

## 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
- Base Metal Electrode system (BME)
- Compliant to RoHS directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### APPLICATIONS

- Consumer electronics
- Telecommunications
- Data processing
- Mobile applications

### ELECTRICAL SPECIFICATION

#### Note

- Electrical characteristics at 20 °C, 30 % to 70 % related humidity, unless otherwise specified

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

**Capacitance Range:** 10 nF to 100  $\mu$ F

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

**Temperature Coefficient of Capacitance (TCC):**  
+ 30 %/- 80 % without voltage applied

#### Dissipation Factor (DF):

**6.3 V:**  $\leq 20$  %

**10 V:**  $\leq 12.5$  %

$\leq 20$  % for 0402  $\geq 0.47$   $\mu$ F

**16 V:** for Cap.  $< 1$   $\mu$ F  $\leq 7.0$  %

$\leq 9$  % for 0402  $\geq 0.068$   $\mu$ F; 0603  $\geq 0.68$   $\mu$ F

$\leq 12.5$  % for 0402  $\geq 0.22$   $\mu$ F

**16 V:** for Cap.  $\geq 1$   $\mu$ F  $\leq 9$  %

$\leq 12.5$  % for 0805  $\geq 3.3$   $\mu$ F; 1206  $\geq 10$   $\mu$ F; 1210  $\geq 22$   $\mu$ F

**25 V:**  $\leq 5$  %

$\leq 7$  % for 0402  $\geq 0.047$  pF; 0603  $\geq 0.1$   $\mu$ F; 0805  $\geq 0.33$   $\mu$ F;

1206  $\geq 1$   $\mu$ F; 1210  $\geq 4.7$   $\mu$ F

$\leq 9$  % for 0402  $\geq 0.068$   $\mu$ F; 0603  $\geq 0.47$   $\mu$ F; 1206  $\geq 4.7$   $\mu$ F

$\geq 50$  V:  $\leq 5.0$  %

$\leq 7$  % for 0603  $\geq 0.1$   $\mu$ F; 0805  $\geq 0.47$   $\mu$ F

#### Test Conditions for Capacitance and DF Measurement:

For  $C \leq 10$   $\mu$ F apply 1.0  $V_{RMS} \pm 0.2$   $V_{RMS}$ , 1.0 kHz  $\pm 10$  %

For  $C > 10$   $\mu$ F apply 0.5  $V_{RMS} \pm 0.2$   $V_{RMS}$ , 120 Hz  $\pm 20$  %

#### Aging Rate:

6.3 V: 12.5 % maximum per decade

10 V/16 V: 9 % maximum per decade

$\geq 25$  V: 7 % maximum per decade

#### Insulation Resistance (IR):

$\geq 10$  G $\Omega$  or  $R \times C \geq 500$   $\Omega \times F$  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

$\leq 100$   $V_{DC}$ : 250 % of rated voltage

# VJ....W1BC Y5V Dielectric



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Surface Mount Multilayer Ceramic Chip Capacitors  
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| QUICK REFERENCE DATA |      |                     |             |             |
|----------------------|------|---------------------|-------------|-------------|
| DIELECTRIC           | CASE | MAXIMUM VOLTAGE (V) | CAPACITANCE |             |
|                      |      |                     | MINIMUM     | MAXIMUM     |
| Y5V                  | 0402 | 50                  | 10 nF       | 1.0 $\mu$ F |
|                      | 0603 | 50                  | 10 nF       | 2.2 $\mu$ F |
|                      | 0805 | 100                 | 10 nF       | 10 $\mu$ F  |
|                      | 1206 | 100                 | 10 nF       | 22 $\mu$ F  |
|                      | 1210 | 100                 | 10 nF       | 100 $\mu$ F |

**Note**

- Detail ratings see selection chart

| ORDERING INFORMATION                 |            |  |  |                |  |  |                                  |
|--------------------------------------|------------|--|--|----------------|--|--|----------------------------------|
| VJ0402                               | V          | 101  | J                                      | X              | Q  | C  | W1BC                             |
| SIZE CODE                            | DIELECTRIC | CAPACITANCE  | TOLERANCE                              | TERMINATION    | VOLTAGE  | PACKAGING  | PROCESS CODE FOR BASIC COMMODITY |
| 0402<br>0603<br>0805<br>1206<br>1210 | V = Y5V    | Two significant digits followed by the number of zeros:<br>101 = 100 pF<br>102 = 1000 pF<br>152 = 1500 pF<br>103 = 10 000 pF | M = $\pm 20$ %<br>Z = -20 %/<br>+ 80 % | X = Ni Barrier | Y = 6.3 V<br>Q = 10 V<br>J = 16 V<br>X = 25 V<br>A = 50 V<br>B = 100 V | C = 7" reel/paper<br>P = 13" reel/paper<br>T = 7" reel/blister<br>R = 13" reel/blister |                                  |

| DIMENSIONS in inches (millimeters) |                |   |   |                 |   |
|------------------------------------|----------------|---|---|-----------------|---|
|                                    | SIZE CODE      | L   | W   | T MAX.          | MB  |
|                                    | 0402<br>(1005) | 0.040 $\pm$ 0.002<br>(1.00 $\pm$ 0.05)        | 0.020 $\pm$ 0.002<br>(0.50 $\pm$ 0.05)        | 0.022<br>(0.55) | 0.010 + 0.002/- 0.004<br>(0.25 + 0.05/- 0.10) |
|                                    | 0603<br>(1608) | 0.063 + 0.006/- 0.004<br>(1.60 + 0.15/- 0.10) | 0.030 + 0.006/- 0.004<br>(0.80 + 0.15/- 0.10) | 0.038<br>(0.95) | 0.016 $\pm$ 0.006<br>(0.40 $\pm$ 0.15)        |
|                                    | 0805<br>(2012) | 0.080 $\pm$ 0.008<br>(2.00 $\pm$ 0.20)        | 0.050 $\pm$ 0.008<br>(1.25 $\pm$ 0.20)        | 0.057<br>(1.45) | 0.020 $\pm$ 0.008<br>(0.50 $\pm$ 0.20)        |
|                                    | 1206<br>(3216) | 0.126 + 0.012/- 0.008<br>(3.20 + 0.30/- 0.20) | 0.063 + 0.012/- 0.008<br>(1.60 + 0.30/- 0.20) | 0.075<br>(1.90) | 0.024 $\pm$ 0.008<br>(0.60 $\pm$ 0.20)        |
|                                    | 1210<br>(3225) | 0.126 $\pm$ 0.016<br>(3.20 $\pm$ 0.40)        | 0.098 $\pm$ 0.012<br>(2.50 $\pm$ 0.30)        | 0.110<br>(2.80) | 0.060 $\pm$ 0.010<br>(0.75 $\pm$ 0.25)        |



# VJ...W1BC Y5V Dielectric

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| SELECTION CHART            |        |        |      |      |                  |      |        |      |      |      |      |        |      |      |      |      |       |
|----------------------------|--------|--------|------|------|------------------|------|--------|------|------|------|------|--------|------|------|------|------|-------|
| DIELECTRIC                 |        | Y5V    |      |      |                  |      |        |      |      |      |      |        |      |      |      |      |       |
| STYLE                      |        | VJ0402 |      |      |                  |      | VJ0603 |      |      |      |      | VJ0805 |      |      |      |      |       |
| EIA CODE                   |        | 0402   |      |      |                  |      | 0603   |      |      |      |      | 0805   |      |      |      |      |       |
| VOLTAGE (V <sub>DC</sub> ) |        | 6.3 V  | 10 V | 16 V | 25 V             | 50 V | 100 V  | 10 V | 16 V | 25 V | 50 V | 100 V  | 10 V | 16 V | 25 V | 50 V | 100 V |
| VOLTAGE CODE               |        | Y      | Q    | J    | X                | A    | B      | Q    | J    | X    | A    | B      | Q    | J    | X    | A    | B     |
| CAP. CODE                  | CAP.   |        |      |      |                  |      |        |      |      |      |      |        |      |      |      |      |       |
| 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  |        | N    | N    | N                | N    |        | S    | S    | S    | S    |        | A    | A    | A    | A    | B     |
| 123                        | 12 nF  |        | N    | N    | N                | N    |        | S    | S    | S    | S    |        | A    | A    | A    | A    |       |
| 153                        | 15 nF  |        | N    | N    | N                | N    |        | S    | S    | S    | S    |        | A    | A    | A    | A    | B     |
| 183                        | 18 nF  |        | N    | N    | N                | N    |        | S    | S    | S    | S    |        | A    | A    | A    | A    |       |
| 223                        | 22 nF  |        | N    | N    | N                | N    |        | S    | S    | S    | S    |        | A    | A    | A    | A    | B     |
| 273                        | 27 nF  |        | N    | N    | N                | N    |        | S    | S    | S    | S    |        | A    | A    | A    | A    |       |
| 333                        | 33 nF  |        | N    | N    | N                | N    |        | S    | S    | S    | S    |        | A    | A    | A    | A    | B     |
| 393                        | 39 nF  |        | N    | N    | N                |      |        | S    | S    | S    | S    |        | A    | A    | A    | A    |       |
| 473                        | 47 nF  |        | N    | N    | N                |      |        | S    | S    | S    | S    |        | A    | A    | A    | A    | B     |
| 563                        | 56 nF  |        | N    | N    | N <sup>(1)</sup> |      |        | S    | S    | S    | S    |        | A    | A    | A    | A    |       |
| 683                        | 68 nF  |        | N    | N    | N                |      |        | S    | S    | S    | S    |        | A    | A    | A    | A    | B     |
| 823                        | 82 nF  |        | N    | N    |                  |      |        | S    | S    | S    | S    |        | A    | A    | A    | A    |       |
| 104                        | 100 nF |        | N    | N    | N                |      |        | S    | S    | S    | S    |        | A    | A    | A    | A    | B     |
| 154                        | 150 nF |        | N    |      |                  |      |        | S    | S    | S    | S    |        | A    | A    | A    | A    |       |
| 224                        | 220 nF | N      | N    |      |                  |      |        | S    | S    | S    | S    |        | A    | A    | A    | A    |       |
| 334                        | 330 nF | N      | N    |      |                  |      |        | S    | S    | S    |      |        | B    | B    | B    | B    |       |
| 474                        | 470 nF | N      | N    |      |                  |      |        | S    | S    | X    |      |        | B    | B    | B    | B    |       |
| 684                        | 680 nF | N      |      |      |                  |      |        | S    | X    |      |      |        | B    | B    | D    | D    |       |
| 105                        | 1.0 μF | N      |      |      |                  |      |        | S    | X    | X    |      |        | B    | B    | D    | D    |       |
| 155                        | 1.5 μF |        |      |      |                  |      |        | S    |      |      |      |        | D    | D    |      |      |       |
| 225                        | 2.2 μF |        |      |      |                  |      |        | S    |      |      |      |        | D    | D    | I    |      |       |
| 335                        | 3.3 μF |        |      |      |                  |      |        |      |      |      |      |        | D    | D    |      |      |       |
| 475                        | 4.7 μF |        |      |      |                  |      |        |      |      |      |      |        | D    | D    | I    |      |       |
| 685                        | 6.8 μF |        |      |      |                  |      |        |      |      |      |      |        | I    |      |      |      |       |
| 106                        | 10 μF  |        |      |      |                  |      |        |      |      |      |      |        | I    |      |      |      |       |
| 226                        | 22 μF  |        |      |      |                  |      |        |      |      |      |      |        |      |      |      |      |       |
| 336                        | 33 μF  |        |      |      |                  |      |        |      |      |      |      |        |      |      |      |      |       |
| 476                        | 47 μF  |        |      |      |                  |      |        |      |      |      |      |        |      |      |      |      |       |
| 686                        | 68 μF  |        |      |      |                  |      |        |      |      |      |      |        |      |      |      |      |       |
| 107                        | 100 μF |        |      |      |                  |      |        |      |      |      |      |        |      |      |      |      |       |

**Notes**

- Letters indicate product thickness, please see packaging quantities
- <sup>(1)</sup> Not in 20 % (code "M") tolerance

# VJ....W1BC Y5V Dielectric



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for Commodity Applications

| SELECTION CHART            |        |        |      |      |                  |       |        |      |      |      |      |       |
|----------------------------|--------|--------|------|------|------------------|-------|--------|------|------|------|------|-------|
| DIELECTRIC                 |        | Y5V    |      |      |                  |       |        |      |      |      |      |       |
| STYLE                      |        | VJ1206 |      |      |                  |       | VJ1210 |      |      |      |      |       |
| EIA CODE                   |        | 1206   |      |      |                  |       | 1210   |      |      |      |      |       |
| VOLTAGE (V <sub>DC</sub> ) |        | 10 V   | 16 V | 25 V | 50 V             | 100 V | 6.3 V  | 10 V | 16 V | 25 V | 50 V | 100 V |
| VOLTAGE CODE               |        | Q      | J    | X    | A                | B     | Y      | Q    | J    | X    | A    | B     |
| CAP. CODE                  | CAP.   |        |      |      |                  |       |        |      |      |      |      |       |
| 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  | B      | B    | B    | B                | B     |        |      |      |      |      | C     |
| 123                        | 12 nF  | B      | B    | B    | B                |       |        |      |      |      |      |       |
| 153                        | 15 nF  | B      | B    | B    | B                | B     |        |      |      |      |      | C     |
| 183                        | 18 nF  | B      | B    | B    | B                |       |        |      |      |      |      |       |
| 223                        | 22 nF  | B      | B    | B    | B                | B     |        |      |      |      |      | C     |
| 273                        | 27 nF  | B      | B    | B    | B                |       |        |      |      |      |      |       |
| 333                        | 33 nF  | B      | B    | B    | B                | B     |        |      |      |      |      | C     |
| 393                        | 39 nF  | B      | B    | B    | B                |       |        |      |      |      |      |       |
| 473                        | 47 nF  | B      | B    | B    | B                | B     |        |      |      |      |      | C     |
| 563                        | 56 nF  | B      | B    | B    | B                |       |        |      |      |      |      |       |
| 683                        | 68 nF  | B      | B    | B    | B                | B     |        |      |      |      |      | C     |
| 823                        | 82 nF  | B      | B    | B    | B                |       |        |      |      |      |      |       |
| 104                        | 100 nF | B      | B    | B    | B                | B     |        | C    | C    | C    | C    | C     |
| 154                        | 150 nF | B      | B    | B    | B                | C     |        | C    | C    | C    | C    | C     |
| 224                        | 220 nF | B      | B    | B    | B                | C     |        | C    | C    | C    | C    | C     |
| 334                        | 330 nF | B      | B    | B    | B                |       |        | C    | C    | C    | C    | C     |
| 474                        | 470 nF | B      | B    | B    | B                |       |        | C    | C    | C    | C    |       |
| 684                        | 680 nF | B      | B    | B    | B                |       |        | C    | C    | C    | C    |       |
| 105                        | 1.0 μF | C      | C    | C    | C                |       |        | C    | C    | C    | C    |       |
| 155                        | 1.5 μF | C      | C    | C    |                  |       |        | C    | C    | C    |      |       |
| 225                        | 2.2 μF | C      | C    | C    | J <sup>(1)</sup> |       |        | C    | C    | C    | G    |       |
| 335                        | 3.3 μF | J      | J    | J    |                  |       |        | C    | C    | C    |      |       |
| 475                        | 4.7 μF | J      | J    | J    |                  |       |        | C    | C    | D    | G    |       |
| 685                        | 6.8 μF | J      | J    |      |                  |       |        | C    | C    | D    |      |       |
| 106                        | 10 μF  | J      | J    | P    |                  |       |        | D    | D    | G    |      |       |
| 226                        | 22 μF  | P      |      |      |                  |       |        | K    | K    |      |      |       |
| 336                        | 33 μF  |        |      |      |                  |       |        |      |      |      |      |       |
| 476                        | 47 μF  |        |      |      |                  |       |        | K    | K    |      |      |       |
| 686                        | 68 μF  |        |      |      |                  |       |        |      |      |      |      |       |
| 107                        | 100 μF |        |      |      |                  |       |        | M    |      |      |      |       |

**Notes**

• Letters indicate product thickness, please see packaging quantities

<sup>(1)</sup> Not in 20 % (code "M") tolerance



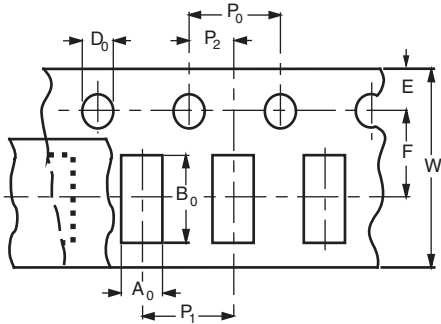
# VJ...W1BC Y5V Dielectric

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for Commodity Applications

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| PACKAGING QUANTITIES   |                        |                     |             |              |              |              |
|------------------------|------------------------|---------------------|-------------|--------------|--------------|--------------|
| SIZE CODE<br>(inch/mm) | MAX. THICKNESS<br>(mm) | THICKNESS<br>SYMBOL | PAPER TAPE  |              | PLASTIC TAPE |              |
|                        |                        |                     | 7" REEL (C) | 13" REEL (P) | 7" REEL (T)  | 13" REEL (R) |
| 0402 (1002)            | 0.55                   | N                   | 10K         | 50K          |              |              |
| 0603 (1608)            | 0.90                   | S                   | 4K          | 15K          |              |              |
|                        | 0.95                   | X                   | 4K          | 15K          |              |              |
| 0805 (2012)            | 0.75                   | A                   | 4K          | 15K          |              |              |
|                        | 0.95                   | B                   | 4K          | 15K          |              |              |
|                        | 1.40                   | D                   |             |              | 3K           | 10K          |
|                        | 1.45                   | I                   |             |              | 3K           | 10K          |
| 1206 (3216)            | 0.95                   | B                   | 4K          | 15K          |              |              |
|                        | 1.05                   | C                   |             |              | 3K           | 10K          |
|                        | 1.30                   | J                   |             |              | 3K           | 10K          |
|                        | 1.35                   | D                   |             |              | 3K           | 10K          |
|                        | 1.80                   | G                   |             |              | 2K           |              |
|                        | 1.80                   | H                   |             |              | 2K           | 8K           |
|                        | 1.90                   | P                   |             |              | 2K           |              |
| 1210 (3225)            | 1.05                   | B                   |             |              | 2K           | 10K          |
|                        | 1.05                   | C                   |             |              | 3K           | 10K          |
|                        | 1.35                   | D                   |             |              | 3K           | 10K          |
|                        | 1.80                   | G                   |             |              | 2K           |              |
|                        | 2.00                   | U                   |             |              | 2K           | 4K           |
|                        | 2.20                   | K                   |             |              | 1K           |              |
|                        | 2.70                   | J                   |             |              | 1K           | 4K           |
|                        | 2.80                   | M                   |             |              | 1K           |              |
|                        | 2.80                   | V                   |             |              | 1K           | 4K           |

## PAPER TAPE SPECIFICATION

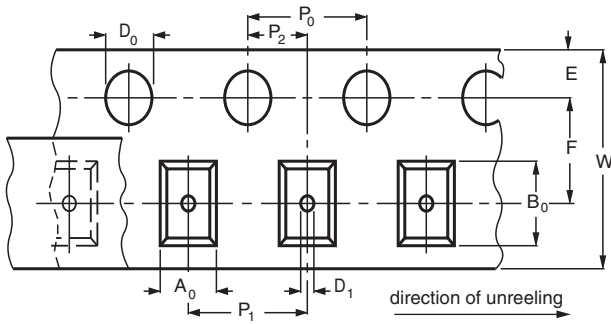


### DIMENSIONS OF PAPER TAPE

in millimeters

| SYM.  | PRODUCT SIZE CODE |                 |                 |                 |
|-------|-------------------|-----------------|-----------------|-----------------|
|       | 0402              | 0603            | 0805            | 1206            |
| $A_0$ | $0.62 \pm 0.05$   | $1.02 \pm 0.05$ | $1.50 \pm 0.10$ | $2.00 \pm 0.10$ |
| $B_0$ | $1.12 \pm 0.05$   | $1.80 \pm 0.05$ | $2.30 \pm 0.10$ | $3.50 \pm 0.10$ |
| $W$   | $8.00 \pm 0.10$   | $8.00 \pm 0.10$ | $8.00 \pm 0.10$ | $8.00 \pm 0.10$ |
| $E$   | $1.75 \pm 0.05$   | $1.75 \pm 0.05$ | $1.75 \pm 0.05$ | $1.75 \pm 0.10$ |
| $F$   | $3.50 \pm 0.05$   | $3.50 \pm 0.05$ | $3.50 \pm 0.05$ | $3.50 \pm 0.05$ |
| $D_0$ | $1.55 \pm 0.05$   | $1.55 \pm 0.05$ | $1.55 \pm 0.05$ | $1.50 \pm 0.05$ |
| $P_0$ | $4.00 \pm 0.10$   | $4.00 \pm 0.10$ | $4.00 \pm 0.10$ | $4.00 \pm 0.10$ |
| $P_1$ | $2.00 \pm 0.05$   | $4.00 \pm 0.10$ | $4.00 \pm 0.10$ | $4.00 \pm 0.10$ |
| $P_2$ | $2.00 \pm 0.05$   | $2.00 \pm 0.05$ | $2.00 \pm 0.05$ | $2.00 \pm 0.05$ |

## BLISTER TAPE SPECIFICATION

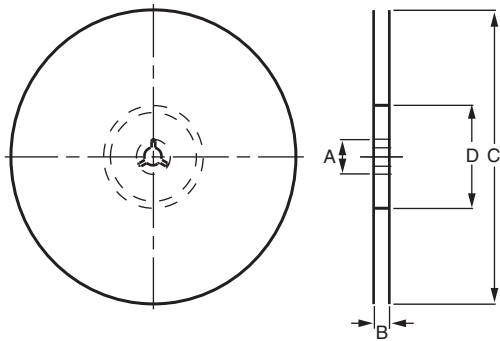


### DIMENSIONS OF BLISTER TAPE

in millimeters

| SYM.  | PRODUCT SIZE CODE |                 |                 |
|-------|-------------------|-----------------|-----------------|
|       | 0805              | 1206            | 1210            |
| $A_0$ | $< 1.57$          | $< 2.00$        | $< 2.97$        |
| $B_0$ | $< 2.45$          | $< 3.70$        | $< 3.73$        |
| $W$   | $8.00 \pm 0.10$   | $8.00 \pm 0.10$ | $8.00 \pm 0.10$ |
| $E$   | $1.75 \pm 0.10$   | $1.75 \pm 0.10$ | $1.75 \pm 0.10$ |
| $F$   | $3.50 \pm 0.05$   | $3.50 \pm 0.05$ | $3.50 \pm 0.05$ |
| $D_0$ | $1.50 \pm 0.05$   | $1.50 \pm 0.05$ | $1.50 \pm 0.05$ |
| $D_1$ | $1.00 \pm 0.10$   | $1.00 \pm 0.10$ | $1.00 \pm 0.10$ |
| $P_0$ | $4.00 \pm 0.10$   | $4.00 \pm 0.10$ | $4.00 \pm 0.10$ |
| $P_1$ | $4.00 \pm 0.10$   | $4.00 \pm 0.10$ | $4.00 \pm 0.10$ |
| $P_2$ | $2.00 \pm 0.05$   | $2.00 \pm 0.05$ | $2.00 \pm 0.05$ |

## REEL SPECIFICATIONS

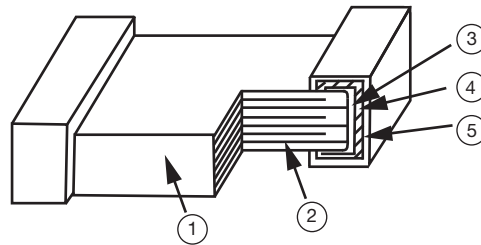


### REEL DIMENSIONS AND TAPE WIDTH

in millimeters

|   | $\varnothing 180 \text{ mm}; 7''$ | $\varnothing 330 \text{ mm}; 13''$ |
|---|-----------------------------------|------------------------------------|
| A | $13.0 \pm 0.5$                    | $13.0 \pm 0.5$                     |
| B | $9.0 \pm 1.0$                     | $9.0 \pm 1.0$                      |
| C | $178.0 \pm 1.0$                   | $330.0 \pm 1.0$                    |
| D | $60.0 \pm 1.0$                    | $100.0 \pm 1.0$                    |

| CONSTRUCTION |                  |                          |
|--------------|------------------|--------------------------|
| NO.          | NAME             | Y5V                      |
| 1            | Ceramic material | BaTiO <sub>3</sub> based |
| 2            | Inner electrode  | Ni                       |
| 3            | Termination      | Inner layer              |
| 4            |                  | Middle layer             |
| 5            |                  | Outer layer              |



### 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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