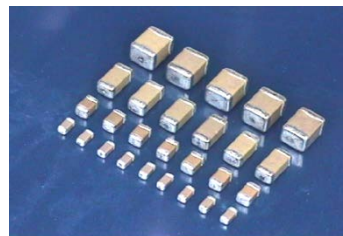


## Multilayer Ceramic Chip Capacitors [ High Capacitance MLCC – 1.0uF and above ]

### HCC Series



#### ◆ Features

- ❑ Surface mount suitable for wave and reflow soldering
- ❑ High reliability
- ❑ Small size and high capacitance value
- ❑ Excellent high frequency characteristics

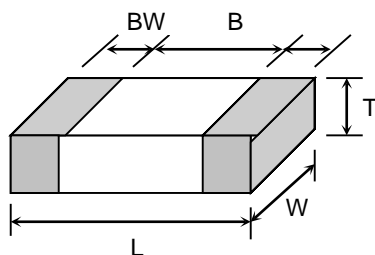
#### ◆ Applications

- ❑ Ideal for smoothing and decoupling circuits
- ❑ Suitable for DC-DC converter, personal computer and peripherals, telecommunication and general electronic equipment
- ❑ RoHS compliant

#### ◆ Summary of Specifications

|                         |                                                                                                                                                                                                                                                             |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operation Temperature   | NP0 / X7R / X7S : -55 °C ~ +125 °C , X6S : -55 °C ~ +105 °C;<br>X5R : -55 °C ~ +85 °C , Y5V : -30 °C ~ +85 °C                                                                                                                                               |
| Rated Voltage           | 4.0Vdc to 50Vdc                                                                                                                                                                                                                                             |
| Temperature Coefficient | X7R : ≤ ± 15% , -55 °C ~ +125 °C (EIA Class II)<br>X7S : ≤ ± 22% , -55 °C ~ +125 °C (EIA Class II)<br>X6S : ≤ ± 22% , -55 °C ~ +105 °C (EIA Class II)<br>X5R : ≤ ± 15% , -55 °C ~ +85 °C (EIA Class II)<br>Y5V : +22%/-82% , -30 °C ~ +85 °C (EIA Class II) |
| Dissipation Factor      | X7R, X5R, X6S, X7S : Max. 0.15; Y5V: Max 0.2                                                                                                                                                                                                                |
| Insulation Resistance   | 10GΩ or 500/CΩ whichever is smaller (C in Farads)                                                                                                                                                                                                           |
| Aging                   | X7S/X7R/X6S/X5R : typically 1.0% and Y5V ≤ 7% per decade of time                                                                                                                                                                                            |
| Dielectric Strength     | 250% Rated Voltage                                                                                                                                                                                                                                          |

#### ◆ Dimension



| TYPE | L                        | W                         | T (max)        | B (min)        | BW (min)       |
|------|--------------------------|---------------------------|----------------|----------------|----------------|
| 0201 | 0.60±0.03<br>[.024±.001] | 0.30±0.03<br>[.011 ±.001] | 0.33<br>[.013] | 0.20<br>[.008] | 0.10<br>[.004] |
| 0402 | 1.00±0.05<br>[.039±.002] | 0.50±0.05<br>[.020 ±.002] | 0.55<br>[.022] | 0.30<br>[.012] | 0.15<br>[.006] |
| 0603 | 1.60±0.10<br>[.063±.004] | 0.80±0.10<br>[.031 ±.004] | 0.95<br>[.037] | 0.40<br>[.016] | 0.15<br>[.006] |
| 0805 | 2.00±0.20<br>[.079±.012] | 1.25±0.20<br>[.049 ±.008] | 1.45<br>[.057] | 0.70<br>[.028] | 0.20<br>[.008] |
| 1206 | 3.20±0.30<br>[.126±.012] | 1.60±0.20<br>[.126±.012]  | 1.80<br>[.071] | 1.50<br>[.059] | 0.30<br>[.012] |
| 1210 | 3.20±0.30<br>[.126±.012] | 2.50±0.20<br>[.098±.008]  | 2.70<br>[.105] | 1.60<br>[.063] | 0.30<br>[.012] |
| 1812 | 4.60±0.3<br>[.181±.012]  | 3.20±0.3<br>[.126±.012]   | 3.00<br>[.118] | 2.50<br>[.098] | 0.30<br>[.012] |
| 2220 | 5.7±0.40<br>[.220±.016]  | 5.00±0.40<br>[.197±.016]  | 3.00<br>[.118] | 3.50<br>[.137] | 0.30<br>[.012] |

#### ◆ How To Order



| Product Code                           | Chip Size                                             | Dielectric                                        | Capacitance Unit : pF                                                              | Tolerance                                                     | Rated Voltage                                                              | Packaging                          | Suffix Code |
|----------------------------------------|-------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------|-------------|
| C: MLCC (Multilayer Ceramic Capacitor) | Ex. 0402 / 0603<br>0805 / 1206<br>1210 / 1812<br>2220 | Ex.:<br>X:X7R<br>S:X6S<br>B:X5R<br>Y:Y5V<br>R:X7S | Ex.:<br>105:10×10 <sup>5</sup><br>106:10×10 <sup>6</sup><br>226:22×10 <sup>6</sup> | Ex.:<br>J : +/- 5%<br>K: +/- 10%<br>M: +/- 20%<br>Z :+80/-20% | Ex.:<br>004: 4Vdc<br>007: 6.3Vdc<br>010: 10Vdc<br>025: 25Vdc<br>050: 50Vdc | T: T&R 7"<br>R: T&R 13"<br>B: Bulk | Y           |

## ◆ Capacitance Range

| X7R (X) Series |      |      |      |     |     |     |     |      |     |     |     |     |     |      |      |     |     |     |     |     |     |      |     |     |     |     |     |     |      |     |     |     |     |      |  |      |  |
|----------------|------|------|------|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|--|------|--|
| Size           | 0402 |      |      |     |     |     |     | 0603 |     |     |     |     |     |      | 0805 |     |     |     |     |     |     | 1206 |     |     |     |     |     |     | 1210 |     |     |     |     | 1812 |  | 2220 |  |
| Code           | 4V   | 6.3V | 6.3V | 10V | 16V | 25V | 50V | 6.3V | 10V | 16V | 25V | 35V | 50V | 6.3V | 10V  | 16V | 25V | 35V | 50V | 10V | 16V | 25V  | 35V | 50V | 10V | 16V | 25V | 35V | 50V  | 25V | 50V | 25V | 50V |      |  |      |  |
| 105            | O    | O    | B    | B   | B   | B   | B   | D    | D   | D   | D   | D   | D   | D    | D    | D/E | D/E | D/E | D/E | D   | D   | D    | D   | D   | D   | D   | D   | D   | D    | E   | F   | F   | F   | F    |  |      |  |
| 155            |      |      | B    | B   |     |     |     | D    | D   | D   | D   | D   | D   | E    | E    | E   | E   | E   | E   | F   | F   | F    | F   | F   | F   | F   | F   | F   | F    | F   | F   | F   | F   | F    |  |      |  |
| 225            |      |      | B    | B   |     |     |     | D    | D   | D   | D   | D   | D   | E    | E    | E   | E   | E   | E   | F   | F   | F    | F   | F   | F   | F   | F   | F   | F    | F   | F   | F   | F   | F    |  |      |  |
| 335            |      |      |      |     |     |     |     | D    | D   | D   | D   | D   | D   | E    | E    | E   | E   | E   | E   | F   | F   | F    | F   | F   | F   | F   | F   | F   | F    | F   | F   | F   | F   | F    |  |      |  |
| 475            |      |      |      |     |     |     |     | D    | D   | D   | D   |     |     | E    | E    | E   | E   | E   | E   | F   | F   | F    | F   | F   | F   | F   | F   | F   | F    | F   | F   | F   | F   | F    |  |      |  |
| 106            |      |      |      |     |     |     |     | D    | D   | D   |     |     |     | E    | E    | E   | E   | E   | E   | F   | F   | F    | F   | F   | F   | F   | F   | F   | F    | F/G | F/G | F/G |     |      |  |      |  |
| 226            |      |      |      |     |     |     |     |      |     |     |     |     |     | E    | E    | E   | E   | E   | E   | F   | F   | F    | F   | F   | F   | F   | F   | F   | F    | F   | F   | F   | F   | F    |  |      |  |
| 476            |      |      |      |     |     |     |     |      |     |     |     |     |     |      |      |     |     |     |     | G   | G   | G    | G   | G   |     |     |     |     |      |     |     |     |     |      |  |      |  |

| X7S (R) Series |      |     |      |     |     |      |     |      |      |  |
|----------------|------|-----|------|-----|-----|------|-----|------|------|--|
| Size           | 0402 |     | 0603 |     |     | 0805 |     | 1206 | 1210 |  |
| Code           | 6.3V | 10V | 10V  | 16V | 25V | 25V  | 50V | 16V  | 6.3V |  |
| 105            |      | O   |      |     |     |      |     |      |      |  |
| 155            |      |     |      |     |     |      |     |      |      |  |
| 225            | O    | O   |      | B   | B   |      |     |      |      |  |
| 335            |      |     |      |     |     |      |     |      |      |  |
| 475            |      |     | B    | B   |     |      | D   |      |      |  |
| 106            |      |     |      |     |     | D    |     |      |      |  |
| 226            |      |     |      |     |     |      |     | E    |      |  |
| 476            |      |     |      |     |     |      |     |      |      |  |
| 107            |      |     |      |     |     |      |     |      | G    |  |

| Y5V (Y) Series |      |     |      |     |     |     |      |     |     |     |     |      |     |     |      |     |     |     |
|----------------|------|-----|------|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|------|-----|-----|-----|
| Size           | 0402 |     | 0603 |     |     |     | 0805 |     |     |     |     | 1206 |     |     | 1210 |     |     |     |
| Code           | 6.3V | 10V | 6.3  | 10V | 16V | 25V | 6.3V | 10V | 16V | 25V | 50V | 10V  | 16V | 25V | 10V  | 16V | 25V | 35V |
| 105            | O    | O   |      | B   | B   | B   |      |     |     | B   | B   | D    |     |     |      |     |     |     |
| 155            |      |     |      | B   | B   | B   |      |     |     | B   | B   | D    |     |     |      |     |     |     |
| 225            |      |     |      | B   | B   |     |      |     |     |     |     |      |     |     |      |     |     |     |
| 475            |      |     |      | B   | B   |     |      |     |     |     |     |      |     |     |      |     |     |     |
| 106            |      |     |      |     |     |     |      |     |     |     |     |      |     |     |      |     |     |     |
| 226            |      |     |      |     |     |     |      |     |     |     |     |      |     |     |      |     |     |     |

| X6S (S) Series |      |      |      |     |     |     |      |      |     |     |     |      |    |      |     |     |      |     |     |    |      |      |     |     |     |     |      |     |     |     |     |     |   |
|----------------|------|------|------|-----|-----|-----|------|------|-----|-----|-----|------|----|------|-----|-----|------|-----|-----|----|------|------|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|---|
| Size           | 0201 |      | 0402 |     |     |     | 0603 |      |     |     |     | 0805 |    |      |     |     | 1206 |     |     |    |      | 1210 |     |     |     |     |      |     |     |     |     |     |   |
| Code           | 4V   | 6.3V | 6.3V | 10V | 16V | 25V | 4V   | 6.3V | 10V | 16V | 25V | 50V  | 4V | 6.3V | 10V | 16V | 25V  | 35V | 50V | 4V | 6.3V | 10V  | 16V | 25V | 35V | 50V | 6.3V | 10V | 16V | 25V | 35V | 50V |   |
| 105            | S    | S    | O    | O   | O   | O   | B    | B    | B   | B   | B   | B    | B  | B    | B   | B   | B    | B   | B   | B  | B    | B    | B   | B   | B   | B   | B    | B   | B   | B   | B   | B   | B |
| 225            |      |      | O    | O   | O   | O   | B    | B    | B   | B   | B   | B    | B  | B    | B   | B   | B    | B   | B   | B  | B    | B    | B   | B   | B   | B   | B    | B   | B   | B   | B   | B   | B |
| 475            |      |      | O    | O   | O   | O   | B    | B    | B   | B   | B   | B    | B  | B    | B   | B   | B    | B   | B   | B  | B    | B    | B   | B   | B   | B   | B    | B   | B   | B   | B   | B   | B |
| 106            |      |      | O    | O   | O   |     | B    | B    | B   | B   | B   |      | B  | B    | B   | B   | B    |     | B   | B  | B    | B    | B   |     | B   | B   | B    | B   | B   |     | B   | B   | B |
| 226            |      |      |      |     |     |     | B    | B    | B   | B   | B   |      | B  | B    | B   | B   | B    |     | B   | B  | B    | B    | B   |     | B   | B   | B    | B   | B   |     | B   | B   | B |
| 476            |      |      |      |     |     |     | B    | B    | B   | B   | B   |      | B  | B    | B   | B   | B    |     | B   | B  | B    | B    | B   |     | B   | B   | B    | B   | B   |     | B   | B   | B |
| 107            |      |      |      |     |     |     |      |      |     |     |     |      |    |      |     |     |      |     |     |    |      |      |     |     |     |     |      |     |     |     |     |     |   |
| 227            |      |      |      |     |     |     |      |      |     |     |     |      |    |      |     |     |      |     |     |    |      |      |     |     |     |     |      |     |     |     |     |     |   |

| X5R (B) Series |      |      |      |     |     |     |      |      |     |     |     |      |     |    |      |     |      |     |     |     |      |      |     |     |     |      |     |     |     |     |   |   |   |
|----------------|------|------|------|-----|-----|-----|------|------|-----|-----|-----|------|-----|----|------|-----|------|-----|-----|-----|------|------|-----|-----|-----|------|-----|-----|-----|-----|---|---|---|
| Size           | 0201 |      | 0402 |     |     |     | 0603 |      |     |     |     | 0805 |     |    |      |     | 1206 |     |     |     |      | 1210 |     |     |     |      |     |     |     |     |   |   |   |
| Code           | 4V   | 6.3V | 6.3V | 10V | 16V | 25V | 35V  | 6.3V | 10V | 16V | 25V | 35V  | 50V | 4V | 6.3V | 10V | 16V  | 25V | 35V | 50V | 6.3V | 10V  | 16V | 25V | 50V | 6.3V | 10V | 16V | 25V | 50V |   |   |   |
| 105            |      | S    | S    | O   | O   | O   | O    | O    | B   | B   | B   | B    | B   | B  | B    | B   | B    | B   | B   | B   | B    | B    | B   | B   | B   | B    | B   | B   | B   | B   | B | B | B |
| 225            |      | S    | S    | O   | O   | O   | O    | O    | B   | B   | B   | B    | B   | B  | B    | B   | B    | B   | B   | B   | B    | B    | B   | B   | B   | B    | B   | B   | B   | B   | B | B | B |
| 335            |      |      |      | O   | O   | O   |      |      | B   | B   | B   | B    |     |    | B    | B   | B    | B   | B   |     | B    | B    | B   | B   |     | B    | B   | B   | B   |     | B | B | B |
| 475            |      |      |      | O   | O   | O   |      |      | B   | B   | B   | B    |     |    | B    | B   | B    | B   | B   |     | B    | B    | B   | B   |     | B    | B   | B   | B   |     | B | B | B |
| 106            |      |      |      | O   | O   |     |      |      | B   | B   | B   | B    |     |    | B    | B   | B    | B   | B   |     | B    | B    | B   | B   |     | B    | B   | B   | B   |     | B | B | B |
| 226            |      |      |      |     |     |     |      |      | B   | B   | B   | B    |     |    | B    | B   | B    | B   | B   |     | B    | B    | B   | B   |     | B    | B   | B   | B   |     | B | B | B |
| 476            |      |      |      |     |     |     |      |      | B   |     |     |      |     |    | B    | B   | B    | B   | B   |     | B    | B    | B   | B   |     | B    | B   | B   | B   |     | B | B | B |
| 107            |      |      |      |     |     |     |      |      |     |     |     |      |     |    |      |     |      |     |     |     |      |      |     |     |     |      |     |     |     |     |   |   |   |
| 227            |      |      |      |     |     |     |      |      |     |     |     |      |     |    |      |     |      |     |     |     |      |      |     |     |     |      |     |     |     |     |   |   |   |

- The yellow indication denotes values that are under development. Please contact Holy Stone office for further details
- Other dimensions, capacitance values and voltages ratings are available on request. Please contact Holy Stone.

## ◆ Thickness Specification

| Symbol Code   | S        | O        | A       | B         | C             | D         | E       | F       | G       | H       |
|---------------|----------|----------|---------|-----------|---------------|-----------|---------|---------|---------|---------|
| Thickness(mm) | 0.3±0.03 | 0.5±0.05 | 0.6±0.1 | 0.85±0.15 | 1.0+0.1/-0.05 | 1.25±0.20 | 1.6±0.2 | 2.0±0.2 | 2.4±0.2 | 2.8±0.2 |

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