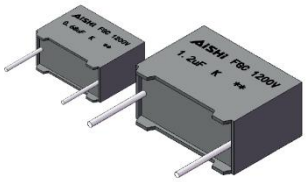
Double Metallized Polypropylene Film Capacitors
FGC Series
630VDC ~ 2000VDC (DC / Pulse, Resonant and High Frequency Applications)

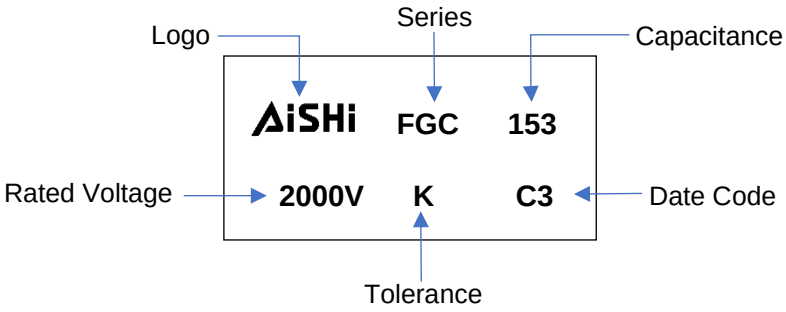
Overview
The FGC series is constructed of metallized polypropylene film and double-sided metallized film as electrodes with radial leads of tinned wires. The capacitor is encapsulated in plastic cases, sealed with epoxy resin.

Applications
Widely used in snubber and silicon-controlled rectifier (SCR and IGBT) and SiC (MOSFET) commutation circuits. Suitable for applications with high frequency and high current applications.

Features
- High ripple current
- Self-healing property
- Low losses
- Operating temperature range: -40°C to 105°C
- High contact reliability
- Suitable for high frequency applications
- Negative temperature coefficient of capacitance
- Lead Space (Pitch): 15mm ~ 22.5mm



Marking



Manufacturing Date Code

Year	Code	Month	Code
2018	A	Jan	1
2019	B	Feb	2
2020	C	Mar	3
2021	D	Apr	4
2022	E	May	5
2023	F	Jun	6

Year	Code	Month	Code
2024	G	Jul	7
2025	H	Aug	8
2026	J	Sep	9
2027	K	Oct	A
2028	L	Nov	N
2029	M	Dec	D

Part Number System

F	GC	3D	K	153	E34	2EL	5
Capacitor Type	Series	Voltage (VDC)	Tolerance	Capacitance (pF)	Size Code	Terminal Code	Lead Length Code
F = Film	DC Film, Double Sided Metallized PP Film	630=2L 1000=3K 1300=3S 1600=3W 2000=3D	J = ±5% K = ±10%	First two digits = significant figures. Third digit = Number of zeros.	Refer to Size Code Table	Refer to Terminal Code Table	Refer to Lead Length Code Table

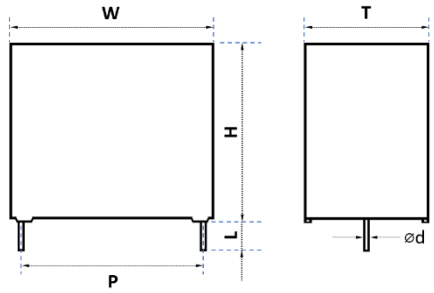
Terminal Code

Digit One (Lead/Terminal Type)		Digit Two (Lead Space)		Digit Three (Lead Ipsilateral)	
2 leads for long	L	10.0mm	C	N/A	L
2 leads for straight cut	2	15.0mm	E		
2 leads for forming cut	E	22.5mm	F		
2 leads for taping forming	T				
2 leads for taping straight	V				

Lead Length Code

Lead Length	
3.2mm	1
3.5mm	2
3.0mm	3
4.0mm	4
5.0mm	5
Taping	T
N/A	N

Dimension (mm)



Size Code Table (mm)

Size Code	Dimension						Pitch		Lead Wire	
	W	Tolerance	H	Tolerance	T	Tolerance	P	Tolerance	Ød	Tolerance
E14	18	0.5	11	0.5	5	0.5	15	0.5	0.8	0.05
E17	18	0.5	12	0.5	6	0.5	15	0.5	0.8	0.05
E21	18	0.5	13	0.5	7	0.5	15	0.5	0.8	0.05
E29	18	0.5	13.5	0.5	7.5	0.5	15	0.5	0.8	0.05
E34	18	0.5	14.5	0.5	8.5	0.5	15	0.5	0.8	0.05
E38	18	0.5	16	0.5	9	0.5	15	0.5	0.8	0.05
E43	18	0.5	16	0.5	10	0.5	15	0.5	0.8	0.05
E47	18	0.5	19	0.5	11	0.5	15	0.5	0.8	0.05
F14	26	0.5	15.5	0.5	6	0.5	22.5	0.5	0.8	0.05
F17	26	0.5	16.5	0.5	7	0.5	22.5	0.5	0.8	0.05
F20	26	0.5	17	0.5	8.5	0.5	22.5	0.5	0.8	0.05
F24	26	0.5	19	0.5	10	0.5	22.5	0.5	0.8	0.05
F26	26	0.5	20	0.5	11	0.5	22.5	0.5	0.8	0.05
F27	26	0.5	22	0.5	12	0.5	22.5	0.5	0.8	0.05
F30	26	0.5	24.5	0.5	13	0.5	22.5	0.5	0.8	0.05
F34	26	0.5	29.5	0.5	14.5	0.5	22.5	0.5	0.8	0.05

Rating and Part Number

Vdc	Vac	Cap Value	Dimensions				Irms max (100KHz 70°C)	Peak Current	$ESR_{Typical}$ 100KHz	ESL	dv/dt	Lead Wire	Part Number
			W	H	T	P							
		µF	mm	mm	mm	mm	A	A	mΩ	nH	V/us	mm	
630	400	0.01	18	11	5	15	1.8	30	62	12	3000	0.8	FGC2LK103E142EL5
630	400	0.012	18	11	5	15	2.2	36	52	12	3000	0.8	FGC2LK123E142EL5
630	400	0.015	18	11	5	15	2.5	45	42	12	3000	0.8	FGC2LK153E142EL5
630	400	0.018	18	11	5	15	2.7	54	35	12	3000	0.8	FGC2LK183E142EL5
630	400	0.02	18	11	5	15	2.8	60	32	12	3000	0.8	FGC2LK203E142EL5
630	400	0.022	18	11	5	15	2.9	66	30	12	3000	0.8	FGC2LK223E142EL5
630	400	0.027	18	12	6	15	3.2	81	25	12	3000	0.8	FGC2LK273E172EL5
630	400	0.033	18	12	6	15	3.7	99	20	12	3000	0.8	FGC2LK333E172EL5
630	400	0.039	18	12	6	15	3.9	117	16	12	3000	0.8	FGC2LK393E172EL5
630	400	0.047	18	13.5	7.5	15	4.5	141	15	12	3000	0.8	FGC2LK473E292EL5
630	400	0.056	18	13.5	7.5	15	4.6	168	14	12	3000	0.8	FGC2LK563E292EL5
630	400	0.068	18	14.5	8.5	15	4.7	204	13.5	12	3000	0.8	FGC2LK683E342EL5
630	400	0.082	18	16	10	15	4.8	246	13.2	12	3000	0.8	FGC2LK823E432EL5
630	400	0.1	18	16	10	15	5	300	13	12	3000	0.8	FGC2LK104E432EL5
630	400	0.12	18	19	11	15	5.4	360	12.5	12	3000	0.8	FGC2LK124E472EL5
630	400	0.047	26	15.5	6	22.5	3.8	70.5	20	15	1500	0.8	FGC2LK473F142FL5
630	400	0.056	26	15.5	6	22.5	4	84	19.5	15	1500	0.8	FGC2LK563F142FL5
630	400	0.068	26	15.5	6	22.5	4.2	102	19	15	1500	0.8	FGC2LK683F142FL5
630	400	0.082	26	15.5	6	22.5	4.5	123	18	15	1500	0.8	FGC2LK823F142FL5
630	400	0.1	26	15.5	6	22.5	5	150	16	15	1500	0.8	FGC2LK104F142FL5
630	400	0.12	26	16.5	7	22.5	5.3	180	14	15	1500	0.8	FGC2LK124F172FL5
630	400	0.15	26	17	8.5	22.5	6	225	11	15	1500	0.8	FGC2LK154F202FL5
630	400	0.18	26	17	8.5	22.5	6.5	270	10	15	1500	0.8	FGC2LK184F202FL5
630	400	0.22	26	19	10	22.5	7.5	330	8.5	15	1500	0.8	FGC2LK224F242FL5
630	400	0.27	26	20	11	22.5	8.5	405	6.5	15	1500	0.8	FGC2LK274F262FL5
630	400	0.33	26	20	11	22.5	9	495	6	15	1500	0.8	FGC2LK334F262FL5
630	400	0.39	26	22	12	22.5	10	585	5	15	1500	0.8	FGC2LK394F272FL5

Rating and Part Number

Vdc	Vac	Cap Value	Dimensions				Irms max (100KHz 70°C)	Peak Current	$ESR_{Typical}$ 100KHz	ESL	dv/dt	Lead Wire	Part Number
			W	H	T	P							
		µF	mm	mm	mm	mm	A	A	mΩ	nH	V/us	mm	
1000	600	0.0082	18	11	5	15	1.5	28.7	80	10	3500	0.8	FGC3KK822E142EL5
1000	600	0.01	18	11	5	15	1.8	35	62	12	3500	0.8	FGC3KK103E142EL5
1000	600	0.012	18	11	5	15	2.2	42	52	12	3500	0.8	FGC3KK123E142EL5
1000	600	0.015	18	11	5	15	2.5	52.5	42	12	3500	0.8	FGC3KK153E142EL5
1000	600	0.018	18	11	5	15	2.7	63	35	12	3500	0.8	FGC3KK183E142EL5
1000	600	0.02	18	12	6	15	2.8	70	32	10	3500	0.8	FGC3KK203E172EL5
1000	600	0.022	18	12	6	15	3	77	29	10	3500	0.8	FGC3KK223E172EL5
1000	600	0.027	18	13.5	7.5	15	3.5	94.5	24	12	3500	0.8	FGC3KK273E292EL5
1000	600	0.033	18	13.5	7.5	15	4	115.5	19	12	3500	0.8	FGC3KK333E292EL5
1000	600	0.039	18	14.5	8.5	15	4.5	136.5	16	12	3500	0.8	FGC3KK393E342EL5
1000	600	0.047	18	14.5	8.5	15	4.9	164.5	14	12	3500	0.8	FGC3KK473E342EL5
1000	600	0.027	26	15.5	6	22.5	3.8	56.7	24	15	2100	0.8	FGC3KK273F142FL5
1000	600	0.033	26	15.5	6	22.5	4.3	69.3	19	15	2100	0.8	FGC3KK333F142FL5
1000	600	0.039	26	15.5	6	22.5	4.8	81.9	16	15	2100	0.8	FGC3KK393F142FL5
1000	600	0.047	26	16.5	7	22.5	5	98.7	15	15	2100	0.8	FGC3KK473F172FL5
1000	600	0.056	26	16.5	7	22.5	5.4	117.6	14.5	15	2100	0.8	FGC3KK563F172FL5
1000	600	0.068	26	17	8.5	22.5	5.6	142.8	14	15	2100	0.8	FGC3KK683F202FL5
1000	600	0.082	26	19	10	22.5	5.8	172.2	13.5	15	2100	0.8	FGC3KK823F242FL5
1000	600	0.1	26	19	10	22.5	6	210	13	15	2100	0.8	FGC3KK104F242FL5
1000	600	0.12	26	20	11	22.5	6.5	180	12.5	15	1500	0.8	FGC3KK124F262FL5
1000	600	0.15	26	22	12	22.5	7	225	11	15	1500	0.8	FGC3KK154F272FL5

Rating and Part Number

Vdc	Vac	Cap Value	Dimensions				Irms max (100KHz 70°C)	Peak Current	$ESR_{Typical}$ 100KHz	ESL	dv/dt	Lead Wire	Part Number
			W	H	T	P							
		µF	mm	mm	mm	mm	A	A	mΩ	nH	V/us	mm	
1300	620	0.0082	18	11	5	15	1.7	28.7	95	10	3500	0.8	FGC3SK822E142EL5
1300	620	0.01	18	11	5	15	2	35	65	12	3500	0.8	FGC3SK103E142EL5
1300	620	0.012	18	11	5	15	2.2	42	52	12	3500	0.8	FGC3SK123E142EL5
1300	620	0.015	18	11	5	15	2.5	52.5	42	12	3500	0.8	FGC3SK153E142EL5
1300	620	0.018	18	12	6	15	2.8	63	38	12	3500	0.8	FGC3SK183E172EL5
1300	620	0.02	18	12	6	15	2.9	70	36	10	3500	0.8	FGC3SK203E172EL5
1300	620	0.022	18	13	7	15	3.1	77	32	10	3500	0.8	FGC3SK223E212EL5
1300	620	0.027	18	13.5	7.5	15	3.7	94.5	26	12	3500	0.8	FGC3SK273E292EL5
1300	620	0.033	18	14.5	8.5	15	4	115.5	19	12	3500	0.8	FGC3SK333E342EL5
1300	620	0.039	18	16	9	15	4.5	136.5	16	12	3500	0.8	FGC3SK393E382EL5
1300	620	0.047	18	16	10	15	4.8	164.5	15	12	3500	0.8	FGC3SK473E432EL5
1300	620	0.056	18	19	11	15	5	196	14	12	3500	0.8	FGC3SK563E472EL5
1300	620	0.027	26	15.5	6	22.5	3.5	56.7	24	15	2100	0.8	FGC3SK273F142FL5
1300	620	0.033	26	15.5	6	22.5	4	69.3	19	15	2100	0.8	FGC3SK333F142FL5
1300	620	0.039	26	15.5	6	22.5	4.8	81.9	16	15	2100	0.8	FGC3SK393F142FL5
1300	620	0.047	26	16.5	7	22.5	5	98.7	15	15	2100	0.8	FGC3SK473F172FL5
1300	620	0.056	26	16.5	7	22.5	5.4	117.6	14.5	15	2100	0.8	FGC3SK563F172FL5
1300	620	0.068	26	17	8.5	22.5	6	142.8	14	15	2100	0.8	FGC3SK683F202FL5
1300	620	0.082	26	19	10	22.5	6.5	172.2	13.5	15	2100	0.8	FGC3SK823F242FL5
1300	620	0.1	26	19	10	22.5	7	210	13	15	2100	0.8	FGC3SK104F242FL5
1300	620	0.12	26	20	11	22.5	6.5	180	12.5	15	1500	0.8	FGC3SK124F262FL5
1300	620	0.15	26	22	12	22.5	7	225	12	15	1500	0.8	FGC3SK154F272FL5
1300	620	0.18	26	24.5	13	22.5	7.5	270	11	15	1500	0.8	FGC3SK184F302FL5
1300	620	0.22	26	29.5	14.5	22.5	8.5	330	9.5	15	1500	0.8	FGC3SK224F342FL5

Rating and Part Number

Vdc	Vac	Cap Value	Dimensions				Irms max (100KHz 70°C)	Peak Current	$ESR_{Typical}$ 100KHz	ESL	dv/dt	Lead Wire	Part Number
			W	H	T	P							
		µF	mm	mm	mm	mm	A	A	mΩ	nH	V/us	mm	
1600	650	0.0033	18	11	5	15	1.1	19.8	190	12	6000	0.8	FGC3WK332E142EL5
1600	650	0.0047	18	11	5	15	1.3	28.2	165	12	6000	0.8	FGC3WK472E142EL5
1600	650	0.0056	18	11	5	15	1.4	33.6	120	12	6000	0.8	FGC3WK562E142EL5
1600	650	0.0068	18	11	5	15	1.6	40.8	100	12	6000	0.8	FGC3WK682E142EL5
1600	650	0.0082	18	11	5	15	1.8	49.2	95	12	6000	0.8	FGC3WK822E142EL5
1600	650	0.01	18	11	5	15	2	60	65	12	6000	0.8	FGC3WK103E142EL5
1600	650	0.012	18	12	6	15	2.3	72	50	12	6000	0.8	FGC3WK123E172EL5
1600	650	0.015	18	12	6	15	2.5	90	45	12	6000	0.8	FGC3WK153E172EL5
1600	650	0.018	18	13.5	7.5	15	3	108	35	12	6000	0.8	FGC3WK183E292EL5
1600	650	0.022	18	13.5	7.5	15	3.2	132	30	12	6000	0.8	FGC3WK223E292EL5
1600	650	0.027	18	14.5	8.5	15	3.8	162	25	12	6000	0.8	FGC3WK273E342EL5
1600	650	0.033	18	14.5	8.5	15	4	198	20	12	6000	0.8	FGC3WK333E342EL5
1600	650	0.015	26	15.5	6	22.5	2.8	45	40	15	3000	0.8	FGC3WK153F142FL5
1600	650	0.022	26	15.5	6	22.5	3.5	66	30	15	3000	0.8	FGC3WK223F142FL5
1600	650	0.033	26	15.5	6	22.5	4	99	20	15	3000	0.8	FGC3WK333F142FL5
1600	650	0.039	26	16.5	7	22.5	4.8	117	16	15	3000	0.8	FGC3WK393F172FL5
1600	650	0.047	26	16.5	7	22.5	5.2	141	15	15	3000	0.8	FGC3WK473F172FL5
1600	650	0.056	26	17	8.5	22.5	5.4	168	14	15	3000	0.8	FGC3WK563F202FL5
1600	650	0.068	26	19	10	22.5	5.8	204	13	15	3000	0.8	FGC3WK683F242FL5
1600	650	0.082	26	19	10	22.5	6	246	12	15	3000	0.8	FGC3WK823F242FL5
1600	650	0.1	26	20	11	22.5	6.5	300	11	15	3000	0.8	FGC3WK104F262FL5

Rating and Part Number

Vdc	Vac	Cap Value	Dimensions				Irms max (100KHz 70°C)	Peak Current	$ESR_{Typical}$ 100KHz	ESL	dv/dt	Lead Wire	Part Number
			W	H	T	P							
		µF	mm	mm	mm	mm	A	A	mΩ	nH	V/us	mm	
2000	700	0.001	18	11	5	15	0.5	9.5	630	12	9500	0.8	FGC3DK102E142EL5
2000	700	0.0012	18	11	5	15	0.6	11.4	500	12	9500	0.8	FGC3DK122E142EL5
2000	700	0.0015	18	11	5	15	0.7	14.25	420	12	9500	0.8	FGC3DK152E142EL5
2000	700	0.0018	18	11	5	15	0.8	17.1	350	12	9500	0.8	FGC3DK182E142EL5
2000	700	0.0022	18	11	5	15	0.9	20.9	300	12	9500	0.8	FGC3DK222E142EL5
2000	700	0.0027	18	11	5	15	1	25.65	240	12	9500	0.8	FGC3DK272E142EL5
2000	700	0.0033	18	11	5	15	1.2	31.35	190	12	9500	0.8	FGC3DK332E142EL5
2000	700	0.0039	18	11	5	15	1.3	37.05	165	12	9500	0.8	FGC3DK392E142EL5
2000	700	0.0047	18	11	5	15	1.4	44.65	135	12	9500	0.8	FGC3DK472E142EL5
2000	700	0.0056	18	12	6	15	1.6	53.2	110	12	9500	0.8	FGC3DK562E172EL5
2000	700	0.0068	18	12	6	15	1.8	64.6	95	12	9500	0.8	FGC3DK682E172EL5
2000	700	0.0082	18	12	6	15	2	77.9	80	12	9500	0.8	FGC3DK822E172EL5
2000	700	0.01	18	13.5	7.5	15	2.5	95	65	12	9500	0.8	FGC3DK103E292EL5
2000	700	0.012	18	14.5	8.5	15	2.8	114	50	12	9500	0.8	FGC3DK123E342EL5
2000	700	0.015	18	14.5	8.5	15	3	142.5	45	12	9500	0.8	FGC3DK153E342EL5
2000	700	0.018	18	16	10	15	3.8	171	35	12	9500	0.8	FGC3DK183E432EL5
2000	700	0.001	26	15.5	6	22.5	0.6	4.5	550	15	4500	0.8	FGC3DK102F142FL5
2000	700	0.0012	26	15.5	6	22.5	0.7	5.4	450	15	4500	0.8	FGC3DK122F142FL5
2000	700	0.0015	26	15.5	6	22.5	0.8	6.75	360	15	4500	0.8	FGC3DK152F142FL5
2000	700	0.0018	26	15.5	6	22.5	0.9	8.1	300	15	4500	0.8	FGC3DK182F142FL5
2000	700	0.0022	26	15.5	6	22.5	1	9.9	250	15	4500	0.8	FGC3DK222F142FL5
2000	700	0.0027	26	15.5	6	22.5	1.2	12.15	230	15	4500	0.8	FGC3DK272F142FL5
2000	700	0.0033	26	15.5	6	22.5	1.2	14.85	200	15	4500	0.8	FGC3DK332F142FL5
2000	700	0.0039	26	15.5	6	22.5	1.4	17.55	180	15	4500	0.8	FGC3DK392F142FL5
2000	700	0.0047	26	15.5	6	22.5	1.6	21.15	140	15	4500	0.8	FGC3DK472F142FL5
2000	700	0.0056	26	15.5	6	22.5	1.8	25.2	120	15	4500	0.8	FGC3DK562F142FL5
2000	700	0.0068	26	15.5	6	22.5	2	30.6	95	15	4500	0.8	FGC3DK682F142FL5
2000	700	0.0082	26	15.5	6	22.5	2.2	36.9	75	15	4500	0.8	FGC3DK822F142FL5
2000	700	0.01	26	15.5	6	22.5	2.3	45	65	15	4500	0.8	FGC3DK103F142FL5
2000	700	0.012	26	15.5	6	22.5	2.5	54	60	15	4500	0.8	FGC3DK123F142FL5
2000	700	0.015	26	15.5	6	22.5	2.8	67.5	45	15	4500	0.8	FGC3DK153F142FL5
2000	700	0.018	26	15.5	6	22.5	3.2	81	35	15	4500	0.8	FGC3DK183F142FL5
2000	700	0.022	26	16.5	7	22.5	4	99	26	15	4500	0.8	FGC3DK223F172FL5
2000	700	0.027	26	16.5	7	22.5	4.5	121.5	20	15	4500	0.8	FGC3DK273F172FL5
2000	700	0.033	26	17	8.5	22.5	5.2	148.5	18	15	4500	0.8	FGC3DK333F202FL5
2000	700	0.039	26	19	10	22.5	5.8	175.5	15	15	4500	0.8	FGC3DK393F242FL5
2000	700	0.047	26	19	10	22.5	6	211.5	13	15	4500	0.8	FGC3DK473F242FL5
2000	700	0.056	26	20	11	22.5	6.5	252	12	15	4500	0.8	FGC3DK563F262FL5

General Technical Data

Applications	DC / Pulse, Resonant and High Frequency Applications
Dielectric	Double Metallized Polypropylene Film
Reference Standard	IEC 60384-16
Climatic Category	40/105/56 IEC 60068-1
Operating Temperature Range	-40°C ~ +105°C (85°C ~105°C, decreasing factor 1.25% per °C for Rated Voltage)
Protection	Solvent resistant plastic case UL94 V-0 Thermosetting resin sealing UL 94 V-0 compliant
Installation	Any position
Packaging	Packed in cardboard boxes with protection for the terminals
Storage Conditions	Storage time: ≤24months from the date marked on the label package Average relative humidity per year ≤70% RH≤85% for 30 days randomly distributed throughout the year Dew is absent Temperature: -40°C ~ +85°C
Storage Life	Product that passed less than 2 years from production, No need reconfirmation
RoHS Compliance	Compliant with the restricted substance requirement 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
Metal Sprayed	Sn/Zn Alloy
Connection Electrode	Tin-plated Copper Wire
Plastic Case	Plastic Case (UL94V-0)
Filling	Epoxy Resin (UL94V-0)
Film Construction	Internal Series Connection 

Electrical Characteristics

Voltage Range	630Vdc ~ 2000Vdc
Capacitance Range	0.001μF ~ 0.39μF
Capacitance Tolerance	±5% or ±10% at +25°C
Capacitance	Measuring Frequency at 1kHZ Measuring Voltage:1±0.2V
Standard Atmospheric Conditions for Static Test	**Ambient temperature** 15°C to 35°C (If there is any doubt on the results, the measurements shall be made at +20 +/- 5°C) **Relative humidity** 45% to 75% (If there is any doubt on the results, the measurements shall be made at 60% to 70 %.) **Air pressure** 86 kPa to 106 kPa.
Voltage Between Terminals U_{TT}	1.5 x V_R VDC for 60 seconds (between terminations) @ +25°C ±5°C
Voltage Between Terminals and Case U_{TC}	2000VAC, 60s（at+25+/-2°C）
Dielectric Dissipation Factor Tgδ 0	≤2×10^{-4}
Dissipation factor	0.0010（25°C，1KHz）
Insulation Resistance	R between leads, for C ≤ 0.33 μF at 100 V; 1 min > 100 000 MΩ RC between leads, for C > 0.33 μF at 100 V; 1 min > 30 000 MΩ*μF
Self-Inductance	<1nH per mm of lead spacing
Hot-Spot	≤85°C
Life Expectancy	100,000 hours (UR，Θhotspot=85°C)
Failure Rate	≤100 Fit V_{NDC} at hot spot temperature (T_{HS}) = 85°C
Max. Altitude	2000 m
Overvoltage Apply 110% of rated voltage Apply 115% of rated voltage Apply 120% of rated voltage Apply 130% of rated voltage	**Maximum duration within one day** 30% of on-load duration 30 mins 5 mins 1 min

Environmental Test

Damp Heat Loading	**Test Conditions:** Test Temperature: +40 +/- 2°C Test Humidity: 90% to 95% R.H. Test Duration: 1000+24/-0 hours Loading Voltage: rated voltage **Performance:** Capacitance Change Rate (△C/C): ≤±5% DF change (△tgδ): ≤50*10^{-4} at 1 KHz Insulation Resistance: ≥50% of initial limit
High Temperature Loading	**Test Conditions:** Testing method per IEC60384-16 / IEC 61071 Test Temperature: +85 +/-2°C. Apply 125% of rated voltage for 1,000 +24/-0 hours Duration: 1000 hours **Performance:** Capacitance Change Rate (△C/C): ≤±5% DF change (△tgδ): ≤15*10^{-4} at 1 KHz. Insulation Resistance: ≥50% of initial limit
Rapid Temperature Change	**Test Conditions:** Testing method per IEC 60068-2-14 Na Test Temperature Cycle: Total 5 cycles High Temperature: +105+/-5°C for 30 minutes Low Temperature: -40 +/-5°C for 30 minutes **Performance:** Capacitance Change Rate (△C/C): ≤±3% DF change (△tgδ): ≤15*10^{-4} at 1 KHz Insulation Resistance: ≥50% of initial limit
Humidity Resistance	**Test Conditions:** 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(56days) **Performance:** Capacitance Change Rate (△C/C): ≤±5% DF change (△tgδ): ≤15*10^{-4} at 1 KHz. Insulation Resistance: ≥50% of initial limit

Environmental Test

Solderability	**Test Conditions:** Testing method per IEC 60068-2-20 Ta Soldering temperature: +245 +/-5°C Immersion duration: 2 +/-0.5 seconds **Performance:** More than 95% of circumferential surface of lead wire shall be covered with new solder.
Soldering Heat Resistance	**Test Conditions:** Flow Soldering: Preheat temperature 100°C~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. Iron Soldering: Soldering Temperature: +400°C Immersion Duration: ≤3 seconds After test, allow it stay alone for 1.5 +/- 0.5 hours at standard temperature and humidity before making measurements. **Performance:** Capacitance Change Rate (△C/C): ≤±2% DF change (△tgδ): ≤15*10^{-4} at 1 KHz. Insulation Resistance: ≥50% of initial limit
Temperature Cycle	**Test Conditions:** 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. +105 +3/-0 °C for 30 minutes 5. +20 +/- 2°C for 3 minutes **Performance:** Capacitance Change Rate (△C/C): ≤±5% DF change (△tgδ): ≤15*10^{-4} at 1 KHz. Insulation Resistance: ≥50% of initial limit

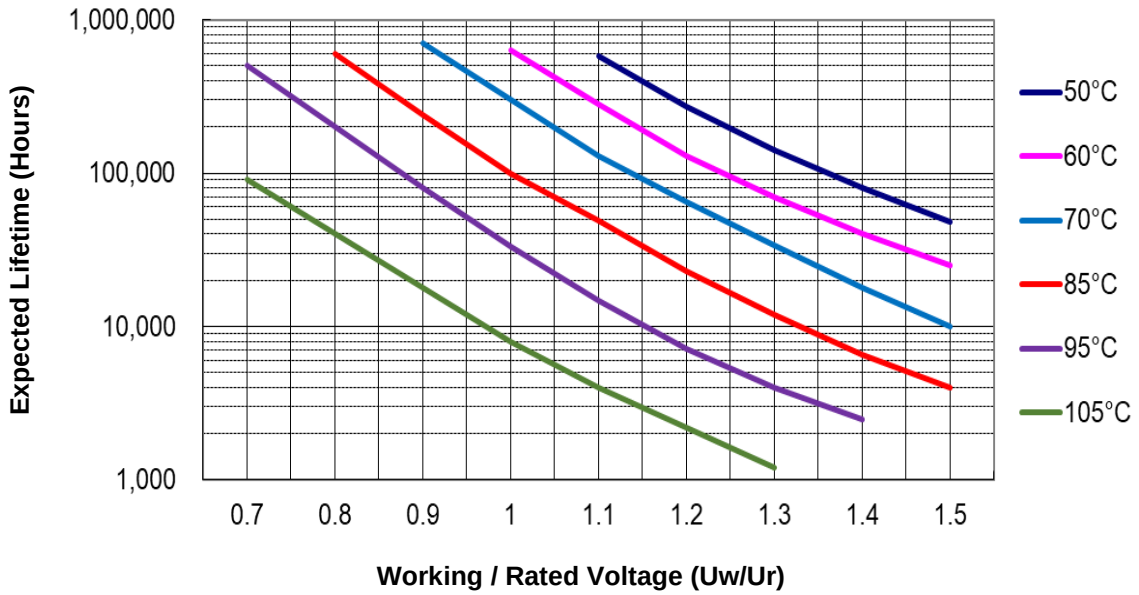
Mechanical Test

Resistance to solvent	**Test Conditions:** Re: 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) **Performance:** Capacitance Change Rate (△C/C): ≤±1% DF change (△tgδ): ≤15*10^{-4} at 1 KHz. Insulation Resistance: ≥50% of initial limit
Terminal Strength	**Test Conditions:** Reference: MIL-STD-202 Method 211 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 **Performance:** No visible damage to appearance
Vibration	**Test Conditions:** 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 **Performance:** Connection Strength: Shall be no open nor short-circuiting. The connection shall be stable Capacitance Change Rate (△C/C): ≤±1% DF change(△tgδ): ≤15*10^{-4} at 1 KHz. Insulation Resistance: ≥50% of initial limit
Mechanical Shock	**Test Conditions:** Pulse-shape: half-sine wave Acceleration: 500 m/s^2 Duration of pulse: 11 ms **Performance:** Capacitance Change Rate (△C/C): ≤±1% DF change (△tgδ): ≤15*10^{-4} at 1 KHz. Insulation Resistance: ≥50% of initial limit
Bump	**Test Conditions:** Total number of bumps: 1 000 times or 4 000 times Acceleration: 400 m/s^2 Pulse duration: 6 ms **Performance:** Capacitance Change Rate (△C/C): ≤±1% DF change (△tgδ): ≤15*10^{-4} at 1 KHz. Insulation Resistance: ≥50% of initial limit

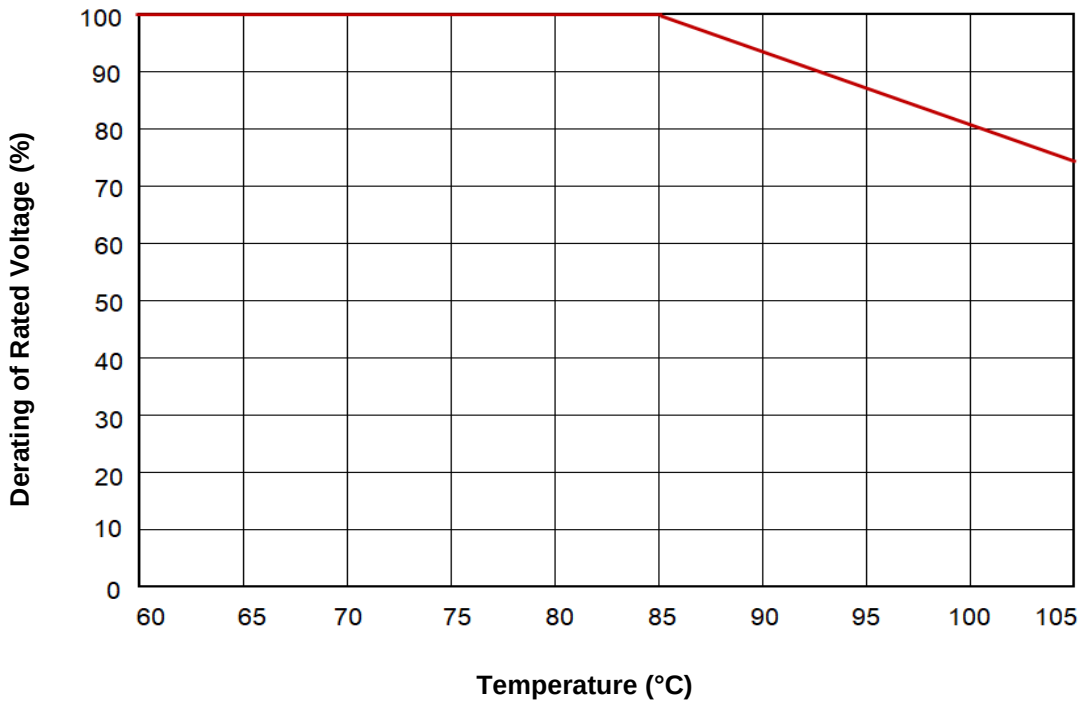
Electrical Test

Charge and Discharge Test	**Test Conditions:** 10000 cycles Charge to VR (DC) Charge resistance: $R = \frac{220 \times 10^{-6}}{C_N}\ \Omega$ Discharge resistance: $R = \frac{V_R\ (DC)}{C_R(dv/dt)}\ \Omega$ **Performance:** Capacitance Change Rate (△C/C): ≤±2% DF change (△tgδ): ≤15*10^{-4} at 1 KHz. Insulation Resistance: ≥50% of initial limit
High Temperature Features	**Test Conditions:** Test Temperature: 105+/-2°C Test Duration:16 +1/-0 hours **Performance:** Capacitance Change Rate (△C/C): -0%~-5% DF change (△tgδ): ≤15*10^{-4} at 1 KHz. Insulation Resistance: ≥50% of initial limit
Low Temperature Features	**Test Conditions:** Test Temperature: -40+/-2°C Test Duration:2 +1/-0 hours **Performance:** Capacitance Change Rate (△C/C): +0%~+5% DF change (△tgδ): ≤15*10^{-4} at 1 KHz. Insulation Resistance: ≥50% of initial limit

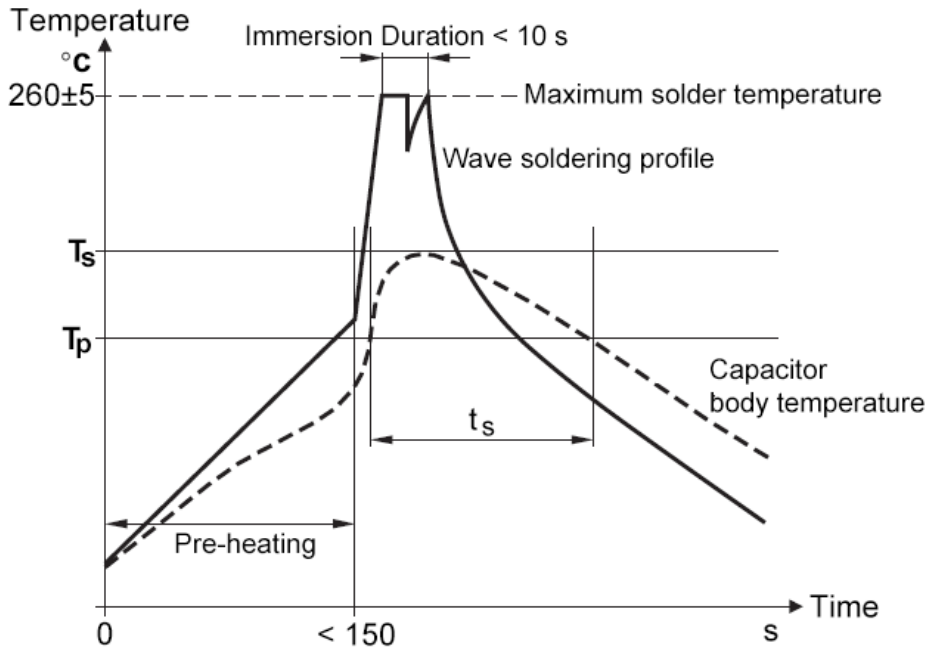
Expected Life Curve at Hot Spot Temperature (T_{HS})



Derating of Rated Voltage Vs Ambient Temperature (T_{AMB})



Wave Soldering Recommendations

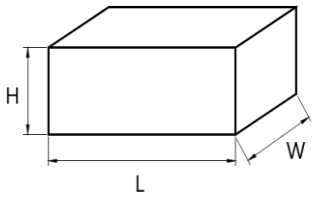


Ts: Capacitor body maximum temperature at wave soldering
Tp: Capacitor body maximum temperature at pre-heating

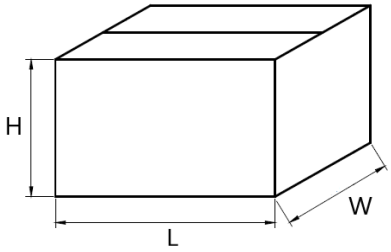
Polypropylene Capacitors	Polyester Capacitors
During pre-heating: Tp≤110°C During soldering: Ts ≤120°C, ts≤60	During pre-heating: Tp≤130°C During soldering: Ts≤160°C, ts≤60s

Packaging Information

Inner Box Specifications (Dimensions)			
Box #	L ±3mm	W±3mm	H ±3mm
# 1	331	331	25
# 2	331	331	35
# 3	331	331	50
# 4	331	331	80
# 5	350	170	35
# 6	350	170	50
# 7	350	170	80



Outer Box Specifications (Dimensions)			
Box #	L ±5mm	W±5mm	H ±5mm
# 1	350	340	265
# 2	370	360	350



Packaging Quantity

Pitch	Size Code	Dimension			Packaging Quantity		
		W	H	T	Long Leads	Short Leads	Ammo Pack
15	E14	18	11	5	800	1,054	680
	E17	18	12	6	800	867	560
	E29	18	13.5	7.5	800	697	450
	E34	18	14.5	8.5	600	612	390
	E38	18	16	9	600	578	370
	E43	18	16	10	600	527	340
	E47	18	19	11	600	476	300
22.5	F14	26	15.5	6	612	612	350
	F17	26	16.5	7	528	528	300
	F20	26	17	8.5	432	432	250
	F24	26	19	10	372	372	210
	F26	26	20	11	336	336	190
	F27	26	22	12	300	300	170
	F30	26	24.5	13	276	276	160
	F34	26	29.5	14.5	252	252	140

Cautions and Warnings

- Don't exceed the upper category temperature.
- For longtime storage, maximum relative humidity 80%, no dew allowed on the capacitor.
- Do not use or store capacitor in corrosive atmosphere, in the dusty environment's regular maintenance and cleaning especially of the terminals is required to avoid conductive path between terminal / or terminal and ground.
- Don't apply any mechanical stress to the capacitor terminals, and avoid any compressive, tensile or flexural stress.
- Don't move the capacitor after fixed to the PC board, and don't pick up the PC bord by the fixed capacitor.
- Don't place the capacitor on a PC board whose holes pacse differs from the specified space.
- Avoid overload of the capacitors
- Do not have unlimited service life expectancy, the max service life expectancy may vary depending on the application the capacitor is used in.

Disclaimer

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