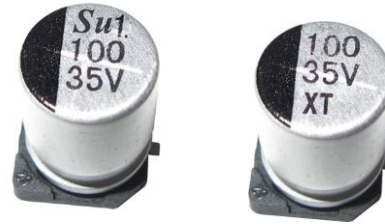


CHIP TYPE SERIES

TS13C1

FEATURES

- Temperature up to +105°C with load life of 1000~2000 hours.
- Lead-free reflow soldering is available subject to customers' request.

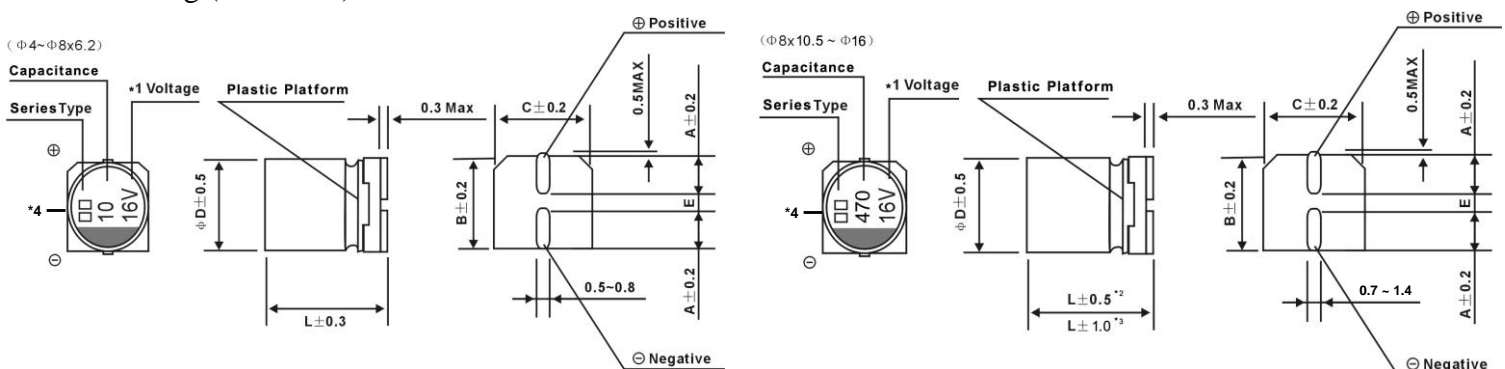


Wide Temperature Series

◆ Specifications

ITEMS		PERFORMANCE CHARACTERISTICS										
Operating Temperature Range	-55°C ~ +105°C											
Voltage Range	4~100V											
Capacitance Range	0.1~10000 μF											
Capacitance Tolerance	±20% at 120Hz, 20°C											
Leakage Current	Leakage current(φ 4~φ 10)≤0.01CV or 3 μA,, whichever is greater.(After 2 minutes' application of rated voltage) Leakage current(φ 12.5~φ 16)≤0.03CV or 4 μA,, whichever is greater.(After 1 minutes' application of rated voltage)											
Tan δ	Measurement frequency : 120Hz, Temperature : 20°C											
	Rated voltage (V)		4	6.3	10	16	25	35	50	63	100	
	Tan δ (MAX)		φ 4~φ 10	0.35	0.3	0.24	0.2	0.16	0.14	0.14	0.12	0.12
Stability at Low Temperature	Measurement frequency : 120Hz											
	Rated voltage (V)		4	6.3	10	16	25	35	50~100			
	Impedance ratio ZT / Z20 (MAX)	φ 4~φ 10	Z-25°C / Z+20°C	7	4	3	2	2	2	3		
			Z-40°C / Z+20°C	15	8	6	4	4	3	4		
	φ 12.5~φ 16	Z-25°C / Z+20°C	7	5	4	3	2	2	2			
		Z-40°C / Z+20°C	17	12	10	8	5	4	3			
Load Life	After 2000 hours' (1000hours' for φ 4~φ 6.3x5.8) application of rated voltage at 105°C, capacitors meet the characteristics requirements listed at right		Capacitance Change	Within ± 20% of initial value for capacitors of 10V or more Within ± 30% of initial value for capacitors of 4V & 6.3V								
			Leakage Current	Initial specified value or less								
			Tan δ	200% or less of initial specified value								
Self 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 according and restored at room temperature, they meet the characteristics requirements listed at right.		Capacitance Change	Within ± 10% of initial value								
			Tan δ	Initial specified value or less								
			Leakage Current	Initial specified value or less								
Applicable Standards	JIS C-5141 and JIS C-5102.											

◆ Drawing (Unit: mm)



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

*2 Applicable toφ8x10.5~φ10x10.5

*3 Applicable toφ10x13.5~φ12.5~φ16

*4 Markings: Su1, S1, CK, XT

(mm)	ØDxL	4x5.4	5x5.4	6.3x5.4	6.3x7.7	8x6.5	8x10.5	10x10.5	10x13.5	12.5x13.5	12.5x16	16x16.5/21.5
A	1.8	2.1	2.4	2.4	3.3	2.9	3.2	3.2	4.7	4.7	5.5	
B	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0	
C	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0	
E	1.0±0.2	1.3±0.2	2.2±0.2	2.2±0.2	3.1±0.2	3.1±0.2	4.5±0.2	4.4±0.2	4.8±0.6	4.4±0.2	6.7±0.2	
L	5.4	5.4	5.4	7.7	6.5	10.5	10.5	10.5	13.5	13.5	16.0	16.5/21.5

TS13C1

◆ Case Size

WV/V		4		6.3		10		16		25	
Cap/μF		0G		0J		1A		1C		1E	
4.7	4R7	--	--	--	--	--	--	4x5.4	13	4x5.4	14
10	100	--	--	--	--	--	--	4x5.4	19	4x5.4 5x5.4	14 14
22	220	4x5.4	23	4x5.4	20	4x5.4 5x5.4	21 27	4x5.4 5x5.4	22 31	5x5.4 6.3x5.4	25 36
33	330	4x5.4 5x5.4	22 27	4x5.4 5x5.4	22 27	4x5.4 5x5.4	23 34	5x5.4 6.3x5.4	28 40	5x5.4 6.3x5.4	29 44
47	470	4x5.4 5x5.4	25 37	4x5.4 5x5.4	25 37	4x5.4 5x5.4 6.3x5.4	30 38 41	5x5.4 6.3x5.4	31 55	6.3x5.4 8x6.5	48 80
56	560	4x5.4	39	5x5.4	46	6.3x5.4	57	6.3x5.4	74	6.3x5.4	82
68	680	5x5.4	45	6.3x5.4	62	6.3x5.4	72	6.3x5.4	80	6.3x5.4	94
100	101	5x5.4 6.3x5.4	39 57	5x5.4 6.3x5.4	39 57	5x5.4 6.3x5.4	41 53	6.3x5.4 8x6.5	75 120	6.3x5.4 6.3x7.7	80 91
150	151	6.3x5.4	61	6.3x5.4	55	6.3x5.4	55	6.3x7.7 8x6.5	80 120	6.3x7.7 8x10.5	92 140
220	221	6.3x5.4	67	6.3x5.4 6.3x7.7	95 69	6.3x5.4 6.3x7.7	95 67	6.3x7.7 8x6.5 8x10.5	89 105 180	8x10.5 10x7.7	175 180
330	331	6.3x7.7	100	6.3x7.7 8x6.5	120 105	6.3x7.7 8x10.5	135 195	8x10.5 10x7.7	195 185	8x10.5 10x10.5	205 220
470	471	6.3x7.7 8x6.5	105 105	6.3x7.7 8x10.5	120 230	6.3x7.7 8x10.5 10x10.5	120 210 295	8x10.5 10x10.5	270 280	10x10.5	280
680	681	8x10.5	210	8x10.5 10x7.7	230 210	8x10.5 10x10.5	230 270	10x10.5	315	10x10.5 10x13.5	245 400
1000	102	8x10.5 10x7.7	230 210	8x10.5 10x10.5	290 315	8x10.5 10x10.5	290 315	10x10.5 10x13.5 12.5x13.5	315 390 500	10x13.5 12.5x13.5	430 580
1500	152	10x10.5	315	10x10.5 10x13.5	410 450	10x10.5 10x13.5	335 460	10x13.5 12.5x13.5	430 550	--	--
2200	222	10x10.5 10x13.5	340 440	10x13.5 12.5x13.5	500 620	12.5x13.5	680	--	--	--	--
3300	332	10x13.5	490	12.5x13.5	660	--	--	--	--	--	--
4700	472	12.5x13.5	600	--	--	--	--	--	--	--	--

WV/V		35		50		63		100	
Cap/μF		1V		1H		1J		2A	
0.1	0R1	--	--	4x5.4	2	4x5.4	2	--	--
0.22	R22	--	--	4x5.4	4	4x5.4	4	--	--
0.33	R33	--	--	4x5.4	4	4x5.4	4	--	--
0.47	R47	--	--	4x5.4	5	4x5.4	5	--	--
1	010	--	--	4x5.4	8	4x5.4	8	4x5.4	7
2.2	2R2	--	--	4x5.4	11	4x5.4	11	5x5.4 6.3x5.4	12 13
3.3	3R3	4x5.4	13	4x5.4	13	5x5.4 6.3x5.4	14 30	6.3x5.4 6.3x7.7 8x6.5	18 30 30
4.7	4R7	4x5.4	15	4x5.4 5x5.4	14 18	5x5.4 6.3x5.4	15 18	5x5.4 6.3x5.4 6.3x7.7	15 19 33
10	100	4x5.4 5x5.4	17 24	5x5.4 6.3x5.4	20 28	6.3x5.4 6.3x7.7 8x6.5	24 39 25	6.3x5.4 6.3x7.7 8x10.5	25 34 77
22	220	5x5.4 6.3x5.4	34 40	6.3x5.4 6.3x7.7 8x6.5	42 42 70	6.3x7.7 8x6.5 8x10.5	48 55 98	8x10.5 10x10.5	82 122
33	330	6.3x5.4 8x6.5	50 85	6.3x7.7 8x6.5	60 70	6.3x7.7 8x10.5	49 112	10x10.5	133
47	470	6.3x5.4 6.3x7.7 8x6.5	58 57 85	6.3x7.7 8x6.5 8x10.5	63 85 120	8x10.5 10x10.5	117 160	10x10.5 10x13.5 12.5x13.5	140 160 250
68	680	6.3x7.7 8x6.5	80 90	8x6.5 8x10.5	70 120	10x10.5 10x13.5	140 160	10x13.5 12.5x13.5	180 300
100	101	6.3x7.7 8x10.5 10x7.7	80 150 160	8x10.5 10x10.5 10x7.7	145 180 160	10x10.5 10x13.5 12.5x13.5	196 210 270	12.5x13.5	380
150	151	8x10.5	185	10x10.5	200	10x13.5	225	--	--
220	221	8x10.5 10x10.5	185 250	10x10.5 10x13.5	220 280	12.5x13.5	470	--	--
330	331	10x10.5 10x13.5	300 330	10x13.5 12.5x13.5	295 420	--	--	--	--
470	471	10x10.5 10x13.5 12.5x13.5	310 375 356	12.5x13.5	470	--	--	--	--
680	681	12.5x13.5	530	--	--	--	--	--	--

Allowable Ripple (mA rms) at 105°C 120Hz

◆ Frequency coefficient of allowable ripple current

Frequency		50Hz	120Hz	300Hz	1kHz	10kHz~
Coefficient	φ 4~ φ 10	0.1~68μF	0.70	1.00	1.17	1.50
		100~3300μF	0.85	1.00	1.08	1.30
	φ 12.5~ φ 16	~68 μF	0.75	1.00	1.35	1.57
		100~680 μF	0.80	1.00	1.23	1.34
		1000~10000 μF	0.85	1.00	1.10	1.15

Note: Specification are subject to change without notice. For more detail and update, please visit our website.