

DC FILTERING

FA/FQ *RoHS Compliant



GENERAL DESCRIPTION

The FA/FQ series uses a non-impregnated metallized polypropylene dielectric specially treated to have a very high dielectric strength in operation condition up to 105°C.

FA/FQ series meets Automotive Electronics Council's AEC-Q200 qualification requirements.

GENERAL CHARACTERISTICS

- Automotive Grade (AEC-Q200)
- Able to Withstand Harsh Environment Conditions
- Low Profile Available

FEATURES & BENEFITS

- High Performance DC Filter
- Low ESR, High Peak & RMS Current
- AEC-Q200 Qualified

APPLICATIONS

- For medium power DC applications
- Renewable Energy Inverter
- OBC & Automotive Applications
- Motor Drives
- Industrial Power Supply

PACKAGING MATERIAL

Self-extinguishing plastic case (V0=in accordance with UL 94) filled thermosetting resin.

Self-extinguishing thermosetting resin(V0=in accordance with UL 94)

OPERATING TEMPERATURE RANGE

- Operating temperature range: -40°C to +105°C

STANDARDS

- IEC 61071-1: Power electronic capacitors
- IEC 61071-2: Power electronic capacitors
- IEC 60384-16: Fixed metallized polypropylene film dielectric DC capacitors
- IEC 60384-16-1: Fixed metallized polypropylene film dielectric DC capacitors
Assessment level E
- IEC 60384-17: Fixed metallized polypropylene film dielectric AC and pulse capacitors
- IEC 60384-17-1: Fixed metallized polypropylene film dielectric AC and pulse capacitors
Assessment level E. AEC-Q200

LIFETIME EXPECTANCY

One unique feature of this technology (versus aluminum electrolytics) is how the capacitor reacts at the end of its lifetime.

Unlike aluminum electrolytic, film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 3% of initial value, with no risk of a short circuit.

The capacitor continues to be functional even after this 3% decrease.

HOW TO ORDER

FQ	27	G*	6	K	0685	K	A
Series	Pitch	Case Size	Type	Voltage	Cap µF Code	Tolerance	Pitch P2
FA (2 pin) FQ (4 pin)	27 = 27.5mm 37 = 37.5mm 52 = 52.5mm	E* for P=27.5mm F* for P=37.5mm G* for P=52.5mm	6 = Polypropylene	I = 450V A = 700V B = 800V C = 900V L = 1100V P = 1200V		J = ± 5% K = ±10% M = ±20%	A = 10.2 B = 20.3 C = 2 pins

(1) FA for 2 pins & FQ for 4 pins

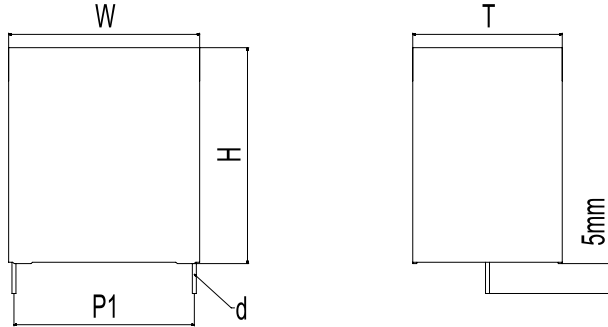
(2) For Pitch P2, add D&E for 6 pins & 12pins products, and the P2 for 6 pins and 12pins is 20.3mm

DC FILTERING

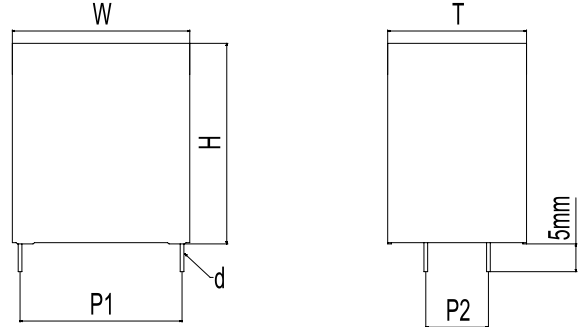
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DIMENSIONS

2 PIN



4 PIN



HOT SPOT CALCULATION

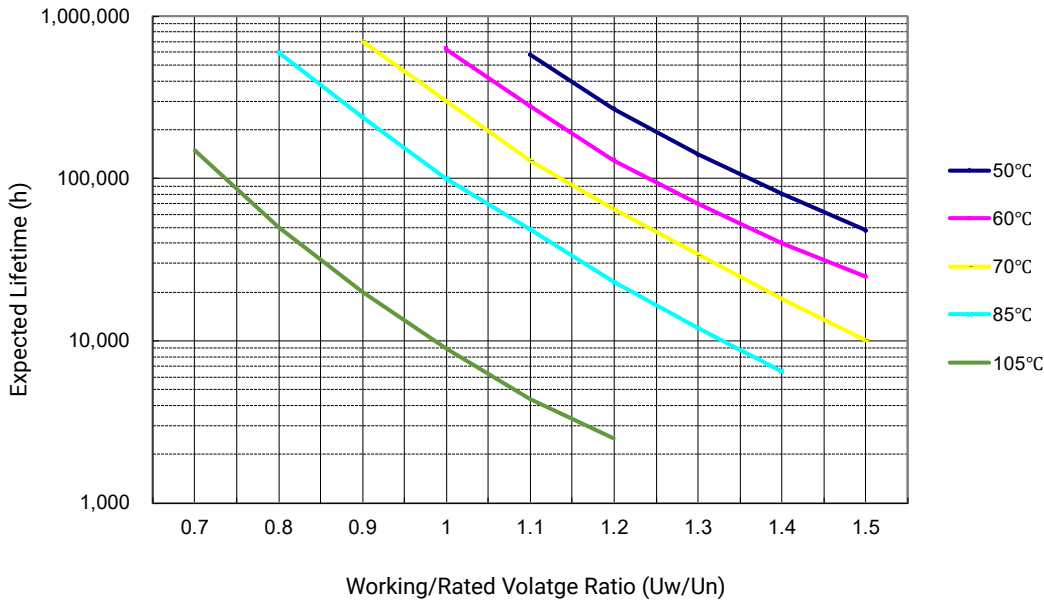
See Hot Spot Temperature, page 2.

$\theta_{hot\ spot} = \theta_{ambient} + (P_d + P_t) \times R_{th}$
 with P_d (Dielectric losses) = $Q \times tg\delta_0$
 $Q \times tg\delta_0 \Rightarrow [\frac{1}{2} \times C_n \times (V_{peak\ to\ peak})^2 \times f] \times tg\delta_0$
 $tg\delta_0$ (tan delta)
 For polypropylene, $tg\delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures.

$$P_t \text{ (Thermal losses)} = R_s \times (I_{rms})^2$$

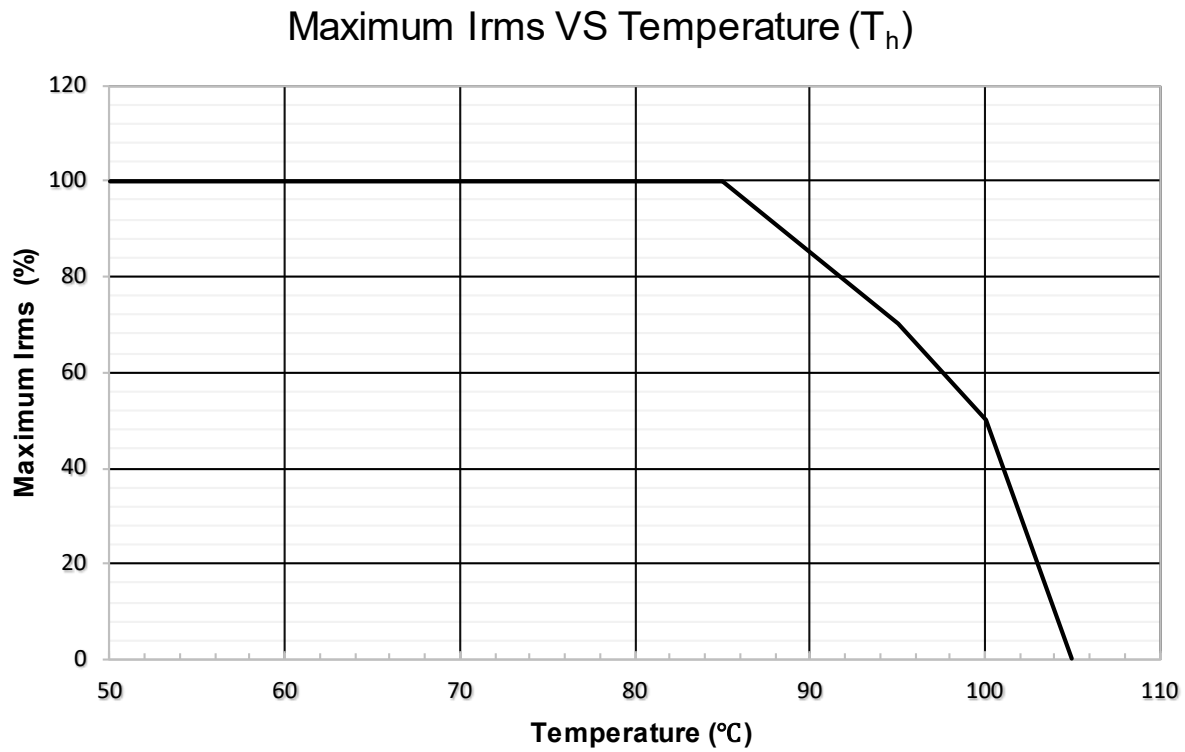
where C_n in Farad I_{rms} in Ampere f in Hertz
 V in Volt R_s in Ohm θ in °C
 R_{th} in °C/W

TYPICAL LIFETIME* CHARACTERISTICS

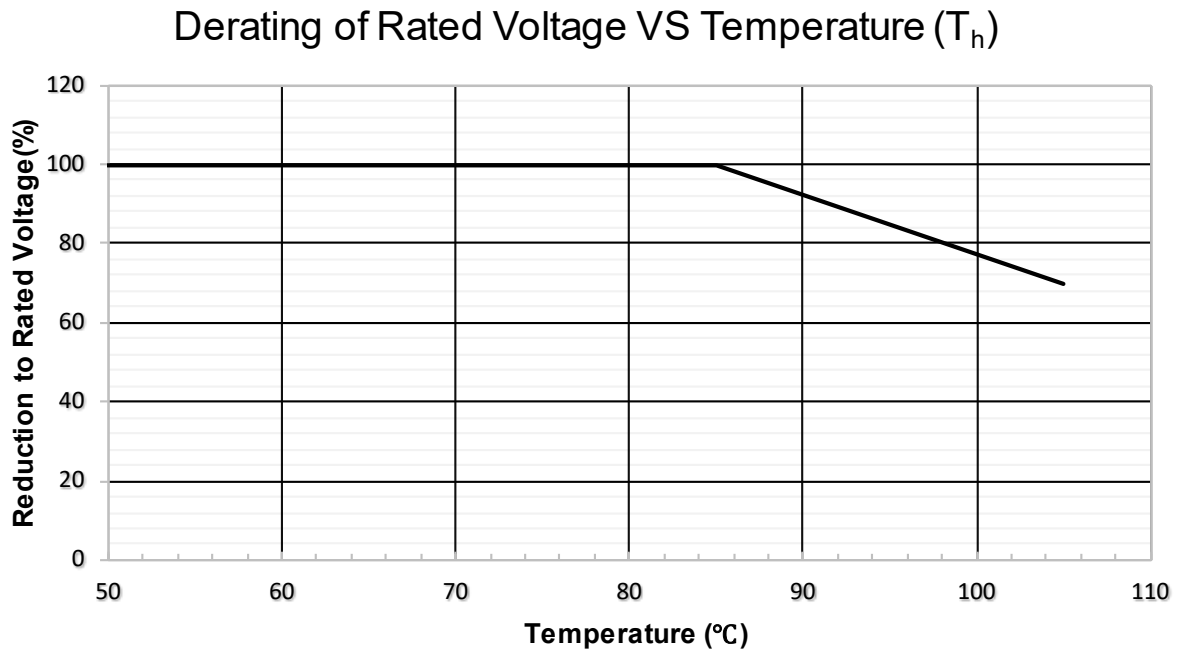


*Lifetime is the number of operating hours required for the capacitor to lose 3% of its initial value.

MAXIMUM IRMS VS TEMPERATURE



VOLTAGE VS TEMPERATURE



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POLYPROPYLENE DIELECTRIC FOR INDUSTRIAL DC FILTERING

These capacitors have been designed primarily for medium power automotive DC filtering applications.

ELECTRICAL CHARACTERISTICS – POLYPROPYLENE DIELECTRIC

Items	Characteristics
Application	DC Filtering / DC Link
Reference Standard	IEC 61071, IEC 60384-16, AEC-Q200D
Climatic Category	40/105/56 IEC 60068-1
Operating Temperature Range	-40~ +105°C (+85°C observing voltage must be de-rating at 1.35% per °C)
Upper Temperature Tmax	+85°C IEC 61071, Endurance Test Temperature
Lower Temperature Tmin	-40°C
Rated Voltage	450Vdc ~ 1200Vdc
Capacitance Range	1.0μF ~ 80μF
Capacitance Tolerance	±5% or ±10% at +25°C
Dissipation Factor (DF)	<= 0.002 (0.20%) at 1 KHz. C≤20μF at +25°C
	<= 0.003 (0.30%) at 1 KHz. C>20μF at +25°C
Test Voltage Between Terminals	1.5 x rated voltage for 10s (terminal to terminal)
Test Voltage Terminal to Case	3.0kVrms 50 Hz for 10 sec at +25°C
Insulation Resistance	IR x C≥30,000 Seconds at 100VDC 1 minute at +25°C
Life Expectancy	100,000 hours at Un @ Hot-Spot temperature T=+70°C
Protection	Solvent resistant plastic case UL94 V-0
	Thermosetting resin sealing UL 94 V-0 compliant
Installation	Any position
Leads	Tinned copper wires, standard lead wire length 5 ±1mm
Packaging	Packed in cardboard boxes with protection for the terminals
RoHS Compliant	Compliant with the restricted substance requirements of Directive 2002/95/EC
Storage Conditions	Storage time: ≤ 24 months from the date marked on the label package
	Temperature and relative humidity should be -10°C ~ +40°C and not more than 75%RH.
	RH ≤ 85% for 30 days randomly distributed throughout the year
Humidity Test	Test conditions & performance:
	Temperature: +40°C±2°C Relative humidity (RH) :93% ±2%
	Test duration: 56 days
	Capacitance change: ≤5% DF change (Δtgδ): ≤50 X 10 ⁻⁴ at 1KHz
	Insulation resistance: ≥50% of initial limit
Endurance Test	Test conditions & performance:
	Temperature: +85°C±2°C Voltage applied:1.3 X V _R (d.c.)
	Test duration: 1000 hours
	Capacitance change: ≤5% DF change (Δ tgδ): ≤50 X 10 ⁻⁴ at 1KHz
	Insulation resistance: ≥50% of initial limit
THB Test (Damp heat test with loading)	Test conditions & performance:
	Temperature: +85°C±2°C Relative humidity (RH) :85% ±2%
	Loading Voltage: Rated Voltage (DC)
	Test duration: 1000 hours
	Capacitance change: ≤5%

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CASE CODE

mm

Case Code	Dimensions				
	W ± 0.5	H ± 0.5	T ± 0.5	P1 ± 1.0	d ± 0.05
	mm	mm	mm	mm	mm
E1	32.0	20.0	11.0	27.5	0.8
E2	32.0	22.0	13.0	27.5	0.8
E4	32.0	28.0	18.0	27.5	0.8
EC	32.0	18.0	9.0	27.5	0.8
EE	32.0	24.5	15.0	27.5	0.8
EG	32.0	31.0	21.0	27.5	0.8
EI	32.0	35.0	20.0	27.5	0.8
F4	42.5	36.0	19.0	37.5	1.0
F5	42.5	38.0	20.0	37.5	1.0
F8	42.5	44.0	24.0	37.5	1.0
F9	42.5	45.0	30.0	37.5	1.0
G9	57.5	45.0	25.0	52.5	1.2
GA	57.5	45.0	30.0	52.5	1.2
GC	57.5	50.0	35.0	52.5	1.2

RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	AVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak Current	I _{rms}	ESR 10KHz	R _{th}	ESL	SPQ
					W ± 0.5	H ± 0.5	T ± 0.5	P1 ± 1.0	d ± 0.05							
uF	V				mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs
Voltage V_{ndc} 450V																
Voltage Code I																
1.0	450	FA27EC6I0105*C	I	EC	32.0	18.0	9.0	27.5	0.8	75	75	2.5	54.0	44.4	25	180
2.0	450	FA27EC6I0205*C	I	EC	32.0	18.0	9.0	27.5	0.8	75	150	3.0	34.5	48.3	25	180
3.0	450	FA27E16I0305*C	I	E1	32.0	20.0	11.0	27.5	0.8	75	225	4.0	23.0	40.8	25	150
4.0	450	FA27E16I0405*C	I	E1	32.0	20.0	11.0	27.5	0.8	75	300	4.0	20.5	45.7	25	150
5.0	450	FA27E26I0505*C	I	E2	32.0	22.0	13.0	27.5	0.8	75	375	5.0	16.5	36.4	25	120
6.0	450	FA27EE6I0605*C	I	EE	32.0	24.5	15.0	27.5	0.8	75	450	6.0	13.5	30.9	25	110
7.0	450	FA27EE6I0705*C	I	EE	32.0	24.5	15.0	27.5	0.8	75	525	6.5	11.5	30.9	25	110
8.0	450	FA27E46I0805*C	I	E4	32.0	28.0	18.0	27.5	0.8	75	600	8.5	8.5	24.4	25	90
9.0	450	FA27E46I0905*C	I	E4	32.0	28.0	18.0	27.5	0.8	75	675	8.5	9.0	23.1	25	90
10.0	450	FA27E46I0106*C	I	E4	32.0	28.0	18.0	27.5	0.8	75	750	9.0	8.0	23.1	25	90
12.0	450	FA27EG6I0126*C	I	EG	32.0	31.0	21.0	27.5	0.8	75	900	10.0	7.0	21.4	25	80
15.0	450	FA27EI6I0156*C	I	EI	32.0	35.0	20.0	27.5	0.8	75	1125	11.5	6.0	18.9	25	80
10.0	450	FA37F46I0106*C	I	F4	42.5	36.0	19.0	37.5	1.0	40	400	7.5	13.5	19.8	30	56
12.0	450	FA37F46I0126*C	I	F4	42.5	36.0	19.0	37.5	1.0	40	480	8.0	11.5	20.4	30	56
15.0	450	FA37F46I0156*C	I	F4	42.5	36.0	19.0	37.5	1.0	40	600	9.0	9.0	20.6	30	56
20.0	450	FA37F56I0206*C	I	F5	42.5	38.0	20.0	37.5	1.0	40	800	11.0	7.0	17.7	30	56
22.0	450	FA37F56I0226*C	I	F5	42.5	38.0	20.0	37.5	1.0	40	880	11.0	7.5	16.5	30	56
25.0	450	FA37F56I0256*C	I	F5	42.5	38.0	20.0	37.5	1.0	40	1000	11.5	6.5	17.4	30	56
30.0	450	FA37F86I0306*C	I	F8	42.5	44.0	24.0	37.5	1.0	40	1200	13.5	5.5	15.0	30	49
35.0	450	FA37F96I0356*C	I	F9	42.5	45.0	30.0	37.5	1.0	40	1400	17.0	4.0	13.0	30	35
40.0	450	FA37F96I0406*C	I	F9	42.5	45.0	30.0	37.5	1.0	40	1600	17.0	4.0	13.0	30	35
40.0	450	FA52G96I0406*C	I	G9	57.5	45.0	25.0	52.5	1.2	20	800	13.0	6.5	13.7	35	30
45.0	450	FA52G96I0456*C	I	G9	57.5	45.0	25.0	52.5	1.2	20	900	12.5	7.0	13.7	35	30
50.0	450	FA52GA6I0506*C	I	GA	57.5	45.0	30.0	52.5	1.2	20	1000	15.0	5.5	12.1	35	25
55.0	450	FA52GA6I0556*C	I	GA	57.5	45.0	30.0	52.5	1.2	20	1100	15.0	5.5	12.1	35	25
60.0	450	FA52GA6I0606*C	I	GA	57.5	45.0	30.0	52.5	1.2	20	1200	15.5	5.0	12.5	35	25
65.0	450	FA52GC6I0656*C	I	GC	57.5	50.0	35.0	52.5	1.2	20	1300	19.0	4.0	10.4	35	20
70.0	450	FA52GC6I0706*C	I	GC	57.5	50.0	35.0	52.5	1.2	20	1400	18.0	4.5	10.3	35	20
75.0	450	FA52GC6I0756*C	I	GC	57.5	50.0	35.0	52.5	1.2	20	1500	19.0	4.0	10.4	35	20
80.0	450	FA52GC6I0806*C	I	GC	57.5	50.0	35.0	52.5	1.2	20	1600	19.0	4.0	10.4	35	20
Voltage V_{ndc} 700V																
Voltage Code A																
1.0	700	FA27EC6A0105*C	A	EC	32.0	18.0	9.0	27.5	0.8	75	75	2.5	54.0	44.4	25	180
2.0	700	FA27EC6A0205*C	A	EC	32.0	18.0	9.0	27.5	0.8	75	150	3.0	34.5	48.3	25	180
3.0	700	FA27E16A0305*C	A	E1	32.0	20.0	11.0	27.5	0.8	75	225	4.0	23.0	40.8	25	150



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

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RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	AVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ					
					W ± 0.5	H ± 0.5	T ± 0.5	P1 ± 1.0	d ± 0.05												
uF	V				mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs					
4.0	700	FA27E26A0405*C	A	E2	32.0	22.0	13.0	27.5	0.8	75	300	5.0	17.0	35.3	25	120					
5.0	700	FA27EE6A0505*C	A	EE	32.0	24.5	15.0	27.5	0.8	75	375	6.0	14.0	29.8	25	110					
6.0	700	FA27E46A0605*C	A	E4	32.0	28.0	18.0	27.5	0.8	75	450	7.5	11.5	23.2	25	90					
7.0	700	FA27E46A0705*C	A	E4	32.0	28.0	18.0	27.5	0.8	75	525	8.0	10.0	23.4	25	90					
8.0	700	FA27E46A0805*C	A	E4	32.0	28.0	18.0	27.5	0.8	75	600	8.5	8.5	24.4	25	90					
9.0	700	FA27EG6A0905*C	A	EG	32.0	31.0	21.0	27.5	0.8	75	675	10.0	7.5	20.0	25	80					
10.0	700	FA27EG6A0106*C	A	EG	32.0	31.0	21.0	27.5	0.8	75	750	10.0	7.0	21.4	25	80					
12.0	700	FA27EI6A0126*C	A	EI	32.0	35.0	20.0	27.5	0.8	75	900	11.5	6.0	18.9	25	80					
10.0	700	FA37F46A0106*C	A	F4	42.5	36.0	19.0	37.5	1.0	40	400	7.5	13.5	19.8	30	56					
12.0	700	FA37F46A0126*C	A	F4	42.5	36.0	19.0	37.5	1.0	40	480	8.0	11.5	20.4	30	56					
15.0	700	FA37F46A0156*C	A	F4	42.5	36.0	19.0	37.5	1.0	40	600	9.0	9.0	20.6	30	56					
20.0	700	FA37F56A0206*C	A	F5	42.5	38.0	20.0	37.5	1.0	40	800	11.0	7.0	17.7	30	56					
22.0	700	FA37F86A0226*C	A	F8	42.5	44.0	24.0	37.5	1.0	40	880	13.0	6.0	14.8	30	49					
25.0	700	FA37F86A0256*C	A	F8	42.5	44.0	24.0	37.5	1.0	40	1000	13.5	5.5	15.0	30	49					
30.0	700	FA37F96A0306*C	A	F9	42.5	45.0	30.0	37.5	1.0	40	1200	16.0	4.5	13.0	30	35					
35.0	700	FA37F96A0356*C	A	F9	42.5	45.0	30.0	37.5	1.0	40	1400	17.0	4.0	13.0	30	35					
30.0	700	FA52G96A0306*C	A	G9	57.5	45.0	25.0	52.5	1.2	20	600	11.0	9.0	13.8	35	30					
35.0	700	FA52G96A0356*C	A	G9	57.5	45.0	25.0	52.5	1.2	20	700	12.0	7.5	13.9	35	30					
40.0	700	FA52G96A0406*C	A	G9	57.5	45.0	25.0	52.5	1.2	20	800	13.0	6.5	13.7	35	30					
45.0	700	FA52GA6A0456*C	A	GA	57.5	45.0	30.0	52.5	1.2	20	900	14.5	6.0	11.9	35	25					
50.0	700	FA52GA6A0506*C	A	GA	57.5	45.0	30.0	52.5	1.2	20	1000	15.0	5.5	12.1	35	25					
55.0	700	FA52GC6A0556*C	A	GC	57.5	50.0	35.0	52.5	1.2	20	1100	17.0	5.0	10.4	35	20					
60.0	700	FA52GC6A0606*C	A	GC	57.5	50.0	35.0	52.5	1.2	20	1200	18.0	4.5	10.3	35	20					
65.0	700	FA52GC6A0656*C	A	GC	57.5	50.0	35.0	52.5	1.2	20	1300	19.0	4.0	10.4	35	20					
Voltage Vndc 800V																					
					Voltage Code B																
1.0	800	FA27EC6B0105*C	B	EC	32.0	18.0	9.0	27.5	0.8	75	75	2.0	62.5	60.0	25	180					
2.0	800	FA27E16B0205*C	B	E1	32.0	20.0	11.0	27.5	0.8	75	150	3.5	31.0	39.5	25	150					
3.0	800	FA27E26B0305*C	B	E2	32.0	22.0	13.0	27.5	0.8	75	225	4.5	21.0	35.3	25	120					
4.0	800	FA27EE6B0405*C	B	EE	32.0	24.5	15.0	27.5	0.8	75	300	5.5	15.5	32.0	25	110					
5.0	800	FA27E46B0505*C	B	E4	32.0	28.0	18.0	27.5	0.8	75	375	7.0	12.5	24.5	25	90					
6.0	800	FA27E46B0605*C	B	E4	32.0	28.0	18.0	27.5	0.8	75	450	7.5	10.5	25.4	25	90					
7.0	800	FA27EG6B0705*C	B	EG	32.0	31.0	21.0	27.5	0.8	75	525	9.0	9.0	20.6	25	80					
8.0	800	FA27EG6B0805*C	B	EG	32.0	31.0	21.0	27.5	0.8	75	600	9.5	8.0	20.8	25	80					
9.0	800	FA27E16B0905*C	B	EI	32.0	35.0	20.0	27.5	0.8	75	675	10.0	8.0	18.8	25	80					
10.0	800	FA37F46B0106*C	B	F4	42.5	36.0	19.0	37.5	1.0	40	400	8.0	12.5	18.8	30	56					
12.0	800	FA37F46B0126*C	B	F4	42.5	36.0	19.0	37.5	1.0	40	480	8.5	10.5	19.8	30	56					
15.0	800	FA37F56B0156*C	B	F5	42.5	38.0	20.0	37.5	1.0	40	600	10.0	8.5	17.6	30	56					
20.0	800	FA37F86B0206*C	B	F8	42.5	44.0	24.0	37.5	1.0	40	800	13.0	6.0	14.8	30	49					
22.0	800	FA37F96B0226*C	B	F9	42.5	45.0	30.0	37.5	1.0	40	880	14.5	5.5	13.0	30	35					
25.0	800	FA37F96B0256*C	B	F9	42.5	45.0	30.0	37.5	1.0	40	1000	15.5	5.0	12.5	30	35					
30.0	800	FA52G96B0306*C	B	G9	57.5	45.0	25.0	52.5	1.2	10	300	12.0	8.0	13.0	35	30					
35.0	800	FA52GA6B0356*C	B	GA	57.5	45.0	30.0	52.5	1.2	10	350	13.0	7.0	12.7	35	25					
40.0	800	FA52GA6B0406*C	B	GA	57.5	45.0	30.0	52.5	1.2	10	400	14.5	6.0	11.9	35	25					
45.0	800	FA52GC6B0456*C	B	GC	57.5	50.0	35.0	52.5	1.2	10	450	16.0	5.5	10.7	35	20					
50.0	800	FA52GC6B0506*C	B	GC	57.5	50.0	35.0	52.5	1.2	10	500	17.0	5.0	10.4	35	20					
Voltage Vndc 900V																					
					Voltage Code C																
1.0	900	FA27EC6C0105*C	C	EC	32.0	18.0	9.0	27.5	0.8	40	40	2.0	63.0	59.5	25	180					
2.0	900	FA27E26C0205*C	C	E2	32.0	22.0	13.0	27.5	0.8	80	160	3.5	32.0	38.3	25	120					
3.0	900	FA27EE6C0305*C	C	EE	32.0	24.5	15.0	27.5	0.8	80	240	5.0	21.0	28.6	25	110					
4.0	900	FA27E46C0405*C	C	E4	32.0	28.0	18.0	27.5	0.8	80	320	6.0	16.0	26.0	25	90					
5.0	900	FA27EG6C0505*C	C	EG	32.0	31.0	21.0	27.5	0.8	80	400	7.5	13.0	20.5	25	80					
6.0	900	FA27EG6C0605*C	C	EG	32.0	31.0	21.0	27.5	0.8	80	480	8.5	10.0	20.8	25	80					
7.0	900	FA27E16C0705*C	C	EI	32.0	35.0	20.0	27.5	0.8	80	560	9.0	9.0	20.6	25	80					
5.0	900	FA37F46C0505*C	C	F4	42.5	36.0	19.0	37.5	1.0	20	100	6.0	21.0	19.8	30	56					
6.0	900	FA37F46C0605*C	C	F4	42.5	36.0	19.0	37.5	1.0	40	240	6.5	18.0	19.7	30	56					
7.0	900	FA37F46C0705*C	C	F4	42.5	36.0	19.0	37.5	1.0	40	280	6.5	18.0	19.7	30	56					
8.0	900	FA37F46C0805*C	C	F4	42.5	36.0	19.0	37.5	1.0	40	320	7.0	16.0	19.1	30	56					
9.0	900	FA37F46C0905*C	C	F4	42.5	36.0	19.0	37.5	1.0	40	360	7.5	14.0	19.0	30	56					
10.0	900	FA37F56C0106*C	C	F5	42.5	38.0	20.0	37.5	1.0	40	400	8.5	12.0	17.3	30	56					



DC FILTERING

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RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	AVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak Current	I _{rms}	ESR 10KHz	R _{th}	ESL	SPQ
					W ± 0.5	H ± 0.5	T ± 0.5	P1 ± 1.0	d ± 0.05							
uF	V				mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs
12.0	900	FA37F56C0126*C	C	F5	42.5	38.0	20.0	37.5	1.0	40	480	9.5	10.0	16.6	30	56
15.0	900	FA37F86C0156*C	C	F8	42.5	44.0	24.0	37.5	1.0	40	600	11.0	8.0	15.5	30	49
16.0	900	FA37F86C0166*C	C	F8	42.5	44.0	24.0	37.5	1.0	40	640	11.0	8.0	15.5	30	49
20.0	900	FA37F96C0206*C	C	F9	42.5	45.0	30.0	37.5	1.0	40	800	14.0	6.0	12.8	30	35
15.0	900	FA52G96C0156*C	C	G9	57.5	45.0	25.0	52.5	1.2	20	300	9.0	14.0	13.2	35	30
20.0	900	FA52G96C0206*C	C	G9	57.5	45.0	25.0	52.5	1.2	20	400	9.5	12.0	13.9	35	30
22.0	900	FA52G96C0226*C	C	G9	57.5	45.0	25.0	52.5	1.2	20	440	10.0	11.0	13.6	35	30
25.0	900	FA52GA6C0256*C	C	GA	57.5	45.0	30.0	52.5	1.2	20	500	11.0	10.0	12.4	35	25
30.0	900	FA52GA6C0306*C	C	GA	57.5	45.0	30.0	52.5	1.2	20	600	12.5	8.0	12.0	35	25
35.0	900	FA52GC6C0356*C	C	GC	57.5	50.0	35.0	52.5	1.2	20	700	14.5	7.0	10.2	35	20
40.0	900	FA52GC6C0406*C	C	GC	57.5	50.0	35.0	52.5	1.2	20	800	15.5	6.0	10.4	35	20
Voltage V_{ndc} 1100V					Voltage Code L											
1.0	1100	FA27E16L0105*C	L	E1	32.0	20.0	11.0	27.5	0.8	95	95	3.0	45.5	36.6	25	150
2.0	1100	FA27EE6L0205*C	L	EE	32.0	24.5	15.0	27.5	0.8	95	190	4.5	23.0	32.2	25	110
3.0	1100	FA27E46L0305*C	L	E4	32.0	28.0	18.0	27.5	0.8	95	285	6.0	15.5	26.9	25	90
4.0	1100	FA27EG6L0405*C	L	EG	32.0	31.0	21.0	27.5	0.8	95	380	8.0	11.5	20.4	25	80
5.0	1100	FA27E16L0505*C	L	E1	32.0	35.0	20.0	27.5	0.8	95	475	9.0	9.5	19.5	25	80
5.0	1100	FA37F46L0505*C	L	F4	42.5	36.0	19.0	37.5	1.0	45	225	6.5	18.0	19.7	30	56
6.0	1100	FA37F46L0605*C	L	F4	42.5	36.0	19.0	37.5	1.0	45	270	7.0	15.0	20.4	30	56
7.0	1100	FA37F56L0705*C	L	F5	42.5	38.0	20.0	37.5	1.0	45	315	8.0	13.0	18.0	30	56
8.0	1100	FA37F56L0805*C	L	F5	42.5	38.0	20.0	37.5	1.0	45	360	9.0	11.0	16.8	30	56
9.0	1100	FA37F86L0905*C	L	F8	42.5	44.0	24.0	37.5	1.0	45	405	10.0	10.0	15.0	30	49
10.0	1100	FA37F86L0106*C	L	F8	42.5	44.0	24.0	37.5	1.0	45	450	10.5	9.0	15.1	30	49
12.0	1100	FA37F96L0126*C	L	F9	42.5	45.0	30.0	37.5	1.0	45	540	12.5	7.5	12.8	30	35
10.0	1100	FA52G96L0106*C	L	G9	57.5	45.0	25.0	52.5	1.2	23	230	8.0	18.0	13.0	35	30
12.0	1100	FA52G96L0126*C	L	G9	57.5	45.0	25.0	52.5	1.2	23	276	8.5	15.0	13.8	35	30
15.0	1100	FA52G96L0156*C	L	G9	57.5	45.0	25.0	52.5	1.2	23	345	9.5	12.0	13.9	35	30
20.0	1100	FA52GA6L0206*C	L	GA	57.5	45.0	30.0	52.5	1.2	23	460	11.5	9.0	12.6	35	25
22.0	1100	FA52GC6L0226*C	L	GC	57.5	50.0	35.0	52.5	1.2	23	506	13.5	8.0	10.3	35	20
25.0	1100	FA52GC6L0256*C	L	GC	57.5	50.0	35.0	52.5	1.2	23	575	14.5	7.0	10.2	35	20
Voltage V_{ndc} 1200V					Voltage Code P											
1.0	1200	FA27E16P0105*C	P	E1	32.0	20.0	11.0	27.5	0.8	100	100	3.0	43.0	38.8	25	150
2.0	1200	FA27EE6P0205*C	P	EE	32.0	24.5	15.0	27.5	0.8	100	200	5.0	21.5	27.9	25	110
3.0	1200	FA27E46P0305*C	P	E4	32.0	28.0	18.0	27.5	0.8	100	300	6.5	14.5	24.5	25	90
4.0	1200	FA27EG6P0405*C	P	EG	32.0	31.0	21.0	27.5	0.8	100	400	8.0	11.0	21.3	25	80
5.0	1200	FA37F46P0505*C	P	F4	42.5	36.0	19.0	37.5	1.0	48	240	6.5	17.0	20.9	30	56
6.0	1200	FA37F46P0605*C	P	F4	42.5	36.0	19.0	37.5	1.0	48	288	7.5	14.0	19.0	30	56
7.0	1200	FA37F56P0705*C	P	F5	42.5	38.0	20.0	37.5	1.0	48	336	8.5	12.0	17.3	30	56
8.0	1200	FA37F56P0805*C	P	F5	42.5	38.0	20.0	37.5	1.0	48	384	9.0	10.5	17.6	30	56
9.0	1200	FA37F86P0905*C	P	F8	42.5	44.0	24.0	37.5	1.0	48	432	10.5	9.5	14.3	30	49
10.0	1200	FA37F86P0106*C	P	F8	42.5	44.0	24.0	37.5	1.0	48	480	11.0	8.5	14.6	30	49
12.0	1200	FA37F96P0126*C	P	F9	42.5	45.0	30.0	37.5	1.0	48	576	13.0	7.0	12.7	30	35
10.0	1200	FA52G96P0106*C	P	G9	57.5	45.0	25.0	52.5	1.2	24	240	8.0	17.0	13.8	35	30
12.0	1200	FA52G96P0126*C	P	G9	57.5	45.0	25.0	52.5	1.2	24	288	9.0	14.0	13.2	35	30
15.0	1200	FA52G96P0156*C	P	G9	57.5	45.0	25.0	52.5	1.2	24	360	10.0	11.0	13.6	35	30
20.0	1200	FA52GC6P0206*C	P	GC	57.5	50.0	35.0	52.5	1.2	24	480	13.0	8.5	10.4	35	20
22.0	1200	FA52GC6P0226*C	P	GC	57.5	50.0	35.0	52.5	1.2	24	528	14.0	7.5	10.2	35	20
25.0	1200	FA52GC6P0256*C	P	GC	57.5	50.0	35.0	52.5	1.2	24	600	15.0	6.5	10.3	35	20



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POLYPROPYLENE DIELECTRIC FOR INDUSTRIAL DC FILTERING

These capacitors have been designed primarily for medium power automotive DC filtering applications.

ELECTRICAL CHARACTERISTICS – POLYPROPYLENE DIELECTRIC

Items	Characteristics
Application	DC Filtering / DC Link
Reference Standard	IEC 61071, IEC 60384-16, AEC-Q200D
Climatic Category	40/105/56 IEC 60068-1
Operating Temperature Range	-40~ +105°C (+85°C observing voltage must be de-rating at 1.35% per °C)
Upper Temperature Tmax	+85°C IEC 61071, Endurance Test Temperature
Lower Temperature Tmin	-40°C
Rated Voltage	450Vdc ~ 1200Vdc
Capacitance Range	5μF ~ 400μF
Capacitance Tolerance	±5% or ±10% at +25°C
Dissipation Factor (DF)	≤ 0.002 (0.20%) at 1 KHz. C≤20μF at +25°C
	≤ 0.003 (0.30%) at 1 KHz. C>20μF at +25°C
Test Voltage Between Terminals	1.5 x rated voltage for 10s (terminal to terminal)
Test Voltage Terminal to Case	3.0kVrms 50 Hz for 10 sec at +25°C
Insulation Resistance	IR x C≥30,000 Seconds at 100VDC 1 minute at +25°C
Life Expectancy	100,000 hours at Un @ Hot-Spot temperature T=+70°C
Protection	Solvent resistant plastic case UL94 V-0
	Thermosetting resin sealing UL 94 V-0 compliant
Installation	Any position
Leads	Tinned copper wires, standard lead wire length 5 ±1mm
Packaging	Packed in cardboard boxes with protection for the terminals
RoHS Compliant	Compliant with the restricted substance requirements of Directive 2002/95/EC
Storage Conditions	Storage time: ≤ 24 months from the date marked on the label package
	Temperature and relative humidity should be -10°C ~ +40°C and not more than 75%RH.
	RH ≤ 85% for 30 days randomly distributed throughout the year
Humidity Test	Test conditions & performance:
	Temperature: +40°C±2°C Relative humidity (RH): 93% ±2%
	Test duration: 56 days
	Capacitance change: ≤5% DF change (Δtgδ): ≤50 X 10 ⁻⁴ at 1KHz
	Insulation resistance: ≥50% of initial limit
Endurance Test	Test conditions & performance:
	Temperature: +85°C±2°C Voltage applied: 1.3 X V _R (d.c.)
	Test duration: 1000 hours
	Capacitance change: ≤5% DF change (Δ tgδ): ≤50 X 10 ⁻⁴ at 1KHz
	Insulation resistance: ≥50% of initial limit
THB Test (Damp heat test with loading)	Test conditions & performance:
	Temperature: +85°C±2°C Relative humidity (RH): 85% ±2%
	Loading Voltage: Rated Voltage (DC)
	Test duration: 1000 hours
	Capacitance change: ≤5%

DC FILTERING

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CASE CODE

mm

Case Code	Dimensions					
	W ± 0.5	H ± 0.5	T ± 0.5	P1 ± 1.0	P2 ± 0.05	d ± 0.05
	mm	mm	mm	mm	mm	mm
F4	42.5	36.0	19.0	37.5	10.2	1.2
F5	42.5	38.0	20.0	37.5	10.2	1.2
F8	42.5	44.0	24.0	37.5	10.2	1.2
F9	42.5	45.0	30.0	37.5	20.3	1.2
G9	57.5	45.0	25.0	52.5	10.2	1.2
GA	57.5	45.0	30.0	52.5	20.3	1.2
GB	57.5	45.0	45.0	52.5	20.3	1.2
GC	57.5	50.0	35.0	52.5	20.3	1.2
GG	57.5	65.0	130.0	52.5	20.3	1.2
GJ	57.5	65.0	70.0	52.5	20.3	1.2

RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	AVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ
					W ± 0.5	H ± 0.5	T ± 0.5	P1 ± 1.0	P2 ± 1.0	d ± 0.05							
					mm	mm	mm	mm	mm	mm							
Voltage Vndc 450V																	
Voltage Code I																	
10.0	450	FQ37F46I0106*A	I	F4	42.5	36.0	19.0	37.5	10.2	1.2	40	400	8.0	12.0	19.5	30	56
12.0	450	FQ37F46I0126*A	I	F4	42.5	36.0	19.0	37.5	10.2	1.2	40	480	8.5	10.0	20.8	30	56
15.0	450	FQ37F46I0156*A	I	F4	42.5	36.0	19.0	37.5	10.2	1.2	40	600	10.0	8.0	18.8	30	56
20.0	450	FQ37F56I0206*A	I	F5	42.5	38.0	20.0	37.5	10.2	1.2	40	800	12.0	6.0	17.4	30	56
22.0	450	FQ37F56I0226*A	I	F5	42.5	38.0	20.0	37.5	10.2	1.2	40	880	11.5	6.5	17.4	30	56
25.0	450	FQ37F56I0256*A	I	F5	42.5	38.0	20.0	37.5	10.2	1.2	40	1000	12.5	5.5	17.5	30	56
30.0	450	FQ37F86I0306*A	I	F8	42.5	44.0	24.0	37.5	10.2	1.2	40	1200	15.0	4.5	14.8	30	49
35.0	450	FQ37F96I0356*B	I	F9	42.5	45.0	30.0	37.5	20.3	1.2	40	1400	18.5	3.5	12.5	30	35
40.0	450	FQ37F96I0406*B	I	F9	42.5	45.0	30.0	37.5	20.3	1.2	40	1600	18.5	3.5	12.5	30	35
40.0	450	FQ52G96I0406*A	I	G9	57.5	45.0	25.0	52.5	10.2	1.2	20	800	13.5	6.0	13.7	35	30
45.0	450	FQ52G96I0456*A	I	G9	57.5	45.0	25.0	52.5	10.2	1.2	20	900	13.5	6.0	13.7	35	30
50.0	450	FQ52GA6I0506*B	I	GA	57.5	45.0	30.0	52.5	20.3	1.2	20	1000	15.5	5.0	12.5	35	25
55.0	450	FQ52GA6I0556*B	I	GA	57.5	45.0	30.0	52.5	20.3	1.2	20	1100	15.5	5.0	12.5	35	25
60.0	450	FQ52GA6I0606*B	I	GA	57.5	45.0	30.0	52.5	20.3	1.2	20	1200	16.5	4.5	12.2	35	25
65.0	450	FQ52GC6I0656*B	I	GC	57.5	50.0	35.0	52.5	20.3	1.2	20	1300	20.5	3.5	10.2	35	20
70.0	450	FQ52GC6I0706*B	I	GC	57.5	50.0	35.0	52.5	20.3	1.2	20	1400	19.0	4.0	10.4	35	20
75.0	450	FQ52GC6I0756*B	I	GC	57.5	50.0	35.0	52.5	20.3	1.2	20	1500	20.5	3.5	10.2	35	20
80.0	450	FQ52GC6I0806*B	I	GC	57.5	50.0	35.0	52.5	20.3	1.2	20	1600	20.5	3.5	10.2	35	20
90.0	450	FQ52GB6I0906*B	I	GB	57.5	45.0	45.0	52.5	20.3	1.2	20	1800	21.5	3.0	10.8	35	15
95.0	450	FQ52GB6I0956*B	I	GB	57.5	45.0	45.0	52.5	20.3	1.2	20	1900	21.5	3.0	10.8	35	15
100.0	450	FQ52GB6I0107*B	I	GB	57.5	45.0	45.0	52.5	20.3	1.2	20	2000	23.5	2.5	10.9	35	15
200.0	450	FQ52GJ6I0207*D	I	GJ	57.5	65.0	70.0	52.5	20.3	1.2	20	2000	30.5	2.0	8.1	35	10
400.0	450	FQ52GG6I0407*E	I	GG	57.5	65.0	130.0	52.5	20.3	1.2	10	4000	50.5	1.5	3.9	35	5
Voltage Vndc 700V																	
Voltage Code A																	
10.0	700	FQ37F46A0106*A	A	F4	42.5	36.0	19.0	37.5	10.2	1.2	40	400	8.0	12.0	19.5	30	56
12.0	700	FQ37F46A0126*A	A	F4	42.5	36.0	19.0	37.5	10.2	1.2	40	480	8.5	10.0	20.8	30	56
15.0	700	FQ37F46A0156*A	A	F4	42.5	36.0	19.0	37.5	10.2	1.2	40	600	10.0	8.0	18.8	30	56
20.0	700	FQ37F56A0206*A	A	F5	42.5	38.0	20.0	37.5	10.2	1.2	40	800	12.0	6.0	17.4	30	56
22.0	700	FQ37F86A0226*A	A	F8	42.5	44.0	24.0	37.5	10.2	1.2	40	880	13.5	5.5	15.0	30	49
25.0	700	FQ37F86A0256*A	A	F8	42.5	44.0	24.0	37.5	10.2	1.2	40	1000	14.5	5.0	14.3	30	49
30.0	700	FQ37F96A0306*B	A	F9	42.5	45.0	30.0	37.5	20.3	1.2	40	1200	17.0	4.0	13.0	30	35
35.0	700	FQ37F96A0356*B	A	F9	42.5	45.0	30.0	37.5	20.3	1.2	40	1400	18.5	3.5	12.5	30	35
30.0	700	FQ52G96A0306*A	A	G9	57.5	45.0	25.0	52.5	10.2	1.2	20	600	12.0	8.0	13.0	35	30
35.0	700	FQ52G96A0356*A	A	G9	57.5	45.0	25.0	52.5	10.2	1.2	20	700	12.5	7.0	13.7	35	30
40.0	700	FQ52G96A0406*A	A	G9	57.5	45.0	25.0	52.5	10.2	1.2	20	800	13.5	6.0	13.7	35	30
45.0	700	FQ52GA6A0456*B	A	GA	57.5	45.0	30.0	52.5	20.3	1.2	20	900	15.0	5.5	12.1	35	25
50.0	700	FQ52GA6A0506*B	A	GA	57.5	45.0	30.0	52.5	20.3	1.2	20	1000	15.5	5.0	12.5	35	25
55.0	700	FQ52GC6A0556*B	A	GC	57.5	50.0	35.0	52.5	20.3	1.2	20	1100	18.0	4.5	10.3	35	20
60.0	700	FQ52GC6A0606*B	A	GC	57.5	50.0	35.0	52.5	20.3	1.2	20	1200	19.0	4.0	10.4	35	20



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RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	AVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	I _{rms}	ESR 10KHz	R _{th}	ESL	SPQ						
					W	H	T	P1	P2	d													
					± 0.5	± 0.5	± 0.5	± 1.0	± 1.0	± 0.05													
µF	V				mm	mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs						
65.0	700	FQ52GC6A0656*B	A	GC	57.5	50.0	35.0	52.5	20.3	1.2	20	1300	20.5	3.5	10.2	35	20						
70.0	700	FQ52GB6A0706*B	A	GB	57.5	45.0	45.0	52.5	20.3	1.2	20	1400	20.0	3.5	10.7	35	15						
75.0	700	FQ52GB6A0756*B	A	GB	57.5	45.0	45.0	52.5	20.3	1.2	20	1500	21.5	3.0	10.8	35	15						
80.0	700	FQ52GB6A0806*B	A	GB	57.5	45.0	45.0	52.5	20.3	1.2	20	1600	21.5	3.0	10.8	35	15						
160.0	700	FQ52GJ6A0167*D	A	GJ	57.5	65.0	70.0	52.5	20.3	1.2	20	3200	30.5	2.5	6.4	35	10						
320.0	700	FQ52GG6A0327*E	A	GG	57.5	65.0	130.0	52.5	20.3	1.2	20	6400	54.0	1.3	4.0	35	5						
Voltage V_{ndc} 900V																							
					Voltage Code C																		
10.0	800	FQ37F46B0106*A	B	F4	42.5	36.0	19.0	37.5	10.2	1.2	40	400	8.5	11.0	18.9	30	56						
12.0	800	FQ37F46B0126*A	B	F4	42.5	36.0	19.0	37.5	10.2	1.2	40	480	9.0	9.0	20.6	30	56						
15.0	800	FQ37F56B0156*A	B	F5	42.5	38.0	20.0	37.5	10.2	1.2	40	600	11.0	7.5	16.5	30	56						
20.0	800	FQ37F86B0206*A	B	F8	42.5	44.0	24.0	37.5	10.2	1.2	40	800	13.5	5.5	15.0	30	49						
22.0	800	FQ37F96B0226*B	B	F9	42.5	45.0	30.0	37.5	20.3	1.2	40	880	15.5	5.0	12.5	30	35						
25.0	800	FQ37F96B0256*B	B	F9	42.5	45.0	30.0	37.5	20.3	1.2	40	1000	16.0	4.5	13.0	30	35						
30.0	800	FQ52G96B0306*A	B	G9	57.5	45.0	25.0	52.5	10.2	1.2	10	300	12.0	7.5	13.9	35	30						
35.0	800	FQ52GA6B0356*B	B	GA	57.5	45.0	30.0	52.5	20.3	1.2	10	350	14.5	6.0	11.9	35	25						
40.0	800	FQ52GA6B0406*B	B	GA	57.5	45.0	30.0	52.5	20.3	1.2	10	400	15.0	5.5	12.1	35	25						
45.0	800	FQ52GC6B0456*B	B	GC	57.5	50.0	35.0	52.5	20.3	1.2	10	450	17.0	5.0	10.4	35	20						
50.0	800	FQ52GC6B0506*B	B	GC	57.5	50.0	35.0	52.5	20.3	1.2	10	500	18.0	4.5	10.3	35	20						
55.0	800	FQ52GB6B0556*B	B	GB	57.5	45.0	45.0	52.5	20.3	1.2	10	550	18.5	4.0	11.0	35	15						
60.0	800	FQ52GB6B0606*B	B	GB	57.5	45.0	45.0	52.5	20.3	1.2	10	600	20.0	3.5	10.7	35	15						
120.0	800	FQ52GJ6B0127*D	B	GJ	57.5	65.0	70.0	52.5	20.3	1.2	10	1200	27.0	3.2	6.4	35	10						
240.0	800	FQ52GG6B0247*E	B	GG	57.5	65.0	130.0	52.5	20.3	1.2	10	2400	48.5	1.6	4.0	35	5						
Voltage V_{ndc} 1100V																							
					Voltage Code L																		
5.0	1100	FQ37F46L0505*A	L	F4	42.5	36.0	19.0	37.5	10.2	1.2	45	225	7.0	16.0	19.1	30	56						
6.0	1100	FQ37F46L0605*A	L	F4	42.5	36.0	19.0	37.5	10.2	1.2	45	270	7.5	13.5	19.8	30	56						
7.0	1100	FQ37F56L0705*A	L	F5	42.5	38.0	20.0	37.5	10.2	1.2	45	315	8.5	11.5	18.1	30	56						
8.0	1100	FQ37F56L0805*A	L	F5	42.5	38.0	20.0	37.5	10.2	1.2	45	360	9.5	10.0	16.6	30	56						
9.0	1100	FQ37F86L0905*A	L	F8	42.5	44.0	24.0	37.5	10.2	1.2	45	405	10.5	9.0	15.1	30	49						
10.0	1100	FQ37F86L0106*A	L	F8	42.5	44.0	24.0	37.5	10.2	1.2	45	450	11.0	8.0	15.5	30	49						
12.0	1100	FQ37F96L0126*B	L	F9	42.5	45.0	30.0	37.5	20.3	1.2	45	540	13.5	6.5	12.7	30	35						
10.0	1100	FQ52G96L0106*A	L	G9	57.5	45.0	25.0	52.5	10.2	1.2	23	230	8.5	16.0	13.0	35	30						
12.0	1100	FQ52G96L0126*A	L	G9	57.5	45.0	25.0	52.5	10.2	1.2	23	276	9.0	13.0	14.2	35	30						
15.0	1100	FQ52G96L0156*A	L	G9	57.5	45.0	25.0	52.5	10.2	1.2	23	345	10.5	10.5	13.0	35	30						
20.0	1100	FQ52GA6L0206*B	L	GA	57.5	45.0	30.0	52.5	20.3	1.2	23	460	12.5	8.0	12.0	35	25						
22.0	1100	FQ52GC6L0226*B	L	GC	57.5	50.0	35.0	52.5	20.3	1.2	23	506	14.5	7.0	10.2	35	20						
25.0	1100	FQ52GC6L0256*B	L	GC	57.5	50.0	35.0	52.5	20.3	1.2	23	575	15.0	6.5	10.3	35	20						
30.0	1100	FQ52GB6L0306*B	L	GB	57.5	45.0	45.0	52.5	20.3	1.2	23	690	16.5	5.0	11.0	35	15						
60.0	1100	FQ52GJ6L0606*D	L	GJ	57.5	65.0	70.0	52.5	20.3	1.2	23	1380	40.0	2.5	3.8	35	10						
70.0	1100	FQ52GJ6L0706*D	L	GJ	57.5	65.0	70.0	52.5	20.3	1.2	23	1610	34.5	2.0	6.3	35	10						
120.0	1100	FQ52GG6L0127*E	L	GG	57.5	65.0	130.0	52.5	20.3	1.2	23	2760	39.5	2.4	4.0	35	5						
140.0	1100	FQ52GG6L0147*E	L	GG	57.5	65.0	130.0	52.5	20.3	1.2	23	3220	43.5	2.0	4.0	35	5						
Voltage V_{ndc} 1200V																							
					Voltage Code P																		
5.0	1200	FQ37F46P0505*A	P	F4	42.5	36.0	19.0	37.5	10.2	1.2	48	240	7.0	15.0	20.4	30	56						
6.0	1200	FQ37F46P0605*A	P	F4	42.5	36.0	19.0	37.5	10.2	1.2	48	288	8.0	12.5	18.8	30	56						
7.0	1200	FQ37F56P0705*A	P	F5	42.5	38.0	20.0	37.5	10.2	1.2	48	336	9.0	11.0	16.8	30	56						
8.0	1200	FQ37F56P0805*A	P	F5	42.5	38.0	20.0	37.5	10.2	1.2	48	384	9.5	9.5	17.5	30	56						
9.0	1200	FQ37F86P0905*A	P	F8	42.5	44.0	24.0	37.5	10.2	1.2	48	432	11.0	8.5	14.6	30	49						
10.0	1200	FQ37F86P0106*A	P	F8	42.5	44.0	24.0	37.5	10.2	1.2	48	480	11.5	7.5	15.1	30	49						
12.0	1200	FQ37F96P0126*B	P	F9	42.5	45.0	30.0	37.5	20.3	1.2	48	576	13.5	6.5	12.7	30	35						
10.0	1200	FQ52G96P0106*A	P	G9	57.5	45.0	25.0	52.5	10.2	1.2	24	240	8.5	15.0	13.8	35	30						
12.0	1200	FQ52G96P0126*A	P	G9	57.5	45.0	25.0	52.5	10.2	1.2	24	288	9.5	12.5	13.3	35	30						
15.0	1200	FQ52G96P0156*A	P	G9	57.5	45.0	25.0	52.5	10.2	1.2	24	360	10.5	10.0	13.6	35	30						
20.0	1200	FQ52GC6P0206*B	P	GC	57.5	50.0	35.0	52.5	20.3	1.2	24	480	14.0	7.5	10.2	35	20						
22.0	1200	FQ52GC6P0226*B	P	GC	57.5	50.0	35.0	52.5	20.3	1.2	24	528	14.5	7.0	10.2	35	20						
25.0	1200	FQ52GC6P0256*B	P	GC	57.5	50.0	35.0	52.5	20.3	1.2	24	600	15.5	6.0	10.4	35	20						
30.0	1200	FQ52GB6P0306*B	P	GB	57.5	45.0	45.0	52.5	20.3	1.2	24	720	16.5	5.0	11.0	35	15						
60.0	1200	FQ52GJ6P0606*D	P	GJ	57.5	65.0	70.0	52.5	20.3	1.2	24	1440	23.0	4.5	6.3	35	10						
120.0	1200	FQ52GG6P0127*E	P	GG	57.5	65.0	130.0	52.5	20.3	1.2	24	2880	40.5	2.3	4.0	35	5						

