

RF Exposure Evaluation declaration

Product Name : Fanless Medical Grade Box PC
Model No. : xxxMEDPC-6200xxxxxxxxxxx (The x
can be 0 to 9 , a to z , A to Z ,”-“, or
blank for marketing purpose)

Applicant : ONYX HEALTHCARE INC.

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The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Fanless Medical Grade Box PC
Model No.	xxxMEDPC-6200xxxxxxxxxx (The x can be 0 to 9 , a to z , A to Z ,”-“ , or blank for marketing purpose)
Trade Name	onyx
FCC ID.	RZ5-MEDPC-6200-A
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW, 2422-2452MHz for 802.11n-40BW BT/BLE: 2402 – 2480MHz 802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz, 5745-5825MHz 802.11n-40MHz: 5190-5310, 5510-5670MHz, 5755-5795MHz
Number of Channels	802.11b/g/n-20MHz: 11, n-40MHz: 7 BT: 79, BLE: 40CH 802.11a/n-20MHz: 24; 802.11n-40MHz: 11
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11a/n: up to 150Mbps
Channel separation	802.11b/g/n: 5 MHz BT: 1M, BLE: 2M 802.11a/n-20MHz:20MHz 802.11n-40MHz:40MHz
Type of Modulation	802.11b:DSSS (DBPSK, DQPSK, CCK) 802.11a/g/n:OFDM (BPSK, QPSK, 16QAM, 64QAM) FHSS: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps)
Antenna Type	Dipole
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”

1.2. Antenna List :

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	ARISTOTLE	RFA-25-L14M3-B32	Dipole	2.5dBi for 2.4GHz band (WLAN and BT)
				3.5dBi for 5GHz band

2. RF Exposure Evaluation

2.1. Limits

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 (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	30
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

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 = gain of antenna in linear scale

π = 3.1416

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

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

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0

2.2. Test Result of RF Exposure Evaluation

Product : Fanless Medical Grade Box PC
 Test Item : RF Exposure Evaluation
 Test Site : N/A

2.4GHz WLAN and BLE

Operation Frequency	2412MHz-2462MHz 2422MHz-2452MHz 2402MHz-2480MHz
Maximum conducted output power	23.57dBm
Antenna gain	2.5dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
227.51	0.08

Power density is lower than the limit (1 mW/cm²).

2.4GHz BT

Operation Frequency	2402-2480MHz
Maximum conducted output power	7.8dBm
Antenna gain	2.5dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
6.025	0.0021

Power density is lower than the limit (1 mW/cm²).

5GHz WLAN

Operation Frequency	802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz, 5745-5825MHz 802.11n-40MHz: 5190-5310, 5510-5670MHz, 5755-5795MHz
Maximum conducted output power	20.2dBm
Antenna gain	3.5dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
104.71	0.046

Power density is lower than the limit (1 mW/cm²).

2.3. Calculations for Multi-Transmitter

Mode	Exposure Calculations	result	Limit	Pass/Fail
WLAN	0.08	0.0821	1	Pass
BT	0.0021			