

Surface Mount Multilayer Ceramic Chip Capacitors for Ultra High Q Commodity Applications



FEATURES

- Ultra stable class 1 dielectric
- Ultra High Q and low ESR at high frequency
- Three standard sizes
- High SRF characteristic
- Ultra Low capacitance to 0.1 pF
- High precision capacitance tolerance ± 0.05 pF
- Supplied in tape on reel
- Ni-barrier with 100 % tin terminations
- Dry sheet manufacturing technology
- Base Metal Electrode system (BME)
- Compliant to RoHS directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Mobile telecommunication
- WLAN
- RF modules
- Tuner

ELECTRICAL SPECIFICATIONS

Note: Electrical characteristics at + 25 °C unless otherwise specified

Operating Temperature: - 55 °C to + 125 °C

Capacitance Range: 0.1 pF to 47 pF

Voltage Range: 25 Vdc to 250 Vdc

Temperature Coefficient of Capacitance (TCC):

0 ppm/°C \pm 30 ppm/°C from - 55 °C to + 125 °C

Dissipation Factor:

0201/0402: Q \geq 400 + 20 C

0603: Cap < 30 pF: Q \geq 800 + 20C

Cap \geq 30 pF: Q \geq 1400

Test Conditions:

Cap. \leq 1000 pF 1.0 V_{rms} \pm 0.2 V_{rms}, 1 MHz \pm 10 %

Cap. > 1000 pF 1.0 V_{rms} \pm 0.2 V_{rms}, 1 kHz \pm 10 %

Aging Rate: 0 % maximum per decade

Insulation Resistance (IR): after 120 s at U_R (DC):

10 G Ω or 500 Ω F whichever is less

Dielectric Strength Test:

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

\leq 100 Vdc: DWV at 250 % of rated voltage

250 Vdc: DWV at 200 % of rated voltage

ORDERING INFORMATION

VJ0402	L	100	F	X	A	C	W1BC
SIZE CODE	DIELECTRIC	CAPACITANCE	TOLERANCE	TERMINATION	VOLTAGE	PACKAGING	PROCESS CODE FOR BASIC COMMODITY
0201 0402 0603	L = Ultra High Q	Expressed in pF two significant digits followed by the number of zeros: 0R3 = 0.3 pF 1R0 = 1.0 pF 150 = 15 pF	Cap. value \leq 5 pF V = \pm 0.05 pF B = \pm 0.10 pF C = \pm 0.25 pF D = \pm 0.50 pF 5 pF > Cap. value < 10 pF B = \pm 0.10 pF C = \pm 0.25 pF D = \pm 0.50 pF Cap. value \geq 10 pF F = \pm 1 % G = \pm 2 % J = \pm 5 %	X = Ni barrier 100 % tin termination	X = 25 V A = 50 V B = 100 V P = 250V	C = 7" reel/paper P = 13" reel/paper	

VJ....W1BC Ultra High Q/Low ESR



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SELECTION CHART							
DIELECTRIC		ULTRA HIGH Q					
EIA CAP. CODE	EIA SIZE	0201	0402	0603			TOLERANCE
	CAP.	25 V	50 V	50 V	100 V	250 V	
0R1	0.1 pF	L	N				B
0R2	0.2 pF	L	N				V, B
0R3	0.3 pF	L	N	S	S	S	V, B
0R4	0.4 pF	L	N	S	S	S	V, B
0R5	0.5 pF	L	N	S	S	S	V, B, C
0R6	0.6 pF	L	N	S	S	S	V, B, C
0R7	0.7 pF	L	N	S	S	S	V, B, C
0R8	0.8 pF	L	N	S	S	S	V, B, C
0R9	0.9 pF	L	N	S	S	S	V, B, C
1R0	1.0 pF	L	N	S	S	S	V, B, C
1R2	1.2 pF	L	N	S	S	S	V, B, C
1R5	1.5 pF	L	N	S	S	S	V, B, C
1R8	1.8 pF	L	N	S	S	S	V, B, C
2R2	2.2 pF	L	N	S	S	S	V, B, C
2R4	2.4 pF					S	V, B, C
2R7	2.7 pF	L	N	S	S	S	V, B, C
3R3	3.3 pF	L	N	S	S	S	V, B, C
3R9	3.9 pF	L	N	S	S	S	V, B, C
4R7	4.7 pF	L	N	S	S	S	V, B, C
5R6	5.6 pF	L	N	S	S	S	B, C, D
6R8	6.8 pF	L	N	S	S	S	B, C, D
8R2	8.2pF	L	N	S	S	S	B, C, D
100	10 pF	L	N	S	S	S	F, G, J
120	12 pF	L	N	S	S	S	F, G, J
150	15 pF	L	N	S	S	S	F, G, J
180	18 pF	L	N	S	S	S	F, G, J
220	22 pF		N	S	S	S	F, G, J
240	24 pF			S	S	S	F, G, J
270	27 pF			S	S	S	F, G, J
330	33 pF			S	S	S	F, G, J
390	39 pF			S	S	S	F, G, J
470	47 pF			S	S	S	F, G, J

Note

- Letters indicate product thickness, see packaging quantities



VJ...W1BC Ultra High Q/Low ESR

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DIMENSIONS in inches [millimeters]					
	SIZE CODE	L	W	T MAX.	MB
	0201 [0603]	0.024 ± 0.0012 [0.60 ± 0.03]	0.012 ± 0.0012 [0.30 ± 0.03]	0.013 [0.33]	0.006 ± 0.002 [0.15 ± 0.05]
	0402 [1005]	0.040 ± 0.002 [1.00 ± 0.05]	0.020 ± 0.002 [0.50 ± 0.05]	0.022 [0.55]	0.010 + 0.002/- 0.004 [0.25 + 0.05/- 0.10]
	0603 [1608]	0.063 ± 0.004 [1.60 ± 0.10]	0.030 ± 0.004 [0.80 ± 0.10]	0.035 [0.87]	0.015 ± 0.006 [0.40 ± 0.15]

STORAGE AND HANDLING CONDITIONS

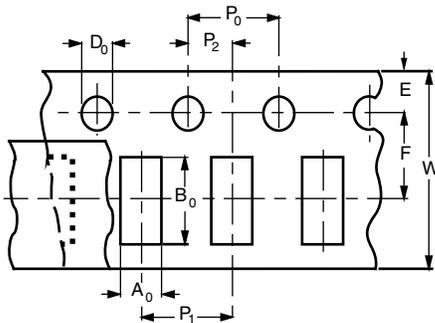
- To store products at 5 °C to 40 °C ambient temperature and 20 % to 70 % related humidity conditions.
- The product is recommended to be used within one year after shipment. Check solderability in case of shelf life extension is needed.

Cautions:

- Don't store products in a corrosive environment such as sulfide, chloride gas, or acid. It may cause oxidization of electrode, which easily be resulted in poor soldering.
- To store products on the shelf and avoid exposure to moisture.
- Don't expose products to excessive shock, vibration, direct sunlight and so on.

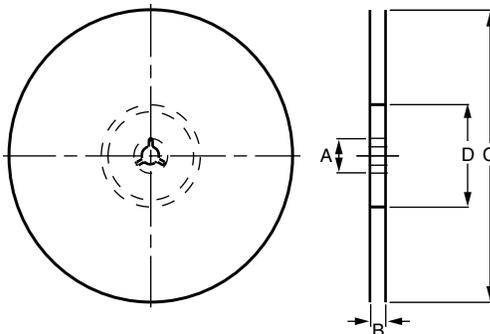
PACKAGING QUANTITIES				
SIZE CODE (inch/mm)	THICKNESS (mm)	THICKNESS SYMBOL	PAPER TAPE	
			7" reel (C)	13" reel (P)
0201 (0603)	0.30 ± 0.03	L	15K	-
0402 (1002)	0.50 ± 0.05	N	10K	50K
0603 (1608)	0.80 ± 0.07	S	4K	10K

PAPER TAPE SPECIFICATIONS



DIMENSIONS OF PAPER TAPE in millimeters			
SYM.	PRODUCT SIZE CODE		
	0201	0402	0603
A ₀	0.37 ± 0.03	0.62 ± 0.05	1.02 ± 0.05
B ₀	0.67 ± 0.03	1.12 ± 0.05	1.82 ± 0.05
W	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
F	3.50 ± 0.05	3.50 ± 0.05	3.50 ± 0.05
D ₀	1.55 ± 0.05	1.55 ± 0.05	1.55 ± 0.05
P ₀	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10
P ₁	2.00 ± 0.05	2.00 ± 0.05	4.00 ± 0.10
P ₂	2.00 ± 0.05	2.00 ± 0.05	2.00 ± 0.05

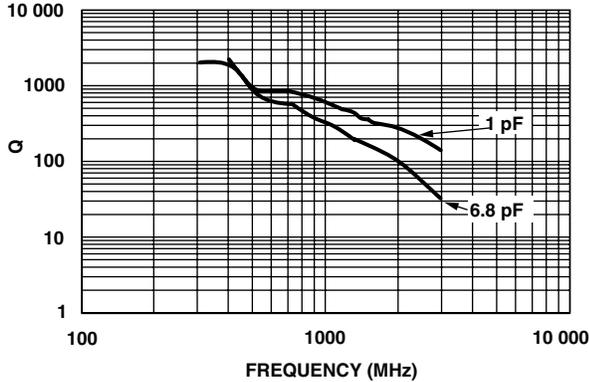
REEL SPECIFICATIONS



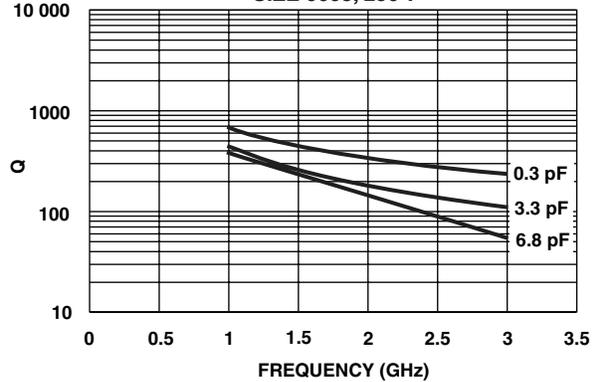
REEL DIMENSIONS AND TAPE WIDTH in millimeters		
	Ø 180 mm; 7"	Ø 330 mm; 13"
A	13.0 ± 0.5	13.0 ± 0.5
B	9.0 ± 1.0	9.0 ± 1.0
C	178.0 ± 1.0	330.0 ± 1.0
D	60.0 ± 1.0	100.0 ± 1.0

ELECTRICAL CHARACTERISTICS

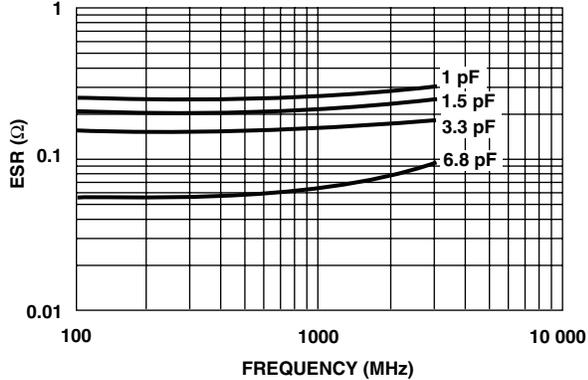
TYPICAL Q VALUE VS. FREQUENCY
SIZE 0402



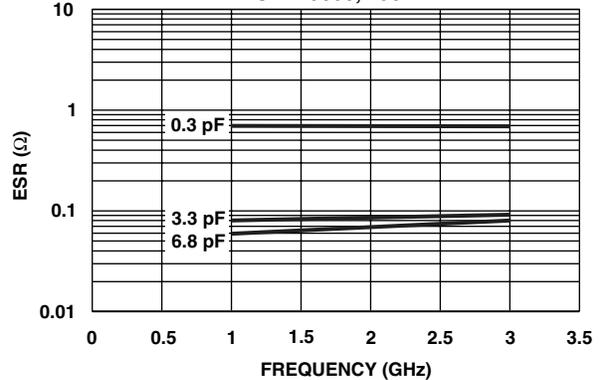
TYPICAL Q VALUE VS. FREQUENCY
SIZE 0603, 250 V



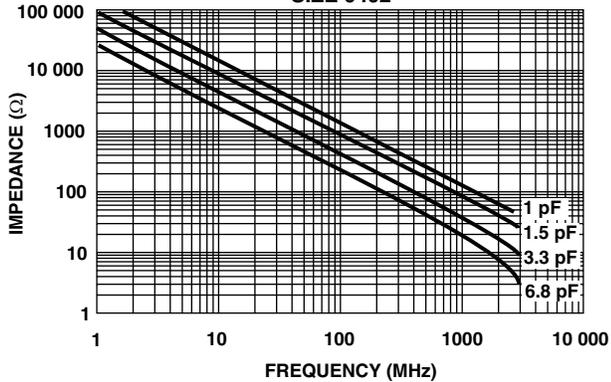
TYPICAL ESR VS. FREQUENCY
SIZE 0402



TYPICAL ESR VS. FREQUENCY
SIZE 0603, 250 V



TYPICAL IMPEDANCE VS. FREQUENCY
SIZE 0402





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