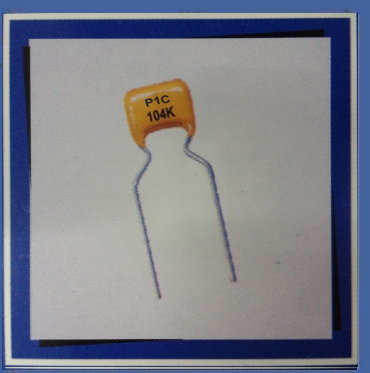


World Class Multi Layer Ceramic Capacitor

RADIAL

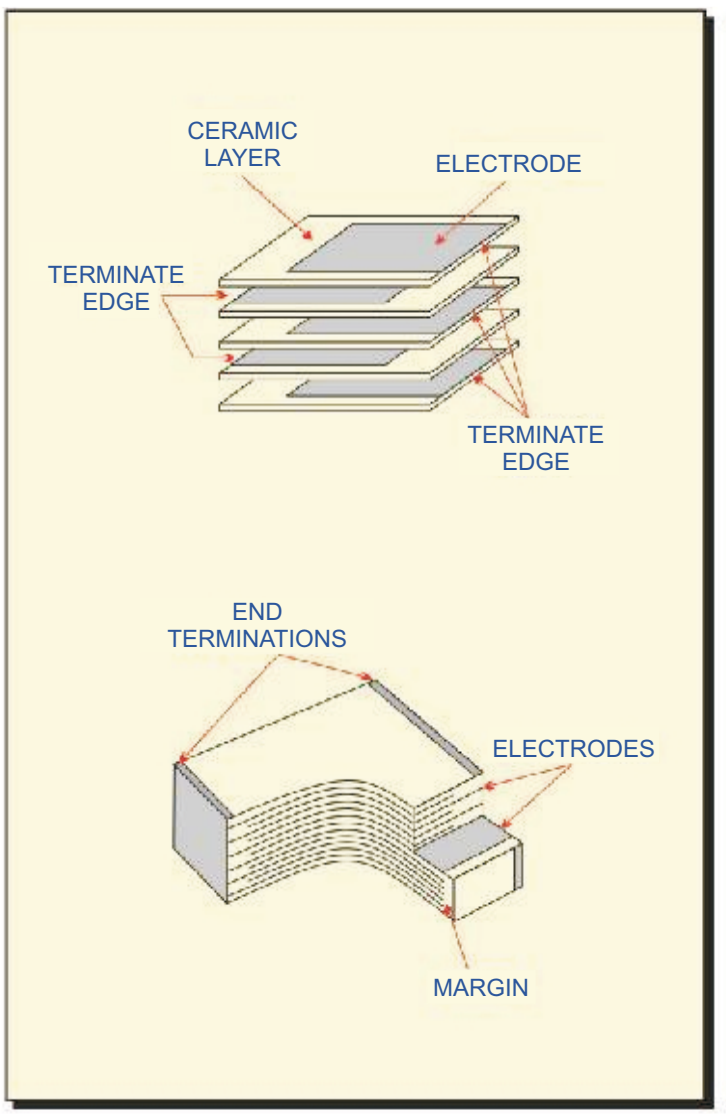
(RoHS Compliant)

GUJARAT POLY ELECTRONICS LIMITED

(Formerly Known as GUJARAT POLY-AVX ELECTRONICS LTD.)

MULTILAYER CERAMIC CAPACITORS

A Multilayer Ceramic (MLC) Capacitor is a monolithic block of ceramic containing two sets of offset, interleaved planar electrodes that extend to two opposite surfaces of the ceramic dielectric. This simple structure requires a considerable amount of sophistication, both in material and in manufacture, to produce it in the quality & quantities needed in today's electronic equipments. Multilayer Ceramic Capacitors are available in a wide range of characteristics. They are classified into two types : Class I are the Temperature Compensating type and Class II are the General Purpose Capacitors with non-linear temperature co-efficients.



CLASS-I

Class - I capacitors or Temperature Compensating capacitors are usually made from mixtures of Titanates where Barium Titanate is normally not a major part of the mix. They have predictable temperature coefficients and in general, do not have an aging characteristic. Thus they are the most stable capacitor available. Normally the T.C.s of Class - I Temperature Compensating capacitors are NPO (Negative-Positive zero ppm/^{0}C.) These capacitors are used in tuned circuits and filters where low loss and stability are necessary.

CLASS-II

General Purpose ceramic capacitors are called Class - II capacitors and have become extremely popular because of the high capacitance values available in very small size. Class - II Capacitors are "Ferro electric" and vary in capacitance value under the influence of the environmental and electrical operating conditions. Class - II capacitors are affected by temperature, Voltage (both AC and DC), frequency and time. Temperature effects for Class - II ceramic capacitors and are used in coupling and decoupling circuits particularly in controlled temperature environment and in circuits where change of capacitance with temperature is not of major importance.

GPEL's manufacturing range includes Ultra-stable COG/1B(NPO) i.e. NPO temperature characteristic in Class I, Stable X7R/2C1 and General - Purpose Y5V/2F4, Z5U temperature characteristics in Class - II.

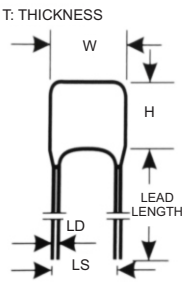
COG/1B (NPO) Dielectric

SIZE AND CAPACITANCE SPECIFICATIONS

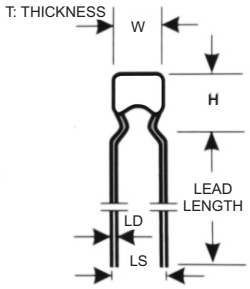
Dimensions: mm(Inches)

GPEL Style	SR15			SR20			SR21			SR30		
Width (W)	3.81 (.150)			5.08 (.200)			5.08 (.200)			7.62 (.300)		
Height (H)	3.81 (.150)			5.08 (.200)			7.62 (.300)			7.62 (.300)		
Thickness (T)	2.54 (.100)			3.18 (.125)			3.18 (.125)			3.81 (.150)		
Lead Spacing (L.S.)	2.54 (.100)			2.54 (.100)			5.08 (.200)			5.08 (.200)		
Lead Diameter (L.D.)	.508 (.020)			.508 (.020)			.508 (.020)			.508 (.020)		
Cap.in pF / Cap. Code	WVDC			WVDC			WVDC			WVDC		
	200	100	63/50	200	100	63/50	200	100	63/50	200	100	63/50
*1-8.2 - 1RO-8R2												
10 - 100												
12 - 120												
15 - 150												
18 - 180												
22 - 220												
27 - 270												
33 - 330												
39 - 390												
47 - 470												
56 - 560												
68 - 680												
82 - 820												
100 - 101												
120 - 121												
150 - 151												
180 - 181												
220 - 221												
270 - 271												
330 - 331												
390 - 391												
470 - 471												
560 - 561												
680 - 681												
820 - 821												
1000 - 102												
1200 - 122												
1500 - 152												
1800 - 182												
2200 - 222												
2700 - 272												
3300 - 332												
3900 - 392												
4700 - 472												
5600 - 562												
6800 - 682												
8200 - 822												
10,000 - 103												
12,000 - 123												
15,000 - 153												
18,000 - 183												
22,000 - 223												
27,000 - 273												
33,000 - 333												
39,000 - 393												

OTHER STYLES

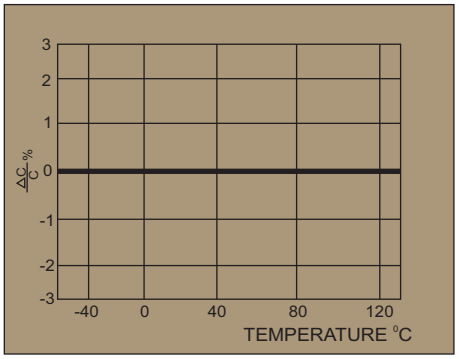


SR 21

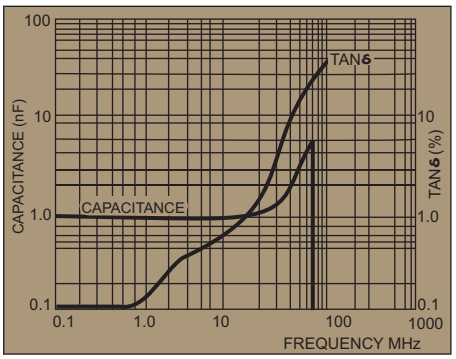


Typical Characteristic Curves

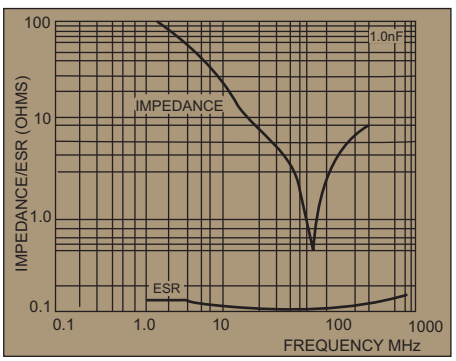
Temperature Coefficient



Capacitance vs. Frequency



Impedance vs. Frequency



*CAPACITANCE VALUE PER E12 SERIES.

E-24 SERIES AVAILABLE ON REQUEST. Other lead style available on special request.
Dimensions are in millimeters, dimensions in parenthesis are in inches.
Manufactured as per CECC 30 601 008.
Other Capacitance values available on request.

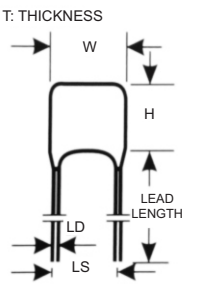
X7R/2C1 Dielectric

SIZE AND CAPACITANCE SPECIFICATIONS

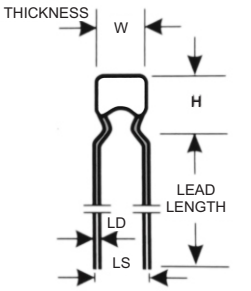
Dimensions: mm(Inches)

GPEL Style		SR15			SR20			SR21			SR30		
Width (W)		3.81 (.150)			5.08 (.200)			5.08 (.200)			7.62 (.300)		
Height (H)		3.81 (.150)			5.08 (.200)			7.62 (.300)			7.62 (.300)		
Thickness (T)		2.54 (.100)			3.18 (.125)			3.18 (.125)			3.81 (.150)		
Lead Spacing (L.S.)		2.54 (.100)			2.54 (.100)			5.08 (.200)			5.08 (.200)		
Lead Diameter (L.D.)		.508 (.020)			.508 (.020)			.508 (.020)			.508 (.020)		
Cap.in pF	Cap. Code	WVDC			WVDC			WVDC			WVDC		
		200	100	63/50	200	100	63/50	200	100	63/50	200	100	63/50
1000 -	102												
1200 -	122												
1500 -	152												
1800 -	182												
2200 -	222												
2700 -	272												
3300 -	332												
3900 -	392												
4700 -	472												
5600 -	562												
6800 -	682												
8200 -	822												
10,000 -	103												
12,000 -	123												
15,000 -	153												
18,000 -	183												
22,000 -	223												
27,000 -	273												
33,000 -	333												
39,000 -	393												
47,000 -	473												
56,000 -	563												
68,000 -	683												
82,000 -	823												
100,000 -	104												
120,000 -	124												
150,000 -	154												
180,000 -	184												
220,000 -	224												
270,000 -	274												
330,000 -	334												
390,000 -	394												
470,000 -	474												
560,000 -	564												
680,000 -	684												
820,000 -	824												
1.0µF -	105												
1.5µF -	155												
2.2µF -	225												

OTHER STYLES

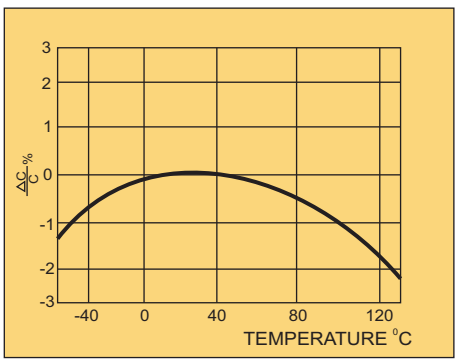


SR 21

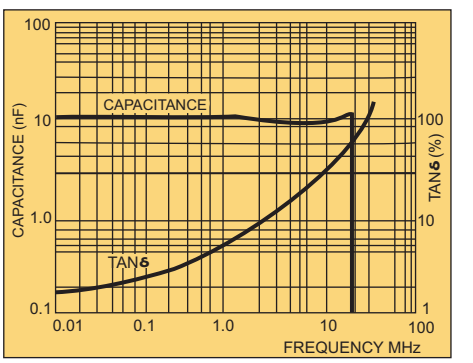


Typical Characteristic Curves

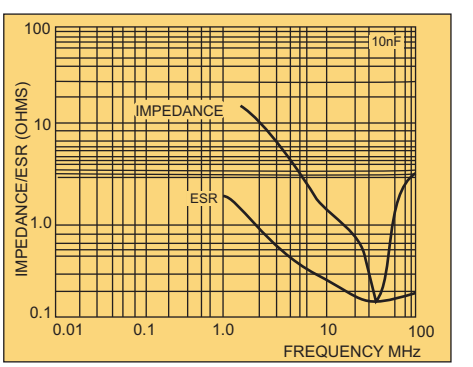
Temperature Coefficient



Capacitance vs. Frequency



Impedance vs. Frequency



Other lead style available on special request.

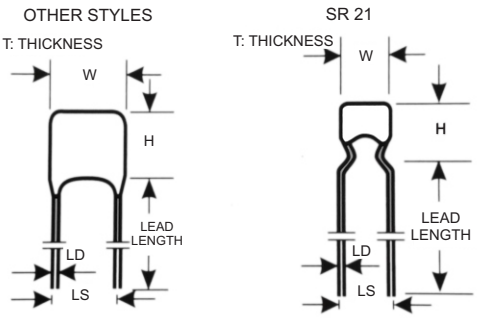
Dimensions are in millimeters, dimensions in parenthesis are in inches.
Manufactured as per CECC 30 701 013.
Other Capacitance values available on request.

Y5V/2F4 Dielectric

SIZE AND CAPACITANCE SPECIFICATIONS

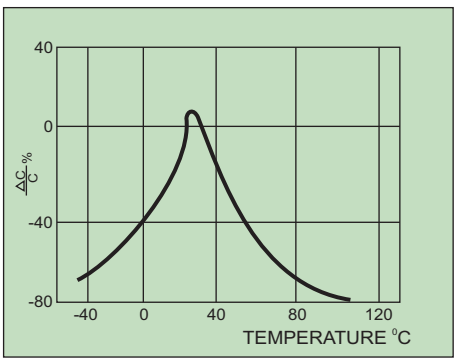
Dimensions: mm(Inches)

GPEL Style		SR15		SR20		SR21		SR30	
Width (W)		3.81 (.150)		5.08 (.200)		5.08 (.200)		7.62 (.300)	
Height (H)		3.81 (.150)		5.08 (.200)		7.62 (.300)		7.62 (.300)	
Thickness (T)		2.54 (.100)		3.18 (.125)		3.18 (.125)		3.81 (.150)	
Lead Spacing (L.S.)		2.54 (.100)		2.54 (.100)		5.08 (.200)		5.08 (.200)	
Lead Diameter (L.D.)		.508 (.020)		.508 (.020)		.508 (.020)		.508 (.020)	
Cap.in pF	Cap. Code	WVDC		WVDC		WVDC		WVDC	
		100	63/50	100	63/50	100	63/50	100	63/50
10,000 -	103								
15,000 -	153								
22,000 -	223								
33,000 -	333								
47,000 -	473								
68,000 -	683								
100,000 -	104								
150,000 -	154								
220,000 -	224								
330,000 -	334								
470,000 -	474								
680,000 -	684								
1.0µF -	105								
1.5µF -	155								
2.2µF -	225								
3.3µF -	335								
4.7µF -	475								

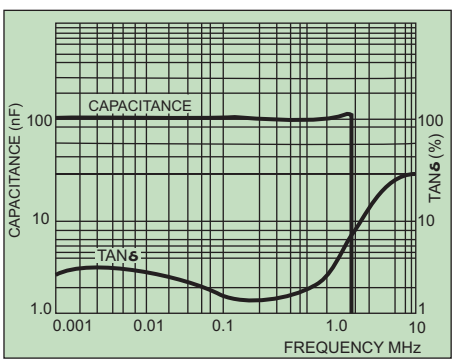


Typical Characteristic Curves

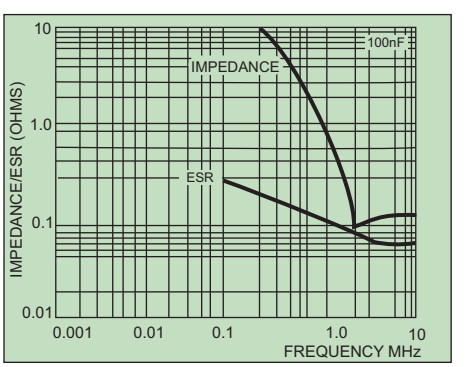
Temperature Coefficient



Capacitance vs. Frequency



Impedance vs. Frequency



Other lead style available on special request.

Dimensions are in millimeters, dimensions in parenthesis are in inches.
Manufactured as per CECC 30 701 006.
Other Capacitance values available on request.

HOW TO ORDER

PART NUMBER EXPLANATION

EXAMPLE : SR21 1C 102 KA600C

SR21 — Lead Styles
SR15
SR20
SR21
SR30

1 — Voltage
5=63/50V
1 = 100V
2 = 200v
9 = 300V Ψ
8 = 400V Ψ
7 = 500V Ψ

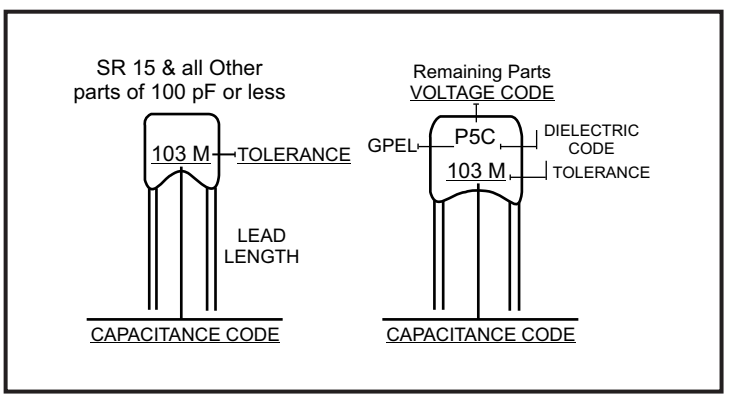
C — Temperature coefficient
A = COG/1B(NPO)
C = X7R/2CI
E = Y5V/2F4

102 — Capacitance code (2 significant digits + no. of zeros)**
Examples:
10 pF = 100
100 pF = 101
1,000 pF = 102
22,000 pF = 223
220,000 pF = 224
1 µF = 105

K — Capacitance Tolerance
C = ±.25 pF+
D = ±.50 pF+
F = ±1%
G = ±2%
J = ±5%
K = ±10%
M = ±20%
Z = (+80, -20)%

A — Specification Code
A = Commercial Standard

600C — Lead length / Packaging
600C=8.1 mm, +2mm/- 0mm
0001 = 31.7 mm MIN
5001, 5002, 5003, 5004 = Tape & Reel (MPQ=3000)
8001, 8002, 8003, 8004 = Tape & Box (MPQ=2500)



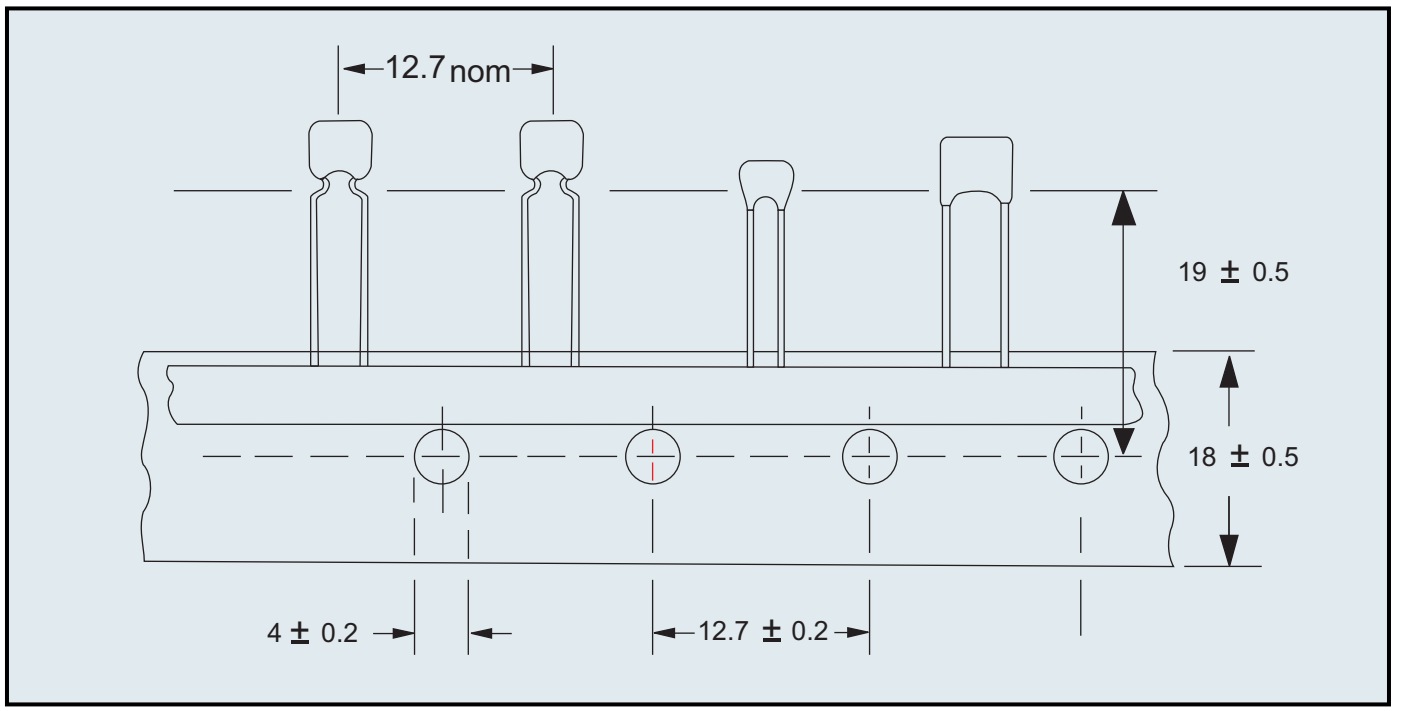
\+ C&D tolerance from 1.0 pF to 9.9 pF
** For values below 10 pF, use "R" in place of decimal point, e.g., 8.2 pF - 8R2
Ψ available on request

GENERAL SPECIFICATIONS

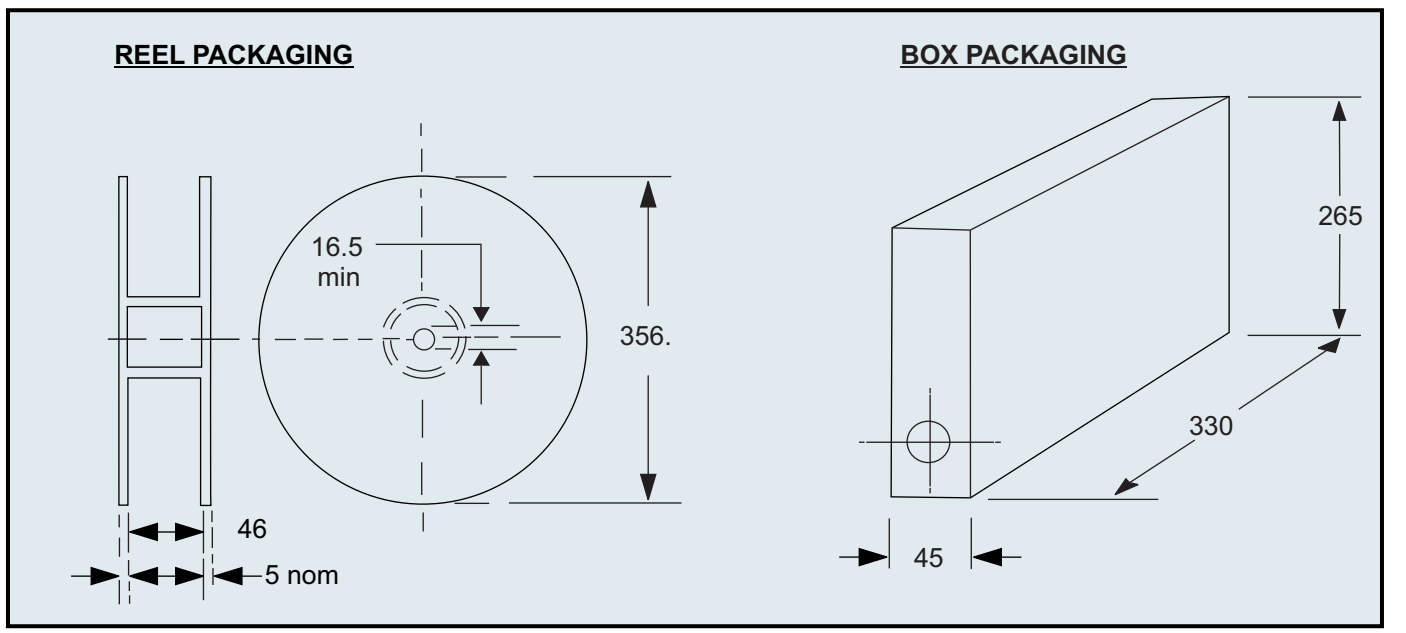
Dielectric	COG/1B NPO (A)	X7R/2CI (C)	Y5V/2F4 (E)
Capacitance Range	See individual Parts Specifications	See individual Parts Specifications	See individual Parts Specifications
Capacitance Test at 25^{0}C	Measured at 1 VRMS max at 1 KHZ (1 MHZ for 1000 pF or less)	Measured at 1 VRMS max at 1 KHZ	Measured at 0.3 V RMS max at 1 KHZ
Capacitance Tolerances	C = ±.25 pF D = ±.5 pF, F = ±1%, G = ±2% J = ±5%, K = ±10%, M = ±20%	J = ±5%, K = ±10%, M = ±20%	M = ±20% Z= +80%-20%
Operationg Temperature Range	-55^{0}C to + 125 ^{0}C	-55^{0}C to + 125 ^{0}C	-25^{0}C to + 85 ^{0}C
Temperature Characteristic	0 ±30 ppm/^{0}C for C > 20pF 0 + 120/-40 ppm/^{0}C for C ≤ 20 pF	±15%	+30% to -80%
Voltage Ratings (DC)	200, 100 and 50/63V DC	200, 100 and 50/63V DC	100 and 50V DC
Dissipation Factor	≤ 0.0015 for C> 50 pF ≤(15/C + 0.7) x 0.0015 For C ≤ 50 pF 1 VRMS, 1MHz for C ≤ 1000 pF 1 VRMS, 1KHz for C > 1000 pF	2.5% max at 1 KHZ, 1 VRMS	3.0% max at 1 KHZ, 0.3 V RMS
Insulation Resistance at rated voltage DC	100 G ohms or 1000 megaohms -µF minimum whichever is less	100 G ohms or 1000 megaohms -µF minimum whichever is less	10 G ohms or 100 megaohms -µF minimum whichever is less
Dielectric Strength	250% of rated VDC	250% of rated VDC	200% of rated VDC
Life Test (1000 hours)	200% rated Voltage at + 125 ^{0}C	200% rated Voltage at + 125 ^{0}C	150% rated Voltage at + 85 ^{0}C

Note: GPEL reserves the right to change the information herein without prior notice.

TAPING DIMENSIONS (mm)



REEL AND BOX DIMENSIONS (mm)



Other Products :- Multilayer Ceramic Capacitors - SMD type & AXIAL type
Single Layer Ceramic Disc Capacitor
Single Layer High Voltage Disc Capacitor
Metal Oxide Varistors (MOV)

PLANT VIEW

GUJARAT POLY ELECTRONICS LIMITED (GPEL), Formerly Known as GUJARAT POLY-AVX ELECTRONICS LTD. has been promoted jointly by Polychem Ltd. and Gujarat Industrial Investment Corporation Limited (GIIC).

POLYCHEM LIMITED is a pioneer in the production of Plastics in India.

GPEL manufactures Multilayer Ceramic Capacitors in Chip and Leaded (Radial & Axial) configurations, Single Layer Ceramic Capacitors. Capacitors are manufactured on highly sophisticated automatic machines.

GPEL standards are set to meet the challenging and steadily increasing demands of the Electronics industry, with the concept of Total Quality Management.

GPEL Capacitors are approved by C-DOT, ITI, RDSO and major OEM's.

GUJARAT POLY ELECTRONICS LTD.

(Formerly Known as GUJARAT POLY-AVX ELECTRONICS LTD.)

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