Part Number	LSHC 002R3S 0300F EA
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Product specification

LSHC 002R3S 0300F EA

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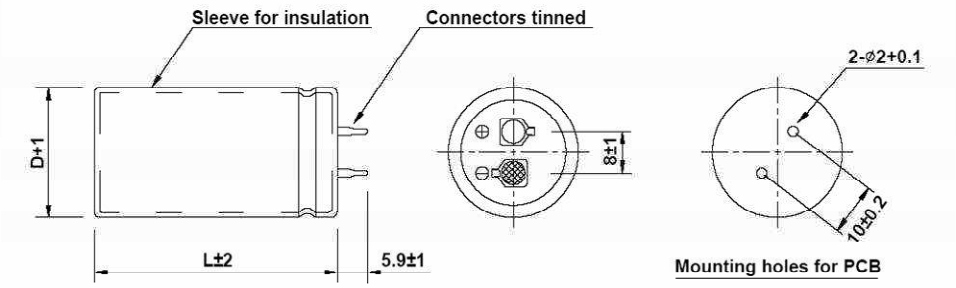
Product specification-Tentative

■ Physical properties

Dimension in mm (not to scale)



■ Specification

Rated Voltage	2.3 V	
Surge Voltage	2.5 V	
Capacitance Tolerance	-10% / 10%	
Resistance Tolerance	MAX.	
Operating temperature range	-25 ~ 60 ˚C	
Storage temperature range	-25 ~ 70 ˚C	
Life Time (25ºC)	After 10 years at rated voltage and +25 ℃	
	Capacitance change	Within 30% of initially specified value
	Internal resistance change	Within 200% of initially specified value
Cycle Life (25ºC)	After 500,000 cycles at +25 ℃ (Freedom Car test manual, DOE/NE-ID-11173)	
	Capacitance change	Within 30% of initially specified value
	Internal resistance change	Within 200% of initially specified value

■ Standard Ratings

Part number	Capacitance (F)	Resistance (mΩ)		Max. Current (A)	Leakage Current (mA)	Max. Stored Energy (Wh)
		(1kHz)	DC			
LSHC 002R3S 0300F EA	300	12	18	54	< 1	0.220

Part number	Dimension (mm)		Weight (g)
	D	L	
LSHC 002R3S 0300F EA	22	46	26

Technical Information (1)

■ How to calculate specification value

1. The Measurement Methods

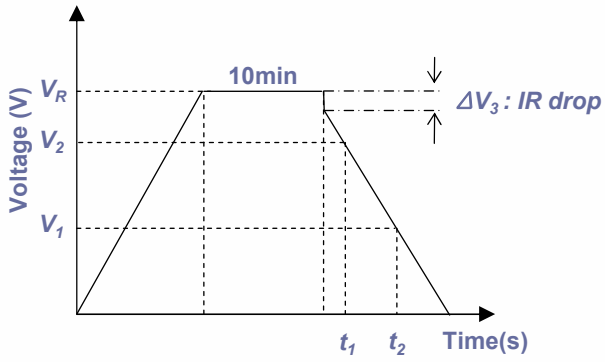
1-1 Capacitance

Apply rated voltage and charge for 10min after the constant current / constant voltage power supply has achieved the rated voltage. After a charge for 10min has finished, discharge with 10mA/F to 1.0V.

* Operating voltage range of LSHC series products : 2.3 ~ 1.0V

Measure the time t1 to t2 where the voltage between capacitor terminals at the time of discharge reduces from V1 to V2 as shown figure and calculate the capacitance value by the following formula:

1) Constant current charge with 10mA/F to V_R
2) Constant voltage charge at V_R for 10min
3) Constant current discharge with 10mA/F to 1.0V



$$C = \frac{I \times (t_2 - t_1)}{V_2 - V_1}$$

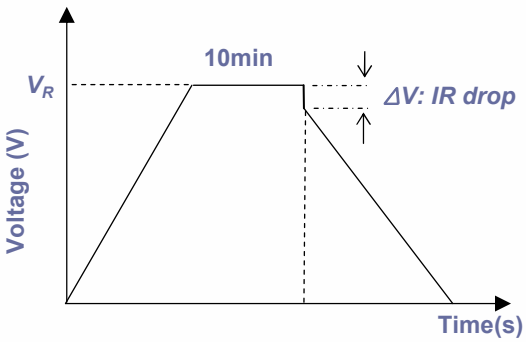
1-2 Resistance

The AC and DC resistance of a capacitor shall be calculated by the following formula;

$$R_{AC} = \frac{V}{I_{AC}}$$ (The frequency of the measuring voltage shall be 1kHz)

$$R_{DC} = \frac{\Delta V}{I_{DC}}$$

Where R_{AC} is the AC internal resistance (Ω);
R_{DC} is the DC internal resistance (Ω);
V is the effective value of AC voltage (V);
ΔV is the drop voltage for 10ms (V);
I_{AC} is the effective value of AC current (A);
I_{DC} is the discharge current (A);



Technical Information (2)

1-3 Leakage current & Self discharge

The leakage current shall be measured using the direct voltage appropriate to the test temperature(25℃) for 72hrs. Self discharge voltage shall be measured after charging up for 12hrs, disconnect the capacitor terminals from the voltage source. The capacitor shall be kept under standard condition for 100hrs.

1-4 Maximum current

Current for 1sec discharge from the rated voltage to the half of it in constant current discharge,

$$I_{Max} = \frac{V_R - 0.5*V_R}{\Delta t / C + R_{DC}}$$

Where I_{Max} is the Maximum current (A);
Δt is the discharge time (sec), 1 sec in this case ;
C is the capacitance (F);
R_{DC} is the DC resistance (Ω);
V_R is the rated voltage (V).

1-5 Maximum stored energy (E_{MAX})

$$E_{MAX}\,(Wh) = \frac{½\,CV_R^2}{3600}$$

2. The Standard Atmospheric Condition for Measurement

All test and measurements shall be made under standard atmospheric conditions for testing. Before the measurements are made, the capacitor shall be stored at the measuring temperature for a time sufficient to allow the entire capacitor to reach this temperature. The period as prescribed for recovery at the end of a test is a normally sufficient for this purpose.

Temperature : 15~35 ℃
Relative humidity : 25~75%
Air Pressure : 86~106 kPa