Boostcap Ultracapacitors

by

Maxwell TECHNOLOGIES™

Large Cells

from 650 Farad to 3000 Farad

alfatec GmbH & Co. KG
Meckenloher Str. 11
D-91126 Rednitzhembach

Telefon: 0 91 22 / 97 96-0
Telefax: 0 91 22 / 97 96-50

Web: www.alfatec.de
Email: info@alfatec.de

BCAP0650 P270
BCAP1200 P270
BCAP1500 P270
BCAP2000 P270
BCAP3000 P270

FEATURES AND BENEFITS

- Ultra-low internal resistance
- Highest power performance available
- Lowest RC time constant
- 2.7 V operating voltage
- Over 1,000,000 duty cycles
- Proprietary material science and packaging technology
- Threaded terminal or weldable post versions

APPLICATIONS

- Automotive subsystems
- Back-up power
- Grid stabilization
- Hybrid drive trains
- Rail system power
- Transportation
- Utility vehicles

PRODUCT SPECIFICATIONS

CAPACITANCE	BCAP0650	BCAP1200	BCAP1500	BCAP2000	BCAP3000
Nominal capacitance	650 F	1,200 F	1,500 F	2,000 F	3,000 F
Tolerance capacitance	-0% / +20%	-0% / +20%	-0% / +20%	-0% / +20%	-0% / +20%
VOLTAGE					
Rated voltage	2.7 V DC	2.7 V DC	2.7 V DC	2.7 V DC	2.7 V DC
Surge voltage	2.85 V DC	2.85 V DC	2.85 V DC	2.85 V DC	2.85 V DC
Maximum operating voltage			N/A		
RESISTANCE					
ESR, DC Max., room temperature	0.8 mΩ	0.58 mΩ	0.47 mΩ	0.35 mΩ	0.29 mΩ
ESR, 1khz (Max.)	0.6 mΩ	0.44 mΩ	0.35 mΩ	0.26 mΩ	0.24 mΩ
TEMPERATURE					
Operating temperature range Stored uncharged	-40°C to +65°C	-40°C to +65°C	-40°C to +65°C	-40°C to +65°C	-40°C to +65°C
Storage temperature range Cell case temperature	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C
POWER					
Pd	6,800 W/kg	5,800 W/kg	6,600 W/kg	6,900 W/kg	5,900 W/kg
Pmax	18,900 W/kg	15,900 W/kg	18,500 W/kg	19,400 W/kg	14,800 W/kg
ENERGY					
Emax	4.11 Wh/kg	4.67 Wh/kg	5.42 Wh/kg	5.63 Wh/kg	5.96 Wh/kg

BCAP0650 P270
BCAP1200 P270
BCAP1500 P270
BCAP2000 P270
BCAP3000 P270

PRODUCT SPECIFICATIONS (cont.)

DC LIFESPAN	BCAP0650	BCAP1200	BCAP1500	BCAP2000	BCAP3000
Endurance At rated voltage and 65°C.	1,500 hours	1,500 hours	1,500 hours	1,500 hours	1,500 hours
Capacitance change % of rated value	≤20%	≤20%	≤20%	≤20%	≤20%
Internal resistance change % of rated value	≤60%	≤60%	≤60%	≤60%	≤60%
Life test At rated voltage and 25°C.	10 years	10 years	10 years	10 years	10 years
Capacitance change % of rated value	≤20%	≤20%	≤20%	≤20%	≤20%
Internal resistance change % of rated value	≤100%	≤100%	≤100%	≤100%	≤100%
CYCLE LIFE					
Cycles Between specified voltage and half rated voltage under constant current at 25°C.	1 million	1 million	1 million	1 million	1 million
Capacitance change % of rated value	≤20%	≤20%	≤20%	≤20%	≤20%
Internal resistance change % of rated value	≤100%	≤100%	≤100%	≤100%	≤100%
SHELF LIFE					
Shelf Life Uncharged over storage temperature	2 years	2 years	2 years	2 years	2 years
Capacitance change % of rated value	10% decrease	10% decrease	10% decrease	10% decrease	10% decrease
ESR change % of rated value	50% increase	50% increase	50% increase	50% increase	50% increase
CURRENT					
Maximum continuous current	62 A	81 A	97 A	123 A	147 A
Maximum peak current, 1 sec	575 A	955 A	1,185 A	1,585 A	2,165 A
Leakage current, I_{LC} After 72 hours. Initial leakage current can be higher.	1.5 mA	2.7 mA	3.0 mA	4.2 mA	5.2 mA
CONNECTION					
Terminal	Threaded or Weldable				
SIZE					
Dimensions (L x W x H) (mm)	See drawings				
Weight	0.16kg	0.26kg	0.28kg	0.36kg	0.51kg

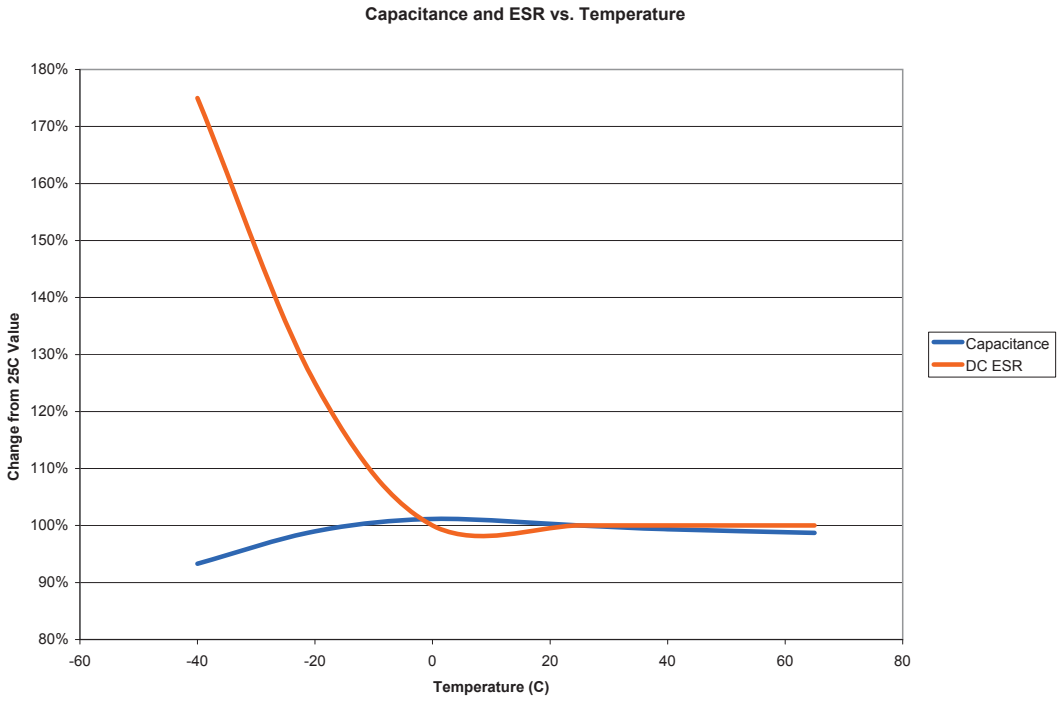
BCAP0650 P270
BCAP1200 P270
BCAP1500 P270
BCAP2000 P270
BCAP3000 P270

PRODUCT SPECIFICATIONS (cont.)

RATINGS AND SAFETY					
Vibration resistance	For all: ISO 16750, SAE J2380				
Short circuit current (Isc) **CAUTION:** Current possible with short circuit from rated voltage Do not use as an operating current.	3,350 A	4,650 A	5,700 A	7,700 A	9,300 A

TYPICAL CHARACTERISTICS

THERMAL CHARACTERISTICS					
Thermal resistance (Rth)	6.5°C/W	5.3°C/W	4.5°C/W	3.8°C/W	3.2°C/W



ADDITIONAL TECHNICAL INFORMATION

Capacitance and ESR, DC measured per document no. 1007239, available at www.maxwell.com.

Unless specified, all specifications are at 25°C

I_c = leakage current after 72 hours at 25°C

Isc (short circuit current) = $\frac{V_{RATED}}{ESR}$

R_{th} = thermal resistance

Emax = $\frac{½\,CV^2}{3{,}600 \times mass}$

Pd = $\frac{\frac{0.12V^2}{R\,(DC)}}{mass}$

Pmax = $\frac{\frac{V^2}{4R\,(1khz)}}{mass}$

Maximum Peak Current (1 sec) = $\frac{½\,V}{ESR(DC) + \frac{1}{C}}$

BCAP0650 P270
BCAP1200 P270
BCAP1500 P270
BCAP2000 P270
BCAP3000 P270

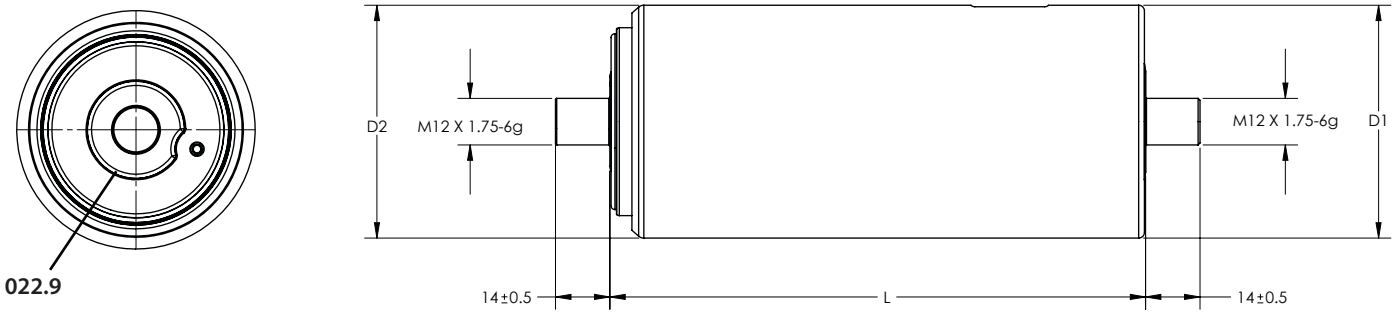
MOUNTING RECOMMENDATIONS

Do not reverse polarity.
Maximum torque for M12 screw terminals is 14Nm.
Cells are designed to be connected into series or parallel strings.
Clean terminals before mounting.

MARKINGS

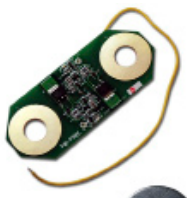
Capacitors are marked with the following information - Rated capacitance and rated voltage as well as energy/ power type indication in the product naming. Serial number, name of manufacturer, positive and negative terminal, warning marking.

DIMENSIONS



Part Number	Volume	L (±0.3mm)	D_1 (±0.2mm)	D_2 (±0.7mm)
BCAP0650 P270 K04 02	0.211 L	51.5 mm (±0.5mm)	60.4mm	60.7mm
BCAP1200 P270 K04 02	0.294 L	74 mm	60.4mm	60.7mm
BCAP1500 P270 K04 02	0.325 L	85 mm	60.4mm	60.7mm
BCAP2000 P270 K04 02	0.373 L	102 mm	60.4mm	60.7mm
BCAP3000 P270 K04 02	0.475 L	138 mm	60.4mm	60.7mm

Integration Kit for BOOSTCAP® Ultracapacitor



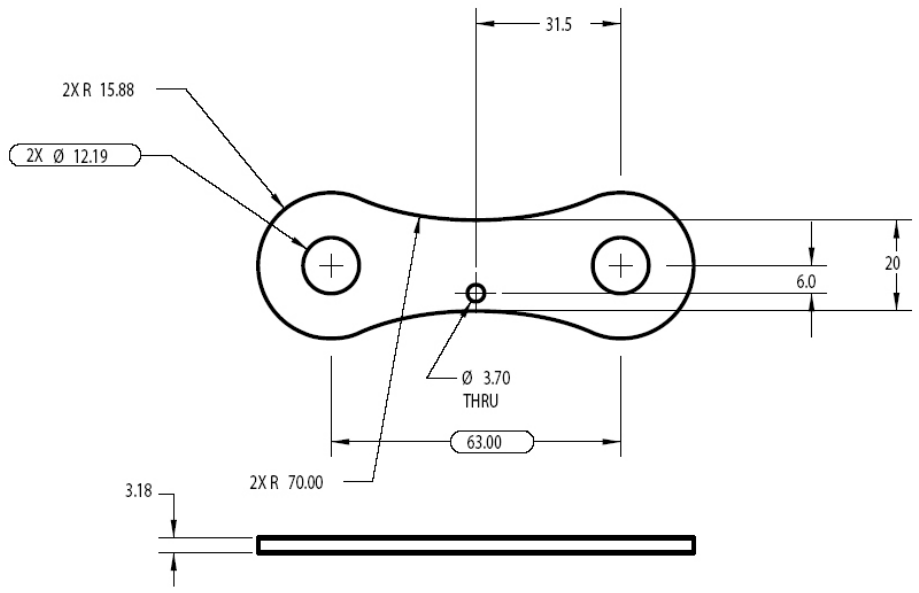
x3 PCBA (93.4 x 38.1mm) + Rivets

x5 Bus Bar
(31.8 x 94.8 x 3.2mm, 6061 Aluminum)

x12 Washers
(M12 DIN137B Steel)

x12 Retaining Nuts
(M12-1.75 x 6mm Steel)

Dimensions:



Ordering info: BKIT-MCINT (106927)
Package contents consists of voltage management board, bus bar and hardware.

Product dimensions and specifications may change without notice. Please contact Maxwell Technologies directly for any technical specifications critical to application.

Specifications:

› **Operating Voltage Range: (Individual Cell)**

Voltage management range:	+2.73 volts to +2.86 volts DC

› **Balance Current:**

Normal balance current:	0 to +300mA maximum

› **Balance Voltage Accuracy:**

Vs=2.73 to 2.86V	±0.100V DC
Temperature coefficient:	±0.00025V / ºC

› **Leakage Current (Vs=5V and Io=0):**

25ºC	±50µA maximum
50ºC	±100µA maximum

› **Environment:**

Temperature range	
Operating:	-40 to 65ºC
Storage:	-40 to 85ºC
Humidity:	0 to 90% non-condensing at 25ºC
	0 to 70% non-condensing at 50ºC

Mounting Recommendations:

For complete mounting instructions, please refer to the Cell Balance Board User's Guide.
Torque each connection to 10 N-m.

The Maxwell Technologies cell balance boards are designed to limit any over voltage of the individual capacitors during proper rated system use. The circuit is capable of providing up to 300mA of current to reduce over voltage on cells. When cells are balanced, the circuit draws less than 50µA (approximately 1% of the typical leakage current of a 3000 F cell), so there is no need to externally control the circuit.

Features:
›› Simple design and assembly
›› Maximize system lifetime by protecting individual cell against over voltage during rated system use
›› Compatible with BCAP3000, 2000, 1500, 1200 and 650

Applications:
›› Fast Prototyping
›› Application specific modules

For detailed information please contact:

alfatec GmbH & Co. KG
Meckenloher Str. 11
D-91126 Rednitzhembach

Telefon: 0 91 22 / 97 96-0
Telefax: 0 91 22 / 97 96-50
Email: info@alfatec.de

www.alfatec.de