Type PPC, -55 ºC to + 125 ºC, Ultra-Thin Polymer Aluminum Electrolytic Capacitor

High Ripple and DC Holdup

Rated for 125 °C, PPC combines the advantages of aluminum electrolytic and aluminum polymer technology. These capacitors have the ultra-low ESR characteristics of conductive aluminum polymer capacitors in a 1mm thin package. With high capacitance and high ripple current per volume, applications for 125 °C polymer capacitors include DC/DC converters, tablets, telecommunications, thin displays, and variety of industrial power conversion.

Highlights

- +125 °C, Up to 2,000 Hours Load Life
- Low Leakage Current
- Very Low ESR and High Ripple Current
- Just 1mm thin

Specifications

Temperature Range	-55 ºC to + 125 ºC
Rated Voltage	6.3 Vdc – 24 Vdc (see table for derating)
Capacitance	8000 µF - 20,000 µF
Capacitance Tolerance	±20% at 120 Hz and 25 °C
Leakage Current (at 25°C)	I Max = 0.005CV after 2 minute charge I = leakage current in µAmps C = rated capacitance in µF V = rated DC Working voltage in Volts
Low Temperature Characteristics (at 120 Hz)	Z(-55 ºC)/Z(+25 ºC): ≤ 3.0
Insulation	Nylon
Operating Temperature	-55 °C to + 125 °C
Terminal Material	Tin plated copper (0.010”)
Precautions	Do not bend or strike capacitor body
Ripple Current Frequency Multiplier	(see tables below)
Mechanical Shock	MIL–STD–202, Method 213, Condition I, 100 G peak, 6mS, Sawtooth, 18 Shocks

Ripple Multipliers for Ambient Temperature (No Heatsink)

Ta (°C)	45	55	65	75	85	95	105
Ripple Current Multiplier	2.22	1.96	1.68	1.37	1.00	0.73	0.48

Ripple Multipliers for Air Velocity (No Heatsink)

Air Velocity (m/s)	0.25	1	2.5	5
Ripple Current Multiplier	1.00	1.36	1.52	1.66

Ripple Multipliers for Frequency

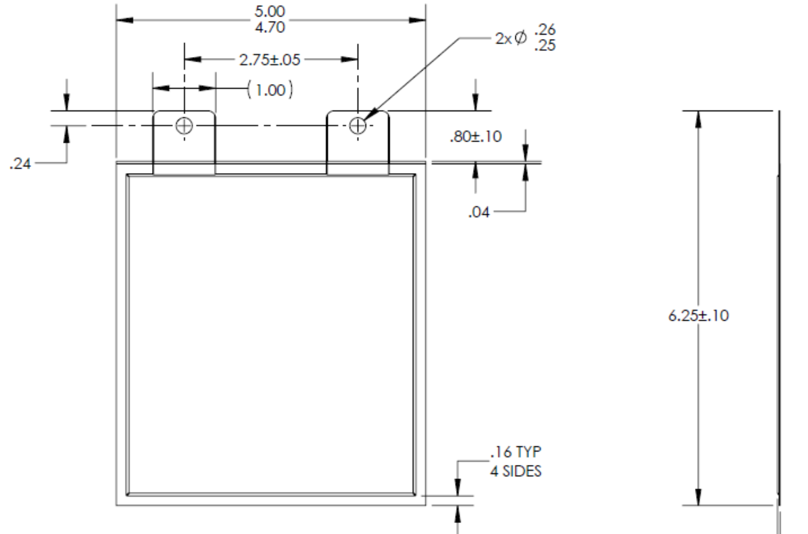
Frequency (Hz)	50	60	120	360	1000	5000	20000
Ripple Current Multiplier	0.77	0.81	1.00	1.16	1.24	1.20	1.12

Ripple Multipliers for Case Ambient Temperature (Heatsinked to Bus)

Ta (°C)	45	55	65	75	85	95	105
One Side	2.96	2.66	2.32	1.96	1.58	1.08	0.60
Both Sides	3.00	3.00	3.00	2.77	2.24	1.52	0.85

Vibration Test	**Level** The specimens, while deenergized or operating under the load conditions specified, shall be subjected to the vibration amplitude, frequency range, and duration specified for each case size. Level = 10g **Amplitude** The specimens shall be subjected to a simple harmonic motion having an amplitude of either 0.06-inch double amplitude (maximum total excursion) or peak level specified above, whichever is less. The tolerance on vibration amplitude shall be ±10 percent. **Frequency Range** The vibration frequency shall be varied logarithmically between the approximate limits of 10 to 2,000 Hz. **Sweep Time and Duration** The entire frequency range of 10 to 2,000 Hz and return to 10 Hz shall be traversed in 20 minutes. This cycle shall be performed 12 times in each of three mutually perpendicular directions (total of 36 times), so that the motion shall be applied for a total period of approximately 12 hours. Interruptions are permitted provided the requirements for rate of change and test duration are met. **Mounting** Recommended mounting with 3M double sided VHB tape appropriate for mounting surfaces and to ensure the entire capacitor surface is held rigid.
Altitude	10,000 Feet
Endurance Life Test	Apply the maximum rated voltage for 2,000 hrs at +85 °C with full rated ripple current. After the test, return the capacitor to room temperature for 24 hours and then test. ΔC at 120Hz/+25 °C: ±20% of the initial ESR at 120Hz/+25 °C: ESR ≤ 200% of the initial DCL after 2 minute charge/+25 °C: ≤ 0.005CV
Shelf Life Test	Subject the capacitor to 1000 hrs at +125 °C without voltage. After the test, return the capacitor to room temperature for 24 hours and then test. ΔC at 120Hz/+25 °C: ±20% of the initial ESR at 120Hz/+25 °C: ESR ≤ 200% of the initial DCL after 2 minute charge/+25 °C: ≤ 0.005CV
Moisture Resistance Test	MIL-STD-202, method 106. After the test, return the capacitor to room temperature for 24 hours and then test. ΔC at 120Hz/+25 °C: ±20% of the initial ESR at 120Hz/+25 °C: ESR ≤ 200% of the initial DCL after 2 minute charge/+25 °C: ≤ 0.005CV
Charge/Discharge Test	Charge to rated Vdc and discharge to 0 Vdc, 100,000 cycles at 0.1 Hz, through a 0.22Ω resistor @ 25C. After the test, return the capacitor to room temperature or 24 hours and then test. ΔC at 120Hz/+25 °C: ±20% of the initial ESR at 120Hz/+25 °C: ESR ≤ 200% of the initial DCL after 2 minute charge/+25 °C: ≤ 0.005CV
Regulatory Information	

Outline Drawing



Dimensions are in inches. Tolerance unless specified ±0.01”

Examples of Ripple Current Capability Calculations

Application	Application Frequency	Catalog Frequency Multiplier	Application Temperature T_A °C	Catalog Temperature Multiplier	Rated Ripple Arms 120Hz	Ripple Capability Arms
No heat sink	120Hz	1	85	1	16	16.0
No heat sink	120Hz	1	45	2.22	16	35.5
One side heat sinked	120Hz	1	85	1.58	16	25.3
Both sides heat sinked	120Hz	1	65	3	16	48.0
No heat sink	1KHz	1.24	85	1	16	19.8
No heat sink	1KHz	1.24	45	2.22	16	44.0
One side heat sinked	1KHz	1.24	85	1.58	16	31.3
Both sides heat sinked	1KHz	1.24	65	3	16	59.5
No heat sink	20KHz	1.12	85	1	16	17.9
No heat sink	20KHz	1.12	45	2.22	16	39.8
One side heat sinked	20KHz	1.12	85	1.58	16	28.3
Both sides heat sinked	20KHz	1.12	65	3	16	53.8

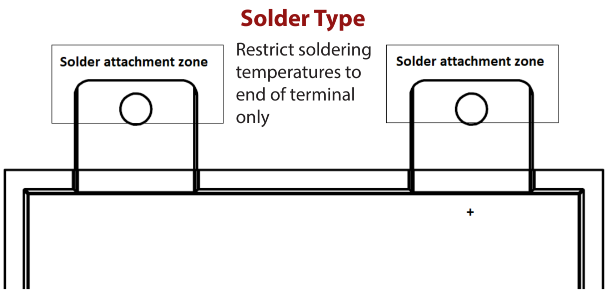
Ratings

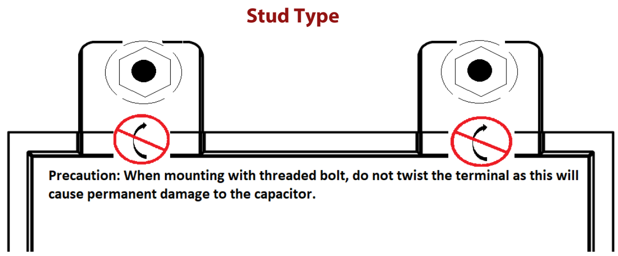
Rated Volatge									
125 °C Vdc	105 °C Vdc	85 °C Vdc	Cap µF	P/N	120 Hz 25 °C Max ESR (Ω)	20 KHz 25 °C Max ESR (234)	Max Ripple 120 Hz (Arms)	Max Ripple 20 kHz (Arms)	Surge 25 °C Vdc
6.3	8	9	20000	PPC203M6R3FG2SAA	0.01	0.006	16	18	11
10	12	15	12000	PPC123M010FG2SAA	0.01	0.006	16	18	18
16	20	24	8000	PPC802M016FG2SAA	0.01	0.006	16	18	28

Part Numbering System

TYPE	CAP	CAP TOL	VDC	WIDTH	LENGTH	TERM STYLE	SPEC CH1	SPEC CH2
PPC	802	M	016	F	G	2S	A	A
PPC	**320** = 32 µF **222** = 2200 µF **163** = 16000 µF	±20%	**6R3** = 6.3 Vdc **010** = 10 Vdc **016** = 16 Vdc	See Outline Drawing		**2S** - TWO SOLDER-ABLE/BOLT / STUD	ASSIGNED BY MFG	ASSIGNED BY MFG

Recommended Mounting

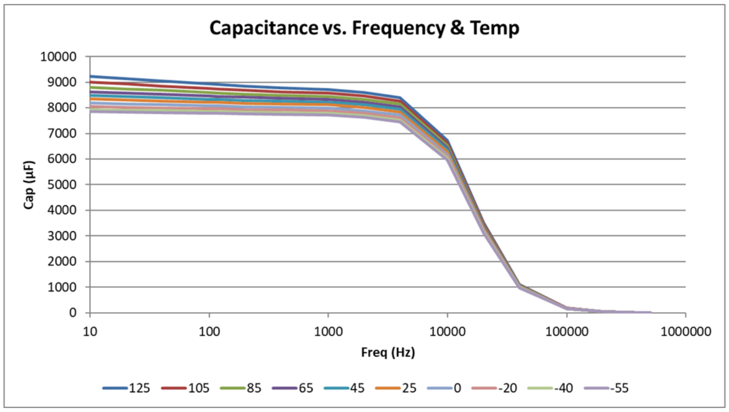


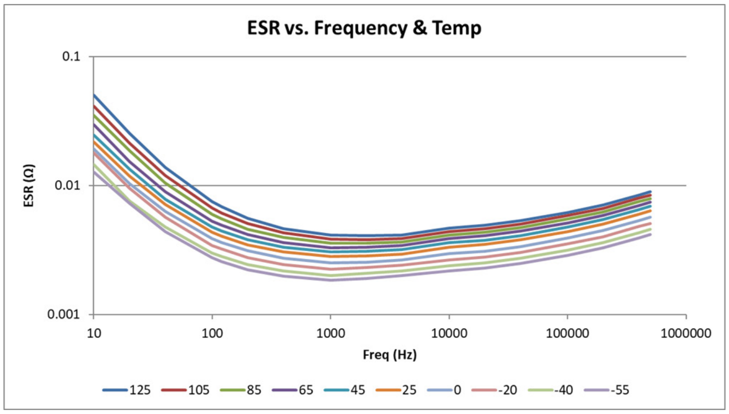


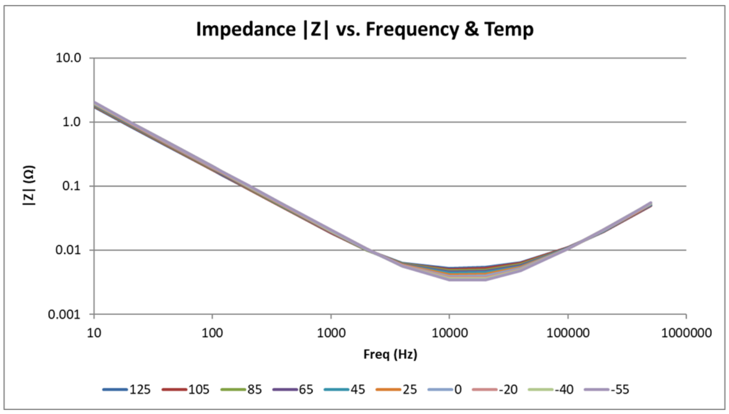
Hardware:
M5 =#10 stud / bolt
Copper flat washer, #10 or M5 washer with (~.500") OD

Precaution: Ensure proper terminal spacing and stud / bolt size.

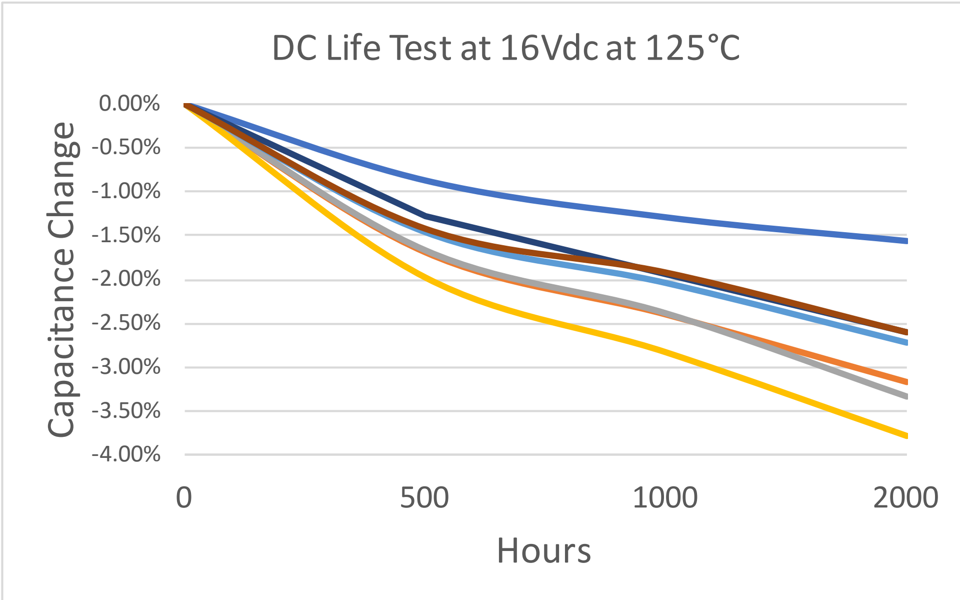
Capacitor Temperature Characteristics



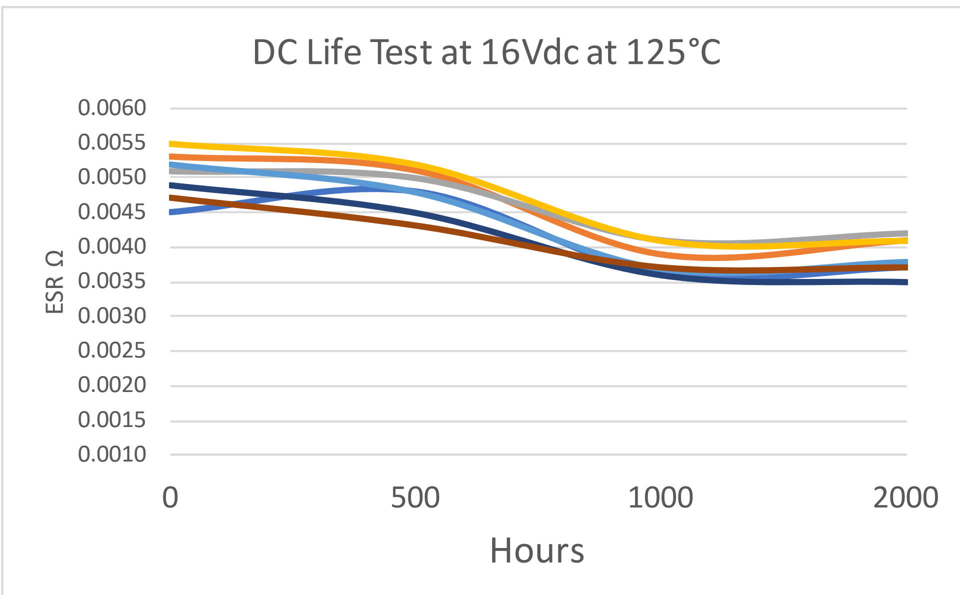




Test Results



This graph represents 8 units on test for 2,000 hours



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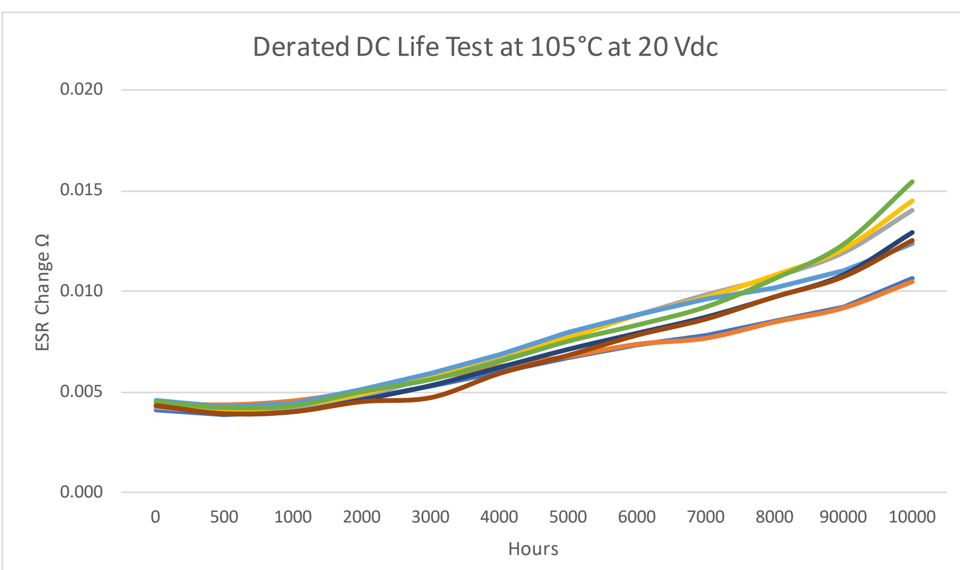
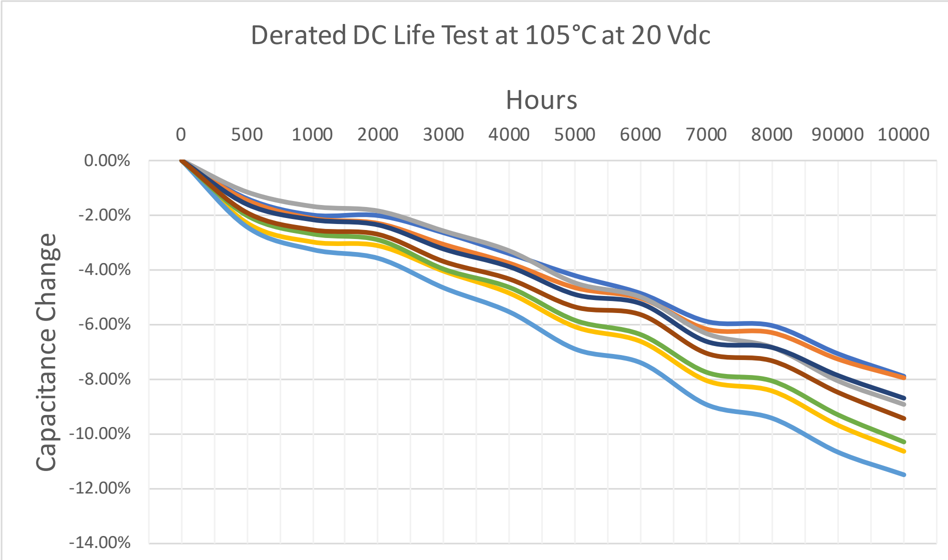
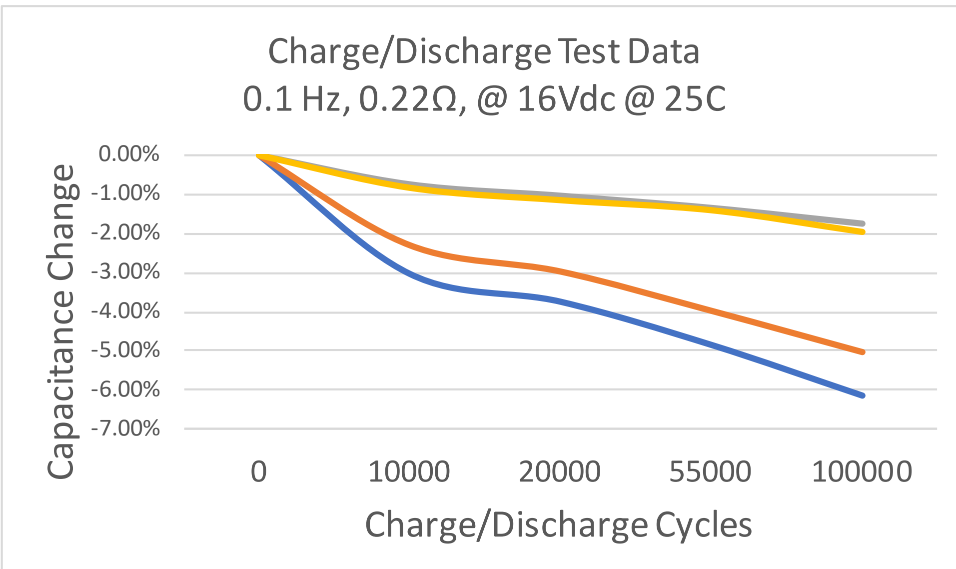


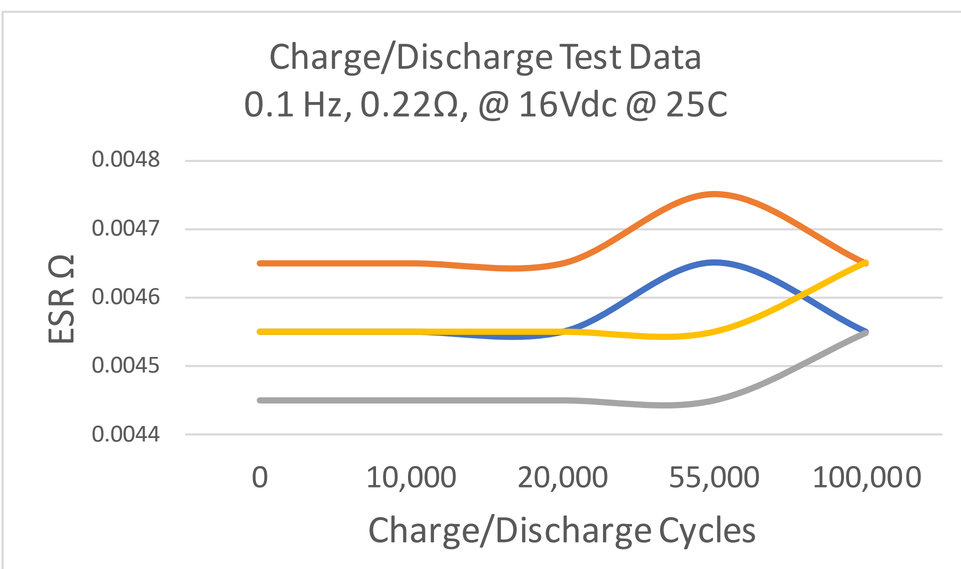
This graph represents 8 units on test for 10,000 hours



This graph represents 8 units on test for 10,000 hours

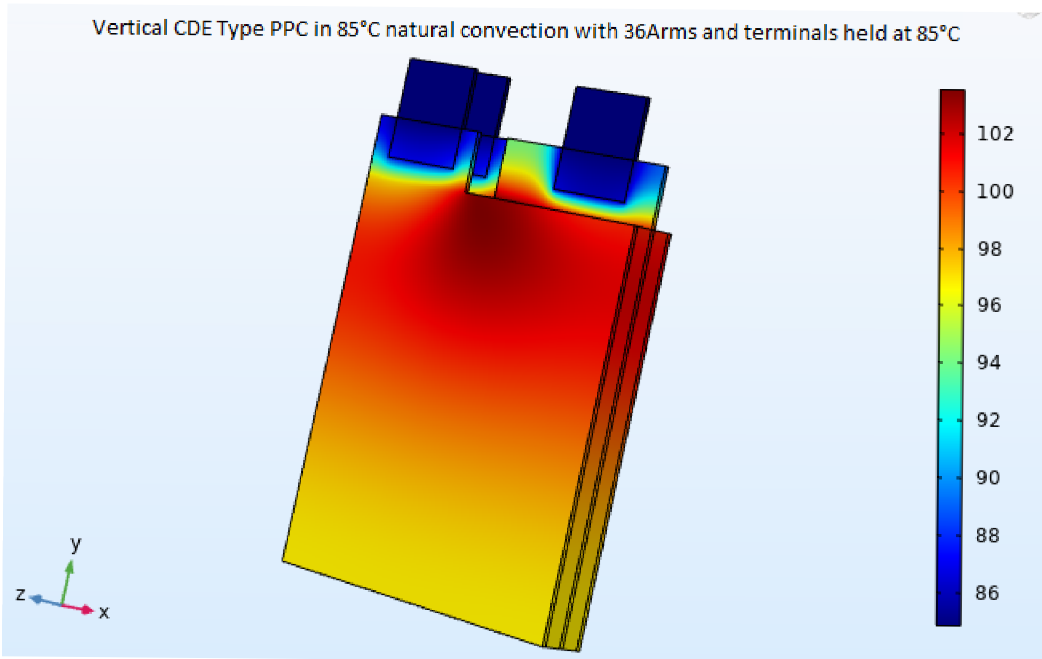


This graph represents 4 units on test for 100,000 cycles

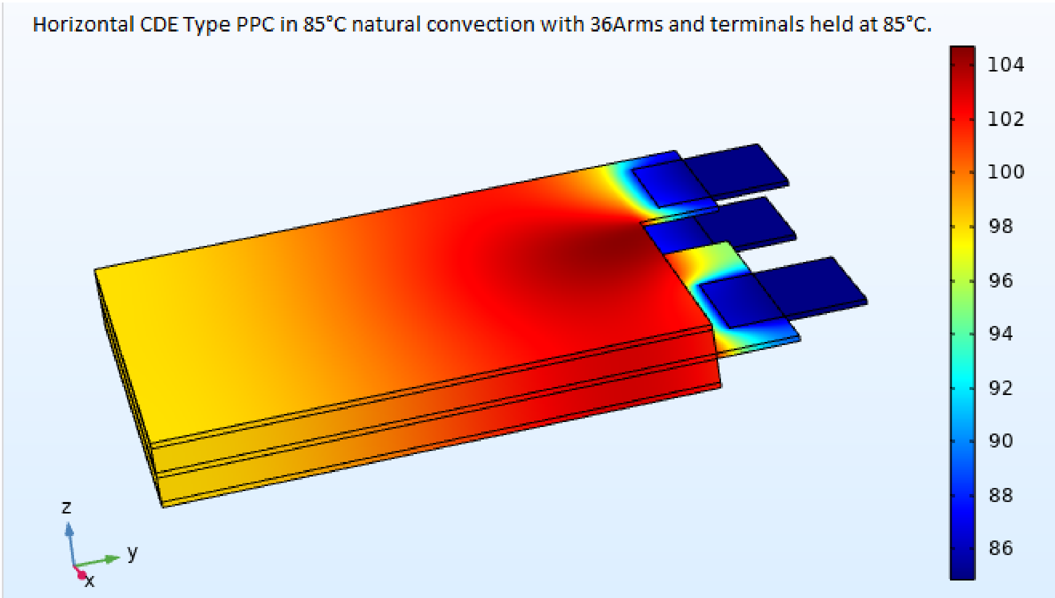


This graph represents 4 units on test for 100,000 cycles

Thermal Model



Z dimension is not to scale



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