2026

Shanghai Yongming Electronics Co., Ltd.

Capacitor Solutions, Ask YMIN for your Applications.

Respond quickly and accurately to customer needs

HIGH POWER, HIGH ENERGY DENSITY

LARGE CAPACITY, SMALL SIZE

Hybrid supercapacitor

Double-layer supercapacitor

Hybrid supercapacitor & double-layer supercapacitor

Corporate Culture	Make a little progress every day
Corporate Vision	Make products that customers respect; build a team that society respects.
Corporate Mission	Make it so that there are no containers that are difficult to store electric charge.
Product and Market Positioning	1. Replace imported brands and become a leading international brand. 2. For capacitor applications, if you have any problems, contact YMIN.

2015

YONGMING IS THE FIRST COMPANY TO OBTAIN STATE GRID TESTING AND CERTIFICATION FOR ALUMINUM ELECTROLYTIC CAPACITORS.

2018

AEC-Q200 PRODUCT CERTIFICATION

2018

PASSED IATF 16949 SYSTEM CERTIFICATION

2021

YONGMING SUPERCAPACITORS BECAME THE FIRST COMPANY TO OBTAIN STATE GRID TESTING AND CERTIFICATION.

2021

YONGMING SUPERCAPACITORS (HPLC DEDICATED) OBTAINED STATE GRID TESTING AND CERTIFICATION.

2021

YONGMING HIGH-VOLTAGE ALUMINUM ELECTROLYTIC CAPACITORS RECEIVED STATE GRID CERTIFICATION.

2021

YONGMING LOW-VOLTAGE ALUMINUM ELECTROLYTIC CAPACITORS RECEIVED STATE GRID CERTIFICATION

17 ITEM | INVENTION PATENT CERTIFICATE
17 invention patent certificates

52 ITEM | UTILITY MODEL PATENT CERTIFICATE
52 utility model patent certificates

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Hybrid Supercapacitor LIC	SLA	LIC Standard Products, Low Self-Discharge	-20	+85	15~1500	3.8	1000		10
	SLX	LIC Ultra-Small Size Products, Low Self-Discharge	-20	+85	1.5~20 (0.5~7.5mAh)	3.8	1000		12
	SLR	LIC Low Temperature Products, Low Self-Discharge	-40	+70	20~1500	3.8	1000		13
	SLD	LIC High Energy Products, Low Self-Discharge	-20	+70	30~1300	4.2	1000		15
	SLA(H)	LIC Automotive Grade Products, Low Self-Discharge	-40	+90	15~300	3.8	1000		16
Double-layer capacitor Supercapacitor EDLC	SDV	Leaded SMD Products	-25	+70	0.1~7.0	2.7 , 3.0	1000		17
	SDA	High Capacity, Standard Products	-40	+70	1.0~160	2.7	1000		18
	SDB	High Voltage, High Capacity Products	-40	+70	1.0~160	3.0	1000		19
	SDS	Miniature, High Capacity Products	-40	+70	0.5~70	2.7	1000		20
	SDL	Low ESR, High Capacity Products	-40	+70	1.0~160	2.7	1000		21
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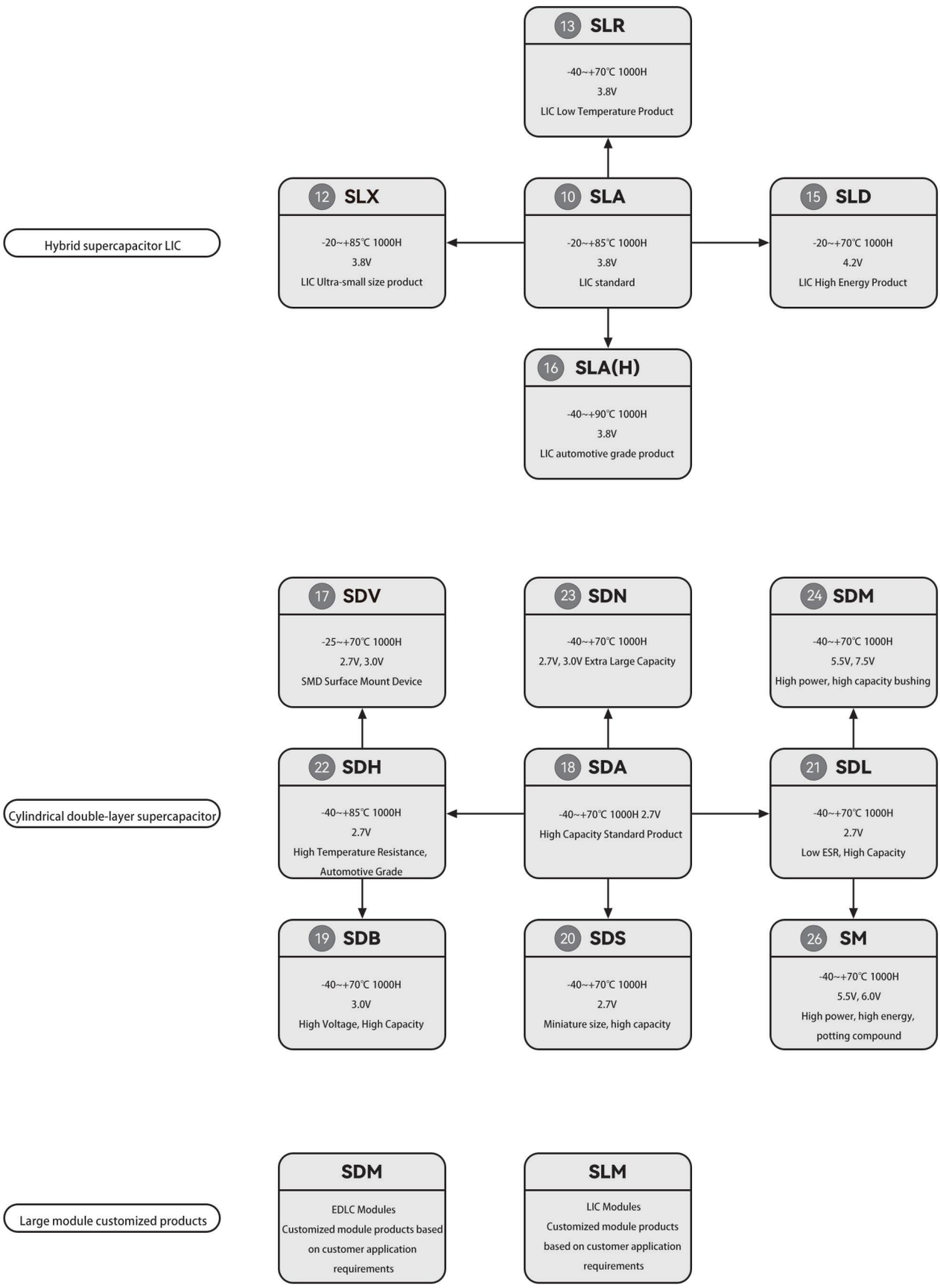
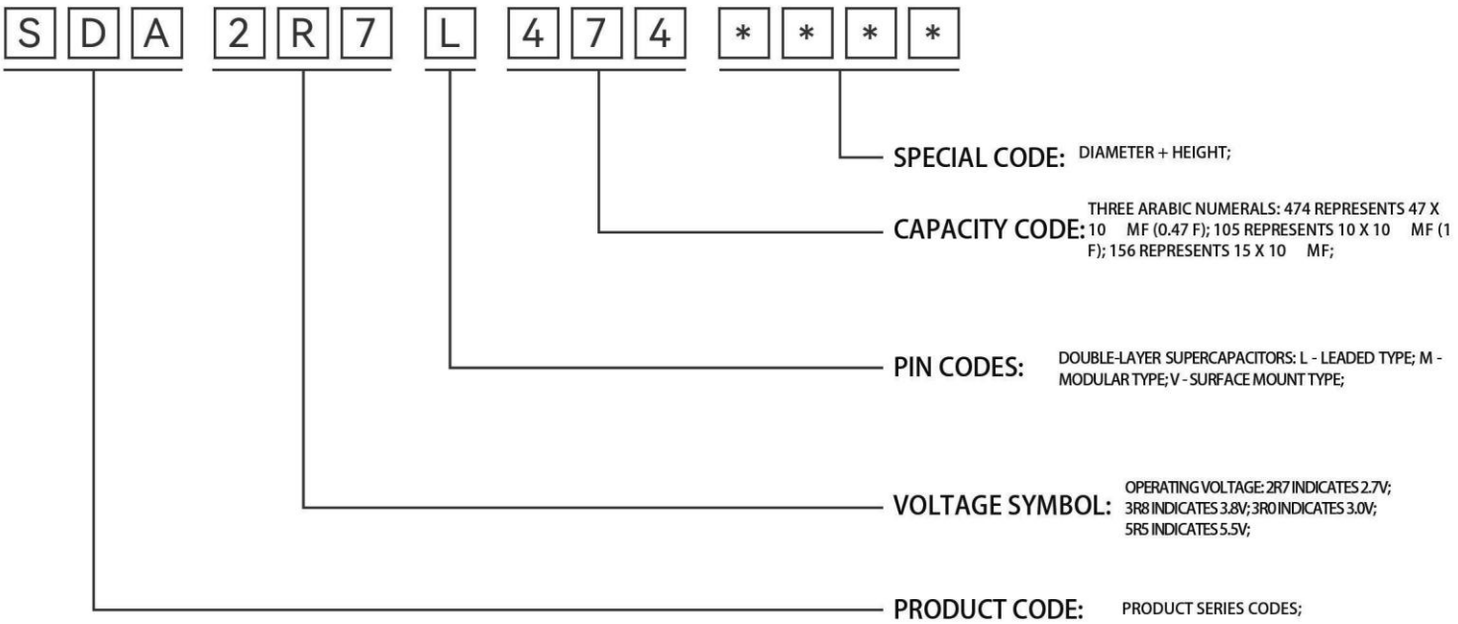
	SDM	High Energy, High Power Products, Sleeves	-40	+70	0.1~30	5.5 , 7.5	1000		24
	SM	High Energy, High Power Products, Potting Compounds	-40	+70	0.1~5.0	5.5 , 6.0	1000		26
Custom Module	SDM	EDLC Custom Modules	Customer needs		Customer needs	Customer needs	Customer needs		/
	SLM	LIC Custom Modules	Customer needs		Customer needs	Customer needs	Customer needs		/

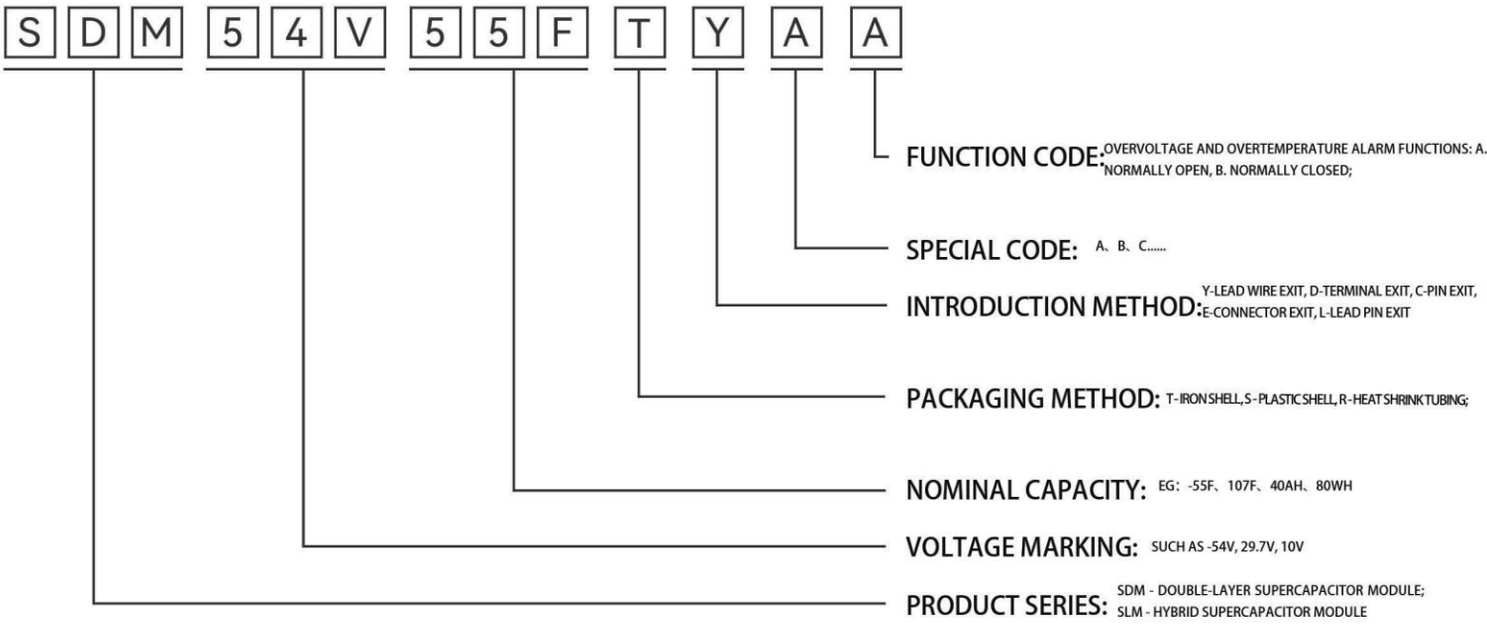
Product System Diagram



PRODUCT CODING RULES



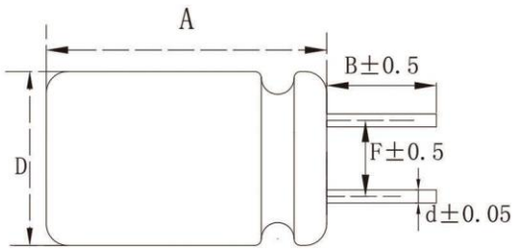
LARGE MODULE PRODUCT SPECIFICATION /MODEL CODING RULES



Cutting and braiding product specifications

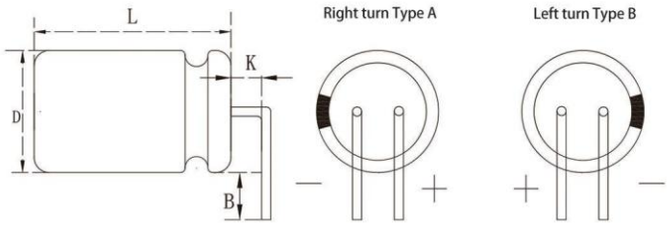
This specification applies to the leaded and taped supercapacitor products manufactured by our company, including technical requirements, judgment criteria, and acceptance specifications.

Lead cutting diagram A



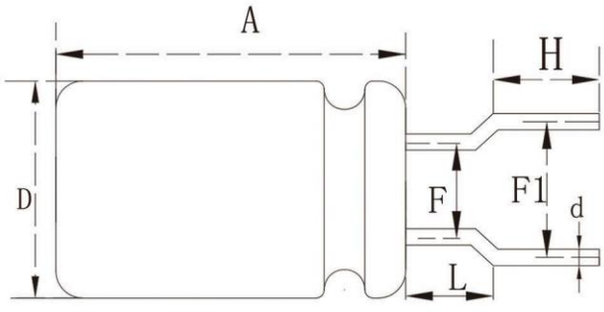
D	5	6.3	8	10	12.5	16	18	ERROR
B	2.5~10							±0.5
d	0.5		0.6			0.8		±0.05
F	2.0	2.5	3.5	5.0		7.5		±0.5

Lead wire cutting and forming diagram F (forming bend 90°)



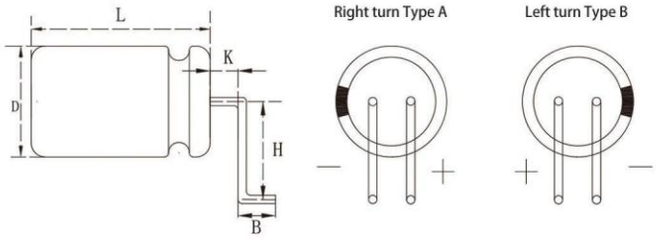
D	Φ5~Φ12.5	Φ16~Φ18	ERROR
K	2.0	2.5	±0.5
B	2.0~10		±0.5
TYPE	Right turn Type A / Left turn Type B		/

Lead cutting diagram G



D	Φ5			Φ6.3		Φ8	ERROR
d	0.5			0.5		0.6	±0.05
F	2.0			2.5		3.5	±0.5
F1	2.5	3.5	5.0	3.5	5.0	5.0	±0.5
L	2.5			2.5		2.5	±0.5
H	2.0~10						±0.5

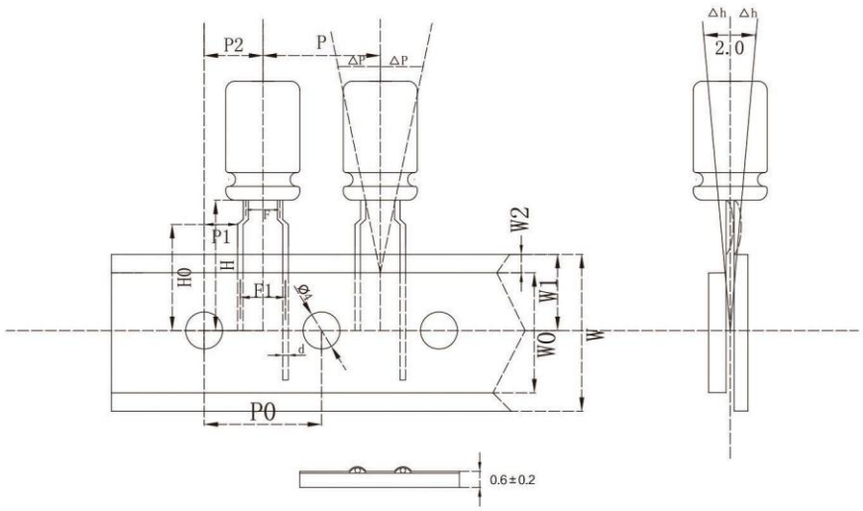
Lead wire cutting and forming H diagram (forming double bend 90°)



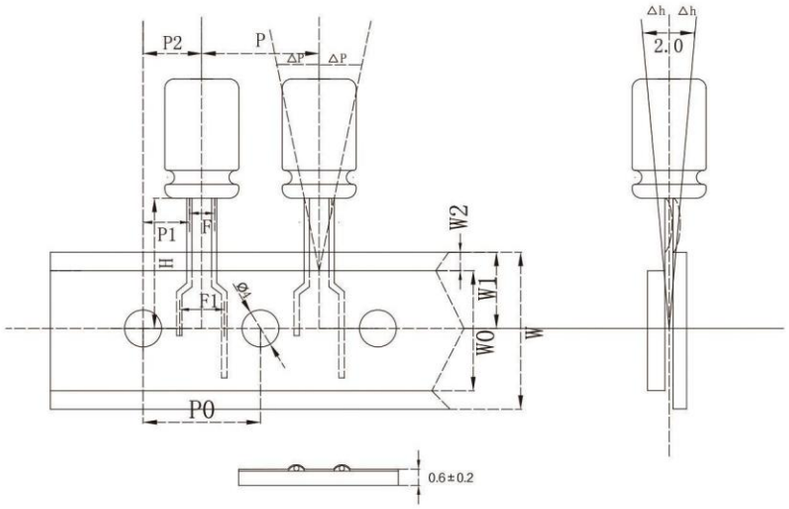
D	Φ5	Φ6.3	Φ8	Φ10	Φ12.5	ERROR
K	2.0	2.0	2.0	2.0	2.0	±0.5
H	7.0	7.0	7.0	7.0	7.0	±0.5
B	2.0~10					±0.5
TYPE	Right turn Type A / Left turn Type B					/

This specification applies to the leaded and taped supercapacitor products manufactured by our company, including technical requirements, judgment criteria, and acceptance specifications.

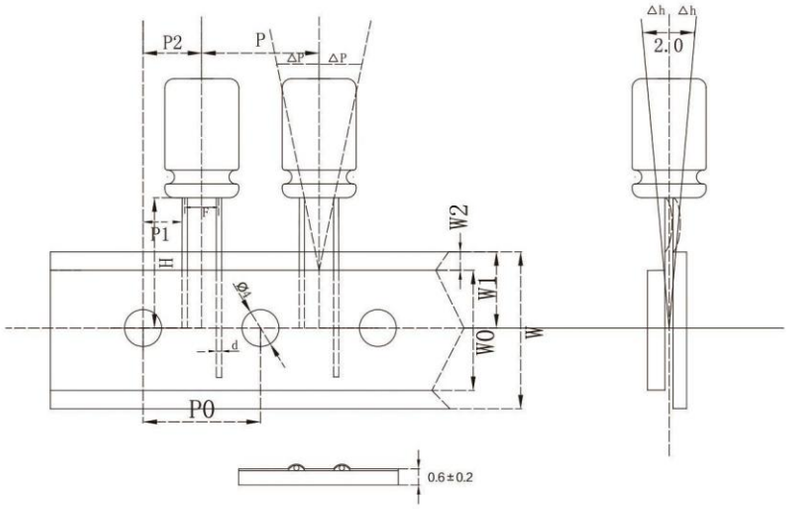
Braided tape external dimensions diagram A



Braided tape external dimensions diagram B



Φ4－Φ8

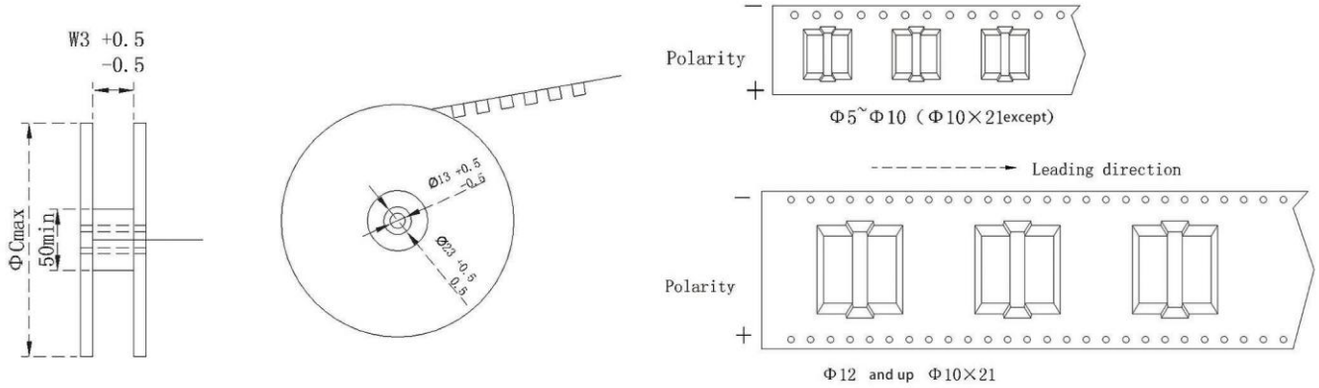


Φ10－Φ13

■ Tape and reel specifications

项目	记号	Φ3.55/Φ4		Φ5				Φ6.3/Φ7			Φ8		Φ10	Φ12.5	Φ13	ALLOWABLE DIFFERENCE
LEAD WIRE PROCESSING MARKINGS		U7	T8	U1	U4	U5	T1	U2	U6	T2	U3	T3	T4	T5		
SHAPE AND DIMENSION DIAGRAM		imgA	imgB	imgA	imgA	imgA	imgB	imgA	imgA	imgB	imgA	imgB	imgB	imgB		
LEAD WIRE DIAMETER	Φd	0.45		0.5							0.5/0.6		0.6			±0.05
MAIN BODY SPACING	P	12.7												15		±1.0
PERFORATION SPACING	P0	12.7												15		±0.2
PERFORATION AND LEAD WIRE SPACING	P1	5.1	5.6	3.85	5.1	4.6	5.35	3.85	4.6	5.1	3.85	4.6	3.85	5.0		±0.7
PERFORATION AND MAIN BODY SPACING	P2	6.35												7.5		±1.0
LEAD WIRE SPACING	F1	2.5	5.0	5.0	2.5	3.5	5.0	5.0	3.5	5.0	5.0	5.0	5.0			+0.8~-0.2
LEAD WIRE SPACING	F	1.5		2.0				2.5			3.5		5.0			±0.5
BACKING PAPER WIDTH	W	18.0														±0.3
TAPE WIDTH	W0	12.5														MIN
PERFORATION AND BACKING PAPER SPACING	W1	9.0														±0.5
TAPE AND BACKING PAPER SPACING	W2	2.0~3.0									0.5~2.0					/
LOWER BODY POSITION	H	18.5														±0.75
LEAD WIRE BENDING HEIGHT	H0	16	--	16			--	16		--	16	--				±0.5
PERFORATION DIAMETER	ΦD0	4.0														±0.3
MAIN BODY TILT ANGLE	Δh	1.0														MAX
MAIN BODY TILT ANGLE	Δp	1.0														MAX
TOTAL BRAIDING THICKNESS	t	0.6														±0.2
PACKAGING QUANTITY		3000		2100				1700			984/1000		672	440	420	

■ Packaging quantity table and tray dimensions for surface mount double-layer supercapacitors



size	W3 (mm)	ΦC (mm)	Material tray / (pcs)	Inner box		Outer box	
				Number of trays (pieces)	Maximum packaging quantity: pcs/box	Number of inner boxes (pieces)	Maximum packaging quantity: pcs/box
Φ5×5.4~5.8	14	382	1200	8	9600	3	28800
Φ6.3×5.4~5.8	18	382	1200	6	7200	3	21600
Φ6.3×7.7	18	382	900	6	5400	3	16200
Φ6.3×10	18	382	700	6	4200	3	12600
Φ8×10	26	382	500	5	2500	3	7500
Φ8×12.5	26	382	400	5	2000	3	6000
Φ10×10	26	382	500	5	2500	3	7500
Φ10×12~13.5	26	382	400	5	2000	3	6000
Φ10×14.5	26	382	350	5	1750	3	5250
Φ10×16.5(17)	26	382	350	5	1750	3	5250
Φ10×21	34	382	175	4	700	3	2100
Φ12.5×13.5(14)	34	382	250	4	1000	3	3000
Φ12.5×16.5(17)	34	382	200	4	800	3	2400
Φ12.5×21	34	382	175	4	700	3	2100

■ Hybrid supercapacitor long-leg products

size	Quantity of individual packages (PCS)	Medium package quantity (PCS)	Bulk package quantity (PCS)	Packaging
Φ3.55*7	500	1000	2000	Carrier tape
Φ4*9	500	1000	2000	Carrier tape
Φ4*12	500	1000	2000	Carrier tape
Φ5*11	500	1000	2000	Carrier tape
Φ6.3*11	500	1000	2000	Carrier tape
Φ6.3*13	500	1000	2000	Carrier tape
Φ8*13	400	800	1600	Carrier tape
Φ8*16	400	800	1600	Carrier tape
Φ8*20	400	800	1600	Carrier tape
Φ8*25	400	800	1600	Carrier tape
Φ10*16	300	600	1200	Carrier tape
Φ10*20	300	600	1200	Carrier tape
Φ10*25	300	600	1200	Carrier tape
Φ10*30	/	450	900	Carrier tape
Φ10*35	/	450	900	Carrier tape
Φ10*40	/	450	900	Reel loading
Φ10*45	/	450	900	Reel loading
Φ12.5*13	200	400	800	Reel loading
Φ12.5*20	200	400	800	Reel loading
Φ12.5*25	/	330	660	Carrier tape
Φ12.5*30	/	330	660	Carrier tape
Φ12.5*35	/	330	660	Reel loading
Φ12.5*40	/	330	660	Reel loading
Φ16*20	/	240	480	Reel loading
Φ16*30	/	240	480	Reel loading
Φ16*35	/	240	480	Reel loading
Φ16*40	/	240	480	Reel loading
Φ18*40	/	240	480	Reel loading
Φ18*50	/	240	480	Reel loading
Φ22*55	/	210	420	Reel loading

■ Lead-type double-layer supercapacitor

size	Quantity of individual packages (PCS)	Medium package quantity (PCS)	Bulk package quantity (PCS)	Packaging
Φ4*12	1000	8000	48000	Bagged.
Φ5*12	1000	6000	36000	Bagged.
Φ6.3*9	1000	8000	32000	Bagged.
Φ6.3*11	1000	4000	24000	Bagged.
Φ6.3*15	1000	5000	20000	Bagged. B
Φ6.3*22	750	3750	15000	agged.
Φ8*9	500	6000	24000	Bagged.
Φ8*11.5	500	4000	16000	Bagged.
Φ8*13	500	4000	16000	Bagged.
Φ8*16	500	3000	12000	Bagged.
Φ8*20	500	2500	10000	Bagged.
Φ8*25	400	1600	6400	Bagged.
Φ10*13	500	2500	10000	Bagged.
Φ10*16	500	2000	8000	Bagged.
Φ10*20	250	1750	7000	Bagged.
Φ10*25	250	1000	6000	Bagged.
Φ12.5*20	100	800	4800	Bagged.
Φ12.5*25	100	800	3200	Bagged.
Φ12.5*30	100	800	3200	Bagged.
Φ16*25	/	176	1056	Bagged.
Φ16*30	/	176	1056	Bagged.
Φ16*35	/	176	1056	Bagged.
Φ18*40	/	140	560	Display box.
Φ18*50	/	140	560	Display box.
Φ22*45	/	66	396	Display box.
Φ22*50	/	66	396	Display box.
Φ22*55	/	66	396	Display box.

■ Surface mount double-layer supercapacitor

size	Quantity of individual packages (PCS)	Medium package quantity (PCS)	Bulk package quantity (PCS)	Packaging
Φ5*5.8	1200	9600	28800	Disc
Φ6.3*5.8	1200	7200	21600	Disc
Φ6.3*10	700	4200	12600	Disc
Φ8*10	500	2500	7500	Disc
Φ8*12.5	400	2000	6000	Disc
Φ8*16	350	1750	5250	Disc
Φ10*10	500	2500	7500	Disc
Φ10*12/13.5	400	2000	6000	Disc
Φ10*14.5/16	350	1750	5250	Disc
Φ12.5*13/15	250	1000	3000	Disc
Φ12.5*16	220	880	2640	Disc
Φ12.5*21	175	700	2100	Disc

■ Modular long-leg products

size	Quantity of individual packages (PCS)	Medium package quantity (PCS)	Bulk package quantity (PCS)	Packaging
10*5*12	500	2000	12000	Bagged
13*6.3*12	500	2000	12000	Bagged
16*8*14	250	1250	5000	Bagged
16*8*18	250	1250	5000	Bagged
16*8*22	250	1250	5000	Bagged
16*8*27	200	1000	4000	Bagged
20*10*22	125	500	3000	Bagged
20*10*27	100	400	2400	Bagged
25*12.5*22	50	400	1600	Bagged
25*12.5*27	50	300	1200	Bagged
25*12.5*32	50	300	1200	Bagged
24*8*14	150	750	3000	Bagged
24*8*18	150	750	3000	Bagged
24*8*22	150	750	3000	Bagged

SLA

◆ Hybrid supercapacitor (LIC), 3.8V, 1000-hour lifespan, cycle life exceeding 250,000 cycles.

◆ Excellent temperature characteristics: Chargeable at -20℃, dischargeable at +85℃, applicable temperature range: -20℃ to +85℃.

◆ High current operating capability: Continuous charging at 20C, continuous discharging at 30C, instantaneous discharging at 50C.

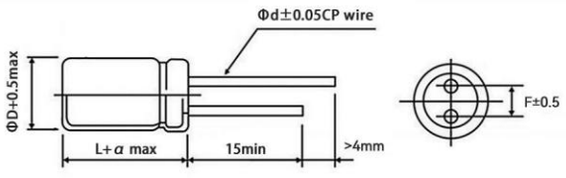
◆ Ultra-low self-discharge characteristics, with a capacitance 10 times that of double-layer capacitors of the same volume.

◆ Safety: Safe materials, non-explosive, non-flammable, compliant with RoHS and REACH directives.

■ Main technical parameters

project	characteristic	
Operating temperature range	-20~+85℃	
Rated operating voltage	3.8V~2.5V, Maximum charging voltage 4.2V	
Nominal capacity range	15F~1500F	
Normal temperature capacity deviation	-10%~+30%（25℃）	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open.	Average self-discharge ≤1.5mV/day (test period over 30 days)
Cycle charge-discharge life	At 25° C, the capacitor was cyclically charged and discharged 250,000 times between 3.8V and 2.5V using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times the initial value.
Optimal storage environment	-10℃ to 40℃, below 60%RH	

■ External dimensions



L≦16	α=1.5
L>16	α=2.0

D	6.3	8	10	12.5	16	18	22
d	0.5	0.6	0.6	0.6	0.8	1.0	1.0
F	2.5	3.5	5	5	7.5	7.5	10

■ Main uses

◆Internet of Things (IoT)◆ETC (OBU)◆Dashcam

◆AGV (Automated Guided Vehicle)◆Wireless Charging Home Remote Control

◆Smart Meter Market Combining with Primary Lithium Batteries (Water Meters, Gas Meters, Heat Meters)

◆Applications in Communication Subsidy Power Supplies/GPS Tracking Subsidy Power Supplies

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	Capacity (3.8~2.5V) (mAH)	72h Leakage Current (μA)	Maximum discharge current		Maximum charging voltage / Maximum charging current	Product Number
							continuous current	Pulse current		
SLA	3.8	15	6.3x13	800	5	2	0.1A	0.5A	4.2V/200mA	SLA3R8O1560613
	3.8	20	8x13	500	10	2	0.1A	0.5A	4.2V/200mA	SLA3R8O2060813
	3.8	40	8x20	200	15	3	0.2A	1.0A	4.2V/300mA	SLA3R8O4060820
	3.8	50	6.3x38	180	18	4	0.22A	2.0A	4.2V/400mA	SLA3R8O5060638
	3.8	50	8x25	180	18	4	0.22A	2.0A	4.2V/400mA	SLA3R8O5060825
	3.8	60	10x16	160	20	4	0.22A	3.0A	4.2V/500mA	SLA3R8O6061016
	3.8	80	10x20	150	30	5	0.25A	3.0A	4.2V/500mA	SLA3R8O8061020
	3.8	120	10x30	100	45	5	0.5A	5.0A	4.2V/1.0A	SLA3R8O1271030
	3.8	120	12.5x20	100	45	5	0.5A	5.0A	4.2V/1.0A	SLA3R8O1271320
	3.8	150	10x35	100	55	5	0.6A	6.0A	4.2V/1.5A	SLA3R8O1571035
	3.8	180	10x40	100	65	5	0.7A	8.0A	4.2V/1.5A	SLA3R8O1871040
	3.8	200	12.5x30	80	70	5	0.7A	8.0A	4.2V/1.5A	SLA3R8O2071330
	3.8	200	15x20	80	70	5	0.7A	8.0A	4.2V/1.5A	SLA3R8O2071520
	3.8	200	10x45	80	70	5	0.7A	8.0A	4.2V/1.5A	SLA3R8O2071045
	3.8	250	12.5x35	50	90	6	0.8A	10.0A	4.2V/2.0A	SLA3R8O2571335
	3.8	250	16x20	50	90	6	0.8A	10.0A	4.2V/2.0A	SLA3R8O2571620
	3.8	300	12.5x40	50	100	8	1.0A	10.0A	4.2V/2.0A	SLA3R8O3071340
	3.8	400	16x30	50	140	8	1.5A	15.0A	4.2V/2.0A	SLA3R8O4071630
	3.8	450	16x35	50	160	8	1.5A	15.0A	4.2V/2.0A	SLA3R8O4571635
	3.8	500	16x40	40	180	10	2.0A	20.0A	4.2V/2.0A	SLA3R8O5071640
	3.8	750	18x40	25	300	12	3.0A	30.0A	4.2V/3.0A	SLA3R8O7571840
	3.8	1100	18x50	20	400	15	3.0A	30.0A	4.2V/3.0A	SLA3R8O1181850
	3.8	1500	22x55	18	550	20	5.0A	40.0A	4.2V/5.0A	SLA3R8O1582255

SLX

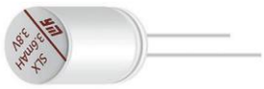
◆ Ultra-small hybrid supercapacitor (LIC), 3.8V, 1000-hour lifespan

◆ Ultra-low self-discharge characteristics

◆ 10 times the capacitance of double-layer capacitors of the same volume

◆ Enables fast charging, especially suitable for high-frequency use in small and micro devices

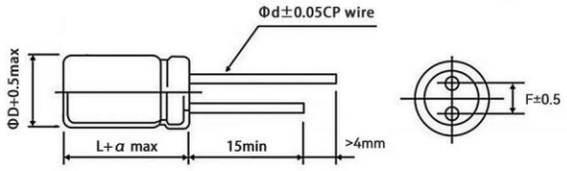
◆ Compliant with RoHS and REACH directives



■ Main technical parameters

project	characteristic	
Operating temperature range	-20~+85℃	
Rated operating voltage	3.8V~2.5V, Maximum charging voltage 4.2V	
Nominal capacity range	1.5F~20F	
Normal temperature capacity deviation	-10%~+30% (25℃)	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open.	Average self-discharge ≤1.5mV/day (test period over 30 days)
Cycle charge-discharge life	At 25° C, the capacitor was cyclically charged and discharged 250,000 times between 3.8V and 2.5V using a constant current.	
Optimal storage environment	-10℃ to 40℃, below 60%RH	

■ External dimensions



α=1.0

D	3.55	4	5	6.3
d	0.45	0.45	0.5	0.5
F	1.1	1.5	2	2.5

■ Main uses

◆Electronic wristbands ◆Wireless earphones, hearing aids ◆Bluetooth thermometers

◆Touchscreen styluses, mobile phone remote control styluses ◆Smart dimming sunglasses, electronic reversible glasses

◆Wearable electronic devices, wireless communication devices, IoT terminals, and other small devices

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	Capacity (3.8~2.5V) (mAH)	72h Leakage Current (μA)	Maximum discharge current		Maximum charging voltage / Maximum charging current	Product Number
							continuous current	Pulse current		
SLX	3.8	1.5	3.55x7	8000	0.5	2	15mA	50mA	4.2V/30mA	SLX3R8O1550307
	3.8	3	4x9	5000	1	2	30mA	100mA	4.2V/60mA	SLX3R8O3050409
	3.8	4	4x12	4000	1.4	2	40mA	150mA	4.2V/80mA	SLX3R8O4050412
	3.8	5	3.55x15	6000	2	2	25mA	80mA	4.2V/30mA	SLX3R8O5050315
	3.8	5	5x11	2000	1.8	2	50mA	200mA	4.2V/100mA	SLX3R8O5050511
	3.8	10	4x25	3000	3.6	3	80mA	300mA	4.2V/150mA	SLX3R8O1060425
	3.8	10	6.3x11	1500	3.6	3	80mA	300mA	4.2V/150mA	SLX3R8O1060611
	3.8	20	5x25	1000	7.5	3	150mA	500mA	4.2V/300mA	SLX3R8O2060525

SLR

◆ Hybrid Supercapacitor (LIC), 3.8V, 1000-hour lifespan

◆ Excellent low-temperature characteristics: Chargeable at -40° C, dischargeable at +70° C, applicable temperature range: -40° C to +70° C

◆ High current operating capability: Continuous charging at 20C, continuous discharging at 30C, instantaneous discharging at 50C

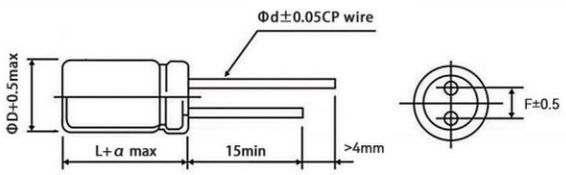
◆ Ultra-low self-discharge characteristics, 10 times the capacitance of double-layer capacitors of the same volume

◆ Safety: Safe materials, non-explosive, non-flammable, compliant with RoHS and REACH directives

■ Main technical parameters

project	characteristic	
Operating temperature range	-40~+70℃	
Rated operating voltage	3.8V~2.5V, Maximum charging voltage 4.2V	
Nominal capacity range	20F~1500F	
Normal temperature capacity deviation	-10%~+30%（25℃）	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open.	Average self-discharge ≤ 1.5mV/day (test period over 30 days)
Cycle charge-discharge life	At 25° C, the capacitor was cyclically charged and discharged 250,000 times between 3.8V and 2.5V using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	

■ External dimensions



L≦16	α=1.5
L>16	α=2.0

D	8	10	12.5	16	18	22
d	0.6	0.6	0.6	0.8	1.0	1.0
F	3.5	5.0	5.0	7.5	7.5	10

■ Main uses

◆Outdoor IoT

◆Smart meter market (water meters, gas meters, heat meters) combined with primary lithium batteries

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	Capacity (3.8~2.5V) (mAH)	72h Leakage Current (μA)	Maximum discharge current		Maximum charging voltage / Maximum charging current	Product Number
							continuous current	Pulse current		
SLR	3.8	20	8x13	500	10	2	0.1A	0.5A	4.2V/200mA	SLR3R8O2060813
	3.8	30	8x16	400	12	2	0.15A	0.6A	4.2V/250mA	SLR3R8O3060816
	3.8	40	8x20	200	15	3	0.2A	1.0A	4.2V/300mA	SLR3R8O4060820
	3.8	40	10x16	200	15	3	0.2A	1.0A	4.2V/300mA	SLR3R8O4061016
	3.8	50	10x20	180	18	4	0.22A	2.0A	4.2V/400mA	SLR3R8O5061020
	3.8	80	10x20	150	30	5	0.25A	3.0A	4.2V/500mA	SLR3R8O8061020
	3.8	100	10x30	120	40	5	0.3A	4.0A	4.2/800mA	SLR3R8O1071030
	3.8	120	10x30	100	45	5	0.5A	5.0A	4.2V/1.0A	SLR3R8O1271030
	3.8	120	12.5x20	100	45	5	0.5A	5.0A	4.2V/1.0A	SLR3R8O1271320
	3.8	150	10x35	100	55	5	0.6A	6.0A	4.2V/1.5A	SLR3R8O1571035
	3.8	180	10x40	100	65	5	0.7A	8.0A	4.2V/1.5A	SLR3R8O1871040
	3.8	200	12.5x30	80	70	5	0.7A	8.0A	4.2V/1.5A	SLR3R8O2071330
	3.8	200	15x20	80	70	5	0.7A	8.0A	4.2V/1.5A	SLR3R8O2071520
	3.8	200	10x45	80	70	5	0.7A	8.0A	4.2V/1.5A	SLR3R8O2071045
	3.8	250	12.5x35	50	90	6	0.8A	10.0A	4.2V/2.0A	SLR3R8O2571335
	3.8	250	16x20	50	90	6	0.8A	10.0A	4.2V/2.0A	SLR3R8O2571620
	3.8	300	12.5x40	50	100	8	1.0A	10.0A	4.2V/2.0A	SLR3R8O3071340
	3.8	400	16x30	50	140	8	1.5A	15.0A	4.2V/2.0A	SLR3R8O4071630
	3.8	450	16x35	50	160	8	1.5A	15.0A	4.2V/2.0A	SLR3R8O4571635
	3.8	500	16x40	40	180	10	2.0A	20.0A	4.2V/2.0A	SLR3R8O5071640
	3.8	750	18x40	25	300	12	3.0A	30.0A	4.2V/3.0A	SLR3R8O7571840
	3.8	1100	18x50	20	400	15	3.0A	30.0A	4.2V/3.0A	SLR3R8O1181850
	3.8	1500	22x55	18	550	20	5.0A	40.0A	4.2V/5.0A	SLR3R8O1582255

SLD

◆ Hybrid Supercapacitor (LIC), 4.2V High Voltage Product

◆ High Energy Density Product: Rechargeable at -20° C, dischargeable at +70° C, applicable temperature range: -20° C to +70° C

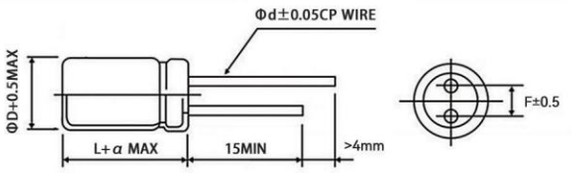
◆ Ultra-low self-discharge characteristics, capacitance is 15 times that of double-layer capacitors of the same volume

◆ Safety: Safe materials, non-explosive, non-flammable, compliant with RoHS and REACH directives

■ Main technical parameters

project	characteristic	
Operating temperature range	-20~+70℃	
Rated operating voltage	4.2V~2.5V	
Nominal capacity range	30F~1300F	
Normal temperature capacity deviation	-10%~+30% (25℃)	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open.	Average self-discharge ≤ 1.5mV/day (test period over 30 days)
Cycle charge-discharge life	At 25° C, the capacitor was cyclically charged and discharged 250,000 times between 3.8V and 2.5V using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	

■ External dimensions



L≦16	α=1.5
L>16	α=2.0

D	5	6.3	8	10	12.5	16	18
d	0.5	0.5	0.6	0.6	0.6	0.8	1.0
F	2	2.5	3.5	5.0	5.0	7.5	7.5

■ Main uses

◆Electronic cigarettes ◆Digital electronic products ◆Replacement for rechargeable batteries

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	Capacity (3.8~2.5V) (mAH)	72h Leakage Current (μA)	Maximum discharge current		Maximum charging voltage / Maximum charging current	Product Number
							continuous current	Pulse current		
SLD	4.2	30	5x35	1500	12	3	0.08 A	0.4 A	4.2V/0.2A	SLD4R2O3060535
	4.2	40	6.3x22	1200	15	4	0.12 A	0.5 A	4.2V/0.2A	SLD4R2O4060622
	4.2	70	8x25	500	30	4	0.15 A	0.6 A	4.2V/0.3A	SLD4R2O7060825
	4.2	100	10x20	300	40	5	0.20 A	0.9 A	4.2V/0.4A	SLD4R2O1071020
	4.2	120	10x25	200	50	5	0.25 A	1.0 A	4.2V/0.5A	SLD4R2O1271025
	4.2	150	10x30	150	60	6	0.35 A	1.5 A	4.2V/0.7A	SLD4R2O1571030
	4.2	200	10x35	100	80	6	0.45 A	2.0 A	4.2V/0.9A	SLD4R2O2071035
	4.2	300	10x40	80	120	8	0.70 A	2.5 A	4.2V/1.5A	SLD4R2O3071040
	4.2	400	10x45	70	160	8	0.90 A	3.5 A	4.2V/1.8A	SLD4R204071045
	4.2	500	12.5x35	60	200	10	1.0 A	4.5 A	4.2V/2.0A	SLD4R2O5071335
	4.2	750	12.5x50	50	300	20	1.5 A	6.5 A	4.2V/3.0A	SLD4R2O7571350
	4.2	1100	16x50	40	450	25	2.5 A	10 A	4.2V/5.0A	SLD4R2O1181650
	4.2	1300	18x40	30	550	30	3.0 A	12 A	4.2V/6.0A	SLD4R2O1381840

SLA(H)

◆ Hybrid Supercapacitor (LIC), 3.8V, 1000-hour lifespan, automotive-grade hybrid supercapacitor

◆ Excellent temperature characteristics: Chargeable at -40℃, dischargeable at +90℃, applicable temperature range: -40℃ to +90℃

◆ High current operating capability: Continuous charging at 20C, continuous discharging at 30C, instantaneous discharging at 50C

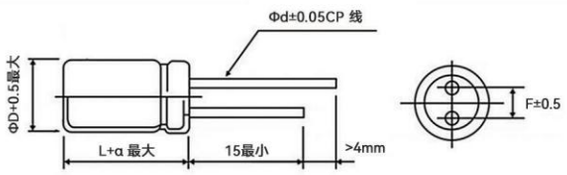
◆ Ultra-low self-discharge characteristics, 10 times the capacitance of double-layer capacitors of the same volume

◆ Safety: Safe materials, non-explosive, non-flammable, compliant with AEC-Q200, RoHS, and REACH directives.

■ Main technical parameters

project	characteristic	
Operating temperature range	-40~+90℃	
Rated operating voltage	3.8V~2.5V	
Nominal capacity range	15F~300F	
Normal temperature capacity deviation	-10%~+30% (25℃)	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open.	Average self-discharge ⩽1.5mV/day (test period over 30 days)
Cycle charge-discharge life	At 25° C, the capacitor was cyclically charged and discharged 250,000 times between 3.8V and 2.5V using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	
Product Certification	Compliant with AEC-Q200 requirements	

■ External dimensions



L≦16	α=1.5
L>16	α=2.0

D	6.3	8	10	12.5
d	0.5	0.6	0.6	0.6
F	2.5	3.5	5	5

■ Main uses

◆ETC(OBU) ◆Dashcam ◆T-BOX ◆Vehicle monitoring

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	Capacity (3.8~2.5V) (mAH)	72h Leakage Current (μA)	Maximum discharge current		Maximum charging voltage / Maximum charging current	Product Number
							continuous current	Pulse current		
SLA(H)	3.8	15	6.3×13	800	5	2	100mA	0.5A	4.2V/200mA	SLAH3R8O1560613
	3.8	20	8×13	500	10	2	100mA	0.5A	4.2V/200mA	SLAH3R8O2060813
	3.8	40	8×20	200	15	3	200mA	1.0A	4.2V/300mA	SLAH3R8O4060820
	3.8	60	12.5×13	160	20	4	220mA	3.0A	4.2V/500mA	SLAH3R8O6061313
	3.8	80	10×20	150	30	5	250mA	3.0A	4.2V/500mA	SLAH3R8O8061020
	3.8	120	10×30	100	45	5	500mA	5.0A	4.2V/1.0A	SLAH3R8O1271030
	3.8	120	12.5×20	100	45	5	500mA	5.0A	4.2V/1.0A	SLAH3R8O1271320
	3.8	150	10×35	100	55	5	600mA	6.0A	4.2V/1.5A	SLAH3R8O1571035
	3.8	180	10×40	100	65	5	700mA	8.0A	4.2V/1.5A	SLAH3R8O1871040
	3.8	200	12.5×30	80	70	5	700mA	8.0A	4.2V/1.5A	SLAH3R8O2071330
	3.8	250	12.5×35	50	90	6	800mA	10.0A	4.2V/2.0A	SLAH3R8O2571335
	3.8	250	16×20	50	90	6	800mA	10.0A	4.2V/2.0A	SLAH3R8O2571620
	3.8	300	12.5×40	50	100	8	1.0A	10.0A	4.2V/2.0A	SLAH3R8O3071340

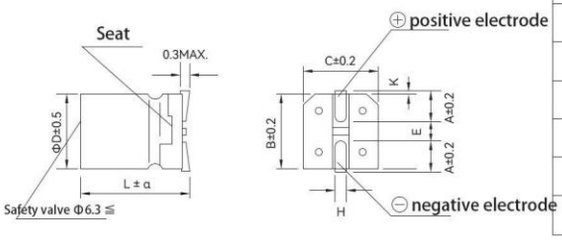
SDV

- ◆ 2.7V and 3.0V SMD surface mount
- ◆ 70℃ 1000-hour lifespan
- ◆ Can withstand two reflow soldering cycles at 250℃ (less than 5 seconds)
- ◆ High energy, high power, long charge/discharge cycle life
- ◆ Compliant with RoHS and REACH directives

■ Main technical parameters

project	characteristic	
Operating temperature range	-25~+70℃	
Rated operating voltage	2.7V、3.0V	
Nominal capacity range	0.1F~7.0F	
Normal temperature capacity deviation	-10%~+30%（25℃）	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open.	Average self-discharge ≤1.5mV/day (test period over 30 days)
Cycle charge-discharge life	At 25° C, the capacitor was cyclically charged and discharged 250,000 times between 3.8V and 2.5V using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	
Reflow soldering requirements	Reflow soldering at 250℃ for less than 5 seconds	

■ External dimensions



ΦD	L	B	C	A	H	E	K	α
5	10	5.3	5.3	2.1	0.75±0.10	1.3	0.7MAX	±0.5
6.3	12	6.6	6.6	2.6	0.75±0.10	1.8	0.7MAX	±0.5
8	12.5	8.3	8.3	3.0	0.90±0.20	3.1	0.7MAX	±0.5
10	13	10.3	10.3	3.5	0.90±0.20	4.6	0.7MAX	±0.5
10	21	10.3	10.3	3.5	0.90±0.20	4.6	0.7MAX	±0.5
12.5	13.5	13	13	4.7	0.90±0.30	4.4	0.7MAX	±1.0

■ Main uses

- ◆Energy Storage: Smart meters/Security equipment/Communication equipment/Rice cookers/Wired controllers/Small appliances
- ◆Backup Power: IoT data terminals/Vehicle devices/Dashcams/Vacuum switches/Fire lights/3D printers/Digital cameras
- ◆High Current Operation: Smart grid control/Wireless transmission

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	Product Number
SDV	2.7/3.0	0.1	5×5.8	8000	SDV2R7V1040506/SDV3R0V1040506
	2.7/3.0	0.22	6.3×5.8	8000	SDV2R7V2240606/SDV3R0V2240606
	2.7/3.0	0.5	6.3×10	4000	SDV2R7V5040610/SDV3R0V5040610
	2.7/3.0	1	8×10	2000	SDV2R7V1050810/SDV3R0V1050810
	2.7/3.0	1.5	8×12.5	1500	SDV2R7V1550813/SDV3R0V1550813
	2.7/3.0	2	10×10	1000	SDV2R7V2051010/SDV3R0V2051010
	2.7/3.0	2.5	10×14	1000	SDV2R7V2551014/SDV3R0V2551014
	2.7/3.0	3	10×16	800	SDV2R7V3051016/SDV3R0V3051016
	2.7/3.0	5	12.5×14	500	SDV2R7V5051314/SDV3R0V5051314
	2.7/3.0	7	12.5×21	300	SDV2R7V7051321/SDV3R0V7051321

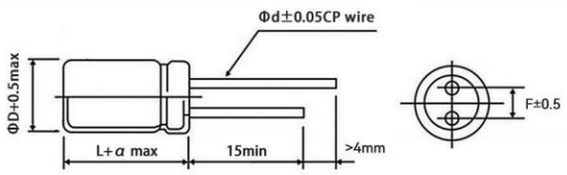
SDA

- ◆ 2.7V standard wound type
- ◆ 70℃ 1000-hour lifespan
- ◆ High energy, high power, long charge/discharge cycle life
- ◆ Compliant with RoHS and REACH directives

■ Main technical parameters

project	characteristic	
Operating temperature range	-40~+70℃	
Rated operating voltage	2.7V	
Nominal capacity range	1.0F~160F	
Normal temperature capacity deviation	-10%~+30% (25℃)	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open.	Average self-discharge ≤1.5mV/day (test period over 30 days)
Cycle charge-discharge life	At 25° C, the capacitor was cyclically charged and discharged 250,000 times between 3.8V and 2.5V using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	

■ External dimensions



L≦16	α=1.5
L>16	α=2.0

D	8	10	12.5	16	18	22
d	0.6	0.6	0.6	0.8	0.8	0.8
F	3.5	5	5	7.5	7.5	10

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	72h Leakage Current (μA)	Continuous current (A)	Peak current (A)	Stored energy (J)	Product Number
SDA	2.7	1	8x11.5	200	3	0.25	1.04	3.6	SDA2R7L1050812
	2.7	2	8x13	180	4	0.49	1.75	7.3	SDA 2R7L2050813
	2.7	3.3	8x20	120	6	0.80	2.79	12.0	SDA2R7L3350820
	2.7	3.3	10x13	100	6	0.81	2.98	12.0	SDA2R7L3351013
	2.7	5	10x20	80	10	1.21	4.22	18.2	SDA2R7L5051020
	2.7	7	10x20	70	14	1.65	5.45	25.5	SDA2R7L7051020
	2.7	10	10x25	60	20	2.29	7.11	36.5	SDA2R7L1061025
	2.7	10	12.5x20	50	20	2.35	7.71	36.5	SDA2R7L1061320
	2.7	15	12.5x25	40	30	3.43	10.66	54.7	SDA2R7L1561325
	2.7	20	12.5x30	35	40	4.46	13.17	72.9	SDA2R7L2061330
	2.7	25	16x25	30	50	5.51	15.88	91.1	SDA2R7L2561625
	2.7	30	16x30	30	60	6.38	17.23	109.4	SDA2R7L3061630
	2.7	35	16x35	28	70	7.30	19.13	127.6	SDA2R7L3561635
	2.7	40	18x40	25	80	8.31	21.60	145.8	SDA2R7L4061840
	2.7	50	18x40	20	100	10.38	27.00	182.3	SDA2R7L5061840
	2.7	60	18x40	20	120	11.91	28.93	218.7	SDA2R7L6061840
	2.7	70	18x50	18	140	13.72	32.70	255.2	SDA2R7L7061850
	2.7	100	22x45	16	160	18.24	39.71	364.5	SDA2R7L1072245
	2.7	120	22x50	15	180	21.04	43.78	437.4	SDA2R7L1272250
	2.7	160	22x55	14	200	25.84	49.54	583.2	SDA2R7L1672255

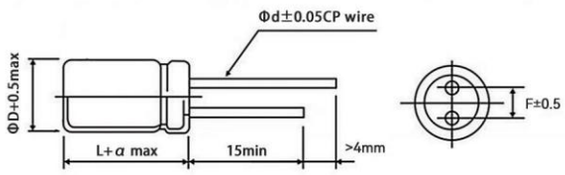
SDB

- ◆ 3.0V standard wound type
- ◆ 70℃ 1000-hour product
- ◆ High energy, high power, high voltage, long charge/discharge cycle life
- ◆ Compliant with RoHS and REACH directives

■ Main technical parameters

project	characteristic	
Operating temperature range	-40~+70℃	
Rated operating voltage	3.0V	
Nominal capacity range	1.0F~160F	
Normal temperature capacity deviation	-10%~+30% (25℃)	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open.	Average self-discharge ≤1.5mV/day (test period over 30 days)
Cycle charge-discharge life	At 25° C, the capacitor was cyclically charged and discharged 250,000 times between 3.8V and 2.5V using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	

■ External dimensions



L≦16	α=1.5
L>16	α=2.0

D	8	10	12.5	16	18	22
d	0.6	0.6	0.6	0.8	0.8	0.8
F	3.5	5	5	7.5	7.5	10

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	72h Leakage Current (μA)	Continuous current (A)	Peak current (A)	Stored energy (J)	Product Number
SDB	3	1	8x11.5	240	3	0.28	1.10	4.5	SDB3R0L1050812
	3	2	8x13	160	4	0.55	2.03	9.0	SDB3R0L2050813
	3	3.3	8x20	100	6	0.90	3.31	14.9	SDB3R0L3350820
	3	3.3	10x13	100	6	0.90	3.31	14.9	SDB3R0L3351013
	3	5	10x20	80	10	1.34	4.69	22.5	SDB3R0L5051020
	3	7	10x20	80	14	1.80	5.71	31.5	SDB3R0L7051020
	3	10	10x25	70	20	2.48	7.32	45.0	SDB3R0L1061025
	3	10	12.5x20	60	20	2.54	7.89	45.0	SDB3R0L1061320
	3	15	12.5x25	50	30	3.67	10.59	67.5	SDB3R0L1561325
	3	20	12.5x30	40	40	4.84	13.64	90.0	SDB3R0L2061330
	3	25	16x25	30	50	6.12	17.65	112.5	SDB3R0L2561625
	3	30	16x25	30	60	7.09	19.15	135.0	SDB3R0L3061625
	3	35	16x35	28	70	8.11	21.26	157.5	SDB3R0L3561635
	3	40	18x40	26	80	9.15	23.44	180.0	SDB3R0L4061840
	3	50	18x40	24	100	11.03	26.79	225.0	SDB3R0L5061840
	3	60	18x40	22	120	12.89	30.20	270.0	SDB3R0L6061840
	3	70	18x50	20	140	14.79	33.87	315.0	SDB3R0L7061850
	3	100	22x45	18	160	19.48	40.54	450.0	SDB3R0L1072245
	3	120	22x50	16	180	22.84	46.39	540.0	SDB3R0L1272250
	3	160	22x55	14	200	28.71	55.05	720.0	SDB3R0L1672255

SDS

◆Miniaturized 2.7V wound product

◆1000-hour lifespan at 70℃

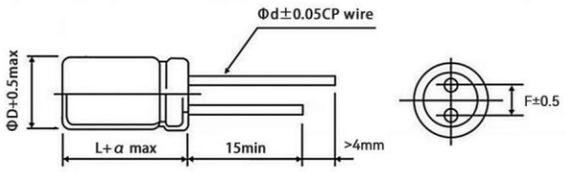
◆High energy density, miniaturized design, long charge/discharge cycle life

◆Compliant with RoHS and REACH directives

■ Main technical parameters

project	characteristic	
Operating temperature range	-40~+70℃	
Rated operating voltage	2.7V	
Nominal capacity range	0.5F~70F	
Normal temperature capacity deviation	-10%~+30% (25℃)	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open.	Average self-discharge ≤1.5mV/day (test period over 30 days)
Cycle charge-discharge life	At 25° C, the capacitor was cyclically charged and discharged 250,000 times between 3.8V and 2.5V using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	

■ External dimensions



L≦16	α=1.5
L>16	α=2.0

D	4.0	5.0	6.3	8	10	12.5	16	18
d	0.45	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	1.5	2.0	2.5	3.5	5	5	7.5	7.5

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	72h Leakage Current (μA)	Continuous current (A)	Peak current (A)	Stored energy (J)	Product Number
SDS	2.7	0.5	4x12	1200	2	0.11	0.36	1.8	SDS2R7L5040412
	2.7	0.5	5x9	1200	2	0.11	0.36	1.8	SDS2R7L5040509
	2.7	1	5x12	600	4	0.23	0.71	3.6	SDS2R7L1050512
	2.7	1	6.3x9	600	4	0.23	0.71	3.6	SDS2R7L1050609
	2.7	1.5	6.3x11	400	5	0.34	1.07	5.5	SDS2R7L1550611
	2.7	2	4x25	300	6	0.46	1.42	7.3	SDS2R7L2050425
	2.7	2	6.3x15	300	6	0.46	1.42	7.3	SDS2R7L2050615
	2.7	2	8.0x9	300	6	0.46	1.42	7.3	SDS2R7L2050809
	2.7	2.5	5x25	250	8	0.57	1.74	9.1	SDS2R7L2550525
	2.7	3	5x25	200	10	0.69	2.13	10.9	SDS2R7L3050525
	2.7	3.3	8.0x13	160	14	0.77	2.49	12.0	SDS2R7L3350813
	2.7	5	6.3x22	120	18	1.14	3.55	18.2	SDS2R7L5050622
	2.7	5	8.0x20	120	18	1.14	3.55	18.2	SDS2R7L5050820
	2.7	7	8x22	100	25	1.56	4.61	25.5	SDS2R7L7050822
	2.7	8	6.3x38	90	30	1.78	5.19	29.2	SDS2R7L8050638
	2.7	10	8x25	80	40	2.18	6.14	36.5	SDS2R7L1060825
	2.7	15	10x25	70	50	3.08	7.86	54.7	SDS2R7L1561025
	2.7	20	12.5x25	60	60	3.97	9.64	72.9	SDS2R7L2061325
	2.7	30	12.5x30	50	80	5.59	12.46	109.4	SDS2R7L3061330
	2.7	40	16x35	40	100	7.30	15.88	145.8	SDS2R7L4061635
	2.7	50	18x35	35	120	8.85	18.62	182.3	SDS2R7L5051835
	2.7	70	18x40	30	160	11.60	22.77	255.2	SDS2R7L7051840

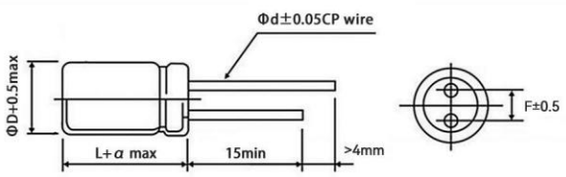
SDL

- ◆ Low-resistance 2.7V wound type product
- ◆ 70℃ 1000-hour product
- ◆ High energy, high power, low resistance, fast charge/discharge, long charge/discharge cycle life
- ◆ Compliant with RoHS and REACH directives

■ Main technical parameters

project	characteristic	
Operating temperature range	-40~+70℃	
Rated operating voltage	2.7V	
Nominal capacity range	1.0F~160F	
Normal temperature capacity deviation	-10%~+30% (25℃)	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open for 24 hours.	The residual voltage is greater than 80% of the rated voltage.
Cycle charge-discharge life	At 25° C, the capacitor was subjected to 500,000 cyclic charge-discharge cycles between its rated voltage and half-voltage using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	

■ External dimensions



L≦16	α=1.5
L>16	α=2.0

D	8	10	12.5	16	18	22
d	0.6	0.6	0.6	0.8	0.8	0.8
F	3.5	5	5	7.5	7.5	10

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	72h leakage current (μA)	Peak current (A)	Peak current (A)	Stored energy (J)	Product Number
SDL	2.7	1	8x11.5	160	2	0.26	1.09	3.6	SDL2R7L1050812
	2.7	2	8x13	120	4	0.50	1.99	7.3	SDL2R7L2050813
	2.7	3.3	8x20	80	6	0.83	3.19	12.0	SDL2R7L3350820
	2.7	3.3	10x16	70	6	0.83	3.31	12.0	SDL2R7L3351016
	2.7	5	10x20	60	10	1.24	4.66	18.2	SDL2R7L5051020
	2.7	7	10x20	50	14	1.71	6.20	25.5	SDL2R7L7051020
	2.7	10	10x25	40	20	2.41	8.44	36.5	SDL2R7L1061025
	2.7	10	12.5x20	35	20	2.44	8.85	36.5	SDL2R7L1061320
	2.7	15	12.5x25	30	30	3.57	12.09	54.7	SDL2R7L1561325
	2.7	20	12.5x30	28	40	4.62	14.67	72.9	SDL2R7L2061330
	2.7	25	16x25	26	50	5.65	17.09	91.1	SDL2R7L2561625
	2.7	30	16x30	24	60	6.66	19.47	109.4	SDL2R7LL3061630
	2.7	35	16x35	22	80	7.68	21.93	127.6	SDL2R7L3561635
	2.7	40	18x40	20	90	8.71	24.55	145.8	SDL2R7L4061840
	2.7	50	18x40	18	100	10.63	28.72	182.3	SDL2R7L5061840
	2.7	60	18x40	16	110	12.58	33.20	218.7	SDL2R7L6061840
	2.7	100	22x45	14	120	19.01	43.55	364.5	SDL2R7L1072245
	2.7	120	22x50	12	130	22.63	51.27	437.4	SDL2R7L1272250
	2.7	160	22x55	10	140	29.19	63.53	583.2	SDL2R7L1672255

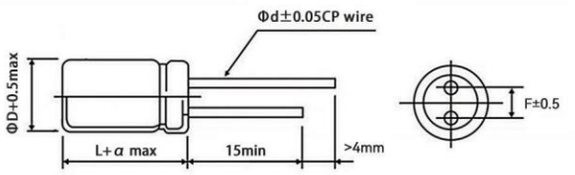
SDH

- ◆ High-temperature resistant 2.7V wound-type supercapacitors, automotive-grade double-layer supe
- ◆ 85℃ 1000-hour lifespan
- ◆ High energy, high power, higher temperature, long charge/discharge cycle life
- ◆ Compliant with AEC-Q200, RoHS, and REACH directives

■ Main technical parameters

project	characteristic	
Operating temperature range	-40~+85℃	
Rated operating voltage	2.7V	
Nominal capacity range	1.0F~70F	
Normal temperature capacity deviation	-10%~+30% (25℃)	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open for 24 hours.	The residual voltage is greater than 80% of the rated voltage.
Cycle charge-discharge life	At 25° C, the capacitor was subjected to 500,000 cyclic charge-discharge cycles between its rated voltage and half-voltage using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	
Product Certification	Compliant with AEC-Q200 requirements	

■ External dimensions



L≦16	α=1.5
L>16	α=2.0

D	8	10	12.5	16	18
d	0.6	0.6	0.6	0.8	0.8
F	3.5	5	5	7.5	7.5

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	72h leakage current (μA)	Continuous current (A)	Peak current (A)	Stored energy (J)	Product Number
SDH	2.7	1	8x11.5	160	4	0.26	1.09	3.6	SDH2R7L1050812
	2.7	2	8x13	120	5	0.50	1.99	7.3	SDH2R7L2050813
	2.7	3.3	8x20	80	8	0.83	3.19	12.0	SDH2R7L3350820
	2.7	3.3	10x13	70	8	0.83	3.31	12.0	SDH2R7L3351013
	2.7	5	10x20	60	15	1.24	4.66	18.2	SDH2R7L5051020
	2.7	7	10x20	50	20	1.71	6.20	25.5	SDH2R7L7051020
	2.7	10	10x25	40	30	2.41	8.44	36.5	SDH2R7L1061025
	2.7	10	12.5x20	35	30	2.44	8.85	36.5	SDH2R7L1061320
	2.7	15	12.5x25	30	40	3.57	12.09	54.7	SDH2R7L1561325
	2.7	20	12.5x30	28	50	4.62	14.67	72.9	SDH2R7L2061330
	2.7	25	16x25	25	60	5.68	17.42	91.1	SDH2R7L2561625
	2.7	30	16x30	24	70	6.66	19.47	109.4	SDH2R7L3061630
	2.7	35	16x35	22	80	7.68	21.93	127.6	SDH2R7L3561635
	2.7	40	18x40	20	90	8.71	24.55	145.8	SDH2R7L4061840
	2.7	50	18x40	18	110	10.63	28.72	182.3	SDH2R7L5061840
	2.7	60	18x40	16	130	12.58	33.20	218.7	SDH2R7L6061840
	2.7	70	18.0x50	15	150	14.37	36.70	255.2	SDH2R7L7061850

SDN

◆Snap-in type 2.7V/3.0V high energy density product

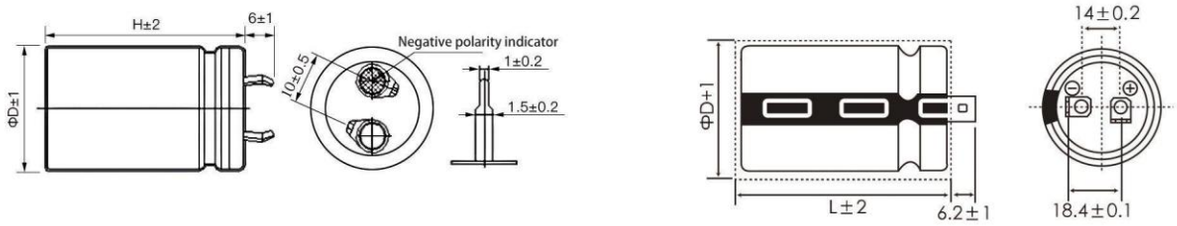
◆2.7V, 3.0V high voltage withstand/1000-hour product/capable of high current discharge

◆RoHS compliant

■ Main technical parameters

project	characteristic	
Operating temperature range	-40~+70℃	
Rated operating voltage	2.7V、3.0V	
Nominal capacity range	100F~600F	
Normal temperature capacity deviation	-10%~+30%（25℃）	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open for 24 hours.	The residual voltage is greater than 80% of the rated voltage.
Cycle charge-discharge life	At 25° C, the capacitor was subjected to 500,000 cyclic charge-discharge cycles between its rated voltage and half-voltage using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	

■ External dimensions



■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/20℃, AC 1kHz)	72h leakage current (μA)	Continuous current (A)	Peak current (A)	Stored energy (J)	Product Number
SDN	2.7/3.0	100	22x45	12	160	19.8/22.0	48.2/53.5	364.5/450.0	SDN2R7S1072245/SDN3R0S1072245
	2.7/3.0	160	22x55	10	200	29.1/32.4	63.5/70.5	583.2/720.0	SDN2R7S1672255/SDN3R0S1672255
	2.7/3.0	180	25x50	8	220	33.9437.7	76.9/85.4	656.1/810.0	SDN2R7S1872550/SDN3R0S1872550
	2.7/3.0	200	30x50	6	240	39.7/44.1	96.4/107.1	729.0/900.0	SDN2R7S2073050/SDN3R0S2073050
	2.7/3.0	240	30x50	6	260	45.2/50.2	102.5/113.9	874.8/1080.0	SDN2R7S2473050/SDN3R0S2473050
	2.7/3.0	250	30x55	6	280	46.5/51.7	103.8/115.3	911.2/1125.0	SDN2R7S2573055/SDN3R0S2573055
	2.7/3.0	330	30x55	4	320	63.8/70.9	149.4/166.1	1202.8/1485.0	SDN2R7S3373055/SDN3R0S3373055
	2.7/3.0	360	35x60	4	340	67.8/75.4	153.7/170.8	1312.2/1620.0	SDN2R7S3673560/SDN3R0S3673560
	2.7/3.0	400	35x60	3	400	79.4/88.2	192.8/214.2	1458.0/1800.0	SDN2R7S4073560/SDN3R0S4073560
	2.7/3.0	470	35x60	3	450	89.1/99.0	203.6/226.3	1713.1/2115.0	SDN2R7S4773560/SDN3R0S4773560
	2.7/3.0	500	35x65	3	500	93.1/103.4	207.6/230.7	1822.5/2250.0	SDN2R7S5073565/SDN3R0S5073565
	2.7/3.0	600	35x72	2.5	550	111.7/124.1	249.2/276.9	2187.0/2700.0	SDN2R7S6073572/SDN3R0S6073572

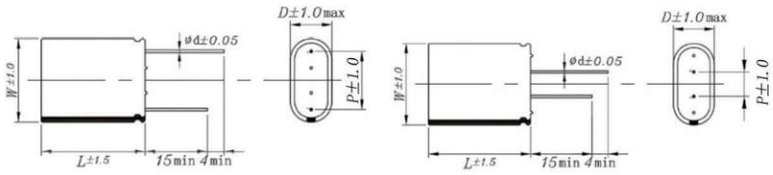
SDM

- ◆ High energy/high power/internal series structure
- ◆ Low internal resistance/long charge/discharge cycle life
- ◆ Low leakage current/suitable for use with other batteries
- ◆ Customized to meet different performance requirements
- ◆ Compliant with RoHS and REACH directives

■ Main technical parameters

project	characteristic	
Operating temperature range	-40~+70℃	
Rated operating voltage	5.5V、7.5V	
Nominal capacity range	0.1F~30F	
Normal temperature capacity deviation	-10%~+30%（25℃）	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open for 24 hours.	The residual voltage is greater than 80% of the rated voltage.
Cycle charge-discharge life	At 25° C, the capacitor was subjected to 500,000 cyclic charge-discharge cycles between its rated voltage and half-voltage using a constant current.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	

■ 2-cell module (5.5V) appearance diagram



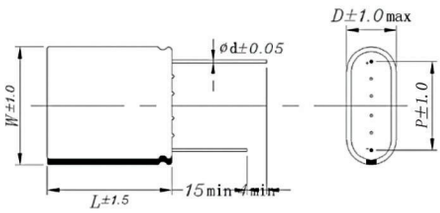
■ 2-cell module (5.5V) external dimensions

Monomer diameter	D	W	P		Φd
			Atype	Btype	
Φ5	5	10	7	/	0.5
Φ6.3	6.3	13	9	/	0.5
Φ8	8	16	11.5	4.5	0.6
Φ10	10	20	15.5	5.0	0.6
Φ12.5	12.5	25	17.5	7.5	0.6
Φ16	16	33	24	8.5	0.8
Φ18	18	37	26	10.5	0.8

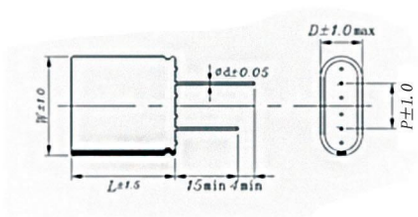
■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/, AC 1kHz)	72h leakage current (μA)	Product Number
SDM	5.5	0.1	10×5×12	1200	2	SDM5R5M1041012
	5.5	0.22	10×5×12	800	2	SDM5R5M2241012
	5.5	0.33	10×5×12	800	2	SDM5R5M3341012
	5.5	0.47	13×6.3×12	600	2	SDM5R5M4741312
	5.5	0.47	16×8×14	400	2	SDM5R5M4741614
	5.5	1	16×8×18	240	4	SDM5R5M1051618
	5.5	1.5	16×8×22	200	6	SDM5R5M1551622
	5.5	2.5	20×10×22	140	10	SDM5R5M2552022
	5.5	3.5	20×10×22	140	12	SDM5R5M3552022
	5.5	5	20×10×27	100	20	SDM5R5M5052027
	5.5	7.5	25×12.5×27	60	30	SDM5R5M7552527
	5.5	10	25×12.5×32	50	44	SDM5R5M1062532
	5.5	15	33×16×35	50	60	SDM5R5M1563335
	5.5	25	37×18×43	40	100	SDM5R5M2563743
	5.5	30	37×18×43	30	120	SDM5R5M3063743

■ 3-cell module (7.5V) appearance diagram



Atype



Btype

■ 3-cell module (7.5V) external dimensions

Monomer diameter	D	W	P		Φd
			Atype	Btype	
Φ8	8	24	20	13.5	0.6
Φ12.5	12.5	37.5	31	21	0.6
Φ16	16	49	25.5	21	0.8

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/, AC 1kHz)	72h leakage current (μA)	Product Number
SDM	7.5	0.33	24×8×14	600	2	SDM7R5M3342414
	7.5	0.6	24×8×18	420	4	SDM7R5M6042418
	7.5	1	24×8×22	240	6	SDM7R5M1052422
	7.5	1.5	30×10×22	210	10	SDM7R5M1553022
	7.5	2.5	30×10×27	150	16	SDM7R5M2553027
	7.5	3.3	30×10×27	150	20	SDM7R5M3353027
	7.5	5	37.5×12.5×27	90	30	SDM7R5M5053827

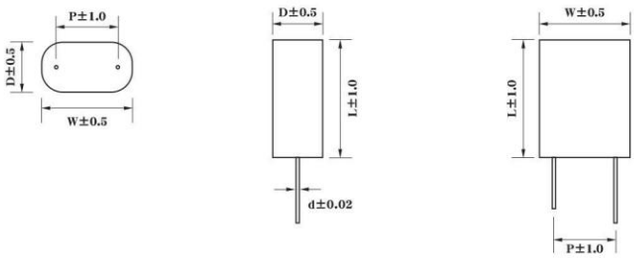
SM

- ◆ Epoxy resin encapsulation
- ◆ High energy/high power/internal series structure
- ◆ Low internal resistance/long charge/discharge cycle life
- ◆ Low leakage current/suitable for use with batteries
- ◆ Customized according to customer needs/meets different performance requirements

■ Main technical parameters

project	characteristic	
Operating temperature range	-40~+70℃ / -40~+85℃	
Rated operating voltage	5.5V、6.0V	
Nominal capacity range	0.1F~5.0F	
Normal temperature capacity deviation	-10%~+30% (25℃)	
High temperature load life	After continuously applying the rated voltage at the rated temperature for 1000 hours, the system is returned to 25° C for testing.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Steady-state damp heat life	After continuously applying the rated voltage for 240 hours at 40℃ and 90%~95%RH humidity, the test was conducted at 25℃.	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Self-discharge characteristics	After constant current charging to the rated voltage, charge at constant voltage for 8 hours, then let stand with the circuit open for 24 hours.	The residual voltage is greater than 80% of the rated voltage.
Cycle charge-discharge life	At 25° C, the capacitor was subjected to 500,000 cyclic charge-discharge cycles between its rated	The following requirements must be met: Capacity change ΔC is less than 30% of the initial value; Internal resistance is less than four times
Optimal storage environment	-10℃ to 40℃, below 60%RH	

■ External dimensions



■ Main uses

- ◆Suitable for smart meters (water, electricity, gas meters), concentrators
- ◆Smart grids and other supporting equipment

■ List of Standard Products

series	Rated voltage (V)	Capacitance (F)	Product dimensions: ΦD×L (mm)	ESR (mΩ/, AC 1kHz)	72h leakage current (μA)	Product Number		Foot spacing (mm)	Wire diameter (mm)
						5.5V	6.0V		
SM	5.5/6.0	0.1	11.5*6.5*13	1200	2	SM5R5M1041213	SM6R0M1041213	7.0	0.5
	5.5/6.0	0.22	14.0*8.0*13.5	800	2	SM5R5M0041414	SM6R0M0041414	9.0	0.5
	5.5/6.0	0.33	14.0*8.0*13.5	800	2	SM5R5M3341414	SM6R0M3341414	9.0	0.5
	5.5/6.0	0.5	17.5*9.5*16.0	400	2	SM5R5M5041816	SM6R0M5041816	11.5	0.6
	5.5/6.0	1	18.0*9.5*20	240	4	SM5R5M1051820	SM6R0M1051820	11.5	0.6
	5.5/6.0	1.5	18.0*9.5*23.6	200	6	SM5R5M1551824	SM6R0M1551824	11.5	0.6
	5.5/6.0	2.5	21.5*11.0*24.0	140	10	SM5R5M2552224	SM6R0M2552224	15.5	0.6
	5.5/6.0	3.5	21.5*11.0*24.0	120	15	SM5R5M3552224	SM6R0M3552224	15.5	0.6
	5.5/6.0	5	22.0*11.5*28.5	100	20	SM5R5M5052229	SM6R0M5052229	15.5	0.6

Product Application Positioning

Main application terminals	Product application requirements	Representative product specifications	Product advantages and application advantages
Vehicle-mounted – Dashcam	High power density and long lifespan	SDM-5.5V-2.5F 13*6.3*24	It exhibits excellent high and low temperature stability and extremely high safety, contributing to improved reliability, extended lifespan, and enhanced product safety.
		SDM-5.5V-5.0F 16*8*27	
Vehicle-mounted – Pre-installed ETC	Certified by AEC-Q200 for ultra-low self-discharge and long lifespan.	SLA(H)-3.8V-40F 8*20	
		SLA(H)-3.8V-80F 10*20	
Vehicle-mounted – Car Door Devices	High power density and long lifespan certified by AEC-Q200	SDH-2.7V-25F 16*25	
		SDH-2.7V-35F 16*30	
Vehicle-mounted – Surveillance System	Wide temperature range, safe, long cycle life	SDH-2.7V-5.0F 10*20	It replaces pouch batteries and other similar products, is resistant to high and low temperatures, has extremely high safety, extends the lifespan of the entire device, and eliminates safety hazards caused by the use of batteries.
		SDH-2.7V-10F 12.5*20	
Vehicle-mounted – Truck Lithium Battery One-button Start	High voltage, high energy density, and high parameter consistency	SDB-3.0V-30F 16*25	Its small size meets positive capacity requirements, facilitating miniaturization of the entire unit. It ensures worry-free low-temperature strong start-up, providing strong support for intelligent lithium batteries and enabling the "one-click strong start" function. This effectively solves the battery anxiety of heavy trucks and improves the vehicle's range.
		SDB-3.0V-25F 12.5*35	
Power Electronics – Guonan Power Grid Meters	Positive capacity, double 85 requirements, zero leakage	SM(G)-5.5V-1.5F 18.5*10*23.6	Dry electrode, 2000 hours of double 85 testing with zero leakage, long lifespan, meeting the 16-year service life of the whole machine, improving the overall reliability of the machine.
		SDB(G)-3.0V-3.3F 8*20	
Power Electronics - HPLC Carrier	Positive capacity, double 85 requirements, zero leakage	SDL(G)-2.7V-10F 10*25	Dry electrode, 1000 hours of double 85 testing with zero leakage, long lifespan, meeting the 16-year service life of the whole machine, improving the overall reliability of the machine.
Power Electronics - Concentrators	Positive capacity, double 85 requirements, zero leakage	SDM-6V-60F RCA	
		SDB-3.0V-160F 22*55	
Security - Combustible Gas Detectors	Extremely high capacitance and internal resistance accuracy, long lifespan	SDB-3.0V-1.5F 8*13	Capacity and internal resistance are tiered for delivery, and the dual 85 test ensures zero leakage after 1000 hours, guaranteeing a long lifespan for the entire unit and improving product safety.
		SDA-2.7V-2.0F 8*13	
Security - IPC Network Cameras	Reflow soldering, small size, no need to replace	SDV-3.0V-0.1F 5*5.8	It meets the requirements of 260℃ reflow soldering, enables surface mount technology, replaces imported 414 capacitors, fills the market gap for domestic surface mount supercapacitors, realizes automated surface mount production, improves product reliability, and increases production efficiency.
		SDV-3.0V-0.22F 6.3*5.8	
Security - Smart Doorbell	Ultra-low self-discharge, safe and environmentally friendly	SLA-3.8V-120F 10*30	High energy density, superior performance of polymer supercapacitors and batteries, no need for replacement or maintenance, ultra-long cycle life and excellent performance with wide temperature resistance, ensuring long-term stable operation of the whole product.
Instrumentation - Gas Meters	High voltage, low internal resistance, long lifespan	SM(R)-6.0V-0.5F 18.5*10*17	It meets the 10-year service life requirement, has passed the dual 85 test for 1000 hours with zero leakage, successfully replaced the import, ensures the safety of the whole machine and extends the service life of the whole machine.
		SDB(R)-3.0V-1.0F 8*13	
Instrumentation - Water Meters, Heat Meters	Low temperature resistance, low leakage current, low internal resistance	SLR-3.8V-40F 8*20	It meets the requirements for starting at -40℃, has ultra-low internal resistance, and replaces the SPC1520, helping to reduce the size of the whole machine while improving the stable operation of the whole product under outdoor low temperature conditions.
		SLR-3.8V-50F 10*20	

Product Application Positioning

Main application terminals	Product application requirements	Representative product specifications	Product advantages and application advantages
Energy storage,	High temperature and humidity resistance, long lifespan and high stability	SDM-5.5V-3.5F 20*20*22 SM-5.5V-1.5F 18.5*10*23.6	It can withstand high temperatures of -40 to +85° C; it ensures long-term stable backup power in various complex application scenarios and ensures the stability and reliability of the whole machine under extreme environments.
industrial robots,	High voltage, low internal resistance, long lifespan	SDM-27V-1.0F RYA SDB-3.0V-10F 12.5*20	Customized modules for different voltages; ensuring long-term stable backup power for various voltage applications of the entire machine, and adapting to diverse product designs.
drones	Low internal resistance, miniaturization, high energy density	SDL-2.7V-50F 18*40 SDL-2.7V-100F 18*55	Ultra-low internal resistance; ensures rapid response of the whole machine under various load conditions, extends battery life, and improves the service life of the whole machine.
Portable multi-source charging/power supply device (military grade)	High temperature and humidity resistance, high power output, and high stability	SDM-25V-1000F 370*370*150	High-voltage, high-capacity modules with high-power output design are independently controllable; the integrated design improves product reliability and ensures effective startup of the entire unit under high-power conditions.
electronic pen, stylus	High energy density, long cycle life, and high stability	SDS-2.7V-2.0F 4*25 SDS-2.7V-3.0F 5*35	The 4*25 size allows for a 2.0F energy density, while most manufacturers only achieve 1.3F. This ultra-high energy density helps the product achieve a more compact design while improving its overall battery life.
Bluetooth thermometer, barbecue probe	Ultra-small diameter, ultra-high temperature resistance, long cycle life	SLX-3.8V-1.8mAh 5*11 SDS-2.7V-1.0F 4*25	With a minimum diameter of 3mm, the slender design meets the dimensions of 4*25 and 5*35. The slender design ensures that the whole product is more compact and enhances the user experience.
RTC clock chip	Reflow soldering, small size, no need to replace	SDV-3.0V-0.22F 6.3*5.8	It meets the requirements of 260℃ reflow soldering, enables surface mount technology, replaces imported 414 capacitors, fills the market gap for domestic surface mount supercapacitors, realizes automated surface mount production, improves product reliability, and increases production efficiency.
Low-light remote control	High energy density, low leakage current, low self-discharge, and environmentally friendly.	SLD-4.2V-70F 8*25 SLA-3.8V-50F 6.3*38	UN38.3 certification and high energy density facilitate a slim design, replacing dry cell batteries and eliminating concerns about the environmental impact of using traditional batteries in the device. It also improves product safety, easily meets transportation safety certification requirements, and makes the entire device a truly green, environmentally friendly, and safe product.

EDLC series module information

SDM5.4V60FSEA

Rated Voltage (V)	5.4
DC Internal Resistance (mΩ)	≤75
Nominal Capacity (F)	60
Maximum Stored Energy (Wh)	0.24

SDM5.4V80FSEA

Rated Voltage (V)	5.4
DC Internal Resistance (mΩ)	≤60
Nominal Capacity (F)	80
Maximum Stored Energy (Wh)	0.32

SDM5.4V120FRCB

Rated Voltage (V)	5.4
DC Internal Resistance (mΩ)	≤20
Nominal Capacity (F)	120
Maximum Stored Energy (Wh)	0.49

SDM5.4V165FRCB

Rated Voltage (V)	5.4
DC Internal Resistance (mΩ)	≤45
Nominal Capacity (F)	165
Maximum Stored Energy (Wh)	0.67

SDM6V5FRCA

Rated Voltage (V)	6
DC Internal Resistance (mΩ)	≤180
Nominal Capacity (F)	5
Maximum Stored Energy (Wh)	0.03

SDM6V60FRCA

Rated Voltage (V)	6
DC Internal Resistance (mΩ)	≤48
Nominal Capacity (F)	60
Maximum Stored Energy (Wh)	0.3

SDM6V80FRCA

Rated Voltage (V)	6
DC Internal Resistance (mΩ)	≤42
Nominal Capacity (F)	80
Maximum Stored Energy (Wh)	0.4

SDM9V3.3FRCA

Rated Voltage (V)	9
DC Internal Resistance (mΩ)	≤270
Nominal Capacity (F)	3.3
Maximum Stored Energy (Wh)	0.04

SDM9V53FRCA

Rated Voltage (V)	9
DC Internal Resistance (mΩ)	≤70
Nominal Capacity (F)	53
Maximum Stored Energy (Wh)	0.6

SDM10.8V40FREA

Rated Voltage (V)	10.8
DC Internal Resistance (mΩ)	≤120
Nominal Capacity (F)	40
Maximum Stored Energy (Wh)	0.65

SDM10V117FREA

Rated Voltage (V)	10
DC Internal Resistance (mΩ)	≤53
Nominal Capacity (F)	117
Maximum Stored Energy (Wh)	1.63

SDM12V2.5FRCA

Rated Voltage (V)	12
DC Internal Resistance (mΩ)	≤390
Nominal Capacity (F)	2.5
Maximum Stored Energy (Wh)	0.05

EDLC series module information

SDM12V3.5FRCA

Rated Voltage (V)	12
DC Internal Resistance (mΩ)	≤270
Nominal Capacity (F)	3.5
Maximum Stored Energy (Wh)	0.07

SDM12V40FRCA

Rated Voltage (V)	12
DC Internal Resistance (mΩ)	≤200
Nominal Capacity (F)	40
Maximum Stored Energy (Wh)	0.8

SDM13.5V5FREB

Rated Voltage (V)	13.5
DC Internal Resistance (mΩ)	≤230
Nominal Capacity (F)	5
Maximum Stored Energy (Wh)	0.13

SDM14V26FTDA

Rated Voltage (V)	14
DC Internal Resistance (mΩ)	≤150
Nominal Capacity (F)	26
Maximum Stored Energy (Wh)	0.71

SDM14V78FTDA

Rated Voltage (V)	14
DC Internal Resistance (mΩ)	≤75
Nominal Capacity (F)	78
Maximum Stored Energy (Wh)	2.12

SDM27V6FLYA

Rated Voltage (V)	27
DC Internal Resistance (mΩ)	≤240
Nominal Capacity (F)	6
Maximum Stored Energy (Wh)	0.61

SDM27V20FRYA

Rated Voltage (V)	27
DC Internal Resistance (mΩ)	≤130
Nominal Capacity (F)	20
Maximum Stored Energy (Wh)	2.03

SDM29.7V13.6FRYA

Rated Voltage (V)	29.7
DC Internal Resistance (mΩ)	≤150
Nominal Capacity (F)	13.6
Maximum Stored Energy (Wh)	1.67

SDM30V5FRYA

Rated Voltage (V)	30
DC Internal Resistance (mΩ)	≤300
Nominal Capacity (F)	5
Maximum Stored Energy (Wh)	0.63

SDM30V5FRYB

Rated Voltage (V)	30
DC Internal Resistance (mΩ)	≤280
Nominal Capacity (F)	5
Maximum Stored Energy (Wh)	0.63

SDM30V6FRYA

Rated Voltage (V)	30
DC Internal Resistance (mΩ)	≤270
Nominal Capacity (F)	6
Maximum Stored Energy (Wh)	0.75

SDM30V11FRYA-E2512

Rated Voltage (V)	30
DC Internal Resistance (mΩ)	≤195
Nominal Capacity (F)	11
Maximum Stored Energy (Wh)	1.38

EDLC series module information

SDM32V20FRYA

Rated Voltage (V)	32
DC Internal Resistance (mΩ)	≤140
Nominal Capacity (F)	20
Maximum Stored Energy (Wh)	2.84

SDM48V0.9FLYB

Rated Voltage (V)	48
DC Internal Resistance (mΩ)	≤950
Nominal Capacity (F)	0.9
Maximum Stored Energy (Wh)	0.29

SDM48V10FTDA

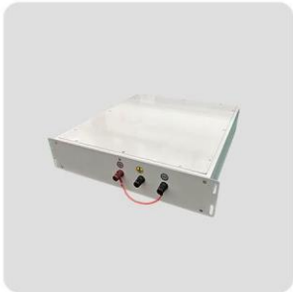
Rated Voltage (V)	48
DC Internal Resistance (mΩ)	≤335
Nominal Capacity (F)	10
Maximum Stored Energy (Wh)	3.2

SDM54V55FTDA

Rated Voltage (V)	54
DC Internal Resistance (mΩ)	≤50
Nominal Capacity (F)	55
Maximum Stored Energy (Wh)	22.28

SDM60V8FTDAB

Rated Voltage (V)	60
DC Internal Resistance (mΩ)	≤300
Nominal Capacity (F)	8
Maximum Stored Energy (Wh)	4



SDM64V80FTDA

Rated Voltage (V)	64
DC Internal Resistance (mΩ)	≤68
Nominal Capacity (F)	80
Maximum Stored Energy (Wh)	45.51

SDM160V10FTDAB

Rated Voltage (V)	160
DC Internal Resistance (mΩ)	≤220
Nominal Capacity (F)	10
Maximum Stored Energy (Wh)	35.56

LIC series module information

SLM7.6V1100FREA

Rated Voltage (V)	7.6
DC Internal Resistance (mΩ)	≤180
Nominal Capacity (F)	1100
Maximum Stored Energy (Wh)	5.2

SLM7.6V3300FRCA

Rated Voltage (V)	7.6
DC Internal Resistance (mΩ)	≤160
Nominal Capacity (F)	3300
Maximum Stored Energy (Wh)	17

SLM12V250FREA

Rated Voltage (V)	12
DC Internal Resistance (mΩ)	≤150
Nominal Capacity (F)	250
Maximum Stored Energy (Wh)	2.55

SLM27V107FREA

Rated Voltage (V)	27
DC Internal Resistance (mΩ)	≤300
Nominal Capacity (F)	107
Maximum Stored Energy (Wh)	6.3

SLM28V35.7FRDA

Rated Voltage (V)	28
DC Internal Resistance (mΩ)	≤600
Nominal Capacity (F)	35.7
Maximum Stored Energy (Wh)	2.28

SLM48V11.5FRDA

Rated Voltage (V)	48
DC Internal Resistance (mΩ)	≤2250
Nominal Capacity (F)	11.5
Maximum Stored Energy (Wh)	2.2

SLM64V40WHTDB

Rated Voltage (V)	64
DC Internal Resistance (mΩ)	≤220
Nominal Capacity (F)	187.5
Maximum Stored Energy (Wh)	40

Technical Specifications	unit	definition	Remark
Capacitance	mF、F	The capacitance of a capacitor is the ratio of the discharged charge to the change in discharge potential during constant current discharge.	C=Q/U C=i*△t/△U
Rated Voltage	V	The rated voltage specified in the standard is the maximum operating voltage of a single capacitor.	Rated voltage is the voltage measured for characteristics.
Surge Voltage	V	The maximum operating voltage a capacitor can withstand for a short period of time without irreversible reaction or explosion.	Surge voltage = Rated voltage + 0.15 V
DC Impedance (ESRdc)	mΩ、Ω	The capacitor impedance during DC charging and discharging.	It includes a combination of AC impedance, electrochemical polarization impedance, and solution diffusion impedance.
AC Impedance (ESRac)	mΩ、Ω	AC impedance is the impedance at a frequency of 1kHz, reflecting the combined resistance of the capacitor's inherent fixed resistance and charge transfer resistance.	Fixed resistance: resistance of the electrode itself, contact resistance between the lead and the current collector, resistance of the solution, etc.; Charge transfer resistance: resistance to the transfer of electrons from the interior of the material to the surface of the material, such as the resistance of an electrochemical reaction, which is controlled by the kinetics of the electrochemical reaction.
Leakage Current	mA、μA	The parasitic micro-short-circuit current that always exists in the presence of voltage.	This value is affected by voltage and temperature; the values in the datasheet are all test results under rated voltage and normal temperature.
Maximum Peak Current	mA、A	The discharge current of a capacitor from its rated voltage to half its rated voltage in 1 second.	Warning statement regarding the current used in supercapacitors
Maximum Continuous Operating Current	mA、A	The charge and discharge current used to meet the specification of a room temperature cycle life >500,000 cycles.	The maximum continuous operating current is the upper limit of the operating current that will not affect the product's service life.
Rated Current	mA、A	The discharge current of a capacitor from its rated voltage to half its rated voltage within 5 seconds.	This value is the reference operating current for the capacitor.
Operating Temperature Range	℃	This represents the temperature range within which the supercapacitor can operate normally.	Do not use outside the operating temperature range.
Storage Temperature Range	℃	This represents the safe storage temperature under no-voltage conditions that does not affect the performance of the supercapacitor.	The storage temperature range is usually wider than the operating temperature range.
Capacity Decay	-	During use, the internal materials of a supercapacitor continuously age and decompose, resulting in an initial decrease in capacitance.	A supercapacitor is considered usable if its capacitance decreases by less than 90% of its initial capacitance; otherwise, it is considered faulty.
Internal Resistance Rise	-	During use, the impedance of a supercapacitor continuously increases due to the continuous aging and decomposition of its internal materials.	If the internal resistance of a supercapacitor rises below a specified value, it is considered usable; otherwise, it is considered faulty.
Maximum Stored Energy	Wh	The energy released by a capacitor when discharging from its rated voltage to 0V is the maximum stored energy of the capacitor.	The formula for calculating the energy stored in a capacitor is as follows: $W = 0.5 * C * U^2 / 3600$
Energy Density	Wh/kg	The ratio of the stored energy to the capacitor's mass is its mass energy density (specific energy).	$E\_{MASS} = 0.5 \times C \times U^2 / (3600 \times M)$
	Wh/L	The ratio of the stored energy to the capacitor's volume is its volumetric energy density.	$E\_{VOL} = 0.5 \times C \times U^2 / (3600 \times V)$
Peak power	W	Instantaneous power, which is not sustainable.	$P = (0.5 \times U\_rated)^2 / R$
Power density	W/kg	The ratio of the capacitor's released power to its mass is its mass power density (specific power).	$P\_mass = (0.12 \times U\_rated^2 / R) / M$
	W/L	The ratio of the capacitor's released power to its volume is its volumetric power density.	$P\_volume = (0.12 \times U\_rated^2 / R) / V$
Cycle life	Second-rate	Under standard operating conditions, a supercapacitor can be cycled more than 500,000 times within the rated voltage to half-voltage range.	Standard operating conditions: Temperature: 15℃-35℃; Relative humidity: 20%-80%; Atmospheric pressure: 86kPa-106kPa

Precautions for using hybrid supercapacitors

This document provides a basic application development guide for hybrid supercapacitors. If you encounter problems during development and use and cannot find solutions in this document, please contact us directly.

1) Do not charge the product above the upper limit voltage. Charging the product above the upper limit voltage will significantly shorten its lifespan, potentially leading to deterioration of electrical characteristics, short circuits, or safety valve opening due to electrolyte leakage or gas generation.

2) Do not apply reverse voltage. This may degrade electrical characteristics or cause electrolyte leakage or gas generation, leading to safety valve opening.

3) Do not discharge the product below the lower limit voltage (2.5 V). Discharging the product below the lower limit voltage will significantly shorten its lifespan, potentially leading to deterioration of electrical characteristics, short circuits, open circuits, or safety valve opening due to electrolyte leakage or gas generation.

Products with voltages below the lower limit voltage will not return to their initial normal state even after recharging. Please pay special attention to storage and handling, and design circuits so that the voltage never falls below the lower limit voltage.

4) Soldering Requirements for Hybrid Supercapacitors

When soldering hybrid supercapacitors, temperature and time must be strictly controlled. Positive and negative terminals must be soldered separately. During soldering, the positive and negative leads must not touch or short-circuit. Wave soldering and reflow soldering are strictly prohibited, as the high-temperature environment of these methods is devastating to hybrid supercapacitors, leading to safety issues and irreversible functional failure.

5) Do Not Short-Circuit the Positive and Negative Terminals

This product is designed to ship with a specific voltage. More specifically, the energy corresponding to this voltage is pre-stored in the product. Therefore, never short-circuit the positive and negative terminals.

This may result in electric shock, burns, or personal injury, malfunctions causing leakage, overheating, smoke, or safety valve opening.

Especially when using metal tools, be careful not to short-circuit the terminals. (Hazardous operation examples: simultaneously cutting two lead terminals with pliers; measuring the spacing between lead terminals with a metal caliper).

6) Do not use a dropped product. Using a dropped product may cause electrolyte leakage or gas generation, leading to a short circuit or safety valve opening.

7) Do not apply excessive thermal stress to the main body, positive terminal, or negative terminal. This will degrade electrical characteristics and cause leakage, short circuits, or abnormal appearance due to increased internal pressure caused by internally generated gas.

8) Safety Precautions for Hybrid Supercapacitors

- Hybrid supercapacitors are pre-charged to the customer-required rated voltage before shipment, shipped energized, and individually packaged.
- Do not short-circuit the positive (+) and negative (-) terminals.
- Do not allow the product terminals to come into direct contact with each other.
- Do not apply force to the positive (+) and negative (-) terminals.
- Do not hold the terminals while carrying the product.
- Do not drop the product or subject it to excessive impact or vibration.
- This may cause electric shock, burns, or personal injury, malfunction, electrolyte leakage, overheating, smoke, safety valve opening, etc.

Precautions for using Electric Double Layer Capacitor

This document provides a basic application development guide for electric double-layer supercapacitors (EDLCs). If you encounter problems during development and use and cannot find a solution in this document, please contact us directly.

1) Lifespan
EDLCs have a longer lifespan than secondary batteries, but their lifespan is not unlimited. The basic lifespan termination failure mode for EDLCs is an increase in equivalent series resistance (ESR) and/or a decrease in capacitance. The actual lifespan termination criterion depends on the application requirements. Prolonged exposure to high temperatures, high voltage, and overcurrent will lead to an increase in ESR and a decrease in capacitance. A reduction in these parameters will extend the supercapacitor's lifespan. Generally, cylindrical EDLCs have a similar structure to electrolytic capacitors, with electrolyte, an aluminum casing, and granules. After years of use, the electrolyte inside the EDLC will dry out, leading to an increase in ESR and termination of lifespan, just like with electrolytic capacitors.

2) Voltage
EDLCs have a rated recommended operating voltage. The voltage value is set based on their longest lifespan at the highest rated temperature. If the operating voltage exceeds the recommended voltage, the result will be a shortened lifespan. If the voltage remains excessively high, gas will be generated inside the EDLC, leading to leakage or rupture of the explosion-proof valve. However, EDLCs can withstand short-term overvoltage.

3) Polarity
The electrode design of EDLCs has a symmetrical characteristic, meaning that the two electrodes have similar components. During the initial assembly of the EDLC, either electrode can be designated as positive or negative. However, during the first charge of the EDLC during 100% quality testing, its electrodes will become polarized. Each EDLC has a negative electrode box or symbol to indicate polarity. Although it can be reduced to zero voltage, its electrodes will still retain a very small amount of charge. Reverse polarity usage should still be avoided.

*Note: The longer the charge is retained in one direction, the more polarized the EDLC becomes. If it is charged for a long time in one direction and then reverse-charged, the lifespan of the EDLC will be greatly shortened.

4) Ambient Temperature
Temperature and voltage affect the lifespan of EDLCs. Generally, for every 10° C increase in ambient temperature, the lifespan of the EDLC is reduced by half. Therefore, it is recommended to use EDLCs at the lowest possible temperature to reduce internal degradation and ESR increases. In environments below normal room temperature, a slightly higher operating voltage can be used without causing internal degradation or shortened lifespan. Increasing the operating voltage at low temperatures will offset the increase in ESR. Increased ESR at high temperatures will lead to permanent degradation of the EDLC/electrolyte decomposition. At low temperatures, due to increased electrolyte viscosity and slow ion movement, the increase in ESR is only a temporary phenomenon.

5) Discharge Characteristics
The voltage of an EDLC during discharge is linear. When determining the capacity and ESR requirements for an application, it is important to consider the withstand voltage discharge and capacitive discharge components. For high pulse current applications, the internal resistance is the most critical factor. For low-current, long-term applications, the capacitive discharge characteristics are the most critical factor.

The voltage drop Vdrop at a discharge current I over t (seconds) is calculated using the formula:

$$Vdrop = I (R + t/C)$$

In pulse battery applications, a low ESR (R value) EDLC must be used to reduce the voltage drop.

For low-current applications, high-capacity (C-value) EDLCs should be used.

6) Charging Methods
EDLCs can be charged using various methods, including constant current, constant power, constant voltage, or in parallel with energy storage devices such as batteries, fuel cells, and DC-DC converters. If the EDLC is connected in parallel with a battery, adding a low-resistance series resistor will improve battery life. If a series resistor is used, ensure that the EDLC voltage output is directly connected to the application and not through a resistor; otherwise, the EDLC's low ESR will be ineffective. Many battery systems experience shortened lifespan during high-pulse current discharges.

The recommended maximum charging current I for EDLCs should be calculated as follows, where Vw is the charging voltage and R is the EDLC ESR:

I = Vw/5R
Continuous high current or high voltage charging will cause the EDLC to overheat. Overheating will lead to increased ESR, gas generation, shortened lifespan, leakage, and explosion-proof valve rupture. If charging with a current or voltage higher than the rated value is required, please contact the manufacturer.

7) Self-discharge and Leakage Current
Self-discharge and leakage current are essentially the same when measured using different methods because EDLCs are constructed with high current-carrying capacity from positive to negative. That is, a small amount of additional current is required to retain the capacitor charge; this is called leakage current. When the charging voltage is removed and the capacitor is no longer under load, the additional current will cause the EDLC to discharge; this is called self-discharge current.

To measure the actual leakage current or self-discharge value, due to its construction, the EDLC must be charged for more than 100 hours. An EDLC can be simulated as several capacitors connected in parallel, each with a different series resistance value. Capacitors with low series resistance can charge quickly, raising the terminal voltage to the same level as the charging voltage. However, when the charging voltage is removed, if any of these parallel capacitors are not fully charged, they will discharge into the parallel capacitors with higher series resistance. This results in a lower terminal voltage and a high self-discharge current. Note that the higher the capacitance, the longer the full charge time.

8) EDLC Series Setup
Because many applications require high voltage, EDLCs can be set in series to increase the operating voltage. It is crucial to ensure that the voltage of a single EDLC does not exceed its maximum rated operating voltage; otherwise, electrolyte decomposition, gas generation, increased ESR, and shortened lifespan may occur. During charging and discharging, under steady-state conditions, differences in capacitance and leakage current will cause capacitor voltage imbalance. During charging, the series capacitors will act as voltage dividers, thus the lower capacitance cells will bear a higher voltage. For example: Two 1F capacitors are connected in series, one with a capacitance of +20% and the other with a capacitance of -20%. The worst-case voltage across the capacitors is:

$Vcap2 = Vsupply \times (Ccap1/(Ccap1 + Ccap2))$

Where Ccap1 has a +20% capacitance.

Therefore, Vsupply = 5V,

$Vcap2 = 5V \times (1.2/(1.2+0.8)) = 3V$. From the above, it can be seen that to avoid exceeding the 3V surge voltage range of the EDLC, the capacitance value of the series capacitors should be within a tolerance of $\pm$20%. In terms of selection, a suitable active voltage balancing circuit can be used to reduce voltage imbalance caused by capacitance imbalance. It should be noted that most voltage balancing methods depend on the specific application.

9) Passive Voltage Balancing
Passive voltage balancing can be achieved by connecting voltage distribution resistors in parallel with each EDLC. This allows current to flow from the higher-voltage EDLC to the lower-voltage EDLC, thus achieving voltage balance. The most important factor is selecting a balancing resistor value that allows for higher current flow to the EDLC without increasing its leakage current. It's crucial to remember that leakage current increases at high temperatures.

Passive voltage balancing is only recommended for infrequent EDLC charging and discharging and when using loads with an additional current capacity capable of handling the balancing resistor. It is suggested that the selected balancing resistor should provide at least 50 times the worst-case EDLC leakage current (select a resistor from 3.3kΩ to 22kΩ depending on the maximum operating temperature). While larger balancing resistors can work in most cases, they are unlikely to provide protection against mismatched capacitors in series.

10) Active Voltage Balancing
Active voltage balancing circuits ensure that the voltage across a series-connected EDLC matches a specific parameter voltage, regardless of any voltage imbalance. It ensures accurate voltage balancing under steady-state conditions, effectively reducing current and requiring only a larger current when capacitor voltage imbalances occur. These characteristics make active voltage balancing circuits ideal for EDLCs with frequent charging and discharging and for energy components such as batteries.

11) Reverse Voltage Protection

When a series-connected EDLC discharges rapidly, the voltage across the capacitor with the lower capacitance value can potentially become negative. As explained earlier, this is undesirable and will shorten the EDLC's lifespan. A simple way to protect against reverse voltage is to add a diode to the capacitor. Using an appropriately rated current-limiting diode instead of a standard diode can also protect the EDLC from overvoltage. Caution must be exercised to ensure the diode can withstand the peak current of the power supply.

12) Soldering Instructions

Overheating can degrade the electrical performance of the EDLC, causing leakage or increased internal pressure. Soldering should follow these specific instructions:

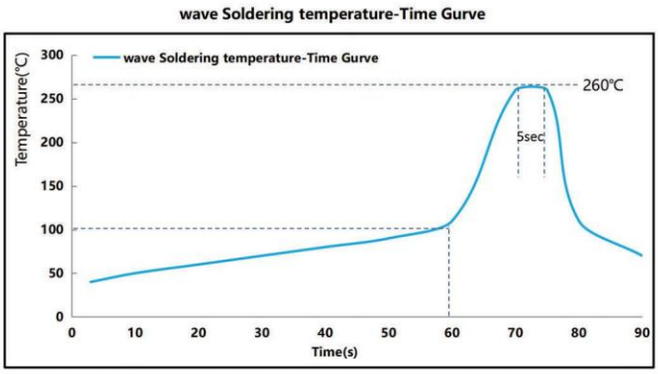
- Do not immerse the EDLC in molten solder.
- Apply flux only to the EDLC leads.
- Ensure the EDLC sleeve does not directly contact the PCB or other components; excessively high solder temperatures can cause the sleeve to shrink or crack.
- Avoid operating the EDLC under an exposed circuit board to prevent short circuits.

13) Manual Soldering

Never allow the EDLC outer sleeve to contact the solder rod, otherwise the sleeve will melt or crack. The recommended soldering tip temperature is below 350° C, and the soldering duration is less than 4 seconds. The direct contact time between the soldering iron and the EDLC leads should be minimized, as overheating of the leads increases the equivalent series resistance (ESR).

14) Wave Soldering: Preheat the PCB for a maximum of 60 seconds, with a solder immersion thickness of 0.8mm or more. The preheating temperature limit should be below 100° C.

The following table information applies only to wave soldering of leads:



Solder temperature (° C)	Recommended soldering time (seconds)	Maximum soldering time (seconds)
220	7	9
240	7	9
250	5	7
260	3	5

15) Reflow Soldering
Unless the EDLC has a clearly defined rated reflow soldering temperature, it should not be reflow soldered. Infrared or conveyor oven heating methods should be used instead.

16) Ripple Current
EDLCs have very low resistance compared to other supercapacitors, but higher resistance compared to aluminum electrolytic capacitors. Under ripple current, they are easily affected by internal heat, leading to increased ESR and shortened lifespan. To ensure longevity, it is recommended that the maximum ripple current should not raise the EDLC surface temperature by more than 3° C.

17) Circuit Board Design
Avoid cleaning the circuit board as much as possible. If cleaning is necessary, use a standard circuit board cleaning solution and clean using an anti-static or ultrasonic immersion method for no more than 5 minutes at a maximum temperature of +60° C. Afterward, rinse thoroughly and air dry. Generally, EDLCs should be treated like aluminum electrolytic capacitors.

18) Long-Term Storage

Do not store EDLCs in the following environments:

- High temperature/high humidity
- Direct contact with water, salt water, oil, or other chemicals
- Direct contact with corrosive materials, acids, alkali metals, or toxic gases
- Direct sunlight
- Dusty environments
- Shock and/or vibration environments

19) Shipping Information

International shipping of EDLCs is subject to US DOT (Department of Transportation)/IATA regulations. The correct international shipping product code is UN3499 CAPACITOR, electric double layer. For details, please refer to the following international shipping regulations:

20) Emergency Procedures

If the EDLC is found to be overheated or smells odor, immediately disconnect the power supply or load connected to the EDLC. Allow the EDLC to cool down, and then handle it properly. Do not allow your face or hands to touch an overheated EDLC. If the EDLC leaks or the explosion-proof valve ruptures, contact the manufacturer for a Material Safety Data Sheet.

In case of leakage:
Skin contact: Wash skin with soap and water.

Eye contact: Wash eyes with water for 15 minutes and see a doctor. Inhalation: Drink milk/water and spit it out; see a doctor.

21) General Safety Considerations

Overcharging, reverse charging, incineration, or heating above 150° C may cause the EDLC's explosion-proof valve to burst. Do not squeeze, damage, nail, or disassemble the EDLC. Misuse of the EDLC may cause the aluminum casing to overheat (burn).

Disposal Procedure:

Do not discard indiscriminately; dispose of according to local laws and regulations.

22) Lifespan

EDLCs have a limited lifespan and will gradually decrease in capacity and increase in internal resistance over time. The characteristics of EDLCs are significantly affected by ambient temperature, humidity, and applied voltage; therefore, proper control of these factors can extend their lifespan.

The durability guarantee for EDLCs is generally 70° C for 1000 hours (85° C for 1000 hours for high-temperature series). Please use products that meet the reliability requirements for integrated use.

Exceeding the specified lifespan may cause characteristic degradation and liquid leakage. For prolonged use in integrated systems, please perform regular inspections and replacements.

23) Lifespan Calculation Formula

The lifespan of EDLC capacitors is affected by operating temperature and voltage. Generally, a 10° C decrease in operating temperature doubles the lifespan; a 0.1V decrease in operating voltage extends the lifespan by 1.5 times. Please use them at low temperatures and low voltages below the maximum operating temperature and voltage. Using them outside the guaranteed range may cause a rapid deterioration in characteristics and damage.

The lifespan calculation formula is as follows:

$$L = 1000 \times 2^{\Delta T/10} \times 1.5^{n}$$

Under voltage V = rated voltage 0.1n (n
is the number of times the voltage drops by 0.1V) and temperature T,
where T = maximum operating temperature - actual operating temperature

L: Actual calculated lifespan, in hours;

T: maximum operating temperature - actual operating temperature

n: number of times the voltage drops by 0.1V;

Note: The effective voltage range is 2.0V to rated voltage, and the effective temperature range is 25℃ to maximum operating temperature; when multiple products are connected in series/parallel, they need to be calculated as individual capacitors.

24) Characteristics

- Can be used as a rechargeable battery and backup power source.
- Capable of hundreds of thousands of charge/discharge cycles, eliminating waste disposal.
- Does not contain toxic materials such as cadmium and chlorine.

25) Regarding the Operating Environment

- This product is designed for general standard use in electronic devices. Use in the following special environments is not within the scope of the design. Therefore, use in the following special environments may affect the performance of the capacitor. Please fully verify the performance and reliability before use.

(1) Use in liquids such as water, oil, pharmaceutical solutions, and organic solvents.

(2) Use under direct sunlight, outdoors, or in dusty environments.

(3) Use in environments with high levels of moisture (frost on resistor parts, water leakage, etc.), sea breezes, chlorine, hydrogen sulfide, ammonia, sulfur dioxide, nitrogen oxides, and other corrosive gases.

(4) Use in environments with strong static electricity or electromagnetic waves.

(5) Use near flammable materials such as heat-generating components or plastic wires.

(6) Use with resin sealing.

(7) When cleaning flux after soldering with solvents, water, or water-soluble detergents (pay special attention to water-soluble flux).

(8) Use in acidic or alkaline environments.

(9) Use in environments with excessive vibration or impact.