

Type 947D Polypropylene, High Energy Density, DC Link Capacitors

High Current, High Capacitance for Inverter Applications



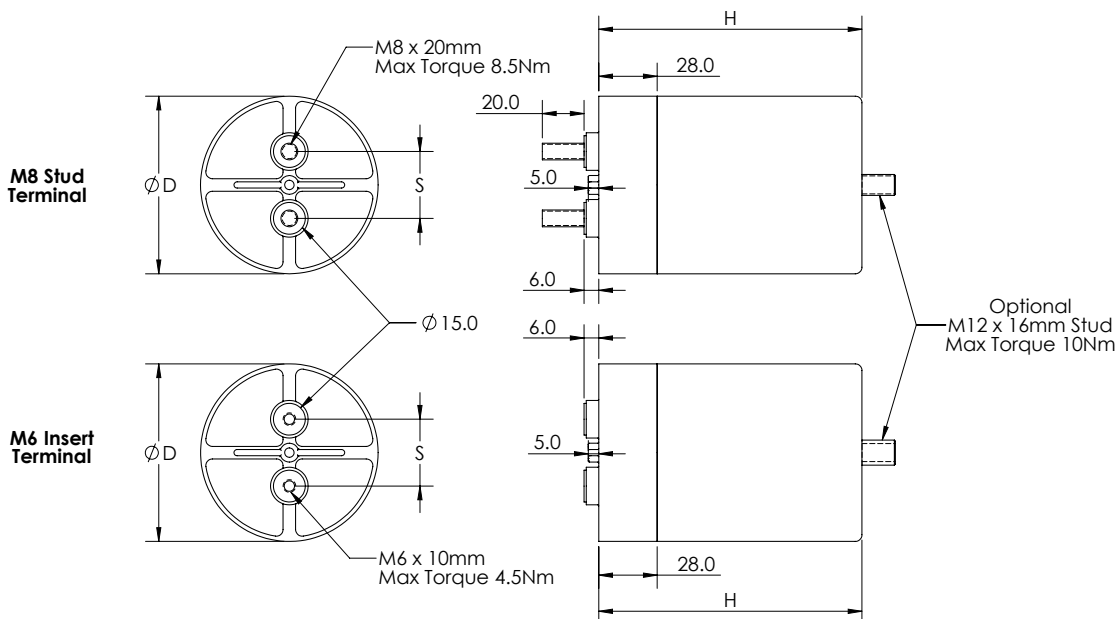
Type 947D series uses the most advanced metallized film technology for long life and high reliability in DC Link applications. This series combines high capacitance and very high ripple current capability needed for today's inverter designs for wind, solar, fuel cells, UPS systems and more.

Specifications

Capacitance Range	130 to 1500 μ F
Capacitance Tolerance	\pm 10% standard
Rated Voltage	900 to 1300 Vdc
Operating Temperature Range	-45 °C to 85 °C (ambient)
Maximum rms Current	see data tables
Maximum rms Voltage	230 Vac
Test Voltage between Terminals @ 25 °C	150% rated DC voltage for 10 s
Test Voltage between Terminals and Case @ 25°C	4 kVac @ 50/60 Hz for 10 s
Life Test	7000 h @ 85 °C, rated voltage
Life Expectancy	350,000 h @ 60 °C Core, rated voltage
RoHS Compliant	

Dimensions

Construction Details	
Case Material	Aluminum Can
Resin Material	Dry Resin UL94V-0
Terminal Material	Tin Plated Brass
Insulator Cap Material	Polypropylene UL94V-0



All dimensions have a \pm 1 mm tolerance
Consult factory for mounting options

Type 947D Polypropylene, High Energy Density, DC Link Capacitors

High Current, High Capacitance for Inverter Applications

Part Numbering System

947D	391	K	112	C	E	R	S	N
Type	Capacitance	Tolerance	Voltage	Diameter ±1mm	Height ±1mm	Terminal	Mounting	Sleeve
947D	391 = 390 µF 152 = 1500 µF	K = ±10%	901 = 900 Vdc 102 = 1000 Vdc 112 = 1100 Vdc 122 = 1200 Vdc 132 = 1300 Vdc	A = 85 mm B = 90 mm C = 100 mm D = 116 mm	C = 75 mm D = 87 mm E = 100 mm F = 112 mm G = 126 mm H = 136 mm J = 150 mm L = 162 mm	G = M6 Insert (32 mm) N = M8 Stud (32 mm) J = M8 Stud (45 mm) M = M6 Insert (45 mm) P = M8 Stud (50 mm) R = M6 Insert (50 mm)	F = Flat Base S = Stud Base	N = No Sleeve S = Black PVC

Ratings

PartNumber	Rated		Can	Can	Lead	Current				Thermal		Max Mass (kg)
	Cap	Voltage	Diameter	Height	Spacing	Case	T _A =55 °C	Typ	Typ	Resistance		
	C (µF)	V _R (V _{DC})	D (mm)	H (mm)	S (mm)	Area (mm ²)	I _{rms} (A)	ESR (mΩ)	ESL (nH)	Θ _{cc} (°C/W)	Θ _{ca} (°C/W)	
947D311K901ACGSN	310	900	85	75	32	31400	67	1.4	30	1.4	3.8	0.5
947D351K901BCMSN	350	900	90	75	45	33900	73	1.2	30	1.3	3.5	0.6
947D371K901ADGSN	370	900	85	87	32	34600	66	1.5	34	1.3	3.5	0.6
947D421K901BDMSN	420	900	90	87	45	37300	75	1.2	33	1.3	3.2	0.6
947D441K901AEGSN	440	900	85	100	32	38100	65	1.7	38	1.2	3.2	0.6
947D441K901CCRSN	440	900	100	75	50	39300	85	1.0	30	1.1	3.1	0.7
947D501K901BEMSN	500	900	90	100	45	41000	74	1.3	37	1.3	2.9	0.7
947D511K901AFGSN	510	900	85	112	32	41300	64	1.9	42	1.2	2.9	0.7
947D541K901CDRSN	540	900	100	87	50	43000	83	1.2	34	1.1	2.8	0.8
947D571K901AGGSN	570	900	85	126	32	45000	63	2.1	46	1.1	2.7	0.8
947D581K901BFMSN	580	900	90	112	45	44400	72	1.5	41	1.3	2.7	0.8
947D601K901DCRSN	600	900	116	75	50	48500	102	0.9	35	0.8	2.5	0.9
947D631K901CERSN	630	900	100	100	50	47100	82	1.3	38	1.0	2.5	0.9
947D641K901AHGSN	640	900	85	136	32	47700	62	2.3	50	1.1	2.5	0.8
947D651K901BGMSN	650	900	90	126	45	48300	71	1.6	45	1.2	2.5	0.9
947D711K901AJGSN	710	900	85	150	32	51400	62	2.5	54	1.1	2.3	0.9
947D731K901BHMSN	730	900	90	136	45	51200	69	1.8	49	1.2	2.3	0.9
947D731K901CFRSN	730	900	100	112	50	50900	81	1.4	42	1.0	2.4	1.0
947D731K901DDRSN	730	900	116	87	50	52800	101	1.0	40	0.8	2.3	1.1
947D781K901ALGSN	780	900	85	162	32	54600	61	2.7	59	1.0	2.2	1.0
947D811K901BJMSN	810	900	90	150	45	55100	68	1.9	53	1.2	2.2	1.0
947D821K901CGRSN	820	900	100	126	50	55300	80	1.6	46	1.0	2.2	1.1
947D861K901DERSN	860	900	116	100	50	57600	100	1.1	45	0.8	2.1	1.2
947D881K901BLMSN	880	900	90	162	45	58500	67	2.1	58	1.2	2.1	1.1
947D921K901CHRSN	920	900	100	136	50	58400	79	1.7	50	1.0	2.1	1.2
947D991K901DFRSN	990	900	116	112	50	62000	99	1.2	50	0.8	1.9	1.3
947D102K901CJRSN	1000	900	100	150	50	62800	78	1.9	54	0.9	1.9	1.3
947D112K901CLRSN	1100	900	100	162	50	66600	77	2.0	59	0.9	1.8	1.4
947D112K901DGRSN	1100	900	116	126	50	67100	98	1.3	55	0.8	1.8	1.5
947D122K901DHRSN	1200	900	116	136	50	70700	96	1.4	60	0.8	1.7	1.6
947D132K901DJRSN	1300	900	116	150	50	75800	95	1.5	65	0.8	1.6	1.7
947D152K901DLRSN	1500	900	116	162	50	80200	94	1.6	70	0.7	1.5	1.8
947D241K102ACGSN	240	1000	85	75	32	31400	63	1.5	30	1.4	3.8	0.5

Type 947D Polypropylene, High Energy Density, DC Link Capacitors

High Current, High Capacitance for Inverter Applications

PartNumber	Rated		Can		Lead		Current			Thermal		Max Mass (kg)
	Cap C	Voltage V _R	Dia D	Height H	Spacing S	Case Area	T _A =55 °C I _{rms}	Typ ESR	Typ ESL	Resistance		
	(μF)	(V _{DC})	(mm)	(mm)	(mm)	(mm ²)	(A)	(mΩ)	(nH)	Θ _{cc} (°C/W)	Θ _{ca} (°C/W)	
947D271K102BCMSN	270	1000	90	75	45	33900	69	1.3	30	1.3	3.5	0.6
947D291K102ADGSN	290	1000	85	87	32	34600	62	1.7	34	1.4	3.5	0.6
947D331K102BDMSN	330	1000	90	87	45	37300	71	1.3	33	1.3	3.2	0.6
947D341K102AEGSN	340	1000	85	100	32	38100	61	1.9	38	1.3	3.2	0.6
947D341K102CCRSN	340	1000	100	75	50	39300	81	1.1	30	1.2	3.1	0.7
947D391K102BEMSN	390	1000	90	100	45	41000	70	1.5	37	1.2	2.9	0.7
947D401K102AFGSN	400	1000	85	112	32	41300	60	2.1	42	1.2	2.9	0.7
947D421K102CDRSN	420	1000	100	87	50	43000	79	1.3	34	1.1	2.8	0.8
947D451K102AGGSN	450	1000	85	126	32	45000	60	2.3	46	1.2	2.7	0.8
947D451K102BFMSN	450	1000	90	112	45	44400	68	1.7	41	1.2	2.7	0.8
947D471K102DCRSN	470	1000	116	75	50	48500	98	0.9	35	0.9	2.5	0.9
947D491K102CERSN	490	1000	100	100	50	47100	78	1.4	38	1.1	2.5	0.9
947D501K102AHGSN	500	1000	85	136	32	47700	58	2.5	50	1.1	2.5	0.8
947D511K102BGMSN	510	1000	90	126	45	48300	67	1.8	45	1.2	2.5	0.9
947D551K102AJGSN	550	1000	85	150	32	51400	58	2.7	54	1.1	2.3	0.9
947D571K102BHMSN	570	1000	90	136	45	51200	66	2.0	49	1.2	2.3	0.9
947D571K102CFRSN	570	1000	100	112	50	50900	77	1.6	42	1.0	2.4	1.0
947D571K102DDRSN	570	1000	116	87	50	52800	96	1.0	40	0.8	2.3	1.1
947D601K102ALGSN	600	1000	85	162	32	54600	57	3.0	59	1.1	2.2	1.0
947D631K102BJMSN	630	1000	90	150	45	55100	65	2.2	53	1.1	2.2	1.0
947D641K102CGRSN	640	1000	100	126	50	55300	76	1.7	46	1.0	2.2	1.1
947D671K102DERSN	670	1000	116	100	50	57600	95	1.2	45	0.8	2.1	1.2
947D691K102BLMSN	690	1000	90	162	45	58500	64	2.3	58	1.1	2.1	1.1
947D721K102CHRSN	720	1000	100	136	50	58400	74	1.9	50	1.0	2.1	1.2
947D771K102DFRSN	770	1000	116	112	50	62000	94	1.3	50	0.8	1.9	1.3
947D791K102CJRSN	790	1000	100	150	50	62800	74	2.1	54	1.0	1.9	1.3
947D871K102CLRSN	870	1000	100	162	50	66600	73	2.2	59	0.9	1.8	1.4
947D871K102DGRSN	870	1000	116	126	50	67100	93	1.4	55	0.8	1.8	1.5
947D971K102DHRSN	970	1000	116	136	50	70700	91	1.5	60	0.8	1.7	1.6
947D102K102DJRSN	1000	1000	116	150	50	75800	90	1.7	65	0.8	1.6	1.7
947D112K102DLRSN	1100	1000	116	162	50	80200	89	1.8	70	0.8	1.5	1.8
947D191K112ACGSN	190	1100	85	75	32	31400	60	1.6	30	1.5	3.8	0.5
947D221K112BCMSN	220	1100	90	75	45	33900	65	1.5	30	1.4	3.5	0.6
947D231K112ADGSN	230	1100	85	87	32	34600	59	1.9	34	1.4	3.5	0.6
947D261K112BDMSN	260	1100	90	87	45	37300	68	1.5	33	1.2	3.2	0.6
947D271K112AEGSN	270	1100	85	100	32	38100	58	2.1	38	1.3	3.2	0.6
947D271K112CCRSN	270	1100	100	75	50	39300	77	1.2	30	1.2	3.1	0.7
947D311K112BEMSN	310	1100	90	100	45	41000	67	1.7	37	1.2	2.9	0.7
947D321K112AFGSN	320	1100	85	112	32	41300	57	2.3	42	1.3	2.9	0.7
947D331K112CDRSN	330	1100	100	87	50	43000	75	1.4	34	1.1	2.8	0.8
947D361K112AGGSN	360	1100	85	126	32	45000	56	2.5	46	1.2	2.7	0.8
947D361K112BFMSN	360	1100	90	112	45	44400	65	1.8	41	1.2	2.7	0.8

Type 947D Polypropylene, High Energy Density, DC Link Capacitors

High Current, High Capacitance for Inverter Applications

PartNumber	Rated		Can		Lead	Current				Thermal		Max Mass (kg)
	Cap C	Voltage V _r	Dia D	Height H	Spacing S	Case Area	T _A =55 °C I _{rms}	Typ ESR	Typ ESL	Resistance		
	(μF)	(V _{DC})	(mm)	(mm)	(mm)	(mm ²)	(A)	(mΩ)	(nH)	Θ _{cc} (°C/W)	Θ _{ca} (°C/W)	
947D371K112DCRSN	370	1100	116	75	50	48500	94	1.0	35	0.9	2.5	0.9
947D391K112CERSN	390	1100	100	100	50	47100	74	1.6	38	1.1	2.5	0.9
947D411K112BGMSN	410	1100	90	126	45	48300	64	2.0	45	1.1	2.5	0.9
947D421K112AHGSN	420	1100	85	136	32	47700	55	2.8	50	1.2	2.5	0.8
947D441K112AJGSN	440	1100	85	150	32	51400	55	3.0	54	1.1	2.3	0.9
947D451K112CFRSN	450	1100	100	112	50	50900	73	1.7	42	1.1	2.4	1.0
947D451K112DDRSN	450	1100	116	87	50	52800	92	1.1	40	0.9	2.3	1.1
947D461K112BHMSN	460	1100	90	136	45	51200	63	2.2	49	1.1	2.3	0.9
947D481K112ALGSN	480	1100	85	162	32	54600	54	3.2	59	1.1	2.2	1.0
947D501K112BJMSN	500	1100	90	150	45	55100	62	2.4	53	1.1	2.2	1.0
947D521K112CGRSN	520	1100	100	126	50	55300	72	1.9	46	1.0	2.2	1.1
947D541K112DERSN	540	1100	116	100	50	57600	91	1.3	45	0.8	2.1	1.2
947D551K112BLMSN	550	1100	90	162	45	58500	61	2.6	58	1.1	2.1	1.1
947D581K112CHRSN	580	1100	100	136	50	58400	71	2.1	50	1.0	2.1	1.2
947D621K112DFRSN	620	1100	116	112	50	62000	90	1.4	50	0.8	1.9	1.3
947D641K112CJRSN	640	1100	100	150	50	62800	70	2.2	54	1.0	1.9	1.3
947D701K112CLRSN	700	1100	100	162	50	66600	69	2.4	59	1.0	1.8	1.4
947D701K112DGRSN	700	1100	116	126	50	67100	89	1.5	55	0.8	1.8	1.5
947D781K112DHRSN	780	1100	116	136	50	70700	87	1.7	60	0.8	1.7	1.6
947D861K112DJRSN	860	1100	116	150	50	75800	86	1.8	65	0.8	1.6	1.7
947D941K112DLRSN	940	1100	116	162	50	80200	85	1.9	70	0.8	1.5	1.8
947D151K122ACGSN	150	1200	85	75	32	31400	57	1.8	30	1.5	3.8	0.5
947D181K122BCMSN	180	1200	90	75	45	33900	62	1.6	30	1.4	3.5	0.6
947D191K122ADGSN	190	1200	85	87	32	34600	56	2.0	34	1.4	3.5	0.6
947D221K122AEGSN	220	1200	85	100	32	38100	55	2.3	38	1.4	3.2	0.6
947D221K122BDMSN	220	1200	90	87	45	37300	65	1.6	33	1.2	3.2	0.6
947D221K122CCRSN	220	1200	100	75	50	39300	73	1.3	30	1.2	3.1	0.7
947D251K122BEMSN	250	1200	90	100	45	41000	64	1.8	37	1.1	2.9	0.7
947D261K122AFGSN	260	1200	85	112	32	41300	54	2.5	42	1.3	2.9	0.7
947D271K122CDRSN	270	1200	100	87	50	43000	72	1.5	34	1.2	2.8	0.8
947D291K122AGGSN	290	1200	85	126	32	45000	54	2.8	46	1.2	2.7	0.8
947D291K122BFMSN	290	1200	90	112	45	44400	62	2.0	41	1.1	2.7	0.8
947D311K122DCRSN	310	1200	116	75	50	48500	90	1.1	35	0.9	2.5	0.9
947D321K122CERSN	320	1200	100	100	50	47100	71	1.7	38	1.1	2.5	0.9
947D331K122AHGSN	330	1200	85	136	32	47700	53	3.0	50	1.2	2.5	0.8
947D331K122BGMSN	330	1200	90	126	45	48300	61	2.2	45	1.1	2.5	0.9
947D361K122AJGSN	360	1200	85	150	32	51400	52	3.3	54	1.2	2.3	0.9
947D371K122BHMSN	370	1200	90	136	45	51200	60	2.4	49	1.1	2.3	0.9
947D371K122CFRSN	370	1200	100	112	50	50900	69	1.9	42	1.1	2.4	1.0
947D371K122DDRSN	370	1200	116	87	50	52800	88	1.2	40	0.9	2.3	1.1
947D401K122ALGSN	400	1200	85	162	32	54600	52	3.5	59	1.1	2.2	1.0
947D411K122BJMSN	410	1200	90	150	45	55100	59	2.6	53	1.1	2.2	1.0

Type 947D Polypropylene, High Energy Density, DC Link Capacitors

High Current, High Capacitance for Inverter Applications

PartNumber	Cap C (μ F)	Rated Voltage V_R (V_{DC})	Can Dia D (mm)	Can Height H (mm)	Lead Spacing S (mm)	Case Area (mm ²)	Current			Thermal		Max Mass (kg)
							$T_A=55^\circ\text{C}$ I _{rms} (A)	Typ ESR (m Ω)	Typ ESL (nH)	Resistance Θ_{cc} ($^\circ\text{C}/\text{W}$)	Θ_{ca} ($^\circ\text{C}/\text{W}$)	
947D421K122CGRSN	420	1200	100	126	50	55300	69	2.1	46	1.1	2.2	1.1
947D441K122DERSN	440	1200	116	100	50	57600	87	1.4	45	0.9	2.1	1.2
947D451K122BLMSN	450	1200	90	162	45	58500	58	2.8	58	1.0	2.1	1.1
947D471K122CHRSN	470	1200	100	136	50	58400	67	2.2	50	1.0	2.1	1.2
947D511K122DFRSN	510	1200	116	112	50	62000	86	1.5	50	0.8	1.9	1.3
947D521K122CJRSN	520	1200	100	150	50	62800	67	2.4	54	1.0	1.9	1.3
947D571K122CLRSN	570	1200	100	162	50	66600	66	2.6	59	1.0	1.8	1.4
947D571K122DGRSN	570	1200	116	126	50	67100	85	1.6	55	0.8	1.8	1.5
947D641K122DHRSN	640	1200	116	136	50	70700	83	1.8	60	0.8	1.7	1.6
947D711K122DJRSN	710	1200	116	150	50	75800	82	1.9	65	0.8	1.6	1.7
947D771K122DLRSN	770	1200	116	162	50	80200	81	2.1	70	0.8	1.5	1.8
947D131K132ACGSN	130	1300	85	75	32	31400	54	1.9	30	1.6	3.8	0.5
947D151K132BCMSN	150	1300	90	75	45	33900	60	1.7	30	1.5	3.5	0.6
947D161K132ADGSN	160	1300	85	87	32	34600	53	2.2	34	1.5	3.5	0.6
947D181K132BDMMSN	180	1300	90	87	45	37300	62	1.8	33	1.1	3.2	0.6
947D191K132AEGSN	190	1300	85	100	32	38100	53	2.5	38	1.4	3.2	0.6
947D191K132CCRSN	190	1300	100	75	50	39300	70	1.4	30	1.2	3.1	0.7
947D211K132AFGSN	210	1300	85	112	32	41300	52	2.7	42	1.3	2.9	0.7
947D211K132BEMSN	210	1300	90	100	45	41000	61	2.0	37	1.1	2.9	0.7
947D231K132CDRSN	230	1300	100	87	50	43000	69	1.6	34	1.2	2.8	0.8
947D241K132AGGSN	240	1300	85	126	32	45000	51	3.0	46	1.3	2.7	0.8
947D241K132BFMSN	240	1300	90	112	45	44400	60	2.2	41	1.1	2.7	0.8
947D251K132DCRSN	250	1300	116	75	50	48500	87	1.2	35	0.9	2.5	0.9
947D271K132AHGSN	270	1300	85	136	32	47700	50	3.3	50	1.2	2.5	0.8
947D271K132CERSN	270	1300	100	100	50	47100	68	1.8	38	1.2	2.5	0.9
947D281K132BGMSN	280	1300	90	126	45	48300	59	2.4	45	1.0	2.5	0.9
947D301K132AJGSN	300	1300	85	150	32	51400	50	3.5	54	1.2	2.3	0.9
947D311K132BHMSN	310	1300	90	136	45	51200	58	2.7	49	1.0	2.3	0.9
947D311K132CFRSN	310	1300	100	112	50	50900	66	2.0	42	1.1	2.4	1.0
947D311K132DDRSN	310	1300	116	87	50	52800	85	1.3	40	0.9	2.3	1.1
947D331K132ALGSN	330	1300	85	162	32	54600	49	3.8	59	1.2	2.2	1.0
947D341K132BJMSN	340	1300	90	150	45	55100	57	2.9	53	1.0	2.2	1.0
947D351K132CGRSN	350	1300	100	126	50	55300	66	2.2	46	1.1	2.2	1.1
947D371K132DERSN	370	1300	116	100	50	57600	84	1.5	45	0.9	2.1	1.2
947D381K132BLMSN	380	1300	90	162	45	58500	56	3.1	58	1.0	2.1	1.1
947D391K132CHRSN	390	1300	100	136	50	58400	64	2.4	50	1.1	2.1	1.2
947D421K132DFRSN	420	1300	116	112	50	62000	82	1.6	50	0.9	1.9	1.3
947D431K132CJRSN	430	1300	100	150	50	62800	64	2.6	54	1.0	1.9	1.3
947D471K132CLRSN	470	1300	100	162	50	66600	63	2.8	59	1.0	1.8	1.4
947D481K132DGRSN	480	1300	116	126	50	67100	82	1.8	55	0.9	1.8	1.5
947D531K132DHRSN	530	1300	116	136	50	70700	80	1.9	60	0.8	1.7	1.6
947D591K132DJRSN	590	1300	116	150	50	75800	79	2.1	65	0.8	1.6	1.7
947D641K132DLRSN	640	1300	116	162	50	80200	78	2.2	70	0.8	1.5	1.8

Type 947D Polypropylene, High Energy Density, DC Link Capacitors

High Current, High Capacitance for Inverter Applications

Expected Lifetime Predictions

- Capacitance: C (μF)
- Equivalent Series Resistance: ESR ($\text{m}\Omega$)
- Frequency: f (kHz)
- Ripple Current: I (A_{rms})
- Ambient Temperature: T_A ($^{\circ}\text{C}$)
- Core Temperature: T_C ($^{\circ}\text{C}$)
- Total Thermal Resistance: Θ ($^{\circ}\text{C}/\text{W}$)
- Thermal Resistance case-to-ambient: Θ_{CA} ($^{\circ}\text{C}/\text{W}$)
- Thermal Resistance core-to-case: Θ_{CC} ($^{\circ}\text{C}/\text{W}$)
- Airflow Speed: v (m/s)
- Applied Voltage: V_A (V_{DC})
- Rated Voltage: V_R (V_{DC})

Use the 10 kHz ESR from the ratings tables.

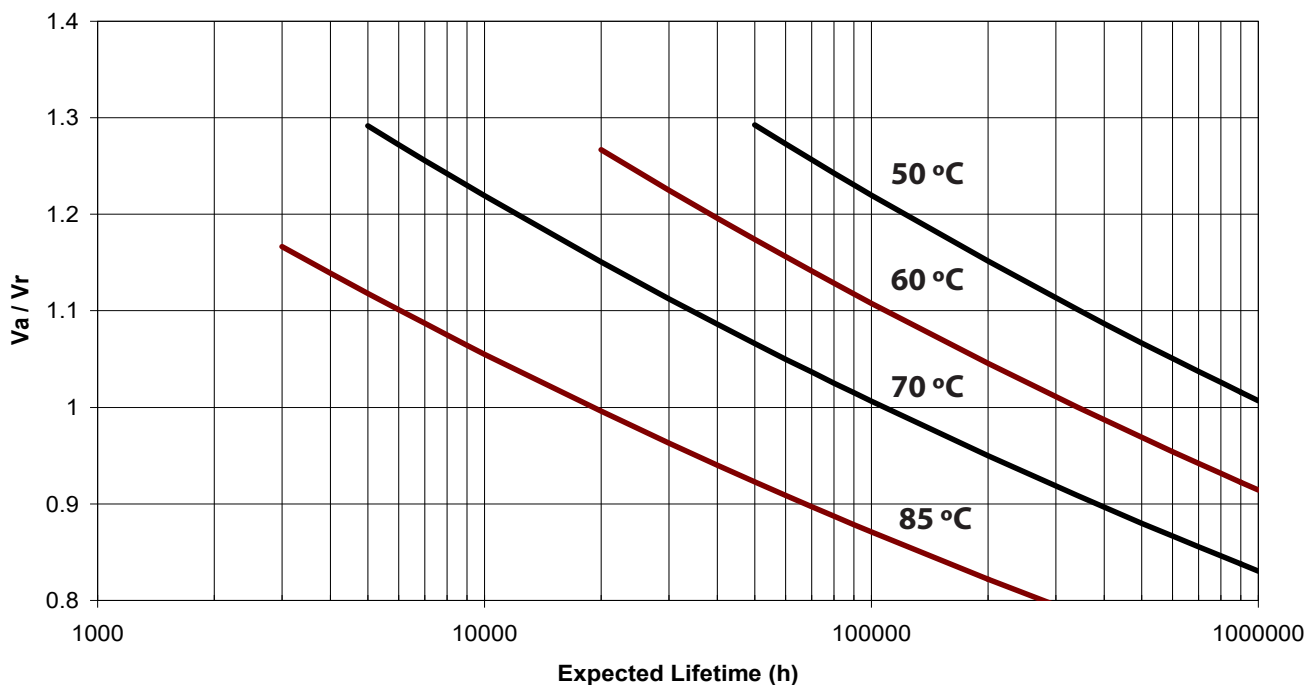
For operation below 10 kHz, the ESR will need to be adjusted using the following equation: $\text{ESR} - 31.83 / (10C) + 31.83 / (fC)$.

Compute $\Theta = \Theta_{\text{CC}} + \Theta_{\text{CA}}$. In the ratings tables, Θ_{CA} is for still air. For $v = 0$ to 5 m/s, multiply Θ_{CA} by $[(5 + 17(0.1^{0.66})) / (5 + 17(v + 0.1)^{0.66})]$

Look up Expected Lifetime on the graph using V_A/V_R and $T_C = T_A + I^2 (\text{ESR}/1000) \Theta$

The maximum allowed temperature rise is 40°C and the maximum allowed core temperature is 95°C .

Expected Lifetime vs Core Temperature and Applied DC Voltage

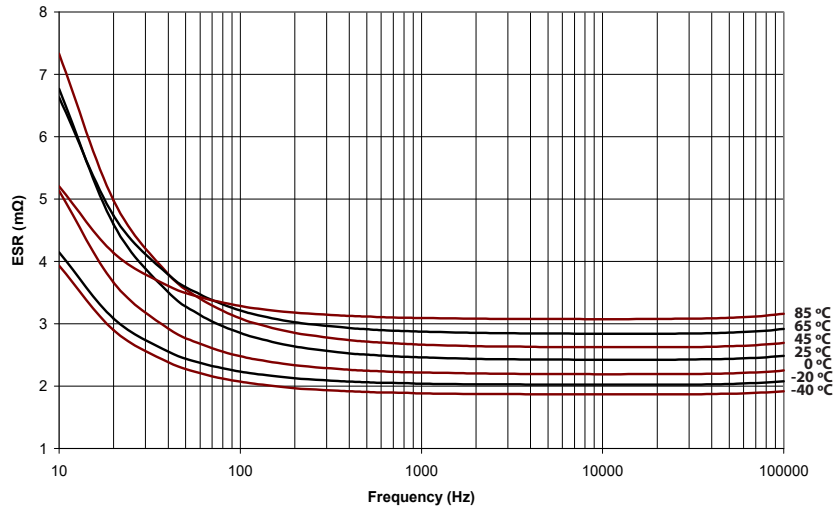


Type 947D Polypropylene, High Energy Density, DC Link Capacitors

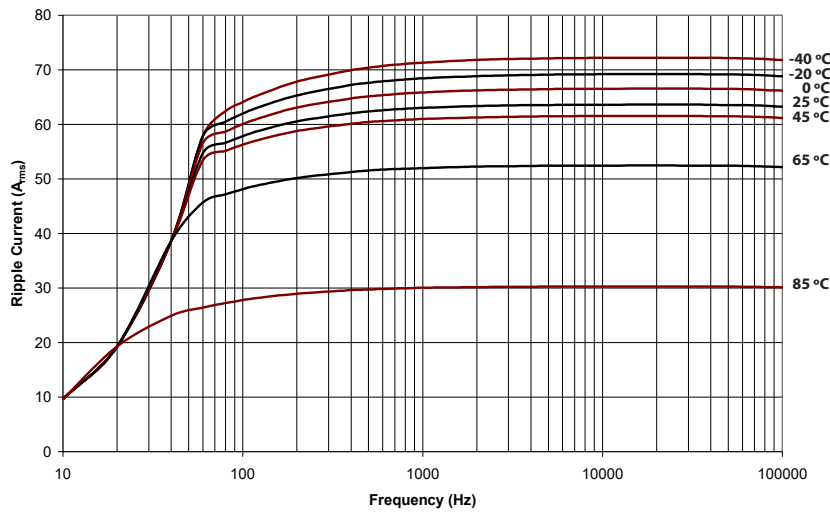
High Current, High Capacitance for Inverter Applications

Typical Performance Curves

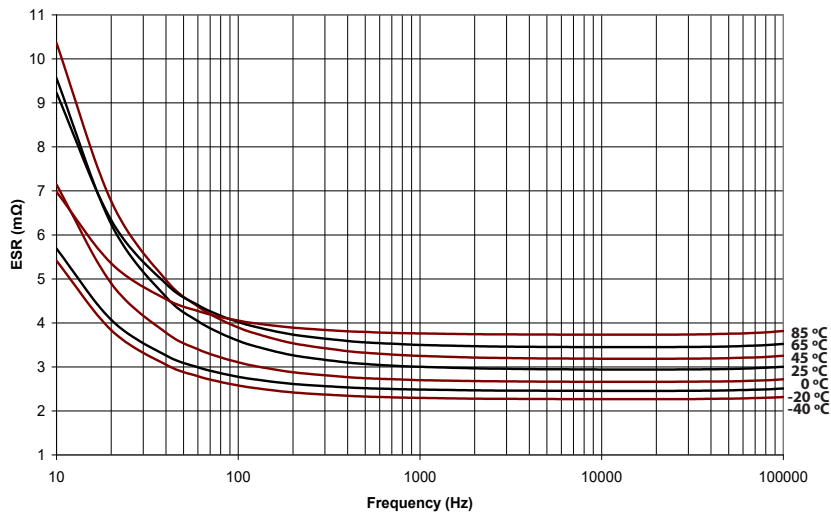
947D641K901AHGSN ESR vs Frequency and Temperature



947D641K901AHGSN Rated Ripple Current, Still Air, 7kh Life



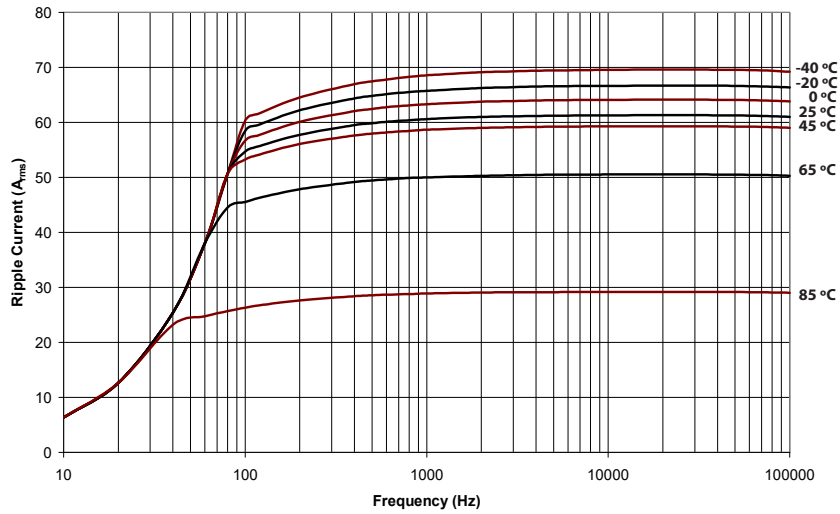
947D421K112AHGSN ESR vs Frequency and Temperature



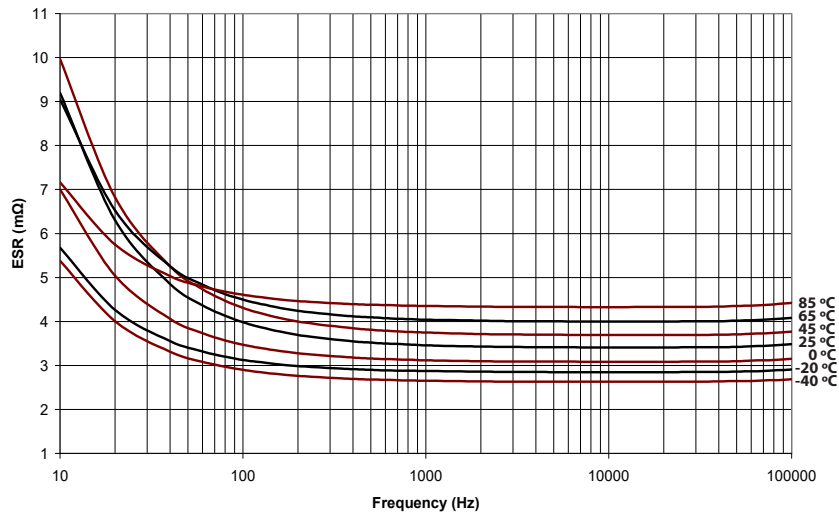
Type 947D Polypropylene, High Energy Density, DC Link Capacitors

High Current, High Capacitance for Inverter Applications

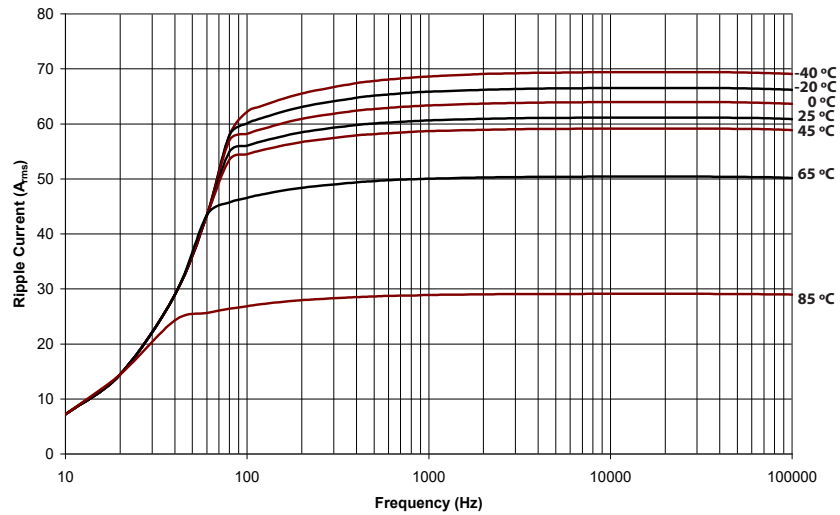
947D421K112AHGSN Rated Ripple Current, Still Air, 7kh Life



947D481K112ALGSN ESR vs Frequency and Temperature



947D481K112ALGSN Rated Ripple Current, Still Air, 7kh Life



Notice and Disclaimer: All product drawings, descriptions, specifications, statements, information and data (collectively, the “Information”) in this datasheet or other publication are subject to change. The customer is responsible for checking, confirming and verifying the extent to which the Information contained in this datasheet or other publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without any guarantee, warranty, representation or responsibility of any kind, expressed or implied. Statements of suitability for certain applications are based on the knowledge that the Cornell Dubilier company providing such statements (“Cornell Dubilier”) has of operating conditions that such Cornell Dubilier company regards as typical for such applications, but are not intended to constitute any guarantee, warranty or representation regarding any such matter – and Cornell Dubilier specifically and expressly disclaims any guarantee, warranty or representation concerning the suitability for a specific customer application, use, storage, transportation, or operating environment. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by Cornell Dubilier with reference to the use of any Cornell Dubilier products is given gratis (unless otherwise specified by Cornell Dubilier), and Cornell Dubilier assumes no obligation or liability for the advice given or results obtained. Although Cornell Dubilier strives to apply the most stringent quality and safety standards regarding the design and manufacturing of its products, in light of the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies or other appropriate protective measures) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage. Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated in such warnings, cautions and notes, or that other safety measures may not be required.