

## FEATURES AND BENEFITS\*

- Up to 500,000 duty cycles or 10 year life
- Low internal resistance
- High power performance
- 310F and 350F capacitance values
- Radial terminals for PCB mounting

## TYPICAL APPLICATIONS

- Wind turbine pitch control
- Automotive subsystems
- Small UPS systems
- Consumer and industrial electronics
- Medical equipment
- Portable tools



## PRODUCT SPECIFICATIONS

### ELECTRICAL

|                                                                 | BCAP0310 | BCAP0350        |
|-----------------------------------------------------------------|----------|-----------------|
| Rated Capacitance <sup>1</sup>                                  | 310 F    | 350 F           |
| Minimum Capacitance, initial <sup>1</sup>                       | 310 F    | 350 F           |
| Maximum ESR <sub>DC</sub> , initial <sup>1</sup>                | 2.2 mΩ   | 3.2 mΩ          |
| Test Current for Capacitance and ESR <sub>DC</sub> <sup>1</sup> | 31 A     | 35 A            |
| Rated Voltage                                                   | 2.70 V   | 2.70 V / 2.50 V |
| Absolute Maximum Voltage <sup>2</sup>                           | 2.85 V   | 2.85 V          |
| Absolute Maximum Current                                        | 250 A    | 170 A           |
| Leakage Current at 25°C, maximum <sup>3</sup>                   | 0.45 mA  | 0.30 mA         |

### TEMPERATURE

|                                                        |       |             |
|--------------------------------------------------------|-------|-------------|
| Operating temperature range<br>(Cell case temperature) |       |             |
| Minimum                                                | -40°C | -40°C       |
| Maximum                                                | 65°C  | 65°C / 70°C |
| Storage temperature range<br>(Stored uncharged)        |       |             |
| Minimum                                                | -40°C | -40°C       |
| Maximum                                                | 70°C  | 70°C        |

### PHYSICAL

|               |                           |                           |
|---------------|---------------------------|---------------------------|
| Mass, typical | 60 g                      | 60 g                      |
| Terminals     | Radial Tab                | Radial Tab                |
| Vibration     | IEC 60068.2.6, SAE J2380  | IEC 60068.2.6, SAE J2380  |
| Shock         | IEC 60068.2.27, SAE J2464 | IEC 60068.2.27, SAE J2464 |

### POWER & ENERGY

|                                                    | BCAP0310    | BCAP0350   |
|----------------------------------------------------|-------------|------------|
| Usable Specific Power, P <sub>d</sub> <sup>4</sup> | 6,600 W/kg  | 4,600 W/kg |
| Impedance Match Specific Power <sup>5</sup>        | 14,000 W/kg | 9,500 W/kg |
| Specific Energy, E <sub>max</sub> <sup>6</sup>     | 5.2 Wh/kg   | 5.9 Wh/kg  |
| Stored Energy <sup>7,11</sup>                      | 0.31 Wh     | 0.35 Wh    |

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

## PRODUCT SPECIFICATIONS (Cont'd)

### SAFETY

|                                                                                                                                 | BCAP0310     | BCAP0350     |
|---------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|
| Short Circuit Current, typical<br>(Current possible with short circuit from rated voltage. Do not use as an operating current.) | 1,200 A      | 840 A        |
| Certifications                                                                                                                  | UL810a, RoHS | UL810a, RoHS |

## TYPICAL CHARACTERISTICS

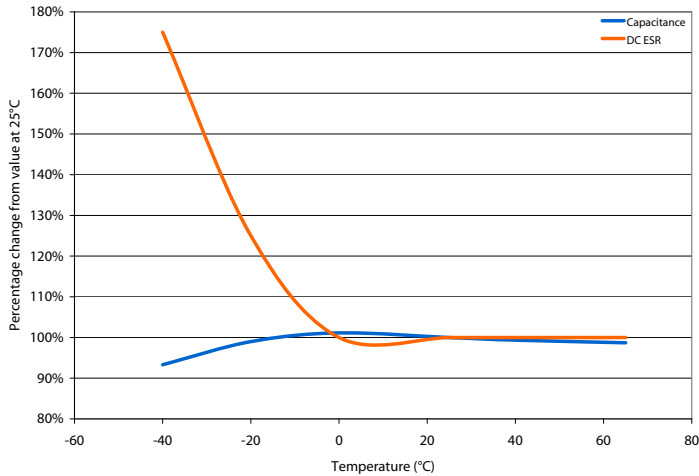
### THERMAL CHARACTERISTICS

|                                                                              |                     |                     |
|------------------------------------------------------------------------------|---------------------|---------------------|
| Thermal Resistance ( $R_{ca}$ , Case to Ambient), typical <sup>8</sup>       | 10.9°C/W            | 10.9°C/W            |
| Thermal Capacitance ( $C_{th}$ ), typical <sup>8</sup>                       | 60 J/°C             | 60 J/°C             |
| Maximum Continuous Current<br>( $\Delta T = 15^\circ\text{C}$ ) <sup>8</sup> | 25 A <sub>RMS</sub> | 21 A <sub>RMS</sub> |
| Maximum Continuous Current<br>( $\Delta T = 40^\circ\text{C}$ ) <sup>8</sup> | 41 A <sub>RMS</sub> | 34 A <sub>RMS</sub> |

### LIFE

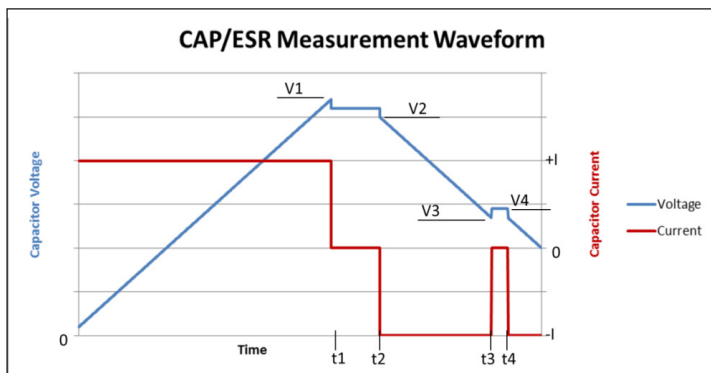
|                                                                                                |                |                |
|------------------------------------------------------------------------------------------------|----------------|----------------|
| DC Life at High Temperature <sup>1</sup><br>(at Rated Voltage & Maximum Operating Temperature) | 1,500 hours    | 1,500 hours    |
| Capacitance Change<br>(% decrease from minimum initial value)                                  | 20%            | 20%            |
| ESR Change<br>(% increase from maximum initial value)                                          | 100%           | 100%           |
| Projected DC Life at 25°C <sup>1</sup><br>(held continuously at Rated Voltage)                 | 10 years       | 10 years       |
| Capacitance Change<br>(% decrease from minimum initial value)                                  | 20%            | 20%            |
| ESR Change<br>(% increase from maximum initial value)                                          | 100%           | 100%           |
| Projected Cycle Life at 25°C <sup>1,9,10</sup>                                                 | 500,000 cycles | 500,000 cycles |
| Capacitance Change<br>(% decrease from minimum initial value)                                  | 20%            | 20%            |
| ESR Change<br>(% increase from maximum initial value)                                          | 100%           | 100%           |
| Test Current                                                                                   | 31 A           | 35 A           |
| Shelf Life<br>(Stored uncharged at 25°C)                                                       | 4 years        | 4 years        |

## ESR AND CAPACITANCE VS TEMPERATURE

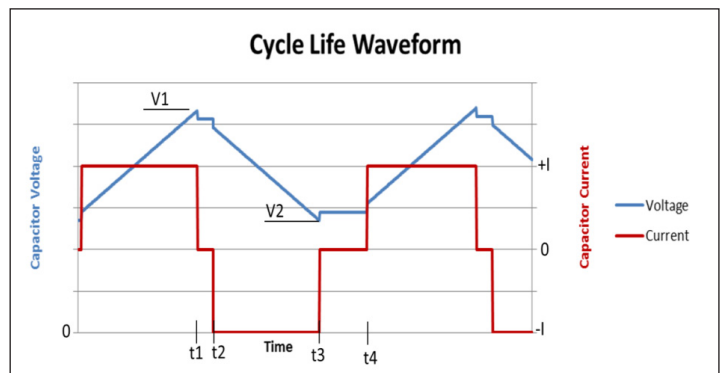


## NOTES

1. Capacitance and  $ESR_{DC}$  measured at 25°C using specified test current per waveform below.
2. Absolute maximum voltage, non-repeated. Not to exceed 1 second.
3. After 72 hours at rated voltage. Initial leakage current can be higher.
4. Per IEC 62391-2,  $P_d = \frac{0.12V^2}{ESR_{DC} \times \text{mass}}$
5.  $P_{max} = \frac{V^2}{4 \times ESR_{DC} \times \text{mass}}$
6.  $E_{max} = \frac{\frac{1}{2} CV^2}{3,600 \times \text{mass}}$
7.  $E_{stored} = \frac{\frac{1}{2} CV^2}{3,600}$
8.  $\Delta T = I_{RMS}^2 \times ESR \times R_{ca}$
9. Cycle using specified test current per waveform below.
10. Cycle life varies depending upon application-specific characteristics. Actual results will vary.
11. Per United Nations material classification UN3499, all Maxwell ultracapacitors have less than 10 Wh capacity to meet the requirements of Special Provisions 361. Both individual ultracapacitors and modules composed of those ultracapacitors shipped by Maxwell can be transported without being treated as dangerous goods (hazardous materials) under transportation regulations.



$V1 = V_{rated}$        $t2 - t1 = 15 \text{ seconds}$       Capacitance =  $I \times (t3 - t2) / (V2 - V3)$   
 $V3 = 0.5 \times V_{rated}$        $t4 - t3 = 5 \text{ seconds}$        $ESR = (V4 - V3) / I$



$V1 = V_{rated}$        $t2 - t1 = 5 \text{ seconds (I=0)}$   
 $V2 = 0.5 \times V_{rated}$        $t4 - t3 = 15 \text{ seconds (I=0)}$

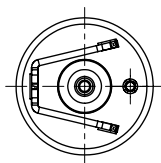
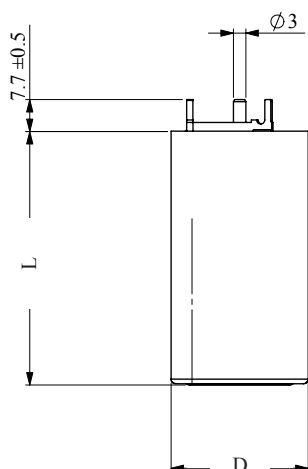
## MOUNTING RECOMMENDATIONS

Do not reverse polarity. Please refer to document number 1008238, available at maxwell.com for soldering recommendations.

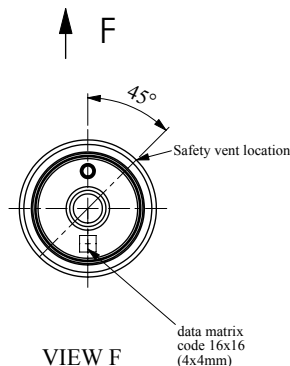
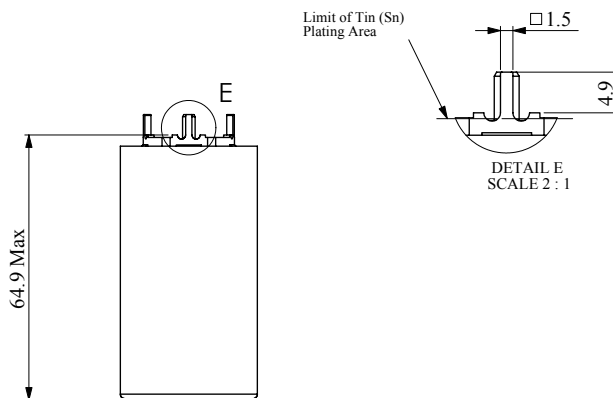
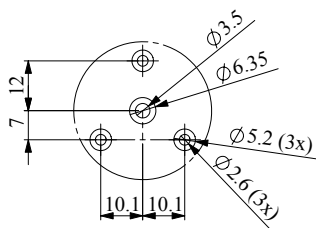
## MARKINGS

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

### BCAP0350 E270 T11



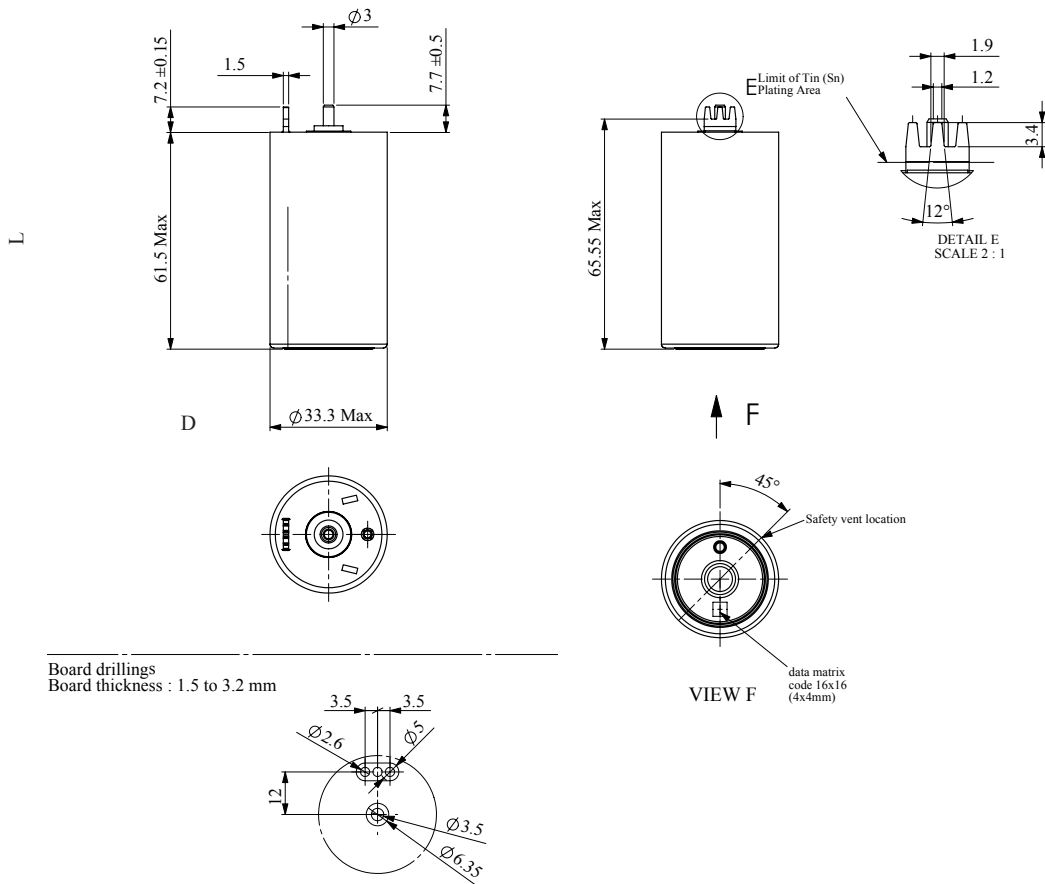
Board drillings  
Board thickness : 1.5 to 3.2 mm



| Part Description  | Dimensions (mm) |         | Package Quantity |
|-------------------|-----------------|---------|------------------|
|                   | L (max)         | D (max) |                  |
| BCAP0350 E270 T11 | 61.5            | 33.3    | 250              |

Product dimensions are for reference only unless otherwise identified. Product dimensions and specifications may change without notice. Please contact Maxwell Technologies directly for any technical specifications critical to application.

## BCAP0310 P270 T10



| Part Description  | Dimensions (mm) |         | Package Quantity |
|-------------------|-----------------|---------|------------------|
|                   | L (max)         | D (max) |                  |
| BCAP0310 P270 T10 | 61.5            | 33.3    | 250              |

Product dimensions are for reference only unless otherwise identified. Product dimensions and specifications may change without notice.

Please contact Maxwell Technologies directly for any technical specifications critical to application. All products featured on this datasheet are covered by the following U.S. patents and their respective foreign counterparts: 6643119, 7295423, 7307830, 7342770, 7352558, 7384433, 7492571, 7508651, 7791860, 7791861, 7883553, 7935155, 8072734, 8279580, and patents pending.



**Maxwell Technologies, Inc.**  
**Global Headquarters**  
3888 Calle Fortunada  
San Diego, CA 92123  
USA  
Tel: +1 858 503 3300  
Fax: +1 858 503 3301



**Maxwell Technologies SA**  
Route de Montena 65  
CH-1728 Rossens  
Switzerland  
Tel: +41 (0)26 411 85 00  
Fax: +41 (0)26 411 85 05



**Maxwell Technologies, GmbH**  
Leopoldstrasse 244  
80807 München  
Germany  
Tel: +49 (0)89 / 4161403 0  
Fax: +49 (0)89 / 4161403 99



**Maxwell Technologies**  
**Shanghai Trading Co. Ltd.**  
Unit A2,C 12th Floor  
Huarun Times Square  
500 Zhangyang Road,  
Pudong New Area  
Shanghai 200122,  
P.R. China  
Phone: +86 21 3852 4000  
Fax: +86 21 3852 4099



**Maxwell Technologies Korea, Ltd.**  
Room 1524, D-Cube City  
Office Tower, 15F #662  
Gyeongin-Ro, Guro-Gu,  
Seoul, 152-706  
South Korea  
Phone: +82 10 4518 9829

MAXWELL TECHNOLOGIES, MAXWELL, MAXWELL CERTIFIED INTEGRATOR, ENABLING ENERGY'S FUTURE, BOOSTCAP, C CELL, D CELL and their respective designs and/or logos are either trademarks or registered trademarks of Maxwell Technologies, Inc. and may not be copied, imitated or used, in whole or in part, without the prior written permission Maxwell Technologies, Inc. All contents copyright © 2013 Maxwell Technologies, Inc. All rights reserved. No portion of these materials may be reproduced in any form, or by any means, without prior written permission from Maxwell Technologies, Inc.

# AMEYA360

Components Supply Platform

Authorized Distribution Brand :



Website :

Welcome to visit [www.ameya360.com](http://www.ameya360.com)

Contact Us :

➤ Address :

401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd  
Minhang District, Shanghai , China

➤ Sales :

Direct      +86 (21) 6401-6692  
  
Email        amall@ameya360.com  
  
QQ          800077892  
  
Skype        ameyasales1 ameyasales2

➤ Customer Service :

Email        service@ameya360.com

➤ Partnership :

Tel          +86 (21) 64016692-8333  
  
Email        mkt@ameya360.com