# MEDIUM & HIGH POWER CAPACITORS FOR POWER ELECTRONICS

## Product Selection Guide

### MEDIUM & HIGH POWER CAPACITORS FOR POWER ELECTRONICS

**TUNING**
- **Series**
  - FAI 1/2/3/4
  - TRAFIM
  - FILFIM

**Features**
- RoHS compliant

**Applications**
- Power factor correction
- Auto battery charger
- Solar PV

**High Power**

#### DC FILTERING
- **Series**
  - **TRAFIM**
  - **FILFIM**

**Features**
- High ripple current capability
- Low voltage stress

**Applications**
- For use in high power DC applications

#### ENERGY STORAGE AND DISCHARGE CAPACITORS
- **Series**
  - **SOIFM**

**Features**
- High energy density
- Low ESR

**Applications**
- For use in high voltage DC applications

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**AVX PRODUCT GUIDE FOR MEDIUM & HIGH POWER FILM CAPACITORS**

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### ELECTROLYTIC ALTERNATIVE

**AVX POWER FILM - APPLICATIONS EXAMPLES**

**Solar PV**

**Static Synchronous Compensator (STATCOM)**

**Inductive Heating**

**Motor Drives (Traction EV, HEV, Power)**

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**AVX PRODUCT GUIDE FOR MEDIUM & HIGH POWER FILM CAPACITORS**

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*Note: The content provided is a simplified representation of the actual product guide. For detailed specifications and applications, please refer to the original PDF document.*
MEDIUM & HIGH POWER CAPACITORS FOR POWER ELECTRONICS

AVX has been a world leader in high performance film capacitor technology design for over 30 years. We produce both dry-wound capacitors, from 75Vdc to 3kVdc (Medium Power Film) and oil-immersed capacitors from 1.5kV to 100kV (High Power Film).

A key feature of AVX Medium & High Power is Controlled Self-healing technology. This enables the capacitors to continue to function without catastrophic failure by effectively insulating any microscopic conduction sites within the dielectric.

While power film capacitors remain functional throughout their operating life, the initial capacitance value will decrease at a rate dependent upon the applied voltage and hot spot temperature. Our standard designs provide <20% capacitance loss over 100,000 hours lifetime at nominal voltage and a 75ºC hot spot temperature, while application designs can be provided on request.

Various series of AVX Medium/High Power Capacitors are available for DC Filtering, Protection, Pulse Discharge, Tuning, AC Filtering and Storage applications. RoHS products are available for many medium power film series.

MEDIUM POWER

### FEATURES AND BENEFITS
- **APPLICATIONS**
  - Automotive
  - Telecom
  - Industrial/Professional
  - Renewable Smart Energy
  - Defense/Aero/Research

- **EQUIVALENT CIRCUIT CERTIFICATES**

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 weak areas. These weak areas are insulated using polypropylene dielectric specially designed to withstand high voltage and high power levels without failure. Controlled self-healing is achieved by the film breakdown of each elementary weak area, isolating the microscopic conduction sites, and maintaining the high power film capacitor operation by a process of sequential dielectric breakdown.

- **CUSTOM DESIGN**

- **APPLICATIONS**

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#### MEDIUM POWER

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<td>Rated DC Voltage: 100Vdc – 3000Vdc, Ripple Current: 0.1Ams to 4.7Amps, Capacitance Range: 1μF – 50μF</td>
<td>High voltage power supplies, DC-Link, Magnetic amplifiers, Switching amplifiers</td>
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</table>
AXV has been a world leader in high performance film capacitor technology design for over 30 years. We produce both dry-wound capacitors, from 75ΩΩ to 3kΩΩ (Medium Power Range) and oil-impregnated capacitors from 1.8kΩΩ to 100kΩΩ (High Power Range).

A key feature of AXV Medium & High Power is Controlled Self-healing technology. This enables the capacitors to continue to function without catastrophic failure by effectively insulating any microscopic conduction sites within the dielectric.

While power film capacitors remain functional throughout their operating life, the initial capacitance value will decrease at a rate dependent upon the applied voltage and hot spot temperature. Our standard designs provide <25% capacitance loss over 100,000 hours lifetime at nominal voltage and a 70ºC hot spot temperature, while applications on design can be provided on request.

Various series of AXV Medium/High Power Capacitors are available for DC Ramping, Protection, Pulse Discharge, Tuning, AC Filtering and Storage applications. RoHS products are available for many medium power film series.

### MEDIUM & HIGH POWER CAPACITORS FOR POWER ELECTRONICS

#### MEDIUM POWER

**FEATURES AND BENEFITS**

- Defense/Aero/Research
- Capacitors are used in wide applications
- High peak current and high energy options
- No derating over operating temperature range: -40ºC up to +105°C (see individual data sheets)
- Dry, oil impregnated technologies and without free oil elements individually protected by “fuse gates”. These ensure failsafe operation over design lifetime
- Tuning, AC filtering and Storage applications. RoHS application specific designs can be provided on request.

**APPLICATIONS**

- Refrigeration
- Wind Power Generation
- Switchgear Products
- Motor Drives
- Switch Mode Power Supplies
- Solar Inverters
- Induction Heating

**EQUIVALENT CIRCUIT CERTIFICATES**

- **FOR POWER ELECTRONICS**
- **Product Selection Guide**

**MEDIUM POWER**

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<td>FFF</td>
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<td>FM</td>
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<td>FS</td>
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<tr>
<td>FP</td>
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<td>FPX/FPY</td>
<td>(RoHS compliant)</td>
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<td>FSB</td>
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<td>(RoHS compliant)</td>
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<td>FE</td>
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**AC FILTERING**

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<td>PLC or FPL</td>
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<td>FPL</td>
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<tr>
<td>AMSPL or AFPL</td>
<td>(RoHS compliant)</td>
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AVX has been a world leader in high performance film capacitor technology design for over 30 years. We produce both dry-wound capacitors, from 75Vdc to 3kVdc (Medium Power Family) and oil-impregnated capacitors from 1.5kV to 100kV (High Power Family).

A key feature of AVX Medium & High Power is Controlled Self-healing technology. This enables the capacitors to continue to function without catastrophic failure by effectively insulating any microscopic conduction sites within the dielectric.

While power film capacitors remain functional throughout their operating life, the initial capacitance value will decrease at a rate dependent upon the applied voltage and hot spot temperature. Our standard designs provide <35% capacitance loss over 100,000 hours life at nominal voltage and a 75ºC hot spot temperature, while application on design can be provided on request.

Various series of AVX Medium/High Power Capacitors are available for DC Rifting, Protection, Pulse Discharge, Tuning and Storage applications. RoHS products are available for many medium power film series.

### MEDIUM & HIGH POWER CAPACITORS FOR POWER ELECTRONICS

#### MEDIUM POWER

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<tr>
<td>PLC</td>
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<td>PLCF</td>
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<td>R (Air Cooled)</td>
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<td>PSM</td>
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<td>PM</td>
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**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 minute element capacitor elements individually protected by "failsafe". These ensure reliable operation over design lifetime of the capacitor.

- **High power (oil-filled) technology uses high pure vegetable oil to enable controlled self-healing for ratings capacities up to 100kV.
- **Dry, oil impregnated technologies and without free oil**
- **Total purity, stability and uniform of dielectrics**
- **No degrading over operating temperature range: -40°C to +105°C**
- **High peak current and high energy options**
- **Polypropylene and polyester dielectric designs available**
- **Custom parts are available for most medium power products**

#### EQUIVALENT CIRCUIT

FOR POWER ELECTRONICS

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**APPLICATIONS**

- **AVX Medium/High Power Capacitors** are used in a wide range of application sectors such as:
  - Automotive
  - Traction
  - Industrial/Professional
  - Renewables & Smart Energy
  - Defense/Aero/Research

- **FEATURES AND BENEFITS**
  - **High performance design**
  - **Self-healing technology**
  - **Customizable for specific requirements**

- **APPLICATIONS**
  - **AVX Medium/High Power Capacitors** are used in a wide range of application sectors such as:
    - Automotive Traction
    - Industrial/Professional
    - Renewables & Smart Energy
    - Defense/Aero/Research
MEDIUM & HIGH POWER FILM CAPACITORS
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**MEDIUM & HIGH POWER CAPACITORS FOR POWER ELECTRONICS**

**TUNING**

- **FXR (RoHS compliant)**
  - Rated DC Voltage: 1200VDC – 3kVDC
  - Rated AC Voltage: 1200Vrms – 6000Vrms

- **FXR 1/3&6 (RoHS compliant)**
  - Rated DC Voltage: 1200VDC – 3kVDC
  - Rated AC Voltage: 1200Vrms – 6000Vrms
  - Applications: Substation, Windmills, Speed converters (Drives and traction), Compensator (Statcom), Static Synchronous Condensers (STATCOM), DC Link, Fuses, IGBT Protection, High Voltage Supplies, Motor Drives, Solar PV, Electric Vehicles, Traction, Wind Turbines, Induction Heating.

- **FILFIM (RoHS compliant)**
  - Rated DC Voltage: 1200VDC – 6000VDC
  - Rated AC Voltage: 10Arms – 40Arms

**HIGH POWER DC FILTERING**

- **FIL**
  - Rated DC Voltage: 1200VDC – 2.6μF – 612μF
  - Capacitance Range: 300Vrms – 600Vrms
  - Ripple Current: up to 255Arms

- **FFLC, FFLV, FFHV, FTHV**
  - Rated DC Voltage: 1200VDC – 2.6μF – 612μF
  - Capacitance Range: 300Vrms – 600Vrms
  - Ripple Current: up to 255Arms

- **FFVE/FFV/FFVS**
  - Rated DC Voltage: 1200VDC – 2.6μF – 612μF
  - Capacitance Range: 300Vrms – 600Vrms
  - Ripple Current: up to 255Arms

**ENERGY STORAGE AND DISCHARGE CAPACITORS**

- **DISPFI**
  - Rated DC Voltage: 1200VDC – 2.6μF – 612μF
  - Capacitance Range: 300Vrms – 600Vrms
  - Ripple Current: up to 255Arms

**ELECTROLYTIC ALTERNATIVE**

- **AVX POWER FLIM – APPLICATIONS EXAMPLES**

**LIFETIME EXPECTANCY FOR A TYPICAL POWER FILM CAP**

- **FIL VS ALUMINIUM**
  - Self-healing optimized with necked-down electrode patterns
  - Voltage capability requires no cascading
  - Dry-out over time results in lower cap, higher ESR
  - Low temperature greatly reduces cap
  - Smaller footprint
  - MTBF: >10 years vs 1 year max.
  - Lifespan: >100,000 hours vs 1000 hours

**AVX PRODUCT GUIDE FOR MEDIUM & HIGH POWER FILM CAPACITORS**

Custom Products are available to all series contact PowerFilmSales.com and/or fill out the following custom form: https://www.avx.com/docs/Catalogs/wrksheet.pdf

Design Specification | Quotation | Final Design & Leadtime | Procurement | Production | Shipment
MEDIUM & HIGH POWER CAPACITORS FOR POWER ELECTRONICS
Product Selection Guide

**TUNING**

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<td>High voltage applications</td>
<td>Inductive Heating (Traction EV, HEV, Power)</td>
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<tr>
<td>DISFIM</td>
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<td>Medium frequency applications</td>
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<tr>
<td>FILFIM</td>
<td>FFLC, FFLI, FFVE, FFV, FFVS</td>
<td>250°C – 350°C</td>
<td>High temperature applications</td>
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**HIGH POWER**

**DC FILTERING**

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<td>DISFIM</td>
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<td>High voltage applications</td>
<td>High Voltage Supplies (HVDC)</td>
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**ENERGY STORAGE AND DISCHARGE CAPACITORS**

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**ELECTROLYTIC ALTERNATIVE**

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**LIFETIME EXPECTANCY FOR A TYPICAL POWER FILM CAP**

- **Films**
  - **Lifetime** up to 100,000 hours
- **Environment**
  - **Humidity** up to 95% RH
- **Temperature**
  - **Operating** from -25°C to 125°C
- **Mechanical**
  - **Vibration** up to 10 g
  - **Shock** up to 100 g

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**Design Specification**

**Quotation**

**Final Design & Leadsheet**

**Approve/Production**

**Shipment**

**AVX PRODUCT GUIDE FOR MEDIUM & HIGH POWER FILM CAPACITORS**

http://www.avx.com