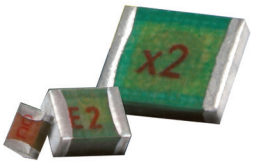
# THE DATASHEET OF

# MC08EA150J-F

## High-Frequency, High-Power, High-Voltage Chips with Nonmagnetic Option




Rugged flexibility and compatibility with FR4 boards make Type MC and MCN capacitors ideal for use where other multilayer caps aren't recommended because of cracking. The natural mica dielectric retains its high-Q to many megahertz, so higher frequency applications are limited by the circuit inductance, not the Type MC capacitor. **Nonmagnetic** Type MCN chips are available for MRI and other high frequency applications that often use more expensive porcelain ceramic chips.

## Highlights

- Extremely high Q at UHF/VHF frequencies
- Free from thermal cracking, FR4 compatible
- Wave solderable
- Nonmagnetic option
- Exceed 2 mm bend test
- Better than porcelain
- High RF current — dV/dt 20,000 V/µs

## Applications

- MRI Coils and Generators
- RF Instruments
- Power Amplifiers
- Tuned LCR Circuits
- CATV
- Ground and Flight Mobile Radio
- Lasers

## Specifications

*Our MC series of mica chip capacitors are intended for RF applications. Mica chip capacitors that have acquired moisture, may experience electrode migration and early failure when continuous DC voltages are applied. Please consult with our factory with any questions regarding your application.*

| | |
|---|---|
| **Temperature Range** | –55 °C to +125 °C |
| **Rated Voltage Range** | 100 Vdc, 500 Vdc, and 1000 Vdc |
| **Capacitance Range** | 0.5 pF to 2,200 pF |
| **Capacitance Tolerance** | ±0.1pF to ±5% |
| **Case Sizes** | 0805, 1210, 1812, and 2220 |
| Regulatory Information | |

## Ratings

| Cap (pF) | Catalog Part Number | Case Type |
|---|---|---|
| 100 Vdc | | |
| 0.5 | MC08CA0R5D-F | 0805 |
| 1.0 | MC08CA010D-F | 0805 |
| 2.0 | MC08CA020D-F | 0805 |
| 3.0 | MC08CA030D-F | 0805 |
| 4.0 | MC08CA040D-F | 0805 |
| 5.0 | MC08CA050D-F | 0805 |
| 6.0 | MC08CA060D-F | 0805 |
| 7.0 | MC08CA070D-F | 0805 |
| 8.0 | MC08CA080D-F | 0805 |
| 9.0 | MC08CA090D-F | 0805 |
| 10.0 | MC08CA100D-F | 0805 |
| 12.0 | MC08EA120J-F | 0805 |
| 15.0 | MC08EA150J-F | 0805 |
| 18.0 | MC08EA180J-F | 0805 |
| 20.0 | MC08EA200J-F | 0805 |
| 22.0 | MC08EA220J-F | 0805 |
| 24.0 | MC08EA240J-F | 0805 |
| 27.0 | MC08EA270J-F | 0805 |
| 30.0 | MC08EA300J-F | 0805 |
| 33.0 | MC08FA330J-F | 0805 |
| 36.0 | MC08FA360J-F | 0805 |
| 39.0 | MC08FA390J-F | 0805 |
| 43.0 | MC08FA430J-F | 0805 |
| 47.0 | MC08FA470J-F | 0805 |
| 50.0 | MC08FA500J-F | 0805 |
| 51.0 | MC08FA510J-F | 0805 |
| 56.0 | MC08FA560J-F | 0805 |
| 62.0 | MC08FA620J-F | 0805 |

| Cap (pF) | Catalog Part Number | Case Type |
|---|---|---|
| 100 Vdc | | |
| 68 | MC08FA680J-F | 0805 |
| 75 | MC08FA750J-F | 0805 |
| 82 | MC08FA820J-F | 0805 |
| 91 | MC08FA910J-F | 0805 |
| 100 | MC08FA101J-F | 0805 |
| 47 | MC12FA470J-F | 1210 |
| 50 | MC12FA500J-F | 1210 |
| 51 | MC12FA510J-F | 1210 |
| 56 | MC12FA560J-F | 1210 |
| 62 | MC12FA620J-F | 1210 |
| 68 | MC12FA680J-F | 1210 |
| 75 | MC12FA750J-F | 1210 |
| 82 | MC12FA820J-F | 1210 |
| 91 | MC12FA910J-F | 1210 |
| 100 | MC12FA101J-F | 1210 |
| 110 | MC12FA111J-F | 1210 |
| 120 | MC12FA121J-F | 1210 |
| 130 | MC12FA131J-F | 1210 |
| 150 | MC12FA151J-F | 1210 |
| 160 | MC12FA161J-F | 1210 |
| 180 | MC12FA181J-F | 1210 |
| 200 | MC12FA201J-F | 1210 |
| 220 | MC12FA221J-F | 1210 |
| 240 | MC12FA241J-F | 1210 |
| 250 | MC12FA251J-F | 1210 |
| 270 | MC12FA271J-F | 1210 |
| 300 | MC12FA301J-F | 1210 |
| 330 | MC12FA331J-F | 1210 |

| Cap (pF) | Catalog Part Number | Case Type |
|---|---|---|
| 100 Vdc | | |
| 360 | MC12FA361J-F | 1210 |
| 390 | MC12FA391J-F | 1210 |
| 430 | MC12FA431J-F | 1210 |
| 250 | MC18FA251J-F | 1812 |
| 270 | MC18FA271J-F | 1812 |
| 300 | MC18FA301J-F | 1812 |
| 330 | MC18FA331J-F | 1812 |
| 360 | MC18FA361J-F | 1812 |
| 390 | MC18FA391J-F | 1812 |
| 430 | MC18FA431J-F | 1812 |
| 470 | MC18FA471J-F | 1812 |
| 500 | MC18FA501J-F | 1812 |
| 510 | MC18FA511J-F | 1812 |
| 560 | MC18FA561J-F | 1812 |
| 620 | MC18FA621J-F | 1812 |
| 680 | MC18FA681J-F | 1812 |
| 750 | MC18FA751J-F | 1812 |
| 820 | MC18FA821J-F | 1812 |
| 910 | MC22FA911J-F | 2220 |
| 1000 | MC22FA102J-F | 2220 |
| 1100 | MC22FA112J-F | 2220 |
| 1200 | MC22FA122J-F | 2220 |
| 1500 | MC22FA152J-F | 2220 |
| 1800 | MC22FA182J-F | 2220 |
| 2000 | MC22FA202J-F | 2220 |
| 2200 | MC22FA222J-F | 2220 |

| Cap (pF) | Catalog Part Number | Case Type |
|---|---|---|
| | 500 Vdc | |
| 0.5 | MC08CD0R5D-F | 0805 |
| 1 | MC08CD010D-F | 0805 |
| 2 | MC08CD020D-F | 0805 |
| 3 | MC08CD030D-F | 0805 |
| 4 | MC08CD040D-F | 0805 |
| 5 | MC08CD050D-F | 0805 |
| 6 | MC08CD060D-F | 0805 |
| 7 | MC08CD070D-F | 0805 |
| 8 | MC08CD080D-F | 0805 |
| 9 | MC08CD090D-F | 0805 |
| 10 | MC08CD100D-F | 0805 |
| 12 | MC08ED120J-F | 0805 |
| 15 | MC08ED150J-F | 0805 |
| 18 | MC08ED180J-F | 0805 |
| 20 | MC08ED200J-F | 0805 |
| 1 | MC12CD010D-F | 1210 |
| 2 | MC12CD020D-F | 1210 |
| 3 | MC12CD030D-F | 1210 |
| 4 | MC12CD040D-F | 1210 |
| 5 | MC12CD050D-F | 1210 |
| 6 | MC12CD060D-F | 1210 |
| 7 | MC12CD070D-F | 1210 |
| 8 | MC12CD080D-F | 1210 |
| 9 | MC12CD090D-F | 1210 |
| 10 | MC12CD100D-F | 1210 |
| 12 | MC12ED120J-F | 1210 |
| 15 | MC12ED150J-F | 1210 |

| Cap (pF) | Catalog Part Number | Case Type |
|---|---|---|
| | 500 Vdc | |
| 18 | MC12ED180J-F | 1210 |
| 20 | MC12ED200J-F | 1210 |
| 22 | MC12ED220J-F | 1210 |
| 24 | MC12ED240J-F | 1210 |
| 27 | MC12ED270J-F | 1210 |
| 30 | MC12ED300J-F | 1210 |
| 33 | MC12FD330J-F | 1210 |
| 36 | MC12FD360J-F | 1210 |
| 39 | MC12FD390J-F | 1210 |
| 43 | MC12FD430J-F | 1210 |
| 47 | MC12FD470J-F | 1210 |
| 50 | MC12FD500J-F | 1210 |
| 51 | MC12FD510J-F | 1210 |
| 56 | MC12FD560J-F | 1210 |
| 62 | MC12FD620J-F | 1210 |
| 68 | MC12FD680J-F | 1210 |
| 75 | MC12FD750J-F | 1210 |
| 82 | MC12FD820J-F | 1210 |
| 91 | MC12FD910J-F | 1210 |
| 100 | MC12FD101J-F | 1210 |
| 110 | MC12FD111J-F | 1210 |
| 120 | MC12FD121J-F | 1210 |
| 130 | MC12FD131J-F | 1210 |
| 150 | MC12FD151J-F | 1210 |
| 100 | MC18FD101J-F | 1812 |
| 110 | MC18FD111J-F | 1812 |
| 120 | MC18FD121J-F | 1812 |

| Cap (pF) | Catalog Part Number | Case Type |
|---|---|---|
| | 500 Vdc | |
| 130 | MC18FD131J-F | 1812 |
| 150 | MC18FD151J-F | 1812 |
| 160 | MC18FD161J-F | 1812 |
| 180 | MC18FD181J-F | 1812 |
| 200 | MC18FD201J-F | 1812 |
| 220 | MC18FD221J-F | 1812 |
| 240 | MC18FD241J-F | 1812 |
| 250 | MC18FD251J-F | 1812 |
| 270 | MC18FD271J-F | 1812 |
| 300 | MC18FD301J-F | 1812 |
| 330 | MC18FD331J-F | 1812 |
| 360 | MC18FD361J-F | 1812 |
| 390 | MC18FD391J-F | 1812 |
| 430 | MC18FD431J-F | 1812 |
| 470 | MC18FD471J-F | 1812 |
| 500 | MC22FD501J-F | 2220 |
| 510 | MC22FD511J-F | 2220 |
| 560 | MC22FD561J-F | 2220 |
| 620 | MC22FD621J-F | 2220 |
| 680 | MC22FD681J-F | 2220 |
| 750 | MC22FD751J-F | 2220 |
| 820 | MC22FD821J-F | 2220 |
| 910 | MC22FD911J-F | 2220 |
| 1000 | MC22FD102J-F | 2220 |
| 1100 | MC22FD112J-F | 2220 |
| 1200 | MC22FD122J-F | 2220 |

| Cap (pF) | Catalog Part Number | Case Type |
|---|---|---|
| | 1000 Vdc | |
| 0.5 | MC12CF0R5D-F | 1210 |
| 1.0 | MC12CF010D-F | 1210 |
| 2.0 | MC12CF020D-F | 1210 |
| 3.0 | MC12CF030D-F | 1210 |
| 4.0 | MC12CF040D-F | 1210 |
| 5.0 | MC12CF050D-F | 1210 |
| 6.0 | MC12CF060D-F | 1210 |
| 7.0 | MC12CF070D-F | 1210 |
| 8.0 | MC12CF080D-F | 1210 |
| 9.0 | MC12CF090D-F | 1210 |
| 10.0 | MC12CF100D-F | 1210 |
| 12.0 | MC12EF120J-F | 1210 |
| 15.0 | MC12EF150J-F | 1210 |
| 18.0 | MC12EF180J-F | 1210 |
| 20.0 | MC12EF200J-F | 1210 |
| 22.0 | MC12EF220J-F | 1210 |
| 24.0 | MC12EF240J-F | 1210 |
| 27.0 | MC12EF270J-F | 1210 |
| 30.0 | MC12EF300J-F | 1210 |
| 33.0 | MC12FF330J-F | 1210 |
| 36.0 | MC12FF360J-F | 1210 |

| Cap (pF) | Catalog Part Number | Case Type |
|---|---|---|
| | 1000 Vdc | |
| 39 | MC12FF390J-F | 1210 |
| 43 | MC12FF430J-F | 1210 |
| 47 | MC12FF470J-F | 1210 |
| 50 | MC12FF500J-F | 1210 |
| 51 | MC22FF510J-F | 2220 |
| 56 | MC22FF560J-F | 2220 |
| 62 | MC22FF620J-F | 2220 |
| 68 | MC22FF680J-F | 2220 |
| 75 | MC22FF750J-F | 2220 |
| 82 | MC22FF820J-F | 2220 |
| 91 | MC22FF910J-F | 2220 |
| 100 | MC22FF101J-F | 2220 |
| 110 | MC22FF111J-F | 2220 |
| 120 | MC22FF121J-F | 2220 |
| 130 | MC22FF131J-F | 2220 |
| 150 | MC22FF151J-F | 2220 |
| 160 | MC22FF161J-F | 2220 |
| 180 | MC22FF181J-F | 2220 |
| 200 | MC22FF201J-F | 2220 |
| 220 | MC22FF221J-F | 2220 |
| 240 | MC22FF241J-F | 2220 |

| Cap (pF) | Catalog Part Number | Case Type |
|---|---|---|
| | 1000 Vdc | |
| 250 | MC22FF251J-F | 2220 |
| 270 | MC22FF271J-F | 2220 |
| 300 | MC22FF301J-F | 2220 |
| 330 | MC22FF331J-F | 2220 |
| 360 | MC22FF361J-F | 2220 |
| 390 | MC22FF391J-F | 2220 |
| 430 | MC22FF431J-F | 2220 |
| 470 | MC22FF471J-F | 2220 |
| 500 | MC22FF501J-F | 2220 |
| 510 | MC22FF511J-F | 2220 |
| 560 | MC22FF561J-F | 2220 |
| 620 | MC22FF621J-F | 2220 |
| 680 | MC22FF681J-F | 2220 |
| 750 | MC22FF751J-F | 2220 |
| 820 | MC22FF821J-F | 2220 |
| 910 | MC22FF911J-F | 2220 |
| 1000 | MC22FF102J-F | 2220 |
| 1100 | MC22FF112J-F | 2220 |
| 1200 | MC22FF122J-F | 2220 |
| 1500 | MC22FF152J-F | 2220 |

## Part Numbering System and Ordering Information

**Order by complete part number, as below. For other options, write your requirement on your RFQ.**

| MC(N) | 22 | F | D | 122 | J | – | T | F |
|---|---|---|---|---|---|---|---|---|
| CDE Type | Case Code | Temperature Coefficient | Voltage | Capacitance | Capacitor Tolerance | | Package | RoHS (MC only) |

**MC** = Standard
**MCN** = Nonmagnetic

**08** = 0805
**12** = 1210
**18** = 1812
**22** = 2220

**A** = 100 Vdc
**D** = 500 Vdc
**F** = 1000 Vdc

**010** = 1 pF
**1R8** = 1.8 pF
**(187)** = 187 pF
**182** = 1800 pF

**Blank** = Bulk
**T** = Tape & reel not specific

**MCN complies** (no F required)

| TC Code | Capacitance Range (pF) | Temperature Coefficient ppm/°C | Capacitance Drift |
|---|---|---|---|
| C | 0.5 to 10 | 100 ±100 | ±(0.5% +0.1 pF) |
| E | 10.5 to 30 | 50 ±50 | ±(0.1% +0.1 pF) |
| F | 30.5 & up | 25 ±25 | ±(0.05% +0.1 pF) |

| Tol. Code | Tolerance | Capacitance Range |
|---|---|---|
| B | ±0.1 pF | 0.5 pF to 5 pF |
| C | ±0.25 pF | 0.5 pF to 100 pF |
| D | ±0.5 pF | 0.5 pF to 10 pF |
| D | ±0.50% | 50.5 pF to 100 pF |
| F | ±1 pF | 5.5 pF to 10 pF |
| F | ±1% | 25.5 pF and up |
| G | ±2% | 13.0 pF and up |
| J | ±5% | 10.5 pF and up |

## Available Capacitance Values

| Case Code | Capacitance (pF) 100 Vdc | 500 Vdc | 1000 Vdc | Minimum Cap. Step, pF |
|---|---|---|---|---|
| 08 | 0.5 to 100 | 0.5 to 20 | N/A | 0.5 |
| 12 | 43.5 to 100 | 0.5 to 100 | N/A | 0.5 |
| 12 | 101 to 430 | 101 to 150 | N/A | 1.0 |
| 12 | | | 0.5 to 50 | 1.0 |
| 18 | 241 to 820 | 91.5 to 470 | N/A | 1.0 |
| 22 | 821 to 1000 | 471 to 1000 | N/A | 1.0 |
| 22 | 1010 to 2200 | 1010 to 1200 | 50.5 to 1500 | 10.0 |

## Standard Minimum Quanti-

**Reel Packed**

Case Codes 08 & 12: 3,000/reel*

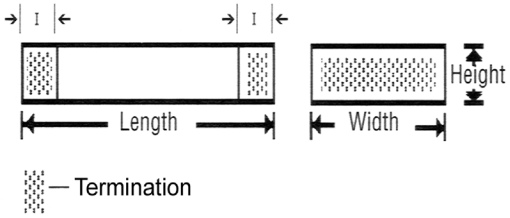
Case Codes 18 & 22: 1,000/reel**

**Bulk Packed**

100 per bag

*note - MC12, 100 volt units -250 pF and above, and 500 volt units -100 pF and above 2000 pc reels

**note - MC22, 1000 volt units -680 pF and above 500 pc reels



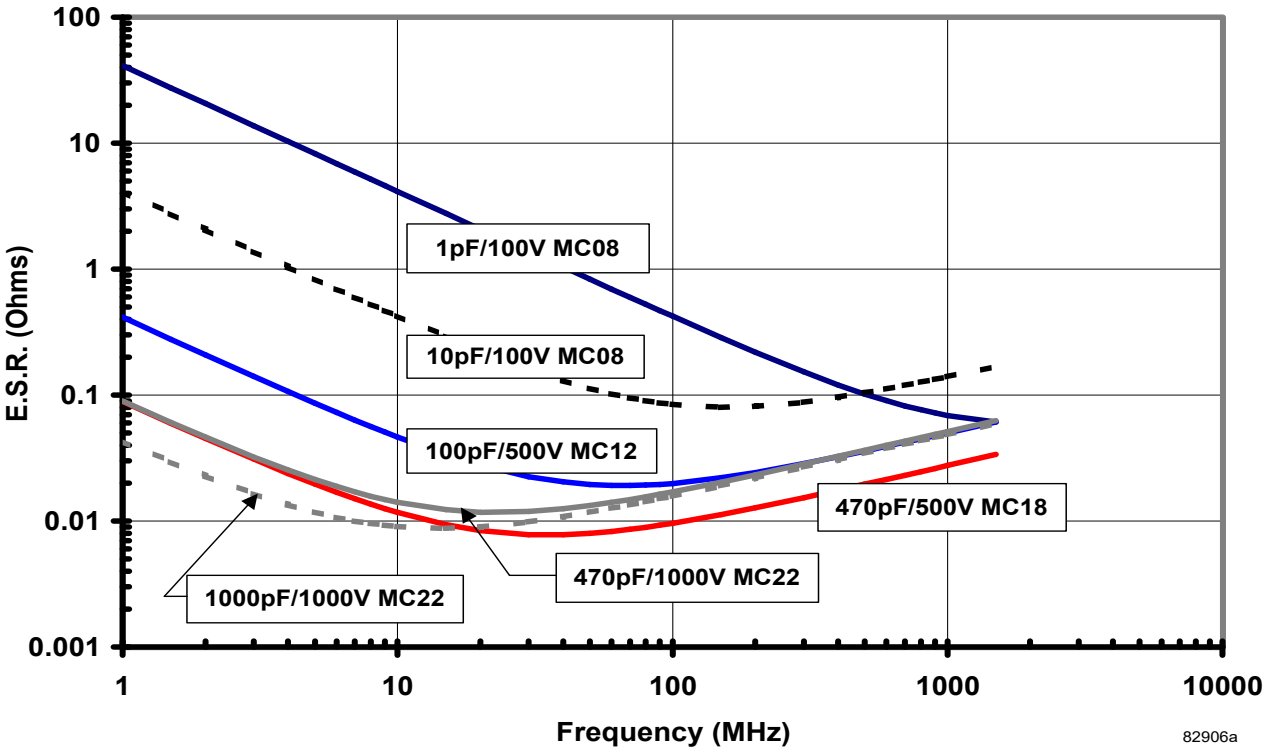

## Case Sizes

| Case Code | Case Type | INCHES L | W | H (Max.) | I Min./Max. | MILLIMETERS L | W | H (Max.) | I Min./Max. |
|---|---|---|---|---|---|---|---|---|---|
| 08 | 0805 | 0.079 +.02 –0 | 0.049 +.02 –0 | 0.055 | 0.008/0.035 | 2.0 +0.5 –0 | 1.25 +0.5 –0 | 1.4 | 0.2/0.9 |
| 12 | 1210 | 0.126 +.024–.004 | 0.098 +.024–.004 | 0.079 | 0.012/0.043 | 3.2 +0.6 –0.1 | 2.5 +0.6 –0.1 | 2.0 | 0.3/1.1 |
| 18 | 1812 | 0.177 +.024 –.008 | 0.126 +.024 –.0 | 0.079 | 0.012/0.051 | 4.5 +0.6 –0.2 | 3.2 +0.6 –0 | 2.0 | 0.3/1.3 |
| 22 | 2220 | 0.224 +.016 –.012 | 0.197 +.016 –.012 | 0.079 | 0.012/0.051 | 5.7 +0.4 –0.3 | 5.0 +0.4 –0.3 | 2.0* | 0.3/1.3 |

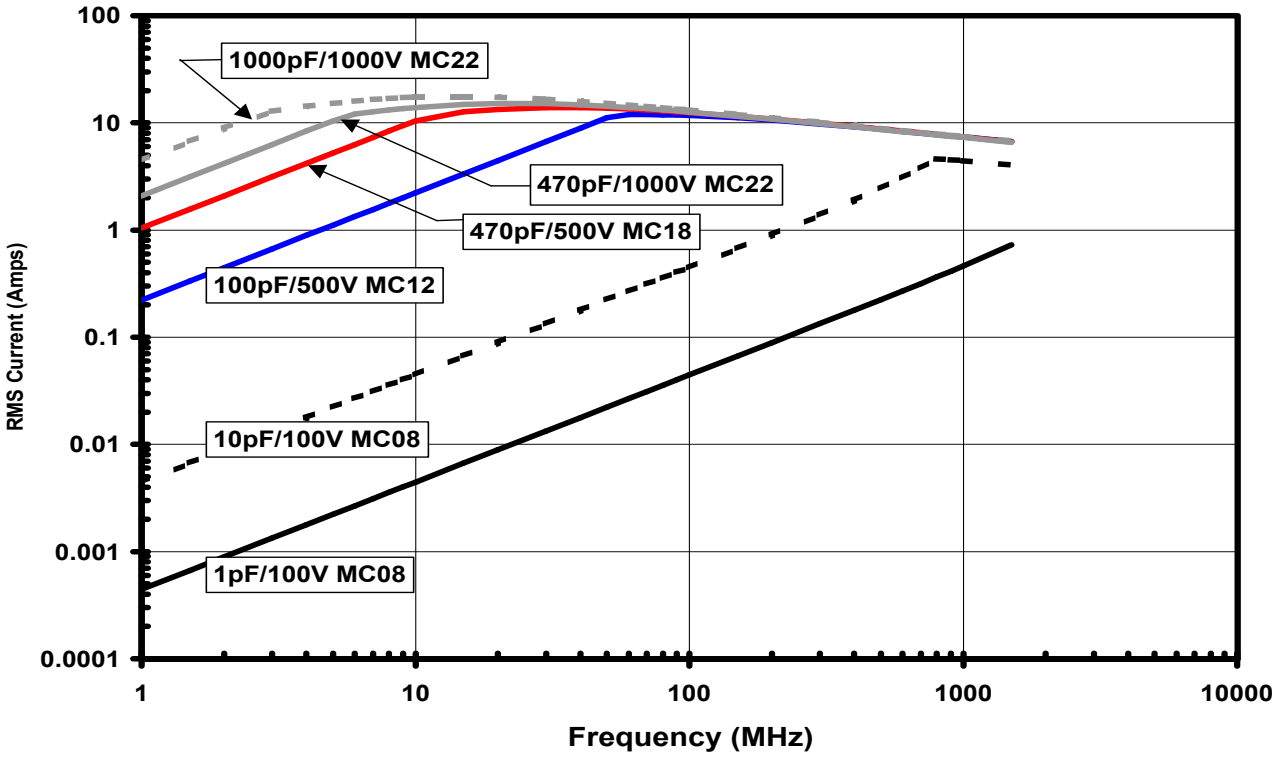
*.157 (4.0 mm) for 1000 V rating

## Typical Performance Curves

### Type MC Typical ESR vs. Frequency

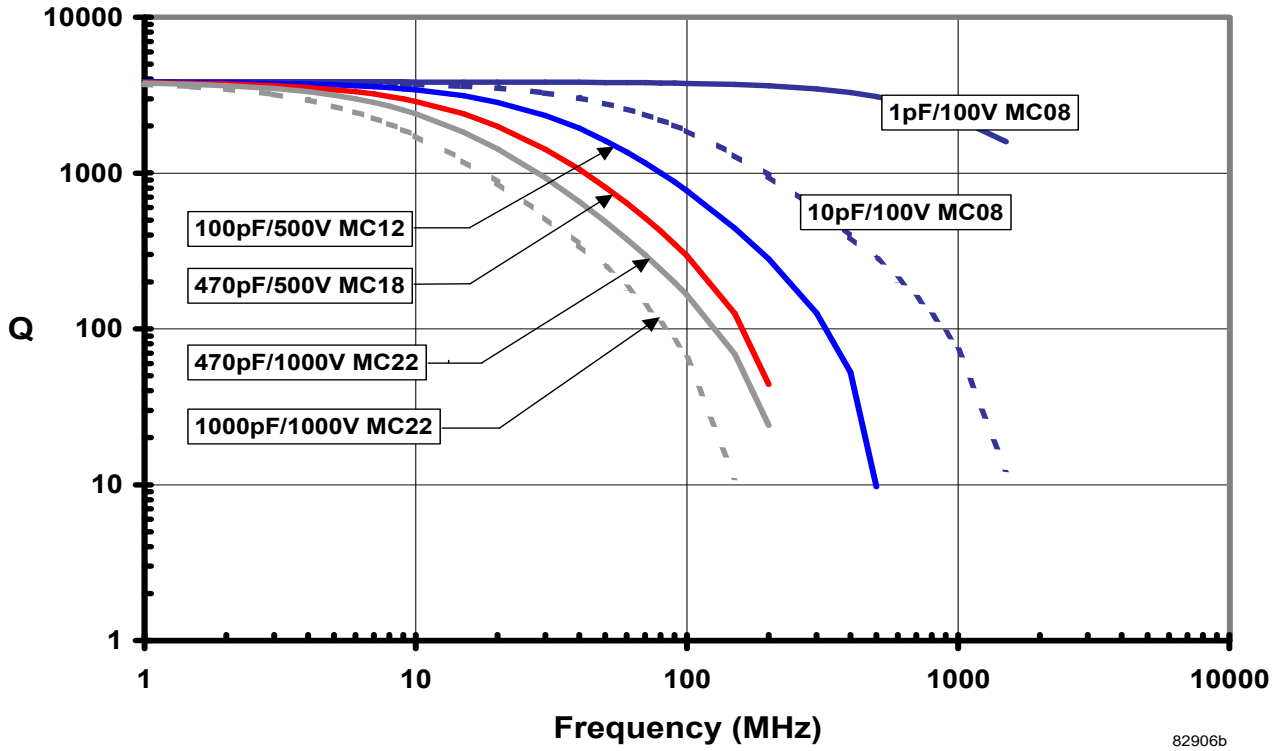



### Type MC Maximum RMS Current vs. Frequency

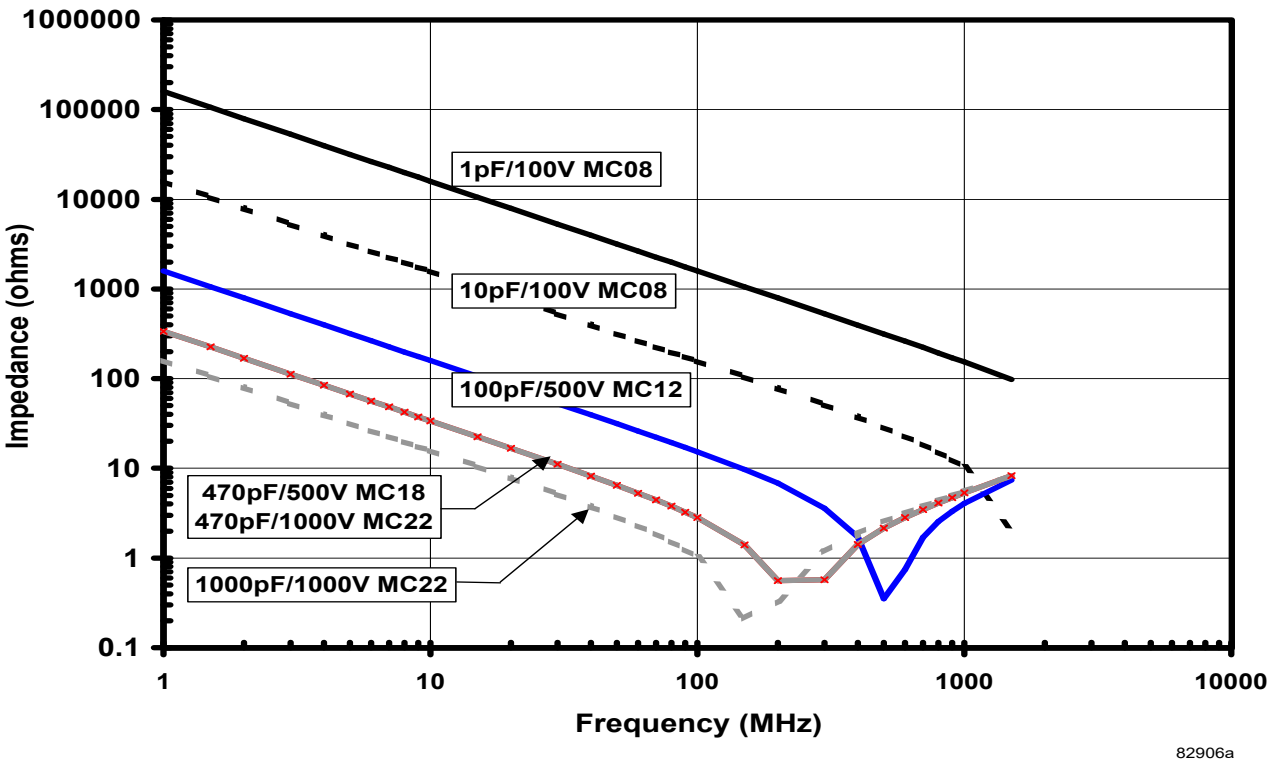


## Typical Performance Curves

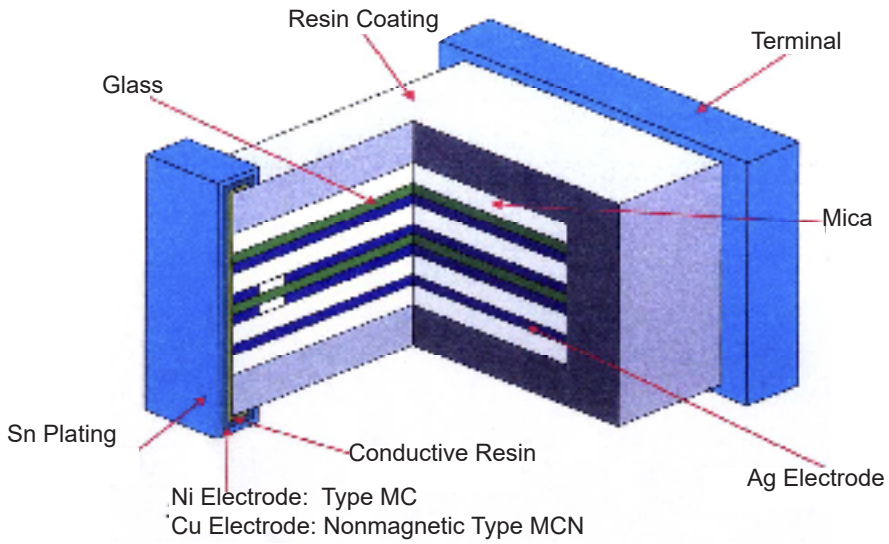
### Type MC Typical Q vs. Frequency




### Type MC Typical Impedance vs. Frequency

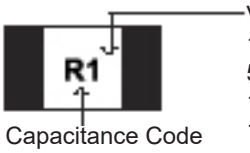


## High Q, Low ESR Construction for RF Power Applications




## Specifications

## Marking




Voltage Code (color coded)
100 Vdc = Brown
500 Vdc = Green
1000 Vdc = Brown Surface/Green Sides
1000 Vdc = Green [ MC12(0.5 - 50 pF)]

| Base Value | Code Ltr. | Base Value | Code Ltr. |
|---|---|---|---|
| 10 | A | 40 | d |
| 11 | B | 43 | R |
| 12 | C | 45 | e |
| 13 | D | 47 | S |
| 15 | E | 50 | f |
| 16 | F | 51 | T |
| 18 | G | 56 | U |
| 20 | H | 60 | m |
| 22 | J | 62 | V |
| 24 | K | 68 | W |
| 25 | a | 70 | n |
| 27 | L | 75 | X |
| 30 | M | 80 | t |
| 33 | N | 82 | Y |
| 35 | b | 90 | y |
| 36 | P | 91 | Z |
| 39 | Q | | |

**Example:**
**R1 = 43 pF**

| Multiplier | Code No. |
|---|---|
| X 0.1 | 0 |
| X 1 | 1 |
| X 10 | 2 |
| X 100 | 3 |
| X 0.01 | 9 |

**Capacitance** is within tolerance when measured as follows:

1—1000 pF @ 1 MHz
>1000 pF @ 1 kHz

**Dissipation Factor** is no more than 0.1% when measured as above at 5 Vrms or less.

## Specifications

**Quality Factor (Q)** is as follows when measured at 1 MHz

| Capacitance Range | Min. Q |
|---|---|
| 1 to 80 pF | 500 to 3000 |
| >80 pF | 3000 |

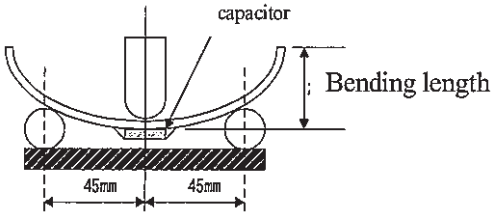
**Insulation Resistance** is no less than 100 GΩ when measured at rated voltage.
*1000 Vdc rated is measured at 500 Vdc

**Withstanding voltage** is two times the rated voltage between 5 seconds and without damage: with 50 mA or less current.

**Life Test:** Subject capacitors to 125 ºC ±3 ºC with 1.5 times rated voltage applied for 2000 (+72, –0) hours. There will be no visual damage and the capacitors will meet the limits of the table below.

**Vibration Resistance:** Subject the capacitors to simple harmonic motion with an amplitude of 1.5 mm; vary the frequency uniformly from 10 to 55 Hz and return to 10 Hz, all in one minute. Repeat that cycle continuously for two hours in each of three mutually perpendicular directions. There will be no visual damage and the capacitors will meet the limits of the table below.

**Bending Test:** Mount the capacitor as shown below and press 1.0 mm bending length, a crack and other abnormalities shall not be on the capacitor. Capacitors shall meet the limits of methods of JIS 5102/8.11




**Moisture Resistance:** Subject the capacitors to 40 ±2 ºC at 90 to 95% humidity for 500 (+24, –0) hours. Return to room ambient for 24 hours. There will be no visual damage and the capacitors will meet the limits of the table below.

**Temperature Coefficient and Drift:** Measure the capacitors' capacitance at 25 ºC, –55 ºC, 25 ºC, 125 ºC and at 25 ºC — all ±3 ºC — after stabilizing at each temperature. The capacitor will meet the limits of the Characteristic table in Ordering Information.

**Heat Resistance:** Subject the capacitors to 125 ±2 ºC for 2 (+1,–0) hours. Then the insulation resistance will be no less than 5GΩ.

**Solderability:** Capacitor is immersed for 2 sec ±0.5, in a solder bath at 235 ºC ±5 ºC and covered with solder (Pb-Free), with 75% or more of the terminal portion.

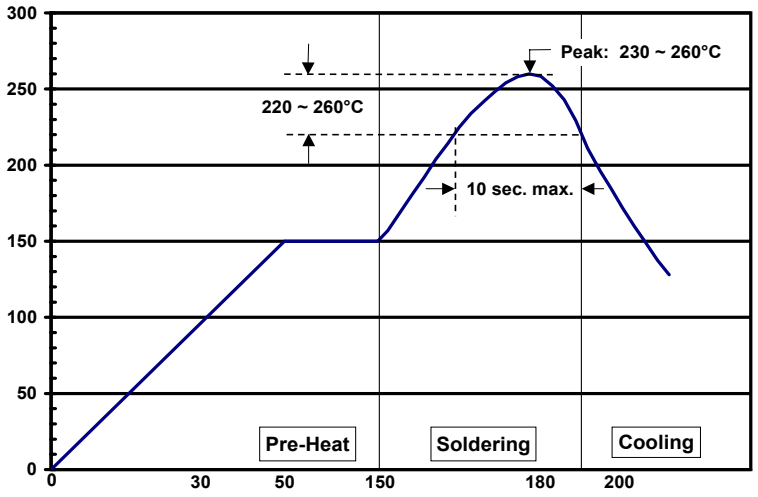
**Solder Heat Resistance:** Subject the capacitors to molten solder at 250±5 ºC for 5±0.5 seconds after 10 to 30 seconds pre-heating at 80 to 120 ºC. There will be no visual damage and the capacitors will meet the limits of the table below.

## After-Test Limits

| Test | Withstand Voltage | Insulation Resistance | Capacitance (whichever >) | DF | Q |
|---|---|---|---|---|---|
| Life Test | IL | IL | IV ±2% or ±.5 pF | 150% max IL | 2/3 x IL |
| Vibration Resistance | IL | 30 GΩ | IV ±1% or ±1 pF | IL | IL |
| Bending Test | IL | | IV ±.5% or ±1 pF | IL | |
| Moisture Res. | IL | 30 GΩ | IV ±3% or ±.5 pF | 150% max IL | 2/3 x IL |
| Solderability | IL | IL | IL | IL | IL |
| Heat Resistance | | 5 GΩ | | | |
| Solder Heat Res. | IL | 30 GΩ | IV ±.5% or ±1 pF | IL | IL |

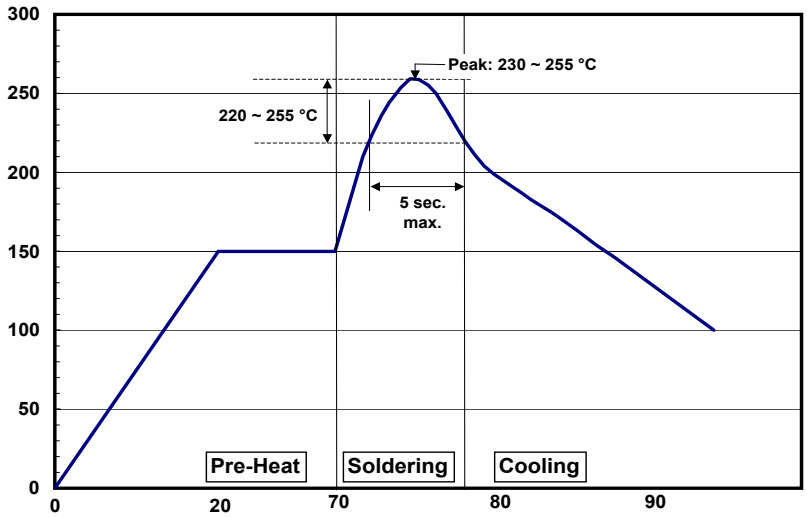
## Soldering Profiles

### Reflow Solder Profile




Time (sec)

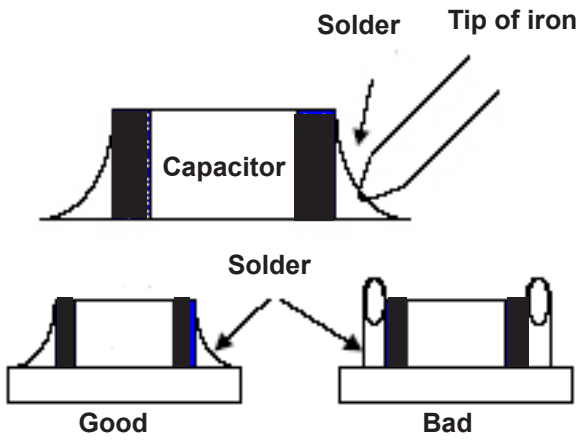
### Wave Solder Profile



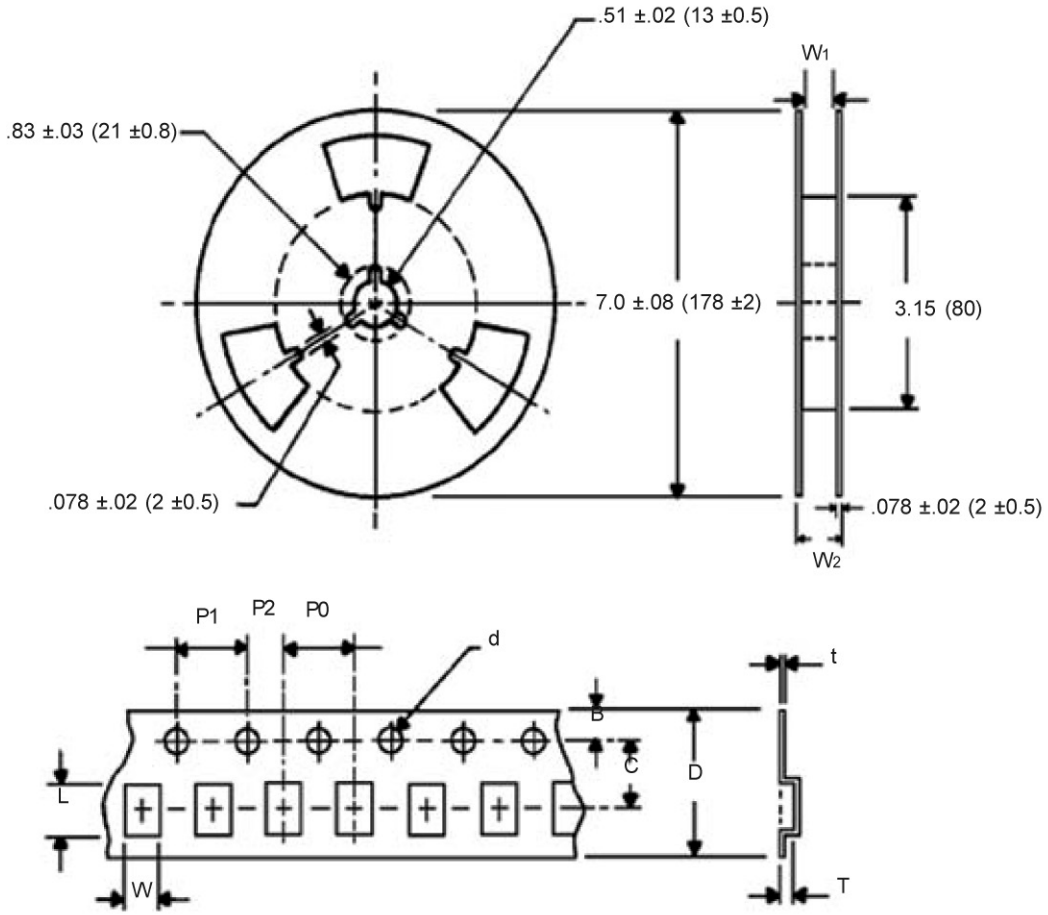

Time (sec)

### Hand Soldering Method

- SnAgCu recommended solder
- Do not use strong acid type flux with RM or RMA
- Soldering iron tip temperature should be 250 ºC to 280 ºC ≤ 5 sec.
- 60 Watt iron or less



## Surface-Mount Chip Mica Capacitors for Auto Insertion




## Carrier Dimensions

| Item | Symbol | Case Code 08 | 12 | 18 | 22 |
|---|---|---|---|---|---|
| Sprocket hole pitch | P1 | .157 ±.008 (4.0 ±0.2) | | | |
| Sprocket hole location | B | .069 ±.008 (1.75 ±0.2) | | | |
| Hole center to cavity center | C | .138 ±.002 (3.5 ±0.05) | | .217±.004 (5.5 ±0.1) | |
| Carrier tape width | D | .315 ±.012 (8.0 ±0.3) | | .472 ±.012 (12.0 ±0.3) | |
| Sprocket hole diameter | d | .059 (1.5 ) | | | |
| Cavity pitch | $P_0$ | .157 .004 (4.0 ±0.1) | | .315 ±.008 (8.0 ±0.2) | |
| Hole center to cavity center | $P_2$ | .079 ±.004 (2.0 ±0.1) | | | |
| Cavity length | L | .110 (2.8 ) | .150 (3.8 ) | .205 (5.2 ) | .246 (6.25 ) |
| Cavity width | W | .075 ±.008 (1.9 ±0.2) | .118 ±.008 (3.0 ±0.2) | .161 ±.008 (4.1 ±0.2) | .217 ±.008 (5.5 ±0.2) |
| Cavity depth | T | .051 ±.004 (1.3 ±0.1) | .059 ±.004 (1.5 ±0.1) | .071 ±.004 (1.8 ±0.1) | .087 ±.004 (2.2 ±0.1) |
| Carrier tape thickness | t | .012 ±.002 (0.3 ±0.05) | | | |
| Holder distance | $W_1$ | .354 (9.0 ) | | .512 (13.0 ) | |
| Reel thickness | $W_2$ | about .47 (12) | | about .63 (16) | |

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