

3838C/P (.380" x .380")



◆ Product Features

High Q, High RF Current/Voltage, High RF Power, Low ESR/ESL, Low Noise, Ultra-Stable Performance.

◆ Product Application

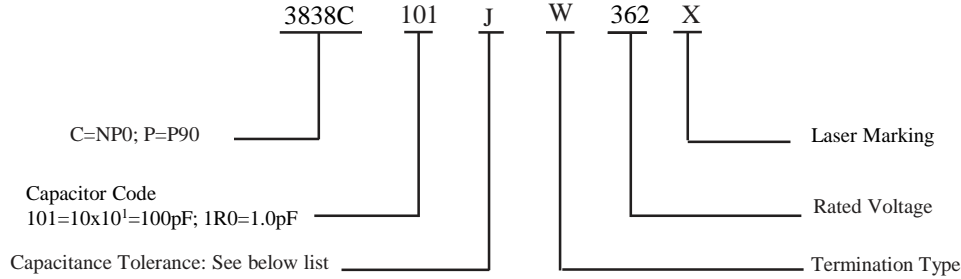
Typical Functional Applications: Bypass, Coupling, Tuning, Impedance Matching and D.C. Blocking.
Typical Circuit Applications: HF/RF Power Amplifiers, Transmitters, Antenna Tuning, Plasma Chambers, and Medical Equipment.

◆ 3838C/P Capacitance Table NP0= C; P90=P

| Cap. pF | Code | Tol. | Rated WVDC | Cap. pF | Code | Tol. | Rated WVDC | Cap. pF | Code | Tol. | Rated WVDC | Cap. pF | Code | Tol. | Rated WVDC |
|---------|------|-------|------------|---------|------|-------------|------------|---------|------|-------------|------------|---------|------|-------------|------------|
| 0.5 | 0R5 | | | 4.7 | 4R7 | | | 51 | 510 | | | 560 | 561 | | |
| 0.6 | 0R6 | | | 5.1 | 5R1 | | | 56 | 560 | | | 620 | 621 | | 2500V |
| 0.7 | 0R7 | | | 5.6 | 5R6 | | | 62 | 620 | | | 680 | 681 | | Code 252 |
| 0.8 | 0R8 | | | 6.2 | 6R2 | B,C,D | | 68 | 680 | | | 750 | 751 | | |
| 0.9 | 0R9 | | | 6.8 | 6R8 | | | 75 | 750 | | | 820 | 821 | | |
| 1.0 | 1R0 | | | 7.5 | 7R5 | | | 82 | 820 | | | 910 | 911 | | |
| 1.1 | 1R1 | | | 8.2 | 8R2 | | | 91 | 910 | | | 1000 | 102 | | 1000V |
| 1.2 | 1R2 | | | 9.1 | 9R1 | | | 100 | 101 | | | 1100 | 112 | | Code 102 |
| 1.3 | 1R3 | | | 10 | 100 | | | 110 | 111 | | | 1200 | 122 | | or 2000V |
| 1.4 | 1R4 | | 3600V | 11 | 110 | | 3600V | 120 | 121 | | | 1500 | 152 | | Code 202 |
| 1.5 | 1R5 | | Code | 12 | 120 | | Code | 130 | 131 | | | 1800 | 182 | | |
| 1.6 | 1R6 | | 362 | 13 | 130 | | 362 | 150 | 151 | | | 2200 | 222 | | |
| 1.7 | 1R7 | B,C,D | or | 15 | 150 | | or | 160 | 161 | F,G, J,K | | 2400 | 242 | F,G, J,K | |
| 1.8 | 1R8 | | 7200V | 16 | 160 | | 7200V | 180 | 181 | | | 2700 | 272 | | |
| 1.9 | 1R9 | | Code | 18 | 180 | | Code | 200 | 201 | | | 3000 | 302 | | 500V |
| 2.0 | 2R0 | | 722 | 20 | 200 | | 722 | 220 | 221 | | | 3300 | 332 | | Code 501 |
| 2.1 | 2R1 | | | 22 | 220 | F,G, J,K | | 240 | 241 | | | 3600 | 362 | | or 2000V |
| 2.2 | 2R2 | | | 24 | 240 | | | 270 | 271 | | | 3900 | 392 | | Code 202 |
| 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 | | | | | | |

Remark: special capacitance, tolerance and WVDC are available, consult with PASSIVE PLUS.

◆ Part Numbering



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


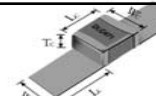
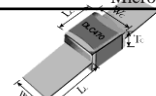
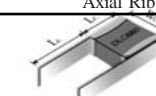
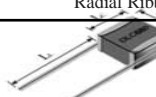
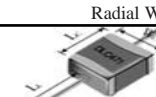
◆ 3838C/P Lead Type and Dimensions

unit:inch(millimeter)

| Series | Term. Code | Type/ Outlines | Capacitor Dimensions | | | | Lead Dimensions | | | Plated Material |
|----------------|------------|-------------------|--------------------------------------------------|----------------------------------|-----------------------|-----------------------|------------------------|--------------------------------|-----------------------------------|-----------------------------------------------------------|
| | | | Length Lc | Width Wc | Thick- ness Tc | Overlap B | Length LL | Width WL | Thick- ness TL | |
| 3838C 3838P | W L | Chip | .380+.015 to -.010 (9.65+0.38 to -0.25) | .380 ±.010 (9.65± 0.25) | .170 (4.32) max | .063 (1.60) max | - | - | - | 100%Sn Solder over Nickel Plating RoHS Compliant |
| 3838C 3838P | MS | Microstrip | .380+.015 to -.010 (9.65+0.38 to -0.25) | .380 ±.010 (9.65± 0.25) | .177 (4.50) max | - | .750 (19.05) min | .35 ±.01 (8.89± 0.25) | .008 ±.001 (0.20± 0.025) | Silver- plated Copper |
| 3838C 3838P | AR | Axial Ribbon | | | | | | | .004 ±.001 (0.10± 0.025) | 100% Silver |
| 3838C 3838P | RR | Radial Ribbon | | | | | | | .394 (10.00) Min | .118± .005 (3.0± 0.13) |
| 3838C 3838P | RW | Radial Wire | | | | | .787 (20.00) Min | Dia.=.031±.004 0.80 ± 0.10 | | |
| 3838C 3838P | AW | Axial Wire | | | | | .984 (25.00) min | | | |

◆ 3838C/P Non-Magnetic Lead Type and Dimensions

unit: inch (millimeter)

| Series | Term. Code | Type/ Outlines | Capacitor Dimensions | | | | Lead Dimensions | | | Plated Material |
|----------------|------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------|------------------------|-----------------------|------------------------|------------------------------------|-------------------------------------|------------------------------------------------------------------------------|
| | | | Length Lc | Width Wc | Thick- ness Tc | Overlap B | Length LL | Width WL | Thick- ness TL | |
| 3838C 3838P | P |  Chip (Non-Mag) | .380+.015 to -.010 (9.65+0.38 to -0.25) | .380 ± .010 (9.65 ± 0.25) | .170 (4.32) max | .063 (1.60) max | - | - | - | 100% Sn Solder over Copper Plating Non-Mag, RoHS Compliant |
| 3838C 3838P | MN |  Microstrip (Non-Mag) | .380+.015 to -.010 (9.65+0.38 to -0.25) | .380 ± .010 (9.65 ± 0.25) | .177 (4.50) max | - | .750 (19.05) min | .350 ± .010 (8.89 ± 0.25) | .008 ± .001 (0.20 ± 0.025) | Silver- plated Copper |
| 3838C 3838P | AN |  Axial Ribbon (Non-Mag) | | | | | | | .004 ± .001 (0.10 ± 0.025) | |
| 3838C 3838P | FN |  Radial Ribbon (Non-Mag) | | | | | | | .394 (10.00) min | .118 ± .005 (3.0 ± 0.13) |
| 3838C 3838P | RN |  Radial Wire (Non-Mag) | .787 (20.00) min | Dia.=.031 ± .004 (0.80 ± 0.10) | | | | | | |
| 3838C 3838P | BN |  Axial Wire (Non-Mag) | | | .984 (25.00) min | | | | | |

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

◆ Performance

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

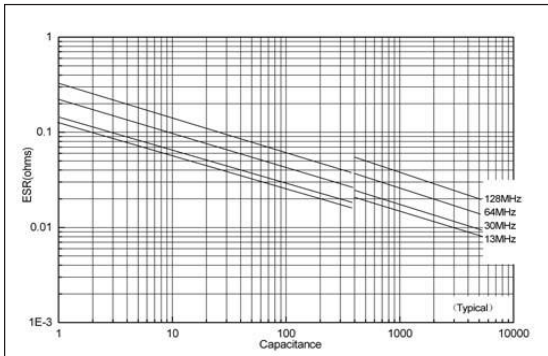
Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

◆ Environmental Tests

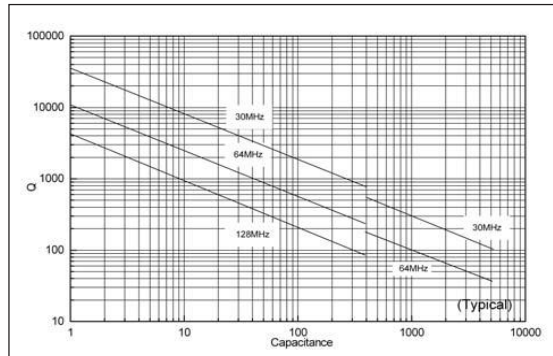
| Item | Specifications | Method |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Thermal shock | DWV: the initial value IR: Shall not be less than 30% of the initial value Capacitance change: no more than 0.5% or 0.5 pF. whichever is greater. | MIL-STD-202, Method 107, Condition A. At the maximum rated temperature (-55°C and 125°C) stay 30 min, the time of removing shall not be more than 3 minutes. Perform the five cycles. |
| Moisture resistance | | 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 1.5 Volts D.C. 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% of Voltage for Capacitors, Rated Voltage > 1250VDC. |
| Terminal strength | Force : 25lbs typical, 10 lbs 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. |

◆ 3838C/P Performance Curves

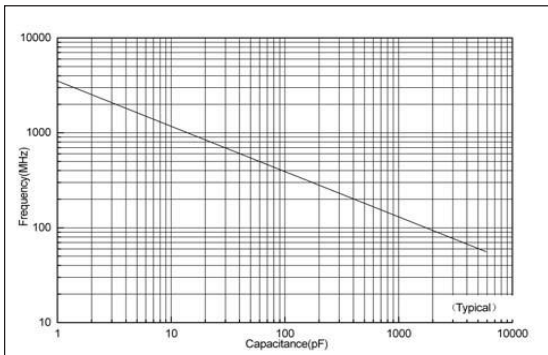
ESR vs Capacitance



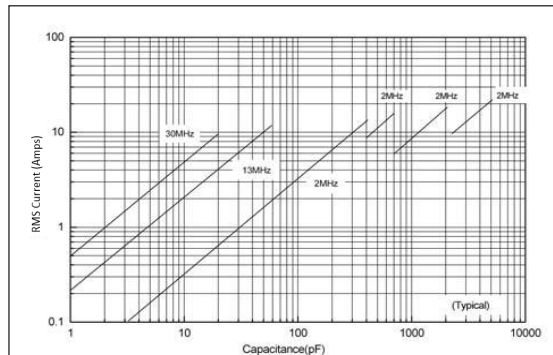
Q vs Capacitance



Series Resonance vs Capacitance



Current Rating vs Capacitance



The current depends on voltage limited:
$$I = \frac{\sqrt{2}}{2} I_{peak} = \frac{\sqrt{2}}{2} \times \frac{V_{rated}}{X_c} = \sqrt{2} \pi f C V_{rated}$$

The current depends on power dissipation limited:
$$I = \sqrt{\frac{P_{dissipation}}{ESR}}$$

Note: If the thermal resistance of mounting surface is 12°C/W, then a power dissipation of 5 W will result in the current limited we can calculate the current limited.

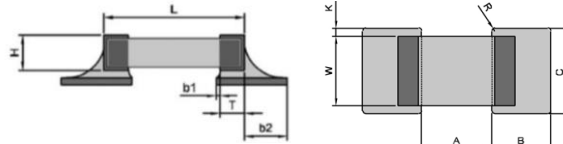
◆ **Recommended Land Pattern Dimensions**

When mounting the capacitor to substrate, it's important to carefully consider that the amount of solder (size of fillet) used has a direct effect upon the capacitor once it's mounted.

- 1) The greater the amount of solder, the greater the stress to the elements. This may cause the substrate to break or crack.
- 2) In the situation where two or more devices are mounted onto a common land, be sure to separate the device into exclusive pads by using soldering resist.

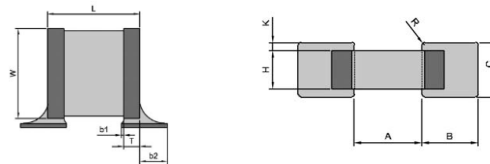
● **Horizontal Mounting**

| | | | | |
|-------------|------|-----|-----|------|
| Orientation | EIA | A | B | C |
| Horizontal | 3838 | 7.1 | 3.0 | 10.2 |



● **Vertical Mounting**

| | | | | |
|-------------|------|-----|-----|-----|
| Orientation | EIA | A | B | C |
| Vertical | 3838 | 7.1 | 3.0 | 5.0 |



◆ **Tape & Reel Specifications**

| Orientation | EIA | A0 | B0 | K0 | W | P0 | P1 | T | F | Qty Min | Qty /reel | Tape material |
|-------------|------|-------|-------|------|-------|------|-------|------|------|---------|-----------|---------------|
| Horizontal | 3838 | 10.10 | 10.10 | 3.30 | 16.00 | 4.00 | 16.00 | 0.30 | 7.50 | 50 | 200 | Plastic |

● **Horizontal Orientation**

