2.85 V CDCL WLZ DATA SHEET

MODEL	2.85V CDCL WLZ SERIES
PART NUMBER	CDCL0650C0-002R85WLZ
	CDCL1200C0-002R85WLZ
	CDCL1500C0-002R85WLZ
	CDCL2000C0-002R85WLZ
	CDCL3000C0-002R85WLZ

Version	Revision Records
V2021-1	The First Release
V2021-2	Modify Product Dimension

FEATURES

- Low ESR & high power density
- 1,000,000 duty cycles
- Laser weldable terminals

APPLICATIONS

- EV/HEV
- Heavy duty machinery
- Hybrid drive trains
- Locomotive engine start-up system
- Mass transportation braking energy recovery system

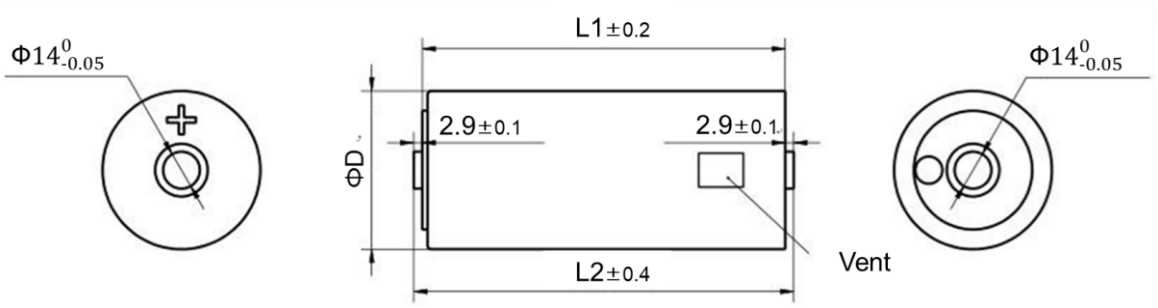
CONSTRUCTION & DIMENSIONS

1) **Construction**

Inside structure: fold anode and cathode electrode with separator

Outer structure: aluminum case, insulating sleeve

2) **Dimensions**



PRODUCT	DIMENSION (mm)		
	D(Max.)	L1	L2
CDCL0650C0-002R85WLZ	60.8	51.5	57.3
CDCL1200C0-002R85WLZ	60.8	74.0	79.8
CDCL1500C0-002R85WLZ	60.8	85.0	90.8
CDCL2000C0-002R85WLZ	60.8	102.0	107.8
CDCL3000C0-002R85WLZ	60.8	138.1	143.9

SPECIFICATIONS

Items	**Characteristics**
Operating Voltage	2.85 VDC
Surge Voltage	3.0 VDC
Operating Temperature Range	-40℃ to 65℃
Vibration Specification	ISO 16750-3 TABLE 14
Shock Specification	SAE J2464 TABLE 4
Capacitance Tolerance	0% to +20% (25℃)
Terminals	Laser weldable posts
Temperature Performance (-40℃ to 65℃)	C_{end}≥95% of rated value ESR_{end}≤ 150% of rated value

SPECIFICATIONS

Accelerated DC Life (1,500 hours @ 65℃, 2.85V DC)	C_{end}≥80% of rated value ESR_{end}≤ 200% of rated value
Projected Life Time (10years，@RT，2.85V DC)	C_{end}≥80% of rated value ESR_{end}≤ 200% of rated value
Cycle Life (1,000,000 cycles between V_R and 1/2V_R)	C_{end}≥80% of rated value ESR_{end}≤ 200% of rated value
Shelf Life (4years，@RT, uncharged)	C_{end}≥ rated value ESR_{end}≤ rated value

DETAIL SPECIFICATIONS

Part Number		CDCL0650C0-002R85WLZ	CDCL1200C0-002R85WLZ	CDCL1500C0-002R85WLZ	CDCL2000C0-002R85WLZ	CDCL3000C0-002R85WLZ
Rated Capacitance (F)		650	1200	1500	2000	3000
Rated ESR (mΩ)	AC ESR（1kHz）	0.44	0.36	0.28	0.24	0.20
	DC ESR (0.1s)	0.56	0.41	0.33	0.28	0.23
	DC ESR (1s)	0.60	0.46	0.37	0.30	0.26
	DC ESR (5s)	0.64	0.52	0.39	0.32	0.28
Leakage Current (mA, RT 72hrs)		3.1	5.8	7.3	9.7	14.5
Stored Energy (Wh)		0.73	1.35	1.69	2.26	3.38
Energy Density (Wh/kg)		4.0	5.2	5.6	6.2	6.8
Max. Continuous Current (Δ T=15℃, A)		63	81	95	112	136
Max. Continuous Current (Δ T=40℃, A)		102	132	154	184	222
Max. Peak Current (A, 1s)		666	1102	1375	1781	2402
Short Circuit Current（kA）		5.1	7.0	8.6	10.2	12.4
Usable Power Density (kW/kg)		8.8	8.1	8.8	8.9	7.5

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Impedance Match Power Density (kW/kg, 10 Hz)	19.7	19.0	20.5	19.8	17.7
Typical Thermal Resistance (°C/W)	6.4	5.0	4.5	4.0	3.1
Typical Thermal Capacitance (J/°C)	219	300	343	417	588
Typical Mass (g)	184	260	300	365	500
Max. Mass (g)	187	263	305	370	505

Notes

1) Surge voltage V_S: Absolute maximum voltage, non-repetitive. The duration must not exceed 1 second.

2) Capacitance C: The test current is 40C, apply 100A when the calculated current exceeding 100A; The test method is shown in Figure 1.

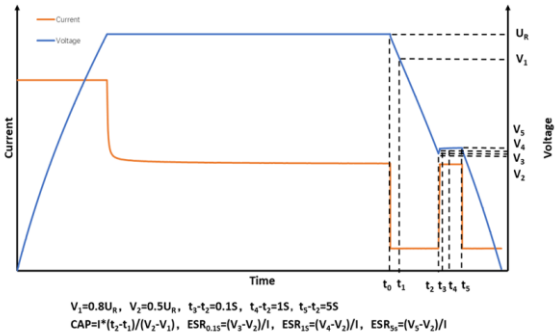

Figure 1

3) Capacitance tolerance: Typical tolerance is +5%.

4) Leakage current measurement procedure: 1) Charge the capacitor to the V_R with a constant current (40C, apply 100A when the calculated current exceeding 100A). 2) Hold the voltage at V_R for 72h. 3) The current to maintain V_R after 72 h is the leakage current.

5) Max. Continuous Current: $I_{MCC} = \sqrt{\Delta T/(ESR_{1s} * R_{Th})}$

6) Max. Peak Current: $I_S = 0.5C * V_R/(\Delta t + \mathrm{ESR}_{1s} * \mathrm{C})$, discharge from V_R to $V_R/2$ in 1 second.

7) Short current: $I_S = V_R/ESR_{0.1s}$

8) Stored energy: $\mathrm{E} = 0.5\mathrm{C} * V^2/3600$

9) Energy density: $E_d = E/M$

10) Usable power density: $P_d = 0.12{V_R}^2/(ESR_{1s} * M)$

11) Matched impedance power density: $P_{dMax} = 0.25{V_R}^2/(ESR_{0.1s} * M)$

12) Storage: Discharged and no load applied at RT. (Cell voltage<0.2 V)

13) Standard markings:

- Name of manufacturer, part number, serial number.
- Rated voltage and capacitance, negative and positive terminals, warning marking.
- Stored energy in watt-hours.

14) Per UN3499, all SPSCAP ultracapacitors have less than 10 Wh capacity, meeting the requirements of Special Provisions 361. When packaged according to the regulation, the ultracapacitors shipped by SPSCAP can be transported without being treated as dangerous goods (hazardous materials).

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