

# Specification

**Part No.: DLC70H**

## DLC70H (.040" x .020")

### ◆ Product Features

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

### ◆ Product Application

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

Typical Applications: Civil Satellite Communications, Mobile Communication Base Stations, RF Repaters, Trunked Communications.

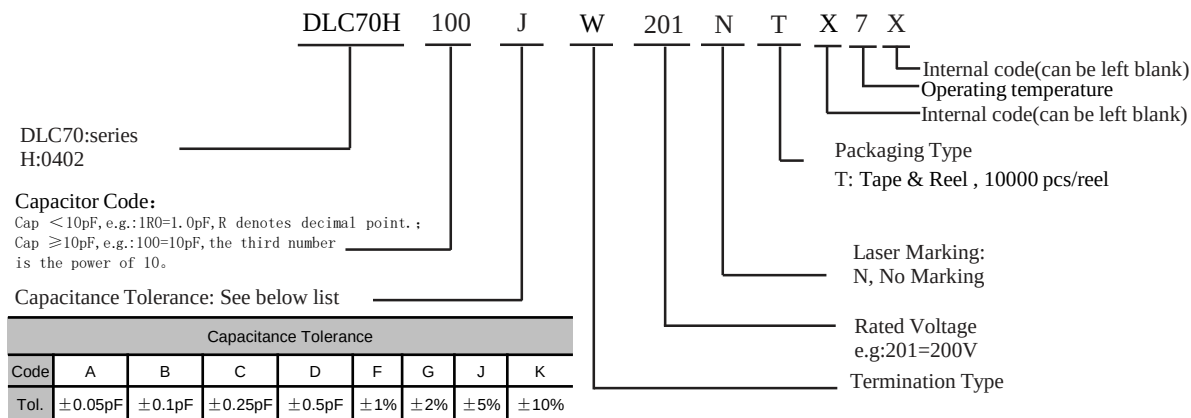


### ◆ DLC70H Capacitance Table

| Cap<br>pF | Code | Tol.    | Rated<br>WVDC       | Cap<br>pF | Code | Tol.    | Rated<br>WVDC       | Cap<br>pF | Code               | Tol.    | Rated<br>WVDC       |
|-----------|------|---------|---------------------|-----------|------|---------|---------------------|-----------|--------------------|---------|---------------------|
| 0.1       | 0R1  | A,B,C,D | 200V<br>Code<br>201 | 1.8       | 1R8  | A,B,C,D | 200V<br>Code<br>201 | 7.5       | 7R5                | A,B,C,D | 200V<br>Code<br>201 |
| 0.2       | 0R2  |         |                     | 1.9       | 1R9  |         |                     | 8.2       | 8R2                |         |                     |
| 0.3       | 0R3  |         |                     | 2.0       | 2R0  |         |                     | 9.1       | 9R1                |         |                     |
| 0.4       | 0R4  |         |                     | 2.1       | 2R1  |         |                     | 10        | 100                | F,G,J   |                     |
| 0.5       | 0R5  |         |                     | 2.2       | 2R2  |         |                     | 11        | 110                |         |                     |
| 0.6       | 0R6  |         |                     | 2.4       | 2R4  |         |                     | 12        | 120                |         |                     |
| 0.7       | 0R7  |         |                     | 2.7       | 2R7  |         |                     | 13        | 130                |         |                     |
| 0.8       | 0R8  |         |                     | 3.0       | 3R0  |         |                     | 15        | 150                |         |                     |
| 0.9       | 0R9  |         |                     | 3.3       | 3R3  |         |                     | 16        | 160                |         |                     |
| 1.0       | 1R0  |         |                     | 3.6       | 3R6  |         | 18                  | 180       |                    |         |                     |
| 1.1       | 1R1  |         |                     | 3.9       | 3R9  |         | 20                  | 200       |                    |         |                     |
| 1.2       | 1R2  |         |                     | 4.3       | 4R3  |         | 22                  | 220       |                    |         |                     |
| 1.3       | 1R3  |         |                     | 4.7       | 4R7  |         | 24                  | 240       |                    |         |                     |
| 1.4       | 1R4  |         |                     | 5.1       | 5R1  |         | 27                  | 270       |                    |         |                     |
| 1.5       | 1R5  |         |                     | 5.6       | 5R6  |         | 30                  | 300       | 50V<br>Code<br>500 |         |                     |
| 1.6       | 1R6  |         |                     | 6.2       | 6R2  |         | 33                  | 330       |                    |         |                     |
| 1.7       | 1R7  |         |                     | 6.8       | 6R8  |         |                     |           |                    |         |                     |

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

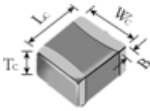
## ◆ Part Numbering



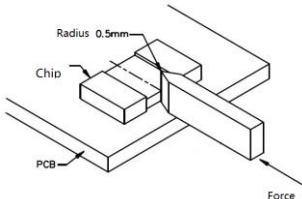
※Operating temperature: left blank : -55°C~125°C; 5: -55°C~150°C; 7: -55°C~175°C.

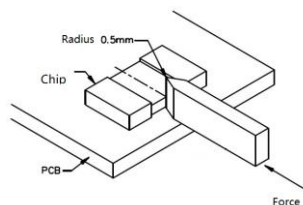
## ◆ DLC70H Termination Type and Dimensions

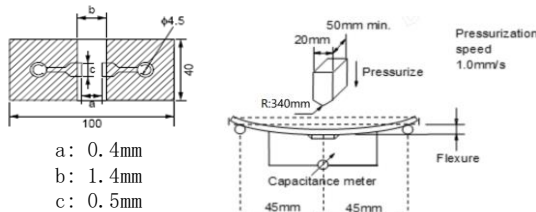
unit: inch (millimeter)

| Series | Term. Code | Type/ Outlines                                                                      | Capacitor Dimensions       |                            |                            |                            | Termina Material                                        |
|--------|------------|-------------------------------------------------------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---------------------------------------------------------|
|        |            |                                                                                     | Length<br>Lc               | Width<br>Wc                | Thickness<br>Tc            | Overlap<br>B               |                                                         |
| 70H    | W          |  | 0.041±0.004<br>(1.05±0.10) | 0.021±0.004<br>(0.55±0.10) | 0.021±0.004<br>(0.55±0.10) | 0.010±0.006<br>(0.25±0.15) | 100%Sn over Nickel Plating ,<br>RoHS Compliant          |
|        | L          |                                                                                     |                            |                            |                            |                            | 10%Pb90%Sn over Nickel Plating ,                        |
|        | P          |                                                                                     |                            |                            |                            |                            | 100%Sn over Copper Plating (Non-Mag),<br>RoHS Compliant |

◆ **Reliability Test Conditions.**

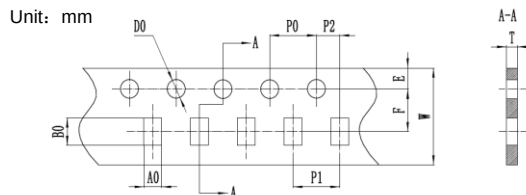
| No.  | Item                                  | Specification                                                                   | Test method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                 |   |      |   |       |   |      |   |        |   |      |
|------|---------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------|---|------|---|-------|---|------|---|--------|---|------|
| 1    | Operating temperature                 | -55℃~125℃<br>-55℃~175℃                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                 |   |      |   |       |   |      |   |        |   |      |
| 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%<br>Test voltage: 1.0±0.2Vrms                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                 |   |      |   |       |   |      |   |        |   |      |
| 5    | D.F                                   | DF≤0.05%                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                 |   |      |   |       |   |      |   |        |   |      |
| 6    | Insulation resistance                 | 10 <sup>5</sup> Megohms min. @ +25 °C<br>10 <sup>4</sup> Megohms min. @ +125 °C | Voltage: DC Rated Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                 |   |      |   |       |   |      |   |        |   |      |
| 7    | Dielectric withstanding voltage (DWV) | Shall be no evidence of breakdown or visible evidence of arcing or damage.      | Test Voltage: 250% of the rated voltage<br>Applied Time: 5 s<br>Charge/discharge current: 50mA max.                                                                                                                                                                                                                                                                                                                                                                                                          |      |                 |   |      |   |       |   |      |   |        |   |      |
| 8    | Temperature coefficient               | (0±30)ppm/℃(-55℃~125℃)<br>(0±60)ppm/℃(+125℃~175℃)                               | 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.<br><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>Tmax±3</td></tr><tr><td>5</td><td>25±2</td></tr></table> <div><math display="block">TC = \frac{C_T - C_3}{C_3 \times \Delta T} \times 10^6 \text{ ppm/}^\circ\text{C}</math></div> | step | temperature (℃) | 1 | 25±2 | 2 | -55±3 | 3 | 25±2 | 4 | Tmax±3 | 5 | 25±2 |
| step | temperature (℃)                       |                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                 |   |      |   |       |   |      |   |        |   |      |
| 1    | 25±2                                  |                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                 |   |      |   |       |   |      |   |        |   |      |
| 2    | -55±3                                 |                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                 |   |      |   |       |   |      |   |        |   |      |
| 3    | 25±2                                  |                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                 |   |      |   |       |   |      |   |        |   |      |
| 4    | Tmax±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:2.0 <sup>+0.5</sup> <sub>0</sub> N<br>Test time: 10±1 sec.<br>                                                                                                                                                                                                                                                                                                                                        |      |                 |   |      |   |       |   |      |   |        |   |      |



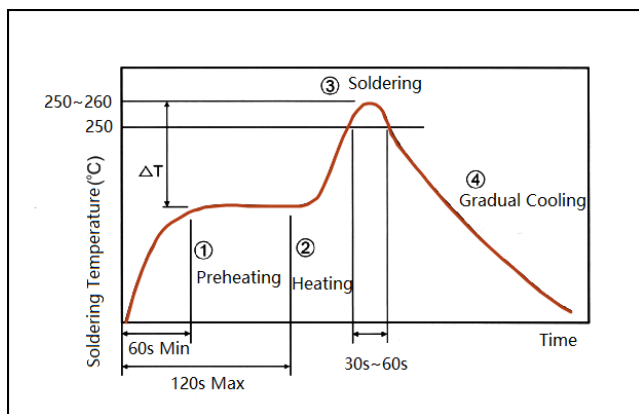
| No.  | Item                            | Specification                                                                                                                                                                                                                                                                  | Test method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |                                 |           |   |                  |           |   |             |          |   |                  |           |   |             |          |
|------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------|-----------|---|------------------|-----------|---|-------------|----------|---|------------------|-----------|---|-------------|----------|
| 11   | Substrate Bending test          | Appearance: No defects or abnormalities.<br>Capacitance Change: With in $\pm 5\%$ or $\pm 0.3\text{pF}$ whichever is larger.                                                                                                                                                   | Mounting method: Reflow solder the capacitor on the test substrate.<br>Pressurization Method: Shown as below. Flexure 1mm. Holding Time $5 \pm 1\text{s}$<br>                                                                                                                                                                                                                                                                                                                                         |      |                                 |           |   |                  |           |   |             |          |   |                  |           |   |             |          |
| 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 $2 \pm 0.5$ seconds. Capacitor shall be immersed to a depth of 10mm.                                                                                                                                                                                                                                                                                                                                                                                                                 |      |                                 |           |   |                  |           |   |             |          |   |                  |           |   |             |          |
| 13   | Resistance to soldering Heat    | Appearance:<br>No evidence of mechanical damage or delamination or exposed.<br>Cap change: within $-1.0\% \sim +2.0\%$ or $\pm 0.5\text{pF}$ whichever is larger.<br>Q: No less than initial requirement.<br>IR( $25^\circ\text{C}$ ): No less than initial requirement.       | Preheat for 1 minute at $150^\circ\text{C}$ to $180^\circ\text{C}$ before immerse the capacitor in a eutectic solution at $260 \pm 5^\circ\text{C}$ for $10 \pm 1$ seconds. Capacitor shall be immersed to a depth of 10mm.<br>And following a $24 \pm 2$ hours cooling period.                                                                                                                                                                                                                                                                                                         |      |                                 |           |   |                  |           |   |             |          |   |                  |           |   |             |          |
| 14   | Temperature Cycle               | Appearance:<br>No evidence of mechanical damage .<br>Cap change: within $\pm 0.5\%$ or $\pm 0.5\text{pF}$ whichever is larger.<br>Q: No less than initial requirement.<br>IR( $25^\circ\text{C}$ ): No less than 30% initial requirement.<br>DWV: To meet initial requirement. | Perform the 5 cycles according to the four heat treatments listed in the following table. Set it for $24 \pm 2$ hours at room temperature. <table><tr><th>step</th><th>Temperature(<math>^\circ\text{C}</math>)</th><th>Time(Min)</th></tr><tr><td>1</td><td><math>-55(-3 \sim 0)</math></td><td><math>\geq 30</math></td></tr><tr><td>2</td><td><math>25 \pm 10</math></td><td><math>\leq 5</math></td></tr><tr><td>3</td><td><math>125(0 \sim +3)</math></td><td><math>\geq 30</math></td></tr><tr><td>4</td><td><math>25 \pm 10</math></td><td><math>\leq 5</math></td></tr></table> | step | Temperature( $^\circ\text{C}$ ) | Time(Min) | 1 | $-55(-3 \sim 0)$ | $\geq 30$ | 2 | $25 \pm 10$ | $\leq 5$ | 3 | $125(0 \sim +3)$ | $\geq 30$ | 4 | $25 \pm 10$ | $\leq 5$ |
| step | Temperature( $^\circ\text{C}$ ) | Time(Min)                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                 |           |   |                  |           |   |             |          |   |                  |           |   |             |          |
| 1    | $-55(-3 \sim 0)$                | $\geq 30$                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                 |           |   |                  |           |   |             |          |   |                  |           |   |             |          |
| 2    | $25 \pm 10$                     | $\leq 5$                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                 |           |   |                  |           |   |             |          |   |                  |           |   |             |          |
| 3    | $125(0 \sim +3)$                | $\geq 30$                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                 |           |   |                  |           |   |             |          |   |                  |           |   |             |          |
| 4    | $25 \pm 10$                     | $\leq 5$                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                 |           |   |                  |           |   |             |          |   |                  |           |   |             |          |
| 15   | Humidity, steady state          | Appearance:<br>No evidence of mechanical damage .<br>Cap change: within $\pm 0.3\%$ or $\pm 0.3\text{pF}$ whichever is larger.<br>IR( $25^\circ\text{C}$ ): No less than initial requirement.                                                                                  | With 1.5 Volts D.C. applied while subjected to an environment of $85^\circ\text{C}$ with 85% relative humidity for 240 hours minimum.<br>Removed and sit $3.5 \pm 0.5$ hours at room temperature.                                                                                                                                                                                                                                                                                                                                                                                       |      |                                 |           |   |                  |           |   |             |          |   |                  |           |   |             |          |
| 16   | High Temperature Load (Life)    | Appearance:<br>No evidence of mechanical damage .<br>Cap change: within $\pm 2\%$ or $\pm 0.5\text{pF}$ whichever is larger.<br>Q: No less than 50% initial requirement.<br>IR( $25^\circ\text{C}$ ): No less than 30% initial requirement.                                    | Test Voltage: 200% of the rated voltage<br>The charge/discharge current is less than 50mA.<br>Temperature: $T_{\text{max}}^\circ\text{C}$ ;<br>Time: 2000h.<br>Measurement:<br>Set it for 48 hours at room temperature, then measure.                                                                                                                                                                                                                                                                                                                                                   |      |                                 |           |   |                  |           |   |             |          |   |                  |           |   |             |          |

### ◆ Tape & Reel Specifications

| EIA  | A0   | B0   | W    | P0   | P1   | T    | F    | Qty/reel | Tape Material |
|------|------|------|------|------|------|------|------|----------|---------------|
| 0402 | 0.70 | 1.20 | 8.00 | 4.00 | 2.00 | 0.65 | 3.50 | 10000    | Paper         |



### ◆ 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

| EIA  | A(mm)   | B(mm)     | C(mm)   |
|------|---------|-----------|---------|
| 0402 | 0.3-0.5 | 0.35-0.45 | 0.4-0.6 |

