




# SPECIFICATION

## CD Series (Y1-Series)

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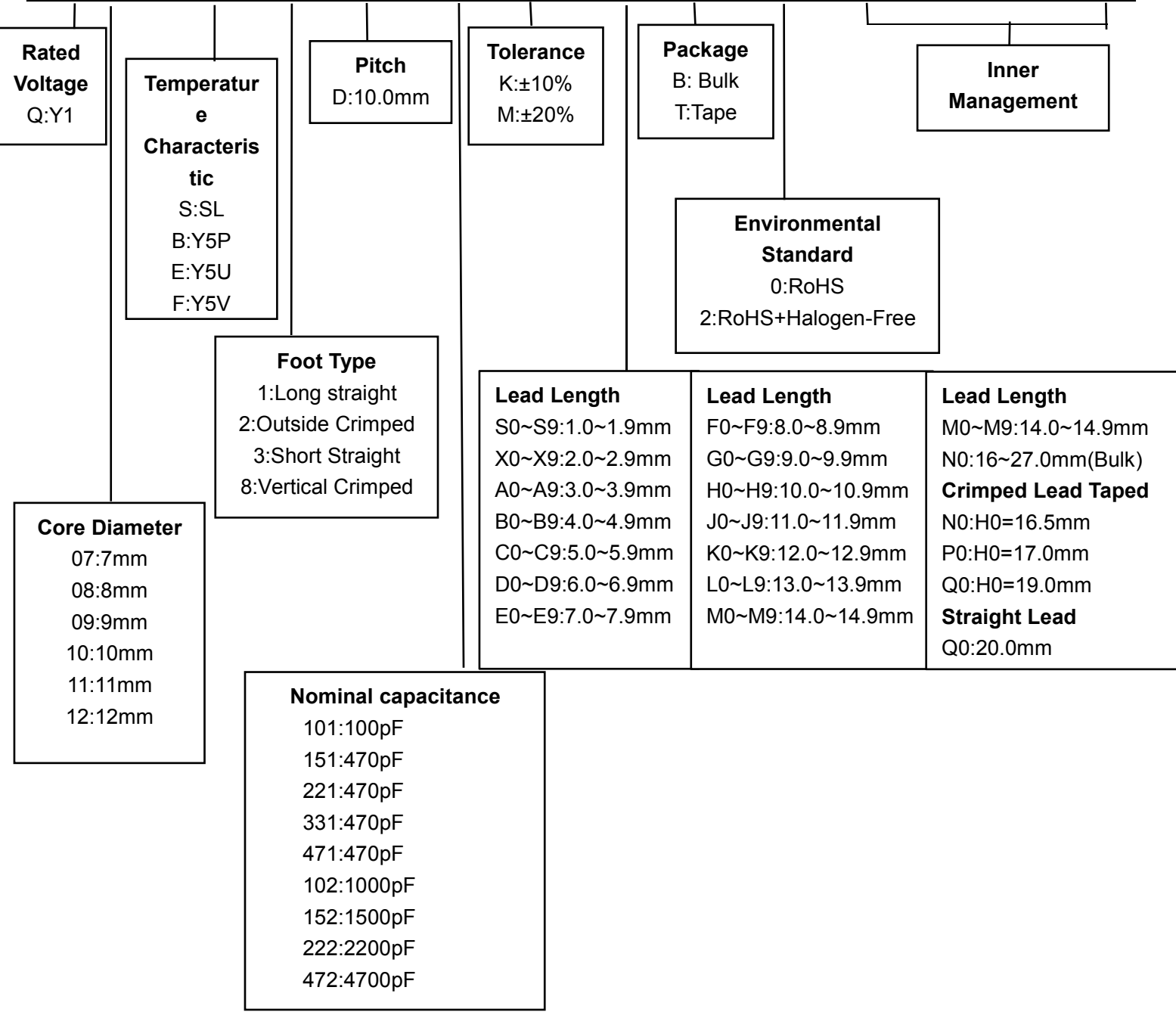
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## 1. Applications

Can be used for power supply noise suppression circuit in cross connection and bypass. It is a primary and secondary coupling X/Y capacitor used as AC line filter and switching power supply and AC converter.

## 2. Part Number Code

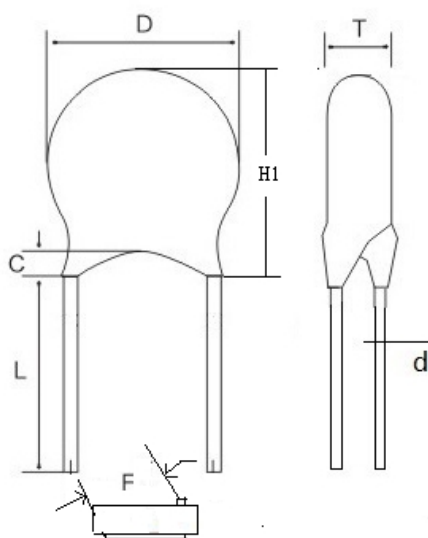
Q	09	F	1	D	222	M	N0	B	0	S	0	N	0
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### 3. Electrical Characteristics

Capacitance and Dissipation factor testing condition	SL: 25°C, 1MHz, 1Vrms Y5P/Y5U/Y5V:25°C, 1KHz, 1Vrms
Dissipation Factor(tanδ)	S(SL): D.F.≤0.15% B(Y5P), E(Y5U), F(Y5V): D.F.≤2.5%
Rated Voltage	400VAC
Withstand Voltage	4000VAC
Insulation Resistance (I.R.)	≥10000MΩ
Temperature Characteristic	SL, Y5P, Y5U, Y5V

### 4. Dimensions

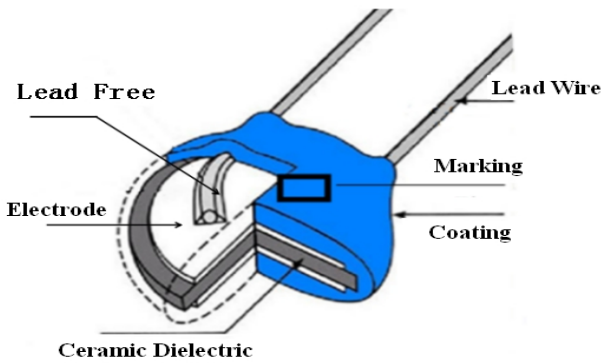


PN of STE	Dimension (mm)							Marking	Packing
	D Max	T Max	L Min	F±0.8	Φd±0.05	H1 Max	c Max		
Q07B1D101KN0B0 S0N0	7.0	4.0	16.0	10.0	0.6	9.5	2.5	Example 2	Bulk
Q07B1D221KN0B0 S0N0	7.0	5.0	16.0	10.0	0.6	9.5	2.5	Example 2	Bulk
Q08B1D331KN0B0 S0N0	8.5	5.0	16.0	10.0	0.6	11.0	2.5	Example 2	Bulk
Q09B1D471KN0B0 S0N0	9.0	5.0	16.0	10.0	0.65	11.5	2.5	Example 1	Bulk

### Safety Standard Certified Ceramic Capacitors-CD Series (Class Y1)









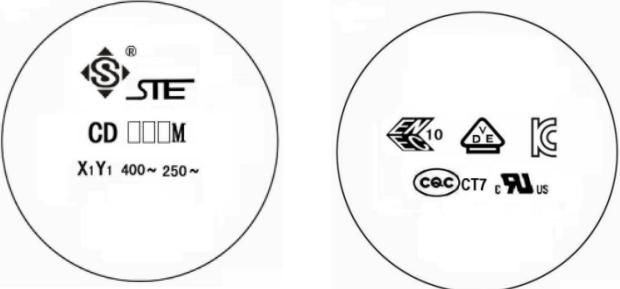
<b>Q12B1D102KN0B0 S0N0</b>	12.0	5.5	16.0	10.0	0.65	15.0	3.0	Example 1	Bulk
<b>Q07E1D331KN0B0 S0N0</b>	7.0	5.0	16.0	10.0	0.6	9.5	2.5	Example 2	Bulk
<b>Q07E1D471KN0B0 S0N0</b>	7.0	5.0	16.0	10.0	0.6	9.5	2.5	Example 2	Bulk
<b>Q08E1D102MN0B0 S0N0</b>	8.0	5.0	16.0	10.0	0.6	10.5	2.5	Example 2	Bulk
<b>Q10E1D152MN0B0 S0N0</b>	10.0	5.0	16.0	10.0	0.65	12.5	2.5	Example 1	Bulk
<b>Q11E1D222MN0B0 S0N0</b>	11.0	5.0	16.0	10.0	0.65	14.0	3.0	Example 1	Bulk
<b>Q08F1D152MN0B0 S0N0</b>	8.0	5.0	16.0	10.0	0.6	10.5	2.5	Example 2	Bulk
<b>Q09F1D222MN0B0 S0N0</b>	9.0	5.0	16.0	10.0	0.65	11.5	2.5	Example 1	Bulk
<b>Q07B1D101KQ0T0 S0N0</b>	7.0	4.0	/	10.0	0.6	9.5	2.5	Example 2	Taping
<b>Q07B1D151KQ0T0 S0N0</b>	7.0	4.0	/	10.0	0.6	9.5	2.5	Example 2	Taping
<b>Q07B1D221KQ0T0 S0N0</b>	7.0	5.0	/	10.0	0.6	9.5	2.5	Example 2	Taping
<b>Q07E1D331KQ0T0 S0N0</b>	7.0	5.0	/	10.0	0.6	9.5	2.5	Example 2	Taping
<b>Q08E1D102MQ0T0 S0N0</b>	8.0	5.0	/	10.0	0.6	10.5	2.5	Example 2	Taping
<b>Q09F1D222MQ0T0 S0N0</b>	9.0	5.0	/	10.0	0.65	11.5	2.5	Example 1	Taping
<b>Q12F1D472MQ0T0 S0N0</b>	12.0	5.5	/	10.0	0.65	15.0	3.0	Example 1	Taping

## 5. Internal Structure

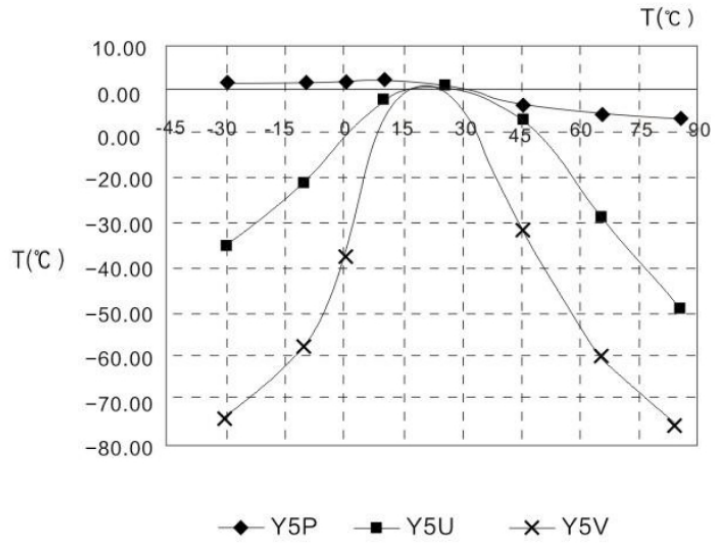
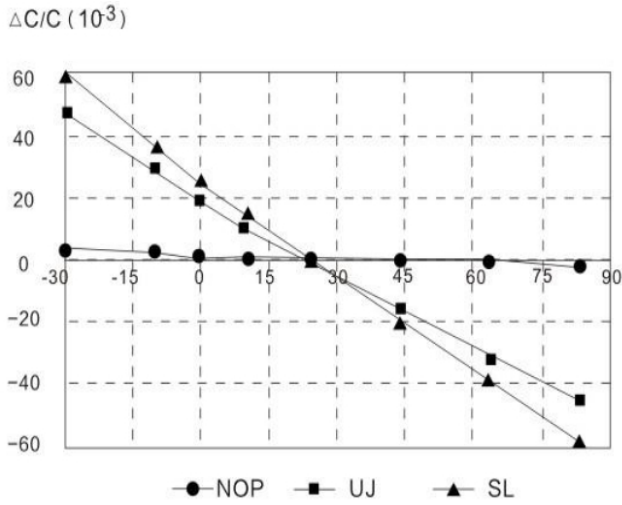


No.	Name	Material	Note
1	Electrode	Metal Layer	
2	Ceramic Dielectric	Ceramic	
3	Lead Free	Tin Bar	
4	Lead Wire	CP wire	
5	Coating	Epoxy Resin	Color:Blue
6	Marking	Laser marking	

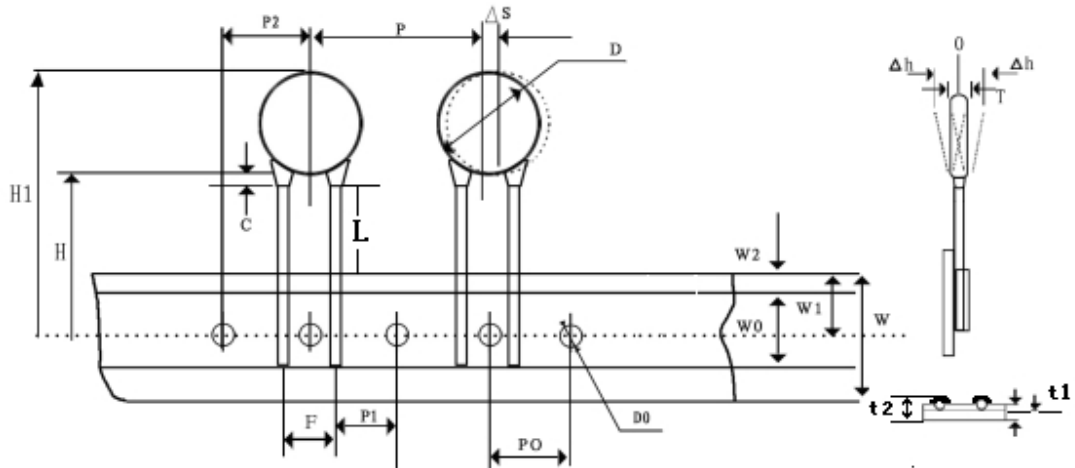
## 6. Marking

	①Registered Trademark			
	②CD	Type (CD:Y1)		
	③Nominal Capacitance	□□□		
	④Capacitance Tolerance	M (±20%)		
	⑤Safety Certification Sign	ENEC(EU)		
		VDE		
		KTL		
CQC				
UL				
⑥Rated Voltage	400V~(400VAC)			
⑦Sub-Class of Safety Performance	X1 Y1			
<b>Example 1: Y1 Single Sided Printing</b>		<b>Example 1: Y2 Double Sided Printing</b>		
				

## 7. Temperature Characteristic Curves



## 8. Taping And Dimensions



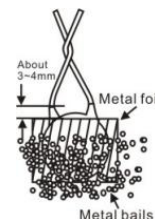
Code	$P_0$	$P$	$P_1$	$P_2$	$F$	$\Delta S$	$\Delta h$	$W$	$W_0$
Size(mm)	12.7	25.4	7.7	12.7	10.0	0	0	17.0	10.5
Tolerance	$\pm 0.3$	$\pm 1.0$	$\pm 0.7$	$\pm 1.3$	$\pm 0.8$	$\pm 2.0$	$\pm 2.0$	+1.5/-1.0	Max
Code	$W_1$	$W_2$	$H_1$	$D_0$	$H$	$L$	$t_1$	$t_2$	$c$
Size(mm)	9.0	3.0	45.0	4.0	20.0	11.0	0.5	1.7	2.5
Tolerance	+0.75/-0.5	Max	Max	$\pm 0.2$	+1.5/-1	Max	$\pm 0.2$	Max	Max

## 9. Safety Certificate

Country	Certification Body	Report Reference	Certificate No.	Capacitance Range	Rated Voltage
USA Canada	UL CUL	UL60384-14	E208107	10~4700pF	X1Y1: 400VAC
Korea	KTL	K60384-14 (2015)	SU03031-19001A	100~4700pF	
China	CQC	GB/T 6346.14-2015	CQC19001213616	10~4700pF	
Germany	VDE	En 60384-14: 2017-04	40025754	10~4700pF	
EU	ENEC	En 60384-14: 2017-04	40025754	10~4700pF	

## 10. Performance Test Methods And Requirements

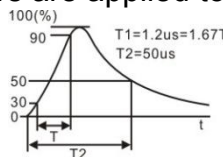
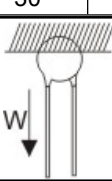
No.	Item	Standard	Test Method
1	Temperature Range	-25°C ~ 125°C	/
2	Appearance/Size	No opparent defect,size within the normal range	Capacitors must be visually inspect to check if there's opparent defect and measure size with vernier caliper
3	Marking	Clear and easy to recognize	Visual inspection
4	Capacitance	Within the specified tolerance	S(SL): 25 ° C, 1 ± 0.1 MHz, 1.0 V B(Y5P), E(Y5U), F(Y5V): 25 ° C, 1 ± 0.1 KHz, 1.0 V.
5	D.F.	S(SL): D.F.≤0.15% B(Y5P), E(Y5U), F(Y5V): D.F.≤2.5%	
6	I.R.	>10000MΩ	500VDC, 60s±5s .
7	Dielectric Strength	Between Leads	No breakdown and flashover Between terminals: AC4000V (r.m.s.), 60s, ≤50mA
		Between Leads and Body	No breakdown and flashover As shown in figure at right,a metal foil should be closely wrapped around the body of the capacitor to the distance of about 3 to 4mm from each terminal.hen,the capacitor should be inserted into a container filled with metal balls of about 1mm diameter.voltage applied AC4000V(r.m.s.),60s





## 11. Reliability Test Methods And Requirements

No.	Item	Standard	Test Method												
1	Temperature Characteristics	Char. Capacitance change	<p>The capacitance measurement should be made at each step specified in Table 3 &lt; Table 3&gt;</p> <table border="1"> <thead> <tr> <th>Step</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>Temperature (°C)</td> <td>20 ±2</td> <td>-25 ±2</td> <td>20 ±2</td> <td>85 ±2</td> <td>20 ±2</td> </tr> </tbody> </table>	Step	1	2	3	4	5	Temperature (°C)	20 ±2	-25 ±2	20 ±2	85 ±2	20 ±2
		Step		1	2	3	4	5							
		Temperature (°C)		20 ±2	-25 ±2	20 ±2	85 ±2	20 ±2							
		S(SL)		+140~-1000ppm/°C											
		B(Y5P)		±10%											
		E(Y5U)		+22/-56%											
F(Y5V)	+30/-80%														
Temperature range: -25 ~+85°C															
2	Solderability	Lead wire should be soldered with uniform coating on the axial direction over 95% of the circumferential direction.	245±3°C, 3±0.3s. Solder composition: Sn96.5Ag3.0Cu0.5												
3	Solder Resistance Heat Up	Appearance	No marked defect												
		Capacitance change	Within ±10%												
		I.R.	≥1000MΩ												
		Dielectric Strength	Per 10.1 [Basic characteristics] item7												
			260 ± 5°C, 10.0 ± 0.5 s.												
4	Vibration	Appearance	No visible damage												
		Capacity	Within the tolerance												
		D.F.	S(SL): D.F.≤5% B(Y5P)/E(Y5U)/F(Y5V): D.F.≤2.5%												
			10~55Hz, 0.75mm, 10Hz→55Hz→10Hz. 1min Apply for a total of 6 hours, 2 hrs each in 3 mutually perpendicular directions.												
5	Humidity (Under Steady State)	Appearance	No visible damage												
		Capacity Rate of Change	S(SL)/B(Y5P)/ E(Y5U)/F(Y5V): ≤±15%												
		I.R.	>5000MΩ												
		Withstand Voltage	Per 10.1 [Basic characteristics] item7												
			40±2°C, 90-95%RH, 500±12 hours.												

No.	Item	Standard	Test Method																										
6	Humidity Loading	Appearance	No visible damage																										
		Capacitance Change	S(SL)/B(Y5P)/E(Y5U)/F(Y5V): ≤±15%																										
		I.R.	>5000MΩ																										
		Dielectric Strength	Per 10.1[Basic characteristics] item7																										
40±2°C, 90~ 95% RH, Apply with U <sub>R</sub> ,500±12 hours.																													
7	Life Test	Appearance	No visible damage																										
		Capacitance change	Within ±20%																										
		I.R.	>5000MΩ																										
		Dielectric Strength	Per 10.1[Basic characteristics] item7																										
Impulse Voltage: 8KVDC,three times. After the capacitors are applied to life test. 																													
125+2/-0°C,relative humidity of 50% max, 1000 hours,1.7*U <sub>R</sub> (r.m.s.), except that once each hour the voltage is increased to AC1000V(r.m.s.) for 0.1 sec.																													
8	Passive Flammability	The burning time shall not be exceeded the standard. The tissue paper shall ignite.																											
		The Varistor under test shall be held in the flame in the position which best promotes burning. Each specimen shall be exposed once in the flame. Specifically as follows: level C requirements. <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Class</th> <th colspan="4">Capacitor volume (mm<sup>3</sup>) Apply flame time (S)</th> <th rowspan="2">Maximum burning time (S)</th> </tr> <tr> <th>volume &lt;250</th> <th>250 &lt; volume ≤ 500</th> <th>500 &lt; volume ≤ 1750</th> <th>volume &gt;1750</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>15</td> <td>30</td> <td>60</td> <td>120</td> <td>3</td> </tr> <tr> <td>B</td> <td>10</td> <td>20</td> <td>30</td> <td>60</td> <td>10</td> </tr> <tr> <td>C</td> <td>5</td> <td>10</td> <td>20</td> <td>30</td> <td>30</td> </tr> </tbody> </table>		Class	Capacitor volume (mm <sup>3</sup> ) Apply flame time (S)				Maximum burning time (S)	volume <250	250 < volume ≤ 500	500 < volume ≤ 1750	volume >1750	A	15	30	60	120	3	B	10	20	30	60	10	C	5	10	20
Class	Capacitor volume (mm <sup>3</sup> ) Apply flame time (S)				Maximum burning time (S)																								
	volume <250	250 < volume ≤ 500	500 < volume ≤ 1750	volume >1750																									
A	15	30	60	120	3																								
B	10	20	30	60	10																								
C	5	10	20	30	30																								
9	Robustness of Termination	Tensile Strength	Lead wire should not be cut off. Capacitor should not be broken.																										
		Bending Strength																											
As shown in the figure at right, 																													
10N, 10±1 sec.  Each lead wire should be subjected to 5N weight and then a 90° bend, at the point of egress, in one direction, return to original position, and then apply a 90° bend in the opposite direction at the rate of one bend in 2 to 3 sec.																													

No.	Item	Standard	Test Method															
10	Rapid Temperature Changes	Appearance	No visible damage															
		Capacitance Rate of Change	S(SL)/B(Y5P)/E(Y5U): ±20%; F(Y5V): ±30%。															
		D.F.	S(SL)/B(Y5P)/E(Y5U): D.F.≤5.0% F(Y5V): D.F.≤7.5%															
		I.R.	>5000MΩ															
		Withstand Voltage	Per 10.1[Basic characteristics] item7															
			Capacitors should be tested in the order shown in the following table (for one cycle) for five consecutive cycles. Temperature cycling <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Order</th> <th>(°C)</th> <th>(min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25 +0/-3</td> <td>30</td> </tr> <tr> <td>2</td> <td>+25 +0/-3</td> <td>3</td> </tr> <tr> <td>3</td> <td>125 +3/-0</td> <td>30</td> </tr> <tr> <td>4</td> <td>+25 +0/-3</td> <td>3</td> </tr> </tbody> </table> [Pre-treatment]: Stored at 85 ± 2 ° C , 1 hour and then 24 ± 2 hours before making initial measurements. [Treatment After testing]: Capacitors must be stored at room temperature for 24 ± 2 hours.	Order	(°C)	(min)	1	-25 +0/-3	30	2	+25 +0/-3	3	3	125 +3/-0	30	4	+25 +0/-3	3
Order	(°C)	(min)																
1	-25 +0/-3	30																
2	+25 +0/-3	3																
3	125 +3/-0	30																
4	+25 +0/-3	3																

## 12. Storage Conditions

12.1 Storage Temperature: ≤35°C.

12.2 Relative Humidity: ≤70% RH.

12.3 Keep away from corrosive atmosphere and sunlight.

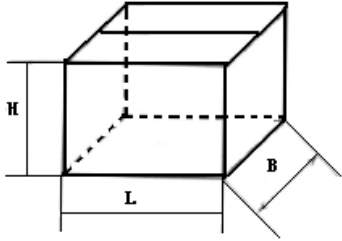
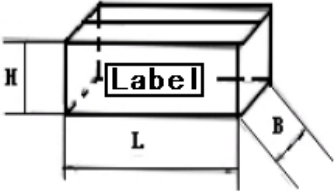
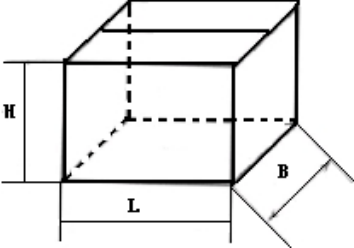
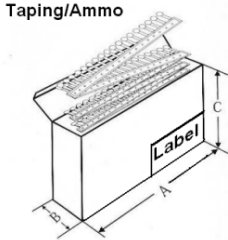
12.4 Period : 1 year.

## 13. Environmental Compliance:

RoHS Compliance

REACH Compliance

## 14. Packaging

External Packaging (Bulk)	Internal Packaging (Bulk)
	
External Packaging (Taping)	Internal Packaging (Taping)
	

Dimension Description (cm)					
External Packaging (Bulk)			Internal Packaging (Bulk)		
L	B	H	L	B	H
41.0	29.0	16.0	18.6	27.3	12.6
External Packaging (Taping)			Internal Packaging (Taping)		
L	B	H	B	A	C
54.0	36.0	26.3	4.4	33.5	26.2

**SPQ Reference Table**

Type	Specification	SPQ Quantity	
Bulk	P=5 B	Long Lead/Short Lead $\Phi \leq 13$	1000
			500
	P=7.5 E	Long Lead/Short Lead $\Phi \leq 8$	1000
		Long Lead/Short Lead $\Phi > 8$	500
	P=10 D	Short lead	1000
		Long Lead	500
		Long Lead $14 \leq \Phi < 17$	250
		Short lead $14 \leq \Phi < 17$	500
		Long Lead/Short Lead $\Phi \geq 17$	250
	Type	Specification	SPQ Quantity
Taping	P=5, $\Phi < 8$	2000	
	P=5, $\Phi 8 \sim 9$ , Thickness $\leq 90$	1500	
	P=7.5	1000	
	P=10	1000	
	Y Ceramic Capacitor	1000	

Note: The above is for reference only, the actual packing number of braided tape shall prevail.