

TCK Series 105°C V- chip Aluminum Electrolytic Capacitor

Operating with wide temperature range -55~+105°C

Endurance 2000 hours

RoHS & REACH compliant, Halogen-free

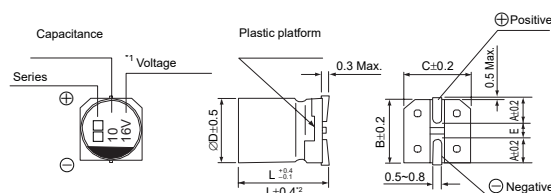


SPECIFICATIONS

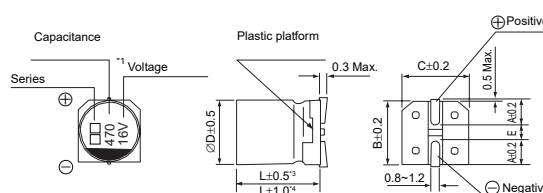
Items	Characteristics												
Operation Temperature Range	-55 ~ +105°C				-40 ~ +105°C				-25 ~ +105°C				
Voltage Range	4 ~ 100V				160 ~ 400V				450V				
Capacitance Range	0.1 ~ 8200μF				3.3 ~ 100μF				3.3 ~ 33μF				
Capacitance Tolerance	±20% at 120Hz, 20°C												
Leakage Current	Rated Voltage	6.3 ~ 100V								160 ~ 450V			
	Case size	Ø4~Ø10				Ø12.5~Ø18				Ø6.3~Ø18			
	Time	After 2 min. application of rated voltage at 20°C				After 1 min. application of rated voltage at 20°C				After 5 min. application of rated voltage at 20°C			
	Leakage current	≤0.01CV or 3μA, whichever is greater				≤0.03CV or 4μA, whichever is greater				≤0.04CV+100μA, whichever is greater			
	C: Nominal capacitance (μF) , V: Rated voltage (V)												
Dissipation Factor (tan δ)	Measurement frequency : 120Hz, Temperature: 20°C												
	Rated Voltage (V)	4	6.3	10	16	25	35	50	63	100	160~250	350~450	
	tan δ (max.)	Ø4~Ø10	0.42	0.30	0.26	0.22	0.16	0.14	0.12	0.10	0.10	0.20	0.25
		Ø12.5~Ø18	0.45	0.38	0.34	0.30	0.26	0.22	0.18	0.14	0.10	0.20	0.25
Stability at Low Temperature	Measurement frequency : 120Hz												
	Rated Voltage (V)		4	6.3	10	16	25	35	50~63	100	160~250	350~450	
	Impedance Ratio ZT/Z20 (max.)	Ø4~Ø10	Z(-25°C)/Z(20°C)	7	4	3	2	2	2	2	3	2	3
			Z(-55°C)/Z(20°C)	15	8	6	4	4	3	3	4	3	6
		Ø12.5~Ø18	Z(-25°C)/Z(20°C)	7	5	4	3	2	2	2	2	2	4
Z(-55°C)/Z(20°C)	17		12	10	8	5	4	3	3	6	10		
Load Life	After 2000 hours application of the rated voltage at 105°C, they meet the characteristics listed below.												
	Capacitance Change		Within ±20% of initial value for capacitors of 10V or more (Within ±30% of initial value for capacitors of 4V or less)										
	Dissipation Factor		200% or less of initial specified value										
	Leakage Current		initial specified value or less										
Shelf Life	After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for load life characteristics listed above.												
Resistance to Soldering Heat	After reflow soldering and restored at room temperature, they meet the characteristics listed below.												
	Capacitance Change		Within ±10% of initial value										
	Dissipation Factor		initial specified value or less										
	Leakage Current		initial specified value or less										
Marking	Black print on the case top.												

DRAWING (Unit: mm)

(Ø4~Ø6.3×7.7)



(Ø8×10.5~Ø18)



*1. Voltage mark for 6.3V is [6V]

*2. Applicable to Ø6.3×7.7

*3. Applicable to Ø8×10.5~Ø10

*4. Applicable to Ø12.5~Ø18



DIMENSIONS (Unit: mm)

ØD x L	4 x 5.4	5 x 5.4	6.3 x 5.4 / 7.7	8 x 6.2 / 10.5	10 x 10.5 / 12.5 / 13.5	12.5 x 13.5 / 16	16 x 16.5	18 x 16.5 / 18.5
A	2.0	2.2	2.6	3.3 / 3.0	3.3	4.9	5.8	6.2
B	4.3	5.3	6.6	8.4	10.4	13.0	17.0	19.0
C	4.3	5.3	6.6	8.4	10.4	13.0	17.0	19.0
E ± 0.2	1.0	1.4	1.9	2.3 / 3.1	4.7	4.7	6.4	6.4
L	5.4	5.4	5.4 / 7.7	6.2 / 10.5	10.5 / 12.5 / 13.5	13.5 / 16	16.5	16.5 / 18.5

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

•Case size ØDxL(mm), ripple current (mA rms) at 105°C, 120Hz

WV Code		4		6.3		10		16		25	
µF		Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current
4.7	475							4 x 5.4	13	4 x 5.4	17
10	106							4 x 5.4	20	5 x 5.4 (4 x 5.4)	23 (20)
22	226	4 x 5.4	20	4 x 5.4	23	5 x 5.4 (4 x 5.4)	29 (22)	5 x 5.4 (4 x 5.4)	32 (25)	6.3 x 5.4 (5 x 5.4)	39 (32)
33	336	5 x 5.4 (4 x 5.4)	30 (25)	5 x 5.4 (4 x 5.4)	34 (30)	5 x 5.4 (4 x 5.4)	35 (30)	6.3 x 5.4 (5 x 5.4)	45 (35)	6.3 x 5.4 (5 x 5.4)	48 (35)
47	476	5 x 5.4 (4 x 5.4)	36 (30)	5 x 5.4 (4 x 5.4)	38 (35)	5 x 5.4	38	6.3 x 5.4 (5 x 5.4)	55 (40)	6.3 x 5.4	60
100	107	6.3 x 5.4 (5 x 5.4)	64 (54)	6.3 x 5.4 (5 x 5.4)	69 (59)	6.3 x 5.4 (5 x 5.4)	80 (60)	6.3 x 5.4	80	6.3 x 7.7 (6.3 x 5.4) (8 x 6.2)	100 (80) (130)
150	157	6.3 x 5.4	80	6.3 x 5.4	85	6.3 x 5.4	85	6.3 x 7.7	105	8 x 10.5 (6.3 x 7.7)	240 (120)
220	227	6.3 x 5.4	90	6.3 x 7.7 (6.3 x 5.4)	120 (95)	6.3 x 7.7 (6.3 x 5.4)	120 (95)	8 x 10.5 (6.3 x 7.7)	270 (120)	8 x 10.5	270
330	337	6.3 x 7.7	120	6.3 x 7.7	120	8 x 10.5 (6.3 x 7.7)	290 (135)	8 x 10.5	290	10 x 10.5 (8 x 10.5)	380 (290)
470	477	6.3 x 7.7	120	8 x 10.5 (6.3 x 7.7)	320 (120)	10 x 10.5 (8 x 10.5)	380 (320)	10 x 10.5 (8 x 10.5)	380 (290)	10 x 10.5	380
680	687	8 x 10.5	320	8 x 10.5	350	10 x 10.5 (8 x 10.5)	380 (350)	10 x 10.5	380	10 x 13.5	400
1000	108	8 x 10.5	320	10 x 10.5 (8 x 10.5)	410 (350)	10 x 10.5	410	12.5 x 13.5 (10 x 13.5) (10 x 10.5)	550 (460) (410)	12.5 x 13.5	580
1500	158	10 x 10.5	410	10 x 13.5 (10 x 10.5)	450 (410)	10 x 13.5	460	12.5 x 13.5	550	12.5 x 16	850
2200	228	10 x 13.5 (10 x 10.5)	440 (410)	12.5 x 13.5 (10 x 13.5)	680 (560)	12.5 x 13.5	680	16 x 16.5 (12.5 x 16)	900 (750)	16 x 16.5	1050
3300	338	10 x 13.5	490	12.5 x 16 (12.5 x 13.5)	850 (810)	16 x 16.5	1000	16 x 16.5	1000	18 x 16.5	1150
4700	478	12.5 x 13.5	600	16 x 16.5	1000	16 x 16.5	1000	18 x 16.5	1225	18 x 18.5	1300
6800	688	16 x 16.5 (12.5 x 16)	950 (650)	18 x 16.5	1290	18 x 16.5	1290				
8200	828			18 x 18.5	1450	18 x 18.5	1450				

WV Code		35		50		63		100	
µF		Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current
0.1	104			4 x 5.4	2	4 x 5.4	2		
0.22	224			4 x 5.4	4	4 x 5.4	4		
0.33	334			4 x 5.4	4	4 x 5.4	4		
0.47	474			4 x 5.4	5	4 x 5.4	5		
1	105			4 x 5.4	8	4 x 5.4	8	4 x 5.4	8
2.2	225			4 x 5.4	12	4 x 5.4	12	6.3 x 5.4 (5 x 5.4)	14 (12)
3.3	335	4 x 5.4	13	4 x 5.4	14	5 x 5.4	17	6.3 x 7.7 (6.3 x 5.4)	55 (20)
4.7	475	4 x 5.4	17	5 x 5.4 (4 x 5.4)	20 (14)	5 x 5.4	20	6.3 x 7.7 (6.3 x 5.4)	50 (21)
10	106	5 x 5.4 (4 x 5.4)	27 (18)	6.3 x 5.4 (5 x 5.4)	32 (27)	6.3 x 7.7 (6.3 x 5.4)	58 (32)	8 x 10.5 (8 x 6.2) (6.3 x 7.7)	77 (55) (58)
22	226	6.3 x 5.4 (5 x 5.4)	44 (36)	6.3 x 7.7 (6.3 x 5.4)	58 (44)	8 x 10.5 (6.3 x 7.7)	100 (58)	10 x 10.5 (8 x 10.5)	126 (100)
33	336	6.3 x 5.4	50	6.3 x 7.7	65	8 x 10.5	140	10 x 10.5	150
47	476	6.3 x 7.7 (6.3 x 5.4)	80 (58)	8 x 10.5 (6.3 x 7.7)	170 (70)	10 x 10.5 (8 x 10.5)	170 (160)	12.5 x 13.5 (10 x 13.5) (10 x 10.5)	250 (180) (160)
68	686							12.5 x 13.5 (10 x 13.5)	300 (180)

•Case size ØDxL(mm), ripple current (mA rms) at 105°C, 120Hz

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

Case size $\varnothing D \times L$ (mm), ripple current (mA rms) at 105°C, 120Hz

μF	WV Code	35		50		63		100		160	
		Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current
22	226									10 × 13.5	50
33	336									12.5 × 13.5	95
47	476							10 × 10.5	160	12.5 × 13.5 (16 × 16.5)	205 (240)
100	107	8 × 10.5 (6.3 × 7.7)	240 (92)	10 × 10.5 (8 × 10.5)	250 (210)	12.5 × 13.5 (10 × 13.5) (10 × 10.5)	400 (350) (310)	16 × 16.5 (12.5 × 13.5)	450 (380)	16 × 16.5	250
150	157	8 × 10.5	240	10 × 10.5	300	10 × 13.5	350				
220	227	10 × 10.5 (8 × 10.5)	270 (250)	10 × 13.5 (10 × 10.5)	330 (280)	16 × 16.5 (12.5 × 13.5)	560 (470)	16 × 16.5	550		
330	337	10 × 10.5	370	16 × 16.5 (12.5 × 13.5) (10 × 13.5)	600 (490) (295)	16 × 16.5 (12.5 × 16)	700 (510)	18 × 16.5	590		
470	477	12.5 × 13.5 (10 × 13.5) (10 × 10.5)	520 (400) (370)	16 × 16.5 (12.5 × 16) (12.5 × 13.5)	700 (550) (470)	16 × 16.5	750	18 × 18.5	980		
680	687	12.5 × 13.5	530	16 × 16.5	750	18 × 16.5	790				
1000	108	16 × 16.5 (12.5 × 16)	800 (600)	18 × 16.5	990						
1500	158	16 × 16.5	750								
2200	228	18 × 16.5	1050								

μF	WV Code	200		250		350		400		450	
		Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current
3.3	335							10 × 13.5 (8 × 10.5)	40 (35)	10 × 13.5 (8 × 12.5)	40 (38)
4.7	475			10 × 13.5	65	10 × 13.5	45	10 × 13.5 (12.5 × 13.5)	45 (48)	10 × 13.5 (12.5 × 13.5)	42 45
10	106	10 × 13.5	75	10 × 13.5	70	12.5 × 13.5	50	12.5 × 13.5	50	12.5 × 13.5	70
22	226	12.5 × 13.5	105	12.5 × 13.5	105	16 × 16.5	85	16 × 16.5	85	16 × 16.5	85
33	336	12.5 × 13.5	120	16 × 16.5	180	18 × 16.5	100	18 × 16.5	100	18 × 16.5	100
47	476	16 × 16.5	220	16 × 16.5	220						
100	107	18 × 16.5	280	18 × 16.5	260						

•Case size $\varnothing D \times L$ (mm), ripple current (mA rms) at 105°C, 120Hz

FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT

Frequency			50Hz	120Hz	300Hz	1KHz	10KHz~
Coefficient	$\varnothing 4 \sim \varnothing 10$	0.1 ~ 68 μF	0.70	1.00	1.17	1.36	1.50
		100 ~ 3300 μF	0.85	1.00	1.08	1.20	1.30
	$\varnothing 12.5 \sim \varnothing 18$	~ 68 μF	0.75	1.00	1.35	1.57	2.00
		100 ~ 680 μF	0.80	1.00	1.23	1.34	1.50
		1000 ~ 6800 μF	0.85	1.00	1.10	1.13	1.15

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5~10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

How to order

<u>TCK</u>	<u>A</u>	<u>106</u>	<u>M</u>	<u>0035</u>	<u>0505</u>	<u>R</u>	<u>000</u>
Type	Material Code	Capacitance Code	Tolerance	Rated Voltage	Size Code	Package Code	Suffix Indicate Special Requirement
TCK	A: Aluminum Cap	pF Code: 1st two digits	M: +/-20%	Code 0035: 35VDC	Code 0505: Size 5x5.4mm	R: Tape & Reel	000: Indicating Standard
	For TCS, TCK	represent significant figures		<u>For DC Voltage</u>	<u>Size for V-chip E-cap</u>		
	TFZ TKZ....etc.	3rd digit represents multiplier (number of zeros to follow)		0006: 6.3VDC	0405: Size 4x5.4mm		
		106 = 10uF		0035: 35VDC	0605: Size 6.3x5.4mm		
		107 = 100uF		0100: 100VDC	0607: Size 6.3x7.7mm		
					1010: Size 10x10.5mm		