

RF Exposure Evaluation declaration

Product Name : ROS Home Center

Model No. : ROS-2000

FCC ID : BJM-ROS2000

Applicant : TATUNG CO.

Address : 22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.

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Report No. : 088191R-RFUSP05V01

The declaration results relate only to the samples calculated.

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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: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

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.

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°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

Product : ROS Home Center
 Test Item : RF Exposure Evaluation
 Test Site : CTR1

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.15dBi(5GHz band) in logarithm scale.

802.11a (5260~5320MHz)

Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	5260.00	40.3645	0.010465
3	5300.00	42.0727	0.010908
4	5320.00	42.5598	0.011034

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11a (5500~5700MHz)

Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
05	5500.00	42.8549	0.011110
10	5600.00	40.4576	0.010489
15	5700.00	43.5512	0.011291

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 20BW (5260~5320MHz) -Antenna A
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	5260.00	20.5116	0.005318
3	5300.00	20.0909	0.005209
5	5320.00	20.6063	0.005342

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 20BW (5500~5700MHz) -Antenna A
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
05	5500.00	20.7014	0.005367
10	5600.00	20.1372	0.005221
15	5700.00	20.3236	0.005269

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 20BW (5260~5320MHz) -Antenna B
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
01	5260.00	20.6063	0.005342
03	5300.00	20.3704	0.005281
04	5320.00	20.7014	0.005367

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 20BW (5500~5700MHz) -Antenna B
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
05	5500.00	20.7970	0.005392
10	5600.00	20.2768	0.005257
15	5700.00	20.4644	0.005306

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 20BW (5260~5320MHz) -Antenna A+B
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
01	5260.00	41.1150	0.010659
03	5300.00	40.4576	0.010489
04	5320.00	41.3048	0.010709

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 20BW (5500~5700MHz) -Antenna A+B
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
05	5500.00	41.4954	0.010758
10	5600.00	40.4576	0.010489
15	5700.00	40.8319	0.010586

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 40BW (5270~5310MHz) - Antenna A
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
01	5270.00	20.6063	0.005342
02	5310.00	20.7014	0.005367

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 40BW (5510~5670MHz) - Antenna A
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
03	5510.00	20.4644	0.005306
05	5590.00	20.1837	0.005233
07	5670.00	20.5589	0.005330

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 40BW (5270~5310MHz) - Antenna B
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
01	5270.00	20.7491	0.005379
02	5310.00	20.9411	0.005429

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 40BW (5510~5670MHz) - Antenna B
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
03	5510.00	20.6063	0.005342
05	5590.00	20.3704	0.005281
07	5670.00	20.8449	0.005404

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 40BW (5270~5310MHz) - Antenna A+B
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
01	5270.00	41.4000	0.010733
02	5310.00	41.6869	0.010808

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

802.11n – 40BW (5510~5670MHz) - Antenna A+B
Output Power Into Antenna & RF Exposure Evaluation Distance (1.15dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
03	5510.00	41.1150	0.010659
05	5590.00	40.5509	0.010513
07	5670.00	41.4000	0.010733

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.