GENERAL SPECIFICATIONS

Working Voltage:
C0G 50, 100, 200, 500, 1k, 2k, 3k, 4k, 5k, 7.5k, 10k, 15k, 20k
X7R 50, 100, 200, 500, 1k, 2k, 3k, 4k, 5k, 7.5k, 10k, 15k, 20k, 30k, 40k, 50k
X5U 3k, 4k, 5k, 7.5k, 10k, 15k, 20k

Temperature Characteristics:
C0G 0 + 30 PPM / °C from - 55°C to + 125°C (1)
X7R + 15% from - 55°C to + 125°C
X5U + 22%, -56% from -55°C to + 85°C

Capacitance Tolerance:
C0G +0.5pF, +1%, +2%, +5%, +10%
X7R ±5%, ±10%, ±20%, +80% / -20%, +100% / -0%
X5U ±5%, ±10%, ±20%, +80% / -20%, +100% / -0%

Construction:
Epoxy encapsulated - meets flame test requirements of UL Standard 94V-0.
High-temperature solder - meets EIA RS-198, Method 302, Condition B (260°C for 10 seconds)

Termination Material:
Check individual Series: Part Number and Ordering Information for Termination Materials offered in each series.

Solderability:
MIL-STD 202, Method 208
(Test Method: ANSI/J-STD-002)
Test A for through-hole mount and surface mount leaded.
Test B for surface mount leadless components.

Terminal Strength:
MIL-STD 202, Method 208, Condition A (2.3kg or 5 lbs)

Resistance to Solvents:
MIL-STD 202, Method 215

Resistance to Soldering Heat:
MIL-STD 202, Method 210, Test Condition C

ELECTRICAL

Capacitance @ 25°C:
Within specified tolerance and following test conditions per MIL-STD 202, Method 305.
C0G, X7R & X5U
> 100pF with 1.0 vrms @ 1 kHz with 1.0 vrms
< 100pF with 1.0 vrms @ 1 MHz with 1.0 vrms

Dissipation Factor @ 25°C:
Same test conditions as capacitance.
C0G - 0.15% maximum
X7R - 2.5% maximum
X5U - 2.5% maximum

Insulation Resistance @25°C:
MIL-STD 202, Method 302
C0G & X7R:
100 gigohm or 1 gigohm x uF, whichever is less.
<500V test @ rated voltage, >1kV test @ 500V.

X5U:
10 gigohm or 100 megohm x uF, whichever is less.
<500V test @ rated voltage, >1kV test @ 500V.

Dielectric Withstanding Voltage:
MIL-STD 202, Method 301
<200V test @ 250% of rated voltage
500V to 1250V test @ 150% of rated voltage
>1251V test @ 120% of rated voltage

ENVIRONMENTAL

Vibration:
MIL-STD 202, Method 204, Condition D (20g)

Shock:
MIL-STD 202, Method 213, Condition I (100g)

Life Test:
MIL-STD 202, Method 108

<200V
C0G - 200% rated voltage @ +125°C
X7R - 200% rated voltage @ +125°C

>500V
C0G - rated voltage @ +125°C
X7R - rated voltage @ +125°C
X5U - rated voltage @ +85°C

Post Test Limits @ 25°C are:
Capacitance Change:
C0G (< 200V) - +3% or 0.25pF, whichever is greater.
C0G (> 500V) - +3% or 0.50pF, whichever is greater.
X7R - + 20% of initial value (2)
Dissipation Factor:
C0G - 0.25% maximum
X7R & X5U - 3.0% maximum
Insulation Resistance:
C0G & X7R:
100 gigohm or 1 gigohm x uF, whichever is less.
<500V test @ rated voltage, >1kV test @ 500V.

X5U:
10 gigohm or 100 megohm x uF, whichever is less.
<500V test @ rated voltage, >1kV test @ 500V.

Moisture Resistance:
MIL-STD 202, Method 106
Post Test Limits @ 25°C are:
Capacitance Change:
C0G (< 200V) - +3% or 0.25pF, whichever is greater.
C0G (> 500V) - +3% or 0.50pF, whichever is greater.
X7R - + 20% of initial value (2)
Dissipation Factor:
C0G - 0.25% maximum
X7R & X5U - 3.0% maximum
Insulation Resistance:
C0G & X7R:
100 gigohm or 1 gigohm x uF, whichever is less.
<500V test @ rated voltage, >1kV test @ 500V.

X5U:
10 gigohm or 100 megohm x uF, whichever is less.
<500V test @ rated voltage, >1kV test @ 500V.

Thermal Shock:
MIL-STD 202, Method 107, Condition A
C0G & X7R: -55°C to 125°C
X5U: -55°C to 85°C

(1) +53 PPM -30 PPM/ °C from +25°C to -55°C, + 60 PPM below 10pF.
(2) X7R & X5U dielectrics exhibit aging characteristics; therefore, it is highly recommended that capacitors be deaged for 2 hours at 150°C and stabilized at room temperature for 48 hours before capacitance measurements are made.