

APPROVAL SHEET

ITEM	SK Broadband Bluetooth Remote
DESCRIPTION	AI2 sound max
PART NUMBER	BRM-SA01
RS MODEL	RD65A00
BUYER	SKB
DATE	2021.09.10
RCU VERSION	1.1
DOC VERSION	1.0

MAKER : REMOTE SOLUTION CO.,LTD.

Writer	EE	ME	Design	Software	Approval
					
2021.09.10	2021.09.10	2021.09.10	2021.09.10	2021.09.10	2021.09.10

DATE : 2021.09.10

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Product Design



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INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	1
REFORM :		RD65A00	68
DECISION :			

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1. Coverage : This product is manufactured as a remote solution and this specification applies to SK Broadband AI2/SMART3 STB remote control.

2. Product Specifications

2-1 Mechanical

2-1-1 Appearance

2-1-1-1 Button Locking No abnormality

2-1-1-2 There should be no abnormality in the adhesive state of the label.

2-1-1-3 There must be no abnormality in the printing status of the button and main body [bleeding, erasing, etc.]

2-1-1-4 Rubber No eccentricity or bias

2-1-1-5 No stick phenomenon due to rubber bias

2-1-1-6 There should be no sharp parts of the equipment

2-1-1-7 The print condition of the product must match the product specification (limit sample)

2-1-1-8 No other special

2-1-2 Decomposition Structure

2-1-2-1 After disassembling, check the internal parts to match the specifications (drawings)

2-1-2-2 After disassembly, there should be no abnormalities when checking the mixing of parts and soldering status.

2-1-2-3 There should be no touch of equipment and parts

2-1-2-4 When comparing with the parts list of the specification sheet, it must match the drawing (specification)

2-1-2-5 The printed contents of the PCB should match the drawings

2-1-2-6 Use the specified standard products for circuit parts.

2-1-2-7 Carbon contact part No flux

2-1-2-8 No lead foreign matter

2-1-2-9 No copper foil exposed in soldered area

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2-1-3 Button Specification

2-1-3-1 Touch Feeling : There is no defect when key button is pressed vertically

2-1-3-2 Operating Force : Metal Dome 130g±20g(Small Key),Metal Dome 180g±20g (Large Key)

Rubber Key : Less then 230g±50g (Small Key)

Rubber Key : Less then 350g±30g (Large Key)

2-1-3-3 Operating distance : 0.5±0.1 mm

2-1-3-4 Return force : more then 40% of the operating force Spec[Key center measurement]

2-1-3-5 Load: There should no defect PCB and other general , when applied for 3 seconds with a force of 3Kg vertically

2-1-4 Battery Specifications

2-1-4-1 After connecting the battery connector, there should be no abnormality in electrical contact.

2-1-5 Dimension

Outside dimension of the product : must meet individual approval specs (overall Length Tolerance:±0.8)

GAP (standard 0.3 mm) - GAP: Front knob and side gap should be less than 0.6 mm.

Step difference: In case of battery cover type, the step difference should be less than 0.4mm.

However, only the overall length is measured during import inspection.

Product Size : 39mm*167mm*29.20mm

Weight : 70.0(±2)g (Lithium battery included)

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2-2 Electrical properties

2-2-1 General Operating Test

2-2-1-1 There should be no problem in Button operation

2-2-1-2 In case of remote controller with Multi Brand, there should be no problem in operation by each other maker

2-2-1-3 Other buttons does not work when Button is operated

2-2-1-4 There should be no abnormality in continuous key operation

2-2-1-5 In case of various LEDs, there should be no problem when checking the brightness and blurring. [Set limit sample if necessary]

2-2-2 Current consumption

function	enter	Condition	SPEC		
			3.1V	3.7V	4.2V
Before leakage current pairing	Leave for 1 minute after power supply	Average	Less then 20uA	Less then 20uA	Less then 20uA
After leakage current pairing	Leave for 1 minute after power supply	Average	Less then 50uA	Less then 50uA	Less then 50uA
IR transmission	Power button 1 minute operation	Peak	Less then 70mA	Less then 0mA	Less then 70mA
RF transmission	HOME button 1 minute action	Peak	Less then 3mA	Less then 3mA	Less then 3mA
Buzzer	STB (using remote control finder)	Peak	OFF	Less then 65mA	Less then 65mA
Backlight	Movement of remote control angle more than 40°	Peak	OFF	Less then 8mA	Less then 8mA
Voice search	Voice search button	Peak	OFF	Less then 5.5mA	Less then 5.5mA

- For IR transmission, it was measured in a state where BLE pairing was not made (factory-first)

2-2-3 High Voltage : When input voltage of 4.3V to the battery terminal is input, there should be no abnormality in the operation of the remote control key.

When the USB (charge) terminal input voltage of 5.5V is input, there must be no abnormality in the operation of the remote control key.

2-2-4 IR LED Current(3.3ohm) : Over 300mA (2 Battery)

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2-2-5 Power Consumption : Less then 300mW (Battery terminal input voltage based on 3.7V)

2-2-6 Oscillation frequency : Input Voltage : D.C 3.7V (Power supply 3.7V)
: 40.00 Mhz $\pm$ 10ppm

2-2-7 Oscillation stop voltage: Less than 2.4V (based on Battery input terminal voltage)

2-2-8 All Key Operation Test

2-2-8-1 All Key operation is abnormal or not checked

2-2-8-2 There should be no abnormality when operating each key ON / OFF more than 10 times
[ON / OFF every 1 second]

2-2-9 Decompression / Boost Operating Voltage

2-2-9-1 There should be no problem in operation when repeating 5 times at 3.0V ~ 4.3V

2-2-9-2 Check the voltage at 0V starting operation

2-2-9-3 Operating stop voltage check on voltage descent from 4.2V
[However, when there is no regulation, it should be less than 2.2V]

2-2-10 Contact resistance

2-2-10-1 Conduction / Carbon is inspected according to specification
[Conduction: 200 Ω or less / Carbon: 300 Ω or less]

2-2-11 Transmission Format (Output Wave Form)

2-2-11-1 Format : uPD6122

2-2-11-2 Carrier : 37.9kHz $\pm$ 3%

2-2-11-3 Frame : Interval(TF) : 108ms $\pm$ 3%

2-2-12 Battery Charging Time

2-2-12-1 When the battery is completely discharged (below 3.0V), the charging time is up to
3 hours

2-2-12-2 Battery charging should not have any problems within the temperature range of
0°C ~ 45°C.

2-2-12-3 Battery charging should be at least 300 charges and no problems with discharge cycles.

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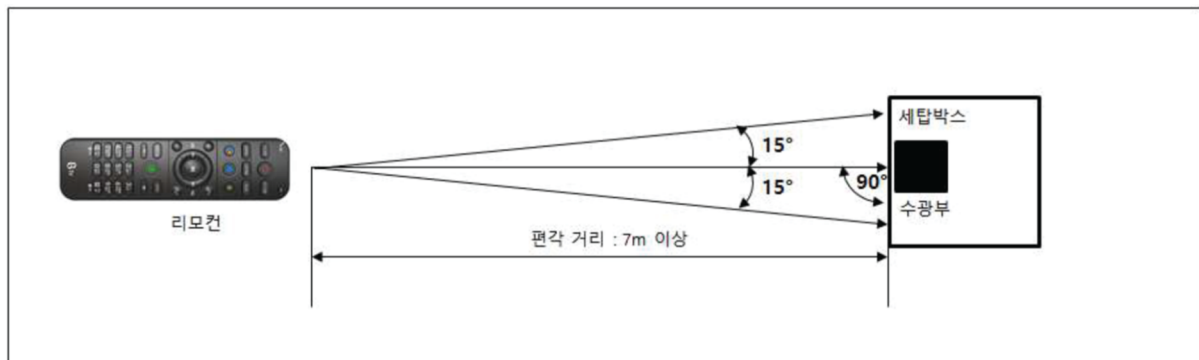
2-2-13 Operating distance and declination Operating distance:

2-2-13-1 Horizontal deflection (on optical axis) Straight line distance

When the receiver of the SET and the Remote Control Unit are horizontally or vertically on the optical axis



2-2-13-2 Remote control unit reference Horizontal deviation 15 ° (left, right, top, bottom) reaching distance (SET fixed)



2-2-12-3 RF straight line reach

RF Button : 7m

RF Voice transmission : 7m

- Measure using the buyer's set-top box. (Illumination : 200Lux, Temp. +25°C)

2-2-13 Buzzer Spec

Decibel : Measured at 10Cm distance using decibel meter: 80dB ±10dB [Applied voltage 3.7V]

[Measured using STB's Remote Control Finder function, battery voltage is based on at least 3.7V]

(When measuring with 1KHz test Sound tone: 75 ± 6dB) [Accredited voltage 3.7V]

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3. Environmental characteristics

3-1 Printing test

3-1-1 Eraser test

3-1-1-1 No abnormality by carrying out the round trip 50 times with the load of 1.0Kg with the eraser

3-1-1-2 There should be no abnormality by scratching the printed surface with the fingernail 5 times.

3-1-2 Tape Test

3-1-2-1 After printing, coating area is attached with Tape with 1Kg load, it is peeled at 45 ° and tested after 3 times test

3-1-3 Alcohol test

3-1-3-1 Gently apply alcohol to the gauze and perform 20 ~ 50 reciprocations with a load of 1 kg.
(CASE: 20 times, RUBBER: 50 times)

3-1-4 Coating property

3-1-4-1 After leaving 2HR at room temperature, 3M SCOTCH Brand No. 600 or more TAPE equivalent or better After close contact, do not pull instantly at 15° from flat surface.

3-2 Reliability Test

3-2-1 High temperature operation test

3-2-1-1 50 ° C $\pm$ 3 ° C, humidity 65%, and left for 24 hours

The operation inspection shall be carried out at intervals of 12 hours, so that there should be no abnormality in function and appearance

3-2-2 Low-temperature operation test

3-2-2-1 Put a rated load in a thermostat of -5 $\pm$ 3 ° C and leave it for 24 hours

The operation inspection shall be carried out at intervals of 12 hours, so that there should be no abnormality in function and appearance.

3-2-3 High temperature and high humidity operation test

3-2-3-1 Leave at rated temperature of 50 $\pm$ 3 ° C and humidity 80% for 24 hours

The operation inspection shall be carried out at intervals of 12 hours, so that there should be no abnormality in function and appearance.

3-2-4 temperature preservation test

3-2-4-1 Leave in a thermostatic chamber at 70 $\pm$ 3 ° C for 48 hours in a no-load state, and leave it at room temperature and humidity for 1 hour

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There should be no abnormality in function and appearance at the time of inspection

3-2-5 Cold storage test

3-2-5-1 Allow to stand for 48 hours in a no-load state in a thermostat at -20 ± 3 ° C for 1 hour

There should be no abnormality in function and appearance at the time of inspection

3-2-6 High temperature and high humidity preservation test

3-2-6-1 Temperature 50 ± 3 °C Leave in a constant temperature chamber of 95% humidity for 48 hours in a no-load state, and leave for one hour at normal temperature and humidity

There should be no abnormality in function and appearance at the time of inspection

3-2-7 Thermal shock test

3-2-7-1 Temperature: 70 ± 3 °C ~ -20 ± 3 °C, 50 cycles at intervals of 30 minutes, left at room temperature and humidity for 1 hour

There should be no abnormality in function and appearance at the time of inspection.

3-2-8 Vibration test

3-2-8-1 Vibration frequency: 10Hz~55Hz(7.5min) → 55Hz(2Hrs) → 55Hz~10Hz(7.5min), amplitude: 1.5mm, As a condition, there should be no abnormalities during inspection after conducting X, Y, Z directions.

3-2-9 Drop Test

3-2-9-1 Tested on Hardwood 6 times, once every 4 times [Dropping at 100cm after battery insertion]

3-2-9-1-1 No Top / Bottom Widening and Crack

3-2-9-1-2 There should be no stick phenomenon due to the rubber deviation.

3-2-9-1-3 There should be no other unusual phenomenon.

3-2-10 Static test

3-2-10-1 Place the R / C with the battery inserted on the copper plate and perform the static test

3-2-10-1-1 ± 10 kV : No problem in operation

3-2-10-1-2 ± 12 kV : No destruction

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4. Software Specification

RCU Key code table

SKB SMART TV CONTROL STB RCU Device Name : BRM_SA01_XXX *RemoteSolution							
Position	No	Key	Code			USB HID Usage Name	
		Key name	MODE1 CUSTOM 0x807F	MODE2 CUSTOM 0xF5A0	Page	Usage ID	Description
Front	1	종말전원	Btv 전원 + TV 전원	Btv 전원 + TV 전원	0x07	0x000100	order: Btv power + BRK → TV power+ VER + BRK
	2	TV 전원	삼성 + LG	삼성 + LG			dedicated TV only key Default Samsung, LG
	3	스마트TV	삼성 + LG	삼성 + LG			dedicated TV only key Default Samsung, LG
	4	Google Assistant	0x042B 0xD12E	0x04E2 0xD1E2	0x0C	0x0221	AC Search
	5	바로그기	0x58A7	0x587A	0x07	0x005800	
	6	출	0x02FD	0x02DF	0x07	0x000200	
	7	권성표	0x6092	0x6029	0x07	0x006000	
	8	신속채널	0x56A0	0x569A	0x07	0x005600	
	9	Zoom-KIDS	0x56A6	0x569A	0x07	0x005600	
Side	10	외부입력	[0x01FE]+[0x0BF4]	[0x01FE]+[0x0BF4]			dedicated TV only key Default Samsung, LG [Source] Navi keys is working TV
	11	종용화	0x45BA	0x45AB	0x07	0x004500	
Front	12	Btv 음량+	0x43BC	0x43CB	0x07	0x004300	
	13	Btv 음량-	0x42BD	0x42DB	0x07	0x004200	
	14	TV 음량+	삼성 + LG	삼성 + LG			
	15	TV 음량-	삼성 + LG	삼성 + LG			
	16	▲(상)	0x49B6	0x49B8	0x07	0x004900	
	17	▼(하)	0x4AB5	0x4A5B	0x07	0x004A00	
	18	◀(좌) / ▶(우) 리턴(뒤가기)	0x4BB4	0x4B4B	0x07	0x004B00	
	19	▶(우) / ▶(우) 리턴(앞가기)	0x4CB3	0x4C3B	0x07	0x004C00	
	20	OK / > / > (재정/일시정지)	0x4B9B	0x4B9B	0x0C	0x4100	Menu Pick
	21	채널 S	0x40BF	0x40FB	0x07	0x004000	
	22	채널 V	0x41BE	0x41EB	0x07	0x004100	
	23	이전	0x4EB1	0x4E1B	0x07	0x004E00	TV code output in Smart TV mode
	24	나가기	0x34CB	0x34CB	0x07	0x003400	TV code output in Smart TV mode
	25	미이크	0xD12E	0xD1E2	0x07	0x002300	
	26	◀(리턴) / Red	0x609F	0x609F	0x07	0x006000	
	27	▶(리턴) / Blue	0x639C	0x63C9	0x07	0x006300	
	28	1	0x21DE	0x21ED	0x07	0x002100	
	29	2	0x22DD	0x22DD	0x07	0x002200	
	30	3	0x23DC	0x23CD	0x07	0x002300	
	31	4	0x24DB	0x24BD	0x07	0x002400	
	32	5	0x25DA	0x25AD	0x07	0x002500	
	33	6	0x26D9	0x26D9	0x07	0x002600	
	34	7	0x27D8	0x27D8	0x07	0x002700	
	35	8	0x28D7	0x28D7	0x07	0x002800	
	36	9	0x29D6	0x29D6	0x07	0x002900	
	37	*문자지움	0x2AD5	0x2A5D	0x07	0x002A00	
	38	0	0x20DF	0x20FD	0x07	0x002000	
	39	#문자변환	0x2BD4	0x2B4D	0x07	0x002B00	
	40	Hot key1 (Reserved)	0x6969	0x6969	0x07	0x006900	
	41	Hot key2 (Reserved)	0x6A95	0x6A59	0x07	0x006A00	
	42	Hot key3 (Reserved)	0x6B94	0x6B49	0x07	0x006B00	
Special Key Code	43	Btv Power	0x01FE	0x01EF	0x07	0x000100	동합전원 버튼 입력 시 함께 송출 IR/BT 보드 변경에 의해 IR 또는 BT 로 송출
	44	Mute	0x45BA	0x45AB	0x07	0x004500	- 특정 음량에 의해 [BN 음량] 상태일 경우, - '음량' 버튼 2초이상 Long press 시, 'Btv 음량' 송출 중지하고 '조용히' 키코드(Press, Release 순차) 송출
	45	Normal Battery	0x3AC5	0x3A5C	0x07	0x003A00+0x00FFFF	
	46	Low Battery	0x3BC4	0x3B4C	0x07	0x003B00+0x00FFFF	
	47	Empty Battery	0x3CC3	0x3C3C	0x07	0x003C00+0x00FFFF	
	48	EarJack Insert	0x3DC2	0x3D2C	0x07	0x003D00+0x00EEEE	
	49	Break Data Code	0xFF00	0xFF00	0x07	0x00FFFF	이어폰 잭 삽입시(BT Connected) IR: 홈 키만 적용, BT: 전 키 적용 리모컨 제조사별 코드(RS) 0xF300~0xF30A: BT02 (UHD 이어폰1) 0xF310~0xF314: BT06 (UHD 이어폰2 - BLE) 0xF320~0xF324: BT03 (Smart STB 신규) 0xF330~0xF334: BT05 (서라운드 STB) 0xF340~0xF344: BT07 (UHD 이어폰3 - BLE) 0xF350~0xF354: BT08 (AI STB - BLE) 0xF360~0xF364: BT09 (키즈통합 리모컨 - BLE) 0xF370~0xF374: BA01(Android 리모컨 - BLE) 0xF380~0xF384: BT10(AI 2 STB - BLE) 0xF390~0xF394: BT11(AI 2 STB - BLE) 0xF3A0~0xF3A4: BA02(ATV STB - BLE) 0xF3B0~0xF3B4: BA02(ATV STB - BLE) 0xF3C0~0xF3C4: BT12(Smart TV 제어) 0xF3D0~0xF3D4: BA03(Smart TV 제어) 0xF3E0~0xF3E4: SA01(싱크리치) * 위와 다른 버전 코드 (0-A) 리모컨 제조사별 코드(모텔) 0xF400~0xF40A: BT02 (UHD 이어폰1) 0xF410~0xF414: BT06 (UHD 이어폰2 - BLE) 0xF420~0xF424: BT03 (Smart STB 신규) 0xF430~0xF434: BT05 (서라운드 STB) 0xF440~0xF444: BT07 (UHD 이어폰3 - BLE) 0xF450~0xF454: BT08 (AI STB - BLE) 0xF460~0xF464: BT09 (키즈통합 리모컨 - BLE) 0xF470~0xF474: BA01(Android 리모컨 - BLE) 0xF480~0xF484: BT10(AI 2 STB - BLE) 0xF490~0xF494: BT11(AI 2 STB - BLE) 0xF4A0~0xF4A4: BT11(AI 2 STB - BLE) 0xF4B0~0xF4B4: BA02(ATV STB - BLE) 0xF4C0~0xF4C4: BT12(Smart TV 제어) 0xF4D0~0xF4D4: BA03(Smart TV 제어) * 위와 다른 버전 코드 (0-A) 리모컨 제조사별 코드(UEI) 0xF540~0xF544: BT07 (UHD 이어폰3 - BLE) 0xF550~0xF554: BT08 (AI STB - BLE) 0xF560~0xF564: BT09 (키즈통합 리모컨 - BLE) 0xF590~0xF594: SR01 (모이스틱 - BLE)
	50	RCU Ver#3	0xF310 ~ 0xF314	0xF310 ~ 0xF314			동조 시작 코드 BT07 삭제부터 삭제 동조 종료 코드 BT07 삭제부터 삭제
	51	RCU Ver#4	0xF4A0 ~ 0xF4A4	0xF4A0 ~ 0xF4A4			
	52	RCU Ver#5	0xF510 ~ 0xF514	0xF510 ~ 0xF514			
	53	Setup-Start	0x64AB	0x64BA	0x07	0x006400+0x00FFFF	
	54	Setup-Stop	0x65AA	0x65AA	0x07	0x006500+0x00FFFF	
	55	Drag Up	0x8778	0x8787	0x07	0x008700+0x00FFFF	
	56	Drag Down	0x827D	0x82D7	0x07	0x008200+0x00FFFF	
	57	Drag Left	0x837C	0x83C7	0x07	0x008300+0x00FFFF	
	58	Drag Right	0x847B	0x84B7	0x07	0x008400+0x00FFFF	
	59	Lock	0x867A ~ 0x86F9	0x86A7 ~ 0x86F9	0x07	0x008600+0x00FFFF	(0)3초간 누름(리모컨 잠금 상태)
	60	Unlock	0x8679 ~ 0x86F9	0x8697 ~ 0x86F9	0x07	0x008600+0x00FFFF	(0)3초간 누름(리모컨 잠금 해제)



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4. Software Specification (2/12)

61	음성 제한	0x022B	0x022B				BLE-관련 상태에서 카 입력시 출력(IR-Only)
62	Btv control mode	0x6699	0x6699	0x07	0x006600		Btv 제어모드 전환 코드
63	TV control mode	0x6798	0x6789	0x07	0x006700		TV 제어모드 전환 코드
64	TV control mode noti	0x6897	0x6879	0x07	0x006800		TV 제어모드 사용중임을 알리는 코드

기능	기능	키조합	입력	비고
Setting mode	1 Unpairing	[*] + [홈]	3sec	remove pairing information
	2 Re-Pairing	[*] + [홈]	3sec	try pairing after removing pairing information
	3 TV Set (Manual)	[스마트TV] + [외부입력]	3sec	setup your TV with the numbering keys
	4 TV Set (Auto Search)	[스마트TV] + [외부입력]	3sec	setup your TV using CH+/- key
	5 TV Set(Grouping)	그룹핑 번호키(1-9) + [스마트TV]	3sec	setup your TV with CH+/- key in TV group
	6 IR Code Learn	[TV 전원] + [OK]	3sec	BT06/07 is not supported
	7 Code Read Out	[스마트TV] + [외부입력]	3sec	press [전성표] after entry setting mode
	8 Change BT-IR mode (BT)	[*] + [1]	3sec	
	9 Change BT-IR mode (IR)	[*] + [2]	3sec	Not-allowed-pairing(keep-pairing@)
	10 Factory Default	[*] + [3]	3sec	
	11 Buzzer Test	[*] + [4]	3sec	stop buzzer when press any key
	12 Backlight On/Off	[*] + [5]	3sec	On/Off toggle(Default: On), On: LED twice/Off: LED 4-tiems blink
	13 Change IR Code mode	[*] + [9]	3sec	Mode 1 <-> Mode 2
	14 Drag Up	[*] + [UP]	Immediately	see operation scenario
	15 Drag Down	[*] + [DOWN]	Immediately	
	16 Drag Left	[*] + [LEFT]	Immediately	
	17 Drag Right	[*] + [RIGHT]	Immediately	
	18 RCU-look/unlook	[#]	2sec	
	19 Android Bugreport	[BACK] + [OK]	5sec	BACK is IR code, OK is BLE code, after 3sec LED blink 1-time

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4. Software Specification (3/12)

RCU RF Protocol

1. BLE Device

RTL8762CKF (Bluetooth v5.0: Single-Mode BLE)

2. BLE Profile & Service

GAP, GATT

HID over GATT Profile

~~Find Me Profile (call RCU) --> included IAS~~

HIDS(HID Service)

Realtek OTA Update Service

~~Voice transmission service --> Realtek mSBC uses HIDS because it is a HOGP type~~

BAS(Battery Service)

DIS(Device Information Service)

~~ATVVS(Android TV Voice Service) - Google Assistant~~

iSet Service - TV auto setup & power/input sync

~~ScPS(Scan Parameters Service) - undecided~~

~~Bond Management Service - undecided~~

IAS(Immediate Alert Service) - call RCU

~~LLS(Link Loss Service) - undecided~~

~~TPS(Tx Power Service) - undecided~~

3. Vendor ID / Product ID

Vendor ID : 0x005D (Realtek)

Product ID : 0x0005(SA01)

4. GAP Appearance Value(Device Class)

0x0180 : Generic Remote Control

5. BD Address

14 4E 34 xx xx xx (14 4E 34 assigned by RemoteSolution)

20 44 41 xx xx xx (20 44 41 assigned by RemoteSolution added)

6. Device Name

BRM_SA01_XXX (BLE)

B : B tv,

RM : RemoteSolution, MM : Movon, UE : UEI

XXX : MAC Address last 3 characters

BRM_Audio11 (A2DP)

B -- B tv,

RM -- RemoteSolution, MM -- Movon, UE -- UEI

7. Method of pairing

Just Works

8. Voice feature

NUGU: 120byte mSBC (60bytes transmitted twice, 57+3 byte, 4.2 Extended LE not used.)

9. HID protocol table

* HID Key press & hold code on ATT - Report ID(0x80)

NUM	Field	Description	Values	Size	Direction
1	Opcode	Notification	0x1B	1byte	RCU -> STB
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	Keycode	Usage ID	3byte	

Ex) When [B tv power] key is pressed: 0x00, 0x01, 0x00

When any key is released: 0x00, 0xFF, 0xFF

* HID Consumer Key code on ATT - Report ID(0x03)

NUM	Field	Description	Values	Size	Direction
1	Opcode	Notification	0x1B	1byte	RCU -> STB
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	Keycode	Usage ID	2byte	
4			0x0000	2byte	

Release key code: 0x00 00 00 00

* HID Voice Search code on ATT - Report ID(0x85)

NUM	Field	Description	Values	Size	Direction
1	Opcode	Notification	0x1B	1byte	RCU -> STB
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	Reserved	0x00	1byte	
4		Start voice	0x23	1byte	
5		Keycode 2	0x00	1byte	

Release key code: 0x00 23 FF

* HID Mic Start on ATT - Report ID(0x85)

NUM	Field	Description	Values	Size	Direction
1	Opcode	Write Request	0x12	1byte	STB -> RCU
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	Reserved	0x00	1byte	
4		MIC Start	0x26	1byte	
5		Keycode 2	0x00	1byte	

* HID Mic Stop on ATT - Report ID(0x85)

NUM	Field	Description	Values	Size	Direction
1	Opcode	Write Request	0x12	1byte	STB -> RCU
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	Reserved	0x00	1byte	
4		MIC Stop	0x27	1byte	
5		Keycode 2	0x00	1byte	

10. Advertisement data format

GAP ADTYPE FLAG

Discovery Mode: LE General Discoverable Mode | BR/EDR Not Supported

GAP ADTYPE LOCAL NAME

see 6 section

GAP ADTYPE 16BIT COMPLETE

Service: 0x1812(HID)

GAP ADTYPE APPEARANCE

see 4 section

11. Scan response data format

GAP ADTYPE LOCAL NAME

see 6 section

GAP ADTYPE APPEARANCE

see 4 section

12. Connection Parameters

Connection interval(IDLE)	Connection interval(Voice)	Connection interval(OTA)
Minimum: 7.5ms 11.25ms	Minimum: 7.5ms 11.25ms	Minimum: 7.5ms 11.25ms
Maximum: 7.5ms 11.25ms	Maximum: 7.5ms 11.25ms	Maximum: 7.5ms 11.25ms
Slave Latency: 499 133	Slave Latency: 499 133	Slave Latency: 0
Supervision timeout: 10sec	Supervision timeout: 10sec	Supervision timeout: 10sec

13. Advertising interval

Pairing 시 ADV			
		interval(min/max)	duration
Step1.	undirect	50ms	20s
Step2.	Standby state		
Reconnect 시 ADV_DIRECT			
		interval(min/max)	duration
Step1.	direct (high duty)	1.87ms	1.28s
Step2.	direct (low duty)	30ms	5s
Step3.	direct (idle low duty)	1.5s	continuous (1.5s interval, 1 cycle)

*When inserting/removing a battery:

Depending on the paired / un-paired state, the above scheme works.

If paired after RCU cold boot, High duty DIRECT_ADV starts after 12 seconds regardless of whether or not there is a key input.

* When connecting, when entering Any Key during ADV_DIRECT:

Regardless of the current step, if there is a key input, it is immediately executed again from Step1 (high duty ADV_DIRECT).

14. BT key code Interval

BT key press interval: 300ms (continuous key), 80ms (normal key)

BT release key code: 30ms

15. DIS(Device Information Service)

Property	Value	Value(ex: RS)
Serial Number String	Manufacturing date	20210819
Manufacturer Name String	Manufacturer	RemoteSolution Co.,LTD.
Model Number String	Model No	BRM_BT12
Firmware Revision String	F/W Revision	1.0
Software Revision String	Rom Patch Revision	1.0.552.8
Hardware Revision String	H/W Revision	1.0
System ID	IEEE 64bit ID(with OUI)	xxxxxxFF344E14

* Serial Number String: The BT chipset MAC is applied to the remote control without the manufacturing date

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4. Software Specification (4/12)

* HID RCU Unpairing on ATT - Report ID(0x81)

NUM	Field	Description	Values	Size	Direction
1	Opcode	Write Request	0x12	1byte	STB -> RCU
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	Reserved	0x00	1byte	
4		Unpaired	0x2A	1byte	
5		Keycode 2	0x00	1byte	

* The RCU removes the pairing information of the RCU when it receives the command from the STB.

* Voice data on ATT - Report ID(0xF8)

NUM	Field	Description	Values	Size	Direction
1	Opcode	Notification	0x18	1byte	RCU -> STB
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	Voice data	0xXX....	120byte	

* QuickSet data on ATT - Report ID(0x86)

NUM	Field	Description	Values	Size	Direction
1	Opcode	Notification	0x18	1byte	RCU -> STB
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	Sequence	0x00 ~ 0xFF	1byte	
4		Data	0xXX....	max	

* QuickSet data on ATT - Report ID(0x86)

NUM	Field	Description	Values	Size	Direction
1	Opcode	Write Request	0x12	1byte	STB -> RCU
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	Sequence	0x00 ~ 0xFF	1byte	
4		Data	0xXX....	max	

[i-SET Protocol]

* i-Set Service Class UUID : 0000FFE0-0000-1000-8000-00805F9B34F8

* i-Set Command - UUID : 0000FE1-0000-1000-8000-00805F9B34F8

NUM	Field	Description	Values	Size	Direction
1	Opcode	Write Request	0x12	1byte	STB -> RCU
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	Command	0x00: i-Set Stop 0x01: i-Set Start 0x02: STB screen off 0x03: STB screen on 0x04: i-Set Get TV code 0x05: Unpairing	1byte	

* i-Set Command Response - UUID : 0000FE1-0000-1000-8000-00805F9B34F8

NUM	Field	Description	Values	Size	Direction
1	Opcode	Notification	0x1b	1byte	RCU -> STB
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	Result	0x00: NG 0x01: OK	1byte	
4		Error code	0x00 : ISET_ERROR_NONE 0x01 : ISET_ERROR_CODE_TIMEOUT 0x02 : ISET_ERROR_CODE_CHKSUM_ERROR 0x03 : ISET_ERROR_CODE_INVALID_COMMAND 0x04 : ISET_ERROR_CODE_INVALID_EDID_FORMAT 0x05 : ISET_ERROR_CODE_UNKNOWN_VENDOR 0x06 : ISET_ERROR_CODE_IDENTICAL_VENDOR 0x07 : ISET_ERROR_CODE_INVALID_EDID_LENGTH 0x08 : ISET_ERROR_CODE_UNKNOWN_DEVICE 0x09 : ISET_ERROR_CODE_NONE_SEQ_ORDER	1byte	
5		TV Set Type	0x00: ISET - only assigned when i-Set TV setup is OK 0x01: Manual(digit or autosearch) 0x02: IR Learning	1byte	
6		Code	0x0000 ~ 0xFFFF(TV set No) eg: Set No is 320 0x01 0x40	2byte	

* i-Set EDID Data - UUID : 0000FE3-0000-1000-8000-00805F9B34F8

NUM	Field	Description	Values	Size	Direction
1	Opcode	Write Command	0x52	1byte	STB -> RCU
2	Att Handle	Handle	0x0000 ~ 0xFFFF	2byte	
3	Payload	EDID Parameters	0x00 ~ 0xFF	256byte	

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4. Software Specification (5/12)

SKB Android STB RCU Operation Scenarios

BT mode: BLE connected, IR mode: BLE disconnected

Bluetooth pairing scenario (BLE + A2DP)

1. In the unpairing state, pressing any key(excluded key: TV전원/통합전원/TV음량+/-,외부입력, tilt key) on the remote control will transmit the pairing
→Or, when the ear jack is inserted (battery voltage>= 2.4V), it transmits the pairing IR code.
2. After transmitting the IR code, the remote control enters Advertising Mode and switches to the pairing mode.
3. In Advertising Mode, LED blinks at 1s (ON: 250ms, OFF: 750ms) cycle.
-Ignore entering the setting mode by voice search and key combination during pairing (however, unpairing and repairing are supported)
4. When the IR Trigger Code is received from the STB, it searches for Bluetooth devices and tries to pair with the remote control BLE.
5. After BT pairing is completed, CSR8630 (after Audio BT) of the remote controller enters Discovery Mode and switches to pairing mode.
6. After pairing BT in STB, search for additional Bluetooth devices and try to pair with Audio BT.
7. When the audio BT is successfully paired with the remote control, LED Blink 5 times at 200ms (ON: 100ms, OFF: 100ms) cycle.
8. The remote controller ends Advertising after 20 seconds in BLE Advertising mode. And, Audio BT Discovery does not.
9. After 30 seconds in the Audio BT Discovery mode, the Discovery mode is terminated, and BT Unpair is completed and the pairing scenario ends.
10. LED OFF when pairing fails

Bluetooth pairing reset (Unpairing) scenario

1. Press the [*] + [Home] keys for 3 seconds
2. When BT Unpair is completed normally, LED blinks 5 times quickly (ON: 100ms, OFF: 100ms)
→ When BT Unpair is completed normally, Power Off Audio BT
→ Audio stream if connected, disconnect and proceed with Unpair

Bluetooth re-pairing scenario

1. Press the [*] + [#] keys for 3 seconds
2. If BT is connected, RCU performs disconnection
3. Store the BT pairing information in the temporary area, and delete the pairing information related to the BT stack.
4. Start BT pairing(always new pairing)
5. When pairing fails, the pairing information in the temporary area is resotred to the pairing area of the BT stack.

Bluetooth unpairing scenario

1. When an unpairing request is received from the STB, the RCU deletes the RCU pairing information.
- RCU supports two types of unpairing.
1.1 HID method방식: HID RCU Unpairing on ATT - Report ID(0x81) in RF Protocol sheet
1.2 iSet method: i-Set Command: 0x05
2. When BT Unpair is completed normally, LED blinks 5 times quickly (ON: 100ms, OFF: 100ms)

Operation scenario when not paired

1. Regardless of whether pairing is successful, all keys except voice search key operate as IR.
2. Attempt pairing when performing the following operation.
2-1. Any Key(excluded key: TV전원/통합전원/TV음량+/-,외부입력, tilt key) is pressed
2-2. Enter [*] + [#] for 3sec
→ 2-3. Insert ear jack (battery voltage>= 2.4V)

Operation scenario when paired

1. TV key (TV전원 / TV음량+/- / 외부입력) operates irrespective of whether pairing is successful or not.
2. The integrated power key is operated by IR. (B tv + TV)
3. [Btv 전원] key operates by IR.
4. All other keys operate as BT. (But TV전원/통합전원/TV음량+/-,외부입력 key works only with IR)
5. In the case of BT disconnection in pairing state, all keys operate as IR.
5-1. However, re-pairing is performed when the voice (NUGU) or [G/A] key is pressed. (Same operation as pressing the [*] +[#] keys for 3 seconds)

All power operation scenario

1. When the [통합전원] key is pressed, it is output in the following order.
1.1 During key input: TV power code (toggle, discrete, learning) is transmitted
1.2 When key is released: Btv power code-> RCU version code -> iSet Macro
2. TV power code classification
2.1 Toggle: When the TV power code is toggled during manual setting or iSet setting
2.2 Discrete: When the TV power code is discrete by the iSet setting
2.3 IR learning: In case of learning IR on the [TV전원] button
3. iSet Macro
3.1 Output when iSet is set and TV's input code is discrete code

* If iSet is wroked, see Section 4 of the "iSet Operation Scenario" sheet.

Battery information transmission scenario

1. Battery level transmission when the [home] key is pressed (in BT mode, BT / IR mode, IR code)
2. Detect voltage range: 3.1V ~ 4.18V divided into 3 levels (Empty / Low / Normal)
2-1. Normal: 3.63V[50%] more-green LED
2-2. Low: More than 3.41V[30%] ~ less than 3.63V[49%]-red LED
2-3. Empty: less than 3.41V[<29%] under-red LED
3. Battery level transmission when BT Connect (Pairing or Reconnecting)
3-1. Battery level means key code (Normal, Low, Empty)
4. After RCU booting, after about 40ms after any key release, transmit the battery status (3 step code).
4-1. However, the [통합전원], [TV 전원], [TV 음량+/-], [외부입력], [Home], [MIC], [GA](BA03) keys are excluded from this operation.
4-2. Battery information is not transmitted for key release that occurs after entering pairing mode.
4-3. After the key is released, it is applied up to 10 times based on the battery information transmission.
(If key input occurs before sending the battery information code, the input key code output is given priority.)
4-4. If BT is connected 10 times (battery code) before and battery information is transmitted, battery information is not transmitted for the key release that occurs thereafter.
5. Battery voltage should be transmitted in level [%] and follow BAS specification.
5-1. 3.1 V or less: 0%

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4. Software Specification (6/12)

- 5-2. 4.18V or higher: 100%
5-3. The voltage between the above voltages is converted as a percentage.

RCU Low Battery operation scenario

1. Low Voltage: 3.41V or more ~ less than 3.63V
2. RED LED ON when key code is transmitted at low voltage
3. No change in BT / IR mode
4. Restrict audio BT (Streaming) operation at low voltage (maintain while streaming is in progress)
5. After inserting the ear jack, the low voltage battery level code is output (usage limit pop-up display); (in BT mode in BT / IR mode in IR code)
6. OTA upgrade restrictions

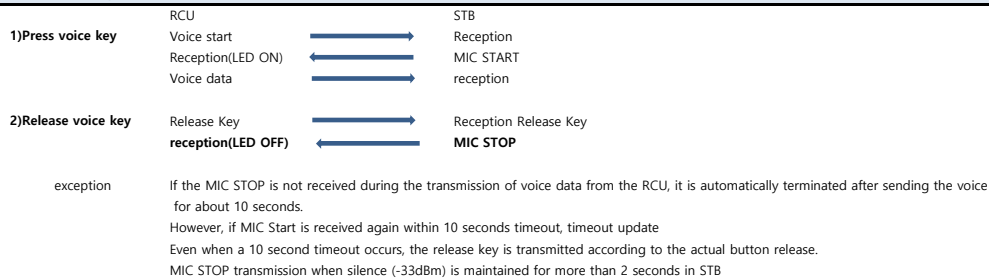
RCU Empty Battery operation scenario

1. Empty Battery: Less than 3.41V[30%]
2. RED LED ON when key code is transmitted during empty voltage
3. BT / IR mode maintenance
4. AD2P operation restriction (STOP during use), Empty Battery Code output when earphone is inserted
5. When the voice search key is input, the empty battery code is output. Do not transmit Mic Start
6. Empty Battery Code output when pairing is attempted. No pairing code sent
7. No cut-off voltage. Operates in empty until the battery runs out

Remote control battery charging operation scenario

1. Battery charging
 - 1-1. Battery less than 50% (Low/Empty) : Red LED blinks (ON: 1000ms, OFF:1000ms)
 - 1-2. Battery 50% or more (Normal): Green LED blinks (ON: 1000ms, OFF:1000ms)
2. When the battery is fully charged: Green LED stays on
3. When key is pressed/released
 - 3-1. When there is a key input, the charging LED display (flashing/lighting) is stopped and the key code for the corresponding key input is transmitted as an LED operation in a normal scene
 - 3-2. When 5 seconds have elapsed since the last key input, the LED is displayed as charging again (LED blinking/lighting)
4. If there is any operation while charging, the LED blinking according to the operation scenario is prioritized.
5. When the charging cable is removed: LED blinking/lighting stops and LED turns OFF
6. BLE IC becomes H/W reset (same as POR) when battery charging cable is connected

Voice Transmission operation scenario



- * Voice transmission start should be operated by MIC start command sent from STB without input of [MIC] button.
* During voice transmission, all keys except the TV key (TV 전원, 외부입력, TV음량+/-), [이전], and [나가기] keys do not transmit codes when the key is input.

Drag Mode

1. When the [문자지움*] key + four-way key is combined, drag works as the four-way key (response to drag operation to use the web browser)
In the process of entering the first drag mode, no break code is transmitted when one key is input while another key is input.
For BT mode / IR mode key code definition, refer to the special key code in the CodeTable sheet.

< Android key value of drag mode >

Key Name	Scancode	Android Keycode
Drag Up	0x136	KEYCODE_BUTTON_L1
Drag Down	0x137	KEYCODE_BUTTON_R1
Drag Left	0x138	KEYCODE_BUTTON_L2
Drag Right	0x139	KEYCODE_BUTTON_R2

2. When any one key is released after key combination, code transmission stops without sending break code.
3. When drag key combination again, send the corresponding key code (drag mode up / down / left / right)

BLE/IR Mode change operation scenario

- This concept is different from IR transmission when unpaired or disconnected.
- Factory Default: BLE mode.
- How to switch modes
- BLE mode: [*] + [1] BLE mode when input for 3 seconds. LED 2 times Blink (ON: 250ms, OFF: 250ms)
 - IR mode: [*] + [2] IR mode switching when input for 3 seconds. LED 4 times Blink (ON: 250ms, OFF: 250ms)
- IR mode operation
- IR transmission when a button is pressed. However, when the [Microphone] button is pressed, the voice is transmitted.
 - BT connection must be maintained and attempted to reconnect (Find Me)
 - When BT connection is made by attempting pairing by unpairing or repairing, it automatically switches to BT mode (maintains the previous mode in case of failure)
- BLE mode operation
- Includes all operation scenarios except IR mode operation.
 - Maintains mode information during POR / repair

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4. Software Specification (7/12)

Find me(Call RCU) operation scenario

Using IAS (Immediate alert level service)

Buzzer Well: See Buzzer Spec

Backlight: Backlight is on while the buzzer is ringing in normal battery condition

Buzzer sound output time: 1 minute

Abort when inputting any button. (Output when the button is input)

~~Stopped buzzer sound when combining / disengaging earjack~~

Periodic connection attempt is required in disconnected state. (TBD)

- After BT disconnection due to STB shutdown or link loss, the remote controller attempts to connect every 1.5 seconds.
- At this time, the average standby current consumed should be similar to the BT connection state.

[*] + [4] Buzzer sound confirmation function when input for 3 seconds (test mode)

Factory Default operation scenario

Factory default function by 2 key combination

[*] + [3] Input for 3 seconds

Initializes pairing information, TV setting information, BLE / IR mode information, iSet, IR learning contents, and manual setting of backlight On / Off.

-LED blink is processed in the same way as unpairing.

OTA mode

1. When requesting the battery level (BAS) of the OTA app, the remote control sends the battery level [%] value to the STB.
 - STB executes OTA only when the battery level of the remote control is 2.4V or higher.
 - STB shows a pop-up window indicating that OTA is impossible for other battery levels.
 - ~~-Before upgrading, stop the audio stream.~~
 - Before upgrade, turn off the back light.
2. When the OTA is upgraded, the GREEN LED turns on.
 - ~~-Blink time may change later~~
3. LED operation for OTA result (Judging whether OTA was successful before rebooting after OTA is completed)
 - Success: GREEN LED blinks 3 times at 250ms intervals (ON: 250ms, OFF: 250ms)
 - * When the new f / w version and the old f / w version are different after the upgrade is completed
 - Failure: RED LED blinks 3 times at 250ms intervals (ON: 250ms, OFF: 250ms)
 - * If the new f / w version and the old f / w version are the same after completing the upgrade
 - * BT connection fails after entering OTA mode
 - * BT connection is lost when upgrading (Battery removal, STB shutdown)
4. The OTA upgrade image is divided into app code and patch code.
 - App code image file name definition by manufacturer
 - * RS: BRM_SA01_Vx.x_YYYYMMDD.bin
 - Define patch code image file name (common to manufacturer)
 - * RTL_Bee2_Patch_Vx.x.x.bin
5. OTA image creation uses Realtek MP_PackTool.

* OTA AES256 key define by remote control manufacturer

RS

52,53,5F,52,44,36,35,41,

28.53.4B.42.5F.42.52.4D

5F.53.41.30.31.29.5F.53.

69.67.6E.61.74.75.72.65

MOVON

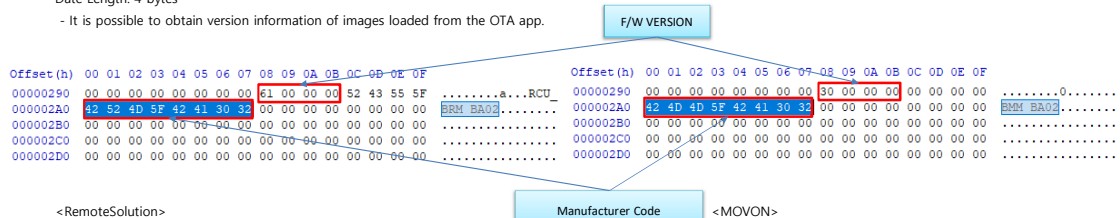
Manufacturer	OTA Manufacturer Code (ASCII)
RemoteSolution	BRM_SA01
Movon	

* Remote control version information location in RCU f/w

Address: 0x000002908

Date Length: 4-bytes

- It is possible to obtain version information of images loaded from the OTA app.



TV Setup scenario

1. Manual setting

- 1-1. [스마트TV] + [외부입력] Press simultaneously for 3 seconds-> LED ON
→ TV start code transmission
- 1-2. 3-digit numeric button input (LED OFF when key input, LED ON when key release)
- > When the 3 digits entered are in the IR DB, the power off code of 3-Frame is transmitted, otherwise, the RED (regardless of battery level) LED is ON for 1 second and then the GREEN LED is ON.
- > However, when 0.0.0 is input, it is set as default (Samsung, LG) and at the same time, 3 times of LED Blink (ON: 250ms, OFF: 250ms), then the setting mode ends.

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4. Software Specification (8/12)

- > 1-2 ~ 1-3 can be repeated
- 1-3. Enter the [Play/Pause] key to complete the setting. At this time, LED 3 times Blink (ON: 250ms, OFF: 250ms)
 → ~~TV termination code transmission~~
- * Keys that can be entered except for numeric keys during manual setting
- > [TV전원] key: Sends a TV power off code 3 frame corresponding to a 3-digit number when input.
 - > [채널+/-] key: Switch to Auto search mode (search starts from next / previous of the current setting number)
 - > When other keys are input, exit the setting mode with output of the TV synchronization end code.
- 2. Auto Search (full DB search)**
- 2-1. [스마트TV] + [외부입력] Press simultaneously for 3 seconds-> LED ON
 -> TV start code transmission
- 2-2. Enter the [채널+] or [채널-] button.
- > Power off code transmission of 3-Frame (LED is OFF during code transmission, and remains ON when transmission is completed)
 - > [채널+]: Power off code transmission of the next setting number
 - > [채널-]: Power off code transmission of previous setting number
 - > If the key is continuously input, the next or previous setting number is searched at about 500ms intervals and the power off code is automatically transmitted.
 - > Even if the entire IR DB is looped, the search is still possible.
- 2-3. Enter the [Play/Pause] key to complete the setting. At this time, LED 3 times Blink (ON: 250ms, OFF: 250ms)
 → ~~TV termination code transmission~~
- * Searchable keys except [채널+] and [채널-]
- > [TV전원] key: Sends the TV Power off code 3 frame of the set number searched when input.
 - > Numeric keys: Switch to manual setting mode
 - > When other keys are input, exit the setting mode with output of the TV synchronization end code.
- 3. Group Search (Brand DB search)**
- 3-1. [스마트TV] + Press one of [1] ~ [9] keys simultaneously for 3 seconds-> LED ON
 → ~~TV start code transmission~~
- 3-2. Enter the [채널+] or [채널-] button.
- > Power-off code transmission of 3-Frame (LED is turned off during code transmission and keeps ON when transmission is completed)
 - > [채널+]: Power off code transmission of the next setting number
 - > [채널-]: Power off code transmission of previous setting number
 - > If the key is continuously input, the next or previous setting number is searched at about 500ms intervals and the power off code is automatically transmitted.
 - > Even if the IR DB of the group is looped, the search is still possible.
- 3-3. Enter the [Play/Pause] key to complete the setting. At this time, LED 3 times Blink (ON: 250ms, OFF: 250ms)
 → ~~TV termination code transmission~~
- * Searchable keys except [CH +] and [CH-]
- > [TV전원] key: Sends the TV Power off code 3 frame of the set number searched when input.
 - > When other keys are input, exit the setting mode with output of the TV synchronization end code.
- * The power-off code of the 3-Frame that is output when setting may differ depending on the TV. If necessary, the power-off code must be output in more than 3-Frame.
- * The waiting time for the setting mode is 15 seconds, and after this time, the setting mode ends with the TV sync code output. At this time, LED is blinked 10 times (ON: 100ms, OFF: 100ms).
- > Keep the previous setting.
- * After completing the setting, iSet integration is not possible.

IR code mode changing

1. Mode 1-> Mode 2 switching
- 1-1. Press [*] + [9] keys simultaneously for 3 seconds
- 1-2. Completed after 4 LED Blinks (ON: 250ms, OFF: 250ms)
2. Mode 2-> Mode 1 switching
- 2-1. Press [*] + [9] keys simultaneously for 3 seconds
- 2-2. Completed after 2 LED Blinks (ON: 250ms, OFF: 250ms)
- * IR code assignment after switching IR mode: see CodeTable

Code Read Out

- This function reads the 3 digit TV number set on the RCU.
1. Press [스마트TV] + [외부입력] key simultaneously for 3 seconds-> LED ON
 → ~~TV start code transmission~~
2. Enter [원격메뉴] [편성표]-> LED OFF for about 1 second
3. The set 3 digit number indicates LED Blink.
- > LED Blink time for each digit (ON: 250ms, OFF: 250ms)
 - > LED OFF time between digits: 1 second
 - > Digit "0" blinks 10 times
4. After the 3-digit setting number blinks, the TV sync exit code is transmitted.
- * The waiting time for the setting mode is 15 seconds, and after this time, the setting mode is terminated with the TV sync code output. At this time, LED is blinked 10 times (ON: 100ms, OFF: 100ms).
- * Any key input is ignored while this function is being executed.

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4. Software Specification (9/12)

Back Light operating scenario

- Initial Activation Conditions
 - Back light is disabled after factory default and initialization (*+3 button is pressed for 3 seconds or longer)
 - Back light is activated when BT pairing is completed
- ON condition
 - ON when remote pick-up or buzzer operation
 - ON when any key is input during audio playback (B / light is not ON when picked up)
 - If key input continues, enters OFF mode after 2 seconds
 - OFF when Find me (buzzer) is running (must be OFF even when ON)
- ON time: It remains ON for 2 seconds, and OFF when there is no operation
 - 2 seconds extension when picking up before OFF
- Voltage range: Low Battery or higher
 - In an empty battery, it does not turn on even if pick up or buzzer operates.
- Back light according to RCU control mode
 - Full area backlight operation in Btv control mode
 - In smart TV control mode, the number area (0~9, *, #) at the bottom of the remote control does not work

* Detailed specifications: see "Backlight" tab

Stuck Key

If any key is pressed for a certain period of time, code transmission is restricted to reduce battery consumption.

- When any key is pressed for 2 minutes, the code (IR / BT) transmission is stopped.
 - ~~When QS interlock key is input, code transmission stops after 30 seconds.~~
 - > In case of key combination in drag mode, code is stopped when pressed for 2 minutes.
- Link operation after entering Stuck Key mode
 - > ~~LED OFF RED RED ON(OFF when all keys are released)~~
 - > Back light auto OFF, no reaction when pick up
 - ~~Automatic shutdown when A2DP working~~
 - ~~No operation when inserting ear jack~~

* Find me should work.

BackLight manual ON/OFF setup

You can manually control the On / Off setting of the backlight.
Press [*] + [5] keys simultaneously for 3 seconds

- Backlight ON setting (default)
 - > When the backlight setting is Off, it is changed to the On state.
 - > Completed after 2 LED Blinks (ON: 250ms, OFF: 250ms)
- Set backlight OFF
 - > When the backlight setting is On, it is changed to the Off state.
 - > After 4 LED Blinks (ON: 250ms, OFF: 250ms)

Android Bug Report

Set the Android Bug Report function.
Press the [이전] + [Play/Pause] keys simultaneously for 5 seconds

- > After 3 seconds of pressing the combination key, the LED will blink once (ON: 250ms, OFF: 250ms).
- > Bug Report starts after 2 seconds after 1 LED blink.

RCU Version Read Out

This is a function to indicate the RCU F/W Version 2 digits as the number of LED blinks.

- Press the [스마트TV] + [외부입력] keys simultaneously for 3 seconds -> LED ON
- [통합전원] input -> LED OFF for about 1 second
- LED Blink indicates the 2-digit (major.minor) version.
 - > LED Blink time by version (ON: 250ms, OFF: 250ms)
 - > LED OFF time between versions: 1 second
 - > Version "0" blinks 10 times

* Setting mode standby time is 15 seconds, and after this time, setting mode is terminated. At this time, blink the LED 10 times (ON: 100ms, OFF: 100ms).

* Any key input while this function is being executed is ignored.

* Example): When F/W version is 1.2

- > LED blinks once
- > LED OFF for 1 second
- > LED blinks twice

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4. Software Specification (10/12)

iSet operation scenario

This function is to set the TV manufacturer code of the remote control automatically by using the EDID information of the TV.

1. Scenario after pairing

- 1.1 After pairing is completed, STB sends power status information to the remote control.
 - * STB power OFF state: STB screen off command (0x02)
 - * STB power ON state: STB screen on command (0x03)The remote control stores the above information in memory and uses it for power and external input sync between STB and TV when the [Integrated Power] and [Btv Power] buttons are pressed.
 - 1.2 STB sends the iSet Start command (0x01) to the remote control and waits for a response from the remote control (0x0100).
 - 1.2.1 The remote control enables zero slave latency to speed up data reception (zero latency disable after success and failure (timeout))
 - 1.2.2 The remote control has a timeout of 20 seconds after receiving the 0x01 command, in case there is no iSet operation of the STB.
When the timeout ends, the RCU responds with 0x0001.
 - 1.3 After receiving the response (0x0100) of the remote control, STB sends EDID raw data (256 bytes) of the TV to the remote control.
 - 1.3.1 STB is divided into 256 bytes of EDID data to be sent.
 - 1.3.2 After receiving EDID data, the remote controller responds with 0x0100 and restarts the 20-second timer.
 - 1.3.3 Check the received EDID length and if it exceeds 256 bytes, respond with 0x0007, end the 20-second timer, disable zero latency, and terminate the iSet.
 - 1.4 After sending all EDIDs, STB sends the iSet Stop command (0x00) command and ends the iSet task.
 - 1.4.1 The remote control disables the 20-second timer and disables zero slave latency.
 - 1.4.2 Validate some attributes as shown below.
 - * When the data length is less than 128 or the number of extension blocks is greater than 0 and the length exceeds 256
NG response code: 0x0107-> ISET_ERROR_CODE_INVALID_EDID_LENGTH
 - * Header information is wrong (first 8 digits of EDID data)
NG response code: 0x0104-> ISET_ERROR_CODE_INVALID_EDID_FORMAT
 - * When CheckSum is wrong
NG response code: 0x0102-> ISET_ERROR_CODE_CHKSUM_ERROR
 - * If HDMI OUI is wrong
NG response code: 0x0104-> ISET_ERROR_CODE_INVALID_EDID_FORMAT
 - 1.5 If the validity check is completed without abnormality, proceed as follows.
 - 1.5.1 When VID is "0"
- * Send OK response code (0x0005-> ISET_ERROR_CODE_UNKNOWN_VENDOR).
* Save VID, PID, HDMI port number in NVM and exit iSet.
- 1.5.2 When VID and PID are searched in EDID TABLE (When the PID of the table is 0xFFFF, only VID is searched.)

EDID TABLE example

```
/* Table structure
 * vid[2], pid[2], set_no[2] // ; VID & PID 는 EDID raw data 순서로 기재한다.
 * end mark
 */
const byte IR_TV_EDID_TABLE[] = {
    TU_VID(0x42D), TU_PID(0x9600), SET_NUM(341), // SAMSUNG(SAM) - LFD TV(옥외 전광판/광고용)
    TU_VID(0x42D), TU_PID(0xFFFF), SET_NUM(226), // SAMSUNG(SAM)
    TU_VID(0x1E6D), TU_PID(0xFFFF), SET_NUM(227), // LG(GSM)
    TU_VID(0x2134), TU_PID(0xFFFF), SET_NUM(9), // HITACHI(HIT)
    TU_VID(0x28C3), TU_PID(0xFFFF), SET_NUM(66), // JUC(JUC)
    TU_VID(0x40D9), TU_PID(0xFFFF), SET_NUM(194), // SHW(SHW)
    TU_VID(0x3A99), TU_PID(0xFFFF), SET_NUM(95), // PANASONIC(MEI)
    TU_VID(0x5262), TU_PID(0xFFFF), SET_NUM(21), // TOSHIBA(TSB)
}
```

In the table above, if SET_NUM is not in F / W

- * Send OK response code (0x0008-> ISET_ERROR_CODE_UNKNOWN_DEVICE).
- * Save the VID, PID, and HDMI port numbers in NVM (optional) and exit iSet.

In the table above, if SET_NUM is within F / W

- * Send OK response code (0x0000-> ISET_ERROR_NONE).
- * VID, PID, and HDMI port numbers are stored in NVM.
- * LED 3 times Blink (ON: 100ms, OFF: 100ms) and iSet is finished.

Note: The code of this setting number is used for power and external input synchronization between STB & TV.

1.5.3 When VID and PID are not searched in EDID TABLE

- * Send OK response code (0x0005-> ISET_ERROR_CODE_UNKNOWN_VENDOR).
- * Save VID, PID, HDMI port number in NVM and exit iSet.

1.6 The TV field (3-byte) of the response code is described in detail in Section 6 below.

2. Scenario when TV EDID is changed (TV change or HDMI port change)

Even if the previous EDID data (256 bytes) and the currently read EDID data 1 byte are different
Proceed from Section 1.2 of "Post-Pairing Scenario".

However, if the VID and PID are the same and the HDMI port is changed, there is no LED blink.

3. Scenario after BT reconnection

After the BT reconnects, the STB sends STB power status information to the remote control as in section 1.1 above.

- * STB power OFF state: STB screen off command (0x02)
- * STB power ON state: STB screen on command (0x03)

~~If the change of EDID is confirmed, follow item 2 above.~~

After that, the STB sends EDID data to the remote control (always with or without change).

4. Scenario according to STB [Integrated Power] button operation (BT connected state)

When the [Integrated Power] button is input while BT is connected, the TV power (toggle, ON, OFF) code is sent according to the current STB power status.

Also, when it turns ON from STB OFF, it sends TV INPUT code 3 times repeatedly to switch HDMI port to STB.

BT disconnected state is output in the order of STB power cord (IR)-> TV power toggle code-> STB version code (IR).

4.1 Enter the [All Power] button

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4. Software Specification (11/12)

The remote control checks the existence of the "TV power ON and OFF" code (discrete) in the TV manufacturer's setting number set in the EDID table.

4.1.1 When the TV power Discrete code (ON, OFF) is present, send the TV power cord as follows according to the STB power state.

STB power ON status: STB power cord (BT/IR) transmission -> TV power OFF code transmission -> STB version code (IR)

STB power OFF status: STB power cord (BT/IR) transmission -> TV power ON code transmission -> STB version code (IR) -> MACRO (TV INPUT)

* MACRO output order

1. Send TV INPUT code 2 seconds after inputting [integrated power]

2. Send TV INPUT code 3 seconds after above 1

3. Transmit and terminate the TV INPUT code 5 seconds after the above 2

* Macro output is available only when the TV INPUT code is discrete (no output when there is no discrete code)

* During the TV INPUT code macro output, the LED turns ON.

* If EDID is received during TV INPUT code macro output, macro output is stopped.

4.1.2 Discrete code does not exist

STB power cord (IR)-> TV power toggle code-> STB version code (IR).

4.2 STB screen ON / OFF command reception

Save screen status information from STB

* During TV INPUT code transmission, when TV power OFF code is transmitted, TV INPUT code transmission is stopped.

5. Scenario according to STB [Btv power] button operation

If there is HDMI discrete code regardless of BT connection or not, send the TV INPUT code at the [Btv power] button to synchronize the external input.

5.1 [Btv Power] button input

STB power cord (BT) transmission-> TV INPUT code transmission and termination after 1 second

5.2 The remote control transmits the corresponding code when there is an HDMI discrete code of the set TV.

-No TV INPUT code transmission

6. i-Set Command Response Code "TV" Field Operation Scenario

This is a function to transmit the currently set TV tuning code to the STB, and the type and setting number set in the TV field (3-byte) are loaded.

6.1 When receiving EDID of TV starting with i-Set Start cmd (0x01)

6.1.1 i-Set TV setup OK: "0x00" in TV Type field and synchronized code allocation by EDID in TV code field

TV Type: 0x00

TV Code: 0x0140 (320)-When the TV setting number set to EDID is 320

6.1.2 i-Set TV setup NG: Allocate the last set type (0x01 or 0x02) and tuned code in the TV Type field

Example 1: User manually tuned 350 times

TV Type: 0x01

TV Code: 0x015E (320)

Example 2: When the user has learned (Manual tuning code is 350)

TV Type: 0x02

TV Code: 0x015E (320)

6.2 For STB request: i-Set Get TV code cmd (0x04)

6.2.1 When the remote control receives the above command (0x04) from the STB, it should send a response code within 5 seconds.

6.2.2 "Result" and "Error Code" fields are assigned as 0x01 and 0x00.

6.2.3 The "TV Type" field is assigned one of 0x00 (iSET), 0x01 (Manual), and 0x02 (IR Learning) according to the method in which the TV is tuned.

6.2.4 The "TV Code" field assigns the currently tuned code.

7. 기타

7. Other

7.1 If TV manufacturer code is set manually after iSet setup

* iSet function disable: Operates regardless of STB power status.

7.2 When VID & PID are connected to another TV, iSet setting and STB interlocking operation should be performed.

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4. Software Specification (12/12)

Smart TV control operation scenario

1. How to switch smart TV control mode

1.1 When the [스마트TV] button is input, the following key code is transmitted and switched at the same time

- Smart home (IR) of the synchronized (manual, automatic, learning) TV
- Smart TV control mode (IR/BT)
- Btv Break code (BT) - BT unconnected status (IR) is not transmitted

* Pairing proceeds in unpaired state (no smart TV mode conversion).

* If the 'smart home' IR code of the TV does not exist, the 'smart TV control' mode will not be switched.

1.2 Controllable Buttons

- Includes TV-only button(s) as well as [이전] and [나가기] buttons.

* 12 buttons: [TV전원], [외부입력], [TV음량 +/-], 4-way, [Play/Pause], [스마트TV], [이전], [나가기]

* The upper button always maintains TV mode in TV control mode.

Note: When the external input button is input, the 5-second timer does not run (because it is already in TV mode).

* It should be IR learning.

- When the volume +/- (tilt key) key is input, the TV volume operates regardless of the right volume slide switch.

2. How to switch Btv control mode

2.1 [Home] button input

- Exit (IR) of the tuned TV
- Btv control mode (IR/BT)
- Btv Break/Release code (IR/BT)
- Btv Home (IR/BT)
- Btv Break/Release code (IR/BT) - BT unconnected status (IR) is not transmitted
- HDMI discrete code (IR) of the tuned TV after 300ms - Transmitted only when discrete code exists in the state of BT connection and iSet synchronization

* If the [Home] button is input after changing to the Btv control mode, the 'Btv Home' key code is transmitted. (No macro transmission)

2.2 Special purpose button input

- Apply button: NUGU, GA, schedule, shortcut
- Transition method: same logic as Btv home button (instead of sending home button, sending the corresponding Btv keycode)

2.3 Btv dedicated button repeat input

- Applied buttons: Btv dedicated buttons (numbers (0~9), *, #, favorite channels, channels +/-, REW (Red), FF (Blue), mute)
- How to switch
 - . When the target button is repeatedly inputted 3 times within 60 seconds, it switches to Btv mode (same macro as the Btv home button. However, the corresponding key code is transmitted instead of the home key)
 - . Only the corresponding key code is transmitted normally until you enter it twice within 60 seconds.
 - . Input the smart TV control mode target button (see Section 1.2) within 60 seconds, or reset the count 3 times when the last input exceeds 60 seconds

2.4 Enter number + [Play/Pause] button

- Apply button: number button (0~9)
- How to switch
 - . When the [Play/Pause] button is input after inputting the number buttons (0~9), it switches to Btv mode (same macro as the Btv home button with the [Play/Pause] button key code)
 - . It operates when the [Play/Pause] button is input after entering the number button once, or when the [Play/Pause] button is input after entering the number button twice
 - (In case of input 3 times, it is changed to Btv mode by operation of section 2.3)

2.5 In case of switching to other Btv control mode

- When H/W reset occurs, Btv mode is default.
- When [통합전원] is input
- In case of TV synchronization (manual, automatic)
- Factory reset (including unpairing)

3. Notification while using TV mode

3.1 Transmission of key code (IR/BT) indicating 'TV control mode'

- Apply button: 4-way button, [Play/Pause], [이전], [나가기]
- Transmission method: When the button is pressed and released, it is transmitted (repeated when the corresponding key is pressed 5 times)
- Count is cleared because it is converted to Btv control mode during factory reset.

~~3.2 Buzzer sound indicating 'TV control mode'~~

- ~~- Apply button: numbers (0~9), *, #, favorite channel, channel +/-, REW, FF~~
- ~~- Buzzer Specification: Refer to 'RCU Smart TV' Warning Buzzer Operation Specification of Buzzer Spec~~

4. LED Color Operation Scenario

4.1 Btv Control Mode: Green

Green is lit even when the TV dedicated button is input

4.2 Smart TV control mode: Blue -> Only the button that transmits the TV code turns blue

Green turns on when Btv dedicated button is input

4.3 When the battery voltage is below the low voltage (including empty), Red is always on regardless of the control mode.

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5. Part List

5.1 Mechanical List

No.	Part Name	Spec	Q'ty	Maker	비고
1	Mid Case	PC/ABS, NH1017D, K21441 (B/K)	1	Ilsang Electronic	
2	Bottom Cover	ABS, HF380, 9001(B/K), Black Spray, Silk2, Urethane Coating	1	Ilsang Electronic	
3	IR Window	PC, 1220R, 40697B(D/R)	1	Ilsang Electronic	
4	Power Knob	ABS, HF380, 9001(B/K), Black Spray,, Silk1, Soft Coating	1	Ilsang Electronic	
5	Back Exit Knob	PC, 1220, Clear,, Black Spray, Gray Spary, Silk2, Laser, Soft Coating	1	Ilsang Electronic	
6	Navi Button	PC, 1220, Clear, Black Spray, Gray Spray, Laser, Soft Coating	1	Ilsang Electronic	
7	Play/Pasue Button	PC, 1220, Clear, Black Spray, Gray Spray, Laser, Soft Coating	1	Ilsang Electronic	
8	Side Button	ABS, HF380, 9001(B/K), Black Spray, Silk1, Urethane Coating	1	Ilsang Electronic	
9	Slide Button	ABS, HF380, 9001(B/K), Black Spray,, Urethane Coating	1	Ilsang Electronic	
10	Tilt Key-L	ABS, HF380, 9001(B/K), Black Spray,, Soft Coating	1	Ilsang Electronic	
11	Tilt Key-R	ABS, HF380, 9001(B/K), Black Spray,, Soft Coating	1	Ilsang Electronic	
12	Indicator LED	PC, LD7800, W1020J(Milky)	1	Ilsang Electronic	
13	Rubber Keypad	SILICONE, COLOR1(CLEAR), Silk5, Spray2, Laser, Soft Coating	1	UNICON	
14	Number keypad	SILICONE, COLOR1(CLEAR), Silk1, Spray1, Laser,, Soft Coating	1	UNICON	
15	Metal Dome Sheet	Φ4DR 130G 21Key, Φ5DR, 180G, 12Key	1	Leading Stars	
16	Pe Bag	PE BAG, 80X220X0.08T	1	Geona Tech	
17	Carton Box	553*415*282 (60EA/1Box)	0.0166	Daeheung	
18	Back Label	BOPP,30X42,SILK2	1	Top Print	
19	Pass Label	ART PAPER,15X30,SILK2	1	Top Print	
20	Protect Tape	TAPE, RB50	1	J & Tech	
21	Battery Foam Tape	18X18X0.3, Foam Double Tape	1	J & Tech	

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5.2 Electronical Part List

Item	Components Name	Components Spec'	Quantity	Reference	Manufacturer
	Antenna SMD	ANTENNA CHIP, ACA3216A1CCS	1	ANT1	Inpaq
	Buzzer SMD	BUZZER SMD, BM9027S	1	BZ1	
		BUZZER SMD, HR-9027BT3S2			FHD
		BUZZER SMD, KDM-09D-3V			Bosan
		BUZZER SMD, BMY-2703			HS Tech
	FPC Connector	FPC CON, THD0509-20CL-GF(20PIN)	2	CON2,CON3	
		FPC CON, FC42-S20FMA-1H(20PIN)			Yeonho, IRIS, Molex, Jinglai
	USB C Type Connector	Z-CF061SLB12R-A-68	1	CON4	ZDT
	Wire to Board Connector	WIRE TO B CON SMD, 12S05WS-02P	1	P1	Yeonho, IRIS, Molex, Jinglai
	Analog Microphone SMD	MIC, ZTS6111(TOP)	1	MIC1	
		MEMS MIC, ZTS6211E (TOP)			Ziltek, Sanico, Knowles, BSE
	FET N-CH	FET N-CH, 2KK5009(SOT23)	6	Q1,Q2,Q3,Q10,Q11,Q13	
		FET N-CH, L2N7002SLT1G(SOT23)			
		FET N-CH, 2N7002K(SOT23)			Kexin, PANJIT, KEC, Semtech
		FET N-CH, PJA3430(SOT-23)			Diodes, Onsemi, Fairchild, UTC
		FET N-CH, MMBT7002K(SOT23)			Vishay, First silicon,Galaxy
	Transistor Chip	MMBTSD123(SOT23)	7	Q4,Q5,Q6,Q7,Q8,Q9,Q12	
		TRANSISTOR NPN, KST8050(SOT23)			
		TRANSISTOR NPN, FTC8050H(SOT23)			Kexin, PANJIT, KEC, Semtech
		TRANSISTOR NPN, FTC8050H(SOT23)			Diodes, Onsemi, Fairchild, UTC
		TRANSISTOR NPN, SS8050(SOT23)			Vishay, First silicon,Galaxy
	Schottky Diode Chip	SCHOTTKY DIODE, 1KK2104(SOD123)	1	D1	
		SCHOTTKY DIODE, MBR0540W-HAF(SOD123FL)			
		SCHOTTKY DIODE, MBR0540T1-D(SOD123)			Kexin, PANJIT, KEC, Semtech
		SCHOTTKY DIODE, MBR0540(SOD123)			Diodes, Onsemi, Fairchild, UTC
					Vishay, First silicon,Galaxy
	Switching Diode Chip	SWITCHING DIODE, 1N4148WS(SOD323)	1	D2	
	Diode TVS	TVS DIODE, SMF5.0A(SOD123F)	1	D3	
	IR LED SMD	IR LED SMD, BIR-HMC33M-TRC-SIDE(30DEG)	1	IR1	
		IR26-61C-L510-R-2G			BriteLED
	RGB LED SMD	YLS191/RGB/21/06A-C	1	LED1	Everlight
	White LED SMD	LED, ORH-W46A-W(WHITE,W7,W8V27,V28)	10	LED2,LED3,LED4,LED5,LED6,LED7,LED8,LED9,LED10,LED11	Orient
		19-213AUDT-S5212-TR8			Everlight
		BL-HZ336G-EH54			BriteLED
	White LED SMD	LC-S01-WB-B22H (Side View)	4	LED14,LED15,LED16,LED17	
		27-21-T1D-KPQHY-3C			GMA
					Everlight
	Photo Transistor SMD	PHOTO TRANSISTOR, PT12-21B-TR8(SMD,R/A)	1	PT1	Everlight
	Tact Switch SMD	TS24ZJ 160gf	1	SW1	
	Slide Switch SMD	MKS12C02 MINI	1	SW2	Foxeco, ALPS, EASTERN, SHOUHAN
	Inductor Chip	INDUCTOR, 3.3NH,±0.3NH,1005	1	L2	
	Inductor Chip	INDUCTOR, 3.9NH,±0.3NH,1005	1	C3	
	Power Inductor Chip	POWER INDUCTOR, PCLS2012-2R2M(2.2UH,1A)	1	L3	
	Power Inductor Chip	POWER INDUCTOR, WIP252010P-2R2MLS(2.2UH)	1	L4	
	Ceramic Capacitor Chip	MLCC, 1.2PF,NP0,±0.25PF,1005	2	C5,C6	
	Ceramic Capacitor Chip	MLCC, 22PF,C0G,±5%,1005	4	C2,C55,C56,C57	
	Ceramic Capacitor Chip	MLCC, 100PF,C0G,±5%,1005	1	C29	
	Ceramic Capacitor Chip	MLCC, 150PF,X7R,±10%,1005	1	C28	
	Ceramic Capacitor Chip	MLCC, 100NF,10V,X7R,±10%,1005	19	C7,C8,C9,C10,C11,C18,C19,C21,C23,C24,C25,C30,C31,C32,C39,C45,C46,C52,C54	MURATA, TDK, Samsung, YAGEO
	Ceramic Capacitor Chip	MLCC, 1UF,X5R,±10%,1005	12	C1,C12,C15,C17,C20,C22,C35,C36,C42,C43,C47,C48	Taiyo-uden, WALSHIN, Darfon
	Ceramic Capacitor Chip	MLCC, 4.7UF,X5R,±20%,1005	5	C13,C16,C44,C49,C51	samihwa, AVX, Kyocera, KEMET
	Ceramic Capacitor Chip	MLCC, 10UF,10V,X5R,±10%,1608	4	C14,C26,C27,C50	Eyang, Fenghua, NIC Compenets
	Ceramic Capacitor Chip	MLCC, 22UF,6.3V,X5R,±20%,1608	3	C33,C38,C41	Pikcor, LRC
	Resistor Chip	RESISTOR CHIP, 0 OHM,1/8W,±5%,2012	2	R24,R82	
	Resistor Chip	RESISTOR CHIP, 0 OHM,1/16W,±5%,1005	1	L1,R88	
	Resistor Chip	RESISTOR CHIP, 2 OHM,1/16W,±5%,1005	1	R1	
	Resistor Chip	RESISTOR CHIP, 3.3 OHM,1/10W,±5%,1608	1	R22	
	Resistor Chip	RESISTOR CHIP, 10 OHM,1/16W,±5%,1005	1	R2	
	Resistor Chip	RESISTOR CHIP, 100 OHM,1/16W,±5%,1005	4	R60,R61,R84,R85	
	Resistor Chip	RESISTOR CHIP, 300 OHM,1/16W,±5%,1005	13	R9,R42,R43,R44,R45,R46,R47,R48,R49,R73,R74,R75,R76	
	Resistor Chip	RESISTOR CHIP, 470 OHM,1/16W,±5%,1005	10	R16,R18,R20,R31,R35,R36,R37,R52,R57,R79	
	Resistor Chip	RESISTOR CHIP, 560 OHM,1/16W,±1%,1005	2	R41,R65	
	Resistor Chip	RESISTOR CHIP, 680 OHM,1/16W,±1%,1005	1	R40	
	Resistor Chip	RESISTOR CHIP, 1K OHM,1/16W,±5%,1005	1	R30	
	Resistor Chip	RESISTOR CHIP, 2.7K OHM,1/16W,±5%,1005	1	R15	
	Resistor Chip	RESISTOR CHIP, 4.7K OHM,1/16W,±5%,1005	3	R3,R4,R13	
	Resistor Chip	RESISTOR CHIP, 5.1K OHM,1/16W,±1%,1005	2	R66,R67	
	Resistor Chip	RESISTOR CHIP, 10K OHM,1/16W,±5%,1005	5	R8,R23,R26,R69,R71	
	Resistor Chip	RESISTOR CHIP, 18K OHM,1/16W,±1%,1005	1	R14	
	Resistor Chip	RESISTOR CHIP, 33K OHM,1/16W,±5%,1005	1	R34	
	Resistor Chip	RESISTOR CHIP, 47K OHM,1/16W,±1%,1005	5	R25,R29,R72,R81,R83	
	Resistor Chip	RESISTOR CHIP, 82K OHM,1/16W,±5%,1005	3	R27,R62,R63	
	Resistor Chip	RESISTOR CHIP, 100K OHM,1/16W,±5%,1005	13	R17,R19,R21,R32,R33,R38,R39,R53,R58,R59,R68,R80,R89	
	Resistor Chip	RESISTOR CHIP, 220K OHM,1/16W,±1%,1005	1	R70	
	Resistor Chip	RESISTOR CHIP, 240K OHM,1/16W,±1%,1005	1	R54	
	Resistor Chip	RESISTOR CHIP, 820K OHM,1/16W,±1%,1005	2	R28,R55	
	THERMISTOR CHIP	THERMISTOR CHIP, TSM0B103F3381RZ	1	R64	THINKING ELECTRONICS
	Bluetooth IC	BLUETOOTH IC, RTL8762CKF(QFN48)	1	U1	Realtek
	Accelerometer IC	ACCELEROMETER IC, DA218B(LGA12)	1	U3	MiraMEMS
	Level Shift IC	LEVEL SHIFT 2-CH, TXB0102DCU(VSSOP8)	1	U5	TI
	Battery Charger IC	BAT CHARGER, BQ25101YFPR(DSBGA)	1	U6	TI
	Step Down Converter IC	DC-DC IC, TPS62840YBGR(DSBGA)	1	U7	TI
	Crystal SMD	X-TAL SMD, 40MHZ,7R40000002_S1,2016	1	X1	
		X-TAL SMD, 40MHZ,±10PPM,9PF,2016			TXC, H&S, Sunny
	Li-Polymer Battery	YJ 602535-485mAh	1		YJ Power
	PCB	PCB, RD65A(FR-4,1.2T,4L,OSP,CARBON)	1		GE, SSSG, JSL, PENG YU

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10

REFORM :

DECISION :

SPECIFICATION

(TRANSMITTER REMOCON)

MODEL NO :

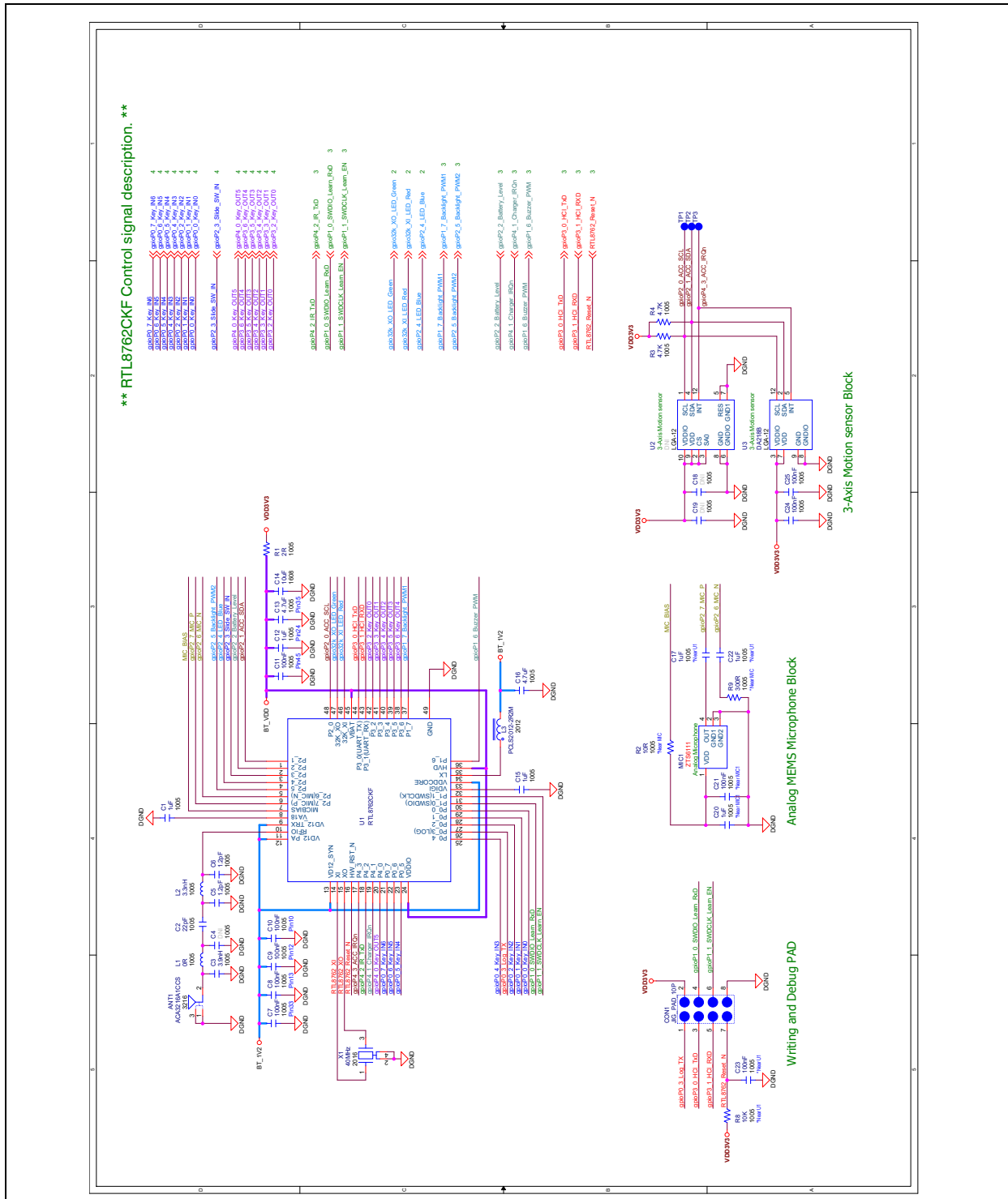
RD65A00

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6. Schematics

6.1 Bluetooth smart PART



REMOTE SOLUTION CO., LTD.

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SPECIFICATION

(TRANSMITTER REMOCON)

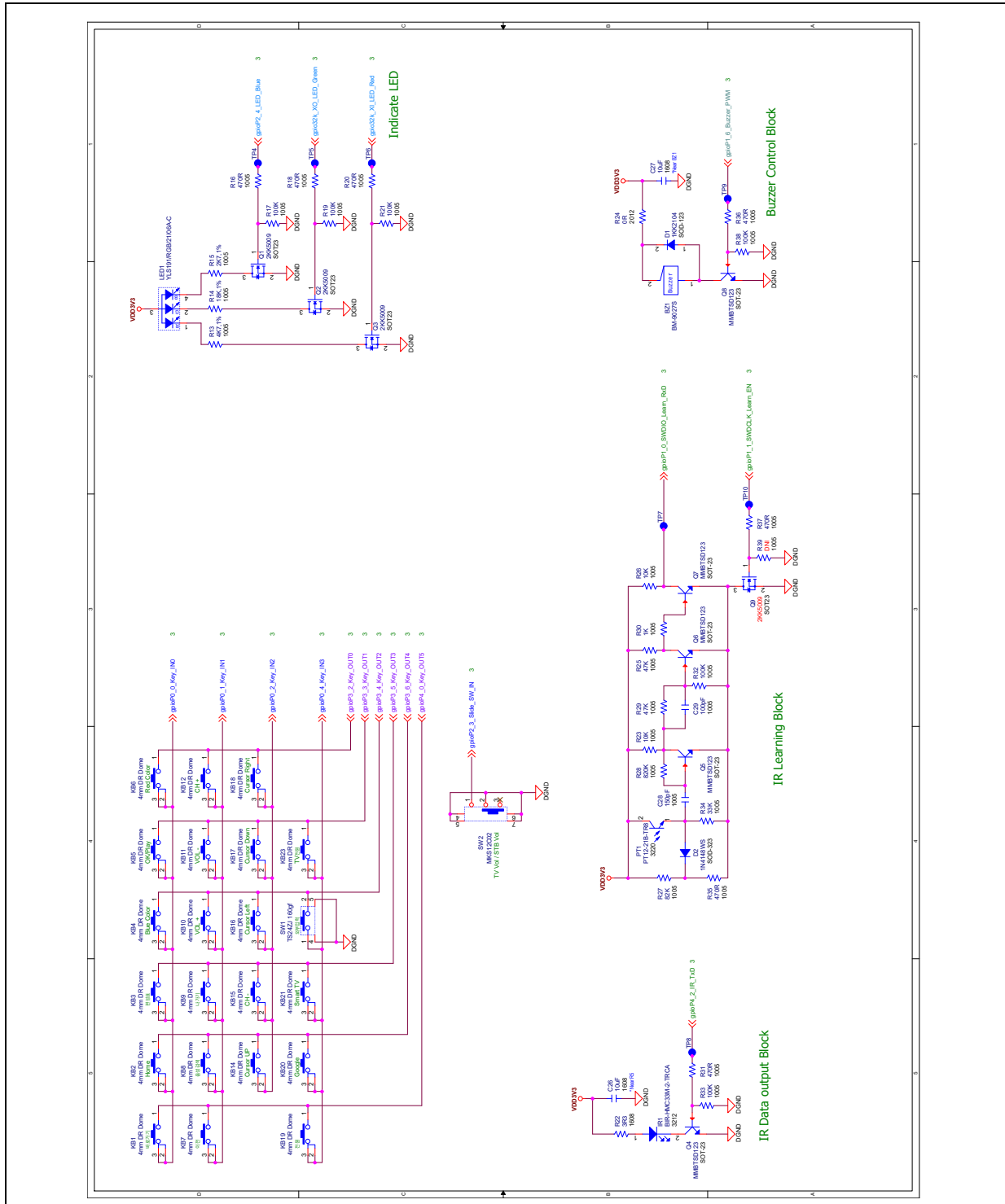
MODEL NO :

RD65A00

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6.2 Keys / IR Learning / IR TxD / Buzzer PART



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SPECIFICATION

(TRANSMITTER REMOCON)

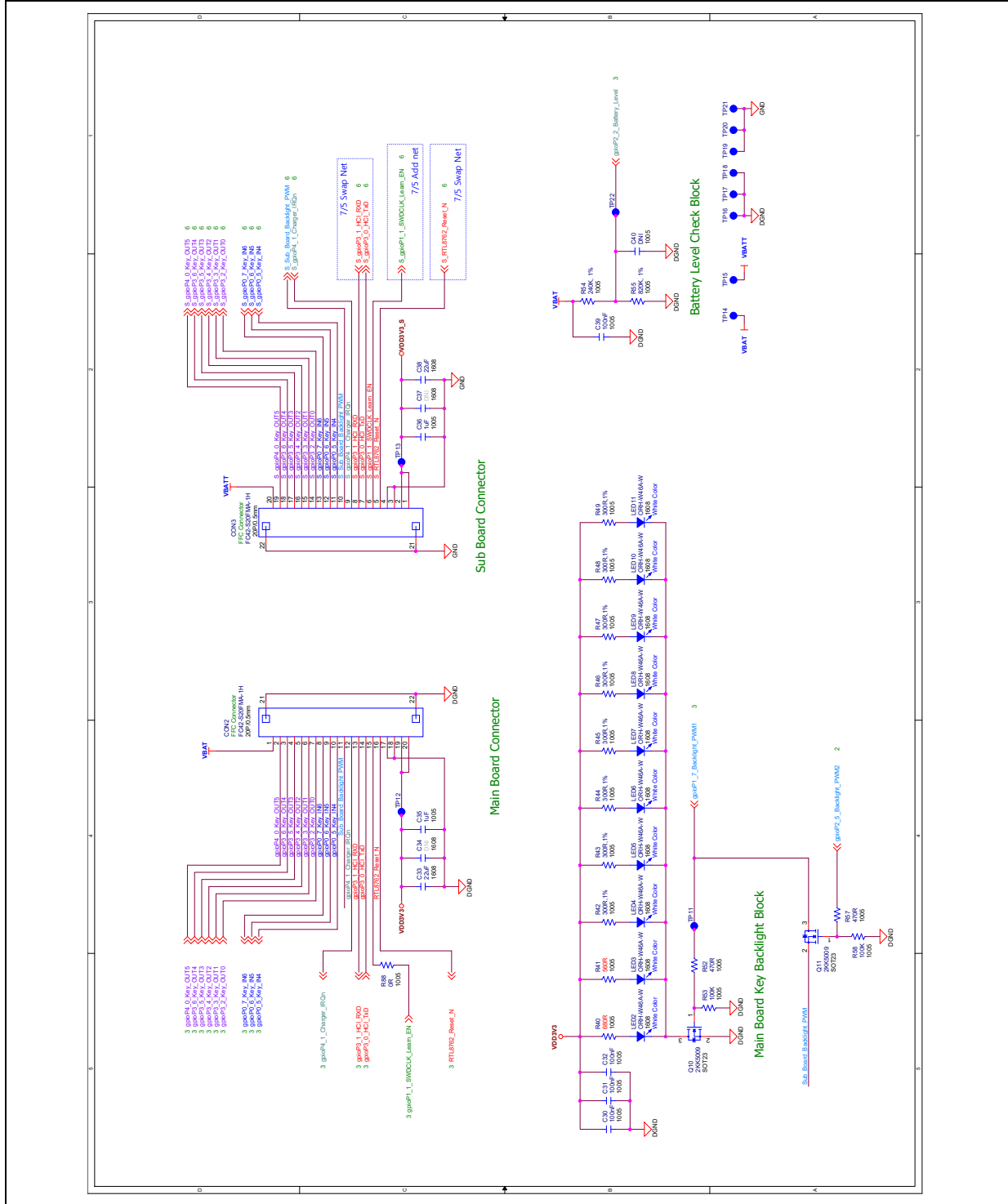
MODEL NO :

RD65A00

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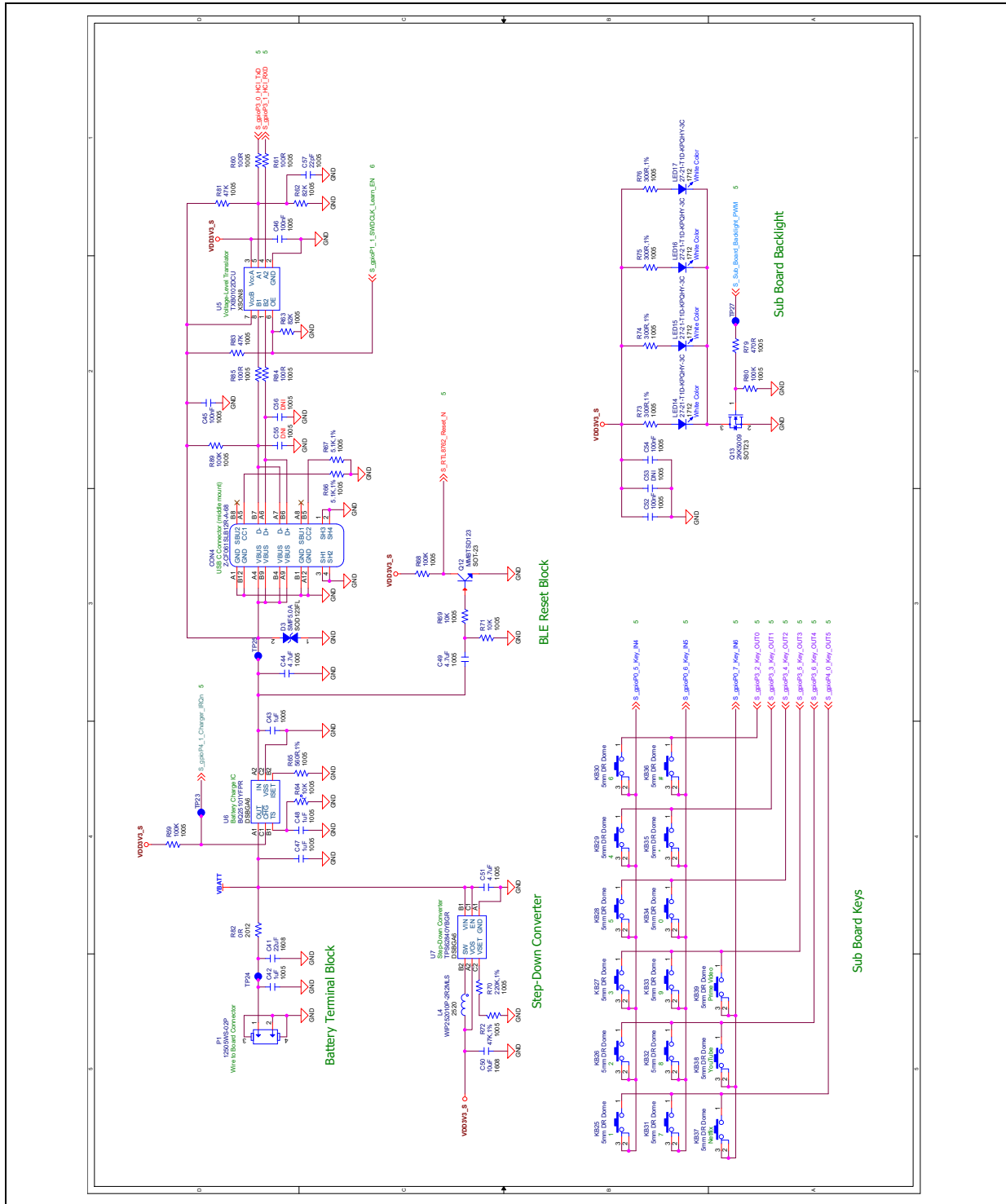
6.3 FFC Connector / Backlight



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INSTITUTION : 2021.09.10	<u>SPECIFICATION</u> (TRANSMITTER REMOCON)	MODEL NO :	26
REFORM :		RD65A00	68
DECISION :			

6.4 Backlight / Battery Terminal Part

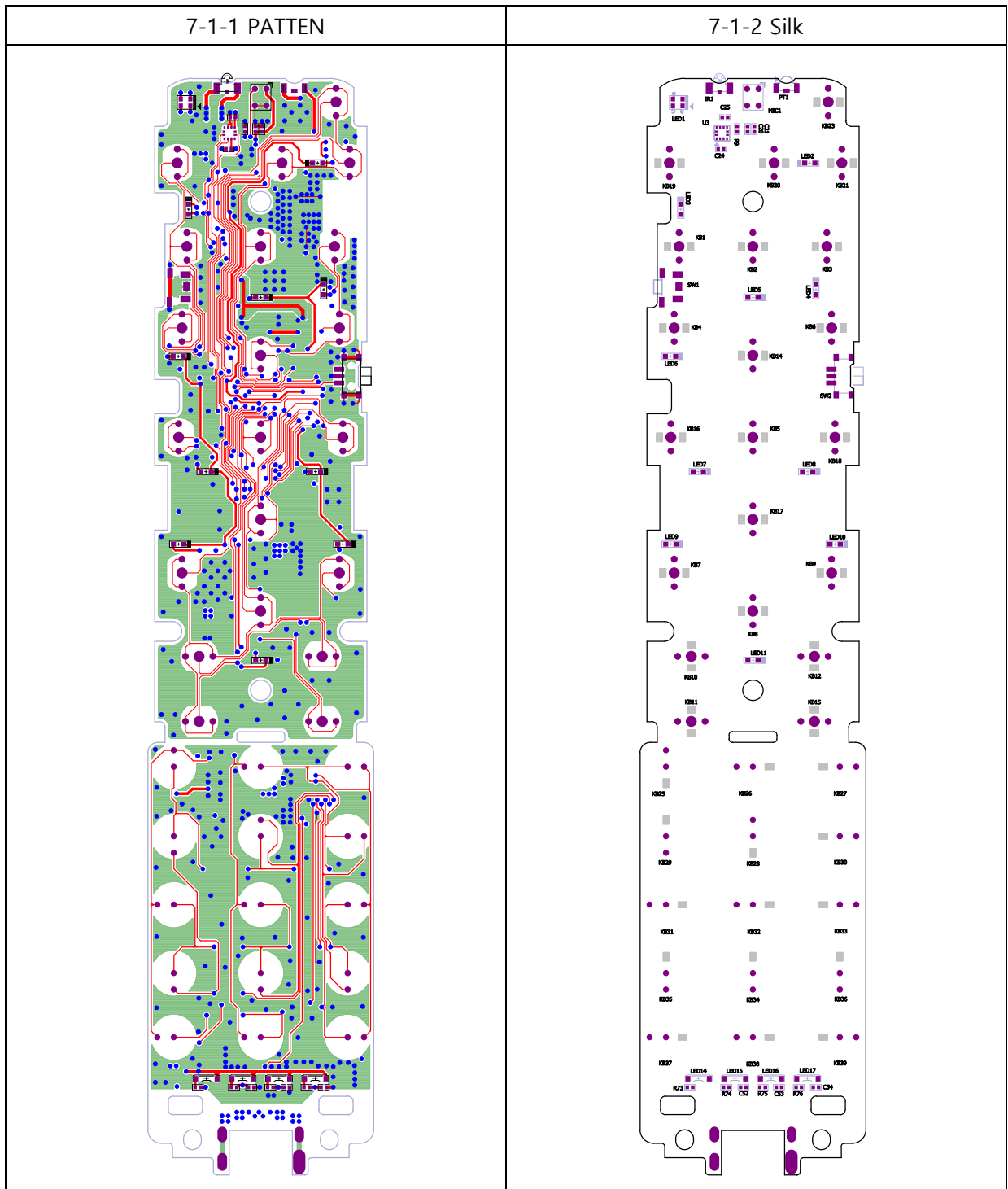


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INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	27
REFORM :			
DECISION :		RD65A00	68

7. PCB Diagram

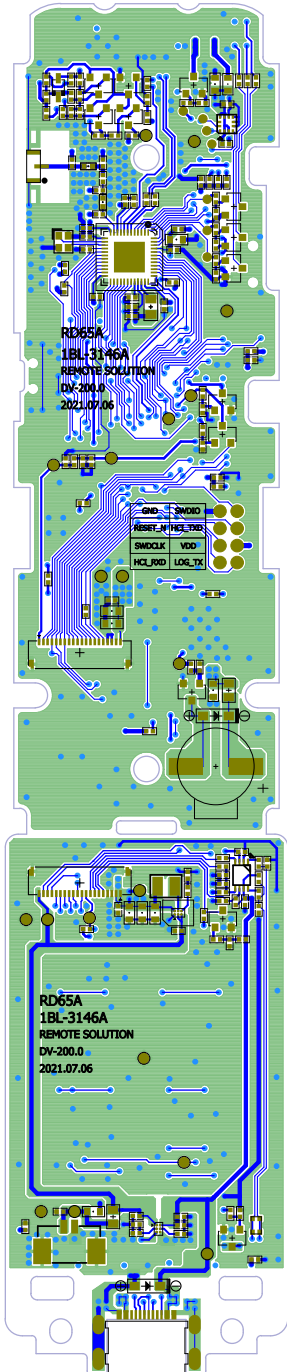
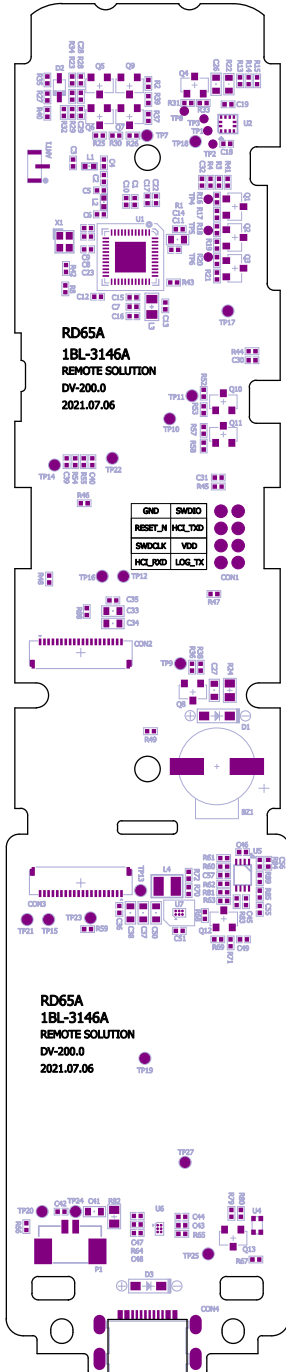
7.1 TOP PCB (1/3)



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INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	28
REFORM :			
DECISION :		RD65A00	68

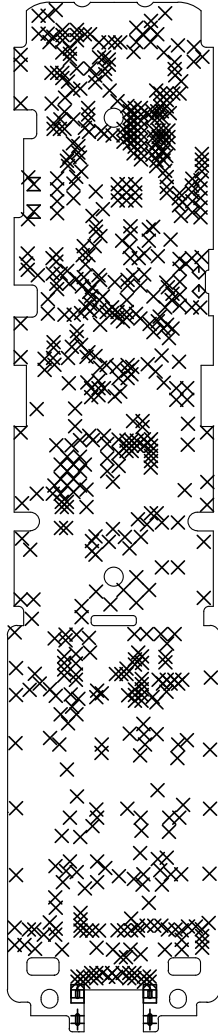
7.2 BOTTOM PCB (2/3)

7-1-3 PATTEN	7-1-4 Silk
 RD65A 1BL-3146A REMOTE SOLUTION DV-200.0 2021.07.06 RD65A 1BL-3146A REMOTE SOLUTION DV-200.0 2021.07.06	 RD65A 1BL-3146A REMOTE SOLUTION DV-200.0 2021.07.06 RD65A 1BL-3146A REMOTE SOLUTION DV-200.0 2021.07.06

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INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	29
REFORM :			
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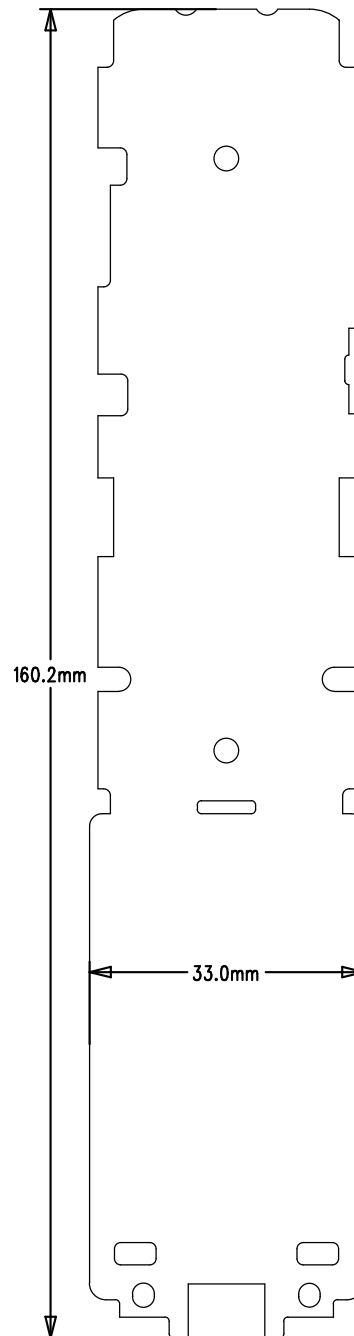
7.3 MAIN PCB (3/3)

7-1-5 Drill Chart	7-1-6 Main PCB 사양																														
	1) PCB Material : FR4, 4-Layer 2) PCB Thickness : 1.2T 3) Copper Foil Thickness : - Out Layer 0.5 OZ - Inner Layer 1 OZ 4) PCB Size Single - 33.0_mm x 168.8mm Array – 160.2_mm x _188.85_mm (5 In 1) 5) SilkScreen Color : White 6) PSR Ink Color : Green 7) Surface : OSP 8) Dome Key : Carbon 9) PCB Version : 1BL-3146A																														
<table><tr><th>SIZE</th><th>QTY</th><th>SYM</th><th>PLATED</th><th>TOL</th></tr><tr><td>0.6 x 1.8</td><td>2</td><td>+</td><td>YES</td><td>+/-0.0</td></tr><tr><td>0.3</td><td>626</td><td>×</td><td>YES</td><td>+/-0.0</td></tr><tr><td>0.6 x 1.4</td><td>2</td><td>□</td><td>YES</td><td>+/-0.0</td></tr><tr><td>0.9</td><td>2</td><td>◇</td><td>NO</td><td>+/-0.0</td></tr><tr><td>0.9</td><td>2</td><td>⊗</td><td>YES</td><td>+/-0.0</td></tr></table>	SIZE	QTY	SYM	PLATED	TOL	0.6 x 1.8	2	+	YES	+/-0.0	0.3	626	×	YES	+/-0.0	0.6 x 1.4	2	□	YES	+/-0.0	0.9	2	◇	NO	+/-0.0	0.9	2	⊗	YES	+/-0.0	
SIZE	QTY	SYM	PLATED	TOL																											
0.6 x 1.8	2	+	YES	+/-0.0																											
0.3	626	×	YES	+/-0.0																											
0.6 x 1.4	2	□	YES	+/-0.0																											
0.9	2	◇	NO	+/-0.0																											
0.9	2	⊗	YES	+/-0.0																											

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INSTITUTION : 2021.09.10	<u>SPECIFICATION</u> (TRANSMITTER REMOCON)	MODEL NO :	30
REFORM :			
DECISION :		RD65A00	68

8. PCB Outline Specification – Main PCB



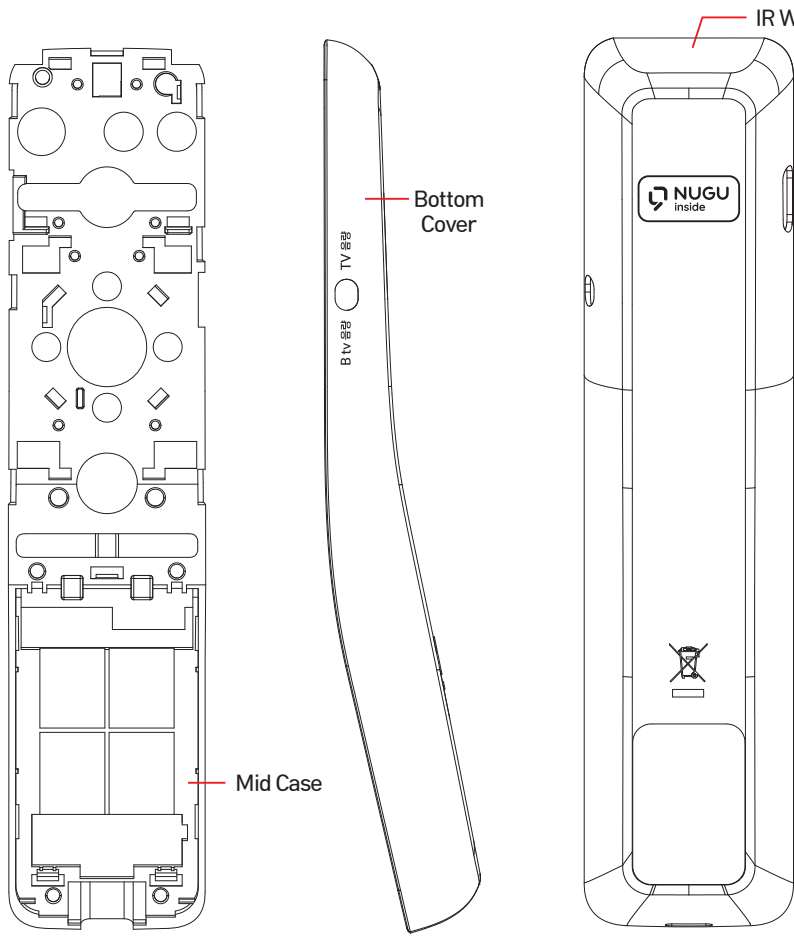
RD65A SKB Signature-070 – Thu Jul 08 10:22:24 2021

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INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	31
REFORM :			
DECISION :		RD65A00	68

9. Design & Mechanical Specification

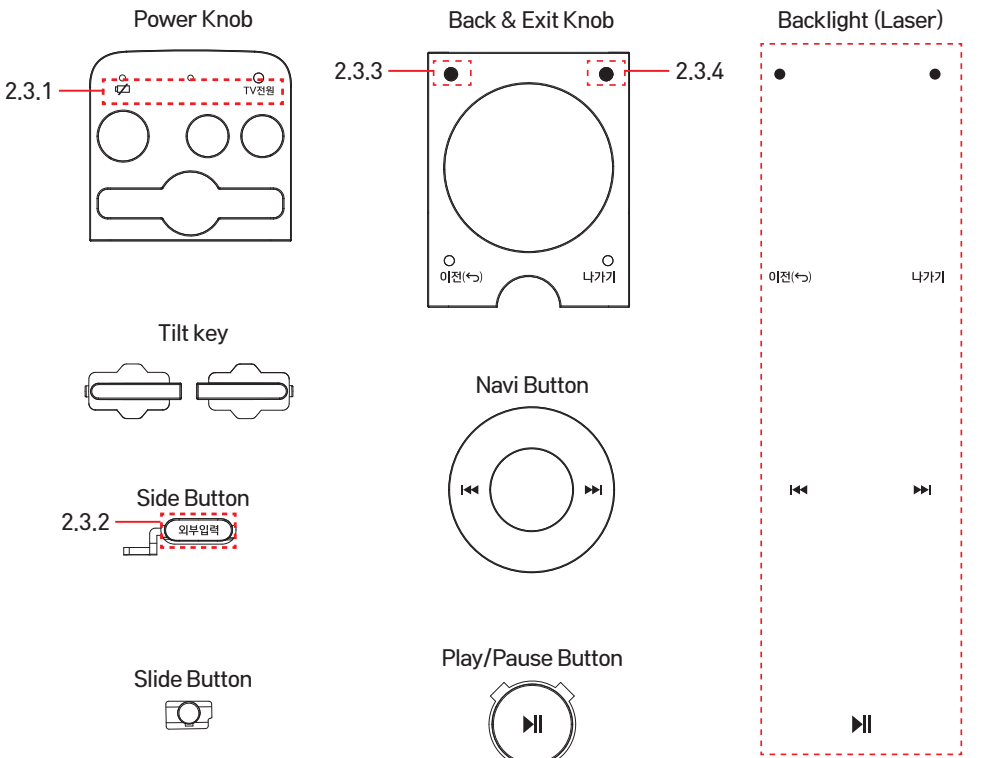
9. Design (1/5) – Mold

DESIGN SPECIFICATION Model : RD65A00	
	
1.MOLD	
1.1 MOLD COLOR * Mid Case : PC/ABS, NH1017D, K21441(Black) Bottom Cover : ABS, HF380, 9001(Black) * IR Window : PC, D/Red	
1.2 SPRAY COLOR * Bottom Cover : Black, Urethane Coating (Matte)	
1.3 SILK COLOR * Coolgray 5C	

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	32
REFORM :			
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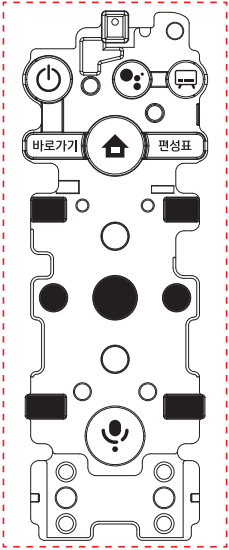
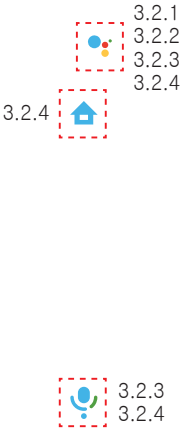
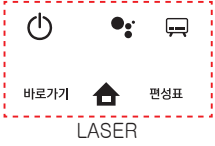
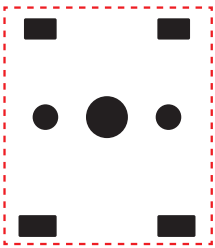
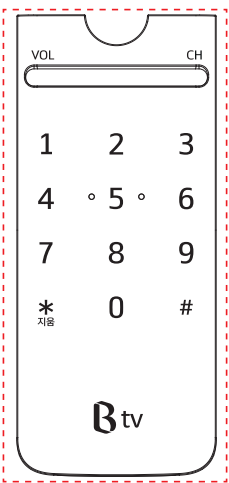
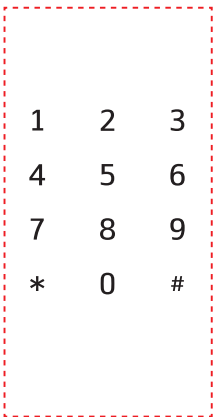
9. Design (2/5) – KNOB

DESIGN SPECIFICATION		Model : RD65A00
		
2.KNOB		
2.1 MOLD COLOR * Power, Tilt, Side, Slide : ABS, HF380, 9001(Black) * Back & Exit, Navi, Play/Pause : PC, 1220(Clear)		2.3 SILK COLOR 2.3.1 Coolgray 3C 2.3.2 Coolgray 5C 2.3.3 P/T 7619C (Red) 2.3.4 P/T 660C (Blue)
2.2 SPRAY COLOR * Power, Tilt : Black, SF Coating (Matte) * Back & Exit, Navi, Play/Pause : Coolgray 3C, Black, SF Coating (Matte) * Side, Slide : Black, Urethane Coating (Matte)		

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	33
REFORM :			
DECISION :		RD65A00	68

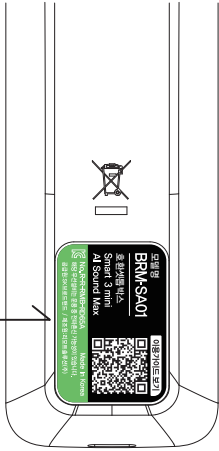
9. Design (3/5) – RUBBER

DESIGN SPECIFICATION		Model : RD65A00	
		 3.2.1 3.2.2 3.2.3 3.2.4 바로가기 편성표 LASER	
		 3.2.3 3.2.4 LASER (CLEAR VIEW) LASER	
 3.1.1.1	 3.2.5	 3.2.5	
3.RUBBER			
3.1 RUBBER COLOR 3.1.1 TRANSLUCENCE WHITE * BLACK VIEW FINISH		3.2 SILK COLOR 3.2.1 P/T 7619C 3.2.2 P/T 7724C 3.2.3 P/T 123C 3.2.4 P/T 660C 3.2.5 COOLGRAY 7C	
		3.3 SPRAY COLOR 3.3.2 COOLGRAY 3C 3.3.3 BLACK * SOFT COATING FINISH	

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INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	34
REFORM :			
DECISION :		RD65A00	68

9. Design (4/5) – LABEL

DESIGN SPECIFICATION		Model : RD65A00
Back Label  SCALE 150% 		
Passed Label 		
4.BACK LABEL	5.PASSED LABEL	
4.1 Material : White Bopp 4.2 Size : 29 X 20mm(±0.1mm) 4.3 Silk Color : Black, P/T 360C 4.4 Coating : Matte Laminating	5.1 Material : Art Paper 5.2 Size : 30 X 15mm(±0.1mm) 5.3 Silk Color : Text-Black, P/T 2728C Background – White	

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	<u>SPECIFICATION</u> (TRANSMITTER REMOCON)	MODEL NO :	35
REFORM :		RD65A00	
DECISION :			68

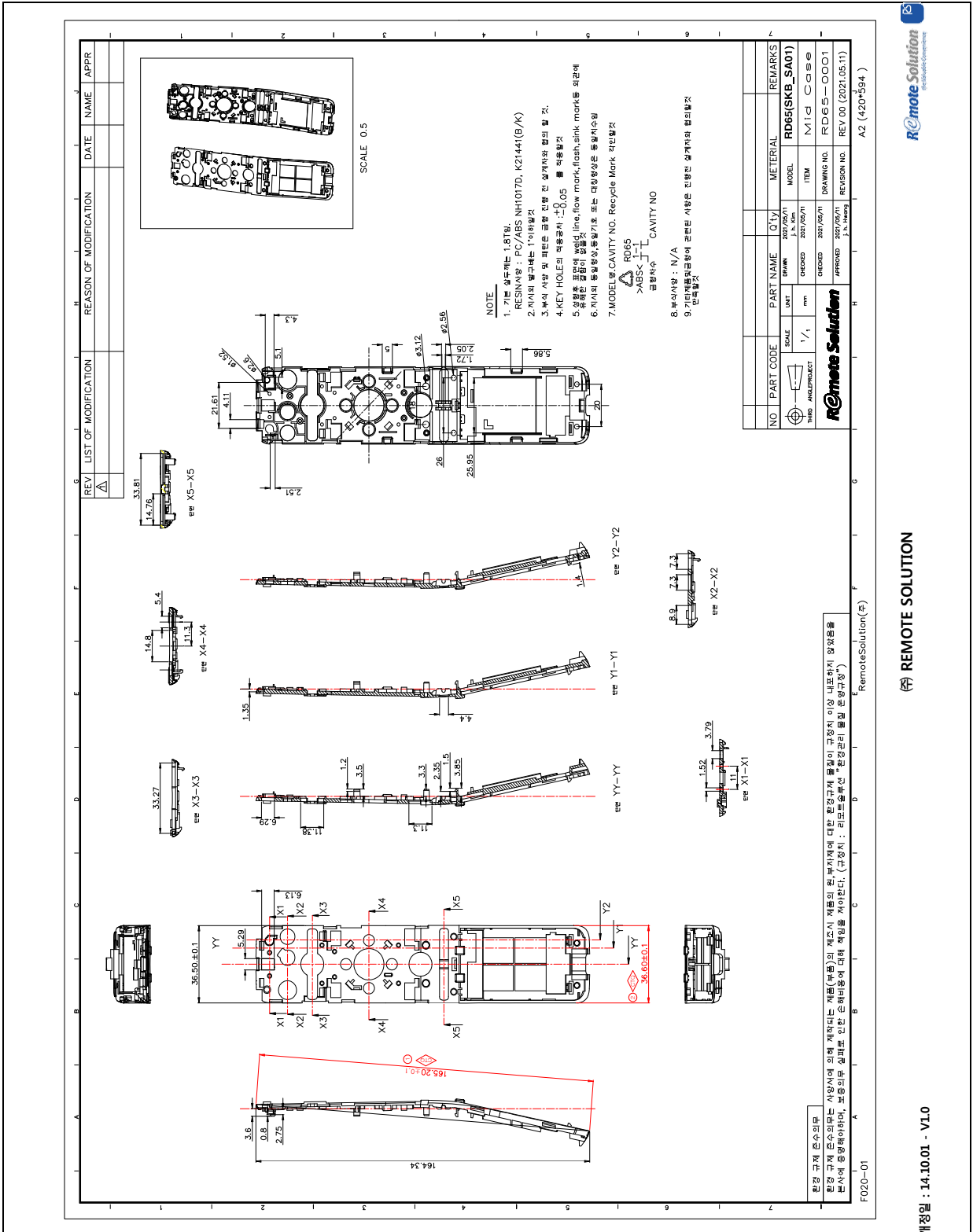
9. Design (5/5) – MANUAL

[illegible]

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	<u>SPECIFICATION</u> (TRANSMITTER REMOCON)	MODEL NO :	36
REFORM :			
DECISION :		RD65A00	68

10. Mechanical Spec(1/17) – Mid Case



REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10

REFORM :

DECISION :

SPECIFICATION

(TRANSMITTER REMOCON)

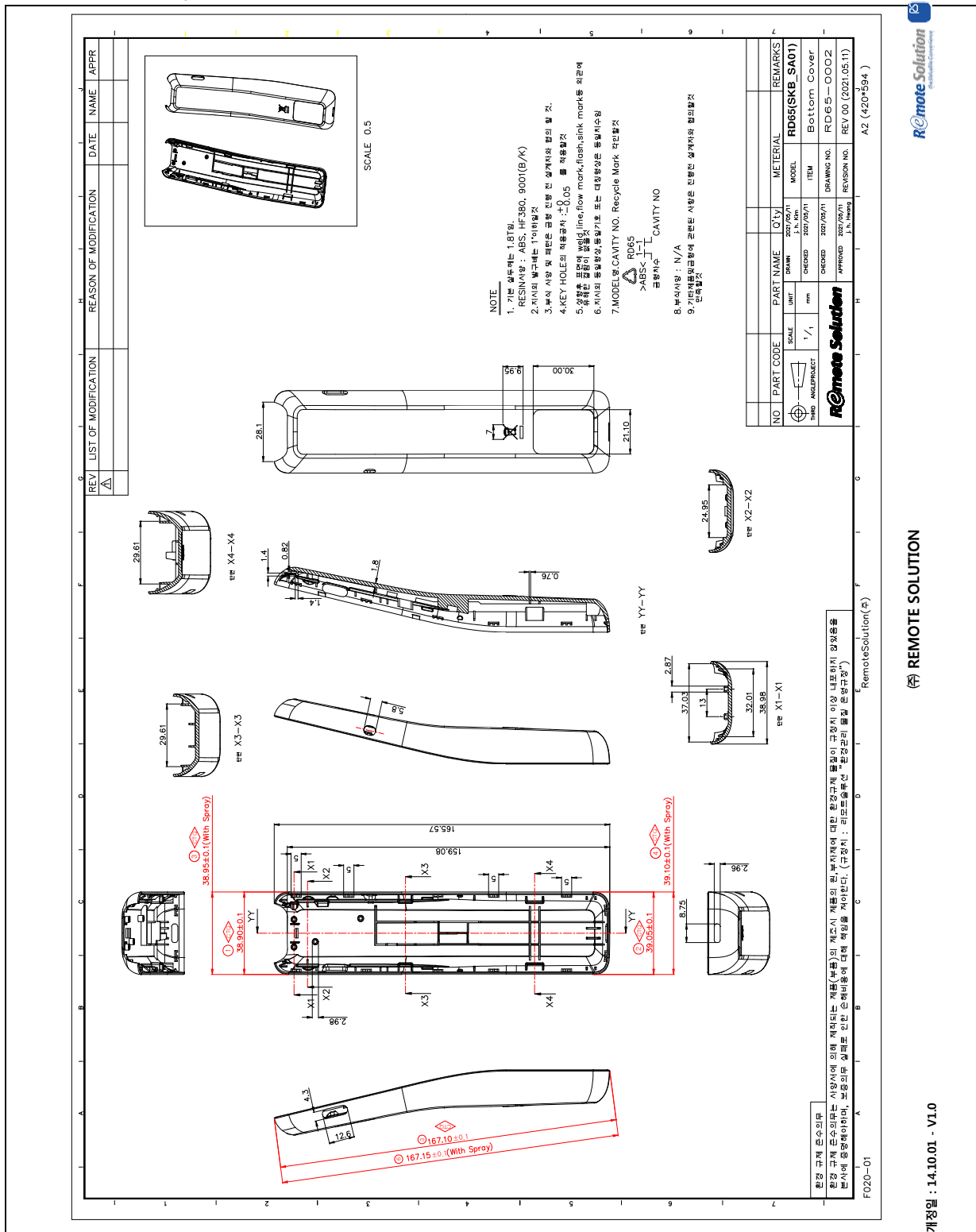
MODEL NO :

RD65A00

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10. Mechanical Spec(2/17) – BOTTOM COVER



REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10

REFORM :

DECISION :

SPECIFICATION

(TRANSMITTER REMOCON)

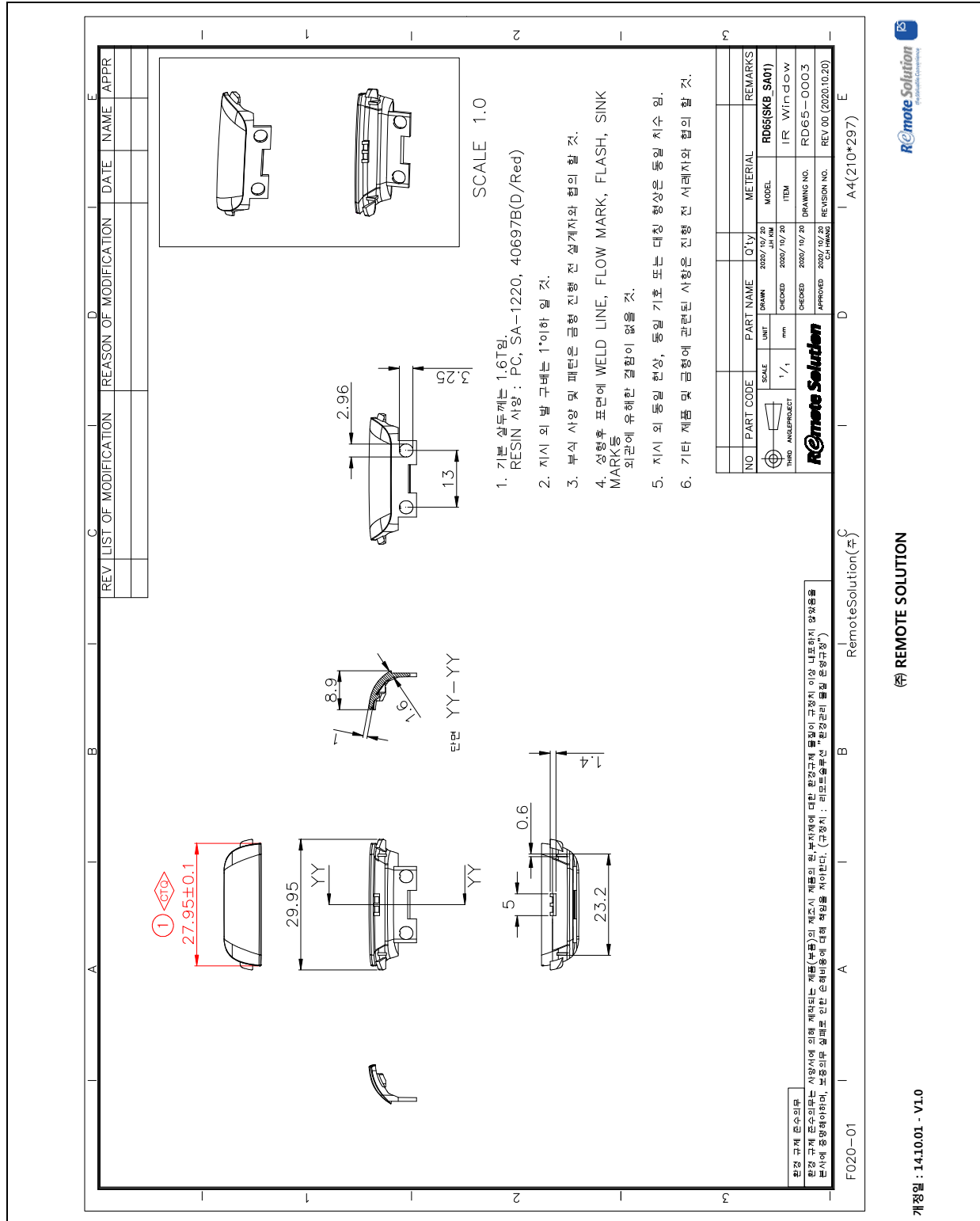
MODEL NO :

RD65A00

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10. Mechanical Spec(3/17) – IR Window



REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10

REFORM :

DECISION :

SPECIFICATION

(TRANSMITTER REMOCON)

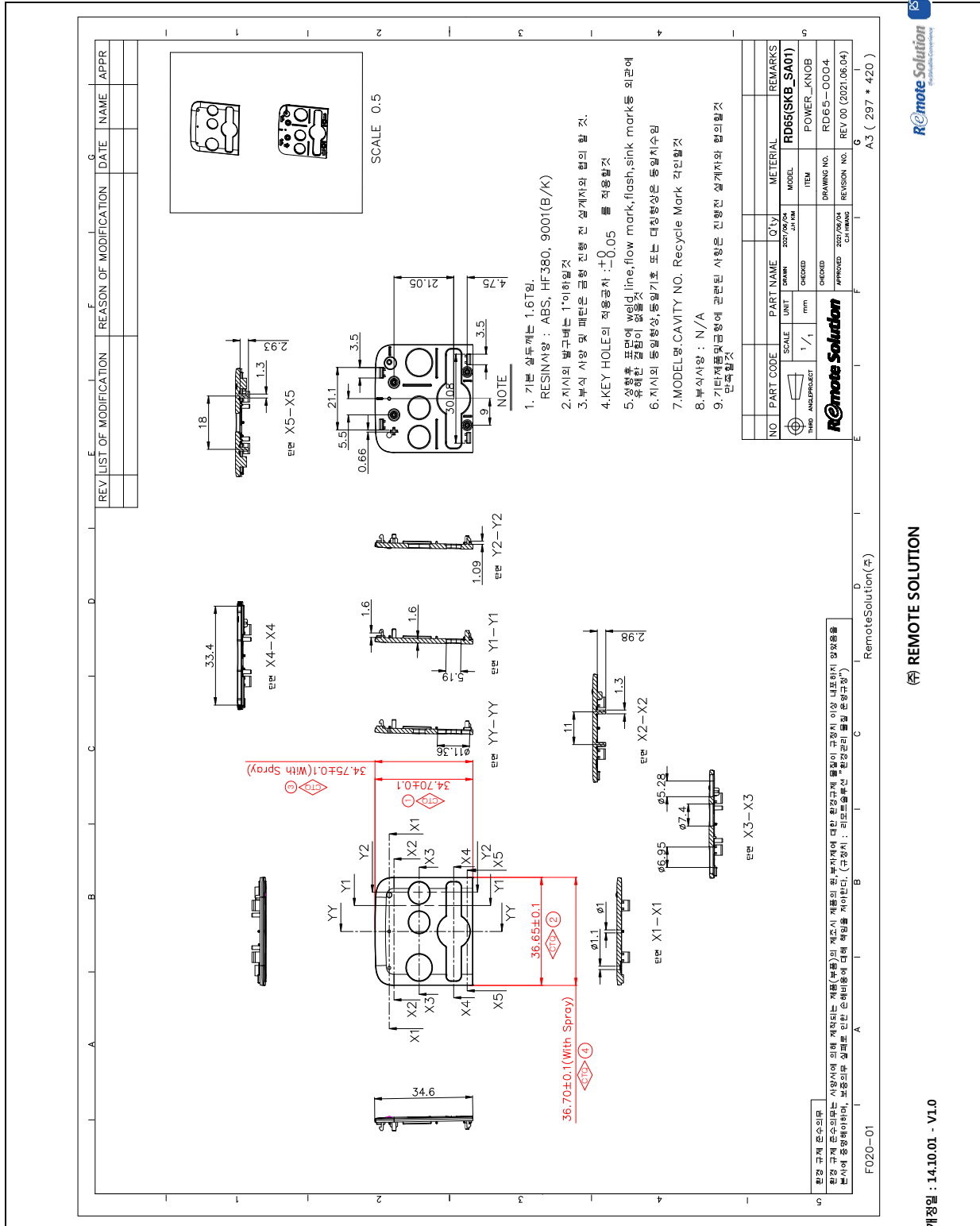
MODEL NO :

RD65A00

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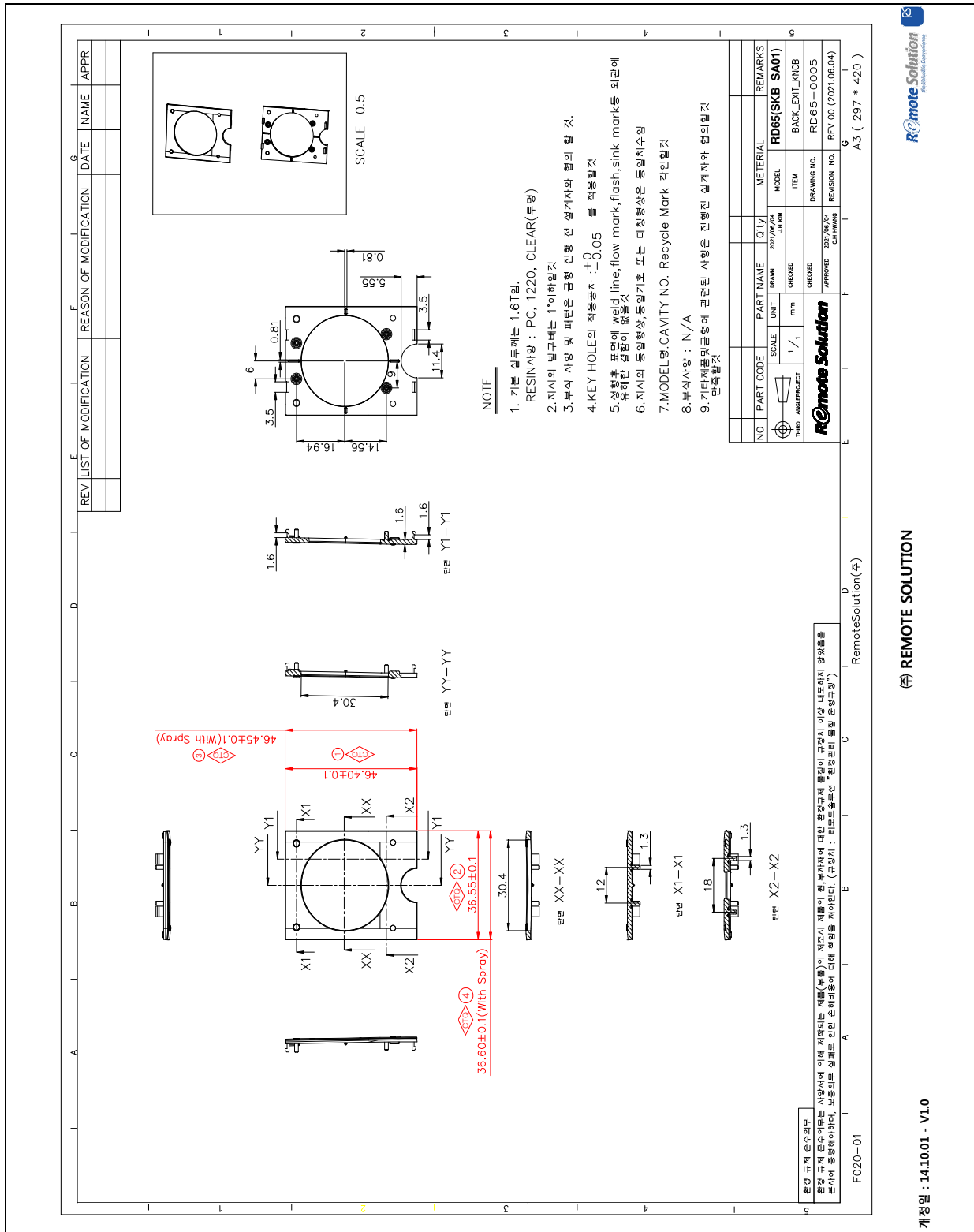
10. Mechanical Spec(4/17) – Power Konb



REMOTE SOLUTION CO., LTD.

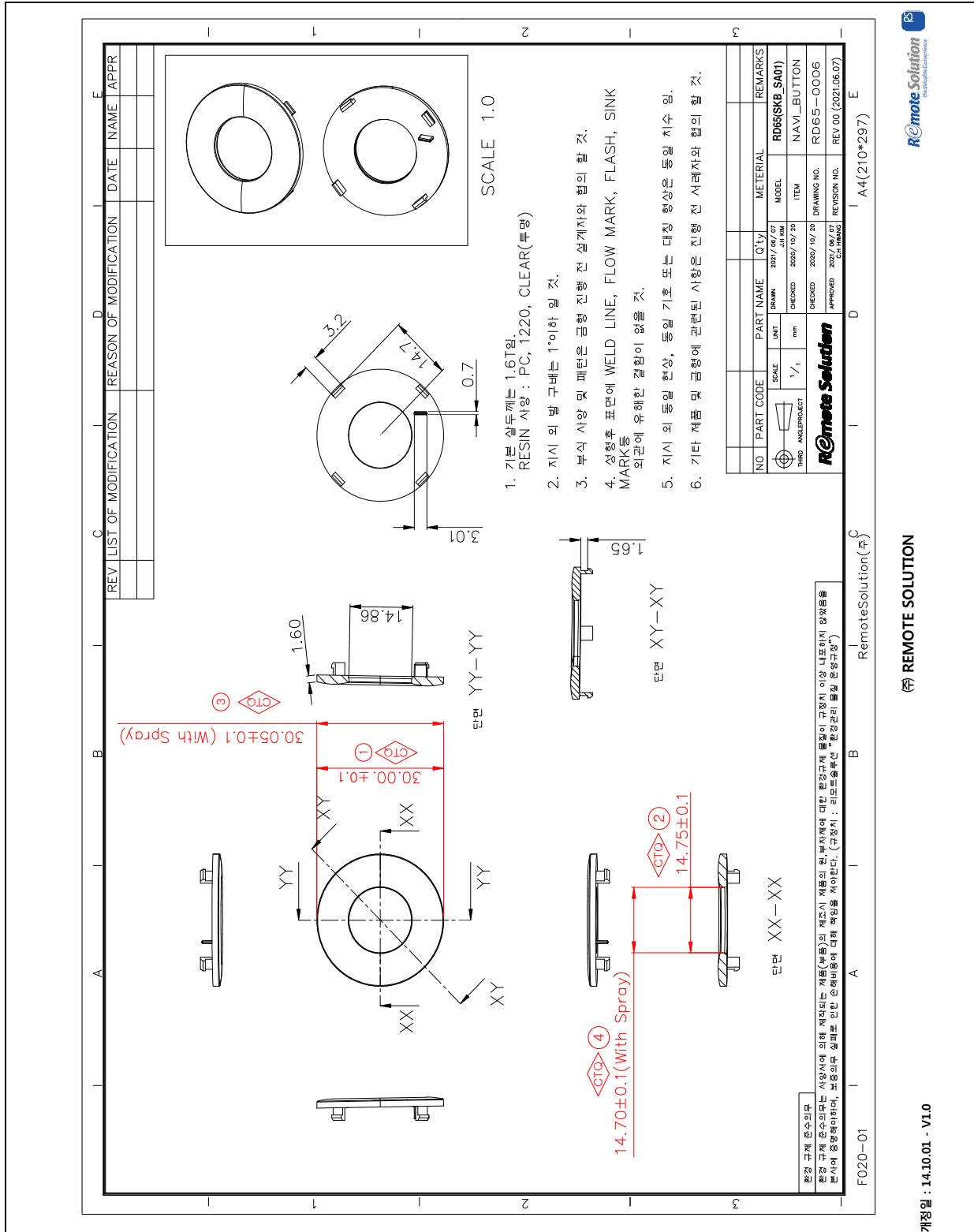
INSTITUTION : 2021.09.10	<u>SPECIFICATION</u> (TRANSMITTER REMOCON)	MODEL NO :	40
REFORM :		RD65A00	68
DECISION :			

10. Mechanical Spec(5/17) – Back Exit Knob



INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	41
REFORM :			
DECISION :		RD65A00	68

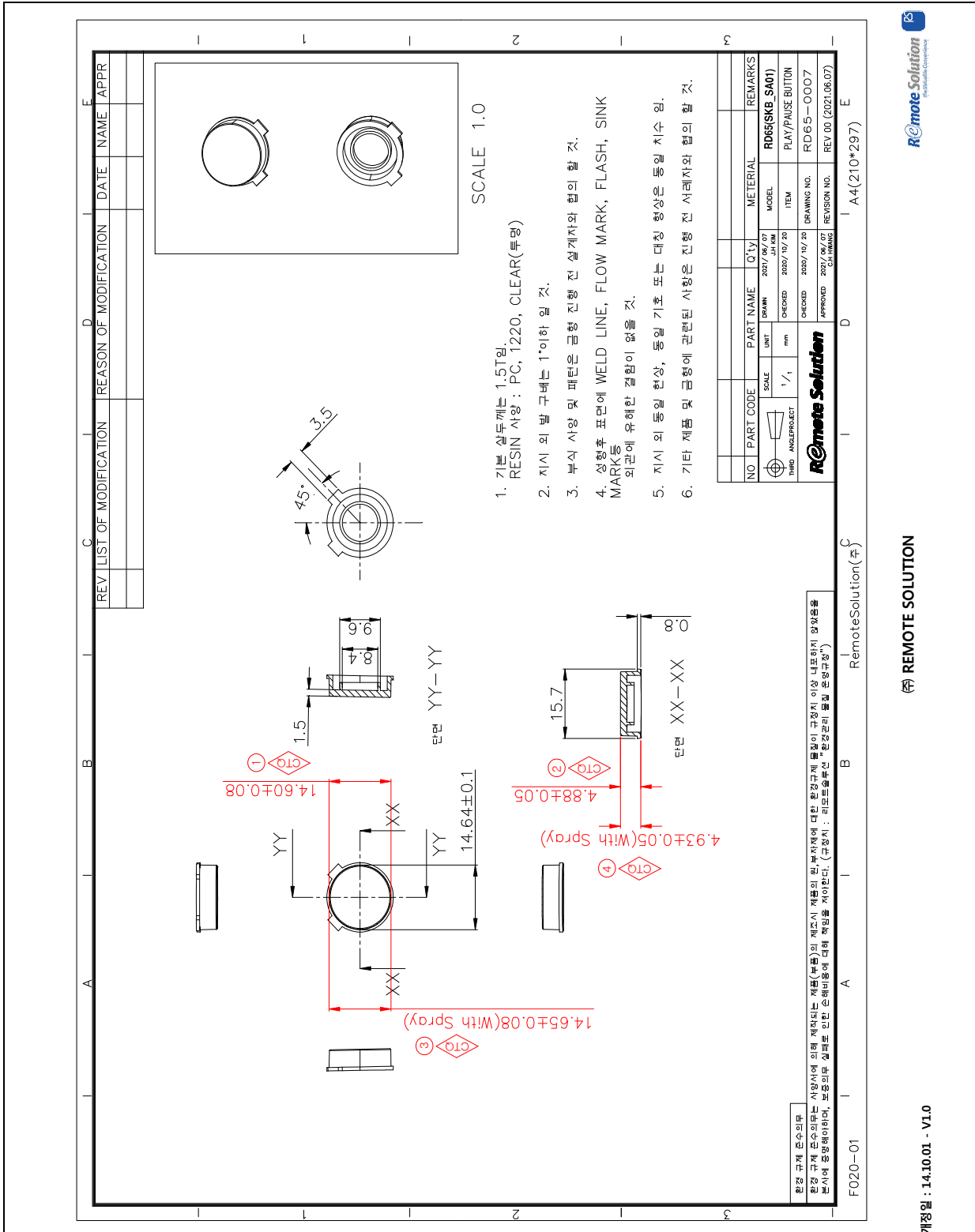
10. Mechanical Spec(6/17) – Navi Button



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INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	42
REFORM :		RD65A00	68
DECISION :			

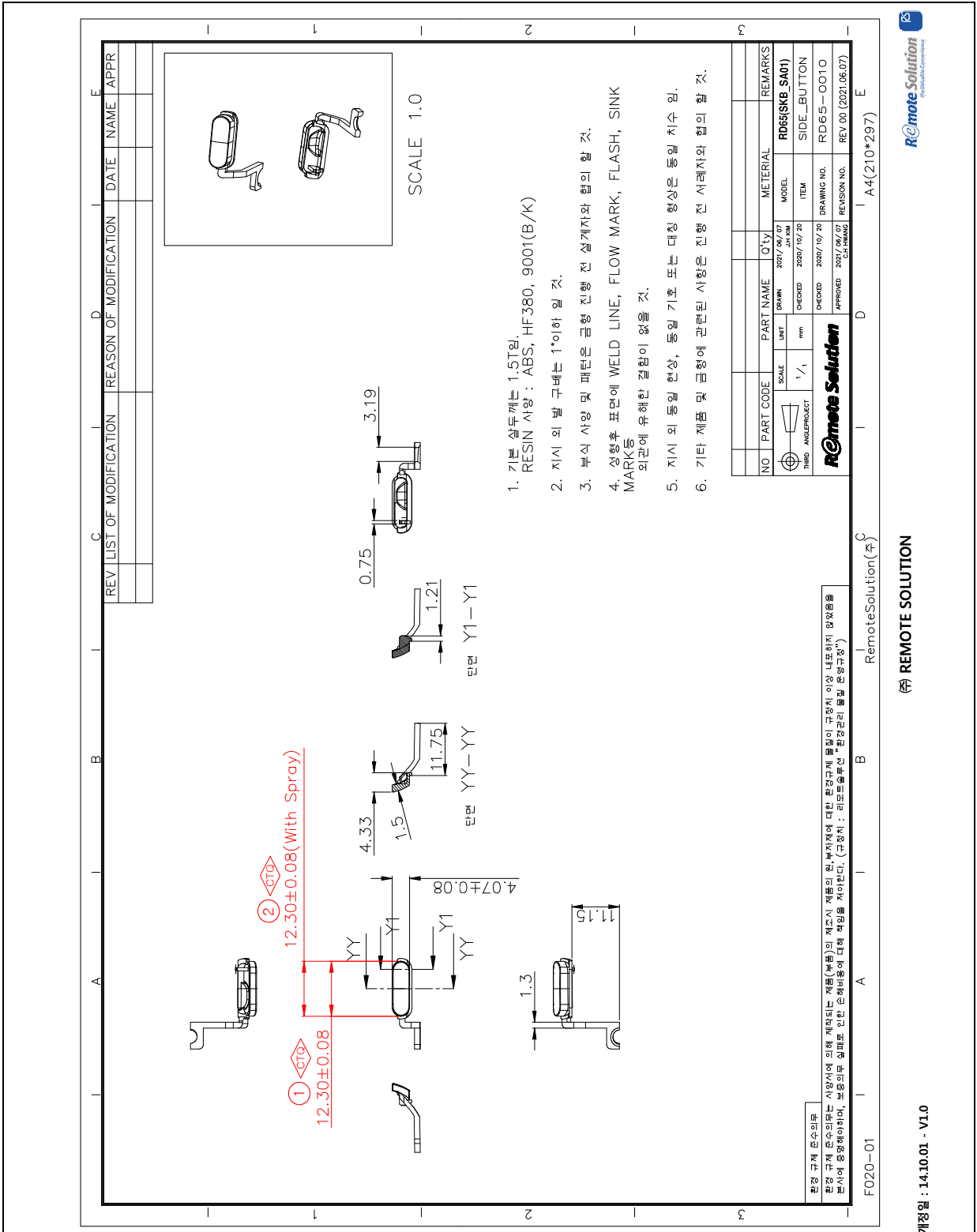
10. Mechanical Spec(7/17) – Play Pause Button



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INSTITUTION : 2021.09.10	<u>SPECIFICATION</u> (TRANSMITTER REMOCON)	MODEL NO :	43
REFORM :			
DECISION :		RD65A00	68

10. Mechanical Spec(8/17) – Side Button

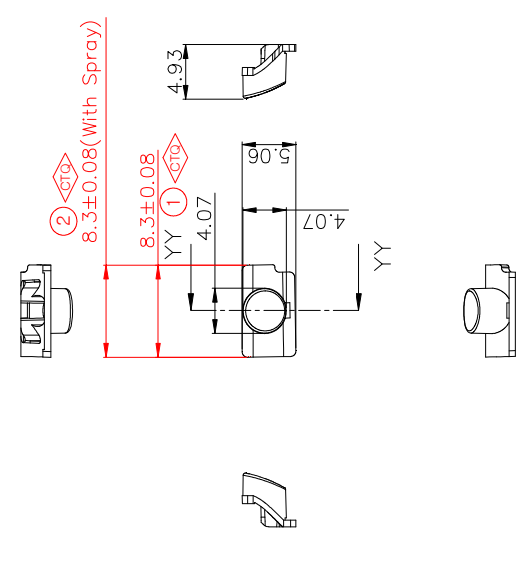
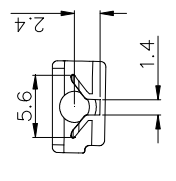


REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	44
REFORM :			
DECISION :		RD65A00	68

10. Mechanical Spec(9/17) – Slide Button

REV	LIST OF MODIFICATION	REASON OF MODIFICATION	DATE	NAME	APPR

SCALE 1.0

단면 YY-YY

- 기본 실두께는 1.5T임.
RESIN 사양 : ABS, HF380, 9001(B/K)
- 지시 외 발 구배는 1°이하 일 것.
- 부식 사양 및 패팅은 금형 진행 전 설계자와 합의 할 것.
- 상형후 표면에 WELD LINE, FLOW MARK, FLASH, SINK MARK등
외관에 유해한 결함이 없을 것.
- 지시 외 동일 한상, 동일 기호 또는 대칭 형상은 동일 치수 임.
- 기타 제품 및 금형에 관련된 사항은 진행 전 설계자와 합의 할 것.

NO	PART CODE	PART NAME	Q'ty	MATERIAL	REMARKS

THIRD ANGLE PROJECT	SCALE	UNIT	DATE	MODEL	ITEM	DRAWING NO.	REVISION NO.
1/1	mm	2021/09/07	RD65(SKB_SA01)	SLIDE_BUTTON	RD65-0011		

한정 규격 준수여부

한정 규격 준수여부는 사용처에 의해 제척되는 제품(부품)의 제조시 제품의 원 부자재에 대한 한정규제 불량이 보장되지 이상 내포하지 않음을
본사에 통보하여야 하며, 통보의무 일파로 인한 손해배상에 대해 책임을 지어한다. (규정지 : 리모트솔루션 원종관리(물류 운영규정))

F020-01 RemoteSolution(주) A4(210*297)

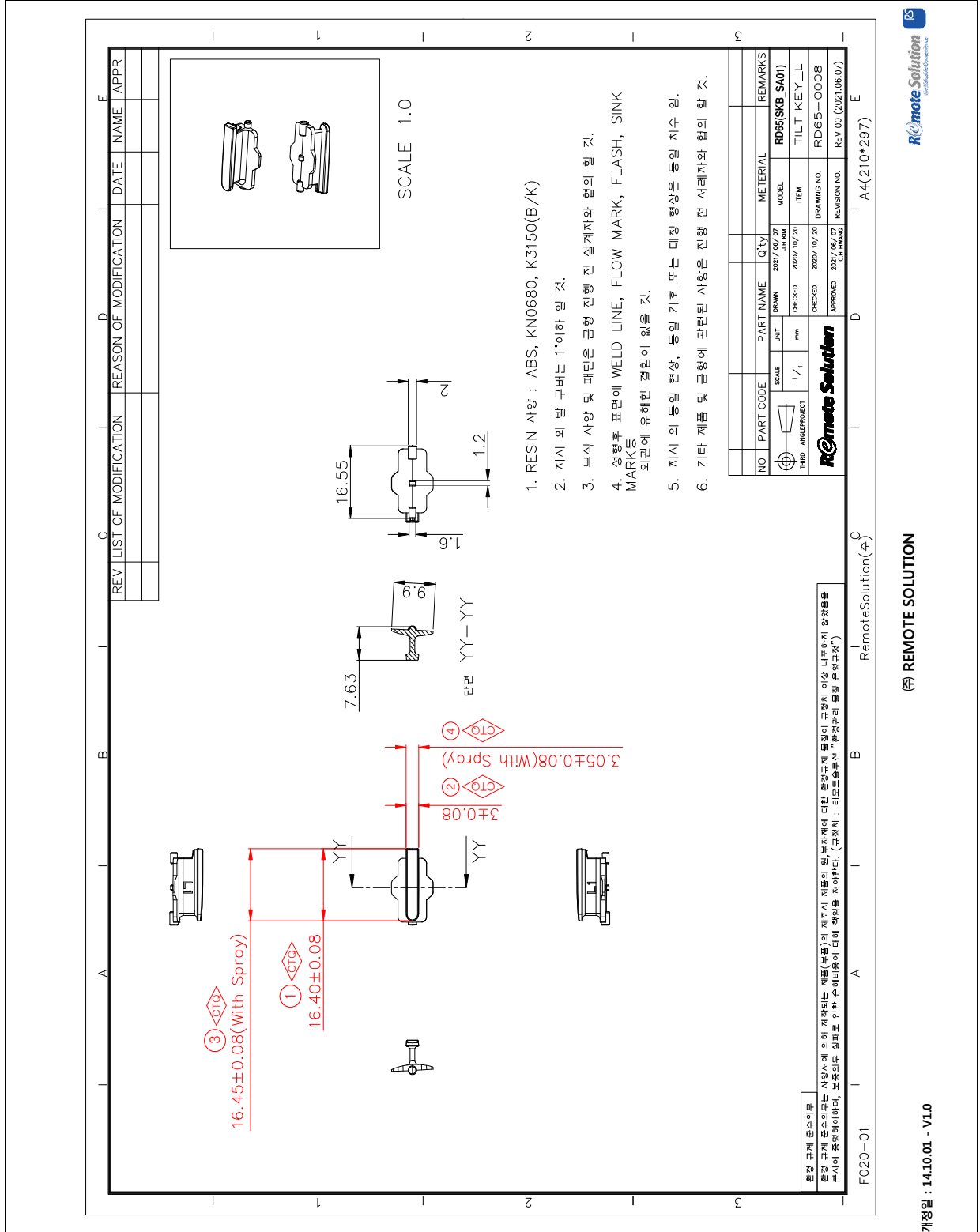
REMOTE SOLUTION

개정일 : 14.10.01 - V1.0

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	45
REFORM :			
DECISION :		RD65A00	68

10. Mechanical Spec(10/17) – Tilt Key(L)



REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	<u>SPECIFICATION</u> (TRANSMITTER REMOCON)	MODEL NO :	47
REFORM :		RD65A00	68
DECISION :			

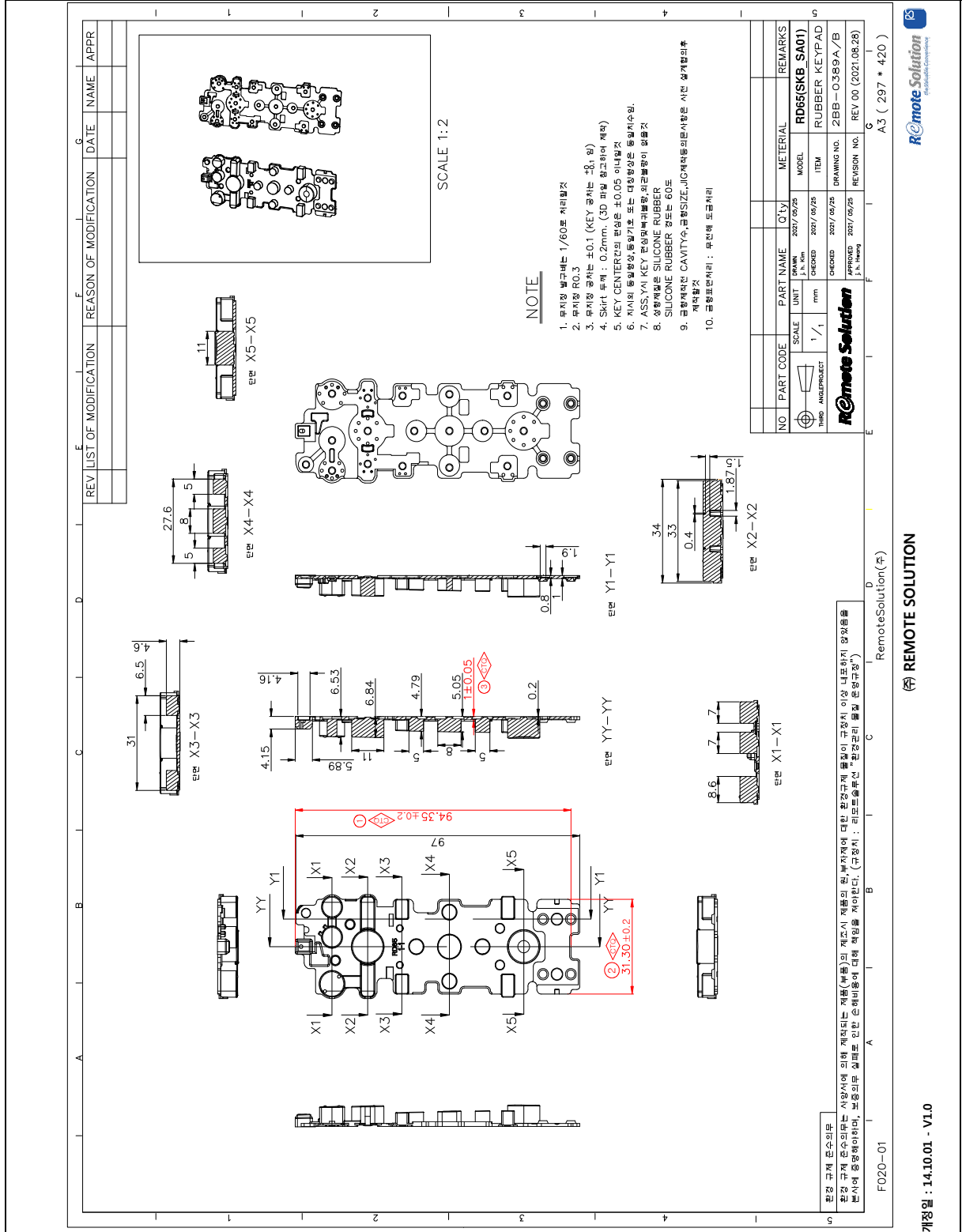
10. Mechanical Spec(12/17) – Indicator LED

[illegible]

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCOON)	MODEL NO :	48
REFORM :			
DECISION :		RD65A00	68

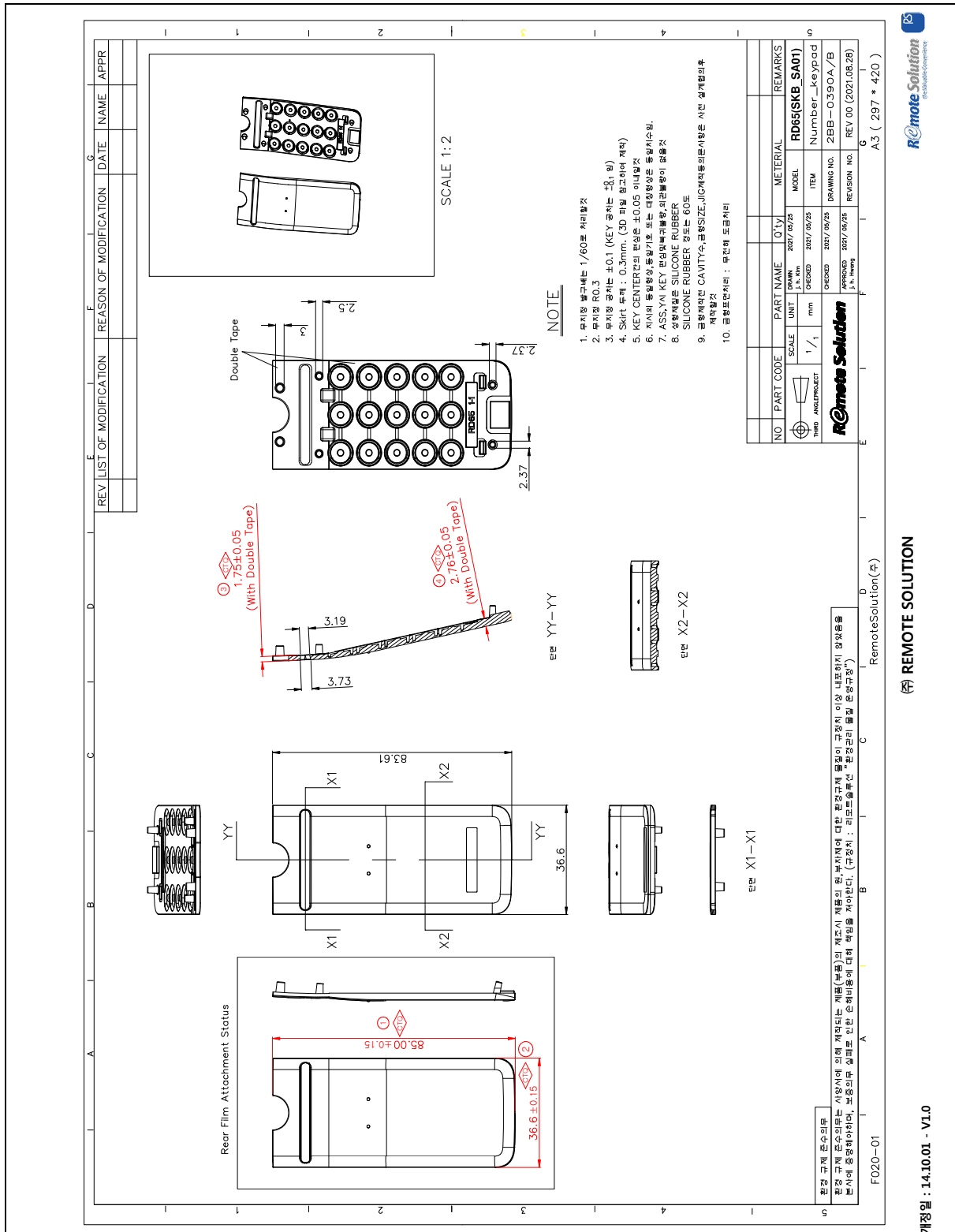
10. Mechanical Spec(13/17) – Rubber Keypad



REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	49
REFORM :		RD65A00	68
DECISION :			

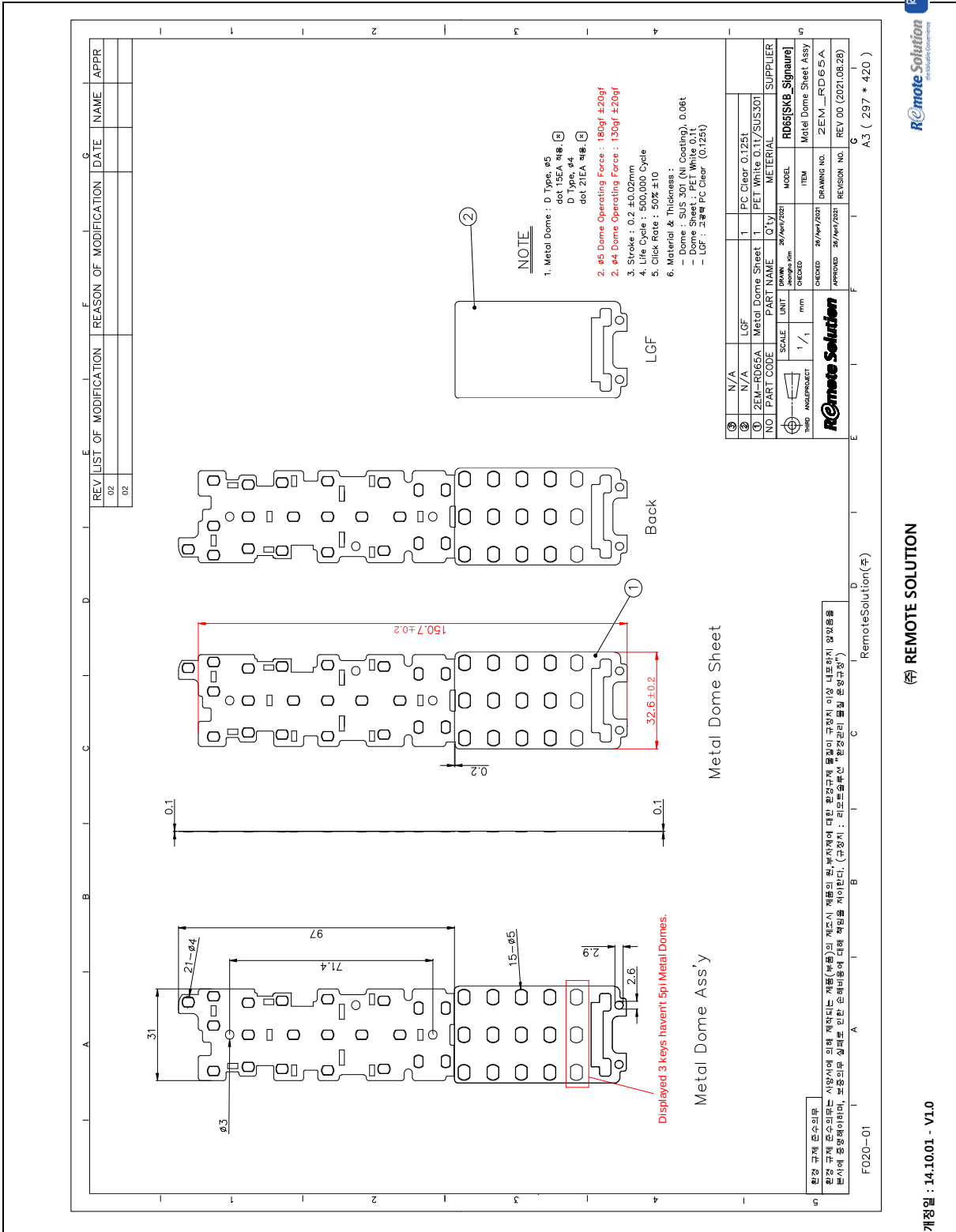
10. Mechanical Spec(14/17) – Number Keypad



REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	<u>SPECIFICATION</u> (TRANSMITTER REMOCON)	MODEL NO :	50
REFORM :			
DECISION :		RD65A00	68

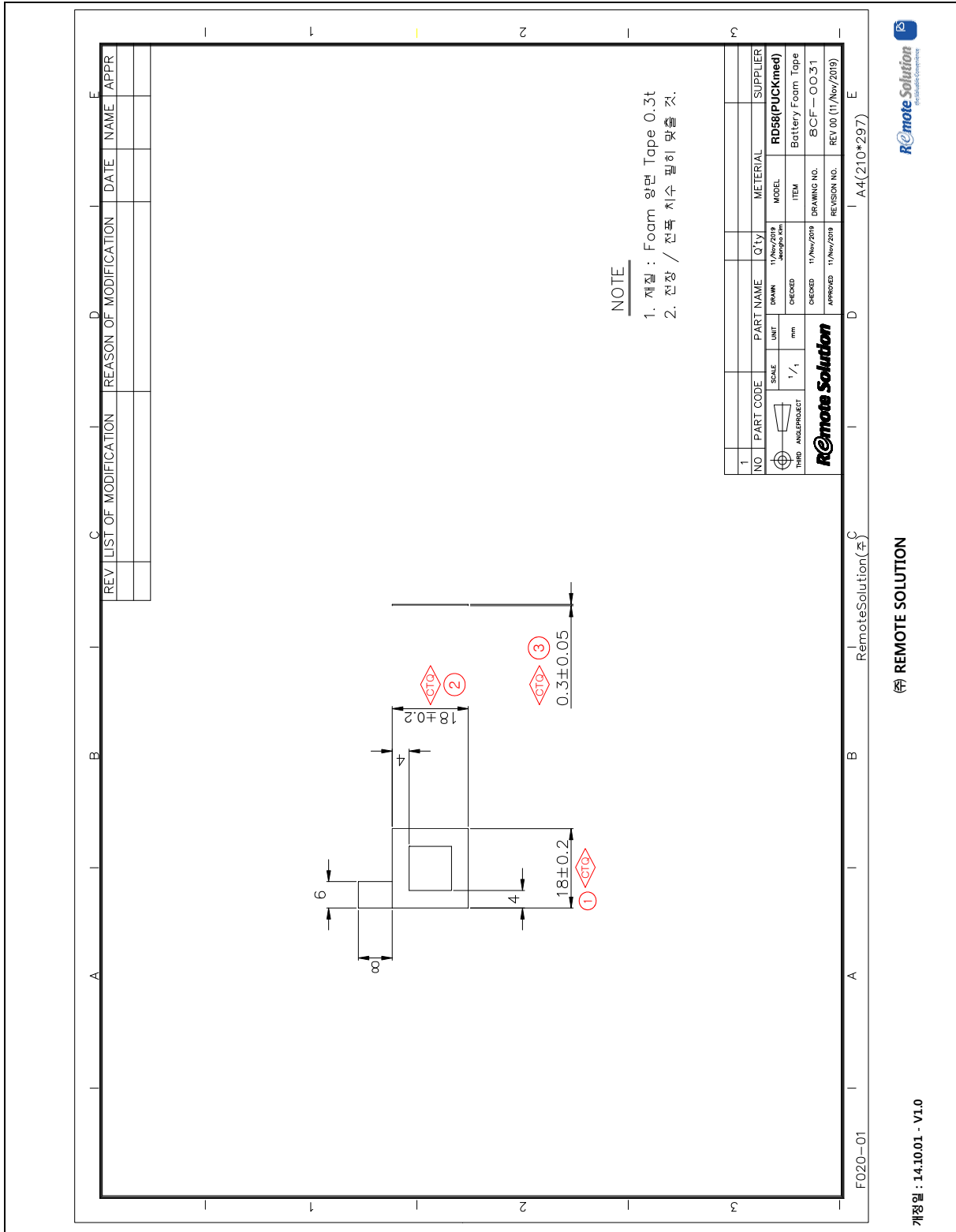
10. Mechanical Spec(15/17) – Metal Dome Sheet



REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	51
REFORM :			
DECISION :		RD65A00	68

10. Mechanical Spec(16/17) – Battery Foam Tape



REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	52
REFORM :			
DECISION :		RD65A00	68

10. Mechanical Spec(17/17) - PE BAG

NO	MODEL	TITLE	MATERIAL	FINISH
1				

COLOR : BLACK

NOTE

1. 도면 치수로 관리 할 것.
2. 재료 : PE 0.08t 투명

Technical drawing of a PE bag. The bag is rectangular with a width of 80 (+5, -3) mm and a height of 270 (+5, -3) mm. The top edge is 220 (+5, -3) mm. The bottom edge is 20 mm. The bag features several symbols: a recycling symbol, a crossed-out symbol, a 'PE' symbol, a 'PE-LD' symbol, and a 'PE-LD' symbol. The bag is labeled 'PE BAG' and 'SKB HEB(RD54K)'.

△				
ISSUE NO	MM/DD/YY	SIGNATURE	CHANGE NO	CHANGE CONTENTS

	SCALE	UNIT	DRAWN 2021/09/03 s. h. Kim	PE BAG SKB HEB(RD54K)
	N / S	mm	CHECKED	
C:\DWG\LOGO.bmp			DRAWN 2021/09/03 c. h. Hwang	Z 7PP-0085T

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	<u>SPECIFICATION</u> (TRANSMITTER REMOCON)	MODEL NO :	53
REFORM :		RD65A00	68
DECISION :			

11. Packaging Specification

10-1 MATERIAL : CARTON

10-2 SIZE : 450 (L)* 385 (W)* 225 (H) (Out Side)

10-3 QUANTITY : 60EA

1. Configuration Table : ①

Configuration	(A)	(B)	(C)	(D)	(E)
Height(mm)	SK180	S125	S125	S125	A180

2. Configuration Table : ②③④

Configuration	(A)	(B)	(C)
Height(mm)	A180	S125	A180

4	BOX BORD	2	(S)(B=Isot)	410*365
3	BOX PARTITION(S)	6	(S)(B=Isot)	375*195
2	BOX PARTITION(L)	4	(S)(B=Isot)	430*195
1	BOX CARTONE	1	(S)(B=Isot)	450*385*225

NO	PART CODE	PART NAME	Q'ty	MATERIAL	SPEC	REMARKS
④	SCALE	UNIT	DRAWN	BOX CARTONE		
	N/S	mm	2021/08/12	RD66		
	CHECKED	2021/ /		Z 7BC-0166A		
	APPROVED	2021/ /				

F020-01

Remote Solution Co., Ltd.

A3 (297 * 420)

1. 상자배합 구성표 : ①

원자부품	(A)	(B)	(C)	(D)	(E)
장형(mm)	SK180	S125	S125	S125	A180

2. Configuration Table : ②③④

Configuration	(A)	(B)	(C)
Height(mm)	A180	S125	A180

4	BOX BORD	2	(S)(B=Isot)	410*365
3	BOX PARTITION(S)	6	(S)(B=Isot)	375*195
2	BOX PARTITION(L)	4	(S)(B=Isot)	430*195
1	BOX CARTONE	1	(S)(B=Isot)	450*385*225

NO	PART CODE	PART NAME	Q'ty	MATERIAL	SPEC	REMARKS
④	SCALE	UNIT	DRAWN	BOX CARTONE		
	N/S	mm	2021/08/12	RD66		
	CHECKED	2021/ /		Z 7BC-0166A		
	APPROVED	2021/ /				

F020-01

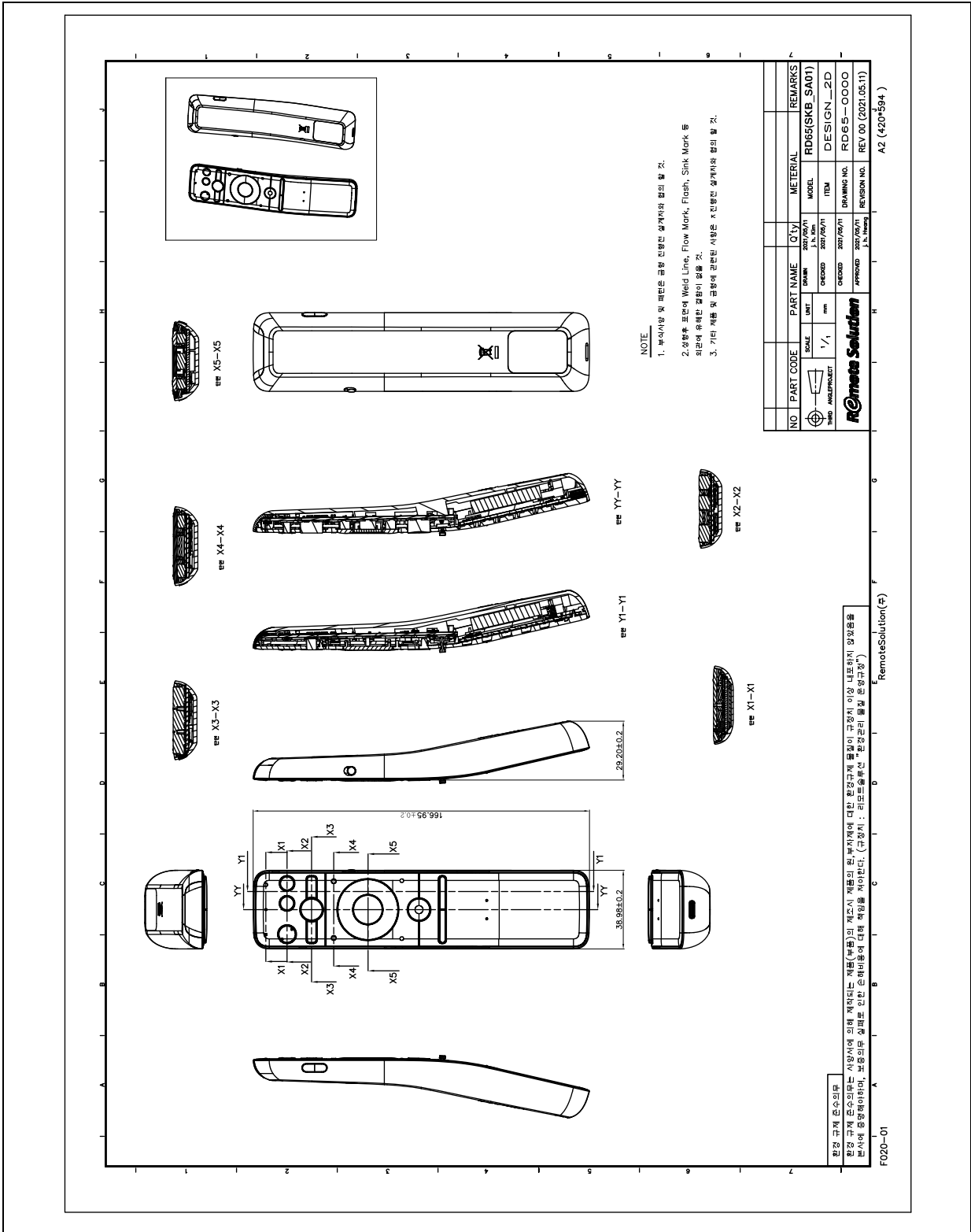
Remote Solution Co., Ltd.

A3(297*420)

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	<u>SPECIFICATION</u> (TRANSMITTER REMOCON)	MODEL NO :	54
REFORM :		RD65A00	68
DECISION :			

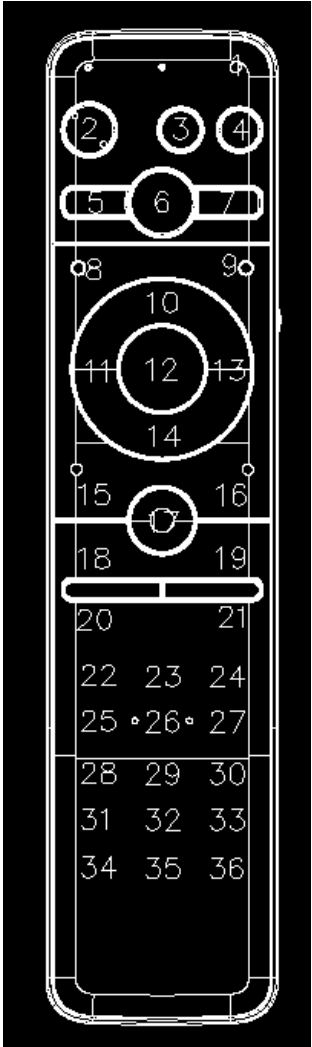
12. Assembling Specification



REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	55
REFORM :			
DECISION :		RD65A00	68

13. Rubber Tension Test

	NO.	Tension	Return	NO.	Tension	Return
	1	220	130	25	312	160
	2	230	120	26	315	170
	3	210	110	27	320	170
	4	230	115	28	310	150
	5	240	124	29	320	140
	6	220	105	30	340	150
	7	230	130	31	330	130
	8	242	120	32	320	140
	9	245	130	33	340	130
	10	250	140	34	320	150
	11	255	120	35	330	160
	12	220	120	36	310	140
	13	248	120			
	14	245	110			
	15	220	130			
	16	220	120			
	17	230	120			
	18	250	142			
	19	245	135			
	20	250	134			
	21	245	142			
	22	320	180			
	23	300	170			
	24	310	175			
	Tension Spec :		상단부 키 : 220 ± 30gr			
			하단부 키 : 320 ± 30gr			

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	56
REFORM :			
DECISION :		RD65A00	68

14. Manufacturing Process Flow Chart(1/3) - SMD

Customer	SKB		Process Flow Diagram			Document No	RS-20210113-01		Sign	김유동							
Product	SIGNATURE					Date	2021.09.07		Review	김유동							
Model	RD65A					Part	SMD		Approval	김유동							
No.	Revision date		Content			Check	No.	Revision date		Content			Check				
Process No		01		02		03		04		05		06		07		08	
P r o c e s s	Outsourcing																
	MAIN		→		→		→		→		→		→		→		
	SUB																
	Personnel	-	-			-			-	-	-	-	-				
Process		LOADER		SCREEN PRINTER		Worktable		CHIP MOUNTER		CHIP MOUNTER		REFLOW		UNLOADER		VISION TEST	
Content		.PCB Loading		.Solder Paste Prin		.Spring Insert		.Chip Mounting		.Chip Mounting		.Soldering		.PCB Unloading		.PCB Inspection (Solder, part's)	
Machine		LOADER		SCREEN PRINTER		.		CHIP MOUNTER		CHIP MOUNTER		REFLOW		UNLOADER		VISION Machine	
Tools		.		.		.Spring Insert Part's		.		.		.		.		.	
Inspection Machine		.		.3D Inspection machine		.		.		.		.		.		.	
Focused Management Item		.PCB Loading position		.Solder cream height		.Spring Reverse shovel		.Coordinate value		.Coordinate value		.temperature control		.PCB Loading position		.Inspection criteria	

RSC-200-001(Rev.0)

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	57
REFORM :		RD65A00	68
DECISION :			

14.Manufacturing Process Flow Chart(2/3) - PBA

Customer	SKB		Process Flow Diagram		Document No	RS-20210113-01		Sign	김유동	
Product	SIGNATURE				Date	2021.09.07		Review	김유동	
Model	RD65A				Part	PBA		Approval	김유동	
No.	Revision date	Content			Check	No.	Revision date	Content		
Process No	01	02	03	04	05	06	07	08		
P r o c e s s	Outsourcing									
	MAIN									
	SUB									
	Personnel									
Process	DOME SHEET 부착		Firmware Download	FFC Cable insert	leakage current test	PCB top/bottom separation				
Content	.Dome Sheet 부착		. Writing	.Upper/Bottom PCB lif	.leakage current test . Leaving state after power on	. PCB top/bottom separation . FFC cable is connected to the lower PCB				
Machine	.Dome Sheet jig		. Writing JIG, PC	. Pincette	.Multimeter (current measurement)					
Tools			. MastC							
Inspection Machine										
Focused Management Item	.Dome Sheet Attachment Check		. check sum	. Insertion direction caution	.Max 20uA					

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REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	58
REFORM :			
DECISION :		RD65A00	68

14. Manufacturing Process Flow Chart (3/3) – Assembly

Customer	SKB			Process Flow Diagram		Document No	RS-20210113-01	Sign	김유동	
Product	SIGNATURE					Date	2021.09.07	Review	김유동	
Model	RD65A					Part	Assembly	Approval	김유동	
No.	Revision date	Content			Check	No.	Revision date	Content		Check
Process No		01	02	03	04	05	06	07	08	
Processes	Outsourcing									
	MAIN									
	SUB									
	Personnel									
Process		Top Assy Assembly	Bottom Assy	Bottom Assy + Side key	Top Assy + PBA bottom	Top Assy + Rubber PAD	Top Assy + key 2 types	Battery attached	Top Assy + Rubber Key + PBA	
Content		. Mid case . Power Knob . Exit & Back knob . NavKey . 4 types of assembly	. Bottom cover . IR Window conclusion	. Bottom Assy . Mute key . Vol Slide knob	. Top Assy . PBA bottom . FFC cable connected	. Top Assy . Rubber PAD(bottom)	. Top Assy . Play/Pause key . Tilt Key 2 types	. Foam Tape attached to the battery . Inside the PCB Silk Box Attach . Battery connector connection	. Rubber sealed on Top Assy . Seating on top of PBA . Connect FFC Cable	
Machine										
Tools										
Inspection Machine										
Focused Management Item		. Check for scratches and foreign substances	. settled state	. settled state		. settled state	. fastening state		. Visual inspection	
Process No		09	10	11						
Process	Outsourcing									
	MAIN									
	SUB									
	Personnel									
Process		Top Assy + Bottom Assy	Enter test mode	IR Test	function test	Visual inspection	packaging			
Content		. Assembly	. 7, 9, 8, 8 Key Input . LED blinking check . Check the buzzer	. IR code check . Backlight inspection . Side Key Separate Inspection	. Insert USB . Voice test . RF Pairing	. foreign body, scratch	. Back label attached . Pebag Packaging . Carton box			
Machine		. Assembly JIG		. 4-in-1	. Functional inspection jig, PC					
Tools										
Inspection Machine										
Focused Management Item		. Confirmation of safety bar application		. Test mode entry						

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REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	59
REFORM :		RD65A00	68
DECISION :			

15. Manufacturing Controlplan (1/2)

Production management plan (Control Plan)														
REMOTESOLUTION (KR)				*Manufacture process : SMD PBA Assembly										
STEPS	ITEMS	Remote Control		NO	Revision date		The Reason of revision		Man	Review	Appr	Set the date : 2021.07.15		
☐	Model	SK Broadband AI2/SMART3 STB용		☐								made	review	admit
Proto		[BRM-SA01]		☐										
☐	Part Number	RD65A00 (SIGNATURE)		☐										
양산선행				☐										
☐	CFT	PM(DW Kim), RD(JH Kim, YT Ahn, H Hong, CH Kim), Prod.(JS Kang,KH Noh), Prod. Tech(RK Kim, YD Kim) QC(SG Son, SM Kim), Purchase(SJ Woo), Sale(GH Lee)		☐	2021.07.15		Initial preparation					7/15	-	7/15
MP				☐										
VENDOR CODE				Customer technical acknowledge/date (when required):								Other admit/date (when required)		
No.	Process	Equipment	NO	Products	Process	Standard	How to check	Cycle	Management Plan	PD	QC	Corrective Action	Remark	
10	Raw material inventory		1	Raw materials	Supplier (warehouse)	Vendor Input								
	Incoming inspection	Visual, Text film	1	Raw materials	A visual inspection (Design)	Don't allow harmful defects	Visual inspection	Sampling	Inspection specification			Isolation, return money, Issuance of		
		Vernier caliper	2	Raw materials	The dimensional check	In line with the structure drawings - length size management	measurement Data	Sampling	Inspection specification			Isolation, return money, Issuance of		
		Tension Gauge	3	Raw materials	Characteristics of check	In accordance with specifications of the structures	measurement Data	Sampling	Inspection specification			Isolation, return money, Issuance of		
		Visual	4	Raw materials	Combined inspection	After the merger is not allowed to produce abnormal	The assembly	Sampling	Inspection specification			Isolation, return money, Issuance of		
		Chamber	5	Raw materials	Reliability Test	Reliability test no abnormalities	measurement Data	once a month	Test specification			Isolation, return money, Issuance of		
EA 1000A III	6	Raw materials	Harmful material inspection	Hazardous substances management benchmark	measurement Data	Once a week	Hazardous substances management			Isolation, return money, Issuance of				
20	Materials Warehousing/ releasing	A material cart	1	Raw materials	FIFO	Confirm materials specifications FIFO management	Now product labeling	Every Lot	ERP P/Q(SAP)			Isolation, return money		
51	Prevention of static electricity	Static Electricity Checker	1	Static Electricity	Management of static Electricity	Should be within Good Zone	Electrostatic tester	once a day	Check Sheet			Anti-static shoes and Electrostatic ring to replace		
52	Stirring solder cream	Solder paste mixer (DMS200)	1	Solder cream	Storage of Solder cream	In cold storage with 5±3℃	Thermometer	once a day	Measurement sheet of temperature			Reset, Adjustment		
			2	Solder cream	Stirring of Solder cream	45 sec	Timer	Before using	Management register of Stock and Delivery			Reset, Adjustment		
			3	Solder cream	Leaving room temperature	25±5℃, 2Hr (Food_proof)	Timer	Before using	Management register of Stock and Delivery			Reset, Adjustment		
30	Supplying PCB	Vaccum Loader (SBSF-200)	1	PCB	Sorting status	For direction to sort out	Visual inspection	1/Lot	-			rearrange		
		2	PCB	PCB The installation	PCB Pick upAfter drop phenomenon	Visual inspection	1/Lot	-			The new installation			
40	Cleaning PCB	PCB Cleaner (PCC-4000)	1	PCB	Cleaning PCB's dirt	Location of brush and Air should be fine	Visual	1/Lot				The new setting		
50	Spreading Solder cream	Screen Printer (HP-520S). Maintain a constant temperature device (HTC-1380)	1	Solder Cream	Squeeze pressure	14-16kgf	Check Equipment	1/Lot	Equipment checklist			From the rear device		
			2	Solder Cream	Squeeze speed/angle	35 ~ 100mm/sec, 60°E (Normal : 70~80mm/sec)	Check Equipment	1/Lot	Equipment checklist			From the rear device		
			3	Solder Cream	Condition of printing solder cream	Tin less, Tin over, No blockage	Visual Inspection (Magnifier)	1/Lot	At the beginning, middle, end			From the rear device		
			4	Solder Cream	Keeping internal fixed temperature	23 ~ 27 degrees	Set Display	once a day	-			From the set temperature		
			5	Solder Cream	Automatic cleaning -> Metal mask	There should be no scraps around the opening area (Manual Cleaning : 1Time/2Hrs.)	Check Equipment	once in 5 times	Equipment			Manual cleaning		
60	SMD components patch	Chip Mount	1	SMD components	Nozzle pressure	Air : 0.45 ~ 0.55 lb Nozzle : -80 ±10 mmHg	Pressure gauge	1time/daily	Equipment work sheet			Reset, Adjustment		
			2	SMD components	PMC specification is consistent	Feeder List (MONITOR) *To prevent the mixing system	Visual inspection	When the model changes	Record the account			Reset, Adjustment		
			3	SMD components	Part a Pick up location	5~25% of component area	Equipment to confirm	When the model changes	Equipment work sheet			Reset, Adjustment		
			4	SMD components	Air/Nozzle pressure	Air : 4.5 ~ 5.5 lb Nozzle : -100 ±10 mmHg	Pressure gauge	1 time/ monthly	equipment work sheet			Reset, Adjustment		
		0형 Mount (SM421)	5	SMD components	Part a Pick up location	5~25% of component area	Equipment to confirm	When the model changes	equipment work sheet			Reset, Adjustment		
70	Reflow Soldering	Reflow Soldering	1	SMD products	Preheat interval	Temperature : 150 ~ 200℃	Preheating temperature Check	1time/ daily	Reflow Profile			From the set parameters		
			2	SMD products	Soldering	Temperature : 200℃ 이상 (peak:235~250℃) - PCB 1.2t / FR-4	Profile Check	1time/ daily	Reflow Profile			From the set parameters		
			1	SMD products	cool down	PCB finishing (Impeded (not allowed))	Visual inspection	All	equipment			From the set parameters		
			2	SMD products	Confirm the part soldering condition	Interpolation, not advanced - part control within 1/3 of the scope of the	Visual inspection	All	work sheet			Identification, Isolation, Repair		
90	visual Inspection	Lupe, Visual	1	SMD products	Management of Soldering Iron temperature	Temperature management of soldering iron(380~420℃)	Measuring temperature	once a day	Checklist for temperature of Soldering Iron			Reset temperature, Change soldering iron		
100	Attaching Metal Dome sheet	MetalDome sheet M/C	1	Raw Materials	Attaching Metal Dome sheet	Adhesion shall be good.	Equipment	All	work sheet			Identification, Isolation, Repair		

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	60
REFORM :			
DECISION :		RD65A00	68

15. Manufacturing Controlplan (2/2)

No.	PROCESS SUB-MAN JOB	Process	Equipment	Manage the project		Special feat	Management Criteria				Division		Corrective Action	Remark
				NO	Products Process		Standard	How to check	Cycle	Management Plan	PD	QC		
110		Realtek IC Writing	Writing M/C	1	Main PCBA	Realtek IC Writing (RTL8762CKF)	Writing(Programming) should be fine - RS / Test Program	Equipment	All	work sheet	○		Identification, Isolation,Repair	
120		Cable Connecting	Handwork	1	PCB Assy	FFC Cable Inserting	Close-up insertion and direction warning.	Visual Inspection	All	work sheet	○		Identification, Isolation,Repair	
130		Leakage current Inspection	Function Test M/C	1	PCB Assy	Leakage current inspection	Current should be fine (satisfied with the spec)	Equipment	All	work sheet	○		Identification, Isolation,Repair	
140		PCB Cutting	Handwork	1	PCB Assy	PCB separation	Separate the top and bottom of the PCB. Connect the FFC cable to the bottom of the PCB.	Visual Inspection	All	work sheet	○		Identification, Isolation,Repair	
S4		Analysis nonconfirming products and repair	Magnifier, Soldering Iron, Inspection JIG	1	PCB Assy	Management of Soldering Iron temperature	Temperature management of soldering Iron(380~420℃)	Measuring temperature	once a day	Checklist for temperature of Soldering Iron	○		Reset temperature, Change soldering iron	
				2	PCB Assy	Analysis and repair	Should pass retest after repair Should be no issue on soldered point	Function / Current test	nonconfirming	Nonconfirming Process checklist	○		Re-test after repair, scrap	
150		Top Case Assembly	Handwork	1	Top Assy	Top Case + Power Knob+Exit/Back+Navi key	No scratches or debris. The seating condition should be good.	visually	All	work sheet	○		Isolation,Repair	
160		Bottom Case Assembly	Handwork	1	Bottom Assy	Bottom case + IR Window	Tightening (The seating condition should be good.)	visually	All	work sheet	○		Isolation,Repair	
				2	Bottom Assy	Bottom Assy + Side key, Mute key, Vol slide knob	No scratches or debris. The seating condition should be good.	visually	All	work sheet	○		Isolation,Repair	
170		Top Assembly	Handwork	1	Top Assy	Top Assy + Bottom PCBA	No scratches or debris. The seating condition should be good.	visually	All	work sheet	○		Isolation,Repair	
				2	Top Assy	Top Assy + Rubber Pad(Lower)	No scratches or debris. The seating condition should be good.	visually	All	work sheet	○		Isolation,Repair	
				3	Top Assy	Top Assy + Function Key(Play/Pause, Tilt)	No scratches or debris. The seating condition should be good.	visually	All	work sheet	○		Isolation,Repair	
180		Battery Attaching	Handwork	1	Battery	Battery + Foam tape, PCBA(Lower)	Attached it in place. Connectors are fastened.	visually	All	work sheet	○		Isolation,Repair	
190		Top Assembly	Handwork	1	Rubber	Top Assy + Rubber PCBA(upper)	The seating condition should be good.	visually	All	work sheet	○		Isolation,Repair	
200		Assembling	Assembly JIG	1	Top Assy, Bottom	Assembling, Top Case Assy + Bottom Cover	There should be no deviations, gaps or gaps Check the filter combination After the provisional match, the full match	visually	All	work sheet	○		Isolation,Repair	
210		IR Operating Inspection	4IN1 Inspection JIG	1	Finished	IR operation inspection Attach Back Label Side key inspection	No abnormality of Full Key IR output Check LED lighting No side key abnormalities	Equipment	All	work sheet	○		Identification, Isolation,Repair	
220		RF Operating Inspection	RF Inspection JIG	1	Finished Barcode	Connecting USB Voice RF operation	Check pairing status and buzzer sound Check RSSI value, SW, FW version Voice and leakage current check Battery Voltage check Version label (manufacture date)	Visually	All	work sheet	○		Containment, repair	
230		visual Inspection	Visually	1	finished	Appearance	There should be no abnormality in the state of matching (Gap, step) There should be no abnormality on the IR Filter part's protective skin. No abnormality in specifications, no foreign matter and no marks	Visually	All	work sheet	○		Containment, repair	
240		Product packing	Handwork	1	finished	PE-Bag	No manual missing or tearing	Visually	All	work sheet	○		Containment, repair	
				2	finished	Carton Box packaging	There should be no abnormality in mixing and quantitation	Visually	Box	work sheet Barcode label	○		Containment, repair	
S5		Analysis nonconfirming products and repair	Handwork	1	finished	Analyzing and dismantling	Management of equipment and poor performance, Caution and confirmation of parts damage when dismantling	Visually/ Identification label	Nonconfirming	Nonconformity Management ledger	○		Re-inspection after repair, Disposal	
				2	finished	Identification Management	Good and non-conforming products should not be mixed		Nonconfirming	Nonconformity Management ledger	○		Re-inspection after repair, Disposal	
250		OQC	Pairing Dongle, Inspection P/G, Power Supply, Current meter, Lupe	1	finished	Visual inspection (Design)	There should be no deleterious defect	Standard Sample /Visual	Sampling G-II, 0.65	Standard document of test, Inspection Manual	○		Sorting, Rework, Releasing nonconforming	
				2	finished	Function test	Pairing, voice, LED lighting, buzzer, Full Key, i-Set No abnormal operation	Inspection P/G	Sampling n=5, c=0	Standard document of test, Inspection Manual	○		Sorting, Rework, Releasing nonconforming	
				3	finished	Electrical characteristics	1. RF (volume) operation current: TBD 2. IR (TV volume) operating current: TBD 3. Leakage current -Before pairing: (AVR) TBD -After pairing: (AVR) TBD 4. battery voltage: TBD	Power Supply, current meter	Sampling n=5, c=0	Standard document of test, Inspection Manual	○		Sorting, Rework, Releasing nonconforming	
				4	finished	Overhaul	Pattern open/short, copper dirt, Cold solder, Solderless, Foreign substances inside, There should be no missing parts, Crack	Visually, Lupe	n=1, c=0	Standard document of test, Inspection Manual	○		Sorting, Rework, Releasing nonconforming	
				5	finished	Condition of packing	There should be no issues with packaging condition, dirt, identification and quantification	Visual	Sampling Check	Standard document of test, Inspection Manual	○		Sorting, Rework, Releasing nonconforming	
S6		Out Going	Forklift, Truck	1	finished	Product inventory management	There should be no issues with quantity of stock, mixing product and condition of storage	Products list	Standby stock	System(SAP)				

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16. TV Brand List (1/4)

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	SAMSUNG TM1940/TM1240 외 IR DB 43종 업데이트
Maker(Brand)Name	Code number (3 digit) List
삼성(SAMSUNG)	226 163 218 215 212 206 167 191 162 181 037 183 178 185 232
	225 154 092 052 035 034 231 135 157 187 341 465
엘지(LG,금성,GOLDSTAR)	227 236 206 192 186 193 175 178 185 224 201 092 183 003 002
	030 164 168 032 072 031 094 096 417
대우(DAEWOO)	014 231 043 190 177 217 176 159 166 233 029 158 150 206 178
	185 216 165 169 156 152 155 151 228 195 153 170 188 198 038
	160 189 039 199 182 235 092 050 053 202 047 051 179 344 375
	420
대우루컴즈(DAEWOO LUCOMS)	327 335 350 351 352 353 321
아남(ANAM)	204 174 234 018 019 223 193 180 171 053 220 222 161 095 221
	210 211 122 158 049 054 055 069 099 302 357 374
에이텍(ATEC)	031
이레전자(ERAЕ)	004 006 007 008 011 012 013
덱트론(DECTRON)	033
디보스(DIBOSS)	015 109
디지털 디바이스(DIGITAL DEVICE)	301 312
디지털스트림테크놀로지(DIGITAL STREAM)	351 360
디지털 싸이노스(DIGIAL CYNOS)	016
삼보컴퓨터(TRIGEM COMPUTER)	332
새찬전자(SAECHAN)	028 041 044
코리아데이터시스템스(KDS)	033 073
티디에스(TDS)	103
트라이뷰(TRIVIEW)	302
프리즘 테크놀로지(PRISM TECHNOLOGY)	303 355 072
하이얼(HAIER)	033 077 078 302 333 345
한국전자(KEC)	053 206
한성(HANSUNG)	378 414 420
현대아이티(HYUNDAI IT) -현대이미지퀘스트	022 017 107 108 309
현우 맥 플러스(MCPLUS)	206
휴리프(HULIF)	104
쿠메스전자(QUMES)	106
뉴컴월드(NEWCOMMWORLD)	219
다오코리아(DaoKorea)	304
모뉴엘(Moneual) - 롯데마트	305 306 307 326
드림뷰(DreamView) - 이마트	308 332
노브랜드(No Brand) - 이마트	308 332 330 463 373 351
일렉트로맨(ELECTROMAN) - 이마트	308
제이엘통상(XPEER) - 홈플러스	321
우성엔터프라이즈(WeCube) - 홈플러스	322
티바(TIVA, 스피드테크놀로지)	324
스카이미디아어(Vishorn)	325 330 336
동양전자(DONGYANG)	068
비티씨정보통신(BTC)	316
씨마디지털텍(CIMADIGITEC)	318 319 072
LS전자(LS ELECTRONICS)	313
모티브씨엔씨(MOTV)	311
시그마TV(SIGMACOM)	310
유니크로(UNIKRO)	100 317
보임틀(VOIMTLE)	304
보림전자(BOLIM)	028 315 323
3S DIGITAL	028
삼인디스플레이(XSTIM)	104 320 329
유투스(케이엘전자 UTUS)	314
인디텍(VIEWPIA)	107
재원전자(JAEWON)	333
지파엔씨(GPNC)	327 306
제노스미디어(ZENOS)	303 328
제이아이케이솔루션(LEGRAND)	342
파인포스(FINEFORCE)	306
더블유시디(WCD)	331
토마토디스플레이(TOMATO DISPLAY)	337 306 356
넥스디지털(NEX)	338
매직나라(MAGIC NARA)	332 339
유니크컴퍼니(UNIQUE COMPANY)	340
알파스캔(ALPHASCAN)	306 203 345

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16. TV Brand List (2/4)

Maker(Brand)Name	Code number (3 digit) List
아마카시(YAMAKASI, 바이텍코리아)	343 346 347 348 349
자비오씨엔씨(XAVVIO)	354
티베라(TVERA)	355
스카이워스(SKYWORTH)	353
오리온정보통신(TOPSYNC)	351 330 357 306
한스정보(HANSJUNGBO, HANS TOUCH)	356
샤오미(XIAOMI)	361
디스플레이파크(DISPLAY PARK)	072
스마트홈 일렉트로닉스 - 스마트라(SMART HOME ELECTRONICS)	362 363 072 420
주연테크(JOOYON)	302 346 373
대유위니아(WINIADAEWOO, WINIADIMCHAE)	338
아낙(ANAC)	345
매직뷰(MAGICVU)	355
모넥스(MONEX)	302
엘디케이(LDK)	321 206
와사비망고(WASABIMANGO)	072 419
하이메이드(HIMADE)	072 072
인트로스(INTROS)	072 355
삼화디스플레이(SAMHWA)	072
아도니스 (ADONIS)	355
큐닉스 (QUNIX)	370 371 372
와이드뷰 (WIDE VU)	373 360
벡셀 (BEXEL)	350
폴라로이드 (POLAROID)	072
클라인즈 (KLEINZ)	373
아인즈 (IENZ)	373
티비스타 (TVSTAR)	355
더함 TV (THEHAM)	072
이엔티비 (ENTV)	374
MOZEE	373
시네아이(DLT) -시네EYE	373
ZEPA	373
젠티뷰(ZENTVIEW)	356 373
FIDES	321 072
프리투스 (FREETOSS)	321
CACC	072
제네시스 (GENESIS)	321 355
이노스 (INNOS)	072
스마트뷰 (SMART VIEW)	418 072 467
이스트라(ESTRA)	419 351
COOCAA	353
티지엔컴퍼니(TG&Co.)	332 308
트루비(TRUVI)	419 420
RIVER(드림어스)	072 420
유맥스(UMAX)	072 420
의영시스템(WOW TV)	357
앤티웍스(ANTWORKS)	330
현아이디어(HYNAEDA)	373
지스타(ZSTA)	373
타라엘씨디(TARALCD)	302
인켈(INKEL-SHERWOOD)	209 353 163 072 151 327 350 354 464
호리온(HORION)	419 072 467
NEXTBOOK	419
브라운슈거(BROWN SUGAR)	419
더하이텍(THEHITECH)	344
루브제(LUVZE)	373
브릴리언츠(BRILLIANT)	353
디포인트(DPOINT)	072
저스트인테크(JIT)	373
OIC코리아(OIC KOREA, PRISM KOREA)	302
델로라(DELORA)	467
브리드(VRID)	072
TNM	420 355 360 466
JAMOS	358
A MARK	092 154 193 206
AOC	193 404
AUDIOVOX	038

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16. TV Brand List (3/4)

Maker(Brand)Name	Code number (3 digit) List
CANDEL	150 081
CAMEL	366
CETRONIC	053
CHANGHONG	351
CITIZEN	050 052 092 150 163 081
CLASSIC	053
CONCERTO	150
CONTEC	053 135 157
CORONADO	092 154 206
CRAIG	053
CROWN	053 092
CURTIS MATHES	052 092 163
CXC	053
DAYTRON	092
DELL	410
DYNASTY	053
ELECTROHOME	038 092
EMERSON	359 026 038 053 092 111 135 154 206
FUNAI	053 359
FUJITSU	205 412
FUTURETECH	053
GE	042 167 037 049 067 071
GRUNDIG	401
HISENSE	368
HITACHI	377 009 023 024 025 083 097 098 150 139 206 376
HP	403
INFINITY	068
INSIGNIA	411
JBL	068
JCPENNY	052 092 089
JVC	058 066 092 070 071 321
KENWOOD	058 070 415
KIVI	420
KLOSS	082
KMC	092 154 206
KTV	053 092 154 250
LUXMAN	051 150
LXI	151 167 037 068 090
MAGNAVOX	001 150 154 167 037 068 206 185 081 082 085
MARANTZ	068 108
MATSUI	068
METZ	408 462
MGA	150
MITSUBISHI	074 075 076 105 150
MTC	052 150 163
NAD	090
NEC	005 014 042 105 150 151 152 413
NIKEI	053
ONKING	053
ONTEC	053
ONWA	053
ORION	111 101 072
PANASONIC	095 161 049 054 055 223 067 068 238 061 069 071 250
PENNEY	150 163 167
PHILCO	150 154 167 037 068 206 185 081 082 085
PHILIPS	026 066 120 150 154 167 203 037 068 206 236 178 185 081 082 085 086 087 312
PIONEER	002 003 027 097 367
PORTLAND	092 150 154 206
PROTON	032 092 122
QUASAR	049 067 071 250
RADIO SHACK	053 185 092
RCA	010 097 150 167 037 370
RUNCO	416
REALISTIC	053
SANYO	020 102 151
SCOTT	053 092

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16. TV Brand List(4/4)

Maker(Brand)Name	Code number (3 digit) List
SEARS	092 150 151 163 167 037 206 089 090
SHARP	001 062 063 064 065 092 208 206
SONY	048 060 059 058 057 056 207 115 194 147 070 139 045 046 080
SOUNDESIGN	053 081
SPECTRICON	193
SSS	053
SYLVANIA	051 150 167 185 037 068 081 082 085
TATUNG	049
TCL	334 009 369 376 460 461
TEAC	407
TECHNICS	095 071
TECHWOOD	150
TEKNIKA	053 092 150 154 163 165 052 206 081
THOMSON	409
TMK	150
TOSHIBA	021 052 105 163 088 151 089 090 091 093
TOTEVISION	092
UNIDEN	406
VICTOR	066
VIDTECH	150
VIEWSONIC	405
VIZIO	364
WARDS	092 150 154 167 185 037 068 071 206 085
WESTING HOUSE	038 014 402
YAMAHA	150
YUPITERUZENITH	053
ZENITH	050 084 072
ZONDA	193

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17. Grouping brand list(1/4)

	Maker(Brand)Name	Code number (3 digit) List
GROUP 01	삼성(SAMSUNG)	226 163 218 215 212 206 167 191 162 181 037 183 178 185 232
		225 154 092 052 035 034 231 135 157 187 341 465
GROUP 02	엘지(LG,금성,GOLDSTAR)	227 236 206 192 186 193 175 178 185 224 201 092 183 003 002
		030 164 168 032 072 031 094 096 417
GROUP 03	대우(DAEWOO)	014 231 043 190 177 217 176 159 166 233 029 158 150 206 178
		185 216 165 169 156 152 155 151 228 195 153 170 188 198 038
		160 189 039 199 182 235 092 050 053 202 047 051 179 344 375
	대우루컴즈(DAEWOO LUCOMS)	420
		327 335 350 351 352 353 321
	아남(ANAM)	204 174 234 018 019 223 193 180 171 053 220 222 161 095 221
	이레전자(ERA)	210 211 122 158 049 054 055 069 099 302 357 374
	디지털 디바이스(DIGITAL DEVICE)	004 006 007 008 011 012 013
	디지털스트림테크놀로지(DIGITAL STREAM)	301 312
	삼보컴퓨터(TRIGEM COMPUTER)	351 360
	코리아데이터시스템스(KDS)	332
	티디엑스(TDS)	033 073
	트라이뷰(TRIVIEW)	103
	프리즘 테크놀로지(PRISM TECHNOLOGY)	302
	한국전자(KEC)	303 355 072
	현대아이티(현대이미지웍스)	053 206
	현우 맥 플러스(MCPLUS)	022 017 107 108 309
	휴리프(HULIF)	206
	쿠메스전자(QUMES)	104
	다오코리아(DaoKorea)	106
	모뉴얼(Moneual) - 롯데마트	304
	드림뷰(DreamView) - 이마트	305 306 307 326
	노브랜드(No Brand) - 이마트	308 332
	일렉트로맨(ELECTROMAN) - 이마트	308 332
	제이엘통상(XPEER) - 홈플러스	308
	우성엔터프라이즈(WeCube) - 홈플러스	321
	티바(TIVA, 스피드테크놀로지)	322
	스카이미디어(Vishom)	324
	동양전자(DONGYANG)	325 330 336
	비티씨정보통신(BTC)	068
	씨마디지털(CIMADIGITEC)	316
	LS전자(LS ELECTRONICS)	318 319 072
	모티브씨엔씨(MOTV)	313
	시그마TV(SIGMACOM)	311
	유니크로(UNIKRO)	310
	보임틀(VOIMTLE)	100 317
	보림전자(BOLIM)	304
	상인디스플레이(XSTIM)	028 315 323
	유투스(케이엘전자 UTUS)	104 320 329
	인디텍(VIEWPIA)	314
	재원전자(JAEWON)	107
	지피엔씨(GPNC)	333
	제노스미디어(ZENOS)	327 306
	제이아이케이솔루션(LEGRAND)	303 328
	파인포스(FINEFORCE)	342
	다불유시디(WCD)	306
	토마토디스플레이(TOMATO DISPLAY)	331
	넥스디지털(NEX)	337 306 356
	매직나라(MAGIC NARA)	338
	유니크컴퍼니(UNIQUE COMPANY)	332 339
	알파스캔(ALPHASCAN)	340
	야마카시(YAMAKASI, 바이텍코리아)	306 203 345
	자비오씨엔씨(XAVVIO)	343 346 347 348 349
	티베라(TVERA)	354
	스카이워스(SKYWORTH)	355
	오리온정보통신(TOPSYNC)	353
	한스정보(HANSJUNGBO, HANS TOUCH)	351 330 357 306
	샤오미(XIAOMI)	356
	디스플레이파크(DISPLAY PARK)	361
		072

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17. Grouping brand list(2/4)

	Maker(Brand)Name	Code number (3 digit) List
GROUP 04	스마트홈 일렉트로닉스 - 스마트라	362 363 072 420
	(SMART HOME ELECTRONICS)	
	주연테크(JOYON)	302 346 373
	대유위니아(WINIADAEWOO, WINIADIMCHAE)	338
	아낙(ANAC)	345
	매직뷰(MAGICVU)	355
	모넥스(MONEX)	302
	엘디케이(LDK)	321 206
	와사비망고(WASABIMANGO)	072
	하이메이드(HIMADE)	072 072
	인트루스(INTROS)	072 355
	삼화디스플레이(SAMHWA)	072
	JAMOS	358
	CAMEL	366
	아도니스(ADONIS)	355
	큐닉스(QNIX)	370 371 372
	와이드뷰 (WIDE VU)	373 360
	벅셀 (BEXEL)	350
	폴라로이드 (POLAROID)	072
	클라인즈 (KLEINZ)	373
	아인즈 (IEINZ)	373
	티비스타 (TVSTAR)	355
	더함 TV (THEHAM)	072
	이엔티비 (ENTV)	374
	MOZEE	373
	시네아이(DLT) -시네EYE	373
	ZEPA	373
	젠티뷰(ZENTVIEW)	356 373
	FIDES	321 072
	프리토스 (FREETOSS)	321
	CACC	072
	제네시스 (GENESIS)	321 355
	이노스 (INNOS)	072
	한성(HANSUNG)	378 414 420
	스마트뷰 (SMART VIEW)	418 072 467
	이스트라(ESTRA)	419 351
	COOCAA	353
	티지애펀퍼니(TG&Co.)	332 308
	트루비(TRUVI)	419 420
	IRIVER(드림어스)	072 420
	유맥스(UMAX)	072 420
	의영시스템	357
	앤티웍스(ANTWORKS)	330
	현아이디어(HYUNIDEA)	373
	지스타(ZSTA)	373
	타라엘씨디(TARALCD)	302
	호리온(HORION)	419 072 467
	NEXTBOOK	419
	브라운슈거(BROWN SUGAR)	419
	더하이텍(THEHITECH)	344
	루브제(LUVZE)	373
	브릴리언츠(BRILLIANT)	353
	디포인트(DPOINT)	072
	저스트인테크(JIT)	373
	OIC코리아(OIC KOREA, PRISM KOREA)	302
	델로라(DELORA)	467
	브리드(VRID)	072
	TNM	420 355 360 466
GROUP 05	SONY	048 060 059 058 057 056 207 115 194 147 070 139 045 046 080
	PANASONIC	095 161 049 054 055 223 067 068 238 061 069 071 250
	NEC	005 014 042 105 150 151 152 413
	JVC	058 066 092 070 071 321
	SANYO	020 102 151
	PIONEER	002 003 027 097 367
	FUJITSU	205 412
	SHARP	001 062 063 064 065 092 208 206

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17. Grouping brand list(3/4)

	Maker(Brand)Name	Code number (3 digit) List
GROUP 06	HITACHI	377 009 023 024 025 083 097 098 150 139 206 376
	HP	403
	TOSHIBA	021 052 105 163 088 151 089 090 091 093
	mitsubishi	074 075 076 105 150
GROUP 07	PHILIPS	026 066 120 150 154 167 203 037 068 206 236 178 185 081 082
		085 086 087 312
	하이얼(HAIER)	033 077 078 302 333 345
	HISENSE	368
	ZENITH	050 084 072
	CANDEL	150 081
	EMERSON	359 026 038 053 092 111 135 154 206
	GE	042 167 037 049 067 071
	GRUNDIG	401
	MAGNAVOX	001 150 154 167 037 068 206 185 081 082 085
GROUP 08	A MARK	092 154 193 206
	PENNEY	150 163 167
	에이텍(ATEC)	031
	3S DIGITAL	028
	뉴컴월드(NEWCOMMWORLD)	219
	디지털 싸이노스(DIGIAL CYNOS)	016
	새찬전자(SAECHEAN)	028 041 044
	AOC	193 404
	AUDIOVOX	038
	CETRONIC	053
	CHANGHONG	351
	CITIZEN	050 052 092 150 163 081
	CLASSIC	053
	CONCERTO	150
	CONTEC	053 135 157
	CORONADO	092 154 206
	CRAIG	053
	CROWN	053 092
	CURTIS MATHES	052 092 163
	CXC	053
	DAYTRON	092
	DELL	410
	DYNASTY	053
	덱트론(DECTRON)	033
	디보스(DIBOSS)	015 109
	ELECTROHOME	038 092
	FUNAI	053 359
	FUTURETECH	053
	INFINITY	068
	INKEL	209 353 163 072 151 327 350 354 464
	INSIGNIA	411
	JBL	068
	JCPENNY	052 092 089
	KENWOOD	058 070 415
	KIVI	420
	KLOSS	082
	KMC	092 154 206
	KTV	053 092 154 250
	LUXMAN	051 150
	LXI	151 167 037 068 090
	MARANTZ	068 108
	MATSUI	068
	METZ	408 462
	MGA	150
	MTC	052 150 163
	NAD	090
	NIKEI	053
	ONKING	053
	ONTEC	053
	ONWA	053

REMOTE SOLUTION CO., LTD.

INSTITUTION : 2021.09.10	SPECIFICATION (TRANSMITTER REMOCON)	MODEL NO :	68
REFORM :			
DECISION :		RD65A00	68

17. Grouping brand list(4/4)

	Maker(Brand)Name	Code number (3 digit) List
GROUP 09	ORION	111 101 072
	PHILCO	150 154 167 037 068 206 185 081 082 085
	PORTLAND	092 150 154 206
	PROTON	032 092 122
	QUASAR	049 067 071 250
	RADIO SHACK	053 185 092
	RCA	010 097 150 167 037 370
	RUNCO	416
	REALISTIC	053
	SCOTT	053 092
	SEARS	092 150 151 163 167 037 206 089 090
	SOUNDESIGN	053 081
	SPECTRICON	193
	SSS	053
	SYLVANIA	051 150 167 185 037 068 081 082 085
	TATUNG	049
	TCL	334 009 369 376 460 461
	TEAC	407
	TECHNICS	095 071
	TECHWOOD	150
	TEKNIKA	053 092 150 154 163 165 052 206 081
	THOMSON	409
	TMK	150
	TOTEVISION	092
	UNIDEN	406
	VICTOR	066
	VIDTECH	150
	VIEWSONIC	405
	VIZIO	364
	WARDS	092 150 154 167 185 037 068 071 206 085
	WESTING HOUSE	038 014 402
	YAMAHA	150
	YUPITERUZENITH	053
	ZONDA	193