









Maxwell Ultracapacitor Cells

Product	Model Number	Rated Voltage (V) ¹	Rated Capacitance ¹ (F)	ESR _{DC} ¹ (mohm)				Leakage Current ² (mA) 72 hours, 25°C	Max. Continuous Current ² (A _{RMS})		Stored Energy ² (Wh) at V _R	Specific Energy ² (Wh/kg) Gravimetric	Dimensions (mm)		Mass (g)	Terminals
				Max (10ms)	Typical (10ms)	Max (5s)	Typical (5s)		ΔT=15°C	ΔT=40°C			Diameter	Length		
Standard Series	 BCAP0001 P270 T01 ⁴	2.7	1	-	-	700	-	0.006	0.4	0.7	0.001	0.91	8.0	12.0	1.1	Straight Lead
	 BCAP0003 P270 S01/S12 ⁴ ESHRSR-0003C0-002R7	2.7	3	70	55	-	129	0.005	1.8	2.9	0.003	2.1	8.0	19.5	1.4	Straight Lead Bent Lead
	 BCAP0005 P270 S01 ⁴ ESHRSR-0005C0-002R7	2.7	5	45	36	-	70	0.008	2.3	3.8	0.005	2.4	10.0	20.5	2.1	Straight Lead
	 BCAP0010 P270 S01/S12 ⁴ ESHRSR-0010C0-002R7	2.7	10	30	25	-	46	0.023	3.4	5.6	0.01	3.2	10.0	30.5	3.1	Straight Lead Bent Lead
	 BCAP0022 P270 T01	2.7	22	-	-	45	-	0.055	2.6	4.2	0.022	3.38	12.5	35.5	6.5	Straight Lead
	 BCAP0025 P270 S01/S12 ⁴ ESHRSR-0025C0-002R7	2.7	25	25	16	-	27	0.049	3.7	6.1	0.025	3.7	16.0	25.5	6.7	Straight Lead Bent Lead
	 BCAP0050 P270 S01 ⁴ ESHRSR-0050C0-002R7	2.7	50	16	10	-	16	0.073	6.1	10	0.05	4.1	18.0	41.0	12.2	Straight Lead
	 BCAP0100 P270 S07 ⁴ ESHRSR-0100C0-002R7	2.7	100	12	8	-	11	0.26	10	17	0.10	4.8	22.0	46.0	21.1	Snap-In
	 BCAP0100 P270 T01 ⁴	2.7	100	-	-	15	-	0.260	6.7	11	0.101	4.39	22.0	45.0	23	Straight Lead
	 BCAP0150 P270 T07 ⁴	2.7	150	-	-	14	-	0.500	7.7	13	0.152	4.75	25.0	50.0	32	Snap-In
	 BCAP0310 P270 T10 ⁴	2.7	310	-	-	2.2	-	0.45	25	41	0.31	5.2	33.3	61.5	60	Radial Tab
	 BCAP0325 P270 S17 ⁴ ESHLSR-0325C0-002R7A2	2.7	325	1.9	1.6	-	2.1	0.45	30	49	0.32	5.0	33.0	62.5	65.3	Radial 4-Pin Type
	 BCAP0350 E270 T11/T13 ⁴	2.7	350	-	-	3.2	-	0.30	21	34	0.35	5.9	33.3	61.5	60	Radial Tab
	 BCAP0360 P270 S18 ⁴ ESHRSR-0360C0-002R7A1	2.7	360	3.2	2.9	-	3.4	0.75	23	38	0.36	5.1	35.0	63.0	71.4	Snap-In
	 BCAP0650 P270 K0405 ⁴	2.7	650	-	-	0.8	-	1.5	54	88	0.66	4.1	60.4	79.5 57.86	160	Threaded Weldable
	 BCAP1200 P270 K0405 ⁴	2.7	1,200	-	-	0.58	-	2.7	70	110	1.22	4.7	60.4	102 80.36	260	Threaded Weldable
 BCAP1500 P270 K0405 ⁴	2.7	1,500	-	-	0.47	-	3.0	84	140	1.52	5.4	60.4	113 91.28	280	Threaded Weldable	
 BCAP2000 P270 K0405 ⁴	2.7	2,000	-	-	0.35	-	4.2	110	170	2.03	5.6	60.4	130 108.36	360	Threaded Weldable	
XP™ Series	 BCAP0003 P270 X01 ⁴ ESHRSR-0003C0-002R7UC	2.7	3	70	55	-	129	0.005	1.8	2.9	0.003	2.1	8.0	19.5	1.4	Straight Lead
	 BCAP0005 P270 X01 ⁴ ESHRSR-0005C0-002R7UC	2.7	5	45	36	-	70	0.008	2.3	3.8	0.005	2.4	10.0	20.5	2.1	Straight Lead
	 BCAP0010 P270 X01 ⁴ ESHRSR-0010C0-002R7UC	2.7	10	30	25	-	46	0.023	3.4	5.6	0.01	3.1	10.0	30.5	3.2	Straight Lead
	 BCAP0025 P270 X01 ⁴ ESHRSR-0025C0-002R7UC	2.7	25	25	16	-	27	0.049	3.7	6.1	0.025	3.7	16.0	25.5	6.8	Straight Lead
	 BCAP0050 P270 X01 ⁴ ESHRSR-0050C0-002R7UC	2.7	50	16	10	-	16	0.073	6.1	10.0	0.05	4.0	18.0	41.0	12.4	Straight Lead
	 BCAP0003 P300 X11/X12 ⁴	3.0	3	95	62	-	-	0.007	1.4	2.3	0.0038	2.7	8.0	19.5	1.4	Straight Lead Bent Lead
	 BCAP0005 P300 X11 ⁴	3.0	5	45	35	-	-	0.012	2.2	3.6	0.0063	3.0	10.0	20.5	2.1	Straight Lead
	 BCAP0010 P300 X11/X12 ⁴	3.0	10	25	20	-	-	0.025	3.4	5.5	0.0125	4.0	10.0	30.5	3.2	Straight Lead Bent Lead
	 BCAP0025 P300 X11/X12 ⁴	3.0	25	22	17	-	-	0.055	4.4	7.2	0.0313	4.7	16.0	25.5	6.8	Straight Lead Bent Lead
	 BCAP0050 P300 X11 ⁴	3.0	50	13	10	-	-	0.1	7.1	11.6	0.0625	5.4	18.0	41.0	12.4	Straight Lead













Maxwell Ultracapacitor Cells

Product	Model Number	Rated Voltage (V) ¹	Rated Capacitance ¹ (F)	ESR _{DC} ¹ (mohm)				Leakage Current ² (mA) 72 hours, 25°C	Max. Continuous Current ³ (A _{RMS})		Stored Energy ³ (Wh) at V _R	Specific Energy ³ (Wh/kg) Gravimetric	Dimensions (mm)		Mass (g)	Terminals
				Max (10ms)	Typical (10ms)	Max (5s)	Typical (5s)		ΔT=15°C	ΔT=40°C			Diameter	Length		
DuraBlue® Series	 BCAP3000 P270 K04/05 ⁴	2.7	3,000	-	-	0.29	-	5.2	130	210	3.04	6.7	60.4	166 144.36	510	Threaded Weldable
	 BCAP3400 P270 K04/05 ⁴	2.7	3,400	-	-	0.29	0.22	10	130	210	3.44	7.1	60.4	166 144.36	513	Threaded Weldable
	 BCAP3400 P285 K04/05 ⁴	2.85	3,400	-	-	0.28	0.22	18	131	211	3.84	7.4	60.4	166 144.36	520	Threaded Weldable
	 BCAP3400 P300 K04/K05 ^{4,7}	3.0	3,400	-	-	0.24	0.15	12	140	225	4.25	8.57	60.4	166 144.36	496	Threaded Weldable
Pseudo-capacitor	 PCAP0050 P230 S01 PSHLR-0050C0-002R3	2.3	50	36	27	-	-	0.076	-	-	0.036	5.2	16.0	25.5	7.0	Straight Lead
	 PCAP0120 P230 S01 PSHLR-0120C0-002R3	2.3	120	27	16	-	-	0.172	-	-	0.088	5.8	18.0	41.0	15.0	Straight Lead
	 PCAP0300 P230 S07 PSHLR-0300C0-002R3	2.3	300	18	13	-	-	0.96	-	-	0.22	9.1	22.0	46.0	24.0	Snap-In

FOOTNOTES

- Capacitance and ESR_{DC} measured at 25°C per Document Number "Application Note: Test Procedures for Capacitance, ESR, Leakage Current and Self-Discharge Characterizations of Ultracapacitors" available at www.maxwell.com.
- After 72 hours at 25°C and rated voltage. Initial leakage current can be higher.
- Energy & Power (Based on IEC 62391-2)
 - Maximum Stored Energy, E_{max} (Wh/kg) = $\frac{1/2 CV^2}{3,600}$
 - Gravimetric Specific Energy (Wh/kg) = $\frac{E_{max}}{mass}$
- UL 810a maximum rated voltage may differ.
- Duration = 60 seconds. Not intended as an operating parameter.
- Maximum continuous current (BOL, Beginning of Life)
- ESR_{DC} specified at 100ms.




Maxwell Ultracapacitor Modules

Product	Model Number	Rated Voltage (V) ¹	Rated Capacitance ¹ (F)	ESR _{DC} ¹ (mohm)	Leakage Current ² (mA)	Max. Continuous Current ³ (A _{RMS})		Stored Energy ³ (Wh) at V _R	Specific Energy ³ (Wh/kg) Gravimetric	Vibration Specification	Cell Voltage Management	Max. Rated String Voltage ⁴	High Pot Capability ⁵ VDC	Dimensions (mm)			Mass (kg)
						ΔT=15°C	ΔT=40°C							Length	Width	Height	
	BMOD0001 P005 B02 EMHSR-0001C5-005R0	5	1.5	< 130	< 0.005	1.2	2	0.0052	1.5	None	None	100	None	23	17.5	9.5	0.0034
	BMOD0002 P005 B02 EMHSR-0002C5-005R0	5	2.5	< 85	< 0.008	1.6	2.6	0.0086	1.7	None	None	100	None	23	21.5	12	0.005
	BMOD0058 E016 B02 ⁴	16	58	22	170	12	19	2.1	3.3	IEC60068-2-6	Passive	750	5,600	226.5	49.5	76	0.63
	BMOD0500 P016 B01 ⁴ BMOD0500 P016 B02 ⁴	16	500	2.1	5.2 170	100	160	18	3.2	SAE J2380	VMS 2.0 Passive	750	2,500	418	68	179	5.4
	BMOD0009 P024 B02 EMHSR-0009C0-024R0	24	9	< 145	5.0, typical	-	-	0.70	1.7	IEC60068-2-6	Passive	500	4,000	148	59.4	58	0.41
	BMOD0083 P048 B01	48	83	10	3.0	61	100	27	2.6	SAE J2380	VMS 2.0	750	2,500	418	194	126	10.3
	BMOD0165 P048 C01 ⁴	48	165	6.0	-	79	130	53	N/A	ISO16750-3 Table 12	CMS 2.0	750	2,750	418	194	179	14.2
	BMOD0130 P056 B03 ⁴	56	130	8.1	120	61	99	57	3.1	Telcordia GR-63 Zone 4	Passive	750	4,000	683	177	175	18
	BMOD0094 P075 B02	75	94	13	50	48	78	73	2.9	SAE J2380	Passive	750	2,500	515	263	220	25
	BMOD0010 P090 B02/C02 EMHSR-0010C0-090R0 C1/C2	90	10	< 121	26, typical	-	-	11.2	1.7	SAE J2380	Passive	750	4,000	292	116	282.6	6.3
	BMOD0063 P125 B04 BMOD0063 P125 B08	125	63	18	10	140	240	140	2.3	ISO16750-3 Table 14	VMS 2.0	1,500	4,000	619	425	265	61
	BMOD0141 P064 B04	64	141	8.3	-	60	46	80	5.5	None	CMS 3.1	1,500	5,600	421	293	182	14.5
	BMOD0006 E160 B02/C02	160	5.8	240	25	7.0	12	21	4	IEC60068-2-6	Passive	750	5,600	367	234	79.4	5.1
	BMOD0004 P240 B02 EMHSR-0003C7-240R0C	240	3.75	< 323	< 26, typical	-	-	30	2.2	IEC60068-2-6	Passive	750	4,000	462	176.8	224.4	13.3

FOOTNOTES

- Capacitance and ESR_{DC} measured at 25°C per Document Number "Application Note: Test Procedures for Capacitance, ESR, Leakage Current and Self-Discharge Characterizations of Ultracapacitors" available at www.maxwell.com.
- After 72 hours at 25°C and rated voltage. Initial leakage current can be higher.
- Energy & Power (Based on IEC 62391-2)
 - Maximum Stored Energy, E_{max} (Wh/kg) = $\frac{1/2 CV^2}{3,600}$
 - Gravimetric Specific Energy (Wh/kg) = $\frac{E_{max}}{mass}$
- UL 810a maximum rated voltage may differ.
- Duration = 60 seconds. Not intended as an operating parameter.
- Maximum continuous current (BOL, Beginning of Life)

Maxwell Ultracapacitor Modules

Product	Model Number	Number of Terminals	Charger Type	Starter Voltage (volts)	Operating Voltage Min/Max (volts)	Module Capacitance (farads)	ESR (ohms)	Peak Power ¹ (kW)	Total Energy ²	Cold Cranking Amps ³	Weight per Module (lbs. / kg.)	Terminal Types and Numbers	Environmental	Safety	BCI Group Size / Dimension	Operating Temperature Range
	GEN 31-0900-12V-2T	2	External	12	7.2 / 16.2	500	0.004	16.4	18.2	900	13.0 / 5.9	SAE 3/8"- 16UNC, 2 each	SAE J1455, RoHS 2002/95/EC	UL2200	Group 31 / 13" L x 6 13/16" W x 9 7/16" H (330mm L x 173mm W x 240mm H)	-40°F to +149°F (-40°C to +65°C)
	GEN 31-1800-12V-2T	2	External	12	7.2 / 16.2	1,000	0.002	32.8	36.5	1,800	18.5 / 8.4					
	GEN 31-0900-24V-2T	2	External	24	14.4 / 27.0	300	0.004	45.6	30.4	900	16.5 / 7.5					
	GEN 31-0980-24V-2T	2	External	24	14.4 / 28.5	340	0.004	45.6	34.4	980	17.5 / 7.9					
	ULTRA 31/900	3	Internal	12	9.5 / 16.2	500	0.004	16.4	18.2	900	13.5 / 6.2	SAE 3/8"- 16UNC, 3 each		N/A		
	ULTRA 31/1800	3	Internal	12	9.5 / 16.2	1,000	0.002	32.8	36.5	1,800	19.0 / 8.7					
	ULTRA 31/900/24V	3	Internal	24	18.0 / 27.0	300	0.004	45.6	30.4	900	17.0 / 7.8					
	ULTRA 31/1100/24V	3	Internal	24	18.0 / 28.5	340	0.004	50.8	38.4	1,100	18.0 / 8.2					

FOOTNOTES

1. Peak Power = $\frac{V_{\max}^2}{4 \times \text{ESR}}$
2. Total Energy = $\frac{1/2 CV^2}{3,600}$
3. CCA = $\frac{C(V_{\max} - V_{\min})}{(T + C \times \text{ESR})}$, where T = 3 seconds

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