VPC Series

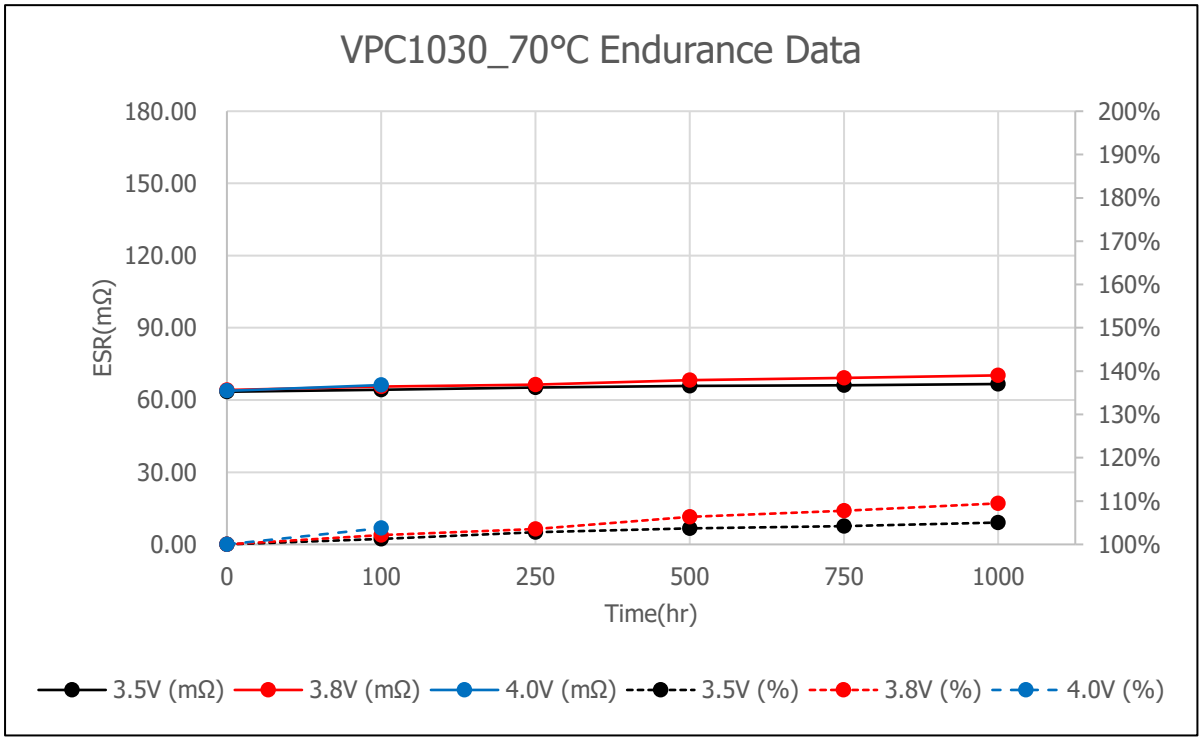
Answers to user questions

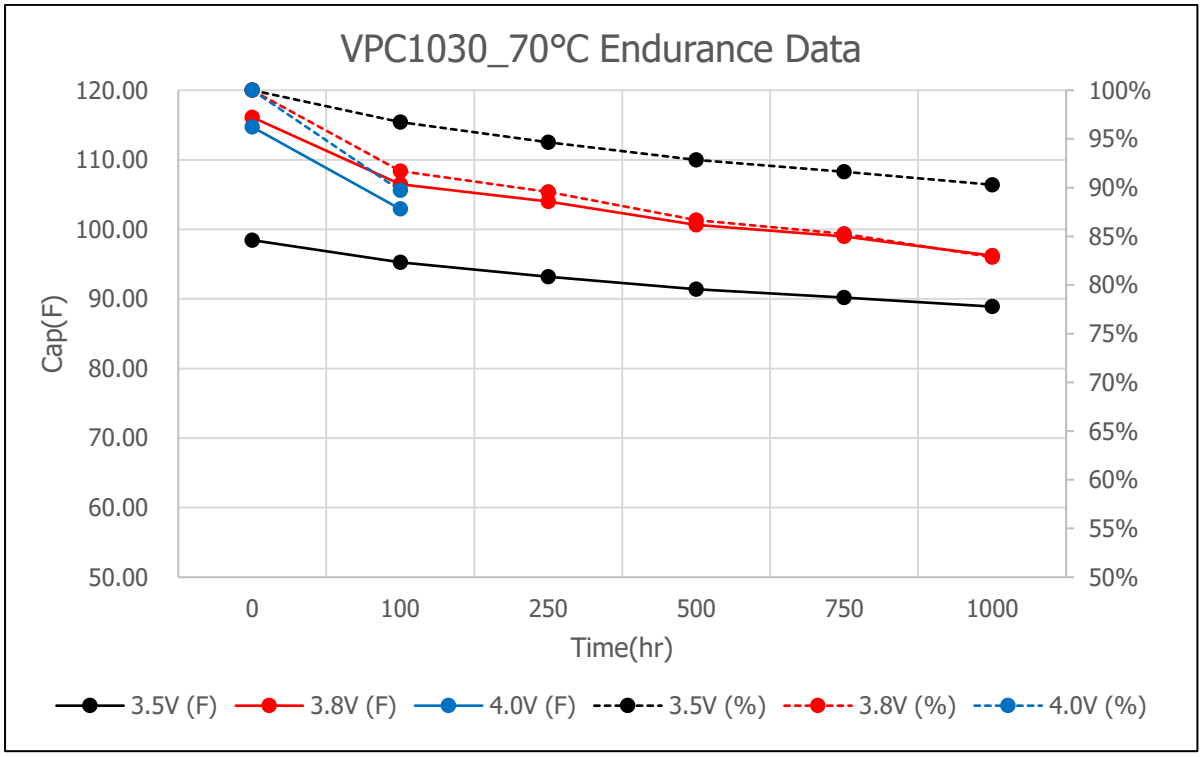
VINATech R&D Center

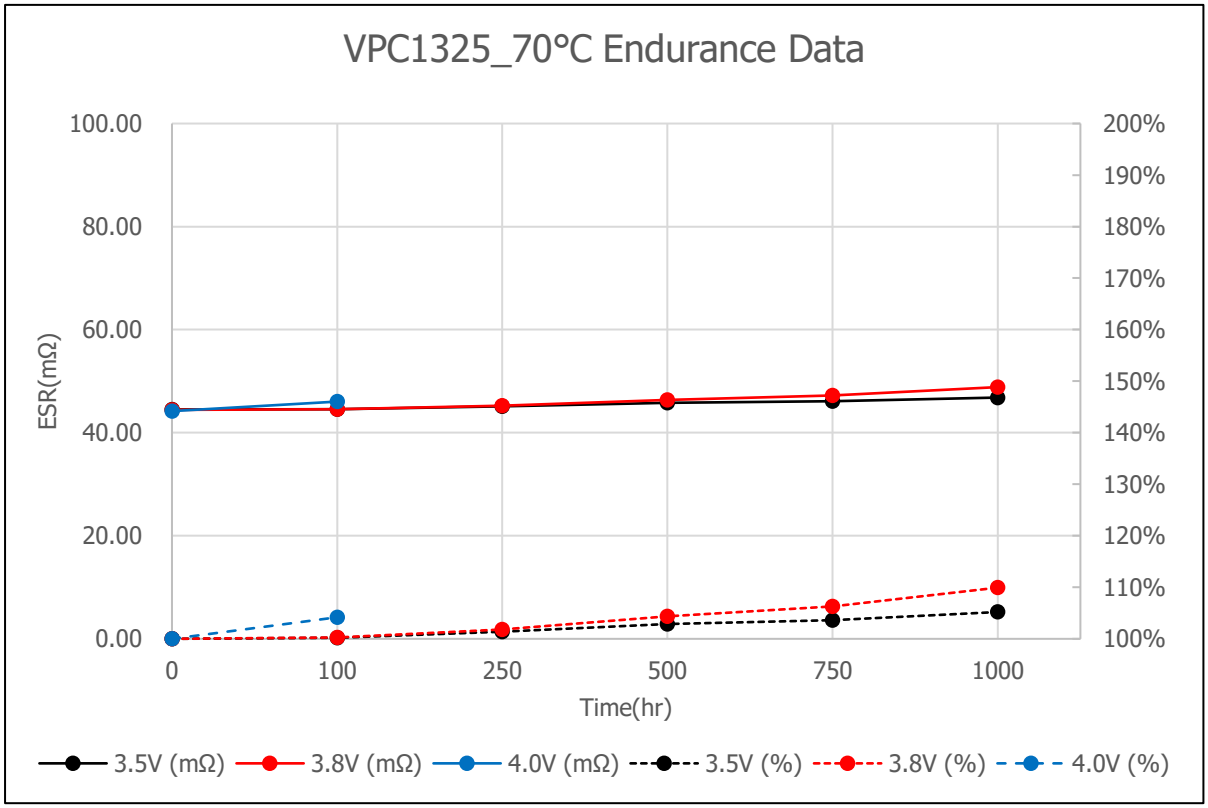
Development 1 Team

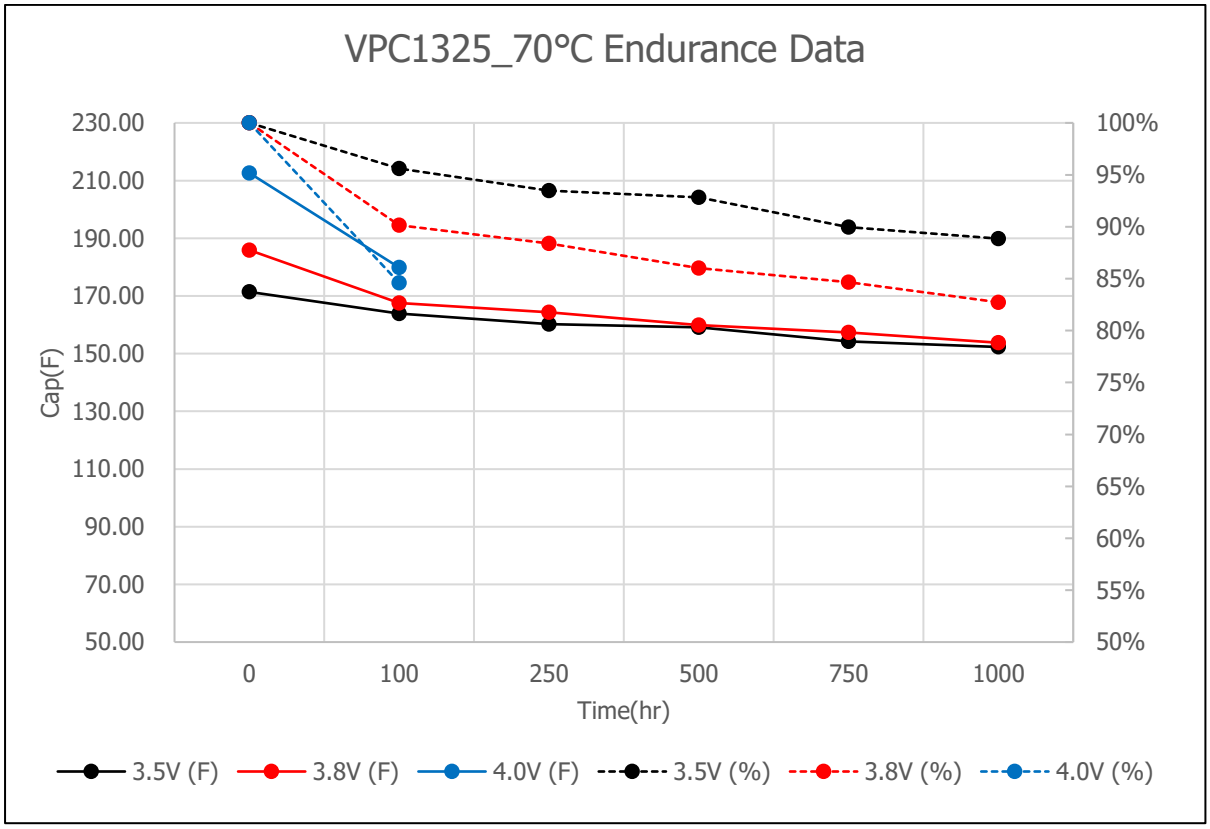
Q. Lifetime when VEL series is used above 3.8V
A. When VEL series is used on 4.0V constantly, it could be used but, the lifetime will be decreased about 2 or 3 times more than when it will be used on 3.8V

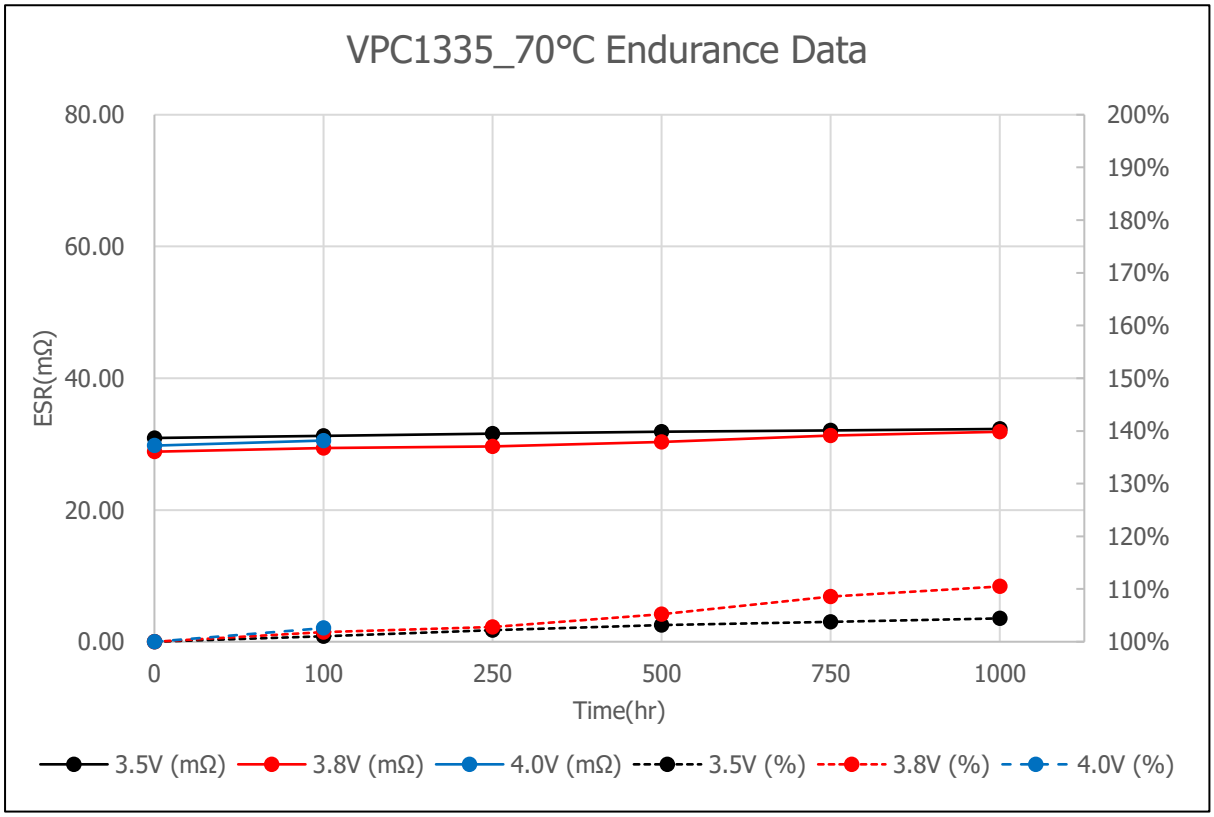
*Attached. Endurance Data on each voltage

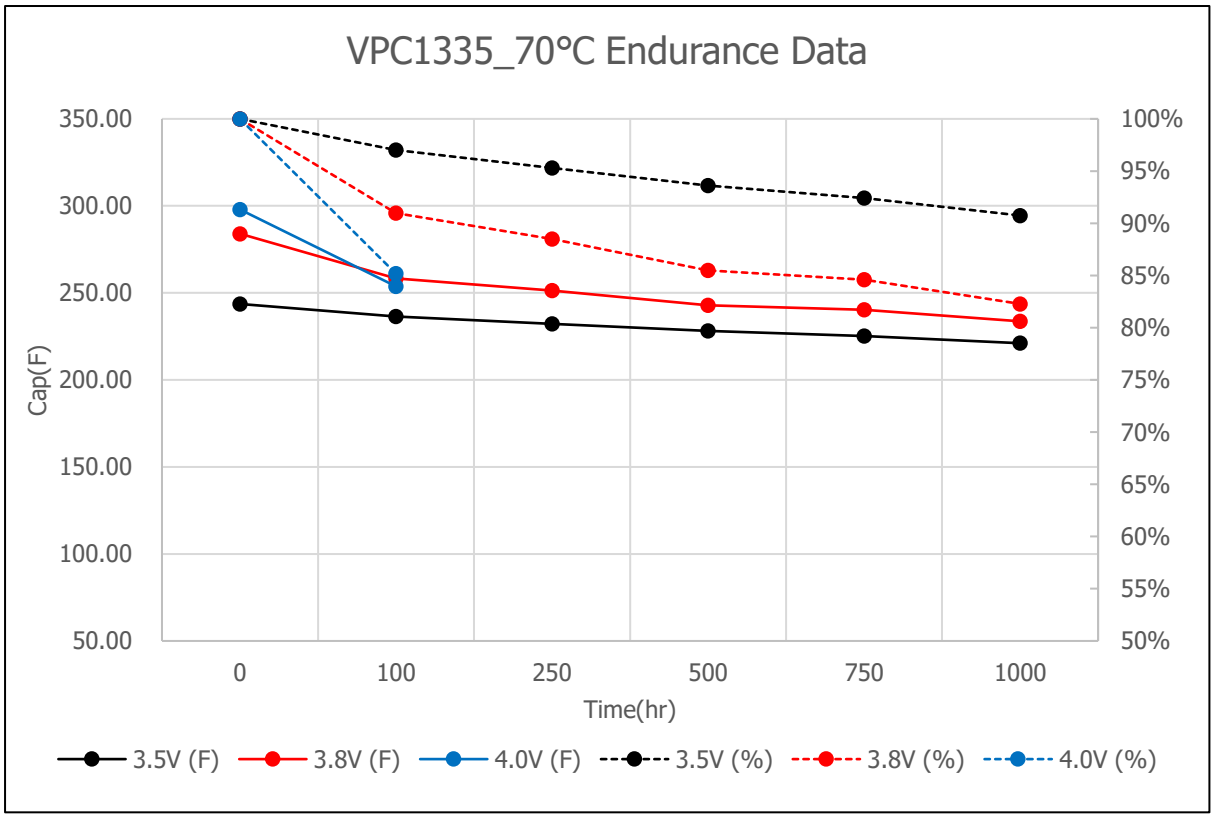



VPC1030_70°C Endurance Data
120.00
110.00
100.00
90.00
80.00
70.00
60.00
50.00
Cap(F)
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
0
100
250
500
750
1000
Time(hr)
3.5V (F)
3.8V (F)
4.0V (F)
3.5V (%)
3.8V (%)
4.0V (%)


VPC1325_70°C Endurance Data
100.00
80.00
60.00
40.00
20.00
0.00
ESR(mΩ)
200%
190%
180%
170%
160%
150%
140%
130%
120%
110%
100%
0
100
250
500
750
1000
Time(hr)
3.5V (mΩ)
3.8V (mΩ)
4.0V (mΩ)
3.5V (%)
3.8V (%)
4.0V (%)


VPC1325_70°C Endurance Data
230.00
210.00
190.00
170.00
150.00
130.00
110.00
90.00
70.00
50.00
Cap(F)
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
0
100
250
500
750
1000
Time(hr)
3.5V (F)
3.8V (F)
4.0V (F)
3.5V (%)
3.8V (%)
4.0V (%)


VPC1335_70°C Endurance Data
80.00
60.00
40.00
20.00
0.00
ESR(mΩ)
200%
190%
180%
170%
160%
150%
140%
130%
120%
110%
100%
0
100
250
500
750
1000
Time(hr)
3.5V (mΩ)
3.8V (mΩ)
4.0V (mΩ)
3.5V (%)
3.8V (%)
4.0V (%)


VPC1335_70°C Endurance Data
350.00
300.00
250.00
200.00
150.00
100.00
50.00
Cap(F)
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
0
100
250
500
750
1000
Time(hr)
3.5V (F)
3.8V (F)
4.0V (F)
3.5V (%)
3.8V (%)
4.0V (%)

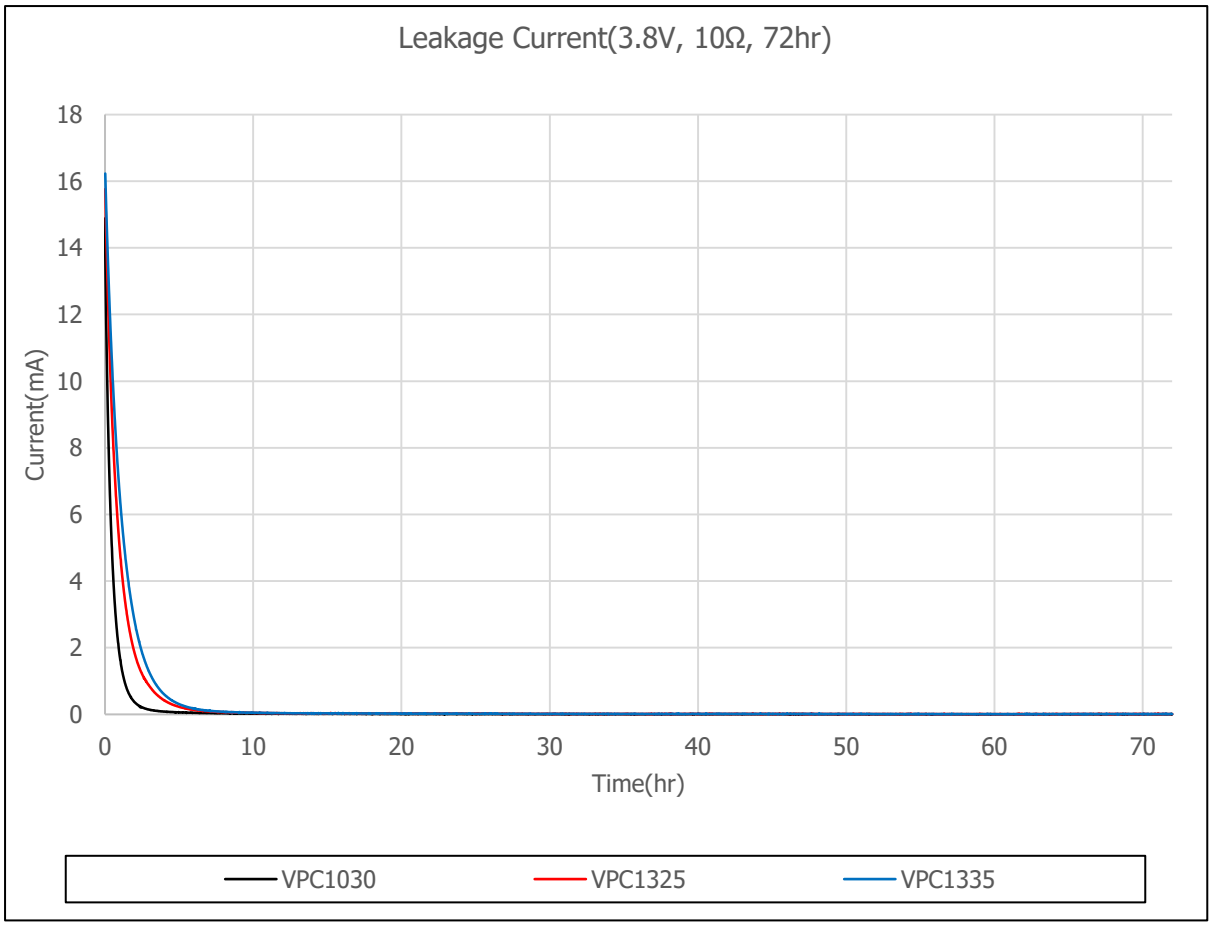
Q. Leakage Current

A. Leakage Current(72hrs) :

- VPC1030 : 1.8μA / VPC1325 : 6.3μA / VPC1335 : 7.2μA

*Test Conditions : Room Temperature

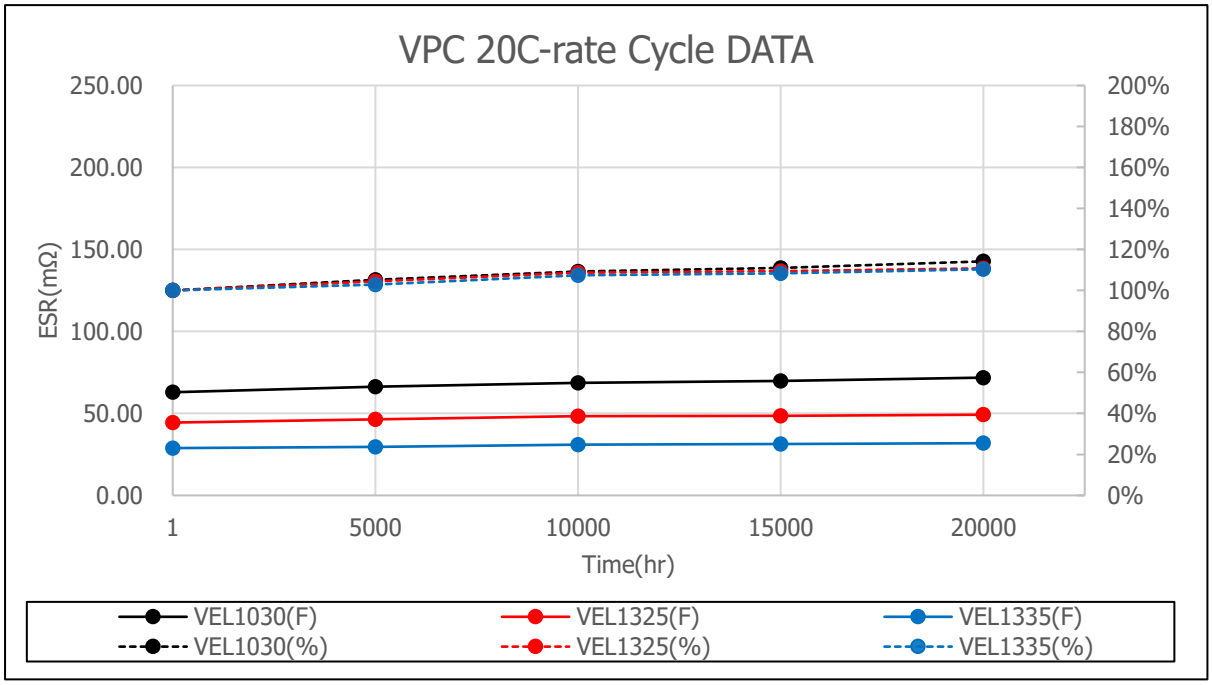
*Measuring Conditions : Charge 3.8V, 72hr, Charge Protection Resistance 10Ω)

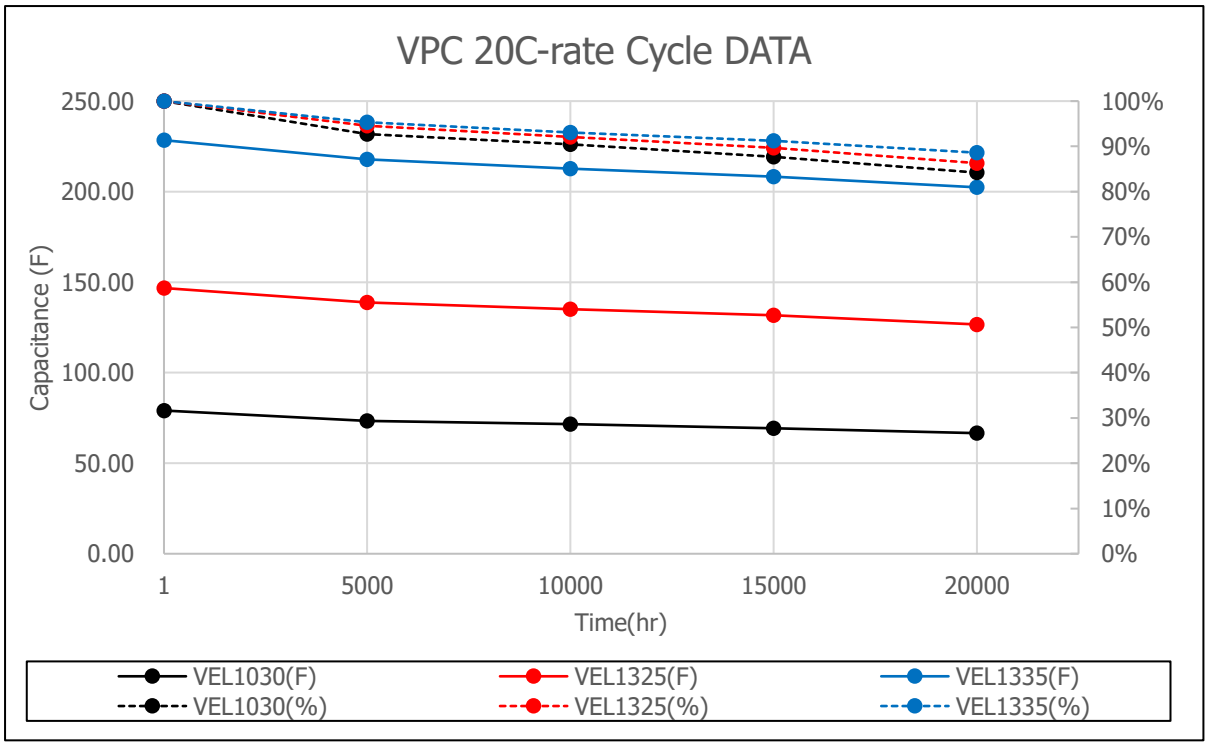


Q. ESR increase and Capactance decrease after 30,000Cycle

A. Estimated lifetime is affected by operating temperature, Cycle-time per a day, charging current and discharging current. If the products are used in the room temperature, 20C-rate(Current), 3.8V – 2.5V(Voltage) DOD 100% condition, capacitance will be decreased about 20% from initial value and ESR will be increased about 10 ~ 15% from initial value.

*20C (VPC 1030 : 840mA, VPC 1325 : 1460mA, VPC 1335 : 2155mA)





Q. Estimated lifetime between 3.8V – 3.3V

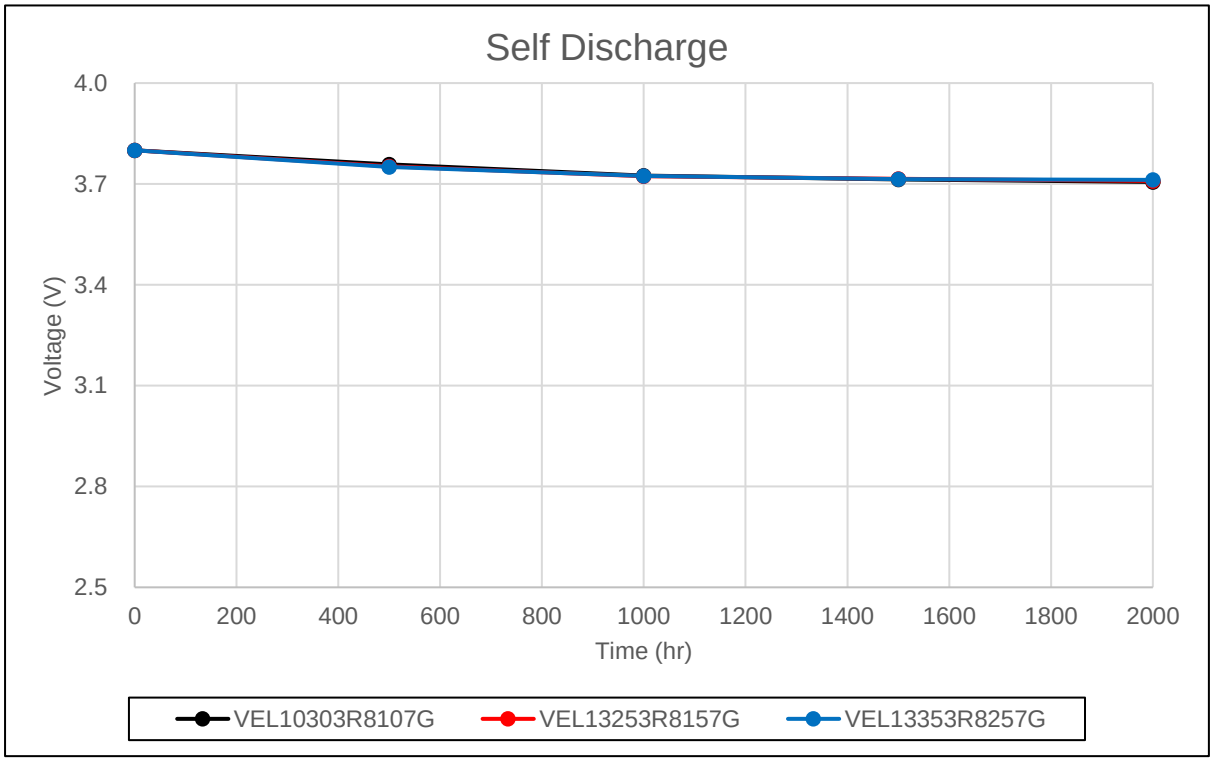
A. Estimated lifetime is affected by operating temperature, Cycle-time per a day, charging current and discharging current. If the products are used in 3.8V – 3.3V, as it will be used about half of DOD(3.8V – 2.5V), it will have 2 or 3 times more lifetime comparing to when the products are used on 3.8V – 2.5V.

Capacitance will be decreased about 20% from initial value and ESR will be increased about 20% from initial value. The lifetime will be estimated depends on the operating conditions.

Q. Self Discharging time which will be decreased up to 30%

A. After 2,000hours, self discharging is about -0.1V, and like EDLC, VEL is also using "Farad" to designate capacitance, After 2,000hours capacitance is decreased about 10%.

But, as VEL is shipped to be charged under 3.65V to be connected LiSoCl2, mainly.



Q. Meaning of Li/SOCl2 Battery System

A.

It means that VEL series is parallel connected with LiSoCl2 Battery to support Transient Minimum Voltage corresponding output of LiSoCl2 Battery.