

SNT / SXT

High Voltage, High Reliability 200°C "T" Series
DC COG (NPO)/X7R Ceramic Chip Surface Mount Capacitors

Features

- Capacitance Range: 10pF to 2.7μF
- Operating Temperature Range: -55°C to 200°C
- Voltage Range: 500V to 5kV
- COG (NPO) and X7R Dielectric



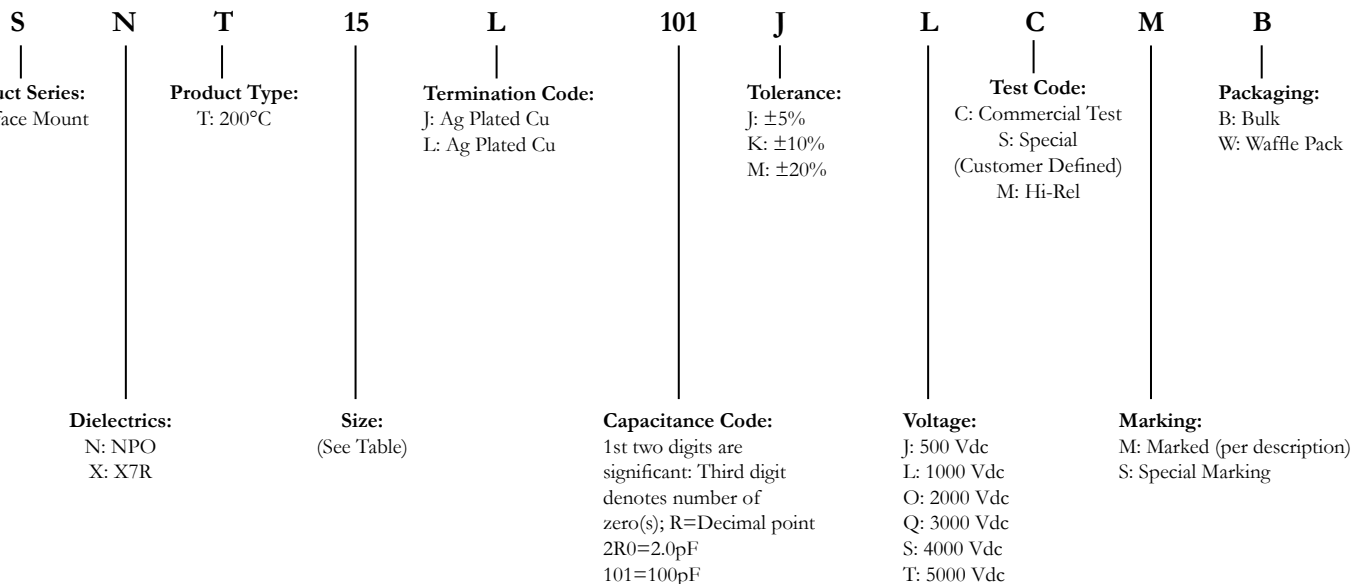
SNT/SXT series is high voltage multilayer ceramic surface mount capacitors for use in severe environment with operating temperatures up to 200°C. These ruggedized capacitors are encapsulated with unique polymer/ceramic system which enables them to operate reliably in high shock and vibrational environment and also to prevent corona (partial discharges) during operation. Each capacitor is 100% tested physically and electrically* and can be screened to Group A and B performance criteria as defined in MIL-PRF-49467. AFM has extensive electrical and environmental test capability with component burn-in and characterization up to 300°C. Custom designs, extended thickness and test protocols to customer Source Control Drawings (SCD's) are available on request.

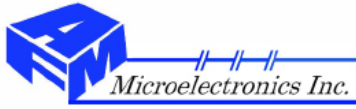
Applications:

Typical applications include filtering of high voltage power supplies, high voltage multipliers, transient protection and noise suppression.

*See Test Options Pages at the End of the Catalog.

AFM Part Number Code





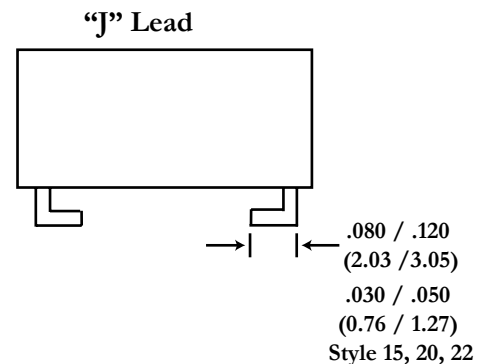
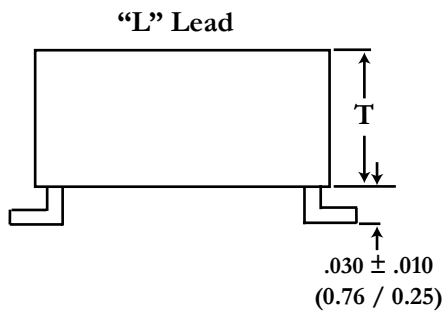
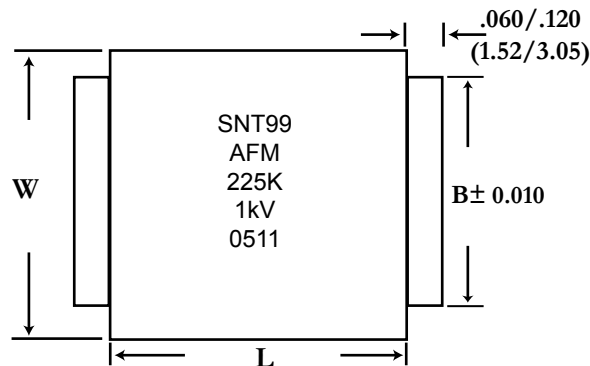
SNT / SXT

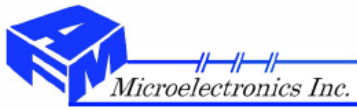
High Voltage, High Reliability 200°C "T" Series
DC COG (NPO)/X7R Ceramic Chip Surface Mount Capacitors

Capacitor Dimensions and Tolerances

Style	Length (L) Inches (mm)	Width (W) Inches (mm)	Thickness (T) Max Inches (mm)	Tab (B) Inches (mm)
15	.225 ±.015 (5.72 ±.38)	.225 ±.015 (5.72 ±.38)	.160 (4.06)	.100 (2.54)
20	.275 ±.015 (6.99 ±.38)	.275 ±.015 (6.99 ±.38)	.210 (5.33)	.100 (2.54)
25	.330 ±.015 (8.38 ±.38)	.255 ±.015 (6.48 ±.38)	.210 (5.33)	.100 (2.54)
35	.450 ±.020 (11.43 ±.51)	.370 ±.020 (9.40 ±.51)	.255 (6.48)	.200 (5.08)
40	.500 ±.020 (12.70±.51)	.500 ±.020 (12.70±.51)	.255 (6.48)	.200 (5.08)
45	.550 ±.020 (13.97±.76)	.500 ±.020 (12.70±.51)	.255 (6.48)	.300 (7.62)
55	.650 ±.030 (16.51±.76)	.600 ±.030 (15.24±.51)	.255 (6.48)	.400 (10.16)
65	.780 ±.030 (19.81±.76)	.700 ±.030 (17.78±.76)	.260 (6.60)	.500 (12.70)
70	.800 ±.030 (20.32±.76)	.400 ±.030 (10.16±.76)	.260 (6.60)	.200 (5.08)
90	1.00 ±.030 (25.40±.76)	.500 ±.020 (12.70±.51)	.260 (6.60)	.300 (7.62)
95	1.30 ±.030 (33.02±.76)	.600 ±.030 (15.24±.76)	.260 (6.60)	.400 (10.16)
99	1.50 ±.030 (38.1±.76)	.700 ±.030 (17.78±.76)	.260 (6.60)	.500 (12.70)

Outline Drawings and Lead Configurations





SNT

High Voltage, High Reliability 200°C "T" Series
DC COG (NPO) Ceramic Chip Surface Mount Capacitors

COG (NPO) Dielectric Capacitance Ranges

Style	500 Vdc		1000 Vdc		2000 Vdc		3000 Vdc		4000 Vdc		5000 Vdc	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
15	27pF	4700pF	27pF	1500pF	12pF	680pF	10pF	150pF				
20	39pF	8200pF	39pF	3900pF	22pF	820pF	22pF	560pF	22pF	390pF		
25	47pF	.010μF	47pF	6800pF	27pF	1200pF	27pF	680pF	27pF	470pF		
35	120pF	.022μF	120pF	.018μF	47pF	3300pF	47pF	1500pF	27pF	680pF		
40	220pF	.039μF	220pF	.022μF	100pF	5600pF	100pF	2200pF	18pF	1200pF		
45	220pF	.056μF	220pF	.033μF	100pF	6800pF	100pF	3900pF	18pF	1500pF	18pF	1000pF
55	390pF	.068μF	390pF	.047μF	150pF	.010μF	150pF	6800pF	27pF	2200pF	27pF	2200pF
65	470pF	.100μF	470pF	.068μF	270pF	.022μF	220pF	8200pF	47pF	3900pF	47pF	2700pF
70	330pF	.120μF	330pF	.068μF	68pF	.010μF	68pF	4700pF	27pF	1500pF	27pF	1200pF
90	470pF	.150μF	390pF	.056μF	120pF	.015μF	100pF	5600pF	56pF	3300pF	47pF	2200pF
95	680pF	.220μF	680pF	.100μF	150pF	.022μF	150pF	.012μF	68pF	4700pF	68pF	2700pF
99	1000pF	.330μF	1000pF	.150μF	270pF	.039μF	270pF	.018μF	120pF	8200pF	120pF	5600pF

Dielectric Characteristics COG (NPO)

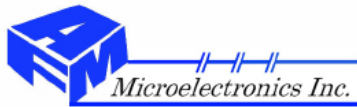
Capacitance Range	10pF to .330μF
Capacitance Tolerances	J±5%, K±10%, M±20%
Dissipation Factor	0.1% Max (25°C, 1 KHz) 1V _{rms} ±0.2V
Temperature Range	-55°C to +200°C
Temperature Coefficient of Capacitance	0±30ppm/°C
Insulation Resistance 1000V or Rated V (whichever is less) at 25°C	100GΩ min or 1000MΩμF Whichever is Less
Insulation Resistance 1000V or Rated V (whichever is less) at 200°C	1GΩ min or 10MΩμF Whichever is less
Voltage Range	500V to 5kV
Dielectric Withstand	1.2 x Rated Voltage 5 Second Min
Aging	None

Marking

Styles 15 and 20 will be marked with EIA capacitance code, and tolerance (821K). Styles 25 and up will be marked with an insulating ink and will contain AFM, capacitance code, tolerance, lot code, voltage and series style.

Packaging

Bulk packaging in plastic bags is standard. Please contact factory for optional waffle packaging or tape and reel.



SXT

High Voltage, High Reliability 200°C "T" Series
DC X7R Ceramic Chip Surface Mount Capacitors

X7R Dielectric Capacitance Ranges

Style	500 Vdc		1000 Vdc		2000 Vdc		3000 Vdc		4000 Vdc		5000 Vdc	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
15	680pF	.047μF	680pF	.012μF	270pF	2700pF	100pF	1200pF				
20	1200pF	.100μF	1200pF	.039μF	560pF	6800pF	560pF	2700pF				
25	1200pF	.120μF	1200pF	.056μF	680pF	.012μF	680pF	4700pF				
35	3300pF	.390μF	3300pF	.180μF	1200pF	.027μF	1200pF	.010μF	270pF	4700pF		
40	6800pF	.470μF	6800pF	.220μF	2700pF	.033μF	2700pF	.012μF	470pF	6800pF		
45	6800pF	.680μF	6800pF	.270μF	2700pF	.047μF	2700pF	.018μF	470pF	6800pF	470pF	4700pF
55	.010μF	1.00μF	.010μF	.470μF	3900pF	.082μF	3900pF	.027μF	680pF	.010μF	680pF	6800pF
65	.015μF	1.50μF	.015μF	.560μF	6800pF	.120μF	6800pF	.047μF	1200pF	.012μF	1200pF	.010μF
70	.010μF	1.00μF	.010μF	.270μF	1800pF	.056μF	1800pF	.018μF	680pF	8200pF	680pF	4700pF
90	.012μF	1.50μF	.012μF	.470μF	3300pF	.120μF	3300pF	.033μF	1200pF	.012μF	1200pF	.012μF
95	.018μF	2.00μF	.018μF	.820μF	4700pF	.180μF	3900pF	.056μF	2200pF	.027μF	2200pF	.015μF
99	.027μF	2.70μF	.027μF	1.50μF	8200pF	.270μF	5600pF	.082μF	3300pF	.039μF	3300pF	.018μF

Dielectric Characteristics X7R

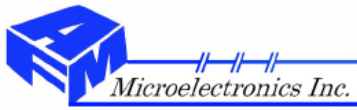
Capacitance Range	100pF to 2.7μF
Capacitance Tolerances	J±5%, K±10%, M±20%
Dissipation Factor	2.5% Max (25°C, 1 KHz) 1Vrms ±0.2V, <.20% @ 200°C
Temperature Range	-55°C to +200°C
Temperature Coefficient of Capacitance	+15%, -40% to 200°C
Insulation Resistance 1000V or Rated V (whichever is less) at 25°C	10GΩ Min or 100MΩμF Whichever is Less
Insulation Resistance 1000V or Rated V (whichever is less) at 200°C	1GΩ Min or 10MΩμF Whichever is Less
Voltage Range	500V to 5kV (See Table)
Dielectric Withstand	1.2 x rated Voltage 5 Second Min
Aging	None

Marking

Styles 15 and 20 will be marked with EIA capacitance code, and tolerance (821K). Styles 25 and up will be marked with an insulating ink and will contain AFM, Capacitance code, tolerance, lot code, voltage and series style.

Packaging

Bulk packaging in plastic bags is standard. Please contact factory for optional waffle packaging or tape and reel.



VNT/VXT

High Voltage, High Temperature 200°C "T" Series
Radial Leaded COG (NPO)/X7R Capacitors

Features

- Capacitance Range: 12pF to .56μF
- Operating Temperature: -55°C to +200°C
- Rated Voltage: 500V to 4kV
- High Reliability
- Conformal Coated
- 200°C Burn-In Testing

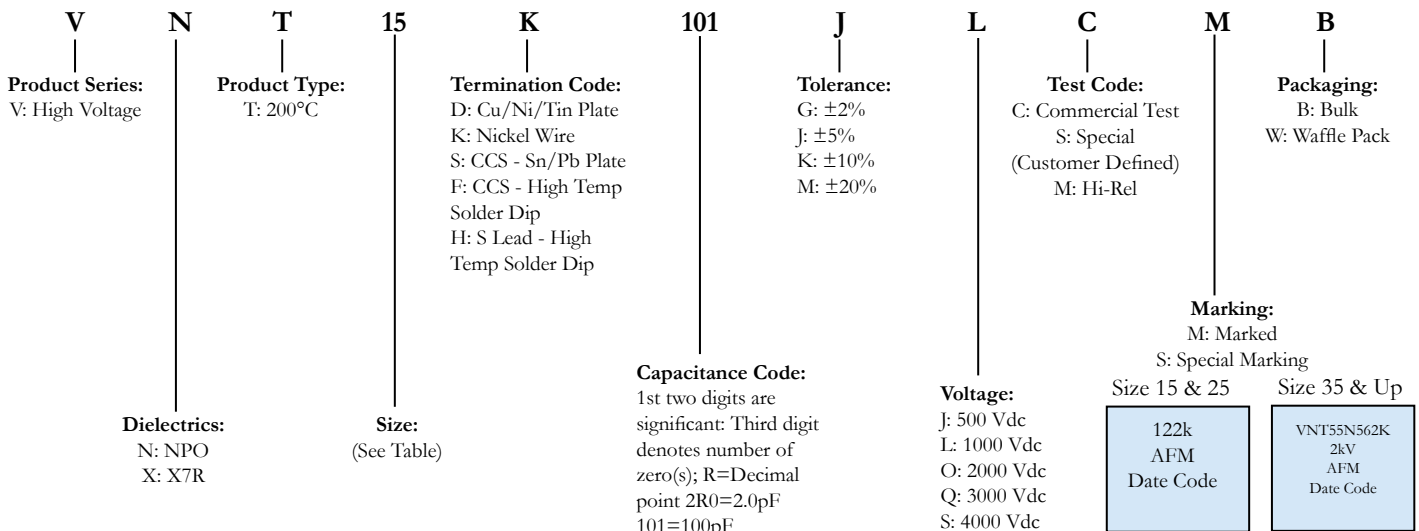


VNT/VXT series is high voltage, high temperature capacitors which are based on AFM's industry proven high temperature HNT/HXT Series of capacitors. These capacitors have operating voltage ratings of 500 volts up to 4000 volts. The VNT/VXT Series is designed using a high insulation resistance, high dielectric constant barium titanate dielectric system.

Applications

Typical Functional Applications: Bypass, Coupling, Tuning, Feedback, Impedance Matching and DC Blocking. Devices such as RF oscillators and precision timing circuits requiring a predictable temperature coefficient are examples of devices utilizing these capacitors.

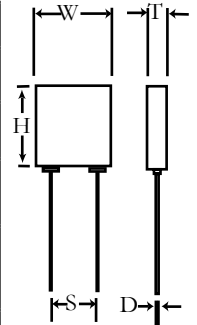
AFM Part Number Code



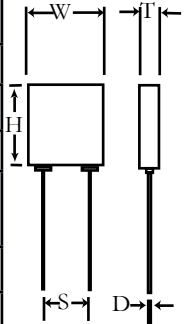
VNT

High Voltage, High Temperature 200°C "T" Series
Radial Leaded COG (NPO) Capacitors

Style		VNT 15				VNT 25				VNT 35				VNT 45			
Dimensions	W Max	.250 (6.35)				.320 (8.13)				.420 (10.67)				.520 (13.21)			
	H Max	.220 (5.59)				.300 (7.62)				.400 (10.16)				.500 (12.70)			
	T Max	.150 (3.81)				.250 (6.35)				.250 (6.35)				.300 (7.62)			
	D ± .002 (.0508)	.025 (.635)				.025 (.635)				.025 (.635)				.025 (.635)			
	S	.170 (4.32)				.200 (5.08)				.300 (7.62)				.400 (10.16)			
Capacitance Range (pF)	Vdc	500	1kV	2kV	500	1kV	2kV	3kV	500	1kV	2kV	3kV	500	1kV	2kV	3kV	
	12																
	15																
	18																
	22																
	28																
	33																
	39																
	47																
	56																
	68																
	82																
	100																
	120																
	150																
	180																
	220																
	270																
	330																
	390																
470																	
560																	
680																	
820																	
1000																	
1200																	
1500																	
1800																	
2200																	
2700																	
3300																	
3900																	
4700																	
5600																	
6800																	



Style		VNT 55					VNT 65					VNT 71				
Dimensions	W Max	.620 (15.75)					.720 (18.29)					.820 (20.83)				
	H Max	.600 (15.24)					.700 (17.78)					.700 (17.78)				
	T Max	.300 (7.62)					.300 (7.62)					.350 (8.89)				
	D ± .002 (.0508)	.025 (.635)					.025 (.635)					.025 (.635)				
S		.500 (12.70)					.600 (15.24)					.700 (17.78)				
Vdc		500	1kV	2kV	3kV	4kV	500	1kV	2kV	3kV	4kV	500	1kV	2kV	3kV	4kV
Capacitance Range	1000pF															
	1200pF															
	1800pF															
	2200pF															
	2700pF															
	3300pF															
	3900pF															
	4700pF															
	5600pF															
	6800pF															
	8200pF															
	.01μF															
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.015μF																
.018μF																
.022μF																
.027μF																
.033μF																



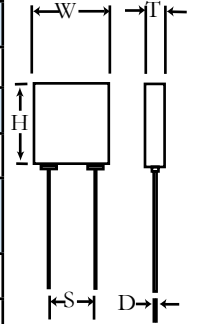
Dielectric Characteristics COG (NPO)

Capacitance Range	12pF to .180μF
Capacitance Tolerances	G±2%, J±5%, K±10%, M±20%
Dissipation Factor	0.1% Max (25°C, 1 KHz) 1Vrms ±0.2V
Temperature Range	-55°C to +200°C
Temperature Coefficient of Capacitance	0±30ppm/°C
Insulation Resistance 1000V or Rated V (whichever is less) at 25°C	100GΩ min or 1000MΩμF Whichever is Less
Insulation Resistance 1000V or Rated V (whichever is less) at 200°C	1GΩ min or 10MΩμF Whichever is Less
Voltage Range	500V to 4kV (See Table)
Dielectric Withstand	1.2 x Rated Voltage 5 Second Min
Aging	None

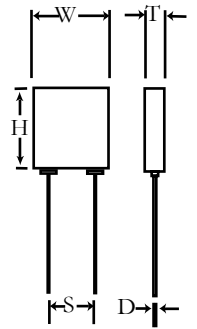
VXT

High Voltage, High Temperature 200°C "T" Series
Radial Leaded X7R Capacitors

Style		VXT 15				VXT 25				VXT 35				VXT 45			
Dimensions	W Max	.250 (6.35)				.320 (8.13)				.420 (10.67)				.520 (13.21)			
	H Max	.220 (5.59)				.300 (7.62)				.400 (10.16)				.500 (12.70)			
	T Max	.150 (3.81)				.250 (6.35)				.250 (6.35)				.300 (7.62)			
	D ± .002 (.0508)	.025 (.635)				.025 (.635)				.025 (.635)				.025 (.635)			
	S	.170 (4.32)				.200 (5.08)				.300 (7.62)				.400 (10.16)			
Voltage dc		500	1kV	2kV	500	1kV	2kV	3kV	500	1kV	2kV	3kV	500	1kV	2kV	3kV	
Capacitance Range	680pF																
	820pF																
	1000pF																
	1200pF																
	1500pF																
	1800pF																
	2200pF																
	2700pF																
	3300pF																
	3900pF																
	4700pF																
	5600pF																
	6800pF																
	8200pF																
	.01μF																
	.012μF																
	.015μF																
	.018μF																
	.022μF																
	.027μF																
.033μF																	
.039μF																	
.047μF																	
.056μF																	
.068μF																	
.082μF																	
.100μF																	
.120μF																	
.150μF																	
.180μF																	



Style		VXT 55					VXT 65					VXT 71				
Dimensions	W Max	.620 (15.75)					.720 (18.29)					.820 (20.83)				
	H Max	.600 (15.24)					.700 (17.78)					.700 (17.78)				
	T Max	.300 (7.62)					.300 (7.62)					.350 (8.89)				
	D ± .002 (.0508)	.025 (.635)					.025 (.635)					.025 (.635)				
	S	.500 (12.7)					.600 (15.24)					.700 (17.78)				
Voltage dc		500	1kV	2kV	3kV	4kV	500	1kV	2kV	3kV	4kV	500	1kV	2kV	3kV	4kV
Capacitance Range (pF)	.012															
	.015															
	.018															
	.022															
	.027															
	.033															
	.039															
	.047															
	.056															
	.068															
	.082															
	.100															
	.120															
	.150															
	.180															
.220																
.270																
.330																
.390																
.470																
.560																
.680																



Dielectric Characteristics X7R

Capacitance Range	680pF to .56μF
Capacitance Tolerances	J±5%, K±10%, M±20%
Dissipation Factor	2.5% Max (25°C, 1 KHz) 1Vrms ±0.2V, <.20% @200°C
Temperature Range	-55°C to +200°C
Temperature Coefficient of Capacitance	+15%, -40% to 200°C
Insulation Resistance 1000V or Rated V (whichever is less) at 25°C	10GΩ min or 100MΩμF Whichever is Less
Insulation Resistance 1000V or Rated V (whichever is less) at 200°C	1GΩ min or 10MΩμF Whichever is Less
Voltage Range	500V to 5kV (See Table)
Dielectric Withstand	1.2 x Rated Voltage 5 Second Min
Aging	None

SNR / SXR

High Voltage, High Reliability DC COG (NPO)/X7R Chip Capacitors

Features

- Capacitance Range: 10pF to 5.6μF
- Operating Temperature Range: -55°C to 125°C
- Voltage Range: 500 Volt to 10KV
- COG (NPO) and X7R Dielectric

SNR/SXR series is high voltage multilayer ceramic chip capacitors for use in high reliability commercial, industrial and military applications. These

capacitors are designed in accordance with MIL-PRF-49467 and can be supplied to NPO and X7R voltage temperature limits. Each capacitor is 100% tested physically and electrically* and can be screened to Group A and B performance criteria as defined in MIL-PRF-49467. Custom designs, extended thickness and test protocols to customer Source Control Drawings (SCD's) are available upon request.



Applications

Typical applications include filtering of high voltage power supplies, high voltage multipliers, transient protection and noise suppression.

* See Test Option pages at the end of the catalog.

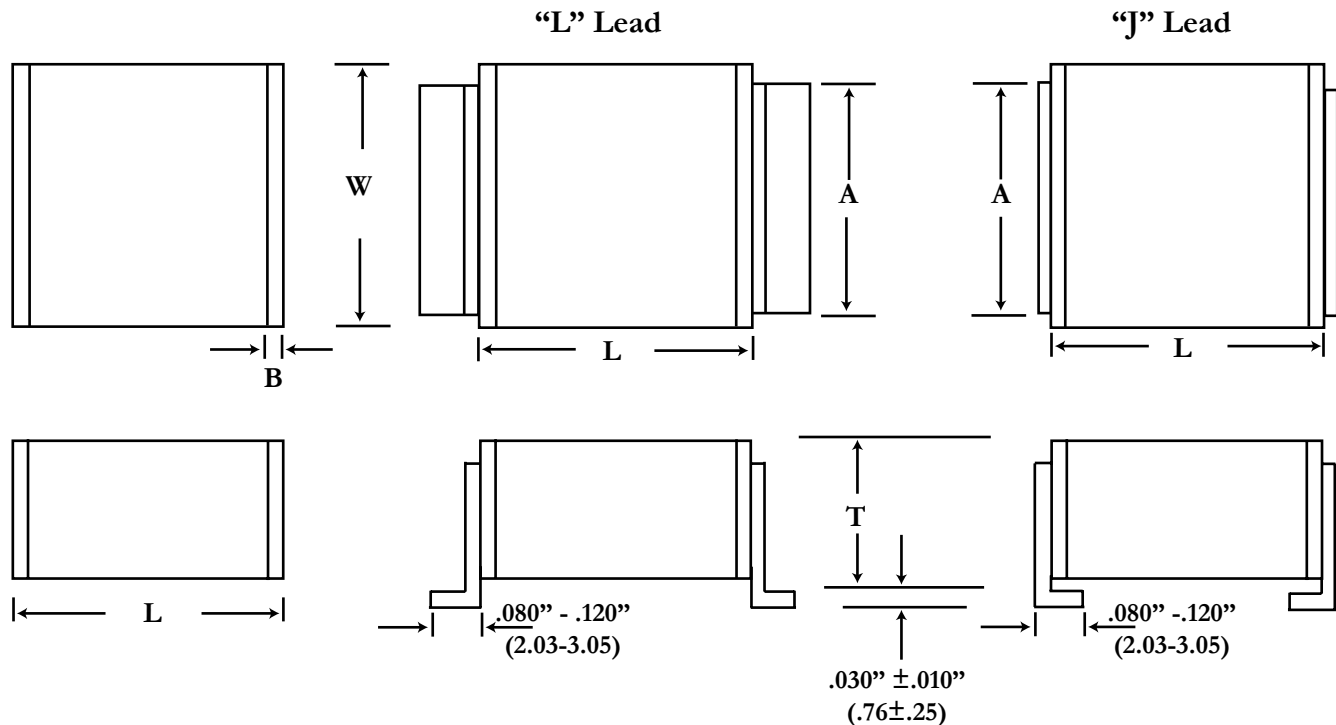
AFM Part Number Code

<p>S</p> <p>Product Series: S: Surface Mount</p>	<p>N</p> <p>Product Type: R: Chip</p>	<p>R</p> <p>Termination Code: C: Pd/Ag Term J: J Lead L: L Lead T: Ag Term, Ni Barrier 100 Sn plated W: Ag Term, Ni Barrier, 90/10 Sn/Pb Plated</p>	<p>15</p> <p>Size: (See Table)</p>	<p>W</p> <p>Capacitance Code: 1st two digits are significant; Third digit denotes number of zero(s); R=Decimal point 2R0=2.0pF 101=100pF</p>	<p>101</p> <p>Tolerance: J: ±5% K: ±10% M: ±20%</p>	<p>J</p> <p>Voltage: J: 500 Vdc L: 1000 Vdc O: 2000 Vdc Q: 3000 Vdc S: 4000 Vdc T: 5000 Vdc W: 10000 Vdc</p>	<p>L</p> <p>Test Code: C: Commercial Test S: Special (Customer Defined) M: Hi-Rel</p>	<p>C</p> <p>Marking: B: Not Marked M: Marked (per description) S: Special Marking</p>	<p>B</p> <p>Packaging: B: Bulk T: Tape & Reel W: Waffle Pack</p>	<p>B</p>
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Chip Capacitor Dimensions and Tolerances

Style	Length (L) Inches (mm)	Width (W) Inches (mm)	Thickness (T) (Max) Inches (mm)	Termination Band (B) Inches (mm)	Tab (A) Inches (mm)
15	.150 ±.015 (3.81 ±.38)	.150 ± .015 (3.81 ±.38)	.140 (3.56)	.020 (.508)	.100 (2.54)
20	.200 ±.020 (5.08 ±.51)	.200 ± .020 (5.08 ±.51)	.180 (4.57)	.020 (.508)	.100 (2.54)
25	.250 ±.020 (6.35 ±.51)	.200 ± .020 (5.08 ±.51)	.180 (4.57)	.020 (.508)	.100 (2.54)
35	.350 ±.030 (8.89 ±.76)	.300 ± .030 (7.62 ±.76)	.220 (5.59)	.020 (.508)	.200 (5.08)
40	.400 ±.030 (10.16±.76)	.400 ± .030 (10.16±.76)	.220 (5.59)	.020 (.508)	.200 (5.08)
45	.450 ±.030 (11.43±.76)	.400 ± .030 (10.16±.76)	.220 (5.59)	.020 (.508)	.300 (7.62)
55	.550 ±.030 (13.97±.76)	.500 ± .030 (12.70±.76)	.220 (5.59)	.020 (.508)	.400 (10.16)
65	.650 ±.030 (16.51±.76)	.600 ± .030 (15.24±.76)	.220 (5.59)	.020 (.508)	.500 (12.70)
70	.700 ±.030 (17.78±.76)	.300 ± .030 (7.62±.76)	.220 (5.59)	.020 (.508)	.200 (5.08)
90	.900 ±.030 (22.86±.76)	.400 ± .030 (10.16±.76)	.220 (5.59)	.020 (.508)	.300 (7.62)
95	1.100 ±.030 (27.94±.76)	.500 ± .030 (12.70±.76)	.220 (5.59)	.020 (.508)	.400 (10.16)
99	1.350 ±.030 (34.29±.76)	.600 ± .030 (15.24±.76)	.220 (5.59)	.020 (.508)	.500 (12.70)

Outline Drawings and Lead Configurations



COG (NPO) Dielectric Capacitance Ranges

Style	500 Vdc		1000 Vdc		2000 Vdc		3000 Vdc		4000 Vdc		5000 Vdc		10,000 Vdc	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
15	27pF	4700pF	27pF	1500pF	12pF	680pF	10pF	150pF						
20	39pF	8200pF	39pF	3900pF	22pF	820pF	22pF	560pF	22pF	390pF				
25	47pF	.010μF	47pF	6800pF	27pF	1200pF	27pF	680pF	27pF	470pF				
35	120pF	.022μF	120pF	.018μF	47pF	3300pF	47pF	1500pF	27pF	680pF				
40	220pF	.039μF	220pF	.022μF	100pF	5600pF	100pF	2200pF	18pF	1200pF				
45	220pF	.056μF	220pF	.033μF	100pF	6800pF	100pF	3900pF	18pF	1500pF	18pF	1000pF		
55	390pF	.068μF	390pF	.047μF	150pF	.010μF	150pF	6800pF	27pF	2200pF	27pF	2200pF		
65	470pF	.100μF	470pF	.068μF	270pF	.022μF	220pF	8200pF	47pF	3900pF	47pF	2700pF		
70	330pF	.120μF	330pF	.068μF	68pF	.010μF	68pF	4700pF	27pF	1500pF	27pF	1200pF		
90	470pF	.150μF	390pF	.056μF	120pF	.015μF	100pF	5600pF	56pF	3300pF	47pF	2200pF	18pF	1200pF
95	680pF	.220μF	680pF	.100μF	150pF	.022μF	150pF	.012μF	68pF	4700pF	68pF	2700pF	27pF	1500pF
99	1000pF	.330μF	1000pF	.150μF	270pF	.039μF	270pF	.018μF	120pF	8200pF	120pF	5600pF	56pF	2200pF

Dielectric Characteristics COG (NPO)

Capacitance Range	10pF to .330μF
Capacitance Tolerances	J±5%, K±10%, M±20%
Dissipation Factor	0.15% Max (25°C, 1 KHz) 1V _{rms} ±0.2V
Temperature Range	-55°C to +125°C
Temperature Coefficient	0±30ppm/°C
Insulation Resistance 1000 V or Rated V (Whichever is less) at 25°C	100GΩ min or 1000MΩμF Whichever is Less
Insulation Resistance 1000 V or Rated V (Whichever is less) at 125°C	10GΩ min or 100MΩμF Whichever is Less
Voltage Range	500V to 10kV (See Table)
Dielectric Withstand	1.2 x Rated Voltage 5 Second Min
Aging	None

Optional Marking

Styles 15 and 20 will be marked with EIA capacitance code, and tolerance (821K). Styles 25 and up will be marked with an insulating ink and will contain AFM, capacitance code, tolerance, lot code, voltage and series style.

Packaging

Bulk packaging in plastic bags is standard. Please contact factory for optional waffle packaging or tape and reel.

X7R Dielectric Capacitance Ranges

Style	500 Vdc		1000 Vdc		2000 Vdc		3000 Vdc		4000 Vdc		5000 Vdc		10,000 Vdc	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
15	680pF	.082μF	680pF	.022μF	270pF	3900pF								
20	1200pF	.180μF	1200pF	.068μF	560pF	8200pF	560pF	3900pF						
25	1200pF	.220μF	1200pF	.082μF	680pF	.018μF	680pF	5600pF						
35	3300pF	.560μF	3300pF	.270μF	1200pF	.033μF	1200pF	.015μF	270pF	6800pF				
40	6800pF	.860μF	6800pF	.390μF	2700pF	.047μF	2700pF	.018μF	470pF	8600pF				
45	6800pF	1.20μF	6800pF	.470μF	2700pF	.068μF	2700pF	.033μF	470pF	.010μF	470pF	6800pF		
55	.010μF	1.80μF	.010μF	.820μF	3900pF	.120μF	3900pF	.039μF	680pF	.015μF	680pF	.010μF		
65	.015μF	2.50μF	.015μF	1.00μF	6800pF	.180μF	6800pF	.082μF	1200pF	.027μF	1200pF	.015μF		
70	.010μF	1.50μF	.010μF	.560μF	1800pF	.082μF	1800pF	.027μF	680pF	.012μF	680pF	6800pF		
90	.012μF	2.20μF	.012μF	.820μF	3300pF	.150μF	3300pF	.047μF	1200pF	.027μF	1200pF	.022μF	470pF	3900pF
95	.018μF	3.00μF	.018μF	1.50μF	4700pF	.270μF	3900pF	.082μF	2200pF	.039μF	2200pF	.027μF	680pF	5600pF
99	.027μF	5.60μF	.027μF	2.20μF	8200pF	.390μF	5600pF	.120μF	3300pF	.056μF	3300pF	.039μF	1200pF	.010μF

Dielectric Characteristics X7R

Capacitance Range	270pF to 5.6μF
Capacitance Tolerances	J±5%, K±10%, M±20%
Dissipation Factor	2.5% Max (25°C, 1 KHz) 1Vrms ±0.2V
Temperature Range	-55°C to +125°C
Temperature Coefficient	±15%
Insulation Resistance 1000 V or Rated V (Whichever is less) at 25°C	100GΩ min or 1000MΩμF Whichever is Less
Insulation Resistance 1000 V or Rated V (Whichever is less) at 125°C	10GΩ min or 100MΩμF Whichever is Less
Voltage Range	500V to 10kV (See Table)
Dielectric Withstand	1.2 x Rated Voltage 5 Second Min
Aging	None

Optional Marking

Styles 15 and 20 can be marked with EIA capacitance code, and tolerance (821K). Styles 25 and up will be marked with an insulating ink and will contain AFM, capacitance code, tolerance, lot code, voltage and series style.

Packaging

Bulk packaging in plastic bags is standard. Please contact factory for optional waffle packaging or tape and reel.

VNR / VXR

High Voltage, High Reliability DC COG(NPO)/X7R Ceramic Chip Capacitors

Features

- Capacitance Range: 10pF to 2.5μF
- Operating Temperature Range: -55°C to 125°C
- Voltage Range: 500 Volt to 5KV
- COG (NPO) and X7R Dielectric

VNR/VXR series is high voltage multilayer ceramic chip capacitors for use in high reliability commercial, industrial and military applications. These capacitors are designed in accordance with MIL-PRF-49467 and can be

supplied to NPO and X7R voltage temperature limits. Each capacitor is 100% tested physically and electrically* and can be screened to Group A and B performance criteria as defined in MIL-PRF-49467.



Applications

Typical applications include filtering of high voltage power supplies, high voltage multipliers, transient protection and noise suppression. Custom designs, extended thickness and test protocols to customer Source Control Drawings (SCD's) are available upon request.*

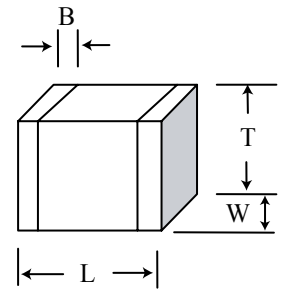
* See Test Option pages at the end of the catalog.

AFM Part Number Code

V Product Series: V: High Voltage	N Product Type: R: Chip	R Product Type: R: Chip	15 Chip Size: (see table)	W Termination Code: C: Pd/Ag Term G: Ag Term, Ni P: Solder Dipped W Term in 60/40 Sn/Pb T: Ag Term, Ni/100% Sn Plated. (Pb Free) W: Ag Term, Ni Barrier, 90/10 Sn/Pb Plated	101 Capacitance Code: 1st two digits are significant: Third digit denotes number of zero(s); R=Decimal point 2R0=2.0pF 101=100pF	J Tolerance: F: ±1%* G: ±2%* J: ±5% K: ±10% M: ±20% *VNR Only	L Voltage: J: 500 Vdc L: 1000 Vdc O: 2000 Vdc Q: 3000 Vdc S: 4000 Vdc T: 5000 Vdc	C Test Code: C: Commercial Test S: Special (Customer Defined) M: Hi-Rel	B Marking: B: Not Marked M: Marked (per description) S: Special Marking	B Packaging: B: Bulk T: Tape & Reel W: Waffle Pack
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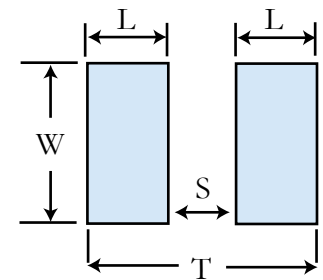
Chip Capacitor Dimensions and Tolerances

Style	EIA Size	Length (L) Inches (mm)	Width (W) Inches (mm)	Thickness (T) Inches (mm)	Bandwidth (B) Inches
12	1210	.120±.010 (3.05±.25)	.100 ± .010 (2.54±.25)	.100 (2.54)	.008-.025
15	1515	.150 ± .015 (3.81 ±.38)	.150 ± .015 (3.81 ±.38)	.140 (3.55)	.010-.030"
18	1812	.180 ± .020 (4.57 ±.51)	.120 ± .015 (3.05 ±.38)	.100 (2.54)	.010-.040"
19	1825	.180 ± .020 (4.57 ±.51)	.250 ± .020 (6.35 ±.51)	.160 (4.06)	.010-.040"
20	2020	.200 ± .020 (5.08 ±.51)	.200 ± .020 (5.08 ±.51)	.180 (4.57)	.010-.040"
22	2225	.220 ± .020 (5.59 ±.51)	.250 ± .020 (6.35 ±.51)	.200(5.08)	.010-.040"
25	2520	.250 ± .020 (6.35 ±.51)	.200 ± .020 (5.08 ±.51)	.180 (4.57)	.030-.060"
33	3333	.330 ± .030 (8.38 ±.76)	.330 ± .030 (8.38 ±.76)	.220 (5.59)	.030-.060"
35	3530	.350 ± .030 (8.89 ±.76)	.300 ± .030 (7.62 ±.76)	.220 (5.59)	.030-.060"
40	4040	.400 ± .030 (10.16±.76)	.400 ± .030 (10.16±.76)	.220 (5.59)	.030-.060"
45	4540	.450 ± .030 (11.43±.76)	.400 ± .030 (10.16±.76)	.220 (5.59)	.030-.060"
54	5440	.540 ± .030 (13.72±.76)	.400 ± .030 (10.16±.76)	.220 (5.59)	.030-.060"
55	5550	.550 ± .030 (13.97±.76)	.500 ± .030 (12.70±.76)	.220 (5.59)	.030-.060"
65	6560	.650 ± .030 (16.51±.76)	.600 ± .030 (15.24±.76)	.220 (5.59)	.030-.060"



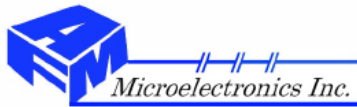
Recommended Pad Dimensions

Style	Chip Size	Total Length (T)		Separation (S)		Pad Width (W)		Pad Length (L)	
		Inches	mm	Inches	mm	Inches	mm	Inches	mm
12	1210	0.177	4.50	0.060	1.52	0.115	2.92	0.060	1.52
15	1515	0.205	5.20	0.075	1.91	0.171	4.34	0.065	1.65
18	1812	0.232	5.89	0.091	2.31	0.146	3.71	0.071	1.80
19	1825	0.232	5.89	0.091	2.31	0.272	6.91	0.071	1.80
20	2020	0.256	6.50	0.110	2.79	0.221	5.61	0.073	1.85
22	2225	0.276	7.01	0.130	3.30	0.268	6.81	0.073	1.85
25	2520	0.342	8.69	0.196	4.98	0.221	5.61	0.073	1.85
33	3333	0.430	10.92	0.280	7.11	0.365	9.27	0.075	1.91
35	3530	0.453	11.51	0.300	7.62	0.335	8.51	0.077	1.96
40	4040	0.507	12.88	0.350	8.89	0.435	11.05	0.079	2.01
45	4540	0.559	14.20	0.400	10.16	0.435	11.05	0.080	2.03
54	5440	0.650	16.51	0.410	10.41	0.435	11.05	0.120	3.05
55	5550	0.745	18.92	0.505	12.83	0.535	13.59	0.120	3.05
65	6560	0.780	19.81	0.520	13.21	0.635	16.13	0.130	3.30



Soldering Process

VNR/VXR chips should not be soldered using wave soldering process. Solder reflow hand solder methods are acceptable. Contact factory for Soldering Tech Bulletin.



VNR

High Voltage, High Reliability DC COG(NPO) Ceramic Chip Capacitors

COG (NPO) Dielectric Capacitance Ranges*

Style	EIA Size	500 Vdc		1000 Vdc		2000 Vdc		3000 Vdc		4000 Vdc		5000 Vdc	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
12	1210	10pF	2200pF	10pF	820pF	10pF	270pF						
15	1515	27pF	4700pF	27pF	1500pF	12pF	680pF	12pF	150pF	10pF	100pF		
18	1812	27pF	2700pF	27pF	1200pF	12pF	470pF	12pF	120pF	10pF	100pF		
19	1825	39pF	8200pF	39pF	3900pF	22pF	820pF	22pF	560pF	22pF	390pF		
20	2020	39pF	8200pF	39pF	3900pF	22pF	820pF	22pF	560pF	22pF	390pF		
22	2225	47pF	.012μF	47pF	8200pF	27pF	1200pF	27pF	680pF	27pF	470pF		
25	2050	47pF	.010μF	47pF	6800pF	27pF	1200pF	27pF	680pF	27pF	470pF		
33	3333	120pF	.015μF	120pF	.012μF	47pF	2700pF	47pF	1200pF	27pF	680pF		
35	3530	120pF	.022μF	120pF	.018μF	47pF	3300pF	47pF	1500pF	27pF	680pF		
40	4040	220pF	.039μF	220pF	.022μF	100pF	5600pF	100pF	2200pF	18pF	1200pF		
45	4540	220pF	.056μF	220pF	.033μF	100pF	6800pF	100pF	3900pF	18pF	1500pF	18pF	1000pF
54	5440	390pF	.082μF	390pF	.033μF	150pF	8200pF	150pF	3300pF	27pF	2200pF	22pF	1500pF
55	5550	390pF	.068μF	390pF	.047μF	150pF	.010μF	150pF	6800pF	27pF	2200pF	27pF	2200pF
65	6560	470pF	.100μF	470pF	.068μF	270pF	.022μF	270pF	6800pF	47pF	3900pF	47pF	2700pF

*For Extended Capacitance Values Please Contact Our Factory

Dielectric Characteristics COG (NPO)

Capacitance Range	10pF to .100μF
Capacitance Tolerances	F±1%, G±2%, J±5%, K±10%, M±20%
Dissipation Factor	0.15% Max (25°C, 1 KHz) 1Vrms ±0.2V
Temperature Range	-55°C to +125°C
Temperature Coefficient	0±30ppm/°C
Insulation Resistance 1000 V or Rated V at 25°C (Whichever is less)	100GΩ min or 1000MΩμF Whichever is Less
Insulation Resistance 1000 V or Rated V at 125°C (Whichever is less)	10GΩ min or 100MΩμF Whichever is Less
Voltage Range	500V to 5kV (See Table)
Dielectric Withstand	1.2 x Rated Voltage 5 Second Min
Aging	None

Marking

Chips are supplied unmarked. Marking, if required is an additional charge. Styles 12-15 will be laser marked with EIA capacitance code, and tolerance (821K). Styles 18 and up will be marked with an insulating ink and will contain AFM, capacitance code, tolerance code and lot code.

Packaging

Bulk packaging in plastic bags is standard. Please contact factory for optional waffle packaging or tape and reel.

X7R Dielectric Capacitance Ranges*

Style	EIA Size	500 Vdc		1000 Vdc		2000 Vdc		3000 Vdc		4000 Vdc		5000 Vdc	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
12	1210	270pF	.033μF										
15	1515	680pF	.068μF	680pF	.022μF								
18	1812	680pF	.056μF	680pF	.018μF	270pF	2500pF						
19	1825	1200pF	.180μF	1200pF	.047μF	560pF	8200pF	560pF	2700pF				
20	2020	1200pF	.180μF	1200pF	.068μF	560pF	8200pF	560pF	3900pF				
22	2225	1200pF	.220μF	1200pF	.082μF	680pF	.018μF	680pF	5600pF				
25	2520	1200pF	.220μF	1200pF	.068μF	680pF	.015μF	680pF	4700pF				
33	3333	3300pF	.470μF	3300pF	.250μF	1200pF	.027μF	1200pF	.012μF				
35	3530	3300pF	.560μF	3300pF	.270μF	1200pF	.033μF	1200pF	.015μF	270pF	6800pF		
40	4040	6800pF	.860μF	6800pF	.390μF	2700pF	.047μF	2700pF	.018μF	470pF	8600pF		
45	4540	6800pF	1.20μF	6800pF	.470μF	2700pF	.068μF	2700pF	.033μF	470pF	.010μF	470pF	6800pF
54	5440	.010μF	1.50μF	.010μF	.680μF	3900pF	.056μF	3900pF	.012μF	680pF	.010μF		
55	5550	.010μF	1.80μF	.010μF	.820μF	3900pF	.120μF	3900pF	.039μF	680pF	.015μF	680pF	.010μF
65	6560	.015μF	2.50μF	.015μF	1.00μF	6800pF	.180μF	6800pF	.082μF	1200pF	.027μF	1200pF	.015μF

*For Extended Capacitance Values Please Contact Our Factory

Dielectric Characteristics X7R

Capacitance Range	270pF to 2.5μF
Capacitance Tolerances	J±5%, K±10%, M±20%
Dissipation Factor	2.5% Max (25°C, 1 KHz) 1Vrms ±0.2V
Temperature Range	-55°C to +125°C
Temperature Coefficient	±15%
Insulation Resistance 1000 V or Rated V at 25°C (Whichever is less)	100GΩ min or 1000MΩμF Whichever is Less
Insulation Resistance 1000 V or Rated V at 125°C (Whichever is less)	10GΩ min or 100MΩμF Whichever is Less
Voltage Range	500V to 5kV (See Table)
Dielectric Withstand	1.2 x Rated Voltage 5 Second Min
Aging	None

Marking

Chips are supplied unmarked. Marking, if required is an additional charge. Styles 12-15 will be laser marked with EIA capacitance code, and tolerance (821K). Styles 18 and up will be marked with an insulating ink and will contain AFM, capacitance code, tolerance code and lot code.

Packaging

Bulk packaging in plastic bags is standard. Please contact factory for optional waffle packaging or tape and reel.

Features

- Capacitance Range: 10pF to .33μF
- Operating Temperature Range: -55°C to 125°C
- Voltage Range: 500V to 10kV
- Intermediate and Higher Voltages are Available
- High Reliability Long Life
- Conformal Coated



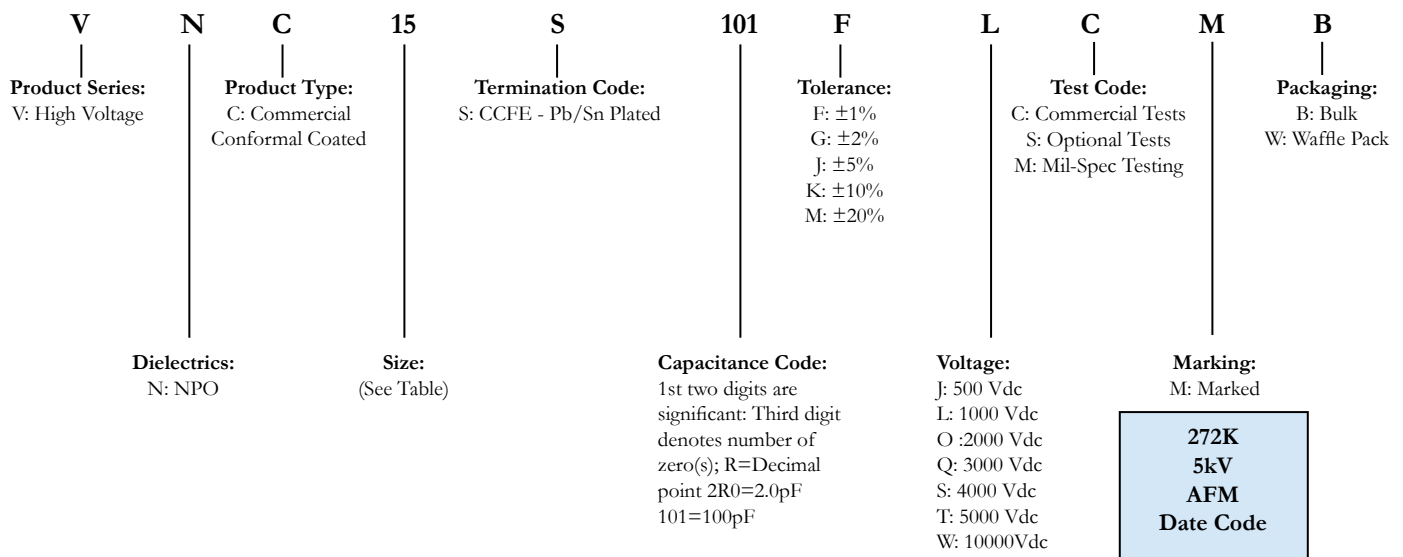
VNC series is high voltage radial lead multilayer ceramic capacitors for use in high reliability commercial and industrial applications. These capacitors are designed

using a high density, extremely stable ceramic, having temperature coefficients meeting COG (NPO) standards. These capacitors conform to or exceed design guidelines outlined in DSCC and other MIL drawings and standards. Each capacitor is 100% tested physically and electrically. Group A and Group B Inspections, as well as partial discharge, SLAM and CSAM are available as options.

Applications

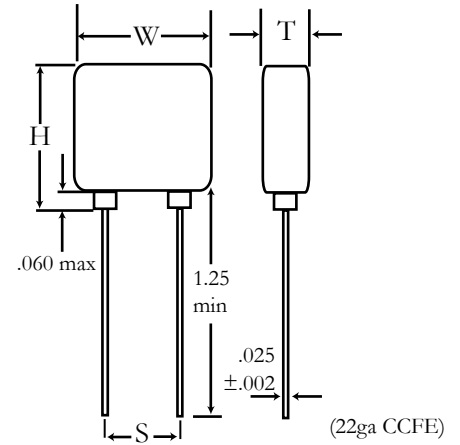
Typical applications include high voltage power supplies, voltage multipliers, surge protection and other custom applications.

AFM Part Number Code



Size Information

Style	Sizes (Max) Inches (mm)			Lead Spacing ±0.30 (S)
	Width (W)	Height (H)	Thickness (T)	
15	.250 (6.35)	.220 (5.59)	.200 (5.08)	.170 (4.32)
20	.320 (8.13)	.280 (7.11)	.250 (6.35)	.220 (5.59)
22	.370 (9.40)	.300 (7.62)	.250 (6.35)	.275 (6.99)
30	.450 (11.43)	.220 (5.59)	.200 (5.08)	.300 (7.62)
35	.470 (11.94)	.400 (10.16)	.270 (6.86)	.375 (9.53)
41	.550 (13.97)	.280 (7.11)	.250 (6.35)	.400 (10.16)
45	.570 (14.48)	.500 (12.70)	.270 (6.86)	.475 (12.07)
55	.670 (17.02)	.600 (15.24)	.270 (6.86)	.575 (14.61)
65	.770 (19.56)	.720 (18.29)	.270 (6.86)	.675 (17.15)
70	.850 (21.59)	.400 (10.16)	.270 (6.86)	.700 (17.78)
90	1.05 (26.67)	.500 (12.70)	.270 (6.86)	.975 (24.77)
95	1.25 (31.75)	.600 (15.24)	.270 (6.86)	1.175 (29.85)
99	1.45 (36.83)	.720 (18.29)	.270 (6.86)	1.375 (34.93)



NPO Capacitance Ranges

Style	500V		1kV		2kV		3kV		4kV		5kV		10kV	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
15	27pF	4700pF	27pF	1500pF	10pF	680pF	10pF	220pF						
20	39pF	8200pF	39pF	3900pF	22pF	820pF	22pF	560pF						
22	47pF	.012µF	47pF	6800pF	27pF	1500pF	27pF	820pF						
30	68pF	.015µF	68pF	4700pF	15pF	1000pF	15pF	390pF	10pF	220pF				
35	120pF	.022 µF	120pF	.018µF	47pF	3300pF	47pF	1500pF	27pF	680pF	15pF	470pF		
41	82pF	.027µF	82pF	.012µF	27pF	2200pF	27pF	820pF	10pF	560pF	10pF	390pF		
45	220pF	.056µF	220pF	.033µF	100pF	6800pF	100pF	3900pF	18pF	1500pF	18pF	1200pF		
55	390pF	.082µF	390pF	.047µF	150pF	.010µF	150pF	6800pF	27pF	2200pF	27pF	2200pF		
65	470pF	.100µF	470pF	.068µF	270pF	.022µF	270pF	8200pF	47pF	3900pF	47pF	2700pF		
70	330pF	.120µF	330pF	.068µF	68pF	.010µF	68pF	4700pF	27pF	1500pF	27pF	1200pF		
90	470pF	.150µF	470pF	.056µF	120pF	.015µF	120pF	5600pF	47pF	3300pF	47pF	2200pF	18pF	820pF
95	680pF	.220µF	680pF	.100µF	220pF	.022µF	220pF	.015µF	82pF	5600pF	82pF	3900pF	33pF	1200pF
99	1000pF	.330µF	1000pF	.15µF	270pF	.039µF	270pF	.018µF	120pF	8200pF	120pF	5600pF	56pF	5600pF

Specification and Performance:

Piezoelectric and Aging Effects:	None
Temperature Range:	-55°C to +200°C
Temperature Coefficient of Capacitance:	0±30ppm/°C
Insulation Resistance (IR, at Rated Voltage):	25°C > 100,000 MΩ or 1000 MΩµF; 125°C > 10,000 MΩ or 100 MΩµF Whichever is Les
Dielectric Withstand Voltage (DWV):	500V to 10kV - 1.2 x V Rated at 25°C
Dissipation Factor:	0.15 max

Features

- Capacitance Range: 100pF to 5.6μF
- Operating Temperature Range: -55°C to 125°C
- Voltage Range: 1kV to 10kV
- Intermediate and Higher Voltages are Available
- High Reliability Long Life
- Conformal Coated

VXC series is high voltage radial lead multilayer ceramic capacitors for use in high reliability commercial and industrial applications. These capacitors are designed

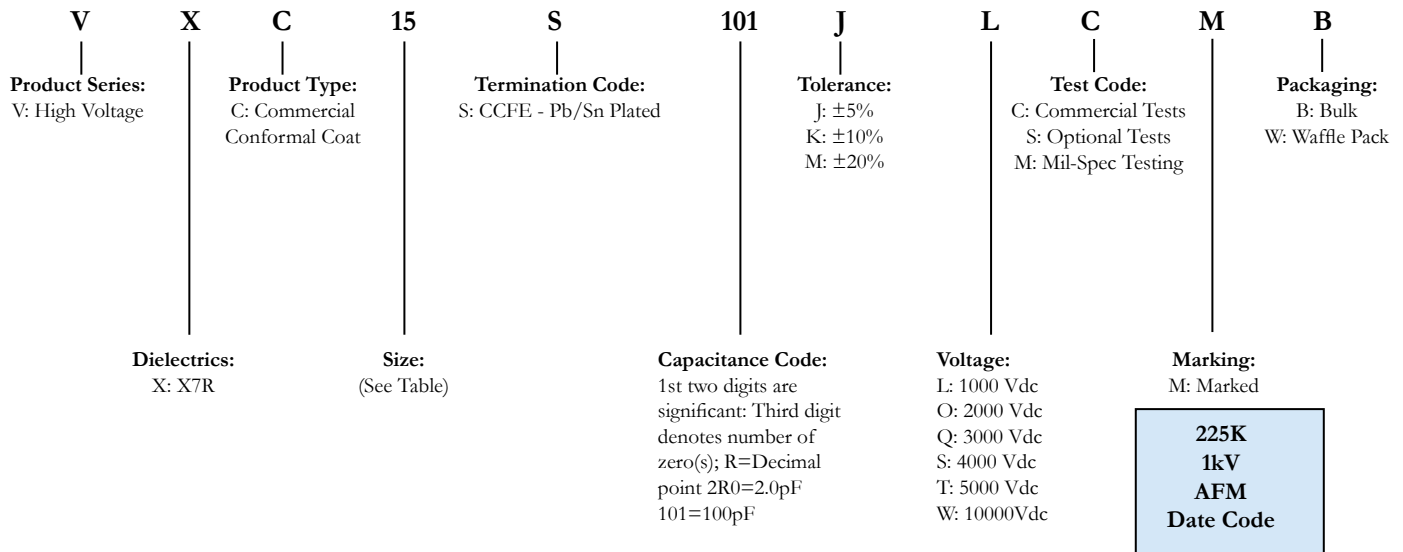
using a high density barium titanate ceramic, having temperature coefficients meeting X7R standards. These capacitors conform to or exceed design guidelines outlined in DSCC and other MIL drawings and standards. Each capacitor is 100% tested physically and electrically. Group A and Group B Inspections, as well as partial discharge, SLAM and CSAM are available as options.



Application

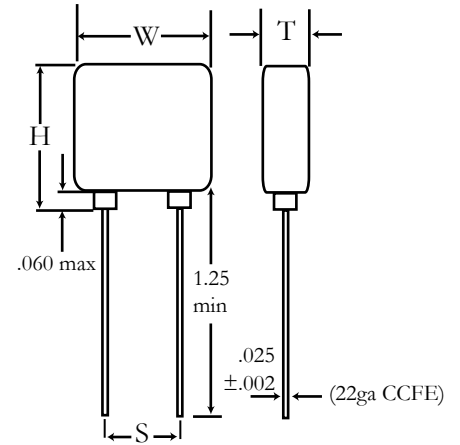
Typical applications include high voltage power supplies, voltage multipliers, surge protection and other custom applications.

AFM Part Number Code



Size Information

Style	Sizes (Max) Inches (mm)			Lead Spacing ±0.30 (S)
	Width (W)	Height (H)	Thickness (T)	
15	.250 (6.35)	.220 (5.59)	.200 (5.08)	.170 (4.32)
20	.320 (8.13)	.280 (7.11)	.250 (6.35)	.220 (5.59)
22	.370 (9.40)	.300 (7.62)	.250 (6.35)	.275 (6.99)
30	.450 (11.43)	.220 (5.59)	.200 (5.08)	.300 (7.62)
35	.470 (11.94)	.400 (10.16)	.270 (6.86)	.375 (9.53)
41	.550 (13.97)	.280 (7.11)	.250 (6.35)	.400 (10.16)
45	.570 (14.48)	.500 (12.70)	.270 (6.86)	.475 (12.07)
55	.670 (17.02)	.600 (15.24)	.270 (6.86)	.575 (14.61)
65	.770 (19.56)	.720 (18.29)	.270 (6.86)	.675 (17.15)
70	.850 (21.59)	.400 (10.16)	.270 (6.86)	.700 (17.78)
90	1.05 (26.27)	.500 (12.70)	.270 (6.86)	.975 (24.77)
95	1.25 (31.75)	.600 (15.24)	.270 (6.86)	1.175 (29.85)
99	1.45 (36.83)	.720 (18.29)	.270 (6.86)	1.375 (34.93)



X7R Capacitance Range

Style	500V		1kV		2kV		3kV		4kV		5kV		10kV	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
15	680pF	.082μF	680pF	.022μF	270pF	3900pF	100pF	1200pF						
20	1200pF	.180μF	1200pF	.068μF	560pF	.012μF	560pF	3900pF						
22	1200pF	.220μF	1200pF	.082μF	680pF	.018μF	680pF	5600pF						
30	1800pF	.220μF	1800pF	.056μF	390pF	8200pF	390pF	2200pF	150pF	1200pF				
35	3300pF	.560μF	3300pF	.270μF	1200pF	.033μF	1200pF	.015μF	270pF	6800pF				
41	2700pF	.390μF	2700pF	.150μF	680pF	.022μF	680pF	8200pF	270pF	4700pF	270pF	2700pF		
45	6800pF	1.20μF	6800pF	.470μF	2700pF	.068μF	2700pF	.033μF	470pF	.010μF	470pF	6800pF		
55	.010μF	1.80μF	.010μF	.680μF	3900pF	.100μF	3900pF	.039μF	680pF	.015μF	680pF	.010μF		
65	.015μF	2.50μF	.015μF	1.00μF	6800pF	.180μF	6800pF	.082μF	1200pF	.027μF	1000pF	.015μF	270pF	1200pF
70	.010μF	1.50μF	.010μF	.680μF	1800pF	.082μF	1800pF	.027μF	680pF	.012μF	680pF	8200pF	150pF	1000pF
90	.012μF	2.20μF	.012μF	1.00μF	3300pF	.150μF	3300pF	.056μF	1200pF	.027μF	1000pF	.022μF	470pF	3900pF
95	.018μF	3.90μF	.018μF	1.5μF	5600pF	.250μF	5600pF	.082μF	2200pF	.047μF	2000pF	.027μF	820pF	5600pF
99	.027μF	5.60μF	.027μF	2.20μF	8200pF	.390μF	8200pF	.120μF	3300pF	.068μF	3000pF	.039μF	1000pF	.010μF

Specification and Performance

Piezoelectric and Aging Effects:	None
Temperature Range:	-55°C to +200°C
Temperature Coefficient of Capacitance:	±15%
Insulation Resistance (IR, at Rated Voltage):	25°C > 100,000 MΩ or 1000 MΩμF; 125°C > 10,000 MΩ or 100 MΩμF Whichever is less
Dielectric Withstand Voltage (DWV):	500V to 10kV - 1.2 x V Rated at 25°C
Dissipation Factor:	2.5% max

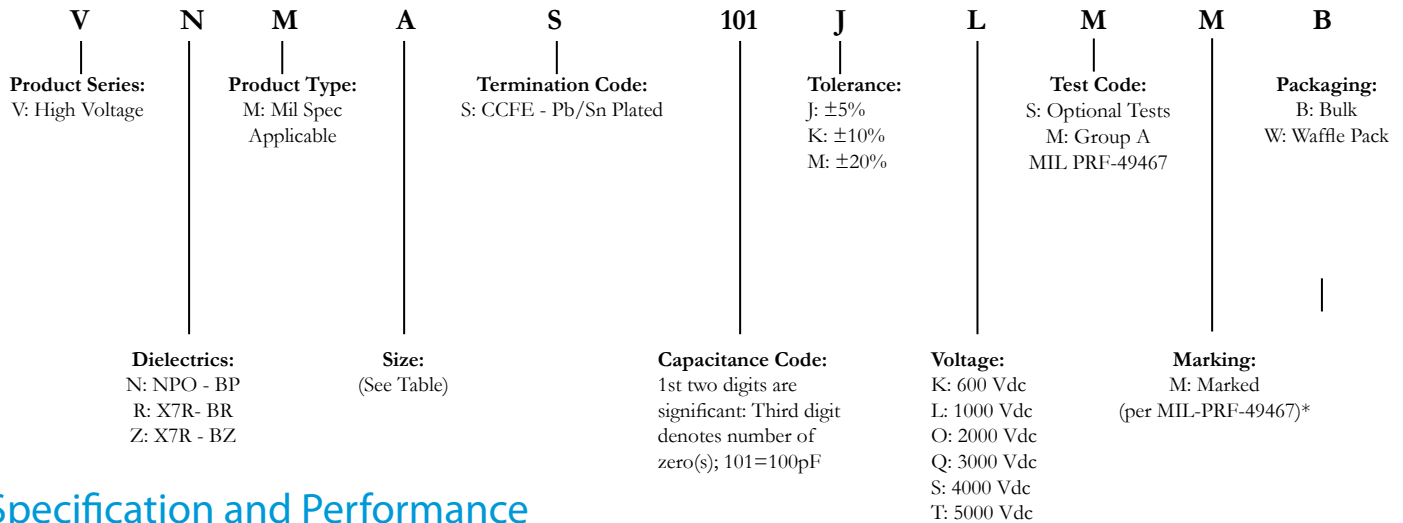
Features

- Capacitance Range: 10pF to .47μF
- Operating Temperature Range: -55°C to 125°C
- Voltage Range: 600V to 5kV
- High Reliability Long Life
- Conformal Coated
- Sizes and Values Conform to MIL-PRF-49467



VNM/VRM/VZM series is high voltage radial lead multilayer ceramic capacitors for use in high reliability commercial, industrial and military applications. These capacitors are designed in accordance with MIL-PRF-49467 and can be supplied to BP, BR, and BZ voltage temperature limits. Each capacitor is 100% tested physically and electrically to Group A Inspection, Subgroups 1, 3, 4, as defined in MIL-PRF-49467. AFM has in-house partial discharge (corona) testing capability and this test is available as an option. Group B Inspection is also available as an option.

AFM Part Number Code

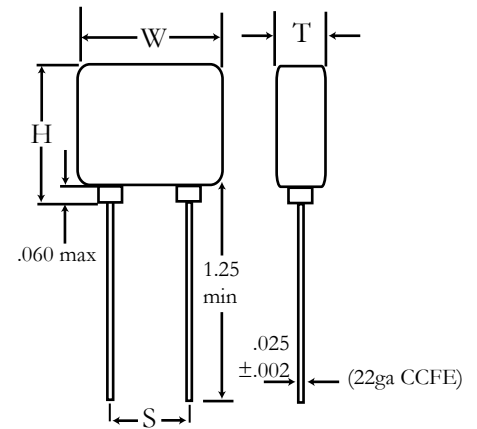


Specification and Performance

BP, BR and BZ Temperature Coefficient:	See "Voltage - Temperature Limits" table on next page
Insulation Resistance (IR, at Rated Voltage):	25°C > 100,000 MΩ or 1000 MΩμF 125°C > 10,000 MΩ or 100 MΩμF Whichever is Less
Dissipation Factor:	0.15% max for BP 2.5% max for BR and BZ

Size Information

Style	Sizes (Max) Inches (mm)			Lead Spacing ±0.30 (S)
	Width (W)	Height (H)	Thickness (T)	
A	.250 (6.35)	.220 (5.59)	.200 (5.08)	.170 (4.32)
B	.320 (8.13)	.280 (7.11)	.250 (6.35)	.220 (5.59)
C	.370 (9.40)	.300 (7.62)	.250 (6.35)	.275 (6.99)
D	.470 (11.94)	.400 (10.16)	.270 (6.86)	.375 (9.53)
E	.570 (14.48)	.500 (12.70)	.270 (6.86)	.475 (12.07)
F	.670 (17.02)	.600 (15.24)	.270 (6.86)	.575 (14.61)
G	.770 (19.56)	.720 (18.29)	.270 (6.86)	.675 (17.15)
Extended Case Codes				
J	1.25 (31.75)	.600 (15.24)	.270(6.86)	1.10 (27.94)
K	1.45 (36.83)	.720 (18.29)	.270 (6.86)	1.30 (33.02)
L	.450 (11.43)	.220 (5.59)	.200 (5.08)	.300 (7.62)
M	.450 (11.43)	.220 (5.59)	.270 (6.86)	.300 (7.62)



Voltage - Temperature Limits (-55°C to +125°C)			
TC	No Load	Rated Voltage	% Change
BP	0±30ppm/°C	100%	0±30ppm/°C
BR	±15%	100%	+15, -40%
BZ	±15%	60%	+15, -45%

BP COG (NPO) Dielectric Capacitance Ranges

Style	600V		1kV		2kV		3kV		4kV		5kV	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A	10pF	5600pF	10pF	1000pF	10pF	330pF						
B	10pF	5600pF	56pF	1800pF	22pF	820pF	10pF	560pF				
C	6800pF	.012µF	68pF	2700pF	27pF	1200pF	22pF	680pF				
D	.018µF	.039µF	120pF	4700pF	47pF	2200pF	39pF	1500pF	18pF	1000pF		
E	.047µF	.068µF	270pF	.018 µF	100pF	4700pF	100pF	3300pF	100pF	1800pF	100pF	1000pF
F			390pF	.018µF	150pF	6800pF	150pF	5600pF	150pF	3300pF	150pF	1800pF
G			470pF	.027µF	270pF	.010µF	270pF	6800pF	270pF	4700pF	270pF	3300pF
K											560pF	3900pF
L									10pF	82pF		
M									47pF	820pF		

BR (X7R) Dielectric Capacitance Ranges

Style	600V		1kV		2kV		3kV		4kV		5kV	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A	100pF	.027μF	470pF	4700pF	220pF	1500pF						
B	.033μF	.082μF	1200pF	.010μF	390pF	3900pF	270pF	1500pF				
C		.100μF	1500pF	.027μF	820pF	5600pF	560pF	2200pF				
D	.12μF	.270μF	3300pF	.068μF	1200pF	.015μF	1000pF	6800pF	100pF	4700pF		
E	.330μF	.470μF	6800pF	.150μF	2700pF	.033μF	2700pF	.012μF	470pF	6800pF	390pF	2200pF
F			.100μF	.270μF	3900pF	.047μF	3300pF	.022μF	680pF	.010μF	560pF	5600pF
G			.12μF	.470μF	6800pF	.100μF	5600pF	.039μF	1200pF	.018μF	1200pF	8200pF
J							6800pF	.047μF	1800pF	.027μF	2200pF	.015μF
K							8200pF	.082μF	2700pF	.047μF	3300pF	.022μF
M									100pF	820pF	100pF	560pF

BZ (X7R) Dielectric Capacitance Ranges

Style	1kV		2kV		3kV		4kV		5kV	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A	680pF	.010μF	220pF	2700pF						
B	1200pF	.015μF	560pF	6800pF	560pF	2200pF				
C	1500pF	.022μF	680pF	.010μF	680pF	3300pF				
D	3300pF	.056μF	1200pF	.027μF	1200pF	8200pF	120pF	6800pF		
E	6800pF	.120μF	2700pF	.056μF	2700pF	.018μF	680pF	.010μF	470pF	6800pF
F	.100μF	.180μF	3900pF	.082μF	3900pF	.027μF	820pF	.015μF	560pF	.010μF
G			5600pF	.150μF	6800pF	.047μF	1200μF	.027μF	1200pF	.015μF
J					6800pF	.047μF	2200pF	.039μF	2200pF	.022μF
K							3300pF	.056μF	3300pF	.033μF