Maxwell TECHNOLOGIES
Enabling Energy's Future™

DATASHEET

2.7V 3400F ULTRACAPACITOR CELL

FEATURES AND BENEFITS

- DuraBlue® Shock and Vibration Technology
- Up to 1,000,000 duty cycles or 10 year DC life*
- High power and energy
- Up to 17.8 kW/kg of Specific Power[1]
- Up to 7.1 Wh of Stored Energy[1]
- Laser-weldable or threaded terminals

TYPICAL APPLICATIONS

- High shock and vibration environments
- Hybrid vehicles
- Rail
- Heavy industrial equipment

PRODUCT SPECIFICATIONS

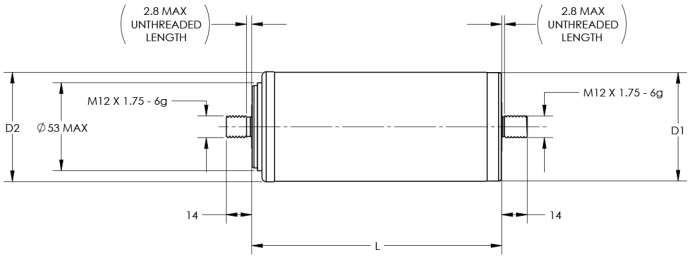
ELECTRICAL	BCAP3400
Rated Voltage	2.70 V
Rated Capacitance, initial[2]	3,400 F
Typical Capacitance, initial[2]	3,615 F
Maximum ESR_{DC}, initial[2], rated value, 100 msec	0.23 mΩ
Maximum ESR_{DC}, initial[2], rated value, 5 sec	0.28 mΩ
Typical ESR_{DC}, initial (100 msecs)[1,2]	0.20 mΩ
Typical ESR_{DC}, initial[1,2], 5 sec	0.22 mΩ
POWER & ENERGY	
Minimum Usable Specific Power, P_d[3]	7.4 kW/kg
Typical Usuable Specific Power, P_d[1,3]	8.5 kW/kg
Minimum Impedance Match Specific Power, P_{max}[4]	15.5 kW/kg
Typical Impedance Match Specific Power, P_{max}[1,4]	17.8 kW/kg
Minimum Specific Energy, E_{max}[5]	6.7 Wh/kg
Typical Specific Energy, E_{max}[1,5]	7.1 Wh/kg
Minimum Stored Energy, E_{stored}[6,12]	3.44 Wh
Typical Stored Energy, E_{stored}[1,6,12]	3.66 Wh
SHOCK & VIBRATION	
Vibration Specification	ISO 16750-3, Table 12
Shock Specification	IEC 60068-2-27
SAFETY	
Short Circuit Current, typical (Current possible with short circuit from rated voltage. Do not use as an operating current.)	12,000 A
Certifications	UL810a, RoHS, REACH
THERMAL	
Thermal Resistance (R_{ca}, Case to Ambient), typical	3.2°C/W
Thermal Capacitance (C_{th}), typical	640 J/°C
Maximum Continuous Current (ΔT = 15°C)[7]	130 A_{RMS}
Maximum Continuous Current (ΔT = 40°C)[7]	210 A_{RMS}

TYPICAL CHARACTERISTICS

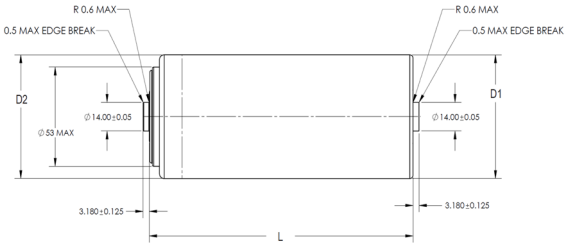
TEMPERATURE	BCAP3400
Operating temperature range (Cell case temperature)	
Minimum	-40°C
Maximum	65°C
ELECTRICAL	
Absolute Maximum Voltage[8]	2.85 V
Absolute Maximum Current	2,600 A
Leakage Current at 25°C, maximum[8]	10 mA
LIFE*	
DC Life at High Temperature[2,10] (held continuously at Rated Voltage & Maximum Operating Temperature)	1,500 hours
Capacitance Change (% decrease from rated value)	20%
ESR Change (% increase from rated value)	100%
Projected DC Life at 25°C[2,10] (held continuously at Rated Voltage)	10 years
Capacitance Change (% decrease from rated value	20%
ESR Change (% increase from rated value)	100%
Projected Cycle Life at 25°C[2, 9, 11]	1,000,000 cycles
Capacitance Change (% decrease from rated value)	20%
ESR Change (% increase from rated value)	100%
Shelf Life (Stored uncharged at 25±10°C)	4 years
PHYSICAL	
Mass, typical	513 g
Terminals	Weldable/Threaded

*Results may vary. Additional terms and conditions, including the limited warranty, apply at the time of purchase. See the warranty details for applicable operating and use requirements.

BCAP3400 P270 K04



BCAP3400 P270 K05



Part Description	Dimensions (mm) L (±0.3mm)	D1 (±0.2mm)	D2 (±0.7mm)	Package Quantity
BCAP3400 P270 K04/05	138	60.4	60.7	15

NOTES

1. Typical values represent mean values of a production sample.
2. Capacitance and ESR_{DC} measured using 100 A test current at 25°C per document number 1007239 available at maxwell.com.
3. Per IEC 62391-2, $P_d = \frac{0.12V^2}{ESR_{DC} \times mass}$
4. $P_{max} = \frac{V^2}{4 \times ESR_{DC} \times mass}$
5. $E_{max} = \frac{½\ CV^2}{3{,}600 \times mass}$
6. $E_{stored} = \frac{½\ CV^2}{3{,}600}$
7. $\Delta T = I_{RMS}^2 \times ESR \times R_{ca}$
8. Absolute maximum voltage, non-repeated. Not to exceed 1 second.
   Maximum Leakage Current
   • Current measured after 72 hrs at rated voltage and 25°C. Initial leakage current can be higher.
9. Cycle using specified test current per waveform in document 1014032.
10. Test per document 1013804.
11. Cycle life varies depending upon application-specific characteristics. Actual results will vary.
12. Per United Nations material classification UN3499, all Maxwell ultracapacitors have less than 10 Wh capacity to meet the requirements of Special Provisions 361. When packaged according to the regulation, both individual ultracapacitors and modules composed of those ultracapacitors shipped by Maxwell can be transported without being treated as dangerous goods (hazardous materials).

MOUNTING RECOMMENDATIONS

Do not reverse polarity. Please refer to document number 1016419, available at maxwell.com for welding recommendations.

MARKINGS

Products are marked with the following information: Rated capacitance, rated voltage, product number, name of manufacturer, positive terminal, warning marking, serial number.

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