



FCC ID: HLEPA550BTGGR

Report No.: EF/2011/70013

Issue Date: July 13, 2011

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## 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 No.:** PA550

**Model Differences:** N/A

**FCC ID:** HLEPA550BTGGR

**Report No.:** EF/2011/70013

**Issue Date:** July 13, 2011

**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.  
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 No.:** PA550

**Model Different:** N/A

**FCC ID:** HLEPA550BTGGR

**File Number:** EF/2011/70013

**Date of test:** July 04, 2011 ~ July 12, 2011

**Date of EUT Received:** July 04, 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:**

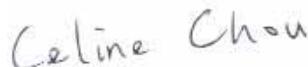


**Date:**

July 13, 2011

*Nick Lin / Engineer*

**Prepared By:**

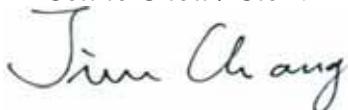


**Date:**

July 13, 2011

*Celine Chou / Clerk*

**Approved By:**



**Date:**

July 13, 2011

*Jim Chang / Supervisor*

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## Version

Version No.	Date	Description
00	July 13, 2011	Initial creation of document

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## 1. GENERAL PRODUCT INFORMATION

General:

Product Name:	PDA Scanner	
Brand Name:	unitech	
Model No.:	PA550	
Model Difference:	N/A	
Data Cable	Model No.: 1550-900036G, Supplier: SINBON	
Power Supply	3.7Vdc Lithium Ion battery or 5Vdc by AC/DC power adapter	
	Battery:	Model No.: 1400-900008G, Supplier: SANYO Electric Co., Ltd.
	Adapter:	Model No.: 3A-182WP05, Supplier: ENG Electric Co., Ltd.

### GSM and WCDMA:

Cellular Phone Standards Frequency Range and Power:	Operating Frequency		Rated Power
	GSM/GPRS 850, Class 10	824.2 MHz – 848.8MHz	33 dBm
	GSM/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:	GSM850: 244KGXW, GSM1900: 247KGXW GPRS850: 252KGXW, GPRS1900: 247KGXW EDGE 850: 253KG7W, EDGE 1900: 249KG7W WCDMA Band II: 4M19F9W, HSDPA Band II: 4M18F9W WCDMA Band V: 4M18F9W, HSDPA Band V: 4M17F9W		
Hardware Version:	V2		
Software Version:	1.1.6.1		
IMEI:	3541 1401 321994515		

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## Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GSM 850	3.7 Vdc	630
GSM 1900	3.7 Vdc	710
GPRS 850	3.7 Vdc	350
GPRS 1900	3.7 Vdc	450
EDGE 850	3.7 Vdc	320
EDGE 1900	3.7 Vdc	420
WCDMA B2	3.7 Vdc	760
WCDMA B5	3.7 Vdc	610
HSUPA B2	3.7 Vdc	740
HSUPA B5	3.7 Vdc	620
HSDPA B2	3.7 Vdc	750
HSDPA B5	3.7 Vdc	620

This test report applies for GSM/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: **HLEPA550BTGGR** 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	MY43360126	04/19/2010	04/18/2012
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2010	01/22/2012
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2010	05/12/2012
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2011	01/04/2012
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2011	01/04/2012
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2010	04/13/2012
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/05/2010	02/04/2012
DC Block	Agilent	BLK-18	155452	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2011	07/04/2012
Splitter	Agilent	11636B	N/A	07/05/2011	07/04/2012
DC Power Supply	Chroma	41901	777188	04/17/2010	04/16/2012

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**966 Chamber**

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

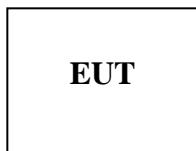
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## 2.5. Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**



**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

<b>FCC Rules</b>	<b>Description Of Test</b>	<b>Result</b>
§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
GSM 850 Band	28.02	ERP	0.634
GSM 1900 Band	26.23	EIRP	0.420
EDGE 850 Band	28.36	ERP	0.685
EDGE 1900 Band	26.40	EIRP	0.437
WCDMA Band II	22.10	EIRP	0.162
WCDMA Band V	19.79	ERP	0.095
HSDPA Band II	22.50	EIRP	0.178
HSDPA Band V	20.37	ERP	0.109

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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 GSM/EDGE and WCDMA/HSDPA Band II, V with power adaptor. The worst-case of E1 position for GSM 850 band, E2 position for GSM 1900, E1 position for HSDPA Band II and E1 position for HSDPA Band V were reported.

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## 5. RF POWER OUTPUT MEASUREMENT

### 5.1. 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

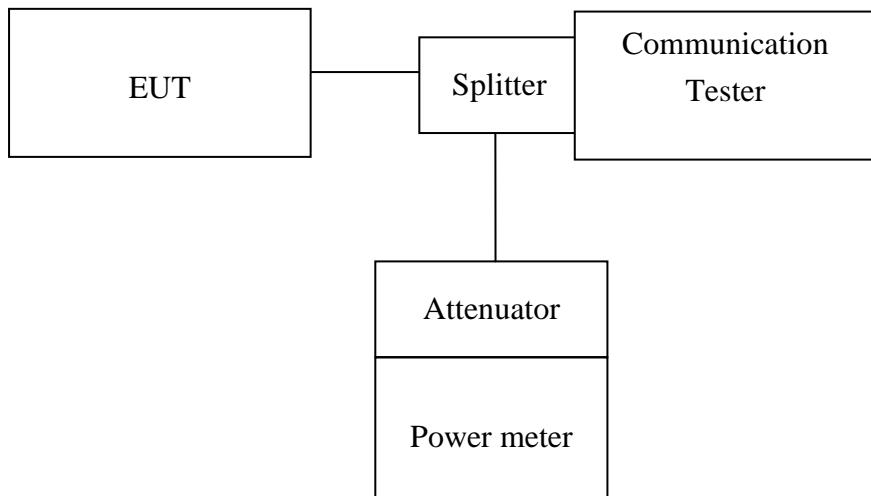
Sub-test in table C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+1.7/-6.7	+21	+2.7/-5.7
2	+22	+3.7/-5.2	+19	+4.7/-4.2
3	+23	+2.7/-5.2	+20	+3.7/-4.2
4	+22	+3.7/-5.2	+19	+4.7/-4.2
5	+24	+1.7/-6.7	+21	+2.7/-5.7

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## 5.2. Test Set-up:



*Note: Measurement setup for testing on Antenna connector*

## 5.3. 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

## 5.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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## 5.5. Measurement Result:

### 5.5.1. RF Conducted Output Power

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

Result:

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
GSM 850 (Class 10)	824.2	128	31.00	30.80
	836.6	190	31.20	31.00
	848.8	251	31.50	31.30

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
GSM 1900 (Class 10)	1850.2	512	29.10	28.90
	1880.0	661	28.80	28.70
	1909.8	810	28.40	28.30

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	31.00	30.90	29.70	29.60
	836.6	190	31.20	31.10	29.60	29.50
	848.8	251	31.40	31.30	29.80	29.70

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	29.10	29.00	27.50	27.30
	1880.0	661	28.80	28.70	27.20	27.10
	1909.8	810	28.40	28.20	26.80	26.70

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<b>EUT Mode</b>	<b>Frequency</b> <b>(MHz)</b>	<b>CH</b>	<b>Peak Power (1DN 1UP)</b> <b>(dBm)</b>	<b>Avg. Power (1DN 1UP)</b> <b>(dBm)</b>	<b>Peak Power (1DN 2UP)</b> <b>(dBm)</b>	<b>Avg. Power (1DN 2UP)</b> <b>(dBm)</b>
EDGE 850 (Class 10)	824.2	128	29.00	25.90	27.10	23.90
	836.6	190	29.30	26.10	27.20	24.10
	848.8	251	29.40	26.30	27.50	24.30

<b>EUT Mode</b>	<b>Frequency</b> <b>(MHz)</b>	<b>CH</b>	<b>Peak Power (1DN 1UP)</b> <b>(dBm)</b>	<b>Avg. Power (1DN 1UP)</b> <b>(dBm)</b>	<b>Peak Power (1DN 2UP)</b> <b>(dBm)</b>	<b>Avg. Power (1DN 2UP)</b> <b>(dBm)</b>
EDGE 1900 (Class 10)	1850.2	512	29.20	26.00	27.20	24.00
	1880.0	661	29.00	25.70	27.00	23.80
	1909.8	810	28.50	25.20	26.40	23.20

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### 5.5.1.2.: 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	25.20	21.59
	1880.0	9400	24.65	21.05
	1907.6	9538	23.95	20.32

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg Power (dBm)
WCDMA Band V	826.40	4132	26.95	23.50
	836.60	4183	26.98	23.45
	846.60	4233	27.18	23.71

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

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### 5.5.1.3.: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 Setting

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

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

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

#### Results:

Mode	Sub-test	RMS Power (dBm) Channel			Power Class 3 Limita- tion (dBm)	Comments
		9262	9400	9538		
HSDPA (B2)	1	22.63	22.39	22.17	20.3dBm – 25.7dBm	Pass
	2	22.34	22.36	22.16	20.3dBm – 25.7dBm	Pass
	3	22.15	21.94	21.64	19.8dBm – 25.7dBm	Pass
	4	22.22	21.95	21.76	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	24.27	24.21	24.43	20.3dBm – 25.7dBm	Pass
	2	24.41	24.24	24.18	20.3dBm – 25.7dBm	Pass
	3	23.81	23.73	23.94	19.8dBm – 25.7dBm	Pass
	4	23.86	23.77	24.00	19.8dBm – 25.7dBm	Pass

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### 5.5.1.4: HSPA (HSDPA & HSUPA) Release 6 mode

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

#### HSPA SUB-TEST Setting

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

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

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

#### Results:

N/A, because the EUT does not supports HSUPA function.

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### 5.5.2. Minimum Communications Power Measurement

#### PCS 1900 band

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.1	27.7	26	24.1	22	19.9	17.9	15.9	13.8
PCL	9	10	11	12	13	14	15	16	17
Output power (dBm)	11.9	9.8	7.8	5.8	3.8	1.8	-0.2		

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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## 6. ERP, EIRP MEASUREMENT

### 6.1. Standard Applicable:

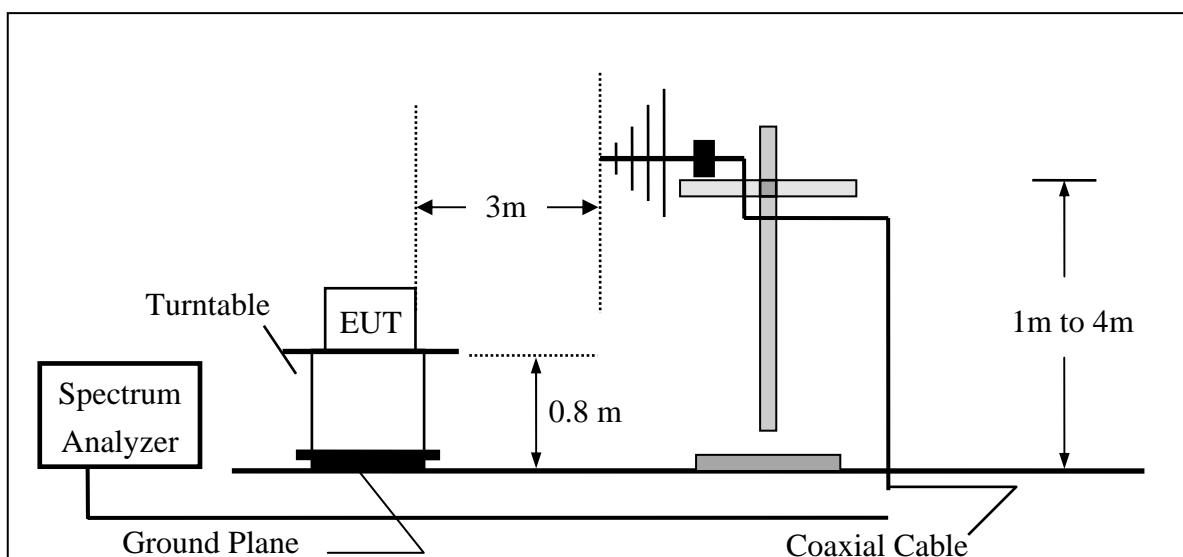
According to FCC §2.1046

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

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

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

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

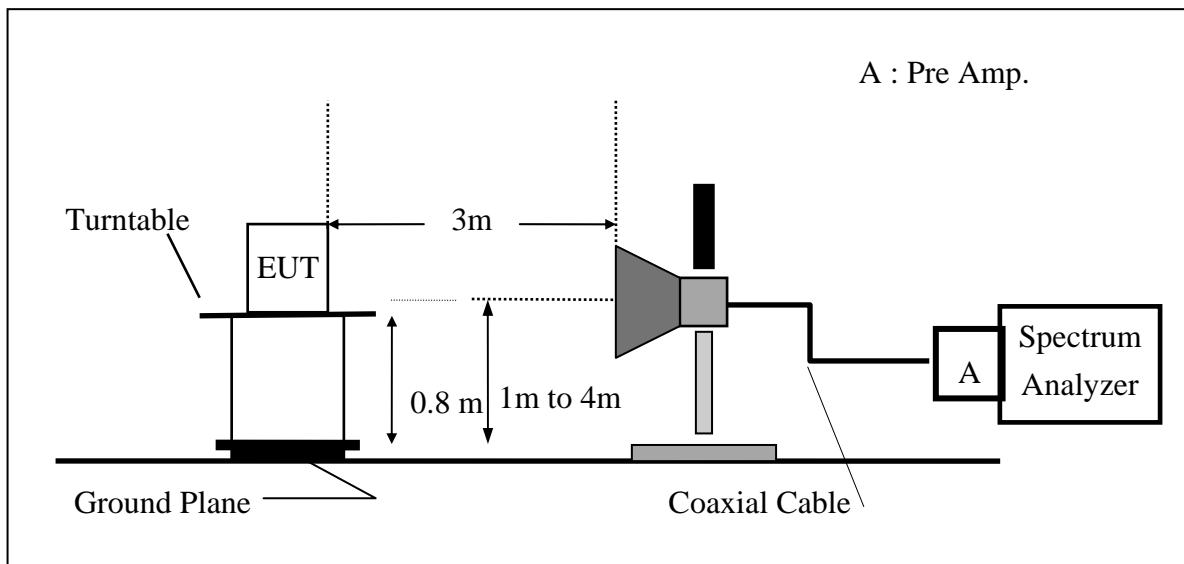


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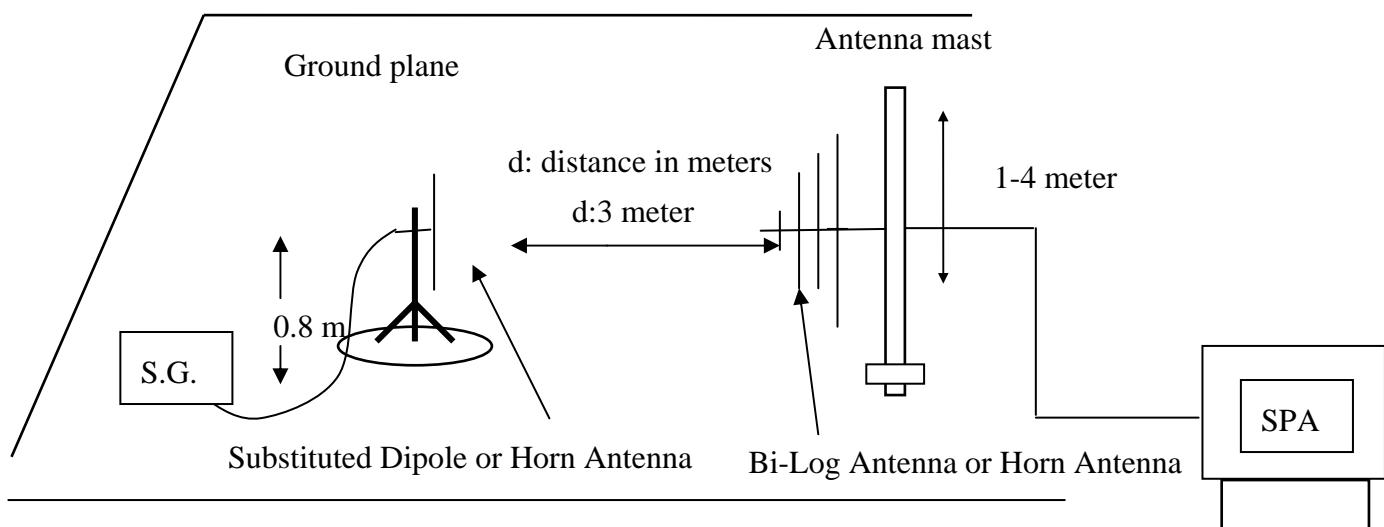
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## (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



## (C) Substituted Method Test Set-UP



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### 6.3. 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 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 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:

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

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

### 6.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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## 6.5. Measurement Result:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
GSM 850	824.20	128	H	V	122.98	36.59	-7.87	3.62	25.09	38.45
				H	119.71	33.44	-7.87	3.62	21.94	38.45
			E1	V	119.32	32.93	-7.87	3.62	21.43	38.45
				H	125.50	39.23	-7.87	3.62	27.73	38.45
			E2	V	123.69	37.30	-7.87	3.62	25.80	38.45
				H	121.59	35.32	-7.87	3.62	23.82	38.45
	836.60	190	H	V	118.79	32.54	-7.88	3.65	21.01	38.45
				H	119.20	32.97	-7.88	3.65	21.44	38.45
			E1	V	118.33	32.08	-7.88	3.65	20.55	38.45
				H	125.78	39.55	-7.88	3.65	28.02	38.45
			E2	V	122.01	35.76	-7.88	3.65	24.23	38.45
				H	120.69	34.46	-7.88	3.65	22.93	38.45
	848.80	251	H	V	122.47	36.35	-7.88	3.68	24.79	38.45
				H	118.50	32.31	-7.88	3.68	20.75	38.45
			E1	V	116.71	30.59	-7.88	3.68	19.03	38.45
				H	125.53	39.34	-7.88	3.68	27.78	38.45
			E2	V	121.45	35.33	-7.88	3.68	23.77	38.45
				H	120.30	34.11	-7.88	3.68	22.55	38.45

### Remark :

(1) The RBW,VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz

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**Measurement Result:**

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>EUT Pol.</b>	<b>Antenna Pol.</b>	<b>SPA Reading (dBuV)</b>	<b>S.G. Output (dBm)</b>	<b>Antenna Gain (dBi)</b>	<b>Cable Loss (dB)</b>	<b>EIRP (dBm)</b>	<b>Limit (dBm)</b>
GSM 1900	1850.20	512	H	V	122.97	18.58	9.90	5.56	22.92	33.00
				H	123.87	19.69	9.90	5.56	24.03	33.00
			E1	V	120.43	16.04	9.90	5.56	20.38	33.00
				H	125.33	21.15	9.90	5.56	25.49	33.00
			E2	V	126.28	21.89	9.90	5.56	<b>26.23</b>	33.00
				H	123.42	19.24	9.90	5.84	23.30	33.00
	1880.00	661	H	V	121.89	17.53	9.99	5.61	21.91	33.00
				H	122.88	18.74	9.99	5.61	23.11	33.00
			E1	V	119.11	14.75	9.99	5.61	19.13	33.00
				H	123.76	19.62	9.99	5.61	23.99	33.00
			E2	V	124.45	20.09	9.99	5.61	24.47	33.00
				H	122.24	18.10	9.99	5.61	22.47	33.00
	1909.80	810	H	V	122.13	17.80	10.08	5.66	22.22	33.00
				H	122.10	17.99	10.08	5.66	22.41	33.00
			E1	V	117.95	13.62	10.08	5.66	18.04	33.00
				H	121.92	17.81	10.08	5.66	22.23	33.00
			E2	V	122.20	17.87	10.08	5.66	22.29	33.00
				H	119.76	15.65	10.08	5.66	20.07	33.00

**Remark :**

(1) The RBW,VBW of SPA for frequency

RBW=300K, VBW=1MHz

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**Measurement Result:**

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
EDGE 850	824.20	128	H	V	121.57	35.18	-7.87	3.62	23.68	38.45
				H	119.96	33.69	-7.87	3.62	22.19	38.45
			E1	V	121.35	34.96	-7.87	3.62	23.46	38.45
				H	125.40	39.13	-7.87	3.62	27.63	38.45
			E2	V	123.86	37.47	-7.87	3.62	25.97	38.45
				H	121.24	34.97	-7.87	3.62	23.47	38.45
	836.60	190	H	V	120.84	34.59	-7.88	3.65	23.06	38.45
				H	119.17	32.94	-7.88	3.65	21.41	38.45
			E1	V	119.31	33.06	-7.88	3.65	21.53	38.45
				H	126.12	39.89	-7.88	3.65	<b>28.36</b>	38.45
			E2	V	123.11	36.86	-7.88	3.65	25.33	38.45
				H	122.51	36.28	-7.88	3.65	24.75	38.45
	848.80	251	H	V	119.87	33.75	-7.88	3.68	22.19	38.45
				H	118.60	32.41	-7.88	3.68	20.85	38.45
			E1	V	117.29	31.17	-7.88	3.68	19.61	38.45
				H	126.10	39.91	-7.88	3.68	28.35	38.45
			E2	V	122.53	36.41	-7.88	3.68	24.85	38.45
				H	120.52	34.33	-7.88	3.68	22.77	38.45

**Remark :**

(1) The RBW,VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz

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**Measurement Result:**

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
EDGE 1900	1850.20	512	H	V	124.84	20.45	9.90	5.56	24.79	33.00
				H	125.36	21.18	9.90	5.56	25.52	33.00
			E1	V	121.38	16.99	9.90	5.56	21.33	33.00
				H	126.24	22.06	9.90	5.56	26.40	33.00
			E2	V	125.90	21.51	9.90	5.56	25.85	33.00
				H	124.24	20.06	9.90	5.84	24.12	33.00
	1880.00	661	H	V	123.46	19.10	9.99	5.61	23.48	33.00
				H	124.02	19.88	9.99	5.61	24.25	33.00
			E1	V	120.15	15.79	9.99	5.61	20.17	33.00
				H	125.57	21.43	9.99	5.61	25.80	33.00
			E2	V	124.32	19.96	9.99	5.61	24.34	33.00
				H	122.55	18.41	9.99	5.61	22.78	33.00
	1909.80	810	H	V	121.84	17.51	10.08	5.66	21.93	33.00
				H	122.02	17.91	10.08	5.66	22.33	33.00
			E1	V	118.38	14.05	10.08	5.66	18.47	33.00
				H	122.68	18.57	10.08	5.66	22.99	33.00
			E2	V	122.74	18.41	10.08	5.66	22.83	33.00
				H	120.27	16.16	10.08	5.66	20.58	33.00

**Remark :**

(1) The RBW,VBW of SPA for frequency

RBW=300K, VBW=1MHz

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**Measurement Result:**

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>EUT Pol.</b>	<b>Antenna Pol.</b>	<b>SPA Reading (dBuV)</b>	<b>S.G. Output (dBm)</b>	<b>Antenna Gain (dBi)</b>	<b>Cable Loss (dB)</b>	<b>EIRP (dBm)</b>	<b>Limit (dBm)</b>
WCDMA II	1852.40	9262	H	V	120.54	16.16	9.90	5.56	20.49	33.00
				H	121.84	17.66	9.90	5.56	22.00	33.00
			E1	V	115.94	11.56	9.90	5.56	15.89	33.00
				H	121.94	17.76	9.90	5.56	22.10	33.00
			E2	V	120.44	16.06	9.90	5.56	20.39	33.00
				H	118.58	14.40	9.90	5.84	18.46	33.00
	1880.00	9400	H	V	119.86	15.50	9.99	5.61	19.88	33.00
				H	121.09	16.95	9.99	5.61	21.32	33.00
			E1	V	115.62	11.23	9.90	5.56	15.57	33.00
				H	121.15	17.01	9.99	5.61	21.38	33.00
			E2	V	119.69	15.33	9.99	5.61	19.71	33.00
				H	117.87	13.73	9.99	5.61	18.10	33.00
	1907.60	9538	H	V	120.08	15.75	10.07	5.66	20.16	33.00
				H	120.98	16.87	10.07	5.66	21.28	33.00
			E1	V	115.85	11.52	10.07	5.66	15.93	33.00
				H	120.60	16.49	10.07	5.66	20.90	33.00
			E2	V	119.43	15.10	10.07	5.66	19.51	33.00
				H	117.63	13.52	10.07	5.66	17.93	33.00

**Remark :**

(1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

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**Measurement Result:**

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
WCDMA Band V	826.40	4132	H	V	113.29	26.93	-10.02	3.63	13.28	38.45
				H	110.63	24.37	-10.02	3.63	10.73	38.45
			E1	V	110.60	24.24	-10.02	3.63	10.59	38.45
				H	116.55	30.29	-10.02	3.63	16.65	38.45
			E2	V	113.96	27.60	-10.02	3.63	13.95	38.45
				H	112.12	25.86	-10.02	3.63	12.22	38.45
	836.60	4183	H	V	115.26	29.00	-10.02	3.65	15.33	38.45
				H	112.18	25.95	-10.02	3.65	12.28	38.45
			E1	V	111.47	25.21	-10.02	3.65	11.54	38.45
				H	118.46	32.23	-10.02	3.65	18.56	38.45
			E2	V	115.33	29.07	-10.02	3.65	15.40	38.45
				H	113.54	27.31	-10.02	3.65	13.64	38.45
	846.60	4233	H	V	116.34	30.19	-10.02	3.67	16.50	38.45
				H	113.29	27.09	-10.02	3.67	13.40	38.45
			E1	V	111.41	25.25	-10.02	3.67	11.56	38.45
				H	119.68	33.48	-10.02	3.67	19.79	38.45
			E2	V	116.42	30.27	-10.02	3.67	16.58	38.45
				H	114.71	28.51	-10.02	3.67	14.82	38.45

**Remark :**

(1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

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**Measurement Result:**

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>EUT Pol.</b>	<b>Antenna Pol.</b>	<b>SPA Reading (dBuV)</b>	<b>S.G. Output (dBm)</b>	<b>Antenna Gain (dBi)</b>	<b>Cable Loss (dB)</b>	<b>EIRP (dBm)</b>	<b>Limit (dBm)</b>
HSDPA Band II	1852.40	9262	H	V	121.38	17.00	9.90	5.56	21.33	33.00
				H	121.76	17.58	9.90	5.56	21.92	33.00
			E1	V	116.87	12.49	9.90	5.56	16.82	33.00
				H	122.34	18.16	9.90	5.56	22.50	33.00
			E2	V	121.45	17.07	9.90	5.56	21.40	33.00
				H	119.64	15.46	9.90	5.84	19.52	33.00
	1880.00	9400	H	V	121.25	16.89	9.99	5.61	21.27	33.00
				H	120.88	16.74	9.99	5.61	21.11	33.00
			E1	V	116.33	11.94	9.90	5.56	16.28	33.00
				H	121.51	17.37	9.99	5.61	21.74	33.00
			E2	V	120.79	16.43	9.99	5.61	20.81	33.00
				H	118.80	14.66	9.99	5.61	19.03	33.00
	1907.60	9538	H	V	121.22	16.89	10.07	5.66	21.30	33.00
				H	120.92	16.81	10.07	5.66	21.22	33.00
			E1	V	116.46	12.13	10.07	5.66	16.54	33.00
				H	121.02	16.91	10.07	5.66	21.32	33.00
			E2	V	120.87	16.54	10.07	5.66	20.95	33.00
				H	118.72	14.61	10.07	5.66	19.02	33.00

**Remark :**

(1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

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**Measurement Result:**

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
HSDPA Band V	826.40	4132	H	V	114.21	27.85	-10.02	3.63	14.20	38.45
				H	111.21	24.95	-10.02	3.63	11.31	38.45
			E1	V	110.86	24.50	-10.02	3.63	10.85	38.45
				H	117.21	30.95	-10.02	3.63	17.31	38.45
			E2	V	114.66	28.30	-10.02	3.63	14.65	38.45
				H	113.45	27.19	-10.02	3.63	13.55	38.45
	836.60	4183	H	V	115.83	29.57	-10.02	3.65	15.90	38.45
				H	112.93	26.70	-10.02	3.65	13.03	38.45
			E1	V	111.75	25.49	-10.02	3.65	11.82	38.45
				H	118.90	32.67	-10.02	3.65	19.00	38.45
			E2	V	116.28	30.02	-10.02	3.65	16.35	38.45
				H	114.71	28.48	-10.02	3.65	14.81	38.45
	846.60	4233	H	V	117.21	31.06	-10.02	3.67	17.37	38.45
				H	114.21	28.01	-10.02	3.67	14.32	38.45
			E1	V	111.72	25.56	-10.02	3.67	11.87	38.45
				H	120.26	34.06	-10.02	3.67	20.37	38.45
			E2	V	117.15	31.00	-10.02	3.67	17.31	38.45
				H	115.40	29.20	-10.02	3.67	15.51	38.45

**Remark :**

(1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

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## 7. 99% OCCUPIED BANDWIDTH MEASUREMENT

### 7.1. Standard Applicable:

According to §FCC 2.1049.

### 7.2. Test Set-up:

Refer to section 5.2 in this report

### 7.3. 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.

### 7.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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**7.5. Measurement Result:**

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>99% Bandwidth (kHz)</b>
GSM 850	824.20	128	241.9528
	836.60	190	238.6956
	848.80	251	244.1831

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>99% Bandwidth (kHz)</b>
GSM 1900	1850.20	512	245.0293
	1880.00	661	247.1087
	1909.80	810	242.1754

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>99% Bandwidth (kHz)</b>
GPRS 850	824.20	128	243.6866
	836.60	190	250.5065
	848.80	251	252.2147

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>99% Bandwidth (kHz)</b>
GPRS 1900	1850.20	512	245.8178
	1880.00	661	247.7270
	1909.80	810	240.4894

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<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>99% Bandwidth (kHz)</b>
EDGE 850	824.20	128	243.9950
	836.60	190	253.2398
	848.80	251	243.0060

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>99% Bandwidth (kHz)</b>
EDGE 1900	1850.20	512	249.2890
	1880.00	661	228.6345
	1909.80	810	244.4779

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>99% Bandwidth (MHz)</b>
WCDMA II	1852.40	9262	4.1641
	1880.00	9400	4.1669
	1907.60	9538	4.1880

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>99% Bandwidth (MHz)</b>
WCDMA V	826.40	4132	4.1717
	836.00	4180	4.1757
	846.60	4233	4.1584

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>99% Bandwidth (MHz)</b>
HSDPA II	1852.4	9262	4.1848
	1880.0	9400	4.1582
	1907.6	9538	4.1757

<b>EUT Mode</b>	<b>Frequency (MHz)</b>	<b>CH</b>	<b>99% Bandwidth (MHz)</b>
HSDPA V	826.40	4132	4.1606
	836.60	4183	4.1540
	846.60	4233	4.1684

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Figure 7-1: GSM 850 Channel Low

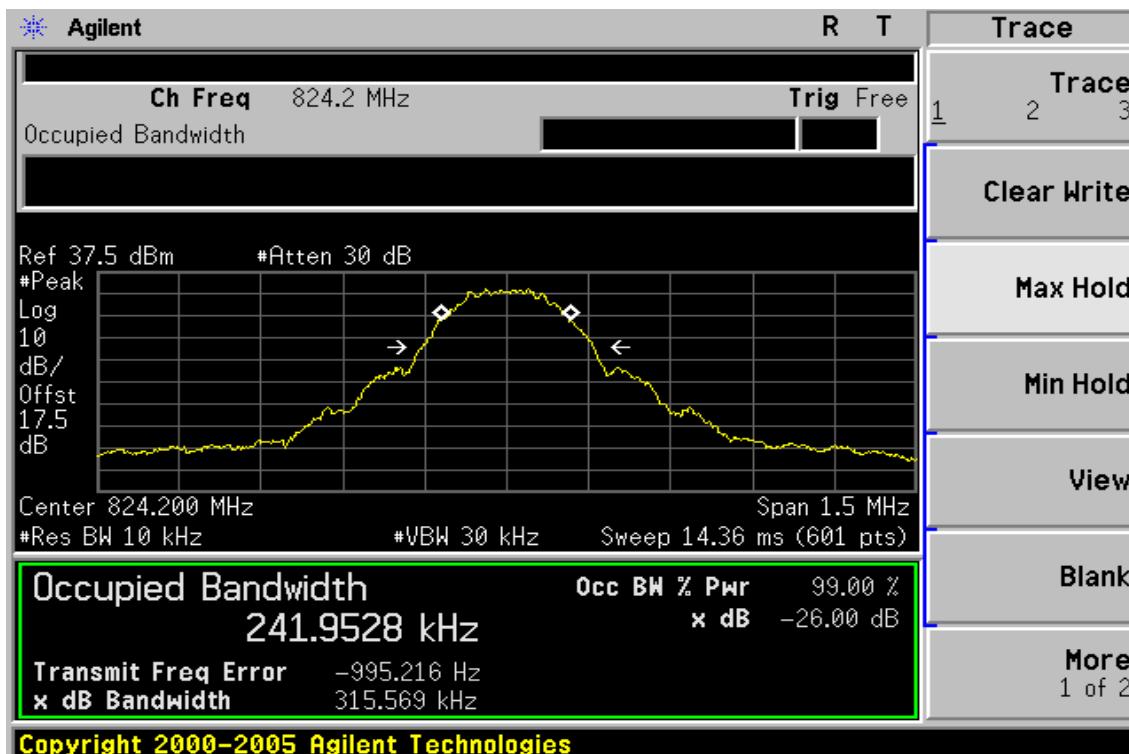
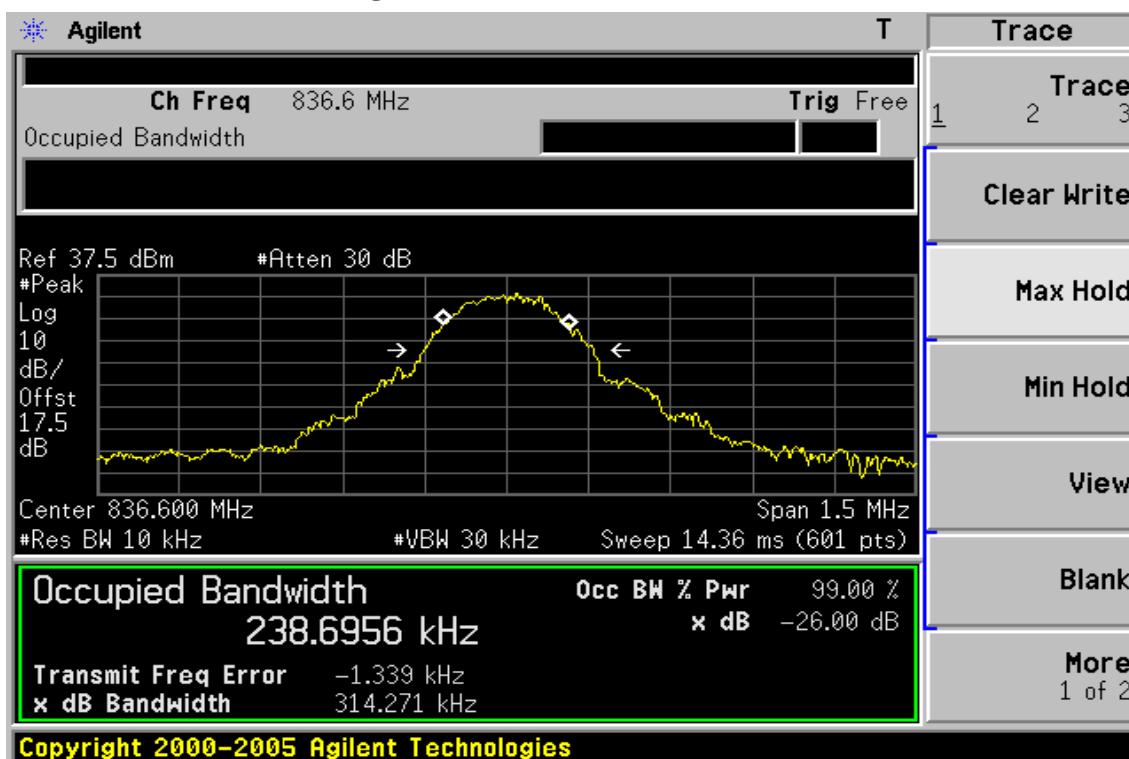


Figure 7-2 GSM 850 Channel Mid



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Figure 7-3: GSM 850 Channel High

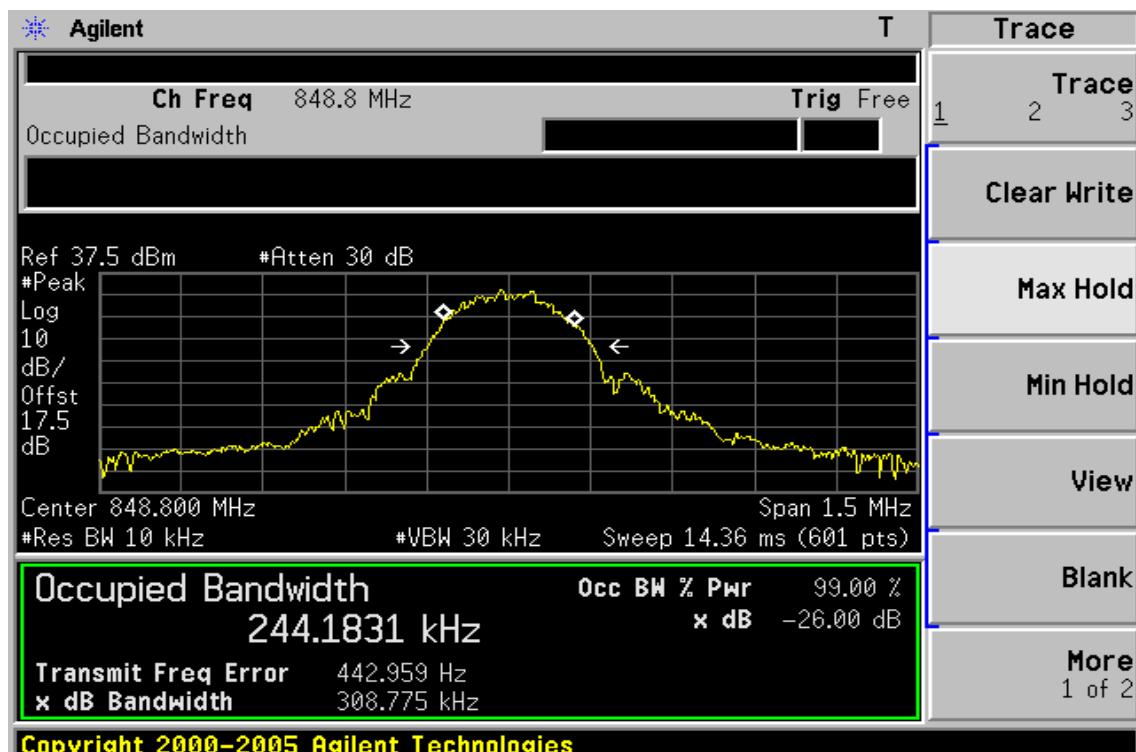
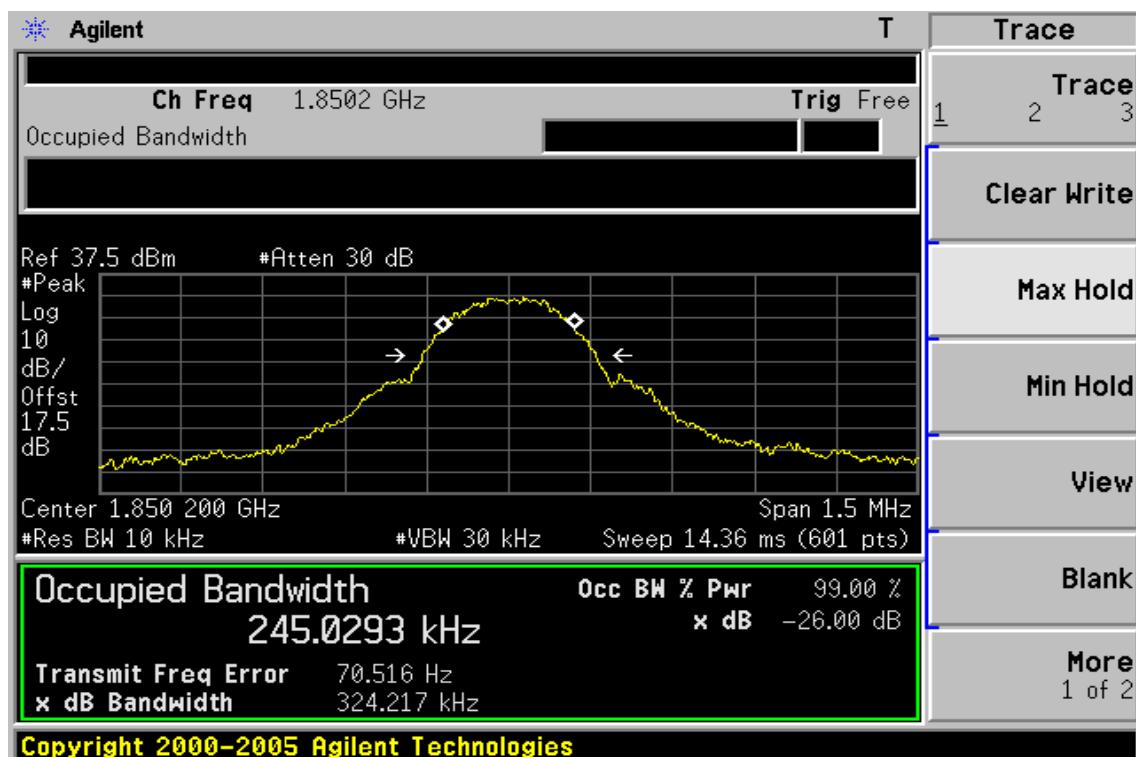


Figure 7-4: GSM 1900 Channel Low



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Figure 7-5 GSM 1900 Channel Mid

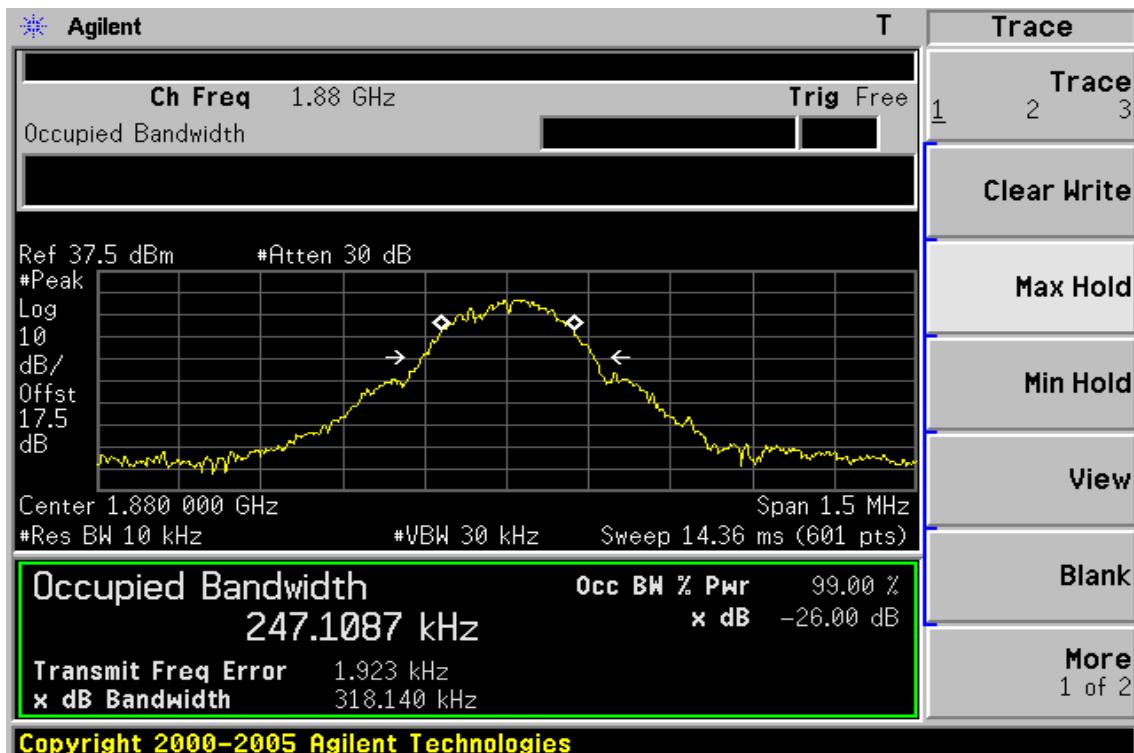
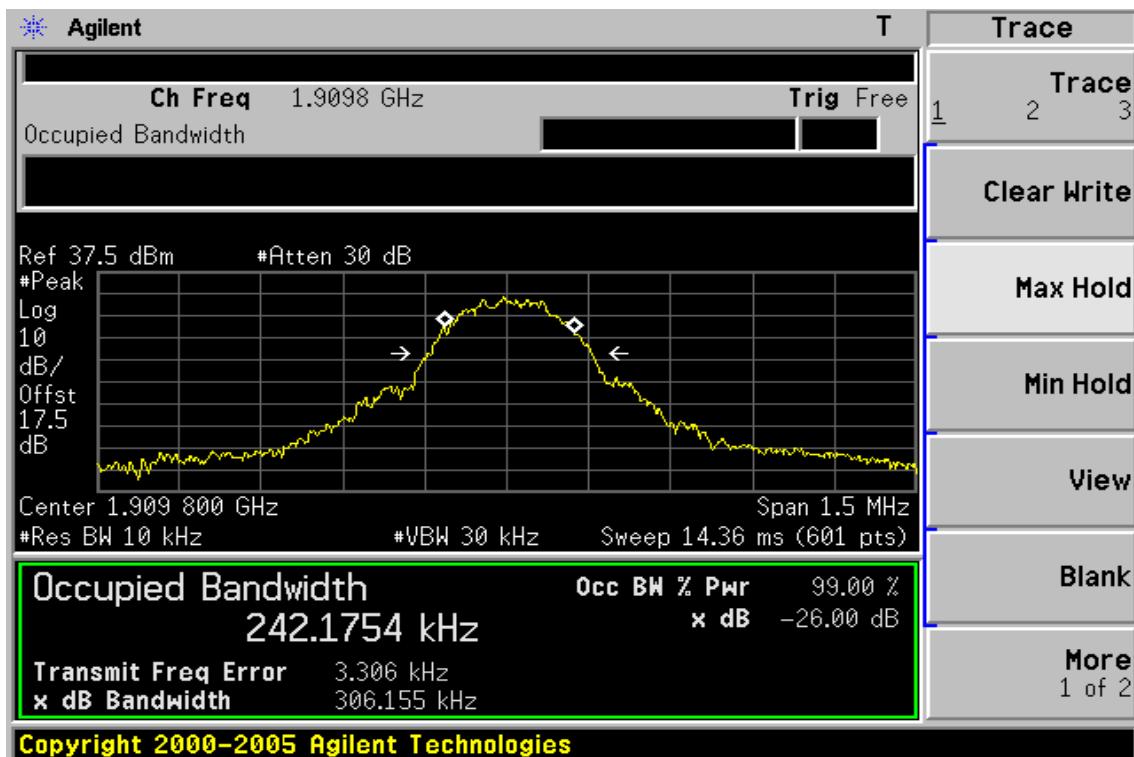


Figure 7-6: GSM 1900 Channel High



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Figure 7-7: GPRS 850 Channel Low

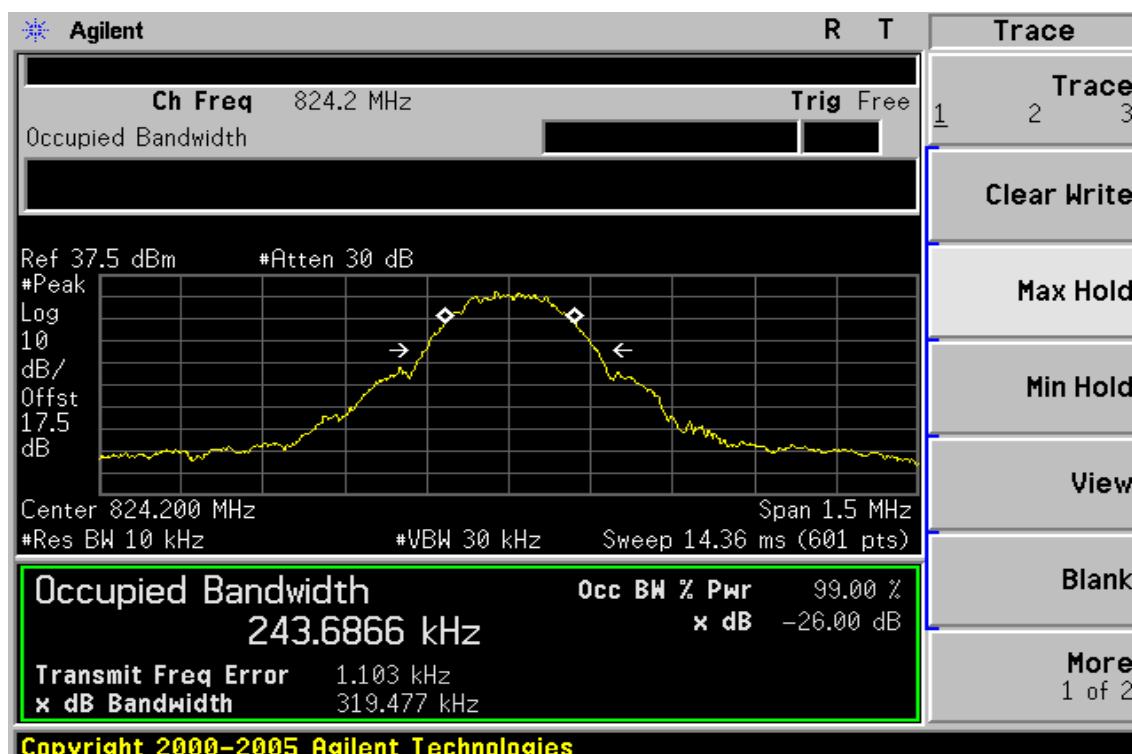
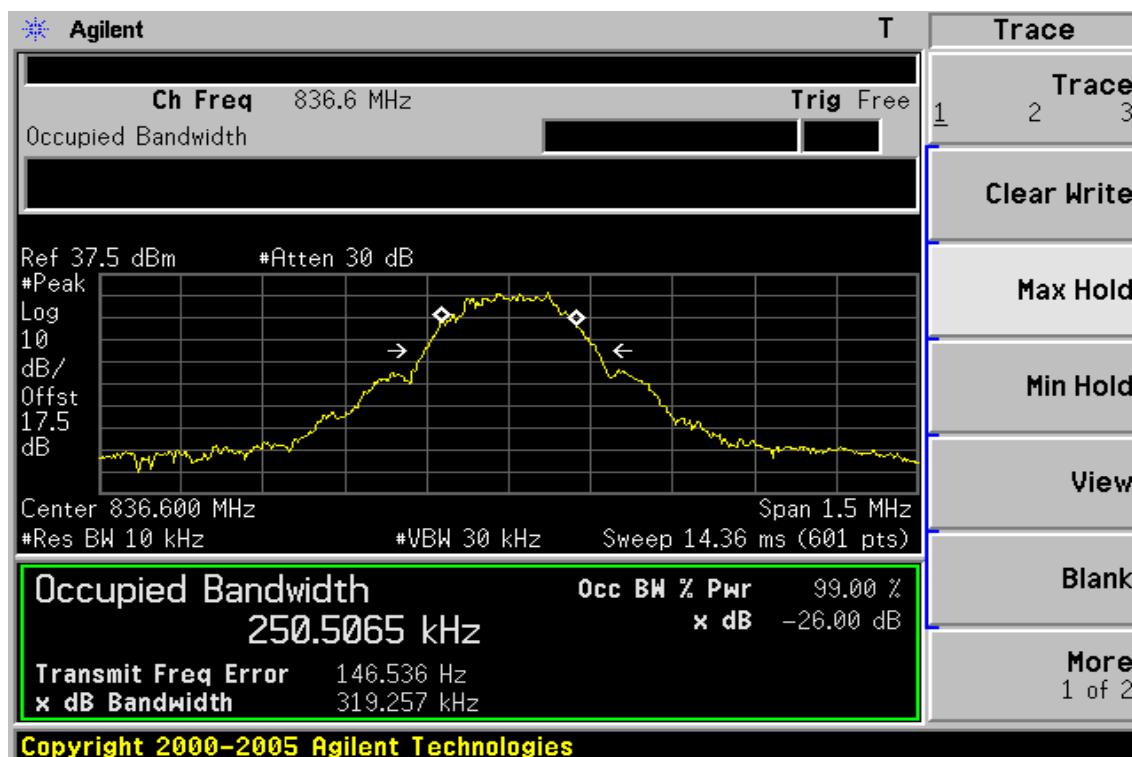


Figure 7-8 GPRS 850 Channel Mid



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Figure 7-9: GPRS 850 Channel High

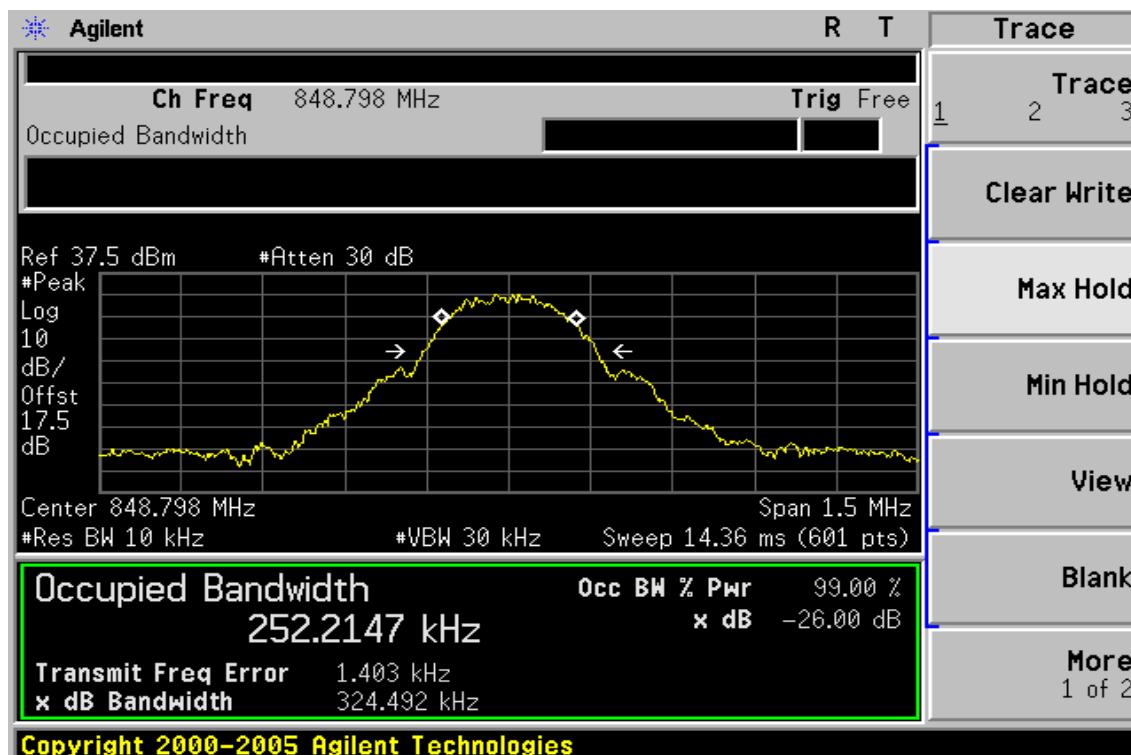
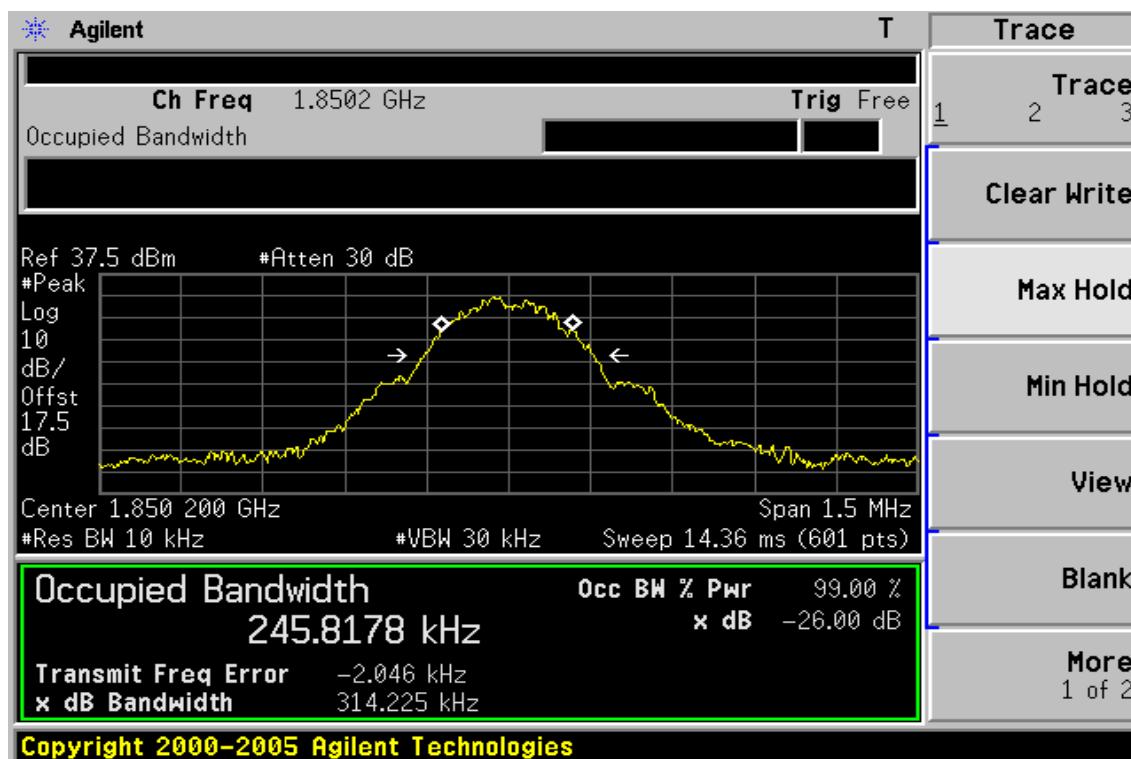


Figure 7-10: GPRS 1900 Channel Low



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Figure 7-11: GPRS 1900 Channel Mid

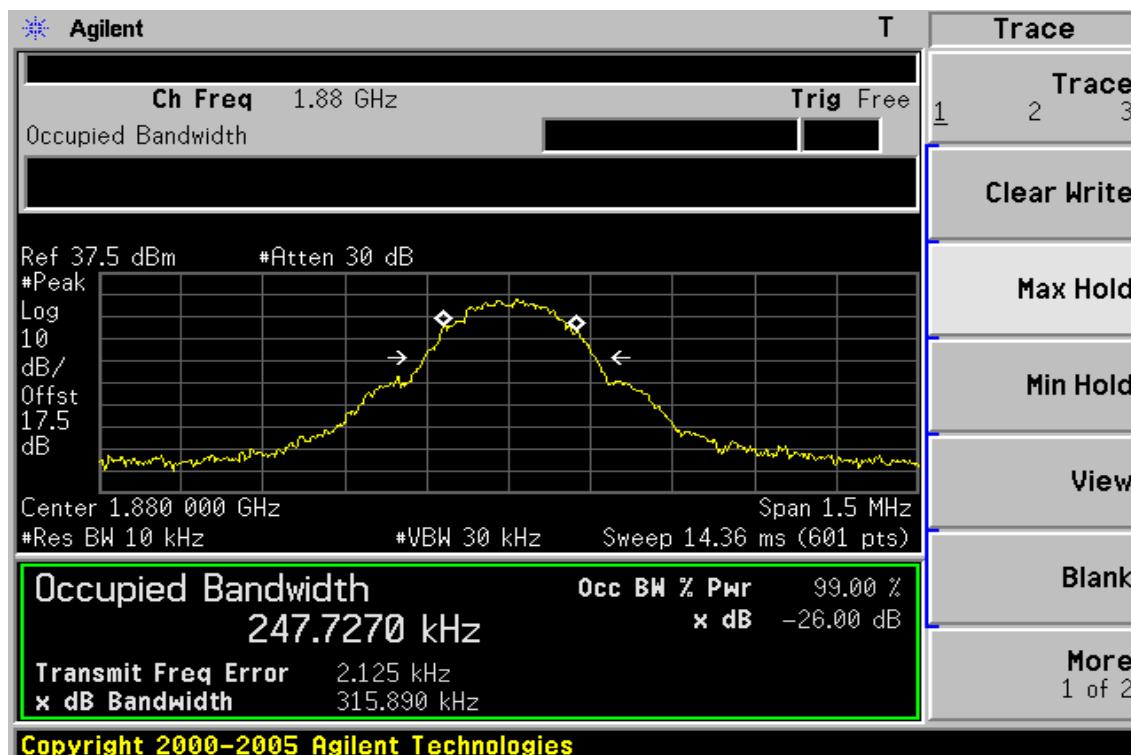
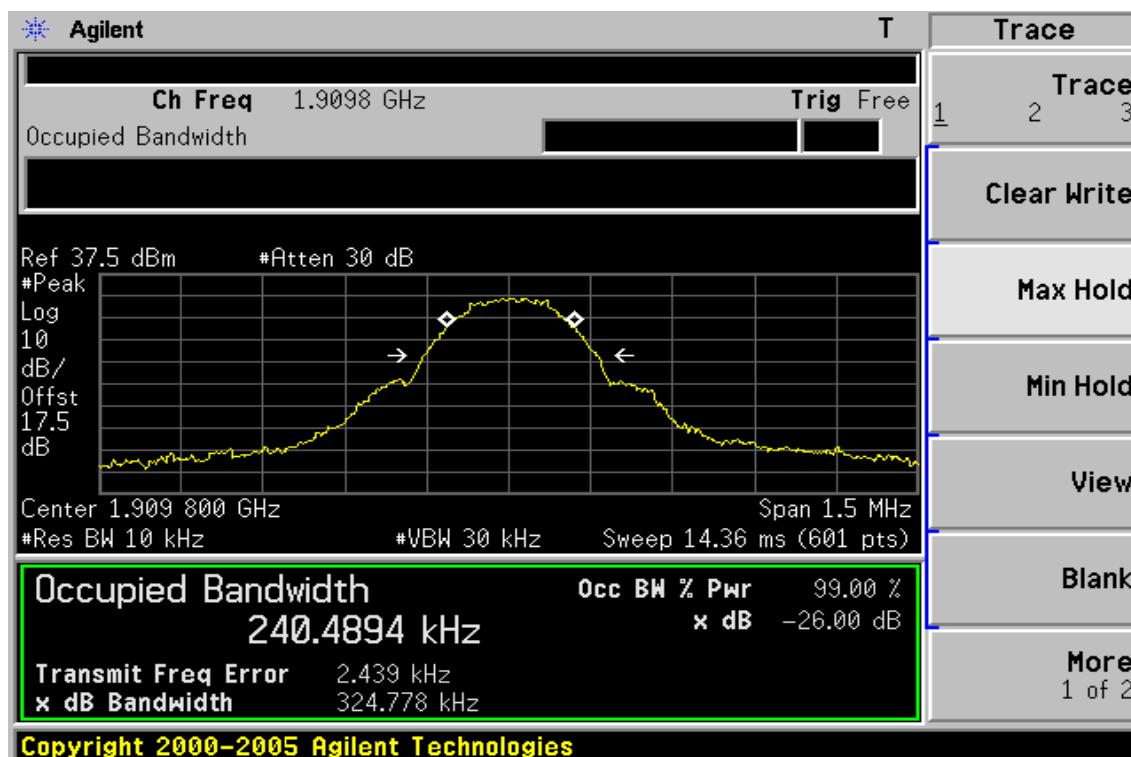


Figure 7-12: GPRS 1900 Channel High



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Figure 7-13: EDGE 850 Channel Low

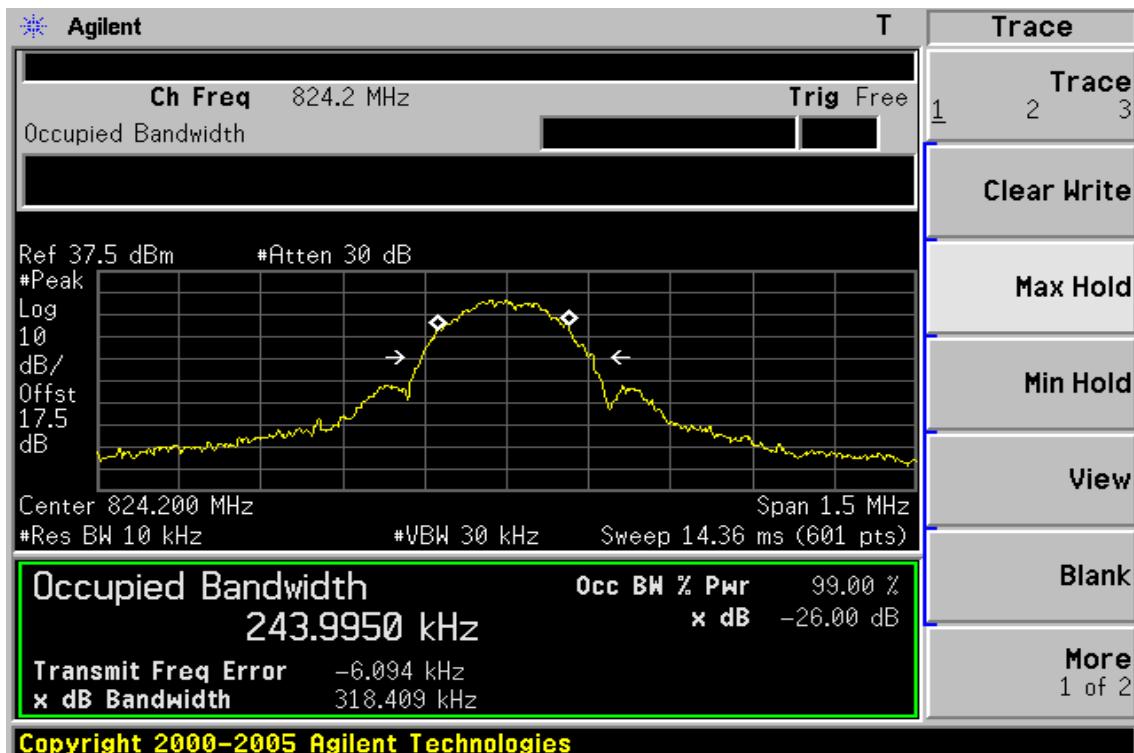
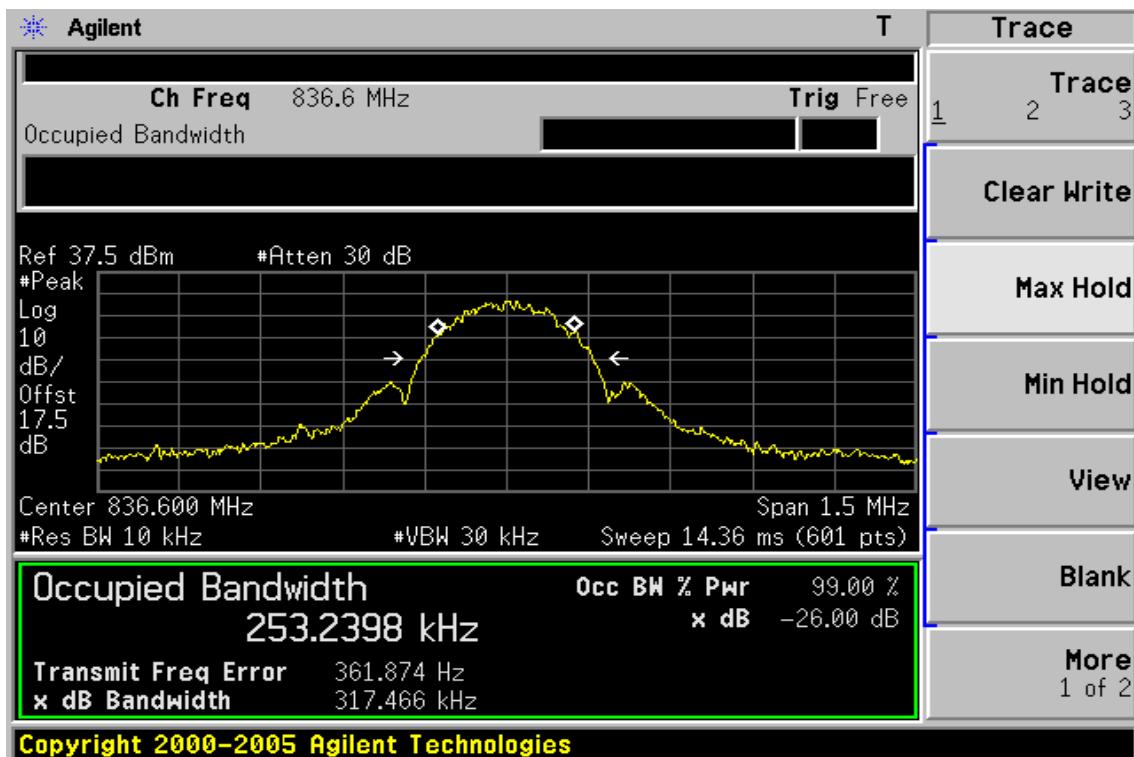


Figure 7-14: EDGE 850 Channel Mid



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Figure 7-15: EDGE 850 Channel High

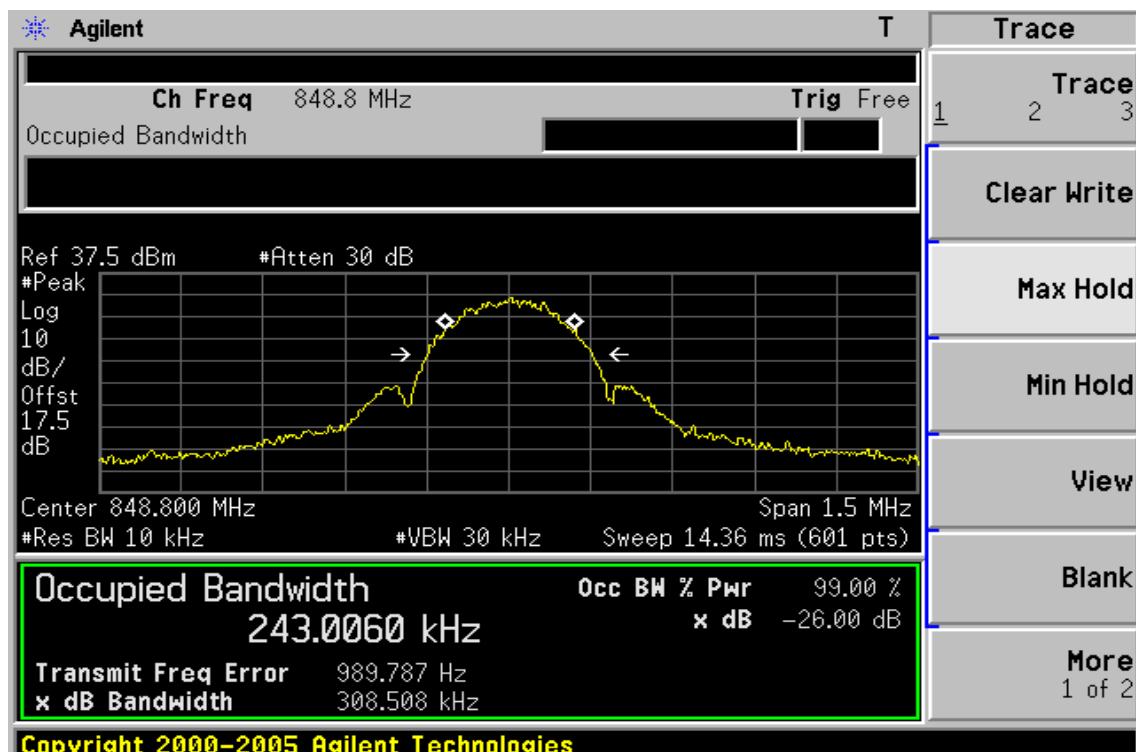
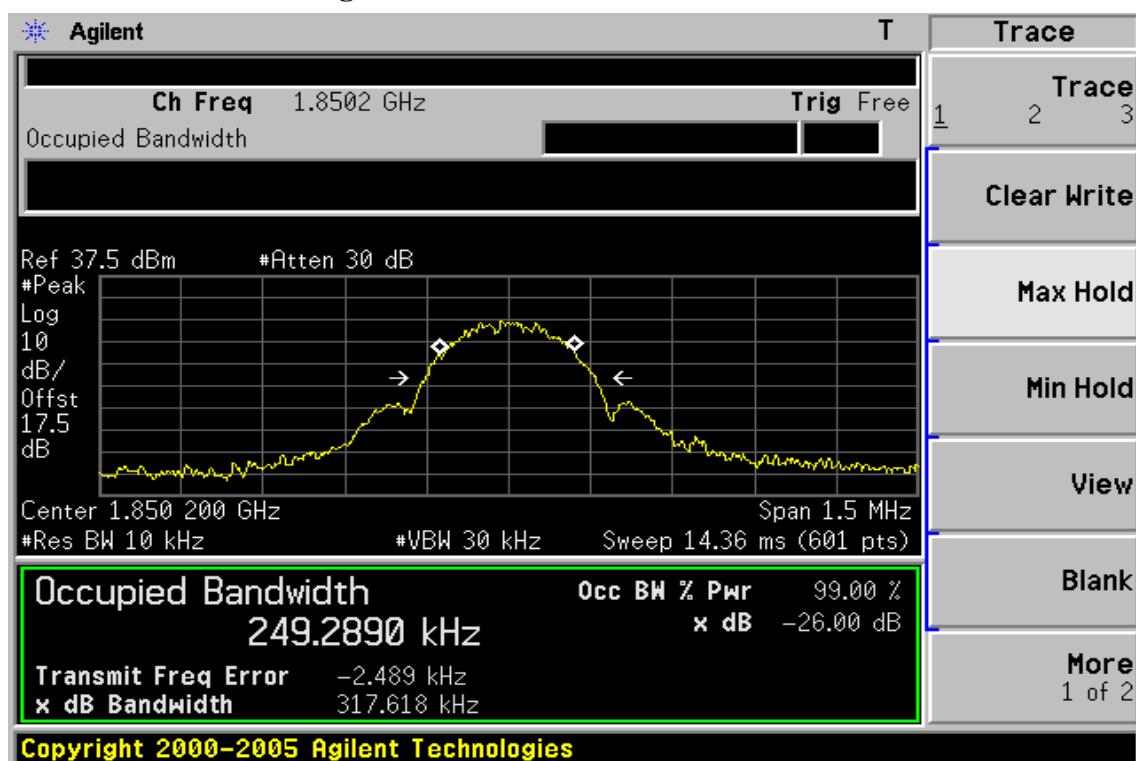


Figure 7-16: EDGE 1900 Channel Low



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Figure 7-17 EDGE 1900 Channel Mid

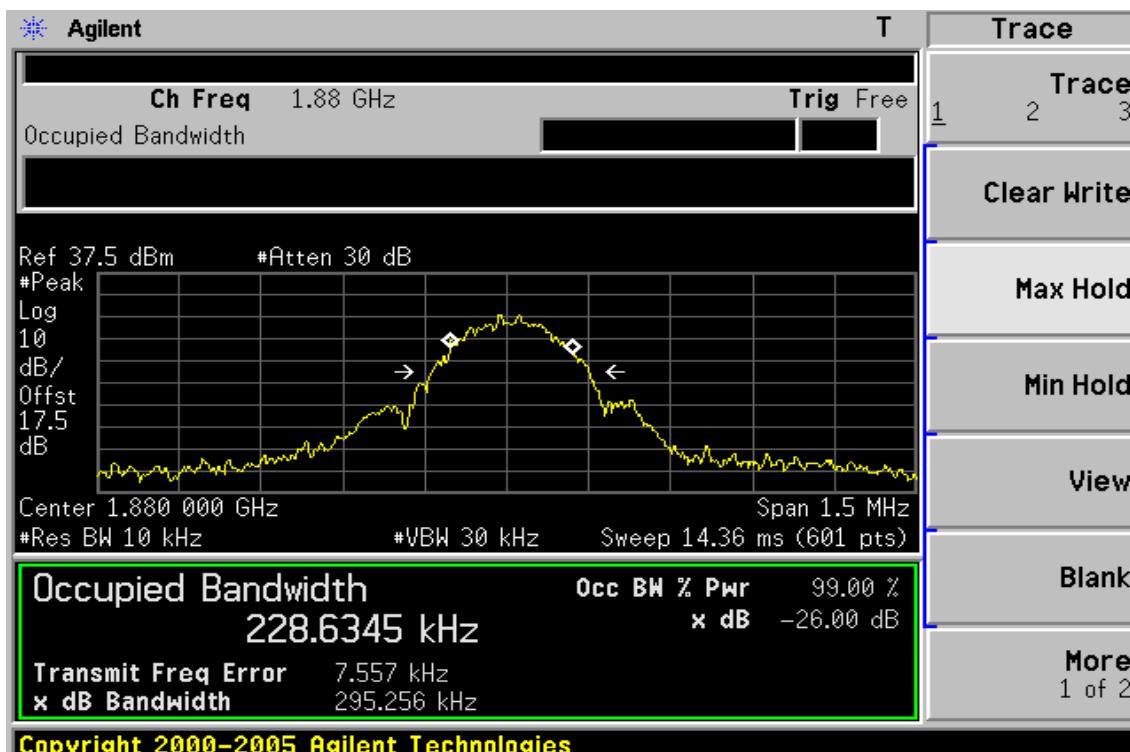
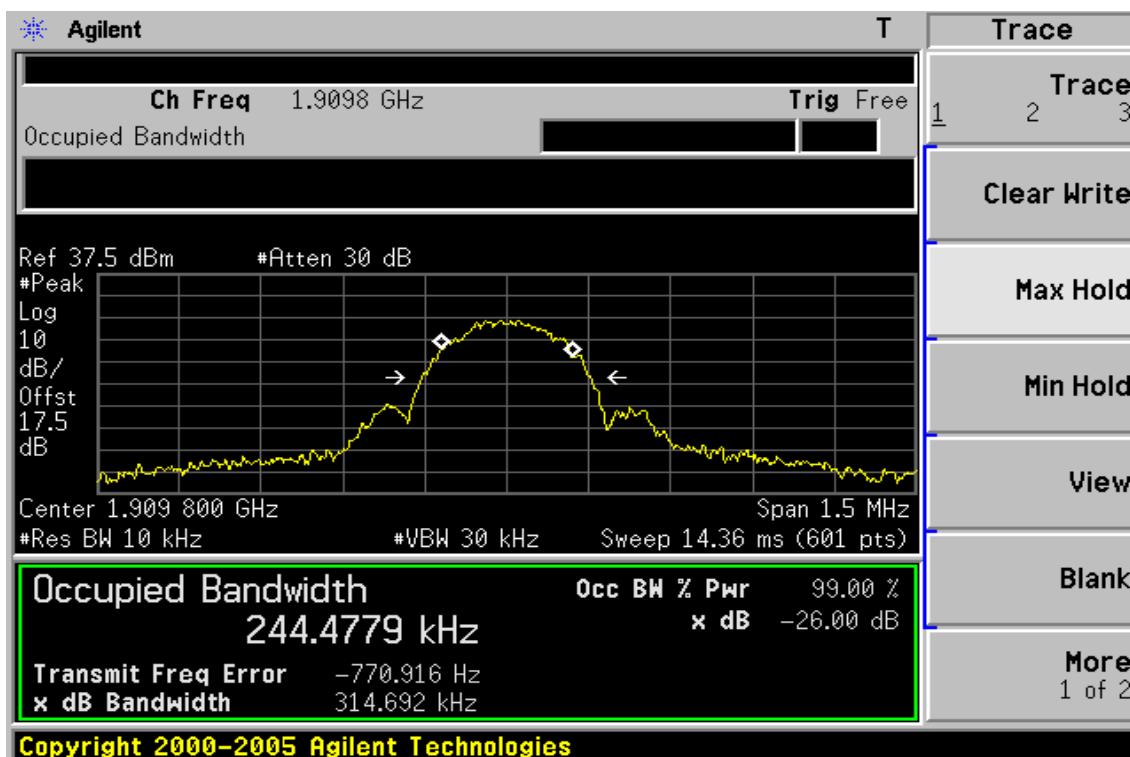


Figure 7-18: EDGE 1900 Channel High



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Figure 7-19: WCDMA II Channel Low

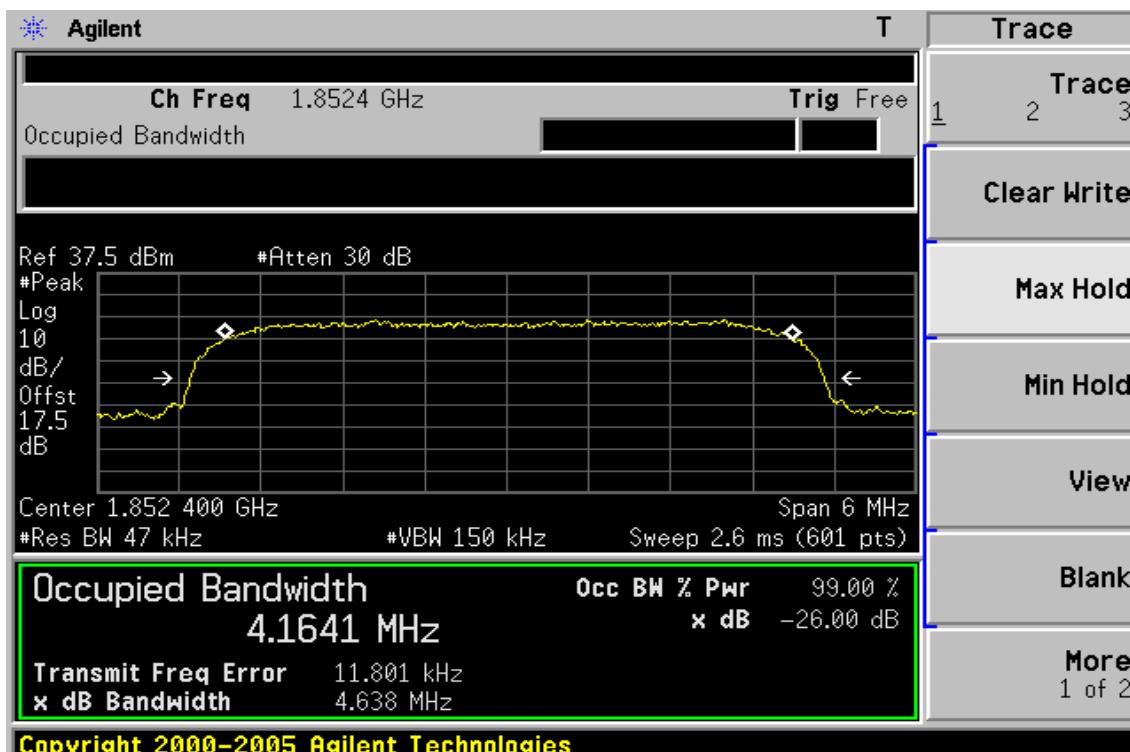
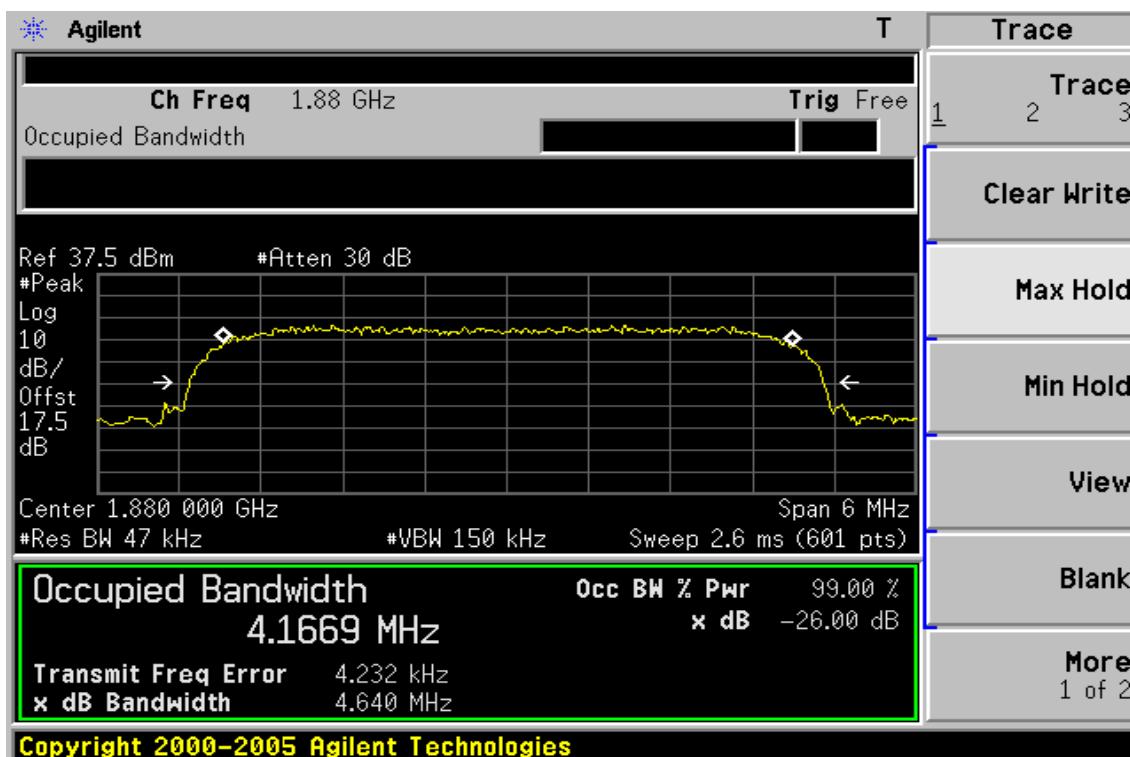


Figure 7-20 WCDMA II Channel Mid



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Figure 7-21: WCDMA II Channel High

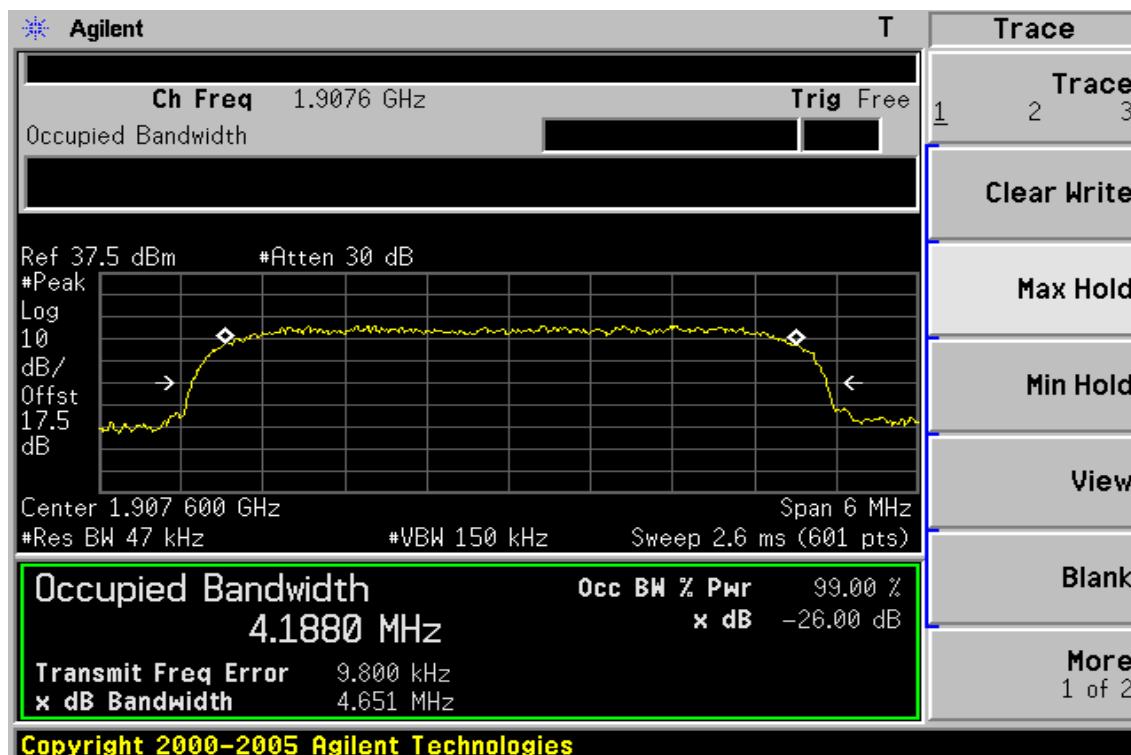
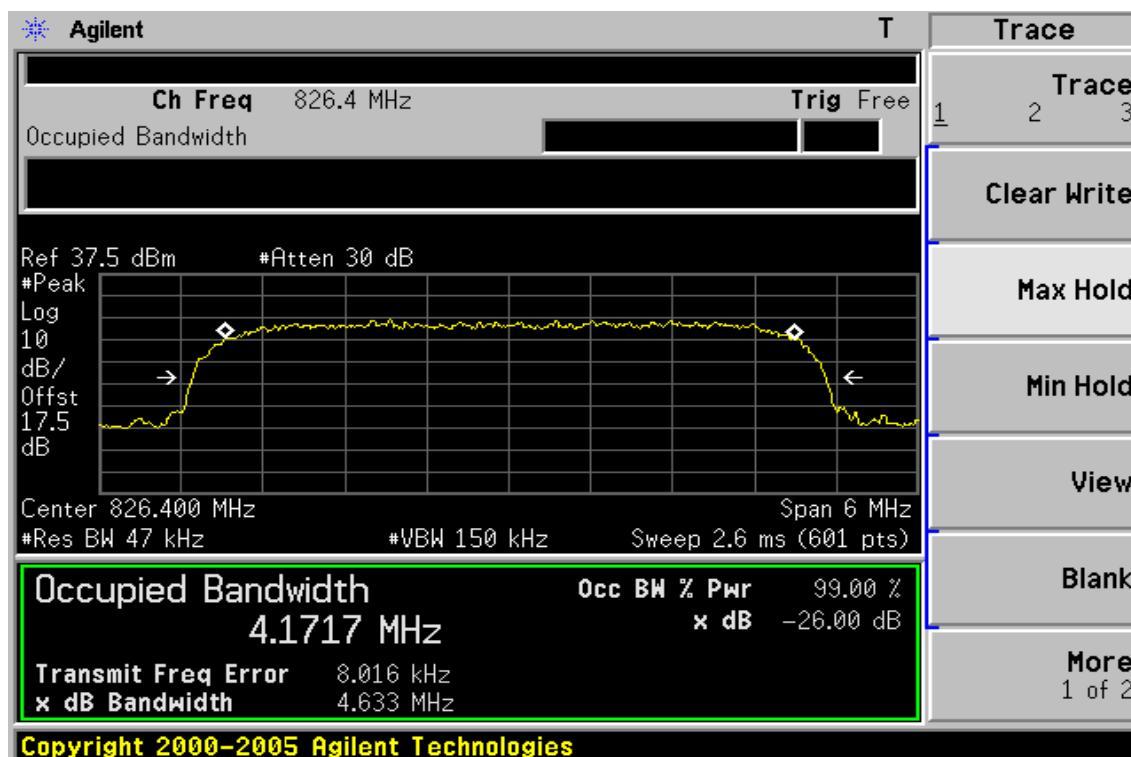


Figure 7-22: WCDMA V Channel Low



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Figure 7-23 WCDMA V Channel Mid

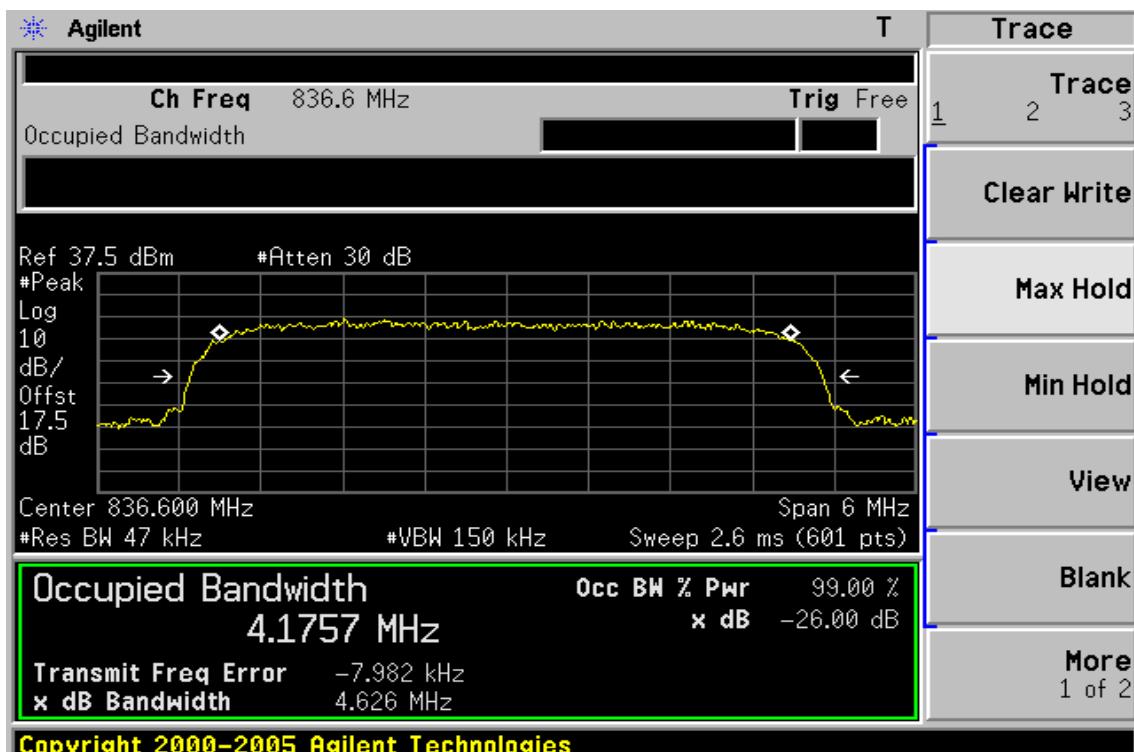
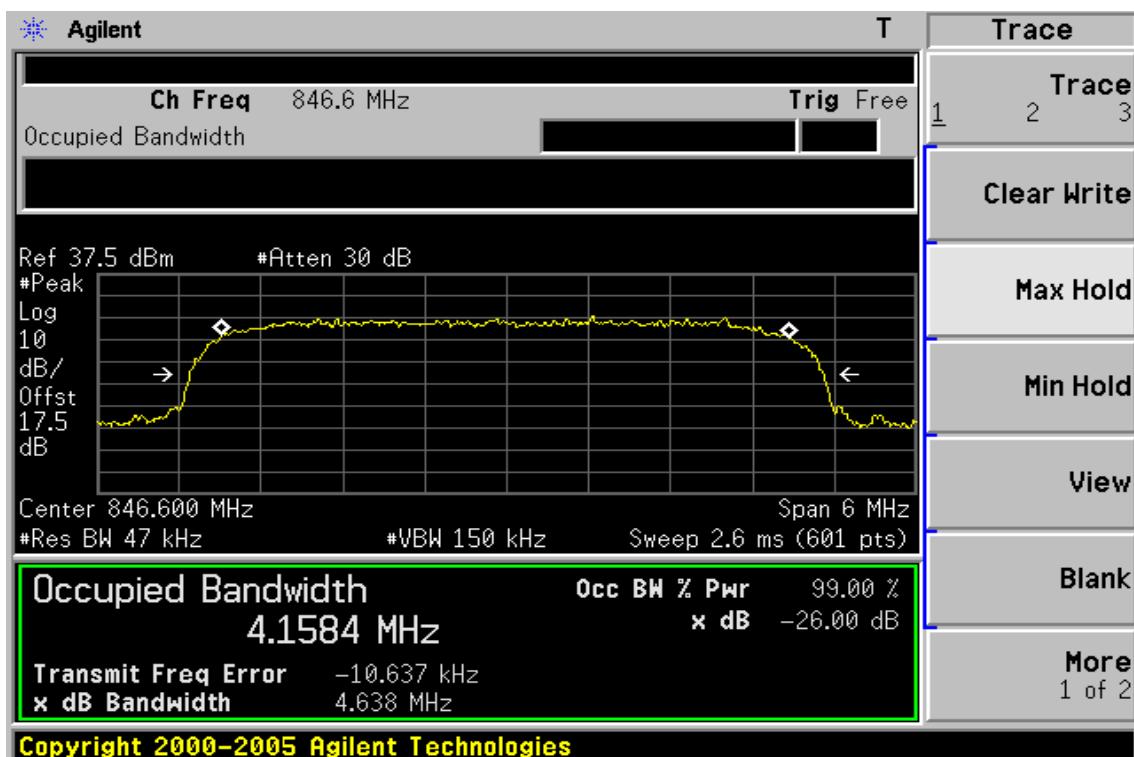


Figure 7-24: WCDMA V Channel High



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Figure 7-25: HSDPA II Channel Low

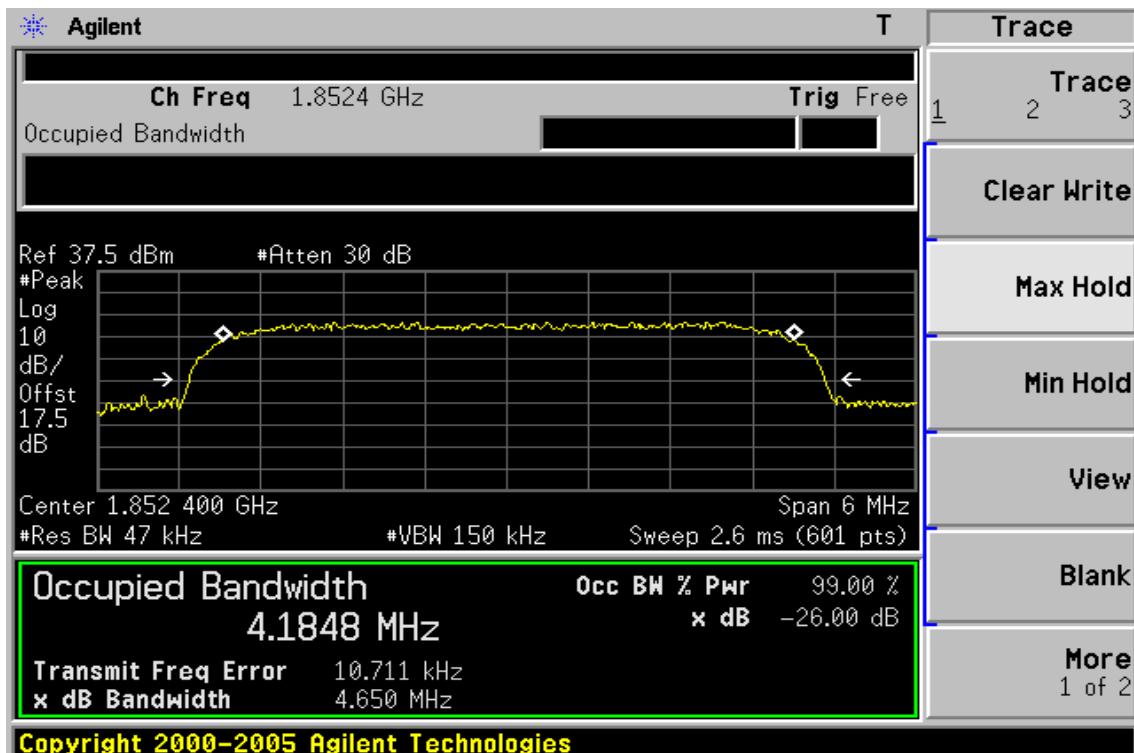
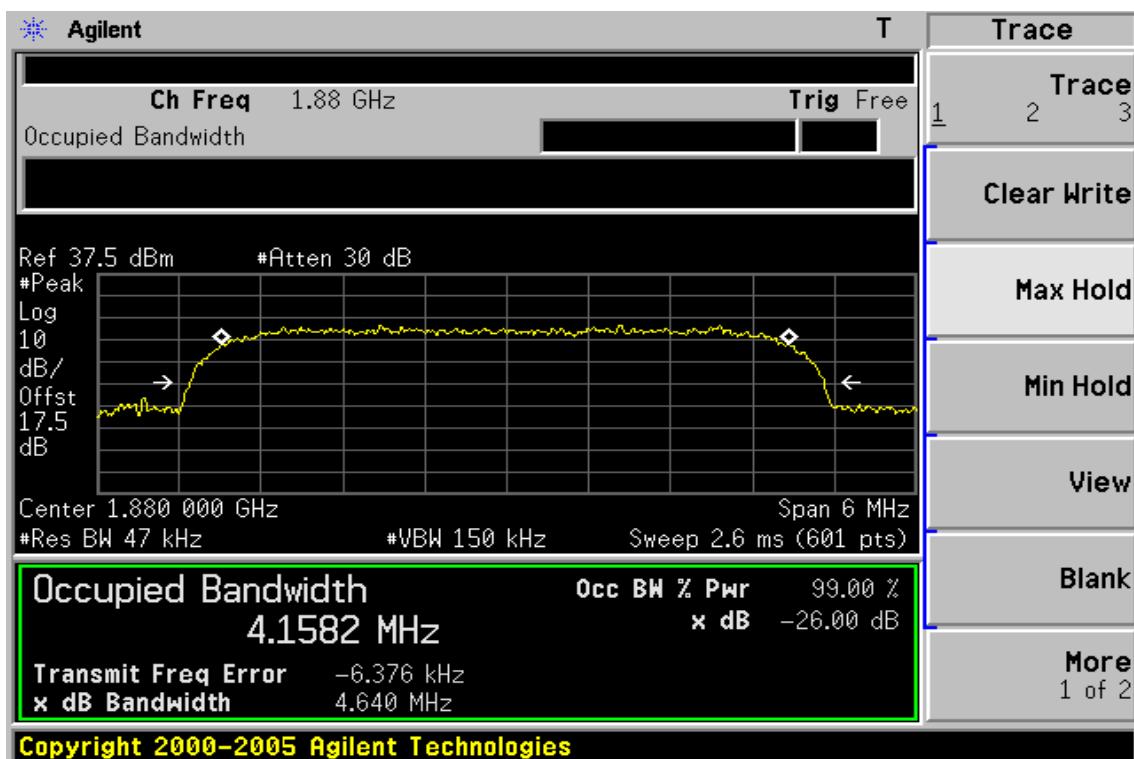


Figure 7-26 HSDPA II Channel Mid



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Figure 7-27: HSDPA II Channel High

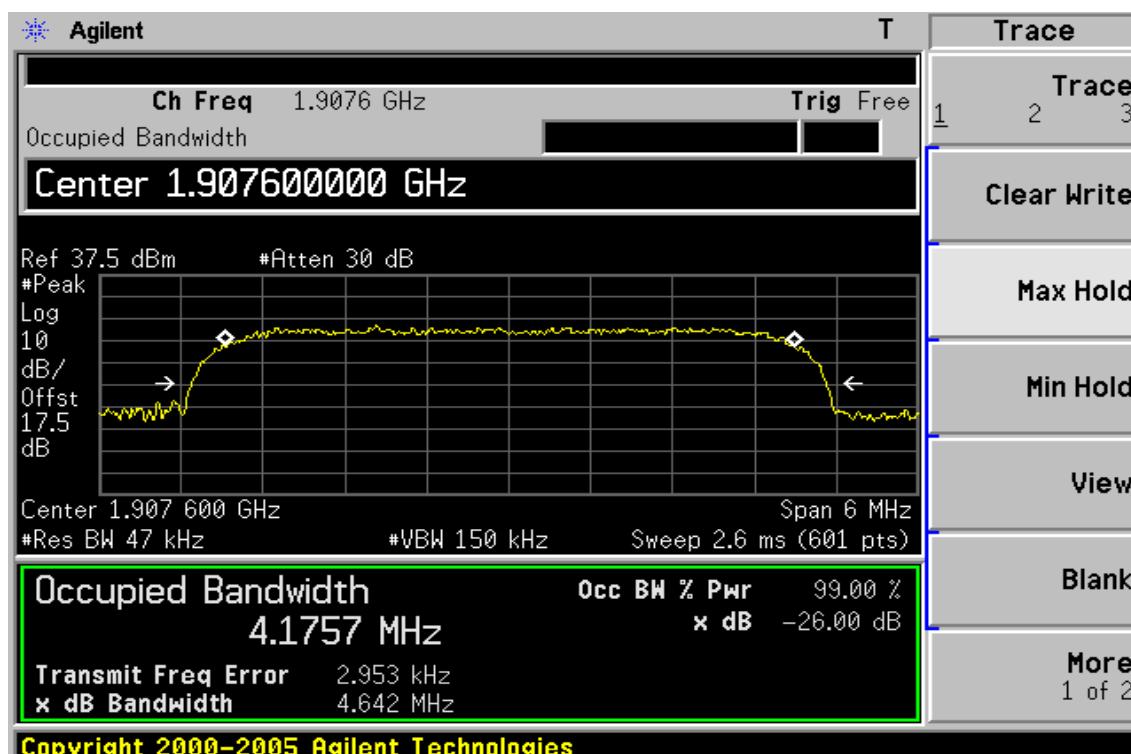
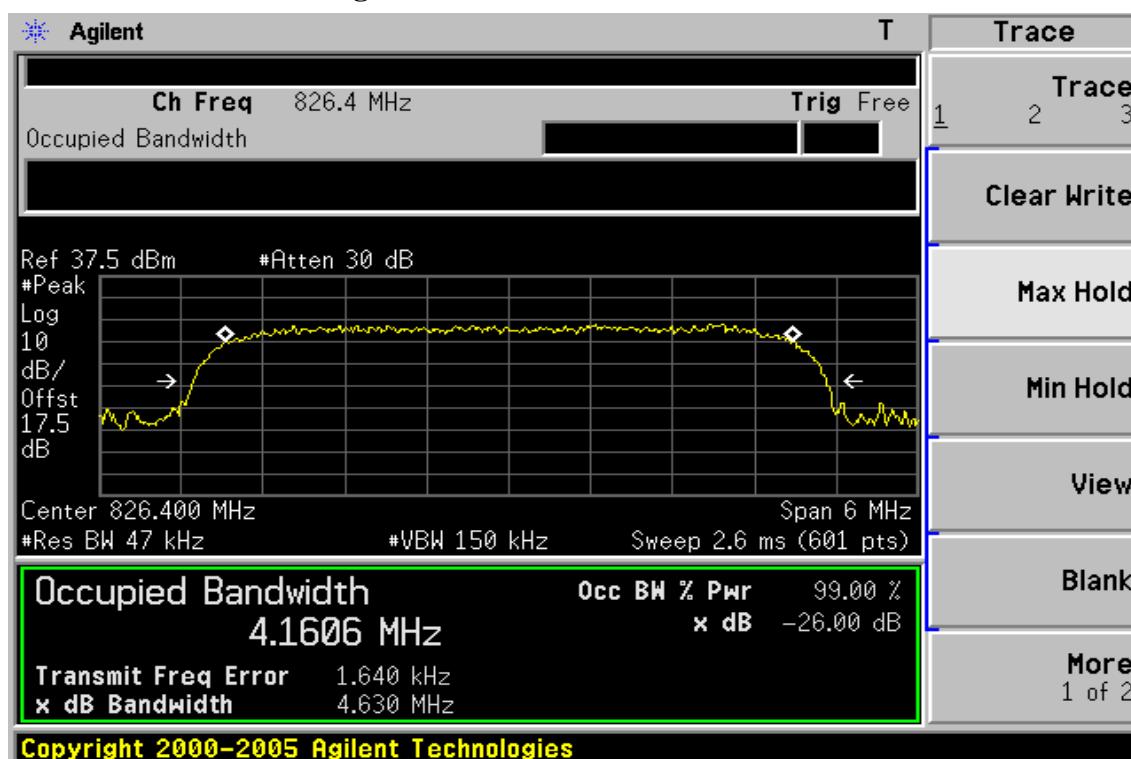


Figure 7-28: HSDPA V Channel Low



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Figure 7-29: HSDPA V Channel Mid

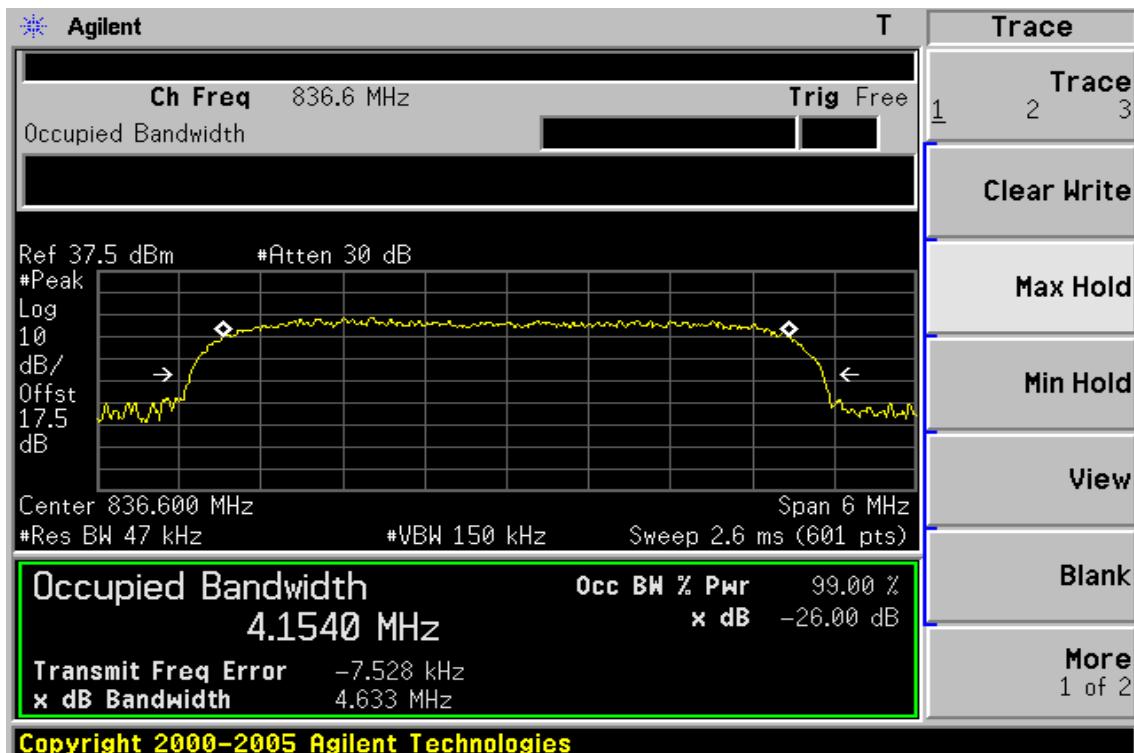
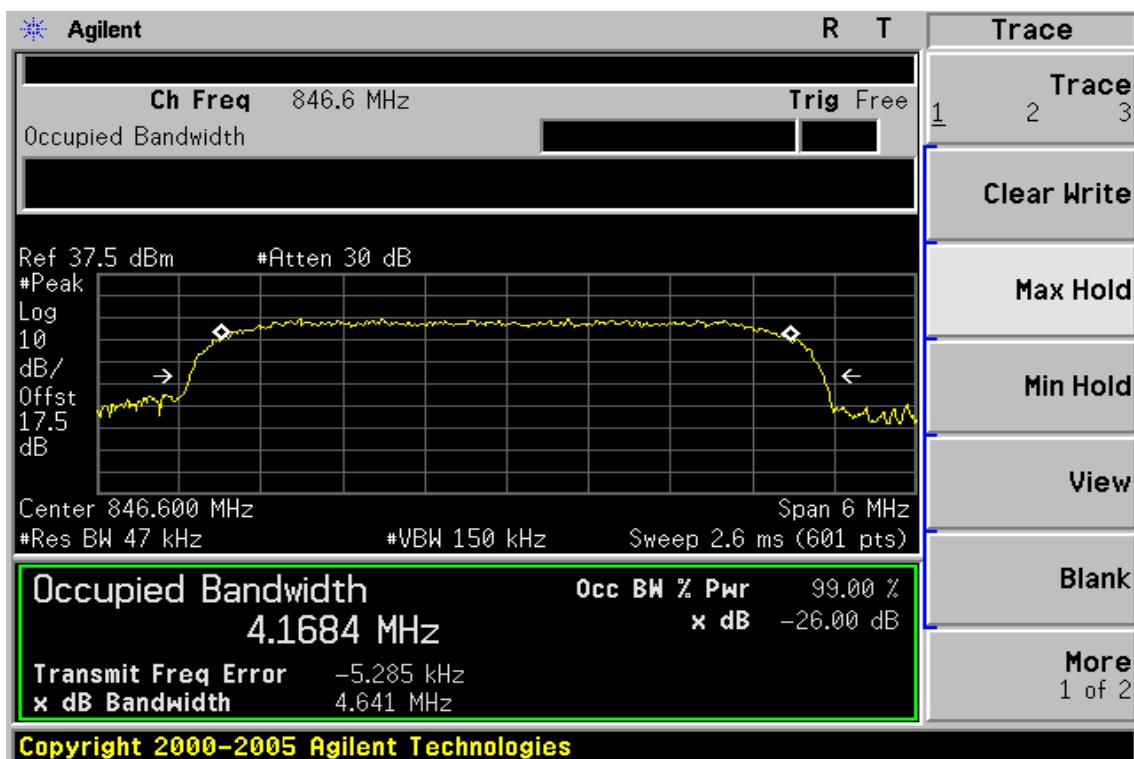


Figure 7-30: HSDPA V Channel High



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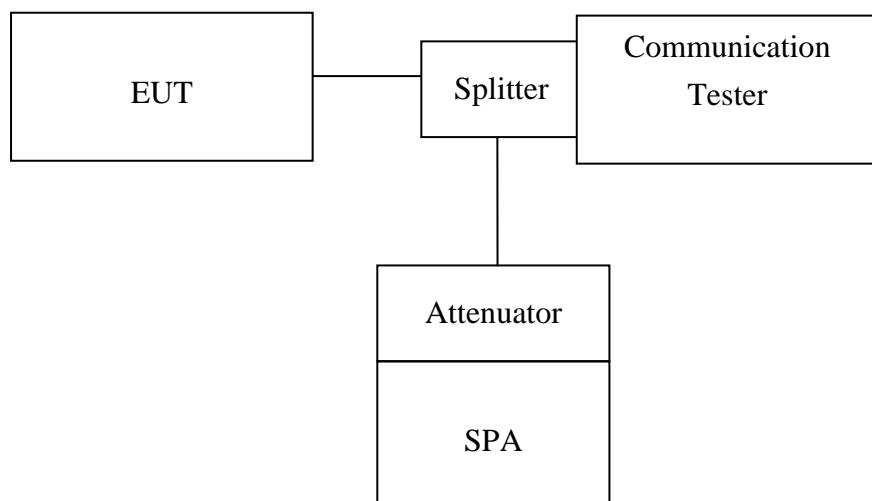
## 8. OUT OF BAND EMISSION AT ANTENNA TERMINALS

### 8.1. 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)

### 8.2. Test SET-UP:



*Note: Measurement setup for testing on Antenna connector*

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### 8.3. 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.

### 8.4. Measurement Equipment Used:

Refer to section 2.4 in this report

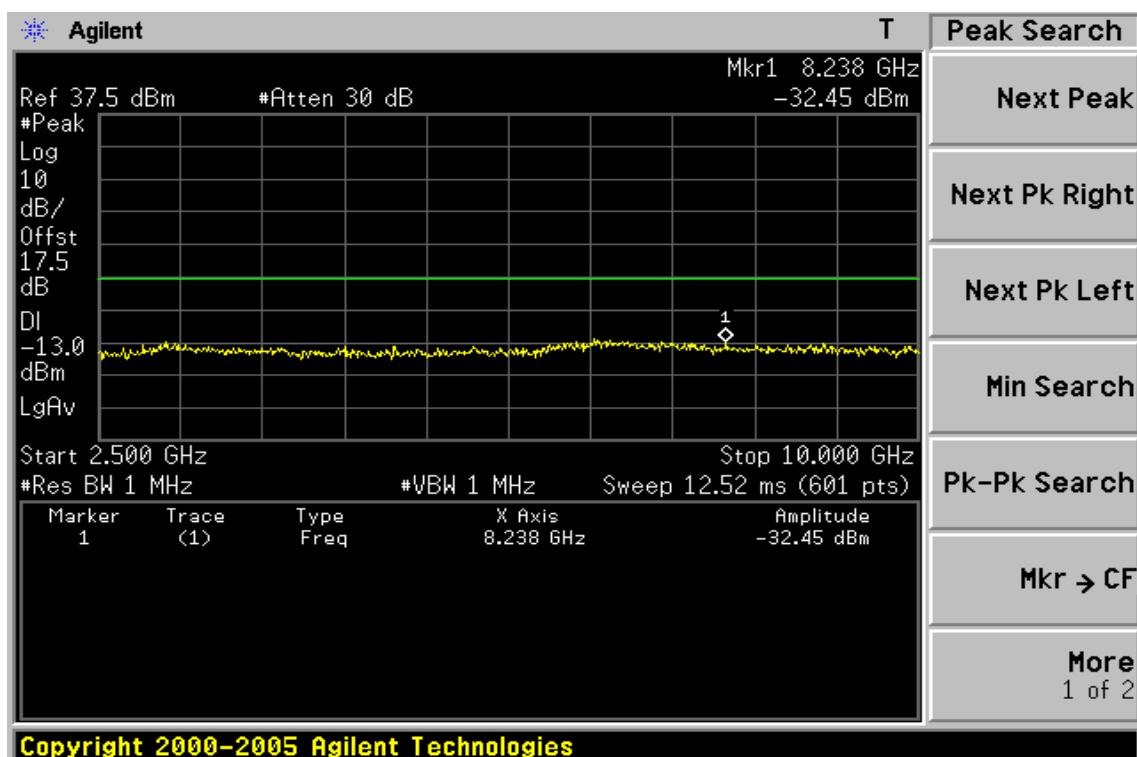
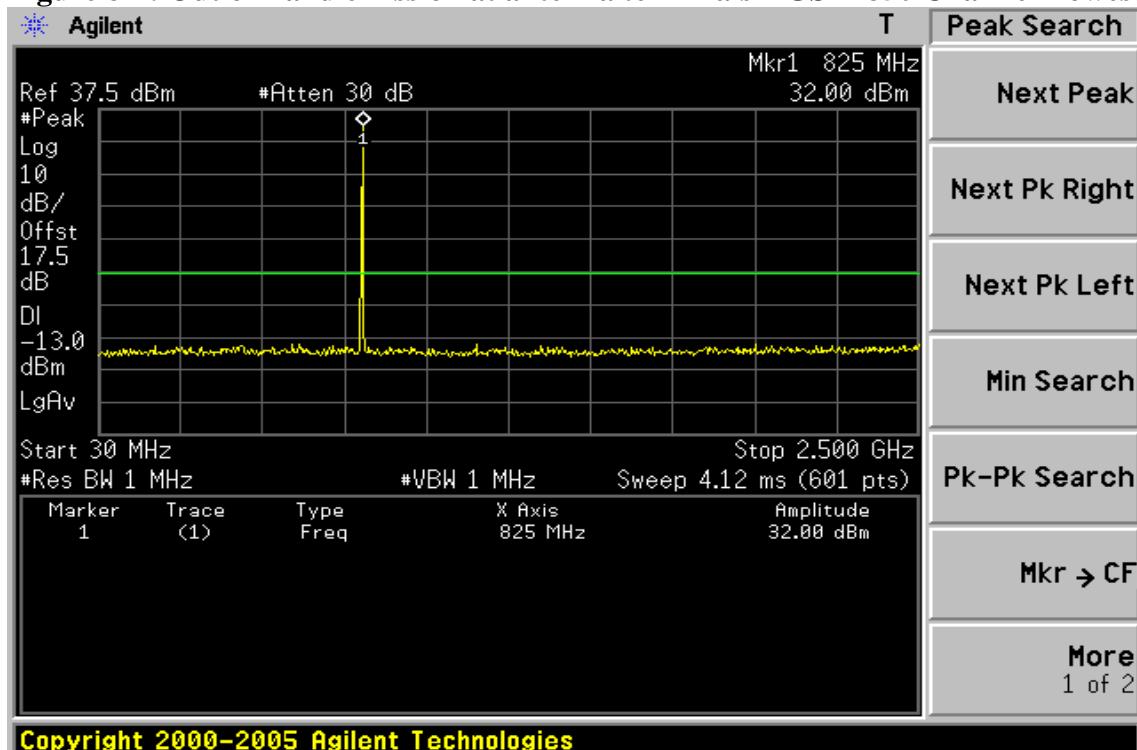
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## 8.5. Measurement Result:

Figure 8-1: Out of Band emission at antenna terminals – GSM 850 Channel Lowest

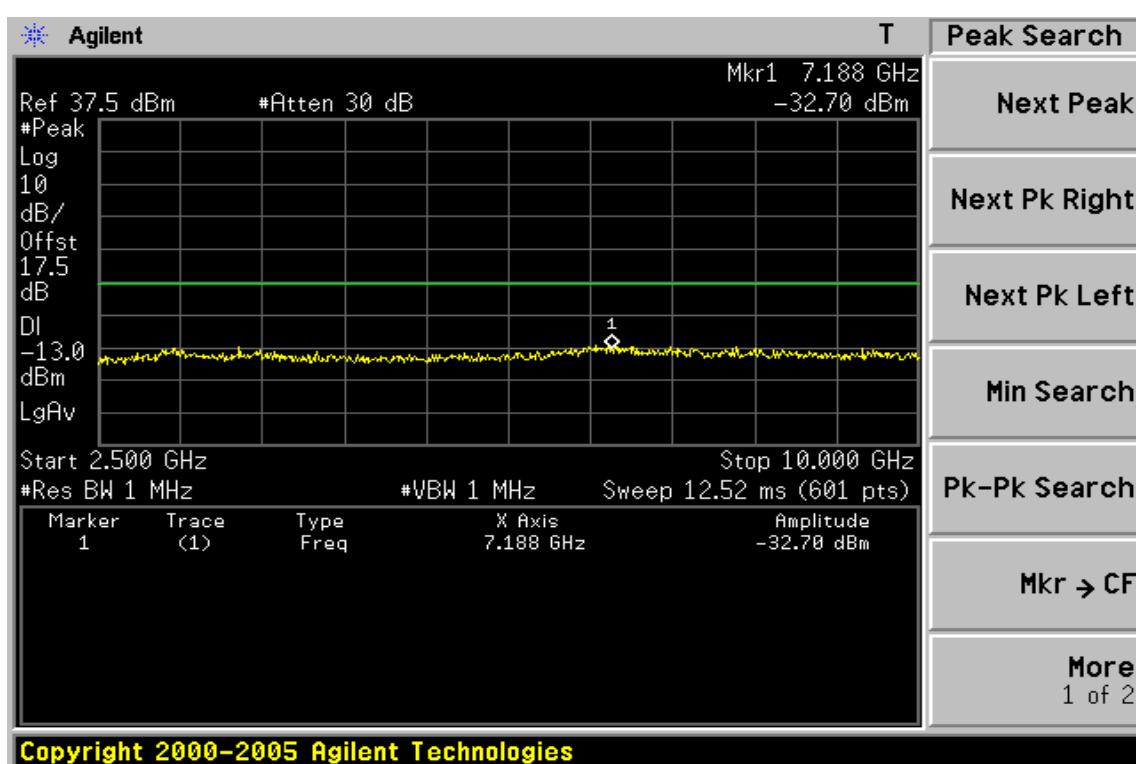
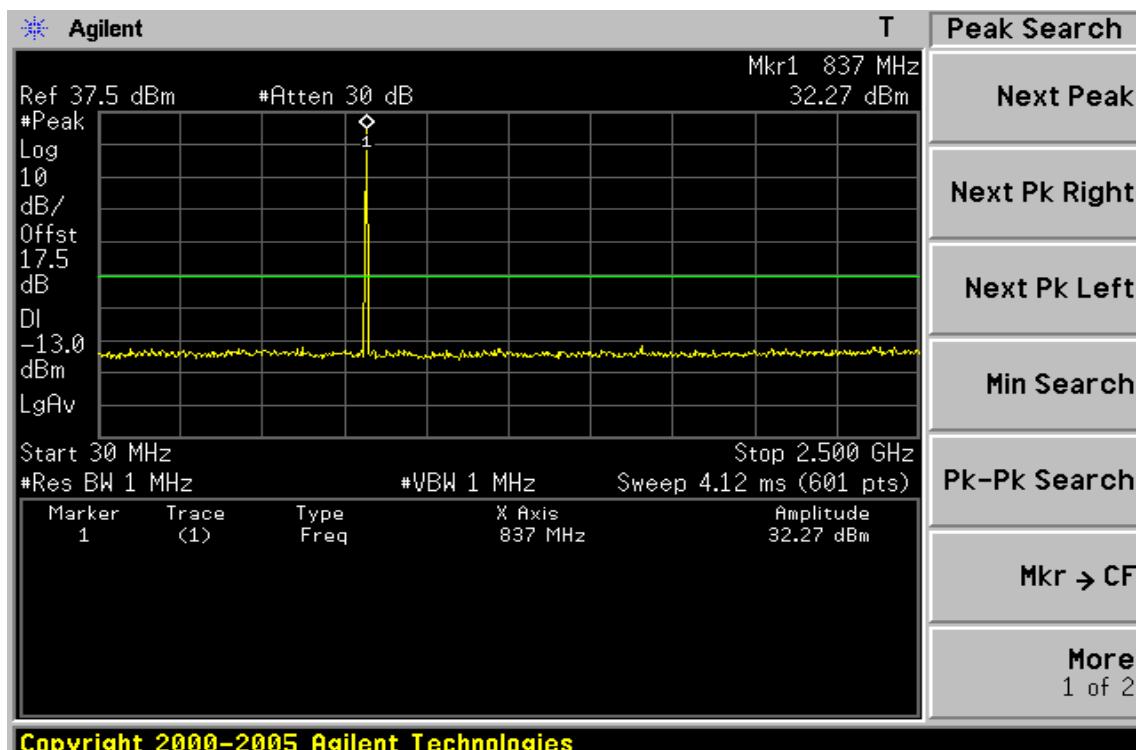


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Figure 8-2: Out of Band emission at antenna terminals – GSM 850 Channel Mid

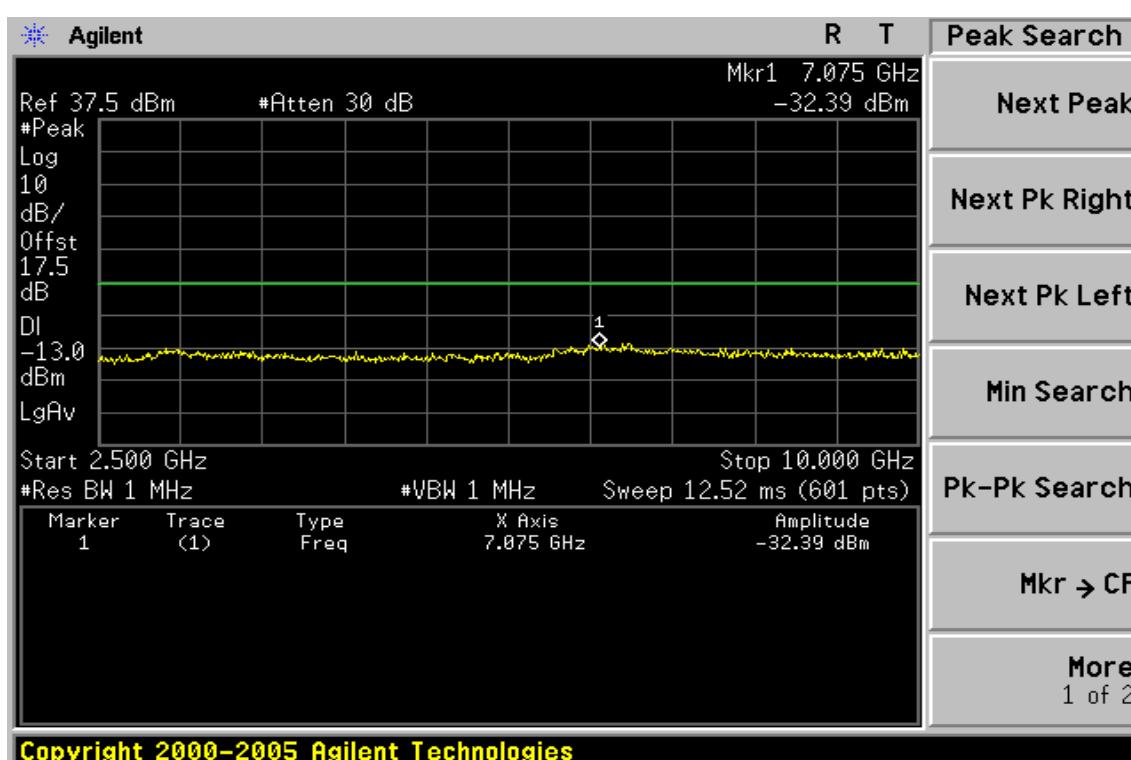
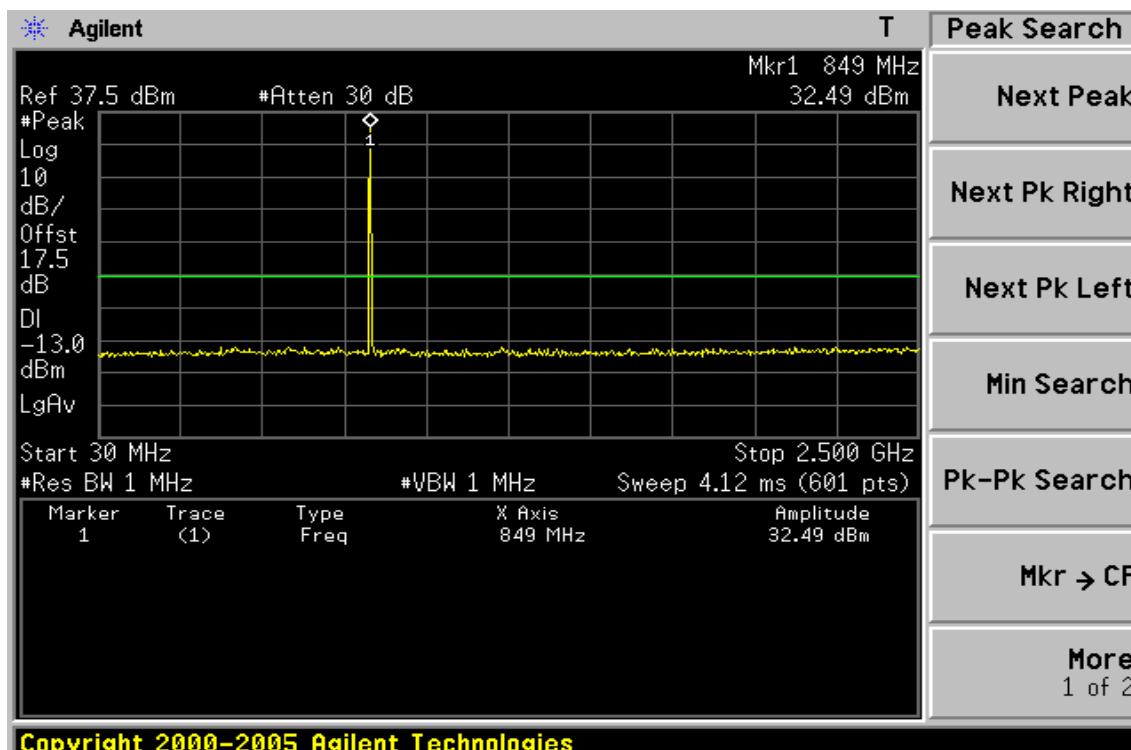


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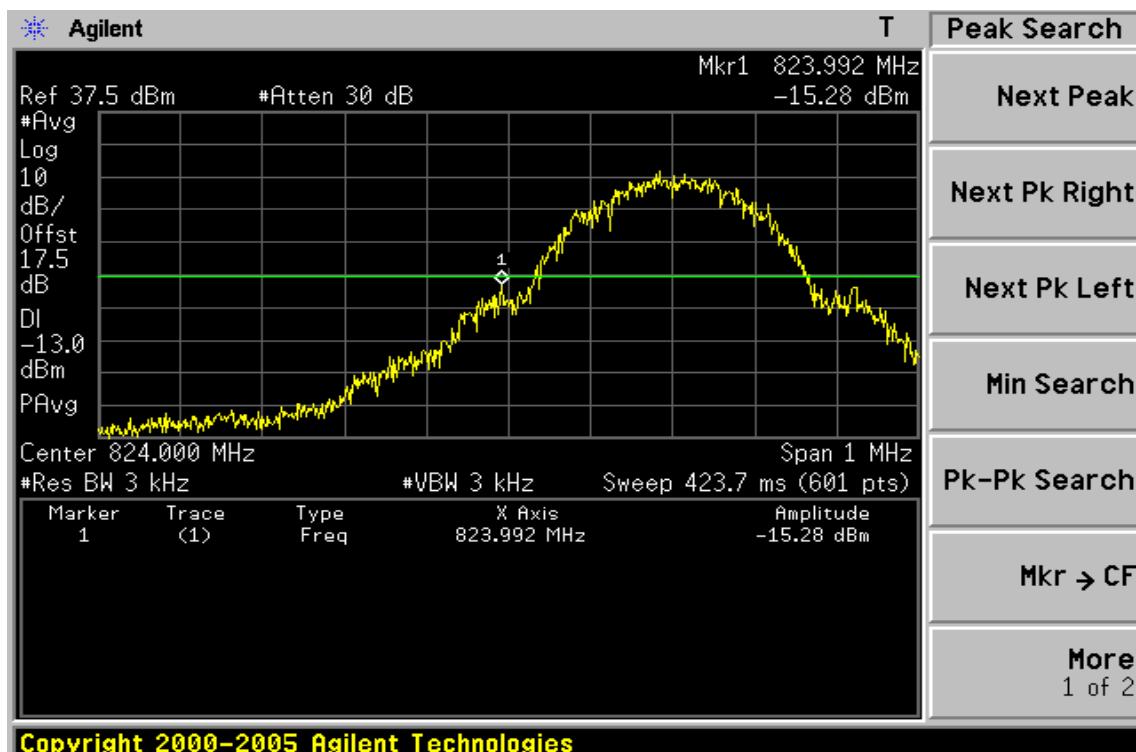
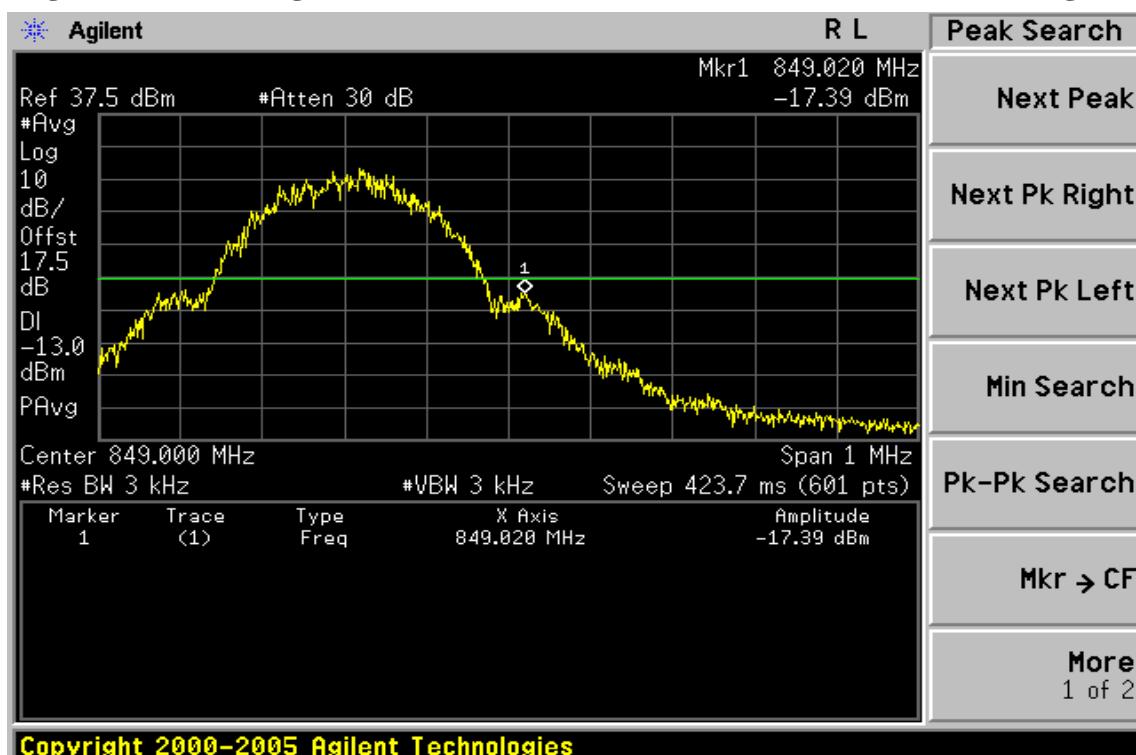
Figure 8-3: Out of Band emission at antenna terminals – GSM 850 Channel Highest



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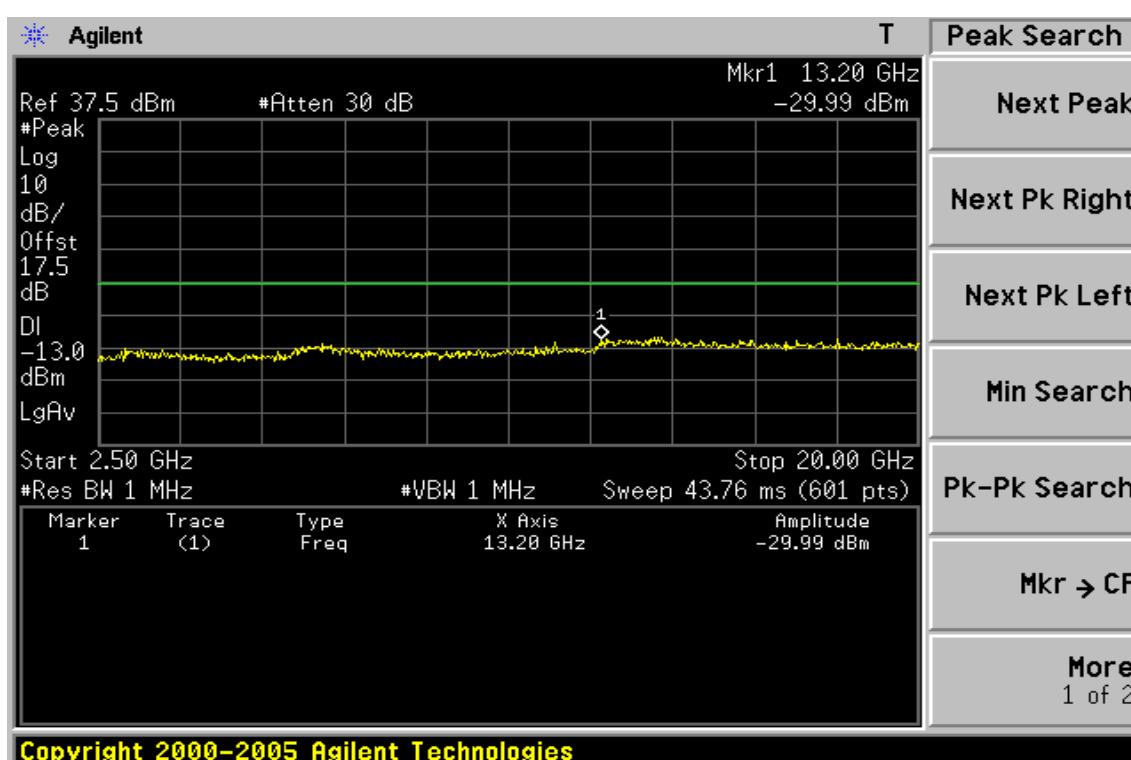
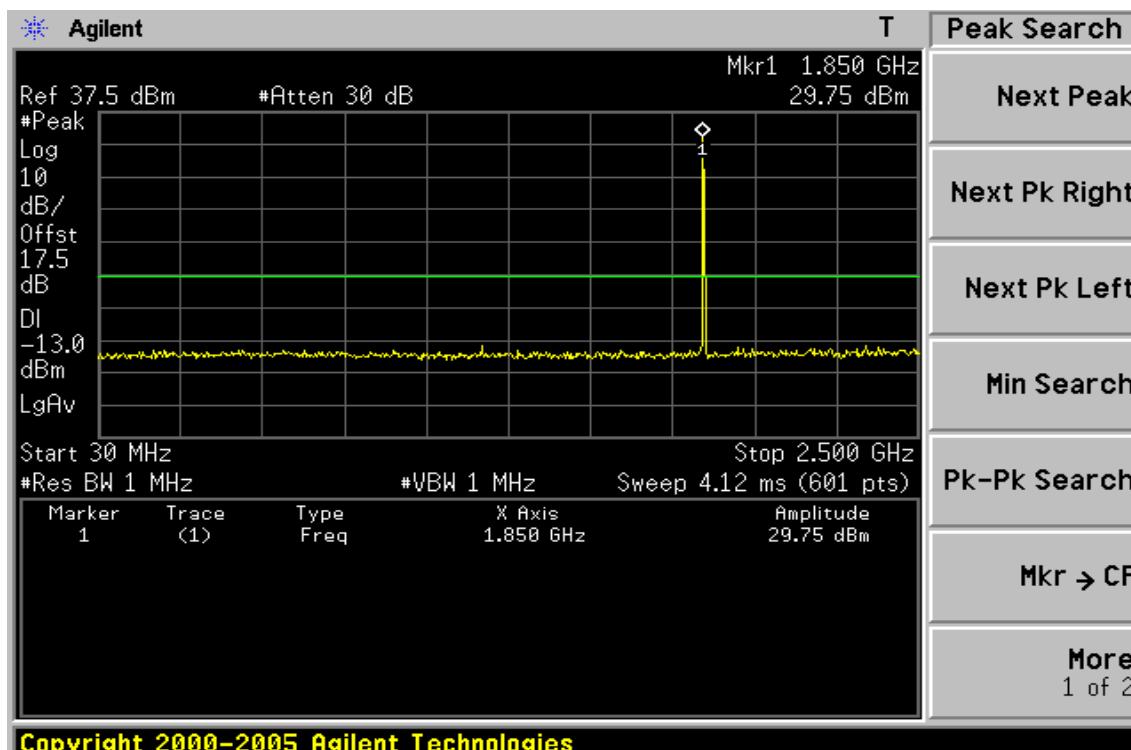
**Figure 8-4: Band edge emission at antenna terminals – GSM 850 Channel Lowest**

**Figure 8-5: Band edge emission at antenna terminals – GSM 850 Channel Highest**


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Figure 8-6: Out of Band emission at antenna terminals – GSM 1900 Channel Lowest

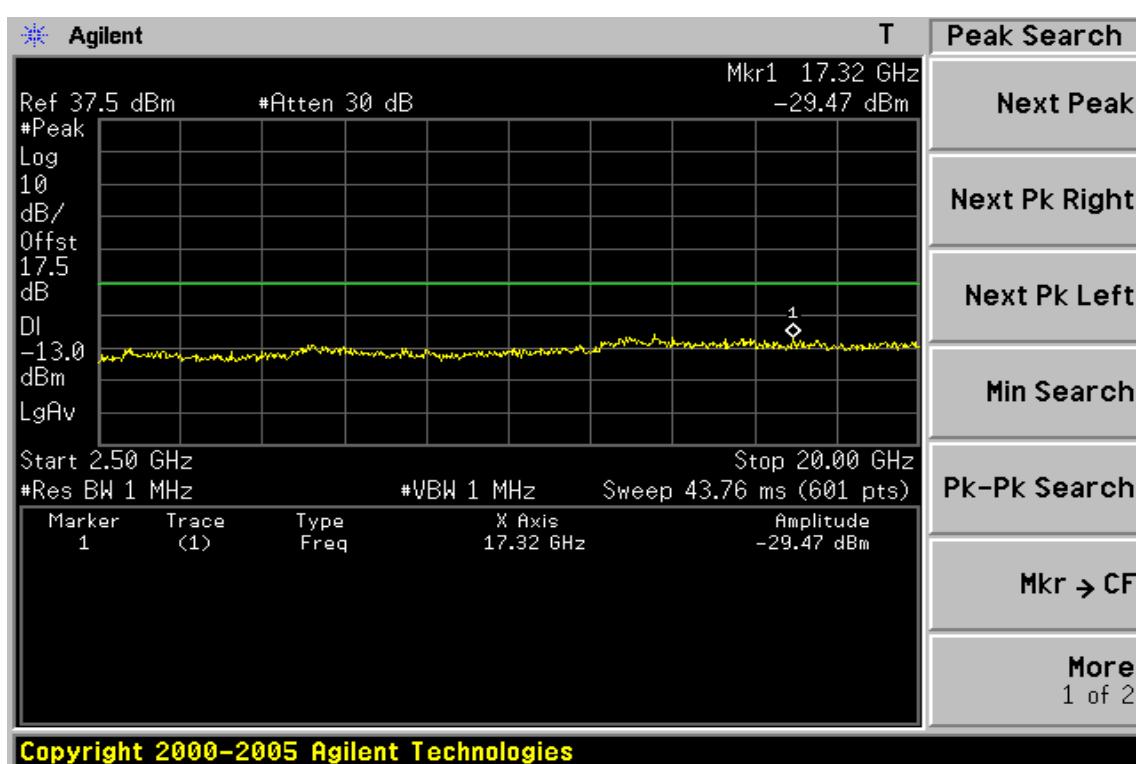
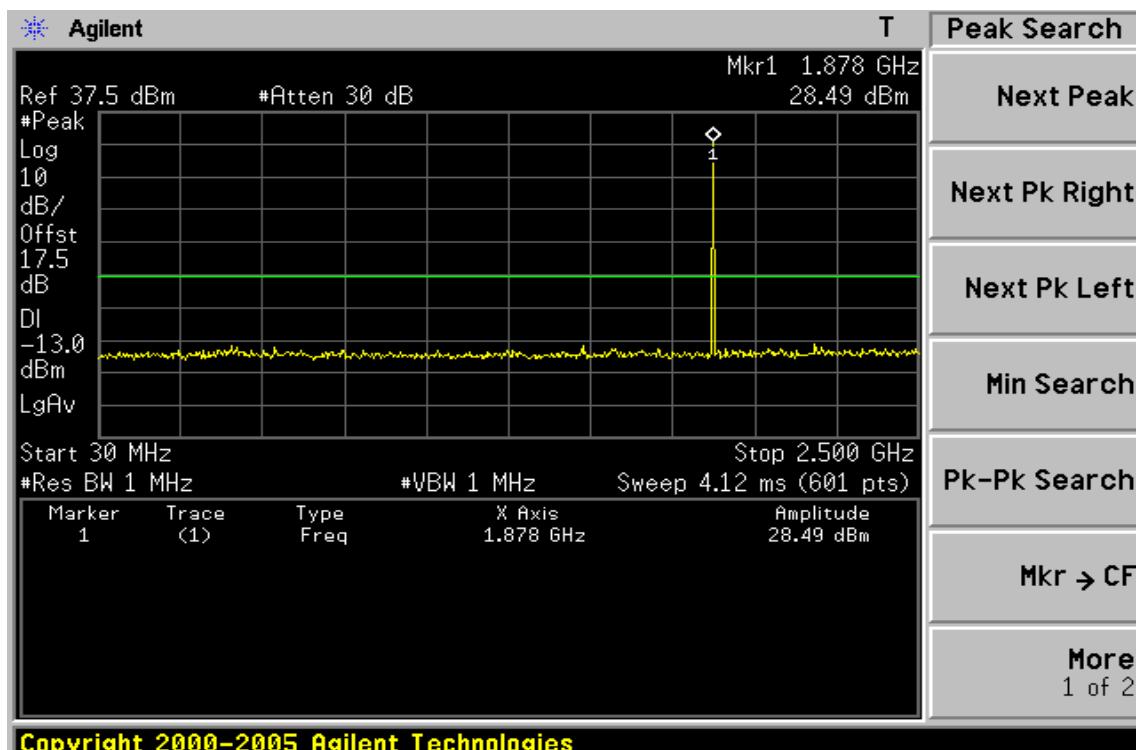


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Figure 8-7: Out of Band emission at antenna terminals – GSM 1900 Channel Mid

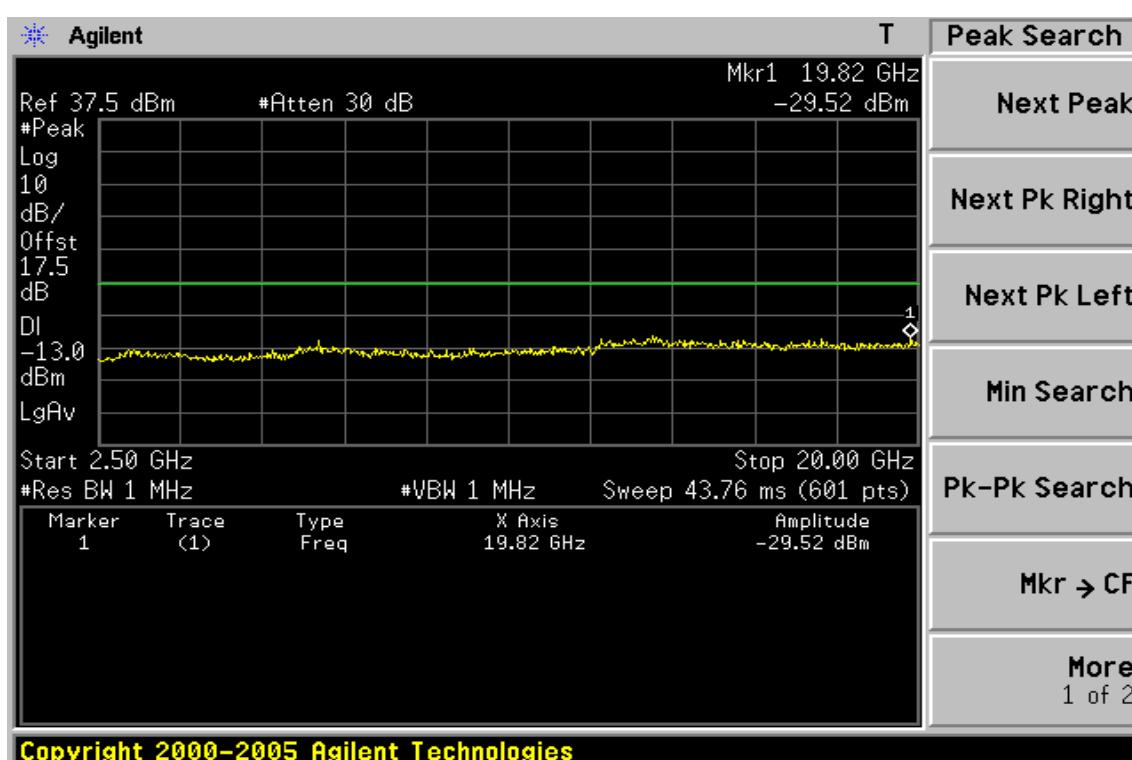
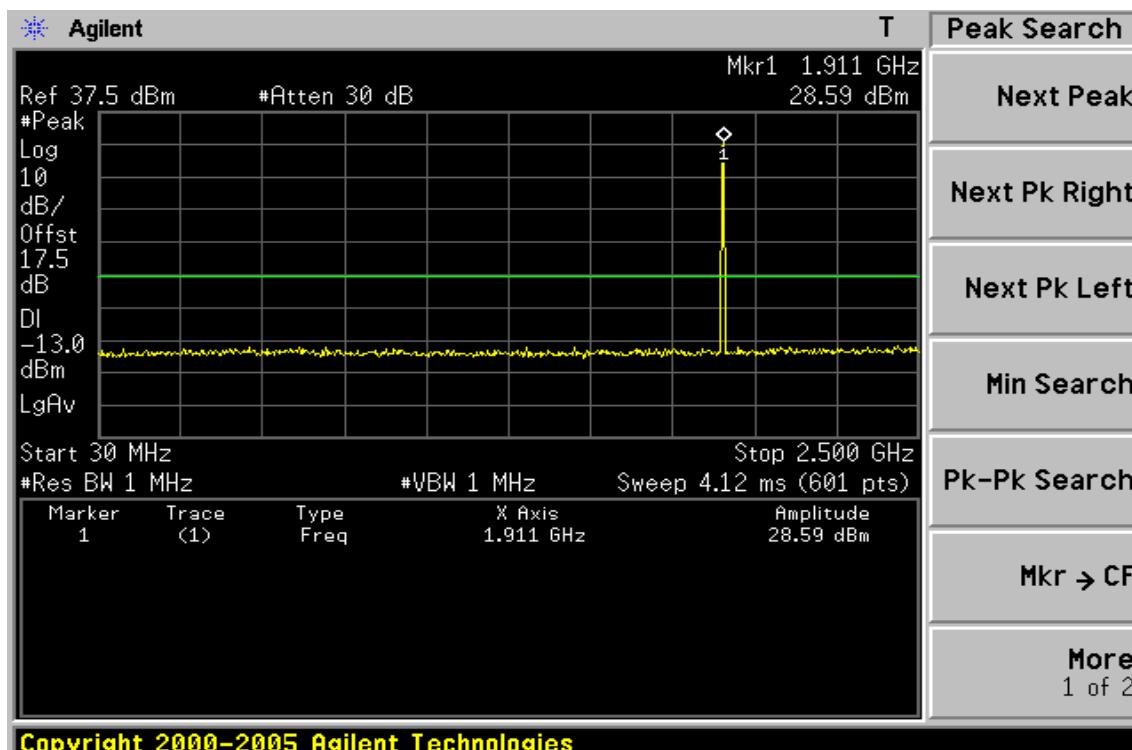


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Figure 8-8: Out of Band emission at antenna terminals – GSM 1900 Channel Highest



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Figure 8-9: Band edge emission at antenna terminals – GSM 1900 Channel Lowest

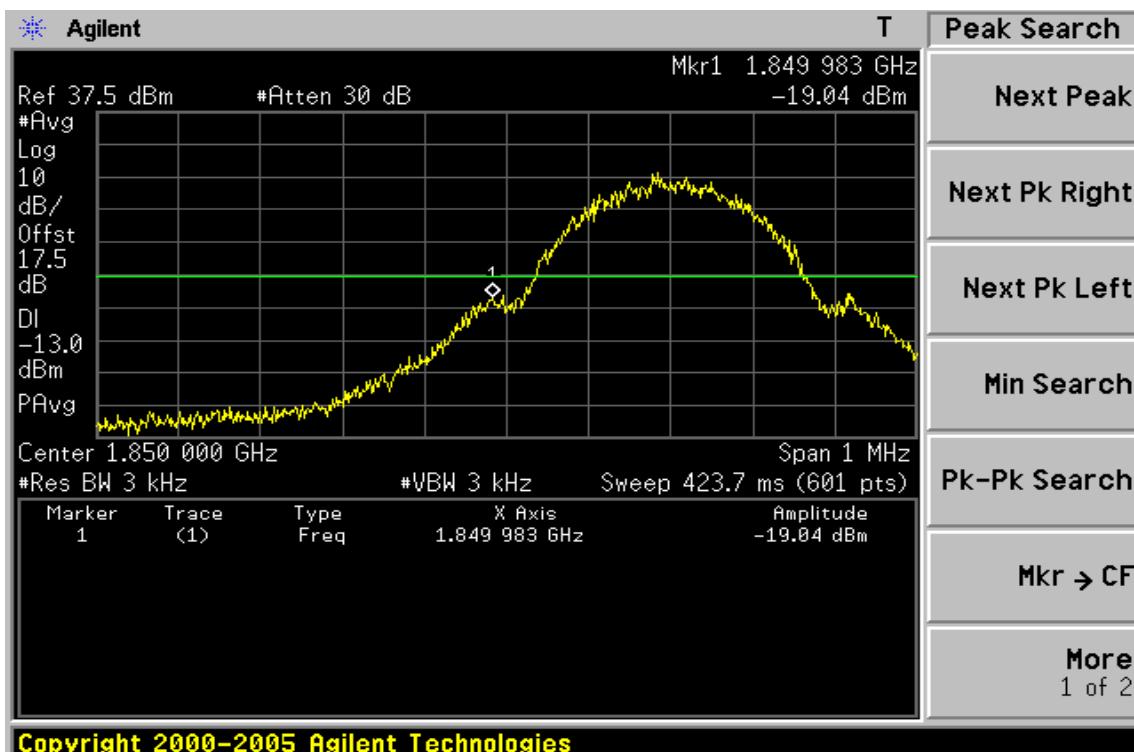
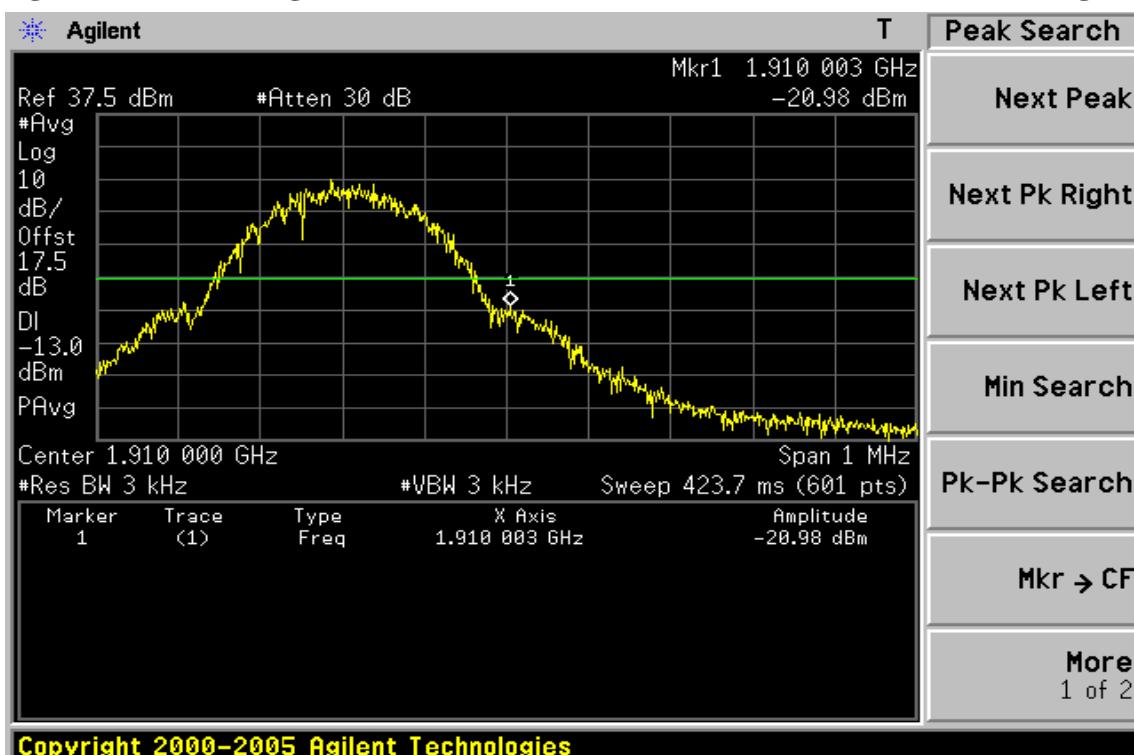


Figure 8-10: Band edge emission at antenna terminals – GSM 1900 Channel Highest

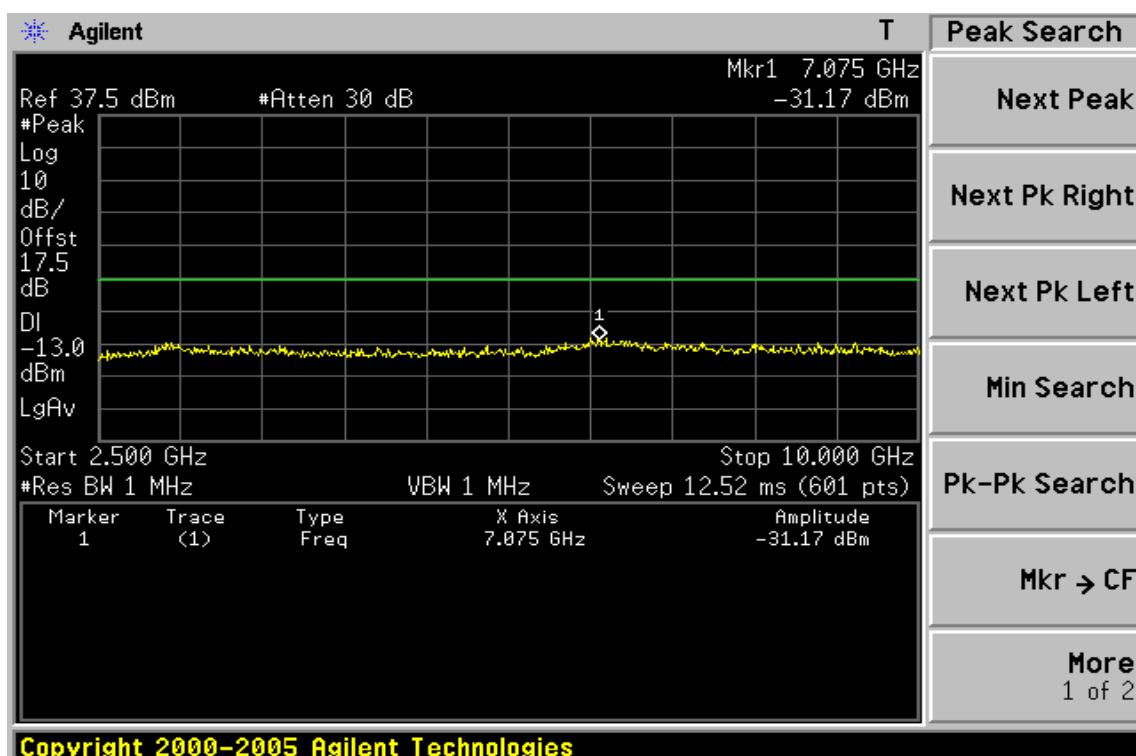
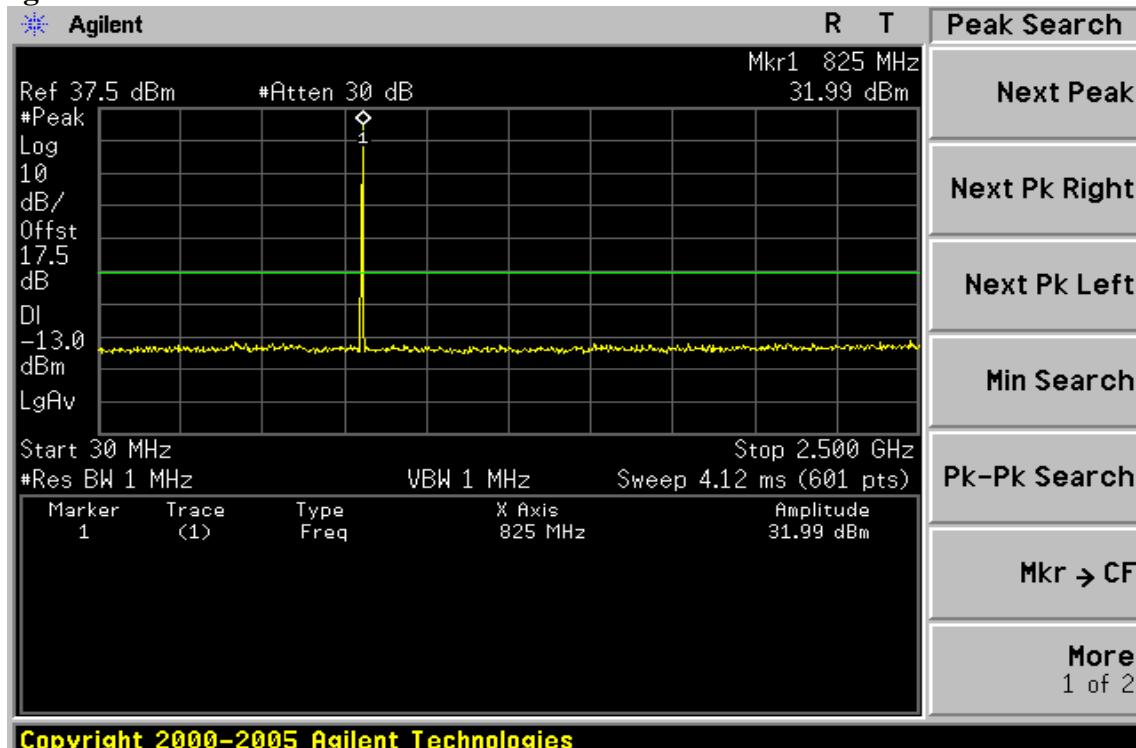


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Figure 8-11: Out of Band emission at antenna terminals – GPRS 850 Channel Lowest

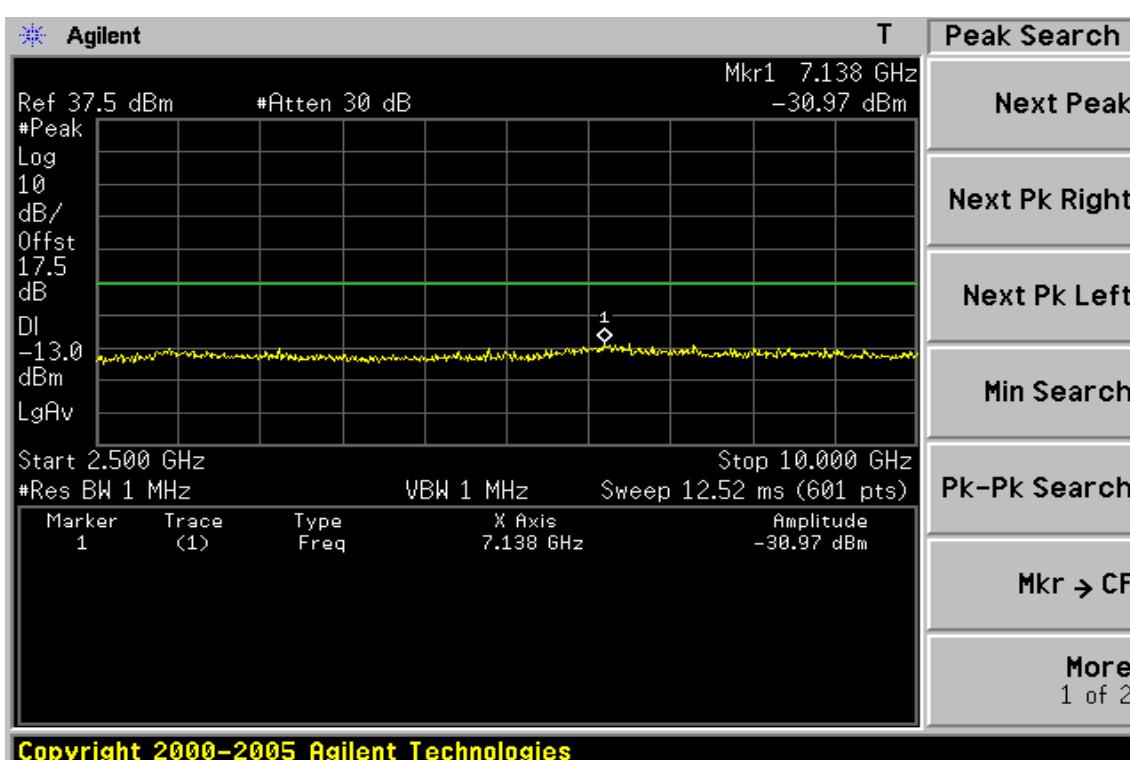
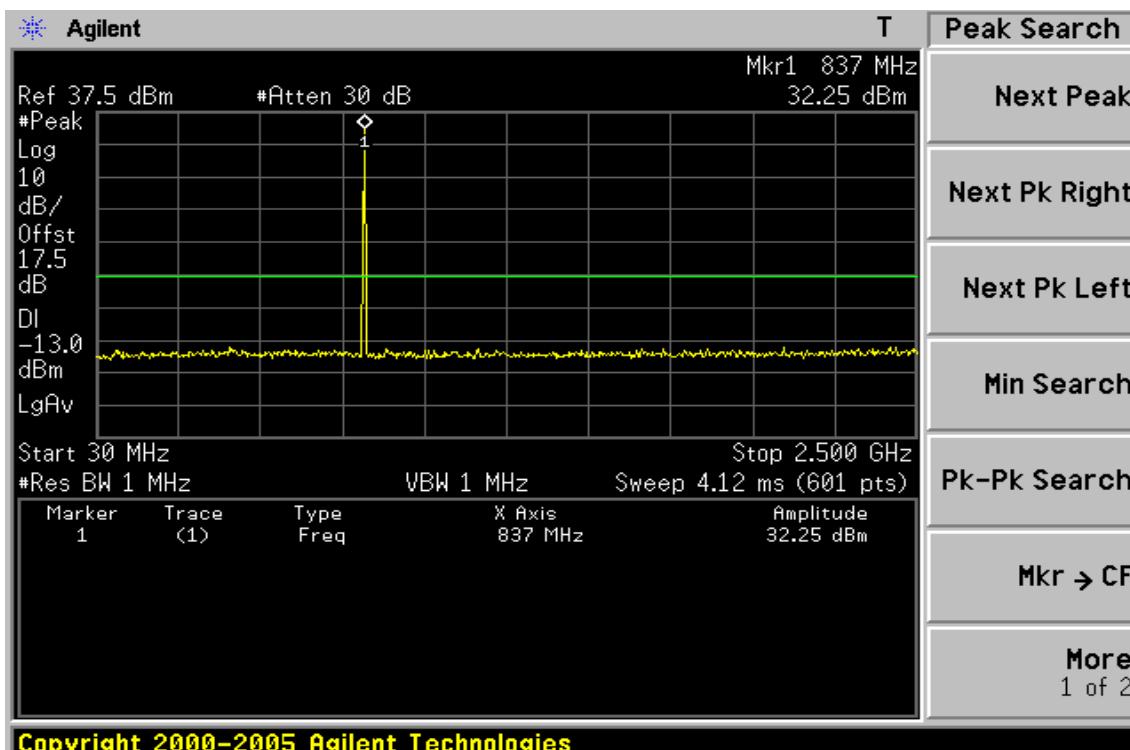


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Figure 8-12: Out of Band emission at antenna terminals – GPRS 850 Channel Mid

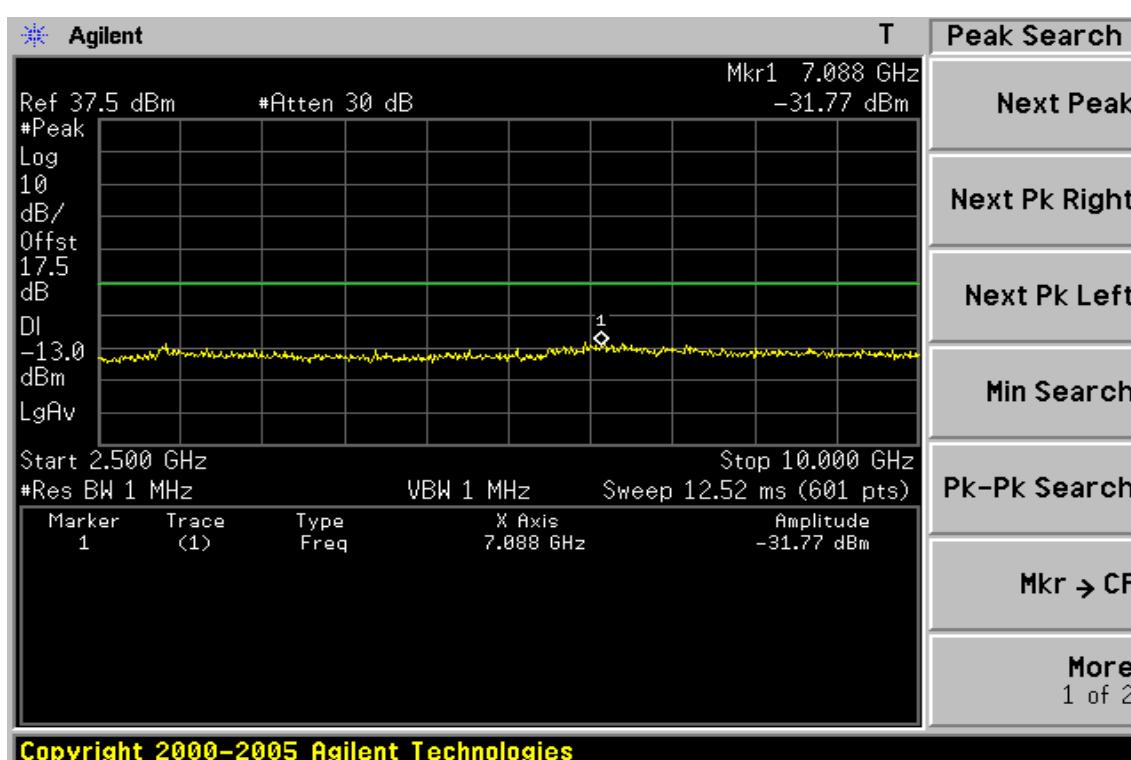
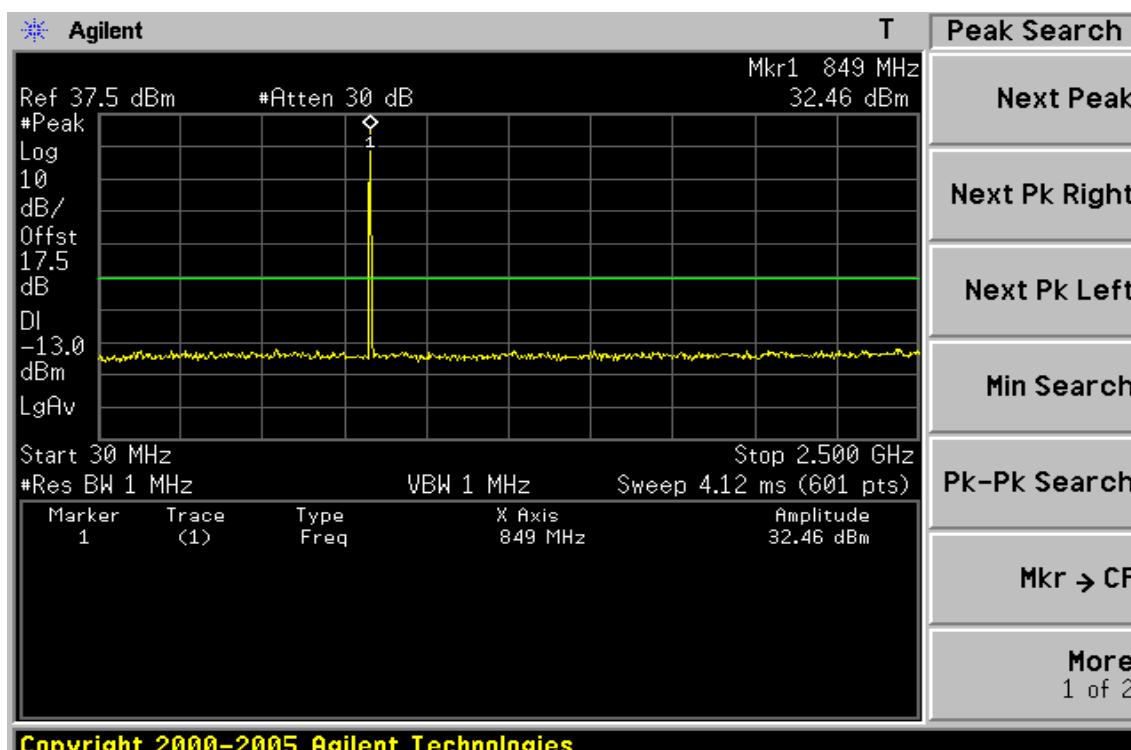


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Figure 8-13: Out of Band emission at antenna terminals – GPRS 850 Channel Highest



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Figure 8-14: Band edge emission at antenna terminals – GPRS 850 Channel Lowest

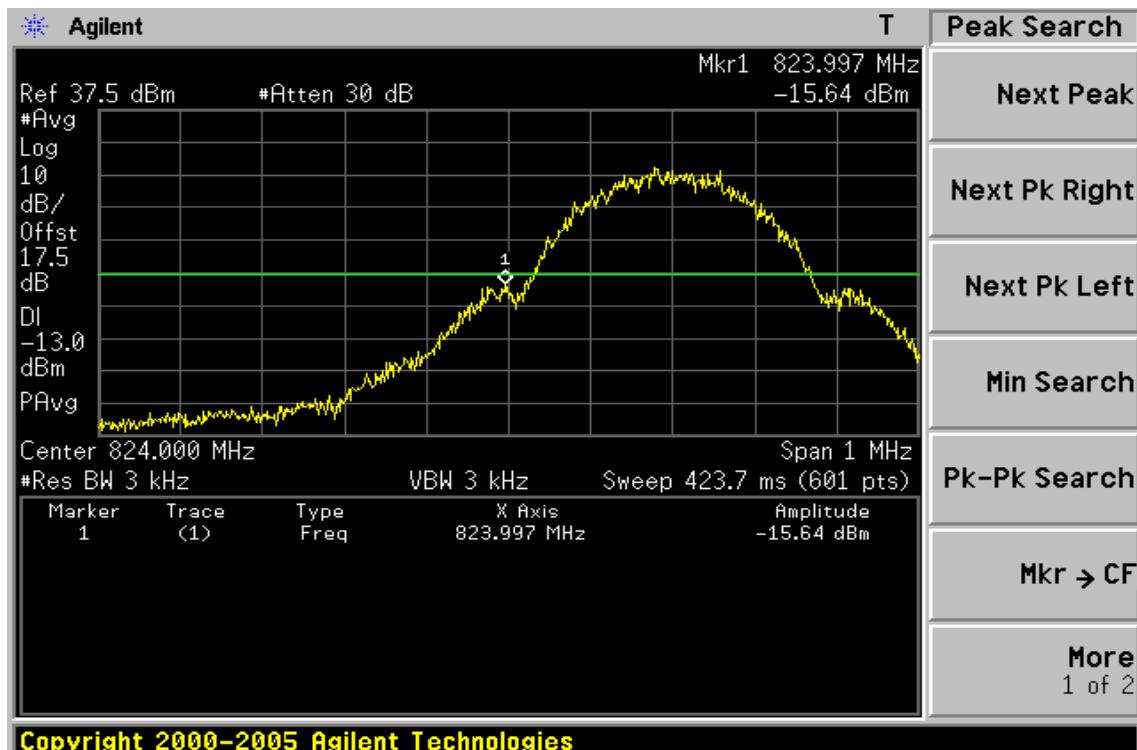
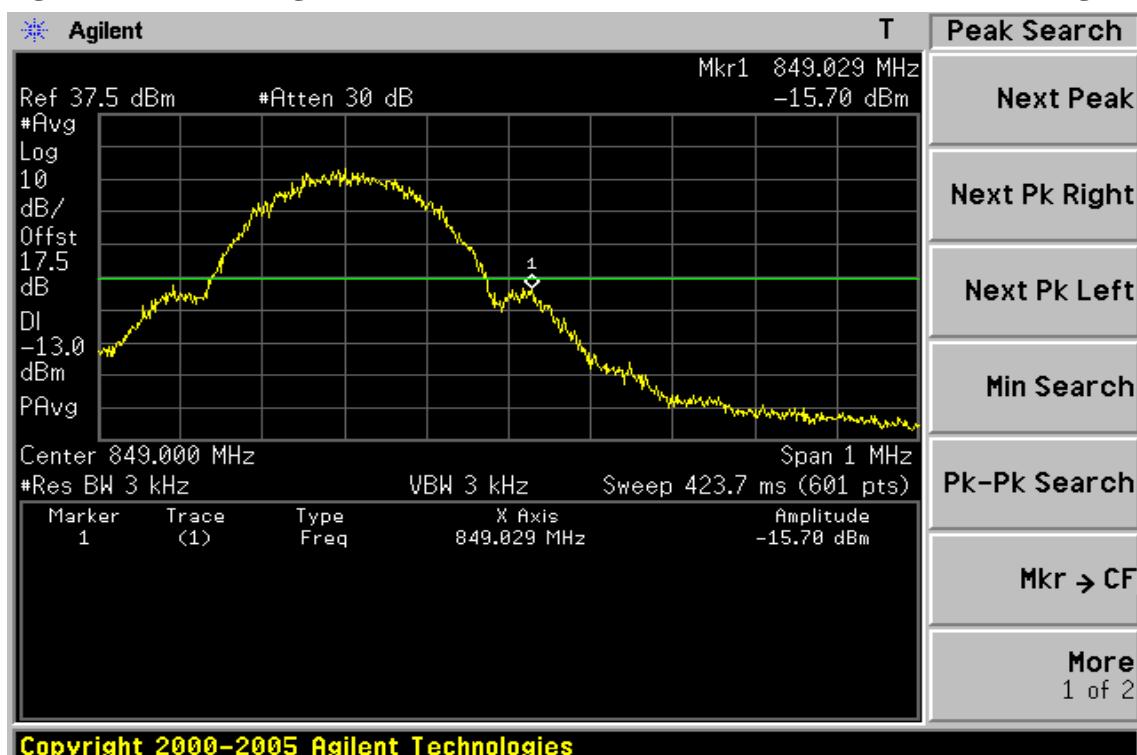


Figure 8-15: Band edge emission at antenna terminals – GPRS 850 Channel Highest

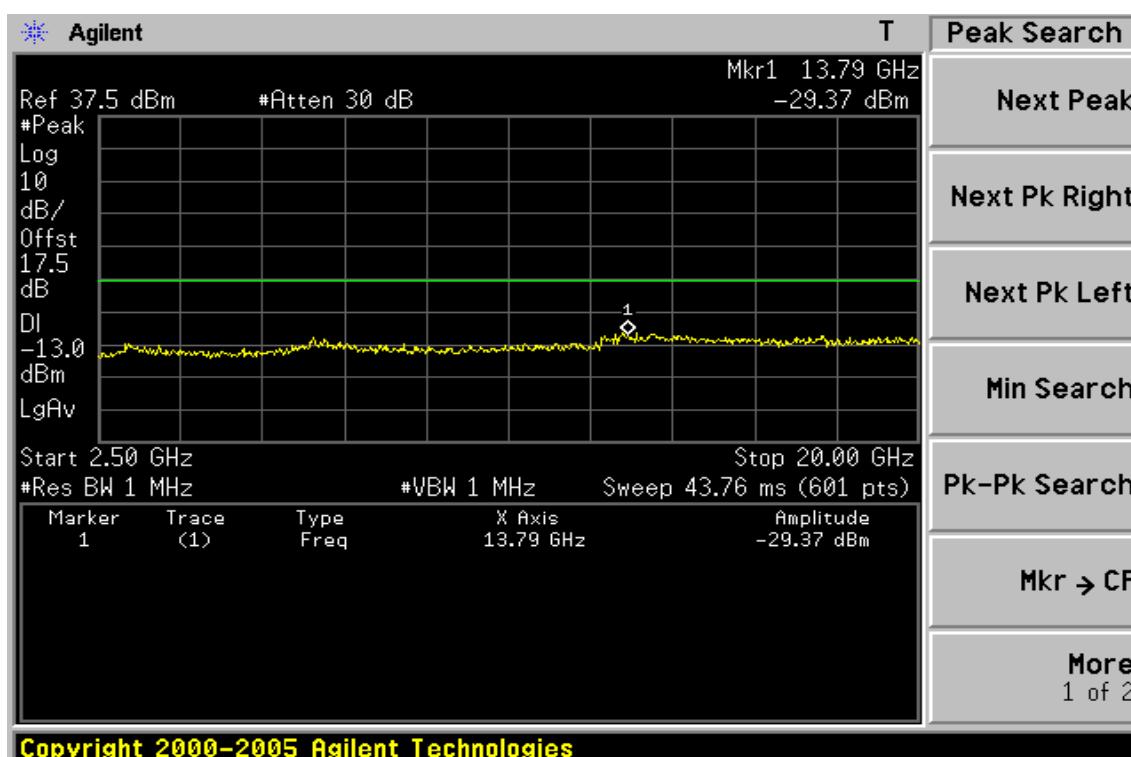
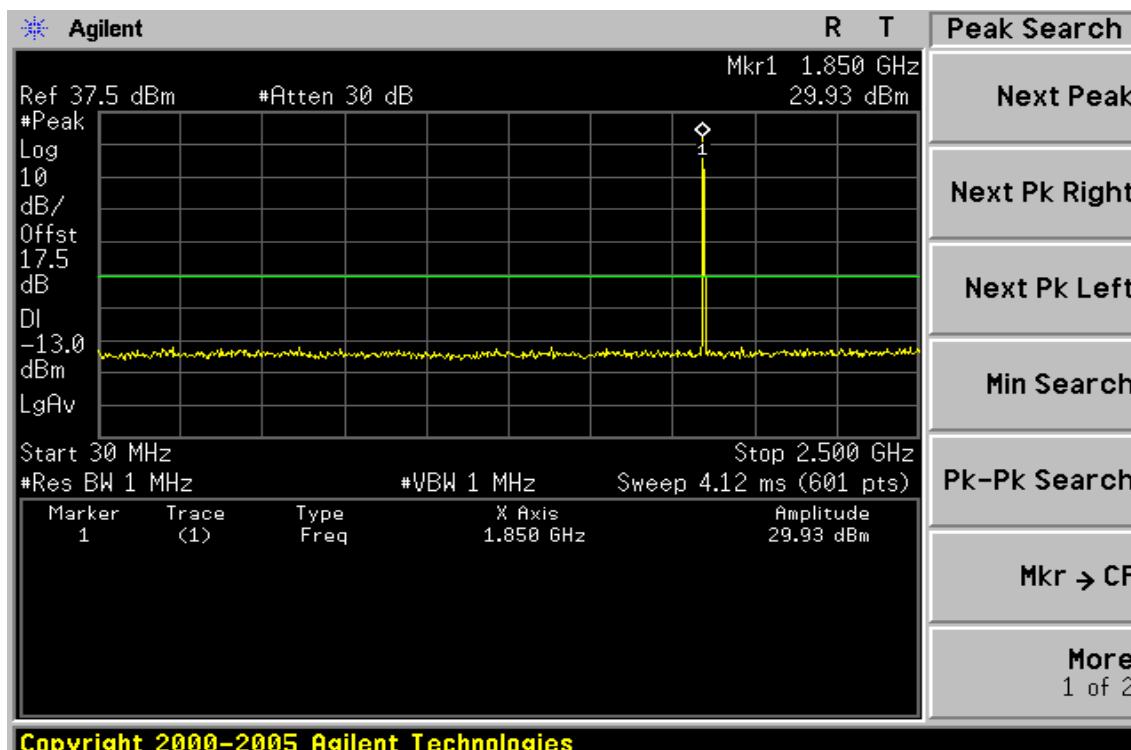


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Figure 8-16: Out of Band emission at antenna terminals – GPRS 1900 Channel Lowest

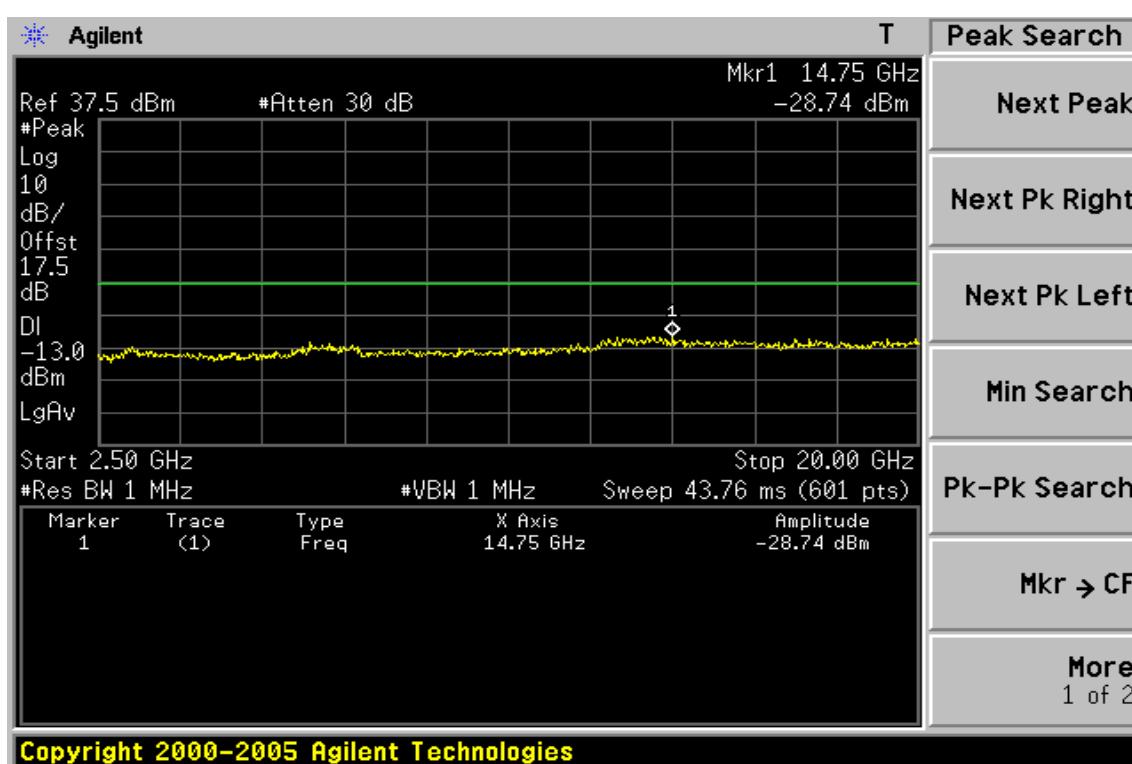
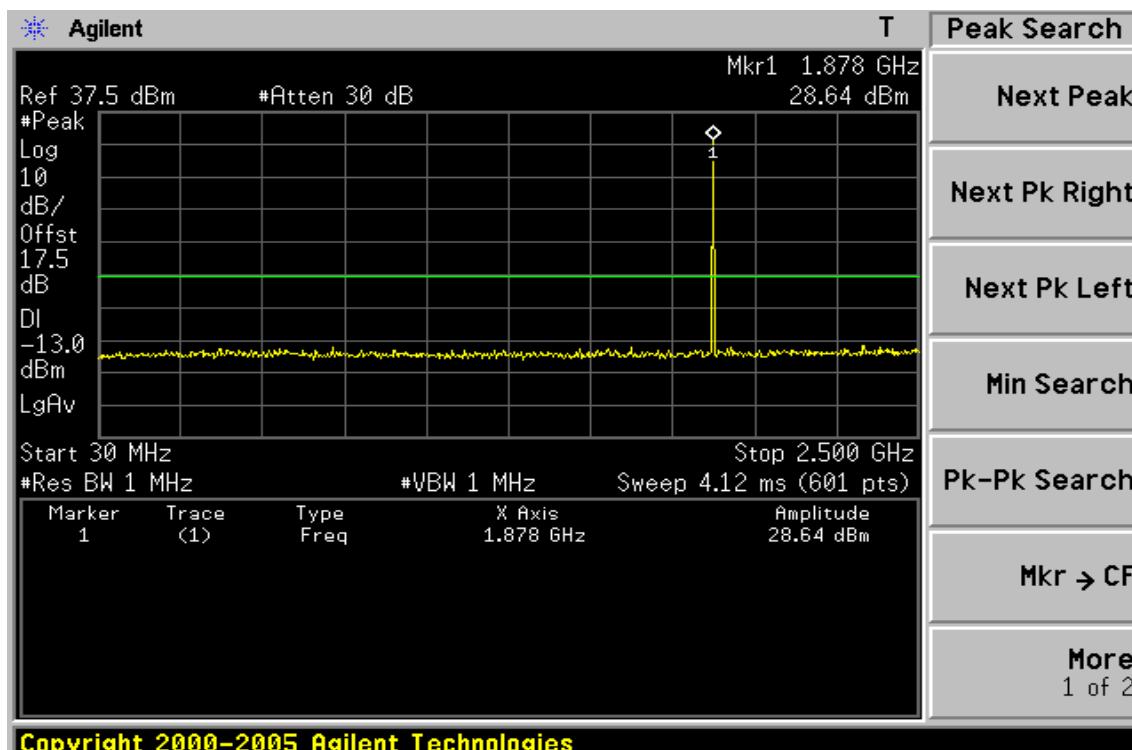


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Figure 8-17: Out of Band emission at antenna terminals – GPRS 1900 Channel Mid

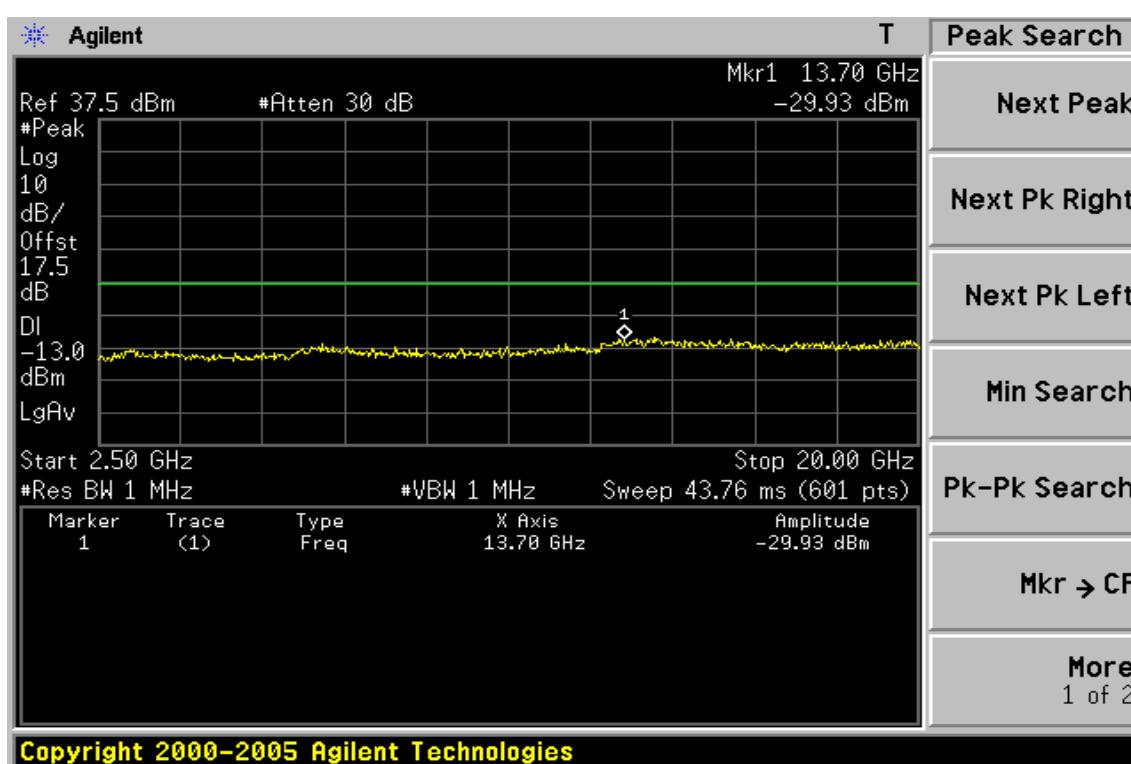
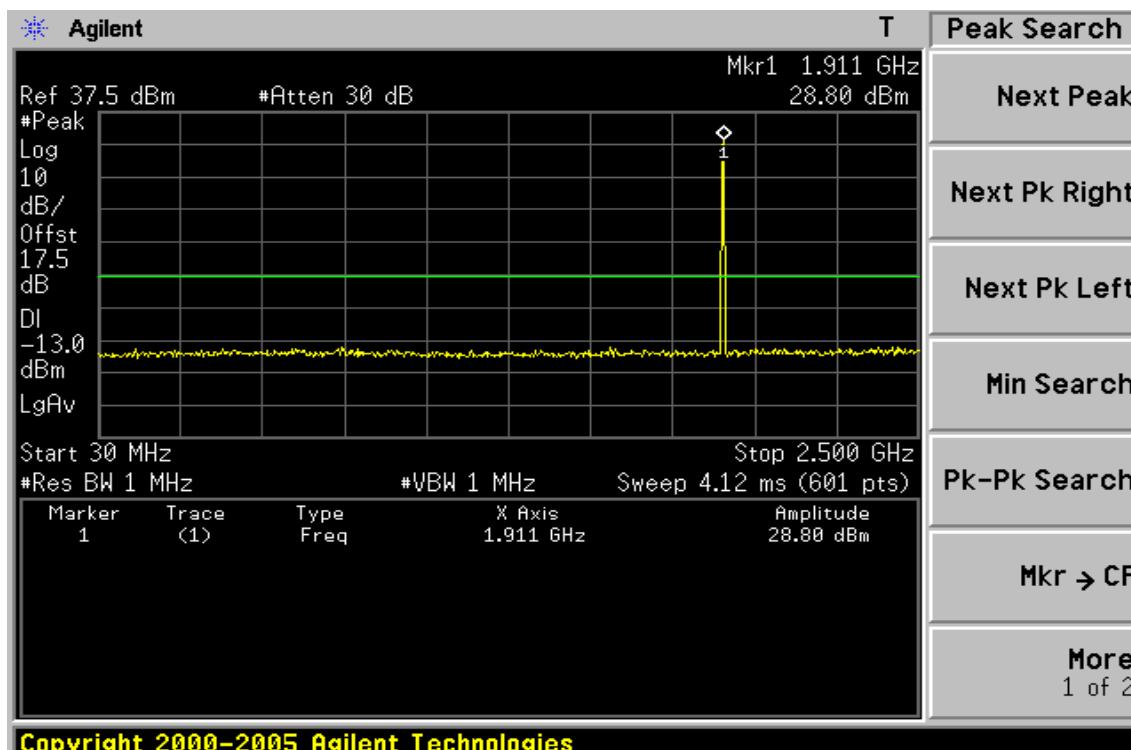


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Figure 8-18: Out of Band emission at antenna terminals – GPRS 1900 Channel Highest



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Figure 8-19: Band edge emission at antenna terminals – GPRS 1900 Channel Lowest

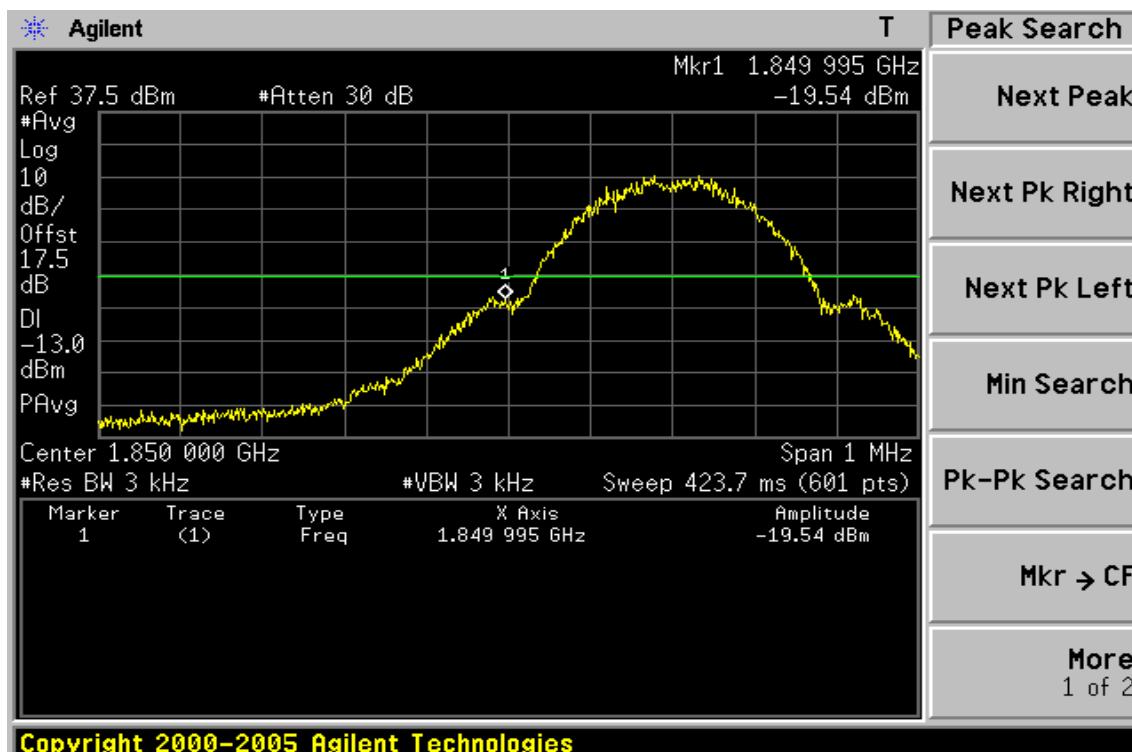
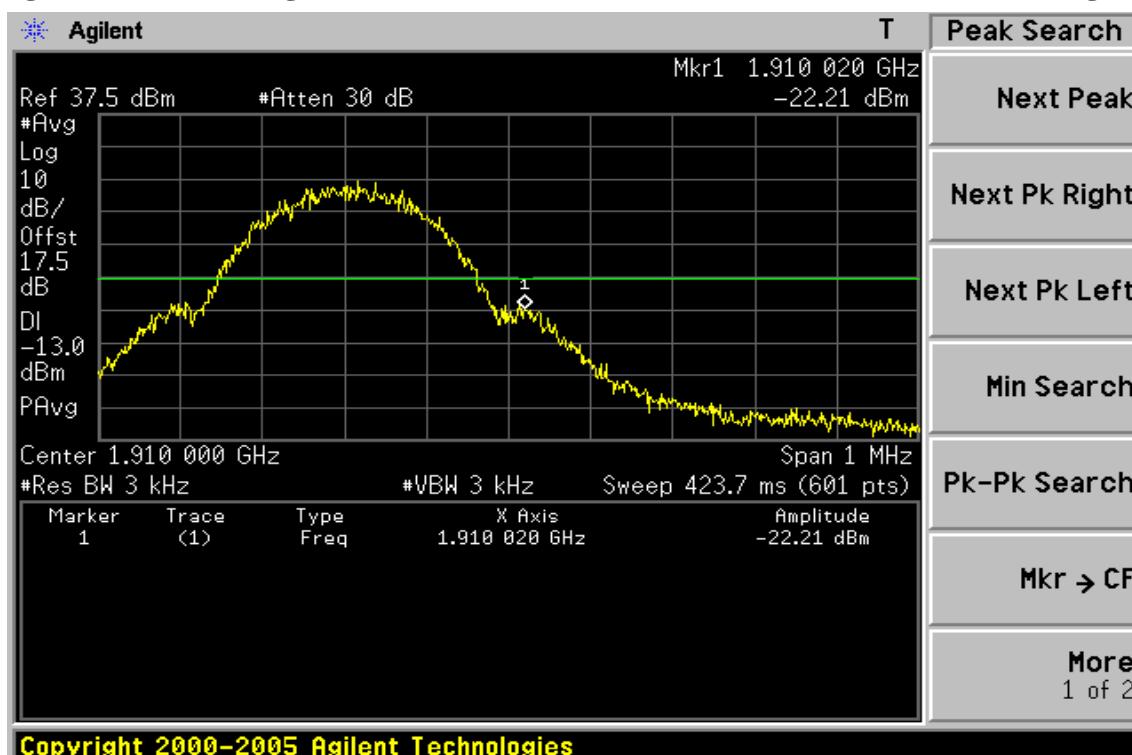


Figure 8-20: Band edge emission at antenna terminals – GPRS 1900 Channel Highest

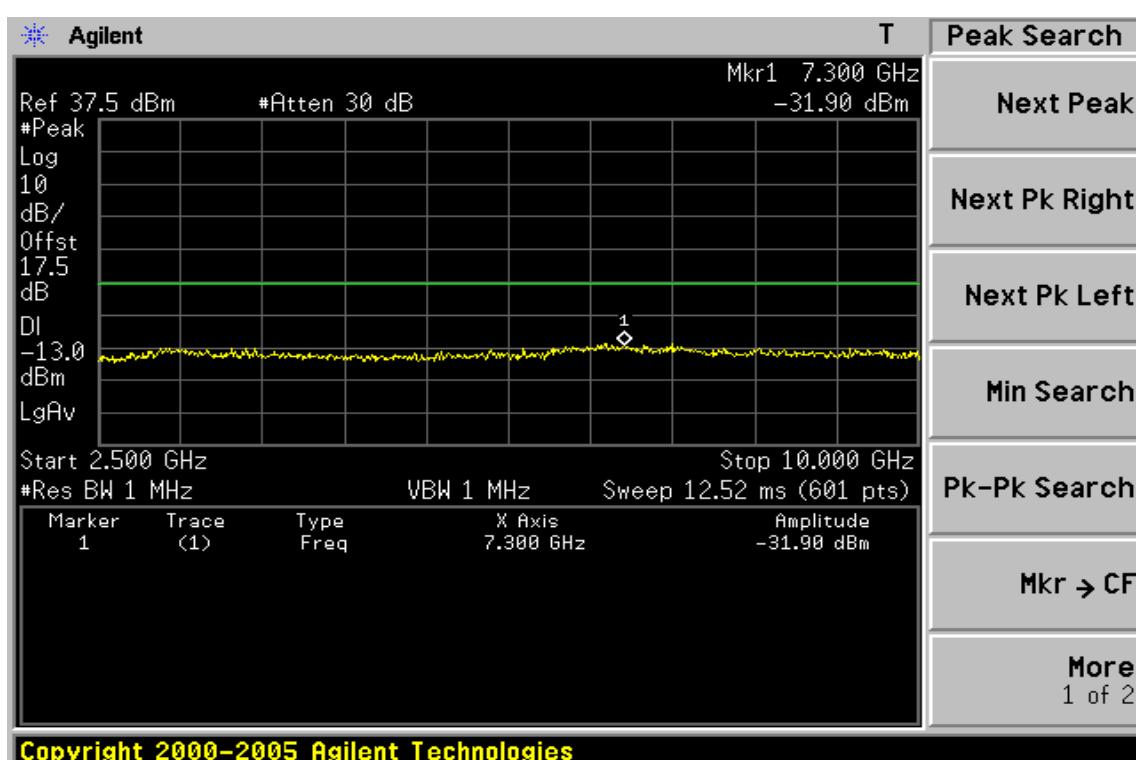
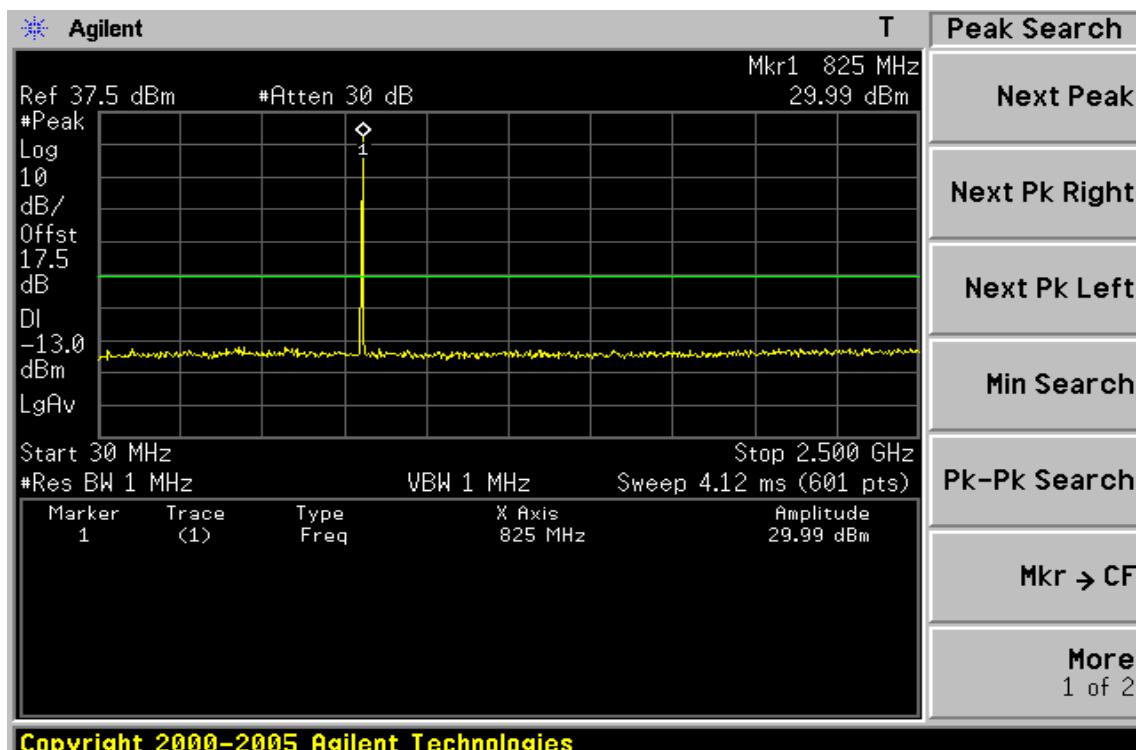


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Figure 8-21: Out of Band emission at antenna terminals – EDGE 850 Channel Lowest

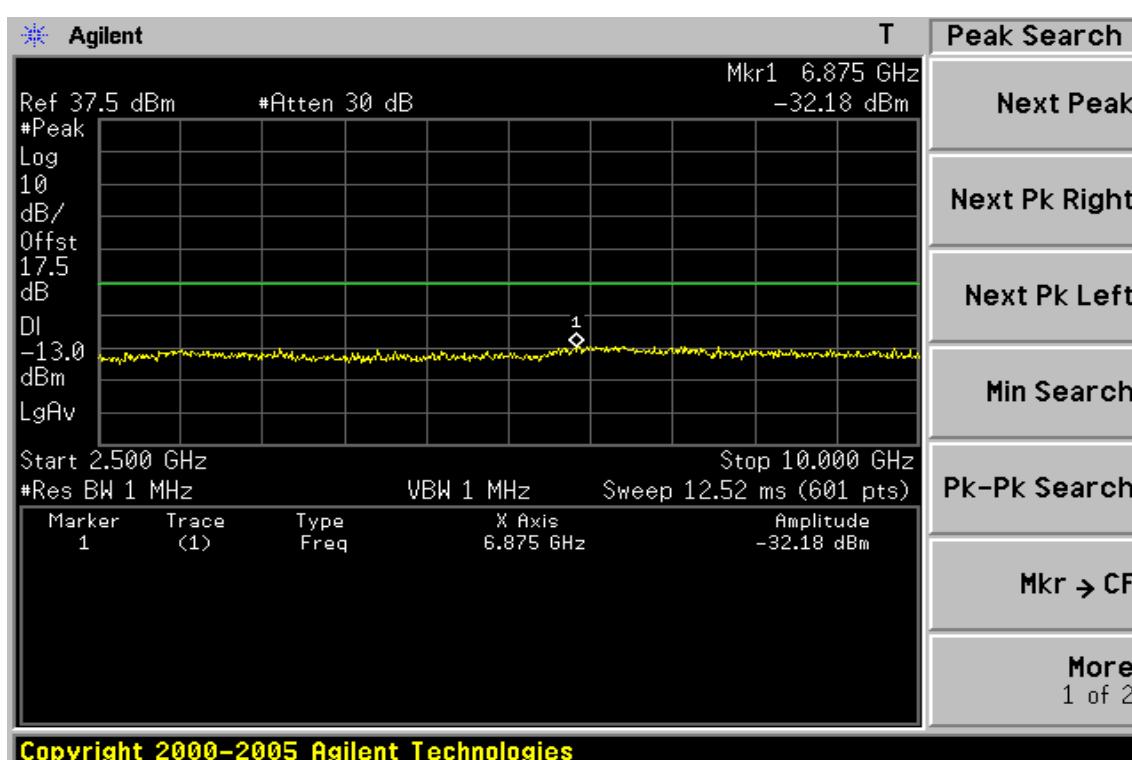
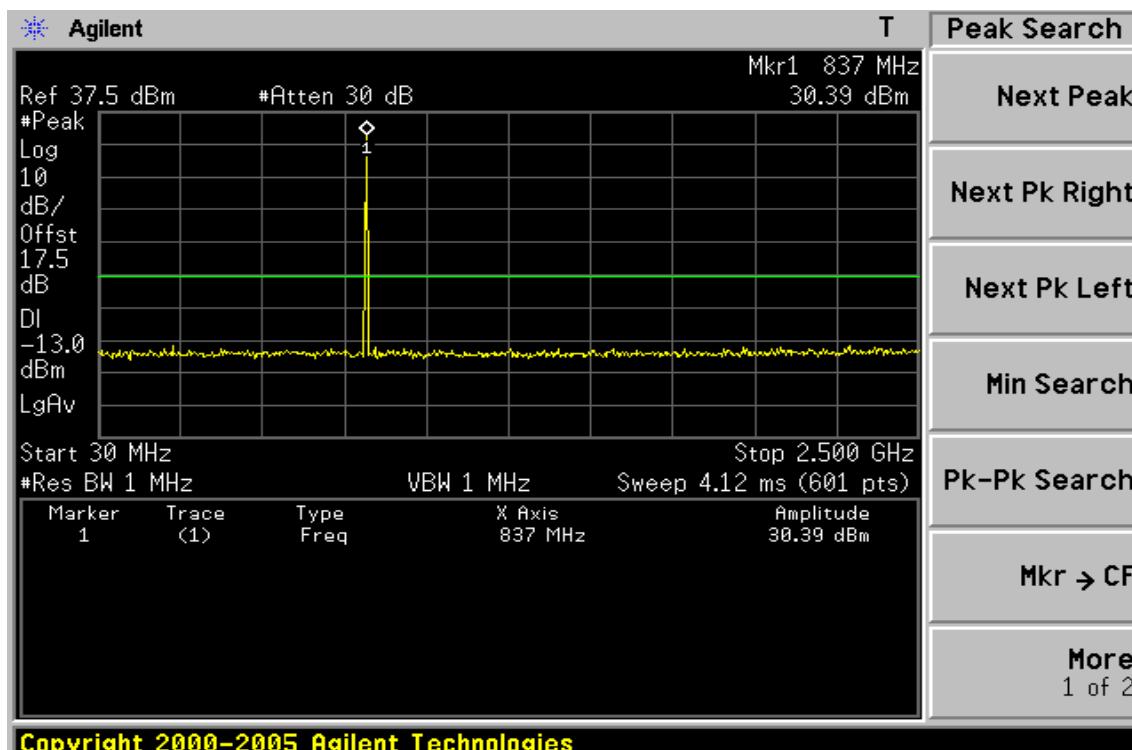


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Figure 8-22: Out of Band emission at antenna terminals – EDGE 850 Channel Mid

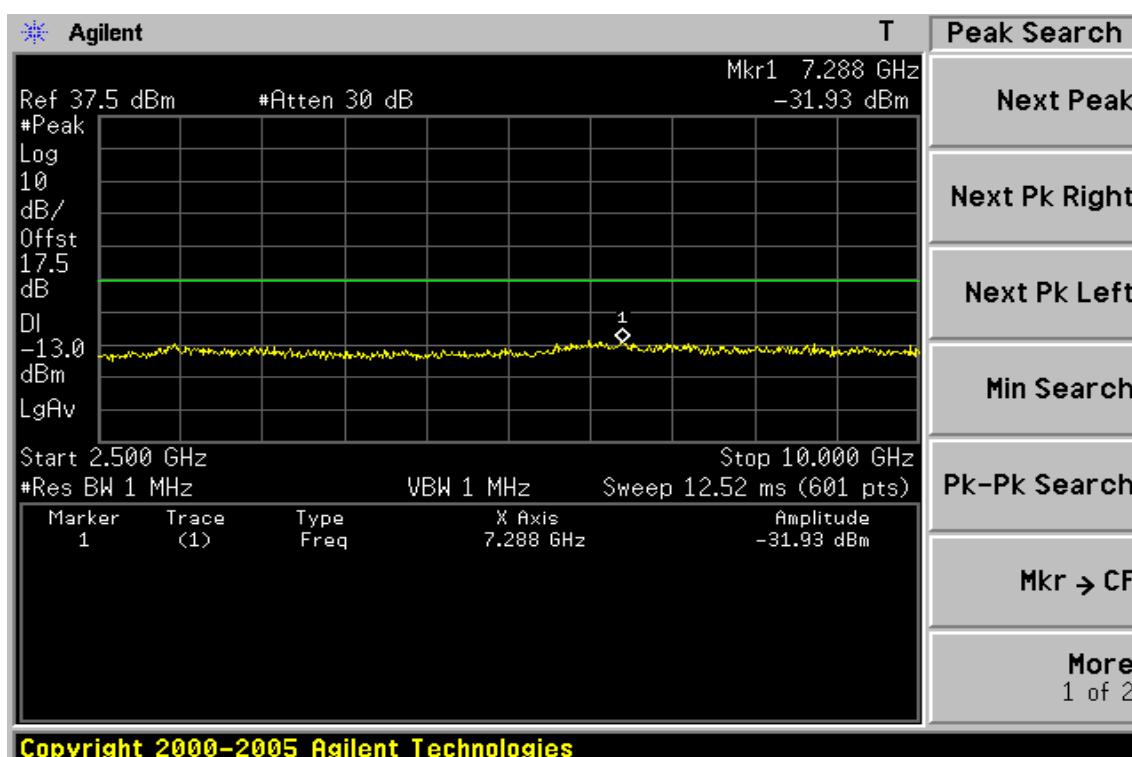
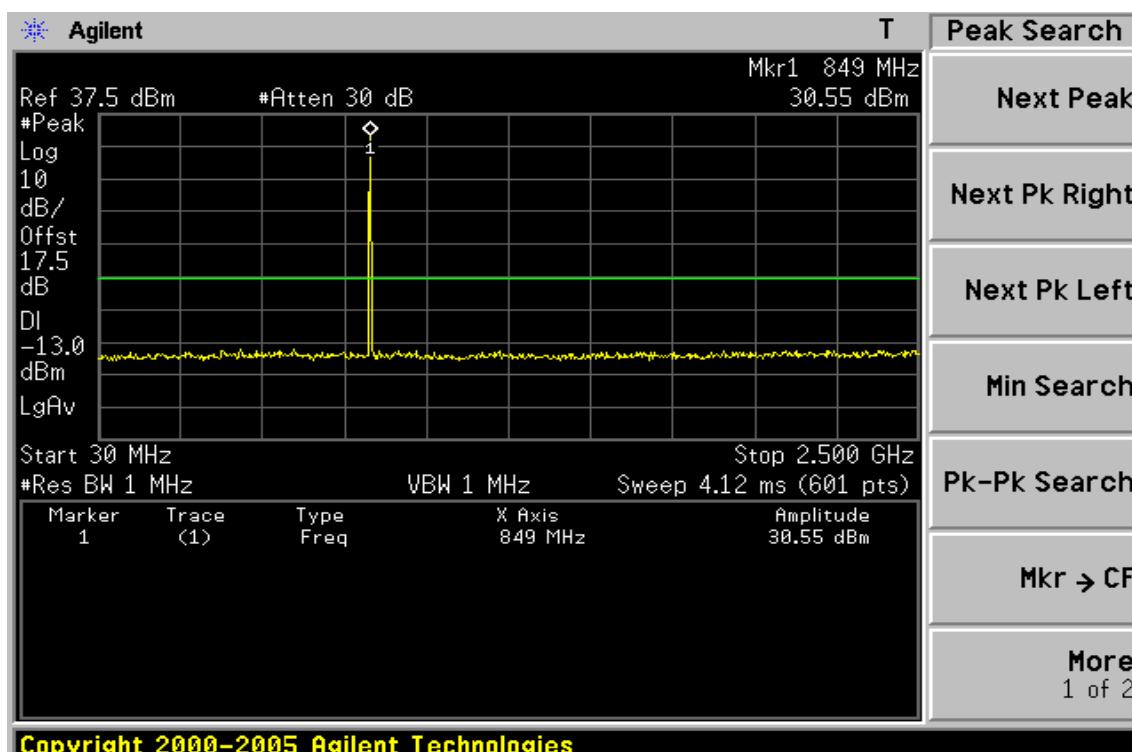


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Figure 8-23: Out of Band emission at antenna terminals – EDGE 850 Channel Highest



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Figure 8-24: Band edge emission at antenna terminals – EDGE 850 Channel Lowest

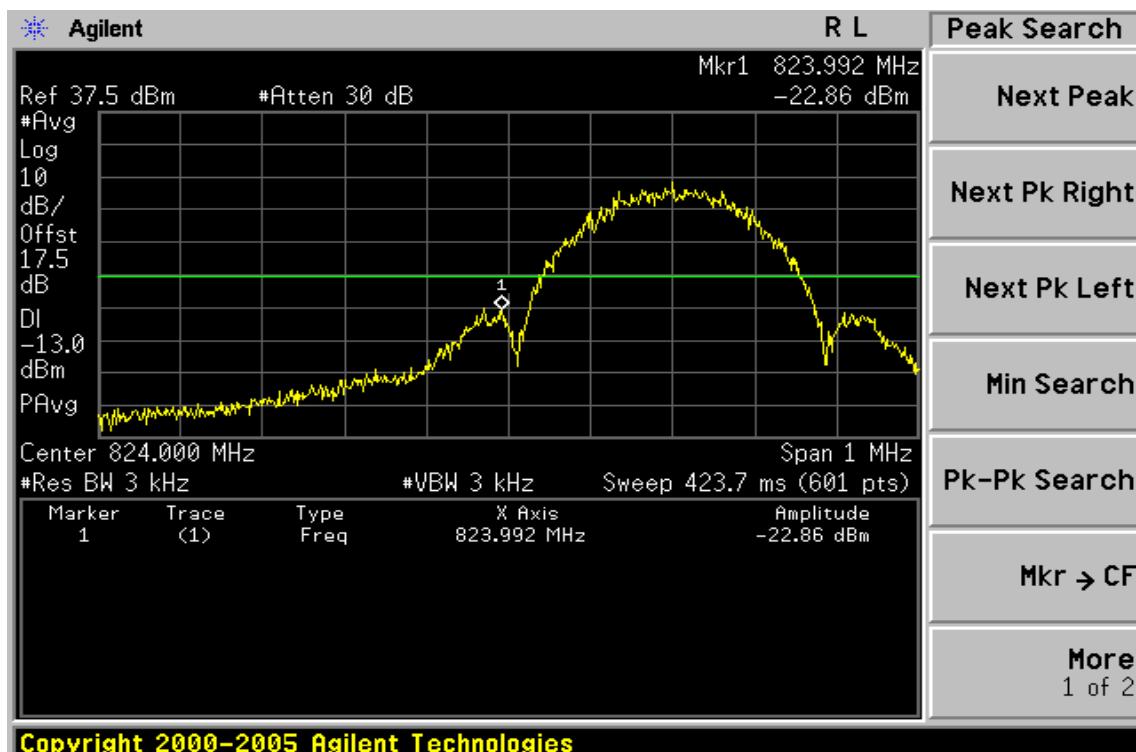
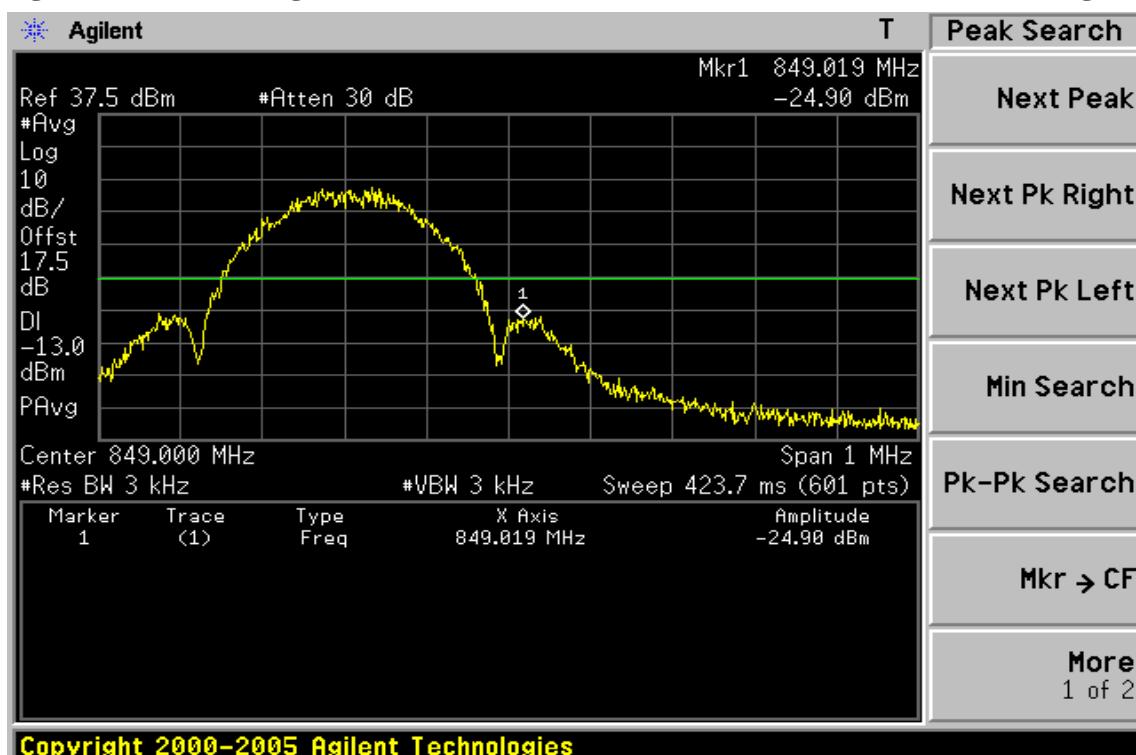


Figure 8-25: Band edge emission at antenna terminals – EDGE 850 Channel Highest

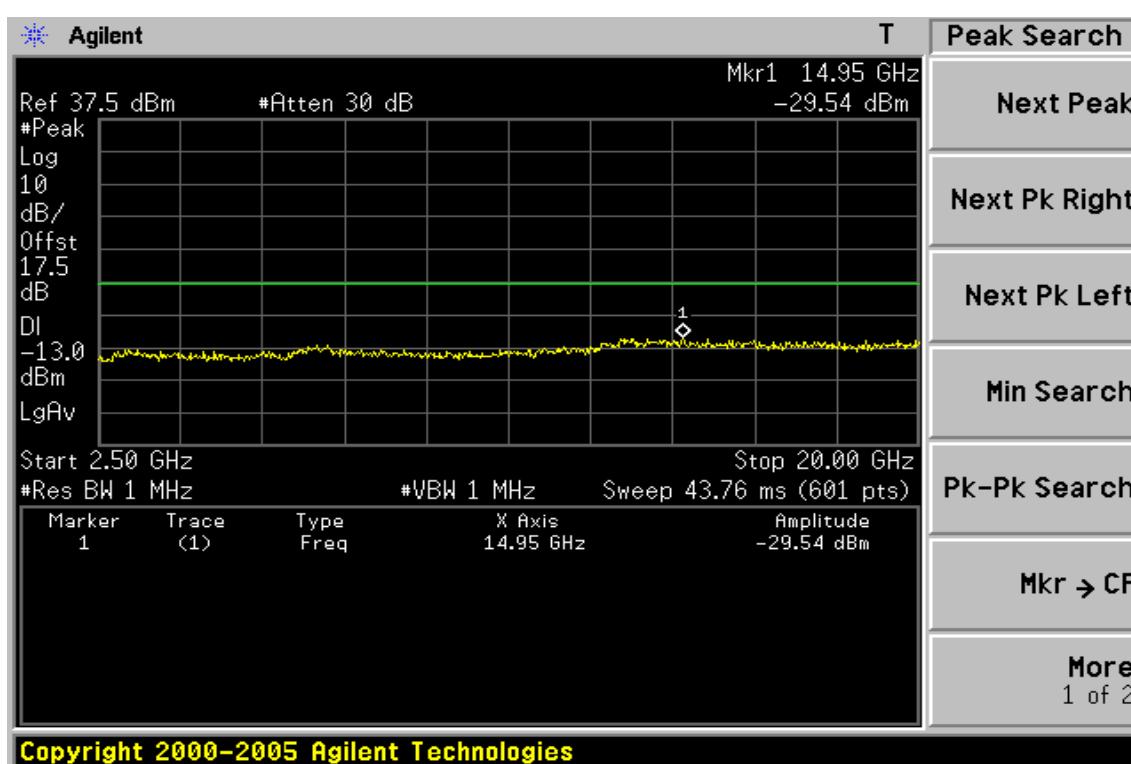
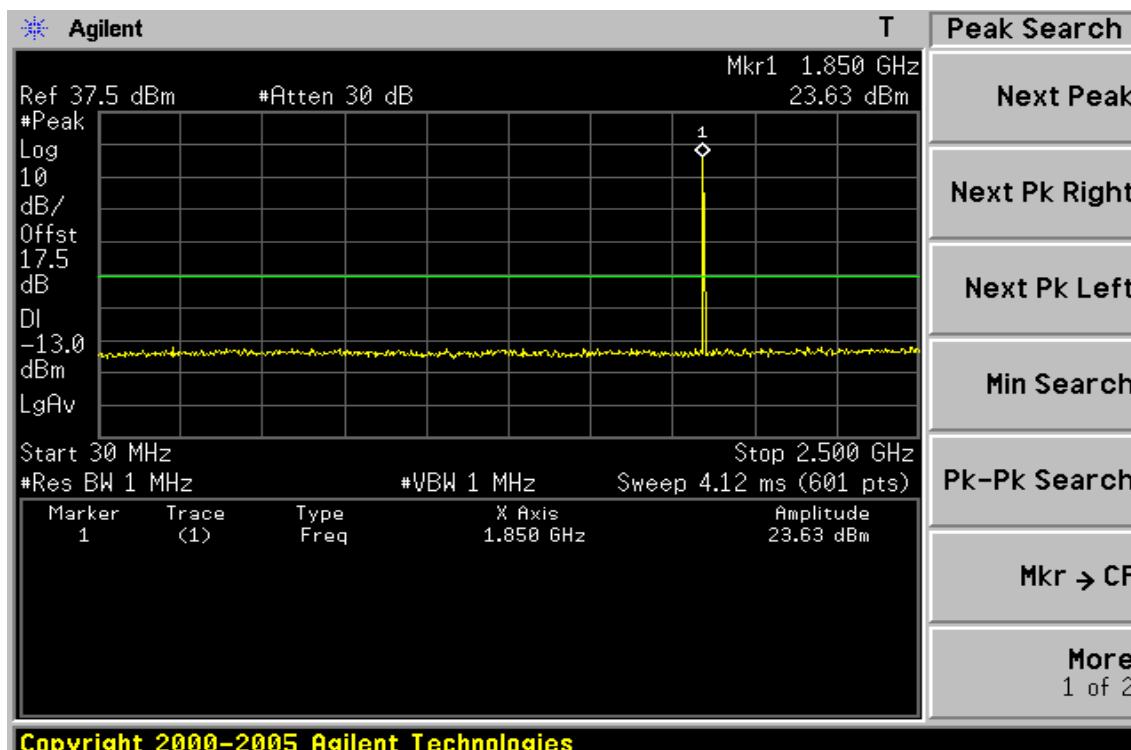


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Figure 8-26: Out of Band emission at antenna terminals – EDGE 1900 Channel Lowest

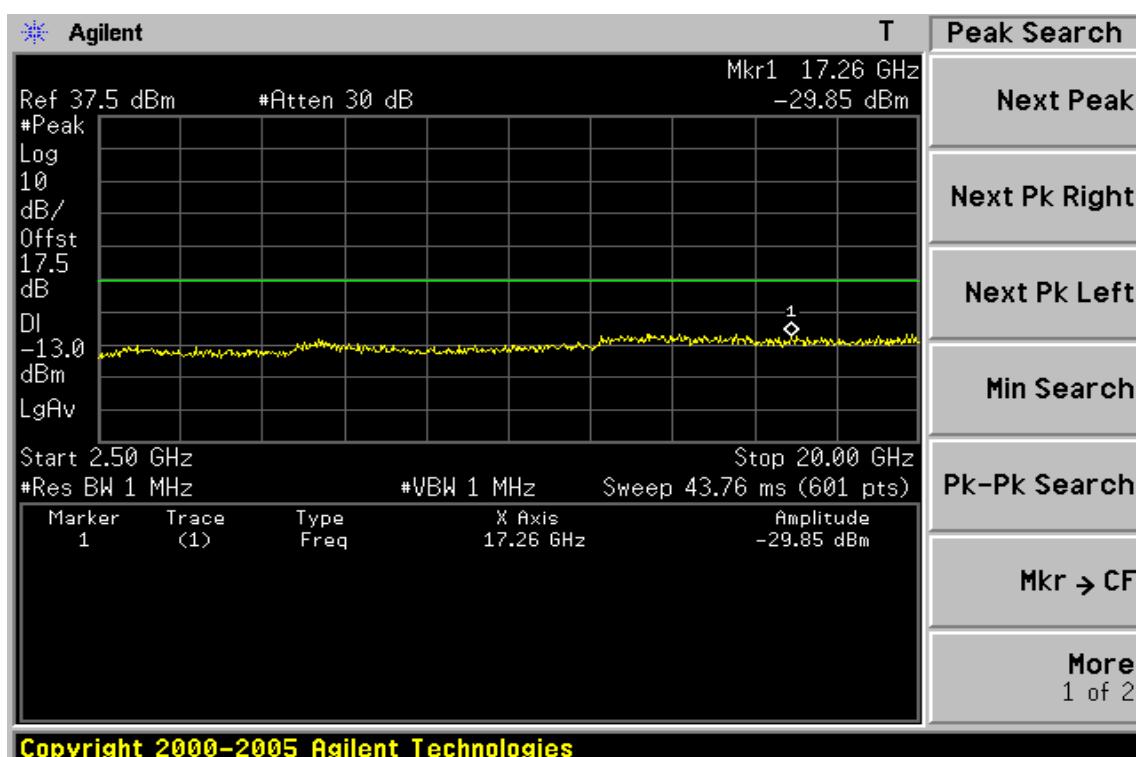
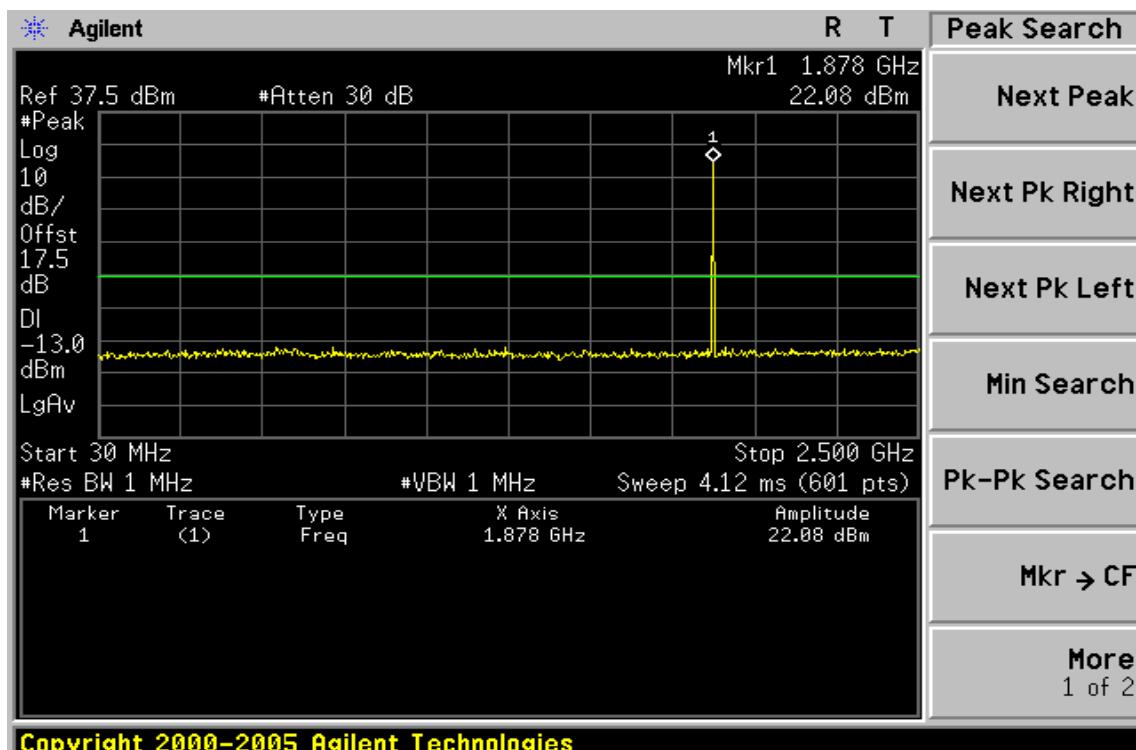


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Figure 8-27: Out of Band emission at antenna terminals – EDGE 1900 Channel Mid

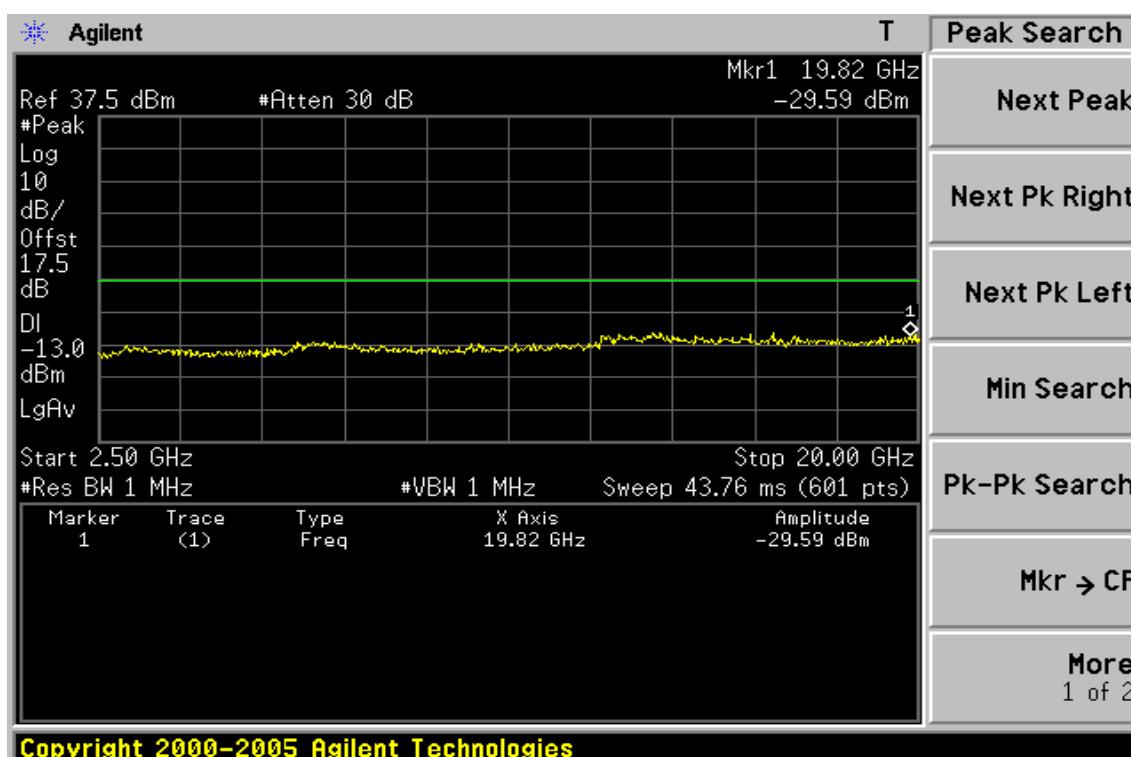
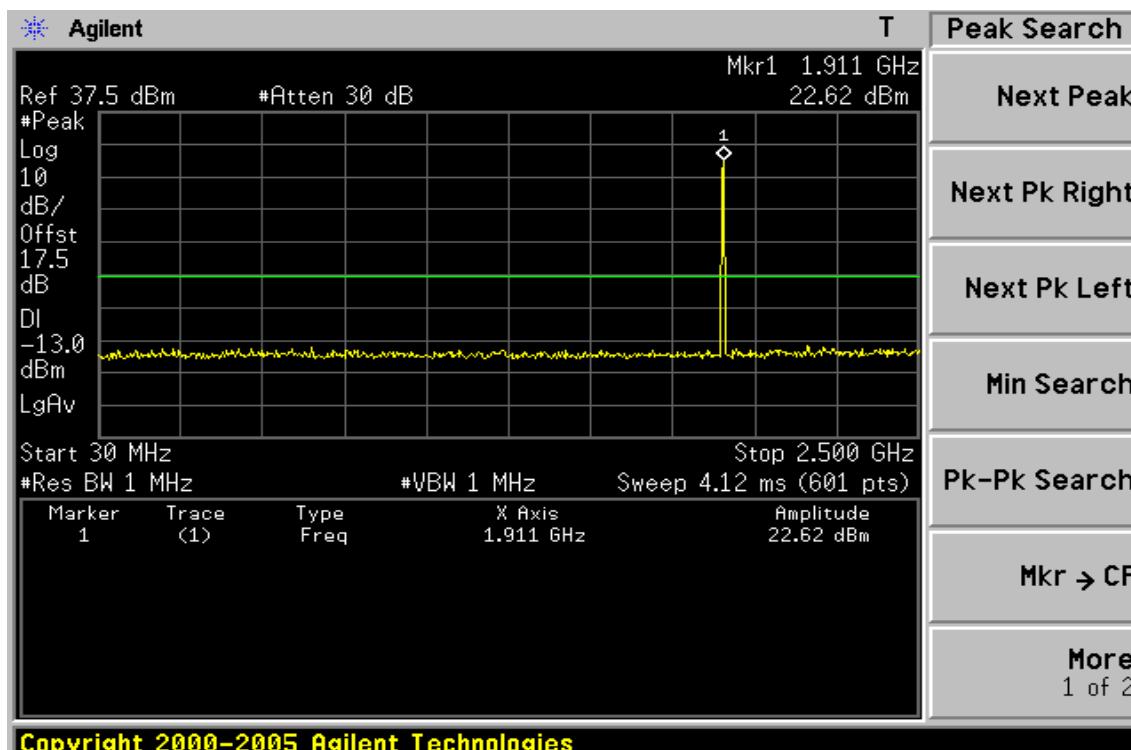


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Figure 8-28: Out of Band emission at antenna terminals – EDGE 1900 Channel Highest



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Figure 8-29: Band edge emission at antenna terminals – EDGE 1900 Channel Lowest

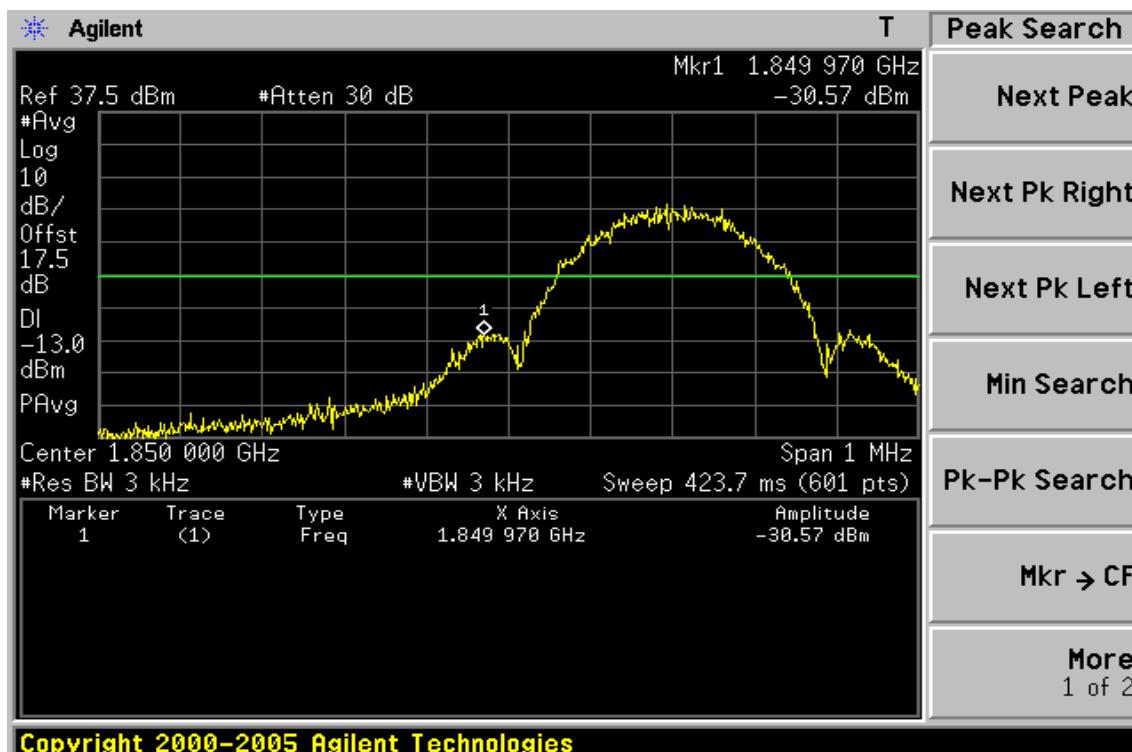
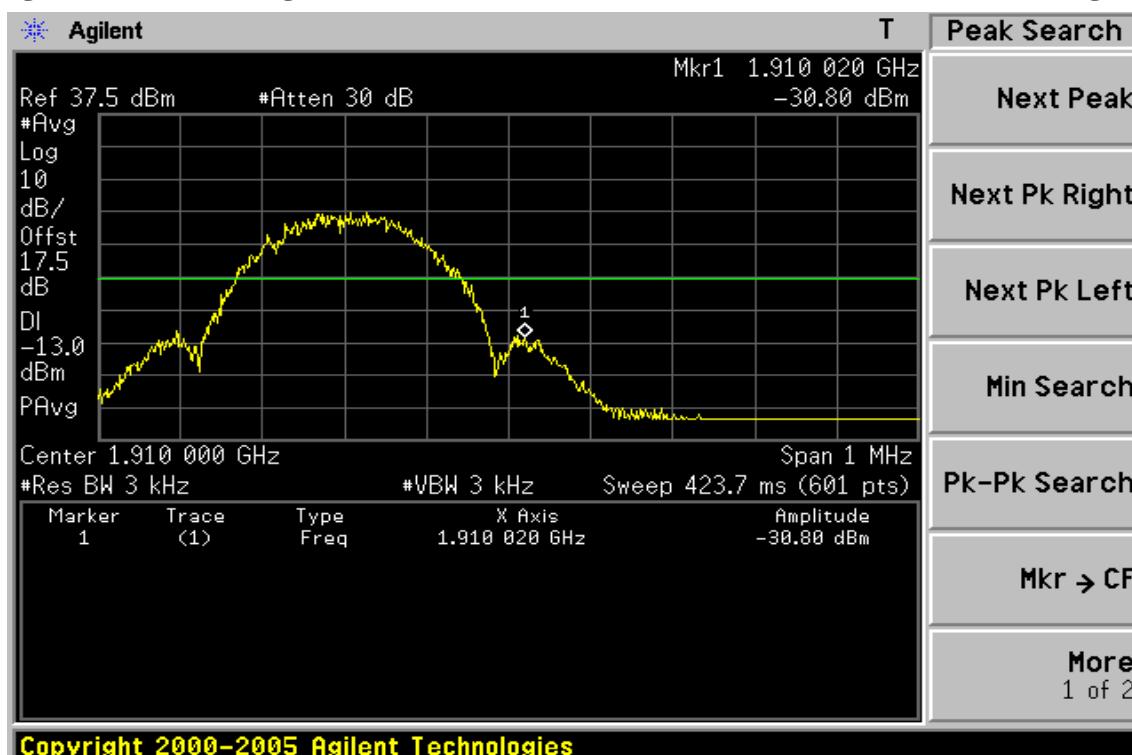


Figure 8-30: Band edge emission at antenna terminals – EDGE 1900 Channel Highest

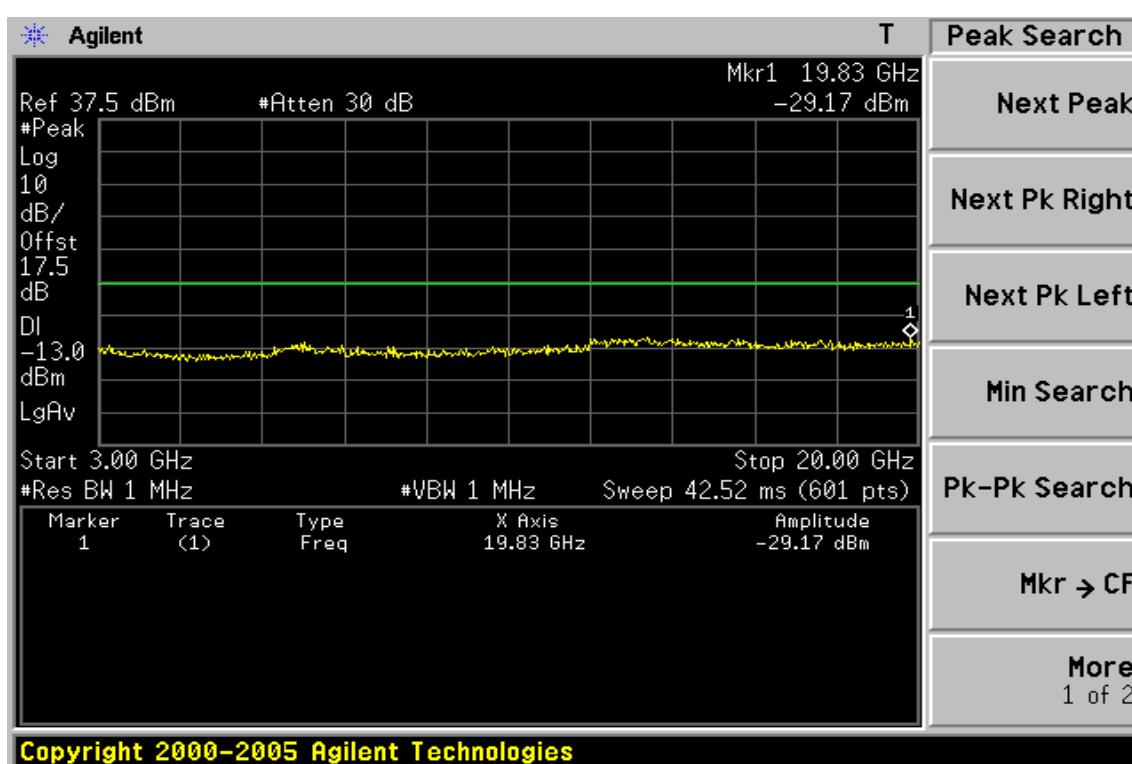
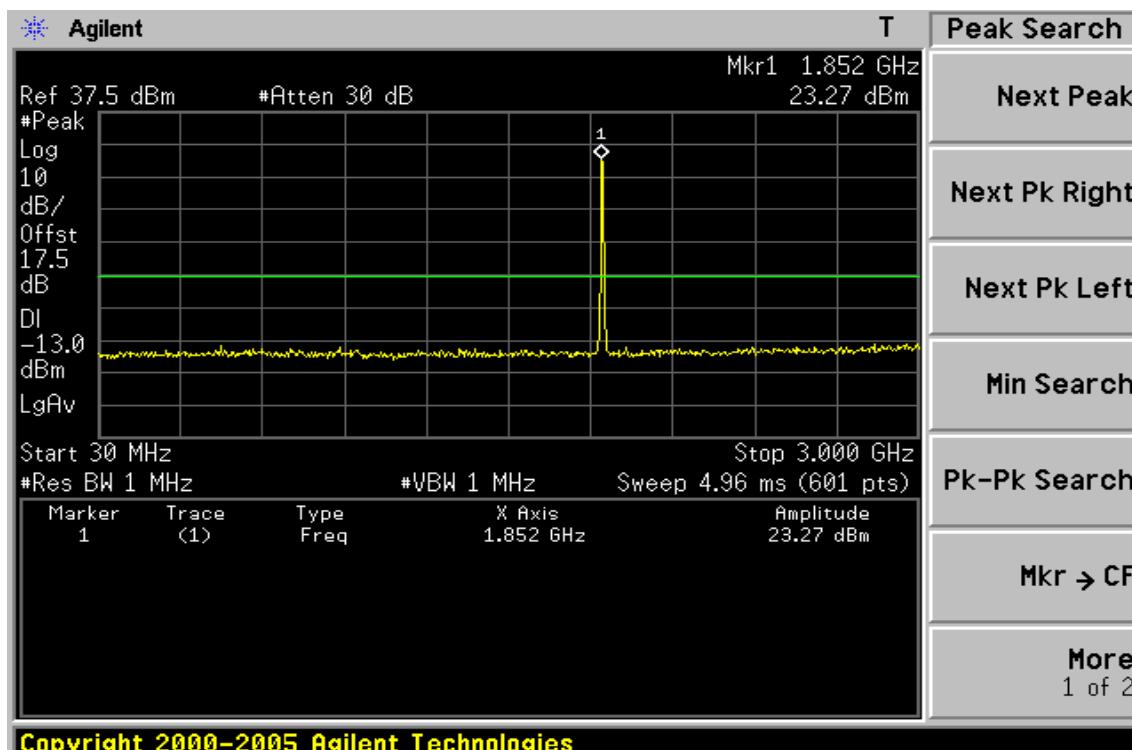


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Figure 8-31: Out of Band emission at antenna terminals – WCDMA II Channel Lowest

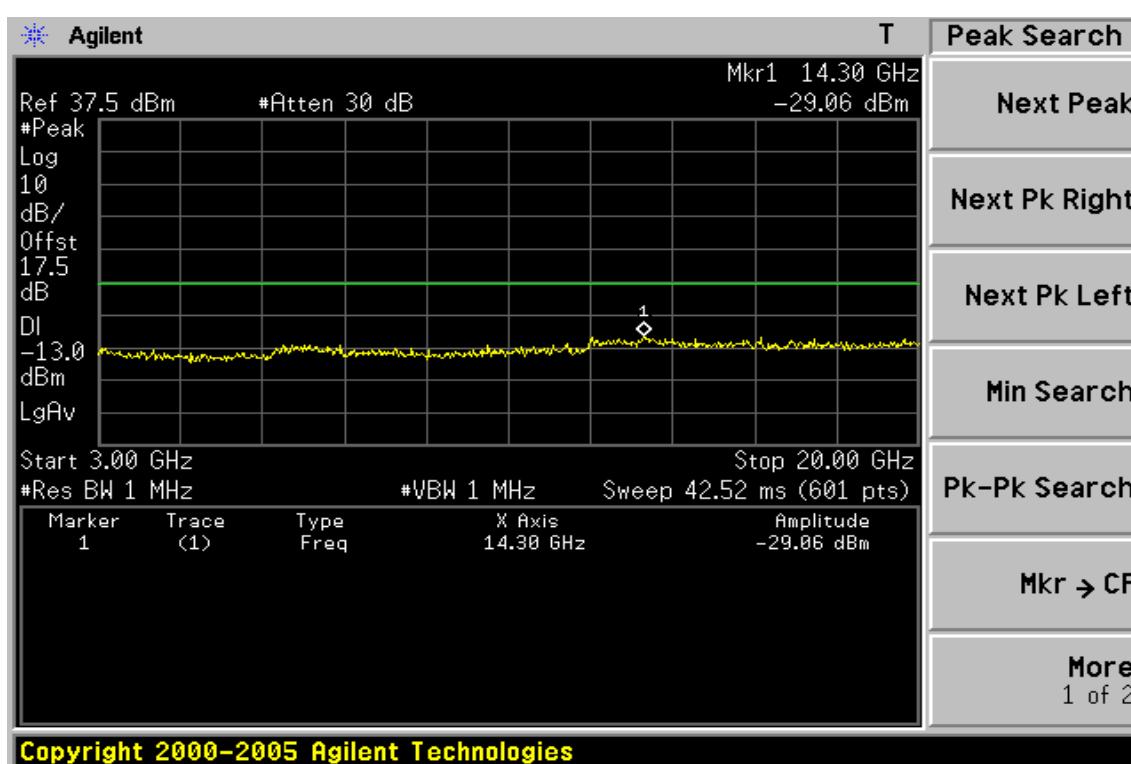
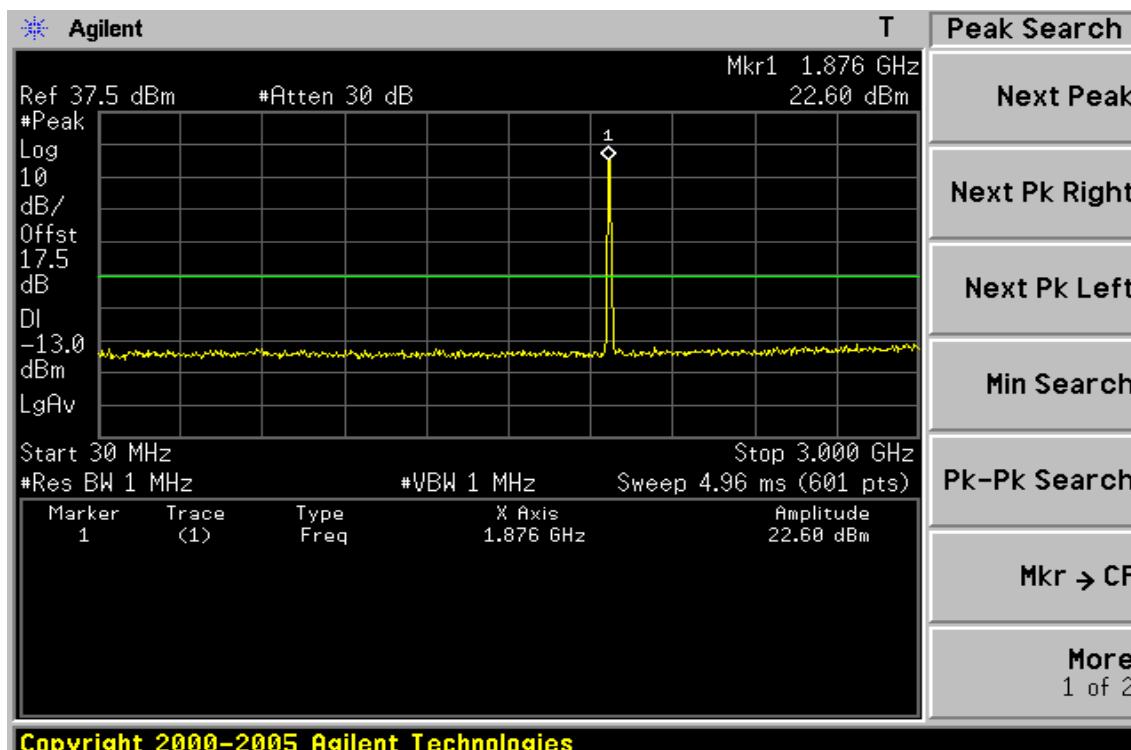


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Figure 8-32: Out of Band emission at antenna terminals – WCDMA II Channel Mid

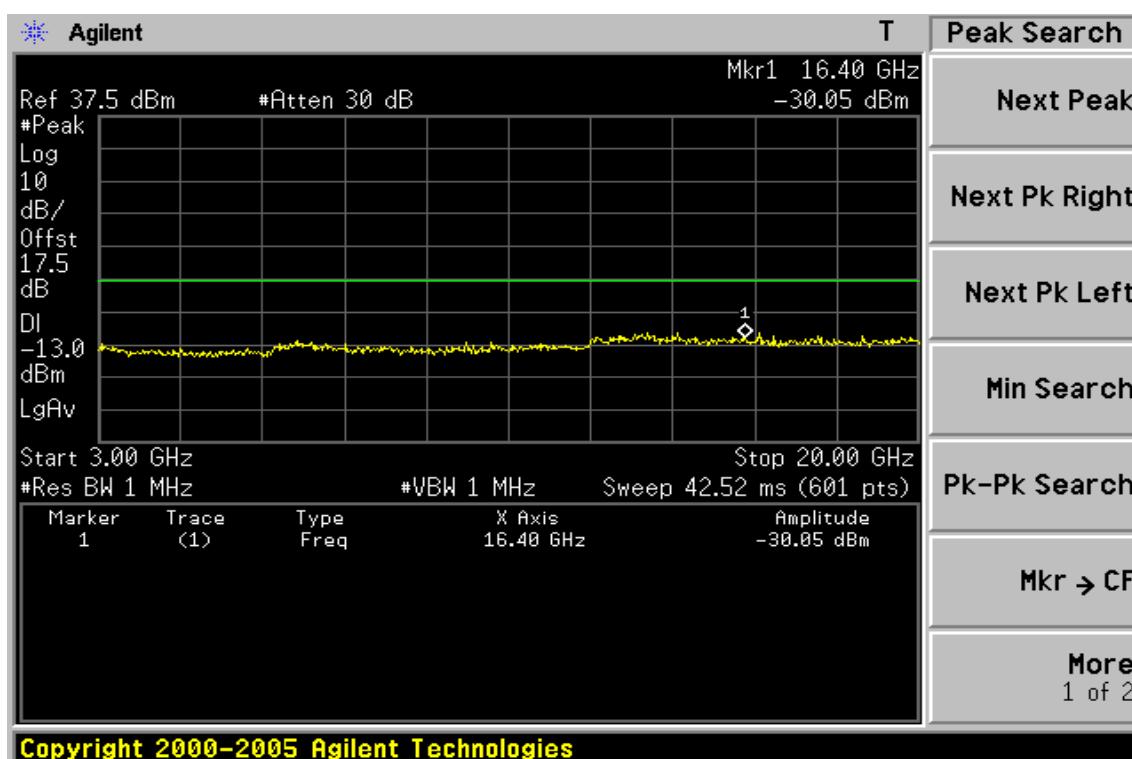
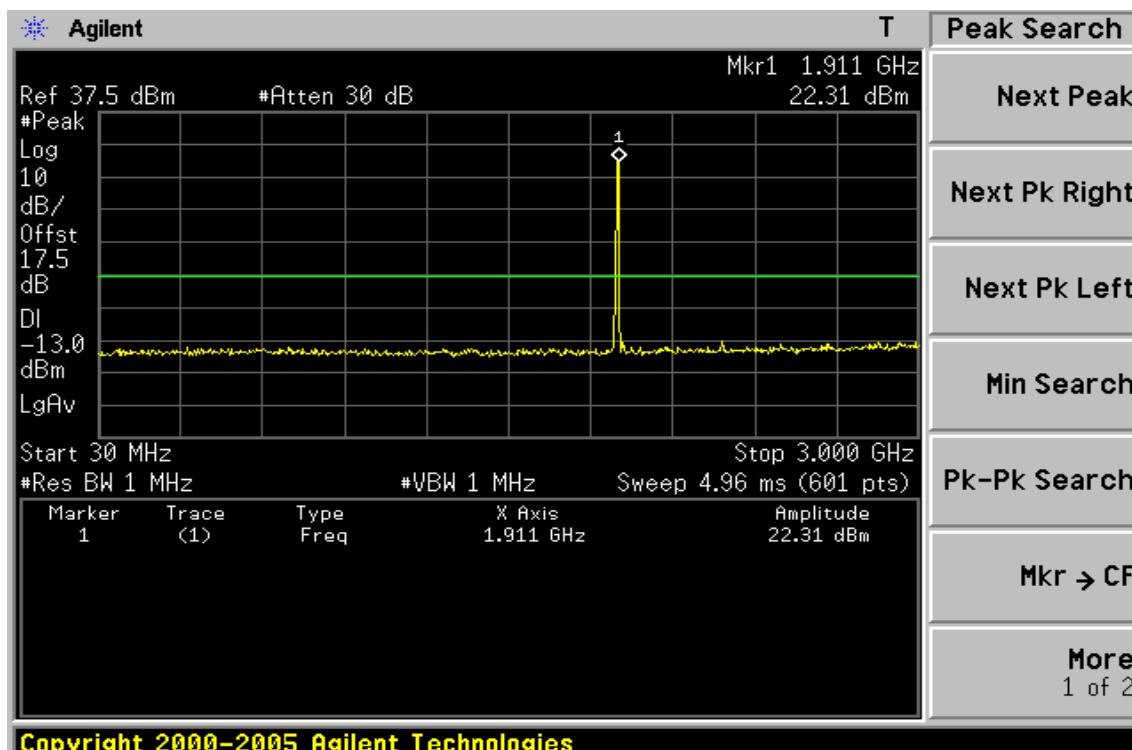


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Figure 8-33: Out of Band emission at antenna terminals – WCDMA II Channel Highest



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Figure 8-34: Band edge emission at antenna terminals – WCDMA II Channel Lowest

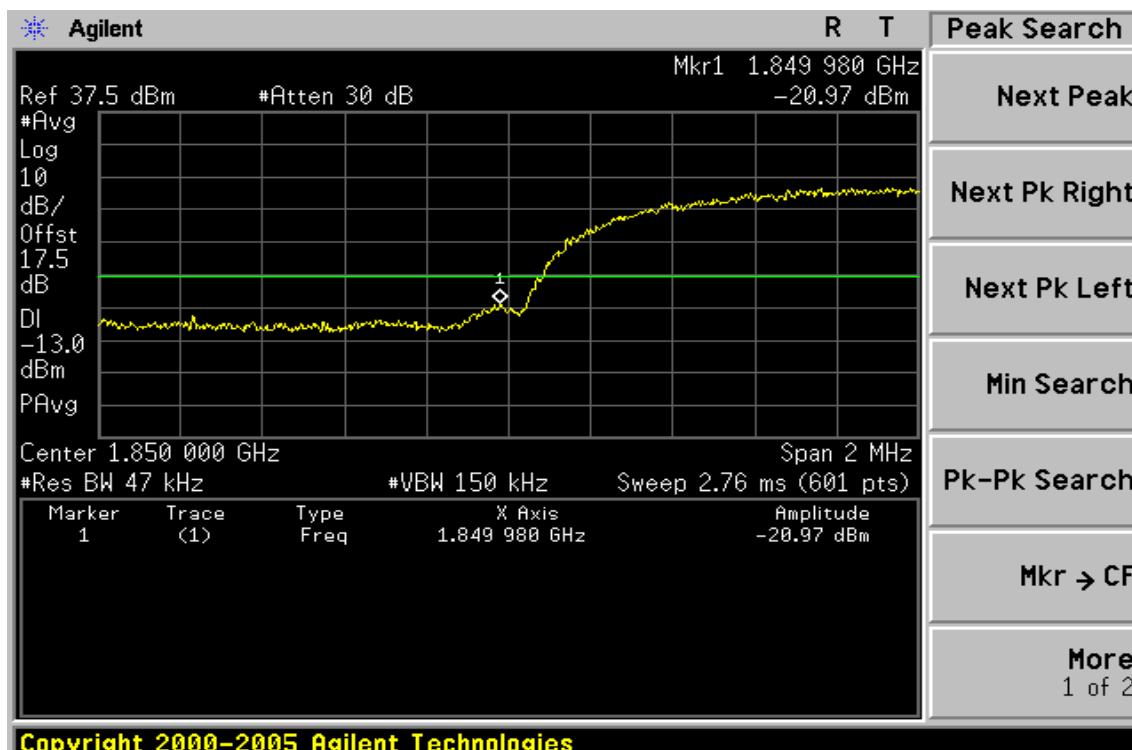
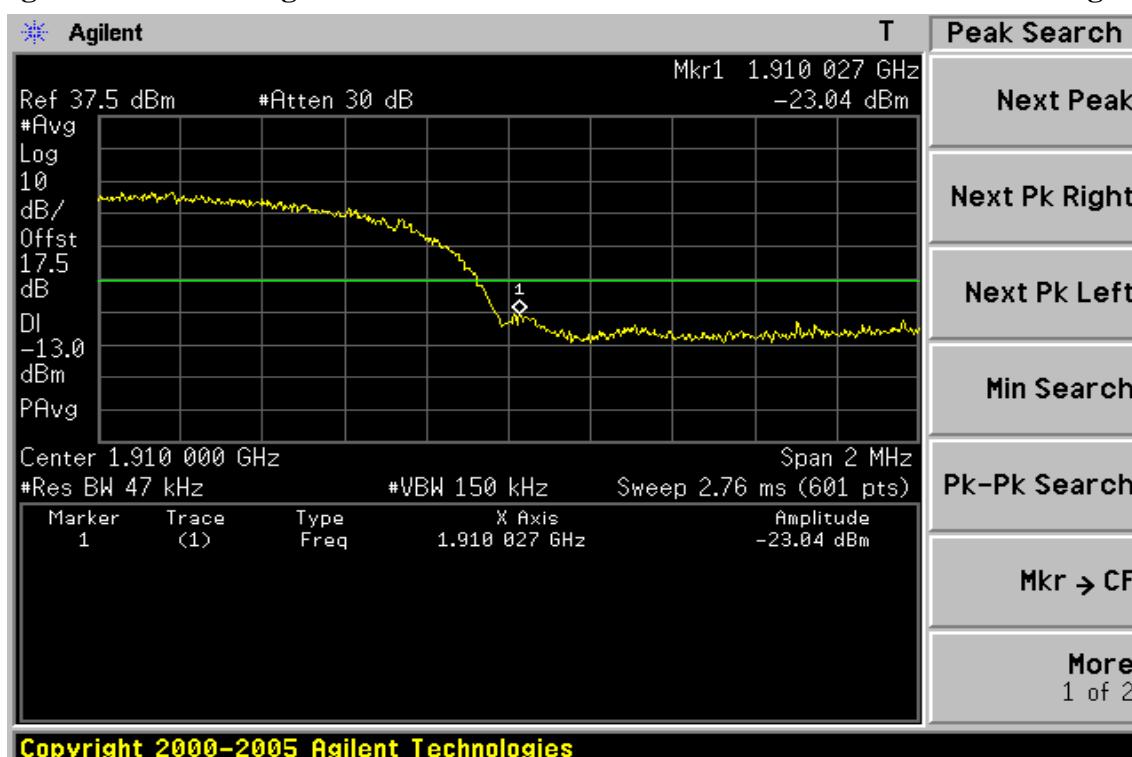


Figure 8-35: Band edge emission at antenna terminals – WCDMA II Channel Highest

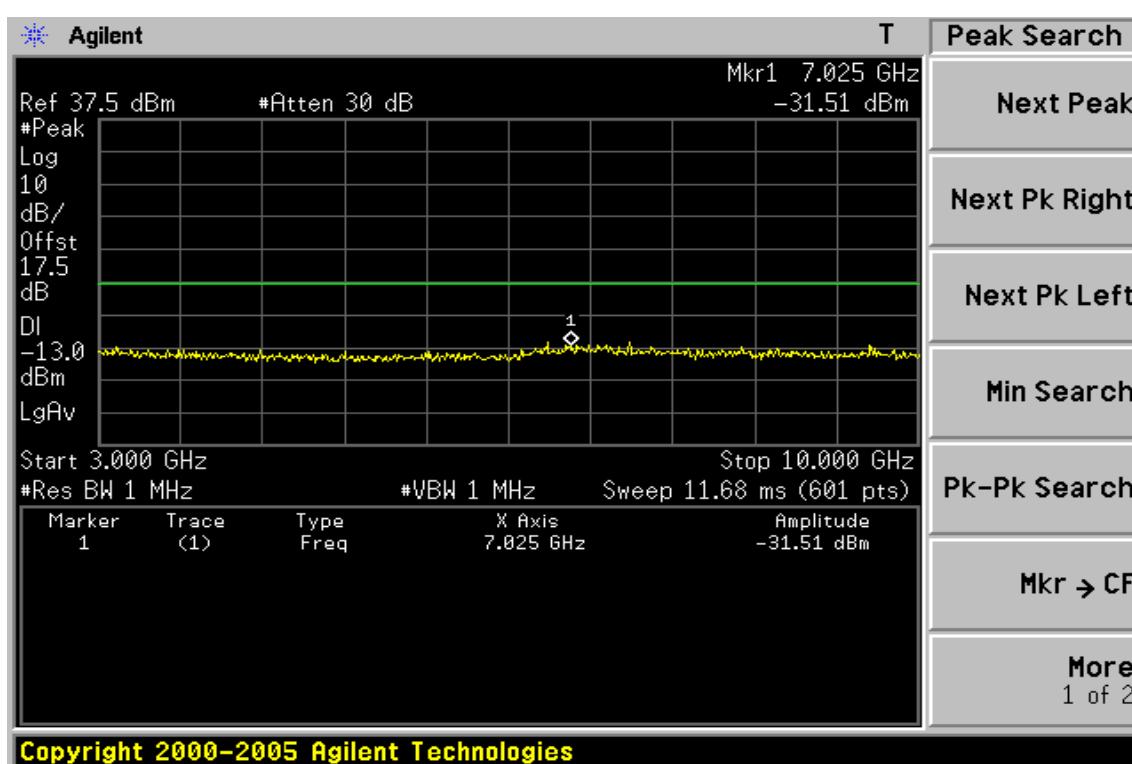
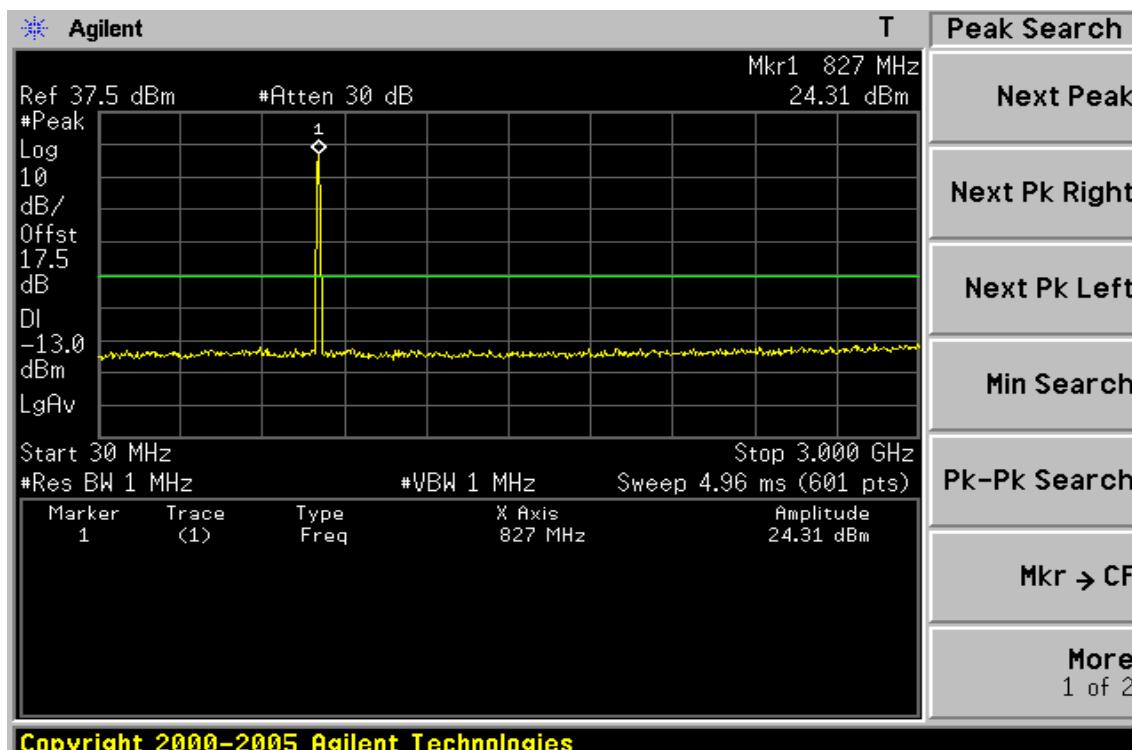


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Figure 8-36: Out of Band emission at antenna terminals – WCDMA V Channel Lowest

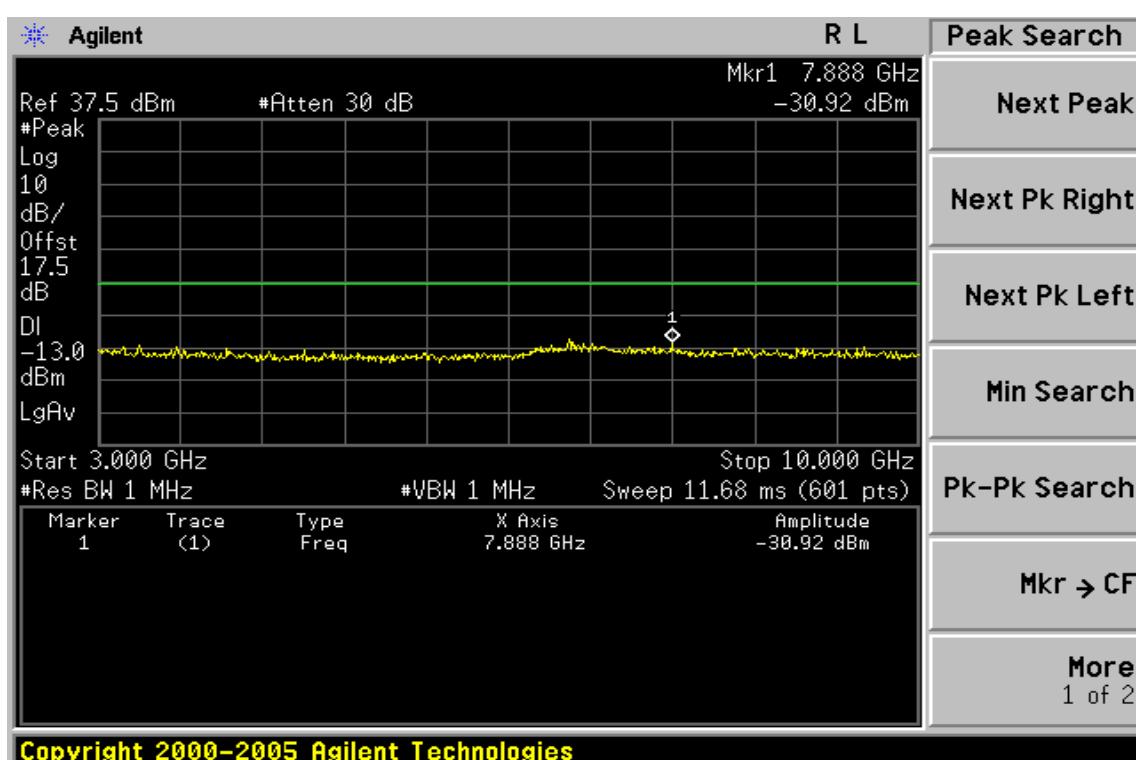
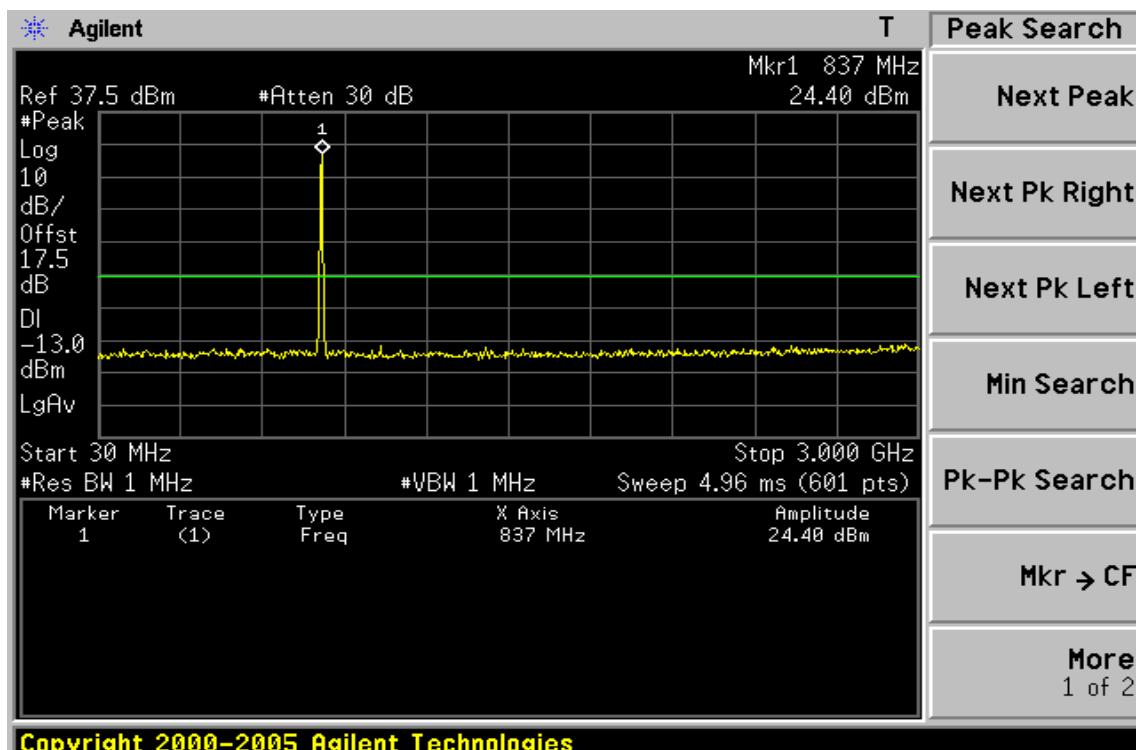


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Figure 8-37: Out of Band emission at antenna terminals – WCDMA V Channel Mid

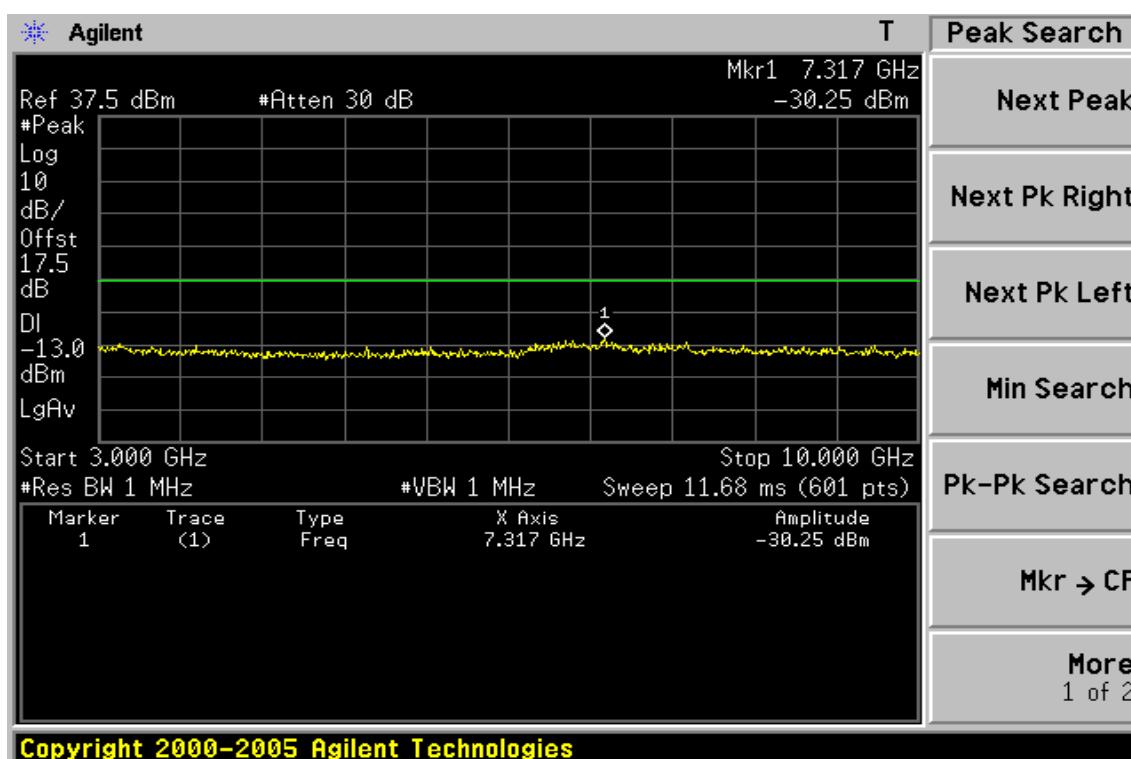
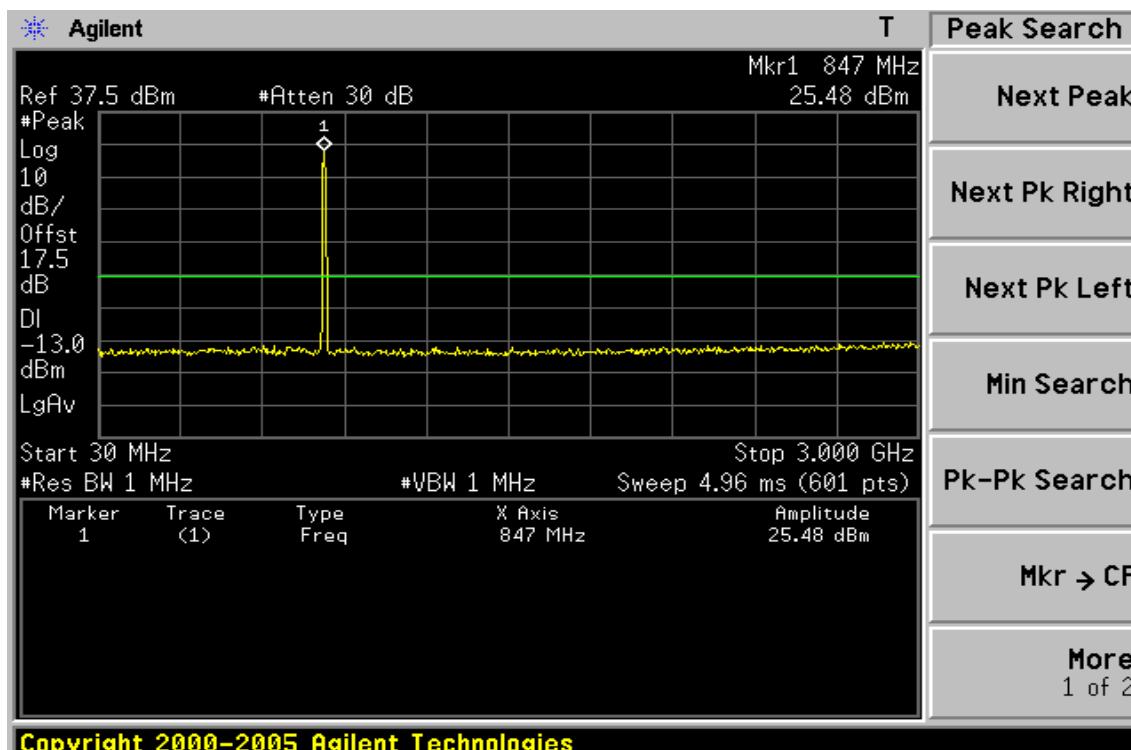


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Figure 8-38: Out of Band emission at antenna terminals – WCDMA V Channel Highest



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Figure 8-39: Band edge emission at antenna terminals – WCDMA V Channel Lowest

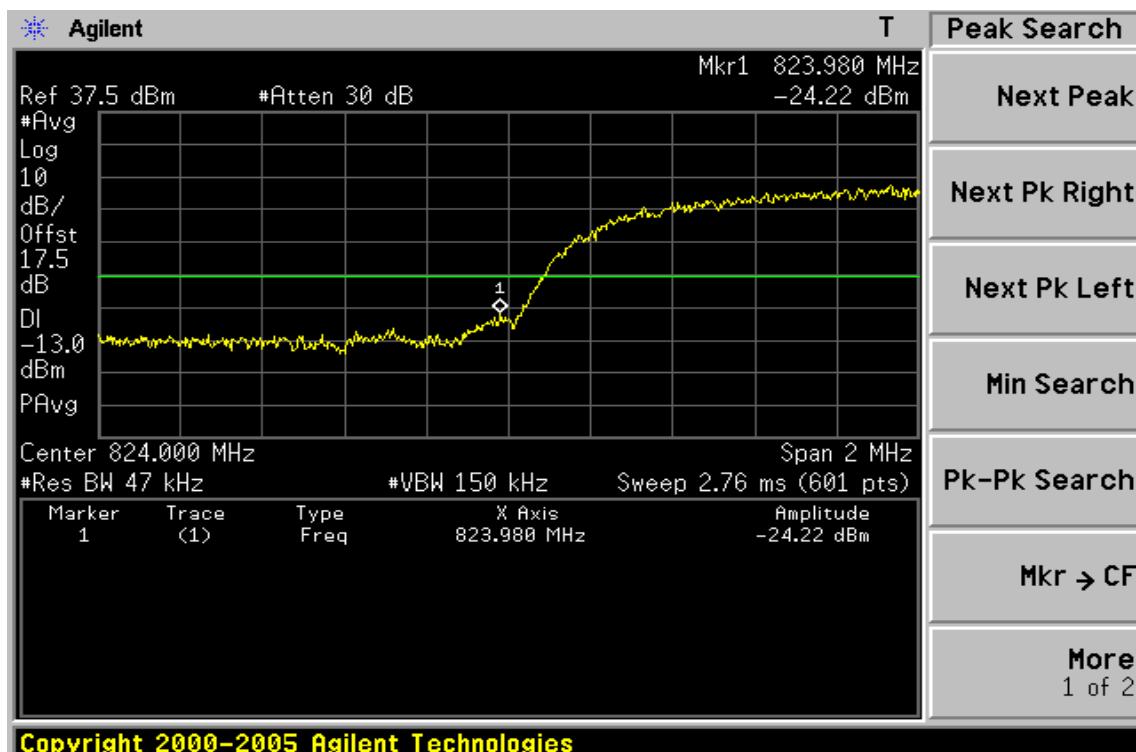
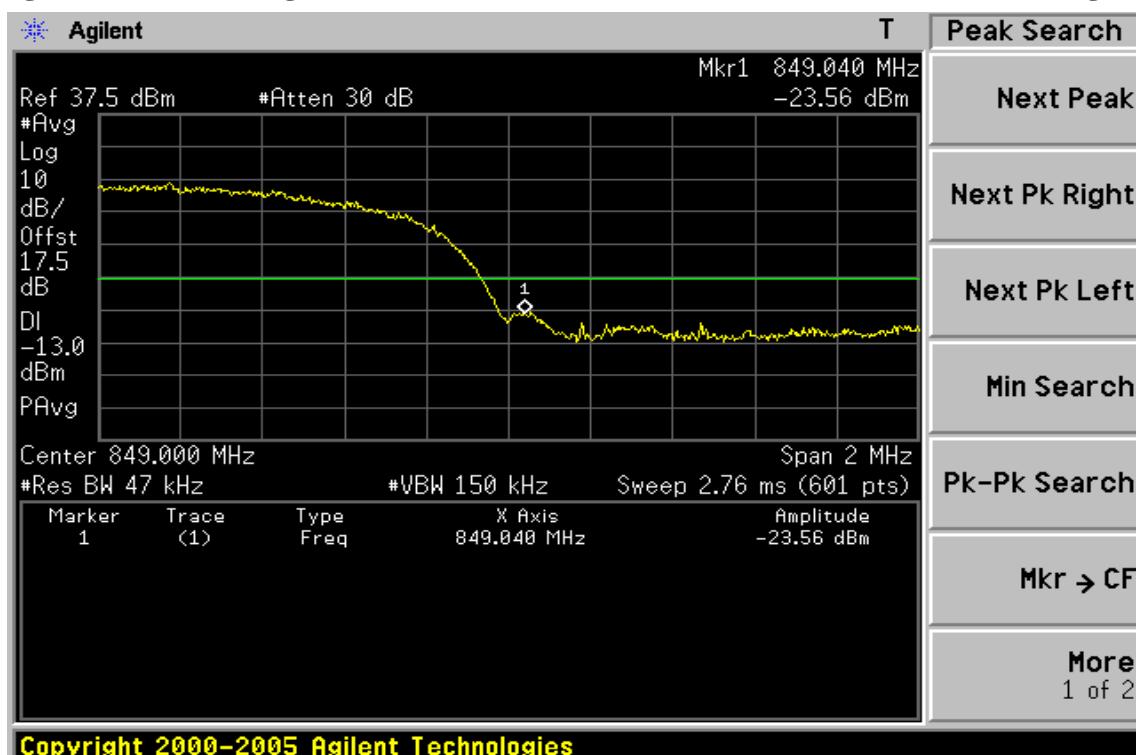


Figure 8-40: Band edge emission at antenna terminals – WCDMA V Channel Highest

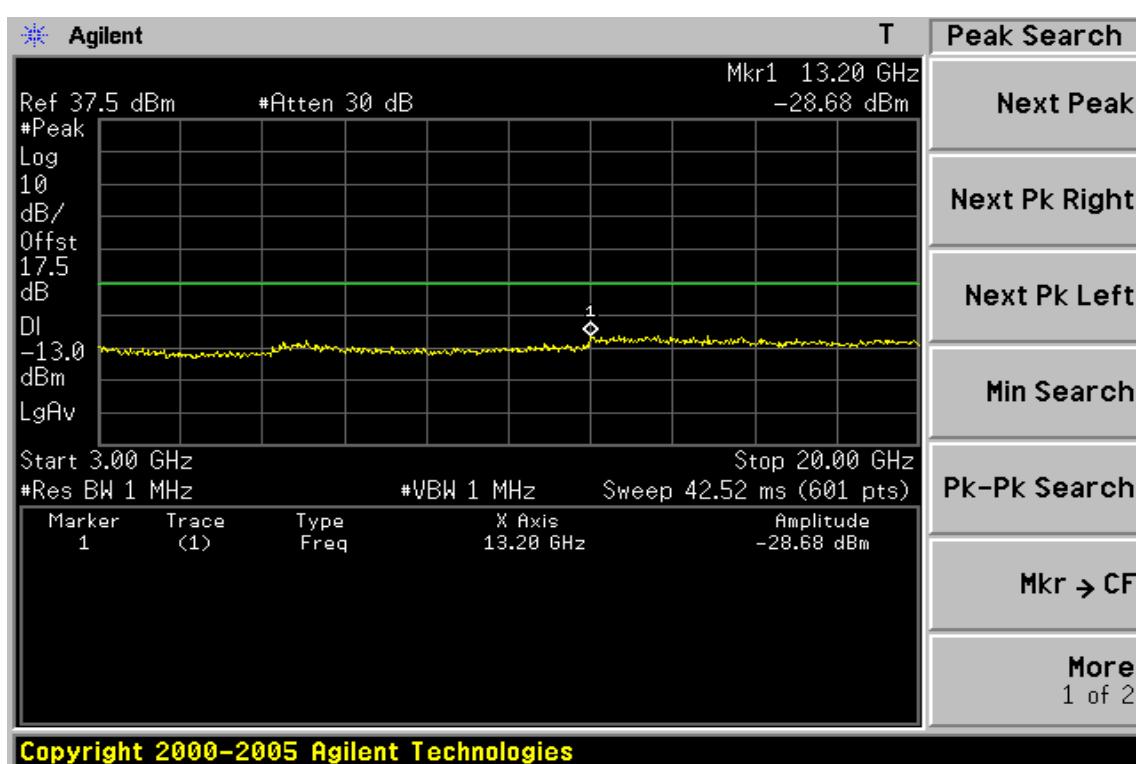
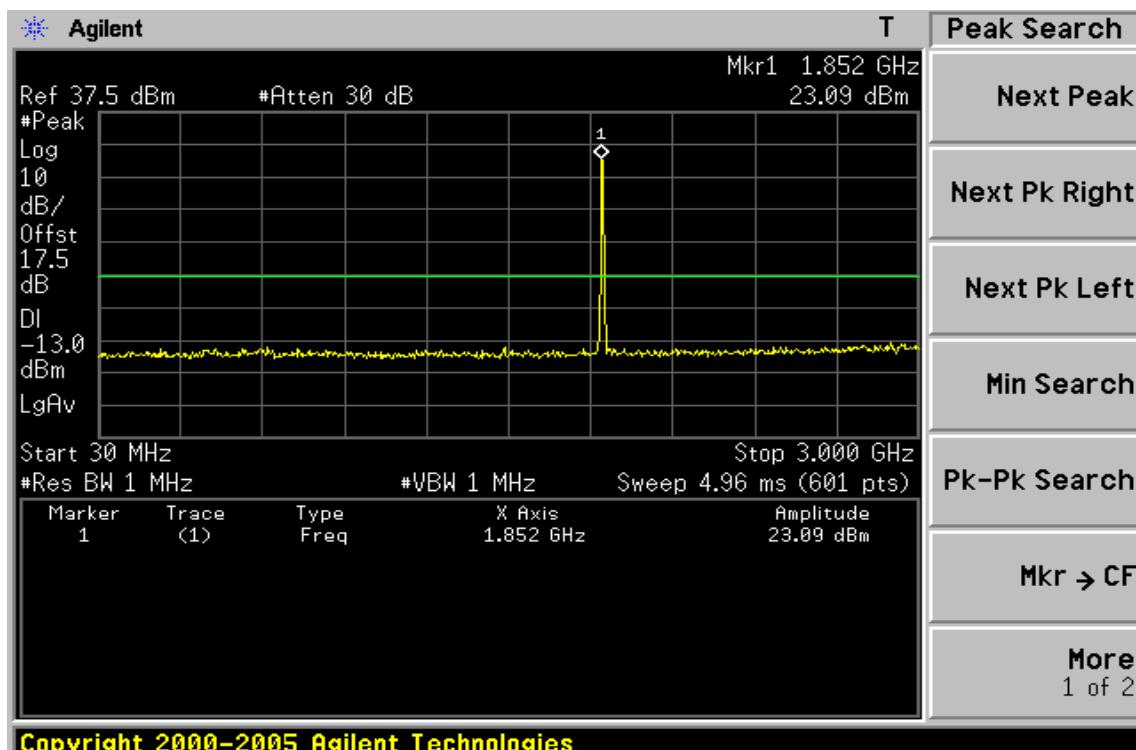


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Figure 8-41: Out of Band emission at antenna terminals – HSDPA II Channel Lowest

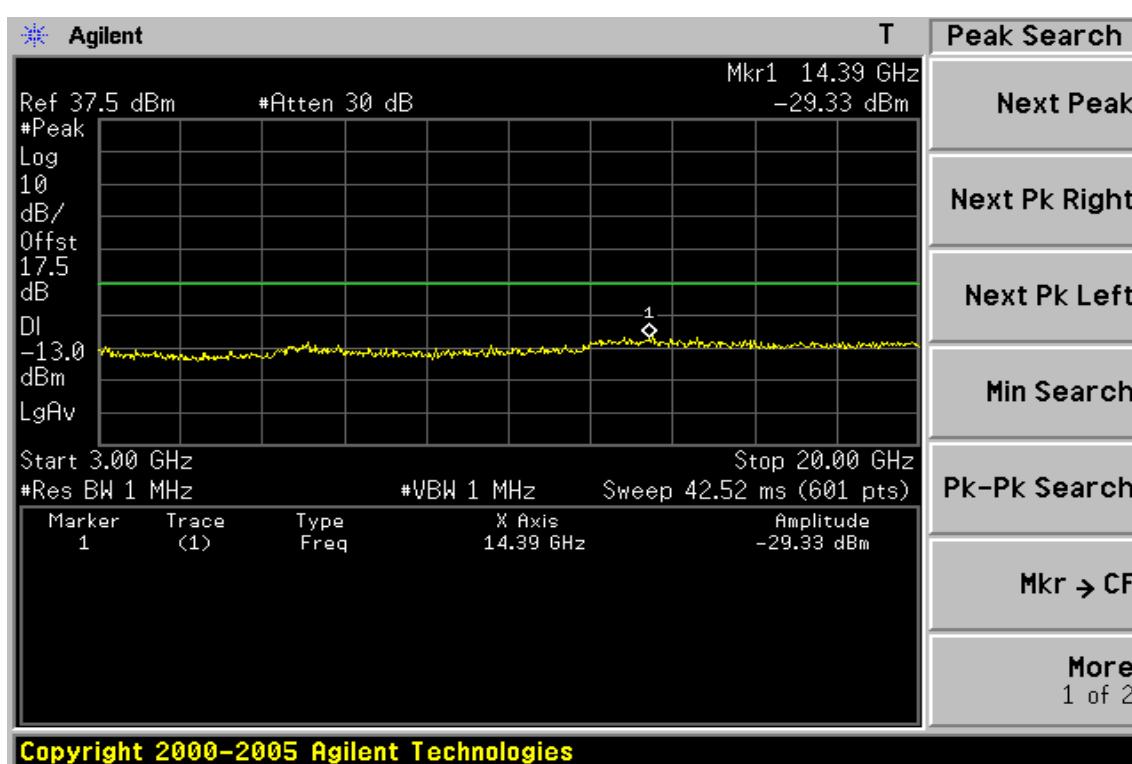
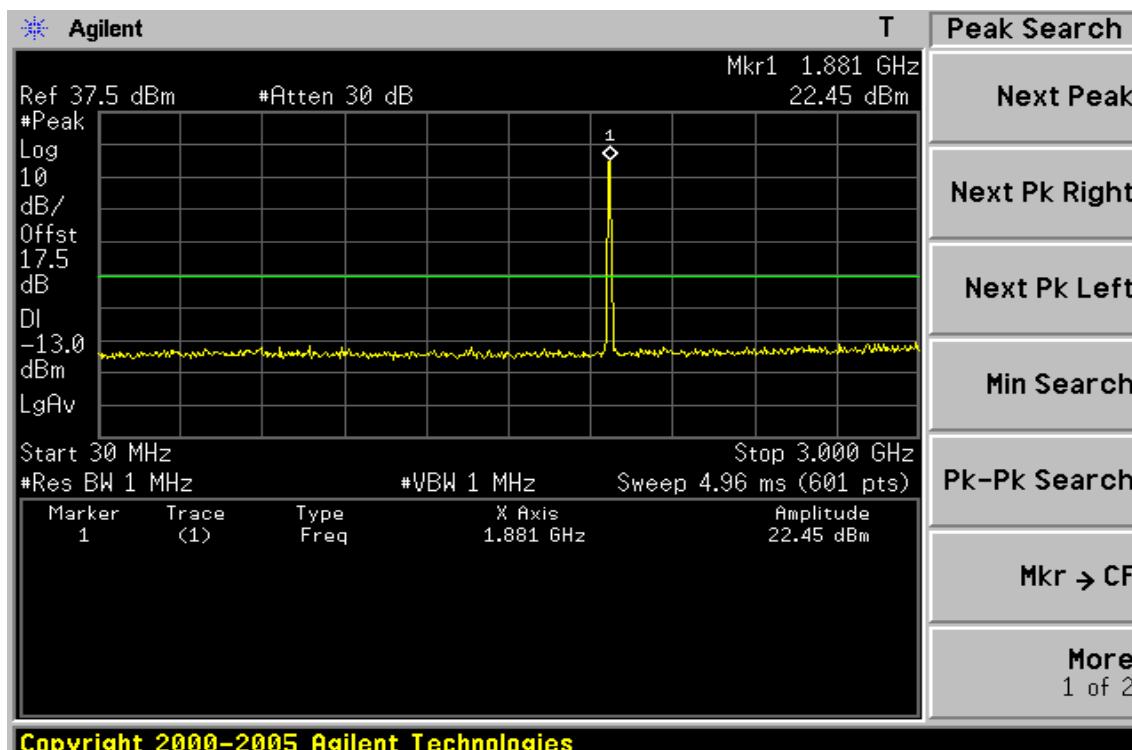


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Figure 8-42: Out of Band emission at antenna terminals – HSDPA II Channel Mid

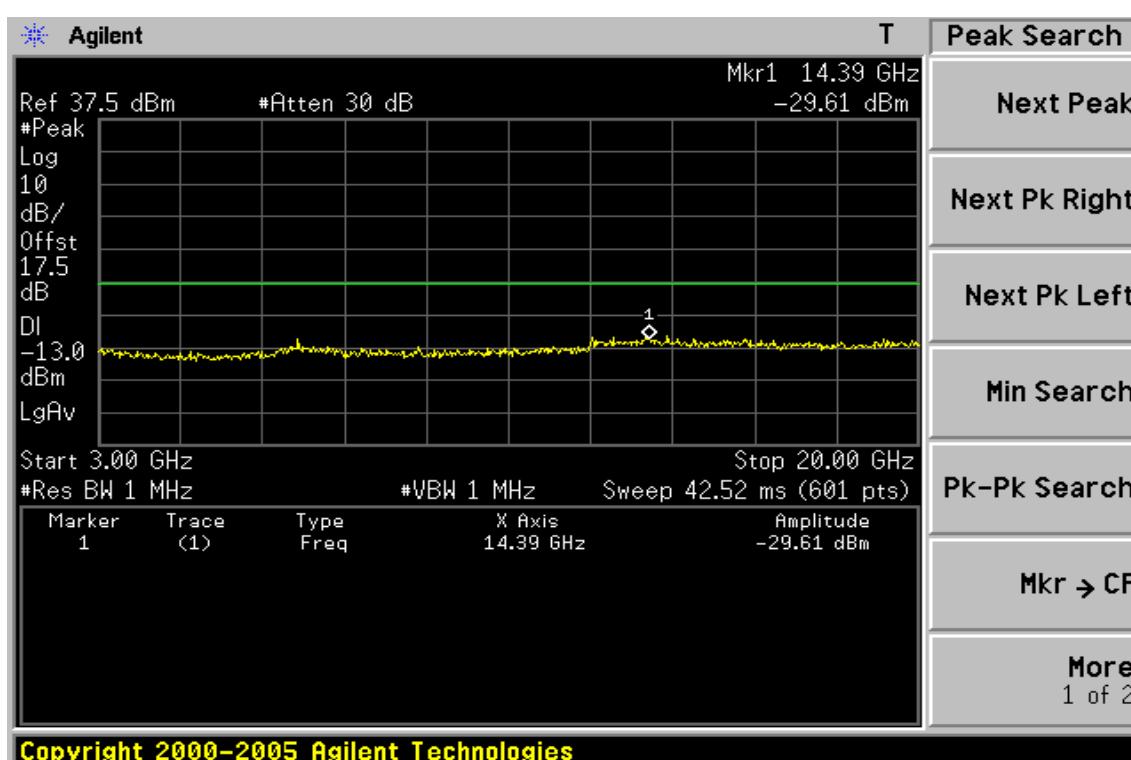
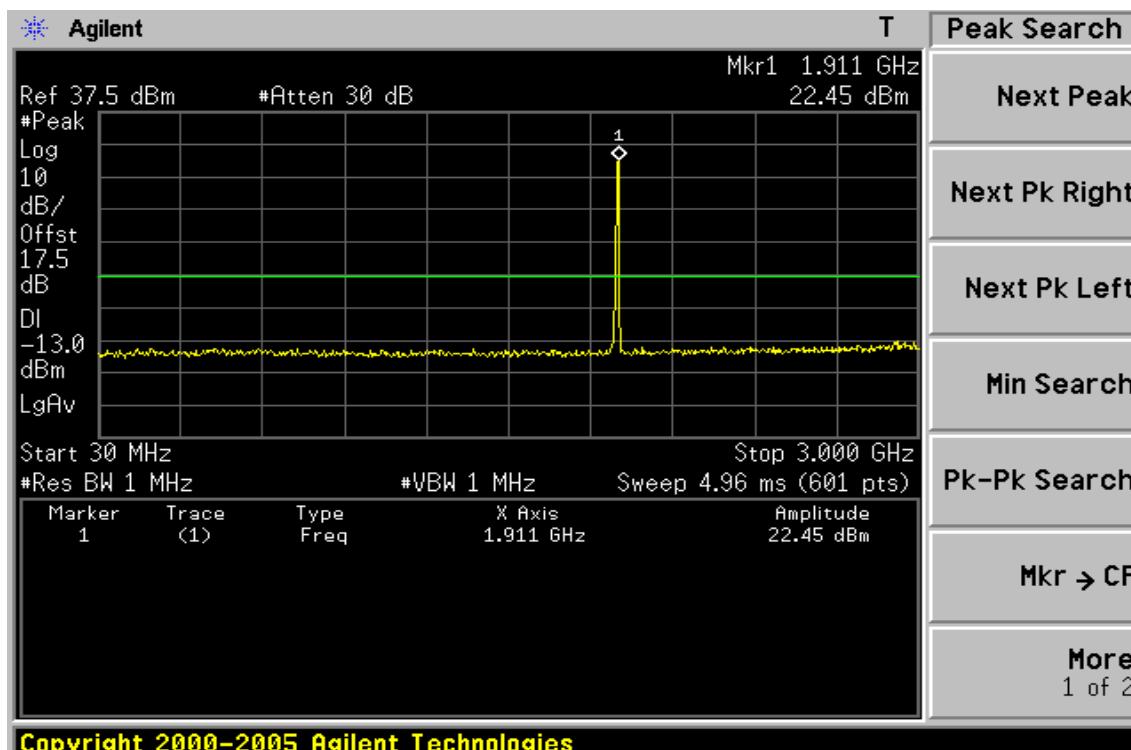


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Figure 8-43: Out of Band emission at antenna terminals – HSDPA II Channel Highest



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Figure 8-44: Band edge emission at antenna terminals – HSDPA II Channel Lowest

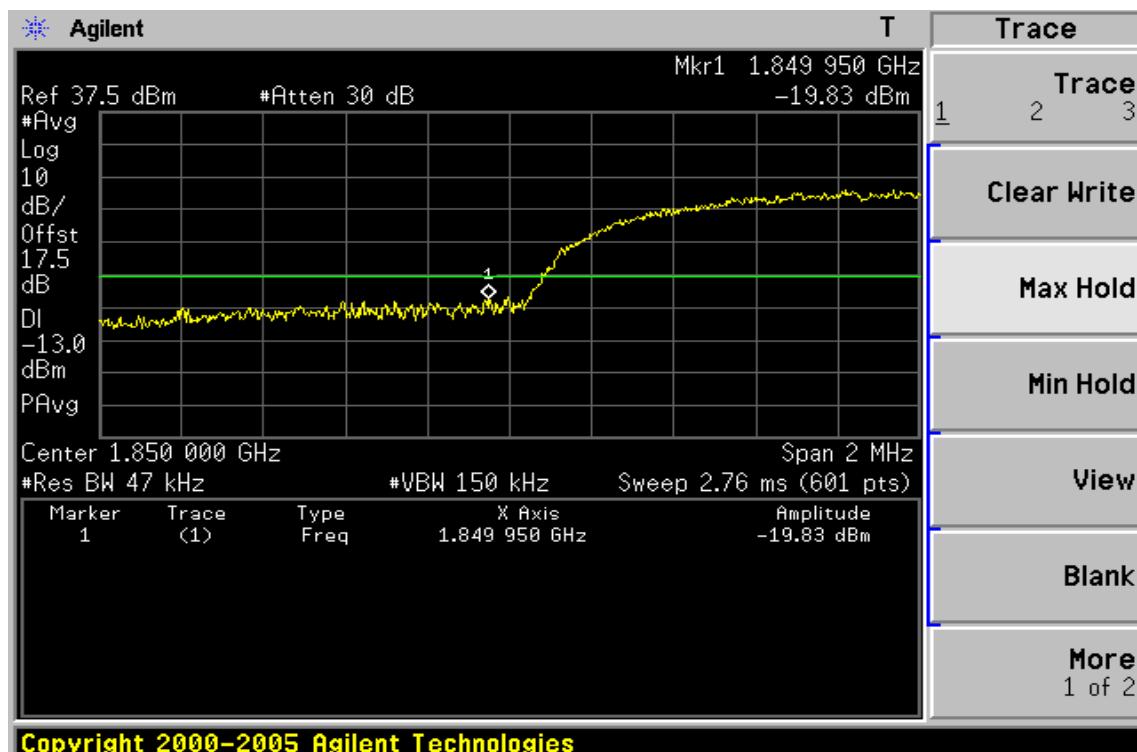
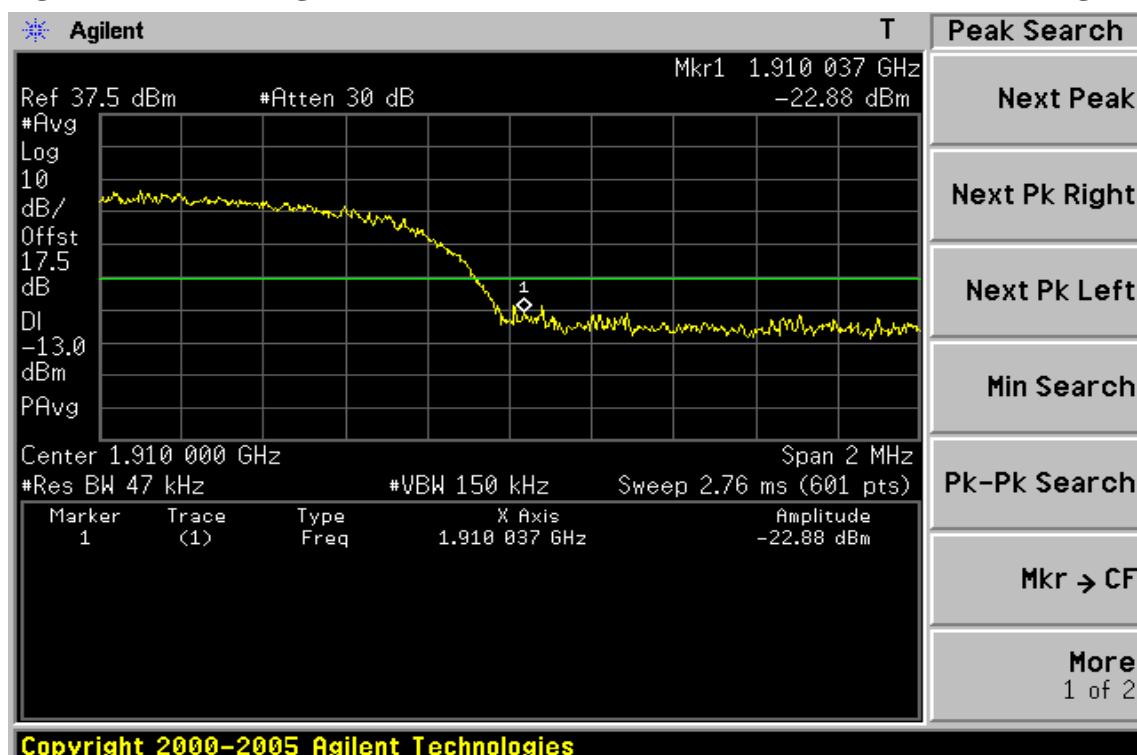


Figure 8-45: Band edge emission at antenna terminals – HSDPA II Channel Highest

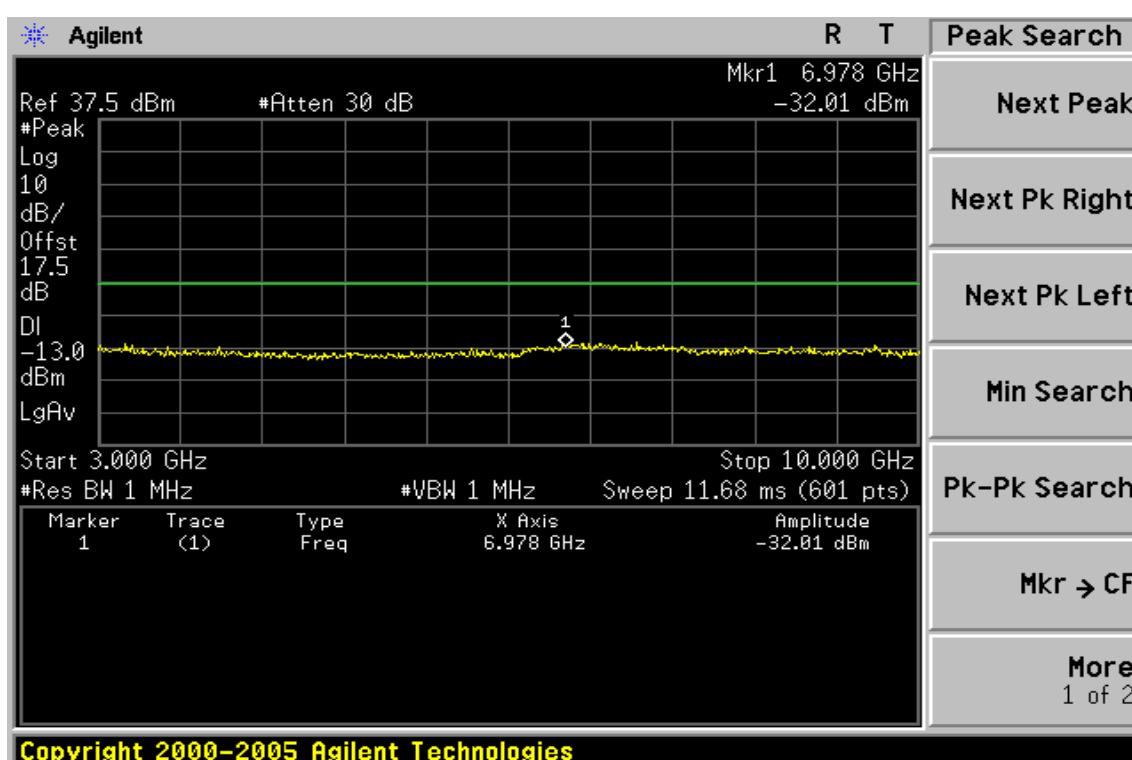
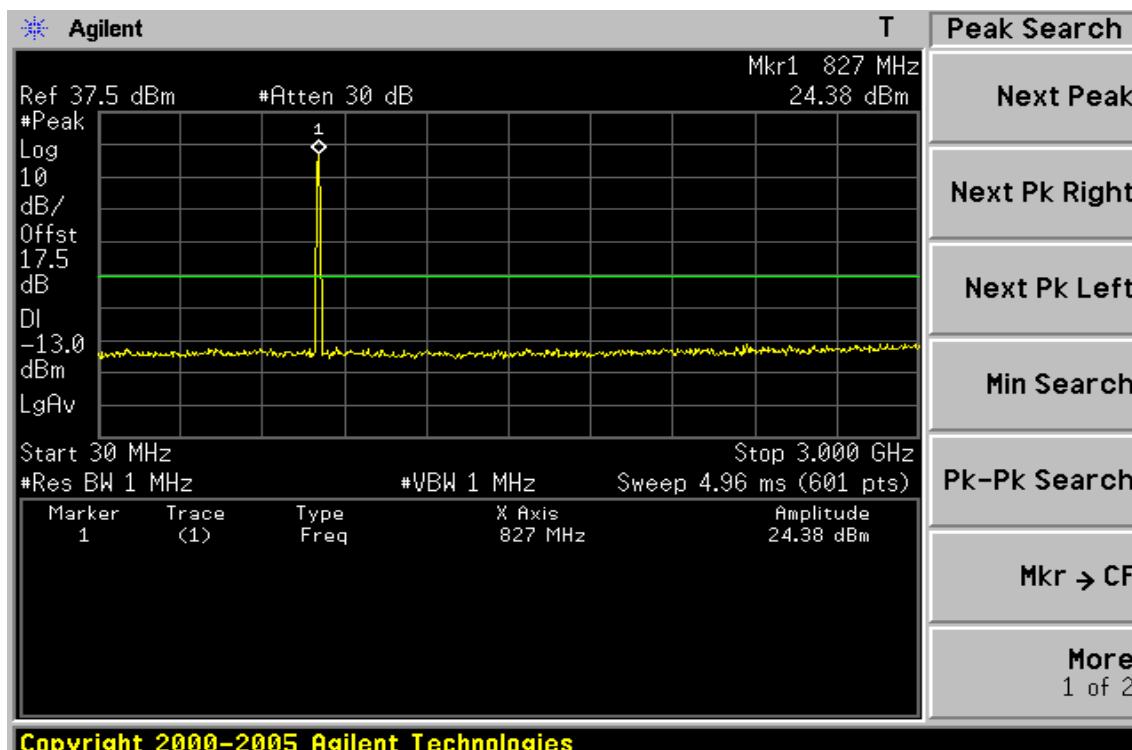


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Figure 8-46: Out of Band emission at antenna terminals – HSDPA V Channel Lowest

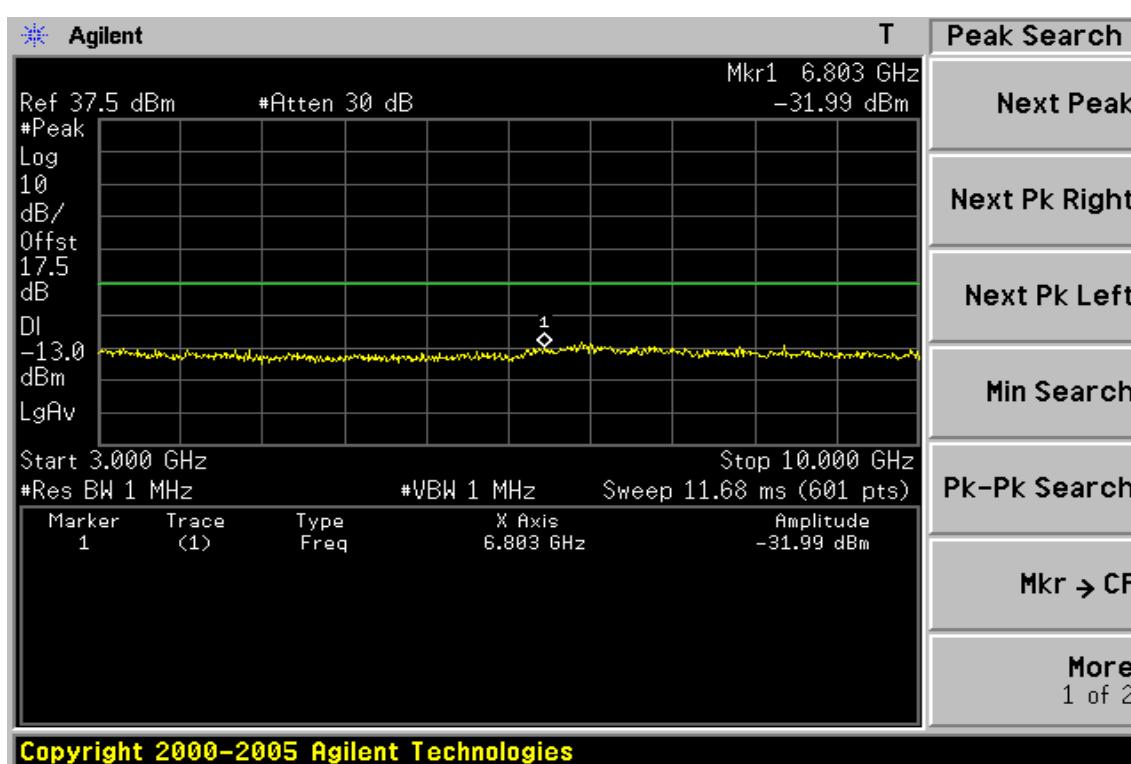
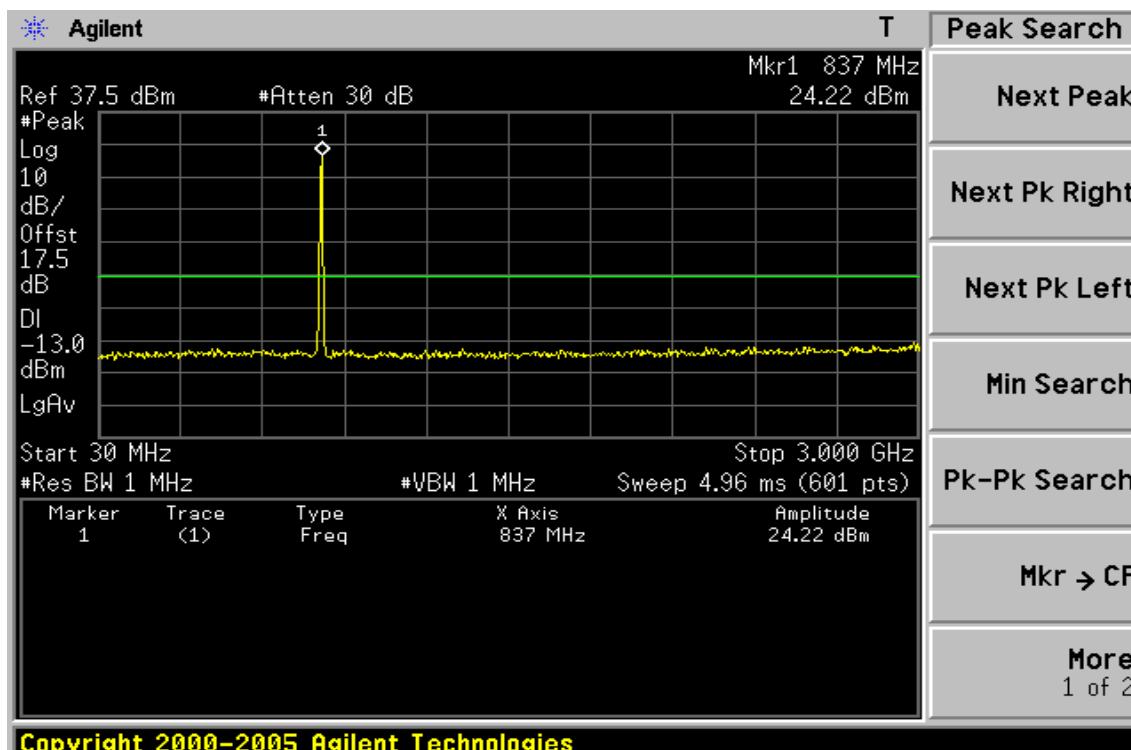


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Figure 8-47: Out of Band emission at antenna terminals – HSDPA V Channel Mid

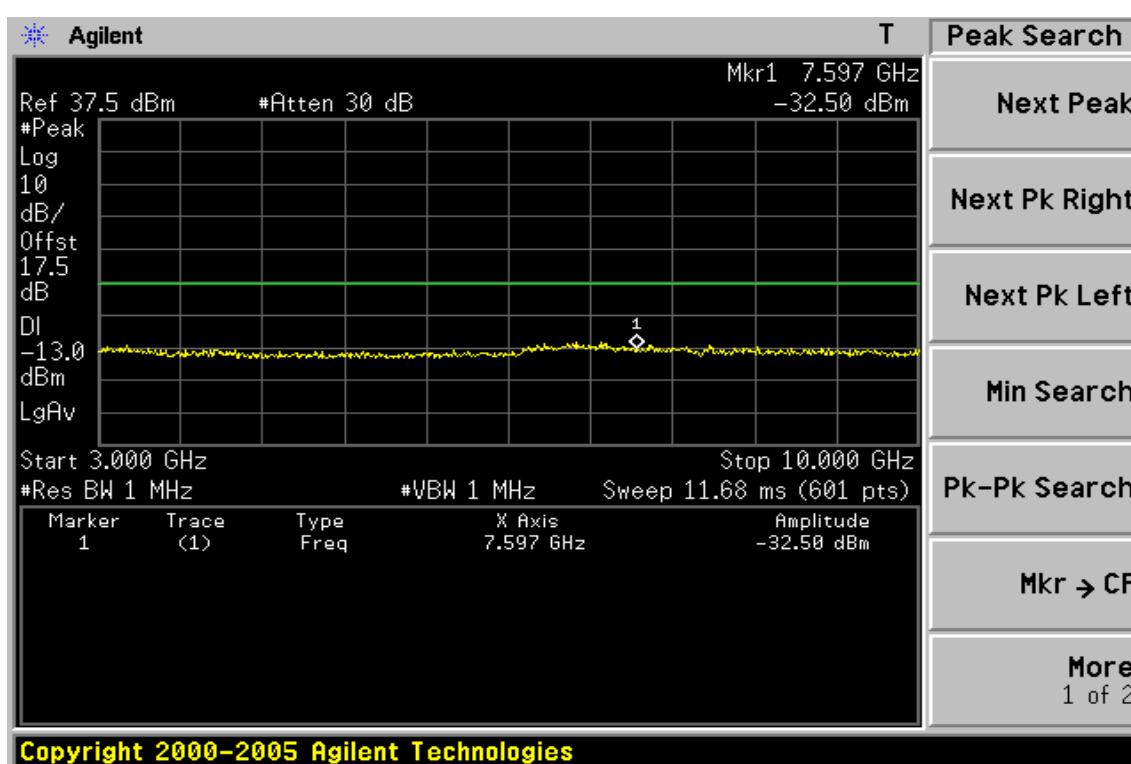
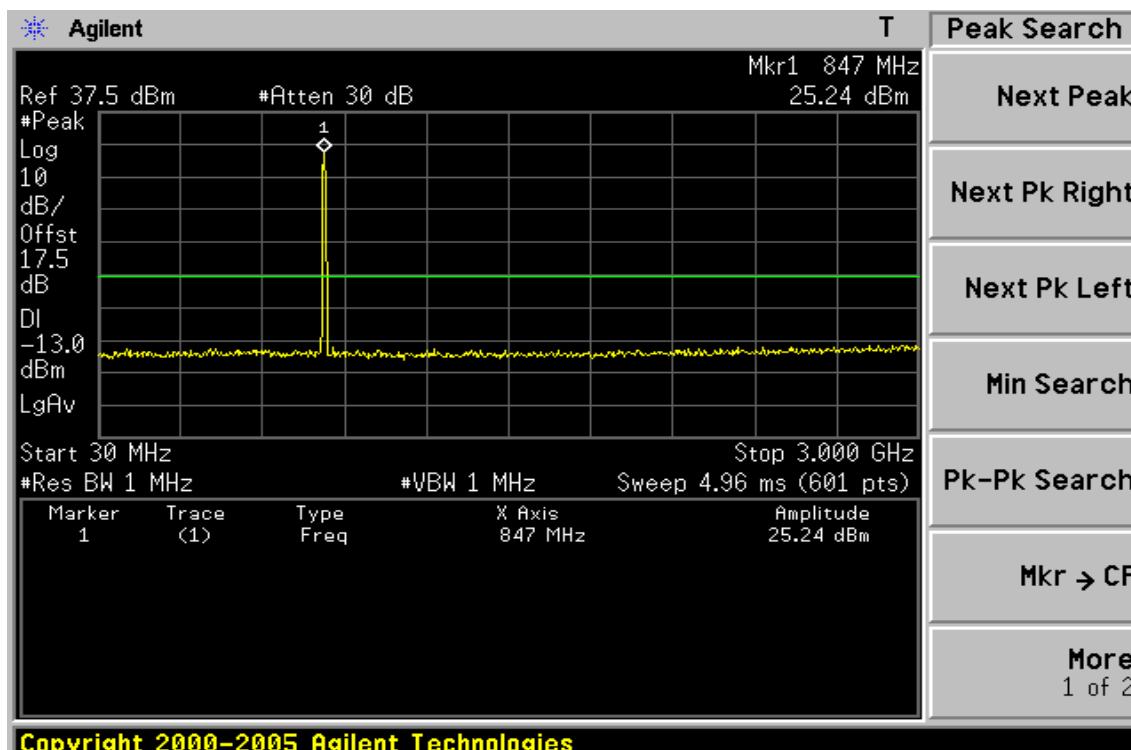


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Figure 8-48: Out of Band emission at antenna terminals – HSDPA V Channel Highest



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Figure 8-49: Band edge emission at antenna terminals – HSDPA V Channel Lowest

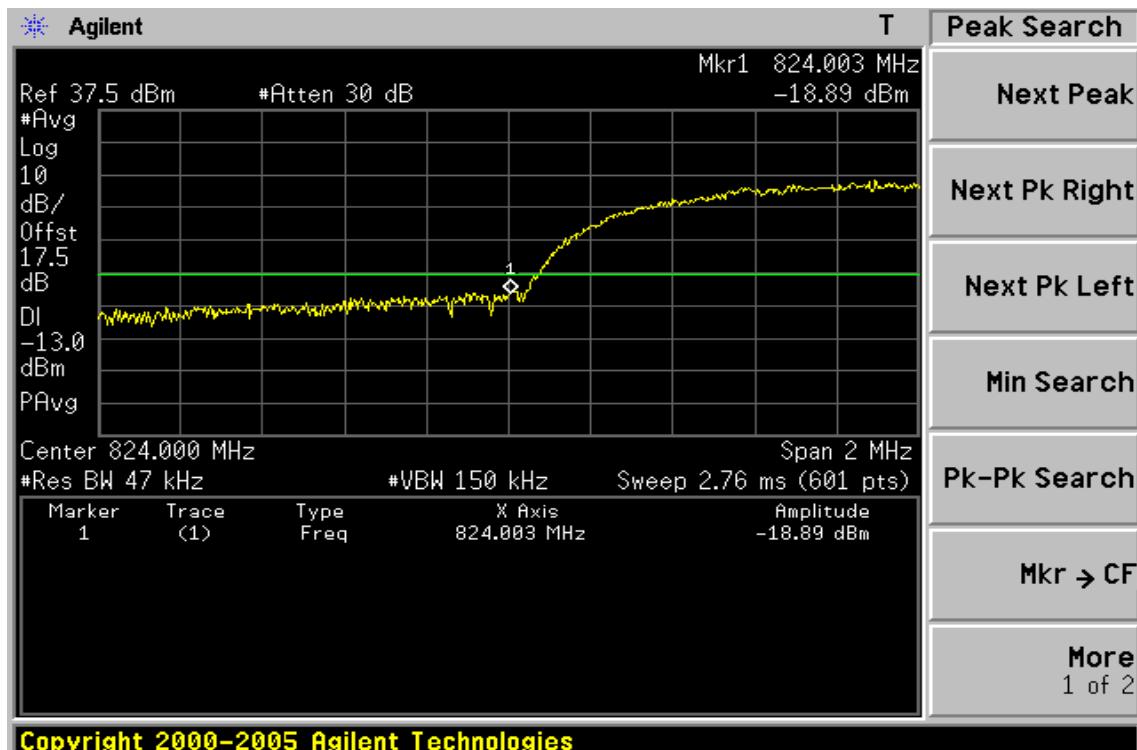
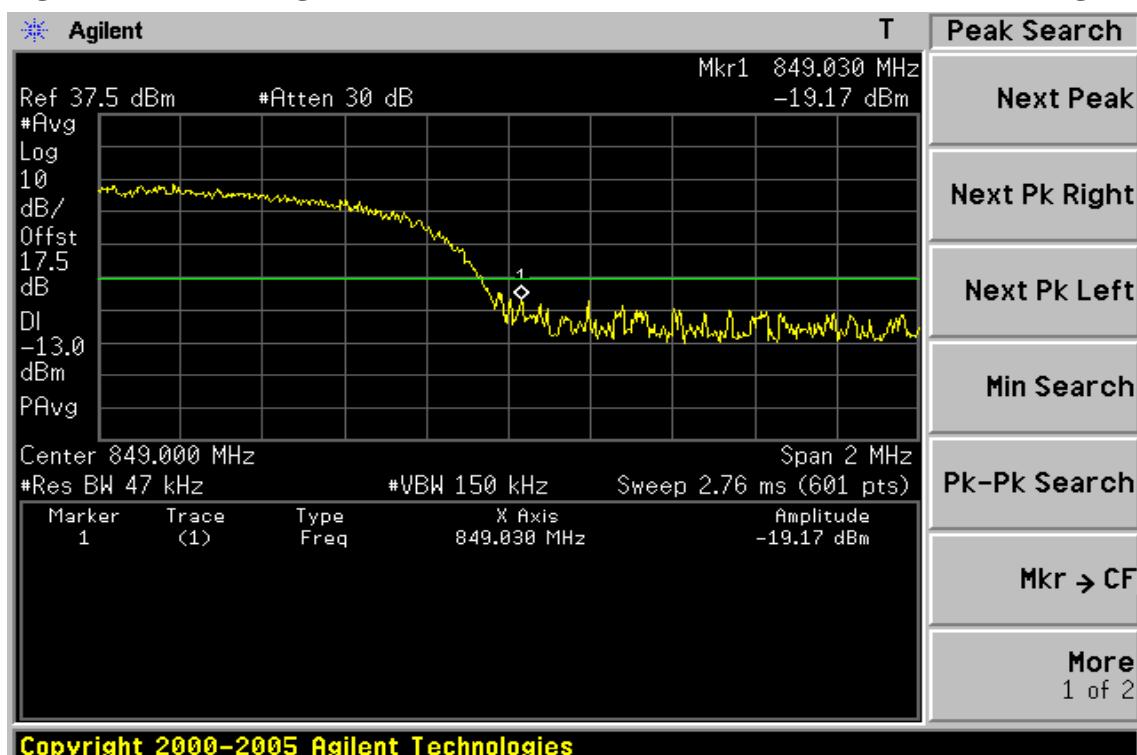


Figure 8-50: Band edge emission at antenna terminals – HSDPA V Channel Highest



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## 9. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT (TX)

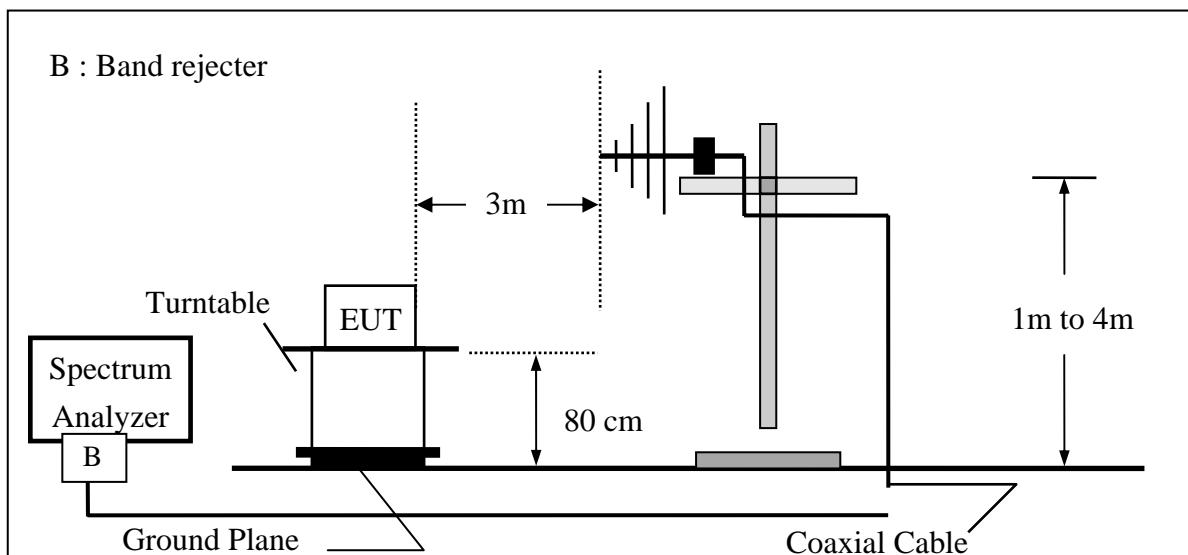
### 9.1. Standard Applicable:

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)

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

Radiated Emission Test Set-Up, Frequency Below 1000MHz

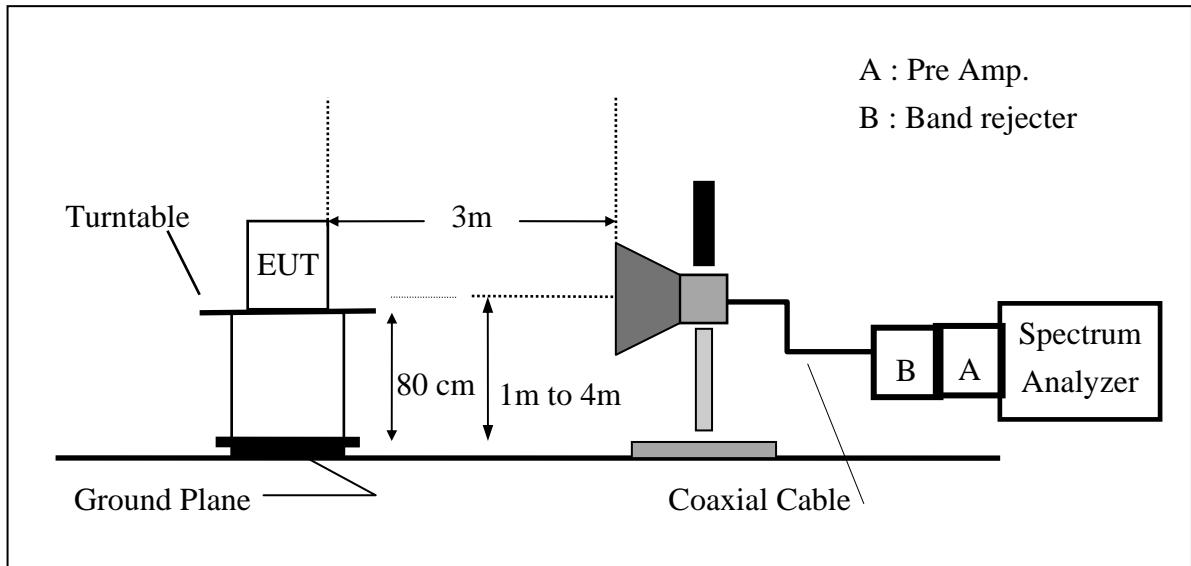


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## Radiated Emission Test Set-UP Frequency Over 1 GHz

**9.3. 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.

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

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

**9.4. Measurement Equipment Used:**

Refer to section 2.4 in this report

**9.5. Measurement Result:**

Refer to attach tabular data sheets.

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### Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode : TX CH Low Mode      Test Date: July 12, 2011  
 Fundamental Frequency : 824.20 MHz      Test By: Nick  
 Temperature : 25      Pol: Ver  
 Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
160.95	34.60	V	-63.67	-7.81	1.62	-73.10	-13.00	-60.10
225.94	38.74	V	-62.06	-7.87	1.86	-71.78	-13.00	-58.78
299.66	40.35	V	-57.91	-7.92	2.17	-68.00	-13.00	-55.00
559.62	32.31	V	-59.62	-7.77	2.97	-70.36	-13.00	-57.36
565.44	35.02	V	-56.57	-7.77	2.98	-67.32	-13.00	-54.32
924.34	33.13	V	-51.56	-7.97	3.83	-63.36	-13.00	-50.36
1648.40	53.76	V	-50.82	9.29	5.23	-46.76	-13.00	-33.76
2472.60	64.46	V	-36.55	10.08	6.53	-33.00	-13.00	-20.00
3296.80	---	V		12.17	7.71		-13.00	
4121.00	---	V		12.61	8.86		-13.00	
4945.20	---	V		12.65	9.74		-13.00	
5769.40	---	V		13.55	10.54		-13.00	
6593.60	---	V		12.05	11.30		-13.00	
7417.80	---	V		11.49	12.10		-13.00	
8242.00	---	V		11.48	12.71		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

#### Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)$

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Operation Mode : TX CH Low Mode  
 Fundamental Frequency : 824.20 MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Hor

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
175.50	35.28	H	-64.47	-7.82	1.65	-73.94	-13.00	-60.94
225.94	38.75	H	-61.64	-7.87	1.86	-71.36	-13.00	-58.36
309.36	39.11	H	-58.46	-7.87	2.21	-68.54	-13.00	-55.54
553.80	36.21	H	-55.43	-7.76	2.97	-66.16	-13.00	-53.16
639.16	32.45	H	-57.48	-7.81	3.13	-68.42	-13.00	-55.42
934.04	33.14	H	-51.27	-7.98	3.85	-63.11	-13.00	-50.11
1648.40	50.67	H	-53.73	9.29	5.23	-49.67	-13.00	-36.67
2472.60	68.72	H	-32.19	10.08	6.53	-28.64	-13.00	-15.64
3296.80	---	H		12.17	7.71		-13.00	
4121.00	---	H		12.61	8.86		-13.00	
4945.20	---	H		12.65	9.74		-13.00	
5769.40	---	H		13.55	10.54		-13.00	
6593.60	---	H		12.05	11.30		-13.00	
7417.80	---	H		11.49	12.10		-13.00	
8242.00	---	H		11.48	12.71		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)$

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Operation Mode : TX CH Mid Mode  
 Fundamental Frequency : 836.60 MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Ver

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
183.26	35.42	V	-64.86	-7.83	1.67	-74.35	-13.00	-61.35
225.94	37.52	V	-63.28	-7.87	1.86	-73.00	-13.00	-60.00
299.66	40.40	V	-57.86	-7.92	2.17	-67.95	-13.00	-54.95
553.80	33.16	V	-59.11	-7.76	2.97	-69.84	-13.00	-56.84
670.20	33.21	V	-55.92	-7.83	3.21	-66.96	-13.00	-53.96
932.10	33.44	V	-51.23	-7.98	3.85	-63.06	-13.00	-50.06
1673.20	55.35	V	-49.21	9.36	5.27	-45.11	-13.00	-32.11
2509.80	60.39	V	-40.39	10.09	6.58	-36.89	-13.00	-23.89
3346.40	---	V		12.28	7.79		-13.00	
4183.00	---	V		12.62	8.93		-13.00	
5019.60	---	V		12.67	9.81		-13.00	
5856.20	---	V		13.68	10.62		-13.00	
6692.80	---	V		11.95	11.39		-13.00	
7529.40	---	V		11.45	12.20		-13.00	
8366.00	---	V		11.59	12.81		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belongs to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH Mid Mode  
Fundamental Frequency : 836.60 MHz  
Temperature : 25  
Humidity : 65%

Test Date: July 12, 2011  
Test By: Nick  
Pol: Hor

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
156.10	35.56	H	-62.68	-7.80	1.60	-72.09	-13.00	-59.09
225.94	38.45	H	-61.94	-7.87	1.86	-71.66	-13.00	-58.66
299.66	39.20	H	-58.47	-7.92	2.17	-68.56	-13.00	-55.56
548.95	37.08	H	-54.68	-7.76	2.96	-65.39	-13.00	-52.39
742.95	33.87	H	-61.79	-7.87	3.44	-73.10	-13.00	-60.10
961.20	32.81	H	-51.33	-8.00	3.91	-63.24	-13.00	-50.24
1673.20	43.96	H	-60.42	9.36	5.27	-56.32	-13.00	-43.32
2509.80	66.37	H	-34.33	10.09	6.58	-30.83	-13.00	-17.83
3346.40	---	H		12.28	7.79		-13.00	
4183.00	---	H		12.62	8.93		-13.00	
5019.60	---	H		12.67	9.81		-13.00	
5856.20	---	H		13.68	10.62		-13.00	
6692.80	---	H		11.95	11.39		-13.00	
7529.40	---	H		11.45	12.20		-13.00	
8366.00	---	H		11.59	12.81		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH High Mode  
 Fundamental Frequency : 848.80 MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Ver

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
194.90	36.19	V	-65.13	-7.84	1.70	-74.67	-13.00	-61.67
225.94	38.68	V	-62.12	-7.87	1.86	-71.84	-13.00	-58.84
299.66	40.48	V	-57.78	-7.92	2.17	-67.87	-13.00	-54.87
555.74	32.78	V	-59.37	-7.76	2.97	-70.11	-13.00	-57.11
648.86	33.33	V	-55.60	-7.81	3.16	-66.57	-13.00	-53.57
920.46	33.00	V	-51.70	-7.97	3.83	-63.49	-13.00	-50.49
1697.60	54.42	V	-50.12	9.44	5.31	-45.99	-13.00	-32.99
2546.40	55.36	V	-45.28	10.20	6.63	-41.72	-13.00	-28.72
3395.20	---	V		12.38	7.87		-13.00	
4244.00	---	V		12.63	9.00		-13.00	
5092.80	---	V		12.74	9.88		-13.00	
5941.60	---	V		13.81	10.70		-13.00	
6790.40	---	V		11.86	11.48		-13.00	
7639.20	---	V		11.40	12.27		-13.00	
8488.00	---	V		11.70	12.91		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH High Mode  
 Fundamental Frequency : 848.80 MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Hor

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
180.35	38.11	H	-62.02	-7.82	1.66	-71.50	-13.00	-58.50
225.94	38.83	H	-61.56	-7.87	1.86	-71.28	-13.00	-58.28
299.66	39.28	H	-58.39	-7.92	2.17	-68.48	-13.00	-55.48
544.10	35.58	H	-56.34	-7.76	2.94	-67.04	-13.00	-54.04
561.56	36.56	H	-54.92	-7.77	2.98	-65.67	-13.00	-52.67
922.40	33.25	H	-51.31	-7.97	3.83	-63.12	-13.00	-50.12
1697.60	48.15	H	-56.20	9.44	5.31	-52.07	-13.00	-39.07
2546.40	63.96	H	-36.64	10.20	6.63	-33.08	-13.00	-20.08
3395.20	---	H		12.38	7.87		-13.00	
4244.00	---	H		12.63	9.00		-13.00	
5092.80	---	H		12.74	9.88		-13.00	
5941.60	---	H		13.81	10.70		-13.00	
6790.40	---	H		11.86	11.48		-13.00	
7639.20	---	H		11.40	12.27		-13.00	
8488.00	---	H		11.70	12.91		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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**Radiated Spurious Emission Measurement Result: GSM 1900 Mode**

Operation Mode : TX CH Low Mode Test Date: July 12, 2011  
Fundamental Frequency : 1850.20MHz Test By: Nick  
Temperature : 25 Pol: Ver  
Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
177.44	36.03	V	-63.72	-7.82	1.66	-73.20	-13.00	-60.20
248.25	36.85	V	-63.11	-7.89	1.98	-72.97	-13.00	-59.97
299.66	38.15	V	-60.11	-7.92	2.17	-70.20	-13.00	-57.20
390.84	39.59	V	-56.30	-7.66	2.48	-66.44	-13.00	-53.44
645.95	32.87	V	-56.10	-7.81	3.15	-67.06	-13.00	-54.06
934.04	32.25	V	-52.41	-7.98	3.85	-64.25	-13.00	-51.25
3700.40	45.85	V	-52.08	12.61	8.31	-47.78	-13.00	-34.78
5550.60	40.44	V	-50.40	13.23	10.33	-47.50	-13.00	-34.50
7400.80	---	V		11.50	12.08		-13.00	
9251.00	---	V		11.92	13.50		-13.00	
11101.20	---	V		11.66	15.11		-13.00	
12951.40	---	V		13.63	16.60		-13.00	
14801.60	---	V		12.76	17.95		-13.00	
16651.80	---	V		15.92	19.14		-13.00	
18502.00	---	V		18.75	10.40		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH Low Mode  
 Fundamental Frequency : 1850.20MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Hor

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out-put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
165.80	35.29	H	-63.71	-7.81	1.63	-73.15	-13.00	-60.15
225.94	38.98	H	-61.41	-7.87	1.86	-71.13	-13.00	-58.13
309.36	39.93	H	-57.64	-7.87	2.21	-67.72	-13.00	-54.72
390.84	41.85	H	-54.72	-7.66	2.48	-64.86	-13.00	-51.86
610.06	35.16	H	-55.34	-7.79	3.06	-66.19	-13.00	-53.19
972.84	33.69	H	-50.38	-8.00	3.95	-62.33	-13.00	-49.33
3700.40	57.04	H	-41.00	12.61	8.31	-36.70	-13.00	-23.70
5550.60	41.55	H	-49.50	13.23	10.33	-46.60	-13.00	-33.60
7400.80	---	H		11.50	12.08		-13.00	
9251.00	---	H		11.92	13.50		-13.00	
11101.20	---	H		11.66	15.11		-13.00	
12951.40	---	H		13.63	16.60		-13.00	
14801.60	---	H		12.76	17.95		-13.00	
16651.80	---	H		15.92	19.14		-13.00	
18502.00	---	H		18.75	10.40		-13.00	

<b>Measurement uncertainty</b>	<b>30MHz - 80MHz: 5.04dB</b>
	<b>80MHz -1000MHz: 3.76dB</b>
	<b>1GHz - 13GHz: 4.45dB</b>

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH Mid Mode  
 Fundamental Frequency : 1880MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Ver

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out- put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
163.86	37.50	V	-61.03	-7.81	1.62	-70.47	-13.00	-57.47
225.94	40.09	V	-60.71	-7.87	1.86	-70.43	-13.00	-57.43
299.66	38.10	V	-60.16	-7.92	2.17	-70.25	-13.00	-57.25
390.84	37.80	V	-58.09	-7.66	2.48	-68.23	-13.00	-55.23
645.95	32.67	V	-56.30	-7.81	3.15	-67.26	-13.00	-54.26
920.46	32.72	V	-51.98	-7.97	3.83	-63.77	-13.00	-50.77
3760.00	49.50	V	-48.16	12.60	8.39	-43.94	-13.00	-30.94
5640.00	40.27	V	-50.31	13.36	10.41	-47.36	-13.00	-34.36
7520.00	---	V		11.45	12.19		-13.00	
9400.00	---	V		11.93	13.61		-13.00	
11280.00	---	V		11.92	15.27		-13.00	
13160.00	---	V		13.33	16.71		-13.00	
15040.00	---	V		13.76	18.15		-13.00	
16920.00	---	V		15.27	19.32		-13.00	
18800.00	---	V		18.68	16.58		-13.00	

<b>Measurement uncertainty</b>	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH Mid Mode  
 Fundamental Frequency : 1880MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Hor

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out- put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
170.65	35.07	H	-64.30	-7.82	1.64	-73.76	-13.00	-60.76
225.94	38.92	H	-61.47	-7.87	1.86	-71.19	-13.00	-58.19
309.36	39.82	H	-57.75	-7.87	2.21	-67.83	-13.00	-54.83
390.84	38.74	H	-57.83	-7.66	2.48	-67.97	-13.00	-54.97
563.50	36.05	H	-55.39	-7.77	2.98	-66.14	-13.00	-53.14
972.84	32.87	H	-51.20	-8.00	3.95	-63.15	-13.00	-50.15
3760.00	42.23	H	-55.54	12.60	8.39	-51.33	-13.00	-38.33
5640.00	---	H		13.36	10.41		-13.00	
7520.00	---	H		11.45	12.19		-13.00	
9400.00	---	H		11.93	13.61		-13.00	
11280.00	---	H		11.92	15.27		-13.00	
13160.00	---	H		13.33	16.71		-13.00	
15040.00	---	H		13.76	18.15		-13.00	
16920.00	---	H		15.27	19.32		-13.00	
18800.00	---	H		18.68	16.58		-13.00	

<b>Measurement uncertainty</b>	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH High Mode  
 Fundamental Frequency : 1909.8 MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Ver

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out- put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
151.25	34.75	V	-62.65	-7.80	1.59	-72.05	-13.00	-59.05
248.25	36.96	V	-63.00	-7.89	1.98	-72.86	-13.00	-59.86
291.90	39.29	V	-59.23	-7.92	2.14	-69.28	-13.00	-56.28
390.84	39.35	V	-56.54	-7.66	2.48	-66.68	-13.00	-53.68
650.80	32.39	V	-56.54	-7.81	3.16	-67.51	-13.00	-54.51
968.96	32.14	V	-52.04	-8.00	3.94	-63.98	-13.00	-50.98
3819.60	47.35	V	-50.04	12.60	8.47	-45.91	-13.00	-32.91
5729.40	41.02	V	-49.30	13.49	10.50	-46.30	-13.00	-33.30
7639.20	---	V		11.40	12.27		-13.00	
9549.00	---	V		11.95	13.74		-13.00	
11458.80	---	V		12.17	15.43		-13.00	
13368.60	---	V		12.97	16.82		-13.00	
15278.40	---	V		15.00	18.29		-13.00	
17188.20	---	V		14.47	19.52		-13.00	
19098.00	---	V		18.66	20.78		-13.00	

<b>Measurement uncertainty</b>	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
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Operation Mode : TX CH High Mode  
 Fundamental Frequency : 1909.8 MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Hor

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out- put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
165.80	36.21	H	-62.79	-7.81	1.63	-72.23	-13.00	-59.23
225.94	39.41	H	-60.98	-7.87	1.86	-70.70	-13.00	-57.70
309.36	40.39	H	-57.18	-7.87	2.21	-67.26	-13.00	-54.26
390.84	37.50	H	-59.07	-7.66	2.48	-69.21	-13.00	-56.21
612.00	33.18	H	-57.28	-7.79	3.06	-68.14	-13.00	-55.14
941.80	32.05	H	-52.26	-7.99	3.87	-64.12	-13.00	-51.12
3819.60	41.53	H	-55.98	12.60	8.47	-51.84	-13.00	-38.84
5729.40	37.34	H	-53.11	13.49	10.50	-50.12	-13.00	-37.12
7639.20	---	H		11.40	12.27		-13.00	
9549.00	---	H		11.95	13.74		-13.00	
11458.80	---	H		12.17	15.43		-13.00	
13368.60	---	H		12.97	16.82		-13.00	
15278.40	---	H		15.00	18.29		-13.00	
17188.20	---	H		14.47	19.52		-13.00	
19098.00	---	H		18.66	20.78		-13.00	

<b>Measurement uncertainty</b>	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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

Operation Mode : TX CH Low Mode Test Date: July 12, 2011  
Fundamental Frequency : 1852.4MHz Test By: Nick  
Temperature : 25 Pol: Ver  
Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
167.74	34.94	V	-63.94	-7.81	1.63	-73.39	-13.00	-60.39
235.64	37.11	V	-63.32	-7.88	1.91	-73.11	-13.00	-60.11
309.36	37.90	V	-60.23	-7.87	2.21	-70.31	-13.00	-57.31
390.84	40.32	V	-55.57	-7.66	2.48	-65.71	-13.00	-52.71
650.80	32.58	V	-56.35	-7.81	3.16	-67.32	-13.00	-54.32
985.45	32.21	V	-51.59	-7.99	3.99	-63.57	-13.00	-50.57
3704.80	36.80	V	-61.11	12.61	8.31	-56.82	-13.00	-43.82
5557.20	---	V		13.24	10.33		-13.00	
7409.60	---	V		11.49	12.09		-13.00	
9262.00	---	V		11.92	13.51		-13.00	
11114.40	---	V		11.68	15.12		-13.00	
12966.80	---	V		13.62	16.61		-13.00	
14819.20	---	V		12.83	17.96		-13.00	
16671.60	---	V		15.87	19.15		-13.00	
18524.00	---	V		18.74	10.86		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH Low Mode  
 Fundamental Frequency : 1852.4MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Hor

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out-put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
149.31	33.23	H	-64.61	-7.80	1.59	-74.00	-13.00	-61.00
225.94	38.47	H	-61.92	-7.87	1.86	-71.64	-13.00	-58.64
309.36	40.11	H	-57.46	-7.87	2.21	-67.54	-13.00	-54.54
390.84	40.11	H	-56.46	-7.66	2.48	-66.60	-13.00	-53.60
652.74	32.65	H	-56.96	-7.81	3.17	-67.94	-13.00	-54.94
975.75	33.32	H	-50.74	-7.99	3.96	-62.69	-13.00	-49.69
3704.80	37.35	H	-60.67	12.61	8.31	-56.38	-13.00	-43.38
5557.20	---	H		13.24	10.33		-13.00	
7409.60	---	H		11.49	12.09		-13.00	
9262.00	---	H		11.92	13.51		-13.00	
11114.40	---	H		11.68	15.12		-13.00	
12966.80	---	H		13.62	16.61		-13.00	
14819.20	---	H		12.83	17.96		-13.00	
16671.60	---	H		15.87	19.15		-13.00	
18524.00	---	H		18.74	10.86		-13.00	

<b>Measurement uncertainty</b>	<b>30MHz - 80MHz: 5.04dB</b>
	<b>80MHz -1000MHz: 3.76dB</b>
	<b>1GHz - 13GHz: 4.45dB</b>

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH Mid Mode  
Fundamental Frequency : 1880MHz  
Temperature : 25  
Humidity : 65%

Test Date: July 12, 2011  
Test By: Nick  
Pol: Ver

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
154.16	33.96	V	-63.70	-7.80	1.60	-73.11	-13.00	-60.11
235.64	37.99	V	-62.44	-7.88	1.91	-72.23	-13.00	-59.23
309.36	38.46	V	-59.67	-7.87	2.21	-69.75	-13.00	-56.75
390.84	38.30	V	-57.59	-7.66	2.48	-67.73	-13.00	-54.73
658.56	32.40	V	-56.61	-7.82	3.18	-67.61	-13.00	-54.61
985.45	32.21	V	-51.59	-7.99	3.99	-63.57	-13.00	-50.57
3760.00	33.83	V	-63.83	12.60	8.39	-59.61	-13.00	-46.61
5640.00	---	V		13.36	10.41		-13.00	
7520.00	---	V		11.45	12.19		-13.00	
9400.00	---	V		11.93	13.61		-13.00	
11280.00	---	V		11.92	15.27		-13.00	
13160.00	---	V		13.33	16.71		-13.00	
15040.00	---	V		13.76	18.15		-13.00	
16920.00	---	V		15.27	19.32		-13.00	
18800.00	---	V		18.68	16.58		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

#### Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)$

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Operation Mode : TX CH Mid Mode  
 Fundamental Frequency : 1880MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Hor

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out- put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
170.65	33.81	H	-65.56	-7.82	1.64	-75.02	-13.00	-62.02
225.94	38.68	H	-61.71	-7.87	1.86	-71.43	-13.00	-58.43
309.36	40.40	H	-57.17	-7.87	2.21	-67.25	-13.00	-54.25
390.84	38.65	H	-57.92	-7.66	2.48	-68.06	-13.00	-55.06
697.36	32.76	H	-54.98	-7.86	3.28	-66.12	-13.00	-53.12
959.26	32.53	H	-51.62	-8.00	3.91	-63.53	-13.00	-50.53
3760.00	36.49	H	-61.28	12.60	8.39	-57.07	-13.00	-44.07
5640.00	---	H		13.36	10.41		-13.00	
7520.00	---	H		11.45	12.19		-13.00	
9400.00	---	H		11.93	13.61		-13.00	
11280.00	---	H		11.92	15.27		-13.00	
13160.00	---	H		13.33	16.71		-13.00	
15040.00	---	H		13.76	18.15		-13.00	
16920.00	---	H		15.27	19.32		-13.00	
18800.00	---	H		18.68	16.58		-13.00	

<b>Measurement uncertainty</b>	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
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Operation Mode : TX CH High Mode  
 Fundamental Frequency : 1907.6MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Ver

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out- put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
170.65	36.32	V	-62.82	-7.82	1.64	-72.28	-13.00	-59.28
235.64	36.91	V	-63.52	-7.88	1.91	-73.31	-13.00	-60.31
309.36	37.74	V	-60.39	-7.87	2.21	-70.47	-13.00	-57.47
390.84	39.39	V	-56.50	-7.66	2.48	-66.64	-13.00	-53.64
660.50	32.53	V	-56.50	-7.82	3.19	-67.51	-13.00	-54.51
978.66	31.81	V	-52.15	-7.99	3.97	-64.11	-13.00	-51.11
3815.20	33.75	V	-63.66	12.60	8.46	-59.52	-13.00	-46.52
5722.80	---	V		13.48	10.49		-13.00	
7630.40	---	V		11.41	12.27		-13.00	
9538.00	---	V		11.95	13.73		-13.00	
11445.60	---	V		12.15	15.42		-13.00	
13353.20	---	V		13.00	16.81		-13.00	
15260.80	---	V		14.91	18.28		-13.00	
17168.40	---	V		14.53	19.50		-13.00	
19076.00	---	V		18.65	20.76		-13.00	

<b>Measurement uncertainty</b>	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
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Operation Mode : TX CH High Mode  
 Fundamental Frequency : 1907.6MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Hor

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out- put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
165.80	37.08	H	-61.92	-7.81	1.63	-71.36	-13.00	-58.36
225.94	38.45	H	-61.94	-7.87	1.86	-71.66	-13.00	-58.66
309.36	40.26	H	-57.31	-7.87	2.21	-67.39	-13.00	-54.39
390.84	38.38	H	-58.19	-7.66	2.48	-68.33	-13.00	-55.33
662.44	32.75	H	-56.45	-7.82	3.19	-67.46	-13.00	-54.46
970.90	32.12	H	-51.96	-8.00	3.94	-63.90	-13.00	-50.90
3815.20	33.56	H	-63.97	12.60	8.46	-59.83	-13.00	-46.83
5722.80	---	H		13.48	10.49		-13.00	
7630.40	---	H		11.41	12.27		-13.00	
9538.00	---	H		11.95	13.73		-13.00	
11445.60	---	H		12.15	15.42		-13.00	
13353.20	---	H		13.00	16.81		-13.00	
15260.80	---	H		14.91	18.28		-13.00	
17168.40	---	H		14.53	19.50		-13.00	
19076.00	---	H		18.65	20.76		-13.00	

<b>Measurement uncertainty</b>	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

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## Radiated Spurious Emission Measurement Result: HSDPA V Mode

Operation Mode : TX CH Low Mode Test Date: July 12, 2011  
Fundamental Frequency : 826.4MHz Test By: Nick  
Temperature : 25 Pol: Ver  
Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
154.16	33.36	V	-64.30	-9.94	1.60	-75.85	-13.00	-62.85
225.94	37.96	V	-62.84	-10.01	1.86	-74.70	-13.00	-61.70
299.66	40.48	V	-57.78	-10.06	2.17	-70.01	-13.00	-57.01
551.86	32.98	V	-59.40	-9.90	2.96	-72.27	-13.00	-59.27
607.15	33.52	V	-55.96	-9.93	3.05	-68.94	-13.00	-55.94
970.90	33.08	V	-51.06	-10.14	3.94	-65.14	-13.00	-52.14
1652.80	38.21	V	-66.37	9.30	5.23	-62.30	-13.00	-49.30
2462.50	40.72	V	-60.36	10.08	6.51	-56.79	-13.00	-43.79
2479.20	---	V		10.07	6.54		-13.00	
3305.60	---	V		12.19	7.73		-13.00	
4132.00	---	V		12.62	8.87		-13.00	
4958.40	---	V		12.65	9.75		-13.00	
5784.80	---	V		13.58	10.55		-13.00	
6611.20	---	V		12.03	11.31		-13.00	
7437.60	---	V		11.48	12.12		-13.00	
8264.00	---	V		11.50	12.73		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $\text{ERP/EIRP (dBm)} = \text{SG Setting(dBm)} + \text{Antenna Gain (dB/dBi)} - \text{Cable loss (dB)}$

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Operation Mode : TX CH Low Mode  
 Fundamental Frequency : 826.4MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Hor

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out- put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
149.31	32.70	H	-65.14	-9.94	1.59	-76.67	-13.00	-63.67
225.94	38.33	H	-62.06	-10.01	1.86	-73.92	-13.00	-60.92
309.36	39.53	H	-58.04	-10.01	2.21	-70.26	-13.00	-57.26
468.44	35.09	H	-58.64	-9.85	2.71	-71.20	-13.00	-58.20
689.60	32.52	H	-55.54	-9.99	3.26	-68.80	-13.00	-55.80
946.65	33.04	H	-51.21	-10.14	3.87	-65.22	-13.00	-52.22
1652.80	---	H		9.30	5.23		-13.00	
2462.50	39.64	H	-61.34	10.08	6.51	-57.77	-13.00	-44.77
2479.20	---	H		10.07	6.54		-13.00	
3305.60	---	H		12.19	7.73		-13.00	
4132.00	---	H		12.62	8.87		-13.00	
4958.40	---	H		12.65	9.75		-13.00	
5784.80	---	H		13.58	10.55		-13.00	
6611.20	---	H		12.03	11.31		-13.00	
7437.60	---	H		11.48	12.12		-13.00	
8264.00	---	H		11.50	12.73		-13.00	

<b>Measurement uncertainty</b>	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH Mid Mode  
 Fundamental Frequency : 836.6MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Ver

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	33.22	V	-64.18	-9.94	1.59	-75.72	-13.00	-62.72
225.94	38.28	V	-62.52	-10.01	1.86	-74.38	-13.00	-61.38
299.66	40.36	V	-57.90	-10.06	2.17	-70.13	-13.00	-57.13
555.74	32.82	V	-59.33	-9.90	2.97	-72.21	-13.00	-59.21
648.86	32.79	V	-56.14	-9.95	3.16	-69.25	-13.00	-56.25
951.50	33.11	V	-51.48	-10.14	3.88	-65.50	-13.00	-52.50
1673.20	37.57	V	-66.99	9.36	5.27	-62.89	-13.00	-49.89
2462.50	40.29	V	-60.79	10.08	6.51	-57.22	-13.00	-44.22
2509.80	---	V		10.09	6.58		-13.00	
3346.40	---	V		12.28	7.79		-13.00	
4183.00	---	V		12.62	8.93		-13.00	
5019.60	---	V		12.67	9.81		-13.00	
5856.20	---	V		13.68	10.62		-13.00	
6692.80	---	V		11.95	11.39		-13.00	
7529.40	---	V		11.45	12.20		-13.00	
8366.00	---	V		11.59	12.81		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH Mid Mode  
 Fundamental Frequency : 836.6MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Hor

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
196.84	38.09	H	-63.31	-9.98	1.70	-74.99	-13.00	-61.99
225.94	39.13	H	-61.26	-10.01	1.86	-73.12	-13.00	-60.12
309.36	39.34	H	-58.23	-10.01	2.21	-70.45	-13.00	-57.45
558.65	34.36	H	-57.18	-9.91	2.97	-70.06	-13.00	-57.06
660.50	32.59	H	-56.69	-9.96	3.19	-69.84	-13.00	-56.84
939.86	33.32	H	-51.02	-10.13	3.86	-65.01	-13.00	-52.01
1673.20	36.18	H	-68.20	9.36	5.27	-64.10	-13.00	-51.10
2509.80	---	H		10.09	6.58		-13.00	
3346.40	---	H		12.28	7.79		-13.00	
4183.00	---	H		12.62	8.93		-13.00	
5019.60	---	H		12.67	9.81		-13.00	
5856.20	---	H		13.68	10.62		-13.00	
6692.80	---	H		11.95	11.39		-13.00	
7529.40	---	H		11.45	12.20		-13.00	
8366.00	---	H		11.59	12.81		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz - 1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH High Mode  
 Fundamental Frequency : 846.6MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Ver

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out- put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
187.14	35.98	V	-64.65	-9.97	1.68	-76.29	-13.00	-63.29
248.25	37.62	V	-62.34	-10.03	1.98	-74.34	-13.00	-61.34
299.66	40.25	V	-58.01	-10.06	2.17	-70.24	-13.00	-57.24
553.80	32.51	V	-59.76	-9.90	2.97	-72.63	-13.00	-59.63
655.65	32.58	V	-56.40	-9.96	3.17	-69.53	-13.00	-56.53
963.14	33.74	V	-50.58	-10.14	3.92	-64.63	-13.00	-51.63
1693.20	45.41	V	-59.13	9.42	5.30	-55.01	-13.00	-42.01
2462.50	39.05	V	-62.03	10.08	6.51	-58.46	-13.00	-45.46
2539.80	---	V		10.18	6.62		-13.00	
3386.40	---	V		12.36	7.85		-13.00	
4233.00	---	V		12.63	8.99		-13.00	
5079.60	---	V		12.73	9.87		-13.00	
5926.20	---	V		13.79	10.69		-13.00	
6772.80	---	V		11.87	11.47		-13.00	
7619.40	---	V		11.41	12.26		-13.00	
8466.00	---	V		11.68	12.89		-13.00	

<b>Measurement uncertainty</b>	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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Operation Mode : TX CH High Mode  
 Fundamental Frequency : 846.6MHz  
 Temperature : 25  
 Humidity : 65%

Test Date: July 12, 2011  
 Test By: Nick  
 Pol: Hor

<b>Freq. (MHz)</b>	<b>SPA. Reading (dBuV)</b>	<b>Ant.Pol. H/V</b>	<b>S.G Out- put (dBm)</b>	<b>Antenna Gain (dB/dBi)</b>	<b>Cable Loss (dB)</b>	<b>ERP/ EIRP (dBm)</b>	<b>Limit (dBm)</b>	<b>Safe Margin (dBm)</b>
158.04	33.57	H	-64.82	-9.95	1.61	-76.38	-13.00	-63.38
225.94	38.73	H	-61.66	-10.01	1.86	-73.52	-13.00	-60.52
309.36	39.14	H	-58.43	-10.01	2.21	-70.65	-13.00	-57.65
558.65	35.43	H	-56.11	-9.91	2.97	-68.99	-13.00	-55.99
742.95	33.48	H	-62.18	-10.01	3.44	-75.63	-13.00	-62.63
930.16	33.41	H	-51.05	-10.12	3.84	-65.02	-13.00	-52.02
1693.20	42.73	H	-61.62	9.42	5.30	-57.50	-13.00	-44.50
2462.50	40.48	H	-60.50	10.08	6.51	-56.93	-13.00	-43.93
2539.80	---	H		10.18	6.62		-13.00	
3386.40	---	H		12.36	7.85		-13.00	
4233.00	---	H		12.63	8.99		-13.00	
5079.60	---	H		12.73	9.87		-13.00	
5926.20	---	H		13.79	10.69		-13.00	
6772.80	---	H		11.87	11.47		-13.00	
7619.40	---	H		11.41	12.26		-13.00	
8466.00	---	H		11.68	12.89		-13.00	

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	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark “ --- ” means that the emission level is too low to be measured
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## 10. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

### 10.1. Standard Applicable:

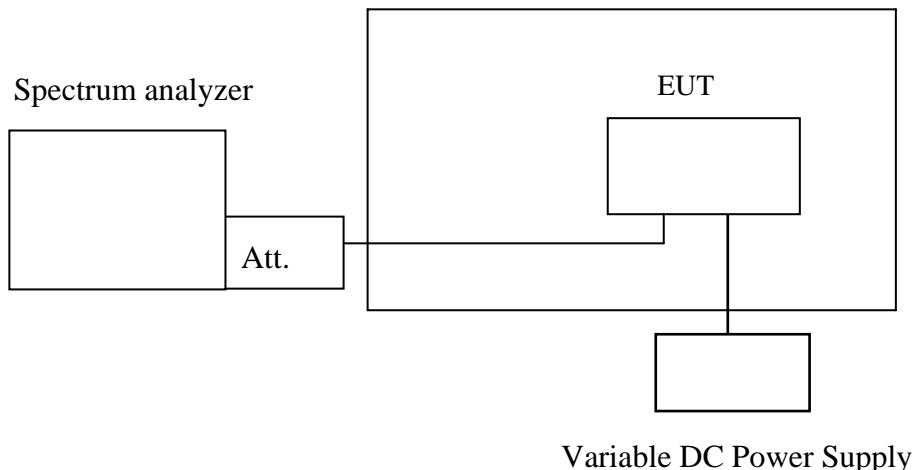
According to FCC §2.1055(a) (1)

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

+/-2.5ppm for 1900MHz band

### 10.2. Test Set-up:

Temperature Chamber



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

### 10.3. 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.

### 10.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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## 10.5. 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 (°)	(MHz)		
3.7	-30	836.600016	-18.00	2091
3.7	-20	836.600018	-20.00	2091
3.7	-10	836.600014	-16.00	2091
3.7	0	836.600020	-22.00	2091
3.7	10	836.600004	-6.00	2091
3.7	20	836.599997	1.00	2091
3.7	30	836.599998	0.00	2091
3.7	40	836.599996	2.00	2091
3.7	50	836.599994	4.00	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)		
3.7	-30	1880.000020	-19.00	4700
3.7	-20	1880.000013	-12.00	4700
3.7	-10	1880.000014	-13.00	4700
3.7	0	1880.000012	-11.00	4700
3.7	10	1880.000010	-9.00	4700
3.7	20	1880.000003	-2.00	4700
3.7	30	1880.000001	0.00	4700
3.7	40	1880.000011	-10.00	4700
3.7	50	1880.000017	-16.00	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)		
3.7	-30	1879.999990	11.00	4700
3.7	-20	1879.999993	8.00	4700
3.7	-10	1879.999995	6.00	4700
3.7	0	1879.999999	2.00	4700
3.7	10	1879.999998	3.00	4700
3.7	20	1880.000003	-2.00	4700
3.7	30	1880.000001	0.00	4700
3.7	40	1880.000008	-7.00	4700
3.7	50	1880.000003	-2.00	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)		
3.7	-30	836.599998	0.00	2091
3.7	-20	836.599996	2.00	2091
3.7	-10	836.599994	4.00	2091
3.7	0	836.599993	5.00	2091
3.7	10	836.599997	1.00	2091
3.7	20	836.600001	-3.00	2091
3.7	30	836.599998	0.00	2091
3.7	40	836.599999	-1.00	2091
3.7	50	836.599994	4.00	2091

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

### 11.1. Standard Applicable:

According to FCC §2.1055(a) (1)

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

+/-2.5ppm 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  $\pm 2.5$  ppm for mobile stations.

### 11.2. Test Set-up:

Refer to section 10.2 in this report

### 11.3. Measurement Procedure:

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

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

### 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)		
4.2	25.00	836.599983	6.00	2091.00
3.7	25.00	836.599989	0.00	2091.00
3.6	25.00	836.599986	3.00	2091.00
3.2 (End Point)	25.00	836.599982	7.00	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)		
4.2	25	1879.999992	14.00	4700
3.7	25	1880.000006	0.00	4700
3.6	25	1879.999993	13.00	4700
3.2 (End Point)	25	1879.999990	16.00	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)		
4.2	25	1880.000005	-2.00	4700
3.7	25	1880.000003	0.00	4700
3.6	25	1880.000002	1.00	4700
3.2 (End Point)	25	1879.999997	6.00	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)		
4.2	25.00	836.599995	2.00	2091.00
3.7	25.00	836.599997	0.00	2091.00
3.6	25.00	836.599996	1.00	2091.00
3.2 (End Point)	25.00	836.599994	3.00	2091.00

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