

ISO9001
ISO14001



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2011

Electronic Materials Components

Multilayer Ceramic Capacitor

- High Q MLCC ; JQ Series
- High V MLCC ; ECCA Series



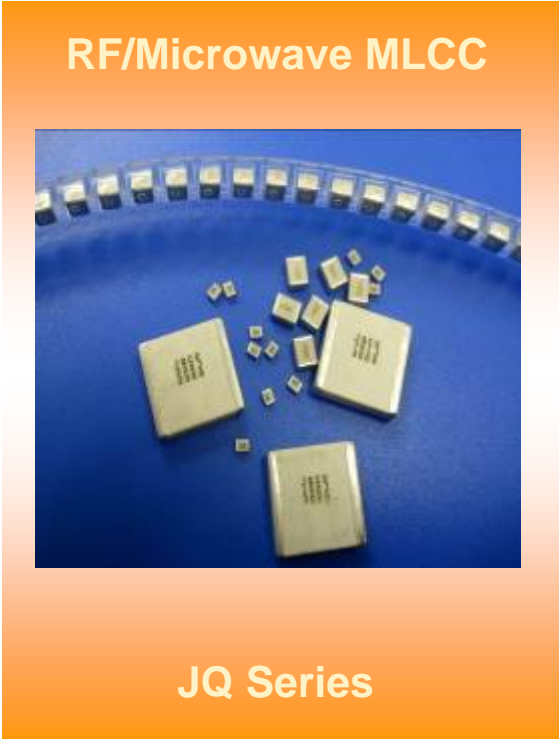
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I. High Q MLCC – JQ Series



1 High Q MLCC란?

조인셋(주)의 High Q MLCC, JQ 시리즈는 주변 온도 변화에 대한 정전용량의 특성 변화가 매우 낮은 고품질 계수의 세라믹 재료를 기반으로 최저 ESR을 갖도록 제작된 제품으로서, 4GHz 미만의 고 주파수 영역에서 우수한 전기적 특성 구현을 제공한다. 제품은 1414에서 9694 사이즈 까지 가능하며, 다양한 정전용량 및 정격전압 사양이 가능하다.

2 특징

- 낮은 ESR, 높은 품질 계수
- 온도 보상형 세라믹 재질 [C0G/A7G] 적용
- 다양한 정전용량 및 정격 전압 제품군, 높은 공명 주파수
- EU-RoHS 대응

3 응용 분야

- RF Power / Low Noise Amplifiers
- Cellular Base Station Amplifiers, Filter Networks
- RF Impedance Matching, DC Blocking, By-Pass, Coupling

4 주문 방법

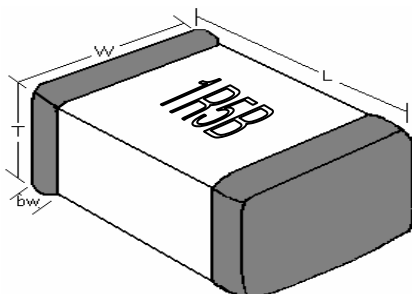
Part No. :

JQ	C	B	101	J	501D	N	B
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

(1)	Product	JQ	Joinset High Q MLCC
(2)	Dielectric	C	C0G : 0 +/- 30ppm/C
		P	A7G : 90 +/- 30ppm/C
(3)	Case Size	B	S : 1608, A : 1414, F : 2012, B : 2828, E : 9694
(4)	Capacitance	101	Examples 1R2 : 1.2pF 100 : 10pF 101 : 100pF

(5)	Tolerance	J	B : +/- 0.1pF C : +/- 0.25pF F : +/- 1%, J : +/- 5%
(6)	Voltage	501D	Examples 251D : 250Vdc 501D : 500Vdc
(7)	Termination	N	Ni Barrier / Sn Solder Plating
(8)	Taping	B	B : Bulk, T : Taping

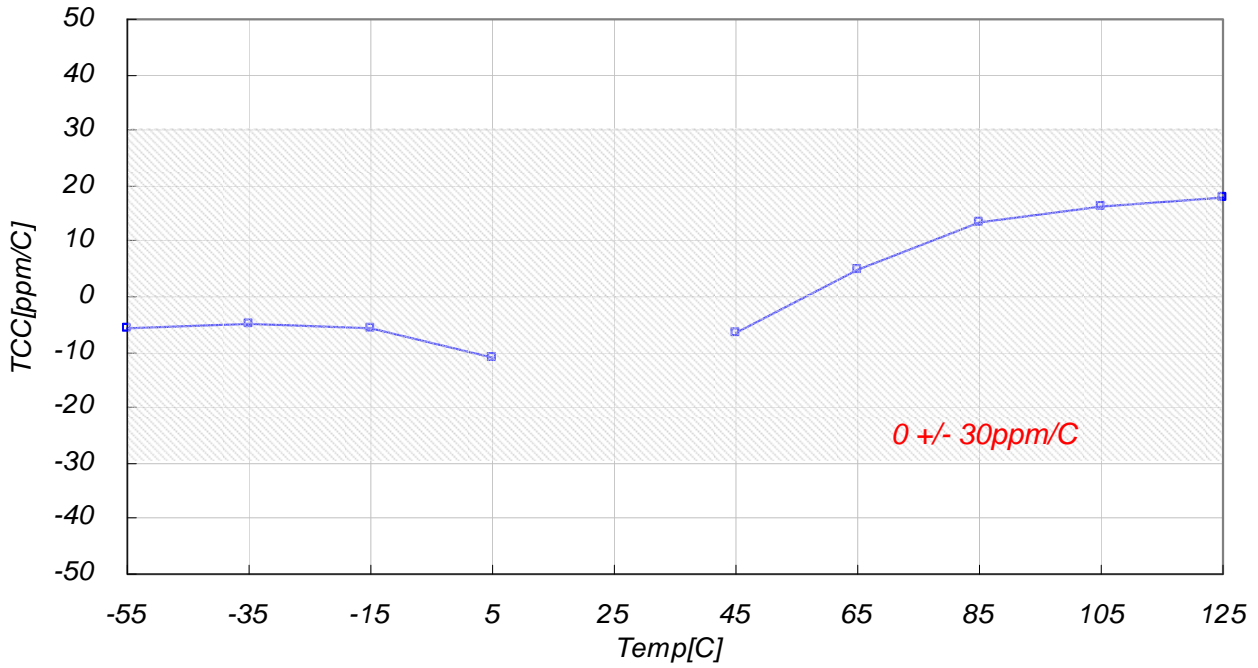
5 제품 형상 및 치수



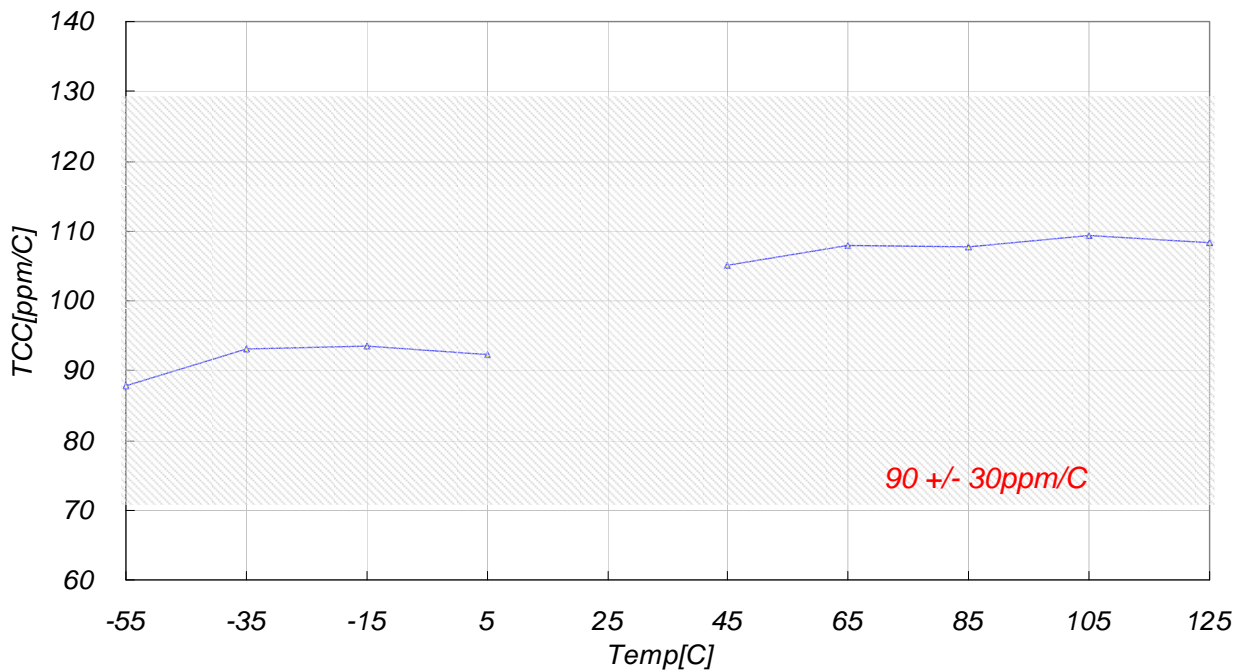
Case	Dimension [mm]				Marking
	L	W	T [max]	BW	
S	1.6 +/- 0.2	0.8 +/- 0.1	0.9	0.2 +/- 0.1	-
A	1.4 +/- 0.4	1.4 +/- 0.4	1.2	0.3 +/- 0.2	O
F	2.0 +/- 0.2	1.25 +/- 0.2	1.0	0.3 +/- 0.2	-
B	2.8 +/- 0.5	2.8 +/- 0.4	2.5	0.4 +/- 0.2	O
E	10 +/- 1.0	10 +/- 1.0	7.0	1.0 +/- 0.5	O

6 온도 특성

TC 1 : EIA C0G [NP0] Material



TC 2 : EIA A7G [P90] Material





7 제품 리스트

TC 1 : EIA C0G [NP0] Material

Cp			Case Size				Cp			Case Size				
code	[pF]	Tol.	S [1608]	A [1414]	F [2012]	B [2828]	code	[pF]	Tol.	S [1608]	A [1414]	F [2012]	B [2828]	E [9694]
0R1	0.1	B					100	10	J					
0R2	0.2	B					120	12	J				500V	
0R3	0.3	B					150	15	J				[2kV]	
0R4	0.4	B					160	16	J					
0R5	0.5	B					180	18	J					
0R6	0.6	B					220	22	J	250V				
0R8	0.8	B					270	27	J					
0R9	0.9	B					330	33	J					
1R0	1.0	B					360	36	J				500V [1kV]	
1R1	1.1	B					390	39	J		250V	250V		3.6kV [7.2kV]
1R2	1.2	B					470	47	J		[500V]	[500V]		
1R3	1.3	B					560	56	J					
1R4	1.4	B					680	68	J					
1R5	1.5	B					820	82	J					
1R8	1.8	B	250V	250V	250V		101	100	J					
2R0	2.0	B	[500V]	[1kV]	[1kV]		121	120	J				500V	
2R1	2.1	B, C					131	130	J					
2R2	2.2	B, C					151	150	J					
2R5	2.5	B, C					181	180	J					
2R7	2.7	B, C					221	220	J					
3R0	3.0	B, C					271	270	J					
3R3	3.3	B, C					331	330	J					
3R6	3.6	B, C					391	390	J					3.6kV [5kV]
3R9	3.9	B, C					471	470	J					
4R0	4.0	B, C					561	560	J				250V	
4R7	4.7	B, C					681	680	J					
5R6	5.6	B, C					821	820	J					3kV
6R8	6.8	B, C					102	1000	J					
8R2	8.2	B, C					222	2200	J					2kV

- 상기 “[] ” 는 해당 제품의 최대 정격 전압 범위를 의미합니다.
- 상기 이외의 제품 사양에 대해서는 당사로 문의해 주시기 바랍니다.



TC 2 : EIA A7G [P90] Material

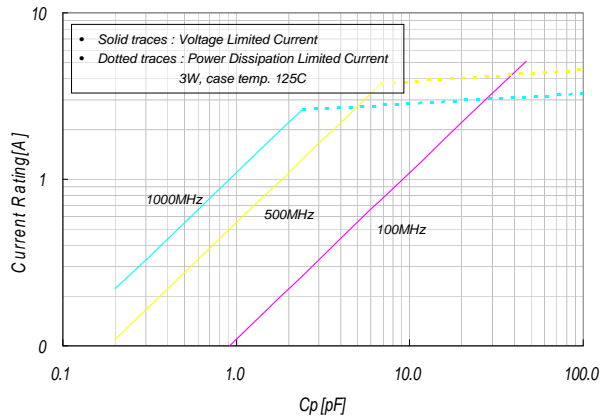
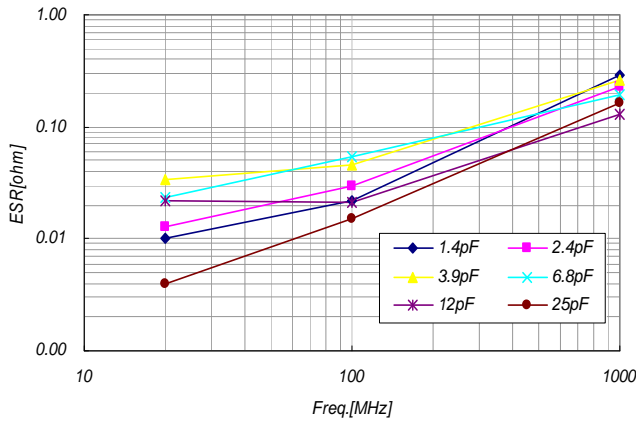
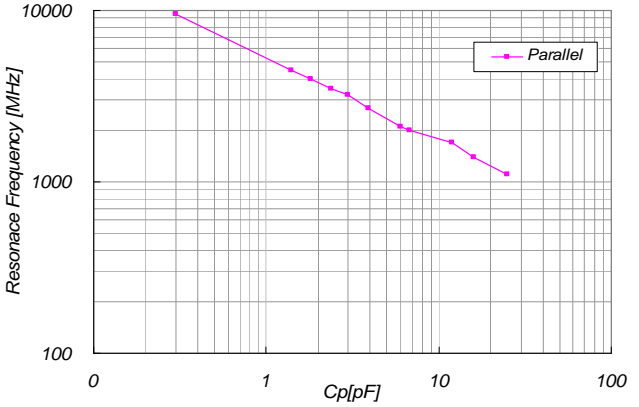
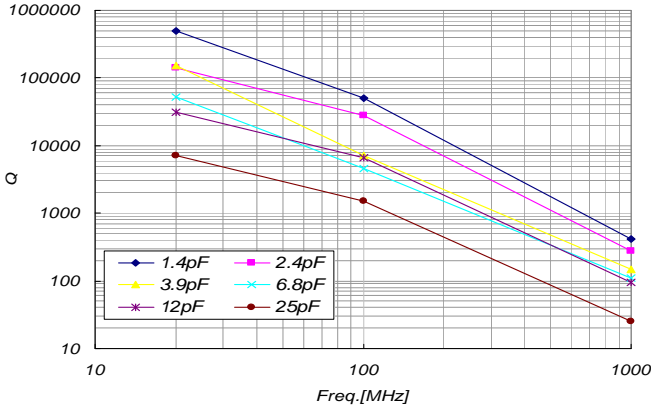
Cp			Case Size		Cp			Case Size		
code	[pF]	Tol.	A [1414]	B [2828]	code	[pF]	Tol.	A [1414]	B [2828]	E [9694]
0R1	0.1	B	250V	500V	100	10	J	250V	500V	3.6kV
0R2	0.2	B			120	12	J			
0R3	0.3	B			150	15	J			
0R4	0.4	B			160	16	J			
0R5	0.5	B			180	18	J			
0R6	0.6	B			220	22	J			
0R8	0.8	B			270	27	J			
0R9	0.9	B			330	33	J			
1R0	1.0	B			360	36	J			
1R1	1.1	B			390	39	J			
1R2	1.2	B	470	47	J	[500V]	500V	[7.2kV]		
1R3	1.3	B	560	56	J					
1R4	1.4	B	680	68	J					
1R5	1.5	B	820	82	J					
1R8	1.8	B	101	100	J					
2R0	2.0	B	121	120	J					
2R1	2.1	B, C	131	130	J					
2R2	2.2	B, C	151	150	J					
2R5	2.5	B, C	181	180	J					
2R7	2.7	B, C	221	220	J					
3R0	3.0	B, C	271	270	J					
3R3	3.3	B, C	331	330	J					
3R6	3.6	B, C	391	390	J					
3R9	3.9	B, C	471	470	J					
4R0	4.0	B, C	561	560	J					
4R7	4.7	B, C	681	680	J					
5R6	5.6	B, C	751	750	J					
6R8	6.8	B, C	821	820	J					
8R2	8.2	B, C	102	1000	J					

- 상기 “[] ” 는 해당 제품의 최대 정격 전압 범위를 의미합니다.
- 상기 이외의 제품 사양에 대해서는 당사로 문의해 주시기 바랍니다.

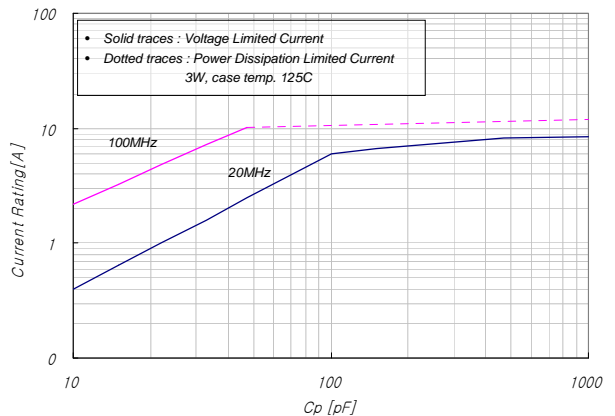
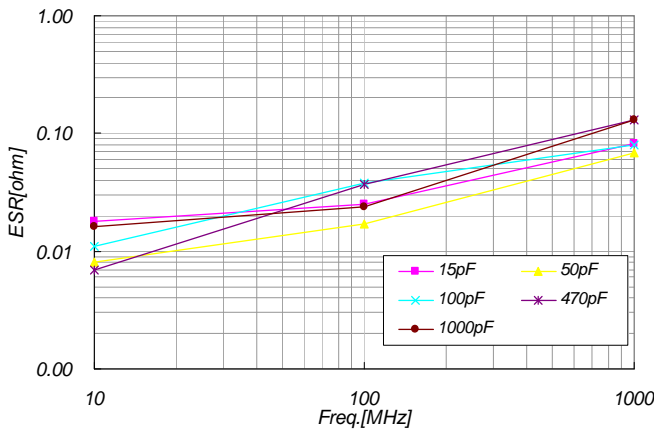
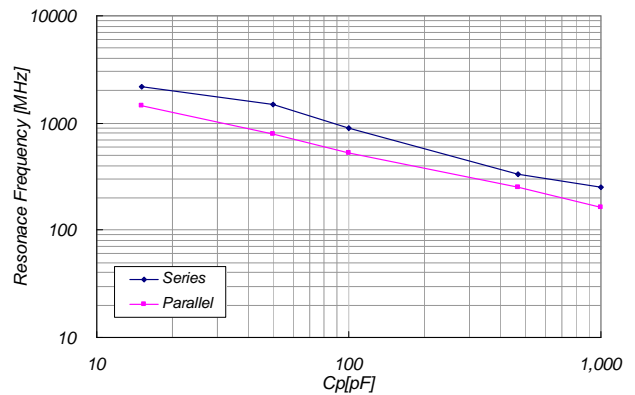
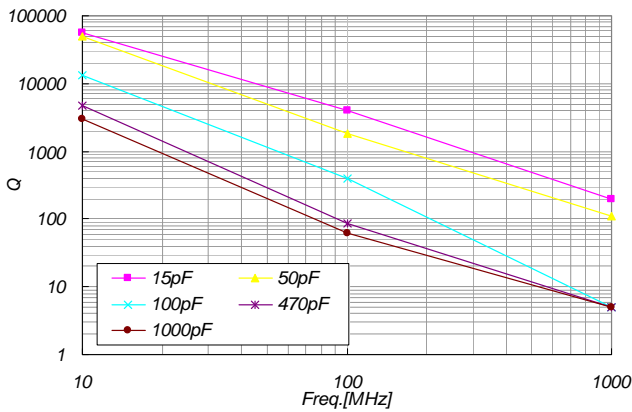


8 주파수 특성

JQCS Series

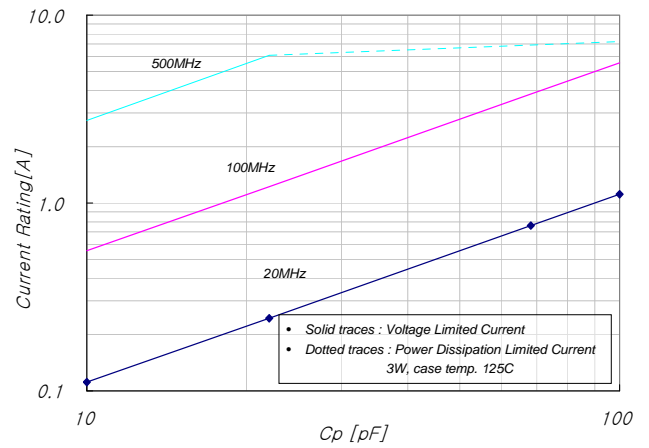
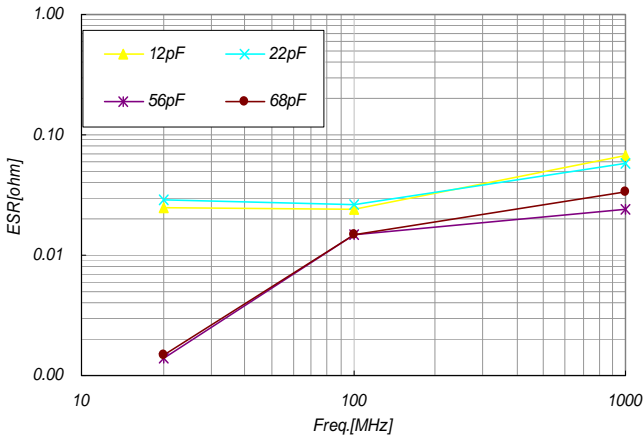
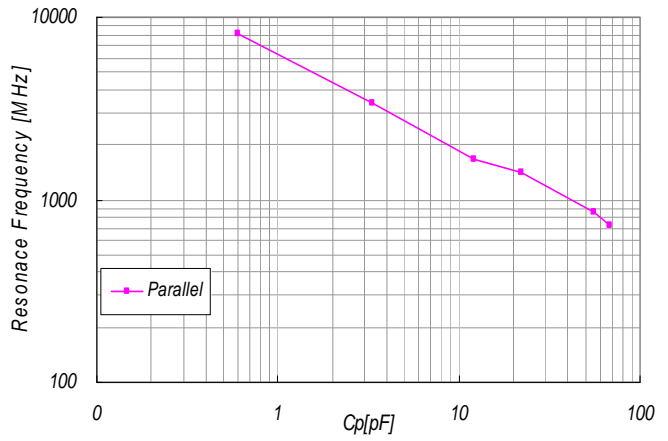
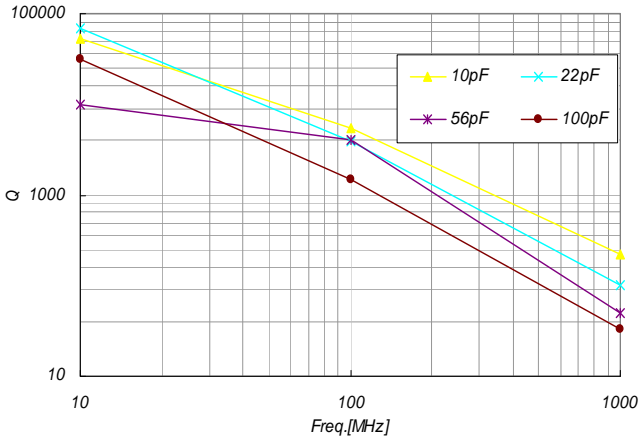


JQCB Series

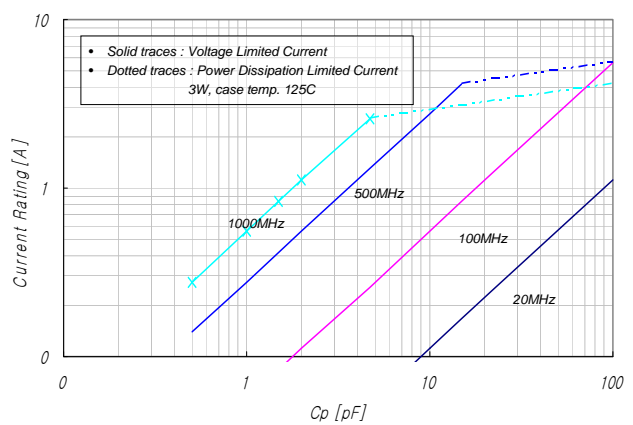
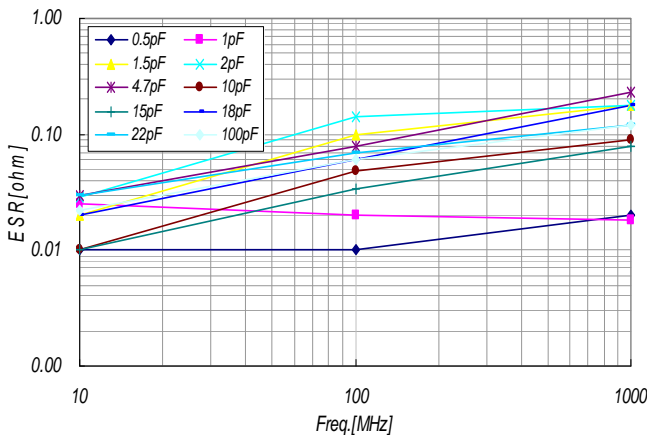
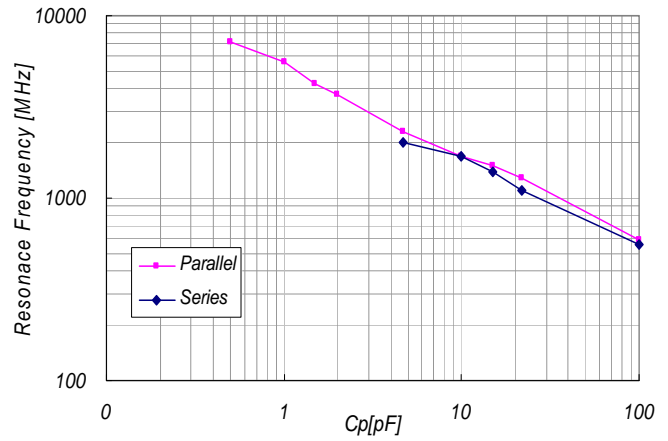
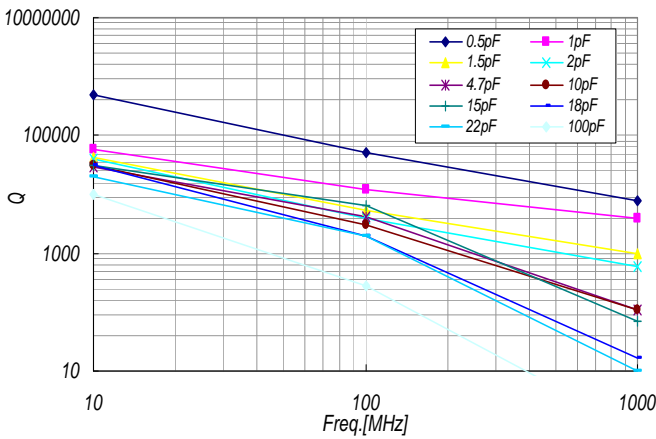




JQCA Series

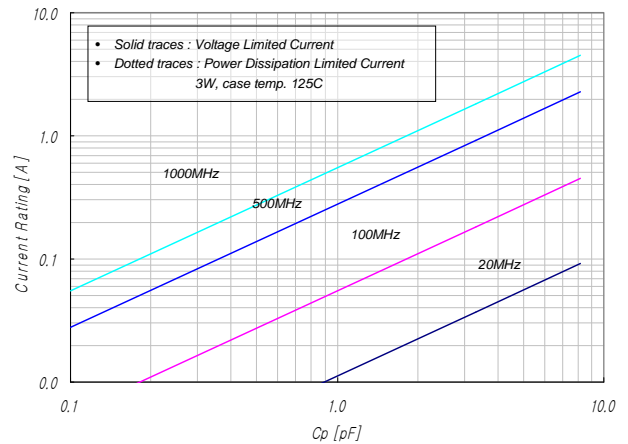
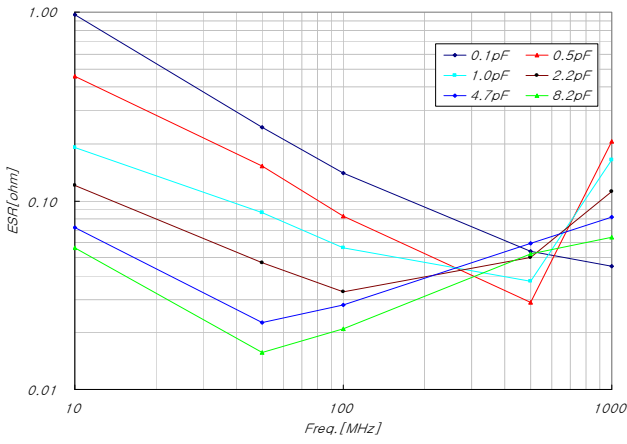
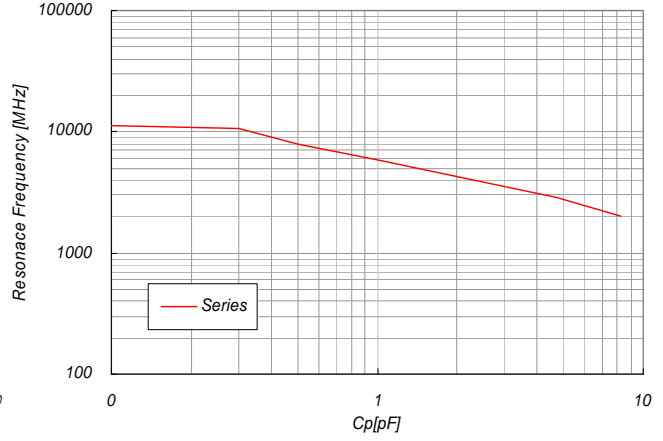
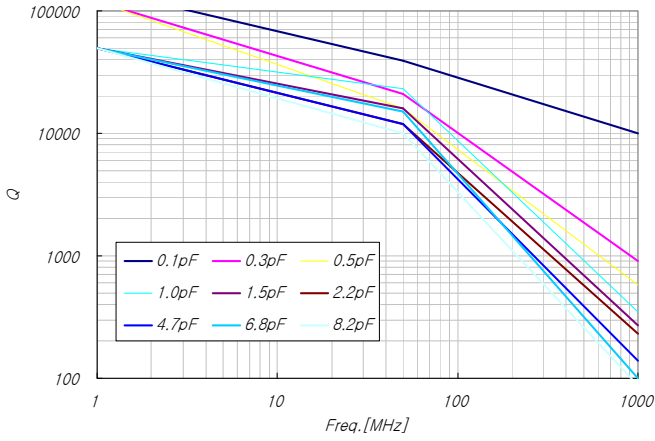


JQCF Series

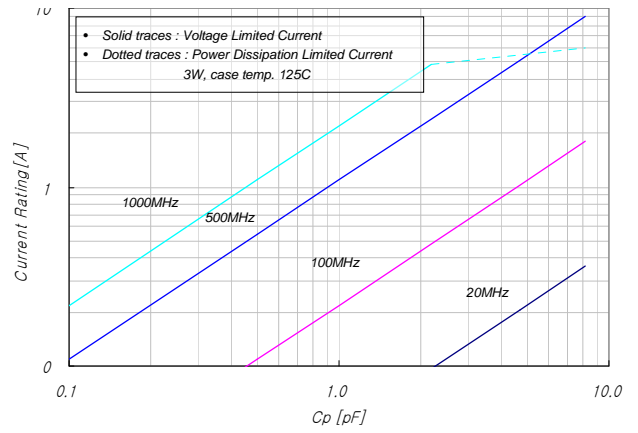
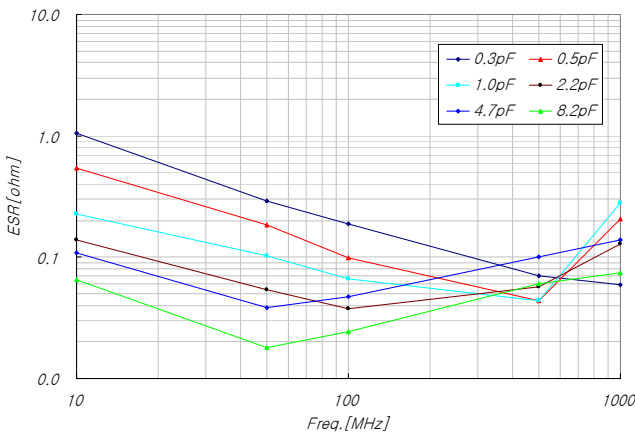
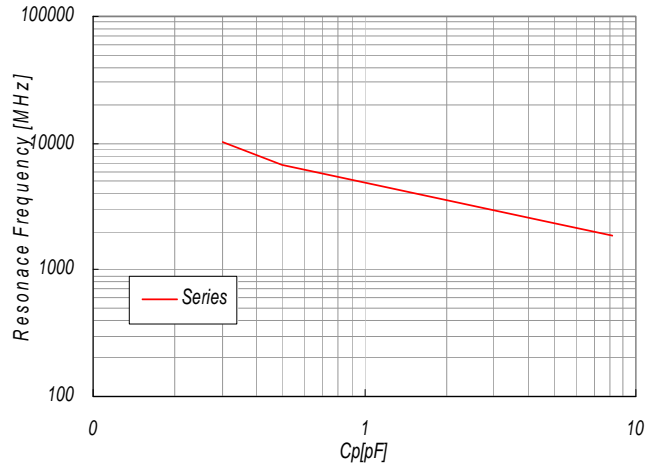
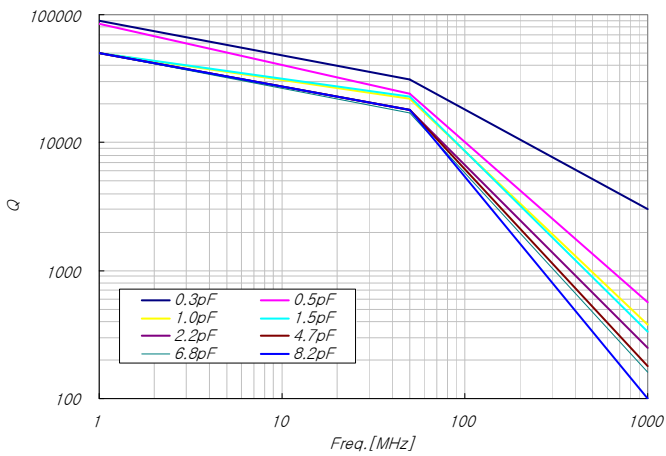




JQPA Series

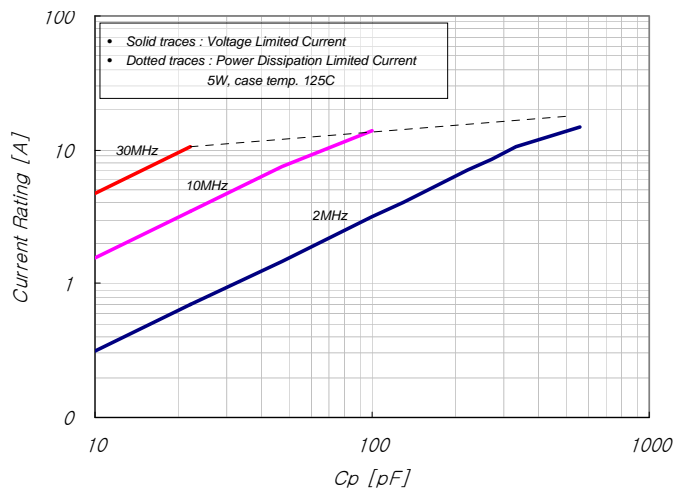
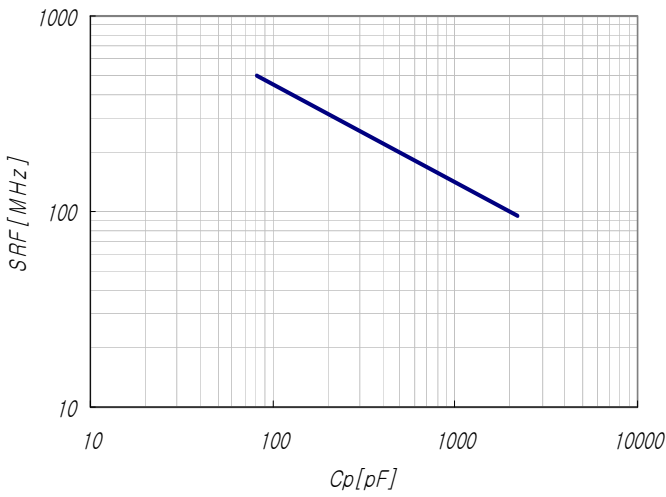
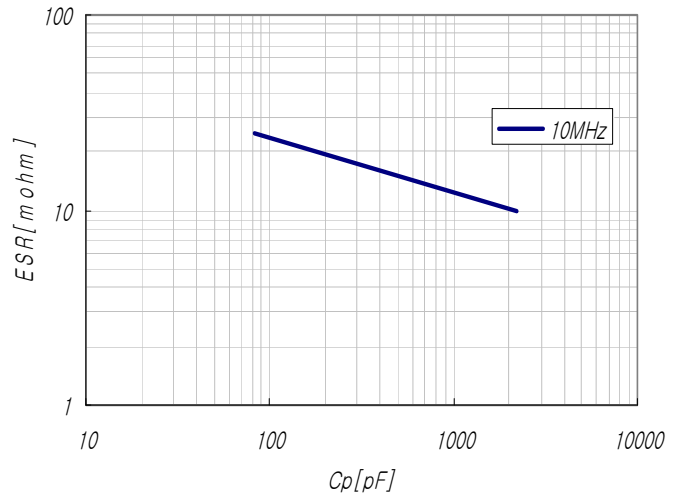
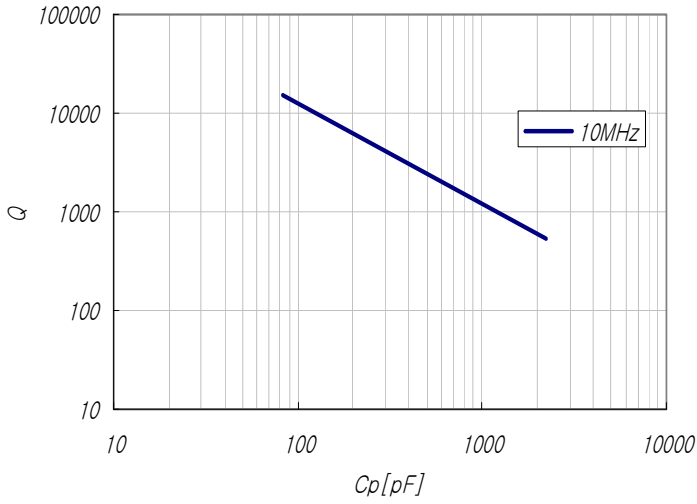


JQPB Series



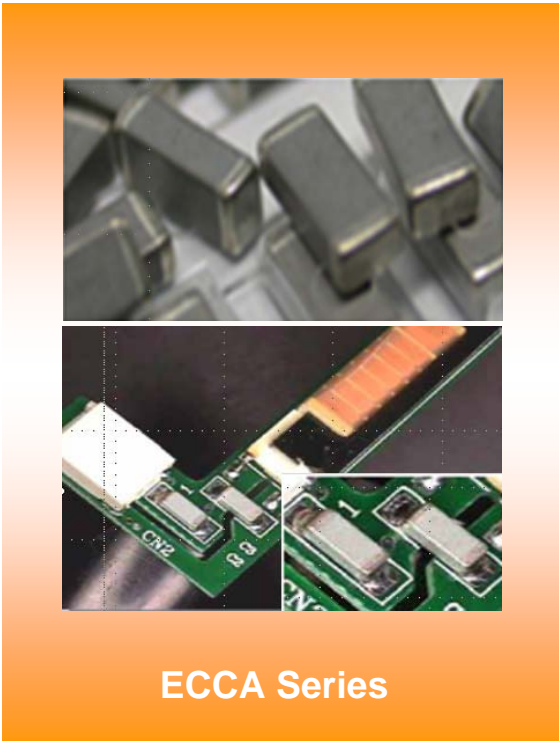


JQPE (<560pF), JQCE (≥ 560pF) Series





II. High Voltage MLCC – ECCA Series



1 High Voltage MLCC란?

조인셋(주)의 High Voltage MLCC, ECCA 시리즈는 100V~5kVdc 범위의 정격전압 사양을 가지며, 높은 전압이 요구되는 회로에 적용되어 높은 절연저항 및 낮은 손실이 유지될 수 있도록 설계된 제품 군이다.

특히, 3kVdc 정격 전압 제품은 UL 및 TUV의 안전 규격 인증을 통해 높은 신뢰성을 보유하고 있으며, 보다 안정적인 전기적 특성을 제공 한다.

2 특징

- EU RoHS 대응 / Halogen Free
- 국제 전기 안전 규격 인증 : 4520 3kVdc 제품군
UL File No. : E248982 / TUV Certification No. : R50016122
- 고전압 적용회로에서 높은 환경 신뢰성 구현

3 응용 분야

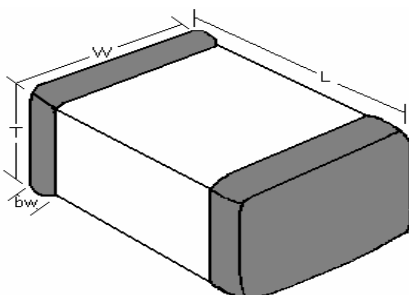
- LCD 백라이트 인버터 ; LCD TV, Monitor, Lap-top computer
- 전기 전자식 안정기, SMPS 전원 노이즈 차단 필터
- 통신 기기 [Modem/LAN] 등

4 주문 방법

Part No. : ECCA C0G 452013 100 J 302D N T
 (1) (2) (3) (4) (5) (6) (7) (8)

(1) Product	ECCA	Joinset Ceramic Capacitor	(5) Tolerance	J	F : +/- 1%, J : +/- 5% K : +/- 10%
(2) Dielectric	C0G	0 +/- 30ppm/C	(6) Voltage	302D	Examples 301D : 3,000Vdc
	X7R	+/- 15%			
(3) Case Size	452013	L4.5 x W2.0 x t1.3 [mm] "Refer to dimension"	(7) Termination	N	Ni Barrier / Sn Solder Plating
(4) Capacitance	100	Examples 5R6 : 5.6p 100 : 10p 101 :100pF	(8) Taping	T	B : Bulk, T : Taping

5 제품 형상 및 치수



Size	Dimension [mm]			
	L	W	T [max]	BW
3225	3.2 +/- 0.3	2.5 +/- 0.3	2.0	0.2 +/- 0.15
4520	4.5 +/- 0.4	2.0 +/- 0.2	1.8	0.6 +/- 0.30
5730	5.7 +0.5/-0.1	3.0 +/- 0.5	2.5	0.3 +/- 0.10



6 제품 리스트

COG Material

Code	Cp[pF]	Tol.	3225	4520	5730	Code	Cp[pF]	Tol.	3225	4520	5730
5R6	5.6	J	1kV	3kV	5kV	331	330	J	200V	1kV	3kV
100	10	J				471	470	J			
120	12	J				561	560	J			
150	15	J				681	680	J			
180	18	J				102	1,000	J, K			
220	22	J				152	1,500	J, K			
270	27	J				222	2,200	J, K			
330	33	J				252	2,500	J, K			
360	26	J				272	2,700	J, K			
390	29	J				332	3,300	J, K			
470	47	J	472	4,700	J, K						
560	56	J	N/A	N/A	N/A	682	6,800	J, K			
680	68	J				103	10,000	J, K			
820	82	J				153	15,000	J, K			
101	100	J				223	22,000	J, K			
121	120	J				333	33,000	J, K			
151	150	J				473	47,000	J, K			
181	180	J				683	68,000	J, K			
221	220	J				104	100,000	K			
						500V	2kV	3kV			

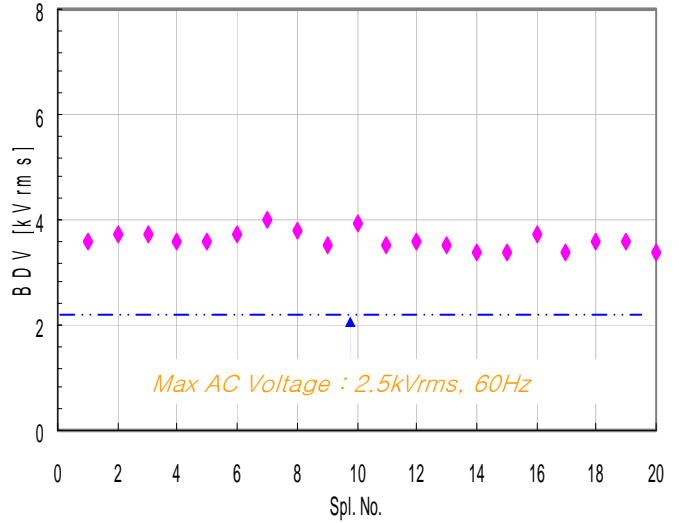
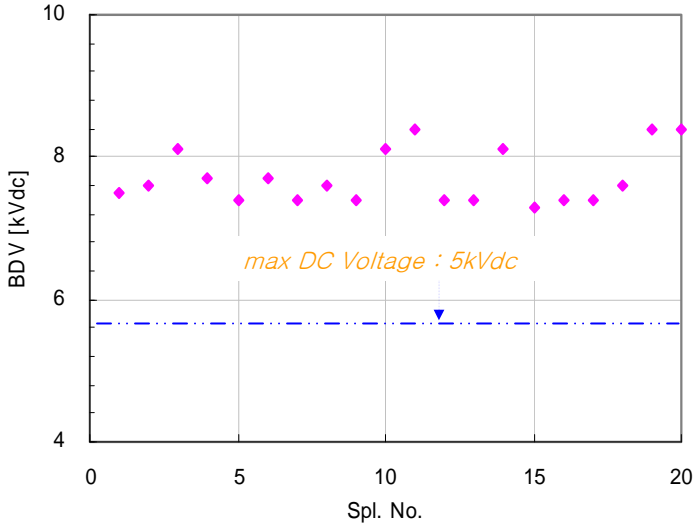
X7R Material

Code	Cp[pF]	Tol.	3225	4520	5730	Code	Cp[pF]	Tol.	3225	4520	5730
101	100	J	500V	3kV	5kV	252	2,500	J	200V	1kV	N/A
121	120	J				272	2,700	J			
151	150	J				332	3,300	J			
181	180	J				472	4,700	J			
221	220	J				682	6,800	J, K			
331	330					103	10,000	J, K			
471	470					153	15,000	J, K			
561	560					223	22,000	J, K			
681	680					333	33,000	J, K			
102	1,000					473	47,000	J, K			
152	1,500		683	68,000	J, K						
222	2,200		104	100,000	J, K						
				2kV	3kV				100V		

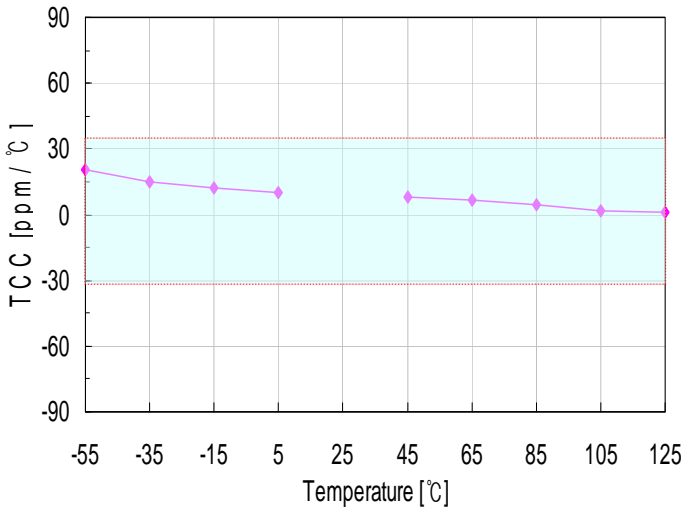


7 전기적 특성 [ECCAC0G575018680J502DNT]

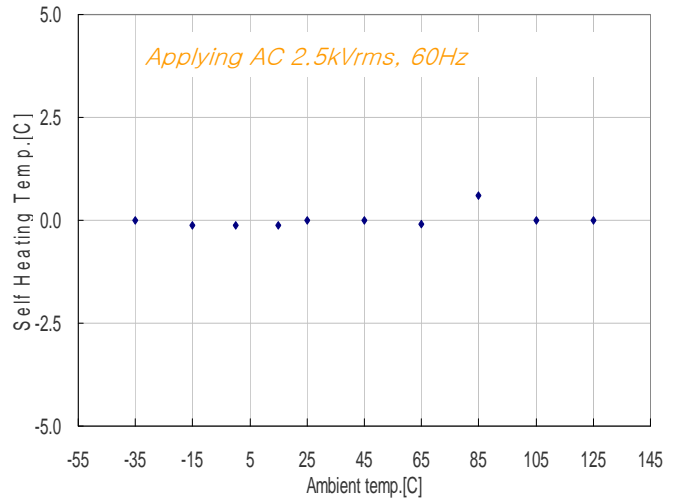
Breakdown Voltage, BDV



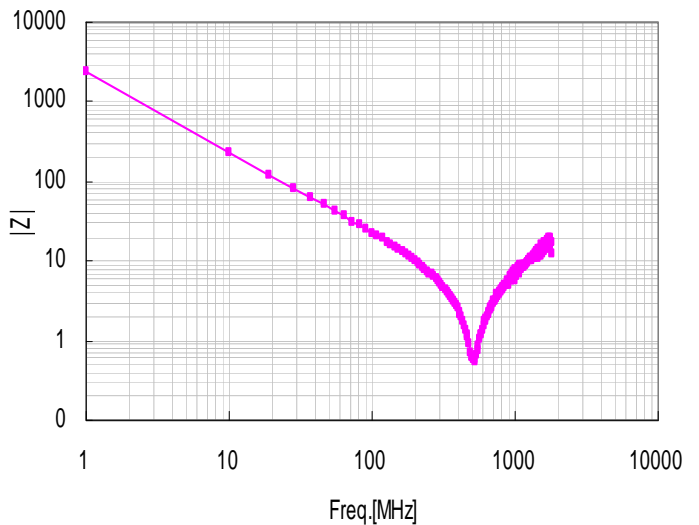
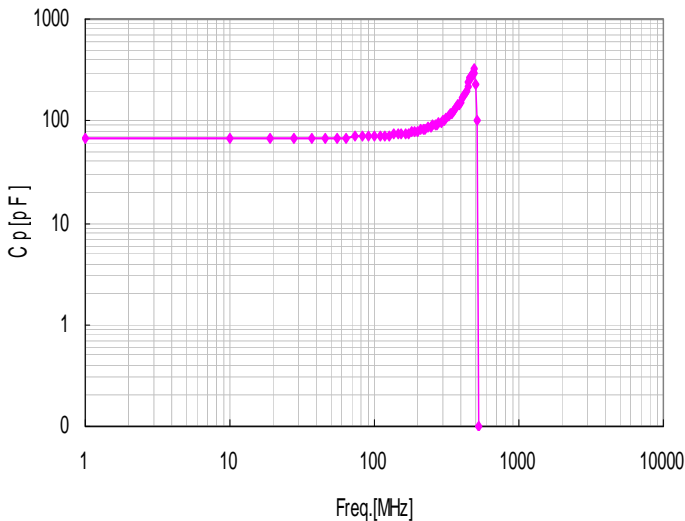
Temperature Change of Capacitance, TCC



Self Heating Temp.



Frequency Characteristics





III. 제품 사양 및 시험 규격

1 제품 사양

항목	JQ Series		ECCA Series		비고
	C [C0G]	P [A7G]	C0G	X7R	
온도 특성	0+/-30ppm/C	90+/-30ppm/C	0+/-30ppm/C	+/-15%	
동작 온도 범위	-55C ~ +125C		-55C ~ +125C		
정전용량, Cp	10pF ~ 2.2nF	0.1pF ~ 470pF	5.6pF~4.7nF	100pF~100nF	
유전손실, DF	a. 1414~2828 : ≤ 0.01% b. 9694 : ≤ 0.02%		≤ 0.1%	≤ 2.5%	▪ ≤ 1nF : 1MHz, 1Vrms ▪ > 1nF : 1kHz, 1Vrms
품질계수, Q	a. 1414~2828 : ≥ 10,000 b. 9694 : ≥ 5,000		-	-	
절연저항, IR	a. 1414~2828 : ≥ 1,000GΩ b. 9694 : ≥ 10GΩ		≥ 10 GΩ	≥ 10GΩ	▪ 정격전압 인가 (최대 1kV)
정격전압, Vw	제품 리스트 참조		제품 리스트 참조		
내전압	a. Vw ≤ 500V : Vw x 250% b. 1kV ≤ Vw ≤ 3kV : Vw x 150% c. 3kV < Vw ≤ 5kV : Vw x 120% d. Vw > 5 : Vw x 110%				▪ 5초 인가
노화 현상	N/A		N/A	O	
압전 효과	N/A		N/A	O	

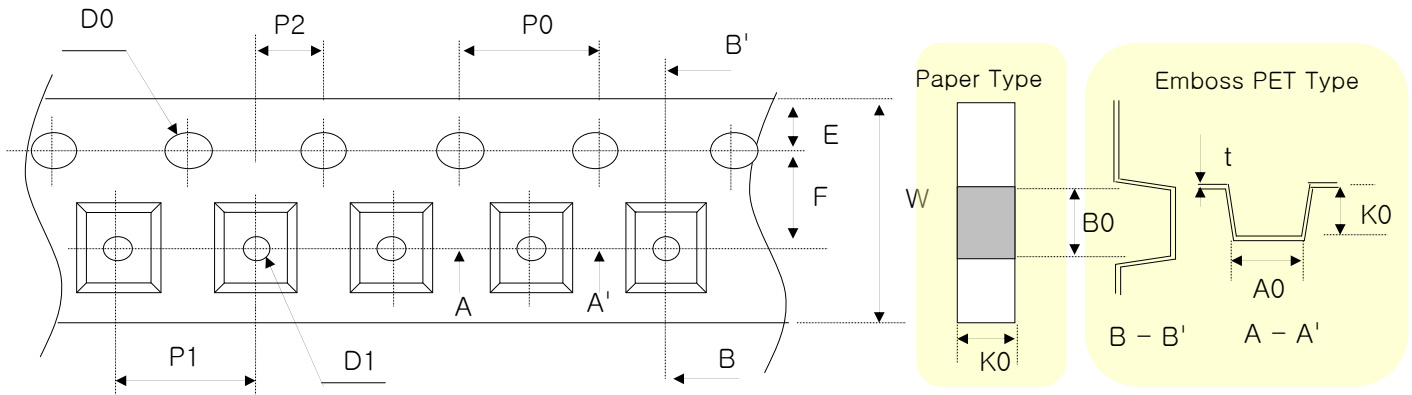
2 신뢰성 시험 규격

	JQ Series		ECCA Series		MIL-STD-202
	C [C0G]	P [A7G]	C0G	X7R	
고온부하	<ul style="list-style-type: none"> 기계적 손상이 없을 것 ΔCp : ≤ +/-3% Q 1414~2828 : min 5,000 9694 : min 2,500 IR : min 10GΩ 		<ul style="list-style-type: none"> ΔCp : ≤ 5% DF : ≤ 0.2% IR : ≥ 10GΩ 	<ul style="list-style-type: none"> ΔCp : ≤ 12.5% DF : ≤ 5% IR : ≥ 1GΩ 	METHOD : 108 a. 인가 전압 * Vw ≤ 500V : Vw x 200% * 1kV ≤ Vw ≤ 2kV : Vw x 150% * Vw ≥ 3kV : Vw x 100% b. 온도 & 시간 : 125C, 1,000hrs
내습성			<ul style="list-style-type: none"> ΔCp : ≤ 5% DF : ≤ 0.2% IR : ≥ 10GΩ 	<ul style="list-style-type: none"> ΔCp : ≤ 12.5% DF : ≤ 2.5% IR : ≥ 10GΩ 	METHOD : 106 85%RH, 85C, 1,000hrs
납내열성			<ul style="list-style-type: none"> ΔCp : ≤ 2.5% DF : ≤ 0.1% IR : ≥ 10GΩ 	<ul style="list-style-type: none"> ΔCp : ≤ 7.5% DF : ≤ 2.5% IR : ≥ 10GΩ 	METHOD : 210 땀납 평가 고온 인두기 접촉 (350C, 10sec)
온도싸이클			<ul style="list-style-type: none"> ΔCp : ≤ 7.5% DF : ≤ 0.1% IR : ≥ 10GΩ 	<ul style="list-style-type: none"> ΔCp : ≤ 7.5% DF : ≤ 2.5% IR : ≥ 10GΩ 	METHOD : 102 1cycle : -55C → 25C → 125C → 25C 각 단계 30분 유지, 5회 반복
PCB 굴곡강도			<ul style="list-style-type: none"> 기계적 손상이 없을 것 ΔCp : ≤ +/-10% 		METHOD : IEC60068-2-21 FR4 t 1.6mm PCB, Solder Joint 1mm 굴곡 평가
단자고착 강도	<ul style="list-style-type: none"> 기계적 손상이 없을 것 ΔCp : ≤ 10% 		METHOD : 211 1608/1414 : 1kgf, 2828 : min 1.5kgf 9694 : min 3.0kgf		



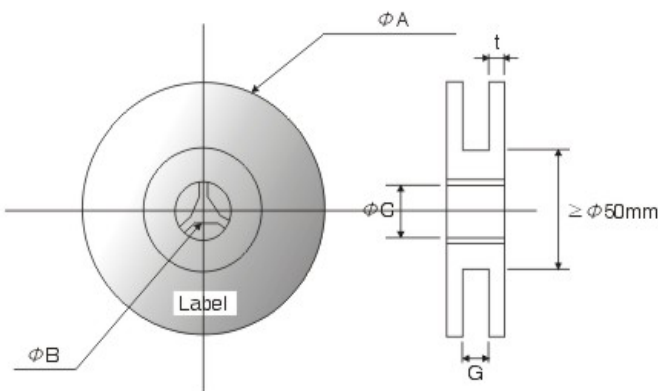
3 포장 사양

1) 캐리어 테이프



Case	type	A0	B0	W	D	D1	E	F	P	P0	P2	K0	t
1608	Paper	1.1 ±0.1	1.9 ±0.1	8.0 ±0.2	1.55 ±0.05		1.75 ±0.1	3.5 ±0.05	4.0 ±0.1	4.0 ±0.1	2.0 ±0.1	1.1max	
1414	Emboss	1.40 ±0.1	2.30 ±0.1	8.0 ±0.2	1.55 ±0.05	1.0 ±0.25	1.75 ±0.1	3.5 ±0.05	4.0 ±0.1	4.0 ±0.1	2.0 ±0.1	1.1max	0.23 ±0.1
2828 3225	Emboss	2.8 ±0.1	3.5 ±0.1	12.0 ±0.2	1.55 ±0.05	1.5 ±0.25	1.75 ±0.1	5.5 ±0.05	4.0 ±0.1	4.0 ±0.1	2.0 ±0.1	2.2 ±0.1	0.23 ±0.1
4520	Emboss	2.35 ±0.1	4.95 ±0.1	12.0 ±0.3	1.75 ±0.1	1.5 ±0.25	1.75 ±0.1	5.5 ±0.05	4.0 ±0.1	4.0 ±0.1	2.0 ±0.05	1.60 ±0.1	0.25 ±0.1
5750	Emboss	5.3 ±0.1	6.2 ±0.1	12.0 ±0.3	1.75 ±0.1	1.5 ±0.25	1.75 ±0.1	5.5 ±0.05	8.0 ±0.1	4.0 ±0.1	2.0 ±0.05	2.8max	0.25 ±0.1

2) 릴 사양



Unit : [mm]

code	1608/1414	2828~5750
ΦA	178±2.0	178±2.0
ΦB	13.0±0.5	13.0±0.5
ΦC	22.0±2.0	22.0±2.0
G	10.0±1.5	14.0±1.5
t	2.5±0.5	2.5±0.5

3) 포장 단위

Size [mm]	1608	1414	2828	3225	4520	5750	9694
pcs/reel	4,000	4,000	1,500	3,000	3,000	1,000	
Inner Box [pcs]	20,000	20,000	7,500	12,000	12,000	4,000	벌크 포장
Outer Box [pcs]	200,000	200,000	75,000	120,000	120,000	40,000	