

**SMD Long Life Electrolytic Caps**

**Features**

- Low profile vertical chip
- Lifetime: 3000-5000 hours at 85°C
- RoHS compliant



**Specification**

Description		Value										Conditions
Operation Temperature Range		-40 ~ +85°C										
Rated Voltage Range (WV)		4~100VDC										
Rated Capacitance Range		0.1~1000 uF										
Capacitance Tolerance		±20%										at 120Hz, 20 °C
Max. Leakage current at 20°C		I ≤ 0.01 CV or 3 μA, whichever is greater (I= Leakage Current(uA), C=Nominal Capacitance(uF), V=Rated Voltage(V))										After 2 minutes applied Rated Voltage
Max. Dissipation Factor tan δ		Shown in the table of standing rating										at 20°C, 120Hz
Working Voltage (V)		4	6.3	10	16	25	35	50	63	100		
Surge Voltage (V)		5	8	13	20	32	44	63	79	125	at 20°C	
Low Temperature Stability Impedance Ratio at 120Hz		7	4	3	2	2	2	2	2	2	Z(-25°C)/ Z(+20°C)	
		15	8	6	4	4	3	3	3	3	Z(-40°C)/ Z(+20°C)	
Load Life	Cap. Change	Within ±20% of the initial value										After 3000-5000 Hours applied Rated Voltage at 85°C
	Dissipation Factor	200% or less of initial specified value										
	Leakage Current	≤ initial specified value										
		Case(ψ)		Life time(hrs)								
		ψ D ≤ 6.3		3000								
		ψ D ≥ 8		5000								
Shelf Life		Shall meet the same requirement as load life test										After placed at 85° C without voltage applied for 1000 hours

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## TCF Series

### Case Size & tan $\delta$ & Rated Ripple Current & ESR

C( $\mu$ F)	Rated Voltage (V)							
	4				6.3			
	Size	tan $\delta$	Ripple	ESR	Size	tan $\delta$	Ripple	ESR
4.7								
10								
22	4x5.4	0.35	19	21.1	4x5.4	0.26	20	15.6
33	4x5.4	0.35	26	14.0	5x5.4	0.26	22	10.4
47	4x5.4	0.35	34	9.87	5x5.4	0.26	46	7.33
100	5x5.4	0.35	61	4.64	6.3x5.4	0.26	71	3.44
220	6.3x5.4	0.35	82	2.11	8x6.2	0.35	250	2.11
330					8x6.2	0.35	300	1.40
470					8x10.2	0.35	380	0.99
1000					10x10.2	0.35	700	0.46

C( $\mu$ F)	Rated Voltage (V)							
	10				16			
	Size	tan $\delta$	Ripple	ESR	Size	tan $\delta$	Ripple	ESR
4.7					4x5.4	0.16	20	45.1
10					4x5.4	0.16	28	21.1
22	4x5.4	0.30	28	18.0	4x5.4	0.26	27	15.6
					5x5.4	0.16	39	9.64
33	4x5.4	0.30	29	12.0	5x5.4	0.26	45	10.4
	5x5.4	0.20	43	8.03	6.3x5.4	0.16	66	6.43
47	5x5.4	0.30	43	8.46	6.3x5.4	0.16	70	4.51
100	6.3x5.4	0.26	70	3.44	6.3x5.4	0.20	70	2.65
220	8x6.2	0.26	250	1.56	8x10.2	0.20	280	1.20
330	8x10.2	0.26	330	1.04	10x10.2	0.20	380	0.80
470	10x10.2	0.26	400	0.73	10x10.2	0.20	420	0.56
1000	10x10.2	0.26	580	0.34				

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C(μF)	Rated Voltage (V)											
	25				35				50			
	Size	tanδ	Ripple	ESR	Size	tanδ	Ripple	ESR	Size	tanδ	Ripple	ESR
0.1									4x5.4	0.12	1	1593
0.22									4x5.4	0.12	2	723
0.33									4x5.4	0.12	3	482
0.47									4x5.4	0.12	5	338
1									4x5.4	0.12	10	159
2.2					4x5.4	0.12	8	72.3	4x5.4	0.12	16	72.3
3.3					4x5.4	0.12	10	48.2	4x5.4	0.12	16	48.2
4.7	4x5.4	0.14	22	39.5	4x5.4	0.12	22	33.8	5x5.4	0.12	23	33.8
10	4x5.4	0.20	24	26.5	4x5.4	0.16	24	21.2	6.3x5.4	0.12	35	15.9
	5x5.4	0.14	28	18.5	5x5.4	0.12	30	15.9				
22	6.3x5.4	0.14	55	8.44	6.3x5.4	0.12	60	7.23	8x6.2	0.12	110	7.23
33	6.3x5.4	0.14	65	5.62	8x6.2	0.14	130	5.62	8x10.2	0.12	120	4.82
47	6.3x5.4	0.20	70	5.64	8x6.2	0.14	165	3.95	10x10.2	0.12	130	3.38
	8x6.2	0.16	96	4.51								
100	8x10.2	0.16	180	2.12	10x10.2	0.14	210	1.85	10x10.2	0.12	190	1.59
220	10x10.2	0.16	310	0.96	10x10.2	0.14	310	0.84				

C(μF)	Rated Voltage (V)							
	63				100			
	Size	tanδ	Ripple	ESR	Size	tanδ	Ripple	ESR
3.3					8x10.2	0.18	30	72.3
4.7	8x10.2	0.18	25	50.8	8x10.2	0.18	80	50.8
10	8x10.2	0.18	25	23.8	8x10.2	0.18	85	23.8
22	8x10.2	0.18	45	10.8	10x10.2	0.18	85	10.8
33	10x10.2	0.18	45	7.23	10x10.2	0.18	90	7.23
47	10x10.2	0.18	55	5.08				

- Note:**
1. Case Size: φD X L (mm);
  2. Max Dissipation Factor (tanδ) at 120Hz, 20°C;
  3. Max Equivalent Series Resistance (ESR) at 120Hz, 20°C, (Ω);
  4. Max Permissible Ripple Current (RC) at 120Hz, 85°C, (mA/rms);

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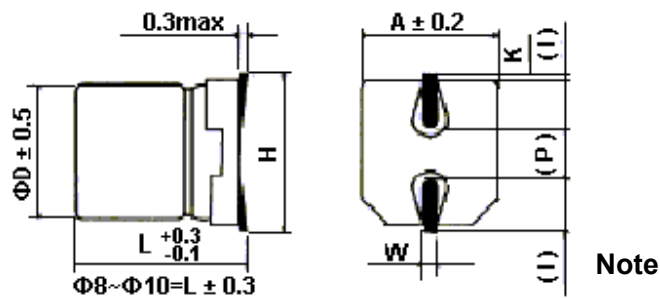
## TCF Series

### Ripple Current Multiplier

#### Frequency coefficient

Frequency(Hz)	60	120	1000	10000
Coefficient	0.80	1.00	1.15	1.25

#### Dimensions (in mm)



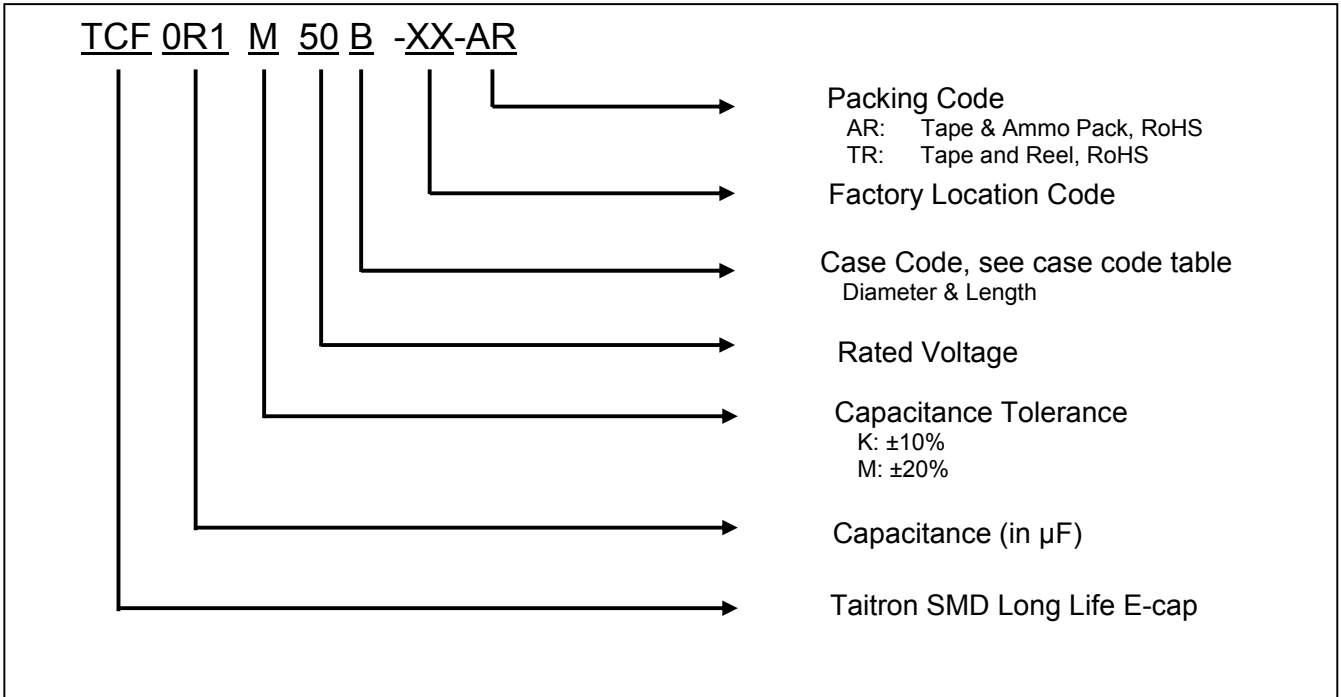
Note: ( ): Reference size

$\phi D$	L	A	H	I	W	P	K
4.0	5.4	4.3	5.5 Max	1.8	0.65±0.1	1.0±0.2	0.35+0.15/-0.20
5.0	5.4	5.3	6.5 Max	2.2	0.65±0.1	1.5±0.2	0.35+0.15/-0.20
6.3	5.4	5.3	7.8 Max	2.6	0.65±0.1	1.8±0.2	0.35+0.15/-0.20
8.0	6.2	6.6	9.5 Max	3.4	0.65±0.1	2.2±0.2	0.35+0.15/-0.20
8.0	10.2	8.3	10.0 Max	3.4	0.90±0.2	3.1±0.2	0.70±0.20
10.0	10.2	10.3	12.0 Max	3.5	0.90±0.2	4.6±0.2	0.70±0.20

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## TCF Series

### How to Order



### Case code table

Diameter (mm)	3	4	5	6	6.3	8	10	12	13	16	18	20	22	25	30	35	40	50	63	76
Code	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V

Length (mm)	5	7	7.5	8	9	11	11.5	12	12.5	13	15	16	17	19	20	21	24	25	25.5	26
Code	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V

Length (mm)	27	28	30	31.5	32	33	35	35.5	36	37	38	40	41	42	43	45	50	80	100	800
Code	W	X	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	LL	MM	NN	PP	QQ	RR

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