

# Surface Mount Multilayer Ceramic Chip Capacitors

## DSCC Qualified Type 05006



### FEATURES

- US defense supply center approved
- Federal stock control number, CAGE CODE SHV71
- Case size 0805
- Stable BP, BR and BX dielectrics
- Excellent aging characteristics
- Lead (Pb)-free termination code “M”
- Tin/lead termination code “Z” and “U”
- 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

- Avionic application
- Sonar applications
- Satellite systems
- Missiles applications
- Geographical information systems
- Global positioning 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 3.3 nF

BR: 100 pF to 220 nF

BX: 100 pF to 180 nF

**Voltage Range:** 10 V<sub>DC</sub> to 200 V<sub>DC</sub>

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

BP: 0 ppm/°C ± 30 ppm/°C from - 55 °C to + 125 °C with zero (0) V<sub>DC</sub> applied

BP: 0 ppm/°C ± 30 ppm/°C from - 55 °C to + 125 °C with 100 % rated V<sub>DC</sub> applied

BR: ± 15 % from - 55 °C to + 125 °C with zero (0) V<sub>DC</sub> applied

BR: + 15 %, - 40 % from - 55 °C to + 125 °C with 100 % rated V<sub>DC</sub> applied

BX: ± 15 % from - 55 °C to + 125 °C with zero (0) V<sub>DC</sub> applied

BX: + 15 %, - 25 % from - 55 °C to + 125 °C with 100 % rated V<sub>DC</sub> applied

#### Dissipation Factor (DF):

BP:

0.15 % max. at 1.0 V<sub>RMS</sub> and 1 MHz for values ≤ 1000 pF

0.15 % max. at 1.0 V<sub>RMS</sub> and 1 kHz for values > 1000 pF

BR and BX:

≤ 25 V: 3.5 % max. at 1.0 V<sub>RMS</sub> and 1 kHz

≥ 50 V: 2.5 % max. at 1.0 V<sub>RMS</sub> 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<sub>DC</sub>-rated: 250 % of rated voltage

QUICK REFERENCE DATA				
DIELECTRIC	CASE	MAXIMUM VOLTAGE (V)	CAPACITANCE	
			MINIMUM	MAXIMUM
BP	0805	200	0.5 pF	3.3 nF
BR	0805	100	100 pF	220 nF
BX	0805	100	100 pF	180 nF

**Note**

- Detail ratings see selection chart

ORDERING INFORMATION							
05006- DSCC NUMBER	BP DIELECTRIC	101 CAPACITANCE NOMINAL CODE	B DC VOLTAGE RATING <sup>(1)</sup>	J CAPACITANCE TOLERANCE	X TERMINATION	- GROUP C TESTING OPTION <sup>(2)</sup>	T PACKAGING
Case code 0805	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	X = 10 V Y = 16 V Z = 25 V A = 50 V B = 100 V C = 200 V	C = ± 0.25 pF D = ± 0.5 pF F = ± 1 % G = ± 2 % J = ± 5 % K = ± 10 % M = ± 20 % <b>Note:</b> 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 U <sup>(2)</sup> = hot solder dipped (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 <b>Note:</b> "I" and "O" are used for "M" termination code

**Notes**

- <sup>(1)</sup> DC voltage rating should not be exceeded in application. Other application factors may affect the MLCC performance. Consult for questions: [mlcc@vishay.com](mailto:mlcc@vishay.com)
- <sup>(2)</sup> "U" termination part number code for DSCC product length, width and thickness dimensions positive tolerances (including bandwidth) above are allowed to increase by the following amounts: Length 0.020" (0.51 mm), width/thickness 0.015" (0.38 mm)

DIMENSIONS in inches (millimeters)					
PART ORDERING NUMBER	LENGTH (L)	WIDTH (W)	MAXIMUM THICKNESS (T)	TERMINATION PAD (P)	
				MINIMUM	MAXIMUM
05006-	0.080 ± 0.008 (2.03 ± 0.20)	0.050 ± 0.008 (1.27 ± 0.20)	0.055 (1.40)	0.012 (0.30)	0.028 (0.71)

**Note**

- Metric equivalents are given for general information only



SELECTION CHART																	
DIELECTRIC		BP						BR					BX				
STYLE		05006															
CASE CODE		0805															
VOLTAGE (V <sub>DC</sub> )		10	16	25	50	100	200	10	16	25	50	100	10	16	25	50	100
VOLTAGE CODE		X	Y	Z	A	B	C	X	Y	Z	A	B	X	Y	Z	A	B
CAP. CODE	CAP.																
0R5	0.5 pF	•	•	•	•	•	•										
1R0	1.0 pF	•	•	•	•	+	•										
1R2	1.2 pF	•	•	•	•	+	•										
1R5	1.5 pF	•	•	•	•	+	•										
1R8	1.8 pF	•	•	•	•	+	•										
2R2	2.2 pF	•	•	•	•	+	•										
2R7	2.7 pF	•	•	•	•	+	•										
3R3	3.3 pF	•	•	•	•	+	•										
3R9	3.9 pF	•	•	•	•	+	•										
4R7	4.7 pF	•	•	•	•	+	•										
5R6	5.6 pF	•	•	•	•	+	•										
6R8	6.8 pF	•	•	•	•	+	•										
8R2	8.2 pF	•	•	•	•	+	•										
100	10 pF	•	•	•	•	+	•										
120	12 pF	•	•	•	•	+	•										
150	15 pF	•	•	•	•	+	•										
180	18 pF	•	•	•	•	+	•										
220	22 pF	•	•	•	•	+	•										
270	27 pF	•	•	•	•	+	•										
330	33 pF	•	•	•	•	+	•										
390	39 pF	•	•	•	•	+	•										
470	47 pF	•	•	•	•	+	•										
560	56 pF	•	•	•	•	+	•										
680	68 pF	•	•	•	•	+	•										
820	82 pF	•	•	•	•	+	•										
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	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	+

**Notes**

- + Use MIL-PRF-55681 (CDR) instead, part numbers removed from DSCC listing
- See soldering recommendations within this data book, or visit [www.vishay.com/doc?45034](http://www.vishay.com/doc?45034)



SELECTION CHART																	
DIELECTRIC		BP					BR					BX					
STYLE		05006															
CASE CODE		0805															
VOLTAGE (V <sub>DC</sub> )		10	16	25	50	100	200	10	16	25	50	100	10	16	25	50	100
VOLTAGE CODE		X	Y	Z	A	B	C	X	Y	Z	A	B	X	Y	Z	A	B
CAP. CODE	CAP.																
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							•	•	•	•	•	•	•	•	•	•
274	270 nF							•	•	•	•	•	•	•	•	•	•
334	330 nF							•	•	•	•	•	•	•	•	•	•
394	390 nF							•	•	•	•	•	•	•	•	•	•
474	470 nF							•	•	•	•	•	•	•	•	•	•
564	560 nF							•	•	•	•	•	•	•	•	•	•
684	680 nF							•	•	•	•	•	•	•	•	•	•
824	820 nF							•	•	•	•	•	•	•	•	•	•
105	1.0 µF							•	•	•	•	•	•	•	•	•	•

**Notes**

- + Use MIL-PRF-55681 (CDR) instead, part numbers removed from DSCC listing
- See soldering recommendations within this data book, or visit [www.vishay.com/doc245034](http://www.vishay.com/doc245034)

DSCC PACKAGING QUANTITIES (1)(2)							
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"	
0805	8 mm	3000	1000	10 000		100	

**Notes**

- (1) Vishay Vitramon uses embossed plastic carrier tape and punch paper carrier tape  
 (2) Reference: EIA standard RS 481 - "Taping of Surface Mount Components for Automatic Placement"

STORAGE AND HANDLING CONDITIONS
<p>(1) Store the components at 5 °C to + 40 °C ambient temperature and ≤ 70 % related humidity conditions.</p> <p>(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.</p> <p>Precautions:</p> <ol style="list-style-type: none"> <li>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.</li> <li>Store products on the shelf and avoid exposure to moisture or dust.</li> <li>Do not expose products to excessive shock, vibration, direct sunlight and so on.</li> </ol>



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**