

# 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.

Y5V's high dielectric constant allows the manufacture of the highest capacitance value in a given case size.

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

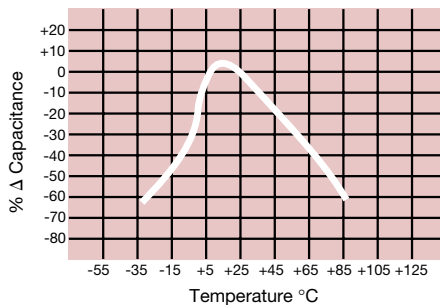
**2**

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

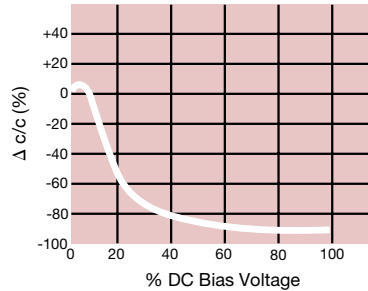
**A**

**Special Code**  
A = Std.  
Product

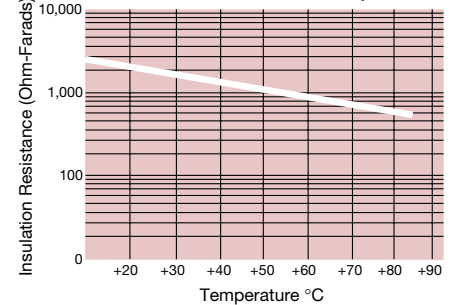
**Temperature Coefficient**



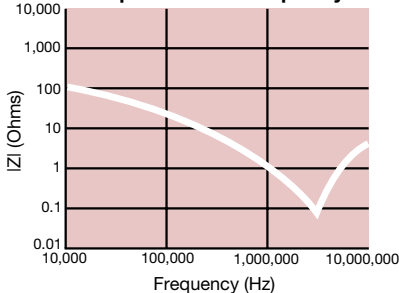
**Capacitance Change vs. DC Bias Voltage**



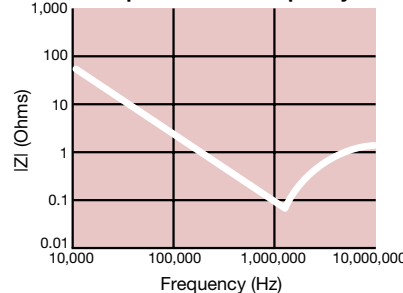
**Insulation Resistance vs. Temperature**



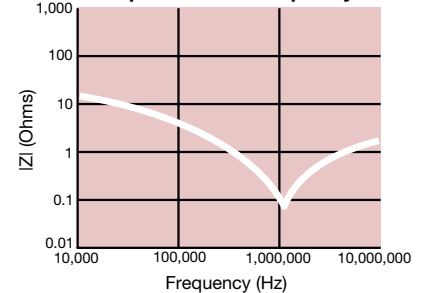
**0.1 μF - 0603 Impedance vs. Frequency**



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



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



## 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	Freq.: 1.0 kHz $\pm$ 10% Voltage: 1.0Vrms $\pm$ .2V For Cap > 10 $\mu$ F, 0.5Vrms @ 120Hz	
<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		
<b>Insulation Resistance</b>		100,000M $\Omega$ or 500M $\Omega$ - $\mu$ F, whichever is less	Charge device with rated voltage for 60 $\pm$ 5 secs @ room temp/humidity	
<b>Dielectric Strength</b>		No breakdown or visual defects	Charge device with 300% 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°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°	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°	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>		Meets Initial Values (As Above)	Charge device with twice rated voltage in test chamber set at 85°C $\pm$ 2°C for 1000 hours (+48, -0)
<b>Load Humidity</b>	Appearance	No visual defects	Remove from test chamber and stabilize at room temperature for 24 $\pm$ 2 hours before measuring.	
	Capacitance Variation	$\leq$ $\pm$ 30%		
	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)		
<b>Load Humidity</b>	Appearance	No visual defects	Store in a test chamber set at 85°C $\pm$ 2°C/ 85% $\pm$ 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied.	
	Capacitance Variation	$\leq$ $\pm$ 30%		
	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)		

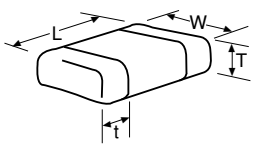
# Y5V Dielectric



## Capacitance Range

PREFERRED SIZES ARE SHADED

SIZE		0201		0402					0603				0805				1206				1210						
Soldering		Reflow Only		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 (in.)	0.60 ± 0.03 (0.024 ± 0.001)		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)						
	MM (in.)	0.30 ± 0.03 (0.011 ± 0.001)		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	MM (in.)	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	6.3	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25
Cap (pF)	2200	1000 pF	1000 pF																								
	2700	A	A																								
Cap (pF)	3300	A	A																								
	3900	A	A																								
	4700	A	A	C	C	C	C	C																			
	5600	A	A	C	C	C	C	C																			
Cap (µF)	6800	A	A	C	C	C	C	C																			
	8200	A	A	C	C	C	C	C																			
Cap (µF)	0.010	A	A	C	C	C	C	C	G	G	G	G	E	E	E	E											
	0.012	A		C	C	C	C	C	G	G	G	G	E	E	E	E											
	0.015	A		C	C	C	C	C	G	G	G	G	E	E	E	E											
	0.018	A		C	C	C	C	C	G	G	G	G	E	E	E	E											
Cap (µF)	0.022	A		C	C	C	C	C	G	G	G	G	E	E	E	E											
	0.027	A		C	C	C	C	C	G	G	G	G	E	E	E	E											
	0.033	A		C	C	C	C		G	G	G	G	E	E	E	E											
Cap (µF)	0.039	A		C	C	C	C		G	G	G	G	E	E	E	E											
	0.047	A		C	C	C	C		G	G	G	G	E	E	E	E					J	J	J	J			
	0.056			C	C	C			G	G	G	G	E	E	E	E	J	J	J	J							
Cap (µF)	0.068			C	C	C			G	G	G	G	E	E	E	E	J	J	J	J							
	0.082			C	C	C			G	G	G	G	E	E	E	E	J	J	J	J							
	0.10			C	C	C			G	G	G	G	E	E	E	E	J	J	J	J	J	J	J	J	J	J	
Cap (µF)	0.12			C	C	C			G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J	J	
	0.15			C	C	C			G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J	J	
	0.18			C	C	C			G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J	J	
Cap (µF)	0.22			C	C	C			G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J	J	
	0.27			C	C	C			G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J	J	
	0.33								G	G			J	J	M	M	J	J	J	J	J	J	J	J	J	J	
Cap (µF)	0.39								G	G			J	J	M	M	J	J	J	J	J	J	J	J	J	J	
	0.47								G	G			J	J	N	N	J	J	J	J	J	J	J	J	J	J	
	0.56								G	G			J	J	N	N	J	J	J	J	J	J	J	J	J	J	
Cap (µF)	0.68								G	G			J	J	N	N	J	J	J	J	J	J	J	J	J	J	
	0.82								G	G			J	J	N	N	J	J	J	J	J	J	J	J	J	J	
	1.0								G	G			N	N	N	N	J	J	J	J	J	J	J	J	J	J	
Cap (µF)	1.2												N	N	N	N	J	J	J	J	J	J	J	J	J	J	
	1.5												N	N	N	N	J	J	J	J	J	J	J	J	J	J	
	1.8												N	N	N	N	M	M	M	M	J	J	J	J	J	J	
Cap (µF)	2.2												N	N	N	N	M	M	M	M	J	J	J	J	J	J	
	2.7												N	N	N	N	M	M	M	M	J	J	J	J	J	J	
	3.3												N	N	N	N	M	M	M	M	P	P	P	P	P	P	
Cap (µF)	3.9												N	N	N	N	P	P	P	P	P	P	P	P	P	P	
	4.7												N	N	N	N	P	P	P	P	P	P	P	P	P	P	
	5.6																Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
Cap (µF)	6.8																Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
	8.2																Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
	10.0																Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
Cap (µF)	12.0																Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
	15.0																Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
	18.0																X	X	X	X	X	X	X	X	X	X	
Cap (µF)	22.0																X	X	X	X	X	X	X	X	X	X	
	47.0																X	X	X	X	X	X	X	X	X	X	
	100.0																X	X	X	X	X	X	X	X	X	X	
WVDC	6.3	10	6.3	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	BB	CC												
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.86 (0.034)	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)	3.05 (0.120)	3.175 (0.125)												
	PAPER								EMBOSSED																		



Contact Factory for Multiples

