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*

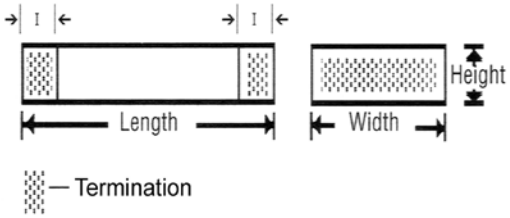
Case Codes 18 & 22: 1,000/reel**

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



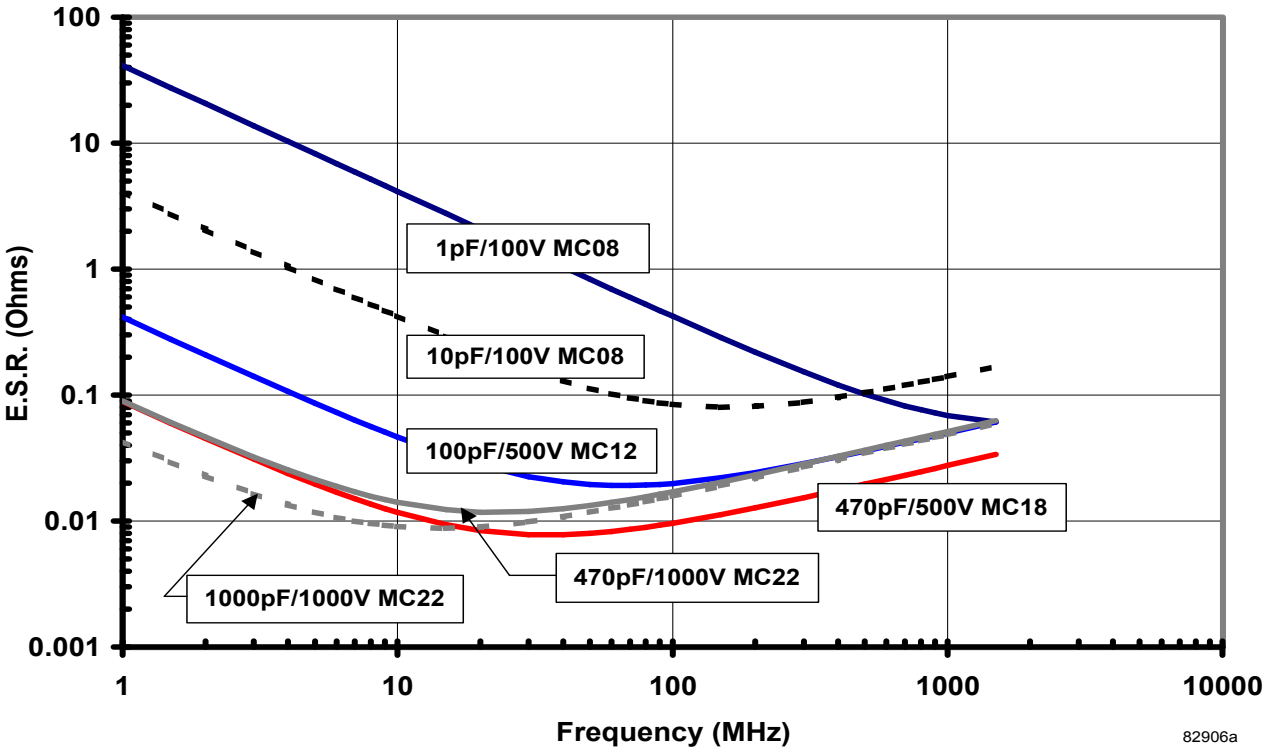
Case Sizes

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

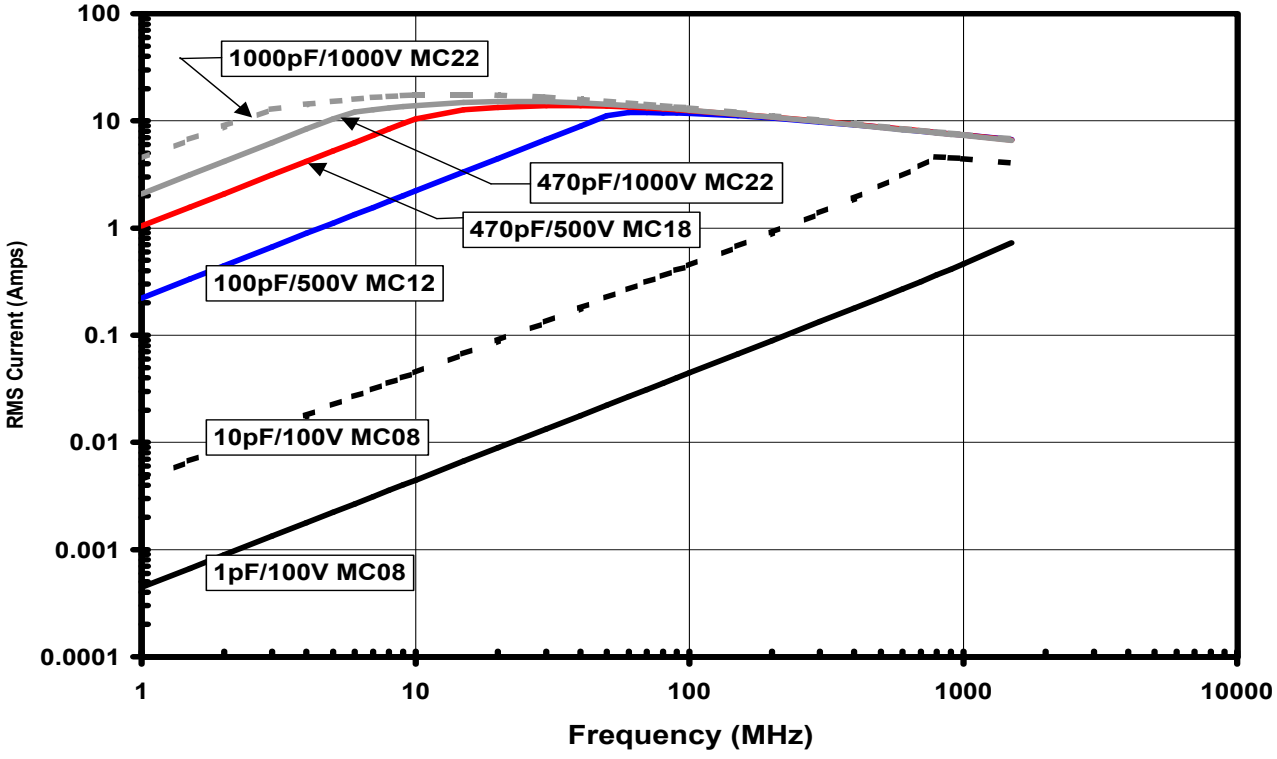
*.157 (4.0 mm) for 1000 V rating

Typical Performance Curves

Type MC Typical ESR vs. Frequency

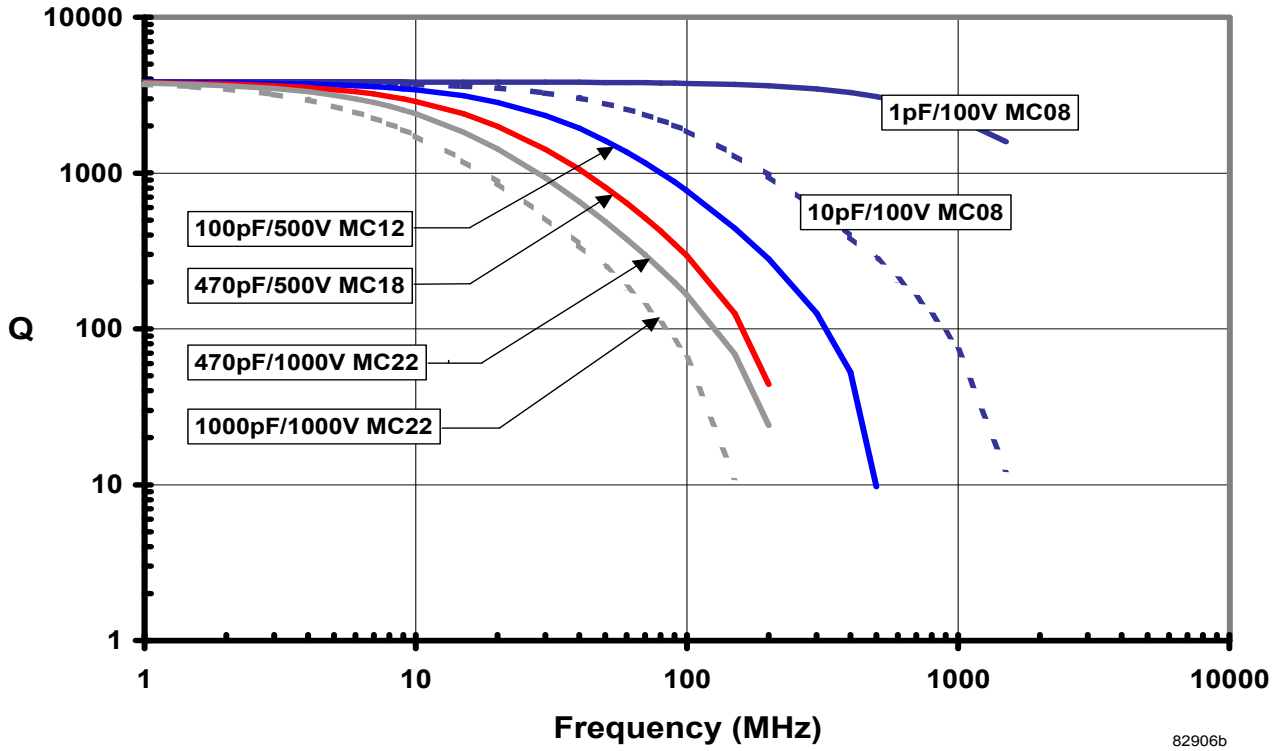


Type MC Maximum RMS Current vs. Frequency

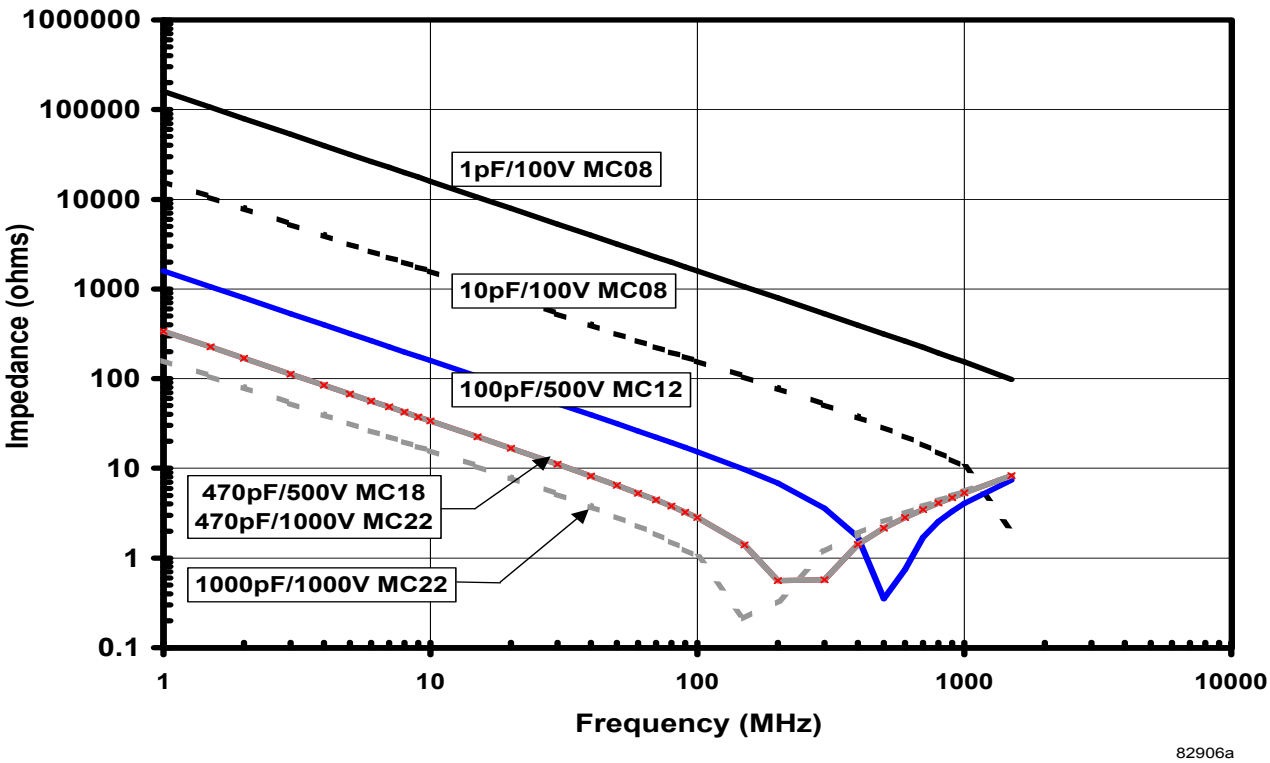


Typical Performance Curves

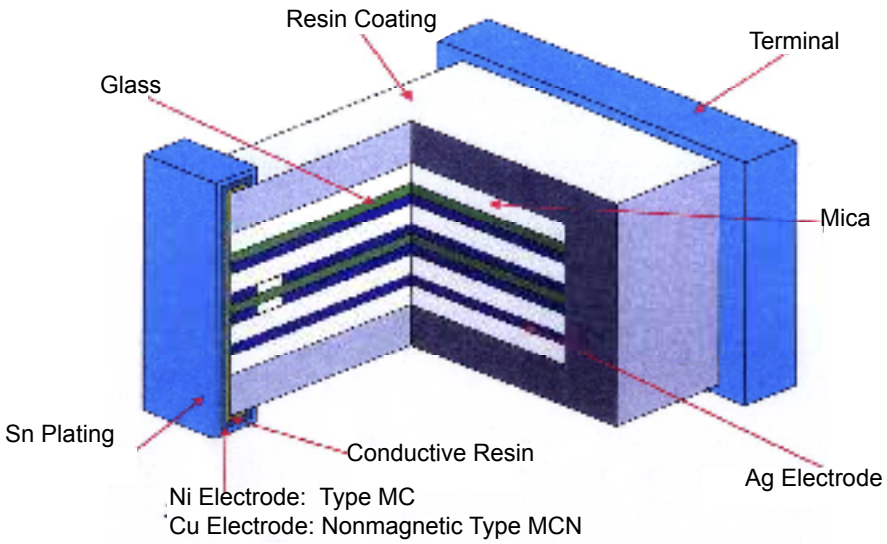
Type MC Typical Q vs. Frequency



Type MC Typical Impedance vs. Frequency

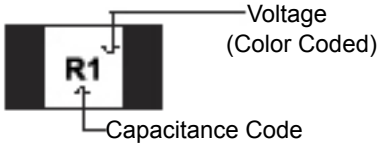


High Q, Low ESR Construction for RF Power Applications



Specifications

Marking



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

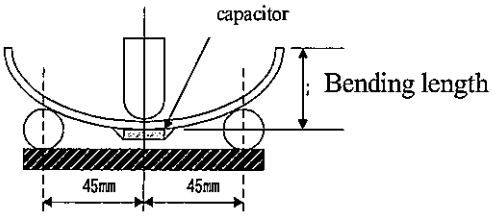
Insulation Resistance is no less than 100 GΩ when measured at 100 Vdc

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 0.06 inches; 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 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.



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: After 2 ±0.5 seconds in molten solder with Sn-PB between molten and solder at 235 ±5 ºC, solder coverage will be no less than 75% when examined at 10X magnification for flow soldering.

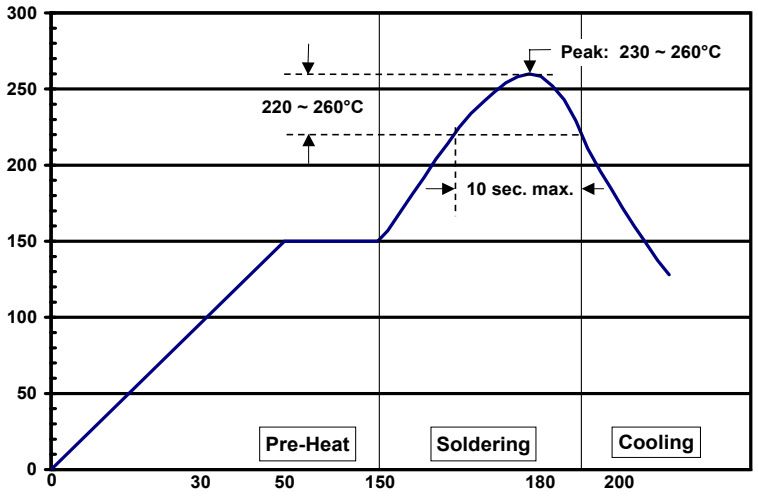
Solder Heat Resistance: Subject the capacitors to molten solder at 250±5 ºC for 5±0.5 seconds after 10 to 30 seconds pre-heating at 80 to 120 ºC. There will be no visual damage and the capacitors will meet the limits of the table below.

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

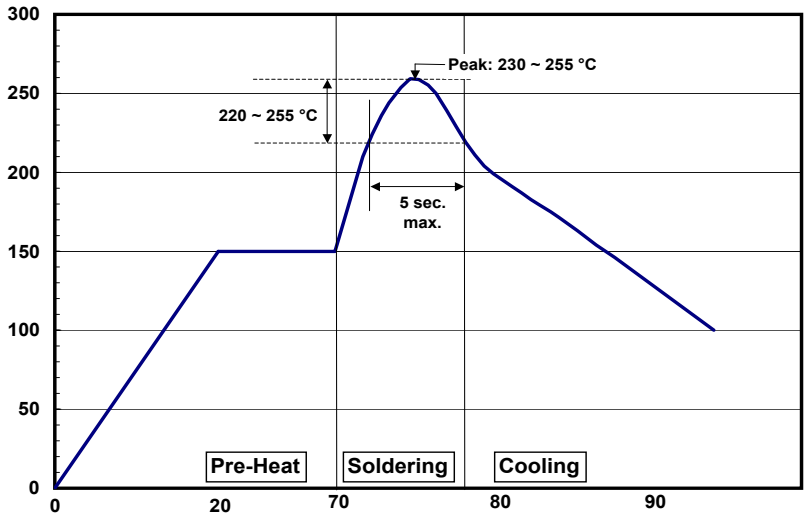
Soldering Profiles

Reflow Solder Profile



Time (sec)

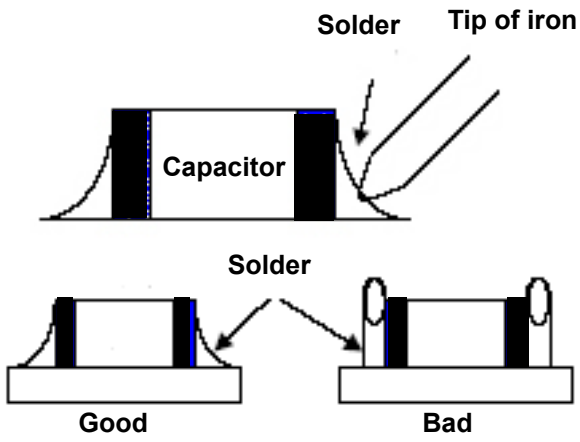
Wave Solder Profile



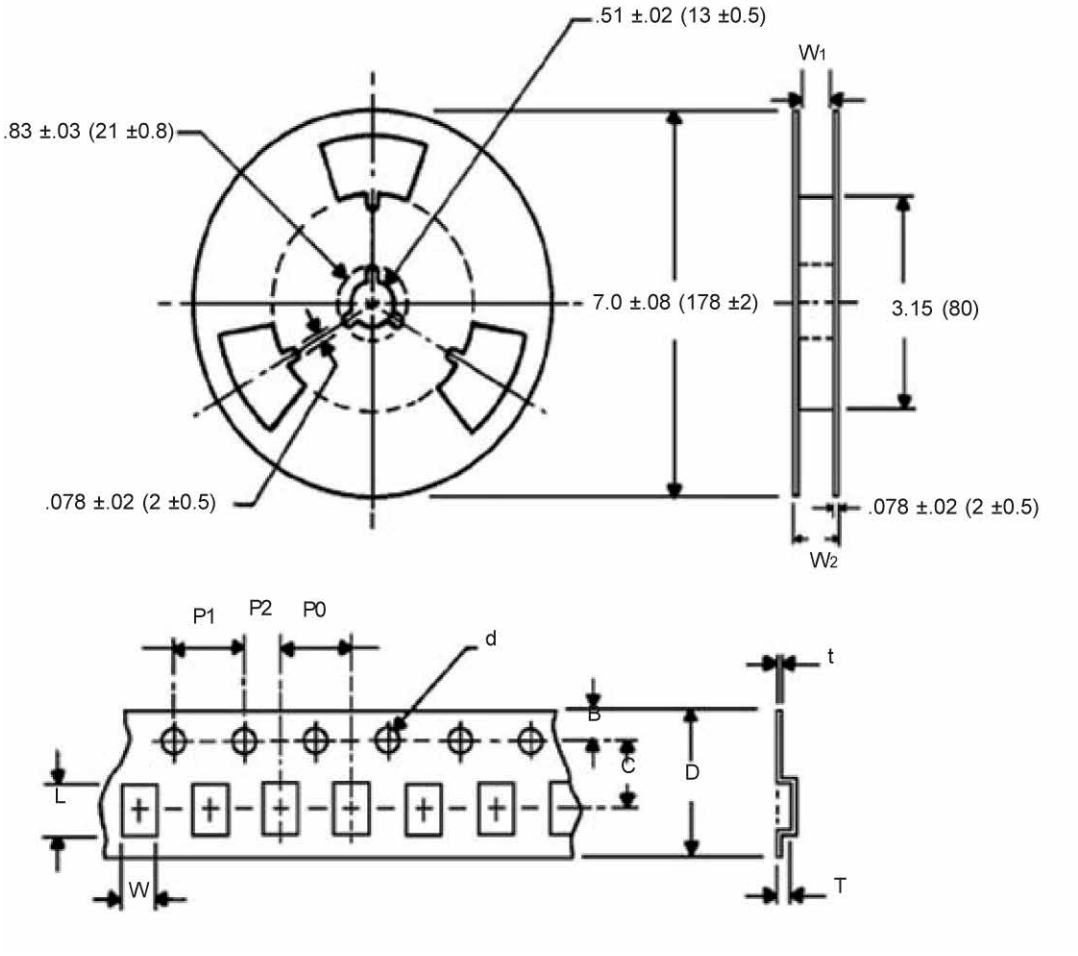
Time (sec)

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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