

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

## INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E and PART 27

OF

**Product Name:** 1KU2

**Brand Name:** N/A

**Model No.:** 1KU2

**Model Difference:** N/A

**FCC ID:** HFS1KU2

**Report No.:** EH/2011/B0018

**Issue Date:** Dec. 12, 2011

**FCC Rule Part:** 2 , 22H, 24E & 27

**Prepared for:** Quanta Computer Inc.  
No.211, Wen Hwa 2nd Road , Kuei Shan  
Hsiang Tao Yuan Shien, Taiwan

**Prepared by:** SGS Taiwan Ltd.  
Electronics & Communication Laboratory  
No. 134, Wu Kung Rd., Wuku Industrial Zone,  
Taipei County, Taiwan.

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## VERIFICATION OF COMPLIANCE

**Applicant:** Quanta Computer Inc.  
 No.211, Wen Hwa 2nd Road , Kuei Shan Hsiang Tao Yuan Shien, Taiwan

**Product Name:** 1KU2

**Brand Name:** N/A

**FCC ID:** HFS1KU2

**Model No.:** 1KU2

**Model Difference:** N/A

**File Number:** EH/2011/B0018

**Date of test:** Nov. 23, 2011 ~ Dec. 06, 2011

**Date of EUT Received:** Nov. 23, 2011

### We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C-2004 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule FCC PART 22 subpart H, PART 24 subpart E and PART 27.

The test results of this report relate only to the tested sample identified in this report.

**Test By:** Jay Lin **Date:** Dec. 12, 2011

\_\_\_\_\_  
*Jay Lin / Engineer*

**Prepared By:** Cherry Chen **Date:** Dec. 12, 2011

\_\_\_\_\_  
*Cherry Chen / Clerk*

**Approved By** Jim Chang **Date:** Dec. 12, 2011

\_\_\_\_\_  
*Jim Chang / Supervisor*

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### Version

Version No.	Date	Description
00	Dec. 12, 2011	Initial creation of document

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## 1. GENERAL PRODUCT INFORMATION

General:

Product Name:	1KU2
Brand Name:	N/A
Model No.:	1KU2
Model Difference:	N/A
Power Supply:	3.6 Vdc by DC Power Supply

GSM and WCDMA:

Cellular Phone Standards Frequency Range and Power	Operating Frequency		Rated Power
	WCDMA/HSUPA/HSDPA Band II	1852.4MHz –1907.6MHz	23 dBm
	WCDMA/HSUPA/HSDPA Band IV	1712.4MHz –1752.6MHz	23 dBm
	WCDMA/HSUPA/HSDPA Band V	826.4MHz –846.6MHz	23 dBm
Hardware Version:	G2D		
Software Version:	111111_1KU_M0.50		
Type of Emission	WCDMA Band II: 4M16F9W, HSUPA Band II: 4M16F9W HSDPA Band II: 4M15F9W WCDMA Band IV: 4M15F9W, HSUPA Band IV: 4M14F9W HSDPA Band IV: 4M16F9W WCDMA Band V: 4M15F9W, HSUPA Band V: 4M14F9W HSDPA Band V: 4M14F9W		
IMEI	004400152020000		

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Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
WCDMA B2	3.6 Vdc	650
HSUPA B2	3.6 Vdc	610
HSDPA B2	3.6 Vdc	640
WCDMA B4	3.6 Vdc	670
HSUPA B4	3.6 Vdc	620
HSDPA B4	3.6 Vdc	660
WCDMA B5	3.6 Vdc	610
HSUPA B5	3.6 Vdc	580
HSDPA B5	3.6 Vdc	600

This test report applies for WCDMA/HSDPA/HSUPA Band II/IV/V.

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### 1.1. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **HFS1KU2** filing to comply with Section Part 22 subpart H, Part 24 subpart E and Part 27 of the FCC CFR 47 Rules.

### 1.2. Test Methodology

Both conducted and radiated testing were performed according to the procedures document of TIA/EIA 603C and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

### 1.3. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-4

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 & 10 meters) and FCC Registration Number: 94644.

All equipment is calibrated externally and traceable to SI (International System of Unit).

### 1.4. Special Accessories

Not available for this EUT intended for grant.

### 1.5. Equipment Modifications

Not available for this EUT intended for grant.

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## 2. SYSTEM TEST CONFIGURATION

### 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements.

### 2.3. Test Procedure

#### 2.3.1 AC Power Line Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4: 2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

#### 2.3.2 Conducted Measurement at Antenna Port:

According to measurement procured TIA/EIA 603C, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

#### 2.3.3 Radiated Emissions (ERP/EIRP):

The EUT is a placed on as turn table which is 80 cm above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 2 of TIA/EIA 603C.

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## 2.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2010	04/18/2012
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2010	01/22/2012
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2010	05/12/2012
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2011	01/04/2012
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2011	01/04/2012
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2010	04/13/2012
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/05/2010	02/04/2012
DC Block	Agilent	BLK-18	155452	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2011	07/04/2012
Splitter	Agilent	11636B	N/A	07/05/2011	07/04/2012
DC Power Supply	Chroma	41901	777188	04/17/2010	04/16/2012
Power Meter	Anritsu	ML2495A	1005007	02/17/2010	02/16/2012

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ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2012
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2011	11/18/2012
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/10/2010	07/09/2012
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/10/2010	07/09/2012
Hor.n antenna	SCHWAZBECK	BBHA 9120D	309	01/22/2010	01/21/2012
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2010	05/08/2012
Signal Generator	R&S	SMR40	100210	01/22/2010	01/21/2012
Signal Generator	Agilent	E4438C	MY45093613	06/11/2011	06/10/2012
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2011	11/27/2012
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2012
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2011	07/04/2012
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2010	05/12/2012
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2011	01/04/2012
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2010	01/04/2012
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2010	01/04/2012
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2010	01/04/2012
3m Site	SGS	966 chamber	N/A	11/09/2011	11/08/2012

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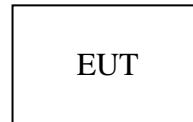
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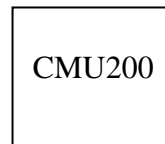
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## 2.5. Configuration of Tested System

**Fig. 2-1 Configuration of Tested System (Fixed Channel)**



**Remote Side**



**Table 2-1 Equipment Used in Tested System**

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Universal Radio Communication Tester	R&S	CMU200	102189	shielded	Un-shielded

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### 3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§2.1046(a) §22.913(a)(2) §24.232(c) §27.50(d)(2)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% Occupied Bandwidth	Compliant
§2.1051 §22.917(a) §24.238(a) §27.53(g)	Out of Band Emissions at Antenna Terminals and Band Edge	Compliant
§2.1053 §22.917(a) §24.238(a) §27.53(g)	Field Strength of Spurious Radiation	Compliant
§2.1055(a)(1) §22.355 §24.235 §27.54	Frequency Stability vs. Temperature	Compliant
§2.1055(d)(2) §22.355 §24.235 §27.54	Frequency Stability vs. Voltage	Compliant

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Max ERP/EIRP measurement result:

	dBm		W
WCDMA Band II	27.48	EIRP	0.560
HSUPA Band II	28.12	EIRP	0.649
HSDPA Band II	28.09	EIRP	0.644
WCDMA Band IV	25.26	EIRP	0.336
HSUPA Band IV	25.19	EIRP	0.330
HSDPA Band IV	25.01	EIRP	0.317
WCDMA Band V	22.07	ERP	0.161
HSUPA Band V	22.05	ERP	0.160
HSDPA Band V	21.86	ERP	0.153

#### 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

EUT staying in continuous transmitting mode. Channel Low, Mid and High for each band with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (E1 mode) and lie down position (E1, E2 mode) for WCDMA/HSUPA/HSDPA Band 2, Band 4 and Band 5 with DC Power Supply. The worst-case of E2 position for all test modes were reported.

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## 5. MEASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SPURIOUS RADIATION

Measurement uncertainty (Polarization : <b>Vertical</b> )	30MHz - 180MHz: 3.37dB
	180MHz -417MHz: 3.19dB
	0.417GHz-1GHz: 3.19dB
	1GHz - 18GHz: 4.04dB
	18GHz - 40GHz: 4.04dB

Measurement uncertainty (Polarization : <b>Horizontal</b> )	30MHz - 167MHz: 4.22dB
	167MHz -500MHz: 3.44dB
	0.5GHz-1GHz: 3.39dB
	1GHz - 18GHz: 4.08dB
	18GHz - 40GHz: 4.08dB

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## 6. RF POWER OUTPUT MEASUREMENT

### 6.1. Standard Applicable:

According to FCC §2.1046.

FCC 22.913(a) Mobile station are limited to 7W.

FCC 24.232(c) Peak Power Measurement limited to 2W

Part 27, 50(d) (2) mobile / portable stations are limited to 1W

3GPP Power limitation for HSDPA and HSUPA

#### Maximum Output Powers for HSDPA

Sub-test in table C.10.1.4	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+1.7/-3.7	+21	+2.7/-2.7
2	+24	+1.7/-3.7	+21	+2.7/-2.7
3	+23.5	+2.2/-3.7	+20.5	+3.2/-2.7
4	+23.5	+2.2/-3.7	+20.5	+3.2/-2.7

#### Maximum Output Powers for HSUPA

Sub-test in table C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+1.7/-6.7	+21	+2.7/-5.7
2	+22	+3.7/-5.2	+19	+4.7/-4.2
3	+23	+2.7/-5.2	+20	+3.7/-4.2
4	+22	+3.7/-5.2	+19	+4.7/-4.2
5	+24	+1.7/-6.7	+21	+2.7/-5.7

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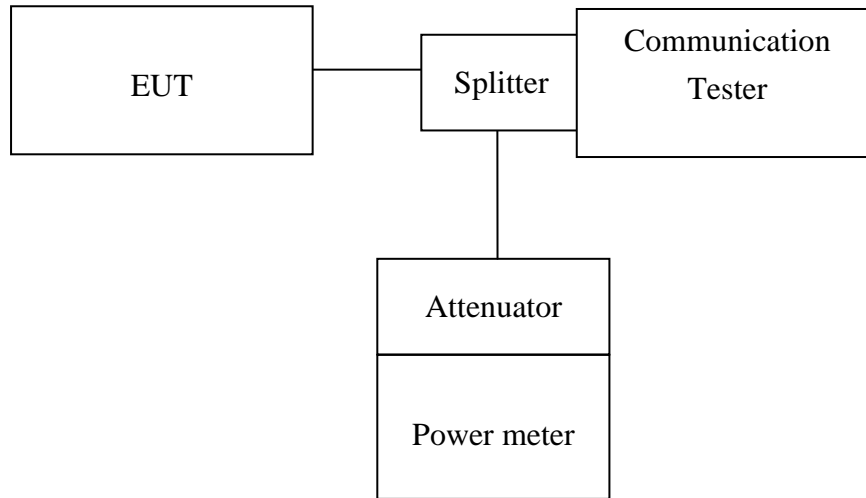
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**6.2. Test Set-up:**



*Note: Measurement setup for testing on Antenna connector*

**6.3. Measurement Procedure:**

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

**6.4. Measurement Equipment Used:**

Refer to section 2.4 in this report

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## 6.5. Measurement Result:

### 6.5.1 RF Conducted Output Power

#### 6.5.1.1.: GSM/EDGE (GMSK; 8-PSK)

Result: N/A

#### 6.5.1.2: WCDMA mode

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.4.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7). RMC 12.2kps is used for this testing.

#### Results:

UMTS B2	WCDMA		HSDPA		HSUPA	
	PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)
CH 9262	26.20	22.99	25.48	21.92	24.31	20.65
CH 9400	26.58	23.42	25.98	22.37	24.59	20.93
CH 9538	26.16	23.08	25.87	22.20	24.37	20.97

UMTS B4	WCDMA		HSDPA		HSUPA	
	PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)
CH 1312	26.92	23.91	26.84	23.43	26.58	22.81
CH 1413	26.87	23.81	26.73	23.18	26.31	22.55
CH 1513	26.98	24.11	26.92	23.50	26.43	22.94

UMTS B5	WCDMA		HSDPA		HSUPA	
	PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)
CH 4132	27.20	24.17	26.91	23.56	26.20	22.79
CH 4183	27.15	24.15	26.79	23.47	26.33	22.83
CH 4233	27.19	24.06	27.46	23.75	27.20	23.13

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

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**6.5.1.3: HSDPA Release 6 mode**

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing

**HSDPA SUB-TEST Setting**

**Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

**Note: The recommended HSDPA MPRs are implemented as per following sub-tests.**

**Result: Please refer to next page for test result.**

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**Results:**

Mode	Sub-test	Transmitter Power (dBm) Channel			Power Class 3 Limitation (dBm)	Comments
		9262	9400	9538		
HSDPA (B2)	1	23.28	23.68	23.35	20.3dBm – 25.7dBm	Pass
	2	22.87	23.28	22.93	20.3dBm – 25.7dBm	Pass
	3	22.80	23.23	22.83	19.8dBm – 25.7dBm	Pass
	4	22.87	23.24	22.94	19.8dBm – 25.7dBm	Pass

Mode	Sub-test	Transmitter Power (dBm) Channel			Power Class 3 Limitation (dBm)	Comments
		1312	1413	1513		
HSDPA (B4)	1	23.62	23.91	23.95	20.3dBm – 25.7dBm	Pass
	2	23.79	23.67	23.96	20.3dBm – 25.7dBm	Pass
	3	23.14	23.46	23.42	19.8dBm – 25.7dBm	Pass
	4	23.21	23.47	23.54	19.8dBm – 25.7dBm	Pass

Mode	Sub-test	Transmitter Power (dBm) Channel			Power Class 3 Limitation (dBm)	Comments
		4132	4183	4233		
HSDPA (B5)	1	24.39	24.40	24.25	20.3dBm – 25.7dBm	Pass
	2	24.10	24.04	23.93	20.3dBm – 25.7dBm	Pass
	3	23.93	23.92	23.76	19.8dBm – 25.7dBm	Pass
	4	23.98	23.96	23.82	19.8dBm – 25.7dBm	Pass

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**6.5.1.4: HSPA (HSDPA & HSUPA) Release 6 mode**

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing

**HSPA SUB-TEST Setting**

**Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$	$\beta_{ec}$	$\beta_{ed}$	$\beta_{ed}$ (SF)	$\beta_{ed}$ (Codes)	CM (dB)	MPR (dB)	AG Index	E-TFCI	RMC (Kbps)
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75	12.2
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	12.2
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}$ : 47/15 $\beta_{ed2}$ : 47/15	4 4	2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

**Note: The recommended HSUPA are implemented as per following sub-tests.**

**Results: Please refer to next page for test result.**

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**Result:**

Mode	Sub-test	TX Power (dBm) Channel			Power Class 3 Limita- tion (dBm)	Comments
		9262	9400	9538		
HSUPA(B2)	1	22.91	23.40	22.96	18.8dBm – 25.7dBm	Pass
	2	20.93	21.36	21.00	16.8dBm – 25.7dBm	Pass
	3	21.84	22.28	21.97	17.8dBm – 25.7dBm	Pass
	4	21.05	21.50	21.00	16.8dBm – 25.7dBm	Pass
	5	22.77	23.28	22.87	18.8dBm – 25.7dBm	Pass

Mode	Sub-test	TX Power (dBm) Channel			Power Class 3 Limita- tion (dBm)	Comments
		1312	1413	1513		
HSUPA(B4)	1	23.83	23.79	24.05	18.8dBm – 25.7dBm	Pass
	2	21.88	21.86	22.09	16.8dBm – 25.7dBm	Pass
	3	22.89	22.81	23.13	17.8dBm – 25.7dBm	Pass
	4	22.01	21.91	22.13	16.8dBm – 25.7dBm	Pass
	5	23.72	23.65	23.96	18.8dBm – 25.7dBm	Pass

Mode	Sub-test	TX Power (dBm) Channel			Power Class 3 Limita- tion (dBm)	Comments
		4132	4183	4233		
HSUPA(B5)	1	24.13	24.08	23.97	18.8dBm – 25.7dBm	Pass
	2	22.19	22.16	22.01	16.8dBm – 25.7dBm	Pass
	3	23.10	23.14	23.00	17.8dBm – 25.7dBm	Pass
	4	22.24	22.22	22.09	16.8dBm – 25.7dBm	Pass
	5	23.99	23.91	23.86	18.8dBm – 25.7dBm	Pass

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**6.5.1.5: Minimum Communications Power Measurement:****PCS 1900 band: N/A for this test item.**

Note: The EUT output power was controlled by simulator. Set Communication Tester CMU200 PCL as above, and get the mobile phone output power reading.

**WCDMA/HSDPA/HSUPA band II/IV/V**

The EUT output power was controlled by simulator. Set Communication Tester CMU200 function key “UE Power Control” and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm. then record the read(see page 18 for measurement data) . The min. power was measures by a function key “minimum power” then record the read. It is -52.5dBm. The power variation can be 0.1dB step by setting.

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## 7. ERP, EIRP MEASUREMENT

### 7.1. Standard Applicable:

According to FCC §2.1046

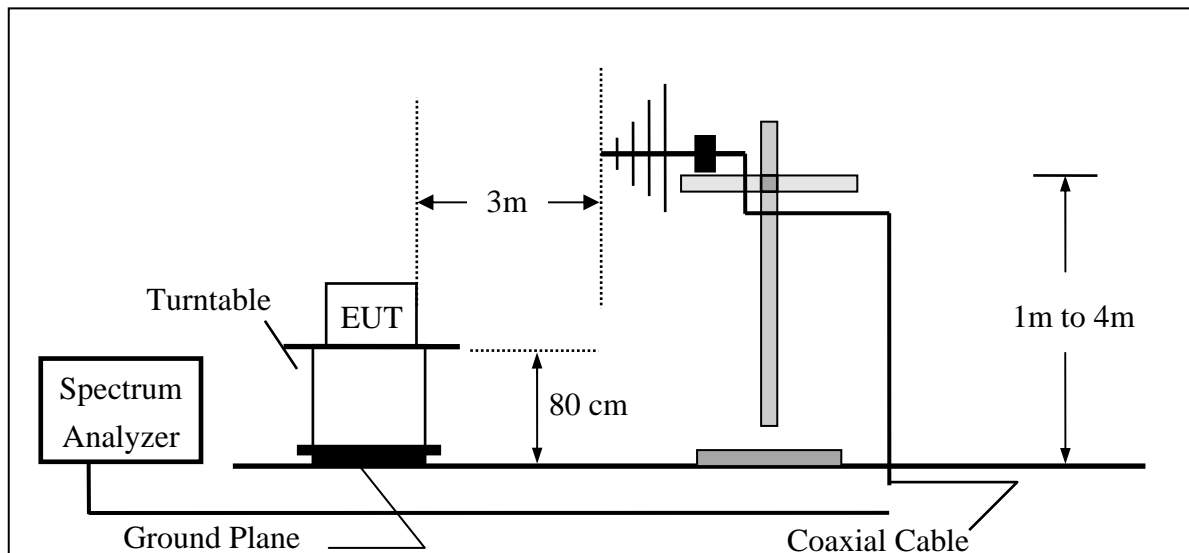
FCC 22.913(a) Mobile station are limited to 7W ERP.

FCC 24.232(b) Mobile station are limited to 2W EIRP.

FCC 27.50(d)(2) Fixed, mobile, and portable (hand-held) stations are limited to 1W EIRP.

### 7.2. Test SET-UP (Block Diagram of Configuration):

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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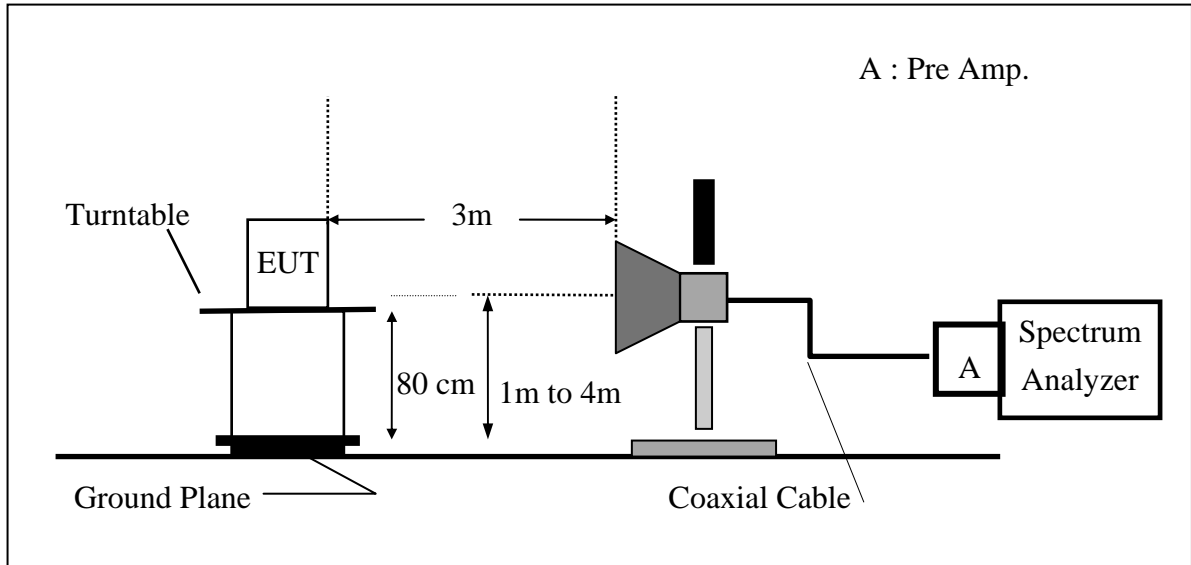
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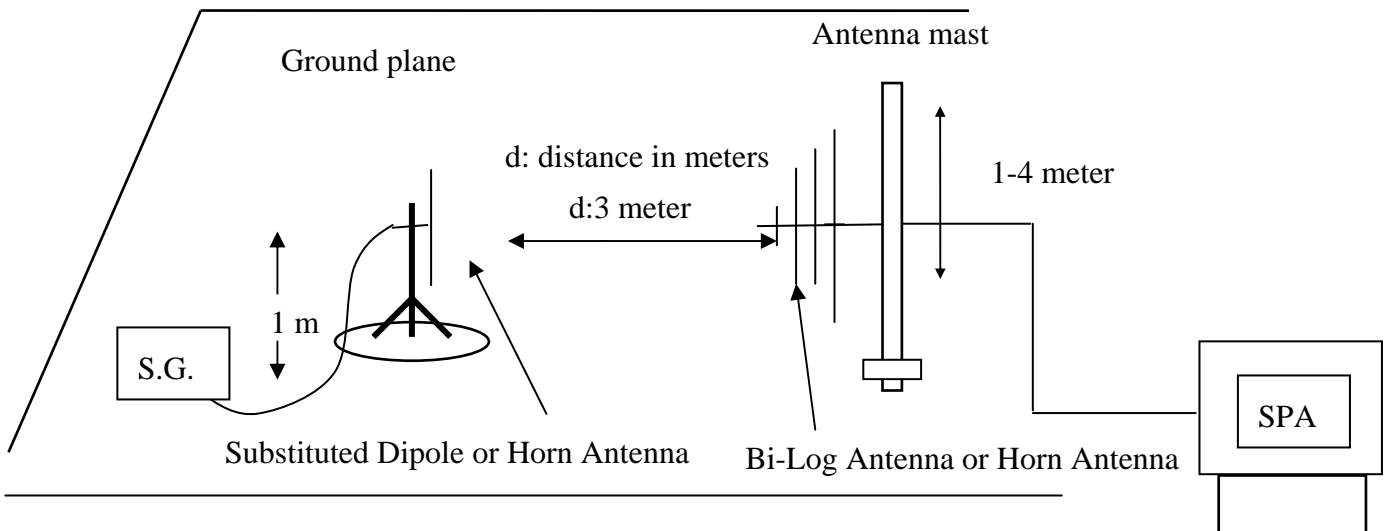
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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



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### 7.3. Measurement Procedure:

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement, the EUT was in communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824.2 –848.80MHz were measured using a substitution method. The EUT was replaced by a dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1710-1755MHz and 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$

### 7.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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7.5. Measurement Result:

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
WCDMA Band II	1852.40	9262	V	24.80	4.17	-5.49	23.49	33.00
			H	22.78	4.51	-5.49	21.80	33.00
	1880.00	9400	V	28.06	4.13	-5.56	26.64	33.00
			H	21.21	4.44	-5.56	20.09	33.00
	1907.60	9538	V	28.94	4.10	-5.56	27.48	33.00
			H	23.75	4.37	-5.62	22.49	33.00
HSUPA Band II	1852.40	9262	V	22.83	4.17	-5.49	21.52	33.00
			H	23.34	4.51	-5.49	22.36	33.00
	1880.00	9400	V	28.16	4.14	-5.56	26.74	33.00
			H	21.70	4.44	-5.56	20.58	33.00
	1907.60	9538	V	29.65	4.10	-5.62	<b>28.12</b>	33.00
			H	24.42	4.37	-5.62	23.17	33.00
HSDPA Band II	1852.40	9262	V	22.83	4.17	-5.49	21.51	33.00
			H	23.31	4.51	-5.49	22.33	33.00
	1880.00	9400	V	28.20	4.14	-5.56	26.78	33.00
			H	21.67	4.44	-5.56	20.54	33.00
	1907.60	9538	V	29.62	4.10	-5.62	28.09	33.00
			H	24.56	4.37	-5.62	23.31	33.00

Remark :

- (1) The RBW,VBW of SPA for frequency RBW= 5MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
WCDMA Band IV	1712.40	1312	V	24.69	4.40	-5.40	23.69	33.00
			H	21.96	4.79	-5.40	21.35	33.00
	1732.60	1413	V	23.57	4.78	-5.42	22.92	33.00
			H	26.34	4.35	-5.42	<b>25.26</b>	33.00
	1752.60	1513	V	23.10	4.31	-5.44	21.97	33.00
			H	22.01	4.77	-5.44	21.34	33.00
HSUPA Band IV	1712.40	1312	V	24.76	4.40	-5.40	23.75	33.00
			H	22.21	4.79	-5.40	21.60	33.00
	1732.60	1413	V	26.26	4.35	-5.42	25.19	33.00
			H	23.95	4.78	-5.42	23.31	33.00
	1752.60	1513	V	23.19	4.31	-5.44	22.06	33.00
			H	21.95	4.77	-5.44	21.27	33.00
HSDPA Band IV	1712.40	1312	V	24.88	4.4	-5.40	23.88	33.00
			H	22.25	4.79	-5.40	21.64	33.00
	1732.60	1413	V	26.08	4.35	-5.42	25.01	33.00
			H	23.98	4.78	-5.42	23.33	33.00
	1752.60	1513	V	23.24	4.31	-5.44	22.12	33.00
			H	21.88	4.77	-5.44	21.20	33.00

**Remark :**

- (1) The RBW,VBW of SPA for frequency RBW= 5MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
WCDMA Band V	826.40	4132	V	21.18	4.00	-4.24	20.94	38.45
			H	21.78	3.99	-4.24	21.54	38.45
	836.60	4183	V	22.32	3.97	-4.22	<b>22.07</b>	38.45
			H	22.28	3.97	-4.22	22.03	38.45
	846.60	4233	V	21.35	4.02	-4.24	21.13	38.45
			H	20.39	4.02	-4.24	20.18	38.45
HSUPA Band V	826.40	4132	V	20.33	3.97	-4.22	20.07	38.45
			H	19.93	3.97	-4.22	19.68	38.45
	836.60	4183	V	19.17	3.99	-4.24	18.93	38.45
			H	19.38	3.99	-4.24	19.14	38.45
	846.60	4233	V	22.11	4.02	-4.24	21.90	38.45
			H	22.27	4.02	-4.24	22.05	38.45
HSDPA Band V	826.40	4132	V	20.31	3.97	-4.22	20.06	38.45
			H	19.92	3.97	-4.22	19.66	38.45
	836.60	4183	V	19.21	3.99	-4.24	18.97	38.45
			H	19.52	3.99	-4.24	19.27	38.45
	846.60	4233	V	22.08	4.02	-4.24	21.86	38.45
			H	21.66	4.02	-4.24	21.45	38.45

**Remark :**

- (1) The RBW,VBW of SPA for frequency RBW= 5MHz , VBW= 8MHz

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## 8. 99% OCCUPIED BANDWIDTH MEASUREMENT

### 8.1. Standard Applicable:

According to §FCC 2.1049.

### 8.2. Test Set-up:

Refer to section 5.2 in this report

### 8.3. Measurement Procedure:

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW (10/30KHz) was set to about 1% of emission BW, VBW= 3 times RBW(30/100KHz), -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

### 8.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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**8.5. Measurement Result:**

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
WCDMA II	1852.40	9262	4.1415
	1880.00	9400	4.1455
	1907.60	9538	4.1558

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSUPA II	1852.40	9262	4.1435
	1880.00	9400	4.1542
	1907.60	9538	4.1554

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSDPA II	1852.40	9262	4.1369
	1880.00	9400	4.1454
	1907.60	9538	4.1478

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
WCDMA IV	1712.40	1312	4.1447
	1732.60	1413	4.1498
	1752.60	1513	4.1315

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EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSUPA IV	1712.40	1312	4.1457
	1732.60	1413	4.1311
	1752.60	1513	4.1392

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSDPA IV	1712.40	1312	4.1331
	1732.60	1413	4.1620
	1752.60	1513	4.1292

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
WCDMA V	826.40	4132	4.1369
	836.60	4183	4.1202
	946.60	4233	4.1511

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSUPA V	826.40	4132	4.1290
	836.60	4183	4.1411
	946.60	4233	4.1420

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSDPA V	826.40	4132	4.1350
	836.60	4183	4.1302
	946.60	4233	4.1244

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Figure 8-1: WCDMA II Channel Low

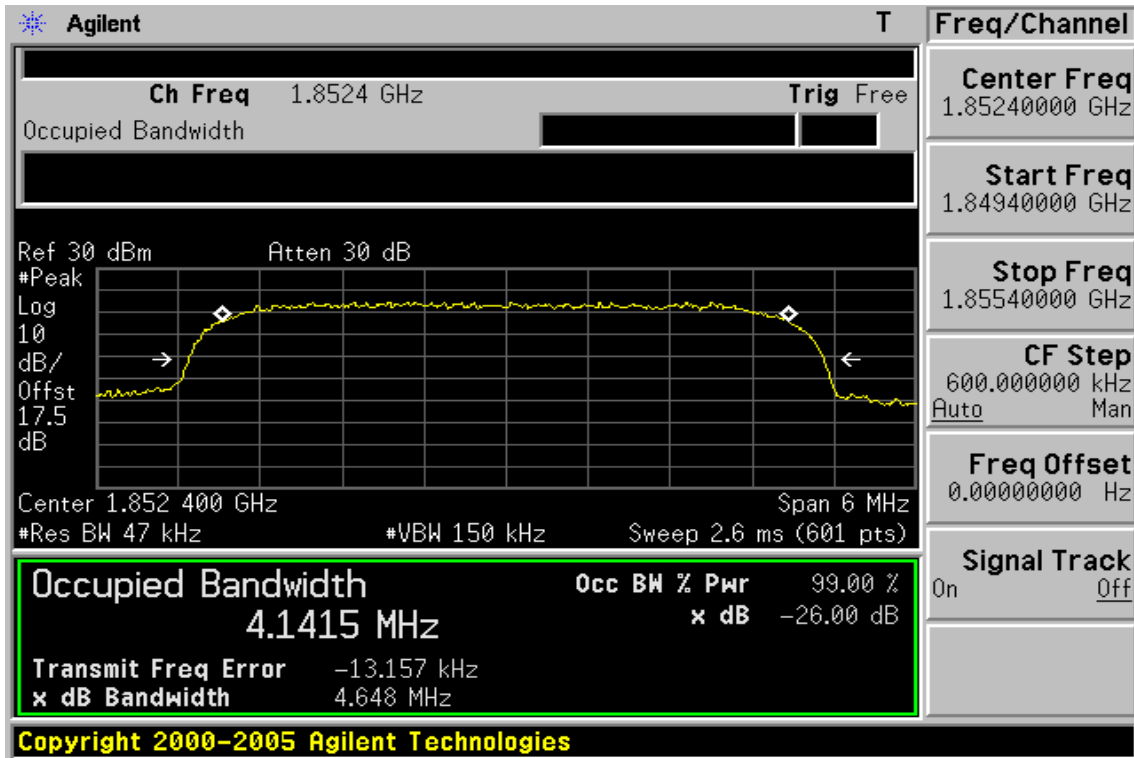
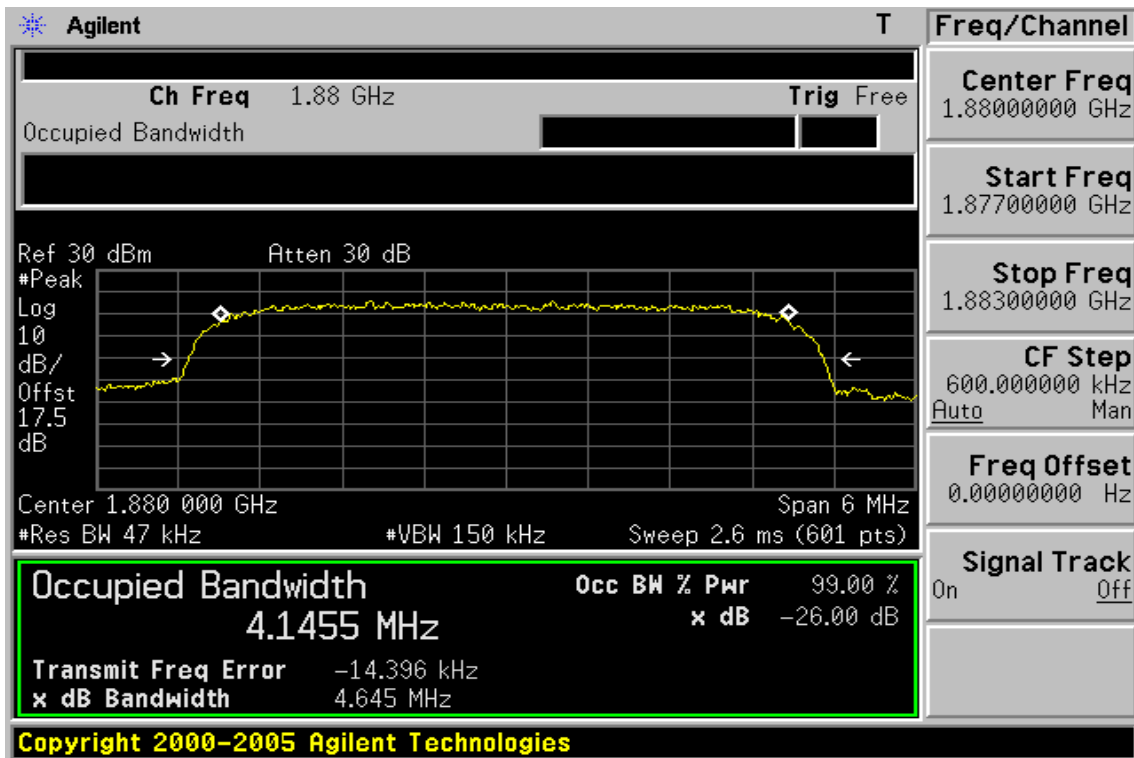


Figure 8-2: WCDMA II Channel Mid



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Figure 8-3: WCDMA II Channel High

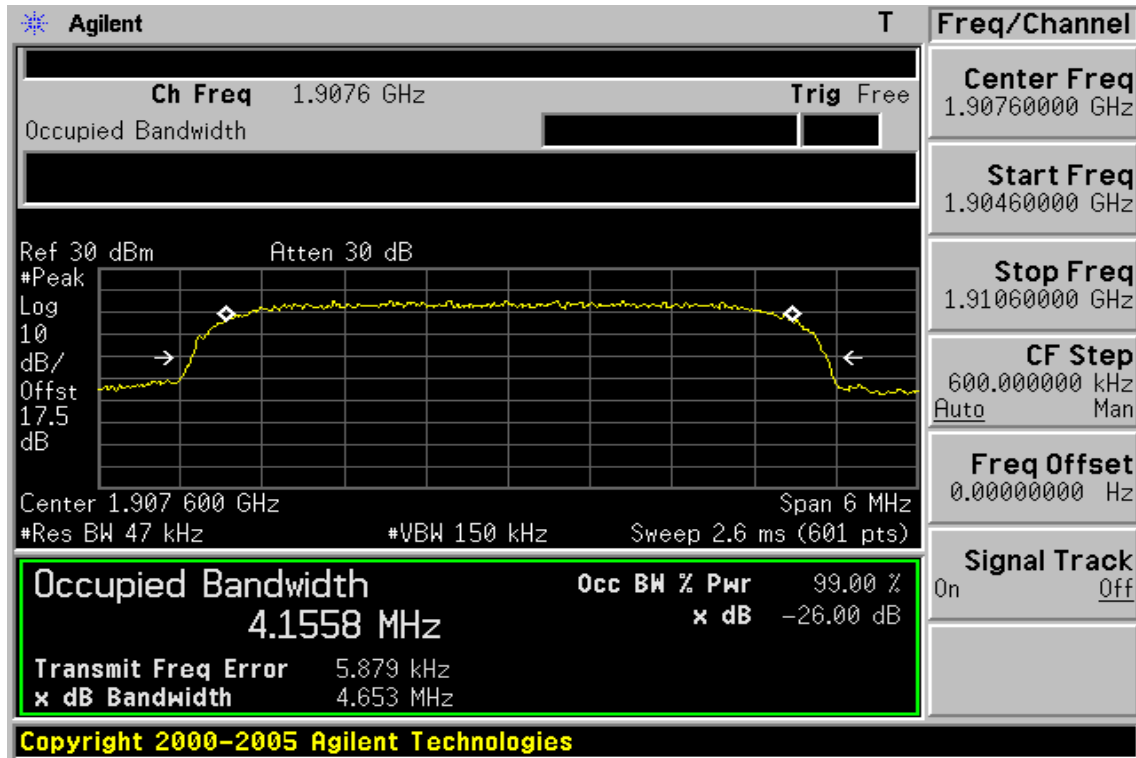
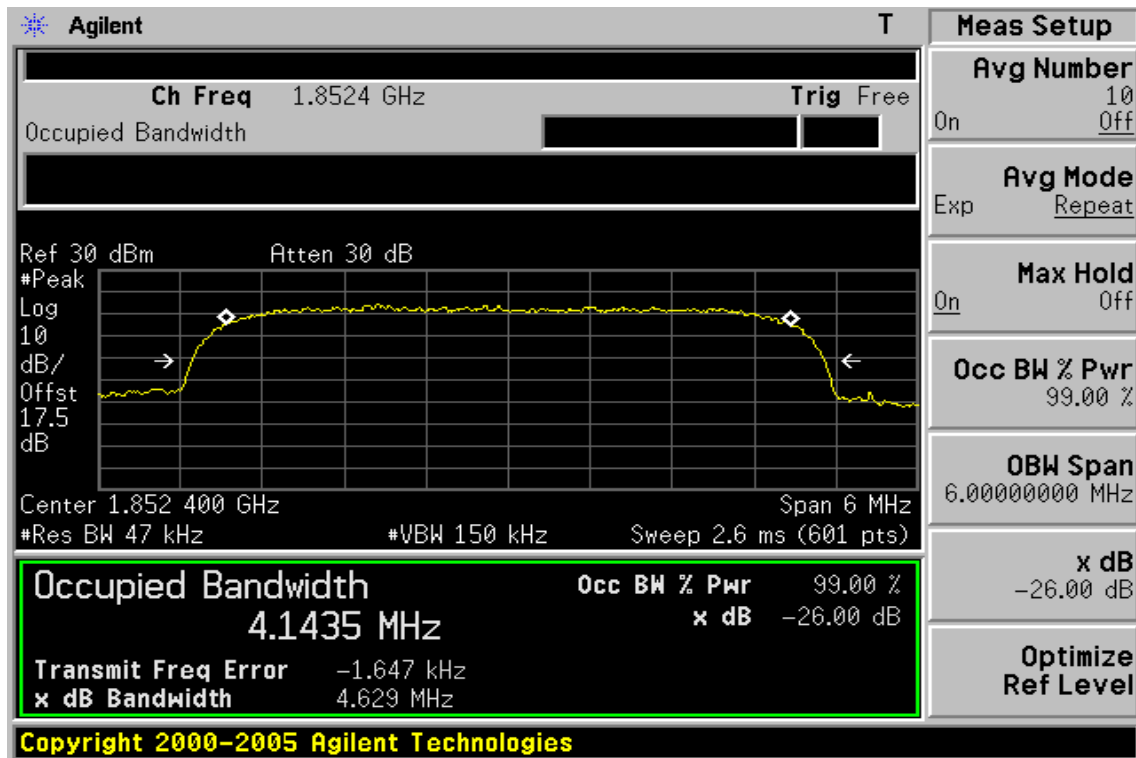


Figure 8-4: HSUPA II Channel Low



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Figure 8-5: HSUPA II Channel Mid

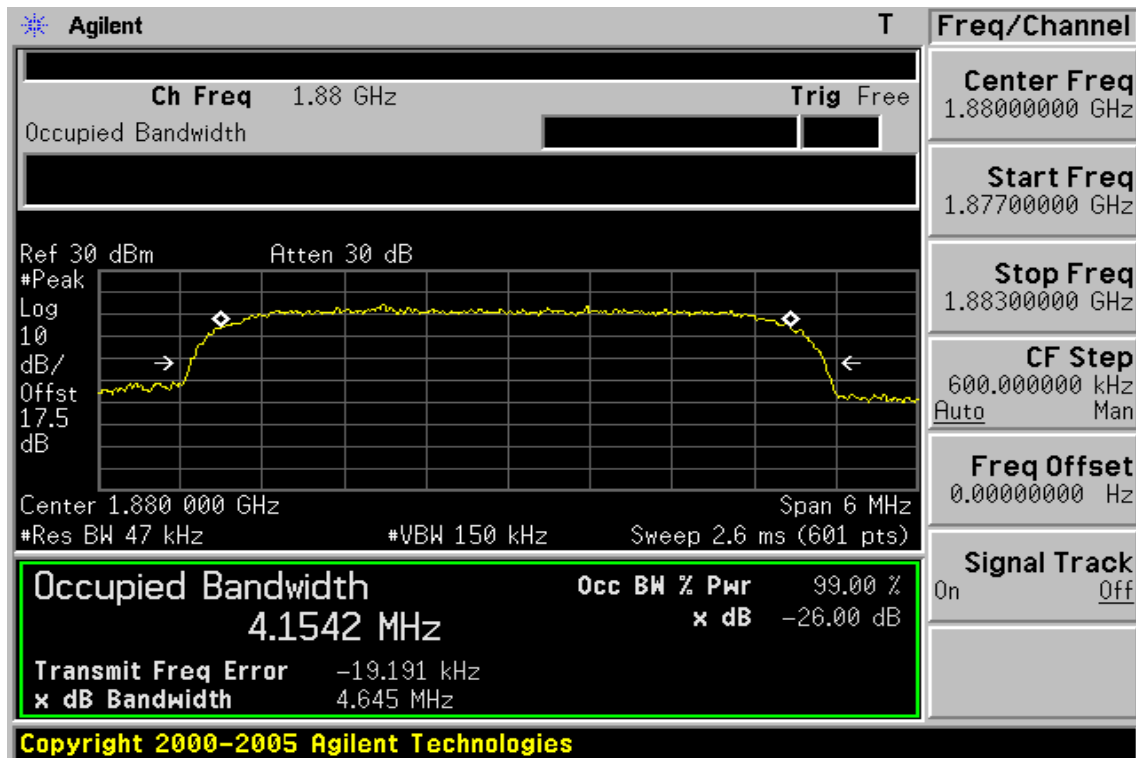
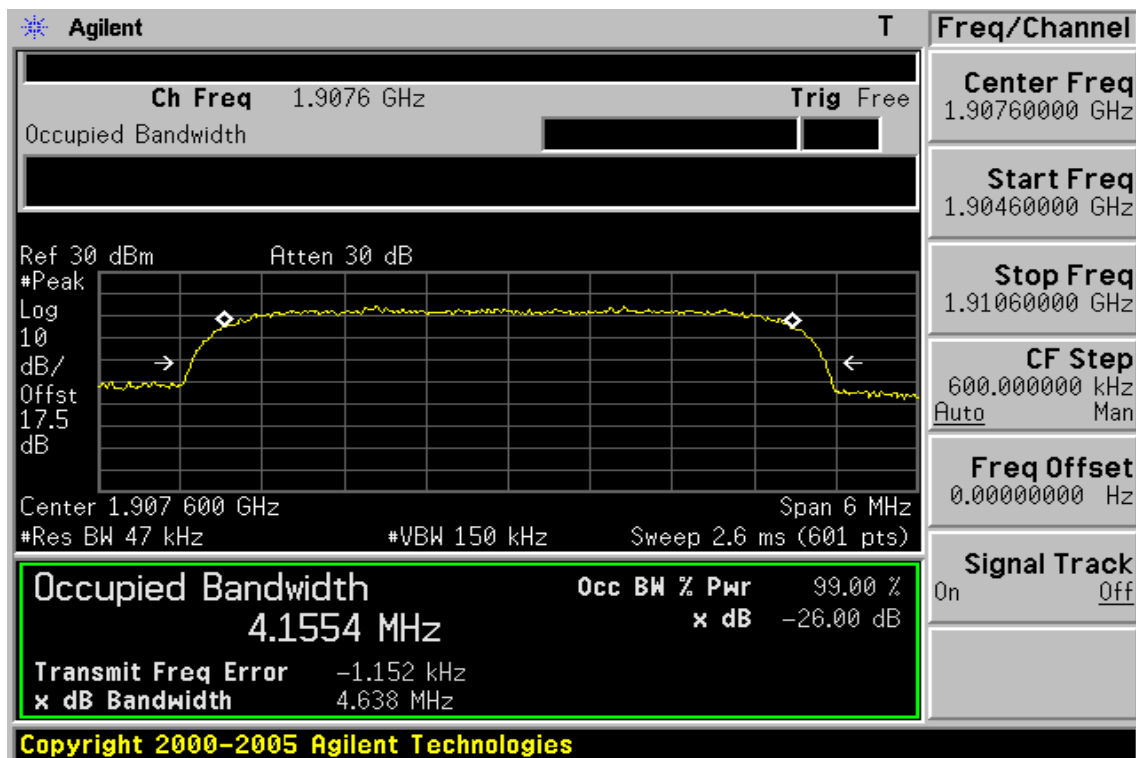


Figure 8-6: HSUPA II Channel High



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Figure 8-7: HSDPA II Channel Low

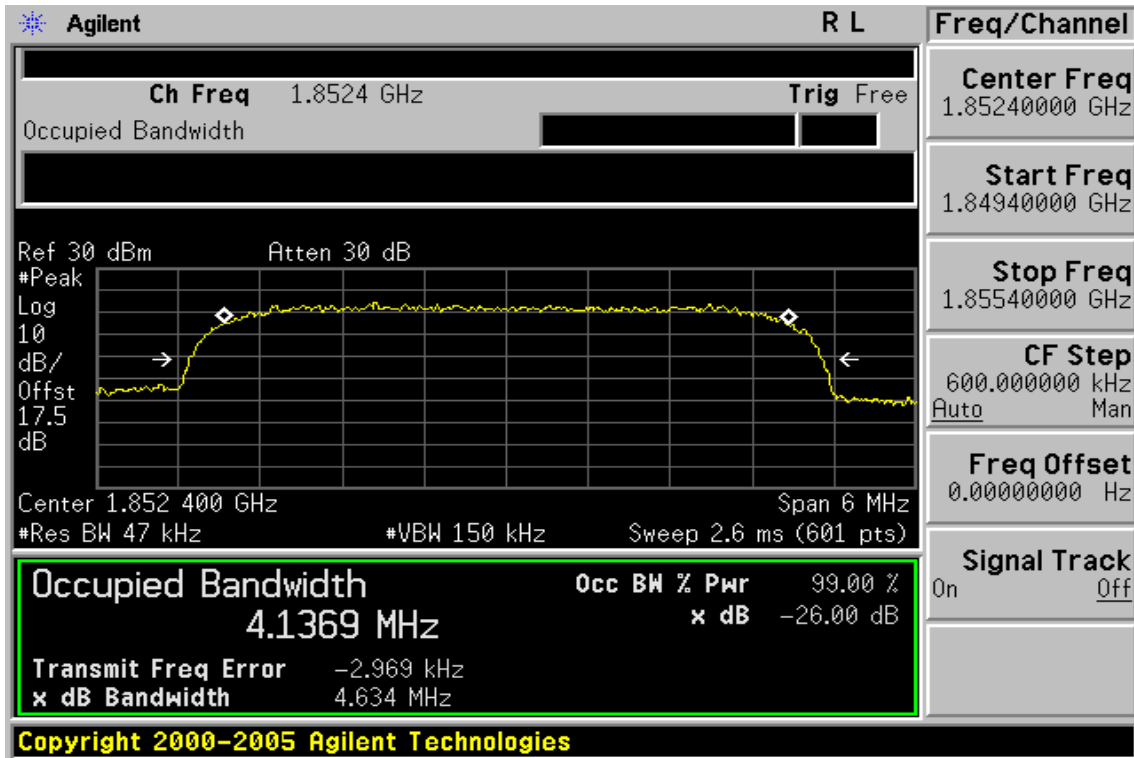
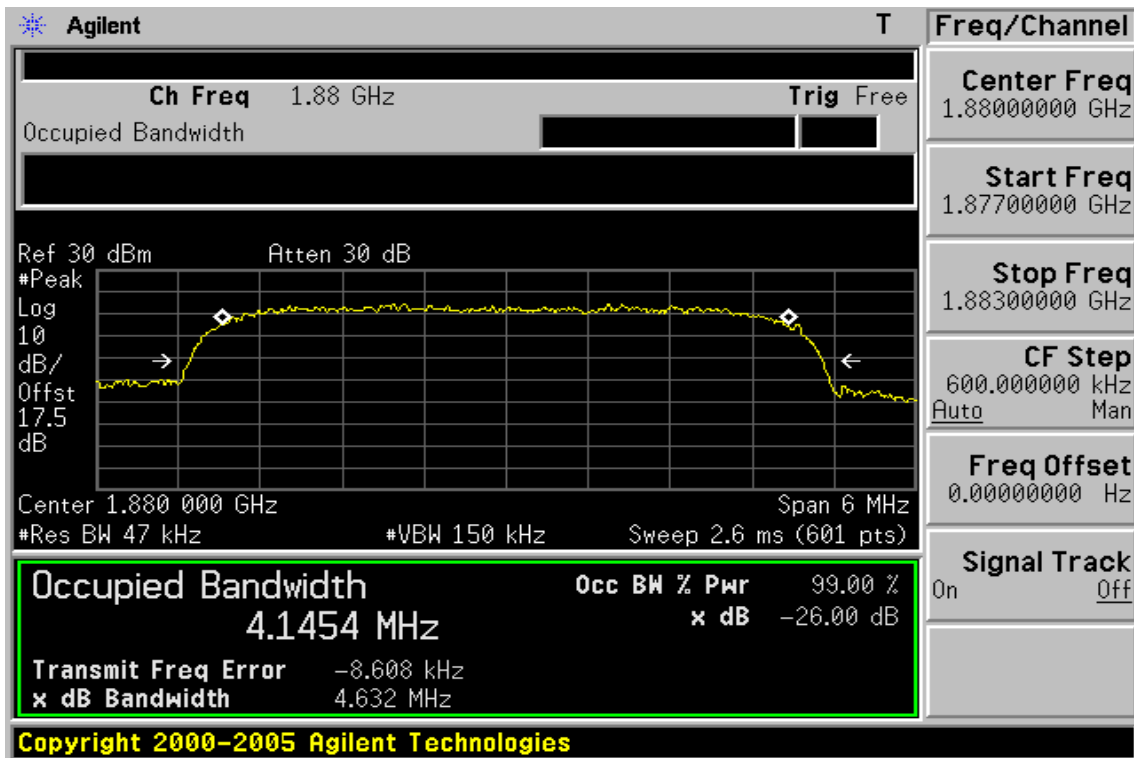


Figure 8-8: HSDPA II Channel Mid



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Figure 8-9: HSDPA II Channel High

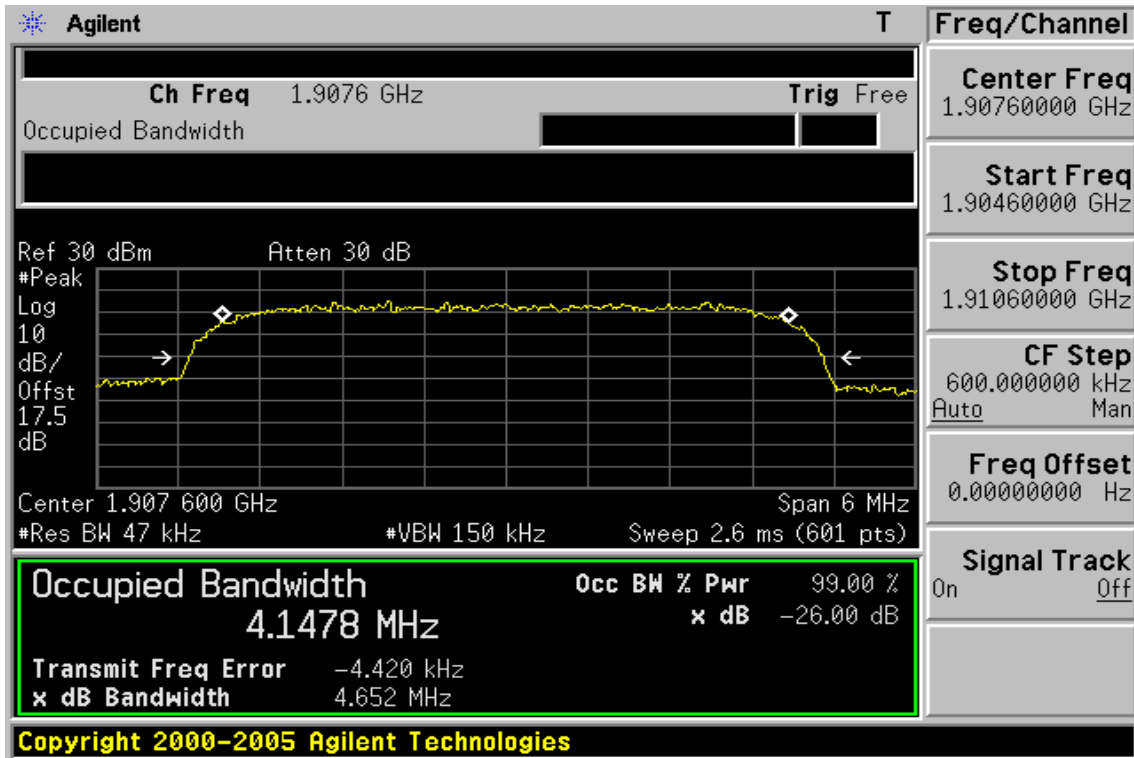
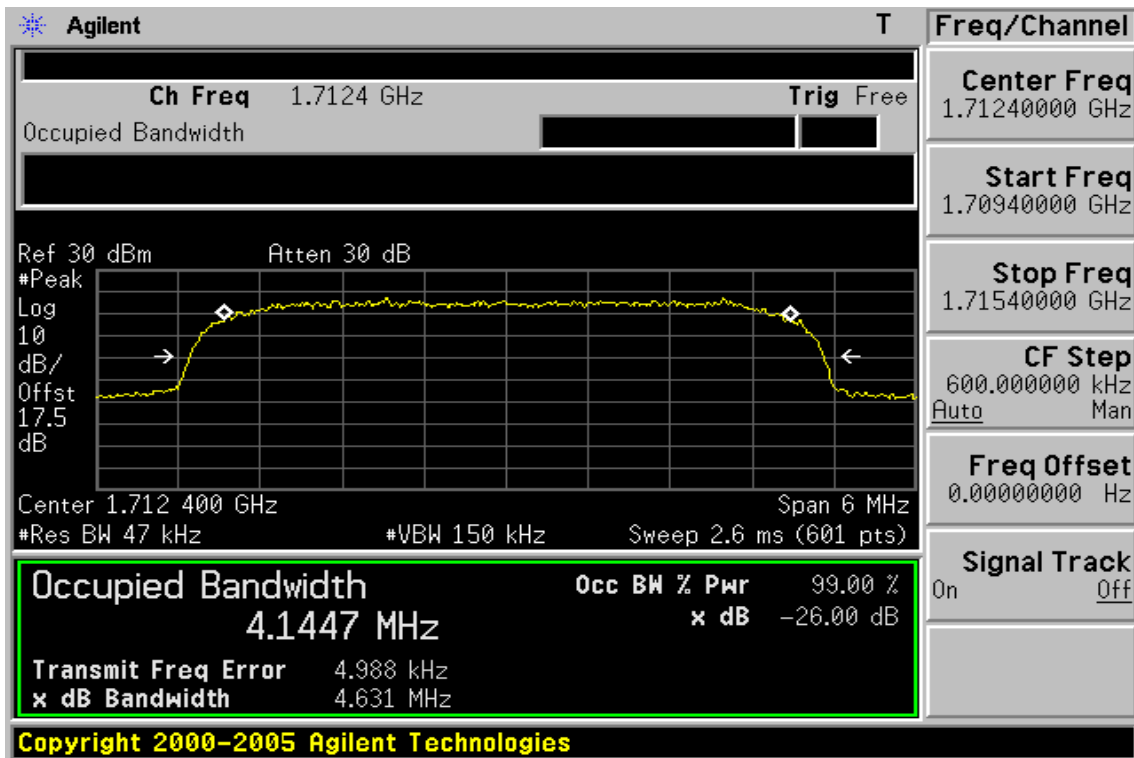


Figure 8-10: WCDMA IV Channel Low



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Figure 8-11: WCDMA IV Channel Mid

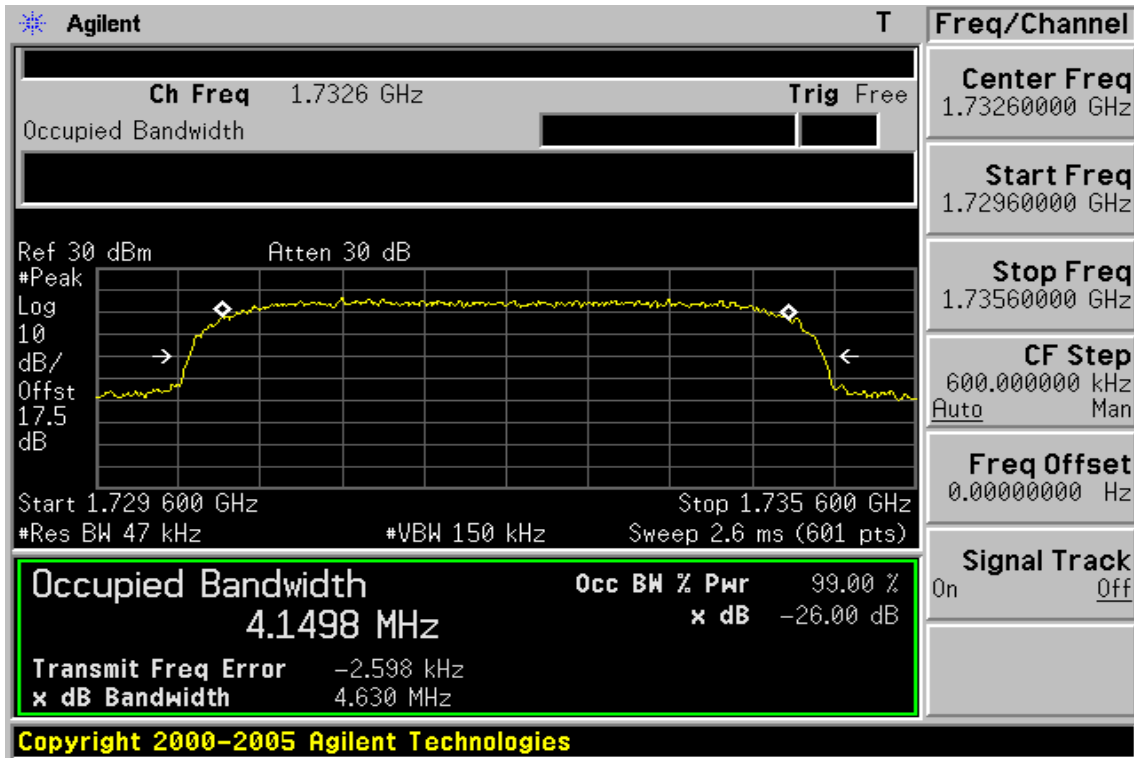
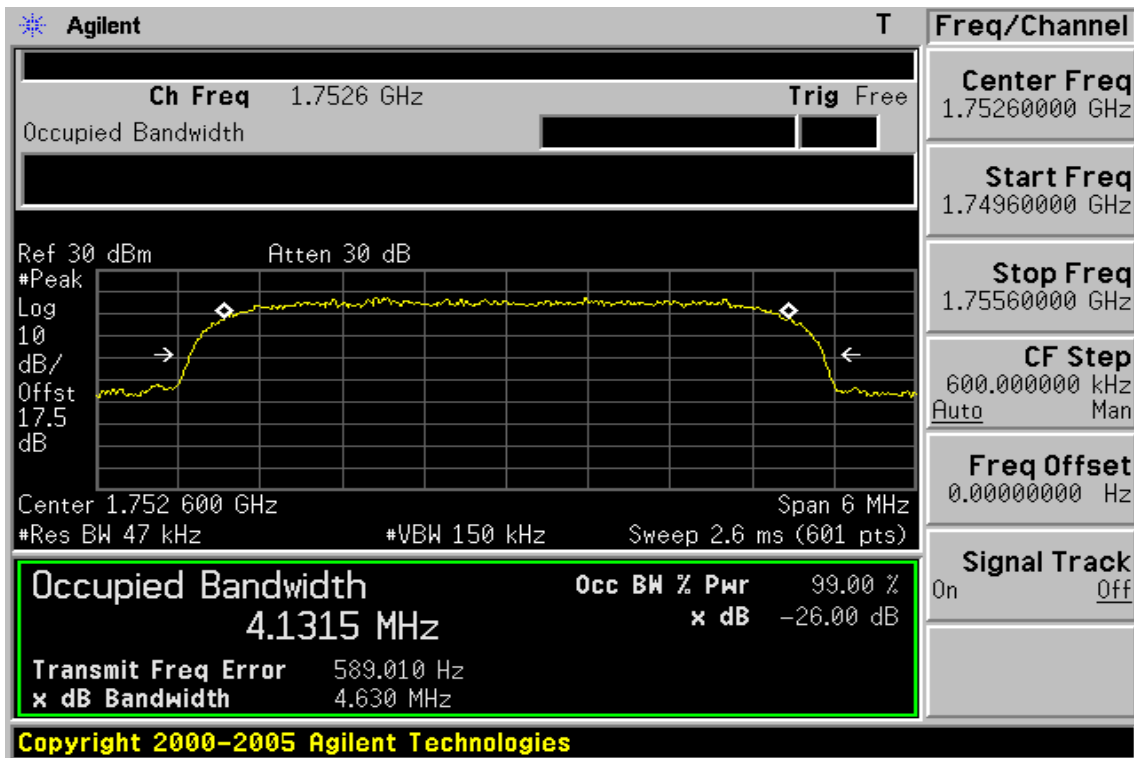


Figure 8-12: WCDMA IV Channel High



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Figure 8-13: HSUPA IV Channel Low

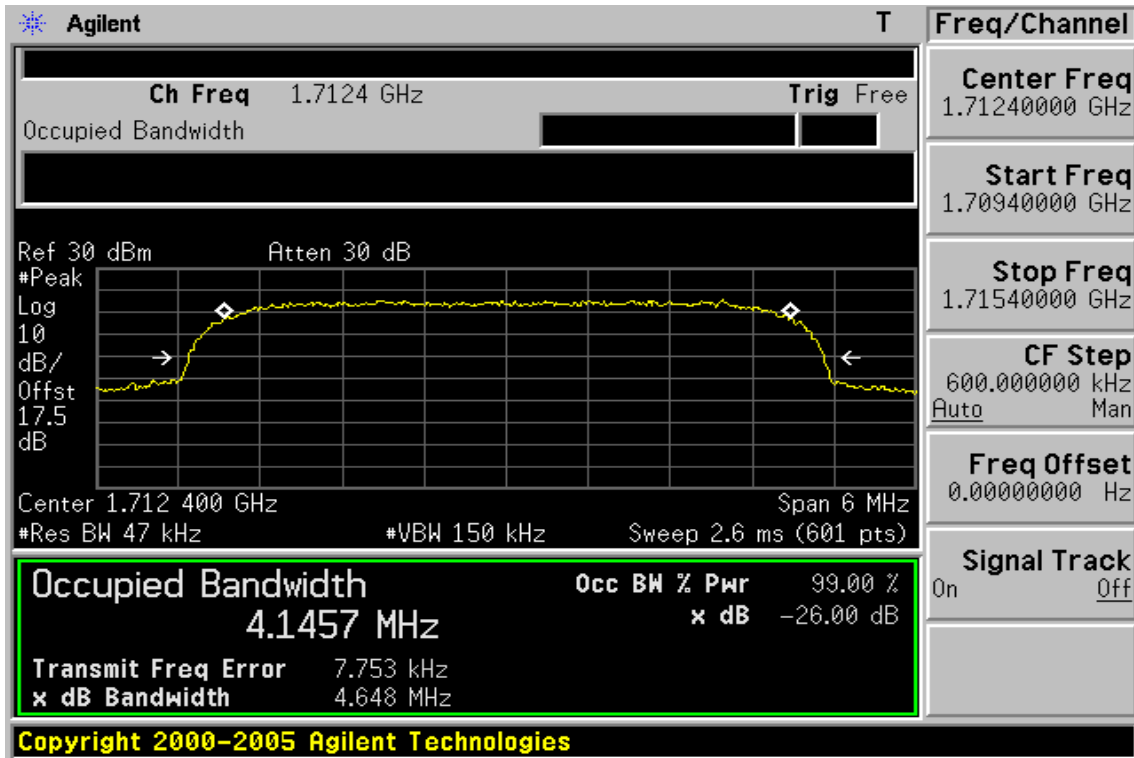
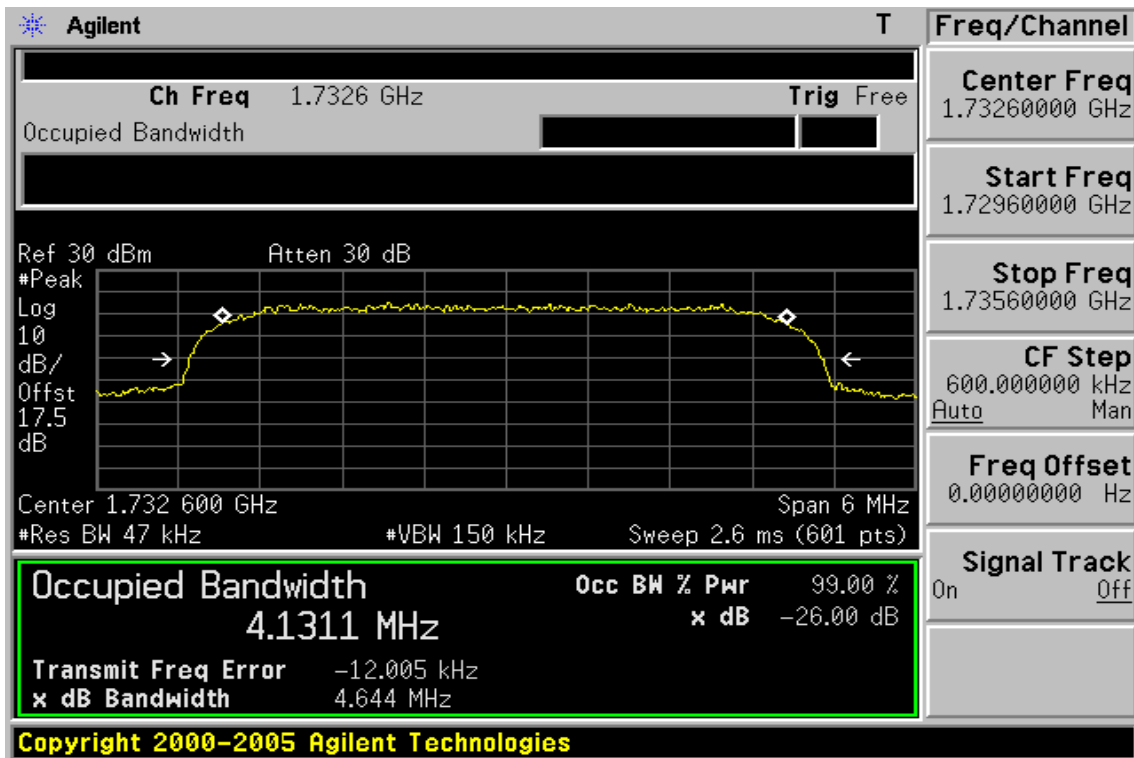


Figure 8-14: HSUPA IV Channel Mid



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Figure 8-15: HSUPA IV Channel High

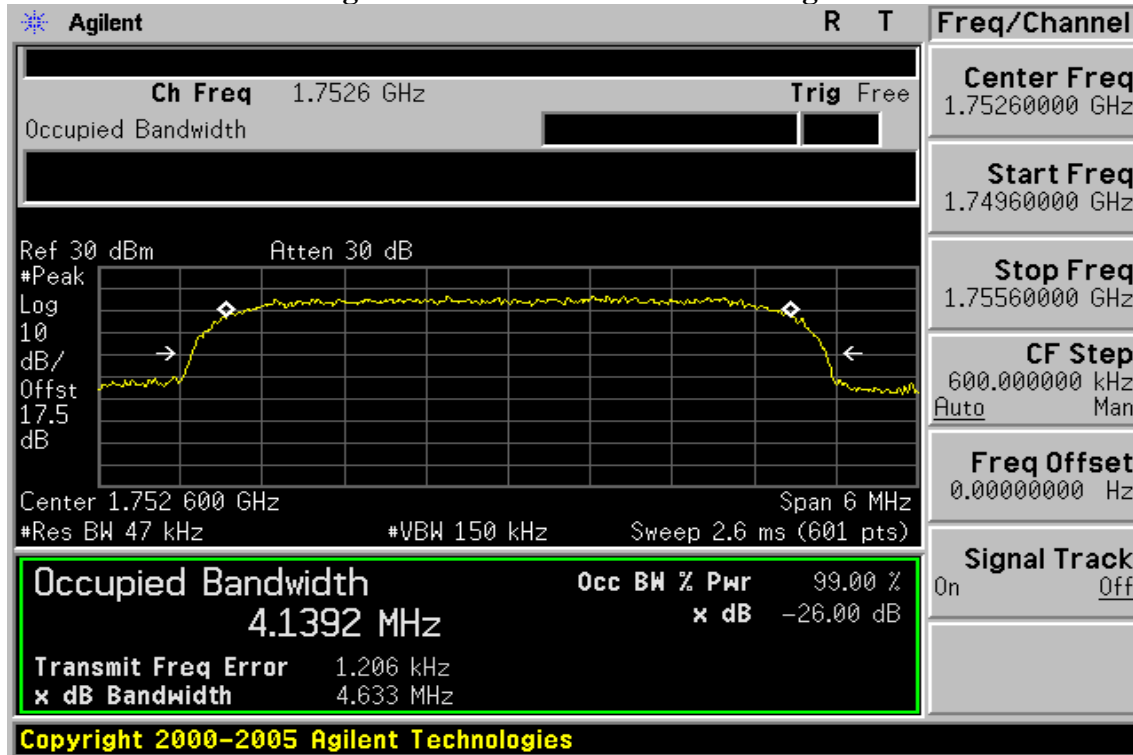
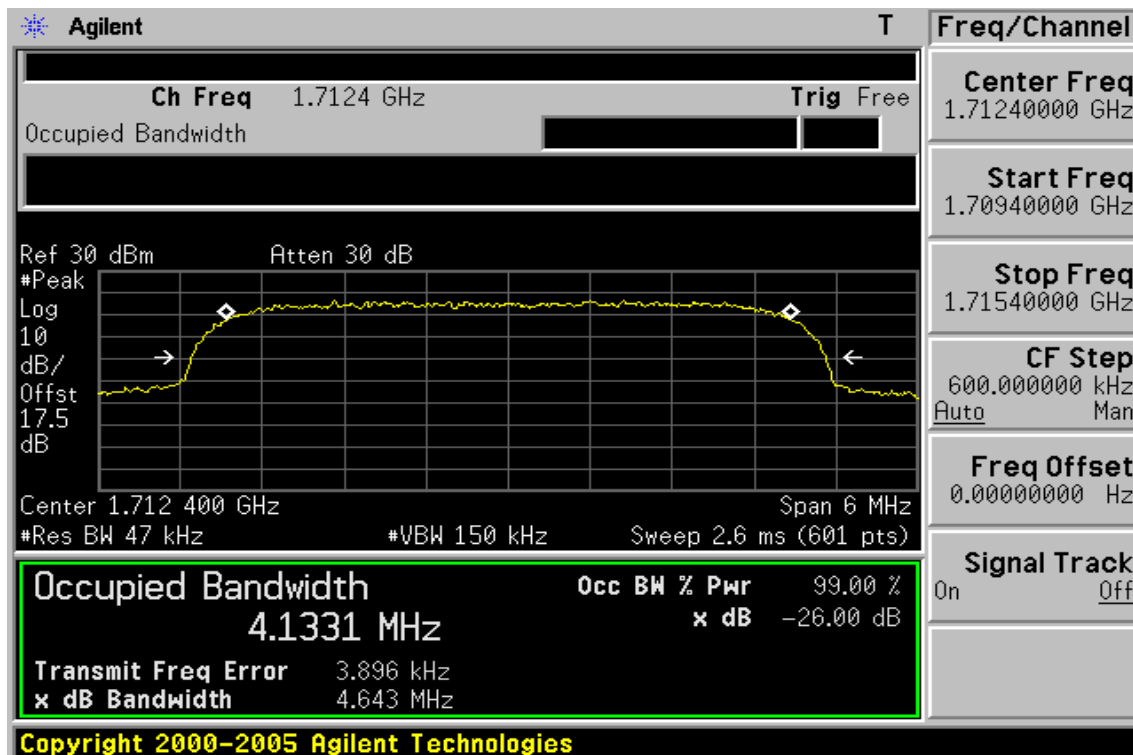


Figure 8-16: HSDPA IV Channel Low



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Figure 8-17: HSDPA IV Channel Mid

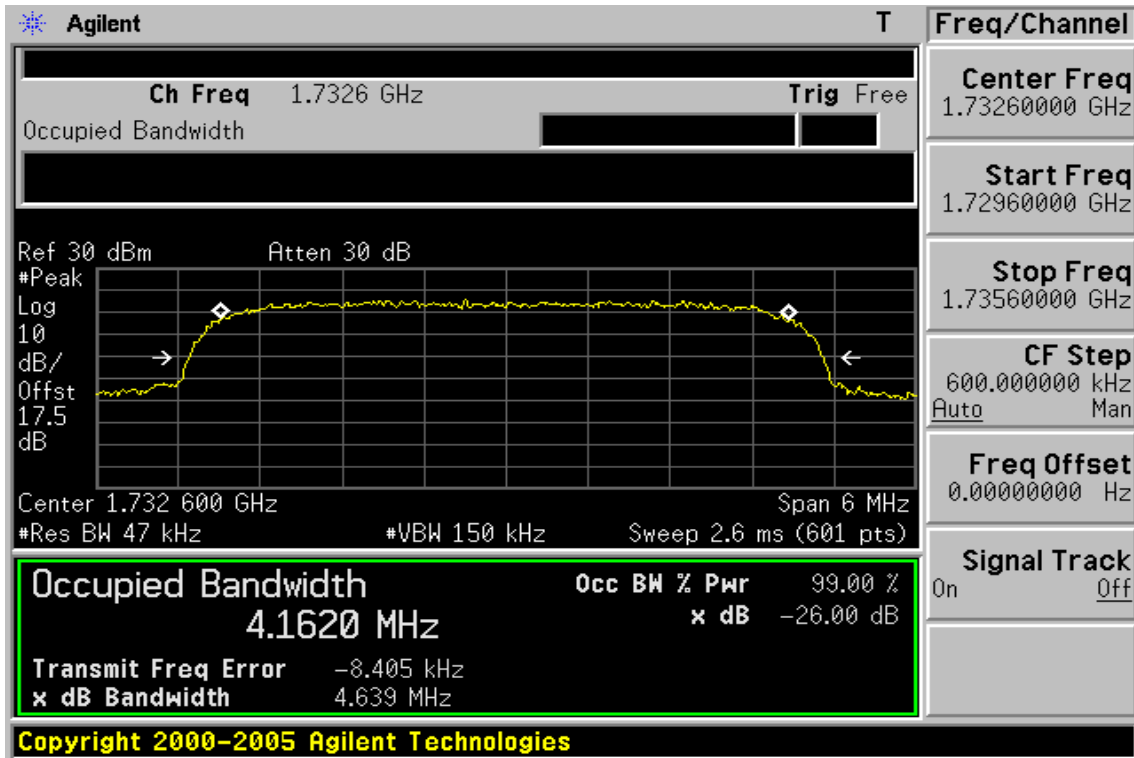
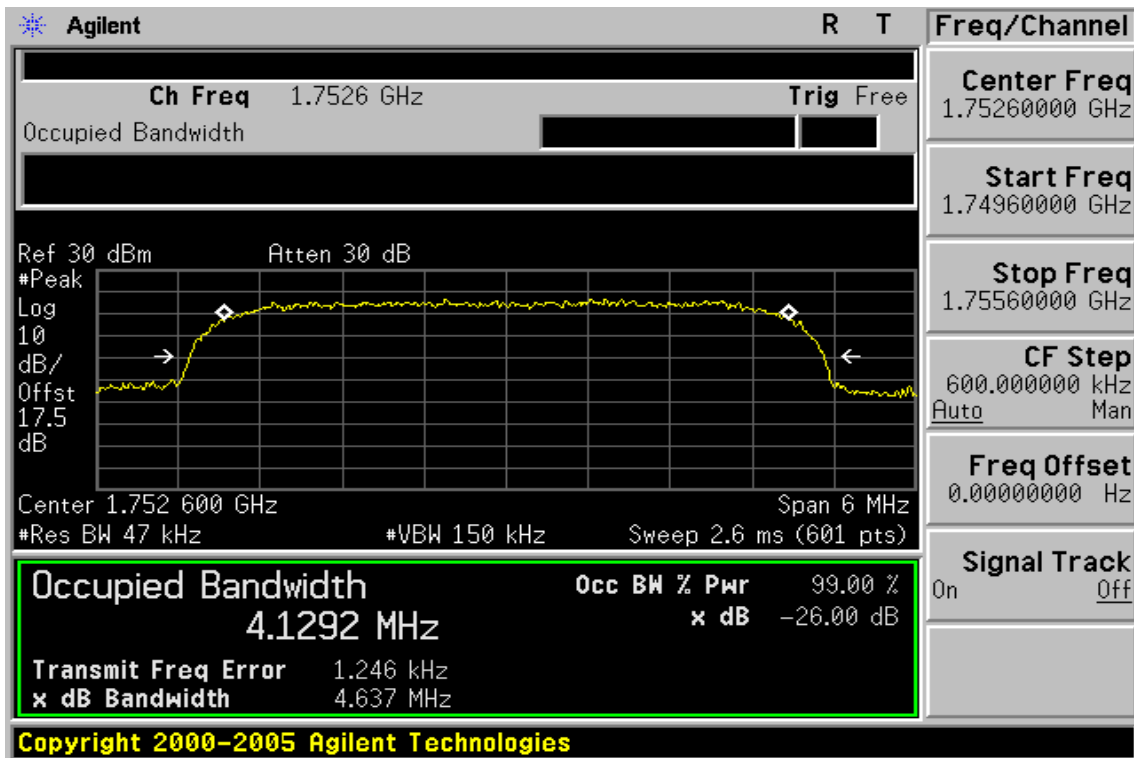


Figure 8-18: HSDPA IV Channel High



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Figure 8-19: WCDMA V Channel Low

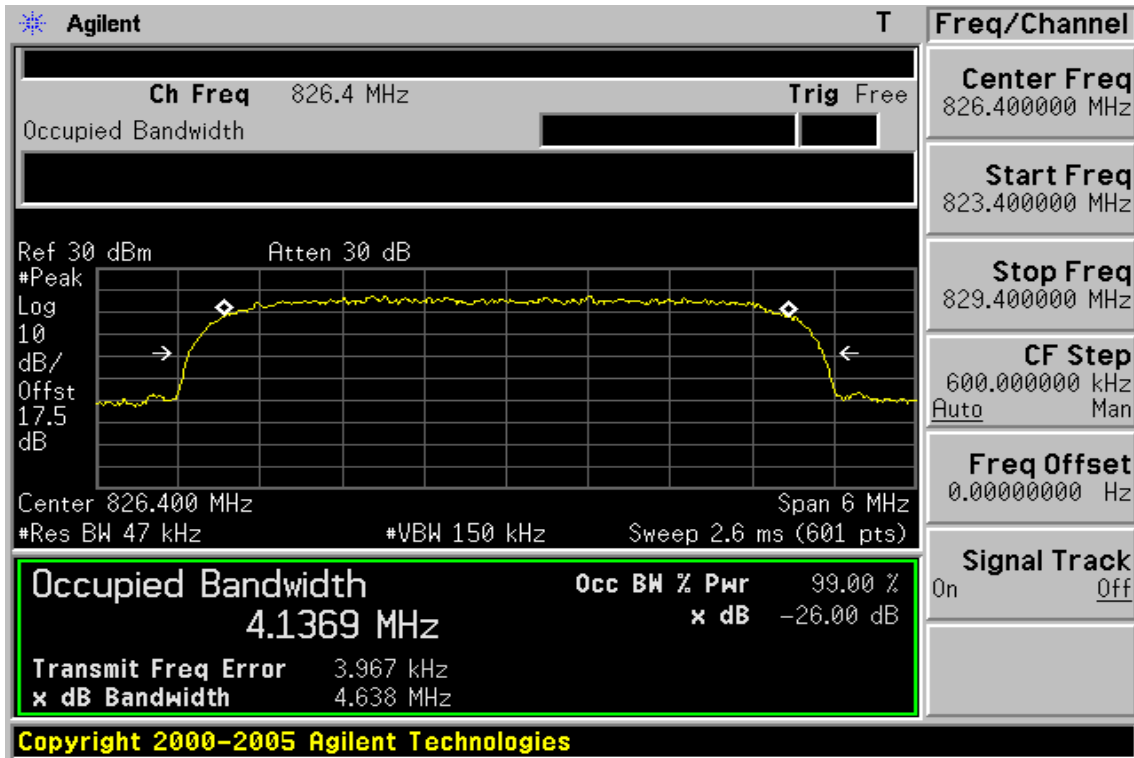
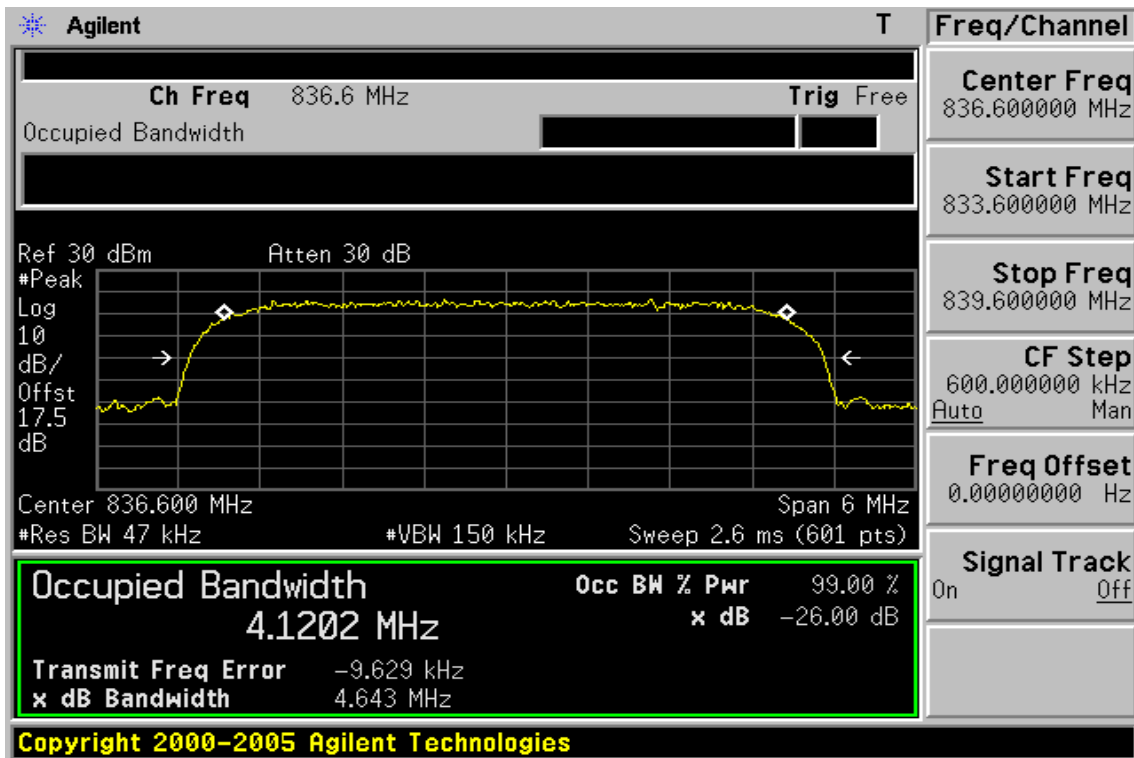


Figure 8-20: WCDMA V Channel Mid



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Figure 8-21: WCDMA V Channel High

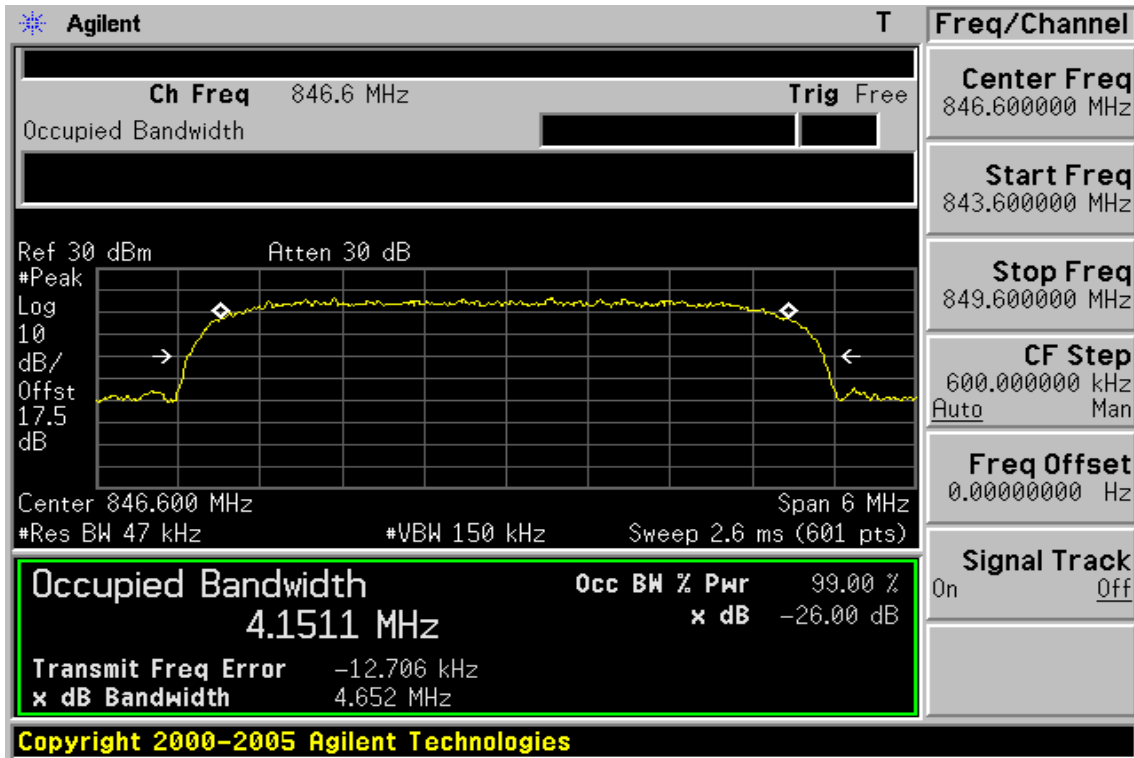
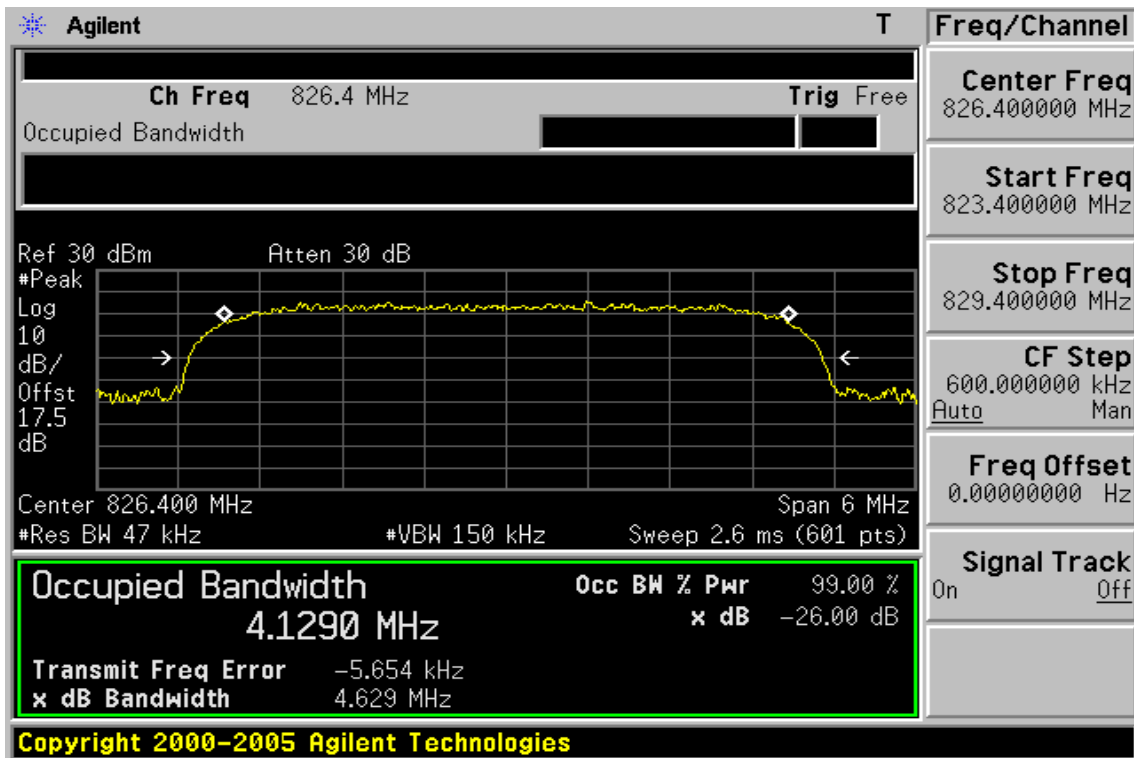


Figure 8-22: HSUPA V Channel Low



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Figure 8-23: HSUPA V Channel Mid

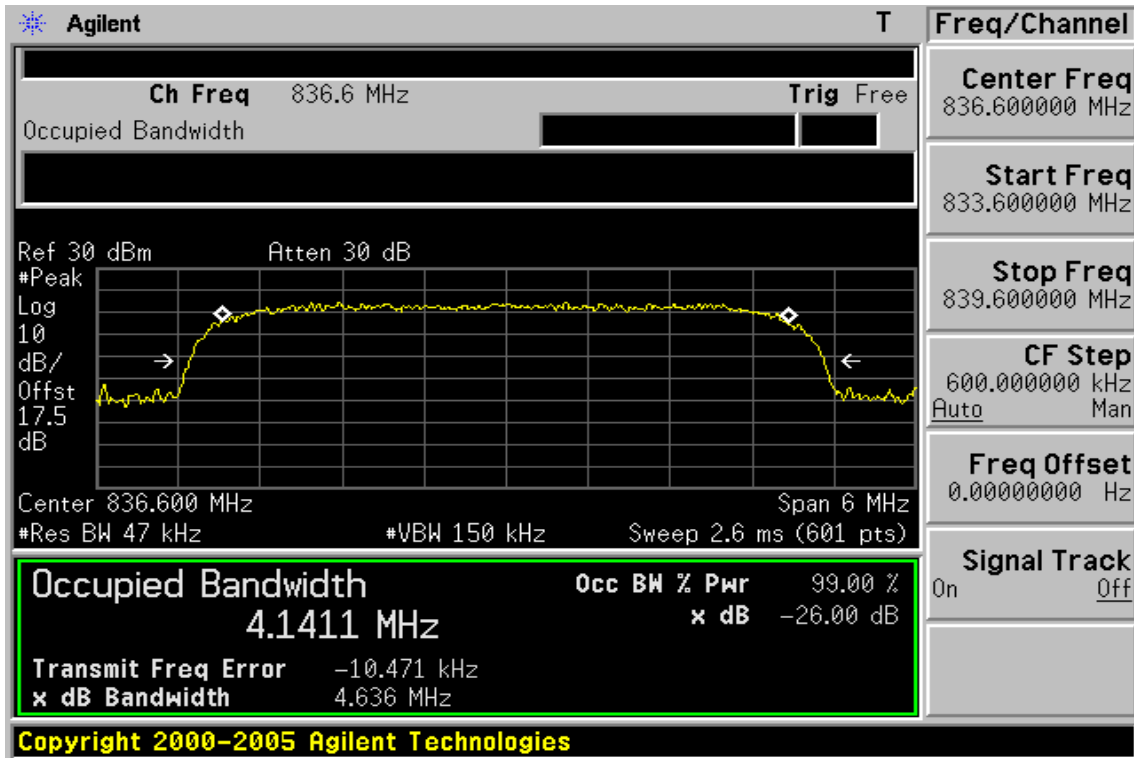
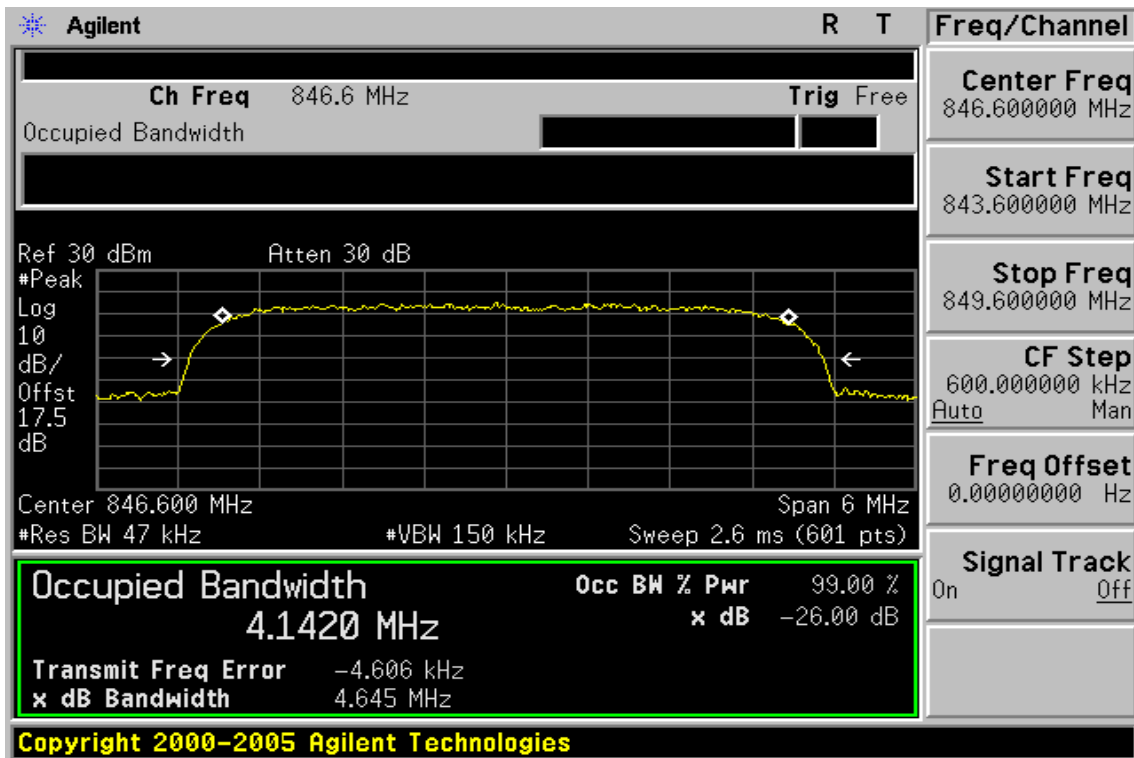


Figure 8-24: HSUPA V Channel High



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Figure 8-25: HSDPA V Channel Low

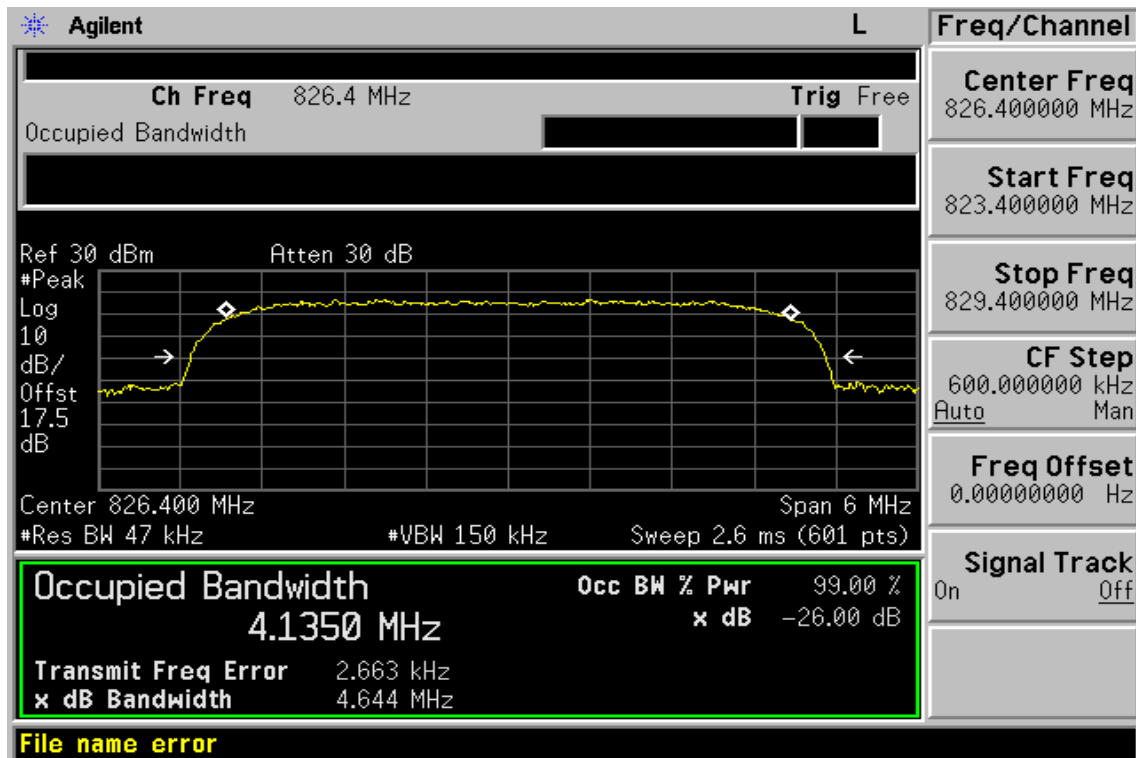
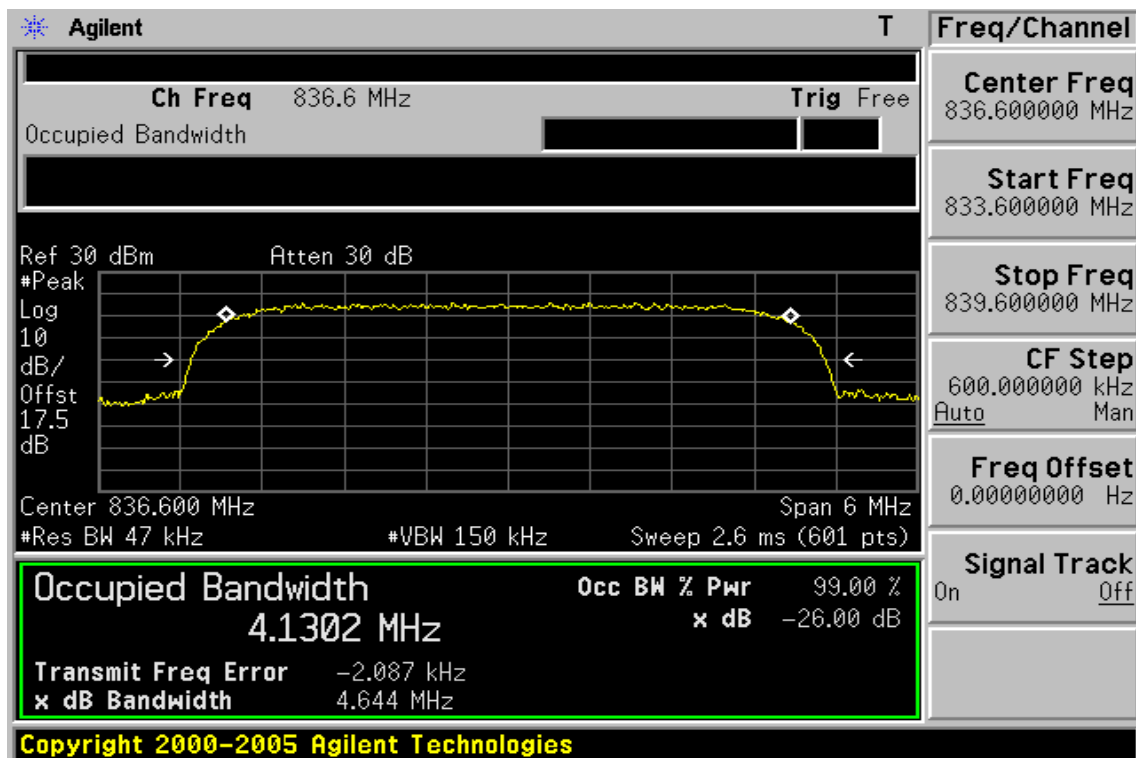


Figure 8-26: HSDPA V Channel Mid



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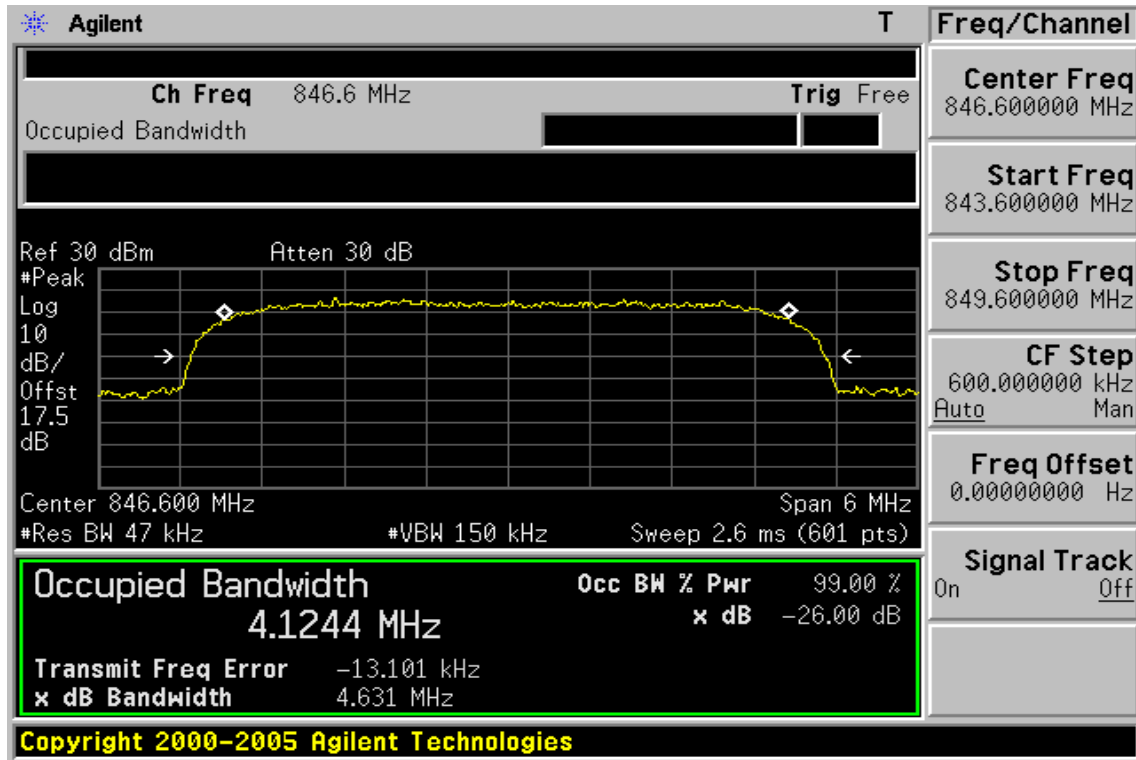
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Figure 8-27: HSDPA V Channel High



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## 9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

### 9.1. Standard Applicable:

According to FCC §2.1051.

FCC §22.917(a), §24.238(a), §27.53(g) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

### 9.2. Test SET-UP:

Refer to section 5.2 in this report

### 9.3. Measurement Procedure:

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10 th harmonic. Limit = -13dBm

Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

### Conducted Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
3. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 1G, 1G to 2.5G, 2.5G to 7.5G, 7.5G to 10G ,10G to 15G and 15G to 20GHz  
Via Software, combine 6 spans of frequency range into one plot

### 9.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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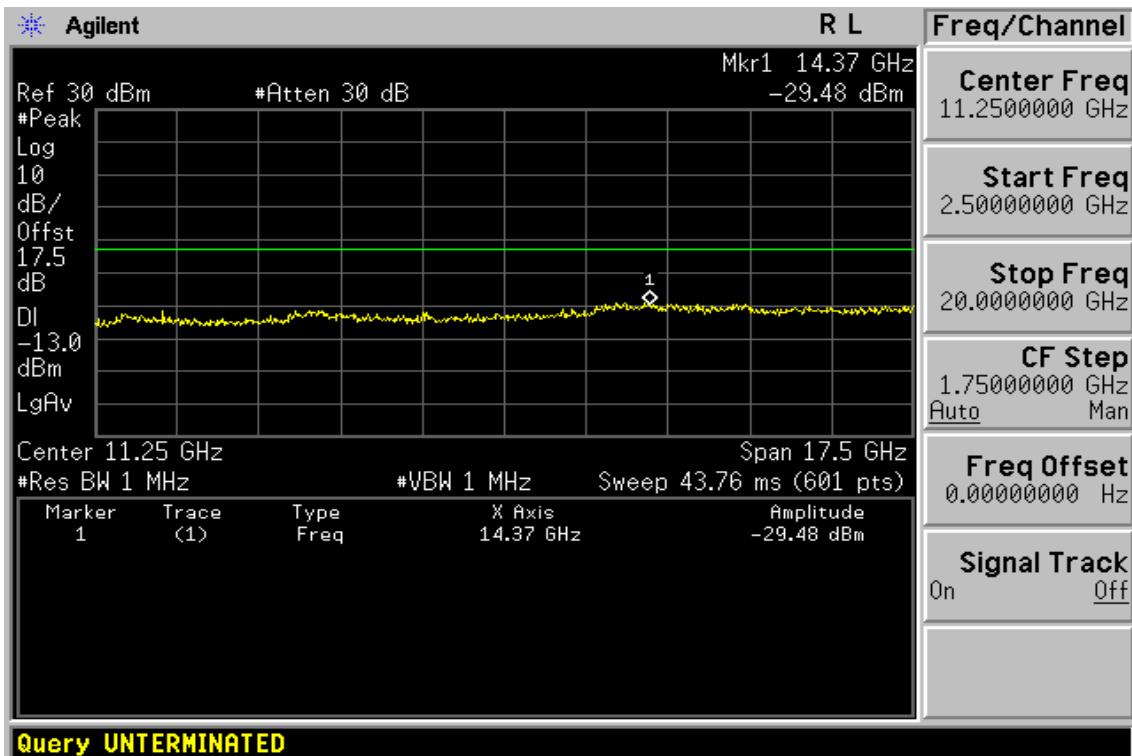
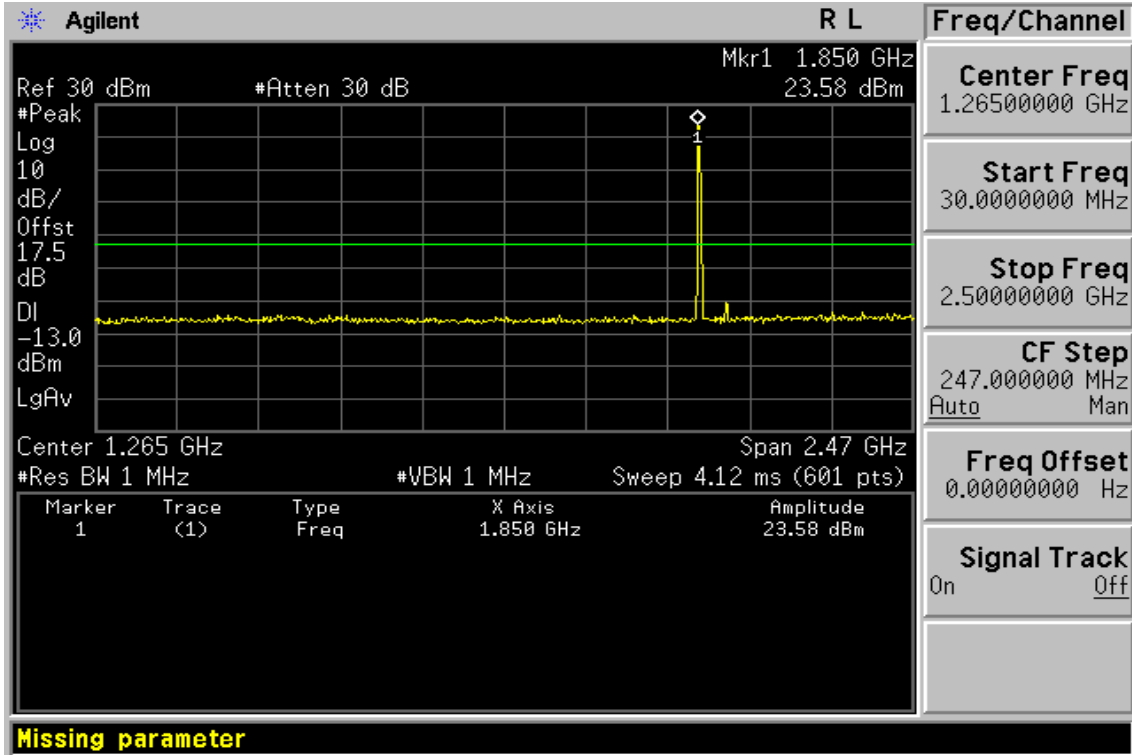
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9.5. Measurement Result:

Figure 9-1: Out of Band emission at antenna terminals – WCDMA II Channel Lowest



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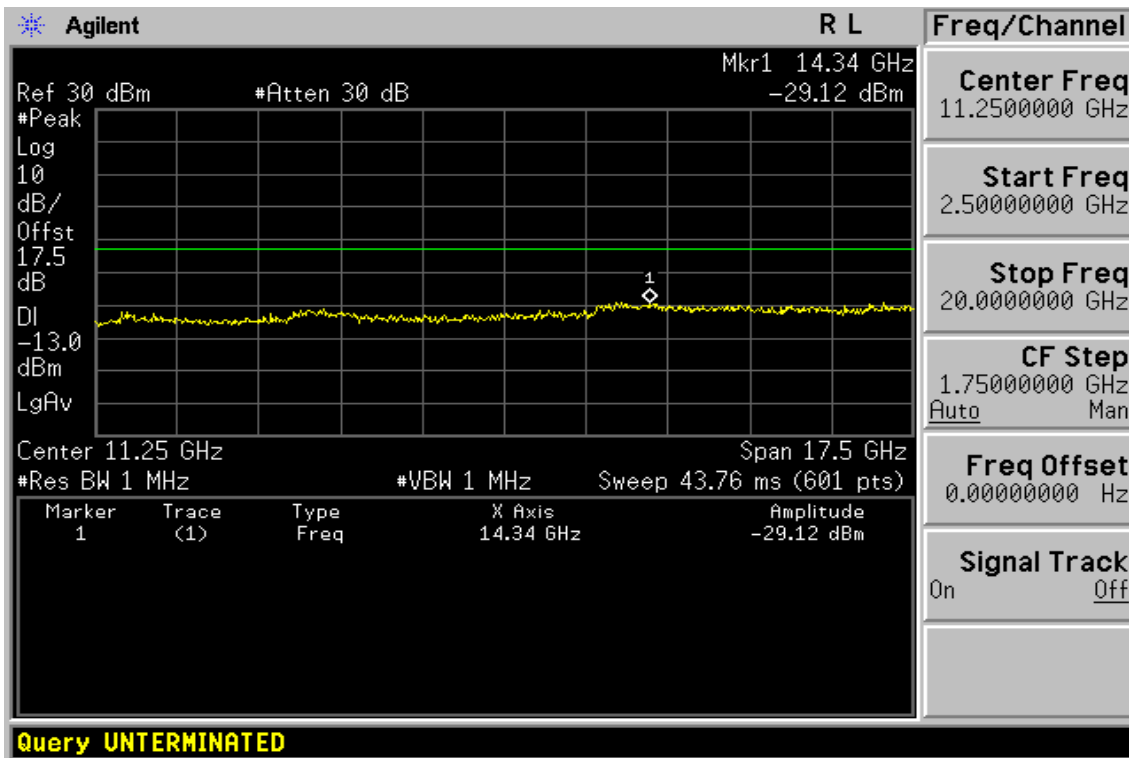
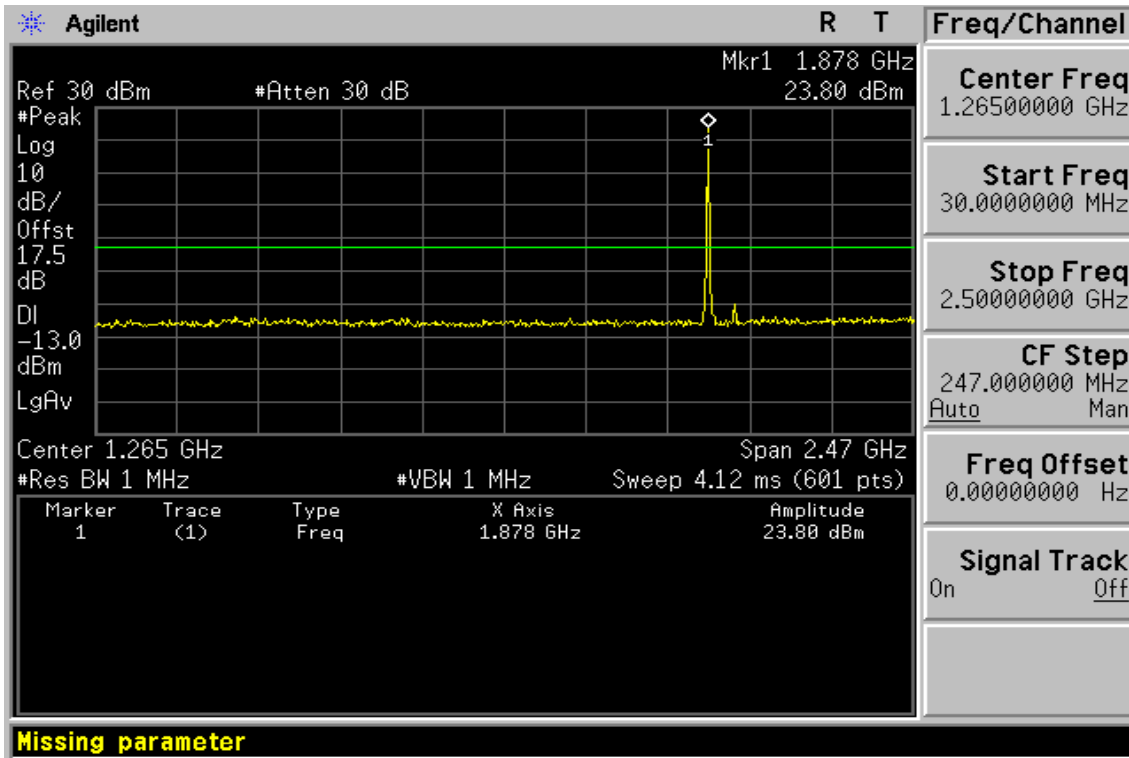
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Figure 9-2: Out of Band emission at antenna terminals –WCDMA II Channel Mid



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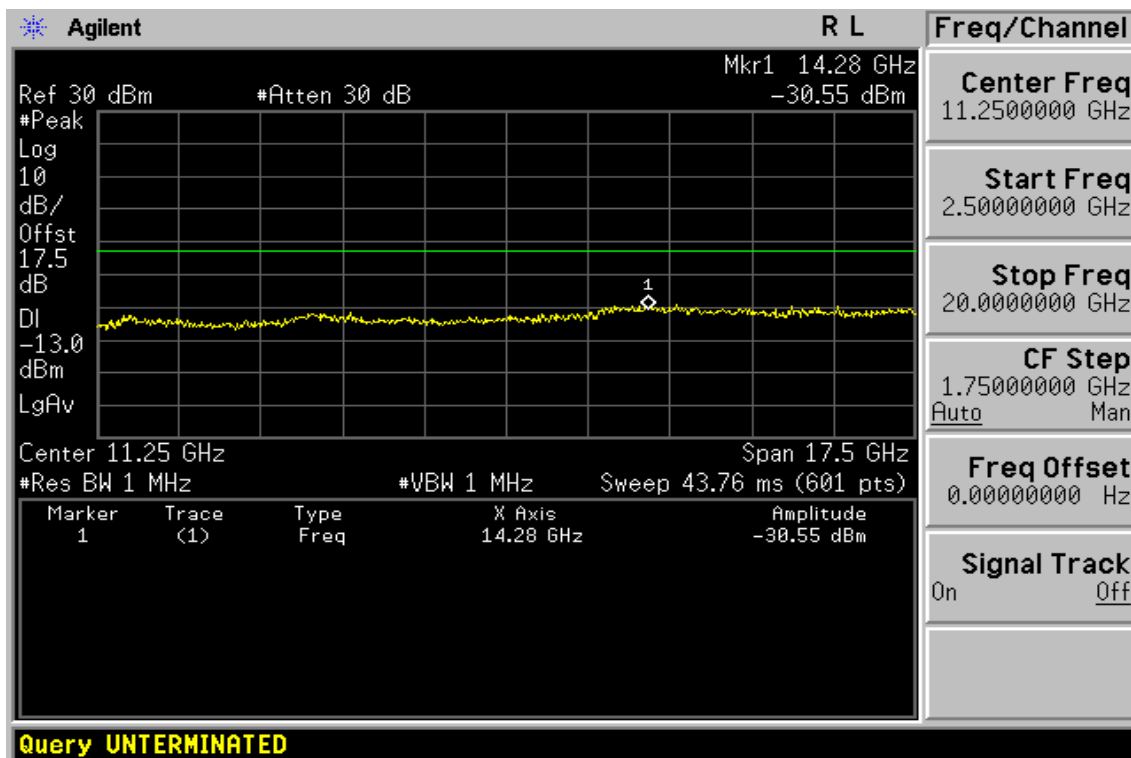
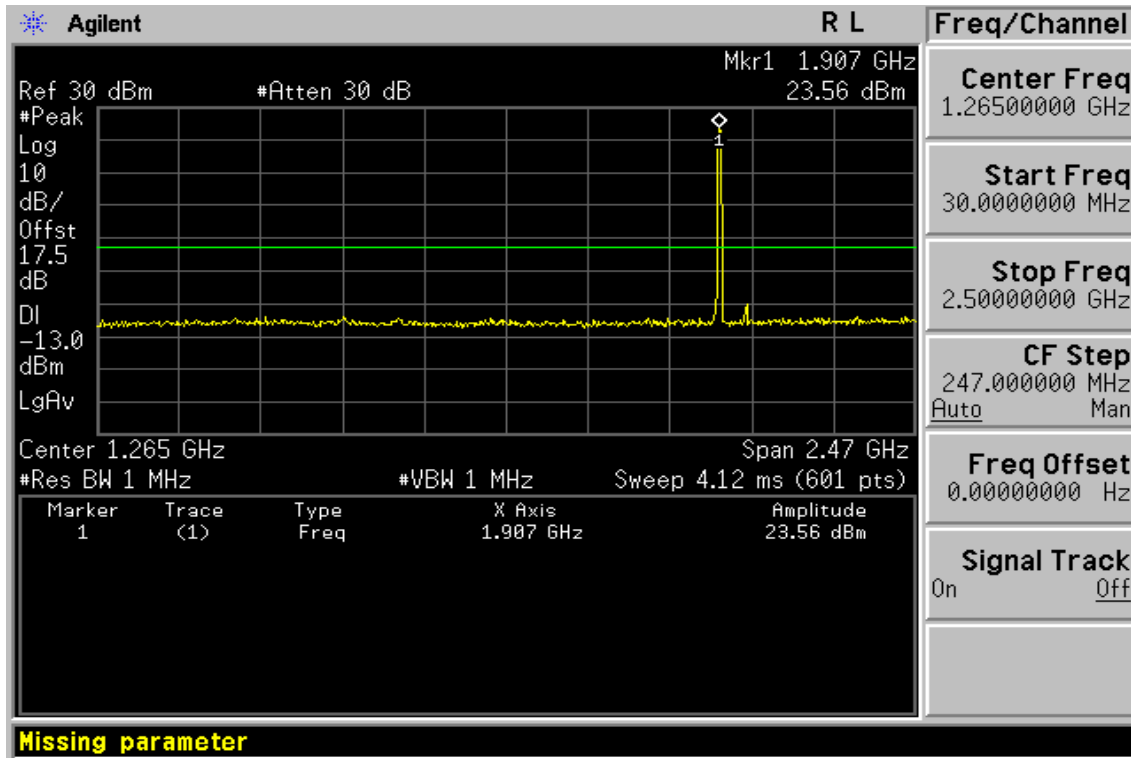
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Figure 9-3: Out of Band emission at antenna terminals –WCDMA II Channel Highest



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Figure 9-4: Band edge emission at antenna terminals – WCDMA II Channel Lowest

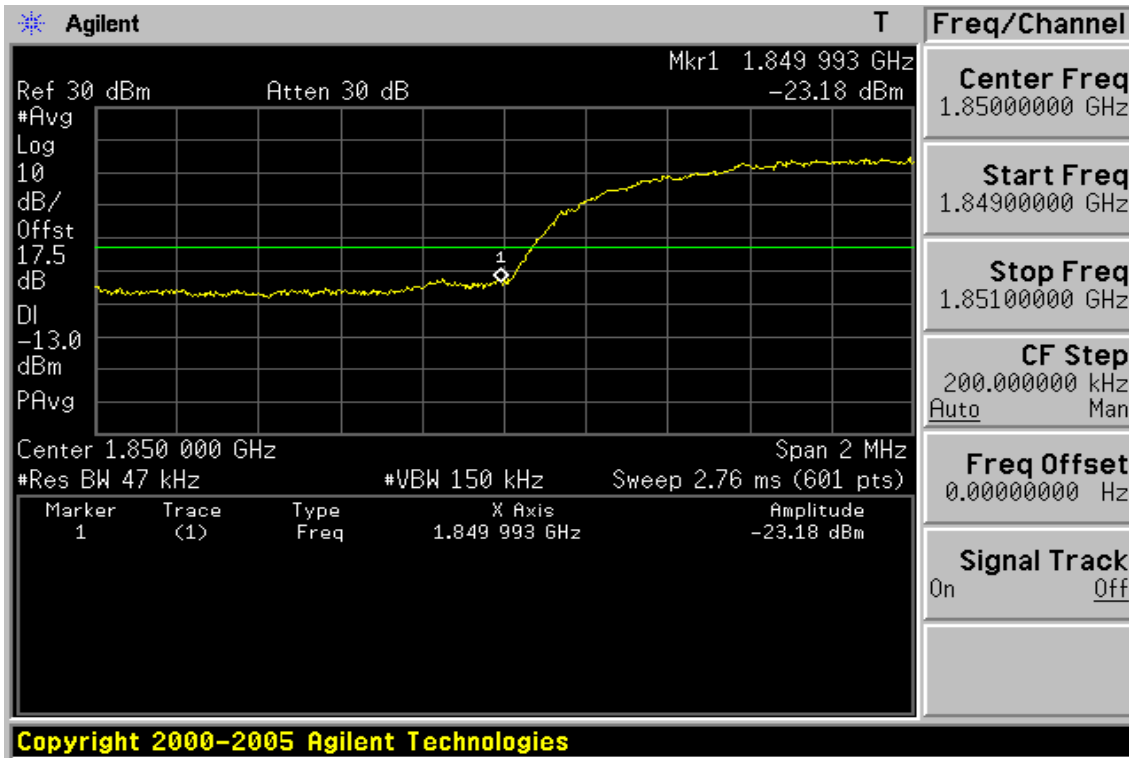
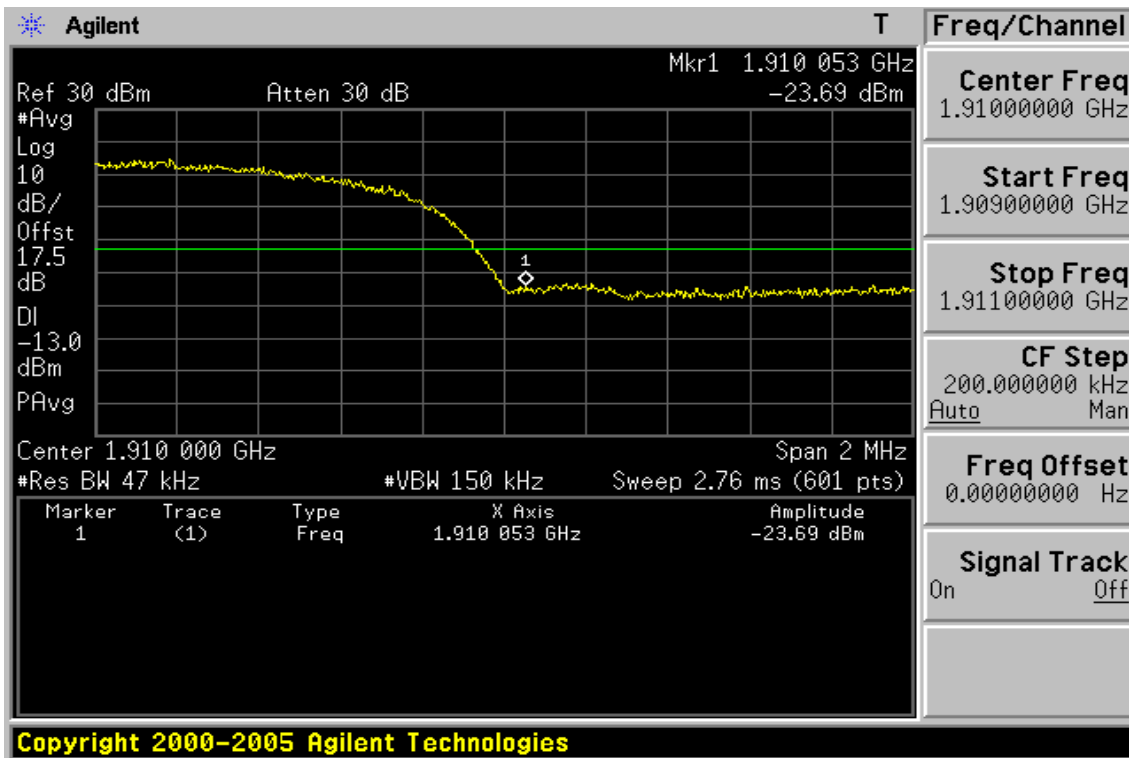


Figure 9-5: Band edge emission at antenna terminals –WCDMA II Channel Highest



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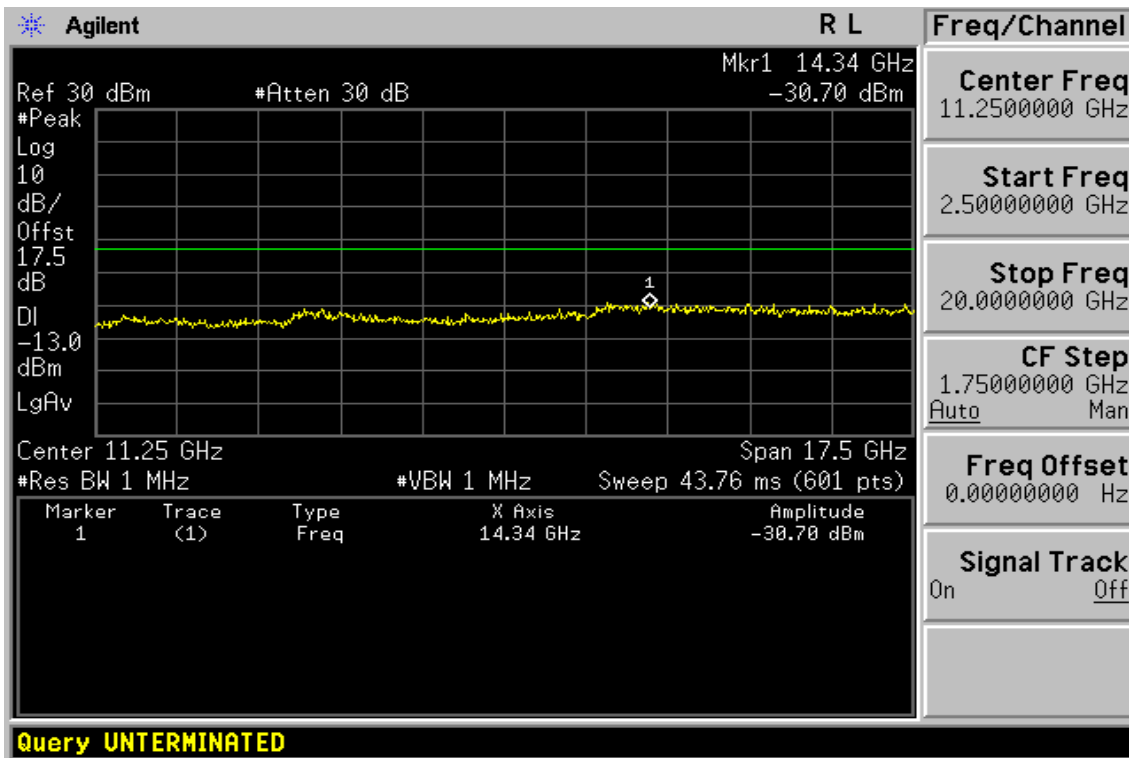
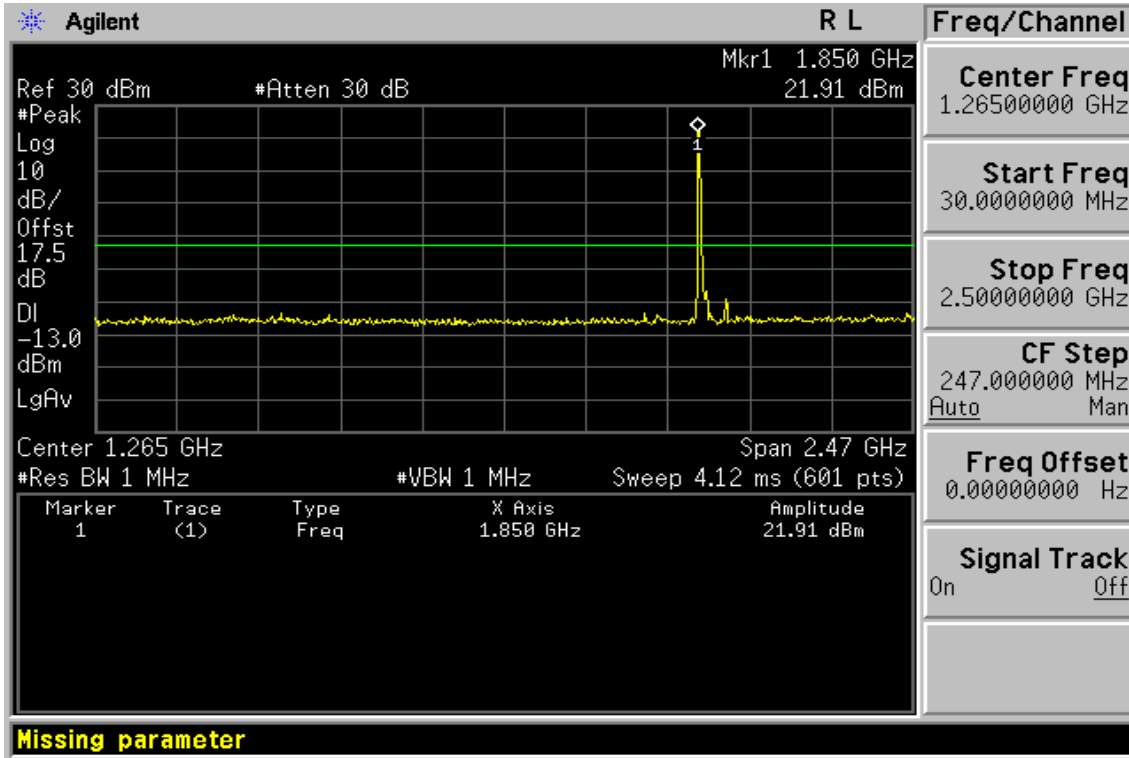
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Figure 9-6: Out of Band emission at antenna terminals – HSUPA II Channel Lowest



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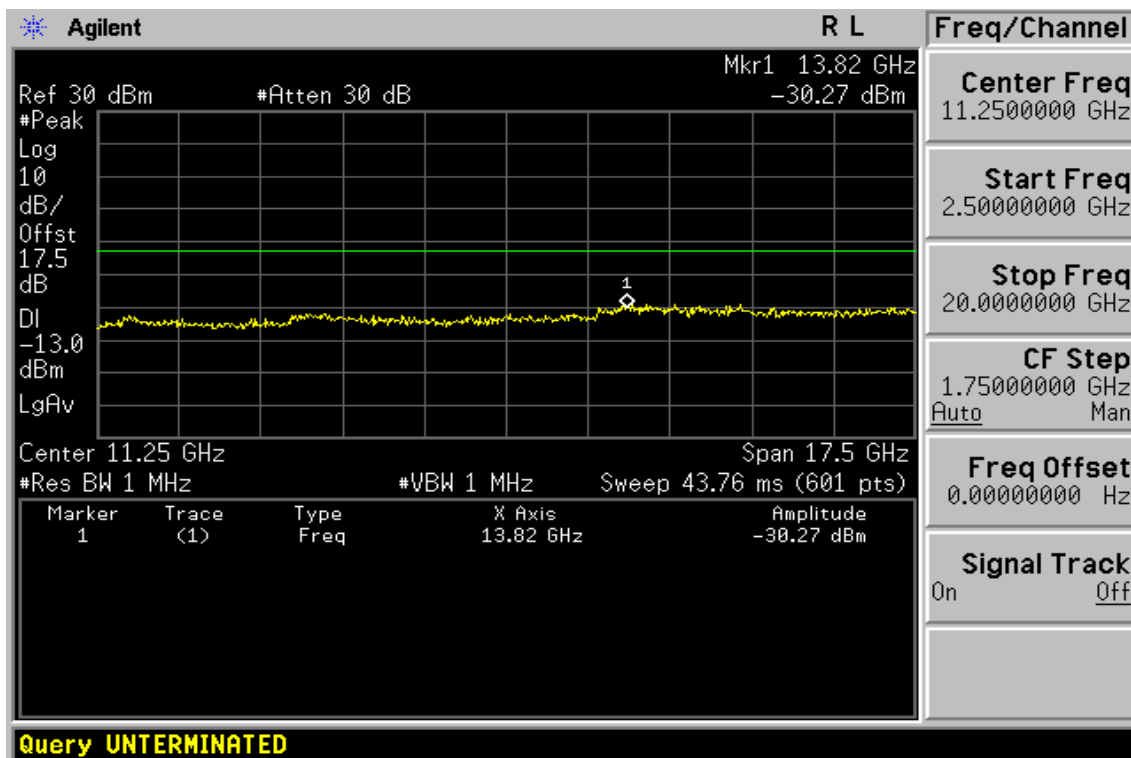
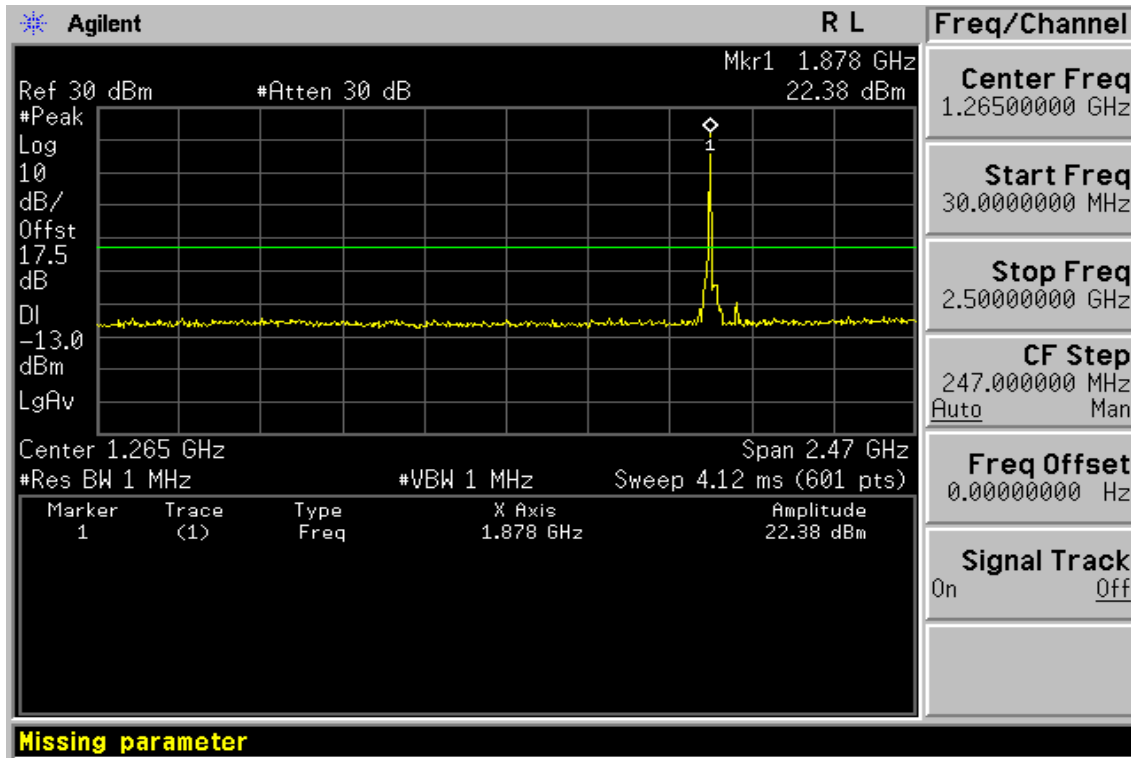
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Figure 9-7: Out of Band emission at antenna terminals –HSUPA II Channel Mid



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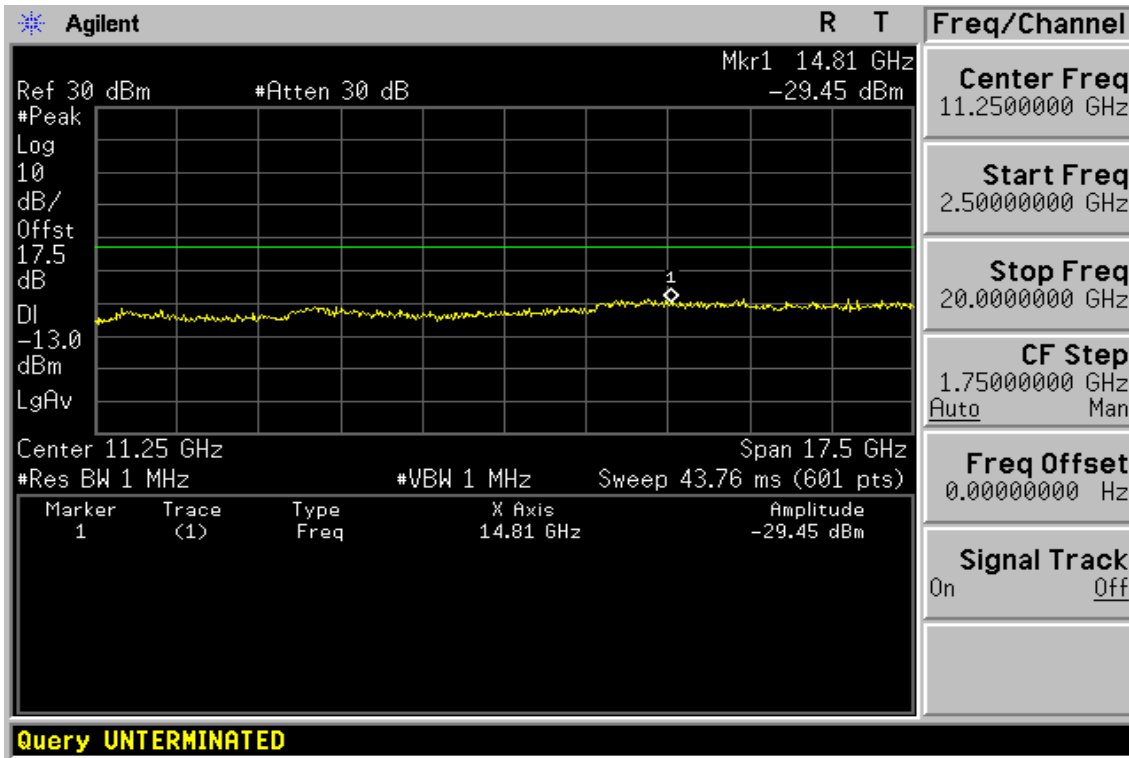
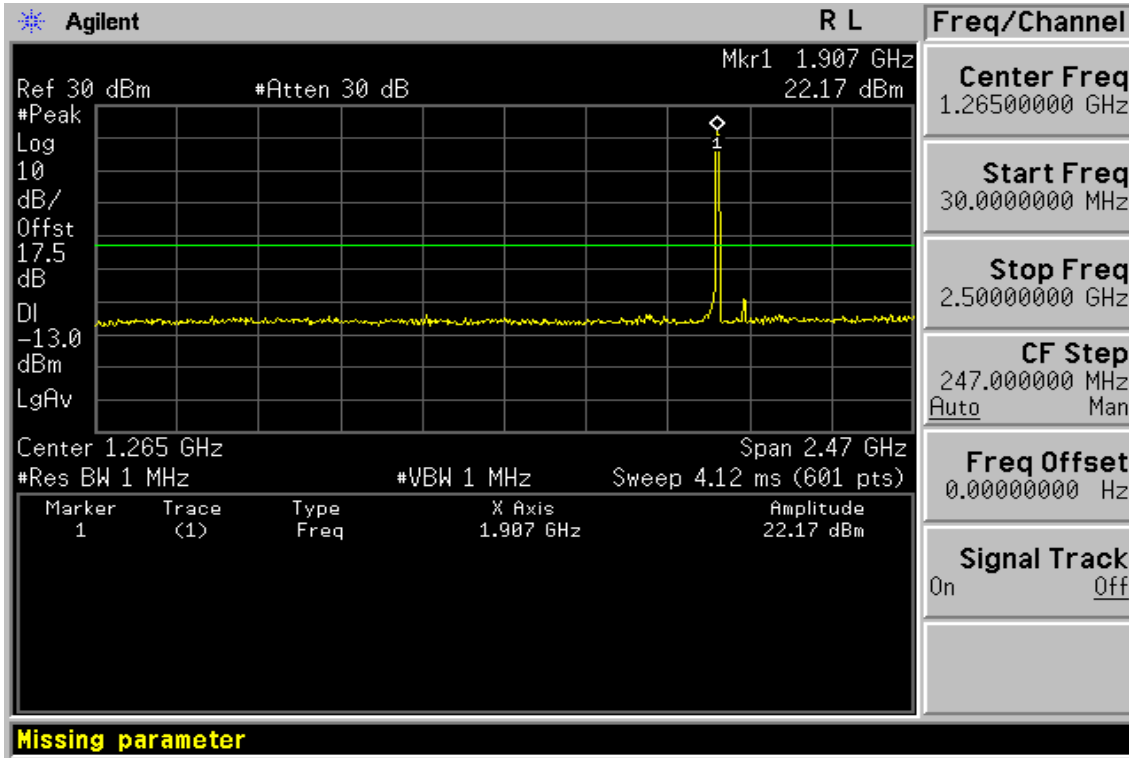
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**Figure 9-8: Out of Band emission at antenna terminals –HSUPA II Channel Highest**



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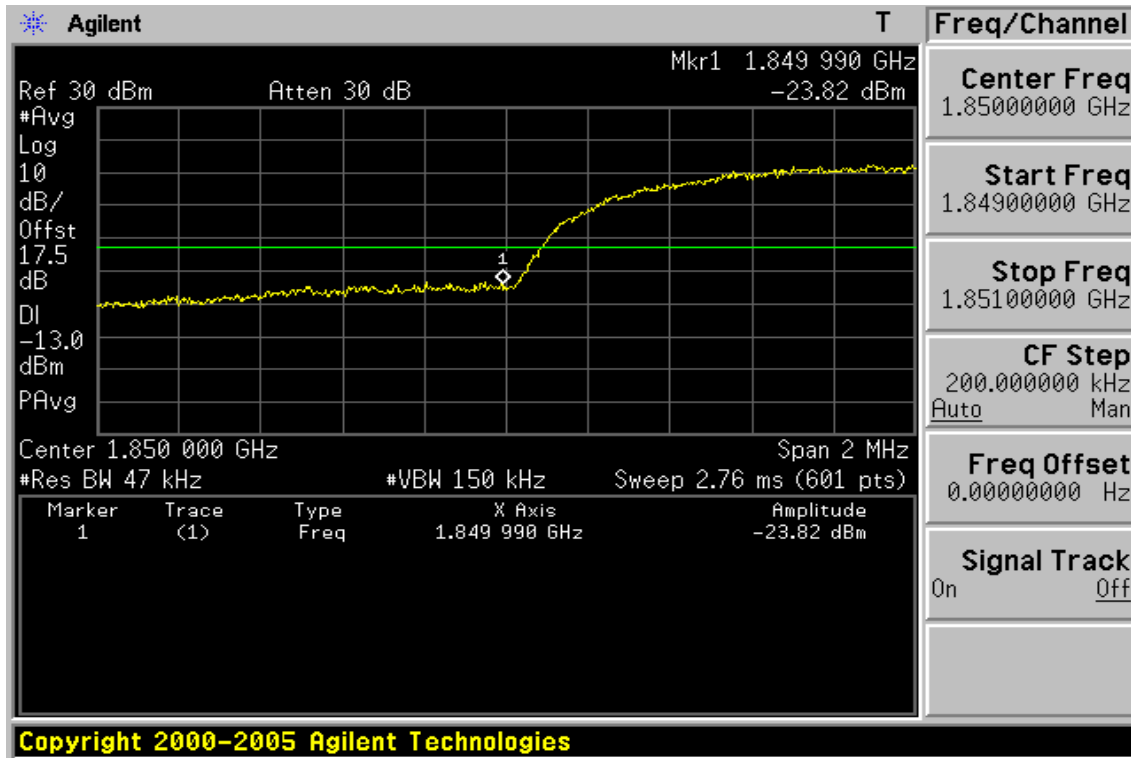
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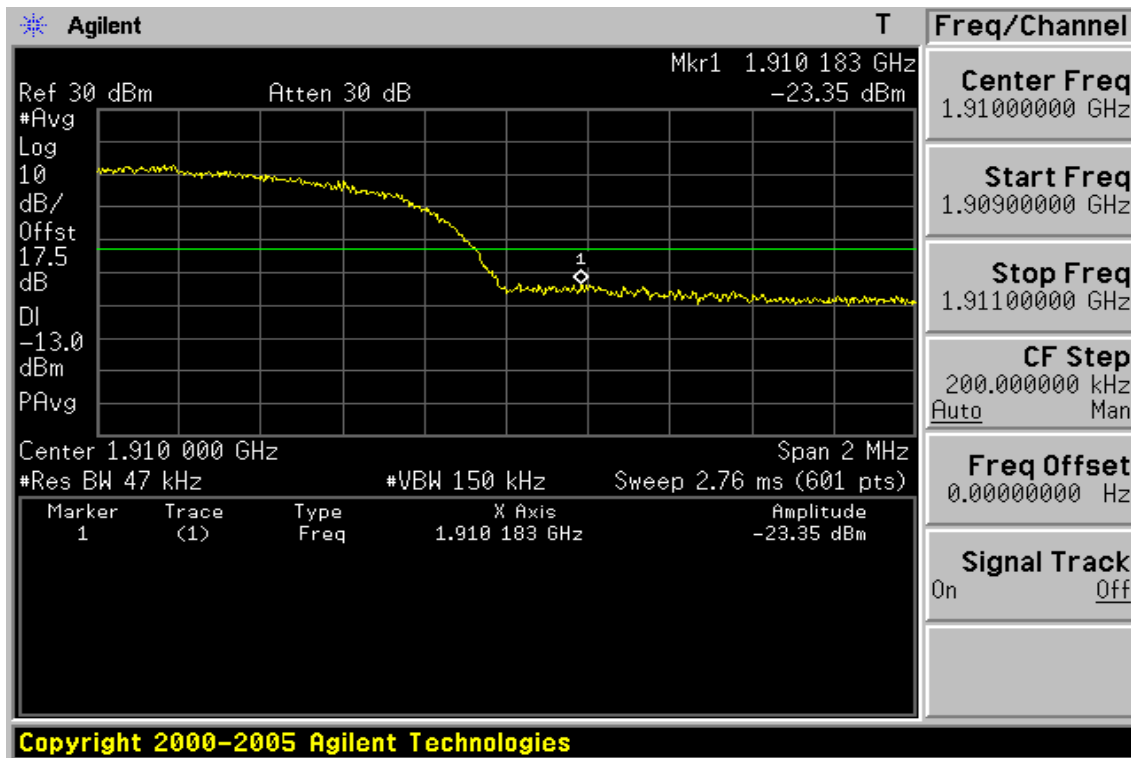
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**Figure 9-9: Bad edge emission at antenna terminals –HSUPA II Channel Lowest**



**Figure 9-10: Band edge emission at antenna terminals –HSUPA II Channel Highest**



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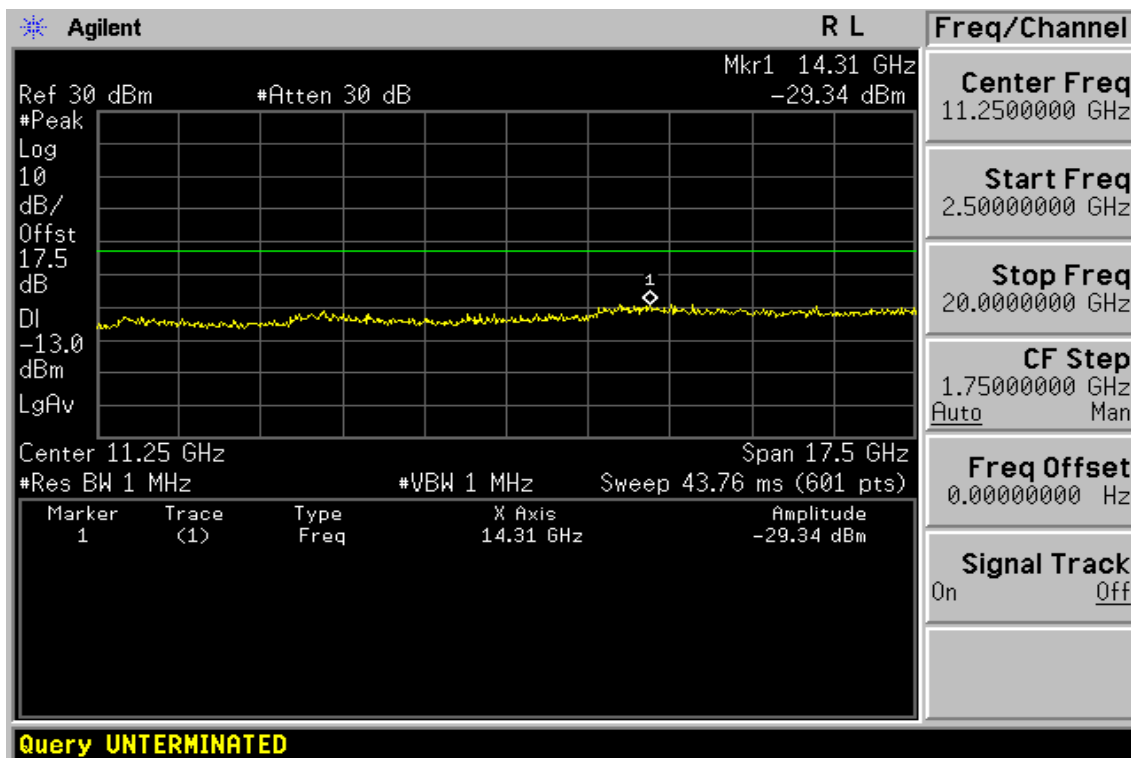
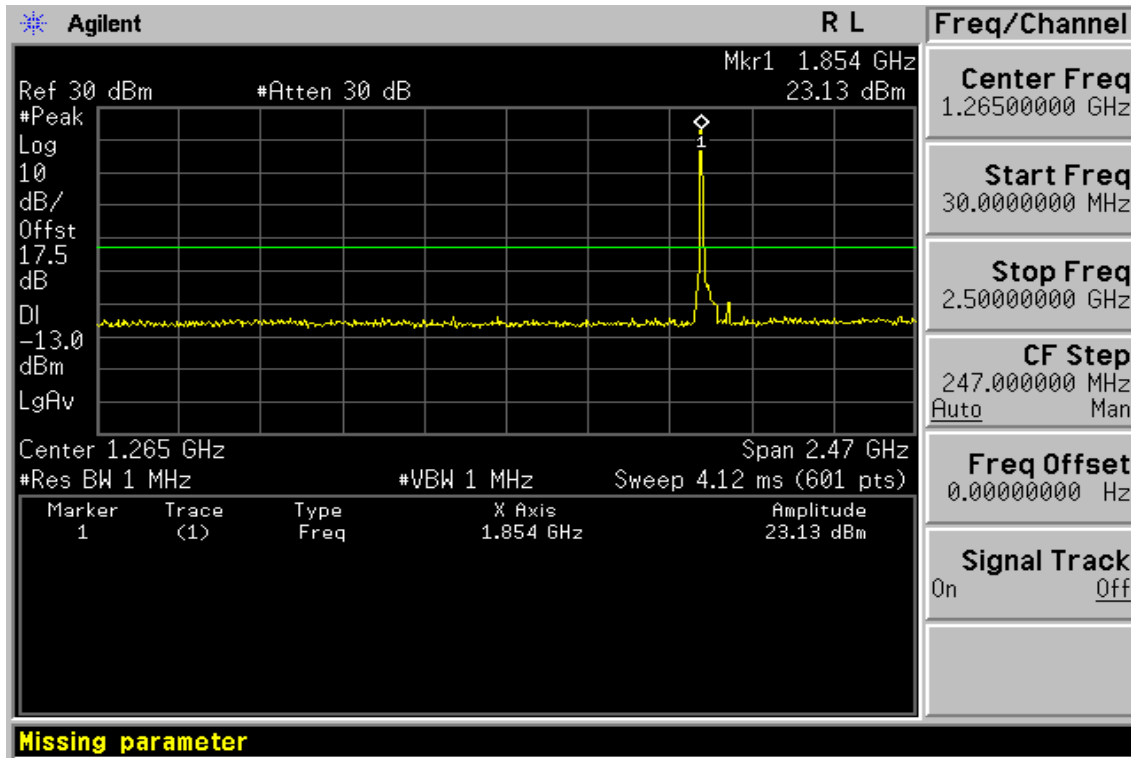
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Figure 9-11: Out of Band emission at antenna terminals – HSDPA II Channel Lowest



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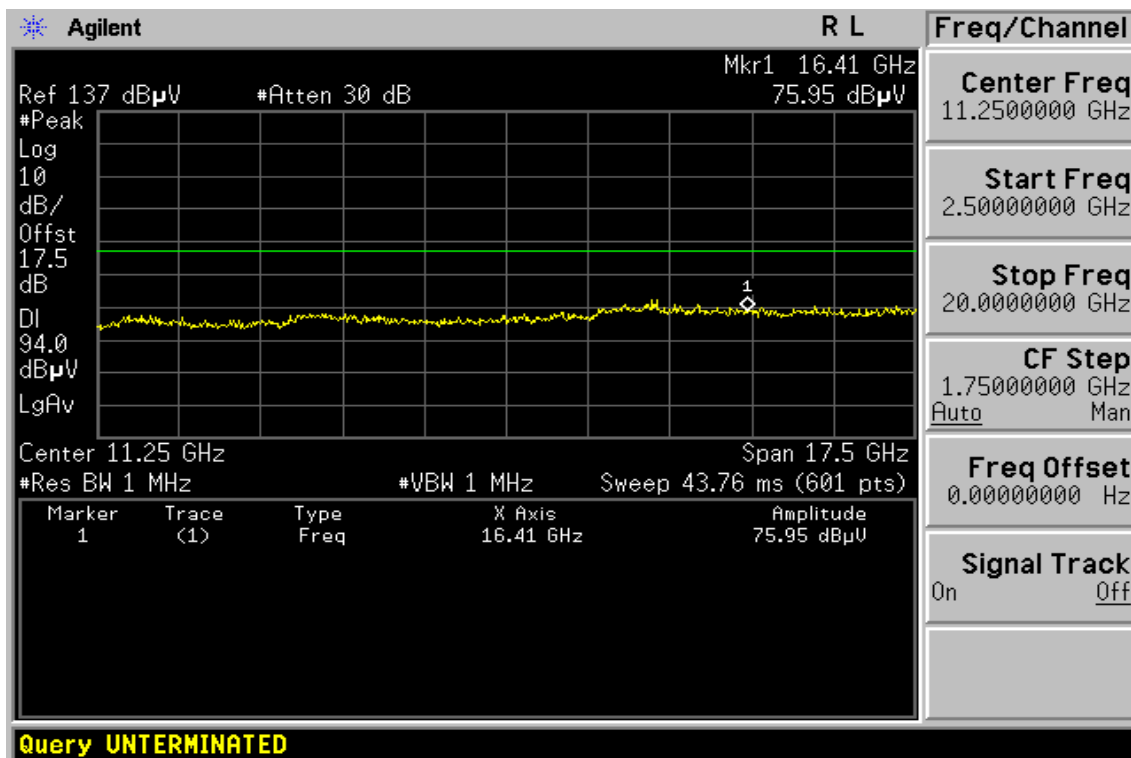
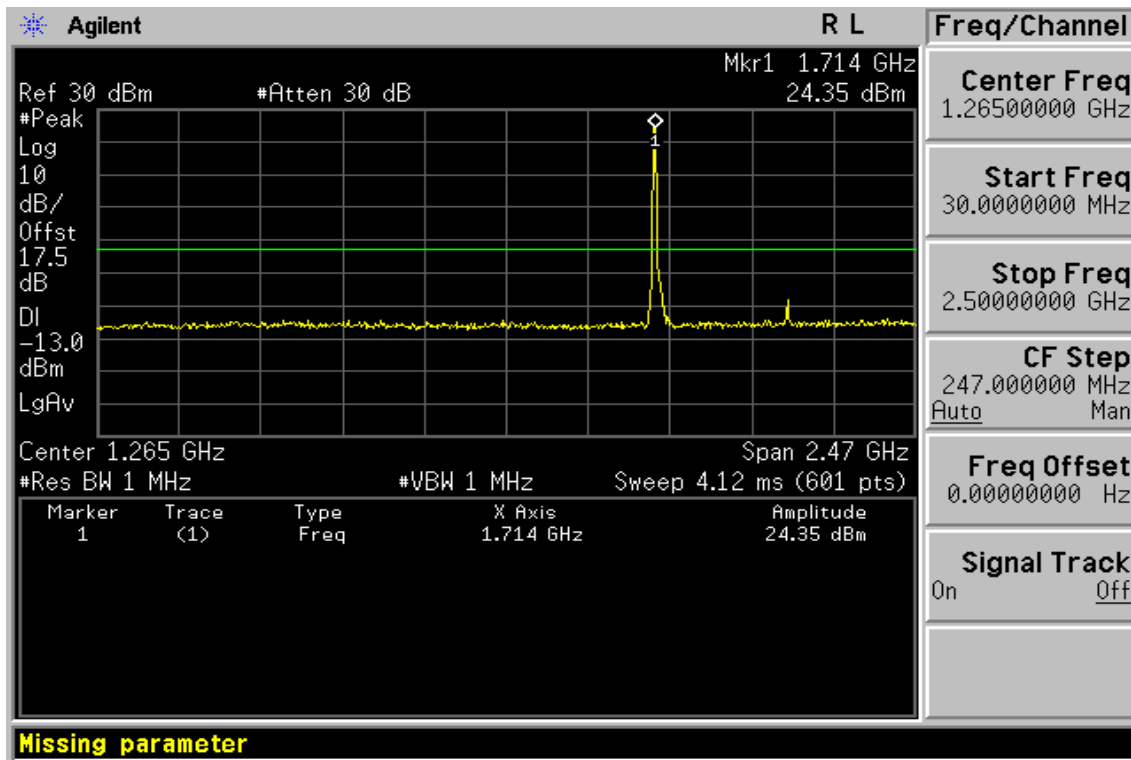
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Figure 9-12: Out of Band emission at antenna terminals –HSDPA II Channel Mid



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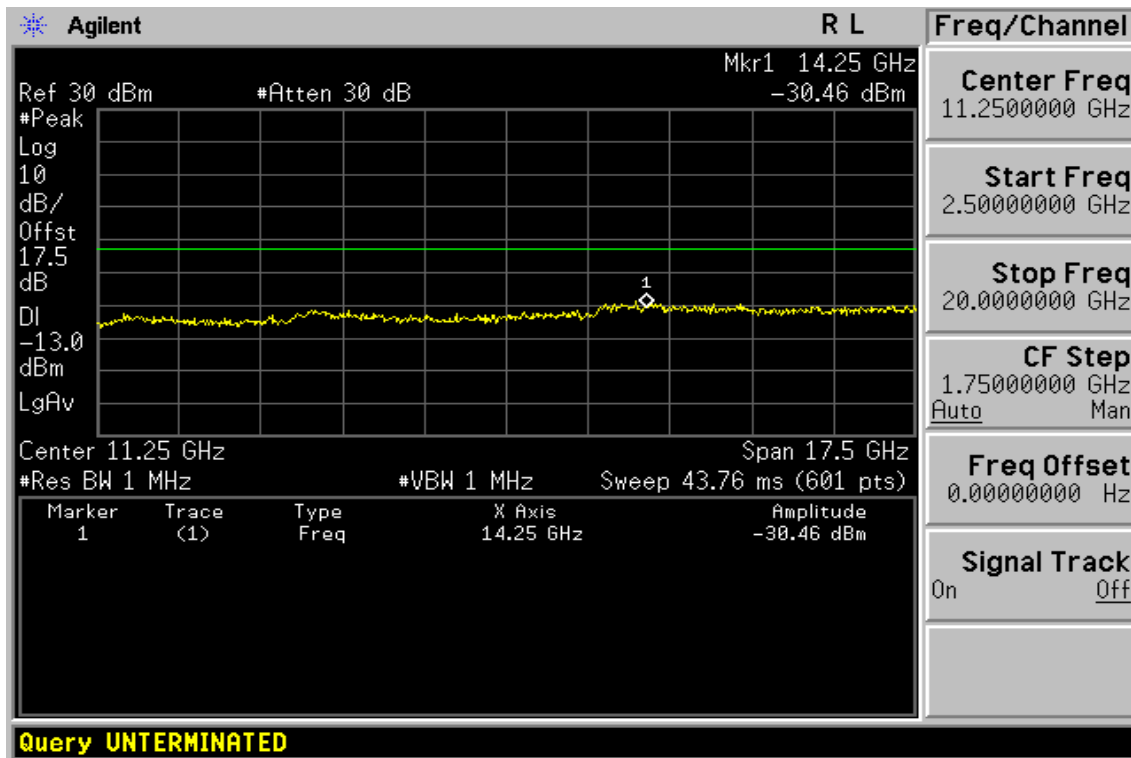
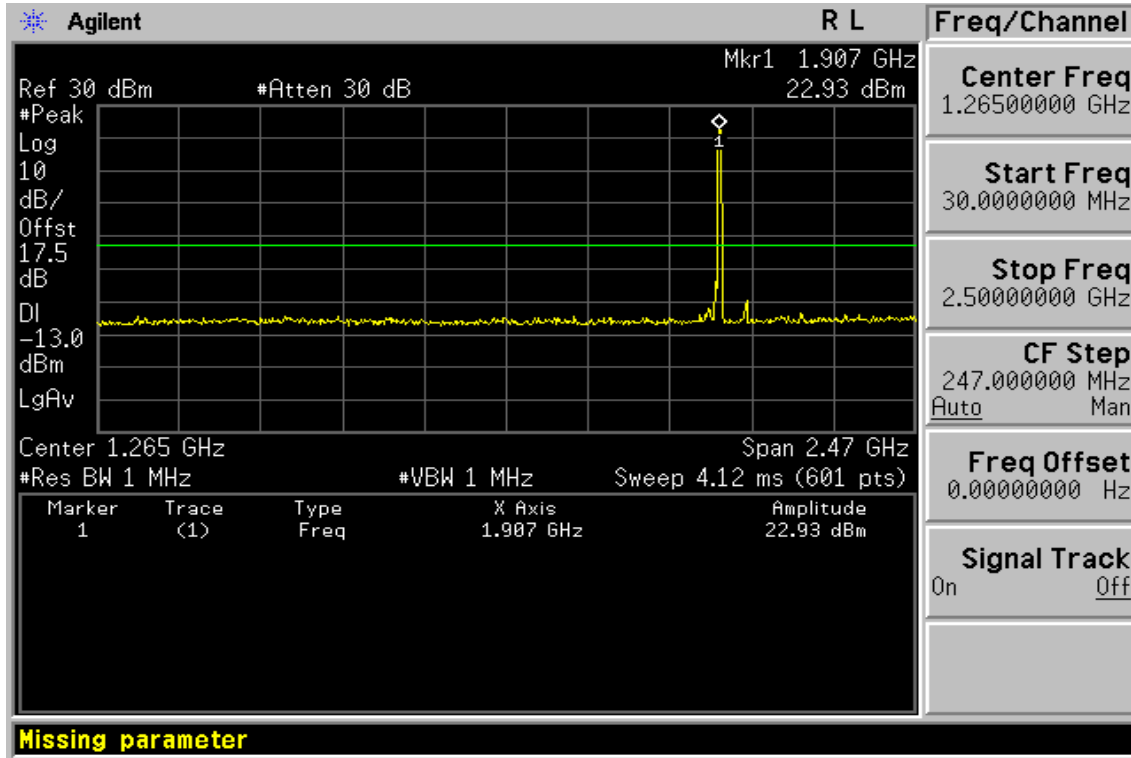
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Figure 9-13: Out of Band emission at antenna terminals –HSDPA II Channel Highest



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Figure 9-14: Band edge emission at antenna terminals –HSDPA II Channel Lowest

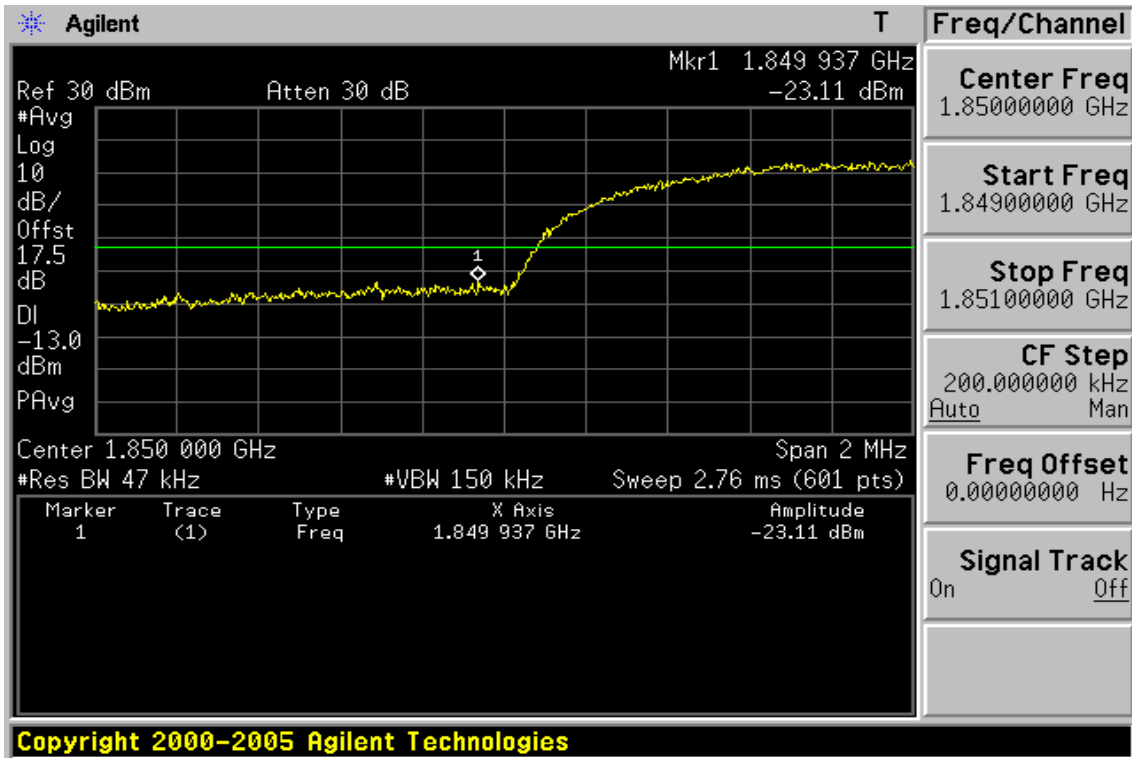
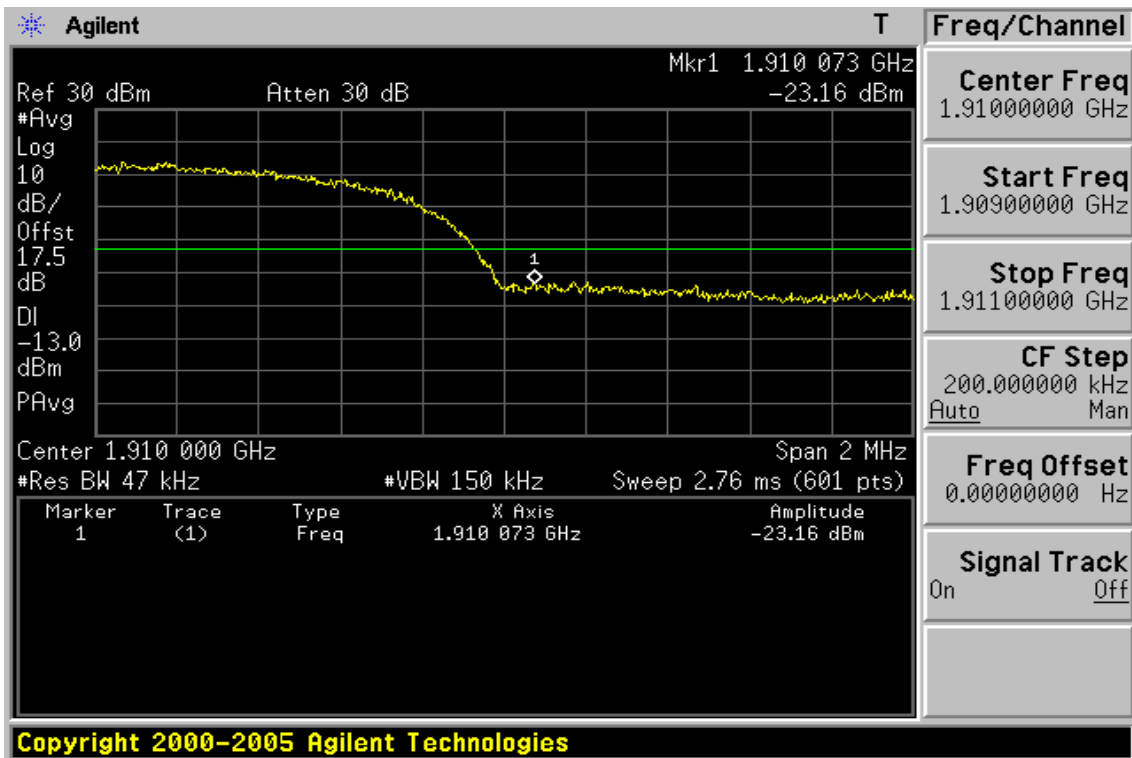


Figure 9-15: Band edge emission at antenna terminals –HSDPA II Channel Highest



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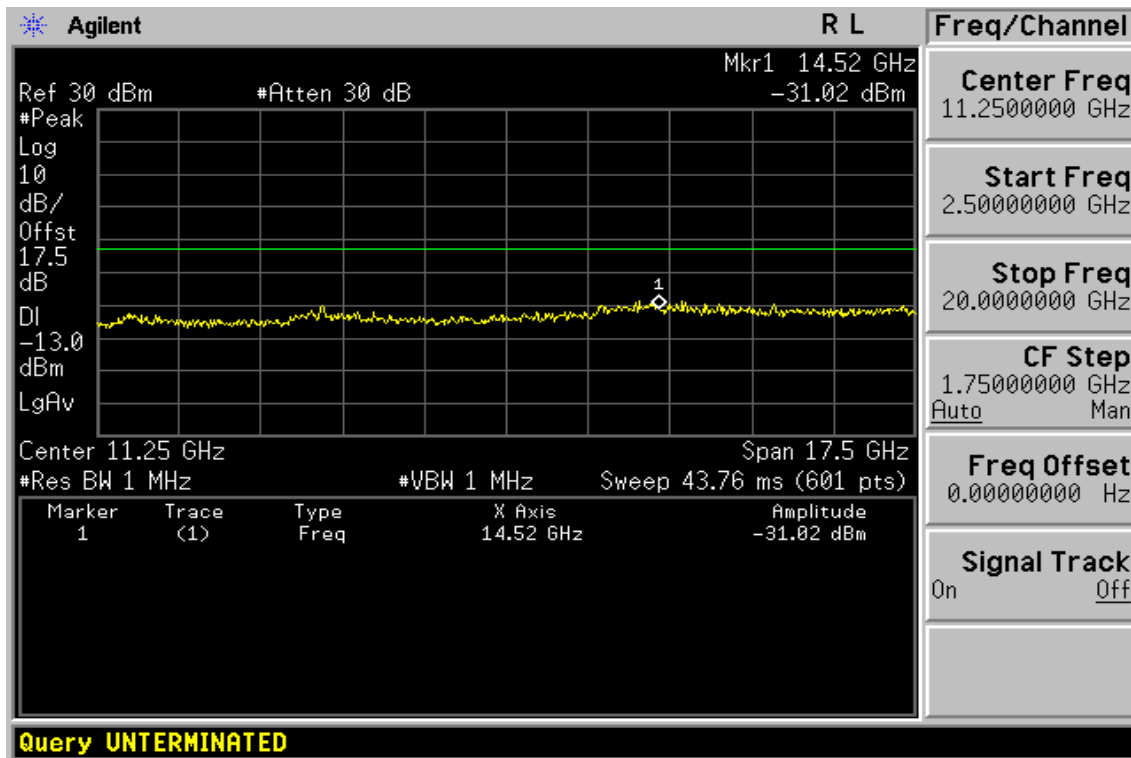
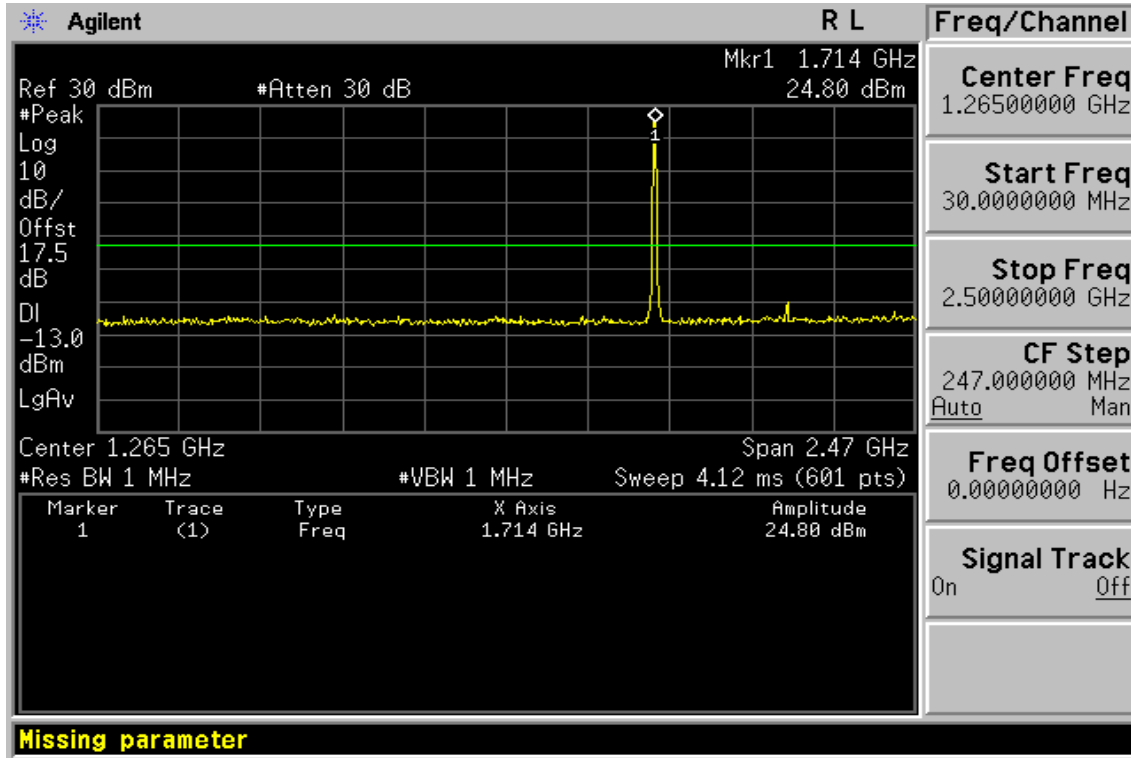
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Figure 9-16: Out of Band emission at antenna terminals – WCDMA IV Channel Lowest



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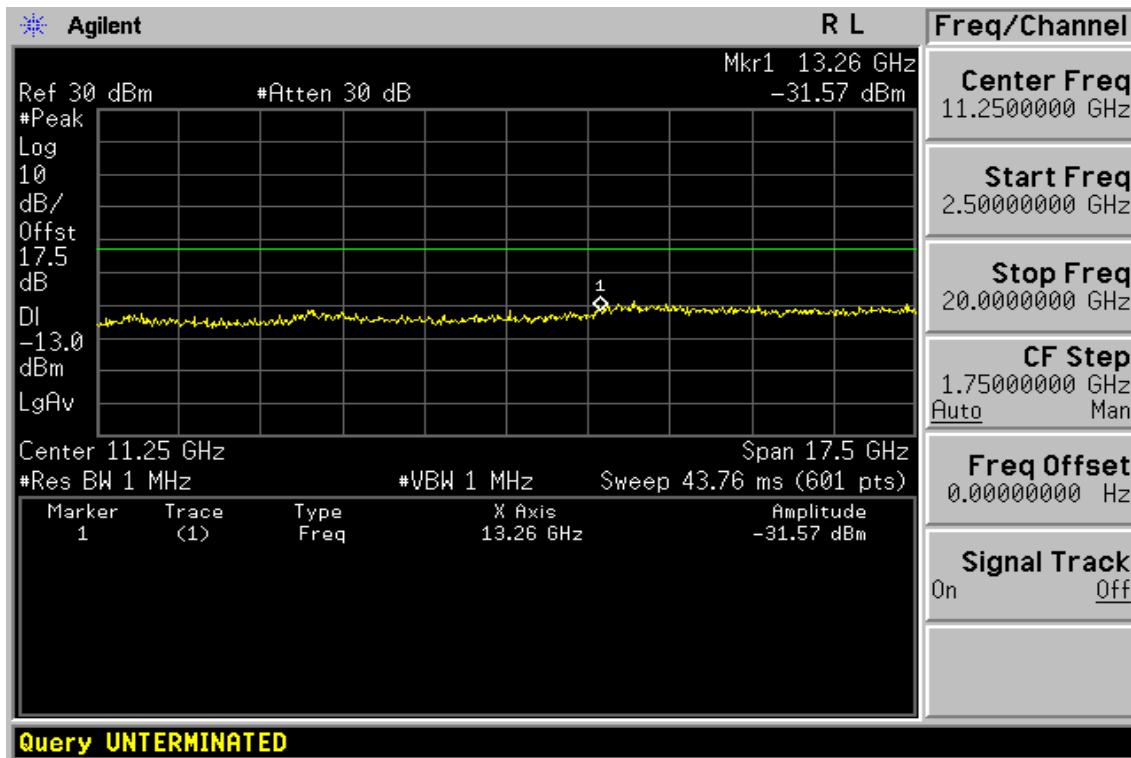
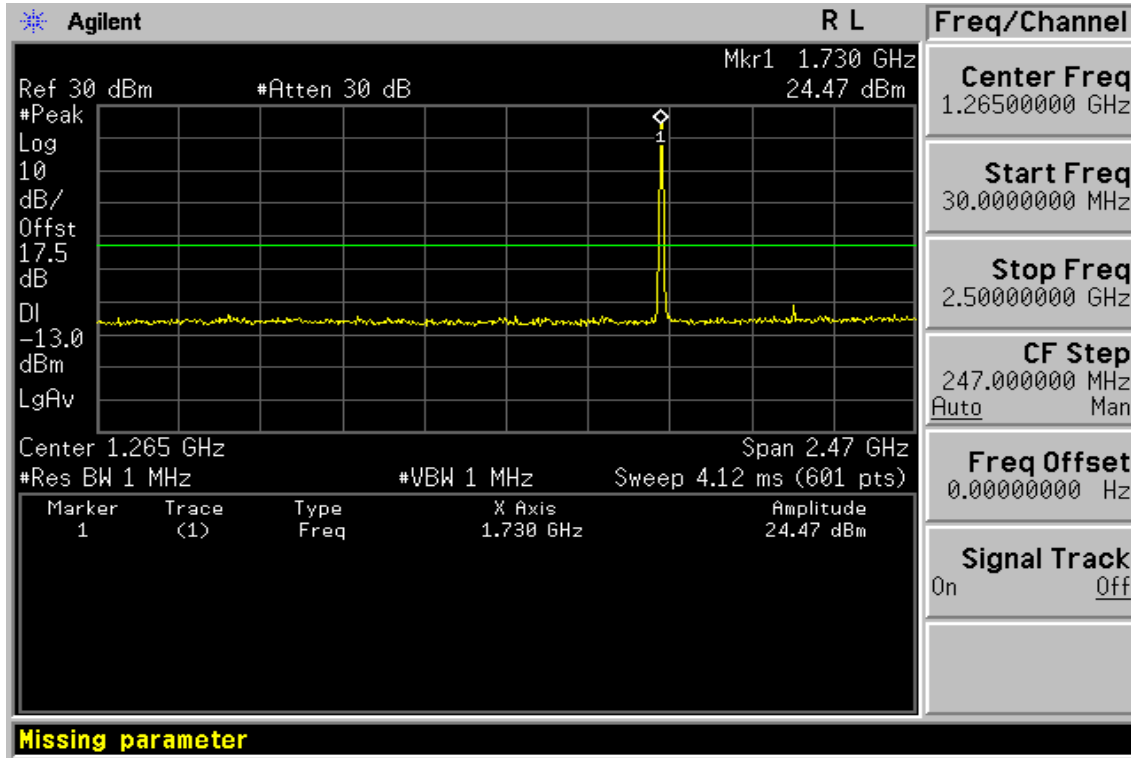
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Figure 9-17: Out of Band emission at antenna terminals – WCDMA IV Channel Mid



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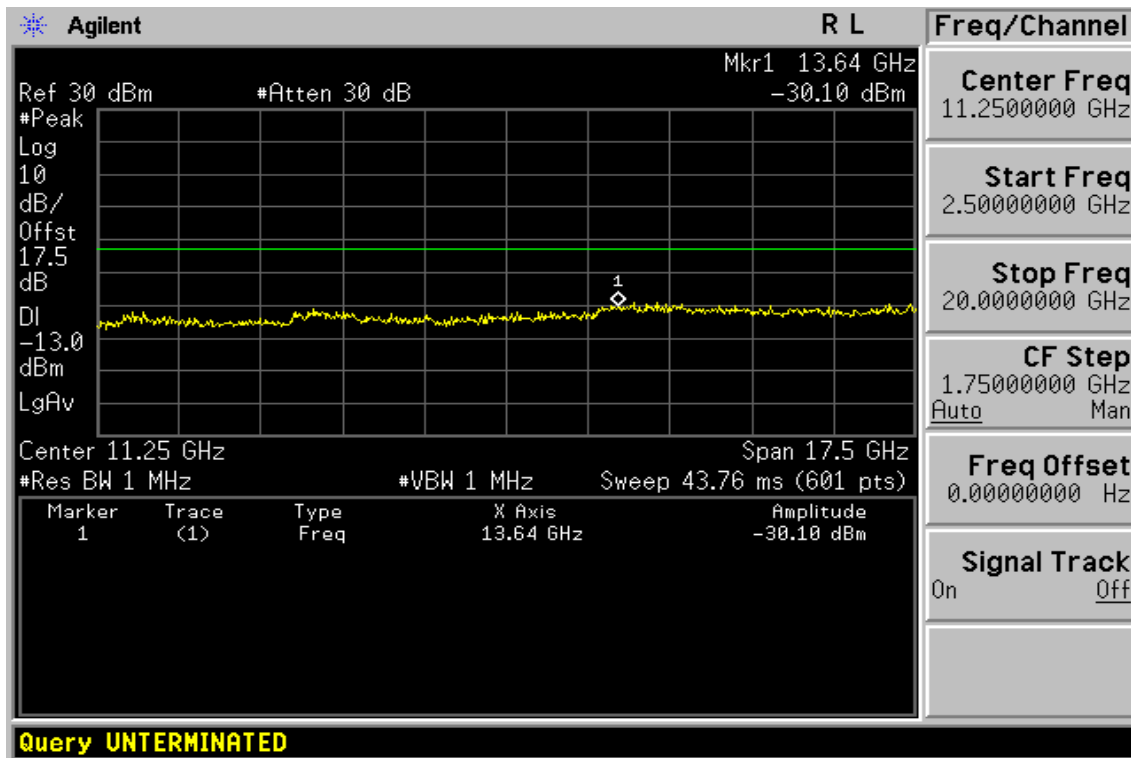
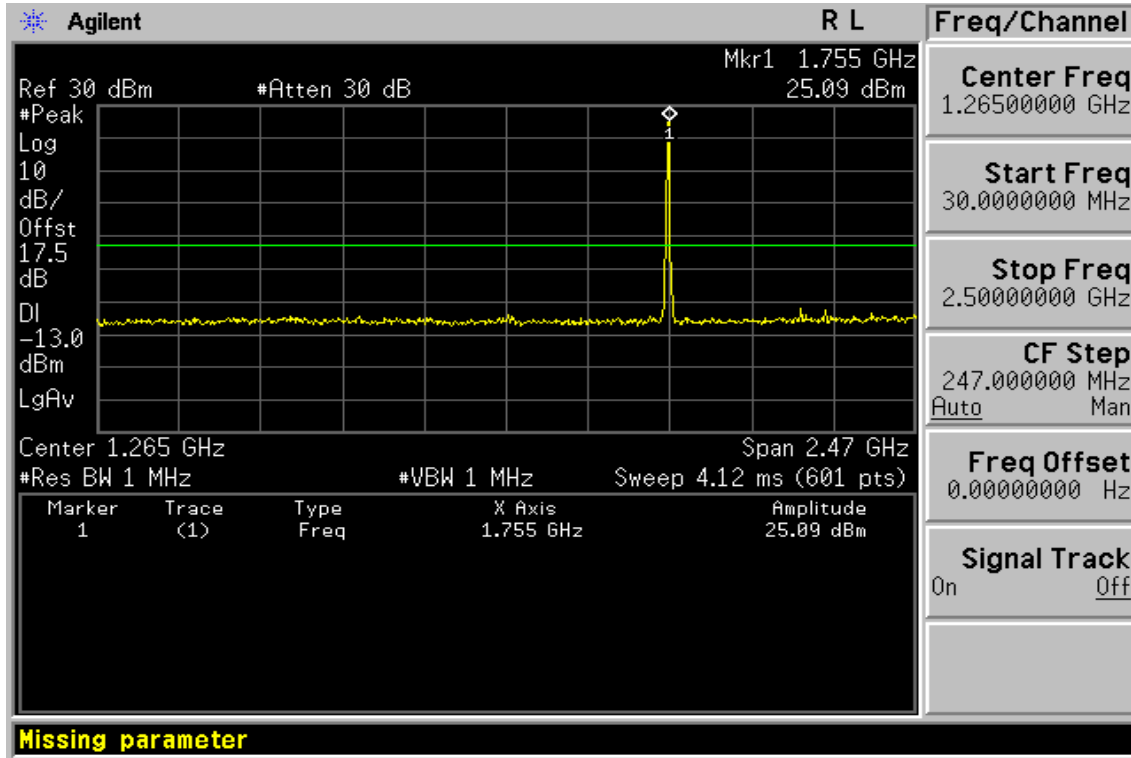
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Figure 9-18: Out of Band emission at antenna terminals –WCDMA IV Channel Highest



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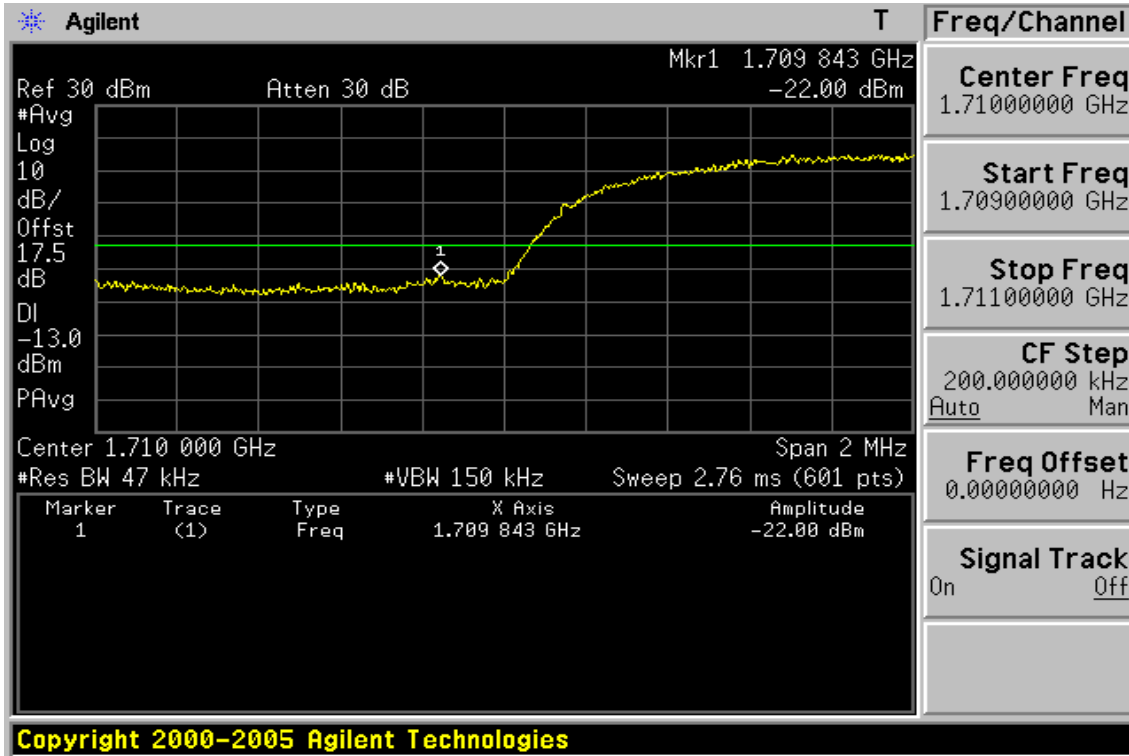
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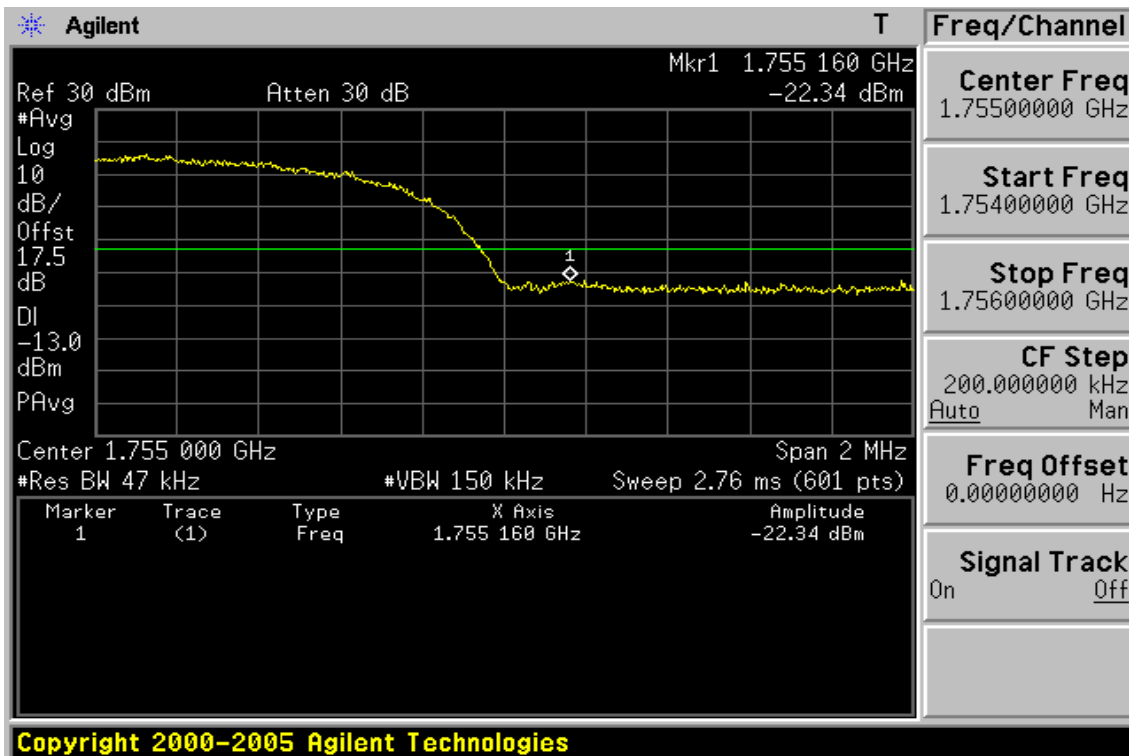
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**Figure 9-19: Bad edge emission at antenna terminals –WCDMA IV Channel Lowest**



**Figure 9-20: Band edge emission at antenna terminals –WCDMA IV Channel Highest**



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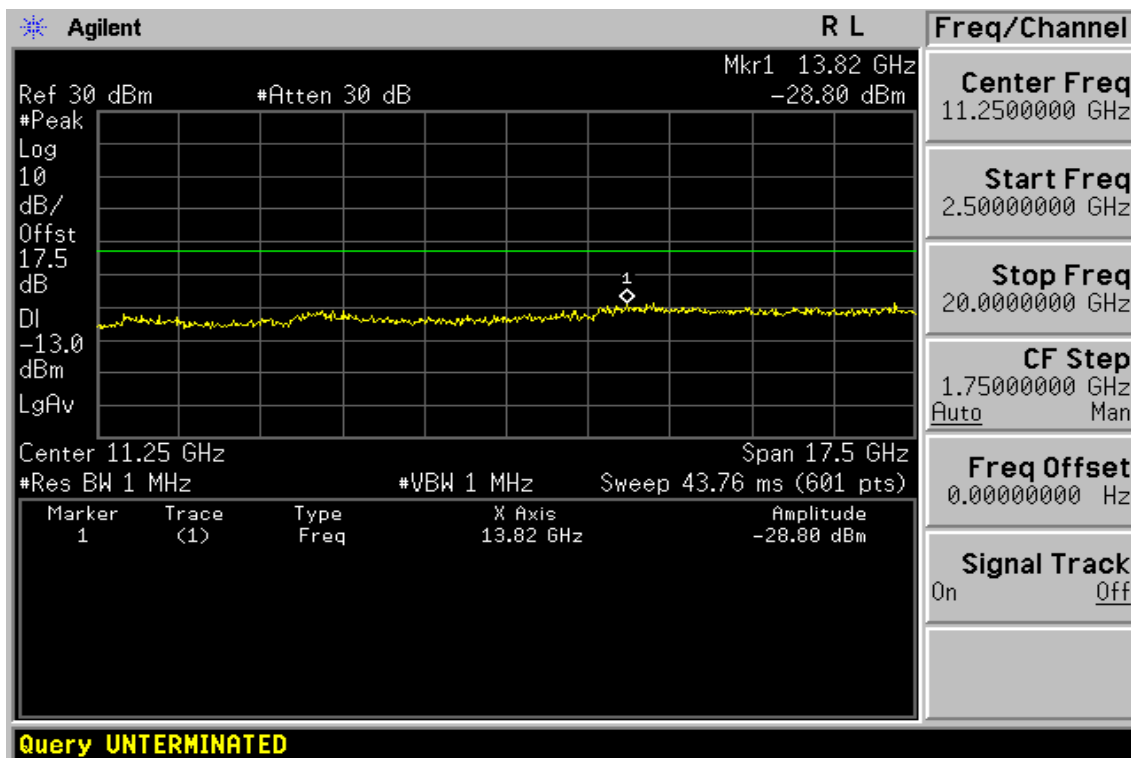
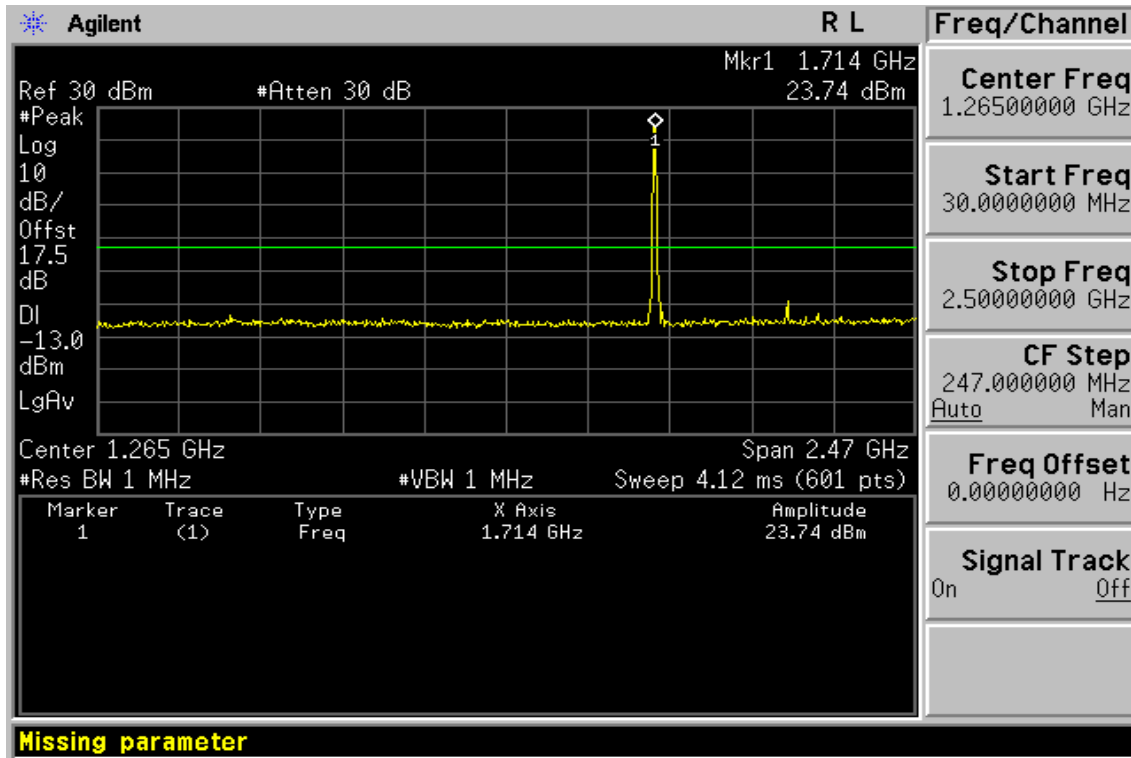
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Figure 9-21: Out of Band emission at antenna terminals – HSUPA IV Channel Lowest



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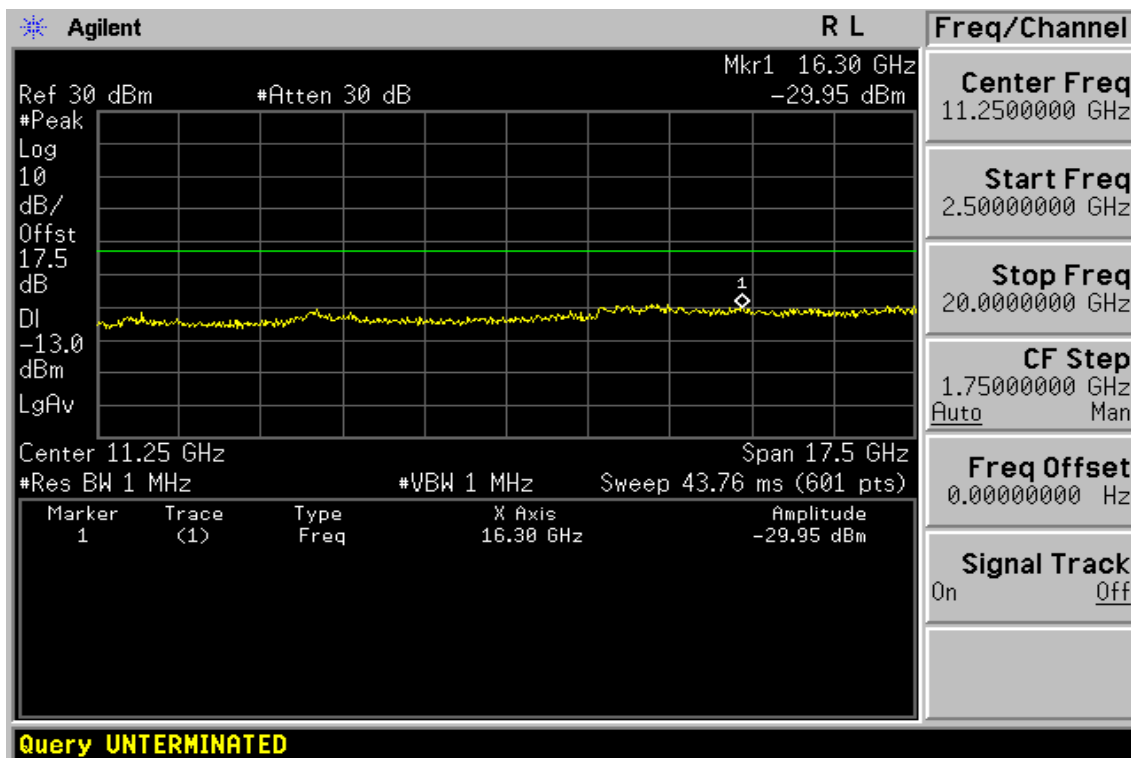
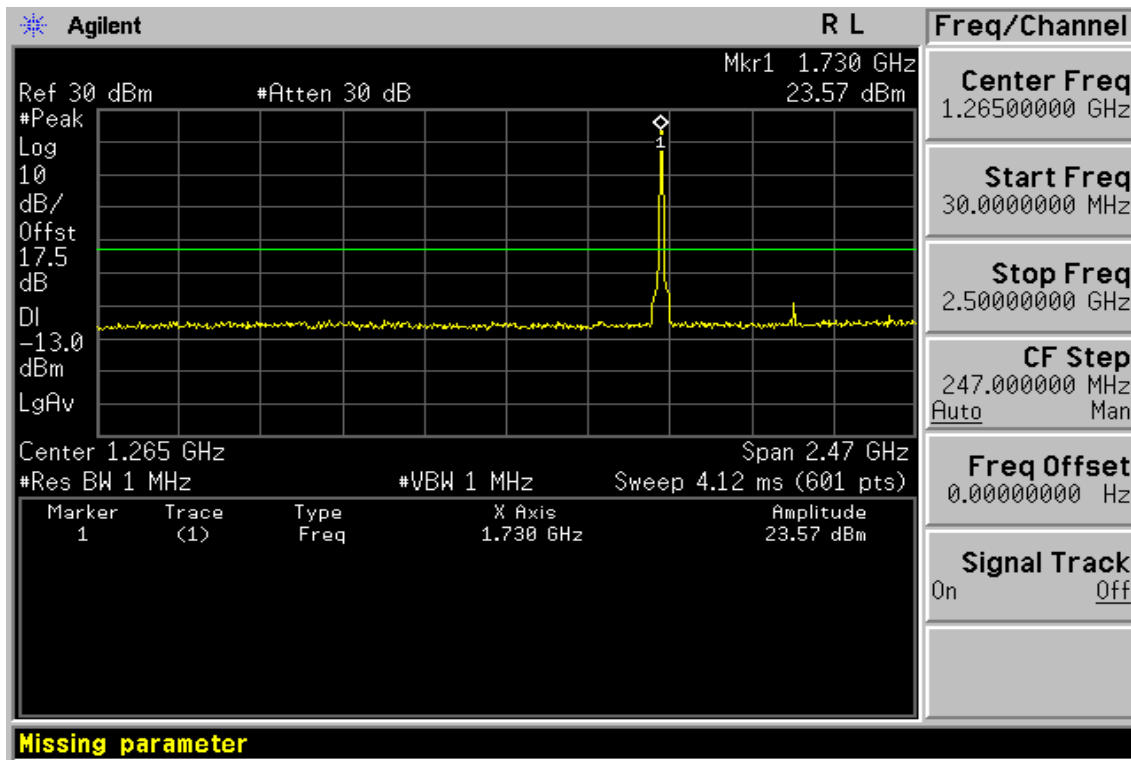
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Figure 9-22: Out of Band emission at antenna terminals –HSUPA IV Channel Mid



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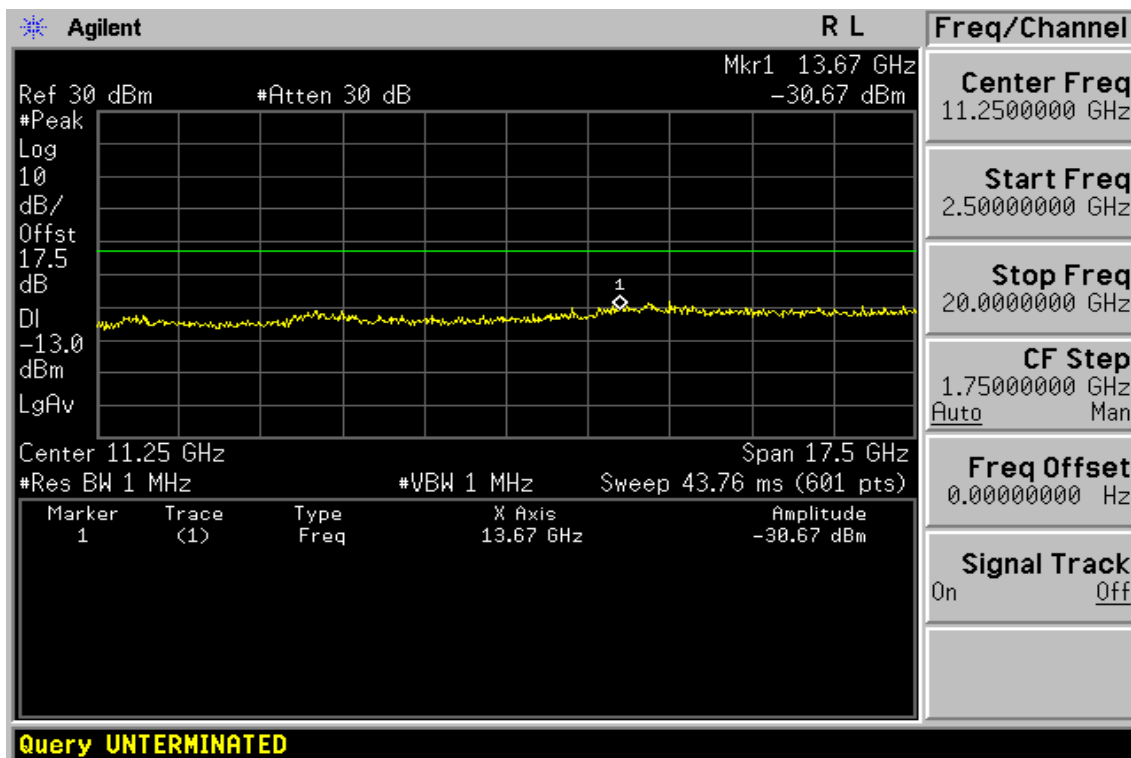
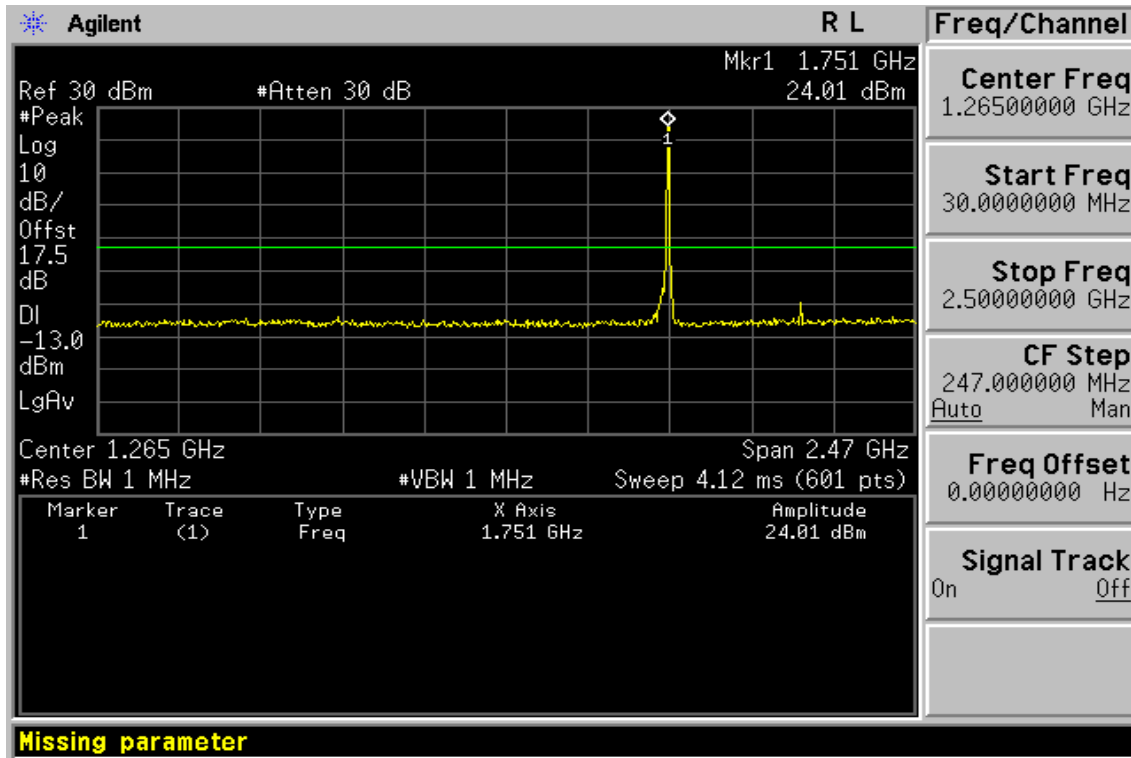
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Figure 9-23: Out of Band emission at antenna terminals –HSUPA IV Channel Highest



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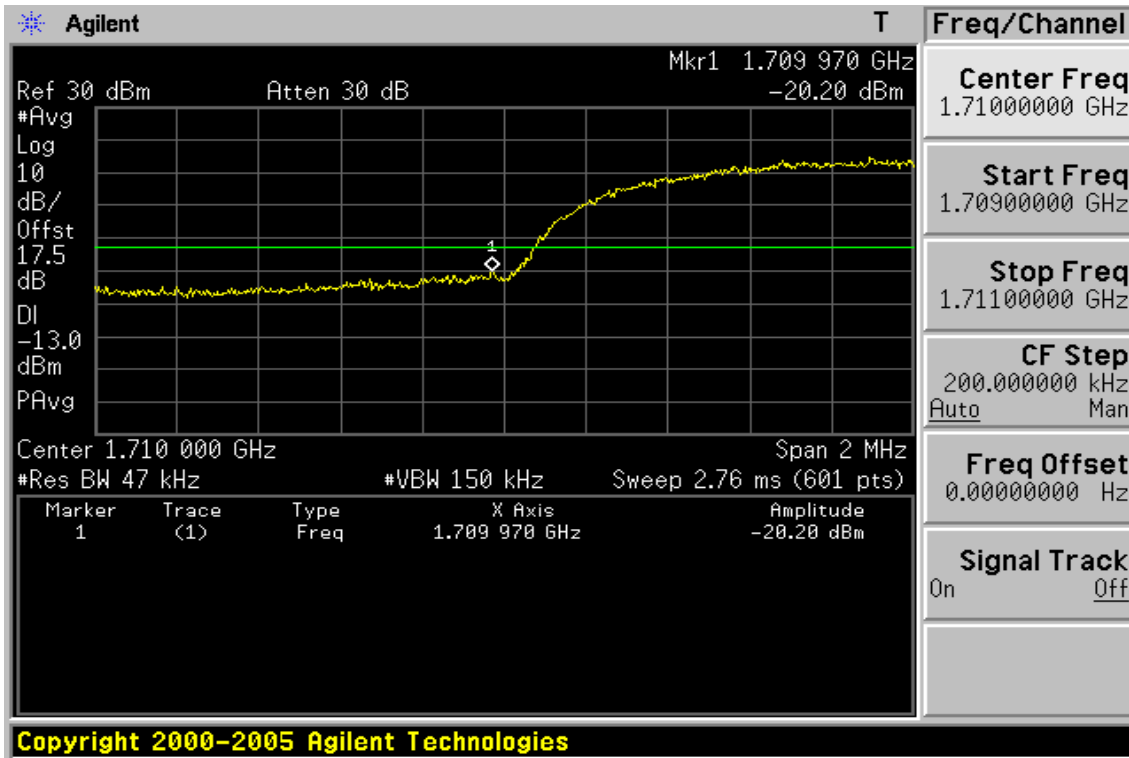
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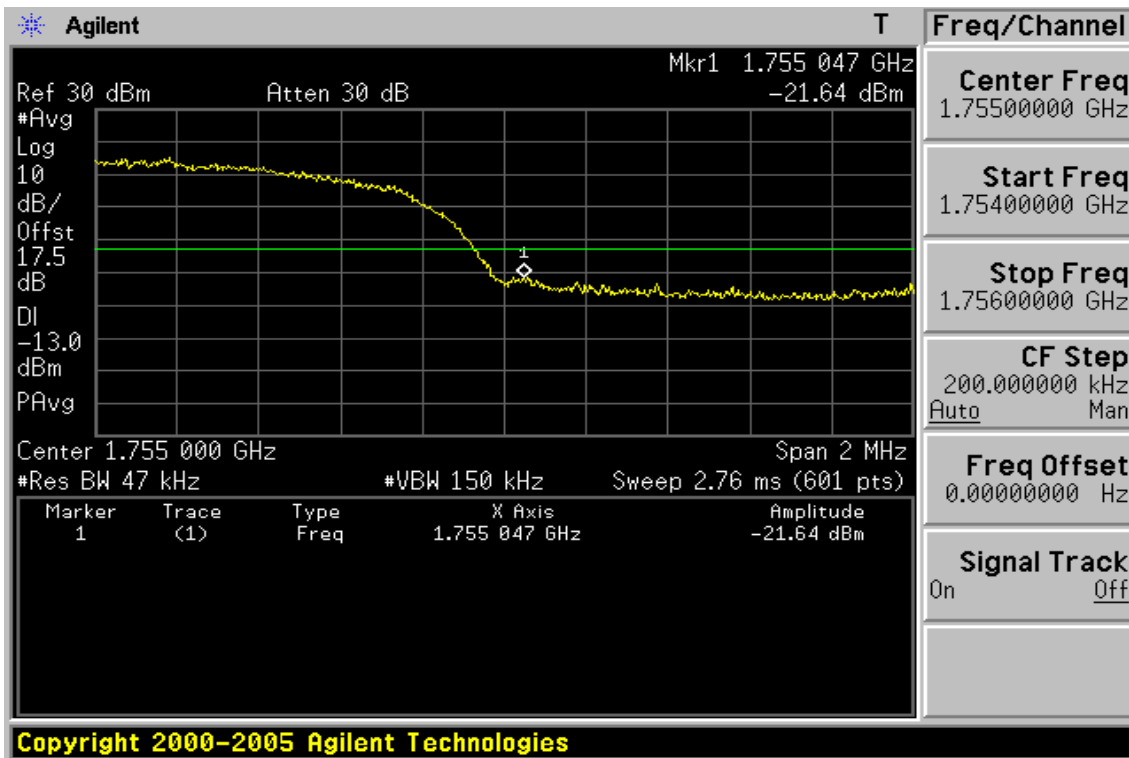
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**Figure 9-24: Band edge emission at antenna terminals –HSUPA IV Channel Lowest**



**Figure 9-25: Band edge emission at antenna terminals –HSUPA IV Channel Highest**



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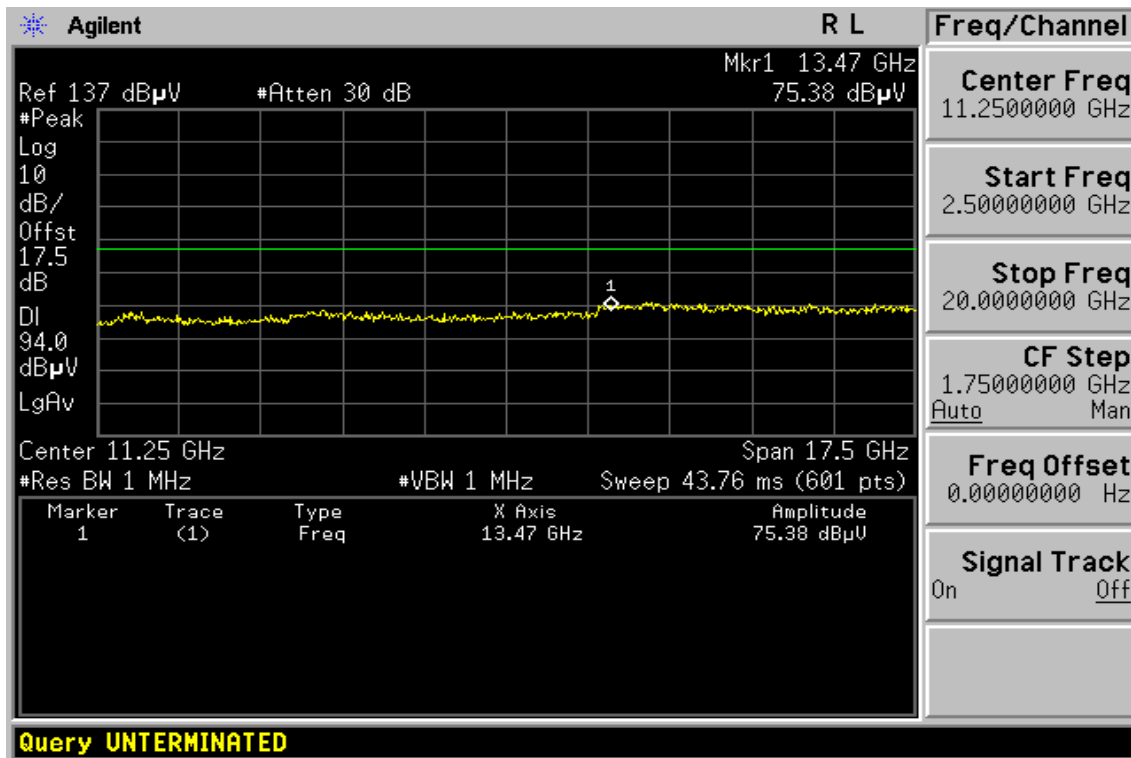
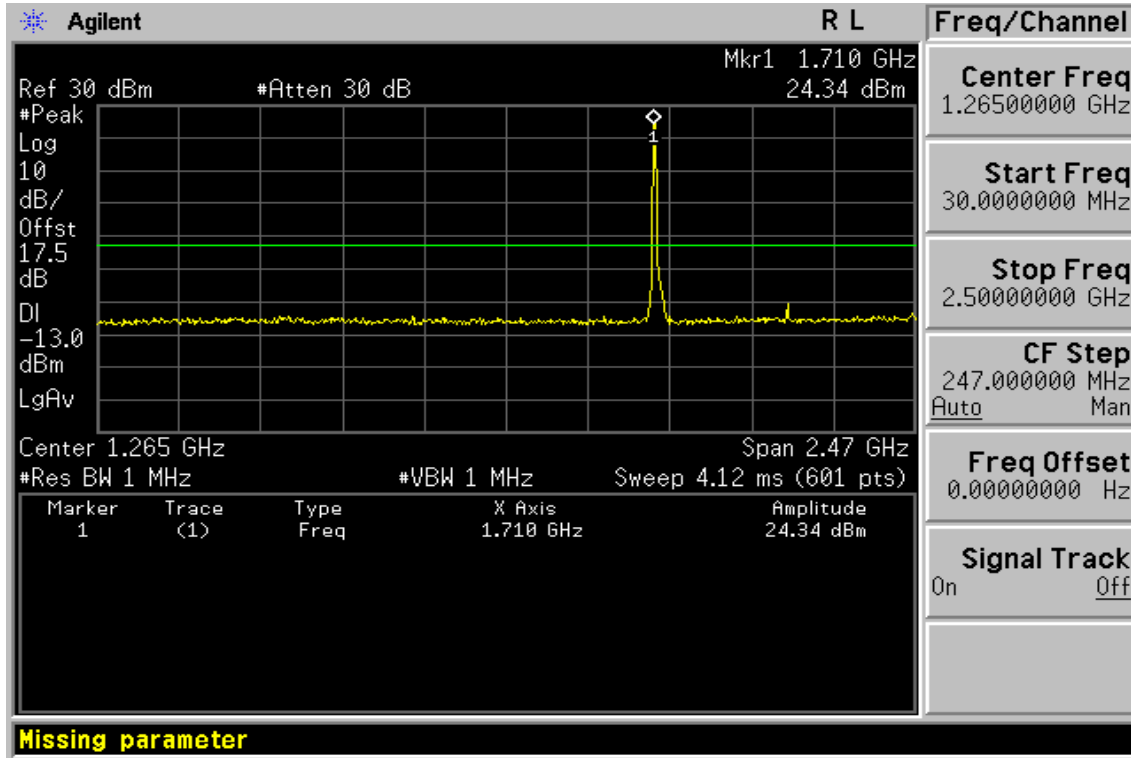
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Figure 9-26: Out of Band emission at antenna terminals – HSDPA IV Channel Lowest



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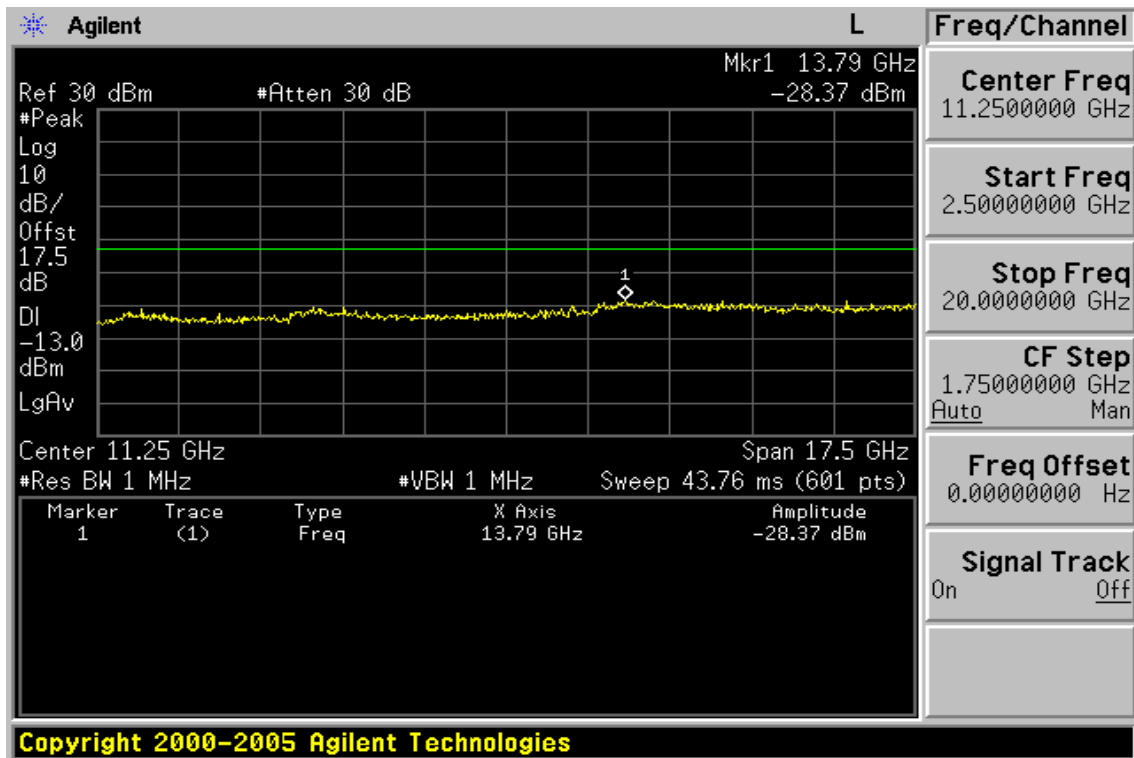
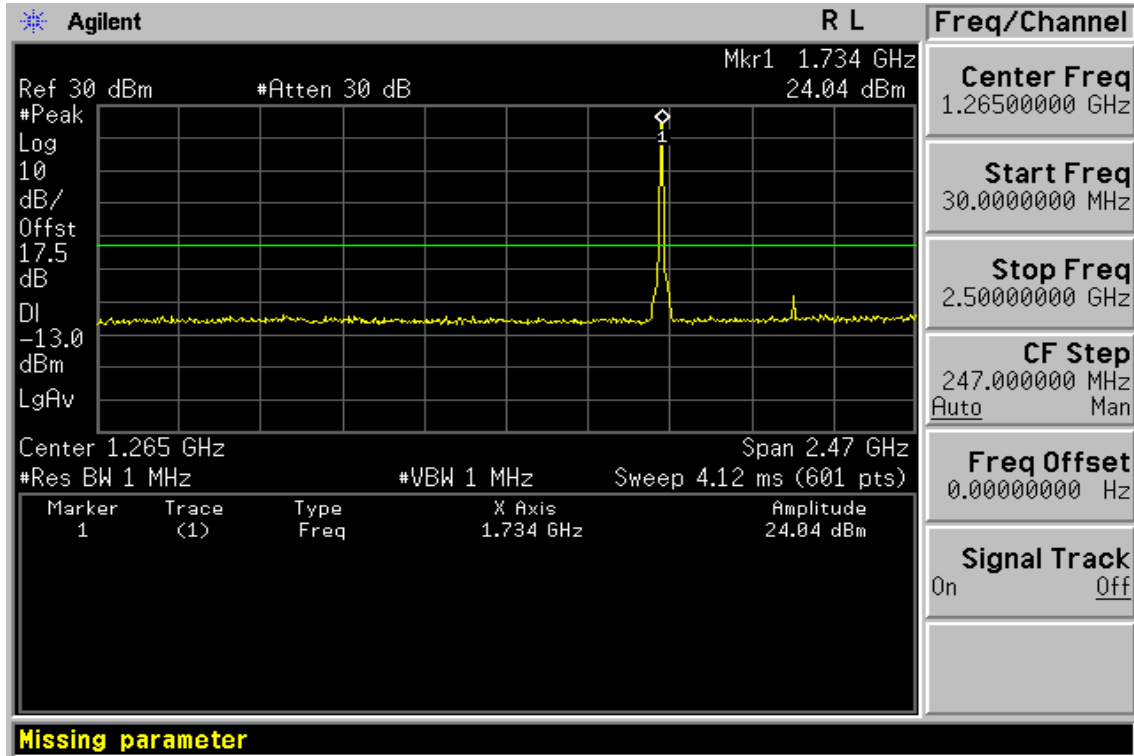
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Figure 9-27: Out of Band emission at antenna terminals – HSDPA IV Channel Mid



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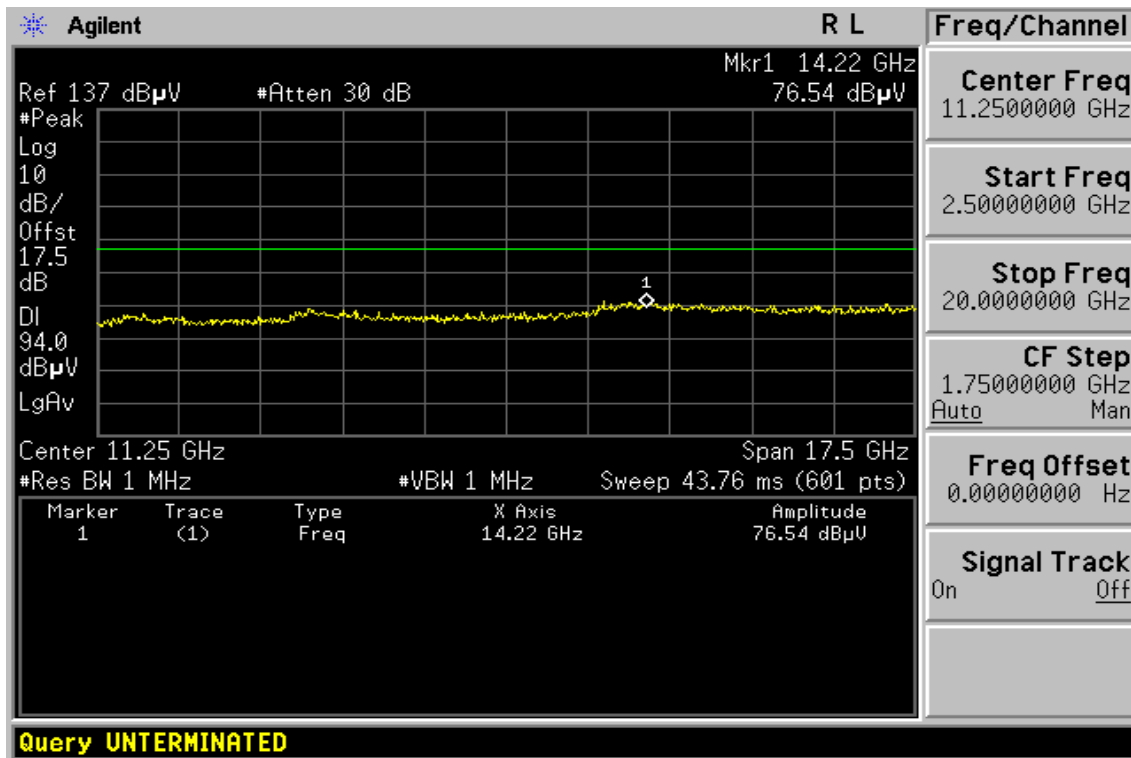
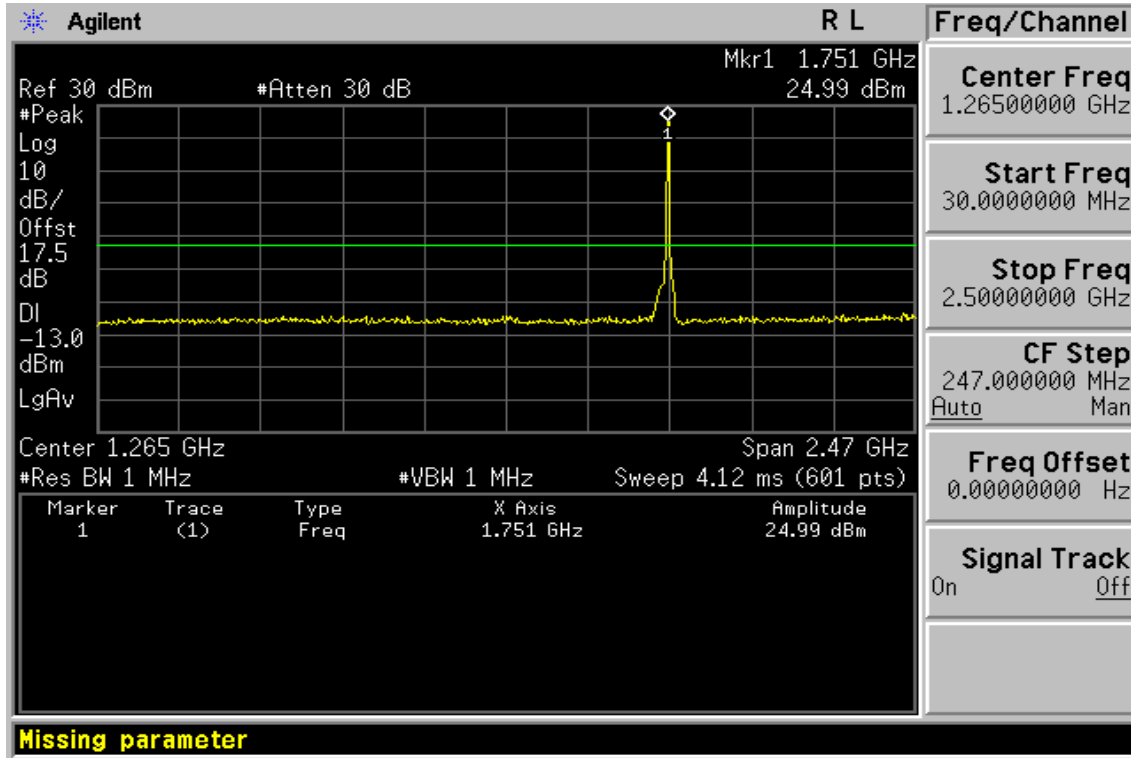
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Figure 9-28: Out of Band emission at antenna terminals – HSDPA IV Channel Highest



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Figure 9-29: Bad edge emission at antenna terminals – HSDPA IV Channel Lowest

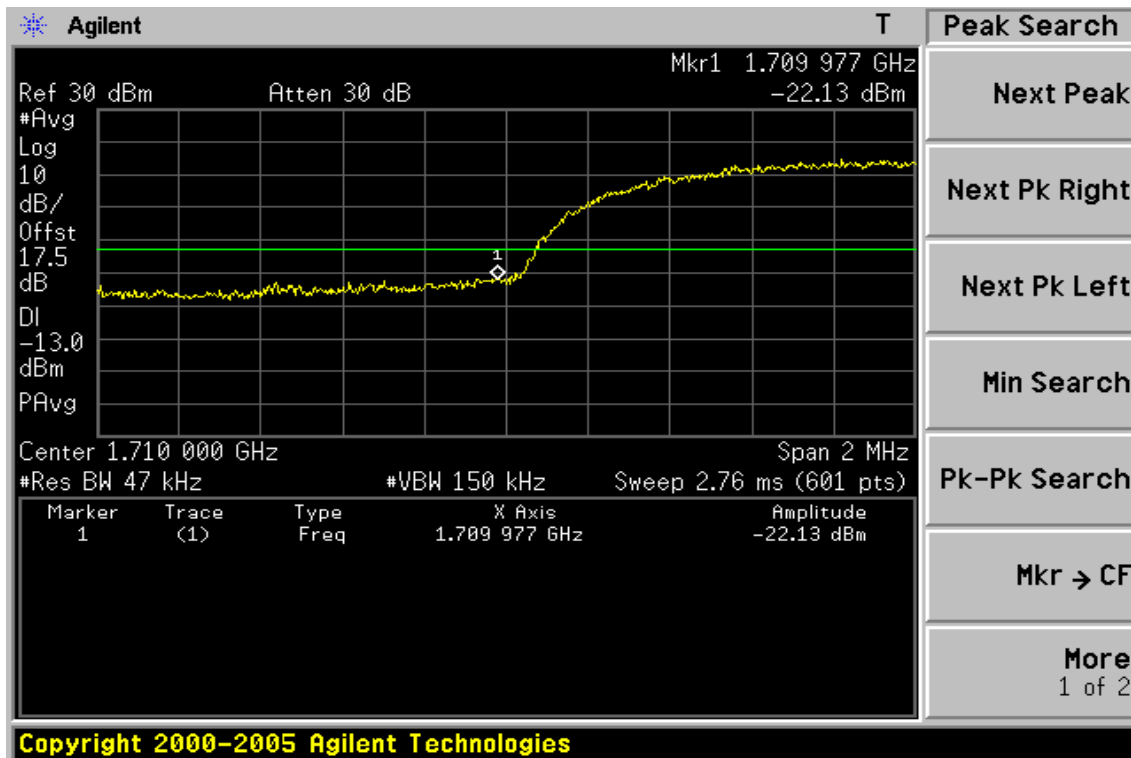
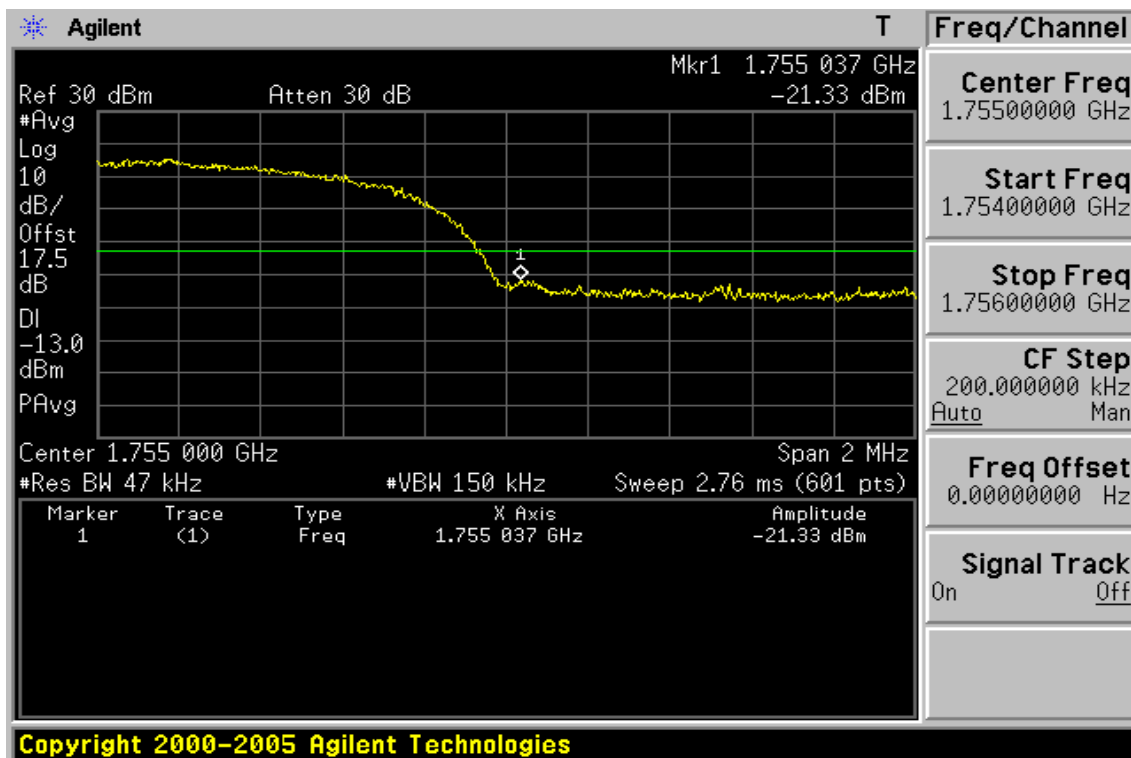


Figure 9-30: Band edge emission at antenna terminals – HSDPA IV Channel Highest



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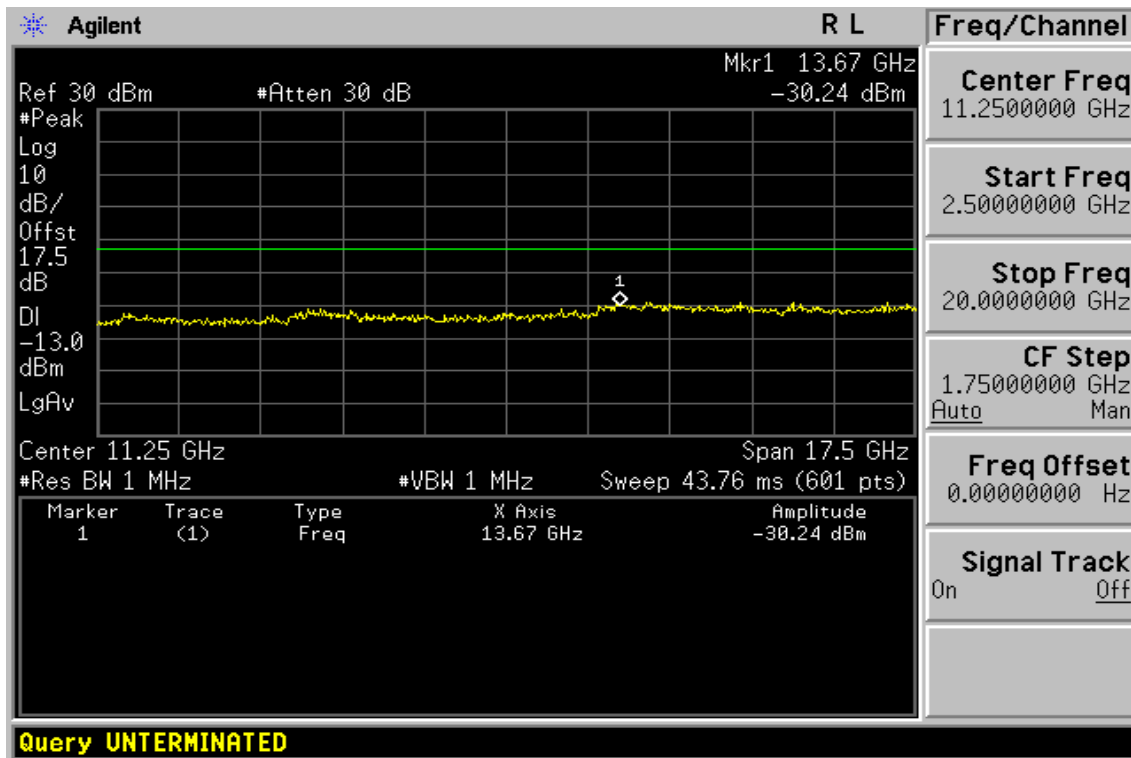
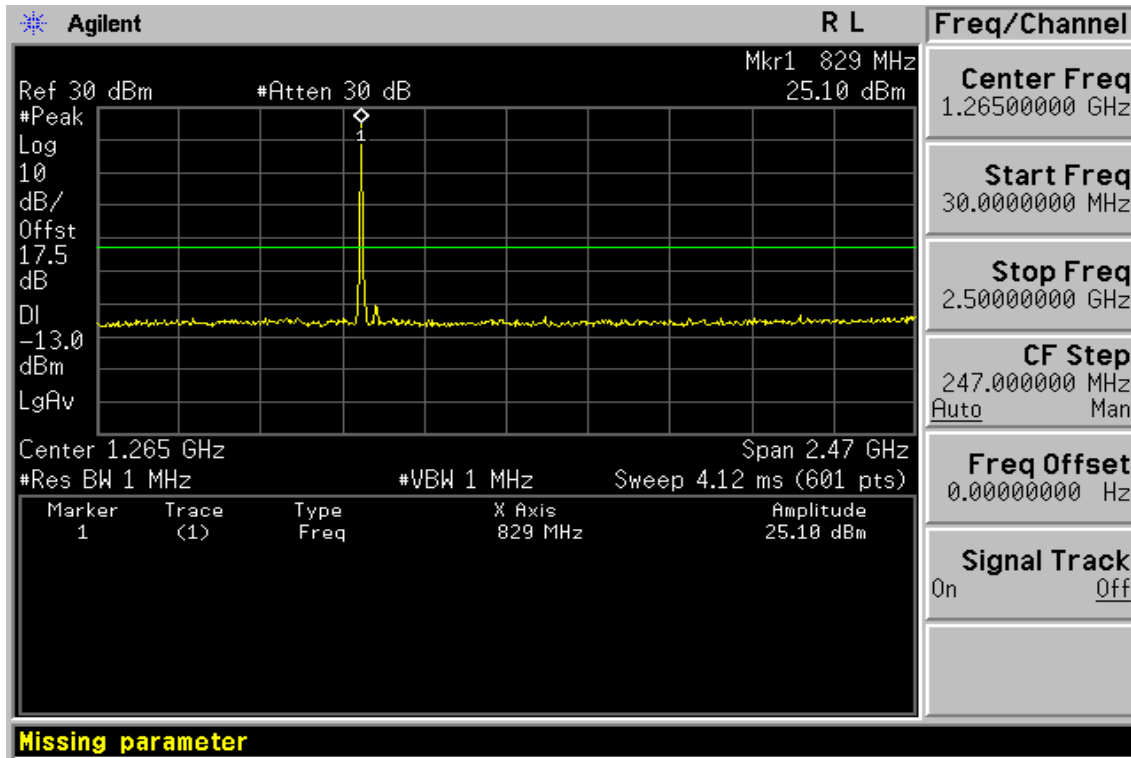
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Figure 9-31: Out of Band emission at antenna terminals – WCDMA V Channel Lowest



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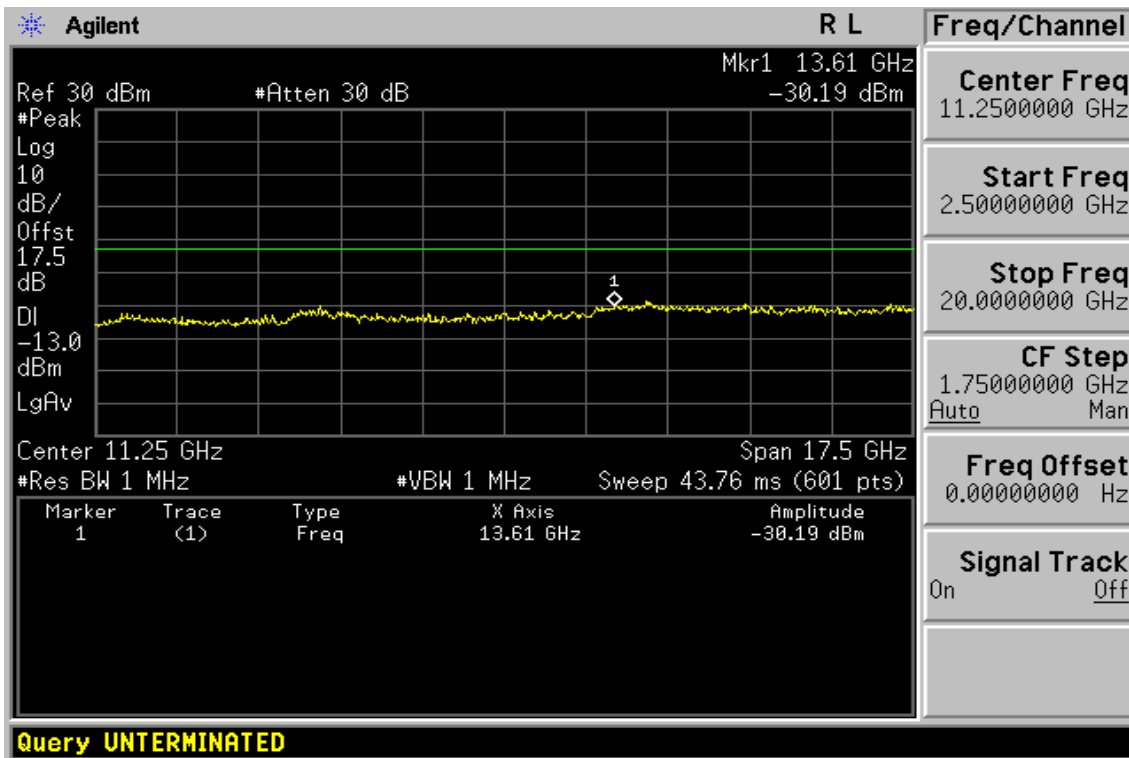
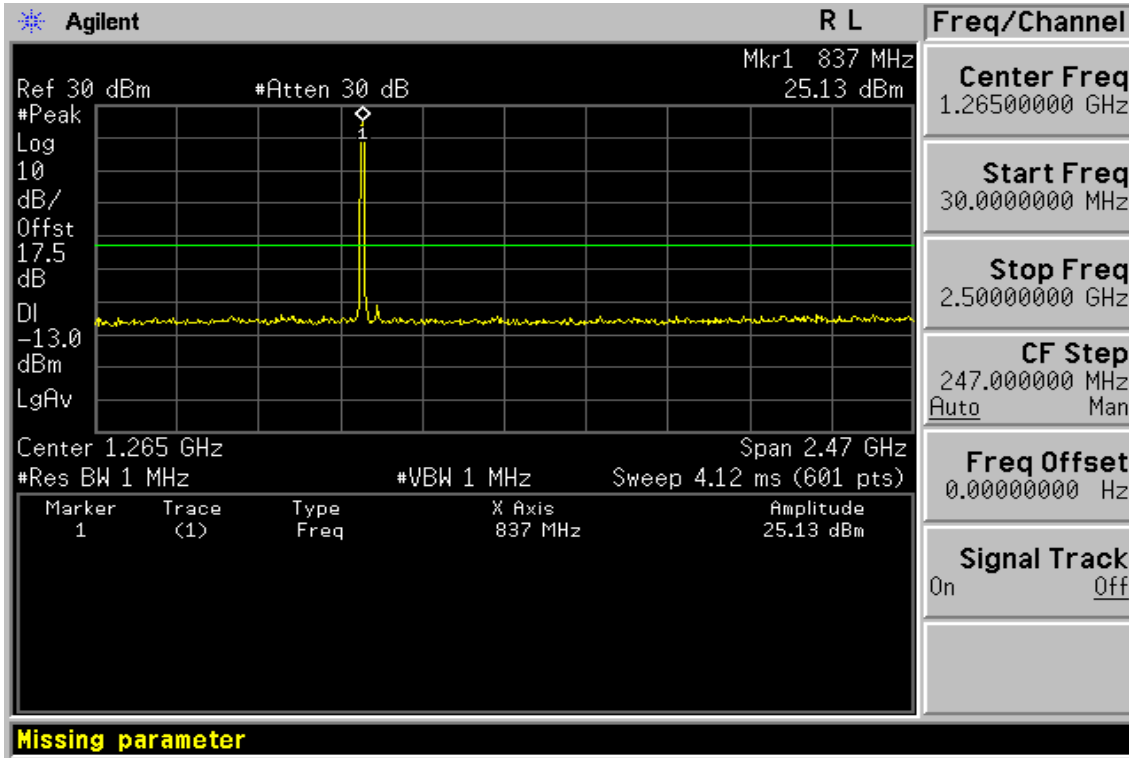
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Figure 9-32: Out of Band emission at antenna terminals – WCDMA V Channel Mid



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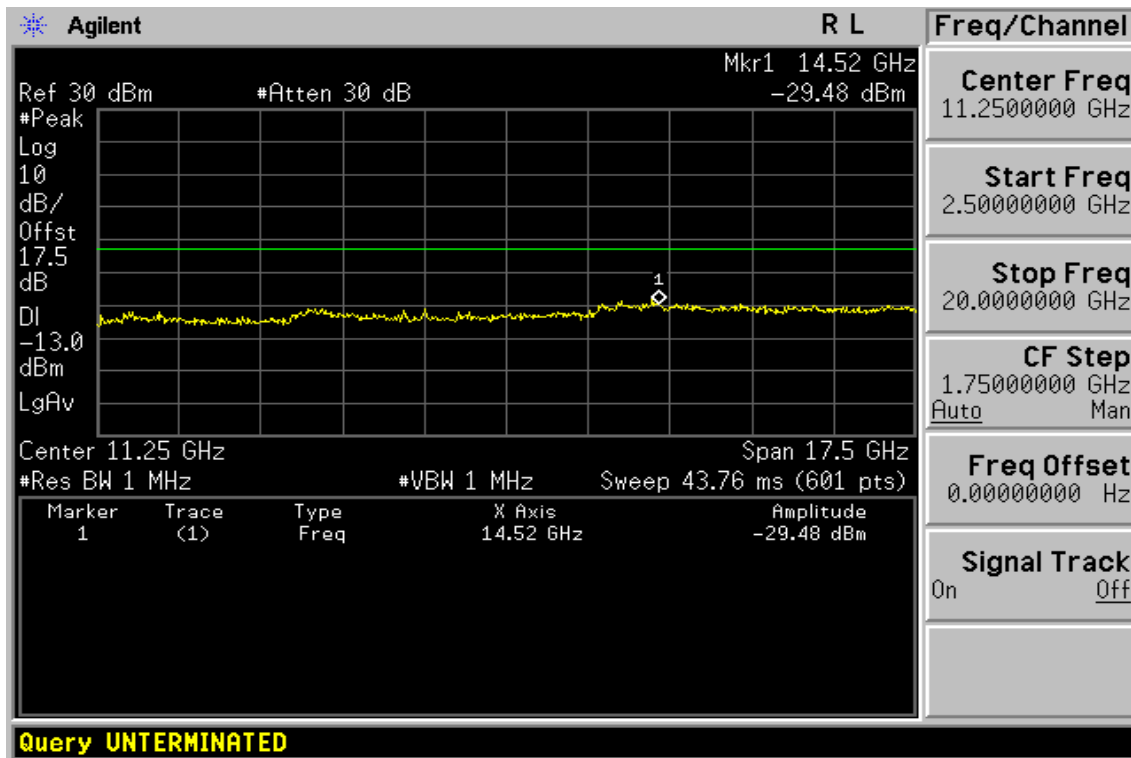
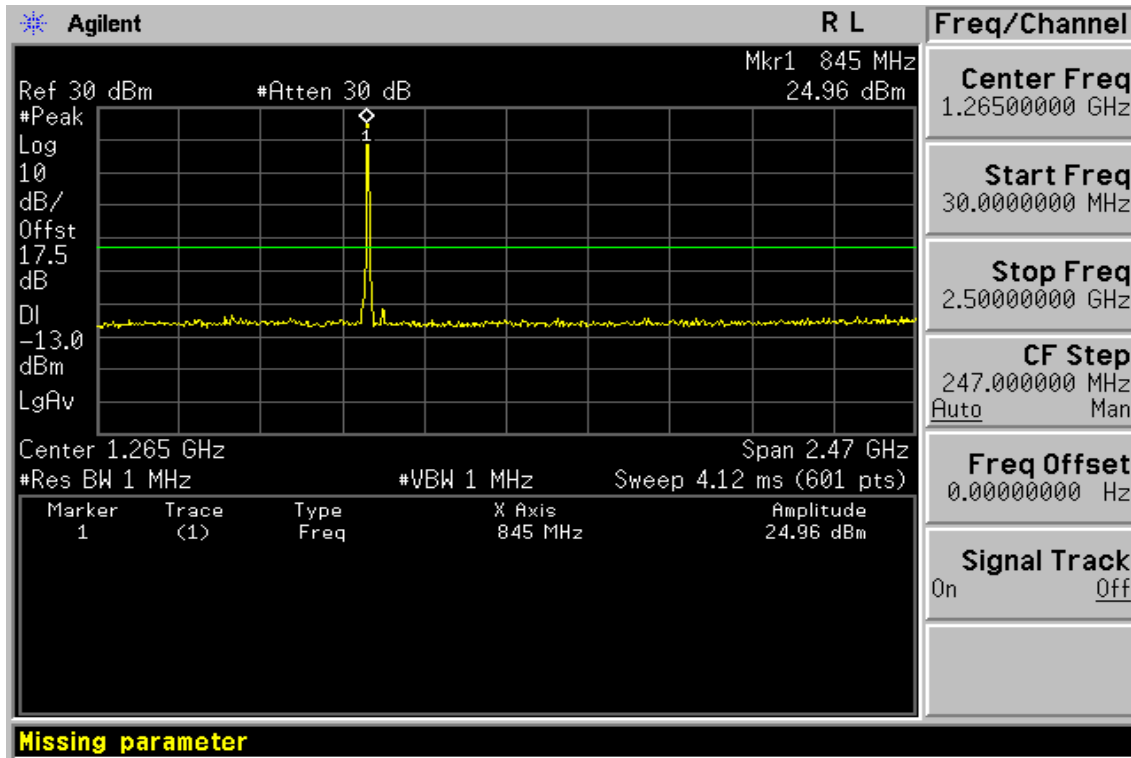
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Figure 9-33: Out of Band emission at antenna terminals – WCDMA V Channel Highest



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Figure 9-34: Bad edge emission at antenna terminals – WCDMA V Channel Lowest

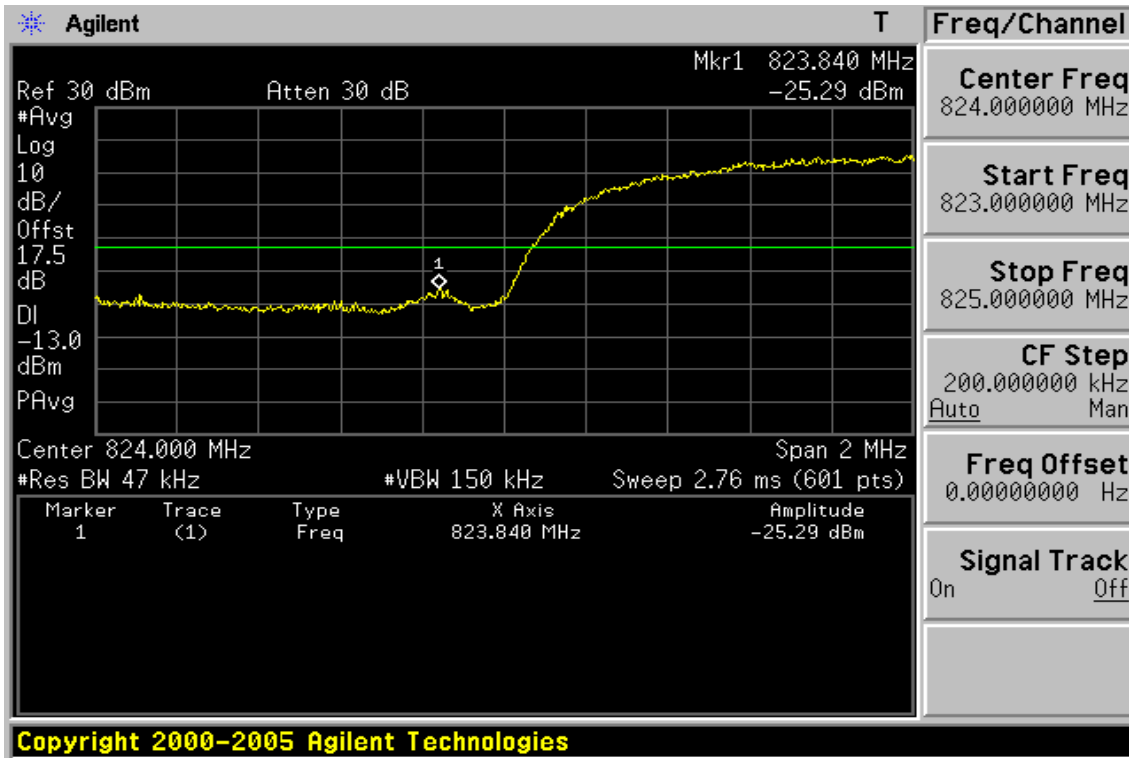
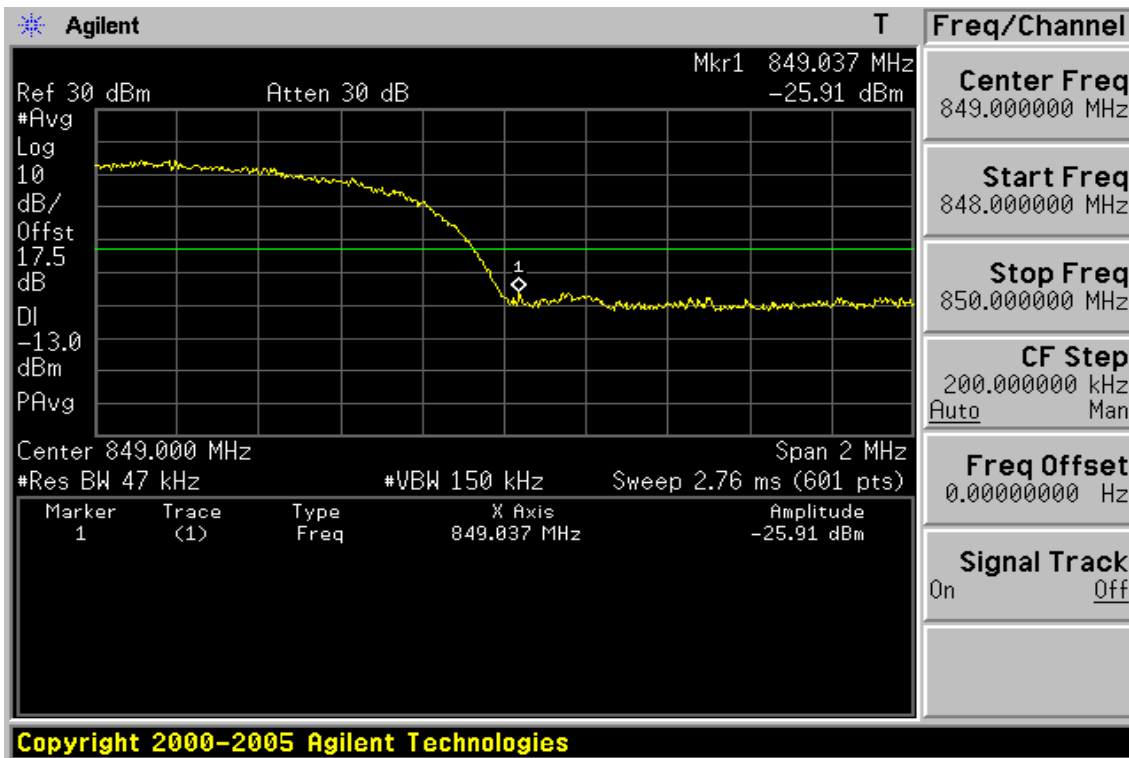


Figure 9-35: Band edge emission at antenna terminals – WCDMA V Channel Highest



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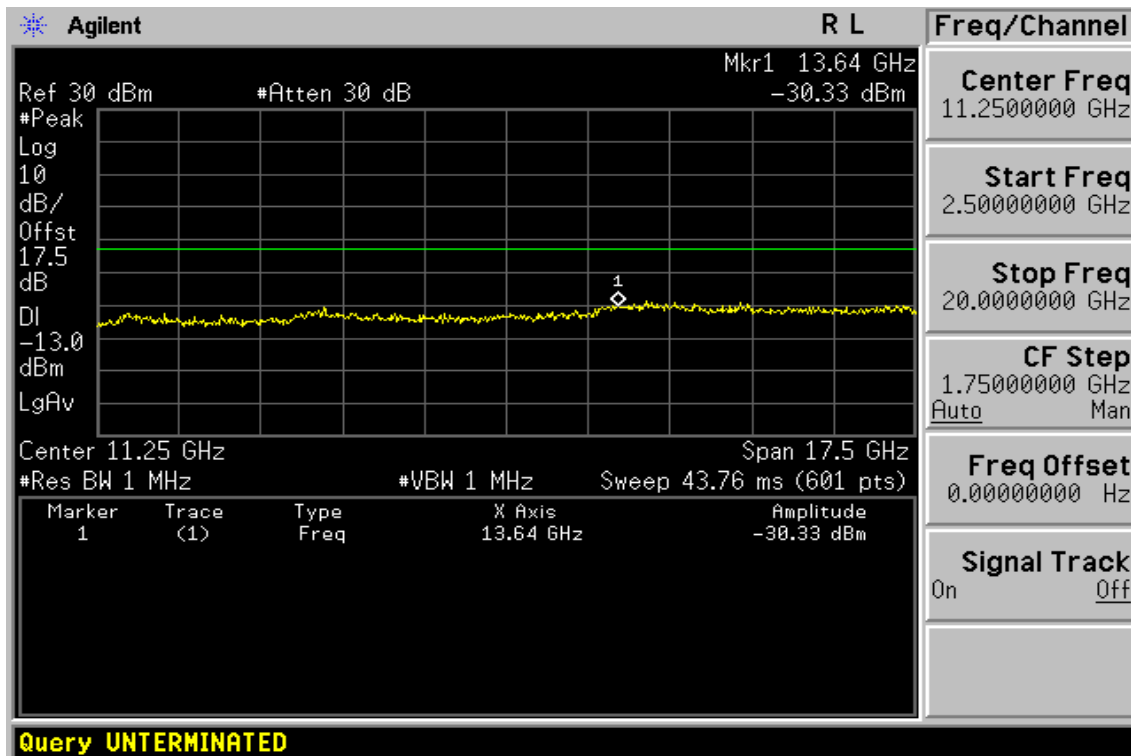
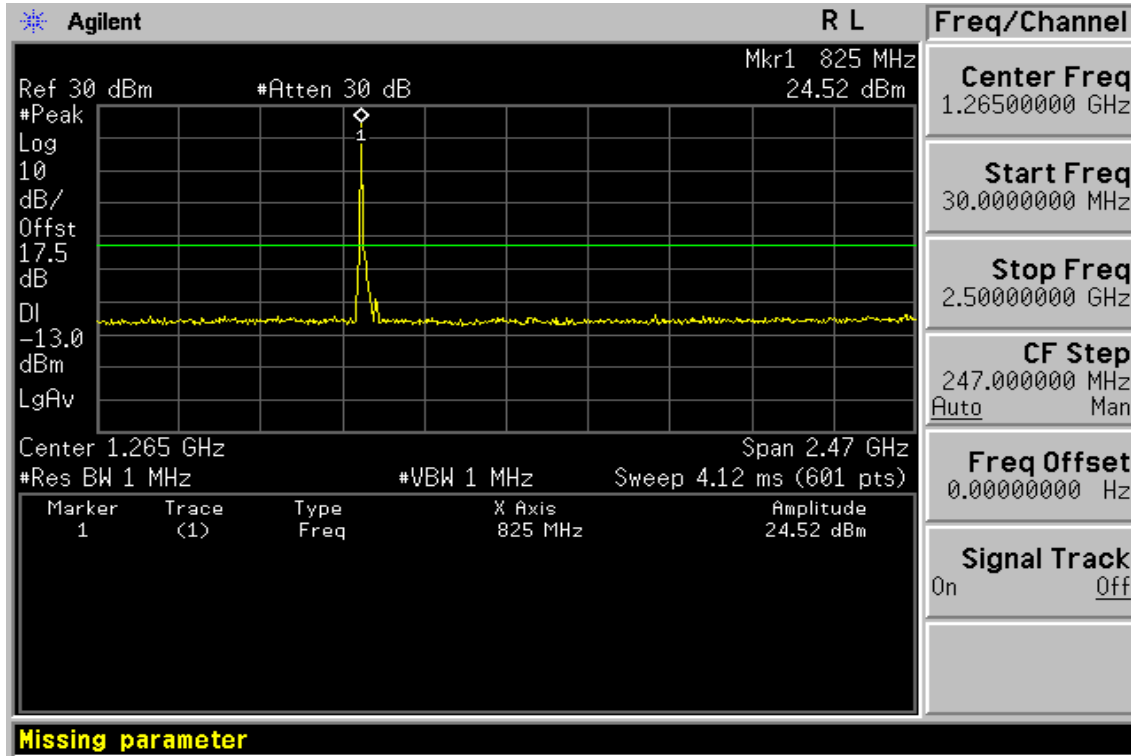
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Figure 9-36: Out of Band emission at antenna terminals – HSUPA V Channel Lowest



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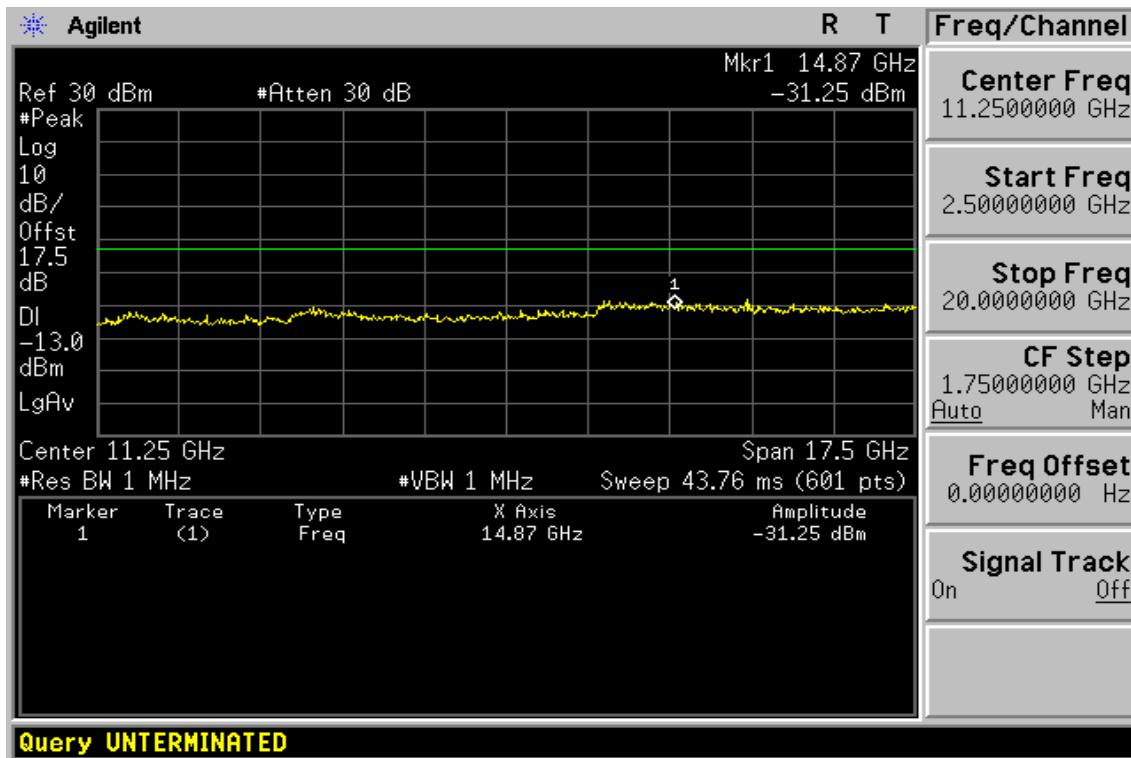
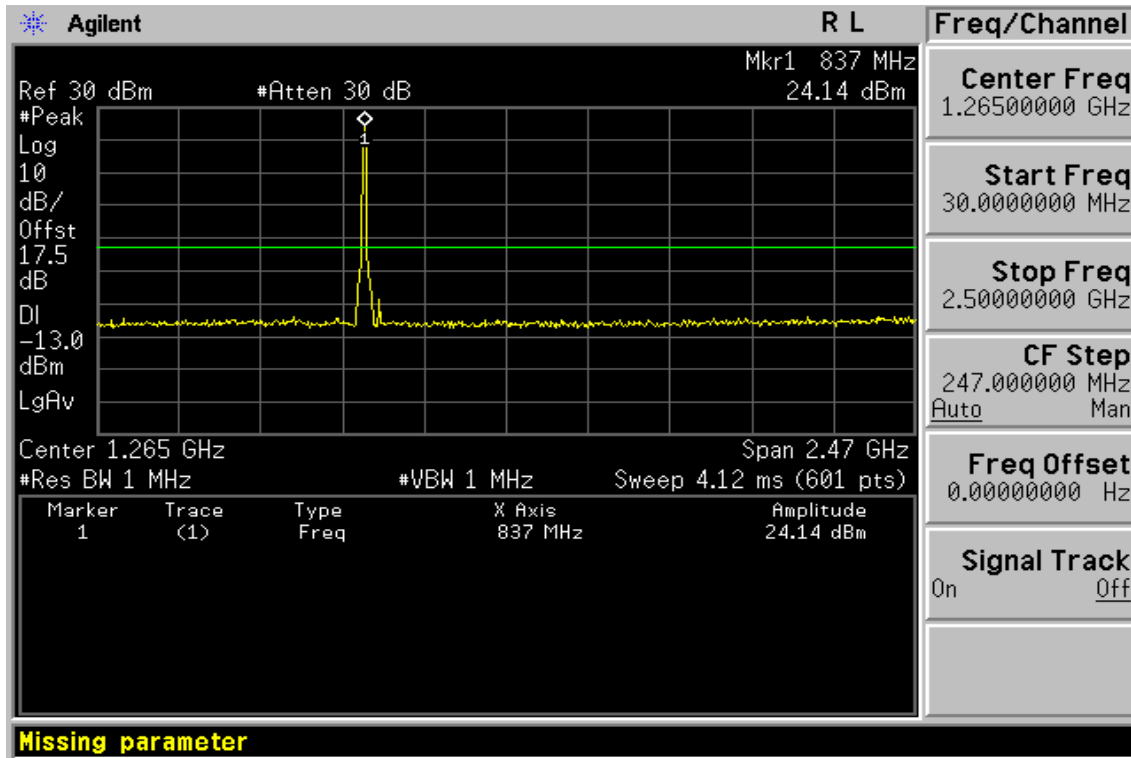
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Figure 9-37: Out of Band emission at antenna terminals – HSUPA V Channel Mid



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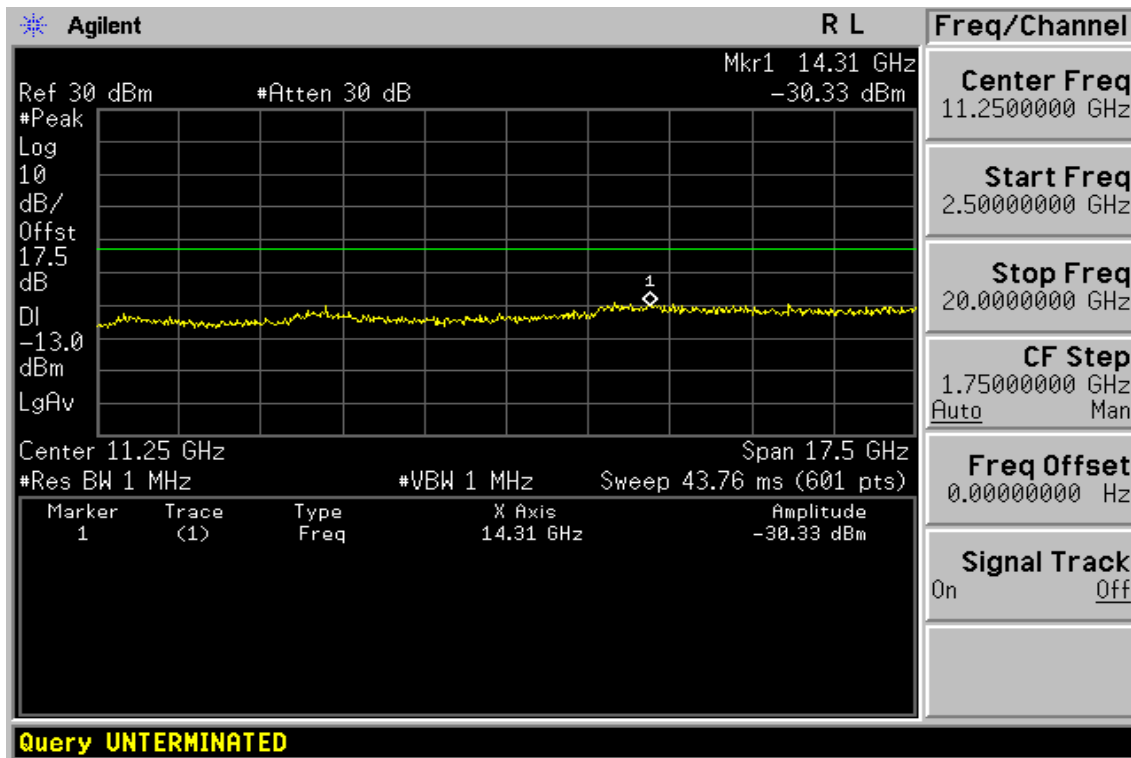
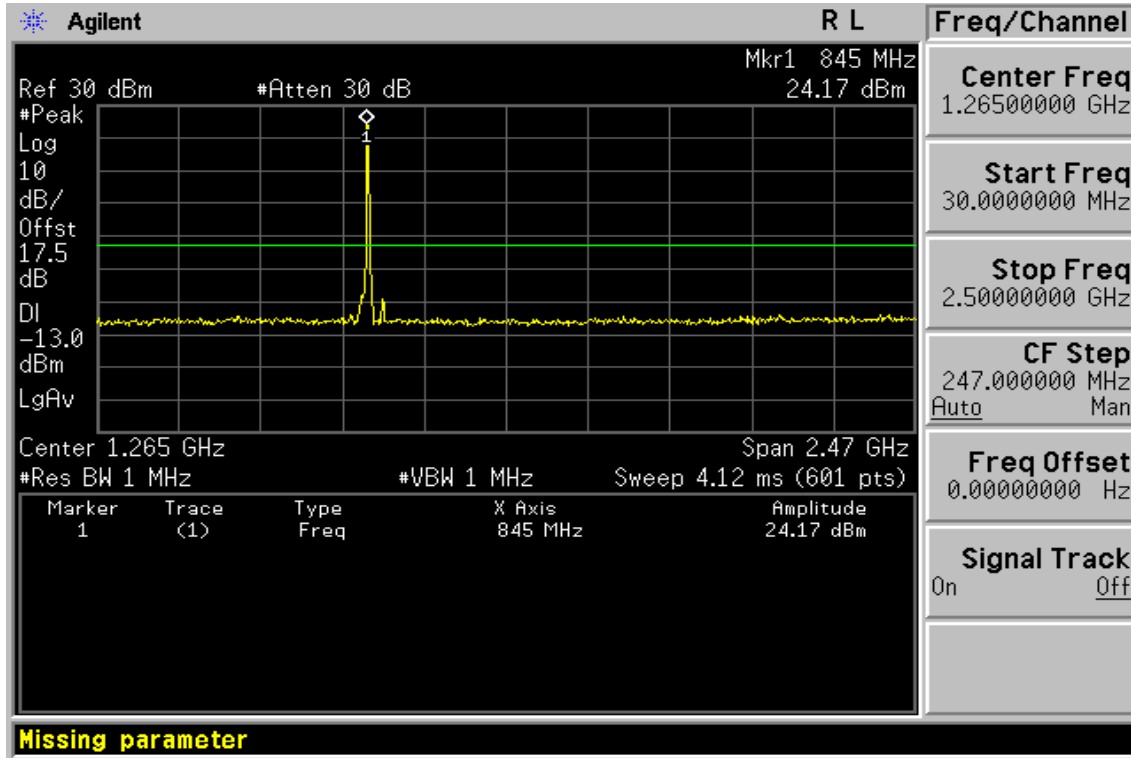
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Figure 9-38: Out of Band emission at antenna terminals – HSUPA V Channel Highest



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Figure 9-39: Bad edge emission at antenna terminals – HSUPA V Channel Lowest

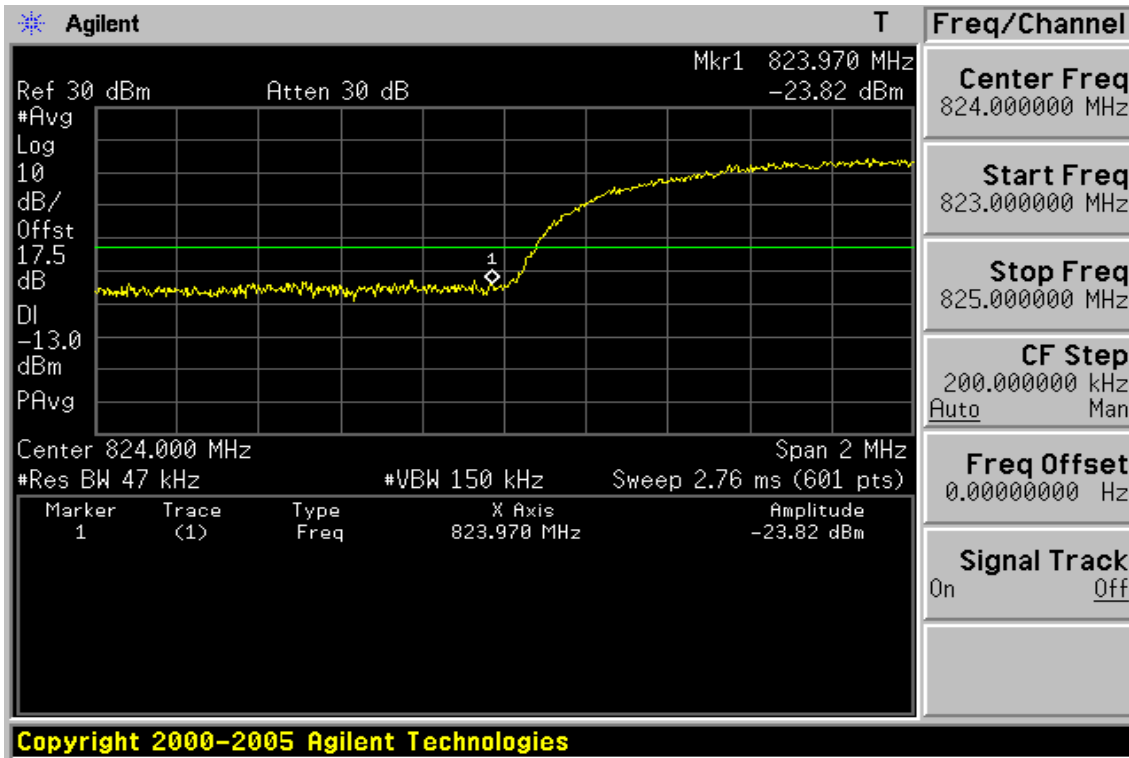
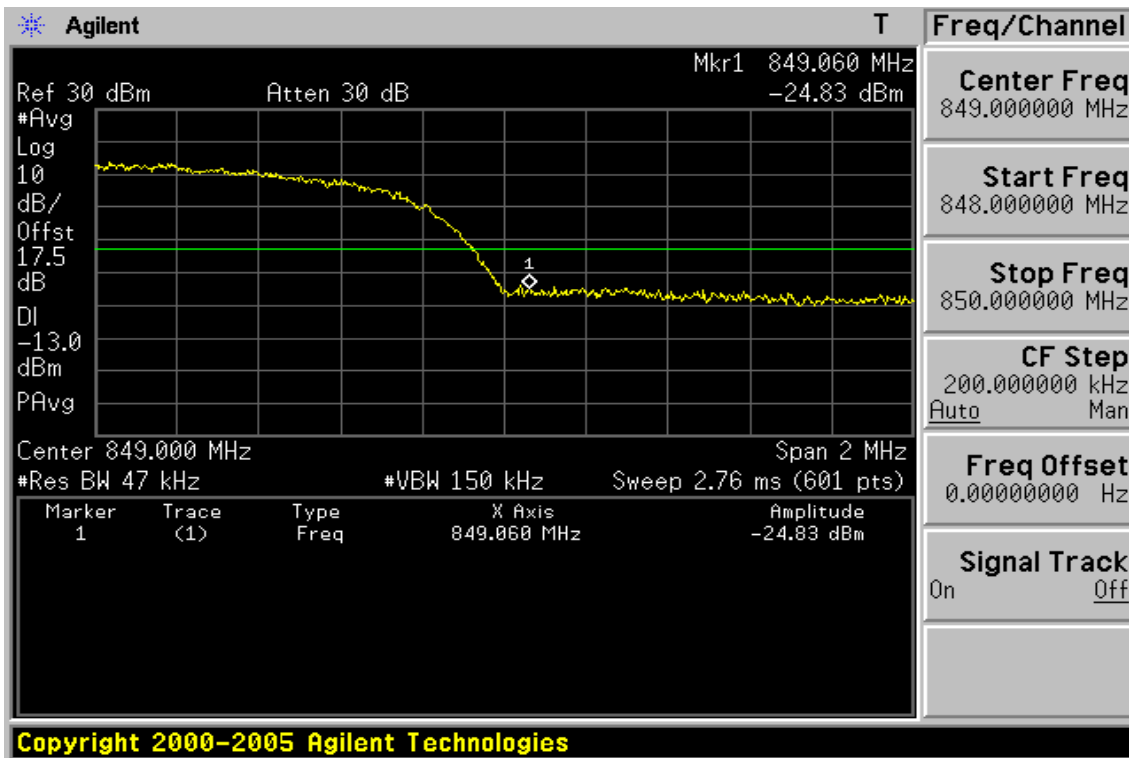


Figure 9-40: Band edge emission at antenna terminals – HSUPA V Channel Highest



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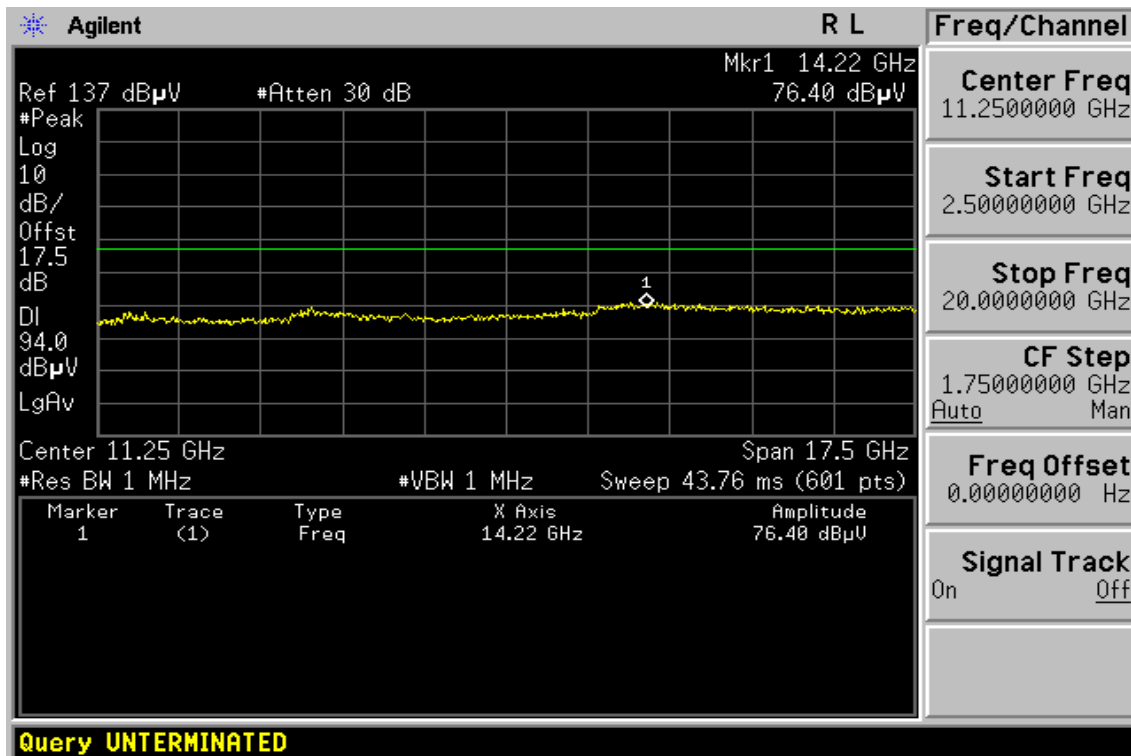
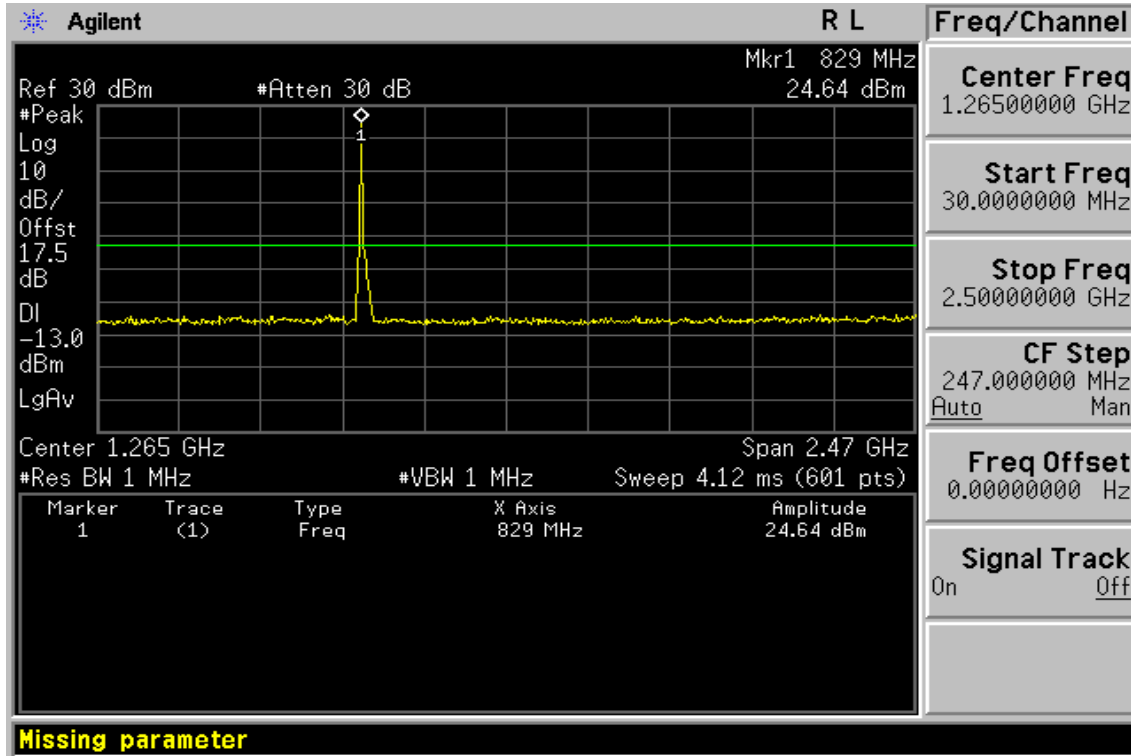
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Figure 9-41: Out of Band emission at antenna terminals – HSDPA V Channel Lowest



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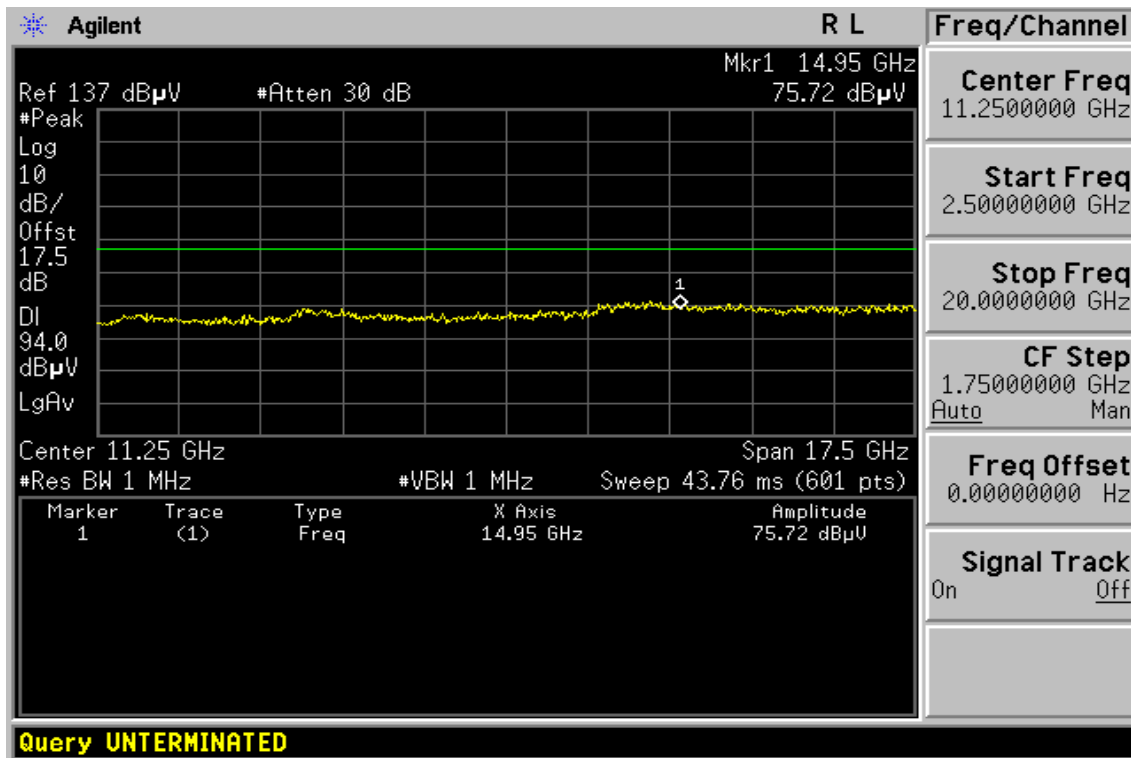
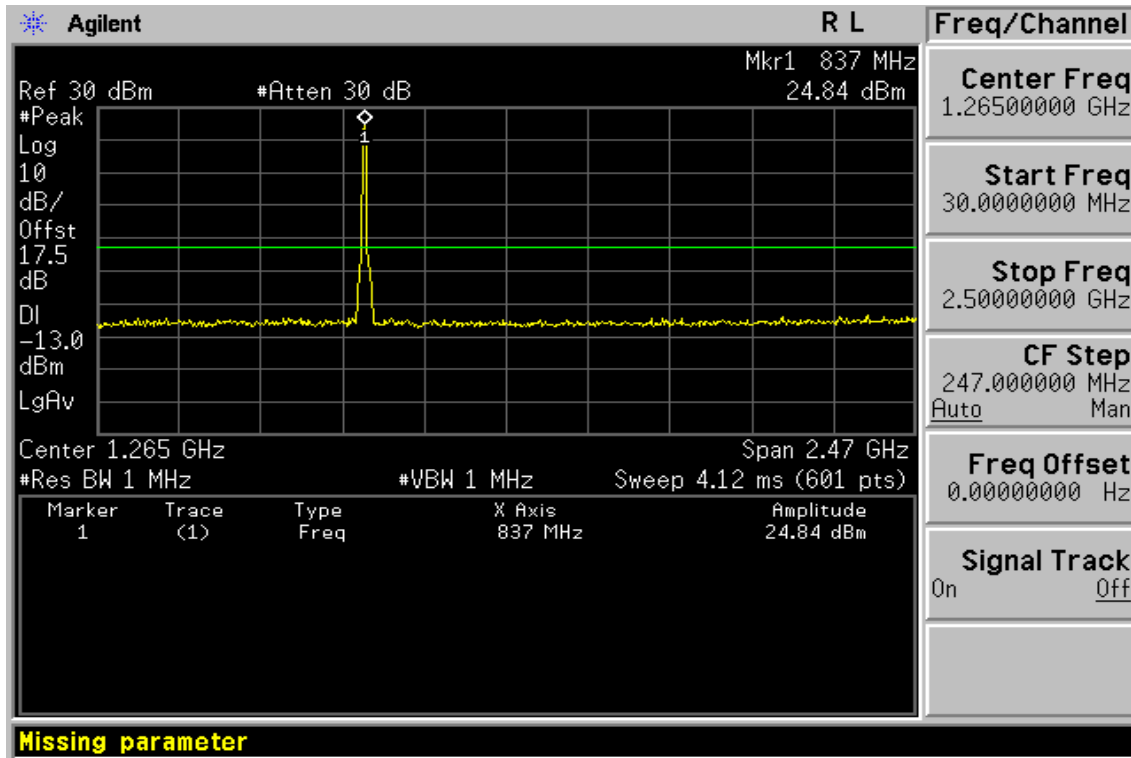
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Figure 9-42: Out of Band emission at antenna terminals – HSDPA V Channel Mid



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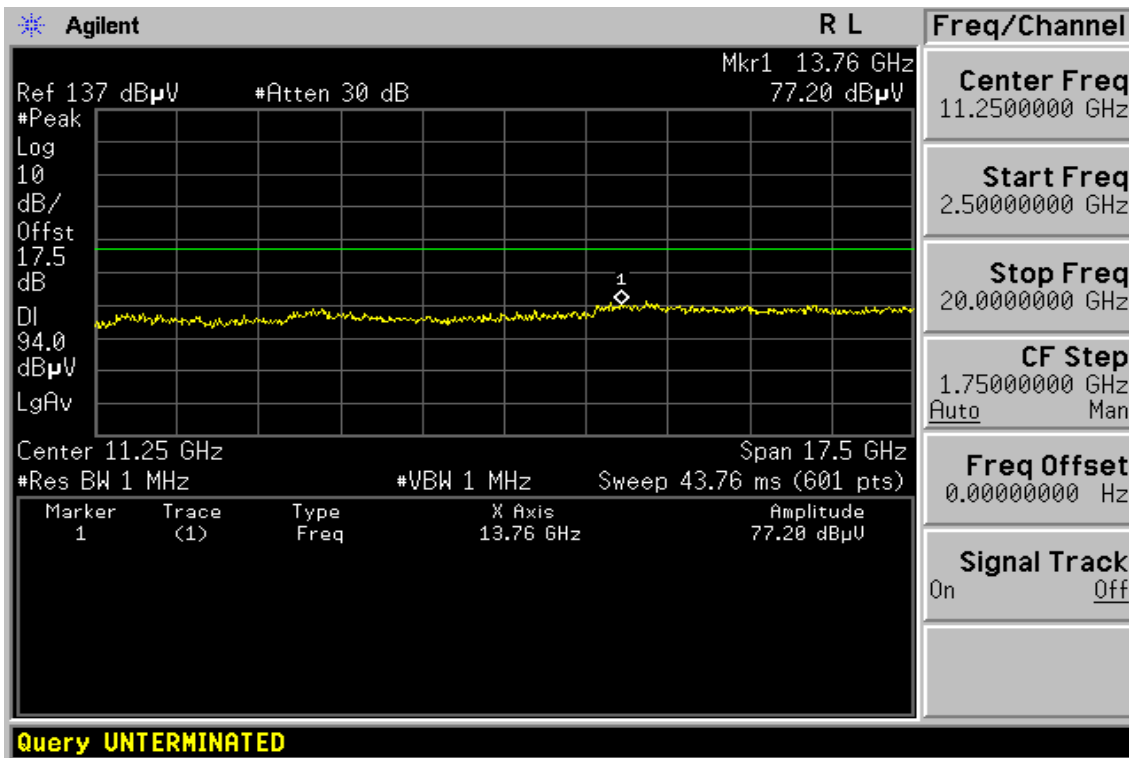
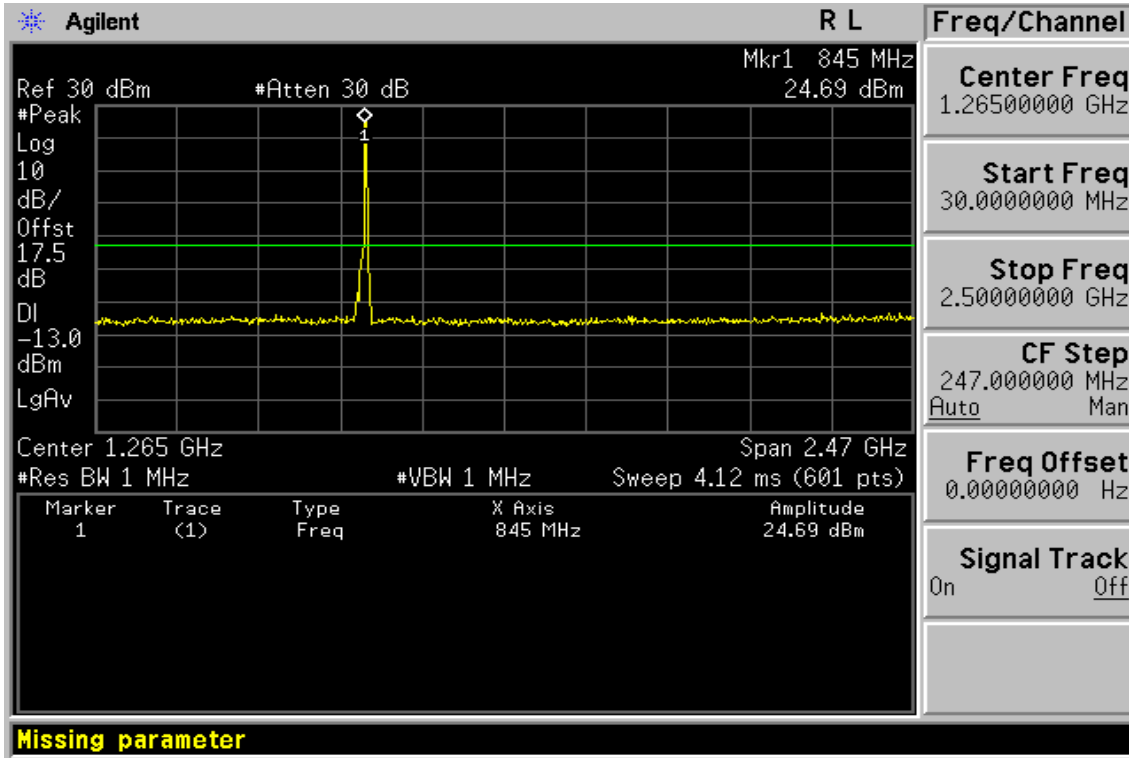
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Figure 9-43: Out of Band emission at antenna terminals – HSDPA V Channel Highest



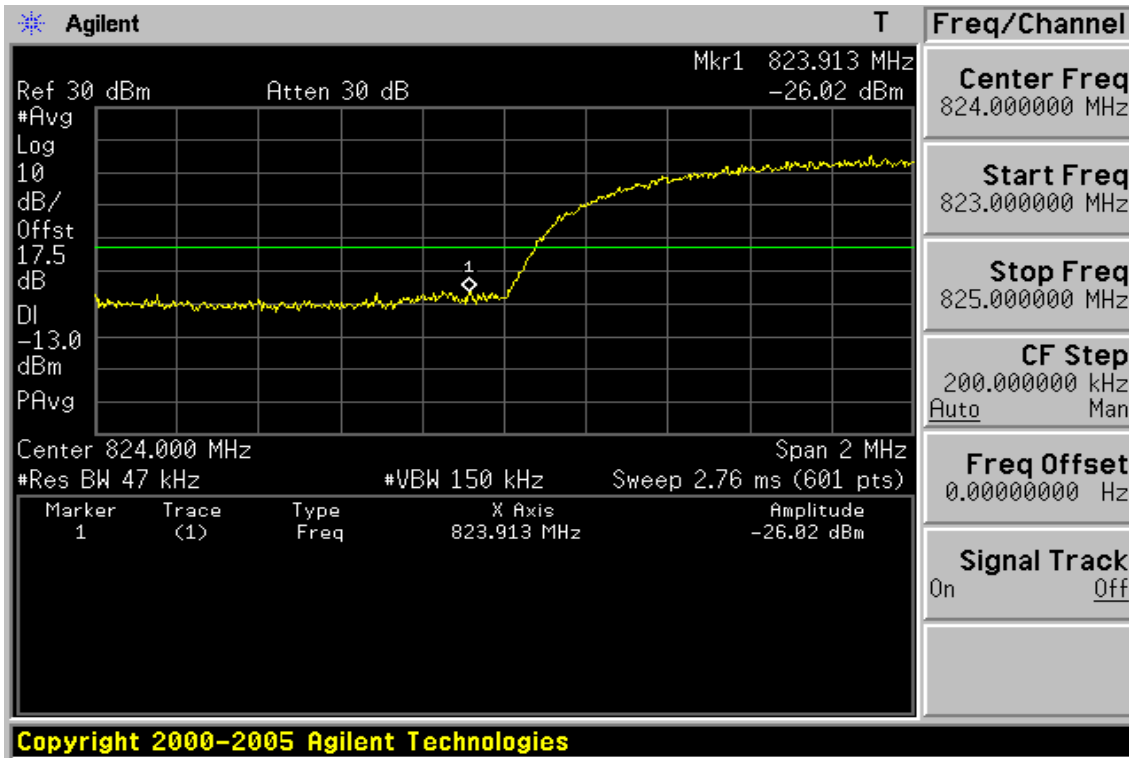
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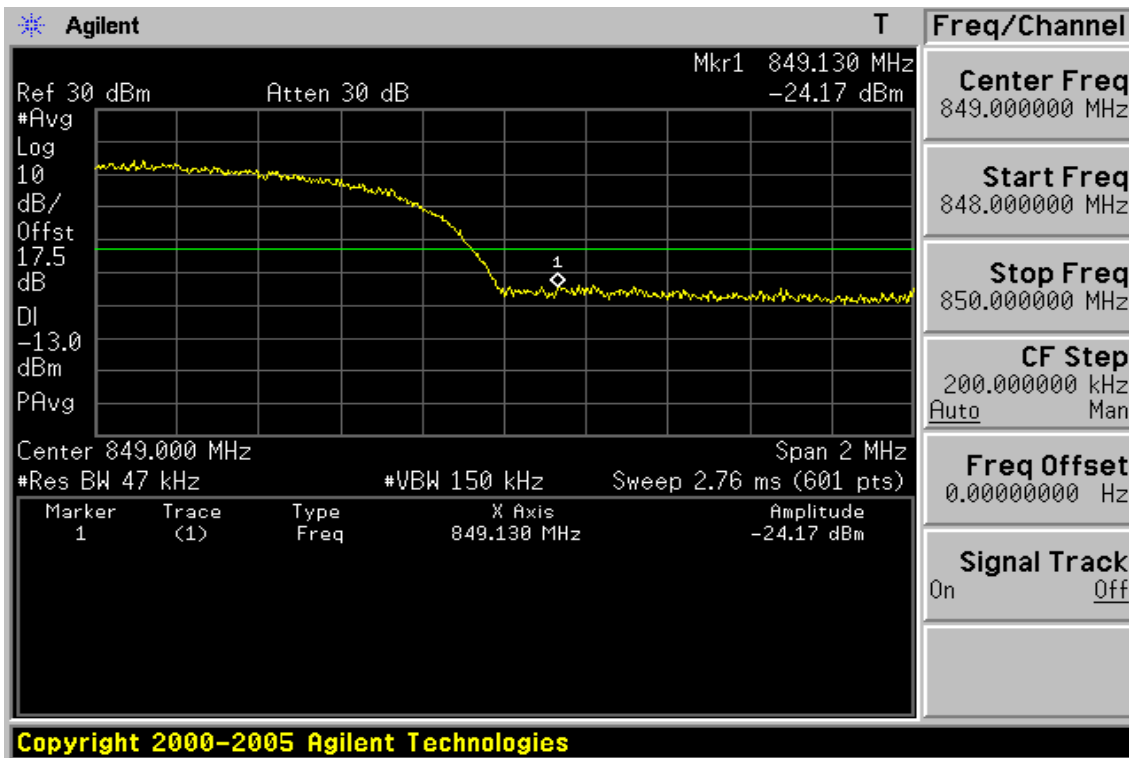
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**Figure 9-44: Bad edge emission at antenna terminals – HSDPA V Channel Lowest**



**Figure 9-45: Band edge emission at antenna terminals – HSDPA V Channel Highest**



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## 10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

### 10.1. Standard Applicable:

According to FCC §2.1053,

FCC §22.917(a), §24.238(a), §27.53(g) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

### 10.2. EUT Setup (Block Diagram of Configuration):

Refer to section 6.2 in this report

### 10.3. Measurement Procedure:

The EUT was placed on a non-conductive, The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission were identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

$ERP = S.G. \text{ output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$

$EIRP = S.G. \text{ output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$

### 10.4. Measurement Equipment Used:

Refer to section 2.4 in this report

### 10.5. Measurement Result:

Refer to attach tabular data sheets.

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**Radiated Spurious Emission Measurement Result: HSUPA II Mode**

Operation Band	:HSUPA B2	Test Date	:2011-12-01
ARFCN	:9262	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1852.4	Engineer	:Jay
Operation Mode	:CH LOW		
EUT Pol.	:E2 PLAN	Pol:	:VERTICAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
36.79	S	-74.05	-60.07	-11.54	-2.47	-13.00	-61.05
128.94	S	-77.39	-75.98	1.37	-2.79	-13.00	-64.39
191.99	S	-80.63	-83.58	6.02	-3.09	-13.00	-67.63
291.90	S	-77.64	-81.12	6.72	-3.25	-13.00	-64.64
361.74	S	-70.58	-74.03	6.85	-3.43	-13.00	-57.58
549.92	S	-77.75	-80.68	6.73	-3.85	-13.00	-64.75
3704.80	H	-30.40	-30.92	7.40	-6.98	-13.00	-17.40
5557.20	H	-43.36	-44.38	8.99	-8.28	-13.00	-30.36
7409.60	H	-43.72	-44.70	10.31	-9.38	-13.00	-30.72
9262.00	---						
11114.40	---						
12966.80	---						
14819.20	---						
16671.60	---						
18524.00	---						

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band	:HSUPA B2	Test Date	:2011-12-01
ARFCN	:9262	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1852.4	Engineer	:Jay
Operation Mode	:CH LOW		
EUT Pol.	:E2 PLAN	Pol:	:HORIZONTAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
129.91	S	-78.84	-77.49	1.43	-2.79	-13.00	-65.84
215.27	S	-59.87	-63.72	6.98	-3.14	-13.00	-46.87
287.05	S	-65.74	-69.19	6.66	-3.22	-13.00	-52.74
374.35	S	-63.29	-66.65	6.76	-3.43	-13.00	-50.29
531.49	S	-79.51	-82.56	6.78	-3.77	-13.00	-66.51
714.82	S	-76.72	-78.91	6.11	-3.98	-13.00	-63.72
3704.80	H	-36.88	-36.90	6.90	-6.98	-13.00	-23.88
5557.20	H	-46.54	-46.85	8.28	-8.28	-13.00	-33.54
7409.60	---						
9262.00	---						
11114.40	---						
12966.80	---						
14819.20	---						
16671.60	---						
18524.00	---						

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

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Operation Band	:HSUPA B2	Test Date	:2011-12-01
ARFCN	:9400	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1880.0	Engineer	:Jay
Operation Mode	:CH MID		
EUT Pol.	:E2 PLAN	Pol:	:VERTICAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
35.82	S	-73.64	-59.58	-11.62	-2.47	-13.00	-60.64
130.88	S	-75.88	-74.48	1.38	-2.79	-13.00	-62.88
286.08	S	-77.31	-80.75	6.65	-3.22	-13.00	-64.31
353.98	S	-70.77	-74.28	6.91	-3.43	-13.00	-57.77
563.50	S	-77.14	-79.90	6.58	-3.87	-13.00	-64.14
703.18	S	-76.99	-79.25	6.26	-4.07	-13.00	-63.99
3760.00	H	-32.00	-32.58	7.42	-7.12	-13.00	-19.00
5640.00	H	-42.23	-43.11	9.01	-8.26	-13.00	-29.23
7520.00	H	-44.22	-45.28	10.46	-9.50	-13.00	-31.22
9400.00	---						
11280.00	---						
13160.00	---						
15040.00	---						
16920.00	---						
18800.00	---						

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:HSUPA B2	Test Date	:2011-12-01
ARFCN	:9400	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1880.0	Engineer	:Jay
Operation Mode	:CH MID		
EUT Pol.	:E2 PLAN	Pol.	:HORIZONTAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
68.80	S	-84.03	-77.54	-3.92	-2.59	-13.00	-71.03
129.91	S	-77.97	-76.62	1.43	-2.79	-13.00	-64.97
213.33	S	-76.21	-80.04	6.97	-3.14	-13.00	-63.21
289.96	S	-65.00	-68.49	6.70	-3.22	-13.00	-52.00
365.62	S	-63.09	-66.52	6.83	-3.43	-13.00	-50.09
565.44	S	-77.75	-80.48	6.55	-3.87	-13.00	-64.75
3760.00	H	-37.85	-37.85	6.85	-7.12	-13.00	-24.85
5640.00	H	-44.50	-44.67	8.30	-8.26	-13.00	-31.50
7520.00	---						
9400.00	---						
11280.00	---						
13160.00	---						
15040.00	---						
16920.00	---						
18800.00	---						

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

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Operation Band	:HSUPA B2	Test Date	:2011-12-01
ARFCN	:9538	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1907.6	Engineer	:Jay
Operation Mode	:CH HIGH		
EUT Pol.	:E2 PLAN	Pol.	:VERTICAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
35.82	S	-73.70	-59.64	-11.62	-2.47	-13.00	-60.70
128.94	S	-77.72	-76.31	1.37	-2.79	-13.00	-64.72
288.02	S	-76.68	-80.14	6.67	-3.22	-13.00	-63.68
358.83	S	-70.18	-73.66	6.87	-3.43	-13.00	-57.18
440.31	S	-77.05	-80.04	6.66	-3.70	-13.00	-64.05
622.67	S	-76.50	-78.80	6.22	-3.97	-13.00	-63.50
3815.20	H	-37.26	-37.79	7.50	-7.20	-13.00	-24.26
5722.80	H	-38.23	-38.98	9.03	-8.44	-13.00	-25.23
7630.40	H	-44.91	-46.26	10.47	-9.45	-13.00	-31.91
9538.00	---						
11445.60	---						
13353.20	---						
15260.80	---						
17168.40	---						
19076.00	---						

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

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Operation Band	:HSUPA B2	Test Date	:2011-12-01
ARFCN	:9538	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1907.6	Engineer	:Jay
Operation Mode	:CH HIGH		
EUT Pol.	:E2 PLAN	Pol.	:HORIZONTAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
130.88	S	-75.85	-74.45	1.38	-2.79	-13.00	-62.85
215.27	S	-61.90	-65.75	6.98	-3.14	-13.00	-48.90
289.96	S	-64.86	-68.35	6.70	-3.22	-13.00	-51.86
371.44	S	-63.56	-66.94	6.78	-3.43	-13.00	-50.56
547.01	S	-78.11	-81.05	6.74	-3.85	-13.00	-65.11
599.39	S	-76.08	-78.40	6.19	-3.92	-13.00	-63.08
3815.20	H	-41.60	-41.65	7.03	-7.20	-13.00	-28.60
5722.80	H	-42.77	-42.80	8.32	-8.44	-13.00	-29.77
7630.40	---						
9538.00	---						
11445.60	---						
13353.20	---						
15260.80	---						
17168.40	---						
19076.00	---						

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

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**Radiated Spurious Emission Measurement Result: HSUPA IV Mode**

Operation Band	:HSUPA B4	Test Date	:2011-12-01
ARFCN	:1312	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1712.4	Engineer	:Jay
Operation Mode	:CH LOW		
EUT Pol.	:E2 PLAN	Pol.	:VERTICAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
36.79	S	-73.60	-59.62	-11.54	-2.47	-13.00	-60.60
146.40	S	-77.29	-75.47	0.96	-2.79	-13.00	-64.29
207.51	S	-71.89	-75.69	6.93	-3.14	-13.00	-58.89
288.02	S	-76.54	-80.00	6.67	-3.22	-13.00	-63.54
360.77	S	-70.19	-73.66	6.86	-3.43	-13.00	-57.19
444.19	S	-77.45	-80.43	6.65	-3.70	-13.00	-64.45
3424.80	H	-47.64	-48.29	7.20	-6.89	-13.00	-34.64
5137.20	---						
6849.60	---						
8562.00	---						
10274.40	---						
11986.80	---						
13699.20	---						
15411.60	---						

$EIRP(dBm) = SG\ Level(dBm) + Antenna\ Gain(dBi) + Cable\ Loss(dB)$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---“ : denotes Noise Floor.

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Operation Band	:HSUPA B4	Test Date	:2011-12-01
ARFCN	:1312	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1712.4	Engineer	:Jay
Operation Mode	:CH LOW		
EUT Pol.	:E2	Pol.	:HORIZONTAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
151.25	S	-83.82	-82.01	1.11	-2.93	-13.00	-70.82
224.00	S	-84.46	-88.21	6.91	-3.17	-13.00	-71.46
368.53	S	-82.15	-85.56	6.81	-3.43	-13.00	-69.15
502.39	S	-79.00	-82.21	6.86	-3.70	-13.00	-66.00
619.76	S	-76.98	-79.28	6.22	-3.97	-13.00	-63.98
669.23	S	-76.79	-79.04	6.28	-4.10	-13.00	-63.79
3424.80	H	-46.86	-47.45	7.15	-6.89	-13.00	-33.86
5137.20	---						
6849.60	---						
8562.00	---						
10274.40	---						
11986.80	---						
13699.20	---						
15411.60	---						

$EIRP(dBm) = SG\ Level(dBm) + Antenna\ Gain(dBi) + Cable\ Loss(dB)$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---” : denotes Noise Floor.

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Operation Band	:HSUPA B4	Test Date	:2011-12-01
ARFCN	:1413	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1732.6	Engineer	:Jay
Operation Mode	:CH MID		
EUT Pol.	:E2	Pol.	:VERTICAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
161.92	S	-85.03	-83.96	1.86	-2.93	-13.00	-72.03
289.96	S	-83.07	-86.56	6.70	-3.22	-13.00	-70.07
450.01	S	-81.13	-84.08	6.62	-3.70	-13.00	-68.13
558.65	S	-77.95	-80.77	6.63	-3.85	-13.00	-64.95
618.79	S	-76.69	-78.98	6.21	-3.97	-13.00	-63.69
769.14	S	-75.83	-77.53	5.82	-4.20	-13.00	-62.83
3464.80	H	-41.27	-41.81	7.31	-6.99	-13.00	-28.27
5197.20	---						
6929.60	---						
8662.00	---						
10394.40	---						
12126.80	---						
13859.20	---						
15591.60	---						
17324.00	---						

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:HSUPA B4	Test Date	:2011-12-01
ARFCN	:1413	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1732.6	Engineer	:Jay
Operation Mode	:CH MID		
EUT Pol.	:E2	Pol.	:HORIZONTAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
158.04	S	-84.44	-82.99	1.48	-2.93	-13.00	-71.44
284.14	S	-83.19	-86.61	6.62	-3.22	-13.00	-70.19
402.48	S	-81.56	-84.89	6.91	-3.62	-13.00	-68.56
550.89	S	-78.18	-81.10	6.72	-3.85	-13.00	-65.18
619.76	S	-76.70	-78.99	6.22	-3.97	-13.00	-63.70
777.87	S	-76.23	-78.03	5.89	-4.16	-13.00	-63.23
3464.80	H	-41.14	-41.62	7.24	-6.99	-13.00	-28.14
5197.20	---						
6929.60	---						
8662.00	---						
10394.40	---						
12126.80	---						
13859.20	---						
15591.60	---						
17324.00	---						

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:HSUPA B4	Test Date	:2011-12-01
ARFCN	:1513	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1752.6	Engineer	:Jay
Operation Mode	:CH HIGH		
EUT Pol.	:E2	Pol.	:VERTICAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
163.86	S	-84.20	-83.41	2.14	-2.93	-13.00	-71.20
305.48	S	-82.31	-85.90	6.81	-3.25	-13.00	-69.31
487.84	S	-80.83	-83.98	6.81	-3.70	-13.00	-67.83
620.73	S	-76.14	-78.44	6.22	-3.97	-13.00	-63.14
699.30	S	-75.61	-77.91	6.30	-4.07	-13.00	-62.61
840.92	S	-76.09	-78.10	6.16	-4.24	-13.00	-63.09
3505.20	H	-41.93	-42.69	7.40	-7.01	-13.00	-28.93
5257.80	---						
7010.40	---						
8763.00	---						
10515.60	---						
12268.20	---						
14020.80	---						
15773.40	---						
17526.00	---						

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:HSUPA B4	Test Date	:2011-12-01
ARFCN	:1513	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1752.6	Engineer	:Jay
Operation Mode	:CH HIGH		
EUT Pol.	:E2	Pol.	:HORIZONTAL

Freq. (MHz)	Note F/H/E/S	EIRP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
254.07	S	-83.56	-87.11	6.76	-3.23	-13.00	-70.56
321.00	S	-83.05	-86.46	6.78	-3.39	-13.00	-70.05
498.51	S	-80.99	-84.19	6.86	-3.70	-13.00	-67.99
618.79	S	-77.49	-79.78	6.21	-3.97	-13.00	-64.49
699.30	S	-76.51	-78.81	6.30	-4.07	-13.00	-63.51
832.19	S	-75.54	-77.52	6.13	-4.24	-13.00	-62.54
3505.20	H	-42.37	-43.04	7.31	-7.01	-13.00	-29.37
5257.80	---						
7010.40	---						
8763.00	---						
10515.60	---						
12268.20	---						
14020.80	---						
15773.40	---						
17526.00	---						

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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**Radiated Spurious Emission Measurement Result: WCDMA V Mode**

Operation Band	:WCDMA B5	Test Date	:2011-12-01
ARFCN	:4132	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:826.4	Engineer	:Jay
Operation Mode	:CH LOW		
EUT Pol.	:E2 PLAN	Pol.	:VERTICAL

Freq. (MHz)	Note F/H/E/S	ERP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
36.79	S	-76.88	-60.74	-13.69	-2.47	-13.00	-63.88
127.97	S	-79.90	-76.30	-0.84	-2.77	-13.00	-66.90
287.05	S	-78.36	-79.72	4.51	-3.22	-13.00	-65.36
353.98	S	-73.22	-74.65	4.76	-3.43	-13.00	-60.22
441.28	S	-77.46	-78.38	4.51	-3.70	-13.00	-64.46
610.06	S	-79.30	-79.73	4.05	-3.92	-13.00	-66.30
1652.80	H	-57.13	-54.40	2.39	-5.36	-13.00	-44.13
2479.20	---						
3305.60	---						
4132.00	H	-52.12	-50.69	5.82	-7.31	-13.00	-39.12
4958.40	H	-46.65	-45.41	6.60	-7.87	-13.00	-33.65
5784.80	H	-41.53	-40.01	6.90	-8.44	-13.00	-28.53
6611.20	---						
7437.60	---						

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.  
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.  
 “---“ : denotes Noise Floor.

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Operation Band	:WCDMA B5	Test Date	:2011-12-01
ARFCN	:4132	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:826.4	Engineer	:Jay
Operation Mode	:CH LOW		
EUT Pol.	:E2 PLAN	Pol.	:HORIZONTAL

Freq. (MHz)	Note F/H/E/S	ERP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
69.77	S	-86.97	-78.56	-5.84	-2.59	-13.00	-73.97
129.91	S	-80.32	-76.82	-0.72	-2.79	-13.00	-67.32
211.39	S	-77.59	-79.31	4.81	-3.14	-13.00	-64.59
251.16	S	-77.36	-78.75	4.57	-3.23	-13.00	-64.36
287.05	S	-67.52	-68.87	4.51	-3.22	-13.00	-54.52
362.71	S	-64.95	-66.32	4.70	-3.43	-13.00	-51.95
1652.80	H	-56.90	-54.46	2.67	-5.36	-13.00	-43.90
2479.20	---						
3305.60	---						
4132.00	H	-53.53	-51.81	5.52	-7.31	-13.00	-40.53
4958.40	H	-42.58	-40.76	6.02	-7.87	-13.00	-29.58
5784.80	H	-48.00	-45.76	6.18	-8.44	-13.00	-35.00
6611.20	---						
7437.60	---						

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

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Operation Band	:WCDMA B5	Test Date	:2011-12-01
ARFCN	:4183	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:836.6	Engineer	:Jay
Operation Mode	:CH MID		
EUT Pol.	:E2 PLAN	Pol.	:VERTICAL

Freq. (MHz)	Note F/H/E/S	ERP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
35.82	S	-75.87	-59.65	-13.77	-2.47	-13.00	-62.87
128.94	S	-79.69	-76.13	-0.78	-2.79	-13.00	-66.69
284.14	S	-78.69	-80.00	4.47	-3.22	-13.00	-65.69
359.80	S	-72.79	-74.18	4.72	-3.43	-13.00	-59.79
440.31	S	-78.11	-79.04	4.51	-3.70	-13.00	-65.11
620.73	S	-78.17	-78.60	4.07	-3.97	-13.00	-65.17
1673.20	H	-54.84	-52.17	2.34	-5.29	-13.00	-41.84
2509.80	---						
3346.40	---						
4183.00	H	-47.44	-45.96	5.89	-7.47	-13.00	-34.44
5019.60	H	-44.28	-43.19	6.66	-7.87	-13.00	-31.28
5856.20	H	-39.01	-37.65	6.93	-8.48	-13.00	-26.01
6692.80	---						
7529.40	---						
8366.00	---						

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:WCDMA B5	Test Date	:2011-12-01
ARFCN	:4183	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:836.6	Engineer	:Jay
Operation Mode	:CH MID		
EUT Pol.	:E2 PLAN	Pol.	:HORIZONTAL

Freq. (MHz)	Note F/H/E/S	ERP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
70.74	S	-87.19	-79.14	-5.49	-2.59	-13.00	-74.19
130.88	S	-79.82	-76.27	-0.77	-2.79	-13.00	-66.82
211.39	S	-77.18	-78.90	4.81	-3.14	-13.00	-64.18
289.96	S	-67.92	-69.30	4.55	-3.22	-13.00	-54.92
368.53	S	-65.72	-67.04	4.66	-3.43	-13.00	-52.72
613.94	S	-78.99	-79.44	4.06	-3.92	-13.00	-65.99
1673.20	H	-58.91	-56.56	2.66	-5.29	-13.00	-45.91
2509.80	---						
3346.40	---						
4183.00	H	-53.06	-51.23	5.54	-7.47	-13.00	-40.06
5019.60	H	-42.04	-40.34	6.05	-7.87	-13.00	-29.04
5856.20	H	-45.16	-43.04	6.18	-8.48	-13.00	-32.16
6692.80	---						
7529.40	---						
8366.00	---						

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:WCDMA B5	Test Date	:2011-12-01
ARFCN	:4233	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:846.6	Engineer	:Jay
Operation Mode	:CH HIGH		
EUT Pol.	:E2 PLAN	Pol.	:VERTICAL

Freq. (MHz)	Note F/H/E/S	ERP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
35.82	S	-75.99	-59.77	-13.77	-2.47	-13.00	-62.99
127.97	S	-79.91	-76.31	-0.84	-2.77	-13.00	-66.91
293.84	S	-79.13	-80.53	4.59	-3.25	-13.00	-66.13
361.74	S	-72.51	-73.88	4.70	-3.43	-13.00	-59.51
444.19	S	-79.31	-80.22	4.50	-3.70	-13.00	-66.31
710.94	S	-77.88	-78.95	4.01	-3.98	-13.00	-64.88
1693.20	H	-55.31	-52.48	2.29	-5.40	-13.00	-42.31
2539.80	---						
3386.40	---						
4233.00	H	-45.89	-44.49	5.96	-7.43	-13.00	-32.89
5079.60	H	-46.64	-45.33	6.66	-8.07	-13.00	-33.64
5926.20	H	-38.63	-37.09	6.96	-8.54	-13.00	-25.63
6772.80	---						
7619.40	---						
8466.00	---						

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:WCDMA B5	Test Date	:2011-12-01
ARFCN	:4233	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:846.6	Engineer	:Jay
Operation Mode	:CH HIGH		
EUT Pol.	:E2 PLAN	Pol.	:HORIZONTAL

Freq. (MHz)	Note F/H/E/S	ERP dBm	S.G Output Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Limit (dBm)	Safe Margin (dB)
129.91	S	-81.36	-77.86	-0.72	-2.79	-13.00	-68.36
214.30	S	-77.33	-79.07	4.82	-3.14	-13.00	-64.33
286.08	S	-67.88	-69.22	4.50	-3.22	-13.00	-54.88
362.71	S	-65.35	-66.72	4.70	-3.43	-13.00	-52.35
545.07	S	-80.46	-81.38	4.59	-3.85	-13.00	-67.46
706.09	S	-77.38	-78.51	4.07	-3.98	-13.00	-64.38
1693.20	H	-55.05	-52.57	2.65	-5.40	-13.00	-42.05
2539.80	---						
3386.40	---						
4233.00	H	-52.24	-50.44	5.55	-7.43	-13.00	-39.24
5079.60	H	-43.24	-41.33	6.07	-8.07	-13.00	-30.24
5926.60	H	-46.59	-44.27	6.18	-8.54	-13.00	-33.59
6772.80	---						
7619.40	---						
8466.00	---						

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

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## 11. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

### 11.1. Standard Applicable:

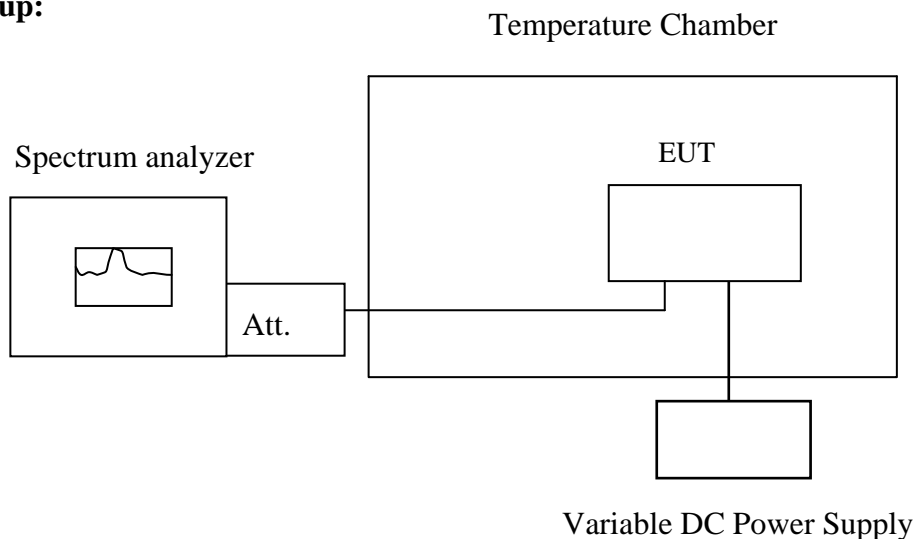
According to FCC §2.1055(a) (1)

Frequency Tolerance: +/-2.5ppm for 850MHz band

+/-2.5ppm for 1900MHz band

§27.54: The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### 11.2. Test Set-up:



**Note :** Measurement setup for testing on Antenna connector

### 11.3. Measurement Procedure:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

### 11.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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**11.5. Measurement Result:**

Reference Frequency: WCDMA II Mid Channel 1880 (ARFCN9400) MHz				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.6	-30	1879.999993	9.00	4700
3.6	-20	1879.999999	3.00	4700
3.6	-10	1880.000006	-4.00	4700
3.6	0	1880.000012	-10.00	4700
3.6	10	1880.000008	-6.00	4700
3.6	20	1880.000002	0.00	4700
3.6	30	1880.000004	-2.00	4700
3.6	40	1879.999996	6.00	4700
3.6	50	1879.999998	4.00	4700

Reference Frequency: WCDMA IV Mid Channel 1732.6 (ARFCN1413) MHz @ 25°C				
Limit: +/- 2.5 ppm = 4331 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.6	-30	1732.599996	8.00	4331
3.6	-20	1732.599998	6.00	4331
3.6	-10	1732.599994	10.00	4331
3.6	0	1732.599997	7.00	4331
3.6	10	1732.600008	-4.00	4331
3.6	20	1732.600004	0.00	4331
3.6	30	1732.600007	-3.00	4331
3.6	40	1732.600009	-5.00	4331
3.6	50	1732.600012	-8.00	4331

**Note: The Power supply is rated 3.6V dc.**

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Reference Frequency: WCDMA V Mid Channel 836.6 MHz (ARFCN4183)				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.6	-30	836.599999	4.00	2091
3.6	-20	836.599996	7.00	2091
3.6	-10	836.599995	8.00	2091
3.6	0	836.599999	4.00	2091
3.6	10	836.599998	5.00	2091
3.6	20	836.600003	0.00	2091
3.6	30	836.600001	2.00	2091
3.6	40	836.599992	11.00	2091
3.6	50	836.599989	14.00	2091

**Note: The Power supply is rated 3.6V dc.**

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## 12. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

### 12.1. Standard Applicable:

According to FCC §2.1055(a) (1)

Frequency Tolerance: +/-2.5ppm for 850MHz band

+/-2.5ppm for 1900MHz band

§27.54: The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### 12.2. Test Set-up:

Refer to section 10.2 in this report

### 12.3. Measurement Procedure:

Set chamber temperature to 25°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

### 12.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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**12.5. Measurement Result:**

Reference Frequency: WCDMA II Mid Channel 1880 (ARFCN9400) MHz				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25	1880.0000080	-6.00	4700
3.6	25	1880.0000020	0.00	4700
3.3	25	1880.0000120	-10.00	4700
2.9 (Endpoint)	25	1879.9999980	4.00	4700

Reference Frequency: WCDMA IV Mid Channel 1732.6 MHz(ARFCN1413) @ 25°C				
Limit: +/- 2.5 ppm = 4331 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25	1732.6000020	2.00	4331
3.6	25	1732.6000040	0.00	4331
3.3	25	1732.5999960	8.00	4331
2.9 (Endpoint)	25	1732.6000580	-54.00	4331

Reference Frequency: GSM Mid Channel 836.6 MHz @ 25°C				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25	836.6000060	-3.00	2091
3.6	25	836.6000030	0.00	2091
3.3	25	836.5999980	5.00	2091
2.9 (Endpoint)	25	836.6000050	-2.00	2091

**Note: The Power supply is rated 3.6V dc.**

*~ End of Report ~*

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