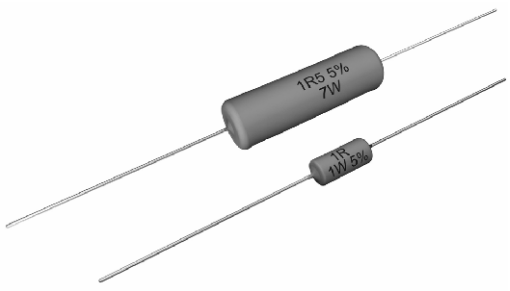
Cemented Wirewound Resistors



FEATURES

- All welded construction
- Ceramic core
- Non-flammable cement coating
- Tinned copper-clad iron leads (for axial parts)
- High power dissipation in small volume
- Ideal for pulse application
- Lead (Pb)-free
- Compliant to RoHS directive 2002/95/EC

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

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	POWER RATING		LIMITING VOLTAGE	RESISTANCE RANGE (2)			TOLERANCE
	$P_{40\,°C}$	$P_{70\,°C}$	$U_{max.}$	TCR = - 10 ... - 80 ppm/K	TCR = 100 ... 180 ppm/K	TCR = ± 100 ppm/K	
AC01	1 W	0.9 W	$\sqrt{P \times R}$	0.10 Ω to 33 Ω	36 Ω to 2.4 kΩ	-	± 5 %
AC03 (1)	3 W	2.5 W	$\sqrt{P \times R}$	0.10 Ω to 390 Ω	430 Ω to 3.3 kΩ	3.6 kΩ to 5.1 kΩ	± 5 %
AC04	4 W	3.5 W	$\sqrt{P \times R}$	0.10 Ω to 620 Ω	680 Ω to 6.8 kΩ	-	± 5 %
AC05	5 W	4.7 W	$\sqrt{P \times R}$	0.10 Ω to 910 Ω	1 kΩ to 10 kΩ	-	± 5 %
AC07	7 W	5.8 W	$\sqrt{P \times R}$	0.10 Ω to 1.5 kΩ	1.6 kΩ to 15 kΩ	-	± 5 %
AC10	10 W	8.4 W	$\sqrt{P \times R}$	0.22 Ω to 560 Ω	620 Ω to 27 kΩ	-	± 5 %

Note

(1) AC03 WSZ: $P_{40\,°C}$ = 1.8 W; $P_{70\,°C}$ = 1.5 W

PART NUMBER AND PRODUCT DESCRIPTION

Part Number: AC03000001509JAC00

A	C	0	3	0	0	0	0	0	1	5	0	9	J	A	C	0	0

MODEL	VARIANT	TCR/MATERIAL	VALUE	TOLERANCE CODE	PACKAGING CODE	SPECIAL
AC01000 = AC01 **AC03000** = AC03 **AC04000** = AC04 **AC05000** = AC05 **AC07000** = AC07 **AC10000** = AC10	**0** = Neutral **1** = RT **2** = SWI = Special winding (3) **3** = DK SP 20 mm (4) **4** = DK LP 33 mm (4) **5** = DK LP 17.8 mm (4) **6** = NI = Non inductive **7** = DK LP 25.4 mm (4) **9** = WSZ 6720 **8** = DK SP 25.4 mm **Z** = Value overflow (Special) **C** = E/K 25.4 mm (4)	**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** = $*10^{2}$ **5** = 10^{-4}	**J** = ± 5.0 %	(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. **00** = Standard

Product Description: AC03 15R 5 % AC

AC03	15R	5 %	AC
MODEL (5)	VALUE (5)	TOLERANCE CODE (5)	PACKAGING DESCRIPTION (6)

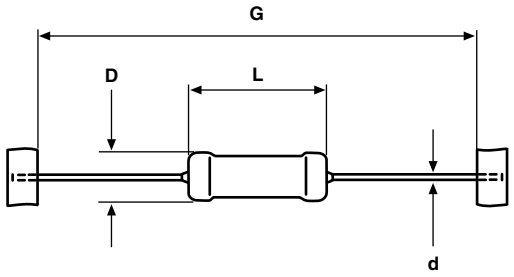
Notes

(2) Resistance value to be selected for ± 10 % tolerance from E12 and for ± 5 % from E24
(3) Special winding on request
(4) Other dimensions and variants on request
(5) See “Part Number and Product Description”
(6) See “Packaging Table”

** Please see document “Vishay Green and Halogen-Free Definitions (5-2008)”: www.vishay.com/doc?99902

PACKAGING TABLE									
MODEL	AMMO			LOOSE			BLISTER		
	PIECES	PACK. CODE	PACK. DESC.	PIECES	PACK. CODE	PACK. DESC.	PIECES	PACK. CODE	PACK. DESC.
AC01	1000	A1	A1						
AC01 DK/EK				500	LC	LC			
AC01RT	2500	AE	AE						
AC03	500	AC	AC						
AC03 DK/EK				500	LC	LC			
AC03 WSZ							1250	BM	BM
AC04	500	AC	AC						
AC04 DK/EK				500	LC	LC			
AC05	500	AC	AC						
AC05 DK/EK				500	LC	LC			
AC07	500	AC	AC						
AC07 DK/EK				250	LB	LB			
AC10	250	AB	AB						

DIMENSIONS

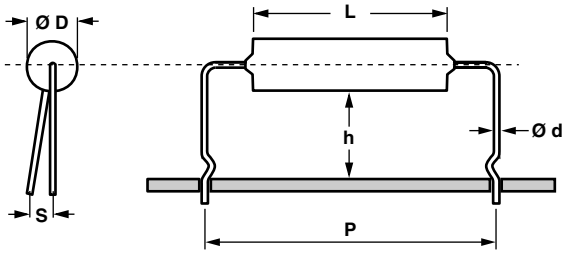


For packaging dimensions see: www.vishay.com/doc?28721

DIMENSIONS - Resistor types, mass and relevant physical dimensions					
MODEL	DIMENSIONS in millimeters [inches]				
	$D_{max.}$	$L_{max.}$	d	G	WEIGHT g PER UNIT
AC01	4.3 [0.169]	11 [0.433]	0.8 ± 0.03 [0.031 ± 0.001]	63 ± 1 [2.480 ± 0.039]	0.52
AC03	4.8 [0.189]	13 [0.512]		63 ± 1 [2.480 ± 0.039]	0.75
AC04	5.5 [0.217]	16.5 [0.650]		63 ± 1 [2.480 ± 0.039]	1.10
AC05	7.5 [0.295]	18 [0.709]		63 ± 1 [2.480 ± 0.039]	1.90
AC07	7.5 [0.295]	26 [1.024]		73 ± 1 [2.874 ± 0.039]	2.60
AC10	8.0 [0.315]	44 [1.732]		88 ± 1 [3.465 ± 0.039]	4.50

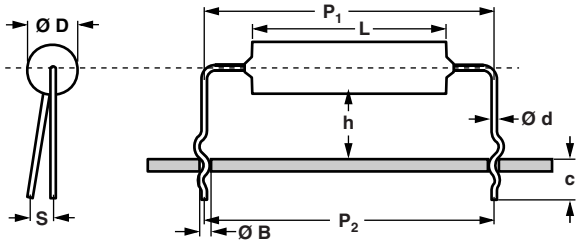
BENDING FORMS

KINK TYPE S = EK



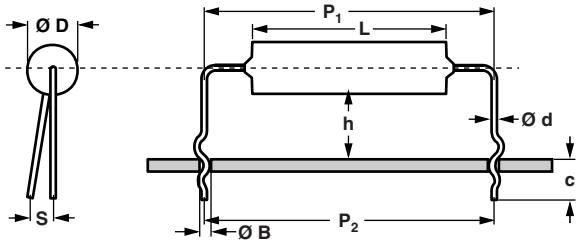
TYPE	Ø d	Ø $D_{max.}$	L	h ± 1	P ± 1	$S_{max.}$
AC01	0.8	(1)	(1)	8	17.8	2
AC03 - AC05					25.4	
AC07					33.0	

DOUBLE KINK SP = DK SP



TYPE	Ø d	Ø $D_{max.}$	L	h ± 1	P_1 ± 1	P_2 ± 3	$S_{max.}$	Ø B	c
AC01	0.8	(1)	(1)	8	19.8	17.8	2	1.0 ± 0.1	4.5 ± 1
AC03 - AC05					22.0	20.0			
					27.4	25.4			
AC07					35.0	33.0			

DOUBLE KINK LP = DK LP



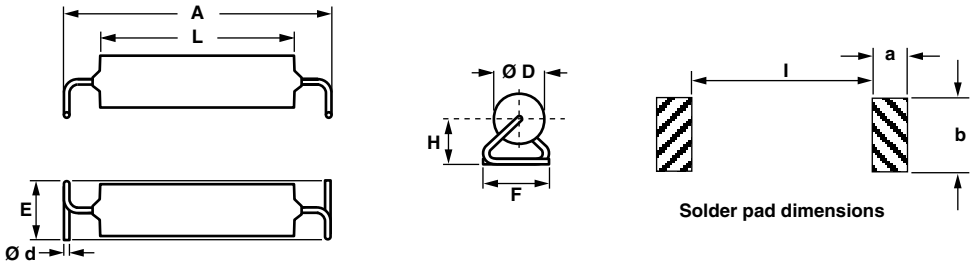
TYPE	Ø d	Ø $D_{max.}$	L	h ± 1	P_1 ± 1	P_2 ± 3	$S_{max.}$	Ø B	c
AC01 - AC03	0.8	(1)	(1)	8	17.8	17.8	2	1.0 ± 0.1	4.5 ± 1
AC03 - AC05					25.4	25.4			
AC07					33.0	33.0			

Note:

(1) See table DIMENSIONS

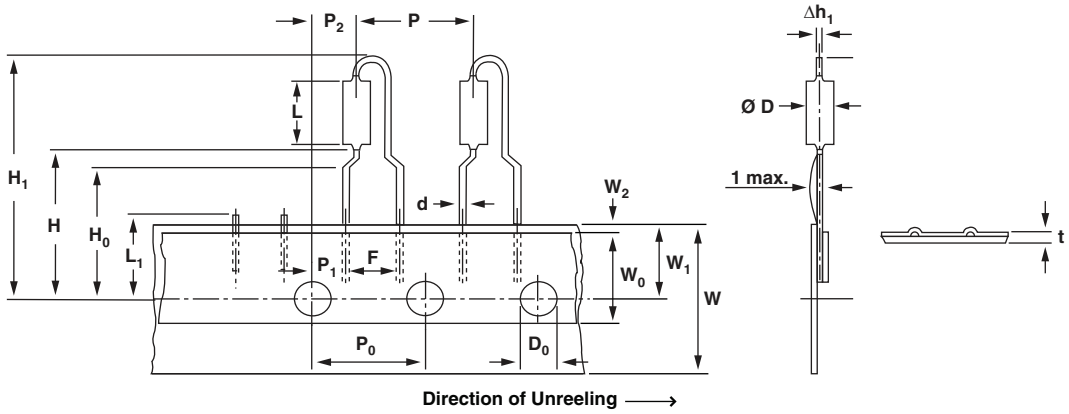
BENDING FORMS

WSZ



TYPE	Ø d	Ø $D_{max.}$	A	L	F	H	E	a	b	l
AC03 WSZ	0.8	(1)	17 ± 0.5	11 - 12	4.8 ± 0.5	3.6 ± 0.5	5.0 ± 0.5	2.5	5.5	14.5

RADIAL TAPED = RT



TYPE AC01		
Lead Ø	Ø d	0.8
Diameter	Ø D	(1)
Length	L	(1)
Pitch of components	P	12.7 ± 1.0
Pitch of spocket holes (2)	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 ± 1.0
Lead spacing	F	5.0 + 0.6, - 0.1
Angle of insertion	Δh_1	2 max.
Width of carrier tape	W	18.0 ± 0.5
Width of adhesive tape	W_0	12.0 ± 0.5
Position of holes	W_1	9.0 ± 0.5
Position of adhesive tape	W_2	0.5 max.
Body to hole center	H	19.5 ± 1.0
Lead crimp to hole center (3)	H_0	16.0 ± 0.5
Hole Ø	D_0	4.0 ± 0.2
Thickness of tape (4)	t	0.9 max.
Height for cutting	L_1	11 max.
Height for insertion	H_1	32 max.

Notes

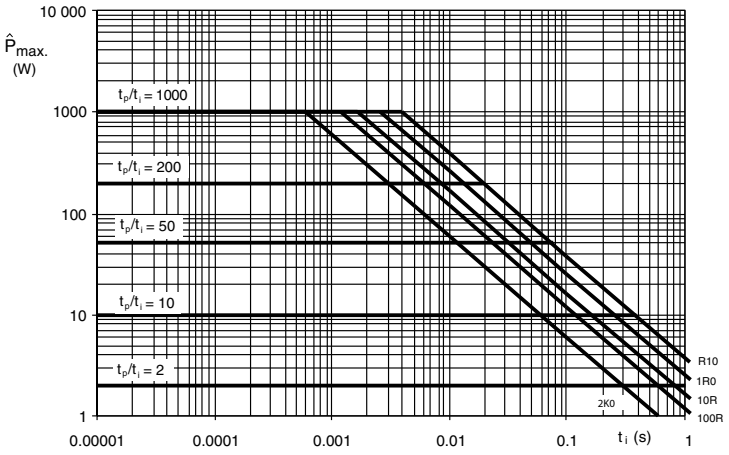
(1) See table DIMENSIONS

(2) Test over 10 holes - 9 intervals P_0 12.7 x 9 = 114.3 ± 0.5

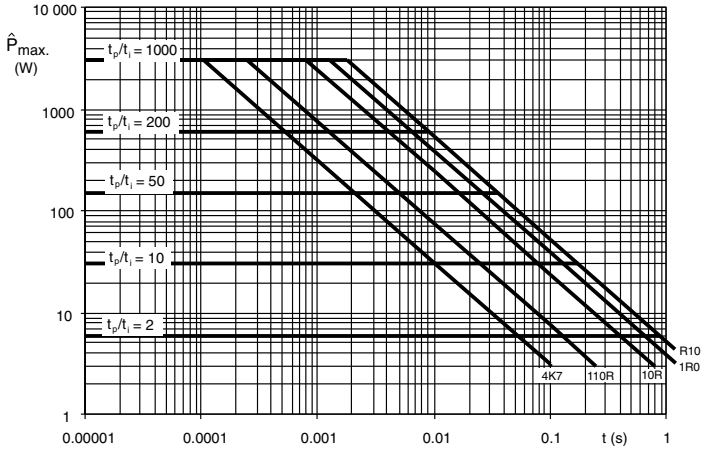
(3) Parallelism, < 0.5 mm

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

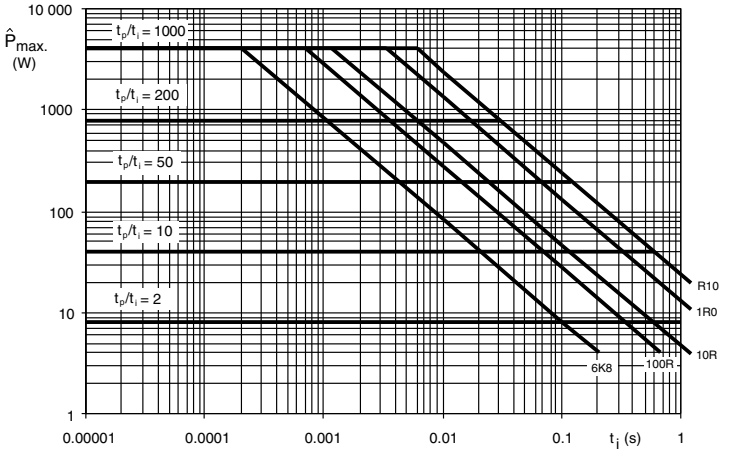
PULSE DIAGRAMS



AC01 Pulse on a regular basis; maximum permissible peak pulse power ($P_{max.}$) as a function of pulse duration (t_i)

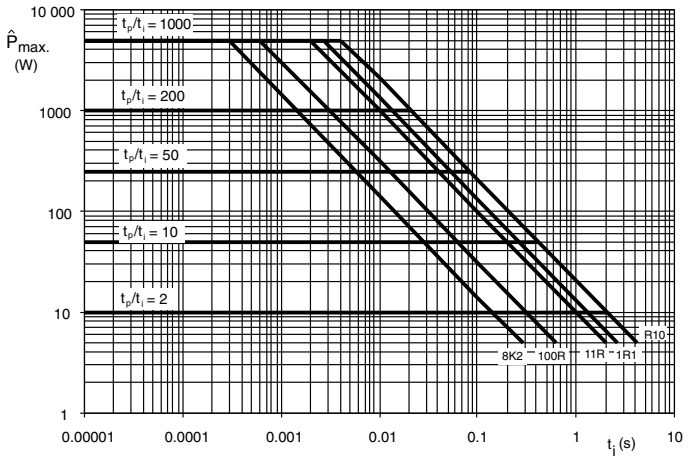


AC03 Pulse on a regular basis; maximum permissible peak pulse power ($P_{max.}$) as a function of pulse duration (t_i)

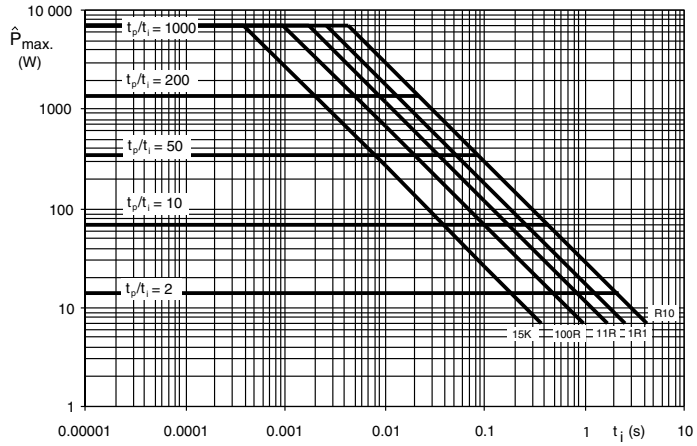


AC04 Pulse on a regular basis; maximum permissible peak pulse power ($P_{max.}$) as a function of pulse duration (t_i)

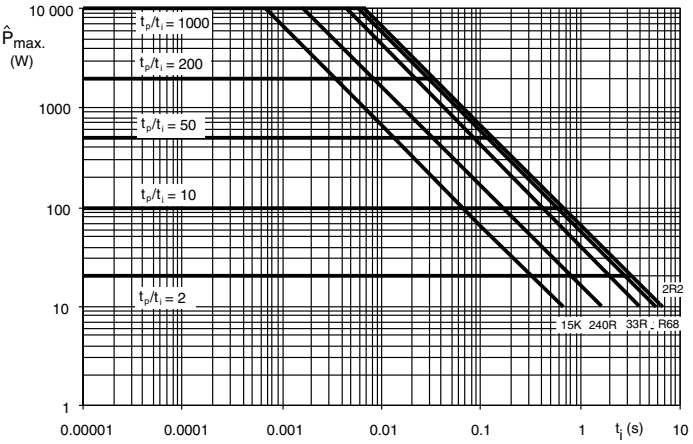
PULSE DIAGRAMS



AC05 Pulse on a regular basis; maximum permissible peak pulse power ($P_{max.}$) as a function of pulse duration (t_i)

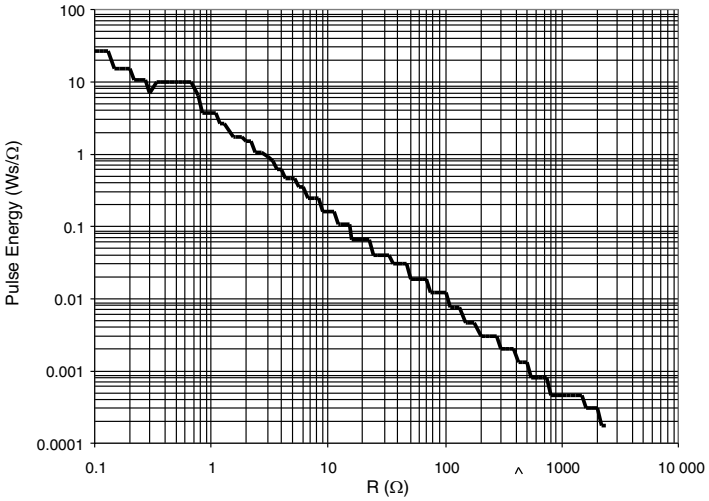


AC07 Pulse on a regular basis; maximum permissible peak pulse power ($P_{max.}$) as a function of pulse duration (t_i)

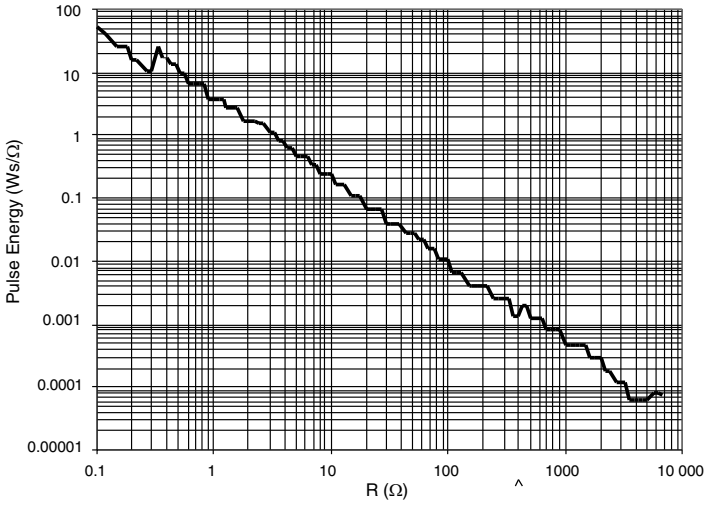


AC10 Pulse on a regular basis; maximum permissible peak pulse power ($P_{max.}$) as a function of pulse duration (t_i)

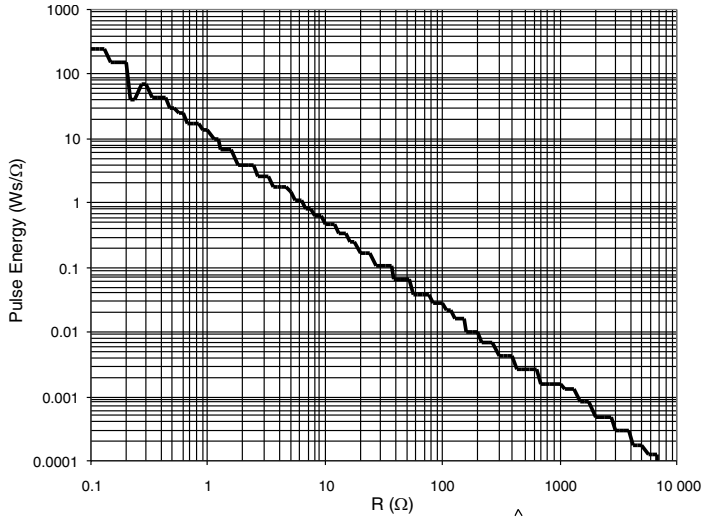
PULSE DIAGRAMS



AC01 Pulse capability; E (Ws) as a function of R (Ω)

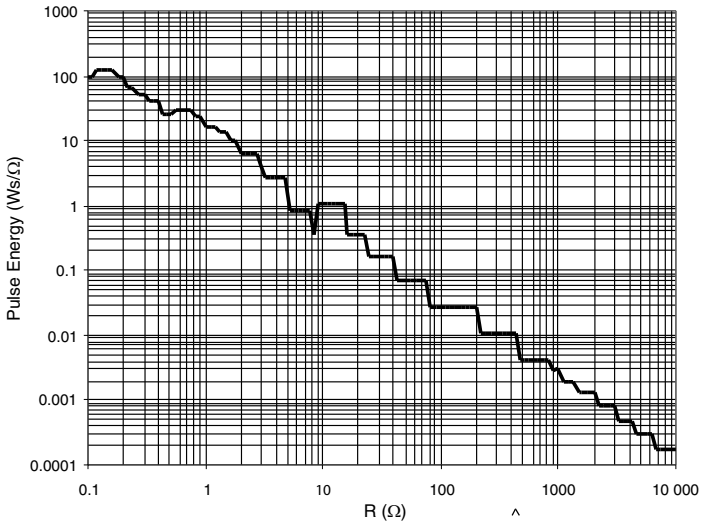


AC03 Pulse capability; E (Ws) as a function of R (Ω)

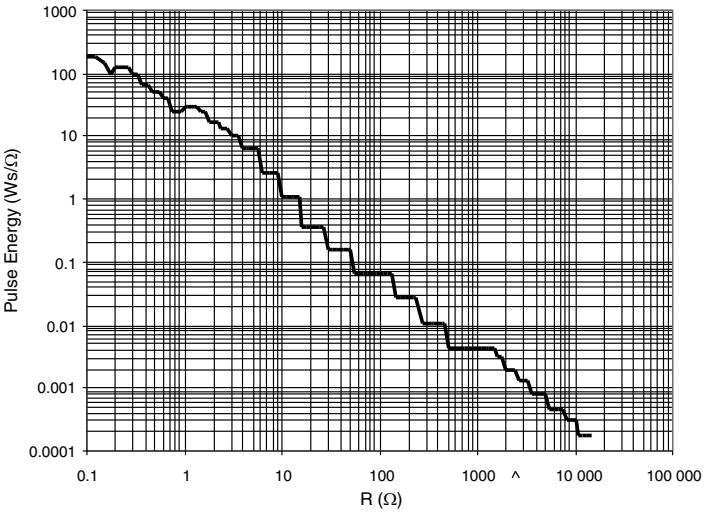


AC04 Pulse capability; E (Ws) as a function of R (Ω)

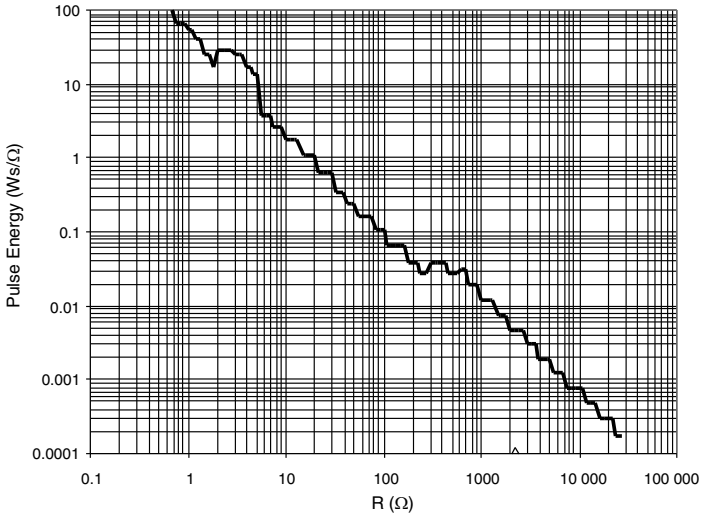
PULSE DIAGRAMS



AC05 Pulse capability; E (Ws) as a function of R (Ω)

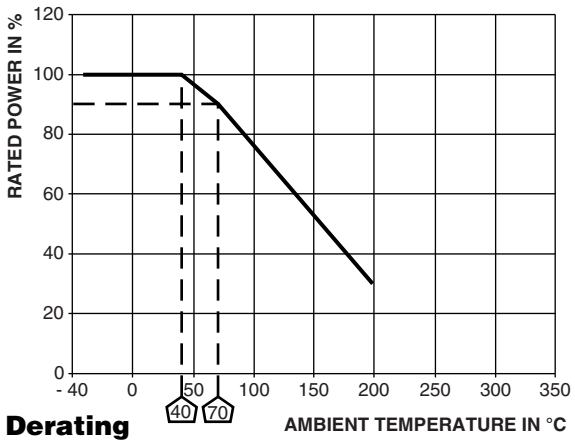


AC07 Pulse capability; E (Ws) as a function of R (Ω)

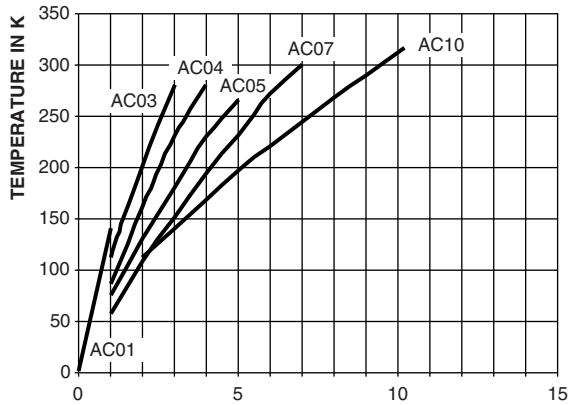


AC10 Pulse capability; E (Ws) as a function of R (Ω)

FUNCTIONAL PERFORMANCE



Derating



Temperature Rise

PERFORMANCE	
TEST	**PERMISSIBLE CHANGE**
Climatic Category (LCT/UCT/Days)	40/200/56
Climatic Sequence, IEC 60115-1, 4.23	$\Delta R = \pm (1\ \%\ R + 0.05\ \Omega)$
Damp Heat, Steady State, IEC 60115-1, 4.24 (40 ± 2) °C, 56 days, (93 ± 3) % RH	$\Delta R = \pm (5\ \%\ R + 0.1\ \Omega)$
Endurance at room temperature (116 % P_{70}), 1000 h, IEC 60115-1, 4.25.2	$\Delta R = \pm (5\ \%\ R + 0.1\ \Omega)$
Storage at UCT, 1000 h, no load, IEC60115-1,4.25.3	$\Delta R = \pm (5\ \%\ R + 0.1\ \Omega)$
Resistance to Soldering Heat, IEC 60115-1, 4.18 (260 ± 5) °C, (10 ± 1) s	$\Delta R = \pm (0.5\ \%\ R + 0.05\ \Omega)$
Robustness of Termination, IEC 60115-1, 4.16 10N	$\Delta R = \pm (0.5\ \%\ R + 0.05\ \Omega)$
Short Time Overload, IEC 60115-1, 4.13 10 x Rated Power for 5 s	$\Delta R = \pm (2\ \%\ R + 0.1\ \Omega)$

HISTORICAL 12NC INFORMATION

- The resistors had a 12-digit ordering code starting with 23.
- The subsequent 7 digits indicated the resistor type, specification and packaging.
- The remaining 3 digits indicated the resistance value:
  - The first 2 digits indicated the resistance value.
  - The last digit indicated the resistance decade in accordance with resistance decade table.

Resistance Decade

RESISTANCE DECADE	LAST DIGIT
0.1 Ω to 0.91 Ω	7
1 Ω to 9.1 Ω	8
10 Ω to 91 Ω	9
100 Ω to 910 Ω	1
1 kΩ to 9.1 kΩ	2
10 kΩ to 56 kΩ	3

12NC Example

The 12NC code of an AC01 resistor, value 47 Ω supplied in ammopack of 1000 units was: 2306 328 33479.

HISTORICAL 12NC - Resistor type and packaging

TYPE	23..			
	BANDOLIER IN AMMOPACK			
	RADIAL	STRAIGHT LEADS		
	2500 units	250 units	500 units	1000 units
AC01	06 328 90... (2)	-	-	06 328 33...
AC03 (1)	-	-	22 329 03...	-
AC04 (1)	-	-	22 329 04...	-
AC05 (1)	-	-	22 329 05...	-
AC07 (1)	-	-	22 329 07...	-
AC10	-	-	-	-

Notes

(1) Products with bent leads and bulk packaging (100 pieces) are available on request

(2) Radial parts with tin plated copper leads

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