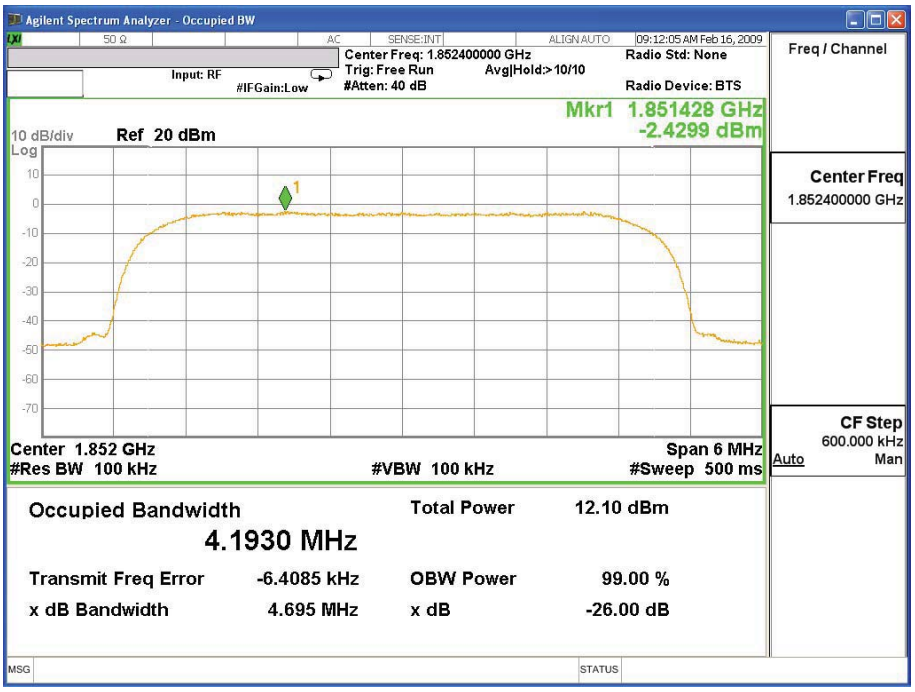
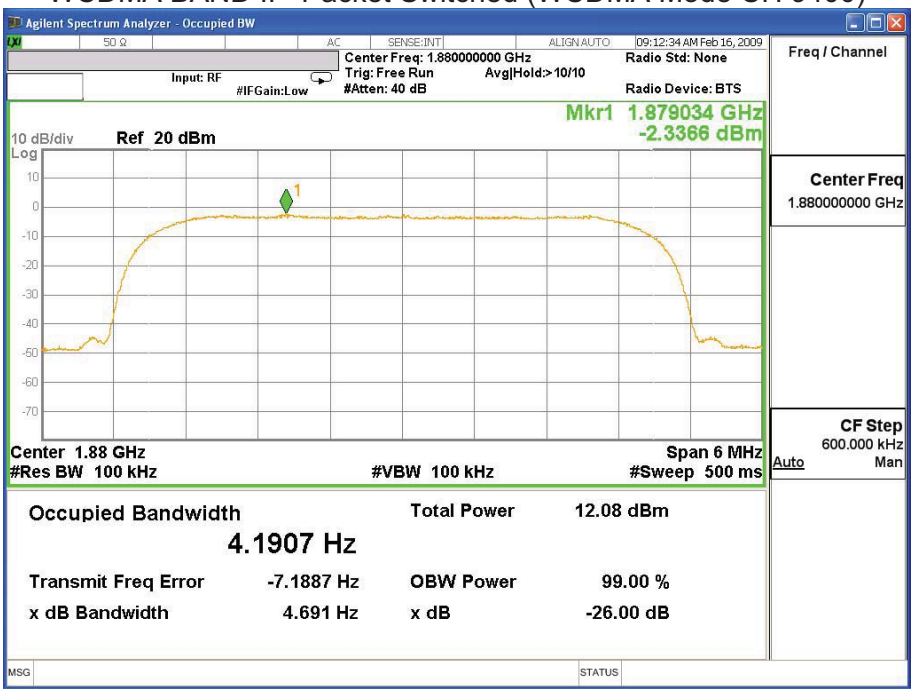
Product	HSUPA PCI Express mini card module		
Test Mode	Occupied Bandwidth		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	WCDMA BAND II		

WCDMA BAND II - Packet Switched (WCDMA Mode CH 9262)

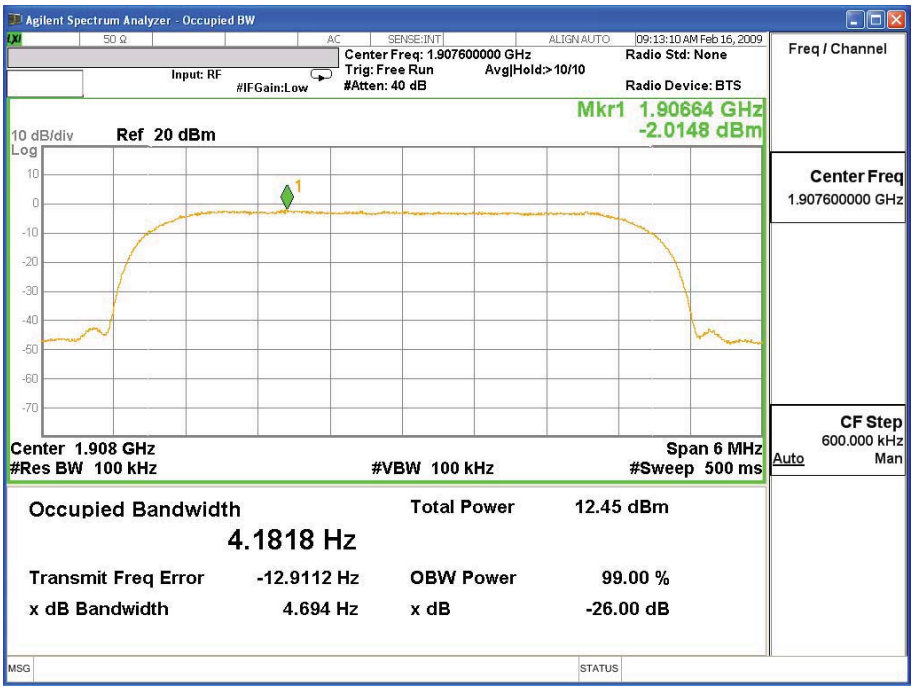


WCDMA BAND II - Packet Switched (WCDMA Mode CH 9400)



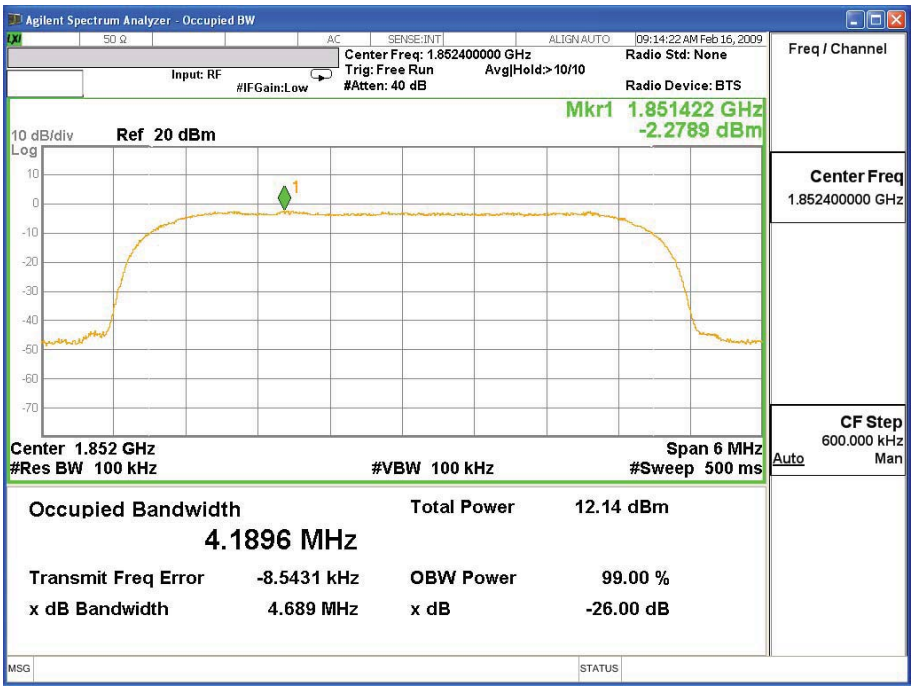
Product	HSUPA PCI Express mini card module		
Test Mode	Occupied Bandwidth		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	WCDMA BAND II		

WCDMA BAND II - Packet Switched (WCDMA Mode CH 9538)

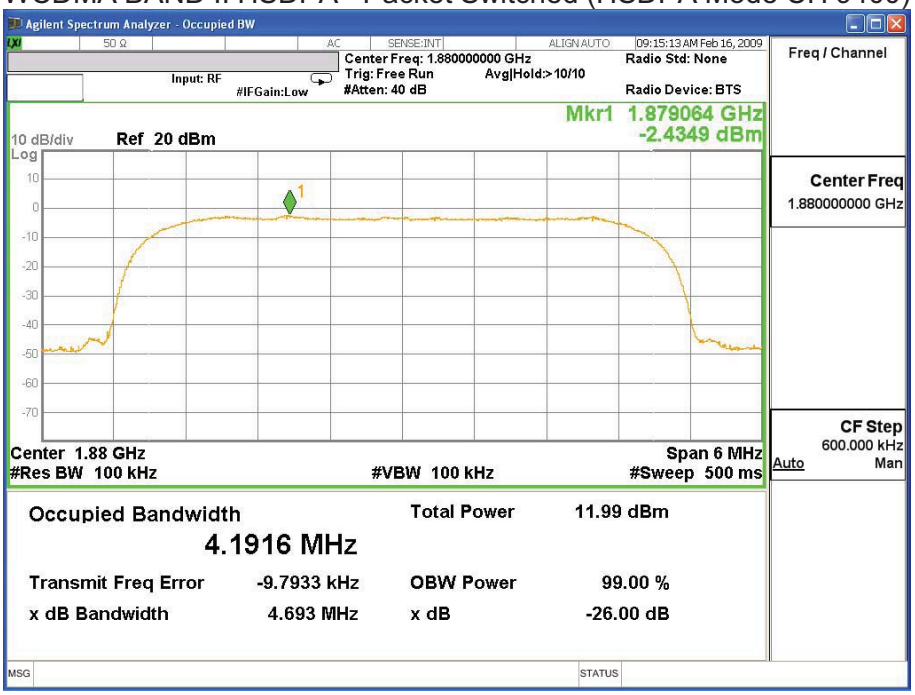


Product	HSUPA PCI Express mini card module		
Test Mode	Occupied Bandwidth		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	WCDMA BAND II HSDPA		

WCDMA BAND II HSDPA - Packet Switched (HSDPA Mode CH 9262)

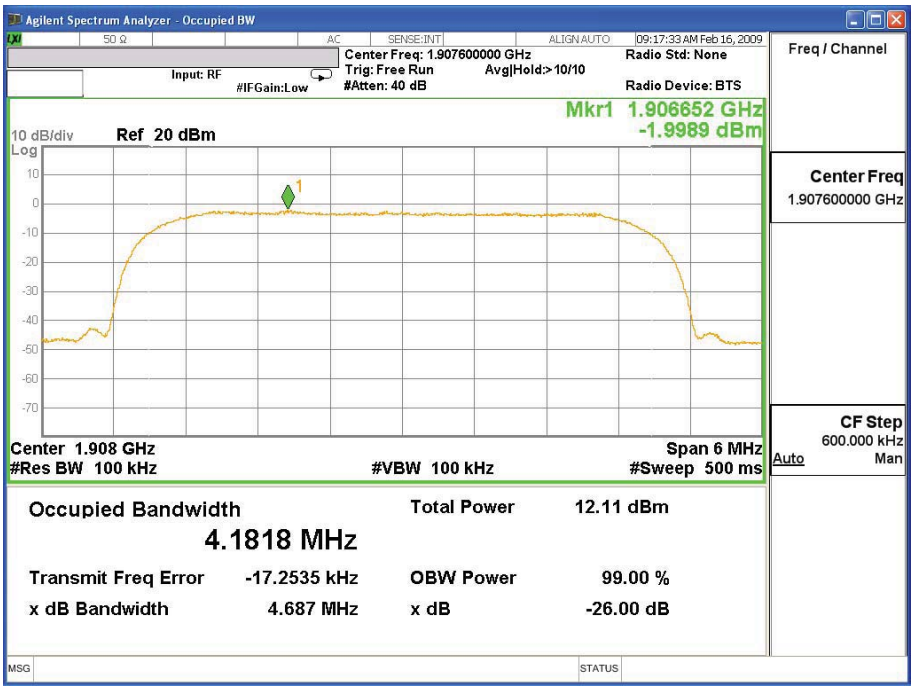


WCDMA BAND II HSDPA - Packet Switched (HSDPA Mode CH 9400)



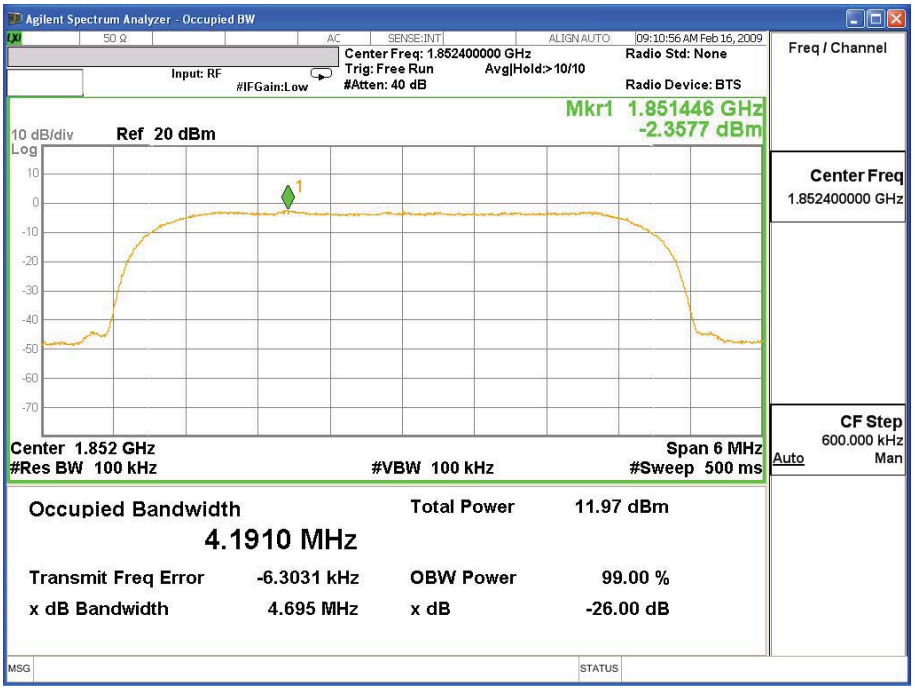
Product	HSUPA PCI Express mini card module		
Test Mode	Occupied Bandwidth		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	WCDMA BAND II HSDPA		

WCDMA BAND II HSDPA - Packet Switched (HSDPA Mode CH 9538)

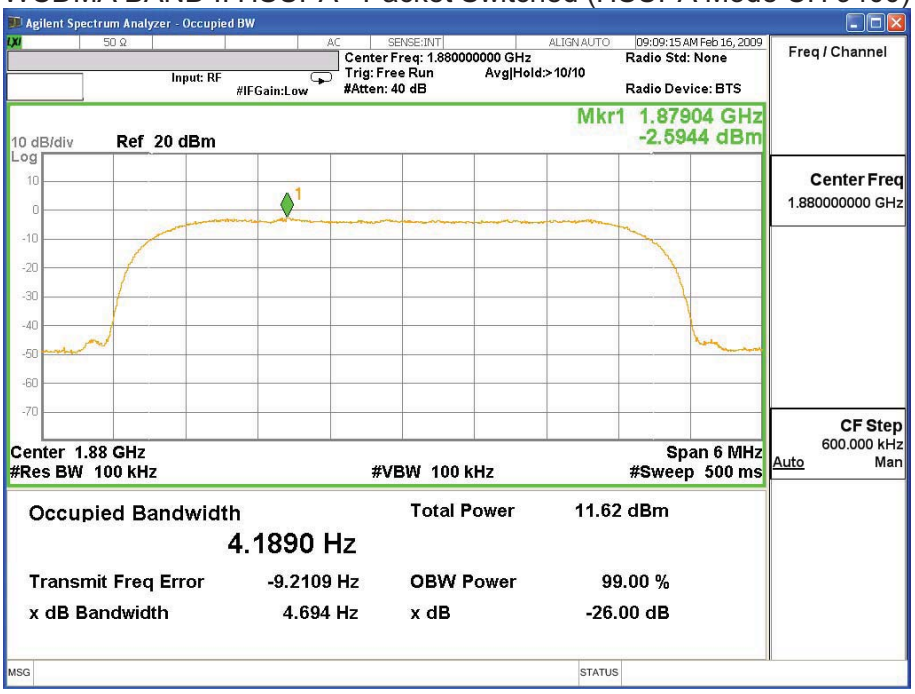


Product	HSUPA PCI Express mini card module		
Test Mode	Occupied Bandwidth		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	WCDMA BAND II HSUPA		

WCDMA BAND II HSUPA - Packet Switched (HSUPA Mode CH 9262)

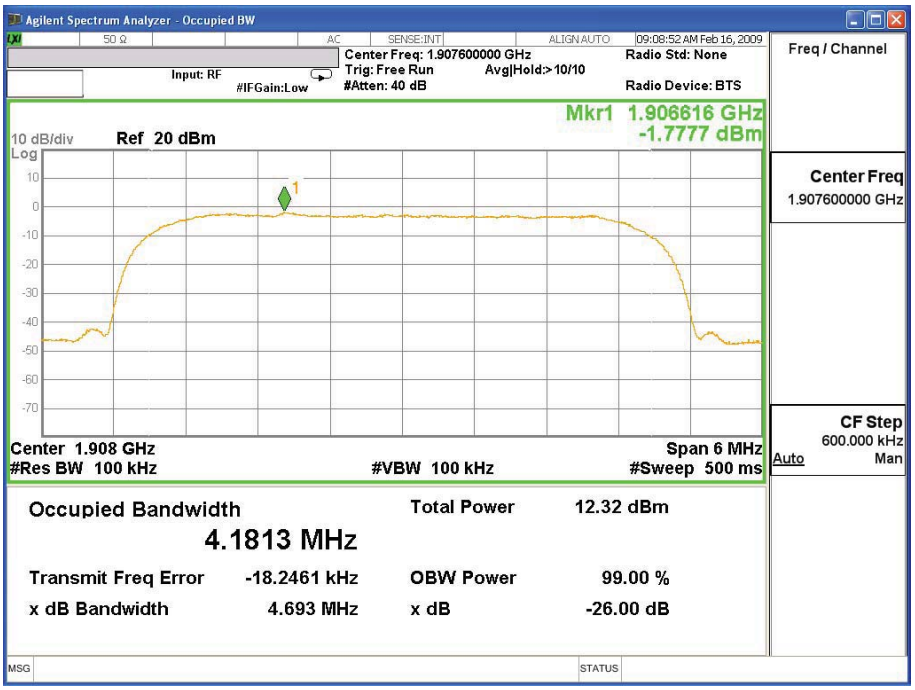


WCDMA BAND II HSUPA - Packet Switched (HSUPA Mode CH 9400)



Product	HSUPA PCI Express mini card module		
Test Mode	Occupied Bandwidth		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	WCDMA BAND II HSUPA		

WCDMA BAND II HSUPA - Packet Switched (HSUPA Mode CH 9538)



4. Spurious Emission At Antenna Terminals (+/-1MHz)

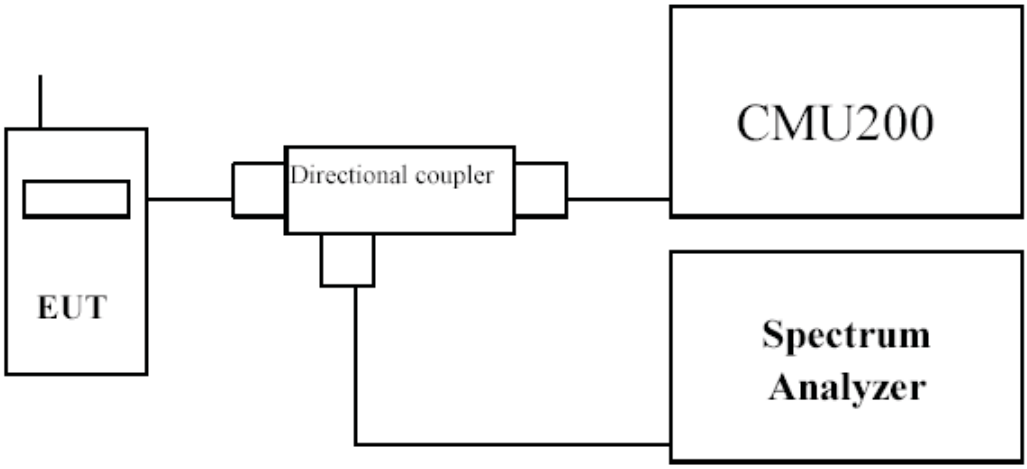
4.1. Test Equipment

The following test equipments are used during the spurious emission test

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum Analyzer	Advantest	R3182 / 100803470	May, 2008
Universal Radio Communication Tester	R & S	CMU200 / 104846	Apr., 2008
Directional coupler	Agilent	87300C / MY44300353	Aug., 2008
Directional coupler	Agilent	778D-012/ 50550	Aug., 2008

Note: All equipments upon which need to be calibrated are with calibration period of 1 year.

4.2. Setup



4.3. Limits

Cellular Band Transmitter limits for narrowband spurious emission

Lower Block Edge Test Frequencies	**Upper Block Edge Test Frequencies**
Block A Channel : 128 Frequency : 824.2 MHz	Block B Channel : 251 Frequency : 848.8 MHz

PCS Band Transmitter limits for narrowband spurious emission

Lower Block Edge Test Channels/Frequencies	**Upper Block Edge Test Channels/Frequencies**
Block A Channel : 512 Frequency : 1850.2 MHz	Block C Channel : 810 Frequency : 1909.8 MHz

4.4. Test Procedure

In accordance with Part 22.917 and 24.238, at least 1% of the emission bandwidth was used for the resolution and video bandwidths up to 1MHz away from the Block Edge. At greater than 1MHz, the resolution and video bandwidth were increased to 1MHz.

The reference power and path losses of all channels used for testing in each frequency block were measured.

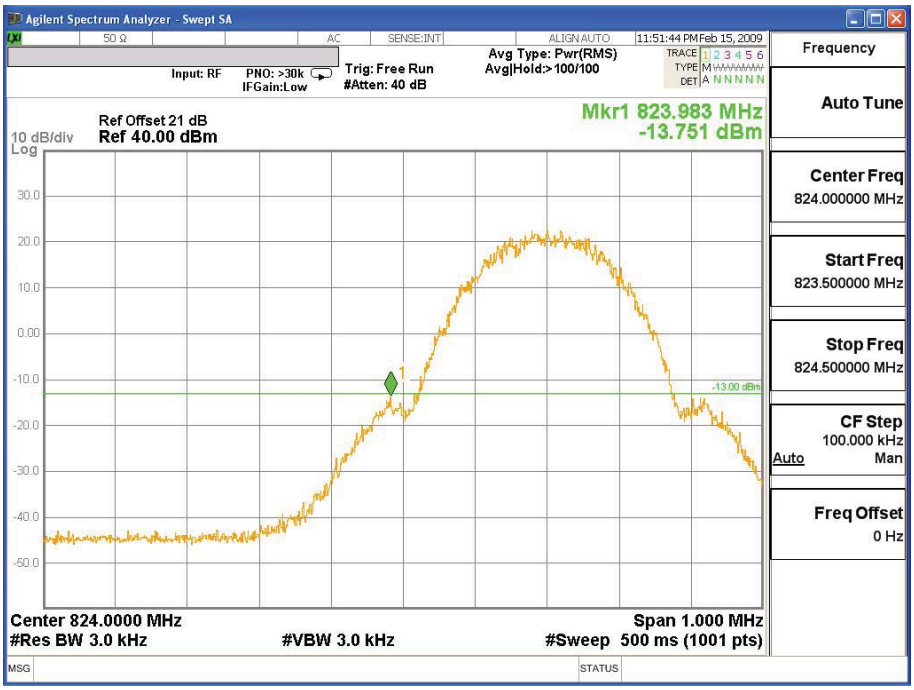
4.5. Test Specification

According to Part 2.1049, 22.917,24.238.

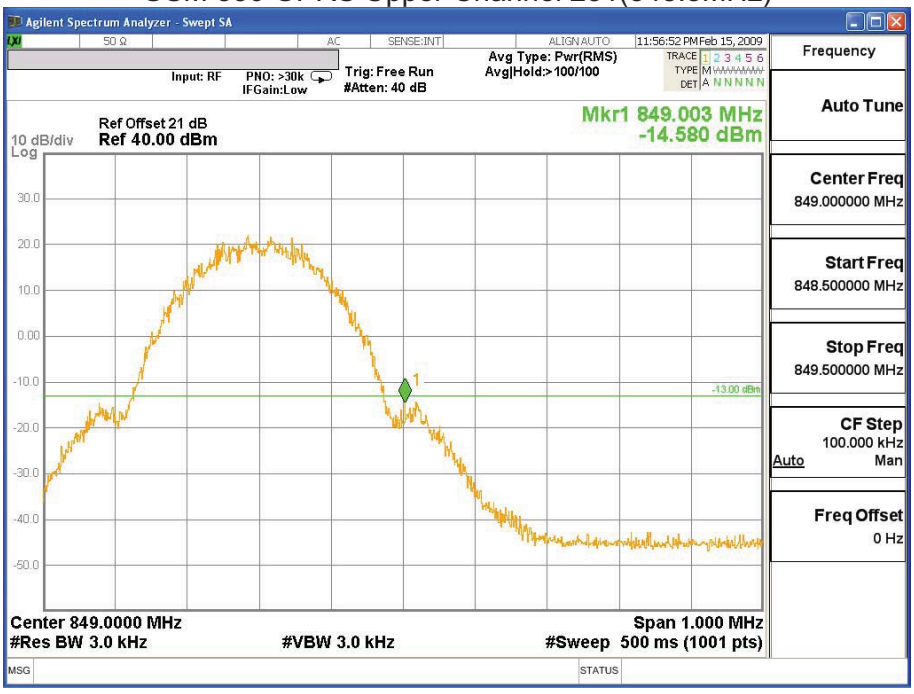
4.6. Test Result of Spurious Emission At Antenna Terminals (+/-1MHz)

Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	Block Edge Test (GSM 850 GPRS)		

GSM 850 GPRS Lower Channel 128 (824.2MHz)

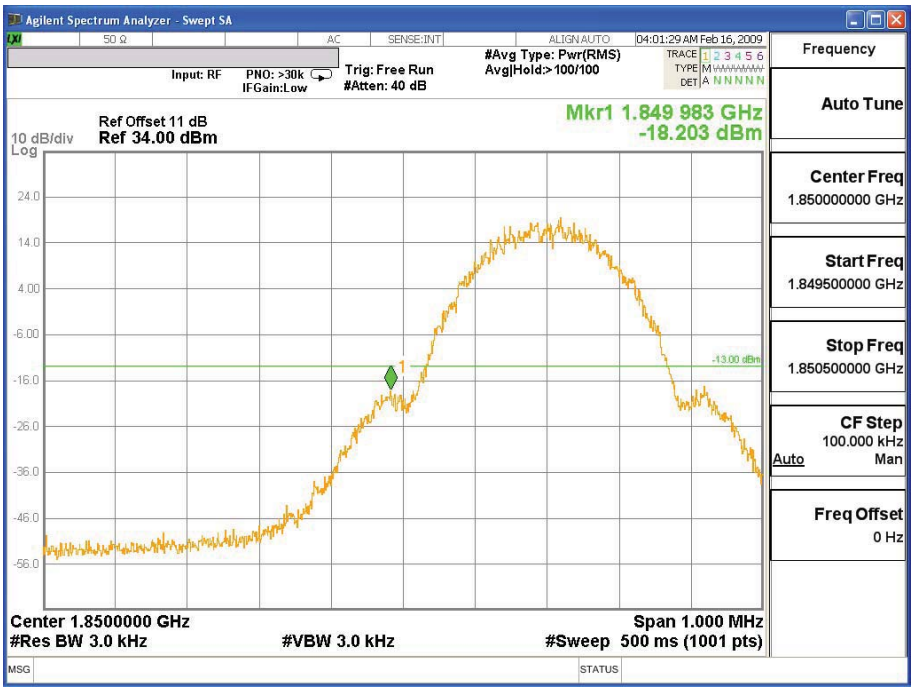


GSM 850 GPRS Upper Channel 251(848.8MHz)

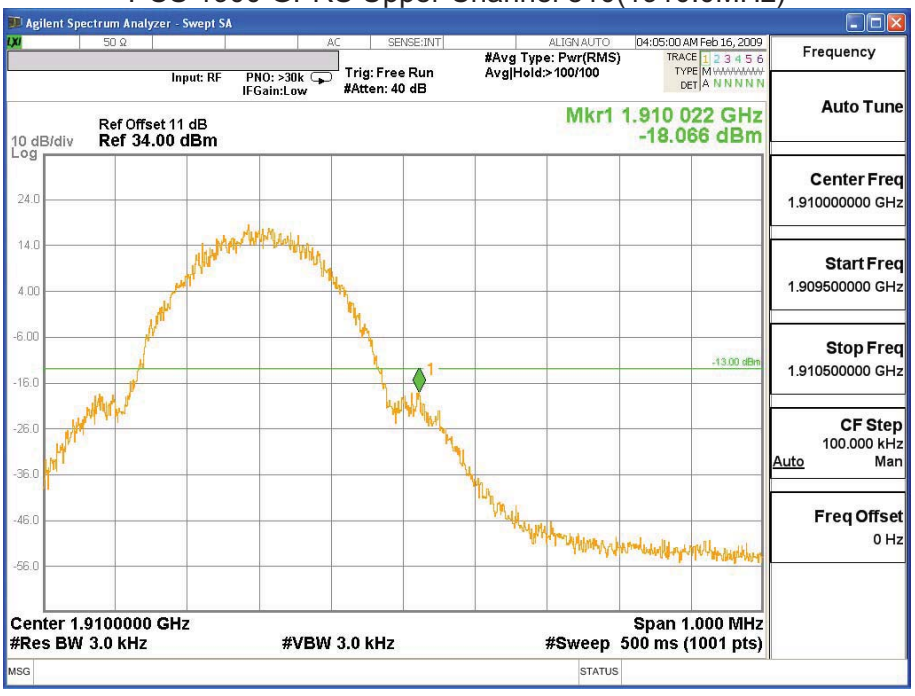


Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 GPRS)		

PCS 1900 GPRS Lower Channel 512 (1850.2MHz)

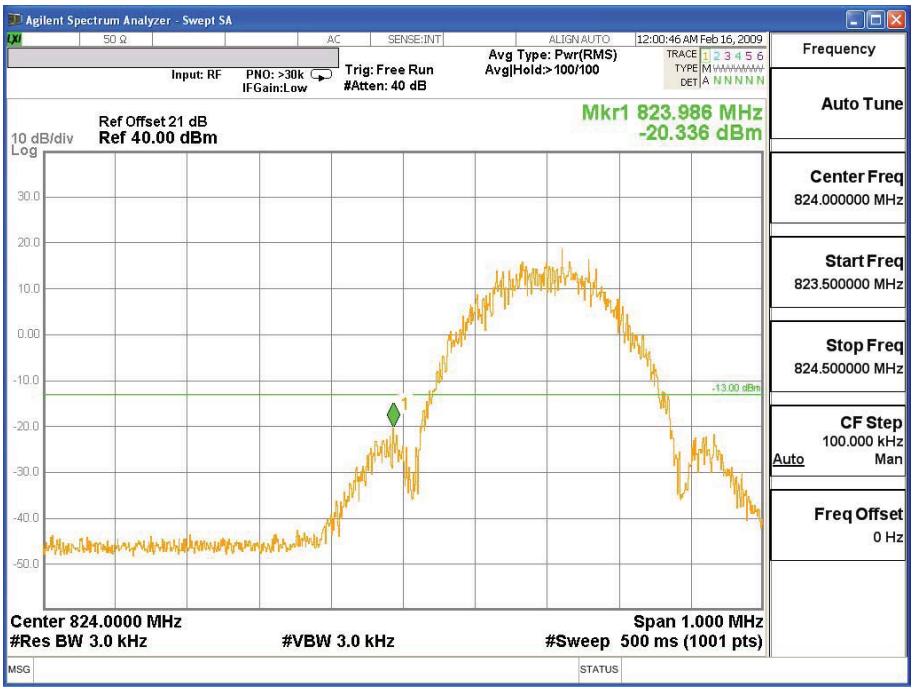


PCS 1900 GPRS Upper Channel 810(1910.0MHz)

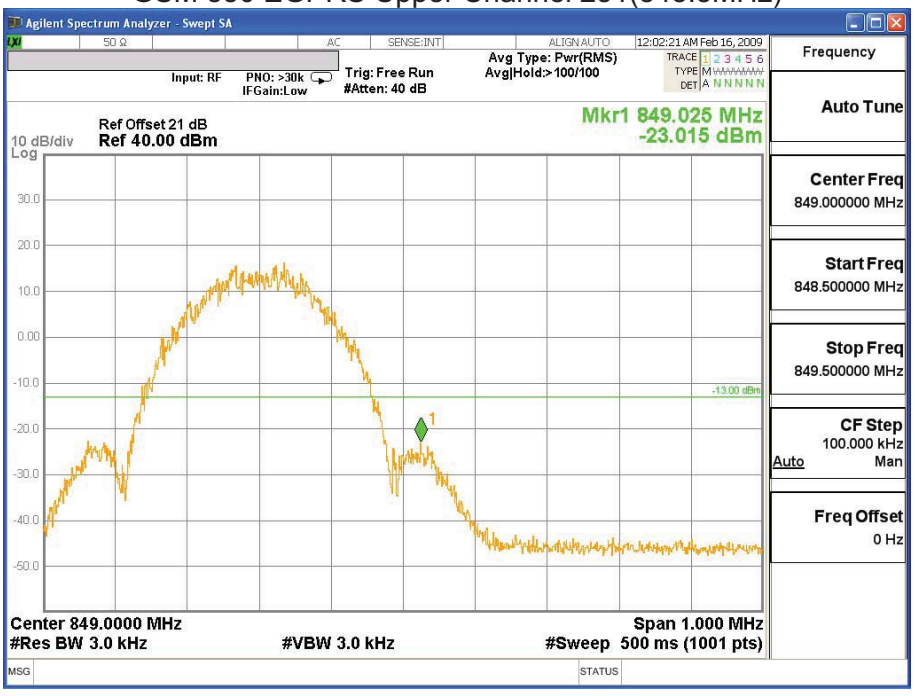


Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	Block Edge Test (GSM 850 EGPRS)		

GSM 850 EGPRS Lower Channel 128 (824.2MHz)

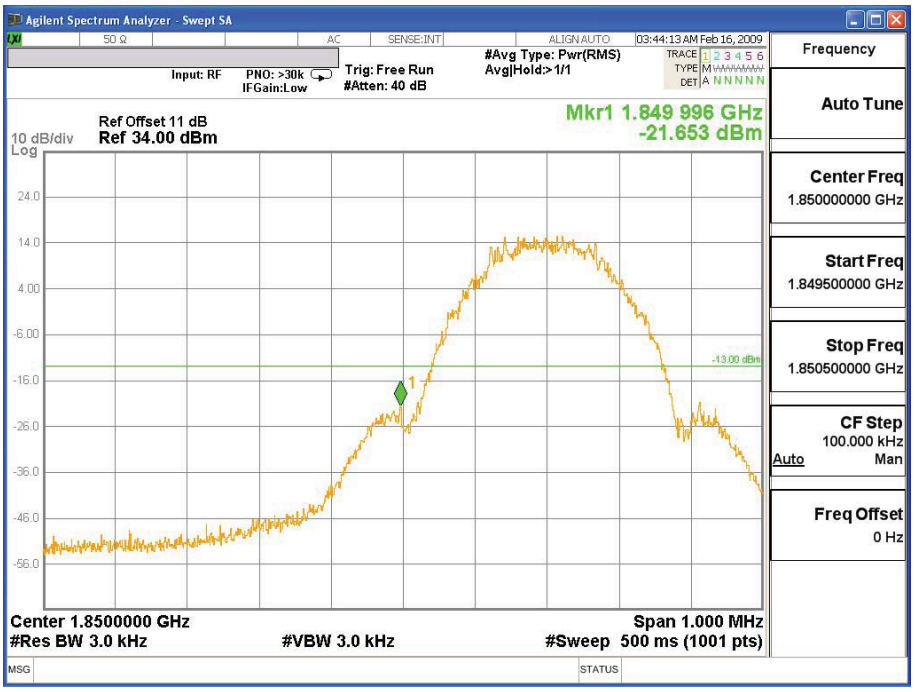


GSM 850 EGPRS Upper Channel 251(848.8MHz)

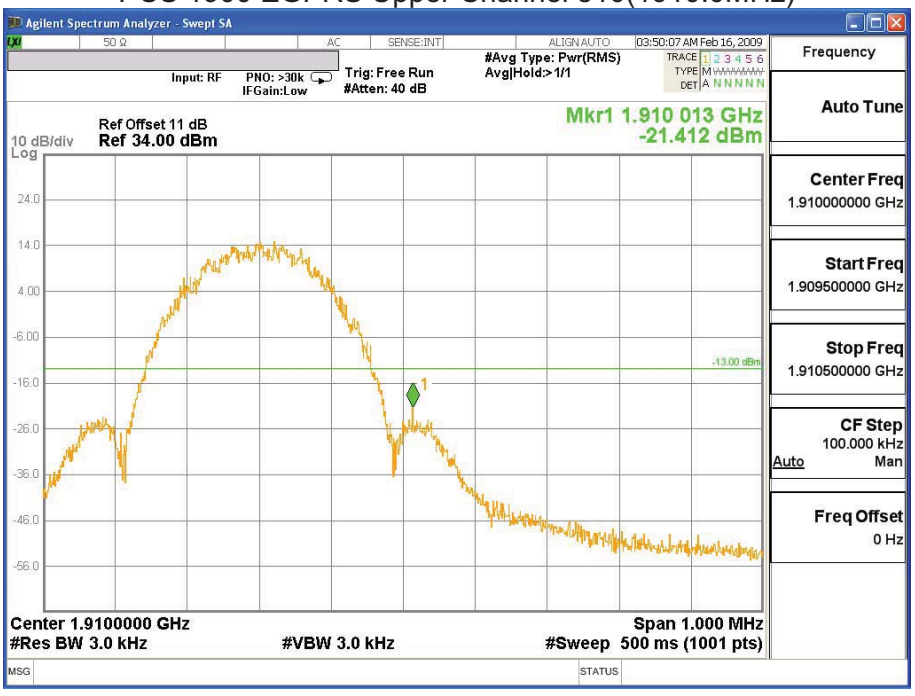


Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 EGPRS)		

PCS 1900 EGPRS Lower Channel 512 (1850.2MHz)

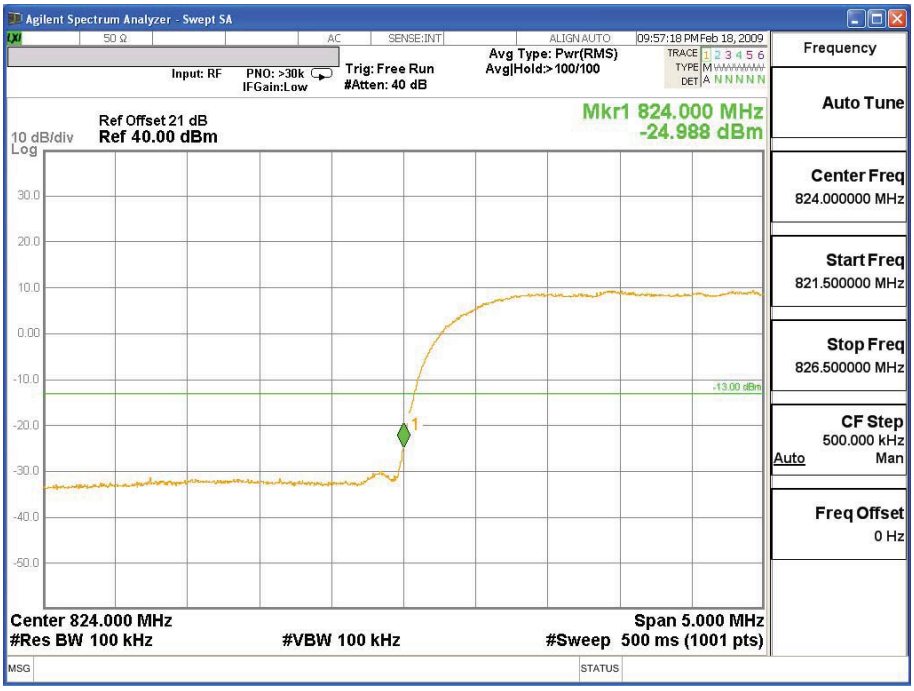


PCS 1900 EGPRS Upper Channel 810(1910.0MHz)

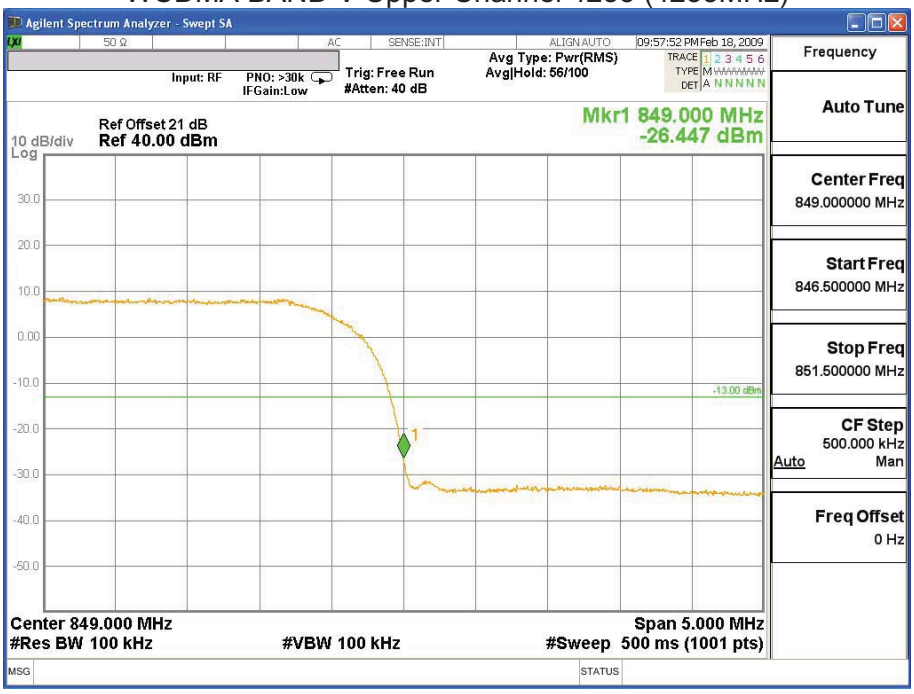


Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND V)		

WCDMA BAND V Lower Channel 4132 (826.4MHz)

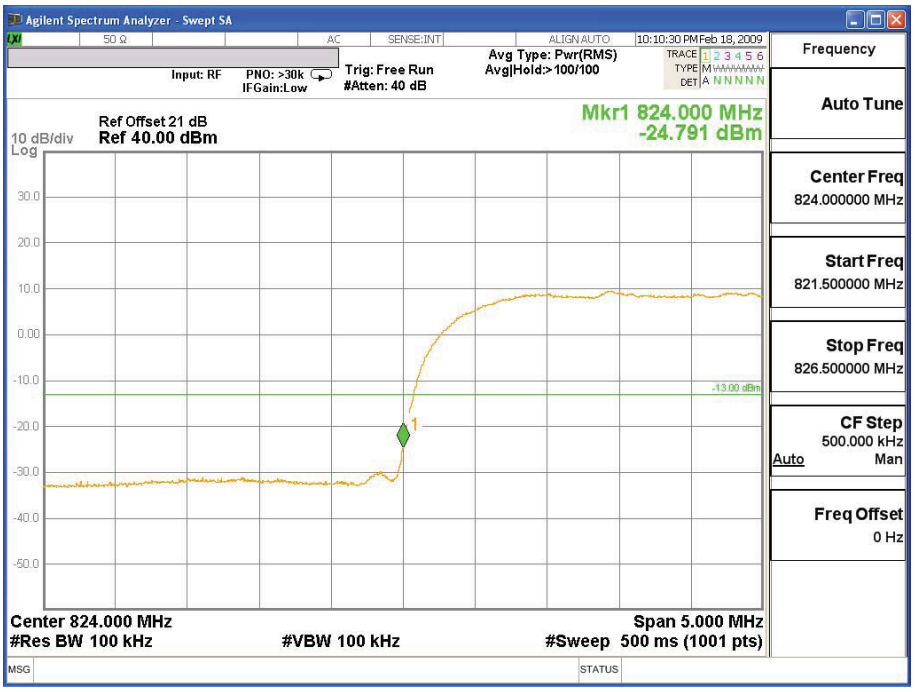


WCDMA BAND V Upper Channel 4233 (4233MHz)

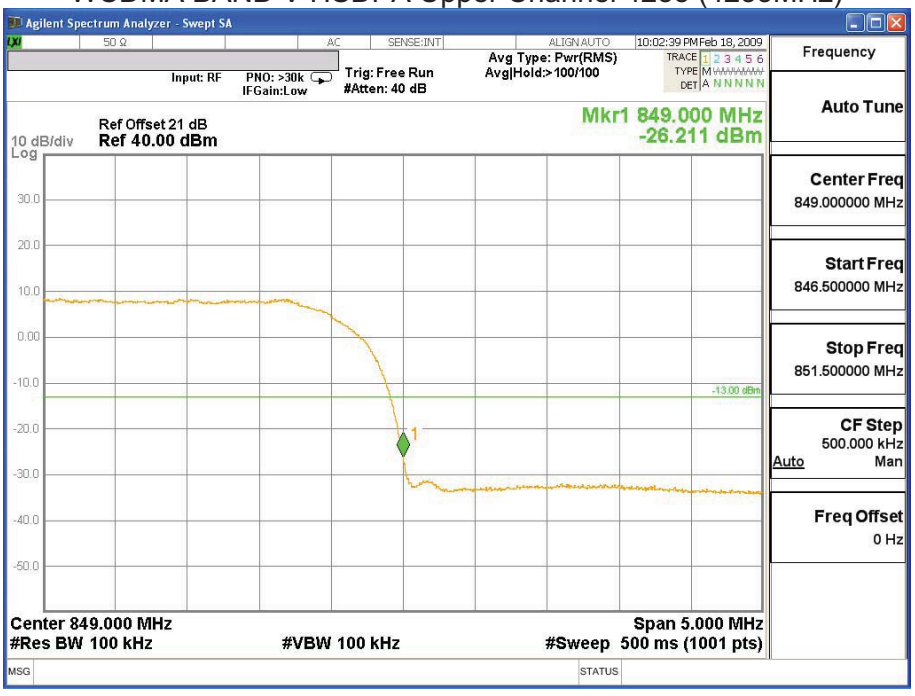


Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND V HSDPA)		

WCDMA BAND V HSDPA Lower Channel 4132 (826.4MHz)

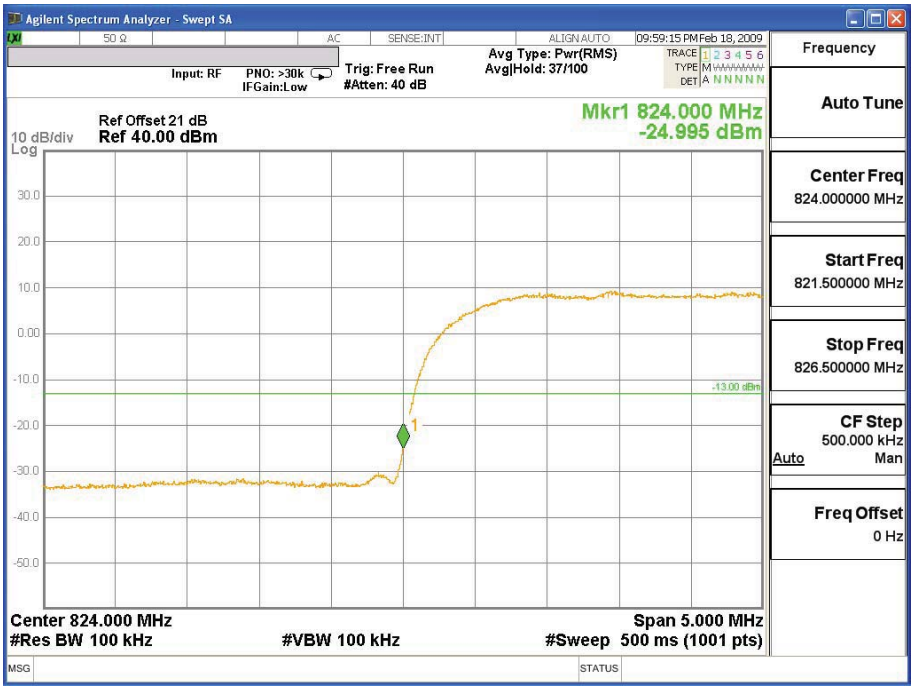


WCDMA BAND V HSDPA Upper Channel 4233 (4233MHz)

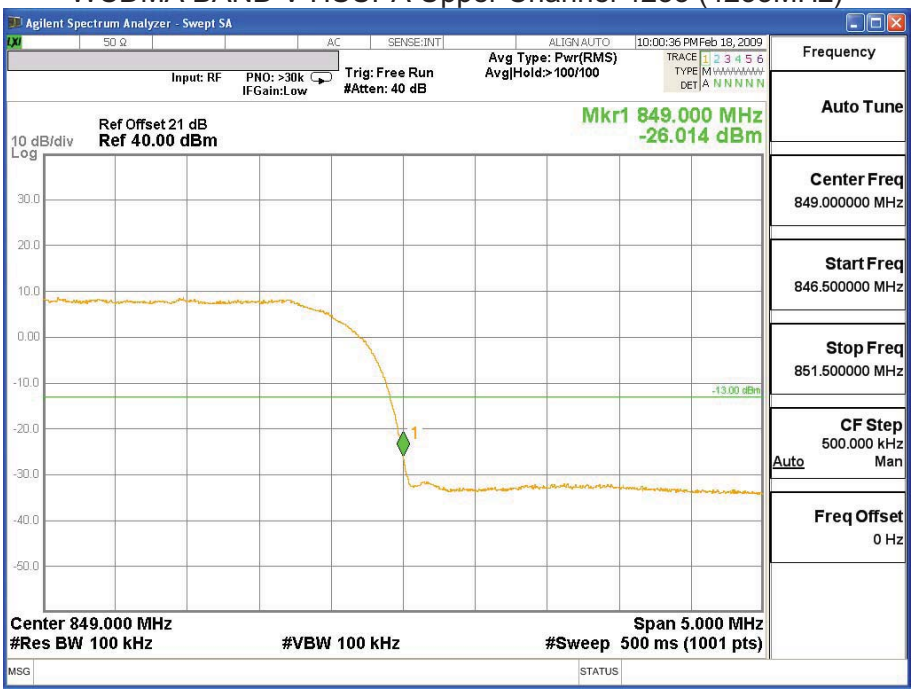


Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND V HSUPA)		

WCDMA BAND V HSUPA Lower Channel 4132 (826.4MHz)

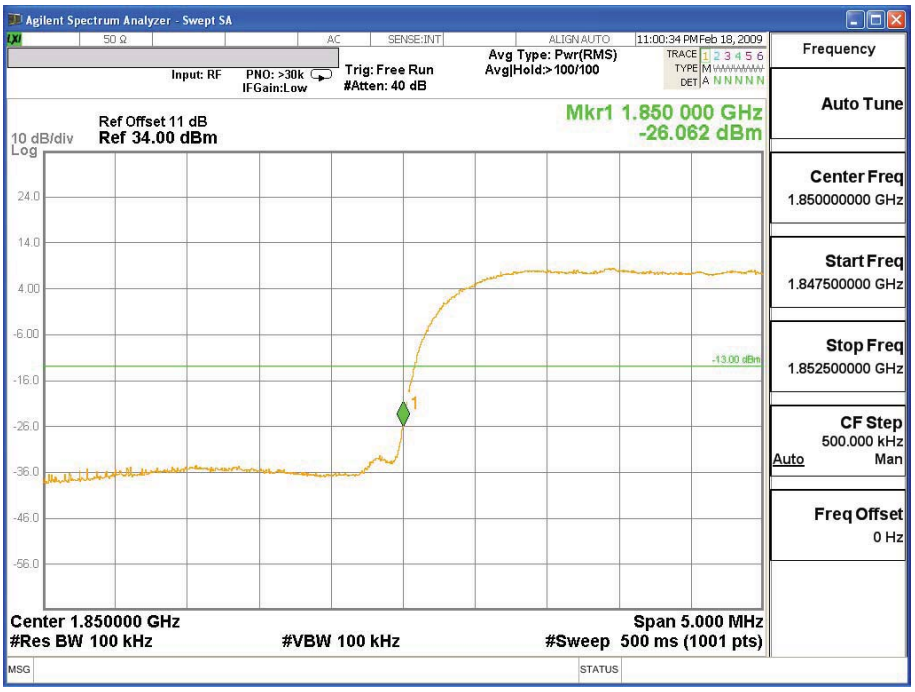


WCDMA BAND V HSUPA Upper Channel 4233 (4233MHz)

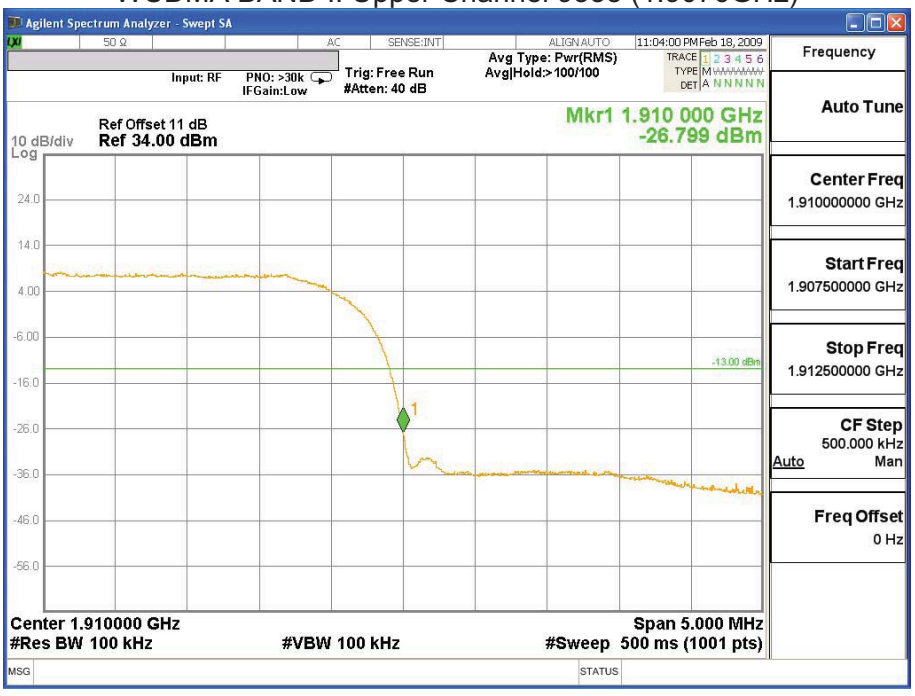


Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND II)		

WCDMA BAND II Lower Channel 9262 (1.8524GHz)

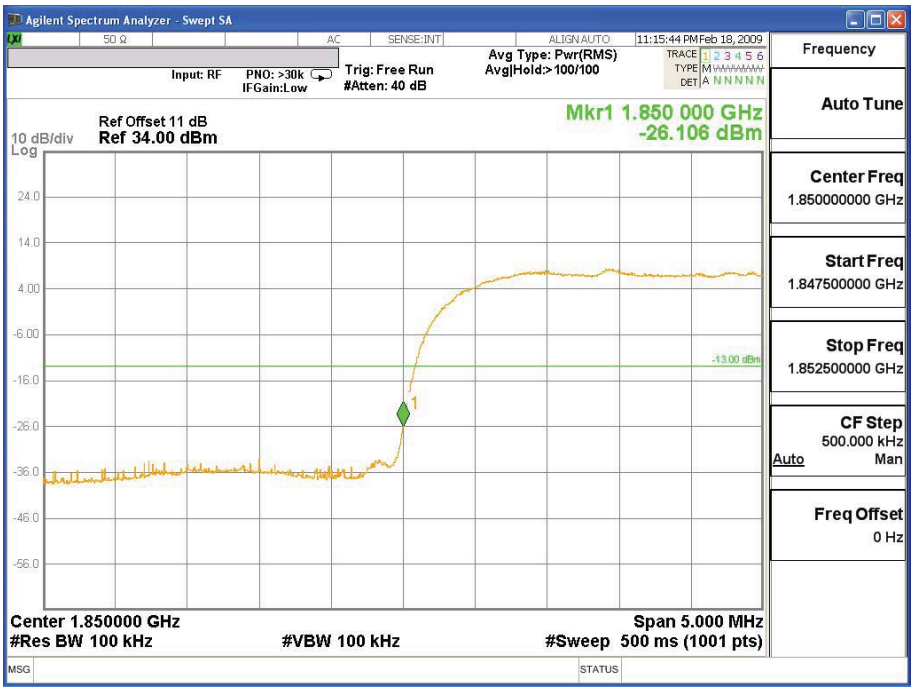


WCDMA BAND II Upper Channel 9538 (1.9076GHz)

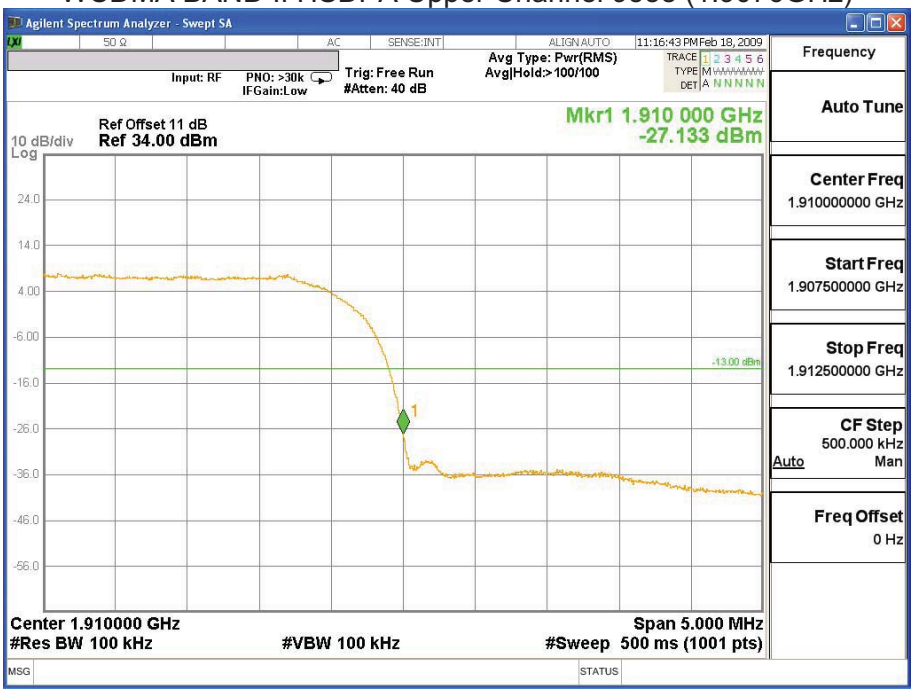


Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND II HSDPA)		

WCDMA BAND II HSDPA Lower Channel 9262 (1.8524GHz)

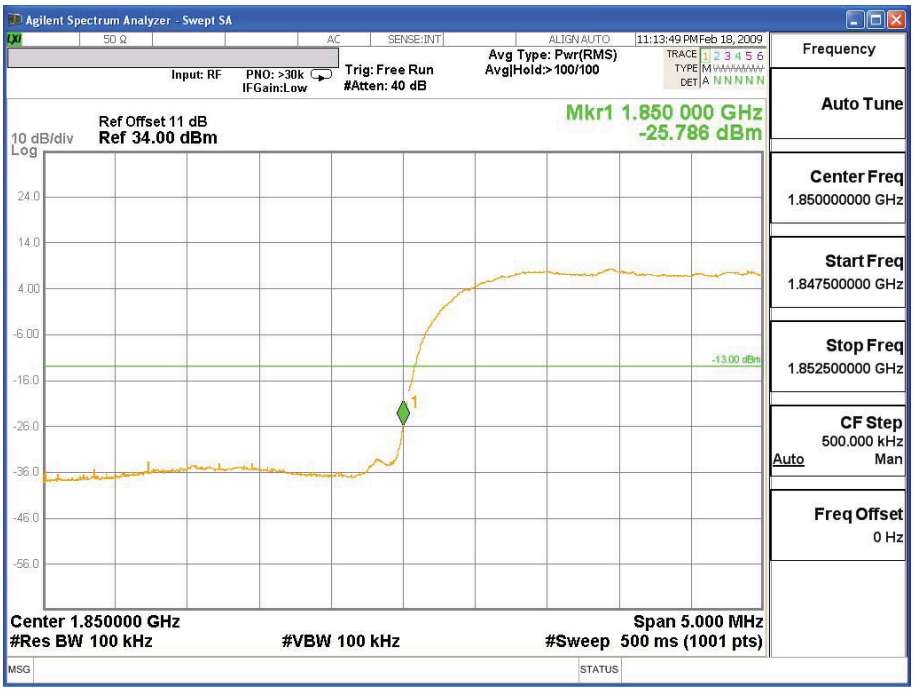


WCDMA BAND II HSDPA Upper Channel 9538 (1.9076GHz)

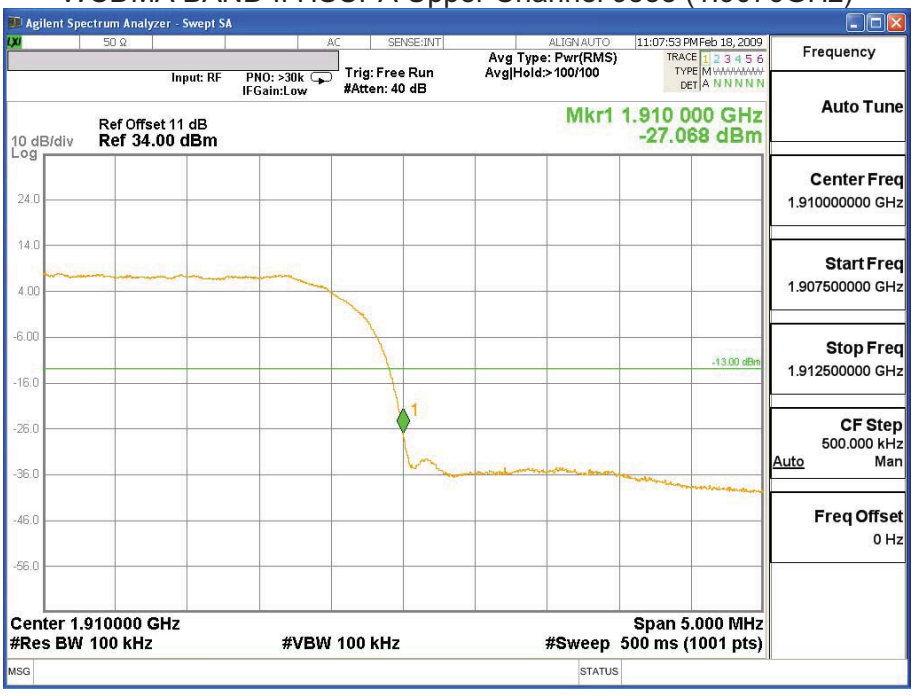


Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND II HSUPA)		

WCDMA BAND II HSUPA Lower Channel 9262 (1.8524GHz)



WCDMA BAND II HSUPA Upper Channel 9538 (1.9076GHz)



5. Spurious Emission

5.1. Test Equipment

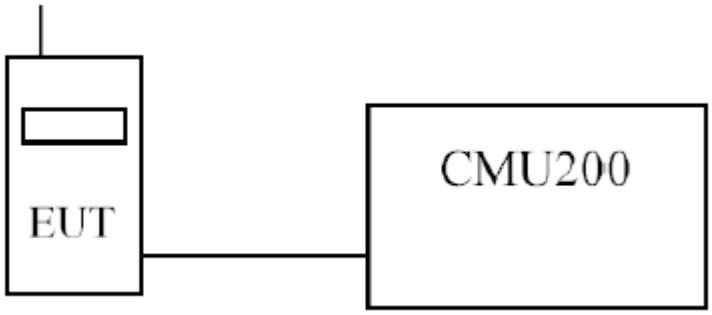
The following test equipments are used during the radiated emission test:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum Analyzer	Agilent	N9020A/ MY48010570	Apr., 2008
Dual Directional couple	Agilent	778D-012/50550	Aug , 2008
Directional coupler	Agilent	87300C/ MY44300353	Aug ., 2008
Bilog Antenna	Schaffner Chase	CBL6112B/2921	Aug ., 2008
Broadband Horn Antenna	Schwarzbeck	BBHA9170/497	Sep ., 2008
Horn Antenna	Schwarzbeck	BBHA9120D/ 305	Sep ., 2008
Pre-Amplifier	QTK	N/A	N/A
Microwave Amplifier (0.5GHZ-26.5GHZ)	Agilent	83017A/ MY39500682	Aug ., 2008
Spectrum Analyzer (9K-40GHz)	R&S	FSP40/100339	Nov ., 2008
Universal Radio Communication Tester	R & S	CMU200 / 104846	Apr ., 2008

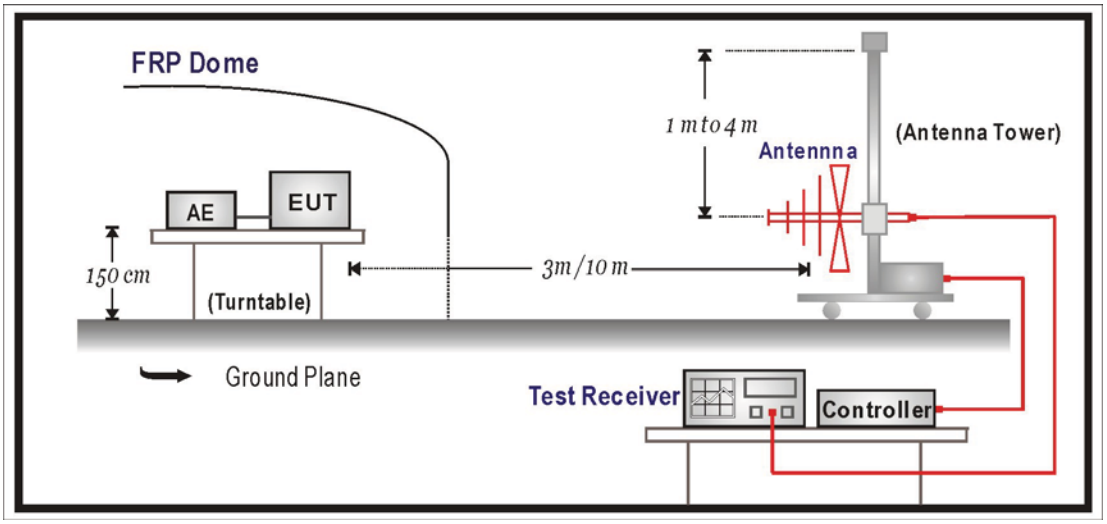
Note: 1. All equipments that need to be calibrated are with calibration period of 1 year.
2. Mark “X” test instruments are used to measure the final test results.

5.2. Test Setup

5.2.1 Spurious emissions at antenna terminals.



5.2.2 Field strength of spurious radiation.



5.3. Limits

Limit	**<-13dBm**

43 + 10Log(P) down on the carrier where P is the power in Watts.

5.4. Test Procedure

In accordance with Part 2.1051, the spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using a combination of filters and attenuators and the frequency spectrum investigated from 30MHz to 20GHz. The EUT was set to transmit on full power. The EUT was tested on bottom, middle and top channels for both power levels. The resolution and video bandwidth was set to 1MHz in accordance with Part 24.238. The spectrum analyzer detector was set to Max Hold.

In addition, measurements were made up to the 10^{th} harmonic of the fundamental.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to TIA/EIA 603-C on radiated measurement.

5.5. Test Specification

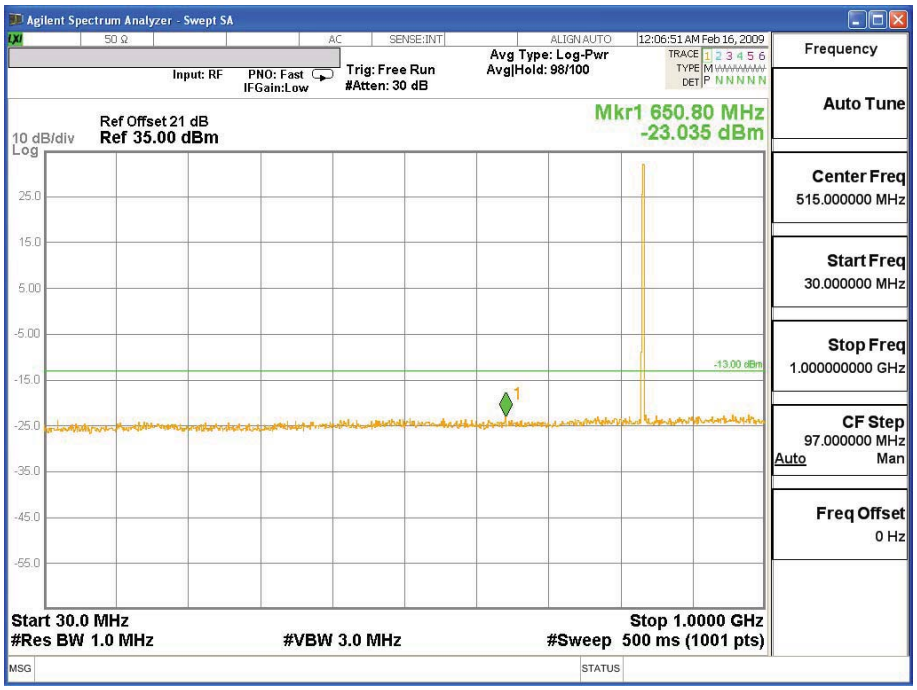
According to Part 2.1051, 2.1053, 22.917(a), 24.238(b).

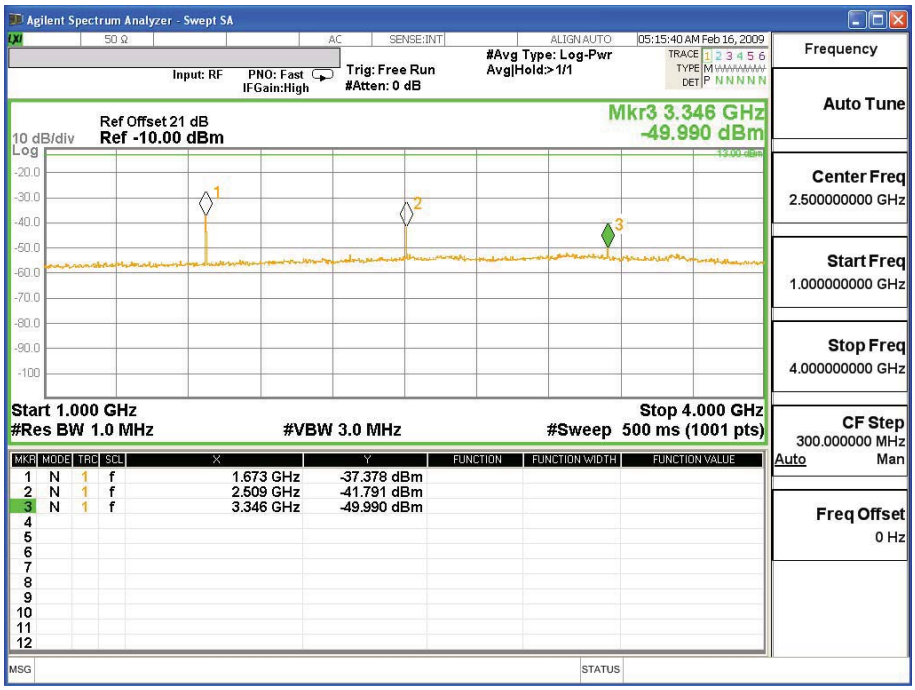
5.6. Test Result of Spurious Emission

Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	GSM 850 GPRS	Test Range	30MHz~10GHz

GSM 850 GPRS Middle-Channel 189

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1670	-37.38	0.58	-36.80	-13
2509.2	-41.79	0.7	-41.09	-13
3345.6	-49.99	1.01	-48.98	-13
4182	-53.30	1.18	-52.12	-13
5018.4	-51.76	1.23	-50.53	-13
5854.8	-50.07	1.45	-48.62	-13
6691.2	-50.99	1.56	-49.43	-13
7527.6	-52.53	1.59	-50.94	-13
8364	-54.72	1.82	-52.90	-13

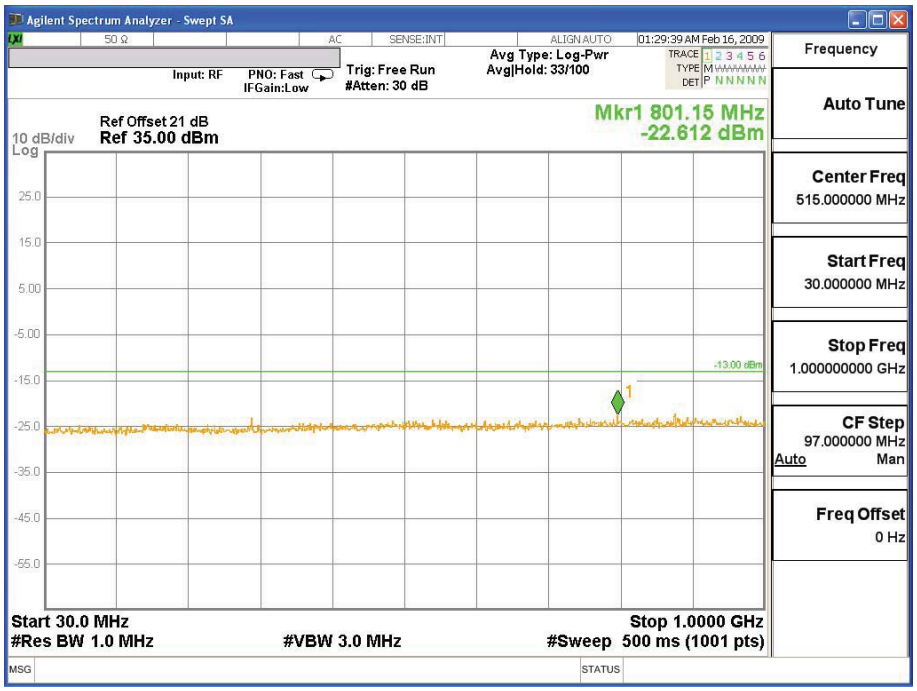



Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
05:15:40 AM Feb 16, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
#Avg Type: Log-Pwr
Avg|Hold:>1/1
Ref Offset 21 dB
10 dB/div
Ref -10.00 dBm
Mkr3 3.346 GHz
-49.990 dBm
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 4.000 GHz
#Sweep 500 ms (1001 pts)
1 N 1 f 1.673 GHz -37.378 dBm
2 N 1 f 2.509 GHz -41.791 dBm
3 N 1 f 3.346 GHz -49.990 dBm
Frequency
Auto Tune
Center Freq
2.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
4.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
05:16:29 AM Feb 16, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
#Avg Type: Log-Pwr
Avg|Hold:>1/1
Ref Offset 21 dB
10 dB/div
Ref -10.00 dBm
Mkr4 6.691 GHz
-50.987 dBm
Start 4.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 7.000 GHz
#Sweep 500 ms (1001 pts)
1 N 1 f 4.182 GHz -53.303 dBm
2 N 1 f 5.018 GHz -51.757 dBm
3 N 1 f 5.855 GHz -50.071 dBm
4 N 1 f 6.691 GHz -50.987 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
4.000000000 GHz
Stop Freq
7.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
05:14:53 AM Feb 16, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
#Avg Type: Log-Pwr
Avg|Hold:>1/1
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 21 dB
10 dB/div
Ref -10.00 dBm
Log
Mkr2 8.364 GHz
-54.715 dBm
12.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 7.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 10.000 GHz
#Sweep 500 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 7.528 GHz -52.525 dBm
2 N 1 f 8.364 GHz -54.715 dBm
3
4
5
6
7
8
9
10
11
12
MSG
STATUS
Frequency
Auto Tune
Center Freq
8.500000000 GHz
Start Freq
7.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz

Product	HSUPA PCI Express mini card module		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2009/02/18	Test Site	CTR
Test Condition	PCS 1900 GPRS	Test Range	30MHz~20GHz

PCS 1900 GPRS Mid-Channel 661

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
3760	-53.50	1.1	-52.40	-13
5640	-45.53	1.23	-44.30	-13
7520	-56.03	1.59	-54.44	-13
9400	-61.62	1.89	-59.73	-13
11280	-51.99	2.07	-49.92	-13
13160	-58.23	2.26	-55.97	-13
15040	-61.47	2.64	-58.83	-13
16920	-60.62	3.5	-57.12	-13
18800	-59.72	3.7	-56.02	-13