Metal Oxide Resistors, High Power

FEATURES

- Rugged metal oxide film
- Lead (Pb)-free solder contacts
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes
- Compatible with "Restriction of the use of Hazardous Substances" (RoHS) directive 2002/95/EC (issue 2004)
- High power dissipation in small size (1 W/0207 size to 4 W/0922 size)
- High temperature coating (up to 200 °C), nonflammable

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE	POWER RATING $P_{70\,°C}$ W	LIMITING ELEMENT VOLTAGE MAX. V≅	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	E-SERIES
WK2	0207	1.0	500	± 50	± 1	4R7 - 1M0	96
WK2	0207	1.0	500	± 100	± 2 ± 5	1R0 - 1M0 R18 - 10M	48 24
WK2	0207	1.0	500	± 200	± 5	0R18 - 10M	24
WR4	0414	2.0	500	± 200	± 2 ± 5	1R0 - 1M0 R18 - 10M	48 24
WR5	0617	3.0	750	± 200	± 2 ± 5	1R0 - 100K R22 - 560K	48 24
WK8	0922	4.0	750	± 200	± 2 ± 5	1R0 - 68K R22 - 100K	48 24

- Coating: green
- Marking: WR4 has color code marking does not have a TCR band. WR5 and WK8 are printed marked. For further information see appropriate catalog or web page.

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	WK2	WR4	WR5	WK8
Rated Dissipation at 70 °C	W	1.0	2.0	3.0	4.0
Limiting Element Voltage[1)]	V≅	500	500	750	750
Insulation Voltage (1 min)	V_{eff}	> 500	> 500	> 500	> 500
Thermal Resistance (max)	K/W	≤ 140	≤ 100	≤ 70	≤ 60
Insulation Resistance	Ω	$> 10^9$			
Voltage Coefficient	1/V	$< 10^{-7}$			
Thermal Time Constant	s	14	20	35	70
Category Temperature Range[2)]	°C	- 55 to + 200			
Terminal Strength, axial	N	> 60	> 80	> 80	> 80
Failure Rate	10^{-8}/h	< 1			
Weight	g	0.2	0.7	1.5	3.5

Note

1) Rated Voltage $\sqrt{P \times R}$

2) For values < 10R the upper limiting temperature is 155 °C. The power rating is correspondingly lower and can be caculated by R_{th}

For technical questions, contact: ff1aresistors@vishay.com

Document Number: 20128
Revision: 18-Jul-06

PART NUMBER AND PRODUCT DESCRIPTION WK2-SERIES

PART NUMBER: WK202070C1001FD5

W	K	2	0	2	0	7	0	C	1	0	0	1	F	D	5		

MODEL/SIZE	SPECIAL CHARACTER	TCR	VALUE	TOLERANCE	PACKING	SPECIAL
WK20207 **WK80922**	**0** = neutral	**C** = ± 50 ppm/K **B** = ± 100 ppm/K **A** = ± 200 ppm/K	3 digit value 1 digit multiplier MULTIPLIER **7** = $*10^{-3}$ **8** = $*10^{-2}$ **9** = $*10^{-1}$ **0** = $*10^{0}$ **1** = $*10^{1}$ **2** = $*10^{2}$ **3** = $*10^{3}$ **4** = $*10^{4}$ **5** = $*10^{5}$ **6** = $*10^{6}$	**F** = ± 1 % **G** = ± 2 % **J** = ± 5 %	**22** = A2 **25** = A5 **D5** = R5	up to 2 digits **00** = standard

PRODUCT DESCRIPTION: WK2 50 1K0 1 % R5

WK2	50	1K0	1 %	R5
MODEL	TCR	RESISTANCE VALUE	TOLERANCE	PACKING[1)]
WK2	± **50** ppm/K ± **100** ppm/K ± **200** ppm/K	**49K9** = 49.9 kΩ **50R1** = 50.1 Ω **1K0** = 1.0 kΩ	± **1** % ± **2** % ± **5** %	**A2** **A5** **R5**

1) Please refer to table PACKING, page 148

PART NUMBER AND PRODUCT DESCRIPTION WK8-SERIES

PART NUMBER: WK80922001000J5C00

W	K	8	0	9	2	2	0	0	1	0	0	0	J	5	C		

MODEL/SIZE	SPECIAL CHARACTER	TCR	VALUE	TOLERANCE	PACKING	SPECIAL
WK80922	**0** = neutral	**0** = standard	3 digit value 1 digit multiplier MULTIPLIER **7** = $*10^{-3}$ **8** = $*10^{-2}$ **9** = $*10^{-1}$ **0** = $*10^{0}$ **1** = $*10^{1}$ **2** = $*10^{2}$ **3** = $*10^{3}$ **4** = $*10^{4}$ **5** = $*10^{5}$	**G** = ± 2 % **J** = ± 5 %	**5C** = AC **G1** = R1	up to 2 digits **00** = standard

PRODUCT DESCRIPTION: WK8 100R 5 % AC

WK8	100R	5 %	AC
MODEL	RESISTANCE VALUE	TOLERANCE	PACKING[1)]
WK8	**100R** = 100 Ω **47K** = 47 kΩ	± **2** % ± **5** %	**AC** **R1**

1) Please refer to table PACKING, page 148.

PART NUMBER AND PRODUCT DESCRIPTION WR-SERIES

PART NUMBER: WR404140A1001GDE

W	R	4	0	4	1	4	0	A	1	0	0	1	G	D	E		

MODEL/SIZE	SPECIAL CHARACTER	TCR	VALUE	TOLERANCE	PACKING	SPECIAL
WR40414 **WR50617**	**0** = neutral	**A** = ± 200 ppm/K	3 digit value 1 digit multiplier	**G** = ± 2 % **J** = ± 5 %	**41** = A1 G73 **51** = A1 G77 **DE** = RE G53 **FE** = RE G73 **GP** = RP	up to 2 digits **00** = standard

MULTIPLIER

7 = $*10^{-3}$
8 = $*10^{-2}$
9 = $*10^{-1}$
0 = $*10^{0}$
1 = $*10^{1}$
2 = $*10^{2}$
3 = $*10^{3}$
4 = $*10^{4}$
5 = $*10^{5}$
6 = $*10^{5}$

PRODUCT DESCRIPTION: WR4 1K0 2 % RE

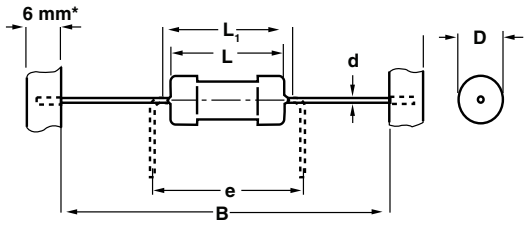
WR4	1K0	2 %	RE
MODEL	RESISTANCE VALUE	TOLERANCE	PACKING[1)]
WR4 **WR5**	**1K0** = 1.0 kΩ **50R1** = 50.1 Ω	± **2** % ± **5** %	**A1 (G73)** **A1 (G77)** **RE (G53)** **RE (G73)** **RP**

1) Please refer to table PACKING, below.

PACKING

MODEL	REEL			BOX		
	PIECES/REEL	CODE	MIN. ORDER QTY PACKING UNITS	PIECES/BOX	CODE	MIN. ORDER QTY PACKING UNITS
WK2	5000	R5	1	5000 2000	A5 A2	1 1
WR4	2500	RE	2	1000	A1	2
WR5	1500	RP	2	1000	A1	2
WK8	1000	R1	2	500	AC	2

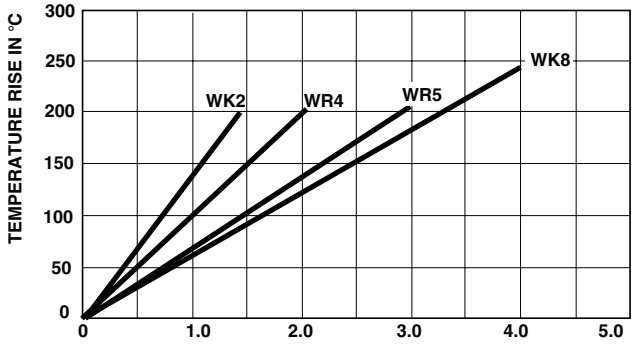
DIMENSIONS



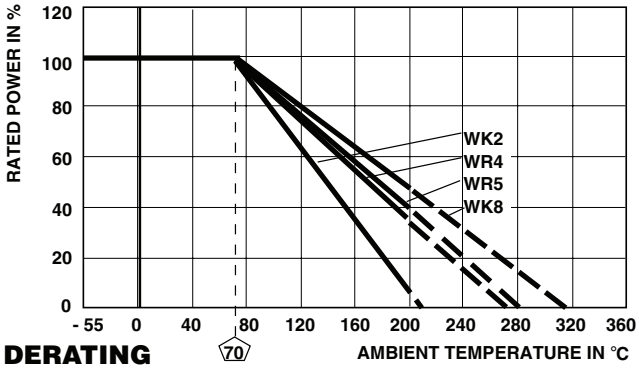
MODEL	DIMENSIONS [in millimeters]					
	D	L	L_{1max}	B	d	e
WK2	2.5 - 0.5	6.3 - 0.5	8.0	53 ± 1	0.6	7.5
WR4	4.1 - 0.5	12.0 - 1.5	16.0	73 ± 1	0.8	15.0
WR5	6.0 - 0.5	16.5 - 1.5	20.0	77 ± 1	0.8	17.5
WK8	9.0 - 0.5	20.0 - 1.5	24.0	77 ± 1	0.8	22.5

- Taping in acc. with IEC60286-1
- D and L measured in acc. with IEC60294
- d according to IEC60301

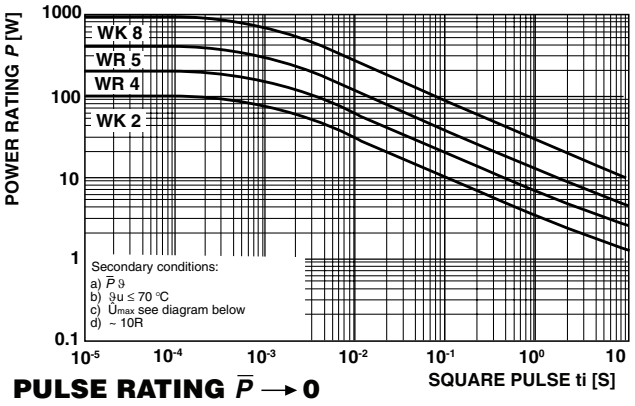
* 9 mm for WR5/WK8



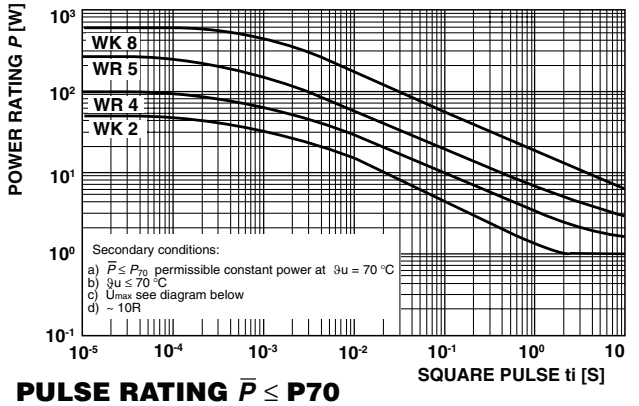
TEMPERATURE RISE



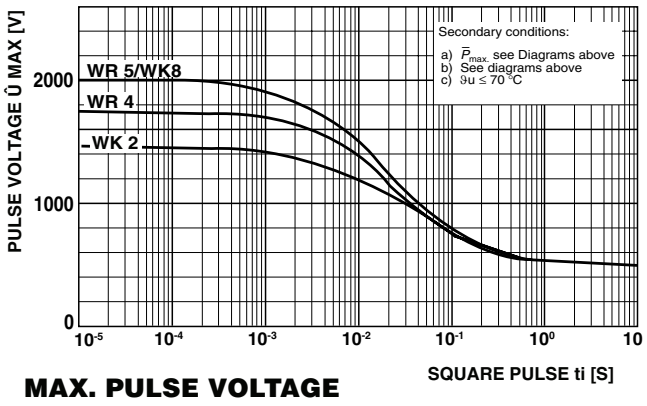
DERATING



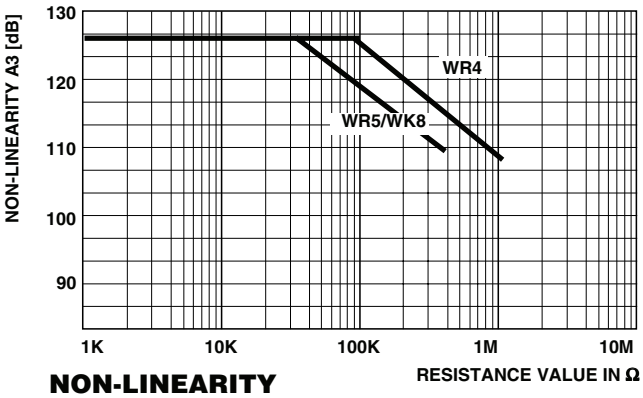
PULSE RATING $\overline{P} \rightarrow 0$



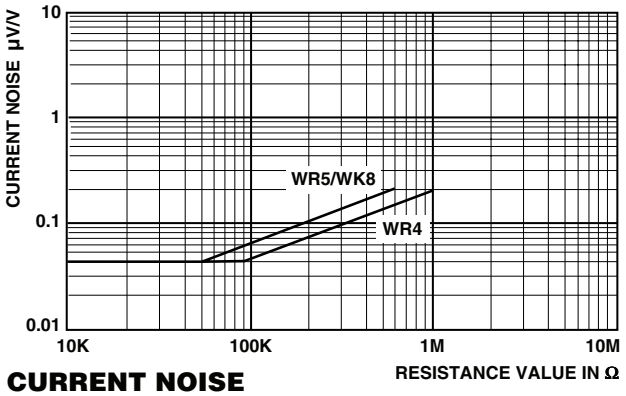
PULSE RATING $\overline{P} \leq$ P70



MAX. PULSE VOLTAGE



NON-LINEARITY



CURRENT NOISE

PERFORMANCE		
TEST	**CONDITIONS OF TEST**	**REQUIREMENTS***
Rated Dissipation at 70 °C IEC 60115-1 4.25.1	1000 hours at 70 °C 1.5 hours “ON”, 0.5 hours “OFF”	WK2 = ± 1.5 % WK4/8 = ± 2.0 % WR4/5 = ± 5.0 %
Endurance at UCT IEC 60115-1 4.25.3	1000 hours at 155 °C without load	≤ ± 1 %
Overload Test IEC 60115-1 4.13	Short time overload 5 seconds at 2.5 x rated voltage or ≤ ± twice the limiting element voltage	≤ ± 0.25 %
Thermal Shock IEC 60115-1 4.19, IEC 60068-2-14	Rapid change between upper and lower category temperature	≤ ± 0.25 %
Climatic Sequence IEC 60115-1 4.23	Dry heat, damp heat cycle, cold, low air pressure	≤ ± 0.5 %
Damp Heat Steady State IEC 60115-1 4.24, IEC 60068-2-3	56 days at 40 °C and 93 % relative humidity	≤ ± 1.5 %
Resistance to Soldering Heat IEC 60115-1 4.18, IEC 60068-2-20	10 seconds at 260 °C solder bath temperature	≤ ± 0.25 %
Robustness of Terminations IEC 60115-1 4.16	Tensile, bending and torsion	≤ ± 0.25 %
Vibration IEC 60115-1 4.22	0.75 mm or 10 g, 10 Hz - 500 Hz 6 hours	≤ ± 0.25 %

* Limiting for change of resistance at test

APPLICABLE SPECIFICATIONS

- CECC 40000
- EN 140000 IEC 60115-1

Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.