

# 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](http://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 $\Omega$	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/ $^{\circ}\text{C}$	$\pm 20 > 10 \Omega$ , $\pm 50 1 \Omega$ to $10 \Omega$ , contact factory for $0.99 \Omega$ and below
Dielectric Withstanding Voltage	$V_{AC}$	1000
Operating Temperature Range	$^{\circ}\text{C}$	-55 to +275
Maximum Working Voltage	V	$(P \times R)^{1/2}$

GLOBAL PART NUMBER INFORMATION				
Global Part Numbering example: SM-2R4000FE6 (visit <a href="http://www.vishay.net">www.vishay.net</a> 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 $\Omega$ 4K000 = 4 k $\Omega$	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 $\Omega$	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	$\pm 0.5\% + 0.05 \Omega$
Short Time Overload	5x rated power for 5 s	$\pm 0.5\% + 0.05 \Omega$
Low Temperature Storage	-55 °C for 24 h	$\pm 0.5\% + 0.05 \Omega$
Load Life	1000 h at rated power, +70 °C, 1.5 h "ON", 0.5 h "OFF"	$\pm 1.0\% + 0.05 \Omega$
Resistance to Solder Heat	MIL-STD 202; 260 °C, 10 s	$\pm 0.5\% + 0.05 \Omega$
Moisture Resistance	Per MIL-STD 202	$\pm 1.0\% + 0.05 \Omega$

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.

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.

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А