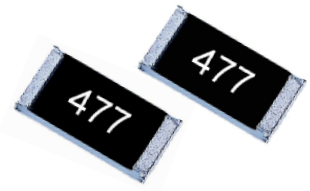
Features:

- R Value extension of RMCF product, values up to 10 G
- E24 values
- RoHS compliant, REACH compliant, and halogen free

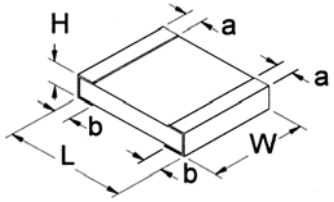


Electrical Specifications

Type/Code	Power Rating (W) @ 70ºC	Maximum Working Voltage (V) (1)	Maximum Overload Voltage (V)	TCR (ppm/ºC)	Ohmic Range (Ω) and Tolerance		
					1%	5%	10%
HMC0402	0.063	50	100	± 200	11M - 20M	-	
				± 400	22M - 100M		
HMC0603	0.1	50	100	± 200	11M - 20M	-	
				± 400	22M - 100M		
				± 500	-	110M - 1G	
HMC0805	0.125	150	300	± 200	11M - 20M	-	
				± 400	22M - 100M		
				± 500	-	110M - 500M	
				± 1000	-	510M - 1G	
				± 1500	-	1.2G - 10G	
HMC1206	0.25	200	400	± 200	11M - 20M	-	
				± 400	22M - 100M	30M - 100M	
				± 500	-	110M - 500M	
				± 1000	-	510M - 1G	
				± 1500	-	1.2G - 10G	
HMC1210	0.33	200	400	± 200	11M - 20M	-	11M - 20M
				± 400	22M - 100M		
HMC2010	0.75	200	400	± 200	11M - 20M		
				± 400	22M - 100M		
HMC2512	1	250	500	± 200	11M - 20M		
				± 400	22M - 100M		

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

Mechanical Specifications



Type/Code	L Body Length	W Body Width	H Body Height	a Top Termination	b Bottom Termination	Unit
HMC0402	0.039 ± 0.002 1.00 ± 0.05	0.020 ± 0.002 0.50 ± 0.05	0.014 ± 0.002 0.35 ± 0.05	0.008 ± 0.004 0.20 ± 0.10	0.008 ± 0.004 0.20 ± 0.10	inches mm
HMC0603	0.063 ± 0.004 1.60 ± 0.10	0.031 ± 0.004 0.80 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	0.012 ± 0.008 0.30 ± 0.20	0.012 ± 0.008 0.30 ± 0.20	inches mm

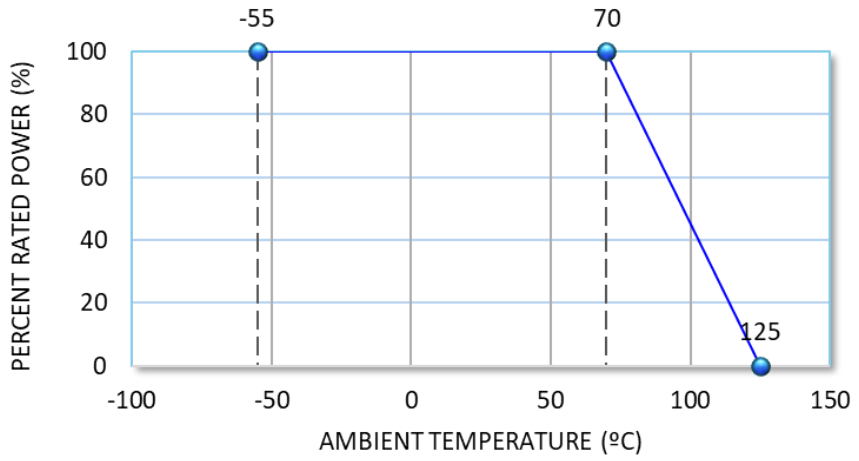
This specification may be changed at any time without prior notice.
Please confirm technical specifications before use.

Mechanical Specifications						
Type/Code	L Body Length	W Body Width	H Body Height	a Top Termination	b Bottom Termination	Unit
HMC0805	0.079 ± 0.008 2.00 ± 0.20	0.049 ± 0.004 1.25 ± 0.10	0.020 ± 0.004 0.50 ± 0.10	0.016 ± 0.008 0.40 ± 0.20	0.016 ± 0.008 0.40 ± 0.20	inches mm
HMC1206	0.122 ± 0.006 3.10 ± 0.15	0.061 ± 0.004 1.55 ± 0.10	0.022 ± 0.006 0.55 ± 0.15	0.020 ± 0.010 0.50 ± 0.25	0.020 ± 0.008 0.50 ± 0.20	inches mm
HMC1210	0.126 ± 0.008 3.20 ± 0.20	0.102 ± 0.006 2.60 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.020 ± 0.008 0.50 ± 0.20	0.020 ± 0.008 0.50 ± 0.20	inches mm
HMC2010	0.197 ± 0.008 5.00 ± 0.20	0.098 ± 0.006 2.50 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.024 ± 0.010 0.60 ± 0.25	0.020 ± 0.008 0.50 ± 0.20	inches mm
HMC2512	0.250 ± 0.008 6.35 ± 0.20	0.126 ± 0.006 3.20 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.024 ± 0.010 0.60 ± 0.25	0.020 ± 0.008 0.50 ± 0.20	inches mm

Performance Characteristics		
Test	Test Condition (JIS C 5202)	Test Result
Long Term Stability	Nominal temperature & humidity for 1000 hours	ΔR ± 0.5%
High Temperature Loading	15 VDC, 1.5 hour ON, 0.5 hour OFF, 1000 hours 70ºC	ΔR ± 3%
Resistance to Solder Heat	260 ± 5ºC, 10 seconds +1/-0	ΔR ± 1%
Short Time Overload	5 seconds at maximum overload voltage	ΔR ± 2%

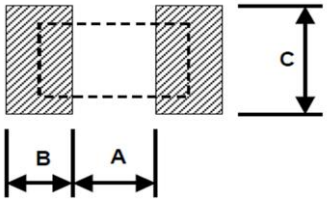
Operating temperature range is -55 to +125ºC

Power Derating Curve:



This specification may be changed at any time without prior notice.
Please confirm technical specifications before use.

Recommended Pad Layout



Type/Code	A	B	C	Unit
HMC0402	0.020 0.50	0.018 0.45	0.024 0.60	inches mm
HMC0603	0.035 0.90	0.024 0.60	0.035 0.90	inches mm
HMC0805	0.047 1.20	0.028 0.70	0.051 1.30	inches mm
HMC1206	0.079 2.00	0.035 0.90	0.063 1.60	inches mm
HMC1210	0.079 2.00	0.035 0.90	0.110 2.80	inches mm
HMC2010	0.150 3.80	0.035 0.90	0.110 2.80	inches mm
HMC2512	0.193 4.90	0.063 1.60	0.138 3.50	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°C 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

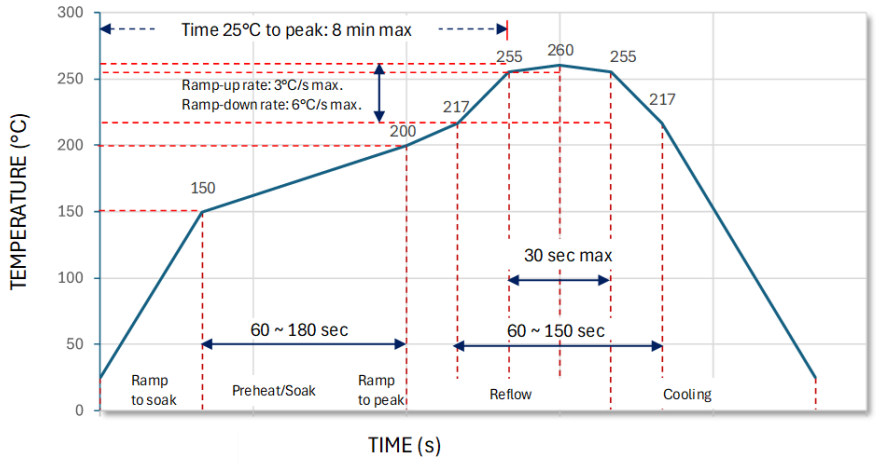
Temperature Diff. = Difference between final preheat stage and soldering stage.

This specification may be changed at any time without prior notice.
Please confirm technical specifications before use.

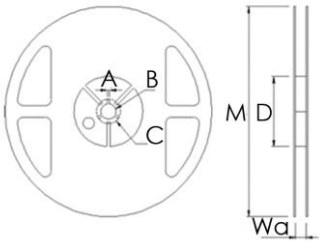
Convection IR Reflow

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 Resistor Reflow Profile



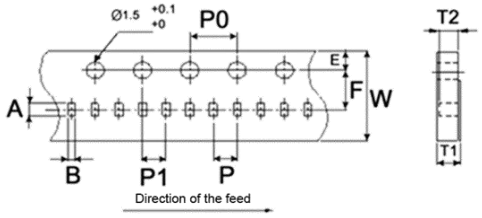
Reel Specifications



Reel Type	Wa	M	A	B	C	D	Unit
7" reel for 8 mm tape	0.354 ± 0.020 9.00 ± 0.50	7.008 ± 0.079 178.00 ± 2.00	0.079 ± 0.020 2.00 ± 0.50	0.531 ± 0.020 13.50 ± 0.50	0.827 ± 0.020 21.00 ± 0.50	2.362 ± 0.039 60.00 ± 1.00	inches mm

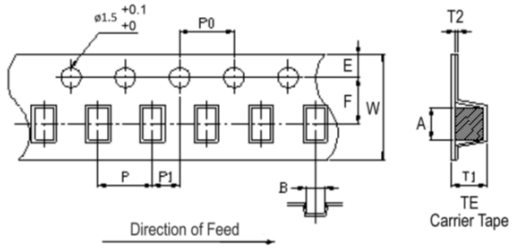
This specification may be changed at any time without prior notice.
Please confirm technical specifications before use.

Taping Specifications - Paper Tape



Type/Code	Nominal Typical Full Reel Weight (g)	Tape Width	A	B	W	E	F	T1	T2	P	P0	P1	Unit
HMC0402	94.5	0.315 8.00	0.047 ± 0.006 1.20 ± 0.15	0.028 ± 0.006 0.70 ± 0.15	0.315 ± 0.008 8.00 ± 0.20	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.002 3.50 ± 0.05	0.016 ± 0.008 0.40 ± 0.20	0.016 ± 0.002 0.40 ± 0.05	0.079 ± 0.004 2.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	inches
													mm
HMC0603	118.3		0.071 ± 0.008 1.80 ± 0.20	0.041 ± 0.008 1.05 ± 0.20				0.024 ± 0.008 0.60 ± 0.20	0.024 ± 0.004 0.60 ± 0.10				inches
													mm
HMC0805	139.2		0.093 ± 0.010 2.35 ± 0.25	0.063 ± 0.010 1.60 ± 0.25				0.030 ± 0.008 0.75 ± 0.20	0.030 ± 0.004 0.75 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	inches
													mm
HMC1206	151.4		0.140 ± 0.010 3.55 ± 0.25	0.077 ± 0.010 1.95 ± 0.25				0.030 ± 0.008 0.75 ± 0.20	0.030 ± 0.004 0.75 ± 0.10				inches
													mm
HMC1210	175.7		0.138 ± 0.008 3.50 ± 0.20	0.110 ± 0.010 2.80 ± 0.25				0.030 ± 0.008 0.75 ± 0.20	0.030 ± 0.004 0.75 ± 0.10				inches
													mm

Taping Specifications - Plastic Tape



Type/Code	Nominal Typical Full Reel Weight (g)	Tape Width	A	B	W	E	F	T1	T2	P	P0	P1	Unit
HMC2010	183.1	0.472 12.00	0.217 ± 0.012 5.50 ± 0.30	0.110 ± 0.008 2.80 ± 0.20	0.472 ± 0.008 12.00 ± 0.20	0.069 ± 0.004 1.75 ± 0.10	0.217 ± 0.002 5.50 ± 0.05	0.041 ± 0.008 1.05 ± 0.20	0.009 ± 0.006 0.23 ± 0.15	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	inches
													mm
HMC2512	255.3		0.264 ± 0.008 6.70 ± 0.20	0.134 ± 0.008 3.40 ± 0.20									inches
													mm

This specification may be changed at any time without prior notice.
Please confirm technical specifications before use.

Part Marking Specifications

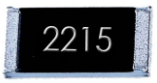
E96 Values for 0805-2512 (1% tolerance)

The nominal resistance is marked on the surface of the overcoating with the use of **four character markings**.

1. The fourth digit is the multiplier.



18.2 MΩ



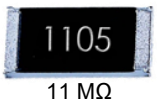
22.1 MΩ

E24 Values for 0805-2512 (1% tolerance)

The nominal resistance is marked on the surface of the overcoating with the use of **four character markings**.

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

1. The fourth digit is the multiplier.



11 MΩ



22 MΩ

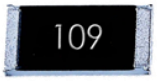
E24 Values for 0805-2512 (5% tolerance)

The nominal resistance is marked on the surface of the overcoating with the use of **three character markings**.

1. First and second digits are E24 code; third digit is the multiplier.



110 MΩ

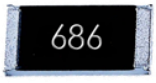


10 GΩ

E24 Values for 0603

The nominal resistance is marked on the surface of the overcoating with the use of **three character markings**.

1. First and second digits are E24 code; third digit is the multiplier.
2. Values that are both E24 and E96 follow E96 marking rules.



68 MΩ



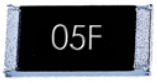
100 MΩ

E96 Values for 0603 size (1% tolerances)

A two character number is assigned to each standard R-Value (E96) as shown in the chart below. This is followed by one alpha character which is used as a multiplier. Each letter ("F" and "G") represents a specific multiplier.

Alpha Character = Multiplier
F = 1,000,000
G = 10,000,000

Chip Marking = Value
05F = 11.0 x 1,000,000 = 11 MΩ
30F = 20.0 x 1,000,000 = 20 MΩ
01G = 10.0 x 10,000,000 = 100 MΩ



11 MΩ



100 MΩ

E96

#	R-Value	#	R-Value	#	R-Value	#	R-Value	#	R-Value	#	R-Value
01	10.0	**17**	14.7	**33**	21.5	**49**	31.6	**65**	46.4	**81**	68.1
02	10.2	**18**	15.0	**34**	22.1	**50**	32.4	**66**	47.5	**82**	69.8
03	10.5	**19**	15.4	**35**	22.6	**51**	33.2	**67**	48.7	**83**	71.5
04	10.7	**20**	15.8	**36**	23.2	**52**	34.0	**68**	49.9	**84**	73.2
05	11.0	**21**	16.2	**37**	23.7	**53**	34.8	**69**	51.1	**85**	75.0
06	11.3	**22**	16.5	**38**	24.3	**54**	35.7	**70**	52.3	**86**	76.8
07	11.5	**23**	16.9	**39**	24.9	**55**	36.5	**71**	53.6	**87**	78.7
08	11.8	**24**	17.4	**40**	25.5	**56**	37.4	**72**	54.9	**88**	80.6
09	12.1	**25**	17.8	**41**	26.1	**57**	38.3	**73**	56.2	**89**	82.5
10	12.4	**26**	18.2	**42**	26.7	**58**	39.2	**74**	57.6	**90**	84.5
11	12.7	**27**	18.7	**43**	27.4	**59**	40.2	**75**	59.0	**91**	86.6
12	13.0	**28**	19.1	**44**	28.0	**60**	41.2	**76**	60.4	**92**	88.7
13	13.3	**29**	19.6	**45**	28.7	**61**	42.2	**77**	61.9	**93**	90.9
14	13.7	**30**	20.0	**46**	29.4	**62**	43.2	**78**	63.4	**94**	93.1
15	14.0	**31**	20.5	**47**	30.1	**63**	44.2	**79**	64.9	**95**	95.3
16	14.3	**32**	21.0	**48**	30.9	**64**	45.3	**80**	66.5	**96**	97.6

Note: 0402 size is unmarked.

This specification may be changed at any time without prior notice.
Please confirm technical specifications before use.

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
HMC	High Resistance Thick Film Chip Resistor	SMD	YES(1)	100% Matte Sn over Ni

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

H	M	C	0	8	0	5	F	T	4	7	M	0

Product Series

Code	Description
HMC	High Resistance Thick Film

Size

Code	W
0402	0.063
0603	0.1
0805	0.125
1206	0.25
1210	0.33
2010	0.75
2512	1

Tolerance

Code	Tol	Value
F	1%	E24
J	5%	
K	10%	

Packaging

Code	Description	Size	Quantity
T	7" Reel Paper Tape	0402	10000
		0603, 0805 1206, 1210	5000
	7" Reel Plastic Tape	2010 2512	4000

Resistance Value

Four characters with the multiplier used as the decimal holder.
30 Mohm = 30M0 100 Mohm = 100M 1.2 Gohm = 1G20

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Please confirm technical specifications before use.