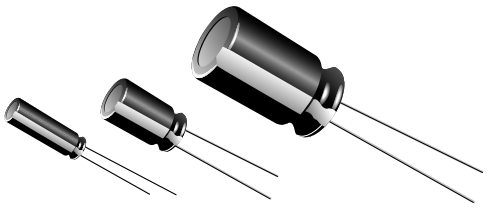
Aluminum Electrolytic Capacitors (Radial Lead Type)

Series: M
Type: A (Radial Leads)
Style: 04/JIS C 5141

IECQ Certified

STANDARD



■ Features

- Lifetime: 85°C 2000 h
- Smaller than series SU
- IEC pub. 384-4 approved

■ Recommended Applications

- Audio visual (television, video, audio),office, home appliances

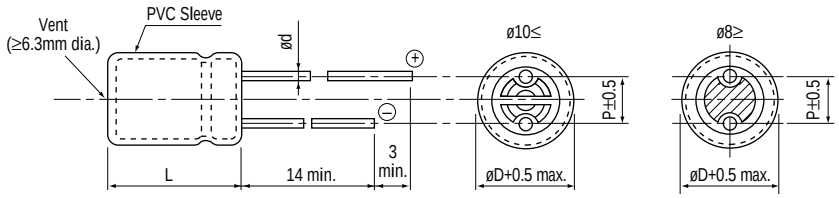
■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11
E	C	A			M					
Product Code			Rated Working Voltage Code		Series Code	N. Capacitance Code			Option	

■ Specifications

Operating temperature range	–40 to +85°C									–25 to +85°C					
Rated working voltage	6.3 to 100 V DC									160 to 450 V DC					
Nominal capacitance range	0.1 to 22000 μF									1.0 to 470 μF					
Capacitance tolerance	±20% (120 Hz/+20°C)														
DC leakage current	I ≤ 0.03 CV or 4 (μA) after 1 minute I ≤ 0.01 CV or 3 (μA) after 2 minutes (Whichever is greater)									I ≤ 0.06 CV + 10 (μA) after 2 minutes					
tan δ	(120 Hz/+20°C)														
	W.V. (V)	**6.3**	**10**	**16**	**25**	**35**	**50**	**63**	**100**	**160**	**200**	**250**	**350**	**400**	**450**
	tan δ	0.28	0.24	0.20	0.16	0.14	0.12	0.11	0.10	0.16	0.18	0.18	0.20	0.20	0.20
	Add 0.02 per 1,000 μF for products of 1,000 μF or more.														
Characteristics at low temperature	Impedance ratio at 120 Hz														
	W.V. (V)	**6.3**	**10**	**16**	**25**	**35**	**50**	**63**	**100**	**160**	**200**	**250**	**350**	**400**	**450**
	Z (–25°C) / Z (+20°C)	5	4	3	2	2	2	2	2	2	2	3	5	6	6
	Z (–40°C) / Z (+20°C)	12	10	8	5	4	3	3	3	—	—	—	—	—	—
	(1) Add 0.5 per 1,000 μF for products of 1,000 μF or more at –25°C (2) Add 1.0 per 1,000 μF for products of 1,000 μF or more at –40°C														
Endurance	After applying working voltage for 2,000 hours at +85°C and then being stabilized at +20°C, capacitor shall meet the following limits.														
	Capacitance change	±20% of initial measured value (ø3.5 ±25%)													
	tan δ	≤ 150% of initial specified value													
	DC leakage current	≤ initial specified value													
Shelf life	After storage for 1,000 hours at +85°C with no voltage applied then being stabilized at +20°C, capacitor shall meet the limits specified in “Endurance.”														

■ Dimensions in mm (not to scale)



L ≤ 16: L + 1.0 max.
L ≥ 20: L + 2.0 max.

Body Dia. øD	5	6.3	8	10	12.5	16	18
Lead Dia. ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8
Lead Space P	2.0	2.5	3.5	5.0	5.0	7.5	7.5

■ Case Size/Ripple Current

øDxL (mm)/mA) rms (120 Hz/+85°C)

	Working Voltage																	
Cap. (µF)	6.3 (0J)		10 (1A)		16 (1C)		25 (1E)		35 (1V)		50 (1H)		63 (1J)		100 (2A)			
0.1(OR1)											5 x11	1.3						
0.22(R22)											5 x11	2.9						
0.33(R33)											5 x11	4.4						
0.47(R47)											5 x11	5			5 x11	10		
1.0 (010)											5 x11	10			5 x11	20		
2.2 (2R2)											5 x11	20			5 x11	30		
3.3 (3R3)											5 x11	35			5 x11	40		
4.7 (4R7)											5 x11	45			5 x11	50		
10 (100)					5 x11	30					5 x11	65	5 x11	70	*5 x11	70		
22 (220)					5 x11	75					5 x11	100	*5 x11	105	*6.3x11.2	115		
33 (330)					5 x11	110					*5 x11	110	6.3x11.2	130	*8 x11.5	145		
47 (470)					5 x11	130			*5 x11	130	6.3x11.2	130	*6.3x11.2	160	*8 x11.5	180		
100 (101)					*5 x11	180	6.3x11.2	180	*6.3x11.2	210	8 x11.5	250	*8 x11.5	270	10 x16	350		
220 (221)	*5 x11	24			*6.3x11.2	280			*8 x11.5	350	10 x12.5	400	10x16	450	*12.5x20	550		
330 (331)			*6.3x11.2	330			8 x11.5	390	10 x12.5	440	10 x16	500	10 x20	550	*12.5x25	700		
470 (471)	*6.3x11.2	380			*8 x11.5	440	10 x12.5	480	10 x16	550	10 x20	650	12.5x20	750	16 x25	900		
1000 (102)	*8 x11.5	580	10 x12.5	630	10 x16	680	10 x20	850	1.5x20	900	*12.5x25	1050	16 x25	1100	18 x35.5	1300		
2200 (222)	10 x16	890	10 x20	920	12.5x20	1000	*12.5x25	1200	16 x25	1250	16 x31.5	1300	18 x35.5	1400				
3300 (332)	10 x20	1020	12.5x20	1090	*12.5x25	1200	16 x25	1300	16 x31.5	1400	18 x35.5	1500						
4700 (472)	*12.5x20	1170	*12.5x25	1200	16 x25	1360	16 x31.5	1500	18 x35.5	1600								
6800 (682)	*12.5x25	1270	16 x25	1400	16 x31.5	1600	18 x35.5	1750										
10000 (103)	16 x25	1450	16 x31.5	1600	18 x35.5	1800												
15000 (153)	16 x31.5	1700	18 x35.5	1850											Case size		Ripple current	
22000 (223)	18 x35.5	1900																

	Working Voltage																	
Cap. (µF)	160 (2C)			200 (2D)			250 (2E)			350 (2V)			400 (2G)			450 (2W)		
1.0	6.3	x11.2	36	6.3	x11.2	34	6.3	x11.2	34	6.3	x11.2	32	*6.3	x11.2	32	*8	x11.5	37
2.2	6.3	x11.2	53	6.3	x11.2	50	*6.3	x11.2	50	*8	x11.5	55	*8	x11.5	50	10	x12.5	44
3.3	6.3	x11.2	66	*6.3	x11.2	62	*8	x11.5	72	*8	x11.5	60	10	x12.5	54	10	x16	60
4.7	*6.3	x11.2	78	*8	x11.5	86	*8	x11.5	86	10	x12.5	65	10	x16	72	10	x20	79
10	10	x12.5	105	10	x12.5	100	10	x16	110	10	x20	115	10	x20	115	12.5	x20	130
22	10	x16	175	10	x20	180	10	x20	180	12.5	x20	195	*12.5	x25	215	16	x25	210
33	10	x20	235	10	x20	220	12.5	x20	250	16	x25	300	16	x25	275	16	x31.5	285
47	12.5	x20	320	12.5	x20	300	*12.5	x25	330	16	x25	325	16	x31.5	350			
100	*12.5	x25	515	16	x25	475	16	x31.5	530	18	x31.5	535	18	x40	600			
220	16	x35.1	830	18	x31.5	835	18	x40	930									
330	18	x31.5	1090	18	x40	1140										Case size		Ripple current
470	18	x40	1440															

( ) shows W.V. and capacitance code

* Lead spacing is narrower than series SU because of miniaturization.