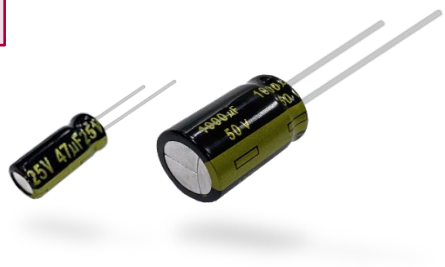
Panasonic INDUSTRY

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

Aluminum Electrolytic Capacitors

Radial Lead Type

FM-A series



Features

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

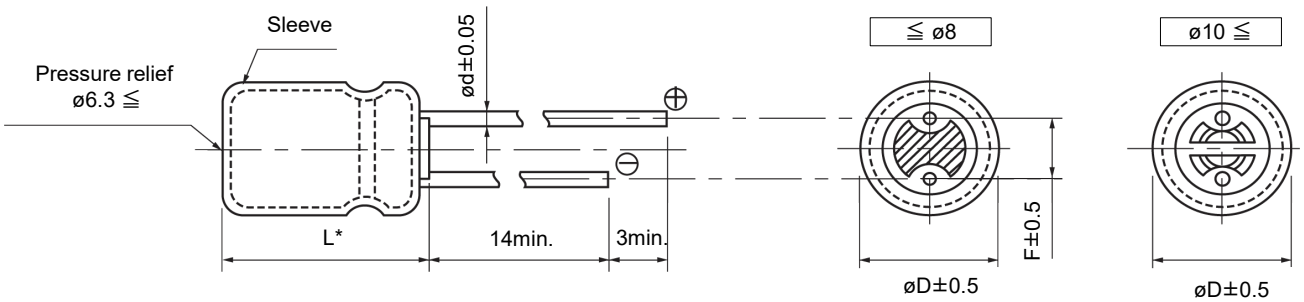
Specifications

Category temp. range	–40 ℃ to +105 ℃							
Rated voltage range	6.3 V to 50 V							
Capacitance range	22 µF to 6800 µF							
Capacitance tolerance	±20 % (120 Hz / +20℃)							
Leakage current	I ≦ 0.01 CV (µA) After 2 minutes							
Dissipation factor (tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	(120 Hz /+20℃)
	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 ℃±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 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 ℃±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 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



* L ≦ 16 : L±1.5
L ≧ 20 : L±2.0

Unit : mm

øD	5.0	6.3	8.0	10.0	12.5		16.0
L	—	—	—	—	12.5 to 25	30 to 40	—
ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	5.0	7.5

Case size / Impedance / Ripple current

R. voltage (V) / Case size (mm) (øD×L)	6.3 to 35			50		
	Impedance*1 (Ω)		Ripple current*1 (mA rms)	Impedance*1 (Ω)		Ripple current*1 (mA rms)
	+20 ℃	-10 ℃	+105 ℃	+20 ℃	-10 ℃	+105 ℃
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

Characteristics list

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	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 ℃)

*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

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	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

*1: Ripple current (100 kHz / +105 ℃)

*2: Impedance (100 kHz / +20 ℃)

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・Please refer to the page of “Taping dimensions”.