RF Exposure Evaluation declaration

Product Name	Wireless Gateway
Model No.	WG-110
FCC ID	XBTWG-110

Applicant	United Integrated Services Co.,Ltd
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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: $Pd = (Pout*G)/(4*pi*r^2)$

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 : Wireless Gateway
Test Item : RF Exposure Evaluation
Test Site : No.3 OATS

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.33 dBi in logarithm scale.

802.11b

Output Power Into Antenna & RF Exposure Evaluation Distance (2.33 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
1	2412.00	61.8016	0.021025
6	2437.00	63.8263	0.021714
11	2462.00	61.5177	0.020928

802.11g

Output Power Into Antenna & RF Exposure Evaluation Distance (2.33 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
1	2412.00	108.3927	0.036875
6	2437.00	107.3989	0.036537
11	2462.00	115.8777	0.039421

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

1.4.   Test Result of RF Exposure Evaluation (Collocation Mode)

For collocation mode is simulation when EUT insert WWAN card and use maximum output power for this RF Exposure Evaluation.

WWAN

Output Power Into Antenna & RF Exposure Evaluation Distance :

Frequency band	ERP (mW)	Power Density at R = 20 cm (mW/cm2)	Limit (f/1500mW/cm2)
850	1500	0.298416	0.5666

Frequency band	EIRP (mW)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)
1900	2000	0.397888	1

Result of Collocation Evaluation :

Frequency band	(Pd of WWAN)/(Pd WWAN limit) + (Pd of WLAN)/(Pd WLAN limit)	Limit
850(WWAN)+2412(802.11g)	(0.298416/0.5666) + (0.036875/1) = 0.563553	<1
1900(WWAN)+2412(802.11g)	(0.397888/1) + (0.036875/1) = 0.434763	<1