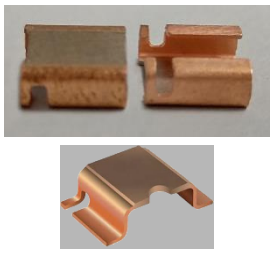
Features:



- Metal element current shunt resistor
- 12W permanent power
- Inductance < 3nH
- Internal heat resistance 15K/W
- AEC-Q200 compliant
- 100% RoHS compliant and lead free without exemption
- Halogen free
- REACH compliant

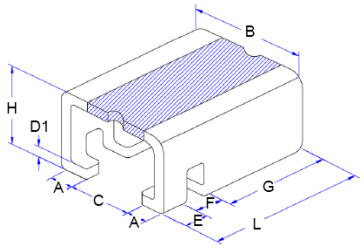
Applications:

- Power modules
- Frequency converters
- Current sensor for power hybrid sources
- High current handling for automotive engine controls and power management

Electrical Specifications

Type/Code	Power Rating (W) @ 100°C	Power Rating (W) @ 70°C	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance 1% and 5%
HCSK1216	5	9	± 50	0.0005
	3	7		0.001
HCSK2725	5	9		0.0005
		7		0.001
		6		0.002
	3	5		0.003
	2	4		0.004
		3		0.005
HCSK4026	5	12		0.0002
		9		0.0005
	4	8		0.0007
		7		0.001
	3	5		0.003

Mechanical Specifications – 1216

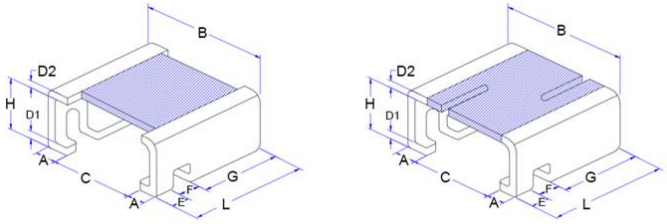


Type/Code	L	B	C	H	E	Unit
HCSK1216	0.150 ± 0.012 3.81 ± 0.30	0.118 ± 0.006 3.00 ± 0.15	0.037 ± 0.006 0.95 ± 0.15	0.071 ± 0.004 1.80 ± 0.10	0.020 ± 0.004 0.50 ± 0.10	inches mm

F	G	A (*)	D1	Unit
0.024 ± 0.006 0.60 ± 0.15	0.106 ± 0.004 2.70 ± 0.10	0.041 1.05	0.012 ± 0.004 0.30 ± 0.10	inches mm

(*) Reference only.

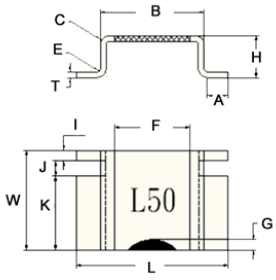
Mechanical Specifications – 2725



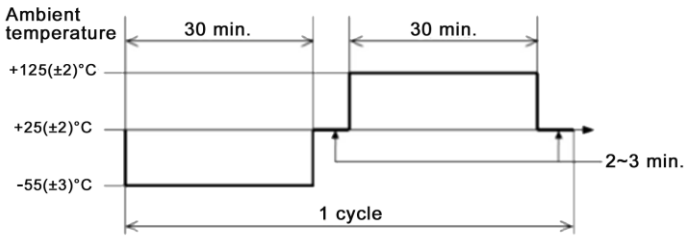
Type/Code	L	B	C (*)	H	E	Unit
HCSK2725 (0.0005)	0.260 ± 0.010 6.60 ± 0.25	0.272 ± 0.006 6.90 ± 0.15	0.122 3.10	0.094 ± 0.008 2.40 ± 0.20	0.028 ± 0.008 0.70 ± 0.20	inches mm
HCSK2725 (0.001)	0.260 ± 0.010 6.60 ± 0.25	0.272 ± 0.006 6.90 ± 0.15	0.122 3.10	0.094 ± 0.008 2.40 ± 0.20	0.028 ± 0.008 0.70 ± 0.20	inches mm
HCSK2725 (0.002)	0.260 ± 0.010 6.60 ± 0.25	0.272 ± 0.006 6.90 ± 0.15	0.122 3.10	0.094 ± 0.008 2.40 ± 0.20	0.028 ± 0.008 0.70 ± 0.20	inches mm
HCSK2725 (0.003)	0.260 ± 0.010 6.60 ± 0.25	0.272 ± 0.006 6.90 ± 0.15	0.122 3.10	0.094 ± 0.008 2.40 ± 0.20	0.028 ± 0.008 0.70 ± 0.20	inches mm
HCSK2725 (0.004)	0.260 ± 0.010 6.60 ± 0.25	0.272 ± 0.006 6.90 ± 0.15	0.122 3.10	0.094 ± 0.008 2.40 ± 0.20	0.028 ± 0.008 0.70 ± 0.20	inches mm
HCSK2725 (0.005)	0.260 ± 0.010 6.60 ± 0.25	0.272 ± 0.006 6.90 ± 0.15	0.122 3.10	0.094 ± 0.008 2.40 ± 0.20	0.028 ± 0.008 0.70 ± 0.20	inches mm
Type/Code	F	G (*)	A	D1	D2	Unit
HCSK2725 (0.0005)	0.039 ± 0.008 1.00 ± 0.20	0.193 4.90	0.075 ± 0.008 1.90 ± 0.20	0.016 ± 0.004 0.40 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	inches mm
HCSK2725 (0.001)	0.039 ± 0.008 1.00 ± 0.20	0.193 4.90	0.075 ± 0.008 1.90 ± 0.20	0.016 ± 0.004 0.40 ± 0.10	0.014 ± 0.004 0.35 ± 0.10	inches mm
HCSK2725 (0.002)	0.039 ± 0.008 1.00 ± 0.20	0.193 4.90	0.075 ± 0.008 1.90 ± 0.20	0.016 ± 0.004 0.40 ± 0.10	0.022 ± 0.004 0.55 ± 0.10	inches mm
HCSK2725 (0.003)	0.039 ± 0.008 1.00 ± 0.20	0.193 4.90	0.075 ± 0.008 1.90 ± 0.20	0.016 ± 0.004 0.40 ± 0.10	0.014 ± 0.004 0.35 ± 0.10	inches mm
HCSK2725 (0.004)	0.039 ± 0.008 1.00 ± 0.20	0.193 4.90	0.075 ± 0.008 1.90 ± 0.20	0.016 ± 0.004 0.40 ± 0.10	0.014 ± 0.004 0.35 ± 0.10	inches mm
HCSK2725 (0.005)	0.039 ± 0.008 1.00 ± 0.20	0.193 4.90	0.075 ± 0.008 1.90 ± 0.20	0.016 ± 0.004 0.40 ± 0.10	0.014 ± 0.004 0.35 ± 0.10	inches mm

(*) Reference only.

Mechanical Specifications – 4026

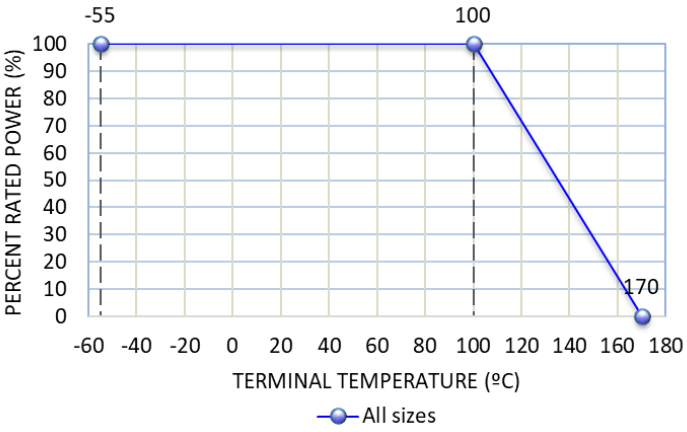


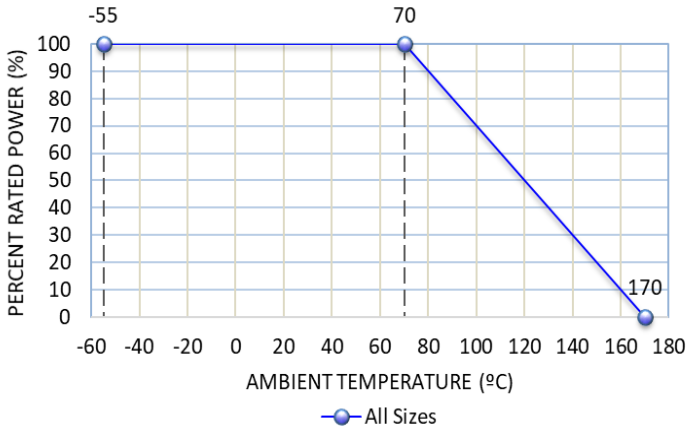
Type/Code	A	B	C	E	H	T	F	Unit
HCSK4026 (0.0002 Ω)	0.055 ± 0.008 1.40 ± 0.20	0.272 6.90	0.024 0.60	0.008 0.20	0.148 ± 0.008 3.75 ± 0.20	0.017 ± 0.004 0.42 ± 0.10	0.197 5.00	inches mm
HCSK4026 (except 0.0002 Ω)					0.104 ± 0.008 2.65 ± 0.20			inches mm
Type/Code	G (max.)	I	J	K	L	W	Unit	
HCSK4026 (all Ω values)	0.028 0.70	0.028 0.70	0.039 1.00	0.193 4.90	0.398 ± 0.006 10.10 ± 0.15	0.260 ± 0.008 6.60 ± 0.20	inches mm	

Environmental Performance Characteristics			
Test	Test Method	Test Specification	Test Condition
Short Time Overload	-	Δ R: ± 1%	5 times rated power for 5 seconds
Temperature Coefficient of Resistance (TCR) (1216, 4026)	JIS-C5202-5.2	Refer to Electrical Specifications	+20°C/+125ºC $TCR\ (ppm/^oC) = \frac{\Delta R}{R \times \Delta t} \times 10^6$
Temperature Coefficient of Resistance (TCR) (2725)	JIS-C5202-5.2	Refer to Electrical Specifications	+25°C/+125ºC $TCR\ (ppm/^oC) = \frac{\Delta R}{R \times \Delta t} \times 10^6$
Moisture Resistance	MIL-STD-202, Method 106	Δ R: ± 1%	The specimens shall be placed in a chamber and subjected to a relative humidity of 90 ~ 98% and a temperature of 25ºC/65ºC, 10 cycles.
High Temperature Exposure	JIS-C5202-7.2	Δ R: ± 1%	The chip (mounted on board) is exposed in the heat chamber, 125ºC for 1000 hours.
Load Life	JIS-C5202-7.10	Δ R: ± 1%	Apply rated power for 1000 hours with 1.5 hours ON and 0.5 hour OFF.
Rapid Change of Temperature	JIS-C5202-7.4	Δ R: ± 1%	The chip (mounted on board) is exposed, -55 ± 3ºC (30 minutes)/+125 ± 2ºC (30 minutes) for 5 cycles. The following conditions shown in the figure below. 

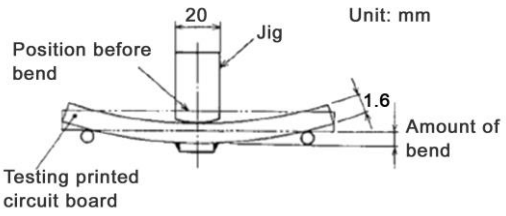
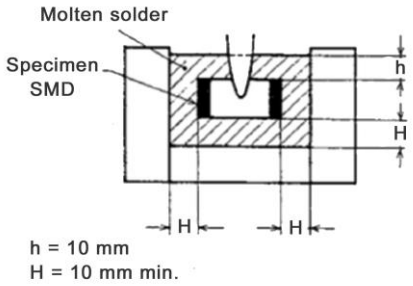
Note: The terminal electron temperature of component should be below 100°C.
Storage Conditions: Temperature of 22 ~ 28°C. Humidity: 40 ~ 75%.
Operating Temperature Range is - 55°C to + 170°C

Power Derating Curve:

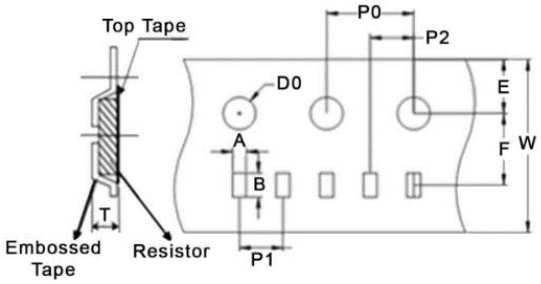




Function Performance Characteristics

Test	Test Method	Test Specification	Test Condition
Bending Strength	JIS-C5202-6.1	Δ R: ± 1%	Mount the chip to test 90 mm (L) * 40 mm (W) FR4 printed circuit board substrate. Apply pressure in direction of arrow unit band width reaches 2 mm (+0.2 / -0 mm) illustrated in the figure below and hold for 10 ± 1 seconds. 
Solderability	JIS-C5202-6.11	Solder shall cover 95% or more of the electrode area.	The part shall be immersed into the flux specified in the solder bath 235ºC ± 5ºC for 2 seconds ± 0.5 seconds. It shall be immersed to a point 10 mm from its root. (Sn96.5/Ag3.0/Cu0.5) 

Taping Specifications – Embossed Plastic Tape

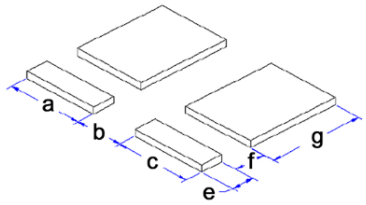


Type/Code	A	B	E	F	W	Unit
HCSK1216	0.130 ± 0.004 3.30 ± 0.10	0.165 ± 0.004 4.20 ± 0.10	0.104 ± 0.004 2.64 ± 0.10	0.217 ± 0.004 5.50 ± 0.10	0.472 ± 0.008 12.00 ± 0.20	inches mm
	P0	P1	P2	D0	T	Unit
	0.157 ± 0.004 4.00 ± 0.10	0.315 ± 0.004 8.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.059 ± 0.004 1.50 ± 0.10	0.083 ± 0.004 2.10 ± 0.10	inches mm
Type/Code	A	B	E	F	W	Unit
HCSK2725	0.276 ± 0.004 7.00 ± 0.10	0.276 ± 0.004 7.00 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.295 ± 0.004 7.50 ± 0.10	0.630 ± 0.008 16.00 ± 0.20	inches mm
	P0	P1	P2	D0	T	Unit
	0.157 ± 0.004 4.00 ± 0.10	0.472 ± 0.004 12.00 ± 0.10	0.079 ± 0.004 2.00 ± 0.10	0.059 ± 0.004 1.50 ± 0.10	0.122 ± 0.004 3.10 ± 0.10	inches mm

Taping Specifications – Embossed Plastic Tape (cont.)

Type/Code	A	B	E	F	W	Unit
HCSK4026 (all Ω values)	0.272 ± 0.004 6.90 ± 0.10	0.409 ± 0.004 10.40 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.453 ± 0.004 11.50 ± 0.10	0.945 ± 0.012 24.00 ± 0.30	inches mm
Type/Code	P0	P1	P2	D0	T	Unit
HCSK4026 (0.0002 Ω)	0.157 ± 0.004 4.00 ± 0.10	0.472 ± 0.004 12.00 ± 0.10	0.079 ± 0.004 2.00 ± 0.10	0.059 ± 0.004 1.50 ± 0.10	0.165 ± 0.004 4.20 ± 0.10	inches mm
HCSK4026 (except 0.0002 Ω)					0.126 ± 0.004 3.20 ± 0.10	inches mm

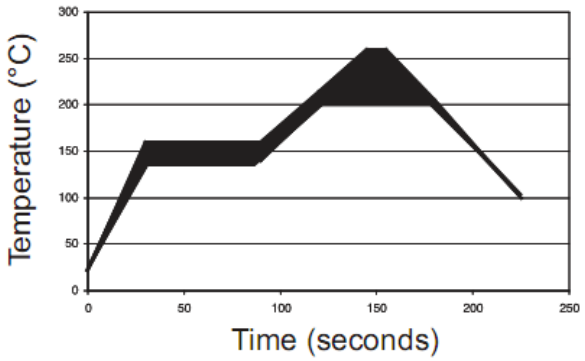
Recommended Pad Layouts



Type/Code	a	b	c	e	f	g	Unit
HCSK1216	0.059 ± 0.004 1.50 ± 0.10	0.024 ± 0.004 0.60 ± 0.10	0.059 ± 0.004 1.50 ± 0.10	0.028 ± 0.004 0.70 ± 0.10	0.020 ± 0.004 0.50 ± 0.10	0.116 ± 0.004 2.95 ± 0.10	inches mm
HCSK2725	0.114 ± 0.008 2.90 ± 0.20	0.079 ± 0.008 2.00 ± 0.20	0.114 ± 0.008 2.90 ± 0.20	0.035 ± 0.004 0.90 ± 0.10	0.039 ± 0.004 1.00 ± 0.10	0.220 ± 0.008 5.60 ± 0.20	inches mm
HCSK4026	0.063 ± 0.008 1.60 ± 0.20	0.272 ± 0.008 6.90 ± 0.20	0.063 ± 0.008 1.60 ± 0.20	0.028 ± 0.004 0.70 ± 0.10	0.039 ± 0.004 1.00 ± 0.10	0.193 ± 0.008 4.90 ± 0.20	inches mm

Soldering Recommendations:

- Peak reflow temperatures and durations
  - IR Reflow Peak = 260ºC max for 10 seconds
  - Not suitable for wave soldering
- Recommended IR reflow profile:



RoHS Compliance

Stackpole Electronics has joined the worldwide effort to reduce the amount of lead in electronic components and to meet the various regulatory requirements now prevalent, such as the European Union's directive regarding "Restrictions on Hazardous Substances" (RoHS 3). As part of this ongoing program, we periodically update this document with the status regarding the availability of our compliant components. All our standard part numbers are compliant to EU Directive 2011/65/EU of the European Parliament as amended by Directive (EU) 2015/863/EU as regards the list of restricted substances.

RoHS Compliance Status

Standard Product Series	Description	Package / Termination Type	Standard Series RoHS Compliant	Lead-Free Termination Composition	Lead-Free Mfg. Effective Date (Std Product Series)	Lead-Free Effective Date Code (YY/WW)
HCSK	Kelvin Termination Current Shunt Resistor	SMD	YES	100% Copper	Always	Always

"Conflict Metals" Commitment

We at Stackpole Electronics, Inc. are joined with our industry in opposing the use of metals mined in the "conflict region" of the eastern Democratic Republic of the Congo (DRC) in our products. Recognizing that the supply chain for metals used in the electronics industry is very complex, we work closely with our own suppliers to verify to the extent possible that the materials and products we supply do not contain metals sourced from this conflict region. As such, we are in compliance with the requirements of Dodd-Frank Act regarding Conflict Minerals.

Compliance to "REACH"

We certify that all passive components supplied by Stackpole Electronics, Inc. are SVHC (Substances of Very High Concern) free and compliant with the requirements of EU Directive 1907/2006/EC, "The Registration, Evaluation, Authorization and Restriction of Chemicals", otherwise referred to as REACH. Contact us for complete list of REACH Substance Candidate List.

Environmental Policy

It is the policy of Stackpole Electronics, Inc. (SEI) to protect the environment in all localities in which we operate. We continually strive to improve our effect on the environment. We observe all applicable laws and regulations regarding the protection of our environment and all requests related to the environment to which we have agreed. We are committed to the prevention of all forms of pollution.

How to Order

1	2	3	4	5	6	7	8	9	10	11	12	13	13
H	**C**	**S**	**K**	**2**	**7**	**2**	**5**	**F**	**T**	**1**	**L**	**0**	**0**

Product Series
HCSK

Size
1216
2725
4026

Tolerance	
Code	Tol
F	1%
J	5%

Packaging			
Code	Description	Size	Quantity
T	Embossed Plastic Tape	1216	3000
		2725, 4026	1400

Resistance Value
Four characters with "L" used as multiplier of 10^{-3} for any value under 0.1 ohm
0.0005 ohm = L500 0.001 ohm = 1L00