

**WIRE WOUND RESISTORS
CERAMIC ENCASED TYPE**

**HCP
SERIES**

**PRECISION POWER
Ceramic Encased**

**Wire Wound Resistors
PC Board Applications**

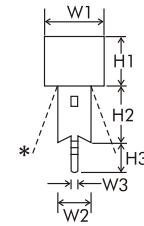
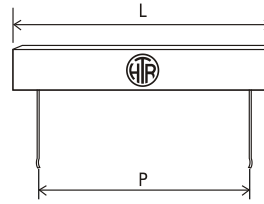
- 3 W to 20 W
- Fire Proof
- R10 to 56K
- Choice of PCB terminal stand-off heights with lock-in mounting tabs





WIRE WOUND
RESISTORS
CERAMIC
ENCASED TYPE
HCP

PHYSICAL CONFIGURATION

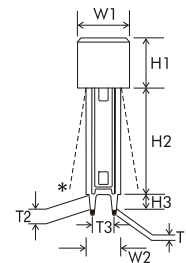
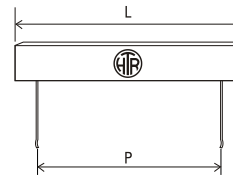


TYPES A, B & C

| TYPE | POWER RATING at 70°C | DIMENSIONS (mm) | | | | | | | | RESISTANCE RANGE | | TYPICAL WEIGHT PER PC (gms) |
|---------------|----------------------|-----------------|-------|-------|--------|-------|---------|---------|---------|------------------|-----|-----------------------------|
| | | L ±1.5 | W1 ±1 | H1 ±1 | P ±1.0 | H2 ±3 | H3 ±0.5 | W2 ±0.3 | W3 ±0.2 | min | max | |
| CP-3A | 3W | 24.5 | 9.5 | 9.5 | 12.0 | 15.0 | 4.5 | 7.3 | 1.4 | R10 | 15K | 6.4 |
| CP-5 | 5W | 28.0 | 9.5 | 9.5 | 15.0 | 15.0 | 4.5 | 7.3 | 1.4 | R10 | 18K | 6.9 |
| CP-5A | | 28.0 | 9.5 | 9.5 | 15.0 | 26.0 | 4.5 | 7.3 | 1.5 | | | 8.0 |
| CP-7 | 7W | 35.0 | 9.5 | 9.5 | 22.5 | 15.0 | 4.5 | 7.3 | 1.4 | R10 | 30K | 8.3 |
| CP-7A | | 35.0 | 9.5 | 9.5 | 22.5 | 26.0 | 4.5 | 7.3 | 1.5 | | | 9.3 |
| CP-7A (25) | | 39.0 | 9.5 | 9.5 | 25.0 | 26.0 | 4.5 | 7.3 | 1.5 | | | R10 |
| CP-10 | 10W | 48.0 | 9.5 | 9.5 | 35.0 | 15.0 | 4.5 | 7.3 | 1.4 | R10 | 47K | 10.8 |
| CP-10A | | 48.0 | 9.5 | 9.5 | 35.0 | 26.0 | 4.5 | 7.3 | 1.5 | | | 11.6 |
| CP-15 | 15W | 48.0 | 12.5 | 12.5 | 32.5 | 15.0 | 4.5 | 7.3 | 1.4 | R10 | 43K | 17.5 |
| CP-15A (25°C) | 48.0 | 12.5 | 12.5 | 32.5 | 26.0 | 4.5 | 7.3 | 1.5 | 18.6 | | | |
| CP-15B | 15W | 48.0 | 12.5 | 12.5 | 32.5 | 15.0 | 5.0 | 10.0 | 2.7 | R10 | 43K | 17.0 |
| CP-15C (25°C) | 48.0 | 12.5 | 12.5 | 32.5 | 30.0 | 5.0 | 10.0 | 2.7 | 20.0 | | | |
| CP20 | 20W | 63.5 | 12.5 | 12.5 | 48.0 | 15.0 | 4.5 | 7.3 | 1.4 | R15 | 56K | 22.9 |
| CP20A (25°C) | 63.5 | 12.5 | 12.5 | 48.0 | 26.0 | 4.5 | 7.3 | 1.5 | 23.8 | | | |
| CP-20B | 20W | 63.5 | 12.5 | 12.5 | 48.0 | 15.0 | 5.0 | 10.0 | 2.7 | R15 | 56K | 23.5 |
| CP-20C (25°C) | 63.5 | 12.5 | 12.5 | 48.0 | 30.0 | 5.0 | 10.0 | 2.7 | 26.5 | | | |

* Maximum Misalignment 5°

PHYSICAL CONFIGURATION



TYPE Z

| TYPE | POWER RATING at 70°C | DIMENSIONS (mm) | | | | | | | | | | RESISTANCE RANGE | | TYPICAL WEIGHT PER PC (gms) |
|---------------|----------------------|-----------------|-------|-------|------|-------|---------|---------|---------|---------|---------|------------------|-----|-----------------------------|
| | | L ±1.5 | W1 ±1 | H1 ±1 | P ±1 | H2 ±2 | H3 ±0.5 | W2 ±0.3 | T1 ±0.2 | T2 ±0.2 | T3 ±0.2 | min | max | |
| CP-5Z | 5W | 28.0 | 9.5 | 9.5 | 15.0 | 22.0 | 4.5 | 7.3 | 1.1 | 1.5 | 3.5 | R10 | 18K | 7.5 |
| CP-7Z | 7W | 35.0 | 9.5 | 9.5 | 22.5 | 22.0 | 4.5 | 7.3 | 1.1 | 1.5 | 3.5 | R10 | 30K | 8.5 |
| CP-10Z | 10W | 48.0 | 9.5 | 9.5 | 35.0 | 22.0 | 4.5 | 7.3 | 1.1 | 1.5 | 3.5 | R10 | 47K | 10.6 |
| CP-15Z (25°C) | 15W | 48.0 | 12.5 | 12.5 | 32.5 | 30.0 | 5.0 | 10.0 | 1.5 | 2.0 | 5.0 | R10 | 43K | 19.5 |
| CP-20Z (25°C) | 20W | 63.5 | 12.5 | 12.5 | 48.0 | 30.0 | 5.0 | 10.0 | 1.5 | 2.0 | 5.0 | R15 | 56K | 25.0 |

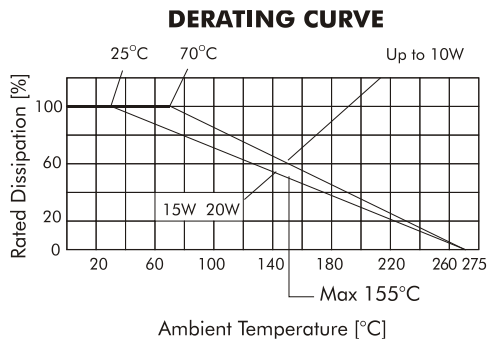
* Maximum Misalignment 5°

Note:

CP15 / 15A, 15B, 15C can also be supplied in a pitch of 35mm. Please specify if required. In this pitch (max) resistance value will be 47K.



WIRE WOUND
RESISTORS
CERAMIC
ENCASED TYPE
HCP



ELECTRICAL CHARACTERISTICS / DATA

| PARAMETER/PERFORMANCE TEST & TEST METHOD | PERFORMANCE REQUIREMENTS |
|---|---|
| Power Rating (Rated Ambient Temperature) | Upto 10W, full power dissipation at 70°C and 15W/ 20W, full power dissipation at 25°C and linearly derated to zero at +275°C (Refer Derating Curve above) |
| Operating Temperature Range (Ambient) | -55°C to +275°C with suitable derating as per derating curve |
| Voltage Rating / Limiting Voltage / Max. Working Voltage | $V = \sqrt{P \times R}$ |
| Maximum Overload Voltage | Varies depending on resistance value, duration of overload and type of pulse waveform (contact factory for details) |
| Resistance Tolerances Available JIS - C - 5202 para 5.1 | ±10% (K); ±5% (J) |

ELECTRICAL AND ENVIRONMENTAL CHARACTERISTICS

| PARAMETER/ PERFORMANCE TEST | TEST METHOD- DETAILS | PERFORMANCE REQUIREMENTS |
|--|--|--|
| Short Time Overload | JIS - C - 5202 para 5.5 Upto 3W - condition A (RV x 2.5 for 5 secs) 5W and above - condition B (Voltage corresponding to 10 times power for 5 secs) | $\Delta R \pm [2\% + R05]$ |
| Dielectric Withstanding Voltage / Voltage Proof | JIS - C - 5202 para 5.7 Condition F (Limiting voltage x 2 or 500V) | $\Delta R \pm [1\% + R05]$ (No flashover, arcing or insulation breakdown) |
| Temperature Co-efficient of Resistance | JIS - C - 5202 para 5.2 | ± 90 ppm / °C [>10R] ± 80 ppm / °C [<10R] ± 200 ppm / °C [<R10] |
| Insulation Resistance | JIS - C - 5202 para 5.6 (Condition F) | >1000MΩ (Min) |
| Pulse Overload / Intermittent Overload | JIS - C - 5202 para 5.8 (Limiting Voltage x 4) 1 sec on / 25 secs off 10,000 cycles ± 200 cycles | $\Delta R \pm [2\% + R05]$ |
| Endurance - under load with humidity | JIS - C - 5202 para 7.9 1000 hours at 40°C ± 2°C, 95% R.H with limiting voltage (1.5 hours on/0.5 hours off) | $\Delta R \pm [\leq 5\% + R05]$ |
| Load Life | JIS - C - 5202 para 7.10 1000 hours at 70°C with limiting voltage (1.5 hours on / 0.5 off) | $\Delta R \pm [3\% + R05]$ - Average |
| Temperature Cycling | JIS - C - 5202 para 7.4 [Room temperature → -55°C → Room temperature → 155°C → Room temperature for 5 cycles] | $\Delta R \pm [2\% + R05]$ - Average |
| Damp Heat (Steady State) | JIS - C - 5202 para 7.5 | $\Delta R \pm [3\% + R05]$ |
| Solvent Resistance | JIS - C - 5202 para 6.9 Solvent A - IPA for 60secs ± 10 secs. | No effect on case filling or marking |

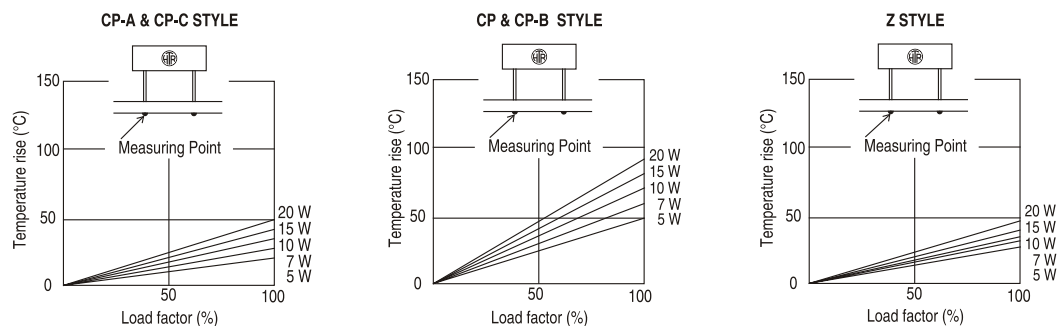
MECHANICAL SPECIFICATIONS

| PARAMETER/ PERFORMANCE TEST | TEST METHOD- DETAILS | PERFORMANCE REQUIREMENTS |
|---|---|--|
| Pull Test / Robustness of Terminations | Direct load for 15 secs 2 to 4.5 kgs depending on size | No effect |
| Solderability | JIS - C - 5202 para 6.5 (Dwell time in solder - 3 secs (± 0.5 secs) | $\Delta R \pm [1\% + R05]$ Continuous and satisfactory (95% Min coverage) |



WIRE WOUND
RESISTORS
CERAMIC
ENCASED TYPE
HCP

TEMPERATURE RISE CHART



PCB DESIGN SUGGESTIONS

| Power Rating | CP - & CP-A TYPES | HCP - Z TYPES | P |
|--------------|-------------------|---------------|------|
| 5W | | | 15.0 |
| 7W | | | 22.5 |
| 10W | | | 35.0 |
| 15W | | | 32.5 |
| 20W | | | 48.0 |
| | CP-B & CP-C TYPES | | |

TYPICAL APPLICATIONS

HCP series has terminations as per international dimensions so they can be merely snapped on to PC boards having international designs / size and then wave soldered. For PCB design suggestions, please refer to the section above.

HCP series resistors can function as a dual purpose device - fuse as well as resistor. Since this involves a compromise between fusing and resistive functions, each design is tailored to ensure desired performance. Please consult factory with requirements.

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. Types CP-10 / 10A, CP-15 / 15A / 15B / 15C / 15CP / 15Z & CP-20 / CP-20A / 20B / 20C / 20Z may have cases with bottom bumps as per international practice.

ORDERING INFORMATION

| Series | Type | Packing | Resistance Value | Tolerance |
|--------|------------|-----------------|------------------|-----------|
| HCP | CP-5/CP-5* | Bulk CP-5/CP-5* | 10R | J |

For RoHS version - CP-5*