

Surface Mount Multilayer Ceramic Chip Capacitors

DSCC Qualified Type 03028



FEATURES

- US defense supply center approved
- Federal stock control number, CAGE CODE SHV71
- Small case size (0603)
- Stable BP, BR and BX dielectrics
- Excellent aging characteristics
- Lead (Pb)-free termination code “M”
- Tin/lead termination code “Z”
- Wet build process
- Reliable Noble Metal Electrode (NME) system
- Made with a combination of design, materials and tight process control to achieve very high field reliability
- Compliant to RoHS Directive 2011/65/EU
- Halogen-free according to IEC 61249-2-21 definition



RoHS
COMPLIANT
HALOGEN
FREE
Available

Note

- * Pb containing terminations are not RoHS compliant, exemptions may apply

APPLICATIONS

- Broadband wireless communication
- Satellite communication
- WiFi (802.11) and WiMax (802.16)
- Subscriber based wireless devices
- Microwave systems

ELECTRICAL SPECIFICATIONS

Note

- Electrical characteristics at + 25 °C unless otherwise specified

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

Capacitance Range:

BP: 0.5 pF to 1.0 nF

BR: 100 pF to 100 nF

BX: 100 pF to 100 nF

Voltage Range: 6.3 V_{DC} to 100 V_{DC}

Temperature Coefficient of Capacitance (TCC):

BP: 0 ppm/°C ± 30 ppm/°C from - 55 °C to + 125 °C with zero (0) V_{DC} applied

BP: 0 ppm/°C ± 30 ppm/°C from - 55 °C to + 125 °C with 100 % rated V_{DC} applied

BR: ± 15 % from - 55 °C to + 125 °C with zero (0) V_{DC} applied

BR: + 15 %, - 40 % from - 55 °C to + 125 °C with 100 % rated V_{DC} applied

BX: ± 15 % from - 55 °C to + 125 °C with zero (0) V_{DC} applied

BX: + 15 %, - 25 % from - 55 °C to + 125 °C with 100 % rated V_{DC} applied

Dissipation Factor (DF):

BP:

0.15 % max. at 1.0 V_{RMS} and 1 MHz for values ≤ 1000 pF

0.15 % max. at 1.0 V_{RMS} and 1 kHz for values > 1000 pF

BR, BX:

≤ 25 V: ± 3.5 % max. at 1.0 V_{RMS} and 1 kHz

≥ 50 V: ± 2.5 % max. at 1.0 V_{RMS} and 1 kHz

Aging Rate:

BP: 0 % maximum per decade

BR, BX: 1 % maximum per decade

Insulation Resistance (IR):

At + 25 °C and rated voltage 100 000 MΩ minimum or 1000 ΩF, whichever is less

At + 125 °C and rated voltage 10 000 MΩ minimum or 100 ΩF, whichever is less

Dielectric Strength Test:

Performed per method 103 of EIA-198-2-E.

Applied test voltages

≤ 200 V_{DC}-rated: 250 % of rated voltage

QUICK REFERENCE DATA				
DIELECTRIC	CASE	MAXIMUM VOLTAGE (V)	CAPACITANCE	
			MINIMUM	MAXIMUM
BP	0603	100	0.5 pF	1.0 nF
BR	0603	100	100 pF	100 nF
BX	0603	100	100 pF	100 nF

Note

- Detail ratings see selection chart

ORDERING INFORMATION							
03028- DSCC NUMBER	BX DIELECTRIC	102 CAPACITANCE NOMINAL CODE	B DC VOLTAGE RATING ⁽¹⁾	J CAPACITANCE TOLERANCE	Z TERMINATION	- GROUP C TESTING OPTION	T PACKAGING
Case code 0603	BP BR BX	Expressed in picofarads (pF). The first two digits are significant, the third is a multiplier. An "R" indicates a decimal point. Examples: 1R8 = 1.8 pF 101 = 100 pF	W = 6.3 V X = 10 V Y = 16 V Z = 25 V A = 50 V B = 100 V	C = ± 0.25 pF D = ± 0.5 pF F = ± 1 % G = ± 2 % J = ± 5 % K = ± 10 % M = ± 20 % Note: C, D < 10 pF (BP) F, G, J, K, M ≥ 10 pF (BP) J, K, M (BR, BX)	M = Silver Palladium Z = Ni barrier with tin/lead plate min. 4 % lead	C = Full group C L = 2000 h life test only M = 1000 h life test only H = Low voltage humidity test only - = No group C testing	T = 7" reel/plastic tape C = 7" reel/paper tape O = 7" reel/flamed paper tape J = 7" reel (low quantity) R = 11 1/4"/13" reel/plastic tape P = 11 1/4"/13" reel/paper tape I = 11 1/4"/13" reel/flamed paper tape B = Bulk Note: "I" and "O" are used for "M" termination code

Note

- ⁽¹⁾ DC voltage rating should not be exceeded in application. Other application factors may affect the MLCC performance. Consult for questions: mlcc@vishay.com

DIMENSIONS in inches (millimeters)					
PART ORDERING NUMBER	LENGTH (L)	WIDTH (W)	MAXIMUM THICKNESS (T)	TERMINATION PAD (P)	
				MINIMUM	MAXIMUM
03028-	0.063 ± 0.006 (1.60 ± 0.15)	0.032 ± 0.006 (0.81 ± 0.15)	0.036 (0.91)	0.008 (0.20)	0.020 (0.51)

Note

- Metric equivalents are given for general information only



SELECTION CHART																			
DIELECTRIC		BP						BR						BX					
STYLE		03028																	
CASE CODE		0603																	
VOLTAGE (V _{DC})		6.3	10	16	25	50	100	6.3	10	16	25	50	100	6.3	10	16	25	50	100
VOLTAGE CODE		W	X	Y	Z	A	B	W	X	Y	Z	A	B	W	X	Y	Z	A	B
CAP. CODE	CAP.																		
0R5	0.5 pF	•	•	•	•	•	•												
R75	0.75 pF	•	•	•	•	•	•												
1R0	1.0 pF	•	•	•	•	•	•												
1R2	1.2 pF	•	•	•	•	•	•												
1R5	1.5 pF	•	•	•	•	•	•												
1R8	1.8 pF	•	•	•	•	•	•												
2R2	2.2 pF	•	•	•	•	•	•												
2R4	2.4 pF	•	•	•	•	•	•												
2R7	2.7 pF	•	•	•	•	•	•												
3R0	3.0 pF	•	•	•	•	•	•												
3R3	3.3 pF	•	•	•	•	•	•												
3R6	3.6 pF	•	•	•	•	•	•												
3R9	3.9 pF	•	•	•	•	•	•												
4R7	4.7 pF	•	•	•	•	•	•												
5R1	5.1 pF	•	•	•	•	•	•												
5R6	5.6 pF	•	•	•	•	•	•												
6R2	6.2 pF	•	•	•	•	•	•												
6R8	6.8 pF	•	•	•	•	•	•												
7R5	7.5 pF	•	•	•	•	•	•												
8R2	8.2 pF	•	•	•	•	•	•												
9R1	9.1 pF	•	•	•	•	•	•												
100	10 pF	•	•	•	•	•	•												
110	11 pF	•	•	•	•	•	•												
120	12 pF	•	•	•	•	•	•												
130	13 pF	•	•	•	•	•	•												
150	15 pF	•	•	•	•	•	•												
160	16 pF	•	•	•	•	•	•												
180	18 pF	•	•	•	•	•	•												
200	20 pF	•	•	•	•	•	•												
220	22 pF	•	•	•	•	•	•												
240	24 pF	•	•	•	•	•	•												
270	27 pF	•	•	•	•	•	•												
300	30 pF	•	•	•	•	•	•												
330	33 pF	•	•	•	•	•	•												
360	36 pF	•	•	•	•	•	•												
390	39 pF	•	•	•	•	•	•												
430	43 pF	•	•	•	•	•	•												
470	47 pF	•	•	•	•	•	•												
510	51 pF	•	•	•	•	•	•												
560	56 pF	•	•	•	•	•	•												
620	62 pF	•	•	•	•	•	•												
680	68 pF	•	•	•	•	•	•												
750	75 pF	•	•	•	•	•	•												
820	82 pF	•	•	•	•	•	•												
910	91 pF	•	•	•	•	•	•												



SELECTION CHART																			
DIELECTRIC		BP						BR						BX					
STYLE		03028																	
CASE CODE		0603																	
VOLTAGE (V _{DC})		6.3	10	16	25	50	100	6.3	10	16	25	50	100	6.3	10	16	25	50	100
VOLTAGE CODE		W	X	Y	Z	A	B	W	X	Y	Z	A	B	W	X	Y	Z	A	B
CAP. CODE	CAP.																		
101	100 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
121	120 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
151	150 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
181	180 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
221	220 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
271	270 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
331	330 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
391	390 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
471	470 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
561	560 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
681	680 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
821	820 pF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
102	1.0 nF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
122	1.2 nF							•	•	•	•	•	•	•	•	•	•	•	•
152	1.5 nF							•	•	•	•	•	•	•	•	•	•	•	•
182	1.8 nF							•	•	•	•	•	•	•	•	•	•	•	•
222	2.2 nF							•	•	•	•	•	•	•	•	•	•	•	•
272	2.7 nF							•	•	•	•	•	•	•	•	•	•	•	•
332	3.3 nF							•	•	•	•	•	•	•	•	•	•	•	•
392	3.9 nF							•	•	•	•	•	•	•	•	•	•	•	•
472	4.7 nF							•	•	•	•	•	•	•	•	•	•	•	•
562	5.6 nF							•	•	•	•	•	•	•	•	•	•	•	•
682	6.8 nF							•	•	•	•	•	•	•	•	•	•	•	•
822	8.2 nF							•	•	•	•	•	•	•	•	•	•	•	•
103	10 nF							•	•	•	•	•	•	•	•	•	•	•	•
123	12 nF							•	•	•	•	•	•	•	•	•	•	•	•
153	15 nF							•	•	•	•	•	•	•	•	•	•	•	•
183	18 nF							•	•	•	•	•	•	•	•	•	•	•	•
223	22 nF							•	•	•	•	•	•	•	•	•	•	•	•
273	27 nF							•	•	•	•	•	•	•	•	•	•	•	•
333	33 nF							•	•	•	•	•	•	•	•	•	•	•	•
393	39 nF							•	•	•	•	•	•	•	•	•	•	•	•
473	47 nF							•	•	•	•	•	•	•	•	•	•	•	•
563	56 nF							•	•	•	•	•	•	•	•	•	•	•	•
683	68 nF							•	•	•	•	•	•	•	•	•	•	•	•
823	82 nF							•	•	•	•	•	•	•	•	•	•	•	•
104	100 nF							•	•	•	•	•	•	•	•	•	•	•	•
124	120 nF																		
154	150 nF																		
184	180 nF																		
224	220 nF																		

Note

- See soldering recommendations within this data book, or visit www.vishay.com/doc?45034



DSCC PACKAGING QUANTITIES (1)					
CASE CODE	TAPE SIZE	7" REEL QUANTITIES		11 1/4" AND 13" REEL QUANTITIES	BULK
		PACKAGING CODE		PACKAGING CODE	VIAL PACKAGING CODE
		"C"/"O"/"T"	"J"	"P"/"I"/"R"	"B"
0603	8 mm	4000	1000	10 000	100

Note

(1) Reference: EIA standard RS 481 - "Taping of Surface Mount Components for Automatic Placement"

STORAGE AND HANDLING CONDITIONS

- (1) Store the components at 5 °C to + 40 °C ambient temperature and ≤ 70 % related humidity conditions.
- (2) The product is recommended to be used within a time-frame of 2 years after shipment.
Check solderability in case extended shelf life beyond the expiry date is needed.

Precautions:

- a. Do not store products in an environment containing corrosive elements, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. This may cause corrosion or oxidization of the terminations, which can easily lead to poor soldering.
- b. Store products on the shelf and avoid exposure to moisture or dust.
- c. Do not expose products to excessive shock, vibration, direct sunlight and so on.



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