

# 500mW Zener Leadless Diode

## RLZ Series

### ●Applications

Constant voltage control

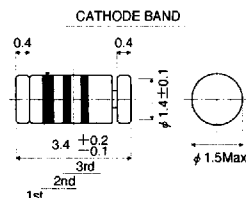
### ●Features

- 1) Designed for mounting on small surface areas (LLDS (LL-34) )
- 2) High reliability

### ●Construction

Silicon epitaxial planar

### ●External dimensions (Units: mm)



\* 3 color bands are printed on body  
LLDS (LL-34)

### ●Cathode band colors

| Type    | 1st Color Band | 2nd Color Band | 3rd Color Band                                        | Type     | 1st Color Band | 2nd Color Band | 3rd Color Band                                        |
|---------|----------------|----------------|-------------------------------------------------------|----------|----------------|----------------|-------------------------------------------------------|
| RLZ 2.0 | Black          | Brown          | *<br>A : Yellow<br>B : Green<br>C : Blue<br>D : White | RLZ 13   | Red            | Brown          | *<br>A : Yellow<br>B : Green<br>C : Blue<br>D : White |
| RLZ 2.2 | Black          | Red            |                                                       | RLZ 15   | Red            | Red            |                                                       |
| RLZ 2.4 | Black          | Orange         |                                                       | RLZ 16   | Red            | Orange         |                                                       |
| RLZ 2.7 | Black          | Yellow         |                                                       | RLZ 18   | Red            | Yellow         |                                                       |
| RLZ 3.0 | Black          | Green          |                                                       | RLZ 20   | Red            | Green          |                                                       |
| RLZ 3.3 | Black          | Blue           |                                                       | RLZ 22   | Red            | Blue           |                                                       |
| RLZ 3.6 | Black          | Purple         |                                                       | RLZ 24   | Red            | Purple         |                                                       |
| RLZ 3.9 | Black          | Gray           |                                                       | RLZ 27   | Red            | Gray           |                                                       |
| RLZ 4.3 | Black          | White          |                                                       | RLZ 30   | Red            | White          |                                                       |
| RLZ 4.7 | Brown          | Black          |                                                       | RLZ 33   | Orange         | Black          |                                                       |
| RLZ 5.1 | Brown          | Brown          |                                                       | RLZ 36   | Orange         | Brown          |                                                       |
| RLZ 5.6 | Brown          | Red            |                                                       | RLZ 39   | Orange         | Red            |                                                       |
| RLZ 6.2 | Brown          | Orange         | *<br>A : Yellow<br>B : Green<br>C : Blue<br>D : White | RLZ 39 E | Yellow         | White          | Yellow                                                |
| RLZ 6.8 | Brown          | Yellow         |                                                       | RLZ 39 F | Yellow         | White          | Green                                                 |
| RLZ 7.5 | Brown          | Green          |                                                       | RLZ 39 G | Yellow         | White          | Blue                                                  |
| RLZ 8.2 | Brown          | Blue           |                                                       | RLZ 43   | Orange         | Orange         | —                                                     |
| RLZ 9.1 | Brown          | Purple         |                                                       | RLZ 47   | Orange         | Yellow         | —                                                     |
| RLZ 10  | Brown          | Gray           |                                                       | RLZ 51   | Orange         | Green          | —                                                     |
| RLZ 11  | Brown          | White          |                                                       | RLZ 56   | Orange         | Blue           | —                                                     |
| RLZ 12  | Red            | Black          |                                                       |          |                |                |                                                       |

※ Products are grouped into colors A, B, C, and D, and listed in order within each group.  
For RLZ2.0A, 3rd color band is yellow.

### ●Absolute maximum ratings (Ta=25°C)

| Parameter            | Symbol           | Limite  | Unit |
|----------------------|------------------|---------|------|
| Power dissipation    | P                | 500     | mW   |
| Junction temperature | T <sub>j</sub>   | 175     | °C   |
| Storage temperature  | T <sub>stg</sub> | -65~175 | °C   |

## ●Electrical characteristics (Ta=25°C)

| Type    | Zener voltage |                    |       |                     | Operating resistance |                     | Rising operating resistance |                     | Reverse current     |                    |
|---------|---------------|--------------------|-------|---------------------|----------------------|---------------------|-----------------------------|---------------------|---------------------|--------------------|
|         | Rank          | V <sub>z</sub> (V) |       |                     | Z <sub>z</sub> (Ω)   |                     | Z <sub>zk</sub> (Ω)         |                     | I <sub>R</sub> (μA) |                    |
|         |               | Min.               | Max.  | I <sub>z</sub> (mA) | Max.                 | I <sub>z</sub> (mA) | Max.                        | I <sub>z</sub> (mA) | Max.                | V <sub>R</sub> (V) |
| RLZ 2.0 | A             | 1.880              | 2.100 | 20                  | 140                  | 20                  | 2000                        | 1                   | 120                 | 0.5                |
|         | B             | 2.020              | 2.200 |                     |                      |                     |                             |                     |                     |                    |
| RLZ 2.2 | A             | 2.120              | 2.300 | 20                  | 120                  | 20                  | 2000                        | 1                   | 120                 | 0.7                |
|         | B             | 2.220              | 2.410 |                     |                      |                     |                             |                     |                     |                    |
| RLZ 2.4 | A             | 2.330              | 2.520 | 20                  | 100                  | 20                  | 2000                        | 1                   | 120                 | 1.0                |
|         | B             | 2.430              | 2.630 |                     |                      |                     |                             |                     |                     |                    |
| RLZ 2.7 | A             | 2.540              | 2.750 | 20                  | 100                  | 20                  | 1000                        | 1                   | 100                 | 1.0                |
|         | B             | 2.690              | 2.910 |                     |                      |                     |                             |                     |                     |                    |
| RLZ 3.0 | A             | 2.850              | 3.070 | 20                  | 80                   | 20                  | 1000                        | 1                   | 50                  | 1.0                |
|         | B             | 3.010              | 3.220 |                     |                      |                     |                             |                     |                     |                    |
| RLZ 3.3 | A             | 3.160              | 3.380 | 20                  | 70                   | 20                  | 1000                        | 1                   | 20                  | 1.0                |
|         | B             | 3.320              | 3.530 |                     |                      |                     |                             |                     |                     |                    |
| RLZ 3.6 | A             | 3.455              | 3.695 | 20                  | 60                   | 20                  | 1000                        | 1                   | 10                  | 1.0                |
|         | B             | 3.600              | 3.845 |                     |                      |                     |                             |                     |                     |                    |
| RLZ 3.9 | A             | 3.74               | 4.01  | 20                  | 50                   | 20                  | 1000                        | 1                   | 5                   | 1.0                |
|         | B             | 3.89               | 4.16  |                     |                      |                     |                             |                     |                     |                    |
| RLZ 4.3 | A             | 4.04               | 4.29  | 20                  | 40                   | 20                  | 1000                        | 1                   | 5                   | 1.0                |
|         | B             | 4.17               | 4.43  |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 4.30               | 4.57  |                     |                      |                     |                             |                     |                     |                    |
| RLZ 4.7 | A             | 4.44               | 4.68  | 20                  | 25                   | 20                  | 900                         | 1                   | 5                   | 1.0                |
|         | B             | 4.55               | 4.80  |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 4.68               | 4.93  |                     |                      |                     |                             |                     |                     |                    |
| RLZ 5.1 | A             | 4.81               | 5.07  | 20                  | 20                   | 20                  | 800                         | 1                   | 5                   | 1.5                |
|         | B             | 4.94               | 5.20  |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 5.09               | 5.37  |                     |                      |                     |                             |                     |                     |                    |
| RLZ 5.6 | A             | 5.28               | 5.55  | 20                  | 13                   | 20                  | 500                         | 1                   | 5                   | 2.5                |
|         | B             | 5.45               | 5.73  |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 5.61               | 5.91  |                     |                      |                     |                             |                     |                     |                    |
| RLZ 6.2 | A             | 5.78               | 6.09  | 20                  | 10                   | 20                  | 300                         | 1                   | 5                   | 3.0                |
|         | B             | 5.96               | 6.27  |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 6.12               | 6.44  |                     |                      |                     |                             |                     |                     |                    |
| RLZ 6.8 | A             | 6.29               | 6.63  | 20                  | 8                    | 20                  | 150                         | 0.5                 | 2                   | 3.5                |
|         | B             | 6.49               | 6.83  |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 6.66               | 7.01  |                     |                      |                     |                             |                     |                     |                    |
| RLZ 7.5 | A             | 6.85               | 7.22  | 20                  | 8                    | 20                  | 120                         | 0.5                 | 0.5                 | 4.0                |
|         | B             | 7.07               | 7.45  |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 7.29               | 7.67  |                     |                      |                     |                             |                     |                     |                    |
| RLZ 8.2 | A             | 7.53               | 7.92  | 20                  | 8                    | 20                  | 120                         | 0.5                 | 0.5                 | 5.0                |
|         | B             | 7.78               | 8.19  |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 8.03               | 8.45  |                     |                      |                     |                             |                     |                     |                    |
| RLZ 9.1 | A             | 8.29               | 8.73  | 20                  | 8                    | 20                  | 120                         | 0.5                 | 0.5                 | 6.0                |
|         | B             | 8.57               | 9.01  |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 8.83               | 9.30  |                     |                      |                     |                             |                     |                     |                    |
| RLZ 10  | A             | 9.12               | 9.59  | 20                  | 8                    | 20                  | 120                         | 0.5                 | 0.2                 | 7.0                |
|         | B             | 9.41               | 9.90  |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 9.70               | 10.20 |                     |                      |                     |                             |                     |                     |                    |
|         | D             | 9.94               | 10.44 |                     |                      |                     |                             |                     |                     |                    |
| RLZ 11  | A             | 10.18              | 10.71 | 10                  | 10                   | 10                  | 120                         | 0.5                 | 0.2                 | 8.0                |
|         | B             | 10.50              | 11.05 |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 10.82              | 11.38 |                     |                      |                     |                             |                     |                     |                    |
| RLZ 12  | A             | 11.13              | 11.71 | 10                  | 12                   | 10                  | 110                         | 0.5                 | 0.2                 | 9.0                |
|         | B             | 11.44              | 12.03 |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 11.74              | 12.35 |                     |                      |                     |                             |                     |                     |                    |
| RLZ 13  | A             | 12.11              | 12.75 | 10                  | 14                   | 10                  | 110                         | 0.5                 | 0.2                 | 10                 |
|         | B             | 12.55              | 13.21 |                     |                      |                     |                             |                     |                     |                    |
|         | C             | 12.99              | 13.66 |                     |                      |                     |                             |                     |                     |                    |

## ●Electrical characteristics (Ta=25°C)

| Type              | Zener voltage |        |       |         | Operating resistance |         | Rising operating resistance |         | Reverse current |        |
|-------------------|---------------|--------|-------|---------|----------------------|---------|-----------------------------|---------|-----------------|--------|
|                   | Rank          | Vz (V) |       |         | Zz (Ω)               |         | Zzk (Ω)                     |         | IR (μA)         |        |
|                   |               | Min.   | Max.  | Iz (mA) | Max.                 | Iz (mA) | Max.                        | Iz (mA) | Max.            | VR (V) |
| RLZ 15            | A             | 13.44  | 14.13 | 10      | 16                   | 10      | 110                         | 0.5     | 0.2             | 11     |
|                   | B             | 13.89  | 14.62 |         |                      |         |                             |         |                 |        |
|                   | C             | 14.35  | 15.09 |         |                      |         |                             |         |                 |        |
| RLZ 16            | A             | 14.80  | 15.57 | 10      | 18                   | 10      | 150                         | 0.5     | 0.2             | 12     |
|                   | B             | 15.25  | 16.04 |         |                      |         |                             |         |                 |        |
|                   | C             | 15.69  | 16.51 |         |                      |         |                             |         |                 |        |
| RLZ 18            | A             | 16.22  | 17.06 | 10      | 23                   | 10      | 150                         | 0.5     | 0.2             | 13     |
|                   | B             | 16.82  | 17.70 |         |                      |         |                             |         |                 |        |
|                   | C             | 17.42  | 18.33 |         |                      |         |                             |         |                 |        |
| RLZ 20            | A             | 18.02  | 18.96 | 10      | 28                   | 10      | 200                         | 0.5     | 0.2             | 15     |
|                   | B             | 18.63  | 19.59 |         |                      |         |                             |         |                 |        |
|                   | C             | 19.23  | 20.22 |         |                      |         |                             |         |                 |        |
|                   | D             | 19.72  | 20.72 |         |                      |         |                             |         |                 |        |
| RLZ 22            | A             | 20.15  | 21.20 | 5       | 30                   | 5       | 200                         | 0.5     | 0.2             | 17     |
|                   | B             | 20.64  | 21.71 |         |                      |         |                             |         |                 |        |
|                   | C             | 21.08  | 22.17 |         |                      |         |                             |         |                 |        |
|                   | D             | 21.52  | 22.63 |         |                      |         |                             |         |                 |        |
| RLZ 24            | A             | 22.05  | 23.18 | 5       | 35                   | 5       | 200                         | 0.5     | 0.2             | 19     |
|                   | B             | 22.61  | 23.77 |         |                      |         |                             |         |                 |        |
|                   | C             | 23.12  | 24.31 |         |                      |         |                             |         |                 |        |
|                   | D             | 23.63  | 24.85 |         |                      |         |                             |         |                 |        |
| RLZ 27            | A             | 24.26  | 25.52 | 5       | 45                   | 5       | 250                         | 0.5     | 0.2             | 21     |
|                   | B             | 24.97  | 26.26 |         |                      |         |                             |         |                 |        |
|                   | C             | 25.63  | 26.95 |         |                      |         |                             |         |                 |        |
|                   | D             | 26.29  | 27.64 |         |                      |         |                             |         |                 |        |
| RLZ 30            | A             | 26.99  | 28.39 | 5       | 55                   | 5       | 250                         | 0.5     | 0.2             | 23     |
|                   | B             | 27.70  | 29.13 |         |                      |         |                             |         |                 |        |
|                   | C             | 28.36  | 29.82 |         |                      |         |                             |         |                 |        |
|                   | D             | 29.02  | 30.51 |         |                      |         |                             |         |                 |        |
| RLZ 33            | A             | 29.68  | 31.22 | 5       | 65                   | 5       | 250                         | 0.5     | 0.2             | 25     |
|                   | B             | 30.32  | 31.88 |         |                      |         |                             |         |                 |        |
|                   | C             | 30.90  | 32.50 |         |                      |         |                             |         |                 |        |
|                   | D             | 31.49  | 33.11 |         |                      |         |                             |         |                 |        |
| RLZ 36            | A             | 32.14  | 33.79 | 5       | 75                   | 5       | 250                         | 0.5     | 0.2             | 27     |
|                   | B             | 32.79  | 34.49 |         |                      |         |                             |         |                 |        |
|                   | C             | 33.40  | 35.13 |         |                      |         |                             |         |                 |        |
|                   | D             | 34.01  | 35.77 |         |                      |         |                             |         |                 |        |
| RLZ 39<br>Note(3) | A             | 34.68  | 36.47 | 5       | 85                   | 5       | 250                         | 0.5     | 0.2             | 30     |
|                   | B             | 35.36  | 37.19 |         |                      |         |                             |         |                 |        |
|                   | C             | 36.00  | 37.85 |         |                      |         |                             |         |                 |        |
|                   | D             | 36.63  | 38.52 |         |                      |         |                             |         |                 |        |
|                   | E             | 37.36  | 39.29 |         |                      |         |                             |         |                 |        |
|                   | F             | 38.14  | 40.11 |         |                      |         |                             |         |                 |        |
|                   | G             | 38.94  | 40.80 |         |                      |         |                             |         |                 |        |
| RLZ 43            | —             | 40.00  | 45.00 | 5       | 90                   | 5       | —                           | —       | 0.2             | 33     |
| RLZ 47            | —             | 44.00  | 49.00 | 5       | 90                   | 5       | —                           | —       | 0.2             | 36     |
| RLZ 51            | —             | 48.00  | 54.00 | 5       | 100                  | 5       | —                           | —       | 0.2             | 39     |
| RLZ 56            | —             | 53.00  | 60.00 | 5       | 110                  | 5       | —                           | —       | 0.2             | 43     |

Note (1) The Zener voltage is measured 40 ms after power is supplied.

(2) For the Zener voltage subdivisions, the free ranks (A, B, or C) or recommended when ordering.

(3) Zener voltages between 43 and 56 are grouped together in no particular order. 39E and above are available only on special order.

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● Zener characteristic curves

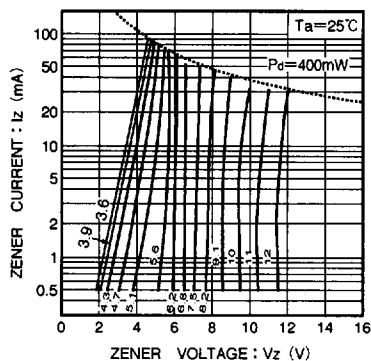


Fig. 1 RLZ3.9 ~ RLZ12 Zener characteristic

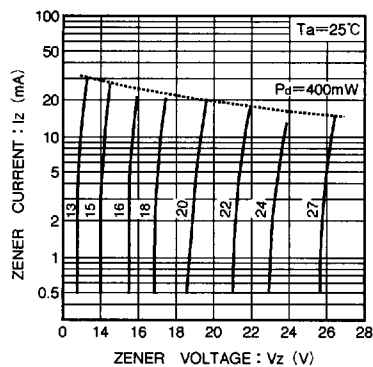


Fig. 2 RLZ13 ~ RLZ27 Zener characteristic

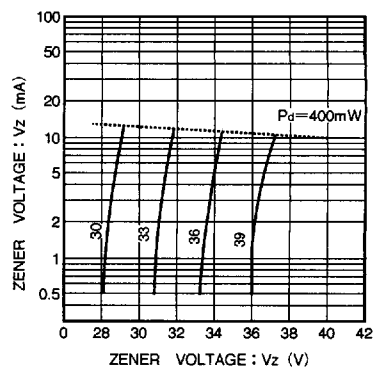


Fig. 3 RLZ30 ~ RLZ39 Zener characteristic

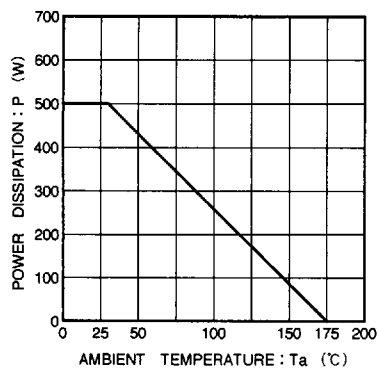


Fig. 4 Derating curve