



# VISHAY FILM CAPACITORS FOCUS PRODUCT OVERVIEW

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R,L,C



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Distribution  
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FILM CAPACITORS

RFI CAPACITORS

EMI SUPPRESSION

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# RFI CAPACITORS

## REFERENCE STANDARDS

EMI suppression capacitors must fully comply with safety standards defined by national authorities. The basic world standard for EMI suppression capacitors is the IEC 60384-14. In accordance with these rules, X & Y capacitors are subdivided in accordance with the impulse capabilities.

SUB CLASS	PEAK IMPULSE VOLTAGE IN SERVICE	IEC 60664-1 INSTALLATION CATEGORY	APPLICATION	PEAK IMPULSE VOLTAGE $U_p$ APPLIED BEFORE ENDURANCE TEST
X1	> 2.5 kV ≤ 4.0 kV	III	High Pulse Application	When $CR \leq 1\mu F$ ; $UP=4kV$ When $CR > 1\mu F$ ; $UP=4vC$
X2	≤ 2.5 kV	II	General Purpose	When $CR \leq 1\mu F$ ; $UP=2.5kV$ When $CR > 1\mu F$ ; $UP=2.5vC$
X3	≤ 1.2 kV	-	General Purpose	None

SUB CLASS	TYPE OF INSULATION BRIDGES	RANGE OF RATED VOLTAGES	PEAK IMPULSE VOLTAGE $U_p$ APPLIED BEFORE ENDURANCE TEST
Y1	Double Insulation or Reinforced Insulation	≤250 V	8.0 kV
Y2	Basic Insulation or Supplementary Insulation	≥150 V ≤250 V	5.0 kV
Y3	Basic Insulation or Supplementary Insulation	≥150 V ≤250 V	None
Y4	Basic Insulation or Supplementary Insulation	≤150 v	2.5kV



# FILM CAPACITORS

## RFI F339X1 480VAC SERIES

### FEATURES

- Halogen Free Materials
- IEC, EN, UL, CSA and CQC safety standards
- Standard across the line X1 applications
- Rated Voltage:
  - F339 X1 480VAC – 480Vac



### DESCRIPTION / REMARKS

F339X1 480VAC - High grade of capacitance stability due to series construction.  
High stability under severe conditions of humidity and heat.

### OVERVIEW

Capacitance Range:

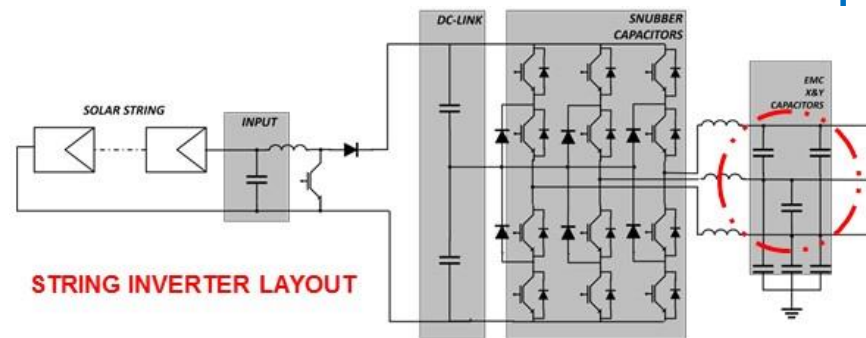
1nF – 2,2µF

Rated Voltage

480Vac

Permissible DC Voltage

F339X1 480VAC > 1000Vdc



# Sales Key Information

### LEAD TIMES

Sample LT: 8Wks  
Production LT: 12Wks

### ASP

0,25 USD

### FOCUS APP's

- R.E. Inverters
- Power Meters
- EMI Filters
- Motor Drives

### COMPETITION

EPCOS: B3291x  
KEMET: F871/PHE841/R49  
PANASONIC: ECQUG  
WIMA: MP3-X1

### Why we win business?

- High capacitance stability under harsh damp heat.
- Full Agency approvals.



# FILM CAPACITORS

## RFI 339X2 310VAC SERIES



### FEATURES

- Automotive Grade up to 4.7 $\mu$ F – AEC-Q200
- Capacitance range up to 40 $\mu$ F
- IEC, EN, UL, CSA and CQC safety standards
- Standard across the line applications



### DESCRIPTION / REMARKS.

MKP339 – AEC-Q200 Automotive Grade X2 class capacitor.

F339MX2 – C-Values above 10 $\mu$ F up to 40 $\mu$ F for Power Applications

For high stability applications, Vishay recommends also the Classic MKP3384

### OVERVIEW

Capacitance Range:

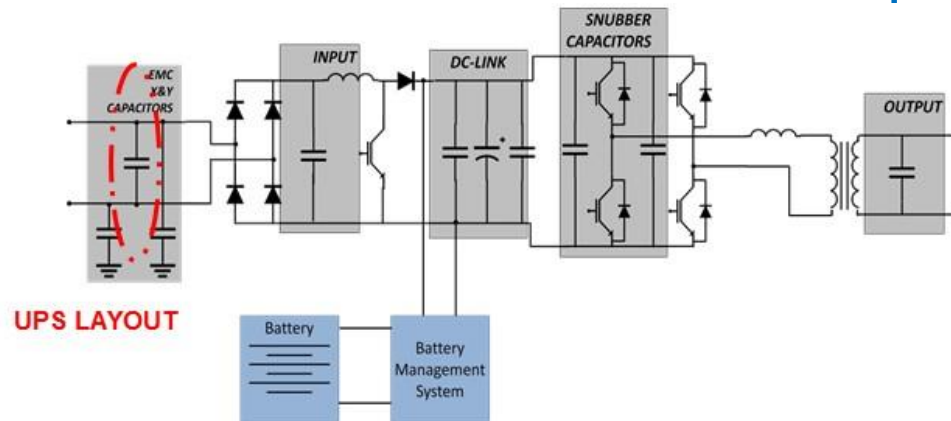
1nF – 40 $\mu$ F

Rated Voltage

310Vac

Permissible DC Voltage

800Vdc @85° C



## Sales Key Information

### LEAD TIMES

Sample LT: 8Wks  
Production LT: 12Wks

### ASP

0,1 USD

### FOCUS APP's

- UPS
- R.E. Inverters
- On Board Chargers
- EMI Filters
- Consumer

### COMPETITION

EPCOS: B3292x  
KEMET: F861/PHE840/R46  
PANASONIC: ECQUL  
WIMA: MKP-X2

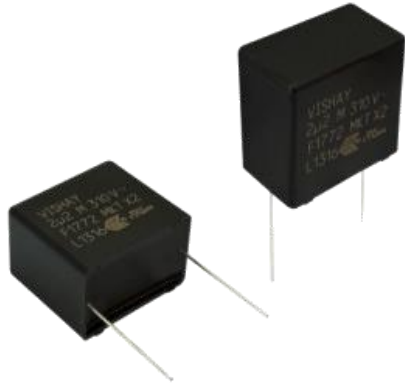
### Why we win business?

- Broadest Capacitance Range
- Cost effective.



# FILM CAPACITORS

## RFI F1772S 310VAC SERIES (X2)



### FEATURES

- 85°C/85% RH at 240V<sub>AC</sub> for 1000 hours
- High stability grade - corona effect free
- For Series Impedance applications and across the line
- Halogen free materials



### DESCRIPTION / REMARKS

With the New F1772S, Vishay offers enhanced protection against humidity penetration, even at higher temperatures (85°C/85% RH at 240V<sub>AC</sub> for 1000 hours).

### OVERVIEW

Capacitance Range:

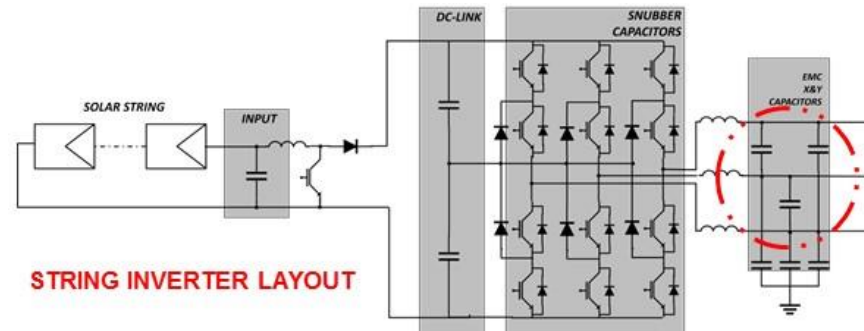
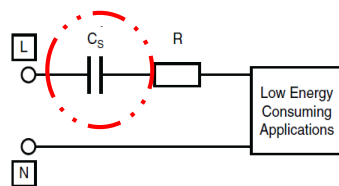
10nF – 2,2µF

Rated Voltage

310Vac

Permissible DC Voltage

630Vdc



# Sales Key Information

### LEAD TIMES

Sample LT: 8Wks  
Production LT: 12Wks

### ASP

0,2 USD

### FOCUS APP's

- R.E. Inverters
- Power Meters
- Series Impedance
- EMI Filters
- Micro Inverters

### COMPETITION

EPCOS: B3293x  
WIMA: MP3-X2R

### Why we win business?

- 85°C/85% RH at 240VAC for 1000 hours
- High capacitance stability over very long lifetime
- Full Agency approvals.

Helder Carneiro - CONFIDENTIAL



# FILM CAPACITORS

## RFI MKP3386 300VAC SERIES (Y2)



### FEATURES

- AEC-Q200 approved – Automotive grade
- IEC, EN, UL, CSA and CQC safety standards
- Standard bypass Y2 applications (between mains and ground)



### DESCRIPTION / REMARKS

Y2 capacitor comply with restrict end of life behavior , ensuring that no short-circuits may occur, and thus protecting humans and animals. Y2 capacitors connect line to ground, which is often on application armor.

### NEWS/ NEW TO COME

New F340Y2 Generation

### OVERVIEW

Capacitance Range:

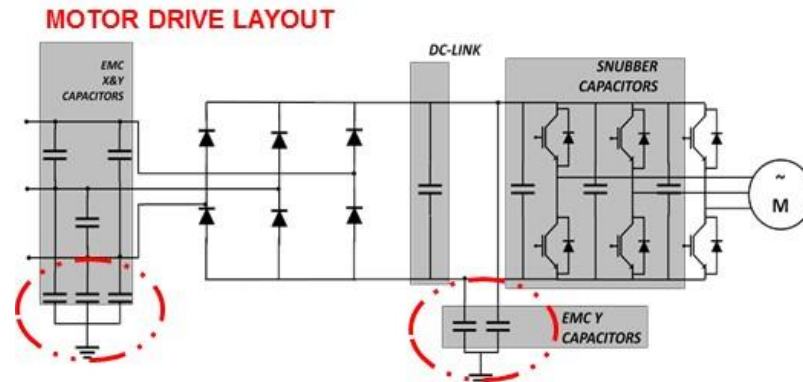
1nF – 0,47µF

Rated Voltage

300Vac

Permissible DC Voltage

1000Vdc



## Sales Key Information

### LEAD TIMES

Sample LT: 8Wks  
Production LT: 12Wks

### ASP

0,1 USD

### FOCUS APP's

- UPS
- R.E. Inverters
- On Board Chargers
- EMI Filters
- Consumer

### COMPETITION

EPCOS: B3202x  
KEMET: F881/PHE850/R41  
WIMA: MKP-Y2

### Why we win business?

- Automotive Grade
- Full Agency approvals.



# F340 Family RFI Film Capacitor

## Robust Design for High Humidity Environments

### ■ Technical Features

- High robustness under high humidity (Grade III B)
- THB 85°C, 85%RH, 1000hours rated voltage
- Featured Products
  - F340 X1 – 480Vac | 220nF up to 8,2μF
  - F340 X2 – 305Vac | 1μF up to 20μF
  - F340 Y2 – 305Vac | 1nF up to 1μF | AEC-Q200 Automotive Grade
- Full Agency Approvals.



### ■ Selling Message

High stability grade Film Capacitor for RFI suppression for long lasting service under severe ambient conditions of heat and humidity.





# FILM CAPACITORS

## HIGH PERFORMANCE DC-LINK SERIES

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# FILM CAPACITORS

## High Performance DC-Link

- MKP1848 – AEC-Q200 Automotive Grade DC-Link

- Features

- Automotive Grade AEC-Q200
- Capacitance from 1 $\mu$ F to 400 $\mu$ F
- Rated Voltage from 450Vdc to 1200Vdc
- Multiple pin configuration for vibration withstand
- Maximum operation temperature: 105°C
- Customization Possible.

- Applications

- On Board Chargers for EV/HEV
- Automotive heating systems and Power Supplies
- Renewable Energy Inverters
- Motor Drives
- UPS





# FILM CAPACITORS

## High Performance DC-Link

- MKP1848C – High Density Economic Pack



HALOGEN  
FREE

GREEN  
(IS-2004)



RoHS  
COMPLIANT

- Features

- High Capacitance density
- Capacitance from 1 $\mu$ F to 500 $\mu$ F
- Rated Voltage from 500Vdc to 1200Vdc
- Multiple pin configuration for vibration withstand
- Maximum operation temperature: 105°C
- Customization Possible.

- Applications

- Renewable Energy Inverters
- Motor Drives
- UPS
- Welding Equipment
- Switch Mode Power Supplies



# FILM CAPACITORS

## High Performance DC-Link

- MKP1848S – Slim Low Profile



- Features

- Low Building Height: 12, 15, 18 & 24mm.
- Capacitance from 1 $\mu$ F to 100 $\mu$ F
- Rated Voltage from 500Vdc to 1000Vdc
- Multiple pin configuration for vibration withstand
- Maximum operation temperature: 105°C
- Customization Possible.

- Applications

- Renewable Energy Inverters
- Micro Inverters
- Switch Mode Power Supplies

# MKP1848H DC-Link Film Capacitor

## Robust Design for High Humidity Environments



### ■ Technical Features

- High robustness under high humidity
- THB 85°C, 85%RH, 1000hours rated voltage
- Rated voltages: 500V<sub>DC</sub>; 700V<sub>DC</sub>; 800V<sub>DC</sub>; 920V<sub>DC</sub> and 1200V<sub>DC</sub>
- Rated capacitance range: 1μF to 80μF
- AEC-Q200 – Automotive Grade
- Maximum Permissible case Temperature: 105°C



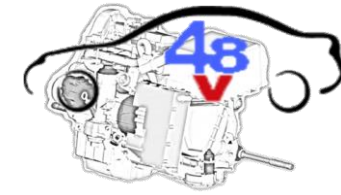
### ■ Selling Message

The MKP1848H is designed to ensure extremely stable capacitance and ESR parameters over a long service life regardless of the environmental conditions during operation



# FILM CAPACITORS

## High Performance DC-Link



- MKT1820 – Low Voltage DC-Link



### ➤ Features

- Capacitance up to 560µF for 63V
- AEC-Q200
- Temperature capabilities up to 150°C.
- Customization under request.

### ➤ Applications

- 48Vdc Board Net
- DC/DC Converters
- General Purpose

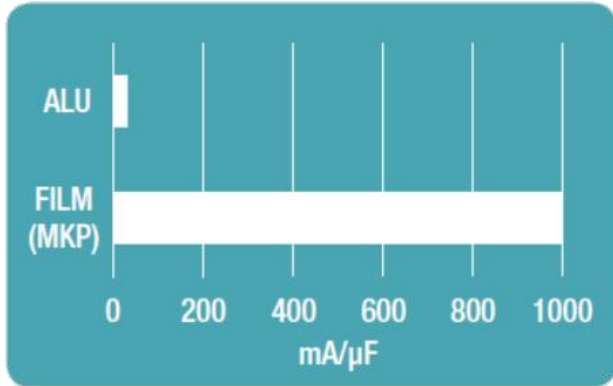


# DC-LINK FILM CAPACITORS

## LOW ESR, HIGH RIPPLE CURRENT CAPABILITIES

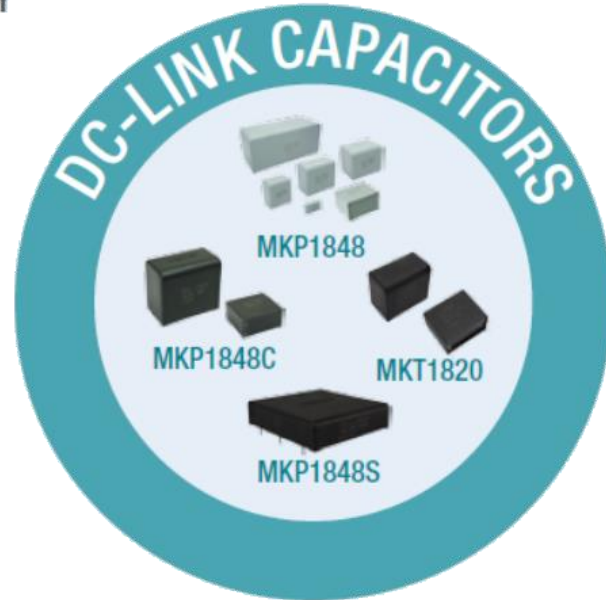
### IN A NUTSHELL

FILM CAPACITOR RIPPLE CURRENT CAPABILITY VS. ALUMINUM ELECTROLYTICS

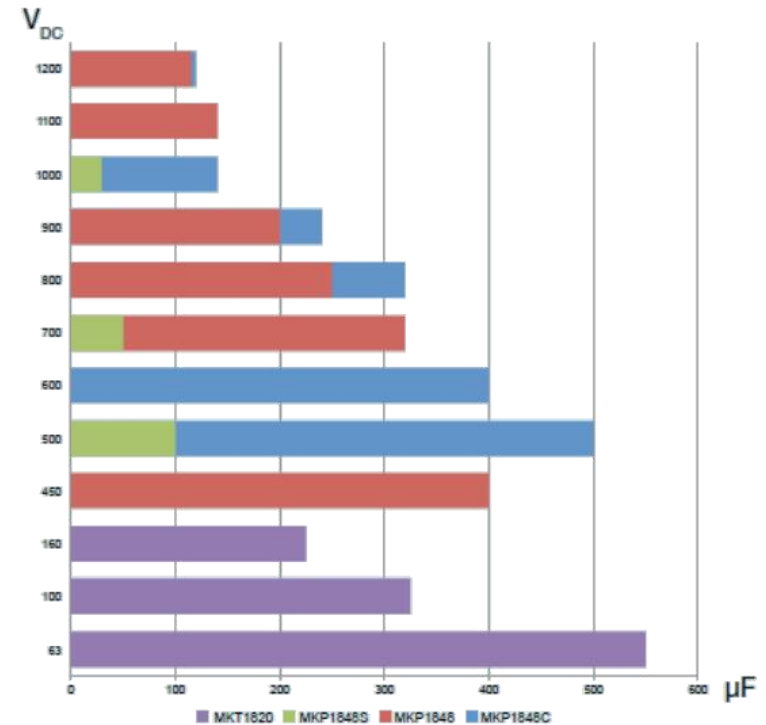


### ADVANTAGES DC-LINK FILM CAPACITOR OVER ALUMINUM ELECTROLYTIC

- High voltage capability: No series connection; no balancing resistors
- Self healing Technology
- Lifetime over 100.000 hours
- No dry out -> Stable parameters until the end of life
- Stable electrical parameters across temperature range



DC-LINK FILM CAPACITORS VOLTAGE VS. CAPACITANCE RANGE



### APPLICATIONS



- On Board Chargers
- 48V Board Net
- Forklifts
- Renewable Energies
- Welding Equipment
- Power Supplies
- Motor Drives

MKP1848	MKP1848C	MKP1848S	MKT1820
Automotive Grade DC-Link Film Capacitor (AEC-Q200 Compliant)	High Density DC-Link Film Capacitor up to 1 μF/cm <sup>3</sup>	Low Profile DC-Link with Building Heights of 12, 15, 18 and 24 mm	Low Voltage and High Temperature (up to 150 °C) DC-Link for 48 V Board Net



# FILM CAPACITORS

## AC FILTERING

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# FILM CAPACITORS

## AC FILTER MKP1847 SERIES



### FEATURES

- Segmented film for safe end of life
- Long lifetime
- High RMS current
- Low ESR
- UL810 compliant
- Halogen Free Materials



### DESCRIPTION / REMARKS

Power electronic designers are implementing more and more complex switching algorithms for pulse-width modulation (PWM) to gain efficiency and to improve the power quality. Such designs introduce higher frequencies and harmonics, which must be filtered by using LC and LCL filters at the output. This is the field of application for the Vishay's AC MKP1847 line, featuring a very large portfolio of C-values and mounting configurations, 2 or 4 pins. It introduces segmented film technology, for increased safety, complying with UL810 standard.

### OVERVIEW

Capacitance/ Voltage Range

1 $\mu$ F – 70 $\mu$ F	230Vac / 450Vdc
1 $\mu$ F – 60 $\mu$ F	250Vac / 500Vdc
1 $\mu$ F – 50 $\mu$ F	275Vac / 600Vdc
1 $\mu$ F - 35 $\mu$ F	310Vac / 630Vdc
1 $\mu$ F – 30 $\mu$ F	350Vac / 700Vdc
1 $\mu$ F – 12 $\mu$ F	440Vac / 1000Vdc



UPS

# MKP1847H AC Filtering Film Capacitor

## Robust Design for High Humidity Environments



### ■ Technical Features

- High robustness under high humidity
- THB 85°C, 85%RH, 1000hours rated voltage applied
- Rated voltages: 250V<sub>AC</sub>, 310V<sub>AC</sub>, 350V<sub>AC</sub> and 480V<sub>AC</sub>
- Rated capacitance range: 1μF to 35 μF
- Segmented film
- UL 810(electrical pending)



### ■ Selling Message

The MKP1847H is designed to ensure extremely stable capacitance and ESR parameters over a long service life regardless of the environmental conditions during operation



# FILM CAPACITORS

## SNUBBER CAPACITORS

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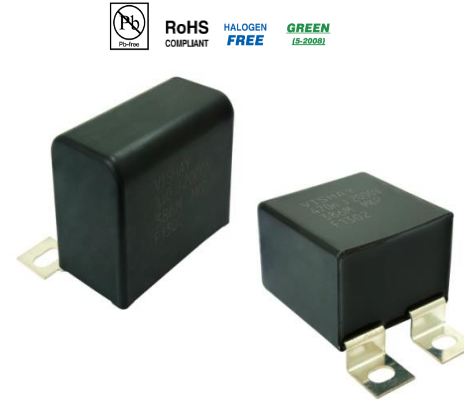
# Snubber Film Capacitor – Single Metalized

## Robust Design

### MKP386M

#### FEATURES

- High pulse strength
- Low ESL and Low ESR
- Reduce or eliminate current voltage spikes
- Environmentally friendly
- Direct Mount on IGBT Modules
- 2- and 4-pin configuration available (385)
- Customized designs on demand



470nF – 5μF	700Vdc
470nF – 10μF	850Vdc
470nF – 7μF	1000Vdc
330nF - 5μF	1250Vdc
220nF – 2,5μF	1600Vdc
47nF – 1,5μF	2000Vdc
47nF – 820nF	2500Vdc

#### DESCRIPTION / REMARKS

Snubber capacitors are designed to reduce or eliminate voltage and current spikes, thus reducing EMI by clamping voltage and current ringing caused by the switching of Power Semiconductors, and to reduce switching losses.

### MKP385

#### FEATURES

- Pure Aluminum Metallization
- High Pulse Strength
- Very High RMS current
- Very Low ESR
- Operating Temperature up to 125°C – limited time
- Halogen Free Materials



		U <sub>RDC</sub>	160V	250V	400V	630V	850V	1000V	1250V	1600V	2000V	2500V
MKP385	C(μF)	Min	0,011	0,01	0,0043	0,0015	0,001	0,00047	0,00047	0,00047	0,00047	0,00047
		Max	82	62	27	15	10	6,8	5,1	2,7	1,6	0,68

#### DESCRIPTION / REMARKS

Specifically design for high current, high frequency and Pulse applications, the MKP385 covers a wide capacitance range and suits multiple Power Electronics applications. From PCB mounted snubbers for discrete switching semiconductors, to resonant tank capacitive component; but also as DC-Link in demanding applications.



# Snubber Film Capacitor – Double Metalized

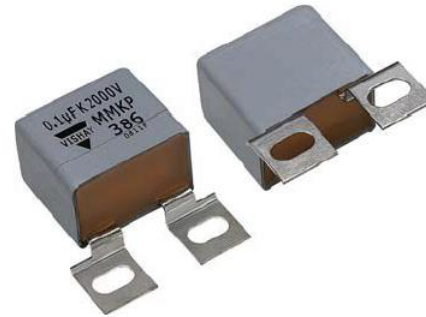
## Robust Design

### MMKP386



#### FEATURES

- Very High pulse strength
- Low ESL and Low ESR
- Reduce or eliminate current voltage spikes
- Direct Mount on IGBT Modules
- 2- and 4-pin configuration available (383/385)
- Customized designs on demand
- Film/Foil available under request as KP386A



470nF – 5μF	700Vdc
470nF – 10μF	850Vdc
470nF – 7μF	1000Vdc
330nF - 5μF	1250Vdc
220nF – 2,5μF	1600Vdc
47nF – 1,5μF	2000Vdc
47nF – 820nF	2500Vdc

#### DESCRIPTION / REMARKS

Snubber capacitors are designed to reduce or eliminate voltage and current spikes, thus reducing EMI by clamping voltage and current ringing caused by the switching of Power Semiconductors, and to reduce switching losses.

### MMKP383



#### FEATURES

- Double Metallization
- Very High Pulse Strength
- Very High RMS current
- Very Low ESR
- Operating Temperature up to 110°C – limited time
- Halogen Free Materials



		U <sub>NDC</sub>	250V	400V	630V	1000V	1400V	1600V	2000V	2500V
MMKP383	C(μF)	Min.	0,0068	0,0047	0,00047	0,0043	0,0022	0,0027	0,001	0,001
		Max.	2,7	1,5	4,7	1,8	0,68	0,56	0,56	0,3

#### DESCRIPTION / REMARKS

Specifically design for high current, high frequency and Pulse applications, the MKP383 covers a wide capacitance range and suits multiple Power Electronics applications. From PCB mounted snubbers for discrete switching semiconductors, to resonant tank capacitive component; but also as DC-Link in demanding applications.



# FILM CAPACITORS

## HIGH FREQUENCY APPLICATIONS





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# Resonant Film Capacitor

## Robust Design

	AC & Pulse		AC & PULSE	
	MKP385 	MMKP383 	MKP1839 MKP1839HQ 	MKP1845 
<b>MAXIMUM TEMPERATURE</b>	110°C	105°C	110°C	100°C
<b>TECHNOLOGY</b>	Metalized Polypropylene	Double Metalized Polyester	Metalized Polypropylene (Series Construction)	Double Metalized Polypropylene
<b>CONSTRUCTION</b>	Radial	Radial	Axial	Axial
<b>RATED VOLTAGE</b>	160 / 250 / 400 / 630 / 850 / 1000 / 1250 / 1600 / 2000 / 2500 Vdc	250 / 400 / 630 / 100 / 1400 / 1600 / 2000 / 2500 Vdc	160 / 250 / 400 V / 630 / 850 / 1250 / 1600 Vdc	160 / 250 / 400 / 630 / 1000 / 1600 / 2000Vdc
<b>CAPACITANCE RANGE</b>	470pF to 82µF	470pF to 4,7µF	100nF to 22µF	1nF to 4,7F
<b>TOLERANCE</b>	±5%	±5%	±10%, ±5%, ±2,5%, ±2% and ±	±5%, ±10% and ±20%
<b>PITCH</b>	5mm to 52,4mm	7,5 mm (bentback) to 37,5mm	11mm to 41,5mm (length)	17mm to 44mm (length)
<b>FEATURES</b>	<p>*High Pulse Strength.</p> <p>*Mono and Internal serial construction.</p> <p>*Low ESL and low ESR.</p>	<p>*High Pulse Strength.</p> <p>*Mono and Internal serial construction.</p> <p>*Low ESL and low ESR.</p>	<p>*High Current Pulse capabilities.</p> <p>*Precision capacitor for pulse operation (MKP1839)</p> <p>*Low Building Height</p>	<p>*Precision capacitor for pulse operations</p> <p>*High Voltage and High Current capabilities</p> <p>*Low Building Height</p>



# NPI ROADMAP

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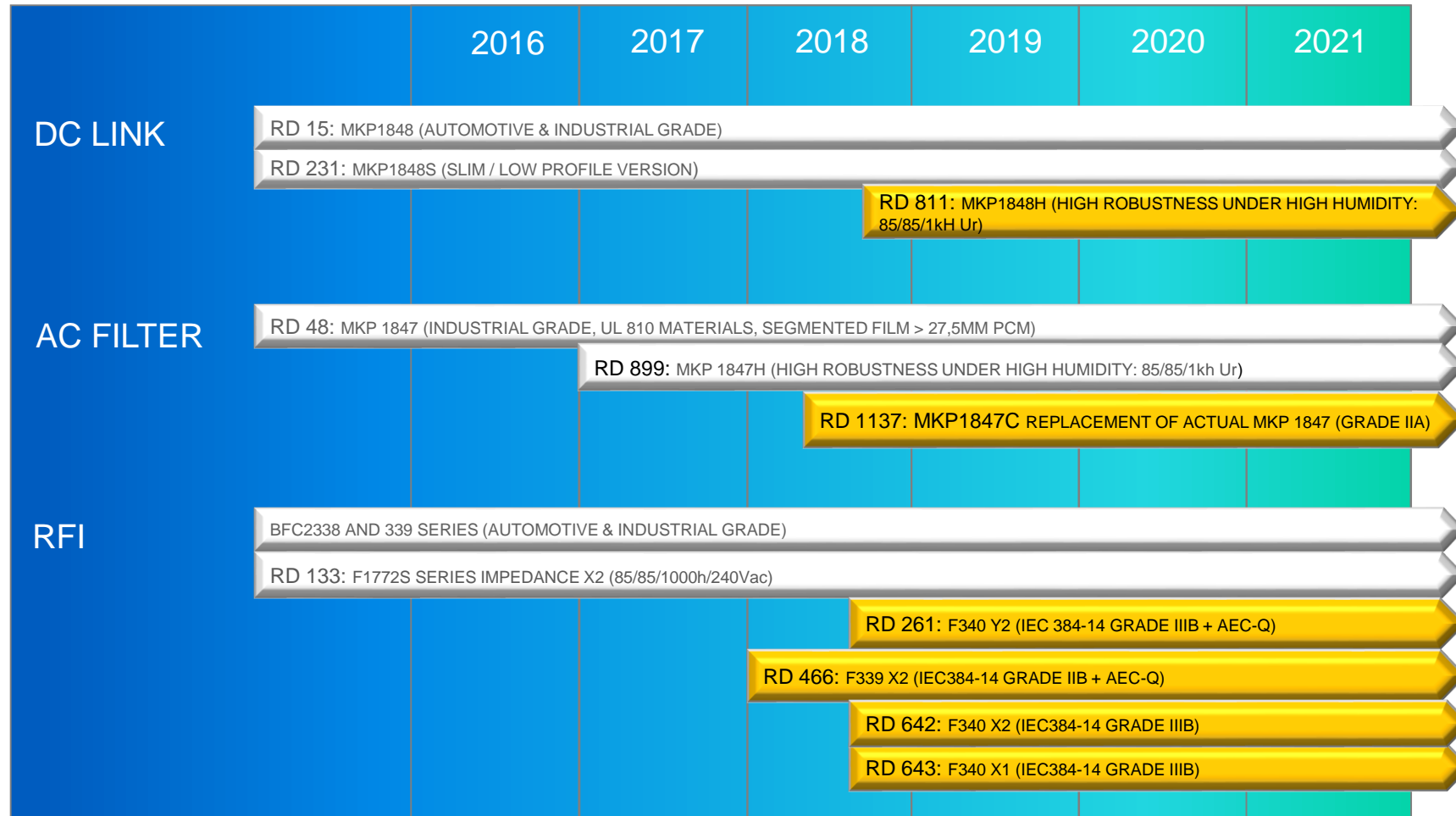




# FILM CAPACITORS

## INDUSTRIAL PORTFOLIO - STRATEGIC PLANNING 2016 - 2021

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MARKETING FILM  
CONFIDENTIAL - 2016





# FOCUS APPLICATIONS

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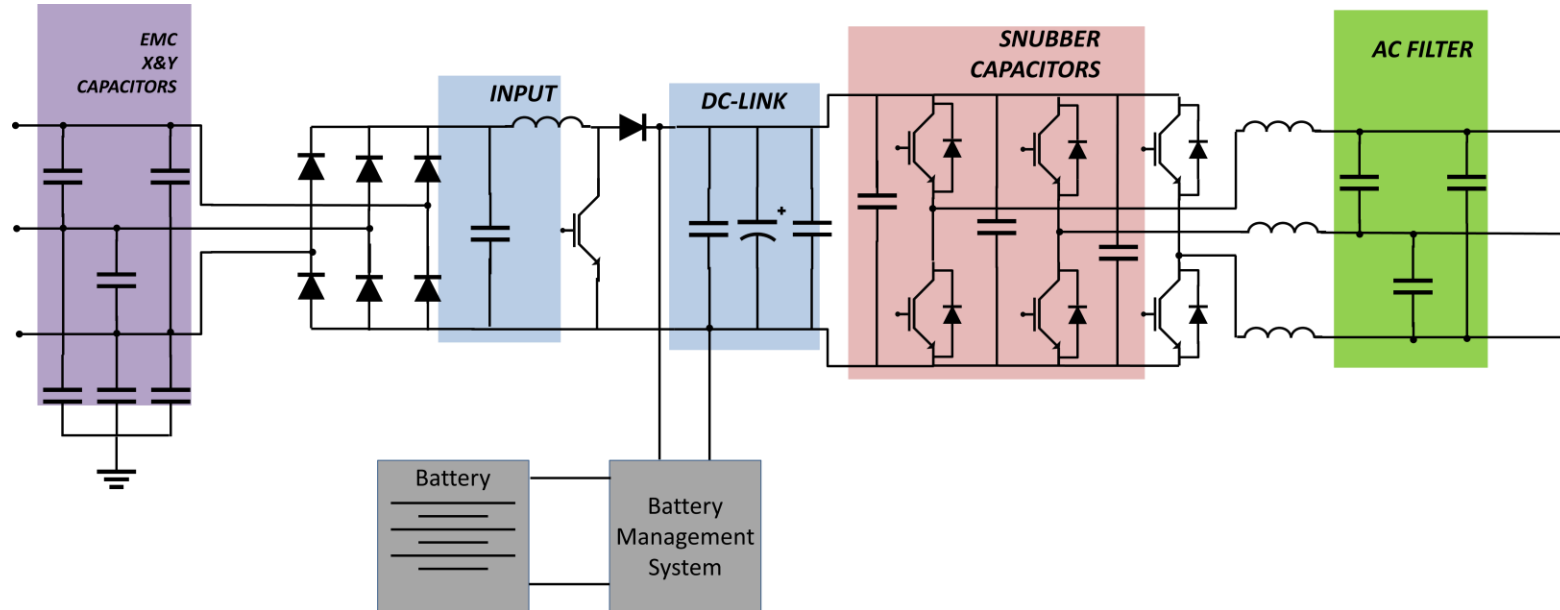
# TARGET MARKETS – FILM CAPS

- **Automotive HEV/EV**
  - Traction Inverters
  - On-Board Chargers
  - Inductive Chargers
  - 48V Board Network Supplementary Vehicle Power
- **Industrial Power**
  - Power Supplies
  - UPS
  - Battery Chargers
  - Motor Drives
  - Smart Meters
  - Welding
- **Alternative Energy Generation & Implementation**
  - Inverters
    - Photovoltaic
    - Wind Power
    - Hydroelectric
  - Battery Chargers
    - BMS (Battery Management Systems)



# INDUSTRIAL POWER INVERTERS

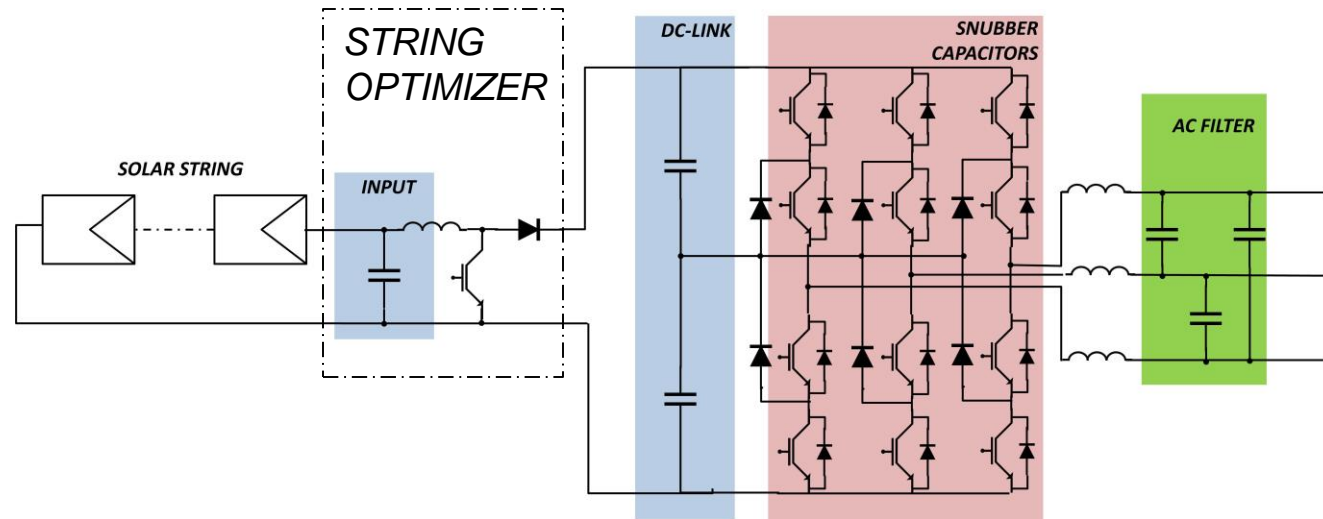
## Uninterruptible Power Supply (UPS)



FUNCTION		VISHAY FILM CAPACITORS SERIES			
		NO THB		THB	
EMC X&Y CAPACITORS	X1	F339 X1 480VAC	1nF up to 1 $\mu$ F - 480Vac	F340 X1	220nF - 8,2 $\mu$ F / 480Vdc
	X2	MKP339 & F339M X2	1nF up to 40 $\mu$ F - 310Vac	F340 X2	1 $\mu$ F - 20 $\mu$ F / 305Vac
	Y2	MKP338 6	1nF up to 470nF - 300Vac	F340 Y2	1nF up to 1 $\mu$ F - 305Vac
INPUT	DC-LINK	MKP1848	1 $\mu$ F - 400 $\mu$ F / 450Vdc - 1,2kVd	MKP1848H	1 $\mu$ F - 80 $\mu$ F / 500Vdc - 1,2kVdc
DC-LINK		MKP1848C	1 $\mu$ F - 500 $\mu$ F / 500Vdc - 1,2kVd		
AC FILTER		MKP1847	1 $\mu$ F - 70 $\mu$ F / 230Vac - 440Vac	MKP1847H	1 $\mu$ F - 35 $\mu$ F / 250Vac - 480Vac
SNUBBER		MKP385	470pF - 82 $\mu$ F / 160Vdc - 2500V	-	-

# INDUSTRIAL POWER INVERTERS

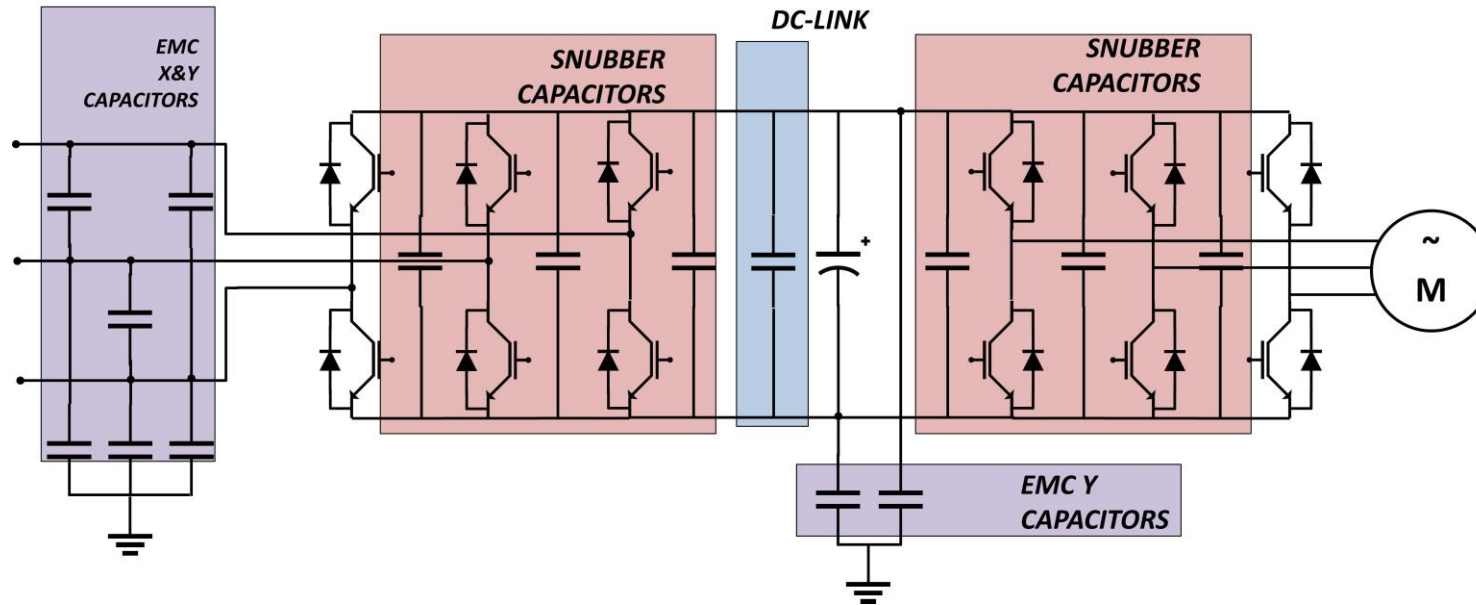
## Solar String Inverters



FUNCTION		VISHAY FILM CAPACITORS SERIES			
		NO THB		THB	
INPUT	DC-LINK	MKP1848	1 $\mu$ F - 400 $\mu$ F / 450Vdc - 1,2kVdc	MKP1848H	1 $\mu$ F - 80 $\mu$ F / 500Vdc - 1,2kVdc
	DC-LINK	MKP1848C	1 $\mu$ F - 500 $\mu$ F / 500Vdc - 1,2kVdc		
	AC FILTER	MKP1847	1 $\mu$ F - 70 $\mu$ F / 230Vac - 440Vac	MKP1847H	1 $\mu$ F - 35 $\mu$ F / 250Vac - 480Vac
	SNUBBER*	MKP385	470pF - 82 $\mu$ F / 160Vdc - 2500Vdc	-	-

# INDUSTRIAL POWER INVERTERS

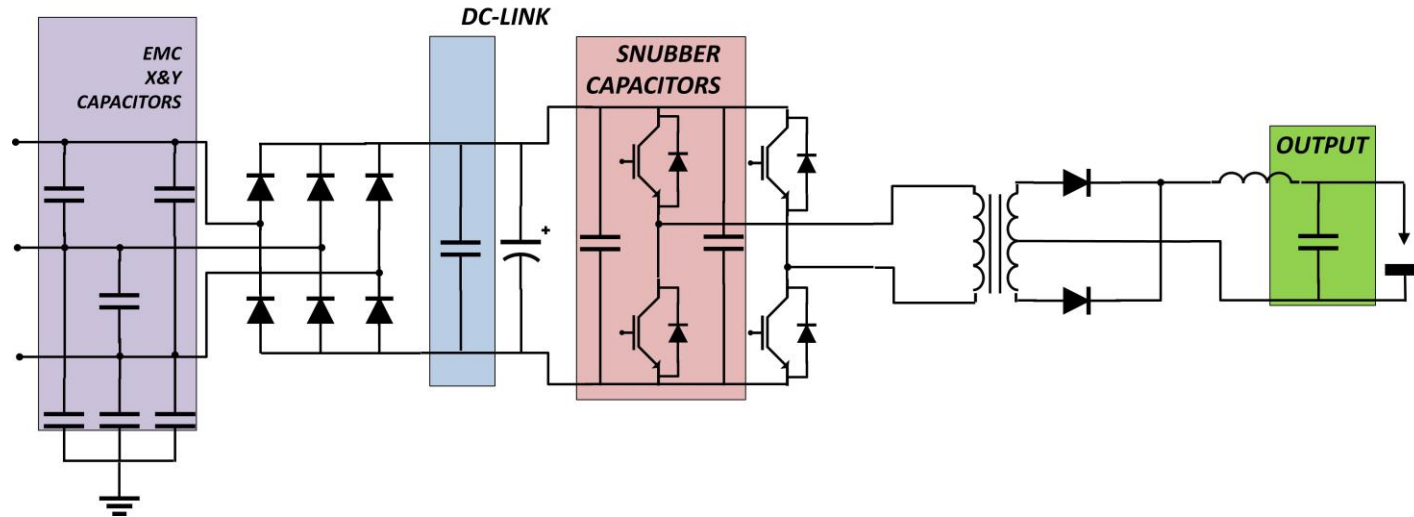
## Motor Drives (Variable Speed Drives)



FUNCTION		VISHAY FILM CAPACITORS SERIES			
		NO THB		THB	
EMC X&Y CAPACITORS	X1	F339 X1 480VAC	1nF up to 1 $\mu$ F - 480Vac	F340 X1	220nF - 8,2 $\mu$ F / 480Vdc
	X2	MKP339 & F339M X2	1nF up to 40 $\mu$ F - 310Vac	F340 X2	1 $\mu$ F - 20 $\mu$ F / 305Vac
	Y2	MKP338 6	1nF up to 470nF - 300Vac	F340 Y2	1nF up to 1 $\mu$ F - 305Vac
DC-LINK		MKP1848	1 $\mu$ F - 400 $\mu$ F / 450Vdc - 1,2kVd	MKP1848H	1 $\mu$ F - 80 $\mu$ F / 500Vdc - 1,2kVdc
		MKP1848C	1 $\mu$ F - 500 $\mu$ F / 500Vdc - 1,2kVd		
AC FILTER		MKP1847	1 $\mu$ F - 70 $\mu$ F / 230Vac - 440Vac	MKP1847H	1 $\mu$ F - 35 $\mu$ F / 250Vac - 480Vac
SNUBBER		MKP385	470pF - 82 $\mu$ F / 160Vdc - 2500V	-	-

# INDUSTRIAL POWER INVERTERS

## Welding Equipment



FUNCTION		VISHAY FILM CAPACITORS SERIES			
		NO THB		THB	
EMC X&Y CAPACITORS	X1	F339 X1 480VAC	1nF up to 1 $\mu$ F - 480Vac	F340 X1	220nF - 8,2 $\mu$ F / 480Vdc
	X2	MKP339 & F339M X2	1nF up to 40 $\mu$ F - 310Vac	F340 X2	1 $\mu$ F - 20 $\mu$ F / 305Vac
	Y2	MKP338 6	1nF up to 470nF - 300Vac	F340 Y2	1nF up to 1 $\mu$ F - 305Vac
DC-LINK		MKP1848	1 $\mu$ F - 400 $\mu$ F / 450Vdc - 1,2kVd	MKP1848H	1 $\mu$ F - 80 $\mu$ F / 500Vdc - 1,2kVdc
		MKP1848C	1 $\mu$ F - 500 $\mu$ F / 500Vdc - 1,2kVd		
AC FILTER		MKP1847	1 $\mu$ F - 70 $\mu$ F / 230Vac - 440Vac	MKP1847H	1 $\mu$ F - 35 $\mu$ F / 250Vac - 480Vac
SNUBBER		MKP385	470pF - 82 $\mu$ F / 160Vdc - 2500V	-	-

EV/PEV	OBC 	EMI FILTER	X2 CAPACITOR	MKP339 X2
			Y2 CAPACITOR	MKP338 6 Y2
		DC-LINK		MKP1848
		OUTPUT FILTER	DC FILTER	MKT1820
48V Board Net	DC/DC Converter 	DC-LINK	MKP1848	
	Heating System 	DC-LINK	MKP1848	
	eBooster 	DC-FILTER	MKT1820	
	Starter Generator 	DC-LINK	MKT1820	

MKP339 X2	<ul style="list-style-type: none"> <li>Withstanding up to 2,5kV Pulse</li> <li>For across the line applications</li> </ul>
MKP338 6 Y2	<ul style="list-style-type: none"> <li>Withstanding up to 2,5kV Pulse</li> <li>For line bypass applications</li> </ul>

MKT1820	<ul style="list-style-type: none"> <li>Capacitance up to 560µF</li> <li>High temperature operation up to 150°C for limited time</li> <li>Halogen Free</li> <li>Customization possible</li> </ul>
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MKP1848	<ul style="list-style-type: none"> <li>Capacitance up to 400µF</li> <li>High Ripple current capabilities</li> <li>Low ESR</li> <li>Long Lifetime</li> <li>Customization possible</li> </ul>
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