

Dielectric characteristics

Class II Dielectrics

Capacitors of this type have a dielectric constant range of 1000-4000 and also have a non-linear temperature characteristic which exhibits a dielectric constant variation of less than $\pm 15\%$ (2R1) from its room temperature value, over the specified temperature range. Generally used for by-passing (decoupling), coupling, filtering, frequency discrimination, DC blocking and voltage transient suppression with greater volumetric efficiency than Class I units, whilst maintaining stability within defined limits.

Capacitance and dissipation factor are affected by:-

- Time (Ageing)
- Voltage (AC or DC)
- Frequency

Class II Dielectrics								
X5R	X7R			X8R	Class II High Temperature			
Stable	Stable			Stable	Stable			
-	2C1	2R1	2X1	-	-	-	IECQ-CECC	Dielectric classifications
X5R	-	X7R	-	X8R	-	-	EIA	
-	BZ	-	BX	-	-	-	MIL	
-	-	-	-	-	-	-	DLI	Ordering code
BW	-	B	X	S	G	E, RE	Novacap	
P	R	X	B	N	-	X	Syfer	
-	-	X	-	-	-	-	Voltronics	
-55°C to +85°C	-55°C to +125°C			-55°C to +150°C	-55°C to +160°C	-55°C to +200°C		Rated temperature range
$\pm 15\%$	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$	+15 -40%	+15 -65%	No DC voltage applied	Maximum capacitance change over temperature range
-	+15 -45%	-	+15 -25%	-	-	-	Rated DC voltage applied	
≤ 0.025 Typical*	$>25V \leq 0.025$ $\leq 25V \leq 0.035$			≤ 0.025	≤ 0.025			Tangent of loss angle ($\tan \delta$)
100G Ω or 1000s (whichever is the least)							Time constant ($R_i \times Cr$)	Insulation resistance (R_i)
$\pm 5\%$, $\pm 10\%$, $\pm 20\%$								Capacitance Tolerance
2.5 times	2.5 times			2.5 times	2.5 times		$\leq 200V$	Dielectric strength Voltage applied for 5 seconds. Charging current limited to 50mA maximum.
	Rated voltage + 250V				Rated voltage + 250V		$>200V$ to $<500V$	
	1.5 times				1.5 times		500V to $<1kV$	
	1.2 times				1.2 times		$\geq 1kV$	
55/85/56	55/125/56			55/150/56	-		Chip	Climatic category (IEC)
-	55/125/21			-	-		Dipped	
-	55/125/56			-	-		Discoidal	
5% Typical	$<2\%$ per time decade							Ageing characteristic (Typical)
-	QC-32100	-	-	-	QC-32100	-	Syfer Chip	Approvals

* Refer to page 34 for details of Dissipation Factor.