

CERAMIC DISC CAPACITORS – (T.C.)



EIA RS 198 . CLASS 1 JIS C 6423 . TYPE I

CLASS I

FEATURES

Part Code Designation

Example:	<u>CH</u>	<u>1H</u>	<u>120</u>	<u>K</u>	<u>05</u>	<u>S</u>	<u>25</u>	<u>B</u>	<u>05</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(6)BULK	(8)
	<u>CH</u>	<u>1H</u>	<u>120</u>	<u>K</u>	<u>05</u>	<u>S-TB</u>	<u>05</u>		
	(1)	(2)	(3)	(4)	(5)	(6)	(8)		

* Linear temperature coefficient of capacitance.

* High stability of capacitance.

* Low loss at wide range of frequency.

1. Temperature Coefficient (Ref. Fig. 1)

Code	PPM/°C	T.C.	EIA Code	Color	Symbol
CH	0 ± 60	NPO	C0H	Black	C
HH	-30 ± 60	N33	S1H	Brown	H
LH	-80 ± 60	N75	U1H	Red	L
PH	-150 ± 60	N150	P2H	Orange	P
RH	-220 ± 60	N330	R2H	Yellow	R
SH	-330 ± 60	N330	S2H	Green	S
TH	-470 ± 60	N470	T2H	Blue	T
UJ	-750 ± 120	N750	U2J	Violet	U
SL	+350 ~ - 1,000	P350 ~ N1000	S2L	-	-

2. Rated Voltage (D.C.)

Code	Voltage	Code	Voltage
1C	16V	2E	250V
1E	25V	2H	500V
1H	50V	3A	1KV
2A	100V		

3. Rated Capacitance

Code	Cap. (Pf)	Code	Cap. (Pf)
010	1	390	39
1P5	1.5	470	47
2P2	2.2	560	56
3P3	3.3	680	68
3P9	3.9	820	82
4P7	4.7	101	100
5P6	5.6	121	120
6P8	6.8	151	150
8P2	8.2	181	180
100	10	221	220
120	12	271	270
150	15	331	330
180	18	391	390
220	22	471	470
270	27	561	560
330	33	681	680

4. Tolerance on rated capacitance

Code	Tol.	Rated Cap. (Pf)
C	± 0.25 Pf	1,2,3,4,5
D	± 0.5 Pf	6,7,8,9
F	± 1 Pf	6,7,8,9,10
J	± 5 %	From 10 Pf to 820 Pf
K	± 10 %	
M	± 20 %	

5. Lead Spacing. (F)

Code	Dimension.(mm)		
	K	S	L
02	-	2.5 ± 0.8	2.5 ± 0.8
05	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8
06	-	6.3 ± 0.8	6.3 ± 0.8
07	-	7.5 ± 0.8	7.5 ± 0.8
10	10.0 ± 0.8	-	10.0 ± 0.8

6. Lead Shape

Code	TYPE	
K	Bulk	Kink
S		Straight
TB	Taping	Box
TR		Reel
B	Bulk	

7. Lead Length. (L)

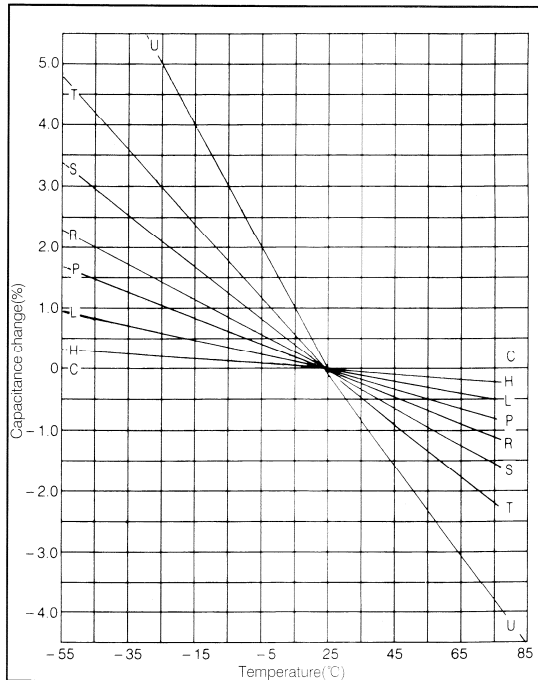
Code	Dimension.(mm)	
	K	S
05	5.0 ± 0.8	5.0 ± 0.8
06	6.3 ± 0.8	6.3 ± 0.8
10	10.0 ± 0.8	10.0 ± 0.8
25	25 min.	25 min.

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Fig. 1 (T.C.PPM/°C)



8. Dimension & Capacitance Range

Dia. (D) Max.	Diemesion (mm)			Capacitance Range (PF)						
	Lead Spacing (F)			50V			500V		1KV	
	K	S	L	CH	UJ	SL	CH	SL	CH	SL
5	5.0 ± 0.8	2.5 ± 0.8	2.5 ± 0.8	1-47	5-47	1-151	1-15	20-50	1-27	20-68
6	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	56-68	56-68	161-221	16-47	51-101	30-40	82-101
7	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	82-101	82-121	241-331	20-82	121-151	41-68	121-151
8	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	121-151	151-181	361-471	101	221	82	181-221
9	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	161-221	181-221	501-681	-	271-331	82-121	271-301
10	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	221-331	221-271	821	-	391-471	-	331-391
12	to	to	to	391	331	-	-	-	-	471
14	10.0 ± 0.8	10.0 ± 0.8	10.0 ± 0.8	471	471	-	-	-	-	561

SPECIFICATION & TEST

NO	ITEM	Performance	Test Method
1	Visual & Mechanical	To meet the specification	The product shall be inspected for visible evidence of defect.
2	Marking	To be clear and legible	N/A
3	Voltage Proof (Between terminal)	No failure	2.5 times the rated voltage shall be applied for 1 to 5 sec. Charging and discharging current shall be limited to 50mA max.
4	Insulation resistance	10,000 MΩmin.	Shall be measured 1 minute after with rated voltage.
5	Capacitance	To be within the specified tolerance	Test frequency: 1MHz ± 100Hz Test voltage shall not exceed 5 Vrms at 25 ± 2°C
6	Q Value	C ≤ 30pF Q = 400 ± 20C C > 30pF Q > 1000	Test frequency: 1MHz ± 100Hz Test voltage shall not exceed 5 Vrms at 25 ± 2°C
7	Temperature Coefficient	To be within the specification	T.C. shall be calculated by the following formula: $PPM/°C = \frac{C(t_1) - C(t_2)}{C(t_1)(t_2 - t_1)} \times 10^6$ Ct2 = capacitance at t2 t2 = 85 ± 3°C Ct1 = capacitance at t1 t1 = 25 ± 2°C

CERAMIC DISC CAPACITORS – (HiK)



EIA RS 198 · CLASS 2 JIS C 6422 · TYPE II

CLASS II

FEATURES

- * Large capacitance in small size
- * Non Linear Temperature coefficient of capacitance.

Part Code Designation

Example:	YP	1H	102	K	05	S	25	B	05
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(6)BULK	(8)
	YP	1H	102	K	05	K-TB	05		
	(1)	(2)	(3)	(4)	(5)	(6)	(8)		

1. Temperature Coefficient (Ref. Fig. 1)

Code	Temp. Range	Cap. Change	EIA Code	Cap. Change
B	-25°C~+85°C	± 10%	Y5P	± 10%
	-55~+125°C	± 15%	X7R	± 15%
	-55~+85°C		X5R	
D	-25°C~+85°C	+20% -30 %	Y5T	+22% -33%
E	-10°C ~	+20% -55%	Z5U	+22% -56%
F		+70°C		+30% -80%

2. Rated Voltage (D.C.)

Code	Voltage	Code	Voltage
1C	16V	2E	250V
1E	25V	2H	500V
1H	50V	3A	1KV
2A	100V	-	-

3. Rated Capacitance

Code	Cap. (Pf)	Code	Cap. (Pf)
101	100	821	820
121	120	102	1,000
151	150	152	1,500
181	180	222	2,200
221	220	332	3,300
271	270	472	4,700
331	330	682	6,800
391	390	103	10,000
471	470	223	22,000
561	560	473	47,000
681	680	104	100,000

4. Tolerance on rated capacitance

Code	Tol.	16V - 1KV
K	± 10%	B
M	± 20%	D,E
Z	+ 80% - 20%	E,F
J	± 5%	E

5. Lead Spacing. (F)

Code	Dimension.(mm)		
	K	S	L
02	-	2.5 ± 0.8	2.5 ± 0.8
05	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8
06	-	6.3 ± 0.8	6.3 ± 0.8
07	-	7.5 ± 0.8	7.5 ± 0.8
10	10.0 ± 0.8	-	10.0 ± 0.8

6. Lead Shape

Code	TYPE	
K	Bulk	Short Kink
S		Short Straight
L		Long Straight
TB	Taping	Box
TR		Reel

7. Lead Length. (L)

Code	Dimension.(mm)		
	K	S	L
05	5.0 ± 0.8	5.0 ± 0.8	-
06	6.3 ± 0.8	6.3 ± 0.8	-
10	10.0 ± 0.8	10.0 ± 0.8	-
25	-	-	25 min.

CERAMIC DISC CAPACITORS – (HiK)

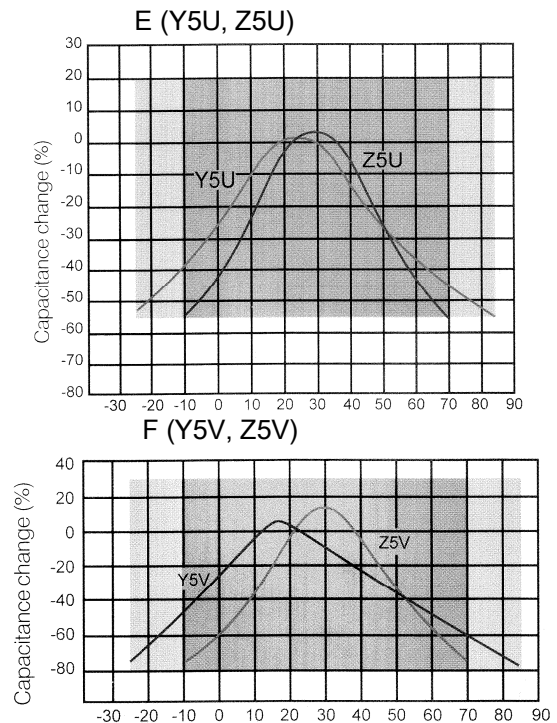
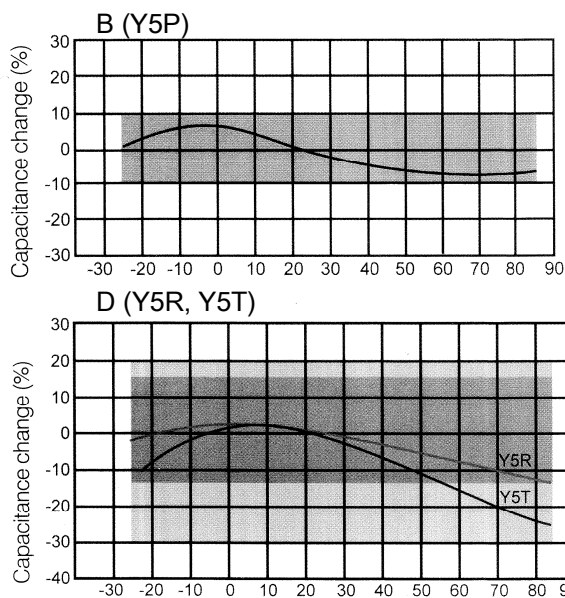


EIA RS 198 · CLASS 2 JIS C 6422 · TYPE II

8. Dimension & Capacitance Range

Dimension				Capacitance Range (PF)										
Dia.(D)	Lead Spacing (F)			50V			500V			1KV				
	Max.	K	S	L	B	D	E	F	B	E	F	B	E	F
5.0	5.0 ± 0.8	2.5 ± 0.8	2.5 ± 0.8	101-222	102-502	102-502	102-103	101-102	202-222	202-222	101-471	102	102-122	
6.0	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	272-332	682-822	682-822	153-223	122	272	272-472	102	202	202	
7.0	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	342-392	103	103	223-303	152-182	392-472	682	122	272	472	
8.0	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	472-682	-	-	-	202-222	682	103	152	472	682	
9.0	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	702-822	-	-	333-403	272-332	822	153	222	562	103	
10.0	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	103	-	203-223	473-503	392-502	103	223	272	103	-	
12.0	to	to	to	-	-	-	-	103	153	-	472	-	183	
14.0	10.0 ± 0.8	10.0 ± 0.8	10.0 ± 0.8	-	-	-	-	223	223	333	103	183	223	
16.0				-	-	-	-	-	-	473	-	223	333	

Fig. 2 (T.C.%)



SPECIFICATION & TEST

NO	ITEM	Performance	Test Method
1	Visual & Mechanical	To meet the specification	The product shall be inspected for visible evidence of defect.
2	Marking	To be clear and legible	N/A
3	Voltage Proof (Between terminal)	No failure	2.5 times the rated voltage shall be applied for 1 to 5 sec. Charging and discharging current shall be limited to 50mA max.
4	Insulation resistance	10,000 MΩmin. or 200ΩF whichever is less	Shall be measured 1 minute after with rated voltage.
5	Capacitance	To be within the specified tolerance	Test frequency: 1KHz ± 100Hz Test voltage shall not exceed 3 Vrms at 25 ± 2°C
6	Dissipation Factor (Tanδ) (%)	Characteristic B,D,E: 2.5% Max. F: 5% Max.	Test frequency: 1KHz ± 100Hz Test voltage shall not exceed 3 Vrms at 25 ± 2°C
7	Temperature Coefficient	To be within the specification	T.C. shall be calculated by the following formula: $C.C.(%) = \frac{C_{tx} - C_{t1}}{C_{t1}} \times 100$ Ctx: Capacitance at any temperature between -25°C and +85°C Ct1: Capacitance at 25 ± 2°C

CERAMIC DISC CAPACITORS – (S.C.)



CLASS 3 TYPE III

CLASS III

FEATURES

- * Linear temperature characteristic of capacitance
- * Stable capacitance change over the specified temperature
- * Low loss at wide range of frequency.
- * Ultra large capacitance in small size.

Part Code Designation

Example:	<u>YP</u>	<u>1H</u>	<u>102</u>	<u>K</u>	<u>05</u>	<u>K-TB</u>	<u>07</u>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	<u>YV</u>	<u>1H</u>	<u>104</u>	<u>Z</u>	<u>05</u>	<u>S</u>	<u>25</u>	<u>B</u>	<u>05</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(6)Bulk	(8)

1. Temperature Coefficient (Ref. Fig. 2)

Code	Temp. Range	Cap. Change	EIA Code
B	-25°C ~	± 10%	Y5P
D		± 15%	Y5R
E	+85°C	+22%	Z5V
		-33%	
		+22%	Y5U
		-56%	
F		+30%	Y5V
		-80%	

2. Rated Voltage (D.C.)

Code	Voltage
1C	16V
1E	25V
1H	50V
2A	100V

3. Rated Capacitance

Code	Cap. (Pf)
103	10,000
223	22,000
473	47,000
104	100,000
224	220,000

4. Tolerance on rated capacitance

Code	Tol.	16V - 50V
K	± 10%	B (Y5P)
M	± 20%	D,E (Y5R, Y5T, Y5U)
Z	+ 80%	F (Y5V)
	- 20%	

5. Lead Spacing (F)

Code	Dimension.(mm)		
	K	S	L
02	-	2.5 ± 0.8	2.5 ± 0.8
05	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8
06	-	6.3 ± 0.8	6.3 ± 0.8
07	-	7.5 ± 0.8	7.5 ± 0.8
10	10.0 ± 0.8	-	10.0 ± 0.8

6. Lead Shape

Code	TYPE	
K	Bulk	Short Kink
S		Short Straight
L		Long Straight
TB	Taping	Box
TR		Reel

7. Lead Length. (L)

Code	Dimension.(mm)		
	K	S	L
05	5.0 ± 0.8	5.0 ± 0.8	-
06	6.3 ± 0.8	6.3 ± 0.8	-
10	10.0 ± 0.8	10.0 ± 0.8	-
25	-	-	25 min.

CERAMIC DISC CAPACITORS – (S.C.)



CLASS 3 TYPE III

8. Dimension & Capacitance Range

Dia. (D) Max.	Diemesion (mm)			Capacitance Range (PF)											
	Lead Spacing (F)			16V				25V				50V			
	K	S	L	B	D	E	F	B	D	E	F	B	D	E	F
5	5.0 ± 0.8	2.5 ± 0.8	2.5 ± 0.8	-	333	473	103-104	332-472	103-223	-	103-104	332-472	103	-	103-223
6	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	-	473	-	104	682-153	333-473	473	104	153	333	473	333-473
7	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	-	104	104	-	273	-	104	-	223	473	-	104
8	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	-	-	-	224	473	-	-	-	333	104	104	-
10	5.0 ± 0.8	5.0 ± 0.8	5.0 ± 0.8	104	-	224	-	683	104	-	334	683	-	-	224
11	to	to	to	-	-	-	-	104	-	-	-	-	224	-	-
12	6.3 ± 0.8	6.3 ± 0.8	6.3 ± 0.8	-	-	-	-	104	-	-	-	473	-	-	-

SPECIFICATION & TEST

NO	ITEM	Performance	Test Method
1	Visual & Mechanical	To meet the specification	The product shall be inspected for visible evidence of defect.
2	Marking	To be clear and legible	N/A
3	Voltage Proof (Between terminal)	No failure	Capacitor shall withstand, for not greater than 5 second, a D.C. test voltage of 2.5 times the rated voltage shall be charging current shall be 10mA max.
4	Insulation resistance	12V / 16V - 100 MΩ 25V / 50V -1000 MΩ	Shall be measured 1 minute after within 10±1V.
5	Capacitance	To be within the specified tolerance	Test frequency: 1KHz ± 100Hz Test voltage shall not exceed 0.1Vrms at 25 ± 2°C
6	Dissipation Factor (Tanδ) (%)	Characteristic B,D,E: 2.5% Max. F: 5% Max.	Test frequency: 1KHz ± 100Hz Test voltage shall not exceed 0.1Vrms at 25 ± 2°C

HIGH VOLTAGE CERAMIC CAPACITOR



2KV – 40KV

SPECIFICATION

- * Operating temperature range: -25°C+85°C
- * Rated working voltage: 2KV to 40KV
- * Capacitance: within the tolerance for Class I at 1MHz, Class II at 1 KHz, 1 to 3Vrms, 25°C
- * Test Voltage: 2KV & above: 2 times rated voltage, 10KV & above: 1.5 times rated voltage, 50mA Max.

Charging current

- * Dissipation factor / Q factor:

Class I: 1MHz, 1 to 3Vrms, 25°C; Class II: 1KHz, 1 to 3Vrms, 25°C

C ≤ 30pf.....	Q ≥ 400 ± 20C	B,E.....	2.5% Max.
C > 30pf.....	Q ≥ 1,000	F.....	5% Max.

- * Insulation resistance: 10,000MΩ or 200 MΩμF, whichever is smaller.
- * Humidity test: Per EIA RS198-C, Method B3, Condition B. ΔC/C: 30% Max for F, 20% Max for others.
- * Life test: Per EIA RS198-C, Method C2, Condition C at 85 ± 2°C and 200% rated working voltage. ΔC/C: 30% Max for F, 20% Max for others. DF: 5% Max for F, 3% Max for others, I.R.: 10,000MΩMin.

Part Code Designation

Example:	<u>Y</u> <u>P</u>	<u>3</u> <u>D</u>	<u>10</u> <u>2</u>	<u>K</u>	<u>6</u>	<u>S</u>	<u>2</u> <u>5</u>	<u>B</u>	<u>1</u> <u>0</u>	<u>E</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

1. Temperature Coefficient (Ref. Fig. 1 & 2)

CLASS I: NPO, N750,SL

CLASS II: B,E,F.

2. Rated Voltage (D.C.)

Code	Voltage	Code	Voltage
3D	2KV	4A	10KV
3F	3KV	4B	12KV
3G	4KV	4C	15KV
3H	5KV	4D	20KV
3I	6KV	4E	25KV
3K	7KV	4F	30KV
3J	8KV	4G	40KV

3. Rated Capacitance

100 ~ 47,000 pf in E-24 Series Coded by

2 significant digits + no. of zeros

4. Tolerance on rated capacitance.

J= ±5%, K= ±10%, M= ±20%

Z= +80-20% P= +100-0%

5. Lead Spacing. (F)

Code	Dimension.(mm)		
	K	S	L
05	5.0 ± 0.8		
06	6.3 ± 0.8		
07	7.5 ± 0.8		
10	10.0 ± 0.8		

6. Lead Shape (See Fig. 3)

Code	TYPE	
K	Bulk	Short kink
S		Short Stright
L		Long Stright

7. Lead Length. (L)

Code	Dimension.(mm)		
	K	S	L
05	5.0 ± 0.8	5.0 ± 0.8	-
06	6.3 ± 0.8	6.3 ± 0.8	-
10	10.0 ± 0.8	10.0 ± 0.8	-
25	-	-	25min

HIGH VOLTAGE CERAMIC CAPACITOR



2KV – 40KV

TEMP. Characteristics / Capacitance (Pf)

UR 額定 電壓 (DC)	TEMP/ COF. / CAP. / (PF). 溫度系數及容量							Dmax mm	Tmax mm
	Class I 1類瓷		Class II 2類瓷						
	SL	NPO	Common D.F.			Low D.F.			
			2B ₄ (Y5P)	2E ₄ (Z5U)	2F ₄ (Z5V)	Y5U	2R ₄ (Y5R)		
1KV	10-100	10-39	100-470	1000	1500	-	-	6	3.5
	120-220	47-32	560-1000	2200	3300	-	100-560	8	
	240-470	100-120	1500-2200	5600	10000	-	680-1000	10	
	560	-	2700-3300	10000	-	-	1200-1500	12	
	-	-	4700-6800	-	22000	-	1800	14	
	-	-	10000	22000	-	-	-	16	
2KV	10-68	56-68	100-560	1000-1500	1500-2200	4700	100-330	8	3.5
	82-150	82	1000-1500	2200	3300-4700	-	470-560	10	
	180-270	100-120	2200-2700	3300	5600-8200	-	680-1000	12	
	330-390	-	3300-3900	4700-6800	10000	-	1200-1500	14	
	470-560	-	4700	10000	-	-	1800	16	
	-	-	-	-	22000	-	-	18	
3KV	56-100	20-39	100-220	100-390	680-1000	-	-	8	4
	120-150	47-56	270-470	470-560	2200-3300	-	330-470	10	
	180	68-82	560-820	680-1000	4700-5600	-	560-680	12	
	200-270	100	1000-1500	1500-2200	8200	-	820-1000	14	
	300-390	-	1800-2200	3300-3900	10000	-	1500	16	
	470	-	2700-3300	4700	-	-	-	18	
6.3KV	-	-	100-470	220-680	1000	-	-	10	7
	-	-	680-820	1000	1500	-	-	12	
	-	-	1000	1500	1800	-	-	14	
	-	-	1500	1800	2200	-	-	16	
	-	-	1800	2200	3300	-	-	18	
10KV	-	-	150-220	330	470	-	-	10	7.5
	-	-	330	470-680	1000	-	-	14	
	-	-	-	1000	-	-	-	16	
	-	-	1000	-	2200	-	-	18	
15KV	-	-	100-150	330	470	-	-	10	10
	-	-	220-330	470-1000	680	1000	-	12	
	-	-	470	680	-	-	-	14	
	-	-	680	-	1000	-	-	18	
20KV	-	5.1	100	560	-	-	-	10.3	14
	-	8.2	200	560	-	-	-	13.6	
	-	12	330	820	-	2000	-	16.7	
	-	18	470	1000	-	-	-	18.3	
	-	22	560	1200	-	3000-4700	-	19.9	
	-	33	680	1500	-	3000	-	21.5	
	-	39	820	1800	-	-	-	23.1	
	-	47	910	2700	-	-	-	24.7	
	-	68	1200	3300	-	-	-	28.5	
	-	82	1800	4700	-	-	-	34.6	

HIGH VOLTAGE CERAMIC CAPACITOR



2KV – 40KV

TEMP. Characteristics / Capacitance (Pf)

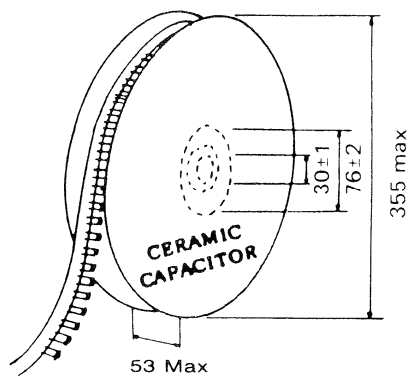
UR	TEMP/ COF. / CAP. / (PF). 溫度系數及容量							Dmax mm	Tmax mm
額定 電壓 (DC)	Class I 1類瓷		Class II 2類瓷						
	SL	NPO	Common D.F.			Low D.F.			
			2B ₄ (Y5P)	2E ₄ (Z5U)	2F ₄ (Z5V)	Y5U	2R ₄ (Y5R)		
25KV	-	3.8	75	470	-	-	-	10.3	14
	-	6.2	150	470	-	-	-	13.6	
	-	10	220	680	-	-	-	16.7	
	-	15	330	820	-	-	-	18.3	
	-	18	470	1000	-	1000	-	19.9	
	-	27	630	1200	-	-	-	21.5	
	-	33	750	1500	-	-	-	23.1	
	-	39	820	2200	-	-	-	24.7	
	-	56	1000	2700	-	-	-	28.5	
	-	68	1500	3300	-	-	-	34.6	
30KV	-	3.2	68	330	-	-	-	10.3	15
	-	5	100	390	-	-	-	13.6	
	-	8.2	110	560	-	-	-	16.7	
	-	12	220	680	-	-	-	18.3	
	-	15	330	820	-	2000	-	19.9	
	-	22	520	1000	-	-	-	21.5	
	-	27	680	1200	-	-	-	23.1	
	-	33	750	1800	-	3000	-	24.7	
	-	47	910	2200	-	-	-	28.5	
	-	56	1200	2700	-	-	-	34.6	

Customer design available upon request.

T/REEL

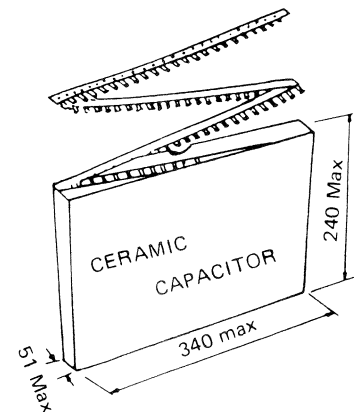
2,500pcs/Reel

5,000pcs/Box



T/BOX

2,000pcs/Box

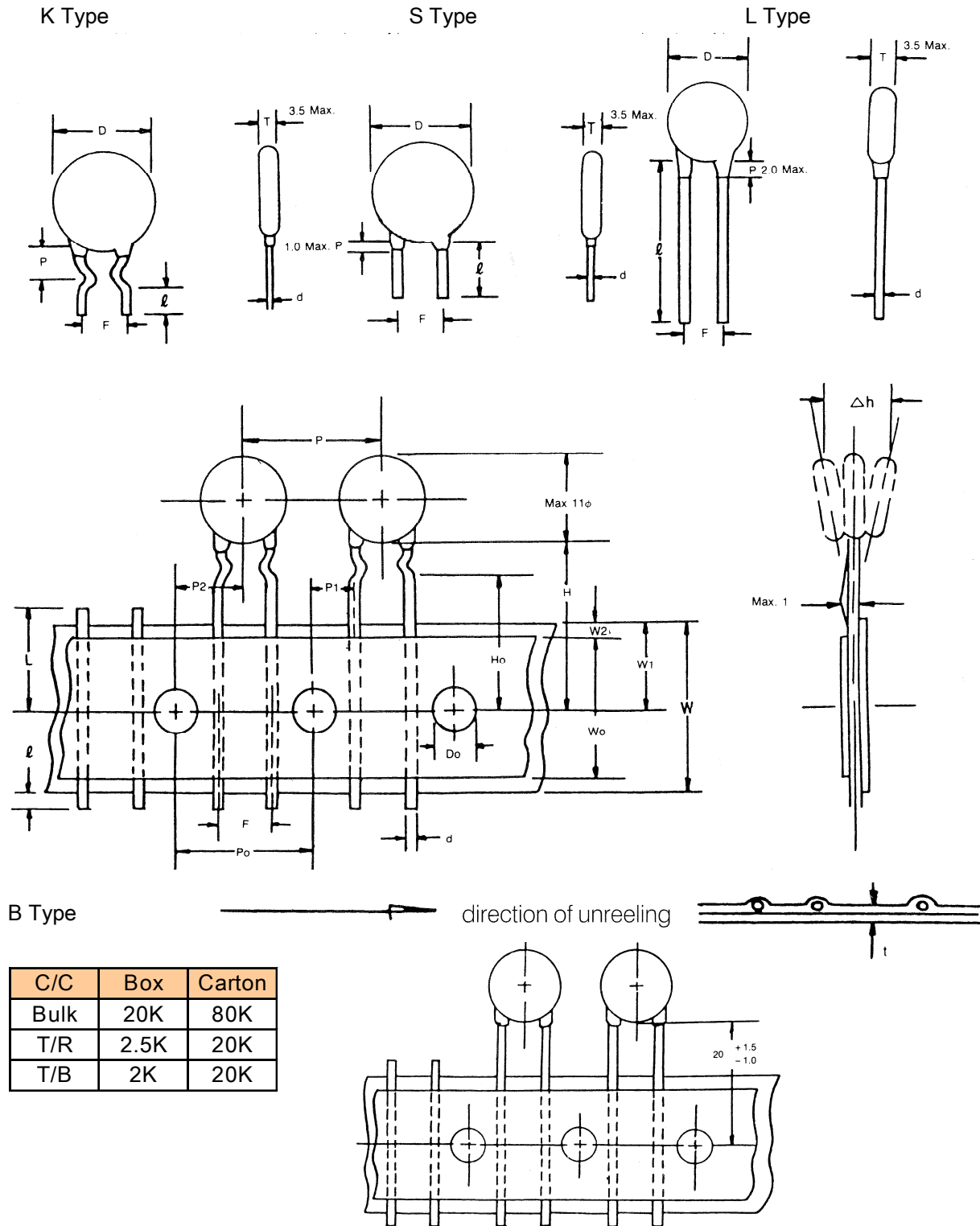


HIGH VOLTAGE CERAMIC CAPACITOR



2KV – 40KV

Fig. 3 Lead Shape



Unit: mm

Symbol	P	P ₀	P ₁	P ₂	d	F	Δh	W	W ₀	W ₁	W ₂	l	D ₀	t	L	H	H ₀
Dimension	12.7	12.7	3.85	6.35	0.6	5	0	18	12.5	9	3	2	4	0.7	11	20	16
Tolerance	±1	±0.3	±0.7	±1.3	+0.06 -0.05	±0.8	±2	+1 -0.5	Min.	+0.75 -0.5	Max.	Max.	±0.3	±0.2	Max.	+1.5 -1.0	±0.5

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