KYOCERA AVX

MEDIUM AND HIGH POWER FILM CAPACITORS

MEDIUM & HIGH POWER
PRODUCT SELECTION GUIDE

FEATURES AND BENEFITS

For medium power (dry) technology, controlled self-healing is achieved by utilizing a segmented metallization pattern where the film surface is divided into several million elementary capacitor elements individually protected by "fuse gates". These ensure failsafe operation over design lifetime of the capacitor.

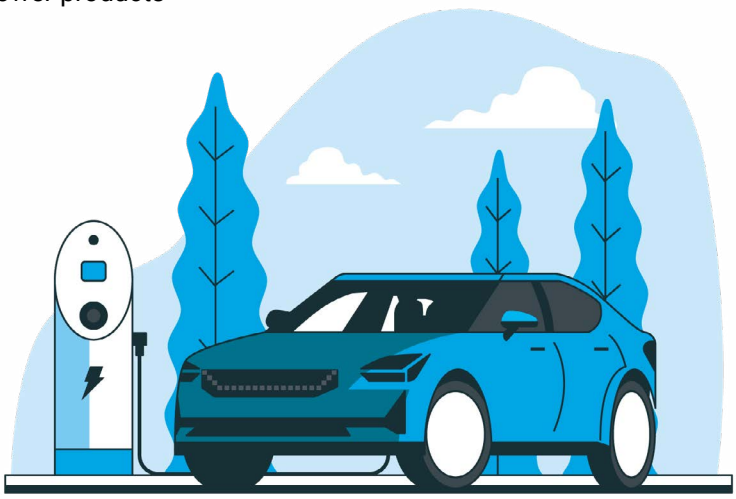
High Power (oil filled) technology uses high purity vegetable oil to enable controlled self-healing for rated voltages up to 100kV.

- Dry, oil impregnated technologies and without free oil
- Total safety, reliability and soft end of lifetime
- No derating over operating temperature range: -40°C up to +105°C (see individual data sheets)
- High peak current and high energy options
- Polypropylene and polyester dielectric designs available
- RoHS Compliants available for most medium power products

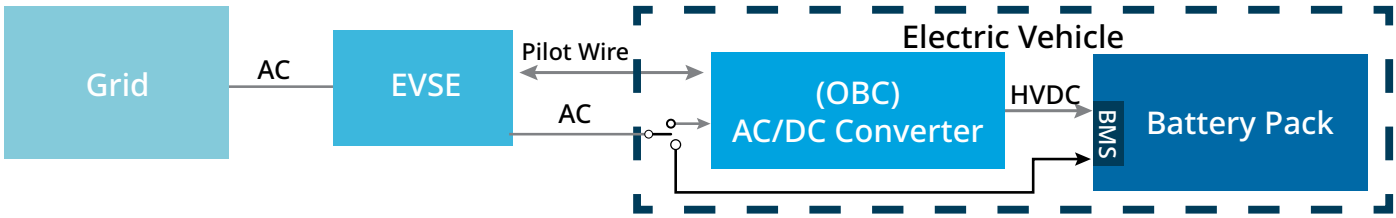
APPLICATIONS

KYOCERA AVX Medium / High Power Capacitors are used in wide range of application sectors including:

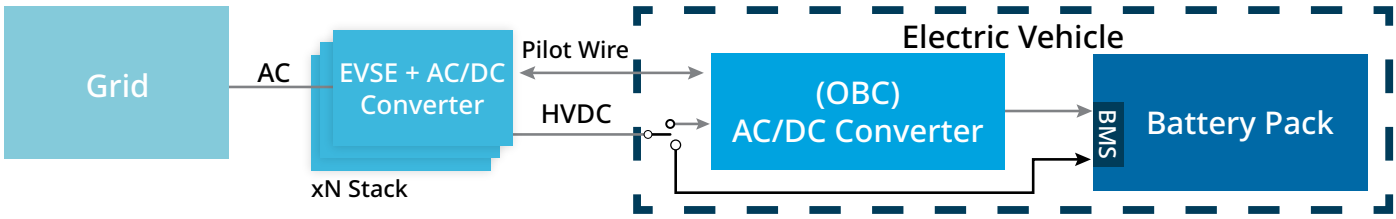
- Automotive
- Traction
- Industrial / Professional
- Renewable / Smart Energy
- Defense / Aero / Research



AC Charging System Power Flow (Level 1&2 Charging Station)



DC Charging System Power Flow (Level 3 Charging Station)



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DC FILTERING — MEDIUM POWER

FM (RoHS Compliant)
Rated DC Voltage: $250V_{DC}$ – $2000V_{DC}$
Capacitance Range: 0.01µF – 0.47µF
Ripple Current: $1.0A_{rms}$ – $8.7A_{rms}$

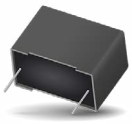
The FM products offer high reliability current stress with self-healing properties. The FM series are ideal for high frequency and high pulse rise time circuits. The FM products can be operated up to 105ºC.

- High Voltage Power Supplies
- Snubber
- Electronic Lighting Ballasts

FFB (RoHS Compliant)
Case size: 1 – 6
Rated DC Voltage: $75V_{DC}$ – $1100V_{DC}$
Capacitance Range: 6.2µF to 110µF
Ripple Current: $2.4A_{rms}$ – $10A_{rms}$
Lead Style: 2 or 4 Leaded or Custom

The FFB capacitor is designed for DC filtering low reactive power. The FFB has been designed for printed circuit board mounting. The product is an alternate to electrolytic technology.

- Switch Mode Power Supplies (SMPS)
- PhotoVoltaic Inverters



FB (RoHS Compliant)
Case size: A – P
Rated DC Voltage: $450V_{DC}$ –$1200V_{DC}$
Capacitance Range: 0.68µF – 75µF
Ripple Current: $2.2A_{rms}$ – $18A_{rms}$

The FB has been designed primarily for high and medium power DC filtering applications. The FB series has been designed for printed circuit board mounting.

- Switch Mode Power Supplies (SMPS)
- PhotoVoltaic Inverters

FE (RoHS Compliant)
Case size: G – P
Rated DC Voltage: $550V_{DC}$ – $1200V_{DC}$
Capacitance Range: 3.3µF – 100µF
Ripple Current: $7.3A_{rms}$ – $19.0A_{rms}$

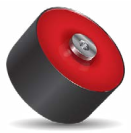
These capacitors have been designed principally for high and medium power DC filtering applications. The FE has been designed for printed circuit board mounting and uses a non-impregnated metallized polypropylene dielectric.

- Switch Mode Power Supplies (SMPS)
- PhotoVoltaic Inverters

FFV3 (RoHS Compliant)
Dielectric: Polyester or Polypropylene
Rated DC Voltage: $75V_{DC}$ – $400V_{DC}$
Capacitance Range: 30µF – 160µF
Ripple Current: $13A_{rms}$ – $33A_{rms}$

The FFV3 capacitors are designed for DC filtering, low reactive power. The FFV has been designed for printed circuit board mounting. The series uses a non-impregnated metallized polypropylene or polyester dielectric, with the controlled self-healing.

- Switch Mode Power Supplies (SMPS)
- PhotoVoltaic Inverters



FFG Design (FFH - RoHS Compliant)
Rated DC Voltage: $600V_{DC}$ –$1900V_{DC}$
Capacitance Range: 5µF – 160µF
Ripple Current:$19A_{rms}$ – $76A_{rms}$

The FFG series capacitors exhibit high surge voltage and RMS current along with lower ESR. The polypropylene dielectric features a controlled self-healing process. DC-Link capacitors are used to couple different electrical grids to one DC voltage level.

- DC Protection
- Switchgear Products
- Sub Station Applications

FFVE/FFVI (FFWE/FFWI - RoHS Compliant)
Dielectric: Polyester or Polypropylene
Rated DC Voltage: $300V_{DC}$ –$1900V_{DC}$
Capacitance Range: 12µF – 400µF
Ripple Current: $49A_{rms}$ – $100A_{rms}$

The FFV capacitor is specifically designed for DC filtering, low reactive power, DC-Link capacitors are used to couple different electrical grids to one DC voltage level.

- Hybrid Electric Vehicle (HEV)
- Power Inverters
- Solar Inverters
- Wind Power Generation
- Motor Drives

FFVS (RoHS Compliant)
Rated DC Voltage: $600V_{DC}$ –$1900V_{DC}$
Capacitance Range: 22µF – 200µF
Ripple Current: $57A_{rms}$ – $87A_{rms}$

FFVS series is a specific range of DC filtering capacitors designed for use in high frequency, high ripple applications beyond the limits of standard FFVE or FFVI. Due to the internal design, stray inductance is extremely low, between 8 and 13nH.

- Induction Heating
- Resonant DC Supply for Scanner
- X-ray Machines

FFLI (RoHS Compliant)
Dielectric: Polypropylene
Rated DC Voltage: $800V_{DC}$ –$3000V_{DC}$
Capacitance Range: 58µF – 3000µF
Ripple Current: $35A_{rms}$ – $110A_{rms}$

The FFLI series is specifically designed for DC filtering applications such as DC link or resonant filters. The FFLI has a dry self-healing metallized polypropylene.

- Wind Power Applications
- Solar Power Applications
- Power Inverters
- UPS

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DC FILTERING — MEDIUM POWER

FFLC
Rated DC Voltage: $800V_{DC}$ – $1350V_{DC}$
Capacitance Range: 1750µF – 25500µF
Ripple Current: $400A_{rms}$

The FFLC series is specifically designed for DC filtering applications such as DC link or resonant filters. Standard designs proposed for the FFLC cover a wide range of voltage and capacitance values which can be customized to meet specific requirements.

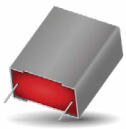
- Railroad Vehicles
- Industrial Applications
- Motor Drives

Custom FHC
Rated DC Voltage: $3000V_{DC}$ – $1400V_{DC}$
Capacitance Range: 1.5µF – 1500µF
Ripple Current: Custom A_{rms}

Custom parts are medium power film capacitors for DC filtering, high rms current and high temperature automotive applications up to 105°C.

- Custom Applications for DC Filtering

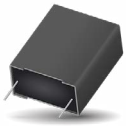
AC FILTERING — MEDIUM POWER



FV X2 (RoHS Compliant)
Rated AC Voltage: $305V_{rms}$
Capacitance Range: 0.1µF – 10µF
Ripple Current: $1.0A_{rms}$ – $22.0A_{rms}$

The FV series is an AC power film capacitor containing non-inductively wound with metallized polypropylene film as dielectric and electrode. The FV series is UL94 class v0 thermoplastic case, with an epoxy seal.

- Across the Line Capacitors
- EMI Filters
- Spark-Killer Circuits



FLC (RoHS Compliant)
Case size: A – O
Rated AC Voltage: $250V_{rms}$ – $350V_{rms}$
Capacitance Range: 1.0µF – 50µF
Ripple Current: $4.0A_{rms}$ – $21A_{rms}$

The FLC capacitors have been designed fo printed circuit mounting for AC filtering. The FLC series has a non-impregnated metallized polypropylene dielectric specially designed to handle operating conditions up to 85°C.

- AC Filtering for Power Converters
- UPS Systems
- Solar Inverters
- Motor Drives

FLA Single Phase (RoHS Compliant)
Rated AC Voltage: $250V_{rms}$ – $690V_{rms}$
Capacitance Range: 10µF – 600µF
Ripple Current: $6.5A_{rms}$ – $50A_{rms}$

The FLA has been designed with overpressure disconnected device for AC filtering. The FLA has a very high dielectric strength allowing operating temperatures up to 85°C. FLA series are suitable for output single phase AC filtering for power converters.

- Overpressure Disconnected
- PFC & AC Filtering Application
- UPS Systems
- Solar Inverters
- Motor Drives

FLB Three Phase (RoHS Compliant)
Rated AC Voltage: $230V_{rms}$ – $690V_{rms}$
Capacitance Range: 3*20.3µF – 3*335µF
Ripple Current: $7.3A_{rms}$ – $43.3A_{rms}$

The FLB has been designed with overpressure disconnected device for AC filtering. The FLB has a very high dielectric strength allowing operating temperatures up to 85°C. FLB series are suitable for output 3 phase AC filtering for power converters.

- Overpressure Disconnected
- PFC & AC Filtering Application
- UPS Systems
- Solar Inverters
- Motor Drives

TUNING — MEDIUM POWER

FAV (RoHS Compliant)
Rated DC Voltage: $300V_{DC}$ – $2000V_{DC}$
Capacitance Range: 80µF – 1200µF
Ripple Current: $10A_{rms}$ – $40A_{rms}$

The FAV series is a metallized polypropylene foil / film dry capacitor. The FAV applied to low frequency applications

- High Reactive Energy Tuning for Convertors
- Protection Of Semi-Conductors
- Auto Battery Charger

FAI 1/2/3/4 (RoHS Compliant)
Rated AC Voltage: $300V_{rms}$ – $600V_{rms}$
Capacitance Range: 110nF – 4µF
Peak Current: $180A_{rms}$ – $600A_{rms}$

The FAI 1/2/3/4 uses metallized polypropylene dielectric specifically designed for very high reactive power. The FAI's special design gives the series a very low level of stray inductance.

- Low & High Frequency Applications
- Induction Heating

FAI 6 (RoHS Compliant)
Rated AC Voltage: $200V_{vms}$ – $650V_{vms}$
Capacitance Range: 1.5µF – 60µF
Ripple Current: $490A_{rms}$ – $2000A_{rms}$

The FAI 6 uses metallized polypropylene dielectric specifically designed for very high reactive power. The FAI's special design gives the series a very low level of stray inductance.

- Medium Frequency Applications
- Induction Heating

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PROTECTION — MEDIUM POWER

FM (RoHS Compliant)
Rated DC Voltage: $250V_{DC}$ – $2000V_{DC}$
Capacitance Range: 0.01µF – 0.47µF
Peak Current: up to $300A_{rms}$

The FM series features a leaded, non-inductively wound polypropylene dielectric design. The product can be operated up to 105ºC with self-healing properties.

- High Voltage Power Supplies
- Snubber
- Electronic Lighting Ballasts

FSB (RoHS Compliant)
Rated DC Voltage: $850V_{DC}$ – $2000V_{DC}$
Capacitance Range: 0.10µF – 3µF
Ripple Current: $3A_{rms}$ – $28A_{rms}$

The FSB series features polypropylene dielectric capable of operation up to 85ºC and is ideal for snubbing applications. The series has through-hole leads for pcb assembly, with an option of bolt-in terminals for the largest case size.

- IGBT Protection
- IGBT Clamping
- Industrial Motor Protection
- Control Circuits

FPX/FPY(RoHS Compliant)
Rated DC Voltage: $1000V_{DC}$ – $3000V_{DC}$
Capacitance Range: 0.5µF – 6.0µF
Ripple Current: $15A_{rms}$ – $160A_{rms}$

The FPX/FPY product is a metallized polypropylene dielectric capacitor with controlled self-healing. The reinforced metallization allows for high impulse currents. Axial connections reduce the series inductance for rigid mechanical mounting.

- Protection of Thyristors
- Protection of Gate turn-off thyristor (G.T.O.)
- Clamping (Secondary snubber)
- IGBT Decoupling
- EMI Filtering

DC FILTERING — HIGH POWER

FFHV/FTHV
Rated DC Voltage: $1200V_{DC}$ – $2300V_{DC}$
Capacitance Range: 800µF – 15µF
Ripple Current: up to $255A_{rms}$

The FFHV/FTHV series are an extension of the medium power FFLC family for high voltage DC filtering applications up to $3kV_{DC}$. This technology enables the product to be used for applications where oil free technology is preferred.

- DC Filtering of HVDC Applications
- Wind Turbines
- DC Link for Statcom
- Motor Drives

TRAFIM
Rated DC Voltage: $1200V_{DC}$ – $6000V_{DC}$
Capacitance Range: 130µF – 15500µF
Ripple Current: $255A_{rms}$

The TRAFIM series is used for High Power applications. TRAFIM capacitors are impregnated with environmental friendly vegetable oil. TRAFIM includes low inductance designs and several mounting options

- DC Link
- Speed converter (Drives and traction)
- Resonant filtering
- Active correction (FACTS)
- Windmills
- Substation

FILFIM
Rated DC Voltage: $56kV_{DC}$ – $100kV_{DC}$
Capacitance Range: 2.6µF – 612µF
Ripple Current: $255A_{rms}$

The FILFIM series is used for DC filtering of high voltage applications. FILFIM Capacitors can be customized to meet applications needs.

- DC Link
- Active correction (FACTS)
- HVDC
- High Power DC Supply

ENERGY STORAGE & DISCHARGE CAPACITORS — HIGH POWER

DISFIM
Terminals: Epoxide or Ceramic
Energy Density: 2200 J/L
Rated DC Voltage: $2kV_{DC}$ – $75kV_{DC}$
Maximum Energy per can: 150kJ
Range: Custom to the application
Capacitance: Up to 40mF

DISFIM product is an impregnated capacitor ideal for pulse discharge applications. The DIS-FIM incorporates self-healing technology that prevents the risk of short circuit.

- Research Applications
- Power Lasers
- High Voltage Supplies
- Welding Machines
- Electromagnetic and ETC Gun

Custom products are available for most series, contact
POWERFILM@KYOCERA-AVX.COM or visit WWW.KYOCERA-AVX.COM for more information

ABOUT KYOCERA AVX

KYOCERA AVX is a worldwide leading supplier of passive electronic components, connectors, passive and active antennas, sensors and control units. KYOCERA AVX offers a wide range of components manufactured to the highest quality and reliability standards.

Our products include ceramic, solid electrolytic and film capacitors, pulse supercapacitors, varistors, thermistors, filters, inductors, diodes, antennas, connectors, sensors and control units. Our worldwide manufacturing capability includes facilities located in seventeen countries on four continents, allowing us to continue meeting customer needs on a global basis.

KYOCERA AVX is committed to supporting the needs of its customers for applications today and in the future. Together with continuous quality improvement process, KYOCERA AVX components provide reliable solutions for consumer application needs.

As a technology leader, KYOCERA AVX will continue to add to its product portfolio on a regular basis. Details of new devices being offered and their specifications will be shown on the KYOCERA AVX website: WWW.KYOCERA-AVX.COM.

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