



Aluminum Electrolytic Capacitors

Radial Lead Type

FM-A series



Features

- Endurance : 105 °C 2000 h to 7000 h
- Low impedance (40 % to 70 % less than FC series)
- RoHS compliant

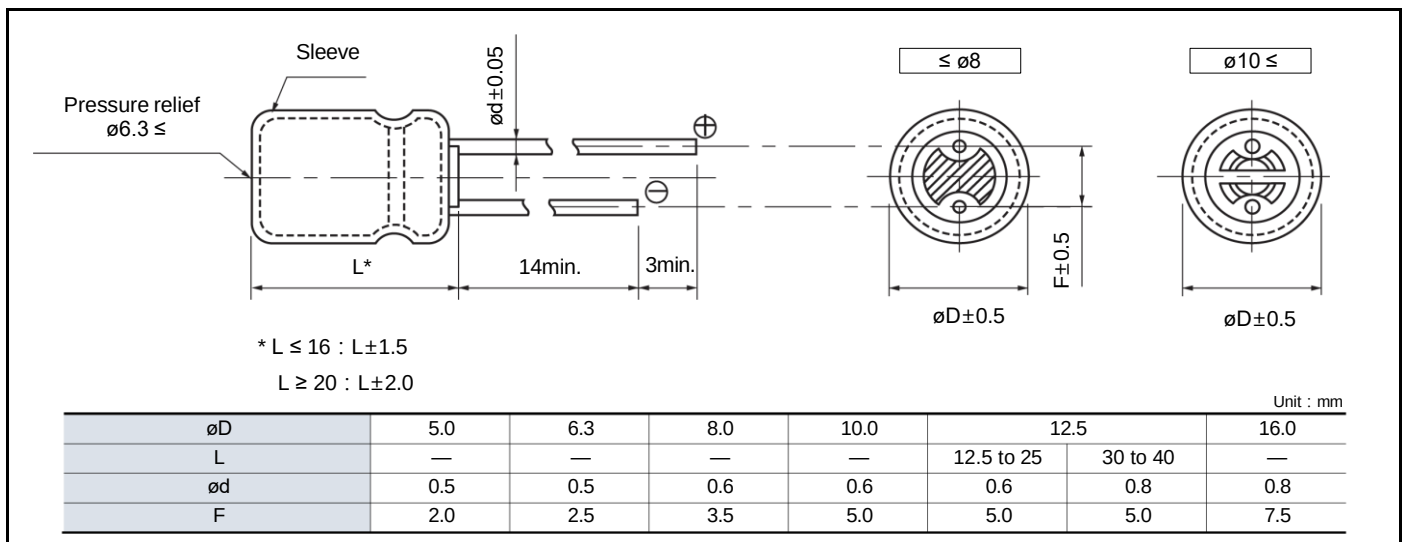
Specifications

Category temp. range	-40 °C to +105 °C							
Rated voltage range	6.3 V to 50 V							
Capacitance range	22 µF to 6800 µF							
Capacitance tolerance	±20 % (120 Hz / +20°C)							
Leakage current	I ≤ 0.01 CV (µA), whichever is greater, 2 minutes after reaching rated voltage, 20 °C *CV = (Capacitance in µF) x (Rated voltage in V)							
Dissipation factor (tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	(120 Hz /+20°C)
	Dissipation factor (tan δ)	0.22	0.19	0.16	0.14	0.12	0.10	
For capacitance value ≥ 1000 µF, add 0.02 per every 1000 µF.								
Endurance	After following life test with DC voltage and +105 °C±2 °C 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 °C, the capacitors shall meet the limits specified bellow.							
	Duration							
	ø5 to ø6.3 : 2000 h, ø8×11.5 to ø8×15: 3000 h							
	ø8×20 to ø10×16 : 4000 h, ø10×20 to ø12.5×20/ ø16×20 : 5000 h							
	ø12.5×25 to ø12.5×35/ ø16×25 : 7000 h							
	Capacitance change		Within ±25 % of the initial value (6.3 V to 10 V : ±30 %)					
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 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (Capacitors are left at room temperature and humidity for 2 hours after the test. Then, apply the rated voltage for 30min with a series protection resistance of 1000 Ω ± 10 Ω. Measure electrical characteristics after discharging the capacitor.)							

Frequency correction factor for ripple current

Freq. (Hz)	60	120	1 k	10 k	100 k
Cap. (µF)					
2.2 to 33	0.45	0.55	0.75	0.90	1.00
47 to 330	0.60	0.70	0.85	0.95	1.00
390 to 1000	0.65	0.75	0.90	0.98	1.00
1200 to 6800	0.75	0.80	0.95	1.00	1.00

Dimensions



Case size / Impedance / Ripple current

R. voltage (V)	6.3 to 35			50		
	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)
	+20 °C	-10 °C	+105 °C	+20 °C	-10 °C	+105 °C
Case size (mm) (øD×L)						
5 × 11	0.300	1.000	280	0.340	1.130	250
6.3 × 11.2	0.130	0.430	455	0.140	0.460	405
8 × 11.5	0.056	0.168	950	0.061	0.183	870
8 × 15	0.041	0.123	1240	0.045	0.135	1140
8 × 20	0.030	0.090	1560	0.033	0.099	1430
10 × 12.5	0.038	0.114	1290	0.042	0.126	1170
10 × 16	0.026	0.078	1790	0.030	0.090	1650
10 × 20	0.019	0.057	2180	0.023	0.069	1890
10 × 25	0.018	0.054	2470	0.022	0.066	2150
12.5 × 20	0.018	0.045	2600	0.022	0.055	2260
12.5 × 25	0.015	0.038	3190	0.018	0.045	2660
12.5 × 30	0.013	0.033	3630	0.016	0.040	3160
12.5 × 35	0.012	0.030	3750	0.014	0.035	3270
16 × 20	0.017	0.043	3300	0.019	0.048	2870
16 × 25	0.014	0.035	3820	0.016	0.040	3320

*1: 100 kHz

Explanation of part numbers

◇ Part number system

e.g.: EEUFM0J821L

EEU		FM		0J		821				L	
Product classification	Series	Code	Rated voltage (V)	Code	Capacitance (μF)	Code	Capacitance (μF)	Code	Capacitance (μF)	Code	suiffix
	FM	FM	6.3	0J	22	220	220	221	1800	182	L, S
			10	1A	33	330	330	331	2200	222	
			16	1C	47	470	470	471	2700	272	
			25	1E	56	560	560	561	3300	332	
			35	1V	68	680	680	681	3900	392	
			50	1H	100	101	820	821	4700	472	
					120	121	1000	102	5600	562	
					150	151	1200	122	6800	682	
					180	181	1500	152			

Characteristics list

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ¹ (mA ms)	Impe- dance ² (Ω)	Endu- rance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *H			
6.3	150	5.0	11.0	280	0.300	2000	0.5	2.0	5.0	2.5	EEUFM0J151()	200	2000
	330	6.3	11.2	455	0.130	2000	0.5	2.5	5.0	2.5	EEUFM0J331()	200	2000
	560	8.0	11.5	950	0.056	3000	0.6	3.5	5.0	—	EEUFM0J561()	200	1000
	820	8.0	15.0	1240	0.041	3000	0.6	3.5	5.0	—	EEUFM0J821L()	200	1000
	1000	10.0	12.5	1290	0.038	4000	0.6	5.0	5.0	—	EEUFM0J102()	200	500
	1200	8.0	20.0	1560	0.030	4000	0.6	3.5	5.0	—	EEUFM0J122L()	200	1000
		10.0	16.0	1790	0.026	4000	0.6	5.0	5.0	—	EEUFM0J122()	200	500
	1500	10.0	20.0	2180	0.019	5000	0.6	5.0	5.0	—	EEUFM0J152()	200	500
	2200	10.0	25.0	2470	0.018	5000	0.6	5.0	5.0	—	EEUFM0J222L()	200	500
	3300	12.5	20.0	2600	0.018	5000	0.6	5.0	5.0	—	EEUFM0J332()	200	500
	3900	12.5	25.0	3190	0.015	7000	0.6	5.0	5.0	—	EEUFM0J392()	200	500
	4700	12.5	30.0	3630	0.013	7000	0.8	5.0	—	—	EEUFM0J472L	100	—
	5600	12.5	35.0	3750	0.012	7000	0.8	5.0	—	—	EEUFM0J562L	100	—
		16.0	20.0	3300	0.017	5000	0.8	7.5	7.5	—	EEUFM0J562S()	100	250
	6800	16.0	25.0	3820	0.014	7000	0.8	7.5	7.5	—	EEUFM0J682()	100	250
10	100	5.0	11.0	280	0.300	2000	0.5	2.0	5.0	2.5	EEUFM1A101()	200	2000
	220	6.3	11.2	455	0.130	2000	0.5	2.5	5.0	2.5	EEUFM1A221()	200	2000
	470	8.0	11.5	950	0.056	3000	0.6	3.5	5.0	—	EEUFM1A471()	200	1000
	680	8.0	15.0	1240	0.041	3000	0.6	3.5	5.0	—	EEUFM1A681L()	200	1000
		10.0	12.5	1290	0.038	4000	0.6	5.0	5.0	—	EEUFM1A681()	200	500
	1000	8.0	20.0	1560	0.030	4000	0.6	3.5	5.0	—	EEUFM1A102L()	200	1000
		10.0	16.0	1790	0.026	4000	0.6	5.0	5.0	—	EEUFM1A102()	200	500
	1200	10.0	20.0	2180	0.019	5000	0.6	5.0	5.0	—	EEUFM1A122()	200	500
	1500	10.0	25.0	2470	0.018	5000	0.6	5.0	5.0	—	EEUFM1A152L()	200	500
	2200	12.5	20.0	2600	0.018	5000	0.6	5.0	5.0	—	EEUFM1A222()	200	500
	3300	12.5	25.0	3190	0.015	7000	0.6	5.0	5.0	—	EEUFM1A332()	200	500
	3900	12.5	30.0	3630	0.013	7000	0.8	5.0	—	—	EEUFM1A392L	100	—
		16.0	20.0	3300	0.017	5000	0.8	7.5	7.5	—	EEUFM1A392S()	100	250
	4700	12.5	35.0	3750	0.012	7000	0.8	5.0	—	—	EEUFM1A472L	100	—
	5600	16.0	25.0	3820	0.014	7000	0.8	7.5	7.5	—	EEUFM1A562()	100	250
16	68	5.0	11.0	280	0.300	2000	0.5	2.0	5.0	2.5	EEUFM1C680()	200	2000
	120	6.3	11.2	455	0.130	2000	0.5	2.5	5.0	2.5	EEUFM1C121()	200	2000
	330	8.0	11.5	950	0.056	3000	0.6	3.5	5.0	—	EEUFM1C331()	200	1000
	470	8.0	15.0	1240	0.041	3000	0.6	3.5	5.0	—	EEUFM1C471L()	200	1000
		10.0	12.5	1290	0.038	4000	0.6	5.0	5.0	—	EEUFM1C471()	200	500
	680	8.0	20.0	1560	0.030	4000	0.6	3.5	5.0	—	EEUFM1C681L()	200	1000
		10.0	16.0	1790	0.026	4000	0.6	5.0	5.0	—	EEUFM1C681()	200	500
	1000	10.0	20.0	2180	0.019	5000	0.6	5.0	5.0	—	EEUFM1C102()	200	500
	1200	10.0	25.0	2470	0.018	5000	0.6	5.0	5.0	—	EEUFM1C122L()	200	500
	1500	12.5	20.0	2600	0.018	5000	0.6	5.0	5.0	—	EEUFM1C152()	200	500
	2200	12.5	25.0	3190	0.015	7000	0.6	5.0	5.0	—	EEUFM1C222()	200	500
	2700	12.5	30.0	3630	0.013	7000	0.8	5.0	—	—	EEUFM1C272L	100	—
		16.0	20.0	3300	0.017	5000	0.8	7.5	7.5	—	EEUFM1C272S()	100	250
	3300	12.5	35.0	3750	0.012	7000	0.8	5.0	—	—	EEUFM1C332L	100	—
	3900	16.0	25.0	3820	0.014	7000	0.8	7.5	7.5	—	EEUFM1C392()	100	250

*1: Ripple current (100 kHz / +105 °C)

*2: Impedance (100 kHz / +20 °C)

· When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

· Please refer to the page of "Taping dimensions".

Matters to Be Observed When Using This Product / Reference information

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	Impe- dance ^{*2} (Ω)	Endu- rance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *H			
25	47	5.0	11.0	280	0.300	2000	0.5	2.0	5.0	2.5	EEUFM1E470()	200	2000
	100	6.3	11.2	455	0.130	2000	0.5	2.5	5.0	2.5	EEUFM1E101()	200	2000
	220	8.0	11.5	950	0.056	3000	0.6	3.5	5.0	—	EEUFM1E221()	200	1000
	330	8.0	15.0	1240	0.041	3000	0.6	3.5	5.0	—	EEUFM1E331L()	200	1000
		10.0	12.5	1290	0.038	4000	0.6	5.0	5.0	—	EEUFM1E331()	200	500
	470	8.0	20.0	1560	0.030	4000	0.6	3.5	5.0	—	EEUFM1E471L()	200	1000
		10.0	16.0	1790	0.026	4000	0.6	5.0	5.0	—	EEUFM1E471()	200	500
	680	10.0	20.0	2180	0.019	5000	0.6	5.0	5.0	—	EEUFM1E681()	200	500
	820	10.0	25.0	2470	0.018	5000	0.6	5.0	5.0	—	EEUFM1E821L()	200	500
	1000	12.5	20.0	2600	0.018	5000	0.6	5.0	5.0	—	EEUFM1E102()	200	500
	1500	12.5	25.0	3190	0.015	7000	0.6	5.0	5.0	—	EEUFM1E152()	200	500
	1800	12.5	30.0	3630	0.013	7000	0.8	5.0	—	—	EEUFM1E182L	100	—
		16.0	20.0	3300	0.017	5000	0.8	7.5	7.5	—	EEUFM1E182S()	100	250
	2200	12.5	35.0	3750	0.012	7000	0.8	5.0	—	—	EEUFM1E222L	100	—
2700	16.0	25.0	3820	0.014	7000	0.8	7.5	7.5	—	EEUFM1E272()	100	250	
35	33	5.0	11.0	280	0.300	2000	0.5	2.0	5.0	2.5	EEUFM1V330()	200	2000
	68	6.3	11.2	455	0.130	2000	0.5	2.5	5.0	2.5	EEUFM1V680()	200	2000
	150	8.0	11.5	950	0.056	3000	0.6	3.5	5.0	—	EEUFM1V151()	200	1000
	220	8.0	15.0	1240	0.041	3000	0.6	3.5	5.0	—	EEUFM1V221L()	200	1000
		10.0	12.5	1290	0.038	4000	0.6	5.0	5.0	—	EEUFM1V221()	200	500
	330	8.0	20.0	1560	0.030	4000	0.6	3.5	5.0	—	EEUFM1V331L()	200	1000
		10.0	16.0	1790	0.026	4000	0.6	5.0	5.0	—	EEUFM1V331()	200	500
	470	10.0	20.0	2180	0.019	5000	0.6	5.0	5.0	—	EEUFM1V471()	200	500
	560	10.0	25.0	2470	0.018	5000	0.6	5.0	5.0	—	EEUFM1V561L()	200	500
	680	12.5	20.0	2600	0.018	5000	0.6	5.0	5.0	—	EEUFM1V681()	200	500
	1000	12.5	25.0	3190	0.015	7000	0.6	5.0	5.0	—	EEUFM1V102()	200	500
	1200	12.5	30.0	3630	0.013	7000	0.8	5.0	—	—	EEUFM1V122L	100	—
		16.0	20.0	3300	0.017	5000	0.8	7.5	7.5	—	EEUFM1V122S()	100	250
	1500	12.5	35.0	3750	0.012	7000	0.8	5.0	—	—	EEUFM1V152L	100	—
1800	16.0	25.0	3820	0.014	7000	0.8	7.5	7.5	—	EEUFM1V182()	100	250	
50	22	5.0	11.0	250	0.340	2000	0.5	2.0	5.0	2.5	EEUFM1H220()	200	2000
	56	6.3	11.2	405	0.140	2000	0.5	2.5	5.0	2.5	EEUFM1H560()	200	2000
	100	8.0	11.5	870	0.061	3000	0.6	3.5	5.0	—	EEUFM1H101()	200	1000
	120	8.0	15.0	1140	0.045	3000	0.6	3.5	5.0	—	EEUFM1H121L()	200	1000
	150	10.0	12.5	1170	0.042	4000	0.6	5.0	5.0	—	EEUFM1H151()	200	500
	180	8.0	20.0	1430	0.033	4000	0.6	3.5	5.0	—	EEUFM1H181L()	200	1000
	220	10.0	16.0	1650	0.030	4000	0.6	5.0	5.0	—	EEUFM1H221()	200	500
	270	10.0	20.0	1890	0.023	5000	0.6	5.0	5.0	—	EEUFM1H271()	200	500
	330	10.0	25.0	2150	0.022	5000	0.6	5.0	5.0	—	EEUFM1H331L()	200	500
	470	12.5	20.0	2260	0.022	5000	0.6	5.0	5.0	—	EEUFM1H471()	200	500
	560	12.5	25.0	2660	0.018	7000	0.6	5.0	5.0	—	EEUFM1H561()	200	500
	680	12.5	30.0	3160	0.016	7000	0.8	5.0	—	—	EEUFM1H681L	100	—
	820	12.5	35.0	3270	0.014	7000	0.8	5.0	—	—	EEUFM1H821L	100	—
		16.0	20.0	2870	0.019	5000	0.8	7.5	7.5	—	EEUFM1H821S()	100	250
	1000	16.0	25.0	3320	0.016	7000	0.8	7.5	7.5	—	EEUFM1H102()	100	250

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