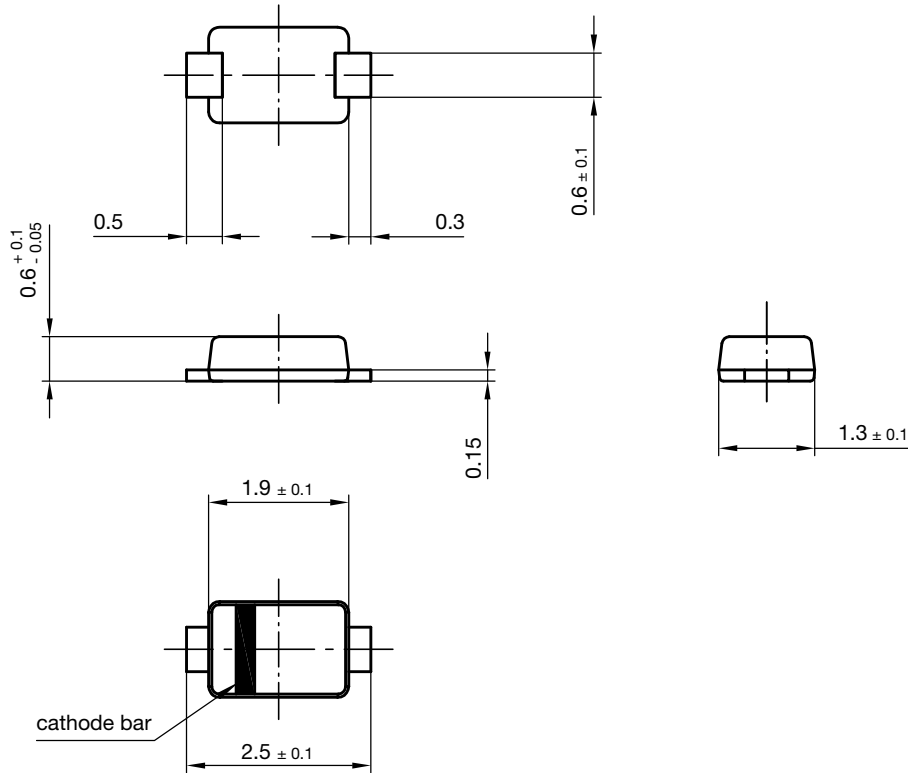


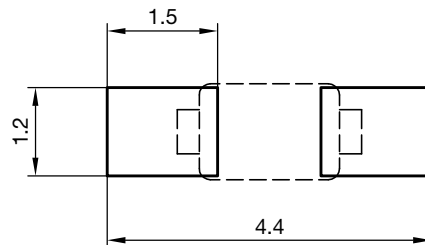
Fig. 11 - Breakdown Characteristics



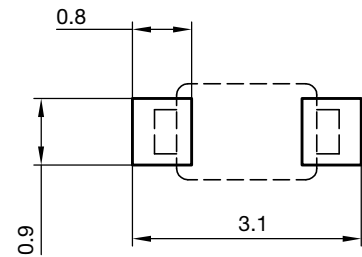
PACKAGE DIMENSIONS in millimeters: DO-219AC (MicroSMF)



foot print recommendation
for wave soldering:



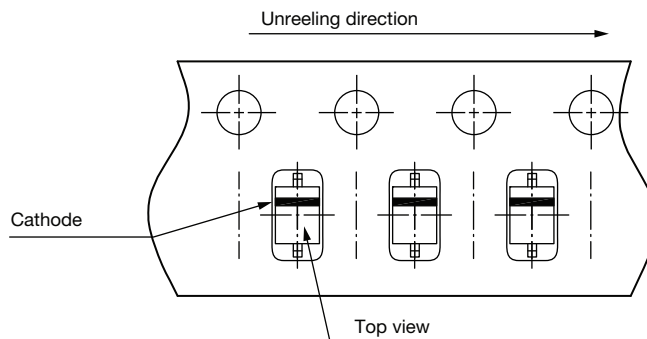
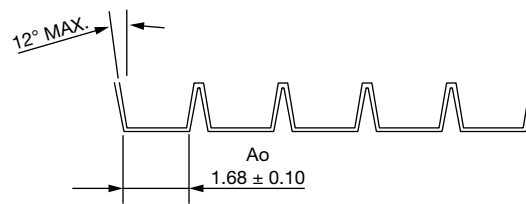
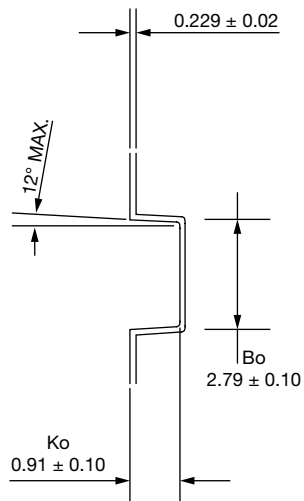
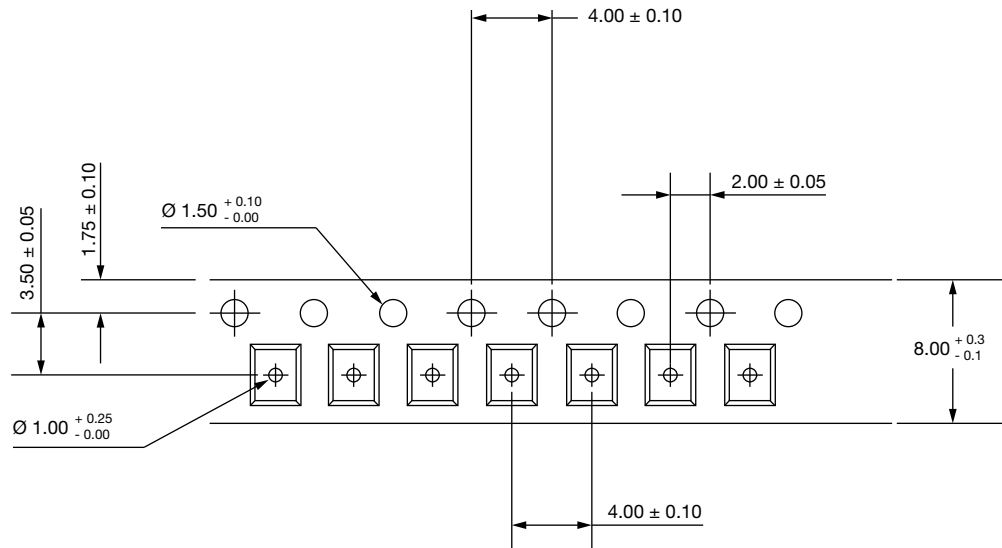
foot print recommendation
for reflow soldering:



22741

Document no.: S8-V-3910.03-001 (4)
Created - Date: 02.Dec.2010
Rev. 5 - Date: 06.May. 2014

BLISTER TAPE DIMENSIONS in millimeters: DO-219AC (MicroSMF)





Disclaimer

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