



SAMWHA Electric, the choice for the future!

SAMWHA ELECTRIC!

SAMWHA ELECTRIC

Advanced Robotics
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Noel Choi
Sales Manager
SAMWHA Europe



SAMWHA CAPACITOR GROUP



SAMWHA CAPACITOR



SAMWHA ELECTRIC



SAMWHA ELECTRONICS



SAMWHA TECOM



KOREA JCC

Overseas Sales Offices

	SAMWHA CAPACITOR	SAMWHA ELECTRIC	SAMWHA ELECTRONICS	SAMWHA TECOM	KOREA JCC	Overseas Sales Offices
Established	1956	1973	1976	1985	1987	SAMWHA Europe
Headquarter	Yong-In, South Korea	Cheongju, South Korea	Yong-In, South Korea	Yong-In, South Korea	Cheongju, South Korea	SAMWHA USA
Overseas Factories	Thailand Indonesia	China	China	Indonesia	Vietnam	SAMWHA Hong Kong
Annual Turnover (2021)	230M EUR	210M EUR	50M EUR	45M EUR	39M EUR	SAMWHA India
Products	MLCC, DCC, DC Link Cap.	E-Cap, EDLC, Hybrid Cap.	Ferrite Core, Magnetic Powder Core, Absorber	Inductor, Transformer	Aluminum Foil	
Employees	1,110	1,310	300	420	250	

Korea's No.1 Aluminum Electrolytic Capacitors manufacturer



- Established in 1973
- Annual turnover : 210M EUR (2021)
- 1,310 Employees worldwide
- 600 million capacitors per month
 - Through Hole Type
 - Surface Mount Type
 - Snap-in/Screw Type
 - Conductive Polymer Hybrid Capacitor
 - Electric Double Layer Capacitor

Korea's No.1 Aluminum Electrolytic Capacitors manufacturer

● Recommended Series'

**R&D
Concept**

High Voltage
Large Capacitance
Larger Size
Long Life
High Temp.
Low ESR
High Ripple



"JZ" Series

- Up to 20000 hours @ 105°C
- Offered up to 450V
- Capacitance up to 330uF



"YM" Series

- High temp. 125°C 4000 hours
- High Ripple current 125°C version
- Available with Anti-Vibration pad

Korea's No.1 Aluminum Electrolytic Capacitors manufacturer

● Our Robotic market 2022

Service Sector I

<p>Picture</p>	
<p>Manufacturer</p>	
<p>SAMWHA Item</p>	<p>Polymer Hybrid : YC 50V 270uF / YM 50V 220uF / YM 50V 27uF</p>
<p>Product Usage</p>	<p>Motor Inverter, Network Module, Motor, Power Supply Unit, Robot Charging Station</p>

Korea's No.1 Aluminum Electrolytic Capacitors manufacturer

● Our Robotic market 2022

	Service Sector II
Picture	
Purpose	Serving system in Restaurants, Hotels
SAMWHA Item	Polymer Hybrid : YM 50V 220uF / YM 50V 27uF Snap-in : HL 450V 470uF / JZ 450V 330uF
Product Usage	Motor Inverter, Sensor, Power Supply Unit, Robot Charging Station

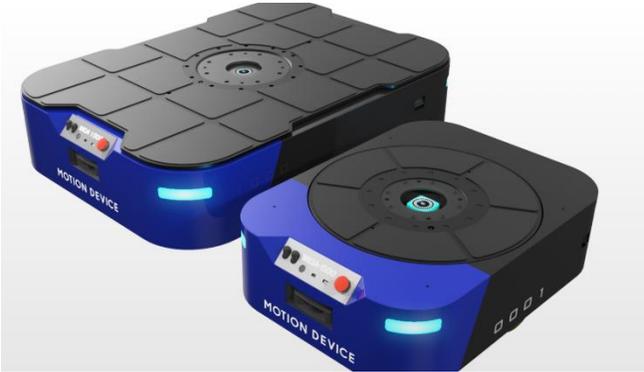
Korea's No.1 Aluminum Electrolytic Capacitors manufacturer

● Our Robotic market 2022

	Service Sector III (Robot Vacuum Cleaner)
Picture	
Purpose	Households, Public Area Clean System (Airport, Bus Terminals, Shopping Mall)
SAMWHA Item	Polymer Hybrid : YM 50V 220uF / YM 50V 27uF Snap-in : HL 450V 470uF / JZ 450V 330uF
Product Usage	Motor Inverter, Sensor, Power Supply Unit, Robot Charging Station

Korea's No.1 Aluminum Electrolytic Capacitors manufacturer

● Our Robotic market 2022

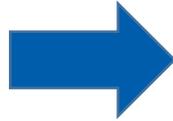
	Industrial Sector
Picture	  
Purpose	<p>Warehouse, Transportation (Autonomous Guided Vehicle, Autonomous Mobile Robots)</p>
SAMWHA Item	<p>Polymer Hybrid : YM 50V 220uF / YM 50V 27uF EDLC : DH 2.7V 3000F Cell, 48V 166F Module</p>
Product Usage	<p>Motor Inverter, Sensor, Power Supply Unit, Robot Charging Station</p>

Korea's No.1 Aluminum Electrolytic Capacitors manufacturer

- What is requested by our customers in the market?

Key Requests

- High temperature
- High ripple current
- High reliability
- Long life



SAMWHA

- **Conductive Polymer Hybrid up to 150°C (YT Series)**
- **High ripple current series of Electrolytic capacitors and polymer hybrid**
 - ✓ **Radial E-cap series of ripple current up to 4000mA**
 - ✓ **Surface mount series of ripple current up to 1300mA**
 - ✓ **Polymer Hybrid series specialized for high ripple current (YM)**
- **High reliability specified series for all product types**
- **Long life series of up to 20000 hours (10000 hours for Polymer Hybrid)**

Korea's No.1 Aluminum Electrolytic Capacitors manufacturer

● Why Conductive Polymer Hybrid?

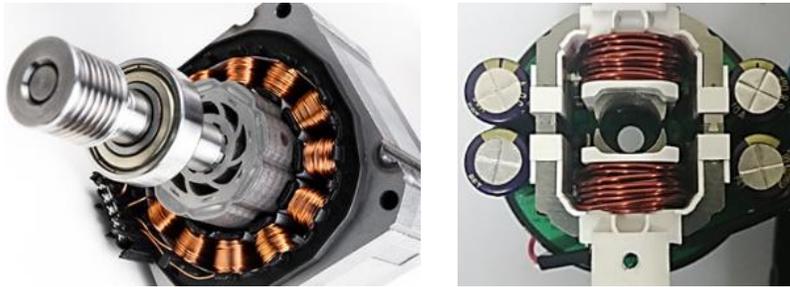
Characteristics	Tantal capacitors		Aluminum Capacitors		
	Tantal	Polymer Tantal	Electrolyte Cap (SMD)	Polymer Al Cap	Hybrid Cap
Electrolyte	MnO ₂	Conductive Polymer	Electrolyte	Conductive Polymer	Liquid Electrolyte Conductive Polymer
Picture					
Max. Voltage	50V	35V	450V	50V	100V
ESR	Normal	Excellent	Weak	Excellent	Excellent
Dissipation					
Ripple current					
Reliability					
Leakage current	Weak	Weak	Excellent	Weak	Excellent
Failure Type	Weak (Short)	Weak (Short)	Excellent (Open)	Weak (Short)	Excellent (Open)

Korea's No.1 Aluminum Electrolytic Capacitors manufacturer

● Why Conductive Polymer Hybrid?

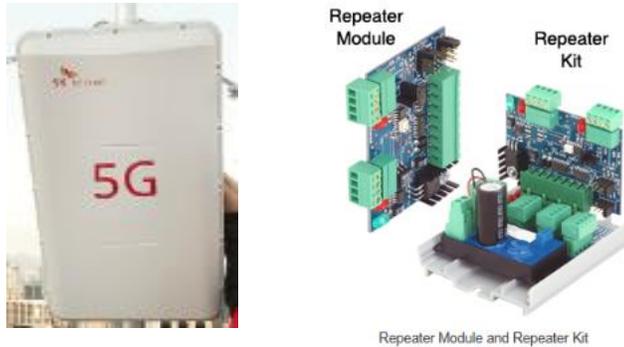
Motors

- High temperature
- High ripple current
- High reliability



Communication Repeaters

- Long life
- High performance



Surveillance Camera/Sensors

- Miniaturization
- High reliability
- High performance



Korea's No.1 Aluminum Electrolytic Capacitors manufacturer

● Why Samwha's Conductive Polymer Hybrid?

Mass production of cylindrical capacitors
➤ 47 years of know-how and technology → Guarantee of 3 times Reflow 260°C
High/low Voltage
➤ Highest : 100V ➤ Lowest : 16V
World's best conductive polymer
➤ Made in Germany (HERAEUS) → High-reliability Hybrid Capacitor

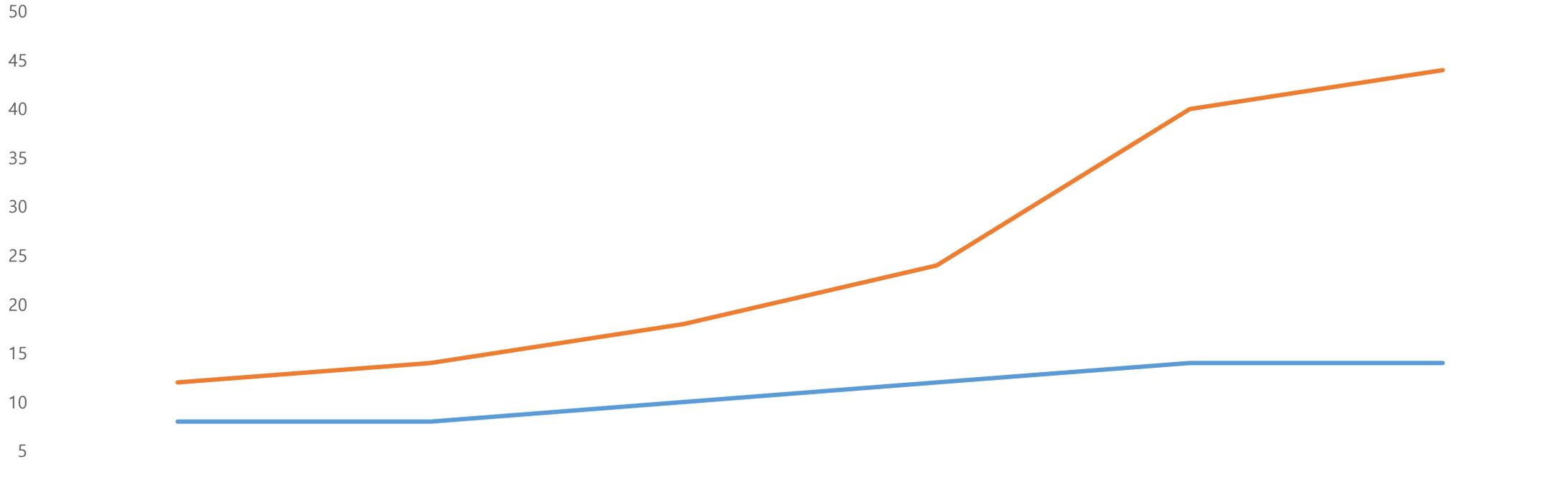


Details		2022	2023
Conductive Polymer Hybrid Cap.	High Voltage	125V	150V
	High Ripple Miniaturization	Ripple 30% ↑ 10 × 10 → 8 × 10	Ripple 30% ↑ 8 × 10 → 6.3 × 7.7
	Production	10Mpcs per Month	20Mpcs per Month
	Available Sizes	Φ6.3 x 7.7 Φ8 x 10 Φ10 x 10 Φ10 x 12.5	Φ6.3 x 5.8 Φ6.3 x 7.7 Φ8 x 10 Φ10 x 10 Φ10 x 12.5

Korea's No.1 Aluminum Electrolytic Capacitors manufacturer

● Why Samwha's Conductive Polymer Hybrid?

Polymer Hybrid Lead-time Trend (in weeks)



	2020 1H	2020 2H	2021 1H	2021 2H	2022 1H	2022 2H
SAMWHA	8	8	10	12	14	14
Competitor	12	14	18	24	40	44

— SAMWHA — Competitor

THANK
YOU

Noel Choi

mh.choi@samwha.com

www.samwha.com

<https://www.rutronik.com/electronic-components/samwha-electric/>