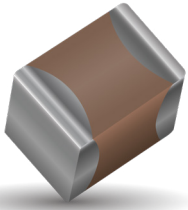


# Y5V Dielectric

## General Specifications



### GENERAL DESCRIPTION

Y5V formulations are for general-purpose use in a limited temperature range. They have a wide temperature characteristic of +22% –82% capacitance change over the operating temperature range of –30°C to +85°C. These characteristics make Y5V ideal for decoupling applications within limited temperature range.



### PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

**0805**

**Size**  
(L" x W")

**3**

**Voltage**  
6.3V = 6  
10V = Z  
16V = Y  
25V = 3  
50V = 5

**G**

**Dielectric**  
Y5V = G

**104**

**Capacitance Code (In pF)**  
2 Sig. Digits + Number of Zeros

**Z**

**Capacitance Tolerance**  
Z = +80 –20%

**A**

**Failure Rate**  
A = Not Applicable

**T**

**Terminations**  
T = Plated Ni and Sn

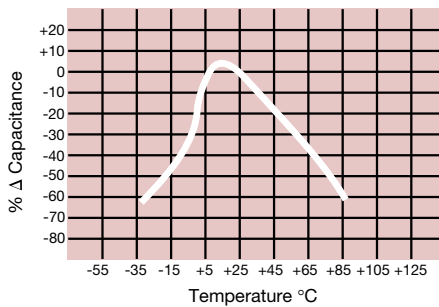
**2**

**Packaging**  
2 = 7" Reel  
4 = 13" Reel

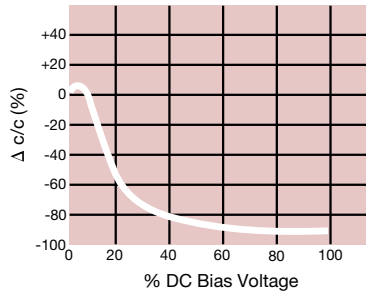
**A**

**Special Code**  
A = Std. Product

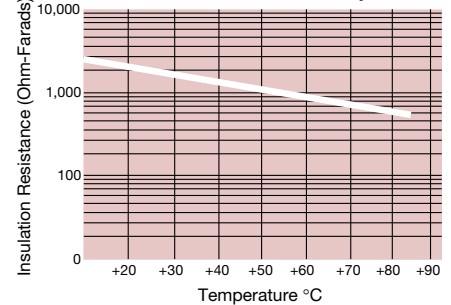
**Temperature Coefficient**



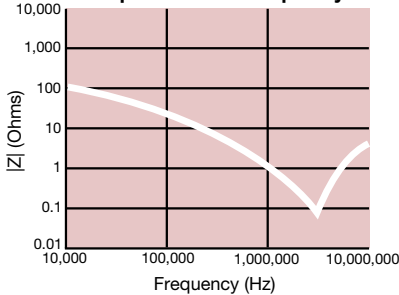
**Capacitance Change vs. DC Bias Voltage**



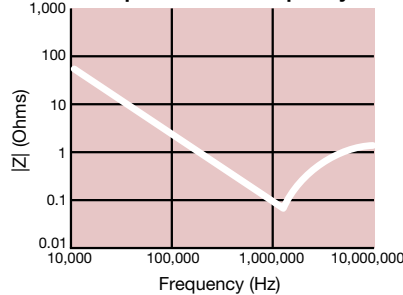
**Insulation Resistance vs. Temperature**



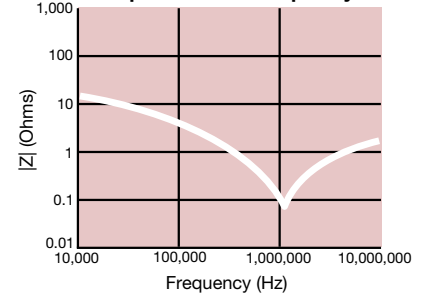
**0.1 μF - 0603 Impedance vs. Frequency**



**0.22 μF - 0805 Impedance vs. Frequency**

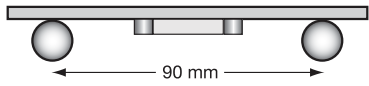


**1 μF - 1206 Impedance vs. Frequency**



# Y5V Dielectric

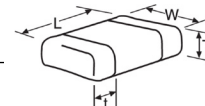
## Specifications and Test Methods

| Parameter/Test                 |                       | Y5V Specification Limits  | Measuring Conditions  |                |
|--------------------------------|-----------------------|---|---|----------------|
| Operating Temperature Range    |                       | -30°C to +85°C  | Temperature Cycle Chamber   |                |
| Capacitance                    |                       | Within specified tolerance  | Freq.: 1.0 kHz ± 10%<br>Voltage: 1.0Vrms ± .2V<br>For Cap > 10 µF, 0.5Vrms @ 120Hz  |                |
| Dissipation Factor             |                       | ≤ 5.0% for ≥ 50V DC rating<br>≤ 7.0% for 25V DC rating<br>≤ 9.0% for 16V DC rating<br>≤ 12.5% for ≤ 10V DC rating |   |                |
| Insulation Resistance          |                       | 10,000MΩ or 500MΩ - µF, whichever is less   |   |                |
| Dielectric Strength            |                       | No breakdown or visual defects  | Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max)   |                |
| Resistance to Flexure Stresses | Appearance            | No defects  | Deflection: 2mm<br>Test Time: 30 seconds<br>1mm/sec<br>  |                |
|                                | Capacitance Variation | ≤ ±30%  |   |                |
|                                | Dissipation Factor    | Meets Initial Values (As Above)   |   |                |
|                                | Insulation Resistance | ≥ Initial Value x 0.1   |   |                |
| Solderability                  |                       | ≥ 95% of each terminal should be covered with fresh solder  | Dip device in eutectic solder at 230 ± 5°C for 5.0 ± 0.5 seconds  |                |
| Resistance to Solder Heat      | Appearance            | No defects, <25% leaching of either end terminal  | Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 ± 2 hours before measuring electrical properties.   |                |
|                                | Capacitance Variation | ≤ ±20%  |   |                |
|                                | Dissipation Factor    | Meets Initial Values (As Above)   |   |                |
|                                | Insulation Resistance | Meets Initial Values (As Above)   |   |                |
|                                | Dielectric Strength   | Meets Initial Values (As Above)   |   |                |
| Thermal Shock                  | Appearance            | No visual defects   | Step 1: -30°C ± 2°  | 30 ± 3 minutes |
|                                | Capacitance Variation | ≤ ±20%  | Step 2: Room Temp   | ≤ 3 minutes    |
|                                | Dissipation Factor    | Meets Initial Values (As Above)   | Step 3: +85°C ± 2°  | 30 ± 3 minutes |
|                                | Insulation Resistance | Meets Initial Values (As Above)   | Step 4: Room Temp   | ≤ 3 minutes    |
|                                | Dielectric Strength   | Meets Initial Values (As Above)   | Repeat for 5 cycles and measure after 24 ± 2 hours at room temperature  |                |
| Load Life                      | Appearance            | No visual defects   | Charge device with twice rated voltage in test chamber set at 85°C ± 2°C for 1000 hours (+48, -0)<br><br>Remove from test chamber and stabilize at room temperature for 24 ± 2 hours before measuring.                                  |                |
|                                | Capacitance Variation | ≤ ±30%  |   |                |
|                                | Dissipation Factor    | ≤ Initial Value x 1.5 (See Above)   |   |                |
|                                | Insulation Resistance | ≥ Initial Value x 0.1 (See Above)   |   |                |
|                                | Dielectric Strength   | Meets Initial Values (As Above)   |   |                |
| Load Humidity                  | Appearance            | No visual defects   | Store in a test chamber set at 85°C ± 2°C/ 85% ± 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied.<br><br>Remove from chamber and stabilize at room temperature and humidity for 24 ± 2 hours before measuring. |                |
|                                | Capacitance Variation | ≤ ±30%  |   |                |
|                                | Dissipation Factor    | ≤ Initial Value x 1.5 (See above)   |   |                |
|                                | Insulation Resistance | ≥ Initial Value x 0.1 (See Above)   |   |                |
|                                | Dielectric Strength   | Meets Initial Values (As Above)   |   |                |

# Y5V Dielectric Capacitance Range

PREFERRED SIZES ARE SHADED

| SIZE         | 0201        |    |                 |    | 0402        |    |                 |    | 0603        |    |                 |    | 0805           |    |                 |    | 1206           |    |                 |    | 1210           |    |                 |   |
|--------------|-------------|----|-----------------|----|-------------|----|-----------------|----|-------------|----|-----------------|----|----------------|----|-----------------|----|----------------|----|-----------------|----|----------------|----|-----------------|---|
| Soldering    | Reflow Only |    |                 |    | Reflow/Wave |    |                 |    | Reflow/Wave |    |                 |    | Reflow/Wave    |    |                 |    | Reflow/Wave    |    |                 |    | Reflow/Wave    |    |                 |   |
| Packaging    | All Paper   |    |                 |    | All Paper   |    |                 |    | All Paper   |    |                 |    | Paper/Embossed |    |                 |    | Paper/Embossed |    |                 |    | Paper/Embossed |    |                 |   |
| (L) Length   | mm          |    | (in.)           |    | mm          |    | (in.)           |    | mm          |    | (in.)           |    | mm             |    | (in.)           |    | mm             |    | (in.)           |    | mm             |    | (in.)           |   |
| (L) Length   | 0.60 ± 0.09 |    | (0.024 ± 0.004) |    | 1.00 ± 0.10 |    | (0.040 ± 0.004) |    | 1.60 ± 0.15 |    | (0.063 ± 0.006) |    | 2.01 ± 0.20    |    | (0.079 ± 0.008) |    | 3.20 ± 0.20    |    | (0.126 ± 0.008) |    | 3.20 ± 0.20    |    | (0.126 ± 0.008) |   |
| (W) Width    | 0.30 ± 0.09 |    | (0.011 ± 0.004) |    | 0.50 ± 0.10 |    | (0.020 ± 0.004) |    | .81 ± 0.15  |    | (0.032 ± 0.006) |    | 1.25 ± 0.20    |    | (0.049 ± 0.008) |    | 1.60 ± 0.20    |    | (0.063 ± 0.008) |    | 2.50 ± 0.20    |    | (0.098 ± 0.008) |   |
| (t) Terminal | 0.15 ± 0.05 |    | (0.006 ± 0.002) |    | 0.25 ± 0.15 |    | (0.010 ± 0.006) |    | 0.35 ± 0.15 |    | (0.014 ± 0.006) |    | 0.50 ± 0.25    |    | (0.020 ± 0.010) |    | 0.50 ± 0.25    |    | (0.020 ± 0.010) |    | .50 ± 0.25     |    | (0.020 ± 0.010) |   |
| WVDC         | 6.3         | 10 | 6               | 10 | 16          | 25 | 50              | 10 | 16          | 25 | 50              | 10 | 16             | 25 | 50              | 10 | 16             | 25 | 50              | 10 | 16             | 25 | 50              |   |
| Cap (pF)     | 820         |    | A               |    |             |    |                 |    |             |    |                 |    |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 1000        |    | A               |    |             |    |                 |    |             |    |                 |    |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 2200        |    | A               |    |             |    |                 |    |             |    |                 |    |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 4700        |    | A               |    |             |    |                 |    |             |    |                 |    |                |    |                 |    |                |    |                 |    |                |    |                 |   |
| Cap (µF)     | 0.010       | A  | A               |    |             |    |                 |    |             |    |                 |    |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 0.022       | A  |                 |    |             |    |                 |    |             |    |                 |    |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 0.047       | A  |                 |    |             |    |                 |    |             |    |                 |    |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 0.10        |    |                 |    | C           | C  |                 |    |             |    |                 | G  | G              |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 0.22        |    |                 |    |             |    |                 |    |             |    |                 | G  |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 0.33        |    |                 |    |             |    |                 |    |             |    |                 | G  |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 0.47        |    |                 |    |             | C  |                 |    |             |    |                 | G  | G              |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 1.0         |    |                 |    | C           | C  |                 |    |             |    |                 | G  | G              | J  |                 |    |                |    |                 |    |                |    |                 | N |
|              | 2.2         |    |                 |    |             |    |                 |    |             |    |                 | J  |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 4.7         |    |                 |    |             |    |                 |    |             |    |                 |    |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 10.0        |    |                 |    |             |    |                 |    |             |    |                 |    |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 22.0        |    |                 |    |             |    |                 |    |             |    |                 |    |                |    |                 |    |                |    |                 |    |                |    |                 |   |
|              | 47.0        |    |                 |    |             |    |                 |    |             |    |                 |    |                |    |                 |    |                |    |                 |    |                |    |                 |   |
| WVDC         | 6.3         | 10 | 6               | 10 | 16          | 25 | 50              | 10 | 16          | 25 | 50              | 10 | 16             | 25 | 50              | 10 | 16             | 25 | 50              | 10 | 16             | 25 | 50              |   |
| SIZE         | 0201        |    |                 |    | 0402        |    |                 |    | 0603        |    |                 |    | 0805           |    |                 |    | 1206           |    |                 |    | 1210           |    |                 |   |



| Letter    | A       | C       | E       | G       | J       | K        | M       | N       | P       | Q       | X       | Y       | Z       |
|-----------|---------|---------|---------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|
| Max.      | 0.33    | 0.56    | 0.71    | 0.90    | 0.94    | 1.02     | 1.27    | 1.40    | 1.52    | 1.78    | 2.29    | 2.54    | 2.79    |
| Thickness | (0.013) | (0.022) | (0.028) | (0.035) | (0.037) | (0.040)  | (0.050) | (0.055) | (0.060) | (0.070) | (0.090) | (0.100) | (0.110) |
|           | PAPER   |         |         |         |         | EMBOSSED |         |         |         |         |         |         |         |