RF Exposure Evaluation Declaration

FCC ID:	2AC9MDSL100FNT1V2
APPLICANT:	Wuxi Mitrastar Technology Co., Ltd

Application Type:	Certification
Product:	Modem BHS MINI Mitrastar
Model No.:	DSL-100FN-T1 v2
Trademark:	MitraStar
FCC Classification:	Digital Transmission System (DTS)

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Revision History

Report No.	Version	Description	Issue Date
1504RSU03002	Rev. 01	Initial report	05-18-2015

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name	Modem BHS MINI Mitrastar
Model No.	DSL-100FN-T1 v2
Frequency Range	802.11b/g/n-HT20: 2412 ~ 2462 MHz 802.11n-HT40: 2422 ~ 2452 MHz
Maximum Output Power	802.11b: 19.49dBm 802.11g: 17.89dBm 802.11n-HT20: 20.36dBm 802.11n-HT40: 19.73dBm
Type of Modulation	802.11b: DSSS 802.11g/n: OFDM

1.2. Antenna Description

Antenna Type	Frequency Band (GHz)	T_X Paths	Max Peak Gain (dBi)	Directional Gain (dBi)
PCB Antenna	2.4	2	Ant 0: 3.2 Ant 1: 3.1	3.2

Note: Directional gain = 10 log[($10^{G1/10}$ + $10^{G2/10}$ + … + $10^{GN/10}$)/N_{ANT}] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

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

f= Frequency in MHz

Calculation 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 is the limit of MPE, $1mW/cm^2$. 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.

2.2. Test Result of RF Exposure Evaluation

Product	Modem BHS MINI Mitrastar
Test Item	RF Exposure Evaluation

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.2dBi for 2.4GHz in logarithm scale.

Test Mode	Frequency Band (MHz)	Maximum Average Output Power (dBm)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)
802.11b	2412 ~ 2462	19.49	0.0370	1
802.11g	2412 ~ 2462	17.89	0.0256	1
802.11n-HT20	2412 ~ 2462	20.36	0.0452	1
802.11n-HT40	2422 ~ 2452	19.73	0.0391	1

CONCULISON:

The WLAN 2.4GHz Band can transmit simultaneously. Therefore, the Max Power Density at R (20 cm) = 0.0452mW/cm^2 < 1mW/cm^2.

So the EUT complies with the requirement.

The End