REPORT ON

RF Exposure Estimation of the Beijing Xinwei Telecom Technology Inc.,
Broadband Wireless desktop terminal McWiLL CPE722

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RF Exposure Measurement

1 Introduction

This document was prepared to analyze the expected level of Non-Ionizing Electromagnetic Radiation("NIER") caused by the radio transmission equipment Broadband Wireless desktop terminal McWiLL CPE722 belonging to Xinwei Telecom Technology Inc.

2 Limits and Guidelines on Maximum Permissible Exposure(MPE)

Based on Section Part 1.1037(b) requirement for environmental impact of human exposure to radio-frequency(RF) radiation, following limits table specified in Part 1.1310 was used to evaluate the MPE for the equipment Broadband Wireless desktop terminal McWiLL CPE722 belonging to Xinwei Telecom Technology Inc.

Limits for Maximum Permissible Exposure(MPE)

Frequency range(MHz)	Electric field strength(V/m)	Magnetic field strength(A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1824/f	4.89/f	*($900/f^2$)	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposures				
0.3-1.34	614	1.63	*(100)	30
1.34-30	1824/f	4.89/f	*($180/f^2$)	30
30-300	27.5	0.163	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz
*Plane-wave equivalent power density
NOTE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
NOTE 2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

3 Calculation of Maximum Permissible Exposure for McWiLL CPE722

Below method describes a theoretical approach to calculate the power density based on a typical configuration of the McWiLL CPE722. In accordance with 47CFR FCC Part 2.1091, the product was defined as a mobile device where a distance of 20cm normally can be maintained between the user and product.

3.1 Typical Configuration of the McWiLL CPE722

The Broadband Wireless desktop terminal McWiLL CPE722 supports frequency band of 698MHz-746MHz with one Ethernet interface connected to terminal. It supports QPSK, 8PSK, QAM16, QAM64 modulation over a bandwidth of 1 MHz.

3.2 Antennas and Technical Description of McWiLL CPE722

	Modulation Type	**CH Bottom (699MHz)**	**CH Middle (721MHz)**	**CH Top (745MHz)**
Max. output power at antenna connector(dBm)	QPSK	18.71	20.33	21.18
	8PSK	19.88	19.56	21.34
	QAM16	18.06	20.87	21.51
	QAM64	9.12	13.27	-2.35
Transmitter frequency band	698 MHz -746MHz			
Number of antenna ports	1			
External antenna gain	2.5dBi			

3.3 Estimation of Maximum Permissible Exposure

Assuming the worst case of an isotropic radiator, the power density for given radiated power and distance can be calculated from following formula:

$S= P*G/(4 \pi r^2)$

Whereas:
S= Power density in mW/cm^2
P= input power to the antenna in mW
G=antenna gain relative to an isotropic antenna
r=distance from the antenna to the point of investigation

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance with the antenna was included in the user manual from manufacturer.

3.4 Calculation result:

For Modulation Type QPSK

Channel Frequency (MHz)	P (dBm)	Power density S (mW/cm^2)	Limit of Power density S (mW/cm^2)
699	18.71	0.026	0.466
721	20.33	0.038	0.480
745	21.18	0.046	0.496

For Modulation Type 8PSK

Channel Frequency (MHz)	P (dBm)	Power density S (mW/cm^2)	Limit of Power density S (mW/cm^2)
699	19.88	0.034	0.466
721	19.56	0.032	0.480
745	21.34	0.048	0.496

For Modulation Type QAM16

Channel Frequency (MHz)	P (dBm)	Power density S (mW/cm^2)	Limit of Power density S (mW/cm^2)
699	18.06	0.022	0.466
721	20.87	0.043	0.480
745	21.51	0.050	0.496

For Modulation Type QAM64

Channel Frequency (MHz)	P (dBm)	Power density S (mW/cm^2)	Limit of Power density S (mW/cm^2)
699	9.12	0.003	0.466
721	13.27	0.007	0.480
745	-2.35	0.0002	0.496

As shown in above tables, the power density of McWiLL CEP722 on operating channel under different modulation type is well below the limits.

3.5 Uncertainty of Calculation

Above calculations do not consider possible reflections from the ground, neighboring buildings or other obstacles. Furthermore above calculations are assuming that the transceiver is operating at full power.