Power Metal Plate™ Current Sense Resistors, Low Value (5 mΩ to 500 mΩ), Surface-Mount, High Power

FEATURES

- 2010 and 2512 size package
- Ideal for all types of current sensing and pulse applications including switching and linear power supplies, instruments, power amplifiers, shunts, power inverters and battery management
- Proprietary processing technique produces low resistance values (5 mΩ to 500 mΩ)
- Solid metal manganese-copper and nickel-chromium-aluminum alloy resistive element with low TCR (< 20 ppm/°C)
- Very low inductance 0.5 nH to 5 nH
- Excellent frequency response to 50 MHz
- Low thermal EMF (< 3 µV/°C)
- AEC-Q200 qualified [1]
- PATENT(S): www.vishay.com/patents
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

Note

[1] Flame retardance test may not be applicable to some resistor technologies

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	SIZE	POWER RATING [1] W	TOLERANCE %	RESISTANCE VALUE RANGE Ω	WEIGHT (typical) g/1000 pieces
WFMA2010	2010	2.0 at 110 °C	± 1.0	0.005 to 0.0329	32
WFMB2010	2010	2.0 at 110 °C	± 1.0	0.033 to 0.500	32
WFMA2512	2512	3.0 at 95 °C	± 1.0	0.010 to 0.0329	41
WFMB2512	2512	3.0 at 95 °C	± 1.0	0.033 to 0.500	41

Note

[1] Terminal temperature

GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: WFMB2512R5000FEA

W	F	M	B	2	5	1	2	R	5	0	0	0	F	E	A		

GLOBAL MODEL (3 digits)	ELEMENT MATERIAL (1 digit)	CASE SIZE (4 digits)	RESISTANCE VALUE [1] (5 digits)	TOLERANCE CODE (1 digit)	PACKAGING CODE [2] (2 digits)	SPECIAL (2 digits)
WFM	**A** = CuMn **B** = NiCrAl	**2010** **2512**	**L** = mΩ* **R** = decimal **5L000** = 0.005 Ω **R0100** = 0.01 Ω * Use "**L**" for resistance values < 0.01 Ω	**F** = ± 1.0 % **J** = ± 5.0 %	**EA** = lead (Pb)-free, tape / reel **EK** = lead (Pb)-free, bulk	Dash numbers **1** thru **99** as applicable

Notes

[1] Resistance values available according to WSL decade values (www.vishay.com/doc?30117)

[2] Packaging code: EB (lead (Pb)-free) is a non-standard packaging code designating 1000 piece reels. This non-standard packaging code is identical to our standard EA (lead (Pb)-free), except that it has a package quantity of 1000 pieces

PATENT(S): www.vishay.com/patents

This Vishay product is protected by one or more United States and international patents.

TECHNICAL SPECIFICATIONS				
PARAMETER	UNIT	MODEL	RESISTOR CHARACTERISTICS	
			2010	2512
Temperature coefficient (20 °C to 60 °C) (element only) (1)	ppm/°C	All	< 20	
Operating temperature range	°C	All	-65 to +170	
Maximum working voltage (3)	V	All	$(P \times R)^{1/2}$	
Maximum terminal temperature	°C	All	110	95
Temperature coefficient (-55 °C to +150 °C) (including terminals) (2)	ppm/°C	WFMA	± 110	± 110
		WFMB	± 50	± 50
Temperature coefficient (20 °C to 60 °C) (including terminals) (2)	ppm/°C	WFMA	± 50 ≤ 10 mΩ ± 30 > 10 mΩ	± 40
		WFMB	± 20	± 20

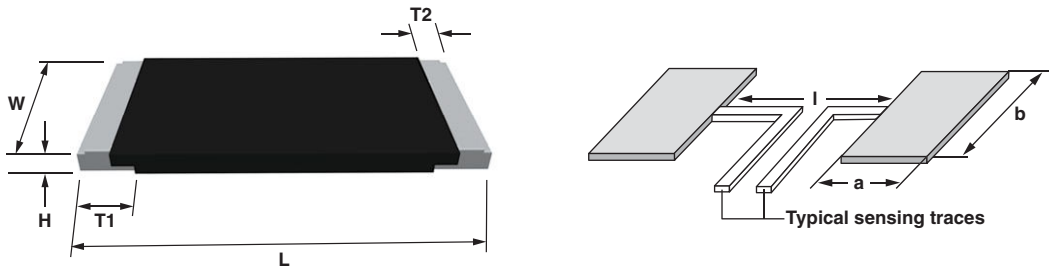
Notes

(1) Element TCR - only applies to the alloy used for the resistor element

(2) Component TCR - total TCR that includes the TCR effects of the resistor element and the copper terminal

(3) Maximum working voltage - the WFM is not voltage sensitive, but is limited by power / energy dissipation and is also not ESD sensitive

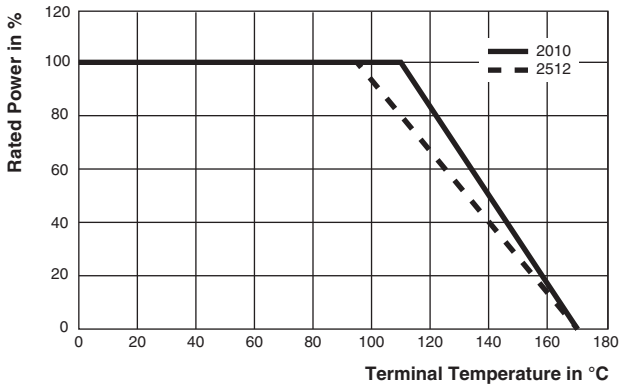
DIMENSIONS



CASE SIZE	RESISTANCE RANGE (mΩ)	DIMENSIONS in inches (millimeters)					SOLDER PAD DIMENSIONS in inches (millimeters)		
		L	W	H	T1	T2	a	b	l
2010	5 to 500	0.200 ± 0.008 (5.08 ± 0.20)	0.100 ± 0.008 (2.54 ± 0.20)	0.020 ± 0.006 (0.50 ± 0.15)	0.028 ± 0.008 (0.70 ± 0.20)	0.016 ± 0.006 (0.40 ± 0.15)	0.049 (1.25)	0.118 (3.00)	0.138 (3.50)
2512	10 to 500	0.250 ± 0.012 (6.35 ± .30)	0.125 ± 0.008 (3.18 ± .20)	0.020 ± 0.006 (0.50 ± 0.15)	0.035 ± 0.008 (0.90 ± 0.20)	0.020 ± 0.008 (0.50 ± 0.20)	0.061 (1.55)	0.142 (3.60)	0.173 (4.40)

PRODUCT	RESISTANCE RANGE (Ω)	THERMAL RESISTANCE (°C/W)	ALLOY
WFMA2010	0.005 to 0.0329	< 30	Mn-Cu
WFMB2010	0.033 to 0.5	< 55	Ni-Cr
WFMA2512	0.01 to 0.0329	< 25	Mn-Cu
WFMB2512	0.033 to 0.5	< 40	Ni-Cr

DERATING



PERFORMANCE		
TEST	**CONDITIONS OF TEST**	**TEST LIMITS**
Thermal shock	-55 °C to +150 °C, 2000 cycles, 15 min at each extreme	± 0.5 %
Low temperature storage	-65 °C for 24 h	± 0.1 %
High temperature exposure	2000 h at +170 °C	± 1.0 %
Bias humidity	+85 °C, 85 % RH, 10 % power, 1000 h	± 0.5 %
Mechanical shock	100 *g*'s for 6 ms, 5 pulses	± 0.2 %
Vibration	Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h	± 0.2 %
Load life	2000 h at maximum terminal temperature at rated power	± 0.7 %
Resistance to solder heat	+260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	± 0.3 %
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7b not required	± 0.3 %

PACKAGING [1]				
MODEL	**REEL**			
	TAPE WIDTH	**DIAMETER**	**PIECES/REEL**	**CODE**
WFMA2010	12 mm/embossed plastic	178 mm/7"	4000	EA
WFMB2010	12 mm/embossed plastic	178 mm/7"	4000	EA
WFMA2512	12 mm/embossed plastic	178 mm/7"	2000	EA
WFMB2512	12 mm/embossed plastic	178 mm/7"	2000	EA

Notes

- Embossed carrier tape per EIA-481

(1) Additional packaging details at www.vishay.com/doc?20051

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