RoHS

MESSRS: 上海盈虹电子	APPROVAL NO	697 - 040
	DATE	2018.05.08

ALUMINUM ELECTROLYTIC

CAPACITOR

APPROVAL SHEET

CATALOG TYPE	NXB 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 长孔硕

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

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Specifications of NXB Series

Item	Characteristics
Rated Voltage Range	6.3 ~ 120 VDC
Operating Temperature Range	- 40 ~ + 105 ℃
Capacitance Tolerance	±20% <M> (at 20℃ ,120Hz)
Leakage Current (at 20 ℃,2 minutes)	I = 0.01CV(μA) or 3 μA,whichever is greater Where,I：Max.Leakage current(μA),C： Nominal capacitance（μF ） V：Rated Voltage（VDC）

Dissipation Factor (TANδ) (at 20℃，120Hz)

Rated voltage(VDC)	6.3	10	16	25	35	50	63	100~120
TANδ(Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08

※ When the Capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.

Temperature Characteristics (Max.Impedance ratio)

Z(-25℃) / Z(20℃)	2
Z(-40℃) / Z(20℃)	3

(at120Hz)

Load Life

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

Capacitance change :≤± 25% of the initial Value

TANδ :≤200% of the initial specified value

Leakage current :≤ The initial specified value

Case Size (ΦD)	Life Time
Φ5, 6.3	2,000 hours
Φ8	3,000 hours
Φ10	4,000 hours
Φ12.5 ~	5,000 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.

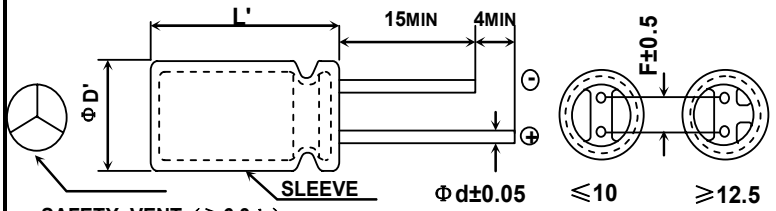
Capacitance change :≤± 25% of the initial Value

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

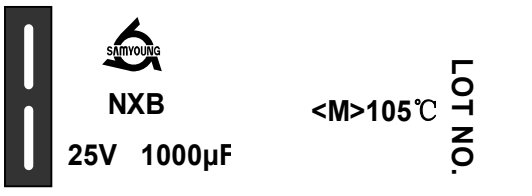


SAFETY VENT（≥6.3φ）

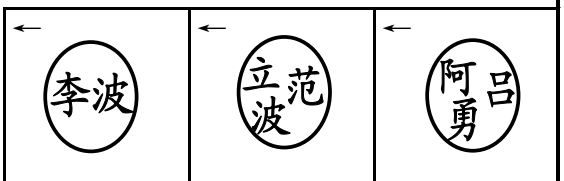
ΦD	5	6.3	8	10	12.5	16	18
Φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ΦD'	ΦD+0.5max						
L'	L+1.5max		L+2.0max				

※Φ10x12L,L'≦L+1.5

B.MARKING: DARK BROWN SLEEVE, SILVER INK



FRONT VIEW OF CAPACITOR BACK VIEW OF CAPACITOR



ALUMINUM ELECTROLYTIC CAPACITOR

APPROVAL NO.
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RATINGS OF NXB Series

VDC / ΦD×L	6.3 WV			10 WV			16 WV			25 WV		
	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE
5×11				100	0.30	250	10	2.00	60	10	1.50	110
	220	0.30	250				47	0.35	150	22	1.50	110
							100	0.30	250	47	0.30	200
				150	0.30	250				68	0.30	250
6.3×11				220	0.30	290	100	0.15	385	100	0.15	330
	470	0.13	405	330	0.13	405	220	0.13	405	150	0.13	405
				470	0.13	405						
6.3×15	560	0.10	646	470	0.10	646	330	0.10	646	220	0.10	646
8×11.5				330	0.094	600	330	0.072	760			
	820	0.072	760	470	0.072	760	470	0.072	760	220	0.072	760
	1000	0.072	760	680	0.072	760				330	0.072	760
8×15	1200	0.060	818	1000	0.060	818	680	0.060	818	390	0.060	818
										470	0.060	818
8×20										560	0.050	1260
	1500	0.050	1260	1200	0.050	1260	1000	0.050	1260	680	0.050	1260
10×12.5	1200	0.053	1360	820	0.053	1360	680	0.053	1030	330	0.053	1360
				1000	0.053	1360				470	0.053	1360
10×16	1500	0.050	1100	1000	0.038	1430	1000	0.038	1430	470	0.038	1430
	1800	0.038	1430	1500	0.038	1430				680	0.038	1430
10×20	2200	0.023	1820	1500	0.023	1820	1000	0.023	1820	680	0.023	1820
				2200	0.023	1820	1500	0.023	1820	820	0.023	2000
										1000	0.025	1900
10×25							1800	0.022	2150			
	3300	0.022	2150	2200	0.022	2150	2200	0.022	2150	1000	0.022	2150
12.5×16	1800	0.031	1452	1500	0.031	1452	1000	0.031	1452	680	0.031	1452
12.5×20				2200	0.021	2360				1000	0.021	1800
	3900	0.021	2360	3300	0.021	2360	2200	0.021	2360	1500	0.021	2360
12.5×25	4700	0.020	2770	3300	0.021	2530	2200	0.021	2360	1800	0.020	2770
				3900	0.020	2770	2700	0.020	2770	2200	0.020	3000
12.5×30	5600	0.018	3290	4700	0.018	3290	3300	0.018	3290	2200	0.018	3290
12.5×35	6800	0.017	3400	5600	0.017	3400	3900	0.017	3400	2700	0.017	3400
16×15	2700	0.040	1375	1800	0.040	1375	1200	0.040	1375	820	0.040	1375
16×20	5600	0.021	3140	4700	0.021	3140	3300	0.021	3140	2200	0.021	3140
16×25	6800	0.019	3460	5600	0.019	3460	4700	0.019	3460	3300	0.019	3460
16×31.5												
	8200	0.013	3680	6800	0.013	3680	5600	0.013	3680	3300	0.013	3680
18×20	5600	0.020	3265	4700	0.023	2826	3300	0.023	2826	2200	0.023	2860
18×25	8200	0.018	3611	5600	0.018	3611	3900	0.018	3611	2700	0.018	3611

VDC / ΦD×L	35 WV			50 WV			63 WV			100 WV			120 WV		
	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE
5×11	47	0.3	250	1	2.50	53	10	0.45	165	3.3	2.00	125			
				2.2	2.50	56									
				3.3	2.50	69									
				4.7	1.50	82									
				10	1.00	250									
				22	0.30	250									
				27	0.30	250				4.7	2.00	125			
6.3×11				4.7	1.50	82									
				47	0.14	350									
	100	0.13	405	56	0.14	385	33	0.300	265	10	0.50	205			
6.3×15	150	0.10	646	100	0.10	646	47	0.250	420	22	0.40	300			
8×11.5	150	0.072	760	68	0.10	646	47	0.200	500	22	0.30	355	22	0.3	472
	220	0.072	760	100	0.072	724	68	0.200	500						
8×15	270	0.060	818	120	0.060	818									
8×20	390	0.050	1260	180	0.050	1260									
10×12													33	0.25	599
10×12.5	220	0.053	1360	150	0.061	979				33	0.25	450	33	0.25	599
	330	0.053	1360	220	0.061	979	68	0.160	600	47	0.25	450			
10×16	330	0.050	1050	220	0.042	1370				47	0.20	580	47	0.2	771
	470	0.038	1430	330	0.042	1370	100	0.100	945	68	0.20	580			
10×20	470	0.023	1820				150	0.080	1100						
	560	0.023	1820	330	0.030	1580	220	0.080	1100						
	680	0.023	1820	470	0.030	1580	330	0.080	1100						
10×25	680	0.022	2150										68	0.2	950
	1000	0.022	2150	470	0.028	1870	220	0.070	1300						
12.5×16	470	0.031	1452	270	0.042	1071									
	560	0.031	1452	470	0.042	1071									
12.5×20	1000	0.021	2360	470	0.027	2050	330	0.040	1495	100	0.10	1045			
							470	0.040	1495						
12.5×25	1000	0.020	2770	560	0.023	2410	470	0.035	1690				120	0.07	1589
	1200	0.020	2770	680	0.023	2410				150	0.070	1195	150	0.07	1589
	1500	0.020	2770	820	0.023	2410									
12.5×30	1500	0.018	3290	680	0.021	2860	470	0.035	1800						
				820	0.021	2860	680	0.035	2100						
12.5×35	1800	0.017	3400	820	0.019	2960									
16×15	560	0.040	1375	390	0.046	1196									
16×20	1500	0.021	3140	820	0.023	2730	470	0.035	1990						
				1000	0.023	2730									
16×25	1500	0.025	3160							220	0.060	1600	220	0.06	2128
	1800	0.019	3460				680	0.030	2780						
	2200	0.019	3460	1000	0.021	3010	1000	0.030	2780						
16×31.5	2200	0.013	3680	1500	0.014	3201	820	0.028	2800	330	0.040	1750	270	0.04	2328
										470	0.040	1750			
16×35.5							1000	0.020	2835						
18×20	1500	0.023	2860	1000	0.022	2850	680	0.030	2780						
18×25	1800	0.018	3611	1200	0.020	3140									
18×35.5				2200	0.020	3300									
18×40	4700	0.018	4600	3300	0.020	3350				820	0.030	2060	560	0.036	2740
18×45				4700	0.020	3400									

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

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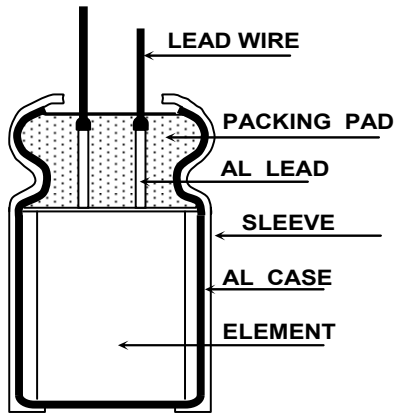
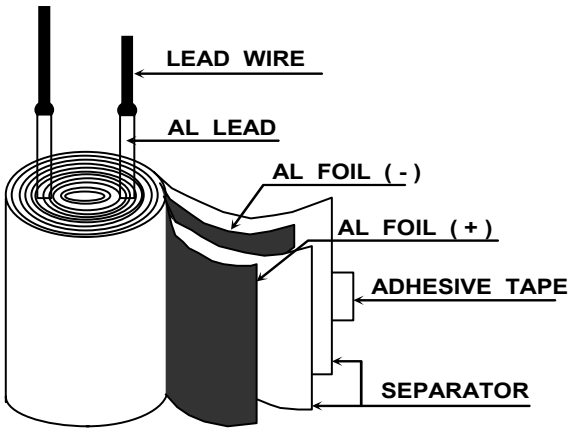
STRUCTURE AND MATERIALS





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)	2	4	6.3	10	16	25	35	50	63	80	100	160	200	250	315	350	400	450	500
Rated Surge Voltage(V)	2.5	5	8	13	20	32	44	63	79	100	125	200	250	300	365	400	450	500	550

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)

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LXY50VB4.7M-5X11 RFO-100V471MJ7P# ECE-A1EGE220 B41041A2687M8 B41041A7226M8 B41044A7157M6 EKXG201EC3101ML20S EKZM160ETD471MHB5D NCD681K10KVY5PF NEV1000M25EF-BULK NEV100M35DC NEV100M63DE NEV220M25DD-BULK NEV.33M100AA NEV4700M50HB NEV.47M100AA NEVH1.0M250AB NEVH3.3M250BB NEVH3.3M450CC KM4700/16 KME50VB100M-8X11.5 SG220M1CSA-0407 ES5107M016AE1DA ESMG160ETD102MJ16S ESX472M16B SZ010M1500A5S-1015 227RZS050M 476CKH100MSA 477RZS050M UVX1V101KPA1FA UVX1V222MHA1CA KME25VB100M-6.3X11 VTL100S10 VTL470S10 VTL470S16A 511D336M250EK5D 052687X ECE-A1CF471 EKMA500ELL4R7ME07D NRE-S560M16V6.3X7TBSTF RGA221M1CTA-0611G ERZA630VHN182UP54N UPL1A331MPH SK035M0100AZS-0611 NEV1000M6.3DE NEV100M16CB NEV100M50DD-BULK NEV2200M16FF NEV220M50EE NEV2.2M50AA