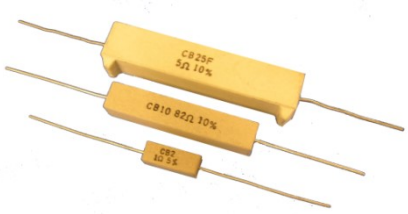
CB / MCB Series

Ceramic Housed with Axial Leads Power Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

Features:

- Fireproof power resistor
- High thermal conductivity
- “M” in MCB stands for metal oxide element
- Standoffs may be available (CBF, MCBF) - contact Stackpole for details
- RoHS compliant, lead free and halogen free



Electrical Specifications - CB					
Type/Code	Power Rating (W) @ 70ºC	Maximum Working Voltage (V)	Maximum Overload Voltage (V)	TCR (ppm/ºC) (1)	Ohmic Range (Ω) and Tolerance
					5%, 10%
CB2	2	250	500	± 800	0.056 - 0.1
				± 500	0.12 - 0.2
				± 200	0.22 - 100
CB3	3	300	600	± 800	0.1
				± 500	0.12 - 3
				± 200	3.3 - 100
CB5	5	350	700	± 800	0.1 - 0.15
				± 500	0.18 - 0.68
				± 200	0.75 - 470
CB7	7	500	1000	± 800	0.39 - 0.51
				± 500	0.56 - 0.82
				± 200	0.91 - 470
CB10	10	700	1400	± 800	0.51 - 1
				± 500	1.1 - 2.7
				± 200	3 - 680
CB15	15	700	1400	± 800	0.56 - 1
				± 500	1.3 - 3
				± 200	3.6 - 820

(1) Lower TCR may be available for certain values. Contact Stackpole.

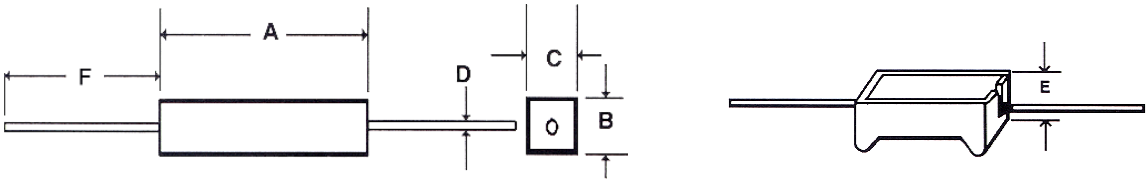
Max Voltage Rating = $\sqrt{P*R}$

Electrical Specifications - MCB					
Type/Code	Power Rating (W) @ 70 ºC	Maximum Working Voltage (V)	Maximum Overload Voltage (V)	TCR (ppm/ºC) (1)	Ohmic Range (Ω) and Tolerance
					5%, 10%
MCB3	3	300	600	± 200	110 - 51K
MCB5	5	350	700		110 - 51K
MCB7	7	500	1000		510 - 51K
MCB10	10	700	1400		750 - 51K
MCB15	15	700	1400		910 - 51K

(1) Lower TCR may be available for certain values. Contact Stackpole.

Max Voltage Rating = $\sqrt{P*R}$

Mechanical Specifications



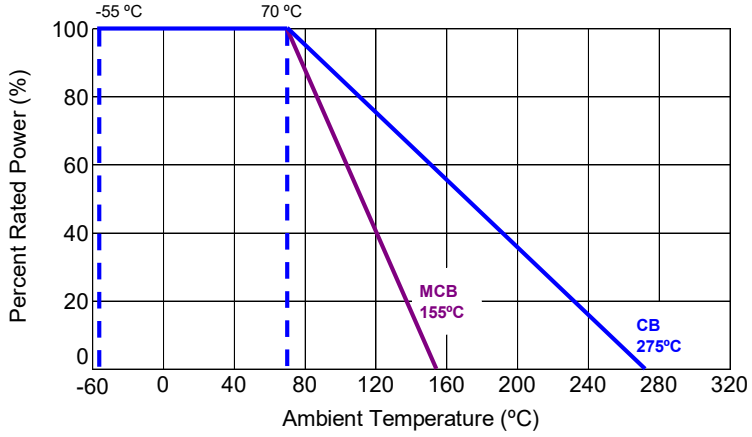
Type/Code	A Body Length	B Height	C Width	D Lead Diameter	E (CBF, MCBF only)	F Lead Length	Unit
CB2	0.709 ± 0.047	0.252 ± 0.047	0.252 ± 0.047	0.031 ± 0.004	0.299 ± 0.039	1.000 min.	inches
	18.00 ± 1.20	6.40 ± 1.20	6.40 ± 1.20	0.80 ± 0.10	7.60 ± 1.00	25.40 min.	mm
CB3, MCB3	0.866 ± 0.047	0.315 ± 0.047	0.315 ± 0.047	0.031 ± 0.004	0.374 ± 0.039	1.000 min.	inches
	22.00 ± 1.20	8.00 ± 1.20	8.00 ± 1.20	0.80 ± 0.10	9.50 ± 1.00	25.40 min.	mm

Mechanical Specifications (cont.)							
Type/Code	A Body Length	B Height	C Width	D Lead Diameter	E (CBF, MCBF only)	F Lead Length	Unit
CB5, MCB5	0.866 ± 0.047 22.00 ± 1.20	0.374 ± 0.039 9.50 ± 1.00	0.374 ± 0.039 9.50 ± 1.00	0.031 ± 0.004 0.80 ± 0.10	0.437 ± 0.039 11.10 ± 1.00	1.000 min. 25.40 min.	inches mm
CB7, MCB7	1.378 ± 0.059 35.00 ± 1.50	0.374 ± 0.039 9.50 ± 1.00	0.374 ± 0.039 9.50 ± 1.00	0.031 ± 0.004 0.80 ± 0.10	0.500 ± 0.039 12.70 ± 1.00	1.000 min. 25.40 min.	inches mm
CB10, MCB10	1.890 ± 0.059 48.00 ± 1.50	0.374 ± 0.039 9.50 ± 1.00	0.374 ± 0.039 9.50 ± 1.00	0.031 ± 0.004 0.80 ± 0.10	0.500 ± 0.039 12.70 ± 1.00	1.000 min. 25.40 min.	inches mm
CB15, MCB15	1.890 ± 0.059 48.00 ± 1.50	0.512 ± 0.047 13.00 ± 1.20	0.512 ± 0.047 13.00 ± 1.20	0.031 ± 0.004 0.80 ± 0.10	0.626 ± 0.039 15.90 ± 1.00	1.000 min. 25.40 min.	inches mm

Performance Characteristics	
Test	Test Specification
Moisture Resistance	± 5%
Thermal Shock	± 2%
Load Life @ 70°C - 1000 hours	± 5%
Resistance to Soldering Heat	± 2%
Short Time Overload - 5 x Pn for 5 seconds	± 2%
Dielectric Withstanding Voltage	± 2%

Operating temperature range for CB is -55°C to +275°C
Operating temperature range for MCB is -55°C to +155°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

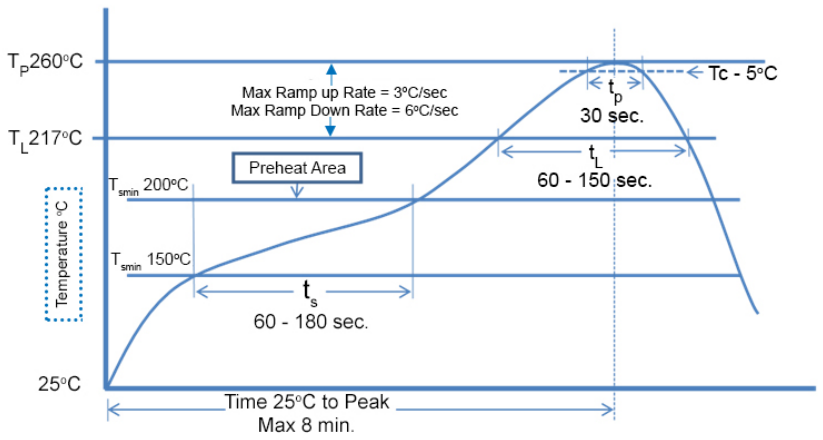
Soldering iron recommended temperatures: 330°C to 350°C with minimum duration.
Maximum number of reflow cycles: 3.

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. = Defference 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



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)
CB	General Purpose Ceramic Housed with Axial Leads Wirewound Resistor	Axial	YES	100% Matte Sn	Jan-06	06/01
MCB	Ceramic Housed General Purpose Metal Oxide Element Resistor	Axial	YES	100% Matte Sn	Jan-06	06/01

"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
C	B	2	J	B	1	0	0	R

Product Series	
Code	Description
CB	Standard
MCB	Standard (Metal Oxide)
CBF	With standoff
MCBF	With standoff (Metal Oxide)

Power Rating	
Code	W
2	2
3	3
5	5
7	7
10	10
15	15

Tolerance	
Code	Tol
J	5%
K	10%

Packaging			
Code	Description	Product Code	Quantity
B	Bulk	CB2, CB5, CBF5, MCB5	1500
		CB3, CB7, CB10, CB15, CBF3, MCB3, MCB7, CBF10, MCB10, MCB15	1000
		CBF15, MCBF15	912

Resistance Value
Four characters with the multiplier used as the decimal holder. "L" used as multiplier of 10^{-3} for any value under 0.1 ohm
0.056 ohm = 56L0 0.1 ohm = R100 33 ohm = 33R0 3.32 Kohm = 3K32