



Multilayer Ceramic Capacitors

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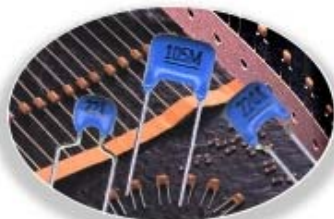
Applications

Package

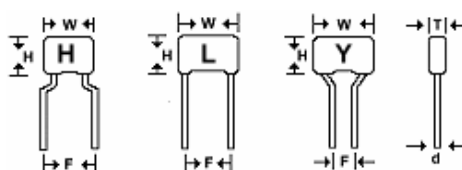
NP0 : Temperature compensation type, with little or no change in capacitance with variation in temperature. hence, they are used in radio-frequency oscillators, precision timing circuits, ultrastable amplifiers, etc.

X7R : Temperature stable type for by-pass and decoupling in radio and television receivers, computer, servo systems, audio tone, and and coupling, etc... where moderate capacitance variations are permissible and dissipation factor is not critical.

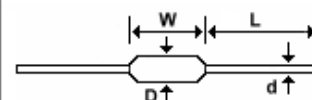
Z5U / Y5V : General type for by-pass and filtering application.



RADIAL



AXIAL



SIZE	LEAD STYLE	Capacitance Range				Dimension (mm)				
		NP0	X7R	Z5U	Y5V	W Max.	H Max.	T Max.	d +- 0.05	F +- 0.8
RD15	L	10 ~1500pF	220pF~0.1uF	0.01~0.22uF	0.01~0.33uF	4.0	4.0	2.2	0.5	2.54
	H					4.0	6.0	2.5	0.5	5.08
RD20	Y	1800~5600pF	0.1~0.27uF	0.33~1.0uF	0.47~1.0uF	5.5	6.0	3.0	0.5	2.54
	H					5.5	6.0	3.0	0.5	5.08
RD30	Y			1.0~1.8uF	1.0~4.7uF	7.0	7.5	3.8	0.5	5.08
	L					7.0	7.5	3.8	0.5	5.08
AX15		10~1000pF	220pF~0.1uF	0.01~0.22uF	0.01~0.22uF	W Max.	D Max.	L Min.	d +-0.05	
						5.0	3.0	20.0	0.5	



Performance Specifications

NP0[Back](#)**Capacitance Test at 25°C**

Measured at 1 VRMS max. at 1 MHz (1 KHz for more than 1000 pF)

Capacitance Tolerances

C = + - 0.25pF **D** = + - 0.50pF **F** = + - 1%
G = + - 2% **J** = + - 5% **K** = + - 10%

Operating Temperature Range

-55°C to + 125°C

Temperature Coefficient $\Delta C = 0 \pm 30 \text{ ppm/}^\circ\text{C}$ **Voltage Ratings**

50 & 100 Vdc

Dissipation Factor / Q Value

DF = 0.1% max. or **Q** : $\geq 400 + 20C$ Less than 30 pF
Q : ≥ 1000 30pF and over

Insulation Resistance

100G or 1000ohmF minimum, whichever is less. The apply rated voltage for
max.of 2 min. with 50 mA limiting current at 25 ° C

Dielectric Strength

250% of rated Vdc for 5s with charging current less than 50 mA

Solderability

75% min. covered with smooth and bright solder coating under
230 + - 5°C solder bath for 4 + - 1s dipping time

Resistance to Leaching

20% of the metallization of the head face may be missing under
260 + - 5°C solder bath for 30 + - 1.0s dipping time.

Aging Rate

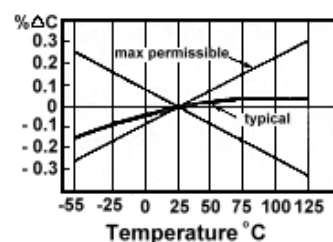
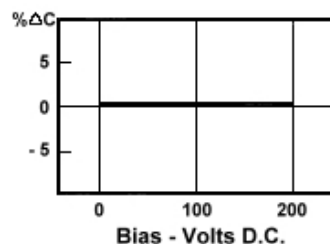
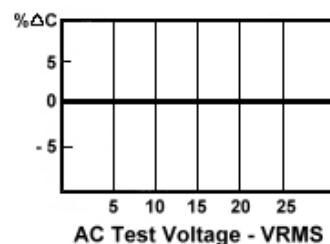
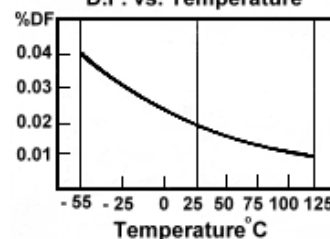
0% per decade hour

Load Life

200% rated voltage at +125°C for 1000hours,
Measurement shall be taken after 24 hrs stabilization.

 $\Delta C : < + - 3 \% \text{ or } + - 0.3\text{pF} \text{ whichever is less}$ **Q** : ≥ 350 for more than 30 pF $\geq 275 + 2.5C$ for 30 pF > C > 10pF $\geq 200 + 10C$ for less than 10 pF**IR** : $\geq 1\text{Gohm}$ or 50 ohmF whichever is less**Humidity Test**

500 hours at 40 + - 2°C under 90 to 95% humidity.
Measurement shall be taken after 24 hrs stabilization.

 $\Delta C : < + - 5 \% \text{ or } + - 0.5\text{pF} \text{ whichever is less}$ **Q** : ≥ 350 for more than 30 pF $\geq 275 + 2.5C$ for 30 pF > C > 10pF $\geq 200 + 10C$ for less than 10 pF**IR** : $\geq 1\text{Gohm}$ or 50 ohmF whichever is less**Temperature Coefficient****D.F. vs. Temperature**



Performance Specifications

X7R

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Capacitance Test at 25°C

Measured at 1 VRMS max. at 1 KHz

Capacitance Tolerances

J = +- 5% **K** =+- 10% **M** = +-20%

Operating Temperature Range

-55°C to +125°C

Temperature Coefficient

ΔC =+- 15% max.

Voltage Ratings

16 ,25 , 50 &100 Vdc

Dissipation Factor / Q Value

DF= 2.5% max. for 25V ,50V ,& 100V

DF= 3.5% max. for 16 V

Insulation Resistance

100G or 1000ohmF minimum, whichever is less. The apply rated voltage for max. of 2 min. with 50 mA limiting current at 25°C

Dielectric Strength

250% of rated Vdc for 5s with charging current less than 50 mA

Solderability

75% min. covered with smooth and bright solder coating under 230 +- 5°C solder bath for 4 +- 1s dipping time

Resistance to Leaching

20% of the metallization of the head face may be missing under 260 +-5°C solder bath for 30 +- 1.0s dipping time.

Aging Rate

3.0% per decade hour

Load Life

200% rated voltage at +125°C for 1000hours, Measurement shall be taken after 24 hrs stabilization.

ΔC : <+-12.5%

DF : <5%

IR : >=1Gohm or 50 ohmF whichever is less

Humidity Test

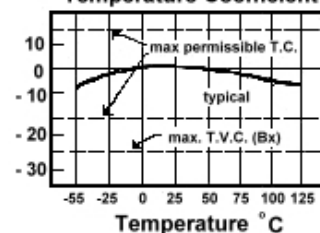
500 hours at 40 +- 2°C under 90 to 95% humidity. Measurement shall be taken after 24 hrs stabilization.

ΔC : <+-12.5%

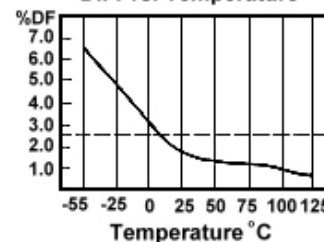
DF : <5%

IR : >=1Gohm or 50 ohmF whichever is less

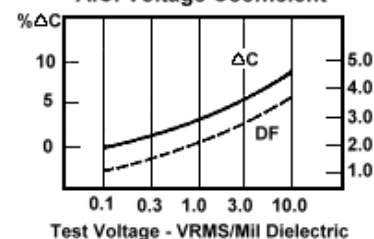
Temperature Coefficient



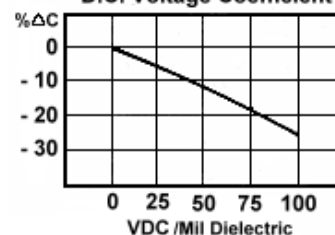
D.F. vs. Temperature



A.C. Voltage Coefficient



D.C. Voltage Coefficient





Performance Specifications

Y5V[Back](#)**Capacitance Test at 25 °C**

Measured at 1 VRMS max. at 1 KHz

Capacitance Tolerances

M = $\pm 20\%$ **Z** = $-20\% \sim +80\%$

Operating Temperature Range

-30°C to $+85^{\circ}\text{C}$

Temperature Coefficient

$\Delta C = +22\% \sim -82\%$

Voltage Ratings

16, 25 & 50 Vdc

Dissipation Factor / Q Value

DF = 5.0% max. for 25 V & 50V.

DF = 7.0% max. for 16 V.

Insulation Resistance

10G or 500ohm F minimum, whichever is less. The apply rated voltage for max. of 2 min. with 50 mA limiting current at 25°C

Dielectric Strength

250% of rated Vdc for 5s with charging current less than 50 mA

Solderability

75% min. covered with smooth and bright solder coating under $230 \pm 5^{\circ}\text{C}$ solder bath for 4 ± 1 s dipping time

Resistance to Leaching

20% of the metallization of the head face may be missing under $260 \pm 5^{\circ}\text{C}$ solder bath for 30 ± 1 0s dipping time.

Aging Rate

7% per decade hour

Load Life

200% rated voltage at $+85^{\circ}\text{C}$ for 1000hours, Measurement shall be taken after 24 hrs stabilization.

$\Delta C : < \pm 30\%$

DF : $< 7.5\%$ for 25 V

IR : $\geq 1\text{Gohm}$ or 50 ohmF whichever is less

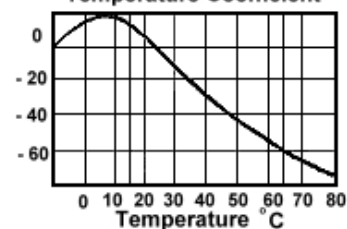
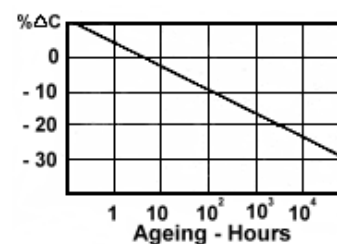
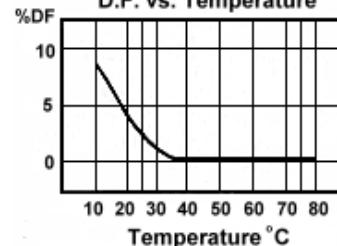
Humidity Test

500 hours at $40 \pm 2^{\circ}\text{C}$ under 90 to 95% humidity. Measurement shall be taken after 24 hrs stabilization.

$\Delta C : < \pm 30\%$

DF : $< 7.5\%$

IR : $\geq 1\text{Gohm}$ or 50 ohmF whichever is less

Temperature Coefficient**D.F. vs. Temperature****D.C. Voltage Coefficient**