K53-68

TANTALUM SOLID-ELECTROLYTE CAPACITORS

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AZHYAR.673546.007 TU

Moulded capacitors in plastic case. These capacitors are available in two versions: standard and low profile. Case height in low profile does not exceed 2.2 mm.

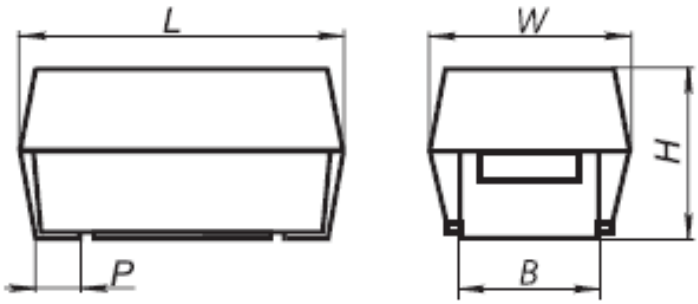
Capacitors are impact-proof (40 000 g – for single impact), highly resistant to special factors. These items may be used in various types of special-purpose vehicles and civilian industry products as well.

Capacitors are suitable for application in direct current, ripple current and pulse current circuits. Capacitors are available in all-climate version.

MAIN PARAMETERS

Name	Value
Rated voltage, V	2.5...50
Rated capacitance, μF	0.1...680
Capacitance tolerance (20°C, 50 Hz), %	±5; ±10; ±20; ±30
Maximum operating temperature Tenv, °C	+125
Minimal operating temperature Tenv, °C	-60
Peak shock acceleration: for standard capacitors for low profile capacitors	 3 000 g 40 000 g

DIMENSIONAL DRAWING

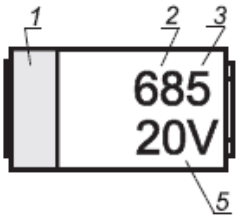


CAPACITORS OVERALL DIMENSIONS AND MASS

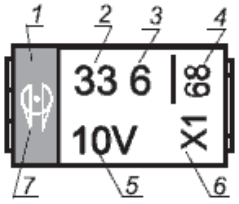
Case code	L, mm	W, mm	H, mm	P, mm	B, mm	Mass, g, max
Version 1 (standart)						
A	3.2±0.2	1.6±0.2	1.6±0.2	0.8±0.3	1.2±0.1	0.05
B	3.5±0.2	2.8±0.2	1.9±0.2	0.8±0.3	2.2±0.1	0.06
C	6.0±0.3	3.2±0.3	2.5±0.3	1.3±0.3	2.2±0.1	0.3
D	7.3±0.3	4.3±0.3	2.9±0.3	1.3±0.3	2.4±0.1	0.5
E	7.3±0.3	4.3±0.3	4.1±0.3	1.3±0.3	2.4±0.1	0.6
Version 2 (low profile)						
R	2.0±0.2	1.3±0.2	1.2±0.2	0.5±0.3	0.9±0.1	0.03
S	3.2±0.2	1.6±0.2	1.2±0.2	0.8±0.3	1.2±0.1	0.05
T	3.5±0.2	2.8±0.2	1.2±0.2	0.8±0.3	2.2±0.1	0.06
U	6.0±0.3	3.2±0.3	1.5±0.2	1.3±0.3	2.2±0.1	0.3
V	7.3±0.3	4.3±0.2	2.0±0.2	1.3±0.3	2.4±0.1	0.4

MARKING OF CAPACITORS

"B", "T" case sizes marking



"C" ,"D" ,"E" ,"U" ,"V" case sizes marking



1 – Positive terminal
2 – Rated capacitance, pF
3 – Capacitance multiplier code
4 – Product code (stripe unavailability is acceptable)
5 – Rated voltage, V
6 – Production date code
7 – Trade mark

There is only polarity marking on **“A” ,”R” ,”S”, “T” case sizes** capacitors

MARKING CODES DESIGNATION

Code	Year
K	2018
L	2019
M	2020
N	2021
P	2022
R	2023
S	2024
T	2025
U	2026
V	2027
W	2028
X	2029

Code	Month	Code	Month
1	January	7	July
2	February	8	August
3	March	9	September
4	April	O	October
5	May	N	November
6	June	D	December

Capaci-tance multi-plier code	Capaci-tance multi-plier
4	10^4
5	10^5
6	10^6
7	10^7
8	10^8

CAPACITORS RELIABILITY

Operation modes	Minimal nonfailure operating time, t_λ, hours	Capacitor failure rate, λ, 1/hour, max
Maximum-permissible mode (U_R, Tenv=85°C)	30 000	10^{-6}
Maximum-permissible mode (0.7U_R, Tenv=125°C)		
Light mode (0.6U_R, Tenv=55°C)	200 000	10^{-7}

Gamma-rated time of capacitor storageability Tcy at y=97% 25 years min

CAPACITORS CASE CODE

C_R, µF	U_R, V									
	2.5	4	6.3	10	16	20	25	32	40	50
0.1								A	A	A
0.15								A	A	A
0.22								A	A	B
0.33								A	A	B
0.47							A	A,B	B	B,C
0.68						A	A	B	B,C	B,C
1					A	A	A,B	B	B,C	C,V
1.5				A	A	A	B	B,C	C,V	C,D,V
2.2			A	A	A,S	A,B	B,C	C	C,D,V	C,D
3.3		A	A	A,S	A,B,S	B	B,C	C	C,D	D
4.7		A	A,S	A,B,R,S	B,T	B,C,U	C	C,D,V	D	D
6.8		A	A,B,R,S	B,S,T	B,C,T,U	B,C,U	C	D,V	E	E
10		A,B,R,S	B,S,T	B,C,T	B,C,U	C,U	C,D	D,V	E	E
15	R	B,S,T	B,C,T	B,C,T,U	C,U	C,D,V	D,V	E	E	E
22	S	B,C,T	B,C,T,U	C,U	C,D,U	C,D,V	D,V	E		
33	T	B,C,T,U	C,U	C,D,U,V	C,D,U,V	D,V	E			
47	T	C,U	C,D,U,V	C,D,U,V	D,V	D	E			
68	U	C,D,U	C,D,U,V	C,D,V	D,V	D,E	E			
100	U	C,D,U	C,D,V	C,D,V	D,E,V	E				
150	U	C,D,V	C,D,V	D,E	E					
220	V	D,V	D,E,V	D,E						
330	V	D,E,V	E	E						
470	V	E	E	E						
680		E	E							

CAPACITOR ELECTRIC PARAMETERS

U_R, V	C_R, µF	Case code	tg δ, %, 20°C, 50 Hz, max	I_{LEAK}, µA, 20°C, after 60 sec., max	I_R, A, 20°C, 100kHz, max	ESR, Ohm, 20°C, 100kHz, max
2.5	15	R	8	0.4	0.04	15
2.5	22	S	8	0.5	0.06	15
2.5	33	T	8	0.8	0.11	5
2.5	47	T	8	1.2	0.11	5
2.5	68	U	10	1.7	0.22	1.8
2.5	100	U	10	2.5	0.22	1.8
2.5	150	U	10	4	0.22	1.8
2.5	220	V	12	5.5	0.42	0.7
2.5	330	V	12	8	0.42	0.7
2.5	470	V	12	12	0.42	0.7
4	3.3	A	8	0.4	0.09	8
4	4.7	A	8	0.4	0.09	8
4	6.8	A	8	0.4	0.11	6
4	10	A	8	0.5	0.11	6
4	10	B	8	0.4	0.15	3.5
4	10	R	8	0.5	0.04	15
4	10	S	8	0.4	0.06	15
4	15	B	8	0.4	0.15	3.5
4	15	S	10	0.6	0.06	15
4	15	T	8	0.6	0.11	5
4	22	B	8	0.9	0.15	3.5
4	22	C	8	0.9	0.24	1.8
4	22	T	8	0.9	0.11	5
4	33	B	8	1.3	0.15	3.5
4	33	C	8	1.2	0.24	1.8
4	33	T	8	1.3	0.11	5
4	33	U	8	1.3	0.22	1.8
4	47	C	8	1.8	0.24	1.8
4	47	U	8	1.8	0.22	1.8
4	68	C	8	2.5	0.26	1.6
4	68	D	8	2.7	0.43	0.8
4	68	U	10	2.5	0.22	1.8
4	100	C	10	3.2	0.26	1.6

U_R, V	C_R, µF	Case code	tg δ, %, 20°C, 50 Hz, max	I_{LEAK}, µA, 20°C, after 60 sec., max	I_R, A, 20°C, 100kHz, max	ESR, Ohm, 20°C, 100kHz, max
4	100	D	10	4	0.43	0.8
4	100	U	10	4	0.22	1.8
4	150	C	10	6	0.3	1.2
4	150	D	10	5	0.43	0.8
4	150	V	12	6	0.42	0.7
4	220	D	10	7	0.43	0.8
4	220	V	12	8.8	0.42	0.7
4	330	D	12	11	0.46	0.7
4	330	E	12	11	0.48	0.7
4	330	V	12	13.2	0.42	0.7
4	470	E	12	15	0.48	0.7
4	680	E	12	27.2	0.52	0.6
6.3	2.2	A	8	0.4	0.09	8
6.3	3.3	A	8	0.4	0.09	8
6.3	4.7	A	8	0.5	0.11	6
6.3	4.7	S	8	0.5	0.06	15
6.3	6.8	A	8	0.5	0.11	6
6.3	6.8	B	8	0.4	0.15	3.5
6.3	6.8	R	8	0.5	0.04	15
6.3	6.8	S	8	0.4	0.06	15
6.3	10	B	8	0.6	0.15	3.5
6.3	10	S	10	0.6	0.06	15
6.3	10	T	8	0.6	0.11	5
6.3	15	B	8	0.9	0.15	3.5
6.3	15	C	8	0.6	0.24	1.8
6.3	15	T	8	0.9	0.11	5
6.3	22	B	8	1.4	0.15	3.5
6.3	22	C	8	1	0.24	1.8
6.3	22	T	8	1.4	0.11	5
6.3	22	U	8	1.4	0.22	1.8
6.3	33	C	8	1.5	0.24	1.8
6.3	33	U	10	2	0.22	1.8
6.3	47	C	10	2.9	0.26	1.6
6.3	47	D	8	2	0.43	0.8
6.3	47	U	10	2.9	0.22	1.8

U_R, V	C_R, µF	Case code	tg δ, %, 20°C, 50 Hz, max	I_{LEAK}, µA, 20°C, after 60 sec., max	I_R, A, 20°C, 100kHz, max	ESR, Ohm, 20°C, 100kHz, max
6.3	47	V	8	2.9	0.27	1.6
6.3	68	C	10	4.1	0.3	1.2
6.3	68	D	8	3.4	0.43	0.8
6.3	68	U	10	4.2	0.22	1.8
6.3	68	V	8	4.1	0.27	1.6
6.3	100	C	10	6.3	0.34	0.9
6.3	100	D	10	5	0.43	0.8
6.3	100	V	10	6.3	0.42	0.7
6.3	150	C	10	9.4	0.34	0.9
6.3	150	D	10	7.5	0.46	0.7
6.3	150	V	10	9.4	0.42	0.7
6.3	220	D	12	13.8	0.46	0.7
6.3	220	E	12	12	0.48	0.7
6.3	220	V	12	13.8	0.42	0.7
6.3	330	E	12	16.5	0.64	0.4
6.3	470	E	12	23.7	0.64	0.4
6.3	680	E	12	42	0.64	0.4
10	1.5	A	8	0.4	0.09	8
10	2.2	A	8	0.4	0.09	8
10	3.3	A	8	0.4	0.11	6
10	3.3	S	8	0.5	0.06	15
10	4.7	A	8	0.5	0.09	8
10	4.7	B	8	0.4	0.15	3.5
10	4.7	R	8	0.4	0.04	15
10	4.7	S	8	0.5	0.06	15
10	6.8	B	8	0.6	0.15	3.5
10	6.8	S	8	0.7	0.06	15
10	6.8	T	8	0.7	0.11	5
10	10	B	8	1	0.15	3.5
10	10	C	8	0.8	0.24	1.8
10	10	T	8	1	0.11	5
10	15	B	8	1.5	0.17	2.8
10	15	C	8	1.4	0.24	1.8
10	15	T	8	1.5	0.11	5
10	15	U	8	1.5	0.22	1.8

U_R, V	C_R, µF	Case code	tg δ, %, 20°C, 50 Hz, max	I_{LEAK}, µA, 20°C, after 60 sec., max	I_R, A, 20°C, 100kHz, max	ESR, Ohm, 20°C, 100kHz, max
10	22	C	8	1.8	0.24	1.8
10	22	U	10	2.2	0.22	1.8
10	33	C	8	3.3	0.3	1.2
10	33	D	8	3	0.32	1.4
10	33	U	10	3.3	0.22	1.8
10	33	V	8	3.3	0.26	1.8
10	47	C	8	4.7	0.3	1.2
10	47	D	8	3.8	0.43	0.8
10	47	U	10	4.7	0.22	1.8
10	47	V	8	4.7	0.42	0.7
10	68	C	10	6.8	0.3	1.2
10	68	D	8	6.8	0.43	0.8
10	68	V	8	6.8	0.42	0.7
10	100	C	10	10	0.3	1.2
10	100	D	10	10	0.46	0.7
10	100	V	10	10	0.42	0.7
10	150	D	12	15	0.46	0.7
10	150	E	12	13	0.48	0.7
10	220	D	12	22	0.54	0.5
10	220	E	12	17.5	0.57	0.5
10	330	E	12	33	0.57	0.5
10	470	E	12	47	0.7	0.3
16	1	A	8	0.4	0.07	12
16	1.5	A	8	0.4	0.09	8
16	2.2	A	8	0.4	0.11	6
16	2.2	S	8	0.5	0.06	15
16	3.3	A	8	0.5	0.11	6
16	3.3	B	8	0.4	0.15	3.5
16	3.3	S	8	0.4	0.06	15
16	4.7	B	8	0.7	0.15	3.5
16	4.7	T	8	0.7	0.11	5
16	6.8	B	8	1.1	0.15	3.5
16	6.8	C	8	1	0.24	1.9
16	6.8	T	8	1.1	0.1	7
16	6.8	U	8	1	0.11	7

U_R, V	C_R, µF	Case code	tg δ, %, 20°C, 50 Hz, max	I_{LEAK}, µA, 20°C, after 60 sec., max	I_R, A, 20°C, 100kHz, max	ESR, Ohm, 20°C, 100kHz, max
16	10	B	8	1.6	0.15	3.5
16	10	C	8	1.3	0.24	1.8
16	10	U	8	1.6	0.22	1.8
16	15	C	8	2	0.24	1.8
16	15	U	8	2.4	0.17	3
16	22	C	8	3.6	0.26	1.6
16	22	D	8	3.5	0.43	0.8
16	22	U	10	3.5	0.17	3
16	33	C	8	5.3	0.3	1.2
16	33	D	8	4	0.43	0.8
16	33	U	12	5.3	0.17	3
16	33	V	10	5.3	0.29	1.4
16	47	D	8	6	0.43	0.8
16	47	V	10	7.5	0.26	1.8
16	68	D	10	10.9	0.46	0.7
16	68	V	10	10.9	0.42	0.7
16	100	D	12	16	0.46	0.7
16	100	E	12	13	0.48	0.7
16	100	V	12	16	0.42	0.7
16	150	E	12	19	0.57	0.5
20	0.68	A	6	0.4	0.07	12
20	1	A	6	0.4	0.08	10
20	1.5	A	8	0.4	0.09	8
20	2.2	A	8	0.5	0.1	7
20	2.2	B	8	0.5	0.15	3.5
20	3.3	B	8	0.7	0.15	3.5
20	4.7	B	8	1	0.15	3.5
20	4.7	C	8	1	0.21	2.4
20	4.7	U	8	1	0.17	3
20	6.8	B	8	1.4	0.15	3.5
20	6.8	C	8	1.2	0.24	1.9
20	6.8	U	8	1.4	0.17	3
20	10	C	8	2	0.24	1.8
20	10	U	8	2	0.22	1.8
20	15	C	8	3	0.25	1.7

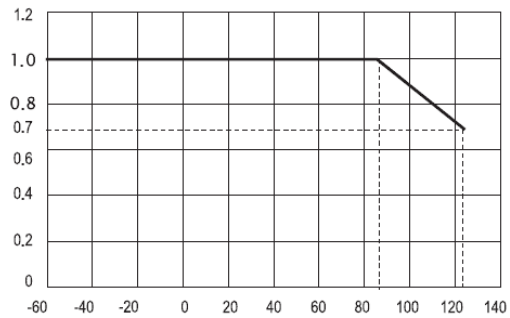
U_R, V	C_R, µF	Case code	tg δ, %, 20°C, 50 Hz, max	I_{LEAK}, µA, 20°C, after 60 sec., max	I_R, A, 20°C, 100kHz, max	ESR, Ohm, 20°C, 100kHz, max
20	15	D	8	2.4	0.38	1
20	15	V	8	3	0.27	1.7
20	22	C	8	4.4	0.37	1.2
20	22	D	8	3.6	0.43	0.8
20	22	V	8	4.4	0.26	1.8
20	33	D	8	5.2	0.43	0.8
20	33	V	8	6.6	0.42	0.7
20	47	D	8	9.4	0.46	0.7
20	68	D	10	13.6	0.46	0.7
20	68	E	8	11	0.48	0.7
20	100	E	10	18	0.57	0.5
25	0.47	A	6	0.4	0.07	14
25	0.68	A	6	0.4	0.08	10
25	1	A	6	0.5	0.09	8
25	1	B	6	0.5	0.13	5
25	1.5	B	6	0.5	0.13	5
25	2.2	B	6	0.6	0.13	4.5
25	2.2	C	6	0.6	0.17	3.5
25	3.3	B	6	0.9	0.15	3.5
25	3.3	C	6	0.7	0.2	2.5
25	4.7	C	8	1	0.21	2.4
25	6.8	C	8	1.2	0.24	1.9
25	10	C	8	2.5	0.27	1.5
25	10	D	8	2.2	0.38	1
25	15	D	8	3	0.38	1
25	15	V	8	3.7	0.26	1.8
25	22	D	8	5.5	0.43	0.8
25	22	V	8	5.5	0.42	0.7
25	33	E	8	7	0.48	0.7
25	47	E	8	11.8	0.48	0.7
25	68	E	8	17	0.48	0.7
32	0.1	A	6	0.5	0.06	20
32	0.15	A	6	0.5	0.06	19
32	0.22	A	6	0.5	0.06	18
32	0.33	A	6	0.5	0.07	15

U_R, V	C_R, µF	Case code	tg δ, %, 20°C, 50 Hz, max	I_{LEAK}, µA, 20°C, after 60 sec., max	I_R, A, 20°C, 100kHz, max	ESR, Ohm, 20°C, 100kHz, max
32	0.47	A	6	0.5	0.07	14
32	0.47	B	6	0.4	0.1	8
32	0.68	B	6	0.5	0.11	6.5
32	1	B	6	0.5	0.13	5
32	1.5	B	6	0.5	0.13	5
32	1.5	C	6	0.5	0.15	4.5
32	2.2	C	6	0.6	0.17	3.5
32	3.3	C	6	1	0.2	2.5
32	4.7	C	8	1.5	0.2	2.5
32	4.7	D	8	1.2	0.31	1.5
32	4.7	V	8	1.5	0.22	2.5
32	6.8	D	8	2	0.33	1.3
32	6.8	V	8	2	0.25	2
32	10	D	8	3	0.38	1
32	10	V	8	3.2	0.25	2
32	15	E	8	4.5	0.42	0.9
32	22	E	8	6	0.48	0.7
40	0.1	A	6	0.5	0.06	20
40	0.15	A	6	0.5	0.06	19
40	0.22	A	6	0.4	0.06	18
40	0.33	A	6	0.5	0.07	15
40	0.47	B	6	0.5	0.09	9
40	0.68	B	6	0.5	0.1	8
40	0.68	C	6	0.5	0.12	7
40	1	B	6	0.5	0.1	8
40	1	C	6	0.5	0.14	5.5
40	1.5	C	6	0.5	0.15	4.5
40	1.5	V	6	0.6	0.15	5
40	2.2	C	8	0.8	0.17	3.5
40	2.2	D	8	0.8	0.24	2.5
40	2.2	V	8	0.8	0.2	3
40	3.3	C	8	1.2	0.17	3.5
40	3.3	D	8	1.2	0.26	2.2
40	4.7	D	8	2	0.31	1.5
40	6.8	E	8	2.5	0.4	1

U_R, V	C_R, µF	Case code	tg δ, %, 20°C, 50 Hz, max	I_{LEAK}, µA, 20°C, after 60 sec., max	I_R, A, 20°C, 100kHz, max	ESR, Ohm, 20°C, 100kHz, max
40	10	E	8	3.4	0.42	0.9
40	15	E	8	5	0.42	0.9
50	0.1	A	6	0.4	0.06	20
50	0.15	A	6	0.4	0.06	19
50	0.22	B	6	0.4	0.07	14
50	0.33	B	6	0.4	0.09	10
50	0.47	B	6	0.5	0.09	9
50	0.47	C	6	0.4	0.11	8
50	0.68	B	6	0.5	0.1	8
50	0.68	C	6	0.4	0.12	7
50	1	C	8	0.4	0.14	5.5
50	1	V	8	0.5	0.14	6
50	1.5	C	8	0.8	0.15	4.5
50	1.5	D	8	0.8	0.2	3.5
50	1.5	V	8	0.8	0.15	5.5
50	2.2	C	8	1.1	0.17	3.5
50	2.2	D	8	1.1	0.24	2.5
50	3.3	D	8	1.6	0.27	2
50	4.7	D	8	2.4	0.31	1.5
50	6.8	E	8	3	0.4	1
50	10	E	8	5	0.48	0.7
50	15	E	8	7.5	0.48	0.7

VOLTAGE VERSUS TEMPERATURE

$\frac{U_T}{U_R}$



EXAMPLE OF REFERENCE DESIGNATION FOR ORDERING

CAPACITOR K53-68 “C” – 25V – 4.7μF ±10% AZHYAR.673546.007 TU