

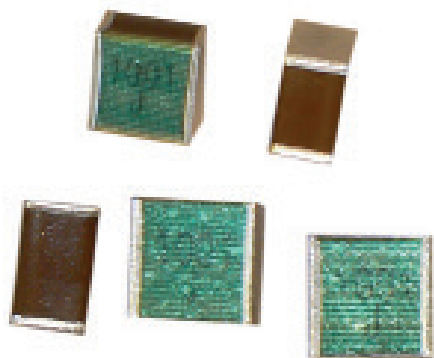


**THE DATASHEET OF
MCH38FM220J**



Types MCH and MCHN Multilayer High RF Power Capacitors

2500 & 4000 Volt RF Capacitors for Medical Imaging Coils, Plasma Generators, VHF/UHF Power Amplifiers and Antenna Tuning with Nonmagnetic Option



The flexible aluminum silicate dielectric eliminates cracking and permits soldering to 260 °C. These high voltage, RF capacitors need no voltage derating at temperatures up to 125 °C and voltages to 4000 Vdc. Exceptionally low ESR and superior thermal qualities set the MCH/MCHN chip capacitors apart from ordinary RF capacitors.

Highlights

- No thermal cracking
- FR4 compatible and wave solderable
- Extremely high Q above 50 MHz
- Nonmagnetic option available
- Ultra stable: no change with (t), (V) and (f)
- Excellent for tuning and impedance matching
- High flashover level
- Withstands 2 mm bend test
- Better than porcelain

Applications

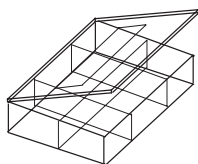
- MRI Coils
- RF Ablation Systems
- Transmitters
- RF Generators
- Antenna Tuning
- Lasers
- RF Power Amplifiers
- MRI Generators

Specifications

Capacitance Range & Rated Voltage	10 – 220 pF at 4kVdc and 270 – 1000 pF at 2500 Vdc (other ratings available)	
Capacitance Tolerance	±5% standard (±2% available)	
Operating Temperature Range	–55 °C to +125 °C (with no voltage derating)	
Case Size	3838 (9.7 x 9.7 mm)	
Temperature Characteristics	Temp. Coefficient	Cap Drift
	0 to +50 ppm/°C	±(0.05%+0.1 pF)
RoHS Compliant		

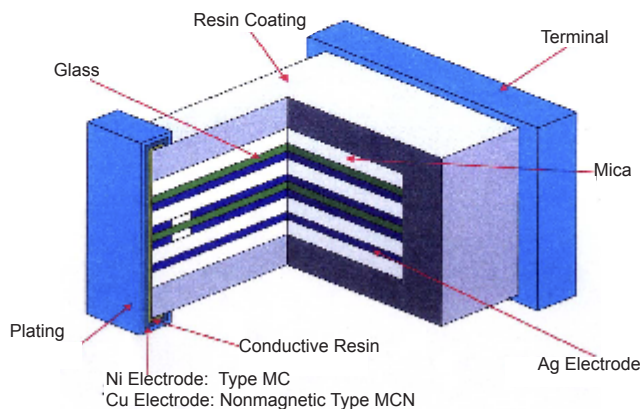
Engineering Design Kits

MCH2500VKIT8, MCH4000VKIT10
Nonmagnetic MCHN2500VKIT9, MCHN4000VKIT11



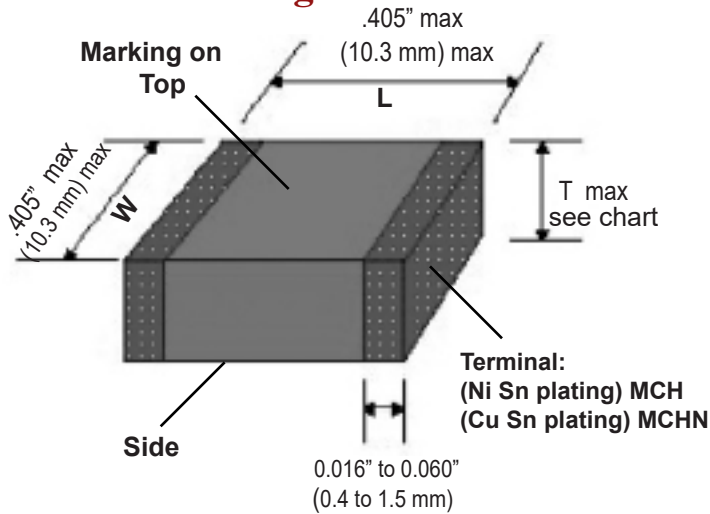
2500 V kits 5 each of 8 values 270 to 1000 pF
4000 V kits 5 each of 10 values 10 – 220 pF

High Q, Low ESR Multilayer Construction for RF Power Applications

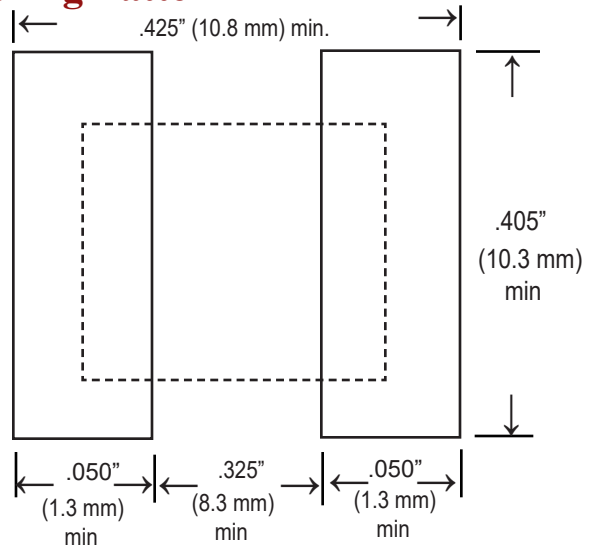


Types MCH and MCHN Multilayer High RF Power Capacitors

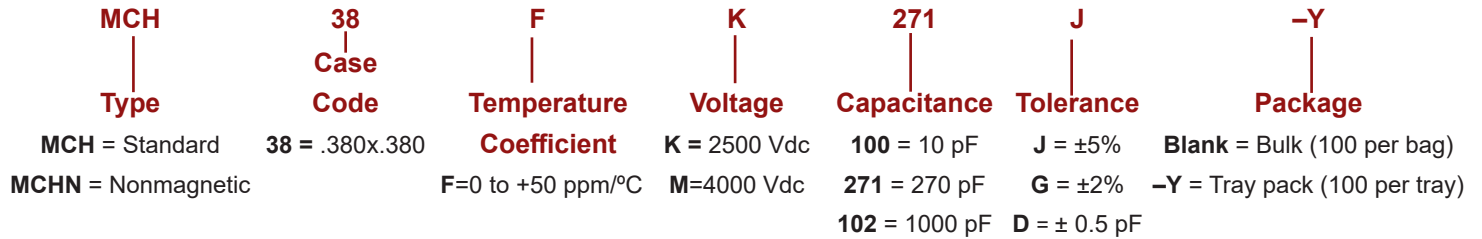
Outline Drawing



Soldering Pattern



Part Numbering System



Ratings (additional ratings available)

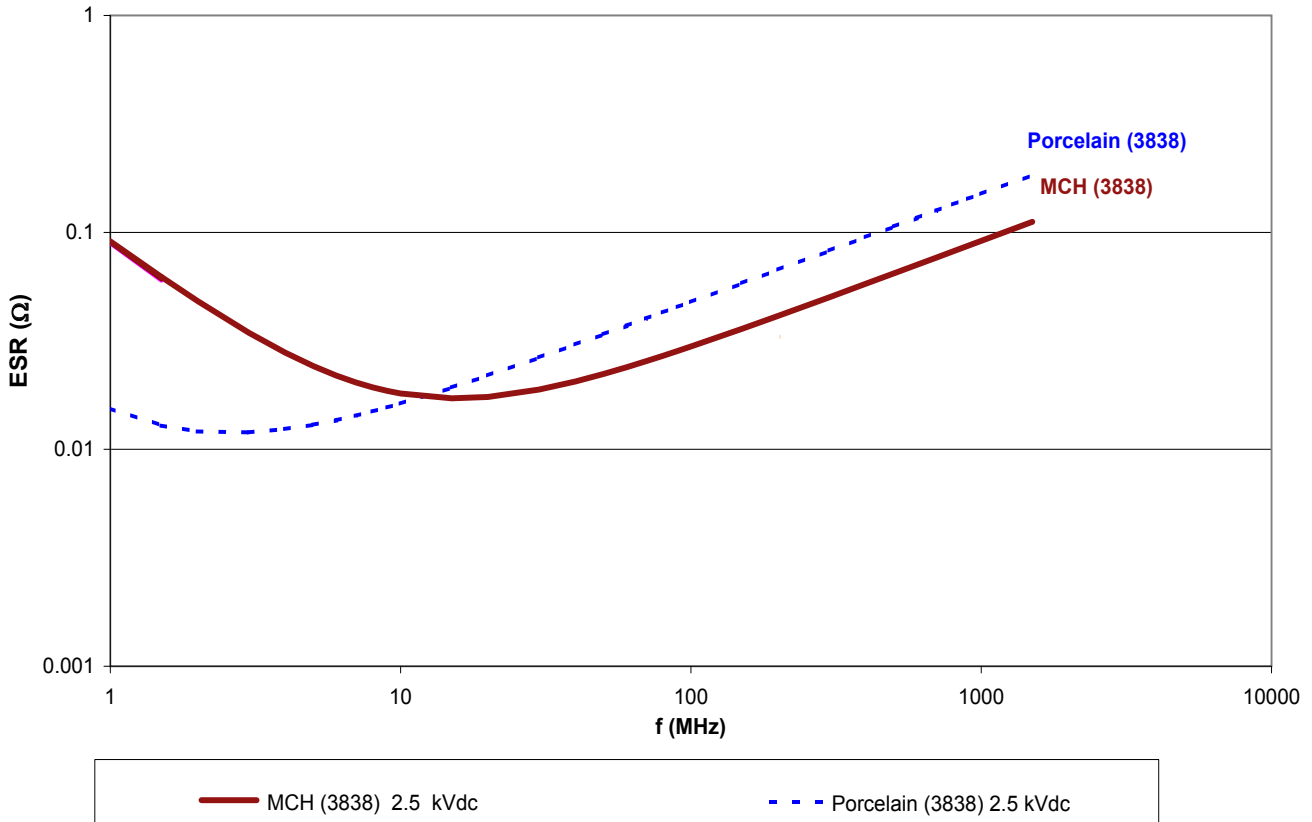
Cap (pF)	Catalog Part Number*	Voltage (Vdc)	Length Inches (mm)	Width Inches (mm)	T max Inches (mm)
10	MCH38FM100D-Y	4000 Vdc	0.380 +0.025 / -0 (9.65 mm +0.65 / - 0)	0.380 +0.025 / -0 (9.65 mm +0.65 / -0)	0.080 (2.03 mm)
12	MCH38FM120J-Y				
15	MCH38FM150J-Y				
18	MCH38FM180J-Y				
22	MCH38FM220J-Y				
27	MCH38FM270J-Y				
33	MCH38FM330J-Y				
39	MCH38FM390J-Y				
47	MCH38FM470J-Y				
56	MCH38FM560J-Y				
68	MCH38FM680J-Y				
82	MCH38FM820J-Y				
100	MCH38FM101J-Y				
120	MCH38FM121J-Y				
150	MCH38FM151J-Y				
180	MCH38FM181J-Y				
220	MCH38FM221J-Y				
270	MCH38FK271J-Y	2500 Vdc			0.160 (4.06 mm)
330	MCH38FK331J-Y				
390	MCH38FK391J-Y				
470	MCH38FK471J-Y				
560	MCH38FK561J-Y				
680	MCH38FK681J-Y				
820	MCH38FK821J-Y				
1000	MCH38FK102J-Y				

*For nonmagnetic version change P/N prefix to MCHN

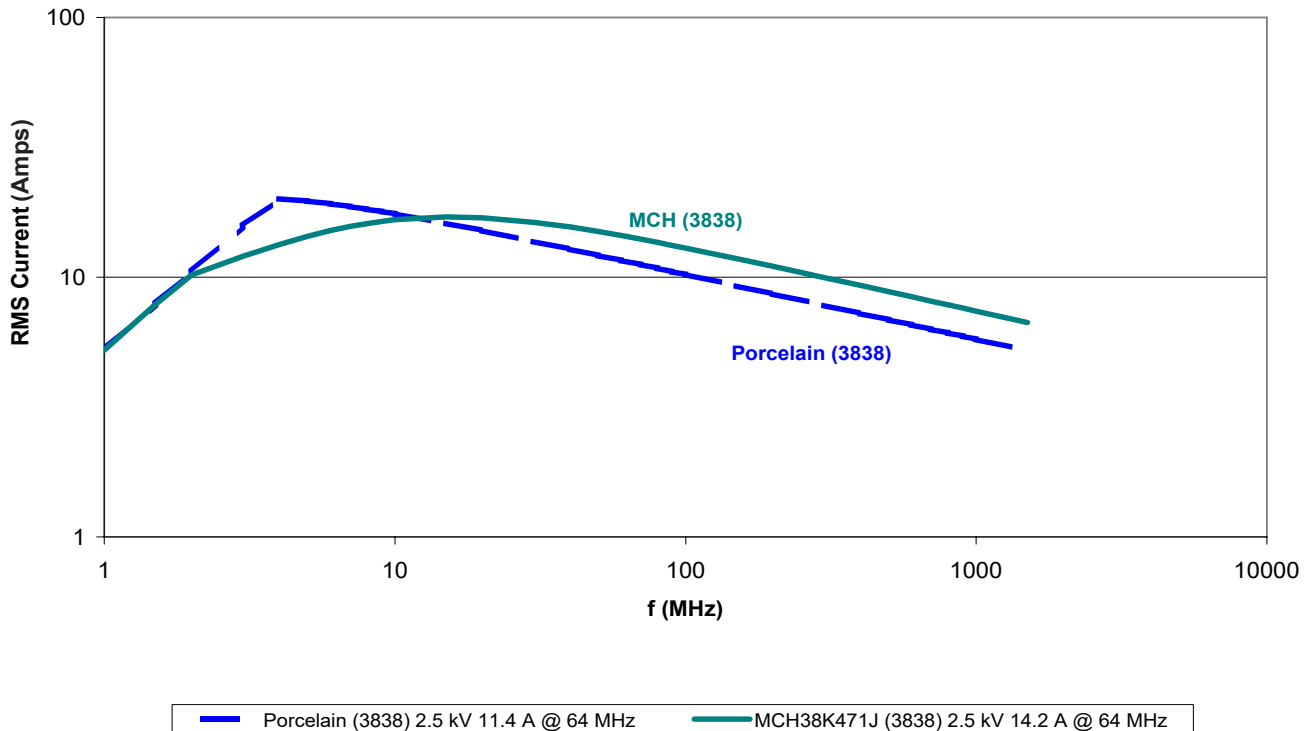
Types MCH and MCHN Multilayer High RF Power Capacitors

Typical Performance Data

ESR vs. Frequency for 470 pF



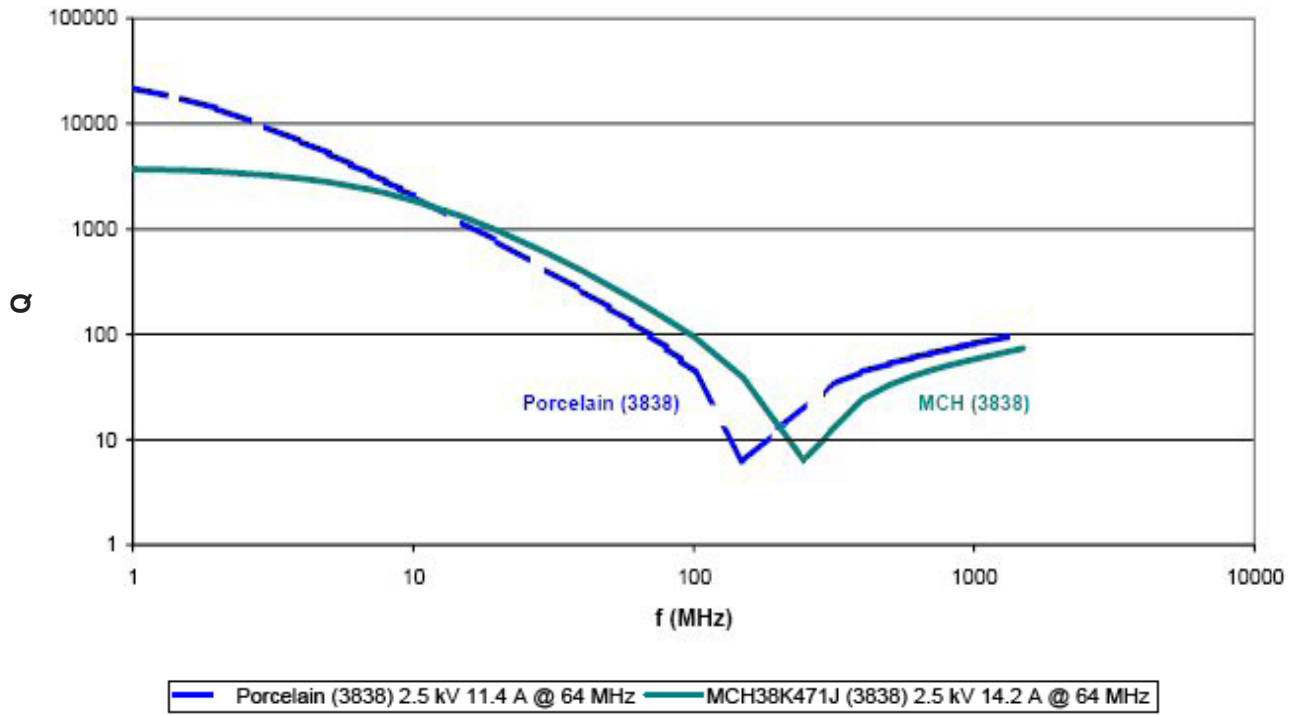
Current Rating (IRMS) for 470 pF at 60 °C Rise



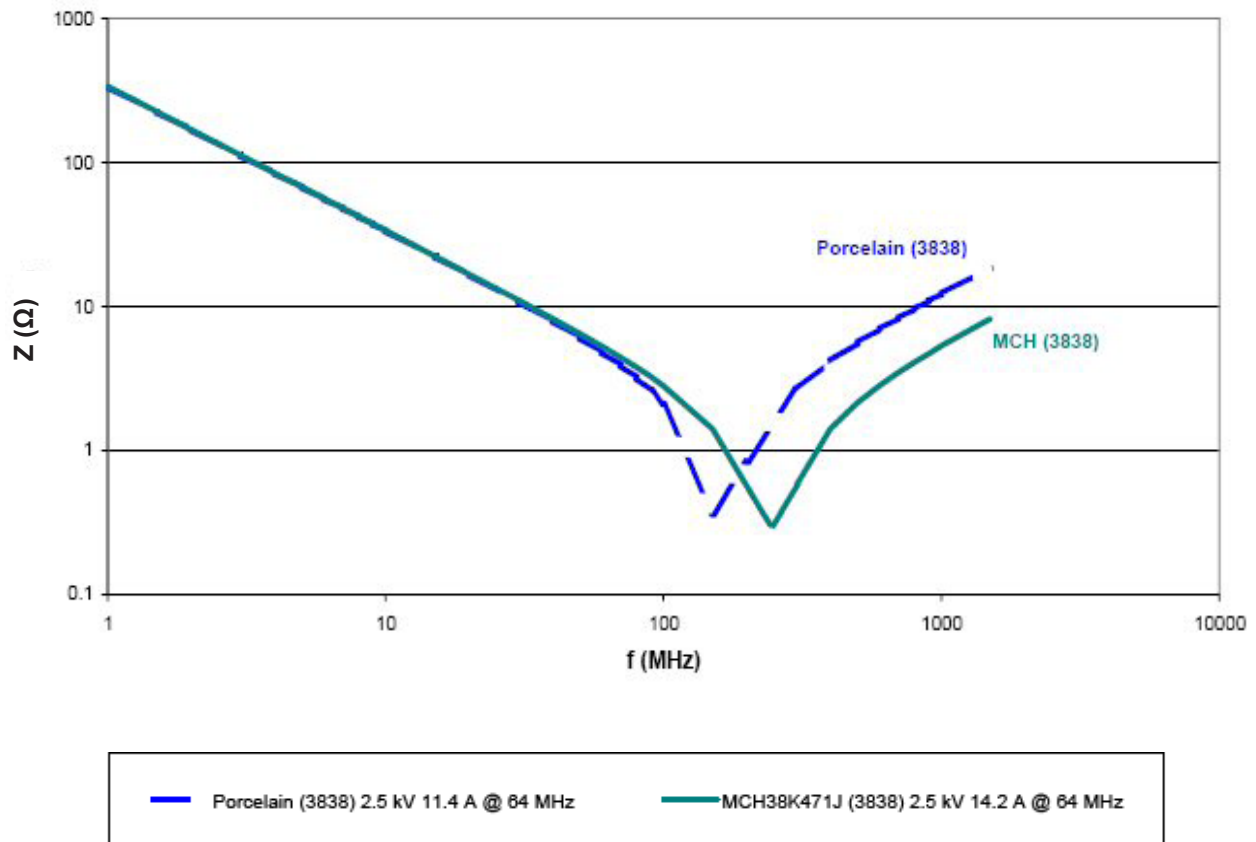
Types MCH and MCHN Multilayer High RF Power Capacitors

Typical Performance Data

Q vs. Frequency 470 pF @ 25 °C

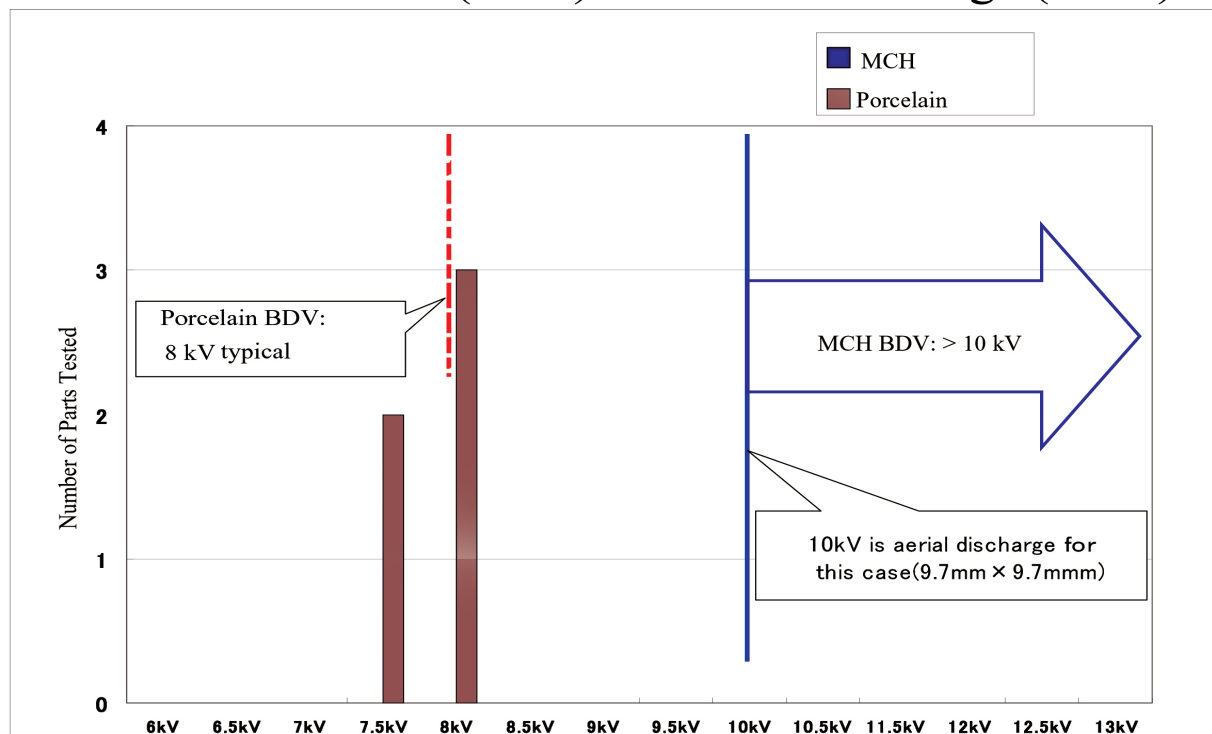


Impedance vs. Frequency for 470 pF @ 25 °C



Typical Performance Data

MCH vs. Porcelain (3838) Breakdown Voltage (BDV)



Environmental Specifications

Humidity (No Load): +40 °C ±2 °C @ 90% to 95% RH, 500 hrs. Measure after 24 hrs, cap is ±3% of initial, DF ≤150% of original, IR 3x10⁴ MΩ, no visual damage

Storage Method: Store at 0 to +40 °C at ≤60% RH, use within 6 months of receipt, if 6 months is exceeded, check solderability

Electrical Specifications

Dielectric Strength: 2500 Vdc: 1.5 x Rated Voltage for 5 seconds
4000 Vdc: 1.2 x Rated Voltage for 5 seconds

Dissipation Factor (DF): ≤0.1% @ 1 MHz and ≤5 Vrms

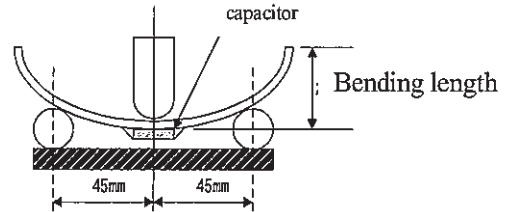
Insulation Resistance: 100K MΩ minimum @ 500 Vdc ±10%

Types MCH and MCHN Multilayer High RF Power Capacitors

Mechanical Specifications

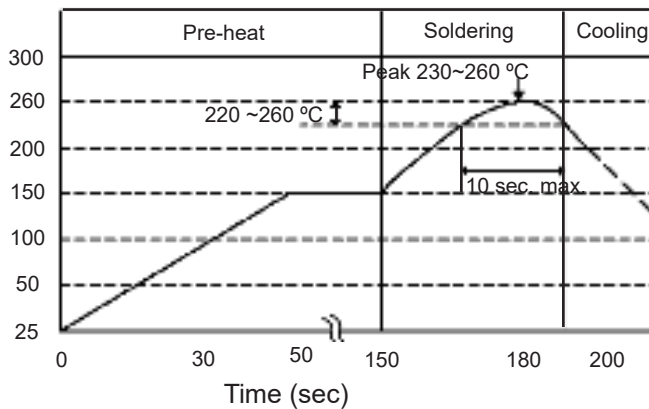
Bending Test:

Mount the capacitor as shown below and press the ram bar until a 2.0 mm deflection is achieved. There will be no visual damage and the capacitors will meet the limits of methods JIS 5102 8.11 and AEC-Q200-005 without cracking or visual damage.

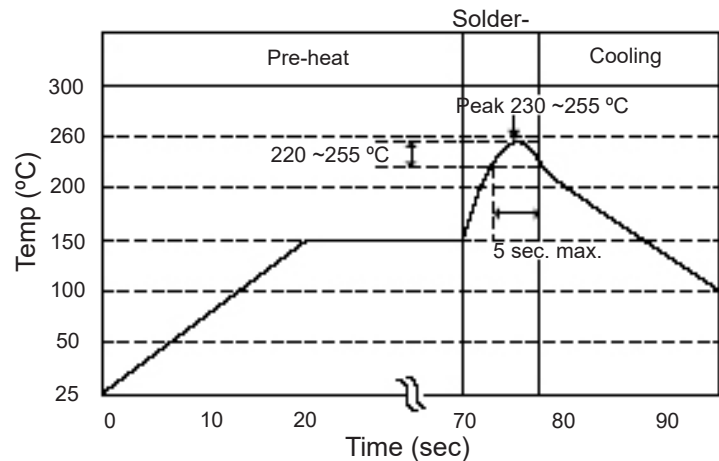


Soldering Specifications

Reflow Solder Profile

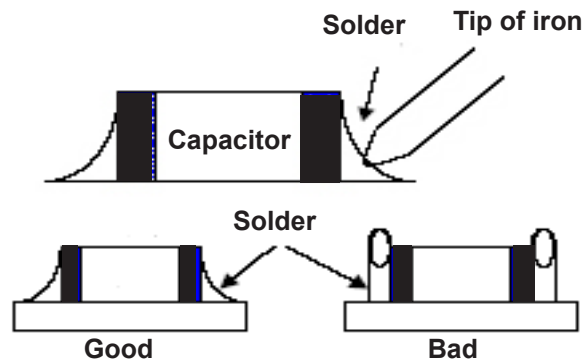


Wave Solder Profile



Hand Soldering Method

- SnPb or SnAgCu recommended solder
- Do not use strong acid type flux with RM or RMS
- Soldering iron tip temperature should be 280 °C to 350 °C ≤ 5 sec.
- 80 Watt iron or less
- Iron tip should not touch chip terminals



Types MCH and MCHN **Multilayer High RF Power Capacitors**

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