

# **Type HB Series**

### **Key Features**

- Up to 15kV Element Voltage
  - Unique specification for the most demanding applications
- High Ratio of Size to Power
  - The solution to your PCB population problems
- 1kW to 1GW
  - Coupled with 1% tolerance gives ultimate design flexibility
- Established Product with Proven Reliability
- Low Inductance
  For the fastest switching speeds

### **Applications**

- High Voltage
- Voltage Divider
- Surge
- Filter
- Balancing
- Inrush Limiting



TE Connectivity (TE) is a leading supplier of standard and custom designed high value/high voltage resistors for high voltage, industrial, control, medical and general-purpose use. The HB is a tough epoxy coated high voltage resistor, with axial or radial leads, values up to 1G Ohm and an operational voltage to 20kV as standard and 30kV to order. The resistors are made from quality materials for optimum reliability and stability. TE can test resistors to conform to relevant international, MIL or customer specifications. TE is happy to advise on the use of resistors for high frequency applications and to supply information for high voltage use.

#### **Characteristics - Electrical**

|  |  | HBA                                  | HB1                     |                     | HB3                  |  |
|--|--|--------------------------------------|-------------------------|---------------------|----------------------|--|
| Power Dissipation - Power @ 20°C (W):                  |  | 0.8                                  | 2.0                     |                     | 4.0                  |  |
| @ 70°C:  |  | 0.4                                  | 1.0                     |                     | 2.0                  |  |
| Ohmic Value - Min (Ohms):                              |  | 1K                                   | 10K                     |                     | 10K                  |  |
| Max:   |  | 120M                                 | 1G                      |                     | 1G                   |  |
| Resistance Tolerance (%) (Tighter By Request):         | 19                                     | %, 2%, 5%                            | 1%, 2%, 5               | 1%, 2%, 5% 1%, 2%   |                      |  |
| Maximum Working Voltage - DC or ACrms (Volts):         |  | 1kV                                  | 7.5kV                   | 7.5kV               |                      |  |
| Insulation Resistance - Epoxy Coated, @500V dc (Ohn    | ıs):                                   | >10 <sup>6</sup> MΩ                  | >10 <sup>6</sup> MΩ >10 |                     | >10 <sup>6</sup> MΩ  |  |
| Load Stability - 1000hr's @ 70°C (%):                  |  | ±0.5%                                | ±0.5% ±0                |                     | ±0.5%                |  |
| Temp. Rapid Change55°C to 125°C for 5 cycles (ΔR)      | :                                      | ±0.1%                                | ±0.1% ±                 |                     | ±0.1%                |  |
| Endurance - 1000 Hours @ 200°C (ΔR):                   |  | <=2%                                 | <=2%                    |                     | <=2%                 |  |
| Resistance to Soldering Heat - 350°C for 3.5seconds (A | ∆R):                                   | 0.05%                                | 0.05%                   | 0.05% 0.05%         |                      |  |
| Temperature Coefficient (ppm/°C):                      | ±1                                     | 00ppm/°C                             | ±100ppm/                | ±100ppm/°C ±100ppr  |                      |  |
| (±20ppm/°C available to special order)                 |  |                                      |                         |                     |                      |  |
| Voltage Coefficient:                                   | Ne                                     | Negligible up to 100K Negligible     |                         | ble up to 200K      |                      |  |
|  | Increasing to 0.02ppm//olt at 800K     |                                      | Inc                     | Increasing to       |                      |  |
|  | Increasing to 0.02ppm/volt at 800K     |                                      |                         | 0.01ppm/Volt at 1M0 |                      |  |
|  | Incroasir                              | Increasing to 1 Oppm Volt at 5M0     |                         |                     | Increasing to        |  |
|  | 111010031                              | 1.0ppm                               |                         |                     | m/Volt at 10M        |  |
|  | Increasir                              | Increasing to 2 0ppm//olt at 50M     |                         | reasing to          |                      |  |
|  | in ici cabii                           | 2 2 2.000 2.000 2.000 2              |                         |                     | 2.0ppm/Volt at 100M  |  |
|  | Increasing                             | reasing to 8.0ppm/Volt at 1000M 8.0p |                         |                     | reasing to           |  |
|  | norodonię                              |                                      |                         |                     | 8.0ppm/Volt at 1000M |  |
| Ambient Temperature Range (°C):                        | -55 to 1                               | 5 to 125 -55 to 125                  |                         | -5                  | 5 to 125             |  |
| Long Term Damp Heat (%):                               | 0.25%                                  | <b>b</b>                             | 0.25% 0.25%             |                     | 0.25%                |  |
| (Steady state 56 Days 95% RH at 40°C)                  |  |                                      |                         |                     |                      |  |
| Noise (Quantech) Dependent                             | -20dB (0.1 $\mu$ V/V) at lower values  |                                      |                         |                     |                      |  |
| on Resistor Type and Value:                            | +10dB (3.3 $\mu$ V/V) at higher values |                                      |                         |                     |                      |  |
| Encapsulation:   | Epoxy coating (Optional)               |                                      |                         |                     |                      |  |
| Solvent Resistance:                                    | Print will withstand the action of all |                                      |                         |                     |                      |  |
|  | commonly used industrial solvents.     |                                      |                         |                     |                      |  |
| Lead Material:   | Tinned copper wire                     |                                      |                         |                     |                      |  |
| Lead Length:   | Minimum 20mm                           |                                      |                         |                     |                      |  |
| Lead Diameter:   |  | Nomina                               | al 0.6 ± 0.05           | mm                  |                      |  |
|  |  |                                      |                         |                     |                      |  |

Dimensions are in millimeters and inches unless otherwise specified. Values in brackets are standard equivalents. Dimensions are shown for reference purposes only. Specifications subject to change. For email, phone or live chat, go to: te.com/help



High Value / High Voltage Resistors

## **Type HB Series**

### Dimensions -Type HBA, HB1 & HB3 (Radial)

Type HB1 & HB3 (Axial)



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| Туре |              | Α    | В    | С    | D    | E    | F    | G    | н   | I   |
|------|--------------|------|------|------|------|------|------|------|-----|-----|
| HBA  | Uncoated     | 10.2 | 7    | 1.75 | 60.2 | 5.0  | -    | -    | -   | -   |
|      | Epoxy Coated | 12.5 | 8    | 2.6  | 60.5 | 5.0  | -    | -    | -   | -   |
| HB1  | Uncoated     | 8.4  | 26   | 1.5  | 33.8 | 22.9 | 26   | 66   | 1.5 | 8.4 |
|      | Epoxy Coated | 10.4 | 26.5 | 3.0  | 35.8 | 22.9 | 26.3 | 66   | 3   | 9.2 |
| HB3  | Uncoated     | 8.4  | 51.1 | 1.5  | 33.8 | 48.3 | 51.1 | 91.1 | 1.5 | 8.4 |
|      | Epoxy Coated | 10.4 | 52   | 3.0  | 35.8 | 48.3 | 53.5 | 91.1 | 3   | 9.6 |

**Derating Curve** 



### **Surface Temperature Rise**



### How to Order

| HB 3   |              | 3            | 1K0 J                   |            | Z                  | R               | E                     |  |
|--|--------------|--------------|-------------------------|------------|--------------------|-----------------|-----------------------|--|
|  |              |              |                         |            |                    |                 |                       |  |
| Co   | ommon Part   | Power Rating | <b>Resistance Value</b> | Tolerance  | Temp. Coefficient  | Lead Style      | <b>Coating Styles</b> |  |
|  |              | @ 70°C       | 1Kohm                   |            | of Resistance      |                 |                       |  |
| HB- High Value /<br>High Voltage<br>Resistor | A 0.4W/      | (1000Ω)      | F - 1%                  |            | R - Radial Leads   |                 |                       |  |
|  | High Voltage | A - 0.4VV    | 1K0                     | G - 2%     |                    | A - Axial Leads | E - Epoxy             |  |
|  | 1 - 1.0W     | 1Mohm        | 1 59/                   | Z - 100ppm | (HB1, HB3 only for | Blue Coating    |                       |  |
|  |              | 3 - 2.0W     | (1000000Ω)<br>1M0       | J - 5%     |                    | Axial Leads)    |                       |  |

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