

**Multi-Layer Ceramic Chip Capacitors Specification.**  
**(Reference Only)**

**Customer: AVX/KYOCERA ASIA**

**KYOCERA PART NUMBER**

**CV105X5R475K06AT**

勝特力材料 886-3-5753170  
勝特力电子(上海) 86-21-54151736  
勝特力电子(深圳) 86-755-83298787  
[Http://www.100y.com.tw](http://www.100y.com.tw)

Capacitor Division  
Electronic Components Group  
Kyocera Corporation

PREPD.	CHKD.

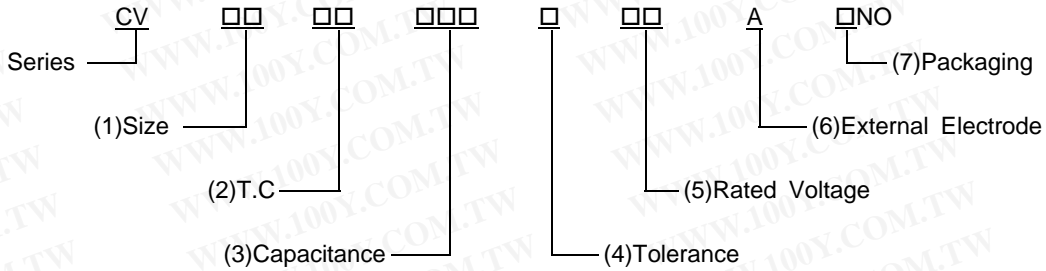




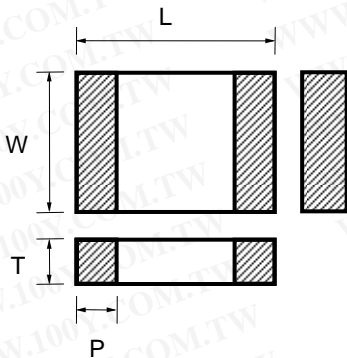
**1.Scope:**

This specification sheet shall be applied to multilayer ceramic chip capacitors;Kyocera CV series.

**2.Nomenclature**



**(1)External Dimensions(Size)**



(unit:mm)

Type	L	W	T	P
105(0603)	1.6±0.15	0.8±0.15	*	0.2~0.6

\*:Refer to Part No.

**(2)Temperature Characteristics**

Characteristics	Applied voltage	Change in capacitance	Operating temperature range	Reference
X5R	No applied voltage	Within +/-15%	-55°C~+85°C	25°C

**(3)Capacitance Value**

Capacitance is identified by three numbers and a letter (see example as follows).  
The first and second digits indicate the first two significant figures, and the final digit is a base 10 logarithmic multiplier in picofarads.

**475(4.7uF)**

**(4) Tolerance**

Code	K
Tolerance	±10%

**(5) Rated Voltage**

Code	06
Voltage	6.3VDC

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**(6) Termination (External Electrode)**

A:NICKEL BARRIER

**(7) Packaging Configuration**

Code	Packaging Configuration	Applying Size
T	Taping(4mm Pitch. φ178 Reel)	Refer to Taping specification

**3.Operating temperature range**

Refer to Item 2-(2)

4.Specifications and Test Methods

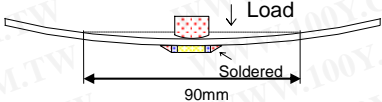
(Table 1-1)

Item		Specification	Measuring Conditions
		X5R	
Temperature Characteristics		Refer to Item 2-(2)	High Temperature Treatment (Table 2) Measuring frequency 1kHz±10% Measuring voltage 0.5±0.2Vrms
Capacitance		Within specified tolerance value	
tanδ		Less than 7.5%	
(*1)Insulation Resistance		10000MΩ or 500MΩ·μF,whichever is less	Measure after charging with the rated voltage within 2minutes at room conditions.
(*1)Dielectric Strength		No problem observed	Applying 1.25 times of the rated voltage for 1 to 5 seconds while charging or discharging current is limited under 50mA.
Appearance		No serious defect	Under Microscope ×10
End Termination adherence		No evidence of peeling on the end termination	After soldering chip capacitors on glass epoxy boards and applying 5N(0.5Kgf) as shown by the arrow mark in the sketch peeling or any sign of peeling should not be found on end terminations. (Refer to Fig.1)
Resistance to Vibration	Appearance	No serious defect	High Temperature Treatment (Table 2) Vibration frequency:10 to 55 (Hz) Swing width:1.5mm Sweep:10→55→10 Hz/1min x,y,z axis 2 hours/each Total 6 hours (Refer to Fig.2)
	Capacitance Variation	Within specified tolerance value	
	tanδ	Satisfies initial specified value	
Resistance to Solder Leaching	Appearance	No serious defect	High Temperature Treatment (Table 2) After dipped molten solder, at 260±5°C for 10±0.5 seconds and kept at room conditions for 48±4 hours, measure and check the specifications. *Pre-heat before immersion 1st: 80°C to 100°C for 120sec. 2st:150°C to 200°C for 120sec.
	Capacitance Variation	Within ±7.5%	
	tanδ	Satisfies initial specified value	
	(*1)Insulation Resistance	10000MΩ or 500MΩ·μF,whichever is less	
	(*1)Dielectric Strength	Resist without problem.	

(\*1)Insulation Resistance/Dielectric Strength;Charging or discharging current for these tests is limited under 50mA.



(Table 1-2)

Item		Specification	Measuring Conditions
		X5R	
Solderability		Coverage $\geq 90\%$ Each termination end	After dipped moltem solder, at $235\pm 5^{\circ}\text{C}$ for $2\pm 0.5$ seconds and cooled gradually at room conditions and check.
Temperature Cycling	Appearance	No serious defect	High Temperature Treatment (Table 2) (Cycle) Room temperature (3 minutes) $\rightarrow$ Lowest operating temperature (30 minutes) $\rightarrow$ Room temperature (3 minutes) $\rightarrow$ Highest operating temperature (30 minutes). After 5 cycles of the above, Keep for after $48\pm 4$ hours at room Conditions then measure. (Refer to Fig.2)
	Capacitance Variation	Within $\pm 7.5\%$	
	tan	Satisfies initial specified value	
	(*1)Insulation Resistance	$10000\text{M}\Omega$ or $500\text{M}\Omega\cdot\mu\text{F}$ , whichever is less	
	(*1)Dielectric Strength	Resist without proble	
Humidity (Steady state)	Appearance	No serious defect	High Temperature Treatment (Table 2) After Exposed to high temperature, $40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and humidity 90 to 95% RH, for $500+24/-0$ hours and keep at room conditions for $48\pm 4$ hours then measure and check the specification limits.
	Capacitance Variation	Within $\pm 12.5\%$	
	tan $\delta$	Less than 2.0 times of the initial value	
	(*1)Insulation Resistance	$1000\text{M}\Omega$ or $50\text{M}\Omega\cdot\mu\text{F}$ , whichever is less	
High Temperature Life Test	Appearance	No serious defect	Voltage Treatment (Table 2) After applying of rated voltage at the highest operation Temperature for $1000+48/-0$ hours, and kept at room conditions for $48\pm 4$ hours. Measure and check the specifications at room conditions.
	Capacitance Variation	Within $\pm 12.5\%$	
	Tan $\delta$	Less than 2.0 times of the initial value	
	(*1)Insulation Resistance	$1000\text{M}\Omega$ or $50\text{M}\Omega\cdot\mu\text{F}$ , whichever is less	
Bending Strength		No mechanical damage	Apply the load as shown; The glass epoxy board is bent up 1mm in 10 sec.  (Refer to Fig.3)

(Table 2)

Initial Treatment	High Temperature Treatment	Keep chip capacitor at $150^{\circ}\text{C} +0/-10^{\circ}\text{C}$ for one hour, Then leave chip capacitor at room temperature and normal humidity for $48\pm 4$ hours.
	Voltage Treatment	Pretreat capacitor for 1 hour at the same condition of the load test, Then leave them at room condition for $48\pm 4$ hrs before beginning the Load test.

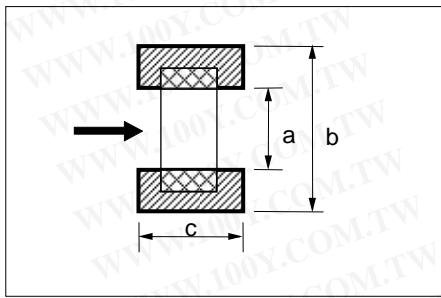


Fig.1 End termination adherence (from side).

Unit:mm

type	a	b	C
105	1.0	3.0	1.2

glass epoxy board

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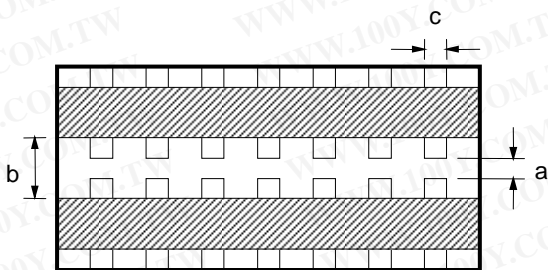


Fig.2 Resistance to vibration, temperature cycling.

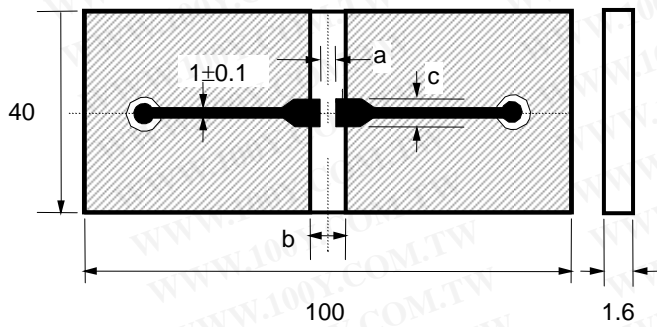
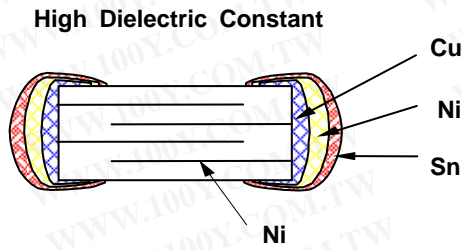


Fig.3 Bend strength.

[Structure]



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[Production facility]

- Kagoshima kokubu plant
- Kagoshima sendai plant
- Hokkaido kitami plant
- Shanghai kyocera electronics

[Working Voltage]

4.5V Max.

**Taping Specification**

**1.Application**

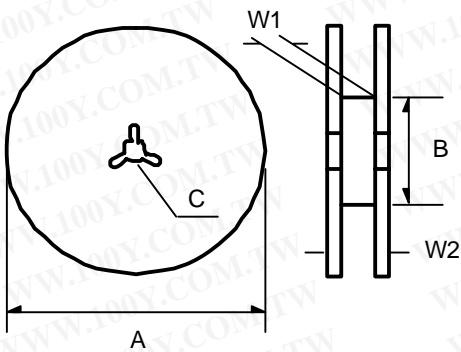
This specification applies to paper carrier tape of Kyocera multi-layer ceramic chip capacitor.

**2.Packing unit**

type	thickness (unit:mm)	material of carrier tape		width of carrier tape		φ178 reel quantity per reel
		paper	Plastic	8mm	12mm	
105	0.8±0.15	O	-	O	-	4000

**3.Shape and dimentions**

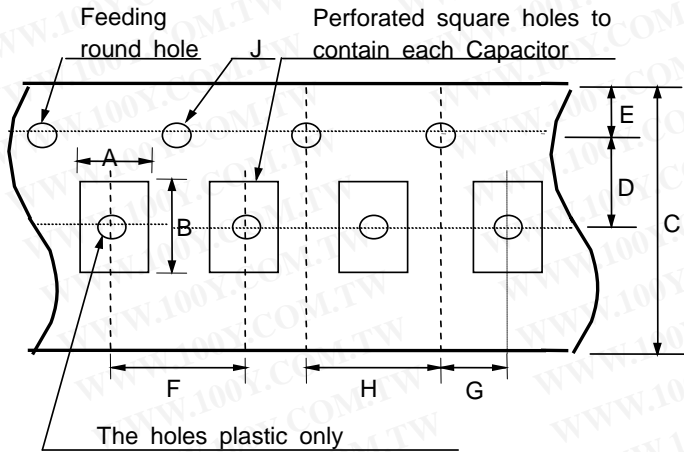
**(1)Reel**



Code	A	B	C	
Dimension	T	φ178±2.0	φ60min	φ13.0±0.5
Code	W1	W2		
Dimension	T	10.0±1.5	16.5max	

Plastic real is used

**(2)Carrier Tape**



(Paper)



(unit:mm)

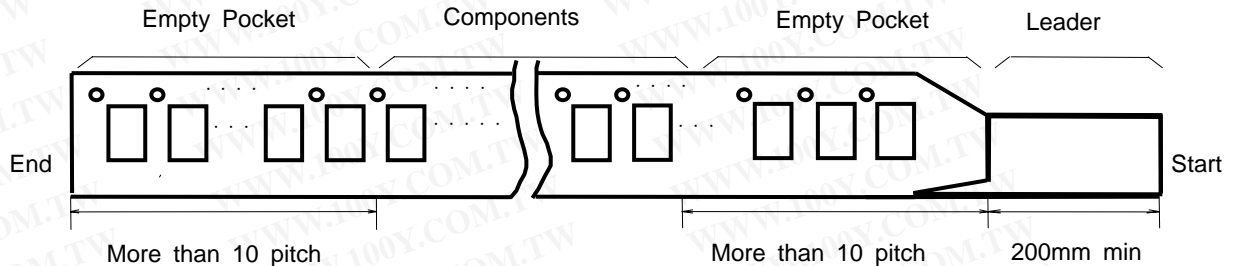
Code	A	B	C	D	E	F	G	H	J
Tolerance	±0.2	±0.2	±0.3	±0.05	±0.1	±0.1	±0.05	±0.1	+0.1/-0
Type	105	1.8	8.0	3.5	1.75	4.0	2.0	4.0	φ1.5



#### 4.Packing method

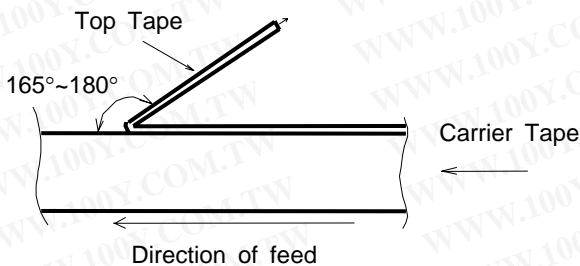
##### (1)Details of leader and trailer

- ①The tape will have a empty pocket at the leader and trailer of carrier tape.
- ②The tape end will not be stucked by glue in order to make it easier to peel off from reel.
- ③The feeding round hole will be on the right side against t leading direction.



##### (2)Heat pressure tape

- ①Peeling strength to be 10~70g when peeling off the top tape by following method.
- ②When peeling top tape off, the glue will be stuck to the top tape side.
- ③Chip capacitor will not stuck on heat pressure tape and will be free in the cavity.



The peel-off angle:165~180 degree against the surface of carrier tape.  
 The peel-off speed:300mm/min.

##### (3)Carrier tape

- ①Chip will not fall off from carrier tape or carrier tape will not be damaged by bending than within aradius of 15mm.
- ②The chip are inserted continuously without any empty pocket.
- ③Chip will not be mis-mounted because of too big clearance between components and cavity. Also the waste of carrier tape will not fill a nozzle hole of mouting machine.

#### 5.Indication and packing

- ①There will be following indication on one side of the reel: "PART NUMBER","LOT NUMBER", "QUANTITY","DATE OF MANUFACTURE","CUSTOMER'S NAME"
- ②There will be following indication on the reel box: "PART NUMBER","LOT NUMBER", "QUANTITY OF REEL","DATE OF MANUFACTURE","CUSTOMER'S NAME"
- ③We adequately pack the box to prevent chip capacitor from any mechanical damage during transportation.