

# **EXHIBIT 2**

## **Test Report Summary**

**Applicant: Nortel Networks**

**For Original Equipment  
Certification on:**

**AB6NT800SFRM**



---

## Test Report Summary for FCC Class II Permissive Change Equipment Authorization

**FCC ID : AB6NT800SFRM Multi-carrier Flexible Radio Module**

<b>Document:</b>	TRS_AB6NT800SFRM
<b>Stream:</b>	00
<b>Issue:</b>	01
<b>Issue Date:</b>	Nov 27, 2002
<b>Security Status:</b>	Nortel Networks Confidential
<b>Author:</b>	Thomas Wong

---

© 2002 Nortel Networks Limited

### **Disclaimer**

The master of this document is stored on an electronic database and “write protected”. The protection can be altered by authorized persons only. Viewing of the master document electronically ensures access to the current issue. Any hardcopies must be regarded as uncontrolled copies.

### **Security Warning**

The information disclosed herein is proprietary to Nortel Networks and not to be used by or disclosed by unauthorized persons without the written consent of Nortel Networks. The recipient of this document shall respect the security status of the information.

---

# 1 Introduction

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 800 MHz Single-carrier Flexible Radio Module (SFRM). The 800 MHz\_SFRM is intended for use in the Domestic Public Cellular Radio Telecommunications Service and is designed in accordance with the following standards:

- *CFR 47, Part 22, Subpart H, Subpart H, Cellular Radiotelephone Service[1]*
- *CFR 47, Part 2, Subpart J, Equipment Authorization Procedures - Equipment Authorization[2]*
- *CFR 47, Part 24, Subpart E, Broadband Personal Communications Service [3]*

## 1. Test Result Summary

Table 1 summarizes the measurement results for the CDMA 800 MHz SFRM.

**Table 1: Test Results Summary**


FCC Measurement Specification	FCC Limit Specification	Description	Results	Test(s) Conducted by	Remarks
2.1046	22.913	RF Output Power	Compliant	Nortel Networks	See Exhibit 2A
2.1047	22.901, 22.915	Modulation Characteristics	Not Applicable		
2.1049		Occupied Bandwidth	OBW = 1.263 MHz	Nortel Networks	See Exhibit 2A
2.1051, 2.1057	22.901, 24.238	Spurious Emission at Antenna Terminals	Compliant	Nortel Networks	See Exhibit 2A
2.1053, 2.1057	22.901, 24.238	Field Strength of Spurious Radiation	Compliant	Sanmina Canada ULC	See Exhibit 2B
2.1055	22.355	Frequency Stability	Compliant	Nortel Networks	See Exhibit 2A

## 2. Engineering Declaration

The CDMA 800 MHz Single-carrier Flexible Radio has been tested in accordance with the requirements contained in the Federal Communication Rules and Regulations Part 2, 22 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 (including tests performed by Sanmina Canada ULC) were conducted on a representative sample of the equipment for which type acceptance/certification is sought.

Report Prepared by

  
Signature

Thomas Wong  
Regulatory Prime  
Nortel Networks  
Calgary, Alberta

Nov 27, 2002

### 3. Type Acceptance Application Requirements

#### 3.1 Name of Applicant

The applicant is Nortel Networks Inc.

#### 3.2 Identification of Equipment

The equipment in this application for type acceptance is the Nortel's CDMA 800 MHz Single-carrier Flexible Radio Module (SFRM). The 800MHz SFRM is marketed under the model name 800MHz SFRM. The FCC ID number sought is AB6NT800SFRM.

#### 3.3 Quantity Production

The 800MHz SFRM will be produced in quantity.

#### 3.4 Type of Emissions

The 800MHz SFRM Assembly is designed to operate in digital mode. The emission type is F9W for CDMA mode. The emission designator is 1M25F9W for one CDMA channel. The emission designator were calculated based on requirements of FCC Rule Part 2, Subpart C - Emissions, section 2.201 and Section 2.202.

#### 3.5 Frequency Range

The 800 MHz SFRM operates in the 800 MHz cellular band where the operating frequency ranges are 824 – 849 MHz for the receiver and 869 - 894 MHz for the transmitter. The following table shows the valid CDMA channels within this band stated in IS97D.

Band	CDMA Channel Number	Transmitter Frequency Assignment for Base Station (MHz)	Valid CDMA Frequency Assignment
A''	991-1012	869.040-869.670	In-Valid
	1013-1023	869.700-870.000	Valid
A	1-311	870.030-879.330	Valid
	312-333	879.360-879.990	In-Valid
B	334-355	880.020-880.650	In-Valid
	356-644	880.680-889.320	Valid
	645-666	889.350-889.980	In-Valid
A'	667-688	890.010-890.640	In-Valid
	689-694	890.670-890.820	Valid
	695-716	890.850-891.480	In-Valid
B'	717-738	891.510-892.140	In-Valid
	739-777	892.170-893.310	Valid
	778-799	893.340-893.970	In-Valid

---

### **3.6 Range of Operating Power**

The 800 MHz SFRM range of operating RF power is 30 dBm to 43.06 dBm . The maximum RF power output is 43.06 dBm..

### **3.7 Complete Circuit Diagrams**

The RF chain of the 800 MHz SFRM is made up mainly of Nortel's TRM (Transmit/Receive Module), SCPA (Single Channel Power Amplifier) from Powerwave, and DPM (Duplexer Preselector Module). Exhibit 8 contains the schematics of the TRM and Exhibit 9 contains the parts lists of the TRM.

The OEM SCPA 800 MHz power amplifier is approved under FCC Tx ID E675JS0061.

### **3.8 Tune-up Procedure**

The tune-up tests will be performed as part of the factory testing on the SFRM. 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.

### **3.9 Circuit Description for Frequency Determining and Stabilizing**

The Global Positioning Satellite Timing Module (GPSTM) 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 GPSTM has a 10 MHz reference output that can be used to synchronize external measurement equipment during system testing.

The GPSTM distributes the primary clock signals directly to the Control Module (CM) and the CORE modules (see Exhibit 3) which in-turn distribute the clock signals to the digital modules and to the SFRM via the high speed optical link.

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

### **3.10 Circuit Description for Suppression of Spurious Radiation**

The Tx band pass filter in the DPM provides out of band emission rejection and permits only signals in the Tx band to the antenna for emission.

---

### **3.11 Circuit Description for Limiting Modulation**

This systems employs digital modulation techniques producing CDMA forward and reverse channel air interfaces which are compatible with IS 95A and IS 97A technical standards.

---

## **4. Test Method and Test Result**

### **4.1 Tests performed by Nortel Networks**

#### **RF Power Output**

The average maximum measured RF output power was 43.06 dBm.

#### **Occupied Bandwidth**

The average maximum measured occupied bandwidth was 1,263 KHz.

#### **Spurious Emissions at Antenna Terminals**

The minimum pass margin for spurious Emissions:

- 1 MHz upper and lower band edge measurements was 13.27 dB.
- 1 MHz to 10 GHz measurements was 15.17 dB.

#### **Frequency Stability**

The GPS module has a frequency stability of 0.8 ppb over the range of -5 °C to 70 °C.

Please refer to the Exhibit 2A for all test setups and results in details provided by Nortel Networks.



---

## **4.2 Tests performed by Sanmina Canada ULC**

### **Radiated Emission Test Results from 30 MHz to 1 GHz**

The minimum pass margin: 50.67 dB for H-Pol  
50.72 dB for V-Pol

### **Radiated Emission Test Results from 1 GHz to 10 GHz**

The minimum pass margin: 36.95 dB for H-Pol  
33.57 dB for V-Pol

Please refer to the Exhibit 2B for all test setups and results in details provided by Sanmina Canada ULC.