



## ≠ Product Features

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

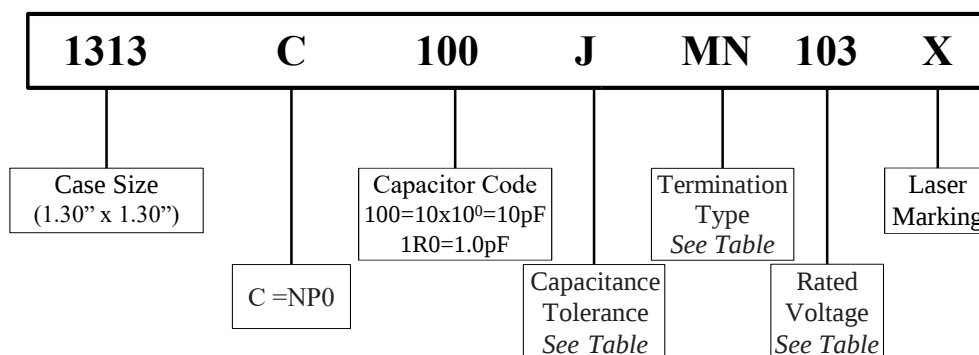
## ≠ Typical Circuit Applications

- 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

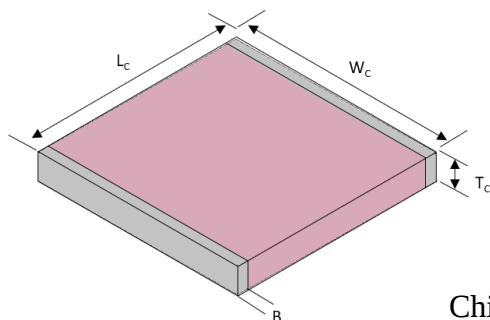
For special capacitances, tolerances and WVDC, please contact PPI.



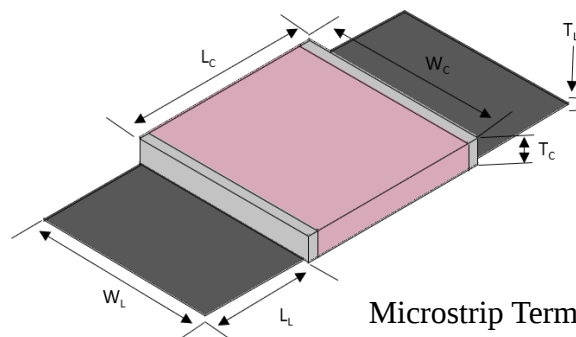
Marking shown for illustration purposes only.  
Actual marking may differ.

| Cap. pF | Cap Code | Tol.      | <u>Rated</u><br>WVDC | Cap. pF | Cap Code | Tol.      | <u>Rated</u><br>WVDC | Cap. pF | Cap Code | Tol. | <u>Rated</u><br>WVDC |  |  |
|---------|----------|-----------|----------------------|---------|----------|-----------|----------------------|---------|----------|------|----------------------|--|--|
| 200     | 201      | G,J,<br>K | 10kV                 | 1800    | 182      | G,J,<br>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,<br>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      |           |                      |         |          |           |                      |         |          |      |                      |  |  |

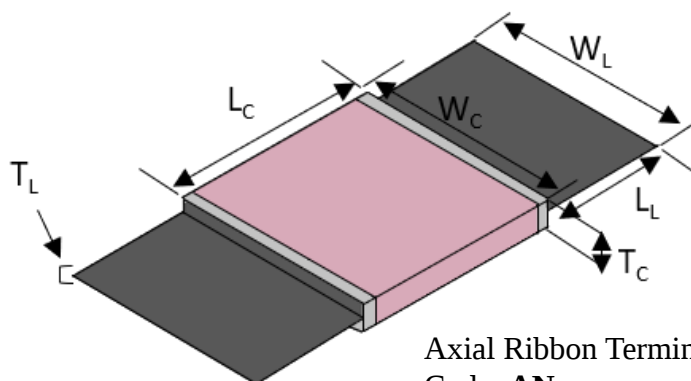
## ≠ Termination Types and Codes



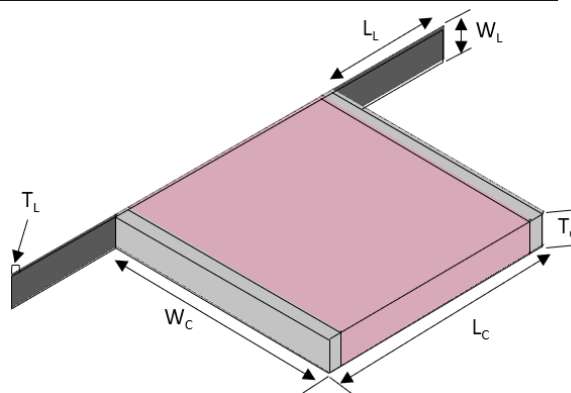
Chip Termination:  
Codes: **L, P**



Microstrip Termination:  
Codes: **MN**



Axial Ribbon Termination:  
Code: **AN**



Radial Wire Termination:  
Codes: **FN**

| Termination Code | Magnetic Termination                            |
|------------------|-------------------------------------------------|
| <b>L</b>         | 90% Sn10%Pb Tin/Lead Solder over Nickel Plating |

| Termination Code                                                                               | Non-Magnetic Terminations         |
|------------------------------------------------------------------------------------------------|-----------------------------------|
| <b>P</b>   | 100%Sn Solder over Copper Plating |
| <b>MN</b>  |                                   |
| <b>AN</b>  | Silver-Plated Copper              |
| <b>FN</b>  |                                   |

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<br>(19.0 min) | 1.299 ± 0.020<br>(33.00 ± 0.50) |
|                          |                  | (34.29 ± 1.27)       | (34.29 ± 1.27) | (5.00 max) |               |                         |                                 |
| AN                       | Axial<br>Ribbon  | 1.350 ± 0.050        | 1.350 ± 0.050  | 0.197 max  | -             | 0.748 min<br>(19.0 min) | 1.299 ± 0.020<br>(33.00 ± 0.50) |
|                          |                  | (34.29 ± 1.27)       | (34.29 ± 1.27) | (5.00 max) |               |                         |                                 |
| FN                       | Radial<br>Ribbon | 1.350 ± 0.050        | 1.350 ± 0.050  | 0.197 max  | -             | 0.699 min<br>(17.0 min) | 0.157 ± 0.010<br>(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;<br>More than 1000pF, Q value more than 2000, Test Frequency 1kHz                                                  |
| Insulation Resistance (IR)             | Test Voltage: 500V<br>10 <sup>5</sup> Megaohms min. @ +25°C rated WVDC<br>10 <sup>4</sup> 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<br>150% of Voltage for 5 seconds, 500VDC < Rated Voltage ≤ 1250 VDC<br>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<br>>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

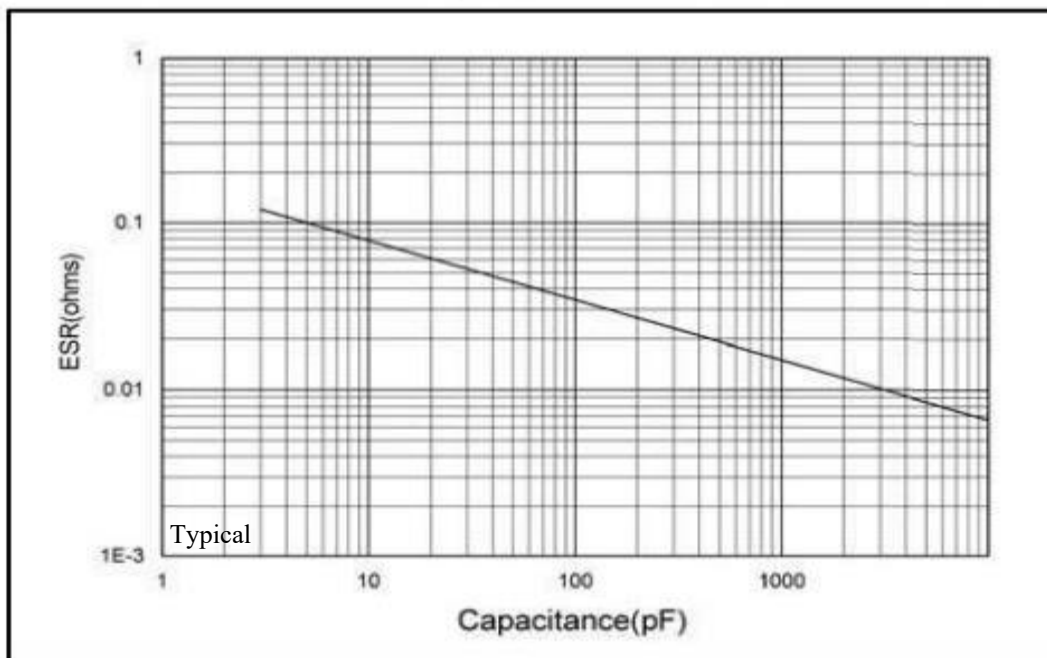
|                         | Specification                                                                                                                                    | Test Parameters                                                                                                              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



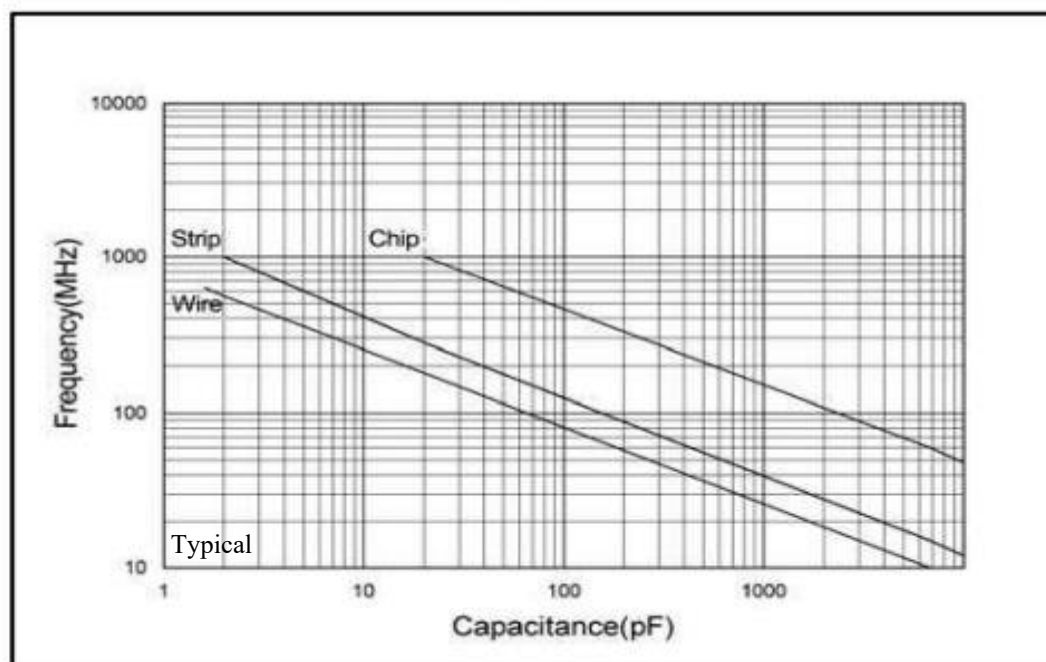
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Multi-Layer Ceramic Capacitors

**1313C (1.30" x 1.30")**

## ⚡ ESR vs. Capacitance Measured @ 30MHz



## ⚡ Self Resonant Frequency vs. Capacitance

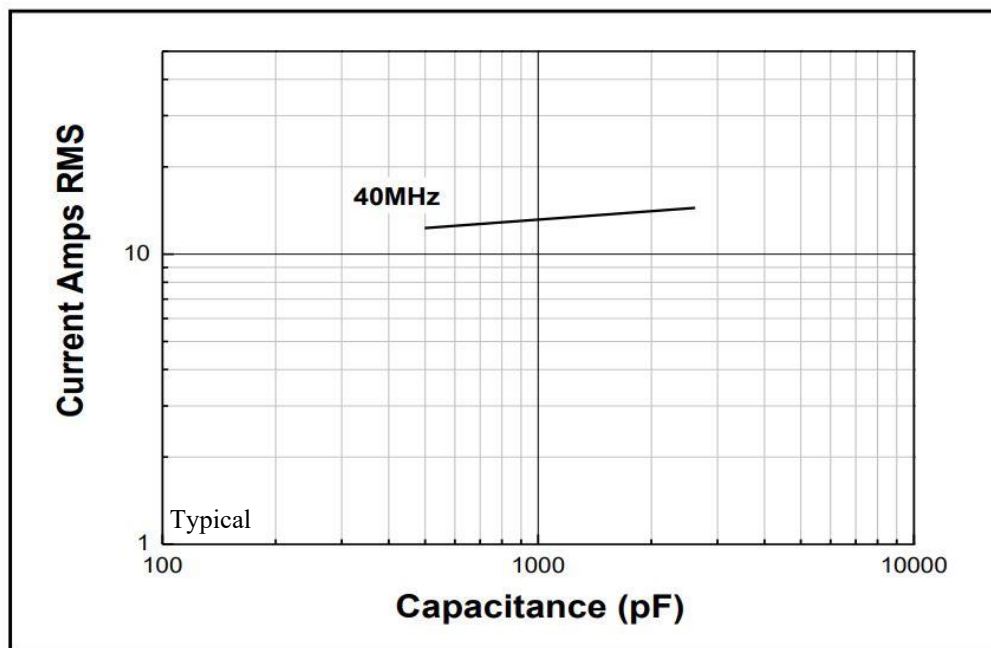




UHF/RF High-Q Power Transmitter  
Multi-Layer Ceramic Capacitors

**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.

