

**SURFACE MOUNT RESISTORS  
CERAMIC ENCASED TYPE**

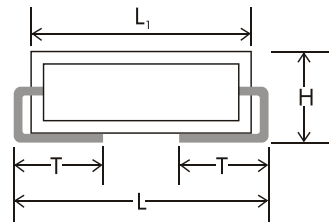
**HCAS  
SERIES  
POWER TYPE**

**Ceramic Encased Wire  
Wound Resistors  
Surface Mount -  
Fire Retardant**

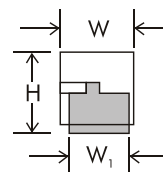
- Fusible safety version available
- Tape and Reel packing available
- Non Inductive style with Aryton - Perry winding available
  - 2W to 3W
  - R10 to 5K6



**PHYSICAL CONFIGURATION**



**SIDE VIEW**



**PROFILE**

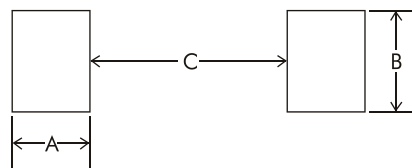
SURFACE MOUNT RESISTORS CERAMIC ENCASED TYPE  
**HCAS**

| HTR TYPE | POWER RATING 70°C | DIMENSIONS (mm) |                |            |            |                |            | RESISTANCE RANGE |     | TYPICAL WEIGHT PER PC (gms) | SIZE | PACKING NO. OF PCS PER REEL |
|----------|-------------------|-----------------|----------------|------------|------------|----------------|------------|------------------|-----|-----------------------------|------|-----------------------------|
|          |                   | L               | L <sub>1</sub> | H          | W          | W <sub>1</sub> | T          | min              | max |                             |      |                             |
| C2S      | 2W                | 11.0 (±0.8)     | 10.0 (±0.7)    | 5.3 (±0.6) | 7.0 (±0.7) | 5.5 (±0.3)     | 2.25 (min) | R10              | 1K6 | 0.8                         | 4527 | 1000                        |
| C3S      | 3W                | 17.0 (±0.8)     | 16.0 (±0.7)    | 7.8 (±0.6) | 7.0 (±0.7) | 5.5 (±0.3)     | 2.5 (min)  | R10              | 5K6 | 2.0                         | 6927 | 700                         |

• For Non Inductive winding, please reduce maximum resistance to one half of value shown.

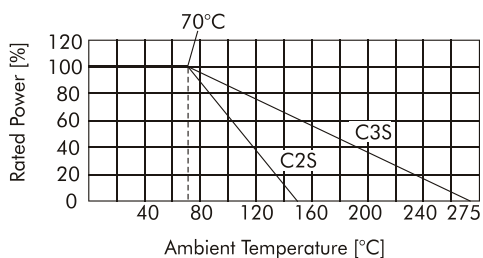
**IMPORTANT MOUNTING / ASSEMBLY DATA**

For the guidance of the design engineer, our applications laboratory has given the recommended pad size and geometry which is shown below :

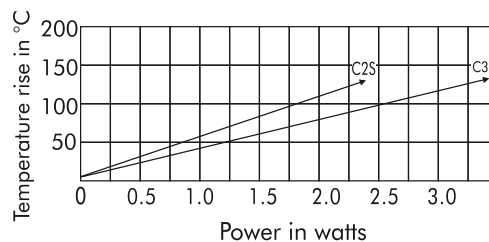


| HTR TYPE | DIMENSIONS (mm) |      |       |
|----------|-----------------|------|-------|
|          | A               | B    | C     |
| C2S      | 3.94            | 5.84 | 5.21  |
| C3S      | 3.94            | 5.97 | 11.94 |

**DERATING CURVE**



**TEMPERATURE RISE CURVE**





SURFACE  
MOUNT  
RESISTORS  
CERAMIC EN-  
CASED TYPE  
**HCAS**

## 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 275°C for C3S / C3FS & at 160°C for C2S / C2FS (Refer Derating Curve above) |
| <b>Resistance Tolerances Available</b>  | ±10% (K); ±5% (J); ±3% (H); ±2% (G); ±1% (F)   |
| <b>Operating Temperature Range</b>  | -55°C to +160°C (C2S / C2SFS) and -55°C to +275°C (C3S / C3SFS) with suitable derating as per derating curve                               |
| <b>Voltage Rating / Limiting Voltage / Max Working Voltage</b>  | $V = \sqrt{P \times R}$  |
| <b>Voltage Proof / Dielectric Withstanding Voltage</b><br>(based on 1000V rms for 60 secs)              | $\Delta R \pm [0.2\% + R05]$ -<br>No flashover or mechanical damage  |
| <b>Insulation Resistance</b> (MIL STD 202F - Test Method 302)   | >1000M (Min)   |
| <b>Short Time Overload</b> (5 x Rated Power for 5 secs)   | $\Delta R \pm [0.2\% + R05]$ - Average   |
| <b>Temperature Co-efficient of Resistance</b>   | <1R0 ±80 ppm/°C<br><100R ±60 ppm/°C<br>>100R ±90 ppm/°C or ±30 ppm/°C<br>(Depending on wire selected)                                      |
| <b>Thermal Shock</b> [-65°C to +125°C, 5 cycles, 15 min. at each extreme temperature]                   | $\Delta R \pm [0.2\% + R05]$ - Average   |
| <b>Temperature Rise</b> (Ambient 30°C)  | Refer Temperature Rise Curve shown above   |
| <b>Moisture Resistance</b> (MIL STD 202F - Test Method 106E with step 7b eliminated)                    | $\Delta R \pm [0.5\% + R05]$ - Average   |
| <b>Damp Heat</b> (Steady State) / <b>Humidity</b><br>(40°C at 95% R.H for 250 hours)                    | $\Delta R \pm [0.5\% + R05]$ - Typical   |
| <b>Endurance - Load Life</b> (70°C with limiting voltage - 1.5 hours on / 0.5 hours off for 1000 hours) | $\Delta R \pm [1.0\% + R05]$ - Average   |
| <b>Solvent Resistance</b> [IPA for 60 secs ± 10 secs]   | No effect on case filling / marking  |

## MECHANICAL SPECIFICATIONS

| PARAMETER/PERFORMANCE TEST & TEST METHOD                | PERFORMANCE REQUIREMENTS   |
|---|--|
| Resistance to Soldering Heat (260°C - 270°C for 4 secs) | $\Delta R \pm [0.5\% + R05]$ - Typical                           |
| Solderability (MIL STD 202F - Test Method 208F)         | Must meet the requirements laid down (95% satisfactory coverage) |

- At HTR, a special "Safety Version" is available in HCAS series for resistance values  $\geq 10R$  wherein the resistor will fuse instantaneously when mains voltage 220/240V is applied with no flame or explosion.
- For resistance values  $< 10R$ , the fusing time and suitability must be tested and validated by the buyer for his particular application.
- For Tape and Reel packing, add 100% to typical weight per pc given to ascertain gross weight of consignment.

Note: The ceramic cases used may be steatite ceramic or cordierite ceramic or high alumina ceramic. Hence, the ceramic cases may be off-white or variations of brown and variations of grey; colours which are inherent to these ceramic materials.

## ORDERING INFORMATION

| Series | HTR Type   | Packing                                       | Resistance Value | Tolerance |
|--------|------------|---|------------------|-----------|
| HCAS   | C2S / C2S* | Bulk C2S / C2S*<br>Tape & Reel C2STR / C2S*TR | 10R              | J         |

- For RoHS version - C2S \*
- For Non Inductive type - N C2S
- For Tape & Reel packing - C2S TR
- For Fusible Safety Version - C2S FS