Super capacitors

PART NUMBER SYSTEM

Part Number System for EDLC Cell (Coin, Radial, Snap-in/Lug/Welded Column, Screw), LIC Cell (Radial), 2-in-series EDLC Module EDLC扣式、引线式、焊针式/焊片式/焊柱式、螺栓式、LIC引线式、EDLC两串模组

1	2	3		4		5	6	7	8	9	10	11	12	13		14	15	16	17	18	19	20	21	22		23	24
SC		C		D		P	R	2	R	7	1	0	5	S		R	H	0	8	0	0	1	2	E		*	*
电容器类型 Capacitor Type Code				超级电容器类型 supercapacitor Type		系列代码 Series Code		额定电压 Rated Voltage Code(V)			容量 Capacitance Code (F)			容差 Capacitance Tolerance Code (%)		引出方式 Lead Form Code		尺寸 Dimension Code						套管 Sleeve Code		客户特殊要求 Customer Special Requirement	
SC= Super capacitor	C	Cell	D	EDLC				2.7	2R7		0.1		104	-30 0	A			VC	6.3×12		063012			E	PET		
	M	Module	H	Hybrid				3	3R0		0.22		224	+5 -5	B			VH	6.3×22		063022			V	PVC		
								3.6	3R6		0.33		334	+20 -3	C			VV	8×12		080012			S	Plastic		
								3.8	3R8		0.47		474	+35 +10	D			RA	8×14		080014						
								5.5	5R5		0.5		504	+30 +10	E			RF	8×20		080020						
								6.0	6R0		0.68		684	+30 +0	F			RH	8×25		080025						
						SRP	PR				1		105	+70 +10	G			RL	10×16		100016						
						SRE	ER				1.5		155	+20 -5	H			RM	10×20		100020						
						SRQ	QR				2		205	+10 0	I			RX	10×25		100025						
						SSP	PS				2.5		255	+0 -40	J			RY	10×30		100030						
						SSE	ES				3		305	+10 -10	K			RZ	11.5×4.8		115004						
						SSL	LS				3.3		335	+15 -15	L			SA	13.5×7		135007						
						SGP	PG				3.5		355	+20 -20	M			SB	13.5×9		135009						
						SGE	EG				5		505	+50 +10	N			SC	12.5×9		125009						
						HBR	BR				7		705	+100 +0	P			SD	12.5×20		125020						
						HBRL	BL				10		106	+30 -10	Q			SL	12.5×25		125025						
						HBE	BE				13		136	+20 +0	R			SV	12.5×30		125030						
						SRM	MR				15		156	+50 -20	S			ST	12.5×35		125035						
						SRS	SR				20		206	+50 +0	T			GA	16×20		160020						
						SRO	OR				25		256	+75 -10	U			GB	16×25		160025						
											30		306	+20 -10	V			RB	16×31.5		160031						
											35		356	+80 +50	W			RN	16×35		160035						
											40		406	+200 +0	X			YH	18×40		180040						
											45		456	+20 +5	Y			YN	18×50		180050						
											50		506	+80 -20	Z			ZH	18×60		180060						
											55		556					ZN	19×4.8		190004						
											60		606					XH	20.5×7.8		205007						
											65		656					XN	20.5×9.8		205009						
											70		706					YK	20.5×10		205010						
											80		806						22×45		220045						
											85		856						22×55		220055						
											100		107						25×50		250050						
											110		117						30×50		300050						
											120		127						33×62		330062						
											150		157						33×77		330077						
											160		167						35×60		350060						
											200		207						35×62		350062						
											220		227						35×67		350067						
											250		257						35×70		350070						
											270		277						35×88		350088						
											350		357						40×70		400070						
											400		407						40×75		400075						
											450		457						40×90		400090						
											470		477						40×105		400105						
											550		557						61×52		610052						
											600		607						61×74		610074						
											650		657						61×85		610085						
											800		807						61×102		610102						
											850		857						61×138		610138						
											900		907						8.5×17×17		081717						
											1000		108						8.5×17×23		081723						
											1200		128						11×21×23		112123						
											1400		148						11×21×27		112127						
											1500		158						13×26×27		132627						
											2000		208														
											3000		308														
											3400		348														

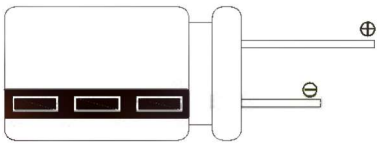
PART NUMBER SYSTEM

Part Number System for LIC Cell(Soft Pack，Screw)，Other Supercapacitor Module LIC 软包、螺栓，其他模组

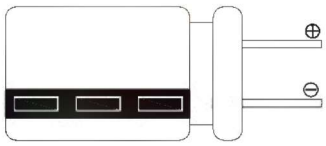
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SC	C		H	A	A	4	R	0	1	0	8	M	*	*
电容器类型 Capacitor Type Code			超级电容器类型 supercapacitor Type	系列代码 Series Code		额定电压 Rated Voltage Code(V)			容量 Capacitance Code(F)			容差 Capacitance Tolerance Code (%)	客户特殊要求 Customer Special Requirement	

SC= Super Capacitor	C	Cell	D	EDLC	HAA	AA	3.8	3R8	3	305	+30 +0	F
	M	Module	H	Hybrid	HAE	AE	4	4R0	11.1	116	+70 +10	G
					HAH	AH	7.5	7R5	13	136	+20 -20	M
					HGA	GA	13.5	013	19.4	196	+30 -10	Q
					SMRP	PR	64	064	21.7	216	+20 +0	R
					SMRE	ER	90	090	165	167	+50 +0	T
					SMRQ	QR	160	160	1000	108	+20 -10	V
					SMSP	PS			2000	208		
					SMSE	ES			3000	308		
					SMGP	PG			3200	328		
					HMBL	BL			5000	508		
					HMBRL	BR			6000	608		
					HMAA	AA			7200	728		
					HMAL	AL			10000	109		
					HMAE	AE			15000	159		
					HMGA	GA			16000	169		
									17000	179		
									20000	209		
									25000	259		
									32000	329		

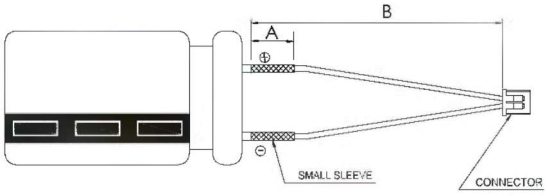
Radial Type Terminal Code



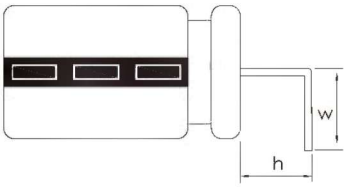
RH-Type



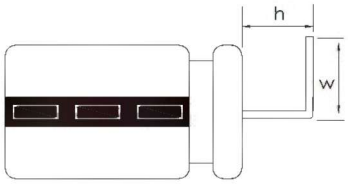
RL-Type



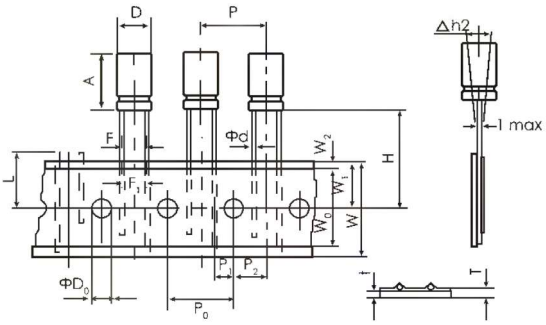
RX-Type

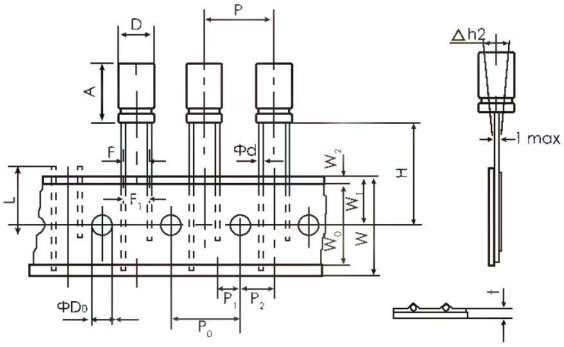


RY-Type



RZ-Type



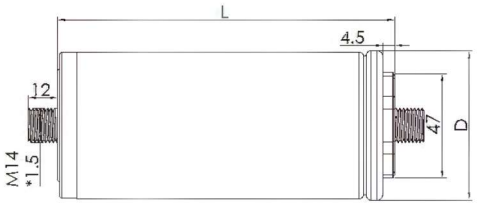


RA-Type

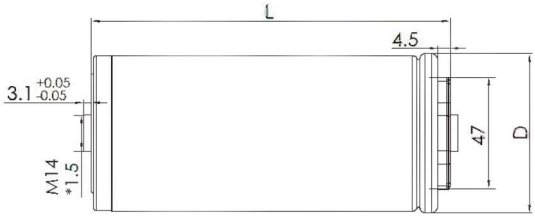
PART NUMBER SYSTEM

Screw Terminal Code

Unit:mm



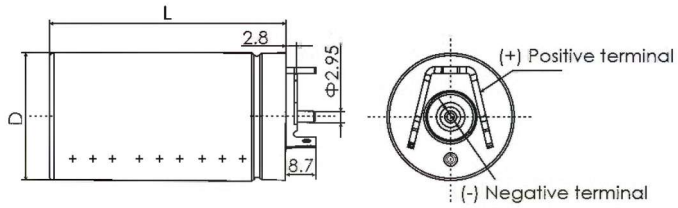
GA-Type



GB-Type

Welded Column Terminal Code

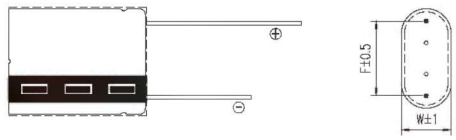
Unit:mm



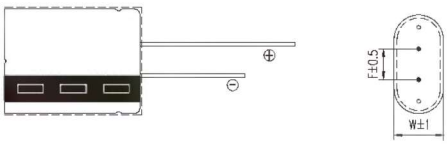
ST-Type

2 Series Type Terminal Code

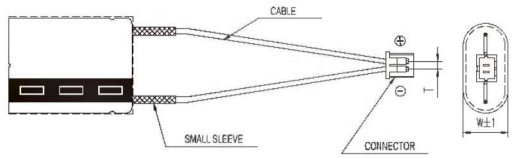
Unit:mm



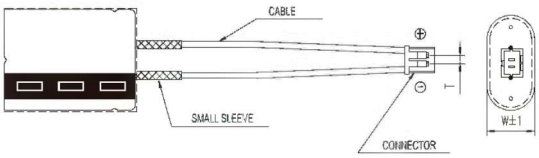
RH-Type



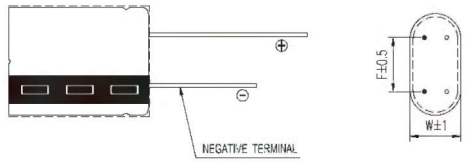
RN-Type



XH-Type



XN-Type

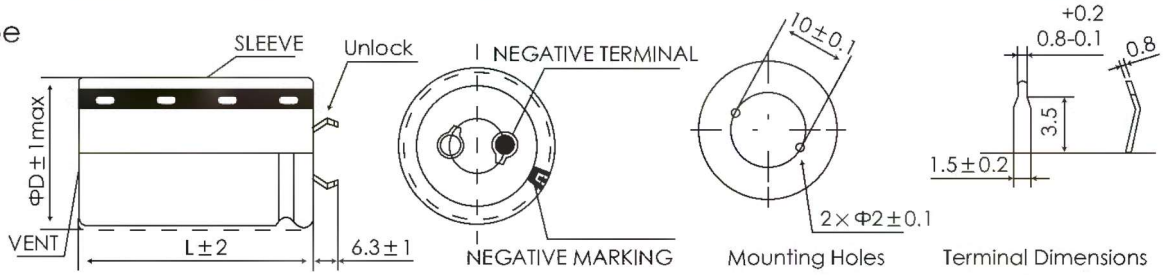


RB-Type

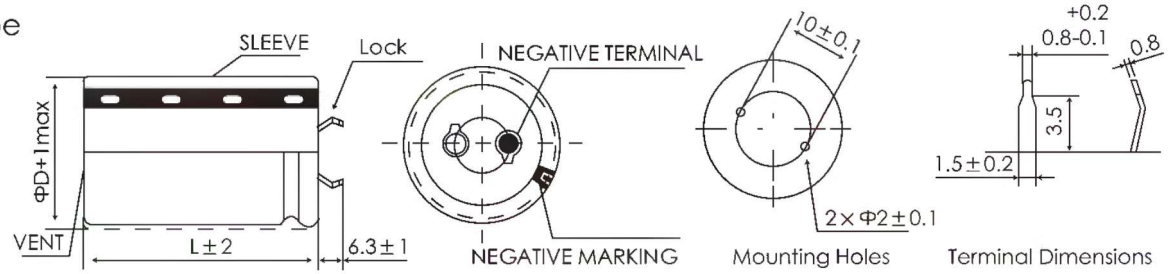
Lug/Snap-in Terminal Code

Unit:mm

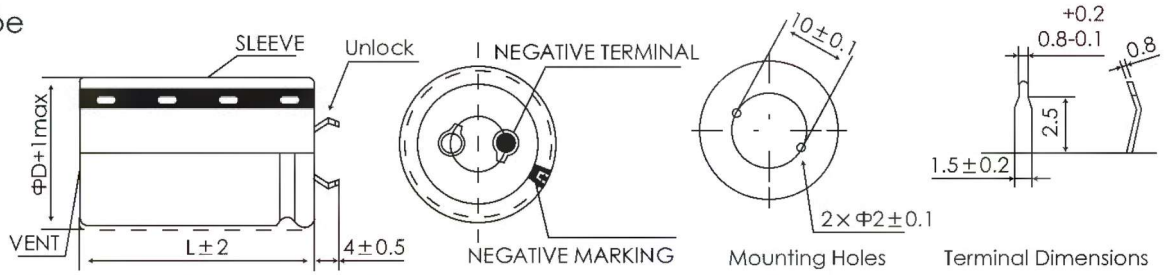
SA-Type



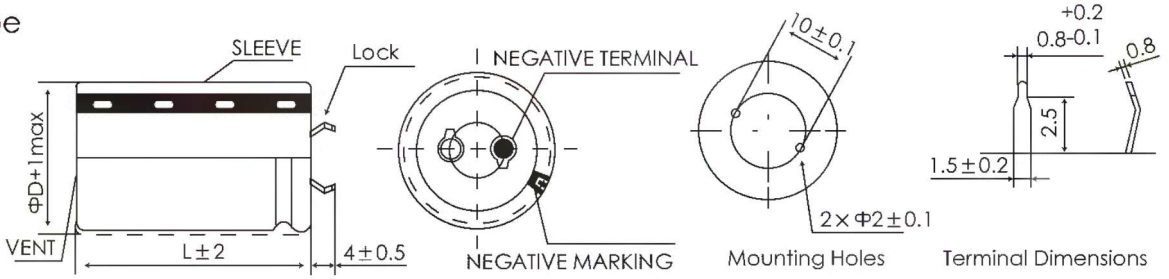
SB-Type



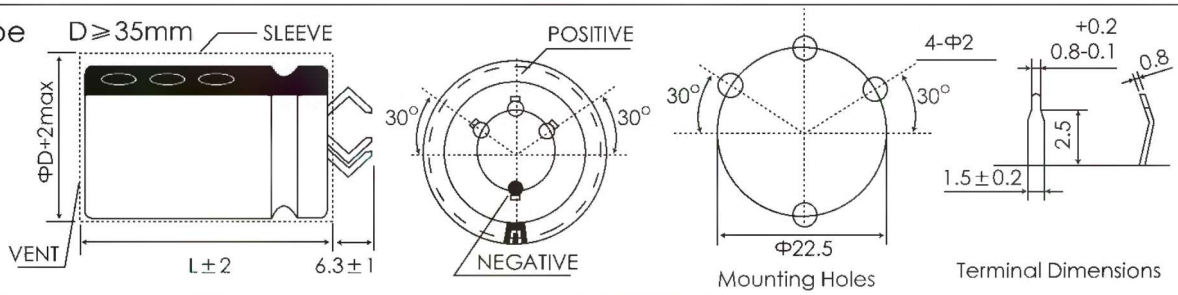
SC-Type



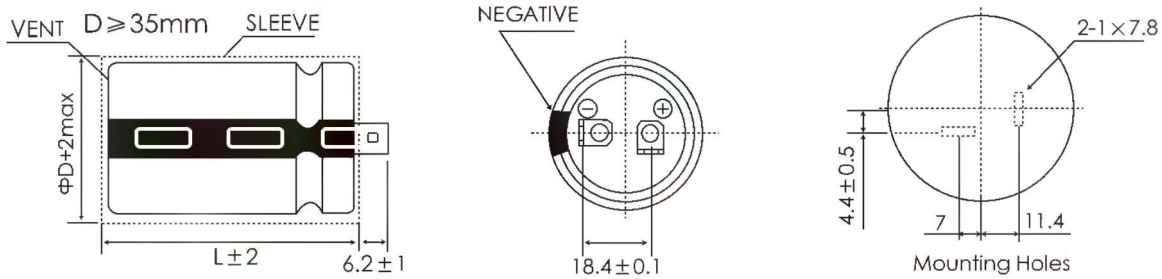
SD-Type



SV-Type



SL-Type



■ TECHNICAL NOTES of EDLC

1. General Description of Electric Double Layer Capacitors

1-1. Operating Principle

By externally applying a voltage below a certain voltage to the boundary, higher charges can be accumulated. Charge and discharge of capacitor utilize adsorption and desorption of ions to the ionic adsorption layer (electric double layer) formed on the electrode surface of the activated carbon used for electrodes. The capacitors have electric charges oriented at the very short distance on boundary of electrolyte and electrodes what is called the "electric double layer capacitor."

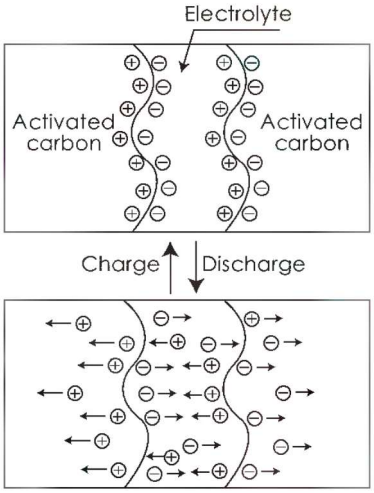


Fig. 1

1-2. Advantages and Disadvantages of Electric Double Layer Capacitor

EDLC differs from rechargeable batteries, not causing chemical reaction, with surface of activated carbon with energy accumulation by ionic physical attachment only, therefore it holds the characteristics stated below:

■Advantages

(1) Small size and capacitance in farads (F) available by utilizing the activated carbon electrode with a large surface area

(2) With low degradation, million cycles of charge-discharge and long life is possible

(3) With a high power density, rapid (high current) charge-discharge is possible

(4) Ease of maintenance

(5) Environment-friendly without using heavy metal for its structure material

■Disadvantages

(1) Low energy density

(2) Series connection is required when used with a low resistance of voltage at a high voltage

(3) Cannot be used in AC circuits

1、双电层电容器的基本概要

1-1、工作原理

在额定电压范围内，通过外部施加电压使得电荷在界面积聚。电容的充放电通过在活性炭电极表面形成的离子吸附界面（双电层）处离子的吸附和脱附来实现。利用电解液和电极的界面之间相隔的距离极其短，电荷在界面处集中排列从而形成物理储电的电容，称为“双电层电容”。

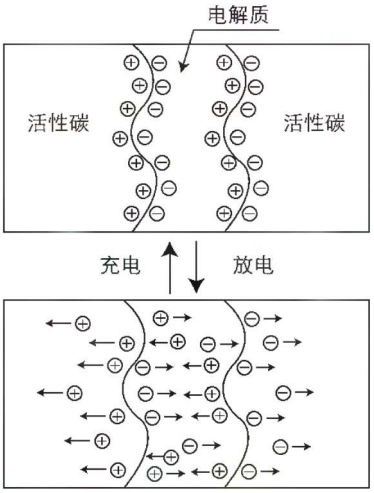


图. 1

1-2、EDLC的特点

EDLC不同于二次电池，不发生化学反应，利用活性炭表面离子的物理吸附实现储能，因此具有以下特征：

■优势：

（1）利用活性炭的比表面获得小体积和大容量

（2）EDLC劣化缓慢，具有长寿命和上百万次的循环寿命

（3）具有高输出功率特性，实现快速充放电

（4）易于维护

（5）构成材料中没有使用重金属元素，环境友好

■劣势：

（1）低能量密度

（2）由于单体电压低，在高电压使用时需要多只串联。

（3）不能使用在AC电路中。

2. Description of life expectancy

Generally, the life of Electric Double Layer Capacitors is largely affected by the ambient temperature and operatingvoltage. Take EDLC SRP as an example, The expected life is approximated by the equation as shown below:

SRP 2.7V EDLC:

$$L = L_0 \times 3.25^{\frac{T_0 - T}{10}} \times 1.52^{\frac{V_0 - V}{0.1}}$$

Where:

L : Expected lifetime at temperature T

L_0 : Lifetime at temperature T0

T : Expected working temperature

T_0 : Upper category temperature

V : Actual working voltage

V_0 : Upper rated working voltage

3. Handling Precautions and Guidelines

For safety application, please contact company directly for any technical specifications, handling precautions and guidelines critical to application.

3-1. Precautions

(1) Prohibition of disassembly

The disassembling may generate internal short circuit in the cell, which may cause gassing, leakage, explosion, or other problems. Electrolyte is harmful: In case the electrolyte comes into contact with the skin, or eyes, physicians shall flush the electrolyte immediately with fresh water and medical advice is to be sought.

(2) Prohibition of dumping of cells into fire

These may cause explosion of the cells, which is very dangerous and is prohibited.

(3) Prohibition of cells immersion into liquid.

The cells shall never be soaked with liquids such as water, seawater, drinks such as juices, coffee or others.

(4) Prohibition of use of damaged cells.

The cells might be damaged during shipping by shock. If any abnormal features of the cells are found such as damages in the cell package, smelling of an electrolyte, an electrolyte leakage and others, the cells shall never be used any more. The Cells with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing or explosion.

3-2. Handling Guidelines

(1) It is not suitable that cell is used under such conditions: AC circuit and wave filtering.

2、寿命估算

一般来说，环境温度和工作电压对EDLC的寿命影响很大。以引线式EDLC SRP型为例，其理论估算寿命的计算公式参照如下：

SRP型双电层电容器:

$$L = L_0 \times 3.25^{\frac{T_0 - T}{10}} \times 1.52^{\frac{V_0 - V}{0.1}}$$

其中:

L：T温度下理论寿命

L_0：最高额定工作温度的工作寿命

T：实际工作温度

T_0：最高额定工作温度

V：实际工作电压

V_0：最高额定工作电压

3、使用注意事项和使用指导

为了确保安全，当设计的设备需使用电容时，请与公司联系咨询电容的技术规格以及使用要求。

3-1、注意事项

(1) 禁止拆卸

拆卸电容器可能产生内部短路，导致产气，电解液泄漏。电解液有害，如果电解液接触皮肤或者眼睛，应该立即用清水冲洗并且寻求医生的治疗。

(2) 禁止将电容器投入火中

将电容器投入火中可能导致爆炸，这种行为是非常危险，是被禁止的。

(3) 禁止将电容器浸没于液体中

电容器不允许被浸泡在液体中，例如水，盐水，饮料例如果汁，咖啡或者其它。

(4) 禁止使用已经损坏的电容器

如果使用前发现电容的外包装破裂，闻到电解液的气味，电解液泄漏或者其它非正常情况，请勿继续使用。

3-2、使用指导

(1) 不可用于以下场合：不能用于交流线路中；不能用于滤波。

(2) Voltage

Work voltage of cell should not exceed Max. work voltage of cell during using. Otherwise, will shorten shelf life, even cause swelling, leakage or crack.

(3) Polarity

Please check the polarity before using. If working under reverse polarity, cell will not only shorten shelf life, but also heavy damage, such as swelling, electrolyte leakage etc.

(4) Environment

Work temperature will have an influence on life of cell. As usual, higher work temperature will shorten life. So, it is better that cell works under as possible as low environmental temperature.

Work temperature of cell should consider internal environmental temperature in the unit and temperature rise when cell works.

Please do not use in environments with water droplets, condensation, toxic gases, etc. Wet environments and rapid temperature changes can become the cause of condensation on the surface of cell, and may lead to rapid degradation and leakage of the cell. Please avoid storing and using cell in such environments.

(5) IR drop

When main power sources shut down, cell will change into work mode from failure mode, at the same time, OCV will decrease due to IR drop. So please choose proper product type according to impedance specified in product datasheet and applied current.

(6) Cells in series connection

When multiple cells are used in series to improve the working voltage, the cell of the same gear must be used and the corre--sponding equalization circuit must be configured, it should be assured that work voltage of any single cell must not exceed Max. work voltage of single cell, otherwise, will shorten shelf life, even cause swelling, leakage or crack.

(7) Soldering

Heat shock will decrease electric performance of cell, even cause swelling, leakage or crack.

Manual soldering temperature should not exceed 350℃, soldering time should not exceed 4s. Wave soldering temperature should not exceed 260℃, soldering time should not exceed 5s, while preheating temperature should be limited to less than 100℃ and maximum preheating time of 60 seconds for PC boards 0.8mm or thicker.

Unless the EDLC is specifically rated to withstand reflow soldering temperature, please don' t use reflow soldering , infrared heating and air heating methods on the EDLC.

（2）电压

使用过程中，电容器的工作电压不能超过其最大工作电压。否则，将缩短其使用寿命，甚至导致气胀，泄露，或者开裂。

（3）极性

使用前一定要检查电容器的极性，电容长时间在相反的极性下工作，不仅会缩短其使用寿命，而且可能导致严重的损毁，例如导致气胀，电解液泄漏等。

（4）环境

电容的寿命会受到工作温度的影响，一般而言，电容的工作环境温度越高，其寿命越短。因此，应使电容的工作温度在最大容许温度下尽可能地降低。

工作温度应该同时考虑工作环境温度以及工作时电容内部产生的温升。

请不要在有水滴、结露、有毒气体等环中使用。潮湿的环境和急剧的温度变化会成为电容表面结露的原因， 并可能导致电容的快速劣化和漏液，请避免在此类环境中存放和使用电容。

（5）IR压降

在主电源关闭时，电容将从电源失效检验模式转为后备电源工作模式，此时由于瞬间启动电流及电容内阻将导致开路电压下降。请根据相关产品介绍中所列出的阻抗和使用电流确定正确的产品型号。

（6）电容串联

当多个单体电容串联使用以提高工作电压时，必须采用同档位单体并且配置对应均衡电路，确保每只单体电容两端的电压不超过其最大工作电压，否则，将缩短其使用寿命，甚至导致气胀，泄露，或者开裂。

（7）焊接

热冲击会影响电容的电性能，甚至会导致电容的鼓气、漏液以及开裂。

手工焊的温度建议低于350℃，焊接持续时间少于4s。波峰焊的温度建议低于260℃，焊接持续时间少于5s，其中预热温度应低于100℃，最多给PCB预热60s，PC板达0.8mm或更厚。

除非EDLC有明确的额定耐回流焊接温度，否则不应对EDLC使用回流焊，而应使用红外线或空气加热方式。

RADIAL EDLC CELL: SRP SERIES 引线式EDLC 单体: SRP系列

■ Typical application 典型应用

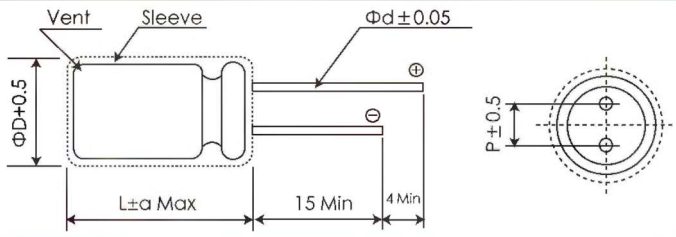
- Intelligent instruments: electronic meter, water meter, gas meter, hot meter
  智能仪表：国网电表、水表、燃气表、热表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator
  通讯终端：智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control, audio control, auto diagnosis system, wireless charging
  汽车电子：汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection
  储能：服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices
  消费类：玩具、机器人、智能家居、医疗器械

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.7 V		
Operating Temperature Rang 工作温度范围	-40 ~ +70℃ (-40 ~ +85℃ @2.3V)		
Surge Voltage 浪涌电压	2.85V（≤1s,1次）		
Capacitance Range 容量范围	0.5~180 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature of 70℃ 在70℃时应满足的规范	Capacitance change 容量变化	Within 10% of the initial value 在初始值的10%以内
		ESR_{AC} change 交流内阻变化	Not more than the initial specified value 不超过初始规定值
	The specifications shall be met at category temperature of -40℃ 在-40℃时应满足的规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 70℃ for 1000 hours 在70℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

EDLC

Dimensions 尺寸

mm



ΦD	5	6.3	8	10	12	12.5	16	18	22
p	2.0	2.5	3.5	5.0			7.5		10
Φd	0.5		0.6				0.8		1.0
a	1.5			2.0					3.5

Ratings for SRP Series SRP 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流(72hrs)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
		ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
2.7 (2.85) 2R7	0.5	900	450	0.005	5×12	0.40	SCCDPR2R7504QRH050012EP
	0.8	700	350	0.006	6.3×12	0.66	SCCDPR2R7804QRH063012EP
	1	400	200	0.008	8×12	0.85	SCCDPR2R7105QRH080012EP
	1	400	200	0.008	8×14	0.90	SCCDPR2R7105QRH080014EP
	2	280	140	0.010	8×14	1.00	SCCDPR2R7205QRH080014EP
	3.3	180	90	0.014	8×20	1.43	SCCDPR2R7335QRH080020EP
	5	180	90	0.016	8×25	1.70	SCCDPR2R7505QRH080025EP
	5	120	60	0.016	10×20	2.10	SCCDPR2R7505QRH100020EP
	7	130	65	0.020	10×20	2.20	SCCDPR2R7705QRH100020EP
	7	110	55	0.020	10×25	2.70	SCCDPR2R7705QRH100025EP
	10	90	45	0.040	10×25	2.80	SCCDPR2R7106QRH100025EP
	10	80	40	0.040	10×30	3.20	SCCDPR2R7106QRH100030EP
	10	80	40	0.040	12.5×20	3.40	SCCDPR2R7106QRH125020EP
	10	80	40	0.040	12.5×25	3.60	SCCDPR2R7106QRH125025EP
	15	60	30	0.045	12.5×25	4.30	SCCDPR2R7156QRH125025EP
	20	50	25	0.060	16×20	5.90	SCCDPR2R7206QRH160020ET
	25	44	22	0.080	16×25	7.40	SCCDPR2R7256QRH160025ET
	30	36	18	0.100	16×30	8.40	SCCDPR2R7306QRH160030EP
	40	36	18	0.120	16×35	9.90	SCCDPR2R7406QRH160035ET
	50	32	16	0.140	18×40	13.6	SCCDPR2R7506QRH180040ET
	60	32	16	0.140	18×40	13.6	SCCDPR2R7606QRH180040ET
	70	36	18	0.200	18×50	16.9	SCCDPR2R7706QRH180050ET
	100	36	18	0.300	18×60	16.9	SCCDPR2R7107QRH180060ET
	100	32	16	0.300	22×45	22.5	SCCDPR2R7107QRH220045EP
	120	32	16	0.300	22×45	22.5	SCCDPR2R7127QRH220045EP
	180	32	16	0.900	22×55	27.0	SCCDPR2R7187QRH220055EP

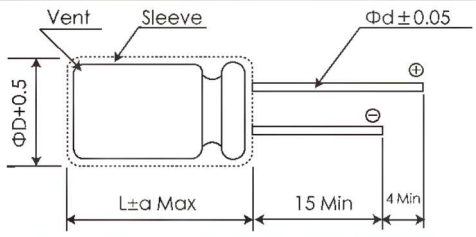
■ Typical application 典型应用

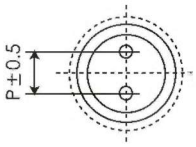
- Intelligent instruments: electronic meter, water meter, gas meter, hot meter
  智能仪表：国网电表、水表、燃气表、热表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator
  通讯终端：智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control, audio control, auto diagnosis system, wireless charging
  汽车电子：汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection
  储能：服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices
  消费类：玩具、机器人、智能家居、医疗器械

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	3 V		
Operating Temperature Rang 工作温度范围	-40 ~ +65℃ (-40 ~ +85℃ @2.4V)		
Surge Voltage 浪涌电压	3.2 V（≤1s,1次）		
Capacitance Range 容量范围	1~180 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature of 65℃ 在65℃时应满足的规范	Capacitance change 容量变化	Within 10% of the initial value 在初始值的10%以内
		ESR_{AC} change 交流内阻变化	Not more than the initial specified value 不超过初始规定值
	The specifications shall be met at category temperature of -40℃ 在-40℃时应满足的规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 65℃ for 1000 hours 在65℃温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃, cycle of charge/discharge from V_R to $1/2V_R$ 在25℃温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

Dimensions 尺寸

mm





ΦD	8	10	12.5	16	18	22
p	3.5	5.0		7.5		10
Φd	0.6			0.8		1.0
a	1.5	2.0				3.5

EDLC

Ratings for SRE Series SRE 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流(72hrs)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
		ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
3 (3.2) 3R0	1	800	400	0.010	8×14	0.9	SCCDER3R0105QRH080014EP
	2	400	200	0.012	8×14	1.0	SCCDER3R0205QRH080014EP
	3.3	200	100	0.016	8×20	1.4	SCCDER3R0335QRH080020EP
	5	190	95	0.020	8×25	1.7	SCCDER3R0505QRH080025EP
	5	160	80	0.020	10×20	2.2	SCCDER3R0505QRH100020EP
	7	120	60	0.030	10×25	2.7	SCCDER3R0705QRH100025EP
	10	180	90	0.045	10×25	2.8	SCCDER3R0106QRH100025EP
	10	100	50	0.045	10×30	3.2	SCCDER3R0106QRH100030EP
	15	70	35	0.055	12.5×25	4.3	SCCDER3R0156QRH125025EP
	20	56	28	0.070	12.5×30	5.2	SCCDER3R0206QRH125030EP
	25	50	25	0.100	16×25	7.4	SCCDER3R0256QRH160025ET
	50	40	20	0.350	18×40	13.8	SCCDER3R0506QRH180040ET
	60	40	20	0.400	18×40	13.3	SCCDER3R0606QRH180040ET
	70	40	20	0.500	16×50	16.9	SCCDER3R0706QRH160050ET
	100	36	18	0.550	22×45	22.5	SCCDER3R0107QRH220045EP
	180	32	16	0.900	22×55	27.0	SCCDER3R0187QRH220055EP

■ Typical application 典型应用

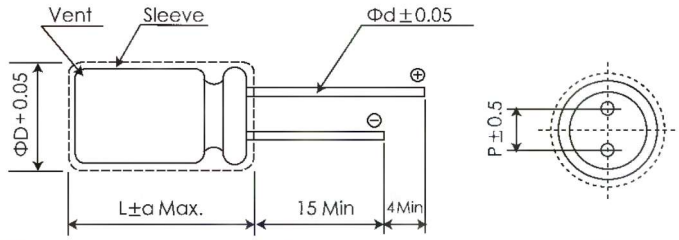
- Intelligent instruments: electronic meter, water meter, gas meter, hot meter
  智能仪表：国网电表、水表、燃气表、热表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator
  通讯终端：智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control, audio control, auto diagnosis system, wireless charging
  汽车电子：汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection
  储能：服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices
  消费类：玩具、机器人、智能家居、医疗器械

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.7 V		
Operating Temperature Rang 工作温度范围	-40~ +85℃		
Surge Voltage 浪涌电压	2.85V（≤1s,1次）		
Capacitance Range 容量范围	1~50 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature of 85℃ 在85℃时应满足的规范	Capacitance change 容量变化	Within 10% of the initial specified value 在规格值的10%以内
		ESR_{AC} change 交流内阻变化	Not more than the initial specified value 不超过初始规定值
	The specifications shall be met at category temperature of -40℃ 在-40℃时应满足的规范	Capacitance change 容量变化	Within 30% of the initial specified value 在规格值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after 2.5V applied at 85℃ for 1000 hours 在85℃ 温度下，以2.5V恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial specified value 在规格值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 85℃ for 1000 hours 在85℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial specified value 在规格值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial specified value 在规格值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

EDLC

Dimensions 尺寸

mm



ΦD	8	10	12.5	16	18
p	3.5	5.0		7.5	
Φd	0.6			0.8	
a	1.5	2.0			

Ratings for SRQ Series SRQ 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流(72hrs)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
		ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
2.7 (2.85) 2R7	1	800	400	0.010	8×14	0.9	SCCDQR2R7105QRH080014EP
	2	320	160	0.012	8×14	1.0	SCCDQR2R7205QRH080014EP
	3.3	200	100	0.016	8×20	1.4	SCCDQR2R7335QRH080020EP
	5	160	80	0.020	10×20	2.2	SCCDQR2R7505QRH100020EP
	7	120	60	0.030	10×25	2.7	SCCDQR2R7705QRH100025EP
	10	180	90	0.045	10×25	2.8	SCCDQR2R7106QRH100025EP
	10	100	50	0.045	10×30	3.2	SCCDQR2R7106QRH100030EP
	10	100	50	0.045	12.5×20	3.4	SCCDQR2R7106QRH125020EP
	15	70	35	0.055	12.5×25	4.3	SCCDQR2R7156QRH125025EP
	20	56	28	0.070	12.5×30	5.2	SCCDQR2R7206QRH125030EP
	25	50	25	0.100	16×25	7.4	SCCDQR2R7256QRH160025ET
	50	40	20	0.350	18×40	13.8	SCCDQR2R7506QRH180040ET

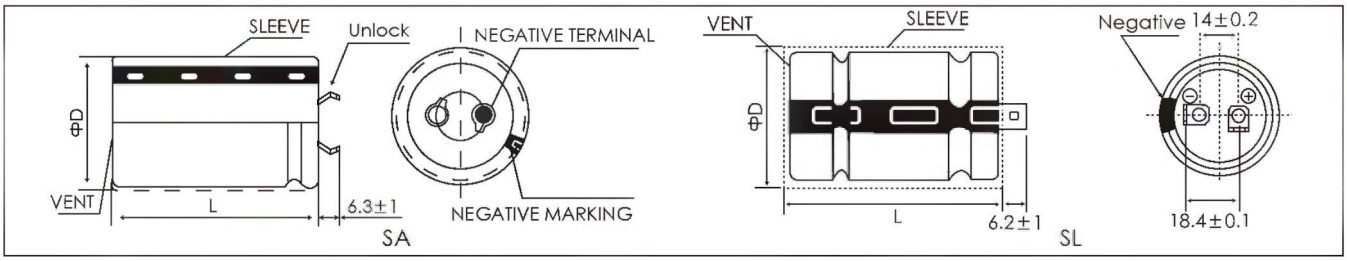
■ Typical application 典型应用

- Backup power supply of fan pitch control system
  风机变桨控制系统的后备电源
- Energy storage system of construction machinery
  工程机械储能系统
- Electric tool
  电动工具
- Industrial standby power supply
  工业备用电源
- AGV on-board power supply
  AGV车载电源

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.7 V		
Operating Temperature Rang 工作温度范围	-40~+65℃ (-40 ~+85℃ @2.3V)		
Surge Voltage 浪涌电压	2.85 V		
Capacitance Range 容量范围	100~800 F		
Capacitance Tolerance 容差范围(25℃)	Q: -10~+30%, I: 0~+10%, R: 0~+20%, F: 0~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 65℃ 在-40℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25℃ 在25℃时初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1500 hours 在65℃温度下，以额定电压恒压1500h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Dimensions 尺寸

mm



Ratings for SSP Series SSP 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流(72hrs)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
		ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
2.7 (2.85) 2R7	100	12	8	0.3	22×45	21	SCCDPS2R7107QSA220045E
	120	12	8	0.3	22×45	21	SCCDPS2R7127QSA220045E
	160	12	8	0.5	22×55	30	SCCDPS2R7167QSA220055E
	150	11	7	0.5	25×50	30	SCCDPS2R7157QSA250050E
	200	10	6	0.7	30×50	36	SCCDPS2R7207QSA300050ES
	220	10	6	0.7	30×50	39	SCCDPS2R7227QSA300050ES
	240	9	5	0.7	30×50	45	SCCDPS2R7247QSA300050ES
	350	3.5	3	1.0	35×60	73	SCCDPS2R7357QSL350060ES
	400	3.2	2.8	1.0	35×60	73	SCCDPS2R7407QSL350060ES
	470	3.5	3	1.3	35×60	73	SCCDPS2R7477QSL350060ES
	500	3.4	2.9	1.3	35×67	76	SCCDPS2R7507QSL350067ES
	600	3	2.5	1.5	35×70	90	SCCDPS2R7607QSL350070ES
	800	3	2.5	2	40×70	120	SCCDPS2R7807QSL400070ES

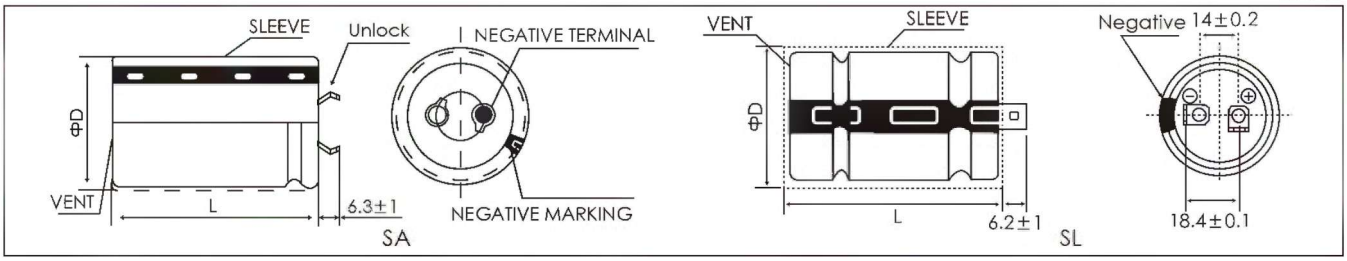
■ Typical application 典型应用

- Backup power supply of fan pitch control system
  风机变桨控制系统的后备电源
- Energy storage system of construction machinery
  工程机械储能系统
- Electric tool
  电动工具
- Industrial standby power supply
  工业备用电源
- AGV on-board power supply
  AGV车载电源

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	3 V		
Operating Temperature Rang 工作温度范围	-40~+65℃ (-40 ~+85℃ @2.5V)		
Surge Voltage 浪涌电压	3.15 V		
Capacitance Range 容量范围	100~600 F		
Capacitance Tolerance 容差范围(25℃)	Q: -10~+30%, I: 0~+10%, R: 0~+20%, F: 0~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 65℃ 在-40℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25℃ 在25℃时初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Dimensions 尺寸

mm



Ratings for SSE Series SSE 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流(72hrs)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
		ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
3 (3.15) 3R0	100	12	8	0.3	22×45	21	SCCDES3R0107QSA220045E
	120	12	8	0.3	22×45	21	SCCDES3R0127QSA220045E
	160	12	8	0.5	22×55	30	SCCDES3R0167QSA220055E
	150	11	7	0.5	25×50	30	SCCDES3R0157QSA250050E
	200	10	6	0.7	30×50	36	SCCDES3R0207QSA300050ES
	220	11	7	0.7	30×50	39	SCCDES3R0227QSA300050ES
	240	11	7	0.7	30×50	45	SCCDES3R0247QSA300050ES
	350	3.6	3.1	1.0	35×60	73	SCCDES3R0357QSL350060ES
	400	3.3	2.9	1.2	35×60	73	SCCDES3R0407QSL350060ES
	470	3.6	3.1	1.3	35×60	73	SCCDES3R0477QSL350060ES
	500	3.5	3	1.3	35×67	76	SCCDES3R0507QSL350067ES
	600	3	2.5	1.5	35×70	90	SCCDES3R0607QSL350070ES

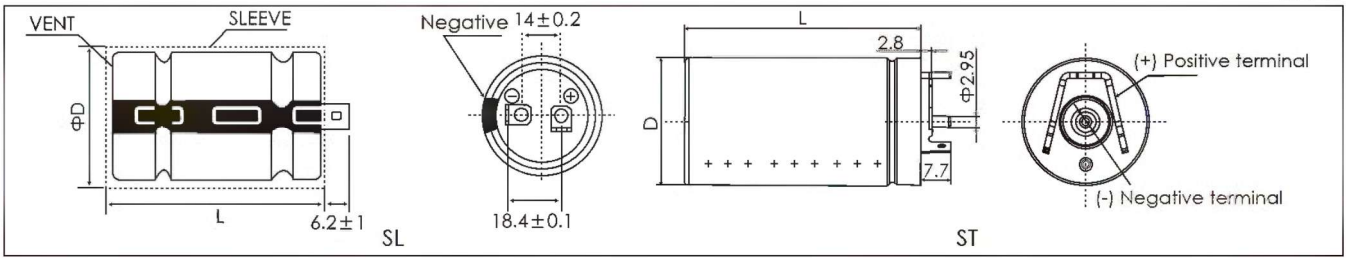
■ Typical application 典型应用

- PaSSLnger car power supply system
  乘用车电源系统
- Energy storage system of construction machinery
  工程机械储能系统
- Industrial standby power supply
  工业备用电源
- AGV on-board power supply
  AGV车载电源
- Microgrid energy storage
  微网储能

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.7 V		
Operating Temperature Rang 工作温度范围	-40~+65℃ (-40~+85℃ @2.3V)		
Surge Voltage 浪涌电压	2.85 V		
Capacitance Range 容量范围	250~1200 F		
Capacitance Tolerance 容差范围(25℃)	Q: -10~+30%, I: 0~+10%, R: 0~+20%, F: 0~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 65℃ 在-40℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 30% of the rated value at 25℃ 在25℃时额定值的30%以内
		ESR change 内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1500 hours 在65℃温度下，以额定电压恒压1500h后，应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR change 内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the rated value 在额定值的30%以内
		ESR change 内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 30% of the rated value 在额定值的30%以内
		ESR change 内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍

Dimensions 尺寸

mm



Ratings for SSL Series SSL 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流(72hrs)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
		ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
2.7 (2.85) 2R7	350	2.8	2.3	1.0	35×60	73	SCCDLS2R7357QSL350060ES
	400	2.7	2.2	1.2	35×60	73	SCCDLS2R7407QSL350060ES
	600	2.6	2.4	1.5	35×70	90	SCCDLS2R7607QSL350070ES
	800	2.7	2.2	1.5	40×70	120	SCCDLS2R7807QSL400070ES
	900	2.5	2.0	2.0	40×75	125	SCCDLS2R7907QSL400075ED
	1000	2.5	2.0	2.0	40×90	150	SCCDLS2R7108QSL400090ED
	1200	2.3	1.8	2.5	40×105	175	SCCDLS2R7128QSL400105ED

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流(72hrs)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
		ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
2.7 (2.85) 2R7	250	1	0.85	0.6	33×62	70	SCCDLS2R7257RST330062E
	350	1.9	1.4	0.7	33×62	65	SCCDLS2R7357RST330062E
	500	2	1.5	1.2	33×77	85	SCCDLS2R7507RST330077E
	400	1.9	1.4	1.2	35×62	90	SCCDLS2R7407RST350062E
	600	2	1.5	1.5	35×88	104	SCCDLS2R7607RST350088E

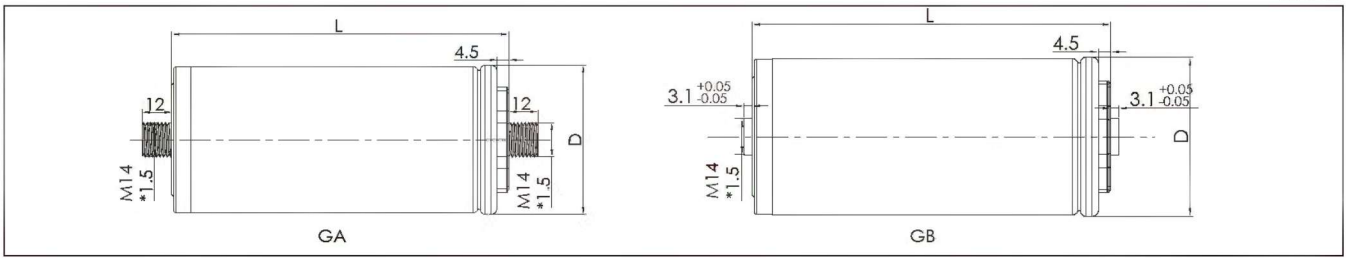
■ Typical application 典型应用

- Subway energy storage system
  地铁线路储能系统
- Start power module of passenger car
  乘用车启动电源模块
- Backup power supply for fan rotor control system
  风机变桨控制系统的后备电源
- Energy storage system for construction machinery
  工程机械储能系统
- Micro network storage
  微网储能

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.7 V		
Operating Temperature Rang 工作温度范围	-40~+65℃		
Surge Voltage 浪涌电压	2.85 V		
Capacitance Range 容量范围	650~3400 F		
Capacitance Tolerance 容差范围(25℃)	0~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 65℃ 在-40℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 20% of the rated value at 25℃ 在25℃时额定值的20%以内
		ESR_{DC} change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1500 hours 在65℃温度下，以额定电压恒压1500h后，应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR_{DC} change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR_{DC} change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 1,000,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环1,000,000次后，应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR_{DC} change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍

Dimensions 尺寸

mm



Ratings for SGP Series SGP 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	ESR_{DC} 直流内阻	Leakage Current 漏电流(72hrs)	Maximum Continuous Current 最大持续电流 (Δt=15℃)	Maximum Continuous Current 最大持续电流 (Δt=40℃)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
(V)	(F)	(mΩ)	(mA)	(A)	(A)	(mm)	(g)	-
2.7 (2.85) 2R7	650	0.8	1.5	54	88	61×52	160	SCCDPG2R7657RGB610052E
								SCCDPG2R7657RGA610052E
	1200	0.58	2.7	70	110	61×74	260	SCCDPG2R7128RGB610074E
								SCCDPG2R7128RGA610074E
	1500	0.47	3	84	140	61×85	280	SCCDPG2R7158RGB610085E
								SCCDPG2R7158RGA610085E
	2000	0.35	4.2	110	170	61×102	360	SCCDPG2R7208RGB610102E
								SCCDPG2R7208RGA610102E
	3000	0.29	5.2	130	210	61×138	510	SCCDPG2R7308RGB610138E
								SCCDPG2R7308RGA610138E
	3400	0.28	10	130	210	61×138	513	SCCDPG2R7348RGB610138E
								SCCDPG2R7348RGA610138E

SCREW EDLC CELL: SGE SERIES 螺栓式EDLC 单体: SGE系列

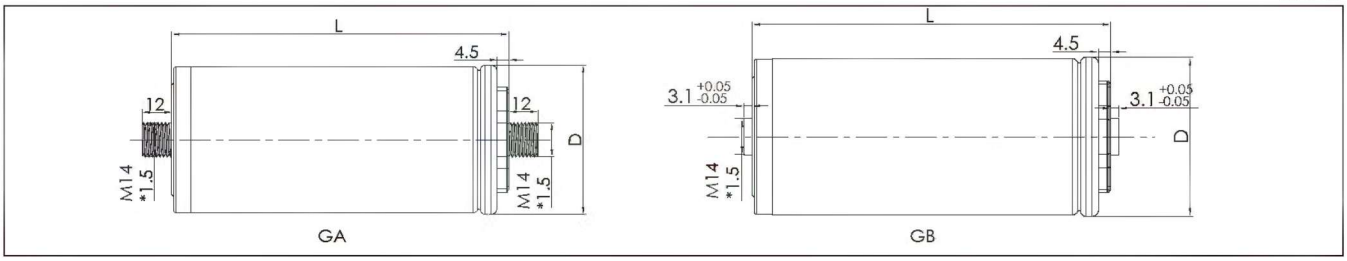
■ Typical application 典型应用

- Subway energy storage system
  地铁线路储能系统
- Start power module of passenger car
  乘用车启动电源模块
- Backup power supply for fan rotor control system
  风机变桨控制系统的后备电源
- Energy storage system for construction machinery
  工程机械储能系统
- Micro network storage
  微网储能

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	3.0 V		
Operating Temperature Rang 工作温度范围	-40~+65℃		
Surge Voltage 浪涌电压	3.15 V		
Capacitance Range 容量范围	650~3400 F		
Capacitance Tolerance 容差范围(25℃)	0~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 65℃ 在-40℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 20% of the rated value at 25℃ 在25℃时额定值的20%以内
		ESR_{DC} change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1500 hours 在65℃温度下，以额定电压恒压1500h后，应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR_{DC} change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR_{DC} change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 1,000,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环1,000,000次后，应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR_{DC} change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍

Dimensions 尺寸

mm



EDLC

Ratings for SGE Series SGE 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	ESR_{DC} 直流内阻	Leakage Current 漏电流(72hrs)	Maximum Continuous Current 最大持续电流 (Δt=15℃)	Maximum Continuous Current 最大持续电流 (Δt=40℃)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
(V)	(F)	(mΩ)	(mA)	(A)	(A)	(mm)	(g)	-
3 (3.15) 3R0	650	0.79	3	54	88	61×52	160	SCCDEG3R0657RGB610052E
								SCCDEG3R0657RGA610052E
	1200	0.55	5	73	110	61×74	260	SCCDEG3R0128RGB610074E
								SCCDEG3R0128RGA610074E
	1500	0.47	7	83	140	61×85	280	SCCDEG3R0158RGB610085E
								SCCDEG3R0158RGA610085E
	2000	0.36	8	102	170	61×102	360	SCCDEG3R0208RGB610102E
								SCCDEG3R0208RGA610102E
	3000	0.27	12	130	210	61×138	510	SCCDEG3R0308RGB610138E
								SCCDEG3R0308RGA610138E
	3400	0.24	15	140	225	61×138	513	SCCDEG3R0348RGB610138E
								SCCDEG3R0348RGA610138E

TECHNICAL NOTES OF LIC

1. Operating Principle

As a new system in the super capacitor field, the lithium-ion capacitor is based on the adoption of the new & advanced material technology, and uses the hybrid electrode material according to the design to realize the combination of principle & technology of the lithium-ion battery and super capacitor in one electrolytic cell by electrochemical calculation. In this way, the features of high specific power, long lifetime and fast charging of the super capacitor can be well maintained, and meanwhile the specific energy will be greatly enhanced with the performance blank between the double layer capacitor and lithium-ion battery effectively filled up, showing excellent application prospect.Lithium Ion Capacitors are hybrid capacitors that use a carbon-based material as the negative electrode. Just as in a conventional EDLC, they use activated carbon for the positive electrode.

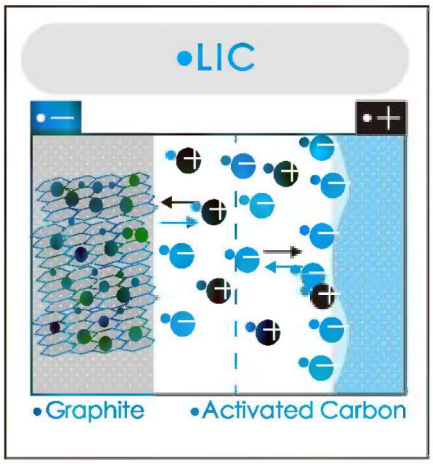


Fig. 1

2. Features

(1)High working voltage:4.0/3.8V
(2)High energy density: 20~90Wh/Kg
(3)Fast charge/discharge at high current:3~15min
(4)Low self discharge:≤5%/3 months
(5)Long life:50000~500,000 charge/discharge cycles
(6)Wide operation temperature range: -25~55&65℃ (Soft pack) /70&85℃ (Al can)
(7)High safety/reliability

3. Application

(1) Electric Vehicle

The lithium-ion capacitor is of tremendous market values in the area of hybrid power cars & coaches and pure electric buses. Some well-known car manufacturers have already conducted systematic testing and evaluation on the lithium-ion capacitor products. The conclusion they have drawn shows that to compare with the present batteries in use, the lithium-ion capacitor possesses significant performance advantages, and will have a bright future in the follow-up development of hybrid power cars and take up an important market share.

1、工作原理

锂离子电容器作为超级电容器领域中的一种新体系，以采用新型先进材料技术为基础，通过电化学计算，按照设计使用混合电极材料，在一个电解池中实现了锂离子电池和双电层电容器的原理和技术的结合，使其在保持双电层电容器高比功率、长寿命和快速充电特性的同时，大幅度提高了比能量，有效的填补了双电层超级电容器和锂离子电池之间的性能空白，表现出了良好的应用前景。锂离子电容器是一种混合型电容器，其使用碳基材料为负极，而正极与普通的双电层电容器一样，使用活性炭材料。

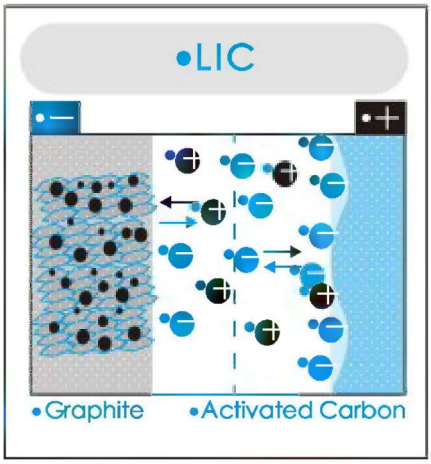


图. 1

2、特点

（1）高工作电压：4.0/3.8V
（2）高能量密度：10~90Wh/Kg
（3）大电流快速充放电：3~15min
（4）低自放电：2~10%/3个月
（5）长寿命：5~50万次充放电循环
（6）宽工作温度范围：-25~55&65℃（软包）/70&85℃（铝壳）
（7）高安全性与高可靠性

3、应用

（1）电动汽车

锂离子电容器在混合动力轿车和大客车，以及纯电动公交车等电动汽车领域中具有巨大的市场价值。众多知名汽车公司都对锂离子电容器产品进行了系统的检测和评估，认为与目前使用的电池相比，锂离子电容器具有显著的性能优势，非常看好锂离子电容器在混合动力轿车后续开发中的应用前景，未来将占据重要的市场份额。

(2) Rail Transit

Off-line operation is one of the technical development directions of the modern tram, and enterprises both at home and abroad highly value this point. Under the premise of keeping the reasonable weight and cost, the adoption of the lithium-ion capacitors can satisfy the off-line operation requirement for the whole journey after a fast charging at the terminal station. Thus a great amount of infrastructure expenditure can be saved, and the remarkable cost/performance advantage demonstrated.

(3) Hybrid power driven engineering machinery and harbor machinery

The engineering machinery and harbor machinery have the common problem of low engine energy efficiency, and are unable to recover the regenerated energy. The hybrid power driven engineering machinery and harbor machinery using the lithium-ion capacitors take the full advantage of the characteristics of the lithium-ion capacitor, and are of very high energy-saving rate and excellent cost performance.

(4) Energy-saving elevator

The adoption of the Li-ion capacitors can recycle the stored potential energy into electricity to be firstly used in the next operation cycle. Thus, the energy-saving is realized. Meanwhile, it can also be used as an emergency back-up power supply of the elevator to greatly improve its safety performance.

(5) Golf Cart and AGV

The golf cart and AGV using the lithium-ion capacitors make the power supply smaller in size, light in weight, lower in cost, longer in lifetime and easy to use. It is a brand new application model worthy to be developed.

(6) Electric Tools

The fast charging electric tools need the combination of high power and energy, long lifetime, excellent safety performance and consistency. The adoption of the lithium-ion capacitor will further improve the performance of the fast charging electric tools, and prolong the lifetime and reduce the cost. It is of a very broad market prospect.

(7) DC Circuit and Smart Meters

Compared with EDLC, the lithium-ion capacitor can offer much higher capacitance. Therefore, it will have a very bright future, and be widely used in electric appliances such as smart meter, mobile DVR, tachograph, hand-held GPRS equipment, and ETC etc.

4. Handling Precautions and Guidelines

For safety application, please contact company directly for any technical specifications, handling precautions and guidelines critical to application.

4.1 Precautions

(1) Prohibition of disassembly

The disassembling may generate internal short circuit in the cell, which may cause gassing, leakage, explosion, or other problems. Electrolyte is harmful: In case the electrolyte comes into contact with the skin, or eyes, physicians shall flush the electrolyte immediately with fresh water and medical advice is to be sought.

(2) Prohibition of dumping of cells into fire

These may cause explosion of the cells, which is very dangerous and is prohibited.

(3) Prohibition of cells immersion into liquid.

The cells shall never be soaked with liquids such as water, seawater, drinks such as juices, coffee or others.

(4) Prohibition of use of damaged cells.

The cells might be damaged during shipping by shock. If any abnormal features of the cells are found such as damages in the cell package, smelling of an electrolyte, an electrolyte leakage and others, the cells shall never be used any more. The Cells with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing or explosion.

(2) 轨道交通

脱线运行是现代有轨电车的技术发展方向之一，国内外企业对此均予以高度重视。应用锂离子电容器作为电源，在保持合理重量和成本的前提下，在终点站一次快速充电即可满足全程脱线运营的要求，节约了大量的基建费用，具有显著的成本和性能优势。

(3) 混合动力工程机械及港口机械

工程机械和港口机械普遍出现发动机能量效率低下，具备能量回收的条件。混合动力工程机械及港口机械充分利用了锂离子电容器的特性，具有优秀的节能效率和高性价比。

(4) 节能电梯

使用锂离子电容器，回收储存势能所转化的电能，下一工作循环时优先使用，实现节能；同时用作为电梯应急后备电源，能够大幅度提高电梯使用的安全性。

(5) 高乐夫球车及AGV

高尔夫球车和AGV使用锂离子电容器，电源体积、重量和成本更低，寿命更长，使用更方便，能够开拓崭新的应用模式。

(6) 电动工具

快充式电动工具需要电源兼顾高功率和高能量、长寿命、高安全性和高一致性等，使用超级电容器能进一步提高快充式电动工具使用性能、延长寿命、降低成本，具有非常广阔的市场前景。

(7) 直流电路和智能仪表

相比双电层电容器，锂离子电容器能提供更高的容量。因此，它具有更广阔的应用前景，如智能仪表、车载DVR，行驶记录仪、手持GPRS设备、ETC等电器。

4、使用注意事项和使用指导

为了确保安全，当设计的设备需使用电容时，请与公司联系咨询电容的技术规格以及使用要求。

4-1、注意事项

(1) 禁止拆卸

拆卸电容器可能产生内部短路，导致产气，电解液泄漏。电解液有害，如果电解液接触皮肤或者眼睛，应该立即用清水冲洗并且寻求医生的治疗。

(2) 禁止将电容器投入火中

将电容器投入火中可能导致爆炸，这种行为是非常危险，是被禁止的。

(3) 禁止将电容器浸没于液体中

电容器不允许被浸泡在液体中，例如水，盐水，饮料例如果汁，咖啡或者其它。

(4) 禁止使用已经损坏的电容器

如果使用前发现电容的外包装破裂，闻到电解液的气味，电解液泄漏或者其它非正常情况，请勿继续使用。

(5) Prohibition of short-circuit or using for outside the working voltage.

Which may cause to gas, leakage or other problems.

(6) Prohibition of reversing the positive(+) and negative(-) terminals.

Which may cause to gas, leakage or other problems.

4.2 Handling Guidelines for monomer

(1) It is not suitable that cell is used under such conditions: AC circuit and wave filtering.

(2) Work voltage of cell should not exceed rated max operating voltage and min allowable operating voltage of cell during using. Otherwise, will shorten shelf life, even cause swelling, leakage or crack.

(3) Please check the polarity before using.If working under reverse polarity, cell will not only shorten shelf life, but also heavy damage, such as swelling, electrolyte leakage etc.

(4) Environment

Work temperature will have an influence on service life of cell. As usual, higher work temperature will shorten service life. So, it is better that cell works under as possible as low environmental temperature.

Work temperature of cell should consider internal work temperature in the unit and temperature rise when cell works.

(5) IR drop

When main power sources shut down, cell will change into work mode from failure mode, at the same time, OCV will decrease due to IR drop. So please choose proper product type according to internal resistance and operating current in product datasheet.

(6) Cells in series connection

When multiple cells are used in series to improve the working voltage, the cell of the same gear must be used and the corresponding equalization circuit must be configured, it should be assured that work voltage of any single cell must not exceed Max.work voltage of single cell, otherwise, will shorten shelf life, even cause swelling, leakage or crack.

(7) Soldering

Heat shock will decrease electric performance of cell, even cause swelling, leakage or crack.

Manual soldering is recommended, soldering temperature should not exceed 350℃, soldering time should not exceed 5s.

Please don't use wave soldering, reflow soldering of infrared heating and air heating.

4.3 Handling Guidelines for Modules

(1) Cell pairing

When using cells in series to form modules, cells in the same gear should be used to ensure the voltage consistency of cells in the group.

(2) Protection mechanism

Modules need to be equipped with over voltage, under voltage, temperature and other protection functions to extend the service life of the module.

(3) Self-discharge

When the module is placed for a long time, it is necessary to pay attention to the self-discharge of the module, in addition to the self-discharge consumption of the single capacitor, there is also the circuit power discharge. The storage time is recommended for 6 months to 2 years.

(4) Insulation protection

Lithium supercapacitive cell is charged storage, modules can reach high voltage through series, so it is necessary to pay attention to insulation protection during use.

（5）禁止短路或使用超过电容器的允许的工作电压

可能导致产气，泄漏，或其他问题。

（6）禁止反向充电

可能导致产气，泄漏，或其他问题。

4-2、单体使用指导

（1）不可以用于以下场合：交流电路和滤波电路。

（2）电容的工作电压不应超过电容额定最高工作电压和最低允许工作电压。否则，会导致缩短使用寿命，甚至引起气胀、泄漏或开裂。

（3）使用前请检查极性。如果在反极性下工作，电容不仅会缩短使用寿命，甚至还会造成严重的损坏，如气胀、电解液泄漏等。

（4）环境

工作温度会影响电容的使用寿命。通常，较高的工作温度会缩短使用寿命。因此，最好是在低环境温度下工作。

电容的工作温度应考虑机组内部工作温度和电容工作时的内部温升。

（5）IR下降

当主电源关闭，电容会从电源失效检测模式转变为后备电源工作模式，此时由于瞬间启动电流和电容内阻会导致开路电压下降。因此，请根据产品规格书中指定的内阻和工作电流选择合适的产品类型。

（6）串联连接的电容

当多个单体电容串联使用以提高工作电压时，必须采用同档位单体并且配置对应均衡电路，确保每只单体电容两端的电压不超过其最大工作电压，否则，将缩短其使用寿命，甚至导致气胀，泄露，或者开裂。

（7）焊接

热冲击会降低电容的电性能，甚至引起气胀、泄漏或开裂。

推荐使用手工焊接，焊接温度不应超过350度，焊接时间不应超过5s。

请不要使用波峰焊、红外线加热和空气加热的回流焊。

4-3、模组使用指导

（1）单体配组

使用单体串联组成模组时，需要采用同一档位内单体，保证成组内单体电压一致性。

（2）保护机制

模组需要配备过压、欠压、温度等保护功能，延长模组的使用寿命。

（3）自放电

模组长期放置时，需要关注模组自放电,除了单体电容自放电消耗之外还有电路功耗放电。存放时间建议6个月~2年。

（4）绝缘防护

锂超容单体是带电储存，模组通过串联可以达到高电压，因此使用过程中需要注意绝缘防护。

RADIAL LIC CELL: HBR SERIES 引线式LIC 单体: HBR系列

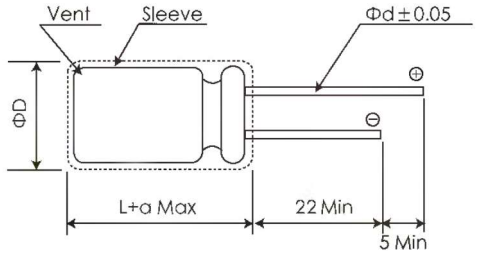
■ Typical application 典型应用

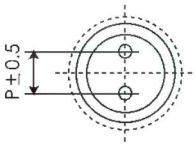
- Smart Meter: water meter, gas meter, hot meter
  智能仪表：水表、气表、热表
- Scanner
  扫描枪
- Electric Tools
  电动工具
- Electric equipment
  电力设备
- Driving recorder
  行车记录仪
- Wireless charging smart home remote control
  无线充智能家用遥控器
- Backup power: IoT Power, Server backup power, ETC
  后备电源：物联网电源、服务器后备电源、ETC

Items 项目	Characteristics 特性		
Rated Max. Operating Voltage 额定最高工作电压	3.8 V		
Rated Min. Operating Voltage 额定最低工作电压	2.5 V		
Min. Allowable Operating Voltage 最低允许工作电压	2.2 V		
Operating Temperature Rang 工作温度范围	-15~+70℃/85℃ (3.5V)		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	5~550 F		
Capacitance Tolerance 容差范围(25℃)	M: -20~+20%, T: 0~+50%, S: -20~+50%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -15℃ to 70℃ 在-15℃至70℃温度范围内，应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR_{AC} change 交流内阻变化	Not more than 10 times of the initial specified value at 25℃ 不超过25℃时初始规定值的10倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 70℃ for 1000 hours 在70℃以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from 3.8~2.5V 在25℃，3.8~2.5V充放电循环500000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Dimensions 尺寸

mm





ΦD	6.3	8	10	12.5	16	18
p	2.6	3.5	5.0	5.0	7.5	7.5
Φd	0.5	0.6	0.6	0.6	0.8	0.8
a	1.5	1.5	2.0	2.0	2.0	2.0

Ratings for HBR Series HBR 系列额定值

UR (Surge Voltage) (浪涌电压) Code	Rated Cap. 额定容量 25℃	Storage Energy 储存能量 25 ℃	Impedance 内阻		Rated. Current 额定电流	Max. Current 最大电流 (≤3sec)	Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	P/N 部品号
			ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)					
(V)	(F)	(mWh)	(mΩ)	(mΩ)	(A)	(A)	(μA)	(mm)	-
3.8 (4.35) 3R8	5	5.7	6000	2000	0.025	0.15	2.0	6.3×12	SCCHBR3R8505SRH063012E
	13	14.8	1800	600	0.065	0.65	2.1	6.3×22	SCCHBR3R8136MRH063022E
	10	11.4	1800	500	0.05	0.5	2.0	8×14	SCCHBR3R8106TRH080014E
	25	28.4	1200	350	0.125	0.8	2.5	8×20	SCCHBR3R8256MRH080020E
	30	34.1	900	250	0.15	0.9	3.0	8×25	SCCHBR3R8306MRH080025E
	30	34.1	900	250	0.15	1.0	3.0	10×16	SCCHBR3R8306TRH100016E
	50	56.9	700	200	0.25	1.8	4.5	10×20	SCCHBR3R8506MRH100020E
	70	79.6	480	120	0.35	3.0	5.0	10×25	SCCHBR3R8706MRH100025E
	110	125.1	450	100	0.55	4.5	6.5	10×30	SCCHBR3R8117MRH100030E
	120	136.5	400	90	0.6	5.0	7.0	12.5×25	SCCHBR3R8127MRH125025E
	220	250.3	240	60	1.1	8.0	12.0	16×25	SCCHBR3R8227MRH160025E
	550	625.6	120	40	2.75	20	35.0	18×40	SCCHBR3R8557MRH180040E

*Note: Special customization is possible.
*注：可以特殊定制。

RADIAL LIC CELL: HBRL SERIES 引线式LIC 单体: HBRL系列

■ Typical application 典型应用

- Smart Meter: water meter, gas meter, hot meter
  智能仪表：水表、气表、热表
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  扫描枪
- Electric Tools
  电动工具
- Electric equipment
  电力设备
- Driving recorder
  行车记录仪
- Wireless charging smart home remote control
  无线充智能家用遥控器
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Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	5~550 F		
Capacitance Tolerance 容差范围(25℃)	M: -20~+20%, T: 0~+50%, S: -20~+50%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25℃ to 70℃ 在-25℃至70℃温度范围内，应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR_{AC} change 交流内阻变化	Not more than 10 times of the initial specified value at 25℃ 不超过25℃时初始规定值的10倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 70℃ for 1000 hours 在70℃ 以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
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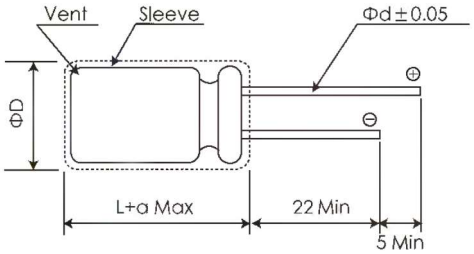
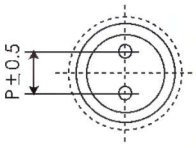
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 250,000 cycles at 25℃ , cycle of charge/discharge from 3.8~2.5V 在25℃，3.8~2.5V充放电循环250000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Dimensions 尺寸

mm





ΦD	6.3	8	10	12.5	16	18
p	2.6	3.5	5.0	5.0	7.5	7.5
Φd	0.5	0.6	0.6	0.6	0.8	0.8
a	1.5	1.5	2.0	2.0	2.0	2.0

Ratings for HBRL Series HBRL 系列额定值

U_R (Surge Voltage) (浪涌电压) Code	Rated Cap. 额定容量 25℃	Storage Energy 储存能量 25℃	Impedance 内阻		Rated. Current 额定电流	Max. Current 最大电流 (≤3sec)	Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	P/N 部品号
			ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)					
(V)	(F)	(mWh)	(mΩ)	(mΩ)	(A)	(A)	(μA)	(mm)	-
3.8 (4.35) 3R8	5	5.7	6000	2000	0.025	0.15	2.5	6.3×12	SCCHBL3R8505SRH063012E
	13	14.8	1200	500	0.065	0.65	3.1	6.3×22	SCCHBL3R8136MRH063022E
	10	11.4	1500	500	0.05	0.5	3.0	8×14	SCCHBL3R8106TRH080014E
	25	28.4	650	300	0.125	0.8	3.3	8×20	SCCHBL3R8256MRH080020E
	30	34.1	700	250	0.15	0.9	4.0	8×25	SCCHBL3R8306MRH080025E
	30	34.1	550	250	0.15	1.0	4.0	10×16	SCCHBL3R8306TRH100016E
	50	56.9	450	200	0.25	1.8	6.0	10×20	SCCHBL3R8506MRH100020E
	70	79.6	250	100	0.35	3.0	8.0	10×25	SCCHBL3R8706MRH100025E
	110	125.1	220	90	0.55	4.5	10.0	10×30	SCCHBL3R8117MRH100030E
	120	136.5	200	80	0.6	5.0	12.0	12.5×25	SCCHBL3R8127MRH125025E
	220	250.3	100	60	1.1	8.0	25.0	16×25	SCCHBL3R8227MRH160025E
	550	625.6	80	40	2.75	20	65	18×40	SCCHBL3R8557MRH180040E

*Note: Special customization is possible.
*注：可以特殊定制。

RADIAL LIC CELL: HBE SERIES 引线式LIC 单体: HBE系列

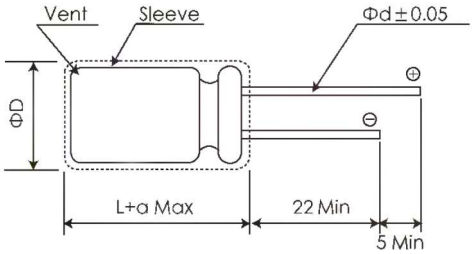
■ Typical application 典型应用

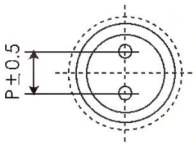
- Smart Meter: water meter, gas meter, hot meter
  智能仪表：水表、气表、热表
- Scanner
  扫描枪
- Electric Tools
  电动工具
- Electric equipment
  电力设备
- Driving recorder
  行车记录仪
- Wireless charging smart home remote control
  无线充智能家用遥控器
- Backup power: IoT Power, Server backup power, ETC
  后备电源：物联网电源、服务器后备电源、ETC

Items 项目	Characteristics 特性		
Rated Max. Operating Voltage 额定最高工作电压	3.8 V		
Rated Min. Operating Voltage 额定最低工作电压	2.5 V		
Min. Allowable Operating Voltage 最低允许工作电压	2.2 V		
Operating Temperature Rang 工作温度范围	-25~+70℃		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	8~1400 F		
Capacitance Tolerance 容差范围(25℃)	M: -20~+20%, T: 0~+50%, S: -20~+50%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25℃ to 70℃ 在-25℃至70℃温度范围内，应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR_{AC} change 交流内阻变化	Not more than 10 times of the initial specified value at 25℃ 不超过25℃时初始规定值的10倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 70℃ for 1000 hours 在70℃以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 250,000 cycles at 25℃ , cycle of charge/discharge from 3.8~2.5V 在25℃，3.8~2.5V充放电循环250000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Dimensions 尺寸

mm





ΦD	6.3	8	10	12.5	16	18
p	2.6	3.5	5.0	5.0	7.5	7.5
Φd	0.5	0.6	0.6	0.6	0.8	0.8
a	1.5	1.5	2.0	2.0	2.0	2.0

LIC

Ratings for HBE Series HBE 系列额定值

U_R (Surge Voltage) (浪涌电压) Code	Rated Cap. 额定容量 25℃	Storage Energy 储存能量 25 ℃	Impedance 内阻		Rated. Current 额定电流	Max. Current 最大电流 (≤3sec)	Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	P/N 部品号
			ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)					
(V)	(F)	(mWh)	(mΩ)	(mΩ)	(A)	(A)	(μA)	(mm)	-
3.8 (4.35) 3R8	8	9.1	2600	1200	0.04	0.25	2.0	6.3×12	SCCHBE3R8805SRH063012E
	22	25.0	1000	450	0.11	0.7	3.5	6.3×22	SCCHBE3R8226SRH063022E
	25	28.4	900	400	0.125	0.8	2.5	8×14	SCCHBE3R8256MRH080014E
	40	45.5	550	250	0.2	1.2	3.2	8×20	SCCHBE3R8406MRH080020E
	55	62.6	450	200	0.275	1.8	5.0	8×25	SCCHBE3R8556MRH080025E
	55	62.6	450	200	0.275	1.8	5.0	10×16	SCCHBE3R8556MRH100016E
	85	96.7	250	120	0.425	3.5	8.0	10×20	SCCHBE3R8856MRH100020E
	110	125.1	220	90	0.55	4	9.0	10×25	SCCHBE3R8117MRH100025E
	150	170.6	140	70	0.75	6	15.0	10×30	SCCHBE3R8157MRH100030E
	200	227.5	120	60	1	7	22.0	10×40	SCCHBE3R8207MRH100040E
	200	227.5	135	65	1	6	18.0	12.5×25	SCCHBE3R8207MRH125025E
	300	341.3	100	50	1.5	10	30.0	12.5×35	SCCHBE3R8307MRH125035E
	350	398.1	90	45	1.75	11	35.0	12.5×40	SCCHBE3R8357MRH125040E
	400	455.0	80	45	2	12	70.0	12.5×45	SCCHBE3R8407MRH125045E
	450	511.9	60	40	2.25	15	70.0	16×30	SCCHBE3R8457MRH160030E
	850	966.9	70	35	4.25	28	70.0	18×40	SCCHBE3R8857MRH180040E
	1000	1137.5	65	30	5	30	100.0	18×50	SCCHBE3R8108TRH180050E
	1400	1592.5	50	28	7	31	120.0	18×60	SCCHBE3R8148MRH180060E

*Note: Special customization is possible.
*注：可以特殊定制。

SOFT PACK LIC CELL: HAA SERIES 软包式LIC 单体: HAA系列

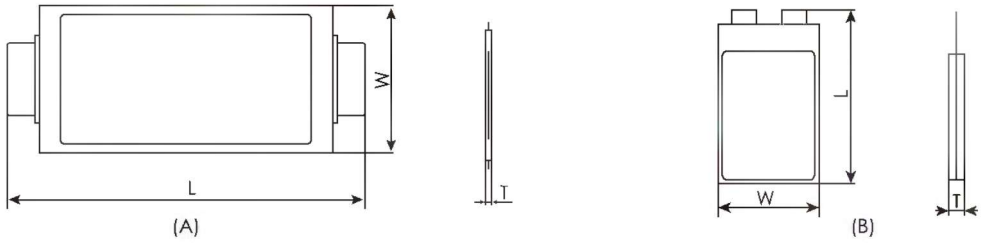
■ Typical application 典型应用

- Rail transit 轨道交通
- Smart power grids 智能电网
- Tunnel locomotive,mining locomotive 隧道机车、矿用机车
- Port truck码头车
- Pure electric bus 纯电动公交车
- Ferry, sightseeing car, golf cart, AGV and RGV 渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery 混合动力工程机械及港口机械
- Emergency UPS 应急后备电源
- Electric tools 电动工具
- Wind power, solar and other renewable energy storag 风电、光伏等可再生能源储能
- Other high power and high energy applications 其他对功率和能量要求比较高的工况应用

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.5~4.0V		
Operating Temperature Rang 工作温度范围	-25~+55℃		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	1000~16000 F		
Capacitance Tolerance 容差范围(25℃)	M: -20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25℃ to 55℃ 在-25℃至55℃温度范围内，应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value at 25℃ 不超过25℃时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 55℃ for 1000 hours 在55℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 55℃ for 1000 hours 在55℃ 温度下，储存1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 50,000 cycles at 25℃, cycle of charge /discharge from 2.5~4.0V 在25℃ 温度下，2.5~4.0V充放电循环50000次后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Dimensions 尺寸

mm



LIC

Ratings for HAA Series HAA 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Capacitance 额定容量 25℃ (*)	Storage Energy 储存能量 25 ℃	Impedance 内阻		Rated. Current 额定电流	Self-discharge 自放电 (72hrs)	Dimension 尺寸 (L*W*T)	P/N 产品代码
			ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)				
(V)	(F)	(Wh)	(mΩ)	(mΩ)	(A)	(V)	(mm)	-
4.0 (4.35) 4R0	1000	1.36	≤20	≤9	5	≥3.92	100×71×3.0(B)	SCCHAA4R0108M
	2000	2.92	≤10	≤6	10	≥3.92	100×71×5.5(B)	SCCHAA4R0208M
	3200	4.65	≤6.5	≤3.2	16	≥3.92	100×60×9.0(B)	SCCHAA4R0328M
	6000	8.10	≤4.5	≤3.0	30	≥3.92	300×123×3.5(A)	SCCHAA4R0608M
	10000	13.20	≤1.8	≤1.2	50	≥3.92	300×123×5.2(A)	SCCHAA4R0109M
	16000	22.00	≤1.5	≤1.2	50	≥3.92	300×123×8.0(A)	SCCHAA4R0169M

*Note: Special customization is possible.
*注：可以特殊定制。

SOFT PACK LIC CELL: HAE SERIES 软包式LIC 单体: HAE系列

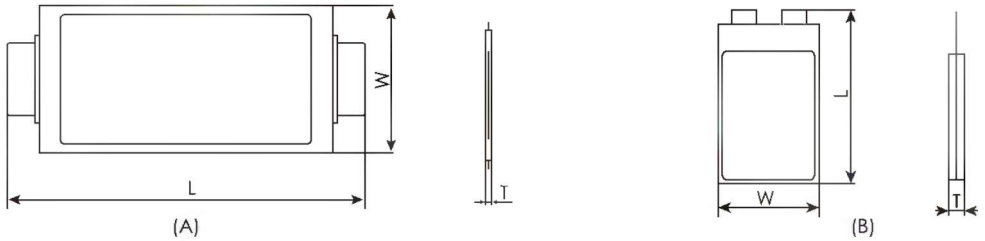
■ Typical application 典型应用

- Pure electric bus 纯电动公交车
- Tunnel locomotive,mining locomotive 隧道机车、矿用机车
- Port truck码头车
- Rail transit 轨道交通
- Smart power grids 智能电网
- Wind power, solar and other renewable energy storag 风电、光伏等可再生能源储能
- Ferry, sightseeing car, golf cart ,AGV and RGV 渡轮、观光车、高尔夫球车、AGV及RGV
- Emergency UPS 应急后备电源
- Hybrid power driven engineering machinery and harbor machinery 混合动力工程机械及港口机械
- Electric tools 电动工具
- Other high power and high energy applications 其他对功率和能量要求比较高的工况应用

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.5~4.0V		
Operating Temperature Rang 工作温度范围	-25~+55℃		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	3000~20000 F		
Capacitance Tolerance 容差范围(25℃)	M: -20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25℃ to 55℃ 在-25℃至55℃温度范围内，应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value at 25℃ 不超过25℃时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 55℃ for 1000 hours 在55℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 55℃ for 1000 hours 在55℃ 温度下，储存1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 50,000 cycles at 25℃, cycle of charge /discharge from 2.5~4.0V 在25℃ 温度下，2.5~4.0V充放电循环50000次后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Dimensions 尺寸

mm



LIC

Ratings for HAE Series HAE 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Capacitance 额定容量 25℃ (*)	Storage Energy 储存能量 25 ℃	Impedance 内阻		Rated. Current 额定电流	Self-discharge 自放电 (72hrs)	Dimension 尺寸 (L*W*T)	P/N 产品代码
			ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)				
(V)	(F)	(Wh)	(mΩ)	(mΩ)	(A)	(V)	(mm)	-
4.0 (4.35) 4R0	3000	5.95	≤6.5	≤3.5	8	≥3.92	100×60×9.2(B)	SCCHAE4R0308M
	7500	15.3	≤2.2	≤1.8	18.75	≥3.92	176×115×7.9(A)	SCCHAE4R0758M
	10000	18.5	≤2.5	≤1.5	25	≥3.92	300×123×5.2(A)	SCCHAE4R0109M
	15000	30.0	≤1.5	≤1.2	37.5	≥3.92	300×123×8.2(A)	SCCHAE4R0159M
	17000	34.0	≤1.2	≤1.2	42.5	≥3.92	300×123×8.3(A)	SCCHAE4R0179M
	20000	42.0	≤1.1	≤1.0	50	≥3.92	300×123×10.8(A)	SCCHAE4R0209M

* Refer to《Ultra-capacitor for electric vehicles QC/T-741-2014》 for the test method of rated cap.
*额定容量的测试方法参见《车用超级电容器 QC/T-741-2014》
*Special customization is possible.
*可以特殊定制。

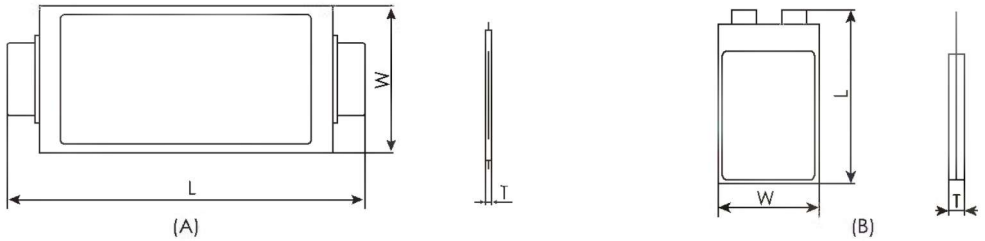
■ Typical application 典型应用

- Backup power (computer, server, UPS) 后备电源（电脑、服务器、UPS）
- Medical power supplies (Portable X-ray machine) 医疗器械电源（便携式x光机）
- Rail transit 轨道交通
- Smart power grids 智能电网
- Tunnel locomotive,mining locomotive 隧道机车、矿用机车
- Port truck码头车
- Pure electric bus 纯电动公交车
- Ferry, sightseeing car, golf cart ,AGV and RGV 渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery 混合动力工程机械及港口机械
- Wind power, solar and other renewable energy storag 风电、光伏等可再生能源储能
- Other high power, high energy and high temperature applications 其他对功率、能量和温度要求比较高的工况应用

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.5V~4.0V		
Operating Temperature Rang 工作温度范围	0~+65℃		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	1000~16000 F		
Capacitance Tolerance 容差范围(25℃)	M：-20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from 0℃ to 65℃ 在0℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value at 25℃ 不超过25℃时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 65℃ for 1000 hours 在65℃ 温度下，储存1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 50,000 cycles at 25℃, cycle of charge /discharge from 2.5~4.0V 在25℃ 温度下，2.5~4.0V充放电循环50000次后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Dimensions 尺寸

mm



LIC

Ratings for HAH Series HAH 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Capacitance 额定容量 25℃ (*)	Storage Energy 储存能量 25 ℃	Impedance 内阻		Rated. Current 额定电流	Self-discharge 自放电 (72hrs)	Dimension 尺寸 (L*W*T)	P/N 产品代码
			ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)				
(V)	(F)	(Wh)	(mΩ)	(mΩ)	(A)	(V)	(mm)	-
4.0 (4.35) 4R0	1000	1.36	≤25	≤11.5	5	≥3.92	100×71×3.0(B)	SCCHAH4R0108M
	2000	2.92	≤11.5	≤6.5	10	≥3.92	100×71×5.5(B)	SCCHAH4R0208M
	3200	4.65	≤7.0	≤4.0	16	≥3.92	100×60×9.0(B)	SCCHAH4R0328M
	6000	8.10	≤4.5	≤3.5	30	≥3.92	300×123×3.5(A)	SCCHAH4R0608M
	10000	13.20	≤2.2	≤1.5	50	≥3.92	300×123×5.2(A)	SCCHAH4R0109M
	16000	22.00	≤1.8	≤1.4	50	≥3.92	300×123×8.0(A)	SCCHAH4R0169M

*Note: Special customization is possible.
*注：可以特殊定制。

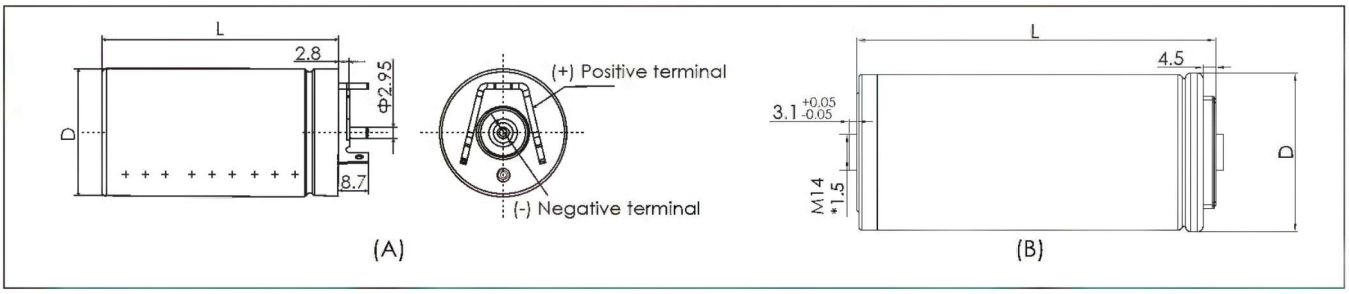
■ Typical application 典型应用

- Rail transit 轨道交通
- Smart power grids 智能电网
- Tunnel locomotive,mining locomotive 隧道机车、矿用机车
- Port truck码头车
- Pure electric bus 纯电动公交车
- Ferry, sightseeing car, golf cart, AGV and RGV 渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery 混合动力工程机械及港口机械
- Emergency UPS 应急后备电源
- Electric tools 电动工具
- Wind power, solar and other renewable energy storag 风电、光伏等可再生能源储能
- Other high power and high energy applications 其他对功率和能量要求比较高的工况应用

Items 项目	Characteristics 特性		
Rated Max. Operating Voltage 额定最高工作电压	4.0 V		
Rated Min. Operating Voltage 额定最低工作电压	2.5 V		
Min. Allowable Operating Voltage 最低允许工作电压	2.0 V		
Operating Temperature Rang 工作温度范围	-25~+65℃		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	3000~32000 F		
Capacitance Tolerance 容差范围(25℃)	M: -20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25℃ to 65℃ 在-25℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value at 25℃ 不超过25℃时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 65℃ for 1000 hours 在65℃ 温度下，储存1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 50,000 cycles at 25℃ , cycle of charge/discharge from 2.5~4.0V 在25℃ 温度下，2.5~4.0V充放电循环50000次后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Dimensions 尺寸

mm



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Ratings for HGA Series HGA 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Capacitance 额定容量 25℃ (*)	Storage Energy 储存能量 25 ℃	Impedance 内阻		Rated. Current 额定电流	Self-discharge 自放电 (72hrs)	Dimension 尺寸 (ΦD×L)	P/N 产品代码
			ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)				
(V)	(F)	(Wh)	(mΩ)	(mΩ)	(A)	(V)	(mm)	-
4.0 (4.35) 4R0	3000	5.00	≤3.0	≤2.5	13	≥3.92	33×62(A)	SCCHGA4R0308M
	4000	6.50	≤2.8	≤2.3	16.3	≥3.92	33×77(A)	SCCHGA4R0408M
	5000	8.30	≤2.7	≤2.2	21	≥3.92	33×90(A)	SCCHGA4R0508M
	6000	10.00	≤2.5	≤2.0	26	≥3.92	33×105(A)	SCCHGA4R0608M
	6500	10.80	≤2.3	≤1.8	28	≥3.92	35×105(A)	SCCHGA4R0658M
	11000	15.50	≤0.47	≤0.46	55	≥3.92	60×74(B)	SCCHGA4R0119M
	25000	36.00	≤0.46	≤0.45	100	≥3.92	60×138(B)	SCCHGA4R0259M
	32000	50.00	≤0.50	≤0.48	52	≥3.92	60×138(B)	SCCHGA4R0329M

* Refer to《GB/T 34870.1-2017 Super capacitors - Part 1: General》 for the test method of rated cap.
*额定容量的测试方法参见《GB/T 34870.1-2017 超级电容器 第1部分：总则》

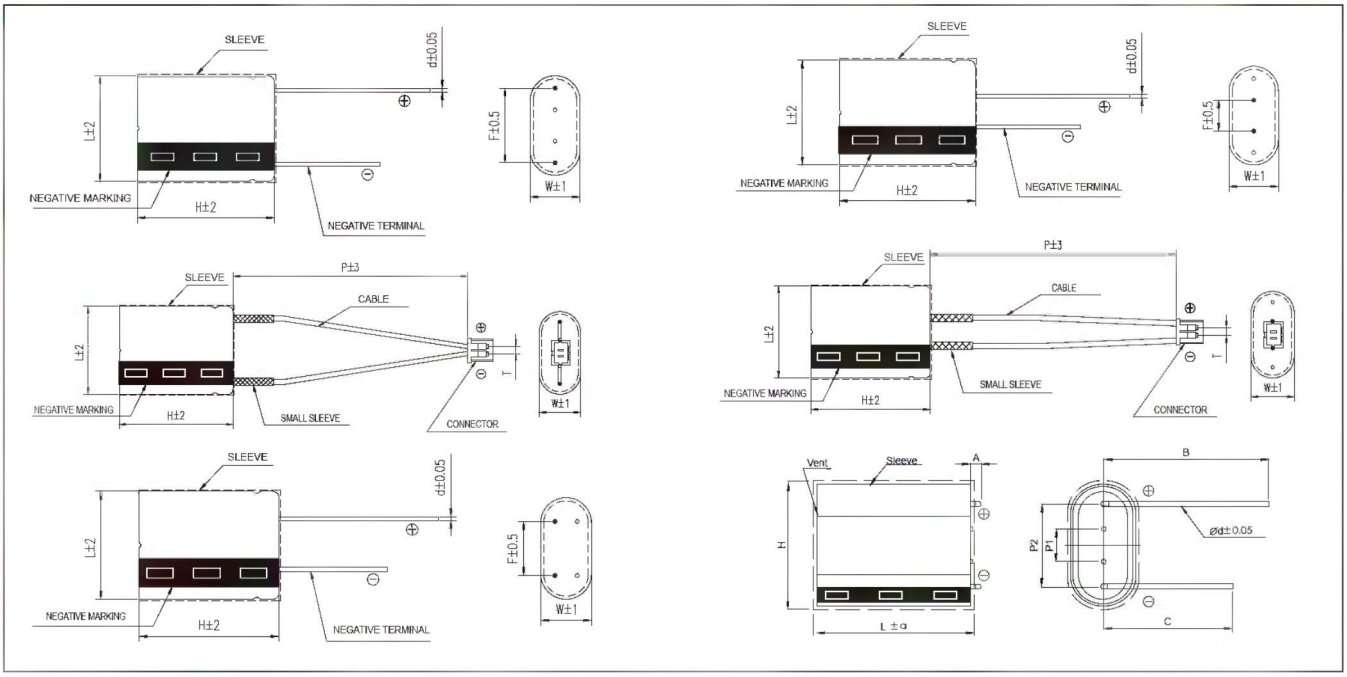
■ Typical application 典型应用

- Intelligent instruments: electronic meter, water meter, gas meter
  智能仪表：国网电表、水表、燃气表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator
  通讯终端：智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control,audio control, auto diagnosis system, wireless charging
  汽车电子：汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection
  储能：服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices
  消费类：玩具、机器人、智能家居、医疗器械


Items 项目	Characteristics 特性		
Rated Voltage 额定电压	5.5 V		
Operating Temperature Rang 工作温度范围	-40~+70℃ (-40~+85℃@4.6V)		
Surge Voltage 浪涌电压	5.7 V		
Capacitance Range 容量范围	0.22~50 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 70℃ 在-40℃至70℃温度范围内，应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25℃ 在25℃时初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 70℃ for 1000 hours 在70℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Dimensions 尺寸

mm

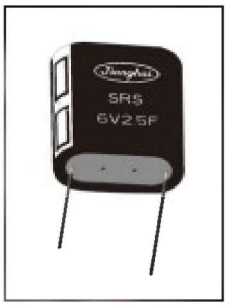


Ratings for SRM Series SRM 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	Pin spacing 引脚间距	Wire diameter 引线直径	P/N 产品代码
		ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)					
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(mm)	(mm)	-
5.5 (5.7) 5R5	0.22	1800	900	0.005	5.5×11×13	7.5/3.5	0.5	SCMDMR5R5224QRH051114ET0H0P075A
	0.33	1400	700	0.006	6.5×13×14	8.8/4.2	0.5	SCMDMR5R53344QRH061314ET0H0P088A
	0.5	820	420	0.008	8.5×17×16	12/5.0	0.6	SCMDMR5R5504QRH081716ET0H0P120A
	1	500	260	0.01	8.5×17×16	12/5.0	0.6	SCMDMR5R5105QRH081716ET0H0P120A
	1.5	380	200	0.012	8.5×17×22	12/5.0	0.6	SCMDMR5R5155QRH081722ET0H0P120A
	2.5	380	200	0.016	8.5×17×27	12/5.0	0.6	SCMDMR5R5255QRH081727ET0H0P120A
	2.5	260	140	0.016	11×21×22	15.5/5.5	0.6	SCMDMR5R5255QRH112122ET0H0P155A
	3.5	340	180	0.02	8.5×17×32	12/5.0	0.6	SCMDMR5R5355QRH081732ET0H0P120A
	3.5	280	150	0.02	11×21×22	15.5/5.5	0.6	SCMDMR5R5355QRH112122ET0H0P155A
	3.5	240	130	0.02	11×21×27	15.5/5.5	0.6	SCMDMR5R5355QRH112127ET0H0P155A
	5	200	110	0.03	11×21×27	15.5/5.5	0.6	SCMDMR5R5505QRH112127ET0H0P155A
	5	180	100	0.03	13×26×23	18/8	0.6	SCMDMR5R5505QRH132623ET0H0P180A
	5	180	100	0.03	11×21×33	15.5/5.5	0.6	SCMDMR5R5505QRH112133ET0H0P155A
	5	180	100	0.03	13×26×28	18/8	0.6	SCMDMR5R5505QRH132627ET0H0P180A
	7.5	140	80	0.045	13×26×28	18/8	0.6	SCMDMR5R5755QRH132627ET0H0P180A
	7.5	140	80	0.045	13×26×33	18/8	0.6	SCMDMR5R5755QRH132633ET0H0P180A
	10	120	70	0.06	17×33×24	24/9	0.8	SCMDMR5R5106QRH173324ET0H0P240A
	10	120	70	0.06	17×33×29	24/9	0.8	SCMDMR5R5106QRH173329ET0H0P240A
	10	140	80	0.06	13×26×33	18/8	0.6	SCMDMR5R5106QRH132633ET0H0P180A
	12.5	108	64	0.08	17×33×29	24/9	0.8	SCMDMR5R5126QRH173329ET0H0P240A
	15	92	56	0.1	17×33×35	24/9	0.8	SCMDMR5R5156QRH173335ET0H0P240A
	17.5	92	56	0.12	17×33×39	24/9	0.8	SCMDMR5R5176QRH173339ET0H0P240A
	20	92	56	0.12	17×33×39	24/9	0.8	SCMDMR5R5206QRH173339ET0H0P240A
	25	84	52	0.14	18×37×43	26/11	0.8	SCMDMR5R5256QRH183743ET0H0P260A
	35	92	56	0.2	18×37×53	26/11	0.8	SCMDMR5R5356QRH183753ET0H0P260A
	50	84	52	0.3	18×37×63	26/11	0.8	SCMDMR5R5506QRH183761ET0H0P260A

■ Typical application 典型应用

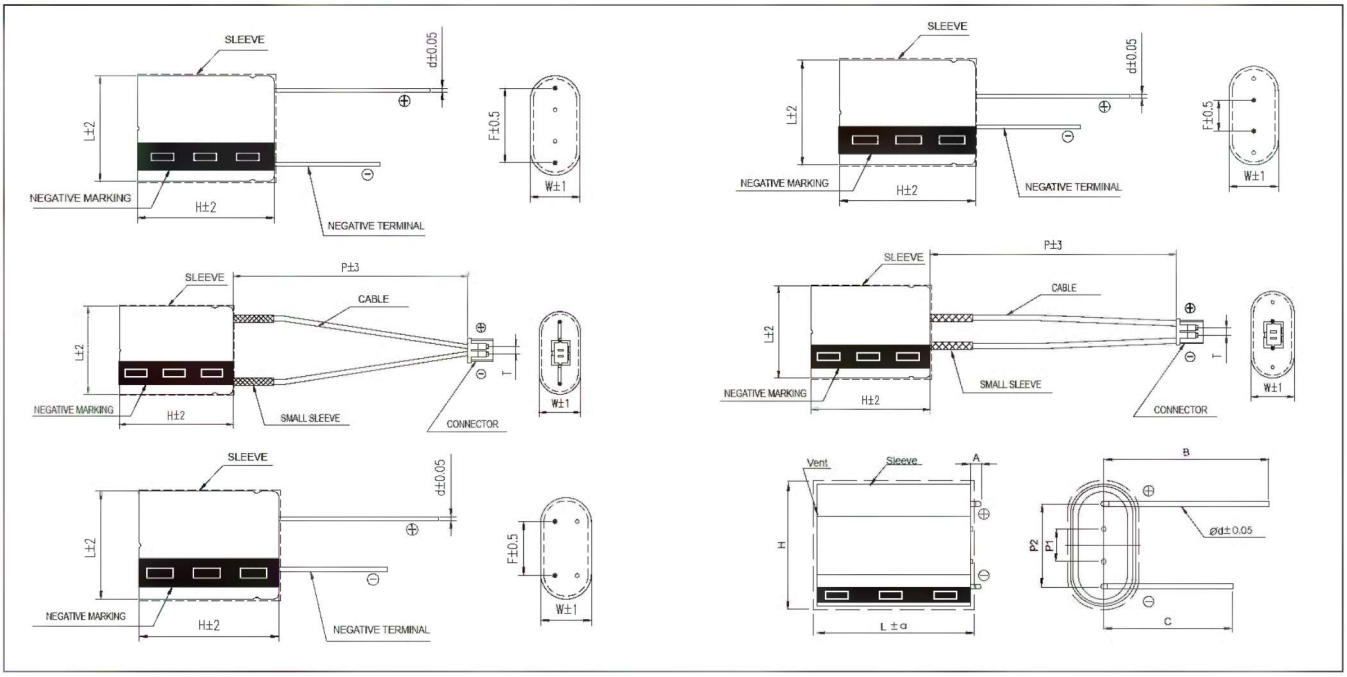
- Intelligent instruments: electronic meter, water meter, gas meter
  智能仪表：国网电表、水表、燃气表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator
  通讯终端：智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control,audio control, auto diagnosis system, wireless charging
  汽车电子：汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection
  储能：服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices
  消费类：玩具、机器人、智能家居、医疗器械




Items 项目	Characteristics 特性		
Rated Voltage 额定电压	6 V		
Operating Temperature Rang 工作温度范围	-40~+65℃ (-40~+85℃@5V)		
Surge Voltage 浪涌电压	6.4 V		
Capacitance Range 容量范围	0.5~50 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 65℃ 在-40℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25℃ 在25℃时初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 65℃ for 1000 hours 在65℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

Dimensions 尺寸

mm

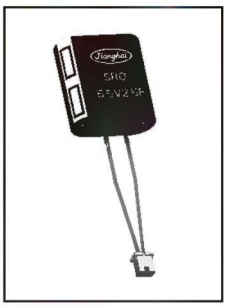


Ratings for SRS Series SRS 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	Pin spacing 引脚间距	Wire diameter 引线直径	P/N 产品代码
		ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)					
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(mm)	(mm)	-
6.0 (6.4) 6R0	0.5	1600	800	0.01	8.5×17×16	12/5.0	0.6	SCMDSR6R0504QRH081716ET0H0P120A
	1	660	340	0.012	8.5×17×16	12/5.0	0.6	SCMDSR6R0105QRH081716ET0H0P120A
	1.5	420	220	0.014	8.5×17×22	12/5.0	0.6	SCMDSR6R0155QRH081722ET0H0P120A
	2.5	780	400	0.02	8.5×17×27	12/5.0	0.6	SCMDSR6R0255QRH081727ET0H0P120A
	2.5	340	180	0.02	11×21×22	15.5/5.5	0.6	SCMDSR6R0255QRH112122ET0H0P155A
	3.5	420	220	0.03	8.5×17×32	12/5.0	0.6	SCMDSR6R0355QRH081732ET0H0P120A
	3.5	340	180	0.03	11×21×22	15.5/5.5	0.6	SCMDSR6R0355QRH112122ET0H0P155A
	3.5	260	140	0.03	11×21×27	15.5/5.5	0.6	SCMDSR6R0355QRH112127ET0H0P155A
	5	380	200	0.045	11×21×27	15.5/5.5	0.6	SCMDSR6R0505QRH112127ET0H0P155A
	5	220	120	0.045	13×26×23	18/8	0.6	SCMDSR6R0505QRH132623ET0H0P180A
	5	220	120	0.045	11×21×33	15.5/5.5	0.6	SCMDSR6R0505QRH112133ET0H0P155A
	5	220	120	0.045	13×26×28	18/8	0.6	SCMDSR6R0505QRH132627ET0H0P180A
	7.5	160	90	0.055	13×26×28	18/8	0.6	SCMDSR6R0755QRH132627ET0H0P180A
	7.5	160	90	0.055	13×26×33	18/8	0.6	SCMDSR6R0755QRH132633ET0H0P180A
	10	132	76	0.055	17×33×24	24/9	0.8	SCMDSR6R0106QRH173324ET0H0P240A
	10	132	76	0.07	13×26×27	18/8	0.6	SCMDSR6R0106QRH132627ET0H0P180A
	10	132	76	0.07	13×26×33	18/8	0.6	SCMDSR6R0106QRH132633ET0H0P180A
	12.5	120	70	0.1	17×33×29	24/9	0.8	SCMDSR6R0126QRH173329ET0H0P240A
	15	120	70	0.12	17×33×35	24/9	0.8	SCMDSR6R0156QRH173335ET0H0P240A
	17.5	104	62	0.15	17×33×35	24/9	0.8	SCMDSR6R0176QRH173335ET0H0P240A
	20	104	62	0.25	17×33×39	24/9	0.8	SCMDSR6R0206QRH173339ET0H0P240A
	25	100	60	0.35	18×37×43	26/11	0.8	SCMDSR6R0256QRH183743ET0H0P260A
	35	100	60	0.45	18×37×53	26/11	0.8	SCMDSR6R0356QRH183753ET0H0P260A
	50	92	56	0.55	18×37×63	26/11	0.8	SCMDSR6R0506QRH183761ET0H0P260A

■ Typical application 典型应用

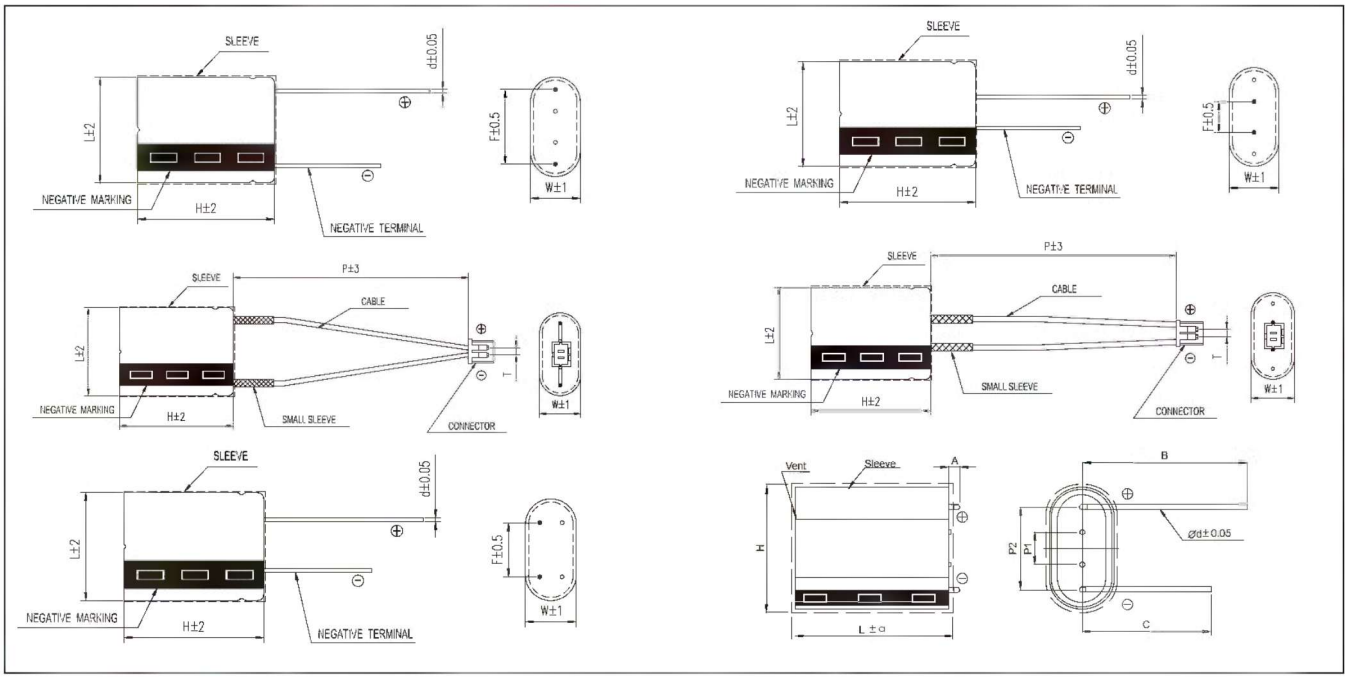
- Intelligent instruments: electronic meter, water meter, gas meter
  智能仪表：国网电表、水表、燃气表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator
  通讯终端：智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control,audio control, auto diagnosis system, wireless charging
  汽车电子：汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection
  储能：服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices
  消费类：玩具、机器人、智能家居、医疗器械



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	5.5 V		
Operating Temperature Rang 工作温度范围	-40~+85℃		
Surge Voltage 浪涌电压	5.7 V		
Capacitance Range 容量范围	0.5~25 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 85℃ 在-40℃至85℃温度范围内，应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25℃ 在25℃时初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after 5.0V applied at 85℃ for 1000 hours 在85℃ 温度下，以5.0V恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 85℃ for 1000 hours 在85℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

Dimensions 尺寸

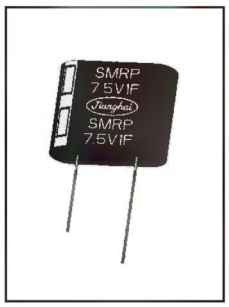
mm



Ratings for SRO Series SRO 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	Pin spacing 引脚间距	Wire diameter 引线直径	P/N 产品代码
		ESR_{DC} 直流内阻	ESR_{AC} 交流内阻 (1KHz)					
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(mm)	(mm)	-
5.5 (5.7) 5R5	0.5	1600	800	0.01	8.5×17×16	12/5.0	0.6	SCMDOR5R5504QRH081716ET0H0P120A
	1	660	340	0.012	8.5×17×16	12/5.0	0.6	SCMDOR5R5105QRH081716ET0H0P120A
	1.5	420	220	0.014	8.5×17×22	12/5.0	0.6	SCMDOR5R5155QRH081722ET0H0P120A
	2.5	780	400	0.02	8.5×17×27	12/5.0	0.6	SCMDOR5R5255QRH081727ET0H0P120A
	2.5	340	180	0.02	11×21×22	15.5/5.5	0.6	SCMDOR5R5255QRH112122ET0H0P155A
	3.5	420	220	0.03	8.5×17×32	12/5.0	0.6	SCMDOR5R5355QRH081732ET0H0P120A
	3.5	340	180	0.03	11×21×22	15.5/5.5	0.6	SCMDOR5R5355QRH112122ET0H0P155A
	3.5	260	140	0.03	11×21×27	15.5/5.5	0.6	SCMDOR5R5355QRH112127ET0H0P155A
	5	380	200	0.045	11×21×27	15.5/5.5	0.6	SCMDOR5R5505QRH112127ET0H0P155A
	5	220	120	0.045	13×26×23	18/8	0.6	SCMDOR5R5505QRH132623ET0H0P180A
	5	220	120	0.045	11×21×33	15.5/5.5	0.6	SCMDOR5R5505QRH112133ET0H0P155A
	5	220	120	0.045	13×26×28	18/8	0.6	SCMDOR5R5505QRH132627ET0H0P180A
	7.5	160	90	0.055	13 x 26×28	18/8	0.6	SCMDOR5R5755QRH132627ET0H0P180A
	7.5	160	90	0.055	13×26×33	18/8	0.6	SCMDOR5R5755QRH132633ET0H0P180A
	10	132	76	0.055	17×33×24	24/9	0.8	SCMDOR5R5106QRH173324ET0H0P240A
	10	132	76	0.07	13×26×27	18/8	0.6	SCMDOR5R5106QRH132627ET0H0P180A
	10	132	76	0.07	13×26×33	18/8	0.6	SCMDOR5R5106QRH132633ET0H0P180A
	12.5	120	70	0.1	17×33×29	24/9	0.8	SCMDOR5R5126QRH173329ET0H0P240A
	15	120	70	0.12	17×33×35	24/9	0.8	SCMDOR5R5156QRH173335ET0H0P240A
	17.5	104	62	0.15	17×33×35	24/9	0.8	SCMDOR5R5176QRH173335ET0H0P240A
	20	104	62	0.25	17×33×39	24/9	0.8	SCMDOR5R5206QRH173339ET0H0P240A
	25	100	60	0.35	18×37×43	26/11	0.8	SCMDOR5R5256QRH183743ET0H0P260A

■ Typical application 典型应用



- Server backup power
  服务器后备电源
- Intelligent instruments: electronic meter, water meter, gas meter
  智能仪表：国网电表、水表、燃气表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator
  通讯终端：智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control, audio control, auto diagnosis system, wireless charging
  汽车电子：汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection
  储能：服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices
  消费类：玩具、机器人、智能家居、医疗器械

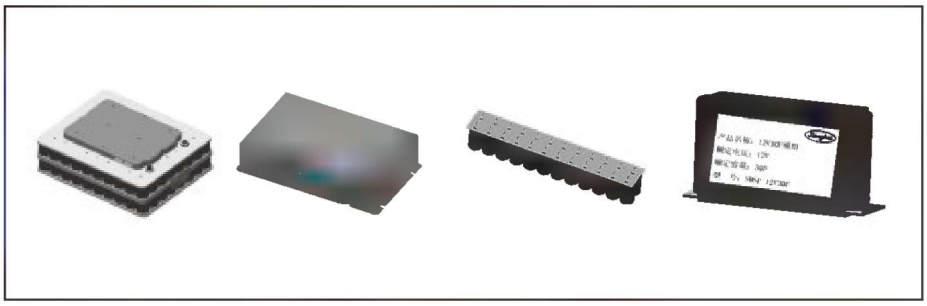
Items 项目	Characteristics 特性		
Rated Voltage 额定电压	7.5~25 V		
Operating Temperature Rang 工作温度范围	-40~+65℃		
Capacitance Range 容量范围	0.33~10 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 65℃ 在-40℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25℃ 在25℃时初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

Ratings for SMRE、SMRP Series SMRE、SMRP 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	ESR_{DC} 直流内阻	Leakage Current 漏电流 (72hrs)	Max. Peak Current (1s) 峰值电流	Size 尺寸	Weight 重量	P/N 产品代码
(V)	(F)	(mΩ)	(mA)	(A)	(mm)	(g)	-
7.5	3	290	0.03	6	13×39×27	20	SCMDPR7R5305QA
12.5	0.65	770	0.014	2.7	9.5×43×22	8	SCMDPR012654QA
13.5	8	350	0.25	14	13×64×51	50	SCMDER013805QA
25	10	340	0.3	28	40×100×63	230	SCMDPR025106QA

■ Typical application 典型应用

- Energy controller backup power
  能源控制器后备电源
- Smart grid backup power supply
  电网后备电源
- Special vehicle power supply
  特种车辆电源



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	5.5~800 V		
Operating Temperature Rang 工作温度范围	-40~+65℃		
Capacitance Range 容量范围	7.5F~180 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 65℃ 在-40℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25℃ 在25℃时初始值的30%以内
		ESR_{AC} chonge 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} chonge 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR_{AC} chonge 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Ratings for SMSP Series SMSP 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	ESR_{DC} 直流内阻	Leakage Current 漏电流 (72hrs)	Max. Peak Current (1s) 峰值电流	Size 尺寸 ΦL×W×H	Weight 重量	P/N 产品代码
(V)	(F)	(mΩ)	(mA)	(A)	(mm)	(g)	-
5.4	165	10	2	3	62×36×61	0.1	SCMDES5R4167RA
12	30	70	0.3	58	93×29×50	0.13	SCMDPS012306QA
	40	55	0.5	75	103×31×52	0.15	SCMDPS012406QA
27	180	30	1.8	380	400×140×92	6.5	SCMDPS027187QA
64	19.5	100	1.0	220	435×72×68	2.5	SCMDPS064196QA
432	7.5	105	2.7	930	650×520×205	56	SCMDPS432755QA
800	9.3	120	6	1900	600×700×1800	250	SCMDPS800935QA

*Customer products are available on request.

■ Typical application 典型应用

- Backup power supply for fan rotor system
  风机变桨系统后备电源
- Energy storage system of construction machinery
  工程机械储能系统
- Industrial standby power supply
  工业备用电源
- AGV on-board power supply
  AGV车载电源

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	80-160 V		
Operating Temperature Rang 工作温度范围	-40~+65℃		
Capacitance Range 容量范围	6F~21.7 F		
Capacitance Tolerance 容差范围(25℃)	0~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 65℃ 在-40℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 20% of the initial value at 25℃ 在25℃时初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Ratings for SSM Series SSM 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	ESR_{DC} 直流内阻	Leakage Current 漏电流 (72hrs)	Max. Peak Current (1s) 峰值电流	Size 尺寸 ΦL×W×H	Weight 重量	P/N 产品代码
(V)	(F)	(mΩ)	(mA)	(A)	(mm)	(Kg)	-
80	21.7	70	60	440	465×150×207	9.5	SCMDPS080216RA
85	20.6	75	60	400	400×148×213	11	SCMDPS085206RA
90	9.6	130	30	220	305×115×263	7.5	SCMDPS090965RA
	11.1	130	30	220	305×115×263	7.5	SCMDPS090116RA
	13	130	30	220	305×115×263	7.5	SCMDPS090136RA
	19.4	75	60	440	410×150×211	11	SCMDPS090196RA
125	7.2	200	30	220	390×190×80	5.5	SCMDPS125725RA
160	6	240	30	220	379×251×83	6.5	SCMDPS160605RA
	10	220	30	320	428×90×300	9	SCMDPS160106RA
	12	220	30	320	480×90×336	11.5	SCMDPS160126RA
	13	220	30	320	480×90×336	14	SCMDPS160136RA
	13	160	30	360	428×125×300	14	SCMDPS160136RA
	15	160	35	360	428×125×300	15	SCMDPS160156RA-H
	20	160	35	380	480×128×328	20	SCMDPS160206RA

*Customer products are available on request.

■ Typical application 典型应用

- DVR voltage sag power compensation system
  DVR电压暂降功率补偿
- Low temperature cold start power module
  低温冷启动电源模块
- Hybrid electric vehicle
  混合动力汽车
- Rail
  轨道交通
- Heavy industrial equipment
  重型工业设备
- UPS system
  UPS系统

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	16-48 V		
Operating Temperature Rang 工作温度范围	-40~+65℃		
Capacitance Range 容量范围	165~500 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 65℃ 在-40℃至65℃温度范围内，应满足规范	Capacitance change 容量变化	Within 20% of the initial value at 25℃ 在25℃时初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1500 hours 在65℃温度下，以额定电压恒压1500h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃ 温度下，不加电压储存1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from V_R to $1/2V_R$ 在25℃ 温度下，V_R ~ $1/2V_R$充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Ratings for SMGP Series SMGP 系列额定值

U_R (Surge Voltage) Code 额定电压(浪涌电压)代码	Rated Cap. 25℃ 额定容量 25℃ (*)	ESR_{DC} 直流内阻	Leakage Current 漏电流 (72hrs)	Max. Peak Current (1s) 峰值电流	Size 尺寸	Weight 重量	P/N 产品代码
(V)	(F)	(mΩ)	(mA)	(A)	(mm)	(Kg)	-
16	500	2	5.2	1900	68×418×177	5.5	SCMDPG016507RGBC
48	165	6	5.2	1900	418×194×180	14.5	SCMDPG048167RGBC
36	500	2.5	25	3800	432×276×181	18	SCMDEG036507QGBB
64	125	8	5.2	1900	432×276×181	20	SCMDPG064127QGBA
75	94	15	5.2	1900	512×262×200	28	SCMDPG075946QRBA

*Customer products are available on request.

■ Typical application 典型应用

- Smart grid primary frequency modulation
  智能电网一次调频系统
- Energy feedback system 能量回馈系统
- Tunnel locomotive,mining locomotive 隧道机车、矿用机车
- Port truck 码头车
- Pure electric bus 纯电动公交车
- Ferry, sightseeing car, golf cart, AGV and RGV
  渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery
  混合动力工程机械及港口机械
- Emergency UPS 应急后备电源
- Electric tools 电动工具
- Wind power, solar and other renewable energy storage 风电、光伏等可再生能源储能

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	12~720 V		
Operating Temperature Rang 工作温度范围	-25~+55℃		
Capacitance Range 容量范围	277~14000 F		
Capacitance Tolerance 容差范围(25℃)	-20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25℃ to 55℃ 在-25℃至55℃温度范围内，应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value at 25℃ 不超过25℃时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 55℃ for 1000 hours 在55℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 55℃ for 1000 hours 在55℃温度下，储存1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 50,000 cycles at 25℃, cycle of charge/discharge from 2.5~4.0V 在25℃温度下，2.5~4.0V充放电循环50000次后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Ratings for HMAA Series HMAA 系列额定值

HMAA Modules HMAA 模组

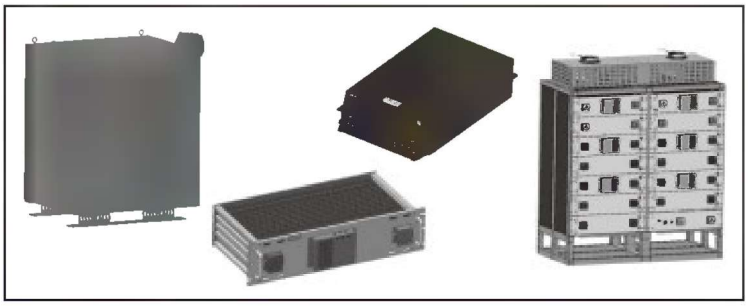
U_R 额定电压	U_{min} 最低电压	Rated Cap. 25℃/额定容量	ESR_{DC} 直流内阻	Rated Current 额定电流	Size 尺寸 L×W×H	Weight 重量	P/N 产品代码
(V)	(F)	(F)	(mΩ)	(A)	(mm)	(Kg)	-
12	7.5	10600	4	100	320×140×105	5	SCMHAA012109MA
32	20	12000	5	300	650×160×345	27	SCMHAA032129MA
64	43	400	80	32	458×228×75	6.4	SCMHAA064407MA
136	90	277	100	50	305×138×415	17.5	SCMHAA136277MA

HMAA System HMAA 系统

U_R 额定电压	U_{min} 最低电压	Rated Cap. 25℃/额定容量	ESR_{DC} 直流内阻	Rated Current 额定电流	Size 尺寸 L×W×H	Weight 重量	P/N 产品代码
(V)	(F)	(F)	(mΩ)	(A)	(mm)	(Kg)	-
56	35	14000	5	1000	802×725×471	665	SCMHAA056149MA
600	375	400	100	300	950×600×2350	980	SCMHAA600407MA
640	400	1250	30	1000	2872×1450×865	2500	SCMHAA640128MA
720	460	520	110	300	1500×650×2520	1325	SCMHAA720527MA

*Customer products are available on request.

■ Typical application 典型应用



- Smart grid primary frequency modulation 智能电网一次调频系统
- Energy feedback system 能量回馈系统
- Tunnel locomotive,mining locomotive 隧道机车、矿用机车
- Port truck 码头车
- Pure electric bus 纯电动公交车
- Ferry, sightseeing car, golf cart, AGV and RGV
  渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery
  混合动力工程机械及港口机械
- Emergency UPS 应急后备电源
- Electric tools 电动工具
- Wind power, solar and other renewable energy storage 风电、光伏等可再生能源储能

Items 项目	Characteristics 特性		
Rated Voltage 额定电压	84~700 V		
Operating Temperature Rang 工作温度范围	-25~+55℃		
Capacitance Range 容量范围	1190~5710 F		
Capacitance Tolerance 容差范围(25℃)	-20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25℃ to 55℃ 在-25℃至55℃温度范围内，应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR_{AC} change 交流内阻变化	Not more than 4 times of the initial specified value at 25℃ 不超过25℃时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 55℃ for 1000 hours 在55℃温度下，以额定电压恒压1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 55℃ for 1000 hours 在55℃ 温度下，储存1000h后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃ , cycle of charge/discharge from 2.5~4.0V 在25℃ 温度下，2.5~4.0V 充放电循环500,000次后，应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR_{AC} change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

Ratings for HMAE Series HMAE 系列额定值

HMAA Modules HMAE 模组

U_R 额定电压	U_{min} 最低电压	Rated Cap. 25℃/额定容量	ESR_{DC} 直流内阻	Rated Current 额定电流	Size 尺寸 L×W×H	Weight 重量	P/N 产品代码
(V)	(F)	(F)	(mΩ)	(A)	(mm)	(Kg)	-
4.2	2.5	900000	1	2000	286×210×1020	50	SCMHAE4R29010MA
56	35	7500	5	262	610×910×170	85	SCMHAE056758MA
72	45	8300	5	375	975×695×162	115	SCMHAE072838MA
84	52.5	5710	6.5	300	900×570×160	110	SCMHAE084578MA

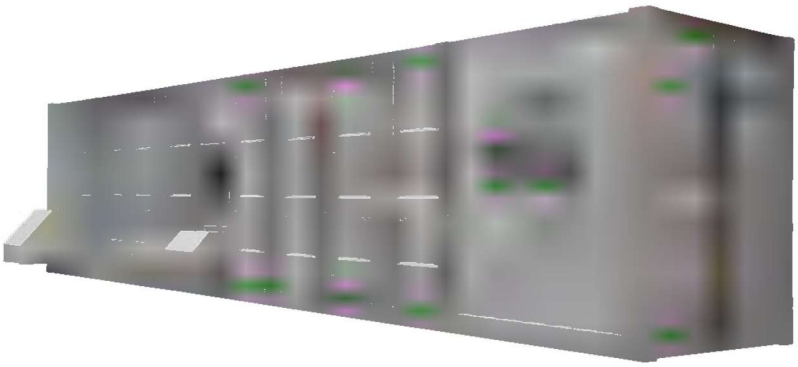
HMAA System HMAE 系统

U_R 额定电压	U_{min} 最低电压	Rated Cap. 25℃/额定容量	ESR_{DC} 直流内阻	Rated Current 额定电流	Size 尺寸 L×W×H	Weight 重量	P/N 产品代码
(V)	(F)	(F)	(mΩ)	(A)	(mm)	(Kg)	-
650	405	1480	20	600	1500×1250×1950	1790	SCMHAE650148MA
650	405	2100	18	850	1500×1350×1950	1980	SCMHAE650218MA
700	490	1190	30	500	1500×1150×2060	2250	SCMHAE700118MA

*Customer products are available on request.

■ Typical application 典型应用

- Smart grid primary frequency modulation
  智能电网一次调频系统

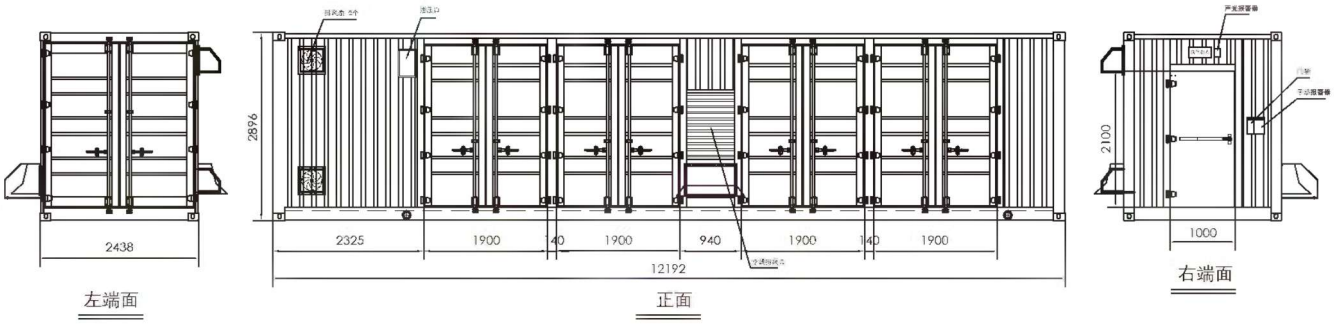


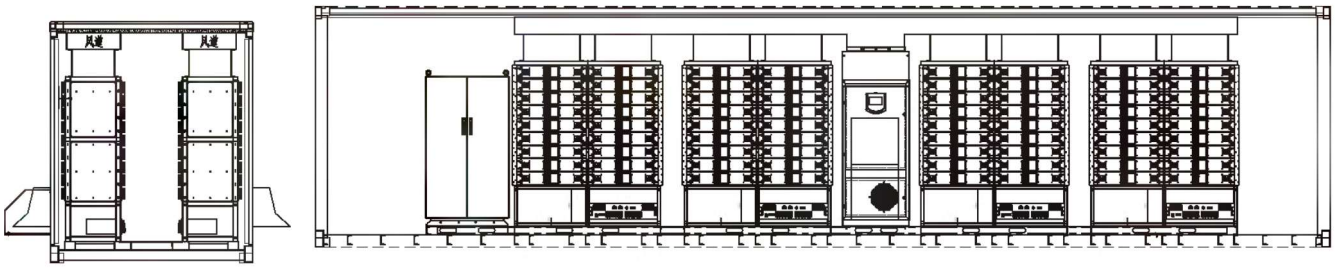
超级电容器系统HMAE 820V 6666F 参数
HMAE 820V 6666F parameters for supercapacitor system

项 目 Items	参 数 Criteria
HMAE 820V 833F 柜体总数 Total number of cabinets	8 个
HMAE 820V 833F 柜体串联数 Number of cabinet series connections	1 串
HMAE 820V 833F 柜体并联数 Number of parallel cabinets	8 并
额定容量 Rated Capacitance (25℃)	6666 F
直流内阻 ESR_{DC} (25℃)	10 mΩ
工作电压区间 Working voltage range	600 ~ 820 V
工作电压区间内储存能量 Energy stored within the operating voltage range	495 kwh
浪涌电压 Surge Voltage	907 V
额定工作电流 Rated current	4800 A
峰值工作电流 Peak current(≤30s)	14400 A
工作温度范围 Operating Temperature Range	-25℃ ~ +55℃
存储温度范围 Storage temperature Range	-40℃ ~ +70℃
额定工作电压 Rated Voltage	864 V
额定储能 Rated energy storage	714 kwh (超级电容装机容量Installed capacity of supercapacitors)
系统重量 System weight	28000 kg
尺寸 size	12192×2800×2896 mm
循环寿命 cycle life(600V ~ 820V)	500,000 (容量衰减capacity fade<20%) 承诺 (运行期间不起火、不爆炸) Commitment (no fire or explosion during operation)

MODULE

尺寸示意图 Dimensional diagram:





■ Typical application 典型应用

- Backup power supply for fan rotor system
  风机变桨系统后备电源
- Energy feedback system
  能量回馈系统
- Ferry, sightseeing car, golf cart, AGV and RGV
  渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery
  混合动力工程机械及港口机械
- Emergency UPS 应急后备电源
- Wind power, solar and other renewable energy storage
  风电、光伏等可再生能源储能

Items 项目	Criteria 模组参数
Rated Capacitance 额定容量 (25℃)	50 F
Capacitance Tolerance 容量偏差	0%~20%
ESR_{DC} 直流内阻 (25℃)	≤170 mΩ
Rated Voltage 额定电压	225 V
Maximum Normal Operating Voltage 最高正常工作电压	240 V
Rated Current 额定电流	13 A
30 Seconds Discharge Current 30秒放电电流	85 A
3 Seconds Maximum Peak Current 3秒最大峰值电流	145 A
Operating Temperature Range 工作温度范围	-25℃ ~+65℃
Storage Temperature Range 存储温度范围	-25℃ ~+65℃
Weight 重量	8 kg
Maximum Stored Energy 最大储存能量	390 Wh
Specific Energy 能量密度	48.7 Wh/Kg
Specific Power 功率密度	9300 W/Kg
Cycle Life 循环寿命	120V-225V: 500000 times 120V-240V: 30000 times

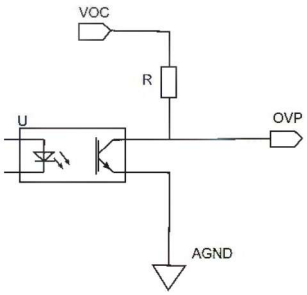
Life Time 寿命	Criteria 参数
High Temperature Loaded 高温负荷	1,500 hours
Capacity Changes 容量变化	≤20%
Change In Internal Resistance 内阻变化	≤100%
Room Temperature Environment 室温环境 Rated Voltage 额定电压 (25℃)	10 years
Capacity Changes 容量变化	≤20%
Change In Internal Resistance 内阻变化	≤100%
Cycle Life 循环寿命	500,000
Capacity Changes 容量变化	≤20%
Change In Internal Resistance 内阻变化	≤100%
Safety 安全	
Dielectric Strength 绝缘耐压	2,500 VDC

保护功能介绍 Introduction to protection functions:

1. 过压保护 Overvoltage protection

项目 Items	参数 Criteria	备注 Remark
过压报警电压 Overvoltage alarm voltage	4.15V±0.05V	过压报警触发后，自保护开关器件切换至断开状态，模组电压无输出 After the overvoltage alarm is triggered, the self-protection switch device switches to the disconnected state, and the module voltage has no output
过压报警方式 Overvoltage alarm method	高电平正常，低电平报警 High level normal, low level alarm	

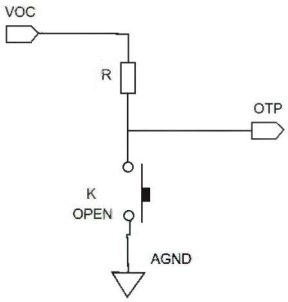
过压报警原理图 Schematic diagram of overvoltage alarm:



2. 过温保护 Over Temperature Protection

项目 Items	参数 Criteria	备注 Remark
欠压报警电压 Under voltage alarm voltage	2.0V±0.05V	欠压报警触发后，自保护开关器件切换至断开状态，模组电压无输出 After the undervoltage alarm is triggered, the self-protection switch device switches to the disconnected state, and the module voltage has no output
欠压报警方式 Under voltage alarm mode	高电平正常，低电平报警 High level normal, low level alarm	

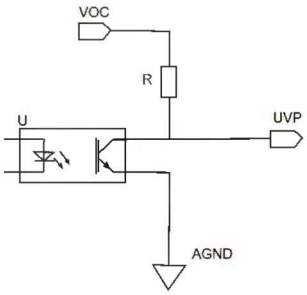
过温报警原理图 Schematic diagram of overtemperature alarm:



3. 欠压保护 under voltage protection

项目 Items	参数 Criteria	备注 Remark
欠压报警电压 Under voltage alarm voltage	2.0V±0.05V	欠压报警触发后，自保护开关器件切换至断开状态，模组电压无输出 After the undervoltage alarm is triggered, the self-protection switch device switches to the disconnected state, and the module voltage has no output
欠压报警方式 Under voltage alarm mode	高电平正常，低电平报警 High level normal, low level alarm	

欠压报警原理图 Undervoltage alarm schematic diagram:



MILLIMETER TO INCH CONVERSION TABLE

mm	inch	mm	inch	mm	inch	mm	inch
1	.039	18	.709	37	1.457	61	2.402
1.5	.059	19	.748	38	1.496	62	2.441
2	.079	20	.787	39	1.535	63	2.480
2.5	.098	21	.827	40	1.575	64	2.520
3	.118	22	.866	41	1.614	65	2.559
3.5	.138	23	.906	41.5	1.634	66	2.598
4	.157	24	.945	42	1.654	67	2.638
5	.197	25	.984	43	1.693	68	2.677
5.3	.209	25.4	1.000	44	1.732	69	2.717
6	.236	26	1.024	45	1.772	70	2.756
6.3	.248	27	1.063	46	1.811	71	2.795
7	.275	28	1.102	47	1.850	72	2.835
8	.314	28.6	1.126	48	1.890	73	2.874
9	.354	29	1.142	49	1.929	74	2.913
10	.394	30	1.181	50	1.969	75	2.953
11	.433	30.5	1.201	51	2.008	76	2.992
11.5	.453	31	1.220	52	2.047	76.2	3.000
12	.472	31.5	1.240	53	2.087	80	3.150
12.5	.492	31.8	1.252	54	2.126	90	3.543
12.7	.500	32	1.260	55	2.165	100	3.937
13	.512	33	1.299	56	2.205	120	4.724
14	.551	34	1.339	57	2.244	140	5.512
15	.591	34.5	1.358	58	2.283	160	6.299
16	.629	36	1.417	59	2.323		
17	.669	36.5	1.437	60	2.362		

NOTE: To convert other millimeter values to inches umitiply by 0.03937

CENTIGRADE TO FAHRENHEIT CONVERSION TABLE

$C^\circ = (F^\circ - 32) \times 5/9$

$F^\circ = (C^\circ \times 18) + 32$

°C	-55	-40	-30	-25	-20	-17.8	0	20	25	40	45	60	70	65	105	125	260
°F	-67	-40	-22	-13	-4	0	32	68	77	104	113	140	158	185	221	257	500

公司概况

Brief Introduction

创建日期：1958年10月

Founded: in October 1958

股票代码：002484

Stock No：002484

主要产品：铝电解电容器、薄膜电容器、固体高分子电容器、超级电容器、轴向/皇冠式电容器

Main Products :Aluminum Electrolytic Capacitors、Film Capacitors、Polymer Capacitors、Super Capacitors、Axial/Crown Capacitors

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Zip Code:226361.

ISO9001 ISO14001 IATF16949 ISO45001 UL CE