RoHS

MESSRS:	APPROVAL NO	710 - 002
	DATE	2024.07.25

ALUMINUM ELECTROLYTIC

CAPACITOR

APPROVAL SHEET

CATALOG TYPE	NXH SERIES
USER PART NO.	
适 用 机 种	
特 记 事 项	Halogen-Free

QINGDAO SAMYOUNG ELECTRONICS CO.,LTD.

MANAGER OF DEVELOPMENT DEPARTMENT

GONG JANG SUG 长硕孔

USER APPROVAL:

APPROVAL NO.:

SamYoung(Korea) : 47,SAGIMAKGOL-RO,JUNGWON-GU,SEONGNAM-SI,GYEONGGI-DO,KOREA

SamYoung(China) : No.5 CHANGJIANG ROAD,PINGDU-CITY,SHANDONG-PROVINCE,CHINA

APPROVAL NO. 710 - 002	ALUMINUM ELECTROLYTIC CAPACITOR	PAGE: 1 OF 5 DATE: 2024.07.25

Specifications

Item	Characteristics
Rated Voltage Range	6.3 ~ 100 V_{DC}
Operating Temperature Range	- 40 ~ + 105 ℃
Capacitance Tolerance	±20% <M> (20℃ ,120Hz)
Leakage Current (at 20 ℃)	After 2 minutes: 0.01CV (μA) or 3 μA,whichever is greater Where,C =Nominal capacitance（μF ） V =Rated Voltage（V_{DC}）
Dissipation Factor (TANδ) (20℃，120Hz)	※ When the Capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.

Rated voltage(V_{DC})	6.3	10	16	25	35	50	63	80~100
TANδ(Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08

Temperature Characteristics (Max.Impedance ratio)		
	Z(-25℃) / Z(20℃)	2
	Z(-40℃) / Z(20℃)	3

(120Hz)

Load Life

The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied（the peak voltage shall not exceed the rated voltage） with the rated ripple current at 105℃ for the specified period of time.

Capacitance change :≤± 30% the of initial Value (6.3 ~ 10V_{DC})
Capacitance change :≤± 25% the of initial Value(16 ~ 100V_{DC})
TANδ :≤200% of the initial specified value
Leakage current :≤ The initial specified value

Case Size (ΦD)	Life Time
Φ5, 6.3	6,000 hours
Φ8	8,000 hours
Φ10 ~	10,000 hours

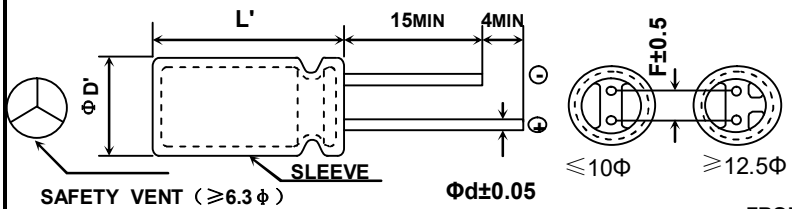
Shelf Life

The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1000 hours at 105℃ without voltage applied.The rated voltage shall be applied to the capacitor for a minimum of 30 minutes,at least 24 hours and not more than 48 hours before the measurements.

Capacitance change :≤± 30% of the initial Value(6.3 ~ 10VDC)
Capacitance change :≤± 25% of the initial Value(16 ~ 100VDC)
TANδ :≤200% of the initial specified value
Leakage current :≤The initial specified value

Others Satisfies characteristic **KS C IEC 60384-4**

A.DIAGRAM OF DIMENSION



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
ΦD'	ΦD+0.5max						
L'	L+1.5max			L+2.0max			

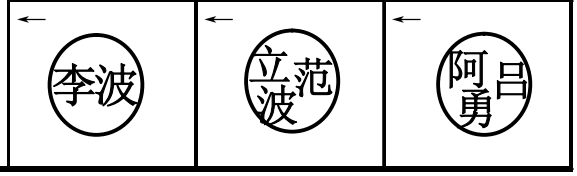
※ Φ10x12L,L'≦L+1.5

B.MARKING:WITH YELLOW SLEEVE, BLACK INK

SAMYOUNG
NXH
25V 1500μF

<M>105℃
LOT NO.

FRONT VIEW OF CAPACITOR BACK VIEW OF CAPACITOR



ALUMINUM ELECTROLYTIC CAPACITOR

APPROVAL NO: 710 - 002

RATINGS OF NXH Series

VDC / ΦD×L	6.3			10			16			25			35		
	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE
5×11	220	0.22	345	150	0.22	345	100	0.22	345	47	0.40	200	33	0.30	200
										68	0.22	345	47	0.22	345
5×15	470	0.13	480	330	0.13	480	220	0.13	480	150	0.13	480	100	0.13	480
6.3×11				220	0.22	350				100	0.15	410			
				330	0.094	540				150	0.094	540			
	470	0.094	540				220	0.094	540	220	0.094	540	100	0.094	540
6.3×15	560	0.084	620	470	0.084	620	330	0.084	620	220	0.084	620	150	0.084	620
8×11.5	680	0.084	620	470	0.084	620				220	0.084	620			
	820	0.056	945	680	0.056	945	470	0.056	945	330	0.056	945	220	0.056	945
8×15										390	0.045	1250	270	0.045	1250
	1200	0.045	1250	1000	0.045	1250	680	0.045	1250	470	0.045	1330	330	0.045	1250
8×20										560	0.029	1500	390	0.029	1500
	1500	0.029	1500	1500	0.029	1500	1000	0.029	1500	680	0.029	1500	470	0.029	1600
10×12.5	1200	0.039	1330	1000	0.039	1330	680	0.039	1330	470	0.039	1330	330	0.039	1330
10×16	1800	0.028	1760	1500	0.028	1760	1000	0.028	1760	680	0.028	1760	470	0.028	1760
10×20										820	0.02	1960	560	0.025	1850
	2200	0.02	1960	1800	0.02	1960	1500	0.02	1960	1000	0.02	1960	680	0.025	1850
10×25	2700	0.018	2250	2200	0.018	2250	1800	0.018	2250	1000	0.018	2250	680	0.018	2250
10×33	3300	0.015	2550	2700	0.015	2550	2200	0.015	2550	1200	0.015	2550	1000	0.015	2550
12.5×16													680	0.030	1750
12.5×20	3900	0.017	2480	3300	0.017	2480	2200	0.017	2480	1000	0.018	2500			
										1500	0.017	2550	1000	0.017	2480
12.5×25	4700	0.015	2900	3900	0.015	2900	2700	0.015	2900	1800	0.015	2900	1200	0.015	2900
							3300	0.015	2900	2200	0.015	2900	1500	0.015	2900
12.5×30	5600	0.013	3450	4700	0.013	3450	3300	0.013	3450	2200	0.013	3450	1500	0.013	3450
12.5×35	6800	0.012	3570	5600	0.012	3570	3900	0.012	3570	2700	0.012	3570	1800	0.012	3570
16×20	6800	0.015	3250	4700	0.015	3250	3300	0.015	3250	2200	0.015	3250	1500	0.015	3250
										2700	0.015	3250	1800	0.015	3250
16×25	8200	0.013	3630	6800	0.013	3630	4700	0.013	3630	3300	0.013	3630	2200	0.013	3630
18×25	10000	0.012	3650	8200	0.012	3650	5600	0.012	3650	3900	0.012	3650	2700	0.012	3650
													3300	0.012	3650

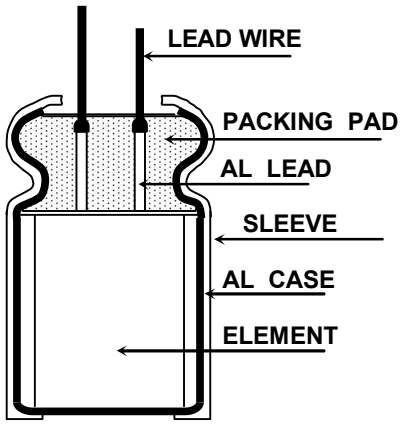
VDC / ΦD×L	50			63			80			100					
	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE			
5×11	1	3.5	40	18	0.45	173	12	1.4	163	8.2	1.2	163			
	2.2	2.5	120												
	4.7	2.5	120												
	10	1.0	145												
	22	0.4	195												
	27	0.34	238												
5×15	56	0.16	350												
6.3×11	33	0.2	320	47	0.3	278	33	0.57	267	18	0.46	267			
	47	0.14	450												
	56	0.14	450												
6.3×15	100	0.12	586												
8×11.5	100	0.074	724	82	0.2	525	56	0.36	462	33	0.29	462			
8×15	120	0.061	950	100	0.18	688	68	0.25	585	47	0.2	585			
	150	0.061	950												
8×20	180	0.046	1190	150	0.16	861	100	0.19	735	68	0.16	735			
10×12										47	0.17	624			
10×12.5	150	0.061	979	100	0.18	620	82	0.23	624	47	0.17	624			
				120	0.16	725				56	0.17	624			
10×16	220	0.042	1370	180	0.10	998	120	0.17	780	68	0.11	780			
	330	0.042	1370							82	0.11	780			
10×20	270	0.03	1580	220	0.10	1010	180	0.084	1040	82	0.11	850			
	330	0.03	1580	270	0.08	1200				100	0.084	1040			
	470	0.03	1580												
10×25	330	0.028	1870	330	0.07	1410	220	0.069	1170	120	0.11	1170			
10×33	470	0.025	2110												
12.5×16							180	0.13	975	100	0.13	975			
12.5×20	470	0.027	2050	390	0.05	1570	270	0.085	1430	150	0.062	1430			
12.5×25	560	0.023	2410	470	0.037	1990	330	0.047	1620	220	0.047	1620			
12.5×30	680	0.021	2860	560	0.032	2410	390	0.051	1950	270	0.051	1950			
12.5×35	820	0.019	2960	680	0.03	2620	470	0.036	2140	330	0.043	2140			
	1000	0.016	2960												
12.5×40							560	0.036	2340	390	0.036	2340			
16×20	820	0.023	2730	560	0.035	2100	390	0.058	1750	270	0.048	1750			
	1000	0.023	2730												
16×25	1000	0.021	3010	820	0.03	2430	560	0.044	2210	330	0.048	1850			
										390	0.038	2210			
16×31.5							680	0.032	2400	470	0.033	2400			
							820	0.032	2400						
16×35.5							820	0.029	2600	560	0.029	2600			
16×40							1000	0.027	2860	680	0.027	2860			
18×20							560	0.054	1950	390	0.045	1950			
18×25	1500	0.019	3290				820	0.038	2270	470	0.038	2270			
18×31.5							1000	0.031	2470	560	0.031	2470			
18×35.5				1200	0.03	2800	1200	0.027	2860	680	0.027	2860			
18×40							1500	0.026	3510	820	0.026	3510			

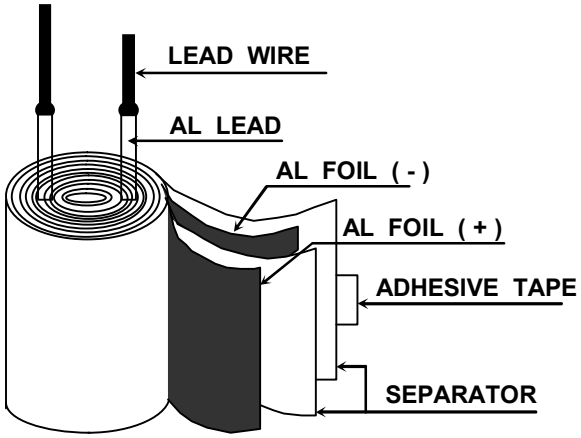
Permissible Ripple Current (mArms / 105℃, 100KHz)
Immpedance (Ω max. / 20℃, 100KHz)
Nominal Capacitance (μF)

ALUMINUM ELECTROLYTIC CAPACITORS

APPROVAL NO. 710 - 002

STRUCTURE AND MATERIALS





CE04 TYPE

MINIATURE SIZED TYPE CAPACITORS COMPONENT

PART NAME	MATERIALS	VENDER
LEAD WIRE	TINNED COPPER - PLY WIRE(Pb-FREE)	KISTRON (KOREA/CHINA) KOHOKU (JAPAN/CHINA) NANTONG HONG YANG (CHINA)
AL LEAD	ALUMINUM 99.92 % OVER	KANG WON AUTO FITTING NAN TONG HUI FENG (CHINA) NANTONG HONG YANG KOHOKU (JAPAN/CHINA) KISTRON (KOREA/CHINA)
PACKING PAD	SYNTHETIC RUBBER	SUNG NAM (KOREA/CHINA) CCW/ZHE JIANG TIAN TAI ZHE JIANG TIAN HUA (CHINA)
SLEEVE	P.E.T(Poly Ethlylene Terephthalate Resin)	MOO DEUNG (KOREA/CHINA) SUZHOU QILIAN SHUN PENG PLASTIC (CHINA) YUN LIN PLASTIC
AL CASE	ALUMINUM 99.0 % OVER	ZHANG JIA GANG LIAN YI LIN AN AO XING (CHINA) NANTONG CHUANGJIA DONG NAM D.N TECH/HA NAM (KOREA/CHINA)
AL FOIL ⊕	FORMED ALUMINUM 99.9 % OVER	K.D.K/JCC/MATSUSHITA (JAPAN) SAM YOUNG (KOREA) BECROMAL (ITALY) SATMA (FRANCE) HEC XINJIANG JOINWORLD (CHINA) HUAFENG / NANTONG /RAOIO LUXON/LITON (TAIWAN)
AL FOIL ⊖	ETCHED ALUMINUM 98.0 % OVER	K-JCC (KOREA) K.D.K (JAPAN) AFT/INCULCU/SHENGHONG ELECON/WU JIANG FEILO (CHINA)
SEPARATOR	INSULATION PAPER	KAN/LUNAN (CHINA) SPO (GERMANY) N.K.K (JAPAN)
ADHESIVE TAPE	POLY PROPYLENE OR POLY IMIDE FILM	NITTO/NICHIBAN (JAPAN) DAEIL/SWECO (KOREA)

When using aluminum electrolytic capacitors,pay strict attention to the following:

1. Electrolytic capacitors for DC application require polarization.

Confirm the polarity.If used in reversed polarity,the circuit life may be shortened or the capacitor may be damaged.For use on circuits whose polarity is occasionally reversed,or whose polarity is unknown,use bi-polarized capacitors (BP-series).Also,note that the electrolytic capacitor cannot be used for AC application.

2. Do not apply a voltage exceeding the capacitor`s voltage rating.

If a voltage exeeceding the capacitor`s voltage rating is applied,the capacitor may be damaged as leakage current increases. When using the capacitor with AC voltage superimposed on DC voltage,care must be exercised that the peak value of AC voltage does not exceed the rated voltage.

3. Do not allow excessive ripple current to pass.

Use the electrolytic capacitor at current values within the permissible ripple range.If the ripple current exceeds the specified value,request capacitors for high ripple current applications.

4. Ascertain the operating temperature range.

Use the electrolytic capacitors according to the specified operating temperature range.Usage at room temperature will ensure longer life.

5. The electrolytic capacitor is not suitable for circuits in which charge and discharge are frequently repeated.

If used in circuits in which charge and discharge are frequently repeated,the capacitance value may drop,or the capacitor may be damaged.Please consult our engineering department for assistance in these applications.

6. Apply voltage treatment to the electrolytic capacitor which has been allowed to stand for a long time.

If the electrolytic capacitor is allowed to stand for a long time,its withstand voltage is liable to drop,resulting in increased leakage current.If the rated voltage is applied to such a product,a large leakage current occurs and this generates internal heat,which damaged the capacitor.If the electrolytic capacitor is allowed to stand for a long time,therefore,use it after giving voltage treatment (Note 1).(However,no voltage treatment is required if the electrolytic capacitor is allowed to stand for less than 2 or 3 years at normal temperature.)

7. Be careful of temperature and time when soldering.

When soldering a printed circuit board with various,components,care must be taken that the soldering temperature is not too high and that the dipping time is not too long.Otherwise,there will be adverse effects on the electrical characteristics and insulation sleeve of electrolytic capacitors in the case of small-sized electrolytic capacitors,nothing abnormal will occur if dipping is performed at less than 260℃ for less than 10 seconds.

8. Do not place a soldering iron on the body of the capacitor.

The electrolytic capacitor is covered with a vinyl sleeve.If the soldering iron comes in contact with the electrolytic capacitor body during wiring,damage to the vinyl sleeve and/or case may result in defective insulation,or improper protection of the capacitor element.

9. Cleaning circuit boards after soldering.

Some solvents have adverse effects on capacitors.
Please refer to the next page.

10.Do not apply excessive force to the lead wires or terminals.

If excessive force is applied to the lead wires and terminals,they may be broken or their connections with the internal elements may be affectde.(For strength of terminals,refer to KS C IEC 60384-4(JIS C5101-1,JIS C5101-4)

11.Care should be used in selecting a storage area.

If electrolytic capacitors are exposed to high temperatures caused by such things as direct sunlight,the life of the capacitor may be adversely affected.Storage in a high humidity atmosphere may affect the solderability of lead wires and terminals.

12.Surge voltage.

The surge voltage rating is the maximum DC over-voltage to which the capacitor may be subjected for short periods not exceeding approximately 30 seconds at infrequent intervals of not more than six minutes.According to KS C IEC 60384-4,the test shall be conducted 1000 cycles at room temperature for the capacitors of characteristic KS C IEC 60384-4 or at the maximum operating temperature for the capacitors of characteristics B and C of KS C IEC 60384-4 with voltage applied through a series resistance of 1000 ohms without discharge.The electrical characteristics of the capacitor after the test are specified in KS C IEC 60384-4.Unless otherwise specified,the rated surge voltage are as follows:

Rated Voltage(V)	4	6.3	10	16	25	35	50	63	80	100	120	160	200	250	315	350	400	420	450	500	550
Rated Surge Voltage(V)	5	8	13	20	32	44	63	79	100	125	150	200	250	300	365	400	450	470	500	550	600

Note 1 Voltage treatment … Voltage treatment shall be performed by increasing voltage up to the capacitor`s voltage rating gradually while lowering the leakage current.In this case,the impressed voltage shall be in the range where the leakage current of the electrolytic capacitor is less than specified value.Meanwhile,the voltage treatment time may be effectively shortened if the ambient temperature is increased (within the operating temperature range).

Note 2 For methods of testing, refer to KS C IEC 60384-4，（JIS C 5101-1，JIS C 5101-4）

CLEANING CONDITIONS

Aluminum electrolytic capacitors that have been exposed to halogenated hydrocarbon cleaning and defluxing solvents are susceptible to attack by these solvents.This exposure can result in solvent penetration into the capacitors, leading to internal corrosion and potential failure.

Common type of halogenated cleaning agents are listed below.

Chemical Name	Structural Formula	Representatice Brand Name
Trichlorotrifluoroethane	$C_2Cl_3F_3$	Freon TF,Daiflon S-3
Fluorotrichloromethane	CCl_3F	Freon-11,Daiflon S-1
1,1,1-Trichloroethane	$F_2H_3Cl_3$	Chloroethane
Trichloroethylene	C_2HCl_3	Trichiene
Methyl Chloride	CH_3Cl	MC

We would like to recommend you the below cleaning materials for your stable cleaning condition taking the place of previous materials.

◎Isopropyl Alcohol(IPA) or Water

Cleaning method: One of immersion, ultrasonic or vapor cleaning.

Maximum cleaning time: 5 minutes(Chip type: 2 minutes)

※Do not use AK225AES

Aluminum electrolytic capacitors are easily affeceted by halogen ions,particularly by chloride ions. Excessive amounts of halogen ions,if happened to enter the inside of the capacitors, will give corrosion accidents-rapid capacitance drop and vent open. The extent of corrosion accidents varies with kinds of electrolytes and seal-materials. Therefore, the prevention of halogen ion contamination is the most improtant check point for quality control in our procuction lines. At present, halogenated hydrocarbon-contained organic solvents such as Trichloroethylene, 1,1,1-Trichloroethane, and Freon are used to remove flux from circuit boards.

If electroytic capacitors are cleaned with such solvents,they may gradually penetrate the seal portion and cause the eosion.When using latex-based adhesive on the capacitors rubber end seal for adhesion to a PCB, corrosion may occur depending on the kind of solvent in the adhesive. Select an adhesive as an organic solvent with dissolved polymer that is not halogenated hydrocarbon. Hot air drying is required for eliminating the solvent between the product and the PCB at 50℃~80℃ after coating.

Followings are the penetration path of the halogenated solvent.

① Penetration between the rubber and the aluminum case

② Penetration between the rubber and the lead wire

③ Penetration through the rubber

The inside of the capacitors,the mechanism of corrosion of aluminum electrolytic capacitors by halogen ions can be explainedas follows:

Halides(RX) are absorbed and diffused into the seal portion. The halides then enter the inside of the capacitors and contact with the electrolyte of the capacitors. Where by halogen ions are made free by a hydrolysis with water in the electrolyte:

$$RX + H_2O \rightarrow ROH + H^+ + X^-$$

The halogen ions (X^-) react with the dielectric substance(Al_2O_3) of aluminum electrolytic capacitors:

$$Al_2O_3 + 6H^+ + 6X^- \rightarrow 2ALX_3 + 3H_2O$$

AlX_3 is dissociated with water:

$$ALX_3 + 3H_2O \rightarrow AL(OH)_3 + 3H^+ + 3X^-$$

※MANUFACTURING SITE

- SamYoung Electronics Co.,Ltd.(Korea/China)