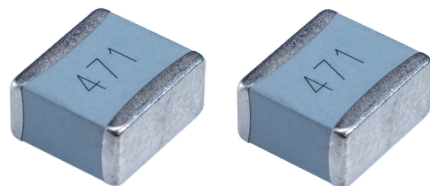


MQ50 High-Q MLCC

1 Features

- 1) Low ESR, low ESL, high self-resonance frequency, high Q and low noise;
- 2) Ultra-high density ceramic body, stability, and ultra-high reliability;
- 3) No Capacitance shift with Temperature variance.



2 Applications

Function: Bypass, Coupling, Tuning, Feedback, Impedance Matching and DC Blocking.

Circuits: MW/RF/Mid-frequency Amplifier, Frequency Mixer, Oscillator, low-noise Amplifier, Filter Network, Timing and Time

Delay. Terminal Applications: Phased Array Radars, MRI, Radio Stations, RF Plasma, Laser Devices, Etc.

3 How to order

MQ	50	0505	C0G	2D	101	J	N	D	R	02
Type	Series	Case Size Code	TCC	Rated V.	Nomina Capacitance	Capacitance Tolerance	Termination Type	Thickness Code	Packing	Micro Strip Type
Table 1	Table 2	Table 3	Table 4	Table 5	Table 6	Table 7	Table 8	Table 9	Table 10	Table 11

Table 1 Product Type

MQ	High-Q MLCC
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Table 2 Product Series

50	Applicable to high reliability .The case sizes of 0505, 1111, 2525, 3838, etc. are available.
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Table 3 Case Size Code Dimensions(mm)

Case Size	Termina Type	Drawing	L	W	T(min)	T(max)	B	L _L (Min)	W _L	T _L
1111	MS/MN		2.79 ^{+0.89} _{-0.51}	2.79 ± 0.51	0.76	2.59	/	6.35	2.36 ± 0.15	0.10 ± 0.03
2525	MS/MN		5.84 ^{+0.51} _{-0.25}	6.50 ± 0.25	/	4.19	/	12.7	6.10 ± 0.25	0.10 ± 0.03
3838	MS/MN		9.65 ^{+0.38} _{-0.25}	9.85 ± 0.30	/	4.32	/	19.05	8.89 ± 0.25	0.25 ± 0.13
0505	N/D/TN		1.40 ± 0.64	1.40 ± 0.38	0.51	1.45	0.25 ^{+0.25} _{-0.13}	/	/	/
1111	N/D/TN		2.79 ^{+0.89} _{-0.51}	2.79 ± 0.51	0.76	2.59	0.38 ^{+0.50} _{-0.25}	/	/	/
2525	N/D/TN		5.84 ^{+0.51} _{-0.25}	6.50 ± 0.25	/	4.19	1.0max	/	/	/
3838	N/D/TN		9.65 ^{+0.38} _{-0.25}	9.85 ± 0.30	/	4.32	1.2max	/	/	/

Table 4 Temperature Coefficient

Code	Temperature Coefficient	Operating Temperature	Table 5 Rated Voltage					
			1H	50V	2H	500V	3E	2500V
C0G	0±30ppm/°C	-55°C ~125°C	2A	100V	2J	600V	3F	3000V
			2C	150V	2K	800V	3V	3600V
			2D	200V	3A	1000V	3H	5000V
			2E	250V	3C	1500V	3L	7200V
			2F	300V	3D	2000V		

Table 6 Nominal Capacitance

EIA Capacitance code in pF.1st two digit are significant figures of capacitance; 3rd digit denotes number of Zeros;

R=decimal point; For examples: 103=10,000pF; 3R9=3.9pF.

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Table 7 Capacitance Tolerance

B	±0.1pF	C _R < 10pF	N	Silver/Nickle/Tin
			D	Silver/Nickel/Gold (Gold Thickness≥1μm)
C	±0.25pF		Z	Silver/Nickle/Tin&Lead
			TN	Silver/Copper/Tin
D	±0.5pF		ZN	Silver/Copper/Tin&Lead
			AW	Axial Wire (Silver plated over Copper Wire for 1111,2525,3838)
F	± 1%	C _R ≥ 10pF	BN	Non-Magnetic Axial Wire(Silver plated over Copper Wire)
			RW	Radial Wire(for 1111,2525,3838)
G	± 2%		RN	Non-Magnetic Radial Wire(for 1111,2525,3838)
			MS	Micro Strip(Silver plated over Copper for 1111,2525,3838)
J	± 5%		MA	Micro Strip(Silver for 1111,2525,3838)
			MN	Non-magnetic Micro Strip(Silver plated over Copper)
K	± 10%		FN	Radial Non-magnetic Micro Strip(Silver plated over Copper)
			AR	Axial Micro Strip(Silver for 1111,2525,3838)
M	± 20%			AN

Table 9 Thickness Code

Case Size Code	Capacitance (pF)	Thickness Code	Standard Thickness(mm)	Thickness Tolerance(mm)
0505	0.1	A	0.60	± 0.15
	0.2~100	D	1.00	± 0.15
1111	0.1	D	1.00	± 0.15
	0.2	F	1.25	± 0.20
	0.3~0.4	H	1.60	± 0.20
	0.5~1000	M	2.30	± 0.20
2525	1~2700	L	3.20	± 0.40
3838	1~5100	N	3.80	± 0.50

Table 10 Packing

B- Bulk with Bag	R- Reel	C- Waffle
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Table 11 Micro-Strip Style

Blank	01	02
There are φ1mm holes in the center of Micro-strip	Micro-strip with no holes	Micro-strip with cushion function,24.2mm holes for assembly,Distance of 2 holes is 39mm

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4 MQ 50 Series COG Capacitance Values

0505																		
Cap. code	Cap. (pF)	Cap. Tolerance	Rated DC Voltage(V)		Cap. code	Cap. (pF)	Cap. Tolerance	Rated DC Voltage(V)		Cap. code	Cap. (pF)	Cap. Tolerance	Rated DC Voltage(V)					
0R1	0.1	B	150	Extended Voltage 250	2R2	2.2	B、C、D	150	Extended Voltage 250	160	16	F、G、J、K、M	150	Extended Voltage 250				
0R2	0.2				2R4	2.4				180	18							
0R3	0.3				2R7	2.7				200	20							
0R4	0.4	B、C			3R0	3.0				220	22							
0R5	0.5				3R3	3.3				240	24							
0R6	0.6				3R6	3.6				270	27							
0R7	0.7	B、C、D			3R9	3.9				300	30							
0R8	0.8				4R3	4.3				330	33							
0R9	0.9				4R7	4.7				360	36							
1R0	1.0	B、C、D			5R1	5.1	B、C、D			390	39	F、G、J、K、M	150	Extended Voltage 250				
1R1	1.1				5R6	5.6				430	43							
1R2	1.2				6R2	6.2				470	47							
1R3	1.3				6R8	6.8				510	51							
1R4	1.4				7R5	7.5				560	56							
1R5	1.5				8R2	8.2				620	62							
1R6	1.6				9R1	9.1				680	68			Extended Voltage 250				
1R7	1.7				100	10	F、G、J、K、M			750	75							
1R8	1.8				110	11				820	82							
1R9	1.9				120	12				910	91							
2R0	2.0				130	13				101	100							
2R1	2.1				150	15												
1111																		
0R1	0.1	B	500	Extended Voltage 1500	4R7	4.7	B、C、D	500	Extended Voltage 1500	750	75	F、G、J、K、M	500	Extended Voltage 1500				
0R2	0.2				5R1	5.1				820	82							
0R3	0.3	B、C			5R6	5.6				910	91							
0R4	0.4				6R2	6.2				101	100			Extended Voltage 1000				
0R5	0.5	B、C、D			6R8	6.8				111	110							
0R6	0.6				7R5	7.5				121	120							
0R7	0.7				8R2	8.2				131	130			Extended Voltage 600				
0R8	0.8	B、C、D			9R1	9.1	F、G、J、K、M			151	150							
0R9	0.9				100	10				161	160							
1R0	1.0				110	11				181	180							
1R1	1.1	B、C、D			120	12				201	200			Extended Voltage 300				
1R2	1.2				130	13				221	220							
1R3	1.3				150	15				241	240							
1R4	1.4				160	16				271	270	F、G、J、K、M	200	Extended Voltage 600				
1R5	1.5				180	18				301	300							
1R6	1.6				200	20				331	330							
1R7	1.7				220	22				361	360							
1R8	1.8				240	24				391	390							
1R9	1.9				270	27				431	430							
2R0	2.0				300	30				471	470							
2R1	2.1				330	33				511	510							
2R2	2.2				360	36				561	560							
2R4	2.4				390	39				621	620			Extended Voltage 300				
2R7	2.7				430	43				681	680							
3R0	3.0				470	47				751	750							
3R3	3.3				510	51				821	820							
3R6	3.6				560	56				911	910							
3R9	3.9				620	62				102	1000							
4R3	4.3				680	68												

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2525																
Cap. code	Cap. (pF)	Cap. Tolerance	Rated DC Voltage(V)		Cap. code	Cap. (pF)	Cap. Tolerance	Rated DC Voltage(V)		Cap. code	Cap. (pF)	Cap. Tolerance	Rated DC Voltage(V)			
1R0	1.0	B、C、D	2500	Extended Voltage 3600	120	12	F、G、J、K、M	2500	Extended Voltage 3600	221	220	F、G、J、K、M	2500	Extended Voltage 3000		
1R1	1.1				130	13				241	240					
1R2	1.2				150	15				271	270					
1R3	1.3				160	16				301	300					
1R4	1.4				180	18				331	330					
1R5	1.5				200	20				361	360					
1R6	1.6				220	22				391	390					
1R7	1.7				240	24				431	430					
1R8	1.8				270	27				471	470					
1R9	1.9				300	30				511	510					
2R0	2.0				330	33				561	560					
2R1	2.1				360	36				621	620					
2R2	2.2				390	39				681	680					
2R4	2.4				430	43				751	750					
2R7	2.7				470	47				821	820					
3R0	3.0				510	51				911	910					
3R3	3.3				560	56				102	1000					
3R6	3.6				620	62				112	1100					
3R9	3.9				680	68				122	1200					
4R3	4.3				750	75				152	1500					
4R7	4.7				820	82				182	1800					
5R1	5.1				910	91				202	2000					
5R6	5.6				101	100				222	2200					
6R2	6.2				111	110				242	2400					
6R8	6.8				121	120				272	2700					
7R5	7.5				131	130										
8R2	8.2				151	150										
9R1	9.1				161	160										
100	10	F、G、J、K、M				181				180						
110	11				201	200										

3838																
1R0	1.0	B、C、D	3600	Extended Voltage 7200	130	13	F、G、J、K、M	3600	Extended Voltage 7200	271	270	F、G、J、K、M	3600			
1R1	1.1				150	15				301	300					
1R2	1.2				160	16				331	330					
1R3	1.3				180	18				361	360					
1R4	1.4				200	20				391	390					
1R5	1.5				220	22				431	430					
1R6	1.6				240	24				471	470					
1R7	1.7				270	27				511	510					
1R8	1.8				300	30				561	560					
1R9	1.9				330	33				621	620					
2R0	2.0				360	36				681	680					
2R1	2.1				390	39				751	750					
2R2	2.2				430	43				821	820					
2R4	2.4				470	47				911	910					
2R7	2.7				510	51				102	1000					
3R0	3.0				560	56				112	1100					
3R3	3.3				620	62				122	1200					
3R6	3.6				680	68				152	1500					
3R9	3.9				750	75				182	1800					
4R3	4.3				820	82				202	2000					
4R7	4.7				910	91				222	2200					
5R1	5.1				101	100				242	2400					
5R6	5.6				111	110				272	2700					
6R2	6.2				121	120				302	3000					
6R8	6.8				131	130				332	3300					
7R5	7.5				151	150				362	3600					
8R2	8.2				161	160				392	3900					
9R1	9.1				181	180				432	4300					
100	10	F、G、J、K、M				201				200	/		472	4700		
110	11				221	220				512			5100			
120	12				241	240										

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5 Electrical Specifications&Test Conditions		
Item	Test Conditions (25°C ±2°C)	Electrical Specifications
Capacitance		Capacitance is up to requirements
Dissipation Factor tanδ	Test Frequency: $C_R \leq 1000\text{pF}, 1\text{MHz} \pm 10\%$ $C_R > 1000\text{pF}, 1\text{kHz} \pm 10\%$ Test Voltage: $1.0\text{Vrms} \pm 0.2\text{Vrms}$	$C_R \geq 50\text{pF}, \tan\delta \leq 0.15\%$; $5\text{pF} < C_R < 50\text{pF}, \tan\delta \leq 1.5(150/C_R + 7) \times 10^{-4}$; $C_R \leq 5\text{pF}$, No test.
Insulation Resistance Ri	Test Voltage: Rated Voltage or 500V (whichever is smaller) Endurance time: 2min±5s	$R_i(25^\circ\text{C}) \geq 100000\text{M}\Omega$ or $1000\text{M}\Omega \cdot \mu\text{F}$ (whichever is smaller); $R_i(125^\circ\text{C}) \geq 10000\text{M}\Omega$ or $100\text{M}\Omega \cdot \mu\text{F}$ (whichever is smaller).
Withstanding Voltage	Test Voltage: $U_R > 1250\text{V}, 1.2U_R$; $500\text{V} < U_R \leq 1250\text{V}, 1.5U_R$; $U_R \leq 500\text{V}, 2.5U_R$ Endurance time: 5s±1s Surge current≤ 50mA	No breakdown, flashover or visible damages

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6 Reliability Characteristics&Test Conditions		
Item	Test Conditions	Electrical Specifications
Thermal Shock	Upper limit: 125°C; Lower limit: -55°C; Recycl times: 5; Endurance: 30min.	No visible damages to appearance. Capacitance change less than ±1% or ±1pF(Whichever is wider).
Resistance to soldering heat	Slot Weld Preheat at 110~140°C, endure 30s~60s. Temperature: 260°C±5°C; Dip time: 10s±1s; Dip depth: 10mm; Dip time: 1time; Recover: 6h~24h.	No visible damages, cracks or exposure of inner electrodes. The peeling of Termination coating is less than 25%. Capacitance values are up to the permissible capacitance tolerance range.
Resistance to Humidity in Steady State	Temperature: 40°C±2°C; Relative: 90%~95%; Endure: 21d(500+10)h; Withstanding Voltage Test within 15min after test finish: UR, 5s; Recover: 6h~24h.	No visible damages, Marks are clear; Capacitance: C ompared with initial value, ΔC / C ≤2% or <1pF, whichever is wider; Dissipation factor: No exceeds the initial value or 2x initial requirements, whichever is higher; Insulation resistance: $R_i \geq 25000\text{M}\Omega$ or $R_i \times C_R \geq 250\text{s}$, whichever is lower.
High-temperature Life Test	Endurance: 2000h for 2525 3838, Other case size: 1000h; Test temperature: 125°C; Test Voltage: $U_R > 1250\text{V}, U_R$; $500 < U_R \leq 1250\text{V}, 1.2U_R$; $U_R \leq 500\text{V}, 2U_R$.	No visible damages, Marks are clear; Capacitance: C ompared with initial value, ΔC / C ≤2% or 1pF, whichever is higher; Dissipation factor: No exceeds the initial value or 2x initial requirements, whichever is higher; Insulation resistance: $R_i \geq 40000\text{M}\Omega$ or $R_i \times C_R \geq 400\text{s}$, whichever is lower.

7 Performance Data

Temperature Coefficient

Capacitance VS Temperature

