

规格書

SPECIFICATION

Customer : _____

Part Name: _____ **E-CAP** _____

SPEC : _____ **TF Series** _____

Part NO. : _____ **ALL** _____

Date : _____ **2017-11-22** _____

CUSTOMER SIGN		

TOPAZCON	
DRAWING	RATIFY
黃峰	陳慶

TF Series

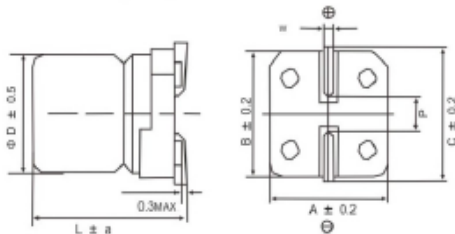
- Suitable for high density mounting
- Endurance: 105 °C 6,000 hours
- RoHS Compliant



● SPECIFICATIONS

Items	Characteristics	
Category	-40 to +105 °C	
Temperature Range		
Rated Voltage Range	6.3 to 450Vdc	
Capacitance Tolerance	± 20%(M) (at 20 °C 120Hz)	
Leakage Current	6.3 to 50 Vdc	160 to 450 Vdc
	$I \leq 0.03CV$ or $4\mu A$ Whichever is greater(at 2 minutes)	$I \leq 0.04CV+100\mu A$ (at 1 minute)
	(at 20 °C)	
Where, I:Max.leakage current (uA); C:Nominal capacitance (uF); V:Rated voltage (V).		
Dissipation Factor (tanδ)	Rate voltage(Vdc)	6.3 10 16 25 35 50 160 to 250 400 to 450
	Tanδ (Max)	0.30 0.28 0.26 0.16 0.14 0.14 0.20 0.24 (at 20 °C 120Hz)
Low Temperature Characteristics (Max.Impedance Ratio)	Rate voltage(Vdc)	6.3 10 16 25 35 50 160 to 250 400 to 450
	Z(-25 °C /Z(+20 °C)	4 3 2 2 2 2 6 6
	Z(-40 °C /Z(+20 °C)	10 8 6 4 3 3 10 18 (at 120Hz)
Endurance	The following specification shall be satisfied when the capacitors are restored to 20 °C after the rated voltage is applied for 6,000 hours at 105 °C .	
	Rate voltage(Vdc)	6.3 to 50Vdc 160 to 450V
	Capacitance Change	≤ ± 30% of the initial value ≤ ± 20% of the initial value
	DF (tanδ)	≤ 300% of the initial specified value ≤ 200% of the initial specified value
	Leakage Current	≤ The initial specified value ≤ The initial specified value
Shelf Life	The following specification shall be satisfied when the capacitors are restored to 20 °C after exposing them for 1,000 hours at 105 °C ,without voltage applied.	
	Rate voltage(Vdc)	6.3 to 50Vdc 160 to 450V
	Capacitance Change	≤ ± 30% of the initial value ≤ ± 20% of the initial value
	DF (tanδ)	≤ 300% of the initial specified value ≤ 200% of the initial specified value
	Leakage Current	≤ 300% The initial specified value ≤ The initial specified value

● DIMENSIONS[mm]



Size code	D	L	A	B	C	W	P
0507	5	7.7	5.3	5.3	5.9	0.5-0.8	1.4
0607	6.3	7.7	6.6	6.6	7.2	0.5-0.8	1.9
0609	6.3	8.7	6.6	6.6	7.2	0.5-0.8	1.9
0811	8	10.5	8.3	8.3	9.0	0.7-1.1	3.1
1010	10	10.5	10.3	10.3	11.0	0.7-1.1	4.5
1214	12.5	13.5	13.0	13.0	13.7	1.0-1.3	4.2
1216	12.5	16.0	13.0	13.0	13.7	1.0-1.3	4.2
1616	16	16.5	17.0	17.0	18.0	1.0-1.3	6.5
1621	16	21.5	17.0	17.0	18.0	1.0-1.3	6.5
1816	18	16.5	19.0	19.0	20.0	1.0-1.3	6.5
1821	18	21.5	19.0	19.0	20.0	1.0-1.3	6.5

● RATED RIPPLE CURRENT MULTIPLIERS

WV(Vdc)	Freq(Hz)			
	120	1k	10k	100k
6.3 to 50	1.00	1.60	1.80	2.00
160 to 450	1.00	1.60	1.80	2.00

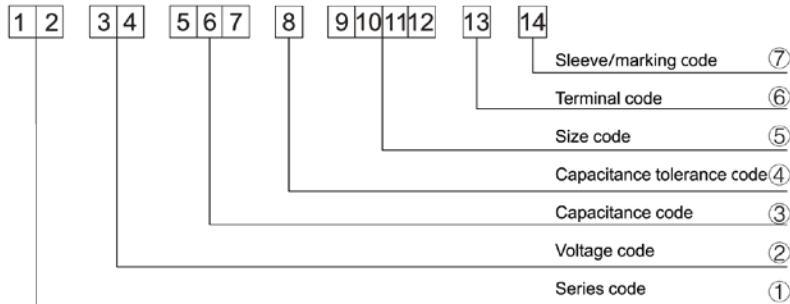
TF Series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size code	Tanδ	Ripple current (mAmps/105 °C, 100KHz)
6.3(0J)	47	0507	0.32	70
	100	0607	0.32	105
	220	0609	0.32	170
	330	0609	0.32	170
	470	0811	0.32	450
10(1A)	33	0507	0.28	71
	150	0607	0.28	105
16(1C)	22	0507	0.26	71
	47	0607	0.26	105
	100	0607	0.26	105
	150	0609	0.26	170
	220	0609	0.26	170
	330	0811	0.26	450
	470	1010	0.26	630
25(1E)	22	0507	0.16	71
	33	0607	0.16	105
	47	0607	0.16	105
	100	0609	0.16	173
	220	0811	0.16	450
	330	1010	0.16	630
35(1V)	10	0507	0.14	71
	10	0607	0.14	105
	22	0507	0.14	71
	22	0607	0.14	105
	33	0607	0.14	170
	47	0607	0.14	170
	100	0609	0.14	450
50(1H)	220	1010	0.14	630
	47	0811	0.14	260
	100	1010	0.14	500
220	1214	0.14	850	

WV (Vdc)	Cap (μF)	Size code	Tanδ	Ripple current (mAmps/105 °C, 100KHz)
160(2C)	10	1010	0.20	95
	15	1214	0.20	140
	22	1216	0.20	200
	33	1616	0.20	280
	47	1616	0.20	320
	68	1621	0.20	400
	100	1821	0.20	560
	200(2D)	10	1214	0.20
15		1214	0.20	140
22		1216	0.20	200
33		1621	0.20	250
33		1816	0.20	245
47		1621	0.20	330
47		1821	0.20	350
68		1821	0.20	430
250(2C)		4.7	1010	0.20
	10	1214	0.20	110
	15	1216	0.20	150
	22	1616	0.20	220
	33	1816	0.20	270
	47	1621	0.20	330
	47	1821	0.20	350
	56	1821	0.20	400
400(2G)	2.2	1010	0.24	35
	3.3	1214	0.24	50
	3.9	1214	0.24	58
	4.7	1214	0.24	72
	6.8	1216	0.24	100
	10	1616	0.24	140
	15	1621	0.24	170
	22	1621	0.24	230
50(1H)	2.2	1010	0.24	35
	3.3	1214	0.24	50
	4.7	1216	0.24	75
	10	1616	0.24	140
	15	1621	0.24	170
	22	1821	0.24	230

Part Number System



① Series code

Series name	Code	
	1	2
SM	S	M
SS	S	S
SH	S	H
SP	S	P
NP	N	P
LL	L	L
RD	R	D
RE	R	E
RT	R	T
RF	R	F
RG	R	G
RJ	R	J
RR	R	R
LF	L	F
LJ	L	J
LR	L	R
LG	L	G

② Voltage code

WV (V _{dc})	Code	
	3	4
4	0	G
6.3	0	J
10	1	A
16	1	C
25	1	E
35	1	V
50	1	H
63	1	J
80	1	K
100	2	A
160	2	C
200	2	D
250	2	E
350	2	V
400	2	G
450	2	W
500	2	H

③ Capacitance code

Cap (uF)	Code		
	5	6	7
0.1	R	1	0
0.22	R	2	2
0.33	R	3	3
0.47	R	4	7
1	1	R	0
2.2	2	R	2
3.3	3	R	3
4.7	4	R	7
6.8	6	R	8
10	1	0	0
22	2	2	0
33	3	3	0
47	4	7	0
100	1	0	1
220	2	2	1
330	3	3	1
470	4	7	1
560	5	6	1
1000	1	0	2
1500	1	5	2
2200	2	2	2
3300	3	3	2
4700	4	7	2
6800	6	8	2
10000	1	0	3
15000	1	5	3

④ Capacitance tolerance code

Tol. (%)	Code
	8
-5 ~ +5	J
-10 ~ +10	K
-20 ~ +20	M

⑤ Size code

ΦD × L (mm)	Code			
	9	10	11	12
3 × 5	0	3	0	5
4 × 5	0	4	0	5
5 × 5	0	5	0	5
6.3 × 5	0	6	0	5
4 × 7	0	4	0	7
5 × 7	0	5	0	7
6.3 × 7	0	6	0	7
8 × 7	0	8	0	7
5 × 11	0	5	1	1
6.3 × 11	0	6	1	1
8 × 12	0	8	1	2
8 × 16	0	8	1	6
10 × 12	1	0	1	2
10 × 16	1	0	1	6
8 × 20	0	8	2	0
10 × 20	1	0	2	0
13 × 20	1	3	2	0
13 × 25	1	3	2	5
16 × 25	1	6	2	5
16 × 32	1	6	3	2
16 × 36	1	6	3	6
18 × 32	1	8	3	2
18 × 36	1	8	3	6
18 × 40	1	8	4	0

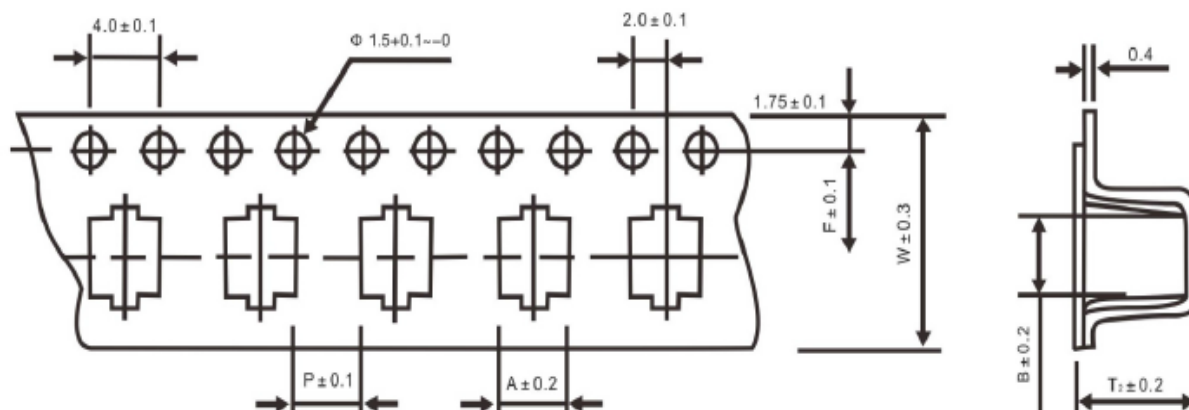
⑦ Sleeve/Marking code

Sleeve/Marking	Code 14
PET	T
Black	B
Yellow	Y
Ink Green	I
Pea Green	P
Orange	O

⑥ Terminal code

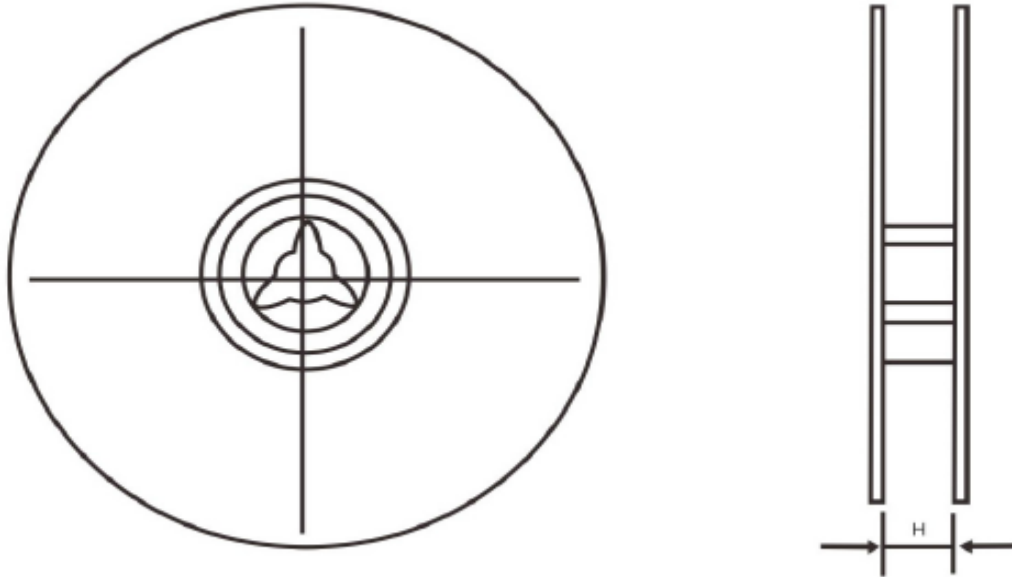
Specification	Code 13
Bulk packing	0
Φ4-8Taping	T1
	T2
	T2
Φ10-18Taping	T3
	T3
Lead Cut	F
	C
	R
	L
	M
	S
	B
	K

● Carrier Tape [mm]



Item	W	A	B	F	P	T ₂		
Series	± 0.3	± 0.2	± 0.2	± 0.1	± 0.1	± 0.2		
TE	0407	12	4.6	4.6	5.5	8.0	7.5	
	0607	16	7	7	7.5	12	8.2	
	0609	16	7	7	7.5	12	9.2	
	0611	16	7	7	7.5	12	11	
	0811	24	8.7	8.7	11.5	16	11	
	0812	24	8.7	8.7	11.5	16	13	
	0814	24	8.7	8.7	11.5	16	14	
	0816	24	8.7	8.7	11.5	16	16	
	TF	1010	24	10.7	10.7	11.5	16	11
		1012	24	10.7	10.7	11.5	16	13
	TG	1013	24	10.7	10.7	11.5	16	14
		1016	24	10.7	10.7	11.5	16	17
		1214	32	13.4	13.4	14.2	24	14
		1216	32	13.4	13.4	14.2	24	16.5
		1616	44	17.5	17.5	20.2	28	16.8
		1621	44	17.5	17.5	20.2	28	22.1
		1816	44	19.5	19.5	20.2	32	17.1
		1821	44	19.5	19.5	20.2	32	22.1

Packing specification for aluminum electrolytic capacitor

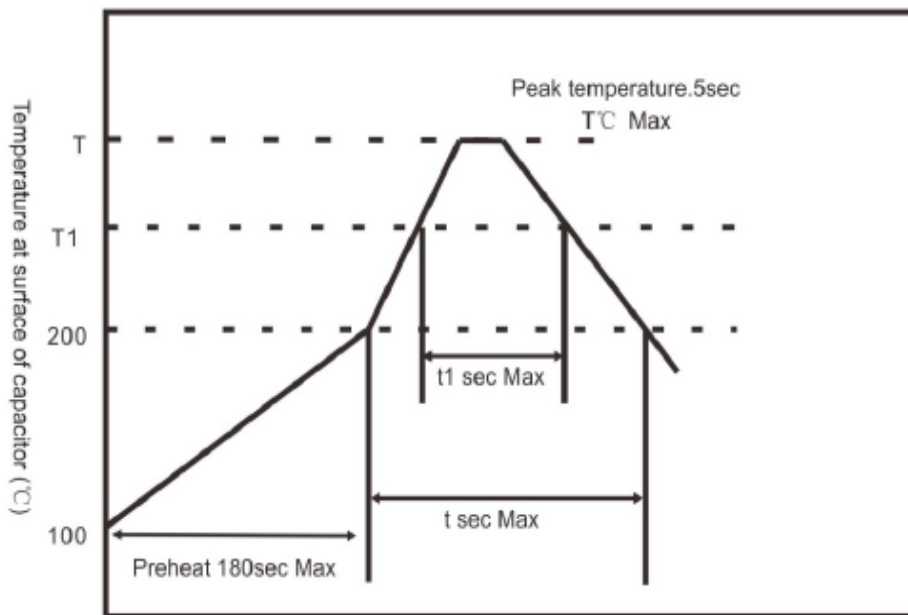


Case Size(mm)	Quantity/Reel(pcs)	Quantity/Bag(pcs)	H(mm)
Ø4×7	2000	12000	14
Ø5×7	1000	6000	14
Ø6.3×5.2	1000	5000	18
Ø6.3×7.7	900	4500	
Ø6.3×10.5	750	3750	
Ø8×10.5	550	2200	26
Ø8×12.5	500	2000	
Ø8×13.5	450	1800	
Ø8×15.5	350	1400	
Ø10×10.5	550	2200	26
Ø10×12.5	450	2000	
Ø10×13.5	350	1800	
Ø10×16.5	200	1400	
Ø12.5×13.5	150	600	34
Ø12.5×16	125	450	
Ø16×16.5	75	375	46
Ø16×21.5	125	225	
Ø18×16.5	125	375	46
Ø18×21.5	125	375	

Chip Al Electrolytic Capacitor—Conditions for Lead-free Reflow Soldering

Size of Al case 6.3~10mm :

- 1) Surface temperature below $T^{\circ}\text{C}$.
- 2) Not exceed t seconds when surface temperature over 200°C , and not exceed t_1 seconds for surface temperature over $T_1^{\circ}\text{C}$.
- 3) Preheat controlled within $100\sim 200^{\circ}\text{C}$, 180 seconds .



Time (sec)

Size	$T(^{\circ}\text{C})$ ①	$T(^{\circ}\text{C})$	$t(\text{sec})$ ②	$t_1(\text{sec})$ ③	Reflow
Ø6.3	250	230	90	40	1
Ø8	240	230	90	30	1
Ø10	235	230	60	30	1

1) Peak temperature

2) Time for over 200°C (Max.)

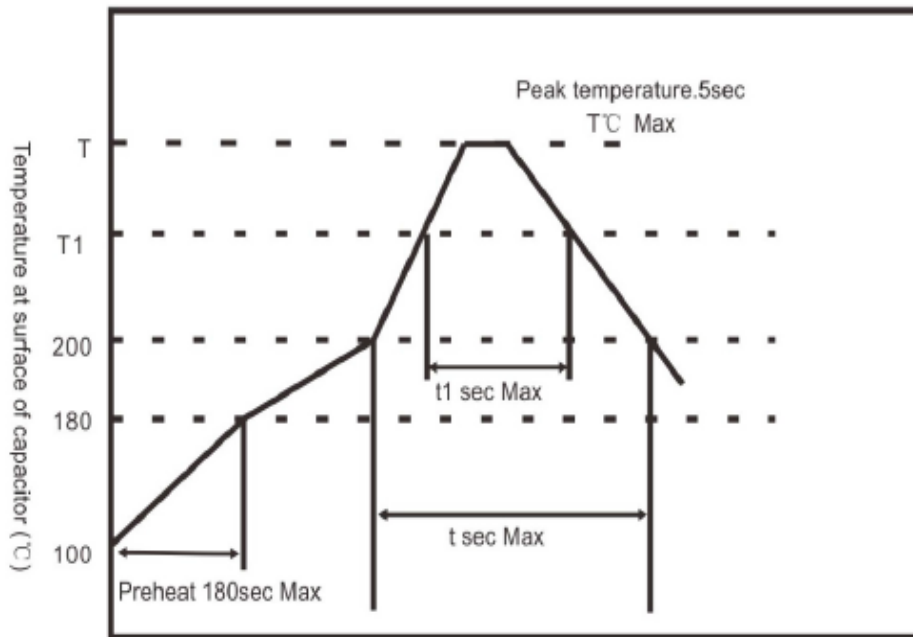
3) Time for over $T_1^{\circ}\text{C}$

Please contact us if beyond above conditions.

Chip Al Electrolytic Capacitor—Conditions for Lead-free Reflow Soldering

Size of Al case 12.5~18mm

- 1) Surface temperature below T°C
- 2) Not exceed t seconds when surface temperature over 200 °C, and not exceed t1 seconds for surface temperature over T1°C.
- 3) Preheat controlled within 100~180 °C, 150 seconds.



Time (sec)

Size	T(°C)①	T(°C)	t(sec)②	t1(sec)③	Reflow
Ø12.5~Ø18	240	230	60	30	1

- 1) Peak temperature
 - 2) Time for over 200°C (Max.)
 - 3) Time for over T1°C
- Please contact us if beyond above conditions.