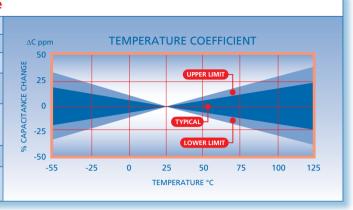




COG/NPO (N) Ultra Stable and RoHS 2013 (RN) ty		
Operating temperature range:	-55°C to 125°C	
Temperature coefficient:	0 ±30 ppm/°C	
Dissipation factor:	0.1% max @ 25℃	
Insulation resistance @25°C: @125°C:	>100G $\Omega$ or >1000 $\Omega$ F whichever is less >10G $\Omega$ or >100 $\Omega$ F whichever is less	
Dielectric ≤200V: withstanding 201-500V: voltage >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater	
Ageing rate:	0% per decade	
Test parameters:	1KHz, 1.0 ±0.2 VRMS, 25°C 1MHz for Capacitance ≤100pF	

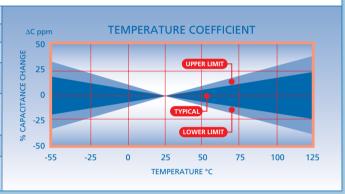


#### -55°C to 125°C Operating temperature range: Temperature coefficient: 0 ±30 ppm/°C 0.1% max @ 25°C Dissipation factor: Insulation resistance @25°C: $>1000\Omega F$ or $>10000\Omega F$ whichever is less @125°C: >100 $\Omega$ F or >1000 $\Omega$ F whichever is less ≤200V: 201-500V: Dielectric withstanding 150% or 500V whichever is greater >500V: 120% or 750V whichever is greater voltage

COG/NPO (M) Ultra Stable Non Magnetic

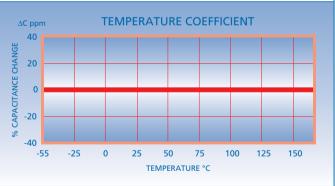
Ageing rate: 0% per decade

Test parameters: 1KHz, 1.0 ±0.2 VRMS, 25°C
1MHz for Capacitance ≤100pF



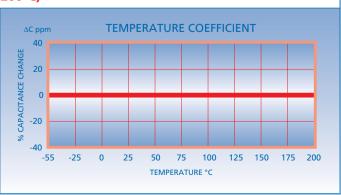
## COG/NPO (F) Ultra Stable High Temperature (up to 160°C)

Operating temperature range:		-55°C to 160°C
	Temperature coefficient:	0 ±30 ppm/°C
Dissipation factor:		0.1% max @ 25°C
	Insulation resistance @25°C: @160°C:	>100G $\Omega$ or >1000 $\Omega$ F whichever is less >1G $\Omega$ or >10 $\Omega$ F whichever is less
	Dielectric <200V: withstanding 201-500V: voltage >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
	Ageing rate:	0% per decade
	Test parameters:	1KHz, 1.0 ±0.2 VRMS, 25°C 1MHz for Capacitance ≤100pF



### COG/NPO (D) Ultra Stable High Temperature (up to 200°C)

operating temperature range.		-55°C to 200°C
		0 ±30 ppm/°C
Dissipation factor @ 25	5°C:	0.1% Max.
Insulation resistance	@25°C: @200°C:	>100G $\Omega$ or >1000 $\Omega$ F whichever is less >1G $\Omega$ or >10 $\Omega$ F whichever is less
Dielectric withstanding voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		0% per decade
Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C 1MHz for capacitance ≤100pF

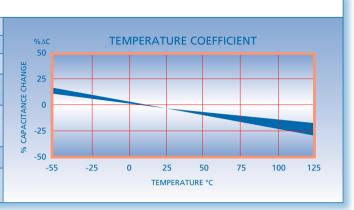




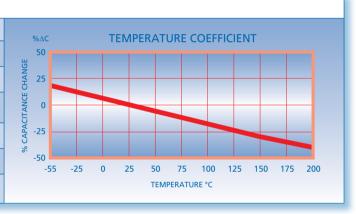




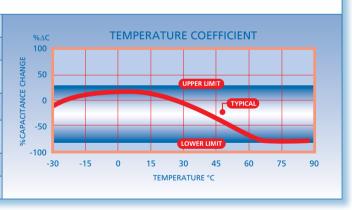
R3L (K) Ultra Stable	
Operating temperature range:	-55°C to 125°C
Temperature coefficient:	-2200 ±500 ppm/°C
Dissipation factor:	0.1% max @ 25°C
Insulation resistance @25°C: @125°C:	>1000 $\Omega F$ or >10000 $\Omega F$ whichever is less >100 $\Omega F$ or >1000 $\Omega F$ whichever is less
Dielectric ≤200V: withstanding 201-500V: voltage >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:	0% per decade
Test parameters:	1KHz, 1.0 ±0.2 VRMS, 25°C 1MHz for Capacitance ≤100pF



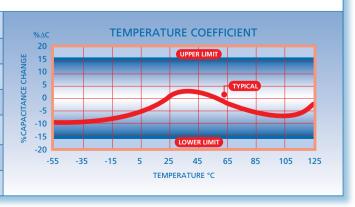
#### **R2D (R) Pulse Energy** -55°C to 200°C Operating temperature range: Temperature coefficient: -2200 ±500 ppm/°C Dissipation factor: 0.1% max @ 25°C @25°C: $>100G\Omega$ or $>1000\Omega$ F whichever is less Insulation resistance @200°C: $> 1G\Omega$ or $> 10\Omega F$ whichever is less Dielectric withstanding voltage: 120% Ageing rate: 0% per decade 1KHz, 1.0 ±0.2 VRMS, 25°C



#### Y5V (Y) General Purpose -30°C to 85°C Operating temperature range: Temperature coefficient: +22% -82% ΔC Max. >25V rating: Dissipation factor 5.0% max 7.0% max ≤25V rating: Insulation resistance @25%: >10G $\Omega$ or >100 $\Omega$ F whichever is less ≤200V: Dielectric 250% 250V: 150% withstanding voltage 4.0% per decade Ageing rate: Test parameters: 1KHz, 1.0 ±0.2 VRMS, 25°C



Z5U (Z) General Purpose	
Operating temperature range:	+10°C to 85°C
Temperature coefficient:	+22% -56% ΔC Max.
Dissipation factor:	4.0% max @ 25°C
Insulation resistance @25%	>10G $\Omega$ or >100 $\Omega$ F whichever is less
Dielectric ≤200V: withstanding voltage ≤200V:	250% 150%
Ageing rate:	4.0% per decade
Test parameters:	1KHz, 0.5 ±0.2 VRMS, 25°C

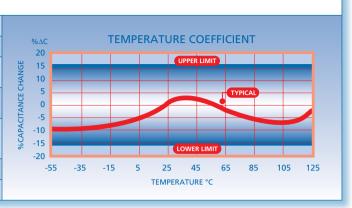




Test parameters:

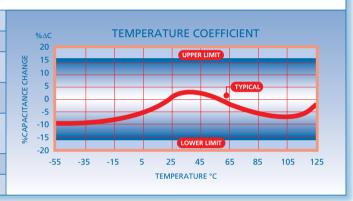


#### X7R (B) Stable and RoHS 2013 (RB) type -55°C to 125°C Operating temperature range: ±15% ΔC Max. Temperature coefficient : >25V rating: 2.5% max Dissipation factor ≤25V rating: 3.5% max Insulation resistance: @25°C: >100G $\Omega$ or >1000 $\Omega$ F whichever is less @125°C: $> 10G\Omega$ or $> 100\Omega$ F whichever is less ≤200V: Dielectric 201-500V: withstanding 150% or 500V whichever is greater voltage >500V: 120% or 750V whichever is greater Ageing rate: <2.0% per decade Test parameters: 1KHz, 1.0 ±0.2 VRMS, 25°C



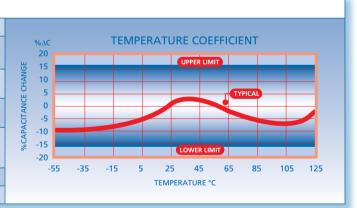
## X7R (C) Stable Non Magnetic

Operating temperature range:		-55°C to 125°C
Temperature coefficient:		±15% ΔC Max.
Dissipation factor	>25V rating: <25V rating:	2.5% max 3.5% max
Insulation resistance:	@25°C: @125°C:	>100G $\Omega$ or >1000 $\Omega$ F whichever is less >10G $\Omega$ or >100 $\Omega$ F whichever is less
Dielectric withstanding voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		<2.0% per decade
Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C



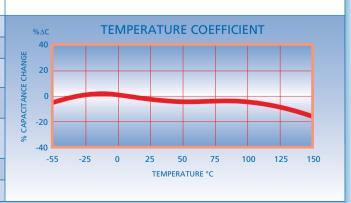
### BX (X) Stable

Operating temperature range:		-55°C to 125°C
	Temperature coefficient: Temp-voltage coefficient:	±15% ΔC Max. +15% -25% ΔC Max.
	Dissipation factor >25V rating: ≤25V rating:	2.5% max 3.5% max
	Insulation resistance: @25°C: @125°C:	>100G $\Omega$ or >1000 $\Omega$ F whichever is less >10G $\Omega$ or >100 $\Omega$ F whichever is less
	Dielectric ≤200V: withstanding 201-500V: voltage >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
	Ageing rate:	<2.0% per decade
	Test parameters:	1KHz, 1.0 ±0.2 VRMS, 25°C



### X8R (S) Stable

71011 (2) 2101210		•	
	Operating temperate	ure range:	-55°C to 150°C
	Temp. coefficient ≤150°C:		±15% ΔC Max.
	Dissipation factor	>25V rating: <25V rating:	2.5% max 3.5% max
	Insulation resistance	@25°C: @150°C:	>100G $\Omega$ or >1000 $\Omega$ F whichever is less >10G $\Omega$ or >100 $\Omega$ F whichever is less
	Dielectric withstanding voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
	Ageing rate:		<2.0% per decade
	Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C



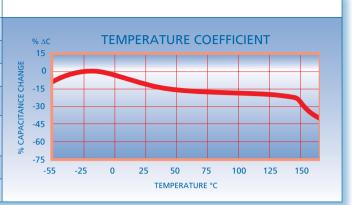






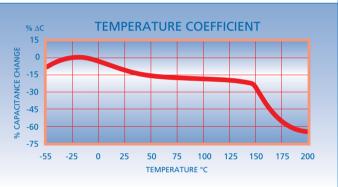
Class II (G)	<b>Stable High</b>	Temperature (	(up to 160°C)
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Operating temperature rang	je:	-55°C to 160°C
Temperature coefficient up to 160°C:		+15 -40% ΔC Max.
Dissipation factor @ 25°C:		2.5% Max.
Insulation resistance	@25°C: @160°C:	>100G $\Omega$ or >1000 $\Omega F$ whichever is less >1G $\Omega$ or >10 $\Omega F$ whichever is less
Dielectric withstanding 2 voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		< 2.0% per decade
Test parameters:		1KHz. 1.0 ±0.2 VRMS. 25°C



## Class II (E) Stable High Temperature (up to 200°C)

Specially services and services		-55°C to 200°C
		+15 -65% ΔC Max.
Dissipation factor @ 25°C:		2.5% Max.
Insulation resistance	@25°C: @200°C:	>100G $\Omega$ or >1000 $\Omega F$ whichever is less >1G $\Omega$ or >10 $\Omega F$ whichever is less
Dielectric withstanding 2 voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		< 2.0% per decade
Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C



### X5R (W) Stable

Operating temperature range:	-55°C to 85°C
Temperature coefficient up to 200°C:	±15% ΔC Max.
Dissipation factor @ 25°C:	5% Max.
Insulation resistance @25%:	$>10G\Omega$ or $>500\Omega$ F whichever is less
Dielectric withstanding voltage:	250%
Ageing rate:	< 5.0% per decade
Test parameters: Except: 22µF, 47µF & 100µF	1KHz, 1.0 ±0.2 VRMS, 25°C 120KHz, 0.5 ±0.1 VRMS, 25°C

