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## **EXHIBIT 2**

# **TEST REPORT SUMMARY**

**Applicant: Nortel Networks**

**For Original Equipment  
Application on:**

**FCC: AB6NT1900MFRM3**

**IC: 332D-1G9MFRM3**

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NORTEL CDMA BTS Development

# MFRM3 G Block Test Report Summary Class II Permissive Change Authorization

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FCC Tx ID: AB6NT1900MFRM3  
IC ID: 332D-1G9MFRM3

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# 1 Introduction

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This test report is submitted in accordance with the FCC Rules and Regulations, Part 2, Subpart J, Sections 2.1046 through 2.1057 for equipment authorization of Nortel Networks' CDMA 1900 MHz Multi-carrier Flexible Radio Module 3 (MFRM3). The 1900 MHz MFRM3 radio is intended for use in the Domestic Public Cellular Radio Telecommunications Service and is designed in accordance with the following standards:

- *CFR 47, Part 24, Subpart E, Broadband Personal Communications Service [1]*
- *CFR 47, Part 2, Subpart J, Equipment Authorization Procedures – Equipment Authorization [2]*

## 2 Summary

Table 1 summarizes the measurement results for the CDMA 1900MHz MFRM3 radio

**Table 1: Test Results Summary**

FCC Measurement Specification	FCC Limit Specification	Description	Results	Test(s) Conducted by	Remarks
2.1046	24.232	RF Output Power	Provided	Nortel	See Exhibit 2A
2.1047		Modulation Characteristics	Not Applicable		
2.1049		Occupied Bandwidth	OBW=1.2717 MHz (one carrier) OBW=2.4985 MHz (two carriers) OBW=3.7140 MHz (three carriers)	Nortel	See Exhibit 2A
2.1051, 2.1057	24.238	Spurious Emission at Antenna Terminals	Provided	Nortel	See Exhibit 2A
2.1055	24.238	Frequency Stability	Compliant	Nortel	See Exhibit 2A

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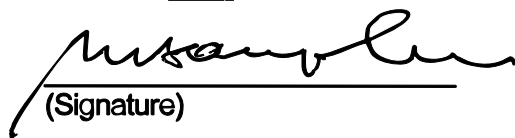
## 3 Engineering Declaration

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The CDMA 1900 MHz MFRM3 radio has been tested in accordance with the requirements contained in the Federal Communication Rules and Regulations Part 2 and 24.

To the best of my knowledge, these tests were performed in accordance with good engineering practices using measurement procedures consistent with industry or commission standards or previous Commission correspondence or guidance and demonstrate that this equipment complies with the appropriate standards. All tests performed by Nortel were conducted on a representative sample of the equipment for which certification is sought.

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## 4. Certification Application Requirements

### 4.1 Name of Applicant

The applicant is Nortel Networks Inc.

### 4.2 Identification of Equipment

The equipment in this application for type acceptance is the Nortel's CDMA 1900 MHz MFRM3. The 1900 MHz MFRM3 is marketed under the model 1900 MHz MFRM3. The FCC ID number is AB6NT1900MFRM3

The IC ID number is 332D-1G9MFRM3

### 4.3 Quantity Production

The 1900 MHz MFRM3 will be produced in quantity.

### 4.4 Technical Description

See Exhibit 3.

### 4.5 Type of Emissions

The 1900MHz MFRM3 radio is designed to operate in digital mode to support up to 3 carriers. The emission designator for IS97 carrier is 1M25F9W. The emission designator for IS864 carrier is 1M25D9W. Tests were conducted with 1, 2, or 3 carrier(s). The emission designators were calculated based on requirements of FCC Rule Part 2, Subpart C - Emissions, section 2.201 and Section 2.202.

### 4.6 Frequency Range

The 1900 MHz MFRM3 operates in the 1900 MHz PCS band where the operating frequency ranges are 1850 – 1915 MHz for the receiver and 1930 – 1995 MHz for the transmitter. The 1900MHz MFRM3 meets all FCC requirements within the valid channels of this frequency range.

### 4.7 Range of Operating Power

The 1900 MHz VBTS 3231 range of operating RF power is 0 dBm to 48.90 dBm . The maximum RF power output is 48.90 dBm..

### 4.8 Complete Circuit Diagrams

The Tx chain of the 1900 MHz MFRM3 radio system for certification is made up of the radio, PA and Triplexer and filter (an OEM equipment). Exhibit 8 contains the schematics of circuit cards inside the 1900MHz MFRM3 and Exhibit 9 contains the parts lists of the circuit cards inside 1900MHz MFRM3.

### 4.9 Tune-up Procedure

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The tune-up tests will be performed as part of the factory testing on the 1900MHz MFRM3. This procedure includes power output levels, spurious emissions, and occupied bandwidth. There are no end-user adjustments that will have any effect on these settings. No tune-up testing is required in the field.

## 4.10 Circuit Description for Frequency Determining and Stabilizing

The Global Positioning Satellite Timing Card (GPSTC) in the base station is the primary clock source in the system. It consists of two outputs:

EVEN\_SEC Clock and,  
SYS\_CLK (at 8fc or 9.8304 MHz)

In addition, the GPSTC has a 10 MHz reference output that can be used to synchronize external measurement equipment during system testing.

The GPSTC distributes the primary clock signals directly to control board which in-turn distribute the clock signals to the radio via the high speed serial link.

The GPSTC has a frequency stability of better than 1.0 part per billion.

## 4.11 Circuit Description for Suppression of Spurious Radiation

The Tx band pass filter in the Triplexer provides out of band emission rejection and permits only signals in the Tx band to the antenna for emission. The close inband spurs are being taken care of by the BBPD (Base Band Pre-Distortion) circuitry in the 2100MHz vBTS3231.

## 4.12 Circuit Description for Limiting Modulation

This system employs digital modulation techniques producing CDMA forward and reverse channel air interfaces which are compatible with IS 97, and IS864 technical standards.

## 5 Test Methods and Test results

### 5.1 RF Power Output

The maximum measured RF output power for one carrier was 48.90 dBm.  
 The maximum measured RF output power for two carriers was 48.85 dBm.  
 The maximum measured RF output power for three carriers was 48.87 dBm.

### 5.2 Occupied Bandwidth

The maximum measured occupied bandwidth for one carrier was 1.2735 MHz.  
 The maximum measured occupied bandwidth for two carriers was 2.4985 MHz.  
 The maximum measured occupied bandwidth for three carriers was 3.7140 MHz.

### 5.3 Frequency Stability

The maximum frequency deviation over the temperature range  $-40$  deg. C to  $50$  deg. C was 5.64 Hz (2.82 ppb) and over 85% to 115% of the nominal voltages was 4.59 Hz (2.30 ppb). which is in the part 24.235 limits.

### 5.4 Spurious Emissions at Antenna Terminals

#### 5.4.1 Test results for IS-95

**Table 2. Spurious Emissions at the 1900 MFRM3 Ant. Port - One Carrier**

Frequency	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
1989 to 1990 MHz (lower adjacent 1 MHz); Channel 1225	-26.53	13.53
1995 to 1996 MHz (upper adjacent 1 MHz); Channel 1275	--27.11	14.11
9 kHz to lower adjacent 1MHz (RBW=1MHz)	-22.31	9.31

Upper adjacent 1MHz to 5 GHz (RBW=1MHz)	-21.88	8.88
5 GHz to 22 GHz (RBW=1MHz)	-31.48	18.48

**Table 3. Spurious Emissions at the 1900 MHz MFRM 3 Ant. Port - Two Carriers**

Frequency (Band)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
1989 to 1990 MHz (lower adjacent 1 MHz); Channel 1225, 1250	-21.26	8.26
1995 to 1996 MHz (upper adjacent 1 MHz); Channel 850, 875	-22.74	9.74
9 kHz to lower adjacent 1MHz (RBW=1MHz)	-17.87	4.87
Upper adjacent 1MHz to 5 GHz (RBW=1MHz)	-16.04	3.04
5 GHz to 22 GHz (RBW=1MHz)	-31.63	18.63

**Table 4. Spurious Emissions at the 1900 MHz MFRM 3 Ant. Port - Three Carriers**

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
1989 to 1990 MHz (lower adjacent 1 MHz); Channel 1225, 1250, 1275	-22.38	9.38
1995 to 1996 MHz (upper adjacent 1 MHz); Channel 825, 850, 875	-20.99	7.99
9 kHz to lower adjacent 1MHz (RBW=1MHz)	-18.26	5.26

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Upper adjacent 1MHz to 5 GHz (RBW=1MHz)	-17.12	4.12
5 GHz to 22 GHz (RBW=1MHz)	-31.45	18.45