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Dalicap
达 利 凯 普

DALICAP PRODUCT

- High Q, RF/Microwave Multilayer Ceramic Capacitor
- Single Layer Chip Ceramic Capacitor
- Multilayer Ceramic Capacitor
- Broadband Ceramic Capacitor
- Thin Film Circuit

2023

ABOUT DALICAP

DALICAP TECH.

◆ Leading supplier of HiQ, RF/Microwave MLCC, especially in the fields of MRI, Telecom, semiconductor RF power, wireless broadcast, laser, testing and analyzing instruments, radar and aerospace etc.

◆ Years' experience in Telecom industry and working with clients in the time of 2G->3G->4G shift to 5G.

◆ With years of solid experience in the industry, including R&D, material, design, process and manufacturing

◆ Individual IP for new product development to insure the competence in the industry

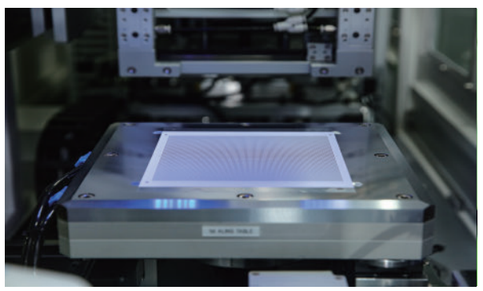
◆ Standard HiQ/RF MLCC or customized(ask sales for more information)

◆ New production capacity to match the continuous increasing demand worldwide

◆ Global network technically and commercially to support clients

Dalicap attaches great importance to trusted worldwide customers, and has always been adhering to the concept of quality first and service first. As an important strategy of Dalicap, the company invested 50 Million USD and put into use a fully new high-end electronic component plant in 2021, with a total land area of 40,000 square meters and a total construction area of 56,000 square meters. It will achieve the capacity of 3 billion/Y microwave MLCC products. In addition to meeting the market demand for 5G telecommunication, it is also expected to make achievements in automotive electronics and other fields in the future.

The company will continue to adhere to the business philosophy of "focus on R&D, quality first" and do our best to create a brilliant future together with you.



ADVANTAGES OF DALICAP

R&D and Engineering Capability

During the phase of R&D, the electromagnetic field simulation technology is introduced and the Coaxial Resonance Line is applied on the measurement of Q value of MLCC. An individual RF testing system is used to simulate the working conditions of MLCC, so as to ensure the technical performance and continuous improvement.

Production Environment and Facilities

Standard 10K-class clean room and temperature control contribute to production process and quality stability. With advanced production facilities, Dalicap ensures the consistency of the output and product quality.

High frequency/RF technical Support

Dalicap has S parameter test fixtures, calibrated by TRL, to measure the S parameter of capacitors, by which S2P file would be initiated and available to customers.
34A Coaxial Resonance Line system is dedicated to measuring the ESR and Q value, which is the most effective method to monitor the performance in the industry.
RF power testing system is built up for the measurement of the temperature rise under the working power, and breakdown voltage is also monitored.
With years of solid experience in the industry, Dalicap provides customized products and technical support as well.

Quality Certification

ISO 9001 & ISO 14001 are certified.
RoHS is compliant.

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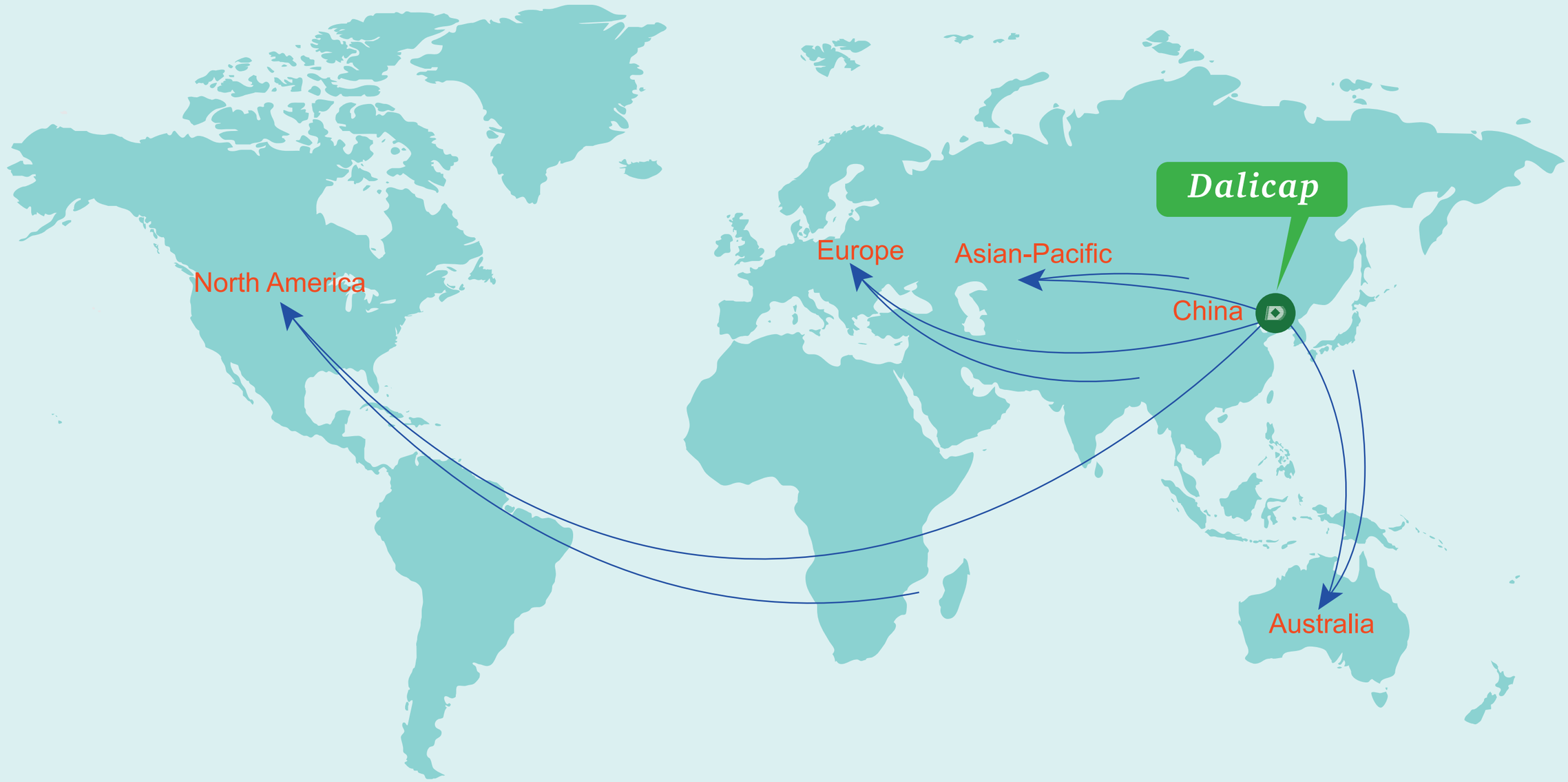
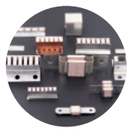
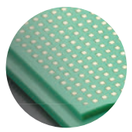
CUSTOMERS OF DALICAP

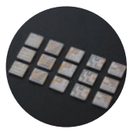
With more than 1000 overseas customers distributed widely in the North America, Europe, Asian-Pacific and Autstralia, Dalicap gains a world wide reputation.



PRODUCT CONTENTS







DLC70 Series RF/Microwave Multilayer Chip Ceramic Capacitors

◆Product Features

High Q, High RF Current/Voltage,High RF Power, Low ESR/ESL, Low Noise, Ultra-Stable Performance.
Lead capacitors' surface are coated with special coating, which can prevent arc and corona from occurring at high RF voltages.

◆Product Applications

Typical Circuit Applications: High Frequency/Microwave/ RF Amplifiers, Low Noise Amplifiers, L/C Filters.
Typical Applications Field: Mobile Base Stations, Repeaters, Wireless Broadcasting Equipments, Radio Stations, Radar, MRI Equipments, HSR Signal Transponders.

◆Part Numbering

DLC70	A	101	J	W	151	X	T
❶ Series	❷ Dimensions Code	❸ Rated Capacitance	❹ Tolerance	❺ Termination Type	❻ Rated Voltage	❼ Laser Marking	❽ Packing Type

①Series: Dalicap 70 Series High Q High Power Capacitor, Temperature Coefficient: 0±30ppm/℃.

②Dimensions Code

unit:inch(millimeter)

	DLC70H	DLC70P	DLC70A	DLC70D
Length	.039±.005 (1.00±0.12)	.063±.006 (1.60±0.15)	.055(+.015~—.010) (1.40+0.38~—0.25)	.079±.008 (2.00±0.20)
Width	.020±.004(0.50±0.10)	.031±.006(0.80±0.15)	.055±.010(1.40±0.25)	.049±.008(1.25±0.20)
Thickness	.020±.004(0.50±0.10)	.031±.006 (0.80±0.15)	.057(1.45)max	.057(1.45)max

	DLC70B	DLC70C	DLC70E
Length	.110(+.025~—.010) (2.79+0.63~—0.25)	.225(+.020~—.010) (5.72+0.51~—0.25)	.380(+.015~—.010) (9.65+0.38~—0.25)
Width	.110±.010(2.79±0.25)	.250±.015(6.35±0.38)	.380±.010(9.65±0.25)
Thickness	.100(2.54)max	.150(3.81)max	.170(4.32)max

③Rated Capacitance

Capacitance is less than 10pF; for example: 1R0=1.0pF, R denotes decimal point.
Capacitance greater than 10pF; for example: 101=100pF, the third number is the power of 10.

④Tolerance

Code	A	B	C	D	F	G	J
Tolerance	±0.05pF	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%

⑤Termination Type

Code	W	P	L
Type	100% Sn Solder over Nickel Plating	100% Sn Solder over Copper Plating (RoHS Compliant)	90% Sn 10% Pb Solder over Nickel Plating (Tin/Lead)

Code	MS	AR	RR	AW	RW
Type	Microstrip	Axial Ribbon	Radial Ribbon	Axial Wire	Radial Wire

Code	MN	AN	FN	BN	RN
Type	Non-mag Microstrip	Non-mag Axial Ribbon	Non-mag Radial Ribbon	Non-mag Axial Wire	Non-mag Radial Wire

⑥Rated Voltage

Code	Rated Voltage(V)	Code	Rated Voltage(V)	Code	Rated Voltage(V)
500	50	301	300	252	2500
101	100	501	500	302	3000
151	150	601	600	362	3600
201	200	102	1000	722	7200
251	250	152	1500		

⑦Laser Marking

X denotes Marking. Capacitance is less than 10pF; for example: the marking of 1.0pF is 1R0.
Capacitance greater than 10pF; for example: the marking of 100pF is 101.

⑧Packaging Type

	70H	70P	70D	70A	70B	70C	70E
T: Horizontal Taping	√	√	√	√	√	√	√
TV: Vertical Taping		√	√	√	√	√	
B: Plastic Bag				√	√		
C: Waffle Box						√	√

◆Performance Requirements

Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

◆Capacitance & Rated Voltage Table

Cap.pF \ Rated WVDC		Size(inch)															
		DLC70H (0402)		DLC70P (0603)		DLC70A (0505)		DLC70D (0805)		DLC70R (0710)		DLC70B (1111)		DLC70C (2225)		DLC70E (3838)	
Cap.pF	Code	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC
0.1	0R1	A, B, C, D.	200V Code 201	A, B, C, D.	250V Code 251	A, B, C, D.	150V Code 151 or 300V Code 301	A, B, C, D.	250V Code 251	B, C, D.	500V Code 501	A, B, C, D.	500V Code 501 or 1500V Code 152	B, C, D.	2500V Code 252 or 3600V Code 362	B, C, D.	3600V Code 362 or 7200V Code 722
0.2	0R2																
0.3	0R3																
0.4	0R4																
0.5	0R5																
0.6	0R6																
0.7	0R7																
0.8	0R8																
0.9	0R9																
1.0	1R0																
1.1	1R1																
1.2	1R2																
1.3	1R3																
1.4	1R4																
1.5	1R5																
1.6	1R6																
1.7	1R7																
1.8	1R8																
1.9	1R9																
2.0	2R0																
2.1	2R1																
2.2	2R2																
2.4	2R4																
2.7	2R7																
3.0	3R0																
3.3	3R3																
3.6	3R6																
3.9	3R9																
4.3	4R3																
4.7	4R7																
5.1	5R1																
5.6	5R6																
6.2	6R2																
6.8	6R8																
7.5	7R5																
8.2	8R2																
9.1	9R1																
10	100	F, G, J.	50V Code 500	F, G, J.		F, G, J.		F, G, J.		G, J.		F, G, J.		F, G, J.		F, G, J.	
11	110																
12	120																
13	130																
15	150																
16	160																
18	180																
20	200																
22	220																
24	240																
27	270																
30	300																
33	330																
36	360																
39	390																
43	430																
47	470																

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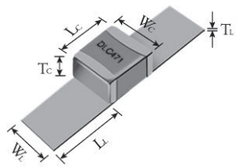
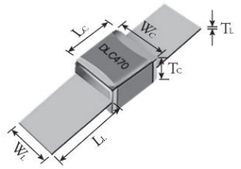
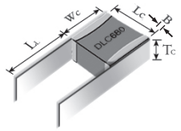
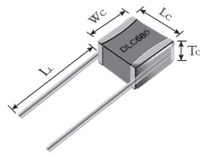
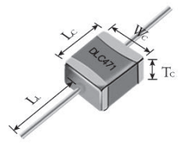
RF/Microwave Multilayer Chip Ceramic Capacitors

◆Capacitance & Rated Voltage Table

Cap.pF \ Rated WVDC		Size(inch)															
		DLC70H (0402)		DLC70P (0603)		DLC70A (0505)		DLC70D (0805)		DLC70R (0710)		DLC70B (1111)		DLC70C (2225)		DLC70E (3838)	
Cap.pF	Code	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC
51	510			F, G, J.	250V Code 251	F, G, J.	150V Code 151 or 200V Code 201	F, G, J.	250V Code 251	G, J.	500V Code 501	F, G, J.	500V Code 501 or 1500V Code 152	F, G, J.	2500V Code 252 or 3600V Code 362	F, G, J.	3600V Code 362 or 7200V Code 722
56	560																
62	620																
68	680																
75	750																
82	820																
91	910																
100	101																
110	111																
120	121																
130	131																
150	151																
160	161																
180	181																
200	201																
220	221																
240	241																
270	271																
300	301																
330	331						150V Code 151										
360	361																
390	391																
430	431																
470	471																
510	511																
560	561																
620	621																
680	681																
750	751																
820	821																
910	911																
1000	102						50V Code 500 or 100V Code 101										
1100	112																
1200	122																
1500	152																
1800	182																
2200	222																
2400	242																
2700	272																
3000	302																
3300	332																
3600	362																
3900	392																
4300	432																
4700	472																
5100	512																
5600	562																
10000	103																

◆DLC70 Lead Type and Dimensions

W/L/P	MS/MN	AR/AN
		
RR/FN	**RW/RN**	**AW/BN**
		

unit: inch(millimeter)

Series	Term. Code	Capacitor Dimensions				Lead Dimensions			Plated Material
		Length (Lc)	Width (Wc)	Thick. (Tc)	Overlap (B)	Length (LL)	Width (WL)	Thickness (TL)	
DLC70B	MS/MN	.135 ± .015 (3.43 ± 0.38)	.110 ± .010 (2.79 ± 0.25)	.100 (2.54)max	.016～.039 (0.40～1.00)	.250 (6.35)min	.093 ± .005 (2.36 ± 0.13)	.004 ± .001 (0.10 ± .025)	100% Ag
DLC70C	MS/MN AR/AN	.245 ± .025 (6.22 ± 0.64)	.250 ± .015 (6.35 ± 0.38)	.165 (4.19) max	.020～.047 (0.50～1.20)	.500 (12.70) min	.240 ± .005 (6.10 ± 0.13)	.008 ± .001 (0.20 ± 0.025)	Silver-plated Copper
	RR/FN					.354 (9.00) min	.118 ± .005 (3.00 ± 0.13)	.012 ± .001 (0.30 ± 0.025)	
	RW/RN					.709 (18.00) min	Dia.=.031±.004 (0.80±0.10)		Silver-plated Copper
	AW/BN					.906 (23.00) min			
DLC70E	MS/MN	.380 +.015～−.010 (9.65 +0.38～−0.25)	.380 ± .010 (9.65 ± 0.25)	.177 (4.50)max	.024～.059 (0.60～1.50)	.728 (18.50) min	.350 ± .020 (8.89 ± 0.50)	.008 ± .001 (0.20 ± .025)	Silver-plated Copper
	AR/AN						.315 ± .010 (8.00 ± 0.25)		
	RR/FN					.354 (9.00) min	.118 ± .005 (3.00 ± 0.13)	.012 ± .001 (0.30 ± 0.025)	
	RW/RN					.709 (18.00) min	Dia.=.031±.004 (0.80±0.10)		Silver-plated Copper
	AW/BN					.906 (23.00) min			

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DLC70 Series
RF/Microwave Multilayer Chip Ceramic Capacitors

◆Performance

Item	Specifications
Quality Factor (Q)	Greater than 10,000, C≤1000pF, at 1±0.1 MHz. Greater than10,000, C>1000pF, at 1±0.1 KHz.
Insulation Resistance (IR)	Test Voltage: Applied Rated Voltage, and 500V maximum. 10^5 Megohms min. @ +25℃. 10^4 Megohms min. @ +125℃.
Rated Voltage	See Rated Voltage Table
Dielectric Withstanding Voltage (DWV)	250% of Rated Voltage for 5 seconds, Rated Voltage≤500VDC 150% of Rated Voltage for 5 seconds, 500VDC＜ Rated Voltage≤1250VDC 120% of Rated Voltage for 5 seconds, Rated Voltage＞1250VDC
Operating Temperature Range	-55℃～+125℃(70B 0.1pF～1000pF can reach to -55℃～+175℃) Notes: For higher temperature, please contact with Dalicap.
Temperature Coefficient (TC)	0±30 ppm/℃; (−55℃～+175℃, 0±60 ppm/℃)
Capacitance Drift	±0.2% or ±0.05pF, whichever is greater.
Piezoelectric Effects	None
Termination Type	See Termination Type Table

Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

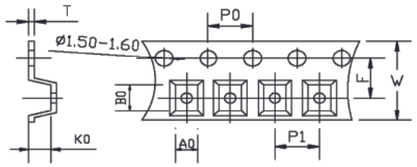
◆Environmental Tests

Item	Specifications	Method
Thermal Shock	DWV: the initial value IR: Shall not be less than 30% of the initial value Capacitance change: no more than 0.5% or 0.5pF. whichever is greater.	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature stay 15 minutes. The time of removing shall not be more than 5 minutes. Perform the five cycles.
Moisture Resistance		MIL-STD-202, Method 106.
Humidity (steady state)	DWV: the initial value IR: the initial value Capacitance change: no more than 0.3% or 0.3pF. whichever is greater.	MIL-STD-202, Method 103, Condition A, with 1.5 Volts D.C. applied while subjected to an environment of 85℃with 85% relative humidity for 240 hours minimum.
Life	IR: Shall not be less than 30% of the initial value Capacitance change: no more than 2.0% or 0.5pF. whichever is greater.	MIL-STD-202, Method 108, for 2000 hours, at 125℃. 200% of Rated Voltage for Capacitors, Rated Voltage≤500VDC 120% of Rated Voltage for Capacitors, 500VDC＜ Rated Voltage≤1250VDC 100% of Rated Voltage for Capacitors, Rated Voltage＞1250VDC

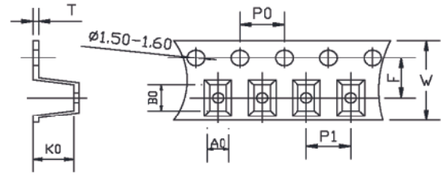
◆Tape & Reel Specifications

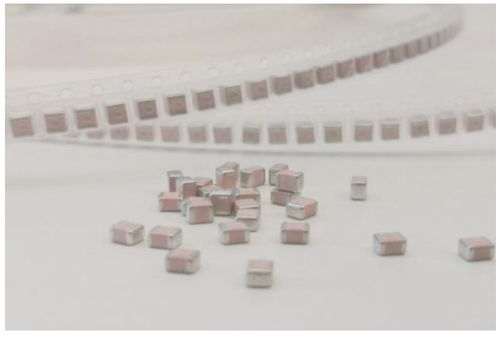
	A0 (mm)	B0 (mm)	K0 (mm)	W (mm)	P0 (mm)	P1 (mm)	T (mm)	F (mm)	Qty/min	Qty/reel	Tape Material
0505-H	1.50	1.75	1.15	8.00	4.00	4.00	0.22	3.50	500	3000	Plastic
0505-H	1.40	1.80	0.95	8.00	4.00	4.00	0.25	3.50	500	3000	Plastic
0505-H	1.50	1.75	1.30	8.00	4.00	4.00	0.22	3.50	500	3000	Plastic
0505-V	1.10	1.60	1.40	8.00	4.00	4.00	0.30	3.50	500	1000	Plastic
1111-H	2.85	3.50	1.95	8.00	4.00	4.00	0.25	3.50	500	2000	Plastic
1111-H	2.85	3.60	2.40	8.00	4.00	4.00	0.25	3.50	500	2000	Plastic
1111-V	2.30	3.55	2.70	12.00	4.00	4.00	0.40	5.50	500	1500	Plastic
2225-H	6.70	6.20	3.40	16.00	4.00	12.00	0.30	7.50	100	500	Plastic
2225-V	4.10	6.15	6.55	16.00	4.00	8.00	0.40	7.50	100	300	Plastic
3838-H	10.10	10.10	3.30	16.00	4.00	16.00	0.30	7.50	50	300	Plastic
3838-H	10.10	10.10	4.30	16.00	4.00	16.00	0.40	7.50	50	200	Plastic

Horizontal Orientation



Vertical Orientation





DLC70 Series High RF Power Multilayer Chip Ceramic Capacitors

◆Product Features

High Q, High RF Current/Voltage, High RF Power, Low ESR/ESL, Low Noise, Ultra-Stable Performance.

◆Product Applications

High RF Power Amplifiers, High Power Filter Networks, Wireless Demodulation.

◆Part Numbering

DLC70	F	101	J	AR	502	X	C
❶ Series	❷ Dimensions Code	❸ Rated Capacitance	❹ Tolerance	❺ Termination Type	❻ Rated Voltage	❼ Laser Marking	❽ Packing Type

①Series: Dalicap 70 Series High RF Power Capacitor, Temperature Coefficient: 0±30ppm/℃.

②Dimensions Code

unit:inch(millimeter)

	DLC70F	DLC70G	DLC70L
Length	.614(+.015~—.010) (15.60+0.38~—0.25)	.760(+.015~—.010) (19.30+0.38~—0.25)	1.350±.050 (34.29±1.27)
Width	.433±.010(11.0±0.25)	.760±.010(19.30±0.25)	1.350±.050(34.29±1.27)
Thickness	.197(5.00)max	.197(5.00)max	.197(5.00)max

③Rated Capacitance

Capacitance is less than 10pF; for example: 1R0=1.0pF, R denotes decimal point.

Capacitance is not less than 10pF; for example: 101=100pF, the third number is the power of 10.

④Tolerance

Code	B	C	D	F	G	J
Tolerance	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%

⑤Termination Type

Code	W	P	L
Type	100% Sn Solder over Nickel Plating	100% Sn Solder over Copper Plating (RoHS Compliant)	90% Sn 10% Pb Solder over Nickel Plating (Tin/Lead)

⑤Termination Type

Code	MS	AR	AW	RW
Type	Microstrip	Axial Ribbon	Axial Wire	Radial Wire

Code	MN	AN	BN	RN
Type	Non-mag Microstrip	Non-mag Axial Ribbon	Non-mag Axial Wire	Non-mag Radial Wire

⑥Rated Voltage

Code	Rated Voltage(V)	Code	Rated Voltage(V)
301	300	302	3000
501	500	362	3600
102	1000	502	5000
152	1500	802	8000
202	2000	103	10000
252	2500		

⑦Laser Marking

X denotes Marking. Capacitance is less than 10pF; for example: the marking of 1.0pF is 1R0.

Capacitance is not less than 10pF; for example: the marking of 100pF is 101.

⑧Packaging Type

	70F	70G	70L
C: Waffle Tray packaging	√	√	√
I: Special packaging	Consult with DALICAP		

◆Performance Requirements

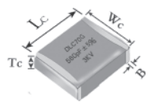
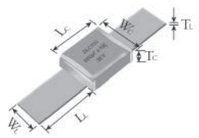
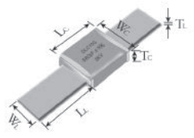
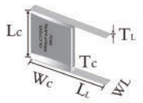
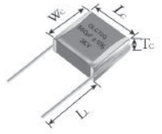
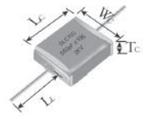
Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

◆Capacitance & Rated Voltage Table

Cap. \ Rated WVDC	Size(inch)					
	DLC70F (6040)		DLC70G (7575)		DLC70L (130130)	
Cap.pF	Code	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC
1.0	1R0						
1.2	1R2						
1.5	1R5						
1.6	1R6						
1.8	1R8						
2.2	2R2	B, C, D.	5000V Code502 Extended Voltage 8000V Code802	B, C, D.	5000V Code502 Extended Voltage 8000V Code802		
2.7	2R7						
3.3	3R3						
3.6	3R6						
3.9	3R9						
4.7	4R7						
5.6	5R6						
6.8	6R8						
8.2	8R2						
10	100	F, G, J.	3000V Code302 Extended Voltage 5000V Code502	F, G, J.	3000V Code302 Extended Voltage 5000V Code502	G, J.	10KV Code 103
12	120						
15	150						
18	180						
22	220						
27	270						
33	330						
39	390						
47	470						
56	560						
68	680						
82	820						
100	101						
120	121						
150	151						
180	181						
200	201						
220	221						
270	271						
300	301						
330	331						
390	391						
470	471						
560	561						
680	681						
820	821						
1000	102		2000V Code202 Extended Voltage 3000V Code302		3000V Code302 Extended Voltage 5000V Code502		
1200	122						
1500	152						
1800	182						
2200	222						

Cap. \ Rated WVDC	Size(inch)					
	DLC70F (6040)		DLC70G (7575)		DLC70L (130130)	
Cap.pF	Code	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC
2700	272	F, G, J.	1000V Code102 Extended Voltage 2000V Code202	G, J.	3000V Code302 Extended Voltage 5000V Code502	G, J.	5KV Code 502
3300	332						
4700	472						
5100	512						
5600	562						
6800	682				1000V Code102 Extended Voltage 3000V Code302		
7500	752						
8200	822						
10000	103						
12000	123				2000V Code 202		
15000	153						
18000	183						
20000	203					J.	3000V Code 302
22000	223						
33000	333						
47000	473						
56000	563						
68000	683						
82000	823						
100000	104						
120000	124						1000V Code 102

◆DLC70 Lead Type and Dimensions

W/L/P	MS/MN	AR/AN
		
FN	**RW/RN**	**AW/BN**
		

unit: inch(millimeter)

Series	Term. Code	Capacitor Dimensions				Lead Dimensions			Plated Material
		Length (Lc)	Width (Wc)	Thick. (Tc)	Overlap (B)	Length (LL)	Width (WL)	Thickness (TL)	
DLC70F	MS/MN AR/AN	.614 +.015～−.010 (15.60 +0.38～−0.25)	.433 ± .010 (11.00 ± 0.25)	.197 (5.00) max	.024～.059 (0.60～1.50)	.748 (19.00) min	.350 ± .010 (8.89 ± 0.25)	.008 ± .001 (0.20 ± 0.025)	Silver-plated Copper
	RW/RN					.748 (19.00) min	Dia.=.030±.004 (0.76±0.10)		
	AW/BN					.906 (23.00) min			
DLC70G	MS/MN AR/AN	.760 +.015～−.010 (19.30 +0.38～−0.25)	.760 ± .010 (19.30 ± 0.25)	.197 (5.00) max	.024～.059 (0.60～1.50)	.748 (19.00) min	.591 ± .010 (15.00 ± 0.25)	.008 ± .001 (0.20 ± 0.025)	Silver-plated Copper
	RW/RN					.748 (19.00) min	Dia.=.030±.004 (0.76±0.10)		
	AW/BN					.906 (23.00) min			
DLC70L	MN/AN	1.350±.050 (34.29±1.27)	1.350±.050 (34.29±1.27)	.197 (5.00) max	.039～.071 (1.00～1.80)	.748 (19.00) min	1.299 ± .020 (33.00 ± 0.50)	.012 ± .001 (0.30 ± 0.025)	Silver-plated Copper
	FN					.669 (17.00) min	.157 ± .008 (4.00 ± 0.20)	.012 ± .001 (0.30 ± 0.025)	

Dalicap
DALICAP TECH. CORPORATION
DLC70 Series
High RF Power Multilayer Chip Ceramic Capacitors

◆Performance

Item	Specifications
Quality Factor (Q)	Less than 1000pF, Q value more than 2000, Test frequency 1MHz; More than 1000pF, Q value more than 2000, Test frequency 1KHz;
Insulation Resistance (IR)	Test Voltage: 500V 10^5 Megohms min. @ +25℃ at rated WVDC. 10^4 Megohms min. @ +125℃ at rated WVDC.
Rated Voltage	See Rated Voltage Table
Dielectric Withstanding Voltage (DWV)	250% of Rated Voltage for 5 seconds, Rated Voltage≤500VDC 150% of Rated Voltage for 5 seconds, 500VDC < Rated Voltage≤1250VDC 120% of Rated Voltage for 5 seconds, Rated Voltage>1250VDC
Operating Temperature Range	−55℃ to +125℃ Notes: For higher temperature, please contact with Dalicap.
Temperature Coefficient (TC)	0±30 ppm/℃
Capacitance Drift	±0.2% or ±0.05pF, whichever is greater.
Piezoelectric Effects	None

Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

◆Environmental Tests

Item	Specifications	Method
Thermal Shock	DWV: the initial value IR: Shall not be less than 30% of the initial value Capacitance change: no more than 0.5% or 0.5pF. whichever is greater.	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature stay 15 minutes. The time of removing shall not be more than 5 minutes. Perform the five cycles.
Moisture Resistance		MIL-STD-202, Method 106.
Humidity (steady state)	DWV: the initial value IR: the initial value Capacitance change: no more than 0.3% or 0.3pF. whichever is greater.	MIL-STD-202, Method 103, Condition A, with 1.5 Volts D.C. applied while subjected to an environment of 85℃with 85% relative humidity for 240 hours minimum.
Life	IR: Shall not be less than 30% of the initial value Capacitance change: no more than 2.0% or 0.5pF. whichever is greater.	MIL-STD-202, Method 108, for 2000 hours, at 125℃. 200% of Rated Voltage for Capacitors, Rated Voltage≤500VDC 120% of Rated Voltage for Capacitors, 500VDC < Rated Voltage≤1250VDC 100% of Rated Voltage for Capacitors, Rated Voltage>1250VDC

Capacitor Assemblies Offering

◆Product Features

High Operating Voltage, High Operating Current, Extended Capacitance, Tighter Tolerances,
High Reliability, High Q, Ultra-low ESR, Non-Magnetic.

◆Typical Applications Field

High Power RF, Medical Electronics, Broadcast, Semiconductor Manufacturing,
High Magnetic Environments, Inductive Heating.

◆Part Numbering

DLC	V	6	7	N	C	101	F	252	X	(G)
❶	❷	❸	❹	❺	❻	❼	❽	❾	❿	⓫
DALICAP	V : Parallel Y : Series Z : Series/ Parallel	Number Capacitors	Termination Type 5 : Match 6 : Silver 7 : Copper 8 : Silver plated copper strip	Cap. Type N:DLC70	Cap. Size B:1111 C:2225 E:3838 F:6040 G:7676 L:130130	Capacitance	Tolerance	Rated Voltage	Laser Marking	G: Molding; C: Coating; Null: No any coating

Capacitance: For capacitor values requiring 3 significant digits,
e.g. 1222.5pF =1222R5
e.g. DLCV66NC101F252X
Silver bracket assembly with six DLC70 pieces in parallel, Capacitance is 100pF,
Capacitance tolerance is ±1%, WVDC is 2500 V and Laser marking.
e.g. DLCY26NG1222R5G203X
Silver bracket assembly with two DLC70 pieces in series, Capacitance is 1222.5pF,
Capacitance tolerance is ±2%, WVDC is 20,000V and Laser marking.

◆Capacitance and Voltage

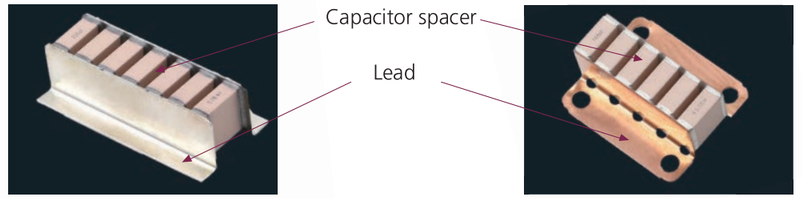
By Buyer's requirements using existing drawings, mechanical sketches, or we can help with capable modeling of assemblies thermal rise predictions.

◆Typical Assembly Configurations

①Parallel Assemblies

unit: inch(millimeter)

	70B	70C	70E	70F	70G
Lead Material	Silver-plated Copper or silver				
Lead Thickness	.004 or .010 (0.1 or 0.25)		.010 or .020 (0.25 or 0.51)		
Lead Length (max.)	.50 (12.7)	.75 (19.1)	2.0 (50.8)		
Capacitor Spacer (typ.)	.050 to .078 (1.3 to 2)		.06 to .10 (1.5 to 2.5)	.078 to .197 (2.0 to 5.0)	
Mtg Configuration	Horizontal/Vertical				



②Series Assemblies

unit: inch(millimeter)

	70C	70E	70F	70G
Lead Type	L-Bracket			
Lead Material	Silver-plated Copper or silver			
Lead Thickness	.010 (0.25)	.010 or .020 (0.25 or 0.51)		
Lead Length (max.)	.75 (19.1)	1.0 (25.4)		
Capacitor Spacer (typ.)	0 to .157 (0 to 4)			
Mtg Configuration	Horizontal			

③Epoxy Molding

④Other Assemblies By Buyer's requirement

DLC75 Series Ultra-Low ESR, RF/Microwave Ceramic Capacitors

◆Product Features

Ultra-Low ESR, High Working Voltage, High RF Power,
High Self-Resonance Frequency.

◆Product Applications

Typical Circuit Applications: High Power Filter Networks,Mixers, Couplers, Matching Networks, Output Coupling, Antenna Coupling, DC blocking, Bypass.

Typical Applications Field: VHA/UHF/Microwave Communication Systems,Mobile Base Stations, Repeaters, Wireless Broadcasting Equipments, Radio Stations, Radar,WiMAX, Satellite Communications.

◆Part Numbering

DLC75	P	101	J	W	251	N	B
①	②	③	④	⑤	⑥	⑦	⑧
Series	Dimensions Code	Rated Capacitance	Tolerance	Termination Type	Rated Voltage	Laser Marking	Packing Type

①Series: Dalicap 75 Series Low ESR Microwave Capacitor, Temperature Coefficient: 0±30ppm/℃.

②Dimensions Code

unit:inch(millimeter)

	DLC75N	DLC75H	DLC75P	DLC75D	DLC75B	DLC75R
Length	.024±.001 (0.60±0.03)	.040±.004 (1.02±0.10)	.063±.006 (1.60±0.15)	.078±.010 (2.00±0.25)	.110(+.020~−.010) (2.79+0.51~−0.25)	.070±.006 (1.78±0.15)
Width	.012±.001 (0.30±0.03)	.020±.004 (0.51±0.10)	.031±.006 (0.80±0.15)	.049±.010 (1.20±0.25)	.110±.010 (2.79±0.25)	.080±.006 (2.03±0.15)
Thickness	.012±.001 (0.30±0.03)	.020±.004 (0.51±0.10)	.031±.006 (0.80±0.15)	.057(1.45)max	.102(2.60)max	.120(3.04)max

③Rated Capacitance

Capacitance is less than 10pF; for example: 1R0=1.0pF, R denotes decimal point

Capacitance greater than 10pF; for example: 101=100pF, the third number is the power of 10.

④Tolerance

Code	A	B	C	D	F	G	J
Tolerance	±0.05pF	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%

⑤Termination Type

Code	W
Type	Nickel, Plated 100% Sn(RoHS)

⑥Rated Voltage

Code	Rated Voltage(V)
250	25
500	50
251	250
501	500

⑦Laser Marking

X denotes Marking. Capacitance is less than 10pF; for example: the marking of 1.0pF is 1R0.

Capacitance is not less than 10pF; for example: the marking of 100pF is 101.

N denotes no marking.

⑧Packaging Type

	75N	75H	75P	75D	75B	75R
T: Horizontal Taping	√	√	√	√	√	√
B: Bulk packaging in a bag			√	√	√	√
TV: Vertical Taping				√	√	

◆Performance Requirements

Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

◆All products are in compliance with RoHS instruction.

◆Capacitance & Rated Voltage Table

Cap.pF \ Rated WVDC		Size(inch)											
		DLC75N (0201)		DLC75H (0402)		DLC75P (0603)		DLC75D (0805)		DLC75R (0708)		DLC75B (1111)	
Cap.pF	Code	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC
0.1	0R1												
0.2	0R2												
0.3	0R3												
0.4	0R4												
0.5	0R5												
0.6	0R6												
0.7	0R7												
0.8	0R8												
0.9	0R9												
1.0	1R0												
1.1	1R1												
1.2	1R2												
1.3	1R3												
1.4	1R4												
1.5	1R5	A, B, C, D.	25V Code 250	A, B, C, D.	50V Code 500 200V or 201 250V Code 251	A, B, C, D.	250V Code 251	A, B, C, D.	250V Code 251	B, C, D.	500V Code 501	B, C, D.	500V Code 501 or 1000V Code 102
1.6	1R6												
1.7	1R7												
1.8	1R8												
1.9	1R9												
2.0	2R0												
2.1	2R1												
2.2	2R2												
2.4	2R4												
2.7	2R7												
3.0	3R0												
3.3	3R3												
3.6	3R6												
3.9	3R9												
4.3	4R3												
4.7	4R7												
5.1	5R1												
5.6	5R6												
6.2	6R2	B, C.		A, B, C.	50V Code 500 or 200V Code 201	A, B, C.		B, C.					
6.8	6R8												
7.5	7R5												
8.2	8R2												
9.1	9R1												
10	100	F, G, J.		F, G, J.		F, G, J.		F, G, J.		G, J.			
11	110												
12	120												
13	130												
15	150												
16	160												
18	180												
20	200												
22	220												
24	240												
27	270												
30	300												
33	330				50V Code 500								
36	360												
39	390												
43	430												
47	470												

Dalicap
DALICAP TECH. CORPORATION
DLC75 Series
Ultra-Low ESR, RF/Microwave Ceramic Capacitors

◆Capacitance & Rated Voltage Table

Cap.pF \ Rated WVDC		Size(inch)											
		DLC75N (0201)		DLC75H (0402)		DLC75P (0603)		DLC75D (0805)		DLC75R (0708)		DLC75B (1111)	
Cap.pF	Code	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC
51	510					F, G, J.	250V Code 251	F, G, J.	250V Code 251	G, J.	500V Code 501	F, G, J.	500V Code 501 1000V Code 102
56	560												
62	620												
68	680												
75	750												
82	820												
91	910												
100	101												300V Code 301 600V Code 601
110	111												
120	121												
130	131												
150	151												
160	161												
180	181												
200	201												
220	221												200V Code 201 500V Code 501
240	241												
270	271												
300	301												
330	331												
360	361												
390	391												
430	431												
470	471												
510	511												100V Code 101 500V Code 501
560	561												
620	621												
680	681												
750	751												
820	821												50V Code 500
910	911												
1000	102												

◆Performance

Item	Specifications
Quality Factor (Q)	Greater than 2,000 at 1±0.1MHz
Insulation Resistance (IR)	10^5 Megohms min. @ +25℃ at rated WVDC. 10^4 Megohms min. @ +125℃ at rated WVDC.
Rated Voltage	See Rated Voltage Table
Dielectric Withstanding Voltage (DWV)	250% of rated voltage for 5 seconds.
Operating Temperature Range	−55℃ to +150℃ Notes: For higher temperature, please contact with Dalicap.
Temperature Coefficient (TC)	0±30ppm/℃
Capacitance Drift	±0.2% or ±0.05pF, whichever is greater.
Piezoelectric Effects	None

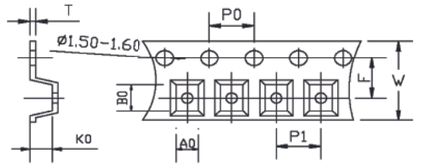
◆Environmental Tests

Item	Specifications	Method
Thermal Shock	DWV: the initial value IR: Shall not be less than 30% of the initial value Capacitance change: no more than 0.5% or 0.5pF. whichever is greater.	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature stay 15 minutes. The time of removing shall not be more than 5 minutes. Perform the five cycles.
Moisture Resistance		MIL-STD-202, Method 106.
Humidity (steady state)	DWV: the initial value IR: the initial value Capacitance change: no more than 0.3% or 0.3pF. whichever is greater.	MIL-STD-202, Method 103, Condition A, with 1.5 Volts D.C. applied while subjected to an environment of 85℃with 85% relative humidity for 240 hours minimum.
Life	IR: Shall not be less than 30% of the initial value Capacitance change: no more than 2.0% or 0.5pF. whichever is greater.	MIL-STD-202, Method 108, for 2000 hours, at 125℃. 200% of Rated Voltage for Capacitors, Rated Voltage≤500VDC 120% of Rated Voltage for Capacitors, 500VDC＜ Rated Voltage≤1250VDC 100% of Rated Voltage for Capacitors, Rated Voltage＞1250VDC

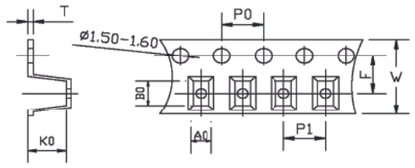
◆Tape & Reel Specifications

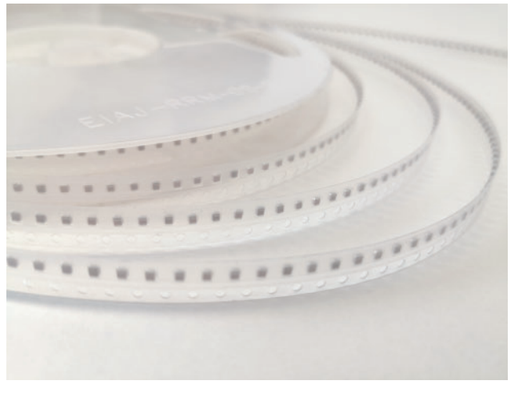
	A0 (mm)	B0 (mm)	K0 (mm)	W (mm)	P0 (mm)	P1 (mm)	T (mm)	F (mm)	Qty/min	Qty/reel	Tape Material
0201-H	0.40	0.70	-	8.00	4.00	2.00	0.42	3.50	1000	15000	Paper
0402-H	0.70	1.20	-	8.00	4.00	2.00	0.65	3.50	1000	10000	Paper
0603-H	1.05	1.80	-	8.00	4.00	4.00	0.95	3.50	500	4000	Paper
0708-H	1.90	2.65	2.20	8.00	4.00	4.00	0.25	3.50	500	1000	Plastic
0805-H	1.45	2.30	0.95	8.00	4.00	4.00	0.22	3.50	500	3000	Plastic
0805-H	1.37	2.20	1.20	8.00	4.00	4.00	0.22	3.50	500	3000	Plastic
0805-V	1.35	2.25	1.35	8.00	4.00	4.00	0.22	3.50	500	1000	Plastic
1111-H	2.85	3.50	1.95	8.00	4.00	4.00	0.25	3.50	500	2000	Plastic
1111-H	2.85	3.60	2.40	8.00	4.00	4.00	0.25	3.50	500	2000	Plastic
1111-V	2.30	3.55	2.70	12.00	4.00	4.00	0.40	5.50	500	1500	Plastic

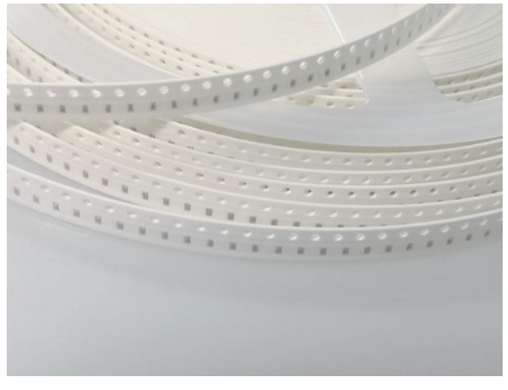
Horizontal Orientation



Vertical Orientation







Broadband Ceramic Capacitors

◆Product Features

Series	Typical operating frequency range	Insertion Loss	Plated Material	Packaging Type
(.010" × .005")01005BB104MW4R0	16KHz(-3dB) to >67GHz	<1dB,typical		40K pcs/reel, lower quantities in cut tape
(.020" × .010")0201BB104KW160	16KHz(-3dB) to >40GHz	<1dB,typical	Au/Sn (RoHS)	15K pcs/reel, lower quantities in cut tape
(.020" × .010")0201BB103KW250	16KHz(-3dB) to >32GHz	<1dB,typical		
(.040" × .020")0402BB103KW500	16KHz(-3dB) to 40GHz	<1dB,typical	Au/Sn (RoHS)	10K pcs/reel, lower quantities in cut tape
(.040" × .020")0402BB104KW500	16KHz(-3dB) to 50GHz	<1.2dB,typical		
(.080" × .050")0805BB103KW101	16KHz(-3dB) to 3GHz	<0.25dB,typical	Ni/Sn(RoHS)	

◆Mechanical Dimensions

unit:inch(millimeter)

Outlines	Code	Capacitor Dimensions			
		Length (L)	Width (W)	Thick. (T)	(S)
	01005	.016±.001 (0.40±0.03)	.008±.001 (0.20±0.03)	.008±.001 (0.20±0.03)	.005(0.13)min
	0201	.023±.001 (0.58±0.03)	.012±.001 (0.30±0.03)	.0118(0.30)max	.0078(0.20)min
	0402	.040±.004 (1.016±0.102)	.020±.004 (0.508±0.102)	.024(0.61)max	.016(0.406)min
	0805	.080±.006 (2.03±0.15)	.050±.006 (1.27±0.15)	.040(1.02)max	.044(1.12)min

◆Electrical Specifications

Item	Series					
Rated Voltage	01005BB104 MW4R0	0201BB104 KW160	0201BB103 KW250	0402BB103 KW500	0402BB104 KW500	0805BB103 KW101
	4WVDC	16WVDC	25WVDC	50WVDC	50WVDC	100WVDC
Capacitance	100nF	100nF	10nF	10nF	100nF	10nF
Operating Temperature Range.	−55℃ to +85℃	−55℃ to +125℃				
Insulation Resistance (IR)	$10^{11}\Omega$ min. @ +25℃ @ rated WVDC					
Dielectric Withstanding Voltage (DWV)	250% of rated voltage for 5 seconds.					
Temperature Coefficient (TC)	±15%					

◆Part Numbering

01005 BB 10 4 M W 4R0

- 4R0 — WVDC
- W — Tin Plated over Nickel Barrier (RoHS) Compliant
- M — Capacitance Tolerance (M tolerance = ±20%)
- 4 — Indicates number of zeros following digits of capacitance in pF
- 10 — Capacitance Code – First 2 significant digits for capacitance
- BB — Series
- 01005 — Case Size

◆Introduction

There are a number of circuits that require coupling RF signals or bypassing them to ground while blocking DC over extraordinarily large RF bandwidths. The applications for which they are intended typically require small, surface-mountable (SMT) units with low insertion losses, reflections, and impedances across RF frequencies extending from the tens of KHz to the tens of GHz. and temperatures typically ranging from -55 to +85℃. This note focuses on a particular implementation of these devices -- multilayer ceramic capacitors (MLCCs)- and how to obtain the best performance when they're used on various substrates.

Broadband capacitors are used in the "signal integrity" market -- optoelectronics/high-speed data; ROSA/TOSA (Transmit/Receive optical subassemblies); SONET (Synchronous Optical Networks); broadband test equipment - as well as in broadband microwave and millimeter wave amplifiers (MMICs, GaN transistors) and oscillators. The basic requirement in the former is to produce an output waveform that closely replicates an input waveform, typically a train of digital pulses, as shown in Fig.1.

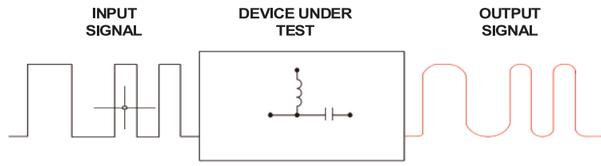


Fig.1"Signal Integrity"- output replication of input

While RF and microwave devices are typically measured in the frequency domain, digital systems are usually characterized in the time domain, and so it is necessary to make a connection between the two (Fig.2).

FREQUENCY DOMAIN
- Insertion loss
- Reflection

TIME DOMAIN
- Rise and fall times
- Eye opening
- Jitter

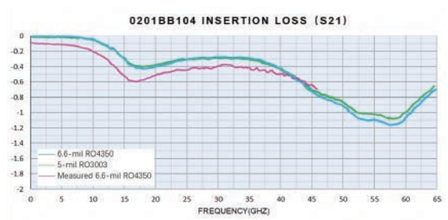


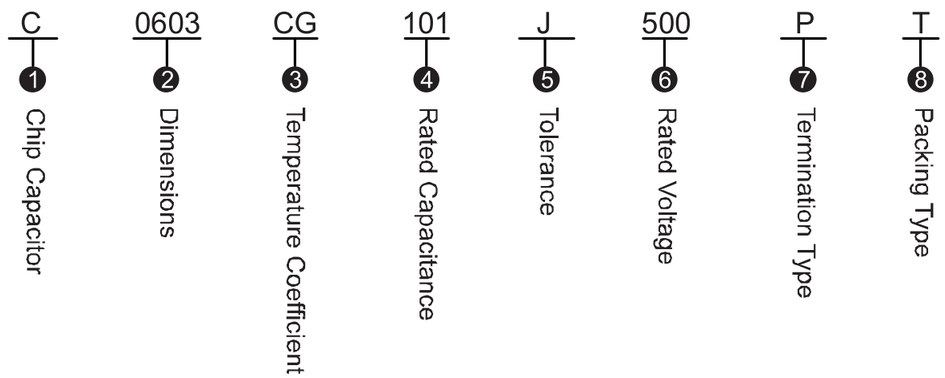
Fig.2 Frequency domain and time domain parameters

General Purpose Non-Magnetic Multilayer Ceramic Capacitors

◆Product Features

Non-Magnetic, Suitable for MRI and other equipment requiring non-magnetic.

◆Part Numbering



①C: General Purpose Non-Magnetic Multilayer Ceramic Capacitors

②Dimensions

unit: millimeter

Series	L	W	T	B(Min)	B(Max)
0603	1.60±0.10	0.80±0.10	0.80±0.10	0.20	0.50
0805	2.00±.020	1.20±.020	1.40	0.25	0.60
1206	3.20±.020	1.60±.020	1.40	0.25	0.60
1210	3.20±.020	2.50±.020	2.00	0.25	0.70

③Temperature Coefficient

CG: 0±30ppm/℃
X: ±15%

④Rated Capacitance

Capacitance is less than 10pF; for example: 1R0=1.0pF, R denotes decimal point.

Capacitance greater than 10pF; for example: 101=100pF, the third number is the power of 10.

⑤Tolerance

Code	B	C	D	G	J	K
Tolerance	±0.1pF	±0.25pF	±0.5pF	±2%	±5%	±10%

⑥Rated Voltage

Code	Rated Voltage(V)	Code	Rated Voltage(V)
250	25	251	250
500	50	501	500
101	100	102	1000
201	200	202	2000

⑦Laser Marking

P: 100% Sn Solder over Copper Plating (RoHS Compliant)

⑧Packaging Type

T: Tape carrier packing

	A0 (mm)	B0 (mm)	K0 (mm)	W (mm)	P0 (mm)	P1 (mm)	T (mm)	F (mm)	Qty/min	Qty/reel	Tape Material
0603	1.05	1.80	0.90	8.00	4.00	4.00	0.90	3.50	1000	4000	Paper
0805	1.40	2.20	1.20	8.00	4.00	4.00	0.22	3.50	1000	3000	Plastic
1206	1.91	3.51	1.30	8.00	4.00	4.00	0.25	3.50	1000	3000	Plastic
1210	2.85	3.50	1.95	8.00	4.00	4.00	0.25	3.50	1000	3000	Plastic

◆Capacitance & Rated Voltage Table

unit: V

CG	0603					0805				1206					1210					
Code.	25	50	100	200	250	50	100	200	250	50	100	200	250	500	50	100	200	250	500	1000
1R0																				
1R2																				
1R5																				
1R8																				
2R2																				
2R7																				
3R3																				
3R9																				
4R7																				
5R6																				
6R8																				
8R2																				
100																				
120																				
150																				
180																				
220																				
270																				
330																				
390																				
470																				
560																				
680																				
820																				
101																				
121																				
151																				
181																				
221																				
271																				
331																				
391																				
471																				
561																				
681																				
821																				
102																				

◆Capacitance & Rated Voltage Table

unit: V

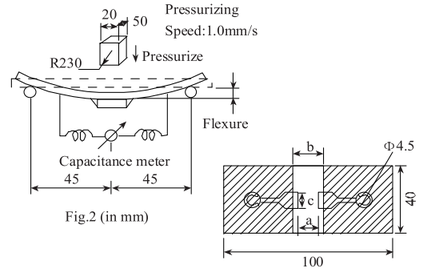
X7R	0603					0805				1206					1210					
Code.	25	50	100	200	250	50	100	200	250	50	100	200	250	500	50	100	200	250	500	1000
331																				
471																				
681																				
821																				
102																				
152																				
222																				
332																				
472																				
682																				
103																				
153																				
223																				
333																				
473																				
683																				
104																				
154																				
224																				
334																				
474																				
684																				
105																				

◆Specifications and Test Methods

No.	Item	Specification	Test Method
1	Operating Temperature	C0G: −55℃～+125℃ X7R: −55℃～+125℃	
2	Appearance	No defects or abnormality	Visual inspection: ×10 microscope.
3	Dimensions	See the previous pages	Callipers inspection
4	Capacitance	Shall be Within the applicable tolerance specified.	
5	D.F.	C0G: Cap≥30pF, Q≥1000; Cap＜30pF, Q≥400+20C X7R: D.F.≤2.5%	<table><tr><th>Type</th><th>Capacitance</th><th>Test Voltage</th><th>Test Frequency</th></tr><tr><td rowspan="2">Class 1 (C0G)</td><td>≤1000pF</td><td>1.0±0.2Vrms</td><td>1MHz±10%</td></tr><tr><td>＞1000pF</td><td>1.0±0.2Vrms</td><td>1KHz±10%</td></tr><tr><td rowspan="2">Class 2 (X7R)</td><td>≤10μF</td><td>1.0±0.2Vrms</td><td>1KHz±10%</td></tr><tr><td>＞10μF</td><td>0.5±0.2Vrms</td><td>120Hz±20%</td></tr></table> Before initial measurement (X7R only) to apply de-aging at 150℃ for 1hr then set for 24±2hrs at room temp.
6	Insulation Resistance (IR)	No less than 10GΩ or 500MΩμF, whichever is smaller.	Voltage: DC Rated Voltage Charging Time: 1~2 min Charge/discharge current: 50mA max. Measurement Temperature: 25℃ Measurement Humidity: 75%
7	Dielectric Withstanding Voltage (DWV)	Shall be no evidence of breakdown or visible evidence of arcing or damage.	1. Test Voltage: 250% of Rated Voltage, Rated Voltage≤500VDC 150% of Rated Voltage, 500VDC＜Rated Voltage≤1250VDC 120% of Rated Voltage, Rated Voltage＞1250VDC 2. Applied Time: 1s to 5 s 3. Charge/discharge current: 50mA max.

Dalicap
DALICAP TECH. CORPORATION
General Purpose Non-Magnetic Multilayer Ceramic Capacitors

◆Specifications and Test Methods

No.	Item	Specification	Test Method
8	Temperature Coefficient	<table><tr><th>Type</th><th>Temperature coefficient ppm/℃</th></tr><tr><td>C0G</td><td>0±30</td></tr></table> <table><tr><th>Type</th><th>Temperature Characteristics</th></tr><tr><td>X7R</td><td>±15%</td></tr></table>	Conduct the five cycles according to the temperatures as below. <table><tr><th>Step</th><th>Temperature(℃)</th></tr><tr><td>1</td><td>25±2℃</td></tr><tr><td>2</td><td>-55±3℃</td></tr><tr><td>3</td><td>25±2℃</td></tr><tr><td>4</td><td>125±3℃</td></tr><tr><td>5</td><td>25±2℃</td></tr></table> C0G: $TC=\frac{C_x-C_3}{C_3\times\Delta T}\times10^6$ (ppm/℃) X7R: $TC=\frac{C_x-C_3}{C_3}\times100(\%)$
9	Adhesive Strength of Termination	No removal of the terminations or other defect should occur.	Pressurizing force: 01R5/0201: 2N; 0402/0603: 5N; 0805/1206/1210/1812: 10N Test time: 10±1 sec.
10	Bending Strength	No cracking shall occur. Cap change: C0G: within ±5% or 0.5pF whichever is larger X7R: within ±12.5%	Solder the capacitor on test jig (glass epoxy board). Then apply a force in the direction shown in below fig. Flexure: 1mm; Holding time: 5±1s 
11	Solderability of Termination	Shall be at least 85 percent covered with a smooth solder coating.	Immerse the capacitor in a eutectic solution requirement temperature (230±5℃) for 2±0.5 seconds. Capacitor shall be immersed to a depth of 10mm.

◆Specifications and Test Methods

No.	Item	Specification		Test Method
12	Resistance to Soldering Heat	Appearance	No evidence of mechanical damage or delamination or exposed.	Immerse the capacitor in a eutectic solution at 265±5℃ for 10±1 seconds. Capacitor shall be immersed to a depth of 10mm. And following a minimum 10 minutes to maximum 24 hours cooling period.
		Capacitance Change ΔC	C0G: Within ±2.5% or 0.25pF (Whichever is larger) X7R: Within ±12.5% .	
		D.F.	To meet initial requirement.	
		Insulation Resistance	No less than 10GΩor 500MΩμF, Whichever is smaller.	
13	Temperature Cycle	Appearance	No evidence of mechanical damage	Fix the capacitor to the supporting jig in the same manner and under the same conditions as (11). Perform the five cycles according to the four heat treatments listed in the following table. Set it for 24±2 hours at room temperature.
		Capacitance Change ΔC	C0G: Within ±2.5% or 0.25pF (Whichever is larger) X7R: Within ±7.5% .	
		D.F.	To meet initial requirement.	
		Insulation Resistance	No less than 10GΩor 500MΩμF, Whichever is smaller.	

Step	Temperature(℃)	Time(minutes)
1	−55℃ (0~−3℃)	30±3
2	25℃	2~3
3	125℃ (0~−3)	30±3
4	25℃	2~3

Non-Magnetic Chip Resistors

◆Product Features

1. Non-Magnetic chip resistors by copper plating on middle termination.
2. Suited for reflow and flow solder.
3. Suitable for no lead soldering.
4. Lead free, Meet RoHS compliant.

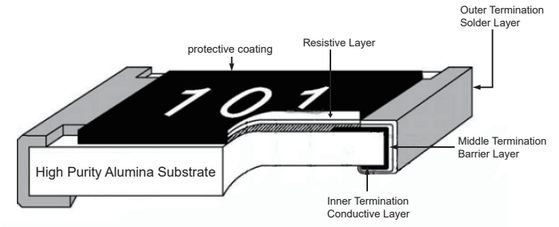
◆Product Applications

MRI medical equipment, Measurement instrument, other non-magnetic applications.

◆Part Number

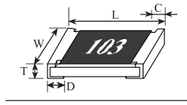
R — Chip resistor
0603 — Size
RC — Temperature Coefficient
103 — Resistance value
J — Tolerance
PD — Packing
NM — Non-Magnetic

◆Configuration

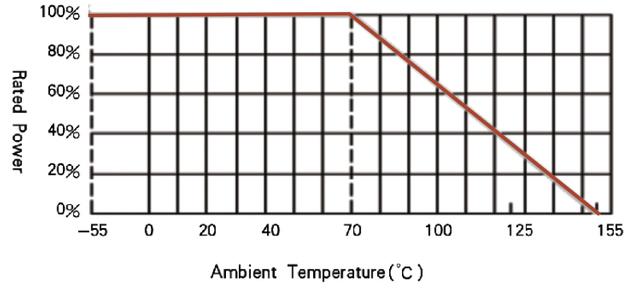


Construction of Chip-Resistor

◆Dimensions

	Size	L	W	C	D	T
	0603	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
	0805	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
	1206	3.10±0.10	1.60±0.10	0.50±0.20	0.50±0.25	0.55±0.10

◆Power Derating Curve

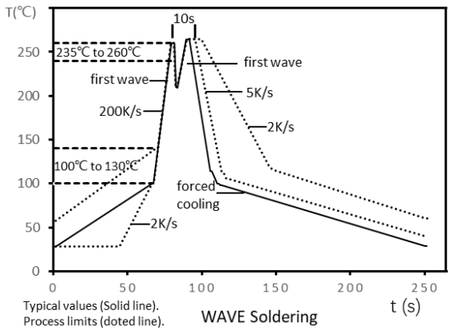


◆Rated Value

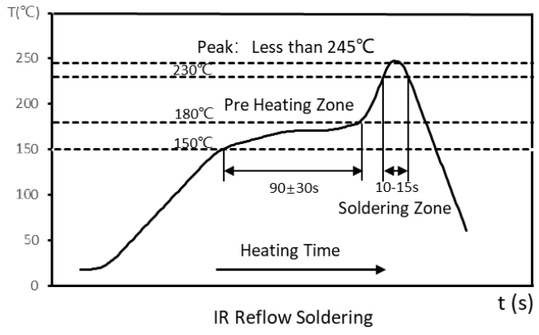
Size	Rated Power At 70°C	RCWV Max.	Overload Voltage Max.	Tolerance	Temperature Coefficient ppm/°C	Resistance Range		Standard Resistance Value
						Min.	Max.	
0603	1/10W	50V	100V	±1%(F)	±100	1Ω	10MΩ	E-96
				±5%(J)	±200	0Ω&1Ω	10MΩ	E-24
0805	1/8W	150V	300V	±1%(F)	±100	1Ω	10MΩ	E-96
				±5%(J)	±200	0Ω&1Ω	10MΩ	E-24
1206	1/4W	200V	400V	±1%(F)	±100	1Ω	10MΩ	E-96
				±5%(J)	±200	0Ω&1Ω	10MΩ	E-24

Jumper: 0603 size maximum resistance ⩽50mΩ and rated current⩽1A.
0805, 1206 size maximum resistance ⩽50mΩ and rated current ⩽2A.
1Ω～10Ω: Temperature Coefficient of Resistance for 0603, 0805, 1206 = -300～+500ppm/°C.

◆Soldering Temperature Curve



Typical values (Solid line).
Process limits (doted line).
WAVE Soldering



IR Reflow Soldering

◆Resistance Marking

R100 4 digit marking for ±1%.
For example: 1R00 = 1Ω; R100 = 100mΩ; R047 = 47mΩ;

R10 3 digit marking for 0603 ±1%.
For example: 1R0 = 1Ω; R10 = 100mΩ; R50 = 500mΩ;

E-24 Series

473 3 digit marking for ±5% E24.
For example: 473 = 47kΩ; 1R5 = 1.5Ω; 0 = 0Ω;

E-96 Series

1542 4 digit marking for E96.
For example: 1542 = 15k4Ω; 22R1 = 22.1Ω;

02C 3 digit marking for E96-0603.
For example: 02C = 102×100 = 10.2kΩ;

◆0603 1% Marking Table

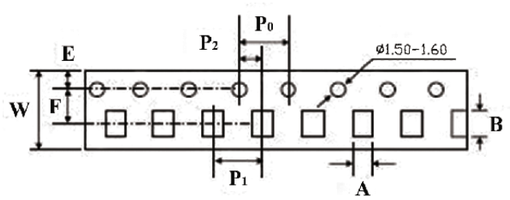
Code	E48	E96	Code	E48	E96	Code	E48	E96	Code	E48	E96
01	100	100	25	178	178	49	316	316	73	562	562
02		102	26		182	50		324	74		576
03	105	105	27	187	187	51	332	332	75	590	590
04		107	28		191	52		340	76		604
05	110	110	29	196	196	53	348	348	77	619	619
06		113	30		200	54		357	78		634
07	115	115	31	205	205	55	365	365	79	649	649
08		118	32		210	56		374	80		665
09	121	121	33	215	215	57	383	383	81	681	681
10		124	34		221	58		392	82		698
11	127	127	35	226	226	59	402	402	83	715	715
12		130	36		232	60		412	84		732
13	133	133	37	237	237	61	422	422	85	750	750
14		137	38		243	62		432	86		768
15	140	140	39	249	249	63	442	442	87	787	787
16		143	40		255	64		453	88		806
17	147	147	41	261	261	65	464	464	89	825	825
18		150	42		267	66		475	90		845
19	154	154	43	274	274	67	487	487	91	866	866
20		158	44		280	68		499	92		887
21	162	162	45	287	287	69	511	511	93	909	909
22		165	46		294	70		523	94		931
23	169	169	47	301	301	71	536	536	95	953	953
24		174	48		309	72		549	96		976

Code	A	B	C	D	E	F	G	H	X	Y	Z
Mulitiplier	10^0	10^1	10^2	10^3	10^4	10^5	10^6	10^7	10^{-1}	10^{-2}	10^{-3}

◆Standard Resistance Value

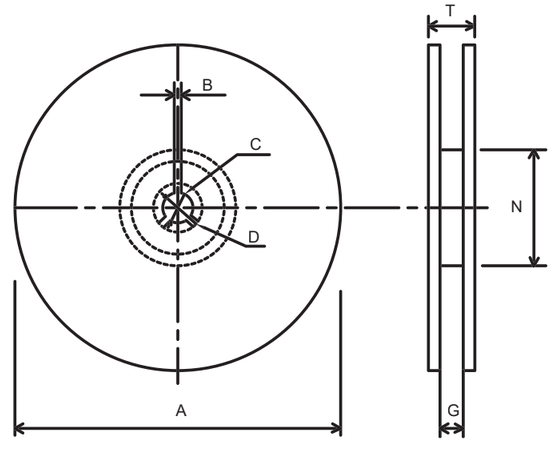
E3	10				22				47									
E6	10		15		22		33		47		68							
E12	10	12	15	18	22	27	33	39	47	56	68	82						
E24	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	
	51	56	62	68	75	82	91											
E96	100	102	105	107	110	113	115	118	121	124	127	130	133	137	140	143	147	
	150	154	158	162	165	169	174	178	182	187	191	196	200	205	210	215	221	
	226	232	237	243	249	255	261	267	274	280	287	294	301	309	316	324	332	
	340	348	357	365	374	383	392	402	412	422	432	442	453	454	475	487	499	
	511	523	536	549	562	576	590	604	619	634	649	665	681	698	715	732	750	
	768	787	806	825	845	866	887	909	931	953	975							

◆Tape and Reel Package



unit:millimeter

	A (mm)	B (mm)	W (mm)	F (mm)	E (mm)	P0 (mm)	P1 (mm)	P2 (mm)
0603	1.10±0.20	1.90±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	4.00±0.10	2.00±0.05
0805	1.65±0.20	2.40±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	4.00±0.10	2.00±0.05
1206	2.00±0.20	3.60±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	4.00±0.10	2.00±0.05



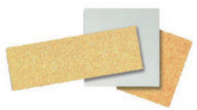
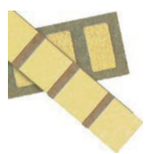
unit:millimeter

	A (mm)	N (mm)	C (mm)	D (mm)	B (mm)	G (mm)	T (mm)	Qty/reel
0603	178.0±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	10.0±1.5	14.9max	5000
0805	254.0±2.0	100.0±1.0	13.5±0.5	20min	2.0±0.5	10.0±1.5	14.9max	10000
1206	330.0±2.0	100.0±1.0	13.5±0.5	20min	2.0±0.5	10.0±1.5	14.9max	20000

◆Specification and Test Methods

Item	Specifications	Test Methods
DC Resistance	F：±1%; J：±5%;	IEC 60115-1/JIS C 5201-1, Clause 4.5. Measure the resistance value.
Short time Overload	J：ΔR≤±(2%+0.1Ω) F：ΔR≤±(1%+0.05Ω)	IEC 60115-1/JIS C 5201-1, Clause 4.13. 2.5 x Rated voltage or Max. Overload Voltage for 5 second. Measure resistance after 30 minutes.
Solderability	Over 95% of termination must be covered with (Sn+Ag+Cu)	IEC 60115-1/JIS C 5201-1, Clause 4.17. After immersing flux, dip in the 245±2℃ molten solder bath for 3±0.5sec.
Resistance to Solder Heat	J：ΔR≤±(1%+0.1Ω) F：ΔR≤±(0.5%+0.05Ω) No mechanical damage.	IEC 60115-1/JIS C 5201-1, Clause 4.18. With 260±5℃ for 10±1 sec.
Temperature Coefficient of Resistance(TCR)	Refer to the rating table information.	IEC 60115-1/JIS C 5201-1, Clause 4.8. Test temperature point is -55℃ and +155℃.
Load Life Humidity	J：ΔR≤±(3%+0.1Ω) F：ΔR≤±(1%+0.05Ω)	IEC 60115-1/JIS C 5201-1, Clause 4.24. Maintain the temperature of the resistor at 40±2℃ and 90%~95% R.H. with the rated voltage applied. Cycle ON for 1.5 hours and OFF for o.5hour for 1000(-0~+48) hours. After 1-4 hours, measure the resistance value.
Load Life	J：ΔR≤±(3%+0.1Ω) F：ΔR≤±(1%+0.05Ω)	IEC 60115-1/JIS C 5201-1, Clause 4.25. Permanent resistance change after 1000(-0~+48) hours (1.5 hours ON, 0.5 hour OFF) at RCWV or Max. Keep the resistor at 70±2℃.
Temperature Cycle	J：ΔR≤±(1%+0.1Ω) F：ΔR≤±(0.5%+0.05Ω) No mechanical damage.	IEC 60115-1/JIS C 5201-1, Clause 4.19. Repeat 5 cycles as follows -55℃(30 Min.), 25℃(2-3Min.), +155℃(30Min.).
Insulation Resistance	Between termination and coating must be over 1000MΩ.	IEC 60115-1/JIS C 5201-1, Clause 4.6. Test voltage: 100±15V.
Bending Strength	J：ΔR≤±(1%+0.1Ω) F：ΔR≤±(0.5%+0.05Ω) No mechanical damage.	IEC 60115-1/JIS C 5201-1, Clause 4.33. Resistance change after bended on the 90mm PCB. Bend: 3mm for 0603, 0805. 2mm for 1206.

Single Layer Chip Ceramic Capacitor(SLC)

General SLC	Margin SLC	Surface Mounting SLC	Array SLC	Multi-PAD SLC
SG	SM	SS	SA	SP
				
Applications: RF, microwave and millimeter wave. **Frequency:** 100MHz ~100GHz, **Capacitance:** 0.1 ~ 10000pF	**Applications:** RF, microwave and millimeter wave. **Frequency:** 100MHz ~100GHz, **Capacitance:** 0.1 ~ 10000pF	high precision single layer series capacitor	an array consisting of multiple single-layer capacitors, suitable for multiple coupling and bypassing	multiple capacitance value, binary tunable single layer capacitor, suited for tuning design or microwave integrated circuit

Meet Standard: MIL-PRF-49464C

◆Inspection Item

Group	Item	Test Method	Test Condition
A1	Burn	-	-
A1	Capacitance	-	100%
A1	Dissipation factor(D.F.)	-	100%
A1	IR	-	100%
A1	DWV	-	100%
A3	Visual	Method 2032 of MIL-STD-883	-
B1	Bond strength	Method 2011 of MIL-STD-883	D, 5 grams minimum with .001" dia wire
B1	Die shear strength	Method 2019 of MIL-STD-883	Limit per MIL-STD-883, Figure 2019-4
B2	Temperature coefficient	-	-
C1	Immersion	Method 107,104 of MIL-STD-202	Immersion: B
C2	Resistance to solder heat	Method 210 of MIL-STD-202	310℃ for 5 seconds
C3	Humidity, steady state, low voltage	Method 103 of MIL-STD-202	Condition A
C4	Life	Method 108 of MIL-STD-202	Applied 200% rated voltage, 2000 hours

Dalicap
DALICAP TECH. CORPORATION
Single Layer Chip Ceramic Capacitor

◆Product Applications

DC blocking, RF bypass, filtering, decoupling, microwave integrated circuit

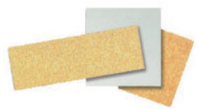
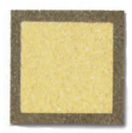
◆Product Features

Reliable performance
Small size, down to 10mil*10mil
Microwave and millimeter wave, frequency up to 100GHz
Suited for conductive adhesive, AuSn eutectic soldering, gold wire bonding

◆Part Number

SG	1010	K301	T	1R0	B	1	G
①	②	③	④	⑤	⑥	⑦	⑧
SLC	Size	Dielectric Coefficient	Metallization	Capacitance	Tolerance	Rated Voltage	Packaging

①SLC Series Capacitors

General SLC	Margin SLC	Surface Mounting SLC
SG	SM	SS
		
Applications: RF, microwave and millimeter wave. **Frequency:** 100MHz ~100GHz, **Capacitance:** 0.1 ~ 10000pF	**Applications:** RF, microwave and millimeter wave. **Frequency:** 100MHz ~100GHz, **Capacitance:** 0.1 ~ 10000pF	High precision single layer series capacitor

②Size

The first two digits represent length, the second two digits represent width, Unit: mil;
for example: 1010, length is 10mil (0.254mm), width is10mil (0.254mm).

③Dielectric Coefficient

dielectric coefficient＜10, K9R6＝9.6; dielectric coefficient ≥10, K301＝300.

Dielectric type	Dielectric constant	Temperature Coefficient Code	Temperature Coefficient	Temperature Range	Max.D.F	IR(Ω) Min@25℃
Type Ⅰ	15	COG	0±30ppm	-55～+125℃	0.15%@1MHz	10^{12}
	35	COG	0±30ppm	-55～+125℃	0.15%@1MHz	10^{12}
	85	COG	0±30ppm	-55～+125℃	0.15%@1MHz	10^{12}
	220	S3L	-3300±500ppm	-55～+125℃	0.25%@1MHz	10^{12}
	300	R3L	-2200±500ppm	-55～+125℃	0.7%@1MHz	10^{11}
	600	S3L	-3300±500ppm	-55～+125℃	1.2%@1MHz	10^{11}
	900	T3M	-4700±500ppm	-55～+125℃	1.2%@1MHz	10^{11}
Type Ⅱ	1300	X7S	±22%	-55～+125℃	4%@1kHz/1MHz	10^{11}
	1500	X7S	±22%	-55～+125℃	4%@1kHz/1MHz	10^{11}
	2500	X7R	±15%	-55～+125℃	4%@1kHz/1MHz	10^{11}
	4000	X7R	±15%	-55～+125℃	4%@1kHz/1MHz	10^{11}
	9000	Y5V	-82%～+22%	-30～+85℃	4%@1kHz/1MHz	10^{11}
Type Ⅲ	15000	X7R/X7S	±15%/±22%	-55～+125℃	2.5%@1kHz/1MHz	10^{10}
	25000	X7R/X7S	±15%/±22%	-55～+125℃	2.5%@1kHz/1MHz	10^{10}
	35000	X7R/X7S	±15%/±22%	-55～+125℃	2.5%@1kHz/1MHz	10^{10}
	45000	X7R/X7S	±15%/±22%	-55～+125℃	2.5%@1kHz/1MHz	10^{9}

④Metallization

Code	Sputter Layer		Plating Layer	
	Metal	Thickness	Metal	Thickness
M	TiW/Au	0.01～0.05/0.03～0.05	Au	≥2
P	TiW/Ni/Au	0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2
T	TaN/TiW/Au	0.03～0.10/0.1～0.2/0.03～0.05	Au	≥2
F	TaN/TiW/Ni/Au	0.03～0.10/0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2
H	TaN/TiW/Pt/Au	0.03～0.10/0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2
D	TiW/Pt/Au	0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2
E	Ti/Pt/Au	0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2
X	TiW/Ni/Ag	0.01～0.05/0.1～0.2/0.10～0.20	-	-
L	frontside：Ti/Pt/Au backside：Ti/Pt	0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2

Note: please contact Dalicap for non-standard Au thickness and metallization system.

⑤Capacitance

Less than 10pF, 1R0＝1.0pF; No less than 10pF, 101＝100pF.

⑥Tolerance

Code	A	B	C	D	F	G	J	K	M	O	Z	V
Tolerance	±0.05pF	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%	±20%	±40%	-20%～+80%	0～+100%

⑦Rated Voltage

Code	Rated Voltage	Code	Rated Voltage
A	10	6	63
B	16	1	100
2	25	C	120
5	50		

⑧Packaging Type

W: Waffle Packaging; G: Stick Box; R: Film Ring.

◆SG/SM Series Capacitance Table

Dimension Code		1010 (.254x.254)				1212 (.305x.305)				1515 (.381x.381)				2020 (.508x.508)			
Rated voltage		16V	25V	50V	100V	16V	25V	50V	100V	16 V	25V	50V	100V	16V	25V	50V	100V
Cap.pF	Tolerance																
0.1	A	K350	K350	K350	K350	K350	K350	K350	K350								
0.3	A	K850	K850	K850	K850	K850	K850	K850	K850	K350	K350	K350	K350				
0.8	B	K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850
1.0	B	K301	K301	K301	K301	K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850
2.2	C D	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301
3.3	C D	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301
4.7	C D	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K301	K301	K301	K301
6.8	C D	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601
8.2	C D	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601
10	C D	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K601	K601	K601	K601
15	J K M	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132
18	J K M	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K132	K132	K132	K132
20	J K M	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K132	K132	K132	K132
22	J K M	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K132	K132	K132	K132
33	J K M	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K252	K252	K252	K252
39	J K M	K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402	K252	K252	K252	K252
47	J K M	K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402
50	J K M	K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402
68	J K M	K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402
82	J K M	K253	K253	K253	K253	K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402
100	J K M	K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902
120	J K M	K353	K353	K353		K153	K153	K153		K153	K153	K153	K153	K902	K902	K902	K902
150	J K M	K353	K353			K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K153
180	J K M	K453				K353	K353	K353		K253	K253	K253		K153	K153	K153	K153
200	J K M	K453				K353	K353			K253	K253	K253		K153	K153	K153	K153
220	J K M					K453				K253	K253	K253		K153	K153	K153	
270	J K M					K453				K353	K353	K353		K153	K153	K153	
330	J K M									K353	K353			K253	K253	K253	
390	J K M									K453				K253	K253	K253	
470	J K M													K353	K353		
560	J K M													K353	K353		
680	J K M													K453			
820	J K M																
1000	J K M																
1200	J K M																
2200	J K M																
10000		Type Ⅰ Dielectric					Type Ⅱ Dielectric				Type Ⅲ Dielectric						

Note: 1) Different colours correspond to different Dielectrics, It is possible to change Dielectric constant.
2) Special Capacitance and rated voltage, Please contact Dalicap.

Dalicap
DALICAP TECH. CORPORATION
SG /SM Series SLC

◆SG/SM Series Capacitance Table

Dimension Code		2525 (.635x.635)				3030 (.762x.762)				3535 (.889x.889)				4040 (1.016x1.016)				5050 (1.270x1.270)			
Rated voltage		16V	25V	50V	100V	16V	25V	50V	100V	16V	25V	50V	100V	16V	25V	50V	100V	16V	25V	50V	100V
Cap.pF	Tolerance																				
0.1	A																				
0.3	A																				
0.8	B	K350	K350	K350	K350	K350	K350	K350	K350												
1.0	B	K850	K850	K850	K850	K350	K350	K350	K350	K350	K350	K350	K350								
2.2	C D	K850	K850	K850	K850	K850	K850	K850	K850	K350	K350	K350	K350	K350	K350	K350	K350				
3.3	C D	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K350	K350	K350	K350
4.7	C D	K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K350	K350	K350	K350
6.8	C D	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850
8.2	C D	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850
10	C D	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K850	K850	K850	K850
15	J K M	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301
18	J K M	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301
20	J K M	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301
22	J K M	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301
33	J K M	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301
39	J K M	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K301	K301	K301	K301
47	J K M	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601
50	J K M	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601
68	J K M	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601
82	J K M	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132
100	J K M	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132
120	J K M	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132
150	J K M	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K132	K132	K132	K132
180	J K M	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
200	J K M	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
220	J K M	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
270	J K M	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K252	K252	K252	K252
330	J K M	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402
390	J K M	K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402
470	J K M	K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402
560	J K M	K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902
680	J K M	K253	K253	K253		K253	K253	K253		K153	K153	K153		K153	K153	K153	K153	K902	K902	K902	K902
1000	J K M	K353	K353			K253	K253	K253		K253	K253	K253		K153	K153	K153		K153	K153	K153	K153
1200	J K M	K453				K353	K353			K253	K253	K253		K253	K253	K253		K153	K153	K153	
1500	J K M					K453				K353	K353			K253	K253	K253		K153	K153	K153	
1800	J K M									K353	K353			K153	K153	K153					
2200	J K M									K453				K353				K253	K253		
10000		Type Ⅰ Dielectric					Type Ⅱ Dielectric				Type Ⅲ Dielectric										

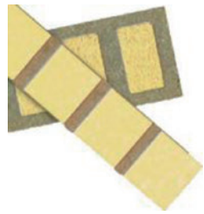
Note: 1) Different colours correspond to different Dielectrics, It is possible to change Dielectric constant.
2) Special Capacitance and rated voltage, Please contact Dalicap.

◆SS Series Capacitance Table

Dimension Code		2010 (.508x.254)				4020 (1.016x.508)				6030 (1.524x.762)				8040 (2.032x.1.016)			
Rated voltage		16V	25V	50V	100V	16V	25V	50V	100V	16V	25V	50V	100V	16V	25V	50V	100V
Cap.pF	Tolerance																
0.1	A	K850	K850	K850	K850	K350	K350	K350	K350								
0.3	A	K301	K301	K301	K301	K350	K350	K350	K350	K350	K350	K350	K350				
0.8	B	K601	K601	K601	K601	K850	K850	K850	K850	K350	K350	K350	K350	K350	K350	K350	K350
1.0	B	K601	K601	K601	K601	K301	K301	K301	K301	K850	K850	K850	K850	K350	K350	K350	K350
2.2	C D	K132	K132	K132	K132	K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850
3.3		K252	K252	K252	K252	K601	K601	K601	K601	K301	K301	K301	K301	K850	K850	K850	K850
4.7		K402	K402	K402	K402	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301
6.8		K402	K402	K402	K402	K132	K132	K132	K132	K601	K601	K601	K601	K301	K301	K301	K301
8.2		K402	K402	K402	K402	K132	K132	K132	K132	K601	K601	K601	K601	K301	K301	K301	K301
10		K402	K402	K402	K402	K132	K132	K132	K132	K601	K601	K601	K601	K301	K301	K301	K301
15	J K M	K902	K902	K902	K902	K252	K252	K252	K252	K132	K132	K132	K132	K601	K601	K601	K601
18		K902	K902	K902	K902	K252	K252	K252	K252	K132	K132	K132	K132	K601	K601	K601	K601
20		K153	K153	K153	K153	K252	K252	K252	K252	K132	K132	K132	K132	K601	K601	K601	K601
22		K153	K153	K153	K153	K402	K402	K402	K402	K132	K132	K132	K132	K132	K132	K132	K132
33		K253	K253	K253		K402	K402	K402	K402	K252	K252	K252	K252	K132	K132	K132	K132
39		K253	K253	K253		K402	K402	K402	K402	K252	K252	K252	K252	K132	K132	K132	K132
47		K353	K353			K902	K902	K902	K902	K402	K402	K402	K402	K252	K252	K252	K252
50		K353	K353			K902	K902	K902	K902	K402	K402	K402	K402	K252	K252	K252	K252
68		K453				K902	K902	K902	K902	K402	K402	K402	K402	K252	K252	K252	K252
82						K153	K153	K153	K153	K402	K402	K402	K402	K402	K402	K402	K402
100						K153	K153	K153	K153	K402	K402	K402	K402	K252	K252	K252	K252
120						K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402
150						K253	K253	K253	K253	K902	K902	K902	K902	K402	K402	K402	K402
180						K253	K253	K253	K253	K153	K153	K153	K153	K902	K902	K902	K902
200						K353	K353	K353		K153	K153	K153	K153	K902	K902	K902	K902
220						K353	K353	K353		K153	K153	K153	K153	K902	K902	K902	K902
270						K453	K453			K153	K153	K153	K153	K153	K153	K153	K153
330						K453				K253	K253	K253	K253	K153	K153	K153	K153
390										K253	K253	K253		K153	K153	K153	K153
470										K353	K353	K353		K153	K153	K153	K153
560										K353	K353			K253	K253	K253	K253
680										K453				K253	K253	K253	
820														K353	K353	K353	
1000														K353	K353		
1200														K453			
10000				Type I Dielectric				Type II Dielectric				Type III Dielectric					

Note: 1) Different colours correspond to different Dielectrics , It is possible to change Dielectric constant.
2) Special Capacitance and rated voltage, Please contact Dalicap.

SA Series Array SLC



◆Product Application

DC blocking, RF bypass, filtering, decoupling,
microwave integrated circuit

◆Product Feature

Integrated design for saving space and simplied assembling
The total size is theoretically minimum 20mils×10 mils

◆Part Number

SA	1010	K301	T	1R0	B	1	G	6
①	②	③	④	⑤	⑥	⑦	⑧	⑨
Array SLC	Size	Dielectric Coefficient	Metallization	Capacitance	Tolerance	Rated Voltage	Packaging	Capacitor Quantity

①SLC Series Capacitors

SA Series Array SLC

②Size

The first two digits represent length, the second two digits represent width, Unit: mil;
for example: 1010, length is 10mil (0.254mm), width is10mil (0.254mm)

③Dielectric Coefficient

dielectric coefficient＜10, K9R6＝9.6; dielectric coefficient ≥10, K301＝300.

Dielectric type	Dielectric constant	Temperature Coefficient Code	Temperature Coefficient	Temperature Range	Max.D.F	IR(Ω) Min@25℃
Type Ⅰ	15	COG	0±30ppm	-55～+125℃	0.15%@1MHz	10^{12}
	35	COG	0±30ppm	-55～+125℃	0.15%@1MHz	10^{12}
	85	COG	0±30ppm	-55～+125℃	0.15%@1MHz	10^{12}
	220	S3L	-3300±500ppm	-55～+125℃	0.25%@1MHz	10^{12}
	300	R3L	-2200±500ppm	-55～+125℃	0.7%@1MHz	10^{11}
	600	S3L	-3300±500ppm	-55～+125℃	1.2%@1MHz	10^{11}
	900	T3M	-4700±500ppm	-55～+125℃	1.2%@1MHz	10^{11}
Type Ⅱ	1300	X7S	±22%	-55～+125℃	4%@1kHz/1MHz	10^{11}
	1500	X7S	±22%	-55～+125℃	4%@1kHz/1MHz	10^{11}
	2500	X7R	±15%	-55～+125℃	4%@1kHz/1MHz	10^{11}
	4000	X7R	±15%	-55～+125℃	4%@1kHz/1MHz	10^{11}
	9000	Y5V	-82%～+22%	-30～+85℃	4%@1kHz/1MHz	10^{11}
Type Ⅲ	15000	X7R/X7S	±15%/±22%	-55～+125℃	2.5%@1kHz/1MHz	10^{10}
	25000	X7R/X7S	±15%/±22%	-55～+125℃	2.5%@1kHz/1MHz	10^{10}
	35000	X7R/X7S	±15%/±22%	-55～+125℃	2.5%@1kHz/1MHz	10^{10}
	45000	X7R/X7S	±15%/±22%	-55～+125℃	2.5%@1kHz/1MHz	10^{9}

④Metallization

Code	Sputter Layer		Plating Layer	
	Metal	Thickness	Metal	Thickness
M	TiW/Au	0.01～0.05/0.03～0.05	Au	≥2
P	TiW/Ni/Au	0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2
T	TaN/TiW/Au	0.03～0.10/0.1～0.2/0.03～0.05	Au	≥2
F	TaN/TiW/Ni/Au	0.03～0.10/0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2
H	TaN/TiW/Pt/Au	0.03～0.10/0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2
D	TiW/Pt/Au	0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2
E	Ti/Pt/Au	0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2
X	TiW/Ni/Ag	0.01～0.05/0.1～0.2/0.10～0.20	-	-
L	frontside：Ti/Pt/Au backside：Ti/Pt	0.01～0.05/0.1～0.2/0.03～0.05	Au	≥2

Note: please contact Dalicp for non-standard Au thickness and metallization system.

⑤Capacitance

Less than 10pF, 1R0＝1.0pF; No less than 10pF, 101＝100pF.

⑥Tolerance

Code	A	B	C	D	F	G	J	K	M	O	Z	V
Tolerance	±0.05pF	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%	±20%	±40%	-20%～+80%	0～+100%

⑦Rated Voltage

Code	Rated Voltage	Code	Rated Voltage
A	10	6	63
B	16	1	100
2	25	C	120
5	50		

⑧Packaging Type

W: Waffle Packaging; G: Stick Box; R: Film Ring.

⑨Capacitor Quantity

Capacitor quantity

◆SA Series Array SLC

Dimension Code		1010 (.254x.254)				1212 (.305x.305)				1515 (.381x.381)				2020 (.508x.508)				2525 (.635x.635)			
Rated voltage		16V	25V	50V	100V	16V	25V	50V	100V	16V	25V	50V	100V	16V	25V	50V	100V	16V	25V	50V	100V
Cap.pF	Tolerance																				
0.1	A	K350	K350	K350	K350	K350	K350	K350	K350												
0.3	A	K850	K850	K850	K850	K850	K850	K850	K850	K350	K350	K350	K350								
0.8	B	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K350	K350	K350	K350
1.0	B	K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850
2.2	C D	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K850	K850	K850	K850
3.3	C D	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301
4.7	C D	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301
6.8	C D	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601
8.2	C D	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601
10	C D	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601
15	J K M	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132
18	J K M	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132
20	J K M	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132
22	J K M	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132
33	J K M	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252
39	J K M	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
47	J K M	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
50	J K M	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402
68	J K M	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402
82	J K M	K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402
100	J K M	K153	K153	K153		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902
120	J K M	K153	K153	K153		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902
150	J K M	K253	K253	K253		K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902
180	J K M	K253	K253	K253		K253	K253	K253		K153	K153	K153		K153	K153	K153	K153	K153	K153	K153	K153
200	J K M	K353	K353			K253	K253	K253		K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K153
220	J K M	K353	K353			K353	K353			K253	K253	K253		K153	K153	K153		K153	K153	K153	K153
270	J K M	K453				K353	K353			K253	K253	K253		K253	K253	K253		K153	K153	K153	
330	J K M					K453				K353	K353			K253	K253	K253		K253	K253	K253	
390	J K M									K453				K353	K353	K353		K253	K253	K253	
470	J K M									K453				K353	K353			K253	K253	K253	
560	J K M													K453				K353	K353		
680	J K M																	K453			
1000	J K M																				
1200	J K M																				
1500	J K M																				
1800	J K M																				
2200	J K M																				
10000		Type Ⅰ Dielectric					Type Ⅱ Dielectric				Type Ⅲ Dielectric										

Note: 1) Different colours correspond to different Dielectrics, It is possible to change Dielectric constant.
2) Special Capacitance and rated voltage, Please contact Dalicap.

◆SA Series Array SLC

Dimension Code		3030 (.762x.762)				3535 (.889x.889)				4040 (1.016x1.016)				5050 (1.27x1.27)				7070 (1.78x1.78)			
Rated voltage		16V	25V	50V	100V	16V	25V	50V	100V	16V	25V	50V	100V	16V	25V	50V	100V	16V	25V	50V	100V
Cap.pF	Tolerance																				
0.1	A																				
0.3	A																				
0.8	B	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350				
1.0	B	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350	K350
2.2	C D	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K350	K350	K350	K350
3.3	C D	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850
4.7	C D	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K850	K850	K850	K850
6.8	C D	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301
8.2	C D	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301
10	C D	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301
15	J K M	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301
18	J K M	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601
20	J K M	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601
22	J K M	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601
33	J K M	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132
39	J K M	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132
47	J K M	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132
50	J K M	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132
68	J K M	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132
82	J K M	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252
100	J K M	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
120	J K M	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
150	J K M	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402
180	J K M	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402
200	J K M	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402
220	J K M	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402
270	J K M	K153	K153	K153		K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402
330	J K M	K153	K153	K153		K153	K153	K153		K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902
390	J K M	K253	K253	K253		K153	K153	K153		K153	K153	K153		K153	K153	K153	K153	K902	K902	K902	K902
470	J K M	K253	K253	K253		K253	K253	K253		K153	K153	K153		K153	K153	K153		K153	K153	K153	K153
560	J K M	K253	K253	K253		K253	K253	K253		K253	K253	K253		K153	K153	K153		K153	K153	K153	
680	J K M	K353	K353			K353	K353			K253	K253	K253		K253	K253	K253		K153	K153	K153	
1000	J K M	K453				K453				K353	K353			K353	K353	K353		K253	K253	K253	
1200	J K M									K453				K353	K353			K253	K253	K253	
1500	J K M													K453				K353	K353		
1800	J K M																	K453			
2200	J K M																				
10000		Type Ⅰ Dielectric					Type Ⅱ Dielectric				Type Ⅲ Dielectric										

Note: 1) Different colours correspond to different Dielectrics, It is possible to change Dielectric constant.
2) Special Capacitance and rated voltage, Please contact Dalicap.

SP Series Multi-Pad SLC

◆Product Applications

Matching networks, parallel resonance circuits, dielectric resonator tuning & coupling.

◆Product Features

Small geometric size is suitable for microwave circuit and is good for circuit design and adjustment
SP Array SLC is mainly customized according to customer drawings and requirements;
Maximum overall size:10×10mm;
Minimum overall size:0.3×0.3mm;
Minimum machining gap:50μm,
Thickness:0.15～0.25mm.

◆Part Number

SP	1010	K301	T	1R0	B	1	G	6
①	②	③	④	⑤	⑥	⑦	⑧	⑨
Multi-PAD SLC	Size	Dielectric Coefficient	Metallization	Capacitance	Tolerance	Rated Voltage	Packaging	Capacitor Quantity

Thin Film Circuit

◆Product Features

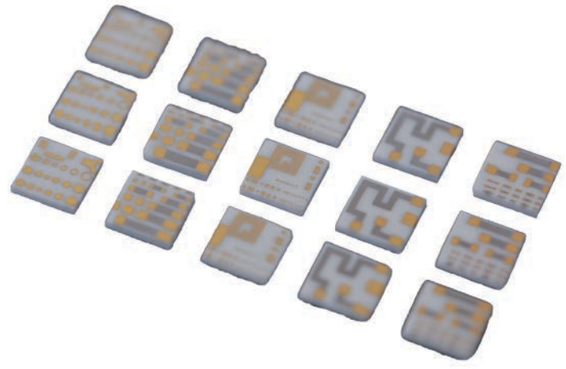
1.Sputtering technology, high reliability and ultra-stable performance, good consistency.
2.Designed and processed with 99.6% pure Al2O3 substrate, which has excellent insulation performance and low loss at high frequency.
3. Designed and processed with high-purity AlN substrate, which has excellent thermal conductivity.

◆Product Applications

Substrates for microwave/millimeter wave application, microwave/millimeter wave device, and high-speed optical communication device.

◆Process Introduction

On the ceramic substrate, through magnetron sputtering, photoetching, dry wet etching, electroplating gold and other processes, the thin film components and metal lines are integrated to form high-precision circuit patterns with specific functions.



◆Material Properties

Material	Chemical Composition	Purity	Color	Nominal Density (g/cm3)	Loss (1 MHz)	Dielectric Constant (1 MHz)	Thermal Conductivity (W/m° K)	CTE (10^{-6}mm/℃)
Aluminum Oxide	Al_2O_3	96%	White	3.7	0.0003	9.5±0.2	24.7	6.5～8.0 (25℃～800℃)
Aluminum Oxide (Polished)	Al_2O_3	99.6%	White	3.87	0.0001	9.9±0.1	26.9	7.0～8.3 (25℃～1000℃)
Aluminum Oxide (As-fired)	Al_2O_3	99.6%	White	3.87	0.0001	9.9±0.1	26.9	7.0～8.3 (25℃～1000℃)
Aluminum Nitride (Polished)	AlN	98%	Gray	3.28	0.001	8.8±0.2	170	4.6 (25℃～300℃)
Aluminum Nitride (As-fired)	AlN	98%	Gray	3.28	0.001	8.8±0.2	170	4.6 (25℃～300℃)

◆ Design Guidelines

● Substrate Materials

1.Material: alumina oxide, aluminum nitride, silicon, glass, etc.

2. Layout: 2 ~ 6 inches square or round (Typical: 2 inches square)

3. Thickness: 0.101 ~ 1.524 mm (Typical: 0.254, 0.381)

4.Roughness: polished(<0.08μm), as-fired(<0.2μm), lapped (customer specified)

● Metal

1. Sputtering：Ti、TiW、TaN、Cu、Ni、Pt、Au
2. Electroplating：Au
3. Au thickness：0.5 ~ 5μm

● TaN Sheet Resistance

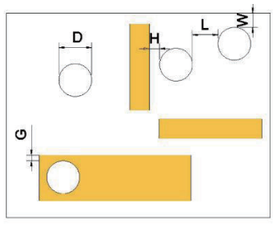
1. Sheet resistance：25 ~ 200Ω/□（Typical：50Ω/□ ）
2. Resistance tolerance： ±10%（Typical： ±20% ）
3. Minimum resistor size：50μm*50μm
4. Resistance TCR：-100±50ppm/℃ @ -55℃ ~ +125℃
5. Maximum service temperature：350℃（<0.5 hours）

● Graphic

1. Minimum line width： 10μm
2. Minimum line gap： 20μm
3. Line tolerance：±3μm（for non-critical areas ±5μm）

● Metallized holes/slots

1. Hole diameter D： 0.5*T minimum
2. Spacing between via holes L： 1*T minimum
3. Hole to edge W：1*T minimum
4. Hole to metal line H：38.1μm minimum
5. Via hole to conductor edge G：50.8μ minimum



● Dimensions

1. Minimum size：0.3mm*0.3mm
2. Tolerance：±0.05mm

● Drawing

1. Format： DXF、DWG
2. Length unit：mm

● Detailed Design Guidelines