

Surface Mount Zener Diodes
VZ : 3.3 to 330V P_D=1W

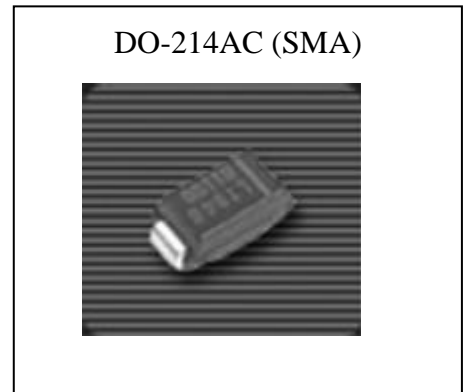
SMA4728A thru SZ1330A

Features

- Glass passivated chip
- Low leakage
- Built in strain relief
- Low inductance
- High peak reverse power dissipation
- Lead (Pb) free components
- For use in stabilizing and clipping with high power rating

Mechanical Data

- Case : JEDEC DO-214AC(SMA) molded plastic body
- Epoxy: UL 94V-0 rate flame retardant
- Lead: Solderable per MIL-STD-750, method 2026
- Polarity : Color band denotes cathode end
- Mounting position : Any

Outline

Maximum Ratings (T_A=25°C, unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|----------------------------------|------------|------|
| DC power dissipation at T _L =50°C (Note 1) | P _D | 1 | W |
| Maximum forward voltage at I _F =200mA | V _F | 1.2 | V |
| Maximum thermal resistance, junction-to-ambient (Note 2) | R _{θJA} | 170 | °C/W |
| Operating junction and storage temperature range | T _J ;T _{STG} | -55 ~ +175 | °C |

 Notes: 1. T_L=lead temperature at 3/8" (9.5mm) from body

2. Valid provided that leads are kept at ambient temperature at a distance of 10mm from case

Ordering Information

| Device | Package | Shipping |
|-----------------|---|------------------------|
| SMAXXXXA-0-T4-G | SMA | 7500 pcs / Tape & Reel |
| SZXXXXA-0-T4-G | (Pb-free lead plating and halogen-free package) | |





Electrical Characteristics Ratings at 25°C ambient temperature, unless otherwise noted.

| Part Number | Device marking code | Nominal zener voltage | | Maximum zener impedance | | | Maximum reverse leakage Current | | Maximum DC zener current | Maximum surge current |
|-------------|---------------------|---------------------------------|-----------------|----------------------------------|----------------------------------|-----------------|---------------------------------|-------|--------------------------|-----------------------|
| | | V _Z @I _{ZT} | I _{ZT} | Z _{ZT} @I _{ZT} | Z _{ZK} @I _{ZK} | I _{ZK} | I _R @V _R | | I _{ZM} | I _{RM} |
| | | (V) | (mA) | (Ω) | (Ω) | (mA) | (μA) | (V) | (mA) | (mA) |
| SMA4728A | 28A | 3.3 | 76.0 | 10.0 | 400 | 1.00 | 100.0 | 1.0 | 274.0 | 1370 |
| SMA4729A | 29A | 3.6 | 69.0 | 10.0 | 400 | 1.00 | 100.0 | 1.0 | 251.0 | 1255 |
| SMA4730A | 30A | 3.9 | 64.0 | 9.0 | 400 | 1.00 | 50.0 | 1.0 | 232.0 | 1160 |
| SMA4731A | 31A | 4.3 | 58.0 | 9.0 | 400 | 1.00 | 10.0 | 1.0 | 210.0 | 1050 |
| SMA4732A | 32A | 4.7 | 53.0 | 8.0 | 500 | 1.00 | 10.0 | 1.0 | 192.0 | 960 |
| SMA4733A | 33A | 5.1 | 49.0 | 7.0 | 550 | 1.00 | 10.0 | 1.0 | 177.0 | 885 |
| SMA4734A | 34A | 5.6 | 45.0 | 5.0 | 600 | 1.00 | 10.0 | 2.0 | 161.0 | 805 |
| SMA4735A | 35A | 6.2 | 41.0 | 2.0 | 700 | 1.00 | 10.0 | 3.0 | 146.0 | 730 |
| SMA4736A | 36A | 6.8 | 37.0 | 3.5 | 700 | 1.00 | 5.0 | 4.0 | 133.0 | 660 |
| SMA4737A | 37A | 7.5 | 34.0 | 4.0 | 700 | 0.50 | 5.0 | 5.0 | 121.0 | 605 |
| SMA4738A | 38A | 8.2 | 31.0 | 4.5 | 700 | 0.50 | 5.0 | 6.0 | 110.0 | 550 |
| SMA4739A | 39A | 9.1 | 28.0 | 5.0 | 700 | 0.50 | 0.5 | 7.0 | 100.0 | 500 |
| SMA4740A | 40A | 10.0 | 25.0 | 7.0 | 700 | 0.25 | 0.5 | 7.6 | 91.0 | 454 |
| SMA4741A | 41A | 11.0 | 23.0 | 8.0 | 700 | 0.25 | 0.1 | 8.4 | 83.0 | 414 |
| SMA4742A | 42A | 12.0 | 21.0 | 9.0 | 700 | 0.25 | 0.1 | 9.1 | 76.0 | 380 |
| SMA4743A | 43A | 13.0 | 19.0 | 10.0 | 700 | 0.25 | 0.1 | 9.9 | 69.0 | 344 |
| SMA4744A | 44A | 15.0 | 17.0 | 14.0 | 700 | 0.25 | 0.1 | 11.4 | 61.0 | 305 |
| SMA4745A | 45A | 16.0 | 15.5 | 16.0 | 700 | 0.25 | 0.1 | 12.2 | 57.0 | 285 |
| SMA4746A | 46A | 18.0 | 14.0 | 20.2 | 750 | 0.25 | 0.1 | 13.7 | 50.0 | 250 |
| SMA4747A | 47A | 20.0 | 12.5 | 22.0 | 750 | 0.25 | 0.1 | 15.2 | 45.0 | 225 |
| SMA4748A | 48A | 22.0 | 11.5 | 23.0 | 750 | 0.25 | 0.1 | 16.7 | 41.0 | 205 |
| SMA4749A | 49A | 24.0 | 10.5 | 25.0 | 750 | 0.25 | 0.1 | 18.2 | 38.0 | 190 |
| SMA4750A | 50A | 27.0 | 9.5 | 35.0 | 750 | 0.25 | 0.1 | 20.6 | 34.0 | 170 |
| SMA4751A | 51A | 30.0 | 8.5 | 40.0 | 1000 | 0.25 | 0.1 | 22.8 | 30.0 | 150 |
| SMA4752A | 52A | 33.0 | 7.5 | 45.0 | 1000 | 0.25 | 0.1 | 25.1 | 27.0 | 135 |
| SMA4753A | 53A | 36.0 | 7.0 | 50.0 | 1000 | 0.25 | 0.1 | 27.4 | 25.0 | 125 |
| SMA4754A | 54A | 39.0 | 6.5 | 60.0 | 1000 | 0.25 | 0.1 | 29.7 | 23.0 | 115 |
| SMA4755A | 55A | 43.0 | 6.0 | 70.0 | 1500 | 0.25 | 0.1 | 32.7 | 22.0 | 110 |
| SMA4756A | 56A | 47.0 | 5.5 | 80.0 | 1500 | 0.25 | 0.1 | 35.8 | 19.0 | 95 |
| SMA4757A | 57A | 51.0 | 5.0 | 95.0 | 1500 | 0.25 | 0.1 | 38.8 | 18.0 | 90 |
| SMA4758A | 58A | 56.0 | 4.5 | 110.0 | 2000 | 0.25 | 0.1 | 42.6 | 16.0 | 80 |
| SMA4759A | 59A | 62.0 | 4.0 | 125.0 | 2000 | 0.25 | 0.1 | 47.1 | 14.0 | 70 |
| SMA4760A | 60A | 68.0 | 3.7 | 150.0 | 2000 | 0.25 | 0.1 | 51.7 | 13.0 | 65 |
| SMA4761A | 61A | 75.0 | 3.3 | 175.0 | 2000 | 0.25 | 0.1 | 56.0 | 12.0 | 60 |
| SMA4762A | 62A | 82.0 | 3.0 | 200.0 | 3000 | 0.25 | 0.1 | 62.2 | 11.0 | 55 |
| SMA4763A | 63A | 91.0 | 2.8 | 250.0 | 3000 | 0.25 | 0.1 | 69.2 | 10.0 | 50 |
| SMA4764A | 64A | 100.0 | 2.5 | 350.0 | 3000 | 0.25 | 0.1 | 76.0 | 9.0 | 45 |
| SZ1110A | 11Z | 110.0 | 2.3 | 450.0 | 4000 | 0.25 | 0.1 | 83.6 | 8.6 | 40 |
| SZ1120A | 12Z | 120.0 | 2.0 | 550.0 | 4500 | 0.25 | 0.1 | 91.2 | 7.8 | 37 |
| SZ1130A | 13Z | 130.0 | 1.9 | 700.0 | 5000 | 0.25 | 0.1 | 98.8 | 7.0 | 34 |
| SZ1150A | 15Z | 150.0 | 1.7 | 1000.0 | 6000 | 0.25 | 0.1 | 114.0 | 6.4 | 30 |
| SZ1160A | 16Z | 160.0 | 1.6 | 1100.0 | 6500 | 0.25 | 0.1 | 121.6 | 5.8 | 28 |

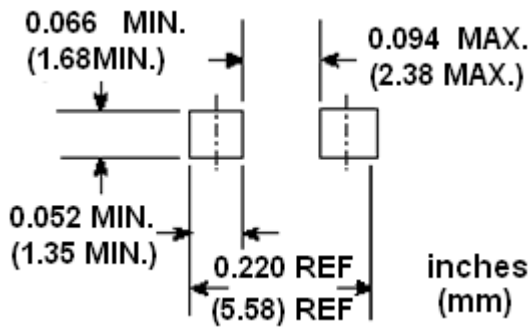
Electrical Characteristics(Cont.)

| Part Number | Device marking code | Nominal zener voltage | | Maximum zener impedance | | | Maximum reverse leakage Current | | Maximum DC zener current | Maximum surge current |
|-------------|---------------------|---------------------------------|-----------------|----------------------------------|----------------------------------|-----------------|---------------------------------|-------|--------------------------|-----------------------|
| | | V _Z @I _{ZT} | I _{ZT} | Z _{ZT} @I _{ZT} | Z _{ZK} @I _{ZK} | I _{ZK} | I _R @V _R | | I _{ZM} | I _{RM} |
| | | (V) | (mA) | (Ω) | (Ω) | (mA) | (μA) | (V) | (A) | (A) |
| SZ1180A | 18Z | 180.0 | 1.4 | 1200.0 | 7000 | 0.25 | 0.1 | 136.8 | 5.2 | 25 |
| SZ1200A | 20Z | 200.0 | 1.2 | 1900.0 | 9990 | 0.25 | 0.1 | 152.0 | 4.7 | 22 |
| SZ1220A | 22Z | 220.0 | 1.0 | 1600.0 | 8000 | 0.25 | 0.1 | 167.2 | 4.0 | 20 |
| SZ1240A | 24Z | 240.0 | 0.9 | 1800.0 | 8500 | 0.25 | 0.1 | 182.4 | 3.8 | 19 |
| SZ1250A | 25Z | 250.0 | 0.9 | 2000.0 | 9000 | 0.25 | 0.1 | 190.0 | 3.6 | 18 |
| SZ1270A | 27Z | 270.0 | 0.8 | 2100.0 | 9000 | 0.25 | 0.1 | 205.0 | 3.3 | 16 |
| SZ1300A | 30Z | 300.0 | 0.8 | 2300.0 | 9500 | 0.25 | 0.1 | 228.0 | 3.0 | 15 |
| SZ1330A | 33Z | 330.0 | 0.7 | 2500.0 | 9500 | 0.25 | 0.1 | 250.2 | 2.7 | 13 |

Note: 1. The type number listed have a standard tolerance on the nominal zener voltage of ±5%.

2. The reverse surge current is a non-repetitive, 8.3ms pulse width square wave or equivalent sine-wave superimposed on I_{ZT} per JEDEC.

Recommended soldering footprint



Typical Characteristics and Characteristics(TA=25°C, unless otherwise noted)

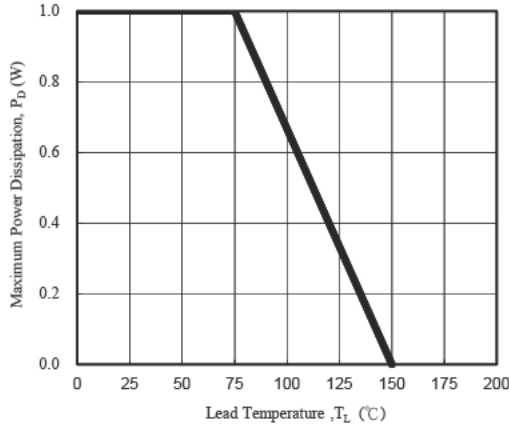


Fig. 1 - Power Temperature Derating Curve

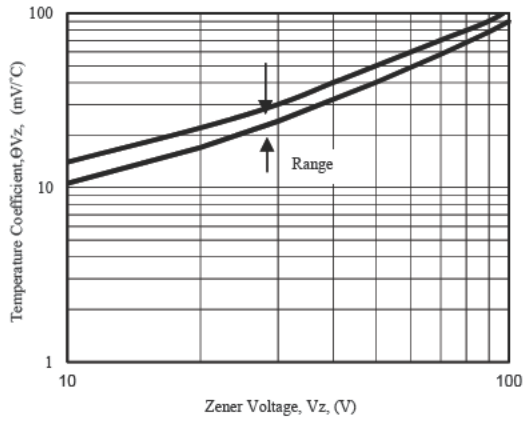


Fig. 2 - Temperature Coefficients v.s. Zener Voltage



Fig. 3 - Typical Thermal Resistance v.s. Lead Length



Fig. 4 - Maximum Surge Power

Reel Dimension



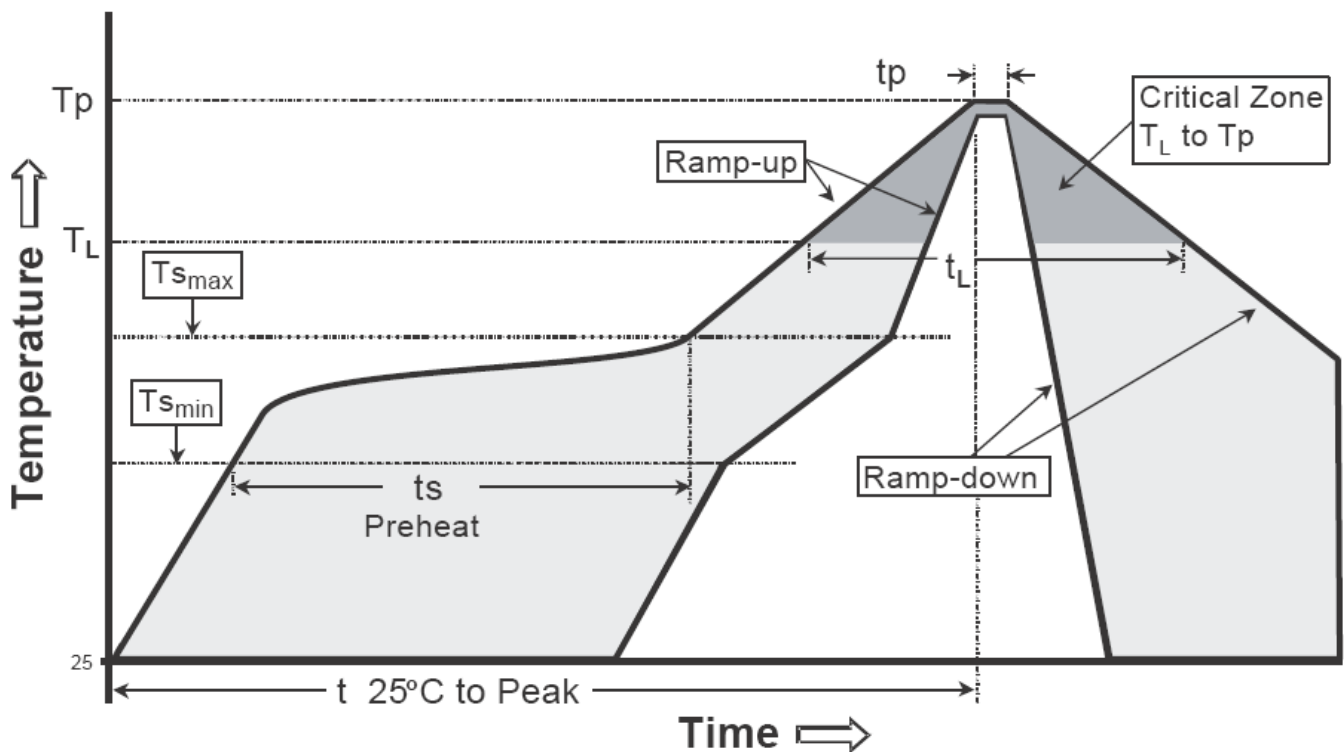
Carrier Tape Dimension



Recommended wave soldering condition

| | | |
|-----------------|------------------|-----------------|
| Product | Peak Temperature | Soldering Time |
| Pb-free devices | 260 +0/-5 °C | 5 +1/-1 seconds |

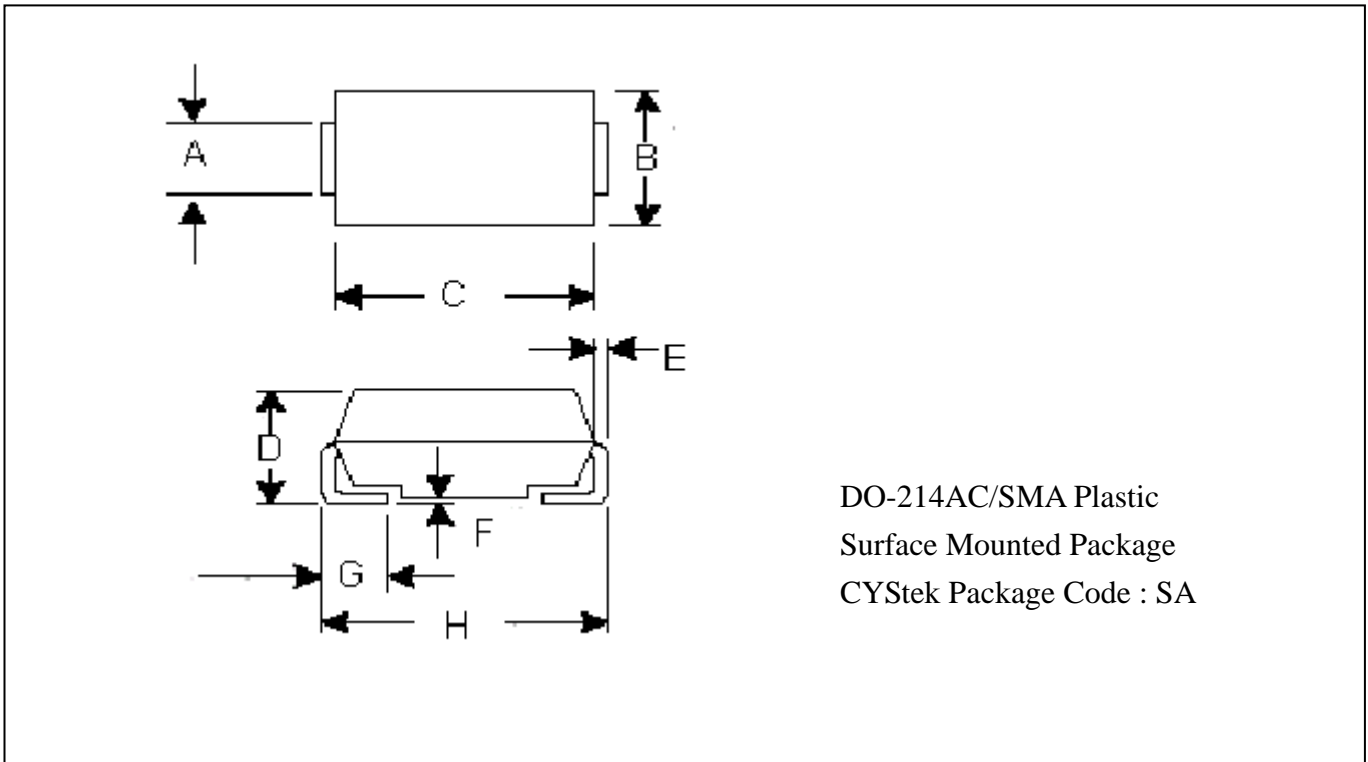
Recommended temperature profile for IR reflow



| Profile feature | Sn-Pb eutectic Assembly | Pb-free Assembly |
|---|-------------------------|------------------|
| Average ramp-up rate (T _{smax} to T _p) | 3°C/second max. | 3°C/second max. |
| Preheat | | |
| -Temperature Min(T _{s min}) | 100°C | 150°C |
| -Temperature Max(T _{s max}) | 150°C | 200°C |
| -Time(t _{s min} to t _{s max}) | 60-120 seconds | 60-180 seconds |
| Time maintained above: | | |
| -Temperature (T _L) | 183°C | 217°C |
| - Time (t _L) | 60-150 seconds | 60-150 seconds |
| Peak Temperature(T _p) | 240 +0/-5 °C | 260 +0/-5 °C |
| Time within 5°C of actual peak temperature(tp) | 10-30 seconds | 20-40 seconds |
| Ramp down rate | 6°C/second max. | 6°C/second max. |
| Time 25 °C to peak temperature | 6 minutes max. | 8 minutes max. |

Note : All temperatures refer to topside of the package, measured on the package body surface.

DO-214AC/SMA Dimension



*:Typical

| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|-----|--------|-------|-------------|------|-----|--------|-------|-------------|------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.048 | 0.064 | 1.23 | 1.63 | E | 0.006 | 0.012 | 0.15 | 0.31 |
| B | 0.095 | 0.109 | 2.40 | 2.76 | F | 0.000 | 0.008 | 0.00 | 0.20 |
| C | 0.157 | 0.181 | 4.00 | 4.60 | G | 0.030 | 0.059 | 0.75 | 1.51 |
| D | 0.075 | 0.089 | 1.90 | 2.26 | H | 0.189 | 0.206 | 4.80 | 5.22 |

Notes : 1.Controlling dimension : millimeters.
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material :

- Lead : Pure tin plated.
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0.

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