

Wirewound Resistors, Precision Power, Surface Mount



FEATURES

- All welded construction
- Molded encapsulation
- Wraparound terminations
- Excellent stability at different environmental conditions
- High power ratings (up to 4 W)
- Available in non-inductive styles ("NI" SPECIAL) with Ayrton-Perry winding (Resistance max. value is one half standard value)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

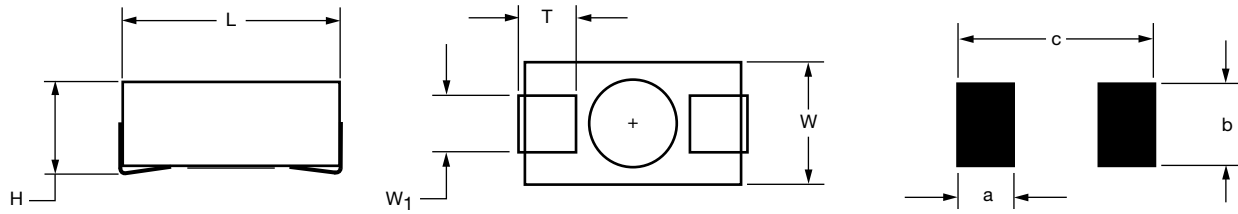


RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

STANDARD ELECTRICAL SPECIFICATIONS					
GLOBAL MODEL	HISTORICAL MODEL	POWER RATING $P_{70^\circ\text{C}}$ W	RESISTANCE RANGE Ω	TOLERANCE $\pm \%$	WEIGHT (TYPICAL) g/1000 PIECES
SM-1	SM1	0.5	0.1 to 400	0.1, 0.25, 0.5, 1, 5	45
SM-2	SM2	1	0.1 to 3K	0.1, 0.25, 0.5, 1, 5	230
SM-3	SM3	3	0.1 to 25K	0.1, 0.25, 0.5, 1, 5	1360
SM-4	SM4	2	0.1 to 15K	0.1, 0.25, 0.5, 1, 5	680
SM-5	SM5	4	0.1 to 50K	0.1, 0.25, 0.5, 1, 5	2040

TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	SM RESISTOR CHARACTERISTICS
Temperature Coefficient	ppm/°C	$\pm 20 > 10 \Omega$, $\pm 50 1 \Omega$ to 10Ω , contact factory for 0.99Ω and below
Dielectric Withstanding Voltage	V_{AC}	1000
Operating Temperature Range	°C	-55 to +275
Maximum Working Voltage	V	$(P \times R)^{1/2}$

GLOBAL PART NUMBER INFORMATION				
Global Part Numbering example: SM-2R4000FE6 (visit www.vishay.net SAP parts manual for all options)				
S	M	-	2	R
4	0	0	0	F
E	6			
GLOBAL MODEL (4 digits)	VALUE (5 digits)	TOLERANCE (1 digit)	PACKAGING CODE (2 digits)	SPECIAL (up to 3 digits)
SM-1 SM-2 SM-3 SM-4 SM-5	R = Decimal K = Thousand 1R500 = 1.5 Ω 4K000 = 4 k Ω	B = $\pm 0.1 \%$ C = $\pm 0.25 \%$ D = $\pm 0.5 \%$ F = $\pm 1 \%$ J = $\pm 5 \%$	E6 = lead (Pb)-free, 7" tape and reel pack E7 = lead (Pb)-free, 13" tape and reel pack	(Dash Number) From 1 to 999 as applicable NI = Non-inductive
Historical Part Number example: SM2-0.4-1%				
SM2	0.4 Ω	1 %		
HISTORICAL MODEL	RESISTANCE VALUE	TOLERANCE		

DIMENSIONS in inches [millimeters]


GLOBAL MODEL	DIMENSIONS in inches [millimeters]					SOLDER PAD DIMENSIONS		
	$L \pm 0.015$ [0.381]	$W \pm 0.015$ [0.381]	$H \pm 0.015$ [0.381]	$W1 \pm 0.015$ [0.381]	$T \pm 0.015$ [0.381]	$a \pm 0.015$ [0.381]	$b \pm 0.015$ [0.381]	$c \pm 0.015$ [0.381]
SM-1	0.190 [4.83]	0.130 [3.30]	0.110 [2.79]	0.060 [1.52]	0.040 [1.02]	0.062 [1.57]	0.100 [2.54]	0.250 [6.35]
SM-2	0.260 [6.60]	0.155 [3.94]	0.125 [3.18]	0.070 [1.78]	0.070 [1.78]	0.096 [2.44]	0.112 [2.84]	0.337 [8.56]
SM-3	0.625 [15.88]	0.270 [6.86]	0.250 [6.35]	0.120 [3.05]	0.135 [3.43]	0.200 [5.08]	0.150 [3.81]	0.700 [17.78]
SM-4	0.450 [11.43]	0.250 [6.35]	0.180 [4.57]	0.120 [3.05]	0.100 [2.54]	0.155 [3.94]	0.230 [5.84]	0.540 [13.72]
SM-5	0.820 [20.83]	0.295 [7.49]	0.305 [7.75]	0.150 [3.81]	0.190 [4.83]	0.220 [5.59]	0.250 [6.35]	0.900 [22.86]

MATERIAL SPECIFICATIONS
Element: copper-nickel alloy

Encapsulation: molded epoxy

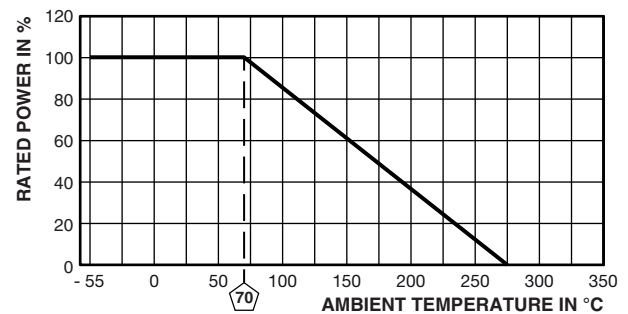
Core: ceramic

Terminal: matte tin

Part Marking: HEI, model, value, tolerance, date code

Note

- Due to resistor size limitations some resistors will have minimal information marked on parts

DERATING


PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal Shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	± 0.5 % + 0.05 Ω
Short Time Overload	5x rated power for 5 s	± 0.5 % + 0.05 Ω
Low Temperature Storage	-55 °C for 24 h	± 0.5 % + 0.05 Ω
Load Life	1000 h at rated power, +70 °C, 1.5 h "ON", 0.5 h "OFF"	± 1.0 % + 0.05 Ω
Resistance to Solder Heat	MIL-STD 202; 260 °C, 10 s	± 0.5 % + 0.05 Ω
Moisture Resistance	Per MIL-STD 202	± 1.0 % + 0.05 Ω

PACKAGING				
MODEL	REEL			
	TAPE WIDTH	DIAMETER	PIECES/REEL	PACKAGE CODE
SM-1	12 mm/embossed plastic	178 mm/7"	650	E6
		330 mm/13"	3000	E7
SM-2	16 mm/embossed plastic	178 mm/7"	600	E6
		330 mm/13"	2000	E7
SM-3	24 mm/embossed plastic	178 mm/7"	125	E6
		330 mm/13"	500	E7
SM-4	24 mm/embossed plastic	178 mm/7"	250	E6
		330 mm/13"	1000	E7
SM-5	32 mm/embossed plastic	178 mm/7"	180	E6
		330 mm/13"	500	E7



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.