PAC.. Series

**Vishay Draloric** 

# **Cemented Leaded Wirewound Precision Resistors**



www.vishay.com

**FEATURES** 

- High power dissipation in small volume
- Ideal for pulse application
- TCR ± 100 ppm/K
- Maximum permissible hot spot temperature is 275  $^{\circ}\mathrm{C}$
- Lead (Pb)-free
- Tolerance 1 %
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

The resistor element is a resistive wire which is wound in a single layer on a ceramic rod. Metal caps are pressed over the ends of the rod. The ends of the resistance wire and the leads are connected to the caps by welding. Tinned copper-clad iron leads with poor heat conductivity are employed permitting the use of relatively short leads to obtain stable mounting without overheating the solder joint.

The resistor is coated with a green silicon cement which is not resistant to aggressive fluxes. The coating is non-inflammable, will not drip even at high overloads and is resistant to most commonly used cleaning solvents, in accordance with IEC 60068-2-45.

STANDARD ELECTRICAL SPECIFICATIONS							
MODEL	POWER RATING P <sub>25 °C</sub> W	LIMITING VOLTAGE U <sub>max.</sub>	RESISTANCE RANGE <sup>(2)</sup> $\Omega$	TOLERANCE ± %			
PAC01	1	$\sqrt{P \times R}$	0.10 to 2.2K	1			
PAC02 <sup>(1)</sup>	2	$\sqrt{P \times R}$	0.10 to 3.6K	1			
PAC03	3	$\sqrt{P \times R}$	0.10 to 4.7K	1			
PAC04	4	√P x R	0.10 to 8.2K	1			
PAC05	5	$\sqrt{P \times R}$	0.10 to 12K	1			
PAC06	6	$\sqrt{P \times R}$	0.10 to 12K	1			

#### Notes

• For Pulse Diagrams see AC.. Series (www.vishay.com/doc?28730)

<sup>(1)</sup> PAC02 WSZ:  $P_{25 \circ C} = 1.8 \text{ W}$ 

<sup>(2)</sup> Resistance value to be selected for  $\pm 1$  % tolerance from E24 and E96



COMPLIANT

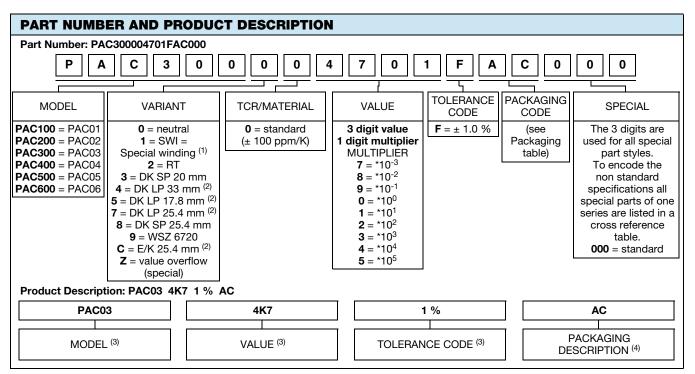
HALOGEN

GREEN

(5-2008)



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#### Notes

(1) Special winding on request

<sup>(2)</sup> Other dimensions on request

<sup>(3)</sup> See "Part Number and Product Description"

(4) See "Packaging Table"

PACKAGING TABLE									
	АММО			LOOSE			BLISTER		
MODEL	PIECES	PACK CODE	PACK. DESC.	PIECES	PACK CODE	PACK. DESC.	PIECES	PACK CODE	PACK. DESC.
PAC01	1000	A1	A1						
PAC01 DK/EK				500	LC	LC			
PAC01RT	2500	AE	AE						
PAC02	500	AC	AC						
PAC02 DK/EK				500	LC	LC			
PAC02 WSZ							1250	BM	BM
PAC03	500	AC	AC						
PAC03 DK/EK				500	LC	LC			
PAC04	500	AC	AC						
PAC04 DK/EK				500	LC	LC			
PAC05	500	AC	AC						
PAC05 DK/EK			•	250	LB	LB			
PAC06	500	AC	AC						
PAC06 DK/EK			•	250	LB	LB			

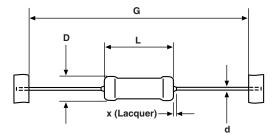
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### **DIMENSIONS** in millimeters [inches]



MODEL	D <sub>max.</sub>	L <sub>max.</sub>	d	X <sub>max.</sub>	G	WEIGHT g PER UNIT
PAC01	4.3 [0.169]	11 [0.433]		2	63 ± 1 [2.480 ± 0.039]	0.52
PAC02	4.8 [0.189]	13 [0.512]		2	63 ± 1 [2.480 ± 0.039]	0.75
PAC03	5.5 [0.217]	16.5 [0.650]	0.8 ± 0.03	3	63 ± 1 [2.480 ± 0.039]	1.10
PAC04	7.5 [0.295]	18 [0.709]	[0.031 ± 0.001]	3	73 ± 1 [2.874 ± 0.039]	1.90
PAC05	7.5 [0.295]	26 [1.024]		3	73 ± 1 [2.874 ± 0.039]	2.60
PAC06	7.5 [0.295]	26 [1.024]		3	73 ± 1 [2.874 ± 0.039]	2.60

Note

• For packaging dimensions see: <u>www.vishay.com/doc?28721</u>



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<b>BENDING FO</b>	RMS								
KINK TYPE S = EK			ØD + S		← L 		 - Ø d		
ТҮРЕ	Ød	9	Ø D <sub>max.</sub>	ð D <sub>max.</sub> L h ± 1		P±1		S <sub>max.</sub>	
PAC01							17.8		
PAC02 - PAC04	0.8		(1)	(1)		8	25.4		2
PAC05 - PAC06							33.0		
DOUBLE KINK SP = DK SP $+ S + - O B P_2$									
ТҮРЕ	ØD	Ø D <sub>max.</sub>	L	h ± 1	P <sub>1</sub> ± 1	P <sub>2</sub> ± 3	S <sub>max.</sub>	ØВ	c
PAC01 PAC02 - PAC04 PAC05 - PAC06	0.8	(1)	(1)	8	19.8   22.0   27.4   35.0	17.8 20.0 25.4 33.0	2	1.0 ± 0.1	4.5 ± 1
DOUBLE KINK LP = DK LP $S = S = P_2$									
ТҮРЕ	ØD	Ø D <sub>max.</sub>	L	h ± 1	P <sub>1</sub> ± 1	P <sub>2</sub> ± 3	S <sub>max.</sub>	ØВ	с
PAC01 - PAC02					17.8	17.8			
PAC02 - PAC04	0.8	(1)	(1)	8	25.4	25.4	2	1.0 ± 0.1	4.5 ± 1
PAC05 - PAC06					33.0	33.0			

Note

(1) See table DIMENSIONS

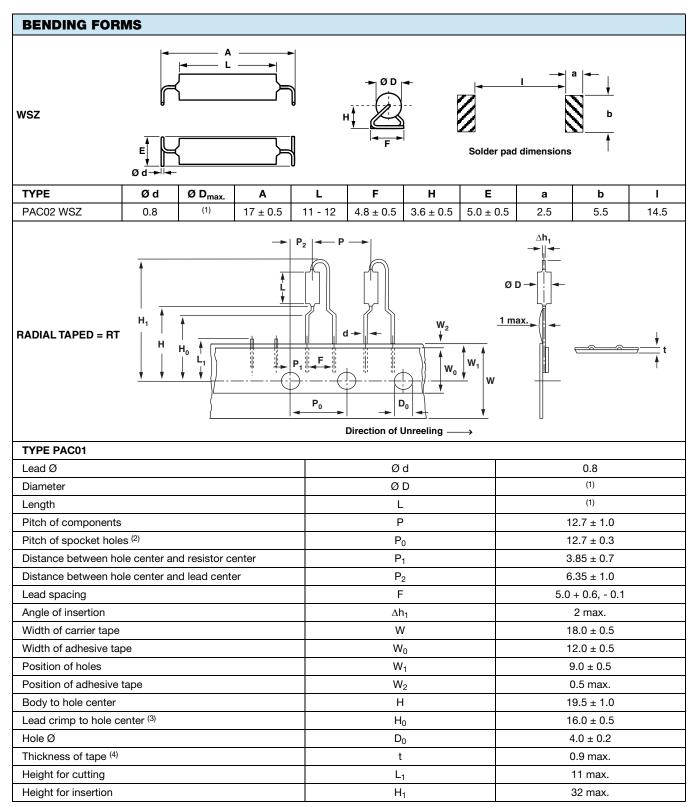
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#### Notes

<sup>(1)</sup> See table DIMENSIONS

 $^{(2)}$  Test over 10 holes - 9 intervals P\_0 12.7 x 9 = 114.3  $\pm$  0.5

<sup>(3)</sup> Parallelism, < 0.5 mm

 $^{(4)}$  Thickness of carrier tape: 0.55 mm  $\pm$  0.1

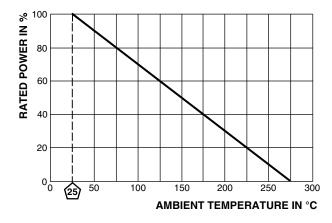
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## DERATING



Maximum dissipation ( $P_{max.}$ ) as a function of the ambient temperature ( $T_{amb}$ )

PERFORMANCE					
TEST	PERMISSIBLE CHANGE				
Climatic category (LCT/UCT/Days)	55/200/56				
Climatic Sequence IEC 60115-1 4.23	$\Delta R = \pm (0.5 \% R + 0.05 \Omega)$				
Damp Heat, Steady State, IEC 60115-1, 4.24 (40 ± 2) °C, 56 days, (93 ± 3) % RH	$\Delta R = \pm (1.0 \% R + 0.05 \Omega)$				
Endurance at room temperature (116 % <i>P</i> <sub>70</sub> ), 1000 h, IEC 60115-1, 4.25.2	$\Delta R = \pm (0.5 \% R + 0.05 \Omega)$				
Storage, UCT, IEC 60115-1, 4.25.3 1000 h, 200 °C, no load	$\Delta R = \pm (1.0 \% R + 0.05 \Omega)$				
Resistance to Soldering Heat, IEC 60115-1, 4.18 (260 $\pm$ 5) °C, (10 $\pm$ 1) s	$\Delta R = \pm (0.2 \% R + 0.05 \Omega)$				
Robustness of Termination, IEC 60115-1, 4.16 10N	$\Delta R = \pm (0.1 \% R + 0.05 \Omega)$				
Short Time Overload, IEC 60115-1, 4.13 10 x Rated Power for 5 s	$\Delta R = \pm (0.2 \% R + 0.05 \Omega)$				

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# **HISTORICAL 12NC INFORMATION**

- The resistors had a 12-digit ordering code staring with 2306 327
- The subsequent first digit indicated the resistor type and packaging.
- The remaining 4 digits indicated the resistance value:
  - The first 3 digits indicated the resistance value.
  - The last digit indicated the resistance decade in accordance with Resistance Decade table.

### Resistance Decade

RESISTANCE DECADE	LAST DIGIT
0.10 to 0.976 Ω	7
1 to 9.76 Ω	8
10 to 97.6 Ω	9
100 to 976 Ω	1
1 to 9.76 kΩ	2
10 to 12 kΩ	3

### **Ordering Example**

The ordering code for an PAC02, resistor value 47  $\Omega$  with  $\pm$  1 % tolerance, supplied in ammopack of 500 units was: 2306 327 04709.

HISTORICAL 12NC - Resistor type and packaging								
	2306 327							
ТҮРЕ	BANDOLIER IN AMMOPACK							
	RADIAL	STRAIGH	IT LEADS					
	2500 units	500 units	1000 units					
PAC01	RT <sup>(1)</sup>	-	2306 327 5					
PAC02	-	2306 327 0	-					
PAC03	-	2306 327 1	-					
PAC04	-	2306 327 2	-					
PAC05	-	2306 327 3	-					
PAC06	-	2306 327 4	-					

Note

<sup>(1)</sup> Radial parts with tin plated copper leads



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