

# SMD Wraparound Ultra Low Value Thin Film Resistors



## DESIGN SUPPORT TOOLS

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**3D**  
Models  
Available

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\***  
Available  
**HALOGEN**  
**FREE**  
Available  
**GREEN**  
(5-2008)  
Available

## 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

MODEL	SIZE	RESISTANCE RANGE $\Omega$	RATED POWER $P_{70\text{ }^{\circ}\text{C}}$ W	LIMITING ELEMENT VOLTAGE V	TOLERANCE $\pm$ %	TEMPERATURE COEFFICIENT $\pm$ ppm/°C
L0603	0603	0.1 to 9.99	0.125	50	1, 2, 3, 5, 10	50, 100, 200, 300
L0805	0805	0.1 to 9.99	0.2	50	1, 2, 3, 5, 10	50, 100, 200, 300
L1206	1206	0.1 to 9.99	0.33	50	1, 2, 3, 5, 10	50, 100, 200, 300
L1505	1505	0.1 to 9.99	0.5	50	1, 2, 3, 5, 10	50, 100, 200, 300
L2010	2010	0.1 to 9.99	1.0	50	1, 2, 3, 5, 10	50, 100, 200, 300
L2512	2512	0.1 to 9.99	2.0 <sup>(1)</sup>	50	1, 2, 3, 5, 10	50, 100, 200, 300

## Note

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

## CLIMATIC SPECIFICATIONS

Operating temperature range	-55 °C; +155 °C
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## MECHANICAL SPECIFICATIONS

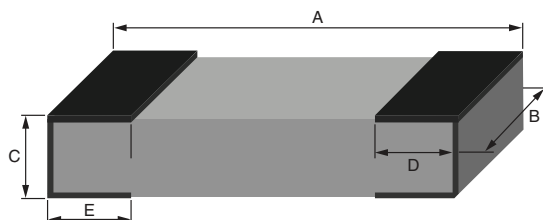
Substrate	Alumina
Technology	NiCr + Ta <sub>2</sub> O <sub>5</sub>
Coating	Silicone
Terminations	Solderable <b>B type:</b> SnPb over nickel barrier <b>N type:</b> SnAg over nickel barrier <b>G type:</b> Gold over nickel barrier

## Note

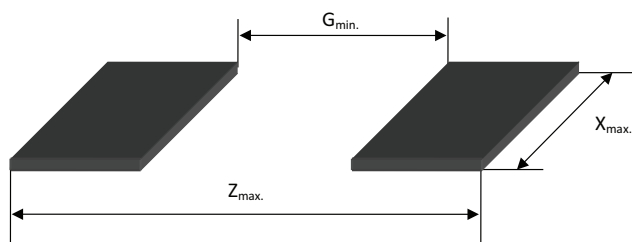
- Refer to Application Note "Guidelines for Vishay Sfernice Resistive and Inductive Components" (document number: 52029) for recommended reflow profile. Profile #3 applies

## 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)		0.48 (0.019)
1505	3.81 (0.150)	1.32 (0.052)		
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**

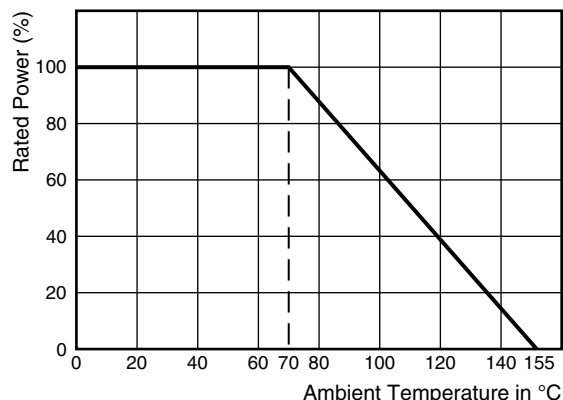
For stringent and special power dissipation requirements, the thermal resistance between the resistive layer and the solder joint can be reduced using enlarged terminations chip resistors which are soldered on large and thick copper pads acting as heat sinks (see application note: "Power Dissipation 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 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.**

## 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. MAX.	
0603	100	100	5000	8 mm
0805				
1206		140	4000	
1505		60		
2010			2000	
2512		50		

### 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		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 Rxxx			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		For more information see Codification of Packaging table		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		OPTION				

**CODIFICATION OF PACKAGING**

CODE 18	PACKAGING
<b>WAFFLE PACK</b>	
W	100 min., 1 mult
WA	100 min., 100 mult (available only in size 1206)
<b>PLASTIC TAPE (Standard for all sizes)</b>	
T	100 min., 1 mult
TA	100 min., 100 mult
TB	250 min., 250 mult
TC	500 min., 500 mult
TD	1000 min., 1000 mult
TE	2500min., 2500 mult
TF	Full tape (quantity depending on size of chips)
<b>PAPER TAPE (Available for 0603, 0805, and 1206. Please consult Vishay Sfernice for other sizes)</b>	
PT	100 min., 1 mult
PA	100 min., 100 mult
PB	250 min., 250 mult
PC	500 min., 500 mult
PD	1000 min., 1000 mult
PE	2500min., 2500 mult
PF	Full tape (quantity depending on size of chips)



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[L0805K2R20HBW](#) [L2512MR250FBT](#) [L-1206M1R00JBWS](#) [L1206MR100LBT](#) [L1505M2R00FBW](#) [L-1206M1R00JBT1](#)  
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