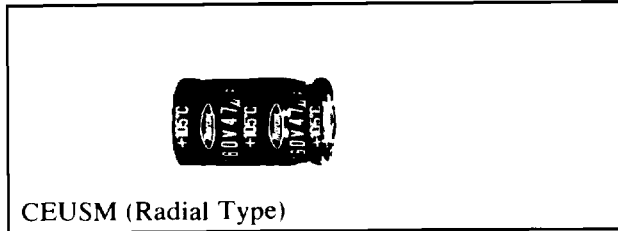


## CEUSM SERIES

MINIATURE FOR + 105°C



CEUSM (Radial Type)

### • FEATURES

1. For general use.
2. 105°C, 1000 hours guaranteed.
3. Washable with Freon TE, TES, TMS for 5 minutes for rated voltage  $\leq 250\text{VDC}$

### • GENERAL SPECIFICATIONS

**Operating temperature range**  $-40^\circ\text{C} \sim +105^\circ\text{C}$ , 6.3V ~ 250VDC (315 ~ 450VDC;  $-25 \sim +105^\circ\text{C}$ )

**Capacitance tolerance** Standard Tolerance;  $\pm 20\%$  (120 Hz, Initial),  $+30\%$ ,  $-10\%$  is also available.

**Leakage current (at 20°C)** After 2 minutes, the maximum leakage current shall not exceed the value from:  $I = 0.01CV + 3(\mu\text{A}) (\leq 250\text{VDC})$ ,  $I = 0.02CV + 30(\mu\text{A}) (315 \sim 450\text{VDC})$  where I: Leakage current ( $\mu\text{A}$ ) C: Nominal capacitance ( $\mu\text{F}$ ) V: Rated DC voltage (VDC)

**Maximum tangent of loss angle (120 Hz, 20°C, Initial)**

CAP \ R.V.	6.3	10	16	25	35	50-80	100	160-250	315~450
1000 $\mu\text{F}$ or less	0.24	0.20	0.17	0.15	0.12	0.10	0.08	0.12	0.20
More than 1000 $\mu\text{F}$	Add .02 to above value for every 1000 $\mu\text{F}$ or less.								

**Low temperature characteristics (Initial)**

The maximum ratio of impedance between  $+20^\circ\text{C}$  and  $-25^\circ\text{C}$ , and  $-40^\circ\text{C}$ , of the capacitor shall satisfy following requirements at 120 Hz.

RATIO \ R.V.	6.3	10	16	25	35	50-80	100	160-250	315~450
$-25^\circ\text{C}/20^\circ\text{C}$	4	3	2	2	2	2	2	2	3
$-40^\circ\text{C}/20^\circ\text{C}$	8	6	4	4	3	3	3	3	—

**Life test**

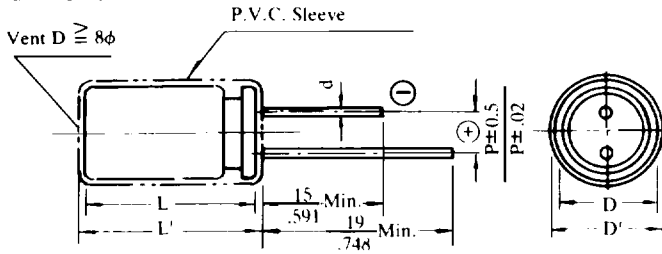
\*At  $105^\circ\text{C} \pm 2^\circ\text{C}$  for a period of 1,000 hours with rated voltage

Capacitance change	6.3V-16V, within $\pm 30\%$ of initial value 25V-450V, within $\pm 25\%$ of initial value
Leakage current	Same as specified value in this table or smaller
Dissipation factor	150% or less of the value given in this table

**Standard**

JIS C 5141 (1982) characterists W

● Dimensions



• mm  $L \leq 16 : L' = (L + 1.0) \text{ Max}$   
 $L > 16 : L' = (L + 2.0) \text{ Max}$   
 $D' = (D + 0.5) \text{ Max}$

• Inches  $L \leq .629 : L' = (L + .039) \text{ Max}$   
 $L > .629 : L' = (L + .079) \text{ Max}$   
 $D' = (D + .020) \text{ Max}$

DIMENSION Unit=  $\frac{\text{mm}}{\text{inch}}$

D $\phi$	5	6.3	8	10	13	16	18
	.196	.248	.314	.393	.511	.629	.708
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
	.078	.098	.138	.197	.197	.295	.295
d $\phi$	0.5	0.5	0.6	0.6	0.6	0.8	0.8
	.020	.020	.024	.024	.024	.031	.031
AWG	24	24	23	23	23	20	20

Type	Rated Voltage (VDC)	Capacitance ( $\mu\text{F}$ )	Max. ESR ( $\Omega$ ) @ 120Hz, 20°C	Maximum Leakage Current ( $\mu\text{A}$ )	Maximum Ripple Current (mA) @ 120Hz, 105°C	Nominal Case Size	
						DxL (mm)	DxL (inches)
CEUSM0J221	6.3	220	1.81	17	240	8 x 11.5	.314 x .452
CEUSM0J331	6.3	330	1.20	24	320	10 x 12.5	.393 x .492
CEUSM0J471	6.3	470	0.85	33	420	10 x 12.5	.393 x .492
CEUSM0J681	6.3	680	0.58	46	500	10 x 16	.393 x .629
CEUSM0J102	6.3	1,000	0.40	66	550	10 x 20	.393 x .787
CEUSM0J152	6.3	1,500	0.29	98	710	13 x 25	.511 x .984
CEUSM0J222	6.3	2,200	0.21	142	800	13 x 25	.511 x .984
CEUSM0J332	6.3	3,300	0.15	210	1,035	16 x 25	.629 x .984
CEUSM0J472	6.3	4,700	0.11	299	1,275	16 x 31.5	.629 x 1.24
CEUSM0J682	6.3	6,800	0.09	431	1,750	16 x 35.5	.629 x 1.40
CEUSM0J103	6.3	10,000	0.07	633	2,045	18 x 40	.708 x 1.57
CEUSM1A220	10	22	15.1	5	54	5 x 11	.196 x .433
CEUSM1A330	10	33	10.0	6	63	5 x 11	.196 x .433
CEUSM1A470	10	47	7.05	8	83	5 x 11	.196 x .433
CEUSM1A680	10	68	4.88	10	115	6.3 x 11	.248 x .433
CEUSM1A101	10	100	3.31	13	146	6.3 x 11	.248 x .433
CEUSM1A151	10	150	2.21	18	210	8 x 11.5	.314 x .452
CEUSM1A221	10	220	1.51	25	260	8 x 11.5	.314 x .452
CEUSM1A331	10	330	1.00	36	340	10 x 12.5	.393 x 4.92
CEUSM1A471	10	470	0.70	50	440	10 x 16	.393 x .629
CEUSM1A681	10	680	0.49	71	560	10 x 20	.393 x .787
CEUSM1A102	10	1,000	0.33	103	680	13 x 20	.511 x .787
CEUSM1A152	10	1,500	0.24	153	800	13 x 25	.511 x .984
CEUSM1A222	10	2,200	0.18	223	960	16 x 25	.629 x .984
CEUSM1A332	10	3,300	0.13	333	1,195	16 x 31.5	.629 x 1.24
CEUSM1A472	10	4,700	0.10	473	1,425	16 x 35.5	.629 x 1.40
CEUSM1A682	10	6,800	0.08	683	1,850	18 x 40	.708 x 1.57
CEUSM1C100	16	10	28.1	5	40	5 x 11	.196 x .433
CEUSM1C220	16	22	12.8	6	75	5 x 11	.196 x .433
CEUSM1C330	16	33	8.54	8	100	5 x 11	.196 x .433
CEUSM1C470	16	47	5.99	11	125	6.3 x 11	.248 x .433
CEUSM1C680	16	68	4.14	14	165	6.3 x 11	.248 x .433
CEUSM1C101	16	100	2.82	19	200	8 x 11.5	.314 x .452
CEUSM1C151	16	150	1.88	27	270	8 x 11.5	.314 x .452
CEUSM1C221	16	220	1.28	38	335	10 x 12.5	.393 x .492
CEUSM1C331	16	330	0.85	56	430	10 x 16	.393 x .629
CEUSM1C471	16	470	0.60	78	575	10 x 20	.393 x .787
CEUSM1C681	16	680	0.41	112	670	13 x 20	.511 x .787
CEUSM1C102	16	1,000	0.28	163	780	13 x 25	.511 x .984
CEUSM1C152	16	1,500	0.21	243	890	16 x 25	.629 x .984
CEUSM1C222	16	2,200	0.16	355	1,055	16 x 25	.629 x .984
CEUSM1C332	16	3,300	0.11	531	1,590	16 x 35.5	.629 x 1.40
CEUSM1C472	16	4,700	0.09	755	1,890	18 x 35.5	.708 x 1.40

Specify designation Q as a last letter of part number, for +30/-10% capacitance tolerance. Example CEUSMIC222(Q).  
 Maximum permissible ripple current at +85°C should be 1.4 times the values on this table.

Type	Rated Voltage (VDC)	Capacitance (μF)	Max ESR (Ω) @ 120Hz, 20°C	Maximum Leakage Current (μA)	Maximum Ripple Current (mA) @ 120Hz, 105°C	Nominal Case Size	
						DxL (mm)	DxL (inches)
CEUSM1E100	25	10	24.9	6	45	5 x 11	196 x .433
CEUSM1E150	25	15	16.5	7	65	5 x 11	196 x .433
CEUSM1E220	25	22	11.3	9	80	5 x 11	196 x .433
CEUSM1E330	25	33	7.53	11	115	6.3 x 11	248 x .433
CEUSM1E470	25	47	5.29	15	145	6.3 x 11	248 x .433
CEUSM1E680	25	68	3.65	20	200	8 x 11.5	314 x .452
CEUSM1E101	25	100	2.48	28	250	8 x 11.5	314 x .452
CEUSM1E151	25	150	1.65	41	325	10 x 12.5	393 x .492
CEUSM1E221	25	220	1.13	58	400	10 x 16	393 x .629
CEUSM1E331	25	330	0.75	86	480	10 x 20	393 x .787
CEUSM1E471	25	470	0.53	121	620	13 x 20	511 x .787
CEUSM1E681	25	680	0.36	173	700	13 x 25	511 x .984
CEUSM1E102	25	1,000	0.25	253	805	16 x 25	629 x .984
CEUSM1E152	25	1,500	0.19	378	1,000	16 x 31.5	629 x 1.24
CEUSM1E222	25	2,200	0.14	553	1,235	16 x 35.5	629 x 1.40
CEUSM1E332	25	3,300	0.10	828	1,630	18 x 40	708 x 1.57
CEUSM1V3R3	35	3.3	60.2	4	22	5 x 11	196 x .433
CEUSM1V4R7	35	4.7	42.3	5	35	5 x 11	196 x .433
CEUSM1V100	35	10	19.9	7	61	5 x 11	196 x .433
CEUSM1V150	35	15	13.2	9	83	5 x 11	196 x .433
CEUSM1V220	35	22	9.04	11	105	6.3 x 11	248 x .433
CEUSM1V330	35	33	6.02	15	140	6.3 x 11	248 x .433
CEUSM1V470	35	47	4.23	20	175	8 x 11.5	314 x .452
CEUSM1V680	35	68	2.92	27	235	8 x 11.5	314 x .452
CEUSM1V101	35	100	1.99	38	290	10 x 12.5	393 x .492
CEUSM1V151	35	150	1.99	56	390	10 x 16	393 x .629
CEUSM1V221	35	220	0.90	80	480	10 x 20	393 x .787
CEUSM1V331	35	330	0.60	119	580	13 x 20	511 x .787
CEUSM1V471	35	470	0.42	168	670	13 x 25	511 x .984
CEUSM1V681	35	680	0.29	241	750	16 x 25	629 x .984
CEUSM1V102	35	1,000	0.20	353	870	16 x 25	629 x .984
CEUSM1V152	35	1,500	0.15	529	1,080	16 x 35.5	629 x 1.40
CEUSM1V222	35	2,200	0.12	773	1,365	18 x 35.5	708 x 1.40
CEUSM1HR10	50	0.1	1658	4	4	5 x 11	196 x .433
CEUSM1HR22	50	0.22	754	4	6	5 x 11	196 x .433
CEUSM1HR33	50	0.33	502	4	7	5 x 11	196 x .433
CEUSM1HR47	50	0.47	352	4	9	5 x 11	196 x .433
CEUSM1HR68	50	0.68	243	4	12	5 x 11	196 x .433
CEUSM1H010	50	1.0	165	4	15	5 x 11	196 x .433
CEUSM1H1R5	50	1.5	110	4	18	5 x 11	196 x .433
CEUSM1H2R2	50	2.2	75.3	4	21	5 x 11	196 x .433
CEUSM1H3R3	50	3.3	50.2	5	30	5 x 11	196 x .433
CEUSM1H4R7	50	4.7	35.2	5	35	5 x 11	196 x .433
CEUSM1H6R8	50	6.8	24.3	7	48	5 x 11	196 x .433
CEUSM1H100	50	10	16.5	8	61	5 x 11	196 x .433
CEUSM1H150	50	15	11.0	11	86	6.3 x 11	248 x .433
CEUSM1H220	50	22	7.53	14	110	6.3 x 11	248 x .433
CEUSM1H330	50	33	5.02	20	150	8 x 11.5	314 x .452
CEUSM1H470	50	47	3.52	27	190	8 x 11.5	314 x .452
CEUSM1H680	50	68	2.43	37	260	10 x 12.5	393 x .492
CEUSM1H101	50	100	1.65	53	330	10 x 16	393 x .629
CEUSM1H151	50	150	1.10	78	440	10 x 20	393 x .787
CEUSM1H221	50	220	0.75	113	545	13 x 20	511 x .787
CEUSM1H331	50	330	0.50	168	630	13 x 20	511 x .787
CEUSM1H471	50	470	0.35	238	710	16 x 25	629 x .984
CEUSM1H681	50	680	0.24	343	830	16 x 25	629 x .984
CEUSM1H102	50	1,000	0.16	503	1,025	16 x 31.5	629 x 1.24
CEUSM1H152	50	1,500	0.13	753	1,400	18 x 40	708 x 1.57

Maximum permissible ripple current at +85°C should be 1.4 times the values on this table.

Type	Rated Voltage (VDC)	Capacitance ( $\mu$ F)	Max ESR ( $\Omega$ ) @ 120Hz, 20°C	Maximum Leakage Current ( $\mu$ A)	Maximum Ripple Current (mA) @ 120Hz, 105°C	Nominal Case Size	
						DxL (mm)	DxL (inches)
CEUSM1J4R7	63	4.7	35.2	6	35	5 x 11	196 x .433
CEUSM1J6R8	63	6.8	24.3	8	48	5 x 11	196 x .433
CEUSM1J100	63	10	16.5	9	61	6.3 x 11	248 x .433
CEUSM1J150	63	15	11.0	13	90	8 x 11.5	314 x .452
CEUSM1J220	63	22	7.53	17	120	8 x 11.5	314 x .452
CEUSM1J330	63	33	5.02	24	155	8 x 11.5	314 x .452
CEUSM1J470	63	47	3.52	33	210	10 x 12.5	393 x .492
CEUSM1J680	63	68	2.43	46	275	10 x 16	393 x .629
CEUSM1J101	63	100	1.65	66	340	10 x 20	393 x .787
CEUSM1J151	63	150	1.10	98	445	13 x 20	511 x .787
CEUSM1J221	63	220	0.75	142	550	13 x 20	511 x .787
CEUSM1J331	63	330	0.50	211	650	13 x 25	511 x .984
CEUSM1J471	63	470	0.35	299	725	16 x 25	629 x .984
CEUSM1J681	63	680	0.24	432	945	16 x 31.5	629 x 1.24
CEUSM1J102	63	1,000	0.15	633	1,220	18 x 35.5	708 x 1.40
CEUSM1K150	80	15	11.0	15	120	8 x 11.5	314 x .452
CEUSM1K330	80	33	5.02	29	160	10 x 16	393 x .629
CEUSM1K470	80	47	3.53	41	220	10 x 16	393 x .629
CEUSM1K680	80	68	2.43	58	290	10 x 20	393 x .787
CEUSM1K101	80	100	1.65	83	360	13 x 20	511 x .787
CEUSM1K151	80	150	1.10	123	480	13 x 20	511 x .787
CEUSM1K221	80	220	0.75	179	600	13 x 25	511 x .984
CEUSM1K331	80	330	0.50	267	690	16 x 31.5	629 x 1.24
CEUSM1K471	80	470	0.35	379	810	16 x 35.5	629 x 1.40
CEUSM1K681	80	680	0.24	547	1,200	18 x 35.5	708 x 1.40
CEUSM2AR47	100	0.47	282	4	9	5 x 11	196 x .433
CEUSM2AR68	100	0.68	195	4	13	5 x 11	196 x .433
CEUSM2A010	100	1.0	132	4	17	5 x 11	196 x .433
CEUSM2A1R5	100	1.5	88.4	5	22	5 x 11	196 x .433
CEUSM2A2R2	100	2.2	60.2	5	27	5 x 11	196 x .433
CEUSM2A3R3	100	3.3	40.2	6	44	5 x 11	196 x .433
CEUSM2A4R7	100	4.7	28.2	8	50	6.3 x 11	248 x .433
CEUSM2A6R8	100	6.8	19.5	10	75	6.3 x 11	248 x .433
CEUSM2A100	100	10	13.2	13	100	8 x 11.5	314 x .452
CEUSM2A150	100	15	8.84	18	135	8 x 11.5	314 x .452
CEUSM2A220	100	22	6.02	25	170	10 x 12.5	393 x .492
CEUSM2A330	100	33	4.02	36	210	10 x 16	393 x .629
CEUSM2A470	100	47	2.82	50	320	10 x 20	393 x .787
CEUSM2A680	100	68	1.95	71	400	10 x 20	393 x .787
CEUSM2A101	100	100	1.32	103	470	13 x 20	511 x .787
CEUSM2A151	100	150	0.88	153	535	13 x 25	511 x .984
CEUSM2A221	100	220	0.60	223	620	16 x 25	629 x .984
CEUSM2A331	100	330	0.40	333	705	16 x 31.5	629 x 1.24
CEUSM2A471	100	470	0.28	473	890	18 x 35.5	708 x 1.40
CEUSM2C3R3A	160	3.3	60.2	8	35	8 x 11.5	314 x .453
CEUSM2C4R7C	160	4.7	42.3	11	45	8 x 11.5	314 x .453
CEUSM2C6R8A	160	6.8	29.2	14	55	8 x 11.5	314 x .453
CEUSM2C100	160	10	19.9	19	70	10 x 20	393 x .787
CEUSM2C150	160	15	13.2	27	90	10 x 20	393 x .787
CEUSM2C220	160	22	9.04	38	120	13 x 20	511 x .787
CEUSM2C330	160	33	6.02	56	160	13 x 25	511 x .984
CEUSM2C470	160	47	4.23	78	200	16 x 25	629 x .984
CEUSM2C680	160	68	2.92	112	240	16 x 31.5	629 x 1.24
CEUSM2C101	160	100	1.99	163	300	16 x 35.5	629 x 1.40

Maximum permissible ripple current at +85°C should be 1.4 times the values on this table.

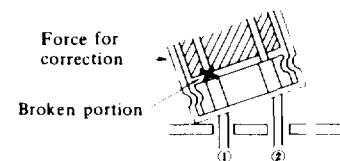
Type	Rated Voltage (VDC)	Capacitance (μF)	Max. ESR (Ω) @120Hz 20°C	Maximum Leakage Current (μA)	Maximum Ripple Current (mA) @120HZ.105°C	Dimensions	
						DxL (mm)	DxL (inches)
CEUSM2D010B	200	1.0	198	5	17	8 x 11.5	.314 x .453
CEUSM2D2R2A	200	2.2	90.4	8	30	8 x 11.5	.314 x .453
CEUSM2D3R3A	200	3.3	60.2	10	40	8 x 11.5	.314 x .453
CEUSM2D4R7B	200	4.7	42.3	13	50	8 x 11.5	.314 x .453
CEUSM2D100	200	10	19.9	23	80	10 x 20	.393 x .787
CEUSM2D220	200	22	9.04	47	140	13 x 20	.511 x .787
CEUSM2D330	200	33	6.02	69	175	13 x 25	.511 x .984
CEUSM2D470	200	47	4.23	97	215	16 x 25	.629 x .984
CEUSM2D101	200	100	1.99	203	340	18 x 35.5	.708 x 1.40
CEUSM2E2R2C	250	2.2	90.4	9	30	8 x 11.5	.314 x .453
CEUSM2E3R3A	250	3.3	60.2	11	40	8 x 11.5	.314 x .453
CEUSM2E4R7	250	4.7	42.3	15	50	10 x 16	.393 x .629
CEUSM2E6R8	250	6.8	29.2	20	60	10 x 20	.393 x .787
CEUSM2E100	250	10	19.9	28	85	13 x 20	.511 x .787
CEUSM2E150	250	15	13.2	41	105	13 x 20	.511 x .787
CEUSM2E220	250	22	9.04	58	145	13 x 25	.511 x .984
CEUSM2E330	250	33	6.02	86	185	16 x 25	.629 x .984
CEUSM2E470	250	47	4.23	121	230	16 x 31.5	.629 x 1.24
CEUSM2E680	250	68	2.92	173	285	18 x 35.5	.708 x 1.40
CEUSM2E101	250	100	1.99	253	360	18 x 40	.708 x 1.57
CEUSM2F010A	315	1	332	36	23	10 x 12.5	.394 x .492
CEUSM2F2R2	315	2.2	151	44	38	10 x 16	.394 x .630
CEUSM2F3R3	315	3.3	100	51	53	10 x 16	.394 x .630
CEUSM2F4R7	315	4.7	70.5	60	61	10 x 20	.394 x .787
CEUSM2F100	315	10	33.2	93	107	13 x 20	.512 x .787
CEUSM2F220	315	22	15.1	169	200	16 x 25	.630 x .984
CEUSM2F330	315	33	10.0	238	265	16 x 31.5	.630 x 1.24
CEUSM2F470	315	47	7.05	326	343	18 x 35.5	.709 x 1.40
CEUSM2V010A	350	1	332	37	24	10 x 12.5	.394 x .492
CEUSM2V2R2	350	2.2	151	45	38	10 x 16	.394 x .630
CEUSM2V3R3	350	3.3	100	53	57	10 x 16	.394 x .630
CEUSM2V4R7	350	4.7	70.5	63	71	10 x 20	.394 x .787
CEUSM2V100	350	10	33.2	100	124	13 x 25	.512 x .984
CEUSM2V220	350	22	15.1	184	225	16 x 31.5	.630 x 1.24
CEUSM2V330	350	33	10.0	261	296	16 x 35.5	.630 x 1.40
CEUSM2V470	350	47	7.05	359	357	18 x 40	.709 x 1.57
CEUSM2G010	400	1	332	38	26	10 x 16	.394 x .630
CEUSM2G2R2	400	2.2	151	48	43	10 x 16	.394 x .630
CEUSM2G3R3	400	3.3	100	56	65	10 x 20	.394 x .787
CEUSM2G4R7	400	4.7	70.5	68	80	13 x 20	.512 x .787
CEUSM2G100	400	10	33.2	110	153	16 x 25	.630 x .984
CEUSM2G220	400	22	15.1	206	262	16 x 35.5	.630 x 1.40
CEUSM2G330	400	33	10.0	294	315	18 x 35.5	.709 x 1.40
CEUSM2W010	450	1	332	40	29	10 x 16	.394 x .630
CEUSM2W2R2	450	2.2	151	50	48	10 x 20	.394 x .787
CEUSM2W3R3	450	3.3	100	60	71	13 x 20	.512 x .787
CEUSM2W4R7	450	4.7	70.5	72	88	13 x 25	.512 x .984
CEUSM2W100	450	10	33.2	120	175	16 x 25	.630 x .984
CEUSM2W220	450	22	15.1	228	288	18 x 35.5	.709 x 1.40

Maximum permissible ripple current at +85°C should be 1.4 times the values on this table.

**3. Care required in mounting**

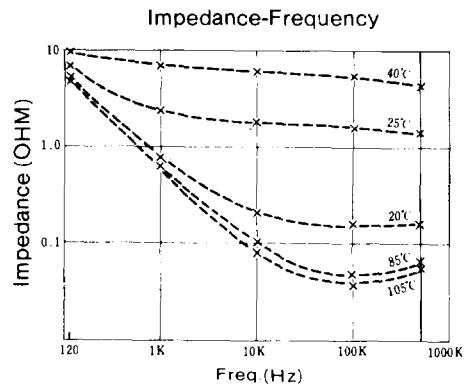
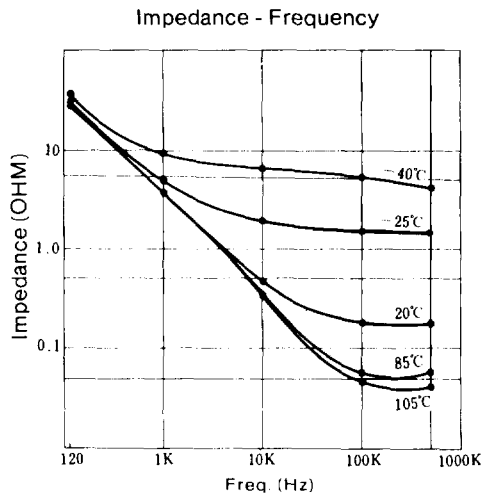
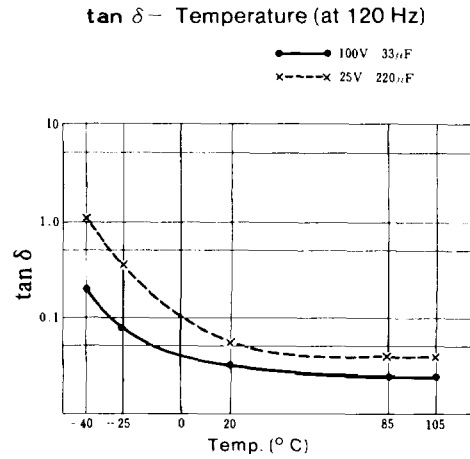
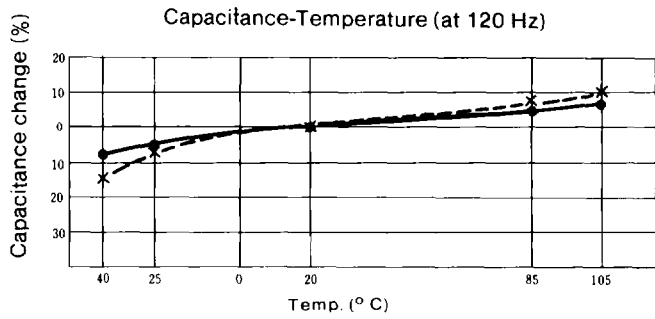
Be careful not to apply excessive force to the rubber plug construction (up to 16mmφ) and lead wires of the capacitor.

It is inadvisable to forcibly correct the direction of the capacitor which have been soldered, while it is a little declined, to a printed circuit board. In such a case, as shown below, too much force is exercised to the lead wire ① with the portion ② as fulcrum. The result might be the disconnection of the lead wires from the internal elements or the pull-off of the cap. Do not apply more than 3kg of force to the lead wire ① at its root.



**WARNING:** See note for cleaning solvents on Inside Front Cover and page 1

● Technical Data on CEUSM



Characteristics at high temperature with applying rated voltage

