DLC10A (.055" x .055")

◆Product Features

High Q, High Power, Low ESR/ESL, Low Noise, High Self-Resonance, Ultra-Stable Performance.

◆Product applications

Typical Functional Applications: Tuning, Bypass, Coupling, Feedback, D.C. Blocking and Impedance Matching.

Typical Circuit Applications: UHF/Microwave RF Power Amplifiers, Mixers, Oscillators, Low Noise Amplifiers, Filter Networks, Timing Circuits and Delay Lines.

◆DLC10A Capacitance Table

Cap.pF	Code	Tol.	Rated WVDC	Cap.pF	Code	Tol.	Rated WVDC	Cap.pF	Code	Tol.	Rated WVDC
0.1	0R1	A, B, C, D	150V Code 151 or 300V Code 301	2.4	2R4	A, B, C, D	150V Code 151 or 300V Code 301	20	200	F, G, J,	150V Code 151 or 300V Code 301
0.2	0R2			2.7	2R7			22	220		
0.3	0R3			3.0	3R0			24	240		
0.4	0R4			3.3	3R3			27	270		
0.5	0R5			3.6	3R6			30	300		
0.6	0R6			3.9	3R9			33	330		
0.7	0R7			4.3	4R3			36	360		
0.8	0R8			4.7	4R7			39	390		
0.9	0R9			5.1	5R1			43	430		
1.0	1R0			5.6	5R6			47	470		
1.1	1R1			6.2	6R2			51	510		150V Code 151 or 200V Code 201
1.2	1R2			6.8	6R8	B, C, J		56	560		
1.3	1R3			7.5	7R5			62	620		
1.4	1R4			8.2	8R2			68	680		
1.5	1R5			9.1	9R1			75	750		
1.6	1R6			10	100	F, G, J		82	820		
1.7	1R7			11	110			91	910		
1.8	1R8			12	120			100	101		
1.9	1R9			13	130						
2.0	2R0			15	150						
2.1	2R1			16	160						
2.2	2R2			18	180						

Remark: special capacitance, tolerance and WVDC are available, consult with DALICAP.

◆Part Numbering

DLC10A 100 J W 151 X T

- DLC10A: DLC10=P90
- 100: Capacitor Code 100=10×10⁰=10pF; 1R0=1.0pF
- J: Capacitance Tolerance: See below list
- W: Termination Type
- 151: Rated Voltage
- X: Laser Marking
- T: Packaging Type
  - T- Chip capacitor, Tape & Reel (7") 500,1000,2000,3000 pcs/Reel
  - TV- Chip capacitor Vertical Orientation Tape & Reel, 500,1000,2000 pcs/Reel

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

◆DLC10A Capacitor Dimensions

unit:inch(millimeter)

Series	Term. Code	Type / Outlines	Capacitor Dimensions				Plated Material
			Length (Lc)	Width (Wc)	Thickness (Tc)	Overlap (B)	
DLC10A	W	 Chip	.055 +.015~ −.010 (1.40+ 0.38~ −0.25)	.055 ±.010 (1.40 ±0.25)	.057 (1.45) max	.020 (0.51) max	100% Sn Solder over Nickel Plating
	L						90 Sn10Pb Solder over Nickel Plating
DLC10A	P (Non-Mag)	 Chip (Non-Mag)					100% Sn Solder over Copper Plating

Note: Non-Mag is no magnetism.

◆Performance

Item	Specifications
Quality Factor (Q)	greater than 10,000 at 1 MHz
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 +200℃
Temperature Coefficient (TC)	+90±20 ppm/℃ (−55℃ to +125℃);
Capacitance Drift	±0.02% or ±0.02pF, whichever is greater.
Piezoelectric Effects	None
Termination Type	See Termination Type Table

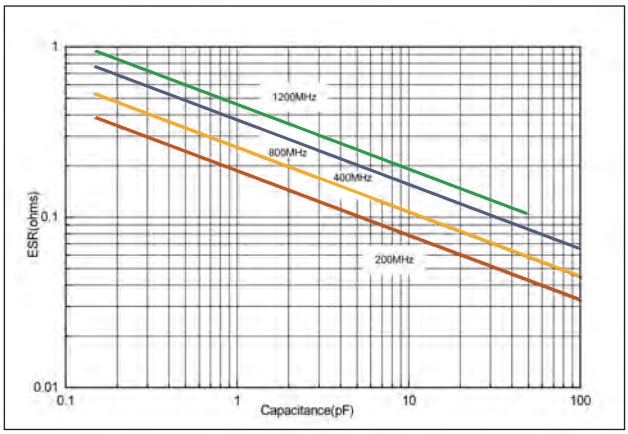
Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

◆Environmental Tests

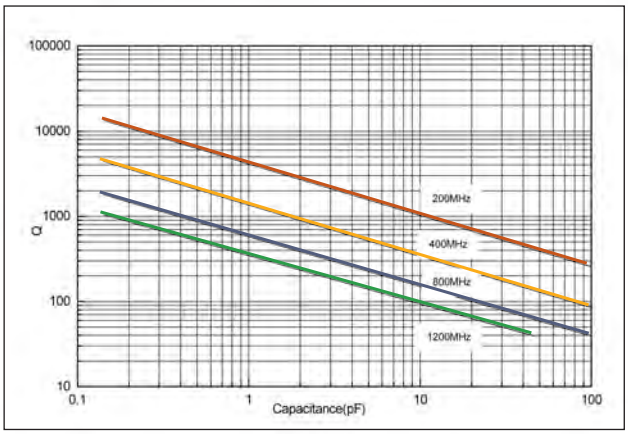
Item	Specifications	Method
Thermal Shock	DWV: the initial value IR: Shall not be less than 30% of the initial value Capacitance change: no more than 0.5% or 0.5pF, whichever is greater.	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature(-55°C and 200°C) stay 30 minutes. The time of removing shall not be more than 3 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 200°C. 200% Rated voltage D.C. applies

◆DLC10A Performance Curve

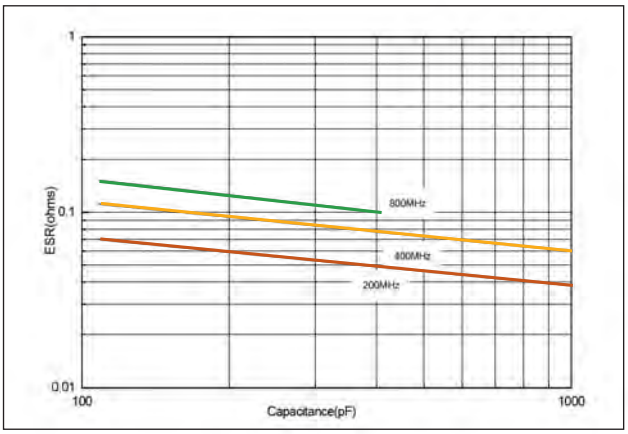
ESR vs Capacitance



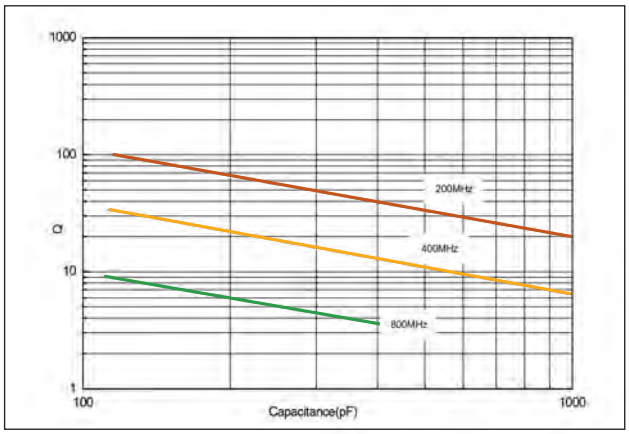
Q vs Capacitance



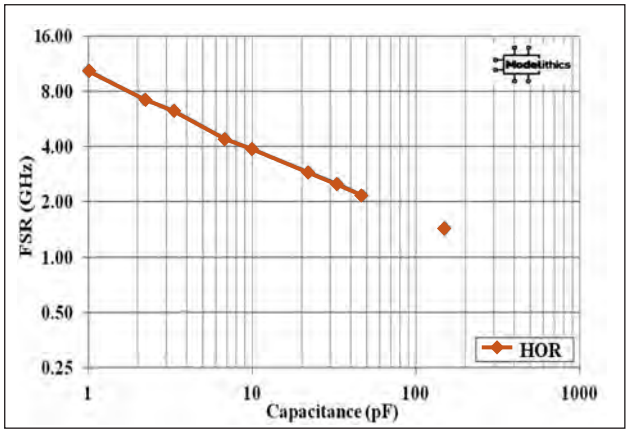
ESR vs Capacitance



Q vs Capacitance



DLC10A Horizontal First Series Resonance(FSRs)



Definitions and Measurement Conditions

For a capacitor in a series configuration, i.e., mounted across a gap in a microstrip trace, with 50-Ohm source and termination resistances, the First Series Resonance, FSR, is defined as the lowest frequency at which the imaginary part of the input impedance, Im[Zin], equals zero when reference planes are at the sample edges. The FSR shall be considered as undefined (gap in plot above) if, over the measured or model-validated frequency range: (a) Im[Zin] never reaches zero; or, (b) at frequencies lower than that at which Im[Zin] = 0, Im[Zin] is not monotonic with frequency and/or the real part of the input impedance, Re[Zin], deviates more than once from montonicity.

FSR is dependent on internal capacitor structure; substrate thickness and dielectric constant; capacitor orientation, as defined above; and mounting pad dimensions. The measurement conditions are: substrate -- Rogers RO4350; substrate dielectric constant = 3.66; horizontal mount substrate thickness (mils) = 25; gap in microstrip trace (mils) = 15; horizontal mount microstrip trace width (mils) = 55. Reference planes at sample edges.

All data has been derived from electrical models created by Modelithics, Inc., a specialty vendor contracted by Dalicap. The models are derived from measurements on a large number of parts disposed on several different substrates.

Dalicap
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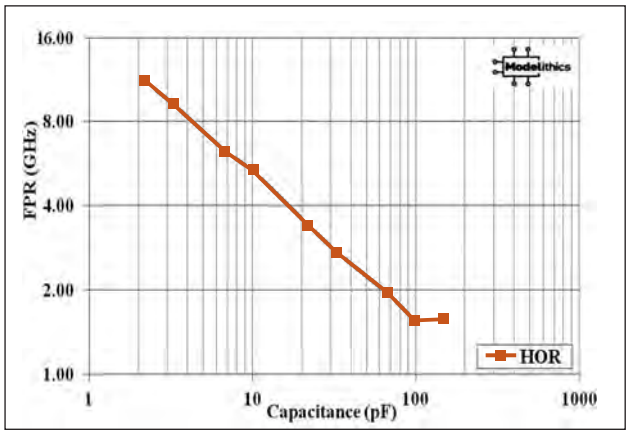
DLC10A High Q. RF/Microwave Multilayer Chip Ceramic Capacitors

DLC10A(.055" x.055")

◆DLC10A Performance Curve

DLC10A Horizontal First Parallel Resonance(FPRs)



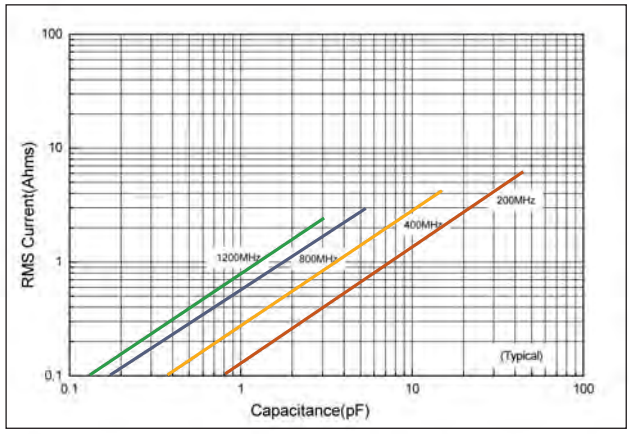
Definitions and Measurement conditions:

For a capacitor in a series configuration, i.e., mounted across a gap in a microstrip trace, with 50-Ohm source and termination resistances, the First Parallel Resonance, FPR, is defined as the lowest frequency at which a suckout or notch appears in |S21|. It is generally independent of substrate thickness or dielectric constant, but does depend on capacitor orientation. A horizontal orientation means the capacitor electrode planes are parallel to the plane of the substrate; a vertical orientation means the electrode planes are perpendicular to the substrate.

The measurement conditions are: substrate -- Rogers RO4350; substrate dielectric constant = 3.66; horizontal mount substrate thickness (mils) = 25; gap in microstrip trace (mils) = 15; horizontal mount microstrip trace width (mils) = 55. Reference planes at sample edges.

All data has been derived from electrical models created by Modelithics, Inc., a specialty vendor contracted by Dalicap. The models are derived from measurements on a large number of parts disposed on several different substrates.

Current Rating vs Capacitance

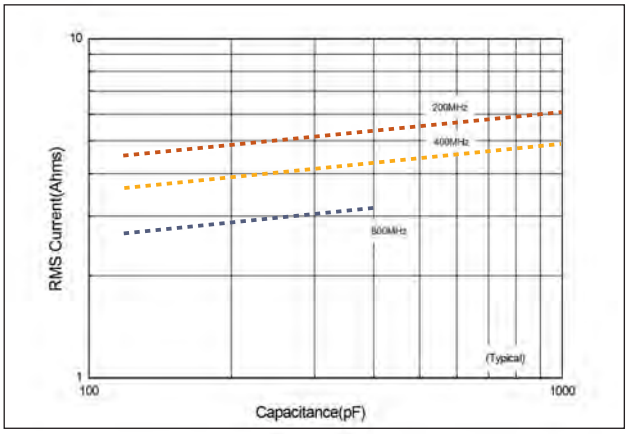


The current depends on voltage limited:

$$I = \frac{\sqrt{2}}{2} I_{peak} = \frac{\sqrt{2}}{2} \times \frac{V_{rated}}{X_C} = \sqrt{2}\pi f C V_{rated}$$

The current depends on power dissipation limited: $I = \sqrt{\frac{P_{dissipation}}{ESR}}$

Current Rating vs Capacitance



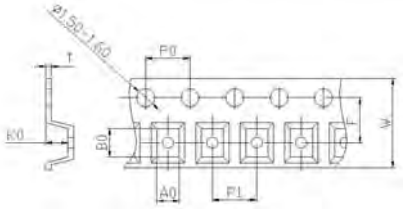
Note: If the thermal resistance of mounting surface is 40°C/W.

then a power dissipation of 1.5 W will result in the current limited

we can calculate the current limited: $I = \sqrt{\frac{P_{dissipation}}{ESR}}$

◆Tape & Reel Specifications

Orientation	EIA	A0	B0	K0	W	P0	P1	T	F	Qty/reel	Tape Material
Horizontal	0505	1.38	1.68	0.98	8.00	4.00	4.00	0.22	3.50	3000	Plastic
Vertical	0505	1.10	1.60	1.40	12.00	4.00	4.00	0.30	5.50	2000	Plastic



◆Design Kits

These capacitors are 100% RoHS. Kits are available in Magnetic and Non-Magnetic that contain 10(ten) pieces per value;16 values per kit.

Design Kit	Description (pF)	Values (pF)	Tolerance
DKDLC10A01	0.1 - 2.0	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.5,	±0.10pF
		1.6, 1.8, 2.0	±0.25pF
DKDLC10A02	1.0 - 10	1.0, 1.2, 1.5, 1.8, 2.0, 2.2, 2.4, 2.7,	±0.10pF
		3.0, 3.3, 3.9, 4.7, 5.6, 6.8, 8.2	±0.25pF
		10	±5%
DKDLC10A03	10 - 100	10, 12, 15, 18, 20, 22, 24, 27, 30, 33, 39, 47, 56, 68, 82, 100	±5%
DKDLC10A05	0.1 - 2.0 Non-magnetic	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.5,	±0.10pF
		1.6, 1.8, 2.0	±0.25pF
DKDLC10A06	1.0 - 10 Non-magnetic	1.0, 1.2, 1.5, 1.8, 2.0, 2.2, 2.4, 2.7,	±0.10pF
		3.0, 3.3, 3.9, 4.7, 5.6, 6.8, 8.2	±0.25pF
		10	±5%
DKDLC10A07	10 - 100 Non-magnetic	10, 12, 15, 18, 20, 22, 24, 27, 30, 33, 39, 47, 56, 68, 82, 100	±5%