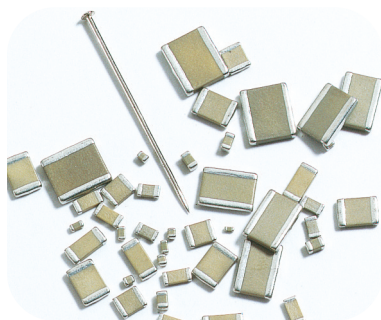




# Z5U & Y5V DIELECTRICS



General purpose EIA Class III dielectrics with +22% to -56% (Z5U) and +22% -82% (Y5V) temperature coefficients and very high capacitance density. The NOVACAP Z5U and Y5V formulations are very stable with time, typically aging less than 2% per decade. General purpose chips are used in by-pass and decoupling functions and other applications where capacitance change over the operating temperature range is not critical.

Note: Flexicap® is the preferred termination for Class III Z5U and Y5V dielectrics to reduce the chance of mechanical cracking due to board flexure.

## COMMERCIAL SMT CHIPS CAPACITANCE & VOLTAGE SELECTION

3 digit code: two significant digits, followed by number of zeros eg: 473 = 47,000 pF

### Z5U / Y5V DIELECTRIC

MAX CAP & VOLTAGE

SIZE	0402	0504	0603	0805	1005	1206	1210	1808	1812	1825	2221	2225
Min Cap	121	121	121	471	681	681	681	222	332	103	103	103
16V	563	474	334	125	185	225	475	565	106	226	186	226
25V	473	394	224	105	155	225	395	395	685	186	156	226
50V	333	224	154	684	105	185	335	335	565	156	126	186
100V	103	823	563	224	334	474	105	105	185	395	395	475
200V	682	223	153	563	823	154	334	334	564	155	155	185
250V	222	183	123	473	683	104	224	224	394	105	105	125

## HOW TO ORDER (Z5U/Y5V)

1206	Y	104	M	250	C	X	T	M
<b>SIZE</b> See Chart	<b>DIELECTRIC</b> Y = Y5V Z = Z5U	<b>CAPACITANCE</b> Value in Picofarads Two significant figures, followed by number of zeros: 104=100,000 pF	<b>TOLERANCE</b> M = +/- 20% Z=+80%, -20% P=+100%, -0%	<b>VOLTAGE-VDCW</b> Two significant figures, followed by number of zeros: 250=25V	<b>TERMINATION</b> C=Polymer w/Nickel Barrier (100% Tin) D=Polymer w/Nickel Barrier (90% Tin/10% Lead)	<b>THICKNESS OPTION</b> X=Non-standard thickness. Specify in Mils if non-standard is required. Standard items are any thickness to Max. shown in charts.	<b>PACKING OPTION</b> T = Reeled	<b>MARKING OPTION</b> M = Marked See Marking Specification

NOTE: REFER TO PAGES 10 & 11 FOR ORDERING INFORMATION



# STANDARD SMT CHIP P/N BREAKDOWN

**1206 N 472 J 101 N X050 H T M - HB**

**Case Size**

**Dielectric Code**

Code	EIA	Class
N	COG/NP0	Ultra Stable
B	X7R	Stable
X	BX	MIL
Y	Y5V	General Purpose
Z	Z5U	General Purpose
S	X8R	High Temp up to 150°C
D	COG/NPO	High Temp up to 200°C
E	Class II (Stable)	High Temp up to 200°C
F	160°	High Temp up to 160°C
G	160°	High Temp up to 160°C
W	X5R	Stable
P	85°	Pulse Power
R	200°	Pulse Energy

**Capacitance**

1st two digits are significant, third digit denotes number of zeros, R= decimal

Examples:

1R0 = 1.0 pF      273 = .027 μF  
 120 = 12 pF      474 = 0.47 μF  
 471 = 470 pF      105 = 1.0 μF  
 102 = 1,000 pF

**Capacitance Tolerance**

Code		COG NPO	X7R	BX	Z5U Y5V	X8R 150°C	D/F	E/G	W X5R
Cap Value < 10pF		█							
<b>B</b>	±0.10pF	█							
<b>C</b>	±0.25pF	█							
<b>D</b>	±0.50pF	█							
<b>F</b>	± 1%						█		
<b>G</b>	± 2%						█		
<b>J</b>	± 5%		█	█		█	█		
<b>K</b>	±10%		█				█		█
<b>M</b>	±20%				█				█
<b>Z</b>	+80% -20%								
<b>P</b>	+100%/-0%								

**Marking**

M = Marked  
 None = Unmarked  
 Marking not available on sizes 0603 and below

**Packaging**

T = Tape and Reel  
 W = Waffle Pack  
 None = Bulk

**High Reliability Testing**

H = High Reliability Testing Required  
 None = Standard SMT, no High-Rel  
 HB = MIL-PRF-55681 Group A  
 HK = MIL-PRF-38534 Class K  
 HS = MIL-PRF-123 Group A

**Special Thickness**

X in the part number denotes a special thickness other than standard. Specify in mils if required. (As shown above X=.050")  
 If no X in the part number then thickness is standard per Novacap catalog specifications.

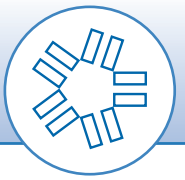
**Termination**

N = Nickel Barrier (100% Tin) (RoHS)  
 P = Palladium Silver  
 PR = Palladium Silver (RoHS)  
 Y = Nickel Barrier (90%Tin/10%Lead)  
 S = Silver  
 C = Polymer with Nickel Barrier (100% Tin) (RoHS)  
 D = Polymer with Nickel Barrier (90%Tin/10%Lead)  
 V = Non-Solderable Silver (RoHS)  
 NG = Nickel Gold

**Voltage**

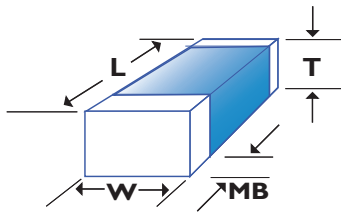
Examples:  
 160 = 16 Volts      102 = 1000 Volts  
 101 = 100 Volts      502 = 5000 Volts  
 501 = 500 Volts      103 = 10,000 Volts

*This ordering information relates to NOVACAP's standard surface mount capacitors. Please refer to the specific catalog pages for ordering information for our application specific products; ie: Stacked, Leaded, Capacitor Arrays, Pulsed Power capacitors and other specialty products.*



## PART NUMBER PREFIX DEFINITIONS

<b>LS</b> = Y3 Certified Safety Capacitor	pg. 38
<b>ES</b> = Y2 Certified Safety Capacitor	pg. 39
<b>AP</b> = Arc Prevention Capacitor	pg. 54
<b>CR</b> = Cap-Rack Capacitor Array	pg. 42 - 43
<b>RC</b> = Bleed Resistor	pg. 34 - 37
<b>RD</b> = Ring Detect Capacitor	pg. 40
<b>ST</b> = Stacked Capacitor Assembly	pg. 54 - 55
<b>SM</b> = Hi-Rel Stacked Capacitor Assembly	pg. 54 - 55



## CODE COMBINATIONS

Dielectric Code	Max. Temp. Rated	Terminations (allowed)
<b>N</b> (COG/NPO)	125°	N, P, Y, S, V, NG, PR
<b>B</b> (X7R)	125°	N, P, Y, C, D, S, V, NG, PR
<b>X</b> (BX)	125°	N, P, Y, C, D, S, V, NG, PR
<b>Y</b> (Y5V)	85°	N, Y, C, D
<b>Z</b> (Z5U)	85°	N, Y, C, D
<b>D</b> (NPO-HIGH TEMP)	200°	P, S, V, PR
<b>E</b> (CLASS II-HIGH TEMP)	200°	P, S, V, PR
<b>F</b> (NPO-HIGH TEMP)	160°	N, P, Y, S, V, C, D, PR
<b>G</b> (CLASS II-HIGH TEMP)	160°	N, P, Y, S, V, C, D, PR
<b>S</b> (X8R)	150°	N, P, Y, S, V, C, D, PR
<b>P</b> (PULSE POWER)	85°	P, PR
<b>R</b> (R2D)	200°	P, PR
<b>W</b> (X5R)	85°	N, Y, NG

DIMENSIONS +/- INCHES (MM)

SIZE	0402	0504	0603	0805	0907	1005	1206	1210	1515	1808	1812	1825
LENGTH L	.040 (.102)	.050 (1.27)	.060 (1.52)	.080 (2.03)	.090 (2.29)	.100 (2.54)	.125 (3.18)	.125 (3.18)	.150 (3.81)	.180 (4.57)	.180 (4.57)	.180 (4.57)
WIDTH W	.020 (.508)	.040 (1.02)	.030 (.762)	.050 (1.27)	.070 (1.78)	.050 (1.27)	.060 (1.52)	.100 (2.54)	.150 (3.81)	.080 (2.03)	.125 (3.18)	.250 (6.35)
T MAX.	.024 (.610)	.044 (1.12)	.035 (.889)	.054 (1.37)	.054 (1.37)	.054 (1.37)	.064 (1.63)	.065 (1.65)	.130 (3.30)	.065 (1.65)	.065 (1.65)	.080 (2.03)
MB	.010 (.254)	.014 (.356)	.014 (.356)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)	.030 (.762)	.024 (.610)	.024 (.610)	.024 (.610)
LENGTH	.004 (.102)	.006 (.152)	.006 (.152)	.008 (.203)	.008 (.203)	.008 (.203)	.008 (.203)	.008 (.203)	.015 (.381)	.012 (.305)	.012 (.305)	.012 (.305)
WIDTH	.004 (.102)	.006 (.152)	.006 (.152)	.008 (.203)	.008 (.203)	.008 (.203)	.008 (.203)	.008 (.203)	.015 (.381)	.008 (.203)	.008 (.203)	.015 (.381)
MB	.006 (.152)	.006 (.152)	.006 (.152)	.010 (.254)	.010 (.254)	.010 (.254)	.010 (.254)	.010 (.254)	.015 (.381)	.014 (.356)	.014 (.356)	.014 (.356)

DIMENSIONS +/- INCHES (MM)

SIZE	2020	2221	2225	2520	3333	3530	4040	4540	5440	5550	6560	7565
LENGTH L	.200 (5.08)	.220 (5.59)	.220 (5.59)	.250 (6.35)	.330 (8.38)	.350 (8.89)	.400 (10.2)	.450 (11.4)	.540 (13.7)	.550 (14.0)	.650 (16.5)	.750 (19.1)
WIDTH W	.200 (5.08)	.210 (5.33)	.250 (6.35)	.200 (5.08)	.330 (8.38)	.300 (7.62)	.400 (10.2)	.400 (10.2)	.400 (10.2)	.500 (12.7)	.600 (15.2)	.650 (16.5)
T MAX.	.180 (4.57)	.080 (2.03)	.080 (2.03)	.180 (4.57)	.250 (6.35)	.250 (6.35)	.300 (7.62)	.300 (7.62)	.300 (7.62)	.300 (7.62)	.300 (7.62)	.300 (7.62)
MB	.024 (.610)	.030 (.762)	.030 (.762)	.030 (.762)	.030 (.762)	.030 (.762)	.040 (1.02)	.040 (1.02)	.040 (1.02)	.040 (1.02)	.040 (1.02)	.040 (1.02)
LENGTH	.015 (.381)	.015 (.381)	.015 (.381)	.015 (.381)	.017 (.432)	.018 (.457)	.020 (.508)	.023 (.584)	.027 (.686)	.028 (.711)	.033 (.838)	.038 (.965)
WIDTH	.015 (.381)	.015 (.381)	.015 (.381)	.015 (.381)	.017 (.432)	.015 (.381)	.020 (.508)	.020 (.508)	.020 (.508)	.025 (.635)	.030 (.762)	.033 (.838)
MB	.014 (.356)	.015 (.381)	.015 (.381)	.015 (.381)	.015 (.381)	.015 (.381)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)