



# UDZ SERIES AC POWER ZENER

1, 3, and 5 Watt Zener Diodes

## ABSTRACT

Devices consist of two fused-in-glass zeners brazed cathode to cathode to provide zener action in both directions.

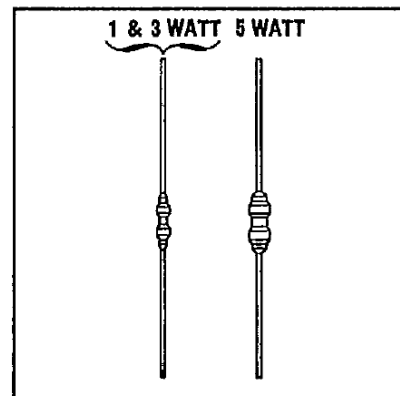
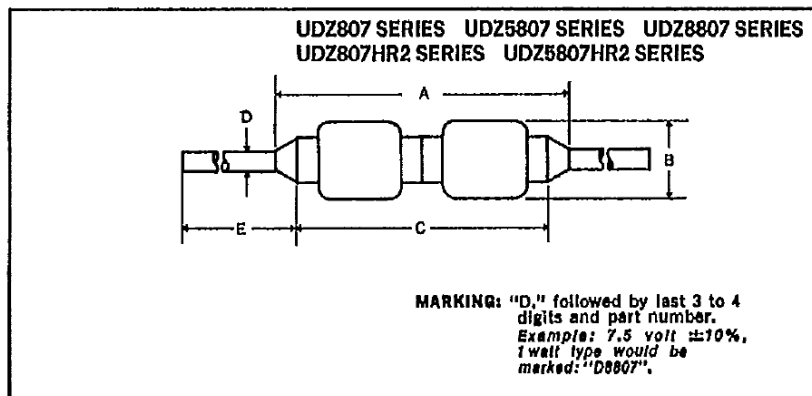
High Surge Ratings, Small Physical Size,

7.5 to 60 Volt

## MAXIMUM RATINGS

|                                         |                                                                |
|-----------------------------------------|----------------------------------------------------------------|
| Zener Voltage .....                     | 7.5 to 60V                                                     |
| Continuous Current .....                | See Tables                                                     |
| Surge Current (8.3ms) .....             | See Tables                                                     |
| Surge Power .....                       | See Graph                                                      |
| Power .....                             | See Data Sheets for Related Series (UZ8807, UZ807, and UZ5807) |
| Storage and Operating Temperature ..... | -65°C to +175°C                                                |

## MECHANICAL SPECIFICATIONS



### Dimensions

1 Watt UDZ807 Series

|   | ins.            | mm            |
|---|-----------------|---------------|
| A | .450 MAX.       | 11.43 MAX.    |
| B | .085 MAX.       | 2.16 MAX.     |
| C | .275 TYP.       | 6.99 TYP.     |
| D | .028 $\pm .001$ | .71 $\pm .03$ |
| E | .700 MIN.       | 17.78 MIN.    |

3 Watt UDZ807/UDZ807HR2 Series

|   | ins.            | mm            |
|---|-----------------|---------------|
| A | .450 MAX.       | 11.43 MAX.    |
| B | .085 MAX.       | 2.16 MAX.     |
| C | .275 TYP.       | 6.99 TYP.     |
| D | .028 $\pm .001$ | .71 $\pm .03$ |
| E | .700 MIN.       | 17.78 MIN.    |

5 Watt UDZ5807/UDZ5807HR2

|   | ins.            | mm             |
|---|-----------------|----------------|
| A | .500 MAX.       | 12.70 MAX.     |
| B | .145 MAX.       | 3.68 MAX.      |
| C | .325 TYP.       | 8.26 TYP.      |
| D | .040 $\pm .001$ | 1.02 $\pm .03$ |
| E | .975 MIN.       | 24.77 MIN.     |

## ELECTRICAL CHARACTERISTICS @ 25°C

| Type                                                      | Nominal Zener Voltage $V_z$ @ $I_{zr}$ | Test Current $I_{zr}$ | Max. Zener Imped $Z_z$ @ $I_{zr}$ | Maximum Leakage @ Reverse Voltage<br>Current $\pm 10\%$ $\pm 5\%$ |       |       | Maximum Cont. Current $I_{zm}$ | Maximum Surge Current $I_s$ |
|-----------------------------------------------------------|----------------------------------------|-----------------------|-----------------------------------|-------------------------------------------------------------------|-------|-------|--------------------------------|-----------------------------|
|                                                           |                                        |                       |                                   | $\mu A$                                                           | Volts | Volts |                                |                             |
| $\pm 10\%$ Tolerance *                                    | Volts                                  | mA                    | Ohms                              |                                                                   |       |       | mA                             | Amps                        |
| 1 WATT ZENERS — Specifications apply for both directions. |                                        |                       |                                   |                                                                   |       |       |                                |                             |
| UDZ8807                                                   | 7.5                                    | 34                    | 6                                 | 50                                                                | 4.9   | 5.2   | 125                            | 5                           |
| UDZ8808                                                   | 8.2                                    | 31                    | 7                                 | 30                                                                | 5.4   | 5.7   | 115                            | 4.5                         |
| UDZ8809                                                   | 9.1                                    | 28                    | 8                                 | 10                                                                | 5.9   | 6.2   | 105                            | 3.9                         |
| UDZ8810                                                   | 10                                     | 25                    | 8.5                               | 3                                                                 | 6.6   | 6.9   | 95                             | 3.37                        |
| UDZ8812                                                   | 12                                     | 23                    | 9                                 | 1                                                                 | 8.6   | 9.1   | 85                             | 2.25                        |
| UDZ8815                                                   | 15                                     | 17                    | 14                                | 0.5                                                               | 10.8  | 11.4  | 63                             | 1.65                        |
| UDZ8818                                                   | 18                                     | 14                    | 20                                | 0.5                                                               | 12.9  | 13.7  | 52                             | 1.12                        |
| UDZ8820                                                   | 20                                     | 12.5                  | 23                                | 0.5                                                               | 14.4  | 15.2  | 47                             | 1.12                        |
| UDZ8824                                                   | 24                                     | 10.5                  | 25                                | 0.5                                                               | 17.3  | 18.2  | 40                             | 0.825                       |
| UDZ8827                                                   | 27                                     | 9.5                   | 35                                | 0.5                                                               | 19.4  | 20.6  | 35                             | 0.825                       |
| UDZ8830                                                   | 30                                     | 8.5                   | 40                                | 0.5                                                               | 21.6  | 22.8  | 31                             | 0.825                       |
| UDZ8833                                                   | 33                                     | 7.5                   | 45                                | 0.5                                                               | 23.7  | 25.1  | 28                             | 0.675                       |
| UDZ8836                                                   | 36                                     | 7.0                   | 50                                | 0.5                                                               | 25.9  | 27.4  | 26                             | 0.562                       |
| UDZ8840                                                   | 40                                     | 6.5                   | 62                                | 0.5                                                               | 28.8  | 30.4  | 24                             | 0.562                       |
| UDZ8845                                                   | 45                                     | 6                     | 75                                | 0.5                                                               | 32.4  | 34.2  | 22                             | 0.450                       |
| UDZ8860                                                   | 60                                     | 4                     | 125                               | 0.5                                                               | 43.2  | 45.6  | 15                             | 0.337                       |



# UDZ SERIES AC POWER ZENER

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## ELECTRICAL CHARACTERISTICS @ 25°C (CONT.)

### 3 WATT ZENERS — Specifications apply for both directions.

|           |     |    |    |     |      |      |     |     |
|-----------|-----|----|----|-----|------|------|-----|-----|
| UDZ807HR2 | 7.5 | 75 | 3  | 500 | 4.9  | 5.2  | 400 | 10  |
| UDZ808HR2 | 8.2 | 75 | 4  | 300 | 5.4  | 5.7  | 360 | 8   |
| UDZ809HR2 | 9.1 | 75 | 4  | 200 | 5.9  | 6.2  | 330 | 7   |
| UDZ810HR2 | 10  | 75 | 5  | 100 | 6.6  | 6.9  | 300 | 5   |
| UDZ812HR2 | 12  | 65 | 5  | 10  | 8.6  | 9.1  | 250 | 4   |
| UDZ815HR2 | 15  | 50 | 6  | 10  | 10.8 | 11.4 | 200 | 3   |
| UDZ818HR2 | 18  | 40 | 8  | 5   | 12.9 | 13.7 | 170 | 2   |
| UDZ820HR2 | 20  | 40 | 9  | 5   | 14.4 | 15.2 | 150 | 2   |
| UDZ824HR2 | 24  | 30 | 10 | 5   | 17.3 | 18.2 | 125 | 1.5 |
| UDZ827HR2 | 27  | 25 | 12 | 1   | 19.4 | 20.6 | 110 | 1.5 |
| UDZ830HR2 | 30  | 25 | 15 | 1   | 21.6 | 22.8 | 100 | 1.5 |
| UDZ833HR2 | 33  | 20 | 21 | 1   | 23.7 | 25.1 | 90  | 1.2 |
| UDZ836HR2 | 36  | 20 | 21 | 1   | 25.9 | 27.4 | 85  | 1   |
| UDZ840HR2 | 40  | 20 | 27 | 1   | 28.8 | 30.4 | 75  | 1   |
| UDZ845HR2 | 45  | 15 | 37 | 1   | 32.4 | 34.7 | 65  | 0.8 |
| UDZ860HR2 | 60  | 10 | 70 | 1   | 43.2 | 45.6 | 50  | 0.6 |

\*For  $\pm 5\%$  voltage tolerance change the 3rd number from the right from 8 to 7 i.e. UDZ8807 to UDZ8707, etc.

†All zener voltages are measured with an automated test set using a 35ms test time. Longer or shorter test times will have a corresponding effect on the measured value due to heating effects.

§Zener impedance is derived from the 60-cycle voltage created when AC current with RMS value of 10% of DC zener test current is superimposed on the test current.

\*\*D.C. Ratings are based on the lead temperature conditions shown in the data sheets covering the UDZ8807, UDZ807, and UDZ5807 series devices. Other conditions will affect the power ratings of all the families except the 1 watt zener family. However, the surge values given apply for any mounting conditions including printed circuit board mounting.

‡Figures shown are for peak sinusoidal surge current of 8.3ms duration using 60 cycle AC. The 8.3ms square pulse rating is 71% of the value shown.

| Type                                                      | Nominal Zener Voltage†<br>V <sub>Z</sub> @ I <sub>ZT</sub> | Test Current<br>I <sub>ZT</sub> | Max. Zener Imped §                     | Maximum Leakage @ Reverse Voltage<br>Current ±10% ±5% |       |       | Maximum Cont. Current<br>I <sub>ZM</sub> | Maximum Surge Current‡<br>I <sub>S</sub> |
|-----------------------------------------------------------|------------------------------------------------------------|---------------------------------|----------------------------------------|-------------------------------------------------------|-------|-------|------------------------------------------|------------------------------------------|
|                                                           |                                                            |                                 | Z <sub>Z</sub><br>@<br>I <sub>ZT</sub> | µA                                                    | Volts | Volts |                                          |                                          |
| ±10%<br>Tolerance *                                       | Volts                                                      | mA                              | Ohms                                   | µA                                                    | Volts | Volts | mA                                       | Amps                                     |
| 5 WATT ZENERS — Specifications apply for both directions. |                                                            |                                 |                                        |                                                       |       |       |                                          |                                          |
| UDZ5807HR2                                                | 7.5                                                        | 175                             | 1.8                                    | 500                                                   | 4.9   | 5.2   | 620                                      | 40                                       |
| UDZ5808HR2                                                | 8.2                                                        | 150                             | 1.8                                    | 400                                                   | 5.4   | 5.7   | 570                                      | 32                                       |
| UDZ5809HR2                                                | 9.1                                                        | 150                             | 2.5                                    | 200                                                   | 5.9   | 6.2   | 510                                      | 24                                       |
| UDZ5810HR2                                                | 10                                                         | 125                             | 2.5                                    | 100                                                   | 6.6   | 6.9   | 470                                      | 22                                       |
| UDZ5812HR2                                                | 12                                                         | 100                             | 2.5                                    | 50                                                    | 8.6   | 9.1   | 385                                      | 18                                       |
| UDZ5815HR2                                                | 15                                                         | 75                              | 3.5                                    | 15                                                    | 10.8  | 11.4  | 300                                      | 12                                       |
| UDZ5818HR2                                                | 18                                                         | 65                              | 4                                      | 10                                                    | 12.9  | 13.7  | 255                                      | 9                                        |
| UDZ5820HR2                                                | 20                                                         | 65                              | 4.5                                    | 10                                                    | 14.4  | 15.2  | 220                                      | 8                                        |
| UDZ5824HR2                                                | 24                                                         | 50                              | 5                                      | 10                                                    | 17.3  | 18.2  | 180                                      | 6.5                                      |
| UDZ5827HR2                                                | 27                                                         | 50                              | 6                                      | 10                                                    | 19.4  | 20.6  | 155                                      | 6                                        |
| UDZ5830HR2                                                | 30                                                         | 40                              | 8                                      | 10                                                    | 21.6  | 22.8  | 140                                      | 5.5                                      |
| UDZ5833HR2                                                | 33                                                         | 40                              | 10                                     | 5                                                     | 23.7  | 25.1  | 130                                      | 5                                        |
| UDZ5836HR2                                                | 36                                                         | 30                              | 11                                     | 5                                                     | 25.9  | 27.4  | 120                                      | 4.5                                      |
| UDZ5840HR2                                                | 40                                                         | 30                              | 14                                     | 5                                                     | 28.8  | 30.4  | 105                                      | 4                                        |
| UDZ5845HR2                                                | 45                                                         | 30                              | 20                                     | 5                                                     | 32.4  | 34.2  | 95                                       | 3.5                                      |
| UDZ5860HR2                                                | 60                                                         | 20                              | 40                                     | 5                                                     | 43.2  | 45.6  | 75                                       | 2.5                                      |

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**Typical Reverse Surge Power  
vs. Surge Duration**

