

CUSTOMER MODEL NO. / TITLE  
REMOTE CONTROL

SPECIFICATION NO.  
WR730-RaySat



## YUWON ELECTRONICS

### SPECIFICATION FOR APPROVAL

#### REMOCON ASS'Y

SPEC' NO YWM-SFA-0147

DATE 2008. 12/07

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### ※ SPECIFICATION FOR APPROVAL

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\* Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CUSTOMER MODEL NO. / TITLE REMOTE CONTROL	SPECIFICATION NO. WR730-RaySat					
<b>1. Scope</b>						
This specification is applied to the specified RF(Radio Frequency) remote control unit.						
<b>2. Appearance and structure</b>						
2-1 Appearance Appearance shall comply with the specified sample, if any.						
2-1-1 The specification shall comply with the applicable drawing, and also there shall be no remarkable irregular color, warp, sink mark, flash scratch, deformation and dirt on the body.						
2-1-2 Color and form of characters shall comply with the artwork or color samples.						
2-1-3 All printing shall be made clearly without any blot.						
2-2 Dimensions and structure Dimensions and structure shall comply with the applicable drawing.						
<b>3. Components and materials</b> Components and materials shall comply with the applicable drawing. Please see following table:						
WR730 RaySat RCU material list :						
Item	Ref no.	Description	Part number or material	Q' ty	DELIVERY	NOTE
1		PCB	YEPBAF017F	1	30DAY	
2		IC	ATmega88v-10mu32	1	70DAY	
3		RF	Nrf24l01	1	84DAY	
4		DC/DC	S-8351A30	1	30DAY	
5		ANT	CHIP ANT	1	30DAY	
6		LED	CHIP RED LED	2	30DAY	
7		CHIP DIODE	SS14	1	30DAY	
8		CRYSTAL	8M	1	30DAY	
9		CRYSTAL	16M	1	30DAY	
10		CHIP C/CAP	104. 50V	5	30DAY	

#### 4. Characteristics

4-1 Measurement Voltage : 3 Volt.

4-2 Measurement Temperature :  $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$   
TEST  $20^{\circ}\text{C} \sim 80^{\circ}\text{C}$

4-3 Measurement humidity :  $65\% \pm 10\%$

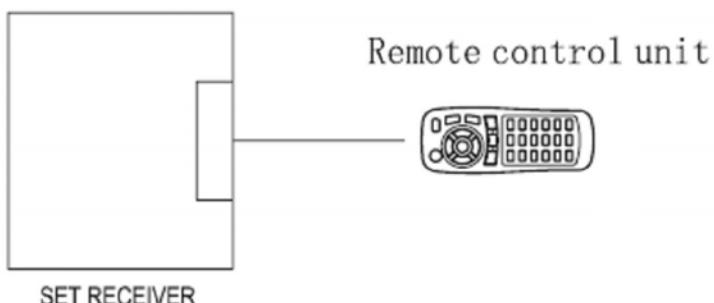
4-4 Resonator : 8MHZ

4-5 Operational Frequency : 2.4GHZ

4-6 Distance & direction :

4-6-1 Horizontal (Battery voltage: 3 volt)

Distance: More than 15 M.



4-8. Operating Voltage range : 1.9 V ~ 3.6 V

4-9. Storage Temperature : 20 years at  $85^{\circ}\text{C}$  / 100 years at  $25^{\circ}\text{C}$

4-10. Operating Temperature : -20 to + 50

4-11. RF Output power : 0 dBm

4-11-1. Modulation Method : GFSK.

4-11-2. Channel : 6 CH

CH1:2.402GHz CH2:2.415GHz CH3:2.428GHz  
CH4:2.442GHz CH5:2.458GHz CH6:2.473GHz

4-12 Function test

4-12-1. Pairing test : ok

4-12-2. Key test : ok

4-13-3. HW Reset function test : ok

4-13-4. Pairing stationay function test : ok

4-13. Key press test : The normal condition time( 6 Hour)

4-13.1. Transmitter, Reciver stability : 3 Day

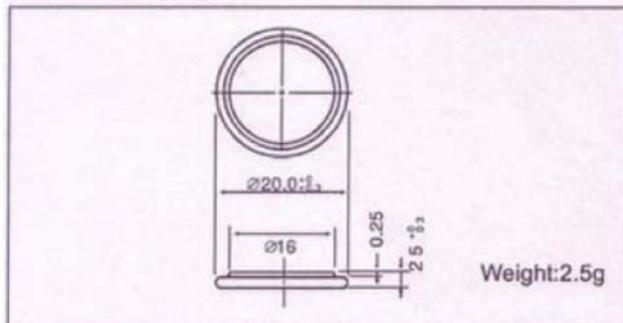
#### 4-14. Battery (CR2025)

4-14 -1. 5 month based on 250 presses a day.

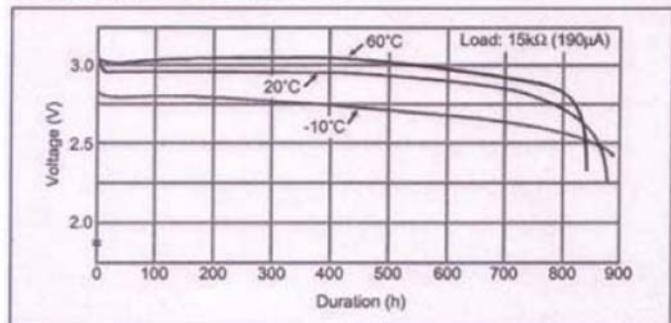
#### Specification

Nominal voltage(V)	3
Nominal capacity(mAh)	165
Continuous standard Ioda(mA)	0.2
Operating temperature(°C)	-30 ~ +60

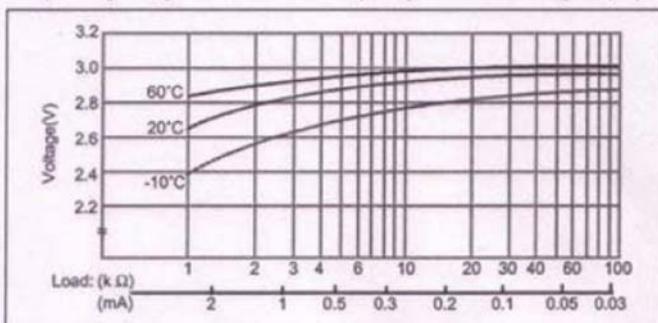
##### ■ Dimensions(mm)



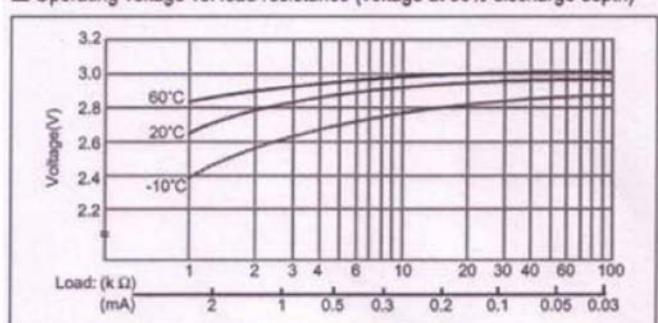
##### ■ Temperature Characteristics



##### ■ Operating voltage vs. load resistance (voltage at 50% discharge depth)



##### ■ Operating voltage vs. load resistance (voltage at 50% discharge depth)



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## 5. UART PROTOCOL

### ◎ Structure of Protocol between RF module and Main CPU

- Size of transfer packet : 6 byte

Start Code :1byte	Command :1byte	DATA :2byte	Checksum :1byte	End Code 1byte
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Start Code : RF MODULE => CPU(0xF6)  
 Command : 0xC0  
 Checksum : Command + DATA  
 End Code : RF MODULE => CPU(0x6F)  
 Repeat code : 300 ms  
 Date byte : First key(0xD1 + key code value{1byte}) , Repeat key(0xD7 + key code value)

### ◎ Structure of Protocol between remocon and RF MODULE

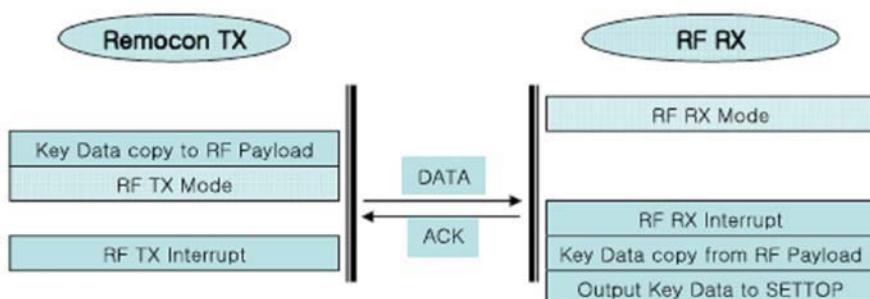
Preamble :1byte	Address :5byte	Packet Control Field :9bit	Start Code :1byte	Command :1byte	DATA :2byte	End Code :1byte	CRC :2byte
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### ◎ UART SET

Properties	Setting Value
Baud Rate	9600bps
Data Bits	8 Bits
Stop Bits	1 Bit
Parity	No
Flow Control	None

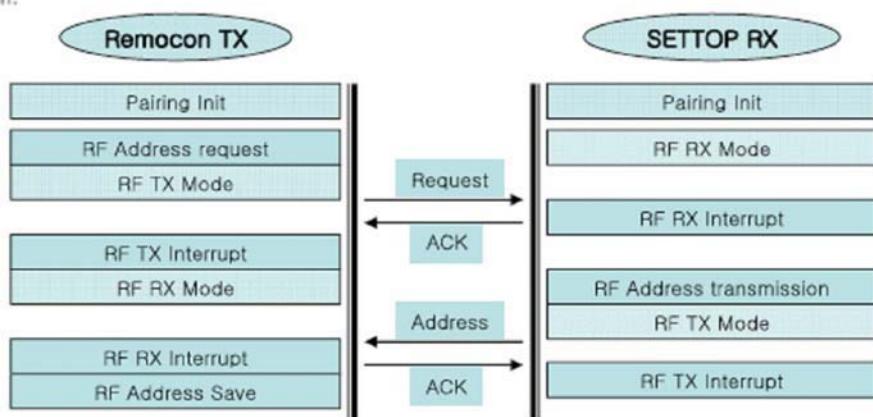
### ◎ REMOCON Module ↔ RF Reciver module

1. Data transmission.



### ◎ Remocon ↔ Receiver(Pairing)

1. RF Address transmission.



## 6. RCU CODESHEET

## ◎ Remocon Operation(Pairing)



## TOP CASE COLOR

■ BLACK

## TOP CASE PRINT COLOR

■ WHITE

■ PANTONE 2995 C

■ PANTONE COOL GRAY 9C

## BOT CASE&amp;BATTERY VOLOR

■ BLACK

## RUBBER BUTTON FORMING COLOR

■ PANTONE 186C

■ PANTONE GREENC

■ PANTONE BLUE 072C

■ PANTONE COOL GRAY 9C

■ WHITE

■ WHITE CLEAR

## RUBBER BUTTON PRINT COLOR

■ PANTONE 186C

■ WHITE

■ BLACK

■ PANTONE 2995 C

## DECO PLATE COLOR

■ BLACK

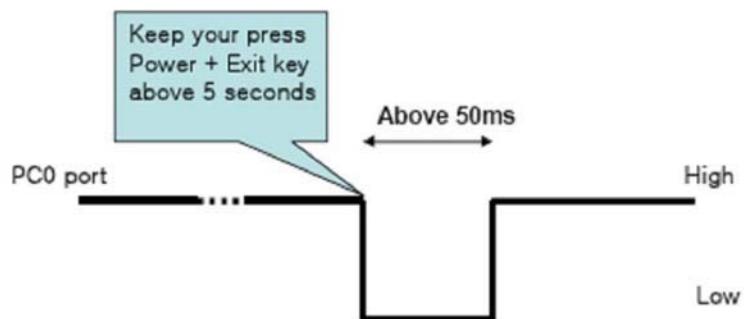
# Within 5 seconds operation completion after power on

1. POWER + Mute press on 2 Seconds
2. Remocon LED ON (The Power button has LED)
3. RF Address Request send
4. RF RX(SET top box) module send ACK to remocon
5. RF RX(SET top box) module send RF Address to remocon
6. Remocon send ACK to RF RX
7. Remocond led on/off display 2 times.

## ◎ Remocon code value

Key name	Code value	Key name	Code Value
POWER	0x10	GUIDE	0x20
TV / Radio	0x11	BACK	0x21
UP	0x12	INFO	0x22
DOWN	0x13	0	0x30
LEFT	0x14	1	0x31
RIGHT	0x15	2	0x32
OK	0x16	3	0x33
CH +	0x17	4	0x34
CH -	0x18	5	0x35
VOL +	0x19	6	0x36
VOL -	0x1A	7	0x37
MUTE	0x1B	8	0x38
RED	0x1C	9	0x39
BLUE	0x1D	MENU	0x3A
GREEN	0x1E	EXIT	0x3B
Guide + info	0x3E	Mute + 5	0x3C
		Power + Exit	0x3D

## ◎ HW Reset function



## ◎ pairing stationary function

.if PB2 port is logic low, pairing function is stop

## 7. RCU SPECIFICATION

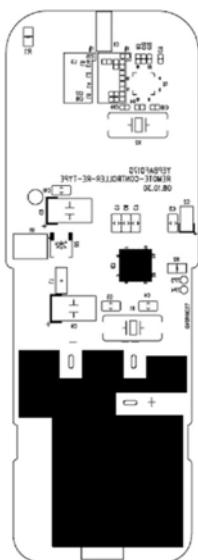
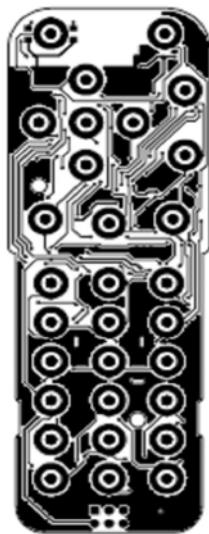


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## 8. REMOCON TEST DATA

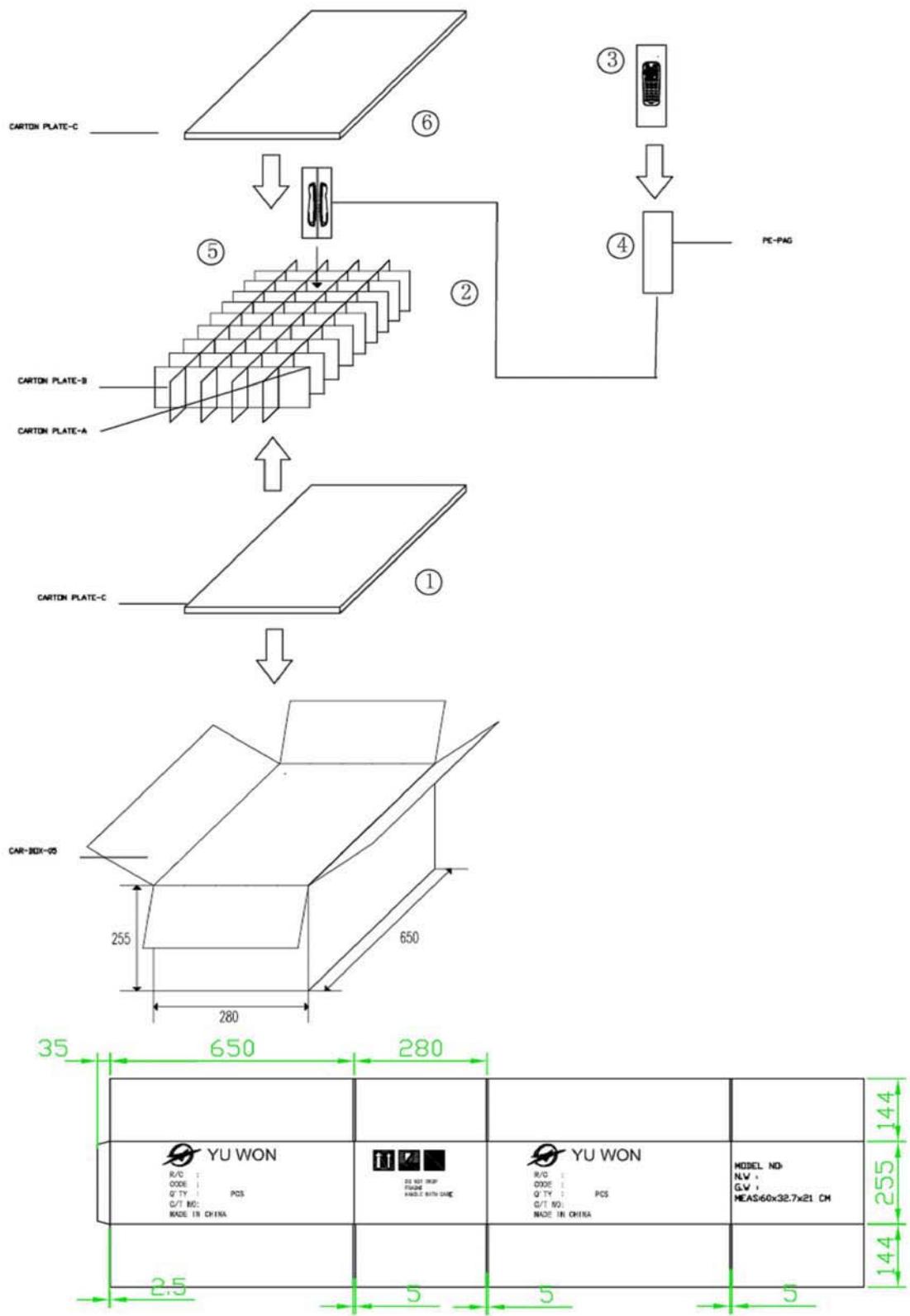
ITEM	MODEL NAME		DATE		TEST Q'TY		TEST VOLTAGE		
RCU	WR730 RaySat		2008.12.05				DC 3V		
TEST	TEST NAME	SPEC	TEST RESULT					OK/NG	NOTE
			SPL1	SPL2	SPL3	SPL4	SPL5		
ELECTRICAL	DISTANCE(M)	10M ↑	15	13	13	14	15		OK
	ACTION VOLTAGE	DC 2.2V MAX	1.9	2	1.9	1.9	2		OK
	HIGH VOLTAGE(V)	4.5V ↓	4.5	4.5	4.5	4.5	4.5		OK
	LOW VOLTAGE(V)	2.3V ↓	OK	OK	OK	OK	OK		OK
	CUNSUME CURRENT(uA)	20uA ↓	15	17	14	16	15		OK
	ACTION VOLTAGE(mA)	40mA ↓	15	17	16	16	17		OK
	ACTION FREQUENCY	INPUT	8MHz	8MHz	8MHz	8MHz	8MHz		OK
	VOLTAGE LEVEL(V)	OUTPUT	3	3	3	3	3		OK
	RIPPLE VOLTAGE								
	BACK UP								
NOTE									
NAME	PCB P/NO	RESONAOR							
	YEPBAF017G								
NOTE									
RESULT	OK <input checked="" type="checkbox"/>				NG <input type="checkbox"/>				

## 9. PCB ASS'Y



Seq.	PCB	location	Part Name	Part No.	Qty.
1			PCB	YEPBAF017F	1
2	IC1		IC	ATmega88v-32M1-A	1
3	J2		RF	Nrf24l01	1
4	U1		IC	S-8351A30	1
5	ANT		ANT	CHIP ANT	1
6	D1.3		LED	CHIP RED LED	2
	D2		CHIP DIODE	B140	1
7	X1		CRYSTAL	8M	1
8	X2		CRYSTAL	16M	1
9	C1.3.6.7.10		CHIP C/CAP	104.50V	5
12	C2		CHIP TANTAL	10uF.6.3V	1
13	C8.9		CHIP TANTAL	220uF.6.3V	2
	C4.5		CHIP C/CAP	20pF.50V	2
14	C11		CHIP C/CAP	33nF.50V	1
15	C12		CHIP C/CAP	10nF.50V	1
16	C13		CHIP C/CAP	1nF.50V	1
17	C14		CHIP C/CAP	1.0pF.50V	1
18	C16		CHIP C/CAP	2.2nF.50V	1
19	C17		CHIP C/CAP	4.7pF.50V	1
	C18.19		CHIP C/CAP	20pF.50V	2
20	R1		CHIP RESISTOR	330 ohm 1/10W	1
21	R2		CHIP RESISTOR	10K 1/10W	1
22	R3		CHIP RESISTOR	22K 1/10W	1
23	R4		CHIP RESISTOR	1M 1/10W	1
24	L1		COIL INDUCTOR CHIP	100uH	1
26	L2		COIL INDUCTOR CHIP	3.9nH	1
27	L3		COIL INDUCTOR CHIP	3.3nH	1
25	L4		COIL INDUCTOR CHIP	4.7nH	1
24	L5.1.6		COIL INDUCTOR CHIP	5.6nH	2
29	J1		CN	2.54 Pin X 6	1

## 10. BOX PACKING



## 有元电子(惠州)有限公司RoHS履历表

Class Name		Remote controller		Contact Person		Jhgpark		Writed	Checked	Approved					
Part No.	Remote controller	TEL/FAX		0752-3868850/0752-3868852											
Maker Part No	Yu Won Electronics (HuiZhou) Co.,Ltd.	E-mail Address		jhgpark@yuwonelec.com		Kuangyy		Jhgpark							
Maker Name	Remote controller	Date		2008.11.20											
1. 原材料组成表(Raw material list):															
No.	Material Name	Material Type	1st Vendor	2nd Vendor	RoHS Test Data (ppm=mg/kg)						Test Date	Access ory	Remarks		
					Cd	Pb	Hg	Cr6+	PBB	PBDE				Report No.	
1	Case	색분	WANDELING	RAINBOW	0	0	0	0	0	1436660	2008-02-26	(1)			
		(ABS)	MINGHUI		0	0	0	0	0	F690501/LF-CTSAYA07-29023	2008-01-03	(2)			
		printing ink	WANDELING		0	0	0	0	<50	GZ0610153493/CHEM	2008-05-14	(3)			
		printing	WANDELING	MEITIAN	0	0	0	0	0	GZ0705074439/CHEM	2008-03-31	(4)			
2	PCB	FR4	BenLiDa							SHR07122930306001C	2007.12.29	(5)			
		HT-50	BenLiDa							CAENC0801142702	2008.05.28	(6)			
		ZIW-305	BenLiDa		0	0	0	0	0	CANEC0802521703	2008.05.26	(7)			
3	Led Free Solder Wire	혼합물	BoHui		0	149	0	0	0	CANEC0800413505	2008-02-27	(8)			
4	CHIP CAP	NFO	FeiYu	HUAWEI	0	0	0	0	0	FSR0805143879103	2008.05.14	(9)			
		X7R	FeiYu		ND	ND	ND	ND	ND	FSR0805143879101	2008.05.14	(10)			
		Y5V	FeiYu		ND	ND	ND	ND	ND	FSR08051479102	2008.05.14	(11)			
5	CHIP-RESISTOR	혼합물	FeiYu		0	0	0	0	0	GZ0801005488/CHEM	2008-01-15	(12)			
6	LED	혼합물	FeiYu		0	0	0	0	0	CANEC0801988101	2008-04-01	(13)			
7	COIL INDUCTOR CHIP	CHIP BEAD	FeiYu		ND	ND	ND	ND	ND	CE/2008/35879	2008.03.25	(14)			
		EELSIRO	FeiYu		ND	ND	ND	ND	ND	CE/2008/34042	2008.03.19	(15)			
		HELS	FeiYu		ND	ND	ND	ND	ND	CE/2008/34044	2008.03.19	(16)			
		EELS6R8	FeiYu		ND	ND	ND	ND	ND	CE/2008/34045	2008.03.19	(17)			
		EELS DR10	FeiYu		ND	ND	ND	ND	ND	CE/2008/34043	2008.03.19	(18)			
8	CHIP DIODE	혼합물	FeiYu		ND	ND	ND	ND	ND	KA080421-Q	2008.04.03	(19)			
9	BAT	혼합물	AoQiLong		ND	ND	ND	ND	ND	2006/66/EC	2008.07.03	(20)			
10	TANTAL	혼합물	FeiYu	Meiji	ND	ND	ND	ND	ND	CE/2007/A0901	2007.10.11	(21)			
11	Carton Box	cardboard	HuaFeng		0	8	0	0	0	CE/2008/71979	2008-07-16	(22)			
		Binding therad	HuaFeng	BAIYANGSHU	0	0	0	0	0	CANEC0701079801	2008-01-03	(23)			
		youmo	HuaFeng	YINGKE	0	0	0	0	0	CANEC0800358003	2008-02-26	(24)			
12	PE Bag	PE	LongSheng	BAOTHANE	0	0	0	0	0	SH8021729/CHEM	2008-03-01	(25)			
13	메탈돔	3M	JiuXing		ND	ND	ND	ND	ND	CANEC0801058001	2007-12-29	(26)			
		잉크	JiuXing		ND	ND	ND	ND	ND	SZR08032727011001	2008-3-24	(27)			
		PC	JiuXing		ND	ND	ND	ND	ND	SHS128318/CHEM	2008-9-26	(28)			
		메탈돔	JiuXing		ND	ND	ND	ND	ND	CANEC0805877801	2008-10-1	(29)			
		PASSED	JiuXing		ND	ND	ND	ND	ND	SH8032078/CHEM	2008-3-18	(30)			
14	SPRING	혼합물	ZhiCheng		ND	ND	ND	ND	ND	CANE0800330603	2008-2-21	(31)			
15	RUBBER	RUBBER	MILINKING		ND	ND	ND	ND	ND	SH8069034/CHEM	2008-5-29	(32)			
		WHITE INK	MILINKING		ND	ND	ND	ND	ND	CE/2008/37192	2008-3-28	(33)			
		VC-8	MILINKING		ND	ND	ND	ND	ND	GZ0803208767	2008-3-20	(34)			
		HeiLi	MILINKING		ND	ND	ND	ND	ND	CANEC0802638503	2008-6-2	(35)			
		black ink	MILINKING		ND	ND	ND	ND	ND	CE/2008/37188	2008-3-28	(36)			
		red ink	MILINKING		ND	ND	ND	ND	ND	GZ0803032292/CHEM	2008-3-7	(37)			
		C-5A	MILINKING		ND	ND	ND	ND	ND	GZ0801003272/CHEM	2008-1-12	(38)			
		색분	MILINKING		ND	ND	ND	ND	ND	CANEC0801852201	2008-6-19	(39)			
		투명 잉크	MILINKING		ND	ND	ND	ND	ND	CE/2008/37193	2008-3-28	(40)			
		온색 잉크	MILINKING		ND	ND	ND	ND	ND	GZ0803032284/CHEM	2008-3-10	(41)			
		잉크	MILINKING		ND	ND	ND	ND	ND	CANEC0800718101	2008-6-19	(42)			