

## DESCRIPTION/FEATURES

- LEADLESS PACKAGE FOR SURFACE MOUNT TECHNOLOGY
- IDEAL FOR HIGH DENSITY MOUNTING
- VOLTAGE RANGE—3.3 TO 100 VOLTS
- HERMETICALLY SEALED, DOUBLE-SLUG GLASS CONSTRUCTION

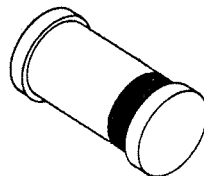
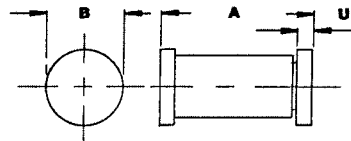
## MAXIMUM RATINGS

1.00 Watt DC Power Rating (See Power Derating Curve)  
 -65°C to +200°C Operating and Storage Junction Temperature  
 Power Derating 10.0 mW/°C above 50°C  
 Forward Voltage @ 200 mA: 1.2 Volts

## APPLICATION

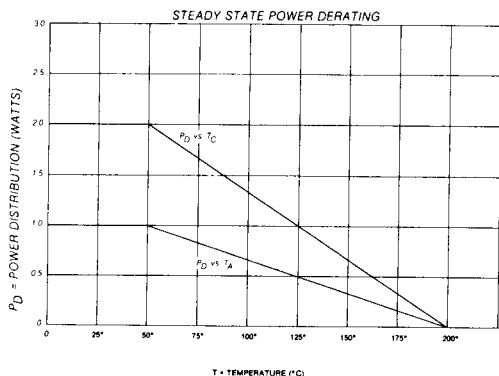
This surface mountable zener diode series is similar to the 1N4728 thru 1N4764 registration in the DO-41 equivalent package except that it meets the new JEDEC surface mount outline DO-213AB. It is an ideal selection for applications of high density and low parasitic requirements. Due to its glass hermetic qualities, it may also be considered for high reliability applications when required by a source control drawing (SCD).

## LEADLESS GLASS ZENER DIODES



| DIM | MILLIMETERS |      | INCHES |      |
|-----|-------------|------|--------|------|
|     | MIN         | MAX  | MIN    | MAX  |
| A   | 4.60        | 5.20 | .189   | .205 |
| B   | 2.49        | 2.65 | .094   | .105 |
| U   | .41         | .55  | .016   | .022 |

DO-213AB



## MECHANICAL CHARACTERISTICS

CASE: Hermetically sealed glass with solder contact tabs at each end.

FINISH: All external surfaces are corrosion resistant, readily solderable.

POLARITY: Banded end is cathode.

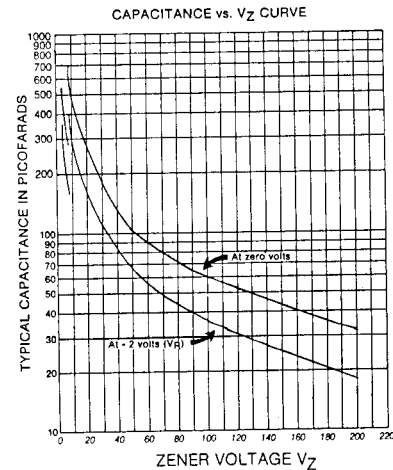
THERMAL RESISTANCE: 75°C/Watt typical junction to contact (case) tabs. (See Power Derating Curve)

MOUNTING POSITION: Any.

# MLL4728 thru MLL4764

## ELECTRICAL CHARACTERISTICS @ $T_C = 30^\circ\text{C}$

| TYPE<br>NUMBER<br>(Note 1) | ZENER<br>VOLTAGE<br>( $V_Z$ )<br>(Note 4) | TEST<br>CURRENT<br>( $I_{ZT}$ ) | MAXIMUM<br>DYNAMIC<br>IMPEDANCE<br>( $Z_{ZT}$ @ $I_{ZT}$ )<br>(Note 2) | MAXIMUM<br>REVERSE<br>CURRENT<br>( $I_R$ @ $V_R$ ) | TEST<br>VOLTAGE<br>( $V_R$ ) | MAXIMUM<br>REGULATOR<br>CURRENT<br>( $I_{ZM}$ )<br>$T_A = 50^\circ\text{C}$ | MAXIMUM<br>KNEE<br>IMPEDANCE<br>( $Z_{ZK}$ @ $I_{ZK}$ )<br>(Note 2) | TEST<br>CURRENT<br>( $I_{ZK}$ ) | MAXIMUM<br>(SURGE)<br>CURRENT<br>( $I_S$ )<br>(Note 3) |
|----------------------------|-------------------------------------------|---------------------------------|------------------------------------------------------------------------|----------------------------------------------------|------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------|--------------------------------------------------------|
|                            | VOLTS                                     | mA                              | OHMS                                                                   | $\mu\text{A}$                                      | VOLTS                        | mA                                                                          | OHMS                                                                | mA                              | mA                                                     |
| MLL4728A                   | 3.3                                       | 76                              | 10                                                                     | 100                                                | 1                            | 276                                                                         | 400                                                                 | 1.0                             | 1380                                                   |
| MLL4729A                   | 3.6                                       | 69                              | 10                                                                     | 100                                                | 1                            | 252                                                                         | 400                                                                 | 1.0                             | 1260                                                   |
| MLL4730A                   | 3.9                                       | 64                              | 9                                                                      | 50                                                 | 1                            | 234                                                                         | 400                                                                 | 1.0                             | 1190                                                   |
| MLL4731A                   | 4.3                                       | 58                              | 9                                                                      | 10                                                 | 1                            | 217                                                                         | 400                                                                 | 1.0                             | 1070                                                   |
| MLL4732A                   | 4.7                                       | 53                              | 8                                                                      | 10                                                 | 1                            | 193                                                                         | 500                                                                 | 1.0                             | 970                                                    |
| MLL4733A                   | 5.1                                       | 49                              | 7                                                                      | 10                                                 | 1                            | 178                                                                         | 550                                                                 | 1.0                             | 890                                                    |
| MLL4734A                   | 5.6                                       | 45                              | 5                                                                      | 10                                                 | 2                            | 162                                                                         | 600                                                                 | 1.0                             | 810                                                    |
| MLL4735A                   | 6.2                                       | 41                              | 2                                                                      | 10                                                 | 3                            | 146                                                                         | 700                                                                 | 1.0                             | 730                                                    |
| MLL4736A                   | 6.8                                       | 37                              | 3.5                                                                    | 10                                                 | 4                            | 133                                                                         | 700                                                                 | 1.0                             | 660                                                    |
| MLL4737A                   | 7.5                                       | 34                              | 4.0                                                                    | 10                                                 | 5                            | 121                                                                         | 700                                                                 | 0.5                             | 605                                                    |
| MLL4738A                   | 8.2                                       | 31                              | 4.5                                                                    | 10                                                 | 6                            | 110                                                                         | 700                                                                 | 0.5                             | 550                                                    |
| MLL4739A                   | 9.1                                       | 28                              | 5.0                                                                    | 10                                                 | 7                            | 100                                                                         | 700                                                                 | 0.5                             | 500                                                    |
| MLL4740A                   | 10                                        | 25                              | 7                                                                      | 10                                                 | 7.6                          | 91                                                                          | 700                                                                 | 0.25                            | 454                                                    |
| MLL4741A                   | 11                                        | 23                              | 8                                                                      | 5                                                  | 8.4                          | 83                                                                          | 700                                                                 | 0.25                            | 414                                                    |
| MLL4742A                   | 12                                        | 21                              | 9                                                                      | 5                                                  | 9.1                          | 76                                                                          | 700                                                                 | 0.25                            | 380                                                    |
| MLL4743A                   | 13                                        | 19                              | 10                                                                     | 5                                                  | 9.9                          | 69                                                                          | 700                                                                 | 0.25                            | 344                                                    |
| MLL4744A                   | 15                                        | 17                              | 14                                                                     | 5                                                  | 11.4                         | 61                                                                          | 700                                                                 | 0.25                            | 304                                                    |
| MLL4745A                   | 16                                        | 15.5                            | 16                                                                     | 5                                                  | 12.2                         | 57                                                                          | 700                                                                 | 0.25                            | 285                                                    |
| MLL4746A                   | 18                                        | 14                              | 20                                                                     | 5                                                  | 13.7                         | 50                                                                          | 750                                                                 | 0.25                            | 250                                                    |
| MLL4747A                   | 20                                        | 12.5                            | 22                                                                     | 5                                                  | 15.2                         | 45                                                                          | 750                                                                 | 0.25                            | 225                                                    |
| MLL4748A                   | 22                                        | 11.5                            | 23                                                                     | 5                                                  | 16.7                         | 41                                                                          | 750                                                                 | 0.25                            | 205                                                    |
| MLL4749A                   | 24                                        | 10.5                            | 25                                                                     | 5                                                  | 18.2                         | 38                                                                          | 750                                                                 | 0.25                            | 190                                                    |
| MLL4750A                   | 27                                        | 9.5                             | 35                                                                     | 5                                                  | 20.6                         | 34                                                                          | 750                                                                 | 0.25                            | 170                                                    |
| MLL4751A                   | 30                                        | 8.5                             | 40                                                                     | 5                                                  | 22.8                         | 30                                                                          | 1000                                                                | 0.25                            | 150                                                    |
| MLL4752A                   | 33                                        | 7.5                             | 45                                                                     | 5                                                  | 25.1                         | 27                                                                          | 1000                                                                | 0.25                            | 135                                                    |
| MLL4753A                   | 36                                        | 7.0                             | 50                                                                     | 5                                                  | 27.4                         | 25                                                                          | 1000                                                                | 0.25                            | 125                                                    |
| MLL4754A                   | 39                                        | 6.5                             | 60                                                                     | 5                                                  | 29.7                         | 23                                                                          | 1000                                                                | 0.25                            | 115                                                    |
| MLL4755A                   | 43                                        | 6.0                             | 70                                                                     | 5                                                  | 32.7                         | 22                                                                          | 1500                                                                | 0.25                            | 110                                                    |
| MLL4756A                   | 47                                        | 5.5                             | 80                                                                     | 5                                                  | 35.8                         | 19                                                                          | 1500                                                                | 0.25                            | 95                                                     |
| MLL4757A                   | 51                                        | 5.0                             | 95                                                                     | 5                                                  | 38.8                         | 18                                                                          | 1500                                                                | 0.25                            | 90                                                     |
| MLL4758A                   | 56                                        | 4.5                             | 110                                                                    | 5                                                  | 42.6                         | 16                                                                          | 2000                                                                | 0.25                            | 80                                                     |
| MLL4759A                   | 62                                        | 4.0                             | 125                                                                    | 5                                                  | 47.1                         | 14                                                                          | 2000                                                                | 0.25                            | 70                                                     |
| MLL4760A                   | 68                                        | 3.7                             | 150                                                                    | 5                                                  | 51.7                         | 13                                                                          | 2000                                                                | 0.25                            | 65                                                     |
| MLL4761A                   | 75                                        | 3.3                             | 175                                                                    | 5                                                  | 56.0                         | 12                                                                          | 2000                                                                | 0.25                            | 60                                                     |
| MLL4762A                   | 82                                        | 3.0                             | 200                                                                    | 5                                                  | 62.2                         | 11                                                                          | 3000                                                                | 0.25                            | 55                                                     |
| MLL4763A                   | 91                                        | 2.8                             | 250                                                                    | 5                                                  | 69.2                         | 10                                                                          | 3000                                                                | 0.25                            | 50                                                     |
| MLL4764A                   | 100                                       | 2.5                             | 350                                                                    | 5                                                  | 76.0                         | 9                                                                           | 3000                                                                | 0.25                            | 45                                                     |



**NOTE 1:** The type numbers shown with an "A" suffix have a  $\pm 5\%$  tolerance on the nominal Zener voltage. Also available with suffix "C" for  $\pm 2\%$ , and "D" for  $\pm 1\%$ , while the absence of a suffix letter denotes  $\pm 10\%$  tolerance.

**NOTE 2:** The Zener impedance is derived from the 60 Hz ac voltage, which results when an ac current having an rms value equal to 10% of the DC Zener current ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed on  $I_{ZT}$  or  $I_{ZK}$ . Zener impedance is measured at two points to insure a sharp knee on the breakdown curve and eliminate unstable units.

**NOTE 3:** The reverse surge current is measured at  $25^\circ\text{C}$  ambient using a  $1/2$  square wave or equivalent sine wave pulse  $1/120$  second duration superimposed on  $I_{ZT}$ .

**NOTE 4:** Voltage measurements to be performed 90 seconds after application of DC current.