

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

Product Name: PDA Scanner

Brand Name: unitech

Model Name: PA969

Model Differences: N/A

FCC ID: HLEPA969BTP

Report No.: EH/2011/B0038

Issue Date: Apr. 10, 2012

FCC Rule Part: 2, 22H & 24E

Prepared for: unitech electronics co., ltd.
5F, No. 136, Lane 235, Pao-Chiao Rd.,
Hsin-Tien Dist., New Taipei City, Taiwan
SGS Taiwan Ltd.

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

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VERIFICATION OF COMPLIANCE

Applicant: unitech electronics co., ltd.
5F, No. 136, Lane 235, Pao-Chiao Rd., Hsin-Tien Dist., New Taipei City, Taiwan

Product Name: PDA Scanner

Brand Name: unitech

Model Number: PA969

Model Different: N/A

FCC ID: HLEPA969BTP

File Number: EH/2011/B0038

Date of test: Dec. 02, 2011 ~ Mar. 29, 2012

Date of EUT Received: Dec. 02, 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.

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

Test By:

Nick Lin

Date:

Apr. 10, 2012

Nick Lin / Engineer

Prepared By:

Gigi yeh

Date:

Apr. 10, 2012

Gigi Yeh / Clerk

Approved By:

Jim Chang

Date:

Apr. 10, 2012

Jim Chang / Supervisor

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Version

Version No.	Date	Description
00	Apr. 10, 2012	Initial creation of document

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1. GENERAL PRODUCT INFORMATION

General:

Product Name:	PDA Scanner	
Brand Name:	unitech	
Model No.:	PA969	
Model difference:	N/A	
Hardware Version:	V3.1	
Software Version:	V1.2.1	
Power Supply:	7.4Vdc form Li-Ion battery or 5Vdc form adapter.	
	Battery:	Model No.: 1400-900006G,
	Adapter :	Model No.: 3A-242DB12,

WCDMA:

Cellular Phone Standards Frequency Range and Power:	Operating Frequency		Rated Power
	GPRS 850, Class 10	824.2 MHz– 848.8 MHz	33 dBm
	GPRS 1900, Class 10	1850.2MHz – 1909.8MHz	30 dBm
	EDGE 850, Class 10	824.2 MHz– 848.8 MHz	27 dBm
	EDGE 1900, Class 10	1850.2MHz – 1909.8MHz	26 dBm
	WCDMA/HSDPA Band II	1852.4MHz – 1907.6MHz	24 dBm
	WCDMA/HSDPA Band V	826.4MHz - 846.6MHz	24 dBm
Type of Emission:	GPRS850: 248KGXW, GPRS1900: 249KGXW EDGE 850: 242KG7W, EDGE 1900: 242KG7W WCDMA Band II: 4M18F9W,HSDPA Band II: 4M18F9W WCDMA Band V: 4M16F9W,HSDPA Band V: 4M15F9W		
IMEI:	354114013292900		

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Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GPRS 850	7.4 Vdc	410
GPRS 1900	7.4 Vdc	380
EDGE 850	7.4 Vdc	390
EDGE 1900	7.4 Vdc	370
WCDMA B2	7.4 Vdc	720
HSDPA B2	7.4 Vdc	590
WCDMA B5	7.4 Vdc	750
HSDPA B5	7.4 Vdc	610

This test report applies for GPRS/EDGE 850/1900 and WCDMA/HSDPA Bands II, Band V.

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

This submittal(s) (test report) is intended for FCC ID: **HLEPA969BTP** filing to comply with Section Part 22 subpart H, Part 24 subpart E 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.

The Output power Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, WCDMA / HSDPA) was used for EUT and Base station setting.

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 TIA/EIA 603C. 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 and RSS-Gen, 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):

According to measurement procured TIA/EIA 603C and RSS-Gen, The EUT is placed on a turn table which is 0.8 m 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 8 and 13 of ANSI C63.4:2003.

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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	MY51100003	04/15/2011	04/14/2013
Spectrum Analyzer	Agilent	E4440A	US41160416	03/17/2012	03/16/2014
Radio Communication Analyzer	R & S	CMU200	102189	08/12/2010	08/11/2012
WIDEB. RADIO COMIN. TESTER	R & S	CMW500	101582	07/12/2010	07/11/2012
Temperature Chamber	TERCHY	MHG-120LF	911009	04/30/2010	04/29/2012
DC Block	Mini-Circuits	BLK-18-S+	1	02/28/2012	02/27/2013
Attenuator	Mini-Circuit	BW-S10W2+	002	02/28/2012	02/27/2013
Splitter	Agilent	11636B	N/A	02/28/2012	02/27/2013
DC Power Supply	Agilent	E3640A	MY40005907	07/15/2011	07/14/2013

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ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2011	04/14/2013
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	02/15/2011	02/14/2013
Spectrum Analyzer	R&S	FSV-30	101398	10/18/2011	10/17/2013
Bilog Antenna	SCHWAZBECK	VULB9168	378	01/10/2012	01/09/2014
Bilog Antenna	SCHWAZBECK	VULB9160	3158	11/24/2011	11/23/2013
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/17/2010	07/16/2012
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/17/2010	07/16/2012
Horn antenna	ETS.LINDGREN	3117	123995	05/19/2011	05/18/2013
Horn antenna	ETS.LINDGREN	3117	123995	05/19/2011	05/18/2013
Horn Antenna	Schwarzbeck	BBHA9170	184	01/17/2012	01/17/2014
Horn Antenna	Schwarzbeck	BBHA9170	185	07/11/2011	07/10/2013
RF amplifier	Miteq	AMF-6F-2600 400-40-8P	971576	12/28/2011	12/27/2012
Signal Generator	R&S	SMR40	100210	02/02/2012	02/01/2014
Signal Generator	Agilent	E4438C	MY45093613	07/15/2011	07/14/2013
Pre-Amplifier	Agilent	8447D	1937A02834	01/04/2012	01/03/2013
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/04/2012	01/03/2013
Attenuator	Mini-Circuit	BW-S10W2+	004	02/28/2012	02/27/2013
Radio Communication Analyzer	R & S	CMU200	102189	08/12/2010	08/11/2012
WIDEB. RADIO COMIN. TESTER	R & S	CMW500	101582	07/12/2010	07/11/2012
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	966_Tx	10m	01/04/2012	01/03/2013
Low Loss Cable	HUBER+SUHNER	966_Rx	3m	01/04/2012	01/03/2013
Filter 800-1000	Micro-Tronics	EWT	M2	05/25/2011	05/24/2013
Filter 1800-2000	Micro-Tronics	EWT	M2	05/25/2011	05/24/2013
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	02/28/2012	02/27/2013
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	02/28/2012	02/27/2013
3m Site NSA	SGS	966 chamber	N/A	07/15/2011	07/14/2012

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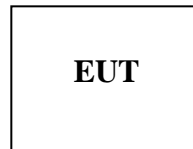
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2.5. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



Remote site

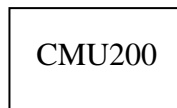


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model / Type No.	Series No.
1.	Universal Radio Communication Tester	R&S	CMU200	102189

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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)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% Occupied Bandwidth	Compliant
§2.1051 §22.917(a) §24.238(a)	Out of Band Emissions at Antenna Terminals and Band Edge	Compliant
§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation	Compliant
§2.1055(a)(1) §22.355 §24.235	Frequency Stability vs. Temperature	Compliant
§2.1055(d)(2) §22.355 §24.235	Frequency Stability vs. Voltage	Compliant

Max ERP/EIRP measurement result:

	dBm	dB	W
GPRS 850 Band	23.48	ERP	0.223
GPRS 1900 Band	28.60	EIRP	0.724
EDGE 850 Band	22.66	ERP	0.185
EDGE 1900 Band	29.36	EIRP	0.863
WCDMA Band II	25.28	EIRP	0.337
WCDMA Band V	15.29	ERP	0.034
HSDPA Band II	26.09	EIRP	0.406
HSDPA Band V	17.46	ERP	0.056

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4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

EUT was 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 (H mode) and lie down position (E1, E2 mode) for GPRS/EDGE and WCDMA/HSDPA Band II, V with power adaptor. The worst-case of H position for GPRS 850 band, H position for GEDGE 1900, H position for WCDMA Band II and E1 position for HSDPA Band V were reported.

5. MEASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SPURIOUS RADIATION

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

Measurement uncertainty (Polarization : Horizontal)	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 to 2W.

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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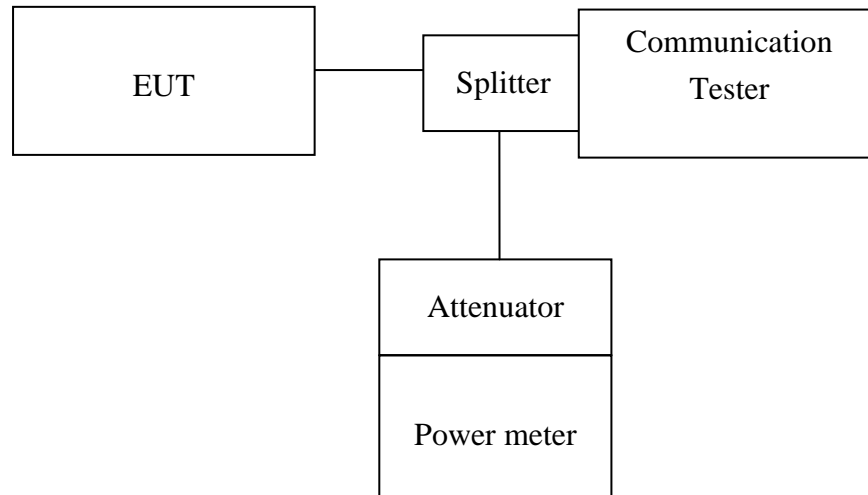
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6.2. Test Set-up:



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. The Procedure of KDB941225 KDB941125 (SAR Measurement Procedures for 3G devices, WCDMA/HSDPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing

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.: GPRS/EDGE (GMSK; 8-PSK)

Result:

EUT Mode	Frequency (MHz)	CH	Peak Power (1DN 1UP) (dBm)	Avg. Power (1DN 1UP) (dBm)	Peak Power (1DN 2UP) (dBm)	Avg. Power (1DN 2UP) (dBm)
GPRS 850 (Class 10)	824.2	128	32.40	32.30	30.90	30.70
	836.6	190	32.50	32.40	30.90	30.80
	848.8	251	32.50	32.30	30.90	30.80

EUT Mode	Frequency (MHz)	CH	Peak Power (1DN 1UP) (dBm)	Avg. Power (1DN 1UP) (dBm)	Peak Power (1DN 2UP) (dBm)	Avg. Power (1DN 2UP) (dBm)
GPRS 1900 (Class 10)	1850.2	512	32.80	32.70	31.20	31.00
	1880.0	661	32.80	32.70	31.20	31.00
	1909.8	810	32.80	32.70	31.30	31.10

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EUT Mode	Frequency (MHz)	CH	Peak Power (1DN 1UP) (dBm)	Avg. Power (1DN 1UP) (dBm)	Peak Power (1DN 2UP) (dBm)	Avg. Power (1DN 2UP) (dBm)
EDGE 850 (Class 10)	824.2	128	30.70	27.50	28.60	25.50
	836.6	190	30.80	27.50	28.80	25.60
	848.8	251	30.70	27.50	28.60	25.50

EUT Mode	Frequency (MHz)	CH	Peak Power (1DN 1UP) (dBm)	Avg. Power (1DN 1UP) (dBm)	Peak Power (1DN 2UP) (dBm)	Avg. Power (1DN 2UP) (dBm)
EDGE 1900 (Class 10)	1850.2	512	30.90	27.70	28.90	25.70
	1880.0	661	30.90	27.70	28.80	25.70
	1909.8	810	30.90	27.70	29.00	25.80

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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:

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg Power (dBm)
WCDMA Band II	1852.4	9262	26.18	22.62
	1880.0	9400	26.12	22.48
	1907.6	9538	25.36	21.78

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg Power (dBm)
WCDMA Band V	826.40	4132	27.44	24.03
	836.60	4183	27.05	23.74
	846.60	4233	27.26	23.79

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 RMS 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 SettingTable C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

Sub-test	β_c	β_a	β_d (SF)	β_c/β_d	β_{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.

Results:

Mode	Sub-test	RMS Power (dBm) Channel			Power Class 3 Limita- tion (dBm)	Comments
		9262	9400	9538		
HSDPA (B2)	1	22.10	21.87	21.83	20.3dBm – 25.7dBm	Pass
	2	21.69	21.47	21.41	20.3dBm – 25.7dBm	Pass
	3	21.62	21.42	21.30	19.8dBm – 25.7dBm	Pass
	4	21.69	21.43	21.42	19.8dBm – 25.7dBm	Pass

Mode	Sub-test	RMS Power (dBm) Channel			Power Class 3 Limita- tion (dBm)	Comments
		4132	4183	4233		
HSDPA (B5)	1	23.07	22.82	22.78	20.3dBm – 25.7dBm	Pass
	2	22.78	22.46	22.46	20.3dBm – 25.7dBm	Pass
	3	22.61	22.34	22.29	19.8dBm – 25.7dBm	Pass
	4	22.66	22.38	22.35	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: β values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)**

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS}	β_{ec}	β_{ed}	β_{ed} (SF)	β_{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	β_{ed1} : 47/15 β_{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.

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Results:

Mode	Sub-test	RMS Power (dBm) Channel			Power Class 3 Limita- tion (dBm)	Comments
		9262	9400	9538		
HSUPA (B2)	1	21.73	21.59	21.44	17.3dBm – 25.7dBm	Pass
	2	19.75	19.55	19.48	16.8dBm – 25.7dBm	Pass
	3	20.66	20.47	20.45	17.8dBm – 25.7dBm	Pass
	4	19.87	19.69	19.48	16.8dBm – 25.7dBm	Pass
	5	21.59	21.47	21.35	17.3dBm – 25.7dBm	Pass

Mode	Sub-test	RMS Power (dBm) Channel			Power Class 3 Limita- tion (dBm)	Comments
		4132	4172	4233		
HSUPA (B5)	1	22.81	22.50	22.50	17.3dBm – 25.7dBm	Pass
	2	20.87	20.58	20.54	16.8dBm – 25.7dBm	Pass
	3	21.78	21.56	21.53	17.8dBm – 25.7dBm	Pass
	4	20.92	20.64	20.62	16.8dBm – 25.7dBm	Pass
	5	22.67	22.33	22.39	17.3dBm – 25.7dBm	Pass

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6.5.2. Minimum Communications Power Measurement

PCS 1900 band

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	28.8	27.4	25.7	23.7	21.6	19.6	17.6	15.6	13.6
PCL	9	10	11	12	13	14	15	16	17
Output power (dBm)	11.6	9.6	7.6	5.6	3.6	1.6	-0.1		

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 band II

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 19 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:

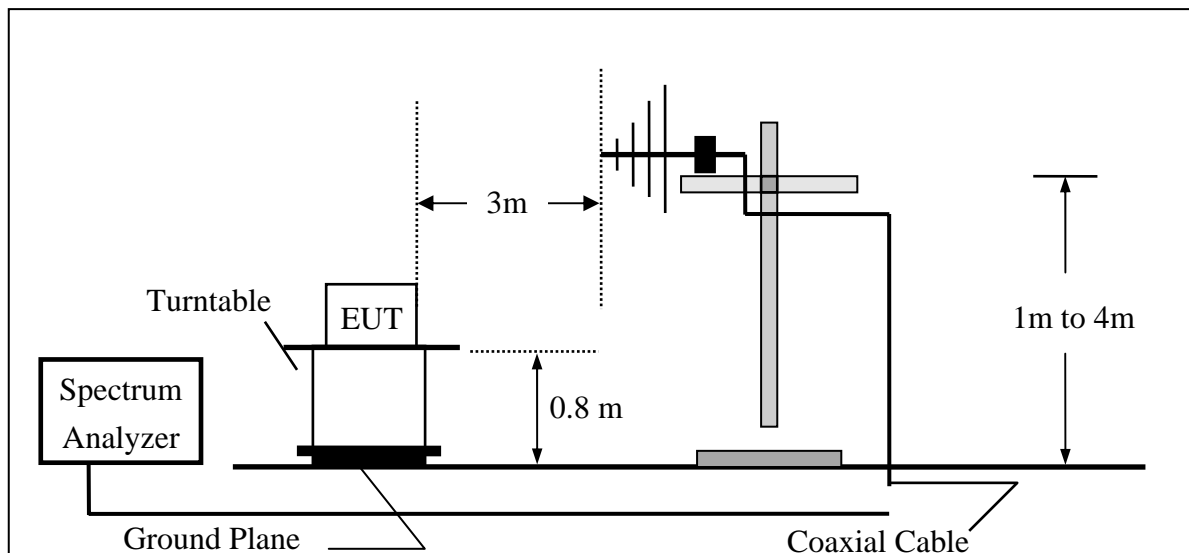
According to FCC §2.1046

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

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

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

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



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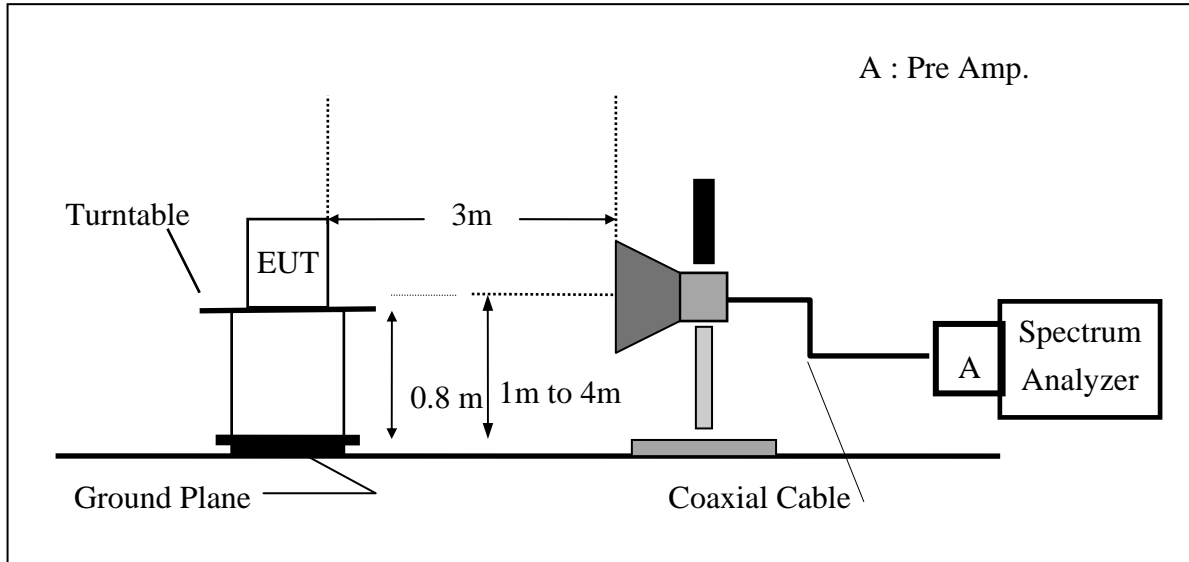
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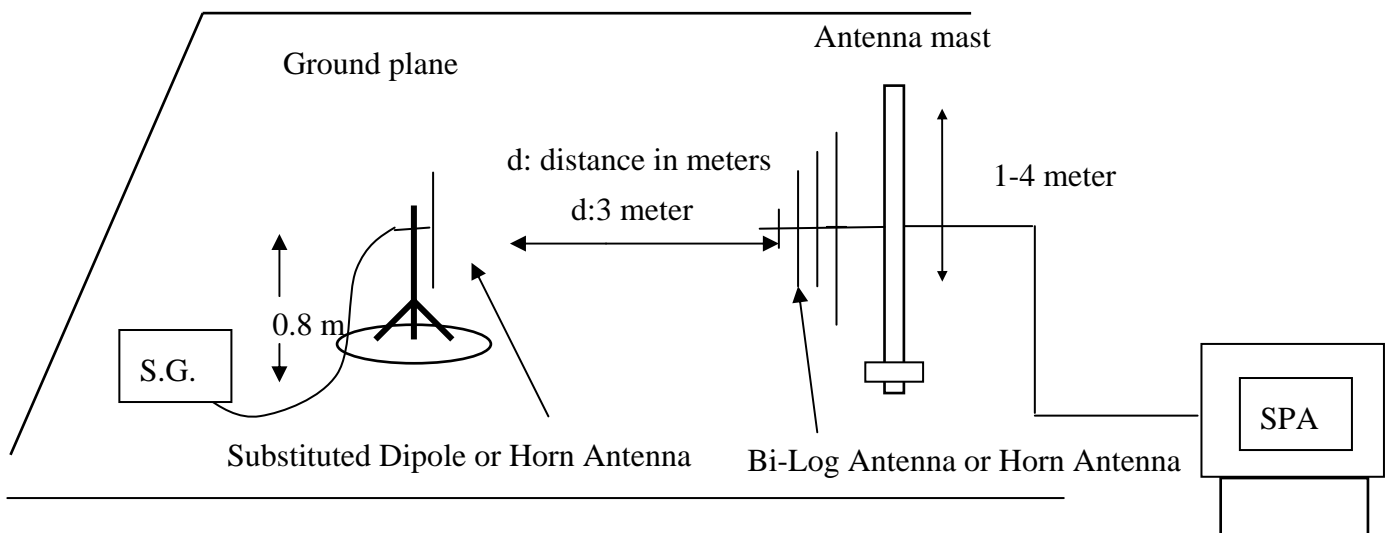
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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(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	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
GPRS 850	H	824.20	128	V	20.27	3.96	-4.22	20.01	38.45
				H	18.97	3.96	-4.22	18.71	38.45
		836.60	190	V	20.10	4.00	-4.24	19.86	38.45
				H	17.07	4.00	-4.24	16.82	38.45
		848.80	251	V	19.00	4.03	-4.33	18.7	38.45
				H	15.98	4.03	-4.33	15.68	38.45
	E1	824.20	128	V	19.1	3.96	-4.22	18.84	38.45
				H	23.37	3.96	-4.22	23.11	38.45
		836.60	190	V	17.72	4.00	-4.24	17.48	38.45
				H	23.49	4.00	-4.24	23.25	38.45
		848.80	251	V	16.36	4.03	-4.33	16.06	38.45
				H	22.67	4.03	-4.33	22.37	38.45
	E2	824.20	128	V	22.15	3.96	-4.22	21.89	38.45
				H	23.74	3.96	-4.22	23.48	38.45
		836.60	190	V	20.09	4.00	-4.24	19.85	38.45
				H	22.20	4.00	-4.24	21.95	38.45
		848.80	251	V	18.98	4.03	-4.33	18.68	38.45
				H	22.61	4.03	-4.33	22.31	38.45

Remark :

- (1) The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
GPRS 1900	H	1850.20	512	V	27.46	4.17	-5.49	26.14	33.00
				H	29.57	4.51	-5.49	28.6	33.00
		1880.00	661	V	25.41	4.13	-5.56	23.98	33.00
				H	28.19	4.44	-5.56	27.06	33.00
		1909.80	810	V	25.77	4.09	-5.56	24.31	33.00
				H	27.06	4.36	-5.56	25.87	33.00
	E1	1850.20	512	V	26.93	4.17	-5.49	25.61	33.00
				H	25.40	4.51	-5.49	24.42	33.00
		1880.00	661	V	22.38	4.13	-5.56	20.96	33.00
				H	23.33	4.44	-5.56	22.21	33.00
		1909.80	810	V	22.56	4.09	-5.56	21.09	33.00
				H	23.56	4.36	-5.56	22.37	33.00
	E2	1850.20	512	V	27.88	4.17	-5.49	26.57	33.00
				H	27.33	4.51	-5.49	26.36	33.00
		1880.00	661	V	25.26	4.13	-5.56	23.83	33.00
				H	23.30	4.44	-5.56	22.18	33.00
		1909.80	810	V	26.32	4.09	-5.56	24.85	33.00
				H	23.12	4.36	-5.56	21.92	33.00

Remark :

- (1) The RBW,VBW of SPA for frequency RBW=300K, VBW=1MHz

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
EDGE 850	H	824.20	128	V	18.91	3.96	-4.22	18.65	38.45
				H	17.82	3.96	-4.22	17.56	38.45
		836.60	190	V	18.06	4.00	-4.24	17.82	38.45
				H	16.06	4.00	-4.24	15.82	38.45
		848.80	251	V	16.81	4.03	-4.33	16.51	38.45
				H	14.22	4.03	-4.33	13.92	38.45
	E1	824.20	128	V	22.92	3.96	-4.22	22.66	38.45
				H	22.90	3.96	-4.22	22.64	38.45
		836.60	190	V	21.68	4.00	-4.24	21.44	38.45
				H	21.67	4.00	-4.24	21.43	38.45
		848.80	251	V	20.38	4.03	-4.33	20.08	38.45
				H	19.70	4.03	-4.33	19.4	38.45
	E2	824.20	128	V	21.96	3.96	-4.22	21.7	38.45
				H	22.62	3.96	-4.22	22.36	38.45
		836.60	190	V	20.01	4.00	-4.24	19.77	38.45
				H	21.32	4.00	-4.24	21.08	38.45
		848.80	251	V	18.40	4.03	-4.33	18.1	38.45
				H	22.15	4.03	-4.33	21.85	38.45

Remark :

- (1) The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
EDGE 1900	H	1850.20	512	V	27.77	4.17	-5.49	26.45	33.00
				H	30.33	4.51	-5.49	29.36	33.00
		1880.00	661	V	25.51	4.13	-5.56	24.08	33.00
				H	29.11	4.44	-5.56	27.99	33.00
		1909.80	810	V	25.34	4.09	-5.56	23.87	33.00
				H	28.46	4.36	-5.56	27.27	33.00
	E1	1850.20	512	V	27.66	4.17	-5.49	26.35	33.00
				H	26.48	4.51	-5.49	25.51	33.00
		1880.00	661	V	22.49	4.13	-5.56	21.06	33.00
				H	24.26	4.44	-5.56	23.13	33.00
		1909.80	810	V	22.91	4.09	-5.56	21.45	33.00
				H	22.93	4.36	-5.56	21.74	33.00
	E2	1850.20	512	V	29.18	4.17	-5.49	27.86	33.00
				H	26.13	4.51	-5.49	25.16	33.00
		1880.00	661	V	25.72	4.13	-5.56	24.30	33.00
				H	25.29	4.44	-5.56	24.17	33.00
		1909.80	810	V	26.75	4.09	-5.56	25.29	33.00
				H	24.62	4.36	-5.56	23.42	33.00

Remark :

- (1) The RBW,VBW of SPA for frequency RBW=300K, VBW=1MHz

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Measurement Result:

EUT				Measurement					
Operation Band	Pol.	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	H	1852.40	9262	V	24.04	4.17	-5.49	22.72	33.00
				H	25.58	4.50	-5.49	24.59	33.00
		1880.00	9400	V	23.28	4.13	-5.56	21.85	33.00
				H	22.68	4.44	-5.56	21.56	33.00
		1907.60	9538	V	25.05	4.10	-5.62	23.53	33.00
				H	26.53	4.37	-5.62	25.28	33.00
	E1	1852.40	9262	V	23.31	4.17	-5.49	21.99	33.00
				H	21.80	4.50	-5.49	20.81	33.00
		1880.00	9400	V	20.14	4.13	-5.56	18.71	33.00
				H	21.30	4.44	-5.56	20.17	33.00
		1907.60	9538	V	21.70	4.10	-5.62	20.18	33.00
				H	22.57	4.37	-5.62	21.32	33.00
	E2	1852.40	9262	V	24.50	4.17	-5.49	23.19	33.00
				H	23.02	4.50	-5.49	22.04	33.00
		1880.00	9400	V	23.15	4.14	-5.56	21.72	33.00
				H	23.08	4.44	-5.56	21.95	33.00
		1907.60	9538	V	25.27	4.10	-5.62	23.75	33.00
				H	24.47	4.37	-5.62	23.22	33.00

Remark :

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

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
WCDMA Band V	H	826.40	4132	V	12.09	3.97	-4.22	11.84	38.45
				H	9.77	3.97	-4.22	9.51	38.45
		836.60	4183	V	12.10	3.99	-4.24	11.86	38.45
				H	9.68	3.99	-4.24	9.43	38.45
		846.60	4233	V	11.14	4.02	-4.24	10.92	38.45
				H	9.73	4.02	-4.24	9.51	38.45
	E1	826.40	4132	V	15.54	3.97	-4.22	15.29	38.45
				H	13.87	3.97	-4.22	13.62	38.45
		836.60	4183	V	15.64	3.99	-4.24	15.40	38.45
				H	14.03	3.99	-4.24	13.78	38.45
		846.60	4233	V	15.18	4.02	-4.24	14.96	38.45
				H	14.18	4.02	-4.33	13.88	38.45
	E2	826.40	4132	V	13.02	3.97	-4.22	12.77	38.45
				H	14.45	3.97	-4.22	14.2	38.45
		836.60	4183	V	12.46	3.99	-4.24	12.22	38.45
				H	14.67	3.99	-4.24	14.43	38.45
		846.60	4233	V	12.14	4.02	-4.24	11.92	38.45
				H	15.15	4.02	-4.24	14.93	38.45

Remark :

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

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
HSDPA Band II	H	1852.40	9262	V	25.16	4.17	-5.49	23.84	33.00
				H	25.78	4.50	-5.49	24.79	33.00
		1880.00	9400	V	24.09	4.13	-5.56	22.66	33.00
				H	26.59	4.44	-5.56	25.46	33.00
		1907.60	9538	V	25.76	4.1	-5.62	24.24	33.00
				H	27.35	4.37	-5.62	26.09	33.00
	E1	1852.40	9262	V	24.33	4.17	-5.49	23.01	33.00
				H	23.29	4.50	-5.49	22.31	33.00
		1880.00	9400	V	21.48	4.14	-5.56	20.05	33.00
				H	22.96	4.44	-5.56	21.83	33.00
		1907.60	9538	V	22.96	4.10	-5.62	21.43	33.00
				H	24.01	4.37	-5.62	22.76	33.00
	E2	1852.40	9262	V	26.51	4.17	-5.49	25.19	33.00
				H	24.06	4.50	-5.49	23.08	33.00
		1880.00	9400	V	25.22	4.14	-5.56	23.79	33.00
				H	23.85	4.44	-5.56	22.73	33.00
		1907.60	9538	V	27.18	4.10	-5.62	25.66	33.00
				H	25.03	4.37	-5.62	23.78	33.00

Remark :

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

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
HSDPA Band V	H	826.40	4132	V	13.63	3.97	-4.22	13.38	38.45
				H	11.64	3.97	-4.22	11.39	38.45
		836.60	4183	V	13.91	3.99	-4.24	13.66	38.45
				H	11.45	3.99	-4.24	11.21	38.45
		846.60	4233	V	13.40	4.02	-4.24	13.19	38.45
				H	11.83	4.02	-4.24	11.61	38.45
	E1	826.40	4132	V	11.17	3.97	-4.22	10.92	38.45
				H	17.38	3.97	-4.22	17.12	38.45
		836.60	4183	V	11.74	3.99	-4.24	11.5	38.45
				H	17.06	3.99	-4.24	16.82	38.45
		846.60	4233	V	10.67	4.02	-4.24	10.46	38.45
				H	17.68	4.02	-4.24	17.46	38.45
	E2	826.40	4132	V	14.79	3.97	-4.22	14.53	38.45
				H	17.27	3.97	-4.22	17.02	38.45
		836.60	4183	V	13.69	3.99	-4.24	13.45	38.45
				H	16.79	3.99	-4.24	16.55	38.45
		846.60	4233	V	13.61	4.02	-4.24	13.39	38.45
				H	17.42	4.02	-4.24	17.20	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 (kHz)
GPRS 850	824.20	128	248.6717
	836.60	190	247.6206
	848.80	251	242.3072

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
GPRS 1900	1850.20	512	249.6803
	1880.00	661	241.1010
	1909.80	810	245.6206

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
EDGE 850	824.20	128	242.9786
	836.60	190	241.8722
	848.80	251	240.9309

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
EDGE 1900	1850.20	512	239.8624
	1880.00	661	242.4461
	1909.80	810	237.7202

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EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
WCDMA II	1852.40	9262	4.1752
	1880.00	9400	4.1688
	1907.60	9538	4.1864

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
WCDMA V	826.40	4132	4.1660
	836.00	4180	4.1636
	846.60	4233	4.1598

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSDPA II	1852.4	9262	4.1820
	1880.0	9400	4.1891
	1907.6	9538	4.1799

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSDPA V	826.40	4132	4.1366
	836.60	4183	4.1413
	846.60	4233	4.1589

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Figure 8-1: GPRS 850 Channel Low

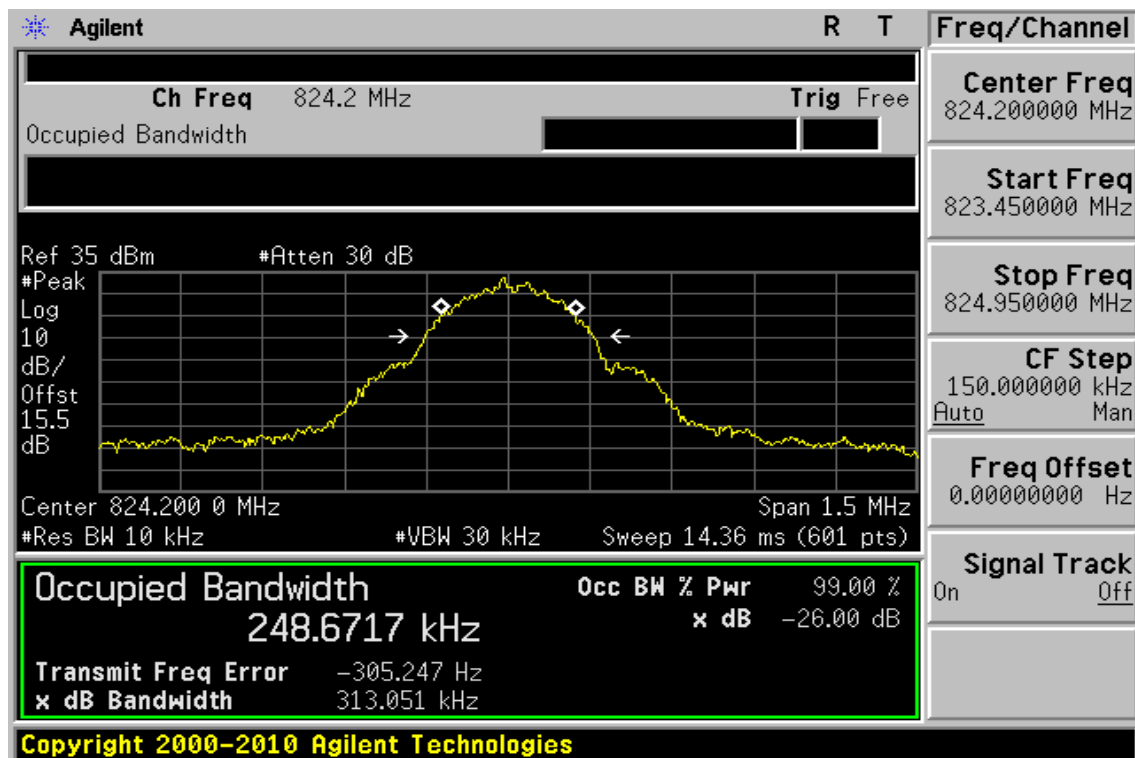
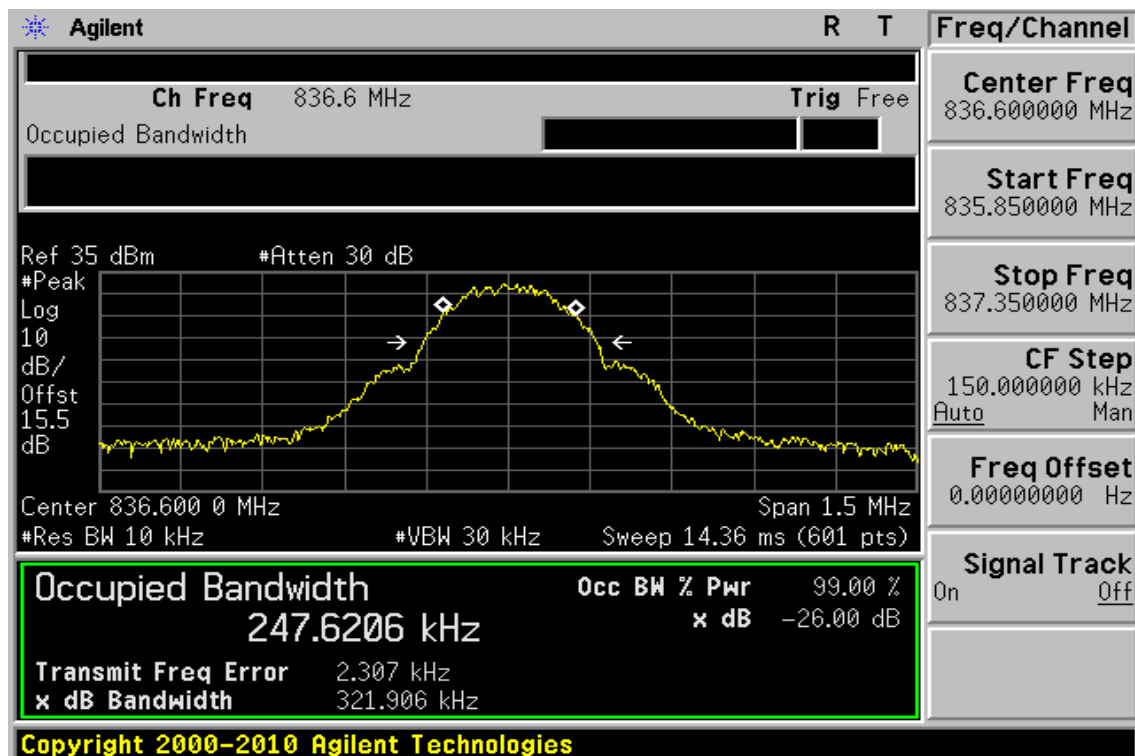


Figure 8-2: GPRS 850 Channel Mid



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Figure 8-3: GPRS 850 Channel High

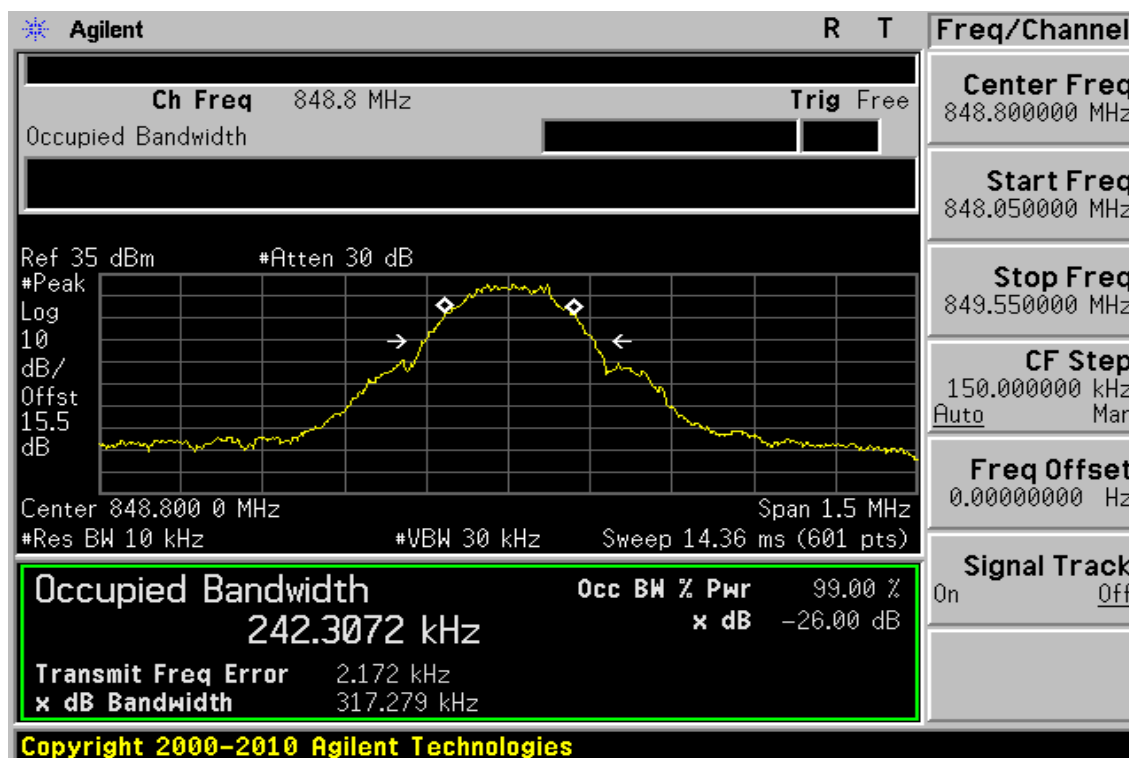
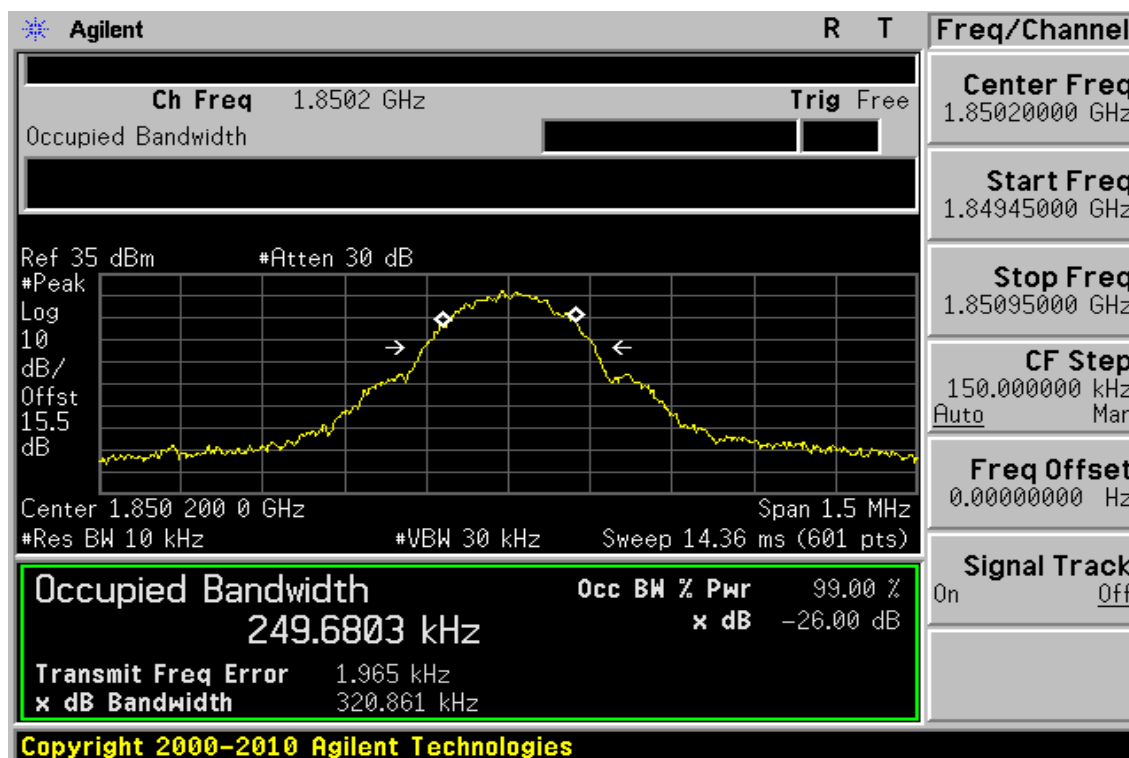


Figure 8-4: GPRS 1900 Channel Low



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Figure 8-5: GPRS 1900 Channel Mid

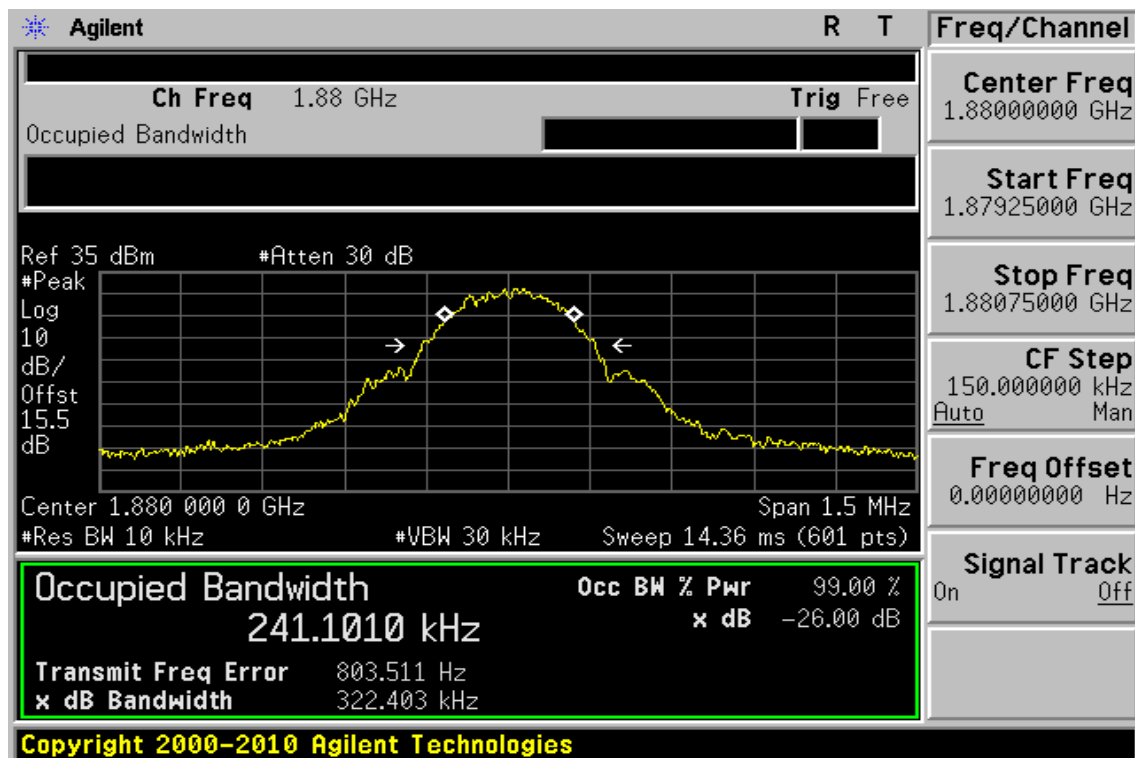
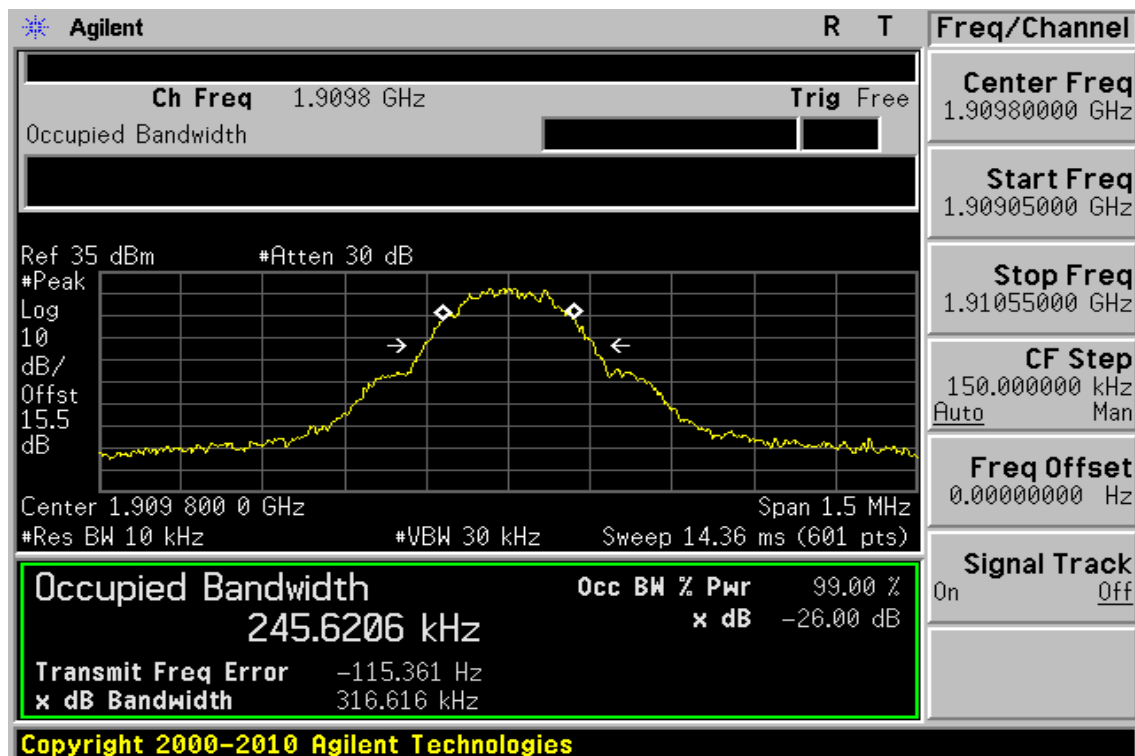


Figure 8-6: GPRS 1900 Channel High



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Figure 8-6: EDGE 850 Channel Low

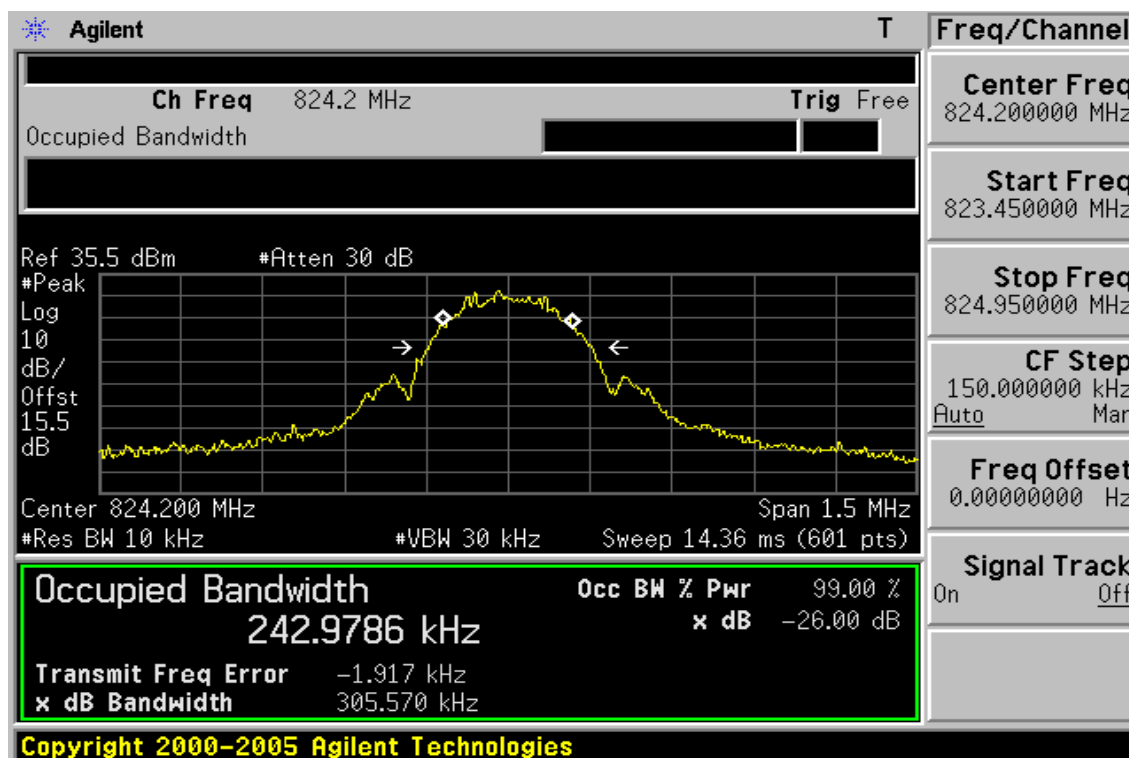
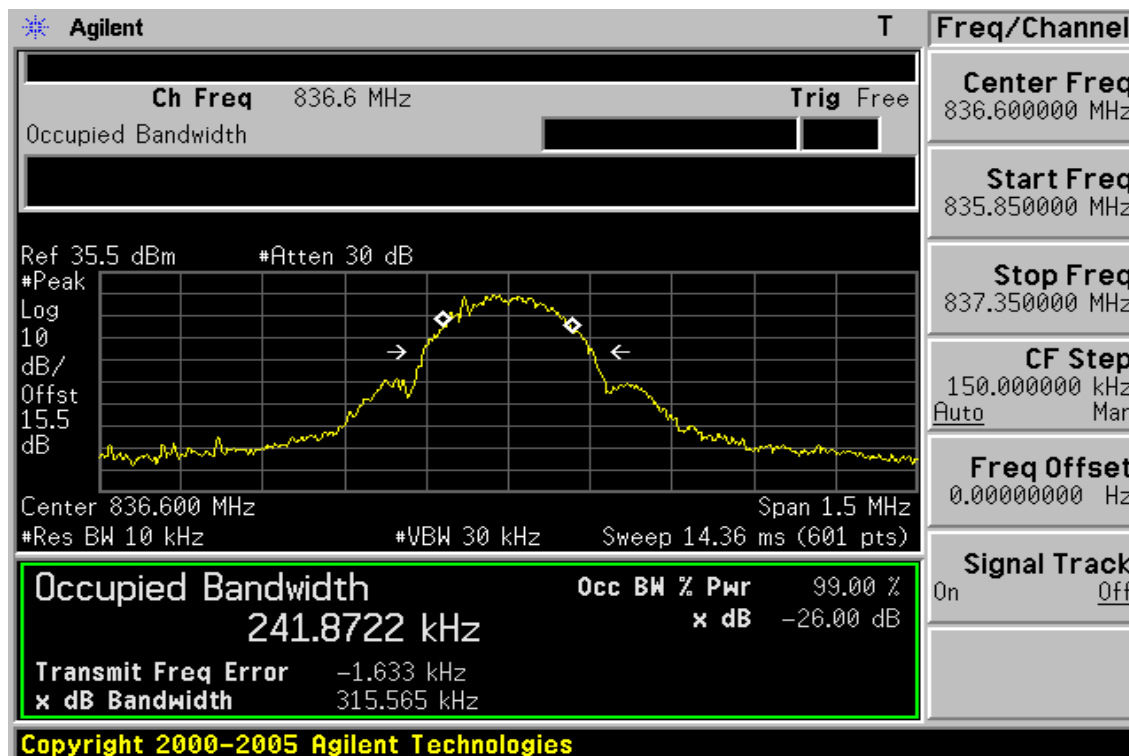


Figure 8-6: EDGE 850 Channel Mid



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Figure 8-7: EDGE 850 Channel High

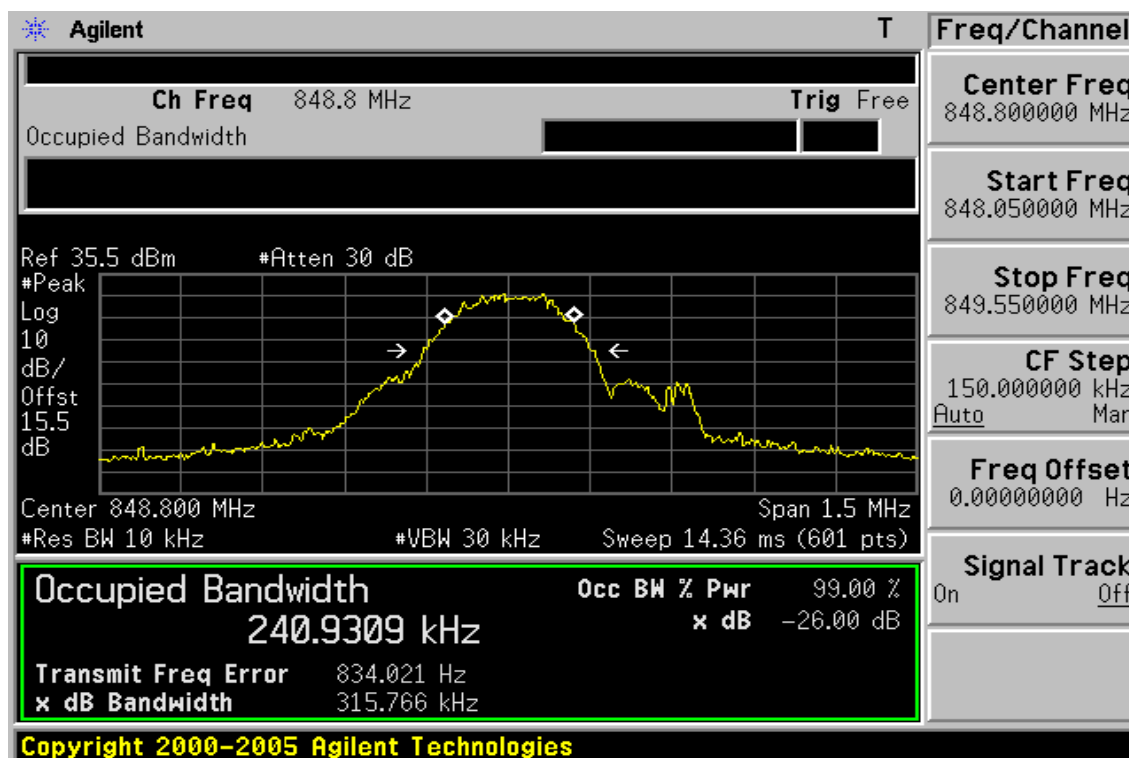
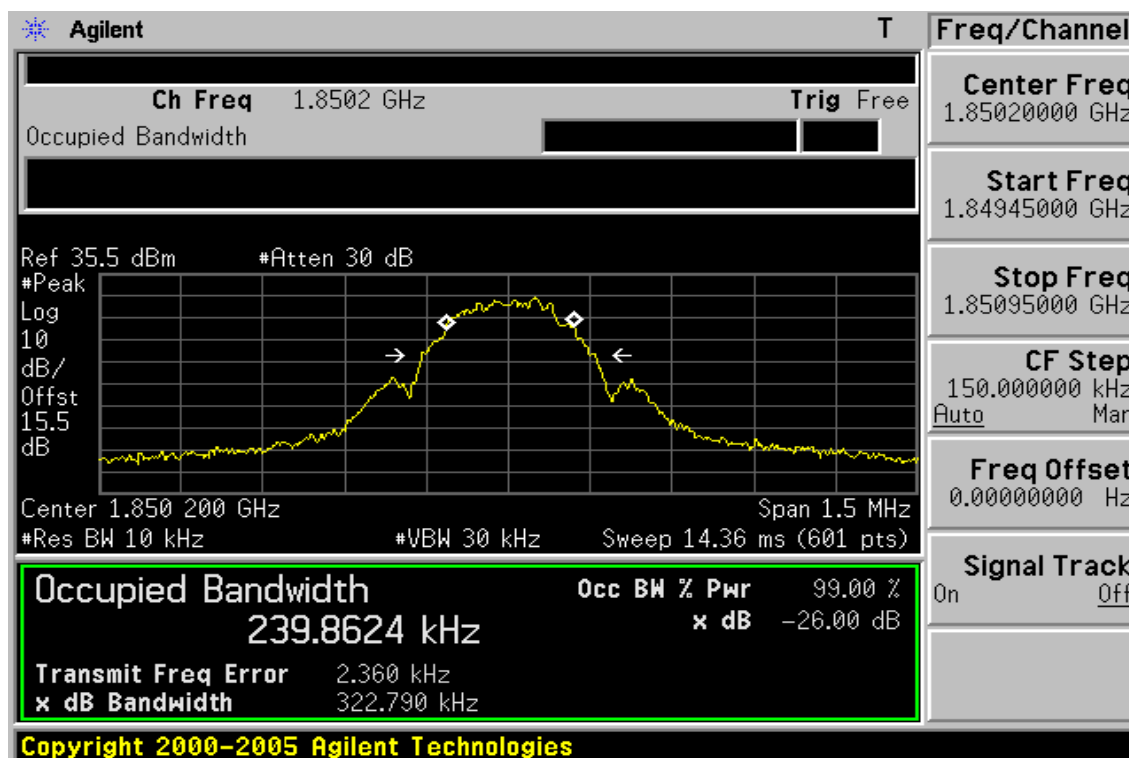


Figure 8-8: EDGE 1900 Channel Low



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Figure 8-9: EDGE 1900 Channel Mid

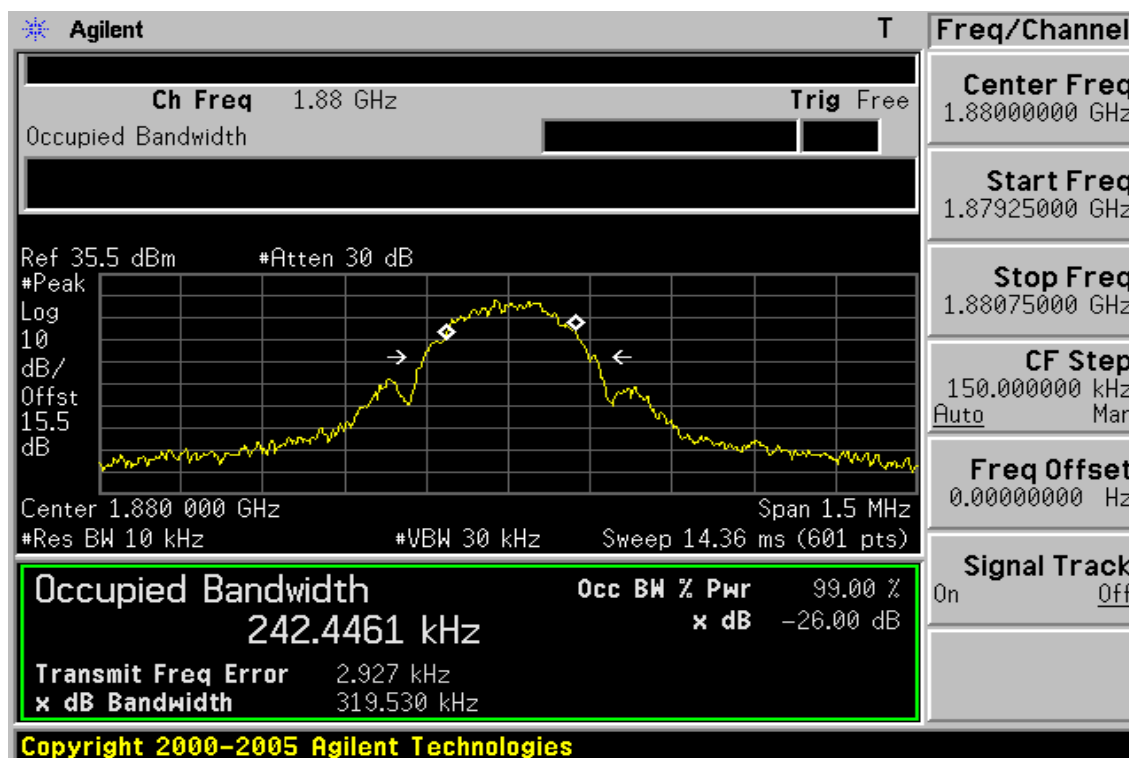
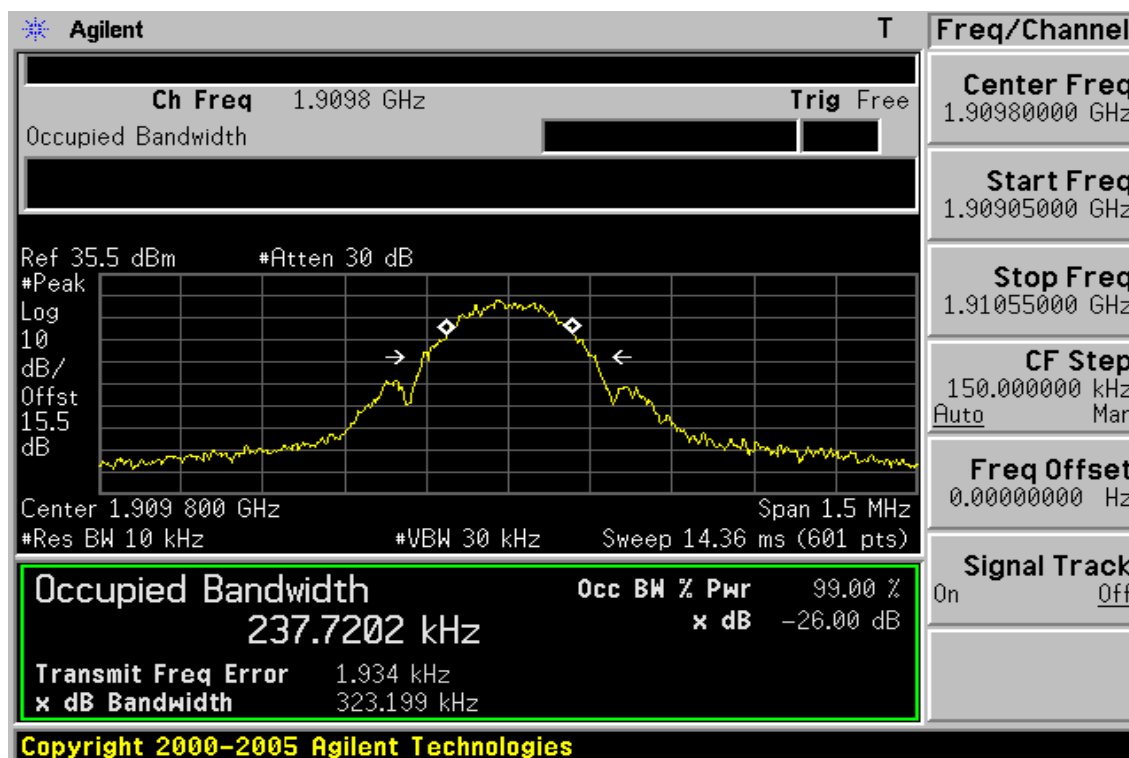


Figure 8-10: EDGE 1900 Channel High



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Figure 8-11: WCDMA II Channel Low

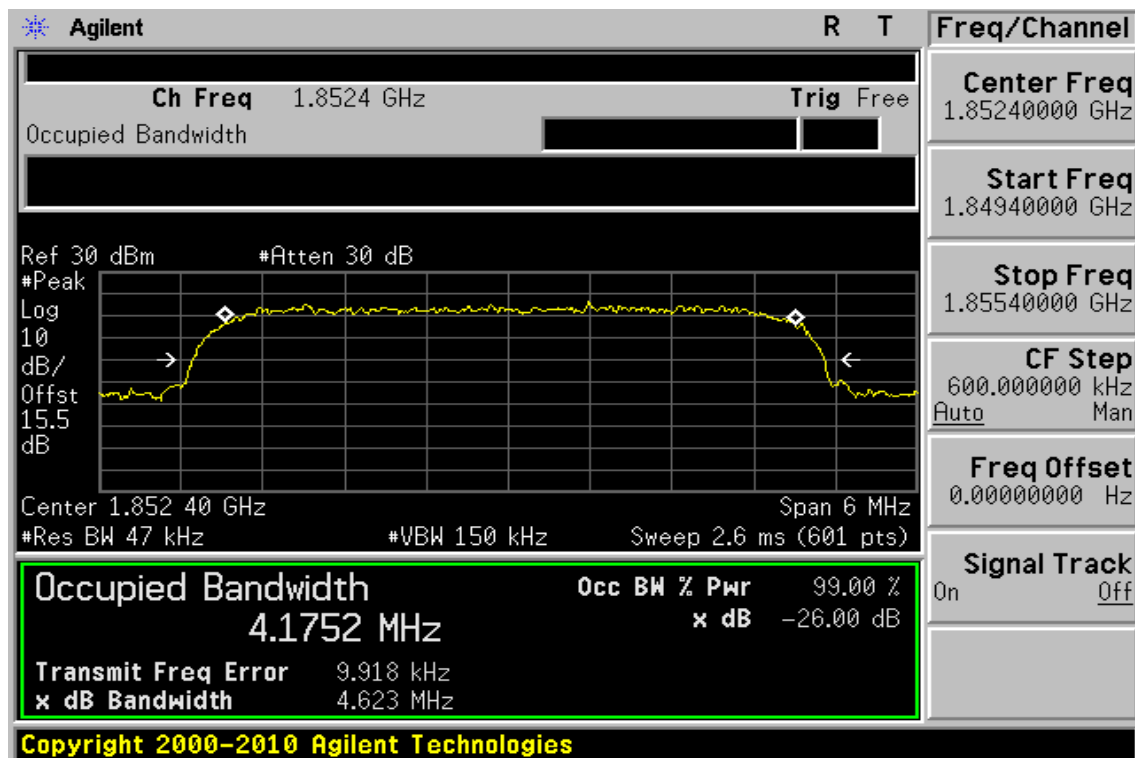
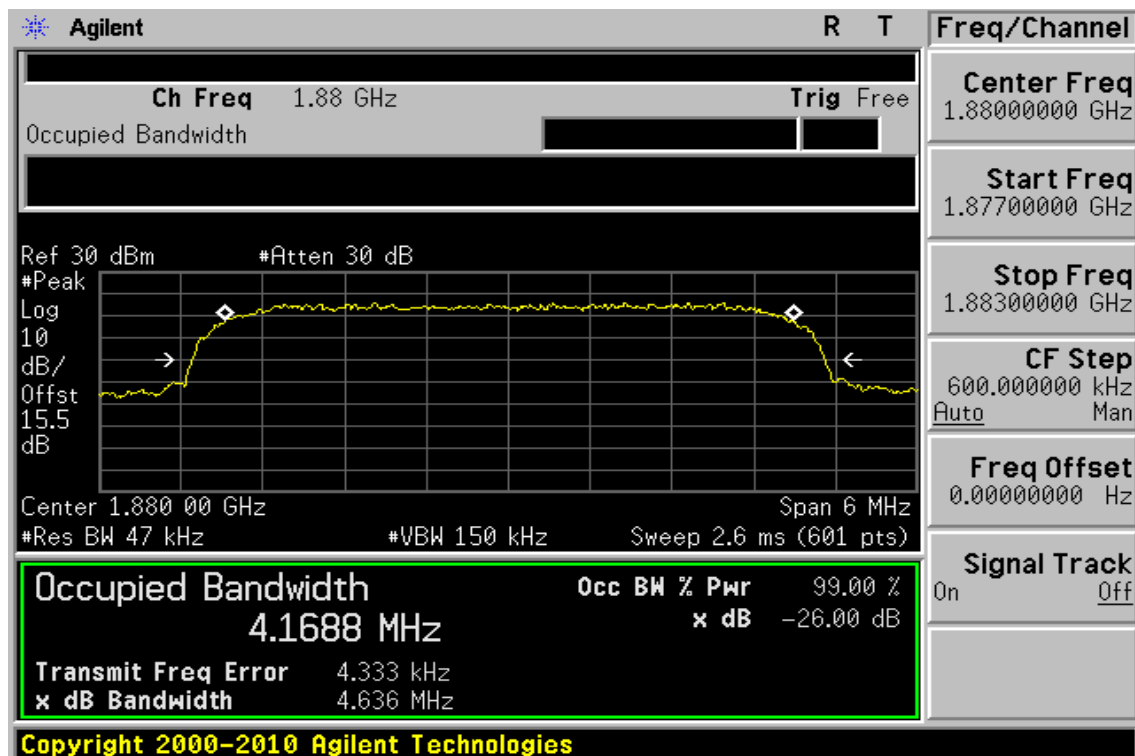


Figure 8-12: WCDMA II Channel Mid



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Figure 8-13: WCDMA II Channel High

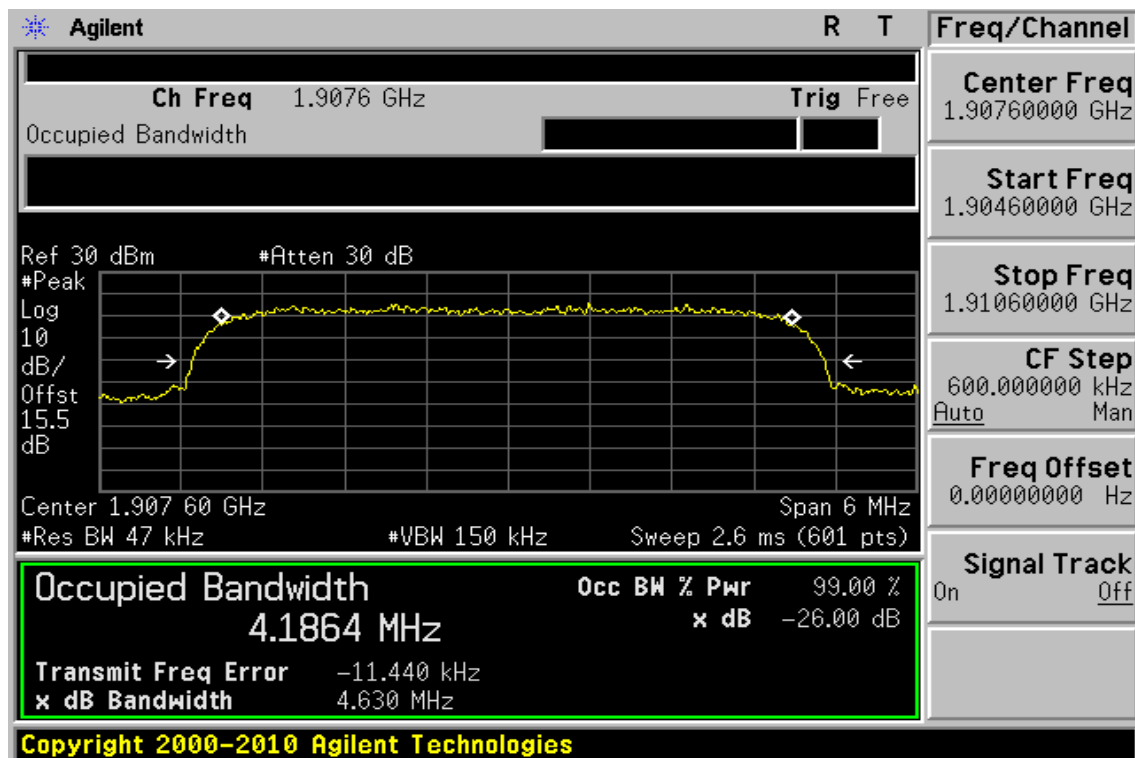
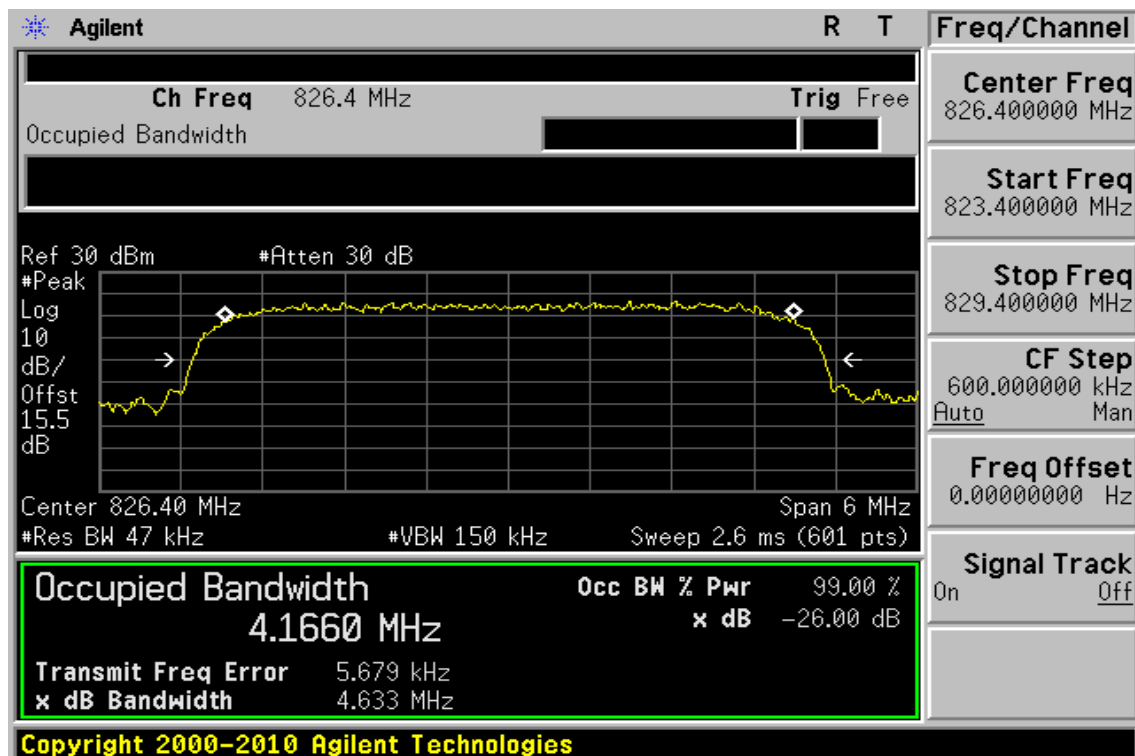


Figure 8-14: WCDMA V Channel Low



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Figure 8-15: WCDMA V Channel Mid

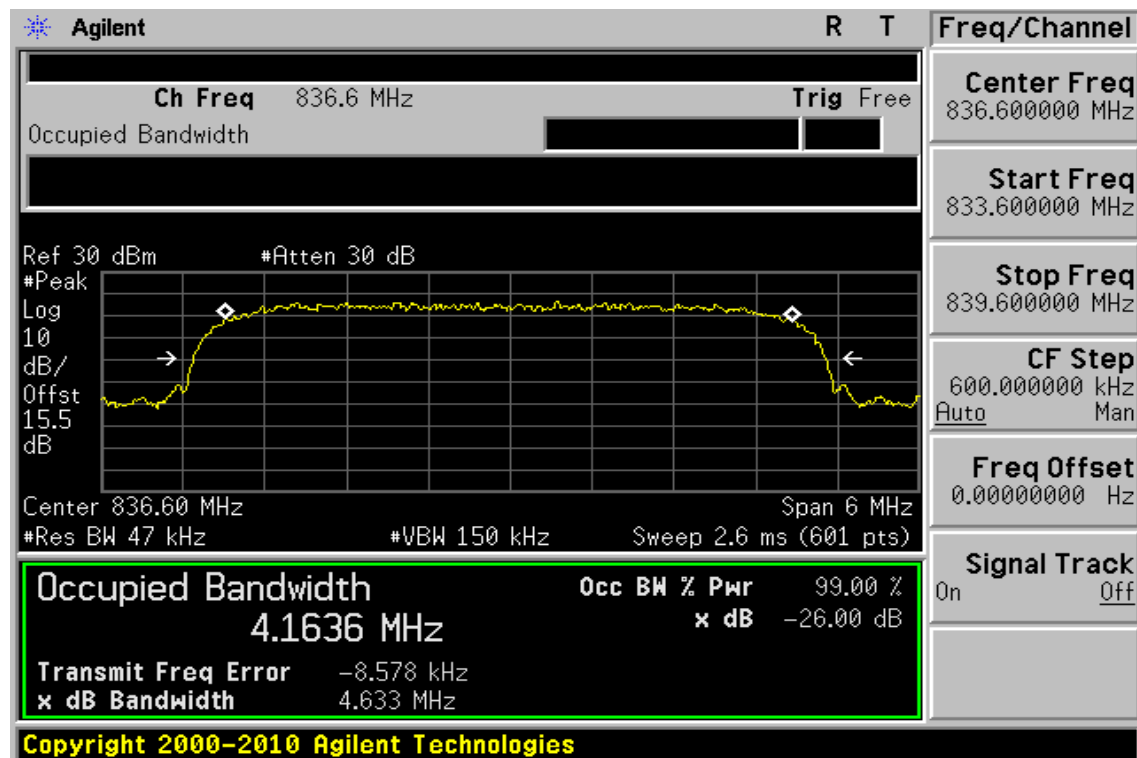
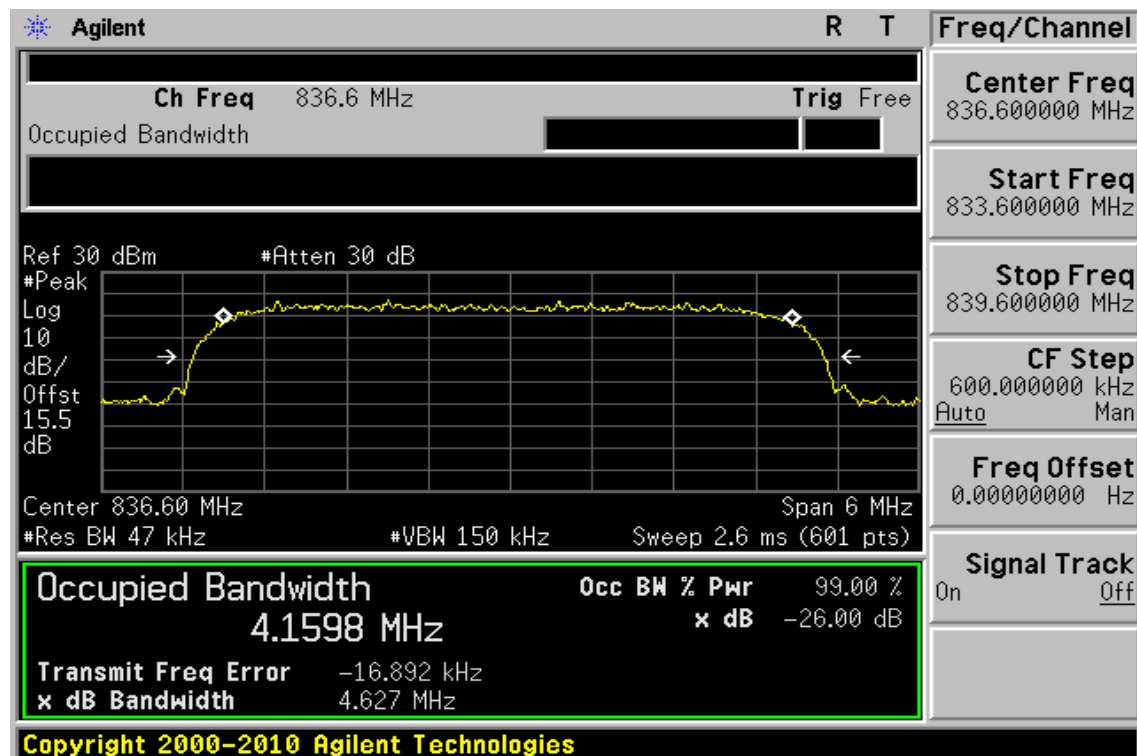


Figure 8-16: WCDMA V Channel High



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Figure 8-17: HSDPA II Channel Low

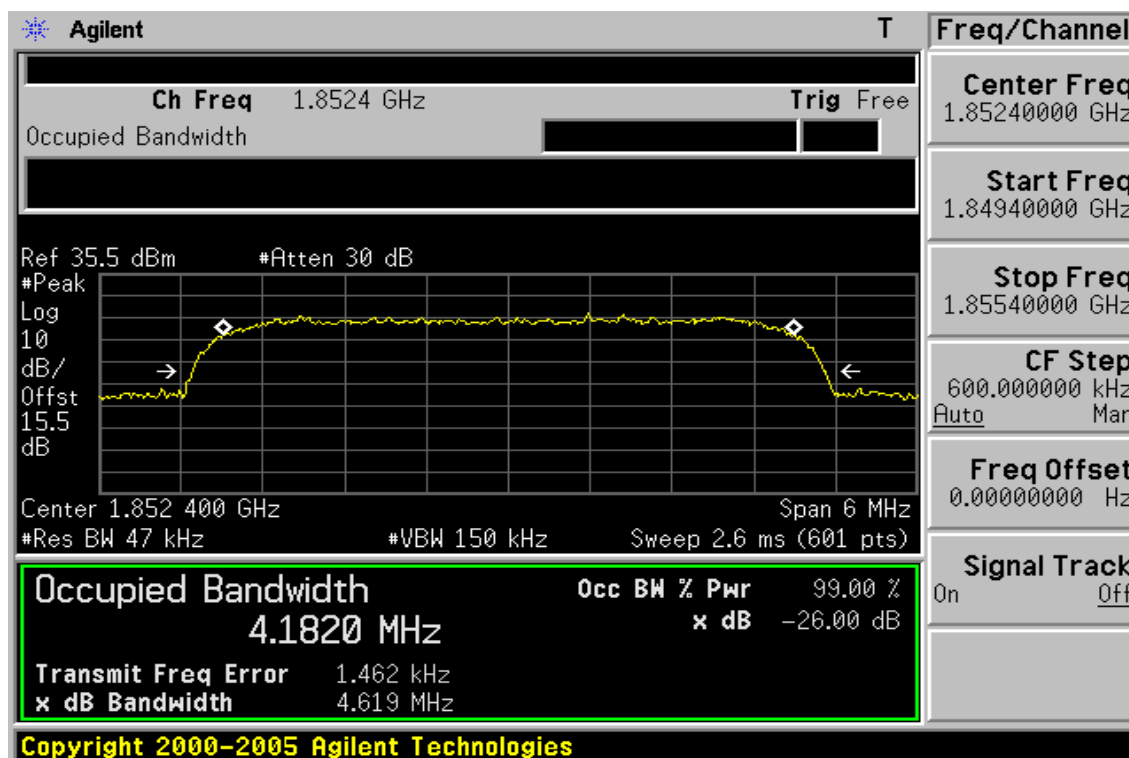
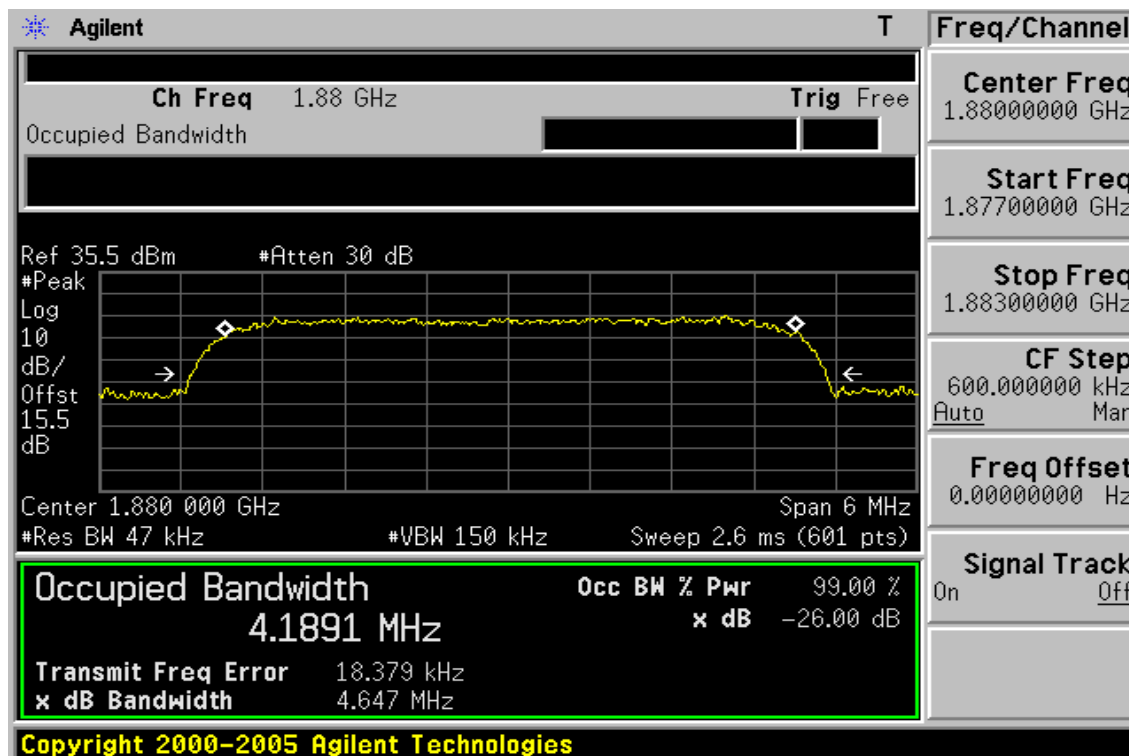


Figure 8-18: HSDPA II Channel Mid



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Figure 8-19: HSDPA II Channel High

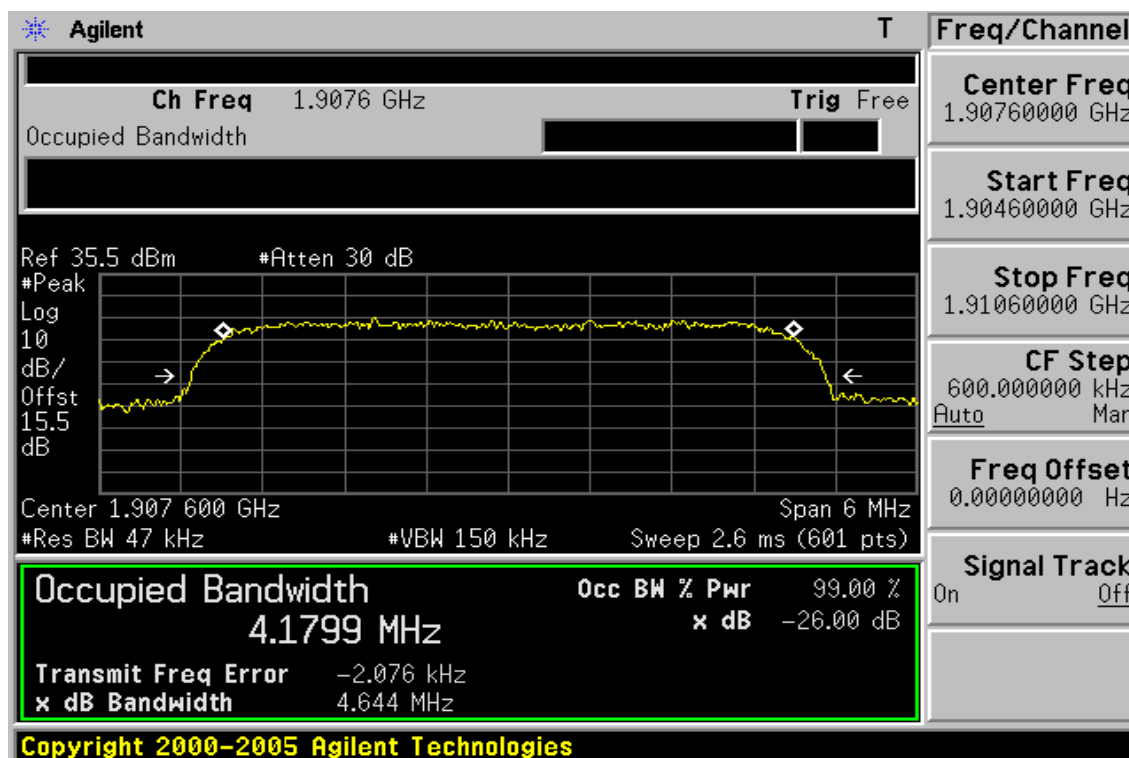
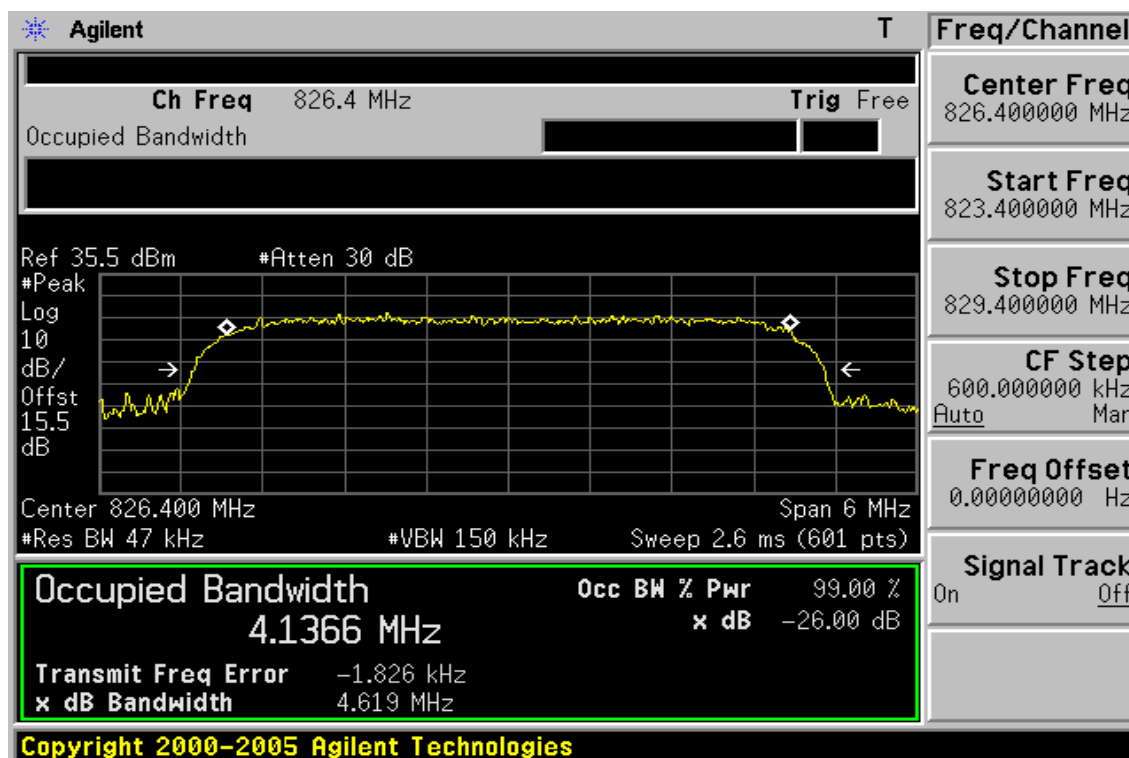


Figure 8-20: HSDPA V Channel Low



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Figure 8-21: HSDPA V Channel Mid

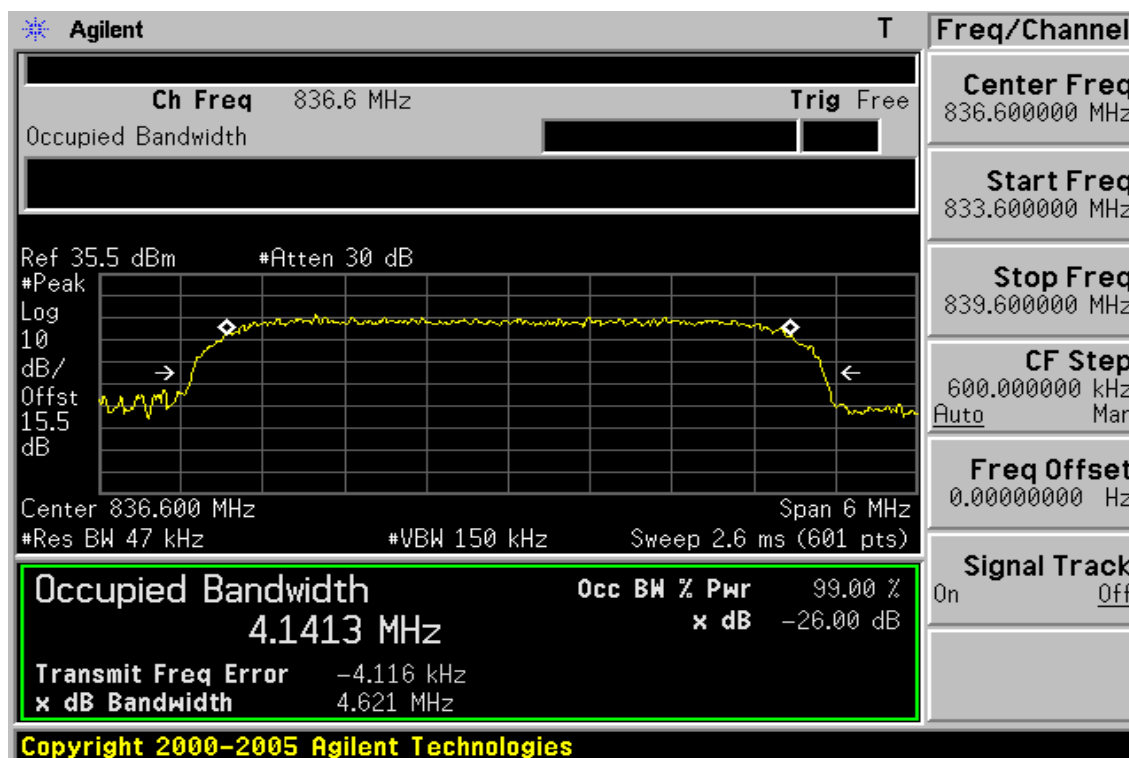
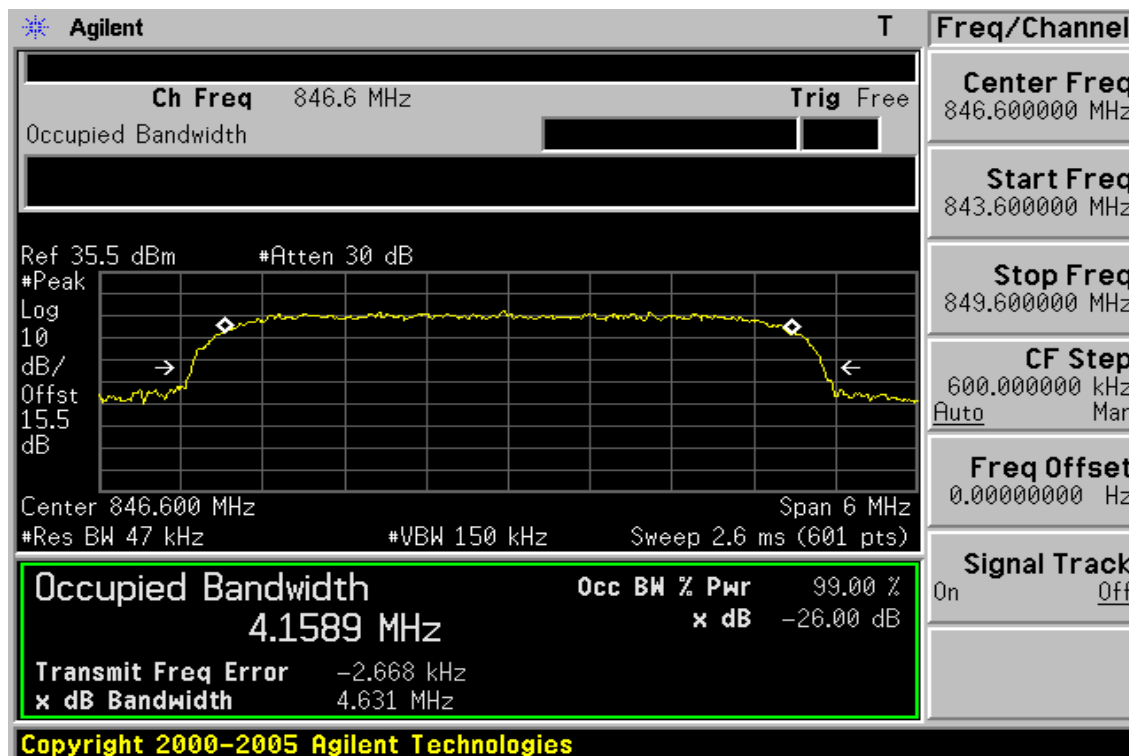


Figure 8-22: HSDPA V Channel High



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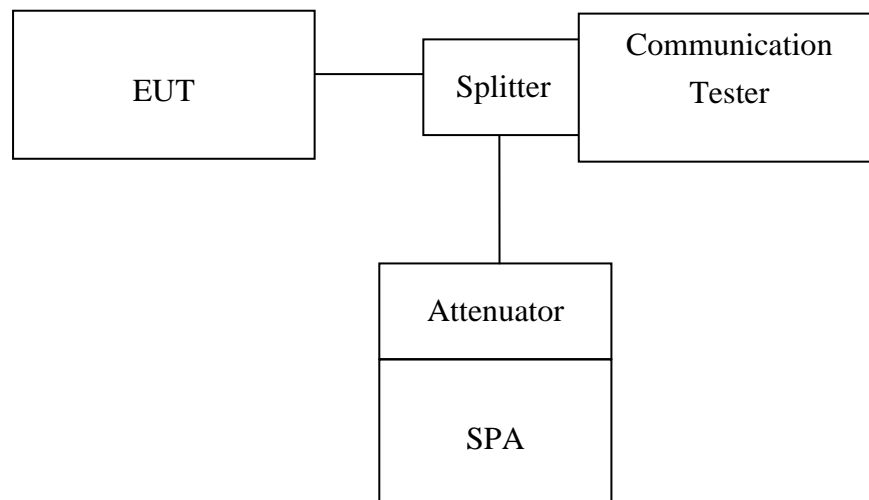
9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

9.1. Standard Applicable:

According to FCC §2.1051.

FCC §22.917(a), §24.238(a) 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:



Note: Measurement setup for testing on Antenna connector

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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= 10th 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.

9.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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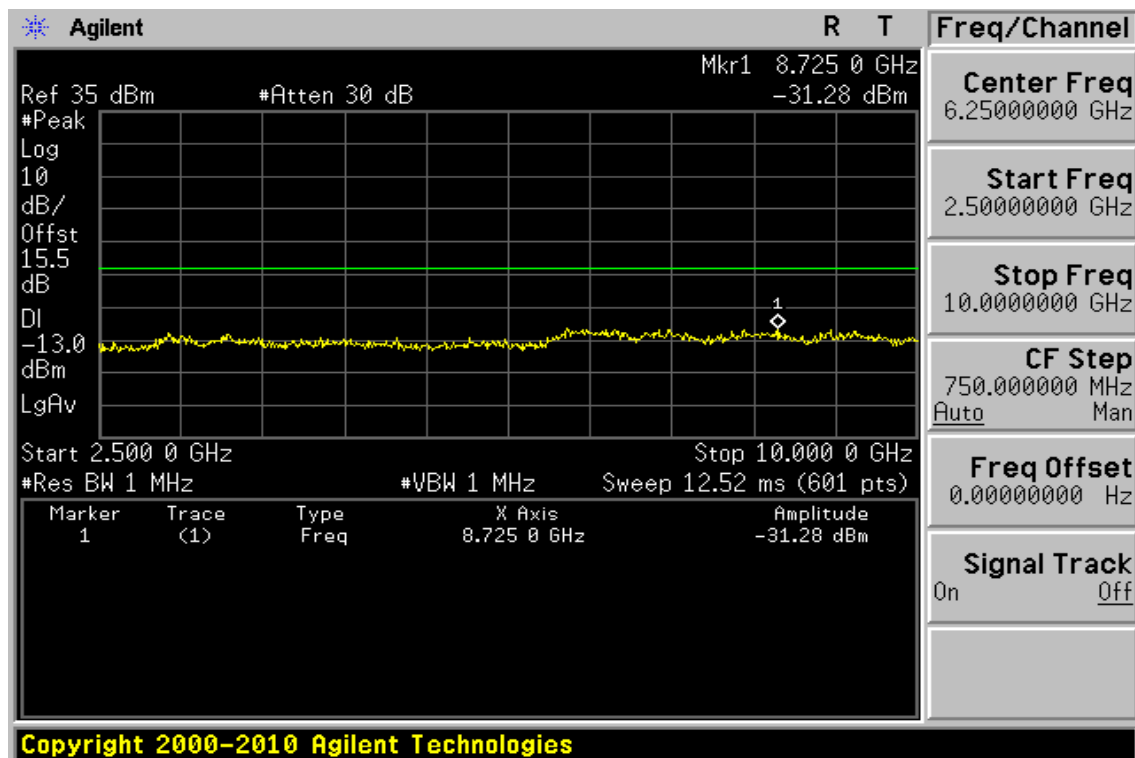
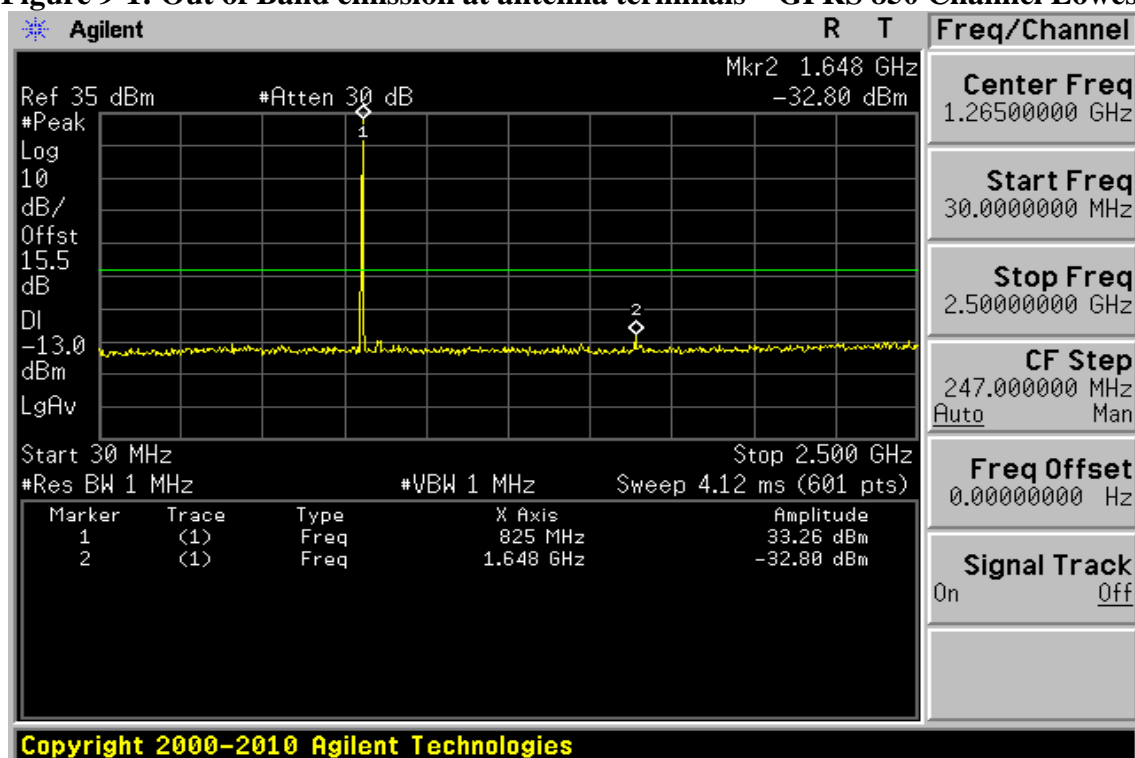
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9.5. Measurement Result:

Figure 9-1: Out of Band emission at antenna terminals – GPRS 850 Channel Lowest



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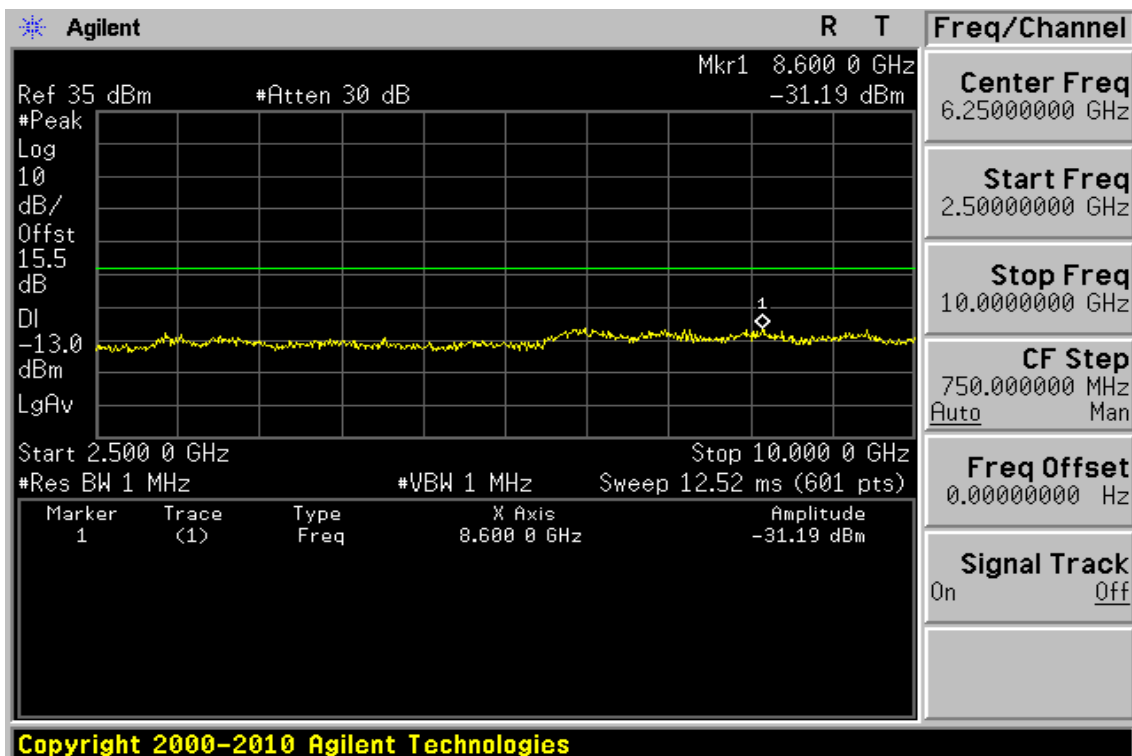
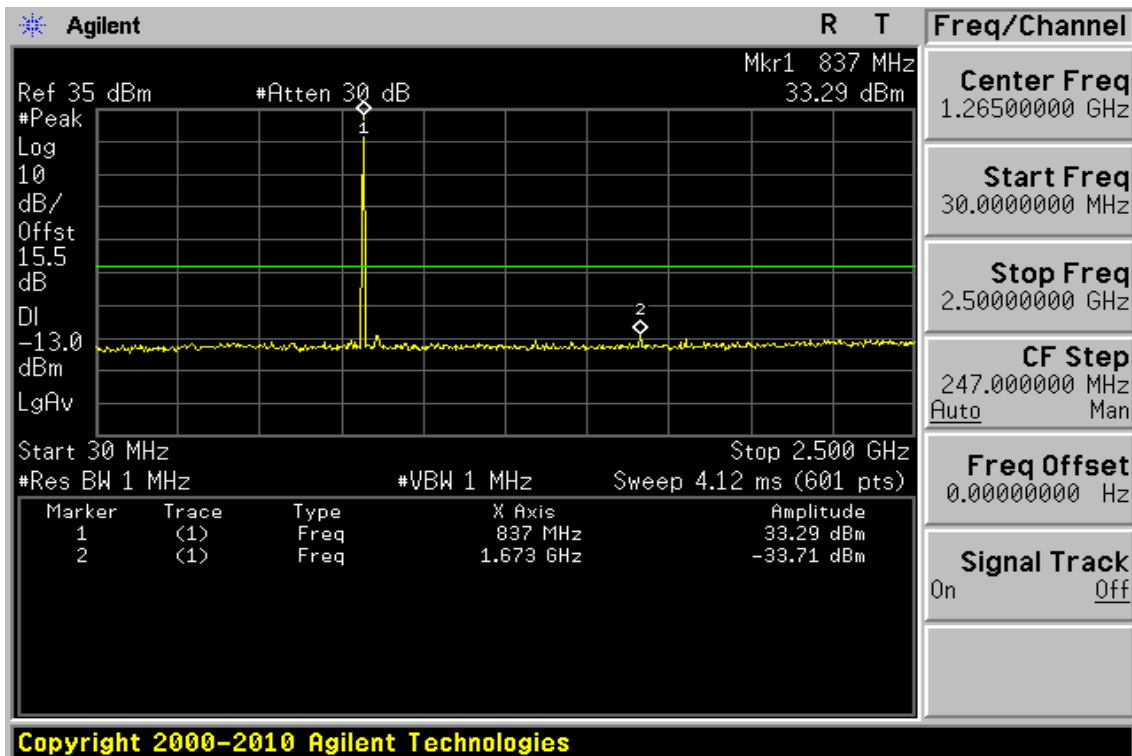
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Figure 9-2: Out of Band emission at antenna terminals – GPRS 850 Channel Mid



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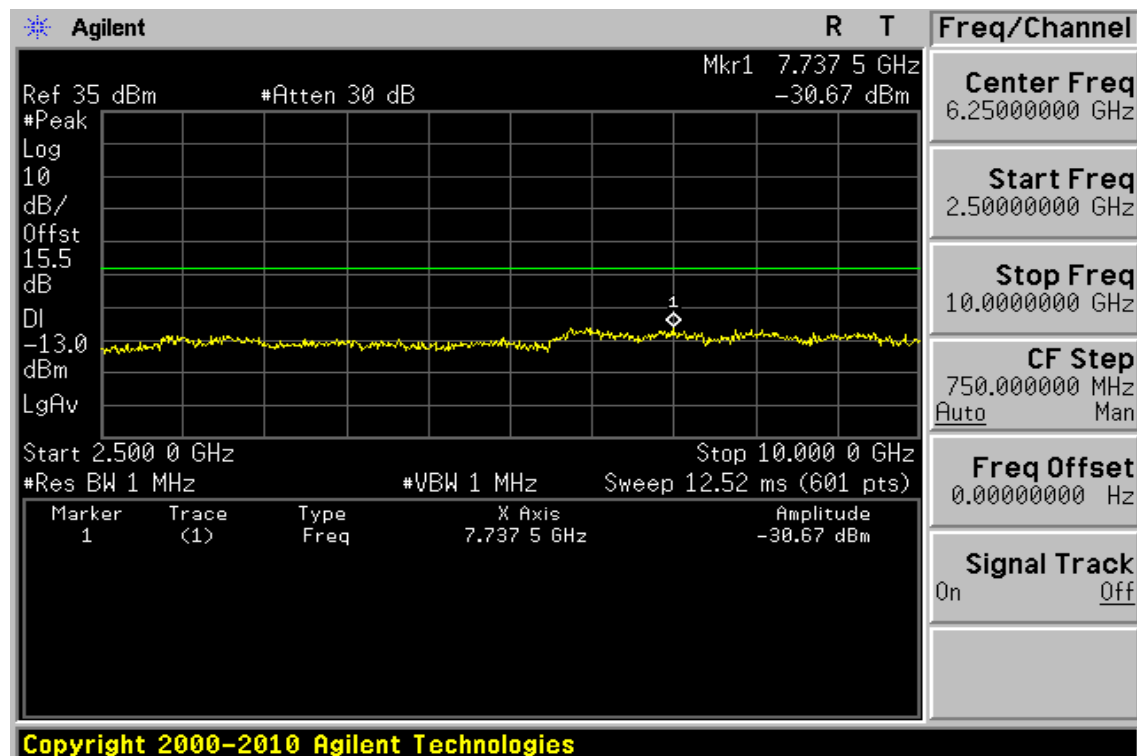
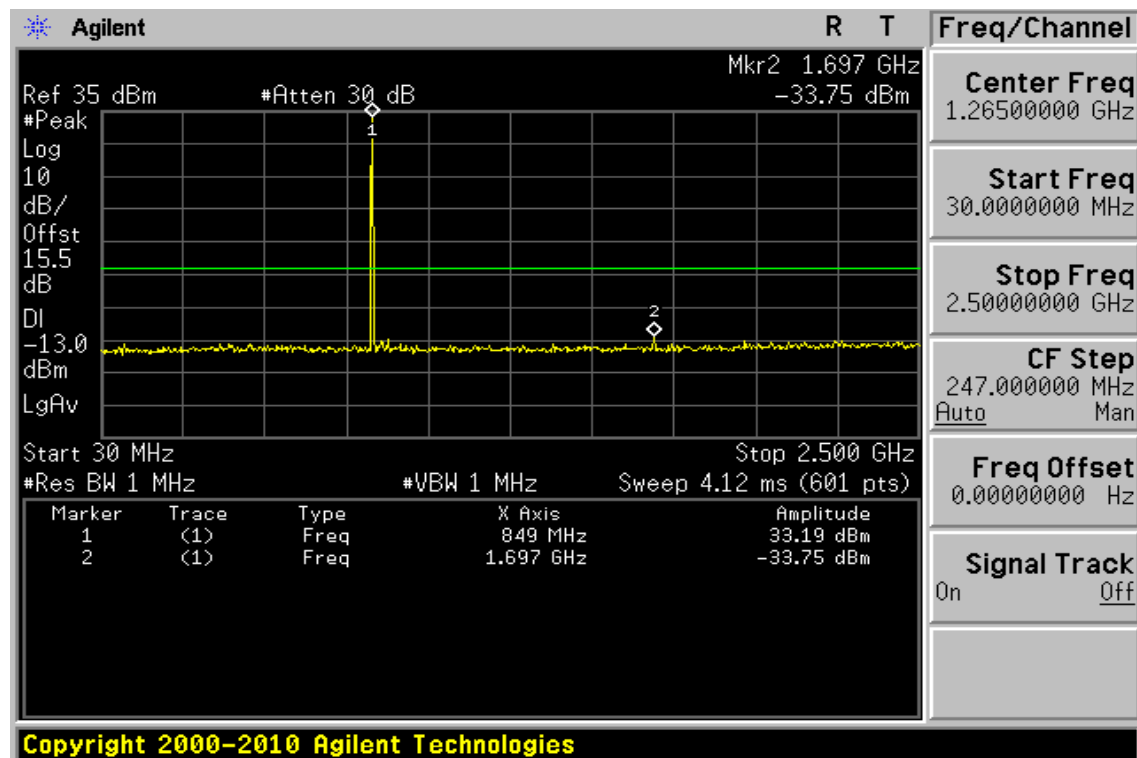
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Figure 9-3: Out of Band emission at antenna terminals – GPRS 850 Channel Highest



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Figure 9-4: Band edge emission at antenna terminals – GPRS 850 Channel Lowest

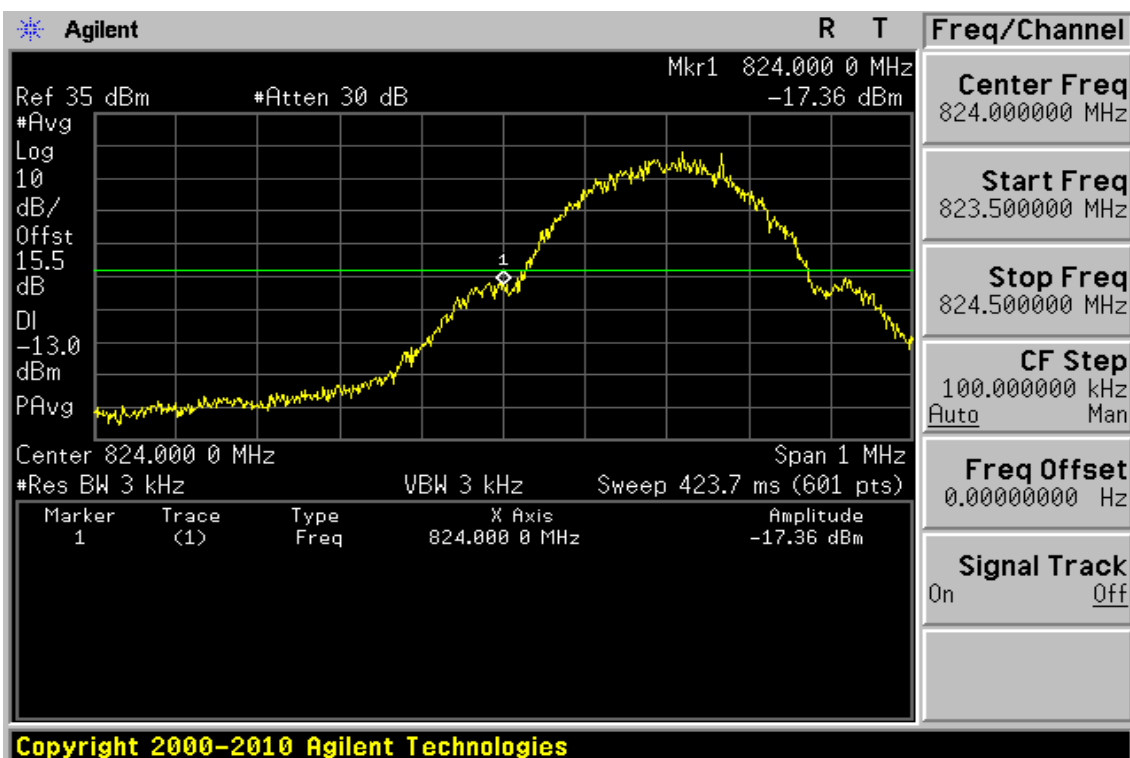
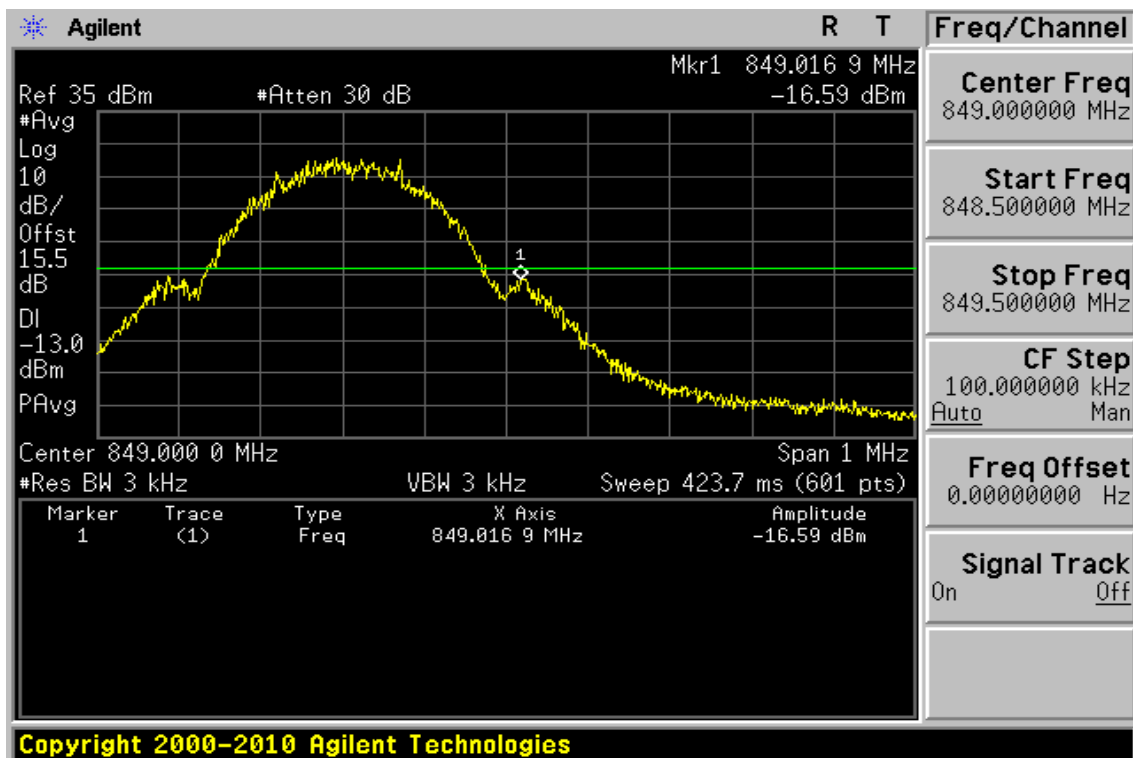


Figure 9-5: Band edge emission at antenna terminals – GPRS 850 Channel Highest



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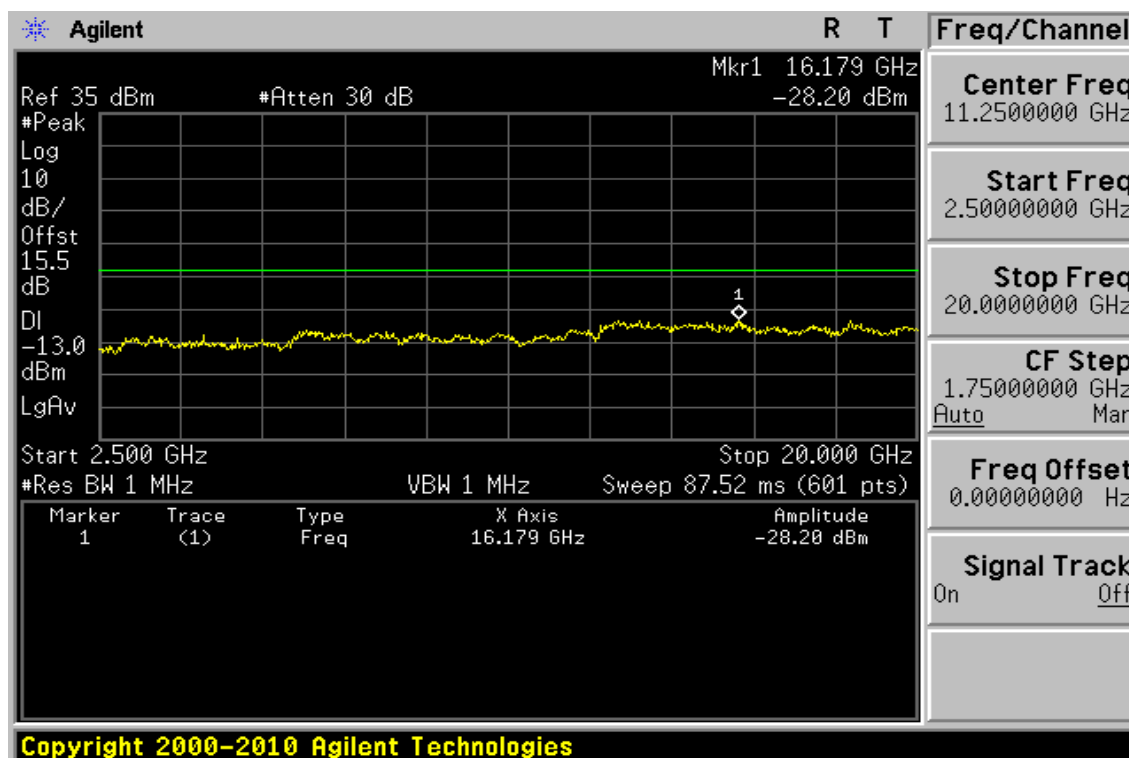
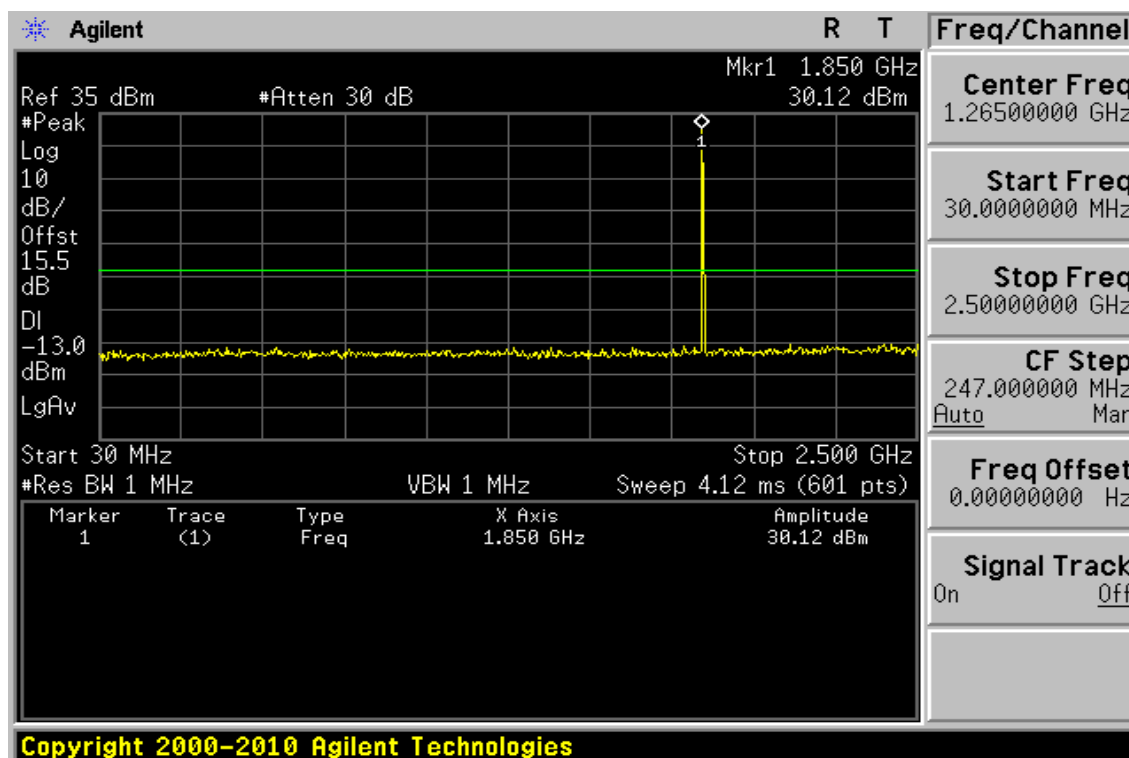
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Figure 9-6: Out of Band emission at antenna terminals – GPRS 1900 Channel Lowest



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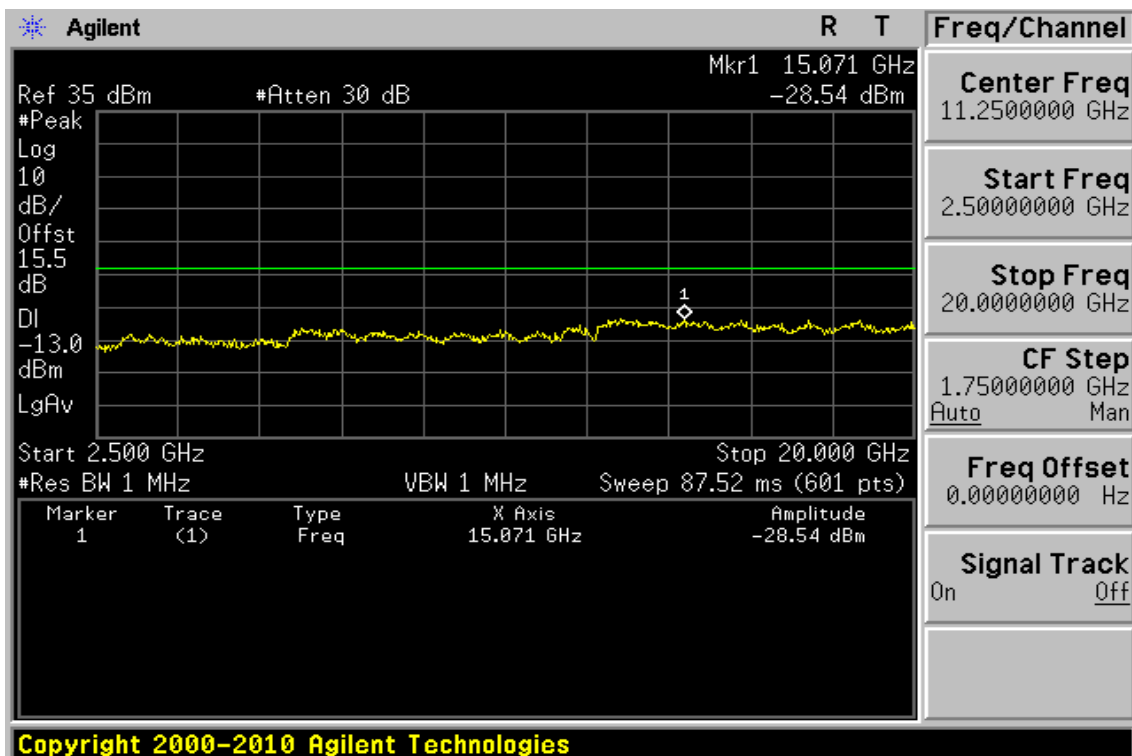
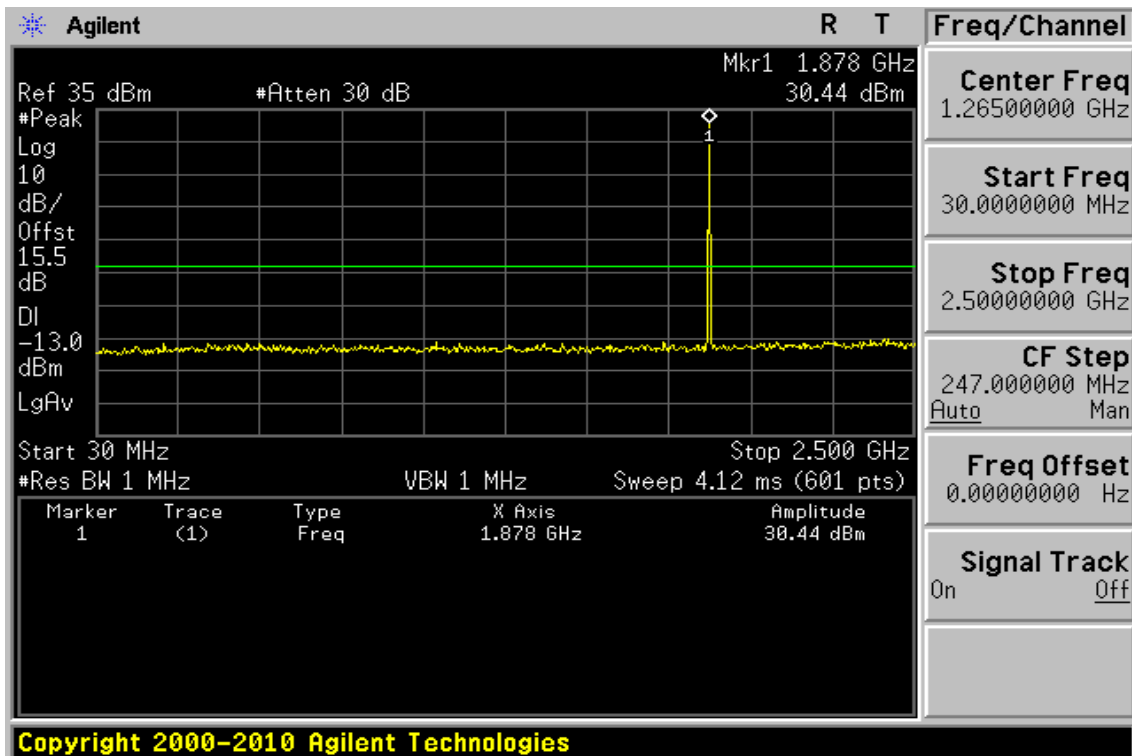
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Figure 9-7: Out of Band emission at antenna terminals – GPRS 1900 Channel Mid



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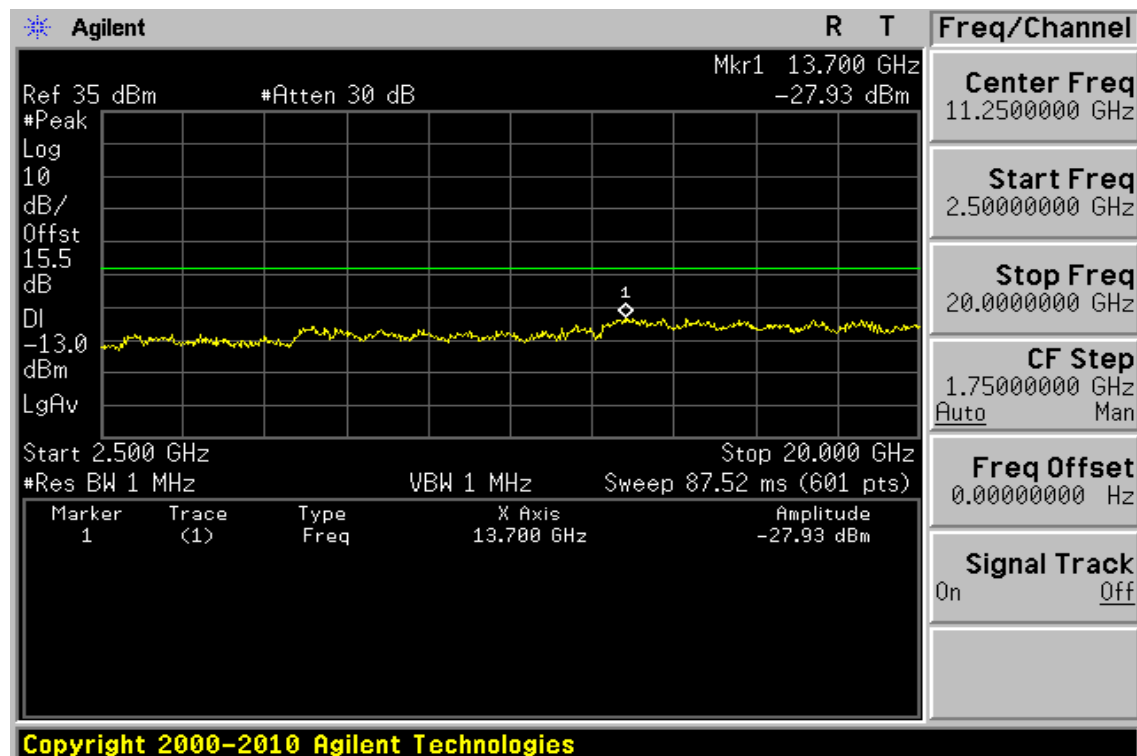
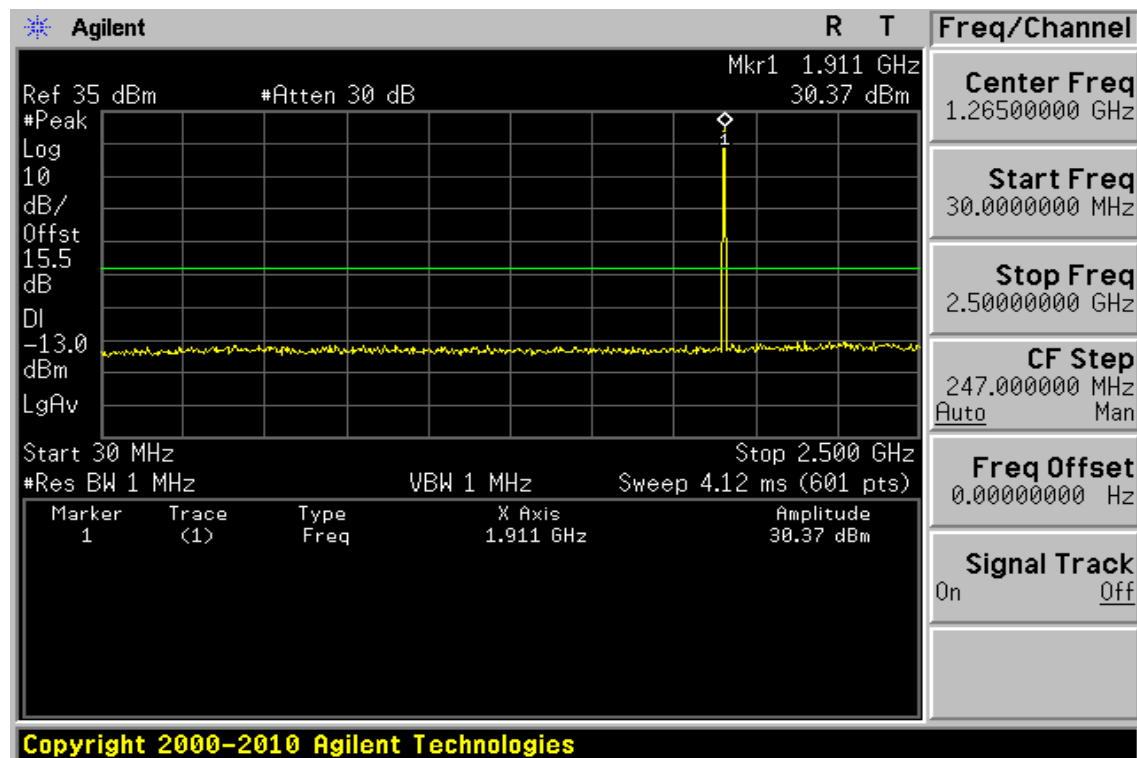
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Figure 9-8: Out of Band emission at antenna terminals – GPRS 1900 Channel Highest



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Figure 9-9: Band edge emission at antenna terminals – GPRS 1900 Channel Lowest

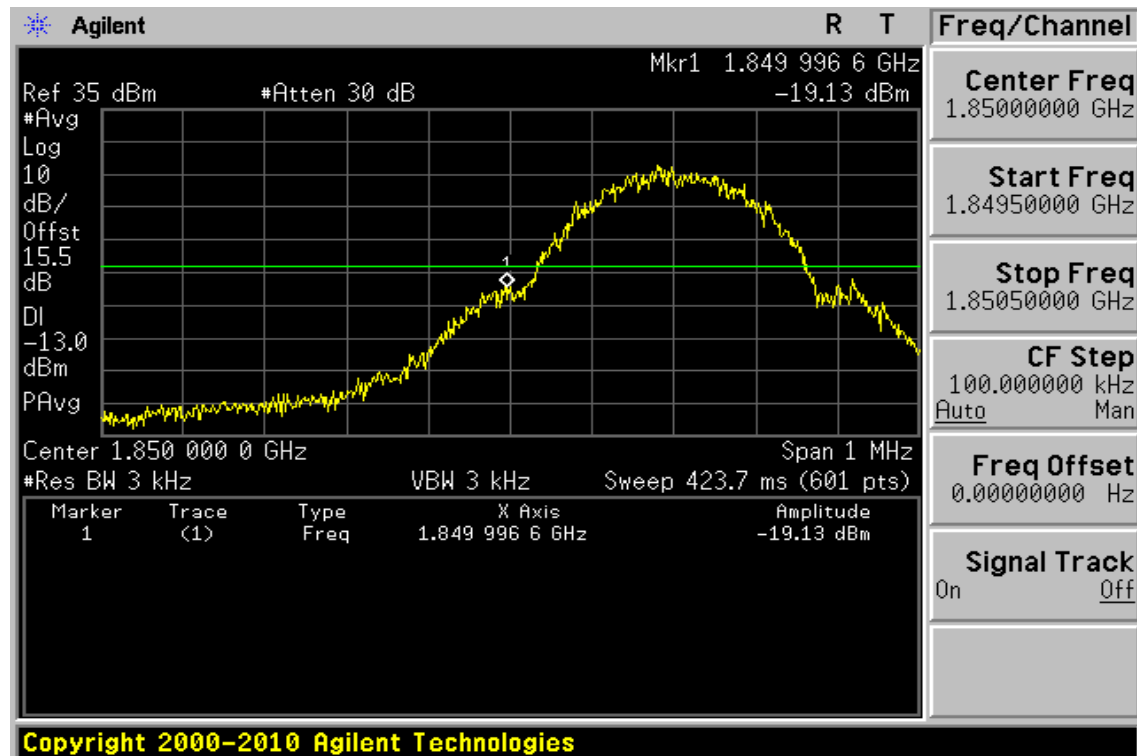
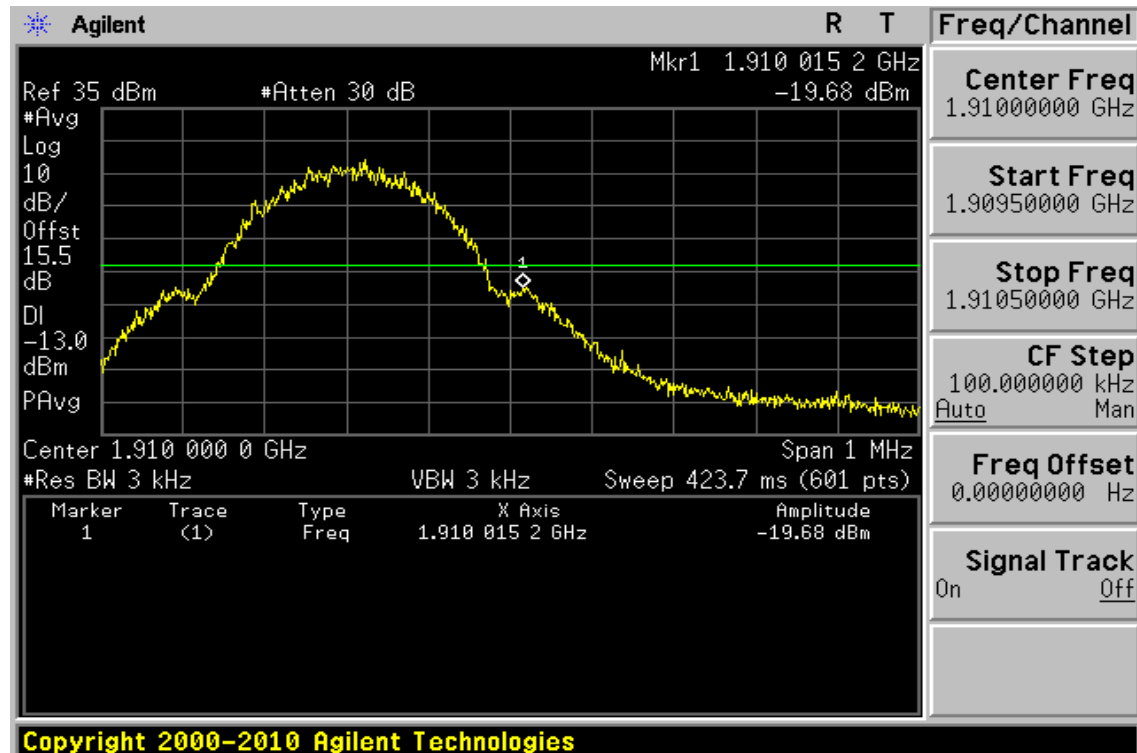


Figure 9-10: Band edge emission at antenna terminals – GPRS 1900 Channel Highest



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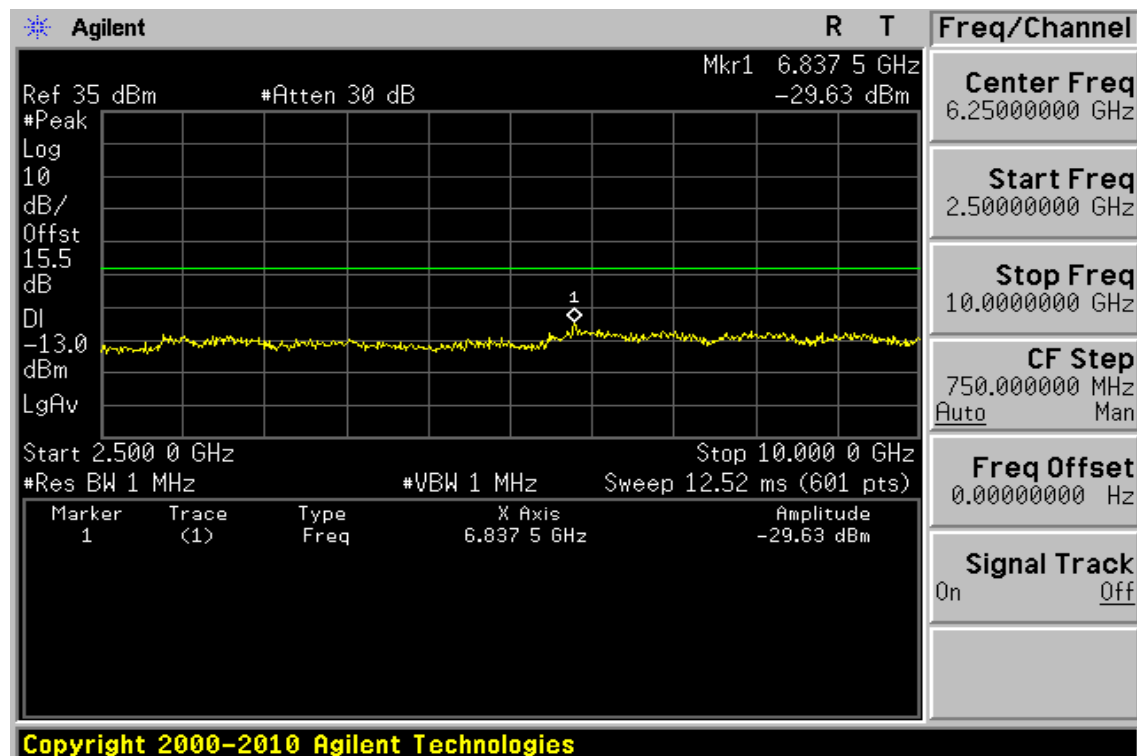
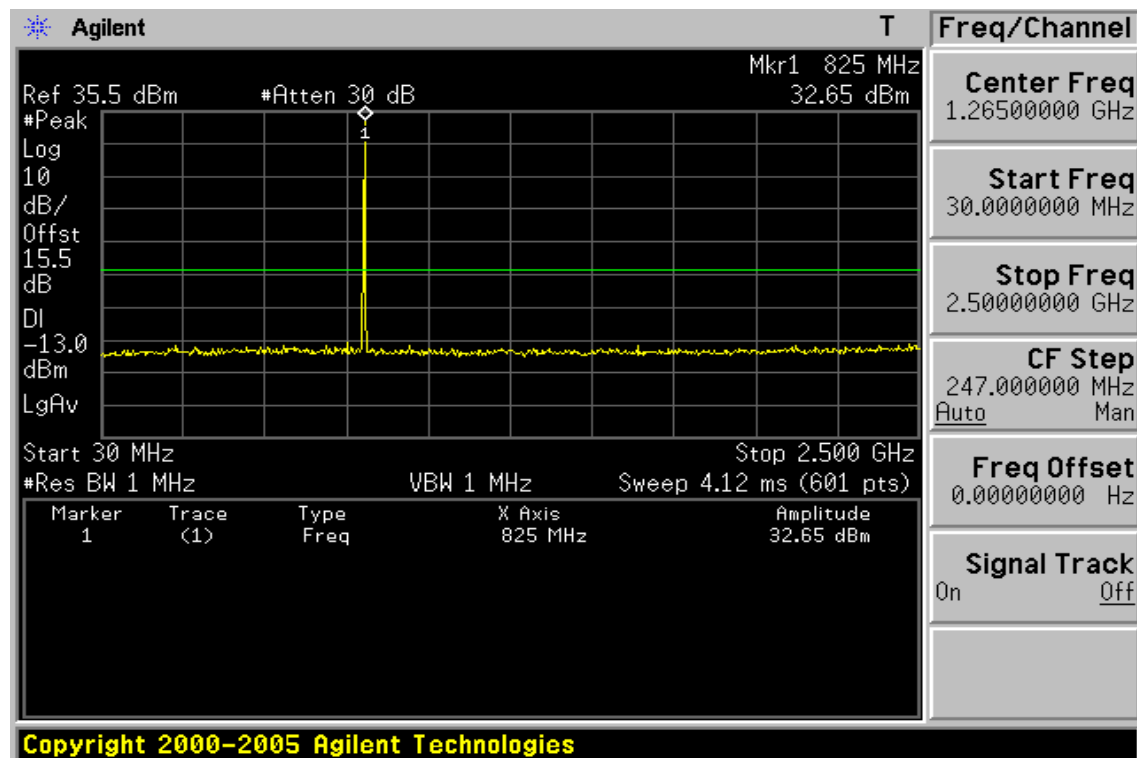
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Figure 9-11: Out of Band emission at antenna terminals – EDGE 850 Channel Lowest



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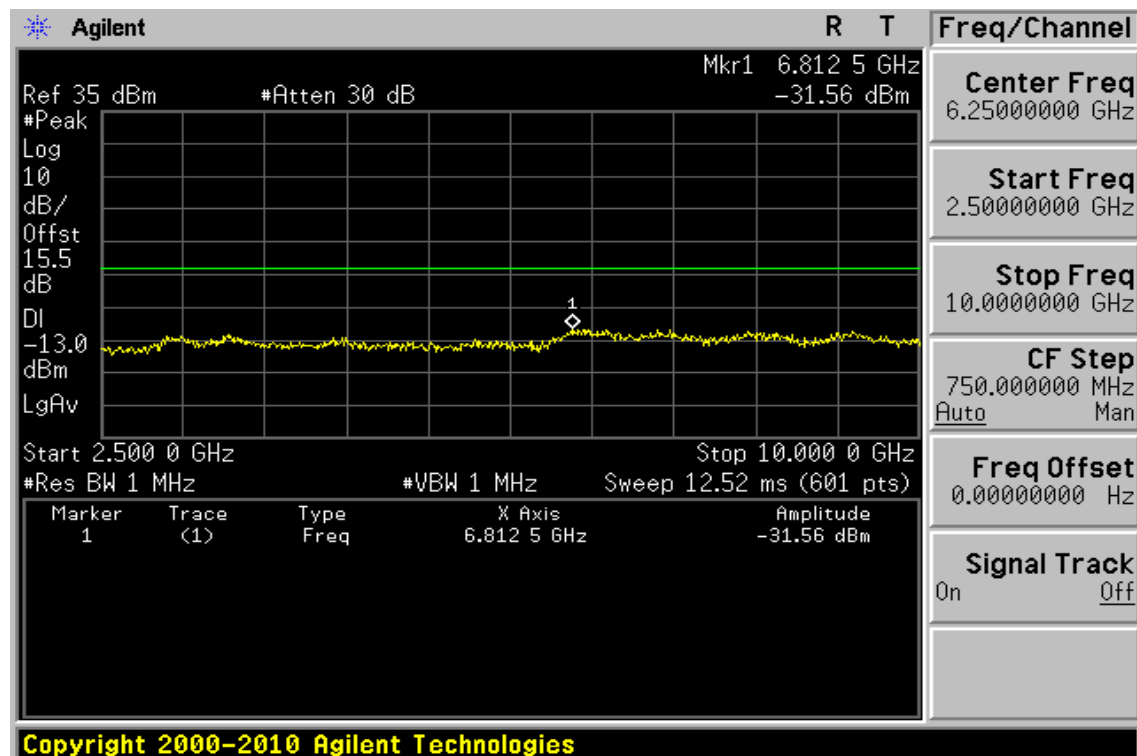
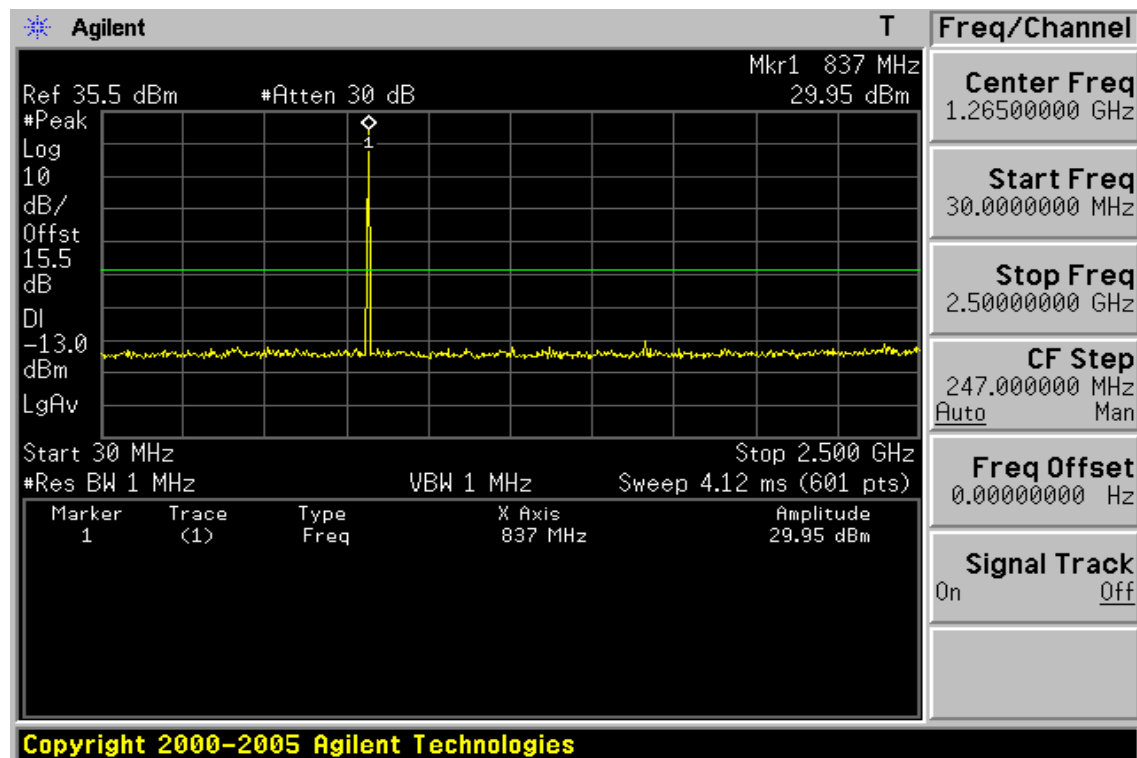
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Figure 9-12: Out of Band emission at antenna terminals – EDGE 850 Channel Mid



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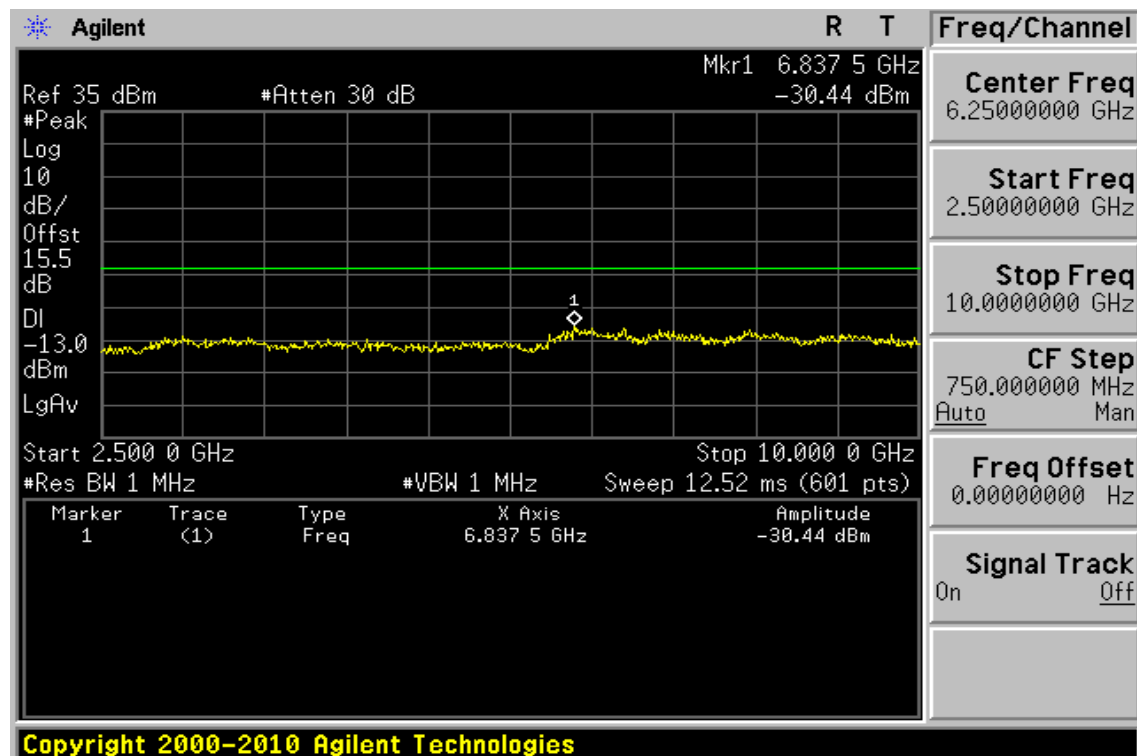
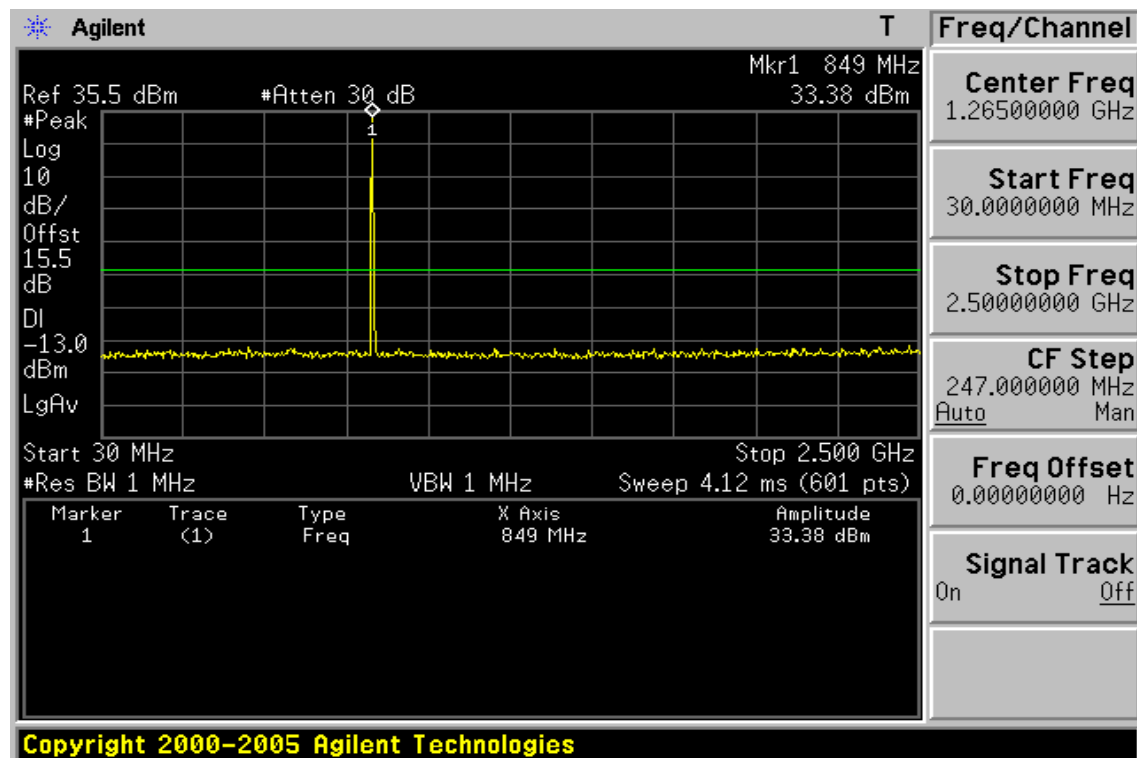
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Figure 9-13: Out of Band emission at antenna terminals – EDGE 850 Channel Highest



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Figure 9-14: Band edge emission at antenna terminals – EDGE 850 Channel Lowest

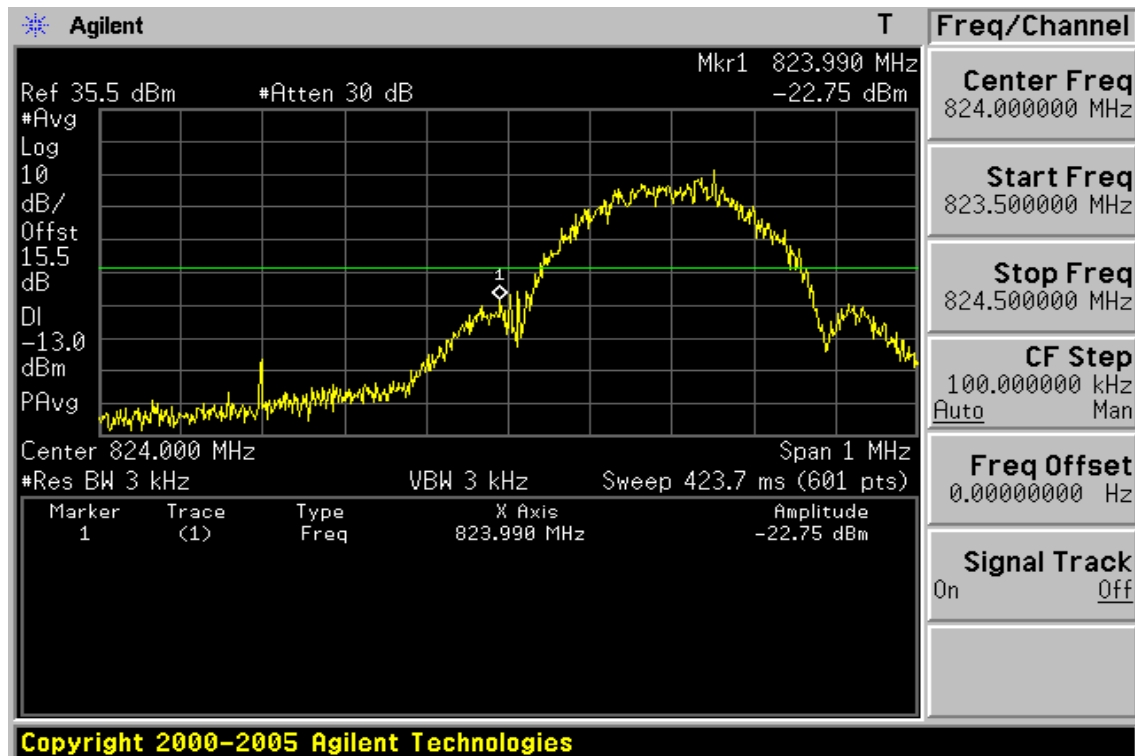
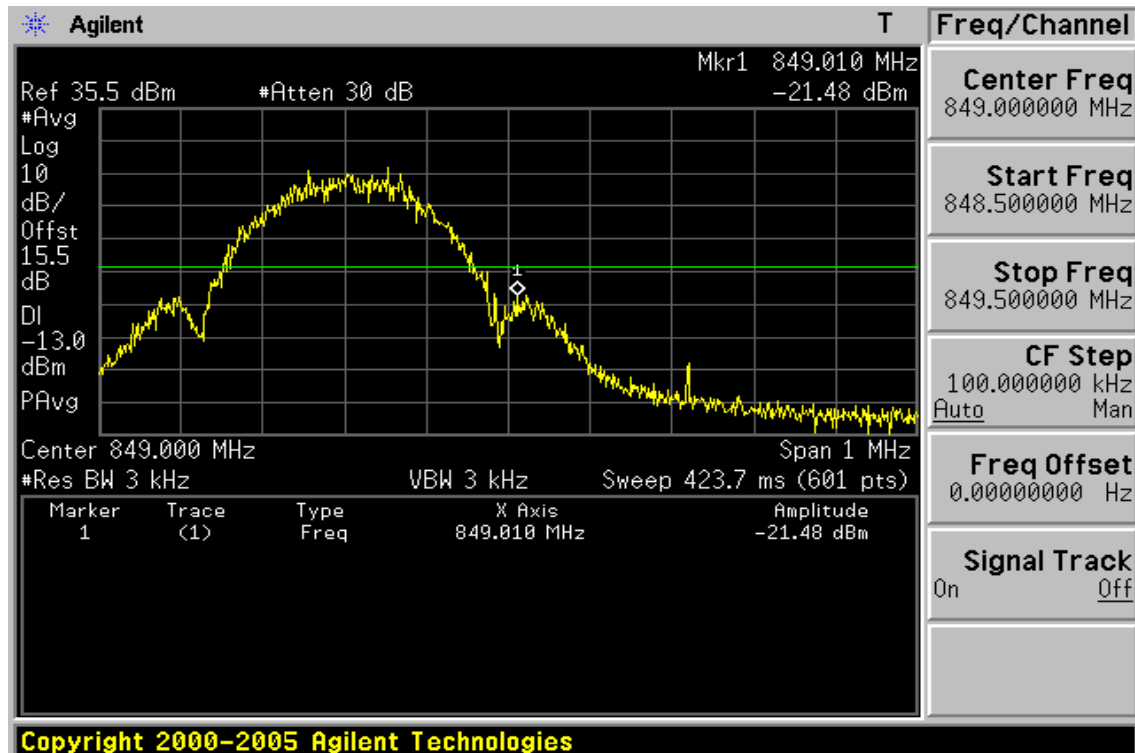


Figure 9-15: Band edge emission at antenna terminals – EDGE 850 Channel Highest



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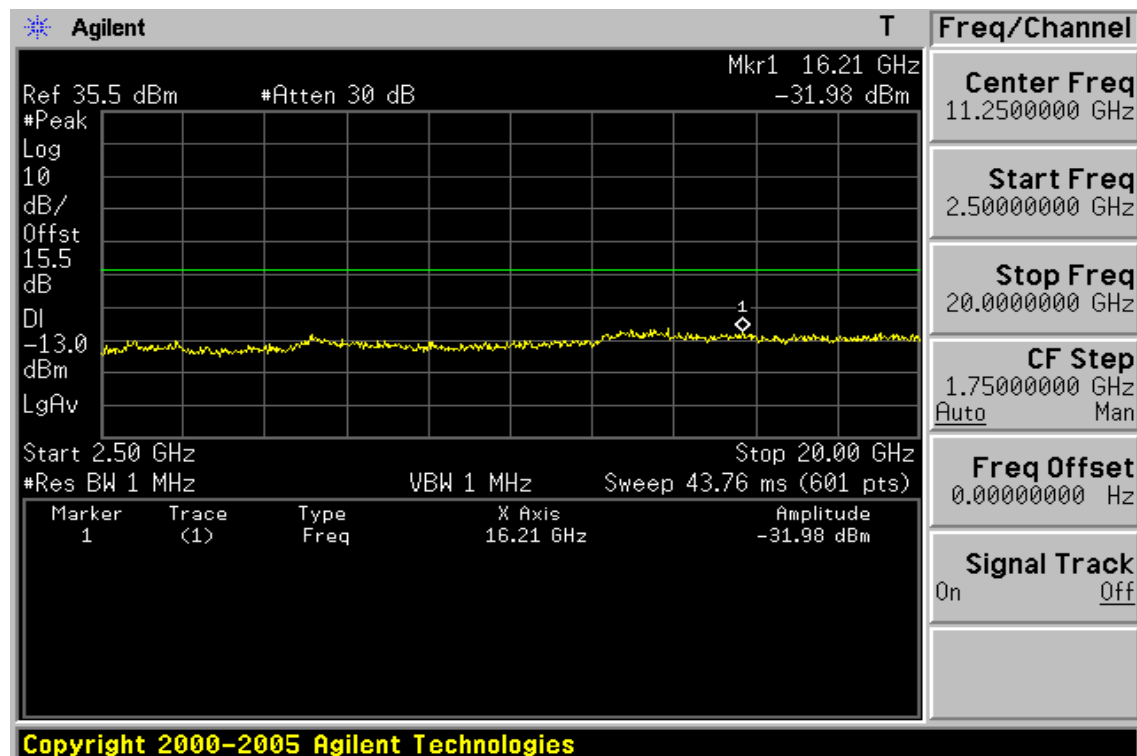
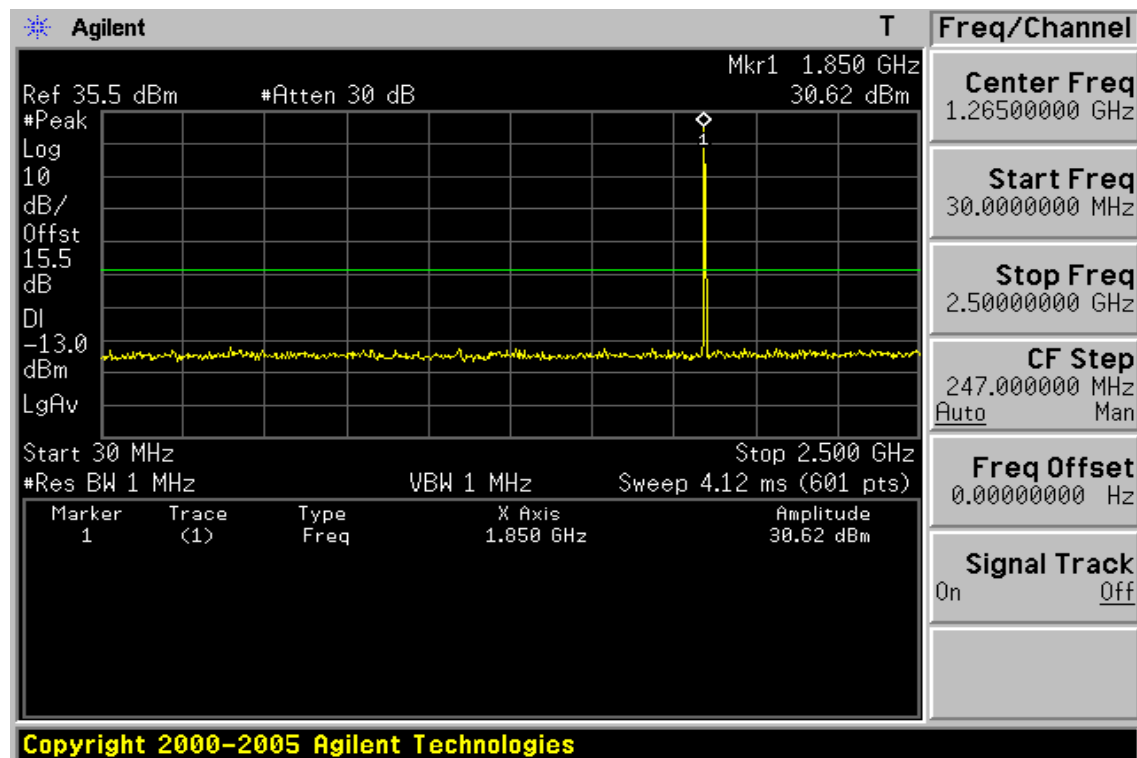
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Figure 9-16: Out of Band emission at antenna terminals – EDGE 1900 Channel Lowest



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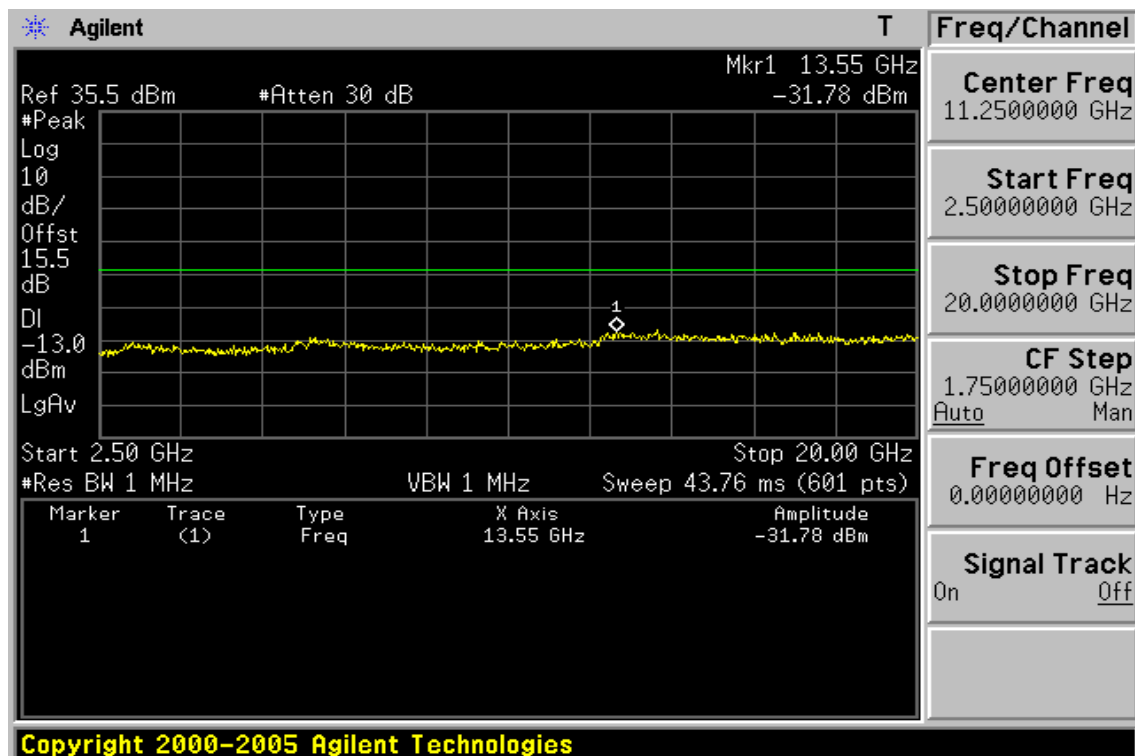
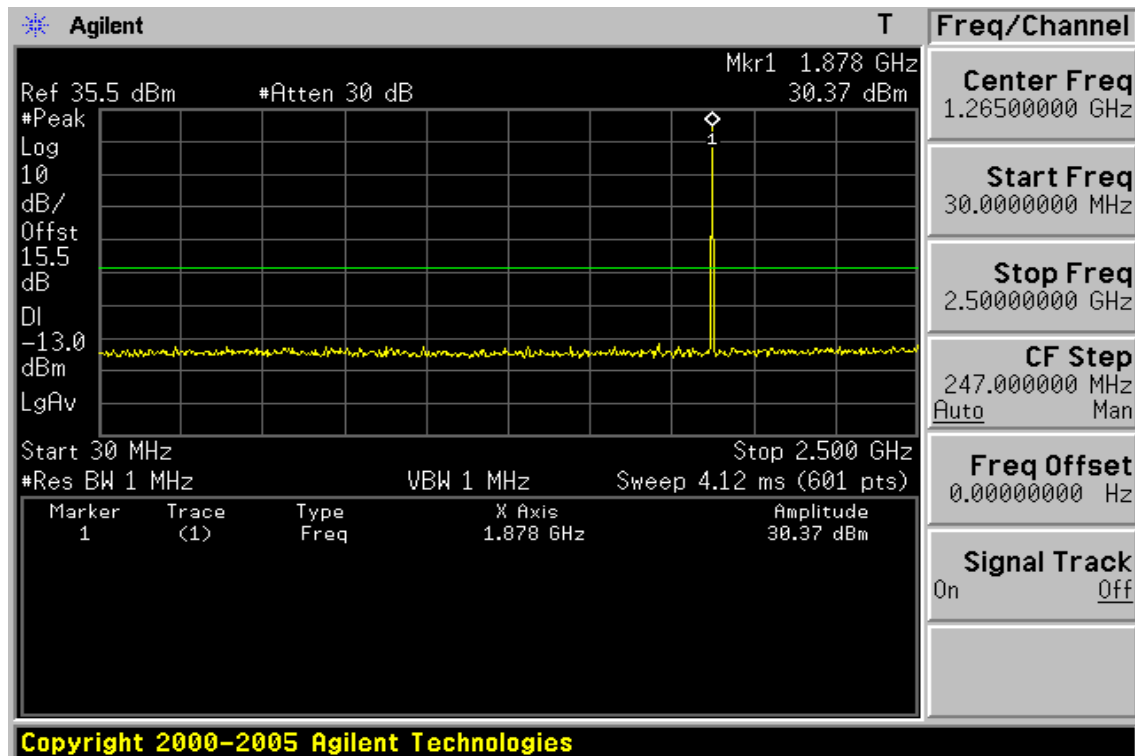
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Figure 9-17: Out of Band emission at antenna terminals – EDGE 1900 Channel Mid



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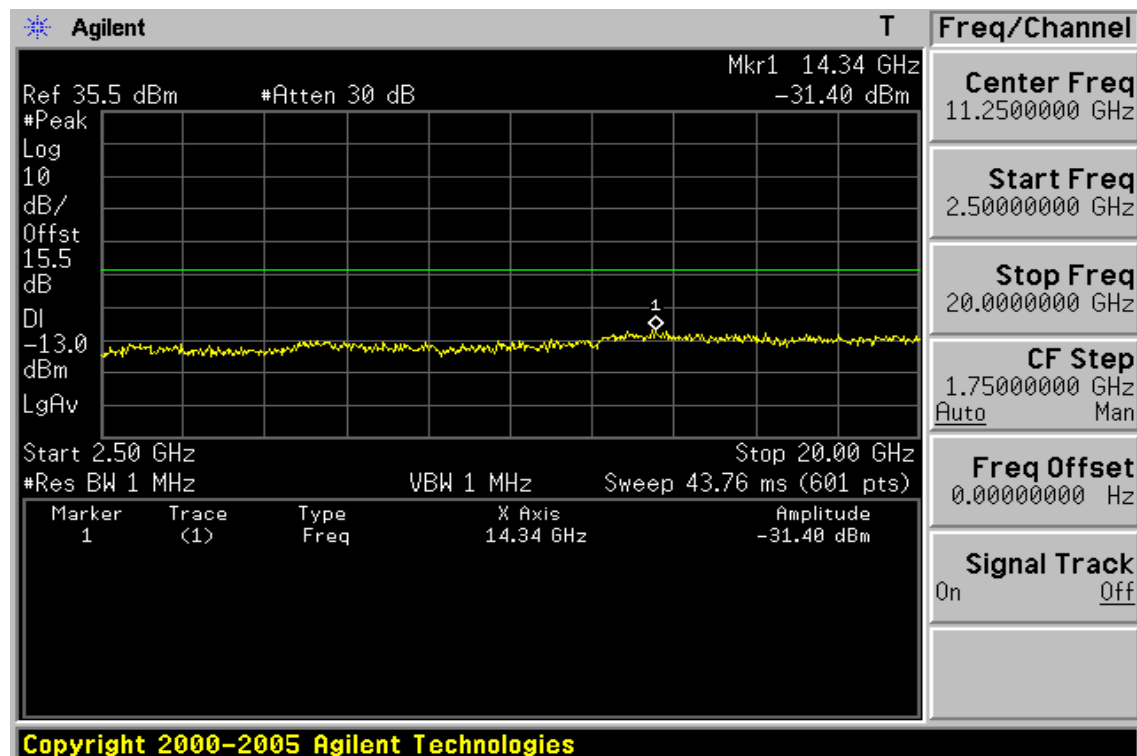
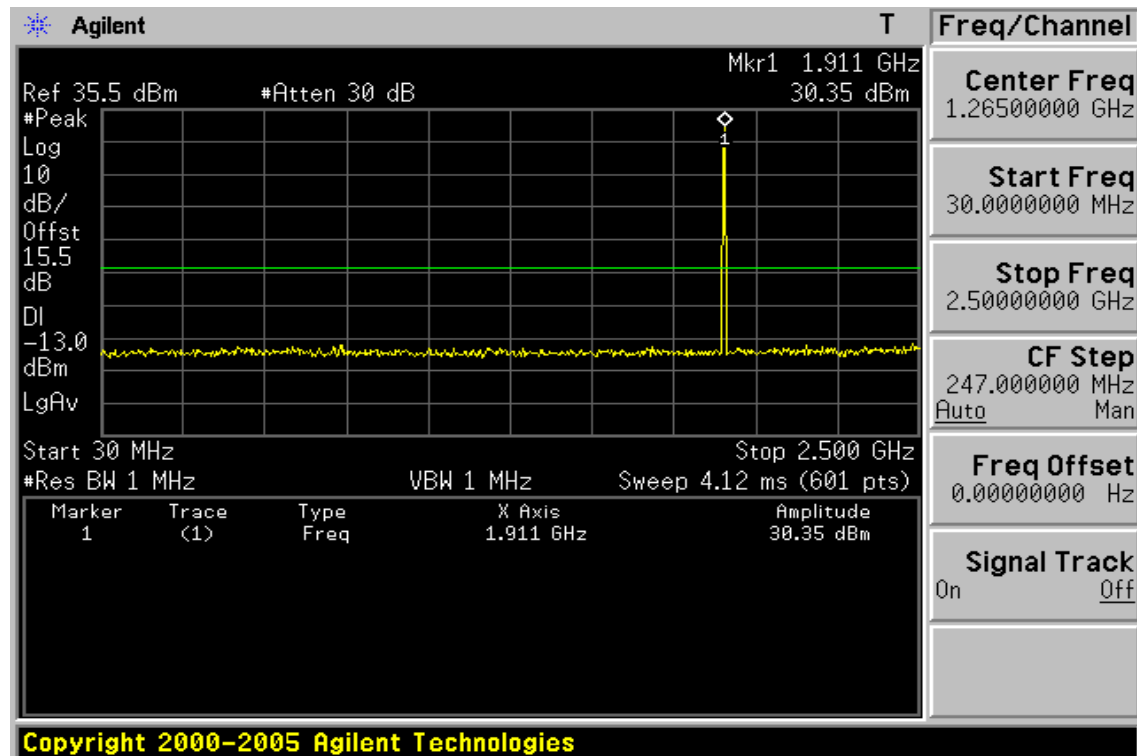
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Figure 9-18: Out of Band emission at antenna terminals – EDGE 1900 Channel Highest



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Figure 9-19: Band edge emission at antenna terminals – EDGE 1900 Channel Lowest

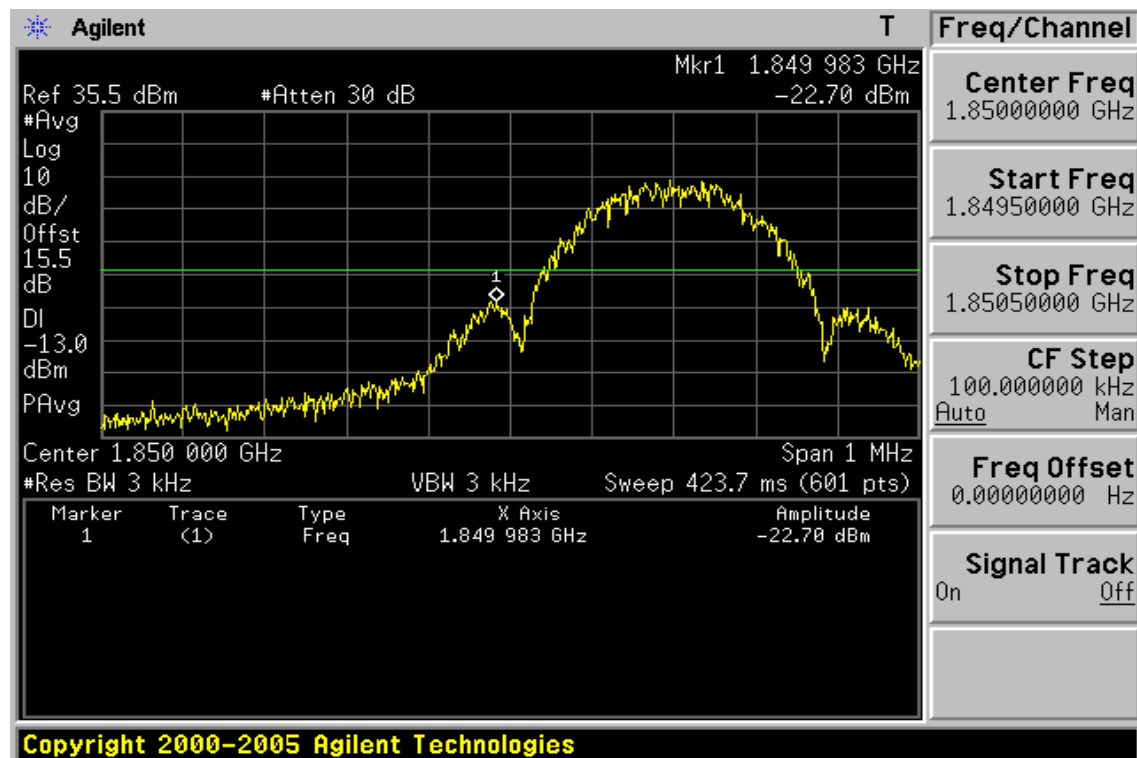
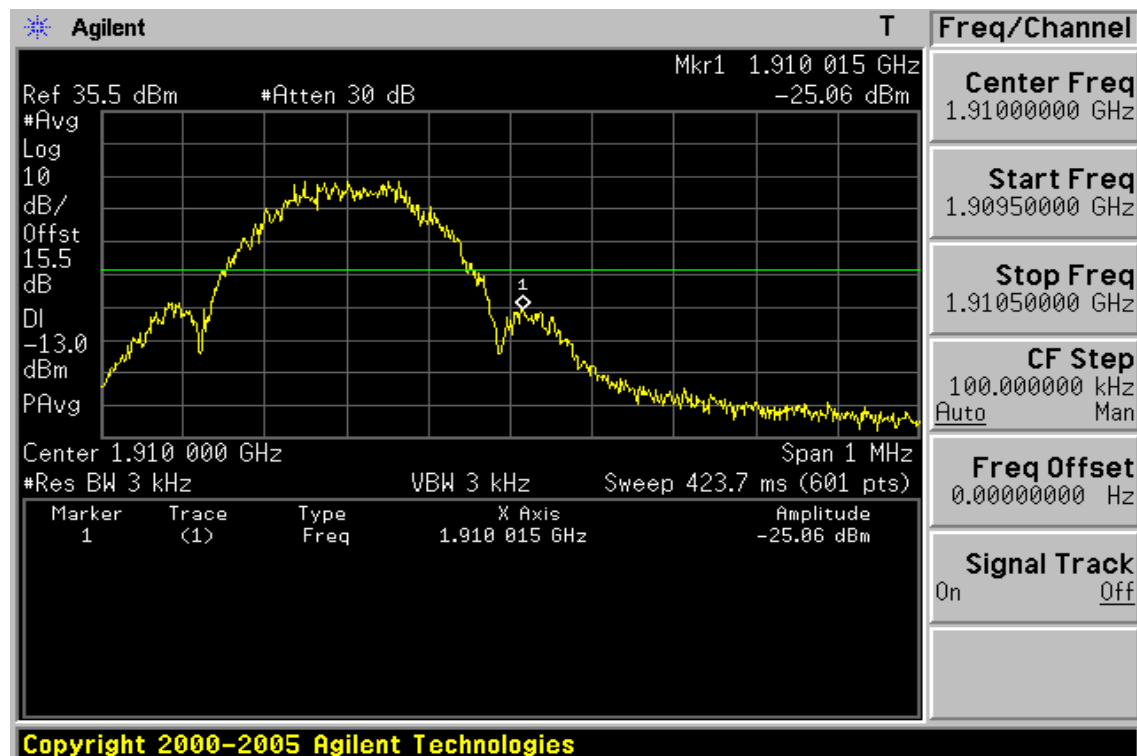


Figure 9-20: Band edge emission at antenna terminals – EDGE 1900 Channel Highest



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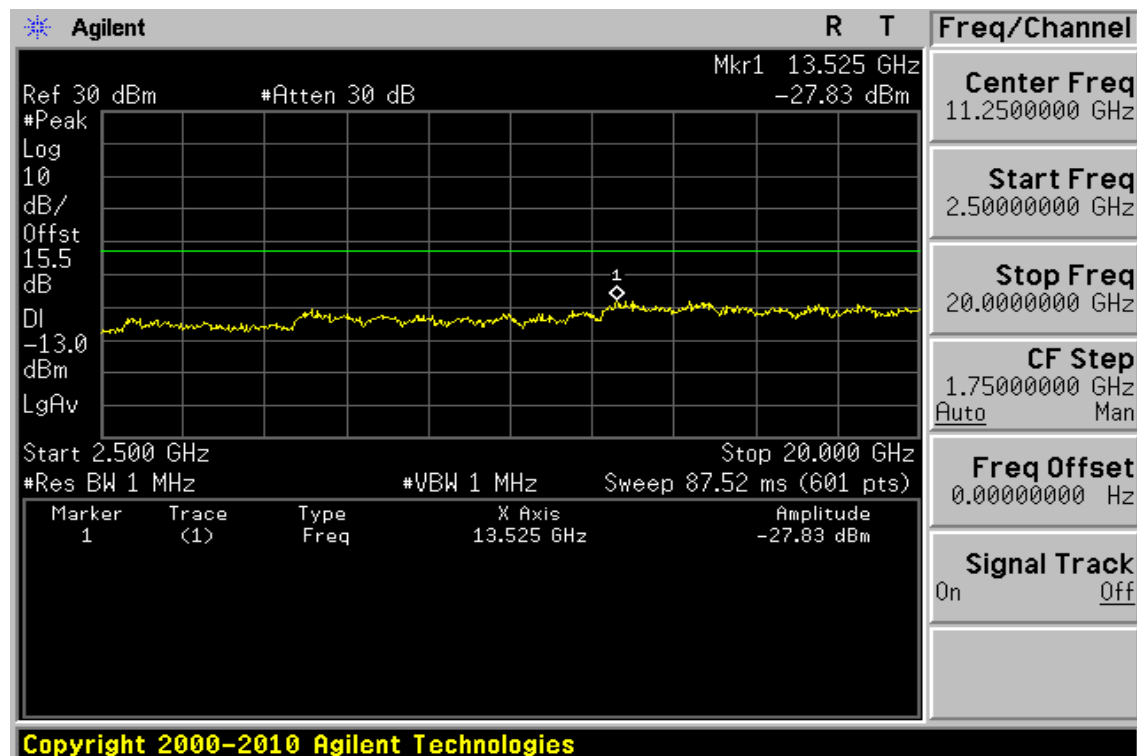
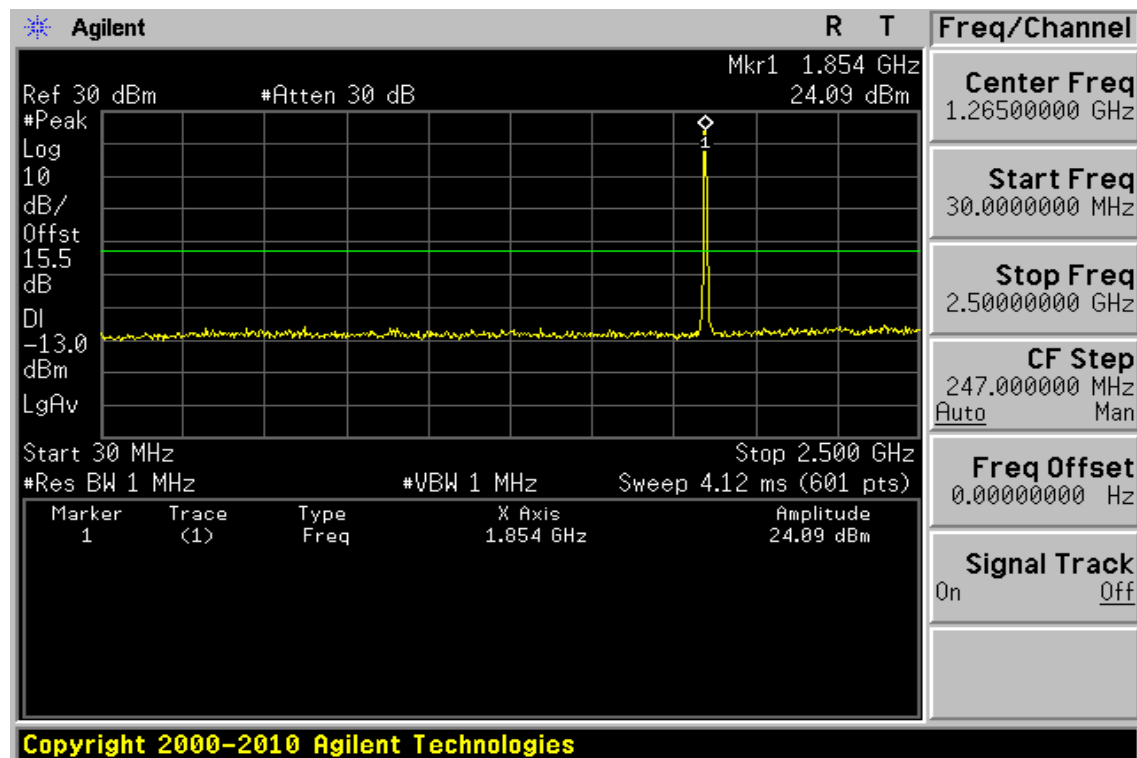
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Figure 9-21: Out of Band emission at antenna terminals – WCDMA II Channel Lowest



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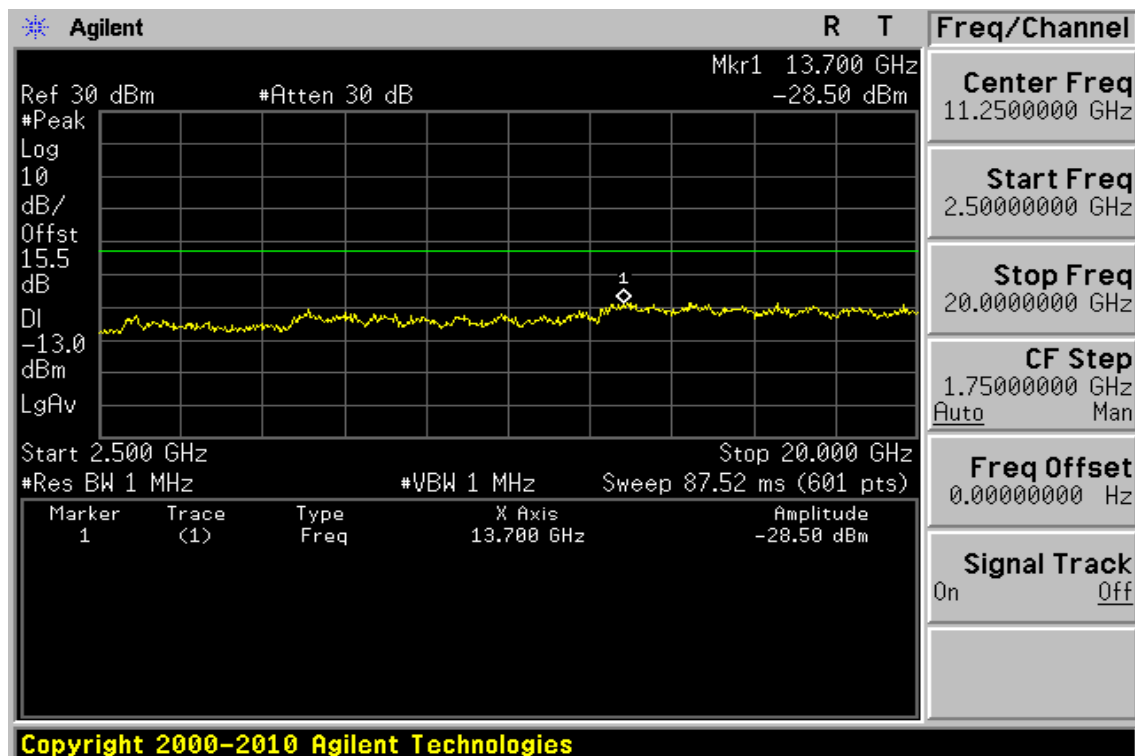
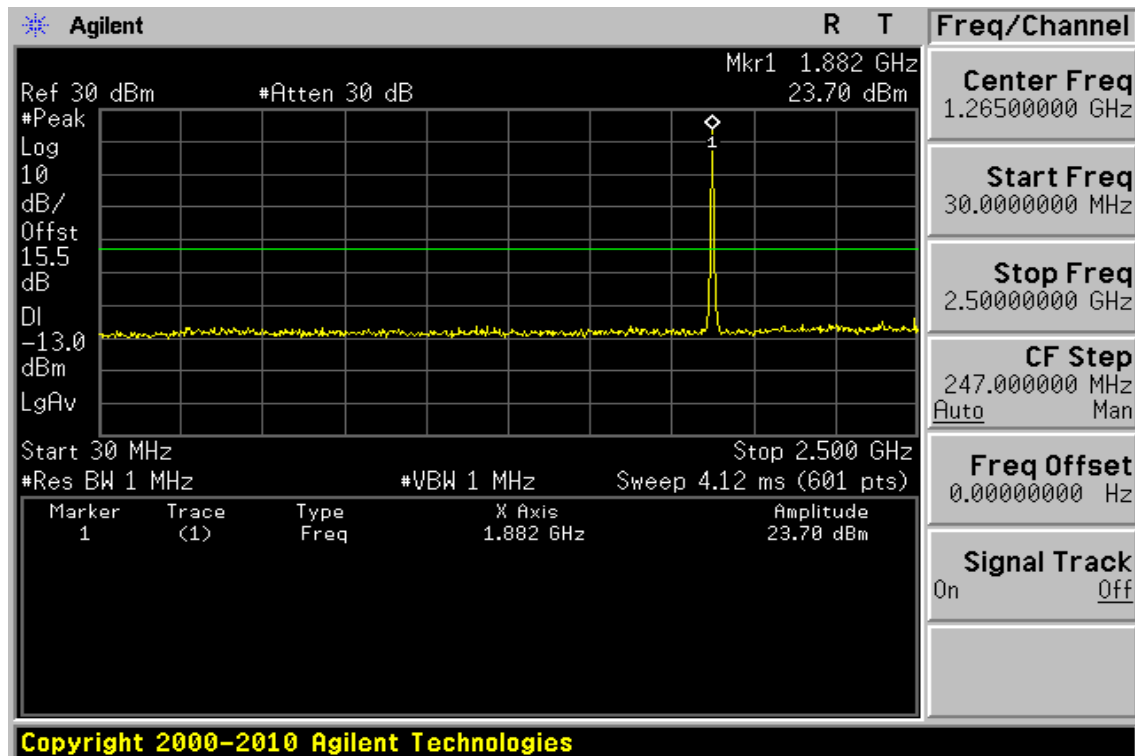
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Figure 9-22: Out of Band emission at antenna terminals – WCDMA II Channel Mid



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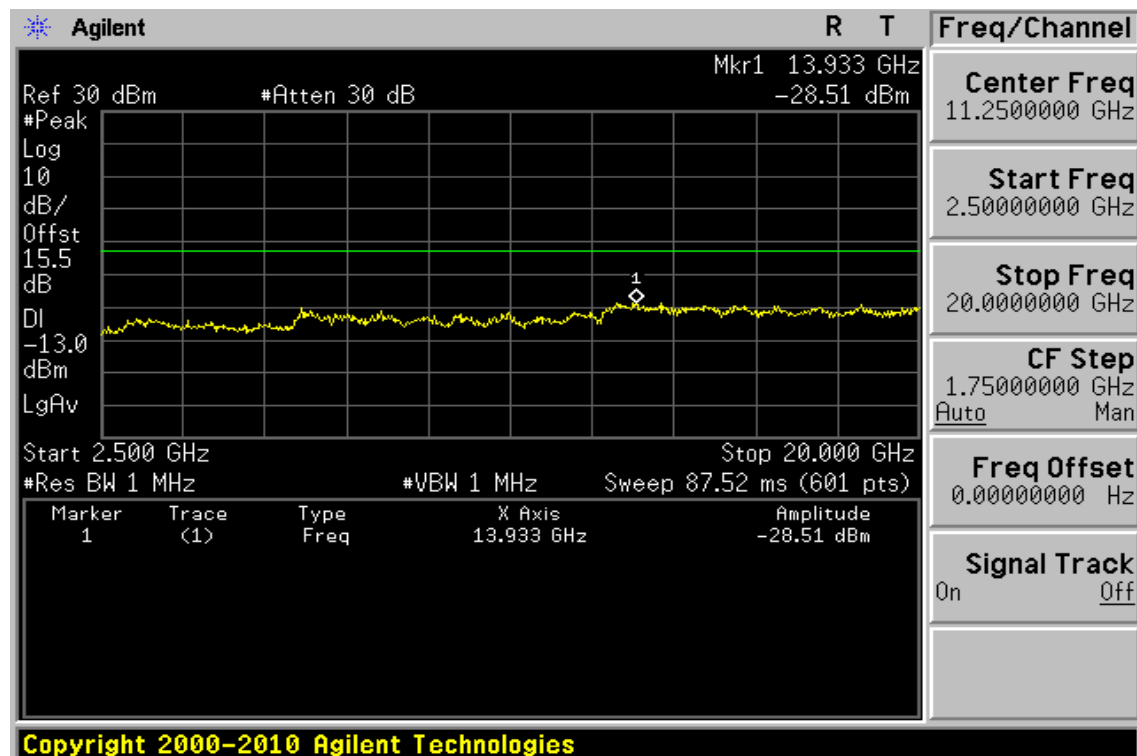
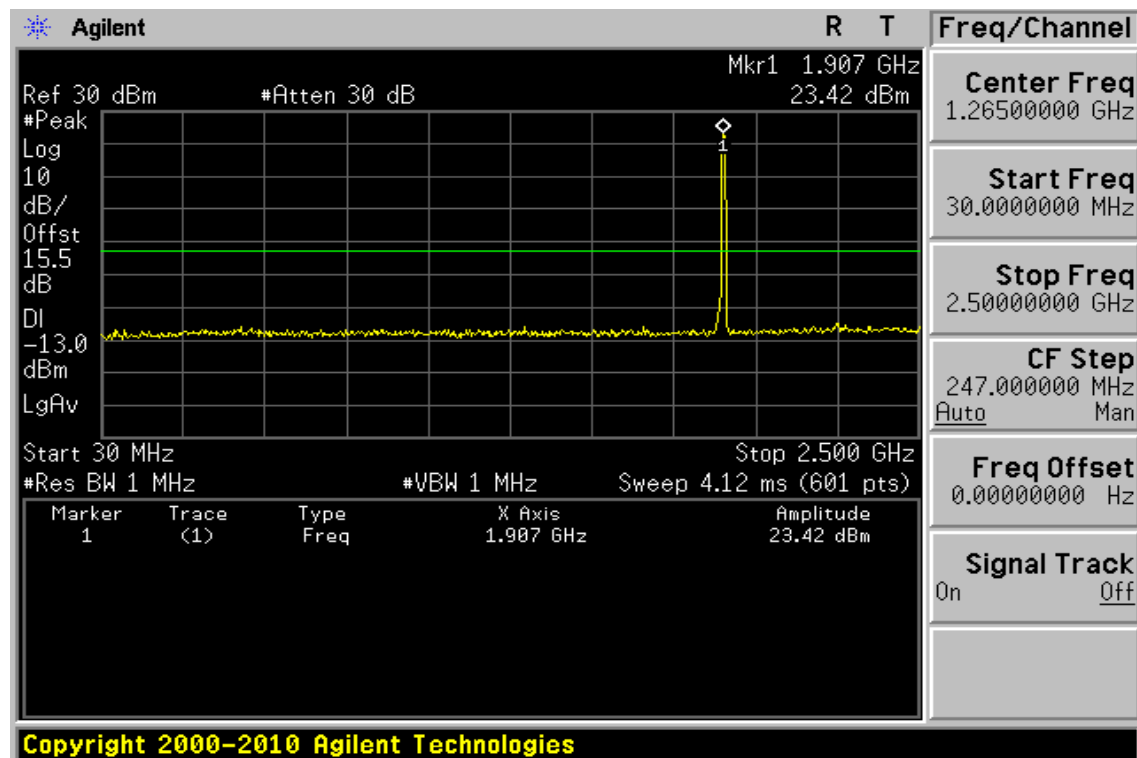
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Figure 9-23: Out of Band emission at antenna terminals – WCDMA II Channel Highest



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Figure 9-24: Band edge emission at antenna terminals – WCDMA II Channel Lowest

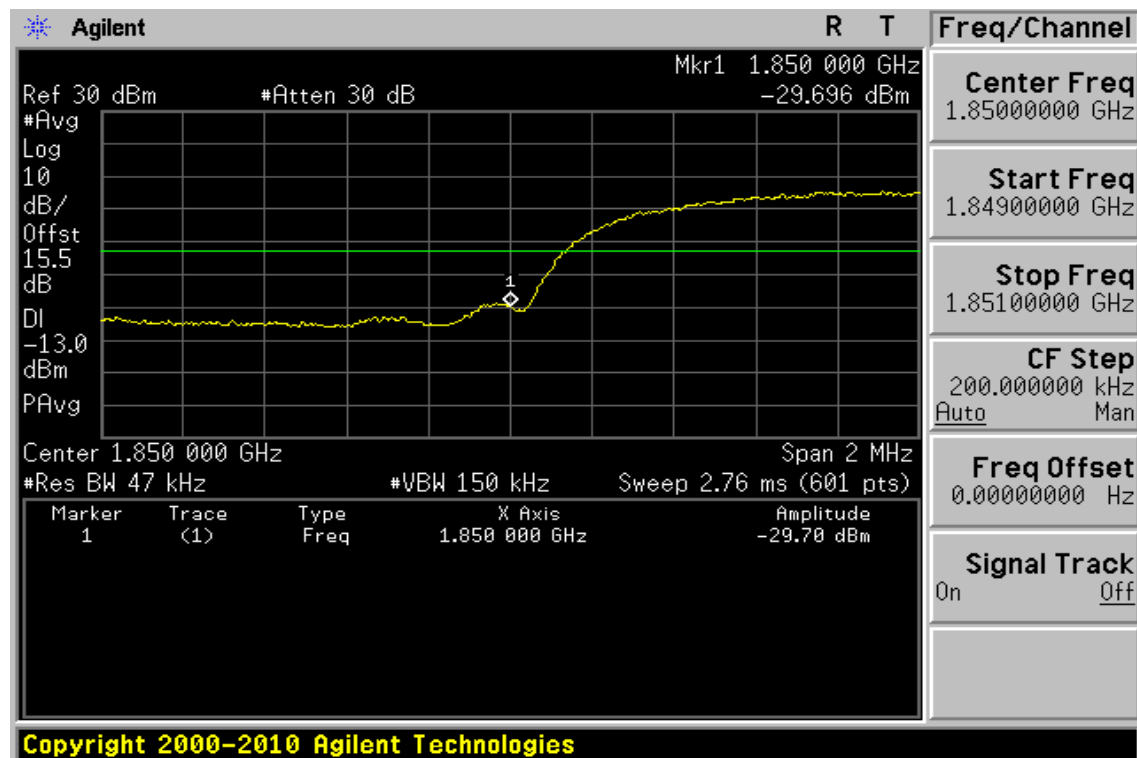
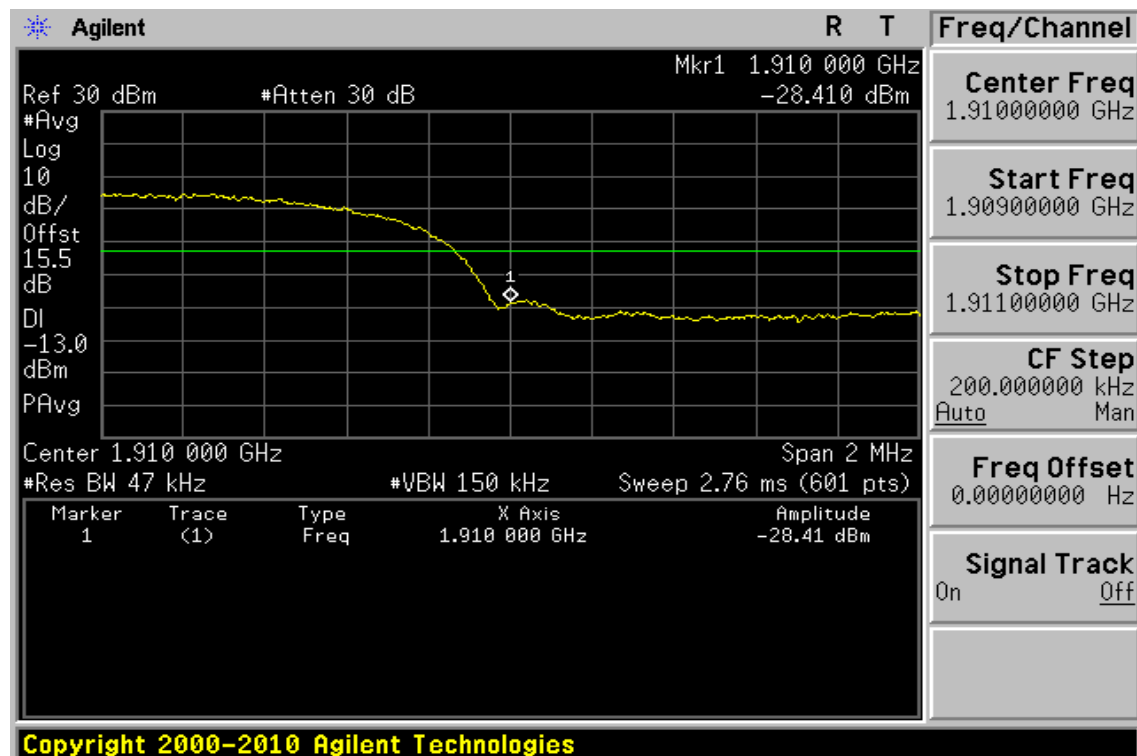


Figure 9-25: Band edge emission at antenna terminals – WCDMA II Channel Highest



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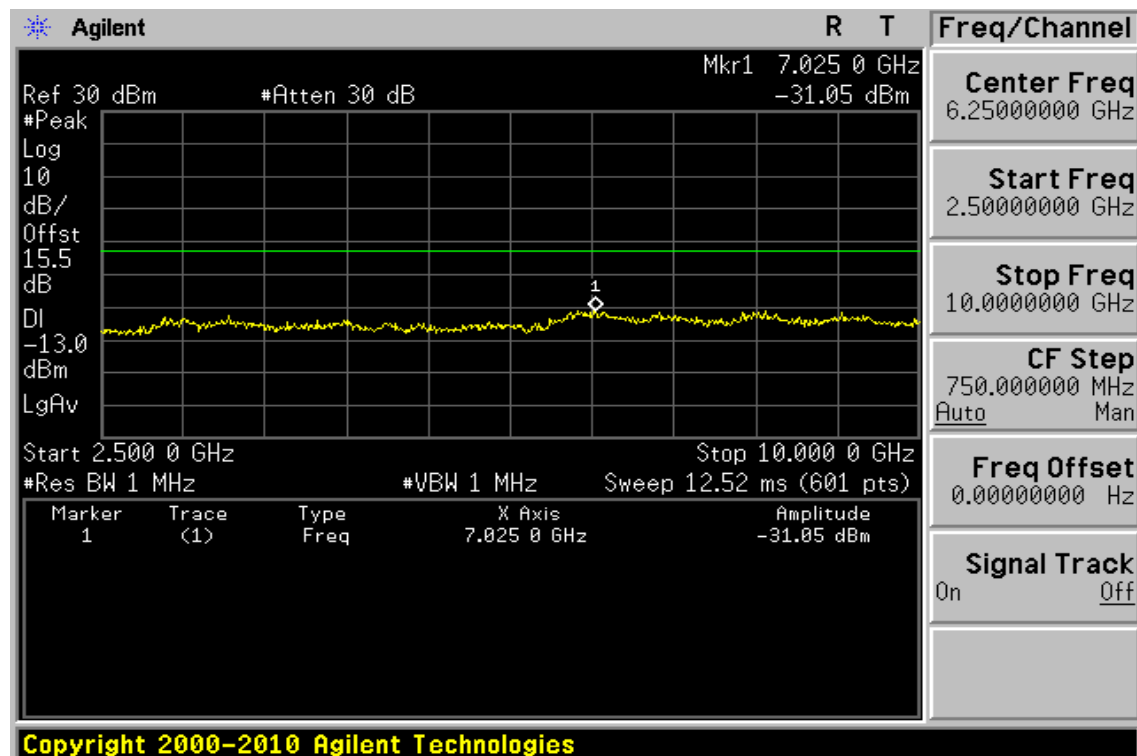
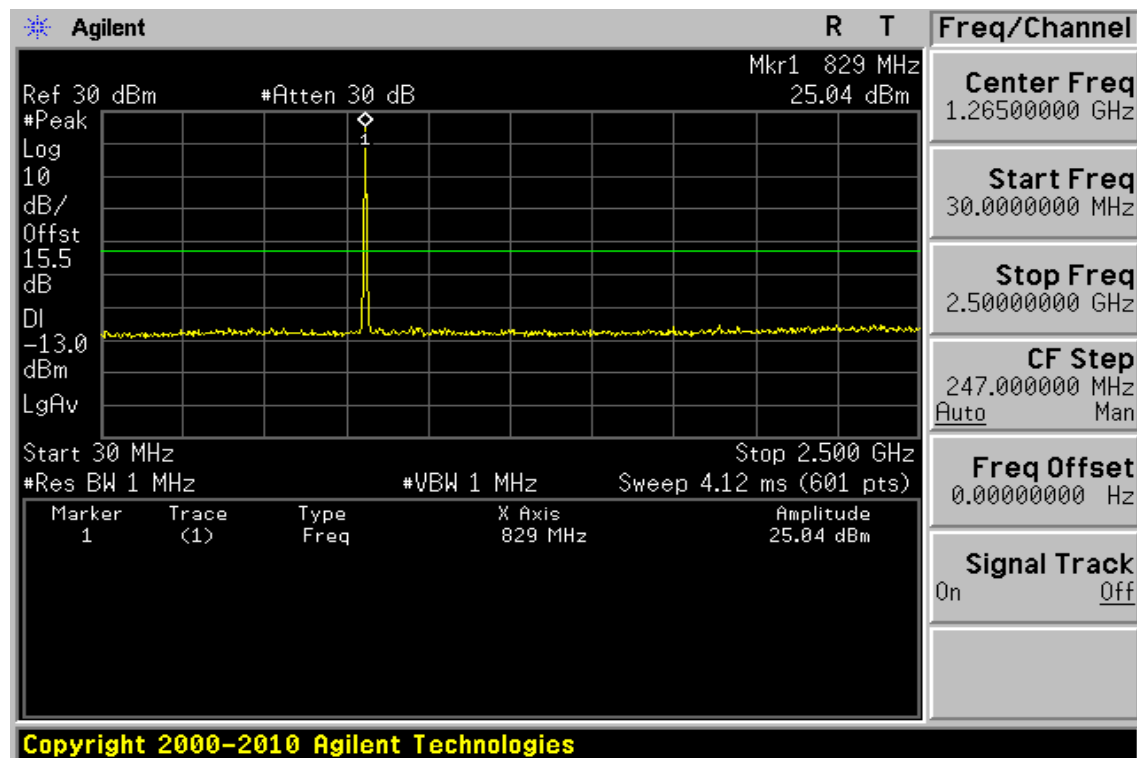
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Figure 9-26: Out of Band emission at antenna terminals – WCDMA V Channel Lowest



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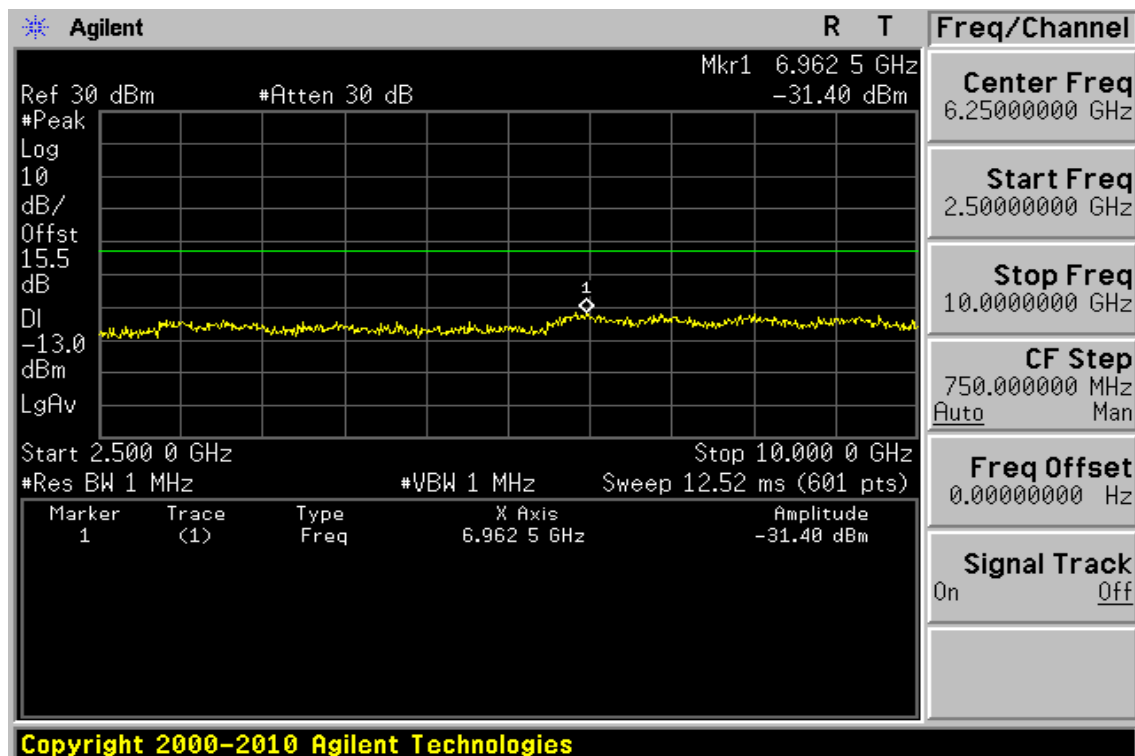
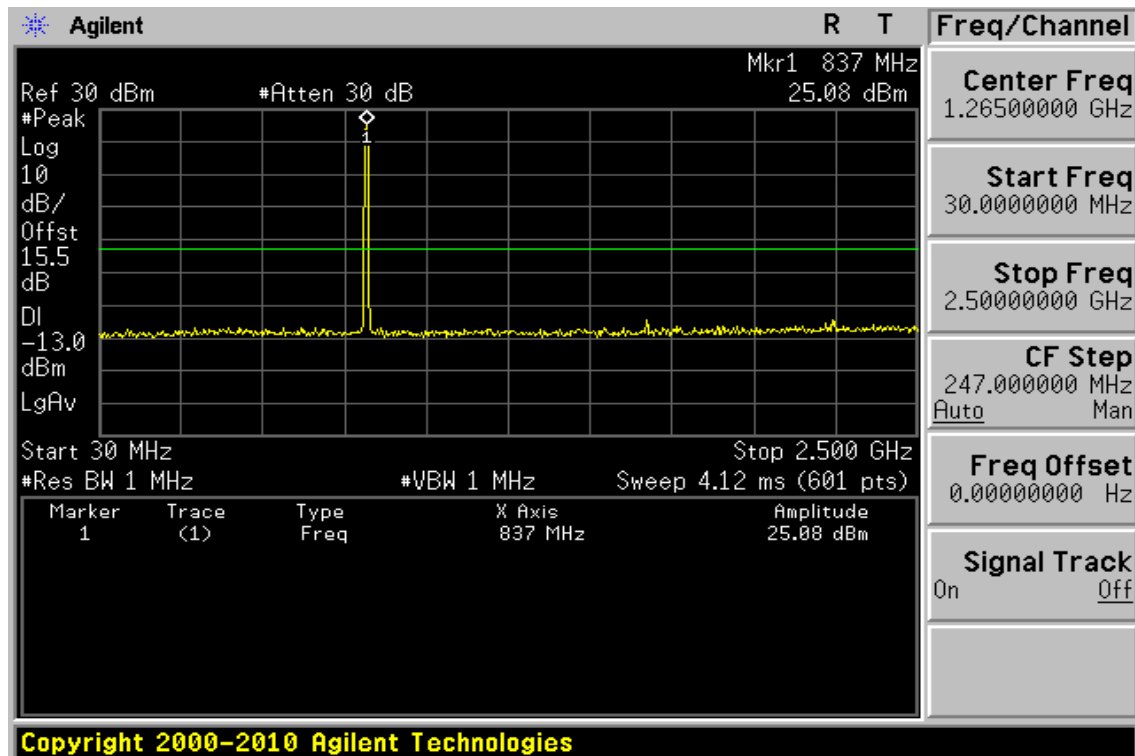
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Figure 9-27: Out of Band emission at antenna terminals – WCDMA V Channel Mid



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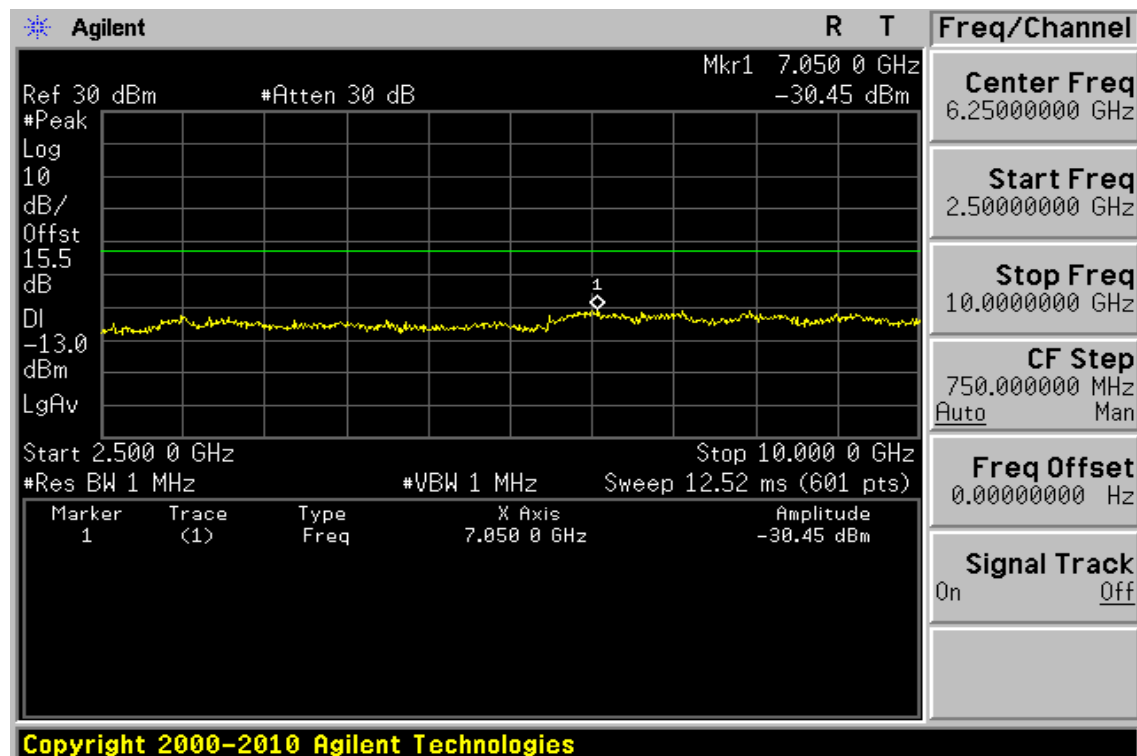
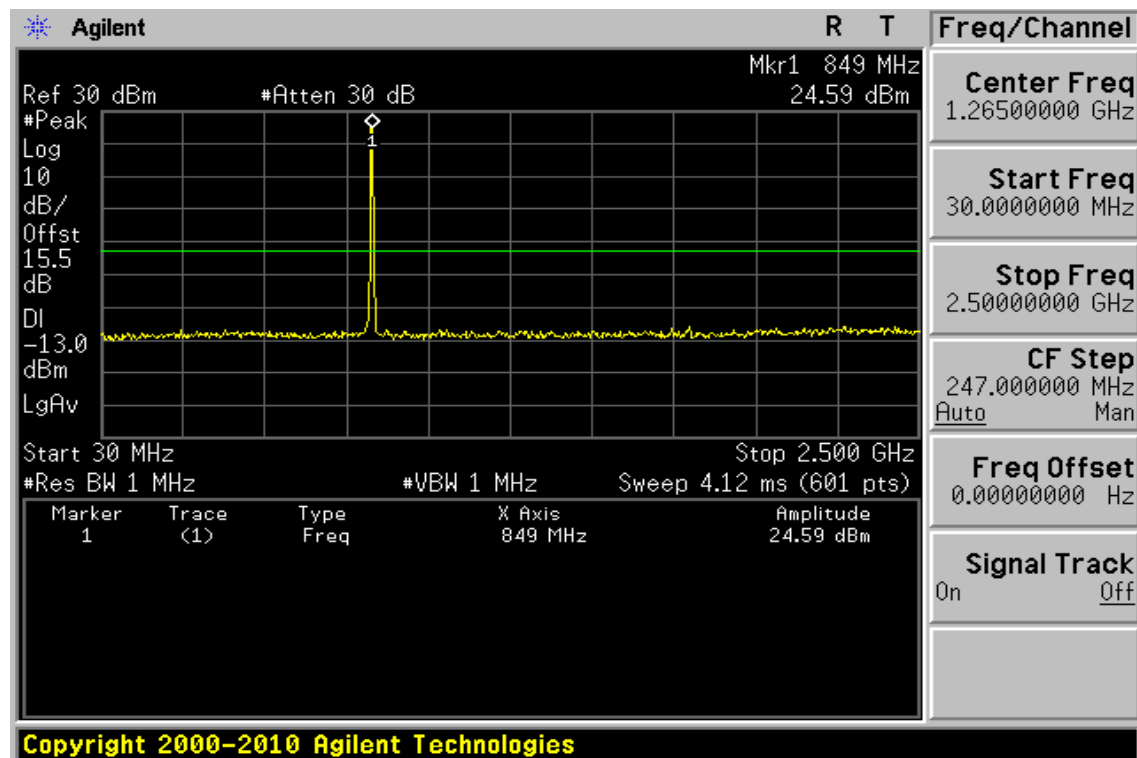
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Figure 9-28: Out of Band emission at antenna terminals – WCDMA V Channel Highest



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Figure 9-29: Band edge emission at antenna terminals – WCDMA V Channel Lowest

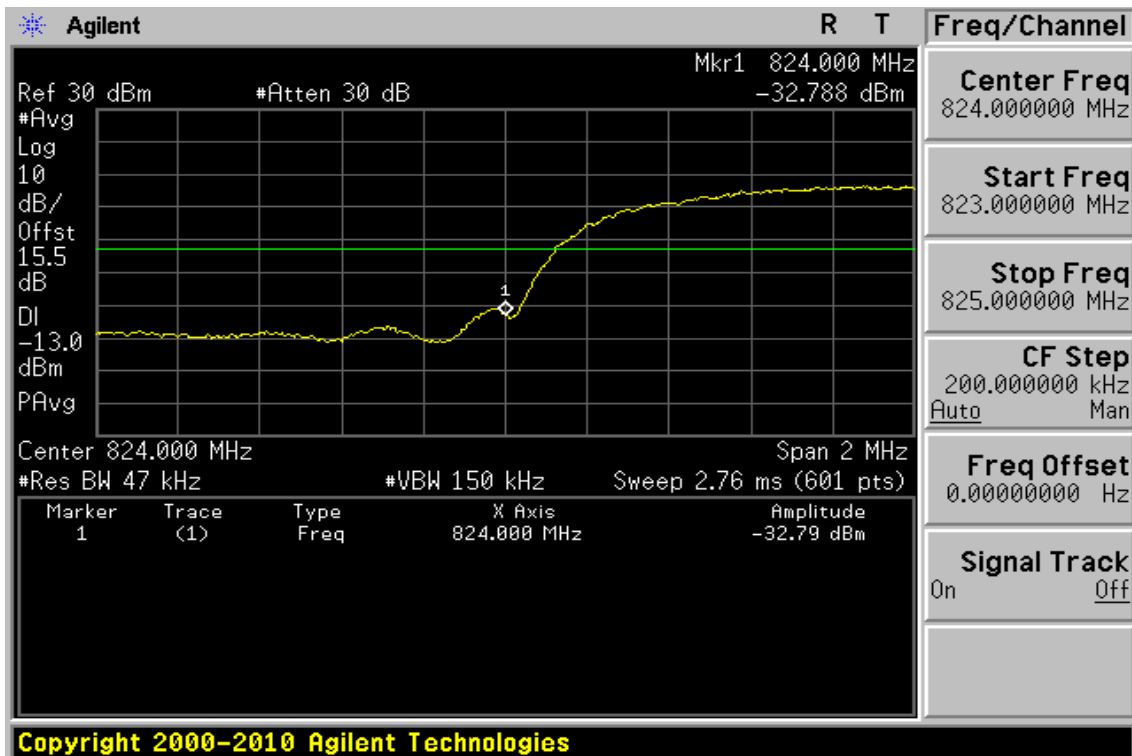
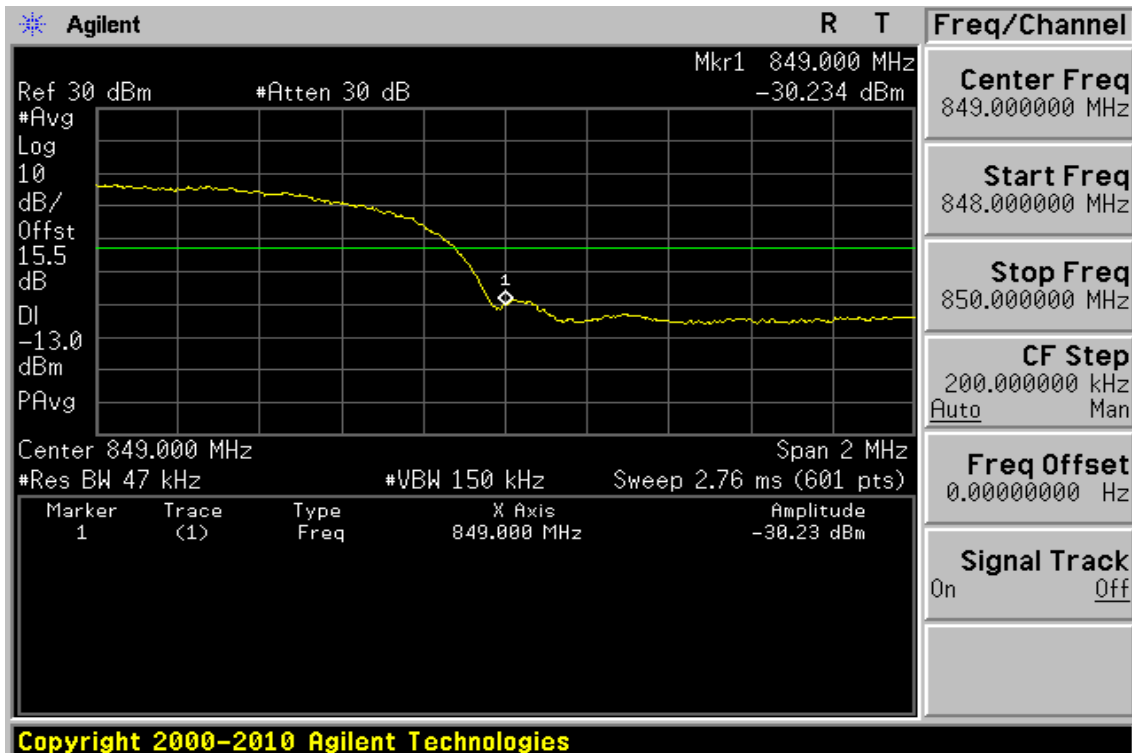


Figure 9-30: Band edge emission at antenna terminals – WCDMA V Channel Highest



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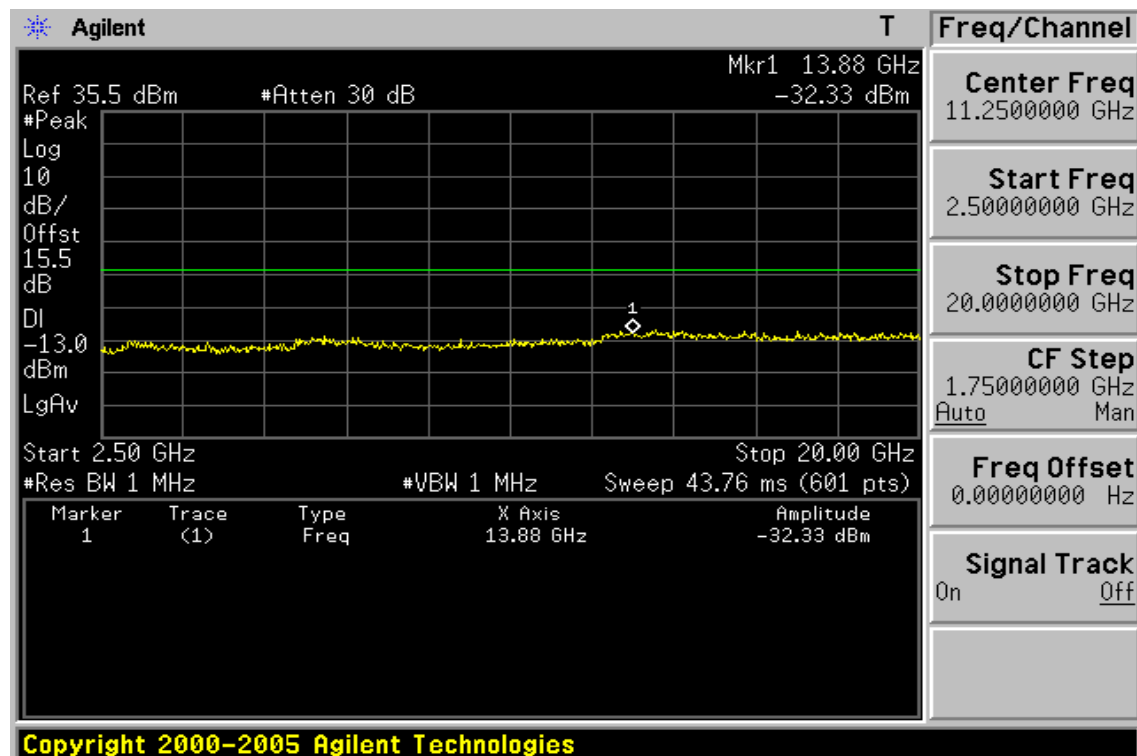
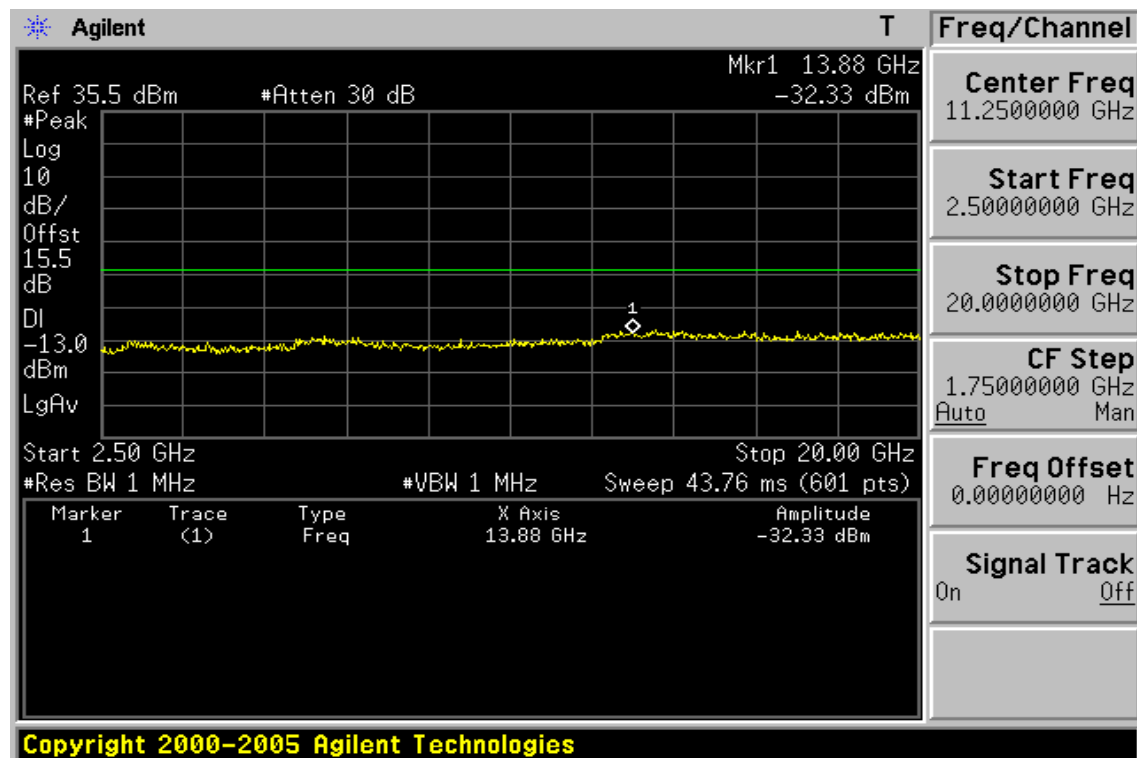
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Figure 9-31: Out of Band emission at antenna terminals – HSDPA II Channel Lowest



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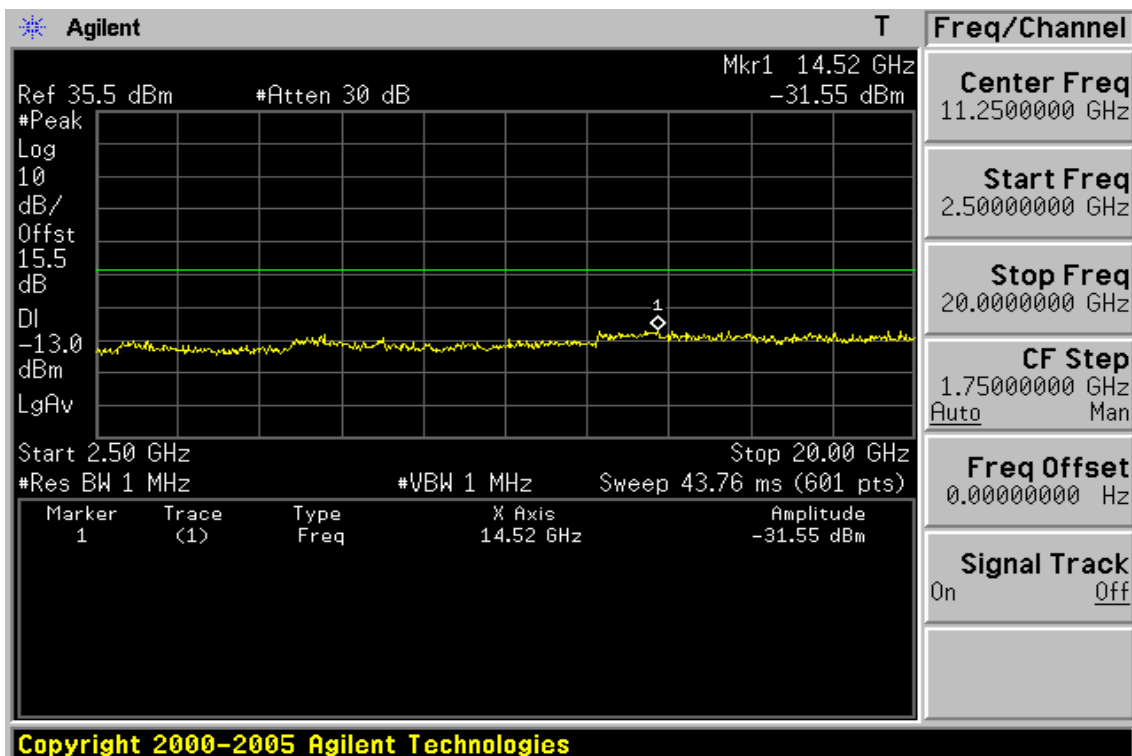
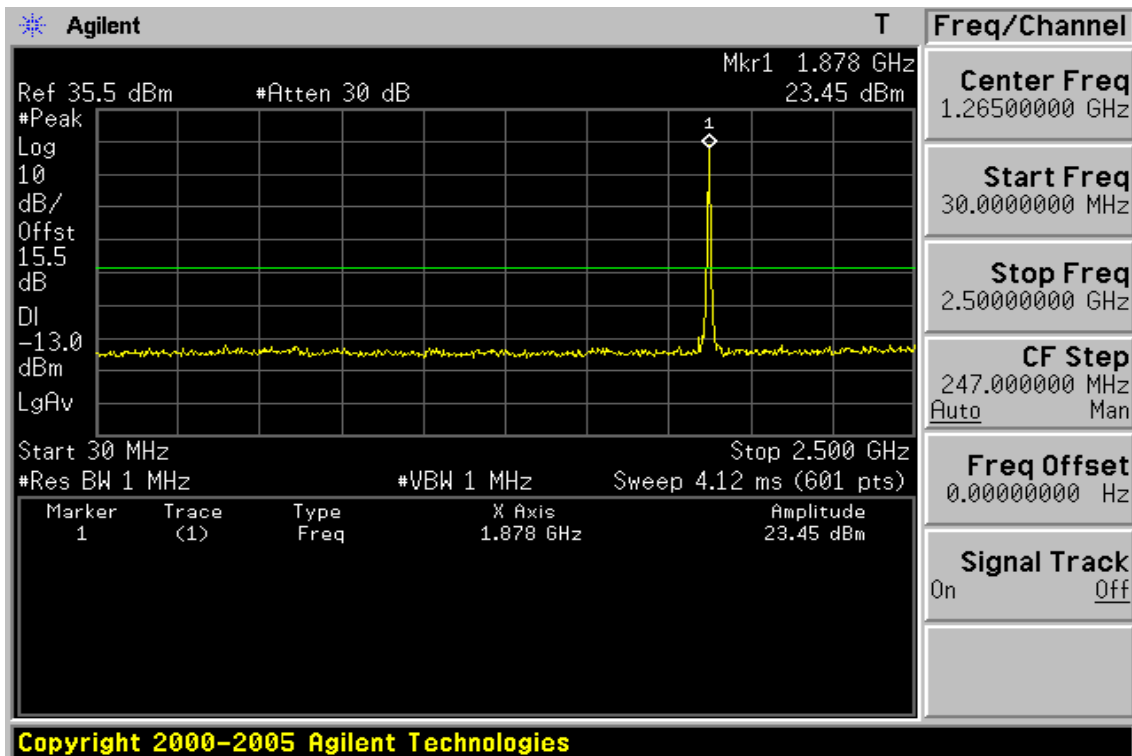
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Figure 9-32: Out of Band emission at antenna terminals – HSDPA II Channel Mid



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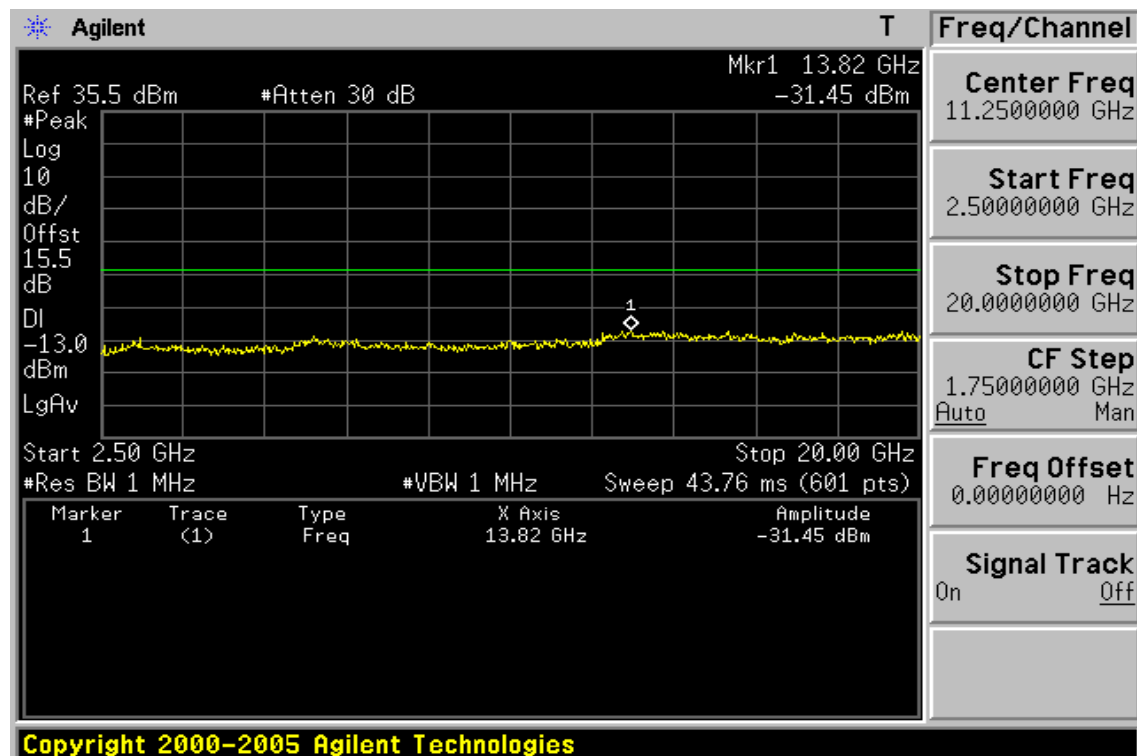
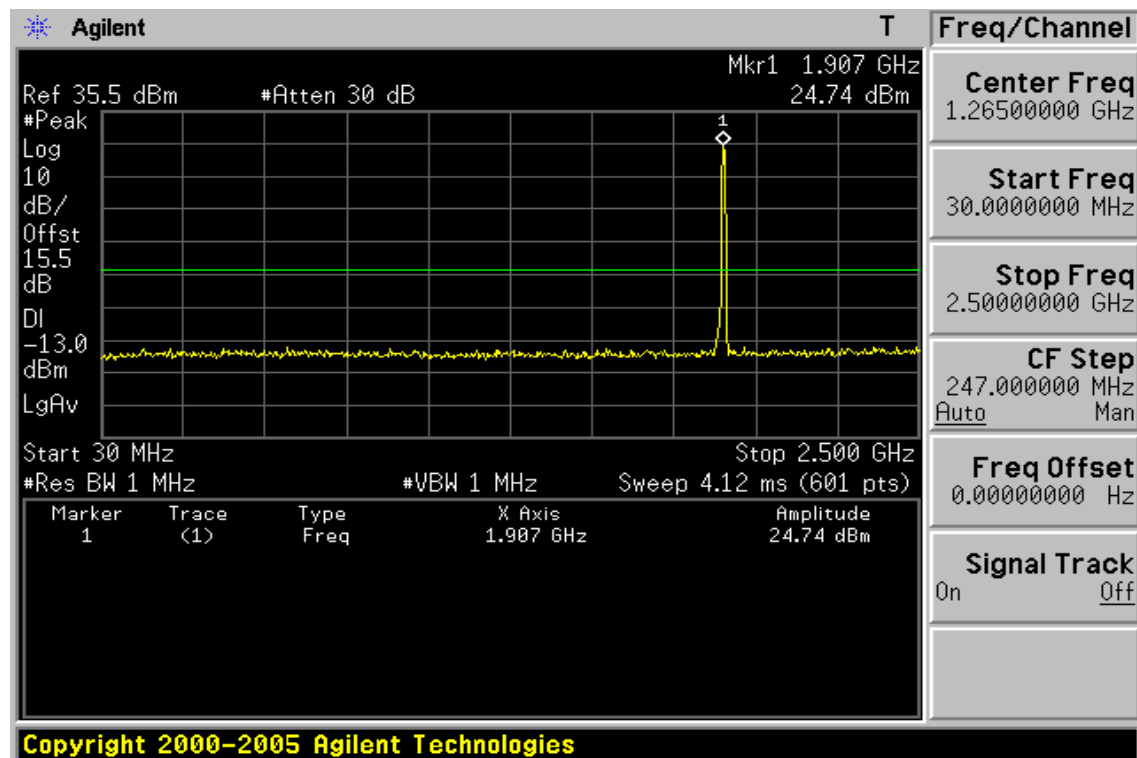
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Figure 9-33: Out of Band emission at antenna terminals – HSDPA II Channel Highest



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Figure 9-34: Band edge emission at antenna terminals – HSDPA II Channel Lowest

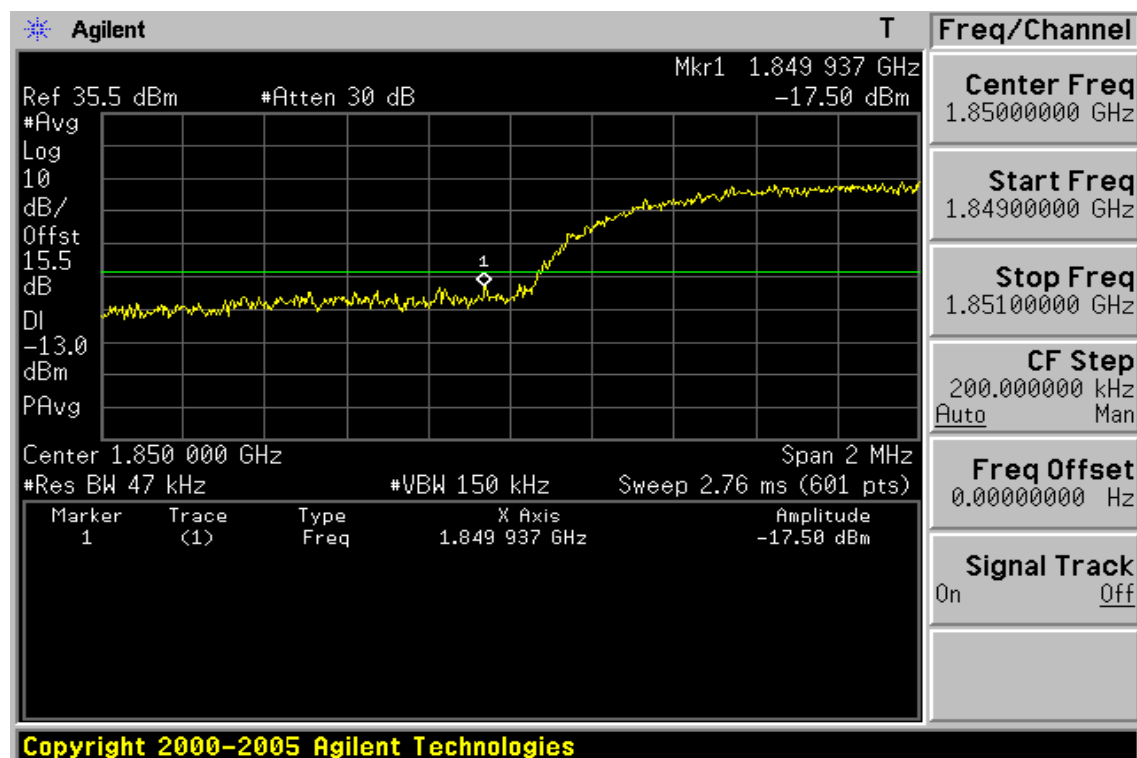
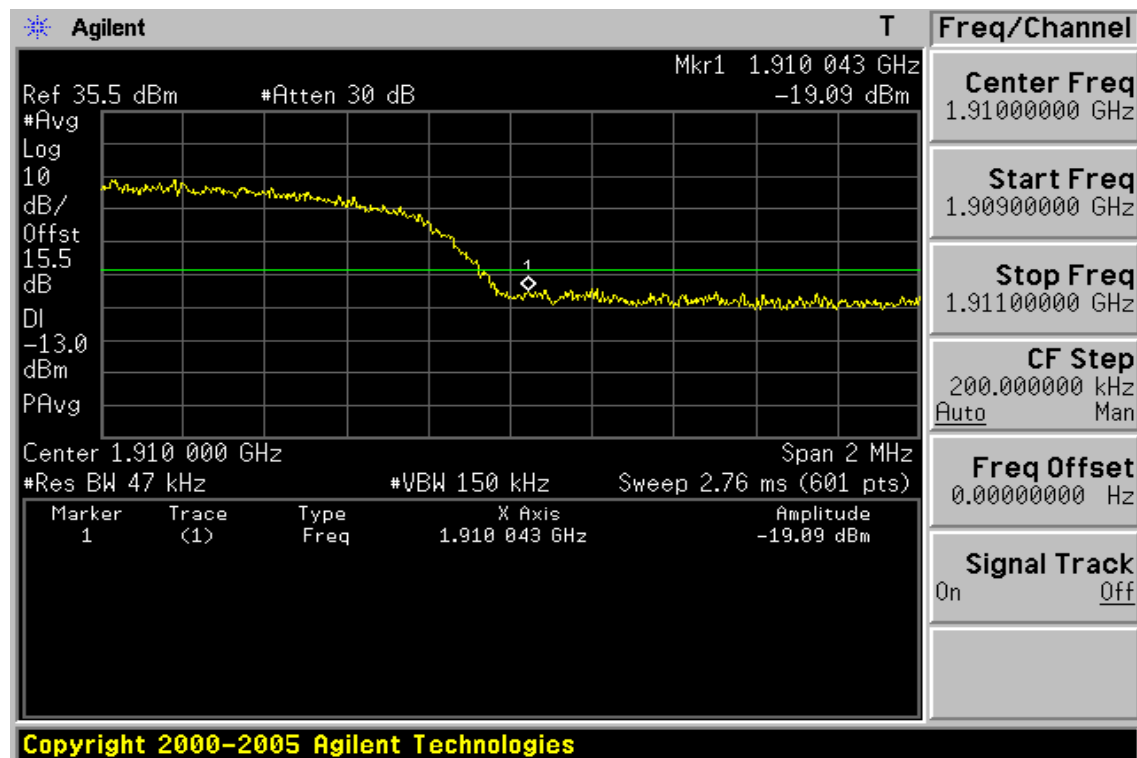


Figure 9-35: Band edge emission at antenna terminals – HSDPA II Channel Highest



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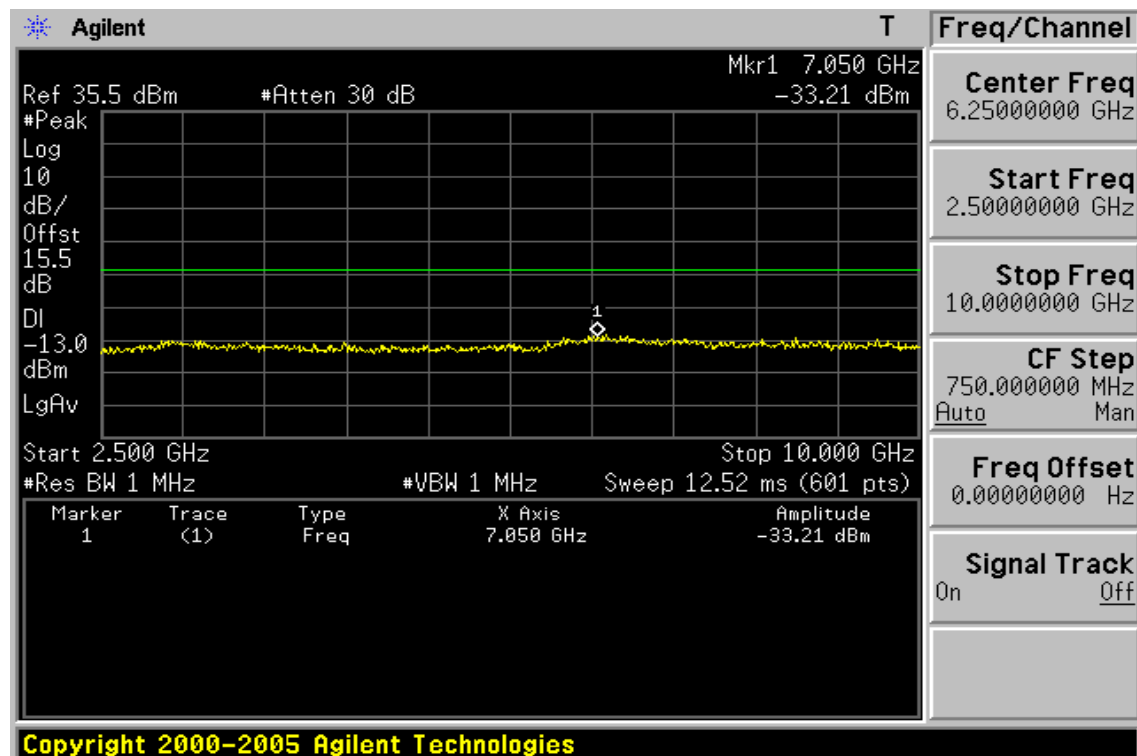
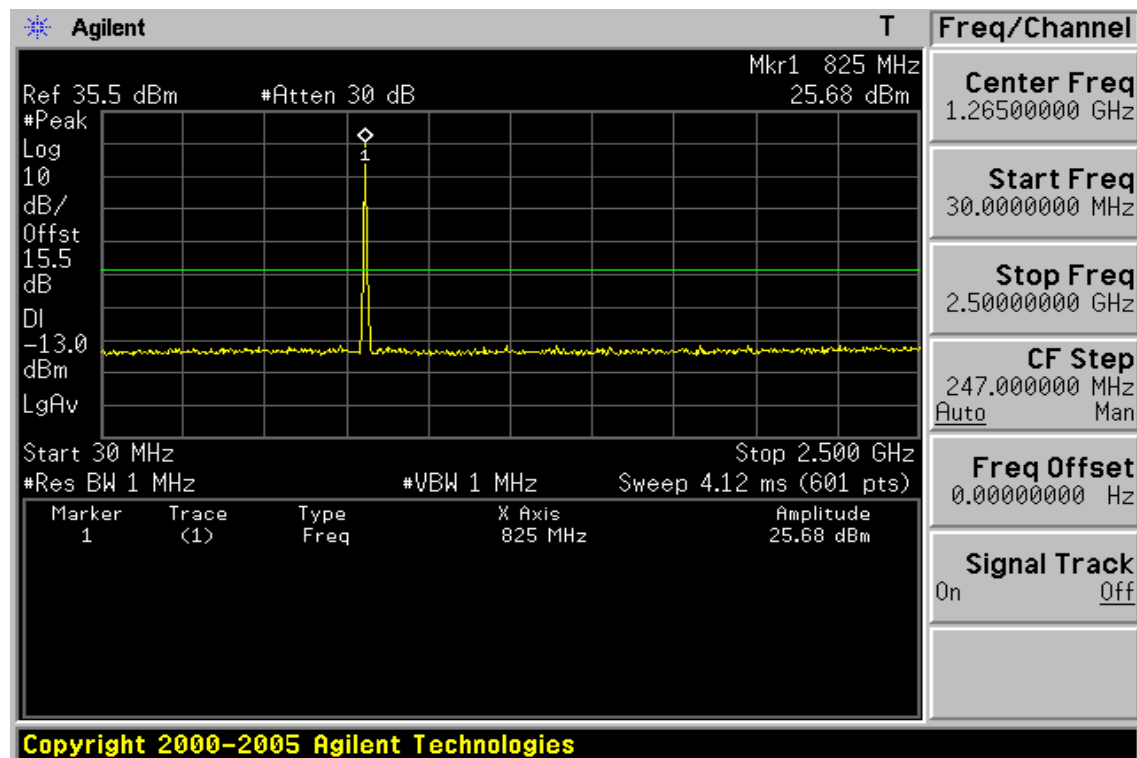
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Figure 9-36: Out of Band emission at antenna terminals – HSDPA V Channel Lowest



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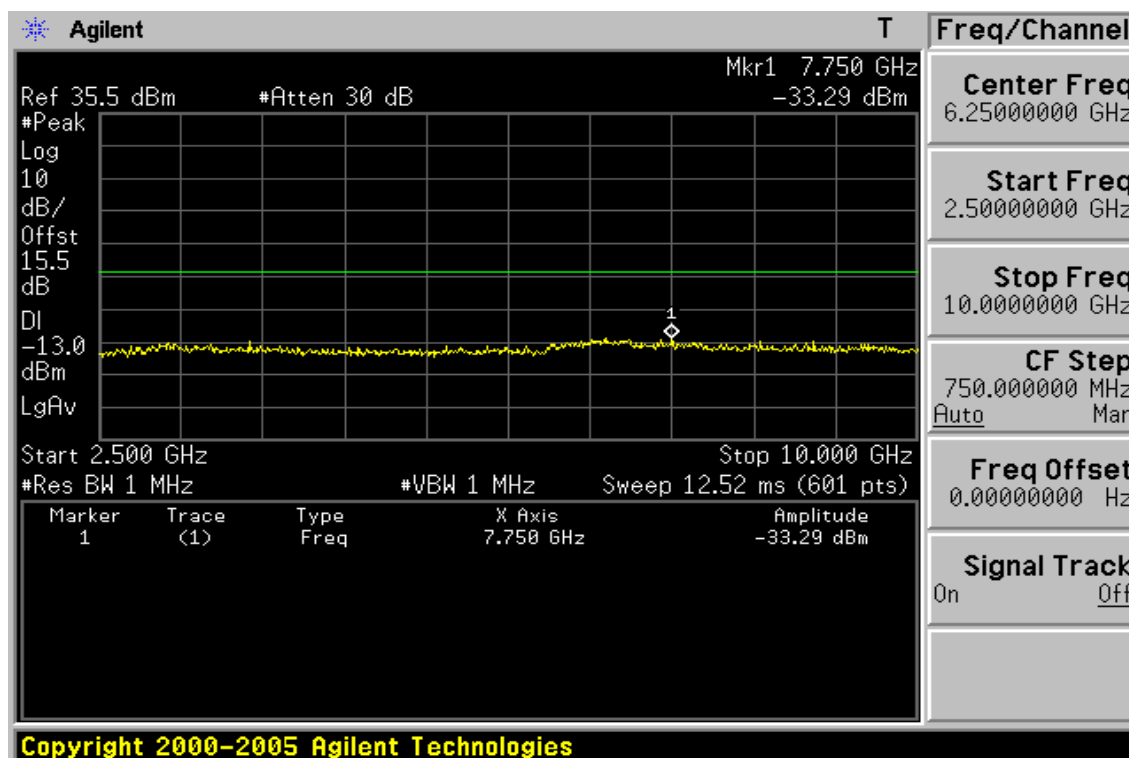
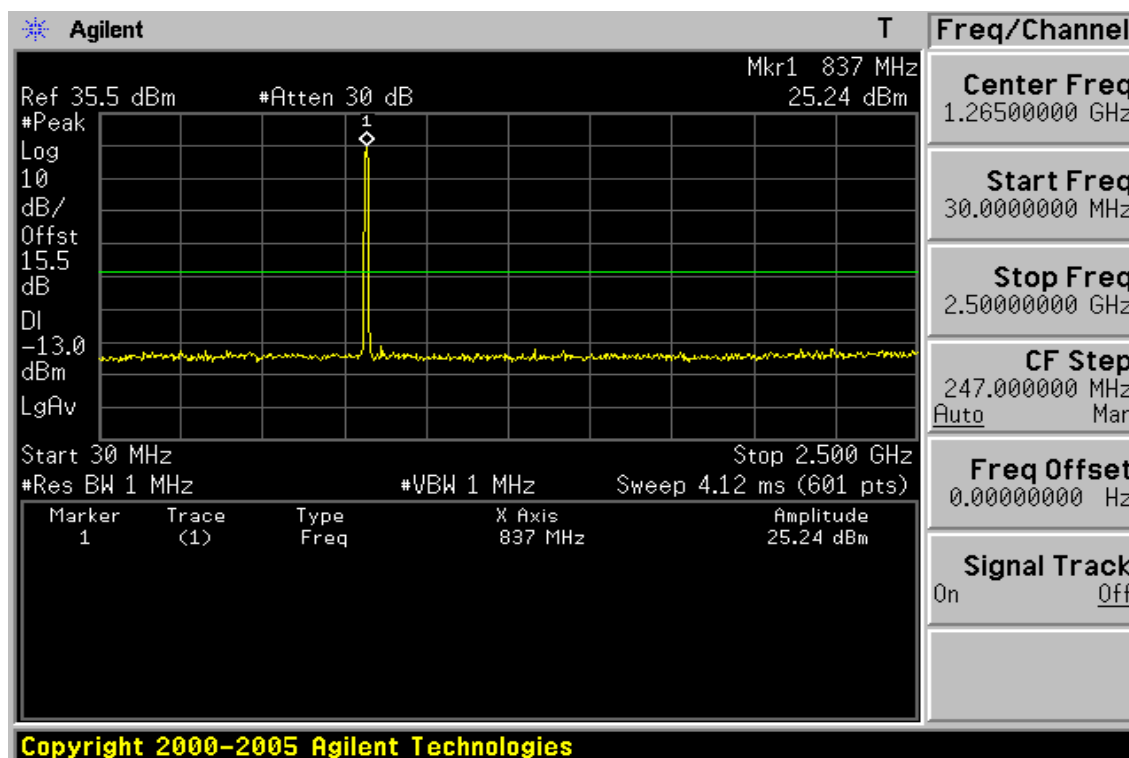
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Figure 9-37: Out of Band emission at antenna terminals – HSDPA V Channel Mid



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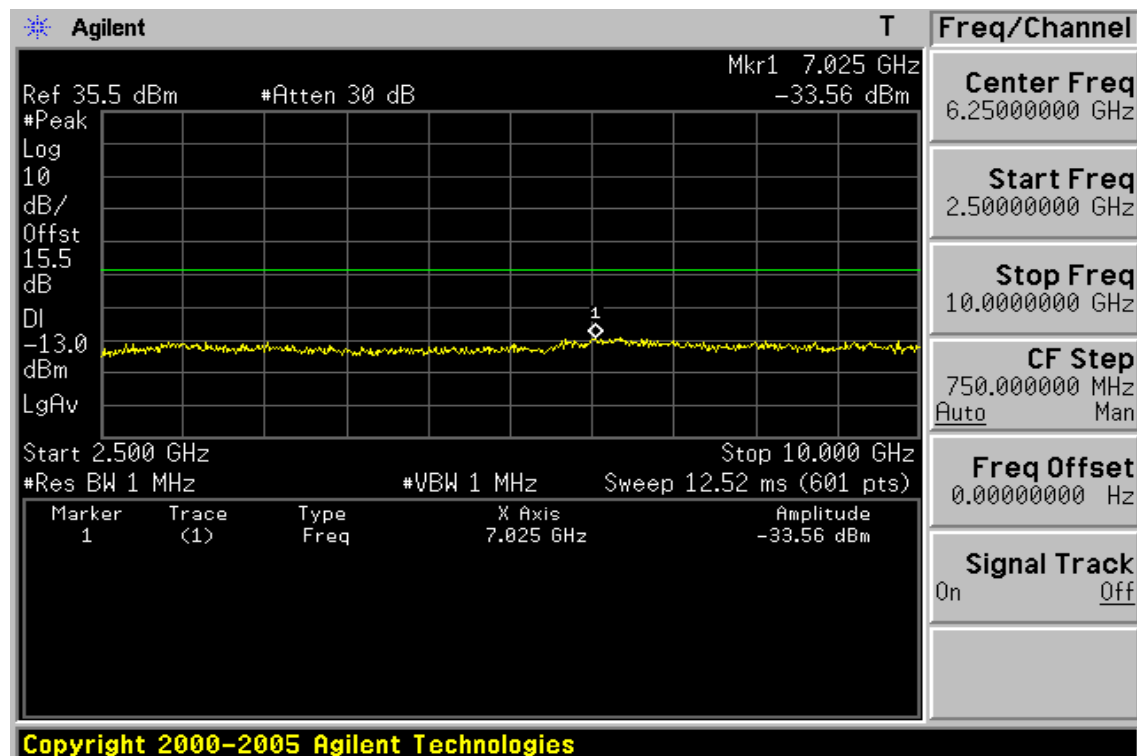
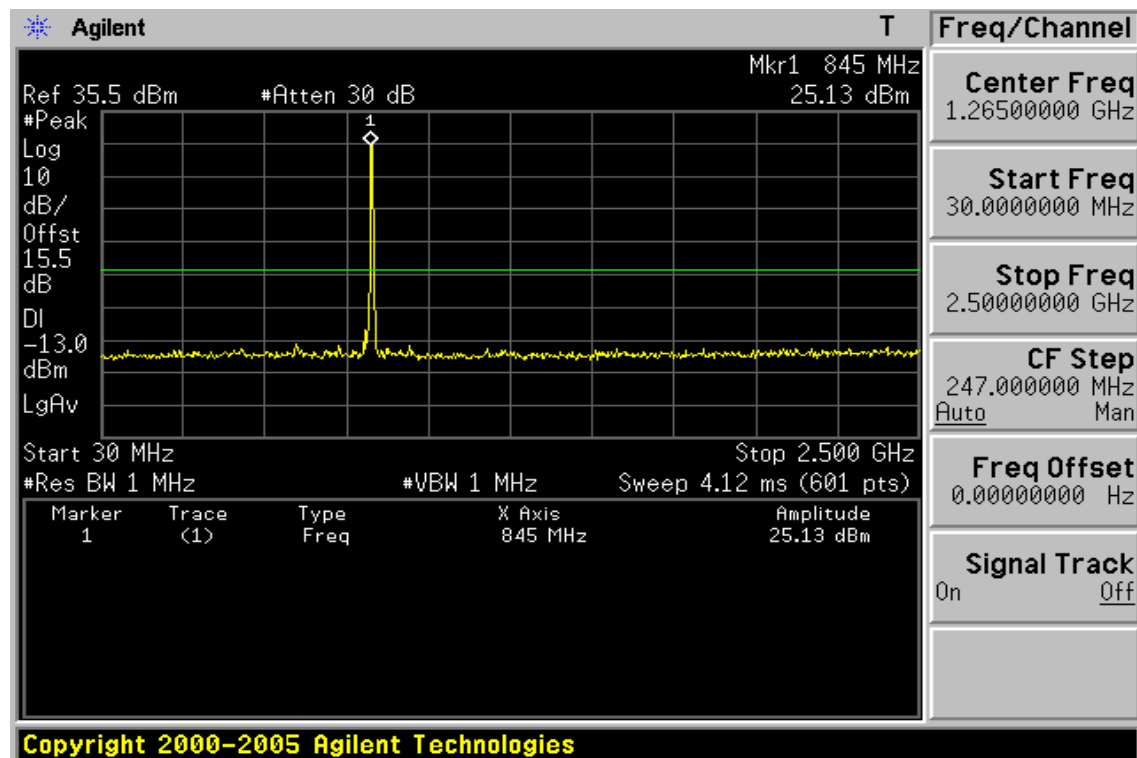
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Figure 9-38: Out of Band emission at antenna terminals – HSDPA V Channel Highest



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Figure 9-39: Band edge emission at antenna terminals – HSDPA V Channel Lowest

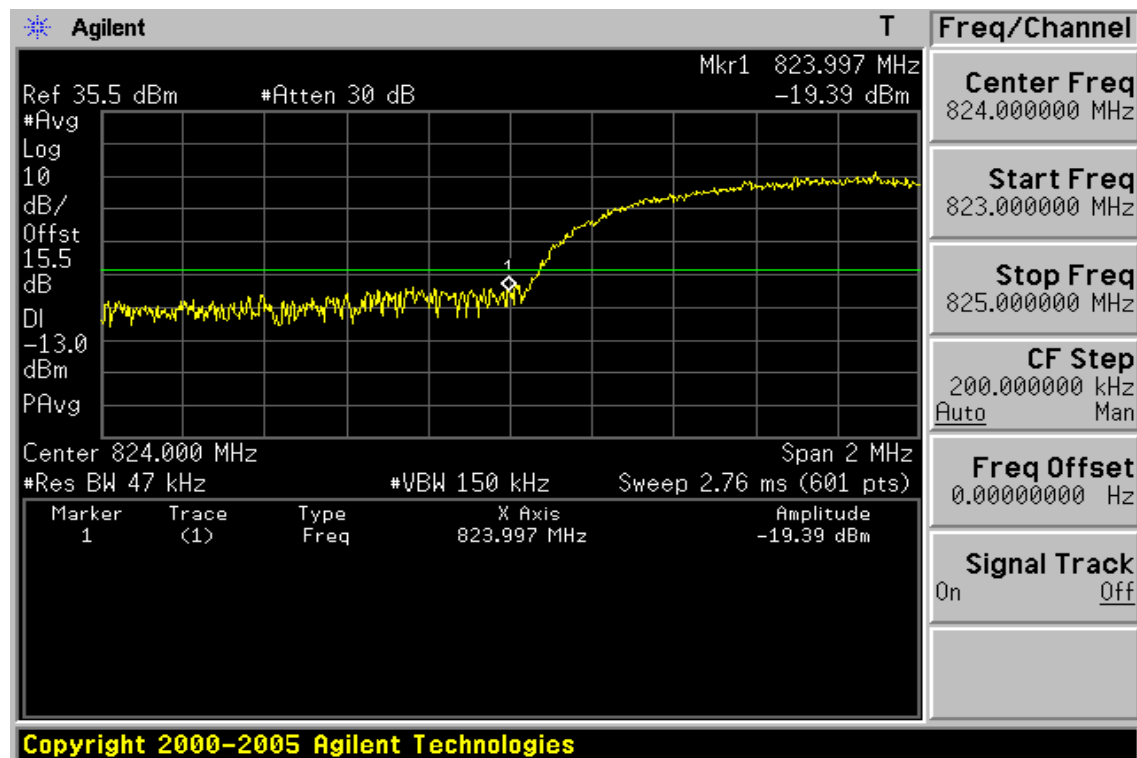
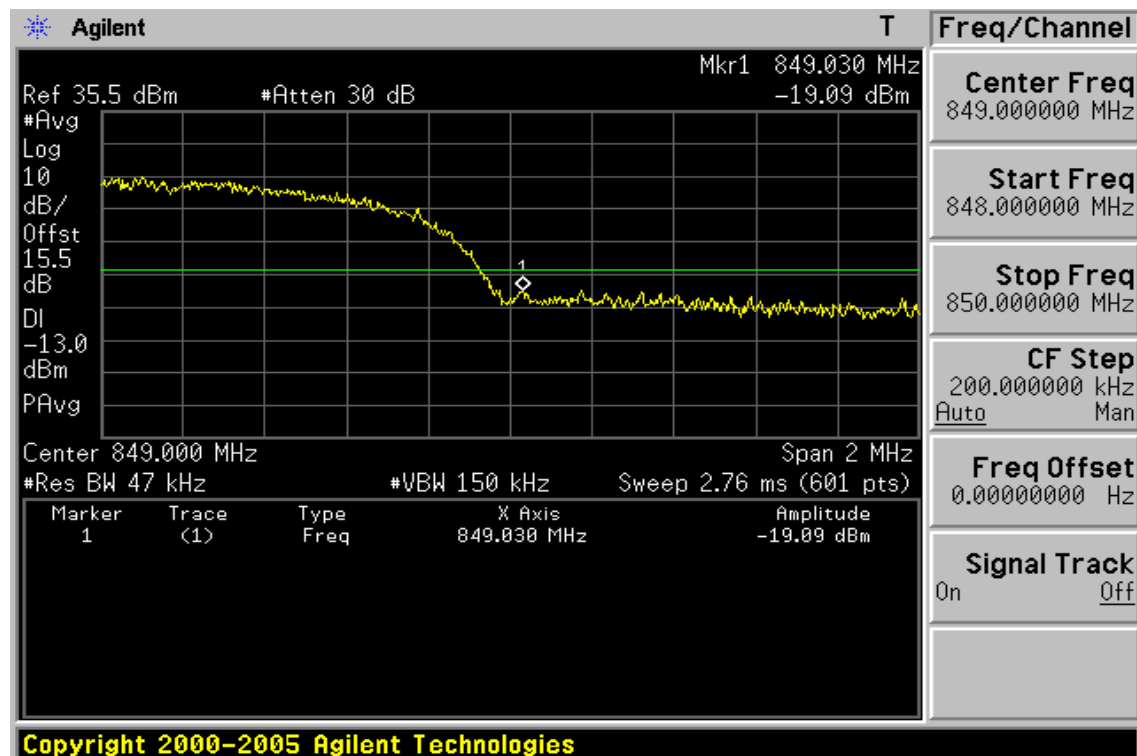


Figure 9-40: Band edge emission at antenna terminals – HSDPA V Channel Highest



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10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT (TX)

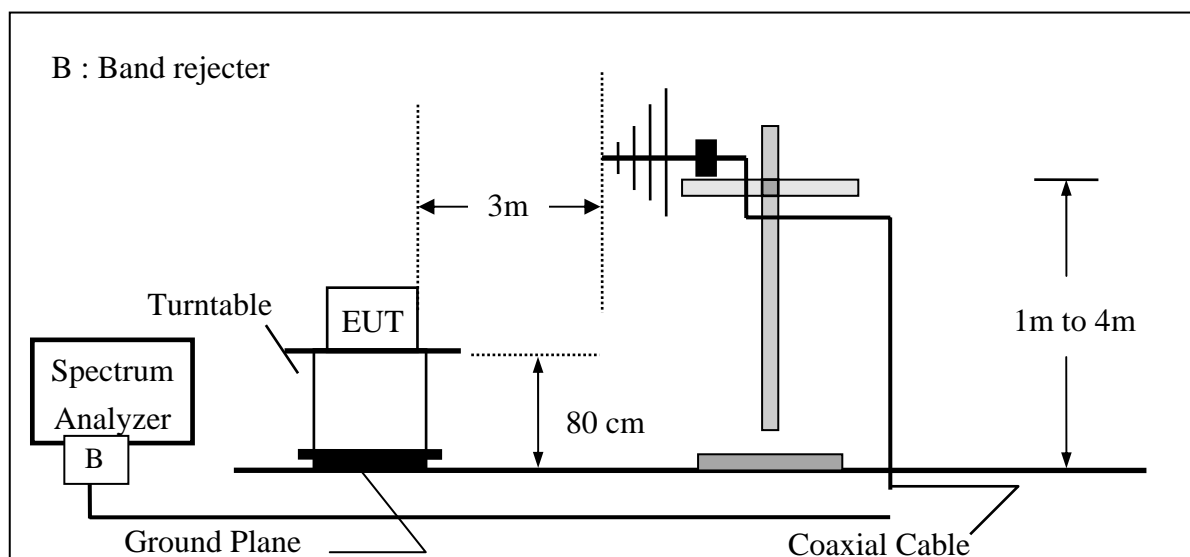
10.1. Standard Applicable:

According to FCC §2.1053,

FCC §22.917(a), §24.238(a) 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):

Radiated Emission Test Set-Up, Frequency Below 1000MHz



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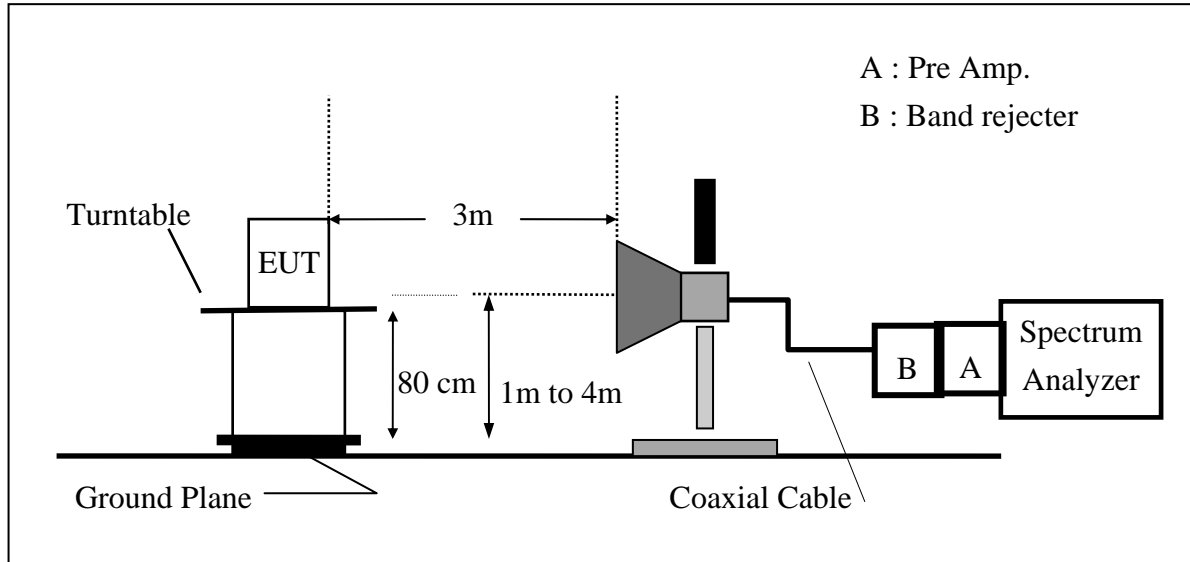
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Radiated Emission Test Set-UP Frequency Over 1 GHz



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 was 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.

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

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

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: GPRS 850 Mode

Operation Band	:GPRS 850	Test Date	:2012-04-06
ARFCN	:CH 128	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:824.2 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
143.49	S	-84.99	-3.53	-1.26	-2.79	-13.00	-71.99
265.71	S	-77.43	-6.51	4.62	-3.27	-13.00	-64.43
400.54	S	-77.84	-5.93	4.78	-3.62	-13.00	-64.84
459.71	S	-74.71	-5.25	4.52	-3.72	-13.00	-61.71
532.46	S	-71.61	-3.42	4.63	-3.77	-13.00	-58.61
667.29	S	-78.12	-0.60	4.13	-4.14	-13.00	-65.12
1648.40	H	-54.05	10.74	2.39	-5.36	-13.00	-41.05
2472.60	H	-32.64	15.05	3.14	-6.15	-13.00	-19.64
3288.00	H	---					
4121.00	H	---					
4945.20	H	---					
5769.40	H	---					
6593.60	H	---					
7417.80	H	---					
8242.00	H	---					

ERP(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	:GPRS 850	Test Date	:2012-04-06
ARFCN	:CH 128	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:824.2 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
199.75	S	-79.02	-6.78	4.70	-3.09	-13.00	-66.02
265.71	S	-72.25	-6.51	4.62	-3.27	-13.00	-59.25
400.54	S	-75.52	-5.93	4.78	-3.62	-13.00	-62.52
459.71	S	-76.72	-5.25	4.52	-3.72	-13.00	-63.72
532.46	S	-73.68	-3.42	4.63	-3.77	-13.00	-60.68
613.94	S	-70.35	-0.61	4.06	-3.92	-13.00	-57.35
1648.40	H	-52.35	10.74	2.68	-5.36	-13.00	-39.35
2472.60	H	-28.40	15.05	3.52	-6.15	-13.00	-15.40
3288.00	H	---					
4121.00	H	---					
4945.20	H	---					
5769.40	H	---					
6593.60	H	---					
7417.80	H	---					
8242.00	H	---					

ERP(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	:GPRS 850	Test Date	:2012-04-06
ARFCN	:CH 190	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:836.6 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
143.49	S	-85.88	-3.53	-1.26	-2.79	-13.00	-72.88
265.71	S	-78.29	-6.51	4.62	-3.27	-13.00	-65.29
293.84	S	-84.70	-5.97	4.59	-3.25	-13.00	-71.70
459.71	S	-76.39	-5.25	4.52	-3.72	-13.00	-63.39
532.46	S	-70.96	-3.42	4.63	-3.77	-13.00	-57.96
725.49	S	-79.17	0.48	3.83	-4.14	-13.00	-66.17
1673.20	H	-57.33	11.56	2.35	-5.29	-13.00	-44.33
2509.80	H	-33.76	14.81	3.19	-6.13	-13.00	-20.76
3346.40	H	---					
4183.00	H	---					
5019.60	H	---					
5856.20	H	---					
6692.80	H	---					
7529.40	H	---					
8366.00	H	---					

ERP(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	:GPRS 850	Test Date	:2012-04-06
ARFCN	:CH 190	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:836.6 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
212.36	S	-79.28	-8.11	4.81	-3.14	-13.00	-66.28
265.71	S	-70.35	-6.51	4.62	-3.27	-13.00	-57.35
306.45	S	-75.16	-6.05	4.66	-3.25	-13.00	-62.16
400.54	S	-75.52	-5.93	4.78	-3.62	-13.00	-62.52
532.46	S	-73.39	-3.42	4.63	-3.77	-13.00	-60.39
614.91	S	-73.29	-0.61	4.06	-3.97	-13.00	-60.29
1673.20	H	-56.95	11.56	2.66	-5.29	-13.00	-43.95
2509.80	H	-32.66	14.81	3.55	-6.13	-13.00	-19.66
3346.40	H	---					
4183.00	H	---					
5019.60	H	---					
5856.20	H	---					
6692.80	H	---					
7529.40	H	---					
8366.00	H	---					

ERP(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	:GPRS 850	Test Date	:2012-04-06
ARFCN	:CH 251	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:848.8 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
99.84	S	-86.64	-7.00	-0.99	-2.72	-13.00	-73.64
143.49	S	-84.86	-3.53	-1.26	-2.79	-13.00	-71.86
265.71	S	-77.55	-6.51	4.62	-3.27	-13.00	-64.55
459.71	S	-76.62	-5.25	4.52	-3.72	-13.00	-63.62
532.46	S	-71.41	-3.42	4.63	-3.77	-13.00	-58.41
702.21	S	-79.17	0.41	4.12	-4.07	-13.00	-66.17
1697.60	H	-61.13	11.45	2.29	-5.40	-13.00	-48.13
2546.40	H	-36.95	15.05	3.30	-6.24	-13.00	-23.95
3395.20	H	---					
4244.00	H	---					
5092.80	H	---					
5941.60	H	---					
6790.40	H	---					
7639.20	H	---					
8488.00	H	---					

ERP(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	:GPRS 850	Test Date	:2012-04-06
ARFCN	:CH 251	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:848.8 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
265.71	S	-71.70	-6.51	4.62	-3.27	-13.00	-58.70
306.45	S	-76.69	-6.05	4.66	-3.25	-13.00	-63.69
411.21	S	-77.65	-5.93	4.69	-3.62	-13.00	-64.65
459.71	S	-76.94	-5.25	4.52	-3.72	-13.00	-63.94
532.46	S	-72.87	-3.42	4.63	-3.77	-13.00	-59.87
667.29	S	-69.74	-0.60	4.13	-4.14	-13.00	-56.74
1697.60	H	-55.54	11.45	2.65	-5.40	-13.00	-42.54
2546.40	H	-36.46	15.05	3.66	-6.24	-13.00	-23.46
3395.20	H	---					
4244.00	H	---					
5092.80	H	---					
5941.60	H	---					
6790.40	H	---					
7639.20	H	---					
8488.00	H	---					

ERP(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: EDGE 1900 Mode

Operation Band	:EDGE 1900	Test Date	:2012-04-06
ARFCN	:CH 512	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1850.2 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
143.49	S	-83.62	-3.53	0.89	-2.79	-13.00	-70.62
265.71	S	-79.72	-6.51	6.77	-3.27	-13.00	-66.72
411.21	S	-75.59	-5.93	6.84	-3.62	-13.00	-62.59
459.71	S	-69.99	-5.25	6.67	-3.72	-13.00	-56.99
532.46	S	-65.24	-3.42	6.78	-3.77	-13.00	-52.24
613.94	S	-65.27	-0.61	6.21	-3.92	-13.00	-52.27
3700.40	H	-38.98	17.19	7.40	-6.98	-13.00	-25.98
5550.60	H	-51.44	19.64	8.99	-8.37	-13.00	-38.44
7400.80	H	---					
9251.00	H	---					
11101.20	H	---					
12951.40	H	---					
14801.60	H	---					
16651.80	H	---					
18502.00	H	---					

$$\text{EIRP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

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	:EDGE 1900	Test Date	:2012-04-06
ARFCN	:CH 512	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1850.2 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
196.84	S	-76.72	-6.78	6.54	-3.09	-13.00	-63.72
265.71	S	-72.92	-6.51	6.77	-3.27	-13.00	-59.92
400.54	S	-74.89	-5.93	6.93	-3.62	-13.00	-61.89
459.71	S	-76.84	-5.25	6.67	-3.72	-13.00	-63.84
532.46	S	-75.73	-3.42	6.78	-3.77	-13.00	-62.73
613.94	S	-72.75	-0.61	6.21	-3.92	-13.00	-59.75
3700.40	H	-41.38	15.92	6.92	-6.98	-13.00	-28.38
5550.60	H	-51.60	20.57	8.27	-8.37	-13.00	-38.60
7400.80	H	---					
9251.00	H	---					
11101.20	H	---					
12951.40	H	---					
14801.60	H	---					
16651.80	H	---					
18502.00	H	---					

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	:EDGE 1900	Test Date	:2012-04-06
ARFCN	:CH 661	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1880 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
128.94	S	-83.48	-6.29	1.37	-2.79	-13.00	-70.48
265.71	S	-79.61	-6.51	6.77	-3.27	-13.00	-66.61
400.54	S	-75.72	-5.93	6.93	-3.62	-13.00	-62.72
459.71	S	-69.95	-5.25	6.67	-3.72	-13.00	-56.95
532.46	S	-65.58	-3.42	6.78	-3.77	-13.00	-52.58
613.94	S	-66.74	-0.61	6.21	-3.92	-13.00	-53.74
3760.00	H	-44.53	17.43	7.42	-7.12	-13.00	-31.53
5640.00	H	---					
7520.00	H	---					
9400.00	H	---					
11280.00	H	---					
13160.00	H	---					
15040.00	H	---					
16920.00	H	---					
18800.00	H	---					

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

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	:EDGE 1900	Test Date	:2012-04-06
ARFCN	:CH 661	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1880 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
190.05	S	-78.96	-6.78	5.81	-3.09	-13.00	-65.96
265.71	S	-69.60	-6.51	6.77	-3.27	-13.00	-56.60
400.54	S	-76.56	-5.93	6.93	-3.62	-13.00	-63.56
459.71	S	-77.03	-5.25	6.67	-3.72	-13.00	-64.03
532.46	S	-77.67	-3.42	6.78	-3.77	-13.00	-64.67
629.46	S	-77.18	0.18	6.23	-3.97	-13.00	-64.18
3760.00	H	-44.15	16.71	6.85	-7.12	-13.00	-31.15
5640.00	H	---					
7520.00	H	---					
9400.00	H	---					
11280.00	H	---					
13160.00	H	---					
15040.00	H	---					
16920.00	H	---					
18800.00	H	---					

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	:EDGE 1900	Test Date	:2012-04-06
ARFCN	:CH 810	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1909.8 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
190.05	S	-82.07	-6.78	5.81	-3.09	-13.00	-69.07
265.71	S	-79.91	-6.51	6.77	-3.27	-13.00	-66.91
411.21	S	-75.88	-5.93	6.84	-3.62	-13.00	-62.88
459.71	S	-70.11	-5.25	6.67	-3.72	-13.00	-57.11
532.46	S	-65.94	-3.42	6.78	-3.77	-13.00	-52.94
613.94	S	-65.44	-0.61	6.21	-3.92	-13.00	-52.44
3819.60	H	-49.66	17.63	7.50	-7.20	-13.00	-36.66
5729.40	H	---					
7639.20	H	---					
9549.00	H	---					
11458.80	H	---					
13368.60	H	---					
15278.40	H	---					
17188.20	H	---					
19098.00	H	---					

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

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	:EDGE 1900	Test Date	:2012-04-06
ARFCN	:CH 810	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1909.8 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
191.99	S	-79.87	-6.78	6.02	-3.09	-13.00	-66.87
265.71	S	-71.82	-6.51	6.77	-3.27	-13.00	-58.82
400.54	S	-77.19	-5.93	6.93	-3.62	-13.00	-64.19
459.71	S	-77.24	-5.25	6.67	-3.72	-13.00	-64.24
532.46	S	-76.95	-3.42	6.78	-3.77	-13.00	-63.95
614.91	S	-76.71	-0.61	6.21	-3.97	-13.00	-63.71
3819.60	H	-54.83	17.02	7.03	-7.20	-13.00	-41.83
5729.40	H	---					
7639.20	H	---					
9549.00	H	---					
11458.80	H	---					
13368.60	H	---					
15278.40	H	---					
17188.20	H	---					
19098.00	H	---					

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: HSDPA II Mode

Operation Band	:WCDMA B2	Test Date	:2012-04-06
ARFCN	:CH 9262	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1852.4 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
143.49	S	-83.03	-3.53	0.89	-2.79	-13.00	-70.03
199.75	S	-78.81	-6.78	6.85	-3.09	-13.00	-65.81
435.46	S	-76.80	-5.73	6.68	-3.70	-13.00	-63.80
459.71	S	-69.66	-5.25	6.67	-3.72	-13.00	-56.66
532.46	S	-66.49	-3.42	6.78	-3.77	-13.00	-53.49
614.91	S	-68.02	-0.61	6.21	-3.97	-13.00	-55.02
3704.80	H	-50.57	17.24	7.40	-7.06	-13.00	-37.57
5557.20	H	---					
7409.60	H	---					
9262.00	H	---					
11114.40	H	---					
12966.80	H	---					
14819.20	H	---					
16671.60	H	---					
18524.00	H	---					

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

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	:WCDMA B2	Test Date	:2012-04-06
ARFCN	:CH 9262	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1852.4 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
202.66	S	-79.05	-8.11	6.90	-3.14	-13.00	-66.05
265.71	S	-72.90	-6.51	6.77	-3.27	-13.00	-59.90
400.54	S	-74.92	-5.93	6.93	-3.62	-13.00	-61.92
459.71	S	-75.71	-5.25	6.67	-3.72	-13.00	-62.71
532.46	S	-75.91	-3.42	6.78	-3.77	-13.00	-62.91
614.91	S	-76.17	-0.61	6.21	-3.97	-13.00	-63.17
3704.80	H	-50.47	15.57	6.89	-7.06	-13.00	-37.47
5557.20	H	---					
7409.60	H	---					
9262.00	H	---					
11114.40	H	---					
12966.80	H	---					
14819.20	H	---					
16671.60	H	---					
18524.00	H	---					

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	:WCDMA B2	Test Date	:2012-04-06
ARFCN	:CH 9400	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1880 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
199.75	S	-79.36	-6.78	6.85	-3.09	-13.00	-66.36
265.71	S	-80.51	-6.51	6.77	-3.27	-13.00	-67.51
411.21	S	-76.13	-5.93	6.84	-3.62	-13.00	-63.13
459.71	S	-69.30	-5.25	6.67	-3.72	-13.00	-56.30
532.46	S	-66.13	-3.42	6.78	-3.77	-13.00	-53.13
613.94	S	-67.05	-0.61	6.21	-3.92	-13.00	-54.05
3760.00	H	-50.64	17.43	7.42	-7.12	-13.00	-37.64
5640.00	H	---					
7520.00	H	---					
9400.00	H	---					
11280.00	H	---					
13160.00	H	---					
15040.00	H	---					
16920.00	H	---					
18800.00	H	---					

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	:WCDMA B2	Test Date	:2012-04-06
ARFCN	:CH 9400	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1880 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
192.96	S	-79.06	-6.78	6.13	-3.09	-13.00	-66.06
265.71	S	-72.45	-6.51	6.77	-3.27	-13.00	-59.45
400.54	S	-75.42	-5.93	6.93	-3.62	-13.00	-62.42
459.71	S	-76.55	-5.25	6.67	-3.72	-13.00	-63.55
532.46	S	-78.03	-3.42	6.78	-3.77	-13.00	-65.03
623.64	S	-76.34	0.18	6.22	-3.97	-13.00	-63.34
3760.00	H	-51.79	16.71	6.85	-7.12	-13.00	-38.79
5640.00	H	---					
7520.00	H	---					
9400.00	H	---					
11280.00	H	---					
13160.00	H	---					
15040.00	H	---					
16920.00	H	---					
18800.00	H	---					

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	:WCDMA B2	Test Date	:2012-04-06
ARFCN	:CH 9538	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1907.6 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
265.71	S	-80.60	-6.51	6.77	-3.27	-13.00	-67.60
435.46	S	-76.53	-5.73	6.68	-3.70	-13.00	-63.53
459.71	S	-69.88	-5.25	6.67	-3.72	-13.00	-56.88
532.46	S	-65.96	-3.42	6.78	-3.77	-13.00	-52.96
613.94	S	-68.97	-0.61	6.21	-3.92	-13.00	-55.97
667.29	S	-70.09	-0.60	6.28	-4.14	-13.00	-57.09
3815.20	H	-51.42	17.63	7.50	-7.20	-13.00	-38.42
5722.80	H	---					
7630.40	H	---					
9538.00	H	---					
11445.60	H	---					
13353.20	H	---					
15260.80	H	---					
17168.40	H	---					
19076.00	H	---					

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	:WCDMA B2	Test Date	:2012-04-06
ARFCN	:CH 9538	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:1907.6 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
187.14	S	-80.29	-6.78	5.46	-3.09	-13.00	-67.29
265.71	S	-72.41	-6.51	6.77	-3.27	-13.00	-59.41
400.54	S	-77.64	-5.93	6.93	-3.62	-13.00	-64.64
459.71	S	-77.29	-5.25	6.67	-3.72	-13.00	-64.29
619.76	S	-77.15	0.18	6.22	-3.97	-13.00	-64.15
699.30	S	-77.06	-0.53	6.30	-4.07	-13.00	-64.06
3815.20	H	-53.18	17.02	7.03	-7.20	-13.00	-40.18
5722.80	H	---					
7630.40	H	---					
9538.00	H	---					
11445.60	H	---					
13353.20	H	---					
15260.80	H	---					
17168.40	H	---					
19076.00	H	---					

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: HSDPA V Mode

Operation Band	:HSDPA B5	Test Date	:2012-04-06
ARFCN	:CH 4132	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:826.4 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	ERP	SG Output Level	Antenna Gain	Cable Loss	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
192.96	S	-81.97	-6.78	3.98	-3.09	-13.00	-68.97
274.44	S	-81.39	-6.51	4.50	-3.22	-13.00	-68.39
400.54	S	-78.96	-5.93	4.78	-3.62	-13.00	-65.96
459.71	S	-70.76	-5.25	4.52	-3.72	-13.00	-57.76
547.01	S	-69.70	-2.45	4.59	-3.85	-13.00	-56.70
638.19	S	-73.16	0.18	4.10	-3.98	-13.00	-60.16
1652.80	H	---					
2479.20	H	---					
3305.60	H	---					
4132.00	H	---					
4958.40	H	---					
5784.80	H	---					
6611.20	H	---					
7437.60	H	---					
8264.00	H	---					

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

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	:HSDPA B5	Test Date	:2012-04-06
ARFCN	:CH 4132	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:826.4 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
192.96	S	-80.16	-6.78	3.98	-3.09	-13.00	-67.16
265.71	S	-73.84	-6.51	4.62	-3.27	-13.00	-60.84
400.54	S	-78.44	-5.93	4.78	-3.62	-13.00	-65.44
459.71	S	-78.50	-5.25	4.52	-3.72	-13.00	-65.50
532.46	S	-78.30	-3.42	4.63	-3.77	-13.00	-65.30
653.71	S	-77.83	-0.48	4.12	-4.14	-13.00	-64.83
1652.80	H	---					
2479.20	H	---					
3305.60	H	---					
4132.00	H	---					
4958.40	H	---					
5784.80	H	---					
6611.20	H	---					
7437.60	H	---					
8264.00	H	---					

ERP(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	:HSDPA B5	Test Date	:2012-04-06
ARFCN	:CH 4183	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:836.6 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
143.49	S	-85.48	-3.53	-1.26	-2.79	-13.00	-72.48
265.71	S	-81.96	-6.51	4.62	-3.27	-13.00	-68.96
411.21	S	-78.10	-5.93	4.69	-3.62	-13.00	-65.10
459.71	S	-71.90	-5.25	4.52	-3.72	-13.00	-58.90
532.46	S	-70.25	-3.42	4.63	-3.77	-13.00	-57.25
638.19	S	-72.85	0.18	4.10	-3.98	-13.00	-59.85
1673.20	H	---					
2509.80	H	---					
3346.40	H	---					
4183.00	H	---					
5019.60	H	---					
5856.20	H	---					
6692.80	H	---					
7529.40	H	---					
8366.00	H	---					

ERP(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	:HSDPA B5	Test Date	:2012-04-06
ARFCN	:CH 4183	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:836.6 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
192.96	S	-81.68	-6.78	3.98	-3.09	-13.00	-68.68
265.71	S	-74.86	-6.51	4.62	-3.27	-13.00	-61.86
400.54	S	-79.46	-5.93	4.78	-3.62	-13.00	-66.46
459.71	S	-79.16	-5.25	4.52	-3.72	-13.00	-66.16
613.94	S	-79.87	-0.61	4.06	-3.92	-13.00	-66.87
694.45	S	-79.60	-0.53	4.15	-4.07	-13.00	-66.60
1673.20	H	---					
2509.80	H	---					
3346.40	H	---					
4183.00	H	---					
5019.60	H	---					
5856.20	H	---					
6692.80	H	---					
7529.40	H	---					
8366.00	H	---					

ERP(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	:HSDPA B5	Test Date	:2012-04-06
ARFCN	:CH 4233	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:846.6 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
143.49	S	-85.96	-3.53	-1.26	-2.79	-13.00	-72.96
274.44	S	-81.68	-6.51	4.50	-3.22	-13.00	-68.68
400.54	S	-79.92	-5.93	4.78	-3.62	-13.00	-66.92
456.80	S	-70.67	-5.25	4.50	-3.72	-13.00	-57.67
532.46	S	-69.02	-3.42	4.63	-3.77	-13.00	-56.02
638.19	S	-72.42	0.18	4.10	-3.98	-13.00	-59.42
1693.20	H	---					
2539.80	H	---					
3386.40	H	---					
4233.00	H	---					
5079.60	H	---					
5926.20	H	---					
6772.80	H	---					
7619.40	H	---					
8466.00	H	---					

ERP(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	:HSDPA B5	Test Date	:2012-04-06
ARFCN	:CH 4233	Temp./Humi.	:23 deg_C / 52 RH
Fundamental Frequency	:846.6 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
196.84	S	-82.11	-6.78	4.39	-3.09	-13.00	-69.11
265.71	S	-73.21	-6.51	4.62	-3.27	-13.00	-60.21
400.54	S	-79.21	-5.93	4.78	-3.62	-13.00	-66.21
459.71	S	-79.08	-5.25	4.52	-3.72	-13.00	-66.08
578.05	S	-79.64	-1.75	4.27	-3.87	-13.00	-66.64
616.85	S	-79.51	-0.61	4.06	-3.97	-13.00	-66.51
1693.20	H	---					
2539.80	H	---					
3386.40	H	---					
4233.00	H	---					
5079.60	H	---					
5926.20	H	---					
6772.80	H	---					
7619.40	H	---					
8466.00	H	---					

ERP(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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11. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

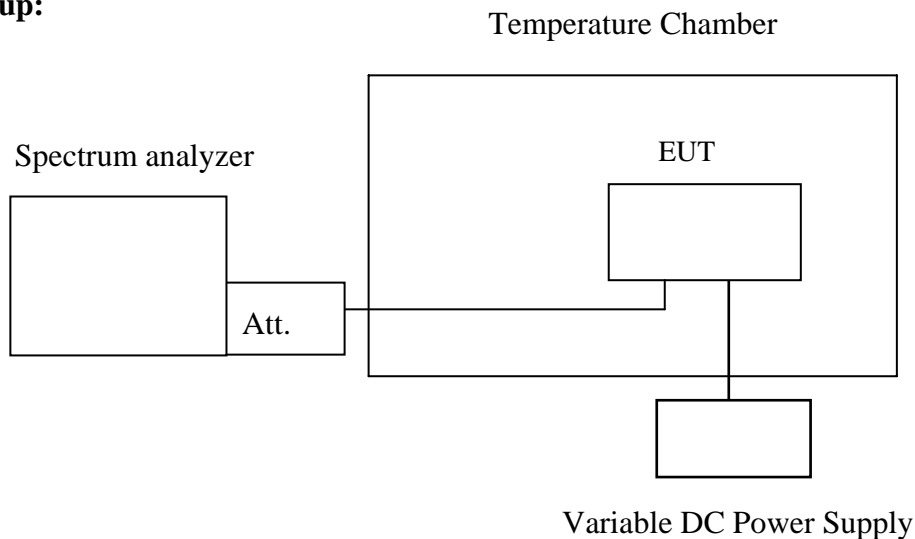
11.1. Standard Applicable:

According to FCC §2.1055(a) (1)

Frequency Tolerance: ± 2.5 ppm for 850MHz band

± 2.5 ppm for 1900MHz band

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: GPRS 850 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)		
7.4	0	836.599986	4.00	2091
7.4	10	836.599993	-3.00	2091
7.4	20	836.599991	-1.00	2091
7.4	30	836.599990	0.00	2091
7.4	40	836.599993	-3.00	2091
7.4	50	836.599989	1.00	2091

Reference Frequency: GPRS 1900 Mid Channel 1880 MHz @ 20°C				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
7.4	0	1879.999980	0.00	4700
7.4	10	1879.999993	-13.00	4700
7.4	20	1879.999987	-7.00	4700
7.4	30	1879.999980	0.00	4700
7.4	40	1879.999977	3.00	4700
7.4	50	1879.999973	7.00	4700

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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)		
7.4	0	1879.999996	2.00	4700
7.4	10	1880.000002	-4.00	4700
7.4	20	1879.999998	0.00	4700
7.4	30	1880.000001	-3.00	4700
7.4	40	1879.999997	1.00	4700
7.4	50	1879.999998	0.00	4700

Reference Frequency: WCDMA V Mid Channel 836.6 (ARFCN4183) MHz				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
7.4	0	836.599997	6.00	2091
7.4	10	836.599998	5.00	2091
7.4	20	836.600003	0.00	2091
7.4	30	836.599998	5.00	2091
7.4	40	836.599999	4.00	2091
7.4	50	836.599998	5.00	2091

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12. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

12.1. Standard Applicable:

According to FCC §2.1055(a) (1)

Frequency Tolerance: ± 2.5 ppm for 850MHz band

± 2.5 ppm for 1900MHz band

According to RSS-133 §6.3, RSS-132 §4.3

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

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 ($\pm 15\%$) 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: GPRS 850 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)		
7.77	25.00	836.599994	-3.00	2091.00
7.40	25.00	836.599991	0.00	2091.00
7.03	25.00	836.600003	-12.00	2091.00
6.4 (End Point)	25.00	836.599979	12.00	2091.00

Reference Frequency: GPRS 1900 Mid Channel 1880 MHz @ 25°C				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
7.77	25	1879.999978	9.00	4700
7.40	25	1879.999987	0.00	4700
7.03	25	1879.999990	-3.00	4700
6.4 (End Point)	25	1879.999965	22.00	4700

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)		
7.77	25	1880.000002	-4.00	4700
7.40	25	1879.999998	0.00	4700
7.03	25	1879.999999	-1.00	4700
6.4 (Endpoint)	25	1879.999975	23.00	4700

Reference Frequency: WCDMA V Mid Channel 836.6 (ARFCN4183) MHz				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
7.77	25.00	836.600001	2.00	2091.00
7.40	25.00	836.600003	0.00	2091.00
7.03	25.00	836.600002	1.00	2091.00
6.4 (Endpoint)	25.00	836.6000050	-2.00	2091.00

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