SPECIFICATION FOR APPROVAL

Model: MCE0060C0-0015R0TBF
File Number: JX-YF-S-154.E
File Version: V2017-1
## Features

- Over 1,000,000 duty cycles
- High power density
- Low ESR

## Applications

- UPS and backup power supply
- Electronic tools
- Solar system
- Energy storage system

## Specification

### ELECTRICAL

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Capacitance</td>
<td>60 F</td>
</tr>
<tr>
<td>Capacitance Tolerance</td>
<td>0% / +20%</td>
</tr>
<tr>
<td>Rated Voltage</td>
<td>15 V</td>
</tr>
<tr>
<td>Surge Voltage</td>
<td>15.5 V</td>
</tr>
<tr>
<td>ESR, DC</td>
<td>25 mΩ</td>
</tr>
<tr>
<td>Maximum Continuous Current (Δ T=15°C)</td>
<td>12 A</td>
</tr>
<tr>
<td>Maximum Continuous Current (Δ T=40°C)</td>
<td>20 A</td>
</tr>
<tr>
<td>Maximum Peak Current, 1 sec.</td>
<td>230 A</td>
</tr>
<tr>
<td>Leakage Current (25°C, after 72h)</td>
<td>0.58 mA</td>
</tr>
<tr>
<td>Capacitance of Individual Cells</td>
<td>350 F</td>
</tr>
<tr>
<td>Number of Cells</td>
<td>6</td>
</tr>
</tbody>
</table>

### Environment

- Operating Temperature Range: -40°C to +65°C
- Storage Temperature Range: -40°C to +70°C
- Environment Humidity: ≤ 85%RH

### PHYSICAL

- Weight: 480 g
- Power Terminals: Terminal Block
- Vibration Specification: IEC 255-21-1

### FUNCTION

- Cell Voltage Balancing: 2.6V~2.65V, hysteresis 0.1V
- Voltage Alarm: 2.7V~2.75V

### POWER AND ENERGY

- Usable Power Density (Pd): 2.250 W/kg
- Impedance Match Power Density (Pmax): 4,687 W/kg
- Gravimetric Energy Density (Emax): 3.91 Wh/kg
- Stored Energy: 1.88 Wh
LIFE

MCE0060C0-0015R0TBF

High Temperature
(at Rated Voltage & Maximum operating Temperature)
- Capacitance Change (% decrease from initial measured value) ≤ 20%
- ESR Change (% increase from specified value) ≤ 100%

Room Temperature
(at Rated Voltage at 25°C)
- Capacitance Change (% decrease from initial measured value) ≤ 20%
- ESR Change (% increase from specified value) ≤ 100%

Cycle Life
(Number of cycles)
- Capacitance Change (% decrease from initial measured value) ≤ 20%
- ESR Change (% increase from specified value) ≤ 100%

Shelf Life
(25°C, uncharged)
- 4 years

THERMAL CHARACTERISTICS

Typical Thermal Resistance 4 °C/W
Typical Thermal Capacitance 500 J/°C

Notes

1. Surge voltage is non-repetitive. The duration must not exceed 1 second.
2. Maximum peak Current is non-repetitive. The duration must not exceed 1 second.
3. Formula of maximum peak Current:
   \[ I_{peak} = \frac{1}{C \times ESR_{dc} + 1} \]
   C is rated capacity, V is rated voltage.
4. Formula of power and energy
   - Usable Power Density \( P_d = \frac{0.12V^2}{ESR_{dc} \times mass} \)
   - Impedance Match Power Density \( P_{max} = \frac{V^2}{4ESR_{dc} \times mass} \)
   - Gravimetric Energy Density \( E_{max} = \frac{1}{3600} \times \frac{2CV^2}{mass} \)
   - Stored Energy \( E = \frac{1}{3600} \times \frac{2CV^2}{mass} \)
Measuring Method

1) Charge and Discharge procedure  
   (Figure 1)
   A) Charge the capacitor using constant current I to rated voltage $V_0$
   B) Keep rated voltage 5 min
   C) Discharge the capacitor using constant current I to half rated voltage, record discharge time $T_1$
      during voltage change from $V_1$ to $V_2$
   D) Rest 2-5s, record voltage change $\Delta V$
   E) Discharge it to a very low voltage around 0.01V
   F) $V_1=$85% $V_0$  $V_2=$50% $V_0$

2) Capacitance

   \[ C = \frac{I \times T_1}{(V_1 - V_2)} \]

   C: Capacitance (F)
   I: Constant Discharge Current (A)
   $T_1$: Discharge Time (S)
   $V_1$-$V_2$: Voltage Change (V)

3) DC ESR

   DC ESR = $\frac{\Delta V}{I}$  

   DC ESR: DC Equivalent Series Resistance (Ω)
   $\Delta V$: Voltage Change (V)
   I: Constant Discharge Current (A)

4) AC ESR

   Measure AC ESR using LCR meter
   Frequency: 1KHz
   Voltage: fully discharge
## Dimensions

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Dimension (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCE006C0-0015R0TBF</td>
<td></td>
</tr>
<tr>
<td>L (±1mm)</td>
<td>130</td>
</tr>
<tr>
<td>W (±1mm)</td>
<td>71</td>
</tr>
<tr>
<td>H (±1mm)</td>
<td>70</td>
</tr>
</tbody>
</table>