



ACCELERATING
INNOVATION

Industrial Products

Oliver Zimmermann

Technical Support

KYOCERA AVX Components

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Company Overview

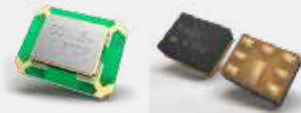
"KYOCERA AVX will foster an environment where our employees can reach their full potential. We will achieve superior customer satisfaction and expand our business by developing technologies and products that enhance society while delivering tomorrow's solutions."



"Unifying 2 Great Brands to Provide Solutions for a Better Tomorrow"



Markets Served



CRYSTALS / SAW DEVICES

+\$3B
Revenue

20,000+
Employees

43
Factories

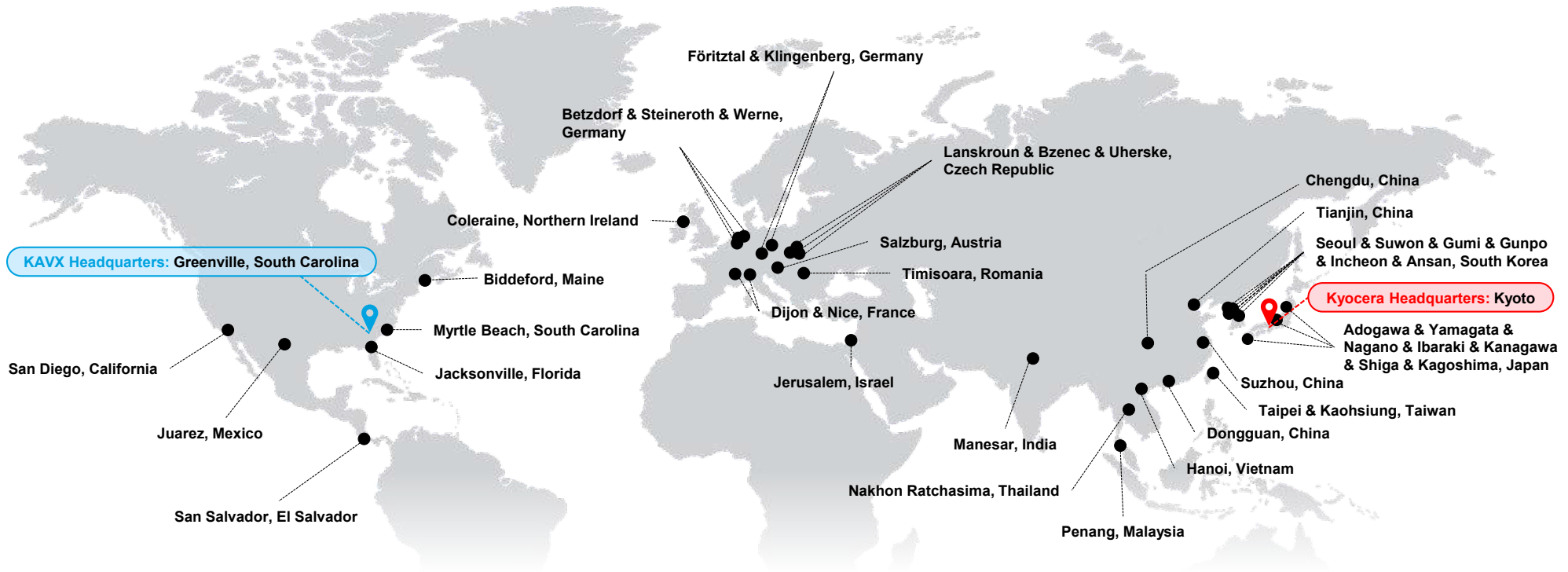
23
Sales Offices



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GLOBAL MANUFACTURING



33 Manufacturing Sites

Kyocera 10 Manufacturing Sites

First Global Expansion – 1977
22 New Sites since 2016

Over 20,000+ Employees



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KYOCERA AVX | PRODUCT PORTFOLIO

CAPACITORS

Ta / NbO / Polymer Capacitors

- Automotive
- General
- High CV
- Radial Leaded
- High Reliability
- Low ESR
- Low Profile
- High Temp
- DLA / MIL SPEC
- SMD Ta MnO₂
- Polymer Space (TCH series)
- Wet Ta & Wet Ta modules



SuperCapacitors

- EDLC Capacitors
- Ultra Capacitors
- S-Capacitors
- Gold Capacitors



Aluminum Capacitors (Commercial Grade)

- Conductive Polymer: Solid Electrolyte
- Hybrid: Solid/Liquid Electrolyte
- Electrolytic: Liquid Electrolyte



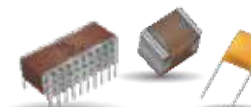
Power / Chip Film Capacitors

- High Power Film
- Medium Power Film
- SMD Chip Film
- Energy Storage Discharge
- Automotive Film



Ceramic Capacitors

- Low Inductance
- Discoidal Ceramics
- High Voltage
- Surface Mount
- EMI Filtering
- Feedthru SMD
- Leaded
- Medical
- Stacked
- DLA / MIL SPEC
- Automotive



CONNECTORS

Automotive / Industrial

- Board to Board
- FPC/FFC
- Wire to Wire / Board
- Backplane
- Shunt
- Interface
- Card Edge
- Memory Card
- Shield Locks
- Power Terminals
- Application Tools
- IDC
- Mechatronics
- I/O Battery
- Poke Home
- Injection Molding
- Press-Fit Pins
- Custom Products



SENSING and CONTROL

Pedals / Controls / Sensors

- Active
- Passive
- Electronic Hand Throttle (EHT)
- Power
- Electric Motor
- Battery Management
- LED
- Temperature
- Position
- Proximity
- Quality
- Speed



RF SOLUTIONS & SYSTEMS

RF / Microwave

- Filters
- Diplexers
- Couplers
- Attenuators
- Capacitors
- Inductors
- Hi-Q Capacitors
- SLC Capacitors
- RF Varistors
- Resistors
- RC Networks
- Fuses
- Active Antennas
- Passive Antennas
- Test Measurement
- Test Services



CIRCUIT PROTECTION / POWER SEMICONDUCTORS

Devices

- MLV Transient Volt. Suppressors
- Fuses
- Thermistors
- Varistors
- Diodes
- Discretes Diodes
- Power Modules
- High-power Devices
- Stacks
- Units



TIMING DEVICES

Crystals / SAWs

- Crystal Units
- Clock Oscillators (SPXO)
- Volt. Controlled Crystal Oscillators (VCXO)
- Temp. Compensated Crystal Oscillators (TCXO)
- SAW Filters
- SAW Duplexers
- SAW Quadplexers



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POWER FILM CAPACITORS



ACCELERATING
INNOVATION



FACTORY LOCATIONS

Europe



Saint Apollinaire, France

COMPETENCE CENTER

High Power
Medium Power
Low Power Front-End

ISO/TS 22163 • ISO 9001 • ISO 14001
IATF 16949 • IECQ-CECC • ESCC-3009

Uherske, Czech Rep

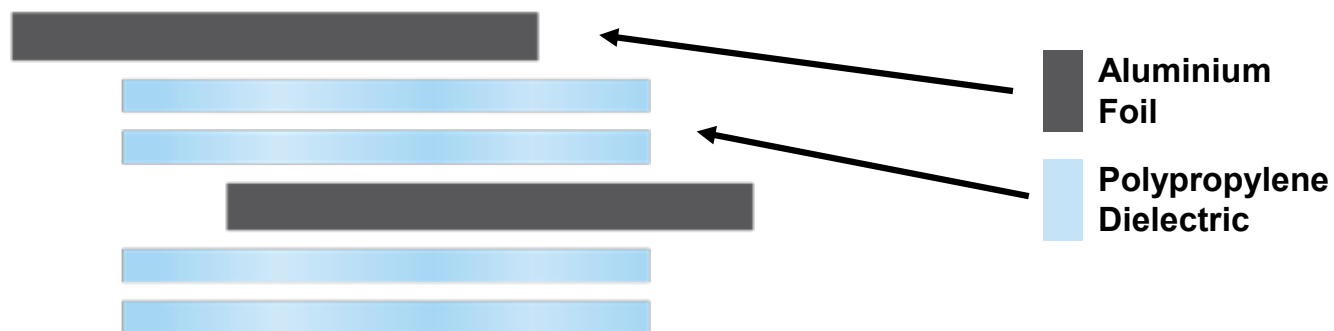
High Power
Medium Power
Low Power

ISO/TS 22163 • ISO 9001
ISO14001 • IATF 16949



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FILM FOIL TECHNOLOGY



Film/foil capacitors consist of two metal foil electrodes made of aluminum foil separated by a piece of plastic film.

The plastic film can be polyester or polypropylene. The typical thickness range of the plastic film varies from $2\mu\text{m}$ to $20\mu\text{m}$, while aluminum foil thicknesses range is $5\mu\text{m}$.



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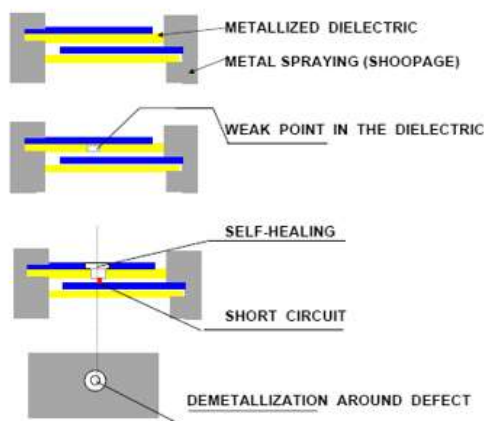
METALLIZED FILM CAPACITOR

SELF HEALING PROCESS

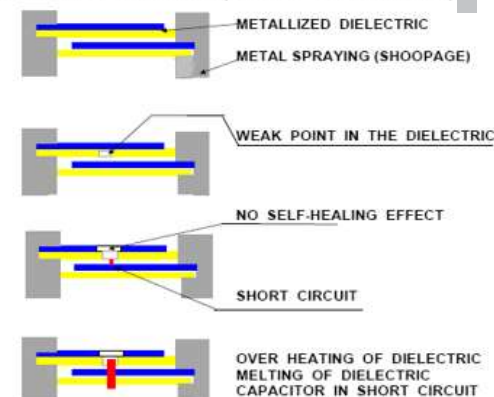


In a metallized film capacitor, a plastic film is coated with a thin layer of zinc or aluminum. The metal layer is deposited on the plastic film through a process known as ***vacuum deposition***. When breakdown occurs in a metallized film capacitor, arcing causes the thin metal layer around the fault area to vaporize. This vaporization process removes the conductive metal layer in the area around the flaw. Since the conductive material is removed, a short circuit cannot occur between the plates. This prevents failure of the component.

SELF HEALING PROCESS (LOW ENERGY)



SELF HEALING PROCESS (HIGH ENERGY)



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METALLIZED FILM CAPACITOR

CONTROLLED SELF HEALING PROCESS



**Self
Healing
Technology**

Since 1976, TPC and then KYOCERA AVX Components Corporation continue to develop metallized technology by using the **Controlled Self-healing**

In the case of self-healing design of metallization, segmentation and internal environment have to limit the energy of self-healing in order to guarantee the safety gap to prevent the avalanche effect.



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METALLIZED FILM CAPACITOR

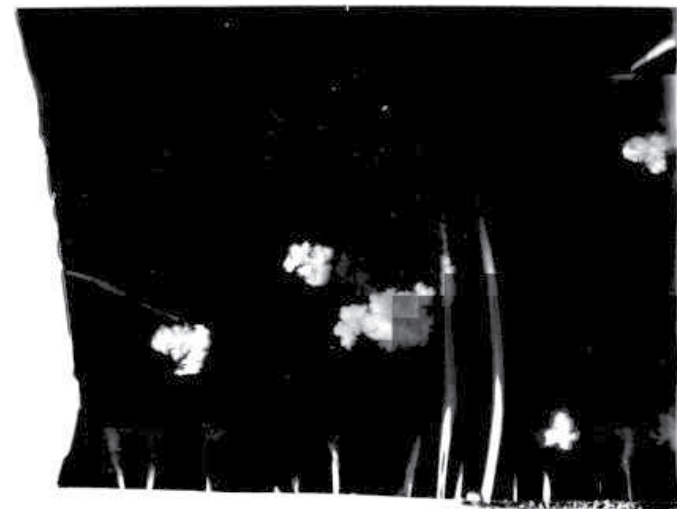
CONTROLLED SELF HEALING

DRY TECHNOLOGY



Controlled Self-Healing Guaranteed by Segmentation

WET & IMPREGNATED TECHNOLOGY



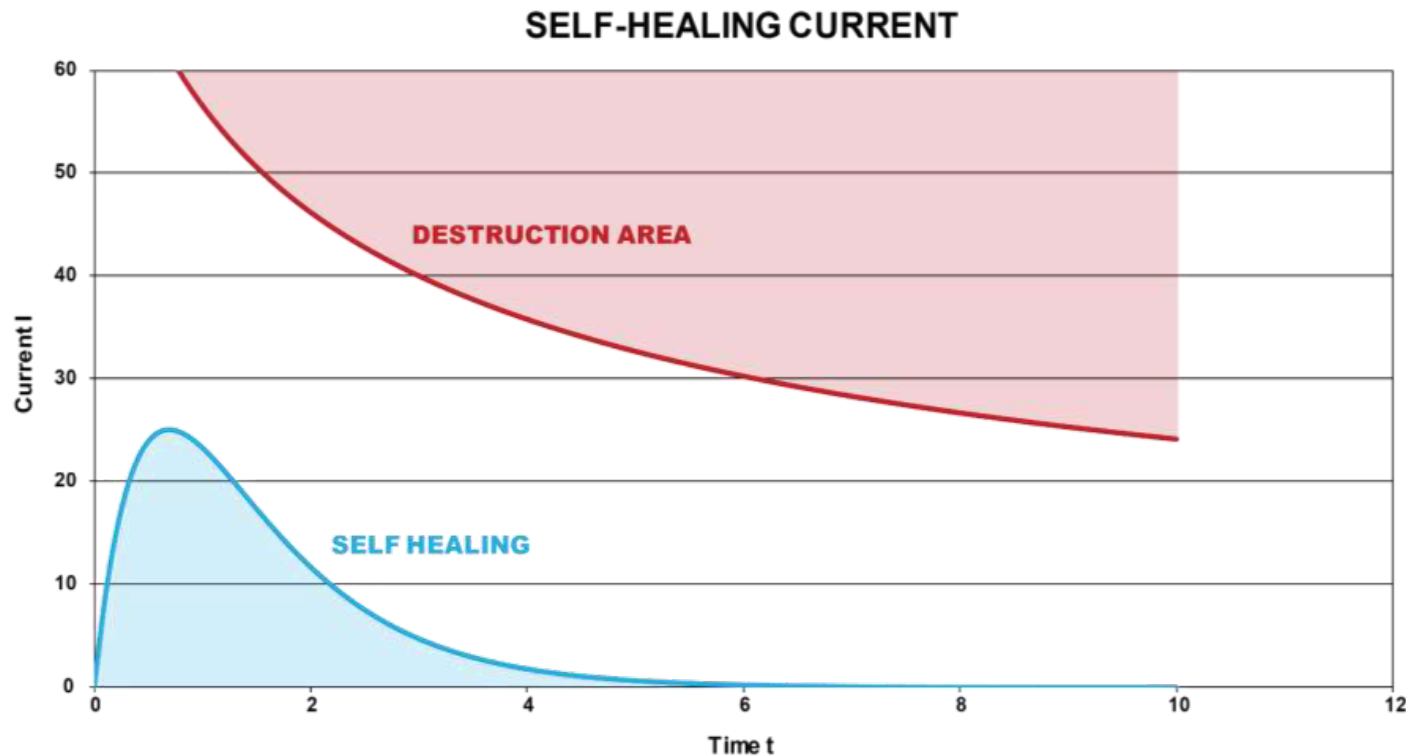
**Controlled Self-Healing Guaranteed:
Oil Acting as Extinguisher**



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METALLIZED FILM CAPACITOR

CONTROLLED SELF HEALING



BENEFITS

TOTAL SAFETY:

- No Risk of Short Circuit
- Failure Mode:**
 - Only Lost of Capacitance
- No Gas Production Because Self-healing is Stopped
- No Explosion in Confined Area

AGING EVOLUTION:

- Capacitance Decrease
- Easy Maintenance



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MATRIX TECHNOLOGY & PROCESS

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

DC Filtering														
	FM	FFB	FE FB	FFV3	FFG	FFVE FFVI FFVS	FFLI	FFLR	FHC	FFPC	FFLC	FFHV FTHV	TFM	IFM
Metallized and Dry	X	X	X	X	X	X	X	X	X	X	X			
Metallized and Wet										X		X		
Metallized and Impregnated													X	X

Snubber / Protection				AC Filtering			Interference Suppression	Tuning			Discharge
FSB	FPG FPX	CPM	TCM	FLC	FLA	FLB	FV	FAV	FAI	FAX	DFM
Metallized and Dry	X	X			X		X				
Metallized and Impregnated					X	X					X
Film Foil Dry or Impregnated			X	X				X	X	X	



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MARKETS



Industrial & Energy – 43%

Wind turbines, solar systems, motor drives, induction heating, power transmission, battery chargers, power supplies



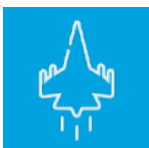
Traction – 27%

Tramways, metros, area trains, heavy locomotives, high speed trains



Automotive– 23%

Motorcycles, hybrid/electrical cars, commercial/utility vehicles, buses, trucks



Defense & Research – 7%

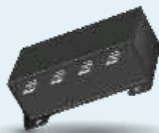
high voltage supplies, power laser, electromagnetic gun



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AUTOMOTIVE APPLICATION: HYBRID & ELECTRICAL VEHICLE

DC
FILTERING



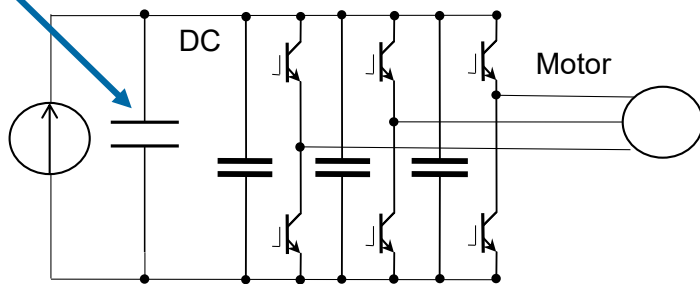
FHC (Standard)



FHC (Custom)



FFVE/FFVI



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DC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FHC
	
Voltage	900Vdc
Capacitance	900μF
Temperature	105°C
Ripple Current	160Arms
Applications	Automotive HEV, Industrial
Standards	IEC61071, AECQ200, ZVEI
RoHS	Yes
Technology	Metallized Film, Dry



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DC FILTERING

FHC Custom Design

Elementary Brick Concept

Metallized PPY

Controlled Self Healing

Wound Technology

Features

410 to 900Vdc Working Voltage

Minimum Thickness 2.5 μ m

110°C Hot Spot Temperature and 115°C Short Time

High RMS Current Capability

Road Map

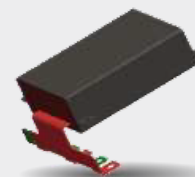
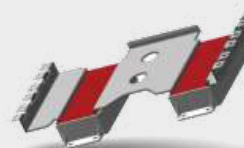
2 μ m Thickness Long Term Dev.

New Shape Of Elementary Brick With Higher Fill Factor



Flexible Size

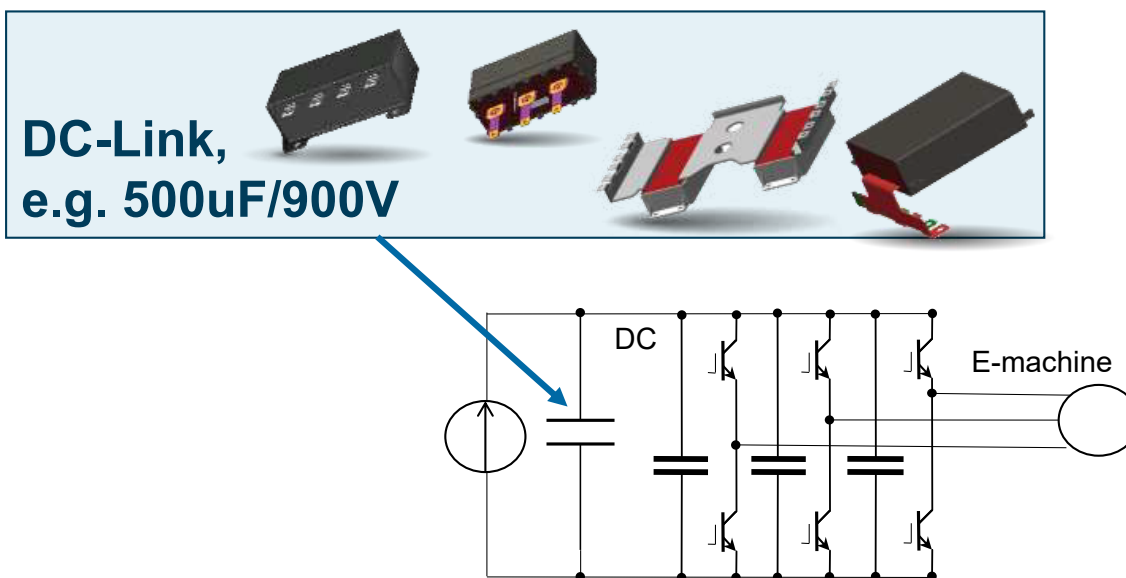
Through Hole Tabs



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KAVX Strategy

- Focus on projects with small to medium volumes, e.g. 10-30Kpcs



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Electric luxury & sport car



- Aston Martin
- Bentley
- Bugati
- Ferrari
- Lamborghini
- Lotus
- Maserati
- Mc Larren
- Rolls Royce

→ Who are their tier 1 ?



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E Motor cycle & Maxi scooter



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Agricultural Vehicles



Steyr, Landini, John deer, Auga, Fendt, New holand, MCCormik, Rexa, Cararo, Deutz Fahr, Class, Massey fergusson, Case IH, Kubota, Challenger, Valtra,

→ Who are their tier 1 ?



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Construction vehicle



Hitachi, Caterpillar, jCB, Volvo, Komatsu, Huyndai, Bobcat, Yanmar, Liebherr, Fiori, Terex, Doosan, HAMM

→ Who are their tier 1 ?



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Trucks & Vans



Special Trucks, Buses & Coaches, AirTaxis,

- Concrete mixer



- Garbage truck



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INDUSTRIAL APPLICATION: WIND TURBINES CONVERTERS



FFVE/FFVI



FFPC



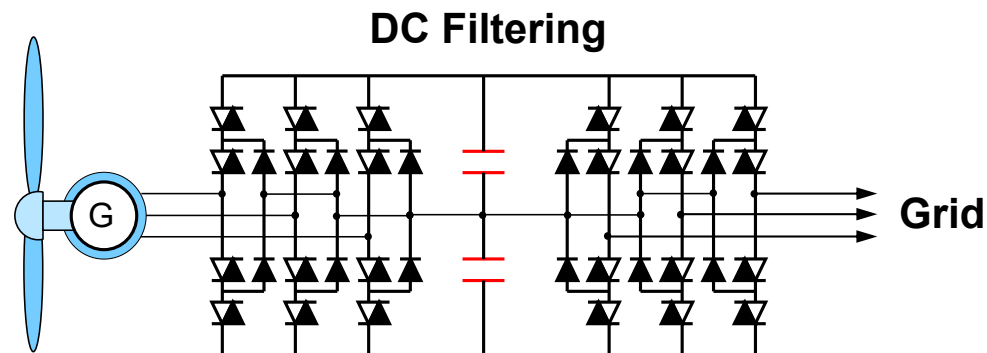
FFLI / FLR



FFLC/FFHV



FTHV/TFM



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DC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FFVE/FFVI	FFLI	FFLR	FFPC
				
Voltage	1900Vdc	3800Vdc	3800Vdc	3800Vdc
Capacitance	400 μ F	3000 μ F	2200 μ F	5060 μ F
Temperature	105°C	95°C	85°C	85°C
Ripple Current	110Arms	112Arms	120Arms	155Arms
Standards	IEC61071, IEC61881	IEC61071, IEC61881	IEC61071, UL810	IEC61071, IEC61881
RoHS	FFWE & FFVI Versions	Yes	Yes	Yes
Technology	Metallized Film, Dry	Metallized Film, Dry Or Wet	Metallized Film, Dry	Metallized Film, Dry Or Wet



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DC FILTERING

Controlled Self Healing

Self Healing

Film Foil

Metallized Film and Aluminum Foil, Wet

NOTE:
Listed are the
maximum values for
standard products.
Higher values are
available upon request.

	FFLC	FFHV / FTHV	TRAFIM-TFM
			
Voltage	1350Vdc	3000Vdc	6000Vdc
Capacitance	25,5mF	12,6mF	11mF
Temperature	85°C	85°C/95°C	95°C
Ripple Current	400Arms	400Arms	400Arms
Standards	IEC61071, IEC61881	IEC61071, IEC61881	IEC61071, IEC61881
RoHS	No	No	No
Technology	Metallized Film, Dry	Metallized Film, Wet	Metallized Film, Impregnated



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INDUSTRIAL APPLICATION: SOLAR INVERTERS

DC FILTERING



FE



FB



FFB



FFV3



FFVE/FFVI



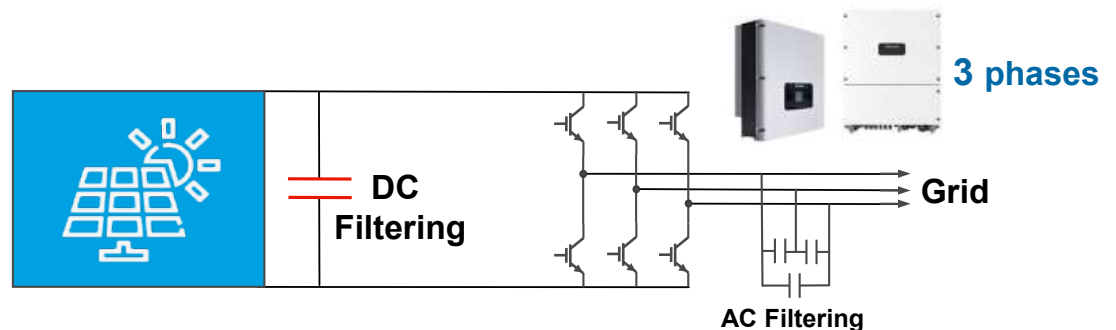
FFLI/FLR



FFPC



FFLC



AC FILTERING

FLC



FLA



FLB



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DC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FB	FB Low Profile	FB THB	FE	FE Low Profile	FE THB	FFB	FFV3
								
Voltage	1200Vdc	1000Vdc	1200Vdc	1200Vdc	1000Vdc	1200Vdc	1100Vdc	1000Vdc
Capacitance	80μF	50μF	22μF	400μF	100μF	100μF	110μF	160μF
Temperature	105°C	105°C	105°C	105°C	105°C	105°C	105°C	105°C
Ripple Current	19Arms	11Arms	14Arms	55Arms	22Arms	28Arms	16,7Arms	33Arms
Dimension (W x H x T)	57,5 x 50 x 35	57,5 x 24 x 39	42 x 45 x 30	57,5 x 80 x 35	57,5 x 24 x 70	57,5 x 80 x 35	32 x 37 x 22	36 x 40 x 36
Standards	IEC61071	IEC61071	IEC61071, THB Test 85°C 85%HR Undc 1000h	IEC61071	IEC61071	IEC61071, THB Test 85°C 85%HR Undc 1000h	IEC61071, IEC61881	IEC61071, IEC61881
RoHS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Technology	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry



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DC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FFVE/FFVI	FFLI	FFLR	FFPC
				
Voltage	1900Vdc	3800Vdc	3800Vdc	3800Vdc
Capacitance	400 μ F	3000 μ F	2200 μ F	5060 μ F
Temperature	105°C	95°C	85°C	85°C
Ripple Current	110Arms	112Arms	120Arms	155Arms
Standards	IEC61071, IEC61881	IEC61071, IEC61881	IEC61071, UL810	IEC61071, IEC61881
RoHS	FFWE & FFWI Versions	Yes	Yes	Yes
Technology	Metallized Film, Dry	Metallized Film, Dry Or Wet	Metallized Film, Dry	Metallized Film, Dry Or Wet



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AC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FLC	FLA	FLB
			
Voltage	450Vrms	690Vrms	690Vrms
Capacitance	50 μ F	600 μ F	3x335 μ F
Temperature	85°C	85°C	85°C
Ripple Current	22Arms	50Arms	43Arms
Dimensions	W:35 x T:50 x H:57,5	D:106 x H:247	D:136 x H:350
Applications	Industrial & Energy	Industrial & Energy	Industrial & Energy
Standards	IEC61071	IEC61071, UL810	IEC61071, UL810
RoHS	Yes	Yes	Yes
Technology	PPY Metallized Film, Dry	PPY Metallized Film, Impregnated	PPY Metallized Film, Impregnated



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INDUSTRIAL APPLICATION: DC FAST CHARGING STATIONS

AC FILTERING

FLC



FLA



FLB



DC FILTERING



FE



FB

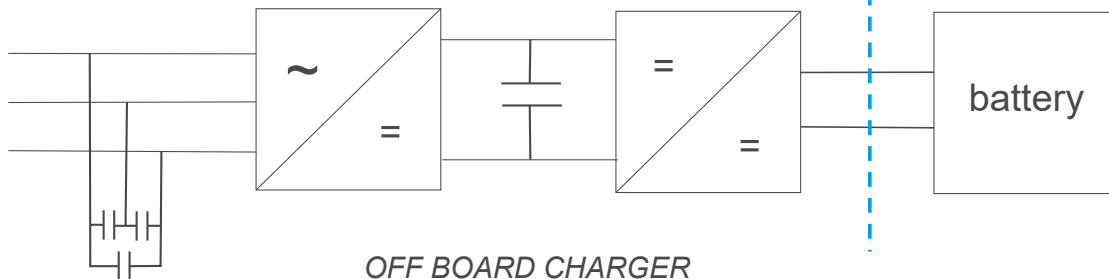


FFVE/FFVI



FFLR

AC



OFF BOARD CHARGER



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DC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FB	FB Low Profile	FB THB	FE	FE Low Profile	FE THB	FFVE/FFVI	FFLR
								
Voltage	1200Vdc	1000Vdc	1200Vdc	1200Vdc	1000Vdc	1200Vdc	1900Vdc	3800Vdc
Capacitance	80μF	50μF	22μF	400μF	100μF	100μF	400μF	2200μF
Temperature	105°C	105°C	105°C	105°C	105°C	105°C	105°C	85°C
Ripple Current	19Arms	11Arms	14Arms	55Arms	22Arms	28Arms	110Arms	92Arms
Dimension (W x H x T)	57.5 x 50 x 35	57.5 x 24 x 39	42 x 45 x 30	57.5 x 80 x 35	57.5 x 24 x 70	57.5 x 80 x 35	D85 H51	D136 H340
Standards	IEC61071	IEC61071	IEC61071, THB Test 85°C 85%HR Undc 1000h	IEC61071	IEC61071	IEC61071, THB Test 85°C 85%HR Undc 1000h	IEC61071, IEC61881	IEC61071, UL810
RoHS	Yes	Yes	Yes	Yes	Yes	Yes	FFWE & FFWI Versions	Yes
Technology	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry



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AC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

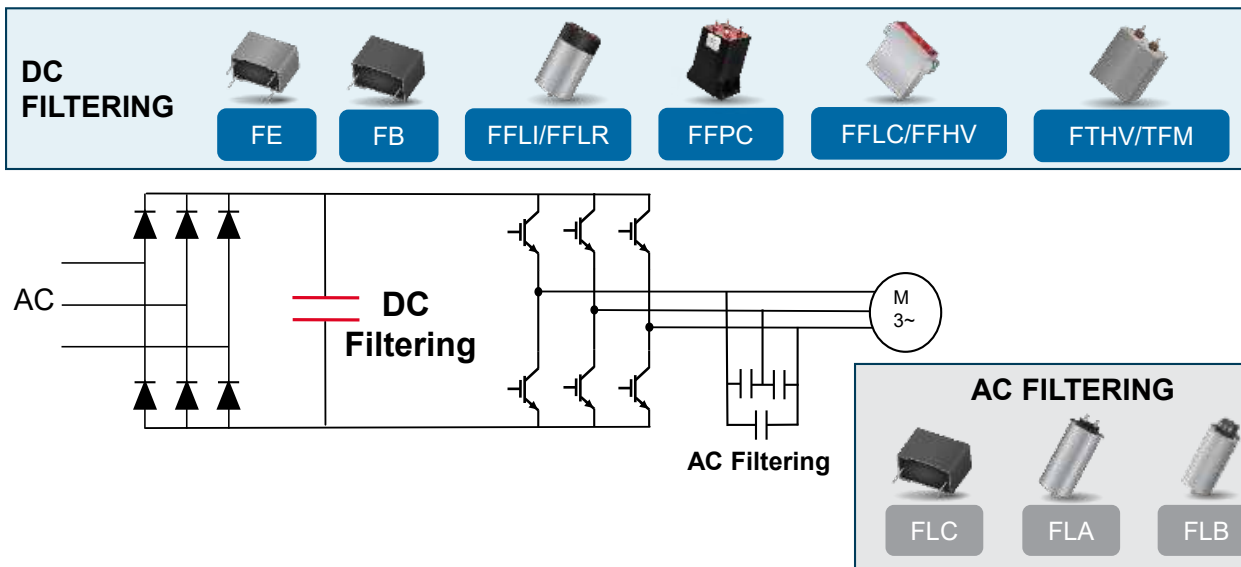
 Metallized Film and Aluminum Foil, Wet

	FLC	FLA	FLB
			
Voltage	450Vrms	690Vrms	690Vrms
Capacitance	50 μ F	600 μ F	3x335 μ F
Temperature	85°C	85°C	85°C
Ripple Current	22Arms	50Arms	43Arms
Dimensions	W:35 x T:50 x H:57.5	D:106 x H:247	D:136 x H:350
Applications	Industrial & Energy	Industrial & Energy	Industrial & Energy
Standards	IEC61071	IEC61071, UL810	IEC61071, UL810
RoHS	Yes	Yes	Yes
Technology	PPY Metallized Film, Dry	PPY Metallized Film, Impregnated	PPY Metallized Film, Impregnated



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INDUSTRIAL APPLICATION: MOTOR DRIVES



**Gas
Compression**



**Steel
Industries**



**Industrial
Converters**



© KYOCERA AVX Components Corporation

DC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FB	FB Low Profile	FB THB	FE	FE Low Profile	FE THB
						
Voltage	1200Vdc	1000Vdc	1200Vdc	1200Vdc	1000Vdc	1200Vdc
Capacitance	80μF	50μF	22μF	400μF	100μF	100μF
Temperature	105°C	105°C	105°C	105°C	105°C	105°C
Ripple Current	19Arms	11Arms	14Arms	55Arms	22Arms	28Arms
Dimension (W x H x T)	57,5 x 50 x 35	57,5 x 24 x 39	42 x 45 x 30	57,5 x 80 x 35	57,5 x 24 x 70	57,5 x 80 x 35
Standards	IEC61071	IEC61071	IEC61071, THB Test 85°C 85%HR Undc 1000h	IEC61071	IEC61071	IEC61071, THB Test 85°C 85%HR Undc 1000h
RoHS	Yes	Yes	Yes	Yes	Yes	Yes
Technology	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry



© KYOCERA AVX Components Corporation

DC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FFLI	FFLR	FFPC	FFLC	FFHV / FTHV	TRAFIM-TFM
						
Voltage	3800Vdc	3800Vdc	3800Vdc	1350Vdc	3000Vdc	6000Vdc
Capacitance	3000 μ F	2200 μ F	5060 μ F	25,5mF	12,6mF	11mF
Temperature	95°C	85°C	85°C	85°C	85°C/95°C	95°C
Ripple Current	112Arms	92Arms	155Arms	400Arms	400Arms	400Arms
Standards	IEC61071, IEC61881	IEC61071, UL 810	IEC61071, IEC61881	IEC61071, IEC61881	IEC61071, IEC61881	IEC61071, IEC61881
RoHS	Yes	Yes	Yes	No	No	No
Technology	Metallized Film, Dry Or Wet	Metallized Film, Dry	Metallized Film, Dry Or Wet	Metallized Film, Dry	Metallized Film, Wet	Metallized Film, Impregnated



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SNUBER, PROTECTION & COMMUTATION RANGE

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FSB	FPX/FPG	CAPACOM	TRACOM
			 Available Upon Request	 Available Upon Request
Voltage	2000Vdc / 2400V Peak / 2600V surge	3000Vdc / 4000V Peak / 4600V surge	4kVrms / 18kV Surge	4kVrms / 18kV Surge
Capacitance	5,6μF	6μF	5μF	100μF
Temperature	85°C	85°C	85°C	85°C
Ripple Current	39Arms	160Arms	Not limited	Not limited
Applications	IGBT Protection	Protection Of Thyristors/GTO's, Clamping (Secondary Snubber), Medium Frequency Tuning	RC Protection of Thyristors, GTO and Diodes	Thyristor Commutation, Harmonic AC Filter, AC Motor Filtering
RoHS	Yes	Version FPH / FPY	No	No
Technology	Metallized Film, Dry	Metallized Film, Dry	Film and Aluminium Foil, Impregnated	Film and Aluminum Foil, Impregnated



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AC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FLC	FLA	FLB
			
Voltage	450Vrms	690Vrms	690Vrms
Capacitance	50 μ F	600 μ F	3x335 μ F
Temperature	85°C	85°C	85°C
Ripple Current	22Arms	50Arms	43Arms
Dimensions	W:35 x T:50 x H:57.5	D:106 x H:247	D:136 x H:350
Applications	Industrial & Energy	Industrial & Energy	Industrial & Energy
Standards	IEC61071	IEC61071, UL810	IEC61071, UL810
RoHS	Yes	Yes	Yes
Technology	PPY Metallized Film, Dry	PPY Metallized Film, Impregnated	PPY Metallized Film, Impregnated



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INDUSTRIAL APPLICATION: RESONANT CONVERTERS

DC FILTERING



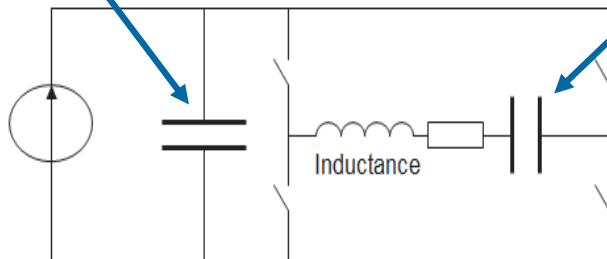
FFVE/FFVI



FFLI/FFLR



FFLC



Tuning Capacitors



FAV



FAI



FAX



Induction
Heating



Crankshaft
Hardener



Industrial
Battery Chargers



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DC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FFVE/FFVI	FFLI	FFLR	FFPC
				
Voltage	1900Vdc	3800Vdc	3800Vdc	3800Vdc
Capacitance	400μF	3000μF	2200μF	5060μF
Temperature	105°C	95°C	85°C	85°C
Ripple Current	110Arms	112Arms	92Arms	155Arms
Standards	IEC61071, IEC61881	IEC61071, IEC61881	IEC61071, UL810	IEC61071, IEC61881
RoHS	FFWE & FFVI Versions	Yes	Yes	Yes
Technology	Metallized Film, Dry	Metallized Film, Dry Or Wet	Metallized Film, Dry	Metallized Film, Dry Or Wet



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TUNING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FAV	FAX	FAI1/2/3/4	FAI6
				
Voltage	650Vrms	650Vrms	500Vrms	650Vrms
Capacitance	1,2 μ F	4,5 μ F	2,4 μ F	600 μ F
Temperature	85°C	85°C	85°C	85°C
Frequency	20kHz	20kHz	500kHz	100kHz
Applications	Resonant Power Supply, Battery Charger	Resonant Power Supply, Battery Charger	Induction Heating	Induction Heating
RoHS	Yes	Yes	Yes	Yes
Technology	Metallized Film and Aluminum Foil, Wet	Metallized Film and Aluminum Foil, Wet	Metallized Film and Aluminum Foil, Wet	Metallized Film and Aluminum Foil, Wet



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OTHER INDUSTRIAL APPLICATIONS

**UPS
Systems**



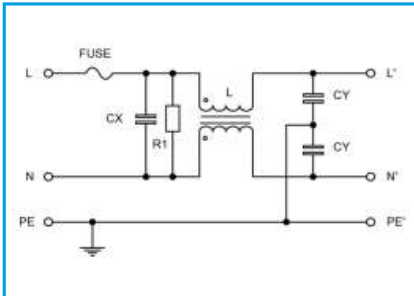
**Power
Supply**



**Lighting
Ballast**



**Interference
Suppression**



**Home
Appliance**



**Induction
Cooking**



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DC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FB	FB Low Profile	FB THB	FE	FE Low Profile	FE THB	FFB	FFV3
								
Voltage	1200Vdc	1000Vdc	1200Vdc	1200Vdc	1000Vdc	1200Vdc	1100Vdc	1000Vdc
Capacitance	80μF	50μF	22μF	400μF	100μF	100μF	110μF	160μF
Temperature	105°C	105°C	105°C	105°C	105°C	105°C	105°C	105°C
Ripple Current	19Arms	11Arms	14Arms	55Arms	22Arms	28Arms	16.7Arms	33Arms
Dimension (W x H x T)	57.5 x 50 x 35	57.5 x 24 x 39	42 x 45 x 30	57.5 x 80 x 35	57.5 x 24 x 70	57.5 x 80 x 35	32 x 37 x 22	36 x 40 x 36
Standards	IEC61071	IEC61071	IEC61071, THB Test 85°C 85%HR Undc 1000h	IEC61071	IEC61071	IEC61071, THB Test 85°C 85%HR Undc 1000h	IEC61071, IEC61881	IEC61071, IEC61881
RoHS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Technology	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry	Metallized Film, Dry



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INTERFERENCE SUPPRESSION

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FV-X2
	
Voltage	305Vrms
Capacitance	10 μ F
Temperature	110°C
Ripple Current	2000A Peak
Applications	Industrial & Energy
Standards	ENEC-VDE, UL , CSA, KC, GB/T
RoHS	Yes
Technology	PPY Metallized Film, Dry



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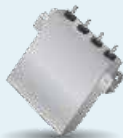
INDUSTRIAL APPLICATION:

RAILWAY (*Traction or Auxiliary Converters*)

DC FILTERING



FTHV



TFM



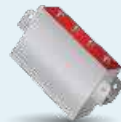
FFHV



FFLI



FFPC

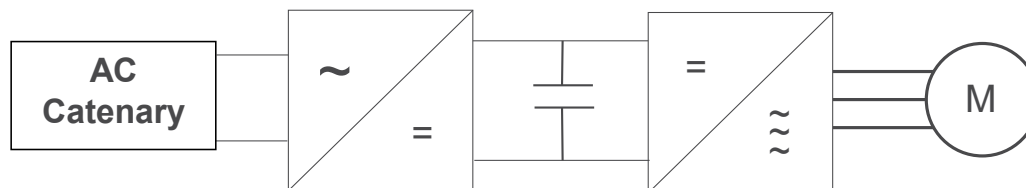


FFLC



Railway:

Tramway • Metro • Area Train • Locomotive • High Speed Train



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DC FILTERING

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

	FFLI	FFPC	FFLC	FFHV / FTHV	TRAFIM-TFM
					
Voltage	3800Vdc	3800Vdc	1350Vdc	3000Vdc	6000Vdc
Capacitance	3000 μ F	5060 μ F	25,5mF	12,6mF	11mF
Temperature	95°C	85°C	85°C	85°C/95°C	95°C
Ripple Current	112Arms	155Arms	400Arms	400Arms	400Arms
Standards	IEC61071, IEC61881	IEC61071, IEC61881	IEC61071, IEC61881	IEC61071, IEC61881	IEC61071, IEC61881
RoHS	Yes	Yes	No	No	No
Technology	Metallized Film, Dry Or Wet	Metallized Film, Dry Or Wet	Metallized Film, Dry	Metallized Film, Wet	Metallized Film, Impregnated



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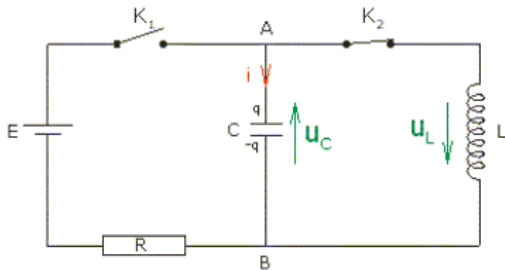
INDUSTRIAL APPLICATION: DISCHARGE

LMJ (Laser Mega Joule) in France 330MJ

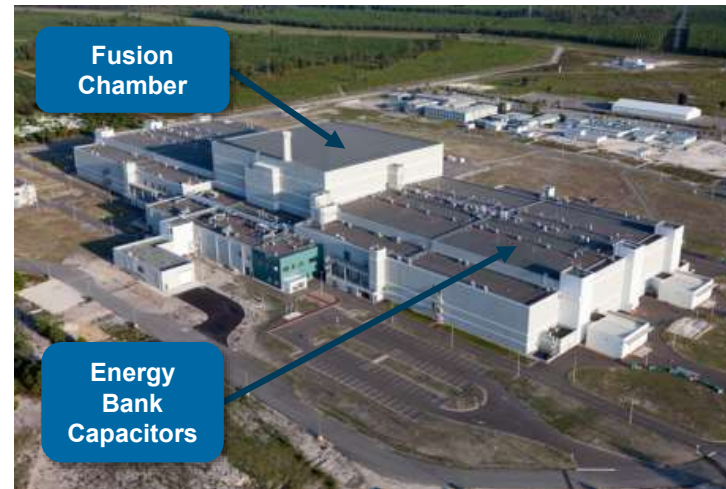
Validation of Theoretical Models and Physical
Data Describing the Behavior of Nuclear Weapons

4,092 Caps / 372 Modules / 11 Caps Each

450 Tons of Caps



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**ENERGY BANK
CAPACITORS**



DISFIM-DFM

DISCHARGE RANGE

 Controlled Self Healing

 Self Healing

 Film Foil

 Metallized Film and Aluminum Foil, Wet

DISFIM-DFM



Voltage	Up to 100kV
Capacitance	40mF
Energy density	2200J/l
Technology	Up to 100kV
Applications	Research Applications, Power Lasers, High Voltage Supplies, Electromagnetic Gun, Welding Machines
Technology	Metallized Film, Impregnated

Mounting on Frames or Cabinets
Note: Available Upon Request



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THANK YOU.



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