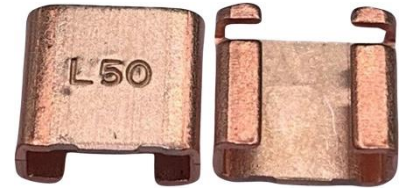


Features:

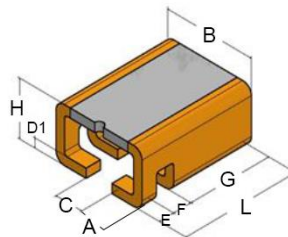
- Up to 12 W permanent power
- Inherent low inductance
- Elevated resistive element for lower thermal stress on PCB
- High temperature capability with operation up to 170°C
- High pulse capability
- RoHS compliant, REACH compliant, lead free, and halogen free
- AEC-Q200 compliant



Electrical Specifications					
Type/Code	Power Rating (W) @ 100°C (*)	Power Rating (W) @ 70°C (*)	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance	
				1%	5%
HCSK1216	5	10	±75		0.0003
	5	9	±50		0.0005
	3	7			0.001
	2	5			0.002
HCSK2725	5	12	±110		0.0002
		11	±50		0.0003
		9			0.0005
		7			0.001
	6			0.002	
	3	5			0.003
	2	4			0.004
			3		
HCSK4026	5	12	±110		0.0002
		11	±50		0.0003
		9			0.0005
	4			0.0007	
	4	8			0.001
		7			0.003
3	5				

(*) Recommended max. power depends on the thermal conditions of the assembly.

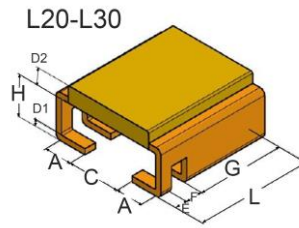
Mechanical Specifications – 1216



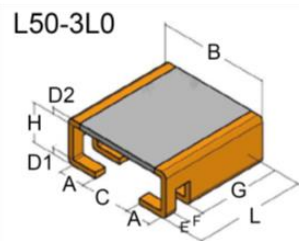
Type/Code	L	B	H	E	F	G	A	D1	C	Unit
HCSK1216	0.150 ± 0.012	0.118 ± 0.006	0.069 ± 0.008	0.020 ± 0.008	0.024 ± 0.008	0.106 ± 0.004	0.106	0.012 ± 0.004	0.041 ± 0.008	inches
	3.81 ± 0.30	3.00 ± 0.15	1.75 ± 0.20	0.50 ± 0.20	0.60 ± 0.20	2.70 ± 0.10	1.05	0.30 ± 0.10	1.05 ± 0.20	mm

The product photo shown above is typical. Actual components may vary depending on resistive element and amount of trim adjustment required to meet desired resistance value.

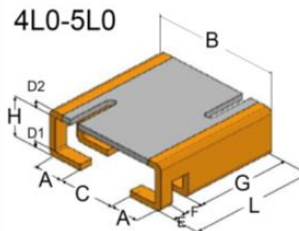
Mechanical Specifications – 2725



Type/Code	L	B	H (Ref.)	E	F	G (Ref.)	C (Ref.)	A	D1	D2 (Ref.)	Unit
HCSK2725 (0.0002, 0.0003)	0.260 ± 0.010 6.60 ± 0.25	0.272 ± 0.014 6.90 ± 0.35	0.094 2.40	0.028 ± 0.008 0.70 ± 0.20	0.039 ± 0.008 1.00 ± 0.20	0.193 4.90	0.122 3.10	0.075 ± 0.008 1.90 ± 0.20	0.020 ± 0.004 0.50 ± 0.10	0.055 1.40	inches mm

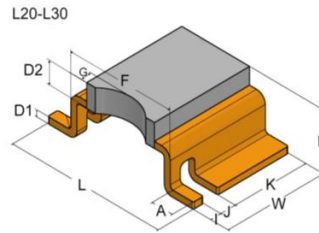


Type/Code	L	B	H (Ref.)	E	F	G (Ref.)	C (Ref.)	A	D1	D2 (Ref.)	Unit
HCSK2725 (0.0005)	0.260 ± 0.010 6.60 ± 0.25	0.272 ± 0.010 6.90 ± 0.25	0.094 2.40	0.028 ± 0.008 0.70 ± 0.20	0.039 ± 0.008 1.00 ± 0.20	0.193 4.90	0.122 3.10	0.075 ± 0.008 1.90 ± 0.20	0.018 ± 0.004 0.45 ± 0.10	0.018 0.45	inches mm
HCSK2725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

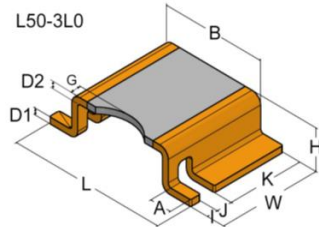


Type/Code	L	B	H (Ref.)	E	F	G (Ref.)	C (Ref.)	A	D1	D2 (Ref.)	Unit
HCSK2725 (0.004, 0.005)	0.260 ± 0.010 6.60 ± 0.25	0.272 ± 0.010 6.90 ± 0.25	0.094 2.40	0.028 ± 0.008 0.70 ± 0.20	0.039 ± 0.008 1.00 ± 0.20	0.193 4.90	0.122 3.10	0.075 ± 0.008 1.90 ± 0.20	0.014 ± 0.004 0.35 ± 0.10	0.014 0.35	inches mm

Mechanical Specifications – 4026



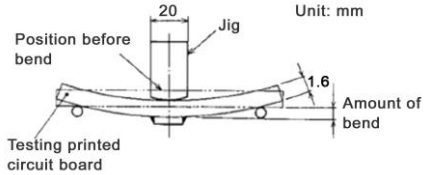
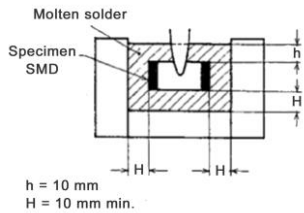
Type/Code	L	W	H (Ref.)	A	D1	D2 (Ref.)	G (max.)	I	J	K	F	Unit
HCSK4026 (0.0002Ω, 0.0003Ω)	0.398 ± 0.008 10.10 ± 0.20	0.260 ± 0.008 6.60 ± 0.20	0.148 3.75	0.055 ± 0.008 1.40 ± 0.20	0.020 ± 0.004 0.50 ± 0.10	0.055 1.40	0.028 0.70	0.028 0.70	0.039 1.00	0.193 4.90	0.272 6.90	inches mm



Type/Code	L	W	H (Ref.)	A	D1	D2 (Ref.)	G (max.)	I	J	K	B	Unit
HCSK4026 (0.0005Ω, 0.0007Ω)	0.398 ± 0.008 10.10 ± 0.20	0.260 ± 0.008 6.60 ± 0.20	0.114 2.90	0.055 ± 0.008 1.40 ± 0.20	0.018 ± 0.004 0.45 ± 0.10	0.018 0.45	0.028 0.70	0.028 0.70	0.039 1.00	0.193 4.90	0.272 6.90	inches mm
HCSK4026 (0.001Ω, 0.003Ω)	0.398 ± 0.008 10.10 ± 0.20	0.260 ± 0.008 6.60 ± 0.20	0.112 2.85	0.055 ± 0.008 1.40 ± 0.20	0.016 ± 0.004 0.40 ± 0.10	0.016 0.40	0.028 0.70	0.028 0.70	0.039 1.00	0.193 4.90	0.272 6.90	inches mm

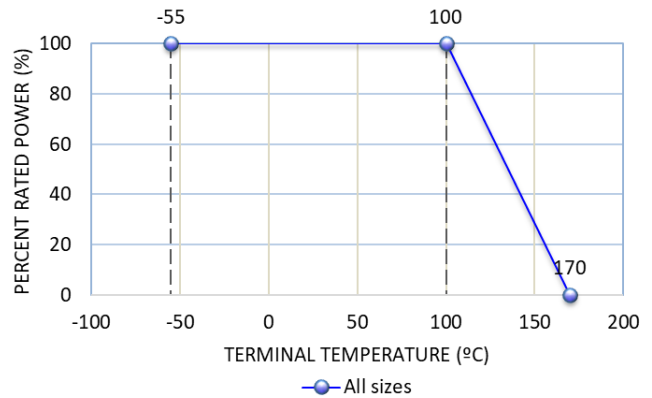
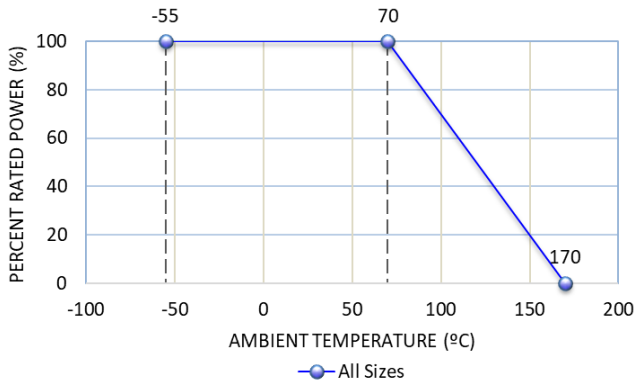
Performance Characteristics

Test	Test Method	Test Specification	Test Condition
Short Time Overload	-	ΔR: ±1%	5 times rated power for 5 seconds
Temperature Coefficient of Resistance (TCR)	JIS-C5202-5.2	Refer to Electrical Specifications	25°C/+125°C $TCR (ppm/°C) = \frac{\Delta R}{R \times \Delta t} \times 10^6$
Moisture Resistance	MIL-STD-202, Method 106	ΔR: ±1%	The specimens shall be placed in a chamber and subjected to a relative humidity of 90~98% and a temperature of 25/65°C, 10 cycles.
High Temperature Exposure	JIS-C5202-7.2	ΔR: ±1%	For 1216: The part (mounted on board) is exposed in the heat chamber, 125°C for 1000 hours.
			For 2725 and 4026 The part (mounted on board) is exposed in the heat chamber, 170°C for 1000 hours.
Load Life	JIS-C5202-7.10	ΔR: ±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	ΔR: ±1%	<p>The part (mounted on board) is exposed to -20 ± 3°C (30 minutes)/+125 ± 2°C (30 minutes) 5 cycles for 1206 size and -55 ± 3°C (30 minutes)/+125 ± 2°C (30 minutes) 1000 cycles for 2725 and 4026 sizes.</p> <p>The following conditions shown in the figure below.</p>

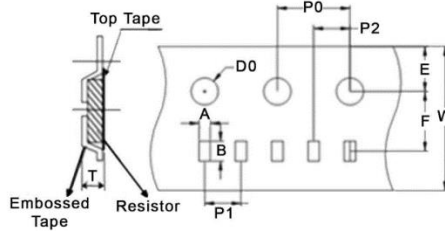
Performance Characteristics (cont.)			
Test	Test Method	Test Specification	Test Condition
Bending Strength	JIS-C5202-6.1	$\Delta R: \pm 1\%$	<p>Mount the part to test 90 mm (L) * 40 mm (W) FR4 printed circuit board substrate. Apply pressure in direction of arrow unit band width reaches 2 mm (+0.2 / -0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

Note: All reliability test should follow Derating Curve. Terminal temperature of component should be below 100°C . Recommended storage condition is temperature of $22 \sim 28^\circ\text{C}$. Humidity: 40 ~ 75%. Operating temperature range is -55 to $+170^\circ\text{C}$

Power Derating Curve:

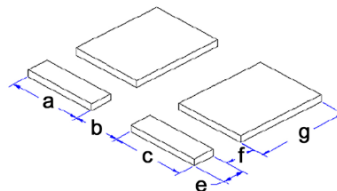


Taping Specifications – Plastic Tape



Type/Code	A	B	E	F	W	Unit
HCSK1216	0.130 ± 0.004	0.165 ± 0.004	0.104 ± 0.004	0.217 ± 0.004	0.472 ± 0.008	inches
	3.30 ± 0.10	4.20 ± 0.10	2.64 ± 0.10	5.50 ± 0.10	12.00 ± 0.20	mm
	P0	P1	P2	D0	T	Unit
HCSK1216	0.157 ± 0.004	0.315 ± 0.004	0.079 ± 0.002	0.059 ± 0.004	0.083 ± 0.004	inches
	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	1.50 ± 0.10	2.10 ± 0.10	mm
	Type/Code	A	B	E	F	W
HCSK2725 (0.0002Ω, 0.0003Ω)	0.276 ± 0.004	0.276 ± 0.004	0.069 ± 0.004	0.295 ± 0.004	0.630 ± 0.008	inches
	7.00 ± 0.10	7.00 ± 0.10	1.75 ± 0.10	7.50 ± 0.10	16.00 ± 0.20	mm
	P0	P1	P2	D0	T	Unit
HCSK2725 (0.0002Ω, 0.0003Ω)	0.157 ± 0.004	0.472 ± 0.004	0.079 ± 0.004	0.059 ± 0.004	0.165 ± 0.004	inches
	4.00 ± 0.10	12.00 ± 0.10	2.00 ± 0.10	1.50 ± 0.10	4.20 ± 0.10	mm
	Type/Code	A	B	E	F	W
HCSK2725 (0.0005Ω - 0.005Ω)	0.276 ± 0.004	0.276 ± 0.004	0.069 ± 0.004	0.295 ± 0.004	0.630 ± 0.008	inches
	7.00 ± 0.10	7.00 ± 0.10	1.75 ± 0.10	7.50 ± 0.10	16.00 ± 0.20	mm
	P0	P1	P2	D0	T	Unit
HCSK2725 (0.0005Ω - 0.005Ω)	0.157 ± 0.004	0.472 ± 0.004	0.079 ± 0.004	0.059 ± 0.004	0.122 ± 0.004	inches
	4.00 ± 0.10	12.00 ± 0.10	2.00 ± 0.10	1.50 ± 0.10	3.10 ± 0.10	mm
	Type/Code	A	B	E	F	W
HCSK4026 (0.0002Ω, 0.0003Ω)	0.272 ± 0.004	0.417 ± 0.004	0.069 ± 0.004	0.453 ± 0.004	0.945 ± 0.012	inches
	6.90 ± 0.10	10.60 ± 0.10	1.75 ± 0.10	11.50 ± 0.10	24.00 ± 0.30	mm
	P0	P1	P2	D0	T	Unit
HCSK4026 (0.0002Ω, 0.0003Ω)	0.157 ± 0.004	0.472 ± 0.004	0.079 ± 0.004	0.059 ± 0.004	0.165 ± 0.004	inches
	4.00 ± 0.10	12.00 ± 0.10	2.00 ± 0.10	1.50 ± 0.10	4.20 ± 0.10	mm
	Type/Code	A	B	E	F	W
HCSK4026 (0.0005-0.003)	0.272 ± 0.004	0.417 ± 0.004	0.069 ± 0.004	0.453 ± 0.004	0.945 ± 0.012	inches
	6.90 ± 0.10	10.60 ± 0.10	1.75 ± 0.10	11.50 ± 0.10	24.00 ± 0.30	mm
	P0	P1	P2	D0	T	Unit
HCSK4026 (0.0005-0.003)	0.157 ± 0.004	0.472 ± 0.004	0.079 ± 0.004	0.059 ± 0.004	0.126 ± 0.004	inches
	4.00 ± 0.10	12.00 ± 0.10	2.00 ± 0.10	1.50 ± 0.10	3.20 ± 0.10	mm

Recommended Pad Layout



Type/Code	a	b	c	e	f	g	Unit
HCSK1216	0.059 ± 0.004	0.024 ± 0.004	0.059 ± 0.004	0.028 ± 0.004	0.020 ± 0.004	0.116 ± 0.004	inches
	1.50 ± 0.10	0.60 ± 0.10	1.50 ± 0.10	0.70 ± 0.10	0.50 ± 0.10	2.95 ± 0.10	mm
HCSK2725	0.114 ± 0.008	0.079 ± 0.008	0.114 ± 0.008	0.035 ± 0.004	0.039 ± 0.004	0.220 ± 0.008	inches
	2.90 ± 0.20	2.00 ± 0.20	2.90 ± 0.20	0.90 ± 0.10	1.00 ± 0.10	5.60 ± 0.20	mm
HCSK4026	0.096 ± 0.008	0.228 ± 0.008	0.096 ± 0.008	0.035 ± 0.004	0.035 ± 0.004	0.220 ± 0.008	inches
	2.44 ± 0.20	5.80 ± 0.20	2.44 ± 0.20	0.90 ± 0.10	0.90 ± 0.10	5.60 ± 0.20	mm

Recommended Solder Profile

This information is intended as a reference for solder profiles for Stackpole resistive components. These profiles should be compatible with most soldering processes. These are only recommendations. Actual numbers will depend on board density, geometry, packages used, etc., especially those cells labeled with “*”.

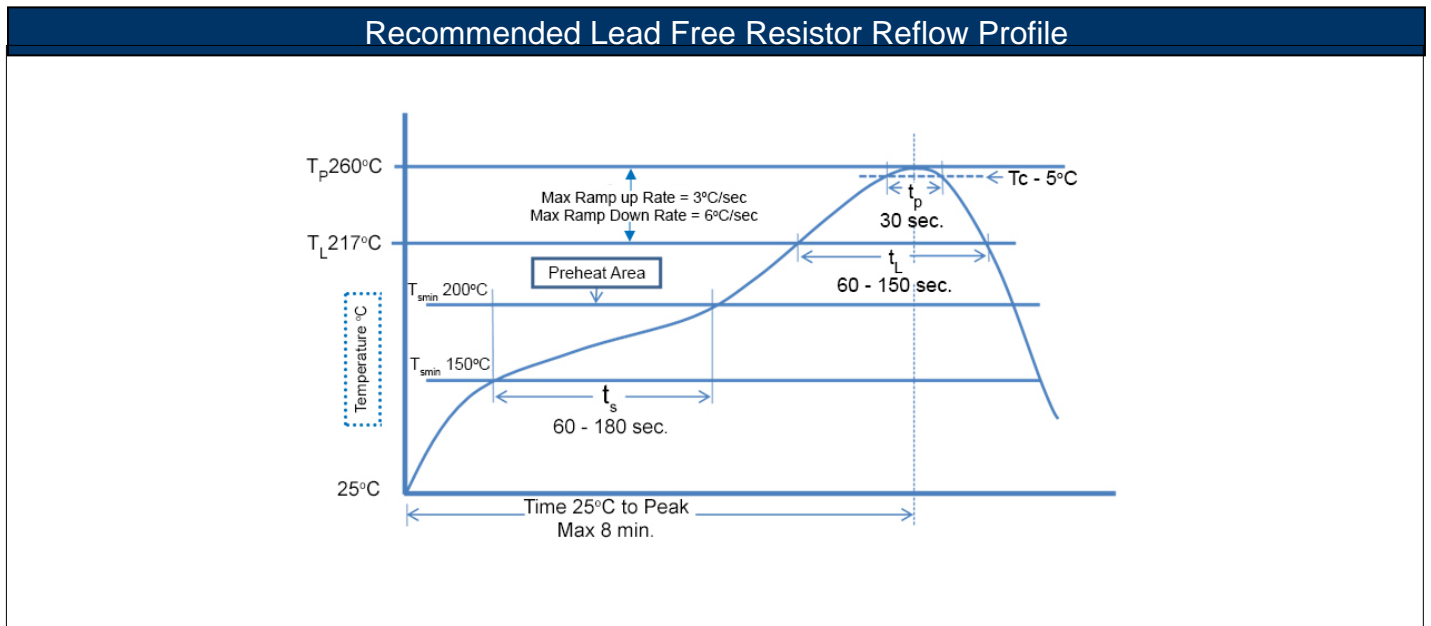
100% Copper

Soldering iron recommended temperatures: 330 to 350°C with minimum duration.
Maximum number of reflow cycles: 3.

Wave Soldering			
Description	Maximum	Recommended	Minimum
Preheat Time	80 seconds	70 seconds	60 seconds
Temperature Diff.	140°C	120°C	100°C
Solder Temp.	260°C	250°C	240°C
Dwell Time at Max.	10 seconds	5 seconds	*
Ramp DN (°C/sec)	N/A	N/A	N/A

Temperature Diff. = Difference between final preheat stage and soldering stage.

Convection IR Reflow			
Description	Maximum	Recommended	Minimum
Ramp Up (°C/sec)	3°C/sec	2°C/sec	*
Dwell Time > 217°C	150 seconds	90 seconds	60 seconds
Solder Temp.	260°C	245°C	*
Dwell Time at Max.	30 seconds	15 seconds	10 seconds
Ramp DN (°C/sec)	6°C/sec	3°C/sec	*



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 Metal Alloy 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

