

TOSHIBA Diode Silicon Epitaxial Planar Type

02DZ2.0~02DZ24

Constant Voltage Regulation Applications

Reference Voltage Applications

- The mounting of four devices on an ultra-compact package allows the number of parts and the mounting cost to be reduced.
- Nominal voltage tolerance about $\pm 2.5\%$ (2.0V~24V)

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

| Characteristic | Symbol | Rating | Unit |
|---------------------------|------------------|---------|------------------|
| Power dissipation | P^* | 200 | mW |
| Junction temperature | T_j | 125 | $^\circ\text{C}$ |
| Storage temperature range | T_{stg} | -55~125 | $^\circ\text{C}$ |

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

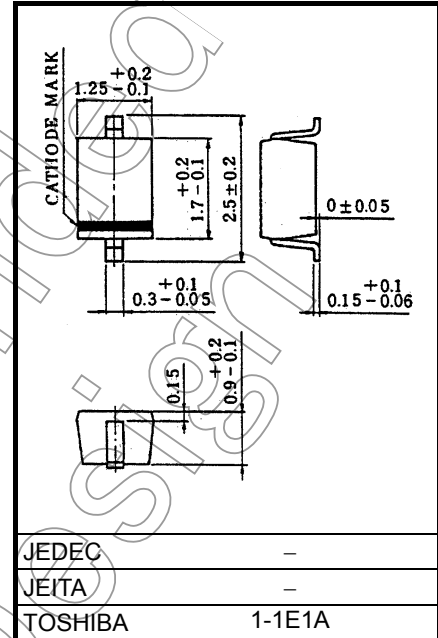
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

*: Mounted on a glass epoxy circuit board of $20 \times 20\text{mm}$, pad dimensions of $4 \times 4\text{mm}$.

Electrical Characteristics

(See Pages 3~5.)

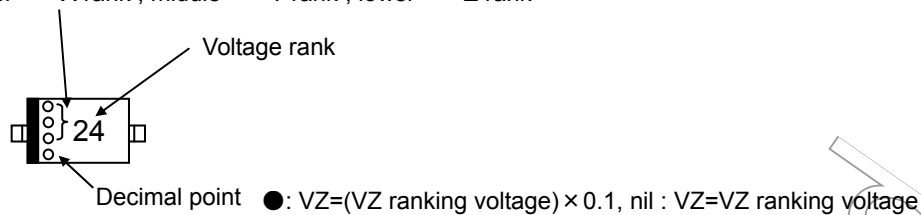
Unit: mm



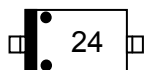
Weight: 4.5mg (typ.)

Marking

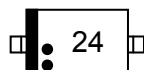
VZ additional ranking
upper ... X rank , middle ... Y rank , lower ... Z rank



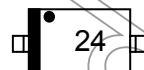
Example1:02DZ2.4-X



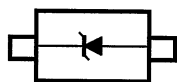
Example2:02DZ2.4-Z



Example3:02DZ24-X



Pin Assignment (top view)



Electrical Characteristics (Ta = 25°C)

| Type No. | | Zener Voltage | | | Dynamic Impedance | | Knee Dynamic Impedance | | Reverse Current | |
|-----------|---|----------------------|------|---------------------|--------------------|---------------------|------------------------|---------------------|---------------------|--------------------|
| | | * V _Z (V) | | I _Z (mA) | Z _Z (Ω) | I _Z (mA) | Z _{ZK} (Ω) | I _Z (mA) | I _R (μA) | V _R (V) |
| | | | | | Max | | Max | | Max | |
| 02DZ2.0** | X | 1.85 | 2.05 | 5 | 100 | 5 | 1000 | 0.5 | 120 | 0.5 |
| | Z | 1.95 | 2.15 | | | | | | | |
| 02DZ2.2** | X | 2.05 | 2.26 | 5 | 100 | 5 | 1000 | 0.5 | 120 | 1.0 |
| | Z | 2.16 | 2.38 | | | | | | | |
| 02DZ2.4 | X | 2.28 | 2.50 | 5 | 100 | 5 | 1000 | 0.5 | 120 | 1.0 |
| | Z | 2.40 | 2.60 | | | | | | | |
| 02DZ2.7 | X | 2.50 | 2.75 | 5 | 110 | 5 | 1000 | 0.5 | 120 | 1.0 |
| | Z | 2.65 | 2.90 | | | | | | | |
| 02DZ3.0 | X | 2.80 | 3.05 | 5 | 120 | 5 | 1000 | 0.5 | 50 | 1.0 |
| | Z | 2.95 | 3.20 | | | | | | | |
| 02DZ3.3 | X | 3.10 | 3.35 | 5 | 130 | 5 | 1000 | 0.5 | 20 | 1.0 |
| | Z | 3.25 | 3.50 | | | | | | | |
| 02DZ3.6 | X | 3.40 | 3.65 | 5 | 130 | 5 | 1000 | 0.5 | 10 | 1.0 |
| | Z | 3.55 | 3.80 | | | | | | | |
| 02DZ3.9 | X | 3.70 | 3.97 | 5 | 130 | 5 | 1000 | 0.5 | 10 | 1.0 |
| | Z | 3.87 | 4.10 | | | | | | | |
| 02DZ4.3 | X | 4.00 | 4.23 | 5 | 130 | 5 | 1000 | 0.5 | 5 | 1.0 |
| | Y | 4.13 | 4.35 | | | | | | | |
| | Z | 4.25 | 4.50 | | | | | | | |
| 02DZ4.7 | X | 4.40 | 4.63 | 5 | 120 | 5 | 1000 | 0.5 | 5 | 1.0 |
| | Y | 4.53 | 4.76 | | | | | | | |
| | Z | 4.66 | 4.90 | | | | | | | |
| 02DZ5.1 | X | 4.80 | 5.07 | 5 | 70 | 5 | 1000 | 0.5 | 1 | 1.5 |
| | Y | 4.97 | 5.24 | | | | | | | |
| | Z | 5.14 | 5.40 | | | | | | | |
| 02DZ5.6 | X | 5.30 | 5.63 | 5 | 40 | 5 | 900 | 0.5 | 1 | 2.5 |
| | Y | 5.43 | 5.81 | | | | | | | |
| | Z | 5.61 | 6.00 | | | | | | | |
| 02DZ6.2 | X | 5.80 | 6.20 | 5 | 30 | 5 | 500 | 0.5 | 1 | 3.0 |
| | Y | 6.00 | 6.39 | | | | | | | |
| | Z | 6.19 | 6.60 | | | | | | | |

*: Test time: t = 30ms

**: Product by order

Electrical Characteristics (Ta = 25°C)

| Type No. | | Zener Voltage | | | Dynamic Impedance | | Knee Dynamic Impedance | | Reverse Current | |
|----------|---|----------------------|-------|---------------------|--------------------|---------------------|------------------------|---------------------|---------------------|--------------------|
| | | * V _Z (V) | | I _Z (mA) | Z _Z (Ω) | I _Z (mA) | Z _{ZK} (Ω) | I _Z (mA) | I _R (μA) | V _R (V) |
| | | Min | Max | | Max | | Max | | Max | |
| 02DZ6.8 | X | 6.40 | 6.80 | 5 | 25 | 5 | 150 | 0.5 | 0.5 | 5.0 |
| | Y | 6.60 | 7.02 | | | | | | | |
| | Z | 6.82 | 7.20 | | | | | | | |
| 02DZ7.5 | X | 7.00 | 7.43 | 5 | 23 | 5 | 120 | 0.5 | 0.5 | 6.0 |
| | Y | 7.23 | 7.66 | | | | | | | |
| | Z | 7.46 | 7.90 | | | | | | | |
| 02DZ8.2 | X | 7.70 | 8.16 | 5 | 20 | 5 | 120 | 0.5 | 0.5 | 6.5 |
| | Y | 7.96 | 8.43 | | | | | | | |
| | Z | 8.23 | 8.70 | | | | | | | |
| 02DZ9.1 | X | 8.50 | 9.00 | 5 | 18 | 5 | 120 | 0.5 | 0.5 | 7.0 |
| | Y | 8.80 | 9.30 | | | | | | | |
| | Z | 9.10 | 9.60 | | | | | | | |
| 02DZ10 | X | 9.40 | 9.93 | 5 | 15 | 5 | 120 | 0.5 | 0.5 | 8.0 |
| | Y | 9.73 | 10.26 | | | | | | | |
| | Z | 10.06 | 10.60 | | | | | | | |
| 02DZ11 | X | 10.40 | 10.98 | 5 | 15 | 5 | 120 | 0.5 | 0.5 | 8.5 |
| | Y | 10.73 | 11.26 | | | | | | | |
| | Z | 11.06 | 11.60 | | | | | | | |
| 02DZ12 | X | 11.40 | 11.93 | 5 | 15 | 5 | 110 | 0.5 | 0.5 | 9.0 |
| | Y | 11.73 | 12.26 | | | | | | | |
| | Z | 12.06 | 12.60 | | | | | | | |
| 02DZ13 | X | 12.40 | 13.08 | 5 | 15 | 5 | 110 | 0.5 | 0.5 | 10 |
| | Y | 12.88 | 13.57 | | | | | | | |
| | Z | 13.37 | 14.10 | | | | | | | |
| 02DZ15 | X | 13.80 | 14.63 | 5 | 15 | 5 | 110 | 0.5 | 0.5 | 11 |
| | Y | 14.33 | 15.11 | | | | | | | |
| | Z | 14.81 | 15.60 | | | | | | | |
| 02DZ16 | X | 15.30 | 16.10 | 5 | 18 | 5 | 150 | 0.5 | 0.5 | 12 |
| | Y | 15.80 | 16.60 | | | | | | | |
| | Z | 16.30 | 17.10 | | | | | | | |
| 02DZ18 | X | 16.80 | 17.76 | 5 | 20 | 5 | 150 | 0.5 | 0.5 | 14 |
| | Y | 17.46 | 18.43 | | | | | | | |
| | Z | 18.13 | 19.10 | | | | | | | |

*: Test time: t = 30ms

**: Product by order

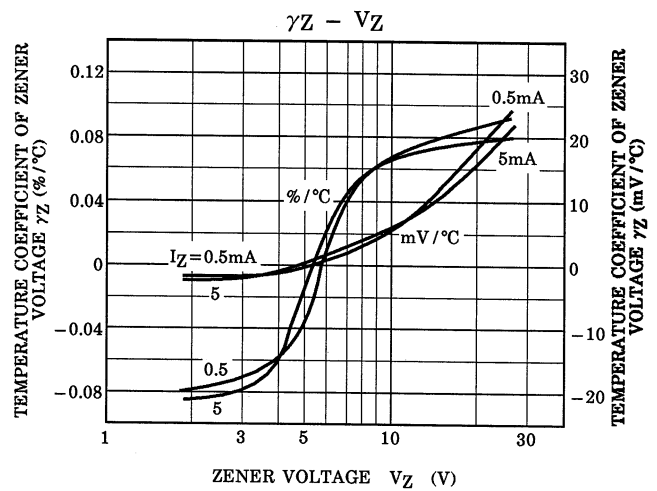
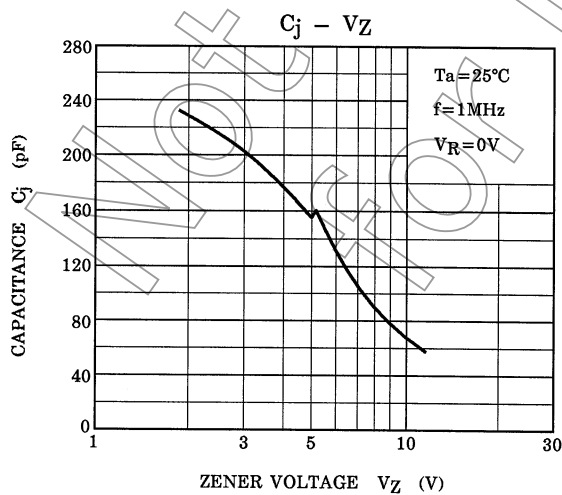
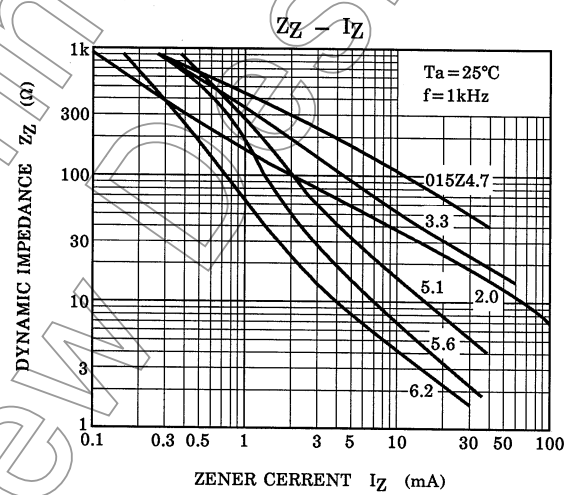
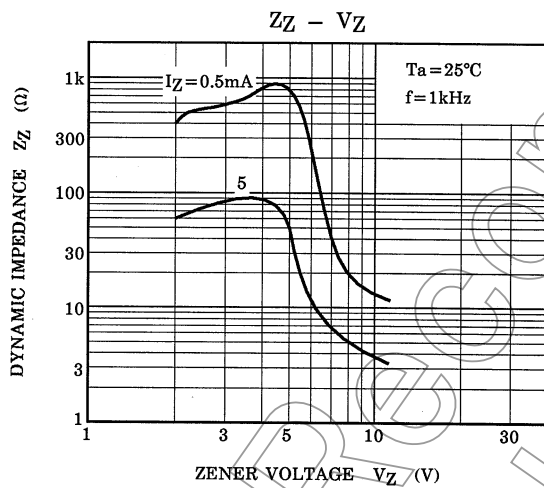
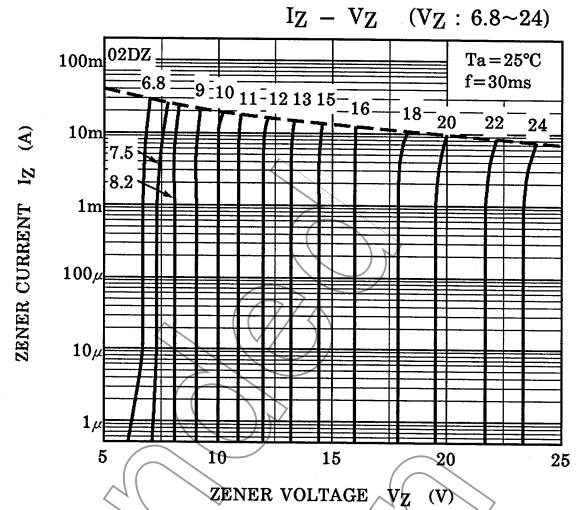
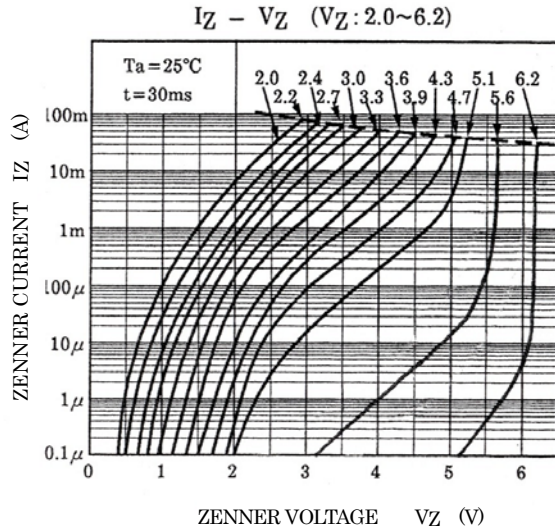
Electrical Characteristics (Ta = 25°C)

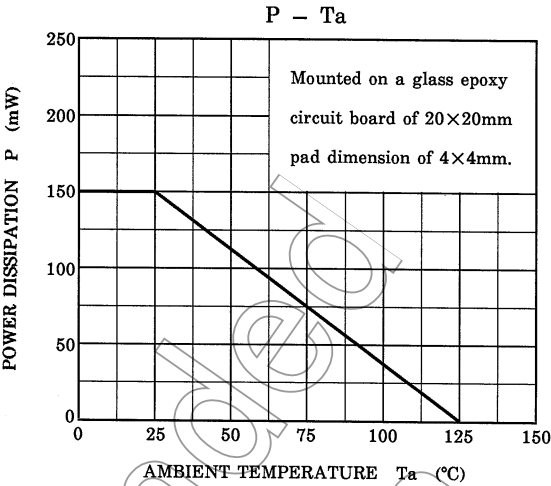
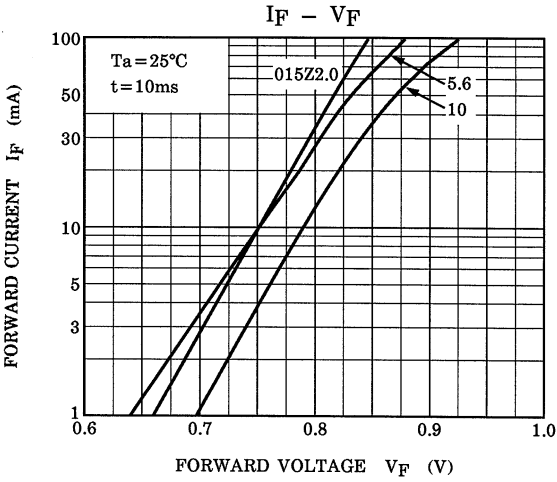
| Type No. | | Zener Voltage | | I _Z (mA) | Dynamic Impedance | | Knee Dynamic Impedance | | Reverse Current | |
|----------|---|----------------------|-------|------------------------|--------------------|------------------------|------------------------|------------------------|---------------------|-----------------------|
| | | * V _Z (V) | | | Z _Z (Ω) | I _Z (mA) | Z _{ZK} (Ω) | I _Z (mA) | I _R (μA) | V _R (V) |
| | | Min | Max | | Max | | Max | | Max | |
| 02DZ20 | X | 18.80 | 19.78 | 5 | 25 | 5 | 200 | 0.5 | 0.5 | 15 |
| | Y | 19.48 | 20.46 | | | | | | | |
| | Z | 20.16 | 21.20 | | | | | | | |
| 02DZ22 | X | 20.80 | 21.88 | 5 | 30 | 5 | 200 | 0.5 | 0.5 | 17 |
| | Y | 21.48 | 22.56 | | | | | | | |
| | Z | 22.16 | 23.30 | | | | | | | |
| 02DZ24 | X | 22.80 | 24.11 | 5 | 40 | 5 | 200 | 0.5 | 0.5 | 19 |
| | Y | 23.61 | 24.92 | | | | | | | |
| | Z | 24.42 | 25.60 | | | | | | | |

*: Test time: t = 30ms

**: Product by order

Not Recommended for New Design





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