



REPORT No. : SZ16060049S01

# RF EXPOSURE EVALUATION REPORT

**APPLICANT** : Legacy Direct

**PRODUCT NAME** : Smart TV box

**MODEL NAME** : BTV3, BTV, BTVi, BeTV, iBTV, LDTV, WTV, BTVi3

**TRADE NAME** : Legacy Direct

**BRAND NAME** : BTV, BTVi, BeTV, iBTV, LDTV, WTV

**FCC ID** : 2AIM5BTV3  
47CFR 2.1091

**STANDARD(S)** : KDB 447498 D01 General RF Exposure Guidance  
v06

**ISSUE DATE** : 2016-07-12



**SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.**

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## DIRECTORY

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Change History		
Issue	Date	Reason for change
1.0	2016-07-12	First edition





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**TEST REPORT DECLARATION**

Applicant	Legacy Direct
Applicant Address	1221 E. Dyer Rd., Santa Ana CA 92705, USA
Manufacturer	Wiatec International Ltd.
Manufacturer Address	Unit 601-605, TaoJinDi Electronic Commercial Plaza B, TengLong Rd, LongHua, Shenzhen, China 518131
Product Name	Smart TV box
Model Name	BTV3, BTV, BTVi, BeTV, iBTV, LDTV, WTV, BTVi3
Brand Name	BTV, BTVi, BeTV, iBTV, LDTV, WTV
HW Version	WIL-BTV3
SW Version	Android 5.1.1
Test Standards	47CFR 2.1091; KDB 447498 D01 General RF Exposure Guidance v06
Issue Date	2016-07-12

Tested by : Chen Shengkui  
Chen Shengkui

Reviewed by : Liu Jun  
Liu Jun

Approved by : Zeng Dexin  
Zeng Dexin



## 1. TECHNICAL INFORMATION

Note: the following data is based on the information by the applicant.

### 1.1. Identification of Applicant

Company Name:	Legacy Direct
Address:	1221 E. Dyer Rd., Santa Ana CA 92705, USA

### 1.2. Identification of Manufacturer

Company Name:	Wiatec International Ltd.
Address:	Unit 601-605, TaoJinDi Electronic Commercial Plaza B, TengLong Rd, LongHua, Shenzhen, China 518131

### 1.3. Equipment Under Test (EUT)

Model Name:	BTV3, BTV, BTVi, BeTV, iBTV, LDTV, WTV, BTVi3
Trade Name:	Legacy Direct
Brand Name:	BTV, BTVi, BeTV, iBTV, LDTV, WTV
Hardware Version:	WIL-BTV3
Software Version:	Android 5.1.1
Frequency Bands:	802.11 b/g/n20: 2412-2462 MHz; 802.11 a20/n20: 5150-5250MHz 802.11 a20/n20: 5725-5825 MHz Bluetooth 2.1+EDR/Bluetooth 4.0: 2402-2480 MHz
Modulation Mode:	WIFI 802.11b: DSSS; WIFI 802.11g: OFDM; WIFI 802.11a/n:OFDM; Bluetooth:2.1+EDR;GFSK/ $\pi$ /4-DQPSK/8-DPSK; Bluetooth4.0: GFSK;
Antenna type:	PCB Antenna
Antenna Gain:	2 dBi

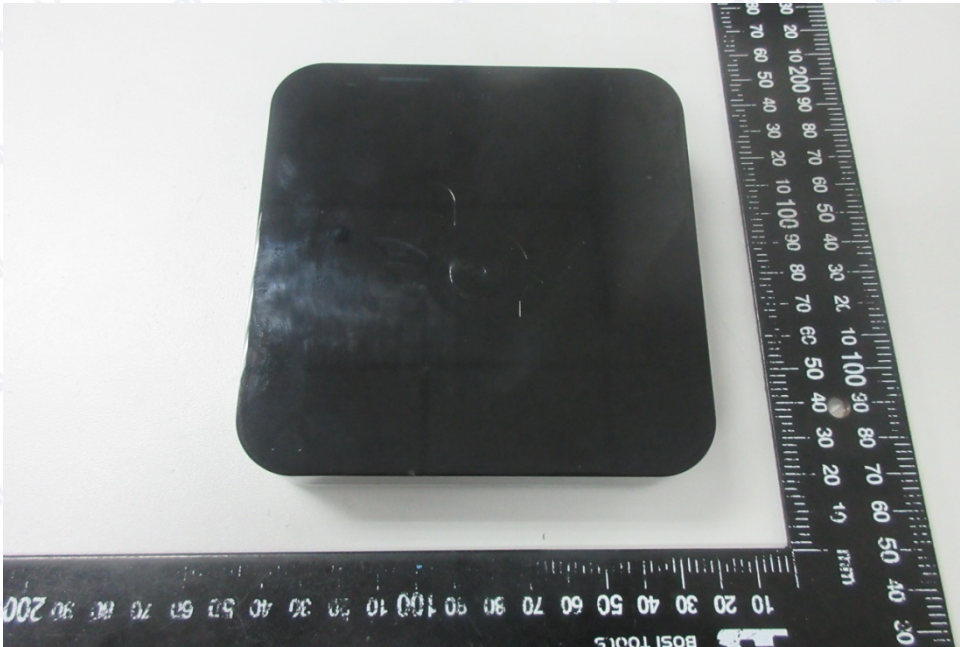




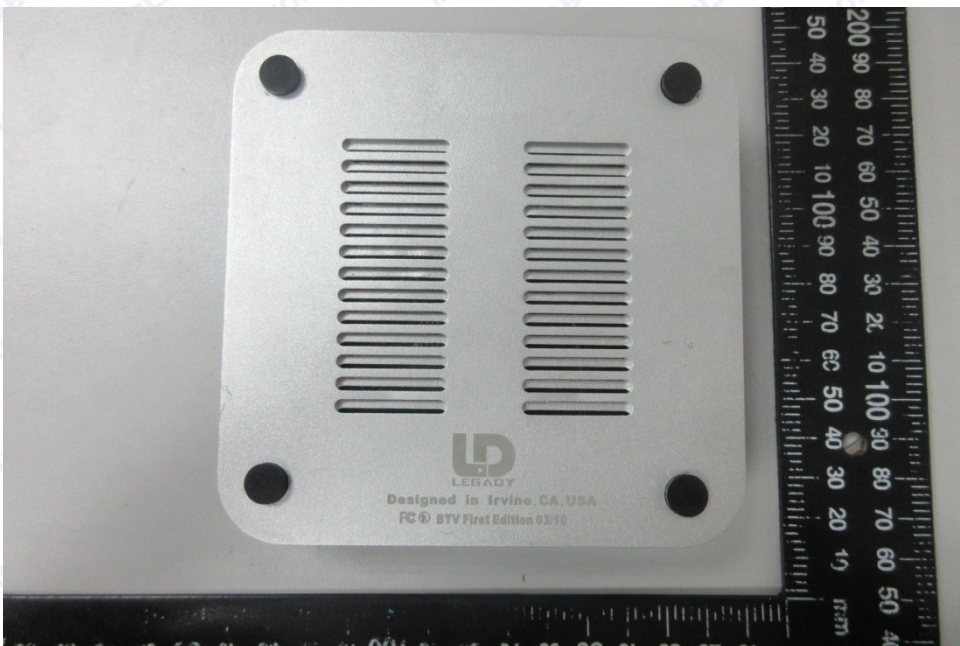
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### 1.3.1. Photographs of the EUT

#### 1. EUT side view



#### 2. EUT top view





### 1.3.2. Identification of all used EUT

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
1#	WIL-BTV3	Android 5.1.1

### 1.4. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	<b>47 CFR§2.1091</b>	Radiofrequency Radiation Exposure Evaluation: mobile devices
2	<b>KDB 447498 D01v06</b>	General RF Exposure Guidance



## 2. DEVICE CATEGORY AND RF EXPOSURE LIMIT

Per user manual, this device is a TV box. Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

### Mobile Devices:

47CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

### GENERAL POPULATION / UNCONTROLLED EXPOSURE

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz

\* = Plane-wave equivalent power density





### 3. MEASUREMENT OF CONDUCTED PEAK OUTPUT POWER

#### 1. Wifi 2.4G Conducted Average Output Power

Band	Channel	Frequency (MHz)	Output Power(dBm)		
			802.11b (DSSS)	802.11g (OFDM)	802.11n20 (OFDM)
WiFi	1	2412	15.12	14.06	12.98
	6	2437	15.24	14.17	13.06
	11	2462	15.38	14.31	13.12

#### 2. Wi-Fi 5GHz Average output power

Band	Channel	Frequency (MHz)	Output Power(dBm)	
			802.11a20	802.11n20
Wi-Fi 5.2GHz	36	5180	10.13	8.65
	44	5220	9.45	8.03
	48	5240	9.43	7.83

Band	Channel	Frequency (MHz)	Output Power(dBm)	
			802.11a20	802.11n20
Wi-Fi 5.8GHz (UNII)	149	5745	12.51	11.57
	157	5785	12.56	11.52
	165	5825	10.97	9.92

#### 3. BT+EDR 2.1 peak output power

Band	Channel	Frequency (MHz)	Output Power(dBm)		
			GFSK	$\pi/4$ -DQPSK	8-DPSK
BT	0	2402	11.15	10.44	10.90
	39	2441	10.92	10.52	10.90
	78	2480	10.60	10.20	10.48





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Band	Channel	Frequency (MHz)	Output Power(dBm)
			GFSK
BT	0	2402	-4.18
	19	2441	-3.63
	39	2480	-3.61



## 4. RF EXPOSURE EVALUATION

### Standalone transmission MPE evaluation

Bands	Frequency (MHz)	Antenna Gain (dBi)	Conducted Average Power (dBm)	Time-averaging EIRP (mW)	Power density (mW/cm <sup>2</sup> )	Limit for MPE (mW/cm <sup>2</sup> )
802.11b	2462	2	15.38	54.70	0.01	1.0
Bluetooth2.1	2402	2	11.15	20.65	0.004	

Note:

1. MPE calculation method

$$\text{Power Density} = \text{EIRP} / 4\pi R^2$$

Where:  $\text{EIRP} = P \cdot G$

P = Peak out power

G = Antenna gain

R = Separation distance (20cm)





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## ANNEX C GENERAL INFORMATION

### 1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

### 2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China

\*\*\*\*\* END OF REPORT \*\*\*\*\*