04

GOLD WIRE BONDING MLCC(MA)

Type: MA

MA Gold Wire Bonding MLCC

1 Features

1) Same assembling wtih semiconductor chip, wire bonding is applicable;
2) Higher cap and smaller chip size than SLCC, excellent temperature stability;
3) Excellent frequency characteristics, low ESL and high self-resonance frequency.

2 Applications

1) Filtering and noise reduction in peripheral circuits of GaAs, GaN chips;
2) Filtering and noise reduction in micro-assembly circuits.
3) Other micro-assembly circuits, which need smaller chip size to replace SLCC

3 How to order

	MA	0202	X7R	2A	102	M	D	4	C
	Type	Case size Code	TCC	Rated V.	Norminal Capacitance	Capacitance Tolerance	Termination Type	Thickness Code	Packing
	Gold wire bonding MLCC	Table 1	Table 2	Table 3	Table 4	Table 5	Table 6	Table 1	Table 7

Table 1 Case size code (mm)

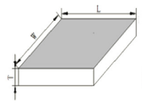
Drawing	Case size code	L	W	T	Thickness code
	1515	0.38 ± 0.05	0.38 ± 0.05	0.30 ± 0.05	3
	0202	0.50 ± 0.07	0.50 ± 0.07	0.35 ± 0.05	4
	2525	0.64 ± 0.07	0.64 ± 0.07	0.50 ± 0.10	5
	0204	0.50 ± 0.07	1.00 ± 0.10	0.35 ± 0.05	4
	0303	0.80 ± 0.07	0.80 ± 0.07	0.50 ± 0.10	5
	3535	0.90 ± 0.07	0.90 ± 0.07	0.50 ± 0.10	5
	0306	0.80 ± 0.07	1.60 ± 0.10	0.50 ± 0.10	5
	0404	1.00 ± 0.10	1.00 ± 0.10	0.60 ± 0.10	A
	0408	1.00 ± 0.10	2.00 ± 0.20	0.60 ± 0.10	A
	0505	1.27 ± 0.10	1.27 ± 0.10	0.60 ± 0.10	A
	0508	1.27 ± 0.10	2.00 ± 0.20	0.60 ± 0.10	A
	0808	2.00 ± 0.20	2.00 ± 0.20	1.00 ± 0.20	D
	0808	2.00 ± 0.20	2.00 ± 0.20	1.50 ± 0.20	G

Table 2 TCC

Dielectric code	Capacitance tolerance	Operating temperature
X7R	± 15%	−55℃ ~125℃
X7S	± 22%	−55℃ ~ 125℃
X7T	−33%~+22%	−55℃ ~ 125℃
X5S	± 22%	−55℃ ~85℃

Table 3 Rated Voltage

0J	6.3V	1E	25V
1A	10V	1H	50V
1C	16V	2A	100V

Table 4 Nominal Capacitance	Table 5 Capacitance tolerance	
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.	M	±20%

Table 6 Termination Type		Table 7 Packing	
D	Nickel - Gold （Gold thickness≥ 1 μm)	B	Bulk with Bag
E	Nickel - Gold （Gold thickness≥ 2.54μm)	C	Waffle
G	Nickel - Gold （Gold thickness≥ 5 μm)		

4 Capacitance Value Table

Size	1515					0202						2525						0204						0303						3535						0306					
C_R \ U_R(V)	10	16	25	50	100	6.3	10	16	25	50	100	10	16	25	50	100	10	16	25	50	100	6.3	10	16	25	50	100	10	16	25	50	100	10	16	25	50	100
101																																								
151																																								
221																																								
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154																																								
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474																																								
684																																								
105																																								
155																																								

尺寸	0404					0408					0505					0508					0808				
C_R \ U_R(V)	10	16	25	50	100	10	16	25	50	100	10	16	25	50	100	10	16	25	50	100	10	16	25	50	100
101																									
151																									
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155																									

X7R X7S X7T X5S

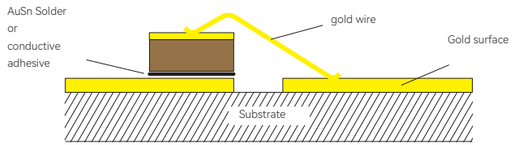
MA Gold Wire Bonding MLCC

5 Electrical Specifications&Test Conditions

ITEMS	Test Conditions (25℃ ±2℃)	Electrical Specifications
Capacitance	Test Frequency: $C_R \leq 100pF$,1.0MHz±0.1MHz $C_R > 100pF$,1.0kHz±0.1kHz Test Voltage: 1.0Vrms±0.2Vrms	Capacitance is up to requirements
Dissipation factor tanδ		X7R/X7S : $tan\delta \leq 350\times10^{-4}$ X7T : $tan\delta \leq 500\times10^{-4}$ X5S : $tan\delta \leq 1000\times10^{-4}$
Insulation Resistance R_i	Test Voltage:Rated Voltage U_R Endurance: 2min±5s	X7R/X7S/X7T : $R_i \geq 10000M\Omega$ or $500M\Omega\cdot\mu F$(whichever is lower). X5S: $R_i \geq 50M\Omega\cdot\mu F$
Withstanding Voltage	2.5U_R; Endurance 5s±1s; Surge current≤ 50mA	No breakdown, flash over or visible damages

Application Instruction

1 Mounting of Gold wire bonding MLCC(MA)



Die Bond Notes:
a.Au-Sn（80/20）solder is recommended;
b.Epoxy conductive adhesive is optional;
c.Under the protection of Nitrogen at 300℃～ 320℃.

Wire Bond Notes:
a. Gold wire dia. 25μm;
b. Thermo-compression soldering or ultrasonic ball soldering is recommended;
c. The pressure of bonding tool must be between 0.2N and 0.5N.

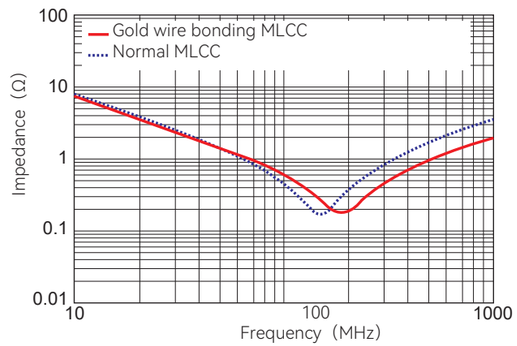
2 Recommended Gold Thickness

Dia. of the gold wire	Termination
25μm	Gold thickness≥ 1μm
38μm	Gold thickness≥ 2.54μm
50μm	Gold thickness≥ 5μm

3 Frequency Characteristics

Good frequency characteristics, low ESL and high self-resonance frequency

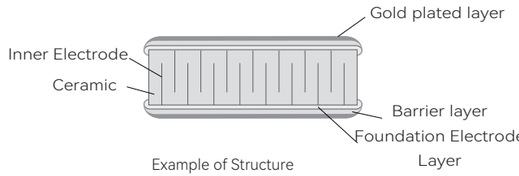
Comparison in terms of Impedance-Frequency



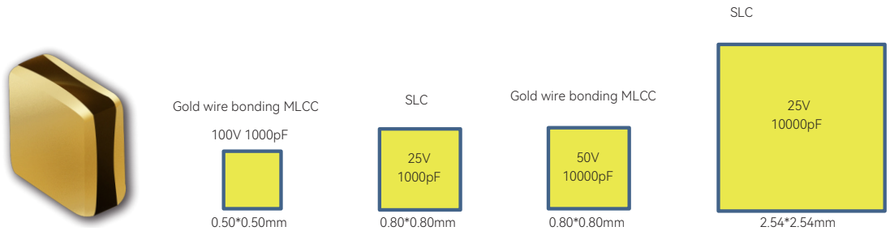
Application Instruction

4 Comparison between Gold wire bonding MLCC and Single Layer Capacitors

Gold wire bonding MLCC has a multi-layer structure, it can achieve higher cap with smaller chip size.



Example of Structure



Comparison between Gold wire bonding MLCC and Single Layer Capacitors

5 Ultimate Strength Test

Items	Test Conditions	Results
Wire bonding Strength	Break strength of gold wire dia. 25μm is recorded by Test method 2023.2 of GJB548B-2005	60mN
Shear Strength	Shear strength is recorded by Test method 2019.2 of GJB548B-2005	0202:8N、0303:13N

6 Storage

Capacitors must be stored in the warehouse with the ambient temperature From -10℃ to 40℃, relative humidity below 80%, and free of acid, alkaline or detrimental gas.

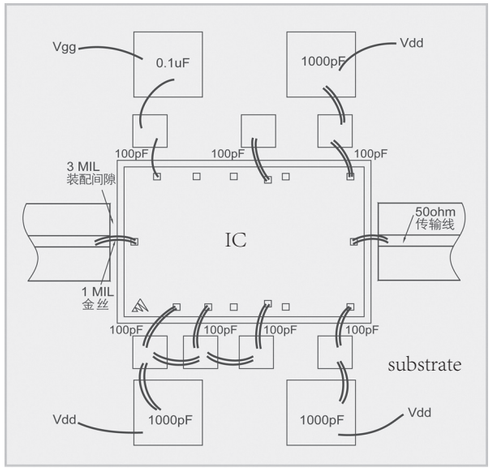
Capacitors must be in vacuum packing or in the protection of Nitrogen after unpacking.

The max. storage period is 18 months.

MA
GOLD WIRE BONDING

Application Instruction

7 Example of application



Optional Part Numbers in this case:

No.	P/N	Nominal Capacitance	Size（mm）
1	MA0303X7R1A104MD5C	0.1μF	0.8*0.8
2	MA0202X7R2A102MD4C	1000pF	0.5*0.5
3	MA0202X7R2A101MD4C	100pF	0.5*0.5
4	MA0202X5S0J104MD4C	0.1μF	0.5*0.5
5	MA1515X7T1A103MD3C	10nF	0.38*0.38