Panasonic INDUSTRY

Aluminum Electrolytic Capacitors

⚠ **This Series is no longer available for purchase in the country of Japan.**

Radial Lead Type

FC series **A** type



Features

- Endurance : 105 ℃ 1000 h to 5000 h
- Low impedance
- AEC-Q200 compliant
- RoHS compliant

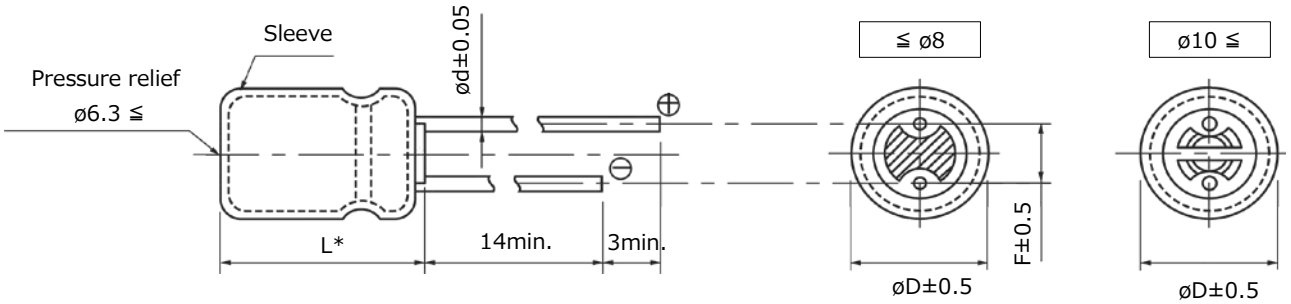
Specifications

Category temp. range	−55 ℃ to +105 ℃									
Rated voltage range	6.3 V to 100 V									
Capacitance range	2.2 μF to 15000 μF									
Capacitance tolerance	±20 % (120 Hz / +20℃)									
Leakage current	I ≦ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater)									
Dissipation factor (tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	63	100	(120 Hz
	Dissipation factor (tan δ)	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.07	/+20℃)
	For capacitance value ≧ 1000 μF, add 0.02 per every 1000 μF.									
Endurance	After following life test with DC voltage and +105 ℃±2 ℃ ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage)when the capacitors are restored to 20 ℃, the capacitors shall meet the limits specified bellow. Duration ø4 to ø6.3 : 1000 h, ø8 : 2000 h, ø10 : 3000 h, ø12.5 to ø18 : 5000 h									
	Capacitance change	Within ±20 % of the initial value								
	Dissipation factor (tan δ)	≦ 200 % of the initial limit								
	DC leakage current	Within the initial limit								
Shelf life	After storage for 1000 h at +105 ℃±2 ℃ with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)									

Frequency correction factor for ripple current

Cap. (μF) \ Freq. (Hz)	60	120	1 k	10 k	100 k
2.2 to 330	0.55	0.65	0.85	0.90	1.00
390 to 1000	0.70	0.75	0.90	0.95	1.00
1200 to 2200	0.75	0.80	0.90	0.95	1.00
2700 to 15000	0.80	0.85	0.95	1.00	1.00

Dimensions



* L ≦ 16 : L±1.0 (ø8x15、ø16x15、ø18x15 : L±1.5)
L ≧ 20 : L±2.0

Unit : mm

	L≧11									L=7		
øD	4.0	5.0	6.3	8.0	10.0	12.5		16.0	18.0	4.0	5.0	6.3
L	—	—	—	—	—	15 to 25	30 to 40	—	—	—	—	—
ød	0.45	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.45	0.45	0.45
F	1.5	2.0	2.5	3.5	5.0	5.0	5.0	7.5	7.5	1.5	2.0	2.5

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

Case size/ Impedance/ Ripple current

R. voltage / Case size (mm) (øD×L)	6.3 V to 35 V			50 V			63 V			100 V		
	Impedance*1 (Ω)		Ripple current*1 (mA rms)	Impedance*1 (Ω)		Ripple current*1 (mA rms)	Impedance*1 (Ω)		Ripple current*1 (mA rms)	Impedance*1 (Ω)		Ripple current*1 (mA rms)
	+20℃	-10℃		+20℃	-10℃		+20℃	-10℃		+20℃	-10℃	
4 × 7	2.00	5.00	65	—	—	—	—	—	—	—	—	—
5 × 7	0.950	2.40	120	—	—	—	—	—	—	—	—	—
6.3 × 7	0.450	1.20	200	—	—	—	—	—	—	—	—	—
5 × 11	0.800	1.60	175	*2	*2	*2	2.00	4.00	145	4.10	8.20	80
6.3 × 11.2	0.350	0.700	290	0.600	1.20	260	1.00	2.00	240	1.80	3.60	114
8 × 11.5	0.117	0.234	555	0.234	0.468	485	0.342	0.684	405	0.680	1.36	260
8 × 15	0.085	0.170	730	0.155	0.310	635	0.230	0.460	535	0.450	0.900	340
8 × 20	0.065	0.130	995	0.120	0.240	860	0.178	0.356	690	0.330	0.660	455
10 × 12.5	0.090	0.180	755	0.162	0.324	615	0.256	0.512	535	0.530	1.060	306
10 × 16	0.068	0.136	1050	0.119	0.238	850	0.194	0.388	600	0.360	0.720	400
10 × 20	0.052	0.104	1220	0.090	0.180	1030	0.147	0.294	885	0.240	0.480	463
10 × 25	0.045	0.090	1440	0.082	0.164	1200	0.130	0.260	1050	0.210	0.420	599
10 × 30	0.035	0.070	1815	0.060	0.120	1610	0.090	0.180	1300	0.150	0.300	698
12.5 × 15	0.065	0.130	1205	0.110	0.220	1150	0.150	0.300	1020	0.230	0.460	511
12.5 × 20	0.038	0.076	1655	0.063	0.126	1480	0.085	0.170	1285	0.180	0.360	671
12.5 × 25	0.030	0.060	1945	0.050	0.100	1832	0.070	0.140	1720	0.110	0.220	807
12.5 × 30	0.025	0.050	2310	0.040	0.080	2215	0.055	0.110	2090	0.098	0.196	937
12.5 × 35	0.022	0.044	2510	0.034	0.068	2285	0.047	0.094	2265	0.087	0.174	1040
12.5 × 40	0.018	0.036	2655	0.030	0.060	2590	0.042	0.084	2560	0.072	0.144	1130
16 × 15	0.043	0.086	1690	0.080	0.160	1610	0.090	0.180	1410	0.140	0.280	793
16 × 20	0.029	0.058	2205	0.048	0.096	1835	0.059	0.118	1765	0.110	0.220	995
16 × 25	0.022	0.044	2555	0.034	0.068	2235	0.050	0.100	2160	0.089	0.178	1170
16 × 31.5	0.018	0.036	3010	0.028	0.056	2700	0.043	0.086	2670	0.062	0.124	1520
16 × 35.5	0.016	0.032	3150	0.025	0.050	2790	0.036	0.072	2770	0.053	0.106	1730
16 × 40	0.015	0.030	3360	0.023	0.046	2845	0.030	0.060	2825	0.047	0.094	1920
18 × 15	0.038	0.076	2000	0.068	0.136	1900	0.086	0.172	1690	0.120	0.240	917
18 × 20	0.028	0.056	2490	0.042	0.084	2420	0.055	0.110	2290	0.080	0.160	1230
18 × 25	0.020	0.040	2740	0.029	0.058	2610	0.043	0.086	2585	0.070	0.140	1420
18 × 31.5	0.016	0.032	3635	0.025	0.050	3000	0.032	0.064	2950	0.062	0.124	1600
18 × 35.5	0.015	0.030	3680	0.023	0.046	3100	0.030	0.060	3095	0.041	0.082	1770
18 × 40	0.014	0.028	3735	—	—	—	0.025	0.050	3205	0.036	0.072	2300

*1: 100 kHz
*2

Case size (mm) (ø D×L)	Capacitance (μF)	Impedance (Ω) (100 kHz)		Ripple current (mA rms) (100 kHz)
		+20℃	-10℃	
5 × 11	2.2	1.80	3.60	45
	3.3	1.30	2.60	65
	4.7	1.30	2.60	95
	10	1.30	2.60	125
	12	1.30	2.60	135
	15	1.30	2.60	145
	18	1.30	2.60	155
	22	1.30	2.60	155

Characteristics list

Endurance : 105 ℃ 1000 h / ø4 to ø6.3, 105 ℃ 2000 h / ø8, 105 ℃ 3000 h / ø10, 105 ℃ 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
								Lead space					
		øD	L	Ripple current*1 (mA rms)	Impe-dance*2 (Ω)	Endu-rance (h)	Lead dia. (ød)	Straight	Taping ✻B	Taping ✻H		Straight leads	Taping
6.3	27	4.0	7.0	65	2.000	1000	0.45	1.5	5.0	2.5	EEAFC0J270( )	200	2000
	56	5.0	7.0	120	0.950	1000	0.45	2.0	5.0	2.5	EEAFC0J560( )	200	2000
	100	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC0J101( )	200	2000
	120	6.3	7.0	200	0.450	1000	0.45	2.5	5.0	2.5	EEAFC0J121( )	200	2000
	220	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC0J221( )	200	2000
	270	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC0J271( )	200	2000
	330	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC0J331S( )	200	2000
	390	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC0J391( )	200	1000
	470	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC0J471( )	200	1000
	560	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC0J561( )	200	1000
	820	8.0	15.0	730	0.085	2000	0.60	3.5	5.0	—	EEUFC0J821L( )	200	1000
		10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC0J821( )	200	500
	1000	10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC0J102( )	200	500
	1200	8.0	20.0	995	0.065	2000	0.60	3.5	5.0	—	EEUFC0J122L( )	200	1000
		10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC0J122( )	200	500
	1500	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC0J152( )	200	500
		12.5	15.0	1205	0.065	5000	0.60	5.0	5.0	—	EEUFC0J152S( )	200	500
	1800	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC0J182( )	200	500
	2200	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC0J222( )	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC0J222S( )	100	250
	2700	10.0	30.0	1815	0.035	3000	0.60	5.0	—	—	EEUFC0J272L	100	—
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC0J272( )	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC0J272S( )	100	250
	3300	12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC0J332( )	200	500
		18.0	15.0	2000	0.038	5000	0.80	7.5	7.5	—	EEUFC0J332S( )	100	250
	3900	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC0J392( )	200	500
	4700	12.5	30.0	2310	0.025	5000	0.80	5.0	—	—	EEUFC0J472	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC0J472S( )	100	250
	5600	12.5	35.0	2510	0.022	5000	0.80	5.0	—	—	EEUFC0J562L	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC0J562( )	100	250
	6800	12.5	40.0	2655	0.018	5000	0.80	5.0	—	—	EEUFC0J682L	100	—
		16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC0J682( )	100	250
		18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC0J682S( )	100	250
	8200	16.0	31.5	3010	0.018	5000	0.80	7.5	—	—	EEUFC0J822	100	—
	10000	16.0	35.5	3150	0.016	5000	0.80	7.5	—	—	EEUFC0J103	100	—
		18.0	25.0	2740	0.020	5000	0.80	7.5	7.5	—	EEUFC0J103S( )	100	250
	12000	16.0	40.0	3360	0.015	5000	0.80	7.5	—	—	EEUFC0J123L	100	—
		18.0	31.5	3635	0.016	5000	0.80	7.5	—	—	EEUFC0J123	50	—
	15000	18.0	35.5	3680	0.015	5000	0.80	7.5	—	—	EEUFC0J153	50	—

*1: Ripple current (100 kHz / +105 ℃)
*2: Impedance (100 kHz / +20 ℃)
・When requesting taped product, please put the letter "B" or "H" be tween the "( )".
Lead wire pitch ✻B=5 mm, 7.5 mm, H=2.5 mm.
・Please refer to the page of “Taping dimensions”.

Characteristics list

Endurance : 105 ℃ 1000 h / ø4 to ø6.3, 105 ℃ 2000 h / ø8, 105 ℃ 3000 h / ø10, 105 ℃ 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
								Lead space					
		øD	L	Ripple current*1 (mA rms)	Impe-dance*2 (Ω)	Endu-rance (h)	Lead dia. (ød)	Straight	Taping ✻B	Taping ✻H		Straight leads	Taping
10	22	4.0	7.0	65	2.000	1000	0.45	1.5	5.0	2.5	EEAFC1A220( )	200	2000
	39	5.0	7.0	120	0.950	1000	0.45	2.0	5.0	2.5	EEAFC1A390( )	200	2000
	82	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1A820( )	200	2000
		6.3	7.0	200	0.450	1000	0.45	2.5	5.0	2.5	EEAFC1A820( )	200	2000
	100	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1A101S( )	200	2000
	150	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1A151( )	200	2000
	180	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1A181( )	200	2000
	220	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1A221S( )	200	2000
	330	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1A331( )	200	1000
	390	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1A391( )	200	1000
	470	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1A471( )	200	1000
	560	10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1A561( )	200	500
	680	8.0	15.0	730	0.085	2000	0.60	3.5	5.0	—	EEUFC1A681L( )	200	1000
		10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1A681( )	200	500
	820	10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1A821( )	200	500
	1000	8.0	20.0	995	0.065	2000	0.60	3.5	5.0	—	EEUFC1A102L( )	200	1000
		10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1A102( )	200	500
	1200	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1A122( )	200	500
		12.5	15.0	1205	0.065	5000	0.60	5.0	5.0	—	EEUFC1A122S( )	200	500
	1500	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC1A152( )	200	500
	1800	12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1A182( )	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC1A182S( )	100	250
	2200	10.0	30.0	1815	0.035	3000	0.60	5.0	—	—	EEUFC1A222L	100	—
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1A222( )	200	500
	2700	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1A272( )	200	500
		18.0	15.0	2000	0.038	5000	0.80	7.5	7.5	—	EEUFC1A272S( )	100	250
	3300	12.5	30.0	2310	0.025	5000	0.80	5.0	—	—	EEUFC1A332	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1A332S( )	100	250
	3900	12.5	35.0	2510	0.022	5000	0.80	5.0	—	—	EEUFC1A392L	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1A392( )	100	250
	4700	12.5	40.0	2655	0.018	5000	0.80	5.0	—	—	EEUFC1A472L	100	—
		16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1A472( )	100	250
	5600	16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1A562( )	100	250
		18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1A562S( )	100	250
	6800	16.0	31.5	3010	0.018	5000	0.80	7.5	—	—	EEUFC1A682	100	—
		18.0	25.0	2740	0.020	5000	0.80	7.5	7.5	—	EEUFC1A682S( )	100	250
	8200	16.0	35.5	3150	0.016	5000	0.80	7.5	—	—	EEUFC1A822L	100	—
		18.0	31.5	3635	0.016	5000	0.80	7.5	—	—	EEUFC1A822	50	—
	10000	18.0	35.5	3680	0.015	5000	0.80	7.5	—	—	EEUFC1A103	50	—
	12000	18.0	40.0	3735	0.014	5000	0.80	7.5	—	—	EEUFC1A123	50	—

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*2: Impedance (100 kHz / +20 ℃)
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Lead wire pitch ✻B=5 mm, 7.5 mm, H=2.5 mm.
・Please refer to the page of “Taping dimensions”.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

Characteristics list

Endurance : 105 ℃ 1000 h / ø4 to ø6.3, 105 ℃ 2000 h / ø8, 105 ℃ 3000 h / ø10, 105 ℃ 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
								Lead space					
		øD	L	Ripple current*1 (mA rms)	Impe-dance*2 (Ω)	Endu-rance (h)	Lead dia. (ød)	Straight	Taping ✻B	Taping ✻H		Straight leads	Taping
16	15	4.0	7.0	65	2.000	1000	0.45	1.5	5.0	2.5	EEAFC1C150( )	200	2000
	27	5.0	7.0	120	0.950	1000	0.45	2.0	5.0	2.5	EEAFC1C270( )	200	2000
	47	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1C470( )	200	2000
	56	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1C560( )	200	2000
		6.3	7.0	200	0.450	1000	0.45	2.5	5.0	2.5	EEAFC1C560( )	200	2000
	68	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1C680( )	200	2000
	100	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1C101( )	200	2000
	120	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1C121( )	200	2000
	220	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1C221( )	200	1000
	270	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1C271( )	200	1000
	330	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1C331( )	200	1000
	390	10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1C391( )	200	500
	470	8.0	15.0	730	0.085	2000	0.60	3.5	5.0	—	EEUFC1C471L( )	200	1000
		10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1C471( )	200	500
	560	10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1C561( )	200	500
	680	8.0	20.0	995	0.065	2000	0.60	3.5	5.0	—	EEUFC1C681L( )	200	1000
		10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1C681( )	200	500
	820	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1C821( )	200	500
		12.5	15.0	1205	0.065	5000	0.60	5.0	5.0	—	EEUFC1C821S( )	200	500
	1000	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1C102S( )	200	500
		10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC1C102( )	200	500
	1200	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC1C122( )	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC1C122S( )	100	250
	1500	10.0	30.0	1815	0.035	3000	0.60	5.0	—	—	EEUFC1C152L	100	—
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1C152( )	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC1C152S( )	100	250
	1800	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1C182( )	200	500
		18.0	15.0	2000	0.038	5000	0.80	7.5	7.5	—	EEUFC1C182S( )	100	250
	2200	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1C222( )	200	500
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1C222S( )	100	250
	2700	12.5	30.0	2310	0.025	5000	0.80	5.0	—	—	EEUFC1C272L	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1C272( )	100	250
	3300	12.5	35.0	2510	0.022	5000	0.80	5.0	—	—	EEUFC1C332	100	—
		18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1C332S( )	100	250
	3900	16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1C392( )	100	250
		18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1C392S( )	100	250
	4700	16.0	31.5	3010	0.018	5000	0.80	7.5	—	—	EEUFC1C472	100	—
		18.0	25.0	2740	0.020	5000	0.80	7.5	7.5	—	EEUFC1C472S( )	100	250
	5600	16.0	35.5	3150	0.016	5000	0.80	7.5	—	—	EEUFC1C562L	100	—
		18.0	31.5	3635	0.016	5000	0.80	7.5	—	—	EEUFC1C562	50	—
	6800	16.0	40.0	3360	0.015	5000	0.80	7.5	—	—	EEUFC1C682	100	—
	8200	18.0	35.5	3680	0.015	5000	0.80	7.5	—	—	EEUFC1C822	50	—

*1: Ripple current (100 kHz / +105 ℃)
*2: Impedance (100 kHz / +20 ℃)
・When requesting taped product, please put the letter "B" or "H" be tween the "( )".
Lead wire pitch ✻B=5 mm, 7.5 mm, H=2.5 mm.
・Please refer to the page of “Taping dimensions”.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

Characteristics list

Endurance : 105 ℃ 1000 h / ø4 to ø6.3, 105 ℃ 2000 h / ø8, 105 ℃ 3000 h / ø10, 105 ℃ 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
								Lead space					
		øD	L	Ripple current*1 (mA rms)	Impe-dance*2 (Ω)	Endu-rance (h)	Lead dia. (ød)	Straight	Taping ✻B	Taping ✻H		Straight leads	Taping
25	10	4.0	7.0	65	2.000	1000	0.45	1.5	5.0	2.5	EEAFC1E100( )	200	2000
	22	5.0	7.0	120	0.950	1000	0.45	2.0	5.0	2.5	EEAFC1E220( )	200	2000
	39	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1E390( )	200	2000
		6.3	7.0	200	0.450	1000	0.45	2.5	5.0	2.5	EEAFC1E390( )	200	2000
	47	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1E470( )	200	2000
	82	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1E820( )	200	2000
	100	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1E101S( )	200	2000
	180	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1E181( )	200	1000
	220	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1E221( )	200	1000
	270	10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1E271( )	200	500
	330	8.0	15.0	730	0.085	2000	0.60	3.5	5.0	—	EEUFC1E331L( )	200	1000
		10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1E331( )	200	500
	390	10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1E391( )	200	500
	470	8.0	20.0	995	0.065	2000	0.60	3.5	5.0	—	EEUFC1E471L( )	200	1000
		10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1E471( )	200	500
	560	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1E561( )	200	500
		12.5	15.0	1205	0.065	5000	0.60	5.0	5.0	—	EEUFC1E561S( )	200	500
	680	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1E681( )	200	500
	820	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC1E821( )	200	500
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1E821S( )	200	500
	1000	10.0	30.0	1815	0.035	3000	0.60	5.0	—	—	EEUFC1E102L	100	—
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1E102( )	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC1E102S( )	100	250
	1200	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1E122( )	200	500
		18.0	15.0	2000	0.038	5000	0.80	7.5	7.5	—	EEUFC1E122S( )	100	250
	1500	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1E152( )	200	500
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1E152S( )	100	250
	1800	12.5	30.0	2310	0.025	5000	0.80	5.0	—	—	EEUFC1E182L	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1E182( )	100	250
	2200	12.5	35.0	2510	0.022	5000	0.80	5.0	—	—	EEUFC1E222	100	—
		18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1E222S( )	100	250
	2700	16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1E272( )	100	250
	3300	16.0	31.5	3010	0.018	5000	0.80	7.5	—	—	EEUFC1E332	100	—
		18.0	25.0	2740	0.020	5000	0.80	7.5	7.5	—	EEUFC1E332S( )	100	250
	3900	16.0	35.5	3150	0.016	5000	0.80	7.5	—	—	EEUFC1E392L	100	—
		18.0	31.5	3635	0.016	5000	0.80	7.5	—	—	EEUFC1E392	50	—
	4700	18.0	35.5	3680	0.015	5000	0.80	7.5	—	—	EEUFC1E472	50	—
	5600	18.0	40.0	3735	0.014	5000	0.80	7.5	—	—	EEUFC1E562	50	—

*1: Ripple current (100 kHz / +105 ℃)
*2: Impedance (100 kHz / +20 ℃)
・When requesting taped product, please put the letter "B" or "H" be tween the "( )".
Lead wire pitch ✻B=5 mm, 7.5 mm, H=2.5 mm.
・Please refer to the page of “Taping dimensions”.

Characteristics list

Endurance : 105 ℃ 1000 h / ø4 to ø6.3, 105 ℃ 2000 h / ø8, 105 ℃ 3000 h / ø10, 105 ℃ 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
								Lead space					
		øD	L	Ripple current*1 (mA rms)	Impe-dance*2 (Ω)	Endu-rance (h)	Lead dia. (ød)	Straight	Taping ✻B	Taping ✻H		Straight leads	Taping
35	6.8	4.0	7.0	65	2.000	1000	0.45	1.5	5.0	2.5	EEAFC1V6R8( )	200	2000
	12	5.0	7.0	120	0.950	1000	0.45	2.0	5.0	2.5	EEAFC1V120( )	200	2000
	22	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1V220( )	200	2000
	27	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1V270( )	200	2000
		6.3	7.0	200	0.450	1000	0.45	2.5	5.0	2.5	EEAFC1V270( )	200	2000
	33	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1V330( )	200	2000
	47	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1V470( )	200	2000
	56	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1V560( )	200	2000
	68	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1V680( )	200	2000
	100	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1V101( )	200	1000
	120	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1V121( )	200	1000
	150	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1V151( )	200	1000
	180	10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1V181( )	200	500
	220	8.0	15.0	730	0.085	2000	0.60	3.5	5.0	—	EEUFC1V221L( )	200	1000
		10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1V221( )	200	500
	270	10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1V271( )	200	500
	330	8.0	20.0	995	0.065	2000	0.60	3.5	5.0	—	EEUFC1V331L( )	200	1000
		10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1V331( )	200	500
	390	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1V391( )	200	500
		12.5	15.0	1205	0.065	5000	0.60	5.0	5.0	—	EEUFC1V391S( )	200	500
	470	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1V471( )	200	500
	560	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC1V561( )	200	500
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1V561S( )	200	500
	680	10.0	30.0	1815	0.035	3000	0.60	5.0	—	—	EEUFC1V681L	100	—
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1V681( )	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC1V681S( )	100	250
	820	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1V821L( )	200	500
		18.0	15.0	2000	0.038	5000	0.80	7.5	7.5	—	EEUFC1V821( )	100	250
	1000	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1V102( )	200	500
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1V102S( )	100	250
	1200	12.5	30.0	2310	0.025	5000	0.80	5.0	—	—	EEUFC1V122L	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1V122( )	100	250
	1500	12.5	35.0	2510	0.022	5000	0.80	5.0	—	—	EEUFC1V152L	100	—
		16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1V152( )	100	250
		18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1V152S( )	100	250
	1800	12.5	40.0	2655	0.018	5000	0.80	5.0	—	—	EEUFC1V182L	100	—
		16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1V182( )	100	250
		18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1V182S( )	100	250
	2200	16.0	31.5	3010	0.018	5000	0.80	7.5	—	—	EEUFC1V222	100	—
		18.0	25.0	2740	0.020	5000	0.80	7.5	7.5	—	EEUFC1V222S( )	100	250
	2700	16.0	35.5	3150	0.016	5000	0.80	7.5	—	—	EEUFC1V272L	100	—
		18.0	31.5	3635	0.016	5000	0.80	7.5	—	—	EEUFC1V272	50	—
	3300	18.0	35.5	3680	0.015	5000	0.80	7.5	—	—	EEUFC1V332	50	—
	3900	18.0	40.0	3735	0.014	5000	0.80	7.5	—	—	EEUFC1V392	50	—

*1: Ripple current (100 kHz / +105 ℃)
*2: Impedance (100 kHz / +20 ℃)
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Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

Characteristics list

Endurance : 105 ℃ 1000 h / ø4 to ø6.3, 105 ℃ 2000 h / ø8, 105 ℃ 3000 h / ø10, 105 ℃ 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
								Lead space					
		øD	L	Ripple current*1 (mA rms)	Impe-dance*2 (Ω)	Endu-rance (h)	Lead dia. (ød)	Straight	Taping ✻B	Taping ✻H		Straight leads	Taping
50	2.2	5.0	11.0	45	1.800	1000	0.50	2.0	5.0	2.5	EEUFC1H2R2( )	200	2000
	3.3	5.0	11.0	65	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H3R3( )	200	2000
	4.7	5.0	11.0	95	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H4R7( )	200	2000
	10	5.0	11.0	125	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H100L( )	200	2000
	12	5.0	11.0	135	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H120( )	200	2000
	15	5.0	11.0	145	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H150( )	200	2000
	18	5.0	11.0	155	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H180( )	200	2000
	22	5.0	11.0	155	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H220( )	200	2000
	33	6.3	11.2	260	0.600	1000	0.50	2.5	5.0	2.5	EEUFC1H330( )	200	2000
	39	6.3	11.2	260	0.600	1000	0.50	2.5	5.0	2.5	EEUFC1H390( )	200	2000
	47	6.3	11.2	260	0.600	1000	0.50	2.5	5.0	2.5	EEUFC1H470( )	200	2000
	68	8.0	11.5	485	0.234	2000	0.60	3.5	5.0	—	EEUFC1H680( )	200	1000
	82	8.0	11.5	485	0.234	2000	0.60	3.5	5.0	—	EEUFC1H820( )	200	1000
	100	10.0	12.5	615	0.162	3000	0.60	5.0	5.0	—	EEUFC1H101( )	200	500
	120	8.0	15.0	635	0.155	2000	0.60	3.5	5.0	—	EEUFC1H121L( )	200	1000
		10.0	12.5	615	0.162	3000	0.60	5.0	5.0	—	EEUFC1H121( )	200	500
	150	10.0	16.0	850	0.119	3000	0.60	5.0	5.0	—	EEUFC1H151( )	200	500
	180	8.0	20.0	860	0.120	2000	0.60	3.5	5.0	—	EEUFC1H181L( )	200	1000
		10.0	16.0	850	0.119	3000	0.60	5.0	5.0	—	EEUFC1H181( )	200	500
	220	10.0	20.0	1030	0.090	3000	0.60	5.0	5.0	—	EEUFC1H221( )	200	500
		12.5	15.0	1150	0.110	5000	0.60	5.0	5.0	—	EEUFC1H221S( )	200	500
	270	10.0	25.0	1200	0.082	3000	0.60	5.0	5.0	—	EEUFC1H271( )	200	500
	330	10.0	30.0	1610	0.060	3000	0.60	5.0	—	—	EEUFC1H331L	100	—
		12.5	20.0	1480	0.063	5000	0.60	5.0	5.0	—	EEUFC1H331( )	200	500
	390	12.5	20.0	1480	0.063	5000	0.60	5.0	5.0	—	EEUFC1H391( )	200	500
		16.0	15.0	1610	0.080	5000	0.80	7.5	7.5	—	EEUFC1H391S( )	100	250
	470	10.0	30.0	1610	0.060	3000	0.60	5.0	—	—	EEUFC1H471L	100	—
		12.5	25.0	1832	0.050	5000	0.60	5.0	5.0	—	EEUFC1H471( )	200	500
	560	12.5	25.0	1832	0.050	5000	0.60	5.0	5.0	—	EEUFC1H561( )	200	500
		18.0	15.0	1900	0.068	5000	0.80	7.5	7.5	—	EEUFC1H561S( )	100	250
	680	12.5	30.0	2215	0.040	5000	0.80	5.0	—	—	EEUFC1H681L	100	—
		16.0	20.0	1835	0.048	5000	0.80	7.5	7.5	—	EEUFC1H681( )	100	250
	820	12.5	35.0	2285	0.034	5000	0.80	5.0	—	—	EEUFC1H821L	100	—
		18.0	20.0	2420	0.042	5000	0.80	7.5	7.5	—	EEUFC1H821( )	100	250
	1000	12.5	40.0	2590	0.030	5000	0.80	5.0	—	—	EEUFC1H102L	100	—
		16.0	25.0	2235	0.034	5000	0.80	7.5	7.5	—	EEUFC1H102( )	100	250
	1200	16.0	31.5	2700	0.028	5000	0.80	7.5	—	—	EEUFC1H122	100	—
		18.0	25.0	2610	0.029	5000	0.80	7.5	7.5	—	EEUFC1H122S( )	100	250
	1500	16.0	35.5	2790	0.025	5000	0.80	7.5	—	—	EEUFC1H152L	100	—
	1800	16.0	40.0	2845	0.023	5000	0.80	7.5	—	—	EEUFC1H182L	100	—
		18.0	31.5	3000	0.025	5000	0.80	7.5	—	—	EEUFC1H182	50	—
	2200	18.0	35.5	3100	0.023	5000	0.80	7.5	—	—	EEUFC1H222	50	—

*1: Ripple current (100 kHz / +105 ℃)
*2: Impedance (100 kHz / +20 ℃)
・When requesting taped product, please put the letter "B" or "H" be tween the "( )".
Lead wire pitch ✻B=5 mm, 7.5 mm, H=2.5 mm.
・Please refer to the page of “Taping dimensions”.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

Characteristics list

Endurance : 105 ℃ 1000 h / ø4 to ø6.3, 105 ℃ 2000 h / ø8, 105 ℃ 3000 h / ø10, 105 ℃ 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
								Lead space					
		øD	L	Ripple current*1 (mA rms)	Impe-dance*2 (Ω)	Endu-rance (h)	Lead dia. (ød)	Straight	Taping ✻B	Taping ✻H		Straight leads	Taping
63	12	5.0	11.0	145	2.000	1000	0.50	2.0	5.0	2.5	EEUFC1J120( )	200	2000
	22	6.3	11.2	240	1.000	1000	0.50	2.5	5.0	2.5	EEUFC1J220( )	200	2000
	33	6.3	11.2	240	1.000	1000	0.50	2.5	5.0	2.5	EEUFC1J330( )	200	2000
	47	8.0	11.5	405	0.342	2000	0.60	3.5	5.0	—	EEUFC1J470( )	200	1000
	56	8.0	11.5	405	0.342	2000	0.60	3.5	5.0	—	EEUFC1J560( )	200	1000
	68	8.0	11.5	405	0.342	2000	0.60	3.5	5.0	—	EEUFC1J680( )	200	1000
	82	10.0	12.5	535	0.256	3000	0.60	5.0	5.0	—	EEUFC1J820( )	200	500
	100	8.0	15.0	535	0.230	2000	0.60	3.5	5.0	—	EEUFC1J101L( )	200	1000
		10.0	12.5	535	0.256	3000	0.60	5.0	5.0	—	EEUFC1J101( )	200	500
	120	10.0	16.0	600	0.194	3000	0.60	5.0	5.0	—	EEUFC1J121( )	200	500
	150	8.0	20.0	690	0.178	2000	0.60	3.5	5.0	—	EEUFC1J151( )	200	1000
	180	10.0	20.0	885	0.147	3000	0.60	5.0	5.0	—	EEUFC1J181( )	200	500
		12.5	15.0	1020	0.150	5000	0.60	5.0	5.0	—	EEUFC1J181S( )	200	500
	220	10.0	20.0	885	0.147	3000	0.60	5.0	5.0	—	EEUFC1J221X( )	200	500
		10.0	25.0	1050	0.130	3000	0.60	5.0	5.0	—	EEUFC1J221( )	200	500
		12.5	20.0	1285	0.085	5000	0.60	5.0	5.0	—	EEUFC1J221S( )	200	500
	270	16.0	15.0	1410	0.090	5000	0.80	7.5	7.5	—	EEUFC1J271( )	100	250
	330	10.0	30.0	1300	0.090	3000	0.60	5.0	—	—	EEUFC1J331L	100	—
		12.5	20.0	1285	0.085	5000	0.60	5.0	5.0	—	EEUFC1J331( )	200	500
	390	12.5	25.0	1720	0.070	5000	0.60	5.0	5.0	—	EEUFC1J391( )	200	500
		18.0	15.0	1690	0.086	5000	0.80	7.5	7.5	—	EEUFC1J391S( )	100	250
	470	12.5	30.0	2090	0.055	5000	0.80	5.0	—	—	EEUFC1J471L	100	—
		16.0	20.0	1765	0.059	5000	0.80	7.5	7.5	—	EEUFC1J471( )	100	250
	560	16.0	25.0	2160	0.050	5000	0.80	7.5	7.5	—	EEUFC1J561( )	100	250
	680	12.5	35.0	2265	0.047	5000	0.80	5.0	—	—	EEUFC1J681L	100	—
		16.0	25.0	2160	0.050	5000	0.80	7.5	7.5	—	EEUFC1J681( )	100	250
		18.0	20.0	2290	0.055	5000	0.80	7.5	7.5	—	EEUFC1J681S( )	100	250
	820	12.5	40.0	2560	0.042	5000	0.80	5.0	—	—	EEUFC1J821L	100	—
		16.0	31.5	2670	0.043	5000	0.80	7.5	—	—	EEUFC1J821	100	—
		18.0	25.0	2585	0.043	5000	0.80	7.5	7.5	—	EEUFC1J821S( )	100	250
	1000	16.0	31.5	2670	0.043	5000	0.80	7.5	—	—	EEUFC1J102U	100	—
		16.0	35.5	2770	0.036	5000	0.80	7.5	—	—	EEUFC1J102	100	—
	1200	16.0	40.0	2825	0.030	5000	0.80	7.5	—	—	EEUFC1J122L	100	—
		18.0	31.5	2950	0.032	5000	0.80	7.5	—	—	EEUFC1J122	50	—
	1500	18.0	35.5	3095	0.030	5000	0.80	7.5	—	—	EEUFC1J152	50	—
	1800	18.0	40.0	3205	0.025	5000	0.80	7.5	—	—	EEUFC1J182	50	—

*1: Ripple current (100 kHz / +105 ℃)
*2: Impedance (100 kHz / +20 ℃)
・When requesting taped product, please put the letter "B" or "H" be tween the "( )".
Lead wire pitch ✻B=5 mm, 7.5 mm, H=2.5 mm.
・Please refer to the page of “Taping dimensions”.

FC series

Characteristics list

Endurance : 105 ℃ 1000 h / ø4 to ø6.3, 105 ℃ 2000 h / ø8, 105 ℃ 3000 h / ø10, 105 ℃ 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
								Lead space					
		øD	L	Ripple current*1 (mA rms)	Impe-dance*2 (Ω)	Endu-rance (h)	Lead dia. (ød)	Straight	Taping ✻B	Taping ✻H		Straight leads	Taping
100	5.6	5.0	11.0	80	4.100	1000	0.5	2.0	5.0	2.5	EEUFC2A5R6( )	200	2000
	12	6.3	11.2	114	1.800	1000	0.5	2.5	5.0	2.5	EEUFC2A120( )	200	2000
	22	8.0	11.5	260	0.680	2000	0.6	3.5	5.0	—	EEUFC2A220( )	200	1000
	33	8.0	15.0	340	0.450	2000	0.6	3.5	5.0	—	EEUFC2A330L( )	200	1000
		10.0	12.5	306	0.530	3000	0.6	5.0	5.0	—	EEUFC2A330( )	200	500
	39	8.0	20.0	455	0.330	2000	0.6	5.0	5.0	—	EEUFC2A390L( )	200	1000
		10.0	16.0	400	0.360	3000	0.6	5.0	5.0	—	EEUFC2A390( )	200	500
	47	10.0	20.0	463	0.240	3000	0.6	5.0	5.0	—	EEUFC2A470( )	200	500
	56	10.0	20.0	463	0.240	3000	0.6	5.0	5.0	—	EEUFC2A560( )	200	500
	68	10.0	25.0	599	0.210	3000	0.6	5.0	5.0	—	EEUFC2A680L( )	200	500
		12.5	15.0	511	0.230	5000	0.6	5.0	5.0	—	EEUFC2A680( )	200	500
	100	10.0	30.0	698	0.150	3000	0.6	5.0	—	—	EEUFC2A101L	100	—
		12.5	20.0	671	0.180	5000	0.6	5.0	5.0	—	EEUFC2A101( )	200	500
	120	16.0	15.0	793	0.140	5000	0.8	7.5	7.5	—	EEUFC2A121S( )	100	250
	150	12.5	25.0	807	0.110	5000	0.6	5.0	5.0	—	EEUFC2A151( )	200	500
		18.0	15.0	917	0.120	5000	0.8	7.5	7.5	—	EEUFC2A151S( )	100	250
	180	12.5	30.0	937	0.098	5000	0.8	5.0	—	—	EEUFC2A181L	100	—
		16.0	20.0	995	0.110	5000	0.8	7.5	7.5	—	EEUFC2A181( )	100	250
	220	12.5	35.0	1040	0.087	5000	0.8	5.0	—	—	EEUFC2A221L	100	—
		16.0	25.0	1170	0.089	5000	0.8	7.5	7.5	—	EEUFC2A221( )	100	250
	270	12.5	40.0	1130	0.072	5000	0.8	5.0	—	—	EEUFC2A271L	100	—
		18.0	20.0	1230	0.080	5000	0.8	7.5	7.5	—	EEUFC2A271S( )	100	250
	330	16.0	31.5	1520	0.062	5000	0.8	7.5	—	—	EEUFC2A331	100	—
		18.0	25.0	1420	0.070	5000	0.8	7.5	7.5	—	EEUFC2A331S( )	100	250
	390	16.0	35.5	1730	0.053	5000	0.8	7.5	—	—	EEUFC2A391L	100	—
		18.0	31.5	1600	0.062	5000	0.8	7.5	—	—	EEUFC2A391	50	—
	470	16.0	40.0	1920	0.047	5000	0.8	7.5	—	—	EEUFC2A471	100	—
	560	18.0	35.5	1770	0.041	5000	0.8	7.5	—	—	EEUFC2A561	50	—
	680	18.0	40.0	2300	0.036	5000	0.8	7.5	—	—	EEUFC2A681	50	—

*1: Ripple current (100 kHz / +105 ℃)
*2: Impedance (100 kHz / +20 ℃)
・When requesting taped product, please put the letter "B" or "H" be tween the "( )".
Lead wire pitch ✻B=5 mm, 7.5 mm, H=2.5 mm.
・Please refer to the page of “Taping dimensions”.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

Guidelines and precautions regarding the technical information and use of our products described in this online catalog.

- If you want to use our products described in this online catalog for applications requiring special qualities or reliability, or for applications where the failure or malfunction of the products may directly jeopardize human life or potentially cause personal injury (e.g. aircraft and aerospace equipment, traffic and transportation equipment, combustion equipment, medical equipment, accident prevention, anti-crime equipment, and/or safety equipment), it is necessary to verify whether the specifications of our products fit to such applications. Please ensure that you will ask and check with our inquiry desk as to whether the specifications of our products fit to such applications use before you use our products.

- The quality and performance of our products as described in this online catalog only apply to our products when used in isolation. Therefore, please ensure you evaluate and verify our products under the specific circumstances in which our products are assembled in your own products and in which our products will actually be used.

- If you use our products in equipment that requires a high degree of reliability, regardless of the application, it is recommended that you set up protection circuits and redundancy circuits in order to ensure safety of your equipment.

- The products and product specifications described in this online catalog are subject to change for improvement without prior notice. Therefore, please be sure to request and confirm the latest product specifications which explain the specifications of our products in detail, before you finalize the design of your applications, purchase, or use our products.

- The technical information in this online catalog provides examples of our products' typical operations and application circuits. We do not guarantee the non-infringement of third party's intellectual property rights and we do not grant any license, right, or interest in our intellectual property.

- If any of our products, product specifications and/or technical information in this online catalog is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially with regard to security and export control, shall be observed.

<Regarding the Certificate of Compliance with the EU RoHS Directive/REACH Regulations>

- The switchover date for compliance with the RoHS Directive/REACH Regulations varies depending on the part number or series of our products.

- When you use the inventory of our products for which it is unclear whether those products are compliant with the RoHS Directive/REACH Regulation, please select "Sales Inquiry" in the website inquiry form and contact us.

We do not take any responsibility for the use of our products outside the scope of the specifications, descriptions, guidelines and precautions described in this online catalog.

Notices

■ Applicable laws and regulations

・This product complies with the RoHS Directive (Restriction of the use of certain hazardous substances in electrical and electronic equipment (DIRECTIVE 2011/65/EU and (EU)2015/863)).
・No Ozone Depleting Chemicals(ODC's), controlled under the Montreal Protocol Agreement, are used in producing this product.
We do not use PBBs or PBDEs as brominated flame retardants.
・Export procedure which followed export related regulations, such as foreign exchange and a foreign trade method, on the occasion of export of this product.
・These products are not dangerous goods on the transportation as identified by UN(United Nations) numbers or UN classification.

■ Limited applications

・This capacitor is designed to be used for electronics circuits such as audio/visual equipment, home appliances, computers and other office equipment, optical equipment, measuring equipment.
・High reliability and safety are required [be / a possibility that incorrect operation of this product may do harm to a human life or property] more. When use is considered by the use, the delivery specifications which suited the use separately need to be exchanged.

■ Intellectual property rights and licenses

・The technical information in this specification provides examples of our products' typical operations and application circuits. We do not guarantee the non-infringement of third party's intellectual property rights and we do not grant any license, right, or interest in our intellectual property.

Items to be observed

■ For specification

・This specification guarantees the quality and performance of the product as individual components.
The durability differs depending on the environment and the conditions of usage.
Before use, check and evaluate their compatibility with actual conditions when installed in the products.
When safety requirements cannot be satisfied in your technical examination, inform us immediately.
・Do not use the products beyond the specifications described in this document.

■ Upon application to products where safety is regarded as important

Install the following systems for a failsafe design to ensure safety if these products are to be used in equipment where a defect in these products may cause the loss of human life or other signification damage, such as damage to vehicles (automobile, train, vessel), traffic lights, medical equipment, aerospace equipment, electric heating appliances, combustion/ gas equipment, rotating rotating equipment, and disaster/crime prevention equipment.

(1) The system is equipped with a protection circuit and protection device.
(2) The system is equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault.

■ Conditions of use

・Before using the products, carefully check the effects on their quality and performance, and determined whether or not they can be used. These products are designed and manufactured for general-purpose and standard use in general electronic equipment. These products are not intended for use in the following special conditions.

(1) In liquid, such as Water, Oil, Chemicals, or Organic solvent.
(2) In direct sunlight, outdoors, or in dust.
(3) In vapor, such as dew condensation water of resistive element, or water leakage, salty air, or air with a high concentration corrosive gas, such as Cl_2, H_2S, NH_3, SO_2, or NOx.
(4) In an environment where strong static electricity or electromagnetic waves exist.
(5) Mounting or placing heat-generating components or inflammables, such as vinyl-coated wires, near these products.
(6) Sealing or coating of these products or a printed circuit board on which these products are mounted, with resin and other material.
(7) Using resolvent, water or water-soluble cleaner for flux cleaning agent after soldering. (In particular, when using water or a water-soluble cleaning agent, be careful not to leave water residues)
(8) Using in the atmosphere where strays acid or alkaline.
(9) Using in the atmosphere where there are excessive vibration and shock.

・Please arrange circuit design for preventing impulse or transitional voltage.
Do not apply voltage, which exceeds the full rated voltage when the capacitors receive impulse voltage, instantaneous high voltage, high pulse voltage etc.
・Our products there is a product are using an electrolyte solution. Therefore, misuse can result in rapid deterioration of characteristics and functions of each product. Electrolyte leakage damages printed circuit and affects performance, characteristics, and functions of customer system.

⚠Application guidelines (Radial lead Type)

1. Circuit design

1.1 Operating temperature and frequency

Electrical characteristics of the capacitor are likely to change due to variation in temperature and/or frequency. Circuit designers should take these changes into consideration.

(1) Effects of operating temperature on electrical parameters

At higher temperatures : leakage current and capacitance increase while equivalent series resistance (ESR) decreases.

At lower temperatures : leakage current and capacitance decrease while equivalent series resistance (ESR) increases.

(2) Effects of frequency on electrical parameters

At higher frequencies : capacitance and impedance decrease while tan d increases.

At lower frequencies : heat generated by ripple current will rise due to an increase in equivalent series resistance (ESR).

1.2 Operating temperature and life expectancy

(1) Expected life is affected by operating temperature. Generally, each 10 °C reduction in temperature will double the expected life. Use capacitors at the lowest possible temperature below the upper category temperature.

(2) If operating temperatures exceed the upper category limit, rapid deterioration of electrical parameter will occur and irreversible damage will result.
Check for the maximum capacitor operating temperatures including ambient temperature, internal capacitor temperature rise due to ripple current, and the effects of radiated heat from power transistors, IC's or resistors.
Avoid placing components, which could conduct heat to the capacitor from the back side of the circuit board.

(3) The formula for calculating expected life at lower operating temperatures is as follows ;

$$L_2 = L_1 \times 2^{\frac{T_1 - T_2}{10}}$$

L_1 : Guaranteed life (h) at temperature, T_1 °C
L_2 : Expected life (h) at temperature, T_2 °C
T_1 : Upper category temperature + temperature rise due to rated ripple current (°C)
T_2 : Actual operating temperature, ambient temperature + temperature rise due to ripple current (°C)

(4) Using the capacitor beyond the estimated lifetime will result in short circuit, electrolyte leak, vent open, and large deterioration of characteristics. The lifetime cannot go above 15 years due to aging of sealing rubber.

1.3 Common application conditions to avoid

The following misapplication load conditions will cause rapid deterioration of a capacitor's electrical parameters. In addition, rapid heating and gas generation within the capacitor can occur, causing the pressure relief vent to operate and resultant leakage of electrolyte. Under extreme conditions, explosion and fire ignition could result. The leaked electrolyte is combustible and electrically conductive.

(1) Reverse voltage
DC capacitors have polarity. Therefore, please do not apply the reverse voltage. Verify correct polarity before insertion.
For circuits with changing or uncertain polarity, use DC bipolar capacitors. DC bipolar capacitors are not suitable for use in AC circuits.

(2) Charge / Discharge applications
Standard capacitors are not suitable for use in repeating charge/discharge applications. For charge/discharge applications, consult us with your actual application condition.
For rush current, please to nor exceed 100 A.

(3) ON-OFF circuit
Do not use capacitors in circuit where ON-OFF switching is repeated more than 10000 times/per day.
In case of applying to the theses ON-OFF circuit, consult with us about circuit condition and so on.

(4) Over voltage

Do not apply voltages exceeding the maximum specified rated voltage. Voltages up to the surge voltage rating are acceptable for short periods of time.

Ensure that the sum of the DC voltage and the superimposed AC ripple voltage does not exceed the rated voltage.

(5) Ripple current

Do not apply ripple currents exceeding the maximum specified value. For high ripple current applications, use a capacitor designed for high ripple currents. In addition, consult us if the applied ripple current is to be higher than the maximum specified value. Ensure that rated ripple currents that superimposed on low DC bias voltages do not cause reverse voltage conditions.

Even if it is within a rated ripple current, in case the practical use is over the pre described endurance lifetime, it causes the increase of deterioration of ESR characteristic and the internal generation heat by ripple current. Due to this, there is some possibility of vent open, bulging of sleeve and rubber, electrolyte leakage, and shot circuit, explosion and ignition in the worst case.

1.4 Using two or more capacitors in parallel

(1) Capacitors connected in parallel

The circuit resistance can closely approximate the series resistance of the capacitor, causing an imbalance of ripple current loads within the capacitors. Careful wiring methods can minimize the possible application of an excessive ripple current to a capacitor.

(2) Capacitors connected in series

Differences in normal DC leakage current among capacitors can cause voltage imbalances.

The use of voltage divider shunt resistors with consideration to leakage currents can prevent capacitor voltage imbalances.

NOTE : Please do not use in the series in the case of conductive polymer hybrid aluminum electrolytic capacitor.

1.5 Capacitor mounting considerations

(1) Double-sided circuit boards

Avoid wiring pattern runs, which pass between the mounted capacitor and the circuit board.

When dipping into a solder bath, an excess solder may deposit under the capacitor by capillary action, causing short circuit between anode and cathode terminals.

(2) Circuit Board Hole Positioning

The vinyl sleeve of the capacitor can be damaged if solder passes through a lead hole into the subsequently processed parts.

Special care when locating hole positions in proximity to capacitors is recommended.

(3) Circuit Board Hole Spacing

The spacing of circuit board holes should match the lead wire spacing of capacitors within the specified tolerances. Incorrect spacing can cause an excessive lead wire stress during the insertion process.

This may result in premature capacitor failure due to the short or open circuit, increased leakage current, or electrolyte leakage.

(4) Clearance for case mounted pressure relief

Capacitors with case mounted pressure relief require sufficient clearance to allow for proper pressure relief operation.

The minimum clearance are dependent on capacitor diameters as follows.

(Dia 10 mm to Dia 16 mm : 2 mm minimum, Dia 18 mm : 3 mm minimum)

(5) Wiring near the pressure relief

Avoid locating high voltage or high current wiring or circuit board paths above the pressure relief.

Flammable, high temperature gas that exceeds 100 °C may be released which could dissolve the wire insulation and ignite.

(6) Circuit board patterns under the capacitor

Avoid circuit board runs under the capacitor, as an electrical short can occur due to an electrolyte leakage.

(7) Please note the resonant after product implementation

The vicinity of the resonant point will take a heavy load on the capacitor.

Capacitors can cause rapid change in characteristics and dropout by this load.

1.6 Electrical isolation of the capacitor

Completely isolate the capacitor as follows.

Between the cathode and the case and between the anode terminal and other circuit paths.

1.7 Capacitor Sleeve

The vinyl sleeve or laminate coating is intended for marking and identification purposes and is not meant to electrically insulate the capacitor.
The sleeve may split or crack if immersed into solvents such as toluene or xylene and then subsequently exposed to high temperatures.

2. Capacitor handling techniques

2.1 Considerations before using

(1) Capacitors have a finite life. Do not reuse or recycle capacitors from used equipment.
(2) Transient recovery voltage may be generated in the capacitor due to dielectric absorption.
If required, this voltage can be discharged with a resistor with a value of about 1 kΩ.
(3) Capacitors stored for a long period of time may exhibit an increase in leakage current.
This can be corrected by gradually applying rated voltage in series with a resistor of approximately 1 kΩ.
(4) If capacitors are dropped, they can be damaged mechanically or electrically. Avoid using dropped capacitors.
(5) Dented or crushed capacitors should not be used.
The seal integrity can be damaged and loss of electrolyte/ shortened life can result.

2.2 Capacitor insertion

(1) Verify the correct capacitance and rated voltage of the capacitor.
(2) Verify the correct polarity of the capacitor before insertion.
(3) Verify the correct terminal dimension and land pattern size before mount to avoid stress on the terminals.
(4) Ensure that the lead clinching operation done by auto insertion equipments does not stress the capacitor leads where they enter the seal of the capacitor.

2.3 Flow Soldering

(1) Do not immerse the capacitor body into the solder bath as excessive internal pressure could result.
(2) Apply proper soldering conditions (temperature, time, etc.). Do not exceed the specified limits.
(3) Do not allow other parts or components to touch the capacitor during soldering.
(4) Radial lead type capacitors are not allowed for the reflow soldering.

2.4 Manual soldering

(1) Apply soldering conditions (temperature and time) based on the specification, or do not exceed temperature of 350 ℃ for 3 seconds or less.
(2) If lead wires must be modified to meet terminal board hole spacing, avoid stress on the lead wire where it enters the capacitor seal.
(3) If a soldered capacitor must be removed and reinserted, avoid excessive stress on the capacitor leads.
(4) Avoid physical contacts between the tip of the soldering iron and capacitors to prevent melting of the vinyl sleeve.

2.5 Other Soldering Considerations

Rapid temperature rise during the preheat operation and resin bonding operation can cause cracking of the capacitor's vinyl sleeve.
For heat curing, do not exceed 150 °C for the maximum time of 2 minutes.

2.6 Capacitor handling after soldering

(1) Avoid moving the capacitor after soldering to prevent excessive stress on the lead wires where they enter the seal. The capacitor may break from element portion due to a torque at outer rim, causing a large stress to terminals.
(2) Do not use the capacitor as a handle when moving the circuit board assembly. The total weight of the board would apply to element portion through terminals, and the capacitor may break.
(3) Avoid striking the capacitor after assembly to prevent failure due to excessive shock. The capacitor may break due to excessive shock or load above specified range.

2.7 Circuit board cleaning

(1) Circuit boards can be immersed or ultrasonically cleaned using suitable cleaning solvents for up to 5 minutes and up to 60 °C maximum temperatures. The boards should be thoroughly rinsed and dried.
The use of ozone depleting cleaning agents is not recommended for the purpose of protecting our environment.
【Target solvent】
Pine Alpha ST-100S, Aqua Cleaner 210SEP, Clean-thru 750H / 750L / 710M, Sunelec B-12,
Sunelec B-12, Cold Cleaner P3-375, Techno Cleaner 219, DK Be-clear CW-5790,
Telpene Cleaner EC-7R, Technocare FRW-17 / FRW-1 / FRV-1

(2) Avoid using the following solvent groups unless specifically allowed in the specification ;
(a) Halogenated cleaning solvents : except for solvent resistant capacitor types, halogenated solvents can permeate the seal and cause internal capacitor corrosion and failure.
For solvent resistant capacitors, carefully follow the temperature and time requirements based on the specification. 1,1,1-trichloroethane should never be used on any aluminum electrolytic capacitor.
(b) Alkaline solvents : could react and dissolve the aluminum case.
(c) Petroleum based solvents : deterioration of the rubber seal could result.
(d) Xylene : deterioration of the rubber seal could result.
(e) Acetone : removal of the ink markings on the vinyl sleeve could result.
(3) A thorough drying after cleaning is required to remove residual cleaning solvents that may be trapped between the capacitor and the circuit board. Avoid drying temperatures, which exceed the upper category temperature of the capacitor.
(4) Monitor the contamination levels of the cleaning solvents during use in terms of electrical conductivity, pH, specific gravity, or water content.
Chlorine levels can rise with contamination and adversely affect the performance of the capacitor.
Control the flux density in the cleaning agent to be less than 2 mass%.
(5) Depending on the cleaning method, the marking on a capacitor may be erased or blurred.
※ Please consult us if you are not certain about acceptable cleaning solvents or cleaning methods.

2.8 Mounting adhesives and coating agents

When using mounting adhesives or coating agents to control humidity, avoid using materials containing halogenated solvents.
Also, avoid the use of chloroprene based polymers.
Harden on dry adhesive or coating agents well lest the solvent should be left.
After applying adhesives or coatings, dry thoroughly to prevent residual solvents from being trapped between the capacitor and the circuit board.

2.9 Fumigation

In exporting electronic appliances with aluminum electrolytic capacitors, in some cases fumigation treatment using such halogen compound as methyl bromide is conducted for wooden boxes.
If such boxes are not dried well, the halogen left in the box is dispersed while transported and enters in the capacitors inside.
This possibly causes electrical corrosion of the capacitors. Therefore, after performing fumigation and drying make sure that no halogen is left.
Don’t perform fumigation treatment to the whole electronic appliances packed in a box.
Leave more than 1/3 of the sealing portion open, and do not cover that portion with any adhesives or coating.

2.10 Flux

If you use a halogen type (Chlorine type, Bromine type, etc.) high-activity flux, please use it after confirmation in advance, as it may have an impact on performance and reliability of this product due to the residue of the flux.

3. Precautions for using capacitors

3.1 Environmental conditions

Capacitors should not be stored or used in the following environments.
(1) Exposure to temperatures above the upper category or below the lower category temperature of the capacitor.
(2) Direct contact with water, salt water, or oil.
(3) High humidity conditions where water could condense on the capacitor.
(4) Exposure to toxic gases such as hydrogen sulfide, sulfuric acid, nitric acid, chlorine, chlorine compound, bromine, bromine compound or ammonia.
(5) Exposure to ozone, radiation, or ultraviolet rays.
(6) Vibration and shock conditions exceeding specified requirements.
Even within the specified requirements, a large vibration acceleration may be applied due to resonance, so be sure to evaluate and confirm with the actual product.

3.2 Electrical precautions

(1) Avoid touching the terminals of a capacitor as a possible electric shock could result. The exposed aluminum case is not insulated and could also cause electric shock if touched.
(2) Avoid short circuiting the area between the capacitor terminals with conductive materials including liquids such as acids or alkaline solutions.
(3) A low-molecular-weight-shiroxane which is included in a silicon material shall causes abnormal electrical characteristics.

4. Emergency procedures

(1) If the pressure relief of the capacitor operates, immediately turn off the equipment and disconnect from the power source.
This will minimize an additional damage caused by the vaporizing electrolyte.
(2) Avoid contact with the escaping electrolyte gas, which can exceed 100 °C temperatures.
If electrolyte or gas enters the eye, immediately flush the eye with large amounts of water.
If electrolyte or gas is ingested by mouth, gargle with water.
If electrolyte contacts the skin, wash with soap and water.

5. Long term storage

(1) Leakage current of a capacitor increases with long storage times. The aluminum oxide film deteriorates as a function of temperature and time.
If used without reconditioning, an abnormally high current will be required to restore the oxide film.
This surge current could cause the circuit or the capacitor to fail.
Expiration date is 42 months from outgoing inspection date.
However, expiration date for series which are not listed below is 12 months from outgoing inspection date.

Series	Expiration date
FC, FK, HD, TA, TP	42 months from outgoing inspection date

For storage condition, keep room temperature (5 °C to 35 °C) and humidity (45 % to 85 %) where direct sunshine doesn't reach.

(2) Environmental Conditions
Do not store under condition outside the area described in the specification, and also under conditions listed below.
(a) Exposure to temperatures above the upper category or below the lower category temperature of the capacitor.
(b) Direct contact with water, salt water, or oil.
(c) High humidity conditions where water could condense on the capacitor.
(d) Exposure to toxic gases such as hydrogen sulfide, sulfuric acid, nitric acid, chlorine, Chlorine compound, Bromine, Bromine compound or ammonia.
(e) Exposure to ozone, radiation, or ultraviolet rays.
(f) Vibration and shock conditions exceeding specified requirements.

6. Capacitor disposal

When disposing capacitors, use one of the following methods.
(1) Incinerate after crushing the capacitor or puncturing the can wall (to prevent explosion due to internal pressure rise).
(2) Dispose as solid waste.

NOTE : Local laws may have specific disposal requirements which must be followed.

The precautions in using aluminum electrolytic capacitors follow the "Safety application guide for the use in fixedaluminum electrolytic capacitors for electronic equipment", RCR-2367D issued by JEITA in October 2017.
Please refer to the above application guide for details.

■ AEC-Q200 compliant

The products are tested based on all or part of the test conditions and methods defined in AEC-Q200.
Please consult with Panasonic for the details of the product specification and specific evaluation test results, etc., and please review and approve Panasonic's product specification before ordering.