

## CHIP TYPE SERIES

# TS13C4

### FEATURES

- Low impedance, Endurance : 105°C 2000H.
- Designed for reflow soldering.
- Designed for surface mounting on high-density PCB.



Fig 1



Fig 2



Fig 3

Note: Fig 1 & 2: Diameter 4 ~10mm

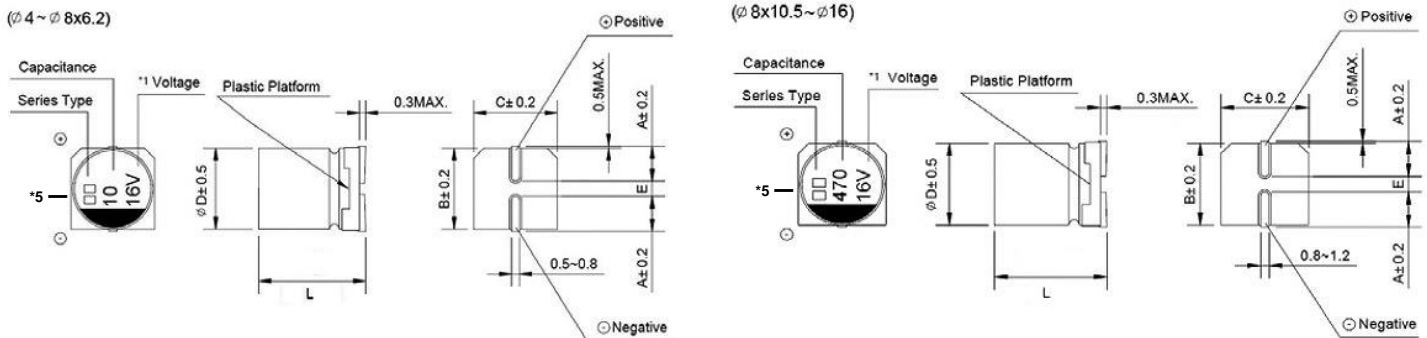
Fig 3 : Diameter: ≥12.5mm

## Low Impedance

### ◆ Specifications

ITEMS PERFORMANCE CHARACTERISTICS													
Operating Temperature Range	-55°C ~ +105°C												
Voltage Range	6.3~100V.DC												
Capacitance Range	1~4700μF												
Capacitance Tolerance	±20% at 120Hz, 20°C												
Leakage Current	I ≤ 0.01 CV or 3 μA whichever is greater (after 2 minutes)												
Dissipation Factor (Tan δ)	Measurement frequency : 120Hz, Temperature : 20°C												
	Rated voltage (V)	6.3	10	16	25	35	50	63	80	100			
	Tan δ (MAX)	Ø4~Ø10	0.28	0.22	0.20	0.16	0.14	0.12	0.12	0.12	0.12		
Stability at Low Temperature	Measurement frequency : 120Hz												
	Impedance ratio ZT / Z20 (MAX)	Ø4~Ø10	Rated voltage (V)		6.3	10	16	25	35	50	63	80	100
			Z(-25°C) / Z(20°C)	4	4	3	3	2	2	2	2	2	
		Ø12.5~Ø16	Z(-55°C) / Z(20°C)	10	7	5	5	4	4	3	4	4	
			Z(-25°C) / Z(20°C)	4	3	3	3	2	2	2	2	2	
Z(-55°C) / Z(20°C)			10	7	5	5	4	4	3	4	4		
Load Life	After applying rated working voltage for 2000 hours at +105°C ±2°C, and then being stabilized at +20°C, capacitors shall meet the following limits.				Capacitance Change		Within ±25% of initial value						
					Dissipation Factor		Less than 250% of the initial value						
					Leakage Current		Within the initial limit						
Self Life	After storage for 1000 h at +105°C ±2°C with no voltage applied and then being stabilized at +20°C, capacitors shall meet the limits specified in endurance.												
Resistance to Soldering Heat	After reflow soldering and then being stabilized at +20°C, capacitors shall meet the following limits.				Capacitance Change		Within ±10% of initial value						
					Dissipation Factor		Within the initial limit						
					Leakage Current		Within the initial limit						

### ◆ DRAWING (Unit:mm)



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

\*5 Markings: Su4, S4, LZ

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## ◆ DIMENSIONS(Unit:mm)

ØDxL	4x5.4	5x5.4	6.3x5.4/7.7	8x6.5/10.5	10x7.7/10.5/13.5	12.5x13.5
A	2.0	2.2	2.6	3.0	3.3	4.9
B	4.3	5.3	6.6	8.4	10.4	13.0
C	4.3	5.3	6.6	8.4	10.4	13.0
E±0.2	1.0	1.4	1.9	3.1	4.7	4.7
L	5.4±0.6	5.4±0.6	5.4/7.7±0.6	10.5±0.6	10.5/13.5±1.0	13.5±1.0

## ◆ DIMENSIONS&MAXIMUM PERMISSIBLE RIPPLE CURRENT&IMPEDANCE

WV/V		6.3			10			16		
Cap/µF		0J			1A			1C		
10	100							4x5.4	3.00	60
22	220	4x5.4	3.00	60	4x5.4	3.00	60	4x5.4 (5x5.4)	3.00 (1.80)	60 (95)
33	330	4x5.4	3.00	60	4x5.4	3.00	60	5x5.4 (6.3x5.4)	1.80 (1.00)	95 (140)
47	470	5x5.4	1.80	95	5x5.4 (6.3x5.4)	1.80 (1.00)	95 (140)	5x5.4 (6.3x5.4)	1.80 (1.00)	95 (140)
68	680							8x6.5	0.60	230
100	101	5x5.4 (6.3x5.4)	1.80 (1.00)	100 (140)	5x5.4 (6.3x5.4)	1.80 (1.00)	100 (140)	6.3x5.4 (6.3x7.7) (8x6.5)	1.00 (0.60) (0.60)	140 (230) (230)
150	151				6.3x5.4	1.00	140	6.3x7.7 (8x10.5)	0.60 (0.45)	230 (450)
220	221	6.3x5.4 (6.3x7.7)	1.00 (0.60)	140 (230)	6.3x5.4 (6.3x7.7) (8x10.5)	1.00 (0.60) (0.45)	140 (230) (450)	6.3x7.7 (8x6.5) (8x10.5)	0.60 (0.60) (0.45)	230 (230) (450)
330	331	6.3x7.7 (8x10.5)	0.60 (0.45)	230 (450)	8x10.5	0.45	450	8x10.5 (10x7.7)	0.45 (0.45)	450 (450)
470	471	6.3x7.7 (8x10.5)	0.60 (0.45)	230 (450)	8x10.5	0.45	450	8x10.5 (10x10.5)	0.45 (0.25)	450 (670)
680	681							10x10.5	0.25	670
820	821	8x10.5 (10x10.5)	0.40 (0.25)	450 (670)						
1000	102	10x10.5	0.25	670	10x10.5	0.25	670	10x10.5 (10x13.5)	0.25 (0.15)	670 (750)
1500	152	10x10.5	0.25	670				12.5x13.5	0.12	820
2200	222	12.5x13.5	0.12	820	12.5x13.5	0.12	820	Case Size ØD×L(mm)	Impedance (Ω) at 20°C 100kHz	Ripple Current (mA rms) at 105°C 100kHz

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

WV/V Cap/μF		25			35			50		
		1E			1V			1H		
1	010							4×5.4	5.00	30
2.2	2R2							4×5.4	5.00	30
3.3	3R3							4×5.4	5.00	30
4.7	4R7	4×5.4	3.00	60	4×5.4	3.00	60	4×5.4 (5×5.4)	5.00 (3.00)	30 (50)
10	100	4×5.4 (5×5.4)	3.00 (1.80)	60 (95)	4×5.4 (5×5.4)	3.00 (1.80)	60 (95)	5×5.4 (6.3×5.4)	3.00 (2.00)	50 (70)
22	220	5×5.4 (6.3×5.4)	1.80 (1.00)	95 (140)	5×5.4 (6.3×5.4)	1.80 (1.00)	95 (140)	6.3×5.4 (6.3×7.7) (8×6.5)	2.00 (1.00) (1.00)	70 (120) (120)
33	330	5×5.4 (6.3×5.4)	1.80 (1.00)	95 (140)	6.3×5.4 (8×6.5)	1.00 (0.60)	140 (230)	6.3×7.7 (8×10.5)	1.00 (0.80)	120 (280)
47	470	6.3×5.4	1.00	140	6.3×5.4 (6.3×7.7) (8×6.5) (8×10.5)	1.00 (0.60) (0.60) (0.45)	140 (230) (230) (450)	6.3×7.7 (8×6.5) (8×10.5)	1.00 (1.00) (0.80)	120 (120) (300)
100	101	6.3×7.7 (8×10.5)	0.60 (0.45)	230 (450)	6.3×7.7 (8×6.5) (8×10.5)	0.60 (0.60) (0.45)	230 (230) (450)	8×10.5 (10×7.7) (10×10.5)	0.80 (0.80) (0.45)	300 (300) (450)
150	151	8×10.5	0.45	450	8×10.5 (10×7.7)	0.45 (0.45)	450 (450)	10×10.5	0.45	450
220	221	8×10.5 (10×7.7) (10×10.5)	0.45 (0.45) (0.25)	450 (450) (670)	8×10.5 (10×10.5)	0.40 (0.25)	450 (670)	10×10.5 (10×13.5)	0.45 (0.35)	500 (550)
330	331	8×10.5 (10×10.5)	0.40 (0.25)	450 (670)	10×10.5	0.25	670	12.5×13.5	0.25	650
470	471	10×10.5	0.25	670	10×13.5	0.15	750			
680	681	10×13.5	0.15	750	12.5×13.5	0.12	820			
1000	102	12.5×13.5	0.11	820				Case Size ØD×L(mm)	Impedance (Ω) at 20°C 100kHz	Ripple Current (mA rms) at 105°C 100kHz

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

WV/V Cap/μF		63			80			100		
		1J			1K			2A		
4.7	4R7	5×5.4	5.00	50				5×5.4 (6.3×5.4)	5.00 (5.00)	25 (40)
10	100	6.3×5.4	3.00	80	6.3×7.7	3.00	60	6.3×7.7 (8×6.5)	3.00 (3.00)	60 (60)
22	220	6.3×7.7	2.50	100	8×10.5	2.00	130	8×10.5 (10×10.5)	2.00 (1.50)	130 (180)
33	330	8×10.5	2.00	250	10×10.5	1.50	180	10×10.5 (10×13.5)	1.50 (1.20)	180 (210)
47	470	8×10.5 (10×7.7) (10×10.5)	2.00 (2.00) (1.50)	250 (250) (300)	8×10.5 (10×10.5) (10×13.5)	2.00 (1.50) (1.20)	130 (180) (240)	10×10.5 (10×13.5) (12.5×13.5)	1.50 (1.20) (0.85)	180 (240) (500)
100	101	10×10.5 (10×13.5) (12.5×13.5)	1.50 (1.00) (0.85)	300 (400) (500)	10×10.5 (10×13.5) (12.5×13.5)	1.50 (1.20) (0.85)	180 (240) (500)	12.5×13.5	0.85	500
150	151				12.5×13.5	0.85	500			
220	221	12.5×13.5	0.65	550				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: F(Hz) Capacitance: C (uF)	50Hz	120Hz	1kHz	10kHz ≤
	Full Capacitance	0.60	0.70	0.85

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