

## Specification and Test Methods

No. Test Item	Specification	Test Method
1 Visual inspection & dimensional check	No defects or abnormality.	Under microscope(40X) (All sorted)
2 Flash	No evidence of damage or flash over during testing.	250% of rated voltage for 1 to 5 secs. Charging & discharging Current less than 50 mA. (All tested)
3 Dielectric strength (BDV)	$\geq 350\%$ of rated voltage.	Under 20 mA, applying voltage gradually to break down. (Sampling)
4 Solderability	95% min.coverage of all metalized area.	Solder temperature: $240 \pm 5^{\circ}\text{C}$ Dipping time: $3 \pm 1\text{sec}$ Solder: lead-free complied (Sampling)
5 Resistance to soldering heat	No remarkable visual damage. Cap change: $-5\% \leq C \leq 10\%$ D.F.&I.R.:To meet initial standard value.	Solder temperature: $260 \pm 5^{\circ}\text{C}$ Dipping time: $30 \pm 1\text{sec}$ Solder: lead free Measurement, to be made after Keeping at room temperature for $24 \pm 2\text{hours}$ . (Sampling)
6 Capacitance	Shall not exceed the limits given in the detailed spec. (Consult spec for the measurement on high value capacitors)	COG-1KHz and 1Vrms if $C > 1000\text{pF}$ 1Mhz and 1Vrms if $C \leq 1000\text{pF}$ X7R-1KHz and 1Vrms Y5V-1KHz and 1Vrms Z5U-1KHz and 0.5Vrms
7 Dissipation factor (Tan or Q)	NPO: $C > 30\text{pF}, Q \geq 400 + 20XC$ $C > 30\text{pF}, Q \geq 1000$ X5R/X7R:DF $\leq 2.5\%$ (50V,100V), $\leq 3.5\%$ (25, 16V) For 6.3V, $\leq 5\%$ ( $C < 3.3\mu\text{F}$ ), $\leq 10\%$ ( $C > 3.3\mu\text{F}$ ) Y5V:DF $\leq 5\%$ (50V),DF $\leq 5\%$ ( $C < 10\mu\text{F}$ ), $\leq 10\%$ ( $C > 10\mu\text{F}$ ) For 16V, $\leq 7\%$ ( $C < 1\mu\text{F}$ ), $\leq 9\%$ ( $C > 1\mu\text{F}$ ); $\leq 12.5\%$ (10V)	Measured under the same condition as the capacitance. (All tested)
8 Insulation resistance	more than $10\text{G}\Omega$ or $500\text{M}\Omega/\text{C}(\mu\text{F})$ whichever is less	Rated voltage for 120 secs., $\leq 50\text{mA}, 25^{\circ}\text{C}$ (All tested)
9 Temperature coefficient	NPO:within $\pm 30\text{ppm}$ X7R/X5R:within $\pm 15\%$ Y5V:within $+22\%, -82\%$ Z5U:within $+22\%, -56\%$	NPO/X7R/With no electrical load- $55^{\circ}\text{C} \sim +125^{\circ}\text{C}$ X5R with no electrical load- $55^{\circ}\text{C} \sim +85^{\circ}\text{C}$ Y5V:With no electrical load- $30^{\circ}\text{C} \sim +85^{\circ}\text{C}$ Z5U:With no electrical load- $10^{\circ}\text{C} \sim +85^{\circ}\text{C}$ (Sampling)
10 Aging rate	NPO:No Cap.Change X7R/X5R:Cap.Change less than 3% decade. Y5V:Cap.Change Less than 7% decade. Z5U:Cap.Change less than 5% decade.	Testing temperature: $25^{\circ}\text{C}$ without electrical load. (Sampling)
11 Highly accelerated life test NPO:the rest conforms to:	Cap.Change: $\leq \pm 3.0\%$ or $\leq 0.3\text{pF}$ , whichever is larger More than $30\text{pF}, Q \geq 350$ $30\text{pF} > C > 10\text{pF}, Q \geq 275 + (2.5 \times \text{cap.value})$ Less than $10\text{pF}, Q \geq 200 + (10 \times \text{cap.value})$ I.R.: $\geq 1\text{G}\Omega$ or $\geq 50\Omega\text{-F}$ whichever is smaller.	Testing temperature: $125 \pm 3^{\circ}\text{C}$ 200% of rated voltage Testing time $\geq 24\text{hours}$ Measurement to be made after keeping at room temperature for $24 \pm 2\text{ hours}$ . (Sampling)
X7R:the rest conforms to:	Cap.Change: $\leq \pm 15\%$ DF value $\leq 5\%$ I.R.: $\geq 1\text{G}\Omega$ or $\geq 50\Omega\text{-F}$ whichever is smaller.	
Y5V:the rest conforms to:	Cap Change: $\leq \pm 30\%$ DF value $\leq 10\%$ I.R.: $\geq 1\text{G}\Omega$ or $\geq 50\Omega\text{-F}$ whichever is smaller.	
Z5U:the rest conforms to :	Cap.Change: $\leq \pm 30\%$ DF value $\leq 7.5\%$ I.R.: $\geq 1\text{G}\Omega$ or $\geq 50\Omega\text{-F}$ whichever is smaller.	