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Product specification

LSUM 016R8L 0058F EA

LS ULTRACAPACITOR

Product specification

Version	Date	Change Description	Author
V00	20 . Feb . 2013	Product specification	S.W Son
V01	07 . JAN . 2014	Change the measurement method(10m-5m)	S.W.Son
V02	02 . Jul . 2014	Add the Product specification(Max series voltage)	S.W.Son

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Product specification

■ Specification

1. Primary specification

Part number	Capacitance (F)	Resistance DC (mΩ)	Max. Current (A)[1]	Leakage Current (mA)
LSUM 016R8L 0058F EA	58.3	22	200	< 11

2. Power & Energy

Part number	Usable Specific Power, P_d (W/kg)	Impedance Match Specific Power, P_{max} (W/kg)	Energy Density (Wh/kg)	Stored Energy (Wh)
LSUM 016R8L 0058F EA	2,500	5,300	3.8	2.3

3. Standard & Reliability

Rated Voltage	16.8V	
Max. Voltage[2]	18.0V	
Maximum Series Voltage	750V	
Capacitance Tolerance	-0 % / +20%	
Resistance Tolerance	< Spec. Value	
Operating temperature range	-40 ~ 65 ˚C	
Storage temperature range	-40 ~ 70 ˚C	
Thermal Resistance	4.8℃/W	
Max. continuous current	ΔT = 15 ℃	12A
	ΔT = 40 ℃	20A
Endurance	After 1500 hours application of Rated voltage .DC at 65℃, the capacitor shall meet the following limits.	
	Capacitance change	Within 20% of initially specified value
	Internal resistance change	Within 100% of initially specified value
Shelf life	After 1500 hours storage at +65 °C without load shall meet specification of endurance	
Life Time (25°C)	After 10 years at rated voltage and +25 °C	
	Capacitance change	Within 20% of initially specified value
	Internal resistance change	Within 100% of initially specified value
Cycle Life (25°C)	After 500.000 cycles between Rated voltage to half rated voltage at +25 °C	
	Capacitance change	Within 20% of initially specified value
	Internal resistance change	Within 100% of initially specified value

4. Monitoring

Part number	Temperature sensor	Temperature interface	Connector	Cell voltage monitoring	Balancing
LSUM 016R8L 0058F EA	-	-	-	-	Passive or Active

*Remarks
1) Current for 1sec discharge from the rated voltage to the half of it in constant current discharge, do not use as an operating current.
2) Non repeated, not to exceed 1sec.

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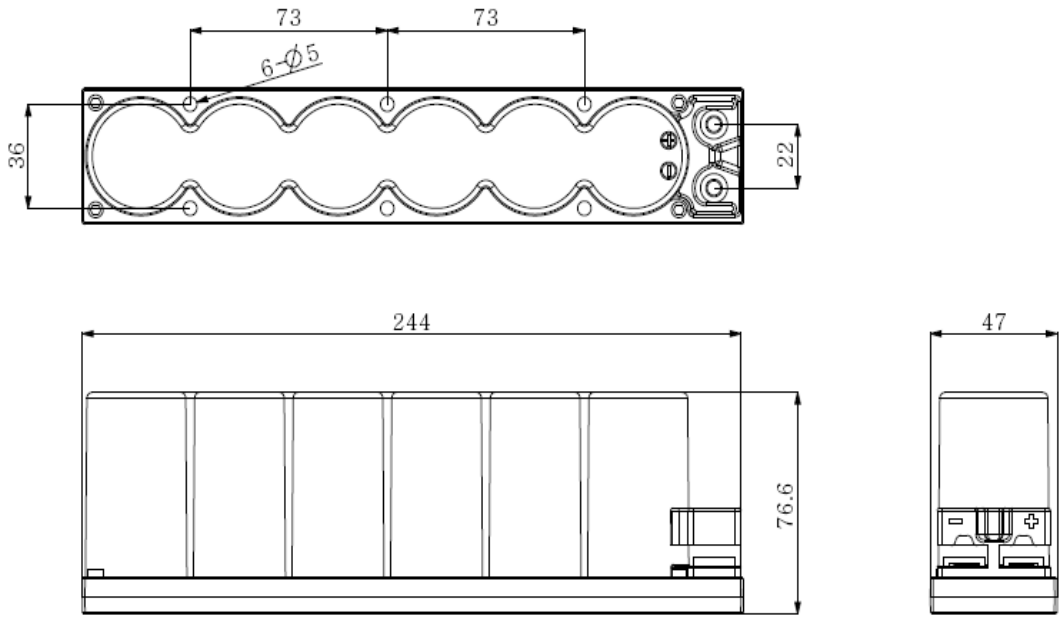
Safety & Physical Protection

Isolation voltage (DC)	Short circuit current(A)	Power Terminals	Recommended Torque - Terminal	Environmental Protection	Shock & vibration Protection
5.6kV	760	M5 Thread	4 Nm		IEC60068-2-27,-29/ IEC60028-2-6

Dimension in mm (not to scale)

Geometric properties

Part number	Dimension (mm)			Weight (kg)
	Length	Width	Height	
LSUM 016R8L 0058F EA	245.0±1.0	47.0±1.0	76.6±1.0	0.6±0.1



Technical Information (1)

How to calculate specification value

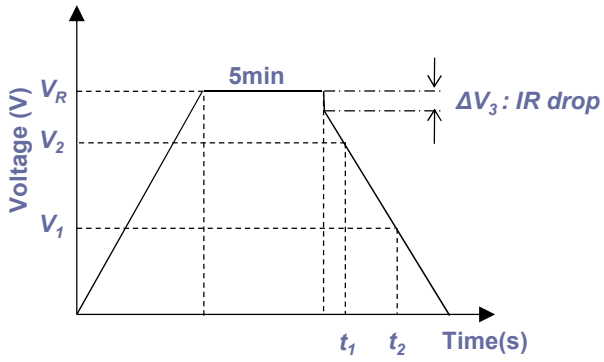
1. The Measurement Methods

1-1 Capacitance

Apply rated voltage and charge for 5min after the constant current / constant voltage power supply has achieved the rated voltage. After a charge for 5min has finished, discharge with 10mA/F to 0.1V.

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 5min
3) Constant current discharge with 10mA/F to 0.1V



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

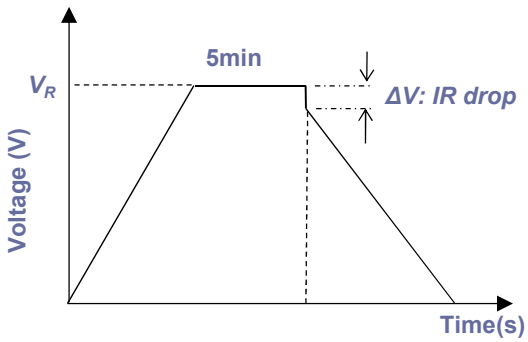
1-2 Resistance

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 100Hz or 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