EFX1S

Metalized polypropylene film EMI suppression capacitors



Applications

- Class X1 for interference suppression
- EMI filtering in across-the-line applications
- Solar inverter
- UPS
- AC Motor drive
- Air conditioner
- Switch mode power supplies (SMPS)

Product features

- High stability of capacitance
- Self-healing property
- Over voltage stress withstanding
- Flame-retardant plastic case and resin

Environmental compliance and general specifications

- Operating temperature range: -40 °C to +110 °C

Agency information

Approval mark	Standard	File number
c UL us	UL 60384-14 CAN/CSA-E60384-14	E529574
IEC 10 DVE	IEC 60384-14:2013 IEC 60384-14:2013/AMD1:2016	40055921
CQC	IEC 60384-14:2013+AMD1:2016 CQC11-471112-2015	CQC22001363199 (350 to 480 Vac) CQC22001363201 (530 to 760 Vac)

Powering Business Worldwide

Part number system

EF	X1	S	76	K	104	C04	2L	H
Capacitor type	**Family**	**Grade**	**Voltage (Vac)**	**Tolerance**	**Capacitance (pF)**	**Size code**	**Terminal code**	**Lead length code**
EF = film capacitors	X1	S = standard	35 = 350 48 = 480 53 = 530 76 = 760	K = ±10% M = ±20%	First two digits= significant figures, third digit = number of zeros example: 104 = 100000 pF	Refer to size code table	Refer to terminal code table	Refer to lead length code table

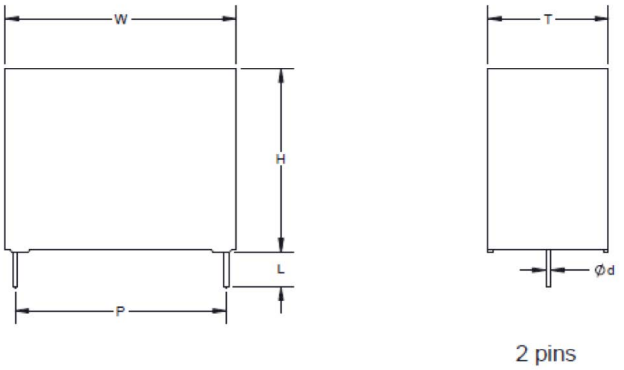
Terminal code table

Digit one (Lead/terminal type)		Digit two (Lead Ipsilateral)	
Straight cut	2	N/A	L
Taping straight	V	-	-

Lead length code table

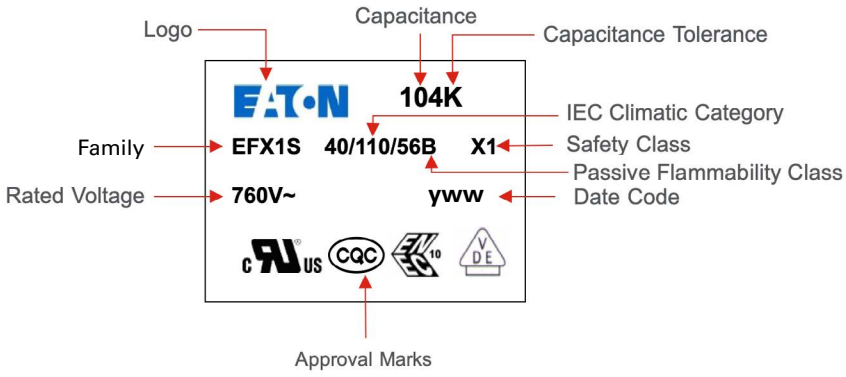
Lead length	
3.0±0.5 mm (Bulk)	D
3.5±0.5 mm (Bulk)	E
4.0±0.5 mm (Bulk)	F
4.5±0.5 mm (Bulk)	G
5.0±0.5 mm (Bulk)	H
25±2 mm (Ammo)	T

Dimensions-mm



2 pins

Part marking



Size code table

Size	Dimension						Pitch		Lead wire		Lead length
Code	W	Tolerance (±)	H	Tolerance (±)	T	Tolerance (±)	P	Tolerance (±)	Ød	Tolerance (±)	L
B01	18	0.5	11	0.5	5	0.5	15	0.5	0.6	0.05	Refer to Lead Length Code Table, Pitch 27.5 and 37.5 without Ammo package
B02	18	0.5	12	0.5	6	0.5	15	0.5	0.6	0.05	
B07	18	0.5	13.5	0.5	7.5	0.5	15	0.5	0.8	0.05	
B09	18	0.5	14.5	0.5	8.5	0.5	15	0.5	0.8	0.05	
B11	18	0.5	16	0.5	10	0.5	15	0.5	0.8	0.05	
B14	18	0.5	18	0.5	9	0.5	15	0.5	0.8	0.05	
B16	18	0.5	19	0.5	11	0.5	15	0.5	0.8	0.05	
B17	18	0.5	22	0.5	12.5	0.5	15	0.5	0.8	0.05	
C01	26	0.5	15.5	0.5	6	0.5	22.5	0.5	0.6	0.05	
C02	26	0.5	16.5	0.5	7	0.5	22.5	0.5	0.8	0.05	
C03	26	0.5	17	0.5	8.5	0.5	22.5	0.5	0.8	0.05	
C04	26	0.5	19	0.5	10	0.5	22.5	0.5	0.8	0.05	
C05	26	0.5	20	0.5	11	0.5	22.5	0.5	0.8	0.05	
C06	26	0.5	22	0.5	12	0.5	22.5	0.5	0.8	0.05	
C07	26	0.5	23	0.5	13	0.5	22.5	0.5	0.8	0.05	
C08	26	0.5	24.5	0.5	13	0.5	22.5	0.5	0.8	0.05	
C09	26	0.5	25	0.5	15	0.5	22.5	0.5	0.8	0.05	
C10	26	0.5	29.5	0.5	14.5	0.5	22.5	0.5	0.8	0.05	
D02	32	0.8	18	0.8	9	0.8	27.5	0.5	0.8	0.05	
D03	32	0.8	20	0.8	11	0.8	27.5	0.5	0.8	0.05	
D04	32	0.8	22	0.8	13	0.8	27.5	0.5	0.8	0.05	
D06	32	0.8	24.5	0.8	13	0.8	27.5	0.5	0.8	0.05	
D07	32	0.8	24.5	0.8	15	0.8	27.5	0.5	0.8	0.05	
D08	32	0.8	28	0.8	14	0.8	27.5	0.5	0.8	0.05	
D09	32	0.8	28	0.8	18	0.8	27.5	0.5	0.8	0.05	
D10	32	0.8	30	0.8	16	0.8	27.5	0.5	0.8	0.05	
D12	32	0.8	33	0.8	18	0.8	27.5	0.5	0.8	0.05	
D13	32	0.8	37	0.8	22	0.8	27.5	0.5	0.8	0.05	
E02	42	1.0	24	1.0	13	1.0	37.5	0.5	1.0	0.05	
E03	42	1.0	26	1.0	15	1.0	37.5	0.5	1.0	0.05	
E07	42	1.0	30	1.0	17	1.0	37.5	0.5	1.0	0.05	
E09	42	1.0	32	1.0	17	1.0	37.5	0.5	1.0	0.05	
E10	42	1.0	32	1.0	19	1.0	37.5	0.5	1.0	0.05	
E11	42	1.0	37	1.0	22	1.0	37.5	0.5	1.0	0.05	
E13	42	1.0	40	1.0	20	1.0	37.5	0.5	1.0	0.05	
E14	42	1.0	43	1.0	28	1.0	37.5	0.5	1.0	0.05	
E15	42	1.0	44	1.0	24	1.0	37.5	0.5	1.0	0.05	
E16	42	1.0	45	1.0	30	1.0	37.5	0.5	1.0	0.05	
E17	42	1.0	50	1.0	35	1.0	37.5	0.5	1.0	0.05	

P=15/22.5 case color is gray, P=27.5/37.5 case color is black.

Rating and part number

Rated voltage 350 Vac/700 Vdc

	Dimensions								
Capacitance value (µF)	W (mm)	H (mm)	T (mm)	P (mm)	Peak current (A)	Surge current (A)	dv/dt (V/µs)	Lead wire diameter (mm)	Part number[1]
0.01	18	11	5	15	5	15	500	0.6	EFX1S35K103B012LH
0.022	18	11	5	15	11	33	500	0.6	EFX1S35K223B012LH
0.033	18	11	5	15	16.5	49.5	500	0.6	EFX1S35K333B012LH
0.047	18	11	5	15	23.5	70.5	500	0.6	EFX1S35K473B012LH
0.068	18	12	6	15	34	102	500	0.6	EFX1S35K683B022LH
0.1	18	13.5	7.5	15	50	150	500	0.8	EFX1S35K104B072LH
0.15	18	14.5	8.5	15	75	225	500	0.8	EFX1S35K154B092LH
0.22	18	16	10	15	110	330	500	0.8	EFX1S35K224B112LH
0.33	18	19	11	15	165	495	500	0.8	EFX1S35K334B162LH
0.047	26	15.5	6	22.5	18.8	56.4	400	0.6	EFX1S35K473C012LH
0.068	26	15.5	6	22.5	27.2	81.6	400	0.6	EFX1S35K683C012LH
0.1	26	15.5	6	22.5	40	120	400	0.6	EFX1S35K104C012LH
0.15	26	15.5	6	22.5	60	180	400	0.6	EFX1S35K154C012LH
0.22	26	16.5	7	22.5	88	264	400	0.8	EFX1S35K224C022LH
0.33	26	17	8.5	22.5	132	396	400	0.8	EFX1S35K334C032LH
0.47	26	19	10	22.5	188	564	400	0.8	EFX1S35K474C042LH
0.68	26	22	12	22.5	272	816	400	0.8	EFX1S35K684C062LH
1	26	25	15	22.5	400	1200	400	0.8	EFX1S35K105C092LH
0.15	32	18	9	27.5	30	90	200	0.8	EFX1S35K154D022LH
0.22	32	18	9	27.5	44	132	200	0.8	EFX1S35K224D022LH
0.33	32	18	9	27.5	66	198	200	0.8	EFX1S35K334D022LH
0.47	32	18	9	27.5	94	282	200	0.8	EFX1S35K474D022LH
0.68	32	20	11	27.5	136	408	200	0.8	EFX1S35K684D032LH
1	32	22	13	27.5	200	600	200	0.8	EFX1S35K105D042LH
1.2	32	28	14	27.5	240	720	200	0.8	EFX1S35K125D082LH
1.5	32	30	16	27.5	300	900	200	0.8	EFX1S35K155D102LH
2.2	32	33	18	27.5	440	1320	200	0.8	EFX1S35K225D122LH
3.3	32	37	22	27.5	660	1980	200	0.8	EFX1S35K335D132LH
1	42	24	13	37.5	100	300	100	1	EFX1S35K105E022LH
1.2	42	24	13	37.5	120	360	100	1	EFX1S35K125E022LH
1.5	42	26	15	37.5	150	450	100	1	EFX1S35K155E032LH
1.8	42	26	15	37.5	180	540	100	1	EFX1S35K185E032LH
2.2	42	30	17	37.5	220	660	100	1	EFX1S35K225E072LH
2.7	42	32	19	37.5	270	810	100	1	EFX1S35K275E102LH
3.3	42	32	19	37.5	330	990	100	1	EFX1S35K335E102LH
4.7	42	37	22	37.5	470	1410	100	1	EFX1S35K475E112LH
5.6	42	44	24	37.5	560	1680	100	1	EFX1S35K565E152LH

1. Standard part numbers listed---addition confirgurations available for tolerance, terminal and lead length. See part number system for available tolerances and terminal and lead length tables for available options. .

Rating and part number

Rated voltage 480 Vac/1000 Vdc

	Dimensions								
Capacitance value (µF)	W (mm)	H (mm)	T (mm)	P (mm)	Peak current (A)	Surge current (A)	dv/dt (V/µs)	Lead wire diameter (mm)	Part number[1]
0.01	18	11	5	15	6	18	600	0.6	EFX1S48K103B012LH
0.015	18	11	5	15	9	27	600	0.6	EFX1S48K153B012LH
0.018	18	11	5	15	10.8	32.4	600	0.6	EFX1S48K183B012LH
0.022	18	11	5	15	13.2	39.6	600	0.6	EFX1S48K223B012LH
0.033	18	11	5	15	19.8	59.4	600	0.6	EFX1S48K333B012LH
0.047	18	12	6	15	28.2	84.6	600	0.6	EFX1S48K473B022LH
0.068	18	13.5	7.5	15	40.8	122.4	600	0.8	EFX1S48K683B072LH
0.1	18	14.5	8.5	15	60	180	600	0.8	EFX1S48K104B092LH
0.15	18	19	11	15	90	270	600	0.8	EFX1S48K154B162LH
0.22	18	22	12.5	15	132	396	600	0.8	EFX1S48K224B172LH
0.047	26	15.5	6	22.5	14.1	42.3	300	0.6	EFX1S48K473C012LH
0.056	26	15.5	6	22.5	16.8	50.4	300	0.6	EFX1S48K563C012LH
0.068	26	15.5	6	22.5	20.4	61.2	300	0.6	EFX1S48K683C012LH
0.082	26	15.5	6	22.5	24.6	73.8	300	0.6	EFX1S48K823C012LH
0.1	26	15.5	6	22.5	30	90	300	0.6	EFX1S48K104C012LH
0.15	26	16.5	7	22.5	45	135	300	0.8	EFX1S48K154C022LH
0.22	26	17	8.5	22.5	66	198	300	0.8	EFX1S48K224C032LH
0.33	26	20	11	22.5	99	297	300	0.8	EFX1S48K334C052LH
0.47	26	24.5	13	22.5	141	423	300	0.8	EFX1S48K474C082LH
0.56	26	25	15	22.5	168	504	300	0.8	EFX1S48K564C092LH
0.68	26	29.5	14.5	22.5	204	612	300	0.8	EFX1S48K684C102LH
0.15	32	18	9	27.5	30	90	200	0.8	EFX1S48K154D022LH
0.22	32	18	9	27.5	44	132	200	0.8	EFX1S48K224D022LH
0.33	32	18	9	27.5	66	198	200	0.8	EFX1S48K334D022LH
0.47	32	20	11	27.5	94	282	200	0.8	EFX1S48K474D032LH
0.56	32	22	13	27.5	112	336	200	0.8	EFX1S48K564D042LH
0.68	32	24.5	13	27.5	136	408	200	0.8	EFX1S48K684D062LH
0.82	32	28	14	27.5	164	492	200	0.8	EFX1S48K824D082LH
1	32	28	18	27.5	200	600	200	0.8	EFX1S48K105D092LH
1.2	32	33	18	27.5	240	720	200	0.8	EFX1S48K125D122LH
1.5	32	33	18	27.5	300	900	200	0.8	EFX1S48K155D122LH
1.8	32	37	22	27.5	360	1080	200	0.8	EFX1S48K185D132LH
0.47	42	24	13	37.5	70.5	211.5	150	1	EFX1S48K474E022LH
0.56	42	24	13	37.5	84	252	150	1	EFX1S48K564E022LH
0.68	42	24	13	37.5	102	306	150	1	EFX1S48K684E022LH
0.82	42	24	13	37.5	123	369	150	1	EFX1S48K824E022LH
1	42	24	13	37.5	150	450	150	1	EFX1S48K105E022LH
1.2	42	26	15	37.5	180	540	150	1	EFX1S48K125E032LH

1. Standard part numbers listed---addition confirgurations available for tolerance, terminal and lead length. See part number system for available tolerances and terminal and lead length tables for available options.

Rating and part number

Rated voltage 480 Vac/1000 Vdc

	Dimensions								
Capacitance value (µF)	**W (mm)**	**H (mm)**	**T (mm)**	**P (mm)**	**Peak current (A)**	**Surge current (A)**	**dv/dt (V/µs)**	**Lead wire diameter (mm)**	**Part number[1]**
1.5	42	30	17	37.5	225	675	150	1	EFX1S48K155E072LH
1.8	42	32	17	37.5	270	810	150	1	EFX1S48K185E092LH
2.2	42	32	19	37.5	330	990	150	1	EFX1S48K225E102LH
2.7	42	37	22	37.5	405	1215	150	1	EFX1S48K275E112LH
3.3	42	44	24	37.5	495	1485	150	1	EFX1S48K335E152LH
3.9	42	43	28	37.5	585	1755	150	1	EFX1S48K395E142LH
4.7	42	45	30	37.5	705	2115	150	1	EFX1S48K475E162LH
5.6	42	50	35	37.5	840	2520	150	1	EFX1S48K565E172LH

1. Standard part numbers listed---addition confirgurations available for tolerance, terminal and lead length. See part number system for available tolerances and terminal and lead length tables for available options.

Rating and part number

Rated voltage 530 Vac/1100 Vdc

	Dimensions								
Capacitance value (µF)	**W (mm)**	**H (mm)**	**T (mm)**	**P (mm)**	**Peak current (A)**	**Surge current (A)**	**dv/dt (V/µs)**	**Lead wire diameter (mm)**	**Part number[1]**
0.0068	18	11	5	15	4.08	12.24	600	0.6	EFX1S53K682B012LH
0.0082	18	11	5	15	4.92	14.76	600	0.6	EFX1S53K822B012LH
0.01	18	11	5	15	6	18	600	0.6	EFX1S53K103B012LH
0.022	18	12	6	15	13.2	39.6	600	0.6	EFX1S53K223B022LH
0.033	18	13.5	7.5	15	19.8	59.4	600	0.8	EFX1S53K333B072LH
0.047	18	14.5	8.5	15	28.2	84.6	600	0.8	EFX1S53K473B092LH
0.056	18	14.5	8.5	15	33.6	100.8	600	0.8	EFX1S53K563B092LH
0.068	18	18	9	15	40.8	122.4	600	0.8	EFX1S53K683B142LH
0.1	18	19	11	15	60	180	600	0.8	EFX1S53K104B162LH
0.033	26	15.5	6	22.5	9.9	29.7	300	0.6	EFX1S53K333C012LH
0.047	26	15.5	6	22.5	14.1	42.3	300	0.6	EFX1S53K473C012LH
0.056	26	15.5	6	22.5	16.8	50.4	300	0.6	EFX1S53K563C012LH
0.068	26	15.5	6	22.5	20.4	61.2	300	0.6	EFX1S53K683C012LH
0.082	26	15.5	6	22.5	24.6	73.8	300	0.6	EFX1S53M823C012LH*
0.1	26	16.5	7	22.5	30	90	300	0.8	EFX1S53K104C022LH
0.15	26	17	8.5	22.5	45	135	300	0.8	EFX1S53K154C032LH
0.22	26	19	10	22.5	66	198	300	0.8	EFX1S53K224C042LH
0.33	26	22	12	22.5	99	297	300	0.8	EFX1S53K334C062LH
0.47	26	29.5	14.5	22.5	141	423	300	0.8	EFX1S53K474C102LH
0.15	32	20	11	27.5	30	90	200	0.8	EFX1S53K154D032LH
0.22	32	20	11	27.5	44	132	200	0.8	EFX1S53K224D032LH
0.33	32	20	11	27.5	66	198	200	0.8	EFX1S53K334D032LH
0.47	32	22	13	27.5	94	282	200	0.8	EFX1S53K474D042LH
0.47	32	24.5	13	27.5	94	282	200	0.8	EFX1S53K474D062LH
0.56	32	24.5	13	27.5	112	336	200	0.8	EFX1S53K564D062LH
0.68	32	24.5	15	27.5	136	408	200	0.8	EFX1S53K684D072LH
0.68	32	28	18	27.5	136	408	200	0.8	EFX1S53K684D092LH
0.82	32	28	18	27.5	164	492	200	0.8	EFX1S53K824D092LH
1	32	33	18	27.5	200	600	200	0.8	EFX1S53K105D122LH
1.5	32	37	22	27.5	300	900	200	0.8	EFX1S53K155D132LH
1.8	32	37	22	27.5	360	1080	200	0.8	EFX1S53M185D132LH*
0.56	42	24	13	37.5	84	252	150	1	EFX1S53K564E022LH
0.68	42	24	13	37.5	102	306	150	1	EFX1S53K684E022LH
0.82	42	26	15	37.5	123	369	150	1	EFX1S53K824E032LH
1	42	26	15	37.5	150	450	150	1	EFX1S53K105E032LH
1	42	30	17	37.5	150	450	150	1	EFX1S53K105E072LH
1.5	42	32	17	37.5	225	675	150	1	EFX1S53M155E092LH*
2	42	40	20	37.5	300	900	150	1	EFX1S53K205E132LH

1. Standard part numbers listed---addition confirgurations available for tolerance, terminal and lead length. See part number system for available tolerances and terminal and lead length tables for available options.
*Only available in M = 20% tolerance, otherwise both K =10% and M = 20% available .

Rating and part number

Rated voltage 760 Vac/1500 Vdc

	Dimensions								
Capacitance value (µF)	W (mm)	H (mm)	T (mm)	P (mm)	Peak current (A)	Surge current (A)	dv/dt (V/µs)	Lead wire diameter (mm)	Part number[1]
0.0047	18	11	5	15	3.055	9.165	650	0.6	EFX1S76K472B012LH
0.0056	18	11	5	15	3.64	10.92	650	0.6	EFX1S76K562B012LH
0.0068	18	11	5	15	4.42	13.26	650	0.6	EFX1S76K682B012LH
0.0082	18	11	5	15	5.33	15.99	650	0.6	EFX1S76K822B012LH
0.01	18	11	5	15	6.5	19.5	650	0.6	EFX1S76K103B012LH
0.012	18	12	6	15	7.8	23.4	650	0.6	EFX1S76K123B022LH
0.015	18	12	6	15	9.75	29.25	650	0.6	EFX1S76K153B022LH
0.022	18	13.5	7.5	15	14.3	42.9	650	0.8	EFX1S76K223B072LH
0.033	18	14.5	8.5	15	21.45	64.35	650	0.8	EFX1S76K333B092LH
0.047	18	19	11	15	30.55	91.65	650	0.8	EFX1S76K473B162LH
0.01	26	15.5	6	22.5	3.5	10.5	350	0.6	EFX1S76K103C012LH
0.012	26	15.5	6	22.5	4.2	12.6	350	0.6	EFX1S76K123C012LH
0.015	26	15.5	6	22.5	5.25	15.75	350	0.6	EFX1S76K153C012LH
0.018	26	15.5	6	22.5	6.3	18.9	350	0.6	EFX1S76K183C012LH
0.022	26	15.5	6	22.5	7.7	23.1	350	0.6	EFX1S76K223C012LH
0.027	26	15.5	6	22.5	9.45	28.35	350	0.6	EFX1S76K273C012LH
0.033	26	15.5	6	22.5	11.55	34.65	350	0.6	EFX1S76K333C012LH
0.047	26	15.5	6	22.5	16.45	49.35	350	0.6	EFX1S76K473C012LH
0.056	26	16.5	7	22.5	19.6	58.8	350	0.8	EFX1S76K563C022LH
0.068	26	16.5	7	22.5	23.8	71.4	350	0.8	EFX1S76K683C022LH
0.082	26	17	8.5	22.5	28.7	86.1	350	0.8	EFX1S76K823C032LH
0.1	26	19	10	22.5	35	105	350	0.8	EFX1S76K104C042LH
0.12	26	19	10	22.5	42	126	350	0.8	EFX1S76K124C042LH
0.15	26	19	10	22.5	52.5	157.5	350	0.8	EFX1S76K154C042LH
0.22	26	23	13	22.5	77	231	350	0.8	EFX1S76K224C072LH
0.33	26	29.5	14.5	22.5	115.5	346.5	350	0.8	EFX1S76K334C102LH
0.056	32	18	9	27.5	19.6	58.8	350	0.8	EFX1S76K563D022LH
0.068	32	18	9	27.5	17	51	250	0.8	EFX1S76K683D022LH
0.082	32	18	9	27.5	20.5	61.5	250	0.8	EFX1S76K823D022LH
0.1	32	18	9	27.5	25	75	250	0.8	EFX1S76K104D022LH
0.15	32	20	11	27.5	37.5	112.5	250	0.8	EFX1S76K154D032LH
0.22	32	22	13	27.5	55	165	250	0.8	EFX1S76K224D042LH
0.33	32	24.5	15	27.5	82.5	247.5	250	0.8	EFX1S76K334D072LH
0.39	32	28	18	27.5	97.5	292.5	250	0.8	EFX1S76K394D092LH
0.47	32	33	18	27.5	117.5	352.5	250	0.8	EFX1S76K474D122LH
0.56	32	33	18	27.5	140	420	250	0.8	EFX1S76K564D122LH
0.68	32	37	22	27.5	170	510	250	0.8	EFX1S76K684D132LH
0.33	42	24	13	37.5	66	198	200	1	EFX1S76K334E022LH
0.39	42	24	13	37.5	78	234	200	1	EFX1S76K394E022LH

1. Standard part numbers listed---addition confirgurations available for tolerance, terminal and lead length. See part number system for available tolerances and terminal and lead length tables for available options.

Rating and part number

Rated voltage 760 Vac/1500 Vdc

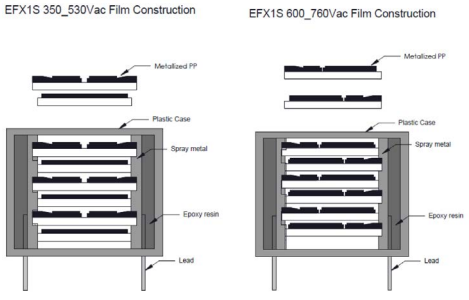
	Dimensions								
Capacitance value (µF)	**W (mm)**	**H (mm)**	**T (mm)**	**P (mm)**	**Peak current (A)**	**Surge current (A)**	**dv/dt (V/µs)**	**Lead wire diameter (mm)**	**Part number[1]**
0.47	42	26	15	37.5	94	282	200	1	EFX1S76K474E032LH
0.56	42	30	17	37.5	112	336	200	1	EFX1S76K564E072LH
0.68	42	30	17	37.5	136	408	200	1	EFX1S76K684E072LH
0.82	42	32	19	37.5	164	492	200	1	EFX1S76K824E102LH
1	42	32	19	37.5	200	600	200	1	EFX1S76K105E102LH
1.2	42	37	22	37.5	240	720	200	1	EFX1S76K125E112LH
1.5	42	44	24	37.5	300	900	200	1	EFX1S76K155E152LH
1.8	42	43	28	37.5	360	1080	200	1	EFX1S76K185E142LH
2	42	45	30	37.5	400	1200	200	1	EFX1S76K205E162LH

1. Standard part numbers listed---addition confirgurations available for tolerance, terminal and lead length. See part number system for available tolerances and terminal and lead length tables for available options.

General information

Application	Interference suppression \ Across-the-line (Class X1)
Dielectric	Metallized Polypropylene Film
Reference standard	IEC 60384-14; UL 60384-14; GB/T 6346.14-2015
Climatic category	40/110/56 IEC60068-1
Passive flammability class	B
Operating temperature range	-40 °C to +110 °C
Protection	Solvent resistant plastic case UL94 V-0, Thermosetting resin sealing UL 94V-0 compliant
Installation	Any position
Packaging	Packed in cardboard boxes with protection for the terminals
Storage conditions	Storage time: ≤24 months from the date marked on the package label, Average relative humidity per year ≤70%, RH≤85% for 30 days in one year, Dew is absent, Temperature: -40°C to +85°C
RoHS compliant	Compliant with the restricted substance requirements of Directive 2011/65/EU
Flame retardant grade	Flame retardant performance accords with horizontal combustion grade HB and vertical combustion grade V-0

Construction

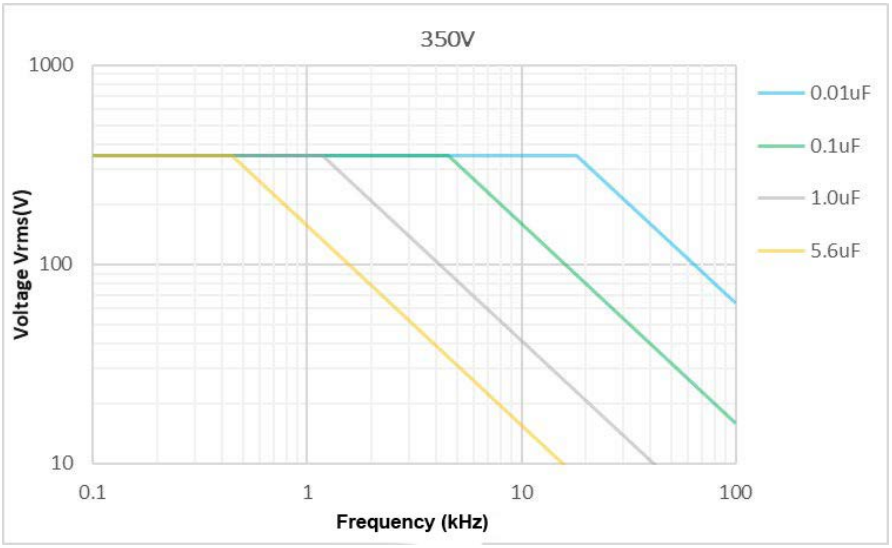
Metallized film	OPP & Al/Zn
Metal sprayed	Sn/Zn Alloy
Connection electrode	(0.6 mm to 0.8 mm) Tinned copper clad steel wire (1.0 mm to 1.2 mm) Tinned copper wires
Plastic case	Plastic case (UL94V-0)
Filling	Epoxy resin (UL94V-0)
Film construction	

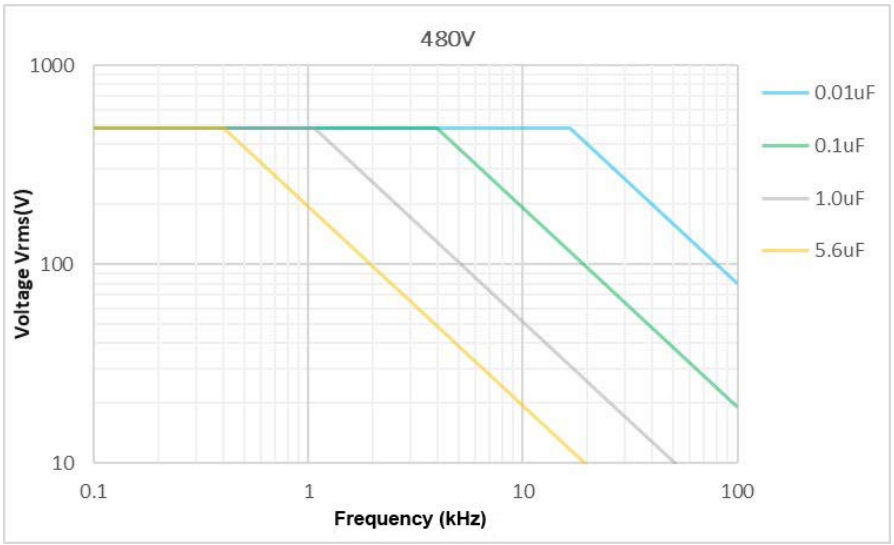
Electrical and general characteristics

Rated AC voltage (U_R)	350 Vac, 480 Vac, 530 Vac, 760 Vac, 50/60 Hz
Recommended DC voltage	700 Vdc, 1000 Vdc, 1100 Vdc, 1500 Vdc
Capacitance range	0.0047 µF to 5.6 µF
Capacitance tolerance	±10% or ±20% at +20 °C
Capacitance	Measuring Frequency at 1 kHz, +20°C Measuring Voltage:1.0 ± 0.2 V
Standard atmospheric conditions for static test	Ambient temperature +15 °C to +35 °C Relative humidity 45% to 75% Air pressure 86 kPa to 106 kPa.
Withstanding DC voltage between terminals U_{TT}	DC Voltage: 4.3 x U_R* for 60 seconds (at +20 ±2 °C) *The U_R in this DC test is the rated AC voltage value
Withstanding AC voltage between terminal and case U_{TC}	$2U_R$ + 1500 Vac, 60 s (at +20 ± 2 °C)
Dissipation factor	≤20 * 10^{-4} at 10 kHz. (C ≤ 1 µF) at +20 °C ≤30 * 10^{-4} at 1 kHz. (C > 1 µF) at +20 °C
Insulation resistance	R between leads, for C ≤ 0.33 µF at 100 V 20°C; 1 min > 15 000 MΩ RC between leads, for C > 0.33 µF at 100 V 20°C; 1 min > 5000 MΩ*µF
Life expectancy	100,000 hours (U_R) hotspot = +85° C)
Failure rate	100 FIT
Maximum altitude	2000 m

Charcteristics curves

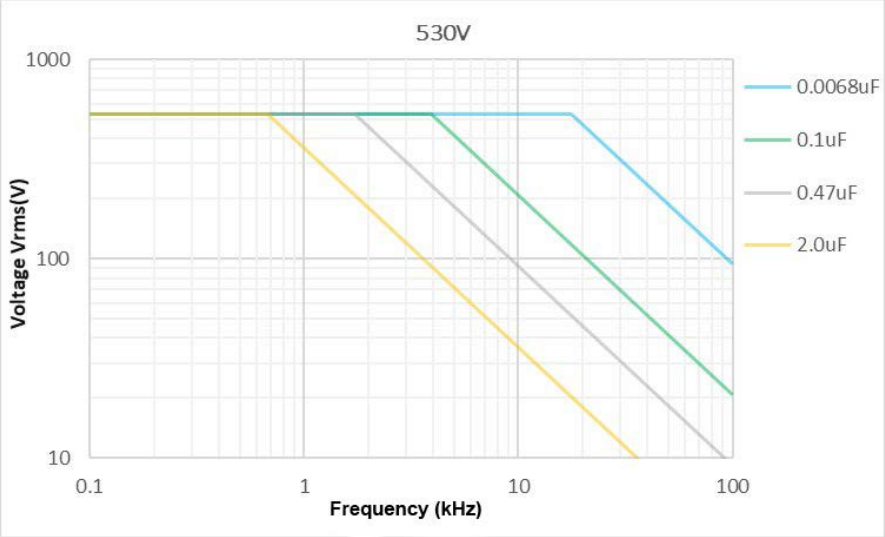
Maximum voltage (V_{rms}) vs frequency

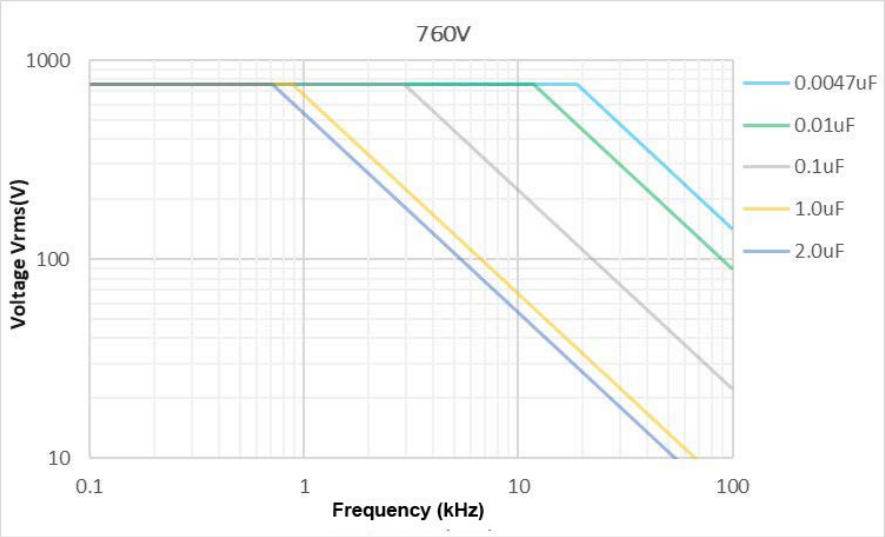




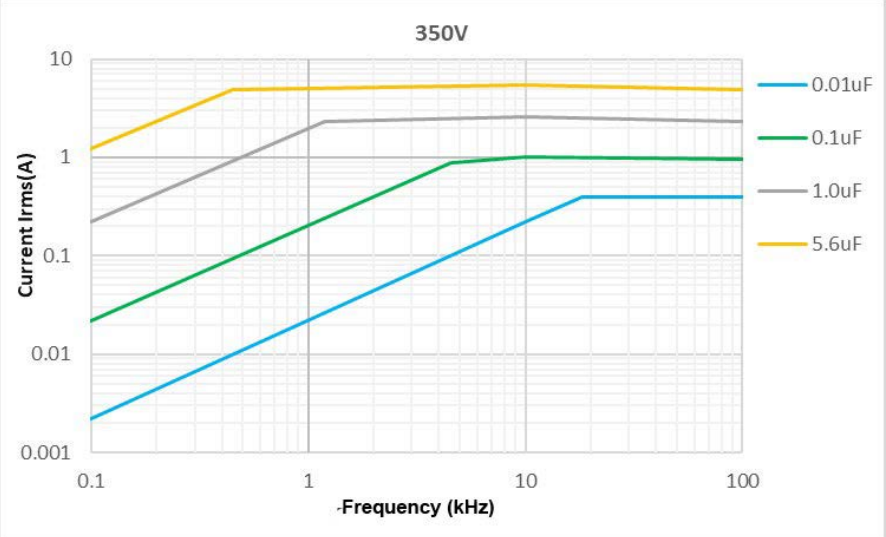
Charcteristics curves

Maximum voltage (V_{rms}) vs frequency



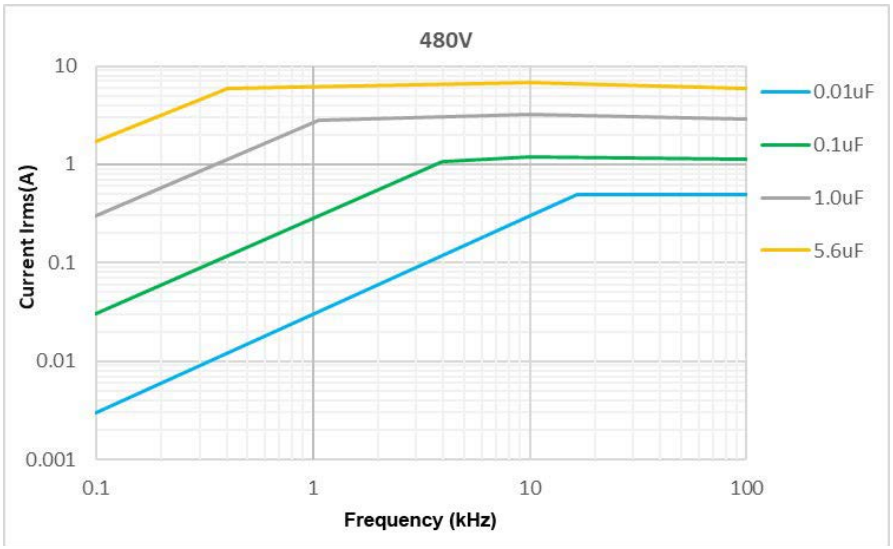


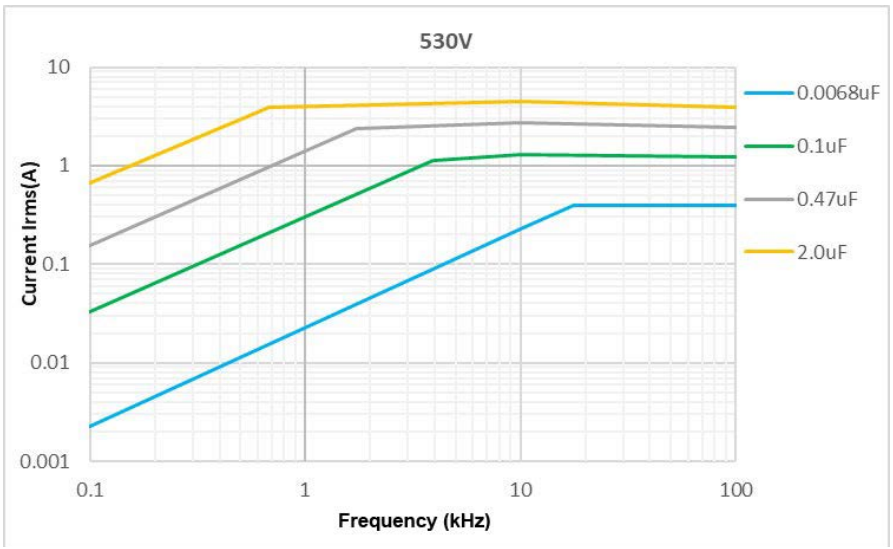
Maximum current (I_{rms}) vs frequency

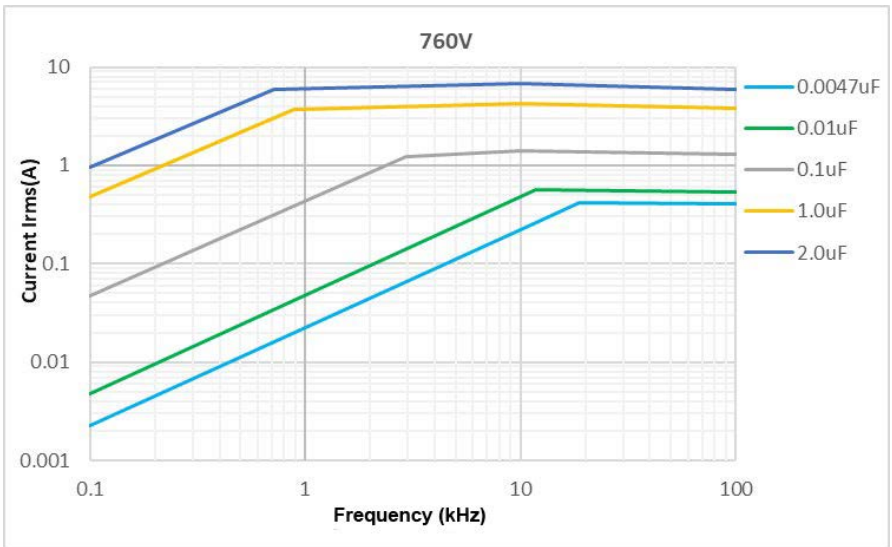


Charcteristics curves

Maximum current (I_{rms}) vs frequency

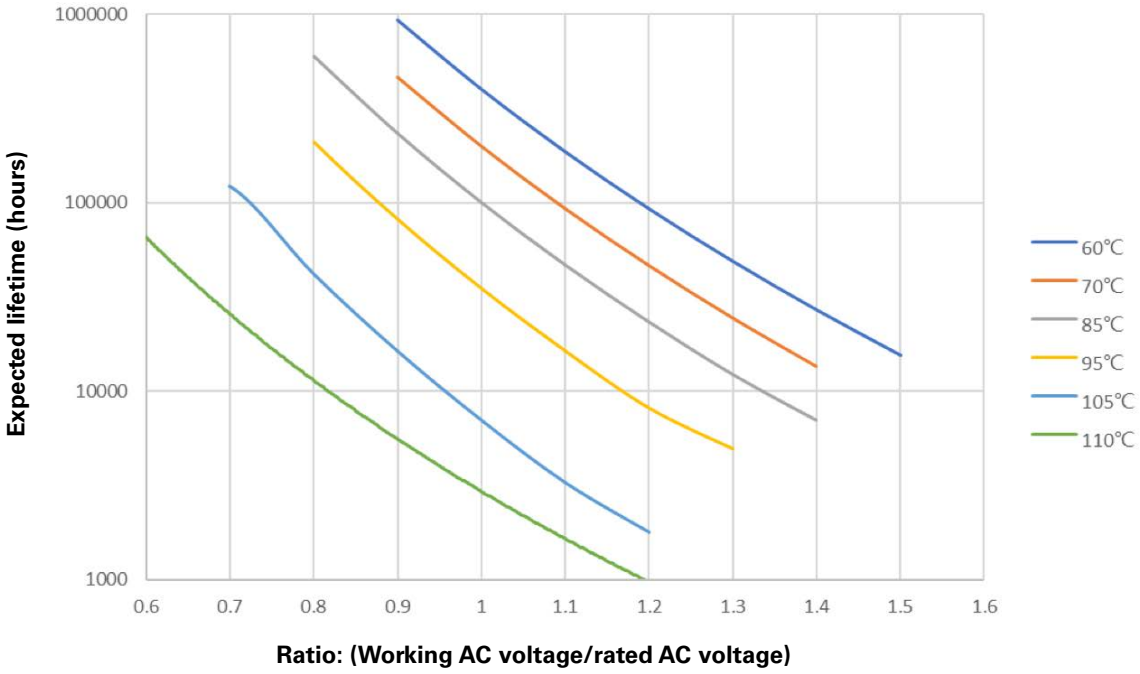




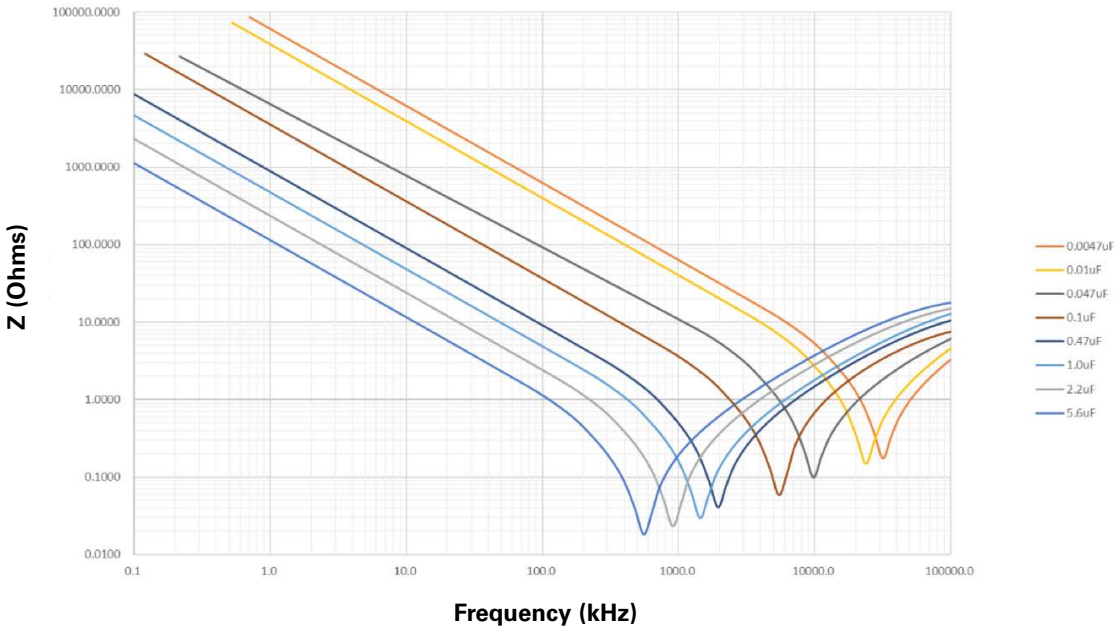


Charcteristics curves

Expected life curve



Impedance vs frequency



Environmental test

Test	Test condition	Performance
Damp heat loading	Test temperature: +40 ±2 °C Test humidity: 90% to 95% R.H. Test Duration: 1000 +24/-0 hours Loading voltage: Rated voltage	Capacitance change rate (△C/C) : ≤±10% DF change (△tgδ): : ≤80*10^{-4} at 10 kHz. (C ≤ 1 µF) DF change (△tgδ): : ≤50 * 10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac)/60 s
Rapid temperature change	Testing method per IEC 60068-2-14 Na Test temperature cycle: Total 5 cycles High temperature: +110 ±5 °C for 30 minutes Low temperature: -40 ±5 °C for 30 minutes	Capacitance change rate (△C/C) : ≤±5% DF change (△tgδ): : ≤80*10^{-4} at 10 kHz. (C ≤ 1 µF) DF change (△tgδ): : ≤50*10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac)/60 s
High temperature loading	Testing method per IEC 60384-14 Test Temperature: +110 ±2 °C. Apply 125% of rated voltage for 1,000 +24/-0 hours; Each of these voltages shall be applied to each capacitor individually through a resistor of 47 Ω ±5%. Once every hour the voltage is increased to 1.5UR or 1000 V rms, whichever is higher, for 0.1 seconds.	Capacitance change rate (△C/C) : ≤±10% DF change (△tgδ): : ≤80*10^{-4} at 10 kHz. (C ≤ 1 µF) DF change (△tgδ): : ≤50*10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac)/60 s
High temperature features	Test Temperature: +110 ±2 °C Test Duration: 16 +1/-0 hours	Capacitance change rate (△C/C) : -0 to -5% DF change (△tgδ): : ≤80*10^{-4} at 10 kHz. (C ≤ 1 µF) DF change (△tgδ): : ≤50*10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac)/60 s
Low temperature features	Test Temperature: -40 ±2 °C Test Duration: 2 +1/-0 hours	Capacitance change rate (△C/C) : +0 to +5% DF change (△tgδ): : ≤80*10^{-4} at 10 kHz. (C ≤ 1 µF) DF change (△tgδ): : ≤50*10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac)/60 s
Solderability	Testing method per IEC 60068-2-20 Ta Soldering temperature: +245 ±5 °C Immersion duration: 2 ±0.5 seconds	More than 95% of circumferential surface of lead wire shall be covered with new solder. Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac) /60 s
Soldering heat resistance	Flow soldering: Preheat temperature +100 °C to +120 °C Preheat duration: 100 seconds maximum Soldering temperature: +260 +-5 °C Immersion duration: ≤10 seconds Immersion depth: 1.5 ± 0.5 mm from roots	Capacitance change rate (ΔC/C): ≤±2% DF change (Δtgδ): ≤80*10^{-4} at 10 kHz. (C ≤ 1 µF) DF change (Δtgδ): ≤50*10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac) /60 s
Temperature cycle	Test temperature cycle: Total 5 cycles Each cycle includes: 1. +20 ± 2 °C for 3 minutes 2. -40 +0/-3 °C for 30 minutes 3. +20 +/- 2 °C for 3 minutes 4. +110 +3/-0 °C for 30 minutes 5. +20 ± 2 °C for 3 minutes	Capacitance change rate (ΔC/C): ≤±5% DF change (Δtgδ): ≤80*10^{-4} at 10 kHz. (C ≤ 1 µF) DF change (Δtgδ): ≤50*10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac) /60 s
Humidity resistance	Testing method per IEC 60068-2-3 Ca Test temperature: +40 +-2 °C Test humidity: 90% to 95% R.H. Test duration: 1344 +24/-0 hours	Capacitance change rate (ΔC/C): ≤±5% DF change (Δtgδ): ≤80*10^{-4} at 10 kHz. (C ≤ 1 µF) DF change (Δtgδ): ≤50*10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac) /60 s

Electrical test

Test	Test condition	Performance
Charge and discharge	10000 cycles Charge to √2 x UR(DC) Charge resistance: $R = \frac{220 \times 10^{-6}}{C_N}\ \Omega$ Discharge resistance: $R = \frac{\sqrt{2} \times U_R\,(DC)}{1.25 \times C(dv/dt)}\ \Omega$	Capacitance change rate (△C/C) : ≤±5% DF change (△tgδ): : ≤80*10^{-4} at 10 kHz. (C ≤ 1 µF) DF change (△tgδ): : ≤50 * 10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac)/60 s
Impulse voltage	3 successive impulses, full wave, peak voltage: X1: 4 kV for C ≤ 1 µF X1: 4 kV/√C for C > 1 µF 24 pulses maximum	No self-healing breakdowns or flashover

Mechanical test

Test	Test condition	Performance
Resistance to solvent	IEC 60068-2-45 test XA method 1 Solvent: propanol (isopropyl-alcohol) Temperature: +23 ±5°C Immersion time: 5 ±0.5 minutes Drying time: 5 minutes Mechanical treatment: 10 rubbing (with cotton-wool)	Capacitance change rate (△C/C) : ≤±1% DF change (△tgδ): : ≤80*10^{-4} at 10 kHz. (C ≤ 1 µF) DF change (△tgδ): : ≤50*10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac)/60 s
Terminal strength	Tension: 0.50 < D ≤0.80, 10N 0.80 < D ≤1.25, 20N Bending test : Bending force: 0.50 < D ≤0.80, 5N 0.80 < D ≤1.25, 10N Make two successive bends in each direction	No visible damage to appearance
Vibration resistance	Testing method per IEC 60068-2-6 Fc. Frequency Change: 10—55—10 Hz. Vibration Distance : 1.5 mm Test Direction : X, Y, Z Test Duration: 2 +1/- 0 hours each direction	Capacitance change rate (△C/C) : ≤±3% DF change (△tgδ): : ≤80*10^{-4} at 10 KHz. (C ≤ 1 µF) DF change (△tgδ): : ≤50*10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac)/60 s
Bump	1000 times, Acceleration: 400 m/s^2 Pulse duration: 6 ms	Capacitance change rate (△C/C) : ≤±3% DF change (△tgδ): : ≤80*10^{-4} at 10 kHz. (C ≤ 1 µF) DF change (△tgδ): : ≤50*10^{-4} at 1 kHz. (C > 1 µF) Insulation resistance: ≥50% of initial limit (T-T) test voltage: 4.3 U_R (dc)/60 s (T-C) test voltage: 2 U_R + 1500 V (ac)/60 s

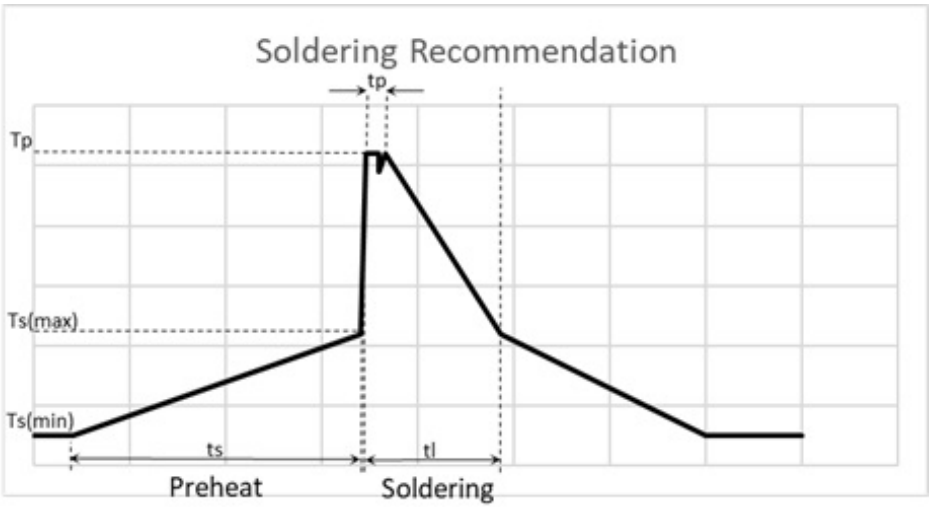
Flammability test

Test	Test condition	Performance
Passive flammability class B	Bore of gas jet: Ø 0.5 mm Fuel: Butane Test duration for actual volume V in mm3: V ≤ 250: 10 s 250 < V ≤ 500: 20 s 500 < V ≤1750: 30 s V > 1750: 60 s One flame application	After removing test flame from capacitor, the capacitor must not continue to burn for more than 10 s. No burning particle must drop from the sample.
Active flammability	20 cycles of 4 kV discharges on the test capacitor connected to U_R	The cheese cloth around the capacitors shall not burn with a flame. No electrical measurements are required.

Packaging information

Pitch	SIze	Dimension			Package quantity	
mm	Code	W	H	T	Bulk pack/box	Ammo pack/box
15	B01	18	11	5	1,054	680
	B02	18	12	6	867	560
	B07	18	13.5	7.5	697	450
	B09	18	14.5	8.5	612	390
	B11	18	16	10	527	340
	B14	18	18	9	578	370
	B16	18	19	11	476	300
	B17	18	22	12.5	408	260
22.5	C01	26	15.5	6	612	350
	C02	26	16.5	7	528	300
	C03	26	17	8.5	432	250
	C04	26	19	10	372	210
	C05	26	20	11	336	190
	C06	26	22	12	300	170
	C07	26	23	13	276	160
	C08	26	24.5	13	276	160
	C09	26	25	15	240	140
	C10	26	29.5	14.5	252	140
27.5	D02	32	18	9	340	NA
	D03	32	20	11	280	NA
	D04	32	22	13	230	NA
	D06	32	24.5	13	230	NA
	D07	32	24.5	15	200	NA
	D08	32	28	14	220	NA
	D09	32	28	18	170	NA
	D10	32	30	16	190	NA
	D12	32	33	18	170	NA
	D13	32	37	22	140	NA
37.5	E02	42	24	13	161	NA
	E03	42	26	15	140	NA
	E07	42	30	17	126	NA
	E09	42	32	17	126	NA
	E10	42	32	19	112	NA
	E11	42	37	22	98	NA
	E13	42	40	20	105	NA
	E14	42	43	28	77	NA
	E15	42	44	24	91	NA
	E16	42	45	30	70	NA
	E17	42	50	35	63	NA

Wave solder profile



Profile feature		
Preheat	• Ts maximimum	110 °C
	• Ts minimum	NA
	• ts	< 150 seconds
Soldering	• Tp	260 °C ±5 °C
	• tp	< 10 seconds
	• tl	≤60 seconds

Capacitor body maximum temperature at wave soldering ≤120 °C

Manual solder

+400 °C, 3 seconds maximum by soldering iron, generally manual, hand soldering is not recommended

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