RF Exposure Evaluation declaration

Product Name : Intelligent Robot

Model No. : Zenbo

FCC ID : MSQ-ZENBO

Applicant : ASUSTeK COMPUTER INC.

Address : 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

Date of Receipt : Aug. 15, 2016

Date of Declaration : Apr. 26, 2017

Report No. : 1740337R-RFUSP05V00

Issued Date: Apr. 26, 2017
Report No.: 1740337R-RFUSP05V00

Product Name	Intelligent Robot
Applicant	ASUSTeK COMPUTER INC.
Address	4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan
Manufacturer	ASUSTeK COMPUTER INC.
Model No.	Zenbo
FCC ID.	MSQ-ZENBO
EUT Rated Voltage	DC 14.4V (Power by Battery)
EUT Test Voltage	AC 120V/60Hz
Trade Name	ASUS
Applicable Standard	FCC 47 CFR 1.1310
Test Result	Complied

Documented By : Genie Chang

(Senior Adm. Specialist / Genie Chang)

Tested By : Yulin Chen

(Engineer / Yulin Chen)

Approved By :

(Director / Vincent Lin)

1. RF Exposure Evaluation

1.1. 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	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4*pi*r^2)$

Where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

Pd id the limit of MPE, 1 mW/cm^2. 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.

1.2. Test Procedure

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

The temperature and related humidity: 18℃ and 78％ RH.

1.3. Test Result of RF Exposure Evaluation

Product : Intelligent Robot
Test Item : RF Exposure Evaluation
Test Site : No.3 OATS

For 2.4GHz

Operation Frequency	2412-2462MHz,2402 – 2480MHz
Maximum Conducted output power	22.61dBm
Antenna gain	0.59dBi for 2.4 GHz

Output Power Into Antenna & RF Exposure Evaluation Distance:

Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
182.3895702	0.041565

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

For 5GHz

Operation Frequency	5180-5240MHz, 5260-5320MHz,5500-5700MHz, 5745-5825MHz, 5190-5230MHz, 5270-5310MHz,5510-5670MHz, 5755-5795MHz 5720MHz, 5710MHz, 5210MHz, 5290MHz, 5530-5690MHz, 5775MHz
Maximum Conducted output power	15.37dBm
Antenna gain	2.51dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
34.43499308	0.012210

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