SKELETON TECHNOLOGIES

DATA SHEET
SkelCap
ULTRACAPACITOR

+ **Capacitance 500 - 3200 F**
+ **Extreme power density**
+ **Durable and safe aluminum casings**
+ **Weldable terminals**
+ **High cycle life >1,000,000 cycles**
+ **High temperature tolerance (operating and storage)**
+ **Made in EU**
+ **RoHS Compliant**

GENERAL SPECIFICATIONS

Rated voltage V_R	2.85 V
Surge voltage	3.0 V
Specific energy	5.1 - 6.8 Wh/kg
Specific power, typical	42 - 80 kW/kg
Power density, typical	58 - 112 kW/L

TEMPERATURE AND LIFE

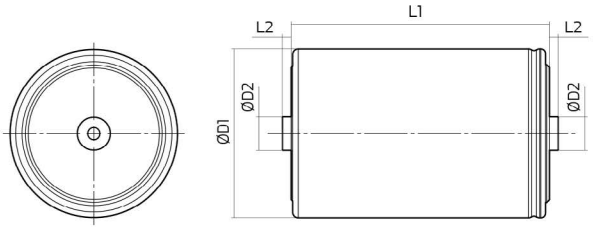
Operating temperature range	
Minimum	-40 °C
Maximum	+65 °C
Storage temperature range (uncharged)	
Minimum	-40 °C
Maximum	+70 °C
Life	
Shelf-life @ RT, uncharged	10 years
Cyclelife @ RT, between V_R and $V_R/2$	1,000,000 cycles
Lifetime @ 65 °C and V_R	1,500 hours

PACKAGE DETAILS	UNIT	SCA0500	SCA0750	SCA1200	SCA1800	SCA3200
Package quantity	pcs	49	49	25	25	25
Package weight	kg	6.2	8.0	7.2	9.3	14.2
Package height	mm	120	120	170	170	170
Package width	mm	395	395	395	395	395
Package depth	mm	395	395	395	395	395

ELECTRICAL	UNIT	SCA0500	SCA0750	SCA1200	SCA1800	SCA3200
Rated capacitance	F	500	750	1200	1800	3200
Initial capacitance, typical	F	540	800	1280	1910	3450
ESR DC per IEC62391-1B, rated / typical	mΩ	**0.40 / 0.35**	**0.37 / 0.32**	**0.19 / 0.16**	**0.16 / 0.13**	**0.13 / 0.11**
DC 10ms ESR (≈ AC 100 Hz), rated / typical	mΩ	0.29 / 0.24	0.28 / 0.21	0.14 / 0.11	0.13 / 0.10	0.12 / 0.09
DC 1s ESR (≈ AC 0.1 Hz), rated / typical	mΩ	0.60 / 0.49	0.45 / 0.35	0.23 / 0.18	0.18 / 0.14	0.14 / 0.12
Maximum peak current, for 1 second[1]	kA	0.6	0.8	1.4	2.0	3.2
Leakage current, 2.85 V (After 72 hours, 25 °C)	mA	1.6	2.5	4.5	6.3	11.0
Leakage current, 2.7 V (After 72 hours, 25 °C)	mA	1.1	1.7	3.5	4.5	8.5
SAFETY						
Short circuit current, typical (Possible current with short cirquit @ rated voltage. Don't use as operating current)	kA	8	9	18	22	26
ENERGY, based on rated capacitance						
Energy[2]	Wh	0.56	0.85	1.35	2.03	3.61
Specific energy[3]	Wh/kg	5.1	5.8	5.4	6.0	6.8
Energy density[4]	Wh/L	7.1	7.9	7.6	8.5	9.3
POWER*						
Power, (matched impedance), typical[5]	kW	8.8	9.7	18.5	20.3	22.6
Specific power, matched impedance, minimum[6]	kW/kg	61	49	57	46	32
Specific power, matched impedance, typical[6]	kW/kg	80	66	73	60	42
Power density, matched impedance, minimum[7]	kW/L	86	68	81	65	43
Power density, matched impedance, typical[7]	kW/L	112	90	104	85	58
STANDARDS AND CERTIFICATIONS						
Vibration Specification			ISO 16750-3, Table 14			
Certifications			RoHS			
THERMAL*						
Thermal resistance, R_{ca}, typical	°C/W	7.1	6.6	5.7	4.3	3.0
Thermal capacitance, C_{th}, typical	J/°C	110	159	253	335	634
Max continuous current, ΔT = 15°C[8]	A	96	104	154	188	237
Max continuous current, ΔT = 40°C[8]	A	157	170	252	307	387
PHYSICAL PARAMETERS						
Typical mass (± 3-6g mm, from small to large size)	kg	0.111	0.147	0.253	0.337	0.533
Volume	L	0.079	0.107	0.178	0.240	0.390
Diameter (± 0.2 mm, including label), D1	mm	40.2	40.2	60.2	60.2	60.2
Length (± 0.3 mm), L1	mm	63	85	63	85	138
Terminal diameter, D2	mm	8	8	12	12	12
Terminal length, L2	mm	3.2	3.2	3.2	3.2	3.2

(1) Maximum peak current (1 sec) = $\frac{½\,CV}{C \times ESR + 1s}$ (2) $E_{stored} = \frac{½\,CV^2}{3{,}600}$ (3) $E_{max} = \frac{½\,CV^2}{3{,}600 \times mass}$ (4) $E_{max} = \frac{½\,CV^2}{3{,}600 \times volume}$

(5) $P_{max} = \frac{V^2}{4 \times ESR}$ (6) $P_{max} = \frac{V^2}{4 \times ESR \times mass}$ (7) $P_{max} = \frac{V^2}{4 \times ESR \times volume}$ (8) $I_{max} = \sqrt{\frac{\Delta T}{ESR \times R_{th}}}$



Typical value represents the mean production sample value
Rated value represents the absolute minimum capacitance or maximum ESR value of production sample.

*Power values calculated using DC 10ms ESR ≈ AC 100Hz.

Standard markings

+ Name of Manufacturer, Part number, Serial number, Rated voltage
+ Rated capacitance, Negative and positive terminals, Warning marking
+ Total energy in watt-hours
+ Electrolyte material used

Notes

+ Testing instructions available on www.skeletontech.com
+ All information provided on this data sheet and all subsequent ultra-capacitors sales and testing are subject to Standard Terms of Service (ToS) available on www.skeletontech.com, document *General Terms of Sale for Skeleton Technologies OÜ.*

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