

HLM, NHLM

Vishay Dale

Wirewound Resistors, Industrial Power, Miniature Flat (HLM)



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FEATURES

- · High temperature silicon coating
- Mounting accommodations ideally suited to high density packaging
- Self-stacking hardware for horizontal or vertical placement
- Withstands high vibrations without loosening
- Mounting hardware functions as a heat sink allowing greater heat dissipation and less derating of stacked units
- Available in non-inductive styles (type NHLM) with Aryton-Perry winding
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912









Note

This datasheet provides information about parts that are RoHS-compliant and / or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details.

STANDARD ELECTRICAL SPECIFICATIONS							
GLOBAL	HISTORICAL	POWER RATING	RESISTANCE RANGE Ω	RESISTANCE RANGE Ω	WEIGHT		
MODEL	MODEL	<i>P</i> _{25 °C} W	± 5 %	± 10 %	(typical) g		
HLM010	HLM-10	10	1.0 to 15K	0.10 to 15K	0.41		
NHLM010	NHLM-10	10	1.0 to 1.8K	1.0 to 1.8K	0.41		
HLM015	HLM-15	15	1.0 to 26K	0.10 to 26K	0.47		
NHLM015	NHLM-15	15	1.0 to 3.6K	1.0 to 3.6K	0.47		
HLM020	HLM-20	20	1.0 to 71K	0.10 to 71K	0.74		
NHLM020	NHLM-20	20	1.0 to 9.8K	1.0 to 9.8K	0.74		

TECHNICAL SPECIFICATIONS						
PARAMETER	UNIT	HLM, NHLM RESISTOR CHARACTERISTICS				
Temperature Coefficient	ppm/°C	\pm 90 for 0.1 Ω to 0.99 Ω ; \pm 50 for 1 Ω to 9.9 Ω ; \pm 30 for 10 Ω and above				
Dielectric Withstanding Voltage	V_{AC}	1000, from terminal to mounting hardware				
Short Time Overload	-	10 x rated power for 5 s				
Maximum Working Voltage	V	$(P \times R)^{1/2}$				
Insulation Resistance	Ω	1000 M Ω minimum dry, 100 M Ω minimum after moisture test				
Operating Temperature Range	°C	-55 to +350				

GLOBAL PART NUMBER INFORMATION									
Global Part Numbering example: NHLM01010Z10R00JJ N H L M 0 1 0 1 0 Z 1 0 R 0 0 J J J									
GLOBAL MODEL	TERM DESIGN		TERMINAL FINISH		SISTANCE VALUE	TOLERANCE	PACKAGING CO	DE	SPECIAL
NHLM010 (see "Standard Electrical Specifications" table above for	10)	E = lead (Pb)-free Z = tin / lead N = nickel	K = 10R	= decimal = thousand $00 = 10.0 \Omega$ $000 = 1 k\Omega$	$J = \pm 5.0 \%$ $K = \pm 10.0 \%$ Note (1) Tin/lead for ty	E = lead (Pb)-free skil J (1) = skin pack (J /pe "Z", lead (Pb)-free for ty	01)	(dash number) (up to 2 digits) from 1 to 99 as applicable
additional P/N's) Historical Part Number example: NHLM-10-10Z 10 Ω 5 % J01 NHLM-10 10Z 10 Ω 5 % J01									
HISTORICAL MODEL TERMINAL/FINISH		l		ANCE VALUE	TOLERANCE	P	ACKAGING		

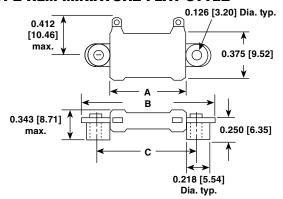




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TYPE HLM MINIATURE FLAT STYLE



	DIMENSIONS in inches [millimeters]							
MODEL	A ± 0.063 [1.59]	A B C BE: 0.063 ± 0.031 [1.59] [0.79] TEF		DISTANC E BETWEE N TERMINA LS (ref.)	STANDARD TERMINAL DESIGNATION			
HLM010	0.750	1.312	1.000	0.406	10Z			
NHLM010	[19.05]	[33.32]	[25.40]	[10.31]	102			
HLM015	1.000	1.562	1.250	0.656	10Z			
NHLM015	[25.40]	[39.67]	[31.75]	[16.66]				
HLM020	2.062	2.625	2.313	1.718	10Z			
NHLM020	[52.37]	[66.68]	[58.75]	[43.64]	102			

POWER RATING

Vishay HL flat resistor wattage ratings are based on mounting horizontally to 10" x 10" x 0.04" [254.0 mm x 254.0 mm x 1.02 mm] steel plate in 25 °C ambient with no air flow.

EXCLUSIVE BRACKET DESIGN

Mounting strap fits snugly through resistor core and is bound against unit by two eccentric spacers. The bracket eliminates expensive cements and improves heat transfer and power handling capabilities.

MATERIAL SPECIFICATIONS

Element: copper-nickel alloy of nickel-chrome alloy, depending on resistance value

Core: ceramic, steatite

Coating: special high temperature silicone

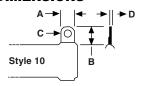
Standard Terminals: model "E" terminals are tinned steel

Terminal Bands: steel

Part Marking: DALE, model, wattage, value, tolerance, date

code

TERMINAL DIMENSIONS



DIMENSION	DIMENSIONS in inches [millimeters]			
DIMENSION	STYLE 10			
Δ.	0.125			
A	[3.18]			
В	0.188			
В	[4.76]			
С	0.063			
	[1.60]			
D	0.020			
U	[0.51]			

TERMINAL FINISH

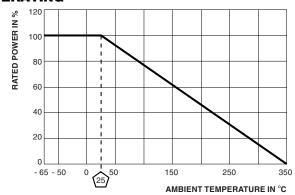
"E" Finish - 100 % Sn coated steel. "Z" Finish - 60/40 Sn/Pb coated steel. "N" Finish - Nickel coated steel. Finish for terminal style 16 is limited to nickel plated steel (N).

NHLM NON-INDUCTIVE

Models of equivalent physical and electrical specifications are available with non-inductive (Aryton-Perry) winding. They are identified by adding the letter N to the front of the HL type designation (NHL024, for example). For NHL models maximum resistance values are lower, see STANDARD ELECTRICAL SPECIFICATIONS table.

Derating is required for ambient temperatures above 25 °C per the following graph.

DERATING



PERFORMANCE					
TEST	CONDITIONS OF TEST	TEST LIMITS			
Thermal Shock	Rated power applied until thermally stable, then a minimum of 15 min at - 55 °C	\pm (2.0 % + 0.05 Ω) ΔR			
Short Time Overload	10x rated power for 5 s	\pm (2.0 % + 0.05 Ω) ΔR			
Dielectric Withstanding Voltage	1000 V _{RMS} , 1 min	\pm (0.1 % + 0.05 Ω) ΔR			
Low Temperature Storage	-55 °C for 24 h	\pm (2.0 % + 0.05 Ω) ΔR			
High Temperature Exposure	250 h at +350 °C	\pm (2.0 % + 0.05 Ω) ΔR			
Moisture Resistance	MIL-STD-202 Method 106, 7b not applicable	\pm (2.0 % + 0.05 Ω) ΔR			
Shock, Specified Pulse	MIL-STD-202 Method 213, 100 g's for 6 ms, 10 shocks	$\pm (0.2 \% + 0.05 \Omega) \Delta R$			
Vibration, High Frequency	Frequency varied 10 Hz to 2000 Hz, 20 g peak, 2 directions 6 h each	$\pm (0.2 \% + 0.05 \Omega) \Delta R$			
Load Life	1000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF"	$\pm (3.0 \% + 0.05 \Omega) \Delta R$			



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