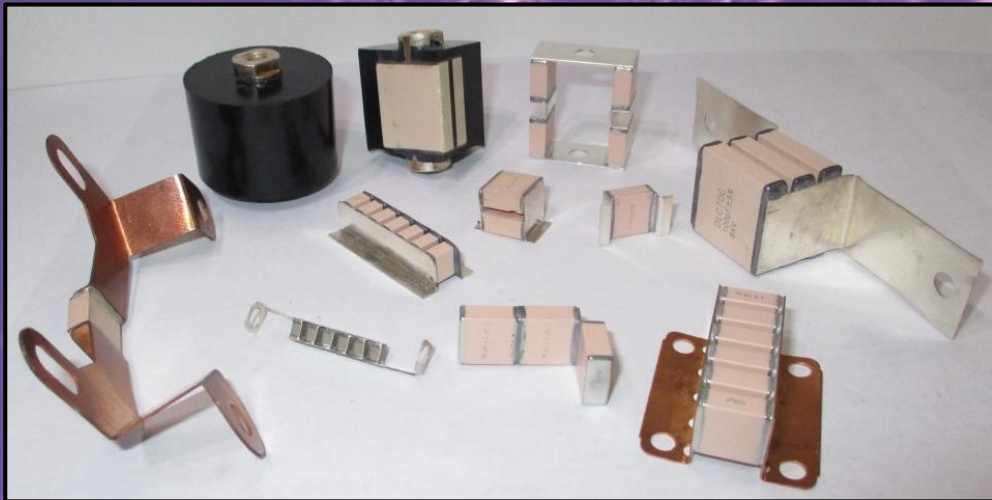




HIGH POWER COMPONENTS

FOR HIGH CURRENT/ HIGH VOLTAGE APPLICATIONS



- High-Q Low ESR Capacitors
- High Power Custom Assemblies



Traditional High Q (>10,000) Low ESR Multi-Layer Ceramic Capacitors

Product Features

- High Q
- High Power
- Low ESR/ESL
- Low Noise
- High Self-Resonance
- Ultra Stable Performance

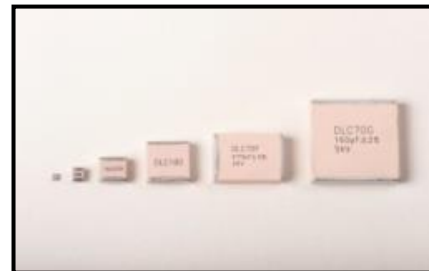
Product Applications

Typical Functional Applications:

- Tuning • Bypass • Coupling
- Feedback • D.C. Blocking
- Impedance Matching

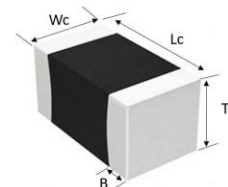
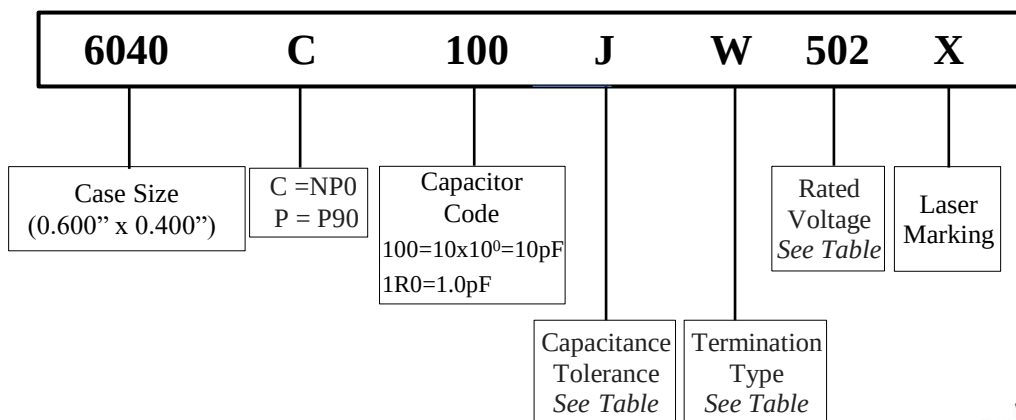
Typical Circuit Applications:

- UHF/Microwave RF Power Amplifiers
- Mixers • Oscillators • Filter Networks
- Low Noise Amplifiers • Timing Circuits and Delay Lines



Marking shown for illustration purposes only.
Actual marking may differ.

Part Numbering



Case Size (Chip) Dimensions

	2225	3838	6040	7676
Length (L_c)	0.225 -0.010+0.25 (5.72 -0.25+ 0.64)	0.380 -0.010+0.015 (9.65 -0.25+0.38)	0.614 -0.010+0.015 (15.6 -0.25+0.38)	0.760 -0.010+0.015 (19.3 -0.25+0.38)
Width (W_c)	0.250 ± 0.015 (6.35 ± 0.38)	0.380±0.010 (9.65±0.25)	0.433±0.010 (11.0±0.25)	0.760±0.010 (19.3±0.25)
Thickness (T_c)	0.150 (3.81) max	0.170 (4.32) max	0.154±0.008 (3.90±0.20) max	0.154±0.008 (3.90±0.20) max
Overlap (B)	0.020~0.470 (0.50~1.20) max	0.024~0.059 (0.60~1.50)	0.063 (1.60) max	0.063 (1.60) max



Traditional High Q (>10,000) Low ESR Multi-Layer Ceramic Capacitors

⚡ Temperature Coefficient

C: -55°C to 125°C 0±30ppm/°C; >125 °C to 200°C 0±60ppm/°C
P: +90±20ppm/°C

⚡ Rated Capacitance

Capacitance is less than 10pF; for example: 1R0=1.0pF, R denotes decimal point
Capacitance greater than 10pF; for example: 101=100pF, the third number is the power of 10

⚡ Tolerance

Capacitance Tolerance								
Code	A	B	C	D	F	G	J	K
Tolerance	±0.05pF	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%

⚡ Termination Types and Codes

Magnetic			⚡ Non-Magnetic		
Termination Code	Type	Magnetic Termination	Termination Code	Type	Non-Magnetic Terminations
W 	Chip	100% Sn Solder over Nickel Plating	P 	Chip	100%Sn Solder over Copper Plating
L	Chip	90% Sn10%Pb Tin/Lead Solder over Nickel Plating	MN 	Microstrip	Silver-Plated Copper
MS 	Microstrip	Silver-Plated Copper	AN 	Axial Ribbon	
AR 	Axial Ribbon		FN 	Radial Ribbon	
RR 	Radial Ribbon		RN 	Axial Wire	
RW 	Axial Wire		BN 	Radial Wire	
AW 	Radial Wire				



Traditional High Q (>10,000) Low ESR Multi-Layer Ceramic Capacitors

⚡ Voltages

Code	Rated Voltage	Code	Rated Voltage
501	500V	362	3600V
102	1000V	502	5000V
152	1500V	722	7200V
202	2000V	802	8000V
252	2500V	103	10000V
302	3000V		

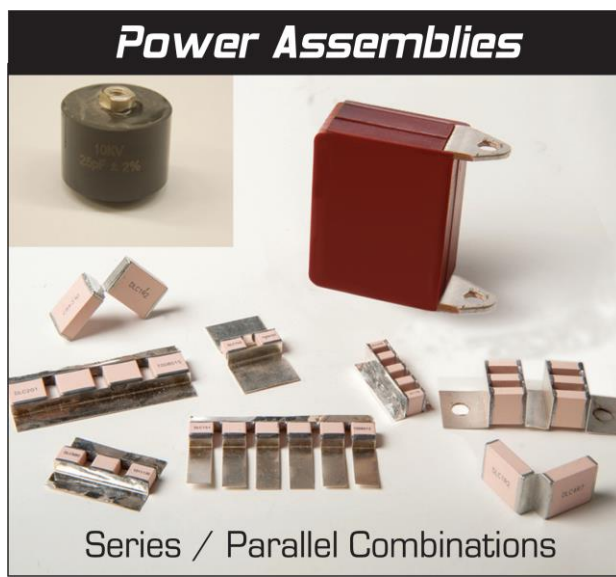
⚡ Laser Marking

An “X” at the end of the part number indicates the part is marked.

⚡ Performance Requirements

Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

All products are in compliance with RoHS instruction. 



Marking shown for illustration purposes only.



Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

2225C/P (0.220" x 0.250")

Product Features

- High Q
- High RF Current/Voltage
- Ultra Stable Performance
- Capacitance Range:
0.5pF to 2700pF
- Working Voltage: 2500V
- Extended Voltage: 3600V

Product Applications

Typical Functional Applications:

- Tuning • Bypass • Coupling
- Feedback • D.C. Blocking
- Impedance Matching

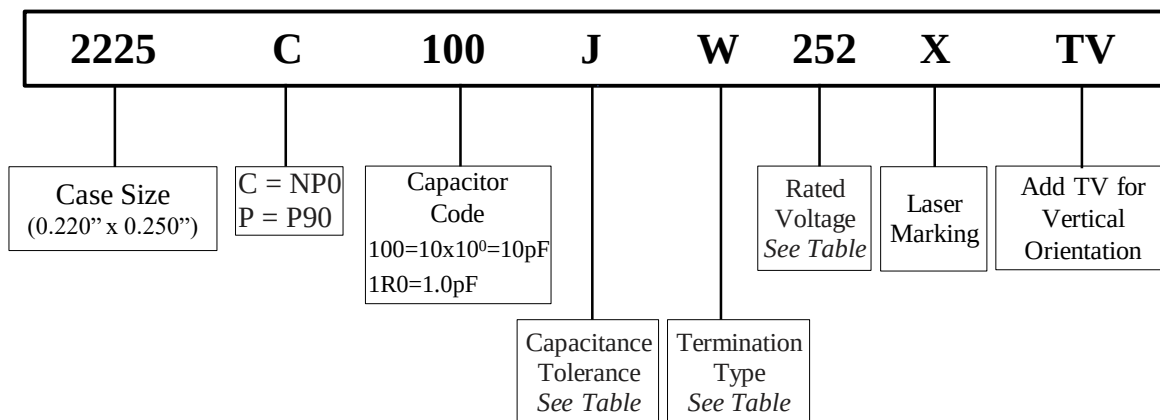
Typical Circuit Applications:

- UHF/Microwave RF Power Amplifiers
- Antenna Tuning • Plasma Chambers
- Medical Equipment



Marking shown for illustration purposes only.
Actual marking may differ.

Part Numbering



Capacitance Tolerance Codes

Code	A	B	C	D	F	G	J	K
Tol.	±0.05pF	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%

Voltage Codes

Voltage	Code	Voltage	Code
500V	501	2500V	252
1000V	102	3000V	302
1500V	152	3600V	362
2000V	202		



Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

2225C/P (0.220" x 0.250")

≠ 2225C/P Capacitance Values

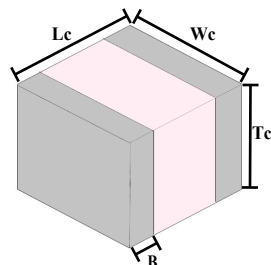
- NP0=C; P90=P

Special capacitances, tolerances and WVDC are available. Please contact PPI.

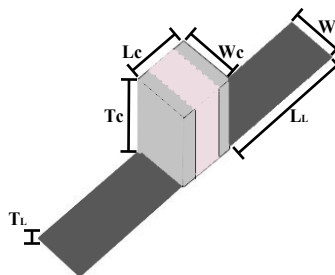


Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC				
			Std.	Ext.				Std.	Ext.				Std.	Ext.				Std.	Ext.			
0.5	0R5	B,C, D	2500V	3600V	4.3	4R3	B,C, D	2500V	3600V	43	430	F,G, J,K	2500V	3600V	430	431	F,G, J,K	1500V	2000V			
0.6	0R6				4.7	4R7				47	470				470	471						
0.7	0R7				5.1	5R1				51	510				F,G, J,K	2500V	3600V	510	511	F,G, J,K	1000V	1500V
0.8	0R8				5.6	5R6				56	560							560	561			
0.9	0R9				6.2	6R2				62	620							620	621			
1.0	1R0				6.8	6R8				68	680							680	681			
1.1	1R1				7.5	7R5				75	750							750	751			
1.2	1R2				8.2	8R2				82	820							820	821			
1.3	1R3				9.1	9R1				91	910							910	911			
1.4	1R4				F,G, J,K	2500V	3600V	100	101	F,G, J,K	2500V	3000V	1000	102	F,G, J,K	500V	N/A					
1.5	1R5							110	111				1100	112								
1.6	1R6							120	121				1200	122								
1.7	1R7							130	131				1500	152								
1.8	1R8							150	151				1800	182								
1.9	1R9							160	161				2200	222								
2.0	2R0							180	181				2700	272								
2.1	2R1							200	201				F,G, J,K	1500V				2000V				
2.2	2R2							220	221													
2.4	2R4							240	241													
2.7	2R7							270	271													
3.0	3R0							300	301													
3.3	3R3							330	331													
3.6	3R6							360	361													
3.9	3R9							390	391													

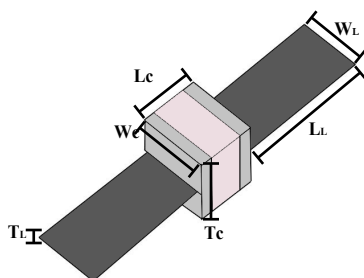
≠ Termination Types and Codes



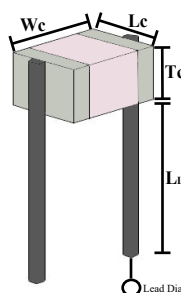
Chip Termination:
Codes: W, L, P



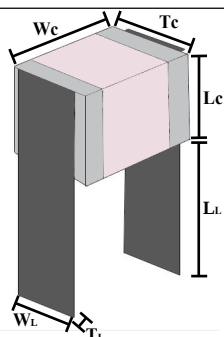
Microstrip Termination:
Codes: MS, MN



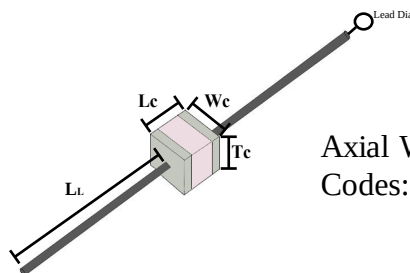
Axial Ribbon Termination:
Code: AR, AN



Radial Wire Termination:
Codes: RW, RN



Radial Ribbon Termination:
Code: RR, FN



Axial Wire Termination:
Codes: AW, BN

Termination Code	Magnetic Termination
W	100% Tin Solder over Nickel Barrier
L	90%Tin/10%Lead Solder over Nickel Barrier
MS	Silver-Plated Copper
AR	
RR	
RW	
AW	

Termination Code	Non-Magnetic Termination
P	100% Tin Solder over Copper Barrier
MN	Silver-Plated Copper
AN	
FN	
RN	
BN	

Note: "Non-Magnetic" means no magnetic materials.



Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

2225C/P (0.220" x 0.250")

≠ Dimensions - For Termination Types images, see previous page Unit: inch (millimeter)

Magnetic Termination									
Code		Capacitor Dimensions				Lead Dimensions			
		Length	Width	Thickness	Overlap	Length	Width	Thickness	
		Lc	Wc	Tc	B	LL	WL	TL	
W/L	Chip	0.225	$\begin{matrix} +0.025 \\ -0.010 \end{matrix}$	0.250 ± 0.015	0.165 max	$0.020 \sim 0.047$	-	-	-
		(5.72	$\begin{matrix} +0.64 \\ -0.25 \end{matrix}$)	(6.35 ± 0.38)	(4.19 max)	$(0.50 \sim 1.20)$			
MS	Microstrip								
AR	Axial Ribbon					0.500 min (12.70 min)	0.240 ± 0.005 (6.1 $\pm$ 0.13)	0.008 ± 0.001 (0.2 $\pm$ 0.025)	
RR	Radial Ribbon	0.245 ± 0.025 (6.22 $\pm$ 0.64)	0.250 ± 0.015 (6.35 $\pm$ 0.38)	0.150 max (3.81 max)	-	0.354 min (9.00 min)	0.118 ± 0.005 (3.00 $\pm$ 0.13)	0.012 ± 0.001 (0.3 $\pm$ 0.025)	
RW	Radio Wire					0.709 min (18.00 min)	Dia. = 0.031 ± 0.004		
AW	Axial Wire					0.906 min (23.00 min)	Dia. = (0.80 ± 0.10)		

		Non-Magnetic Termination					Lead Dimensions		
		Capacitor Dimensions							
Code		Length	Width	Thickness	Overlap	Length	Width	Thickness	
		Lc	Wc	Tc	B	LL	WL	TL	
P	Chip	0.225	$\begin{matrix} +0.025 \\ -0.010 \end{matrix}$	0.250 ± 0.015	0.165 max	0.020 ~ 0.047	-	-	-
		(5.72	$\begin{matrix} +0.64 \\ -0.25 \end{matrix}$)	(6.35 ± 0.38)	(4.19 max)	(0.50 ~ 1.20)			
MN	Microstrip					0.500 min	0.240 ± 0.005	0.008 ± 0.001	
AN	Axial Ribbon					(12.70 min)	(6.1 ± 0.13)	(0.2 ± 0.025)	
FN	Radial Ribbon	0.245 ± 0.025	0.250 ± 0.015	0.150 max	-	0.354 min	0.118 ± 0.005	0.012 ± 0.001	
		(6.22 ± 0.64)	(6.35 ± 0.38)	(3.81 max)		(9.00 min)	(3.00 ± 0.13)	(0.3 ± 0.025)	
RN	Radio Wire					0.709 min	Dia. = 0.031 ± 0.004		
BN	Axial Wire					(18.00 min)			
						0.906 min	Dia. = (0.80 ± 0.10)		
						(23.00 min)			

⊗ Note: Non-Magnetic means no magnetic materials. All leads are attached with high temperature solder and parts are RoHS Compliant.



Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

2225C/P (0.220" x 0.250")

⚡ Electrical Specifications

Quality Factor (Q)	Greater than 10,000 at 1 MHz
Insulation Resistance (IR)	Test Voltage: 500V 10 ⁵ Megaohms min. @ +25°C 10 ⁴ Megaohms min. @ +125°C
Rated Voltage	See Rated Voltage in Capacitance Table
Dielectric Withstanding Voltage (DWV)	250% of Rated Voltage of 5 seconds, Rated Voltage ≤ 500VDC 150% of Voltage for 5 seconds, 500VDC < Rated Voltage ≤ 1250 VDC 120% of Voltage for 5 seconds, Rated Voltage > 1250 VDC
Operating Temperature Range	-55°C to 200°C
Temperature Coefficient (TC)	C: -55°C to 125°C 0±30ppm/°C; >125°C to 200°C 0±60ppm/°C P: -55°C to 200°C +90±20ppm/°C
Capacitance Drift	±0.02% or ±0.02pF, whichever is greater
Piezoelectric Effects	None
Termination Type	See Termination Type Table

Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

⚡ Environmental Specifications

	Specification	Test Parameters
Thermal Shock	DWV: The initial Value IR: Shall not be less than 30% of the initial value. Capacitance Change:	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature (-55°C and 200°C) stay 30 minutes, the time of removing shall not be more than 3 minutes. Perform five cycles.
Moisture Resistance	No more than 0.5% or 0.5pF, whichever is greater.	MIL-STD-202, Method 106
Humidity (Steady State)	DWV: The initial Value IR: The initial value. Capacitance Change: No more than 0.3% or 0.3pF, whichever is greater.	MIL-STD-202, Method 103, Condition A With 1.5Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours minimum.
Life	IR: Shall not be less than 30% of the initial value. Capacitance Change: No more than 2.0% or 0.5pF, whichever is greater.	MIL-STD-202, Method 108. For 2000 hours, at 200°C. 200% of Voltage for Capacitors, Rated Voltage ≤ 500VDC; 120% of Voltage for Capacitors, 500VDC < Rated Voltage ≤ 1250VDC; 100% for Voltage for Capacitors, Rated Voltage > 1250VDC
Terminal Strength	Force: 20lbs typical, 10lbs. Minimum. Duration Time: 5 to 10 seconds	MIL-STD-202, Method 211A, Test Condition A. Applied a force and maintained for a period of 5 to 10 seconds. The force shall be in the direction of the axes of the terminations.

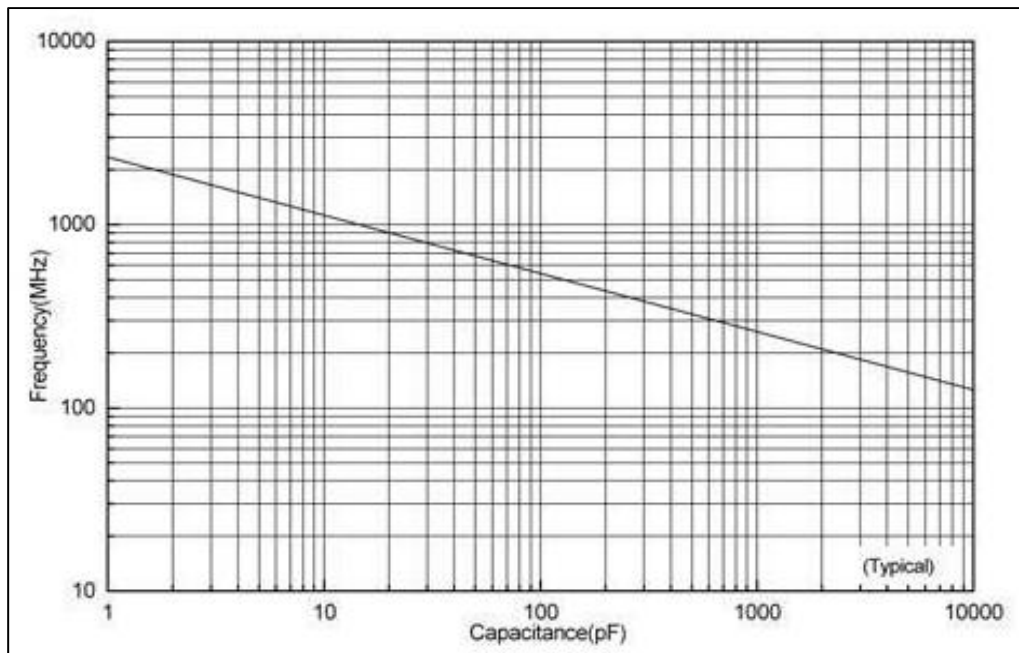


Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

2225C/P (0.220" x 0.250")

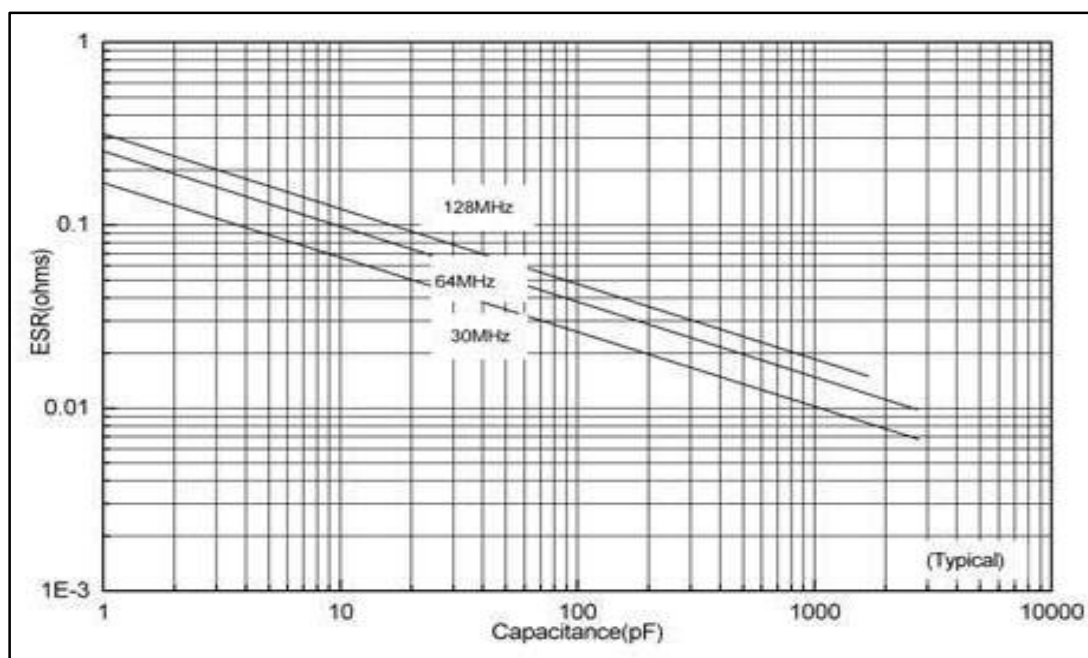
≠ Series Resonance vs. Capacitance

Series Resonance vs. Capacitance



≠ ESR vs. Frequency

2225C/P ESR vs Frequency



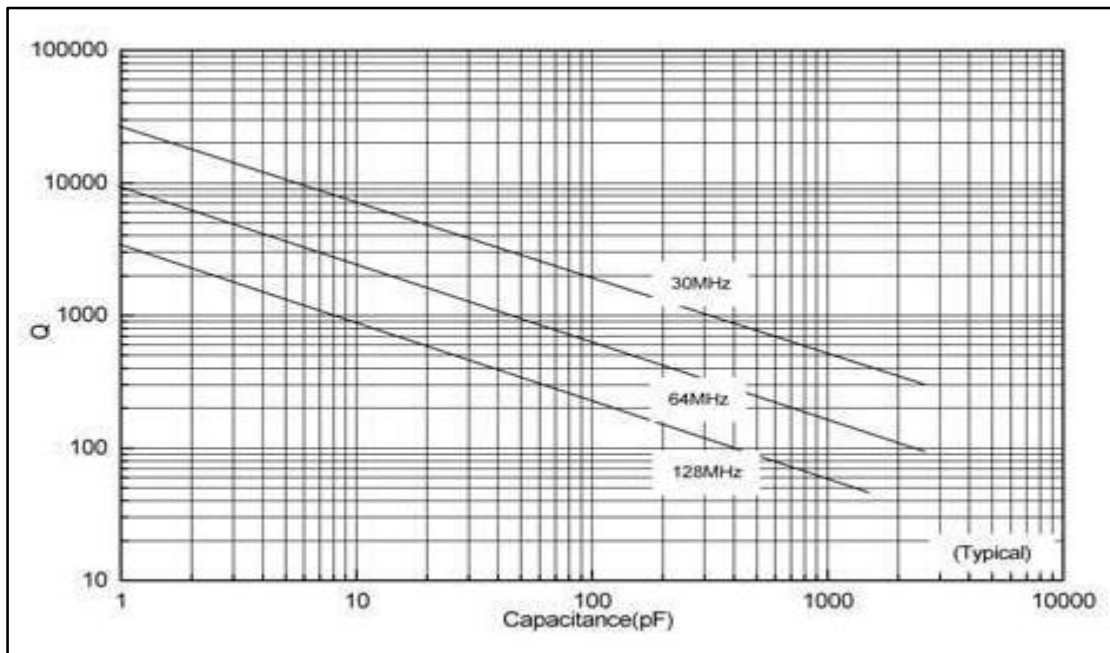


Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

2225C/P (0.220" x 0.250")

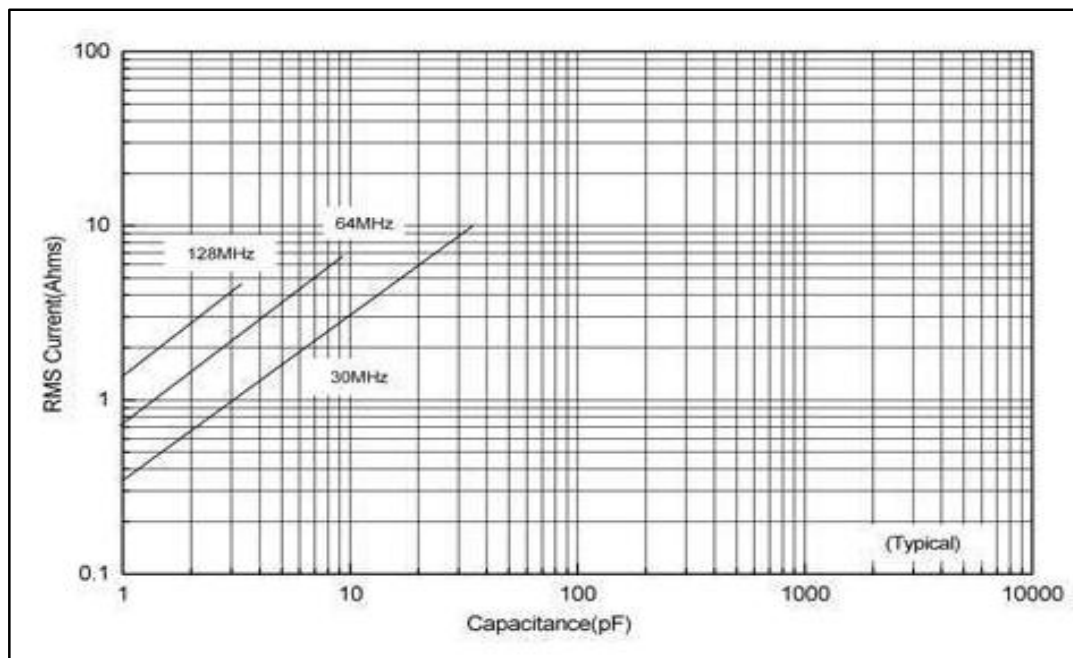
⚡ Q vs. Capacitance

Q vs Capacitance



⚡ Current Rating vs. Capacitance

2225C/P Current Rating vs Capacitance



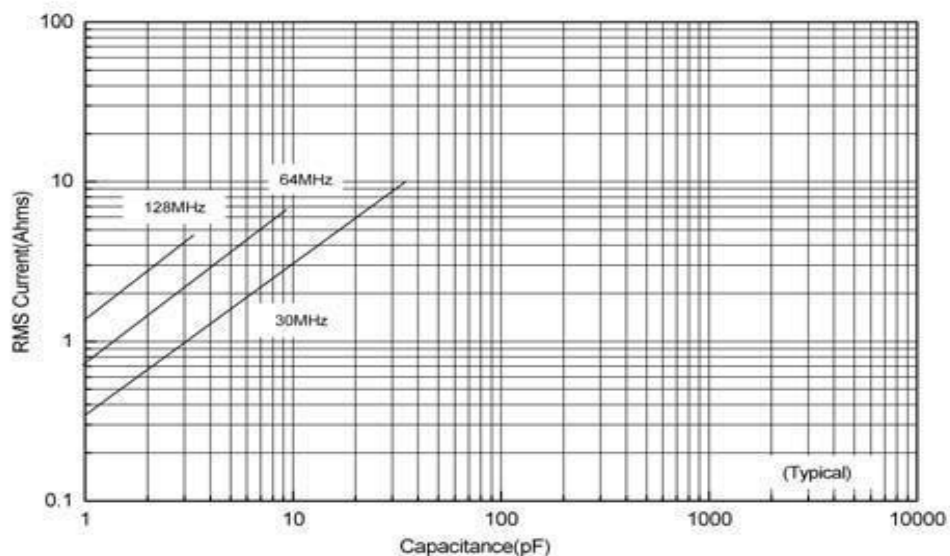


Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

2225C/P (0.220" x 0.250")

⚡ Current Rating vs. Capacitance

2225C/P Current Rating vs Capacitance



Current limits can depend on two different criteria. The first Voltage Limited Current ($I_{\text{volt lim}}$, represented by the solid line), the second is Power Dissipation Limited Current ($I_{\text{pow diss}}$).

$$I_{\text{volt lim}} = \frac{\sqrt{2}}{2} I_{\text{peak}} = \frac{\sqrt{2}}{2} \times \frac{V_{\text{rated}}}{X_C} = \sqrt{2} \pi F C V_{\text{rated}}$$

$I_{\text{pow diss}} = \sqrt{\frac{P_{\text{dissipation}}}{\text{ESR}}}$ (If the thermal resistance of the mounting surface is 15°C/W, then you will reach the power dissipated limit of 4W)

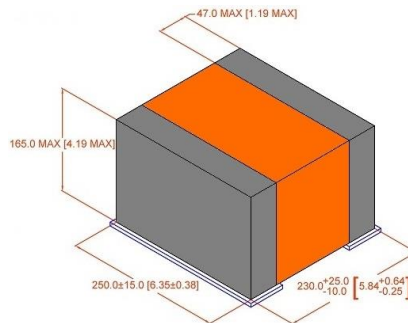


Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

2225C/P (0.220" x 0.250")

⚡ Capacitor Application Program

PPI's brand new online Capacitor Application Program (C.A.P.) helps Engineers and Designers select capacitors according to parameters such as cap value and frequency. C.A.P. allows engineers to insert capacitors requirements (Cap value, Frequency), producing Scattering Matrices (S2P) Charts while providing options (Case Size, Terminations, Mounting), and parameters (ESR, Q, Impedance) along with Datasheets. Once engineers have determined their capacitor requirements, C.A.P. also includes online Requests For Quotes (RFQs) and/or sample requests.



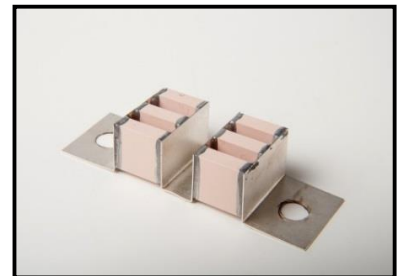
⚡ Recommended Land Pattern Dimensions

Regarding Landing Patterns, please refer to IPC-7351B (table 3-5, 3-6).

⚡ Custom Assemblies

Passive Plus offers Capacitor Assemblies for high power requirements. Typical assemblies are configured in series and/or parallel combinations, producing higher voltage/current handling capabilities, extended capacitance range and tighter tolerances.

To get started, simply send us either a mechanical drawing or circuit conditions and we can recommend a solution. All components are 100% up-screened for Partial Discharge and Sonoscanned. All assemblies include a 100hr Military burn in.



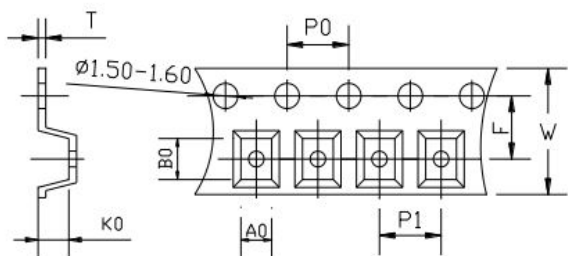


Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

2225C/P (0.220" x 0.250")

Tape & Reel Specifications (mm)

Orientation	Measurement Unit	W	P0	P1	T	F	Minimum Qty per Reel	Std Qty per Reel	Tape Material
H	in. mm	0.630 16.00	0.157 4.00	0.472 12.00	0.012 0.30	0.295 7.50	500	500	Plastic
V	in. mm	0.630 16.00	0.157 4.00	0.315 8.00	0.020 0.50	0.295 7.50	500	500	Plastic



A₀B₀K₀

- Determined by component size. Typical clearance between the cavity and the component is: .50 (.002) min to .65 (.026) max for 12mm tape.
- The component cannot rotate more than 20° within the determined cavity.



Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

3838C/P (0.380" x 0.380")

Product Features

- High Q
- High RF Current/Voltage
- Ultra Stable Performance
- Capacitance Range:
0.5pF to 5100pF
- Working Voltage: 3600V
- Extended Voltage: 7200V

Product Applications

Typical Functional Applications:

- Tuning • Bypass • Coupling
- D.C. Blocking • Impedance Matching

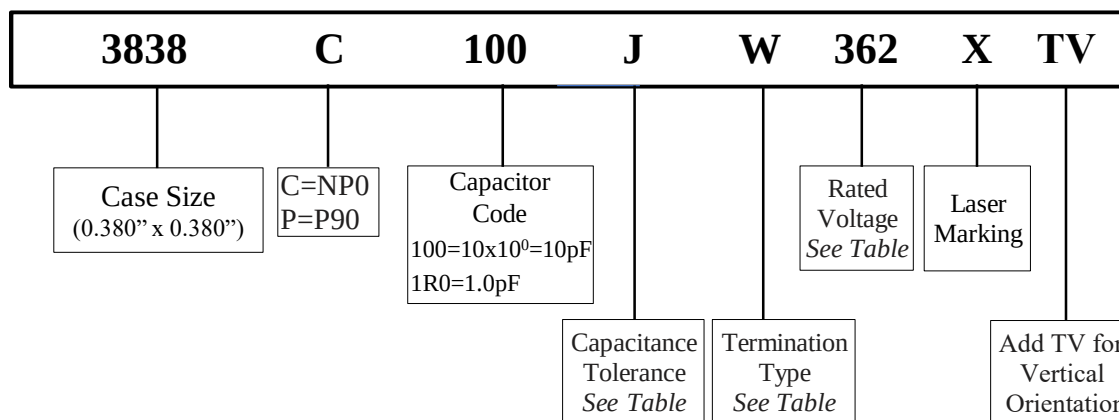
Typical Circuit Applications:

- HF/RF Power Amplifiers
- Antenna Tuning • Plasma Chambers
- Medical Equipment • Transmitters



Marking shown for illustration purposes only.
Actual marking may differ.

Part Numbering



Capacitance Tolerance Codes

Code	A	B	C	D	F	G	J	K
Tol.	±0.05pF	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%

Voltage Codes

Voltage	Code
500V	501
1000V	102
2500V	252
3600V	362
7200V	722

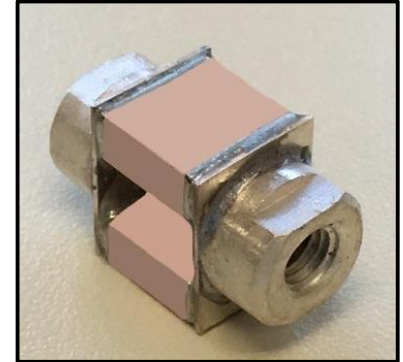


Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

3838C/P (0.380" x 0.380")

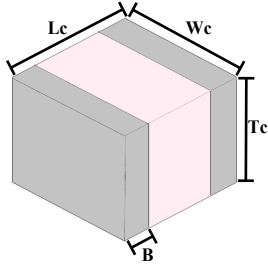
≠ 3838C/P Capacitance Values

Special capacitances, tolerances and WVDC are available. Please contact PPI.

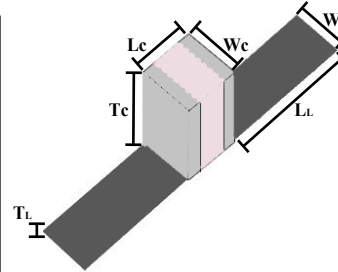


Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC
			Std.	Ext.				Std.	Ext.				Std.	Ext.				
0.5	0R5	B,C, D	3600V	7200V	4.7	4R7	B,C, D	3600V	7200V	51	510	F,G, J,K	3600V	7200V	560	561	F,G, J,K	2500V
0.6	0R6				5.1	5R1				56	560				620	621		
0.7	0R7				5.6	5R6				62	620				680	681		
0.8	0R8				6.2	6R2				68	680				750	751		
0.9	0R9				6.8	6R8				75	750				820	821		
1.0	1R0				7.5	7R5	F,G, J,K	3600V	7200V	82	820	910	911	F,G, J,K	1000V			
1.1	1R1				8.2	8R2				91	910	1000	102					
1.2	1R2				9.1	9R1				100	101	1100	112					
1.3	1R3				10	100				110	111	1200	122					
1.4	1R4				11	110				120	121	1500	152					
1.5	1R5				12	120				130	131	1800	182					
1.6	1R6				13	130				150	151	2200	222					
1.7	1R7				15	150				160	161	2400	242					
1.8	1R8				16	160				180	181	2700	272					
1.9	1R9				18	180				F,G, J,K	3600V	N/A	3000	302	F,G, J,K	500V		
2.0	2R0				20	200							220	221			3300	332
2.1	2R1				22	220							240	241			3600	362
2.2	2R2				24	240							270	271			3900	392
2.4	2R4				27	270							300	301			4300	432
2.7	2R7				30	300	330	331	4700				472					
3.0	3R0				33	330	360	361	5100				512					
3.3	3R3				36	360	390	391										
3.6	3R6				39	390	430	431										
3.9	3R9				43	430	470	471										
4.3	4R3				47	470	510	511										

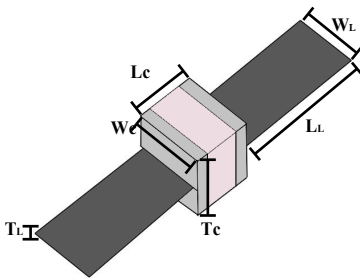
≠ Termination Types and Codes



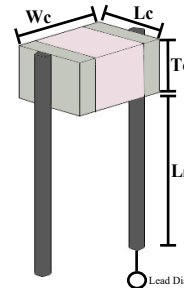
Chip Termination:
Codes: W, L, P



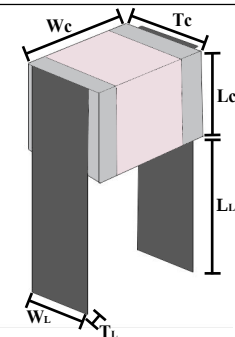
Microstrip Termination:
Codes: MS, MN



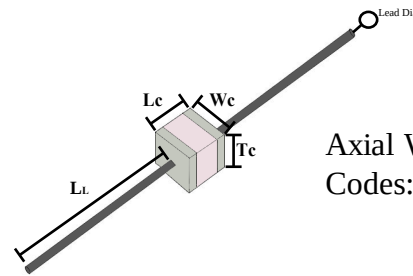
Axial Ribbon Termination:
Code: AR, AN



Radial Wire Termination:
Codes: RW, RN



Radial Ribbon Termination:
Code: RR, FN



Axial Wire Termination:
Codes: AW, BN

Termination Code

Magnetic Termination

W

100% Tin
Solder over Nickel Barrier

L

90%Tin/10%Lead
Solder over Nickel Barrier

MS

AR

RR

RW

AW

Silver-Plated Copper

Termination Code

Non-Magnetic

P

100% Tin
Solder over Copper Barrier

MN

AN

FN

RN

BN

Silver-Plated Copper

Note: "Non-Magnetic" means no magnetic materials.



Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

3838C/P (0.380" x 0.380")

≠ Dimensions - For Termination Types images, see previous page Unit: inch (millimeter)

Magnetic Termination									
		Capacitor Dimensions				Lead Dimensions			
Code		Length	Width	Thickness	Overlap	Length	Width	Thickness	
		Lc	Wc	Tc	B	LL	WL	TL	
W/L	Chip	0.380	$+0.015$ -0.010	0.380 ± 0.010	0.170 max	$0.024 \sim 0.059$	-	-	-
		(9.65	$+0.38$ -0.25)	(9.65 ± 0.25)	(4.32 max)	$(0.60 \sim 1.50)$			
MS	Microstrip					0.728 min (18.50 min)	0.350 ± 0.020 (8.89 $\pm$ 0.50)	0.008 ± 0.001 (0.20 $\pm$ 0.025)	
AR	Axial Ribbon					0.728 min (18.50 min)	0.315 ± 0.010 (8.00 $\pm$ 0.25)	0.008 ± 0.001 (0.20 $\pm$ 0.025)	
RR	Radial Ribbon	0.380	$+0.015$ -0.010	0.380 ± 0.010	0.177 max	-	0.354 min (9.00 min)	0.118 ± 0.005 (3.00 $\pm$ 0.13)	0.012 ± 0.001 (0.3 $\pm$ 0.025)
		(9.65	$+0.38$ -0.25)	(9.65 ± 0.25)	(4.50 max)				
RW	Radio Wire					0.709 min (18.00 min)	Dia. = 0.031 ± 0.004		
AW	Axial Wire					0.906 min (23.00 min)	Dia. = (0.80 ± 0.10)		

		Non-Magnetic Termination							
		Capacitor Dimensions				Lead Dimensions			
Code		Length	Width	Thickness	Overlap	Length	Width	Thickness	
		Lc	Wc	Tc	B	LL	WL	TL	
P	Chip	0.380	$+0.015$ -0.010	0.380 ± 0.010	0.170 max	0.024 ~ 0.059	-	-	-
		(9.65	$+0.38$ -0.25)	(9.65 ± 0.25)	(4.32 max)	(0.60 ~ 1.50)			
MN	Microstrip					0.728 min (18.50 min)	0.350 ± 0.020 (8.89 ± 0.50)	0.008 ± 0.001 (0.20 ± 0.025)	
AN	Axial Ribbon					0.728 min (18.50 min)	0.315 ± 0.010 (8.00 ± 0.25)	0.008 ± 0.001 (0.20 ± 0.025)	
FN	Radial Ribbon	0.380	$+0.015$ -0.010	0.380 ± 0.010	0.177 max	-	0.354 min (9.00 min)	0.118 ± 0.005 (3.00 ± 0.13)	0.012 ± 0.001 (0.3 ± 0.025)
		(9.65	$+0.38$ -0.25)	(9.65 ± 0.25)	(4.50 max)				
RN	Radio Wire					0.709 min (18.00 min)	Dia. = 0.031 ± 0.004		
BN	Axial Wire					0.906 min (23.00 min)	Dia. = (0.80 ± 0.10)		

Note: Non-Magnetic means no magnetic materials. All leads are attached with high temperature solder and parts are RoHS Compliant.



Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

3838C/P (0.380" x 0.380")

⚡ Electrical Specifications

Quality Factor (Q)	Greater than 10,000 at 1 MHz
Insulation Resistance (IR)	Test Voltage: 500V 10 ⁵ Megaohms min. @ +25°C 10 ⁴ Megaohms min. @ +125°C
Rated Voltage	See Rated Voltage in Capacitance Table
Dielectric Withstanding Voltage (DWV)	250% of Rated Voltage of 5 seconds, Rated Voltage ≤ 500VDC 150% of Voltage for 5 seconds, 500VDC < Rated Voltage ≤ 1250 VDC 120% of Voltage for 5 seconds, Rated Voltage > 1250 VDC
Operating Temperature Range	-55°C to 200°C
Temperature Coefficient (TC)	C: -55°C to 125°C 0±30ppm/°C; >125°C to 200°C 0±60ppm/°C P: -55°C to 200°C +90±20ppm/°C
Capacitance Drift	±0.02% or ±0.02pF, whichever is greater
Piezoelectric Effects	None
Termination Type	See Termination Type Table

⚡ Environmental Specifications

	Specification	Test Parameters
Thermal Shock	DWV: The initial value IR: Shall not be less than 30% of the initial value. Capacitance Change:	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature (-55°C and 200°C) stay 30 minutes, the time of removing shall not be more than 3 minutes. Perform five cycles.
Moisture Resistance	No more than 0.5% or 0.5pF, whichever is greater.	MIL-STD-202, Method 106
Humidity (Steady State)	DWV: The initial value IR: The initial value Capacitance Change: No more than 0.3% or 0.3pF, whichever is greater.	MIL-STD-202, Method 103, Condition A With 1.5Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours minimum.
Life	IR: Shall not be less than 30% of the initial value. Capacitance Change: No more than 2.0% or 0.5pF, whichever is greater.	MIL-STD-202, Method 108. For 2000 hours, at 200°C. 200% of Voltage for Capacitors, Rated Voltage ≤ 500VDC; 120% of Voltage for Capacitors, 500VDC < Rated Voltage ≤ 1250VDC; 100% for Voltage for Capacitors, Rated Voltage > 1250VDC
Terminal Strength	Force: 20lbs typical, 10lbs. min. Duration Time: 5 to 10 seconds	MIL-STD-202, Method 211A, Test Condition A. Applied a force and maintained for a period of 5 to 10 seconds. The force shall be in the direction of the axes of the terminations.

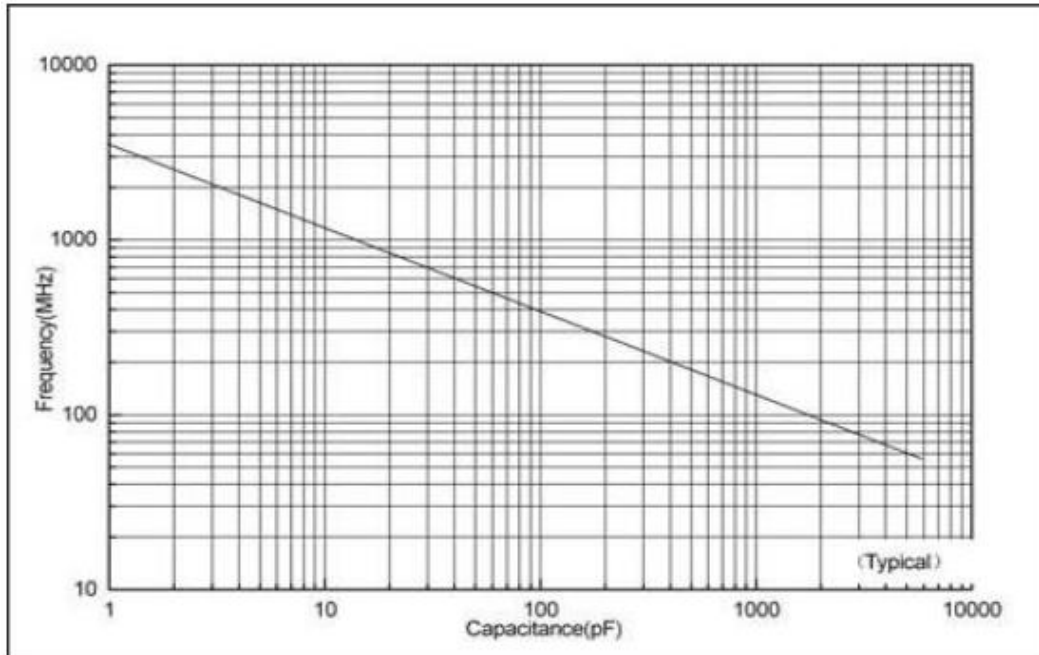
Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.



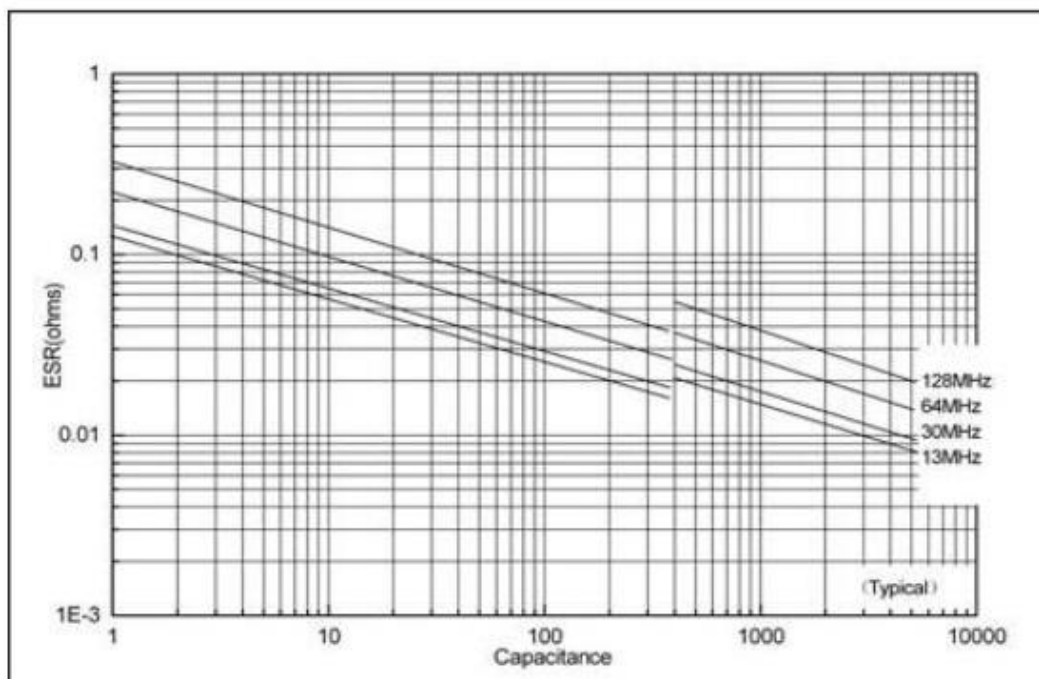
Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

3838C/P (0.380" x 0.380")

≠ Series Resonance vs. Capacitance



≠ ESR vs. Frequency

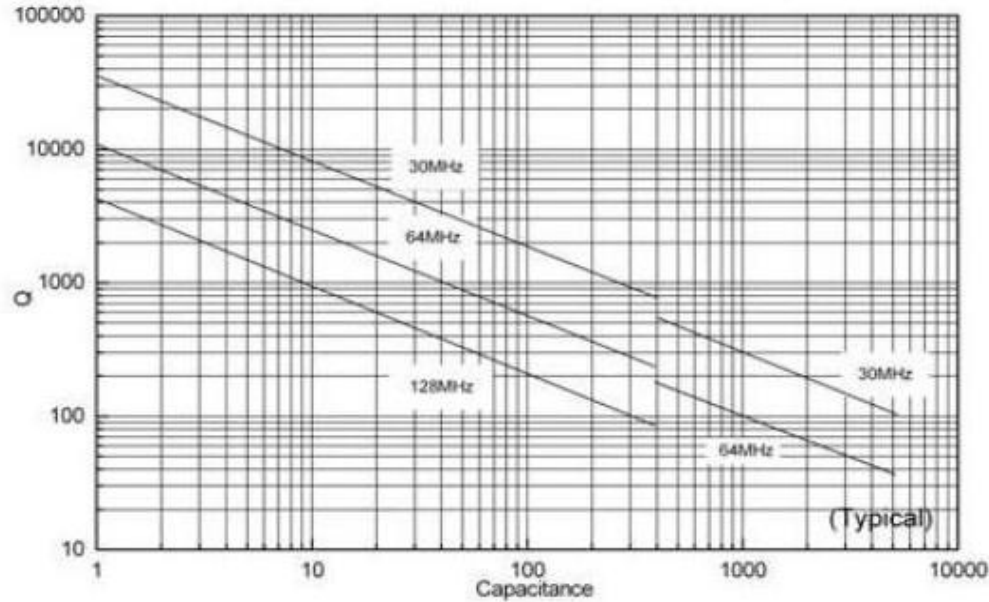




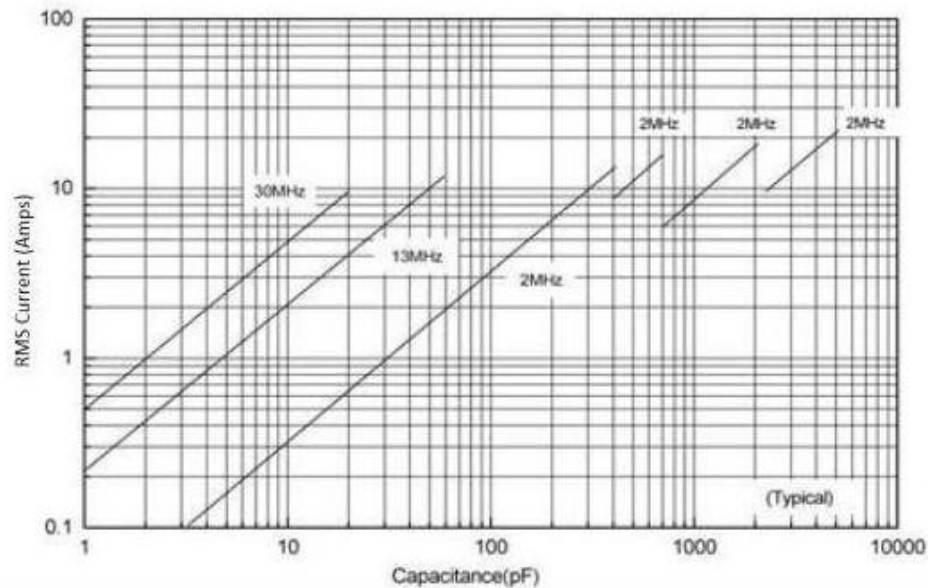
Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

3838C/P (0.380" x 0.380")

≠ Q vs. Capacitance



≠ Current Rating vs. Capacitance



Current limits can depend on two different criteria. The first Voltage Limited Current ($I_{\text{volt lim}}$, represented by the solid line), the second is Power Dissipation Limited Current ($I_{\text{pow diss}}$).

$$I_{\text{volt lim}} = \frac{\sqrt{2}}{2} I_{\text{peak}} = \frac{\sqrt{2}}{2} \times \frac{V_{\text{rated}}}{X_C} = \sqrt{2} \pi F C V_{\text{rated}}$$

$I_{\text{pow diss}} = \sqrt{\frac{P_{\text{dissipation}}}{\text{ESR}}}$ (If the thermal resistance of the mounting surface is 12°C/W, then you will reach the power dissipated limit of 5W)



Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

3838C/P (0.380" x 0.380")

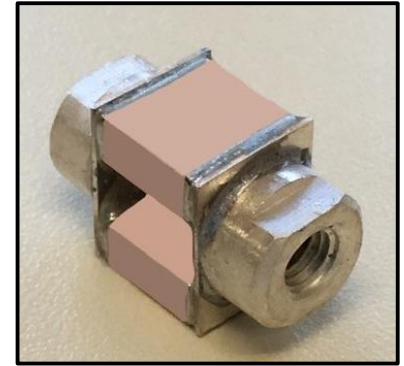
≠ Recommended Land Pattern Dimensions

Regarding Landing Patterns, please refer to IPC-7351B (table 3-5, 3-6).

≠ Custom Assemblies

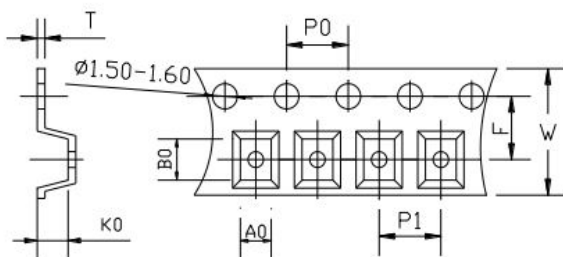
Passive Plus offers Capacitor Assemblies for high power requirements. Typical assemblies are configured in series and/or parallel combinations, producing higher voltage/current handling capabilities, extended capacitance range and tighter tolerances.

To get started, simply send us either a mechanical drawing or circuit conditions and we can recommend a solution. All components are 100% up-screened for Partial Discharge and Sonoscanned. All assemblies include a 100hr Military burn in.



≠ Tape & Reel Specifications (mm)

Orientation	Measurement Unit	W	P0	P1	T	F	Minimum Qty per Reel	Std Qty per Reel	Tape Material
H	in.	0.630	0.157	0.630	0.012	0.295	50	200	Plastic
	mm	16.00	4.00	16.00	0.30	7.50			



A₀B₀K₀

- Determined by component size. Typical clearance between the cavity and the component is: .50 (.002) min to .65 (.026) max for 12mm tape.
- The component cannot rotate more than 20° within the determined cavity.



UHF/RF High-Q Power Transmitter Multi-Layer Ceramic Capacitors

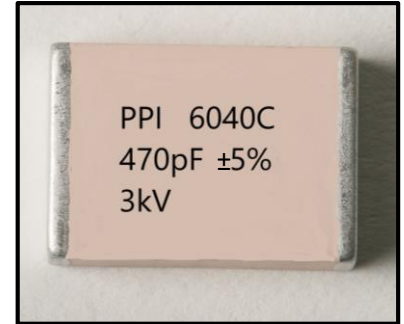
6040C (0.600" x 0.400")

Product Features

- High Q
- High RF Current/Voltage
- Ultra Stable Performance
- Capacitance Range:
1.0pF to 6800pF
- Working Voltage: 5000V
- Extended Voltage: 8000V

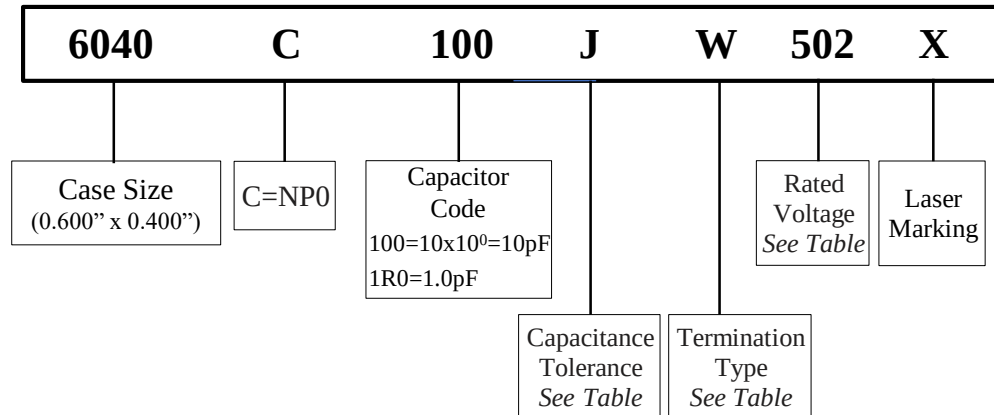
Typical Circuit Applications

- Semiconductor Manufacturing
- High Energy Power Transfers
- Plasma Chambers
- Medical Equipment



*Marking shown for illustration purposes only.
Actual marking may differ.*

Part Numbering



Capacitance Tolerance Codes

Code	B	C	D	F	G	J	K
Tol.	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%

Voltage Codes

Voltage	Code
1000V	102
2000V	202
3000V	302
5000V	502
8000V	802



UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

6040C (0.600" x 0.400")

⚡ 6040C Capacitance Values

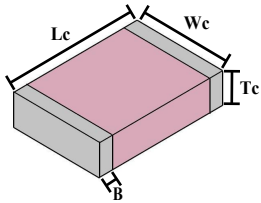
For special capacitances, tolerances and WVDC, please contact PPI.



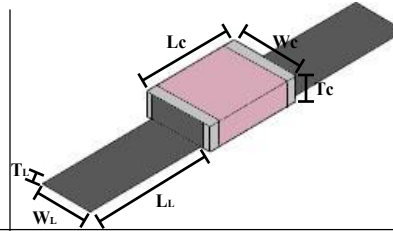
Marking shown for illustration purposes only.
Actual marking may differ.

Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC			
			Std.	Ext.				Std.	Ext.				Std.	Ext.		
1.0	1R0	B,C, D	5000V	8000V	39	390	F,G, J,K	5000V	8000V	1500	152	F,G, J,K	2000V	3000V		
1.2	1R2				47	470				1800	182					
1.5	1R5				56	560				2200	222					
1.8	1R8				68	680				2700	272	F,G, J,K	1000V	2000V		
2.2	2R2				82	820				3300	332					
2.7	2R7				100	101				4700	472					
3.3	3R3				120	121	5100	512								
3.9	3R9				150	151	5600	562								
4.7	4R7				180	181	6800	682								
5.6	5R6				F,G, J,K	5000V	8000V	220	221	F,G, J,K	3000V	5000V				
6.8	6R8							270	271							
8.2	8R2							330	331							
10	100	390	391													
12	120	470	471													
15	150	560	561													
18	180	680	681													
22	220	820	821	F,G, J,K				2000V	3000V							
27	270	1000	102													
33	330	1200	122													

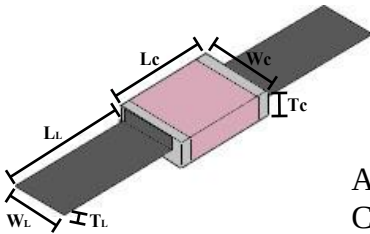
≠ Termination Types and Codes



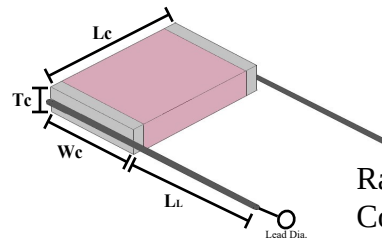
Chip Termination:
Codes: **W, L, P**



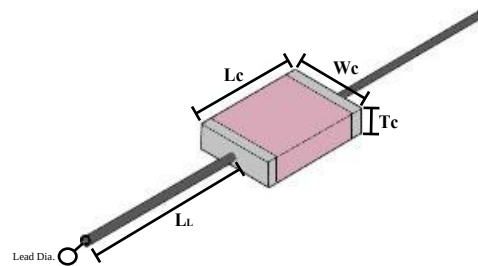
Microstrip Termination:
Codes: **MS, MN**



Axial Ribbon Termination:
Code: **AR, AN**



Radial Wire Termination:
Codes: **RW, RN**



Axial Wire Termination:
Codes: **AW, BN**

Termination Code	Magnetic Termination
W	100% Tin Solder over Nickel Barrier
L	90%Tin/10%Lead Solder over Nickel Barrier
MS	Silver-Plated Copper
AR	
RW	
AW	

Termination Code	Non-Magnetic
P	100% Tin Solder over Copper Barrier
MN	Silver-Plated Copper
AN	
RN	
BN	

Note: "Non-Magnetic" means no magnetic materials.



UHF/RF High-Q Power Transmitter Multi-Layer Ceramic Capacitors

6040C (0.600" x 0.400")

≠ Dimensions - For Termination Types images, see previous page Unit: inch (millimeter)

Magnetic Termination									
Code		Capacitor Dimensions				Lead Dimensions			
		Length		Width	Thickness	Overlap	Length	Width	Thickness
		Lc		Wc	Tc	B	LL	WL	TL
W/L	Chip	0.614	+0.015 -0.010	0.433 ± 0.010	0.154 ± 0.008	0.063 max	-	-	-
		(15.6	+0.38 -0.25)						
MS	Microstrip						0.787 min (20.0 min)	0.350 ± 0.010 (8.89 ± 0.50)	0.008 ± 0.001 (0.20 ± 0.025)
AR	Axial Ribbon	0.614	+0.015 -0.010	0.433 ± 0.010	0.154 ± 0.008	-	0.787 min (20.0 min)	0.350 ± 0.010 (8.89 ± 0.50)	0.008 ± 0.001 (0.20 ± 0.025)
RW	Radio Wire	(15.6	+0.38 -0.25)	(11.0 ± 0.25)	(3.90 ± 0.20)		0.787 min (20.0 min)	Dia. = 0.030 ± 0.004	
AW	Axial Wire						0.984 min (25.00 min)	Dia. = (0.80 ± 0.10)	

Non-Magnetic Termination									
Code		Capacitor Dimensions				Lead Dimensions			
		Length		Width	Thickness	Overlap	Length	Width	Thickness
		Lc		Wc	Tc	B	LL	WL	TL
P	Chip	0.614	$+0.015$ -0.010	0.433 ± 0.010	0.154 ± 0.008	0.063 max	-	-	-
		(15.6	$+0.38$ -0.25)	(11.0 ± 0.25)	(3.90 ± 0.20)	(1.60 max)			
MN	Microstrip						0.787 min (20.0 min)	0.350 ± 0.010 (8.89 $\pm$ 0.50)	0.008 ± 0.001 (0.20 $\pm$ 0.025)
AN	Axial Ribbon	0.614	$+0.015$ -0.010	0.433 ± 0.010	0.154 ± 0.008	-	0.787 min (20.0 min)	0.350 ± 0.010 (8.89 $\pm$ 0.50)	0.008 ± 0.001 (0.20 $\pm$ 0.025)
RN	Radio Wire	(15.6	$+0.38$ -0.25)	(11.0 ± 0.25)	(3.90 ± 0.20)		0.787 min (20.0 min)	Dia. = 0.030 ± 0.004	
BN	Axial Wire						0.984 min (25.00 min)	Dia. = (0.80 ± 0.10)	

Note: Non-Magnetic means no magnetic materials. All leads are attached with high temperature solder and parts are RoHS Compliant.



Electrical Specifications

Quality Factor (Q)	No less than 1000pF, Q value more than 2000, Test Frequency 1MHz; More than 1000pF, Q value more than 2000, Test Frequency 1MHz
Insulation Resistance (IR)	Test Voltage: 500V 10 ⁵ Megaohms min. @ +25°C 10 ⁴ Megaohms min. @ +125°C
Rated Voltage	See Rated Voltage in Capacitance Table
Dielectric Withstanding Voltage (DWV)	250% of Voltage of 5 seconds, Rated Voltage ≤ 500VDC 150% of Voltage for 5 seconds, 500VDC < Rated Voltage ≤ 1250 VDC 120% of Voltage for 5 seconds, Rated Voltage > 1250 VDC
Operating Temperature Range	-55°C to 175°C
Temperature Coefficient (TC)	-55°C to 125°C 0±30ppm/°C >125°C to 175°C 0±60ppm/°C
Capacitance Drift	±0.02% or ±0.02pF, whichever is greater
Piezoelectric Effects	None
Termination Type	See Termination Type Table

Environmental Specifications

	Specification	Test Parameters
Thermal Shock	DWV: The initial value IR: Shall not be less than 30% of the initial value. Capacitance Change:	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature (-55°C and 175°C) stay 30 minutes, the time of removing shall not be more than 3 minutes. Perform five cycles.
Moisture Resistance	No more than 0.5% or 0.5pF, whichever is greater.	MIL-STD-202, Method 106
Humidity (Steady State)	DWV: The initial value IR: The initial value Capacitance Change: No more than 0.3% or 0.3pF, whichever is greater.	MIL-STD-202, Method 103, Condition A With 1.5Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours minimum.
Life	IR: Shall not be less than 30% of the initial value. Capacitance Change: No more than 2.0% or 0.5pF, whichever is greater.	MIL-STD-202, Method 108. For 2000 hours, at 125°C. 200% of Voltage for Capacitors, Rated Voltage ≤ 500VDC; 120% of Voltage for Capacitors, 500VDC < Rated Voltage ≤ 1250VDC; 100% for Voltage for Capacitors, Rated Voltage > 1250VDC
Terminal Strength	Force: 25lbs typical, 20lbs. min. Duration Time: 5 to 10 seconds	MIL-STD-202, Method 211A, Test Condition A. Applied a force and maintained for a period of 5 to 10 seconds. The force shall be in the direction of the axes of the terminations.

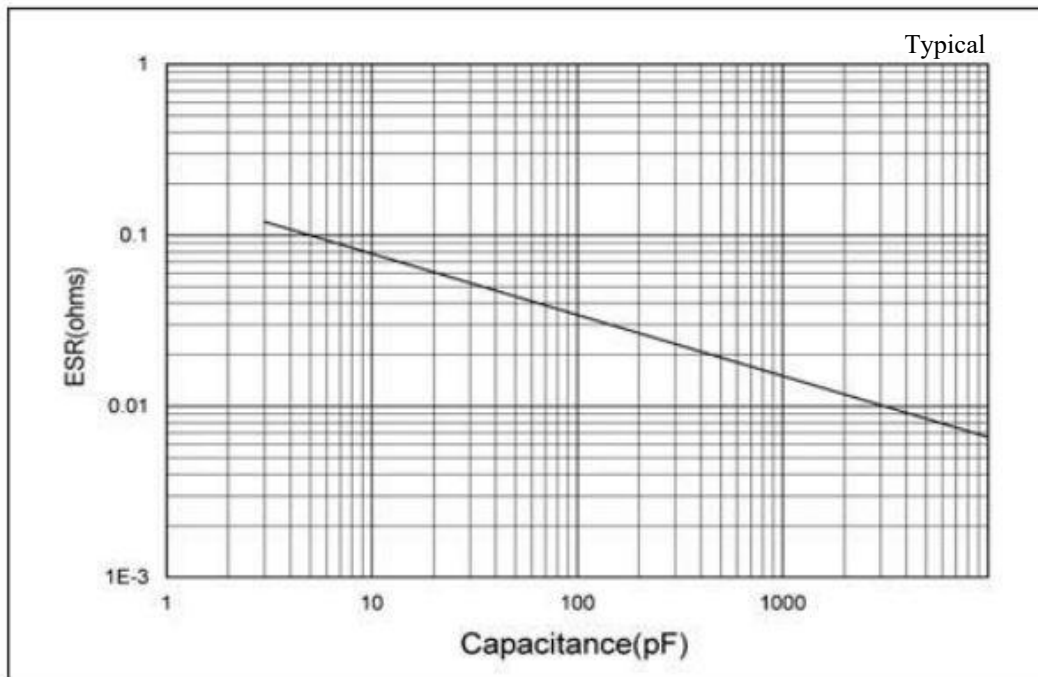
Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.



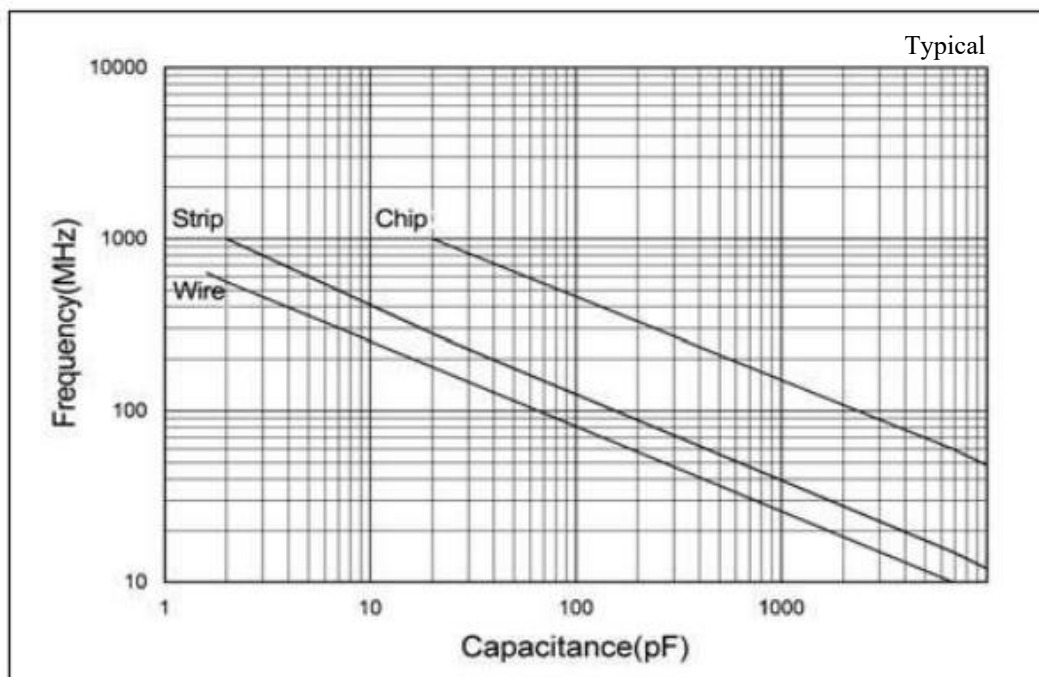
UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

6040C (0.600" x 0.400")

⚡ ESR vs. Capacitance Measured @ 30MHz



⚡ Self Resonant Frequency vs. Capacitance

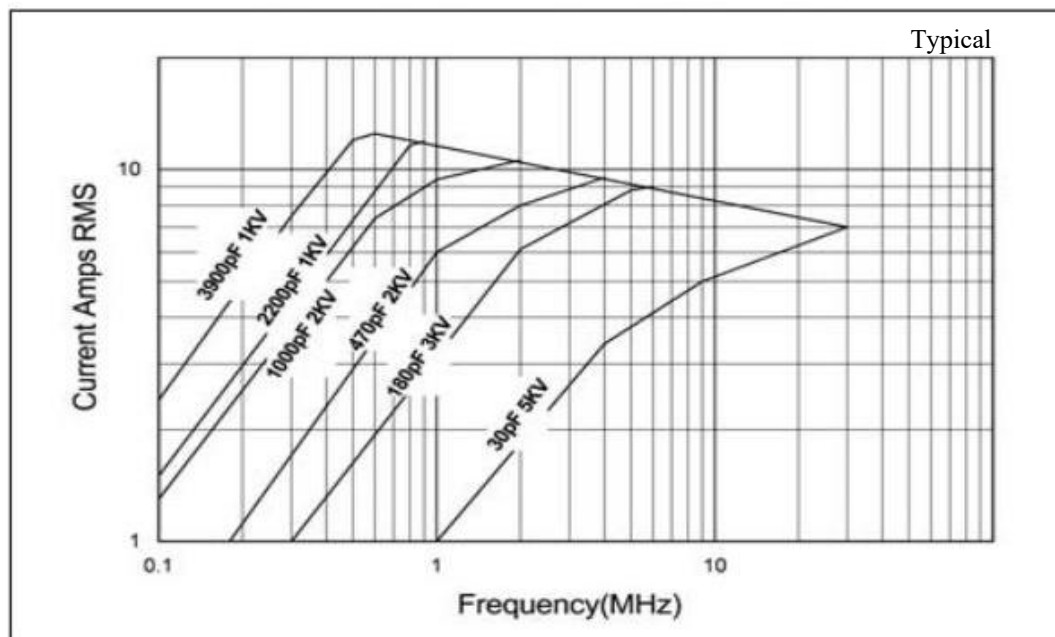




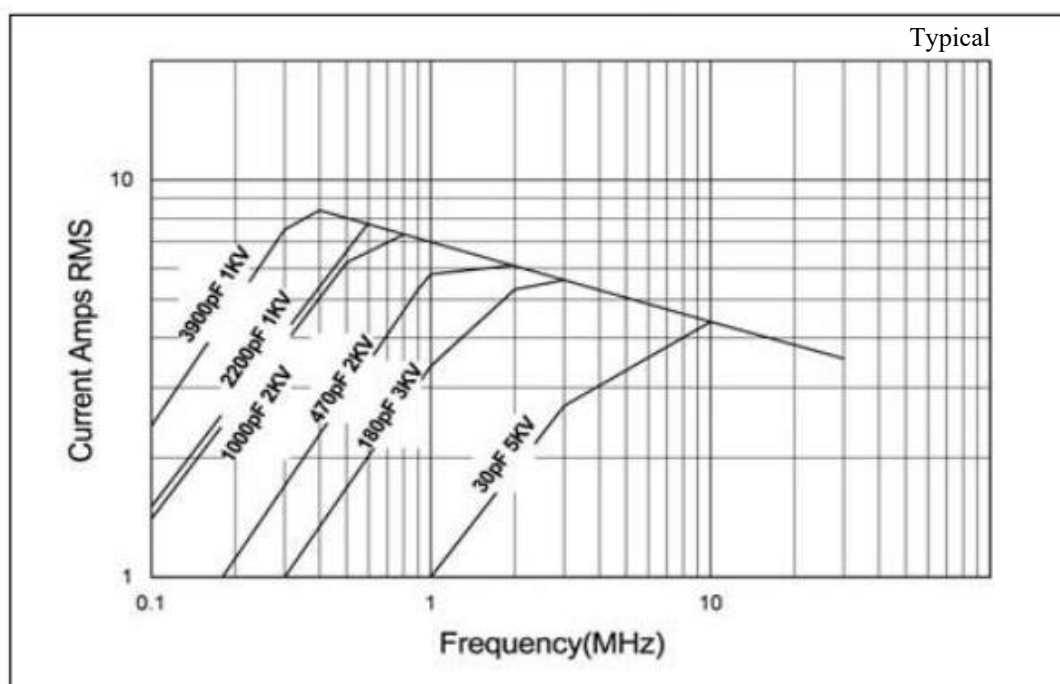
UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

6040C (0.600" x 0.400")

Strip Terminals Rated Current vs. Frequency



Wire Terminals Rated Current vs. Frequency

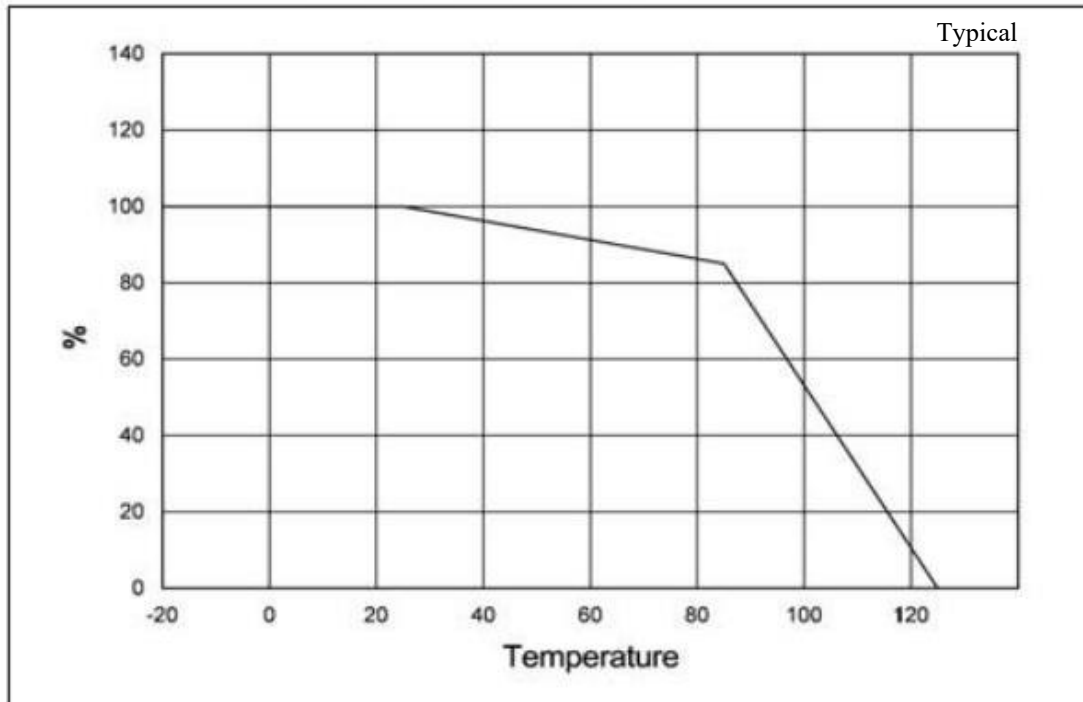




UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

6040C (0.600" x 0.400")

≠ % Maximum Current vs. Ambient Temperature



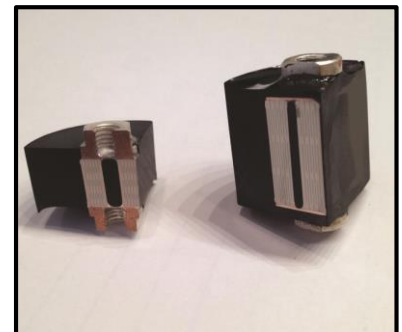
≠ Recommended Land Pattern Dimensions

Regarding Landing Patterns, please refer to IPC-7351B (table 3-5, 3-6).

≠ Custom Assemblies

Passive Plus offers Capacitor Assemblies for high power requirements. Typical assemblies are configured in series and/or parallel combinations, producing higher voltage/current handling capabilities, extended capacitance range and tighter tolerances.

To get started, simply send us either a mechanical drawing or circuit conditions and we can recommend a solution. All components are 100% up-screened for Partial Discharge and Sonoscanned. All assemblies include a 100hr Military burn in.





UHF/RF High-Q Power Transmitter Multi-Layer Ceramic Capacitors

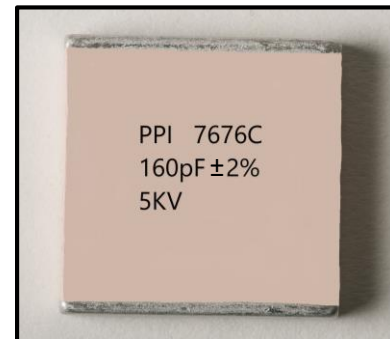
7676C (0.760" x 0.760")

Product Features

- High Q
- High RF Current/Voltage
- Ultra Stable Performance
- Capacitance Range:
1.0pF to 20000pF
- Working Voltage: 5000V
- Extended Voltage: 8000V

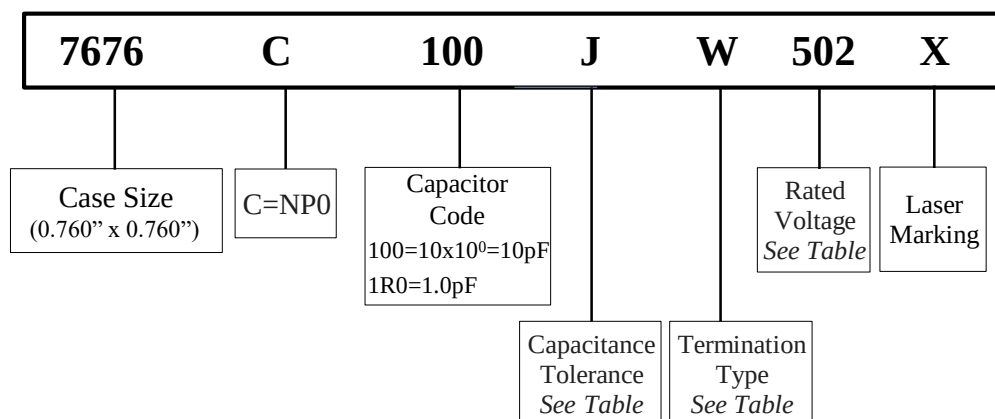
Typical Circuit Applications

- Semiconductor Manufacturing
- High Energy Power Transfers
- Plasma Chambers
- Medical Equipment



Marking shown for illustration purposes only.
Actual marking may differ.

Part Numbering



Capacitance Tolerance Codes

Code	B	C	D	F	G	J	K
Tol.	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%

Voltage Codes

Voltage	Code
1000V	102
2000V	202
3000V	302
5000V	502
8000V	802



UHF/RF High-Q Power Transmitter Multi-Layer Ceramic Capacitors

7676C (0.760" x 0.760")

± 7676C Capacitance Values

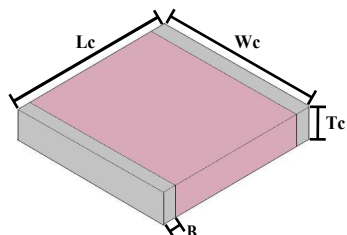
Special capacitances, tolerances and WVDC are available. Please contact PPI.



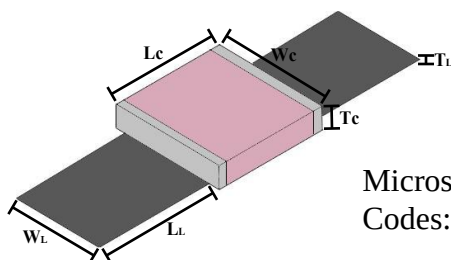
Marking shown for illustration purposes only.
Actual marking may differ.

Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC	
			Std.	Ext.				Std.	Ext.				Std.	Ext.
1.0	1R0	B,C, D	5000V	8000V	33	330	F,G, J,K	5000V	8000V	1000	102	G,J, K	3000V	5000V
1.2	1R2				39	390				1200	122			
1.5	1R5				47	470				1500	152			
1.8	1R8				56	560				1800	182			
2.2	2R2				68	680				2200	222			
2.7	2R7				82	820				2700	272			
3.3	3R3				100	101				3300	332			
3.9	3R9				120	121				4700	472			
4.7	4R7				150	151				5100	512			
5.6	5R6				180	181				5600	562			
6.8	6R8	220	221	6800	682									
8.2	8R2	270	271	7500	752									
10	100	F,G, J,K	5000V	8000V	300	301	F,G, J,K	3000V	5000V	8200	822	G,J, K	1000V	2000V
12	120				390	391				10000	103			
15	150				470	471				12000	123			
18	180				560	561				15000	153			
22	220				680	681				18000	183			
27	270				820	821				20000	203			

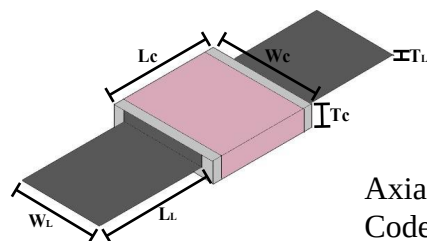
≠ Termination Types and Codes



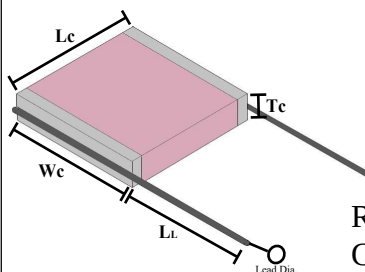
Chip Termination:
Codes: **W, L, P**



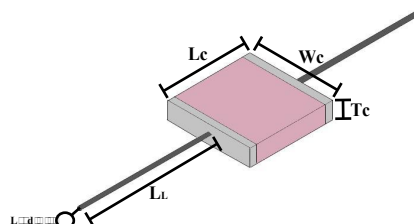
Microstrip Termination:
Codes: **MS, MN**



Axial Ribbon Termination:
Code: **AR, AN**



Radial Wire Termination:
Codes: **RW, RN**



Axial Wire Termination:
Codes: **AW, BN**

Termination Code	Magnetic Termination
W	100% Tin Solder over Nickel Barrier
L	90%Tin/10%Lead Solder over Nickel Barrier
MS	
AR	
RW	Silver-Plated Copper
AW	

Termination Code	Non-Magnetic
P	100% Tin Solder over Copper Barrier
MN	
AN	
RN	Silver-Plated Copper
BN	

Note: "Non-Magnetic" means no magnetic materials.



≠ Dimensions - For Termination Types images, see previous page Unit: inch (millimeter)

Magnetic Termination									
Code		Capacitor Dimensions					Lead Dimensions		
		Length		Width	Thickness	Overlap	Length	Width	Thickness
		Lc		Wc	Tc	B	LL	WL	TL
W/L	Chip	0.760	+0.015	0.760 ± 0.010	0.197 max	0.024 ~ 0.059	-	-	-
		-0.010							
		(19.3	+0.38	(19.3 ± 0.25)	(5.00 max)	(0.60 ~ 1.50)			
			-0.25)						
MS	Microstrip						0.748 min (19.0 min)	0.591 ± 0.010 (15.00 ± 0.25)	0.008 ± 0.001 (0.20 ± 0.025)
AR	Axial Ribbon	0.760	+0.015	0.760 ± 0.010	0.197 max	-	0.748 min (19.0 min)	0.591 ± 0.010 (15.00 ± 0.25)	0.008 ± 0.001 (0.20 ± 0.025)
			-0.010						
		(19.3	+0.38	(19.3 ± 0.25)	(5.00 max)				
			-0.25)						
RW	Radio Wire						0.748 min (19.0 min)	Dia. = 0.031 ± 0.006 Dia. = (0.80 ± 0.15)	
AW	Axial Wire						0.906 min (23.00 min)		

Non-Magnetic Termination									
Code		Capacitor Dimensions					Lead Dimensions		
		Length		Width	Thickness	Overlap	Length	Width	Thickness
		Lc		Wc	Tc	B	LL	WL	TL
P	Chip	0.760	+0.015	0.760 ± 0.010	0.197 max	0.024 ~ 0.059	-	-	-
		-0.010							
		(19.3	+0.38	(19.3 ± 0.25)	(5.00 max)	(0.60 ~ 1.50)			
			-0.25)						
MN	Microstrip						0.748 min (19.0 min)	0.591 ± 0.010 (15.00 ± 0.25)	0.008 ± 0.001 (0.20 ± 0.025)
AN	Axial Ribbon	0.760	+0.015	0.760 ± 0.010	0.197 max	-	0.748 min (19.0 min)	0.591 ± 0.010 (15.00 ± 0.25)	0.008 ± 0.001 (0.20 ± 0.025)
			-0.010						
		(19.3	+0.38	(19.3 ± 0.25)	(5.00 max)				
			-0.25)						
RN	Radio Wire						0.748 min (19.0 min)	Dia. = 0.031 ± 0.006 Dia. = (0.80 ± 0.15)	
BN	Axial Wire						0.906 min (23.00 min)		

Note: Non-Magnetic means no magnetic materials. All leads are attached with high temperature solder and parts are RoHS Compliant.



✚ Electrical Specifications

Quality Factor (Q)	No less than 1000pF, Q value more than 2000, Test Frequency 1MHz; More than 1000pF, Q value more than 2000, Test Frequency 1kHz
Insulation Resistance (IR)	Test Voltage: 500V 10 ⁵ Megaohms min. @ +25°C 10 ⁴ Megaohms min. @ +125°C
Rated Voltage	See Rated Voltage in Capacitance Table
Dielectric Withstanding Voltage (DWV)	250% of Voltage of 5 seconds, Rated Voltage ≤ 500VDC 150% of Voltage for 5 seconds, 500VDC < Rated Voltage ≤ 1250 VDC 120% of Voltage for 5 seconds, Rated Voltage > 1250 VDC
Operating Temperature Range	-55°C to 175°C
Temperature Coefficient (TC)	-55°C to 125°C 0±30ppm/°C >125°C to 175°C 0±60ppm/°C
Capacitance Drift	±0.2% or ±0.05pF, whichever is greater
Piezoelectric Effects	None
Termination Type	See Termination Type Table

✚ Environmental Specifications

	Specification	Test Parameters
Thermal Shock	DWV: The initial value IR: Shall not be less than 30% of the initial value. Capacitance Change:	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature (-55°C and 175°C) stay 30 minutes, the time of removing shall not be more than 3 minutes. Perform five cycles.
Moisture Resistance	No more than 0.5% or 0.5pF, whichever is greater.	MIL-STD-202, Method 106
Humidity (Steady State)	DWV: The initial value IR: The initial value Capacitance Change: No more than 0.3% or 0.3pF, whichever is greater.	MIL-STD-202, Method 103, Condition A With 1.5Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours minimum.
Life	IR: Shall not be less than 30% of the initial value. Capacitance Change: No more than 2.0% or 0.5pF, whichever is greater.	MIL-STD-202, Method 108. For 2000 hours, at 125°C. 200% of Voltage for Capacitors, Rated Voltage ≤ 500VDC; 120% of Voltage for Capacitors, 500VDC < Rated Voltage ≤ 1250VDC; 100% for Voltage for Capacitors, Rated Voltage > 1250VDC
Terminal Strength	Force: 30lbs. min. Duration Time: 5 to 10 seconds	MIL-STD-202, Method 211A, Test Condition A. Applied a force and maintained for a period of 5 to 10 seconds. The force shall be in the direction of the axes of the terminations.

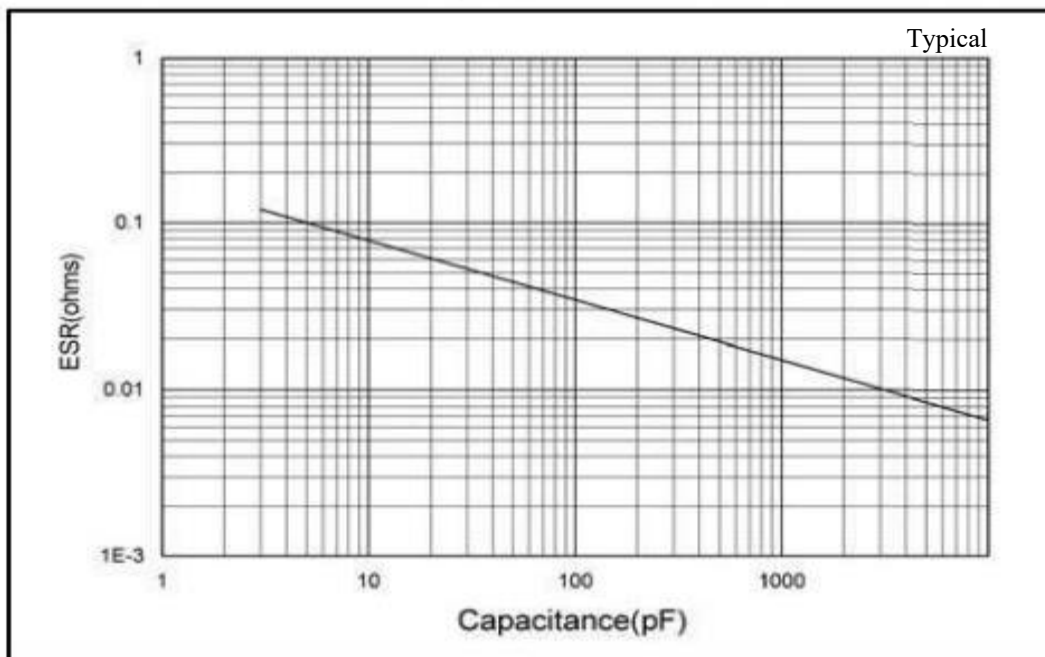
Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.



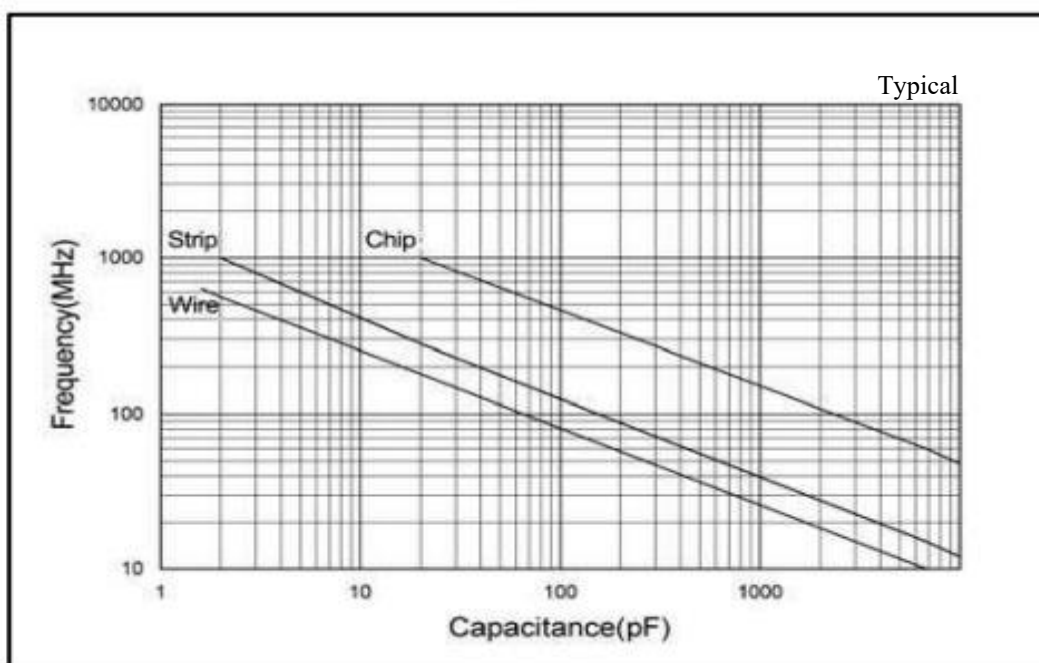
UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

7676C (0.760" x 0.760")

⚡ ESR vs. Capacitance Measured @ 30MHz



⚡ Self Resonant Frequency vs. Capacitance

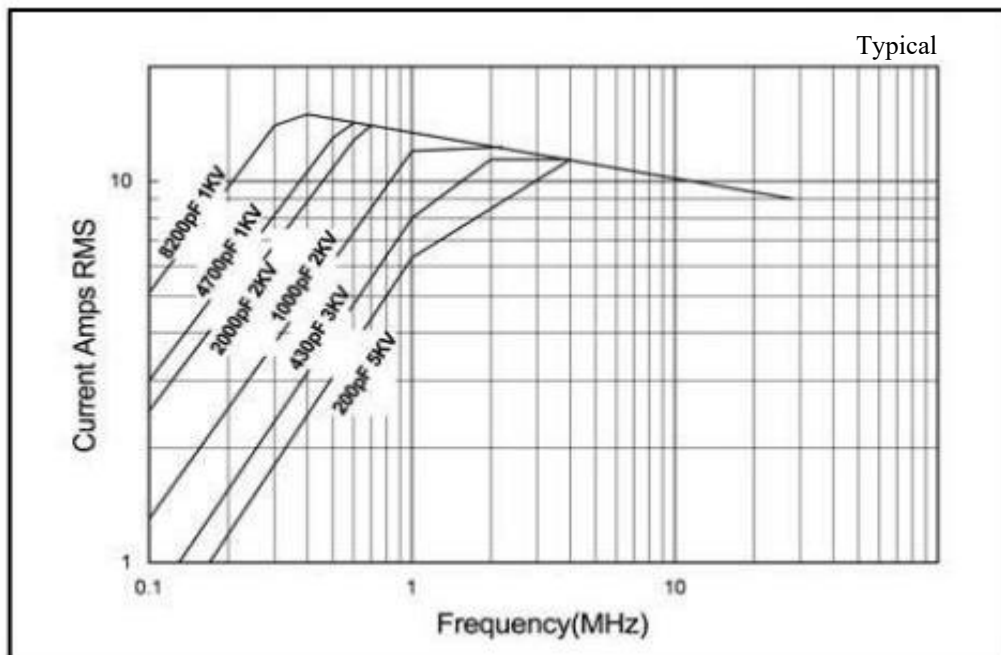




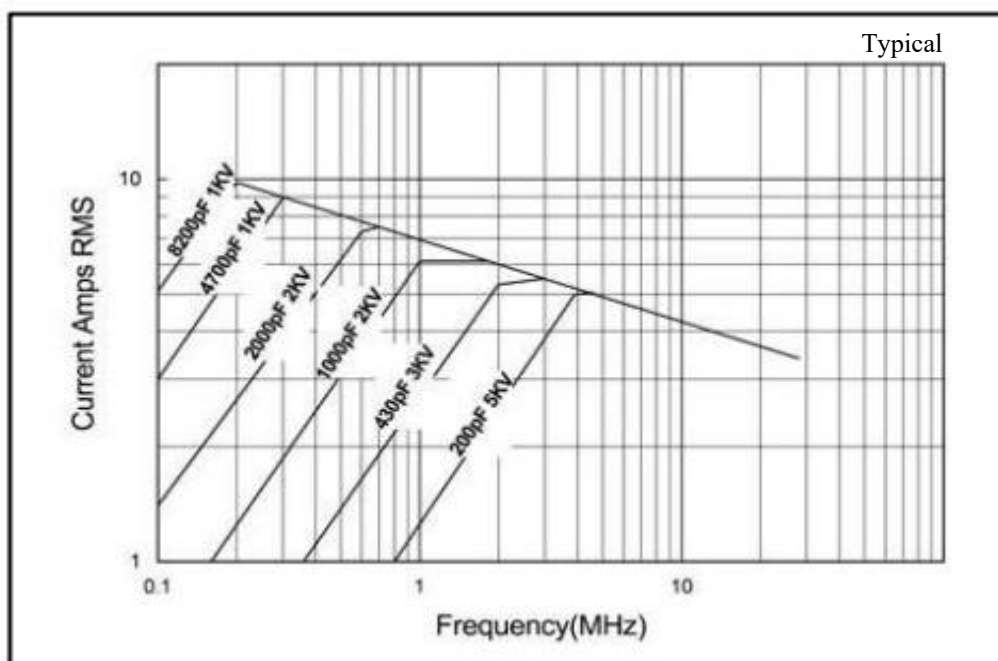
UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

7676C (0.760" x 0.760")

⚡ Strip Terminals Rated Current vs. Frequency



⚡ Wire Terminals Rated Current vs. Frequency

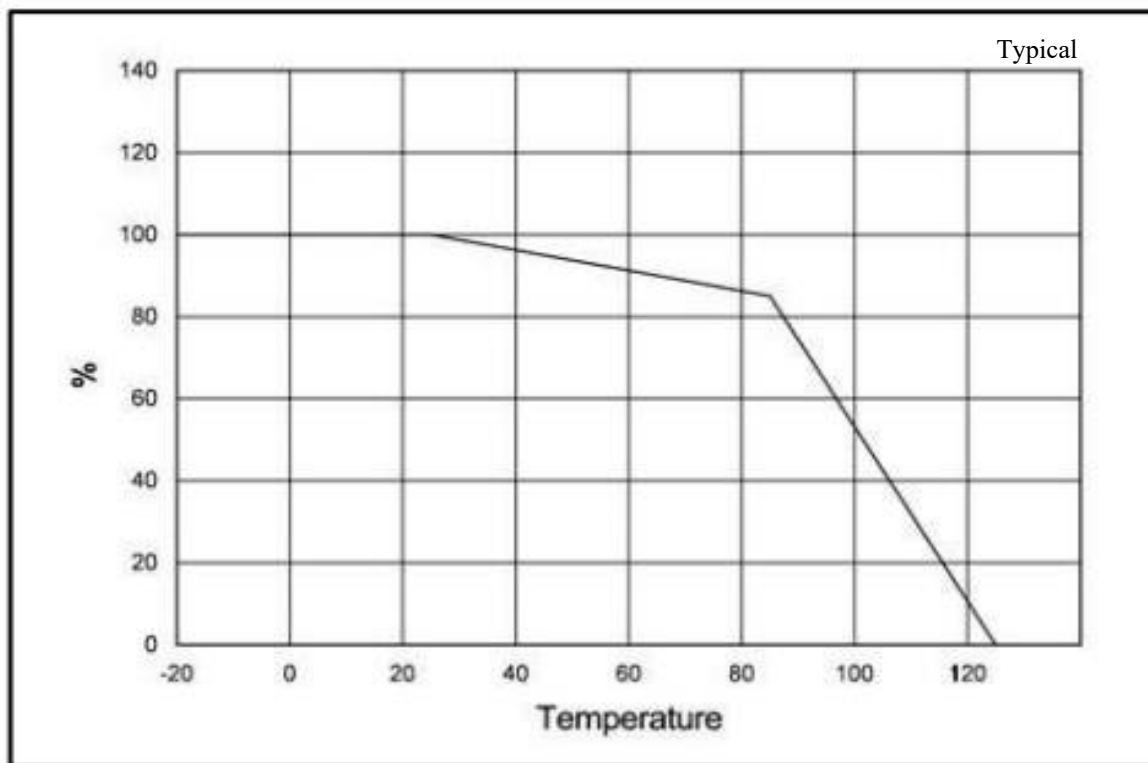




UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

7676C (0.760" x 0.760")

≠ % Maximum Current vs. Ambient Temperature



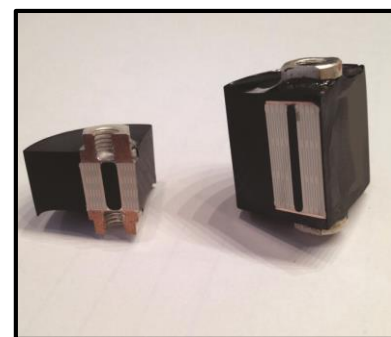
≠ Recommended Land Pattern Dimensions

Regarding Landing Patterns, please refer to IPC-7351B (Table 3-5, 3-6).

≠ Custom Assemblies

Passive Plus offers Capacitor Assemblies for high power requirements. Typical assemblies are configured in series and/or parallel combinations, producing higher voltage/current handling capabilities, extended capacitance range and tighter tolerances.

To get started, simply send us either a mechanical drawing or circuit conditions and we can recommend a solution. All components are 100% up-screened for Partial Discharge and Sonoscanned. All assemblies include a 100hr Military burn in.





≠ Product Features

- High Q
- High RF Current/Voltage
- Ultra Stable Performance
- Capacitance Range:
200pF to 120000pF
- Working Voltage: 10000V

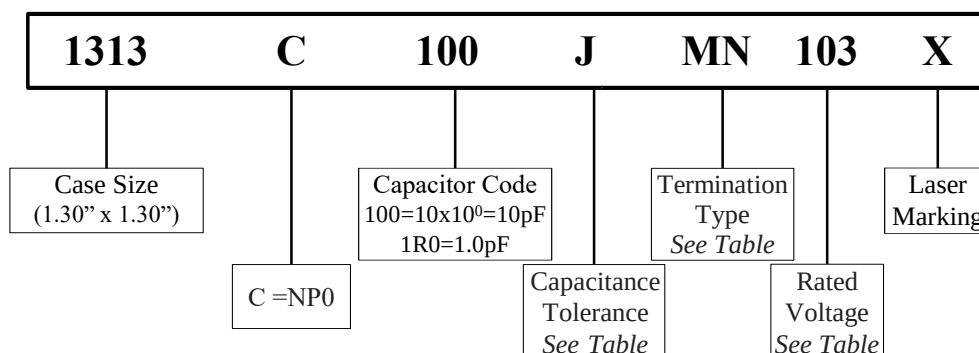
≠ Typical Circuit Applications

- Semiconductor Manufacturing
- High Energy Power Transfers
- Plasma Chambers
- Medical Equipment



*Marking shown for illustration purposes only.
Actual marking may differ.*

≠ Part Numbering



≠ Capacitance Tolerance Codes

Code	G	J	K
Tol.	±2%	±5%	±10%

≠ Voltage Codes

Voltage	Code
1000V	102
3000V	302
5000V	502
10000V	103



UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

1313C (1.30" x 1.30")

± 1313C Capacitance Values

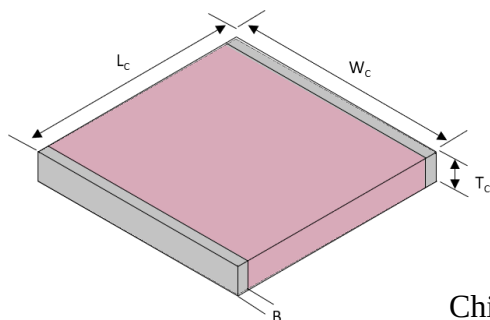
For special capacitances, tolerances and WVDC, please contact PPI.



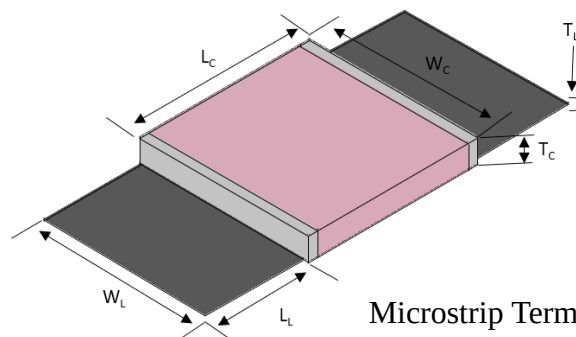
Marking shown for illustration purposes only.
Actual marking may differ.

Cap. pF	Cap Code	Tol.	<u>Rated</u> WVDC	Cap. pF	Cap Code	Tol.	<u>Rated</u> WVDC	Cap. pF	Cap Code	Tol.	<u>Rated</u> WVDC		
200	201	G,J, K	10kV	1800	182	G,J, K	10kV	12000	123	J,K	3000V		
220	221			2200	222			15000	153				
270	271			2700	272			22000	223				
300	301			3300	332	G,J, K	5000V	33000	333	J,K	1000V		
330	331			4700	472			47000	473				
390	391			5100	512			56000	563				
470	471			5600	562			68000	683				
560	561			6800	682	J,K	1000V	82000	823				
680	681			7500	752			100000	104				
820	821			10000	103			120000	124				
1000	102												
1200	122												
1500	152												

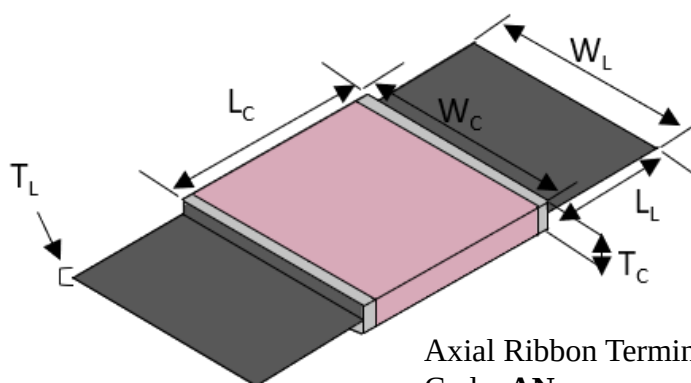
≠ Termination Types and Codes



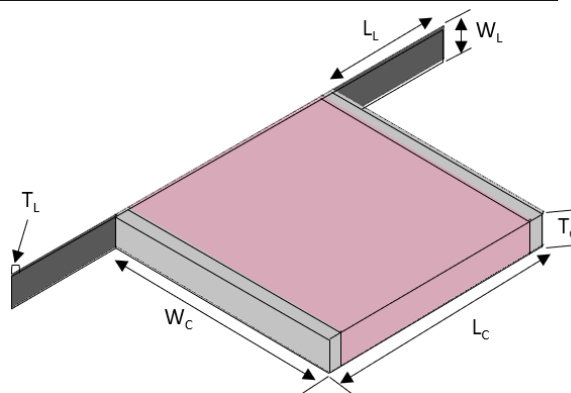
Chip Termination:
Codes: **L, P**



Microstrip Termination:
Codes: **MN**



Axial Ribbon Termination:
Code: **AN**



Radial Wire Termination:
Codes: **FN**

Termination Code	Magnetic Termination
L	90% Sn10%Pb Tin/Lead Solder over Nickel Plating

Termination Code	Non-Magnetic Terminations
P 	100%Sn Solder over Copper Plating
MN 	
AN 	Silver-Plated Copper
FN 	

Note: "Non-Magnetic" means no magnetic materials.



Dimensions - For Termination Types images, see previous page Unit: inch (millimeter)

Magnetic Termination							
Code		Capacitor Dimensions			Overlap	Lead Dimensions	
		Length	Width	Thickness		Length	Width
		Lc	Wc	Tc	B	LL	WL
L	Chip	1.350 ± 0.050	1.350 ± 0.050	0.197 max	0.039 ~ 0.071	-	-
		(34.29 ± 1.27)	(34.29 ± 1.27)	(5.00 max)	(1.00 ~ 1.80)		

Non-Magnetic Termination							
Code		Capacitor Dimensions			Overlap	Lead Dimensions	
		Length	Width	Thickness		Length	Width
		Lc	Wc	Tc	B	LL	WL
P	Chip	1.350 ± 0.050	1.350 ± 0.050	0.197 max	0.039 ~ 0.071	-	-
		(34.29 ± 1.27)	(34.29 ± 1.27)	(5.00 max)	(1.00 ~ 1.80)		
MN	Microstrip	1.350 ± 0.050	1.350 ± 0.050	0.197 max	-	0.748 min (19.0 min)	1.299 ± 0.020 (33.00 ± 0.50)
		(34.29 ± 1.27)	(34.29 ± 1.27)	(5.00 max)			
AN	Axial Ribbon	1.350 ± 0.050	1.350 ± 0.050	0.197 max	-	0.748 min (19.0 min)	1.299 ± 0.020 (33.00 ± 0.50)
		(34.29 ± 1.27)	(34.29 ± 1.27)	(5.00 max)			
FN	Radial Ribbon	1.350 ± 0.050	1.350 ± 0.050	0.197 max	-	0.699 min (17.0 min)	0.157 ± 0.010 (4.00 ± 0.25)
		(34.29 ± 1.27)	(34.29 ± 1.27)	(5.00 max)			

Note: Non-Magnetic means no magnetic materials. All leads are attached with high temperature solder and parts are RoHS Compliant.



⚡ Electrical Specifications

Quality Factor (Q)	No less than 1000pF, Q value more than 2000, Test Frequency 1MHz; More than 1000pF, Q value more than 2000, Test Frequency 1kHz
Insulation Resistance (IR)	Test Voltage: 500V 10 ⁵ Megaohms min. @ +25°C rated WVDC 10 ⁴ Megaohms min. @ +125°C rated WVDC
Rated Voltage	See Rated Voltage Table
Dielectric Withstanding Voltage (WVDC)	250% of Voltage of 5 seconds, Rated Voltage ≤ 500VDC 150% of Voltage for 5 seconds, 500VDC < Rated Voltage ≤ 1250 VDC 120% of Voltage for 5 seconds, Rated Voltage > 1250 VDC
Operating Temperature Range	-55°C to 175°C
Temperature Coefficient (TC)	-55°C to 125°C 0±30ppm/°C >125°C to 175°C 0±60ppm/°C
Capacitance Drift	±0.02% or ±0.02pF, whichever is greater
Piezoelectric Effects	None
Termination Type	See Termination Type Table

Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

⚡ Environmental Specifications

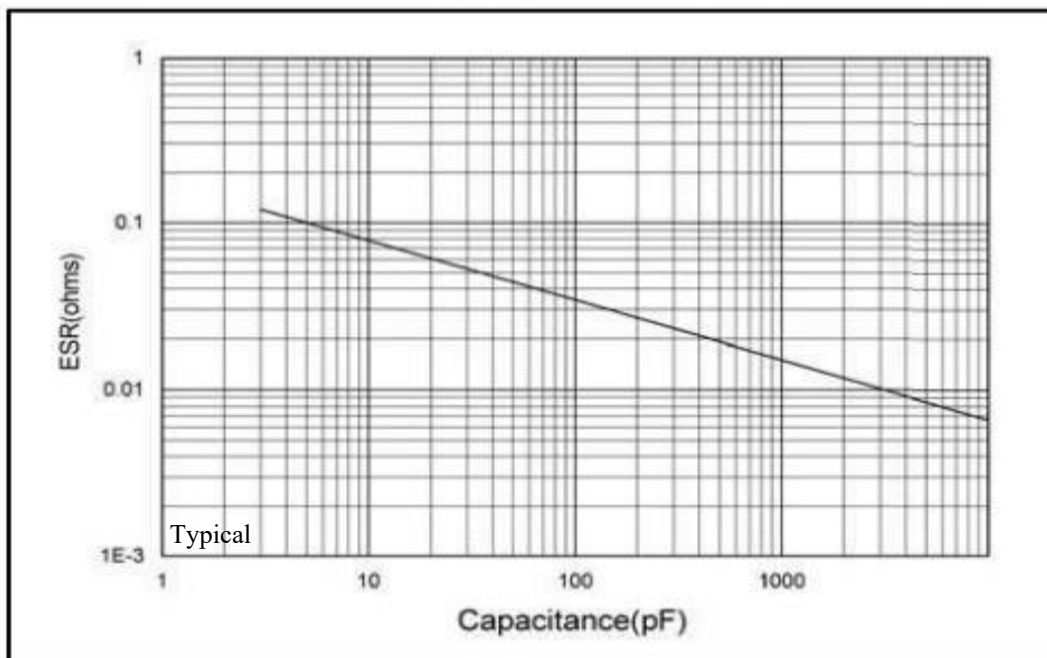
	Specification	Test Parameters
Thermal Shock	DWV: The initial value IR: Shall not be less than 30% of the initial value. Capacitance Change:	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature (-55°C and 175°C) stay 30 minutes, the time of removing shall not be more than 3 minutes. Perform five cycles.
Moisture Resistance	No more than 0.5% or 0.5pF, whichever is greater.	MIL-STD-202, Method 106
Humidity (Steady State)	DWV: The initial value IR: The initial value Capacitance Change: No more than 0.3% or 0.3pF, whichever is greater.	MIL-STD-202, Method 103, Condition A With 1.5Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours minimum.
Life	IR: Shall not be less than 30% of the initial value. Capacitance Change: No more than 2.0% or 0.5pF, whichever is greater.	MIL-STD-202, Method 108. For 2000 hours, at 125°C. 200% of Voltage for Capacitors, Rated Voltage ≤ 500VDC; 120% of Voltage for Capacitors, 500VDC < Rated Voltage ≤ 1250VDC; 100% for Voltage for Capacitors, Rated Voltage > 1250VDC
Terminal Strength	Force: 30lbs. min. Duration Time: 5 to 10 seconds	MIL-STD-202, Method 211A, Test Condition A. Applied a force and maintained for a period of 5 to 10 seconds. The force shall be in the direction of the axes of the terminations.



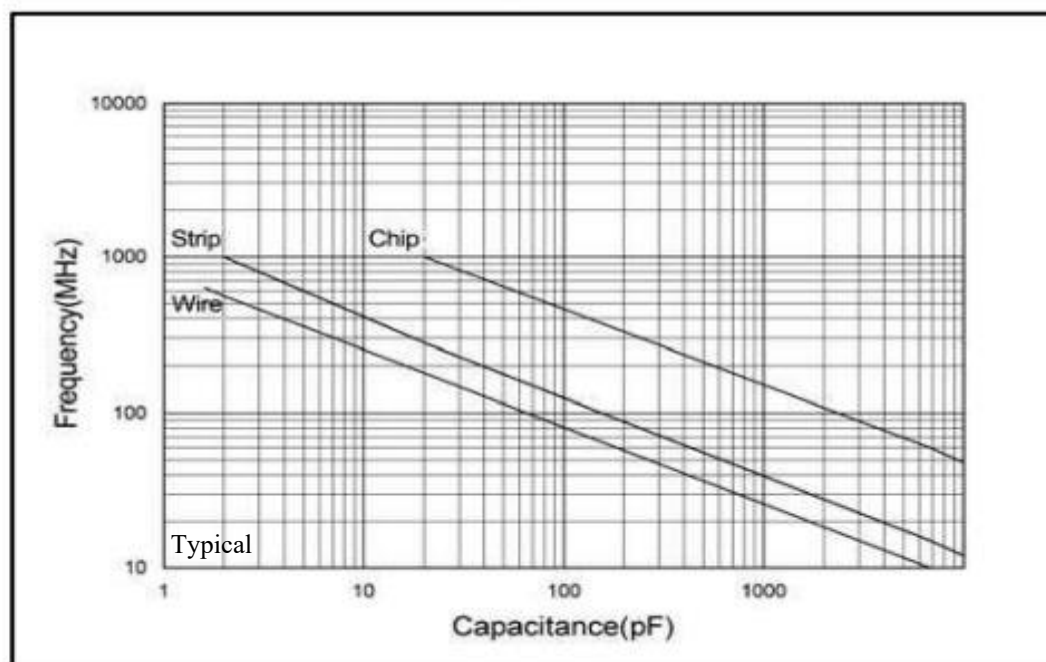
UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

1313C (1.30" x 1.30")

⚡ ESR vs. Capacitance Measured @ 30MHz



⚡ Self Resonant Frequency vs. Capacitance

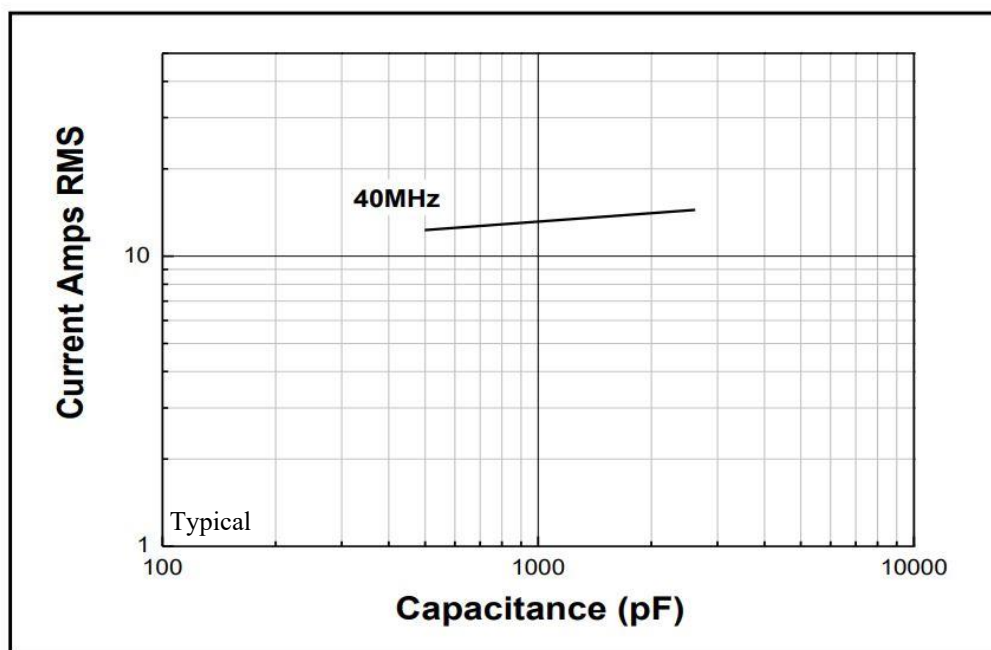




UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

1313C (1.30" x 1.30")

⚡ Rated Current vs. Frequency



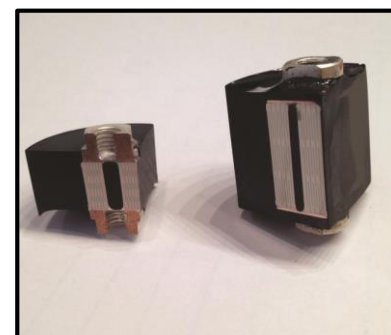
⚡ Recommended Land Pattern Dimensions

Regarding Landing Patterns, please refer to IPC-7351B (table 3-5, 3-6).

⚡ Custom Assemblies

Passive Plus offers Capacitor Assemblies for high power requirements. Typical assemblies are configured in series and/or parallel combinations, producing higher voltage/current handling capabilities, extended capacitance range and tighter tolerances.

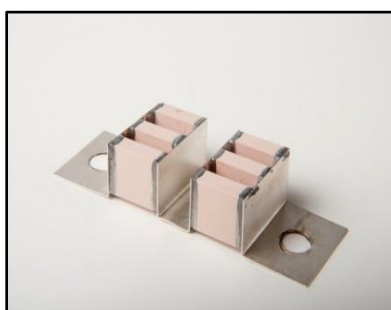
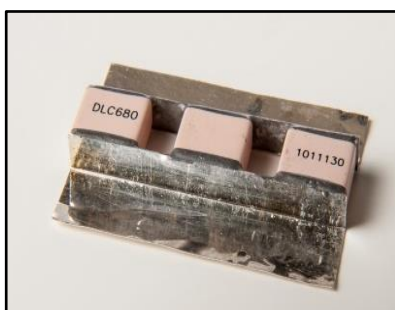
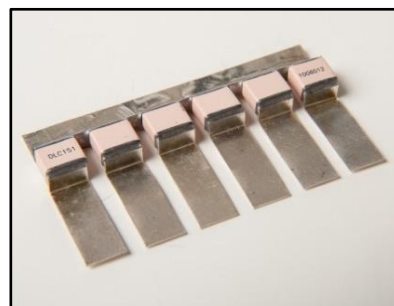
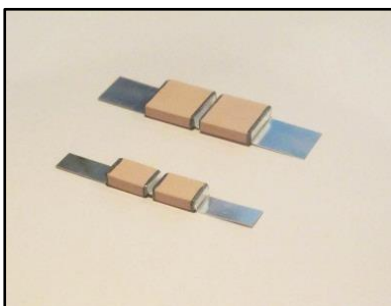
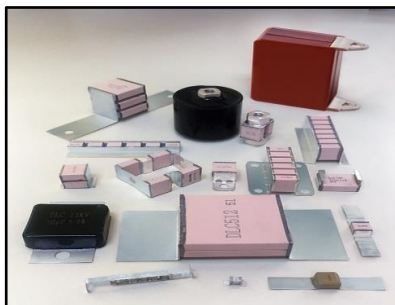
To get started, simply send us either a mechanical drawing or circuit conditions and we can recommend a solution. All components are 100% up-screened for Partial Discharge and Sonoscanned. All assemblies include a 100hr Military burn in.





UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

Custom Capacitor Assemblies



*Marking shown for illustration purposes only.
Actual marking may differ.*

Please contact PPI (sales@passiveplus.com) to discuss custom assembly options.



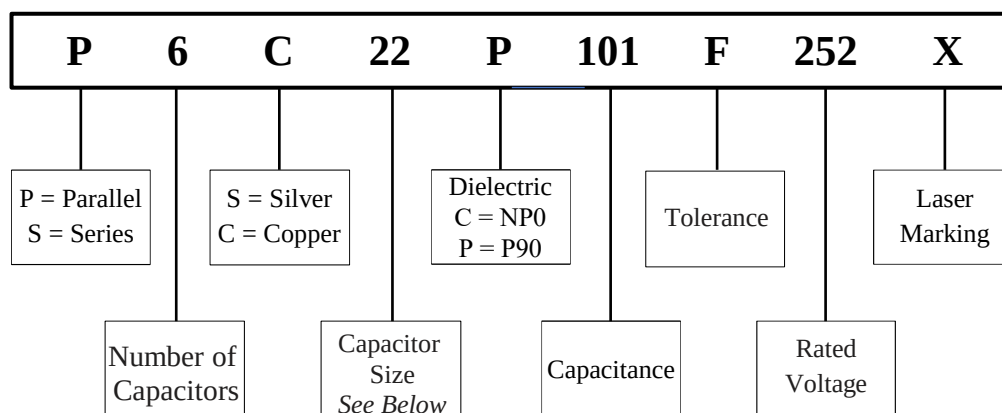
Product Features

High Operating Voltage, High Operating Current, Extended Capacitance,
Tighter Tolerances, High Reliability, High Q, Ultra-low ESR, Non-Magnetic

Typical Applications Field

High Power RF, Medical Electronics, Broadcast, Semiconductor Manufacturing,
High Magnetic Environments, Inductive Heating

Part Numbering



Marking shown for illustration purposes only.
Actual marking may differ.

Capacitor Size:

11 = 1111; 22 = 2225; 38 = 3838; 60 = 6040; 76 = 7676

Capacitance: For capacitor values requiring 3 significant digits,

e.g. 1222.5pF = 1222R5

e.g. P6S22P101F252X

Silver bracket assembly with six 2225C pieces in parallel, Capacitance is 100pF,

Capacitance tolerance is $\pm 1\%$, WVDC is 2500 V and Laser marking.

e.g. S2S25C1222R5G203X

Silver bracket assembly with two 2225C pieces in series, Capacitance is 1222.5pF,

Capacitance tolerance is $\pm 2\%$, WVDC is 20,000V and Laser marking.

Capacitance and Voltage

By Buyer's requirements using existing drawings, mechanical sketches, or we can help with capable modeling of assemblies thermal rise predictions.



UHF/RF High-Q Power Transmitter
Multi-Layer Ceramic Capacitors

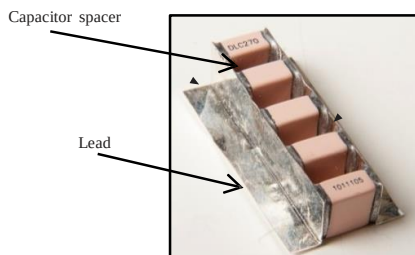
Custom Capacitor Assemblies

≠ Typical Assembly Configurations

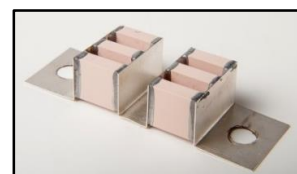
≠ Parallel Assemblies

unit:inch (millimeter)

	1111C/P	22225C/P	3838C/P	6040C	7676C
Lead Material	Silver plated Copper or Silver				
Lead Thickness	.004 or .010 (0.1 or 0.25)			.010 or .020 (0.25 or 0.51)	
Lead Length (max.)	.50 (12.7)	.75 (19.8)		2.0 (50.8)	
Capacitor Spacer (typ.)	.050 or .078 (1.3 or 2)			.090 (2.3)	.050 or .157 (1.3 or 4)
Mounting Configuration	Horizontal / Vertical				



3838 Series/Parallel Combination



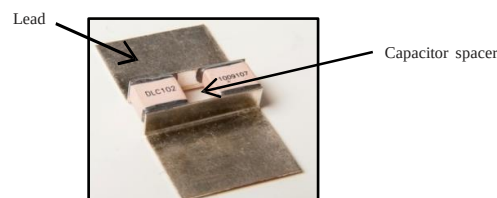
Marking shown for illustration purposes only.
Actual marking may differ.

≠ Series Assemblies

unit:inch (millimeter)

	22225C/P	3838C/P	6040C	7676C
Lead Type	L Bracket			
Lead Material	Silver plated Copper or Silver			
Lead Thickness	.010 (0.25)		.010 or .020 (0.25 or 0.51)	
Lead Length (max.)	.75 (19.8)	1.0 (25.4)		
Capacitor Spacer (typ.)	.050 or .157 (1.3 or 4)			
Mounting Configuration	Horizontal			

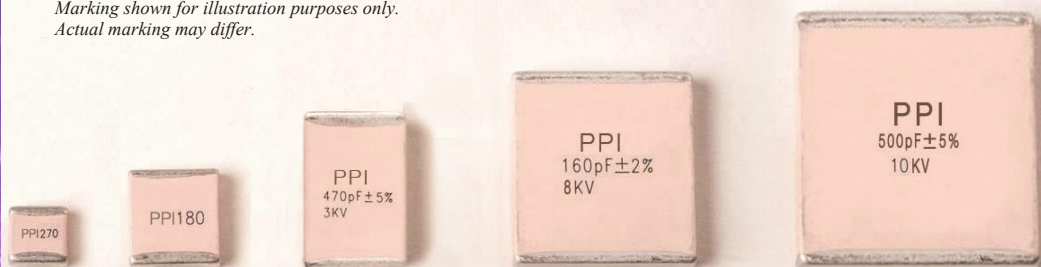
- Epoxy Molding Available



Marking shown for illustration purposes only.
Actual marking may differ.

Other Assemblies: By Buyer's requirement. Contact PPI.

Marking shown for illustration purposes only.
Actual marking may differ.



2225 3838 6040 7676 1313



PPI *Passive Plus*
RF & Microwave Components

Headquarters: New York, USA

