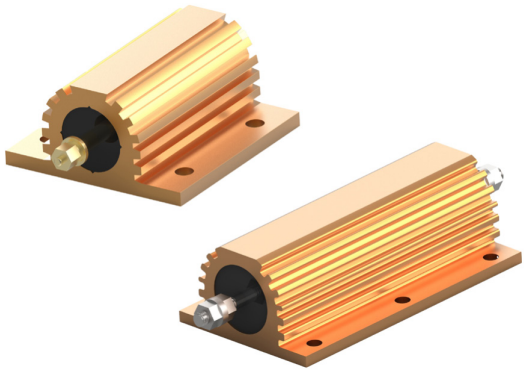
ALUMINIUM HOUSED POWER RESISTORS

TYPE HS SERIES

INTRODUCTION

TE Connectivity (TE) 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 HS 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.



This latest datasheet revision introduces two new additions to the series: the HSCS stud terminal type in HSC75, HSC100, and HSC150 variants, and the HSHC type with power ratings from 350W to 500W, extending the HS Series to offer the broadest power rating range currently available. Upon request, TE can also offer design modifications to address customer-specific application requirements. Low resistance values, alternative mounting configurations, and alternative termination types are also available on request.

FEATURES

- Established product with proven reliability leading the way with over 50 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

ELECTRICAL CHARACTERISTICS

HSA & HSC – 5 WATTS TO 75 WATTS

Type	HSA5	HSA10	HSA25	HSA50	HSC75
Dissipation with heatsink, see derating curve (Watts) Dissipation @ 25°C without heatsink (Watts)	10 5.5	16 8	25 12.5	50 20	75 45
Ohmic value minimum (Ohms) Ohmic value maximum (Ohms)	R01 10K	R01 15K	R01 36K	R01 100K	R05 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) Thickness (mm)	41500 1	41500 1	53500 1	53500 1	99500 3
Number of mounting holes	2 hole	2 hole	2 hole	2 hole	4 hole

HSC – 100 WATTS TO 300 WATTS

Type	HSC100	HSC150	HSC200	HSC250	HSC300
Dissipation with heatsink, see derating curve (Watts) Dissipation @ 25°C without heatsink (Watts)	100 50	150 55	200 50	250 60	300 75
Ohmic value minimum (Ohms) Ohmic Maximum (Ohms)	R05 100K	R10 100K	R10 50K	R10 68K	R10 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) Thickness (mm)	99500 3	99500 3	375000 3	476500 3	578000 3
Number of mounting holes	4 hole	4 hole	6 hole	6 hole	6 hole

HSHC – 350 WATTS TO 500 WATTS

Type	HSHC350	HSHC400	HSHC450	HSHC500
Dissipation with heatsink, see derating curve (Watts) Dissipation @ 25°C without heatsink (Watts)	350 85	400 100	450 110	500 125
Ohmic value minimum (Ohms) Ohmic Maximum (Ohms)	1R0 100K	1R0 100K	1R0 100K	1R0 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) Thickness (mm)	578000 3	578000 3	578000 3	578000 3
Number of mounting holes	6 hole	6 hole	6 hole	6 hole

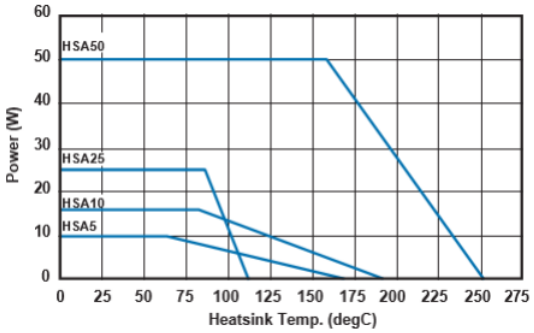
ENVIRONMENTAL CHARACTERISTICS

Type	Specifications
Long term stability	For improvements in long-term stability, resistors must be derated as follows: for 50% of stated ΔR maximum dissipation must not exceed 70% of rating: for 25% of stated ΔR maximum, dissipation must not exceed 50% of rating.
Insulation resistance	Dry: 10,000MΩ minimum. After moisture test: 1000MΩ minimum
Heat dissipation	Although the use of proprietary heat sinks with lower thermal resistance is acceptable, uprating is not recommended. The use of proprietary heat sink compound to improve thermal conductivity is recommended for optimum performance of all sizes but essential for higher power ratings (200W and higher)
Resistance tolerance	±5% Standard. Other options on request.
Specification	Temperature coefficient of resistance: ≤100R, ±50ppm/°C; TCR >100R, ±30ppm/°C Tolerance, ±5% standard: ±10%, ±3%, ±2%, ±0.5% & ±0.25% available Tolerance for values below R10, ±10% standard
Shelf life	24 months when stored in original packaging away from chemical pollution

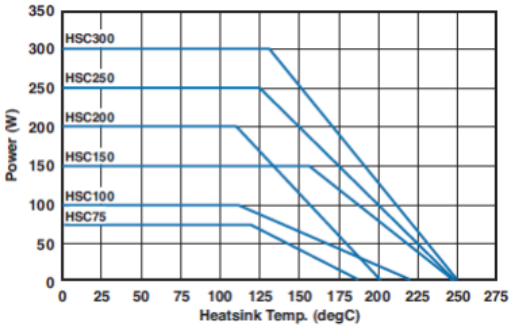
POWER DERATING CURVE

The derating curves plot power against allowable external heatsink temperature. The curves do not show the temperature the heatsink will rise to under the power condition or take ambient temperature into consideration.

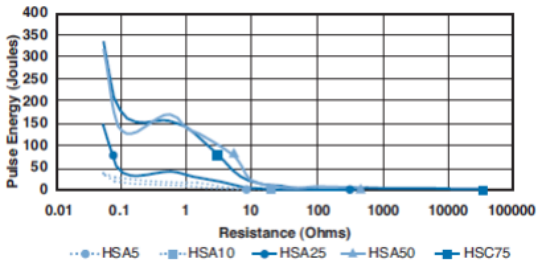
HSA5 - 50



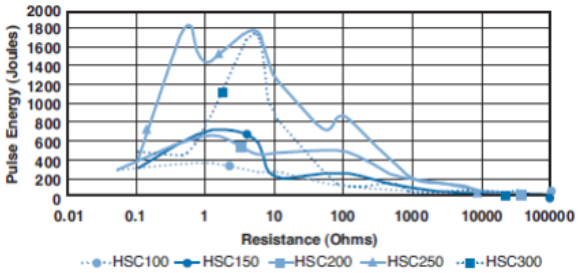
HSC75 - HSC300



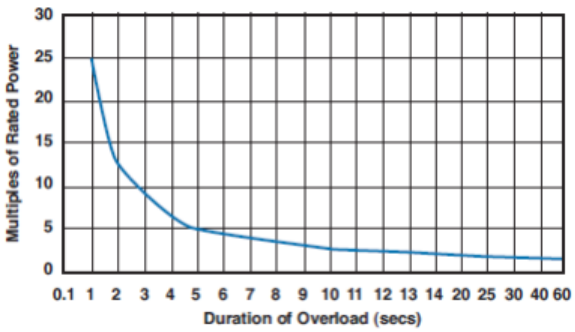
PULSE ENERGY HSA5 TO HSC75 (PULSE LENGTH 200MS)



PULSE ENERGY HSC100 TO HSC300 (PULSE LENGTH 200MS)

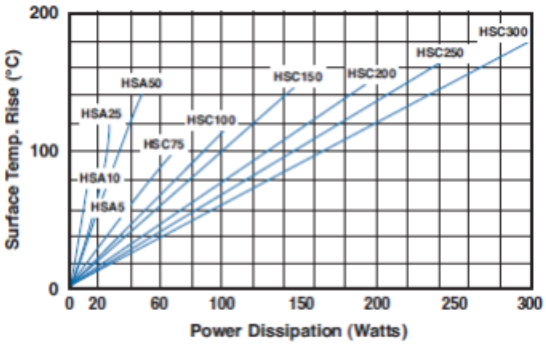


POWER OVERLOAD



This graph indicates the amount that the rated power (at 20°C) of the standard HS series resistor may be increased for overloads of 100mS to 60S

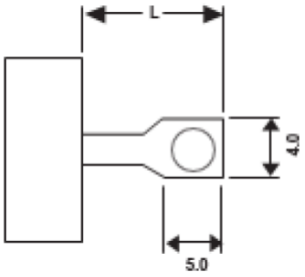
SURFACE TEMPERATURE RISE



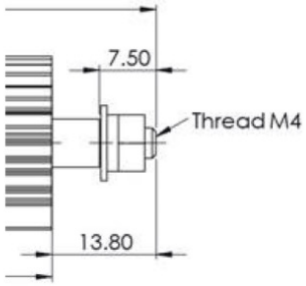
For resistor mounted on standard heatsink, related to power dissipation

PRODUCT SPECIFICATIONS (Unit: mm)

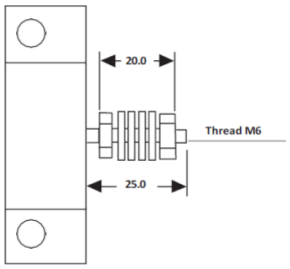
HSA5 – HSC150 STANDARD



HSC75S – HSC150S



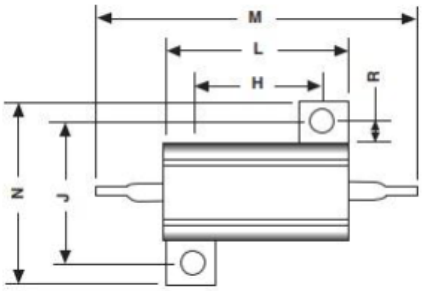
HSC200 – HSC300 & HSHC350 – HSHC500 STANDARD



Standard Type	L
HSA5, 10	7
HSA25, 50	10
HSC75, 100, 150	8

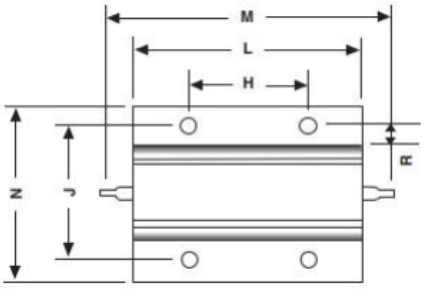
DIMENSIONS (Unit: mm)

HSA5 – HSA50



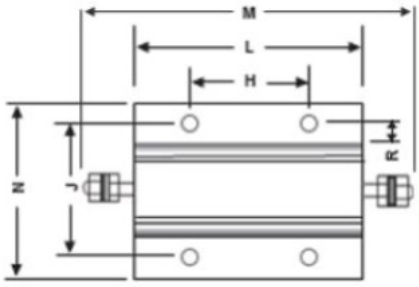
HSA5 – HSA10 : MOUNTING HOLE 2 X 2.4MM
HSA25 – HSA50 : MOUNTING HOLE 2 X 3.3MM

HSC75 – HSC150



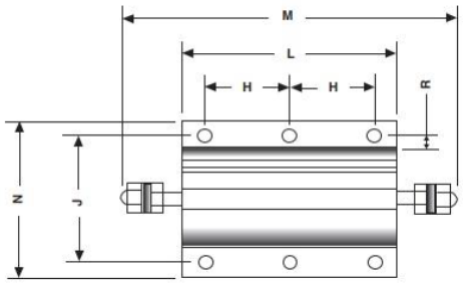
HSC75 – HSC150 : MOUNTING HOLE 4 X 4.4MM

HSC75S – HSC150S



HSC75 – HSC150 : MOUNTING HOLE 4 X 4.4MM

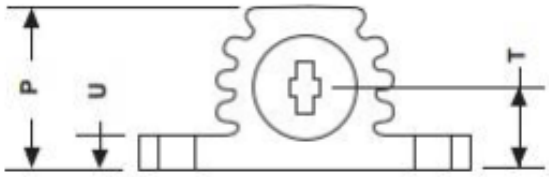
HSC300 – HSC300, HSHC350 – HSHC500



HSC200 – HSC250 : MOUNTING HOLE 2 X 2.4MM
HSC300, HSHC350 - HSHC500 : MOUNTING HOLE 2 X 3.3MM

DIMENSIONS (CONTINUED)

END ELEVATION (ALL MODELS)



Type	H ±0.3	J ±0.3	L maximum	M maximum	N maximum	P maximum	R minimum	T±0.5	U maximum
HSA5	11.3	12.4	17.0	30.0	17.0	9.0	1.9	4.3	2.5
HSA10	14.3	15.9	21.0	36.5	21.0	11.0	1.9	5.2	3.2
HSA25	18.3	19.8	29.0	51.0	28.0	15.0	2.8	7.2	3.2
HSA50	39.7	21.4	51.0	72.5	30.0	17.0	2.8	8.2	3.2
HSC75	29.0	37.0	49.0	71.0	48.0	24.0	5.0	11.5	3.5
HSC100	35.0	37.0	66.0	87.5	48.0	24.0	5.0	11.5	3.5
HSC150	58.0	37.0	98.0	122.0	48.0	24.0	5.0	11.5	3.5
HSC200	35.0	57.2	90.0	143.0	73.0	42.0	5.6	20.25	5.3
HSC250	44.5	57.2	109.0	163.0	73.0	42.0	5.6	20.25	5.3
HSC300	52.0	59.0	128.0	180.0	73.0	42.0	5.6	20.25	5.3
HSC75S	29.0	37.0	49.0	78.0	48.0	24.0	5.0	11.5	3.5
HSC100S	35.0	37.0	66.0	94.0	48.0	24.0	5.0	11.5	3.5
HSC150S	58.0	37.0	98.0	127.0	48.0	24.0	5.0	11.5	3.5
HSHC350	61.5	59.0	147.0	196.0	73.0	42.0	5.6	20.25	5.3
HSHC400	71.0	59.0	166.0	215.0	73.0	42.0	5.6	20.25	5.3
HSHC450	80.5	59.0	185.0	234.0	73.0	42.0	5.6	20.25	5.3
HSHC500	90.0	59.0	204.0	253.0	73.0	42.0	5.6	20.25	5.3

ORDERING INFORMATION

Part Number

HS C 75 _ 1K0 J

Part Number

HS	Standard
HSH	High power
NHS	Low inductance

Mounting style

C	Flange two sides

Power rating

10 Watt	HSC5
16 Watt	HSC10
25 Watt	HSC25
50 Watt	HSC50
75 Watt	HSC75

Tolerance

F	1%
G	2%
E	3%
J	5%
K	10%

Resistance Value

R10	0.1 ohm (1000 milliohms)
1R0	1 ohm (1000 mille ohms)
1K0	1K (1000 ohms)

Terminal

Blank	Standard terminal
S	Screw

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