

Ultra Kondensator

ETC-UC-650F

FEATURES AND BENEFITS

- » Shock and Vibration Technology
- » Up to 1,000,000 duty cycles
- » Up to 10 year DC life
- » Highest power and energy

TYPICAL APPLICATIONS

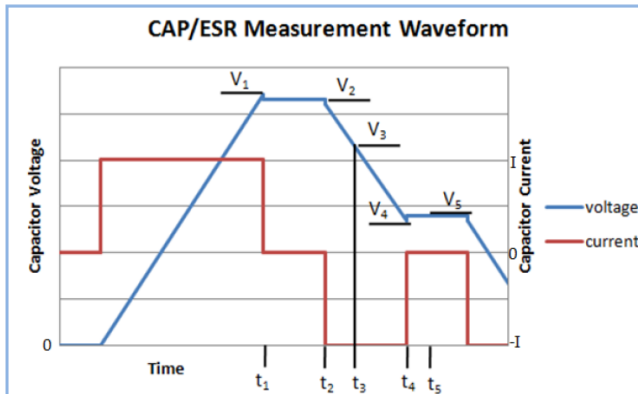
- » High shock and vibration environments
- » Automotive subsystems
- » Wind turbine pitch control
- » Hybrid vehicles
- » Rail
- » Heavy industrial equipment
- » UPS & telecom systems



Electrical	Rated Capacitance ¹	650 F
	Minimum Capacitance, initial ¹	650 F
	Typical Capacitance, initial ¹	690 F
	Maximum Capacitance, initial ¹	780 F
	Typical ESR _{DC} , initial ^{1,2}	0.70 mΩ
	Maximum ESR _{DC} , initial, ¹ rated value	0.90 mΩ
	Test Current for Capacitance and ESR _{DC}	50 A
	Rated Voltage	2.70 V
	Absolute Maximum Voltage ³	2.85 V
	Absolute Maximum Current ¹⁰	550 A
Power & Energy	Leakage Current at 25°C, maximum ^{2,4}	5 mA
	Self-discharge ⁵	≥2.16V
	Minimum Usable Specific Power, P_d^6	5.1 kW/kg
	Typical Usable Specific Power, $P_d^{2,6}$	6.5 kW/kg
	Minimum Impedance Match Specific Power, P_{max}^7	10.6 kW/kg
	Typical Impedance Match Specific Power, $P_{max}^{2,7}$	13.7 kW/kg
	Minimum Specific Energy, E_{max}^8	3.5 Wh/kg
	Typical Specific Energy, $E_{max}^{2,8}$	3.7 Wh/kg
	Minimum Stored Energy, E_{store}^9	0.66 Wh
	Typical Stored Energy, $E_{stor}^{2,9}$	0.71 Wh
Thermal	Thermal Resistance(R_{ca} , Case to Ambient), typic cycles	6 °C/W
	Thermal Capacitance (C_{th}), typical	210 J/°C
	Maximum Continuous Current ($\Delta T = 15^\circ C$) ¹¹	53 ARMS
Physical	Maximum Continuous Current ($\Delta T = 40^\circ C$) ¹¹	86 ARMS
	Vibration Specification	QC/T 741-2014
	Shock Specification	ISO 8568-2007
	Mass, typical	≤190g
Terminals	Threaded or Weldable	

Temperature	Operating temperature range (Cell case temperature)	
	Minimum	-40 °C
	Maximum	65 °C
	Stored temperature range (Stored uncharged)	
Life	Minimum	-40 °C
	Maximum	70 °C
	DC Life at High Temperature ¹ (held continuously at Rated Voltage & 65°C)	1500 h
	Capacitance Change (% decrease from rated value)	20%
	ESR Change (% increase from rated value)	100%
	Projected DC Life at 25°C ¹ (25°C, held continuously at Rated Voltage)	10years
	Capacitance Change (% decrease from rated value)	20%
	ESR Change (% increase from rated value)	100%
	Projected Cycle Life at 25°C ^{1,12,13}	1,000,000
	Capacitance Change (% decrease from rated value)	20%
ESR Change (% increase from rated value)	100%	
Test Current	100A	
Shelf Life ¹⁴ Stored uncharged at 25°C	4years	

Notes:



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

$$V3 = 80\% \times V_{\text{rated}} \quad t5 - t4 = 5 \text{ seconds} \quad \text{ESR} = (V5 - V4) / I$$

$$V4 = 0.5 \times V_{\text{rated}}$$

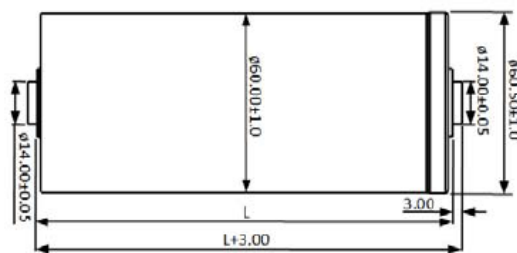
1. Capacitance and ESR DC measured at 25°C using specified test current per waveform above.
2. Typical values represent mean values of a production sample.
3. Absolute maximum voltage, non-repeated. Not to exceed 1 second.
4. After 72 hours at rated voltage. Initial leakage current can be higher.
5. Selfdischarge, Hold rated voltage for 1 hour, Open circuit the cell 72 hours, Measure and record the voltage of cell.
6. Per IEC62391-2, $P_d = 0.12 \text{ V}^2 / (\text{ESR}_{\text{DC}} \times \text{mass})$
7. $P_{\text{max}} = \text{V}^2 / (4 \times \text{ESR}_{\text{DC}} \times \text{mass})$

MOUNTING RECOMMENDATIONS

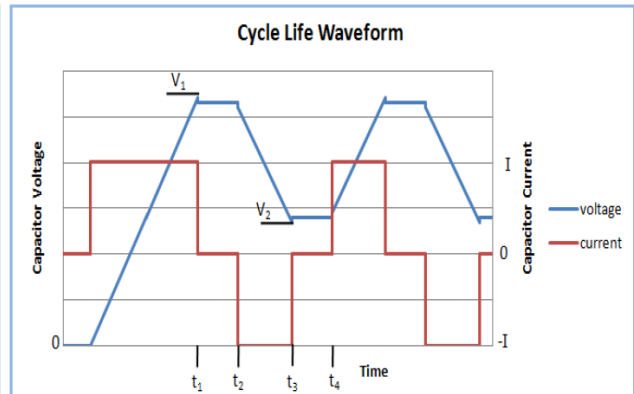
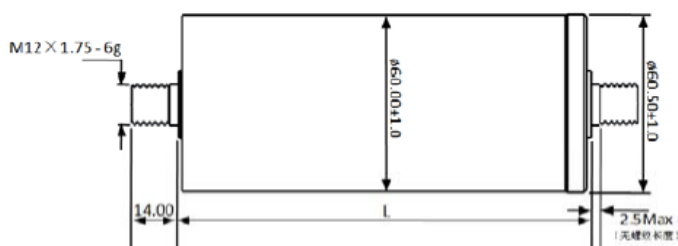
Do not reverse polarity. Welding without stored energy.

Ultracapacitors 2.7V/650F (Unit: mm)

SPC2R700650F03G1/ W



SPC2R700650F03G1/ T



$$V1 = V_{\text{rated}} \quad t2 - t1 = 15 \text{ seconds}$$

$$V2 = 0.5 \times V_{\text{rated}} \quad t4 - t3 = 15 \text{ seconds}$$

8. $E_{\text{max}} = 0.5 \text{ CV}^2 / (3600 \times \text{mass})$
9. $E_{\text{stored}} = 0.5 \text{ C V}^2 / 3600$
10. $I_{\text{max}} (1 \text{ sec}) = 0.5 \text{ CV} / (\text{C} \times \text{ESR} + 1)$
11. $\Delta T = \text{IRMS}^2 \times \text{ESR} \times \text{Rca}$
12. Cycle using specified test current per waveform above.
13. Cycle life varies depending upon application-specific characteristics. Actual results will vary.
14. Capacitance decrease 10% from rated value or ESR_{DC} decrease

MARKINGS

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

Part Description	Dimensions (mm)			Package Quantit
	D (±1.0mm)	L (±1.0mm)	H of Terminal (±0.1mm)	
2.7V/650F	60	51.5	3.0 (W) / 14.0 (T)	18

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

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