

Specification

Part No.: DLC75B

DLC75B (.110" x .110")



◆ Product Features

Ultra-low ESR value, high working voltage, high RF power,
high self-resonant frequency.

◆ Product Application

Typical applications : mobile communication base station, repeater, cluster
communication, MRI.

◆ DLC75B Capacitance Table

Cap. pF	Code	Tol.	Rated WVDC	Cap. pF	Code	Tol.	Rated WVDC	Cap. pF	Code	Tol.	Rated WVDC	Cap. pF	Code	Tol.	Rated WVDC		
0.2	0R2	A,B,C,D	500V Code 501 or 1000V Code 102	2.4	2R4	A,B,C,D	500V Code 501 or 1000V Code 152	20	200	F,G,J	500V Code 501 or 1000V Code 152	160	161	F,G,J	300V Code 301 or 600V Code 601		
0.3	0R3			2.7	2R7			22	220			180	181		200V Code 201 or 500V Code 501		
0.4	0R4			3.0	3R0			24	240			200	201				
0.5	0R5			3.3	3R3			27	270			220	221				
0.6	0R6			3.6	3R6			30	300			240	241				
0.7	0R7			3.9	3R9			33	330			270	271				
0.8	0R8			4.3	4R3			36	360			300	301				
0.9	0R9			4.7	4R7			39	390			330	331				
1.0	1R0			5.1	5R1			43	430			360	361				
1.1	1R1			5.6	5R6			47	470			390	391				
1.2	1R2			6.2	6R2			51	510			430	431				
1.3	1R3			6.8	6R8			56	560			470	471				
1.4	1R4			7.5	7R5			62	620			510	511		100V Code101 or500V Code501		
1.5	1R5			8.2	8R2			68	680			560	561				
1.6	1R6			9.1	9R1			75	750			620	621				
1.7	1R7			10	100			82	820			680	681				
1.8	1R8	F,G,J		11	110	F,G,J		91	910		300V Code 301 or 600V Code 601	750	751		50V Code 500 or 300V Code 301		
1.9	1R9			12	120			100	101			820	821				
2.0	2R0			13	130			110	111			910	911				
2.1	2R1			15	150			120	121			1000	102				
2.2	2R2			16	160			130	131								
				18	180			150	151								

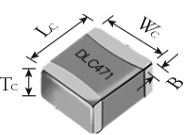
Remark: special capacitance, tolerance and WVDC are available, consult with DALICAP.

◆ Part Numbering

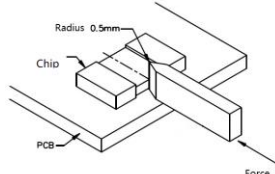
	DLC75B	101	J	W	301	X	T	
DLC75:series								Packaging Type
B:1111								T: Horizontal Orientation Tape & Reel , 2000 pcs/reel
Capacitor Code:								TV: Vertical Orientation Tape & Reel, 1500pcs/Reel
Cap < 10pF, e.g.:1R0=1.0pF, R denotes decimal point. ;								Laser Marking:
Cap ≥ 10pF, e.g.:101=100pF, the third number is the power of 10.								X, Laser Marking; N, No Marking
Capacitance Tolerance: See beUltra Low list								Rated Voltage e.g:301=300V
								Termination Type
	Capacitance Tolerance							
Code	A	B	C	D	F	G	J	K
Tol.	±0.05pF	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%

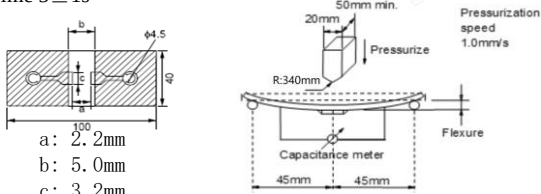
◆ DLC75B Termination Type and Dimensions

unit: inch (millimeter)

Series	Term. Code	Type/ Outlines	Capacitor Dimensions				Termina Material
			Length Lc	Width Wc	Thickness Tc	Overlap B	
75B	W		.110 -.010~+.025 (2.79 -.025 ~ 0.63)	.110±.010 (2.79±0.25)	.102 (2.60) max	.016~.039 (0.40~1.00)	100%Sn over Nickel Plating , RoHS Compliant
	L						10%Pb90%Sn over Nickel Plating ,
	P (Non-Mag)						100%Sn over Copper Plating , RoHS Compliant

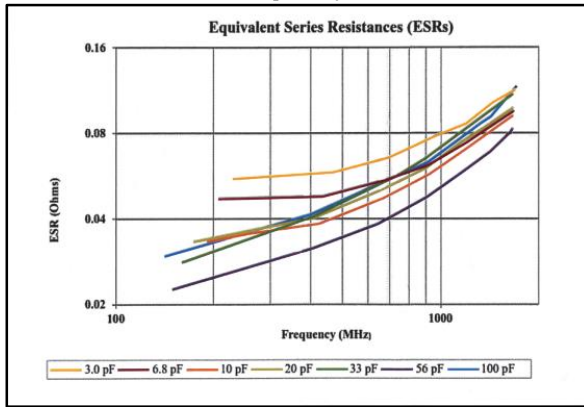
◆ **Reliability Test Conditions.**

No.	Item	Specification	Test method												
1	Operating temperature	-55℃～150℃	-												
2	Appearance	No defects or abnormality	Visual inspection: ×10 microscope.												
3	Dimensions	See the previous page	Caliper inspection												
4	Capacitance	Shall be within the applicable tolerance specified.	Test frequency: 1MHz±10% Test voltage: 1.0±0.2Vrms												
5	D.F	D.F≤0.05%													
6	Insulation resistance	10 ⁵ Megohms min. @ +25 ℃ 10 ⁴ Megohms min. @ +125 ℃	Voltage: DC Rated Voltage (500V max)												
7	Dielectric withstanding voltage (DWV)	Shall be no evidence of breakdown or visible evidence of arcing or damage.	Test Voltage: Rated voltage≤500V: 250% of the rated voltage 500V<Rated voltage≤1250V: 150% of the rated voltage Rated voltage>1250V: 120% of the rated voltage Applied Time: 5 s Charge/discharge current: 50mA max.												
8	Temperature coefficient	(0±30)ppm/℃	The capacitance change should be measured after 5 min. at each specified temp. stage. Capacitance value as a reference is the value in step 3. <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>150±3</td></tr><tr><td>5</td><td>25±2</td></tr></table> $TC = \frac{C_5 - C_3}{C_3 \times \Delta T} \times 10^6 \text{ ppm/}^\circ\text{C}$	step	temperature (℃)	1	25±2	2	-55±3	3	25±2	4	150±3	5	25±2
step	temperature (℃)														
1	25±2														
2	-55±3														
3	25±2														
4	150±3														
5	25±2														
9	Capacitance Drift	±0.2% or ±0.05pF, whichever is larger.													
10	Adhesive Strength of Termination	No removal of the terminations or other defect should occur.	Pressurizing force: 22.0 ^{+1.0} ₀ N Test time: 10±1 sec. 												

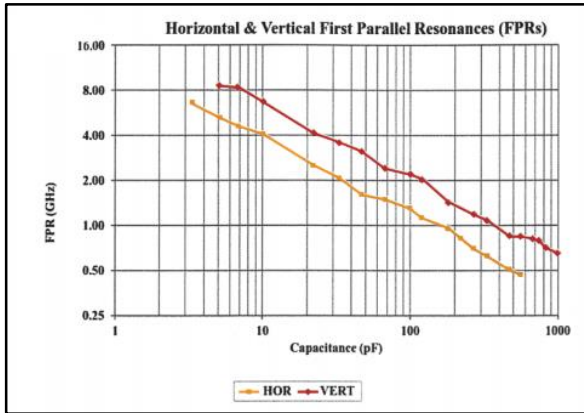
No.	Item	Specification	Test method															
11	Substrate Bending test	Appearance: No defects or abnormalities. Capacitance Change: With in $\pm 5\%$ or $\pm 0.3\text{pF}$ whichever is larger.	Mounting method: RefUltra Low solder the capacitor on the test substrate. Pressurization Method: Shown as below. Flexure 1mm. Holding Time $5 \pm 1\text{s}$ 															
12	Solderability of termination	Shall be at least 95 percent covered with a smooth solder coating.	Immerse the capacitor in a eutectic solution requirement temperature $245 \pm 2^\circ\text{C}$ for 2 ± 0.5 seconds. Capacitor shall be immersed to a depth of 10mm.															
13	Resistance to soldering Heat	Appearance: No evidence of mechanical damage or delamination or exposed. Cap change: within $-1.0\% \sim +2.0\%$ or $\pm 0.5\text{pF}$ whichever is larger. Q: No less than initial requirement. IR(25°C): No less than initial requirement.	Preheat for 1 minute at 150°C to 180°C before immerse the capacitor in a eutectic solution at $260 \pm 5^\circ\text{C}$ for 10 ± 1 seconds. Capacitor shall be immersed to a depth of 10mm. And following a 24 ± 2 hours cooling period.															
14	Temperature Cycle	Appearance: No evidence of mechanical damage . Cap change: within $\pm 0.5\%$ or $\pm 0.5\text{pF}$ whichever is larger. Q: No less than initial requirement. IR(25°C): No less than 30% initial requirement. DWV: To meet initial requirement.	Perform the 5 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(min)</th></tr><tr><td>1</td><td>$-55(-3 \sim 0)$</td><td>≥ 30</td></tr><tr><td>2</td><td>$25+10$</td><td>≤ 5</td></tr><tr><td>3</td><td>$125(0 \sim +3)$</td><td>≥ 30</td></tr><tr><td>4</td><td>$25+10$</td><td>≤ 5</td></tr></table>	step	Temperature($^\circ\text{C}$)	Time(min)	1	$-55(-3 \sim 0)$	≥ 30	2	$25+10$	≤ 5	3	$125(0 \sim +3)$	≥ 30	4	$25+10$	≤ 5
step	Temperature($^\circ\text{C}$)	Time(min)																
1	$-55(-3 \sim 0)$	≥ 30																
2	$25+10$	≤ 5																
3	$125(0 \sim +3)$	≥ 30																
4	$25+10$	≤ 5																
15	Humidity, steady state	Appearance: No evidence of mechanical damage . Cap change: within $\pm 0.3\%$ or $\pm 0.3\text{pF}$ whichever is larger. IR(25°C): No less than initial requirement.	With 1.5Volts D.C. applied while subjected to an environment of 75°C with 75% relative humidity for 240 hours minimum. Removed and sit 3.5 ± 0.5 hours at room temperature.															
16	High Temperature Load (Life)	Appearance: No evidence of mechanical damage . Cap change: within $\pm 2\%$ or $\pm 0.5\text{pF}$ whichever is larger. Q: No less than 50% initial requirement. IR(25°C): No less than 30% initial requirement.	Test Voltage: Rated voltage $\leq 500\text{V}$: 200% of the rated voltage $500\text{V} < \text{Rated voltage} \leq 1250\text{V}$: 120% of the rated voltage Rated voltage $> 1250\text{V}$: 100% of the rated voltage . The charge/discharge current is less than 50mA. Temperature: 150°C ; Time: 2000h. Measurement: Set it for 48 hours at room temperature, then measure.															

◆ DLC75B Performance Curve

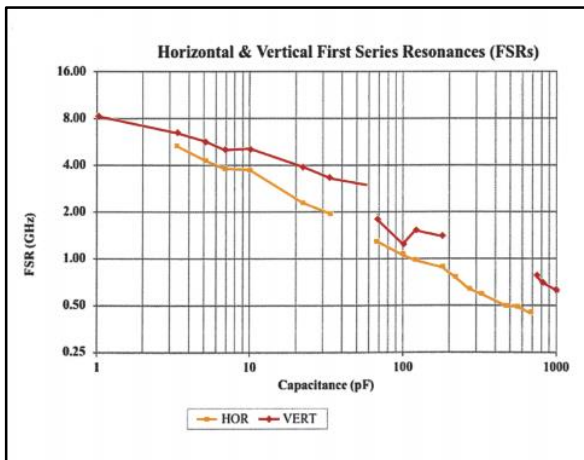
ESR Vs Frequency



Horizontal First Parallel Resonance (FPR)



Horizontal First Series Resonance (FSR)



Definitions and Measurement conditions:

On the S21 curve of a capacitor, there are several parallel resonance points (V-shaped attenuation points). The first parallel resonance frequency (FPR) is the frequency of the lowest-frequency parallel resonance point. It is not affected by the thickness and dielectric constant of the substrate, but it is affected by the installation direction of the capacitor. A horizontal direction means that the internal electrode plates of the capacitor are parallel to the substrate.

Definition and Measurement Conditions

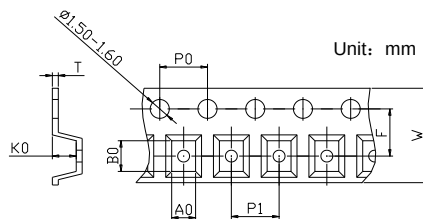
On the input impedance $[Z_{in}]$ curve of a capacitor, there exist several series resonance points (V-shaped attenuation points). The first series resonance frequency (FSR) refers to the frequency of the series resonance point with the lowest frequency, where the imaginary part of the input impedance is zero ($\text{Im}[Z_{in}] = 0$). Below the FSR, the real part ($\text{Re}[Z_{in}]$) and the imaginary part ($\text{Im}[Z_{in}]$) of the input impedance do not vary linearly with frequency. The value of FSR is related to the following factors: the internal electrode structure of the capacitor, substrate material, substrate thickness, substrate dielectric constant, mounting orientation of the capacitor on the substrate, and substrate pad size.

Definition and Measurement Conditions

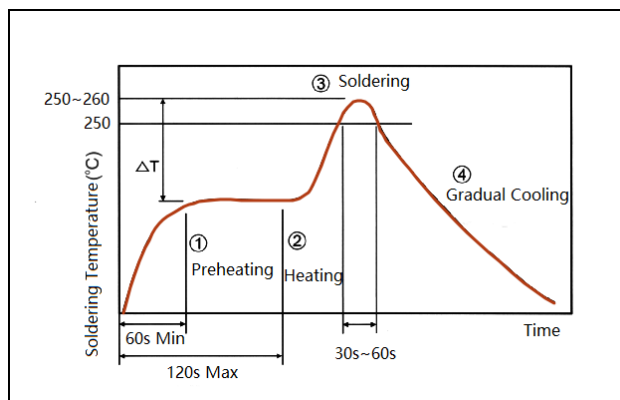
Definition: The capacitor is mounted in series on a microstrip line, i.e., the capacitor is bridged across the two ends of a 50-ohm microstrip line with a gap.
Measurement Conditions: The substrate is a Rogers RO4350 board with a dielectric constant of 3.48. For horizontal mounting, the substrate thickness is 55 mils; for vertical mounting, the substrate thickness is 45 mils. The microstrip gap is 61.1 mils for both horizontal and vertical mounting. The microstrip width is 123.7 mils for horizontal mounting and 101.0 mils for vertical mounting. The reference plane is set at the edge of the sample.

◆ Tape & Reel Specifications

Orientation	EIA	A0	B0	K0	W	P0	P1	T	F	Qty/reel	Tape Material
Horizontal	1111	2.75	3.60	2.40	8.00	4.00	4.00	0.25	3.50	2000	Plastic
Horizontal	1111	2.85	3.60	2.40	8.00	4.00	4.00	0.25	3.50	2000	Plastic
Vertical	1111	2.30	3.55	2.70	12.00	4.00	4.00	0.40	5.50	1500	Plastic



◆ Recommended soldering conditions



$\Delta T \leq 190^{\circ}\text{C}$;

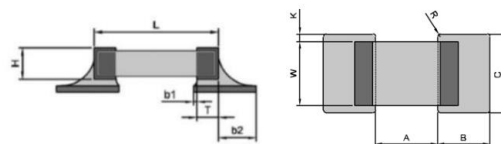
Maximum temperature: $255^{\circ}\text{C} \pm 5^{\circ}\text{C}$;

Heating rate: $\leq 4^{\circ}\text{C/s}$.

◆ Recommended Land Dimensions

Horizontal Mounting

Orientation	EIA	A(mm)	B(mm)	C(mm)
Horizontal	1111	2.00	1.50	2.80



Vertical Mounting

Orientation	EIA	A(mm)	B(mm)	C(mm)
Vertical	1111	1.90	1.70	2.50

