



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
SIZE See Chart	DIELECTRIC Y = Y5V Z = Z5U	CAPACITANCE Value in Picofarads Two significant figures, followed by number of zeros: 104=100,000 pF	TOLERANCE M = +/- 20% Z=+80%, -20% P=+100%, -0%	VOLTAGE-VDCW Two significant figures, followed by number of zeros: 250=25V	TERMINATION C=Polymer w/Nickel Barrier (100% Tin) D=Polymer w/Nickel Barrier (90% Tin/10% Lead)	THICKNESS OPTION X=Non-standard thickness. Specify in Mils if non-standard is required. Standard items are any thickness to Max. shown in charts.	PACKING OPTION T = Reeled	MARKING OPTION 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	Tolerance	COG NPO	X7R	BX	Z5U Y5V	X8R 150°C	D/F	E/G	W X5R
B	±0.10pF	█							
C	±0.25pF	█							
D	±0.50pF	█							
F	± 1%						█		
G	± 2%						█		
J	± 5%		█	█		█		█	
K	±10%								█
M	±20%				█				
Z	+80% -20%								
P	+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.

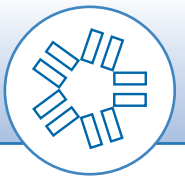
Termination

N = Nickel Barrier (100% Tin) (RoHS)
 P = Palladium Silver
 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
 NG = Nickel Gold

Voltage

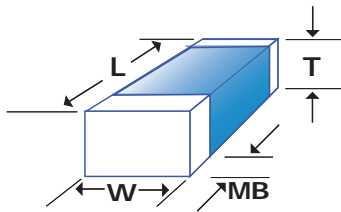
Examples:
 160 = 16 Volts 102 = 1000 Volts
 101 = 100 Volts 502 = 5000 Volts
 501 = 500 Volts 103 = 10,000 Volts

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

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



CODE COMBINATIONS

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

DIMENSIONS +/- INCHES (MM)

SIZE	0402	0504	0603	0805	0907	1005	1206	1210	1515	1808	1812	1825
LENGTH L	.040 (1.02)	.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)