

FCC ID:2BA7R-U130121

RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm ²)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

11.1 Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} =output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π =3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, 1mW/cm², If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

RF Exposure Information: The radiated output power of this device meets the limits of FCC/IC radio frequency exposure limits. This device should be operated with a minimum separation distance of 20cm (8 inches) between the equipment and a person's body.

Characteristics	Description
Product:	Home Server
Model Number:	U130121
Sample number:	2#
Device Type:	Bluetooth V5.0
Data Rate :	1Mbps, 2Mbps
Modulation:	GFSK
Operating Frequency Range:	2402-2480MHz
Number of Channels:	40 Channels
Transmit Power Max:	2.56 dBm
Antenna Type:	FPC Antenna
Antenna Gain:	2.99 dBi
Test Voltage:	AC 120V/60Hz
Power Supply:	DC 12V from Adapter
Adapter:	Model:JHD-AP030U-120250-AS Input:100-240V~50/60Hz 1.0A Output:12V,2500mA
Date of Received:	May 15, 2024
Temperature Range:	0°C ~ +45°C

Characteristics	Description
Product:	Home Server
Model Number:	U130121
Sample:	2#
Device Type:	Bluetooth V5.0
Data Rate:	1Mbps for GFSK modulation 2Mbps for $\pi/4$ -DQPSK modulation 3Mbps for 8DPSK modulation
Modulation:	GFSK, $\pi/4$ -DQPSK, 8DPSK
Operating Frequency Range(s) :	2402-2480MHz
Number of Channels:	79 channels
Transmit Power Max:	6.71 dBm
Antenna Type:	FPC Antenna
Antenna Gain:	2.99 dBi
Test Voltage:	AC 120V/60Hz
Power Supply:	DC 12V from Adapter
Adapter:	Model:JHD-AP030U-120250-AS Input:100-240V~50/60Hz 1.0A Output:12V,2500mA
Date of Received:	May 15, 2024
Temperature Range:	0°C ~ +45°C

Characteristics	Description
Product:	Home Server
Model Number:	U130121
Sample Number:	2#
IEEE 802.11 WLAN Mode Supported:	802.11b 802.11g 802.11n(20MHz channel bandwidth) 802.11n(40MHz channel bandwidth)
Modulation:	DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n;
Operating Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20); 2422-2452MHz for 802.11n(HT40);
Number of Channels:	11 channels for 802.11b/g/n(HT20); 7 Channels for 802.11n(HT40);
Transmit Power Max:	15.32 dBm
Antenna Type:	FPC Antenna
Antenna Gain:	Antenna 1: 2.99 dBi Antenna 2: 2.99 dBi
Power Supply:	AC 120V/60Hz
Power Supply:	DC 12V from Adapter
Adapter:	Model:JHD-AP030U-120250-AS Input:100-240V~50/60Hz 1.0A Output:12V,2500mA
Temperature Range:	0°C ~ +45°C

Characteristics	Description
Product:	Home Server
Model Number:	U130121
Sample Number:	2#
Wifi Type:	Wifi 5G with 5150MHz-5250MHz Band Wifi 5G with 5250MHz-5350MHz Band Wifi 5G with 5470MHz-5725MHz Band Wifi 5G with 5725MHz-5850MHz Band
WLAN Supported:	802.11a/n/ac
Data Rate :	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: MCS0-MCS15 802.11ac: MCS0-MCS9
Modulation:	OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11ac
Frequency Range:	UNII-1: 5150MHz-5250MHz Band 5180-5240MHz for 802.11a/n(HT20)/ac(VHT20) 5190-5230MHz for 802.11n(HT40)/ac(VHT40) 5210MHz for 802.11ac(VHT80)
	UNII-2A: 5250MHz-5350MHz Band 5260-5320MHz for 802.11a/n(HT20)/ac(VHT20) 5270-5310MHz for 802.11n(HT40)/ac(VHT40) 5290MHz for 802.11ac(VHT80) 5250MHz for 802.11ac(VHT160)
	UNII-2C: 5470MHz-5725MHz Band 5500-5700MHz for 802.11a/n(HT20)/ac(VHT20) 5510-5670MHz for 802.11n(HT40)/ac(VHT40) 5530-5610MHz for 802.11ac(VHT80) 5570MHz for 802.11ac(VHT160)
	UNII-3 with 5725MHz-5850MHz Band 5745-5825MHz for 802.11a/n(HT20)/ac(VHT20) 5755-5795MHz for 802.11n(HT40)/ac(VHT40) 5775MHz for 802.11ac(VHT80);
TPC Function:	Not Applicable
Antenna Port:	☒ Antenna port 1 ☒ Antenna port 2
Antenna Type:	ANT 1: FPC Antenna ANT 2: FPC Antenna
Antenna Gain:	Ant1:0.98 dBi, Ant2:0.98 dBi
Transmit Power:	UNII-1 Band: 16.56 dBm UNII-2A Band: 16.56 dBm UNII-2C Band: 16.31 dBm UNII-3 Band: 16.29 dBm
Test Voltage:	AC 120V/60Hz

Power Supply:	DC 12V from Adapter
Adapter:	Model: JHD-AP030U-120250-AS Input: 100-240V~50/60Hz 1.0A Output: 12V, 2500mA
Date of Received:	July 15, 2024
Temperature Range:	0°C ~ +45°C
Note: 1. For more details, please refer to the User's manual of the EUT.	

11.2 Measurement Result

Below BT and WIFI mode can transmit simultaneously.

Mode	Max Conducted Power (dBm)	Antenna gain (dBi)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
BLE	2.56	2.99	1.99	0.00071	1
BT	6.71	2.99	1.99	0.00186	1
2.4G WIFI	15.32	2.99	1.99	0.01348	1
5G WIFI	16.56	0.98	1.25	0.01794	1

Max RF Exposure evaluation.

BT (mW/cm ²)	5G WIFI (mW/cm ²)	Summation of Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
0.00186	0.01794	0.0198	1

Note: All the modes are tested, only the worst data are described in the table.

----- The End -----