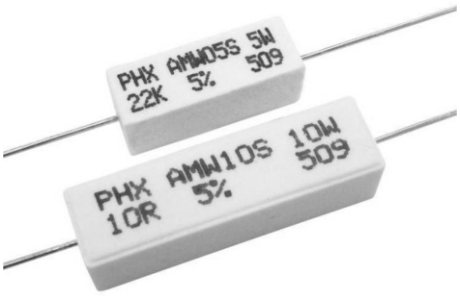
Wirewound/Metal Film Resistors, Commercial Power, Axial Lead



FEATURES

- High power dissipation in small volume
- Completely welded construction
- Fire proof inorganic construction
- Formed leads available on request
- Film resistors version available on request
- Long leads available

Pb-free

e3

RoHS COMPLIANT

For closest Vishay Dale equivalent, please contact: ww2aresistors@vishay.com

Note:

• There may be slight differences between the Vishay Phoenix and the Vishay Dale crosses

TECHNOLOGY

The resistor element is a resistive wire, which is wound, on ceramic rod.
Tinned copper leads are connected to the caps by welding. The resistor body are housed in a rectangular ceramic case with a special inorganic potting which is non-flammable, will not melt even at high overloads and is resistant to most commonly used cleaning solvents and moisture.

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	POWER RATING $P_{40\,°C}$ W	RESISTANCE RANGE (1) Ω	TOLERANCE (2) %	E-SERIES Decade Values
AMW03S	3	0.10 - 2.4K	± 5	24
AMW05S	5	0.10 - 4.7K		
AMW07S	7	0.10 - 6.8K		
AMW10S	10	0.10 - 10K		

Notes:

(1) Special resistance values available upon request

(2) Other tolerances available upon request

TECHNICAL SPECIFICATIONS

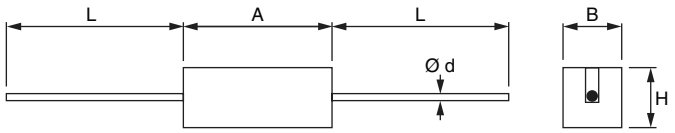
PARAMETER	UNIT	AMWS RESISTOR CHARACTERISTICS
Limiting Voltage	V	$\sqrt{P \times R}$
Insulation Voltage	V	> 2000
Temperature Coefficient (3)	ppm/°C	R < 10 Ω: 0 to + 600; R ≥ 10 Ω: - 100 to + 150;
Operating Temperature	°C	- 55 to + 275
Short Time Overload	-	10 x rated power for 5 s

Note:

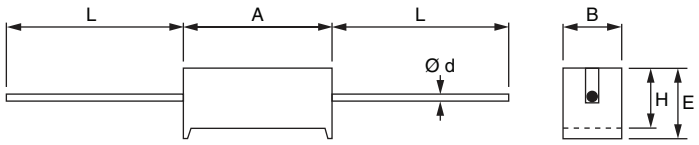
(3) Temperature Coefficient of ± 30, 50 or 90 ppm/ºC available upon request

DIMENSIONS in millimeters (inches)

FLAT VERSION



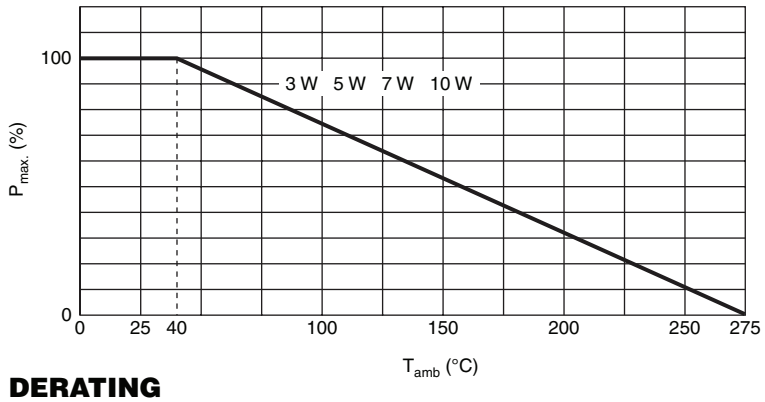
STAND-OFF VERSION



TYPE	A	H	B	E	Ø d	L (1)
AMW03S	17.5 ± 1.5 (0.689 ± 0.06)	6.4 ± 0.8 (0.252 ± 0.031)	6.4 ± 0.8 (0.252 ± 0.031)	8.0 ± 1.0 (0.315 ± 0.04)	0.8 ± 0.03 (0.031 ± 0.001)	28.0 ± 3 (1.10 ± 0.12)
AMW05S	22.2 ± 1.5 (0.874 ± 0.06)	8.0 ± 1.0 (0.315 ± 0.04)	8.0 ± 1.0 (0.315 ± 0.04)	9.5 ± 1.0 (0.374 ± 0.04)		
AMW07S	22.2 ± 1.5 (0.874 ± 0.06)	9.5 ± 1.0 (0.374 ± 0.04)	9.5 ± 1.0 (0.374 ± 0.04)	11 ± 1.0 (0.433 ± 0.04)		
AMW10S	35 ± 1.5 (1.378 ± 0.06)	9.5 ± 1.0 (0.374 ± 0.04)	9.5 ± 1.0 (0.374 ± 0.04)	11.9 ± 1.0 (0.469 ± 0.04)		

ELECTRICAL CHARACTERISTICS

The power that the resistor can dissipate depends on the operating temperature.



DERATING

Maximum dissipation ($P_{max.}$) in percentage of rated power as a function of ambient temperature (T_{amb})

Notes:

Application information available on request:

- Pulse load behavior
- Hot spot and solder spot curves

MARKING

The resistor is marked with the resistor type designation, nominal resistance value, tolerance, rated power and the production date (week and year), in red on the resistor body.

Example: AMW07S - 5.1 kΩ - 5 % - week 02 - year 200**5**

Example:

PHX	AMW07S	502
5K1	5 %	7 W

ORDERING INFORMATION

PRODUCT	TOLERANCE	ORDERING CODE	VERSION	LEAD Ø in millimeters (inches)	PACKAGING	QUANTITY (pieces)
AMW03S	± 5 %	2306 270 13xxx	FLAT	0.80 (0.031)	BOX	360
		2306 270 23xxx	STAND-OFF			300
AMW05S		2306 271 13xxx	FLAT			250
		2306 271 23xxx	STAND-OFF			
AMW07S		2306 272 13xxx	FLAT			
		2306 272 23xxx	STAND-OFF			
AMW10S		2306 273 13xxx	FLAT			
		2306 273 23xxx	STAND-OFF			

Last Digit of Ordering Code

RESISTANCE DECADE	LAST DIGIT
0.1 Ω - 0.91 Ω	7
1 Ω - 9.1 Ω	8
10 Ω - 91 Ω	9
100 Ω - 910 Ω	1
1 kΩ - 9.1 kΩ	2
10 kΩ - 91 kΩ	3
100 kΩ - 910 kΩ	4

The resistors have 12 digit ordering code starting with 2306. The next 5 digits indicate the resistor type and packaging, see table ORDERING INFORMATION.
The last 3 digits indicate the resistance value:
- The first 2 digits of these last 3 indicate the actual resistance value
- The last digit indicates the resistance decade in accordance with table “Last Digit of Ordering Code”

Example:
AMW03S, 100 Ω, 5 %, flat case, box of 250 pieces is **2306 270 13101**

NAFTA ORDERING INFORMATION

PRODUCT	TOLERANCE	NAFTA ORDERING CODE	VERSION	LEAD Ø in millimeters (inches)	PACKAGING	QUANTITY (pieces)
AMW03S	± 5 %	AMW03SxxxxxJ	FLAT	0.80 (0.031)	BOX	250
		AMW03SxxxxxJSO	STAND-OFF			
AMW05S		AMW05SxxxxxJ	FLAT			
		AMW05SxxxxxJSO	STAND-OFF			
AMW07S		AMW07SxxxxxJ	FLAT			
		AMW07SxxxxxJSO	STAND-OFF			
AMW10S		AMW10SxxxxxJ	FLAT			
		AMW10SxxxxxJSO	STAND-OFF			

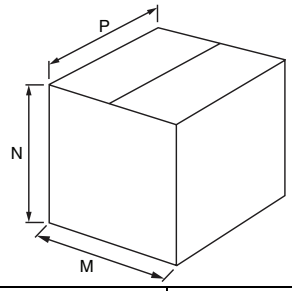
Examples of the Ohmic Value

Value	5 DIGITS
1 Ω	1R000
10 Ω	10R00
100 Ω	100R0
1 kΩ	1K000
10 kΩ	10K00
100 kΩ	100K0

The ohmic value in the NAFTA ordering code (see table NAFTA ORDERING INFORMATION) is represented by the "xxxxx" in the middle of the above ordering code. The table "Examples of the Ohmic Value" gives some examples on how to use these 5 digits.

Example:
AMW03S, 100 Ω, ± 5 %, flat case, box of 250 pieces is **AMW03S100R0J**

PACKAGING in millimeters (inches)



PRODUCT	VERSION	P	M	N	QUANTITY (pieces)
AMW03S	FLAT	227 (8.94)	92 (3.63)	100 (3.94)	250
	STAND-OFF	227 (8.94)	92 (3.63)	-	
AMW05S	FLAT	227 (8.94)	92 (3.63)	100 (3.94)	
	STAND-OFF	227 (8.94)	92 (3.63)	-	
AMW07S	FLAT	256 (10.08)	92 (3.63)	105 (4.14)	
	STAND-OFF	256 (10.08)	92 (3.63)	-	
AMW10S	FLAT	256 (10.08)	105 (4.14)	105 (4.14)	
	STAND-OFF	256 (10.08)	105 (4.14)	-	

TESTS AND REQUIREMENTS

Essentially all tests and requirements present in table below, follow the schedule of IEC standard publication 60115-1, 60015-4, 60068.

PERFORMANCE				
IEC 60115-1 CLAUSE	**IEC 60068 TEST METHOD**	**TEST**	**PROCEDURE**	**REQUIREMENTS**
4.6.1.1	-	Insulation resistance	500 V_{DC} during 1 min; V-block method	$R_{ins\ min.}$ 100 MΩ
4.7	-	Voltage proof on insulation	1000 V_{RMS} during 1 min; V-block method	No breakdown or flashover
4.8	-	Temperature coefficient	Between - 55 °C at + 275 °C R < 10 Ω R ≥ 10 Ω	 0 to + 600 ppm/°C; + 150 to - 100 ppm/°C
4.13	-	Short time overload	Dissipation 10 x Pn; 5 s	$\Delta R/R_{max.}$ ± 2 % + 0.05 Ω
4.16	21(U)	Robustness of terminations:		No visible damage $\Delta R/R_{max.}$ ± 2 % + 0.05 Ω
4.16.2	21(Ua1)	Tensile all samples	Load 10 N; 10 s	
4.16.3	21(Ub)	Bending half number of samples	Load 5 N; 4 x 90°	
4.16.4	21(Uc)	Tension other half of samples	3 x 360° in opposite directions	
4.17	20(Ta)	Solderability (after aging)	16 h at 155 °C; leads immersed in flux 600, leads immersed 2 mm for 2 ± 0.5 s in a solder bath at 235 ± 5 °C	Good tinning; no damage $\Delta R/R_{max.}$ ± 0.5 % + 0.05 Ω
4.18	20(Tb)	Resistance to soldering heat	Thermal shock: 3 s, 350 °C; 6 mm from body	$\Delta R/R_{max.}$ ± 4 % + 0.05 Ω
4.19	14(Na)	Rapid change of temperature	30 min at - 55 °C and 30 min + 275 °C; 5 cycles	No visual damage $\Delta R/R_{max.}$ ± 5 % + 0.05 Ω
4.23		Climatic sequence:		$\Delta R/R_{max.}$ ± 3 % + 0.05 Ω
4.23.2	2(Ba)	Dry heat	16 h, 275 °C	
4.23.3	30(Db)	Damp heat (accelerated) 1st cycle	24 h, 25 °C to 55 °C; 90 to 100 % RH	
4.23.4	1(Aa)	Cold	2 h, - 65 °C	
4.23.6	30 (Db)	Damp heat (accelerated) remaining cycles	6 days; 55 °C; 90 to 98 % RH	
4.24	3 (Ca)	Damp heat (steady state)	56 days; 40 °C; 90 to 95 % RH; loaded with 0.01 Pn	$\Delta R/R_{max.}$ ± 5 % + 0.05 Ω
4.25.1	-	Endurance 40 °C	1000 h load with Pn or $V_{max.}$; 1.5 h ON and 0.5 h OFF	No damage $\Delta R/R_{max.}$ ± 5 % + 0.1 Ω

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