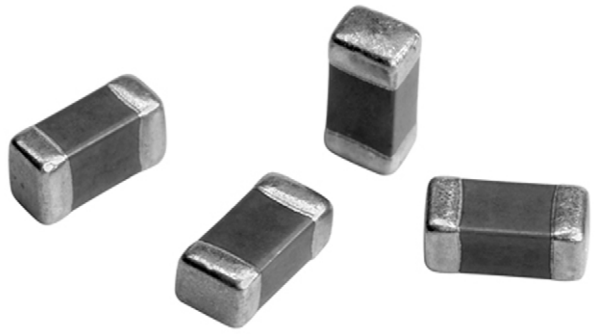
Surface Mount Multilayer Ceramic Chip Capacitors for High Q Commodity Applications



FEATURES

- Ultra stable class 1 dielectric
- High Q and low ESR at high frequency
- 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 manufacturing technology
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free
RoHS COMPLIANT
HALOGEN FREE
GREEN (5-2008)

APPLICATIONS

- Mobile telecommunication
- WLAN
- RF modules
- Tuner

ELECTRICAL SPECIFICATIONS

Note

- Electrical characteristics at 25 °C, 30 % to 70 % related humidity, unless otherwise specified

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

Capacitance Range: 0.5 pF to 3300 pF

Voltage Range: 16 V_{DC} to 100 V_{DC}

Temperature Coefficient of Capacitance (TCC):
± 30 ppm/°C from - 55 °C to + 125 °C

Dissipation Factor:
Cap. < 30 pF: Q ≥ 400 + 20 C
Cap. ≥ 30 pF: Q ≥ 1000

Test Conditions for Capacitance and DF Measurement
Cap. ≤ 1000 pF 1.0 V_{RMS} ± 0.2 V_{RMS}, 1 MHz ± 10 %
Cap. > 1000 pF 1.0 V_{RMS} ± 0.2 V_{RMS}, 1 kHz ± 10 %

Aging Rate: 0 % maximum per decade

Insulation Resistance (IR): after 120 s at U_R (DC)
≥ 10 GΩ or R x C ≥ 500 Ω x 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
≤ 100 V_{DC}: DWV at 250 % of rated voltage

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QUICK REFERENCE DATA

DIELECTRIC	CASE	MAXIMUM VOLTAGE (V)	CAPACITANCE	
			MINIMUM	MAXIMUM
High Q	0402	50	0.5 pF	470 pF
	0603	100	0.5 pF	3.3 nF

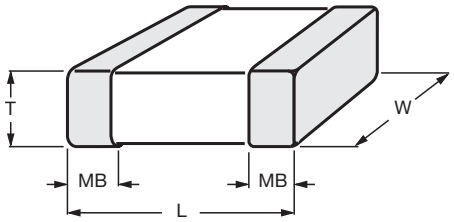
Note

- Detail ratings see selection chart

ORDERING INFORMATION

VJ0402	Q	101	F	X	J	C	W1BC
SIZE CODE	DIELECTRIC	CAPACITANCE	TOLERANCE	TERMINATION	VOLTAGE	PACKAGING	PROCESS CODE FOR BASIC COMMODITY
0402 0603	Q = High Q	Two significant digits followed by the number of zeros: 1R0 = 1.0 pF 101 = 100 pF	Cap. value ≤ 5 pF B = ± 0.10 pF C = ± 0.25 pF 5 pF > Cap. value < 10 pF C = ± 0.25 pF D = ± 0.50 pF Cap. value ≥ 10 pF F = ± 1 % G = ± 2 % J = ± 5 %	X = Ni barrier 100 % tin termination	J = 16 V X = 25 V A = 50 V B = 100 V	C = 7" reel / paper P = 13" reel / paper	

DIMENSIONS in inches (millimeters)



SIZE CODE	L	W	T MAX.	MB
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 + 0.006 / - 0.004 (1.60 + 0.15/ - 0.10)	0.030 + 0.006 /- 0.004 (0.80 + 0.15 / - 0.10)	0.038 (0.95)	0.016 ± 0.006 (0.40 ± 0.15)

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SELECTION CHART									
DIELECTRIC		HIGH Q							
STYLE		VJ0402				VJ0603			
SIZE CODE		0402				0603			
VOLTAGE (V_{DC})		16 V	25 V	50 V	100 V	16 V	25 V	50 V	100 V
VOLTAGE CODE		J	X	A	B	J	X	A	B
CAP. CODE	CAP.								
0R5	0.5 pF		N	N			S	S	S
1R0	1.0 pF		N	N			S	S	S
1R2	1.2 pF		N	N			S	S	S
1R5	1.5 pF		N	N			S	S	S
1R8	1.8 pF		N	N			S	S	S
2R2	2.2 pF		N	N			S	S	S
2R7	2.7 pF		N	N			S	S	S
3R3	3.3 pF		N	N			S	S	S
3R9	3.9 pF		N	N			S	S	S
4R7	4.7 pF		N	N			S	S	S
5R6	5.6 pF		N	N			S	S	S
6R8	6.8 pF		N	N			S	S	S
8R2	8.2 pF		N	N			S	S	S
100	10 pF		N	N			S	S	S
120	12 pF		N	N			S	S	S
150	15 pF		N	N			S	S	S
180	18 pF		N	N			S	S	S
220	22 pF		N	N			S	S	S
270	27 pF		N	N			S	S	S
330	33 pF		N	N			S	S	S
390	39 pF		N	N			S	S	S
470	47 pF		N	N			S	S	S
560	56 pF		N	N			S	S	S
680	68 pF		N	N			S	S	S
820	82 pF		N	N			S	S	S
101	100 pF		N	N			S	S	S
121	120 pF		N	N			S	S	S
151	150 pF		N	N			S	S	S
181	180 pF		N	N			S	S	S
221	220 pF		N	N			S	S	S
271	270 pF	N	N	N			S	S	S
331	330 pF	N	N	N			S	S	S
391	390 pF	N	N	N			S	S	S
471	470 pF	N	N	N			S	S	S
561	560 pF						S	S	S
681	680 pF						S	S	S
821	820 pF						S	S	S
102	1000 pF						S	S	S
122	1200 pF					X	X	X	
152	1500 pF					X	X	X	
182	1800 pF					X	X	X	
222	2200 pF					X	X	X	
272	2700 pF					X	X	X	
332	3300 pF					X	X	X	
472	4700 pF								
562	5600 pF								
682	6800 pF								
822	8200 pF								
103	10 000 pF								

Note

- Letters indicate product thickness, see packaging quantities

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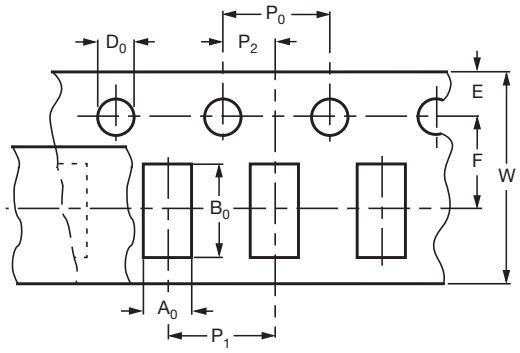
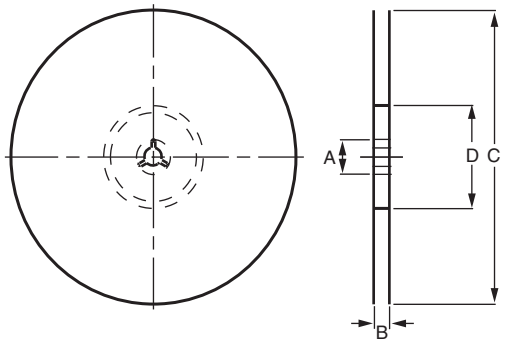
PACKAGING QUANTITIES				
SIZE CODE (inch/mm)	MAX. THICKNESS (mm)	THICKNESS SYMBOL	PAPER TAPE	
			7" REEL (C)	13" REEL (P)
0402 (1002)	0.55	N	10K	20K
0603 (1608)	0.95	S, X	4K	15K

PAPER TAPE SPECIFICATION



DIMENSIONS OF PAPER TAPE in millimeters		
SYM.	PRODUCT SIZE CODE	
	0402	0603
A_0	0.62 ± 0.05	1.02 ± 0.05
B_0	1.12 ± 0.05	1.80 ± 0.05
W	8.00 ± 0.10	8.00 ± 0.10
E	1.75 ± 0.05	1.75 ± 0.05
F	3.50 ± 0.05	3.50 ± 0.05
D_0	1.55 ± 0.05	1.55 ± 0.05
P_0	4.00 ± 0.10	4.00 ± 0.10
P_1	2.00 ± 0.05	4.00 ± 0.10
P_2	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

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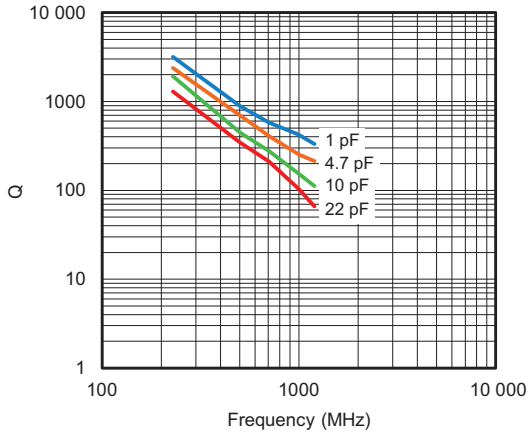
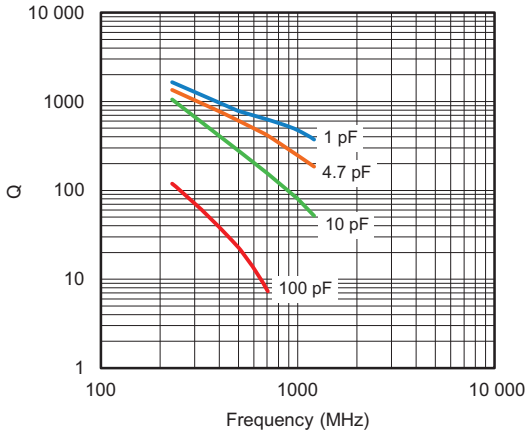
TYPICAL ELECTRICAL CHARACTERISTICS

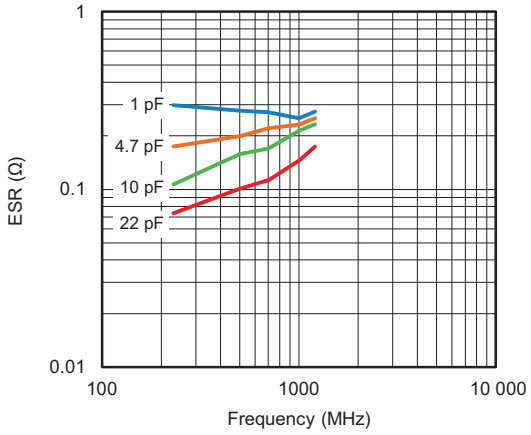
Q Value vs. Frequency (Size 0402)



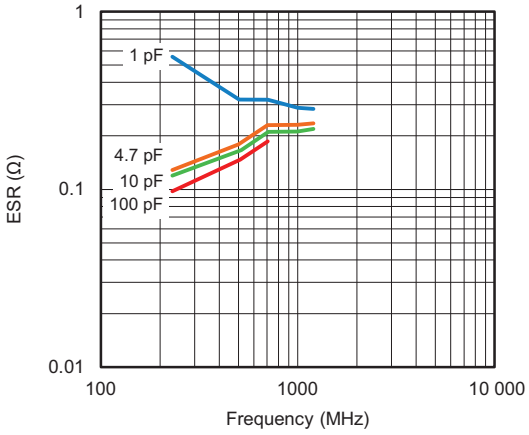
Q Value vs. Frequency (Size 0603)



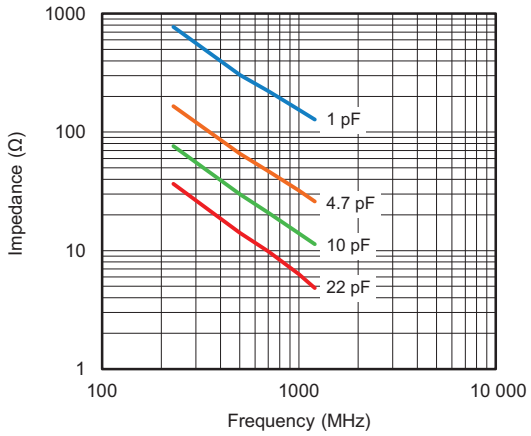
ESR vs. Frequency (Size 0402)



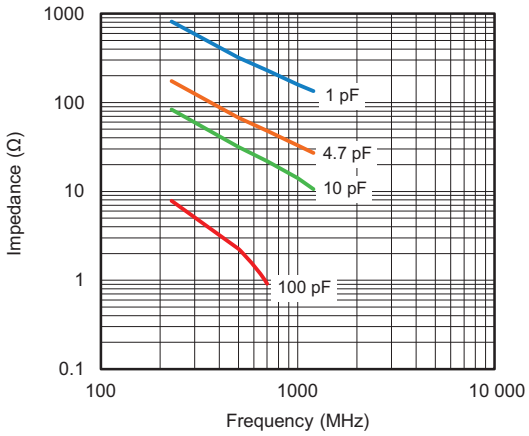
ESR vs. Frequency (Size 0603)



Impedance vs. Frequency (Size 0402)



Impedance vs. Frequency (Size 0603)



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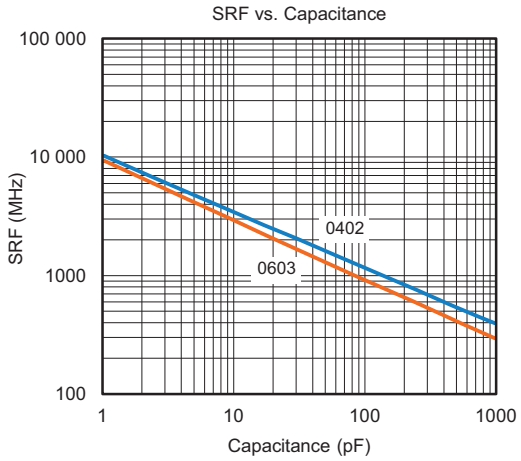
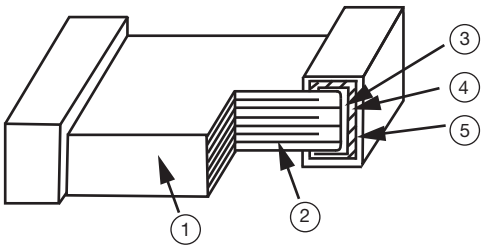
TYPICAL ELECTRICAL CHARACTERISTICS



CONSTRUCTION

NO.	NAME		HIGH Q
1	Ceramic material		$CaZrO_3$ based
2	Inner electrode		Ni
3	Termination	Inner layer	Cu
4		Middle layer	Ni
5		Outer layer	Sn (matt)



STORAGE AND HANDLING CONDITIONS

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

Cautions:
a. Do not 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.
b. To store products on the shelf and avoid exposure to moisture.
c. Do not expose products to excessive shock, vibration, direct sunlight and so on.

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