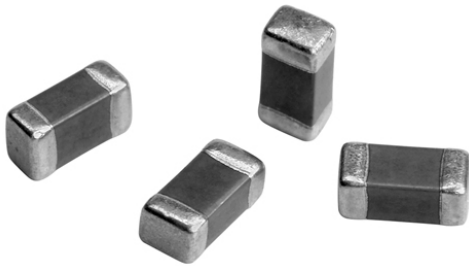


## Surface Mount Multilayer Ceramic Chip Capacitors for Commodity Applications



### FEATURES

- Class 3 dielectric
- Four standard sizes
- High capacitance per unit volume
- Supplied in tape on reel
- For high frequency applications
- Ni-barrier with 100 % tin terminations
- Dry sheet technology process



RoHS  
COMPLIANT

### APPLICATIONS

- Consumer electronics
- Telecommunications
- Data processing
- Mobile applications

### ELECTRICAL SPECIFICATIONS

**Note:** Electrical characteristics values - temperature at 20 °C, unless otherwise specified

**Operating Temperature:** - 25 °C to + 85 °C

**Capacitance Range:** 100 pF to 4.7 μF

**Voltage Rating:** 10 Vdc to 100 Vdc

**Temperature Coefficient of Capacitance (TCC):**

+ 30 %/- 80 % without voltage applied

**Dissipation Factor (DF):**

**6.3 V:** ≤ 20 %

**10 V:** ≤ 12.5 %

**16 V:** for Cap < 1 μF ≤ 7.0 %

≤ 9 % for 0402 ≥ 0.068 μF; 0603 ≥ 0.68 μF

**16 V:** for Cap ≥ 1.0 μF ≤ 9 %

≤ 12.5 % for 0805 ≥ 4.7 μF; 1206 ≥ 10 μF

**25 V:** ≤ 5 %

≤ 7 % for 0402 ≥ 0.047 pF; 0603 ≥ 0.1 μF; 0805 ≥ 0.33 μF; 1206 ≥ 1 μF

≤ 9 % for 0402 ≥ 0.068 μF; 0603 ≥ 0.47 μF; 1206 ≥ 4.7 μF

≥ 50 V: ≤ 5.0 %

≤ 7 % for 0603 ≥ 0.1 μF; 0805 ≥ 0.47 μF

**Aging Rate:**

6.3 V: 12.5 % maximum per decade

10 V/16 V: 9 % maximum per decade

≥ 25 V: 7 % maximum per decade

**Insulation Resistance (IR):**

10 GΩ or 500 ΩF whichever is less

**Dielectric Withstanding Voltage (DWV):**

This is the maximum voltage the capacitors are tested for 1 to 5 s period and the charge/discharge current does not exceed 50 mA

≤ 50 Vdc: DWV at 250 % of rated voltage

100 Vdc: DWV at 300 % of rated voltage

### DIMENSIONS in inches [millimeters]

	SIZE CODE	L	W	T MAX.	MB
	0402 (1005)	0.040 ± 0.002 [1.0 ± 0.05]	0.020 ± 0.002 [0.5 ± 0.05]	0.022 [0.55]	0.010 + 0.002/- 0.004 [0.25 + 0.05/- 0.10]
	0603 (1608)	0.063 + 0.006/- 0.004 [1.6 + 0.15/- 0.10]	0.030 + 0.006/- 0.004 [0.8 + 0.15/- 0.10]	0.038 [0.95]	0.015 ± 0.006 [0.40 ± 0.15]
	0805 (2012)	0.080 ± 0.008 [2.0 ± 0.20]	0.050 ± 0.008 [1.25 ± 0.20]	0.058 [1.45]	0.020 ± 0.008 [0.50 ± 0.20]
	1206 (3216)	0.125 + 0.012/- 0.004 [3.2 + 0.30/- 0.10]	0.063 + 0.012/- 0.004 [1.6 + 0.30/- 0.10]	0.075 [1.90]	0.025 ± 0.008 [0.60 ± 0.20]

### ORDERING INFORMATION

VJ0402	V	103	M	X	Q	C	W1BC
SIZE CODE	DIELECTRIC	CAPACITANCE	TOLERANCE	TERMINATION	VOLTAGE	PACKAGING	PROCESS CODE FOR BASIC COMMODITY
0402 0603 0805 1206	V = Y5V	two significant digits followed by the number of zeros: 103 = 10 000 pF	M = ± 20 % Z = - 20/+ 80 %	X = Ni-Barrier	Y = 6.3 V Q = 10 V J = 16 V X = 25 V A = 50 V B = 100 V	C = 7" reel/paper P = 13" reel/paper T = 7" reel/blister R = 13" reel/blister	

# VJ...W1BC Y5V Dielectric

Vishay

Surface Mount Multilayer Ceramic Chip Capacitors  
for Commodity Applications



SELECTION CHART																					
DIELECTRIC		Y5V																			
EIA CAP CODE	EIA CAP	0402					0603					0805					1206				
		6.3V	10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	10V	16V	25V	50V
102	1000 pF																				
122	1200																				
152	1500																				
182	1800																				
222	2200																				
272	2700																				
332	3300																				
392	3900																				
472	4700																				
562	5600																				
682	6800																				
822	8200																				
103	0.01 µF		N	N	N	N		S	S	S	S		A	A	A	A	B	B	B	B	B
123	0.012		N	N	N	N		S	S	S	S		A	A	A	A		B	B	B	B
153	0.015		N	N	N	N		S	S	S	S		A	A	A	A	B	B	B	B	B
183	0.018		N	N	N	N		S	S	S	S		A	A	A	A		B	B	B	B
223	0.022		N	N	N	N		S	S	S	S		A	A	A	A	B	B	B	B	B
273	0.027		N	N	N	N		S	S	S	S		A	A	A	A		B	B	B	B
333	0.033		N	N	N	N		S	S	S	S		A	A	A	A	B	B	B	B	B
393	0.039		N	N	N			S	S	S	S		A	A	A	A		B	B	B	B
473	0.047		N	N	N			S	S	S	S		A	A	A	A	B	B	B	B	B
563	0.056		N	N	N			S	S	S	S		A	A	A	A		B	B	B	B
683	0.068		N	N	N			S	S	S	S		A	A	A	A	B	B	B	B	B
823	0.082		N	N	N			S	S	S	S		A	A	A	A		B	B	B	B
104	0.1 µF	N	N	N	N			S	S	S	S		A	A	A	A	B	B	B	B	B
154	0.15		N					S	S	S	S		A	A	A	A		B	B	B	C
224	0.22		N					S	S	S			A	A	A	A		B	B	B	C
334	0.33	N	N					S	S	S			B	B	B	B		B	B	B	B
474	0.47	N	N					S	S				B	B	B	B		B	B	B	B
684	0.68	N						S	X				B	B	D	D		B	B	B	B
105	1 µF	N						S	X				B	B	D	D		C	C	C	C
155	1.5							S					D	D				C	C	C	
225	2.2							S					D	D				C	C	C	
335	3.3												D	D				J	J	J	
475	4.7												D	D				J	J	J	
685	6.8												I					J	J		
106	10 µF												I					J	J		
226	22 µF																	P			
336	33 µF																				
476	47 µF																				
686	68 µF																				
107	100 µF																				

**Note:**

Letters indicate product thickness, please see packaging quantities

PACKAGING						
SIZE (inch/mm)	THICKNESS (mm)	THICKNESS SYMBOL	PAPER TAPE		PLASTIC TAPE	
			7" reel (C)	13" reel (P)	7" reel (T)	13" reel (R)
0402 (1002)	0.50 ± 0.05	N	10K	50K		
0603 (1608)	0.80 ± 0.07	S	4K	15K		
	0.80 + 0.15/- 0.10	X	4K	15K		
0805 (2012)	0.60 ± 0.10	A	4K	15K		
	0.80 ± 0.10	B	4K	15K		
	1.25 ± 0.10	D			3K	10K
1206 (3216)	0.80 ± 0.10	B	4K	15K		
	0.95 ± 0.10	C			3K	10K
	1.15 ± 0.15	J			3K	10K
	1.25 ± 0.10	D			3K	10K
	1.60 ± 0.20	G			2K	
	1.60 ± 0.30/- 0.10	P			2K	

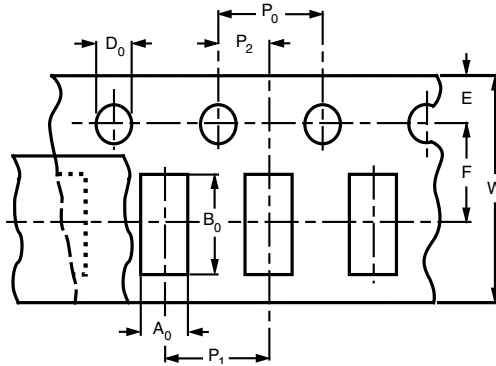
### COVER TAPE (POLYESTER - ANTISTATIC)

PROPERTIES OF COVER TAPE	
PARAMETER	WIDTH
Breaking force	≥ 10.7 N
Elongation at break	≥ 63 %
Surface resistance	< 10 <sup>10</sup> Ω/sq.
Softening point	71 ± 5 °C
Thickness	62 μm

### CARRIER TAPE (POLYCARBONATE)

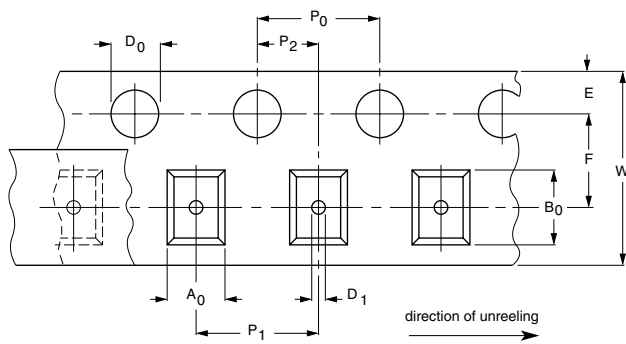
PROPERTIES OF CARRIER TAPE	
PARAMETER	WIDTH
Thickness	190 to 280 μm
Tensile strength at break	> 60 N/mm <sup>2</sup>
Elongation at break	100 to 150 %
Surface resistance	> 10 <sup>12</sup> Ω/sq.

### PAPER TAPE SPECIFICATIONS



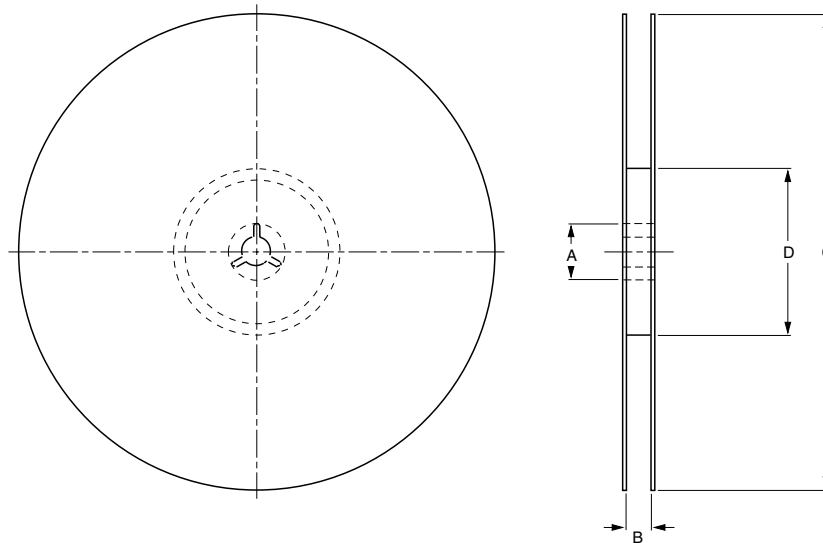
DIMENSIONS OF PAPER TAPE in millimeters								
SYMBOL	PRODUCT SIZE CODE							
	0402		0603		0805		1206	
	SIZE	TOL.	SIZE	TOL.	SIZE	TOL.	SIZE	TOL.
A <sub>0</sub>	0.62	± 0.05	1.02	± 0.05	1.50	± 0.10	2.00	± 0.10
B <sub>0</sub>	1.12	± 0.05	1.82	± 0.05	2.30	± 0.10	3.50	± 0.10
W	8.00	± 0.10	8.00	± 0.10	8.00	± 0.10	8.00	± 0.10
E	1.75	± 0.05	1.75	± 0.05	1.75	± 0.05	1.75	± 0.10
F	3.50	± 0.05	3.50	± 0.05	3.50	± 0.05	3.50	± 0.05
D <sub>0</sub>	1.55	± 0.05	1.55	± 0.05	1.55	± 0.05	1.50	± 0.05
P <sub>0</sub>	4.00	± 0.10	4.00	± 0.10	4.00	± 0.10	4.00	± 0.10
P <sub>1</sub>	2.00	± 0.05	4.00	± 0.10	4.00	± 0.10	4.00	± 0.10
P <sub>2</sub>	2.00	± 0.05	2.00	± 0.05	2.00	± 0.05	2.00	± 0.05

## BLISTER TAPE SPECIFICATIONS



DIMENSIONS OF BLISTER TAPE in millimeters			
DIMENSION	PRODUCT		TOLERANCE
	0805	1206	
A <sub>0</sub>	< 1.57	< 2.00	-
B <sub>0</sub>	< 2.45	< 3.60	-
W	8.00	8.00	± 0.10
E	1.75	1.75	± 0.10
F	3.50	3.50	± 0.05
D <sub>0</sub>	1.50	1.50	± 0.05
D <sub>1</sub>	1.00	1.00	± 0.10
P <sub>0</sub>	4.00	4.00	± 0.10
P <sub>1</sub>	4.00	4.00	± 0.10
P <sub>2</sub>	2.00	2.00	± 0.05

## REEL SPECIFICATIONS



REEL DIMENSIONS AND TAPE WIDTH in millimeters		
	Ø 180 mm; 7 inch	Ø 330 mm; 13 inch
A	13.0 ± 1.0	13.0 ± 0.5
B	9.0 ± 1.0	9.0 ± 1.0
C	178.0 ± 1.0	330.0 ± 1.0
D	60.5 ± 1.0	100.0 ± 1.0



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