Axial Cemented Wirewound Resistors

FEATURES

- All welded construction
- Non flammable cement coating
- Ceramic core
- Various kinds of lead forming available
- Lead (Pb)-free
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes
- Compliant to RoHS directive 2002/95/EC

Pb-free
RoHS COMPLIANT
GREEN (5-2008)**

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	POWER RATING $P_{40\ °C}$	RESISTANCE RANGE (1)		TOLERANCE
		WM 50 (Class 1) TCR - 10 ... - 80 ppm/K	WM 110 (Class 3) TCR 100 ... 180 ppm/K	
Z301	1 W	0.30 Ω to 270 Ω	0.68 Ω to 2 kΩ	± 10 %, ± 5 %
ZDA0411	2 W	0.47 Ω to 560 Ω	1.50 Ω to 4.30 kΩ	± 10 %, ± 5 %
ZDV0411	2 W	0.47 Ω to 560 Ω	1.50 Ω to 4.30 kΩ	± 10 %, ± 5 %
Z302	3 W	0.10 Ω to 510 Ω 0.10 Ω to 510 Ω 0.22 Ω to 510 Ω 1 Ω to 510 Ω	1.80 Ω to 3.30 kΩ 24 Ω to 3.30 kΩ - -	± 10 % ± 5 % ± 2 % ± 1 %
Z303	4 W	0.10 Ω to 1 kΩ 0.10 Ω to 1 kΩ 0.10 Ω to 1 kΩ 1 Ω to 1 kΩ	1.80 Ω to 3.90 kΩ 12 Ω to 3.90 kΩ - -	± 10 % ± 5 % ± 2 % ± 1 %
Z305	6 W	0.10 Ω to 2.4 kΩ 0.10 Ω to 2.4 kΩ 0.62 Ω to 2.4 kΩ	3.90 Ω to 10 kΩ 10 Ω to 10 kΩ -	± 10 % ± 5 % ± 2 %, ± 1 %
Z306	8 W	0.13 Ω to 4.7 kΩ 1 Ω to 4.7 kΩ 2.2 Ω to 4.7 kΩ	6.80 Ω to 16 kΩ - -	± 10 %, ± 5 % ± 2 % ± 1 %
Z307	10 W	0.20 Ω to 8.2 kΩ 1.80 Ω to 8.2 kΩ 3.30 Ω to 8.2 kΩ	12 Ω to 30 kΩ - -	± 10 %, ± 5 % ± 2 % ± 1 %

Note

(1) Resistance value to be selected for ± 10 % tolerance from E12 and for ± 5 % from E24

** Please see document “Vishay Material Category Policy”: www.vishay.com/doc?99902

PART NUMBER AND PRODUCT DESCRIPTION

Part Number: Z320414115091K2C000

Z	3	2	0	4	1	4	1	1	5	0	9	K	2	C	0	0	0

MODEL	TCR/MATERIAL	VALUE	TOLERANCE CODE	PACKAGING CODE	SPECIAL
Z310309 = Z301 **ZDA0411** = ZDA0411 **ZDV0411** = ZDV0411 **Z320414** = Z302 **Z330617** = Z303 **Z350922** = Z305 **Z360933** = Z306 **Z370947** = Z307	**1** = - 10 ... - 80 ppm/K WM 50 Class 1 **3** = 100 ... 180 ppm/K WM 110 Class 3 **4** = SWI (special winding)	**3 digit value** **1 digit multiplier** MULTIPLIER **F** = $*10^{-4}$ **7** = $*10^{-3}$ **8** = $*10^{-2}$ **9** = $*10^{-1}$ **0** = $*10^{0}$ **1** = $*10^{1}$ **2** = $*10^{2}$	**F** = ± 1.0 % **G** = ± 2.0 % **J** = ± 5.0 % **K** = ± 10.0 %	(See Packaging table)	The 5 digit BV number will be encoded using a 36 character code. This code contains numbers 0...9 and letters A...Z (36 characters total) and allows to encode at least 46 655 five digit BV numbers. **000** = Standard

Product Description: Z302 1 15R 10 % AC G53

Z302	1	15R	10 %	AC G53
MODEL (1)	TCR/MATERIAL (1)	VALUE (1)	TOLERANCE CODE (1)	PACKAGING DESCRIPTION (2)

Notes

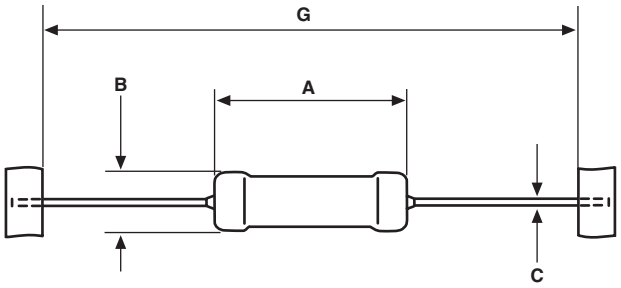
(1) See “Part Number” above

(2) See “Packaging Table”

PACKAGING TABLE

MODEL	TAPE/LEAD LENGTH (mm)	AMMO PACK			REEL			LOOSE		
		PCS	PACKAGING CODE	PACKAGING DESCRIPTION	PCS	PACKAGING CODE	PACKAGING DESCRIPTION	PCS	PACKAGING CODE	PACKAGING DESCRIPTION
Z301	53	1000	21	A1 G53	7500	DS	RS R53			
					2000	D2	R2 R53			
Z302	53	500	2C	AC G53	7500	DS	RS R53			
		4000	24	A4 G53	2000	D2	R2 R53			
	63	4000	25	A4 G63						
	73	500	4C	AC G73						
	83	500	6C	AC G83	1000	H1	R1 R83			
					7500	HS	RS R83			
	94							500	LC	LC
	108				7500	JS	RS R108			
Z303	53	500	2C	AC G53	1000	D1	R1 R53			
	83	500	6C	AC G83	1000	H1	R1 R83			
	94							500	LC	LC
Z305	83	100	6A	AA G83						
		250	6B	AB G83	500	HC	RC R83			
Z306	83	250	6B	AB G83	500	HC	RC R83			
Z307	120							200	LJ	LJ
ZDA0411	73	1000	41	A1 G73	2000	F2	R2 R73			
ZDV0411	73	2000	40	A2 G73						

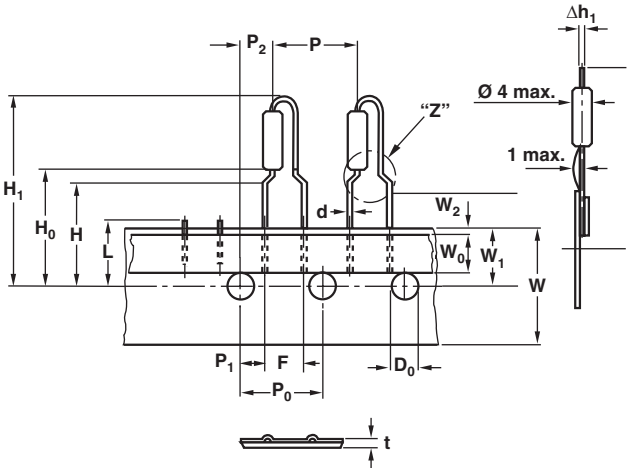
DIMENSIONS

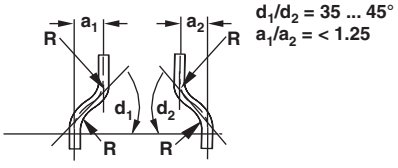


For packaging dimensions see appropriate catalog or web page.

MODEL	DIMENSIONS in millimeters [inches]				
	$A_{max.}$	$B_{max.}$	$C_{max.}$	G	MASS (g)
Z301	8.5 [0.355]	3 [0.118]	0.7 [0.027]	53 ± 1 [2.087 ± 0.039]	0.5
ZDA0411	11 [0.433]	4 [0.157]	0.7 [0.027]	53 ± 1 [2.087 ± 0.039	0.8
Z302	13 [0.512]	4.8 [0.189]	0.8 [0.031]	53 ± 1 [2.087 ± 0.039]	1.1
Z303	15.8 [0.622]	5.5 [0.217]	0.8 [0.031]	53 ± 1 [2.087 ± 0.039]	1.4
Z305	22.3 [0.878]	8.7 [0.343]	0.8 [0.031]	83 ± 1 [3.268 ± 0.039]	3.7
Z306	32.3 [1.272]	8.7 [0.343]	0.8 [0.031]	83 ± 1 [3.268 ± 0.039]	5
Z307	49.8 [1.961	9 [0.354]	0.8 [0.031]	120 ± 2 [4.724 ± 0.079]	7

DIMENSIONS ZDV0411





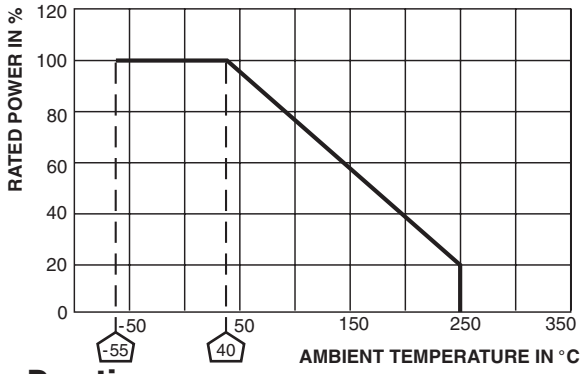
DIMENSIONS in millimeters			TOL.
Lead Ø	d	0.6	
Pitch of components	P	12.7	± 1.0
Pitch of sprocket holes (1)	P_0	12.7	± 0.3
Distance between hole center and resistor center	P_1	3.85	± 0.7
Distance between hole center and lead center	P_2	6.35	± 0.7
Lead spacing	F	5	+ 0.6, - 0.1
Angle of Insertion	Δh1	2 max.	-
Width of carrier tape	W	18.0	+ 1, - 0.5
Width of adhesive tape	W_0	12.0	± 0.5
Position of holes	W_1	9	+ 0.75, - 0.5
Position of adhesive tape	W_2	0.5	+ 0, - 0.5
Body to hole center	H	16.0	± 0.5
Lead crimp to hole center (2)	H_0	19.5	± 1.0
Hole Ø	D_0	4.0	± 0.2
Thickness of tape (3)	t	0.9 max.	-
Height of cutting	L	11 max.	-
Height of insertion	H_1	32.3 max.	-

Notes

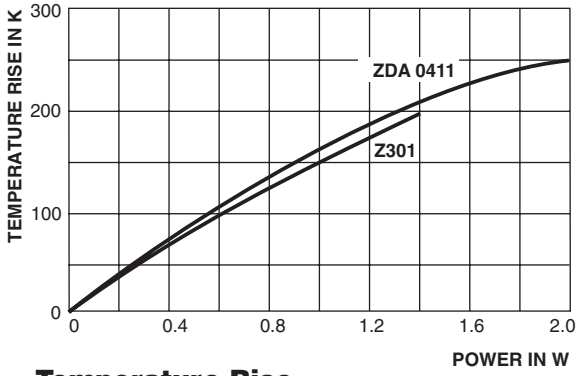
(1) Test over 10 holes - 9 intervals P_0 12 x 9 = 114.3 ± 0.5

(2) Parallelism, < 0.5 mm

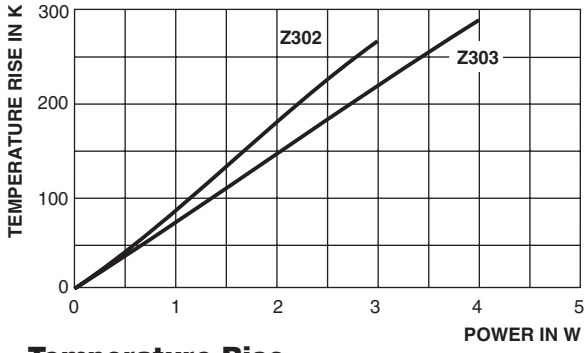
(3) Thickness of carrier tape: 0.55 mm ± 0.1



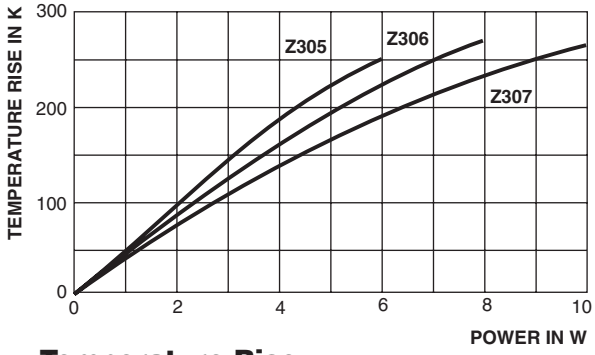
Derating



Temperature Rise



Temperature Rise



Temperature Rise

PERFORMANCE	
TEST	**TEST RESULTS**
Damp Heat, Steady State (40 ± 2) °C, 56 days, (93 ± 3) % RH	± 3 % ΔR
Climatic Sequence IEC 60115-1 4.23	± 3 % ΔR
Endurance at 25 °C 5000 h at 25 °C, 1.5 h “ON”, 0.5 h “OFF”	± 3 % ΔR
Short Time Overload 5 x Rated Power x 5 s	± 1 % ΔR
Vibration 6 h, 10 Hz to 2000 Hz, 1.5 mm or 196 m/s^2	± 1 % ΔR
Shock IEC 60068-2-27	± 1 % ΔR
Resistance to Soldering Heat (260 ± 5) °C, (10 ± 1) s	± 1 % ΔR

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