Test Report for USA Type Approval (FCC)
for
Mainstreet Broadband Wireless (Release 1.1)

Customer Premises Unit (CPE)

28GHz

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1. ***Introduction***

1.1 Objective

This test report is to show compliance according to the FCC Part 101 requirements and FCC Part 2 methods for the Customer Premise Unit (CPE) Mainstreet Broadband Wireless system Release 1.1(LMDS 28GHz 36170) to achieve certification in the United States according to the radio standards of the Federal Communication Commission (FCC).

1.2 Scope

The test results are documented according to the test methods as mentioned in the FCC standards, and is to be submitted with the FCC Form 731 "Application for Equipment Authorization. This report is to show compliance for the 27.5 to 28.35GHz band only. Due to a non compliance mentioned in issue V1.0 , the system has been retested with a new NIU to reduce the spurious, therefore, this report has been updated to show compliance according to the 'Unwanted Emissions'.

1.3 General

The frequency band that is allocated for 28GHz in the USA is:

27.500 GHz to 28.350 GHz	Maximum authorized bandwidth	850MHz
29.100 GHz to 29.250 GHz		150MHz
31.000GHz to 31.075 GHz		75MHz
31.075GHz to 31.225 GHz		150MHz
31.225GHz to 31.300 GHz		75MHz

Note: the Commission reserves the right to issue a license for less than the maximum bandwidth if it appears that a lesser bandwidth would be sufficient to support an applicant's intended communications. Each assignment will be made on a service area basis, and the assigned spectrum may be subdivided as desired by the licensee.

2. ***Reference***

• FCC (Type Approval)	47 CFR CH. 1 Part 101 " Fixed Microwave Services "
• FCC (Type Approval)	47 CFR CH.1 Part 2 " Frequency Allocations and Radio Treaty Matters; General Rules and Regulations "
• FCC (EMC)	47 CFR CH. 1 Part 15 Subpart A " Radio Frequency Devices "
• TIA/EIA (Type Approval)	TSB10-F " Interference Criteria for Microwave Systems "

3. ***Equipment Requirements***

	QTY	Product
• BTS	1	36170 Peripheral Shelf
	1	Control Card Interconnect Panel
	1	System Synchronization Unit (Model 2)
	2	Switching Hub Cards (Model 2)
	2	Control Cards (Model 2)
	6	ATM Radio Interface Card (ARIC)
	1	OC-3/STM1 Card
	2	Transmitters
	2	Receivers
	1	Combiner / Splitter
	2	Bias-Tee
• CPE	2	Transceivers from M/A Com
	2	Transceivers from Millitech
	2	T1 Circuit Emulation NIU
	1	Ethernet NIU

4. ***Test Equipment***

a) Spectrum Analyzer (40GHz)
b) Power Meter (high power sensor 40GHz)
c) DC Power supply (variable 48Vdc +/- 15%)
d) Environmental Chamber (-30°C to +50°C)
e) OATS (30MHz to 40GHz)

5. ***Test Results***

The test results were performed by different labs and/or other suppliers and complied together in this test report. The measurements were taken according to the instructions mentioned in the FCC Part 2 and Part 101. The section 5.1.2 'Unwanted Emissions' was the only section that has been changed in this issue V1.1.

5.1 Type Approval

5.1.1 Output Power:

The output power was adjusted to the maximum level to display the worst conditions.

Unit under Test	Frequency Band (MHz)	Maximum Output Power at the Antenna Port
Millitech CPE Transceiver	27650 to 28350	+19dBm maximum (1 carriers)

5.1.2 Unwanted Emissions :

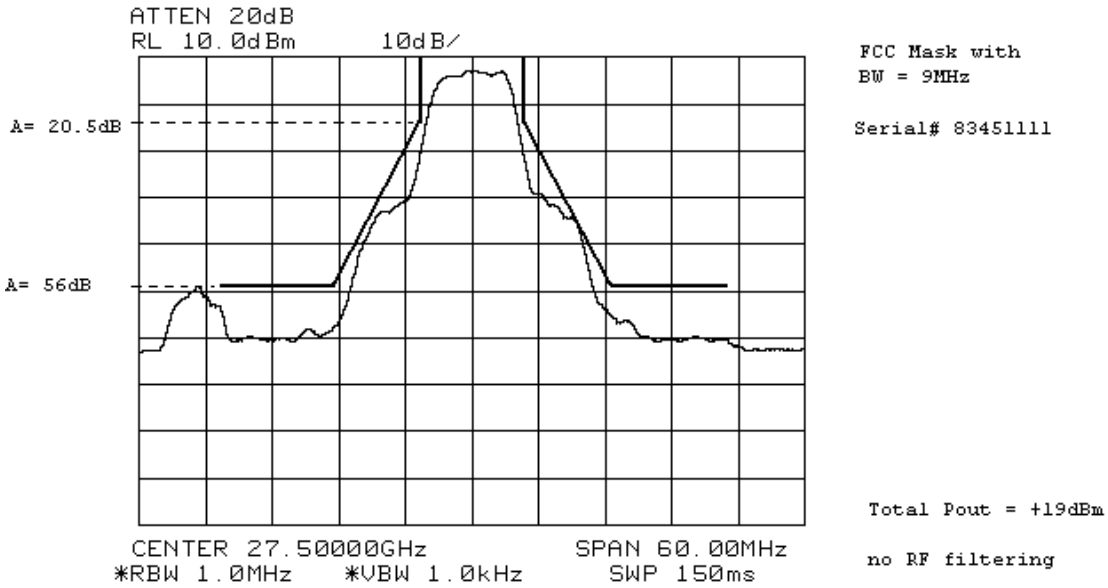
Note!

Newbridge Networks Corporation has been communicating with the FCC based on the subject of the spectrum mask limits and that the following requirements may be different within the future for the 28GHz band. Today the authorized bandwidth is BW=850MHz, but it is understood that this may change in the near future and that the product may need modifications to meet the new limits.
At the present time the mask has been measured and a mask with an authorized bandwidth of 850MHz has been used. The necessary bandwidth is 9MHz.
Which ever direction the FCC takes , Newbridge Networks Corporation will take the necessary action to meet the new standards.

The system has introduced a new NIU that has improved the spurious levels at the TX output, which is well below the spectrum mask requirements.

Spectrum Mask (CPE)

The measurements were taken, operating with a NIU and BTS to be able to have the CPE OTRU transmitting. If the downstream is not synchronized, the upstream will mute the CPE TX output.



Newbridge Networks Corporation
Confidential Information

c) Spurious (BTS)

Note: The upstream, which consists of the NIU and CPE radio, were measured with a new NIU and the spurious levels were well below the FCC requirements.

The spurious levels are guaranteed to be below the FCC limits when operating at the output power rating of +19dBm.
The spurious levels will not exceed a level of -30dBm for the transmitter and receiver of the CPE. These levels are a requirement that the suppliers have guaranteed to Newbridge Networks Corporation.

5.1.3 Frequency Stability:

The supplier for the CPE radio has confirmed of performing the measurements according to the temperature range and guarantees that the frequency will stay within +/- 20 ppm . To achieve the specifications of the FCC, an algorithm has been designed that will correct the frequency when the system is operating in a closed loop; upstream and downstream fully functional (synchronized). In normal operation with the BTS, the CPE transmitter will only transmit when the system is operating in a closed loop. This algorithm has been designed to achieve the +/-10ppm limits.

5.1.4 Interference Protection

5.2 Type Examination

The equipment was also tested according to the FCC Part 15 Subpart B (or Bellcore) standards.

See appendices for report of Customer Premise Unit (NIU) and OTR meet Class B limits.

7.0 ***Declaration of Compliance***

7.1 Type Approval

" This equipment has been tested in accordance with the requirements contained in the appropriate Commission regulations. To the best of my knowledge, these tests were performed using measurement procedures consistent with industry or Commission standards and demonstrate that the equipment will comply with the appropriate standards. .Each unit manufactured, imported or marketed, as defined in the Commission's regulations, will conform within the variations that can be expected due to quantity production and testing on a statistical basis. I further certify that some of the necessary measurements were made by Newbridge Networks Corporation, 600 March Road, Kanata, Ontario, K2K2E6."

7.2 Type Examination

All digital apparatus, which is newly manufactured or imported into the USA, need to be self -certified according to the FCC Part 15 Subpart B standard. A record of the measurements and results, showing the date that the measurements were completed, shall be retained by the manufacturer for a period of at least 5 years and made available for examination on the request of the Commission.

Appendices

Appendix I

The following statement is placed on the device :

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.