



# High Capacitance Value MLC - X7R & X5R



NOVACAP offers RoHS Compliant, High Capacitance Value MLC capacitors in values up to 100 Microfarads. This product is ideal to replace tantalum and Low ESR electrolytic capacitors without polarity concerns. The low ESR characteristics allow for comparable circuit designs to be achieved at typically one-third to one-fifth of the capacitance values. Parts are suitable for reflow soldering process. Applications include digital circuits, power supply bypass capacitor, LCD modules, smoothing capacitors, Input/Output filters in DC-DC Converters.

## DIMENSIONS

SIZE	0402	0603	0805	1206	1210	1812
<b>LENGTH L</b>	.040 (1.02)	.063(1.60)	.080 (2.03)	.126 (3.20)	.126 (3.20)	.180 (4.57)
<b>WIDTH W</b>	.020 (.508)	.032 (.813)	.050 (1.27)	.063 (1.62)	.100 (2.54)	.125 (3.18)
<b>T MAX.</b>	.024 (.610)	.035 (.889)	.054 (1.37)	.072 (1.83)*	.085 (2.16)*	.110 (2.79)*
<b>MB</b>	.010 (.254)	.014 (.356)	.020 (.508)	.020 (.508)	.024 (.607)	.035 (.889)
<b>LENGTH</b>	.004 (.102)	.006 (.152)	.008 (.203)	.008 (.203)	.012 (.305)	.016 (.406)
<b>WIDTH</b>	.004 (.102)	.006 (.152)	.008 (.203)	.008 (.203)	.012 (.305)	.012 (.305)
<b>MB</b>	.004 (.102)	.010 (.254)	.010 (.254)	.012 (.305)	.012 (.305)	.020 (.508)

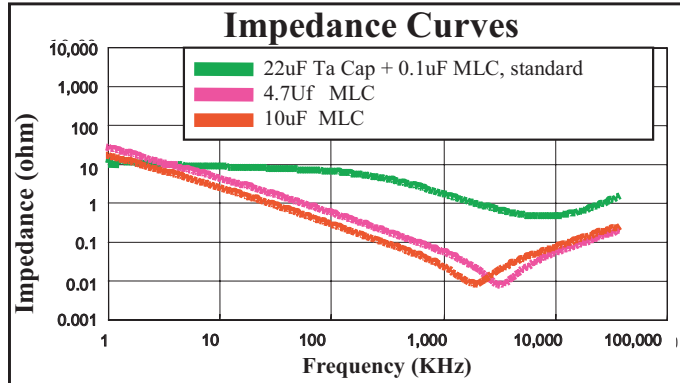
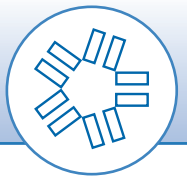
Dimensions in inches; bracketed dimensions in millimeters.

	X7R	X5R	X7R	X5R	X7R	X5R	X7R	X5R	X7R	X5R	X7R	X5R
Cap & Tolerance	682K	104K	104K	104K	154K	224K	474K	105K	105K	225M	105K	.
Voltage	25V	25V	50V	50V	50V	50V	50V	25V	100V	35V	100V <sup>1</sup>	.
Cap & Tolerance	103K	224K	333K	154K	334K	474K	684K	335K	225K	475K	225K	.
Voltage	25V	16V	16V	25V	35V	50V	35V	25V	100V	25V	100V <sup>1</sup>	.
Cap & Tolerance	153K	474K	473K	224K	105K	225K	105K	475K	105K	106M	.	.
Voltage	16V	10V	16V	25V	25V	25V	35V	25V	50V	50V <sup>1</sup>	.	.
Cap & Tolerance	223K	105K	683K	334K	474K	475K	334K	106K	225M	226M	.	.
Voltage	16V	10V	16V	25V	16V	16V	25V	25V	25V	16V <sup>1</sup>	.	.
Cap & Tolerance	333K	.	104K	474K	684K	106K	684K	225K	335M	476M	.	.
Voltage	16V	.	16V	25V	16V	16V	25V	16V	25V	10V <sup>1</sup>	.	.
Cap & Tolerance	473K	.	224K	105K	105K	335K	225K	226M	106K	107M	.	.
Voltage	16V	.	16V	25V	16V	10V	25V	10V	25V <sup>1</sup>	6.3V <sup>1</sup>	.	.
Cap & Tolerance	104K	.	105K	684K	225K	226M	335K	685K	475M	.	.	.
Voltage	16V	.	16V	10V	16V	6.3V	16V	6.3V	16V	.	.	.
Cap & Tolerance	.	.	.	225K	.	.	475K	476M	106M	.	.	.
Voltage	.	.	.	10V	.	.	10V	6.3V	10V	.	.	.
Cap & Tolerance	.	.	.	335K	.	.	106K	107M	.	.	.	.
Voltage	.	.	.	6.3V	.	.	10V	4.0V	.	.	.	.
Cap & Tolerance	.	.	.	475M	.	.	.	.	.	.	.	.
Voltage	.	.	.	6.3V	.	.	.	.	.	.	.	.
Cap & Tolerance	.	.	.	106M	.	.	.	.	.	.	.	.
Voltage	.	.	.	4.0V	.	.	.	.	.	.	.	.

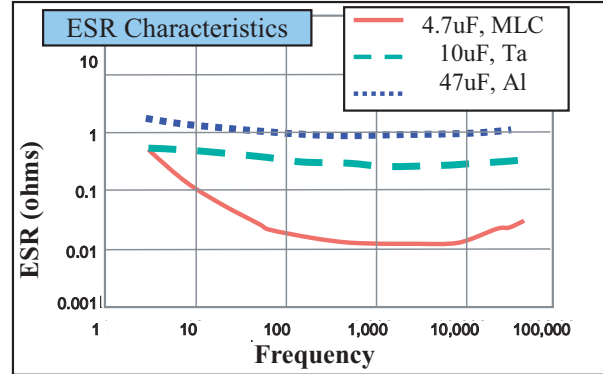
### Notes:

\* Denotes maximum thickness (Tmax). An X072 (1206), X085 (1210), X110 (1812) is required in the part number when ordering. (ie. 1206B474K500NX072T or 1210B475M160NX085T) or 1812B225K101NX110T)

<sup>1</sup> Thickness Maximum (Tmax) is .110" (2.79 mm) - (ie. 1210B106K250NX110T)



TYPICAL DATA



TYPICAL DATA

## DIELECTRIC CHARACTERISTICS - X7R

OPERATING TEMPERATURE RANGE:	-55°C to 125°C
TEMPERATURE COEFFICIENT (X7R):	+/-15% ΔC Max.
DISSIPATION FACTOR:	3.5% max Except: 0805 ≥ 1.0μF = 5% 1206 ≥ 4.7μF = 5% 1206 ≥ 22μF = 10% 1210 ≥ 10μF = 5%
INSULATION RESISTANCE, 25°C	> 10GΩ or >500ΩF whichever is less
DIELECTRIC WITHSTANDING VOLTAGE:	250%
TEST PARAMETERS, 25°C	1KHz, 1.0 +/- 0.2 VRMS

## DIELECTRIC CHARACTERISTICS - X5R

OPERATING TEMPERATURE RANGE:	-55°C to 85°C
TEMPERATURE COEFFICIENT (X5R):	+/-15% ΔC Max.
DISSIPATION FACTOR:	5% max Except: 0603 ≥ 2.2μF = 10% 0805 ≥ 10μF = 10% 1206 ≥ 22μF = 10% 1210 ≥ 47μF = 10% 1812 at 100μF = 10%
INSULATION RESISTANCE, 25°C	> 10GΩ or >500ΩF whichever is less
DIELECTRIC WITHSTANDING VOLTAGE:	250%
TEST PARAMETERS, 25°C	1KHz, 1.0 +/- 0.2 VRMS Except: 22μF, 47μF and 100 μF 120 Hz, 0.5 +/- 0.1 VRMS

## HOW TO ORDER

1206	W	476	M	6R3	N	X072	T	
<b>SIZES</b>	<b>DIELECTRIC</b>	<b>CAPACITANCE</b>	<b>TOLERANCE</b>	<b>VOLTAGE-VDCW</b>	<b>TERMINATION</b>	<b>THICKNESS OPTION</b>	<b>PACKING OPTION</b>	
0402	B = X7R	Value in Picofarads	K = +/- 10 %	160 = 16V	N = Nickel Barrier	X= Denotes thickness maximum	T= Reeled	
0603	W = X5R	Two significant figures, followed by number of zeros:	M = +/- 20 %	250 = 25V	(100% Tin)	(Tmax), See NOTES on previous page for further explanation.	(Blank)= Bulk	
0805				500 = 50V	Y = Nickel Barrier			
1206				100 = 10V	(90% Tin/10% Lead)			
1210			47,000,000 pF		6R3 = 6.3V	NG =Nickel Barrier		
1812			476 = 47μF		4R0 = 4.0V	Gold Flash		