

# 规格書

## SPECIFICATION

Customer : \_\_\_\_\_

Part Name: \_\_\_\_\_ **E-CAP** \_\_\_\_\_

SPEC : \_\_\_\_\_ **RR Series** \_\_\_\_\_

Part NO. : \_\_\_\_\_ **ALL** \_\_\_\_\_

Date : \_\_\_\_\_ **2017-11-22** \_\_\_\_\_

CUSTOMER SIGN		

TOPAZCON	
DRAWING	RATIFY
黃峰	陳慶

# RR Series

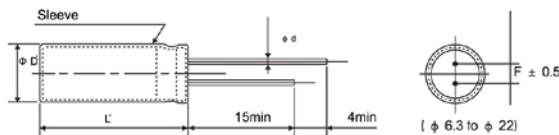


- Life time: +130 °C 1,000–2,000hours; +105 °C 8,000–12,000 hours
- Miniaturized, Long life
- Suitable for output circuit and input circuit of LED driving power
- RoHS Compliant

## ● SPECIFICATIONS

Items	Characteristics									
Temperature Range	-25 to +105 °C (160–500Vdc)									
Rated Voltage Range	160 to 500Vdc									
Capacitance Tolerance	± 20%(M) (20 °C 120Hz)									
Leakage Current	160 ~ 400Vdc		450–500Vdc		I: Leakage Current( μ A), C:Nominal capacitance ( μ F), V:Rated Voltage(V)					
	1 ≤ 0.02CV +10 μ A		1 ≤ 0.03CV +10 μ A		(20 °C ,2minutes)					
Dissipation Factor (tan δ )	Rated voltage(Vdc)	160	200	250	350	400	450	500		
	tan δ (Max)	0.15	0.15	0.15	0.20	0.20	0.20	0.24	(20 °C 120Hz)	
Temperature Characteristics (Max.Impedance Ratio)	Rate Voltage(Vdc)	160	200	250	350	400	450	500		
	Z(-25 °C ) /Z(+20 °C )	3	3	3	5	5	6	6	(120Hz)	
Endurance	Z(-40 °C ) /Z(+20 °C )									
	6 6 6 6 6 6 - -									
Shelf Life	After application of rated DC voltage with rated ripple current (the voltage peak is not more than rated voltage) at 130 °C for the specified period of time or application of DC voltage with rated ripple current (the voltage peak is no more than rated voltage) at 105 °C for the specified period of time, measuring the parameters when the capacitors are restored to 20 °C , the capacitors shall meet the requirements as below .									
	Capacitance Change	≤ ± 20% of the initial value				130C life time(h)		105C lifetimel(h)		
	D.F. (tan δ )	≤ 200% of the initial specified value				160–450VV		160–450VV		500VV
	Leakage Current	≤ The initial specified value				Φ D=6.3		1000		8000
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20 °C after exposing them for 1,000 hours at 105 °C without voltage application									
	Capacitance Change	≤ ± 20% of the initial value				Φ D ≥ 8		2000		12000
	D.F. (tan δ )	≤ 200% of the initial specified value								10000
	Leakage Current	≤ 200% The initial specified value								

## ● DIMENSIONS[mm]



Φ D	6.3	8	10	12.5	16	18	22
Φ d	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.5	3.5	5.0	5.0	7.5	7.5	10
Φ D	Φ D+0.5max						
L'	L+2max						

## ● RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

CAP ( μ F )	Freq ( Hz )			
	120	1k	10k	100k
CAP < 33	0.40	0.70	0.90	1.00
CAP ≥ 33	0.55	0.80	0.90	1.00

# RR Series

● STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φ D × L(mm)	tan δ	Ripple current (mAmps/105 °C, 100kHz)	Ripple current (mAmps/130 °C, 100kHz)
160V(2C)	1	6.3 × 9	0.15	45	30
		6.3 × 12	0.15	50	34
	1.5	6.3 × 9	0.15	50	34
		6.3 × 12	0.15	55	36
	1.8	6.3 × 9	0.15	58	38
		6.3 × 12	0.15	64	42
	2.2	6.3 × 9	0.15	64	42
		6.3 × 12	0.15	70	46
	2.8	6.3 × 9	0.15	68	45
		6.3 × 12	0.15	75	49
	3.3	6.3 × 9	0.15	72	47
		6.3 × 12	0.15	80	52
	4.7	8 × 9	0.15	82	54
		8 × 12	0.15	86	56
	5.6	8 × 9	0.15	88	58
		8 × 12	0.15	98	64
	6.8	8 × 9	0.15	100	65
		8 × 16	0.15	110	72
	10	8 × 16	0.15	225	146
		10 × 9	0.15	200	130
15	8 × 16	0.15	288	188	
22	10 × 16	0.15	475	309	
33	10 × 20	0.15	570	372	
47	12.5 × 25	0.15	660	429	
68	12.5 × 25	0.15	800	520	
100	16 × 25	0.15	1120	728	
150	16 × 30	0.15	1280	832	
200V(2D)	1	6.3 × 9	0.15	52	40
		6.3 × 12	0.15	56	42
	1.5	6.3 × 9	0.15	56	42
		6.3 × 12	0.15	60	45
	1.8	6.3 × 9	0.15	60	45
		6.3 × 12	0.15	68	50
	2.2	6.3 × 9	0.15	68	50
		6.3 × 12	0.15	74	55
	2.8	6.3 × 9	0.15	74	55
		6.3 × 12	0.15	80	60
	3.3	6.3 × 9	0.15	86	65
		6.3 × 12	0.15	96	72
	4.7	6.3 × 12	0.15	128	102
		8 × 9	0.15	135	107
	5.6	8 × 12	0.15	154	122
		8 × 9	0.15	150	120
	6.8	8 × 12	0.15	165	132
		8 × 16	0.15	220	176
	8.2	8 × 9	0.15	158	125
		8 × 12	0.15	175	140
10	8 × 16	0.15	220	182	
	10 × 9	0.15	210	160	
15	8 × 16	0.15	290	202	
	8 × 20	0.15	330	230	
22	10 × 9	0.15	280	195	
	8 × 16	0.15	338	235	
33	8 × 20	0.15	350	240	
	8 × 20	0.15	382	248	
47	10 × 16	0.15	446	290	
	10 × 20	0.15	492	320	
68	10 × 20	0.15	570	370	
	12.5 × 16	0.15	570	370	
100	12.5 × 20	0.15	600	390	
	12.5 × 16	0.15	600	390	
150	12.5 × 20	0.15	628	408	
	12.5 × 25	0.15	660	430	

WV (Vdc)	Cap (μF)	Case size φ D × L(mm)	Tan δ	Ripple current (mAmps/105 °C, 100kHz)	Ripple current (mAmps/130 °C, 100kHz)
200V(2D)	68	16 × 25	0.15	860	560
		12.5 × 30	0.15	882	574
	100	16 × 25	0.15	1060	690
		12.5 × 40	0.15	1120	728
	150	16 × 35	0.15	1290	840
		16 × 35	0.15	1290	840
250V(2E)	1	6.3 × 9	0.15	52	40
		6.3 × 12	0.15	56	42
	1.5	6.3 × 9	0.15	56	42
		6.3 × 12	0.15	60	45
	1.8	6.3 × 9	0.15	60	45
		6.3 × 12	0.15	68	50
	2.2	6.3 × 9	0.15	68	50
		6.3 × 12	0.15	74	55
	2.8	6.3 × 9	0.15	74	55
		6.3 × 12	0.15	84	62
	3.3	6.3 × 9	0.15	86	65
		6.3 × 12	0.15	100	74
	4.7	8 × 9	0.15	120	95
		8 × 12	0.15	154	122
	5.6	8 × 9	0.15	150	120
		8 × 12	0.15	165	132
	6.8	8 × 9	0.15	158	125
		8 × 16	0.15	228	182
	8.2	8 × 16	0.15	274	192
		10 × 9	0.15	235	165
10	8 × 16	0.15	294	205	
	15	8 × 20	0.15	378	245
22	10 × 16	0.15	462	300	
	12.5 × 16	0.15	550	358	
33	12.5 × 20	0.15	610	398	
	12.5 × 16	0.15	610	398	
47	12.5 × 20	0.15	648	420	
	12.5 × 30	0.15	874	568	
68	16 × 25	0.15	874	568	
	12.6 × 35	0.15	966	628	
100	16 × 30	0.15	1140	740	
	12.5 × 50	0.15	1288	838	
150	16 × 35	0.15	1400	910	
	16 × 35	0.15	1400	910	
350V(2V)	1	6.3 × 9	0.20	52	40
		6.3 × 12	0.20	58	44
	1.5	6.3 × 12	0.20	65	50
		8 × 9	0.20	68	52
	1.8	6.3 × 12	0.20	70	54
		8 × 9	0.20	74	57
	2.2	6.3 × 12	0.20	78	60
		8 × 9	0.20	82	63
	2.8	8 × 12	0.20	90	68
		10 × 9	0.20	95	72
	3.3	8 × 12	0.20	100	75
		10 × 9	0.20	105	78
	4.7	8 × 12	0.20	135	108
		8 × 16	0.20	160	125
	6.8	8 × 20	0.20	195	142
		8 × 20	0.20	250	164
	10	10 × 20	0.20	300	195
		15	10 × 20	0.20	380
	22	12.5 × 20	0.20	476	309
		10 × 20	0.15	570	370
33	16 × 20	0.20	600	390	
	16 × 20	0.20	740	480	
47	16 × 20	0.20	740	480	
	18 × 25	0.20	880	572	
100	18 × 30	0.20	1160	754	
	18 × 30	0.20	1160	754	

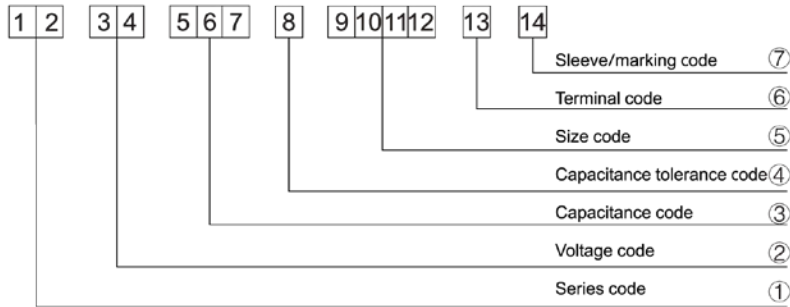
# RR Series

● STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size φ D × L(mm)	tan δ	Ripple current (mA rms/105 °C, 100kHz)	Ripple current (mA rms/130 °C, 100kHz)
400V(2G)	1	6.3 × 9	0.20	62	55
		6.3 × 12	0.20	66	60
		8 × 12	0.20	72	66
	1.2	6.3 × 12	0.20	68	62
		8 × 9	0.20	75	68
	1.5	8 × 12	0.20	86	75
			0.20	92	80
		8 × 16	0.20	92	80
	1.8	8 × 9	0.20	80	70
			0.20	90	78
		8 × 16	0.20	104	88
	2.2	6.3 × 12	0.20	85	72
			0.20	92	80
		8 × 16	0.20	110	94
	2.8	8 × 16	0.20	120	96
			0.20	148	118
		8 × 20	0.20	148	118
	3.3	8 × 12	0.20	120	96
			0.20	128	102
		8 × 20	0.20	152	122
	4.7	8 × 12	0.20	148	110
			0.20	168	125
		8 × 20	0.20	175	133
	5.6	10 × 16	0.20	180	135
			0.20	200	140
		8 × 20	0.20	202	142
	6.8	10 × 16	0.20	210	148
			0.20	220	154
		10 × 20	0.20	252	164
	8.2	10 × 16	0.20	288	187
			0.20	304	198
		10 × 20	0.20	304	198
	10	8 × 40	0.20	340	220
			0.20	380	234
		12.5 × 20	0.20	400	260
	15	8 × 50	0.20	476	310
			0.20	532	346
		12.5 × 25	0.20	532	346
	33	10 × 45	0.20	627	408
			0.20	608	395
16 × 25		0.20	608	395	
47	12.5 × 40	0.20	660	429	
		0.20	792	515	
	18 × 25	0.20	792	515	
68	12.5 × 55	0.20	870	566	
		0.20	900	585	
	18 × 30	0.20	900	585	
100	18 × 40	0.20	1180	768	

WV (Vdc)	Cap (μF)	Size φ D × L(mm)	tan δ	Ripple current (mA rms/105 °C, 100kHz)	Ripple current (mA rms/130 °C, 100kHz)	
450V(2W)	1	8 × 9	0.20	64	56	
		8 × 12	0.20	68	62	
	1.5	8 × 12	0.20	84	74	
		10 × 9	0.20	90	76	
	1.8	8 × 12	0.20	90	76	
		10 × 9	0.20	95	80	
	2.2	8 × 16	0.20	92	78	
	2.8	8 × 16	0.20	120	96	
	3.3	8 × 16	0.20	125	100	
	4.7	8 × 20	0.20	168	125	
	5.6	10 × 16	0.20	180	135	
	6.8	10 × 20	0.20	220	154	
	8.2	10 × 20	0.20	266	174	
		10 × 25	0.20	304	198	
	10	12.5 × 16	0.20	290	188	
		8 × 45	0.20	400	260	
	15	12.5 × 20	0.20	400	260	
		10 × 40	0.20	500	325	
	22	16 × 20	0.20	500	325	
		10 × 50	0.20	615	400	
	33	16 × 25	0.20	665	432	
		12.5 × 45	0.20	720	468	
	47	16 × 35	0.20	818	532	
		18 × 30	0.20	900	585	
	68	18 × 30	0.20	900	585	
	100	18 × 40	0.20	1180	768	
	500V(2H)	10	12.5 × 20	0.24	288	/
			12.5 × 25	0.24	302	/
		15	12.5 × 25	0.24	396	/
			16 × 20	0.24	396	/
22		12.5 × 35	0.24	504	/	
		16 × 25	0.24	504	/	
33		18 × 25	0.24	630	/	
47		18 × 30	0.24	792	/	
68		22 × 35	0.24	1100	/	
100		22 × 35	0.24	1480	/	

## 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 <sub>dc</sub> )	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

Lead Forming

Taping Specifications

Fig.1 Code:T1

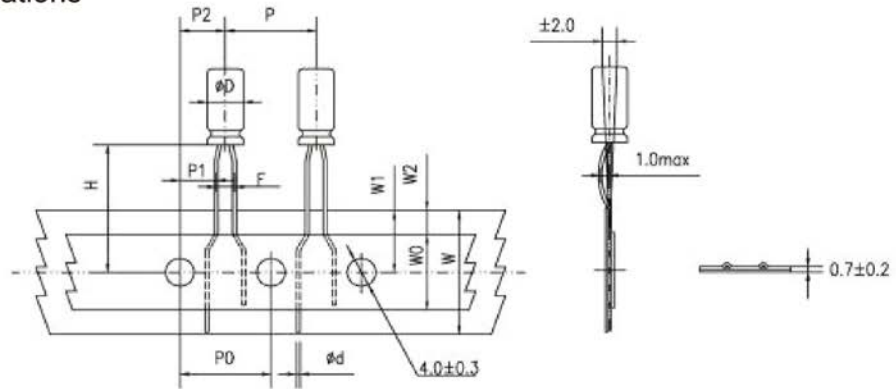


Fig.2 Code:T2

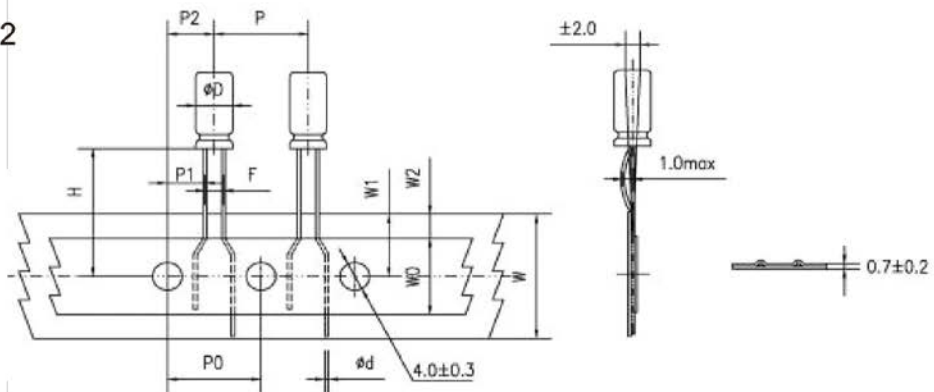


Fig.3 Code:T2

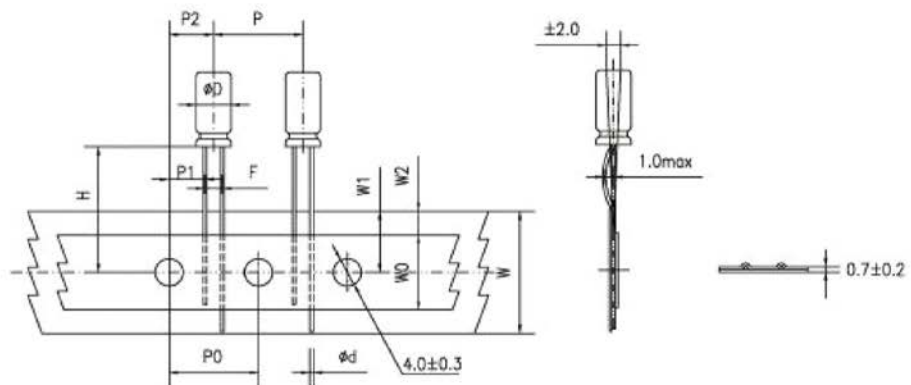
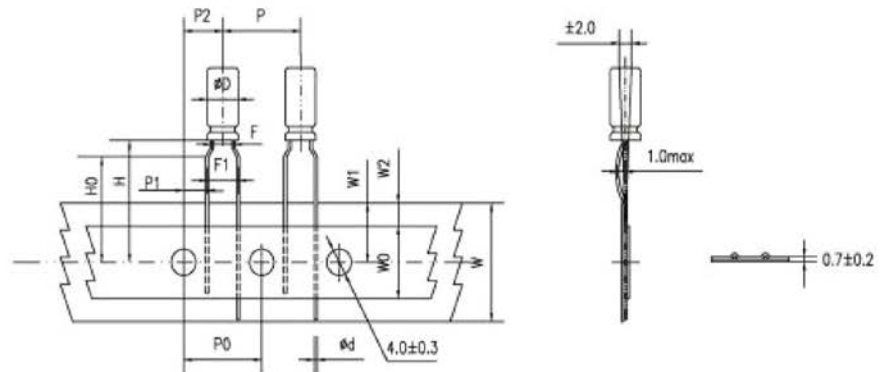


Fig.4 Code:T3



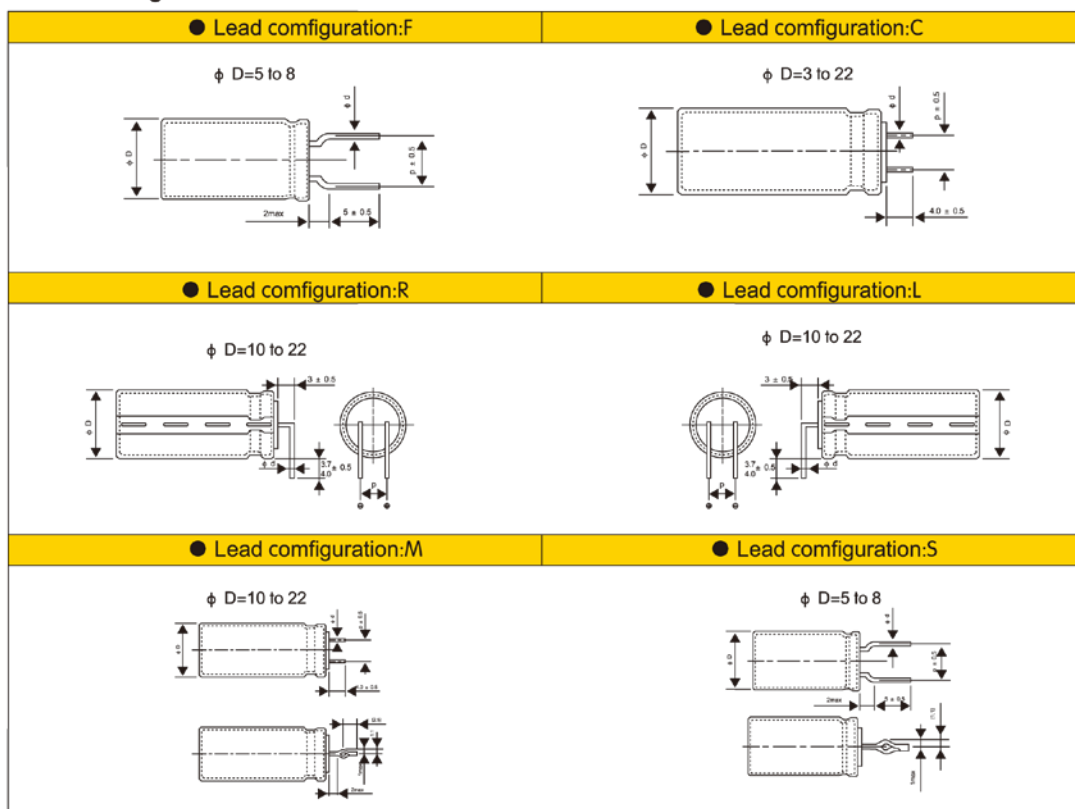
**Specification Fig.1 & Fig.2 & Fig.3**

Items	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 8×12		8×16 8×20	10×9/12 10×12.5 10×13/16 10×20/25	
Pin Code		T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>		T <sub>2</sub>	T <sub>2</sub>	T <sub>2</sub>	T <sub>2</sub>	T <sub>2</sub>	T <sub>2</sub>		
Lead wire diameter	φd	0.45		0.45		0.5		0.45	0.5	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	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	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**

Items	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		T <sub>3</sub>	T <sub>3</sub>	T <sub>3</sub>	T <sub>3</sub>	T <sub>3</sub>	T <sub>3</sub>	T <sub>3</sub>	T <sub>3</sub>	T <sub>3</sub>	
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:



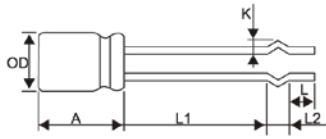
● LEAD SPACING & RECOMMENDED PCB DIMENSIONS

(mm)

Dimension	εD	εd	p	PC Board		Lead Configuration
				Hole diameter	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		

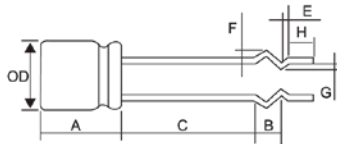


● Lead configuration: B



∅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 configuration: 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