

# SMD Wraparound Ultra Low Value Thin Film Resistors



With extremely low resistance and high power capabilities, these ultra low value resistors are available with solderable or weldable terminations.

## FEATURES

- NiCr + Ta<sub>2</sub>O<sub>5</sub> resistive layer
- Pre-soldered or gold terminations
- No inductance for high frequency applications
- Alumina substrates for high power handling capability
- Resistance range: 0.1  $\Omega$  to 9.99  $\Omega$
- TCR down to 50 ppm/°C
- Power rating: Up to 2 W at + 70 °C
- Withstand AEC-Q200 humidity test
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS\***  
COMPLIANT  
**GREEN**  
(5-2008)  
Available

## Note

\* Lead (Pb)-containing terminations are not RoHS-compliant. Exemptions may apply.

## STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE	RESISTANCE RANGE $\Omega$	RATED POWER $P_{70^\circ\text{C}}$ W	LIMITING ELEMENT VOLTAGE V	TOLERANCE $\pm$ %	TEMPERATURE COEFFICIENT $\pm$ ppm/°C
L0603	0603	0.1 to 9.99	0.125	50	1, 3, 5	50, 100, 200, 300
L0805	0805	0.1 to 9.99	0.2	50	1, 3, 5	50, 100, 200, 300
L1206	1206	0.1 to 9.99	0.33	50	1, 3, 5	50, 100, 200, 300
L1505	1505	0.1 to 9.99	0.5	50	1, 3, 5	50, 100, 200, 300
L2010	2010	0.1 to 9.99	1.0	50	1, 3, 5	50, 100, 200, 300
L2512	2512	0.1 to 9.99	2.0 <sup>(1)</sup>	50	1, 3, 5	50, 100, 200, 300

## Note

<sup>(1)</sup> With special assembly care

## CLIMATIC SPECIFICATIONS

Operating temperature range	- 55 °C; + 155 °C
-----------------------------	-------------------

## MECHANICAL SPECIFICATIONS

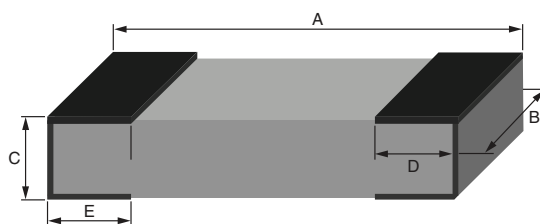
Substrate	Alumina
Technology	NiCr + Ta <sub>2</sub> O <sub>5</sub>
Coating	Silicone
Terminations	Solderable <b>B type:</b> SnPb over nickel barrier <b>N type:</b> SnAg over nickel barrier <b>G type:</b> Gold over nickel barrier

## Note

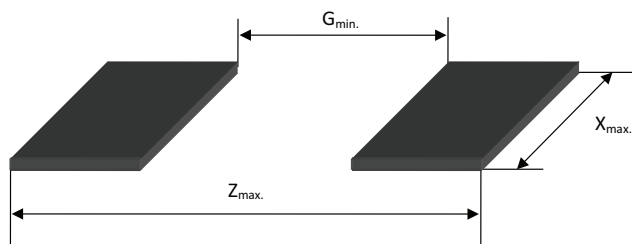
- Refer to Application Note "Guidelines for Vishay Sfernice Resistive and Inductive Components" (document number: 52029) for recommended reflow profile. Profile #3 applies.

## TOLERANCE AND TCR VS. OHMIC VALUE

OHMIC VALUE RANGE in $\Omega$	TIGHTEST TOLERANCE (%)	BEST TCR (ppm/°C)	TERMINATIONS
0R1 < 0R25	1	300	N or B
0R25 < 0R5	1	200	N or B
0R5 < 2R5	1	100	N or B
2R5 < 9R99	1	50	N or B
0R1 < 0R25	5	300	G
0R25 < 0R5	5	200	G
0R < 1R	5	100	G
1R < 2R5	3	100	G
2R5 to 9R99	3	50	G

**DIMENSIONS** in millimeters (inches)


CASE SIZE	A	B	C	D/E
	$\pm 0.152 (\pm 0.006)$	$\pm 0.127 (\pm 0.005)$	$\pm 0.127 (+ 0.005)$	$\pm 0.127 (\pm 0.005)$
0603	1.52 (0.060)	0.85 (0.033)	0.5 (0.020)	0.38 (0.015)
0805	1.91 (0.075)	1.27 (0.050)		0.40 (0.016)
1206	3.06 (0.120)	1.60 (0.063)		
1505	3.81 (0.150)	1.32 (0.052)		0.48 (0.019)
2010	5.08 (0.200)	2.54 (0.100)		
2512	6.30 (0.248)	3.30 (0.129)		

**SUGGESTED LAND PATTERN** in millimeters (inches) (to IPC-7351A)


CASE SIZE	Z <sub>max.</sub>	G <sub>min.</sub>	X <sub>max.</sub>
0603	2.37 (0.093)	0.35 (0.014)	0.98 (0.039)
0805	2.76 (0.109)	0.74 (0.029)	1.40 (0.055)
1206	3.91 (0.154)	1.85 (0.073)	1.73 (0.068)
1505	4.66 (0.183)	2.44 (0.096)	1.45 (0.057)
2010	5.93 (0.233)	3.71 (0.146)	2.67 (0.105)
2512	7.15 (0.281)	4.93 (0.194)	3.43 (0.135)

**Option: Enlarged Terminations: 0063**

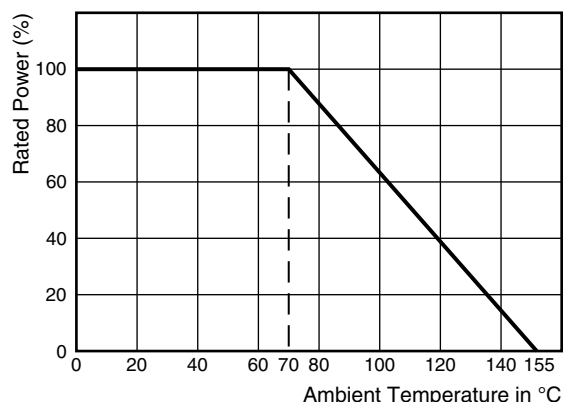
For stringent and special power dissipation requirements, the thermal resistance between the resistive layer and the solder joint can be reduced using enlarged terminations chip resistors which are soldered on large and thick copper pads acting as heat sinks (see application note: "Power Dissipation in High Precision Vishay Sfernice Chip Resistors and Arrays (P Thin Film, PRA Arrays, CHP Thick Film)": [www.vishay.com/doc?53048](http://www.vishay.com/doc?53048)).

For enlarged terminations: Please consult Vishay Sfernice.

**Option: AEC-Q200 withstanding**

Please order option 0058.

## POWER DERATING CURVE



## PACKAGING

Several types of packaging are proposed: waffle-pack and tape and reel

SIZE	MOQ	NUMBER OF PIECES PER PACKAGE		TAPE WIDTH
		WAFFLE PACK 2" x 2"	TAPE AND REEL	
			MIN.	
0603	100	100	5000	8 mm
0805			4000	
1206		60		
1505			2000	
2010				
2512		45		

## PACKAGING RULES

### Waffle Pack

Can be filled up to maximum quantity indicated in the table here above, taking into account the minimum order quantity. When quantity ordered exceeds maximum quantity of a single waffle pack, the waffle packs are stacked up on the top of each other and closed by one single cover.

**To get "not stacked up" waffle pack in case of ordered quantity > maximum number of pieces per package: Please consult Vishay/Sfernice for specific ordering code.**

### Tape and Reel

Can be filled up to maximum quantity indicated in the table here above, taking into account the minimum order quantity. When quantity ordered is between the MOQ and the maximum reel capacity, only one reel is provided.

**When several reels are needed for ordered quantity within MOQ and maximum reel capacity: Please consult Vishay Sfernice for specific ordering code.**

PERFORMANCE			
TESTS	CONDITIONS	VALUES AND DRIFT	
		MIL-R-55342 REQUIREMENTS	TYPICAL PERFORMANCES
Thermal shock	MIL-R-55342 C MIL-STD-702, method 107	± 0.25 %	± 0.02 %
Short time overload	MIL-R-55342 C PARA 3.10.4.7.5	± 0.10 %	± 0.01 %
Low temperature operation	MIL-R-55342 C PARA 3.9 and 4.7.4	± 0.25 %	± 0.01 %
Resistance to solder heat	MIL-R-55342 C PARA 3.12, 4.7.7, 4.7.1.2	± 0.25 %	± 0.04 %
Moisture resistance	MIL-R-55342 C PARA 3.13 and 4.7.8 MIL-STD-202, method 106	± 0.40 %	± 0.01 %
	AEC-Q200 85 °C/85 % RH/0.1 Pn 1000 h	-	Max. < 0.5 % + 0.05 Ω
High temperature	MIL-R-55342 C PARA 3.11 and 4.7.6	± 0.20 %	± 0.075 %
Load life	MIL-R-55342 C 2000 h Pn at 70 °C MIL-STD-202, method 108	± 0.50 %	± 0.15 %

**GLOBAL PART NUMBER INFORMATION**

New Global Part Numbering: L0805K1R00FBT0099

L	0	8	0	5	K	1	R	0	0	F	B	T	0	0	9	9
GLOBAL MODEL	SIZE		TCR		VALUE		TOLERANCE		TERMINATION		PACKAGING <sup>(1)</sup>		OPTION			
L	0603 0805 1206 1505 2010 2512		H = ± 50 ppm K = ± 100 ppm L = ± 200 ppm M = ± 300 ppm		R designated decimal point For values under 1R if 3 significant digits: Rxxx if 2 significant digits: xRxx		F = ± 1 % G = ± 2 % H = ± 3 % J = ± 5 % K = ± 10 %		B: SnPb over nickel barrier N: SnAg over nickel barrier G: Gold over nickel barrier		Blank: Waffle pack T: Tape and reel		Leave blank if no option			
											B: Lead bearing version N and G: Lead (Pb)-free/ RoHS version					

Historical Part Number example: L 0805 K 1R00 1 % B T R0099

L	0805	K	1R00	1 %	B	T	R0099
MODEL	SIZE	TCR	VALUE	TOLERANCE	TERMINATION	PACKAGING <sup>(1)</sup>	OPTION

**Note**<sup>(1)</sup> For specific quantity of parts per packaging please consult Vishay Sfernice



## 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.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9