

Dielectric General Information

DLI Class I Dielectric Materials

Dielectric Code	Relative ϵ_r @ 1 MHz	Temperature Coefficient -55°C to 125°C (ppm/°C Maximum)	1 MHz Dissipation Factor (% Maximum)	25°C Insulation Resistance (M Ω)	125°C Insulation Resistance (M Ω)
LA	6.0	P115 \pm 20	0.20	>10 ⁶	>10 ⁵
PI	9.9	P105 \pm 20	0.15	>10 ⁶	>10 ⁵
PG	13	P22 \pm 30	0.15	>10 ⁶	>10 ⁵
AH	20	P90 \pm 20	0.15	>10 ⁶	>10 ⁵
CF	24	0 \pm 15	0.60	>10 ⁶	>10 ⁵
NA	22	N30 \pm 15	0.15	>10 ⁶	>10 ⁵
CD	37	N20 \pm 15	0.15	>10 ⁶	>10 ⁵
NG	43	N220 \pm 60	0.25	>10 ⁶	>10 ⁵
CG	70	0 \pm 30	0.70	>10 ⁶	>10 ⁵
DB	72	N50 \pm 30	0.15	>10 ⁶	>10 ⁵
NP	85	N750 \pm 200	0.50	>10 ⁴	>10 ³
NR	160	N1500 \pm 500	0.25	>10 ⁶	>10 ⁵
NS	300	N2400 \pm 500	0.70	>10 ⁶	>10 ⁵
NU	600	N3700 \pm 1000	1.50	>10 ⁶	>10 ⁵
NV	900	N4700 \pm 1000	1.20	>10 ⁶	>10 ⁵

DLI Class II Dielectric Materials

Dielectric Code	Relative ϵ_r @ 1 MHz	Temperature Coefficient -55°C to 125°C (% Maximum)		1 MHz Dissipation Factor (% Maximum)	25°C Insulation Resistance (M Ω)	125°C Insulation Resistance (M Ω)
		No Bias, Pre Voltage Conditioning	No Bias, Post Voltage Conditioning			
BF*	445	\pm 7.5	\pm 10	2.5	>10 ⁴	>10 ²
BD	700	\pm 10	\pm 15	2.5	>10 ⁴	>10 ³
BG*	900	\pm 10	\pm 15	2.5	>10 ⁴	>10 ³
BC	1300	\pm 10	\pm 15	2.5	>10 ⁴	>10 ³
BE	1250	\pm 10	\pm 15	2.5	>10 ⁴	>10 ³
BL	2000	\pm 15	\pm 25	2.5	>10 ⁵	>10 ⁴
BJ	3300	\pm 10	\pm 15	3.0	>10 ⁵	>10 ⁴
BN	4500	\pm 15	\pm 25	3.0	>10 ⁵	>10 ⁴

DLI Class III Dielectric Materials

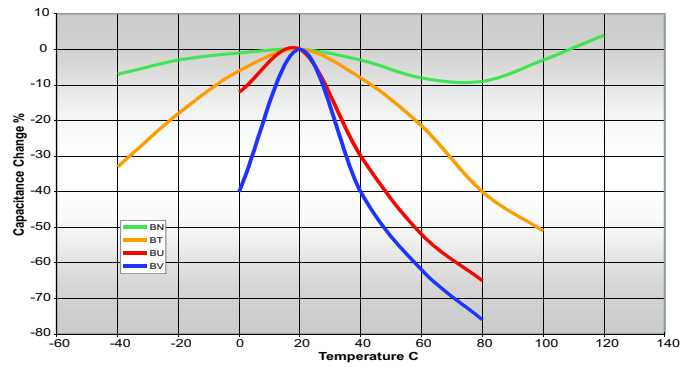
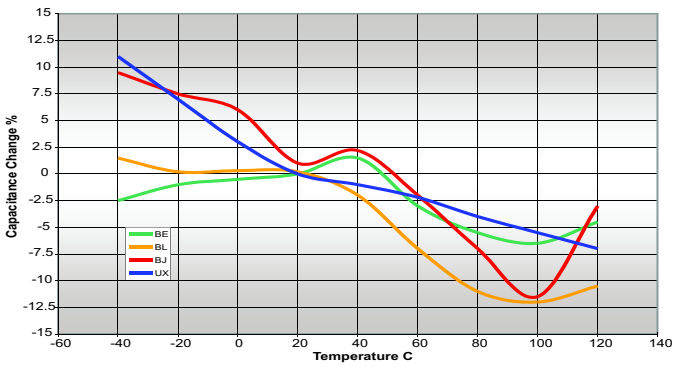
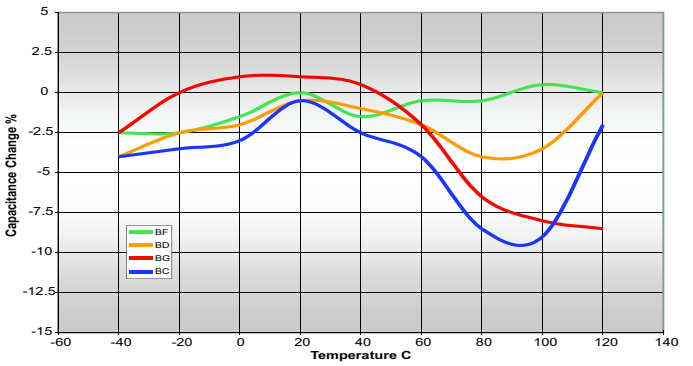
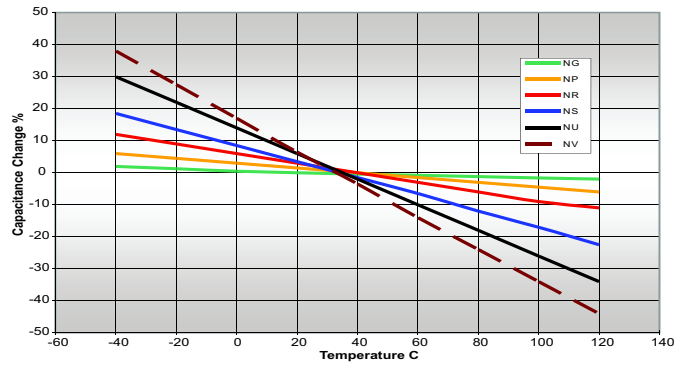
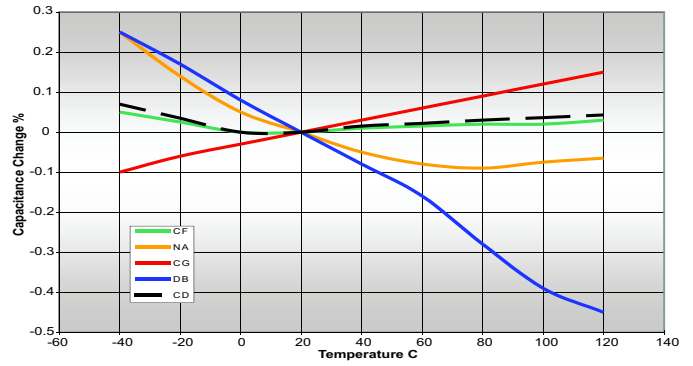
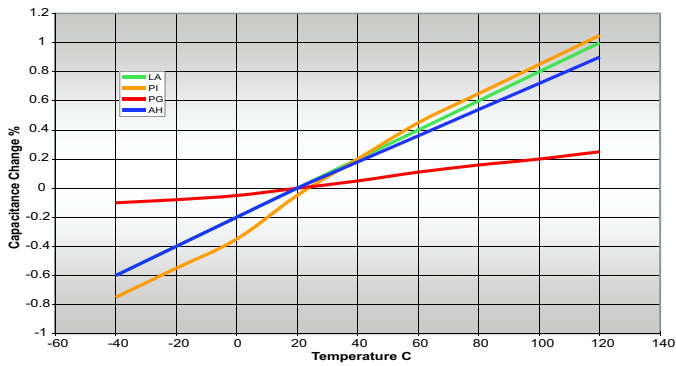
BT*	4200	+22, -56% (-55 to 105°C)	+22, -56% (-55 to 105°C)	3.0	>10 ⁵	>10 ²
BU	8500	+22, -82% (10°C to 85°C)	+22, -82% (10°C to 85°C)	3.0	>10 ⁵	>10 ⁴
BV	13,500	+22, -82% (10°C to 85°C)	+22, -82% (10°C to 85°C)	3.0	>10 ⁵	>10 ⁴
UX**	25,000	\pm 15%	\pm 25%	2.5	>10 ³	>10 ²

* Recommended for commercial use only.

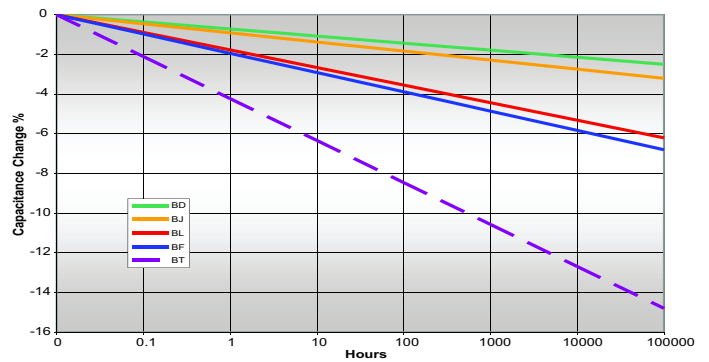
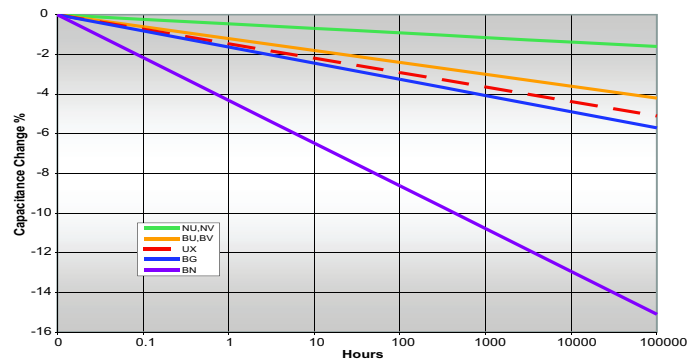
** UX is not recommended for applications requiring space qualification.
Please contact an inside sales representative for additional information.

Dielectric General Information

Dielectric Temperature Characteristics




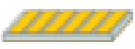







Dielectric Aging Characteristics



Dielectric General Information

Termination Codes

	Code	Description (Layers in order from dielectric material to outermost)	Capacitor Types
	P	S1 (Sputter Plated) 1. 300 Angstroms Titanium-Tungsten 2. 50µ Inches min. Nickel-Vanadium 3. 100µ Inches min. Gold	Di-Cap®, T-Cap®, Bar Cap®, Binary Cap®, and Gap Cap
		AU-100 (Wet Plated) 1. 50µ Inches min. Nickel 2. 100µ Inches min. Gold	
		S2 1. 300 Angstroms Titanium-Tungsten 2. 50µ Inches min. Nickel-Vanadium 3. 300µ Inches min. Gold-Tin	
	M	S5 1. 300 Angstroms Titanium-Tungsten 2. 100µ Inches min. Gold	Di-Cap®, T-Cap®, Bar Cap®, Binary Cap®, and Gap Cap
	B	SI	Single Border Cap
	E	SI	Double Border Cap
	L	Single beam lead. (Standard lead material is silver (Ag) .002" thick. Optional Gold (Au))	Di-Cap®
	A	Axial beam lead. (Standard lead material is silver (Ag) .002" thick. Optional Gold (Au))	Di-Cap®
	S	Standing axial beam lead. (Standard lead material is silver (Ag) .002" thick. Optional Gold (Au))	Di-Cap®



Environmental & Physical Testing Procedures

Parameter	MIL-STD-202	
	Method	Condition
Thermal Shock	107	A, (modified), -55°C to +125°C.
Immersion	104	B
Moisture Resistance	106	-
Resistance to Solder Heat	210	C, 260°C for 20 seconds.
Life	108	A, 96 Hours @ +125°C.
Barometric Pressure	105	B
Shock, (Specified Pulse)	213	I, 100g's, 6ms.
Vibration, High Frequency	204	G, 30g's peak, 10Hz to 2kHz.

Parameter	MIL-STD-883	
	Method	Condition
Bond Strength	2011	D, 3 grams minimum with .001" dia wire
Die Shear Strength	2019	Limit per MIL-STD-883, Figure 2019-4.
Temperature Cycling	1010	C
Mechanical Shock	2002	B,Y1,
Constant Acceleration	2001	3,000g's, Y1 direction

Test Level Codes

Code	Description
	Industrial / Commercial Options
Y	• 1% AQL 2 Side Visual Screening.
X	• 100% 4 Side Visual Screening. • 1% AQL for the electrical parameters Capacitance, Dissipation Factor, Insulation Resistance, and Dielectric Withstanding Voltage.
	High Reliability Options
A	MIL-PRF-49464 Group A • 100% Thermal Shock. • 100%, 100 +0/-4 Hours Voltage Conditioning. • 100% Electrical Screening. • 100% 6 Side Visual Screening. • Bond Strength. • Die Shear Strength. • Temperature Coefficient Limits.
B	MIL-PRF-49464 Group B • MIL-PRF-49464, Group A above • Low Voltage Humidity. • Life.
D	Special agreed upon testing to customers' formal specification. Customer Drawing Required! (May include, but is not limited to, one or more of the following common requests.) • MIL-PRF-38534 Class H Element Evaluation. • MIL-PRF-38534 Class K Element Evaluation. • 10(0) Destructive Bond Pull per MIL-STD-883, Method 2011. • 10(0) Die Shear per MIL-STD-883, Method 2019. Consult Factory for other alternatives or assistance in specifying custom testing.
E	6 Side Visual Screening per MIL-STD-883, Method 2032.

All Single Layer Capacitors are Lead Free and RoHS compliant.

Capacitance Tolerance Table

Tolerance Code	Tolerance
A	±.05pF
B	±.10pF
C	±.25pF
D	±.50pF
E	±.5%
F	±1%
G	±2%
H	±3%
I	±4%
J	±5%
K	±10%
L	±15%
M	±20%
X	GMV
V	+100%, -0%
Z	+80%, -20%
S	Special