

1W, 10V - 220V Voltage Regulator Diode

FEATURES

- Silicon zener diodes
- Low profile surface-mount package
- Zener and surge current specification
- Low leakage current
- Excellent stability
- Moisture sensitivity level: level 1, per J-STD-020
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- On-board DC/DC converter

MECHANICAL DATA

- Case: Sub SMA
- Molding compound meets UL 94 V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As indicated by Cathode band
- Weight: 19mg (approximately)

| KEY PARAMETERS | | |
|----------------|------------|------|
| PARAMETER | VALUE | UNIT |
| V_Z | 10 - 220 | V |
| P_{tot} | 1.0 | W |
| T_{JMAX} | 175 | °C |
| Package | Sub SMA | |
| Configuration | Single die | |



Sub SMA

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | |
|--|----------------|-------------|-------|
| PARAMETER | SYMBOL | VALUE | UNIT |
| Forward voltage @ $I_F=0.2\text{A}$ | V_F | 1.2 | Volts |
| Power dissipation at $T_L=73^\circ\text{C}$ $T_A=25^\circ\text{C}$ (Note 1) | P_{tot} | 2.3 | Watts |
| | | 1.0 | |
| Non-repetitive peak pulse power dissipation 100 μs square pulse (Note 2) | P_{ZSM} | 300 | Watts |
| Non-repetitive peak pulse power dissipation 10/1000 μs waveform (BZD27C10P to BZD27C100P) | P_{RSM} | 150 | Watts |
| Non-repetitive peak pulse power dissipation 10/1000 μs waveform (BZD27C110P to BZD27C220P) | P_{RSM} | 100 | Watts |
| Operating and storage temperature range | T_J, T_{STG} | -55 to +175 | °C |

Notes:

1. Mounted on Cu-Pad size 5mm x 5mm
2. $T_J=25^\circ\text{C}$ prior to surge

| THERMAL PERFORMANCE | | | |
|--|-----------------|-------------|-------------|
| PARAMETER | SYMBOL | TYP. | UNIT |
| Junction-to-lead thermal resistance | $R_{\theta JL}$ | 44 | °C/W |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 88 | °C/W |
| Junction-to-case thermal resistance | $R_{\theta JC}$ | 48 | °C/W |

Thermal Performance Note: Units mounted on PCB (5mm x 5mm Cu pad test board)

| ORDERING INFORMATION | | |
|-------------------------------------|----------------|---------------------------------------|
| ORDERING CODE (Note 1, 2) | PACKAGE | PACKING |
| BZD27CxxPHRUG | Sub SMA | 1,800 / 7" Plastic reel (8mm tape) |
| BZD27CxxPHRVG | Sub SMA | 3,000 / 7" Plastic reel (8mm tape) |
| BZD27CxxPHRTG | Sub SMA | 7,500 / 13" Paper reel (8mm tape) |
| BZD27CxxPHMTG | Sub SMA | 7,500 / 13" Plastic reel (8mm tape) |
| BZD27CxxPHRQG | Sub SMA | 10,000 / 13" Paper reel (8mm tape) |
| BZD27CxxPHMQG | Sub SMA | 10,000 / 13" Plastic reel (8mm tape) |
| BZD27CxxPHR3G | Sub SMA | 1,800 / 7" Plastic reel (12mm tape) |
| BZD27CxxPHRFG | Sub SMA | 3,000 / 7" Plastic reel (12mm tape) |
| BZD27CxxPHR2G | Sub SMA | 7,500 / 13" Paper reel (12mm tape) |
| BZD27CxxPHM2G | Sub SMA | 7,500 / 13" Plastic reel (12mm tape) |
| BZD27CxxPHRHG | Sub SMA | 10,000 / 13" Paper reel (12mm tape) |
| BZD27CxxPHMHG | Sub SMA | 10,000 / 13" Plastic reel (12mm tape) |
| BZD27CxxP RUG | Sub SMA | 1,800 / 7" Plastic reel (8mm tape) |
| BZD27CxxP RVG | Sub SMA | 3,000 / 7" Plastic reel (8mm tape) |
| BZD27CxxP RTG | Sub SMA | 7,500 / 13" Paper reel (8mm tape) |
| BZD27CxxP MTG | Sub SMA | 7,500 / 13" Plastic reel (8mm tape) |
| BZD27CxxP RQG | Sub SMA | 10,000 / 13" Paper reel (8mm tape) |
| BZD27CxxP MQG | Sub SMA | 10,000 / 13" Plastic reel (8mm tape) |
| BZD27CxxP R3G | Sub SMA | 1,800 / 7" Plastic reel (12mm tape) |
| BZD27CxxP RFG | Sub SMA | 3,000 / 7" Plastic reel (12mm tape) |
| BZD27CxxP R2G | Sub SMA | 7,500 / 13" Paper reel (12mm tape) |
| BZD27CxxP M2G | Sub SMA | 7,500 / 13" Plastic reel (12mm tape) |
| BZD27CxxP RHG | Sub SMA | 10,000 / 13" Paper reel (12mm tape) |
| BZD27CxxP MHG | Sub SMA | 10,000 / 13" Plastic reel (12mm tape) |

Note :

- "xx" defines voltage from 10V (BZD27C10P) to 220V (BZD27C220P)
- "H" means AEC-Q101 qualified.

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Part number | Marking code | Working Voltage (Note 1) | | | Differential Resistance | | Temperature Coefficient | | Test current | Reverse Current@ Reverse Voltage | |
|-------------|--------------|-----------------------------|-------|------|-------------------------|------|-------------------------|------|--------------|----------------------------------|-------|
| | | $V_Z @ I_{ZT}$ | | | $r_{diff} @ I_Z$ | | $ALPH_Z @ I_Z$ | | I_{ZT} | I_R | V_R |
| | | V | | | Ω | | %/°C | | mA | μA | V |
| | | Min. | Nom. | Max. | Typ. | Max. | Max. | Max. | | Max. | |
| BZD27C10P | E1 | 9.4 | 10 | 10.6 | 2 | 4 | 0.05 | 0.09 | 50 | 7 | 7.5 |
| BZD27C11P | E2 | 10.4 | 11 | 11.6 | 4 | 7 | 0.05 | 0.10 | 50 | 4 | 8.2 |
| BZD27C12P | E3 | 11.4 | 12.05 | 12.7 | 4 | 7 | 0.05 | 0.10 | 50 | 3 | 9.1 |
| BZD27C13P | E4 | 12.4 | 13.25 | 14.1 | 5 | 10 | 0.05 | 0.10 | 50 | 2 | 10 |
| BZD27C15P | E5 | 13.8 | 14.7 | 15.6 | 5 | 10 | 0.05 | 0.10 | 25 | 1 | 11 |
| BZD27C16P | E6 | 15.3 | 16.2 | 17.1 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 12 |
| BZD27C18P | E7 | 16.8 | 17.95 | 19.1 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 13 |
| BZD27C20P | E8 | 18.8 | 20 | 21.2 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 15 |
| BZD27C22P | E9 | 20.8 | 22.05 | 23.3 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 16 |
| BZD27C24P | F0 | 22.8 | 24.2 | 25.6 | 7 | 15 | 0.06 | 0.11 | 25 | 1 | 18 |
| BZD27C27P | F1 | 25.1 | 27 | 28.9 | 7 | 15 | 0.06 | 0.11 | 25 | 1 | 20 |
| BZD27C30P | F2 | 28 | 30 | 32 | 8 | 15 | 0.06 | 0.11 | 25 | 1 | 22 |
| BZD27C33P | F3 | 31 | 33 | 35 | 8 | 15 | 0.06 | 0.11 | 25 | 1 | 24 |
| BZD27C36P | F4 | 34 | 36 | 38 | 21 | 40 | 0.06 | 0.11 | 10 | 1 | 27 |
| BZD27C39P | F5 | 37 | 39 | 41 | 21 | 40 | 0.06 | 0.11 | 10 | 1 | 30 |
| BZD27C43P | F6 | 40 | 43 | 46 | 24 | 45 | 0.07 | 0.12 | 10 | 1 | 33 |
| BZD27C47P | F7 | 44 | 47 | 50 | 24 | 45 | 0.07 | 0.12 | 10 | 1 | 36 |
| BZD27C51P | F8 | 48 | 51 | 54 | 25 | 60 | 0.07 | 0.12 | 10 | 1 | 39 |
| BZD27C56P | F9 | 52 | 56 | 60 | 25 | 60 | 0.07 | 0.12 | 10 | 1 | 43 |
| BZD27C62P | G0 | 58 | 62 | 66 | 25 | 80 | 0.08 | 0.13 | 10 | 1 | 47 |
| BZD27C68P | G1 | 64 | 68 | 72 | 25 | 80 | 0.08 | 0.13 | 10 | 1 | 51 |
| BZD27C75P | G2 | 70 | 74.5 | 79 | 30 | 100 | 0.08 | 0.13 | 10 | 1 | 56 |
| BZD27C82P | G3 | 77 | 82 | 87 | 60 | 200 | 0.08 | 0.13 | 10 | 1 | 62 |
| BZD27C91P | G4 | 85 | 90.5 | 96 | 60 | 200 | 0.08 | 0.13 | 5 | 1 | 68 |
| BZD27C100P | G5 | 94 | 100 | 106 | 60 | 200 | 0.09 | 0.13 | 5 | 1 | 75 |
| BZD27C110P | G6 | 104 | 110 | 116 | 80 | 250 | 0.09 | 0.13 | 5 | 1 | 82 |
| BZD27C120P | G7 | 114 | 120.5 | 127 | 150 | 300 | 0.09 | 0.13 | 5 | 1 | 91 |
| BZD27C130P | G | 124 | 132.5 | 141 | 150 | 300 | 0.09 | 0.13 | 5 | 1 | 100 |
| BZD27C150P | G9 | 138 | 147 | 156 | 150 | 300 | 0.09 | 0.13 | 5 | 1 | 110 |
| BZD27C160P | H0 | 153 | 162 | 171 | 150 | 350 | 0.09 | 0.13 | 5 | 1 | 120 |
| BZD27C180P | H1 | 168 | 179.5 | 191 | 280 | 450 | 0.09 | 0.13 | 5 | 1 | 130 |
| BZD27C200P | H2 | 188 | 200 | 212 | 350 | 750 | 0.09 | 0.13 | 5 | 1 | 150 |
| BZD27C220P | H3 | 208 | 220.5 | 233 | 430 | 900 | 0.09 | 0.13 | 5 | 1 | 160 |

CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.1 TYPICAL FORWARD CHARACTERISTICS

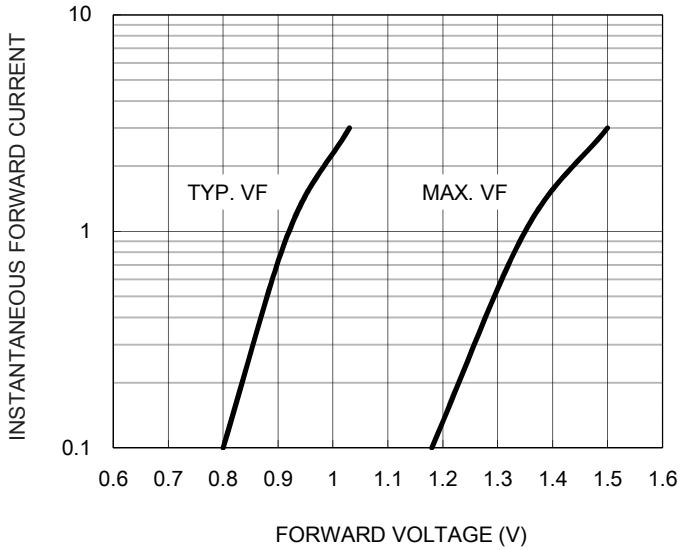


Fig.2 TYP. DIODE CAPACITANCE vs REVERSE VOLTAGE

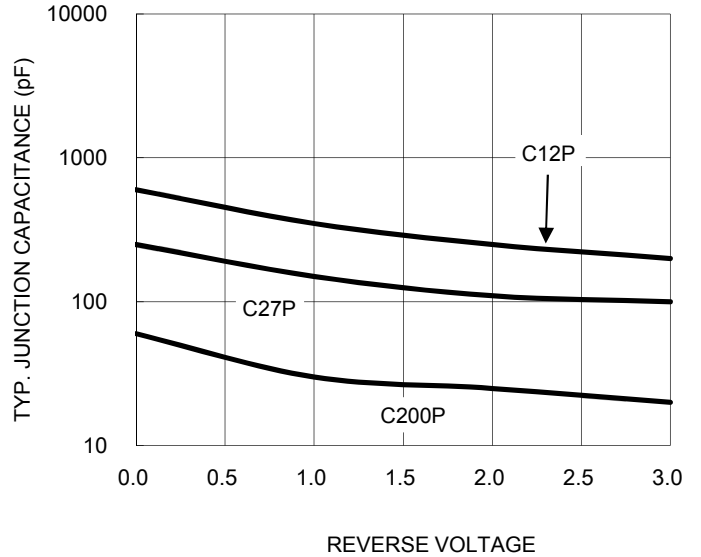
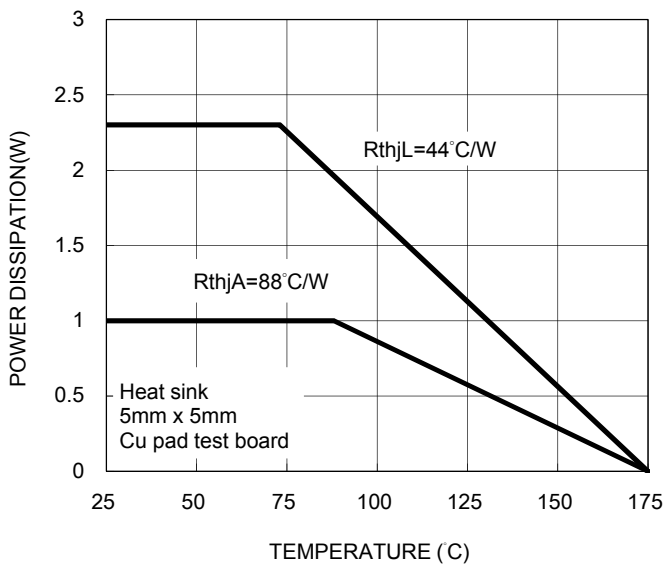
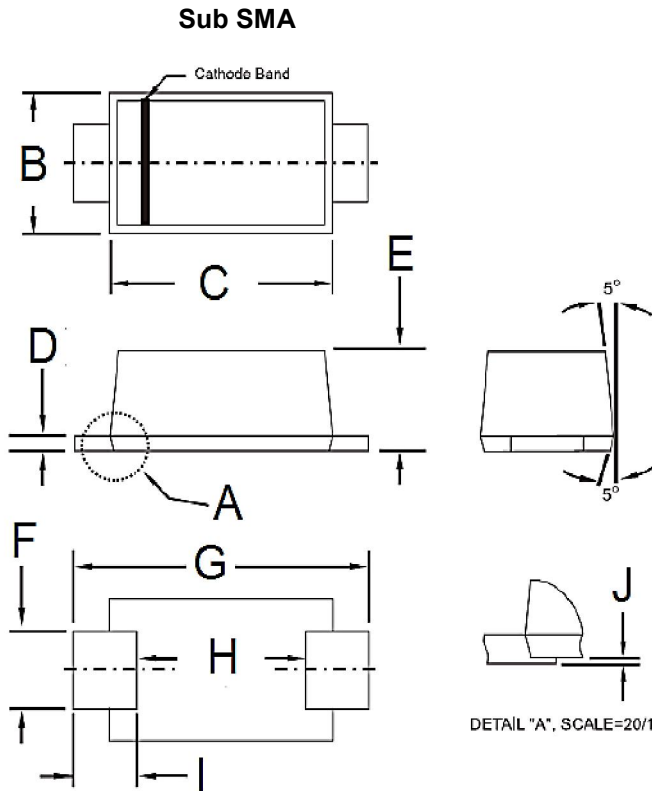


Fig.3 POWER DISSIPATION v.s TEMPERATURE

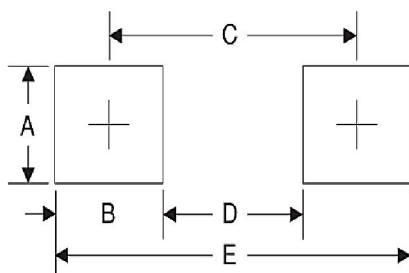


PACKAGE OUTLINE DIMENSIONS



| DIM. | Unit (mm) | | Unit (inch) | |
|------|-----------|------|-------------|-------|
| | Min | Max | Min | Max |
| B | 1.70 | 1.90 | 0.067 | 0.075 |
| C | 2.70 | 2.90 | 0.106 | 0.114 |
| D | 0.16 | 0.30 | 0.006 | 0.012 |
| E | 1.23 | 1.43 | 0.048 | 0.056 |
| F | 0.80 | 1.20 | 0.031 | 0.047 |
| G | 3.40 | 3.80 | 0.134 | 0.150 |
| H | 2.45 | 2.60 | 0.096 | 0.102 |
| I | 0.35 | 0.85 | 0.014 | 0.033 |
| J | 0.00 | 0.10 | 0.000 | 0.004 |

SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A | 1.4 | 0.055 |
| B | 1.2 | 0.047 |
| C | 3.1 | 0.122 |
| D | 1.9 | 0.075 |
| E | 4.3 | 0.169 |

MARKING DIAGRAM



- P/N = Marking Code
- G = Green compound Code
- YW = Date Code
- F = Factory Code

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