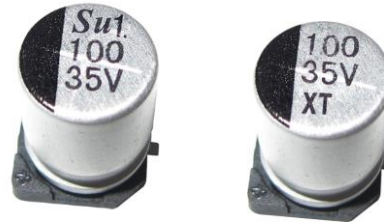


## CHIP TYPE SERIES

# TS13C1

### FEATURES

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

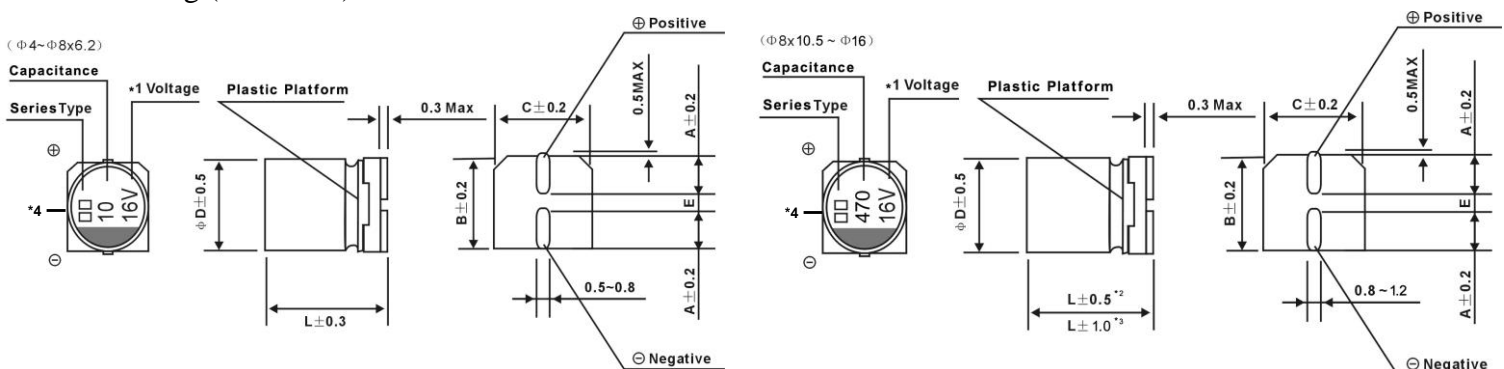


## Wide Temperature Series

### ◆ 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
φ 12.5~ φ 16		0.42	0.38	0.34	0.30	0.26	0.22	0.18	0.14	0.12	
Stability at Low Temperature	Measurement frequency : 120Hz										
	Rated voltage (V)		4	6.3	10	16	25	35	50	63	100
	Impedance ratio	φ 4~ φ 10	Z-25°C / Z+20°C	7	4	3	2	2	2	2	3
			Z-40°C / Z+20°C	15	8	6	4	4	3	4	4
ZT / Z20 (MAX)	φ 12.5~ φ 16	Z-25°C / Z+20°C	7	5	4	3	2	2	2	2	
		Z-40°C / Z+20°C	17	12	10	8	5	4	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 to φ8x10.5~φ10

\*3 Applicable to φ12.5~φ16

\*4 Markings: Su1, S1, CK, XT

	(mm)											
ØDxL	4x5.4	5x5.4	6.3x5.4	6.3x7.7	8x6.2	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±0.2	1.0	1.3	2.2	2.2	2.2	3.1	4.5	4.4	4.4	4.4	6.7	
L	5.4	5.4	5.4	7.7	6.2	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	245
1000	102	8x10.5 10x7.7	230 210	8x10.5 10x10.5	290 315	8x10.5 10x10.5	290 315	10x10.5 12.5x13.5	315 515	12.5x13.5	700
1500	152	10x10.5	315	10x10.5	410	10x10.5 12.5x13.5	335 458	12.5x13.5	580	--	--
2200	222	10x10.5	340	12.5x13.5	850	12.5x13.5	910	--	--	--	--

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	140
68	680	6.3x7.7 8x6.5	80 90	8x6.5 8x10.5	70 120	10x10.5	140	--	--
100	101	6.3x7.7 8x10.5 10x7.7	80 150 160	8x10.5 10x10.5 10x7.7	145 180 160	10x10.5 12.5x13.5	196 510	12.5x13.5	386
150	151	8x10.5	185	10x10.5	200	--	--	--	--
220	221	8x10.5 10x10.5	185 250	10x10.5	220	12.5x13.5	560	--	--
330	331	10x10.5	300	12.5x13.5	580	--	--	--	--
470	471	10x10.5 12.5x13.5	310 356	--	--	--	--	--	--
680	681	12.5x13.5	580	--	--	--	--	--	--

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	
		~68 uF	0.75	1.00	1.35	1.57	2.00
	φ 12.5~ φ 16	100~680 uF	0.80	1.00	1.23	1.34	1.50
		1000~10000 uF	0.85	1.00	1.10	1.13	1.15

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