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Grade: General

Cycle life Test Report For lithium Ion Capacitors

1. Experimental Steps:

Test Conditions:

Non-constant Voltage Test:

- Charging: Charge the product at 10C current to 3.8V.
- Discharging: Discharge the product at 10C current to 2.5V.
- Rest: Rest for 5 minutes after each discharge.
- Test Frequency: Measure the capacity and ESR
of the product after every 500 charge-discharge cycles.

Constant Voltage Test:

- Charging: Charge the product at 10C current to 3.8V.
- Constant Voltage Charging: Maintain at 3.8V for 10 minutes.
- Discharging: Discharge the product at 10C current to 2.5V.
- Rest: Rest for 5 minutes after each discharge.
- Test Frequency: Measure the capacity and ESR
of the product after a certain number of charge-discharge cycles.

Note: Design and specifications are subject to change without prior notice.

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2. Experimental Data

LIC0813Q3R8206 Test Data (10C/100mA)

Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min			Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min		
	Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate		Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate
Initial Value	8.29	290	100.0%	8.27	281	100.0%	5500	8.17	348	98.55%	7.99	361	96.65%
500	8.29	290	99.98%	8.25	291	99.8%	6000	8.15	351	98.32%	7.98	365	96.44%
1000	8.29	292	99.89%	8.21	310	99.30%	7000	8.13	356	98.11%	7.97	378	96.32%
1500	8.28	294	99.57%	8.21	318	99.30%	8000	8.11	361	97.86%	7.95	380	96.18%
2000	8.25	295	99.32%	8.21	325	99.28%	9000	8.10	386	97.75%	7.94	381	96.02%
2500	8.23	296	99.28%	8.20	326	99.20%	10000	8.09	396	97.55%	7.79	386	94.15%
3000	8.23	300	99.15%	8.16	330	98.72%	12000	8.07	400	97.32%	7.70	412	93.11%
3500	8.22	320	99.05%	8.16	339	98.65%	15000	8.02	418	96.79%			
4000	8.21	342	98.89%	8.09	347	97.87%	18000	7.97	424	96.15%			
4500	8.20	343	98.80%	8.08	358	97.74%	21000	7.89	438	95.20%			
5000	8.19	345	98.65%	8.00	281	96.74%							

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LIC0820Q3R8406 Test Data(10C/150mA)

Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min			Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min		
	Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate		Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate
Initial Value	15.10	35	100.0%	15.10	176	100.0%	5500	14.93	181	98.85%	14.80	187	98.01%
500	15.10	77	100.0%	15.10	178	100.0%	6000	14.92	189	98.81%	14.80	188	98.01%
1000	15.04	79	99.60%	14.99	179	99.30%	7000	14.92	192	98.79%	14.75	189	97.68%
1500	15.03	80	99.56%	14.99	180	99.30%	8000	14.91	201	98.76%	14.70	190	97.35%
2000	14.97	100	99.15%	14.90	182	98.70%	9000	14.91	204	98.75%	14.60	192	96.69%
2500	14.97	102	99.11%	14.90	182	98.70%	10000	14.91	211	98.72%	14.50	198	96.03%
3000	14.95	124	98.99%	14.90	184	98.70%	12000	14.91	216	98.71%	14.30	202	94.70%
3500	14.94	145	98.92%	14.89	184	98.60%	15000	14.90	222	98.68%			
4000	14.93	158	98.90%	14.88	185	98.51%	18000	14.90	237	98.68%			
4500	14.93	168	98.89%	14.80	186	98.01%	21000	14.10	247	93.38%			
5000	14.93	170	98.87%	14.80	186	98.01%							

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LIC0825Q3R8506 Test Data(10C/200mA)

Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min			Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min		
	Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate		Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate
Initial Value	20.50	130	100.0%	20.20	158	100.0%	5500	20.36	186	99.31%	19.94	181	98.71%
500	20.50	158	100.0%	20.20	159	100.0%	6000	20.13	189	98.21%	19.94	183	98.69%
1000	20.48	159	99.90%	20.10	160	99.50%	7000	20.11	191	98.11%	19.93	185	98.68%
1500	20.47	161	99.87%	20.09	162	99.48%	8000	19.91	192	97.12%	19.93	186	98.65%
2000	20.47	163	99.84%	20.02	162	99.12%	9000	19.89	194	97.01%	19.92	187	98.60%
2500	20.46	165	99.81%	20.00	163	99.01%	10000	19.78	195	96.51%	19.70	194	97.52%
3000	20.44	168	99.72%	19.99	164	98.97%	12000	19.68	198	95.98%	19.30	201	95.54%
3500	20.42	178	99.61%	19.98	167	98.91%	15000	19.61	200	95.64%			
4000	20.40	181	99.51%	19.97	170	98.88%	18000	19.54	202	95.32%			
4500	20.38	182	99.42%	19.95	175	98.78%	21000	19.50	209	95.12%			
5000	20.38	183	99.41%	19.95	179	98.77%							

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LIC1020Q3R8806 Test Data(10C/300mA)

Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min			Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min		
	Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate		Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate
Initial Value	25.90	114	100.0%	26.5	120	100.4%	5500	25.8	179	99.61%	26.11	123	98.51%
500	25.90	117	100.0%	26.29	120	99.20%	6000	25.8	181	99.51%	26.10	124	98.49%
1000	25.90	121	100.0%	26.26	120	99.11%	7000	25.8	189	99.46%	26.08	124	98.42%
1500	25.89	132	99.98%	26.24	120	99.00%	8000	25.7	192	99.41%	26.07	125	98.36%
2000	25.88	138	99.91%	26.22	121	98.96%	9000	25.7	193	99.33%	25.80	126	97.36%
2500	25.87	142	99.89%	26.21	121	98.90%	10000	25.7	194	99.10%	25.60	127	96.60%
3000	25.87	148	99.88%	26.20	121	98.88%	12000	25.6	194	99.01%	25.30	128	95.47%
3500	25.86	151	99.84%	26.19	122	98.82%	15000	25.5	194	98.46%			
4000	25.85	157	99.79%	26.18	122	98.78%	18000	24.7	194	95.37%			
4500	25.84	159	99.78%	26.16	122	98.71%	21000	24.3	195	93.82%			
5000	25.83	167	99.74%	26.15	123	98.68%							

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LIC1313Q3R8706 Test Data(10C/270mA)

Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min			Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min		
	Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate		Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate
Initial Value	26.00	140	100.0%	24.60	145	100.0%	5500	25.32	179	97.38%	24.23	151	95.93%
500	25.90	140	99.60%	24.40	145	99.20%	6000	25.27	180	97.21%	24.23	151	95.93%
1000	25.89	141	99.58%	24.38	145	98.80%	7000	25.09	184	96.51%	24.21	151	95.53%
1500	25.89	144	99.56%	24.35	145	98.40%	8000	24.47	191	94.12%	24.20	152	95.12%
2000	25.88	151	99.54%	24.34	145	98.00%	9000	24.21	192	93.11%	23.95	154	94.31%
2500	25.88	153	99.52%	24.33	146	98.00%	10000	24.18	197	93.01%	23.76	154	93.98%
3000	25.62	154	98.52%	24.32	146	97.20%	12000	24.15	200	92.88%	23.49	158	93.90%
3500	25.58	161	98.40%	24.31	146	97.15%	15000	24.07	208	92.56%			
4000	25.56	164	98.32%	24.30	147	97.15%	18000	23.79	211	91.50%			
4500	25.51	168	98.10%	24.28	150	96.75%	21000	23.60	233	90.77%			
5000	25.37	178	97.56%	24.28	150	96.75%							

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Cycle life Test Report For lithium Ion Capacitors

LIC1320Q3R8127 Test Data(10C/450mA)

Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min			Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min		
	Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate		Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate
初始值	50.80	73	100.0%	50.60	74	100.0%	5000	50.24	90	98.89%	49.32	81	97.48%
500	50.80	73	100.0%	50.60	74	100.0%	5500	50.19	92	98.79%	49.08	83	97.00%
1000	50.75	74	99.90%	50.30	74	99.40%	6000	50.14	94	98.71%	49.08	85	96.99%
1500	50.74	74	99.88%	50.25	75	99.30%	7000	50.13	94	98.68%	49.07	89	96.98%
2000	50.69	79	99.79%	50.09	76	99.00%	8000	50.04	95	98.51%	49.00	90	96.84%
2500	50.65	81	99.71%	50.04	76	98.90%	9000	50.03	96	98.49%	48.50	92	95.85%
3000	50.64	84	99.68%	50.01	76	98.84%	10000	49.94	97	98.30%	47.70	94	94.27%
3500	50.61	85	99.62%	50.00	76	98.81%	12000	49.80	97	98.03%	49.32	96	97.48%
4000	50.52	86	99.45%	49.87	77	98.56%	15000	48.80	98	96.06%			
4500	50.40	89	99.21%	49.80	78	98.42%	18000	50.24	100	98.89%			

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Cycle life Test Report For lithium Ion Capacitors

LIC1620Q3R8257 Test Data(10C/800mA)

Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min			Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min		
	Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate		Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate
Initial Value	88.30	56	100.0%	88.60	56	100.0%	5500	86.25	67	97.68%	86.50	59	97.63%
500	87.86	56	99.50%	88.60	56	100.0%	6000	86.14	70	97.55%	86.13	60	97.21%
1000	87.84	57	99.48%	87.98	56	99.30%	7000	85.84	71	97.21%	85.98	61	97.04%
1500	87.69	58	99.31%	87.89	56	99.20%	8000	85.66	72	97.01%	85.83	61	96.87%
2000	87.64	61	99.25%	87.63	57	98.90%	9000	85.64	73	96.99%	85.54	62	96.55%
2500	87.51	62	99.11%	87.27	57	98.50%	10000	85.63	73	96.98%	85.20	64	96.16%
3000	87.43	62	99.02%	87.18	57	98.40%	12000	85.63	74	96.98%	84.20	66	95.03%
3500	86.84	64	98.35%	86.83	57	98.00%	15000	85.60	75	96.94%			
4000	86.81	64	98.31%	86.83	57	98.00%	18000	85.60	75	96.94%			
4500	86.62	67	98.10%	86.82	58	97.99%	21000	83.40	77	94.45%			
5000	86.43	67	97.88%	86.62	58	97.77%							

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LIC1640Q3R8507 Test Data(10C/2000mA)

Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min			Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min		
	Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate		Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate
初始值	207.00	23	100.0%	204.20	22	100.0%	5500	202.90	31	98.02%	201.75	23	98.80%
500	207.00	26	100.0%	204.20	22	100.0%	6000	202.82	31	97.98%	201.67	23	98.76%
1000	204.93	27	99.00%	204.00	22	99.90%	7000	202.63	31.8	97.89%	201.55	24	98.70%
1500	204.70	27	98.89%	203.87	22	99.84%	8000	202.53	31.9	97.84%	201.50	24	98.68%
2000	204.54	28	98.81%	203.77	22	99.79%	9000	202.47	32	97.81%	201.36	24	98.61%
2500	204.18	29	98.64%	203.61	22	99.71%	10000	202.43	32	97.79%	199.89	24	97.89%
3000	203.92	29	98.51%	203.42	22	99.62%	12000	202.34	32	97.75%	199.10	25	97.50%
3500	203.81	29	98.46%	203.00	23	99.41%	15000	202.20	32	97.68%			
4000	203.67	29.5	98.39%	202.93	23	99.38%	18000	201.66	32	97.42%			
4500	203.50	30	98.31%	202.40	23	99.12%	21000	200.79	33	97.00%			
5000	203.07	31	98.10%	202.12	23	98.98%							

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LIC1840Q3R8757 Test Data(10C/3000mA)

Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min			Number of Cycles	Without Constant Voltage			With Constant Voltage for 10min		
	Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate		Capacity (mAh)	ESR (mΩ)	Retention Rate	Capacity (mAh)	ESR (mΩ)	Retention Rate
初始值	273.00	22	100.0%	271.10	22	100.0%	5000	271.64	26	99.50%	266.82	23	98.42%
500	273.00	22	100.0%	271.10	22	100.0%	5500	270.00	26.1	98.90%	266.00	23	98.12%
1000	273.00	23	100.0%	271.10	22	100.0%	6000	268.69	27	98.42%	266.00	23	98.12%
1500	273.00	23	100.0%	270.02	22	99.60%	7000	267.87	27	98.12%	265.00	23	97.75%
2000	272.45	24	99.80%	268.66	22	99.10%	8000	267.57	27	98.01%	264.35	23	97.51%
2500	272.40	24	99.78%	268.42	22	99.01%	9000	267.13	28	97.85%	262.99	23	97.01%
3000	272.13	25	99.68%	268.39	22	99.00%	10000	266.26	28	97.53%	261.39	24	96.42%
3500	272.02	25	99.64%	268.33	22	98.98%	12000	265.68	29	97.32%	260.50	24	96.09%
4000	271.94	25	99.61%	268.01	23	98.86%	15000	264.81	30	97.00%			
4500	271.66	26	99.51%	267.01	23	98.49%	18000	260.39	31	95.38%			

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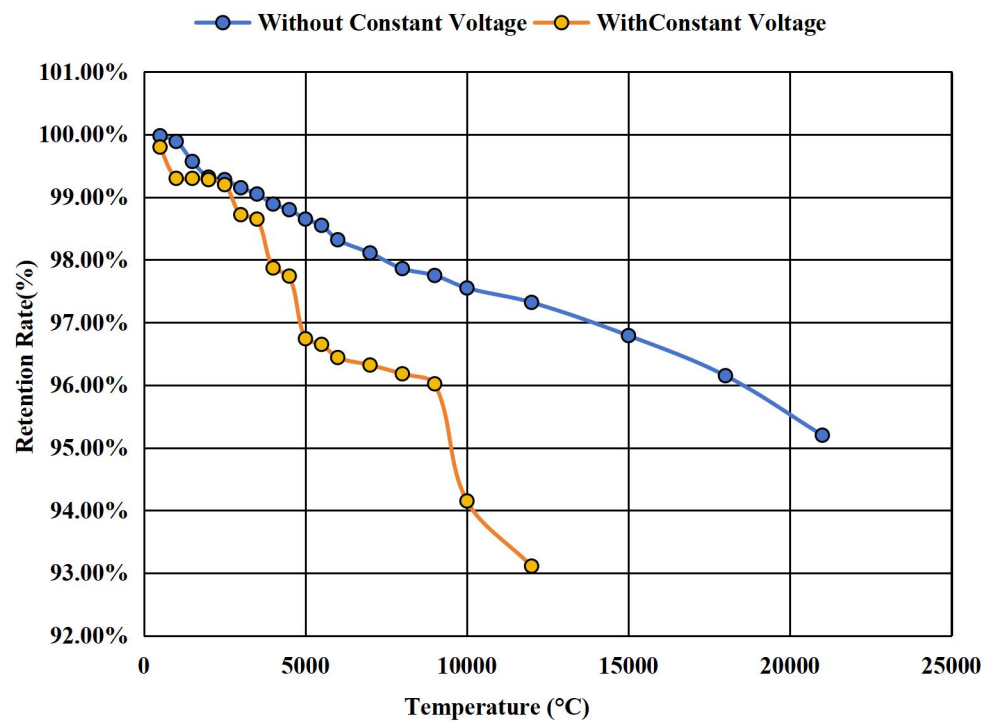
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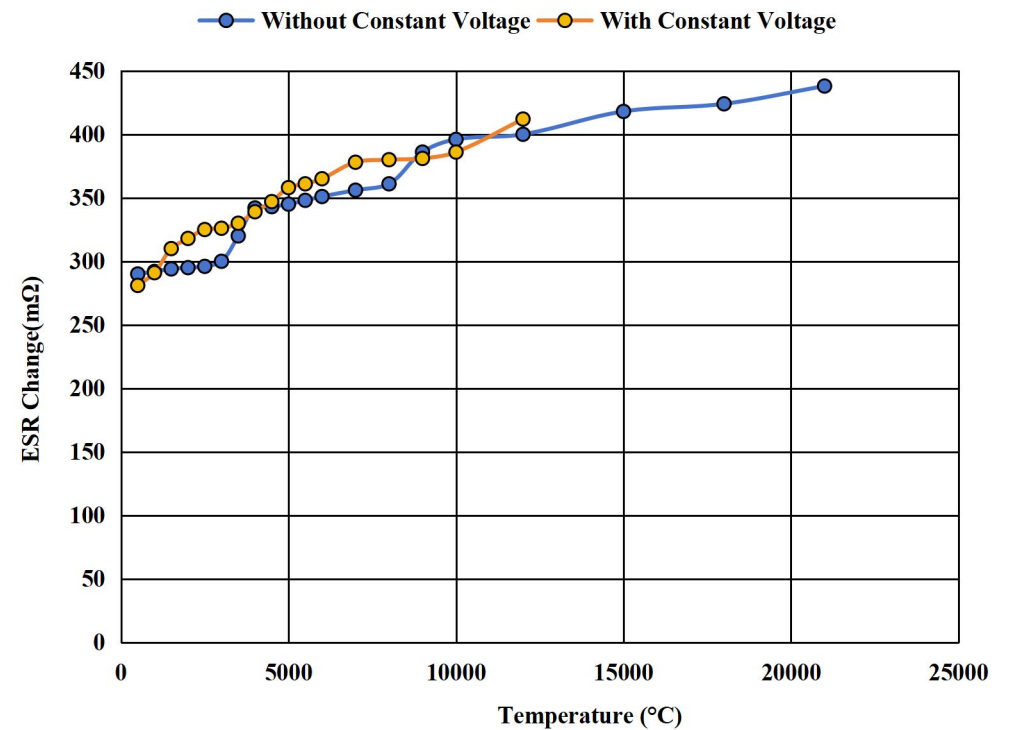
3. Cycle life Curve

· LIC0813Q3R8206

Capacity Retention Rate (%)



ESR Variation



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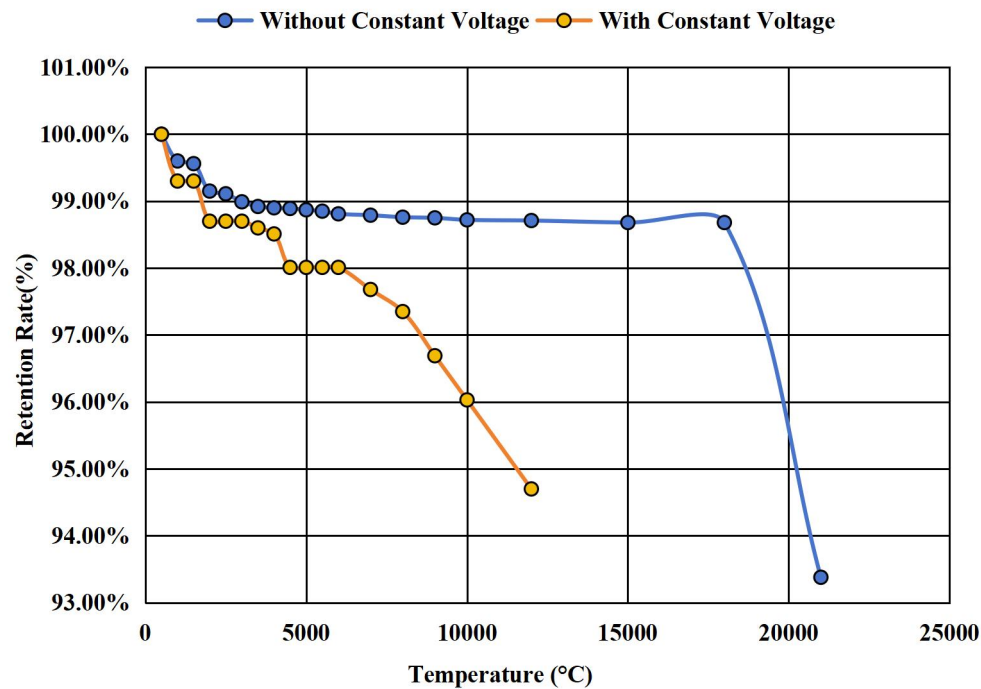
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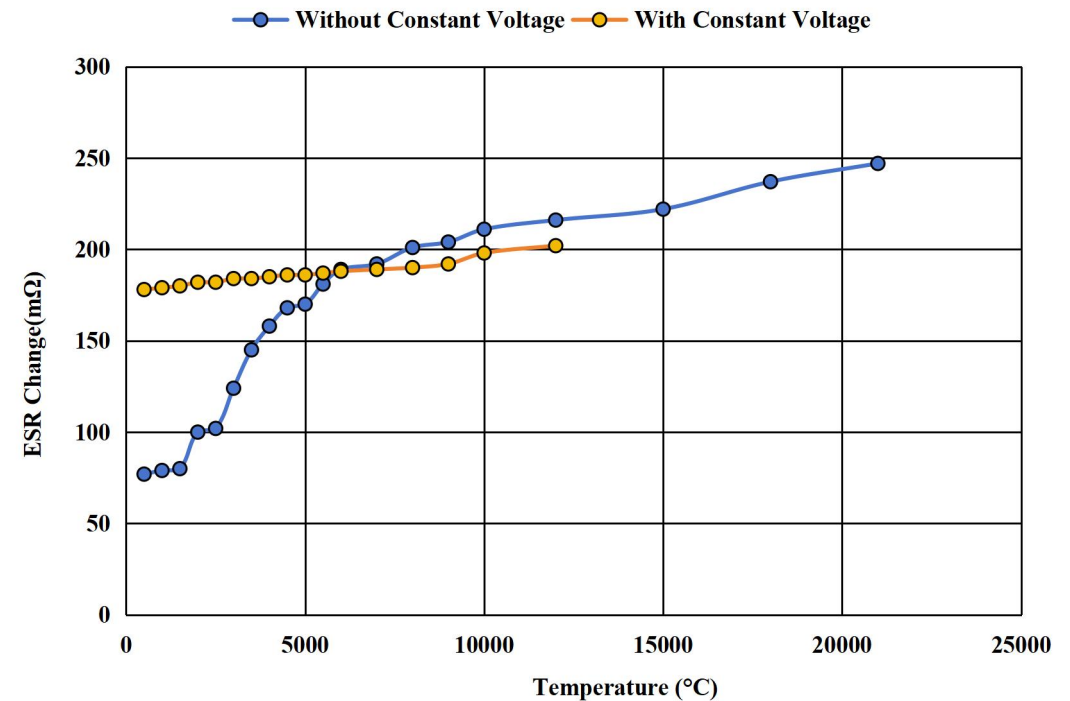
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• LIC0820Q3R8406

Capacity Retention Rate (%)



ESR Variation



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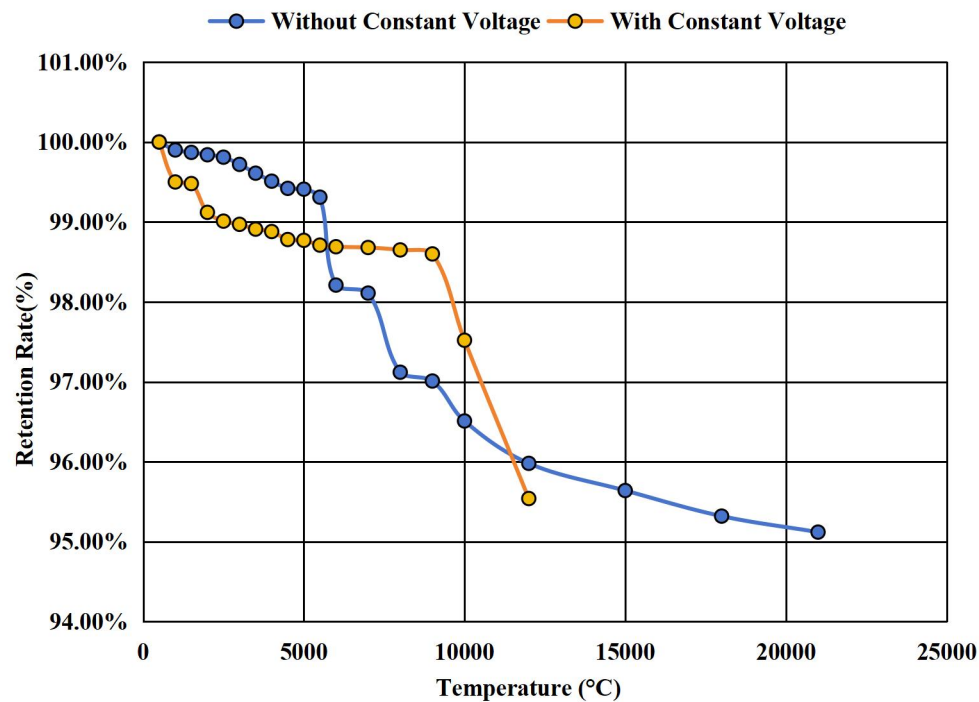
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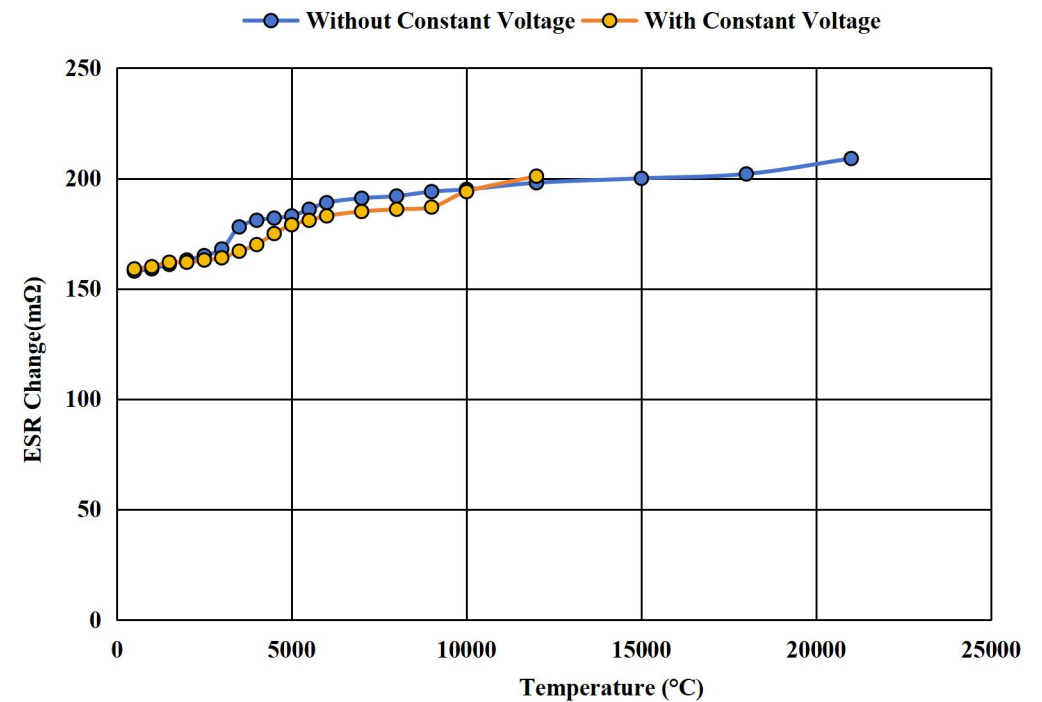
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• LIC0825Q3R8506

Capacity Retention Rate(%)



ESR Variation



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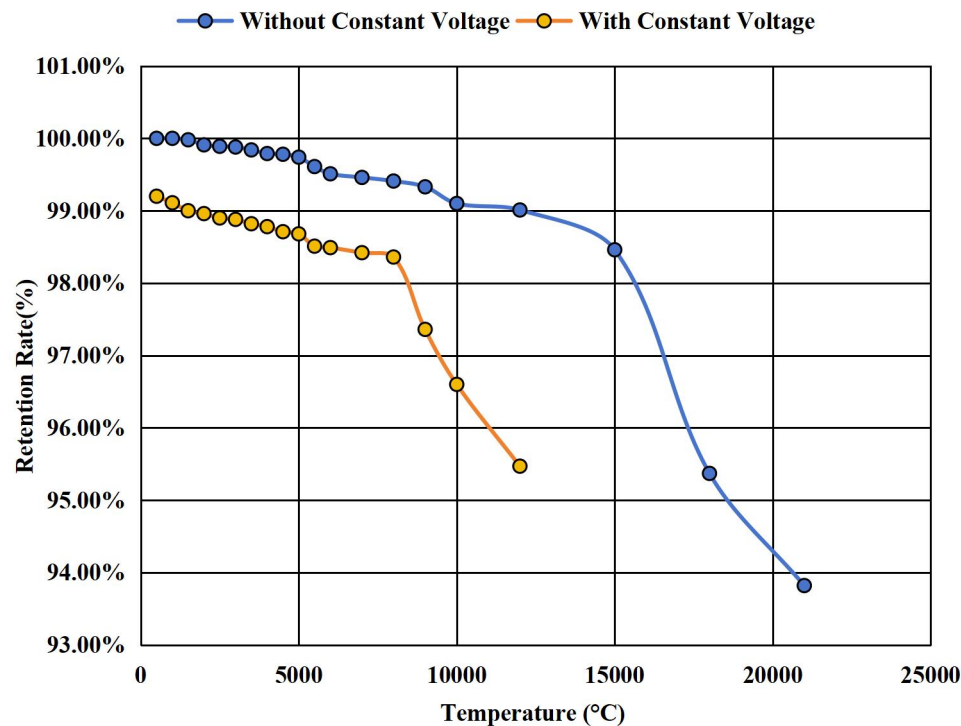
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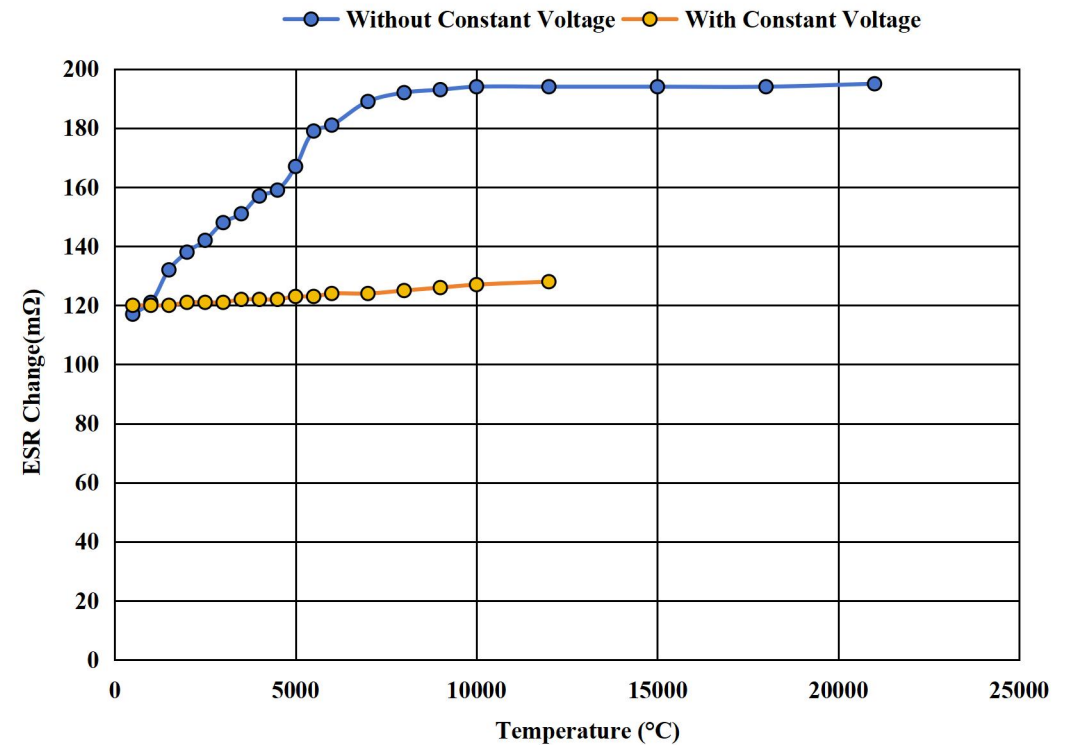
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• LIC1020Q3R8806

Capacity Retention Rate(%)



ESR Variation



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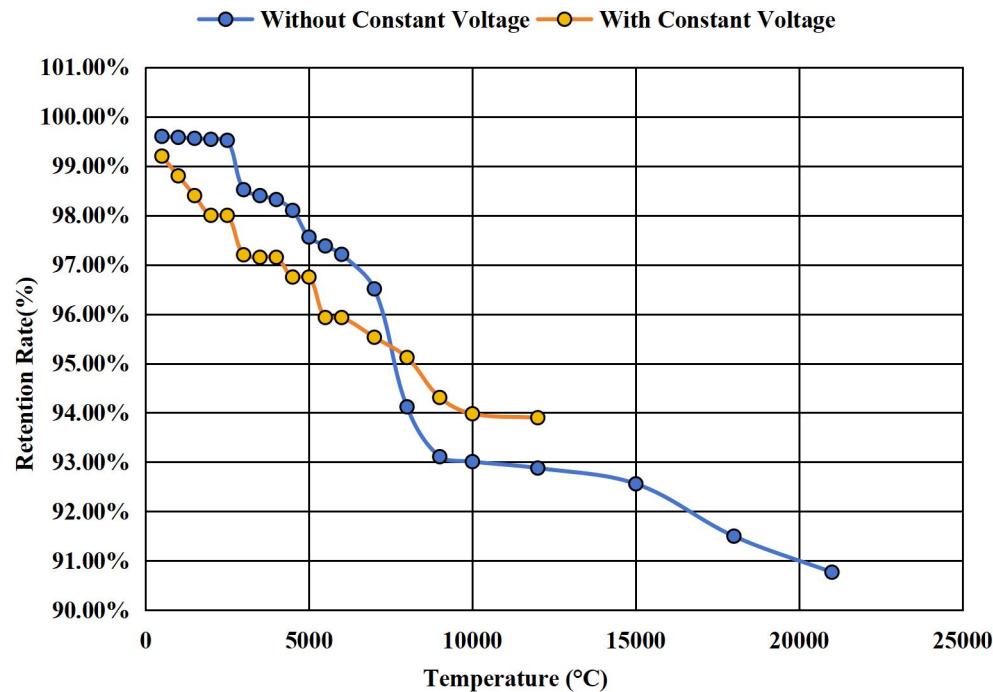
Revision: 1.1 Page: 19

Grade: General

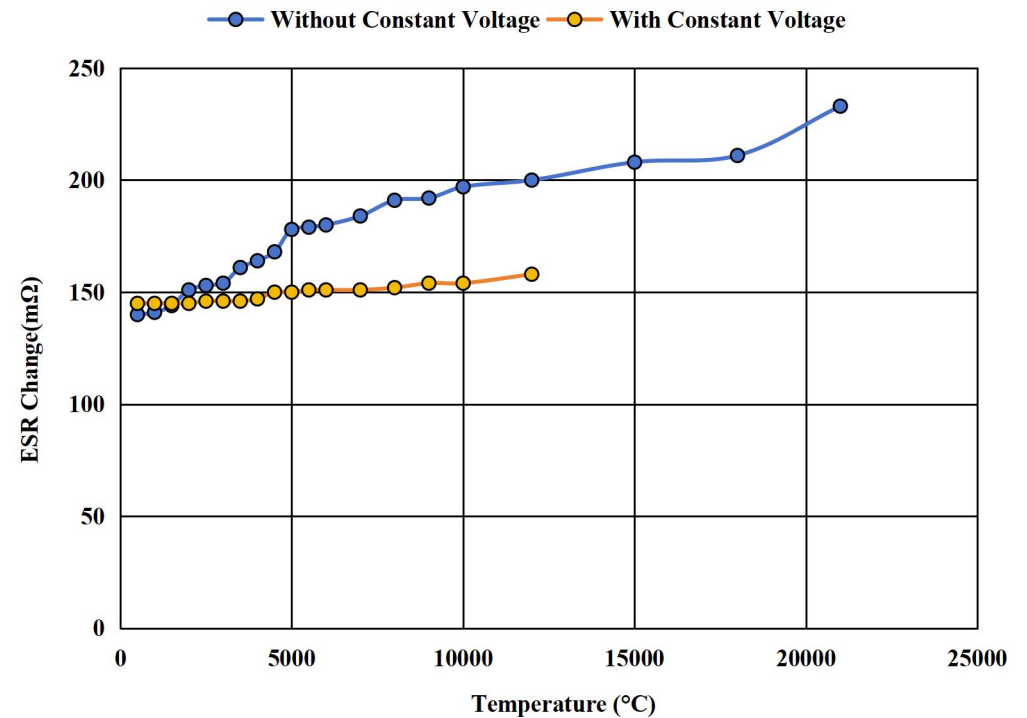
Cycle life Test Report For lithium Ion Capacitors

• LIC1313Q3R8706

Capacity Retention Rate(%)



ESR Variation



Note: Design and specifications are subject to change without prior notice.

It is recommended that you obtain technical specifications from CDA to ensure that the component is suitable for your use.

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Date: 2024/05/13

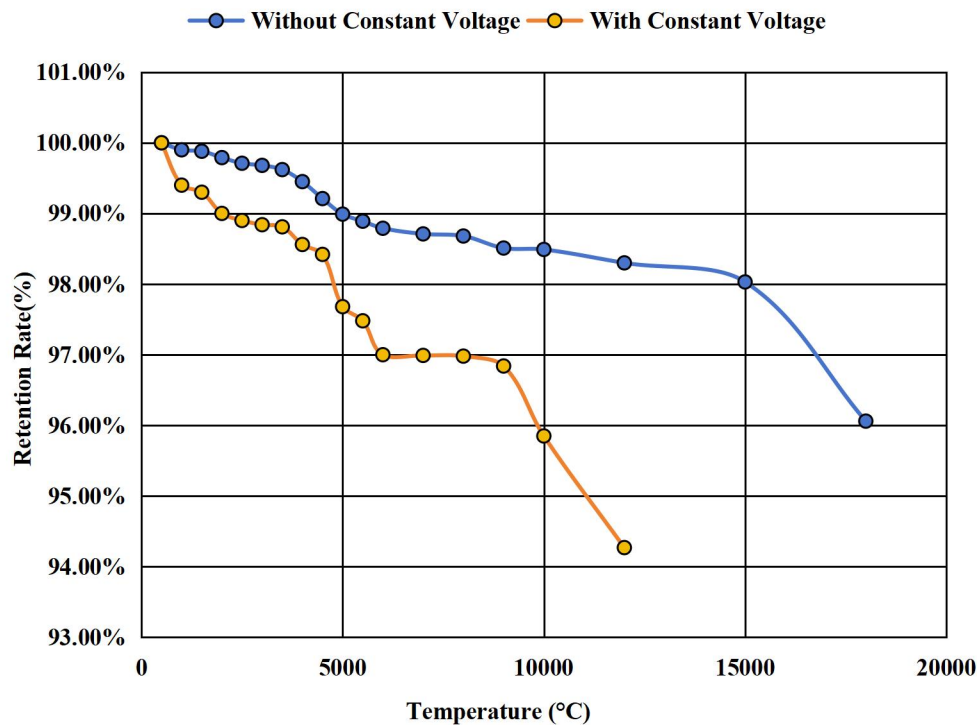
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Grade: General

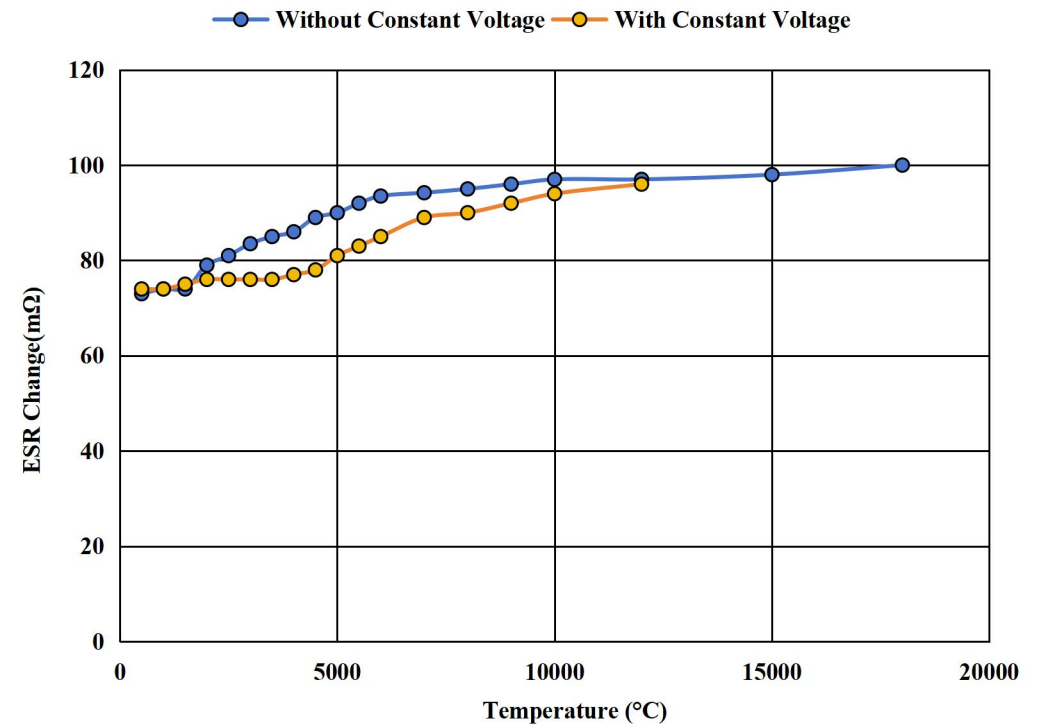
Cycle life Test Report For lithium Ion Capacitors

• LIC1320Q3R8127

Capacity Retention Rate(%)



ESR Variation



Note: Design and specifications are subject to change without prior notice.

It is recommended that you obtain technical specifications from CDA to ensure that the component is suitable for your use.

DAT NO.: CDART-24513LMP

Doc. No: CDART-24513LMP

Date: 2024/05/13

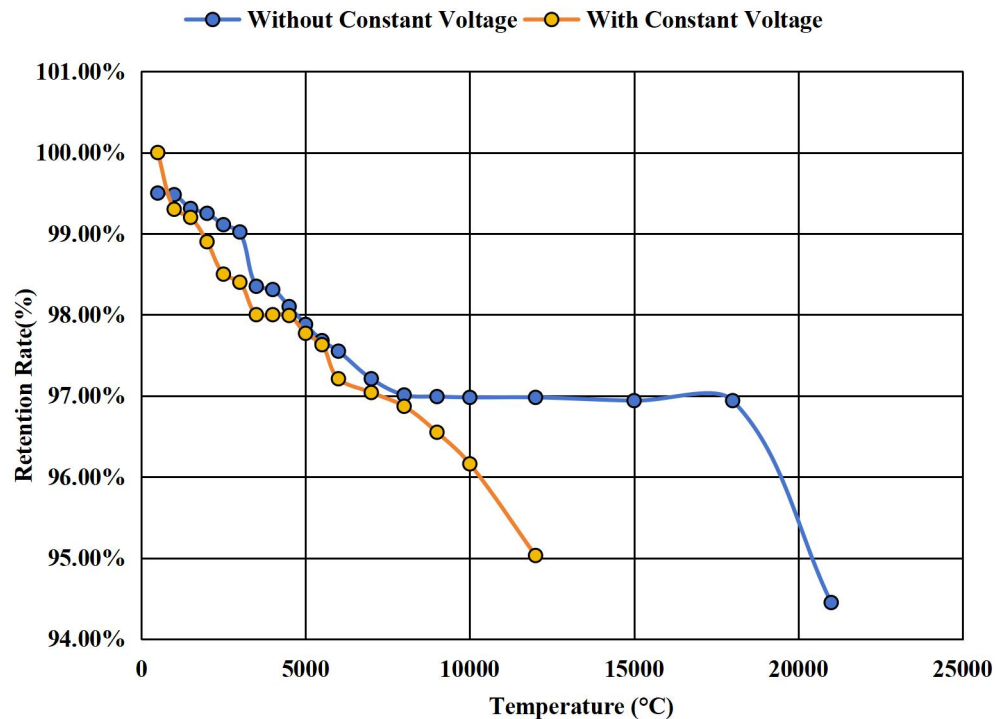
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Grade: General

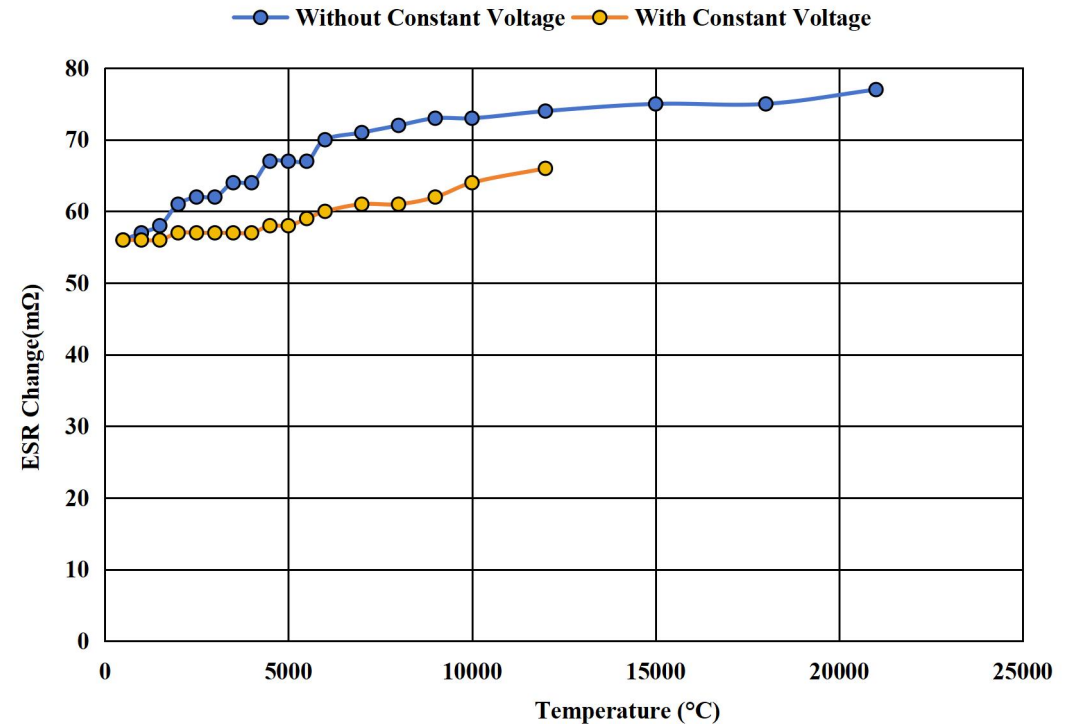
Cycle life Test Report For lithium Ion Capacitors

• LIC1620Q3R8257

Capacity Retention Rate(%)



ESR Variation



Note: Design and specifications are subject to change without prior notice.

It is recommended that you obtain technical specifications from CDA to ensure that the component is suitable for your use.

DAT NO.: CDART-24513LMP

Doc. No: CDART-24513LMP

Date: 2024/05/13

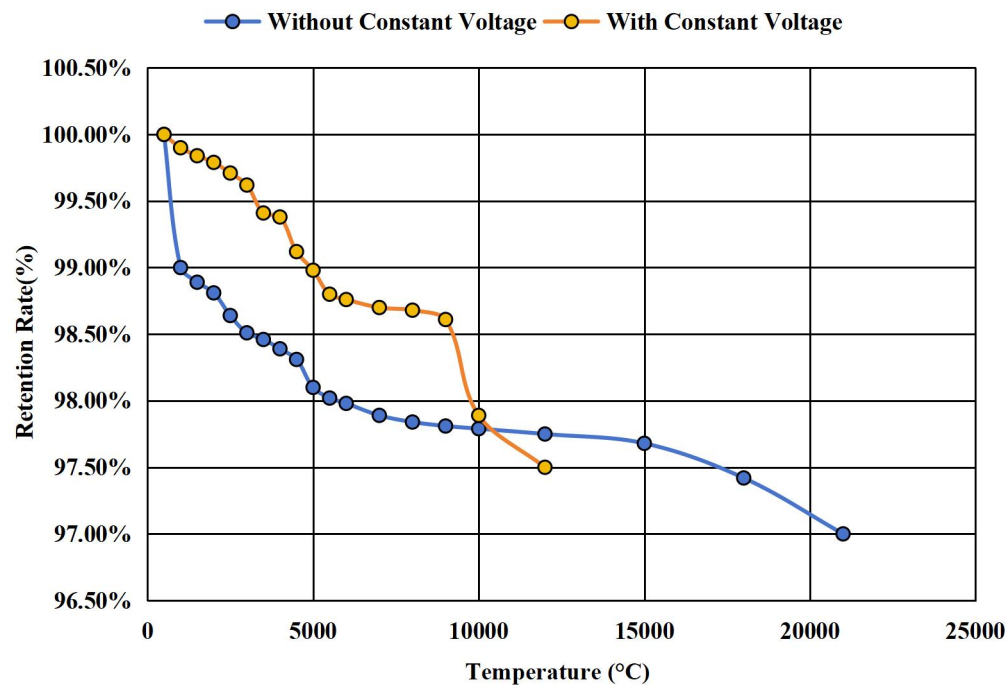
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Grade: General

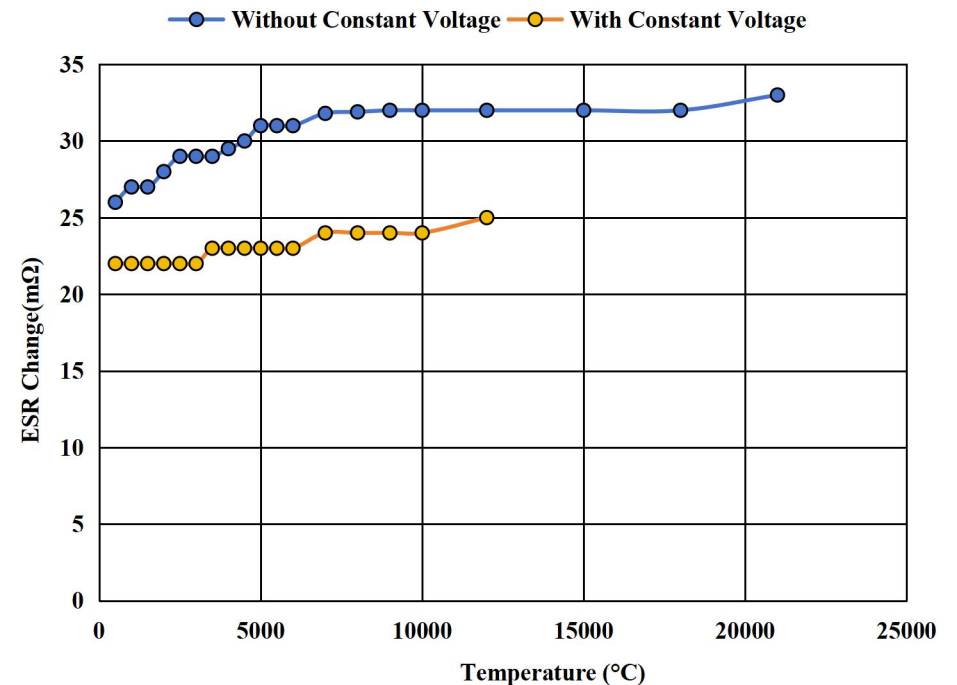
Cycle life Test Report For lithium Ion Capacitors

• LIC1640Q3R8507

Capacity Retention Rate(%)



ESR Variation



Note: Design and specifications are subject to change without prior notice.

It is recommended that you obtain technical specifications from CDA to ensure that the component is suitable for your use.

DAT NO.: CDART-24513LMP

Doc. No: CDART-24513LMP

Date: 2024/05/13

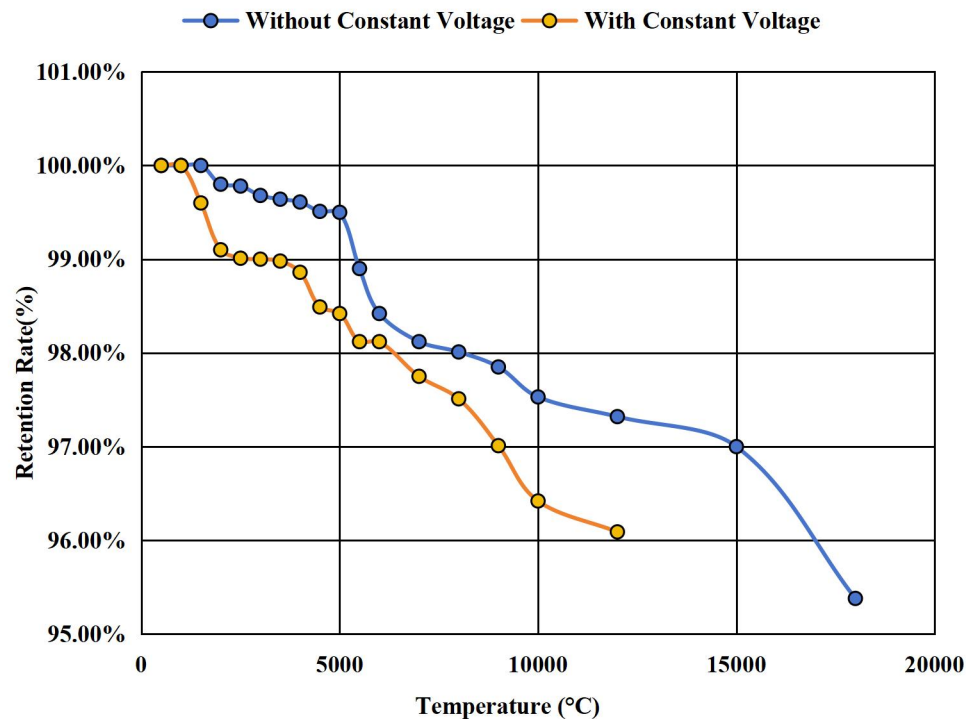
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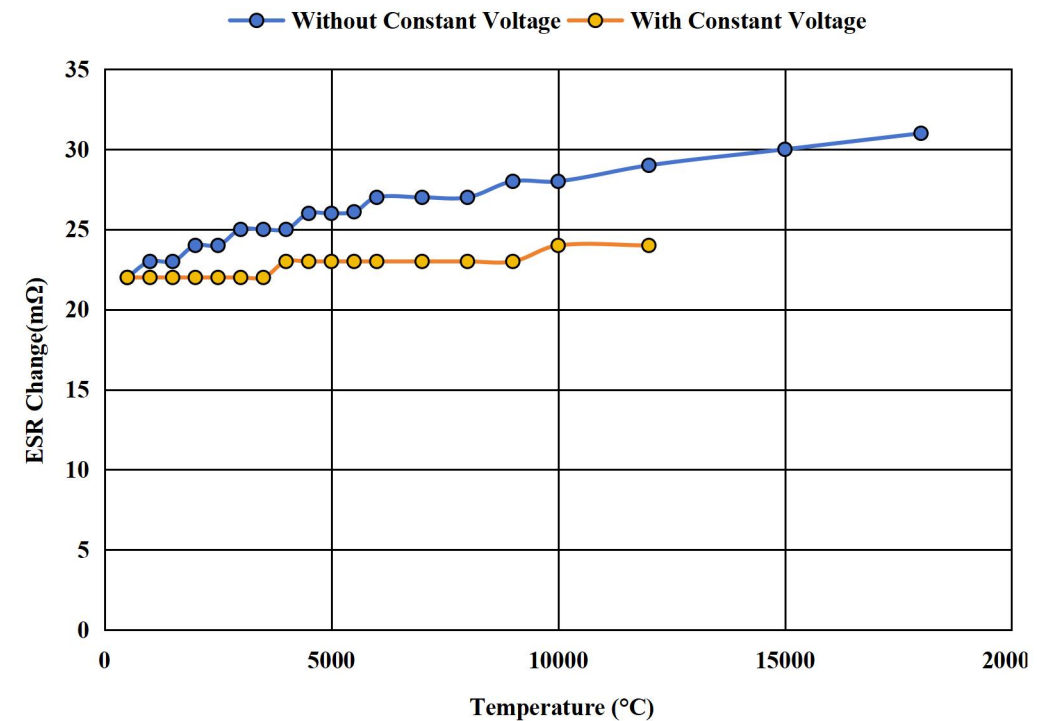
Cycle life Test Report For lithium Ion Capacitors

• LIC1840Q3R8757

Capacity Retention Rate(%)



ESR Variation



Note: Design and specifications are subject to change without prior notice.

It is recommended that you obtain technical specifications from CDA to ensure that the component is suitable for your use.

DAT NO.: CDART-24513LMP