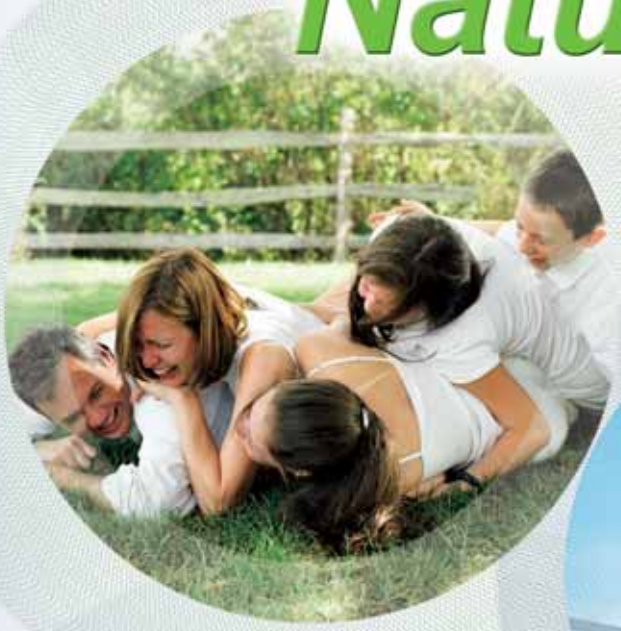
www.vina.co.kr

RoHS compliant

Vision for Nature



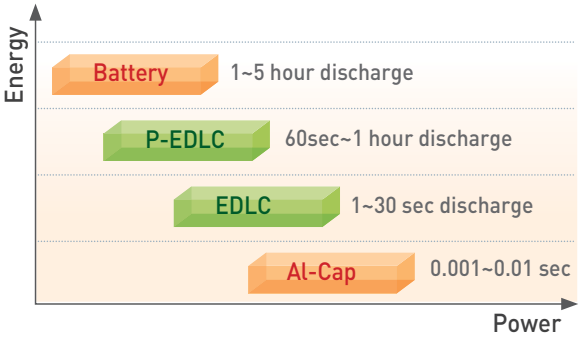
Vision for Nature

VINA Tech

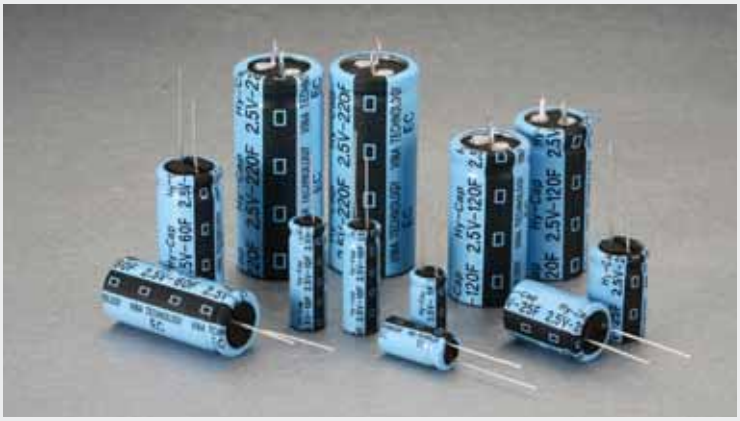
Hy-Cap / VinaTech Supercapacitor

Environment-friendly New Energy Storage Device

Hy-Cap is a brand name of VinaTech's supercapacitor products. Supercapacitor is an electrochemical energy storage device in the "power" industries.
Compared with battery, supercapacitor has one-tenth of energy, but delivers over 10 times power due to ultra low ESR. It operates more reliably in wider temperature and its life is semi-permanent, over 500,000 cycles.



EDLC [Electric Double Layer Capacitor]



FEATURES
Rated 2.5V & 2.7V
Higher Power Density (low ESR)
Over 500,000 cycle life (semi-permanent)
Short-term Peak Power assist applications
Operating temperature range : - Rated 2.5V : -25℃ ~ 70℃ - Rated 2.7V : -40℃ ~ 65℃

P-EDLC [Hybrid Capacitor]

FEATURES
Rated 2.3V
Higher Energy Density (2 times of EDLC)
Over 25,000 cycle life
Low current & long-term backup applications
Operating temperature range : -25℃ ~ 60℃

RoHS compliant

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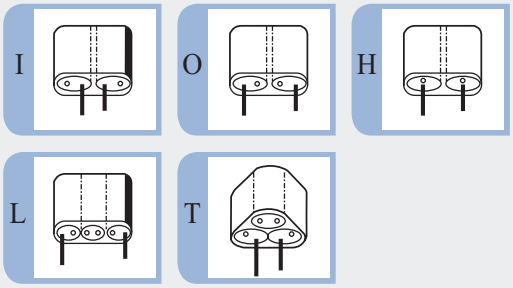
Hy-Cap / VinaTech Supercapacitor

Environment-friendly New Energy Storage Device

PART NUMBER SYSTEM

VEC 2R7 357 QG - H

Module Terminal Type Code
(2 or 3 serial connection)



Design Code
ex) G : Standard

Capacitance Tolerance

CODE	TOLERANCE	CODE	TOLERANCE
K	-10 ~ +40%	M	-20 ~ +20%
Q	-10 ~ +30%	V	-10 ~ +20%

Capacitance Tolerance
ex) 305 : 3F (30 × 105 μF)
357 : 350F (35 × 107 μF)

Rated Voltage

VOLTAGE	2.3 V	2.5 V	2.7 V
CODE	2R3	2R5	2R7

Series

CODE	Full name
VHC	VINA Hybrid Capacitor
VEC	VINA EDLC Capacitor

Hy-Cap / VinaTech Supercapacitor

Standard Products

FEATURES

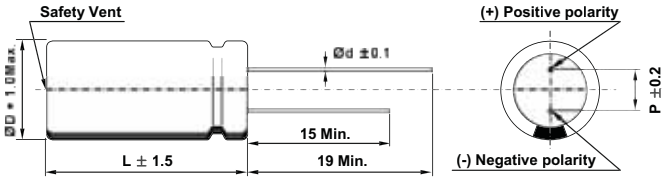
EDLC (Electric Double Layer Capacitor)

- High Power Density (Low ESR)
- Over 500,000 cycle life (semi-permanent)
- Short-term Peak Power assist applications

P-EDLC (Hybrid Capacitor)

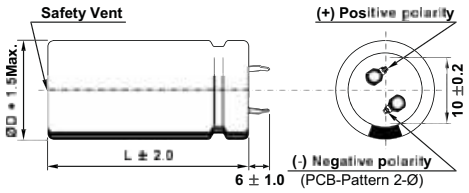
- High Energy Density (2 times of EDLC)
- Over 25,000 cycle life
- Low current & long-term backup applications

LEAD TYPE

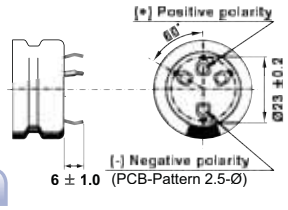


D	8	10	16, 18
d	0.6		0.8
P	4	5.5	8

LUG TYPE



2 PIN TYPE



4 PIN TYPE

SPECIFICATION

ITEM		CHARACTERISTICS		
Product series		P-EDLC	EDLC	
Rated Voltage (V_R)		2.3 V	2.5 V	2.7 V
Operating Temperature		-25 ~ +60℃	-25 ~ +70℃	-40 ~ +65℃
Capacitance Tolerance		-10 ~ +30%		
High Temperature Load Life		After 1,000 hours at V_R loaded under +60, +70, +65℃ respectively, capacitors meet the following criteria.		
	Capacitance Change	≤ 30% of initial value		
	ESR Change	≤ 2 times of specified value		
Temperature Characteristics	Measure	at -25, +25, +60℃	at -25, +25, +70℃	at -40, +25, +65℃
	△C	≤ 50% of initial value	≤ 5% of initial value	
	ESR	≤ 4 times of specified value	≤ 2 times of specified value	
Cycle Life Characteristics	Cycle	25,000	500,000	
	△C	≤ 30% of initial value		
	ESR	≤ 2 times of specified value		
	Condition	Cycle of Charge/discharge from V_R to 1/2V_R		
Shelf Life		After 1,000 hour storage under +60, +70, +65℃ respectively without load, capacitors meet the criteria of high temp. load life above.		

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Hy-Cap / VinaTech Supercapacitor

Standard Products

LEAD TERMINAL

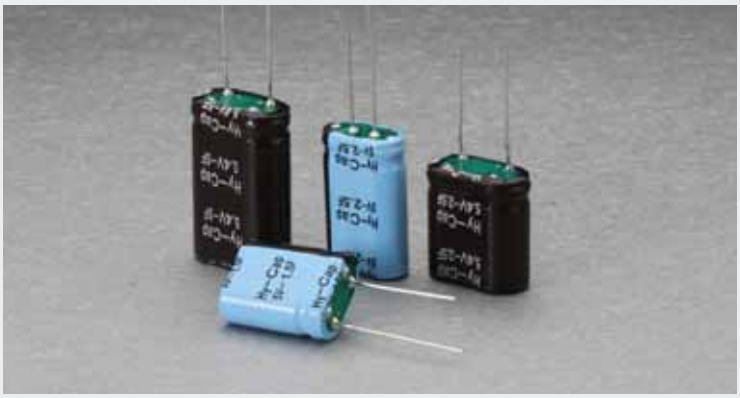
PART NUMBER		Rated Voltage (V)	Capacitance (F)	ESR (mΩ)		Leakage Current (㎃, 72hr)	Size (㎜)	Weight (g)	Volume (㎖)	Energy Density (Wh/L)
				AC(1㎑)	DC		D × L			
P-EDLC	VHC 2R3 106 QG	2.3	10	220	400	0.014	10×20	2.5	1.6	4.7
	VHC 2R3 226 QG		22	120	170	0.038	10×30	3.6	2.4	6.9
	VHC 2R3 506 QG		50	60	100	0.090	16×25	8.5	5.0	7.3
	VHC 2R3 127 QG		120	45	80	0.240	18×40	16.0	10.2	8.7
EDLC	VEC 2R5 155 QG	2.5	1.5	120	180	0.003	08×20	1.5	1.0	1.3
	VEC 2R5 305 QG		3	140	210	0.008	08×20	1.7	1.0	2.6
	VEC 2R5 405 QG		4	75	110	0.009	10×25	2.7	2.0	1.7
	VEC 2R5 505 QA		5	120	180	0.012	08×25	2.1	1.3	3.5
	VEC 2R5 505 QG		5	110	165	0.012	10×20	2.2	1.6	2.8
	VEC 2R5 705 QG		7	80	120	0.020	10×20	2.5	1.6	3.8
	VEC 2R5 106 QD		10	65	95	0.027	10×25	3.1	2.0	4.4
	VEC 2R5 106 QG		10	65	95	0.027	10×30	3.2	2.4	3.7
	VEC 2R5 156 QG		15	60	90	0.035	13×25	4.5	3.1	4.2
	VEC 2R5 256 QG		25	35	55	0.060	16×25	7.6	5.0	4.3
	VEC 2R5 606 QG		60	20	30	0.120	18×40	13.7	10.2	5.1
	VEC 2R7 155 QG	2.7	1.5	50	65	0.003	08×20	1.4	1.0	1.5
	VEC 2R7 305 QG		3	50	65	0.008	08×20	1.4	1.0	3.0
	VEC 2R7 405 QG		4	30	40	0.009	10×25	2.5	2.0	2.0
	VEC 2R7 505 QA		5	35	45	0.012	08×25	1.7	1.3	3.9
	VEC 2R7 505 QG		5	35	45	0.012	10×20	2.1	1.6	3.2
	VEC 2R7 705 QG		7	30	40	0.020	10×20	2.2	1.6	4.5
	VEC 2R7 106 QG		10	20	26	0.030	10×30	3.0	2.4	4.3
	VEC 2R7 156 QG		15	25	33	0.053	13×25	4.5	3.1	4.9
	VEC 2R7 256 QG		25	15	20	0.068	16×25	6.8	5.0	5.0
	VEC 2R7 506 QG		50	10	15	0.105	18×40	11.3	10.2	5.0

LUG TERMINAL

PART NUMBER		Rated Voltage (V)	Capacitance (F)	ESR (mΩ)		Leakage Current (㎃, 72hr)	Size (㎜)	Weight (g)	Volume (㎖)	Energy Density (Wh/L)	Pin No.
				AC(1㎑)	DC		D × L				
P-EDLC	VHC 2R3 227 QG	2.3	220	30	50	0.640	22×45	24.7	17.1	9.5	2
	VHC 2R3 407 QG		400	20	25	2.120	30×45	48.5	31.8	9.2	2, 4
	VHC 2R3 607 QG		600	15	20	3.800	30×60	65.0	42.4	10.4	
	VHC 2R3 807 QG		800	10	15	5.000	35×70	94.0	67.0	8.7	4
EDLC	VEC 2R5 127 QG	2.5	120	18	25	0.240	22×45	22.1	17.1	6.1	2
	VEC 2R5 227 QG		220	14	18	0.400	25×60	37.9	29.4	6.5	
	VEC 2R5 357 QG		350	6	10	0.900	35×60	70.6	57.7	5.3	4
	VEC 2R7 107 QG	2.7	100	6	8	0.500	22×45	19.7	17.1	5.9	2
	VEC 2R7 227 QG		220	4.5	5.8	1.000	25×70	37.7	34.3	6.5	
	VEC 2R7 357 QG		350	3.0	3.5	1.400	35×60	54.1	57.7	6.1	4

Hy-Cap / VinaTech Supercapacitor

Module for higher voltage



FEATURES

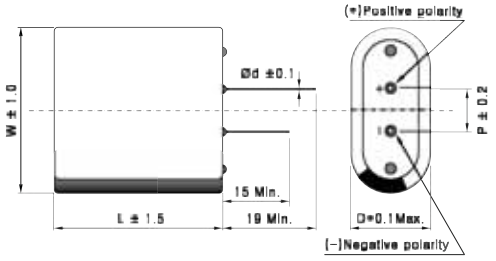
2 to 3 units serially connected to provide 5V ~ 7.5V products.

Lead terminal type

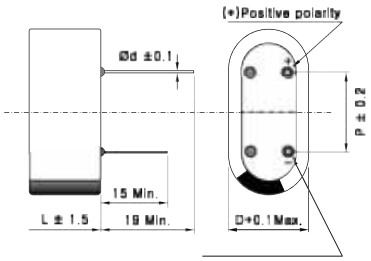
Other custom-made modules to be discussed according to customers' requirements (voltage & capacitance)

2 SERIAL MODULE : DRAWING

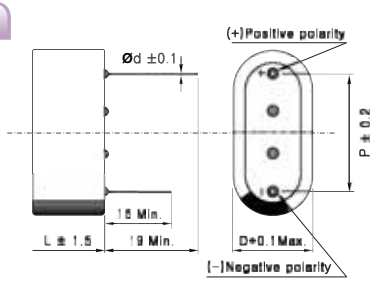
I TYPE



H TYPE



O TYPE



D = 8.5㎜

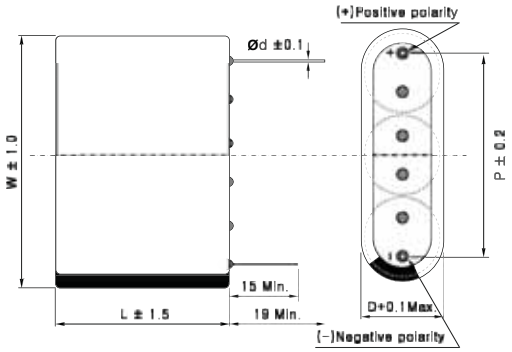
TYPE	I	O	H
P	4.7	12.3	8.5

D = 10.5㎜

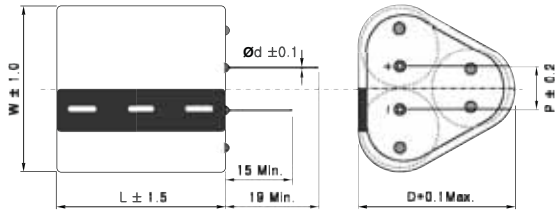
TYPE	I	O	H
P	5.5	15.5	10.5

3 SERIAL MODULE : DRAWING

L TYPE



T TYPE



D = 8.5㎜

TYPE	L	T
P	20.8	4.7

D = 10.5㎜

TYPE	L	T
P	26.0	5.5

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Hy-Cap / VinaTech Supercapacitor

Module for higher voltage

SPECIFICATIONS (2 SERIAL MODULE)

ITEM		CHARACTERISTICS	
Rated Voltage (V_R)		5 V	5.4 V
Operating Temperature		-25 ~ +70℃	-40 ~ +65℃
Capacitance Tolerance		-10 ~ +30%	
High Temperature Load Life	Measure	After 1,000 hours at V_R loaded under +70, +65℃ respectively, capacitors meet the following criteria.	
	△C	≤ 30% of initial value	
	ESR	≤ 2 times of specified value	
Temperature Characteristics	Measure	at -25, +25, +70℃	at -40, +25, +65℃
	△C	≤ 30% of initial value	≤ 5% of initial value
	ESR	≤ 4 times of specified value	≤ 2 times of specified value
Cycle Life Characteristics	Cycle	500,000	
	△C	≤ 30% of initial value	
	ESR	≤ 2 times of specified value	
	Condition	Cycle of Charge/discharge from V_R to $1/2V_R$	
Shelf Life		After 1,000 hour storage under +70, +65℃ respectively without load, capacitors meet the criteria of high temp. load life above.	

STANDARD PRODUCTS (2 SERIAL MODULE)

PART NUMBER	Rated Voltage (V)	Capacitance (F)	ESR (mΩ)		Leakage Current (㎃, 72hr)	Size (㎜)	Weight (g)	Volume (㎖)	Energy Density (Wh/L)
			AC(1㎑)	DC		W x L × H			
VEC 5R0 754 QG	5	0.75	250	375	0.003	8.5×22×17	3.5	3.2	0.8
VEC 5R0 155 QG		1.5	300	450	0.008	8.5×22×17	3.8	3.5	1.5
VEC 5R0 205 QG		2	150	225	0.009	10.5×27×21	5.9	6.0	1.2
VEC 5R0 255 QA		2.5	240	360	0.012	8.5×27×17	4.6	3.9	2.2
VEC 5R0 255 QG		2.5	240	360	0.012	10.5×22.5×21	5.0	5.3	1.6
VEC 5R0 355 QG		3.5	180	270	0.020	10.5×22.5×21	5.4	5.9	2.1
VEC 5R0 505 QG		5	150	225	0.027	10.5×32×21	7.0	7.6	2.3
VEC 5R0 755 QG		7.5	120	180	0.035	13×28×26	9.6	9.5	2.7
VEC 5R4 754 QG	5.4	0.75	250	375	0.003	8.5×22×17	3.2	3.2	1.0
VEC 5R4 155 QG		1.5	110	145	0.008	8.5×22×17	3.3	3.5	1.7
VEC 5R4 205 QG		2	60	80	0.009	10.5×27×21	5.5	6.0	1.4
VEC 5R4 255 QA		2.5	90	120	0.012	8.5×27×17	4.5	3.9	2.6
VEC 5R4 255 QG		2.5	90	120	0.012	10.5×22.5×21	4.7	5.3	1.9
VEC 5R4 355 QG		3.5	70	90	0.020	10.5×22.5×21	4.8	5.3	2.7
VEC 5R4 505 QG		5	50	65	0.030	10.5×32×21	6.6	7.6	2.7
VEC 5R4 755 QG		7.5	50	65	0.053	13×28×26	9.6	9.5	3.2

※ Note : Modules higher than 5.4V to be supplied on custom-product basis.

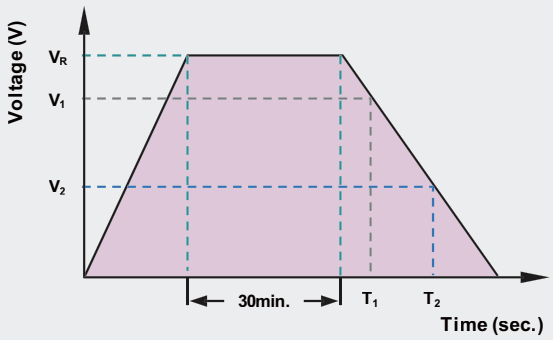
Hy-Cap / VinaTech Supercapacitor

RELIABILITY ITEMS TESTED & SPECIFICATION

ITEM		PERFORMANCE	TEST CONDITION
Cycle Life	△C	≤ 30% of initial value	• 1 cycle : Charge & discharge from V_R and 1/2V_R at 25℃ ① EC series : 500,000 cycles ② HC series : 25,000 cycles
	△ESR	≤ 2 times of specified value	
	Appearance	No remarkable change	
High Temp. Load Life	△C	≤ 30% of initial value	• Temp. : T_{Max} ± 2℃ • Voltage : V_R VDC • Test Time : T_{Max} : 1,000 (+48)hrs
	△ESR	≤ 2 times of specified value	
	Appearance	No remarkable change	
Temperature Characteristics (* 2.7V case)	△C	≤ 5% of initial value	• Temperature : T_{Min} ± 2℃ • Storage time : 12 hours • No load
	△ESR	≤ 2 times of specified value	
	Appearance	No remarkable change	
Vibration Resistance	△C	≤ 30% of initial value	• Amplitude : 1.5㎜ • Frequency : 10~55㎐ • Direction : X,Y,Z (2 hours) • Test time : 6 hours
	△ESR	≤ 2 times of specified value	
	Appearance	No remarkable change	
Soldering Effect	Cap.	Specified value	• Soldering Temp. : 310 ± 5℃ • Immersion time : 1 ± 0.2 sec. • Dip Length : To 1.6㎜ (auto-soldering)
	ESR	Specified value	
	Appearance	No remarkable change	

MEASUREMENT OF CAPACITANCE & ESR

Capacitance (F)



$$C(F) = I \times \frac{(T_2 - T_1)}{(V_1 - V_2)}$$

Where

V_R	Rated Voltage
V_1	0.8V_R
V_2	0.4V_R
I	Discharge Current (1mA per farad)

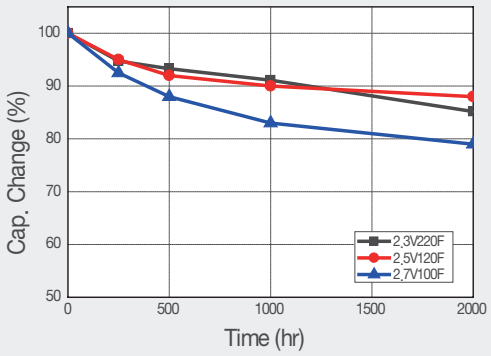
Equivalent Series Resistance (ESR)

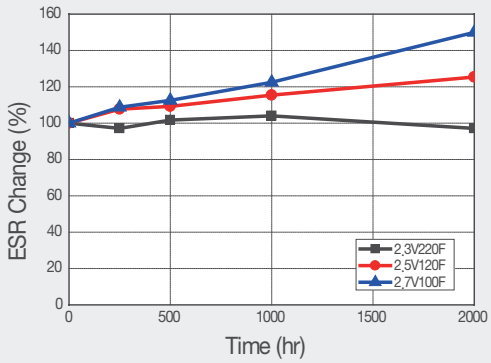
AC ESR is measured by 4-probe impedance analyzer.

*Condition : Potentiostat mode, AC amplitude : 5mV, Frequency : 1㎑

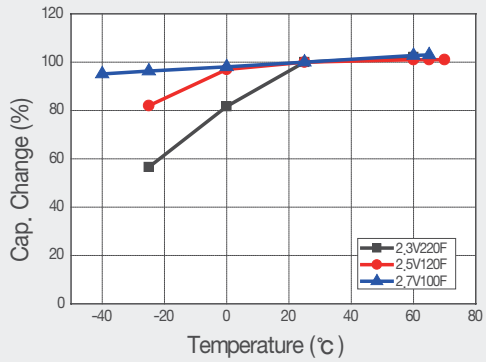
RELIABILITY TEST RESULTS (ITEM : VHC 2R3 227 QG / VEC 2R5 127 QG / VEC 2R7 107 QG)

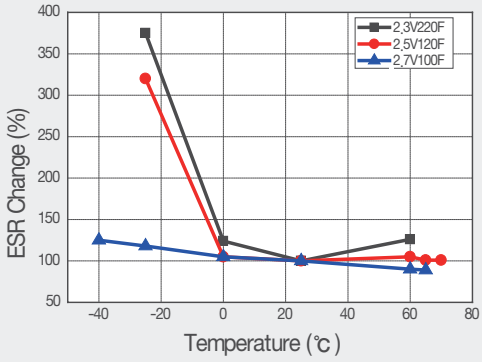
High Temperature Load Life Test (2.3V : 60℃ , 2.5V : 70℃, 2.7V : 65℃)



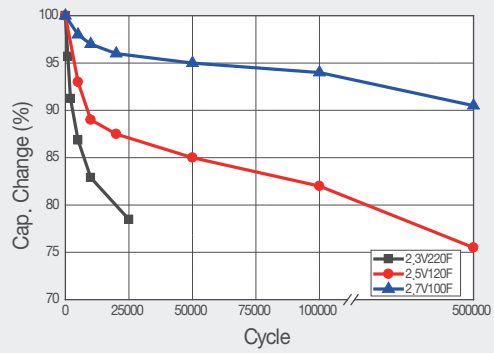


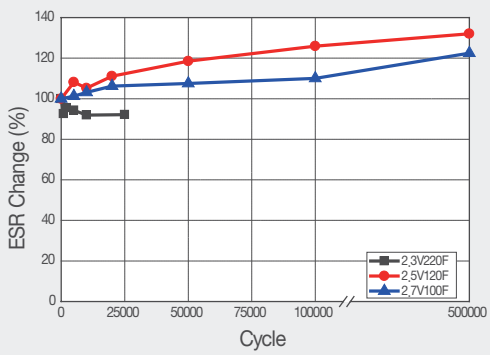
Temperature Characteristics





Cycle Life Characteristics





Measurement condition

- Capacitance 2.3V 220F : 0.22A charge to 2.3V(CCC), 5 minute hold at 2.3V(CVC), and 0.22A discharge to 1.0V
  2.5V 120F : 1.2A charge to 2.5V(CCC), 5 minute hold at 2.5V(CVC) and 1.2A discharge to 0.1V
- ESR AC amplitude 5mV, and 1kHz frequency

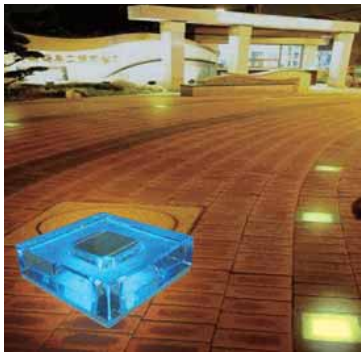
Application

UPS / DVR

- Peak Power Assist (Bridge power)
- Improve battery's life & down-sizing

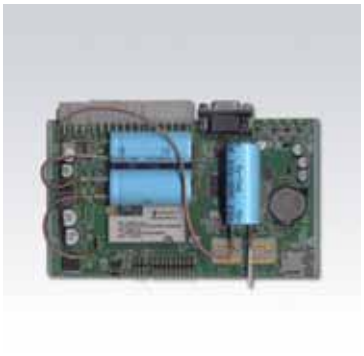
SOLAR & EMERGENCY LIGHT

- Solar LED light, Exit light
- Easy Installation
- No maintenance



AMR / TELECOMMUNICATION

- Long life : No maintenance
- Wider temperature : -40℃ to +65(70)℃



VEHICLE ELECTRONICS

- Navigation system backup
- Black Box (Driving recorder)
- Battery Assist (Car-audio)

SOLAR

- Energy Storage to power for solar heliostat-tracking
- No maintenance / replacement
- Wider operating temperature

WINDMILL (PITCH CONTROL)

- Instant peak power providing
- No maintenance & replacement
- Semi-permanent

HYBRID ELECTRIC VEHICLE

- Engine + Electric motor with supercapacitor (covering peak power when acceleration or engine starting)
- Long life cycle (over 500,000 cycles)

OTHER APPLICATION

- Electric Valve (actuator)
- Electric Toy
- Industrial Robotics

Hy-Cap / VinaTech Supercapacitor

Environment-friendly New Energy Storage Device

NOTES ON USING HY-CAP

1. Make sure of polarity(+ and – marking) when using.
2. Do not use higher than rated voltage.
   In case of connecting more than 2 units for modules, we recommend “unit voltage – 0.2” per unit for the sake of safer voltage balancing (e.g. 2.5V in case of 2.7V unit).
3. Please store or use products under the proper conditions.
4. When soldering, be aware of proper conditions in order to avoid excessive heat or time on the products.

※ For more details, please contact us.

1. 제품의 극성을 확인 후 사용하십시오.
2. 정격 전압 이상으로 사용하지 마십시오.
   단, 3직렬 이상 모듈 구성시에는, 전압 밸런스를 감안하여 셀당 0.2V씩 낮추어 사용하십시오.
3. 제품의 보증 온도 이내에서 보관 또는 사용하십시오.
4. 납땜시 작업 조건(온도, 시간)을 지켜 과도한 열이 제품에 가해지지 않도록 하십시오.

※ 자세한 사항은 아래 연락처로 문의 바랍니다.

LEAD-TERMINAL BENDING PROCESS

Not recommend

(a) (b) (c)

Recommend

(d)

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