RoHS

MESSRS:	APPROVAL NO	296-028
	DATE	2014.01.13

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 长孔硕

USER APPROVAL:

APPROVAL NO.:

SamYoung(Korea) : 146-1,SANGDAEWON-DONG,JOONGWON-GU,SUNGNAM-CITY,KYUNGKI-DO,KOREA

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

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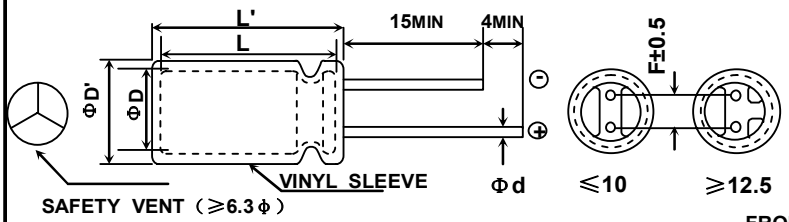
Specifications of NXH Series

Item	Characteristics
Rated Voltage Range	6.3 ~ 50 V_{DC}
Operating Temperature Range	- 40 ~ + 105 ℃
Capacitance Tolerance	±20% <M> (at 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) (at 20℃，120Hz)	Rated voltage(V_{DC}) 6.3 / 10 / 16 / 25 / 35 / 50 TANδ(Max) 0.22 / 0.19 / 0.16 / 0.14 / 0.12 / 0.10 ※ 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 (at 120Hz)
Load Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied with the rated ripple current at 105℃ for the following test time. Capacitance change :≤± 30% the of initial Value (6.3 ~ 10V_{DC}) Capacitance change :≤± 25% the of initial Value(16 ~ 50V_{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 ~ 50VDC) TANδ :≤200% of the initial specified value Leakage current :≤The initial specified value
Others	Satisfies characteristic **W of KS C 6421**

A.DIAGRAM OF DIMENSION

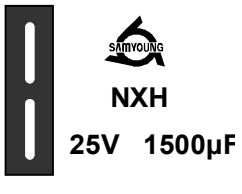


When ΦD≤8,ΦD'≤ΦD+0.5,and L'≤L+1.5

When ΦD＞8,ΦD'≤ΦD+0.5,and L'≤L+2.0

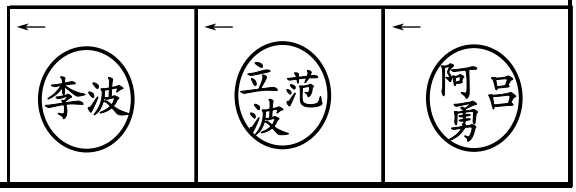
ΦD	5	6.3	8	10	12.5	16	18
Φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5

B.MARKING:WITH YELLOW SLEEVE, BLACK INK



FRONT VIEW OF CAPACITOR

BACK VIEW OF CAPACITOR



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RATINGS OF NXH Series

VDC / ΦD×L	6.3			10			16		
	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
5×15	470	0.13	480	330	0.13	480	220	0.13	480
6.3×11	470	0.094	540	330	0.094	540	220	0.094	540
6.3×15	560	0.084	620	470	0.084	620	330	0.084	620
8×11.5	820	0.056	945	680	0.056	945	470	0.056	945
8×15	1200	0.045	1250	1000	0.045	1250	680	0.045	1250
8×20	1500	0.029	1500	1500	0.029	1500	1000	0.029	1500
10×12.5	1200	0.039	1330	1000	0.039	1330	680	0.039	1330
10×16	1800	0.028	1760	1500	0.028	1760	1000	0.028	1760
10×20	2200	0.020	1960	1800	0.020	1960	1500	0.020	1960
10×25	2700	0.018	2250	2200	0.018	2250	1800	0.018	2250
10×33	3300	0.015	2550	2700	0.015	2550	2200	0.015	2550
12.5×20	3900	0.017	2480	3300	0.017	2480	2200	0.017	2480
12.5×25	4700	0.015	2900	3900	0.015	2900	2700	0.015	2900
12.5×30	5600	0.013	3450	4700	0.013	3450	3300	0.013	3450
12.5×35	6800	0.012	3570	5600	0.012	3570	3900	0.012	3570
16×20	6800	0.015	3250	4700	0.015	3250	3300	0.015	3250
16×25	8200	0.013	3630	6800	0.013	3630	4700	0.013	3630
18×25	10000	0.012	3650	8200	0.012	3650	5600	0.012	3650

VDC / ΦD×L	25			35			50		
	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE	CAP.(μF)	IMP.	RIPPLE
5×11	68	0.22	345	33	0.3	250	2.2	2.5	120
				47	0.22	345	4.7	2.5	120
							10	1.0	145
							22	0.40	195
							27	0.34	238
5×15	150	0.13	480	100	0.13	480	56	0.16	350
6.3×11				100	0.094	540	33	0.20	320
	100	0.094	540				47	0.14	450
	150	0.094	540				56	0.14	450
6.3×15	220	0.084	620	150	0.084	620	100	0.12	586
8×11.5							68	0.10	646
	330	0.056	945	220	0.056	945	100	0.074	724
8×15	390	0.045	1250	270	0.045	1250	120	0.061	950
	470	0.045	1330						
8×20				390	0.029	1500			
	560	0.029	1500	470	0.029	1600	180	0.046	1190
10×12.5	470	0.039	1330	330	0.039	1330	150	0.061	979
10×16	680	0.028	1760	470	0.028	1760	220	0.042	1370
							330	0.042	1370
10×20	820	0.020	1960	560	0.020	1960	270	0.030	1580
	1000	0.020	1960	680	0.025	1850			
10×25	1000	0.018	2250	680	0.018	2250	330	0.028	1870
10×33	1200	0.015	2550	1000	0.015	2550	470	0.025	2110
12.5×20	1000	0.018	2500	1000	0.017	2480	470	0.027	2050
	1500	0.017	2550						
12.5×25	1800	0.015	2900	1200	0.015	2900	560	0.023	2410
12.5×30	2200	0.013	3450	1500	0.013	3450	680	0.021	2860
12.5×35	2700	0.012	3570	1800	0.012	3570	820	0.019	2960
16×20	2200	0.015	3250	1500	0.015	3250	820	0.023	2730
	2700	0.015	3250				1000	0.023	2730
16×25	3300	0.013	3630	2200	0.013	3630	1000	0.021	3010
18×25	3900	0.012	3650	2700	0.012	3650	1500	0.019	3290

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

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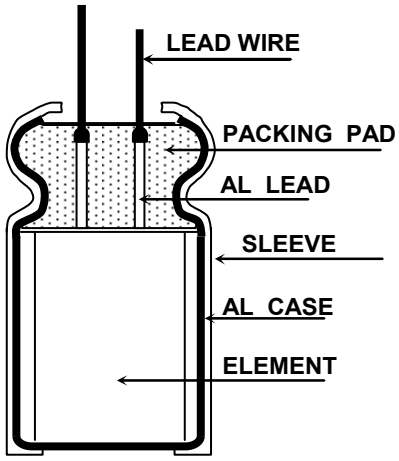
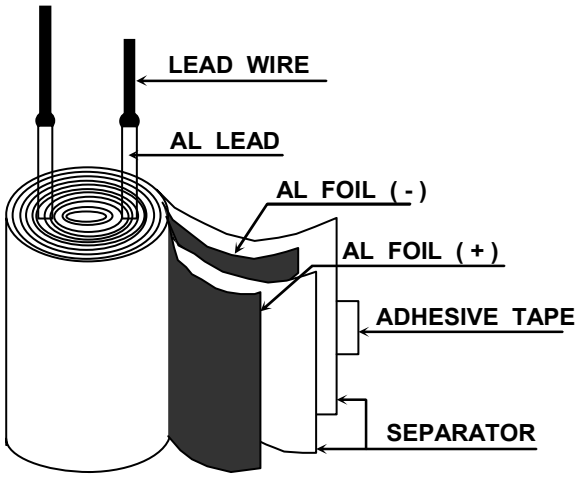
STRUCTURE AND MATERIALS





CE04 TYPE

*MINIATURE SIZED TYPE CAPACITORS COMPONENT

PART NAME	MATERIALS	VENDER	
LEAD WIRE	TINNED COPPER - PLY WIRE(Pb-FREE)	KISTRON	(KOREA)
		JIANG SU HONG YANG	(CHINA)
AL LEAD	ALUMINUM 99.92 % OVER	KANG WON AUTO FITTING	(CHINA)
		NAN TONG HUI FENG	(CHINA)
		JIANG SU HONG YANG	(CHINA)
		KISTRON	(KOREA)
PACKING PAD	SYNTHETIC RUBBER OR BAKE PAD	SUNG NAM	(KOREA/CHINA)
		ZHE JIANG TIAN TAI	(CHINA)
		ZHE JIANG TIAN HUA	
SLEEVE	P.E.T(Poly Ethlylene Terephthalate Resin)	MOO DEUNG	(KOREA/CHINA)
		YUN LIN PLASTIC	(CHINA)
AL CASE	ALUMINUM 99.0 % OVER	ZHANG JIA GANG LIAN YI	(CHINA)
		LIN AN AO XING	(CHINA)
		D.N TECH	(KOREA/CHINA)
AL FOIL ⊕	FORMED ALUMINUM 99.9 % OVER	K.D.K	(JAPAN)
		SAM YOUNG	(KOREA)
		HUAFENG / HISTAR / HAIYI	(CHINA)
AL FOIL ⊖	ETCHED ALUMINUM 98.0 % OVER	K-JCC	(KOREA)
		WU JIANG FEILO	(CHINA)
		K.D.K	(JAPAN)
		ELECON	(CHINA)
SEPARATOR	INSULATION PAPER	KAN	(CHINA)
		N.K.K	(JAPAN)
ADHESIVE TAPE	POLY PROPYLENE FILM	DAI IL	(KOREA)

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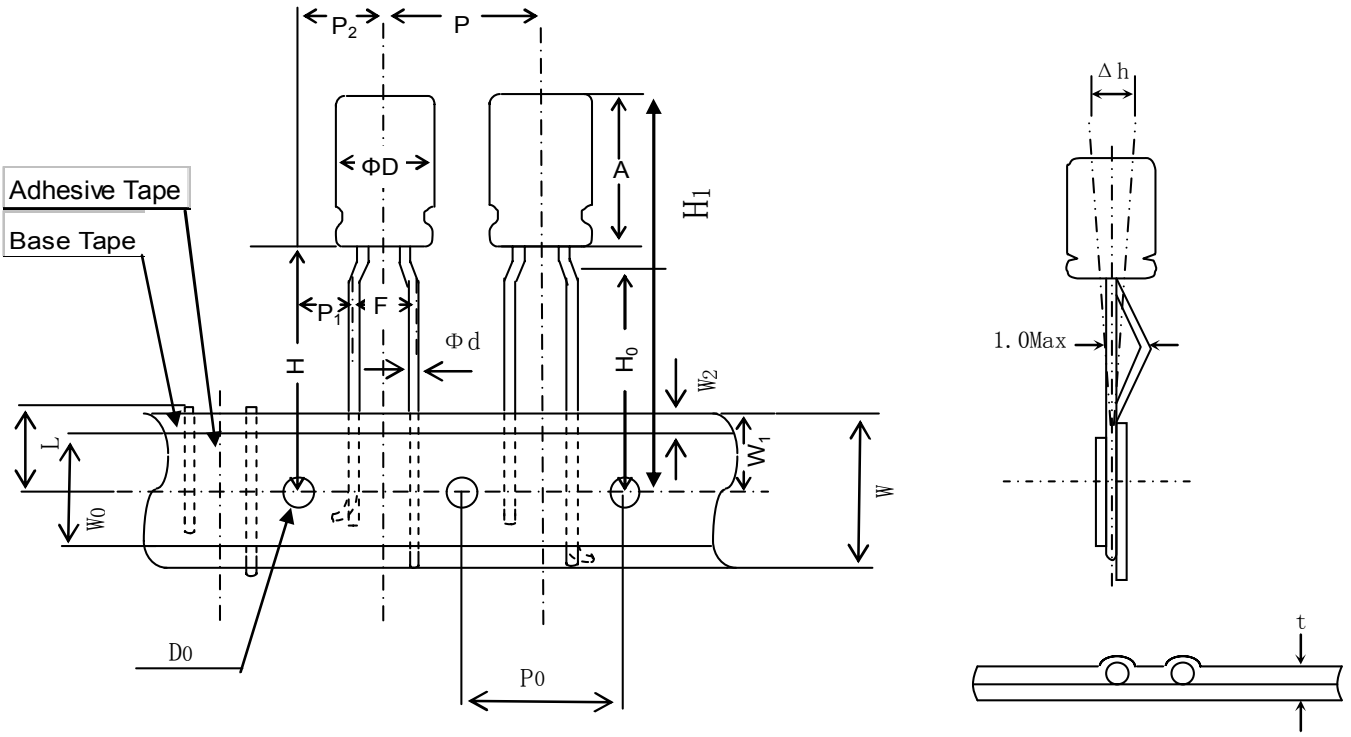
Taping Dimensions：5.0mm T/P (8.0Φ*11.5L)



Items	Dimensions	Tolerance	Remarks
ΦD	8	±0.5	
A	13.0 Max	-	
Φd	0.6	±0.05	
P	12.7	±1.0	
Po	12.7	±0.2	Cumulative pitch error : 1mm/20pitch
P_1	3.85	±0.7	To be measured at bottom of clinch
P_2	6.35	±1.0	
F	5.0	$^{+0.8}_{-0.2}$	
△h	0	±2.0	
W	18.0	±0.5	
W_0	10Min	-	
W_1	9.0	±0.5	
W_2	1.5 Max	-	Not to protrude over base tape
H	18.5	±0.75	
H_0	16.0	±0.5	
H_1	H+A	-	check insertion machine specs
D_0	4.0	±0.2	
t	0.7	±0.2	
L	11.0Max	-	

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 C6035 KS C6421(JIS C5102,JIS C5141)

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 C6421,the test shall be conducted 1000 cycles at room temperature for the capacitors of characteristic W of KS C6421 or at the maximum operating temperature for the capacitors of characteristics B and C of KS C6421 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 C6421.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 6035, KS C 6421， (JIS C 5102，JIS C 5141)

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. Therefore, for ordinary capacitors, the cleaning materials of alcohol system had to be used. However, the solvent proof type capacitors of Samyoung Elec. Can withstand cleaning by some halogenated solvents shown:

(rated voltage≤100 V_{DC} only)

*** FREON TE® OR TES®**

Cleaning method: One of immersion, ultrasonic or vap or cleaning.
Maximum cleaning time: 5 minutes(where, KRE,SRM is 2 minutes)

*** 1,1,1-Trichlorethane**

Cleaning method: immersion cleaning at the normal temperature
Maximum cleaning time: 5 minutes(where, KRE,SRM is not assured)

— Caution —

* When the lead space of the capacitor is different from the hole space of the PC board to be mounted , use the lead forming type capacitor to prevent stress on seal.
* Consult for flux to be used and other cleaning conditions.
(Freon TE and TES are registered trademarks of Dupont,Inc.)

*** Influence of cleaning solvent for aluminum electrolytic capacitor.**

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. However, if general types of aluminum electroytic capacitors,whose seal constructions are not solvent-proof, are cleaned with such solvents, the solvents may gradually penetrate the seal portion and erode. The inside of the capacitors.

The mechanism of corrosion of aluminum electrolytic capacitors by halogen ions can be explained as 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:

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

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