Type 947C Polypropylene, DC Link Capacitors

High Current, High Capacitance for Inverter Applications



Type 947C series uses the most advanced metallized film technology for long life, high reliability in DC Link applications. This series delivers high capacitance, high voltage and high ripple current handling capabilities required for inverters used in wind, solar, fuel cell applications and more.

Highlights

- Non-polar dielectric
- Dry, resin filled
- High reliability and life expectancy
- Replacement for aluminum electrolytic capacitors (lower capacitance, higher current)
- High current to 100 Amps
- Low ESR
- Low Inductance

Specifications

Capacitance Range	110 to 1500 µF
Capacitance Tolerance	±10% standard, ±5% optional
Rated Voltage	800 to 1300 Vdc
Operating Temperature Range	-40 ºC to 85 ºC (ambient)
Maximum rms Current	see data tables
Maximum rms Voltage	230 Vac
Test Voltage between Terminals @ 25 ºC	150% rated DC voltage for 10 s
Test Voltage between Terminals & Case @ 25 ºC	4 kVac @ 50/60 Hz for 60 s
Life Test	5000 h @ 85 ºC, rated voltage
Life Expectancy	200,000 h @ 60 ºC , rated voltage
Reliability	100 FIT typical (medium size capacitor)
Standards	IEC 61071, IEC 61881
RoHS Compliant	

Dimensions

Construction Details	
Case Material	Aluminum with Black PVC Sleeve
Resin Material	Dry Resin UL94V-0
Terminal Material	Tin Plated Brass

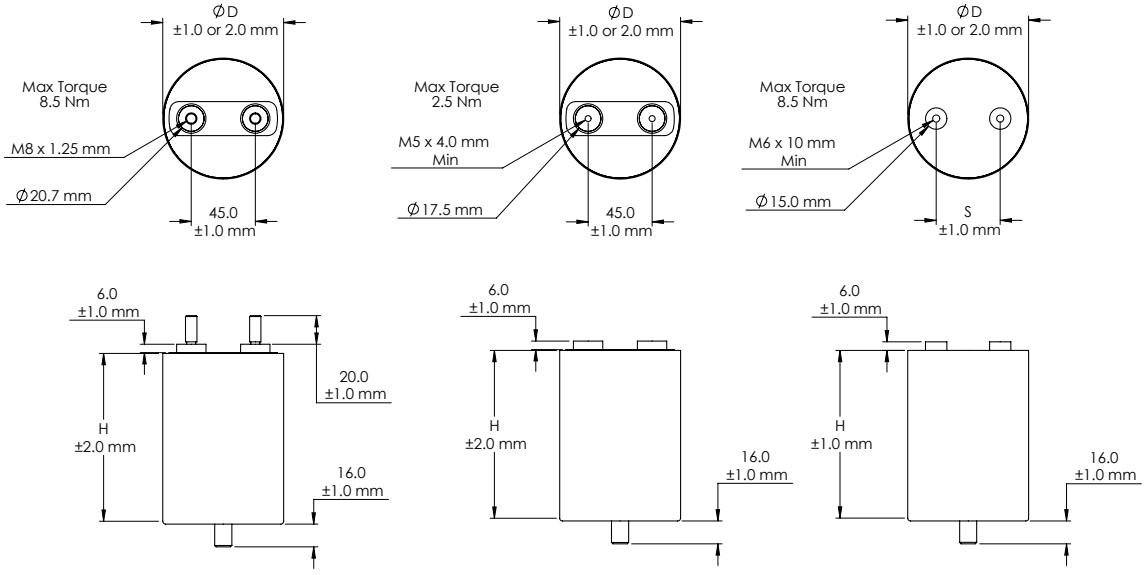


Figure 1 **Figure 2** **Figure 3**

All Shown with Optional M12 x 1.75 THD Stud

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Part Numbering System

947C	361	K	801	C	A	M	S	– NS
Type	**Capacitance**	**Tolerance**	**Voltage**	**Diameter D**	**Height H**	**Terminal**	**Mounting**	**Sleeving**
947C	**361** = 360 µF	**K** = ±10 %	**801** = 800 Vdc	**C =** 90 mm	**T** = 85 mm	**I** = M5 Insert	**blank** = no stud	Specify –NS
	731 = 730 µF	**J** = ±5 %	**901** = 900 Vdc	B = 85 mm	**A** = 97 mm	Threaded	**S** = M12 Stud	for Bare Can
	152 = 1500 µF		**102** = 1000 Vdc	D = 116 mm	**B** = 120 mm	**M** = M8 Stud	Threaded	
			112 = 1100 Vdc		**G** = 140 mm	Threaded		
			122 = 1200 Vdc		**C** = 145 mm	**H** = M6 Insert		
			132 = 1300 Vdc		**L** = 165 mm	Threaded		
					D = 170 mm			

Ratings

NOTE: Other ratings, sizes and performance specifications are available. Contact us.

Part Number	Cap. C (µF)	Rated Voltage Vr (Vdc)	Can Diameter D (mm)	Can Height H (mm)	Lead Spacing S (mm)	Case Area (mm^2)	Current ΔT = 40 Irms (A)	Typ ESR (mΩ)	Typ ESL (nH)	Thermal Resistance Θcc (°C/W)	Thermal Resistance Θca (°C/W)	Mass (kg)	Fig
947C311K801BTHS	310	800	85	85	31.7	34000	61	1.9	29	2.9	3.4	0.6	3
947C341K801CTMS	340	800	90	85	45.0	36800	66	1.7	29	2.8	3.1	0.7	1
947C341K801CTIS	340	800	90	85	45.0	36800	66	1.7	29	2.8	3.1	0.7	2
947C361K801CAMS	360	800	90	97	45.0	40100	65	1.9	33	3.0	2.9	0.9	1
947C361K801CAIS	360	800	90	97	45.0	40100	65	1.9	33	3.0	2.9	0.9	2
947C381K801BAHS	380	800	85	97	31.7	37300	61	2.0	33	2.7	3.1	0.7	3
947C411K801CAMS	410	800	90	97	45.0	40100	65	1.9	33	2.7	2.9	0.7	1
947C411K801CAIS	410	800	90	97	45.0	40100	65	1.9	33	2.7	2.9	0.7	2
947C491K801CBMS	490	800	90	120	45.0	46700	59	2.6	41	2.6	2.5	1.0	1
947C491K801CBIS	490	800	90	120	45.0	46700	59	2.6	41	2.6	2.5	1.0	2
947C511K801BBHS	510	800	85	120	31.7	43400	59	2.5	41	2.3	2.6	0.8	3
947C561K801CBMS	560	800	90	120	45.0	46700	64	2.3	41	2.3	2.5	0.9	1
947C561K801CBIS	560	800	90	120	45.0	46700	64	2.3	41	2.3	2.5	0.9	2
947C601K801CCMS	600	800	90	145	45.0	53700	58	3.1	49	2.2	2.1	1.2	1
947C601K801CCIS	600	800	90	145	45.0	53700	58	3.1	49	2.2	2.1	1.2	2
947C621K801DTHS	620	800	116	85	50.0	52100	103	1.0	35	2.1	2.2	1.1	3
947C651K801BGHS	650	800	85	140	31.7	48700	59	2.9	49	2.0	2.4	0.9	3
947C701K801CCMS	700	800	90	145	45.0	53700	63	2.7	49	2.0	2.1	1.1	1
947C701K801CCIS	700	800	90	145	45.0	53700	63	2.7	49	2.0	2.1	1.1	2
947C731K801CDMS	730	800	90	170	45.0	60800	58	3.5	58	1.9	1.9	1.3	1
947C731K801CDIS	730	800	90	170	45.0	60800	58	3.5	58	1.9	1.9	1.3	2
947C751K801DAHS	750	800	116	97	50.0	56500	101	1.1	40	2.1	2	1.2	3
947C791K801BDHS	790	800	85	170	31.7	56700	59	3.3	58	1.7	2	1.1	3
947C851K801CDMS	850	800	90	170	45.0	60800	63	3.0	58	1.7	1.9	1.2	1
947C851K801CDIS	850	800	90	170	45.0	60800	63	3.0	58	1.7	1.9	1.2	2
947C102K801DBHS	1000	800	116	120	50.0	64900	97	1.3	50	2.0	1.8	1.4	3
947C122K801DCHS	1200	800	116	145	50.0	74000	92	1.6	60	1.9	1.6	1.7	3
947C152K801DLHS	1500	800	116	165	50.0	81300	93	1.8	70	1.7	1.4	1.9	3
947C241K901BTHS	240	900	85	85	31.7	34000	57	2.1	29	2.9	3.4	0.6	3

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947C261K901CTMS	260	900	90	85	45.0	36800	61	2.0	29	2.9	3.1	0.7	1
947C261K901CTIS	260	900	90	85	45.0	36800	61	2.0	29	2.9	3.1	0.7	2
947C291K901BAHS	290	900	85	97	31.7	37300	56	2.3	33	2.7	3.1	0.7	3
947C321K901CAMS	320	900	90	97	45.0	40100	61	2.1	33	2.7	2.9	0.7	1
947C321K901CAIS	320	900	90	97	45.0	40100	61	2.1	33	2.7	2.9	0.7	2
947C401K901BBHS	400	900	85	120	31.7	43400	56	2.8	41	2.3	2.6	0.8	3
947C431K901CBMS	430	900	90	120	45.0	46700	59	2.6	41	2.3	2.5	0.9	1
947C431K901CBIS	430	900	90	120	45.0	46700	59	2.6	41	2.3	2.5	0.9	2
947C481K901DTHS	480	900	116	85	50.0	52100	96	1.1	35	2.1	2.2	1.1	3
947C511K901BGHS	510	900	85	140	31.7	48700	56	3.2	49	2.0	2.4	0.9	3
947C551K901CCMS	550	900	90	145	45.0	53700	59	3.0	49	2.0	2.1	1.0	1
947C551K901CCIS	550	900	90	145	45.0	53700	59	3.0	49	2.0	2.1	1.0	2
947C581K901DAHS	580	900	116	97	50.0	56500	94	1.3	35	2.1	2	1.2	3
947C611K901BDHS	610	900	85	170	31.7	56700	56	3.7	58	1.7	2	1.1	3
947C661K901CDMS	660	900	90	170	45.0	60800	59	3.4	58	1.8	1.9	1.2	1
947C661K901CDIS	660	900	90	170	45.0	60800	59	3.4	58	1.8	1.9	1.2	2
947C791K901DBHS	790	900	116	120	50.0	64900	91	1.5	50	2.0	1.8	1.4	3
947C102K901DCHS	1000	900	116	145	50.0	74000	89	1.7	60	1.8	1.6	1.7	3
947C122K901DLHS	1200	900	116	165	50.0	81300	89	2.0	70	1.6	1.4	1.9	3
947C191K102BTHS	190	1000	85	85	31.7	34000	53	2.4	29	2.9	3.4	0.6	3
947C211K102CTMS	210	1000	90	85	45.0	36800	58	2.2	29	2.9	3.1	0.7	1
947C211K102CTIS	210	1000	90	85	45.0	36800	58	2.2	29	2.9	3.1	0.7	2
947C231K102CAMS	230	1000	90	97	45.0	40100	54	2.6	33	3.0	2.9	0.9	1
947C231K102CAIS	230	1000	90	97	45.0	40100	54	2.6	33	3.0	2.9	0.9	2
947C241K102BAHS	240	1000	85	97	31.7	37300	54	2.5	33	2.7	3.1	0.7	3
947C251K102CAMS	250	1000	90	97	45.0	40100	56	2.4	33	2.7	2.9	0.8	1
947C251K102CAIS	250	1000	90	97	45.0	40100	56	2.4	33	2.7	2.9	0.8	2
947C311K102CBMS	310	1000	90	120	45.0	46700	53	3.2	41	2.6	2.5	1.0	1
947C311K102CBIS	310	1000	90	120	45.0	46700	53	3.2	41	2.6	2.5	1.0	2
947C321K102BBHS	320	1000	85	120	31.7	43400	53	3.1	41	2.3	2.6	0.8	3
947C351K102CBMS	350	1000	90	120	45.0	46700	57	2.8	41	2.3	2.5	0.9	1
947C351K102CBIS	350	1000	90	120	45.0	46700	57	2.8	41	2.3	2.5	0.9	2
947C381K102DTHS	380	1000	116	85	50.0	52100	90	1.3	35	2.2	2.2	1.1	3
947C391K102CCMS	390	1000	90	145	45.0	53700	53	3.7	49	2.2	2.1	1.2	1
947C391K102CCIS	390	1000	90	145	45.0	53700	53	3.7	49	2.2	2.1	1.2	2
947C411K102BGHS	410	1000	85	140	31.7	48700	53	3.5	49	2.0	2.4	0.9	3
947C441K102CCMS	440	1000	90	145	45.0	53700	56	3.3	49	2.0	2.1	1.1	1
947C441K102CCIS	440	1000	90	145	45.0	53700	56	3.3	49	2.0	2.1	1.1	2
947C471K102DAHS	470	1000	116	97	50.0	56500	90	1.4	40	2.1	2	1.2	3
947C471K102CDMS	470	1000	90	170	45.0	60800	52	4.3	38	1.9	1.9	1.3	1
947C471K102CDIS	470	1000	90	170	45.0	60800	52	4.3	38	1.9	1.9	1.3	2
947C491K102BDHS	490	1000	85	170	31.7	56700	53	4.1	49	1.7	2	1.1	3

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947C531K102CDMS	530	1000	90	170	45.0	60800	56	3.8	58	1.8	1.9	1.2	1
947C531K102CDIS	530	1000	90	170	45.0	60800	56	3.8	58	1.8	1.9	1.2	2
947C641K102DBHS	640	1000	116	120	50.0	64900	87	1.6	50	2.0	1.8	1.4	3
947C801K102DCHS	800	1000	116	145	50.0	74000	85	1.9	60	1.8	1.6	1.7	3
947C971K102DLHS	970	1000	116	165	50.0	81300	84	2.2	70	1.6	1.4	1.9	3
947C161K112BTHS	160	1100	85	85	31.7	34000	51	2.6	29	2.9	3.4	0.6	3
947C171K112CTMS	170	1100	90	85	45.0	36800	54	2.4	29	2.9	3.1	0.7	1
947C171K112CTIS	170	1100	90	85	45.0	36800	54	2.4	29	2.9	3.1	0.7	2
947C191K112BAHS	190	1100	85	97	31.7	37300	50	2.9	33	2.7	3.1	0.7	3
947C211K112CAMS	210	1100	90	97	45.0	40100	54	2.6	33	2.7	2.9	0.8	1
947C211K112CAIS	210	1100	90	97	45.0	40100	54	2.6	33	2.7	2.9	0.8	2
947C261K112BBHS	260	1100	85	120	31.7	43400	50	3.4	41	2.3	2.6	0.8	3
947C281K112CBMS	280	1100	90	120	45.0	46700	53	3.2	41	2.3	2.5	0.9	1
947C281K112CBIS	280	1100	90	120	45.0	46700	53	3.2	41	2.3	2.5	0.9	2
947C311K112DTHS	310	1100	116	85	50.0	52100	85	1.4	35	2.2	2.2	1.1	3
947C331K112BCHS	330	1100	85	145	31.7	50100	50	4.0	49	2.0	2.3	0.9	3
947C361K112CCMS	360	1100	90	145	45.0	53700	53	3.7	49	2.0	2.1	1.1	1
947C361K112CCIS	360	1100	90	145	45.0	53700	53	3.7	49	2.0	2.1	1.1	2
947C381K112DAHS	380	1100	116	97	50.0	56500	84	1.5	40	2.2	2	1.2	3
947C401K112BDHS	400	1100	85	170	31.7	56700	50	4.5	58	1.7	2	1.1	3
947C431K112CDMS	430	1100	90	170	45.0	60800	53	4.2	58	1.8	1.9	1.2	1
947C431K112CDIS	430	1100	90	170	45.0	60800	53	4.2	58	1.8	1.9	1.2	2
947C521K112DBHS	520	1100	116	120	50.0	64900	82	1.8	50	2.0	1.8	1.4	3
947C661K112DCHS	660	1100	116	145	50.0	74000	81	2.1	60	1.8	1.6	1.7	3
947C801K112DLHS	800	1100	116	165	50.0	81300	81	2.4	70	1.6	1.4	1.9	3
947C131K122BTHS	130	1200	85	85	31.7	34000	48	2.9	29	2.9	3.4	0.6	3
947C141K122CTIS	140	1200	90	85	45.0	36800	51	2.7	29	2.9	3.1	0.7	1
947C141K122CTIS	140	1200	90	85	45.0	36800	51	2.7	29	2.9	3.1	0.7	2
947C161K122BAHS	160	1200	85	97	31.7	37300	48	3.1	33	2.7	3.1	0.7	3
947C161K122CAMS	160	1200	90	97	45.0	40100	49	3.1	33	3.0	2.9	0.9	1
947C161K122CAIS	160	1200	90	97	45.0	40100	49	3.1	33	3.0	2.9	0.9	2
947C171K122CAMS	170	1200	90	97	45.0	40100	51	3.0	33	2.8	2.9	0.8	1
947C171K122CAIS	170	1200	90	97	45.0	40100	51	3.0	33	2.8	2.9	0.8	2
947C211K122CBMS	210	1200	90	120	45.0	46700	48	3.9	41	2.6	2.5	1.0	1
947C211K122CBIS	210	1200	90	120	45.0	46700	48	3.9	41	2.6	2.5	1.0	2
947C221K122BBHS	220	1200	85	120	31.7	43400	48	3.7	41	2.3	2.6	0.8	3
947C241K122CBMS	240	1200	90	120	45.0	46700	51	4.0	49	2.3	2.5	0.9	1
947C241K122CBIS	240	1200	90	120	45.0	46700	51	4.0	49	2.3	2.5	0.9	2
947C261K122DTHS	260	1200	116	85	50.0	52100	82	1.5	35	2.2	2.2	1.1	3
947C271K122CCMS	270	1200	90	145	45.0	53700	48	4.4	49	2.2	2.1	1.2	1
947C271K122CCIS	270	1200	90	145	45.0	53700	48	4.4	49	2.2	2.1	1.2	2
947C281K122BGHS	280	1200	85	140	31.7	48700	48	4.3	49	2.0	2.4	0.9	3

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947C301K122CCMS	300	1200	90	145	45.0	53700	51	4.0	49	2.0	2.1	1.1	1
947C301K122CCIS	300	1200	90	145	45.0	53700	51	4.0	49	2.0	2.1	1.1	2
947C321K122DAHS	320	1200	116	97	50.0	56500	81	1.7	40	2.1	2	1.2	3
947C321K122CDMS	320	1200	90	170	45.0	60800	47	5.1	58	1.9	1.9	1.3	1
947C321K122CDIS	320	1200	90	170	45.0	60800	47	5.1	58	1.9	1.9	1.3	2
947C331K122BDHS	330	1200	85	170	31.7	56700	47	5.0	58	1.7	2	1.1	3
947C361K122CDMS	360	1200	90	170	45.0	60800	51	4.6	58	1.8	1.9	1.2	1
947C361K122CDIS	360	1200	90	170	45.0	60800	51	4.6	58	1.8	1.9	1.2	2
947C431K122DBHS	430	1200	116	120	50.0	64900	78	2.0	50	2.0	1.8	1.4	3
947C551K122DCHS	550	1200	116	145	50.0	74000	78	2.3	60	1.8	1.6	1.7	3
947C661K122DLHS	660	1200	116	165	50.0	81300	76	2.6	70	1.6	1.4	1.9	3
947C111K132BTHS	110	1300	85	85	31.7	34000	46	3.2	29	2.9	3.4	0.6	3
947C121K132CTMS	120	1300	90	85	45.0	36800	49	2.9	29	2.9	3.1	0.7	1
947C121K132CTIS	120	1300	90	85	45.0	36800	49	2.9	29	2.9	3.1	0.7	2
947C131K132BAHS	130	1300	85	97	31.7	37300	45	3.6	33	2.8	3.1	0.7	3
947C151K132CAMS	150	1300	90	97	45.0	40100	50	3.1	33	2.7	2.9	0.7	1
947C151K132CAIS	150	1300	90	97	45.0	40100	50	3.1	33	2.7	2.9	0.7	2
947C181K132BBHS	180	1300	85	120	31.7	43400	45	4.1	41	2.3	2.6	0.8	3
947C201K132CBMS	200	1300	90	120	45.0	46700	49	3.8	41	2.3	2.5	0.9	1
947C201K132CBIS	200	1300	90	120	45.0	46700	49	3.8	41	2.3	2.5	0.9	2
947C221K132DTHS	220	1300	116	85	50.0	52100	78	1.7	35	2.2	2.2	1.1	3
947C231K132BGHS	230	1300	85	140	31.7	48700	45	4.8	49	2.0	2.4	0.9	3
947C251K132CCMS	250	1300	90	145	45.0	53700	48	4.4	49	2.0	2.1	1.1	1
947C251K132CCIS	250	1300	90	145	45.0	53700	48	4.4	49	2.0	2.1	1.1	2
947C271K132DAHS	270	1300	116	97	50.0	56500	77	1.8	40	2.1	2	1.2	3
947C281K132BDHS	280	1300	85	170	31.7	56700	45	5.4	49	1.7	2	1.1	3
947C311K132CDMS	310	1300	90	170	45.0	60800	49	4.9	58	1.7	1.9	1.2	1
947C311K132CDIS	310	1300	90	170	45.0	60800	49	4.9	58	1.7	1.9	1.2	2
947C371K132DBHS	370	1300	116	120	50.0	64900	76	2.1	50	2.0	1.8	1.4	3
947C461K132DCHS	460	1300	116	145	50.0	74000	74	2.5	60	1.8	1.6	1.7	3
947C561K132DLHS	560	1300	116	165	50.0	81300	73	2.8	70	1.6	1.4	1.9	3

1. Rated Current is for temperature rise of +40 °C at 1–20 kHz.
2. θcc is core-to-case thermal resistance at 0–10 kHz. For higher frequency see Expected Lifetime Predictions.
3. θca is case-to-ambient thermal resistance for still air. For moving air see Expected Lifetime Predictions.

Expected Lifetime Predictions

To use the Expected Lifetime curves calculate Va/Vr and core temperature T. Start by estimating:

- Applied dc voltage Va
- Ripple Current I
- Ripple Frequency f
- Ambient Temperature Ta
- Airflow speed v

Units:

A=m^2	T, Ta & Tc=°C
C=µF	θ, θca & θcc =°C/W
ESR=mΩ	v=m/s
f=kHz	Va &Vr=Vdc
I=A	

NOTE: The temperature rise in the 947C is I^2(ESR) times the thermal resistance θ. The ESR is mainly the metal resistance; the metal resistance is the 10 kHz ESR. The dielectric resistance needs to be considered for operation below 10kHz.

1. Start with the 10kHz ESR from the ratings table. If frequency is less than 10kHz, use the following equation: ESR - 31.83/(10C) + 31.83/(fC).

2. Compute total thermal resistance θ as the sum of core-to-case thermal resistance θcc and case-to-ambient thermal resistance θca. Both are in the Ratings table but θca is for still air. For moving air use the capacitor surface area A and airflow speed v to calculate θca = 1/[A(5+17(v+0.1)0.66)].

Please note that the θcc for all designs built to figures 1 and 2; θcc is for 10 kHz or less. For frequency > 10 kHz multiply θcc by [1+(f –10)/100], e.g., for 75 kHz multiply θcc by 1.65.

3. Compute Va/Vr and the core temperature T.
$T = Ta + I^2(ESR)\theta$

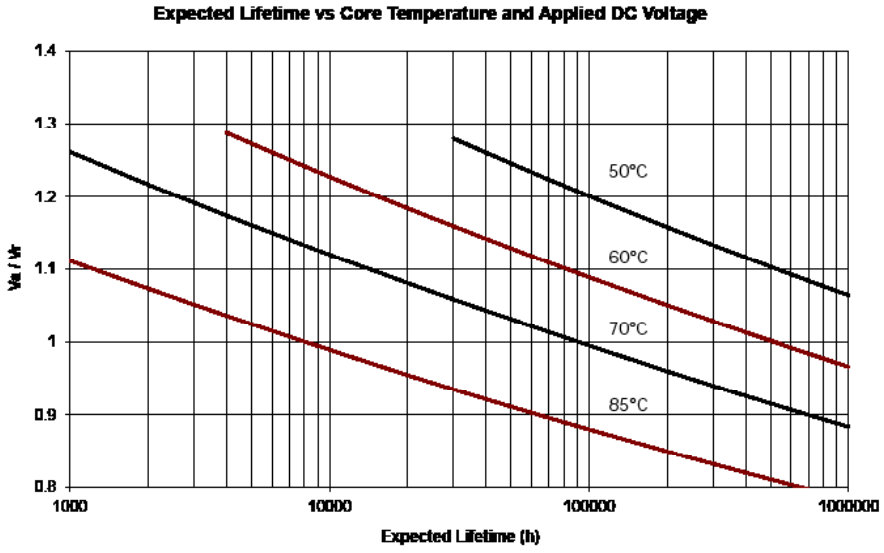
4. Look up estimated lifetime from the Expected Lifetime curves.

5. If you want a longer expected lifetime, choose a capacitor with higher voltage rating or consider using multiple capacitors in

The expected lifetime predictions assume no exposure to overvoltage transients. Expected lifetime can be calculated for varying exposure to overvoltage transients. As an illustration at 50 °C the expected lifetime is 100,000 h with the 24-hour Va / Vr profile below:

Va / Vr	Duration
1.67	100 ms
1.50	5 minutes
1.30	2.5 hours
1.10	9.6 hours
1.00	11.9 hours

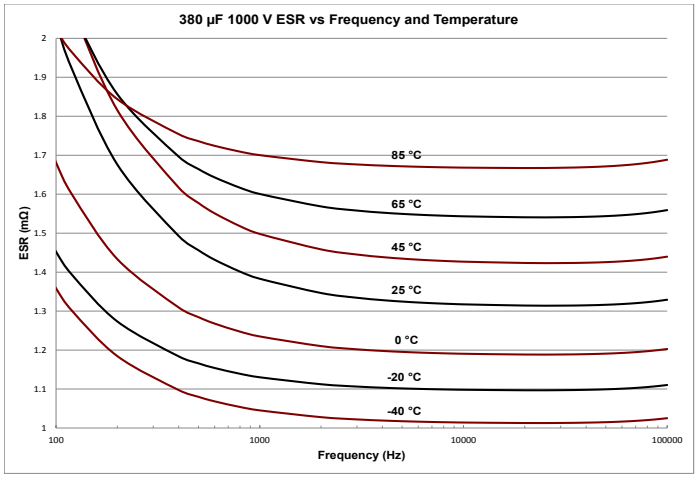
For applications with more severe 24-hour profiles, contact us.

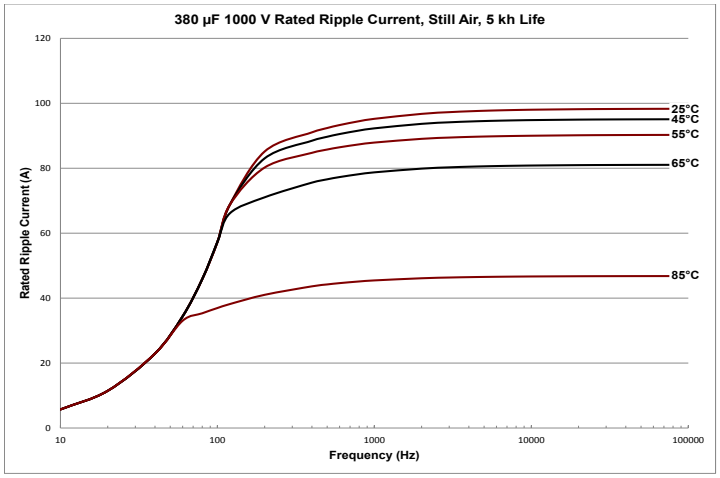


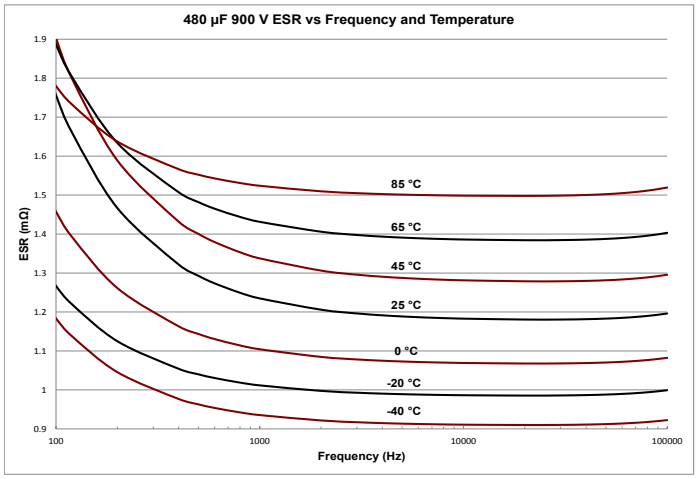
Type 947C Polypropylene, DC Link Capacitors

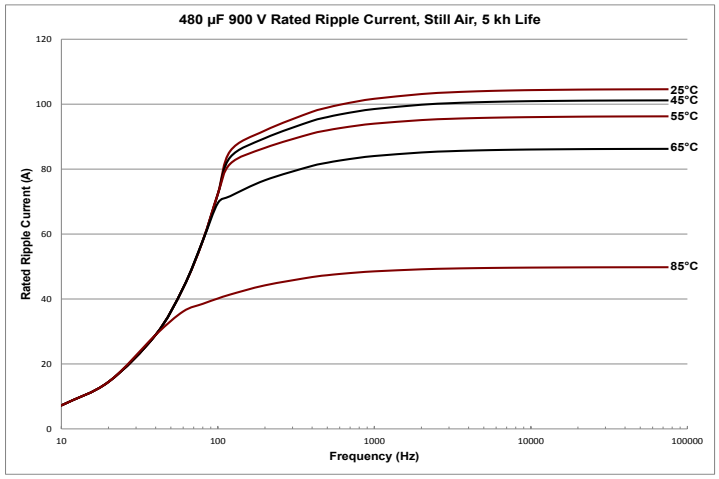
High Current, High Capacitance for Inverter Applications

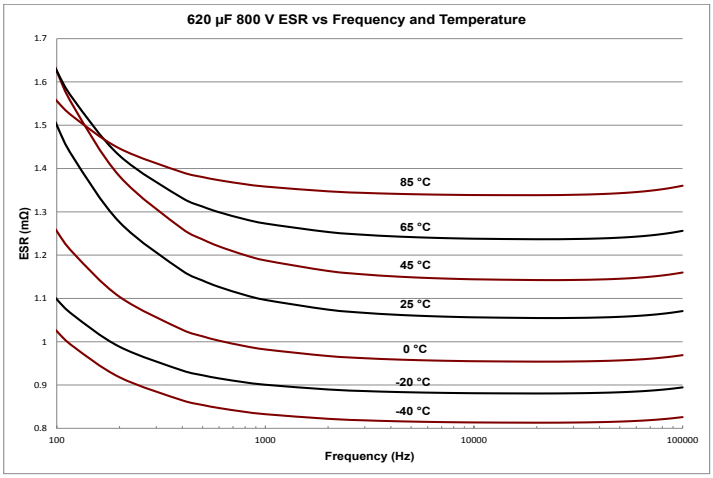
Typical Performance Curves

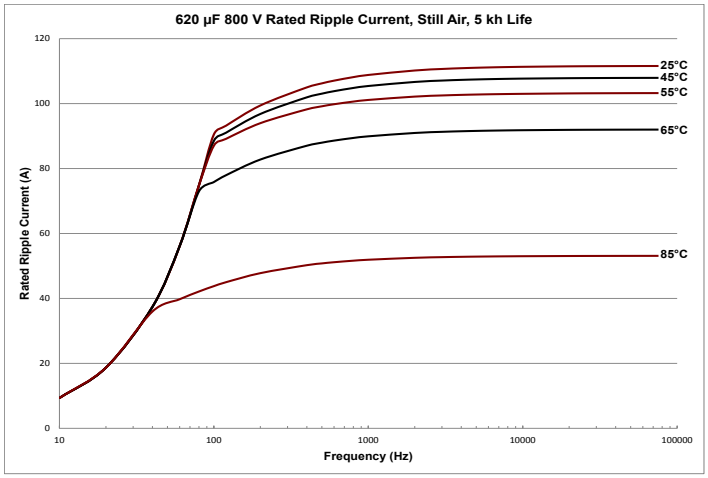












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