

MQ30 High-Q MLCC

1 Features

- 1) Ultra-low ESR, ESL, high self-resonance frequency, ultra-high Q;
- 2) High frequency-selection characteristic;
- 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: Broadcast Station, RF Plasma, Mobile Base Station, Mobile Phone, WIFI, IoT, Etc.

3 How to Order

MQ	30	0805	COG	2E	241	J	N	D	R
Type	Series	Case Size Code	TCC	Rated V.	Nominal Capacitance	Capacitance Tolerance	Termination Type	Thickness Code	Packaging
Table 1	Table 2	Table 3	Table 4	Table 5	Table 6	Table 7	Table 8	Table 9	Table 10

Table 1 Product Type			Table 2 Product Series						
MQ	High-Q MLCC		30	Ultra-low ESR, applicable to consumer electronics. Case sizes of 0402,0603,0805 available					

Table 3 Case Size Code(mm)							
Drawing	Case Size Code	0402	0603	0805	0505	1111	0709
	L	1.00 ± 0.15	1.60 ± 0.15	2.00 ± 0.20	1.40 ± 0.64	2.79 ^{+0.89} _{-0.51}	1.78 ± 0.38
	W	0.50 ± 0.10	0.90 ± 0.15	1.25 ± 0.20	1.40 ± 0.38	2.79 ± 0.51	2.13 ± 0.25
	Tmin	/	/	/	0.51	0.76	/
	Tmax	0.55	0.90	1.30	1.45	2.59	2.92
	B	0.25 ± 0.10	0.35 ± 0.15	0.50 ± 0.25	0.25 ^{+0.25} _{-0.13}	0.38 ^{+0.50} _{-0.25}	0.25 ^{+0.25} _{-0.13}
Unit: mm							

Table 4 Temperature Coefficient			Table 5 Rated Voltage					
Code	Temperature Coefficient	Operating Temperature	1H	50V	2H	500V	3E	2500V
			2A	100V	2J	600V	3F	3000V
COG	0±30ppm/°C	-55 °C ~125 °C	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 Code			Table 8 Termination Type	
B	±0.1pF	C _R < 10pF	N	Silver/Nickle/Tin
C	±0.25pF		D	Silver/Nickel/Gold
D	±0.5pF			
F	± 1%	C _R ≥ 10pF	Z	Silver/Nickle/Tin&Lead
G	± 2%			
J	± 5%		TN	Silver/Copper/Tin
K	± 10%			
M	± 20%			

Table 9 Thickness Code				
Case Size Code	Capacitance (pF)	Thickness Code	Standard Thickness(mm)	Thickness Tolerance(mm)
0402	0.1~27	B	0.50	± 0.05
0603	0.1~100	8	0.80	± 0.15
0805	0.1~240	D	1.00	± 0.15
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
	0.3~1000	H	1.60	± 0.20
0709	1.0~100	V	2.50	± 0.35

Table 10 Packaging		
B- Bulk with Bag	R- Reel	C- Waffle

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4 MQ 30 Series COG Capacitance Value

0402											
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	200	2R0	2.0	B、C、D	200	9R1	9.1	B、C、D	200
0R2	0.2			2R2	2.2			100	10		
0R3	0.3			2R4	2.4			110	11		
0R4	0.4	B、C		2R7	2.7			120	12	F、G、J、K、M	
0R5	0.5			3R0	3.0			150	15		
0R6	0.6			3R3	3.3			180	18		
0R7	0.7			3R6	3.6			200	20		
0R8	0.8			3R9	3.9			220	22		
0R9	0.9	B、C、D		4R3	4.3			240	24		
1R0	1.0			4R7	4.7			270	27		
1R1	1.1			5R1	5.1			300	30		
1R2	1.2			5R6	5.6			330	33		
1R3	1.3			6R2	6.2			360	36		
1R5	1.5			6R8	6.8			390	39		
1R6	1.6			7R5	7.5			430	43		
1R8	1.8			8R2	8.2			470	47		
0603											
0R1	0.1	B	250	2R7	2.7	B、C、D	250	200	20	F、G、J、K、M	250
0R2	0.2			3R0	3.0			220	22		
0R3	0.3	B、C		3R3	3.3			240	24		
0R4	0.4			3R6	3.6			270	27		
0R5	0.5			3R9	3.9			300	30		
0R6	0.6			4R3	4.3			330	33		
0R7	0.7	B、C、D		4R7	4.7			360	36		
0R8	0.8			5R1	5.1			390	39		
0R9	0.9			5R6	5.6			430	43		
1R0	1.0			6R2	6.2			470	47		
1R1	1.1			6R8	6.8			510	51		
1R2	1.2			7R5	7.5			560	56		
1R3	1.3			8R2	8.2			620	62		
1R5	1.5	B、C、D		9R1	9.1	680		68			
1R6	1.6			100	10	750		75			
1R8	1.8			110	11	820		82			
2R0	2.0			120	12	910		91			
2R2	2.2			150	15	101		100			
2R4	2.4			180	18						
0805											
0R1	0.1	B	250	3R3	3.3	B、C、D	250	300	30	F、G、J、K、M	250
0R2	0.2			3R6	3.6			330	33		
0R3	0.3	B、C		3R9	3.9			360	36		
0R4	0.4			4R3	4.3			390	39		
0R5	0.5			4R7	4.7			430	43		
0R6	0.6			5R1	5.1			470	47		
0R7	0.7	B、C、D		5R6	5.6			510	51		
0R8	0.8			6R2	6.2			560	56		
0R9	0.9			6R8	6.8			620	62		
1R0	1.0			7R5	7.5			680	68		
1R1	1.1			8R2	8.2	750		75			
1R2	1.2			9R1	9.1	820		82			
1R3	1.3			100	10	910		91			
1R5	1.5			110	11	101		100			
1R6	1.6			120	12	111		110			
1R8	1.8			150	15	121		120			
2R0	2.0			180	18	151		150			
2R2	2.2			200	20	181		180			
2R4	2.4			220	22	201		200			
2R7	2.7			240	24	221		220			
3R0	3.0	270		27	241	240					

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0505											
0R1	0.1	B	250	2R7	2.7	B、C、D	250	200	20	F、G、 J、K、M	250
0R2	0.2			3R0	3.0			220	22		
0R3	0.3	B、C		3R3	3.3			240	24		
0R4	0.4			3R6	3.6			270	27		
0R5	0.5			3R9	3.9			300	30		
0R6	0.6			4R3	4.3			330	33		
0R7	0.7			4R7	4.7			360	36		
0R8	0.8			5R1	5.1			390	39		
0R9	0.9	5R6		5.6	430			43			
1R0	1.0	B、C、D		6R2	6.2			470	47		
1R1	1.1		6R8	6.8	510	51					
1R2	1.2		7R5	7.5	560	56					
1R3	1.3		8R2	8.2	620	62					
1R5	1.5		9R1	9.1	680	68					
1R6	1.6		100	10	750	75					
1R8	1.8		110	11	820	82					
2R0	2.0		120	12	910	91					
2R2	2.2		150	15	101	100					
2R4	2.4			180	18						
1111											
0R1	0.1	B	500	4R7	4.7	B、C、D	500	750	75	F、G、 J、K、M	500
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		
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		
0R8	0.8			9R1	9.1			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					
1R2	1.2		130	13	221	220					
1R3	1.3		150	15	241	240					
1R4	1.4		160	16	271	270					
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	B、C、D	330	33	511	510					
2R2	2.2		360	36	561	560					
2R4	2.4		390	39	621	620					
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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0709											
1R0	1.0	B、C、D	500	3R9	3.9	B、C、D	500	220	22	F、G、J、K、M	500
1R1	1.1			4R3	4.3			240	24		
1R2	1.2			4R7	4.7			270	27		
1R3	1.3			5R1	5.1			300	30		
1R4	1.4			5R6	5.6			330	33		
1R5	1.5			6R2	6.2			360	36		
1R6	1.6			6R8	6.8			390	39		
1R7	1.7			7R5	7.5			430	43		
1R8	1.8			8R2	8.2			470	47		
1R9	1.9			9R1	9.1			510	51		
2R0	2.0	B、C、D	500	100	10	F、G、J、K、M	500	560	56	F、G、J、K、M	500
2R1	2.1			110	11			620	62		
2R2	2.2			120	12			680	68		
2R4	2.4			130	13			750	75		
2R7	2.7			150	15			820	82		
3R0	3.0			160	16			910	91		
3R3	3.3			180	18			101	100		
3R6	3.6			200	20						

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5 Electrical Specifications&Test Conditions		
Item	Test Conditions (25℃ ±2℃)	Electrical Specifications
Capacitance		Capacitance values are up to requirements
Dissipation Factor tanδ	Test Frequency: C _R ≤ 1000pF, 1MHz±10% C _R > 1000pF, 1kHz±10% Test Voltage: 1.0Vrms±0.2Vrms	C _R ≥ 50pF, tanδ ≤ 0.15%; 5pF <C _R <50pF, tanδ ≤ 1.5(150/C _R +7)×10 ⁻⁴ ; C _R ≤ 5pF, test free.
Insulation Resistance Ri	Test Voltage: Rated Voltage Endurance time: 2min ± 5s	Ri (25℃) ≥ 100000MΩ or 1000MΩ · μF (whichever is smaller) ; Ri (125℃) ≥ 10000MΩ or 100MΩ · μF (whichever is smaller)
Withstanding Voltage	2.5U _R , 5s ± 1s, Surge current ≤ 50mA	No breakdown, flashover or visible damages

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6 Reliability Characteristics&Test Conditions		
Item	Test Conditions	Reliability Characteristics
Thermal Shock	Upper limit:125°C; Lower limit:-55°C; Recycle 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°C ~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 humidity:90%~95%; Endure:21d (500+10) h; Withstanding Voltage Test within 15min after test finish:U _R ,5s; Recover:6h~24h	No visible damages, Marks are clear; Capacitance:Compared 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 ≥25000MΩ or R _i ×C _R ≥250s,whichever is lower.
High-temperature Life Test	Endurance:1000h; Test temperature:125°C; Test Voltage 2U _R .	No visible damages, Marks are clear; Capacitance: Compared 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 ≥40000MΩ or R _i ×C _R ≥400s,whichever is lower.

7 Performance Data

Temperature Coefficient

Capacitance VS Temperature

