Maximum Permissible Exposure Evaluation

FCC ID: 2ARJA-M16

1. Client Information

Applicant	:	Vsoon Smart Manufacture Co., Ltd.
Addres	:	The 3rd Floor, B5 Building, Huachuang Industry Park , No.9 , Huateng Road, Shiqi Town, Panyu District , Guangzhou,Guangdong, China
Manufacturer	:	Vsoon Smart Manufacture Co., Ltd.
Address	:	The 3rd Floor, B5 Building, Huachuang Industry Park , No.9 , Huateng Road, Shiqi Town, Panyu District , Guangzhou,Guangdong, China

1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, China
Tel: +86 75526509301 Fax: +86 75526509195

2. General Description of EUT

EUT Name	:	Set Top Box	
Models No.	:	M16	
Model Difference	:	All these models are identical in the same PCB layout and electrical circuit, the only difference is model name, appearance and color for commercial.	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz Bluetooth/BLE: 2402MHz~2480MHz
		Max Output Power:	WIFI: 16.25dBm Bluetooth: 3.664dBm BLE: 0.157dBm
		Antenna Gain:	3dBi Internal Antenna
Power Supply	:	DC Voltage supplied by AC/DC Adapter	
Power Rating	:	AC/DC Adapter (DSX-050150L-US): Input: AC 100~240V, 50/60Hz, 0.3A. Output: DC 5V, 1.5A.	
Connecting I/O Port(S)	:	Please refer to the User's Manual	

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MPE Calculations for WIFI

1. Antenna Gain:

Internal Antenna: 3dBi.

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. Test Result:

Mode	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm^2) [S]
802.11b	16.25	16±1	17	3.0	20	0.019907
802.11g	14.57	15±1	16	3.0	20	0.015811
802.11n (HT20)	14.09	14±1	15	3.0	20	0.012559
802.11n (HT40)	12.84	13±1	14	3.0	20	0.009976
BLE	0.157	0±1	1	3.0	20	0.000500

Mode	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm^2) [S]
GFSK	3.664	3±1	4	3.0	20	0.000998
π/4-DQPSK	3.570	3±1	4	3.0	20	0.000998
8-DPSK	3.439	3±1	4	3.0	20	0.000998

5. 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

For 802.11b/g/n:2412~2462 MHz
For Bluetooth/BLE: 2402MHz~2480MHz
MPE limit S: $1mW/cm^2$
The MPE is calculated as ***$0.01773mW/cm^2$ < limit $1mW/cm^2$***. So, RF exposure limit warning or SAR test are not required.

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.

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