

## TFZ 105°C Long life, Extremely Low Impedance SMD Electrolytic Capacitor

Extra lower impedance with temperature range -55~+105°C

Load life of 2000~5000 hours

Impedance 5~25% less than TKZ series

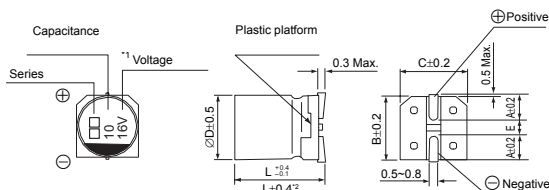
RoHS & REACH compliant, Halogen-free

### SPECIFICATIONS

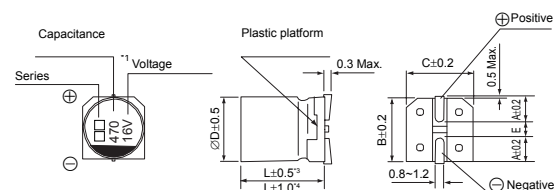
Items	Characteristics																										
Operation Temperature Range	-55 ~ +105°C																										
Voltage Range	6.3 ~ 100V																										
Capacitance Range	3.3 ~ 8200μF																										
Capacitance Tolerance	±20% at 120Hz, 20°C																										
Leakage Current	Leakage current ≤0.01CV or 3μA (∅4~∅10), whichever is greater (after 2 minutes application of rated voltage at 20°C) Leakage current ≤0.03CV or 4μA (∅12.5~∅18), whichever is greater (after 1 minute application of rated voltage at 20°C) C: Nominal capacitance (μF) , V: Rated voltage (V)																										
Dissipation Factor (tan δ)	Measurement frequency : 120Hz, Temperature : 20°C <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63~80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td rowspan="2">tan δ (max.)</td> <td>∅4~∅10</td> <td>0.26</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> </tr> <tr> <td>∅12.5~∅18</td> <td>0.26</td> <td>0.19</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.10</td> <td>0.08</td> </tr> </tbody> </table>	Rated Voltage (V)	6.3	10	16	25	35	50	63~80	100	tan δ (max.)	∅4~∅10	0.26	0.19	0.16	0.14	0.12	0.10	0.08	∅12.5~∅18	0.26	0.19	0.18	0.16	0.14	0.10	0.08
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Stability at Low Temperature	Measurement frequency : 120Hz <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3 ~ 16</th> <th>25 ~ 100</th> </tr> </thead> <tbody> <tr> <td>Impedance Ratio</td> <td>Z(-25°C) / Z(20°C)</td> <td>2</td> </tr> <tr> <td rowspan="2">ZT/Z20 (max.)</td> <td>Z(-40°C) / Z(20°C)</td> <td>3</td> </tr> <tr> <td>Z(-55°C) / Z(20°C)</td> <td>4</td> </tr> </tbody> </table>	Rated Voltage (V)	6.3 ~ 16	25 ~ 100	Impedance Ratio	Z(-25°C) / Z(20°C)	2	ZT/Z20 (max.)	Z(-40°C) / Z(20°C)	3	Z(-55°C) / Z(20°C)	4															
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Load Life	After 5000 hrs. (2000 hrs. for ∅4~∅6.3×5.8) application of the rated voltage at 105°C, they meet the characteristics listed below. <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±30% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>initial specified value or less</td> </tr> </tbody> </table>	Capacitance Change	Within ±30% of initial value	Dissipation Factor	200% or less of initial specified value	Leakage Current	initial specified value or less																				
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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. <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±10% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>initial specified value or less</td> </tr> <tr> <td>Leakage Current</td> <td>initial specified value or less</td> </tr> </tbody> </table>	Capacitance Change	Within ±10% of initial value	Dissipation Factor	initial specified value or less	Leakage Current	initial specified value or less																				
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Marking	Black print on the case top.																										

### DRAWING (Unit: mm)

(∅4~∅6.3×7.7)



(∅8×10.5~∅18)



- \*1. Voltage mark for 6.3V is [6V]
- \*2. Applicable to ∅6.3×7.7
- \*3. Applicable to ∅8×10.5~∅10
- \*4. Applicable to ∅12.5~∅18

**DIMENSIONS (Unit: mm)**

∅D x L	4 x 5.8	5 x 5.8	6.3 x 5.8	6.3 x 7.7	8 x 10.5	10 x 10.5	10 x 13.5	12.5 x 13.5	12.5 x 16	16 x 16.5	18 x 16.5	18 x 18.5
A	2.0	2.2	2.6	2.6	3.0	3.3	3.3	4.9	4.9	5.8	6.2	6.2
B	4.3	5.3	6.6	6.6	8.4	10.4	10.4	13.0	13.0	17.0	19.0	19.0
C	4.3	5.3	6.6	6.6	8.4	10.4	10.4	13.0	13.0	17.0	19.0	19.0
E ± 0.2	1.0	1.4	1.9	1.9	3.1	4.7	4.7	4.7	4.7	6.4	6.4	6.4
L	5.8	5.8	5.8	7.7	10.5	10.5	13.5	13.5	16.0	16.5	16.5	18.5

**DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & IMPEDANCE**

WV Code μF		6.3			10			16		
		Case size	Impedance	Ripple current	Case size	Impedance	Ripple current	Case size	Impedance	Ripple current
10	106							4 x 5.8	1.35	90
15	156							4 x 5.8	1.35	90
22	226	4 x 5.8	1.35	90	4 x 5.8	1.35	90	5 x 5.8	0.76	160
33	336	5 x 5.8 (4 x 5.8)	0.76 (1.35)	160 (90)	5 x 5.8	0.76	160	6.3 x 5.8	0.44	240
47	476	5 x 5.8 (4 x 5.8)	0.76 (1.35)	160 (90)	6.3 x 5.8	0.44	240	6.3 x 5.8 (5 x 5.8)	0.44 (0.76)	240 (160)
56	566	5 x 5.8	0.76	160	6.3 x 5.8	0.44	240	6.3 x 5.8	0.44	240
68	686	6.3 x 5.8	0.44	240	6.3 x 5.8	0.44	240	6.3 x 7.7 (6.3 x 5.8)	0.34 (0.44)	300 (240)
100	107	6.3 x 5.8	0.44	240	6.3 x 7.7	0.34	300	6.3 x 7.7 (6.3 x 5.8)	0.34 (0.44)	300 (240)
150	157	6.3 x 5.8	0.44	240	6.3 x 7.7	0.34	300	6.3 x 7.7	0.34	300
220	227	6.3 x 7.7 (6.3 x 5.8)	0.34 (0.44)	300 (240)	6.3 x 7.7	0.34	300	8 x 10.5 (6.3 x 7.7)	0.17 (0.34)	600 (300)
330	337	8 x 10.5	0.17	600	10 x 10.5 (8 x 10.5)	0.09 (0.17)	850 (600)	10 x 10.5 (8 x 10.5)	0.08 (0.17)	850 (600)
470	477	8 x 10.5	0.17	600	10 x 10.5 (8 x 10.5)	0.09 (0.17)	850 (600)	10 x 10.5 (8 x 10.5)	0.09 (0.17)	850 (600)
680	687	10 x 10.5 (8 x 10.5)	0.09 (0.17)	850 (600)	10 x 10.5	0.09	850	10 x 13.5 (10 x 10.5)	0.07 (0.09)	950 (850)
1000	108	10 x 10.5 (8 x 10.5)	0.09 (0.17)	850 (600)	10 x 13.5 (10 x 10.5)	0.07 (0.09)	950 (850)	12.5 x 16 (12.5 x 13.5)	0.055 (0.06)	1200 (1100)
1500	158	10 x 13.5	0.09	950	12.5 x 13.5	0.06	1100	16 x 16.5	0.05	1450
2200	228	12.5 x 13.5	0.06	1100	12.5 x 16	0.055	1200	16 x 16.5	0.05	1450
3300	338	12.5 x 16	0.055	1200	16 x 16.5	0.05	1260	16 x 16.5	0.05	1450
4700	478	16 x 16.5	0.05	1450	16 x 16.5	0.05	1450	18 x 16.5	0.048	1500
6800	688	18 x 16.5	0.048	1500	18 x 16.5	0.048	1500			
8200	828	18 x 16.5	0.048	1500						

WV Code μF		25			35			50		
		Case size	Impedance	Ripple current	Case size	Impedance	Ripple current	Case size	Impedance	Ripple current
4.7	475				4 x 5.8	1.35	90	5 x 5.8	1.52	85
10	106	4 x 5.8	1.35	90	5 x 5.8	0.76	160	6.3 x 5.8 (5 x 5.8)	0.88 (1.35)	165 (115)
15	156	5 x 5.8	0.76	160	5 x 5.8	0.76	160	6.3 x 5.8	0.88	165
22	226	6.3 x 5.8 (5 x 5.8)	0.44 (0.76)	240 (160)	6.3 x 5.8	0.44	240	6.3 x 7.7 (6.3 x 5.8)	0.68 (0.88)	195 (165)
33	336	6.3 x 5.8	0.44	240	6.3 x 5.8	0.44	240	6.3 x 7.7	0.68	195
47	476	6.3 x 7.7 (6.3 x 5.8)	0.34 (0.44)	300 (240)	6.3 x 7.7 (6.3 x 5.8)	0.34 (0.88)	300 (165)	8 x 10.5 (6.3 x 7.7)	0.34 (0.68)	350 (195)
56	566	6.3 x 7.7	0.34	300	6.3 x 7.7	0.34	300	8 x 10.5	0.34	350
68	686	6.3 x 7.7	0.34	300	8 x 10.5	0.17	600	8 x 10.5	0.34	350
100	107	8 x 10.5 (6.3 x 7.7)	0.17 (0.34)	600 (300)	8 x 10.5	0.17	600	10 x 10.5 (8 x 10.5)	0.18 (0.34)	670 (350)
150	157	8 x 10.5 (6.3 x 7.7)	0.16 (0.34)	600 (300)	10 x 10.5	0.09	850	10 x 13.5 (10 x 10.5)	0.14 (0.18)	780 (670)
220	227	8 x 10.5	0.17	600	10 x 10.5 (8 x 10.5)	0.09 (0.16)	850 (600)	10 x 13.5 (10 x 10.5)	0.14 (0.26)	780 (750)
330	337	10 x 10.5 (8 x 10.5)	0.09 (0.17)	850 (600)	10 x 13.5 (10 x 10.5)	0.07 (0.10)	950 (850)	12.5 x 13.5	0.12	900
470	477	10 x 13.5 (10 x 10.5)	0.07 (0.09)	950 (850)	12.5 x 13.5 (10 x 13.5) (10 x 10.5)	0.06 (0.07) (0.10)	1100 (1000) (950)	16 x 16.5 (12.5 x 16) (12.5 x 13.5)	0.08 (0.10) (0.08)	1250 (1050) (1100)
680	687	12.5 x 13.5	0.06	1100	12.5 x 16 (12.5 x 13.5)	0.055 (0.06)	1200 (1100)	16 x 16.5	0.073	1250
1000	108	16 x 16.5 (12.5 x 16) (12.5 x 13.5)	0.05 (0.055) (0.06)	1450 (1200) (1100)	16 x 16.5	0.05	1450	18 x 16.5	0.073	1250
1500	158	16 x 16.5	0.05	1450	18 x 16.5	0.048	1500	18 x 16.5	0.066	1500
2200	228	16 x 16.5	0.05	1450	18 x 18.5	0.038	1750			
3300	338	18 x 16.5 (18 x 18.5)	0.048 (0.048)	1500 (1500)						

•Case size ∅DxL(mm), Impedance (Ω) at 20°C, 100KHz, Ripple current (mA rms) at 105°C, 100KHz

**DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & IMPEDANCE**

μF	WV Code	63			80			100		
		Case size	Impedance	Ripple current	Case size	Impedance	Ripple current	Case size	Impedance	Ripple current
3.3	335				5 × 5.8	5.0	25			
4.7	475	5 × 5.8	3.0	50	6.3 × 5.8	3.0	40			
10	106	6.3 × 7.7 (6.3 × 5.8)	1.2 (1.5)	120 (80)	6.3 × 7.7	2.4	60	8 × 10.5	1.3	130
22	226	8 × 10.5 (6.3 × 7.7)	0.65 (1.2)	250 (120)	8 × 10.5	1.3	130	10 × 10.5 (8 × 10.5)	0.7 (1.3)	200 (160)
33	336	8 × 10.5	0.65	250	10 × 10.5	0.7	200	10 × 13.5	0.7	200
47	476	10 × 10.5 (8 × 10.5)	0.5 (0.65)	300 (250)	10 × 13.5	0.45	300	12.5 × 13.5	0.32	500
68	686	12.5 × 13.5 (10 × 10.5)	0.16 (0.5)	800 (300)	12.5 × 13.5	0.32	500	12.5 × 13.5	0.32	500
100	107	12.5 × 13.5 (10 × 13.5) (10 × 10.5)	0.16 (0.25) (0.5)	800 (400) (300)	12.5 × 13.5 (10 × 13.5)	0.32 (0.18)	500 (750)	16 × 16.5 (12.5 × 16) (12.5 × 13.5)	0.17 (0.26) (0.32)	795 (550) (500)
150	157	12.5 × 13.5 (10 × 13.5)	0.16 (0.25)	800 (650)	12.5 × 13.5	0.32	500	12.5 × 16	0.26	550
220	227	12.5 × 13.5	0.16	800	12.5 × 16 (12.5 × 13.5)	0.26 (0.12)	550 (900)	18 × 16.5	0.15	850
330	337	16 × 16.5	0.082	900	16 × 16.5	0.17	795	18 × 16.5	0.15	850
470	477	16 × 16.5	0.082	900	18 × 16.5	0.15	850	18 × 18.5	0.15	950
680	687	18 × 16.5	0.08	1150	18 × 18.5	0.15	950			
1000	108	18 × 18.5	0.06	1250						

•Case size ØD×L(mm), Impedance (Ω) at 20°C, 100KHz, Ripple current (mA rms) at 105°C, 100KHz

**FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT**

Frequency		50Hz	120Hz	300Hz	1KHz	10KHz~	
Coefficient	Ø4 ~ Ø10	4.7 ~ 68μF	0.35	0.50	0.64	0.83	1.00
		100 ~ 1500μF	0.40	0.55	0.70	0.85	1.00
	Ø12.5 ~ Ø18	~ 68μF	0.40	0.55	0.70	0.85	1.00
		100 ~ 680μF	0.45	0.65	0.80	0.90	1.00
		1000 ~ 4700μF	0.65	0.85	0.95	1.00	1.00

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**

TFZ	A	106	M	0035	0505	R	000
Type	Material Code	Capacitance Code	Tolerance	Rated Voltage	Size Code	Package Code	Suffix Indicate Special Requirement
TFZ	<b>A: Aluminum Cap</b> For TCS, TCK TFZ TKZ.....etc.	<b>pF Code: 1st two digits</b> represent significant figures 3rd digit represents multiplier (number of zeros to follow) 106 = 10uF 107 = 100uF	<b>M: +/-20%</b>	<b>Code 0035: 35VDC</b> <b>For DC Voltage</b> 0006: 6.3VDC 0035: 35VDC 0063: 63VDC 0100: 100VDC	<b>Code 0505: Size 5x5.8mm</b> <b>Size for V-chip E-cap</b> 0505: Size 5x5.8mm 0607: Size 6.3x7.7mm 1010: Size 10x10.5mm 1616: Size 16x16.5mm	<b>R: Tape &amp; Reel</b>	<b>000: Indicating Standard</b>

Note: Specification is subject to change without further notice. For more details and updates, please visit our website.