

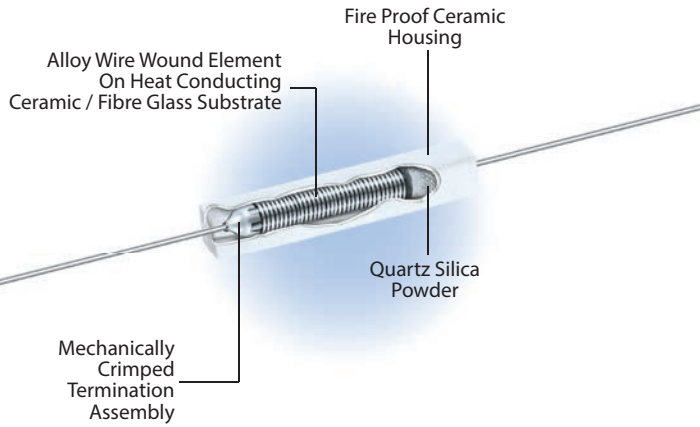


WIRE WOUND RESISTORS  
CERAMIC ENCASED TYPE

**HEA**  
SERIES

EUROPEAN STYLE  
Power Ceramic Encased  
Wire Wound

- 1 W to 17 W
- R025 to 82K
- Non Inductive Aryton-Perry style available upto 1K0

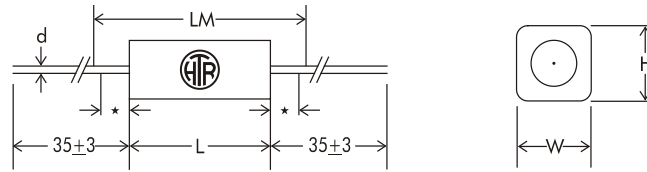




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## PHYSICAL CONFIGURATION



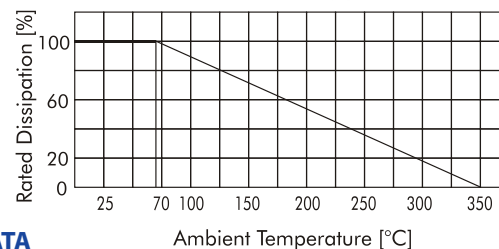
\*6mm, reduced solderability in this area

| HTR TYPE      | POWER RATING at 70°C | DIMENSIONS (mm) |      |      |         |         | RESISTANCE RANGE |     | TYPICAL WEIGHT PER PC (gms) |
|---------------|----------------------|-----------------|------|------|---------|---------|------------------|-----|-----------------------------|
|               |                      | L ±1.5          | W ±1 | H ±1 | d ±0.05 | * LM ±1 | min              | max |                             |
| C-1B          | 1W                   | 13.0            | 6.0  | 6.0  | 0.8     | 35      | R025             | 5K6 | 1.3                         |
| C-2A          | 2.5W                 | 15.0            | 6.0  | 6.0  | 0.8     | 35      | R025             | 6K8 | 1.6                         |
| C-4           | 4W                   | 20.0            | 6.0  | 6.0  | 0.8     | 40      | R04              | 11K | 2.0                         |
| C-5B          | 5W                   | 25.0            | 6.0  | 6.0  | 0.8     | 45      | R05              | 16K | 2.3                         |
| C-6           | 6W                   | 30.0            | 6.0  | 6.0  | 0.8     | 50      | R10              | 22K | 2.8                         |
| C-7A          | 7W                   | 38.0            | 6.0  | 6.0  | 0.8     | 60      | R10              | 33K | 4.9                         |
| C-7B/<br>C-8  | 7W<br>8W             | 25.0            | 9.0  | 9.0  | 0.8     | 45      | R05              | 16K | 4.8                         |
| C-9/<br>C-10A | 9W/<br>10W           | 38.0            | 9.0  | 9.0  | 0.8     | 60      | R10              | 33K | 7.3                         |
| C-11          | 11W                  | 50.0            | 9.0  | 9.0  | 0.8     | 70      | R10              | 47K | 9.5                         |
| C-17          | 17W                  | 75.0            | 9.0  | 9.0  | 0.8     | 95      | R10              | 82K | 13.8                        |

\* For resistance values less than R10 and tolerance less than ±2%, please measure resistance over centered length LM.

\* If customer requires extra tough moulding then mark resistor with letter "GS"

## DERATING CURVE



## ELECTRICAL AND ENVIRONMENTAL CHARACTERISTICS/ DATA

| PARAMETER/PERFORMANCE TEST & TEST METHOD   | PERFORMANCE REQUIREMENTS   |
|--|--|
| <b>Power Rating</b> (Rated Ambient Temperature)  | Full Power dissipation at 70°C and linearly derated to zero at 350°C (Refer Derating Curve above)  |
| <b>Resistance Tolerances Available</b>   | ±10% (K); ±5% (J); ±3% (H); ±2% (G); ±1% (F)   |
| <b>Temperature Range</b>   | -55°C to +350°C with suitable derating as per derating curve   |
| <b>Voltage Rating / Limiting Voltage / Max. Working Voltage</b>  | $V = \sqrt{P \times R}$  |
| <b>Maximum Overload Voltage</b>  | Varies depending on resistance value, duration of overload and type of pulse waveform (contact factory for details)  |
| <b>Voltage Proof / Dielectric Withstanding Voltage</b> (based on limiting voltage x 2 for 60 secs)               | $\Delta R \pm [1\% + R05]$ - No flashover, mechanical damage, arcing or insulation breakdown   |
| <b>Short Time Overload</b> (5 x Rated Power for 5 secs)  | $\Delta R \pm [2\% + R05]$   |
| <b>Temperature Co-efficient of Resistance</b>  | ± 120 ppm/°C for <R10 (Average)<br>± 80 ppm/°C for <R0 (Average)<br>± 60 ppm/°C for <100R (Average)<br>± 90 ppm/°C or ± 30 ppm/°C for >100R depending on wire selected |
| <b>Insulation Resistance</b>   | >1000MΩ (Min)  |
| <b>Temperature Cycling</b> (Room Temperature → -55°C → Room Temperature → 200°C → Room Temperature for 5 cycles) | $\Delta R \pm [2\% + R05]$   |
| <b>Damp Heat</b> (Steady State) (40°C at 93% R.H for 1000 hours - no load applied)                               | $\Delta R \pm [2\% + R05]$ - Average   |
| <b>Endurance - Load life</b> (70°C with limiting voltage - 1.5 hours on / 0.5 hours off for 1000 hours)          | $\Delta R \pm [\leq 3\% + R05]$ - Average  |



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## MECHANICAL SPECIFICATIONS

| PARAMETER/PERFORMANCE TEST & TEST METHOD                        | PERFORMANCE REQUIREMENTS               |
|---|--|
| <b>Terminal Tensile Strength</b>                                | 50 Newtons                             |
| <b>Resistance to Soldering Heat</b> (260°C - 270°C for 10 secs) | $\Delta R \pm [0.2\% + R05]$ - Typical |
| <b>Solderability</b> (As per IEC - 60068 - 2 - 20Ta)            | Must meet the requirements laid down   |
| <b>Marking</b>  | As per IEC Pub. 60062                  |

## TYPICAL APPLICATIONS

HEA series enjoys a wide market in audio and TV field.

Apart from these applications and as they are available in close tolerance, they have increasingly found favour with OEM's in the industrial field, especially where the following properties are required -

- a) High degree of insulation
- b) Low surface temperature

Depending on resistance value and application, the resistors core may be fiberglass or ceramic. These resistors are also available for use in pulse application. For further information please refer to "Pulse / Surge capability of resistors".

In case tailor-made pulse resistor is required, please refer to "Questionnaire of data required" and provide data accordingly.

Note :

1. The ceramic cases used may be steatite ceramic or cordierite ceramic or high alumina ceramic. Thus, the ceramic cases may be off-white or variations of brown / grey, colours which are inherent to these ceramic material.
2. In case the device is to be subjected to aggressive solvents, please inform factory so case filling can be changed to solvent resistant type.

TAPING: Types C-2A, C-4, C-5B, C-6, C-7A, C7B, C8, C-9, C-10A, C11 can be supplied in taped form. Please refer to Tape / Reel specifications.

## ORDERING INFORMATION

| Series | HTR type | Packing   | Resistance Value | Tolerance |
|--------|----------|---|------------------|-----------|
| HEA    | C4 / C4* | Bulk C4 / C4*<br>Tape & Ammo C4T / C4*T<br>Tape & Reel C4TR / C4*TR | 100R             | J         |

1. For RoHS version - C-4 \*
2. For Pulse type - C-4 I
3. For Non Inductive type - N C-4
4. For Tape / Reel - C-4 TR
5. C4\* GS - "GS" stands for grey silicon - applicable for customer who washes PCB with solvents.