ANGA POW®

ELECTRIC DOUBLE LAYER CAPACITORS

PRODUCT SPECIFICATION

規格書

CUSTOMER :	**DATE :**
(客戶) :	**(日期) : 2019-10-12**

CATEGORY (品名)	:	ELECTRIC DOUBLE LAYER CAPACITORS
DESCRIPTION (型号)	:	DRL 3V500F (φ35X70)
VERSION (版本)	:	01
Customer P/N	:	/
SUPPLIER	:	/

SUPPLIER	
PREPARED (拟定)	**CHECKED (审核)**
赵安平	刘渭清

CUSTOMER	
APPROVAL (批准)	**SIGNATURE (签名)**

ELECTRIC DOUBLE LAYER CAPACITORS SPECIFICATIONS
DRL SERIES

SPECIFICATION DRL SERIES					ALTERNATION HISTORY RECORDS		
Rev.	Date	Mark	Page	Contents	Purpose	Drafter	Approver

ELECTRIC DOUBLE LAYER CAPACITORS SPECIFICATIONS
DRL SERIES

C O N T E N T S

ELECTRIC DOUBLE LAYER CAPACITORS SPECIFICATIONS
DRL SERIES

1. Application

The specification applies to electric double layer capacitors used in electronic equipment.

2. Part Number System

DRL 507 Q 0I Q 70 SX

- DRL — Series
- 507 — Capacitance (2.1)
- Q — Tolerance (2.4)
- 0I — Voltage (2.2)
- Q — Diameter (2.5)
- 70 — Case Length (2.6)
- SX — Type (2.3)

2.1 Capacitance code

Code	**507**
Capacitance (F)	500

2.2 Rated voltage code

Code	**0T**
Voltage (W.V.)	3

2.3 Type

Code	**SX**
Type	X-TYPE

2.4 Capacitance tolerance

"Q stands for +10% ~ +30%

2.5 Diameter

Code	**Q**
Diameter	35

2.6 Case length

70=70mm

3. Characteristics

Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests is as follows:

Ambient temperature: 15°C to 35°C
Relative humidity : 25% to75%
Air Pressure : 86kPa to 106kPa

If there is any doubt about the results, measurement shall be made within the following conditions:

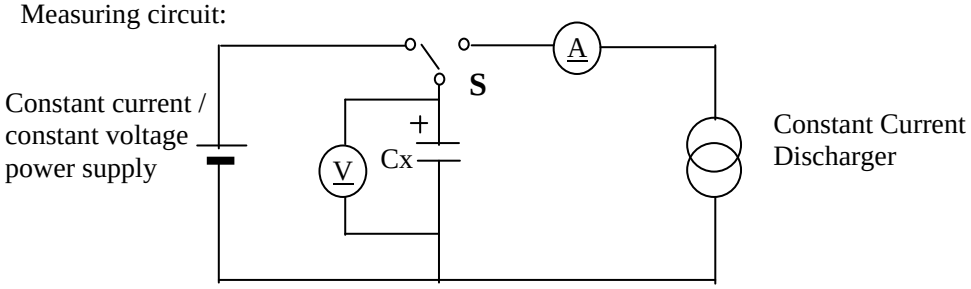
Ambient temperature: 20°C ± 2°C
Relative humidity : 60% to 70%
Air Pressure : 86kPa to 106kPa

Operating temperature range

The ambient temperature range at which the capacitor can be operated continuously at rated voltage is -40°C to 60°C.

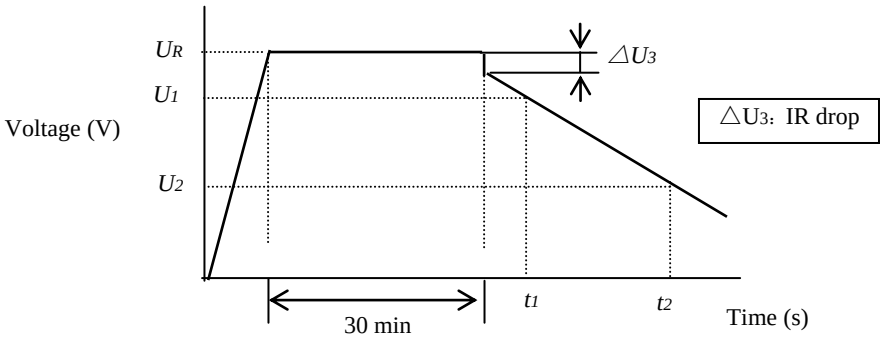
ELECTRIC DOUBLE LAYER CAPACITORS SPECIFICATIONS
DRL SERIES

<table>
<tr><th colspan="2">ITEM</th><th>PERFORMANCE</th></tr>
<tr><td>3.1</td><td>Rated voltage (WV)

Surge voltage (SV)</td><td>
<table>
<tr><td>WV (V.DC)</td><td>3.0</td></tr>
<tr><td>SV (V.DC)</td><td>3.2</td></tr>
</table>
</td></tr>
<tr><td>3.2</td><td>Nominal capacitance (Tolerance)</td><td>
<Condition>
Constant current discharge method:
Measuring circuit:


Key
(A) d.c. ammeter
(V) d.c. voltmeter
S changeover switch
Cx capacitor under test
Figure 1- Circuit for constant current discharge method

Measuring method
a) Set the d.c.voltage at the rated voltage (U_R)
b) Set the constant current value of the constant current discharger to the discharge current specified in Table 1.
c) Turn the switch S to the d.c.power supply ,apply voltage and charge for 30 min after the constant current / constant voltage power supply has achieved the rated voltage.
d) After a charge for 30 min has finished ,change over the switch S to the constant current discharger ,and discharge with a constant current.
e) Measure the time t_1 and t_2 where the voltage between capacitor terminals at the time of discharge reduces from U_1 to U_2 as shown in Figure 2 ,and calculate the capacitance value by the following formula:
</td></tr>
</table>

3.2	Nominal capacitance (Tolerance)	**<Condition>**  **Figure 2- Voltage characteristic between capacitor terminals** $$C = \frac{Ix(t_2-t_1)}{U_1-U_2}$$ Where C is the capacitance(F); I is the discharge current (A); U_1 is the measurement starting voltage (V); U_2 is the measurement end voltage (V); t_1 is the time from discharge start to reach U_1 (s); t_2 is the time from discharge start to reach U_2 (s). f) The discharge current I and the voltages U_1 and U_2 at the time of discharge voltage drop shall be as per Table 1 .The method classification shall be in accordance with the individual standards. **Table 1 – Discharge conditions** Charge time: 30 min I(mA): 4 x CU_R U_1: The value to be 80% of the charging voltage (0.8xU_R) U_2: The value to be 40% of the charging voltage (0.4xU_R) NOTE C_R is the rated capacitance in F(Farad),and U_R is the rated voltage in V (Volt)

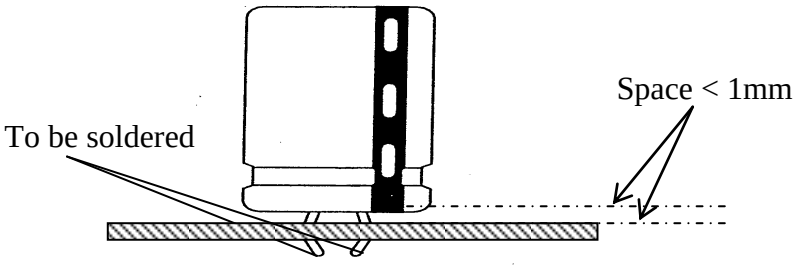
<table>
<tr><td>3.3</td><td>ESR</td><td>
<Condition>
Measuring frequency :1kHz
Measuring temperature:20±2℃
Measuring point : 2mm max from the surface of a sealing resin on the lead wire.
<Criteria>
(20℃)Less than the initial limit:
<table>
<tr><th>Rated Voltage (V)</th><th>Capacitance (F)</th><th>Dimension (D×L, mm)</th><th>ESR, DC（mΩ）（max）</th></tr>
<tr><td>3</td><td>500</td><td>35X70</td><td>8</td></tr>
</table>
</td></tr>
<tr><td>3.4</td><td>Leakage current</td><td>
<Condition>
1. Ambient temperature: 25°C ± 2°C.
2.The electrification time:72H
3. Desistance value of protective resistor less than 1Ω .
<Criteria>
Less than the initial limit(25°C ± 2°C):
I≤ 1.3 mA
I is the Leakage current
</td></tr>
<tr><td>3.5</td><td>Temperature characteristic</td><td>
<Condition>
<table>
<tr><th>STEP</th><th>Temperature(℃)</th><th>Item</th><th>Characteristics</th></tr>
<tr><td>1</td><td>20±2</td><td>Capacitance、ESR</td><td>----------</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">-40+3</td><td>Δ C/C</td><td>Within ±30% of initial capacitance</td></tr>
<tr><td>ESR</td><td>Less than or equal to 4 times of the value of item 3.3</td></tr>
<tr><td>3</td><td>Keep at 15 to 35℃ for 15 minutes or more</td><td>---------</td><td>---------</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">60±2</td><td>Δ C/C</td><td>Within ±30% of initial capacitance</td></tr>
<tr><td>ESR</td><td>The limit specified in 3.3</td></tr>
</table>
a. ESR -40℃/ ESR 20℃: ESR ratio at 1kHz;
b. ΔC/C 20℃: Capacitance change ;
</td></tr>
</table>

<table>
<tr>
<td>3.6</td>
<td>Load life test</td>
<td>
<Condition>
The Capacitor is stored at a temperature of 60 ±2 ℃ with rated voltage for 1000 +48/0 hours .The result should meet the following table:

<Criteria>
<table>
<tr><td>Item</td><td>Performance</td></tr>
<tr><td>Capacitance Change</td><td>Within ±30% of initial capacitance</td></tr>
<tr><td>ESR</td><td>Less than or equal to 4 times of the value of item 3.3</td></tr>
<tr><td>Appearance</td><td>No visible damage and no leakage of electrolyte</td></tr>
</table>
</td>
</tr>
<tr>
<td>3.7</td>
<td>Damp heat test</td>
<td>
<Condition>
Humidity Test:
The capacitor shall be exposed for 240±48 hours in an atmosphere of 90~95%RH at 40±2℃, the characteristic change shall meet the following requirement.

<Criteria>
<table>
<tr><td>Item</td><td>Performance</td></tr>
<tr><td>Capacitance Change</td><td>Within ±30% of initial capacitance</td></tr>
<tr><td>ESR</td><td>Less than or equal to 4 times of the value of item 3.3</td></tr>
<tr><td>Appearance</td><td>No visible damage and no leakage of electrolyte</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><td>3.8</td><td>Terminal strength</td><td><Condition>
A static load of 25N (2.5kgf) shall be applied to the lead wire terminal in the axial direction away from the capacitor body for 30s.

<Criteria>
There shall be no intermittent contacts, open or short circuit and there shall be no mechanical damage such as terminal damage.</td></tr>
<tr><td>3.9</td><td>Vibration test</td><td><Condition>
The following conditions shall be applied for 2 hours in each 3 mutually perpendicular directions.
Vibration frequency range : 10Hz ~ 55Hz
Peak to peak amplitude : 1.5mm
Sweep rate : 10Hz ~ 55Hz ~ 10Hz in about 1 minute
<Criteria>
After the test, the following items shall be tested:
<table>
<tr><td>Appearance</td><td>No mechanical damage in terminal. No leakage of electrolyte or swelling of the case. The markings shall be legible.</td></tr>
<tr><td>Inner construction</td><td>No intermittent contact, open or short circuit. No damage of tab terminals or electrodes.</td></tr>
</table>
Mounting method: The capacitor must be fixed in place with a bracket.
 
</td></tr>
</table>

<table>
<tr><td>3.10</td><td>Solderability</td><td>The capacitor shall be tested under the following conditions:
Solder : Sn-3Ag-0.5Cu
Soldering temperature: 245±3°C
Immersing time : 2.0±0.5s
Immersing depth : 1.5~ 2.0mm from the root.
Flux : Approx .25% rosin in

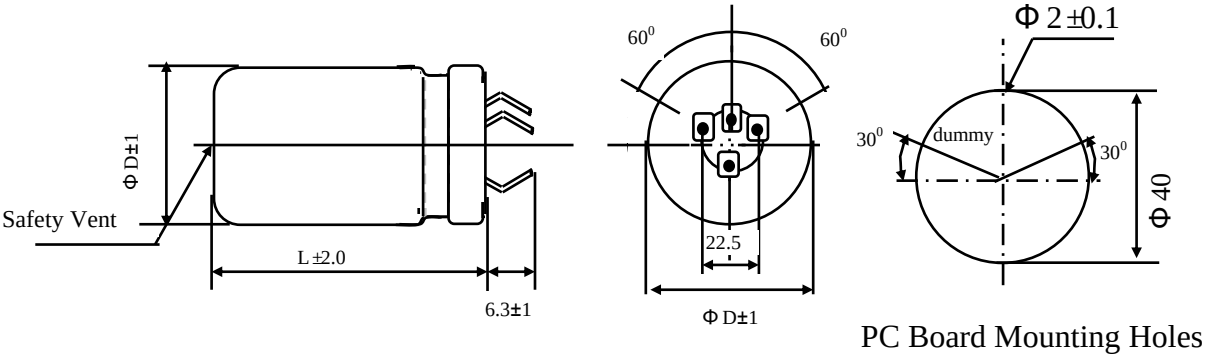
Performance: At least 75% of the dipped portion of the terminal shall be covered with new solder.</td></tr>
<tr><td>3.11</td><td>Resistance to soldering heat</td><td>A) Solder bath method
Lead terminals of a capacitor are placed on the heat isolation board with thickness of 1.6±0.5mm. It will dip into the flux of isopropylaehol solution of colophony.
Then it will be immersed at the surface of the solder with the following condition:
Solder : Sn-3Ag-0.5Cu
Soldering temperature : 260 ±5°C
Immersing time : 5±0.5s
Heat protector: t=1.6mm glass –epoxy board

B) Soldering iron method
Bit temperature : 350 ±10°C
Application time : 3.5 ±0.5 s
Heat protector: t=1.6mm glass –epoxy board
For both methods, after the capacitor at thermal stability, the following items shall be measured:
<table><tr><td>Item</td><td>Performance</td></tr><tr><td>Capacitance Change</td><td>Within ±10% of initial capacitance</td></tr><tr><td>Appearance</td><td>No visible damage legible marking and no leakage of electrolyte</td></tr></table></td></tr>
</table>

4. Product Dimensions

Unit: mm

X-Type



PC Board Mounting Holes

5 . Notice item

（1）The capacitor has fixed polarity.

（2）The capacitor should be used under rated voltage.

（3）The capacitor should not be used in the charge and discharge circuit with high frequency.

（4）The ambient temperature affects the super capacitor life.

（5）Voltage reduction ΔV=IR will happen at the moment of discharge.

（6）The capacitor cannot be stored on the place with humidity over 85%RH or place with toxic gas.

（7）The capacitor should stored in the environment within -30℃~50℃ temperature and less than 60% relative humidity.

（8）If the capacitor is applied on the double-side PCB, the connection should not be around the place on which the super capacitor can contact.

（9）Don't twist capacitor or make it slanting after installing.

（10）Need avoid over heat on the capacitor during soldering (The temperature should be 260℃ with the time less than 5s during soldering on 1.6mm printed PCB.)

（11）There is voltage balance problem between each capacitor unit during series connection between super capacitor.