Part Number	LSUC 002R8L 0350F EA

TEST REPORT

Characterization & life Test

For LSUC 002R8L 0350F EA

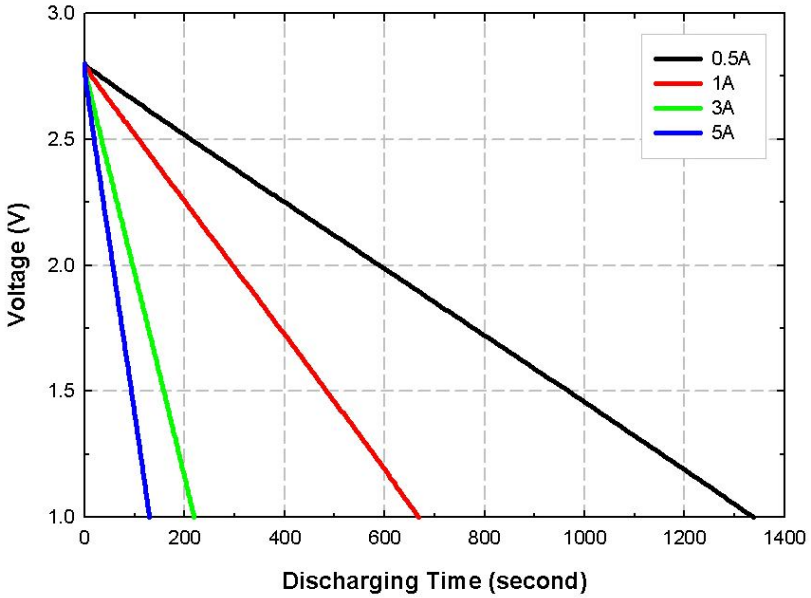
LS ULTRACAPACITOR
LSUC

TEST REPORT

Characterization & life Test

1. Constant Current Discharging Test

Current (A)	Cap ratio _ 25℃
0.5A	100
1A	99.97
3.5A	98.29
5A	97.22



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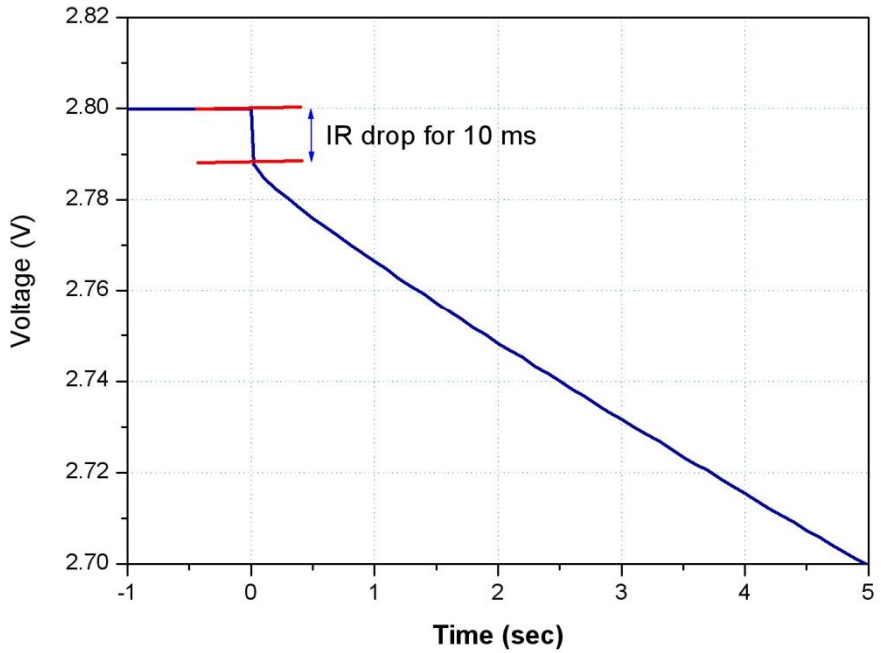
TEST REPORT

Characterization Test

2. DC ESR Test

Temp (℃)	DC ESR (mΩ)	Test condition
25	2.21	IR drop for 10ms @ 5A discharging



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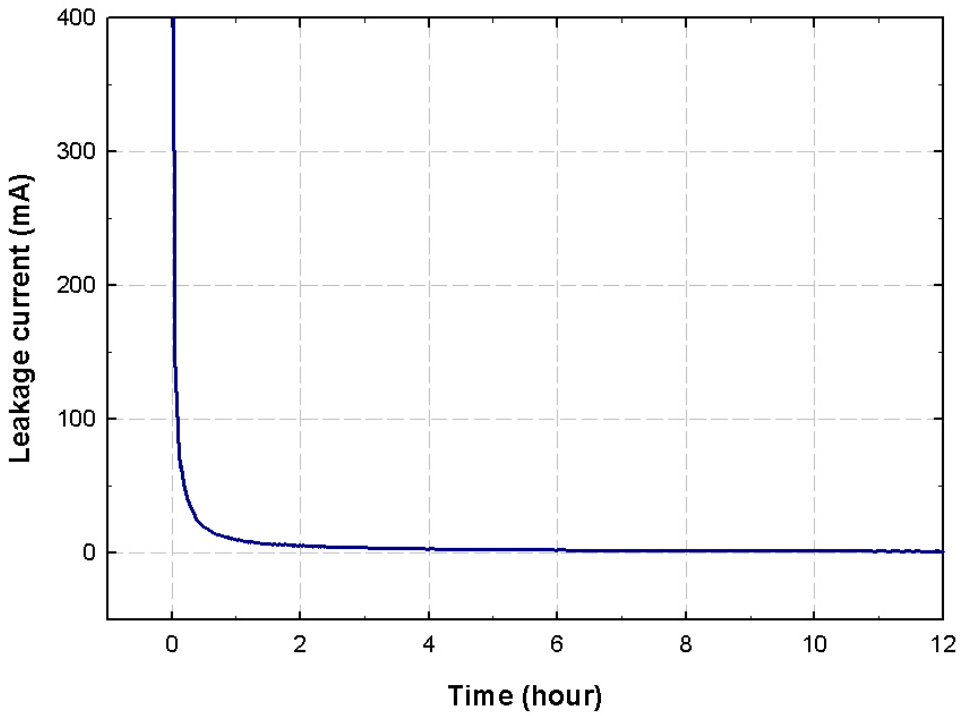
3. Leakage Current Test

Temp (℃)	Leakage current (mA)	Test condition
25	1.381	12 hr charging @ 2.8 V



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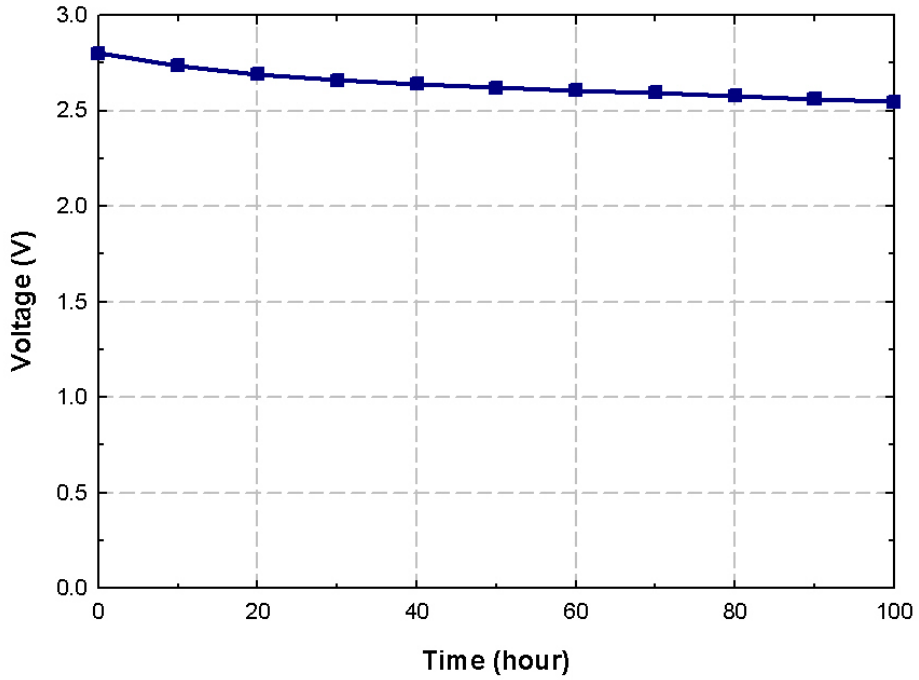
4. Self-Discharge Test

Temp (℃)	Voltage (V) @ 100hr	Test condition
25	2.547	After 12 hr charging @ 2.8 V, Rest 100hr



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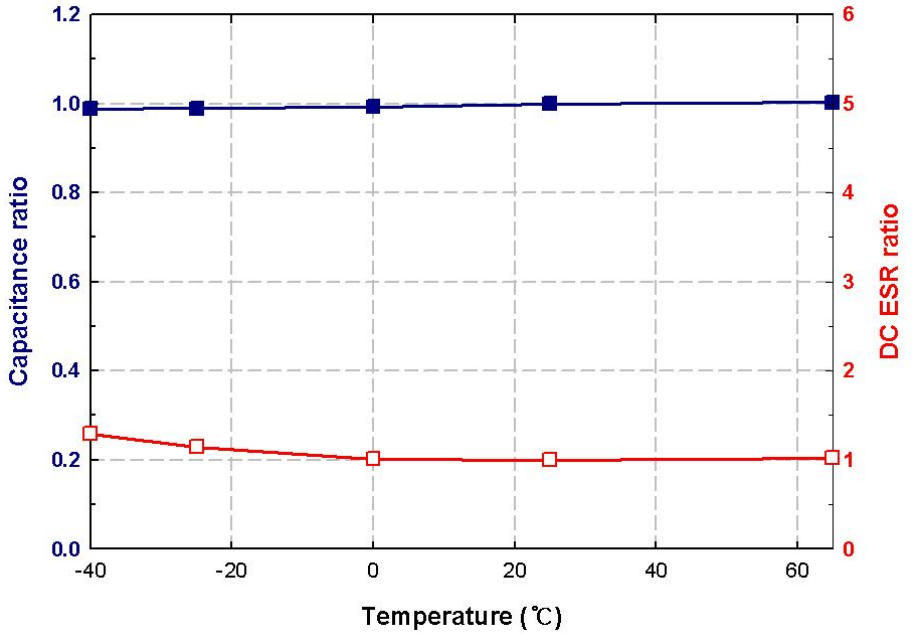
TEST REPORT

Characterization & life Test

5. Environmental test

: Relation curves of Capacitance and DC ESR as a function of temperature (-40℃ ~ 65℃)



Temp (℃)	-40	-25	0	25	65
Cap. Ratio	0.989	0.990	0.993	1	1.003
DC ESR Ratio	1.291	1.148	1.014	1	1.012

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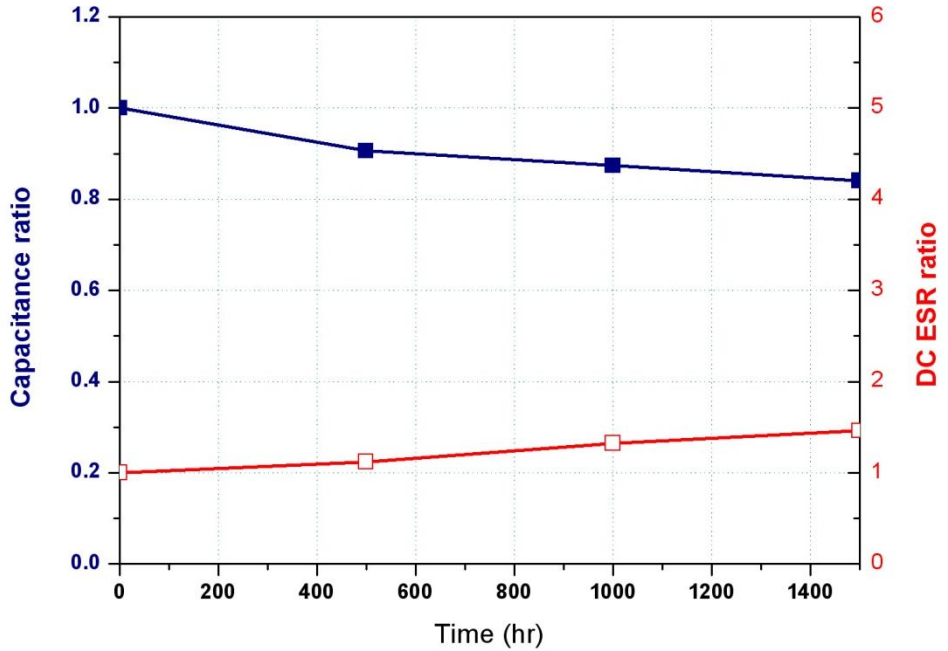
TEST REPORT

Characterization & life Test

6. 2.8V, 65℃ Load life test



Temp (℃)	0	500	1,000	1,500
Cap. Ratio	1	0.905	0.873	0.840
DC ESR Ratio	1	1.118	1.321	1.460

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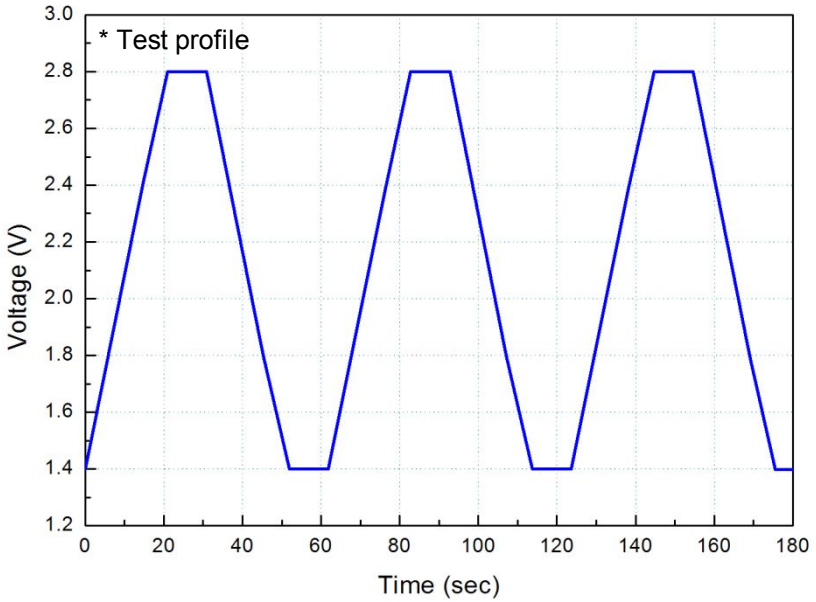
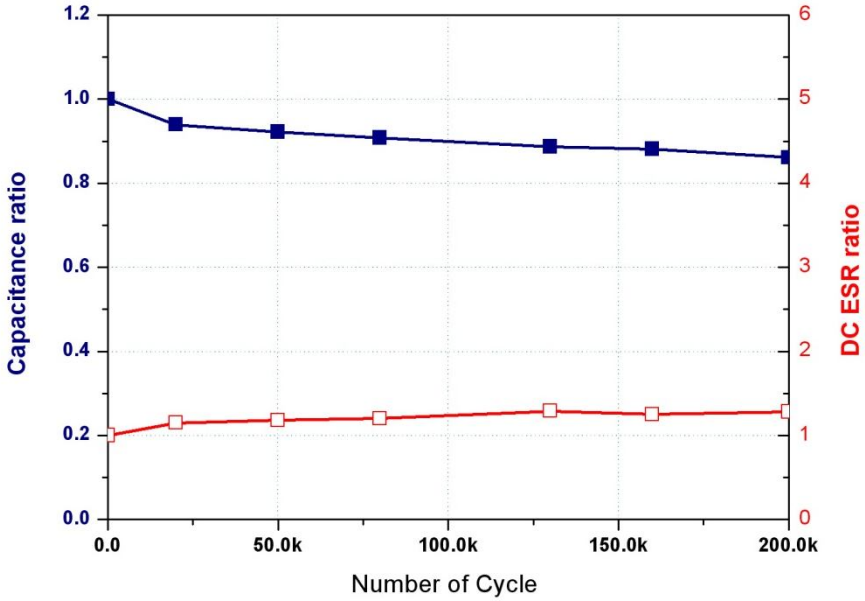
Characterization & life Test

7. 2.8V, 25℃ cycle life test

The capacitors are characterized initially and then periodically throughout the cycle test. Constant current charging and discharging are used. Takes 20secs from V1 to V2 for constant current charging/ discharging. Charging/discharging holding time=10sec at room temperature. (V 1= 2.8V, V 2 = 1.4V)





Number of cycle	0	50K	80K	200K
Cap. Ratio	1	0.922	0.908	0.861
DC ESR Ratio	1	1.180	1.200	1.280

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7. Vibration test

: Sequence of test = 1 set, 5set test was performed for LSUC 002R8L 0350F EA VE02.

Sequence of Test (1set)	Vertical → Longitudinal → Lateral → Vertical Test		
Vertical	**Freq. (Hz)**	**G.acc.**	
Spot	16	5	4,000cycle
Sweep	10~20	3	10 → 190 → 10Hz 60 rounds 1 Hz/sec
	20~20	2	
	40~90	1.5	
	90~140	1	
	140~190	0.75	
Longitudinal	**Freq. (Hz)**	**G.acc.**	
Spot	13	3.5	4,000cycle
Sweep	10~15	2.5	10 → 190 → 10Hz 60 rounds 1 Hz/sec
	15~30	1.75	
	30~60	1.25	
	60~110	1	
	110~190	0.75	

Test time	Initial	After 5set
Capacitance (%)	373.87F (100%)	373.27F (99.84%)
DC ESR (%)	2.134mΩ (100%)	2.145mΩ (100.54%)

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8. Resistance to Centrifugal Force

Simulator	
Radii	1.0 m
Max. rpm	> 1,000 rpm

Weight (g)	rpm	Load ([N])	Test time (hr)	Leakage	Deformation
100	191	40	2	X	X
			15	X	X
	302	100	2	X	X
			15	X	X
200	191	80	21	X	X

[After Loading 80 N for 15 hr]

Test No.	DC Resistance (mΩ)	
	Before	After
#1	2.07	2.19
#2	2.14	2.26
#3	2.05	2.22