

TOSHIBA ZENER DIODE SILICON DIFFUSED TYPE

# 3Z12~3Z390

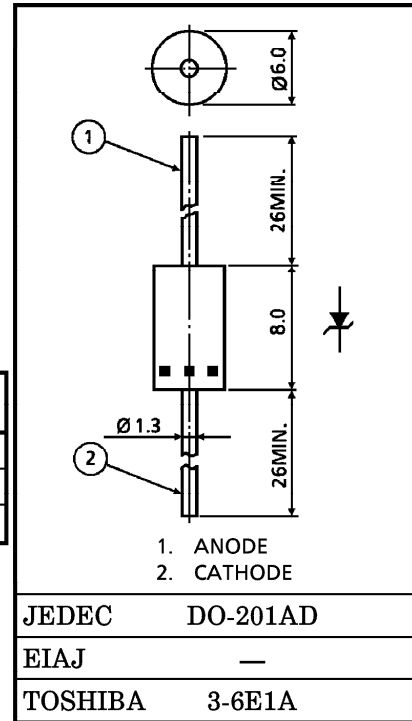
VOLTAGE DETECTOR AND SUPPRESSOR APPLICATIONS

Unit in mm

- Average Power Dissipation :  $P=3W$
- Peak Reverse Power Dissipation :  $P_{RSM}=1500W/1ms\ expo$
- Zener Voltage :  $V_Z=12\sim390V$
- Tolerance of Zener Voltage :  $\pm 10\%$
- Plastic Mold Package

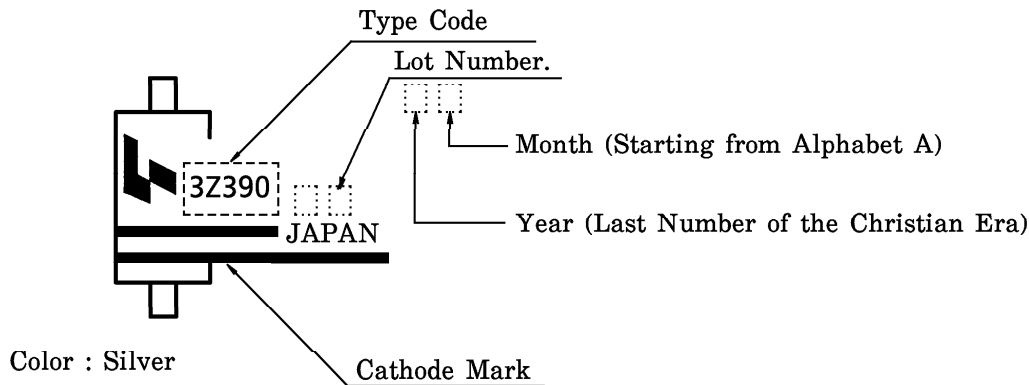
MAXIMUM RATINGS ( $T_a = 25^\circ C$ )

| CHARACTERISTIC            | SYMBOL    | RATING    | UNIT       |
|---------------------------|-----------|-----------|------------|
| Power Dissipation         | P         | 3.0       | W          |
| Junction Temperature      | $T_j$     | -40 ~ 150 | $^\circ C$ |
| Storage Temperature Range | $T_{stg}$ | -40 ~ 150 | $^\circ C$ |



Weight : 1.18g

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● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

| TYPE  | ZENER CHARACTERISTICS   |      |      |                                    |                                | TEMPERATURE COEFFICIENT OF ZENER VOLTAGE $\alpha_T$ (mV/°C) |      | FORWARD VOLTAGE |                               | REVERSE CURRENT  |                               |
|-------|-------------------------|------|------|------------------------------------|--------------------------------|---|------|-----------------|-------------------------------|------------------|-------------------------------|
|       | ZENER VOLTAGE $V_Z$ (V) |      |      | ZENER IMPEDANCE $r_d$ ( $\Omega$ ) | MEASUREMENT CURRENT $I_Z$ (mA) | TYP.  | MAX. | $V_F$ (V)       | MEASUREMENT CURRENT $I_F$ (A) | $I_R$ ( $\mu$ A) | MEASUREMENT VOLTAGE $V_R$ (V) |
|       | MIN.                    | TYP. | MAX. | MAX.                               |                                |   |      |                 |                               |                  |                               |
| 3Z12  | 10.8                    | 12   | 13.2 | 30                                 | 10                             | 8   | 13   | 1.2             | 0.2                           | 10               | 8                             |
| 3Z13  | 11.7                    | 13   | 14.3 | 30                                 | 10                             | 9   | 14   | 1.2             | 0.2                           | 10               | 9                             |
| 3Z15  | 13.5                    | 15   | 16.5 | 30                                 | 10                             | 11  | 17   | 1.2             | 0.2                           | 10               | 10                            |
| 3Z16  | 14.4                    | 16   | 17.6 | 30                                 | 10                             | 12  | 19   | 1.2             | 0.2                           | 10               | 11                            |
| 3Z18  | 16.2                    | 18   | 19.8 | 30                                 | 10                             | 14  | 23   | 1.2             | 0.2                           | 10               | 13                            |
| 3Z20  | 18.0                    | 20   | 22.0 | 30                                 | 10                             | 16  | 26   | 1.2             | 0.2                           | 10               | 14                            |
| 3Z22  | 19.8                    | 22   | 24.2 | 30                                 | 10                             | 18  | 28   | 1.2             | 0.2                           | 10               | 16                            |
| 3Z24  | 21.6                    | 24   | 26.4 | 30                                 | 10                             | 20  | 32   | 1.2             | 0.2                           | 10               | 17                            |
| 3Z27  | 24.3                    | 27   | 29.7 | 30                                 | 10                             | 23  | 36   | 1.2             | 0.2                           | 10               | 19                            |
| 3Z30  | 27.0                    | 30   | 33.0 | 30                                 | 10                             | 25  | 40   | 1.2             | 0.2                           | 10               | 21                            |
| 3Z33  | 29.7                    | 33   | 36.3 | 30                                 | 10                             | 26  | 41   | 1.2             | 0.2                           | 10               | 26.4                          |
| 3Z36  | 32.4                    | 36   | 39.6 | 30                                 | 9                              | 28  | 45   | 1.2             | 0.2                           | 10               | 28.8                          |
| 3Z43  | 38.7                    | 43   | 47.3 | 40                                 | 7                              | 33  | 53   | 1.2             | 0.2                           | 10               | 34.4                          |
| 3Z47  | 42.3                    | 47   | 51.7 | 65                                 | 6                              | 38  | 60   | 1.2             | 0.2                           | 10               | 37.6                          |
| 3Z51  | 45.9                    | 51   | 56.1 | 65                                 | 6                              | 43  | 68   | 1.2             | 0.2                           | 10               | 40.8                          |
| 3Z68  | 61.2                    | 68   | 74.8 | 120                                | 4                              | 57  | 90   | 1.2             | 0.2                           | 10               | 54.4                          |
| 3Z75  | 67.5                    | 75   | 82.5 | 150                                | 4                              | 66  | 104  | 1.2             | 0.2                           | 10               | 60                            |
| 3Z82  | 73.8                    | 82   | 90.2 | 170                                | 3                              | 71  | 113  | 1.2             | 0.2                           | 10               | 65.4                          |
| 3Z100 | 90                      | 100  | 110  | 300                                | 3                              | 87  | 138  | 1.2             | 0.2                           | 10               | 80                            |
| 3Z110 | 99                      | 110  | 121  | 300                                | 3                              | 96  | 152  | 1.2             | 0.2                           | 10               | 88                            |
| 3Z150 | 135                     | 150  | 165  | 450                                | 2                              | 136   | 212  | 1.2             | 0.2                           | 10               | 120                           |
| 3Z180 | 162                     | 180  | 198  | 500                                | 1.5                            | 161   | 255  | 1.2             | 0.2                           | 10               | 144                           |
| 3Z200 | 180                     | 200  | 220  | 500                                | 1.5                            | 170   | 269  | 1.2             | 0.2                           | 10               | 160                           |
| 3Z220 | 198                     | 220  | 242  | 5000                               | 0.5                            | 200   | 309  | 1.2             | 0.2                           | 10               | 176                           |
| 3Z240 | 216                     | 240  | 264  | 5000                               | 0.5                            | 215   | 343  | 1.2             | 0.2                           | 10               | 192                           |
| 3Z270 | 243                     | 270  | 297  | 5000                               | 0.5                            | 243   | 385  | 1.2             | 0.2                           | 10               | 216                           |
| 3Z300 | 270                     | 300  | 330  | 5000                               | 0.5                            | 270   | 428  | 1.2             | 0.2                           | 10               | 240                           |
| 3Z330 | 297                     | 330  | 363  | 5000                               | 0.5                            | 296   | 470  | 1.2             | 0.2                           | 10               | 264                           |
| 3Z390 | 351                     | 390  | 429  | 10000                              | 0.5                            | 350   | 555  | 1.2             | 0.2                           | 10               | 312                           |

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