Features:

- 2 W 2512 size chip
- Wide resistance range
- Cooler operation than standard 2512 size thick film chip
- RoHS compliant, REACH compliant, and halogen free

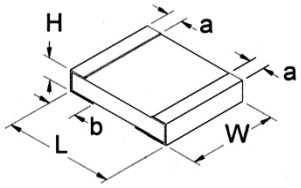
Electrical Specifications

Type/Code	Package Type	Power Rating (W) @ 70ºC	Maximum Working Voltage (V)(1)	Maximum Overload Voltage (V)	TCR (ppm/ºC)	Ohmic Range (Ω) and Tolerance
						1%, 5%
RHC2512	2512	2	200	400	±100	0.1 - 1M

Note: (1) Lesser of √(P*R) or maximum working voltage

Please refer to the High-Power Resistor Application Note for more information on designing and implementing high power resistor types.

Mechanical Specifications



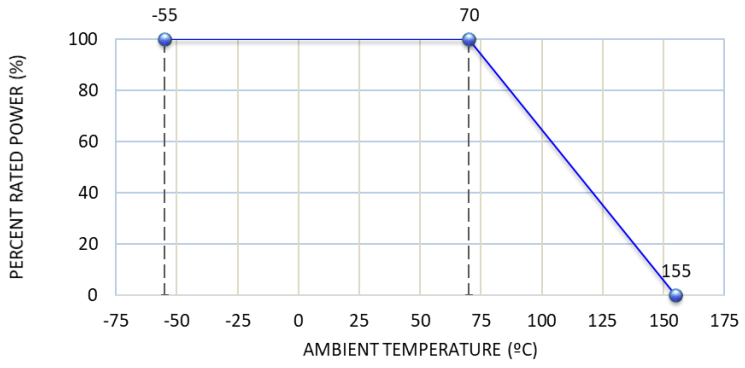
Type/Code	L Body Length	W Body Width	H Body Height	a Top Termination	b Bottom Termination	Unit
RHC2512	0.248 ± 0.008 6.30 ± 0.20	0.126 ± 0.008 3.20 ± 0.20	0.024 ± 0.004 0.60 ± 0.10	0.028 ± 0.008 0.70 ± 0.20	0.087 ± 0.008 2.20 ± 0.20	inches mm

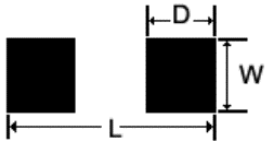
Performance Characteristics

Test	Typical
Moisture Resistance	±1% + 0.05Ω for <10Ω and ±1% for ≥10Ω
Load Life	
Resistance to Soldering	
Temperature Cycling	
Thermal Shock	
Short Time Overload	
Insulation Resistance	≥1MΩ

Operating temperature range is -55 to +155°C

Power Derating Curve:



Recommended Pad Layout


Type/Code	L Total Length	W Total Width	D Pad Depth	Unit
RHC2512	0.315 8.00	0.138 3.50	0.118 3.00	inches 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% Matte Tin / RoHS Compliant Terminations

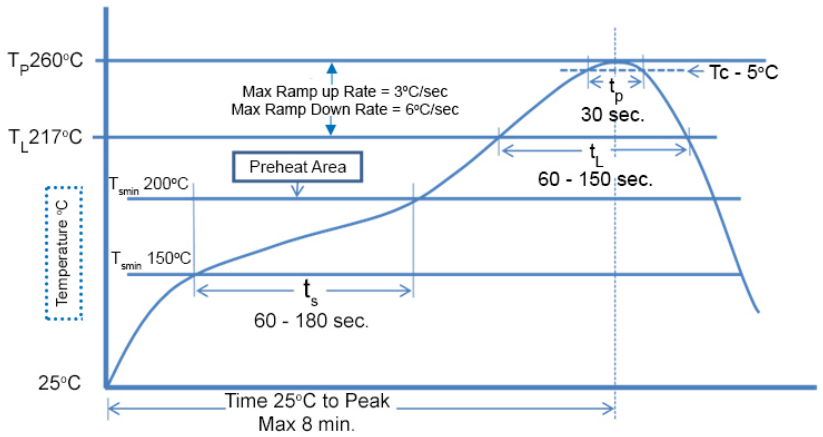
Soldering iron recommended temperatures: 330 to 350°C with minimum duration.
Maximum number of reflow cycles: 3.

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

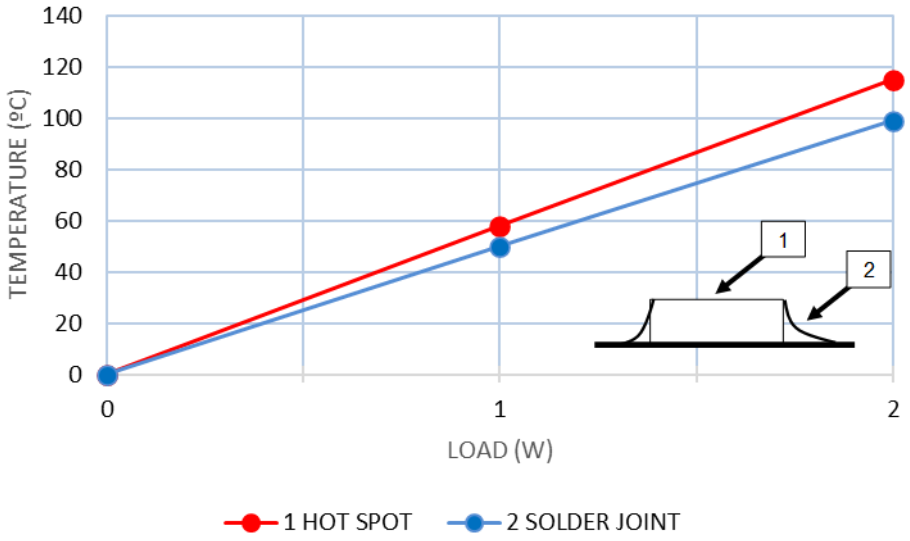
Temperature Diff. = Difference between final preheat stage and soldering stage.

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	*

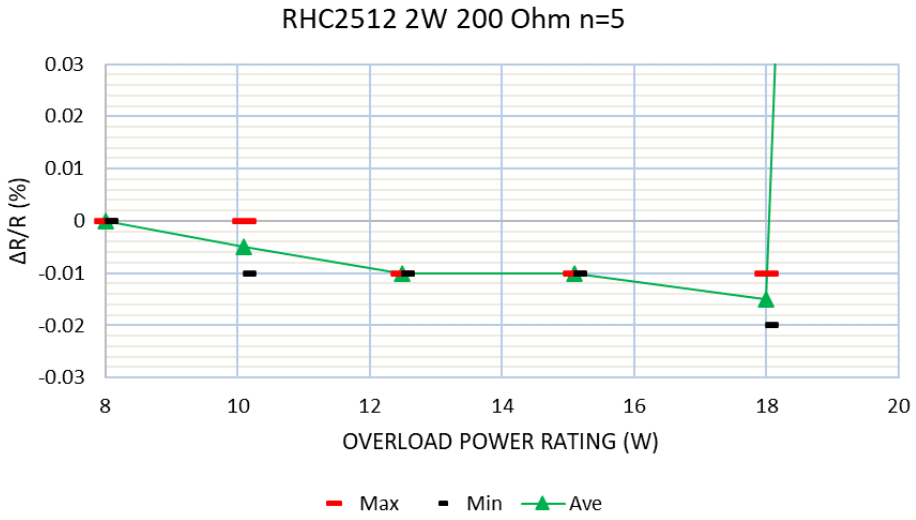
Recommended Lead Free Resistor Reflow Profile

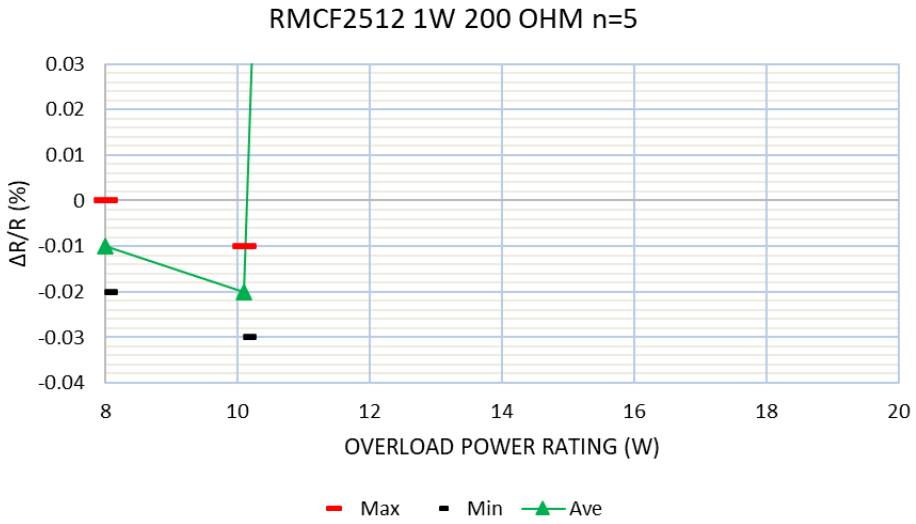


Heat Rise and Terminal Temperature:



Repeated Overload:

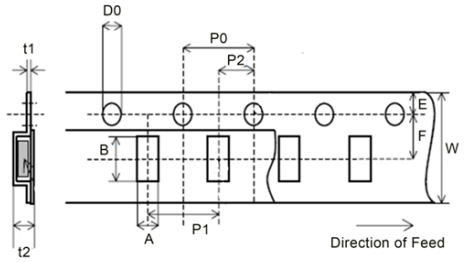




Test condition:
Voltage (Power): 2.0, 2.25, 2.5, 2.75, 3.0, 3.25 times of rated voltage. (8 W, 10.1 W, 12.5 W, 15.1 W, 18 W, 21.1 W)

Applied time:
Each voltage 5 seconds.
As a reference test, the RMCF was tested with the same rated voltage and testing substrate.

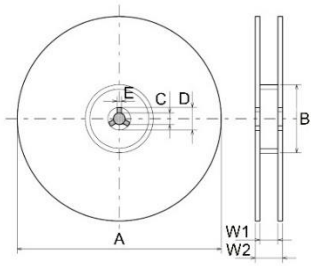
Packaging Specifications - Plastic Tape



Type	A	B	W	F	E	P1	Unit
RHC2512	0.134 ± 0.004 3.40 ± 0.10	0.260 ± 0.004 6.60 ± 0.10	0.472 ± 0.008 12.00 ± 0.20	0.217 ± 0.002 5.50 ± 0.05	0.069 ± 0.004 1.75 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	Inches mm

Type	P2	P0	D0	t1	t2	Unit
RHC2512	0.079 ± 0.002 2.00 ± 0.05	0.157 ± 0.004 4.00 ± 0.10	0.061 ± 0.002 1.55 ± 0.05	0.010 ± 0.002 0.25 ± 0.05	0.039 ± 0.004 1.00 ± 0.10	Inches mm

Reel Specifications



Type	A	B	C	D	E	W1	W2	Unit
RHC2512	7.087 ± 0.118 180.00 ± 3.00	2.362 ± 0.039 60.00 ± 1.00	0.512 ± 0.008 13.00 ± 0.20	0.827 ± 0.031 21.00 ± 0.80	0.079 ± 0.020 2.00 ± 0.50	0.512 ± 0.012 13.00 ± 0.30	0.606 ± 0.039 15.40 ± 1.00	Inches mm

Part Marking Instructions

3-digit marking in E24 values (1% and 5% tolerances)
First and second digits are E24 code; third digit is the multiplier

3-digit marking for 2512 in E24			
Resistance	18Ω	100Ω	10KΩ
Marking	180	101	103

E24 Code	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91

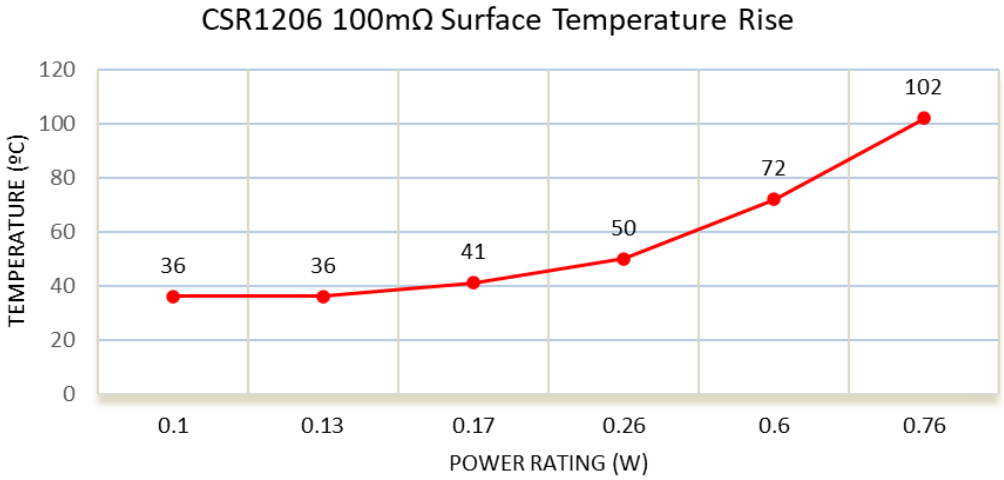
4-digit marking in E96 values (1% tolerances)
Values < 100Ω will use "R" as the decimal holder

4-digit marking for 2512 in E96			
Resistance	0.976	10Ω	1MΩ
Marking	R976	10R0	1004

High Power Chip Resistors and Thermal Management

Stackpole has developed several surface mount resistor series in addition to our current sense resistors, which have had higher power ratings than standard resistor chips. This has caused some uncertainty and even confusion by users as to how to reliably use these resistors at the higher power ratings in their designs.

The data sheets for the RHC, RMCP, RNCP, CSR, CSRN, CSRF, CSS, and CSSH state that the rated power assumes an ambient temperature of no more than 100°C for the CSS / CSSH series and 70°C for all other high power resistor series. In addition, IPC and UL best practices dictate that the combined temperature on any resistor due to power dissipated and ambient air shall be no more than 105°C. At first glance this wouldn't seem too difficult, however the graph below shows typical heat rise for the CSR1206 100 milliohm at full rated power. The heat rise for the RMCP and RNCP would be similar. The RHC with its unique materials, design, and processes would have less heat rise and therefore would be easier to implement for any given customer.



The 102°C heat rise shown here would indicate there will be additional thermal reduction techniques needed to keep this part under 105°C total hot spot temperature if this part is to be used at 0.75 watts of power. However, this same part at the usual power rating for this size would have a heat rise of around 72°C. This additional heat rise may be dealt with using wider conductor traces, larger solder pads and land patterns under the solder mask, heavier copper in the conductors, via through PCB, air movement, and heat sinks, among many other techniques. Because of the variety of methods customers can use to lower the effective heat rise of the circuit, resistor manufacturers simply specify power ratings with the limitations on ambient air temperature and total hot spot temperatures and leave the details of how to best accomplish this to the design engineers. Design guidelines for products in various market segments can vary widely so it would be unnecessarily constraining for a resistor manufacturer to recommend the use of any of these methods over another.

Note: The final resistance value can be affected by the board layout and assembly process, especially the size of the mounting pads and the amount of solder used. This is especially notable for resistance values ≤ 50mΩ. This should be taken into account when designing.

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)
RHC	High Power Thick Film Chip Resistor	SMD	YES(1)	100% Matte Sn over Ni	Jul-04	04/27

Note (1): RoHS Compliant by means of exemption 7c-I.

"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

R	H	C	2	5	1	2	F	T	1	0	K	0

Product Series

Series	Description
RHC	High Power

Size

Code	W
2512	2

Tolerance

Code	Tol	Value
F	1%	E96, E24
J	5%	E24

Packaging

Code	Description	Size	Quantity
T	7" Reel Plastic Tape	2512	4000

Resistance Value

Four characters with the multiplier used as the decimal holder.

0.1 ohm = R100
4.75 ohm = 4R75
10.2 Kohm = 10K2
1 Mohm = 1M00

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

SEI Stackpole:

RHC2512FT15R0 RHC2512FT150R RHC2512FT68R0 RHC2512FT7R50 RHC2512FT22K0 RHC2512JT270R
RHC2512FT470R RHC2512FT15K0 RHC2512FT680R RHC2512FT68K0 RHC2512FT100R RHC2512FTR100
RHC2512FT604R RHC2512FT47K0 RHC2512FT1K00 RHC2512FT10R0 RHC2512FT1K50 RHC2512FT100K
RHC2512FT220R RHC2512FT10K0 RHC2512FT4R99 RHC2512FT47R5 RHC2512FT2R49 RHC2512FT3K30
RHC2512FT2K20 RHC2512FT33K0 RHC2512FT47R0 RHC2512FT1R00 RHC2512FT330R RHC2512FT4K70
RHC2512FT22R0 RHC2512FT33R0 RHC2512FT105R RHC2512FT13R7 RHC2512FT140R RHC2512FT1R58
RHC2512FT1R69 RHC2512FT210R RHC2512FT249R RHC2512FT2R20 RHC2512FT309R RHC2512FT39R2
RHC2512FT44R2 RHC2512FT4R53 RHC2512FT549R RHC2512FT5R10 RHC2512FT5R11 RHC2512FT62R0
RHC2512FT649R RHC2512FT6R49 RHC2512FT7R15 RHC2512FT866R RHC2512FT91K0 RHC2512FTR620
RHC2512FTR820 RHC2512JT12R0 RHC2512JT1K10 RHC2512JT2K70 RHC2512JT390K RHC2512JT47K0
RHC2512JT5K60 RHC2512JT750R RHC2512JT9K10 RHC2512JTR430 RHC2512FT110R RHC2512FT15R4
RHC2512FT1R37 RHC2512FT232R RHC2512FT26R1 RHC2512FT38R3 RHC2512FT3R32 RHC2512FT430K
RHC2512FT510R RHC2512FT51K0 RHC2512FT5R90 RHC2512FT732R RHC2512FTR330 RHC2512FTR390
RHC2512JT110K RHC2512JT33K0 RHC2512JT3R00 RHC2512JT510R RHC2512JT680R RHC2512JT8K20
RHC2512JTR200 RHC2512JTR240 RHC2512JTR910 RHC2512FT10R2 RHC2512FT12K0 RHC2512FT14R7
RHC2512FT160R RHC2512FT19R6 RHC2512FT1R27 RHC2512FT270R RHC2512FT28R0 RHC2512FT31R6
RHC2512FT412R RHC2512FT45R3 RHC2512FT51R0 RHC2512FT5R23