

Aluminum Electrolytic Capacitors
(Radial Lead Type)

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

Standard

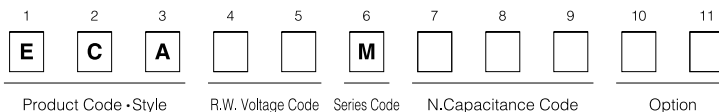


- Features
- Lifetime: 85 °C 2000 h
 - Smaller than series SU.
- Recommended Applications
- AV (TV, Video, Audio), Office, Home appliance

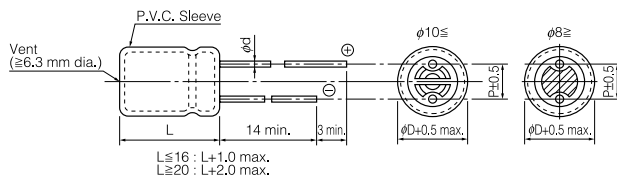
■ Specifications

Operating Temp. Range	-40 to +85 °C										-25 to +85 °C																																																	
Rated W.V. Range	6.3 to 100 V. DC										160 to 450 V. DC																																																	
Nominal Cap. 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 minutes I ≤ 0.01 CV or 3 (µA) after 2 minutes (Whichever, greater)										I ≤ 0.06 CV+10 (µA) after 2 minutes																																																	
Dissipation Factor	<table><tr><td>W.V. (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr><tr><td>D.F.</td><td>0.28</td><td>0.24</td><td>0.20</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.11</td><td>0.10</td><td>0.16</td><td>0.18</td><td>0.18</td><td>0.20</td><td>0.20</td><td>0.20</td></tr></table> (max.) Add 0.02 per 1000 µF for products of 1000 µF or more. (120 Hz/+20 °C)															W.V. (V)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	D.F.	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															
W.V. (V)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450																																														
D.F.	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																																														
Characteristics at Low Temperature	<table><tr><td>W.V. (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr><tr><td>Z (-25 °C)/ Z (+20 °C)</td><td>5</td><td>4</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>3</td><td>5</td><td>6</td><td>6</td></tr><tr><td>Z (-40 °C)/ Z (+20 °C)</td><td>12</td><td>10</td><td>8</td><td>5</td><td>4</td><td>3</td><td>3</td><td>3</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr></table> 1 Add 0.5 per 1000 µF for products of 1000 µF or more at -25 °C. 2 Add 1.0 per 1000 µF for products of 1000 µF or more at -40 °C. (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	-	-	-	-	-	-
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	-	-	-	-	-	-																																														
Endurance	After applying rated working voltage for 2000 hours at +85 °C and then being stabilized at +20 °C, capacitor shall meet the following limits <table><tr><td>Capacitance change</td><td>±20 % of initial measured value</td></tr><tr><td>D.F.</td><td>≤ 150 % of initial specified value</td></tr><tr><td>DC leakage current</td><td>≤ Initial specified value</td></tr></table>															Capacitance change	±20 % of initial measured value	D.F.	≤ 150 % of initial specified value	DC leakage current	≤ Initial specified value																																							
Capacitance change	±20 % of initial measured value																																																											
D.F.	≤ 150 % of initial specified value																																																											
DC leakage current	≤ Initial specified value																																																											
Shelf Life	After storage for 1000 hours at +85 °C with no voltage applied and then being stabilized at +20 °C, capacitor shall meet the limits specified in "Endurance".																																																											

■ Explanation of Part Numbers



■ Dimensions in mm (not to scale)



Body Dia. ϕD	5	6.3	8	10	12.5	16	18
Lead Dia. ϕd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
Lead space P	2	2.5	3.5	5	5	7.5	7.5

■ Case size/Ripple current

 $\phi D \times L$ (mm)/(mA) r.m.s. (120 Hz/+85 °C)[illegible]

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

() shows W.V. and capacitance code.

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

■ Standard Products

W.V.	Cap. (±20%)	Case size		Specification		Lead Length				Part No.	Min. Packaging Qty	
		Dia.	Length	Ripple current (120Hz +85°C) (mA)	D.F.	Lead Dia.	Lead Space				Straight Leads	Taping
							Straight	Taping *B	Taping *I			
(V)	(μF)	(mm)	(mm)	(mA)		(mm)	(mm)	(mm)	(mm)		(pcs)	(pcs)
6.3	220	5	11	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	11.5	580	0.28	0.6	3.5	5.0		ECA0JM102()	200	1000
	2200	10	16	890	0.30	0.6	5.0	5.0		ECA0JM222()	200	500
	3300	10	20	1020	0.32	0.6	5.0	5.0		ECA0JM332()	200	500
	4700	12.5	20	1170	0.34	0.6	5.0	5.0		ECA0JM472()	200	500
	6800	12.5	25	1270	0.38	0.6	5.0	5.0		ECA0JM682()	200	500
	10000	16	25	1450	0.46	0.8	7.5	7.5		ECA0JM103()	100	250
	15000	16	31.5	1700	0.56	0.8	7.5			ECA0JM153	100	
	22000	18	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	12.5	630	0.24	0.6	5.0	5.0		ECA1AM102()	200	500
	2200	10	20	920	0.26	0.6	5.0	5.0		ECA1AM222()	200	500
	3300	12.5	20	1090	0.28	0.6	5.0	5.0		ECA1AM332()	200	500
	4700	12.5	25	1200	0.30	0.6	5.0	5.0		ECA1AM472()	200	500
	6800	16	25	1400	0.34	0.8	7.5	7.5		ECA1AM682()	100	250
	10000	16	31.5	1600	0.42	0.8	7.5			ECA1AM103	100	
	15000	18	35.5	1850	0.52	0.8	7.5			ECA1AM153	50	
16	10	5	11	30	0.20	0.5	2.0	5.0	2.5	ECA1CM100()	200	2000
	22	5	11	75	0.20	0.5	2.0	5.0	2.5	ECA1CM220()	200	2000
	33	5	11	110	0.20	0.5	2.0	5.0	2.5	ECA1CM330()	200	2000
	47	5	11	130	0.20	0.5	2.0	5.0	2.5	ECA1CM470()	200	2000
	100	5	11	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	11.5	440	0.20	0.6	3.5	5.0		ECA1CM471()	200	1000
	1000	10	16	680	0.20	0.6	5.0	5.0		ECA1CM102()	200	500
	2200	12.5	20	1000	0.22	0.6	5.0	5.0		ECA1CM222()	200	500
	3300	12.5	25	1200	0.24	0.6	5.0	5.0		ECA1CM332()	200	500
	4700	16	25	1360	0.26	0.8	7.5	7.5		ECA1CM472()	100	250
	6800	16	31.5	1600	0.30	0.8	7.5			ECA1CM682	100	
10000	18	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	11.5	390	0.16	0.6	3.5	5.0		ECA1EM331()	200	1000
	470	10	12.5	480	0.16	0.6	5.0	5.0		ECA1EM471()	200	500
	1000	10	20	850	0.16	0.6	5.0	5.0		ECA1EM102()	200	500
	2200	12.5	25	1200	0.18	0.6	5.0	5.0		ECA1EM222()	200	500
	3300	16	25	1300	0.20	0.8	7.5	7.5		ECA1EM332()	100	250
	4700	16	31.5	1500	0.22	0.8	7.5			ECA1EM472	100	
	6800	18	35.5	1750	0.26	0.8	7.5			ECA1EM682	50	
35	47	5	11	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	11.5	350	0.14	0.6	3.5	5.0		ECA1VM221()	200	1000

When requesting taped product, please put the letter "B" or "I" between the "()". Lead wire pitch B=5mm, 7.5mm, I=2.5mm.

The taping dimensions are explained on p.25 of our Catalog. Please use it as a reference guide.

High temperature Load Life test : 85°C 2000h

■ Standard Products

W.V.	Cap. (±20%)	Case size		Specification		Lead Length				Part No.	Min. Packaging Qty	
		Dia.	Length	Ripple current (120Hz) (+85°C)	D.F.	Lead Dia.	Lead Space				Straight Leads	Taping
							Straight	Taping *B	Taping *i			
(V)	(μF)	(mm)	(mm)	(mA)		(mm)	(mm)	(mm)			(pcs)	(pcs)
35	330	10	12.5	440	0.14	0.6	5.0	5.0		ECA1VM331()	200	500
	470	10	16	550	0.14	0.6	5.0	5.0		ECA1VM471()	200	500
	1000	12.5	20	900	0.14	0.6	5.0	5.0		ECA1VM102()	200	500
	2200	16	25	1250	0.16	0.8	7.5	7.5		ECA1VM222()	100	250
	3300	16	31.5	1400	0.18	0.8	7.5			ECA1VM332	100	
	4700	18	35.5	1600	0.20	0.8	7.5			ECA1VM472	50	
50	0.10	5	11	1.3	0.12	0.5	2.0	5.0	2.5	ECA1HM0R1()	200	2000
	0.22	5	11	2.9	0.12	0.5	2.0	5.0	2.5	ECA1HMR22()	200	2000
	0.33	5	11	4.4	0.12	0.5	2.0	5.0	2.5	ECA1HMR33()	200	2000
	0.47	5	11	5	0.12	0.5	2.0	5.0	2.5	ECA1HMR47()	200	2000
	1	5	11	10	0.12	0.5	2.0	5.0	2.5	ECA1HM010()	200	2000
	2.2	5	11	20	0.12	0.5	2.0	5.0	2.5	ECA1HM2R2()	200	2000
	3.3	5	11	35	0.12	0.5	2.0	5.0	2.5	ECA1HM3R3()	200	2000
	4.7	5	11	45	0.12	0.5	2.0	5.0	2.5	ECA1HM4R7()	200	2000
	10	5	11	65	0.12	0.5	2.0	5.0	2.5	ECA1HM100()	200	2000
	22	5	11	100	0.12	0.5	2.0	5.0	2.5	ECA1HM220()	200	2000
	33	5	11	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	11.5	250	0.12	0.6	3.5	5.0		ECA1HM101()	200	1000
	220	10	12.5	400	0.12	0.6	5.0	5.0		ECA1HM221()	200	500
	330	10	16	500	0.12	0.6	5.0	5.0		ECA1HM331()	200	500
	470	10	20	650	0.12	0.6	5.0	5.0		ECA1HM471()	200	500
	1000	12.5	25	1050	0.12	0.6	5.0	5.0		ECA1HM102()	200	500
	2200	16	31.5	1250	0.14	0.8	7.5			ECA1HM222	100	
	3300	18	35.5	1300	0.16	0.8	7.5			ECA1HM332	50	
63	10	5	11	70	0.11	0.5	2.0	5.0	2.5	ECA1JM100()	200	2000
	22	5	11	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	11.5	270	0.11	0.6	3.5	5.0		ECA1JM101()	200	1000
	220	10	16	450	0.11	0.6	5.0	5.0		ECA1JM221()	200	500
	330	10	20	550	0.11	0.6	5.0	5.0		ECA1JM331()	200	500
	470	12.5	20	750	0.11	0.6	5.0	5.0		ECA1JM471()	200	500
	1000	16	25	1100	0.11	0.8	7.5	7.5		ECA1JM102()	100	250
	2200	18	35.5	1400	0.13	0.8	7.5			ECA1JM222	50	
100	0.47	5	11	10	0.10	0.5	2.0	5.0	2.5	ECA2AMR47()	200	2000
	1.0	5	11	20	0.10	0.5	2.0	5.0	2.5	ECA2AM010()	200	2000
	2.2	5	11	30	0.10	0.5	2.0	5.0	2.5	ECA2AM2R2()	200	2000
	3.3	5	11	40	0.10	0.5	2.0	5.0	2.5	ECA2AM3R3()	200	2000
	4.7	5	11	50	0.10	0.5	2.0	5.0	2.5	ECA2AM4R7()	200	2000
	10	5	11	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

When requesting taped product, please put the letter "B" or "i" between the "()". Lead wire pitch B=5mm, 7.5mm, i=2.5mm.

The taping dimensions are explained on p of our Catalog. Please use it as a reference guide.

High temperature Load Life test : 85°C 2000h

■ Standard Products

W.V.	Cap. (±20%)	Case size		Specification		Lead Length				Part No.	Min. Packaging Qty	
		Dia.	Length	Ripple current (120Hz {+85°C) (mA)	D.F.	Lead Dia.	Lead Space				Straight Leads	Taping
							Straight	Taping *B	Taping *I			
(V)	(μF)	(mm)	(mm)	(mA)		(mm)	(mm)	(mm)	(mm)		(pcs)	(pcs)
100	33	8	11.5	145	0.10	0.6	3.5	5.0		ECA2AM330()	200	1000
	47	8	11.5	180	0.10	0.6	3.5	5.0		ECA2AM470()	200	1000
	100	10	16	350	0.10	0.6	5.0	5.0		ECA2AM101()	200	500
	220	12.5	20	550	0.10	0.6	5.0	5.0		ECA2AM221()	200	500
	330	12.5	25	700	0.10	0.6	5.0	5.0		ECA2AM331()	200	500
	470	16	25	900	0.10	0.8	7.5	7.5		ECA2AM471()	100	250
	1000	18	35.5	1300	0.10	0.8	7.5			ECA2AM102	50	
160	1	6.3	11.2	36	0.16	0.5	2.5	5.0	2.5	ECA2CM010()	200	2000
	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	12.5	105	0.16	0.6	5.0	5.0		ECA2CM100()	200	500
	22	10	16	175	0.16	0.6	5.0	5.0		ECA2CM220()	200	500
	33	10	20	235	0.16	0.6	5.0	5.0		ECA2CM330()	200	500
	47	12.5	20	320	0.16	0.6	5.0	5.0		ECA2CM470()	200	500
	100	12.5	25	515	0.16	0.6	5.0	5.0		ECA2CM101()	200	500
	220	16	31.5	830	0.16	0.8	7.5			ECA2CM221	100	
	330	18	31.5	1090	0.16	0.8	7.5			ECA2CM331	50	
	470	18	40	1440	0.16	0.8	7.5			ECA2CM471	50	
200	1	6.3	11.2	34	0.18	0.5	2.5	5.0	2.5	ECA2DM010()	200	2000
	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	11.5	86	0.18	0.6	3.5	5.0		ECA2DM4R7()	200	1000
	10	10	12.5	100	0.18	0.6	5.0	5.0		ECA2DM100()	200	500
	22	10	20	180	0.18	0.6	5.0	5.0		ECA2DM220()	200	500
	33	10	20	220	0.18	0.6	5.0	5.0		ECA2DM330()	200	500
	47	12.5	20	300	0.18	0.6	5.0	5.0		ECA2DM470()	200	500
	100	16	25	475	0.18	0.8	7.5	7.5		ECA2DM101()	100	250
	220	18	31.5	835	0.18	0.8	7.5			ECA2DM221	50	
	330	18	40	1140	0.18	0.8	7.5			ECA2DM331	50	
250	1	6.3	11.2	34	0.18	0.5	2.5	5.0	2.5	ECA2EM010()	200	2000
	2.2	6.3	11.2	50	0.18	0.5	2.5	5.0	2.5	ECA2EM2R2()	200	2000
	3.3	8	11.5	72	0.18	0.6	3.5	5.0		ECA2EM3R3()	200	1000
	4.7	8	11.5	86	0.18	0.6	3.5	5.0		ECA2EM4R7()	200	1000
	10	10	16	110	0.18	0.6	5.0	5.0		ECA2EM100()	200	500
	22	10	20	180	0.18	0.6	5.0	5.0		ECA2EM220()	200	500
	33	12.5	20	250	0.18	0.6	5.0	5.0		ECA2EM330()	200	500
	47	12.5	25	330	0.18	0.6	5.0	5.0		ECA2EM470()	200	500
	100	16	31.5	530	0.18	0.8	7.5			ECA2EM101	100	
	220	18	40	930	0.18	0.8	7.5			ECA2EM221	50	
350	1	6.3	11.2	32	0.20	0.5	2.5	5.0	2.5	ECA2VM010()	200	2000
	2.2	8	11.5	55	0.20	0.6	3.5	5.0		ECA2VM2R2()	200	1000

When requesting taped product, please put the letter "B" or "I" between the "()". Lead wire pitch B=5mm, 7.5mm, I=2.5mm.

The taping dimensions are explained on p of our Catalog. Please use it as a reference guide.

High temperature Load Life test : 85°C 2000h

■ Standard Products

W.V.	Cap. (±20%)	Case size		Specification		Lead Length				Part No.	Min. Packaging Qty	
		Dia.	Length	Ripple current (120Hz +85°C) (mA)	D.F.	Lead Dia.	Lead Space				Straight Leads	Taping
							Straight	Taping *B	Taping *i			
(V)	(μF)	(mm)	(mm)	(mA)		(mm)	(mm)	(mm)	(mm)		(pcs)	(pcs)
350	3.3	8	11.5	60	0.20	0.6	3.5	5.0		ECA2VM3R3()	200	1000
	4.7	10	12.5	65	0.20	0.6	5.0	5.0		ECA2VM4R7()	200	500
	10	10	20	115	0.20	0.6	5.0	5.0		ECA2VM100()	200	500
	22	12.5	20	195	0.20	0.6	5.0	5.0		ECA2VM220()	200	500
	33	16	25	300	0.20	0.8	7.5	7.5		ECA2VM330()	100	250
	47	16	25	325	0.20	0.8	7.5	7.5		ECA2VM470()	100	250
	100	18	31.5	535	0.20	0.8	7.5			ECA2VM101	50	
400	1	6.3	11.2	32	0.20	0.5	2.5	5.0	2.5	ECA2GM010()	200	2000
	2.2	8.0	11.5	50	0.20	0.6	3.5	5.0		ECA2GM2R2()	200	1000
	3.3	10	12.5	54	0.20	0.6	5.0	5.0		ECA2GM3R3()	200	500
	4.7	10	16	72	0.20	0.6	5.0	5.0		ECA2GM4R7()	200	500
	10	10	20	115	0.20	0.6	5.0	5.0		ECA2GM100()	200	500
	22	12.5	25	215	0.20	0.6	5.0	5.0		ECA2GM220()	200	500
	33	16	25	275	0.20	0.8	7.5	7.5		ECA2GM330()	100	250
	47	16	31.5	350	0.20	0.8	7.5			ECA2GM470	100	
100	18	40	600	0.20	0.8	7.5			ECA2GM101	50		
450	1	8	11.5	37	0.20	0.6	3.5	5.0		ECA2WM010()	200	1000
	2.2	10	12.5	44	0.20	0.6	5.0	5.0		ECA2WM2R2()	200	500
	3.3	10	16.0	60	0.20	0.6	5.0	5.0		ECA2WM3R3()	200	500
	4.7	10	20	79	0.20	0.6	5.0	5.0		ECA2WM4R7()	200	500
	10	12.5	20	130	0.20	0.6	5.0	5.0		ECA2WM100()	200	500
	22	16	25	210	0.20	0.8	7.5	7.5		ECA2WM220()	100	250
33	16	31.5	285	0.20	0.8	7.5			ECA2WM330	100		

When requesting taped product, please put the letter "B" or "i" between the "()". Lead wire pitch B=5mm, 7.5mm, i=2.5mm.

The taping dimensions are explained on p. of our Catalog. Please use it as a reference guide.

High temperature Load Life test : 85°C 2000h

*not same as SMO page.