

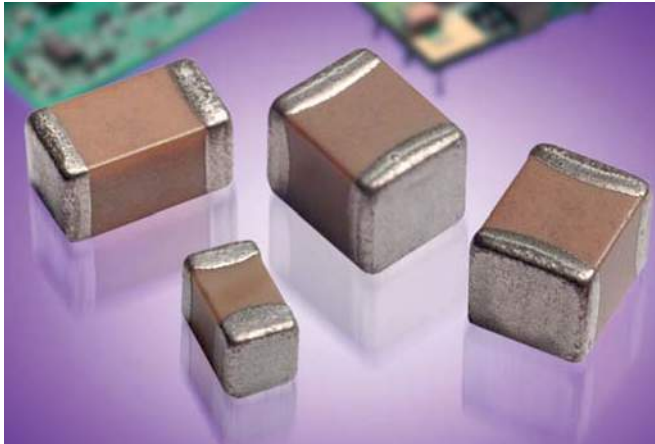


**THE DATASHEET OF**  
**12103G106ZAT2A**



# Y5V Dielectric

## General Specifications



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 2 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

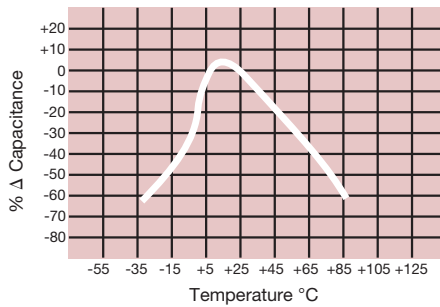
**2**

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

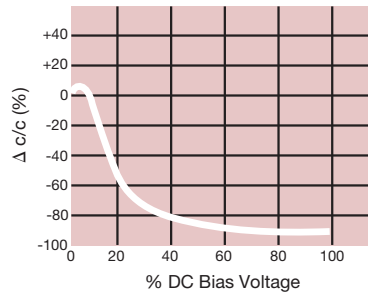
**A**

**Special Code**  
A = Std. Product

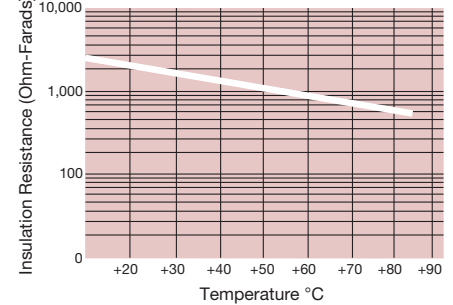
Temperature Coefficient



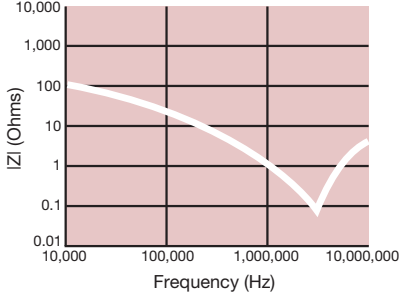
Capacitance Change vs. DC Bias Voltage



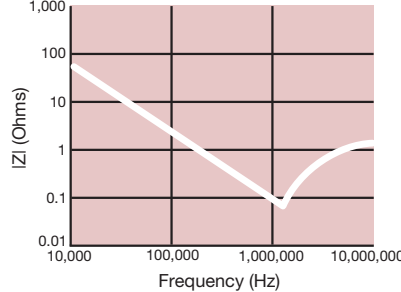
Insulation Resistance vs. Temperature



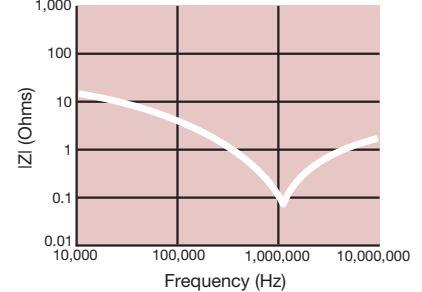
0.1 μF - 0603 Impedance vs. Frequency



0.22 μF - 0805 Impedance vs. Frequency



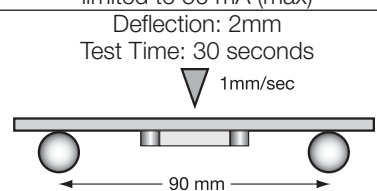
1 μF - 1206 Impedance vs. Frequency



# Y5V Dielectric



## Specifications and Test Methods

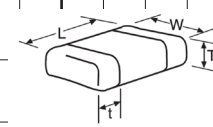
Parameter/Test		Y5V Specification Limits	Measuring Conditions	
<b>Operating Temperature Range</b>		-30°C to +85°C	Temperature Cycle Chamber	
<b>Capacitance</b>		Within specified tolerance		
<b>Dissipation Factor</b>		$\leq 5.0\%$ for $\geq 50V$ DC rating $\leq 7.0\%$ for 25V DC rating $\leq 9.0\%$ for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

# 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							
Packaging	All Paper		All Paper				All Paper				Paper/Embossed				Paper/Embossed				Paper/Embossed			
(L) Length	mm	0.60 ± 0.09	1.00 ± 0.10				1.60 ± 0.15				2.01 ± 0.20				3.20 ± 0.20				3.20 ± 0.20			
	(in.)	(0.024 ± 0.004)	(0.040 ± 0.004)				(0.063 ± 0.006)				(0.079 ± 0.008)				(0.126 ± 0.008)				(0.126 ± 0.008)			
(W) Width	mm	0.30 ± 0.09	0.50 ± 0.10				.81 ± 0.15				1.25 ± 0.20				1.60 ± 0.20				2.50 ± 0.20			
	(in.)	(0.011 ± 0.004)	(0.020 ± 0.004)				(0.032 ± 0.006)				(0.049 ± 0.008)				(0.063 ± 0.008)				(0.098 ± 0.008)			
(t) Terminal	mm	0.15 ± 0.05	0.25 ± 0.15				0.35 ± 0.15				0.50 ± 0.25				0.50 ± 0.25				.50 ± 0.25			
	(in.)	(0.006 ± 0.002)	(0.010 ± 0.006)				(0.014 ± 0.006)				(0.020 ± 0.010)				(0.020 ± 0.010)				(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	10 16 25 50	10 16 25 50	10 16 25 50	10 16 25 50	10 16 25 50	10 16 25 50	10 16 25 50	10 16 25 50							
Cap (pF)	820																					
	1000																					
	2200																					
Cap (μF)	4700																					
	0.010																					
	0.022																					
	0.047																					
	0.10																					
	0.22																					
	0.33																					
	0.47																					
	1.0																					
	2.2																					
	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	10 16 25 50	10 16 25 50	10 16 25 50	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. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSSED							

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