

东莞市华耘实业有限公司

RC1941 设计规格书

Design Specification

for

RC1941 Remote Controller

of

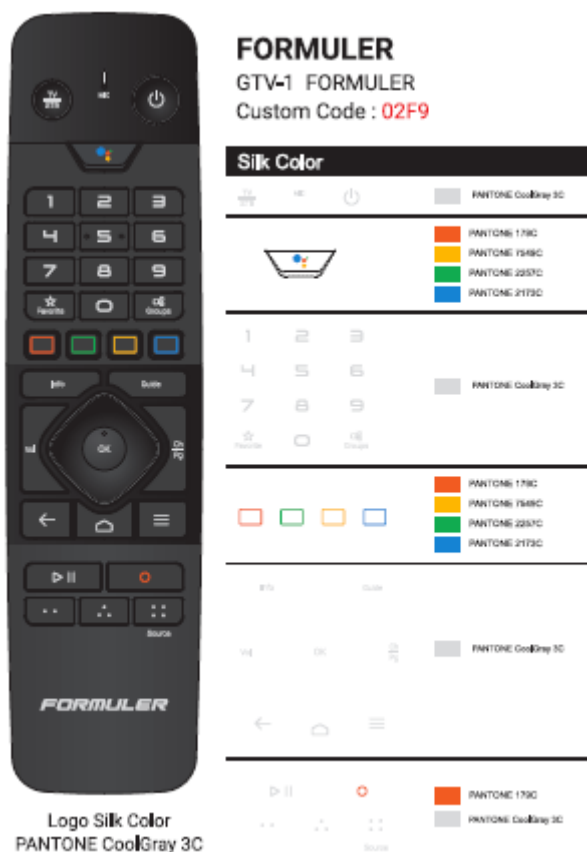
Dongguan Huayun Industrial Co., Ltd.

- 功能描述：蓝牙语音红外学习遥控器。
- **Functional description: Bluetooth Voice Infrared Learning Remote Controller**

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审核: Reviewed by:		日期: Date:	

1、外观造型

1. Appearance



蓝牙设备名: GTV; 客户编码: NEC 02F9;

Name of Bluetooth device: GTV; Client code: NEC 02F9;

基本功能: 蓝牙按键、语音、**万能**; 软件对应版本命名:

Basic functions: Bluetooth key, voice, **infrared learning**; software version name:

客户不是运营商，是机顶盒开发公司

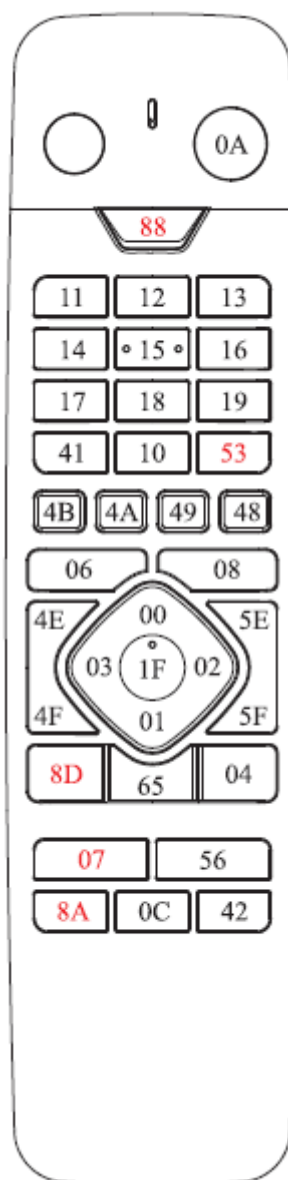
- Client is STB (set top box) development company instead of operator**
- 语音协议标准/语音引擎等信息;
 - Voice protocol and standard/voice engine;**
 - 语音协议标准 按照谷歌（申请谷歌认证）Google 引擎
 - Voice protocol standard, subject to Google (apply for Google authentication) searching engine**
- 安卓版本号
 - Android version number**
 - 安卓版本 9.0
 - Android version 9.0**
- 盒子端主机型号
 - Model of box end host**

- **Cpu:**
- 5. 蓝牙模块型号
- 4. **Model of Bluetooth module**
- **BT ic: RTL8822BS I51G3P1**

2、 按键功能定义及键值

2. Function Definition and Values of Keys

- 红外码值表: NEC 客户编码: 02F9
- Table of infrared code value: NEC; Client code: 02F9



- 产品在未连接机顶盒蓝牙功能时所有按键发红外码值功能;


- Press any button to send infrared code value before connecting the remote controller (hereinafter referred to as “the Product”) to STB and activating Bluetooth function;
- “TV/STB”键是红外学习键，控制电视开关机，任何状态下只发红外码；
- “TV/STB” key: Infrared learning key to turn on/off TV. It can send infrared code only under all conditions.





● 蓝牙码值：安卓 9.0 标准码值

● Bluetooth code value: Standard codes for Android 9.0

键名 Key Name	HID 键码值 HID Key Code	HID 键码值 HID Key Code	备注 Remarks	红外 Infrared
	Usage Page	Usage ID		码值 Code
TV/STB	任何状态下只发红外码 Send infrared code only under all conditions		切换键 Learning Key	
POWER	0x0C	0x0030		0A
语音键 Voice Key	0x0C	0x0221		88
1	0x07	0x1E		11
2	0x07	0x1F		12
3	0x07	0x20		13
4	0x07	0x21		14
5	0x07	0x22		15
6	0x07	0x23		16
7	0x07	0x24		17
8	0x07	0x25		18
9	0x07	0x26		19
0	0x07	0x27		10
	0x0C	0x0067		41



键名 Key Name	HID 键码值 HID Key Code	HID 键码值 HID Key Code	备注 Remarks	红外 Infrared
	Usage Page	Usage ID		码值 Code
Guide	0x0C	0x008D		08
音量+ Volume +	0x0C	0x00E9		4E
音量- Volume -	0x0C	0x00EA		4F
上 Up	0x0C	0x0042		00
下 Down	0x0C	0x0043		01
左 Left	0x0C	0x0044		03
右 Right	0x0C	0x0045		02
OK	0x0C	0x0084		1F
CH+	0x0C	0x009C		5E
CH-	0x0C	0x009D		5F
	0x0C	0x0224	返回 Return	8D
	0x0C	0x0223	主页 Home	65
	0x0C	0x0040	列表 List	04
	0x0C	0x00CD	放音/暂停 Play/Pause	07

	0x0C	0x0068		53
红 Red	0x0C	0x0069		4B
绿 Green	0x0C	0x006A		4A
黄 Yellow	0x0C	0x006C		49
蓝 Blue	0x0C	0x006B		48
INFO	0x0C	0x01BD		06

	0x0C	0x00B2	录音 Record	56
	0x0C		鼠标 Mouse	8A
	0x0C	0x00E2	静音 Mute	0C
	0x0C		收藏夹 Favorite	42

3、蓝牙配对方法

3. Bluetooth Matching Method

步骤 Step	操作 Operation
1	打开主机蓝牙设备 Turn on Bluetooth of host
2	<p>同时按下“OK 键”和“”指示灯亮一下后熄灭，3 秒后指示灯慢速闪烁，遥控器进入广播扫描模式（进入后可松开按键）。</p> <p>Press “OK” and “” key simultaneously and indicator will flash once and become off, 3s later, the indicator will flicker slowly and the Product enters broadcast scanning mode (release key now).</p>
3	<p>1) 点击主机蓝牙【搜索设备】->【搜索到的设备】->点击【GTV】</p> <p>1) Click host Bluetooth [Search Device] → [Device Found] → Click [GTV]</p> <p>2) 如果进入广播扫描模式 1 分钟后遥控器还未进入配对模式，超时退出广播扫描模式。</p> <p>2) If failing to enter matching mode 1 min after entering broadcast scanning mode, the Product will quit broadcast scanning mode.</p>
4	<p>点击【GTV】设备后遥控器退出广播扫描模式，进入配对模式，白灯快速闪烁，进入配对状态。</p> <p>Click [GTV] to quit broadcast scanning mode, enter matching mode and red light flickers quickly, which means matching status is entered.</p> <p>1) 链接成功后指示灯长亮 2 秒，然后退出配对模式指示灯熄灭。</p> <p>1) Once matching succeeds, the indicator is on for 2s, quit matching mode and indicator becomes off.</p> <p>2) 如果配对模式未配对成功，超时 60 秒退出。</p> <p>2) Once matching fails, the Product will quit matching mode within 60s.</p>

3.1 语音传输要求

3.1 voice transmission requirements

- 遥控器通过麦克风进行语音采集;
- The remote control carries on the speech acquisition through the microphone;
- 遥控器与机顶盒建立蓝牙连接;
- The remote control establishes a bluetooth connection with the set-top box
- 遥控器与机顶盒内置蓝牙模块要求使用低功耗蓝牙 4.0 BLE 协议进行数据传输;
- The built-in bluetooth module of remote control and set-top box requires the use of low-power bluetooth 4.0 BLE protocol for data transmission.
- 采样的语音数据使用标准 PCM 进行编码, 采样率为 16KHz, 采样精度为 16bit, 采样声道为单声道;
- The sampled voice data is encoded by standard PCM, with a sampling rate of 16KHz, a sampling accuracy of 16bit, and a sampling channel of mono

3.2 配对信息保存

3.2 save the pairing information

遥控器与主机成功完成蓝牙配对后, 必须满足以下要求:

Upon successful completion of bluetooth pairing between the remote control and the host, the following requirements must be met:

- 1) 遥控器配对连接上之后, 内置 Flash 存储蓝牙配对信息。当遥控器断电时, 蓝牙配对信息不丢失;
- 1) Once the remote pair is connected, the built-in Flash stores the bluetooth pairing information.
when the remote control is power off, the bluetooth pairing information will not be lost;
- 2) 遥控器蓝牙断连后支持自动恢复连接, 自动恢复连接的时长 $\leq 1.5S$
- 2) When the bluetooth connection of the remote control is broken, automatic connection recovery is supported. The duration of automatic connection recovery is $\leq 1.5s$

4.指示灯三种要求

4. Infrared Learning

a.STB,TV 模式 LED 红光

Aloys GTV RCU Modes of Operation

TV MODE

Press STB/TV button on RCU once.
RCU changes to IR TV-control mode



TV Mode: RED LED

按一次STB/TV 按钮，遥控器切换到红外线控制电视模式（电视模式下LED 红色）

备注：切换时间长
按2秒，默认STB



红外线TV 控制键

IR TV Control keys

TV SOURCE/INPUT select

电视源输入选择 TV/HDMI/AV

初始状态下，默认 SAMSUNG TV 红外线码：

Default IR TV Code = Samsung

默认 TV 键：以下用黄色框圈出来，发红外码

Default TV key: the following is circled in yellow, the infrared code



b. STB 蓝牙模式下 LED 白光

Press STB/TV button on RCU again.
RCU changes back to STB mode



STB Mode: WHITE LED

STB 模式下LED 白光

c. STB, 红外模式 LED 橙光

STB, LED orange light in infrared mode

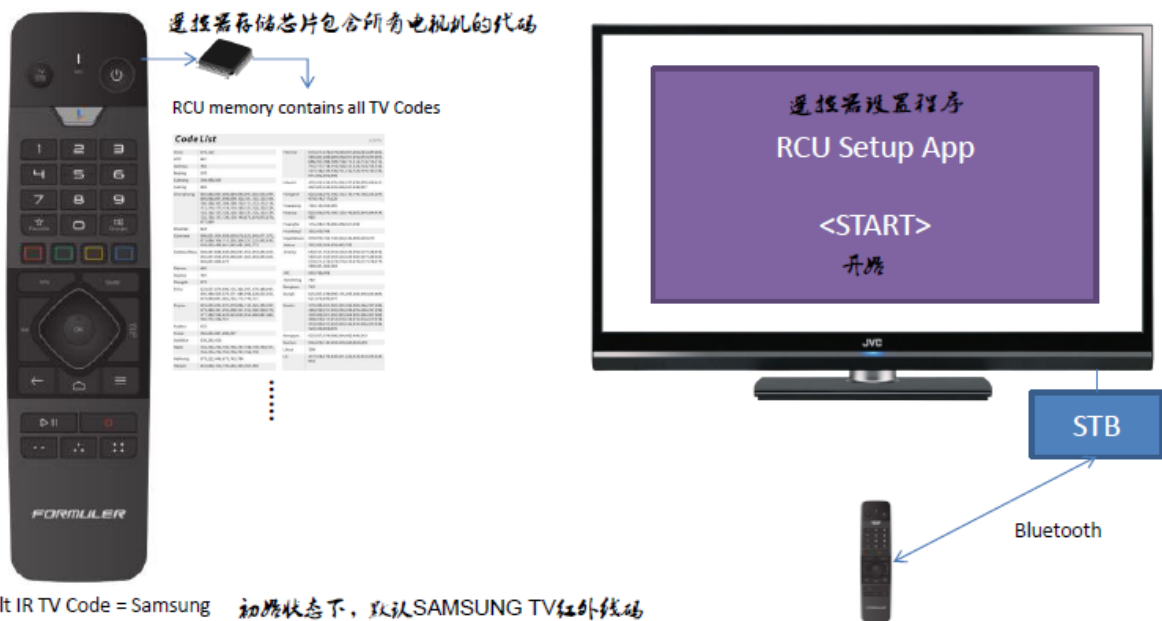
5. 万能 APP 操作方法，如下图

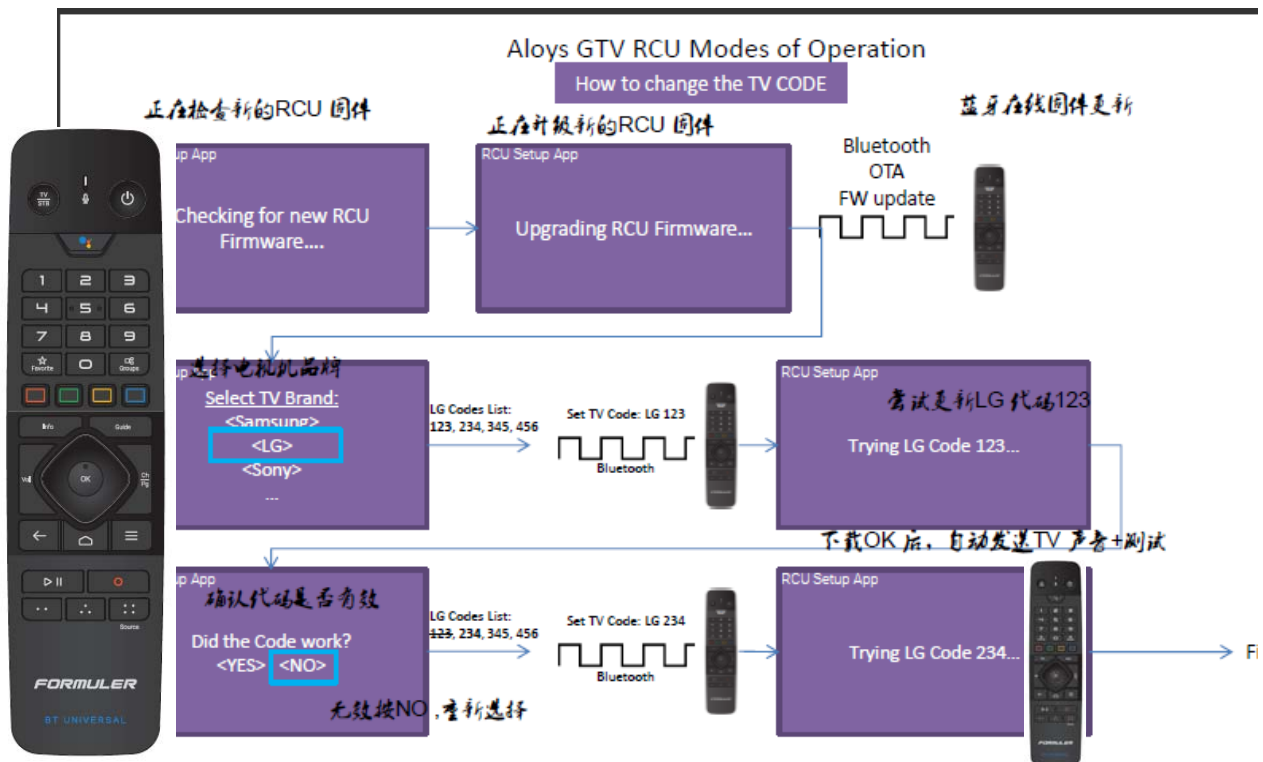
The above universal APP only does the reference operation method,

Aloys GTV RCU Modes of Operation

How to change the TV CODE

怎么更改TV 红外码





b. 以上万能 APP 只做参考操作方法，

b. The above universal APP only does the reference operation method,

5、语音

5. Voice

<p>语音键</p> <p>Voice Key</p>	<p>1. 上层开启语音；</p> <p>1. Upper startup voice;</p> <p>2. 谷歌标准语音（安卓 9.0）；</p> <p>2. Google standard voice (Android 9.0);</p> <p>3. 语音开启指示灯常亮；</p> <p>3. Voice enabling indicator is normally on;</p>
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1.1. 麦克风要求

1.1. Microphone requirements

要求遥控器内置麦克风：

The remote requires a built-in microphone

1) 支持不低于 16K/16bit 采样率；

1) Supports no less than 16K/16bit sampling rate

2) 灵敏度达到 >-45dB；

2) The sensitivity reached >-45db;

3) 信噪比 (SNR) $\geq 58\text{dB}$;

3) Signal to noise ratio (SNR) $\geq 58\text{dB}$;

4) 麦克风可以实现拾音功能，拾取以遥控器为中心 15cm 及以内正常讲话的声音，拾音效果清晰、无杂音。

4) The microphone can realize the sound pickup function, and pick up the normal voice within 15cm with the remote control as the center. The sound pickup effect is clear and there is no noise.

6、低功耗模式

6. Low-consumption Mode

状态 Status	方式 Method
状态一、状态二 Status 1 and 2	遥控器 10 秒进入休眠模式 The Product will enter sleep mode automatically if being idled for 10s
状态三 Status 3	完成按键操作后直接进入待机模式 Enter standby modes directly after finishing operation of key
状态六 Status 6	语音模式下一一直处于工作模式 The Product is always working under voice mode

备注:

Note:

(1) 状态一：未配对

(1) Status 1: Unmatched

(2) 状态二：已配对，未连接上

(2) Status 2: Matched, unconnected

(3) 状态三：有连接，按键模式

(3) Status 3: Connected, key mode

(4) 状态五：有链路，语音模式（语音开启）

(4) Status 5: Linked, voice mode (voice enabled)

(5) 遥控器处于待机模式时，按按键唤醒。

(5) Remote controller enters standby status, press key to awake.

7、电源管理

7. Power Management

- A. 采用 2 节 5 号干电池供电
- A. The Product is powered by 2 AA batteries
- B. 低电检测和提示
- B. Low-battery detection and prompt
 - a. VBAT \leq 2.2V 开始提示低电，VBAT \leq 2V 以下禁止工作，重上电才能恢复
 - a. The Product prompts “low battery” if VBAT \leq 2.2V, or disables operation if VBAT \leq 2V unless it is repowered
 - b. 检测到禁止工作电压，红灯快速闪烁 10 秒后进入禁止，这 10 秒内可以正常工作，同时间隔 3 秒发送一次禁止工作键值，可发 F20。
 - b. Upon detecting voltage of prohibiting work, the Product’s red indicator will flicker for 10s quickly before entering disabling mode, but the Product can be handled normally 10s before disabling. Meanwhile, the key value of disabling work will be sent at interval of 3s and it can send the value F20.

8、固定频点发送（测发射功率及频偏）：

8. Fixed-frequency Transmission (measure transmitting power and frequency offset):

进入条件 Entry condition	<p>1: 按住“返回键”，遥控器上电，仅检测到“返回键”键被按下，且保持仅“返回键”按下达到 1 秒，遥控器进入固定频点发送。指示灯 100ms 快速闪烁</p> <p>1: Hold “Return” key and power on the Product, if “Return” key is pressed and held for 1s, the Product will enable transmission at fixed frequency. The indicator will flicker quickly at interval of 100 ms.</p> <p>2: 也可整机测试工具配置</p> <p>2: Tool configuration can be tested</p> <p>3: 注意点</p> <p>3: Notice</p> <p>1) 非按住“返回键”上电的不可进入，通过初始化完是否检测到“返回键”判断</p> <p>1) The fixed-frequency transmission mode cannot be entered unless “Return” key is pressed before powering on; the “Return” key is detected through initialization.</p> <p>2) 上电 1 秒内只能有“返回键”是按下状态，且要维持 1 秒才进入</p> <p>2) The fixed-frequency transmission mode cannot be entered unless “Return” key is pressed before powering on for 1s;</p> <p>3) 休眠情况下唤醒不算重新上电，需要注意</p> <p>3) Please be noted, awakening from sleep mode is not regarded as repowering</p>
参数 Parameter	<p>发射频率: 2412Mhz 发射功率: 0db</p> <p>Transmission frequency: 2412Mhz; transmission power: 0db</p>

退出方式 Quit	1: 任意按键退出 1: Press any key to quit 2: 断电退出 2: Power off to quit 3: 超时 10 秒退出 3: Quit automatically after 10s timeout
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9、指示灯说明（3 个灯）：

9. Indicator (single lamp):

状态 Status	运行灯指示 Running Indicator		周期 Period	优先级 Priority	原始 Original
无链路状态 Not linked	指示灯闪烁2下 Indicator flickers twice		300ms		
有链路状态 LinkedRemote control electrical performance requirements	按键单击 Click key	指示灯闪烁1下 Indicator flickers once	300ms		
	语音：白灯常亮 Voice: Red indicator is normally on				
低电 Low battery	红灯快速闪烁3秒 Red indicator flickers for 3s quickly		100ms		
禁止工作 Disabled	红灯快速闪烁10秒进入 Red indicator flickers quickly for 10s before entering disabled mode		100ms		

遥控器电气性能要求

Remote control electrical performance requirements

常规部分

Regular part

序号 number	项目 project	指标要求 Index requirements
1	工作温度	-10° --55°

	Work Temperature	
2	工作电压 Working voltage	2.2-3.6V
3	动态电流（蓝牙） Dynamic current (BT)	单击遥控器按键，测量电流的平均值<10mA； Click the button of the remote control to measure the average value of the current < 10mA； 长按遥控器按键，测量电流的平均值<10mA； Long press the button of the remote control to measure the average value of the current < 10mA；
4	动态电流（红外） Dynamic current (infrared)	持续按压红外按键使之处于工作状态，测量电流的平均值≤55mA Keep pressing the infrared button to keep it in working state, and the average value of the measured current is ≤55mA
5	静态电流 static current	蓝牙连接 BT connection: <100 μA 蓝牙断开 BT Disconnect : <10 μA

射频部分

序号 number	项目 project	指标要求 Index requirements
1	工作频率 Working frequency	2400-2483.50MHz
2	调制方式 Modulation Type	GFSK
3	传输速率 Transmission rate	1Mbps
4	发射功率 Transmission power	4dBm
5	频偏 deviation	±30KHz
6	天线形式 Antenna Type	PCB 天线 PCB Antenna

10.OTA 升级

10. OTA update

遥控器在蓝牙连接时，遥控器支持软件固件空中升级

When the remote control is connected with bluetooth, it supports software firmware upgrade in the air

11、生产测试

11. Production Test

- 遥控器 PCBA 测试、校准
- PCBA test and calibration of remote controller
- 整机量产测试方法由“微纳”提供。
- Test method for mass production should be provided by “Winner”.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.