规格書

SPECIFICATION

Customer：_____

Part Name: E-CAP

SPEC : SM Series

Part NO. : ALL

Date : 2017-11-22

CUSTOMER SIGN		

TOPAZCON	
DRAWING	RATIFY
黃峰	陳慶

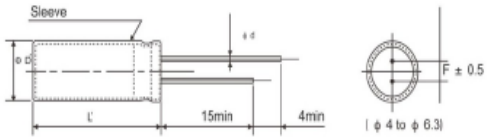
SM Series

- Miniature Bi-polarized series with 5 ~ 7mm height
- Endurance:+85 ℃ 1,000-2,000hours
- RoHS Compliant

SPECIFICATIONS

Items	Characteristics							
Category Temperature Range	-40 to +85 ℃							
Rated Voltage Range	6.3 to 50Vdc							
Capacitance Tolerance	± 20%(M)							(at20 ℃ ,120Hz)
Leakage Current	I ≤ 0.03CV or 5uA whichever is greater Where, I:Max.leakage current(μ A), C:Nominal capacitance (μ F) V:Rated voltage(V)							(at 20 ℃ after2minutes)
Dissipation Factor (tanδ)	Rated voltage(Vdc)	6.3	10	16	25	35	50	(at20 ℃ ,120Hz)
	Tanδ (Max)	0.25	0.25	0.20	0.20	0.15	0.15	
Low Temperature Characteristics (Max.Impedance Ratio)	Rated voltage(Vdc)	6.3	10	16	25	35	50	(at120Hz)
	Z(-25 ℃)/Z(+20 ℃)	4	3	3	2	2	2	
	Z(-40 ℃)/Z(+20 ℃)	10	8	6	4	4	4	
Endurance	The following specifications shall be satisfied when the capacitor are restored to 20 ℃ after the rated voltage is applied for 1,000 to 2,000 hours at 85 ℃							
	Capacitance change	≤ ± 20% of the initial value			L	Times		
	DF (tanδ)	≤ 200% of the initial specified value			5mm	1000		
	Leakage current	≤ The initial value			7mm	2000		
Shelf Life	The following specifications shall be satisfied when the capacitor are restored to 20 ℃ after exposing them for 1,000hours at 85 ℃ without voltage applied.							
	Capacitance change	≤ ± 20% of the initial value						
	DF (tanδ)	≤ 200% of the specified value						
	Leakage current	≤ 200% The initial specified value						

DIMENSIONS[MM]



Φ D	4	5	6.3	6.3
Φ d	0.45	0.45	0.45	0.5
F	1.5	2.0	2.5	2.5
Φ D'	Φ D+0.5max			
L'	L+1.5max			

RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Freq.(Hz) / Cap(uF)	50(60)	100(200)	500	1K	≥ 10K
0.1-1	0.50	1.00	1.20	1.30	1.50
2.2-4.7	0.65	1.00	1.20	1.30	1.50
10-47	0.80	1.00	1.20	1.30	1.50

The endurance of capacitors is shorted with internal heating produced by ripple current at the rate of halving the lifetime with every 5 ℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced

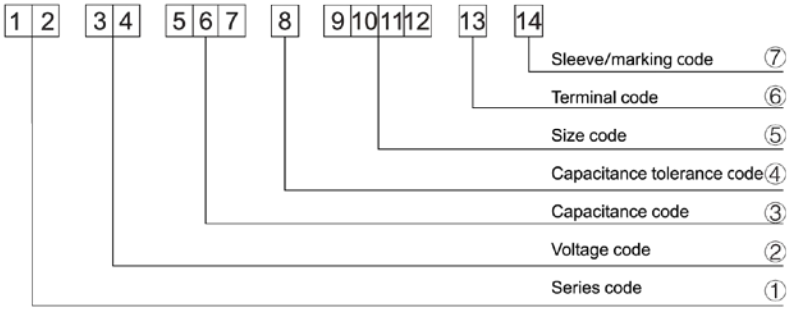
SM Series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size ΦD × L(mm)	Tanδ	Ripple current (mArms/85℃,120HZ)
6.3(0J)	10	4 × 5	0.25	14
	22	5 × 5 5 × 7	0.25	25 32
	33	6.3 × 5 5 × 7	0.25	35 40
	47	6.3 × 5 6.3 × 7	0.25	40 56
10(1A)	10	5 × 5 4 × 7	0.25	18 23
	22	6.3 × 5 5 × 7	0.25	30 35
	33	6.3 × 5 6.3 × 7	0.25	37 45
	47	6.3 × 5 6.3 × 7	0.25	43 65
16(1C)	4.7	4 × 5 4 × 7	0.20	12 18
	10	5 × 5 4 × 7	0.20	20 25
	22	6.3 × 5 6.3 × 7	0.20	32 45
	33	6.3 × 5 6.3 × 7	0.20	39 60
	47	6.3 × 7	0.20	65
25(1E)	3.3	5 × 5 4 × 7	0.20	10 15
	4.7	5 × 5 4 × 7	0.20	13 18
	10	6.3 × 5 6.3 × 7	0.20	21 35
	22	6.3 × 5 6.3 × 7	0.20	27 50

WV (Vdc)	Cap (μF)	Case size ΦD × L(mm)	Tanδ	Ripple current (mArms/85℃,120HZ)
35(1V)	2.2	5 × 5 4 × 7	0.15	9 13
	3.3	5 × 5 5 × 7	0.15	11 19
	4.7	5 × 5 5 × 7	0.15	14 22
	10	6.3 × 5 6.3 × 7	0.15	24 37
50(1H)	0.1	4 × 5 4 × 7	0.15	1.6 2.1
	0.22	4 × 5 4 × 7	0.15	2.5 4.5
	0.33	4 × 5 4 × 7	0.15	3.0 5.6
	0.47	4 × 5 4 × 7	0.15	3.6 6.6
	1	4 × 5 4 × 7	0.15	6.7 10
	2.2	5 × 5 5 × 7	0.15	10 15
	3.3	5 × 5 5 × 7	0.15	14 19
	4.7	6.3 × 5 6.3 × 7	0.15	17 26

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 (Vdc)	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
Lesd Cut	F
	C
	R
	L
	M
	S
	B
	K

Lead Forming

Taping Specifications

Fig.1 Code:T1

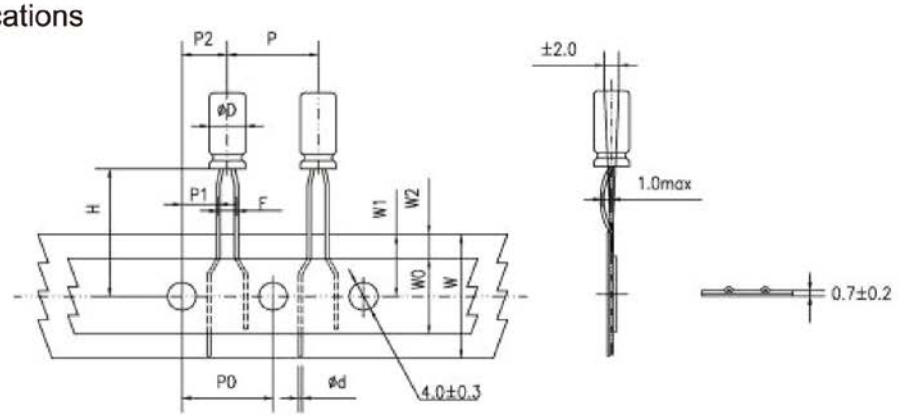


Fig.2Code:T2

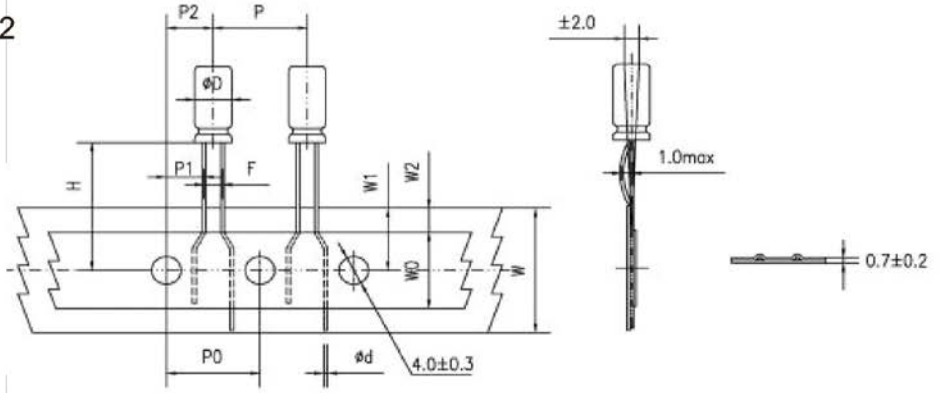


Fig.3 Code:T2

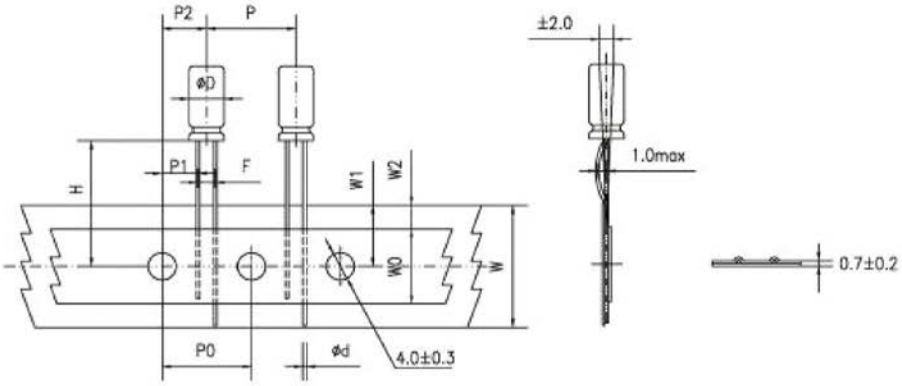
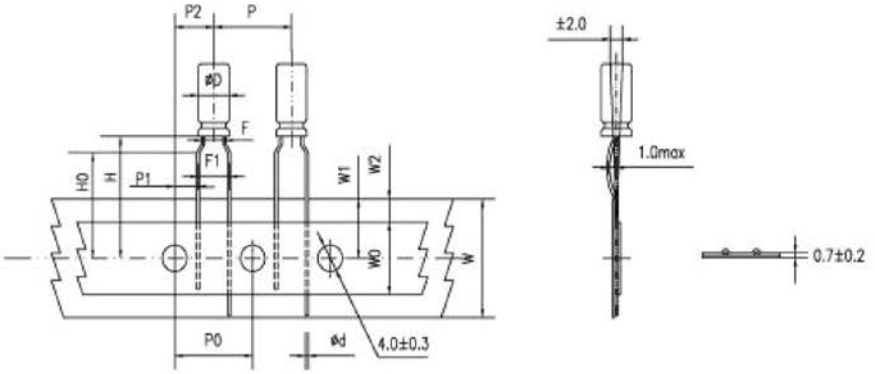


Fig.4 Code:T3



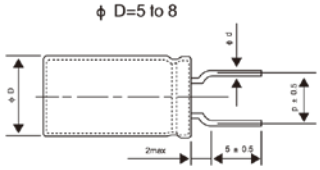
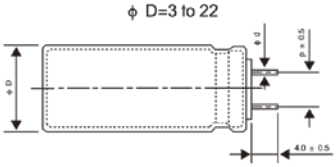
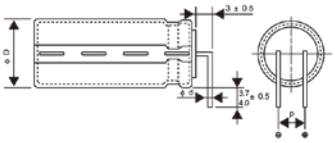
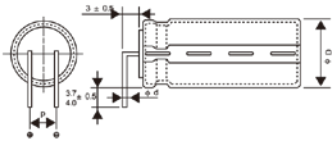
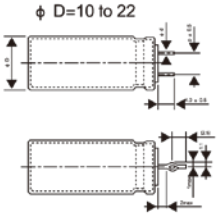
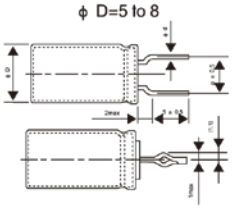
Specification Fig.1 & Fig.2 & Fig.3

Iterms	Symbol	CASE SIZE													Tolerance
		4 × 5 4 × 7		5 × 5 5 × 7		5x11		6.3x5	6.3x7 6.3x9	6.3x11 6.3x12	8x5/7 8x9/11 8x11.5 8x12	8x16 8x20	10x9/12 10x12.5 10x13/16 10x20/25		
Pin Code		T1	T2	T1	T2	T1		T2	T2	T2	T2	T2	T2		
Lead wire diameter	ϕd	0.45		0.45		0.5		0.45	0.5	0.5	0.45/0.5	0.6	0.6		± 0.05
Pitch of body	P	12.7		12.7		12.7		12.7	12.7	12.7	12.7	12.7	12.7		± 1.0
Feed hole pitch	PO	12.7		12.7		12.7		12.7	12.7	12.7	12.7	12.7	12.7		± 0.2
Hole center to lead distance	P1	5.1	5.6	5.1	5.35	5.1	5.35	5.1	5.1	5.1	4.6	4.6	3.85		± 0.7
Feed hole center to body center distance	P2	6.35		6.35		6.35		6.35	6.35	6.35	6.35	6.35	6.35		± 1.0
Lead to lead distance	F	2.5	1.5	2.5	2.0	2.5	2.0	2.5	2.5	2.5	3.5	3.5	5.0		± 0.5
Height of body from tape center	H	18.5		18.5		18.5		18.5	18.5	18.5	18.5	18.5	18.5		± 0.75
Base tape width	W	18.0		18.0		18.0		18.0	18.0	18.0	18.0	18.0	18.0		± 0.5
Adhesive tape width	WO	11.0		11.0		11.0		11.0	11.0	11.0	11.0	11.0	11.0		min
Hole positron	W1	9.0		9.0		9.0		9.0	9.0	9.0	9.0	9.0	9.0		+0.75 −0.5
Hole down tape position	W2	3.0		3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0		max

Specification Fig.4

Iterms	Symbol	CASE SIZE									Tolerance
		4 × 5 4 × 7	5 × 5	5 × 7	5 × 11	6.3 × 5	6.3 × 7 6.3 × 9	6.3 × 11 6.3 × 12	8 × 5/7 8 × 9/11 8 × 11.5/12	8 × 16 8 × 20	
Pin Code		T3	T3	T3	T3	T3	T3	T3	T3	T3	
Lead wire diameter	ϕd	0.45	0.45	0.45	0.5	0.45	0.5	0.5	0.45/0.5	0.6	± 0.05
Pitch of body	P	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	± 1.0
Feed hole pitch	PO	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	± 0.2
Hole center to lead distance	P1	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	± 0.7
Feed hole center to body center distance	P2	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	± 1.0
Lead to lead distance	F	1.5	2.0	2.0	2.0	2.5	2.5	2.5	3.5	3.5	± 0.5
Lead to lead distance	F1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	+0.8 −0.2
Height of body from tape center	H	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	± 0.75
Lead wire clinch height	HO	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	± 0.5
Base tape width	W	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	± 0.5
Adhesive tape width	WO	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	min
Hole position	W1	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	+0.75 −0.5
Hole down tape position	W2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	max

Lead Forming & Cut:

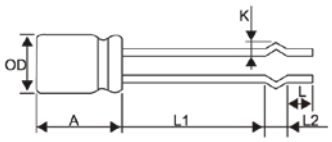
Lead comfiguration:F	Lead comfiguration:C
ϕ D=5 to 8 	ϕ D=3 to 22 
Lead comfiguration:R	**Lead comfiguration:L**
ϕ D=10 to 22 	ϕ D=10 to 22 
Lead comfiguration:M	**Lead comfiguration:S**
ϕ D=10 to 22 	ϕ D=5 to 8 

LEAD SPACING&RECOMMENDED PCB DIMENSIONS

(mm)

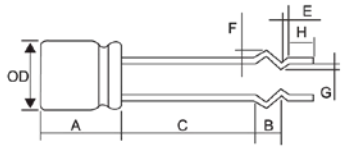
ϕD / Dimensionc	ϕd	p	PC Board		Lead Configuration
			Hole diame ter	Thickness	
5	0.5	5.0	0.8	1.6	F C S
6.3	0.5	5.0	0.8		
8	0.5/0.6	5.0	1.0		
10	0.6	5.0	1.0	1.6	C M R L
12.5	0.6	5.0	1.0		
16	0.8	7.5	1.2		
18	0.8	7.5	1.2		
20	0.8	7.5	1.2		
22	0.8	10.0	1.2		

Lead comfiguration:B



⌀D	L1	L2	K	A	L
5	17.5–19.5	2.6	1.9	10.0–15.0	3.0–5.0
6.3	17.5–19.5	2.6	1.9	10.0–16.0	
8	12.0–14.0	2.5	1.3	10.0–20.0	
8	13.5–15.5	2.5	1.5		
8	13.0–15.0	3.0	1.5		
8	19.5–21.5	3.0	1.5		
8	21.0–23.0	3.0	1.5		
10	7.5–9.5	2.5	1.7	10.0–25.0	
10	17.0–19.0	2.5	1.7		
10	10.5–12.5	2.5	1.5		
10	10.0–12.0	3.0	1.5		
10	13.0–15.0	3.0	1.5		
10	18.0–20.0	3.0	1.5		
10	21.0–23.0	3.0	1.5		
	± 1.0	± 0.5	0.3	± 1.0	± 1.0

Lead comfiguration:K



⌀D	C	B	E	F	G	A	H
8	13.5–15.5	3	1.2	1.8	0.8	10–20	3.0–5.0
10	18.5–20.5	3	1.2	1.8	1	10–25	
10	19.0–21.0	3	1.5	1.4	0.5		
	± 1.0	± 0.5	± 0.3	± 0.3	± 0.3	± 1.0	± 1.0