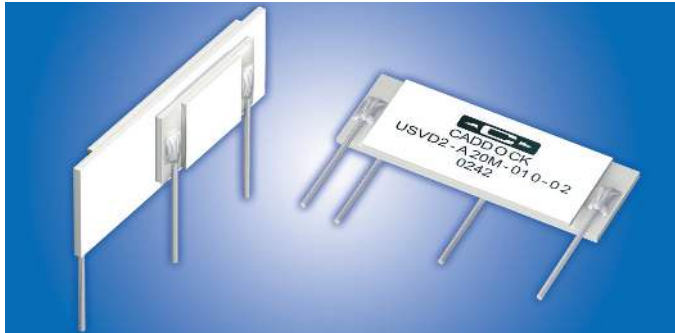


# Type USVD and Type HVD Ultra-Precision Voltage Dividers - 450 Volts to 5 KV



**Type USVD Ultra-Precision Voltage Dividers** have the very highest precision available in voltage dividers in the range of 450 Volts DC up to 2000 Volts DC. These dividers are formed by bonding together two selected Type USF Ultra-Precision Resistors. The precise selection of these high performance resistors, which form the voltage dividers, makes possible the outstanding voltage division performance. Ratio Tolerance as tight as 0.01% and Ratio TC of 2ppm/°C.

**Type HVD Ultra-Precision Voltage Dividers** are monolithic voltage dividers built with ceramic sandwich construction. These voltage dividers have ultra-precision performance in the range of 1500 volts DC to 5000 volts DC, with a Ratio Tolerance of 0.05% and Ratio TC of 5ppm/°C. These dividers are ideal for high performance voltage division applications in medical equipment, laboratory equipment, analytical instruments, etc.

| Part Number             | V <sub>max</sub><br>Continuous<br>Operating<br>Voltage<br>(VDC) | Voltage<br>Division<br>(RT : R2) | Resistance |       |              | Ratio<br>Tolerance<br>(RT : R2) | Ratio T.C.<br>(RT : R2) | Ratio V.C.<br>(RT : R2) | Fig. |
|-------------------------|---|----------------------------------|------------|-------|--------------|---------------------------------|-------------------------|-------------------------|------|
|                         |   |                                  | R1         | R2    | RT = R1 + R2 |                                 |                         |                         |      |
| USVD2 - B1M - 010 - 02  | 450   | 100 : 1                          | 990 K      | 10 K  | 1 Meg        | 0.01%                           | 2 ppm/°C                | 0.05 ppm/V              | 1    |
| USVD2 - B1M - 025 - 02  | 450   | 100 : 1                          | 990 K      | 10 K  | 1 Meg        | 0.025%                          | 2 ppm/°C                | 0.05 ppm/V              | 1    |
| USVD2 - B2M - 010 - 02  | 650   | 100 : 1                          | 1.98 Meg   | 20 K  | 2 Meg        | 0.01%                           | 2 ppm/°C                | 0.02 ppm/V              | 1    |
| USVD2 - B2M - 025 - 02  | 650   | 100 : 1                          | 1.98 Meg   | 20 K  | 2 Meg        | 0.025%                          | 2 ppm/°C                | 0.02 ppm/V              | 1    |
| USVD2 - A10M - 010 - 02 | 1400  | 1,000 : 1                        | 9.99 Meg   | 10 K  | 10 Meg       | 0.01%                           | 2 ppm/°C                | 0.02 ppm/V              | 1    |
| USVD2 - A10M - 025 - 02 | 1400  | 1,000 : 1                        | 9.99 Meg   | 10 K  | 10 Meg       | 0.025%                          | 2 ppm/°C                | 0.02 ppm/V              | 1    |
| USVD2 - B10M - 010 - 02 | 1400  | 100 : 1                          | 9.9 Meg    | 100 K | 10 Meg       | 0.01%                           | 2 ppm/°C                | 0.02 ppm/V              | 1    |
| USVD2 - B10M - 025 - 02 | 1400  | 100 : 1                          | 9.9 Meg    | 100 K | 10 Meg       | 0.025%                          | 2 ppm/°C                | 0.02 ppm/V              | 1    |
| USVD2 - A20M - 010 - 02 | 2000  | 1,000 : 1                        | 19.98 Meg  | 20 K  | 20 Meg       | 0.01%                           | 2 ppm/°C                | 0.02 ppm/V              | 1    |
| USVD2 - A20M - 025 - 02 | 2000  | 1,000 : 1                        | 19.98 Meg  | 20 K  | 20 Meg       | 0.025%                          | 2 ppm/°C                | 0.02 ppm/V              | 1    |
| USVD2 - B20M - 010 - 02 | 2000  | 100 : 1                          | 19.8 Meg   | 200 K | 20 Meg       | 0.01%                           | 2 ppm/°C                | 0.02 ppm/V              | 1    |
| USVD2 - B20M - 025 - 02 | 2000  | 100 : 1                          | 19.8 Meg   | 200 K | 20 Meg       | 0.025%                          | 2 ppm/°C                | 0.02 ppm/V              | 1    |
| HVD5 - A10M - 050 - 05  | 1500  | 1,000 : 1                        | 9.99 Meg   | 10 K  | 10 Meg       | 0.05%                           | 5 ppm/°C                | 0.02 ppm/V              | 2    |
| HVD5 - B10M - 050 - 05  | 1500  | 100 : 1                          | 9.9 Meg    | 100 K | 10 Meg       | 0.05%                           | 5 ppm/°C                | 0.02 ppm/V              | 2    |
| HVD5 - A20M - 050 - 05  | 2500  | 1,000 : 1                        | 19.98 Meg  | 20 K  | 20 Meg       | 0.05%                           | 5 ppm/°C                | 0.02 ppm/V              | 2    |
| HVD5 - B20M - 050 - 05  | 2500  | 100 : 1                          | 19.8 Meg   | 200 K | 20 Meg       | 0.05%                           | 5 ppm/°C                | 0.02 ppm/V              | 2    |
| HVD5 - A50M - 050 - 05  | 5000  | 1,000 : 1                        | 49.95 Meg  | 50 K  | 50 Meg       | 0.05%                           | 5 ppm/°C                | 0.04 ppm/V              | 2    |
| HVD5 - B50M - 050 - 05  | 5000  | 100 : 1                          | 49.5 Meg   | 500 K | 50 Meg       | 0.05%                           | 5 ppm/°C                | 0.04 ppm/V              | 2    |

### Specifications:

**Absolute Tolerance:** ±0.10% for all resistors, measured at +23°C ±2°C.

**Ratio Tolerance (RT : R2):** See table. Ratio Tolerance measured at +23°C ±2°C, at 100 volts DC applied to the divider.

**Absolute TC:** USVD2: 10 ppm/°C, HVD5: 30 ppm/°C, referenced to +25°C, ΔR taken at -40°C and +85°C.

**Ratio Temperature Coefficient (RT : R2):** See table. Ratio Temperature Coefficient from -40°C to +85°C.

**Ratio Voltage Coefficient (RT : R2):** See table. Maximum Ratio V.C. measured at 10% of V<sub>max</sub>. to 100% of V<sub>max</sub>.

**Voltage Rating:** Maximum voltage (volts DC) applied to RT = (R1 + R2). See table.

**Load Life Stability:** Ratio stability with maximum continuous operating voltage applied to the divider for 1000 hours at +85°C, ratio change 0.02% max.

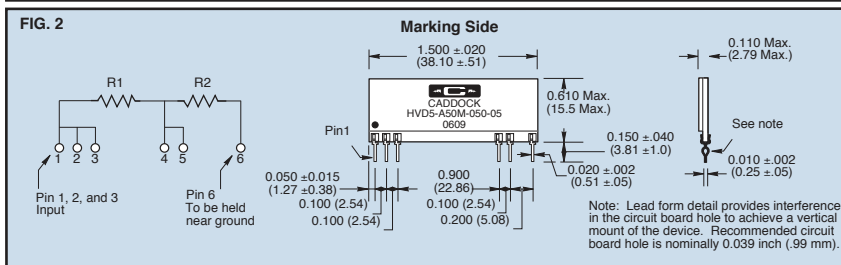
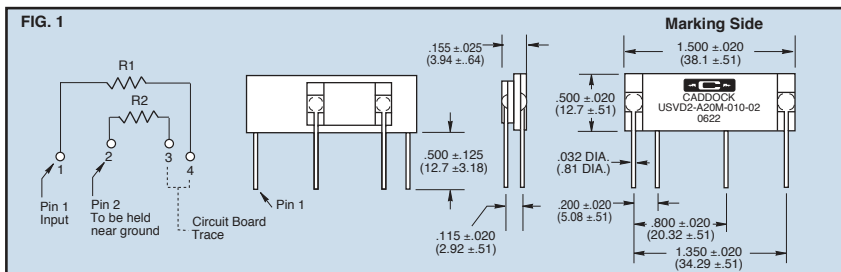
**Overvoltage:** 1.5 times rated voltage for 5 seconds, ratio change 0.02% max.

**Thermal Shock:** Mil-Std-202. Method 107, Cond. A, except minimum temperature is -40°C, ratio change 0.02% max.

**Operating Temperature:** -40°C to +85°C

### Custom Type USVD and Type HVD

**Voltage Dividers:** For high quantity applications (greater than 1000 per year) these voltage dividers can be produced with custom voltage division ratios and ratio specifications that optimize the performance and the cost for your application.



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