# HCS Aluminum Housed Power Resistors



HCS offers a comprehensive range of standard and custom-designed aluminium housed resistors for general-purpose applications, power supplies, power generation, and the traction and drives industries. The HCS Series comprises extremely stable, high-quality wire wound resistors manufactured from premium materials to deliver optimum reliability and long-term stability. Designed to dissipate high power within a compact footprint, these resistors maintain relatively low surface temperatures in operation. Their aluminium housing enables efficient transfer and dissipation of heat when mounted to an appropriate heat sink.

## Features

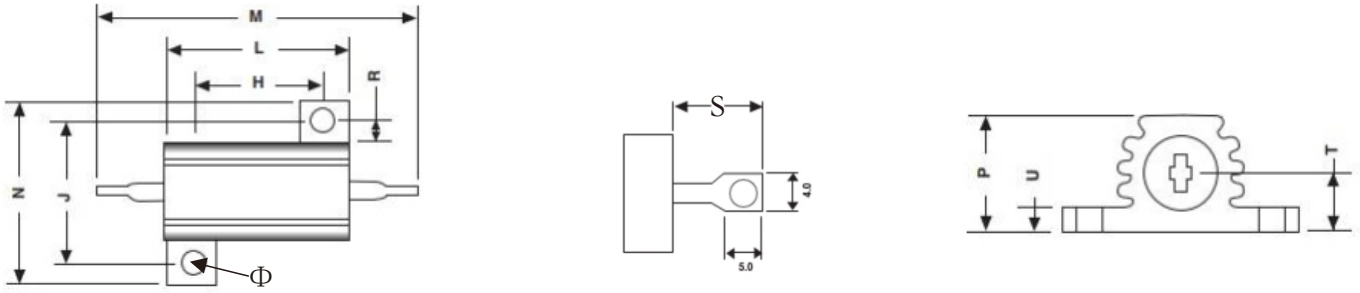
- Established product with proven reliability leading the way with over 30 years of design and manufacturing experience.
- 5 Watts to 500 Watts: Largest range on the market.
- Versatile product benchmark in wide range of industries.
- Custom designs, windings, terminations, mountings available on request.
- Low resistance, low inductance and higher voltage versions available specialising the standard.

## Applications

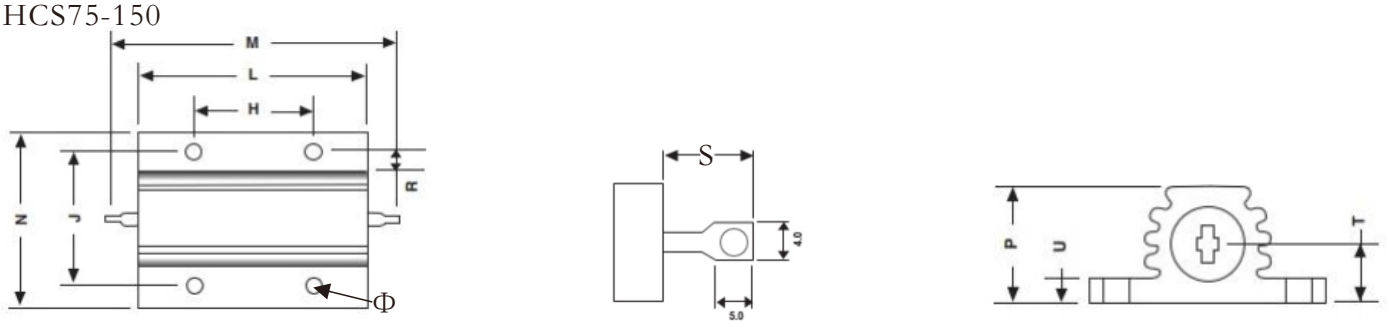
- Braking resistor
- Balancing resistor
- Capacitor charging & discharging
- Crowbar
- Filter
- Electrical machinery general use

## Dimensions

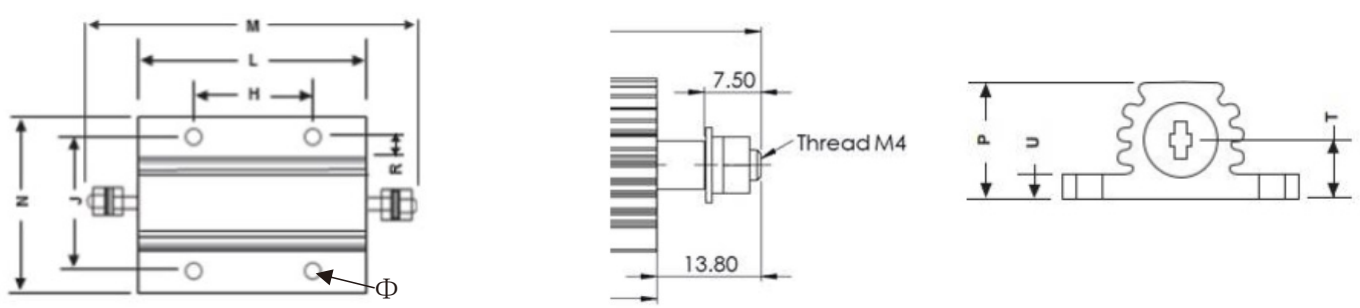
HCS5-50




HCS75-150

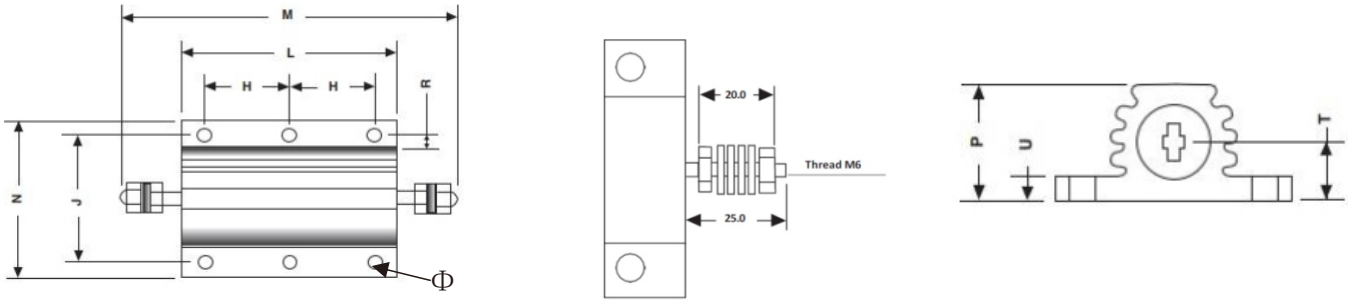



HCSA75S-150S



# HCS Aluminum Housed Power Resistors

HCS200-500




| Type | H ±0.3 | J ±0.3 | L max | M max | N max | P max | R max | T ±0.5 | U max | Φ | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HCS5 | 11.3 | 12.4 | 17.0 | 30.0 | 17.0 | 9.0 | 1.9 | 4.3 | 2.5 | 2*2.4 | 7 |
| HCS10 | 14.3 | 15.9 | 21.0 | 36.5 | 21.0 | 11.0 | 1.9 | 5.2 | 3.2 | 2*2.4 | 7 |
| HCS25 | 18.3 | 19.8 | 29.0 | 51.0 | 28.0 | 15.0 | 2.8 | 7.2 | 3.2 | 2*3.3 | 10 |
| HCS50 | 39.7 | 21.4 | 51.0 | 72.5 | 30.0 | 17.0 | 2.8 | 8.2 | 3.2 | 2*3.3 | 10 |
| HCS75 | 29.0 | 37.0 | 49.0 | 71.0 | 48.0 | 24.0 | 5.0 | 11.5 | 3.5 | 4*4.4 | 8 |
| HCS100 | 35.0 | 37.0 | 66.0 | 87.5 | 48.0 | 24.0 | 5.0 | 11.5 | 3.5 | 4*4.4 | 8 |
| HCS150 | 58.0 | 37.0 | 98.0 | 122.0 | 48.0 | 24.0 | 5.0 | 11.5 | 3.5 | 4*4.4 | 8 |
| HCS200 | 35.0 | 57.2 | 90.0 | 143.0 | 73.0 | 42.0 | 5.6 | 20.25 | 5.3 | 2*2.4 | - |
| HCS250 | 44.5 | 57.2 | 109.0 | 163.0 | 73.0 | 42.0 | 5.6 | 20.25 | 5.3 | 2*2.4 | - |
| HCS300 | 52.0 | 59.0 | 128.0 | 180.0 | 73.0 | 42.0 | 5.6 | 20.25 | 5.3 | 2*3.3 | - |
| HCS75S | 29.0 | 37.0 | 49.0 | 78.0 | 48.0 | 24.0 | 5.0 | 11.5 | 3.5 | 4*4.4 | - |
| HCS100S | 35.0 | 37.0 | 66.0 | 94.0 | 48.0 | 24.0 | 5.0 | 11.5 | 3.5 | 4*4.4 | - |
| HCS150S | 58.0 | 37.0 | 98.0 | 127.0 | 48.0 | 24.0 | 5.0 | 11.5 | 3.5 | 4*4.4 | - |
| HCS350 | 61.5 | 59.0 | 147.0 | 196.0 | 73.0 | 42.0 | 5.6 | 20.25 | 5.3 | 2*3.3 | - |
| HCS400 | 71.0 | 59.0 | 166.0 | 215.0 | 73.0 | 42.0 | 5.6 | 20.25 | 5.3 | 2*3.3 | - |
| HCS450 | 80.5 | 59.0 | 185.0 | 234.0 | 73.0 | 42.0 | 5.6 | 20.25 | 5.3 | 2*3.3 | - |
| HCS500 | 90.0 | 59.0 | 204.0 | 253.0 | 73.0 | 42.0 | 5.6 | 20.25 | 5.3 | 2*3.3 | - |

## Ordering Information

Example:

| HCS | 50 | J | 100R0 | C2 |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| Series Name | Power Rating | Resistance Tolerance | Resistance | T.C.R |

(1)Type: HCS Series

(2)Power Rating: 5=5W,10=10W,100=100W,200=200W.....

(3)Tolerance: F=±1%,G=±2%,J=±5%,K=±10%

(4)Resistance Value:R100=0.1Ω,1R00=1Ω,10R0=10Ω,100R0=100Ω

(5)T.C.R:C2=±50PPM/C,C1=±30PPM/C

## Power And Resistance etc

### HCS 5W~75W

36K

| Type | HCS 5W | HCS 10W | HCS 25W | HCS 50W | HCS 75W |
|---|---|---|---|---|---|
| Dissipation with heatsink, see derating curve (Watts)<br>Dissipation @ 25°C without heatsink (Watts) | 5<br>3.5 | 10<br>6 | 25<br>12.5 | 50<br>20 | 75<br>45 |
| Ohmic value minimum (Ohms)<br>Ohmic value maximum (Ohms) | R01<br>10K | R01<br>15K | R01<br>36K | R01<br>100K | R05<br>50K |
| Ohmic operating temperature range (°C) | -55 to 200 | | | | |
| Maximum working voltage (DC or AC rms) Volts | 160 | 265 | 550 | 1250 | 1400 |
| Voltage proof 1 minute (DC or AC rms) Volts | 990 | 990 | 1767 | 1767 | 3500 |
| Voltage proof 1 minute (AC pk) Volts | 1400 | 1400 | 2500 | 2500 | 5000 |
| Stability (resistance change, 1000 hours) (%) | 1 | 1 | 1 | 1 | 2 |
| Standard heatsink – area ($mm^2$)<br>Thickness (mm) | 41500<br>1 | 41500<br>1 | 53500<br>1 | 53500<br>1 | 99500<br>3 |
| Number of mounting holes | 2 hole | 2 hole | 2 hole | 2 hole | 4 hole |

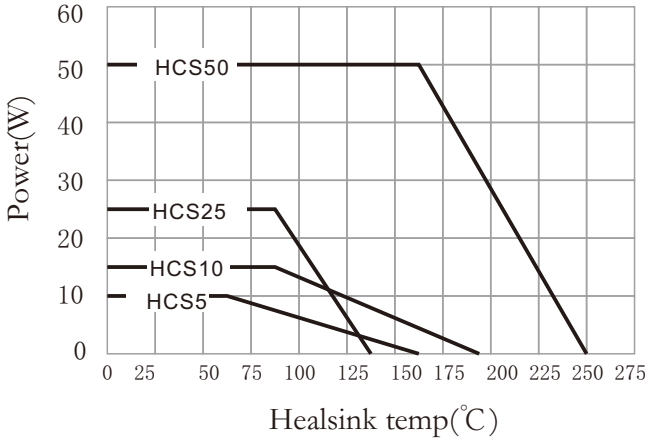
### HCS 100W~300W

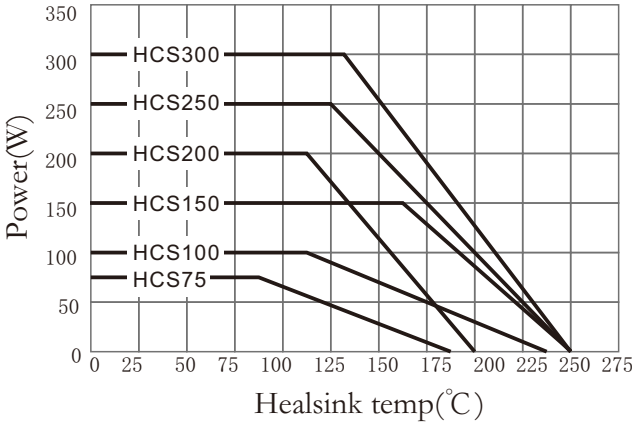
| Type | HCS 100W | HCS 150W | HCS 200W | HCS 250W | HCS 300W |
|---|---|---|---|---|---|
| Dissipation with heatsink, see derating curve (Watts)<br>Dissipation @ 25°C without heatsink (Watts) | 100<br>50 | 150<br>55 | 200<br>50 | 250<br>60 | 300<br>75 |
| Ohmic value minimum (Ohms)<br>Ohmic Maximum (Ohms) | R05<br>100K | R10<br>100K | R10<br>50K | R10<br>68K | R10<br>82K |
| Operating temperature range (°C) | -55 to 200 | | | | |
| Maximum working voltage (DC or AC rms) Volts | 1900 | 2500 | 1900 | 2200 | 2500 |
| Voltage proof 1 minute (DC or AC rms) Volts | 3535 | 3535 | 3959 | 3959 | 3959 |
| Voltage proof 1 minute (AC pk) Volts | 5000 | 5000 | 5600 | 5600 | 5600 |
| Stability (resistance change, 1000 hours) (%) | 2 | 2 | 3 | 3 | 3 |
| Standard heatsink – area ($mm^2$)<br>Thickness (mm) | 99500<br>3 | 99500<br>3 | 375000<br>3 | 476500<br>3 | 578000<br>3 |
| Number of mounting holes | 4 hole | 4 hole | 6 hole | 6 hole | 6 hole |

### HCS 350W~500W

| Type | HCS 350W | HCS 400W | HCS 450W | HCS 500W |
|---|---|---|---|---|
| Dissipation with heatsink, see derating curve (Watts)<br>Dissipation @ 25°C without heatsink (Watts) | 350<br>85 | 400<br>100 | 450<br>110 | 500<br>125 |
| Ohmic value minimum (Ohms)<br>Ohmic Maximum (Ohms) | 1R0<br>100K | 1R0<br>100K | 1R0<br>100K | 1R0<br>100K |
| Operating temperature range (°C) | -55 to 200 | | | |
| Maximum working voltage (DC or AC rms) Volts | 2500 | 2500 | 2500 | 2500 |
| Voltage proof 1 minute (DC or AC rms) Volts | 3600 | 3600 | 3600 | 3600 |
| Voltage proof 1 minute (AC pk) Volts | 5000 | 5000 | 5000 | 5000 |
| Stability (resistance change, 1000 hours) (%) | 3 | 3 | 3 | 3 |
| Standard heatsink – area ($mm^2$)<br>Thickness (mm) | 578000<br>3 | 578000<br>3 | 578000<br>3 | 578000<br>3 |
| Number of mounting holes | 6 hole | 6 hole | 6 hole | 6 hole |

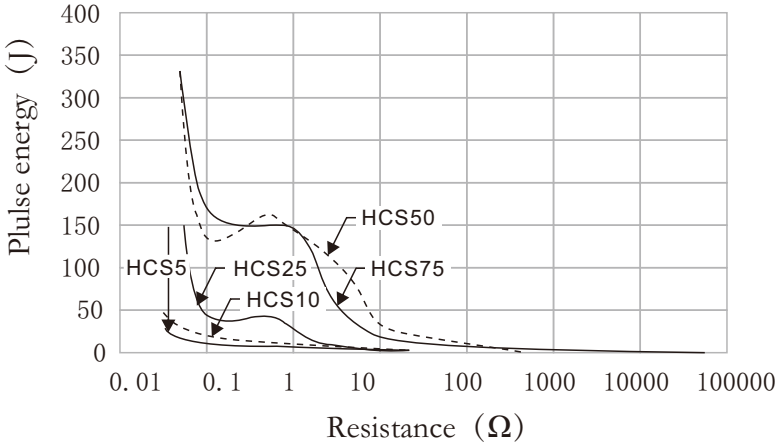
## Derating curve



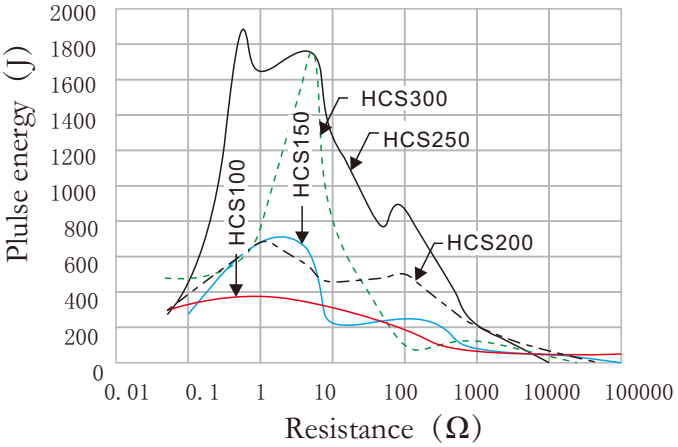




## Pulse energy (Pulse length 200ms)

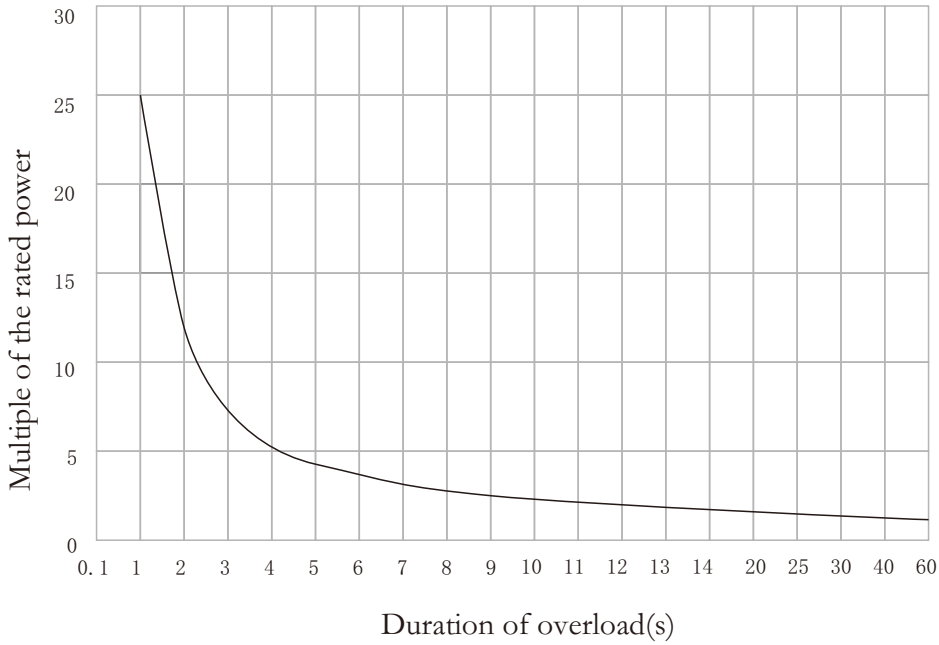
HCS 5W-75W




HCS 100W-300W

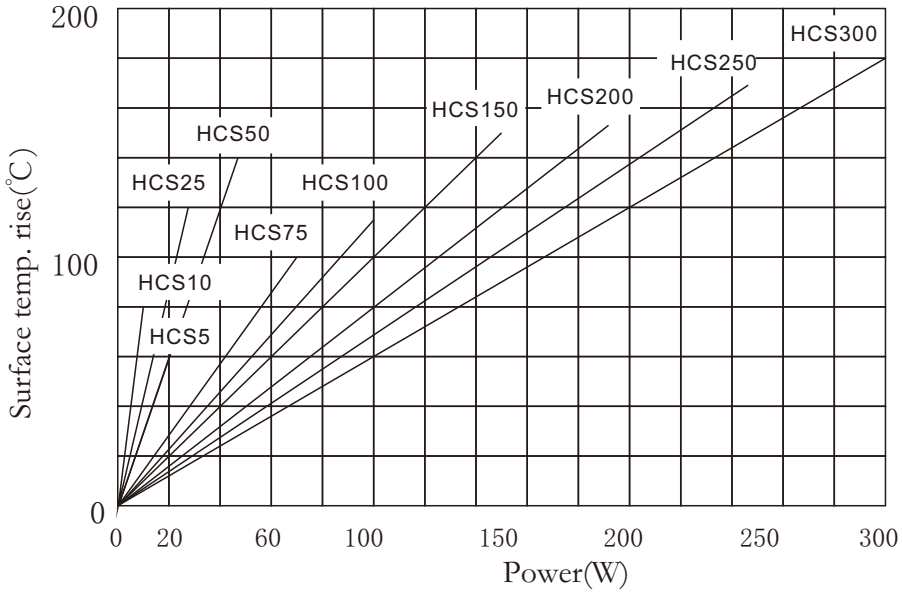



## Power overload




This graph indicates the amout that power(at 20℃) of he stand HCS Series resistor may be reduced for overloads of 100 MS to 60 S.

## Surface temperature rise




For resistor mounted on standard heatsink related to power dissipation.

Remarks: Heatsink is recommended as it got good heat radiation. Even you have used the heatsink, the maximum temperature 200℃ can not be surpassed.

## Performance

| Item | Performance requirements | Conditons test(JIS C 5201—1) |
|---|---|---|
| Temperature coefficients | TCR≤100R: ±50ppm/℃; TCR >100R: ±30ppm/℃ | $T.C.R=\frac{R2-R1}{R1\times(T2-T1)}\times 10^{-6}$ PPM/℃ R1:normal temperature(T1)resistance value R2:normal temperature+100℃(T2)resistance value |
| Load life | △R≤±(1.0%R0+0.05Ω) | 25℃, PR,1000h |
| Inslation resistance | 1000MΩ MIN | DC500V |
| Short time overload | △R≤±(1.0%R0+0.05Ω) | Account 5 times rated power to account the voltage or max ,overload voltage(get the lower) 5 seconds. |
| Resistance to soldering heat | △R≤±(1.0%R0+0.05Ω) | Immerge into the 350±10℃ tin stove for2—3second |
| solderability | The soldering area is over95% | Immerge into the 245±3℃ tin stove for2—3second |
| Temperature cycling | △R≤±(1%R0+0.05Ω) | At -55℃ for 30 min ,then at 25℃ for 10—15min,then at 275℃ for 30 min ,then at 25℃ fo10—15min,total 5 cycles. |
| load life in humidity | △R≤±(5%R0+0.05Ω) | Overload rated voltage or max, working voltage(get the lower) for 1000 hours(1.5 hours on and half -hour off) at the 70±2℃. |
| load life in heat | △R≤±(5%R0+0.05Ω) | Overload rated voltage or max, working voltage (get the lower) for 1000 hours (1.5 hours on and half-hour off) at the 70±2℃. |
| Terminal strength | △R≤±(1%R0+0.05Ω) | 5W—15W: Pull 20N, Horizontal 10 Second |
| Vibration | △R≤±(1%R0+0.05Ω) | Frequency: 10—50Hz, Swing: 0.75mm,Times: 6 Hours |
| Shock proof | △R≤±(0.2%R0+0.05Ω) | 100g, 6ms,10 Cycles |
| Nonflammability | no visible flame | Respectively load AC voltage by 5,10,16 times,rated power for 5Minutes |