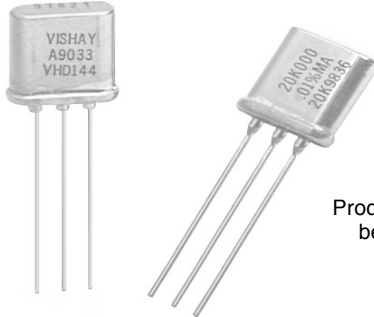


### Bulk Metal<sup>®</sup> Foil Technology Small Package, Ultimate Tracking Voltage Dividers



Product may not  
be to scale

Vishay Models VHD200 and VHD144 are hermetic versions of the molded divider 300144 shown on the first page of "300144 and 300145." The difference between them is that the VHD144 has the full power rating of the 300144 while the VHD200 has a reduced power rating in exchange for a full spectrum of values without the time delay for new artwork (for values not yet tooled) and without NRE charges. Further, the ratio match and the TCR tracking of the VHD200 are considerably improved over all of the above.

The value of the hermetic enclosure over the molded part is in the long term performance. Moisture and oxygen both pass through plastic and both contribute to long term degradation of resistive elements. Divider ratios of 1:1 are not as likely to lose ratio with time but as the ratios become greater, the imbalance of power has more effect on the ratio stability and the hermetic enclosure becomes of paramount importance.

#### FEATURES

- Temperature Coefficient of Resistance:  
Nominal TCR: 0.6ppm/°C (0° to 60°C)  
2.0ppm/°C (– 55° to + 125°C)  
TCR Tracking: VHD200 to ± 0.1ppm/°C  
VHD144 to ± 0.5ppm/°C
- Ratio Stability: < ± 0.001% (10ppm) under load-life conditions
- Ratio Tolerance: VHD200 to ± 0.001% (10ppm)  
VHD144 to ± 0.005% (50ppm)
- Thermal EMF: 0.05μV/°C (typical)  
0.10μV/°C (maximum) between leads
- Rise Time: to 1ns, no ringing
- Noise Factor: < – 40dB
- Non Inductive: < 0.08μH

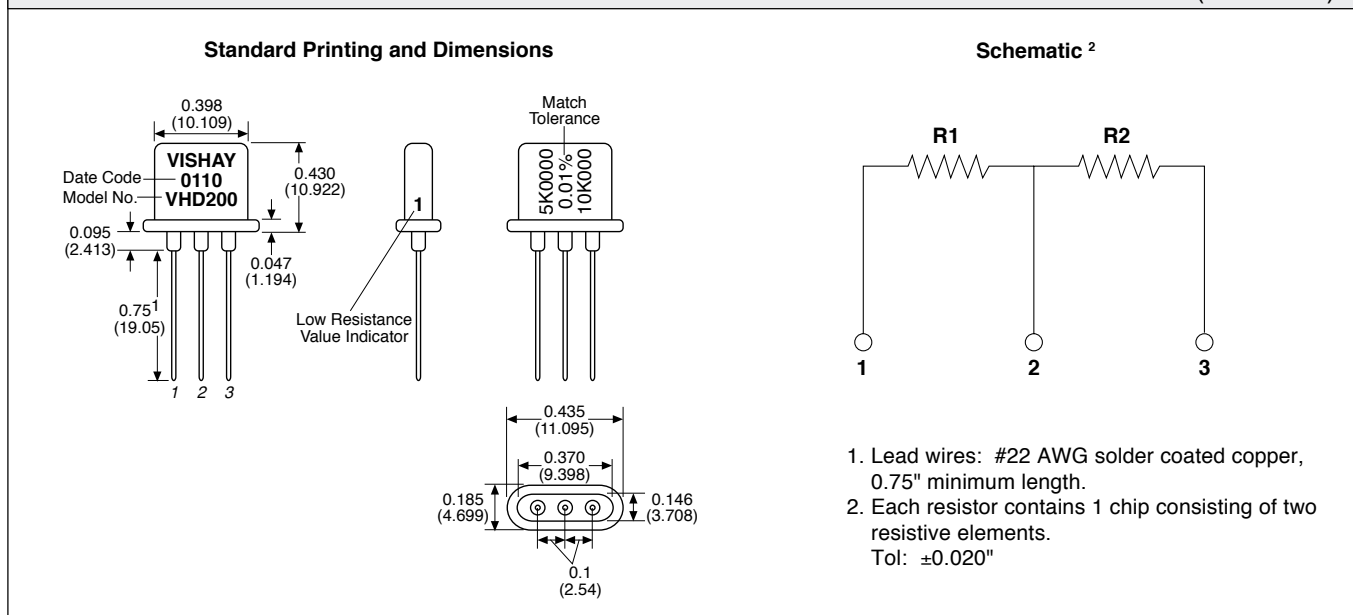
#### ORDERING INFORMATION - VHD200 AND VHD144

Specify Vishay Ultra Precision Miniature Voltage Dividers as follows:

| MODEL NUMBER | RESISTANCE VALUE* | ABSOLUTE TOLERANCE | RATIO MATCH TOLERANCE | TCR TRACKING |
|--------------|-------------------|--------------------|-----------------------|--------------|
| VHD144       | R1 = 5KΩ          | ±0.05%             | ±0.01%                | 0.5ppm/°C    |
|              | R2 = 10KΩ         | ±0.05%             |                       |              |

\*Specify the resistance value for each resistor of the set — even if all values are the same.

**FIGURE 1 - VHD200 AND VHD144 STANDARD PRINTING AND DIMENSIONS** in inches (millimeters)



**TABLE 1 - VHD200 AND VHD144 SPECIFICATIONS**

| VISHAY<br>MODEL     | RESISTANCE<br>RATIO<br>AVAILABLE <sup>1</sup><br>(Ω)  | POWER<br>RATING <sup>3, 6</sup>  | STANDARD RESISTANCE TOLERANCE |                             | TCR TRACKING<br>AVAILABLE TO                                    | SHELF LIFE<br>STABILITY<br>(ppm/yr) |
|---------------------|---|--|-------------------------------|-----------------------------|---|-------------------------------------|
|                     |   |  | ABSOLUTE<br>AVAILABLE TO      | RATIO MATCH<br>AVAILABLE TO |   |                                     |
| VHD200 <sup>2</sup> | Any value from<br>100 Ω to 20K<br>per side  | 0.1W @ +85°C (for<br>the entire resistive<br>element R1 + R2)<br>divided proportion-<br>ally between the<br>two elements<br>(over 10K). <sup>4</sup> | ±0.005%                       | ±0.001%                     | ±0.1 ppm/°C   | 5                                   |
| VHD144 <sup>5</sup> | 100/100<br>100/12.3K<br>500/500<br>500/15K<br>800/800<br>1K/1K<br>1K/2K<br>1.5K/3K<br>2K/2K<br>2K/3K<br>2K/4K<br>2K/20K<br>2.7K/10K<br>3K/6K<br>5K/5K<br>5K/10K<br>5.5K/7.7K<br>6K/6K<br>6K/20K<br>10K/10K<br>10K/20K<br>15K/15K<br>20K/20K | 0.2W @ +85°C (for<br>the entire resistive<br>element R1 + R2)<br>divided proportion-<br>ally between the<br>two elements.                            | ±0.005%                       | ±0.005%                     | < ±0.5 ppm/°C<br>For Like Values<br><br>< ±1 ppm/°C<br>Standard | 5                                   |

- For resistance ratios outside the range, contact Vishay's Applications Engineering Department.
- The VHD200 is available in any required ratio between the resistance values of 100 ohms and 20Kohms, such that R1 can be any value between 100 ohms and 20Kohms and R2 can also be any value between 100 ohms and 20Kohms.
- Power is proportional to the divider ratio.  
Example: In a VHD144 (1K/10K dual), the power rating would be 18 mW on the 1K and 182mW on the 10K, for a total of 200mW on R1 + R2.

$$P_1 = \left( \frac{R_1}{R_1 + R_2} \right) P \quad P_2 = \left( \frac{R_2}{R_1 + R_2} \right) P$$

- For power rating below 10K, contact the Applications Engineering Department.
- Any value from 100 ohms to 20Kohms inclusive is available with some derating of power.
- Maximum working voltage is 200 Volts.

This datasheet has been download from:

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Datasheets for electronics components.