

PRODUCT CONTENTS



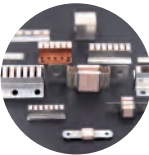
**DLC70 Series
RF/Microwave Multilayer Chip Ceramic Capacitors** 01-07

Product Features
High Q, High RF Current/Voltage,High RF Power, Low ESR/ESL, Low Noise,
Ultra-Stable Performance.
SIZE: 0402, 0603, 0505, 0805, 1111, 2225, 3838



**DLC70 Series
High RF Power Multilayer Chip Ceramic Capacitors** 08-12

Product Features
High Q, High RF Current/Voltage, High RF Power, Low ESR/ESL, Low Noise,
Ultra-Stable Performance.
SIZE: 6040, 7575, 130130



Capacitor Assemblies Offering 13-14

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



DLC75 Series Ultra-Low ESR, RF/Microwave Ceramic Capacitors 15-20

Product Features
Ultra-Low ESR, High Working Voltage, High RF Power, High Self-Resonance Frequency.
SIZE: 0201, 0402, 0603, 0805, 0708, 1111



Broadband Ceramic Capacitors 21-22

Product Features
Small Size, Lower RF Impedance in Broadband, Low Insertion Losses, Low Reflection.
SIZE: 01005, 0201, 0402, 0805



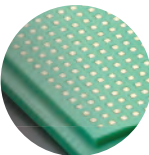
General Purpose Non-Magnetic Multilayer Ceramic Capacitors 23-29

Product Features
Non-Magnetic, Suitable for MRI and other equipment requiring non-magnetic.
SIZE: 0603, 0805, 1206, 1210



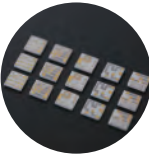
Non-Magnetic Chip Resistors 30-34

Product Applications
MRI medical equipment, Measurement instrument, other non-magnetic applications.
SIZE: 0603, 0805, 1206



Single Layer Chip Ceramic Capacitor 35-47

Product Applications
Suitable for RF/Microwave phased array radar T/R assembly, and filter, DC blocking and bypass
at microwave frequencies.



Thin Film Circuit 48-50

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





DLC70 Series RF/Microwave Multilayer Chip Ceramic Capacitors

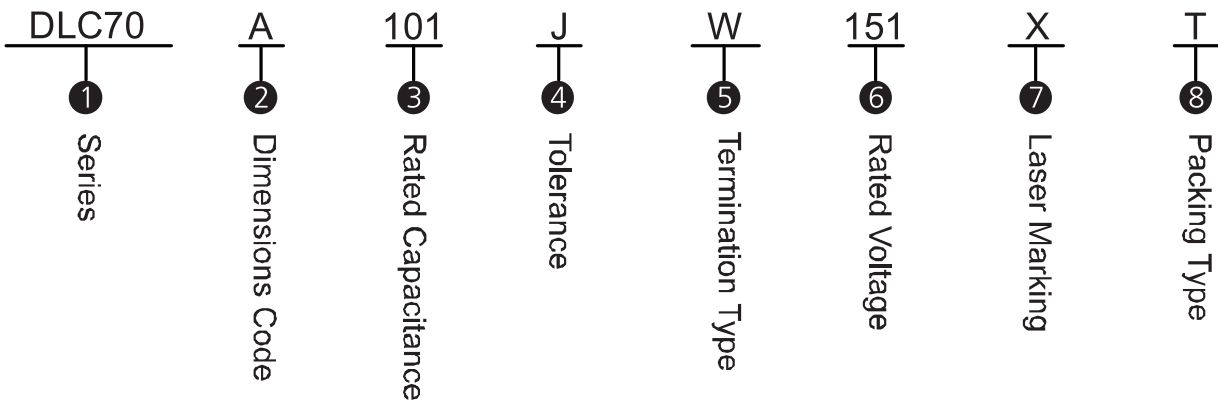
◆ Product Features

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



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

② Dimensions 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	

③ Rated 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.

④ Tolerance

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

⑤ Termination 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

⑥ Rated 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		

⑦ Laser 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.

⑧ Packaging 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

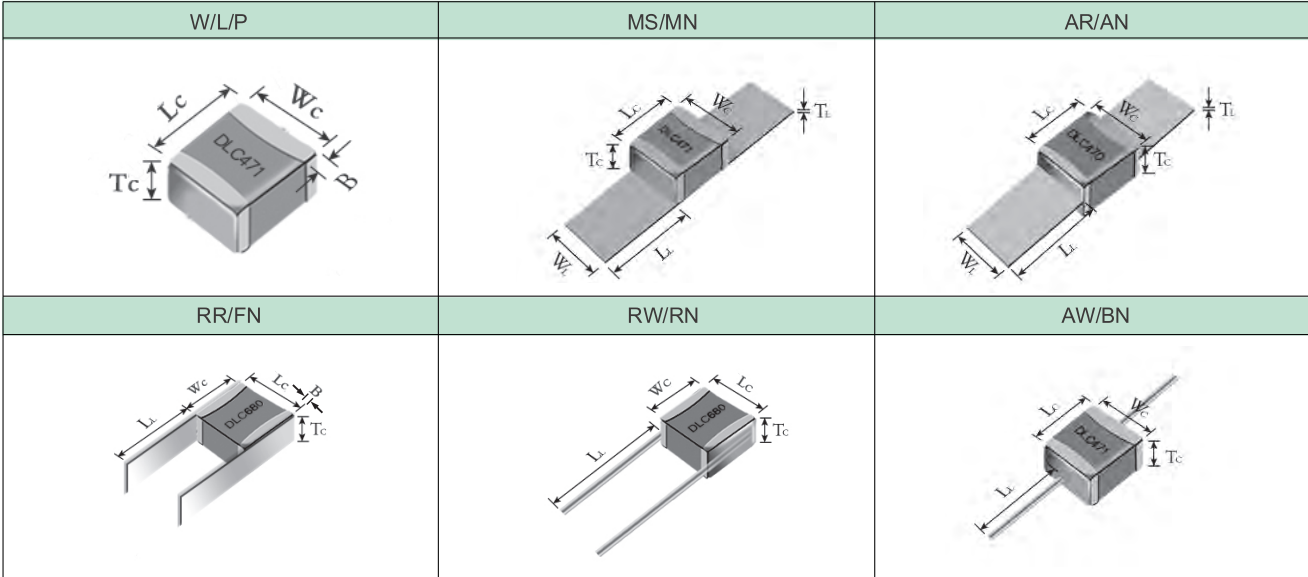
<div>Rated WVDC</div> <div>Cap.pF</div>		Size(inch)															
		DLC70H (0402)		DLC70P (0603)		DLC70A (0505)		DLC70D (0805)		DLC70R (0710)		DLC70B (1111)		DLC70C (2225)		DLC70E (3838)	
Cap.pF	Code	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC
0.1	0R1	A, B, C, D.	200V Code 201	A, B, C, D.		A, B, C, D.		A, B, C, D.		B, C, D.		A, B, C, D.		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																

◆Capacitance & Rated Voltage Table

Rated WVDC Cap.pF		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		150V Code 151 or 200V Code 201	F, G, J.	250V Code 251	G, J.	500V Code 501		500V Code 501 or 1500V Code 152		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																
360	361																
390	391																
430	431																
470	471																
510	511																
560	561																
620	621																
680	681																
750	751																
820	821																
910	911																
1000	102																
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



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)	Silver-plated Copper	
	RW/RN					.709 (18.00) min	Dia.=.031±.004 (0.80±0.10)			
	AW/BN					.906 (23.00) min				
DLC70E	MS/MN	.380 +.015 ~ -.010 (9.65 +0.38 ~ -.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)	Silver-plated Copper
	RW/RN						.709 (18.00) min	Dia.=.031±.004 (0.80±0.10)		
	AW/BN						.906 (23.00) min			



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 °C . 10 ⁴ Megohms min. @ +125 °C .
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 °C ~ +125 °C(70B 0.1pF~ 1000pF can reach to -55 °C ~ +175 °C) Notes: For higher temperature, please contact with Dalicap.
Temperature Coefficient (TC)	0 ± 30 ppm/°C; (−55 °C ~ +175 °C, 0 ± 60 ppm/°C)
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 °Cwith 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 °C. 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

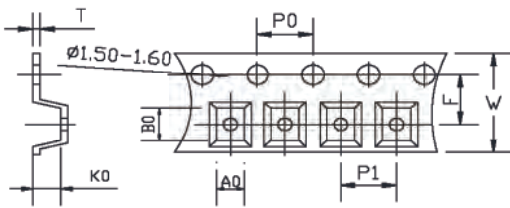


DLC70 Series
RF/Microwave Multilayer Chip Ceramic Capacitors

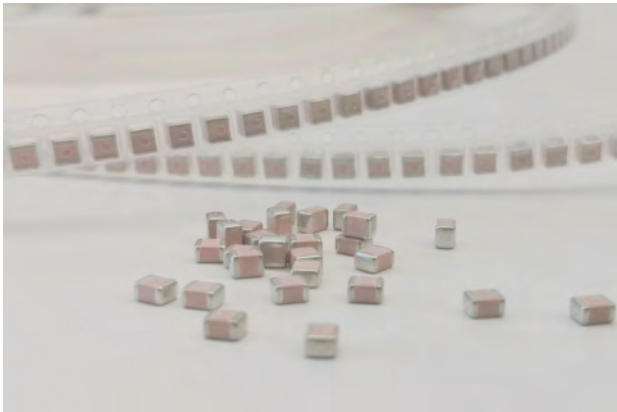
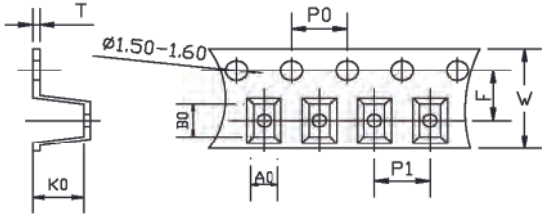
◆Tape & Reel Specifications

	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

DLC70 Series High RF Power Multilayer Chip Ceramic Capacitors

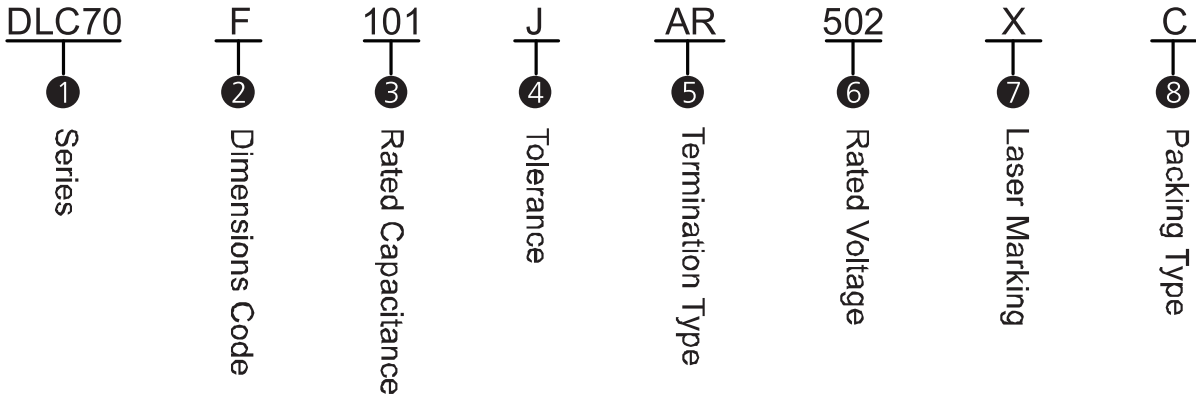
◆Product Features

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



① **Series:** Dalicap 70 Series High RF Power Capacitor, Temperature Coefficient: $0 \pm 30\text{ppm}/^\circ\text{C}$.

② Dimensions Code

	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

③ Rated 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.

④ Tolerance

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

⑤ Termination 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)



⑤ Termination 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

⑥ Rated 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		

⑦ Laser 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.

⑧ Packaging 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

Rated WVDC Cap.		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						
2.7	2R7						
3.3	3R3						
3.6	3R6	B, C, D.	5000V Code502	B, C, D.	5000V Code502	F, G, J.	3000V Code302 Extended Voltage 8000V Code802
3.9	3R9						
4.7	4R7						
5.6	5R6						
6.8	6R8						
8.2	8R2						
10	100						
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	F, G, J.	3000V Code302 Extended Voltage 5000V Code502	F, G, J.	3000V Code302 Extended Voltage 5000V Code502	G, J.	10KV Code 103
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						
1200	122						
1500	152						
1800	182						
2200	222						

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



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			
	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			
	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)	



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°C at rated WVDC. 10 ⁴ Megohms min. @ +125°C 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°C to +125°C Notes: For higher temperature, please contact with Dalicap.
Temperature Coefficient (TC)	0 ± 30 ppm/°C
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 °Cwith 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°C. 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)
1	2	3	4	5	6	7	8	9	10	11
DALICAP	Z: Series/ Parallel Y: Series V: 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 $\pm 1\%$, 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 $\pm 2\%$, WVDC is 20,000V and Laser marking.

◆ Capacitance and Voltage

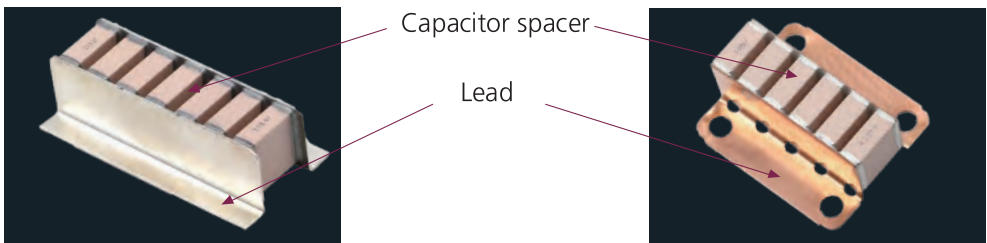
By Buyer's requirements using existing drawings, mechanical sketches, or we can help with capable modeling of assemblies thermal rise predictions.

◆ Typical Assembly Configurations

① Parallel 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				



② Series 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			

③ Epoxy Molding



④ Other 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.

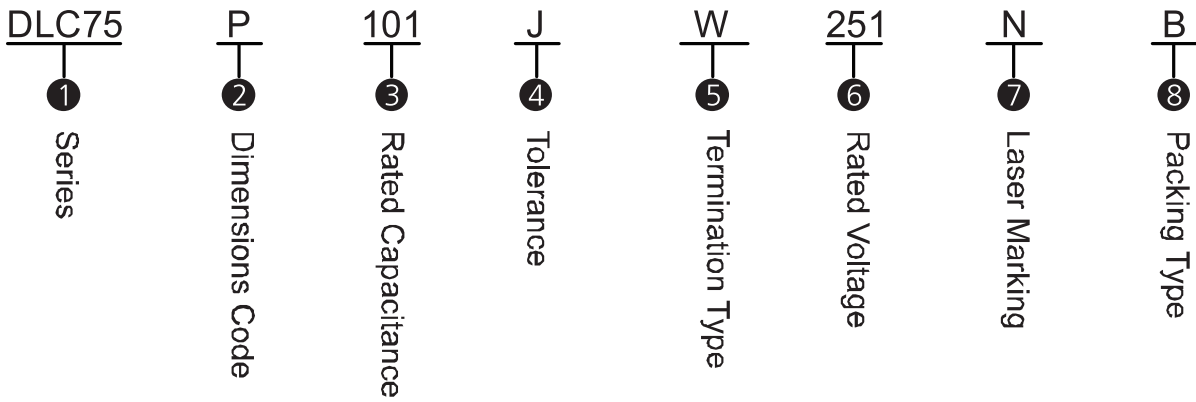


◆ Product Applications

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



① **Series:** Dalicap 75 Series Low ESR Microwave Capacitor, Temperature Coefficient: $0 \pm 30 \text{ ppm}/^\circ\text{C}$.

② Dimensions 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

③ Rated 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.



④ Tolerance

Code	A	B	C	D	F	G	J
Tolerance	$\pm 0.05 \text{ pF}$	$\pm 0.1 \text{ pF}$	$\pm 0.25 \text{ pF}$	$\pm 0.5 \text{ pF}$	$\pm 1\%$	$\pm 2\%$	$\pm 5\%$

⑤ Termination Type

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

⑥ Rated Voltage

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

⑦ Laser 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.

⑧ Packaging 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

Rated WVDC Cap.pF		Size(inch)											
		DLC75N (0201)		DLC75H (0402)		DLC75P (0603)		DLC75D (0805)		DLC75R (0708)		DLC75B (1111)	
		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				50V								
1.1	1R1				Code								
1.2	1R2				500								
1.3	1R3				200V								
1.4	1R4				or								
1.5	1R5	A,		A,	201	A,		A,					
1.6	1R6	B,		B,	250V	B,		B,					
1.7	1R7	C,		C,	Code	C,		C,					
1.8	1R8	D,		D,	251	D,		D,					
1.9	1R9		25V										
2.0	2R0		Code										
2.1	2R1		250										
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												
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												

◆Capacitance & Rated Voltage Table

Rated WVDC Cap.pF		Size(inch)											
		DLC75N (0201)		DLC75H (0402)		DLC75P (0603)		DLC75D (0805)		DLC75R (0708)		DLC75B (1111)	
		Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC	Tol.	Rated WVDC
51	510												
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												
360	361												
390	391												
430	431												
470	471												
510	511												
560	561												
620	621												
680	681												
750	751												
820	821												
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 °C at rated WVDC. 10 ⁴ Megohms min. @ +125 °C at rated WVDC.
Rated Voltage	See Rated Voltage Table
Dielectric Withstanding Voltage (DWV)	250% of rated voltage for 5 seconds.
Operating Temperature Range	−55 °C to +150 °C Notes: For higher temperature, please contact with Dalicap.
Temperature Coefficient (TC)	0 ± 30ppm/°C
Capacitance Drift	± 0.2% or ± 0.05pF, whichever is greater.
Piezoelectric Effects	None

◆Environmental Tests

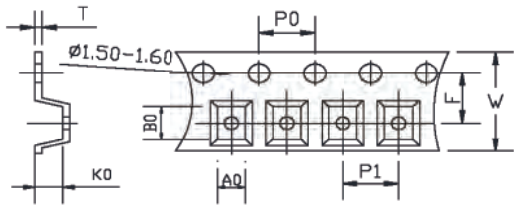
Item	Specifications	Method
Thermal Shock	DWV: the initial value IR: Shall not be less than 30% of the initial value Capacitance change: no more than 0.5% or 0.5pF, whichever is greater.	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature stay 15 minutes. The time of removing shall 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 °C 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 °C. 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



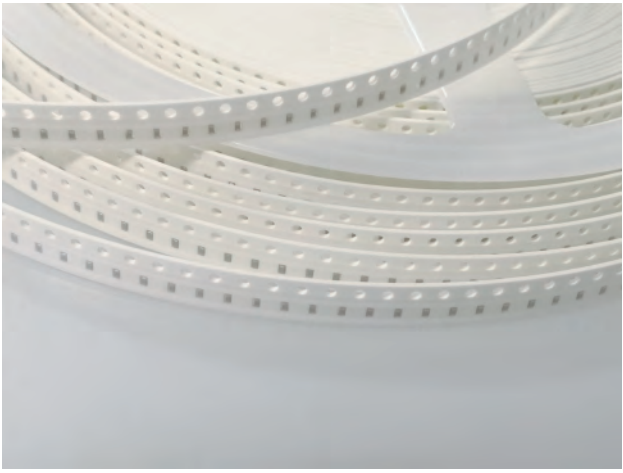
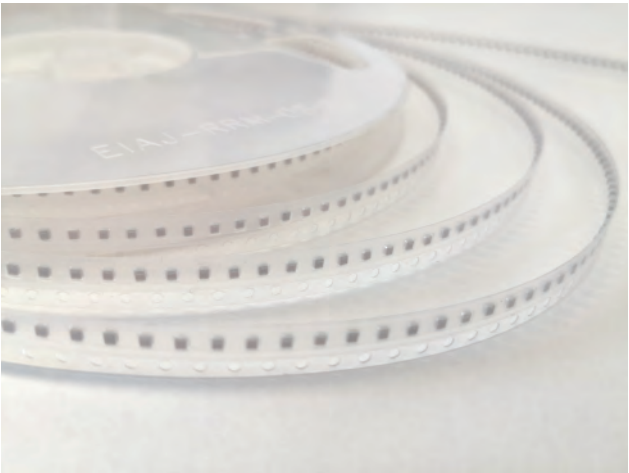
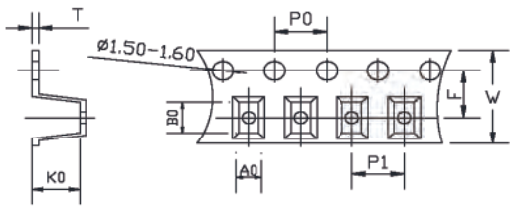
◆Tape & Reel Specifications

	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



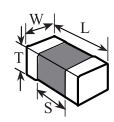
Broadband Ceramic Capacitors

◆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

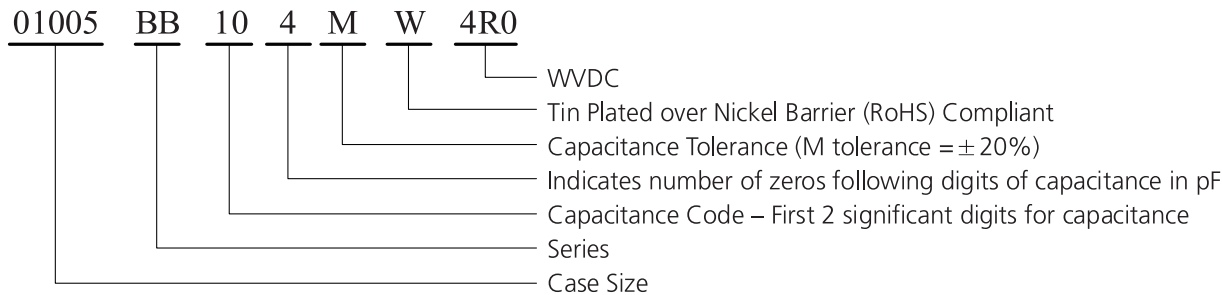
unit:inch(millimeter)

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°C to +85°C	-55°C to +125°C				
Insulation Resistance (IR)	10 ¹¹ Ω min. @ +25°C @ rated WVDC					
Dielectric Withstanding Voltage (DWV)	250% of rated voltage for 5 seconds.					
Temperature Coefficient (TC)	± 15%					

◆Part Numbering



◆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°C. 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.

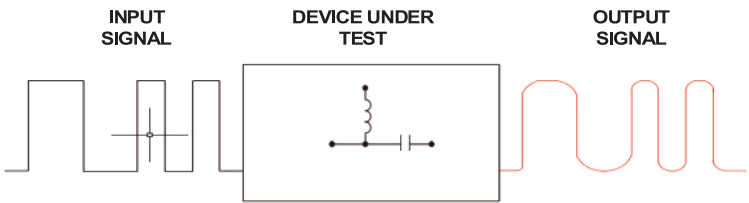
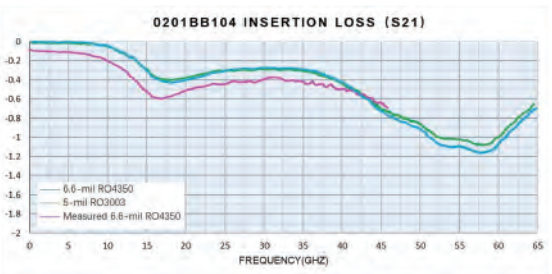


Fig.1"Signal Integrity"- output replication of input

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



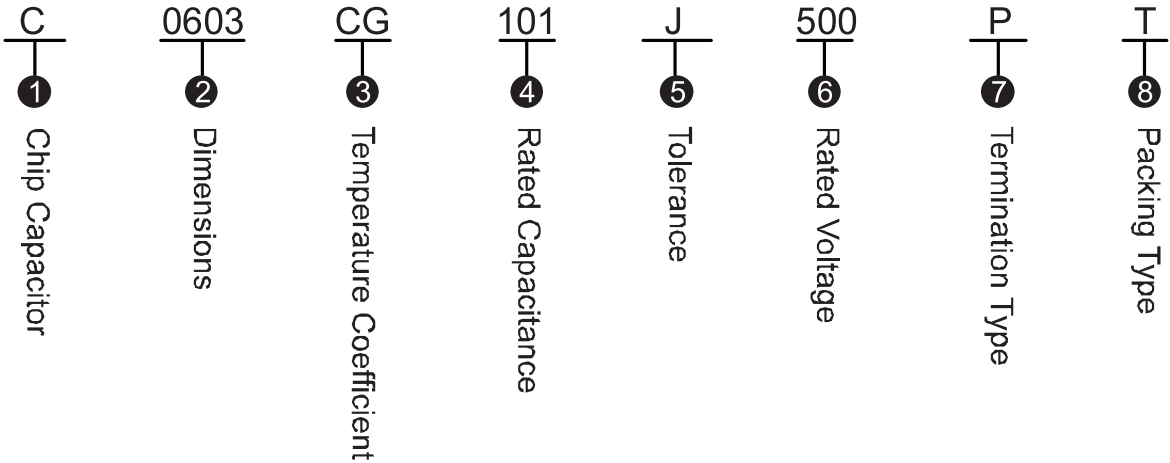


General Purpose Non-Magnetic Multilayer Ceramic Capacitors

◆Product Features

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

◆Part Numbering



⑥ Rated 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

⑦ Laser Marking

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

⑧ Packaging 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

① C: General Purpose Non-Magnetic Multilayer Ceramic Capacitors

② Dimensions

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

③ Temperature Coefficient

CG: 0±30ppm/℃

X: ±15%

④ Rated 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.

⑤ Tolerance

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

unit: V

[illegible]

unit: V

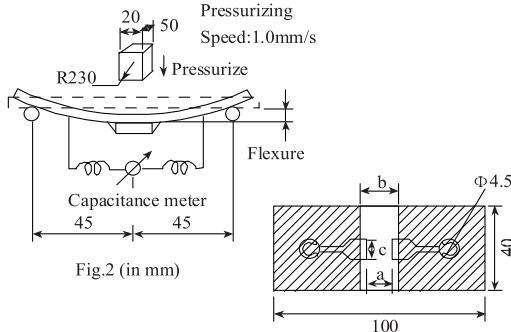
[illegible]



◆ 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.	<div>C0G: Cap ≥ 30pF, Q ≥ 1000; Cap < 30pF, Q ≥ 400+20C</div> <div>X7R: D.F. ≤ 2.5%</div>	<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>≤ 10 μF</td><td>1.0 ± 0.2Vrms</td><td>1KHz ± 10%</td></tr><tr><td>> 10 μF</td><td>0.5 ± 0.2Vrms</td><td>120Hz ± 20%</td></tr></table> <p>Before initial measurement (X7R only) to apply de-gaging at 150℃ for 1hr then set for 24±2hrs at room temp.</p>	Type	Capacitance	Test Voltage	Test Frequency	Class 1 (C0G)	≤ 1000pF	1.0 ± 0.2Vrms	1MHz ± 10%	> 1000pF	1.0 ± 0.2Vrms	1KHz ± 10%	Class 2 (X7R)	≤ 10 μF	1.0 ± 0.2Vrms	1KHz ± 10%	> 10 μF	0.5 ± 0.2Vrms	120Hz ± 20%
Type	Capacitance	Test Voltage	Test Frequency																		
Class 1 (C0G)	≤ 1000pF	1.0 ± 0.2Vrms	1MHz ± 10%																		
	> 1000pF	1.0 ± 0.2Vrms	1KHz ± 10%																		
Class 2 (X7R)	≤ 10 μF	1.0 ± 0.2Vrms	1KHz ± 10%																		
	> 10 μF	0.5 ± 0.2Vrms	120Hz ± 20%																		
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.																		

◆ 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>	Type	Temperature coefficient ppm/℃	C0G	0 ± 30	Type	Temperature Characteristics	X7R	± 15%	<p>Conduct the five cycles according to the temperatures as below.</p> <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> <p>C0G: $TC = \frac{C_x - C_3}{C_3 \times \Delta T} \times 10^6$ (ppm/℃)</p> <p>X7R: $TC = \frac{C_x - C_3}{C_3} \times 100(\%)$</p>	Step	Temperature(℃)	1	25 ± 2℃	2	-55 ± 3℃	3	25 ± 2℃	4	125 ± 3℃	5	25 ± 2℃
Type	Temperature coefficient ppm/℃																						
C0G	0 ± 30																						
Type	Temperature Characteristics																						
X7R	± 15%																						
Step	Temperature(℃)																						
1	25 ± 2℃																						
2	-55 ± 3℃																						
3	25 ± 2℃																						
4	125 ± 3℃																						
5	25 ± 2℃																						
9	Adhesive Strength of Termination	No removal of the terminations or other defect should occur.	<p>Pressurizing force: 01R5/0201: 2N; 0402/0603: 5N; 0805/1206/1210/1812: 10N Test time: 10±1 sec.</p>																				
10	Bending Strength	<p>No cracking shall occur.</p> <p>Cap change: C0G: within ±5% or 0.5pF whichever is larger X7R: within ±12.5%</p>	<p>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</p>  <p>Fig.2 (in mm)</p>																				
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 $265\pm5^{\circ}\text{C}$ 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 $\pm 2.5\%$ or 0.25pF (Whichever is larger) X7R: Within $\pm 12.5\%$.																
		D.F.	To meet initial requirement.																
		Insulation Resistance	No less than $10\text{G}\Omega$ or $500\text{M}\Omega\mu\text{F}$, 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. <table><tr><th>Step</th><th>Temperature($^{\circ}\text{C}$)</th><th>Time(minutes)</th></tr><tr><td>1</td><td>-55°C ($0\sim-3^{\circ}\text{C}$)</td><td>30 ± 3</td></tr><tr><td>2</td><td>25°C</td><td>$2\sim3$</td></tr><tr><td>3</td><td>125°C ($0\sim-3$)</td><td>30 ± 3</td></tr><tr><td>4</td><td>25°C</td><td>$2\sim3$</td></tr></table>	Step	Temperature($^{\circ}\text{C}$)	Time(minutes)	1	-55°C ($0\sim-3^{\circ}\text{C}$)	30 ± 3	2	25°C	$2\sim3$	3	125°C ($0\sim-3$)	30 ± 3	4	25°C	$2\sim3$
		Step	Temperature($^{\circ}\text{C}$)		Time(minutes)														
		1	-55°C ($0\sim-3^{\circ}\text{C}$)		30 ± 3														
		2	25°C		$2\sim3$														
3	125°C ($0\sim-3$)	30 ± 3																	
4	25°C	$2\sim3$																	
Capacitance Change ΔC	C0G: Within $\pm 2.5\%$ or 0.25pF (Whichever is larger) X7R: Within $\pm 7.5\%$.																		
D.F.	To meet initial requirement.																		
Insulation Resistance	No less than $10\text{G}\Omega$ or $500\text{M}\Omega\mu\text{F}$, Whichever is smaller.																		



Non-Magnetic Chip Resistors

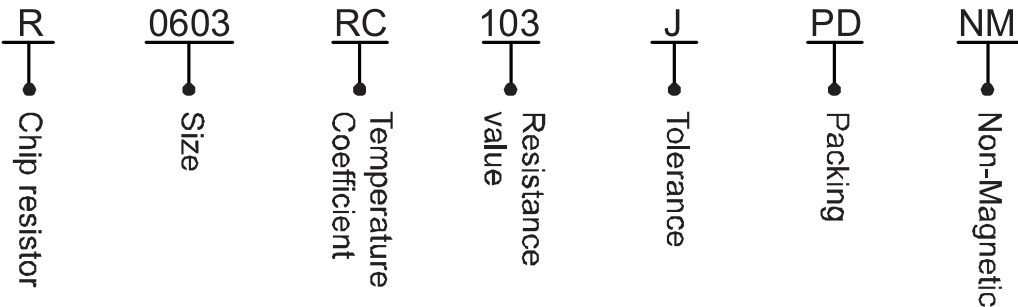
Product Features

- 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.

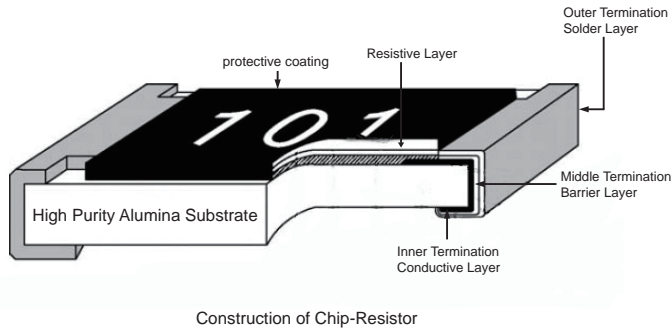
Product Applications

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

Part Number



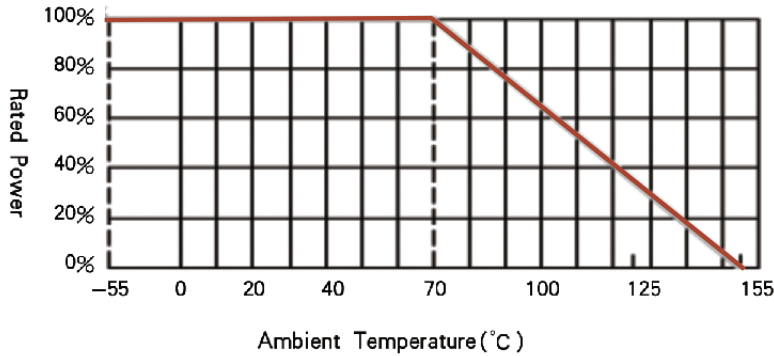
Configuration



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

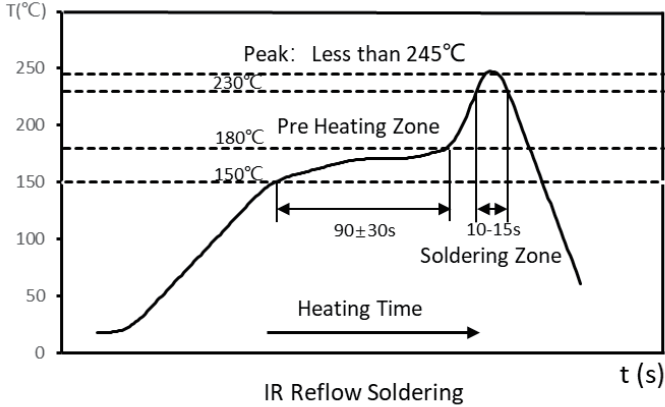
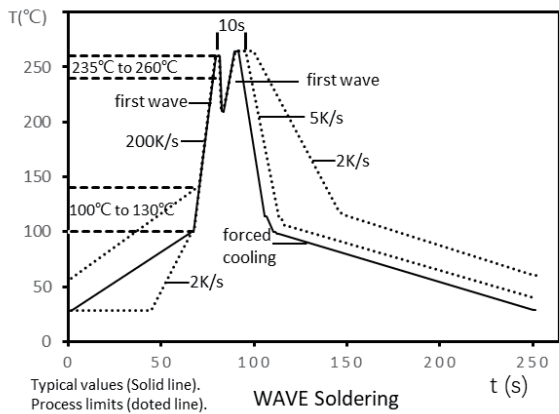


◆ Rated Value

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	1 Ω	10MΩ	E-96
				± 5%(J)	± 200	0Ω&1Ω	10MΩ	E-24
0805	1/8W	150V	300V	± 1%(F)	± 100	1 Ω	10MΩ	E-96
				± 5%(J)	± 200	0Ω&1Ω	10MΩ	E-24
1206	1/4W	200V	400V	± 1%(F)	± 100	1 Ω	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.
1 Ω ~ 10 Ω: Temperature Coefficient of Resistance for 0603, 0805, 1206 = -300~+500ppm/°C.

◆ Soldering Temperature Curve



◆ Resistance Marking

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

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

E-24 Series

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

E-96 Series

1542 4 digit marking for E96.
For example: 1542 = 15k4 Ω; 22R1 = 22.1 Ω;

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

◆ 0603 1% Marking Table

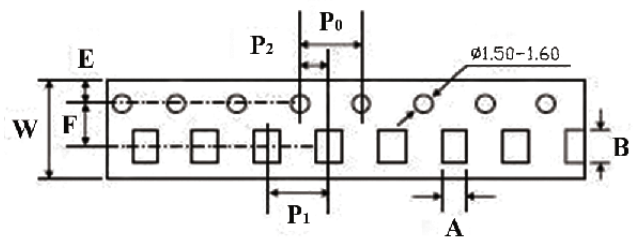
Code	E48	E96	Code	E48	E96	Code	E48	E96	Code	E48	E96
01	100	100	25	178	178	49	316	316	73	562	562
02		102	26		182	50		324	74		576
03	105	105	27	187	187	51	332	332	75	590	590
04		107	28		191	52		340	76		604
05	110	110	29	196	196	53	348	348	77	619	619
06		113	30		200	54		357	78		634
07	115	115	31	205	205	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
Multitplier	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

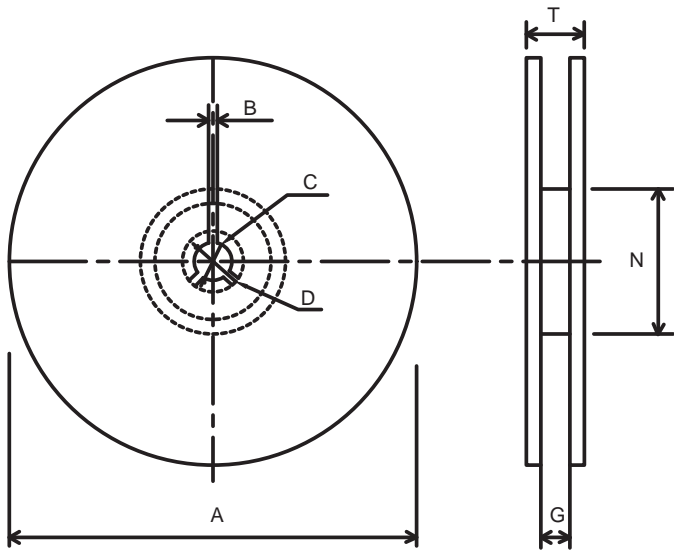
E3	10				22				47								
E6	10		15		22		33		47		68						
E12	10	12	15	18	22	27	33	39	47	56	68	82					
E24	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47
	51	56	62	68	75	82	91										
E96	100	102	105	107	110	113	115	118	121	124	127	130	133	137	140	143	147
	150	154	158	162	165	169	174	178	182	187	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 0.5hour 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°C 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

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

① SLC 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

② Size

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).



③ Dielectric 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

④ Metallization

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.

⑤ Capacitance

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

⑥ Tolerance

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%

⑦ Rated Voltage

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

⑧ Packaging 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		K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301
4.7		K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K301	K301	K301	K301
6.8		K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601
8.2		K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601
10		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		K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K132	K132	K132	K132
20		K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K132	K132	K132	K132
22		K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K132	K132	K132	K132
33		K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K252	K252	K252	K252
39		K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402	K252	K252	K252	K252
47		K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402
50		K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402
68		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402
82		K253	K253	K253	K253	K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402
100		K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902
120		K353	K353	K353		K153	K153	K153		K153	K153	K153	K153	K902	K902	K902	K902
150		K353	K353			K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K153
180		K453				K353	K353	K353		K253	K253	K253		K153	K153	K153	K153
200		K453				K353	K353			K253	K253	K253		K153	K153	K153	K153
220						K453				K253	K253	K253		K153	K153	K153	
270						K453				K353	K353	K353		K153	K153	K153	
330										K353	K353			K253	K253	K253	
390										K453				K253	K253	K253	
470														K353	K353		
560														K353	K353		
680														K453			
820																	
1000																	
1200																	
2200																	
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.

◆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		K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K350	K350	K350	K350
4.7		K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K850	K350	K350	K350	K350
6.8		K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850
8.2		K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850
10		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		K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301
20		K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301
22		K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301
33		K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301
39		K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K301	K301	K301	K301
47		K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601
50		K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601
68		K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601
82		K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132
100		K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132
120		K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132
150		K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K132	K132	K132	K132
180		K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
200		K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
220		K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
270		K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K252	K252	K252	K252
330		K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402
390		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402
470		K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K402	K402	K402	K402
560		K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902
680		K253	K253	K253		K253	K253	K253		K153	K153	K153		K153	K153	K153	K153	K902	K902	K902	K902
1000		K353	K353			K253	K253	K253		K253	K253	K253		K153	K153	K153		K153	K153	K153	K153
1200		K453				K353	K353			K253	K253	K253		K253	K253	K253		K153	K153	K153	
1500						K453				K353	K353			K253	K253	K253		K153	K153	K153	
1800									K353	K353			K353	K353			K153	K153	K153		
2200									K453				K353				K253	K253			
10000				Type I Dielectric				Type II Dielectric				Type III Dielectric									



SS Series SLC



SA Series Array SLC

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	J K M	K402	K402	K402	K402	K132	K132	K132	K132	K601	K601	K601	K601	K301	K301	K301	K301
15		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



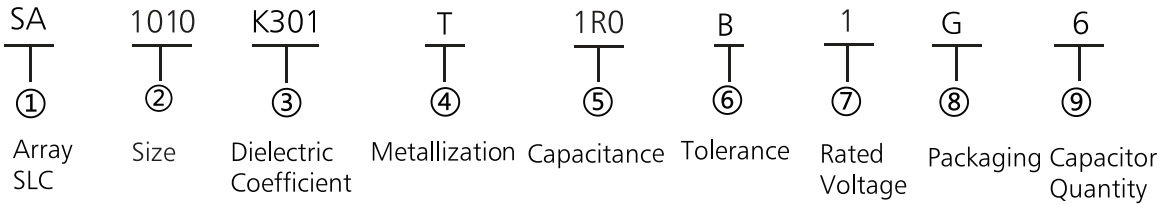
Product Application

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

Product Feature

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

Part Number



SLC Series Capacitors

SA Series Array SLC

Size

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)



③ Dielectric 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°C
Type I	15	COG	0±30ppm	-55 ~ +125°C	0.15%@1MHz	10 ¹²
	35	COG	0±30ppm	-55 ~ +125°C	0.15%@1MHz	10 ¹²
	85	COG	0±30ppm	-55 ~ +125°C	0.15%@1MHz	10 ¹²
	220	S3L	-3300±500ppm	-55 ~ +125°C	0.25%@1MHz	10 ¹²
	300	R3L	-2200±500ppm	-55 ~ +125°C	0.7%@1MHz	10 ¹¹
	600	S3L	-3300±500ppm	-55 ~ +125°C	1.2%@1MHz	10 ¹¹
	900	T3M	-4700±500ppm	-55 ~ +125°C	1.2%@1MHz	10 ¹¹
Type II	1300	X7S	±22%	-55 ~ +125°C	4%@1kHz/1MHz	10 ¹¹
	1500	X7S	±22%	-55 ~ +125°C	4%@1kHz/1MHz	10 ¹¹
	2500	X7R	±15%	-55 ~ +125°C	4%@1kHz/1MHz	10 ¹¹
	4000	X7R	±15%	-55 ~ +125°C	4%@1kHz/1MHz	10 ¹¹
	9000	Y5V	-82% ~ +22%	-30 ~ +85°C	4%@1kHz/1MHz	10 ¹¹
Type III	15000	X7R/X7S	±15%/±22%	-55 ~ +125°C	2.5%@1kHz/1MHz	10 ¹⁰
	25000	X7R/X7S	±15%/±22%	-55 ~ +125°C	2.5%@1kHz/1MHz	10 ¹⁰
	35000	X7R/X7S	±15%/±22%	-55 ~ +125°C	2.5%@1kHz/1MHz	10 ¹⁰
	45000	X7R/X7S	±15%/±22%	-55 ~ +125°C	2.5%@1kHz/1MHz	10 ⁹

④ Metallization

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.



⑤ Capacitance

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

⑥ Tolerance

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%

⑦ Rated Voltage

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

⑧ Packaging Type

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

⑨ Capacitor Quantity

Capacitor quantity



SA Series Array SLC

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		K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301
4.7		K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301	K301
6.8		K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601
8.2		K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601
10		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		K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132
20		K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132
22		K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132
33		K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252
39		K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252
47		K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252
50		K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402
68		K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402
82		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402
100		K153	K153	K153		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902
120		K153	K153	K153		K153	K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902
150		K253	K253	K253		K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K902	K902	K902	K902	K902
180		K253	K253	K253		K253	K253	K253		K153	K153	K153		K153	K153	K153	K153	K153	K153	K153	K153
200		K353	K353			K253	K253	K253		K253	K253	K253		K153	K153	K153	K153	K153	K153	K153	K153
220		K353	K353			K353	K353			K253	K253	K253		K153	K153	K153		K153	K153	K153	K153
270		K453				K353	K353			K253	K253	K253		K253	K253	K253		K153	K153	K153	
330						K453				K353	K353			K253	K253	K253		K253	K253	K253	
390										K453				K353	K353	K353		K253	K253	K253	
470										K453				K353	K353			K253	K253	K253	
560														K453				K353	K353		
680																		K453			
1000																					
1200																					
1500																					
1800																					
2200																					
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

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		K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K850	K850	K850	K850	K850	K850	K850	K850	
4.7		K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K850	K850	K850	K850	
6.8		K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	
8.2		K601	K601	K601	K601	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	K301	
10		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		K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K301	K301	K301	K301	
20		K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	K601	
22		K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K601	K601	K601	K601	K601	K601	K601	K601	
33		K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	
39		K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	K132	
47		K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	
50		K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132	K132	K132	K132	K132	
68		K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	K252	K132	K132	K132	K132
82		K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252	K252	K252	K252	K252	
100		K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
120		K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K252	K252	K252	K252
150		K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402	K402
180		K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402
200		K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402	K402	K402	K402	K402	K402
220		K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402
270		K153	K153	K153		K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K902	K402	K402	K402	K402
330		K153	K153	K153		K153	K153	K153		K153	K153	K153	K153	K902	K902	K902	K902	K902	K902	K902	K902	K902
390	K253	K253	K253		K153	K153	K153		K153	K153	K153		K153	K153	K153	K153	K902	K902	K902	K902	K902	
470	K253	K253	K253		K253	K253	K253		K153	K153	K153		K153	K153	K153		K153	K153	K153	K153	K153	
560	K253	K253	K253		K253	K253	K253		K253	K253	K253		K153	K153	K153		K153	K153	K153			
680	K353	K353			K353	K353			K253	K253	K253		K253	K253	K253		K153	K153	K153			
1000	K453				K453				K353	K353			K353	K353	K353		K253	K253	K253			
1200									K453				K353	K353			K253	K253	K253			
1500													K453				K353	K353				
1800																	K453					
2200																						
10000			Type I Dielectric				Type II Dielectric				Type III Dielectric											

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

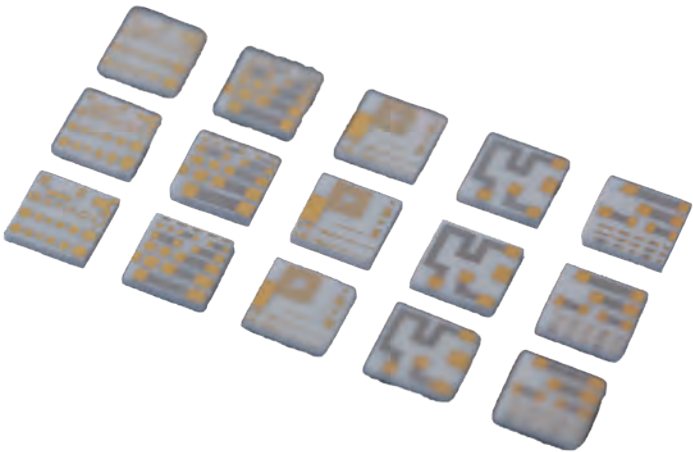
- 1.Sputtering technology, high reliability and ultra-stable performance, good consistency.
- 2.Designed and processed with 99.6% pure Al₂O₃ substrate, which has excellent insulation performance and low loss at high frequency.
3. Designed and processed with high-purity AlN substrate, which has excellent 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/cm ³)	Loss (1 MHz)	Dielectric Constant (1 MHz)	Thermal Conductivity (W/m ² K)	CTE (10 ⁻⁶ mm/°C)
Aluminum Oxide	Al ₂ O ₃	96%	White	3.7	0.0003	9.5±0.2	24.7	6.5~8.0 (25°C~800°C)
Aluminum Oxide (Polished)	Al ₂ O ₃	99.6%	White	3.87	0.0001	9.9±0.1	26.9	7.0~8.3 (25°C~1000°C)
Aluminum Oxide (As-fired)	Al ₂ O ₃	99.6%	White	3.87	0.0001	9.9±0.1	26.9	7.0~8.3 (25°C~1000°C)
Aluminum Nitride (Polished)	AlN	98%	Gray	3.28	0.001	8.8±0.2	170	4.6 (25°C~300°C)
Aluminum Nitride (As-fired)	AlN	98%	Gray	3.28	0.001	8.8±0.2	170	4.6 (25°C~300°C)

◆ 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

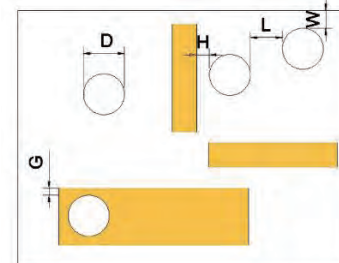
1. Sheet resistance: 25 ~ 200Ω/□ (Typical: 50Ω/□)
2. Resistance tolerance: ±10% (Typical: ±20%)
3. Minimum resistor size: 50μm*50μm
4. Resistance TCR: -100±50ppm/°C @ -55°C ~ +125°C
5. Maximum service temperature: 350°C (<0.5 hours)

● 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: 50.8μm 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

