MQ40 High-Q MLCC

1 Features

1) Ultra-low ESR, ESL, high self-resonance frequency;
2) New material systems, excellent performance, ultra-high Q, good frequency-selection characteristics;
3) No Capacitance shift with Tempearture variance;
4) Applicable to mobile base station and terminal devices;
5) Small case sizes are available.

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: Mobile Base Stations, Mobile Phone, WIFI, IoT, Etc.

3 How to Order

MQ	40	0603	C0G	2E	101	J	N	7	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 3	Table 9

Table 1 Product Type

MQ	High-Q MLCC

Table 2 Product Series

40	Ultra-low ESR, applicable to consumer electronics. Case sizes of 0402, 0603, 0805 available

Table 3 Case Size Code(mm)

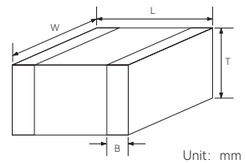
Drawing	Case Size Code	0402	0603	0805
 Unit: mm	Thickness code	B	7	C
	L	1.00 ± 0.05	1.60 ± 0.15	2.00 ± 0.15
	W	0.50 ± 0.05	0.80 ± 0.15	1.25 ± 0.15
	T	0.50 ± 0.05	0.70 ± 0.10	0.85 ± 0.15
	B	0.25 ± 0.10	0.35 ± 0.15	0.45 ± 0.25

Table 4 Temperature Coefficient			Table 5 Rated Voltage			
Code	TCC	Working Temperature	2D	200V	2E	250V
C0G	0±30ppm/℃	–55℃ ~125℃				

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.

Table 7 Capacitance Tolerance Code			Table 8 Termination Type	
B	±0.1pF	C_R < 10pF	N	Silver/Nickle/Tin
C	±0.25pF			
D	±0.5pF			
F	±1%	C_R ≥ 10pF		
G	±2%			
J	±5%			
K	±10%			

Table 9 Packaging	
B- Bag	R- Reel

4 MQ 40 Series C0G 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	1R8	1.8	B、C、D	200	7R5	7.5	B、C、D	200
0R2	0.2			2R0	2.0			8R2	8.2		
0R3	0.3	B、C		2R2	2.2			9R1	9.1		
0R4	0.4			2R4	2.4			100	10	F、G、J、K、M	
0R5	0.5			2R7	2.7			110	11		
0R6	0.6			3R0	3.0			120	12		
0R7	0.7			3R3	3.3			150	15		
0R8	0.8			3R6	3.6			180	18		
0R9	0.9	B、C、D		3R9	3.9			200	20		
1R0	1.0			4R3	4.3			220	22		
1R1	1.1			4R7	4.7			240	24		
1R2	1.2			5R1	5.1			270	27		
1R3	1.3			5R6	5.6			300	30		
1R5	1.5			6R2	6.2			330	33		
1R6	1.6			6R8	6.8						

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			4R7	4.7			360	36		
0R8	0.8			5R1	5.1			390	39		
0R9	0.9	B、C、D		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			9R1	9.1			680	68		
1R6	1.6			100	10	F、G、J、K、M		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

		B	250	3R0	3.0	B、C、D	250	240	24	F、G、J、K、M	250
0R2	0.2			3R3	3.3			270	27		
0R3	0.3	B、C		3R6	3.6			300	30		
0R4	0.4			3R9	3.9			330	33		
0R5	0.5			4R3	4.3			360	36		
0R6	0.6			4R7	4.7			390	39		
0R7	0.7			5R1	5.1			430	43		
0R8	0.8			5R6	5.6			470	47		
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1R6	1.6			110	11			910	91		
1R8	1.8			120	12			101	100		
2R0	2.0			150	15			111	110		
2R2	2.2			180	18			121	120		
2R4	2.4			200	20			151	150		
2R7	2.7			220	22						

5 Electrical Specifications&Test Conditions

Item	Test Conditions（25℃ ±2℃）	Electrical Specifications
Capacitance	Test Frequency: 1MHz±10% Test Voltage: 1.0Vrms±0.2Vrms	Capacitance values are up to requirements
Q		$C_R \geq 30pF, Q \geq 1400$; $C_R < 30pF, Q \geq 800+20C$（$C=C_R/pF$）
Insulation Resistance Ri	Test Voltage:ated Voltage U_R Endurance time: 2min±5s	Ri ≥ 104MΩ
Withstanding Voltage	$2.5U_R$,5s±1s, Surge current≤ 50mA	No breakdown, flashover or visible damages

6 Reliability Characteristics&Test Conditions

Item	Test Conditions	Reliability Characteristics
Thermal Shock	Upper limit:125℃; Lower limit:-55℃; Recycle times:5; Endurance:30min.	No visible damages to appearance. Capacitance change less than ±2.5% or ±0.25pF(Whichever is wider)
Resistance to soldering heat	Slot Weld Preheat at 110℃~140℃,endure 30s~60s. Temperature:260℃±5℃; Dip time:10s ±1s; Dip depth:10mm; Dip time:1 time; recover:6h~24h.	No visible damages, cracks or exposure of inner electrodes. The peeling of Termination coating is less than 25%; Capacitance values variation is within ±2.5% or ±0.25pF， Whichever is wider.
Resistance to Humidity in Steady State	Temperature:40℃ ±2℃; Relative humidity:90~95%; Endure:21d（500+10）h; Withstanding Voltage Test within 15min after test finish:UR,5s: Recover:6h~24h.	Capacitance:Compared with initial value,ΔC/C ≤ 7.5% or 0.75pF,whichever is higher; Q ≥ 200（$C_R \geq 30pF$） Q ≥ 100+10C/3（$C_R < 30pF$） （$C=C_R/pF$） Insulation resistance： $R_i \geq 500M\Omega$
High-temperature Life Test	Time endure:1000h; Test temperature:125℃; Test voltage： $2U_{R.}$	Capacitance:Compared with initial value, ΔC/C ≤ 3% or 0.30pF,whichever is higher; Q ≥ 350（$C_R \geq 30pF$） Q ≥ 275+5C/2（$10pF \leq C_R < 30pF$） Q ≥ 200+10C（$C_R < 10pF$） （$C=C_R/pF$） Insulation resistance： $R_i \geq 1000M\Omega$

7 Performance Data

Temperature Coefficient