Data Sheet

Customer :

Product : Aluminum Electrolytic Capacitors – ESX Series

Size : 5x11mm ~ 18x41mm

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Edition : Ver. 1

Record of change

Date	Ver.	Description	Page
20-May-2016	1		

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20-May-2016	20-May-2016	20-May-2016	
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Subject : Storage of Aluminium Electrolytic Capacitors

We recommend the following conditions for storage :

1. It is recommended to keep capacitors between the ambient temperatures of 5℃to 35℃ and a relative humidity of 75% or below.

2. Confirm that the environment does not have any of the following conditions :
   (1) Damp conditions such as water, saltwater spray, or oil spray or fumes. High humidity or humidity condensation situations.
   (2) In an atmosphere filled with toxic gasses (such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, ammonia, elc.)
   (3) Being exposed to direct sunlight, ozone, ultraviolet ray, or radiation.
   (4) Being exposed to acidic or alkaline solutions.

3. Keep capacitors in the original package.

4. Storage life & Re-aging :
   When Aluminium Electrolytic Capacitors are stored without applied voltage, their L.C. (Leakage Current) characteristic increases over time. For long-term stored products, the following treatments must be performed before use :
   (1) For Low Voltage Aluminium Electrolytic Capacitors (i.e., Working Voltage W.V. ≦ 120V) :
   After one year of storage, a test must be performed before use. If the L.C. value exceeds the specified value,it is recommended not to use them, as lifespan and quality cannot be 100% guaranteed.
   (2) For Medium/High Voltage Aluminium Electrolytic Capacitors (i.e., Working Voltage W.V. ≧160V) :
   (A) If stored for more than 6 months, a test must be performed before use to ensure lifespan and quality.
   (B) If stored for 6-24 months and the L.C. value is between 25% and 40% of the specified value, it is recommended to recharge (re-agent) before use. If the L.C. value exceeds 40% of the specified value, do not use.
   (3) Re-aging condition : It is recommended to apply D.C. working voltage to the capacitor for 2 hours through 1KΩ of protective series resistor.

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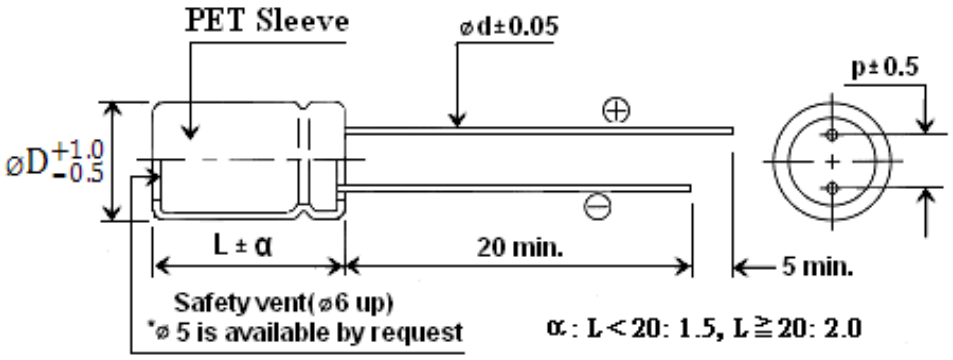
ESX SERIES

- ESX series capacitors are extremely low impedance for high frequency.
- Load life 105℃, 5000 hours assured. (2000 hours for D≦8mm as specified below)

Characteristics

Voltage Range	6.3 ~ 63V					100V			
Capacitance Range	1.0 ~ 10000uF								
Temperature Range	-55 ~ + 105℃					-40 ~ + 105℃			
Leakage Current	I=0.01CV or 3uA, whichever is greater (After 2 minutes)								
Capacitance Tolerance	±20% at 120Hz , 20℃(10% Tol. is available upon request)								
Dissipation Factor	WV	6.3	10	16	25	35	50	63	100
	tan δ	0.20	0.18	0.16	0.14	0.12	0.10	0.09	0.08
	For capacitance > 1000uF, add 0.02 for every 1000uF.(at 20℃, 120Hz)								
Stability at Low Temperature (120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	Z-40℃/Z 20℃	6	4	3	3	2	2	2	2
	Z-55℃/Z 20℃	8	6	5	5	4	4	4	3
Load Life After the rated voltage has been applied for 2000~5000 hours at 105℃	2000hrs for D≦8mm, 5000hrs for D≧10mm		Capacitance change			Within ±25% of initial value			
			D.F. (tanδ)			200% or less of initial specified value			
			Leakage current			Less than initial specified value			
Shelf life (at 105℃)	After storage for 1000 hours at 105℃ with no voltage applied, the capacitor shall meet the specified limit in load life. Pre-treatment for measurement shall be conducted after application of DC working voltage for 30 minutes.								



Drawing

Dϕ	5	6.3	8	10	13	16	18
p	2.0	2.5	3.5	5.0	5.0	7.5	7.5
dϕ	0.5	0.5	0.5	0.6	0.6	0.8	0.8

■ Ripple Current Coefficients

Cap(uF)\Freq. (Hz)	60	120	400	1K	10K	＞10K
Cap. ≦ 10	0.47	0.59	0.76	0.85	0.97	1
10＜Cap.≦100	0.52	0.62	0.80	0.89	0.97	1
100＜Cap.≦1000	0.58	0.72	0.84	0.90	0.98	1
1000＜Cap.	0.63	0.78	0.87	0.91	0.98	1

Part Numbering System

ESX	□ □ □	□	□ □	**B**	□ □
Series	Capacitance	Tolerance	Rated Voltage	Package	Extended Code

Case size & Maximum Ripple Current (mA rms 105℃, 100KHz) & Imp. (Ω 20℃, 100KHz)

WV / Cap.	6.3			10			16			25		
uF	Size	Imp	RC	Size	Imp	RC	Size	Imp	RC	Size	Imp	RC
10							5x11	4.00	37	5x11	2.10	56
22							5x11	2.00	70	5x11	1.80	120
33							5x11	1.26	130	5x11	1.20	150
47				5x11	1.20	120	5x11	0.52	190	5x11	0.50	220
68				5x11	0.89	145	5x11	0.45	210	6.3x11	0.39	270
100	5x11	0.95	185	5x11	0.48	205	6.3x11	0.31	260	6.3x11	0.28	300
150	6.3x11	0.75	210	6.3x11	0.37	270	6.3x11	0.26	300	8x12	0.19	435
220	6.3x11	0.55	300	6.3x11	0.28	330	8x12	0.21	455	8x12	0.125	550
330	8x12	0.30	390	8x12	0.16	430	8x12	0.12	550	10x13	0.082	720
470	8x12	0.22	430	8x12	0.12	555	10x13	0.095	722	10x16	0.065	1040
680	8x12	0.18	510	10x13	0.10	660	10x16	0.074	920	10x20	0.052	1280
1000	10x13	0.10	660	10x16	0.07	1010	10x20 10x25	0.054 0.050	1100 1180	13x20 13x25	0.039 0.038	1530 1580
1500	10x16 10x20	0.074 0.054	1050 1100	10x20	0.054	1270	10x25 13x20	0.041 0.050	1470 1400	13x25	0.032	2020
2200	10x25 13x20	0.057 0.050	1300 1400	13x20 13x25	0.050 0.040	1400 1690	13x20 13x25	0.035 0.033	1850 1950	16x25	0.027	2405
3300	13x20 13x25	0.050 0.048	1400 1500	13x25	0.029	1980	16x25	0.028	2340	16x31.5 18x25	0.020 0.022	2960 3050
4700	13x25 16x25	0.032 0.030	1800 2100	16x25	0.029	2100	16x31.5	0.022	2650	18x36	0.021	3520
6800	16x25	0.022	2230	16x31.5	0.025	2600	18x31.5 18x36	0.020 0.022	2700 3000	18x41	0.017	3600
10000	16x31.5 16x36	0.021 0.019	2600 2740	18x31.5 18x36	0.017 0.022	2770 3000	18x41	0.015	3300			

Case size & Maximum Ripple Current (mA rms 105℃ 100KHz) & Imp. (Ω 20℃ 100KHz)

WV / Cap.	35			50			63			100		
uF	Size	Imp	RC	Size	Imp	RC	Size	Imp	RC	Size	Imp	RC
1				5x11	3.95	25	5x11	2.80	27	5x11	3.50	40
2.2				5x11	2.60	33	5x11	2.40	38	5x11	2.50	52
3.3				5x11	2.00	45	5x11	2.00	48	5x11	2.50	64
4.7				5x11	1.89	58	5x11	1.89	62	5x11	2.50	76
10	5x11	1.90	70	5x11	1.70	100	5x11	1.65	105	6.3x11	1.0	128
22	5x11	1.36	130	6.3x11	1.00	135	6.3x11	0.80	170	8x12	0.64	224
33	5x11	0.95	175	6.3x11	0.74	230	8x12	0.61	245	10x13	0.40	319
47	6.3x11	0.44	250	8x12	0.50	285	8x12	0.56	290	10x16	0.30	417
68	6.3x11	0.35	300	8x12	0.30	340	8x16	0.30	480	10x20	0.25	470
100	8x12	0.19	380	8x12 10x13	0.24 0.18	340 475	10x16	0.24	590	13x20	0.15	570
150	8x16	0.15	580	10x13 10x16	0.17 0.13	490 675	10x20	0.11	790	13x25	0.12	762
220	10x13	0.098	720	10x16 10x20	0.12 0.085	675 900	10x25 13x20	0.082 0.080	1020 1054	16x25	0.070	1048
330	10x16	0.065	995	10x20 10x25	0.085 0.068	810 1050	13x25	0.067	1160	16x31.5	0.050	1404
470	10x20	0.050	1150	13x21	0.048	1490	16x25	0.044	1750	18x41	0.030	1980
680	13x20	0.044	1440	13x25	0.041	1840	16x31.5	0.040	2070			
1000	16x25	0.036	1950	16x25 16x31.5	0.043 0.030	1600 2130	16x36	0.031	2450			
1500	16x25 16x31.5	0.030 0.027	2100 2520	16x31.5 16x36	0.038 0.026	2000 2700	18x35.5	0.025	2700			
2200	16x31.5 18x25	0.025 0.026	2600 2570	18x36	0.024	2900	18x41	0.023	2990			
3300	18x36	0.020	3000									
4700	18x41	0.019	3300									