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OUR BUSINESS

World Leading Manufacturer Of Supercapacitors And Carbon Solutions

VISION
FOR NATURE

We promise that our customers will be our highest priority as we believe that we can only exist as long as our customers do.

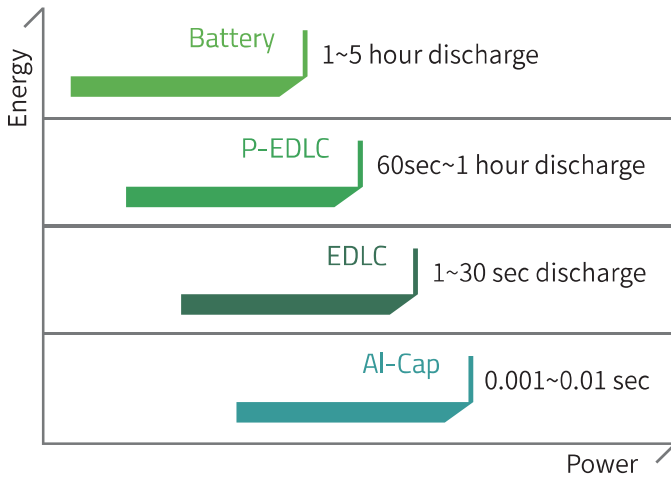
VISION FOR NATURE

 IATF 16949:2016	 ISO 14001 CERTIFIED ISO 14001		 UL
 VENTURE MARK	 INNOBIZ	 Best HRD	 Enterprise R&D Center
 Green Certification	Export Prospect Enterprise	 N&T	Component Material Specialty Enterprise

HyCap Introduction

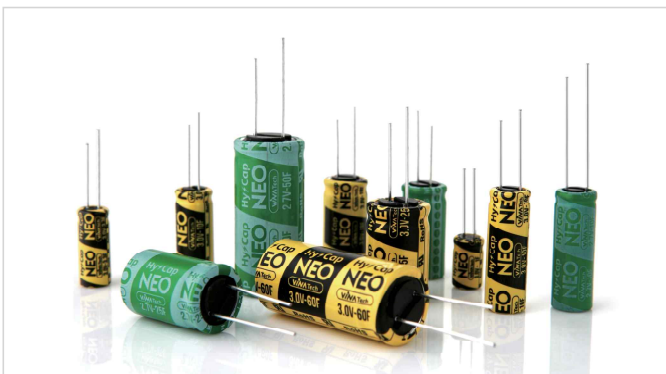


Environment-friendly New Energy Storage Device



An EDLC(Electric Double Layer Capacitor) also known as Super-Capacitor or Ultra-Capacitor is an energy storing device that has lower energy density but has higher power density compared to batteries. The advantages of EDLCs are high current charging/discharging, long cycle life(500,000+ Cycle), wide range of operating temperature(-40°C ~ 85°C), and no risk of explosion.

Features



EDLC | Electric Double Layer Capacitor



P-EDLC | Hybrid Capacitor

Rated Voltage: 2.7V, 3.0V	Rated Voltage: 2.3V
Higher Power Density (low ESR)	Higher Energy Density (2 times of EDLC)
Over 500,000 cycle life	Over 100,000 cycle life
Short-term Peak Power assist applications	Low current & long-term backup applications
Operating temperature range -40°C ~ 65°C	Operating temperature range -25°C ~ 60°C

HyCap Specification



Characteristics

Item		Characteristics	
Product Series		P-EDLC(VHC)	EDLC(VEC/WEC)
Rated Voltage (V _R)		2.3 V	2.7 V 3.0 V
Operating Temperature		-25 ~ +60°C	-40 ~ +65°C
Capacitance Tolerance		-10 ~ +30%	
High Temperature Load Life	Measure	After 1,000 hours at V _R loaded under +60, +65°C respectively, capacitors meet the following criteria.	
	Cap. Change	≤ 30% of initial value	
	ESR Change	100% increase from specified value	
85°C Higher Temperature		N/A	De-rated Voltage: Max 2.3V De-rated Voltage: Max 2.4V
Cycle Life Characteristics	Cycle	100,000	500,000
	Cap. Change	≤ 30% of initial value	
	ESR Change	100% increase from specified value	
	Condition	Cycle of charge/discharge from V _R to ½V _R	
Shelf life		2 Years No Electrical Charge, Temperature below 70°C (ΔC : ≤ 10% of initial value / ΔESR : ≤ 50% of specified value)	

Part Number System



① Series

Code	Full name
VHC	P-EDLC (Hybrid Capacitor)
VEC	EDLC / 2 Series Module
WEC(NEO)	EDLC / 2 Series Module
VEM	Customized EDLC Module

② Rated Voltage

Voltage	2.3 V	2.7 V	3.0 V
Code	2R3	2R7	3R0

③ Capacitance Code

ex) 367 : 360F (36 × 10⁷ μF)

④ Capacitance Tolerance

Code	Tolerance	Code	Tolerance
Q	-10 ~ +30%	H	0 ~ +20%

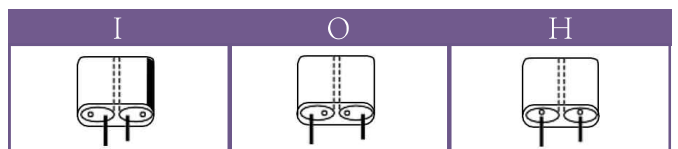
⑤ Design Code

ex) G : Standard

Nonstandard items only available under negotiation

⑥ Terminal Code for Module & Axial Type Cells

(2 or 3 serial connection)



** Module specification for 2 series cells has identical characteristics to above items. Please contact us at hycap@vina.co.kr if you need detailed data sheets.

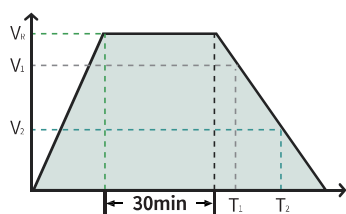
HyCap Specification

Reliability Test & Condition

Item		Item	Test Condition
Cycle Life	Cap. Change	≤ 30% of initial value	1 cycle : Charge & discharge from V_R and $\frac{1}{2}V_R$ at 25°C ① EC series : 500,000 cycles ② HC series : 100,000 cycles ③ HG series : 1,000,000 cycles
	ESR Change	100% increase from specified value	
	Appearance	No remarkable change	
High Temp. Load Life	Cap. Change	≤ 30% of initial value	Temp. : $T_{Max} \pm 2^\circ C$ Voltage : V_R (Vdc) Test Time : T_{Max} : 1,000 (+48)hours
	ESR Change	100% increase from specified value	
	Appearance	No remarkable change	
Temperature Characteristics (* 2.7V case)	Cap. Change	≤ 5% of initial value	Temperature : $T_{Min} \pm 2^\circ C$ Storage time : 12 hours No load
	ESR Change	100% increase from specified value	
	Appearance	No remarkable change	
Vibration Resistance	Cap. Change	≤ 30% of initial value	Amplitude : 1.5mm Frequency : 10~55Hz Direction : X,Y,Z (2 hours) Test time : 6 hours
	ESR Change	100% increase from specified value	
	Appearance	No remarkable change	
Soldering Effect	Cap.	Specified value	Soldering Temp. : $310 \pm 5^\circ C$ Immersion time : 1 ± 0.2 sec. Dip Length : Up to 1.6 mm (auto-soldering)
	ESR	Specified value	
	Appearance	No remarkable change	
Humidity	Cap. Change	≤ 10% of initial value	Rated Voltage Temperature : $70^\circ C \pm 2^\circ C$ Relative Humidity : 90% Test Time : 72 hours
	ESR Change	100% increase from specified value	
	Appearance	No remarkable change	

Measurement of Capacitance & ESR

Capacitance (F)



Where

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

V_R Rated Voltage

V_1 0.8 V_R

V_2 0.4 V_R

I Discharge Current (1mA per Farad)

DC ESR(R_d) is calculated by voltage drop (ΔV) which is measured by the period of time from discharge start to 10 milli-seconds later. The discharge current(A) for test and measurement, $40 \times$ Capacitance(F) \times Rated Voltage(V_R) would be recommended

Equivalent Series Resistance (ESR)

AC ESR is measured by 4-probe impedance analyzer. *Condition : Potentiostat mode, AC amplitude : 5mV, Frequency : 1kHz

Note 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 - 0.2V" 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.

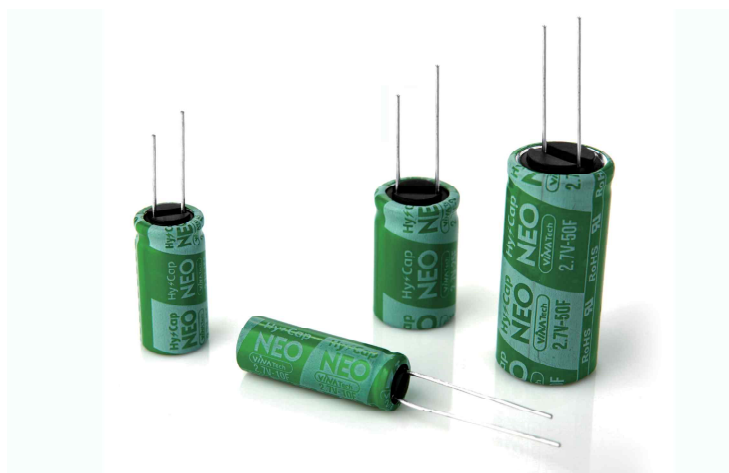
HyCap/Cell 2.7V WEC(NEO) Series

VINATech's development engineers have re-invented their EDLC technology in both 2.7V and 3.0V radial series to overcome the challenge facing customers where finished products are installed in extreme environments. The challenging conditions are over and above recommended specifications for standard EDLCs.

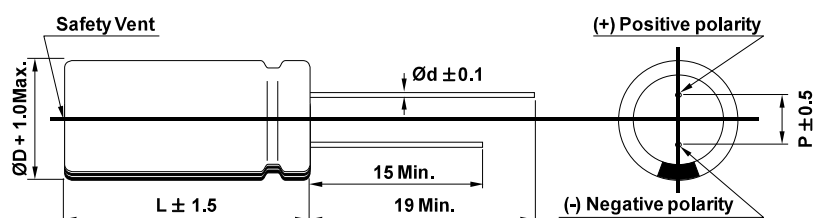
Features

EDLC (Electric Double Layer Capacitor)

- High Power Density
- Over 500,000 cycle life (semi-permanent)
- Short-term Peak Power assist applications
- RoHS compliant
- Long-term reliability improved at high temperature and humidity



Lead Terminal Type



	8	10, 13	16, 18
D(Ø)			
d(Ø)		0.6	0.8
P(mm)	3.5	5.0	7.5

Part Number	Rated Voltage(V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm) D×L	Weight (g)	Volume (ml)
			AC(1kHz)	DC					
WEC2R7105QG	2.7	1	155	230	1.0	0.002	08 × 13	1.1	0.7
WEC2R7155QG		1.5	100	150	1.5	0.003	08 × 20	1.4	1.0
WEC2R7335QG		3.3	80	140	3.0	0.007	08 × 20	1.5	1.0
WEC2R7505QA		5	45	75	4.5	0.010	08 × 25	1.8	1.3
WEC2R7505QG		5	65	100	4.5	0.010	10 × 20	2.1	1.6
WEC2R7705QG		7	65	110	5.0	0.014	10 × 20	2.2	1.6
WEC2R7106QA		10	37	65	8.0	0.020	10 × 25	2.6	2.0
WEC2R7106QG		10	30	45	9.0	0.020	10 × 30	3.2	2.4
WEC2R7106QC		10	45	70	7.5	0.020	13 × 20	3.4	2.7
WEC2R7156QG		15	30	45	12.0	0.030	13 × 25	4.5	3.3
WEC2R7186QC		18	30	50	12.5	0.036	13 × 25	4.8	3.3
WEC2R7256QG		25	21	30	19.0	0.050	16 × 25	6.8	5.0
WEC2R7346QA		34	18	27	23.0	0.068	18 × 30	9.2	7.6
WEC2R7406QC		40	18	30	24.0	0.080	13 × 46	8.0	6.1
WEC2R7506QG		50	13.5	20	33.0	0.100	18 × 40	12.5	10.2

HyCap/Cell 3.0V WEC(NEO) Series

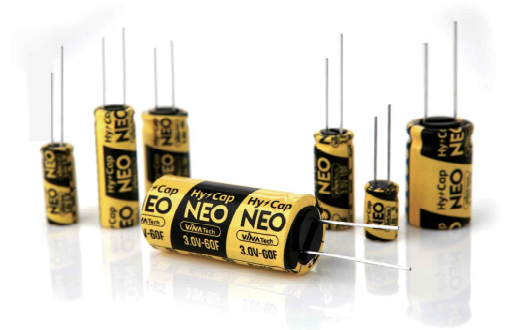
Hy-Cap Anti Wetting Solution

The NEO series has been developed by VINATech's development team to combat the extreme conditions experienced by customers in all sectors when the final user deploys in areas of high temperature and high humidity. This new technology has been proven as the only viable Anti Wetting solution in the market.

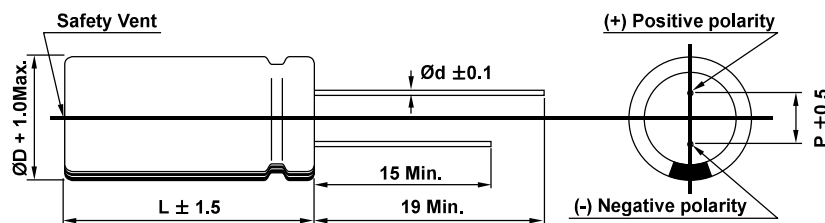
Features

EDLC (Electric Double Layer Capacitor)

- High Power Density
- Over 500,000 cycle life (semi-permanent)
- Higher energy density compared with 2.7V Caps
- RoHS compliant
- Long-term reliability improved at high temperature and humidity



Lead Terminal Type



D(Ø)	8	10, 13	16, 18
d(Ø)		0.6	0.8
P(mm)	3.5	5.0	7.5

Part Number	Rated Voltage(V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm)		Weight (g)	Volume (ml)
			AC(1kHz)	DC			D×L			
WEC3R0105QG	3.0	1	175	265	1.0	0.003	08 × 13	1.1	0.7	
WEC3R0155QG		1.5	115	175	1.5	0.005	08 × 20	1.4	1.0	
WEC3R0205QG		2	115	175	2.0	0.006	08 × 20	1.4	1.0	
WEC3R0335QG		3.3	85	145	3.0	0.010	08 × 20	1.5	1.0	
WEC3R0505QD		5	50	85	5.0	0.015	08 × 25	1.8	1.3	
WEC3R0505QG		5	80	120	4.5	0.015	10 × 20	2.1	1.6	
WEC3R0705QD		7	45	75	6.5	0.021	08 × 30	2.2	1.5	
WEC3R0705QG		7	80	135	5.0	0.021	10 × 20	2.2	1.6	
WEC3R0106QA		10	45	75	8.5	0.030	10 × 25	2.6	2.0	
WEC3R0106QG		10	35	55	9.5	0.030	10 × 30	3.2	2.4	
WEC3R0106QD		10	50	75	8.5	0.030	13 × 20	3.4	2.7	
WEC3R0156QG		15	37	55	12.0	0.045	13 × 25	4.5	3.3	
WEC3R0186QC		18	30	50	14.0	0.054	13 × 25	4.8	3.3	
WEC3R0256QG		25	25	40	18.5	0.075	16 × 25	7.2	5.0	
WEC3R0506QG		50	15	22	35.0	0.150	18 × 40	12.5	10.2	
WEC3R0606QG		60	15	22	38.0	0.180	18 × 40	13.5	10.2	

HyCap/Cell 2.7V VEC Series



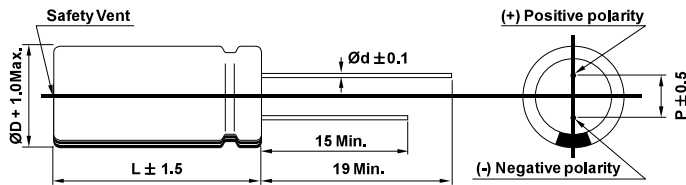
Features

EDLC (Electric Double Layer Capacitor)

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



Lead Terminal Type

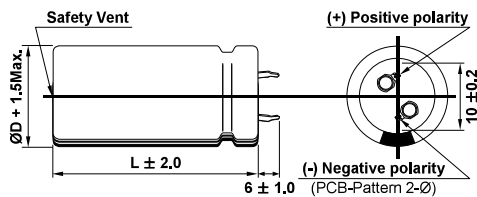


D(Ø)	8	10, 13	16, 18
d(Ø)		0.6	0.8
P(mm)	3.5	5.0	7.5

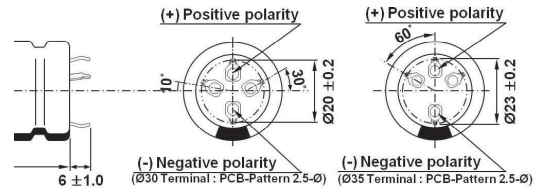
Part Number	Rated Voltage(V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm) D×L	Weight (g)	Volume (ml)
			AC(1kHz)	DC					
VEC2R7105QG	2.7	1	130	195	1.0	0.002	08 x 13	1.1	0.7
VEC2R7155QG		1.5	80	120	1.5	0.003	08 x 20	1.4	1.0
VEC2R7335QG		3.3	55	95	3.0	0.007	08 x 20	1.5	1.0
VEC2R7505QA		5	35	60	5.0	0.010	08 x 25	1.8	1.3
VEC2R7505QG		5	55	85	4.5	0.010	10 x 20	2.1	1.6
VEC2R7705QG		7	55	95	5.5	0.014	10 x 20	2.2	1.6
VEC2R7106QA		10	25	45	9.0	0.020	10 x 25	2.6	2.0
VEC2R7106QG		10	30	35	10.0	0.020	10 x 30	3.2	2.4
VEC2R7106QC		10	35	55	8.5	0.020	13 x 20	3.4	2.7
VEC2R7156QG		15	25	40	12.5	0.030	13 x 25	4.5	3.3
VEC2R7186QC		18	25	40	14.0	0.036	13 x 25	4.8	3.3
VEC2R7256QG		25	17	26	20.0	0.050	16 x 25	6.8	5.0
VEC2R7346QA		34	15	23	25.5	0.068	18 x 30	9.2	7.6
VEC2R7406QC		40	15	25	26.0	0.080	13 x 46	8.0	6.1
VEC2R7506QG		50	11	17	36.5	0.100	18 x 40	12.5	10.2
VEC2R7606QG		60	11	17	40.0	0.120	18 x 40	13.5	10.2

Snap-in Terminal Type

2 PIN TyPE



4 PIN TyPE



Part Number	Rated Voltage(V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm) D×L	Weight (g)	Volume (ml)
			AC(1kHz)	DC					
VEC2R7107QG	2.7	100	6.0	10.0	65.0	0.200	22 x 45	20.0	17.1
VEC2R7227QG		220	4.5	7.0	115.0	0.440	25 x 70	38.0	34.3
VEC2R7367QG		360	3.0	4.5	185.0	0.720	35 x 62	70.0	59.6
VEC2R7407QG		400	3.0	4.5	190.0	0.800	35 x 72	80.0	69.2
VEC2R7507QG		500	3.0	4.5	205.0	1.000	35 x 82	96.0	78.9

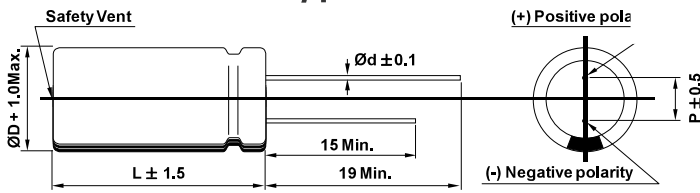
HyCap/Cell 3.0V VEC Series

Features

- High power density (Low ESR)
- Over 500,000 cycle life (semi-permanent)
- Higher energy density compared with 2.7V caps
- RoHS compliant



Lead Terminal Type

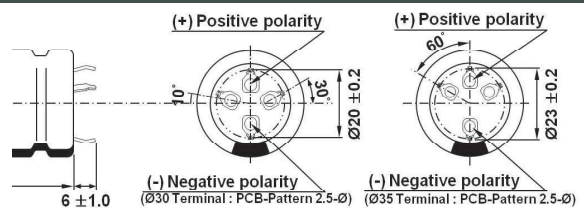
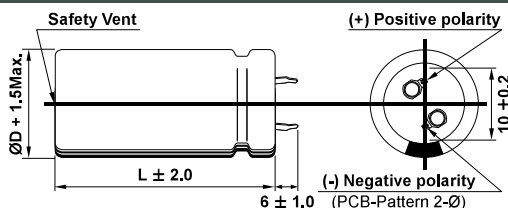


D(Ø)	8	10, 13	16, 18
d(Ø)		0.6	0.8
P(mm)	3.5	5.0	7.5

Part Number	Rated Voltage(V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm) D×L	Weight (g)	Volume (ml)
			AC(1kHz)	DC					
VEC3R0105QG	3.0	1	145	220	1.0	0.003	08 x 13	1.1	0.7
VEC3R0155QG		1.5	95	140	1.5	0.005	08 x 20	1.4	1.0
VEC3R0205QG		2	95	145	2.0	0.006	08 x 20	1.4	1.0
VEC3R0335QG		3.3	70	105	3.5	0.010	08 x 20	1.5	1.0
VEC3R0505QD		5	40	70	5.5	0.015	08 x 25	1.8	1.3
VEC3R0505QG		5	65	100	5.0	0.015	10 x 20	2.1	1.6
VEC3R0705QG		7	65	110	5.5	0.021	10 x 20	2.2	1.6
VEC3R0106QA		10	35	60	9.0	0.030	10 x 25	2.6	2.0
VEC3R0106QG		10	25	40	10.0	0.030	10 x 30	3.2	2.4
VEC3R0106QD		10	40	60	9.0	0.030	13 x 20	3.6	2.7
VEC3R0156QG		15	30	45	13.0	0.045	13 x 25	4.5	3.3
VEC3R0186QC		18	25	40	15.5	0.054	13 x 25	4.8	3.3
VEC3R0256QG		25	20	30	21.0	0.075	16 x 25	7.2	5.0
VEC3R0506QG		50	12.5	19	38.0	0.150	18 x 40	12.5	10.2
VEC3R0606QG		60	12.5	19	42.0	0.180	18 x 40	13.5	10.2

Snap-in Terminal Type

2 PIN Type	4 PIN Type
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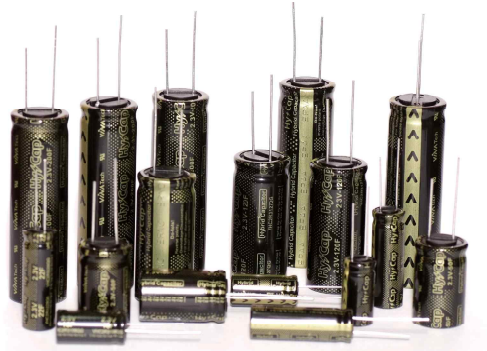
Part Number	Rated Voltage(V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm) D×L	Weight (g)	Volume (ml)
			AC(1kHz)	DC					
VEC3R0107QG	3.0	100	6.0	10.0	75.0	0.300	22 x 45	20.0	17.1
VEC3R0367QG		360	3.0	4.5	200.0	1.080	35 x 62	70.0	59.6
VEC3R0407QG		400	3.0	4.5	210.0	1.200	35 x 72	80.0	69.2
VEC3R0507QG		500	3.0	4.5	230.0	1.500	35 x 82	96.0	78.9

HyCap/Cell 2.3V VHC Series

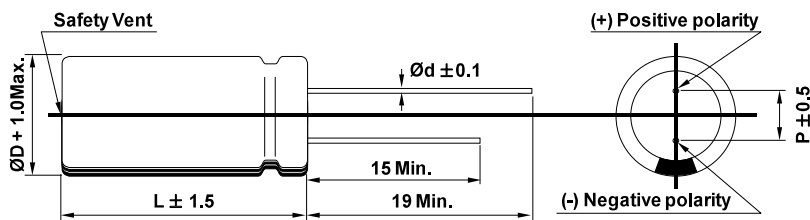
Features

P-EDLC (Hybrid Capacitor)

- Higher Capacitance (2 times of EDLC)
- Over 100,000 cycle life
- Low current & long-term backup applications
- RoHS compliant



Lead Terminal Type

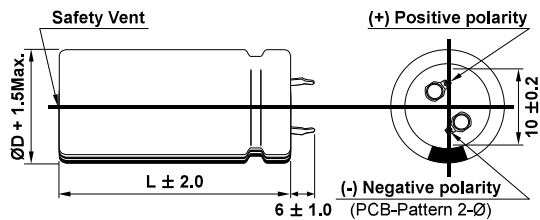


D(Ø)	8	10, 13	16, 18
d(Ø)		0.6	0.8
P(mm)	3.5	5.0	7.5

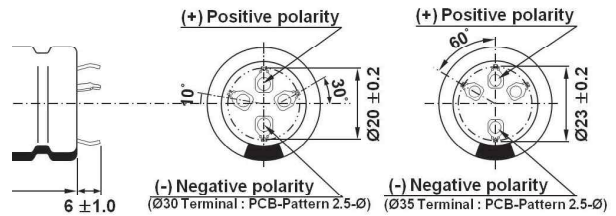
Part Number	Rated Voltage(V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm)	Weight (g)	Volume (ml)
			AC(1kHz)	DC			D×L		
VHC2R3106QG	2.3	10	220	700	0.2	0.020	10 x 20	2.5	1.6
VHC2R3226QG		22	120	330	0.4	0.038	10 x 30	3.6	2.4
VHC2R3506QG		50	60	160	0.9	0.090	16 x 25	8.5	5.0
VHC2R3127QG		120	45	80	2.0	0.240	18 x 40	16.0	10.2

Snap-in Terminal Type

2 PIN TyPE

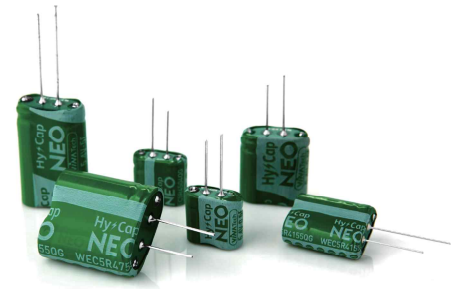


4 PIN TyPE



Part Number	Rated Voltage(V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm)	Weight (g)	Volume (ml)
			AC(1kHz)	DC			D×L		
VHC2R3227QG	2.3	220	30	50	3.5	0.640	22 x 45	24.7	17.1
VHC2R3307QG		300	30	50	4.6	0.950	22 x 45	25.1	17.1
VHC2R3807QG		800	10	15	12.7	5.000	35 x 72	94.0	69.2

HyCap/Module 5.4V WEC(NEO) Series

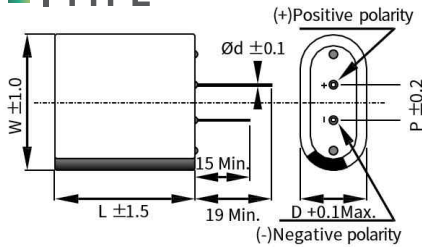


Features

- High Power Density
- Over 500,000 cycle life (semi-permanent)
- 2 units serially connected to provide 5.4V products
- RoHS compliant
- Long-term reliability improved at high temperature and humidity

Drawing

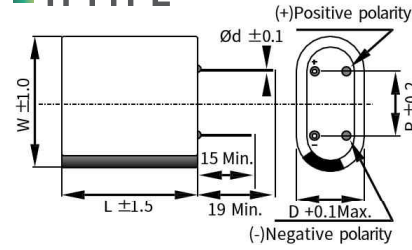
I TYPE



TYPE	I	O	H
P	4.7	12.3	8.5

D = 8.5mm

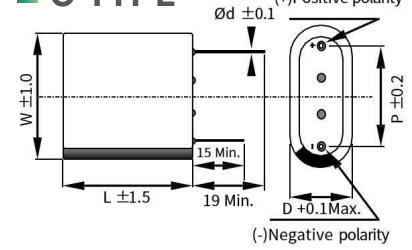
H TYPE



TYPE	I	O	H
P	5.5	15.5	10.5

D = 10.5mm

O TYPE



TYPE	I	O	H
P	7.5	18.5	13

D = 13mm

SPECIFICATION

Item	Characteristics
Product series	EDLC 2 SERIAL MODULE
Rated Voltage (V _R)	5.4 V
Operating Temperature	-40 ~ +65°C
Capacitance Tolerance	-10 ~ +30%

High Temp. Load Life	After 1,000 hours at V _R loaded under +65°C, capacitors meet the following criteria.	
	Cap. Change	≤ 30% of initial value
Cycle Life Characteristics	ESR	≤ 2 times of specified value
	Cycle	500,000
	ΔC	≤ 30% of initial value
	ESR	≤ 2 times of specified value
	Method	Cycle of Charge/discharge from V _R to 1/2V _R

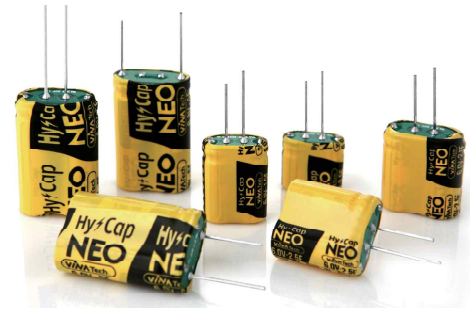
Shelf life	2 years No Electrical Charge, Temperature Below 70°C (ΔC : ≤10% of initial value / ΔESR : ≤ 50% of specified value)
------------	---

Part Number	Rated Voltage (V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm)
			AC(1kHz)	DC			D × W × L
WEC5R4504QG	5.4	0.5	315	465	1.0	0.002	8.5×17×15.5
WEC5R4155QG		1.5	165	285	3.0	0.007	8.5×17×22
WEC5R4255QA		2.5	95	155	4.5	0.010	8.5×17×27
WEC5R4255QG		2.5	135	205	4.5	0.010	10.5×21×22.5
WEC5R4505QA		5.0	79	135	8.0	0.020	10.5×21×22.5
WEC5R4505QG		5.0	65	95	9.0	0.020	10.5x21x32
WEC5R4755QG		7.5	65	95	12.0	0.030	13x26x28

Max. Current : 1 sec. discharge to 1/2V_R

When do module more than 2 series, please fully discharge over 1 hour first, then assemble right after within 1 hour.

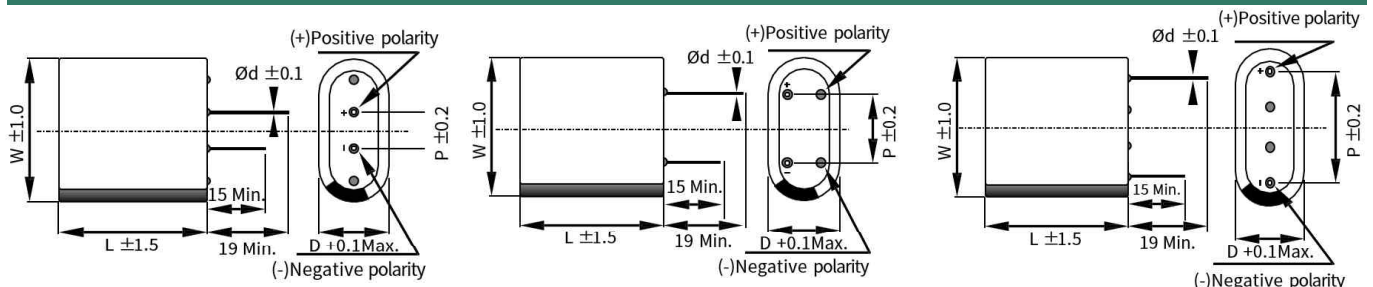
HyCap/Module 6.0V WEC(NEO) Series



Features

- High Power Density
- Over 500,000 cycle life (semi-permanent)
- 2 units serially connected to provide 6.0V products
- RoHS compliant
- Long-term reliability improved at high temperature and humidity

Drawing



TYPE	I	O	H
P	4.7	12.3	8.5

D = 8.5mm

TYPE	I	O	H
P	5.5	15.5	10.5

D = 10.5mm

TYPE	I	O	H
P	7.5	18.5	13

D = 13mm

SPECIFICATION

Item	Characteristics
Product series	EDLC 2 SERIAL MODULE
Rated Voltage (V _R)	6.0 V
Operating Temperature	-40 ~ +65°C
Capacitance Tolerance	-10 ~ +30%

High Temp. Load Life	After 1,000 hours at V _R loaded under +65°C, capacitors meet the following criteria.	
	Cap. Change	≤ 30% of initial value
Cycle Life Characteristics	ESR	≤ 2 times of specified value
	Cycle	Over 500,000
	ΔC	≤ 30% of initial value
	ESR	≤ 2 times of specified value
	Method	Cycle of Charge/discharge from V _R to 1/2V _R

Shelf life	2 years No Electrical Charge, Temperature Below 70°C (ΔC : ≤ 10% of initial value / ΔESR : ≤ 50% of specified value)
------------	--

Part Number	Rated Voltage (V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm)
			AC(1kHz)	DC			D × W × L
WEC6R0504QG	6.0	0.5	355	535	1.0	0.003	8.5x17x15.5
WEC6R0155QG		1.5	175	295	3.0	0.010	8.5x17x22
WEC6R0255QG		2.5	165	245	4.5	0.015	10.5x21x22.5
WEC6R0355QG		3.5	165	275	5.0	0.021	10.5x21x22.5
WEC6R0505QA		5.0	95	155	8.5	0.030	10.5x21x27
WEC6R0505QG		5.0	75	115	9.5	0.030	10.5x21x32
WEC6R0755QG		7.5	79	115	12.0	0.045	13x26x28

Max. Current : 1 sec. discharge to 1/2V_R

When do module more than 2 series, please fully discharge over 1 hour first, then assemble right after within 1 hour.

HyCap/Module

5.4V VEC Series

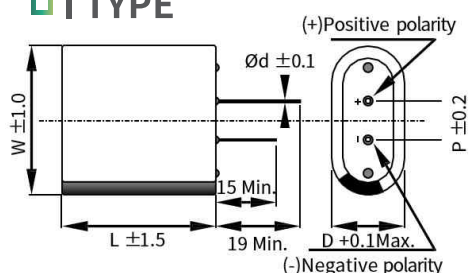
Features

2 units serially connected to provide 5.4V products



Drawing

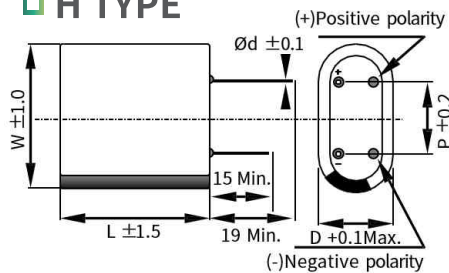
I TYPE



TYPE	I	O	H
P	4.7	12.3	8.5

D = 8.5mm

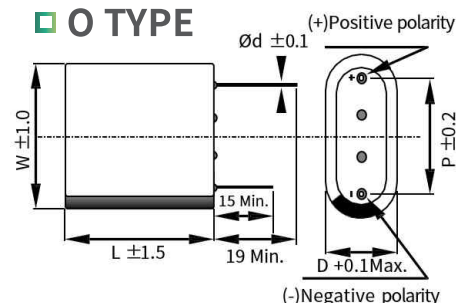
H TYPE



TYPE	I	O	H
P	5.5	15.5	10.5

D = 10.5mm

O TYPE



TYPE	I	O	H
P	7.5	18.5	13

D = 13mm

SPECIFICATION

Item	Characteristics	
Rated Voltage (V_R)	5.4 V	
Operating Temperature	-40 ~ +65°C	
Capacitance Tolerance	-10 ~ +30%	
High Temp. Load Life	Measure	After 1,000 hours at V_R loaded under +65°C, capacitors meet the following criteria.
	Cap. Change	≤ 30% of initial value
	ESR Change	100% increase from specified value
Cycle Life Characteristics	Cycle	500,000
	Cap. Change	≤ 30% of initial value
	ESR Change	100% increase from specified value
	Condition	Cycle of charge/discharge from V_R to $1/2V_R$
Shelf life	2 years No Electrical Charge, Temperature Below 70°C (ΔC : ≤ 10% of initial value / ΔESR : ≤ 50% of specified value)	

Part Number	Rated Voltage (V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm) D × W × L	Weight (g)	Volume (ml)
			AC(1kHz)	DC					
VEC5R4504QG	5.4	0.5	265	395	1.0	0.002	8.5×17×15.5	2.6	2.2
VEC5R4155QG		1.5	115	195	3.0	0.007	8.5×17×22	3.3	3.2
VEC5R4255QA		2.5	75	125	5.0	0.010	8.5×17×27	4.5	3.9
VEC5R4255QG		2.5	115	175	4.5	0.010	10.5×21×22.5	4.7	5.0
VEC5R4355QG		3.5	115	195	5.5	0.014	10.5×21×22.5	4.8	5.0
VEC5R4505QA		5.0	65	95	9.0	0.020	10.5×21×27	6.4	7.0
VEC5R4505QG		5.0	55	75	10.0	0.020	10.5×21×32	6.6	7.1
VEC5R4755QG		7.5	55	85	12.5	0.030	13×26×28	9.6	9.5

Max. Current : 1 sec. discharge to $1/2V_R$

When do module more than 2 series, please fully discharge over 1 hour first, then assemble right after within 1 hour.

HyCap/Module

6.0V VEC Series

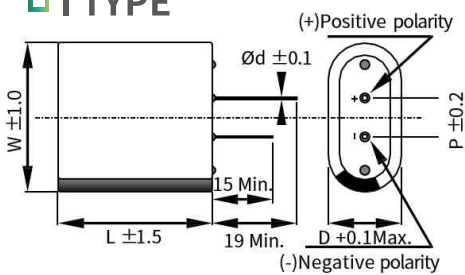
Features

2 units serially connected to provide 6.0V products



Drawing

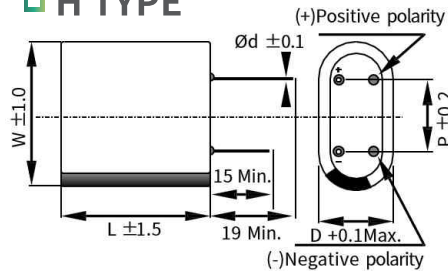
I TYPE



TYPE	I	O	H
P	4.7	12.3	8.5

D = 8.5mm

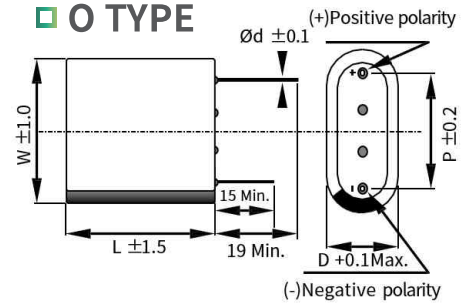
H TYPE



TYPE	I	O	H
P	5.5	15.5	10.5

D = 10.5mm

O TYPE



TYPE	I	O	H
P	7.5	18.5	13

D = 13mm

SPECIFICATION

Item	Characteristics	
Rated Voltage (V _R)	6.0 V	
Operating Temperature	-40 ~ +65°C	
Capacitance Tolerance	-10 ~ +30%	
High Temp. Load Life	Measure	After 1,000 hours at V _R loaded under +65°C, capacitors meet the following criteria.
	Cap. Change	≤ 30% of initial value
	ESR Change	100% increase from specified value
Cycle Life Characteristics	Cycle	500,000
	Cap. Change	≤ 30% of initial value
	ESR Change	100% increase from specified value
	Condition	Cycle of charge/discharge from V _R to 1/2V _R
Shelf life	2 years No Electrical Charge, Temperature Below 70°C (ΔC : ≤10% of initial value / ΔESR : ≤ 50% of specified value)	

Part Number	Rated Voltage (V)	Capacitance (F)	ESR (mΩ)		Max. Current (A)	Leakage Current (mA, 72hr)	Size (mm) D × W × L	Weight (g)	Volume (ml)
			AC(1kHz)	DC					
VEC6R0504QG	6.0	0.5	265	295	1.0	0.003	8.5×17×15.5	2.5	2.2
VEC6R0155QG		1.5	145	215	3.5	0.010	8.5×17×22	3.3	2.8
VEC6R0255QG		2.5	135	205	5.0	0.015	10.5×21×22.5	4.7	4.4
VEC6R0355QG		3.5	135	225	5.5	0.021	10.5×21×22.5	4.7	4.4
VEC6R0505QA		5.0	75	125	9.0	0.030	10.5×21×27	6.6	6.3
VEC6R0505QG		5.0	55	85	10.0	0.030	10.5×21×32	6.6	7.1
VEC6R0755QG		7.5	65	95	13.0	0.045	13×26×28	9.6	9.5

Max. Current : 1 sec. discharge to 1/2V_R

When do module more than 2 series, please fully discharge over 1 hour first, then assemble right after within 1 hour.

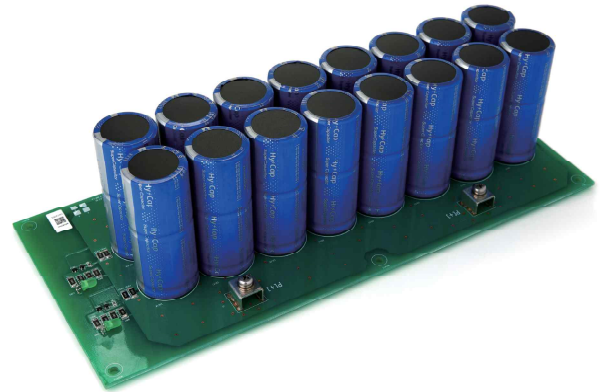
HyCap/Module Customized Series

Features

- Ultra-low internal resistance
- High power and reliable performance
- Over 500,000 duty cycles
- Compact & fully enclosed splash proof design

Typical Applications

- Automotive
- Consumer electronics
- Renewable energy system
- Short term UPS & Telecommunications
- Wind turbine pitch control



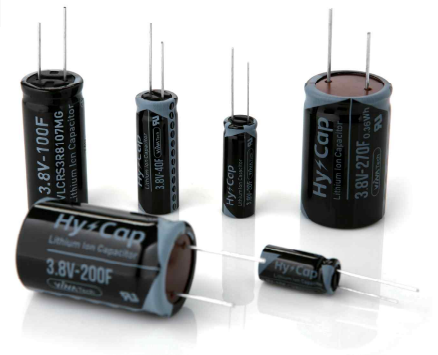
Application Area	Part Name	Voltage (V)	Capacitance (F)	Cell Structure	Size(mm) (WxLxH)
Power Supply Control Unit	VEM30R0406QG	30.0	40.0	3.0V – 400F 10S	180x180x70
Power Supply Control Unit	VEM30R0366QG	30.0	36.0	3.0V – 360F 10S	122x150x70
Power Supply Control Unit	VEM30R0126QG	30.0	12.0	3.0V 120F 10S	87x100x50
Power Supply Control Unit	VEM30R0106QG	30.0	10.0	3.0V – 100F 10S	160x60x50
Power Supply Control Unit	VEM60R0505QG	60.0	5.0	3.0V – 100F 20S	146x104x70
Wind Turbine	VEM100R0106QG	100.0	10.0	3.0V – 360F 36S	225x235x70
Wind Turbine	VEM16R0606QG	16.0	60.0	3.0V - 360F 6S	37x233x70
Electric Bicycles	VEM60R0415QG	60.0	4.16	2.7V – 100F 24S	94x148x50
Electric Bicycles	VEM27R0255QG	27.0	2.5	2.7V – 25F 10S	55x120x30
Elevators	VEM144R0755QG	144.0	7.5	3.0V – 360F 48S	315x340x70
Elevators	VEM18R0127QG	18.0	120	3.0V – 360F 6S2P	270x100x70
Elevators	VEM15R0806QG	15.0	80.0	3.0V – 400F 5S	126x82x70
Elevators	VEM90R0166QG	90.0	16.6	3.0V – 500F 30S	400x200x90

HyCap/Module Lithium Ion Capacitor

PART NUMBER SYSTEM

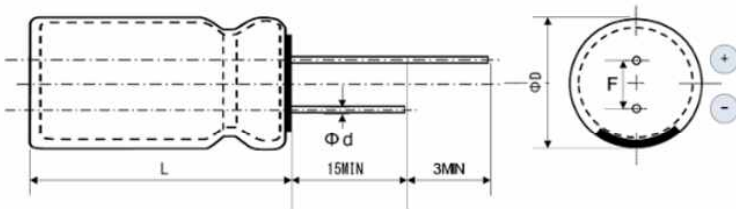
VLC RS 3R8 406 MG

- **VLC** VINATech Lithium Ion Capacitor (Series)
- **RS** Low Resistance Type(Characteristics)
- **3R8** 3.8V (Maximum Available Voltage) *R=Decimal Point
- **406** 40F(40 X 10⁶μF) Capacitance
- **M** -15 ~ +15% Capacitance Tolerance
- **G** Standard Design



Items	Specification	Test Conditions
Operating temperature range(°C)	-30 ~ + 85°C	-
Maximum available voltage(V)	3.8V	Within the Operating Temperature Range (3.5V when over 70~85°C)
Minimum available voltage(V)	2.2V	Within the Operating Temperature Range (2.5V when over 70~85°C)
Soldering	Capacitance : Within initial specified value DCR : Within initial specified value Appearance : No noticeable abnormality	Material : Sn-3Ag-0.5Cu Soldering iron temperature : 390±5°C Duration : 3sec The soldering iron of the above conditions is applied twice to the lead wire (+pole, -pole) 1 mm away from the cell main body
Floating charge characteristics-1		Apply 3.8V to capacitor for 1000 hours at 70°C and measure the floating charge characteristics after returning to normal temperature and humidity
Floating charge characteristics-2	Capacitance : Over 80% of initial specified value	Apply 3.5V to capacitor for 1000 hours at 85°C and measure the floating charge characteristics after returning to normal temperature and humidity
Heat cycle characteristics	Internal resistance : Within 1.5 times of initial specified value Appearance : No noticeable abnormality	Leave the capacitor in below condition, and measure the characteristics after returning to normal temperature and humidity Temperature : 85±2°C, -40±2°C Duration : 30min Cycle Numbers : 100cycles
Floating Charge Characteristics in high temperature and high humidity		Apply 3.8V 90%Rh to capacitor for 500 hours at 60°C and measure the floating charge characteristics after returning to normal temperature and humidity
Shock resistance		According to JIS C 60068-2-27 Half-sine wave A=294
Vibration resistance	No exterior abnormality observed Initial specified values retained	Apply a sine wave vibration of 1.5mm amplitude and frequency 10 ~55Hz, for 2hours per each direction (X,Y and Z), total 6 hours

HyCap Lithium Ion Capacitor



Part number	Dimension (mm)			
	ØD(±0.5)	L(±2)	Ød(±0.05)	F(±0.5)
VLCRS3R8206MG	Ø10.0	30	Ø0.6	5.0
VLCRS3R8406MG	Ø12.5	35	Ø0.8	5.0
VLCRS3R8107MG	Ø18.0	40	Ø0.8	7.5
VLCRS3R8277MG	Ø25.0	40	Ø1.0	12.5

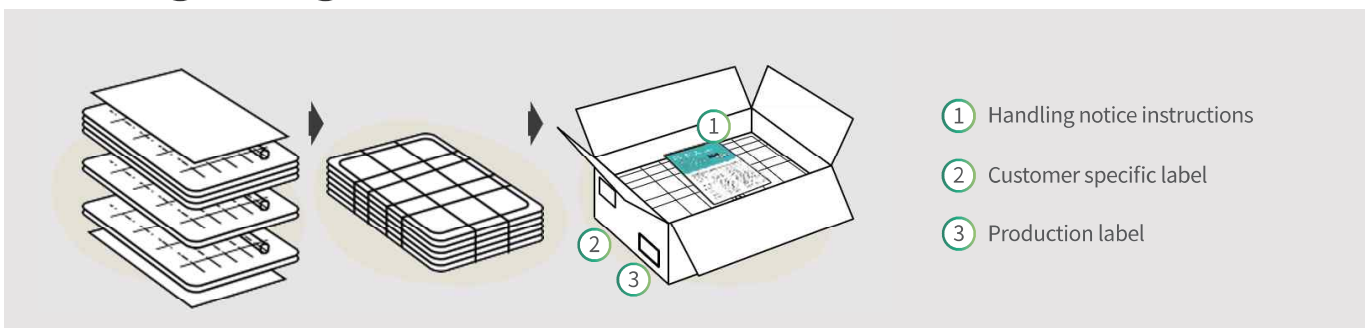


Specification

Part number	Operating temp. range [°C]	Maximum available voltage [V]	Minimum available voltage [V]	Initial capacitance [F]	Initial DCR [mΩ]	Temperature characteristics			
						-30°C		+70°C/+85°C	
						Capacitance [F]	DCR [mΩ]	Capacitance [F]	DCR [mΩ]
VLCRS3R8206MG	-30 ~ +70 (Over +70 ~ +85)	3.8 (3.5)	2.2 (2.5)	20 ± 15%	Under 250	10	4000	Within initial spec※ Charging voltage is 3.5V when above 70°C	
VLCRS3R8406MG				40 ± 15%	Under 125	20	2000		
VLCRS3R8107MG				100 ± 15%	Under 60	51	1000		
VLCRS3R8277MG				270 ± 15%	Under 60	115	1000		

※ Product design and specifications are subject to change without notice. Contact us for the current technical specifications.

Packing configuration



- ① Handling notice instructions
- ② Customer specific label
- ③ Production label

Part number	Tray	Package	Out box	Size(mm)		
				W	L	H
VLCRS3R8206MG	20	100	400	330	450	250
VLCRS3R8406MG	20	100	400	330	450	250
VLCRS3R8107MG	20	100	400	330	530	250
VLCRS3R8277MG	20	100	400	330	600	330

HyCap Application



SMART METERS / NETWORK EQUIPMENT

- Long life : No maintenance
- Wider operating temperature : -40°C to +65(70) °C



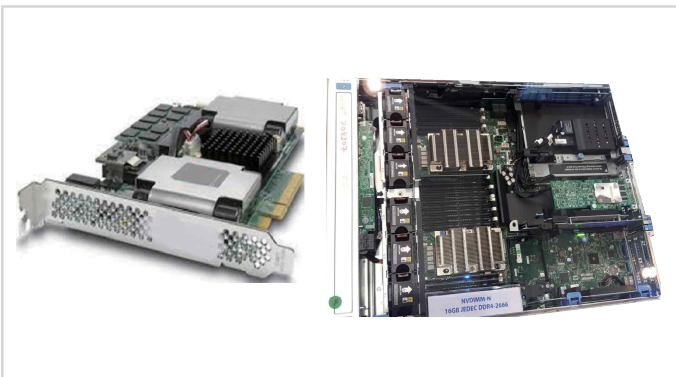
AUTOMOTIVE AFTER-MARKET PRODUCTS

- For navigation system or black box memory backup
- Compensate peak power for car audio woofers



UPS / DVR

- Responds to momentary blackouts
- Compensates peak power
- *UPS: Uninterruptible Power Supply
- *DVR: Dynamic Voltage Restorer



Memory back up

- Applied spec : 2.7V-(10F ~ 100F)
- Circuit conditions:
 - Differs depending on server conditions.

Hy⚡cap Application



EMERGENCY LAMPS

- Semi permanent and no maintenance service required
- Excellenet stability in an emergency



WIND TURBINE

- Compensates peak power for pitch control
- Semi permanent and no maintenance service required



REGENERATIVE ENERGY STORAGE DEVICE

- Hybrid electric cars, suitable for an elevators or railway vehicles
- Reduce energy cost and CO₂ emissions

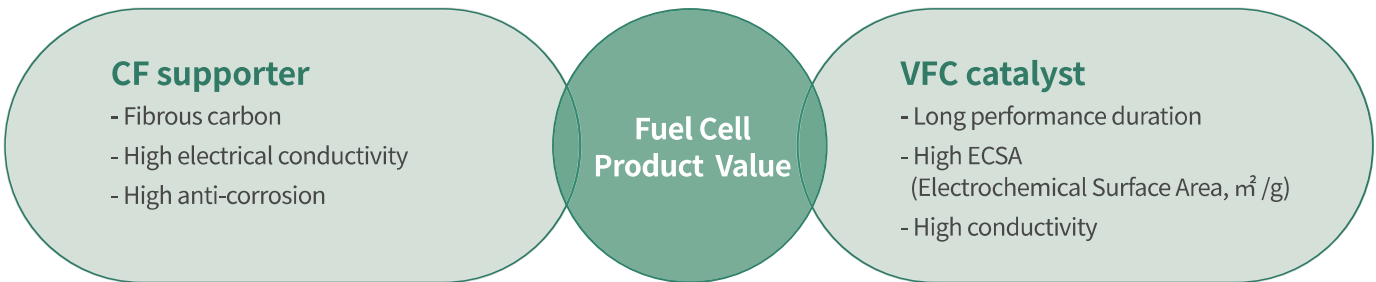
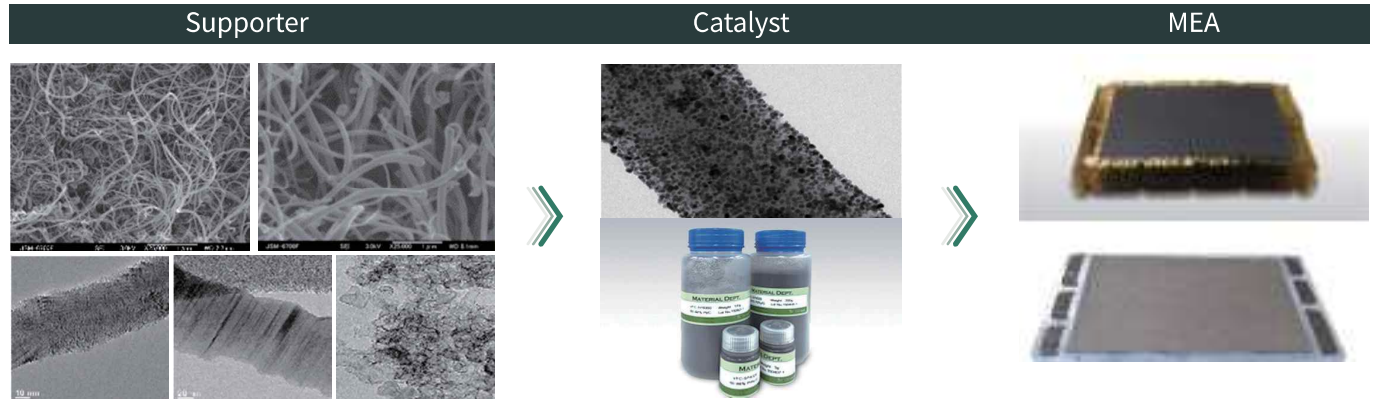


OTHER APPLICATION

- Motor running geared toy
- Pavement Marker

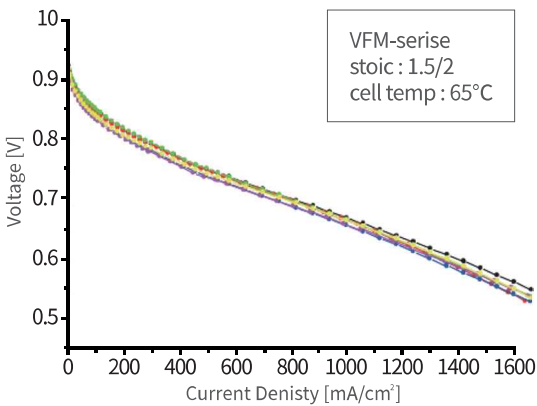
HyCap Carbon Solution

Fuel Cell Product Value Chain

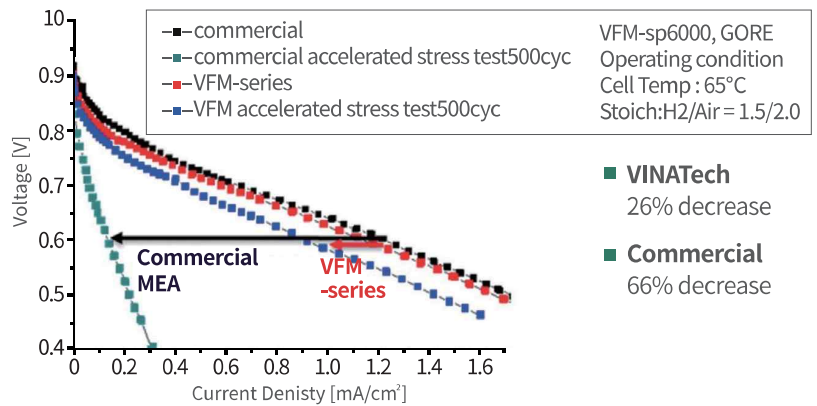


MEA Performance & Catalyst Corrosion

Performance



Accelerated Corrosion Test



Sample products

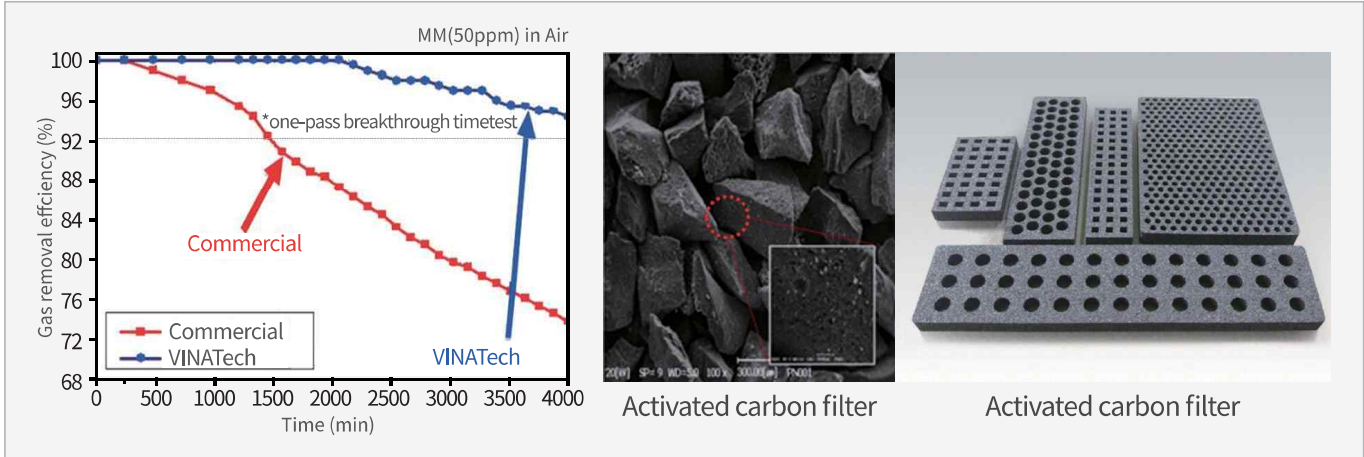
PEMFC			DMFC
25cm ² (3 layer)	360cm ² (5 layer)	360cm ² (7 layer)	220cm ² (5 layer)

We can provide customized product for customers.
(Change size and material, Electrode and MEA property control, and so on)

HyCap Carbon Solution

VINATech's Activated Carbon Filter

Eliminating gas : Methyl Mercaptan, Hydrogen Sulphide, and Trimethylamine



Features

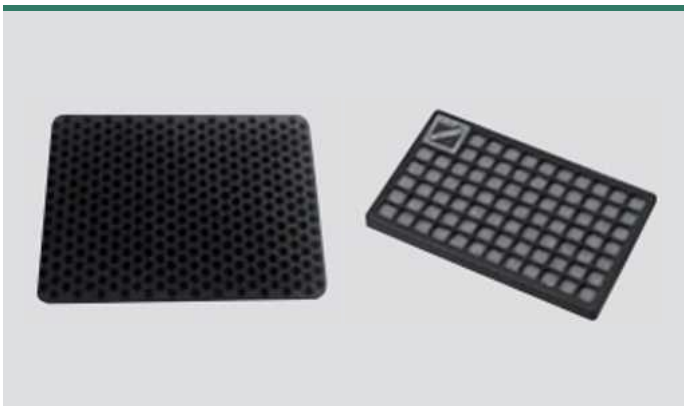
- Specific surface area : 600 m²/g or above
- Deodorizing efficiency : 90%
- MM Deodorizing efficiency time : 2,000min
- Block-shaped deodorizing filter for refrigerator

Carbon Solution Application

FUEL CELL



Deodorizing Filter



- Deodorizing Filter
 - Deodorizing Filter for refrigerators, cars and furniture
 - Deodorizing Filter for food garbage treatment

VISION FOR
NATURE





CUSTOMERS ARE
THE REASON BEHIND
OUR BUSINESS.



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| **Sales Office** : (AcroTower), B-607, Simin-daero 230, Dongan-gu, Anyang-si, Gyeonggi-do, South Korea (postal code 14067)

TEL : +82-31-448-3066

Product design and specifications are subject to change without notice.
Contact us for the current technical specifications before purchasing products.