



Radial Lead Type

Series: **M** Type: **A**

Features

- Endurance : 85 °C 2000 h
- Smaller than series SU
- RoHS compliant

Specifications

Category temp. range	-40 °C to +85 °C	-25 °C to +85 °C
Rated voltage range	6.3 V.DC to 100 V.DC	160 V.DC to 450 V.DC
Capacitance range	2.2 μF to 22000 μF	2.2 μF to 470 μF
Capacitance tolerance	±20 % (120 Hz/+20 °C)	
Leakage current	$I \leq 0.01 CV$ or 3 (μA) After 2 minutes (Whichever is greater)	$I \leq 0.06 CV$ or 10 (μA) After 2 minutes
Dissipation factor	Please see the attached characteristics list	
Endurance	After applying rated working voltage for 2000 hours at +85 °C±2 °C, when the capacitors are restored to 20°C, capacitors shall meet the following limits.	
	Capacitance change	Within ±20 % of the initial value
	tan δ	≤ 150 % of the initial limit
	DC leakage current	Within the initial limit
Shelf life	After storage for 1000 hours at +85 °C±2 °C 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

Frequency (Hz)	50, 60	120	1 k	10 k to
Correction factor	0.70	1.00	1.30	1.70

Dimensions

Unit : mm

φD	5	6.3	8	10	12.5	16	18
φd	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	7.5	7.5

Characteristics list

Endurance : 85 °C 2000 h

Rated vol. (V.DC)	Cap. (±20 %) (μF)	Case size(mm)		Specification		Lead length(mm)				Part No.	Min. Packaging Q'ty	
		φD	L	Ripple current *1 (mA r.m.s)	tan δ *2	Lead dia. (φd)	Lead space				Straight leads (pcs)	Taping (pcs)
							Straight	Taping *B	Taping *i			
6.3	220	5.0	11.0	240	0.28	0.5	2.0	5.0	2.5	ECA0JM221()	200	2000
	470	6.3	11.2	380	0.28	0.5	2.5	5.0	2.5	ECA0JM471()	200	2000
	1000	8.0	11.5	580	0.28	0.6	3.5	5.0		ECA0JM102()	200	1000
	2200	10.0	16.0	890	0.30	0.6	5.0	5.0		ECA0JM222()	200	500
	3300	10.0	20.0	1020	0.32	0.6	5.0	5.0		ECA0JM332()	200	500
	4700	12.5	20.0	1170	0.34	0.6	5.0	5.0		ECA0JM472()	200	500
	6800	12.5	25.0	1270	0.38	0.6	5.0	5.0		ECA0JM682()	200	500
	10000	16.0	25.0	1450	0.46	0.8	7.5	7.5		ECA0JM103()	100	250
	15000	16.0	31.5	1700	0.56	0.8	7.5			ECA0JM153	100	
22000	18.0	35.5	1900	0.70	0.8	7.5			ECA0JM223	50		
10	330	6.3	11.2	330	0.24	0.5	2.5	5.0	2.5	ECA1AM331()	200	2000
	1000	10.0	12.5	630	0.24	0.6	5.0	5.0		ECA1AM102()	200	500
	2200	10.0	20.0	920	0.26	0.6	5.0	5.0		ECA1AM222()	200	500
	3300	12.5	20.0	1090	0.28	0.6	5.0	5.0		ECA1AM332()	200	500
	4700	12.5	25.0	1200	0.30	0.6	5.0	5.0		ECA1AM472()	200	500
	6800	16.0	25.0	1400	0.34	0.8	7.5	7.5		ECA1AM682()	100	250
	10000	16.0	31.5	1600	0.42	0.8	7.5			ECA1AM103	100	
	15000	18.0	35.5	1850	0.52	0.8	7.5			ECA1AM153	50	
16	10	5.0	11.0	30	0.20	0.5	2.0	5.0	2.5	ECA1CM100()	200	2000
	22	5.0	11.0	75	0.20	0.5	2.0	5.0	2.5	ECA1CM220()	200	2000
	33	5.0	11.0	110	0.20	0.5	2.0	5.0	2.5	ECA1CM330()	200	2000
	47	5.0	11.0	130	0.20	0.5	2.0	5.0	2.5	ECA1CM470()	200	2000
	100	5.0	11.0	180	0.20	0.5	2.0	5.0	2.5	ECA1CM101()	200	2000
	220	6.3	11.2	280	0.20	0.5	2.5	5.0	2.5	ECA1CM221()	200	2000
	470	8.0	11.5	440	0.20	0.6	3.5	5.0		ECA1CM471()	200	1000
	1000	10.0	16.0	680	0.20	0.6	5.0	5.0		ECA1CM102()	200	500
	2200	12.5	20.0	1000	0.22	0.6	5.0	5.0		ECA1CM222()	200	500
	3300	12.5	25.0	1200	0.24	0.6	5.0	5.0		ECA1CM332()	200	500
	4700	16.0	25.0	1360	0.26	0.8	7.5	7.5		ECA1CM472()	100	250
	6800	16.0	31.5	1600	0.30	0.8	7.5			ECA1CM682	100	
10000	18.0	35.5	1800	0.38	0.8	7.5			ECA1CM103	50		
25	100	6.3	11.2	180	0.16	0.5	2.5	5.0	2.5	ECA1EM101()	200	2000
	330	8.0	11.5	390	0.16	0.6	3.5	5.0		ECA1EM331()	200	1000
	470	10.0	12.5	480	0.16	0.6	5.0	5.0		ECA1EM471()	200	500
	1000	10.0	20.0	850	0.16	0.6	5.0	5.0		ECA1EM102()	200	500
	2200	12.5	25.0	1200	0.18	0.6	5.0	5.0		ECA1EM222()	200	500
	3300	16.0	25.0	1300	0.20	0.8	7.5	7.5		ECA1EM332()	100	250
	4700	16.0	31.5	1500	0.22	0.8	7.5			ECA1EM472	100	
	6800	18.0	35.5	1750	0.26	0.8	7.5			ECA1EM682	50	

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()". Lead wire pitch

*B=5 mm, 7.5 mm, i=2.5 mm

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

Characteristics list

Endurance : 85 °C 2000 h

Rated vol. (V.DC)	Cap. (±20 %) (μF)	Case size(mm)		Specification		Lead length(mm)				Part No.	Min. Packaging Qty	
		φD	L	Ripple current *1 (mA r.m.s)	tan δ *2	Lead dia. (φd)	Lead space				Straight leads (pcs)	Taping (pcs)
							Straight	Taping *B	Taping *i			
35	10	5.0	11.0	60	0.12	0.5	2.0	5.0	2.5	ECA1VM100()	200	2000
	47	5.0	11.0	130	0.14	0.5	2.0	5.0	2.5	ECA1VM470()	200	2000
	100	6.3	11.2	210	0.14	0.5	2.5	5.0	2.5	ECA1VM101()	200	2000
	220	8.0	11.5	350	0.14	0.6	3.5	5.0		ECA1VM221()	200	1000
	330	10.0	12.5	440	0.14	0.6	5.0	5.0		ECA1VM331()	200	500
	470	10.0	16.0	550	0.14	0.6	5.0	5.0		ECA1VM471()	200	500
	1000	12.5	20.0	900	0.14	0.6	5.0	5.0		ECA1VM102()	200	500
	2200	16.0	25.0	1250	0.16	0.8	7.5	7.5		ECA1VM222()	100	250
	3300	16.0	31.5	1400	0.18	0.8	7.5			ECA1VM332	100	
50	4700	18.0	35.5	1600	0.20	0.8	7.5			ECA1VM472	50	
	2.2	5.0	11.0	20	0.12	0.5	2.0	5.0	2.5	ECA1HM2R2()	200	2000
	3.3	5.0	11.0	35	0.12	0.5	2.0	5.0	2.5	ECA1HM3R3()	200	2000
	4.7	5.0	11.0	45	0.12	0.5	2.0	5.0	2.5	ECA1HM4R7()	200	2000
	10	5.0	11.0	65	0.12	0.5	2.0	5.0	2.5	ECA1HM100()	200	2000
	22	5.0	11.0	100	0.12	0.5	2.0	5.0	2.5	ECA1HM220()	200	2000
	33	5.0	11.0	110	0.12	0.5	2.0	5.0	2.5	ECA1HM330()	200	2000
	47	6.3	11.2	130	0.12	0.5	2.5	5.0	2.5	ECA1HM470()	200	2000
	100	8.0	11.5	250	0.12	0.6	3.5	5.0		ECA1HM101()	200	1000
	220	10.0	12.5	400	0.12	0.6	5.0	5.0		ECA1HM221()	200	500
	330	10.0	16.0	500	0.12	0.6	5.0	5.0		ECA1HM331()	200	500
	470	10.0	20.0	650	0.12	0.6	5.0	5.0		ECA1HM471()	200	500
	1000	12.5	25.0	1050	0.12	0.6	5.0	5.0		ECA1HM102()	200	500
2200	16.0	31.5	1300	0.14	0.8	7.5			ECA1HM222	100		
3300	18.0	35.5	1500	0.16	0.8	7.5			ECA1HM332	50		
63	10	5.0	11.0	70	0.11	0.5	2.0	5.0	2.5	ECA1JM100()	200	2000
	22	5.0	11.0	105	0.11	0.5	2.0	5.0	2.5	ECA1JM220()	200	2000
	33	6.3	11.2	130	0.11	0.5	2.5	5.0	2.5	ECA1JM330()	200	2000
	47	6.3	11.2	160	0.11	0.5	2.5	5.0	2.5	ECA1JM470()	200	2000
	100	8.0	11.5	270	0.11	0.6	3.5	5.0		ECA1JM101()	200	1000
	220	10.0	16.0	450	0.11	0.6	5.0	5.0		ECA1JM221()	200	500
	330	10.0	20.0	550	0.11	0.6	5.0	5.0		ECA1JM331()	200	500
	470	12.5	20.0	750	0.11	0.6	5.0	5.0		ECA1JM471()	200	500
	1000	16.0	25.0	1100	0.11	0.8	7.5	7.5		ECA1JM102()	100	250
2200	18.0	35.5	1400	0.13	0.8	7.5			ECA1JM222	50		

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()". Lead wire pitch

*B=5 mm, 7.5 mm, i=2.5 mm

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

Characteristics list

Endurance : 85 °C 2000 h

Rated vol. (V.DC)	Cap. (±20 %) (μF)	Case size(mm)		Specification		Lead length(mm)			Part No.	Min. Packaging Qty		
		φD	L	Ripple current *1 (mA r.m.s)	tan δ *2	Lead dia. (φd)	Lead space			Straight leads (pcs)	Taping (pcs)	
							Straight	Taping *B				Taping *i
100	2.2	5.0	11.0	30	0.10	0.5	2.0	5.0	2.5	ECA2AM2R2()	200	2000
	3.3	5.0	11.0	40	0.10	0.5	2.0	5.0	2.5	ECA2AM3R3()	200	2000
	4.7	5.0	11.0	50	0.10	0.5	2.0	5.0	2.5	ECA2AM4R7()	200	2000
	10	5.0	11.0	70	0.10	0.5	2.0	5.0	2.5	ECA2AM100()	200	2000
	22	6.3	11.2	115	0.10	0.5	2.5	5.0	2.5	ECA2AM220()	200	2000
	33	8.0	11.5	145	0.10	0.6	3.5	5.0		ECA2AM330()	200	1000
	47	8.0	11.5	180	0.10	0.6	3.5	5.0		ECA2AM470()	200	1000
	100	10.0	16.0	350	0.10	0.6	5.0	5.0		ECA2AM101()	200	500
	220	12.5	20.0	550	0.10	0.6	5.0	5.0		ECA2AM221()	200	500
	330	12.5	25.0	700	0.10	0.6	5.0	5.0		ECA2AM331()	200	500
	470	16.0	25.0	900	0.10	0.8	7.5	7.5		ECA2AM471()	100	250
1000	18.0	35.5	1300	0.10	0.8	7.5			ECA2AM102	50		
160	2.2	6.3	11.2	53	0.16	0.5	2.5	5.0	2.5	ECA2CM2R2()	200	2000
	3.3	6.3	11.2	66	0.16	0.5	2.5	5.0	2.5	ECA2CM3R3()	200	2000
	4.7	6.3	11.2	78	0.16	0.5	2.5	5.0	2.5	ECA2CM4R7()	200	2000
	10	10.0	12.5	105	0.16	0.6	5.0	5.0		ECA2CM100()	200	500
	22	10.0	16.0	175	0.16	0.6	5.0	5.0		ECA2CM220()	200	500
	33	10.0	20.0	235	0.16	0.6	5.0	5.0		ECA2CM330()	200	500
	47	12.5	20.0	320	0.16	0.6	5.0	5.0		ECA2CM470()	200	500
	100	12.5	25.0	515	0.16	0.6	5.0	5.0		ECA2CM101()	200	500
	220	16.0	31.5	830	0.16	0.8	7.5			ECA2CM221	100	
	330	18.0	31.5	1090	0.16	0.8	7.5			ECA2CM331	50	
470	18.0	40.0	1440	0.16	0.8	7.5			ECA2CM471	50		
200	2.2	6.3	11.2	50	0.18	0.5	2.5	5.0	2.5	ECA2DM2R2()	200	2000
	3.3	6.3	11.2	62	0.18	0.5	2.5	5.0	2.5	ECA2DM3R3()	200	2000
	4.7	8.0	11.5	86	0.18	0.6	3.5	5.0		ECA2DM4R7()	200	1000
	10	10.0	12.5	100	0.18	0.6	5.0	5.0		ECA2DM100()	200	500
	22	10.0	20.0	180	0.18	0.6	5.0	5.0		ECA2DM220()	200	500
	33	10.0	20.0	220	0.18	0.6	5.0	5.0		ECA2DM330()	200	500
	47	12.5	20.0	300	0.18	0.6	5.0	5.0		ECA2DM470()	200	500
	100	16.0	25.0	475	0.18	0.8	7.5	7.5		ECA2DM101()	100	250
	220	18.0	31.5	835	0.18	0.8	7.5			ECA2DM221	50	
	330	18.0	40.0	1140	0.18	0.8	7.5			ECA2DM331	50	

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()". Lead wire pitch

*B=5 mm, 7.5 mm, i=2.5 mm

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

Characteristics list

Endurance : 85 °C 2000 h

Rated vol. (V.DC)	Cap. (±20 %) (μF)	Case size(mm)		Specification		Lead length(mm)			Part No.	Min. Packaging Q'ty		
		φD	L	Ripple current *1 (mA r.m.s)	tan δ *2	Lead dia. (φd)	Lead space			Straight leads (pcs)	Taping (pcs)	
							Straight	Taping *B				Taping *i
250	2.2	6.3	11.2	50	0.18	0.5	2.5	5.0	2.5	ECA2EM2R2()	200	2000
	3.3	8.0	11.5	72	0.18	0.6	3.5	5.0		ECA2EM3R3()	200	1000
	4.7	8.0	11.5	86	0.18	0.6	3.5	5.0		ECA2EM4R7()	200	1000
	10	10.0	16.0	110	0.18	0.6	5.0	5.0		ECA2EM100()	200	500
	22	10.0	20.0	180	0.18	0.6	5.0	5.0		ECA2EM220()	200	500
	33	12.5	20.0	250	0.18	0.6	5.0	5.0		ECA2EM330()	200	500
	47	12.5	25.0	330	0.18	0.6	5.0	5.0		ECA2EM470()	200	500
	100	16.0	31.5	530	0.18	0.8	7.5			ECA2EM101	100	
350	2.2	8.0	11.5	55	0.20	0.6	3.5	5.0		ECA2VM2R2()	200	1000
	3.3	8.0	11.5	60	0.20	0.6	3.5	5.0		ECA2VM3R3()	200	1000
	4.7	10.0	12.5	65	0.20	0.6	5.0	5.0		ECA2VM4R7()	200	500
	10	10.0	20.0	115	0.20	0.6	5.0	5.0		ECA2VM100()	200	500
	22	12.5	20.0	195	0.20	0.6	5.0	5.0		ECA2VM220()	200	500
	33	16.0	25.0	300	0.20	0.8	7.5	7.5		ECA2VM330()	100	250
	47	16.0	25.0	325	0.20	0.8	7.5	7.5		ECA2VM470()	100	250
	100	18.0	31.5	535	0.20	0.8	7.5			ECA2VM101	50	
400	2.2	8.0	11.5	50	0.20	0.6	3.5	5.0		ECA2GM2R2()	200	1000
	3.3	10.0	12.5	54	0.20	0.6	5.0	5.0		ECA2GM3R3()	200	500
	4.7	10.0	16.0	72	0.20	0.6	5.0	5.0		ECA2GM4R7()	200	500
	10	10.0	20.0	115	0.20	0.6	5.0	5.0		ECA2GM100()	200	500
	22	12.5	25.0	215	0.20	0.6	5.0	5.0		ECA2GM220()	200	500
	33	16.0	25.0	275	0.20	0.8	7.5	7.5		ECA2GM330()	100	250
	47	16.0	31.5	350	0.20	0.8	7.5			ECA2GM470	100	
	100	18.0	40.0	600	0.20	0.8	7.5			ECA2GM101	50	
450	2.2	10.0	12.5	44	0.20	0.6	5.0	5.0		ECA2WM2R2()	200	500
	3.3	10.0	16.0	60	0.20	0.6	5.0	5.0		ECA2WM3R3()	200	500
	4.7	10.0	20.0	79	0.20	0.6	5.0	5.0		ECA2WM4R7()	200	500
	10	12.5	20.0	130	0.20	0.6	5.0	5.0		ECA2WM100()	200	500
	22	16.0	25.0	210	0.20	0.8	7.5	7.5		ECA2WM220()	100	250
	33	16.0	31.5	285	0.20	0.8	7.5			ECA2WM330	100	

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()". Lead wire pitch

*B=5 mm, 7.5 mm, i=2.5 mm

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

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.

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- ⊖ [View ECA-1EM101](#) on WIN SOURCE
- ⊖ [Panasonic](#) Information

Optimize Your Supply Chain with WIN SOURCE Solutions

- ✓ Global Sourcing Solution
- ✓ Obsolete Management
- ✓ Cost Control Management
- ✓ Shortage Management
- ✓ Alternative Solution
- ✓ Excess Inventory Management