

**Features:**

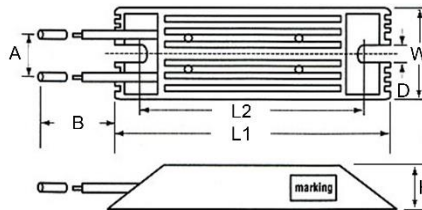
- Provides good stability for high power
- Available in non-inductive
- Resistant to moisture, solvent, and insulation
- Flame retardant material
- 100% RoHS compliant and lead free without exemption
- Halogen free
- REACH compliant



**Electrical Specifications**

Type / Code	Power Rating (W) @ 25°C	Ohmic (Ω) Range and Tolerance 1%, 5%, 10%	
		Standard (MHL)	Non-inductive (NMHL)
MHL60 / NMHL60	60	0.1 - 10 K	0.1 - 2.5 K
MHL80 / NMHL80	80	0.1 - 10 K	0.2 - 3 K
MHL100 / NMHL100	100	0.1 - 10 K	0.2 - 4 K
MHL120 / NMHL120	120	0.15 - 15 K	0.2 - 5 K
MHL150 / NMHL150	150	0.15 - 15 K	0.2 - 6 K
MHL200 / NMHL200	200	0.3 - 15 K	0.2 - 7 K
MHL300 / NMHL300	300	0.5 - 30 K	0.5 - 8 K
MHL400 / NMHL400	400	0.5 - 30 K	0.5 - 10 K
MHL500 / NMHL500	500	0.5 - 30 K	0.5 - 12 K
MHL800 / NMHL800	800	1 - 50 K	0.5 - 12 K
MHL1000 / NMHL1000	1000	1 - 100 K	1 - 15 K

**Mechanical Specifications**



Type / Code	L1	L2	W	H	A	B	D	Unit
MHL60 / NMHL60	4.528 ± 0.079	3.937 ± 0.079	1.575	0.787	0.709 ± 0.394	5.906 ± 0.394	0.209	inches
	115.00 ± 2.00	100.00 ± 2.00						mm
MHL80 / NMHL80	5.512 ± 0.079	4.921 ± 0.079	40.00	20.00	18.00 ± 10.00	150.00 ± 10.00	5.30	inches
	140.00 ± 2.00	125.00 ± 2.00						mm
MHL100 / NMHL100	6.496 ± 0.079	5.906 ± 0.079	2.362	1.181	60.00	30.00	inches	mm
	165.00 ± 2.00	150.00 ± 2.00						mm
MHL120 / NMHL120	7.480 ± 0.079	6.890 ± 0.079	3.937	1.969	100.00	50.00	inches	mm
	190.00 ± 2.00	175.00 ± 2.00						mm
MHL150 / NMHL150	8.465 ± 0.079	7.874 ± 0.079	60.00	30.00	100.00	50.00	inches	mm
	215.00 ± 2.00	200.00 ± 2.00						mm
MHL200 / NMHL200	6.496 ± 0.079	5.906 ± 0.079	3.937	1.969	100.00	50.00	inches	mm
	165.00 ± 2.00	150.00 ± 2.00						mm
MHL300 / NMHL300	8.465 ± 0.079	7.874 ± 0.079	60.00	30.00	100.00	50.00	inches	mm
	215.00 ± 2.00	200.00 ± 2.00						mm
MHL400 / NMHL400	10.433 ± 0.079	9.843 ± 0.079	60.00	30.00	100.00	50.00	inches	mm
	265.00 ± 2.00	250.00 ± 2.00						mm
MHL500 / NMHL500	13.189 ± 0.079	12.598 ± 0.079	60.00	30.00	100.00	50.00	inches	mm
	335.00 ± 2.00	320.00 ± 2.00						mm
MHL800 / NMHL800	15.748 ± 0.079	15.157 ± 0.079	60.00	30.00	100.00	50.00	inches	mm
	400.00 ± 2.00	385.00 ± 2.00						mm
MHL1000 / NMHL1000	15.748 ± 0.079	15.157 ± 0.079	60.00	30.00	100.00	50.00	inches	mm
	400.00 ± 2.00	385.00 ± 2.00						mm

Short Time Overload Rating									
Load Time (s)	5	10	30	60	180	300	600	900	1800
Max. Amps Rated Load (%)	400	350	250	200	140	120	110	105	100

Note: Max. change in resistance  $\leq \pm 5\%$

NEMA Standard ON-OFF Cycles (8 hours)							
Time Cycles	Seconds ON	5	10	15	15	15	15
	Seconds OFF	75	70	75	45	30	15
Max Amps Rated Load (%)		290	215	185	160	150	125

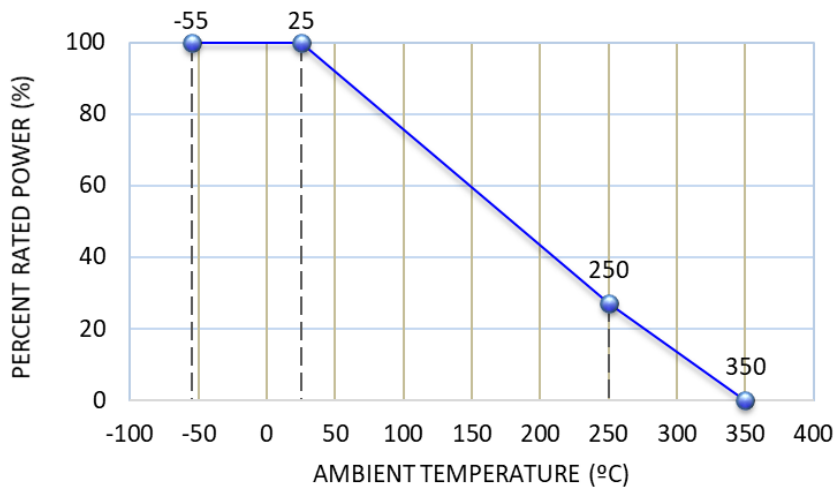
Note: Max. change in resistance  $\leq \pm 5\%$

Lead Wire Conductor Cross-Section: Withstand Voltage			
Withstand Voltage (V)	1.25 mm <sup>2</sup>	2 mm <sup>2</sup>	3.5 mm <sup>2</sup>
2500	X	-	-
3000	X	X	X
3500	-	X	X

Performance Characteristics		
Test	Test Conditions	Specifications
Short Time Overload	5 X power rating for 5 seconds	$\Delta R(2\% + 0.05\Omega)$ max.
Moisture Resistance	Temperature: 40°C; Humidity: 95% Voltage: DC 100 V for 500 hours	$\Delta R(3\% + 0.05\Omega)$ max.
Load Life	Rated load for 1.5 hour ON; 0.5 hour OFF 1000 hours total	$\Delta R(5\% + 0.05\Omega)$ max.
Load Life in Moisture	Temperature: 40°C; Humidity: 95% 1/10 X rated wattage 1.5 hour ON; 0.5 hour OFF; 1000 hours total	$\Delta R(3\% + 0.05\Omega)$ max.
Vibration	10 c/s - 50 c/s - 10 c/s (1 minute) 2 hours each of paralleled and right angle	$\Delta R(1\% + 0.05\Omega)$ max.
Heat Resistance	275°C - 2 hours	$\Delta R(5\% + 0.05\Omega)$ max.
Insulation Resistance		100 M $\Omega$ min.
Temperature Coefficient		260 ppm / °C max.

Operating temperature range is -55°C to 250°C

**Power Derating Curve:**



### 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 “\*”.

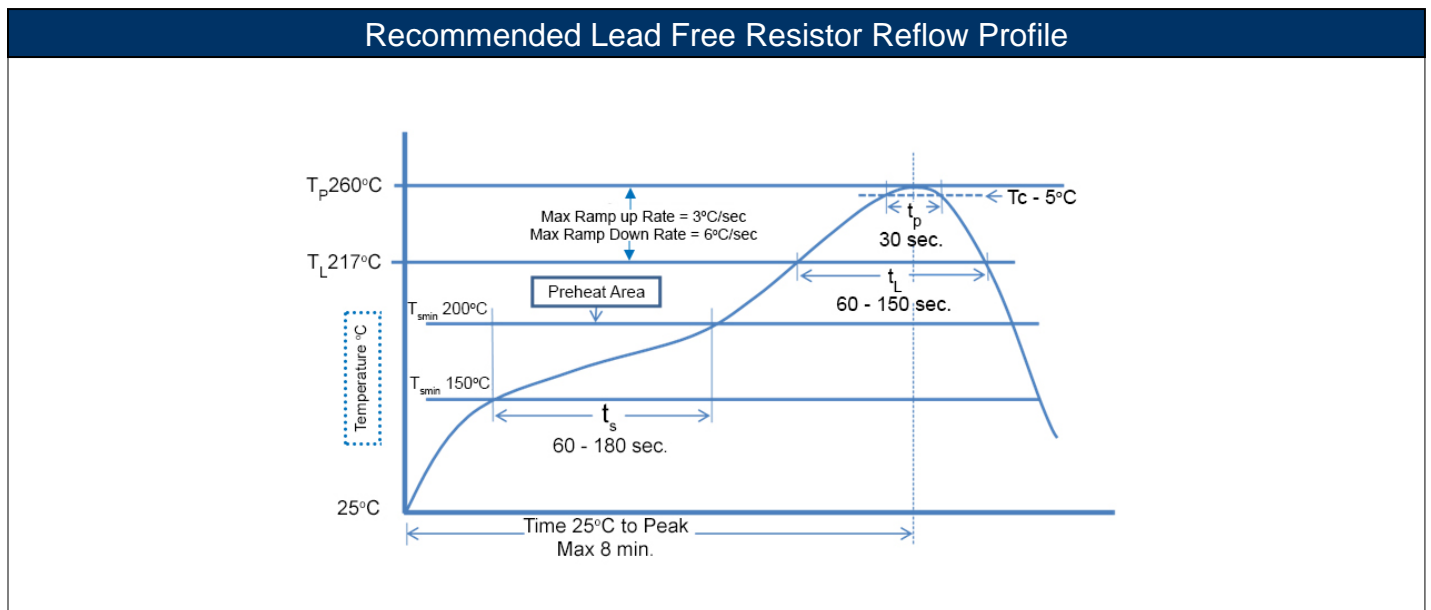
### 100% Matte Tin / RoHS Compliant Terminations

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.

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)
MHL	Metal Clad Wirewound Resistor	Special	YES	100% Matte Sn	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**

