



## **AirCard 881 Test Report**

For

Class II Permissive Change Filing

**FCC ID: N7NAC881**

**Prepared by  
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### 1 Introduction and Purpose

This document provides additional test data in support of a Class II Permissive Change filing with FCC for the AirCard 881 wireless modem.

#### Test Summary

FCC RULE	DESCRIPTION OF TEST	RESULT	PAGE
2.1046	RF Power Output	Complies	<b>Error! Bookmark not defined.</b>

The tests described in this report were performed by Mr. Philip Wright at:

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## 2 Description of Equipment Under Test

AirCard 881 is a multi-band wireless modem operating on the GSM/GPRS/EDGE/UMTS network. In the US, only cellular and PCS bands are used for GSM/GPRS/EDGE/UMTS operation, so this test report only contains data for these two bands (850MHz and 1900MHz).

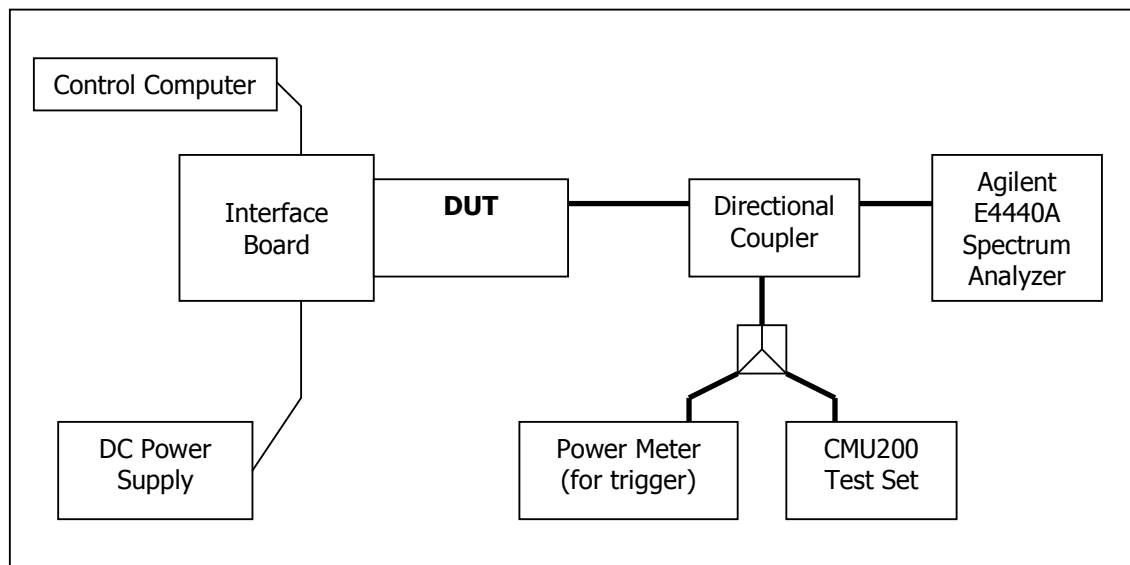
## 3 RF Power Output

FCC 2.1046

### 3.1 Test Procedure

The transmitter output was connected to a Rohde & Schwarz CMU200 Test Set and configured to operate at maximum power in a call. The power was measured using the spectrum analyzer at three equally spaced operating frequencies for each band. The RBW was set to 5MHz for the WCDMA measurements. The spectrum analyzer was set to measure the RF output power with the cable and coupler losses accounted for.

### Test Setup



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### 3.2 Test Equipment

#### Instrument List

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	836766/030	N/A
Spectrum Analyzer	Agilent	PSA E4440A	US41421268	Mar. 1, 2007
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	Minnow	N/A	N/A
Directional Coupler	Mini-Circuits	ZA3PD-2	N/A	N/A

### 3.3 Settings for UMTS Mode on the CMU200

#### UE Power Control Settings

Maximum allowable UE-Power = 24.0 dBm

UL Target Power = 24.0 dBm

#### Node B Settings

Primary Scrambling Code = 9

Output Channel Power = -51.7 dBm

OCNS = Off

Total Output Power (Ior+Ioc) = -51.7 dBm

#### RMC Settings

Reference Channel Type: 12.2 kbps Downlink/Uplink DL DTCH Transport Format: 12.2

kbps DL Resources in Use: 100 % UL CRC (Sym. Loop Mode 2): Off

Test Mode: Loop Mode 2 Channel Data Source DTCH: PRBS9

#### Voice Settings

Voice Source: Echo

Loopback Type: Off

#### Adaptive Multirate Settings

Active Code Set: Selection A

Codec Mode: 12.2 kbps

#### Signaling RAB Settings

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SRB Cell DCH: 3.4 kbps

BS Down Link Physical Channels Settings

Ior = -51.7 dBm  
P-CPICH = -3.3 dB  
P-SCH = -8.3 dB  
S-SCH = -8.3 dB  
P-CCPCH = -5.3 dB  
S-CCPCH = -5.3 dB  
S-CCPCH Channel Code = 2  
PICH = -8.3 dB  
PICH Channel Code = 3  
AICH = -8.3 dB  
AICH Channel Code = 6  
DPDCH = -10.3 dB  
DPDCH Channel Code = 96  
Power Offset (DPCCH/DPDCH) = 0.0 dB  
DL DPCH Timing Offset = 0  
Secondary Scrambling Code = 0  
Secondary Scrambling Code (HSDPA) = 0  
HSDPA Channels = On

TPC Settings

Algorithm = 2  
TPC Step Size = 1dB  
TPC Pattern Setup = Set 1 (All 1, after linked to get maximum power)

**HSDPA Mode Settings:**

Network Settings

Packet Switched Domain = ON

HSDPA Test Mode Settings

Radiobearer Setup = RMC 12.2 kbps + HSPDA  
RMC Test Loop = Loop Mode 1 RLC TM

HSDPA HS-DSCH Settings

Data Pattern = PRBS9  
Force NACK = Off  
CQI Feedback Cycle = 4 ms  
UE Category = 8  
Channel Configuration Type = Fixed Reference Channel

Fixed Reference Channel Settings

H-Set Selection = H-Set 5 QPSK

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RV Coding Sequence = {0,2,5,6}

### HSPA Mode Settings:

#### HSUPA

E-DCH Physical Layer Category: 5  
Maximum Channelisation Code: SF4  
Initial Service Grant: Value: 30

#### RMC Settings

Reference Channel Type: 12.2 kbps + HSPA 34.108  
DL DTCH Transport Format: 12.2 kbps  
DL Resources in Use: 100 %  
UL CRC (Sym. Loop Mode 2): Off  
Test Mode: Loop Mode 2  
Channel Data Source DTCH: PRBS9

#### Paket Switched

DCH Type: HSUPA Test Mode  
Data Rate: HSDPA/HSUPA

#### HSUPA Test Mode Settings

Radiobearer Setup = SRB 3.4 + HSPA

#### HSUPA Settings

TTI mode: 10ms

#### E-AGCH

Pattern Length: 1  
AG Value: 20

#### Downlink Physical Channels

HSUPA Channels: On  
E-AGCH: -6.0db  
E-AGCH Chan. Code: 6  
E-RGCH/E-HICH: -5.0db  
E-RGCH Active: Off  
E-RGCH/E-HICH Chan. Code: 6

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### 3.4 Test Results UMTS

Frequency (MHz)	Channel	Power (dBm)		
		WCDMA Mode	HSDPA Mode	HSUPA Mode
826.4	4132	22.44	22.33	22.30
836.4	4182	22.52	22.19	22.37
846.6	4233	22.56	22.31	22.45
1852.4	9262	22.53	22.46	22.35
1880.0	9400	22.38	22.34	22.24
1907.6	9538	22.54	22.43	22.46

Note: The results above reflect max power with all up bits.

## 4 Conclusion

The test results shown above demonstrate that the output power in HSUPA mode is not higher than in WCDMA mode or HSDPA mode, therefore SAR testing in HSUPA mode is not required.

Additionally since both HSDPA and HSUPA use the same frequency bands and modulation scheme for transmit, enabling the HSUPA feature will not change the occupied bandwidth, spurious emissions, frequency stability, etc. No further testing is required.