Maximum Permissible Exposure Evaluation

FCC ID: 2AZTZ-OT55A0KAGC

1. Client Information

Applicant	:	Kontech Electronics Co., Ltd.
Address	:	No.30, Langkou Industrial Park, Dalang Street, Longhua New District, Shenzhen, Guangdong, China
Manufacturer	:	Kontech Electronics Co., Ltd.
Address	:	No.30, Langkou Industrial Park, Dalang Street, Longhua New District, Shenzhen, Guangdong, China

2. General Description of EUT

EUT Name	:	OUTDOOR TV	
Models No.	:	OT55A0KAGC, OT43#*####, OQ43#*####, OT55#*####, OQ55#*####, OT65#*####, OQ65#*####, OT75#*####, OQ75#*#### (# stands for letters A-Z; * stands for numbers 0-9)	
Model Different	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is size and color.	
Brand Name	:	SYLVOX, ZINVAX, MISTAAD, GOTHOT, VUESTATION, KONTECH	
Product Description	:	Operation Frequency:	Bluetooth 5.0:2402MHz~2480MHz 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n (HT40):2422MHz~2452MHz
		Number of Channel:	Bluetooth 5.0:79 channels Bluetooth 5.0(BLE): 40 channels 802.11b/g/n(HT20):11 Channels 802.11n (HT40):7 Channels
Power Rating	:	Input: 100-240Vac, 50/60Hz, 4A Max	
Software Version	:	N/A	
Hardware Version	:	N/A	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	the MPE report used the EUT (20210407-13-2#).	

MPE Calculations for WIFI

1. **Antenna Gain:**

PCB Antenna:0dBi.

2. **EUT Operation Condition:**

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3. **Exposure Evaluation:**

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

Where

S: power density
P: power input to the antenna
G: power gain of the antenna in the direction of interest relative to an isotropic radiator.
R: distance to the center of radiation of the antenna

4. **Antenna Information**

OT55A0KAGC, OT43#*####, OQ43#*####, OT55#*####, OQ55#*####, OT65#*####, OQ65#*####, OT75#*####, OQ75#*#### (# stands for letters A-Z; * stands for numbers 0-9) can only use antennas certificated as follows provided by manufacturer

Internal Identification	Antenna type and antenna number	Operate frequency band	Maximum antenna gain
Antenna 0	PCB Antenna	2402 MHz – 2480 MHz	0dBi
Antenna 1	PCB Antenna	2412 MHz – 2462 MHz	2dBi
Antenna 2	PCB Antenna	2412 MHz – 2462 MHz	2dBi

5. **RF Output Power**

2.4G WiFi

Test Mode	Channel	Frequency (MHz)	Measured Peak Output Power (dBm)		
			Antenna 1	Antenna 2	Sum
IEEE 802.11b	1	2412	7.872	9.728	/
	6	2437	5.048	9.448	/
	11	2462	6.022	9.357	/
IEEE 802.11g	1	2412	14.159	15.652	/
	6	2437	12.599	15.412	/
	11	2462	12.389	15.577	/
IEEE 802.11n HT20	1	2412	12.095	13.16	15.67
	6	2437	9.01	12.428	14.057
	11	2462	10.223	13.143	14.934
IEEE 802.11n HT40	3	2422	8.482	10.261	12.472
	6	2437	6.856	9.744	11.546
	9	2452	6.098	9.854	11.38

BT

Test Mode	Channel	Frequency (MHz)	Measured Peak Output Power (dBm)
			Antenna 3
GFSK(1Mbps)	00	2402	5.155
	39	2441	7.198
	78	2480	7.624
π /4-DQPSK(2Mbps)	00	2402	7.691
	39	2441	9.658
	78	2480	10.071
8-DPSK(3Mbps)	00	2402	8.029
	39	2441	10.012
	78	2480	10.371

BLE

Test Mode	Channel	Frequency (MHz)	Measured Peak Output Power (dBm)
			Antenna 3
GFSK(1Mbps)	00	2402	5.171
	39	2441	7.172
	78	2480	7.569

6. Manufacturing Tolerance

2.4GWLAN (Antenna 1)

IEEE 802.11b			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	8.0	5.0	6.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11g			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	14.0	13.0	12.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	12.0	9.0	10.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT40			
Channel	Channel 3	Channel 6	Channel 9
Target (dBm)	8.0	7.0	6.0
Tolerance ±(dB)	1.0	1.0	1.0

2.4GWLAN (Antenna 2)

IEEE 802.11b			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	10.0	9.0	9.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11g			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	16.0	15.0	16.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	13.0	12.0	13.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT40			
Channel	Channel 3	Channel 6	Channel 9
Target (dBm)	10.0	10.0	10.0
Tolerance ±(dB)	1.0	1.0	1.0

BT (Antenna 0)

GFSK(1Mbps)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	5.0	7.0	8.0
Tolerance ±(dB)	1.0	1.0	1.0
π /4-DQPSK(2Mbps)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	7.0	10.0	10.0
Tolerance ±(dB)	1.0	1.0	1.0
8-DPSK(3Mbps)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	8.0	10.0	10.0
Tolerance ±(dB)	1.0	1.0	1.0

BLE (Antenna 0)

GFSK(1Mbps)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	5.0	7.0	8.0
Tolerance ±(dB)	1.0	1.0	1.0

7. Measurement Results

Antenna 1

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm2)	MPE Limits (mW/cm2)
	dBm	mW					
IEEE 802.11b	9.00	7.9433	0	1.0000	100%	0.0016	1.0000
IEEE 802.11g	15.00	31.6228	0	1.0000	100%	0.0063	1.0000
IEEE 802.11n HT20	13.00	19.9526	0	1.0000	100%	0.0040	1.0000
IEEE 802.11n HT40	9.00	7.9433	0	1.0000	100%	0.0016	1.0000

Antenna 2

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm2)	MPE Limits (mW/cm2)
	dBm	mW					
IEEE 802.11b	11.00	12.5893	0	1.0000	100%	0.0025	1.0000
IEEE 802.11g	17.00	50.1187	0	1.0000	100%	0.0100	1.0000
IEEE 802.11n HT20	14.00	25.1189	0	1.0000	100%	0.0050	1.0000
IEEE 802.11n HT40	11.00	12.5893	0	1.0000	100%	0.0025	1.0000

Antenna 0

BT

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm2)	MPE Limits (mW/cm2)
	dBm	mW					
GFSK(1Mbps)	9.00	7.9433	0	1.0000	100%	0.0016	1.0000
π /4-DQPSK(2Mbps)	11.00	12.5893	0	1.0000	100%	0.0025	1.0000
8-DPSK(3Mbps)	11.00	12.5893	0	1.0000	100%	0.0025	1.0000

BLE

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm2)	MPE Limits (mW/cm2)
	dBm	mW					
GFSK(1Mbps)	9.00	7.9433	0	1.0000	100%	0.0016	1.0000

8. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm^2)
300-1,500	**F/1500**
1,500-100,000	**1.0**

9. Summary simultaneous transmission results

The sample supports 3 antennas for 2.4G WLAN and BT. The 2.4G WLAN and BT can transmit simultaneous.

According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;

$\sum$ of MPE ratios $\leqslant$ 1.0

Antenna 1 and Antenna 2 for 2.4GWLAN
Antenna 0 for BT

Modulation Type	MPE BT Ant 0 (mW/cm2)	MPE WIFI Ant 1 (mW/cm2)	MPE WIFI Ant 2 (mW/cm2)	∑MPE ratios	Limit	Results
BT+WIFI	0.0025	0.0063	0.0100	0.0188	1.0	PASS

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

Note

For a more detailed features description, please refer to the RF Test Report.

10. Conclusion:

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----END OF REPORT-----