

# Type USVD Ultra-Precision Voltage Dividers

Voltage Ratings up to 2000 Volts DC • Ratio Tolerance to 0.01% • Ratio TC: 2 ppm/°C

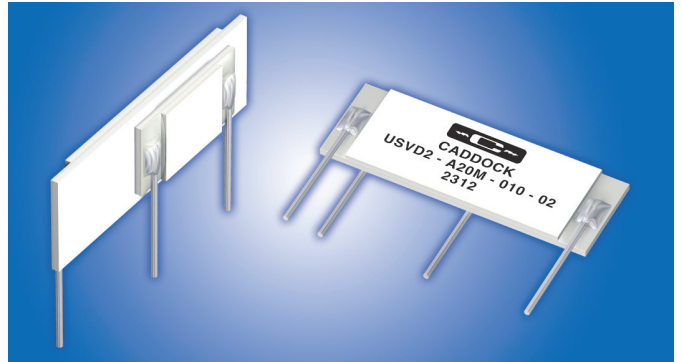
**Type USVD Ultra-Precision Voltage Dividers** have the highest precision available in the voltage range of 450 Volts DC to 2000 Volts DC. These voltage dividers are formed by bonding together two selected USF300 Series Ultra-Precision Resistors. The precise selection of the USF300 Resistors makes possible the outstanding voltage divider performance:

- Ratio Tolerance as tight as 0.01%
- Ratio TC: 2 ppm/°C

The USVD2 voltage dividers are ideal for high performance DC voltage measurement applications in Test & Measurement Equipment, Medical Equipment, Industrial Equipment, and Laboratory Equipment.

For Ultra-Precision Voltage Dividers, with higher voltage ratings of up to 5000 Volts DC, see the **Type HVD5 Voltage Dividers**.

For Voltage Dividers designed for AC Power Quality Monitoring and Metering applications, see the **Type VMN Voltage Monitoring Resistor Networks** that provide outstanding precision and long-term stability in electrical service monitoring applications, with transient voltage conditions.



## Specifications:

**Ratio Tolerance (RT : R2):** 0.01% or 0.025%, measured at +23°C ±2°C, with 100 volts DC applied to the divider.

**Ratio TC (RT : R2):** 2 ppm/°C, referenced to +25°C, ΔR taken at -40°C and +85°C

**Ratio Voltage Coefficient (RT : R2):** See table. Ratio VC measured at 10% to 100% of Vmax.

**Absolute Tolerance:** ±0.1% for all resistors, measured at +23°C ±2°C.

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

**Voltage Rating (Vmax):** Maximum Continuous Operating Voltage (DC) applied to RT, see Table.

**Overvoltage:** 1.5 times Vmax, applied to RT for 5 seconds, ratio change 0.01% max.

**Ratio Stability Under Load:** Change in Ratio, with Vmax. applied to the Divider

Ambient +85°C: Initial 1,000 hours ratio change 0.015% max.

Ambient +50°C: Initial 1,000 hours ratio change 0.01% max.

**Shelf Ratio Stability:** Less than 20 ppm/yr, typical, for the first year. Extended Shelf Ratio Stability (10 years) 10 ppm/yr, maximum.

**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

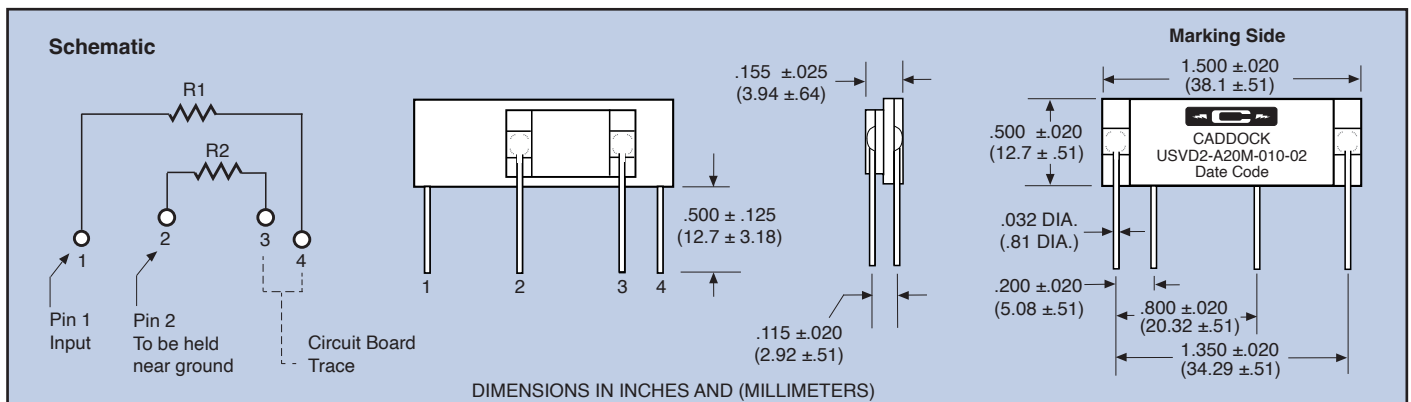
**Terminal Finish:** Matte Tin (Sn)

Part Number	Vmax Maximum Continuous Operating Voltage (VDC)	Voltage Divider Ratio RT : R2	Resistance			Ratio Tolerance (RT : R2)	Ratio TC (RT : R2)	Ratio VC (RT : R2)
			R1	R2	RT = R1 + R2			
USVD2-B1M-010-02	450	100 : 1	990K	10 K	1 Meg	0.01%	2 ppm/°C	0.05 ppm/V
USVD2-B1M-025-02	450	100 : 1	990K	10 K	1 Meg	0.025%	2 ppm/°C	0.05 ppm/V
USVD2-B2M-010-02	650	100 : 1	1.98 Meg	20 K	2 Meg	0.01%	2 ppm/°C	0.02 ppm/V
USVD2-B2M-025-02	650	100 : 1	1.98 Meg	20 K	2 Meg	0.025%	2 ppm/°C	0.02 ppm/V
USVD2-A10M-010-02	1400	1,000 : 1	9.99 Meg	10 K	10 Meg	0.01%	2 ppm/°C	0.02 ppm/V
USVD2-A10M-025-02	1400	1,000 : 1	9.99 Meg	10 K	10 Meg	0.025%	2 ppm/°C	0.02 ppm/V
USVD2-B10M-010-02	1400	100 : 1	9.90 Meg	100 K	10 Meg	0.01%	2 ppm/°C	0.02 ppm/V
USVD2-B10M-025-02	1400	100 : 1	9.90 Meg	100 K	10 Meg	0.025%	2 ppm/°C	0.02 ppm/V
USVD2-A20M-010-02	2000	1,000 : 1	19.98 Meg	20 K	20 Meg	0.01%	2 ppm/°C	0.02 ppm/V
USVD2-A20M-025-02	2000	1,000 : 1	19.98 Meg	20 K	20 Meg	0.025%	2 ppm/°C	0.02 ppm/V
USVD2-B20M-010-02	2000	100 : 1	19.80 Meg	200 K	20 Meg	0.01%	2 ppm/°C	0.02 ppm/V
USVD2-B20M-025-02	2000	100 : 1	19.80 Meg	200 K	20 Meg	0.025%	2 ppm/°C	0.02 ppm/V

**Custom Type USVD Voltage Dividers** are formed from USF300 Series Resistors with Standard Resistance Values to achieve custom Voltage Division Ratios between 100:1 and 1,000:1: available with an MOQ of 250 pieces. See the Type USF Data Sheet for a list of Standard Resistance Values.

A customized version of the standard Type USVD Voltage Dividers, that has specifications adjusted to optimize the performance and cost for your application (such as ratio tolerance of 0.05% and ratio TC of 5 ppm/°C): available with MOQ of 1,000 pieces.

For assistance, contact Caddock Applications Engineering by phone (541-496-0700) or email (caddock@caddock.com).



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