

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

**Product Name:** Mobile Phone

**Brand Name:** OPTICON, PEGATRON

**Model Name:** H-21

**Model Different:** N/A

**FCC ID:** UFOH-21

**Report No.:** EH/2009/C0004

**Issue Date:** Feb. 23, 2010

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

**Prepared for:** Opto Electronics Co.,Ltd  
4-12-17, Tsukagoshi, Warabi-shi, Saitama-ken  
335-0002, Japan

**Prepared by:** SGS Taiwan Ltd.  
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## VERIFICATION OF COMPLIANCE

**Applicant:** Opto Electronics Co., Ltd  
4-12-17, Tsukagoshi, Warabi-shi, Saitama-ken 335-0002, Japan

**Product Name:** Mobile Phone

**Brand Name:** OPTICON, PEGATRON

**Model Name:** H-21

**Model Different:** N/A

**FCC ID:** UFOH-21

**File Number:** EH/2009/C0004

**Date of test:** Dec. 02, 2009 ~ Dec. 26, 2009

**Date of EUT Received:** Dec. 02, 2009

### 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 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:**

*Jason Wu*

**Date:**

Feb. 23, 2010

*Jason Wu / Asst. Supervisor*

**Prepared By:**

*Eva Kao*

**Date:**

Feb. 23, 2010

*Eva Kao / Asst. Supervisor*

**Approved By:**

*Vincent Su*

**Date:**

Feb. 23, 2010

*Vincent Su / Manager*

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## Version

Version No.	Date	Description
00	Feb. 23, 2010	Initial creation of document

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# 1 GENERAL INFORMATION

General:

Product Name:	Mobile Phone	
Brand Name:	OPTICON, PEGATRON	
Model Name:	H-21	
Model Difference:	N/A	
SHF:	M/N: AH061A-01, Supplier: SKY PARTNERSHIP	
Data Cable:	M/N: CBAUB-018-8, Supplier: ACON	
Power Supply	3.7Vdc by Li-ion Battery or 5Vdc by AC/DC power adapter	
	Battery:	M/N: LBP-02, Supplier: Optoelectronics
	Adapter:	M/N: PA1008-1FU, Supplier: Powertron

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GSM and WCDMA:

Cellular Phone Standards Frequency Range and Power:	Operating Frequency		Rated Power
	GSM/GPRS 850, Class 10	824.2 MHz– 848.8 MHz	33 dBm
	GSM/GPRS 900, Class 10	880.2MHz – 914.8MHz	33 dBm
	GSM/GPRS 1800, Class 10	1710.2MHz – 1784.8MHz	30 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 900, Class 10	880.2MHz – 914.8MHz	27 dBm
	EDGE 1800, Class 10	1710.2MHz – 1784.8MHz	26 dBm
	EDGE 1900, Class 10	1850.2MHz – 1909.8MHz	26dBm
	WCDMA/HSUPA/HSDPA Band I	1922.4MHz –1977.6MHz	24 dBm
	WCDMA/HSUPA/HSDPA Band II	1852.4MHz –1907.6MHz	24 dBm
	WCDMA/HSUPA/HSDPA Band V	826.4MHz –846.6MHz	24 dBm
	Hardware Version:	V1.02	
Software Version:	N/A		
IMEI:	004400152020002		

Final Amplifier Voltage and Current Information:

Test mode	DC voltage (V)	DC current (mA)
GSM 850	3.7Vdc	505
EDGE 850	3.7Vdc	535
DCS 1900	3.7Vdc	430
EDGE 1900	3.7Vdc	475
WCDMA B2	3.7Vdc	780
HSUPA B2	3.7Vdc	790
WCDMA B5	3.7Vdc	700
HSUPA B5	3.7Vdc	720

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WLAN: 802.11 b/g:

Frequency Range:	2412 – 2462 MHz
Channel number:	11 channels
Transmit Power:	802.11 b: 17.08dBm (Peak) 802.11 g: 15.51dBm (Peak)
Modulation Technology:	DSSS, OFDM
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps
Antenna Designation:	PIFA Antenna, 3.58dBi (peak)

Bluetooth:

Bluetooth Version:	V2.1 + EDR (GFSK + $\pi/4$ DQPSK + 8DPSK)
Channel number:	79 channels
Modulation type:	Frequency Hopping Spread Spectrum
Transmit Power:	3.62 dBm (Peak)
Frequency Range:	2.402GHz – 2.480GHz
Dwell Time:	$\leq 0.4s$
Operating Mode:	Point-to-Point
Antenna Designation:	PIFA Antenna, 3.58dBi (peak)

GPS:

Receiver Frequency	L1 Band, 1575.42MHz
Frequency Conversion oscillator	19.2MHz
Antenna Designation	PIFA Antenna

This test report applies for GSM/GPRS/EDGE 850/1900 MHz.

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

This submittal(s) (test report) is intended for **FCC ID: UFOH-21** 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 on chapter 13 of TIA/EIA 603C and FCC 47 CFR 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

### 1.3 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1

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.

### 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 Conducted Measurement at Antenna Port:

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

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

According to measurement procured TIA/EIA 603C and TIA/EIA IS-98 for Mobile stations. 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 according to the requirements.

A standard antenna was used to replace the EUT and connect to the SG. Adjust the SG output level to reach the max emission level which were measured above.

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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	04/19/2008	04/18/2010
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2008	01/22/2010
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2008	05/13/2010
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2009	01/04/2010
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2009	01/04/2010
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2008	04/13/2010
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/05/2008	02/04/2010
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2009	07/04/2010
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010
DC Power Supply	HP	6038A	2929A-07548	06/27/2009	06/26/2011
DC Power Supply	Chroma	41901	777188	04/17/2008	04/16/2010

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**ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber**

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2009	02/11/2010
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2009	11/18/2010
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/10/2008	07/09/2010
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/10/2008	07/09/2010
Hor.n antenna	SCHWAZBECK	BBHA 9120D	309	01/22/2008	01/21/2010
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010
Signal Generator	R&S	SMR40	100210	01/22/2008	01/21/2010
Signal Generator	Agilent	E4438C	MY45093613	06/11/2009	06/10/2010
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2009	11/27/2010
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2009	01/04/2010
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2009	07/04/2010
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2008	05/12/2010
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	01/05/2009	01/04/2010
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2009	01/04/2010
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2009	01/04/2010
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2009	01/04/2010
3m Site	SGS	966 chamber	N/A	11/08/2009	11/09/2010

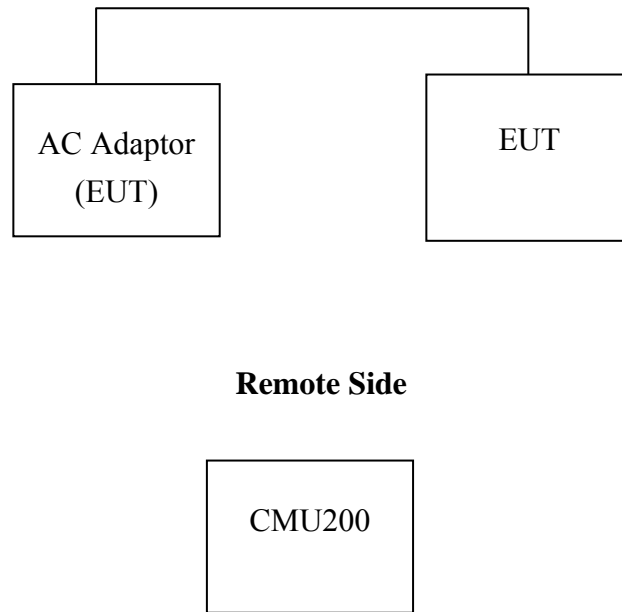
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## 2.5 Configuration of Tested System

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



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

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

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### 3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a) §22.913(a)(2) §24.232(c)	RF Conducted 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	Compliant
§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation (TX)	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

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#### 4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

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

The field strength of spurious radiation emission was measured as EUT stand-up position (E1 mode) and lie down position (E1, E2 mode) for GSM/GPRS/EDGE with power adaptors. The worst-case of E2 position for GSM 850 / GSM 1900 / WCDMA Band II, E1 position for WCDMA Band V.

Max ERP/EIRP measurement result:

	dBm	dB	W
GSM 850 Band	30.36	ERP	1.086
EDGE 850 Band	26.46	ERP	0.443
GSM 1900 Band	28.83	EIRP	0.764
EDGE 1900 Band	28.56	EIRP	0.718
WCDMA Band II	24.83	EIRP	0.304
HSUPA Band II	25.23	EIRP	0.333
WCDMA Band V	22.21	ERP	0.166
HSUPA Band V	22.76	ERP	0.189

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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

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

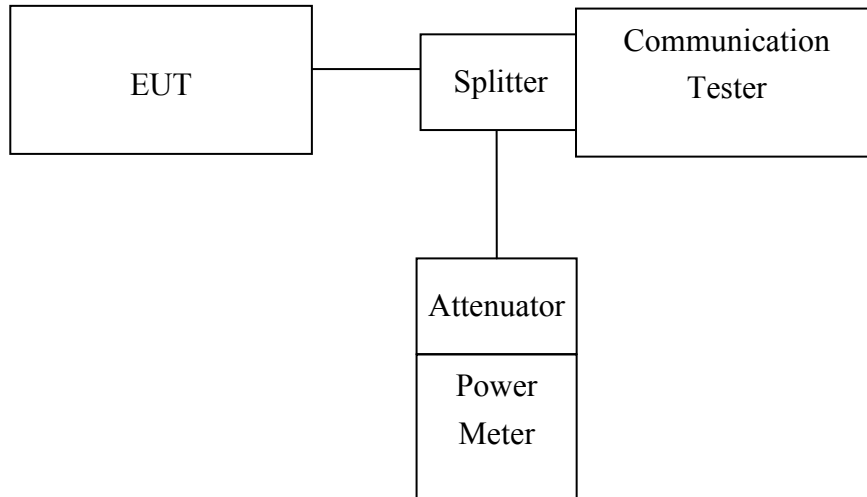
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**5.2 Test Set-up:**



*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 (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/EDGE (GMSK; 8-PSK)**

**Result:**

Frequency (MHz)	CH	1 Time Slot				2 Time Slot			
		GMSK Mode		8-PSK Mode		GMSK Mode		8-PSK Mode	
		Peak Power (dBm)	AV Power (dBm)	Peak Power (dBm)	AV Power (dBm)	Peak Power (dBm)	AV Power (dBm)	Peak Power (dBm)	AV Power (dBm)
824.2	128	32.90	32.80	30.60	27.40	32.90	32.80	30.60	27.40
836.6	190	33.10	32.90	30.80	27.60	33.00	32.90	30.80	27.60
848.8	251	33.10	33.00	30.80	27.60	33.10	33.00	30.80	27.60
1850.2	512	29.80	29.70	29.50	26.30	29.80	29.70	29.50	26.30
1880.0	661	29.70	29.60	29.50	26.30	29.70	29.60	29.50	26.30
1909.8	810	29.60	29.50	29.30	26.10	29.60	29.50	29.30	26.10

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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	26.16	23.12
	1880	9400	26.42	23.06
	1907.6	9538	26.59	23.23

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	AVG. Power (dBm)
WCDMA Band V	826.4	4132	27.15	23.80
	836.6	4183	27.20	23.69
	846.6	4233	27.10	23.75

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

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**5.5.13: HSDPA Release 6 mode**

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

**HSDPA SUB-TEST Setting**

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

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

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

**Results:**

Mode	Sub-test	Transmitter Power (dBm)			Power Class 3 Limitation (dBm)	Comments
		Channel				
		9262	9400	9538		
HSDPA(B2)	1	23.41	23.32	23.50	20.3dBm – 25.7dBm	Pass
	2	23.00	22.92	23.08	20.3dBm – 25.7dBm	Pass
	3	22.93	22.87	22.97	19.8dBm – 25.7dBm	Pass
	4	23.00	22.88	23.09	19.8dBm – 25.7dBm	Pass

Mode	Sub-test	Transmitter Power (dBm)			Power Class 3 Limitation (dBm)	Comments
		Channel				
		4132	4183	4233		
HSDPA(B5)	1	24.02	23.94	23.94	20.3dBm – 25.7dBm	Pass
	2	23.73	23.58	23.62	20.3dBm – 25.7dBm	Pass
	3	23.56	23.46	23.45	19.8dBm – 25.7dBm	Pass
	4	23.61	23.50	23.51	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 4	2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

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

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**Results:**

Mode	Sub-test	TX Power (dBm)			Power Class 3 Limitation (dBm)	Comments
		Channel				
		9262	9400	9538		
HSUPA(B2)	1	23.04	23.04	23.17	18.8dBm – 25.7dBm	Pass
	2	21.09	21.11	21.21	16.8dBm – 25.7dBm	Pass
	3	22.10	22.06	22.25	17.8dBm – 25.7dBm	Pass
	4	21.22	21.16	21.25	16.8dBm – 25.7dBm	Pass
	5	22.93	22.90	23.08	18.8dBm – 25.7dBm	Pass

Mode	Sub-test	TX Power (dBm)			Power Class 3 Limitation (dBm)	Comments
		Channel				
		4132	4183	4233		
HSUPA(B5)	1	23.76	23.62	23.67	18.8dBm – 25.7dBm	Pass
	2	21.82	21.70	21.71	16.8dBm – 25.7dBm	Pass
	3	22.80	22.68	22.75	17.8dBm – 25.7dBm	Pass
	4	21.87	21.76	21.79	16.8dBm – 25.7dBm	Pass
	5	23.62	23.45	23.56	18.8dBm – 25.7dBm	Pass

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**5.5.1.5 Minimum Communications Power Measurement**

**PCS 1900 band**

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.8	28.2	26.2	24.2	22.2	20.2	18.2	16.2	14.1
PCL	9	10	11	12	13	14	15	16	17
Output power (dBm)	12.1	10.2	8.1	6.1	4.1	2.2	0.1		

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

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

The EUT output power was controlled by simulator. Set Communication Tester CMU200 function key “UE Power Control” and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm. then record the read(see page 15 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

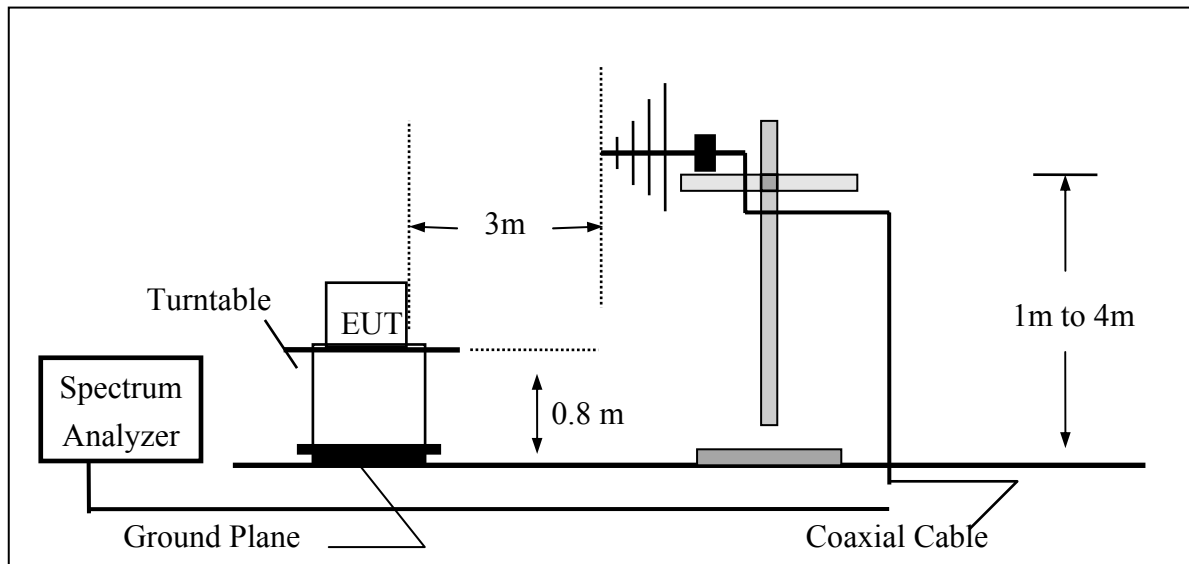
According to FCC §2.1046

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



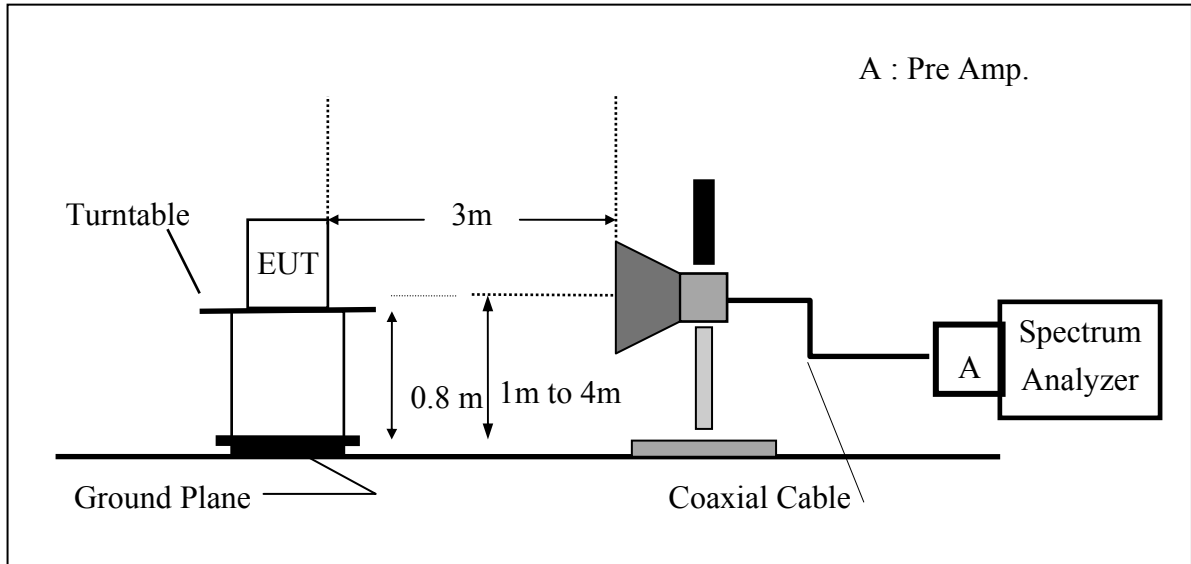
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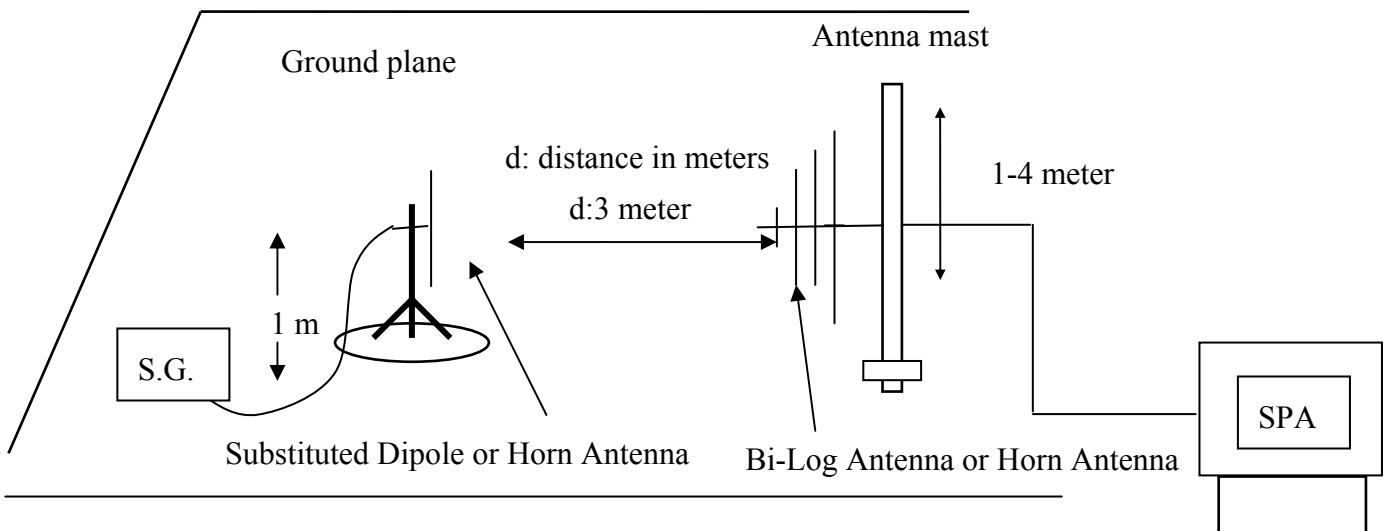
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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(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 –848.80.8MHz 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 1850 –1910MHz 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)
GPRS 850	824.20	128	H	V	127.63	41.24	-10.01	3.62	27.61	38.45
				H	127.97	41.70	-10.01	3.62	28.07	38.45
			E1	V	129.60	43.21	-10.01	3.62	29.58	38.45
				H	120.75	34.48	-10.01	3.62	20.85	38.45
			E2	V	128.15	41.76	-10.01	3.62	28.13	38.45
				H	130.26	43.99	-10.01	3.62	<b>30.36</b>	38.45
	836.60	190	H	V	127.58	41.33	-10.01	3.65	27.66	38.45
				H	128.38	42.15	-10.01	3.65	28.49	38.45
			E1	V	129.38	43.13	-10.01	3.65	29.46	38.45
				H	120.71	34.48	-10.01	3.65	20.82	38.45
			E2	V	127.57	41.32	-10.01	3.65	27.65	38.45
				H	130.15	43.92	-10.01	3.65	30.26	38.45
	848.80	251	H	V	127.58	41.46	-10.01	3.68	27.77	38.45
				H	128.52	42.33	-10.01	3.68	28.64	38.45
			E1	V	129.10	42.98	-10.01	3.68	29.29	38.45
				H	120.37	34.18	-10.01	3.68	20.49	38.45
			E2	V	127.59	41.47	-10.01	3.68	27.78	38.45
				H	129.97	43.78	-10.01	3.68	30.09	38.45

Remark :

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

**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)
EDGE 850	824.20	128	H	V	123.62	37.23	-10.01	3.62	23.60	38.45
				H	125.60	39.33	-10.01	3.62	25.70	38.45
			E1	V	125.62	39.23	-10.01	3.62	25.60	38.45
				H	121.44	35.17	-10.01	3.62	21.54	38.45
			E2	V	125.34	38.95	-10.01	3.62	25.32	38.45
				H	126.36	40.09	-10.01	3.62	<b>26.46</b>	38.45
	836.60	190	H	V	123.43	37.18	-10.01	3.65	23.51	38.45
				H	125.56	39.33	-10.01	3.65	25.67	38.45
			E1	V	125.86	39.61	-10.01	3.65	25.94	38.45
				H	122.31	36.08	-10.01	3.65	22.42	38.45
			E2	V	124.80	38.55	-10.01	3.65	24.88	38.45
				H	125.97	39.74	-10.01	3.65	26.08	38.45
	848.80	251	H	V	123.87	37.75	-10.01	3.68	24.06	38.45
				H	125.24	39.05	-10.01	3.68	25.36	38.45
			E1	V	125.93	39.81	-10.01	3.68	26.12	38.45
				H	122.01	35.82	-10.01	3.68	22.13	38.45
			E2	V	124.60	38.48	-10.01	3.68	24.79	38.45
				H	125.69	39.50	-10.01	3.68	25.81	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)
GSM 1900	1850.20	512	H	V	121.40	17.01	9.90	5.56	21.35	33.00
				H	126.22	22.04	9.90	5.56	26.38	33.00
			E1	V	122.26	17.87	9.90	5.56	22.21	33.00
				H	126.45	22.27	9.90	5.56	26.61	33.00
			E2	V	128.88	24.49	9.90	5.56	<b>28.83</b>	33.00
				H	123.52	19.34	9.90	5.84	23.40	33.00
	1880.00	661	H	V	121.93	17.57	9.99	5.61	21.95	33.00
				H	126.35	22.21	9.99	5.61	26.58	33.00
			E1	V	122.83	18.47	9.99	5.61	22.85	33.00
				H	126.04	21.90	9.99	5.61	26.27	33.00
			E2	V	128.79	24.43	9.99	5.61	28.81	33.00
				H	123.17	19.03	9.99	5.61	23.40	33.00
	1909.80	810	H	V	122.84	18.51	10.08	5.66	22.93	33.00
				H	126.52	22.41	10.08	5.66	26.83	33.00
			E1	V	123.01	18.68	10.08	5.66	23.10	33.00
				H	125.85	21.74	10.08	5.66	26.16	33.00
			E2	V	128.35	24.02	10.08	5.66	28.44	33.00
				H	122.67	18.56	10.08	5.66	22.98	33.00

**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	123.64	19.25	9.90	5.56	23.59	33.00
				H	127.33	23.15	9.90	5.56	27.49	33.00
			E1	V	121.98	17.59	9.90	5.56	21.93	33.00
				H	127.79	23.61	9.90	5.56	27.95	33.00
			E2	V	128.48	24.09	9.90	5.56	28.43	33.00
				H	122.11	17.93	9.90	5.84	21.99	33.00
	1880.00	661	H	V	123.93	19.57	9.99	5.61	23.95	33.00
				H	126.73	22.59	9.99	5.61	26.96	33.00
			E1	V	121.92	17.56	9.99	5.61	21.94	33.00
				H	127.48	23.34	9.99	5.61	27.71	33.00
			E2	V	128.12	23.76	9.99	5.61	28.14	33.00
				H	121.39	17.25	9.99	5.61	21.62	33.00
	1909.80	810	H	V	124.62	20.29	10.08	5.66	24.71	33.00
				H	127.00	22.89	10.08	5.66	27.31	33.00
			E1	V	121.91	17.58	10.08	5.66	22.00	33.00
				H	127.07	22.96	10.08	5.66	27.38	33.00
			E2	V	128.47	24.14	10.08	5.66	<b>28.56</b>	33.00
				H	121.53	17.42	10.08	5.66	21.84	33.00

**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)
WCDMA II	1852.40	9262	H	V	119.94	15.56	9.90	5.56	19.89	33.00
				H	123.82	19.64	9.90	5.56	23.98	33.00
			E1	V	117.10	12.72	9.90	5.56	17.05	33.00
				H	123.49	19.31	9.90	5.56	23.65	33.00
			E2	V	124.88	20.50	9.90	5.56	<b>24.83</b>	33.00
				H	117.92	13.74	9.90	5.84	17.80	33.00
	1880.00	9400	H	V	118.99	14.63	9.99	5.61	19.01	33.00
				H	122.77	18.63	9.99	5.61	23.00	33.00
			E1	V	116.48	12.12	9.99	5.61	16.50	33.00
				H	122.54	18.40	9.99	5.61	22.77	33.00
			E2	V	124.01	19.65	9.99	5.61	24.03	33.00
				H	116.80	12.66	9.99	5.61	17.03	33.00
	1907.60	9538	H	V	119.02	14.69	10.07	5.66	19.10	33.00
				H	122.58	18.47	10.07	5.66	22.88	33.00
			E1	V	117.08	12.75	10.07	5.66	17.16	33.00
				H	122.09	17.98	10.07	5.66	22.39	33.00
			E2	V	123.76	19.43	10.07	5.66	23.84	33.00
				H	116.38	12.27	10.07	5.66	16.68	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)	EIRP (dBm)	Limit (dBm)
HSUPA II	1852.40	9262	H	V	120.69	16.31	9.90	5.56	20.64	33.00
				H	124.45	20.27	9.90	5.56	24.61	33.00
			E1	V	118.30	13.92	9.90	5.56	18.25	33.00
				H	124.41	20.23	9.90	5.56	24.57	33.00
			E2	V	125.28	20.90	9.90	5.56	<b>25.23</b>	33.00
				H	118.78	14.60	9.90	5.84	18.66	33.00
	1880.00	9400	H	V	119.76	15.40	9.99	5.61	19.78	33.00
				H	123.85	19.71	9.99	5.61	24.08	33.00
			E1	V	117.34	12.98	9.99	5.61	17.36	33.00
				H	123.66	19.52	9.99	5.61	23.89	33.00
			E2	V	125.03	20.67	9.99	5.61	25.05	33.00
				H	117.67	13.53	9.99	5.61	17.90	33.00
	1907.60	9538	H	V	119.88	15.55	10.07	5.66	19.96	33.00
				H	123.61	19.50	10.07	5.66	23.91	33.00
			E1	V	118.37	14.04	10.07	5.66	18.45	33.00
				H	123.03	18.92	10.07	5.66	23.33	33.00
			E2	V	124.85	20.52	10.07	5.66	24.93	33.00
				H	117.57	13.46	10.07	5.66	17.87	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)
WCDMA V	826.40	4132	H	V	116.48	30.12	-10.01	3.63	16.48	38.45
				H	121.36	35.10	-10.01	3.63	21.46	38.45
			E1	V	122.21	35.85	-10.01	3.63	<b>22.21</b>	38.45
				H	115.14	28.88	-10.01	3.63	15.24	38.45
			E2	V	119.38	33.02	-10.01	3.63	19.38	38.45
				H	121.01	34.75	-10.01	3.63	21.11	38.45
	836.60	4183	H	V	116.18	29.93	-10.01	3.65	16.26	38.45
				H	120.73	34.50	-10.01	3.65	20.84	38.45
			E1	V	120.23	33.98	-10.01	3.65	20.31	38.45
				H	117.30	31.07	-10.01	3.65	17.41	38.45
			E2	V	119.07	32.82	-10.01	3.65	19.15	38.45
				H	120.44	34.21	-10.01	3.65	20.55	38.45
	846.60	4233	H	V	117.57	31.42	-10.01	3.67	17.74	38.45
				H	121.75	35.55	-10.01	3.67	21.87	38.45
			E1	V	121.14	34.99	-10.01	3.67	21.31	38.45
				H	118.32	32.12	-10.01	3.67	18.44	38.45
			E2	V	120.06	33.91	-10.01	3.67	20.23	38.45
				H	121.08	34.88	-10.01	3.67	21.20	38.45

**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)
HSUPA V	826.40	4132	H	V	116.90	30.54	-10.01	3.63	16.90	38.45
				H	121.88	35.62	-10.01	3.63	21.98	38.45
			E1	V	120.49	34.13	-10.01	3.63	20.49	38.45
				H	117.14	30.88	-10.01	3.63	17.24	38.45
			E2	V	120.05	33.69	-10.01	3.63	20.05	38.45
				H	121.53	35.27	-10.01	3.63	21.63	38.45
	836.60	4183	H	V	117.24	30.99	-10.01	3.65	17.32	38.45
				H	121.74	35.51	-10.01	3.65	21.85	38.45
			E1	V	121.03	34.78	-10.01	3.65	21.11	38.45
				H	117.67	31.44	-10.01	3.65	17.78	38.45
			E2	V	119.84	33.59	-10.01	3.65	19.92	38.45
				H	121.28	35.05	-10.01	3.65	21.39	38.45
	846.60	4233	H	V	118.41	32.26	-10.01	3.67	18.58	38.45
				H	122.64	36.44	-10.01	3.67	<b>22.76</b>	38.45
			E1	V	121.85	35.70	-10.01	3.67	22.02	38.45
				H	118.75	32.55	-10.01	3.67	18.87	38.45
			E2	V	120.69	34.54	-10.01	3.67	20.86	38.45
				H	121.95	35.75	-10.01	3.67	22.07	38.45

**Remark:**

- (1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

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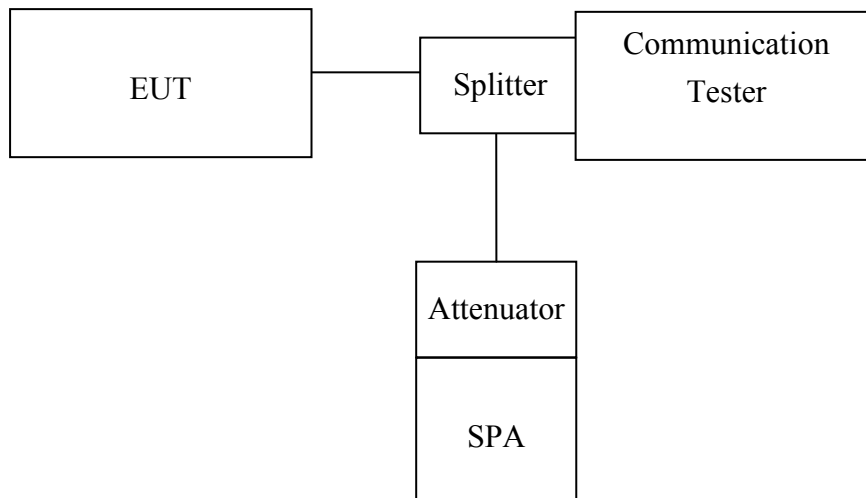
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## 7 99% OCCUPIED BANDWIDTH MEASUREMENT

### 7.1 Standard Applicable

According to FCC§2.1049(h).

### 7.2 Test Set-up:



*Note: Measurement setup for testing on Antenna connector*

### 7.3 Measurement Procedure

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW (10/30kHz for GSM; 47kHz for WCDMA) was set to about 1% of emission BW, VBW= 3 times RBW(30/100kHz for GSM; 150kHz for WCDMA), -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:**

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
GSM 850	824.20	128	0.2446
	836.60	190	0.2443
	848.80	251	0.2449

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EDGE 850	824.20	128	0.2444
	836.60	190	0.2450
	848.80	251	0.2458

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
PCS 1900	1850.20	512	0.2459
	1880.00	661	0.2451
	1909.80	810	0.2454

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EDGE 1900	1850.20	512	0.2532
	1880.00	661	0.2519
	1909.80	810	0.2520

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EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
WCDMA II	1852.4	9262	4.1672
	1880.0	9400	4.1714
	1907.6	9538	4.1621

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSUPA II	1852.4	9296	4.1604
	1880.0	9400	4.1678
	1907.6	9538	4.1690

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
WCDMA V	826.4	4132	4.1675
	836.6	4183	4.1511
	846.6	4233	4.1561

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSUPA V	826.40	4132	4.1575
	836.60	4183	4.1682
	846.60	4233	4.1519

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Figure 7-1: GSM 850 Channel Low

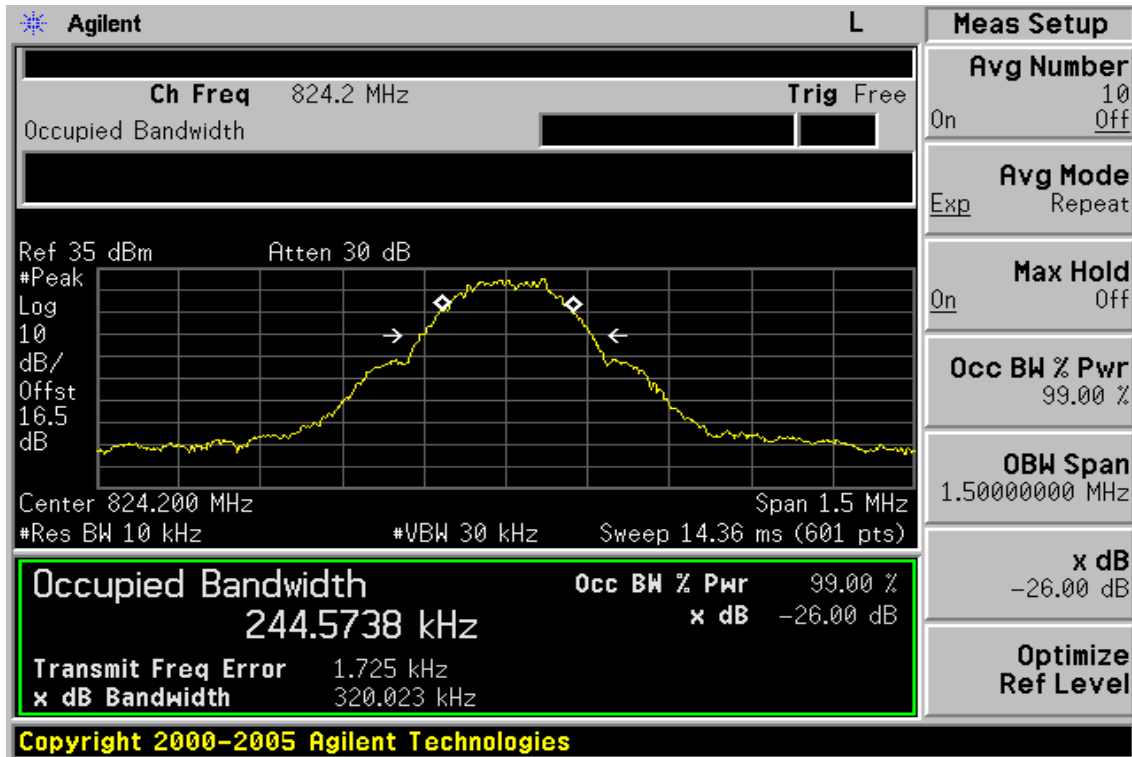
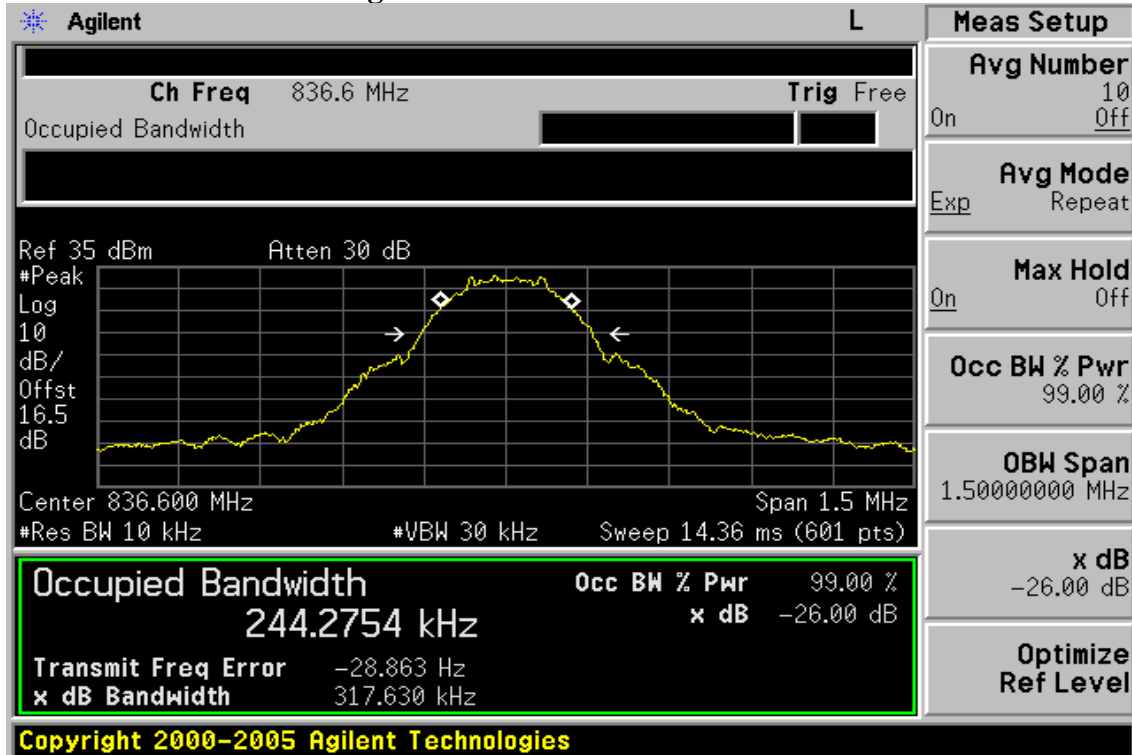


Figure 7-2 GSM 850 Channel Mid



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Figure 7-3: GSM 850 Channel High

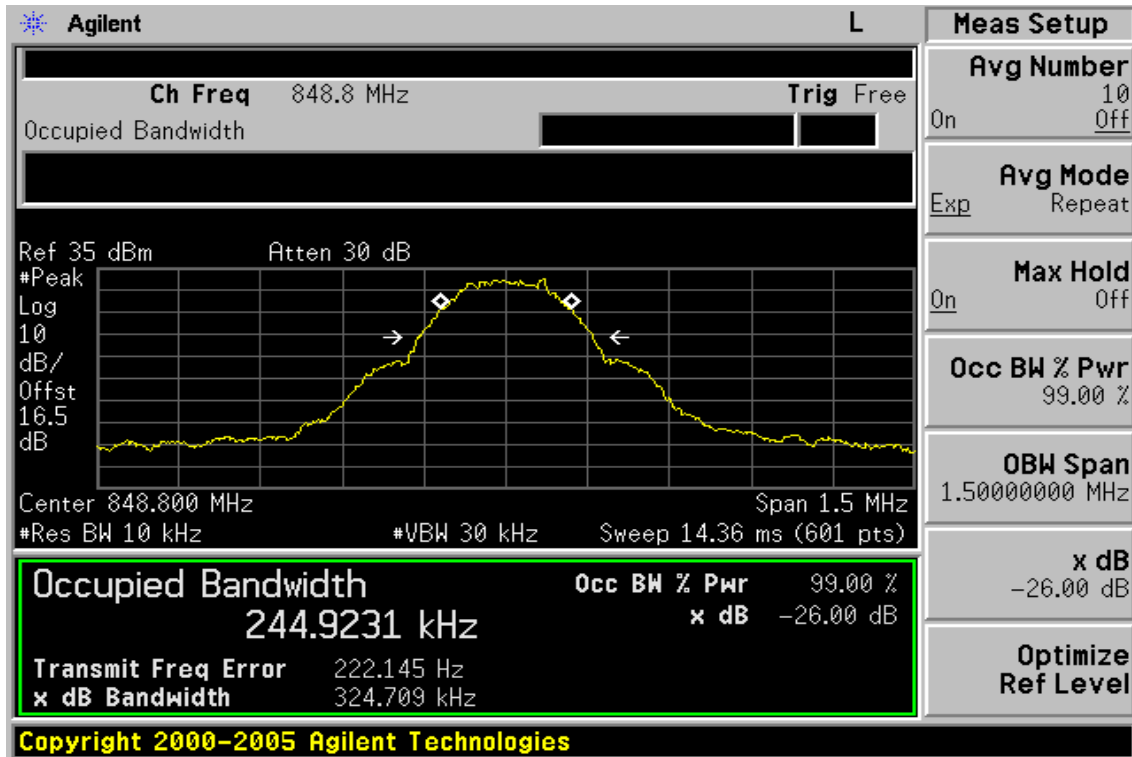
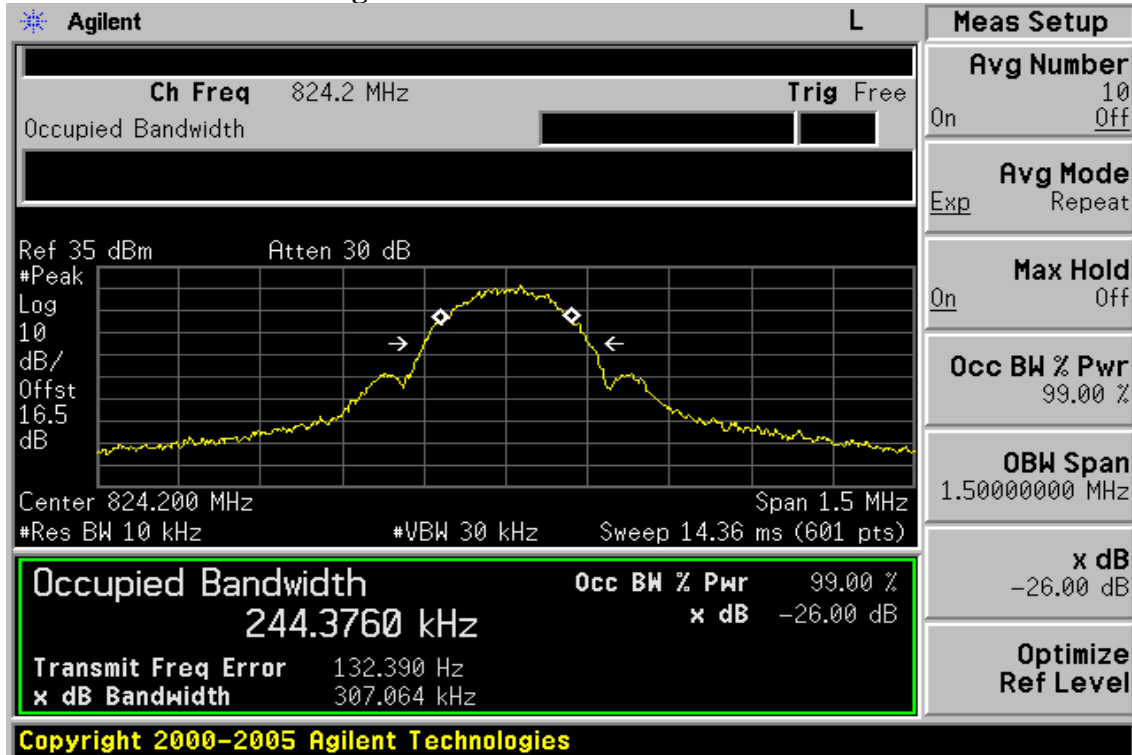


Figure 7-4: EDGE 850 Channel Low



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Figure 7-5: EDGE 850 Channel Mid

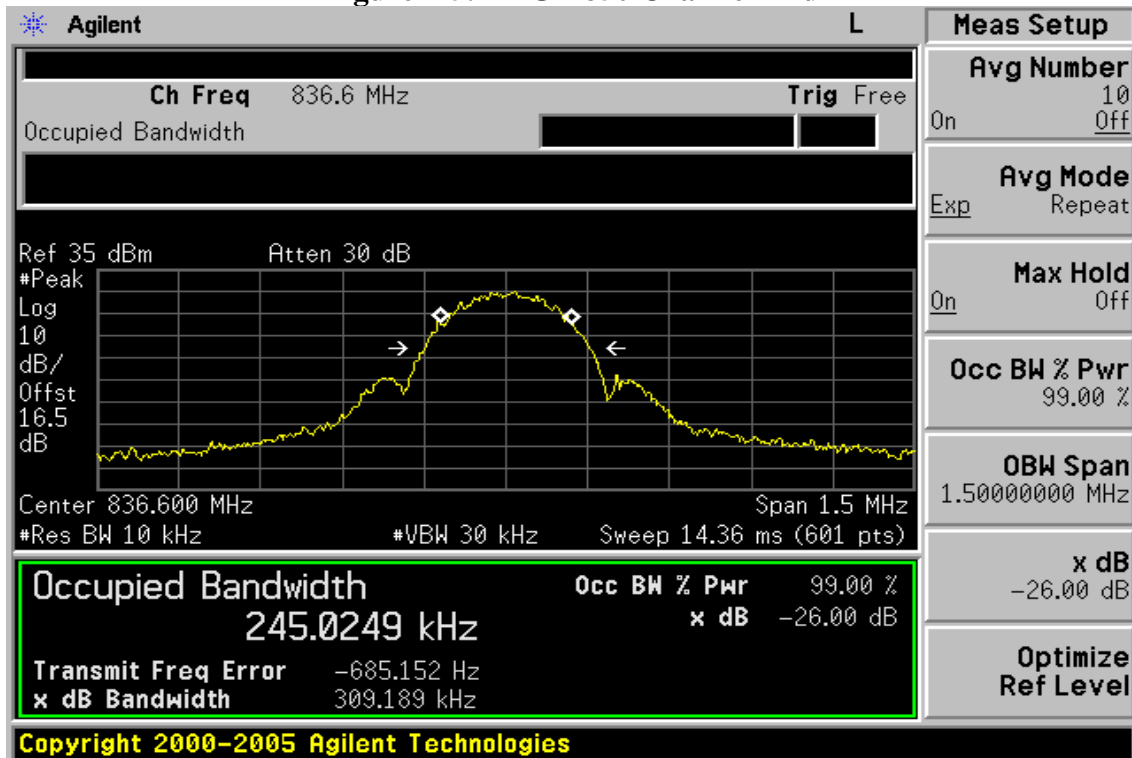
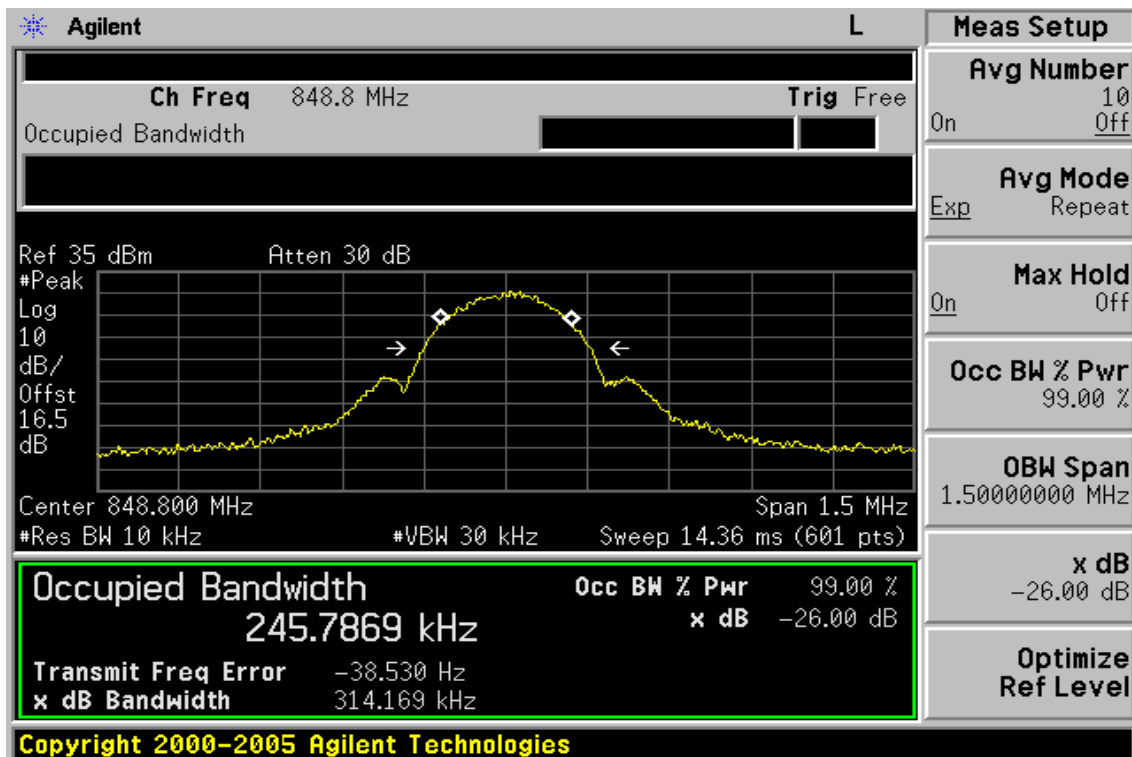


Figure 7-6 EDGE 850 Channel High



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Figure 7-7: PCS 1900 Channel Low

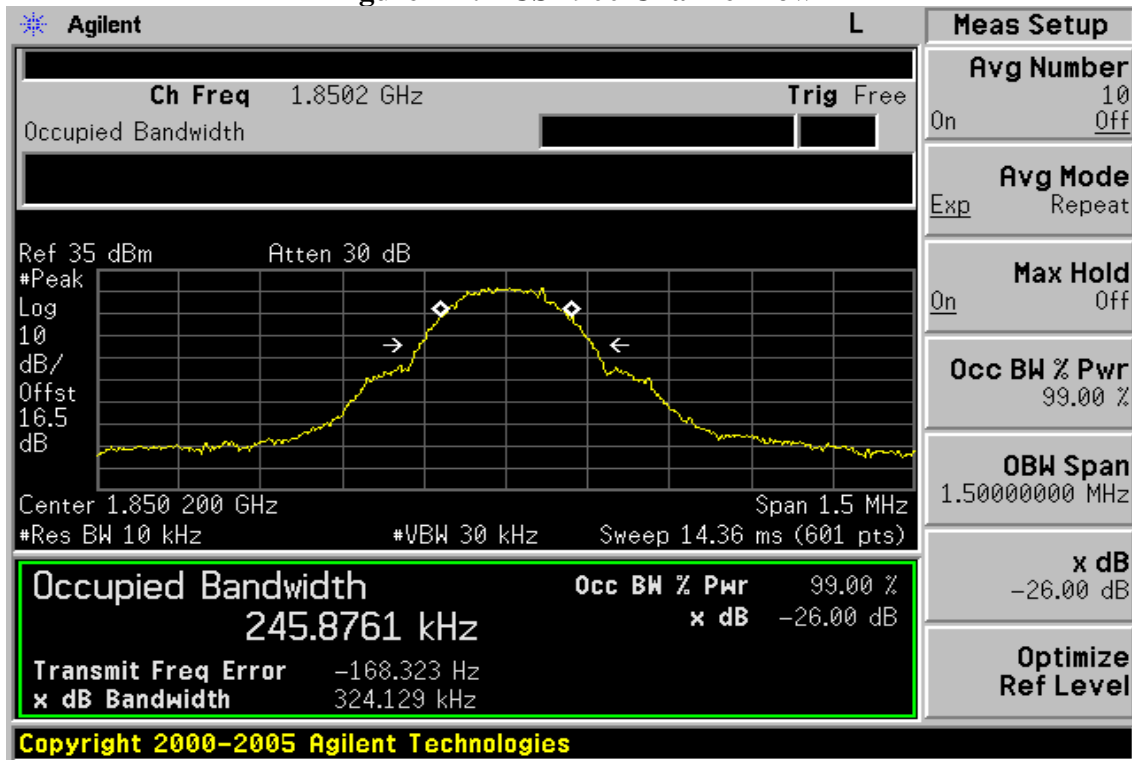
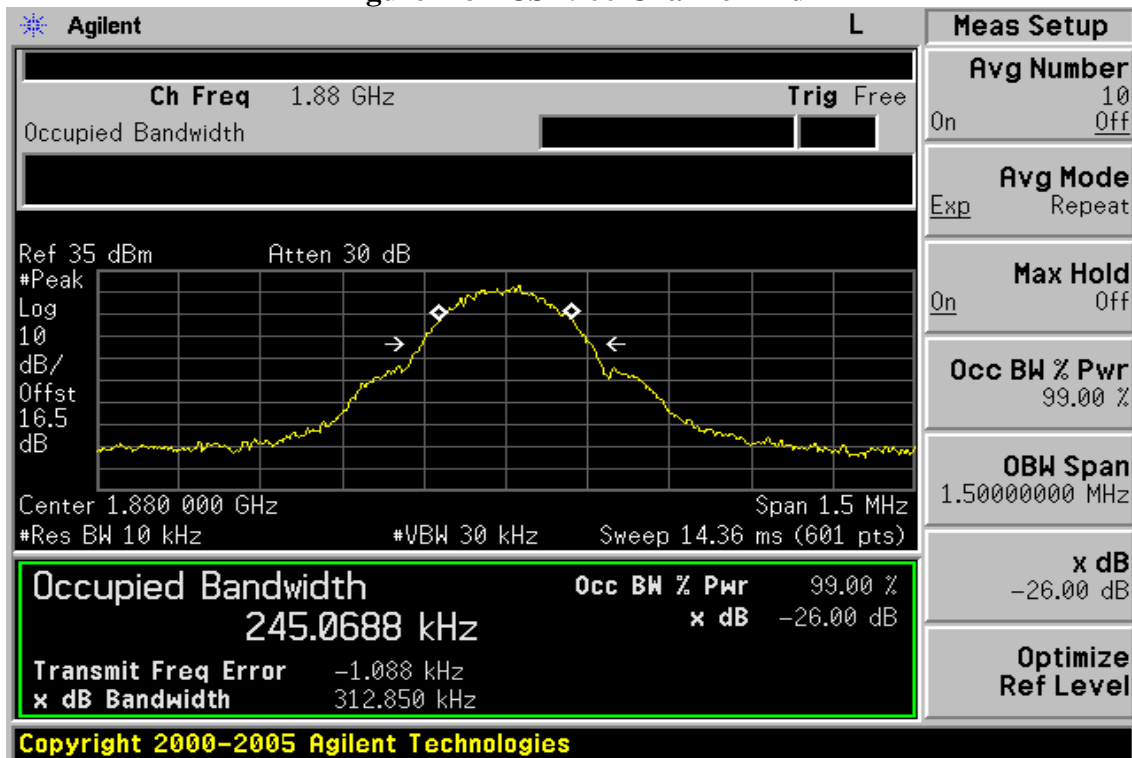


Figure 7-8 PCS 1900 Channel Mid



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Figure 7-9: PCS 1900 Channel High

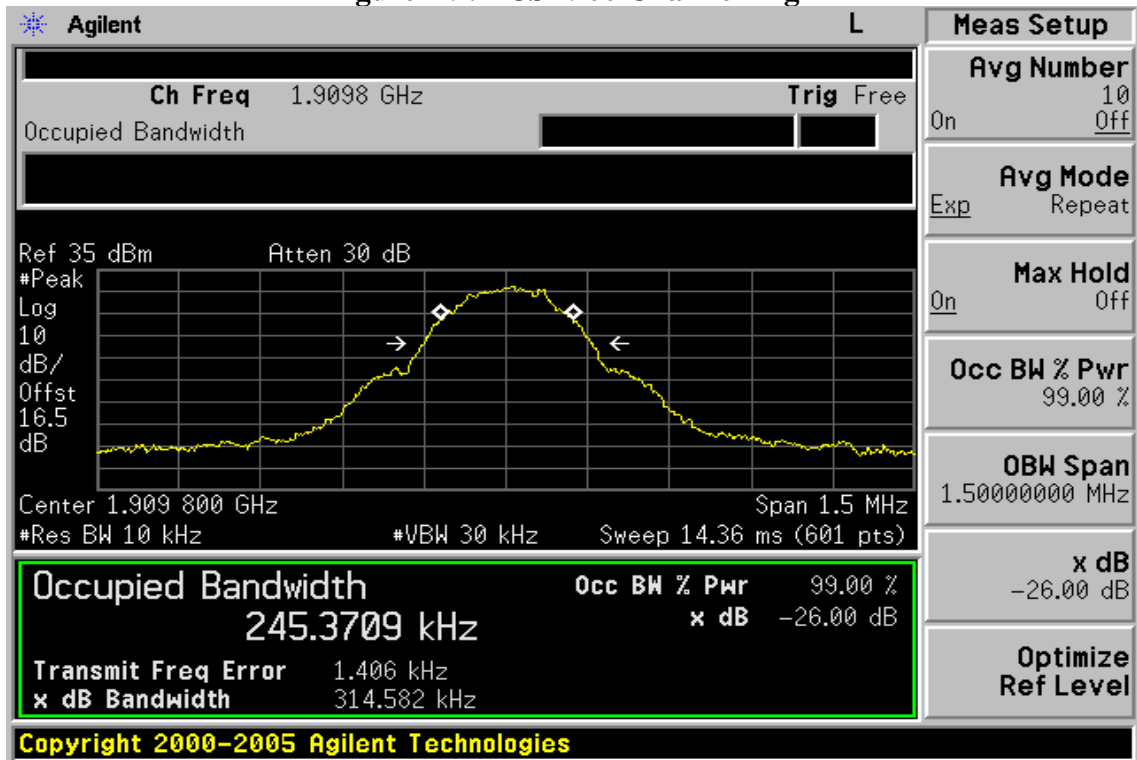
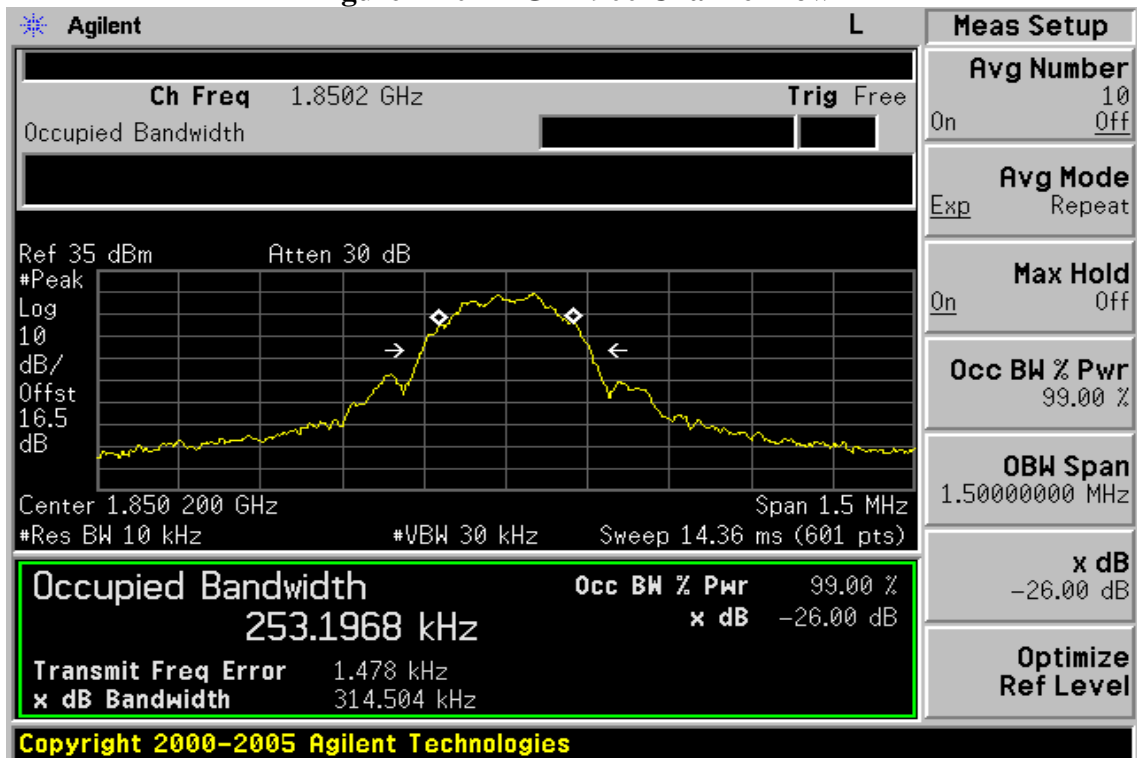


Figure 7-10 EDGE 1900 Channel Low



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Figure 7-11 EDGE 1900 Channel Mid

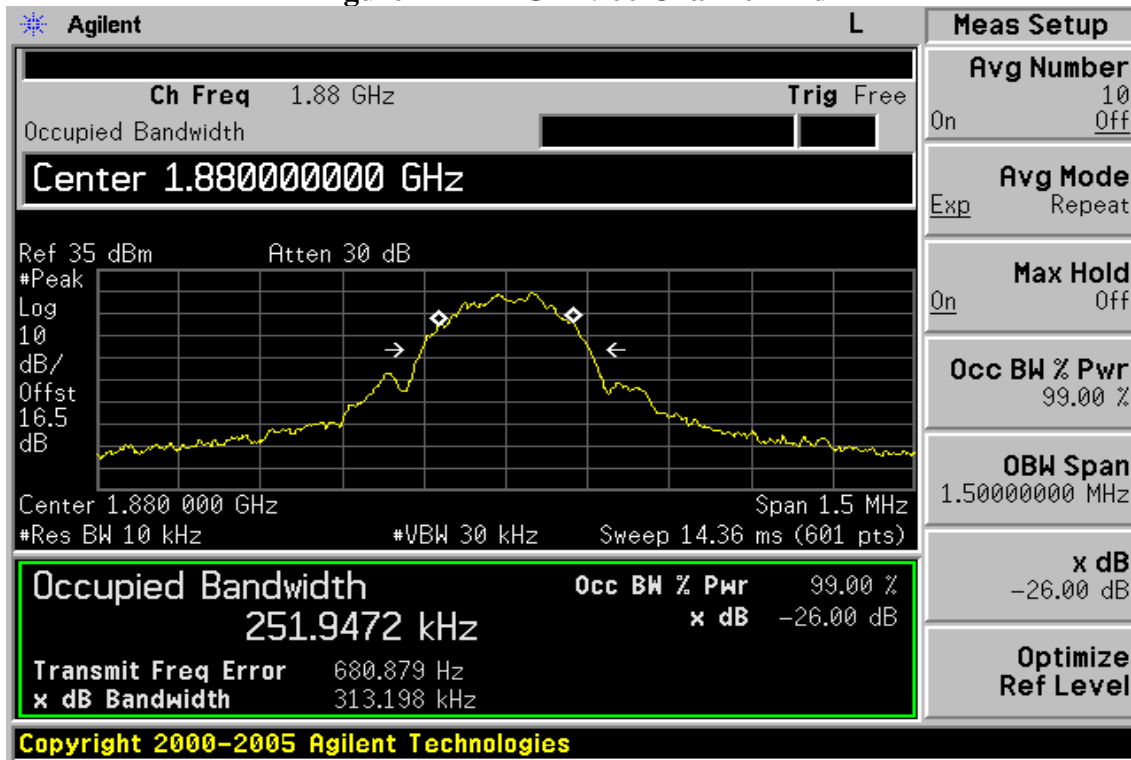
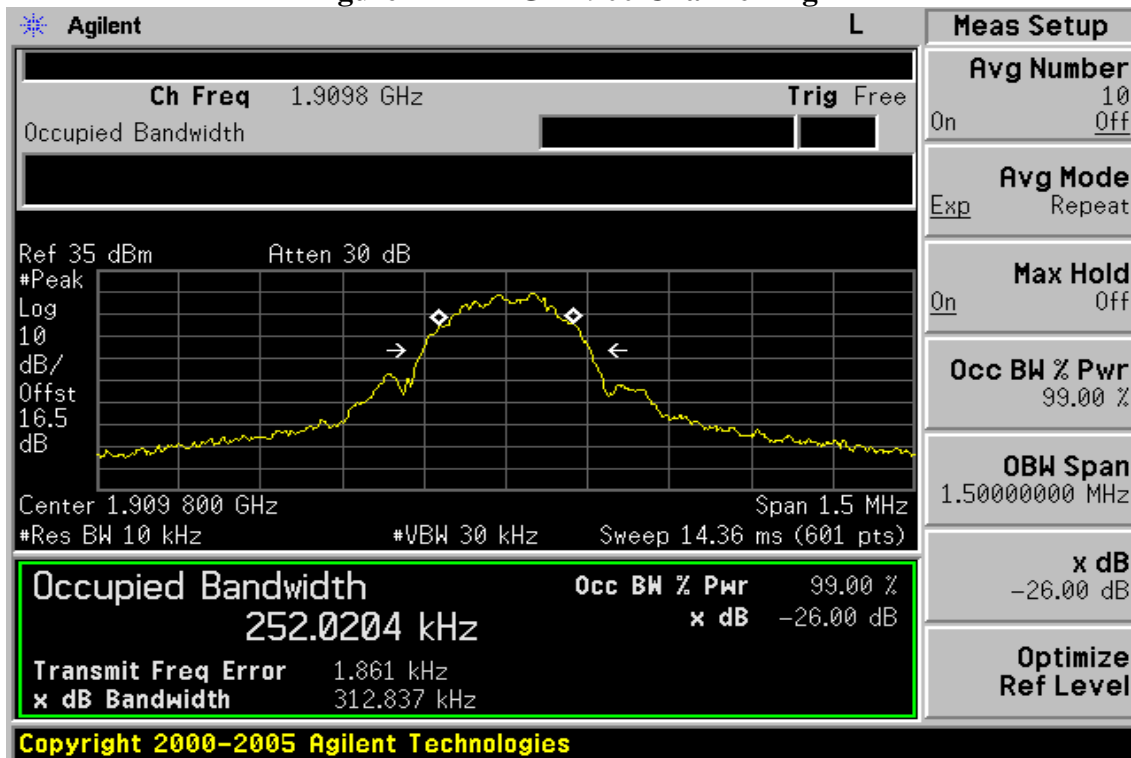


Figure 7-12 EDGE 1900 Channel High



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Figure 7-13 WCDMA Band II Channel Low

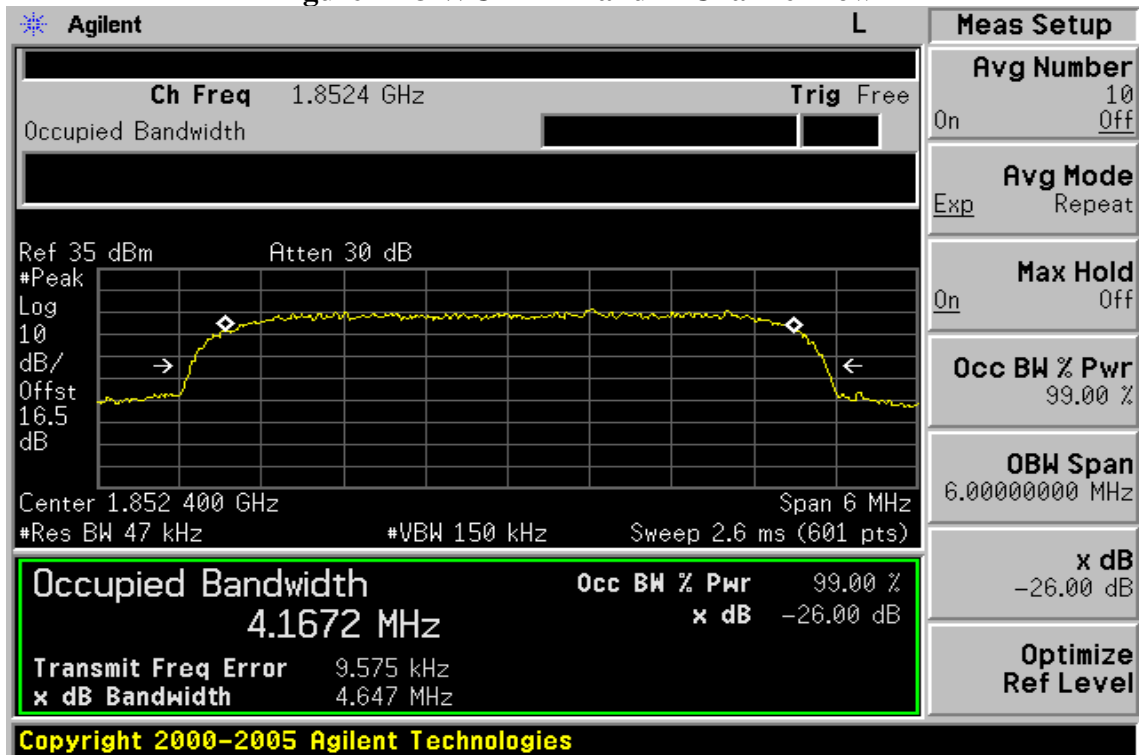
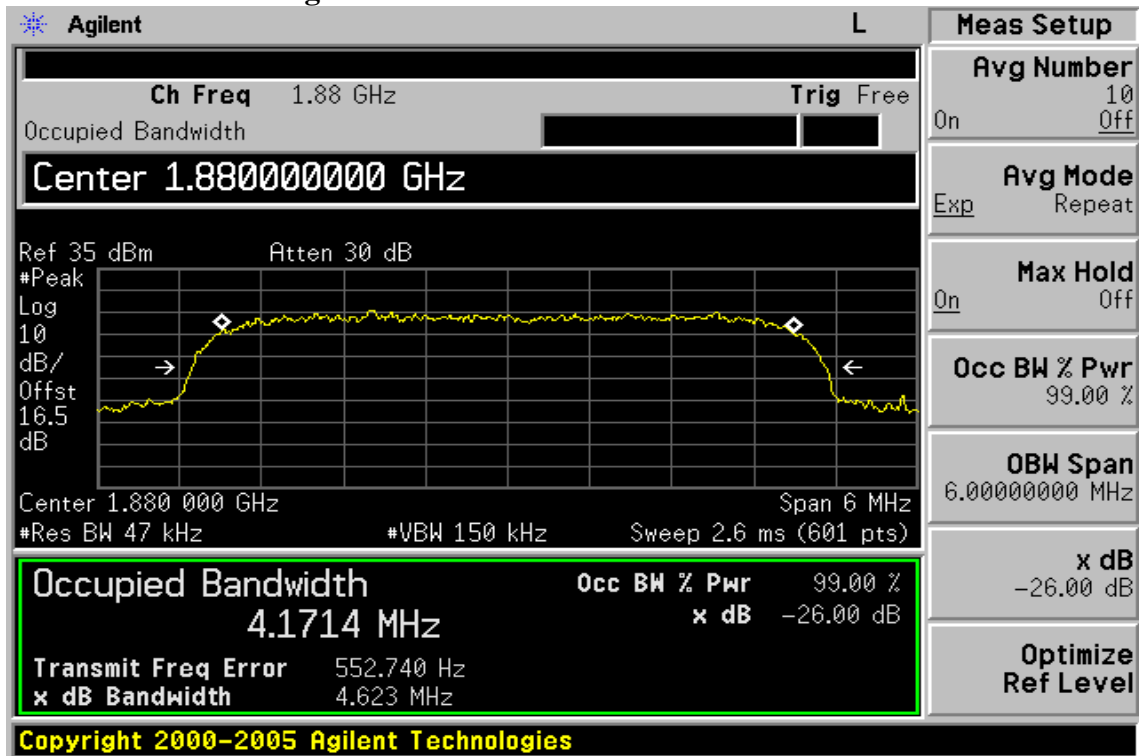


Figure 7-14 WCDMA Band II Channel Mid



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Figure 7-15 WCDMA Band II Channel High

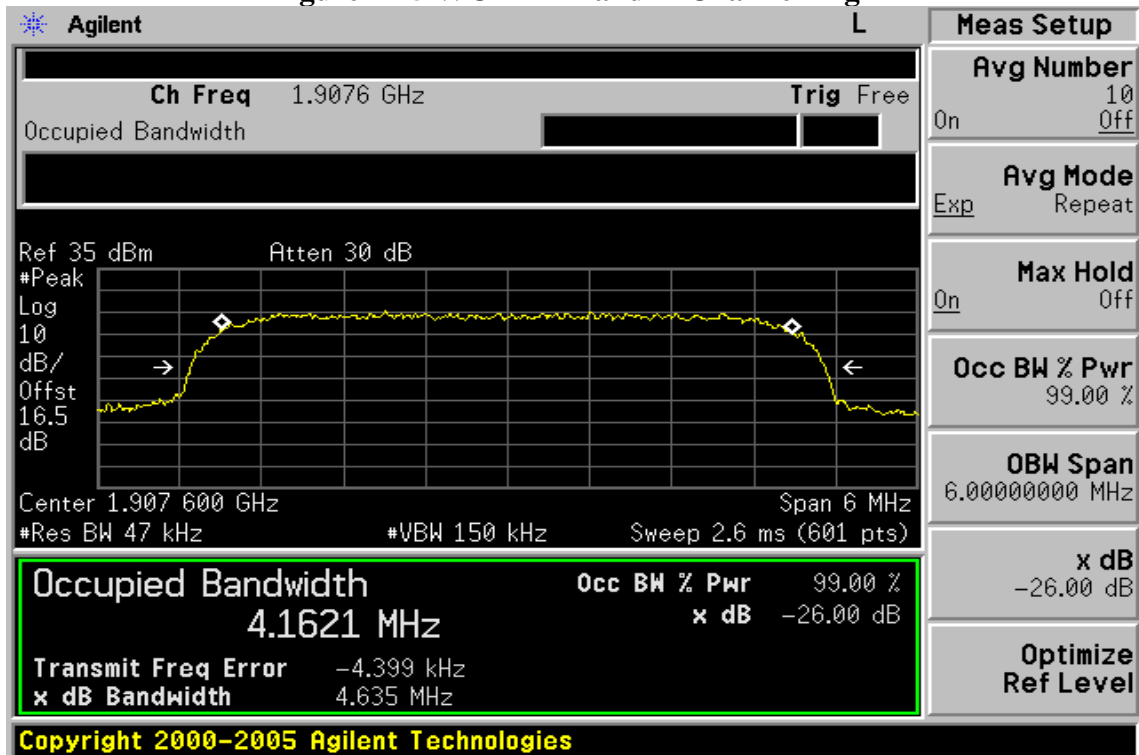
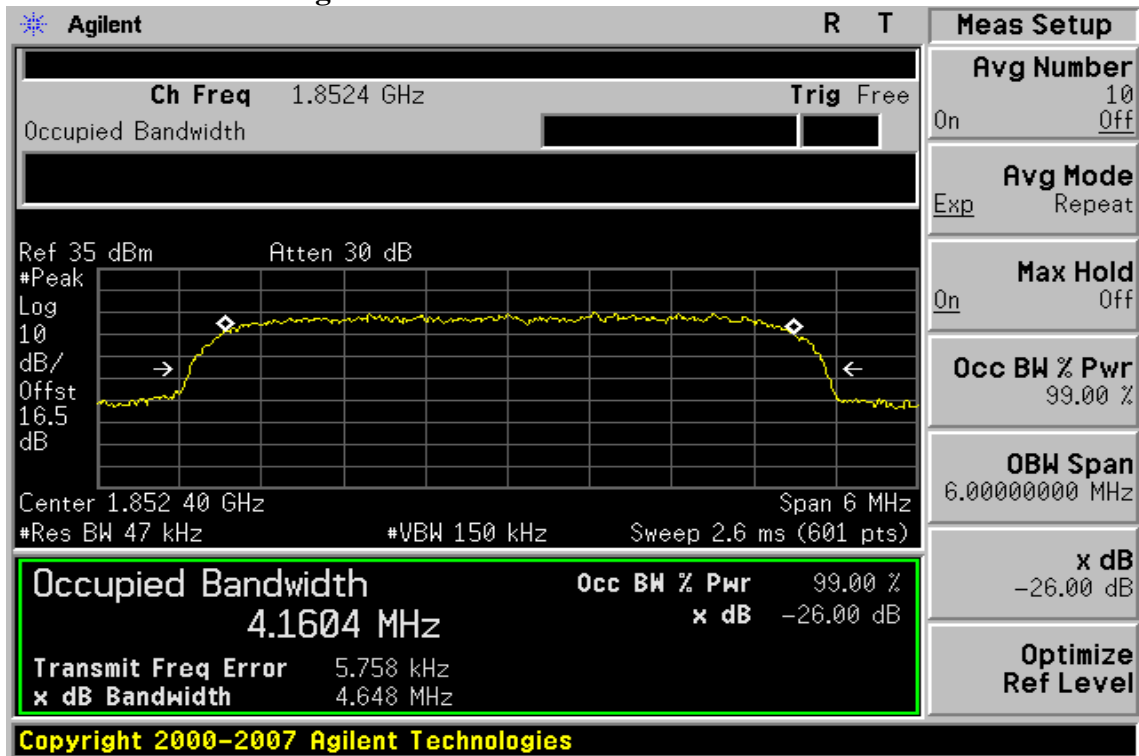


Figure 7-16 HSUPA Band II Channel Low



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Figure 7-14 HSUPA Band II Channel Mid

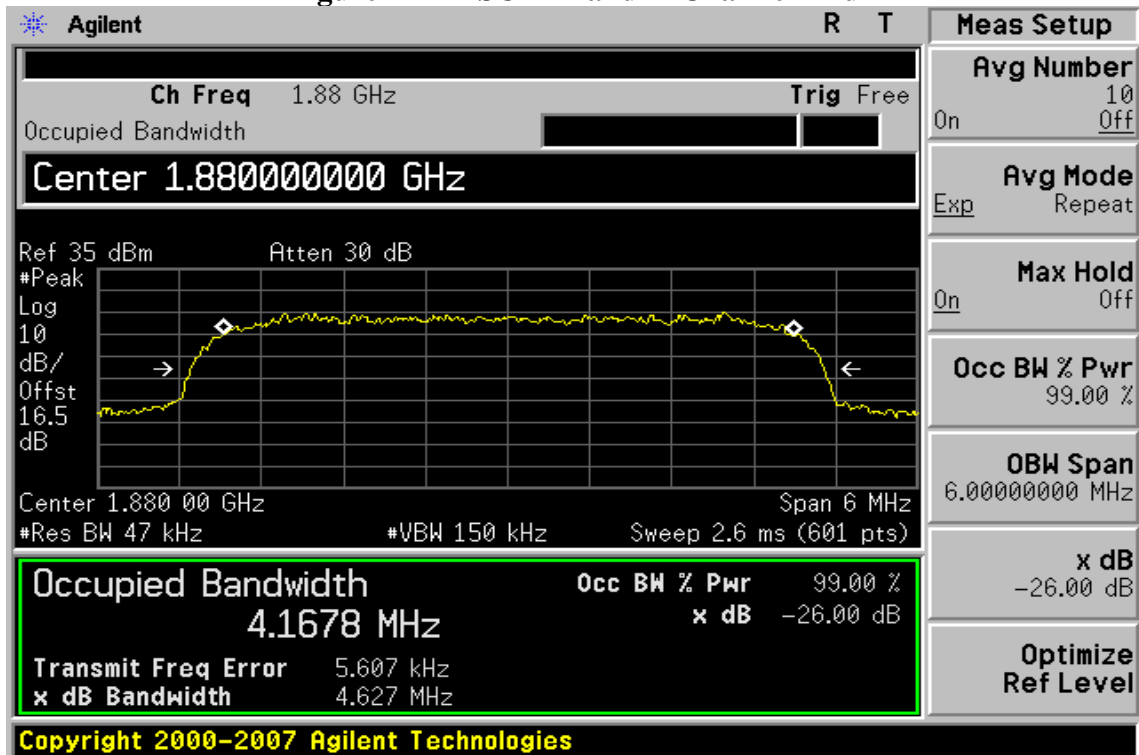
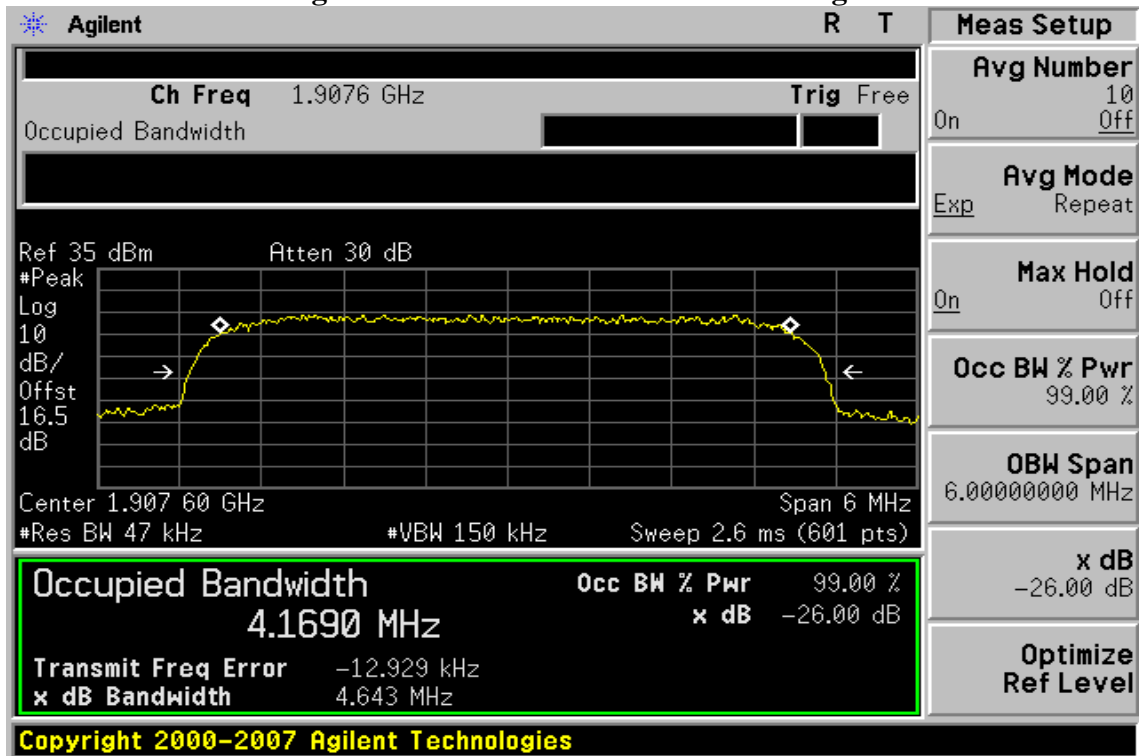


Figure 7-15 HSUPA Band II Channel High



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Figure 7-13 WCDMA Band V Channel Low

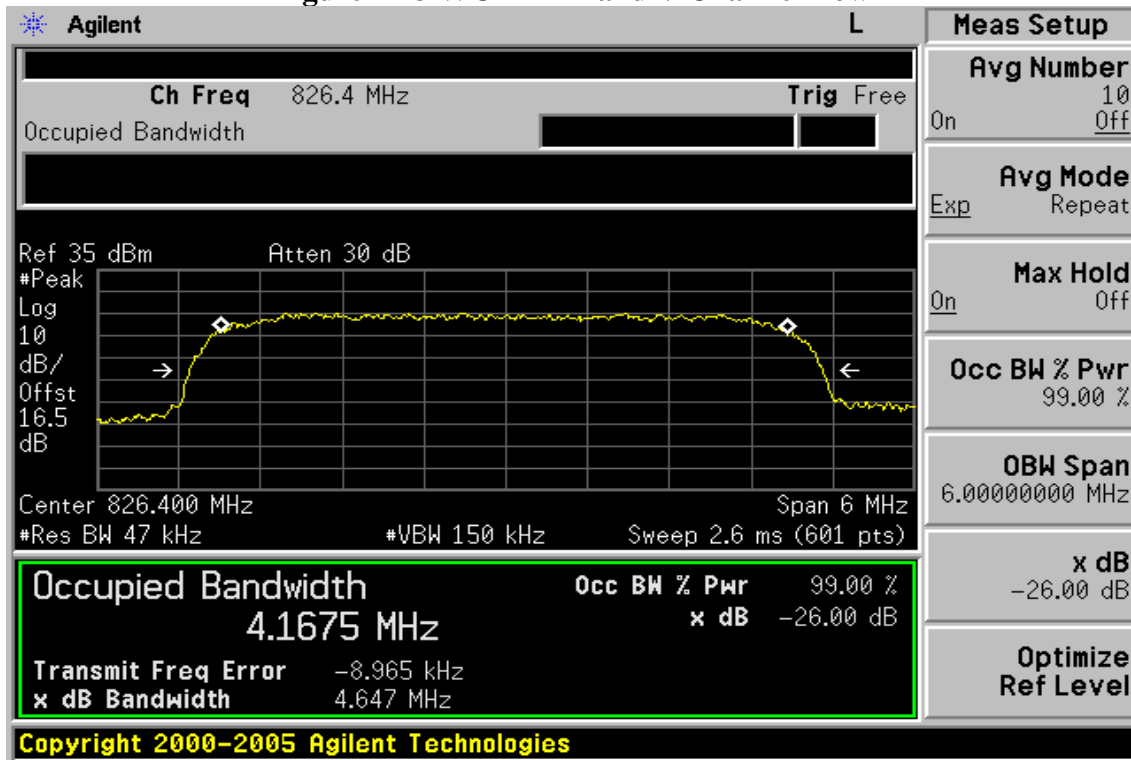
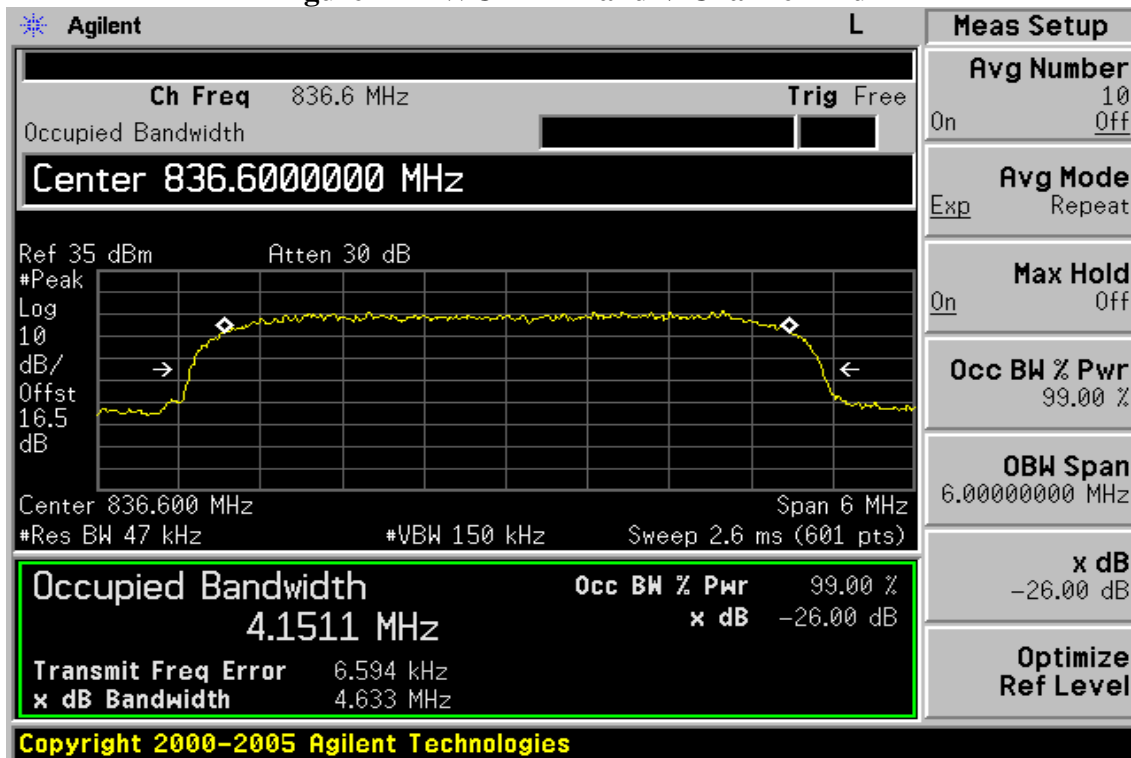


Figure 7-14 WCDMA Band V Channel Mid



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Figure 7-15 WCDMA Band V Channel High

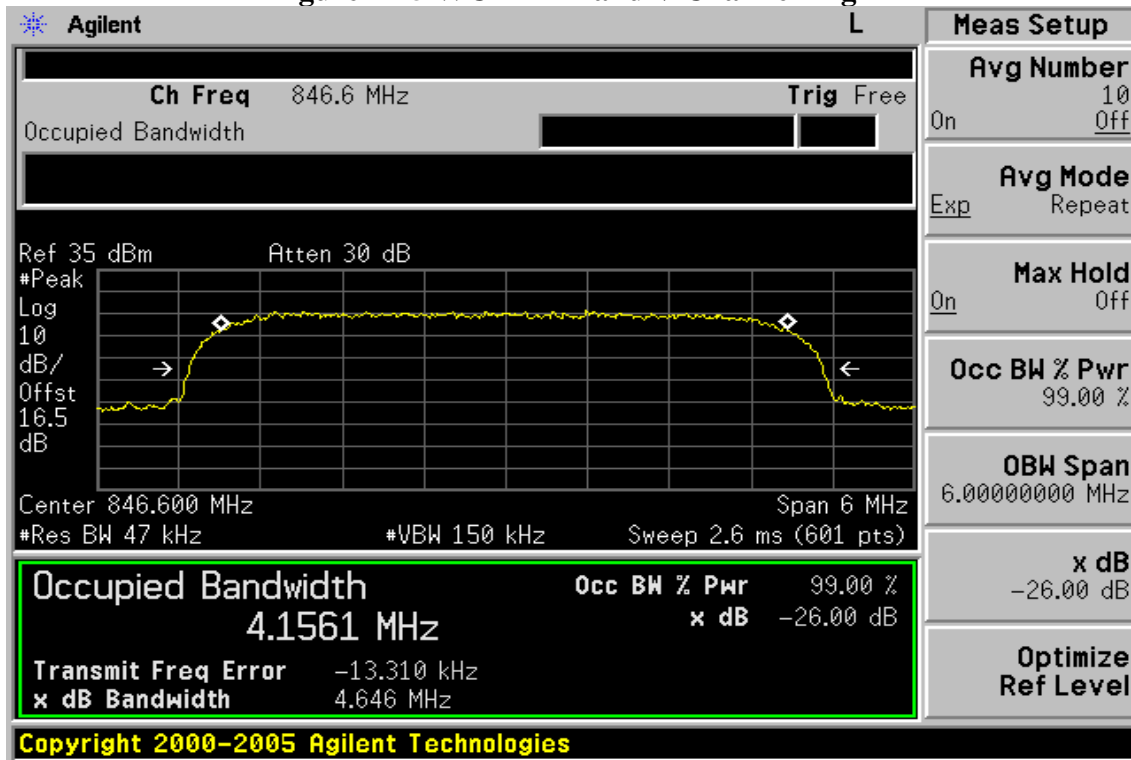
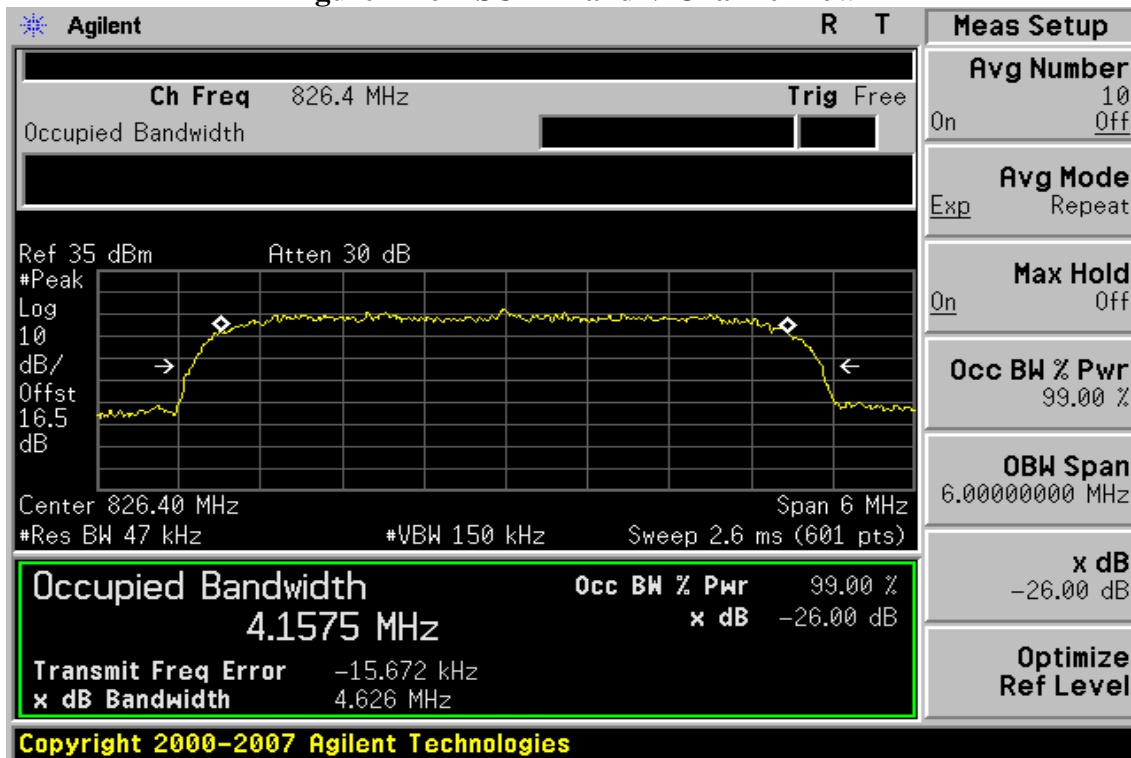


Figure 7-16 HSUPA Band V Channel Low



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Figure 7-14 HSUPA Band V Channel Mid

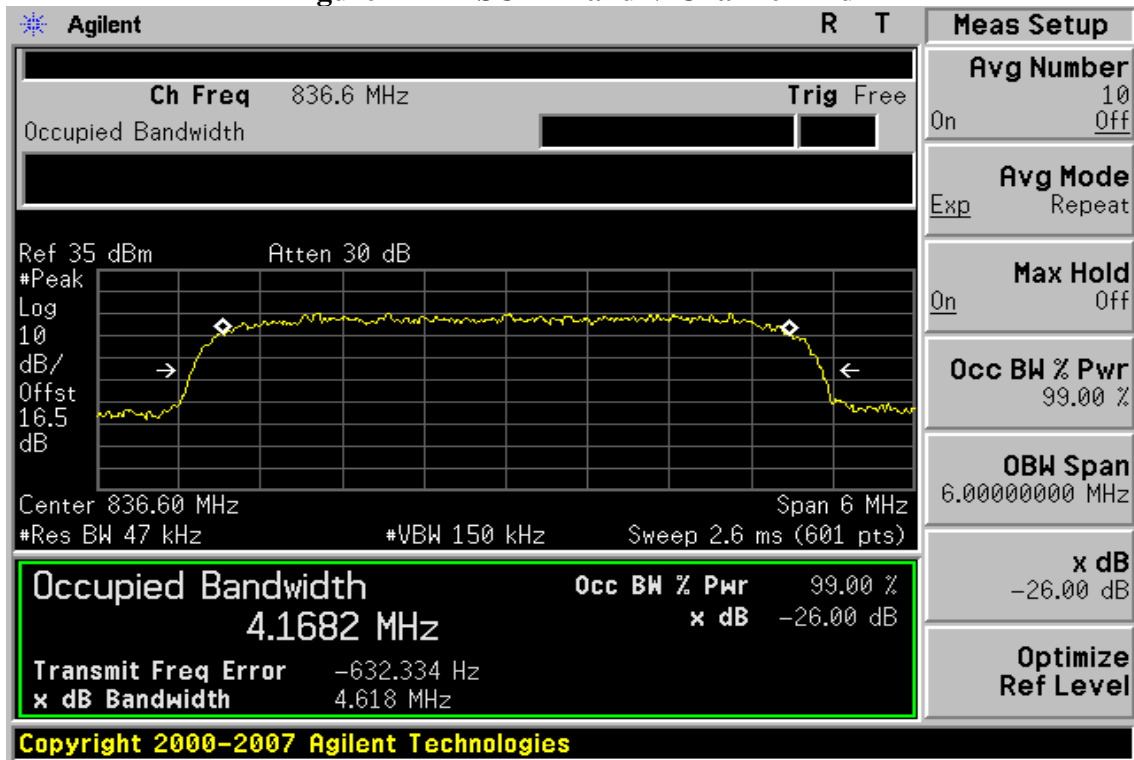
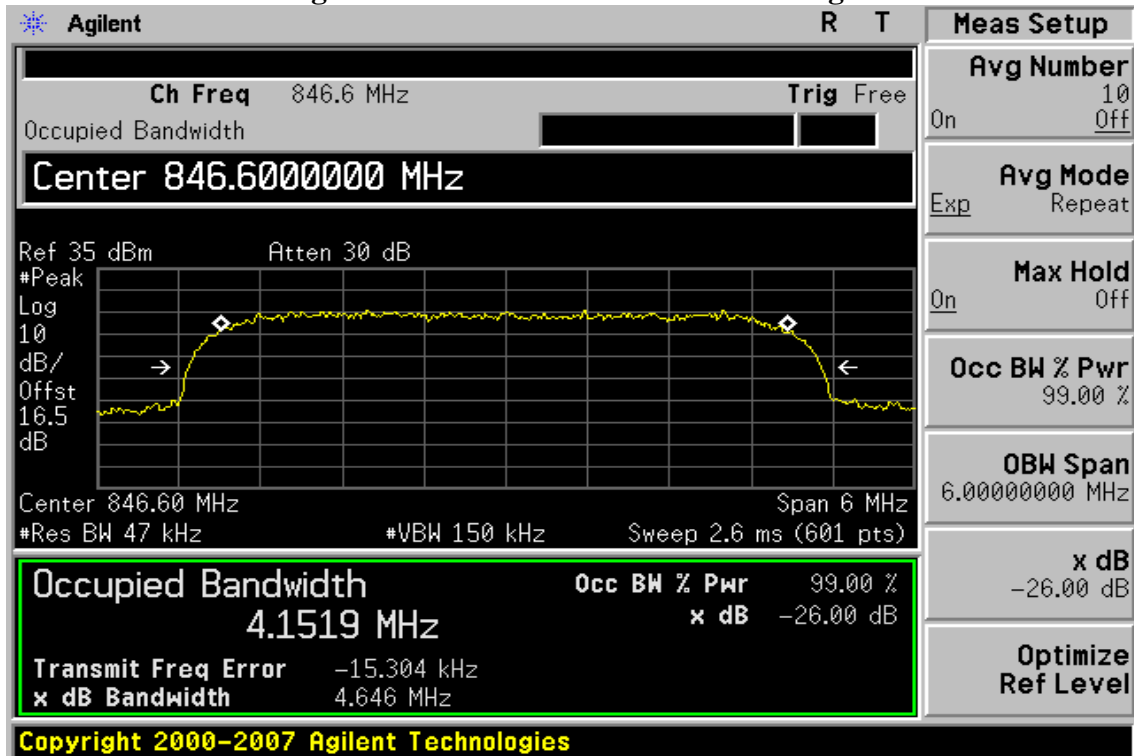


Figure 7-15 HSUPA Band V Channel High



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## 8 OUT OF BAND EMISSION AT ANTENNA TERMINALS (TX)

### 8.1 Standard Applicable

According to FCC §2.1051.

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

### 8.2 Test SET-UP

Refer to section 7.2 in this report

### 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= 10 th harmonic. Limit = -13dBm

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

### 8.4 Measurement Equipment Used:

Refer to section 2.4 in this report

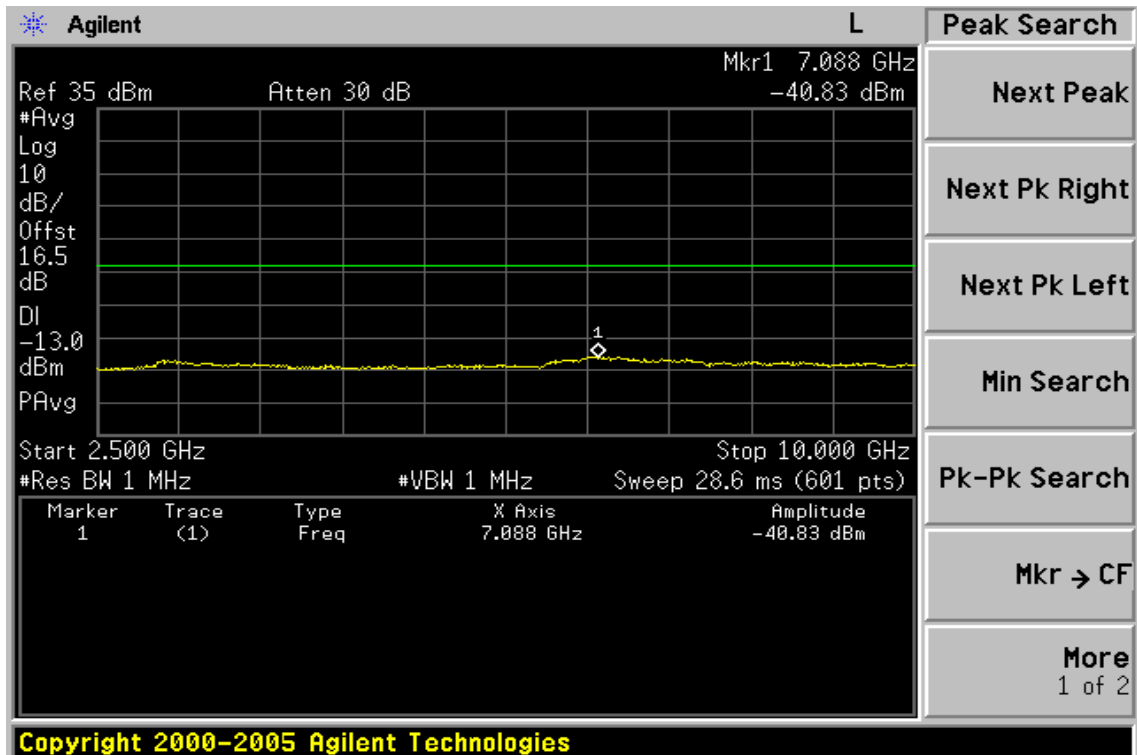
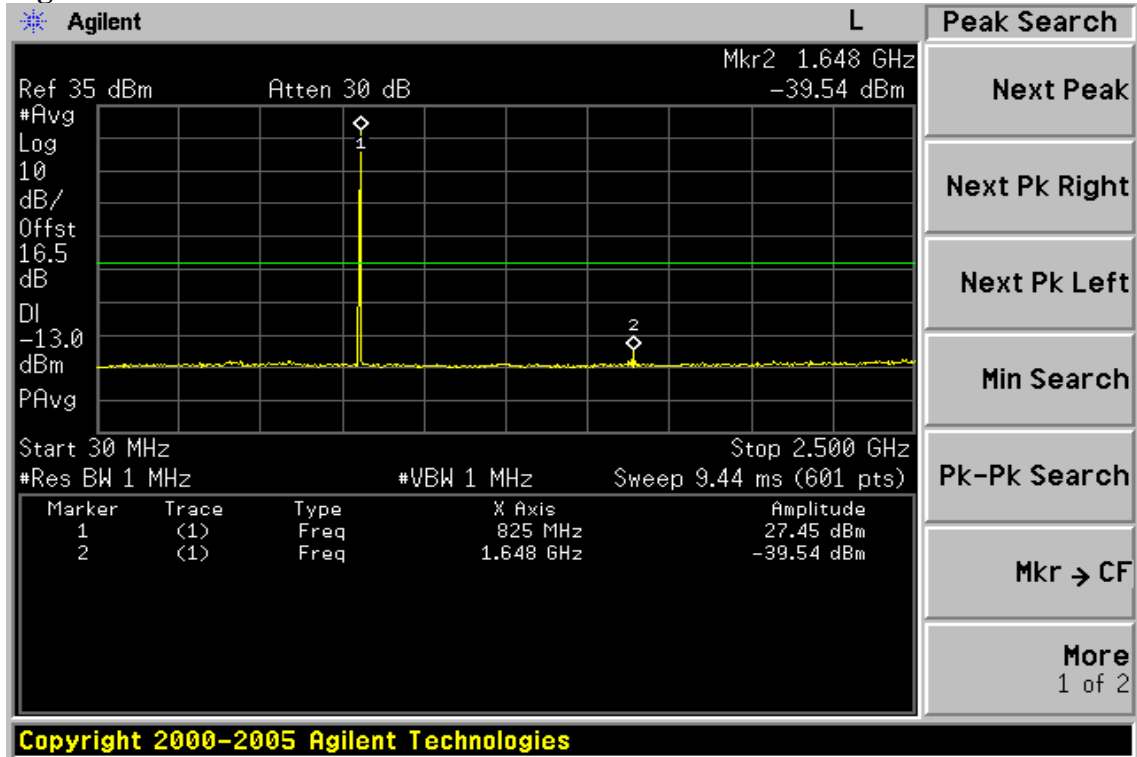
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### 8.5 Measurement Result

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

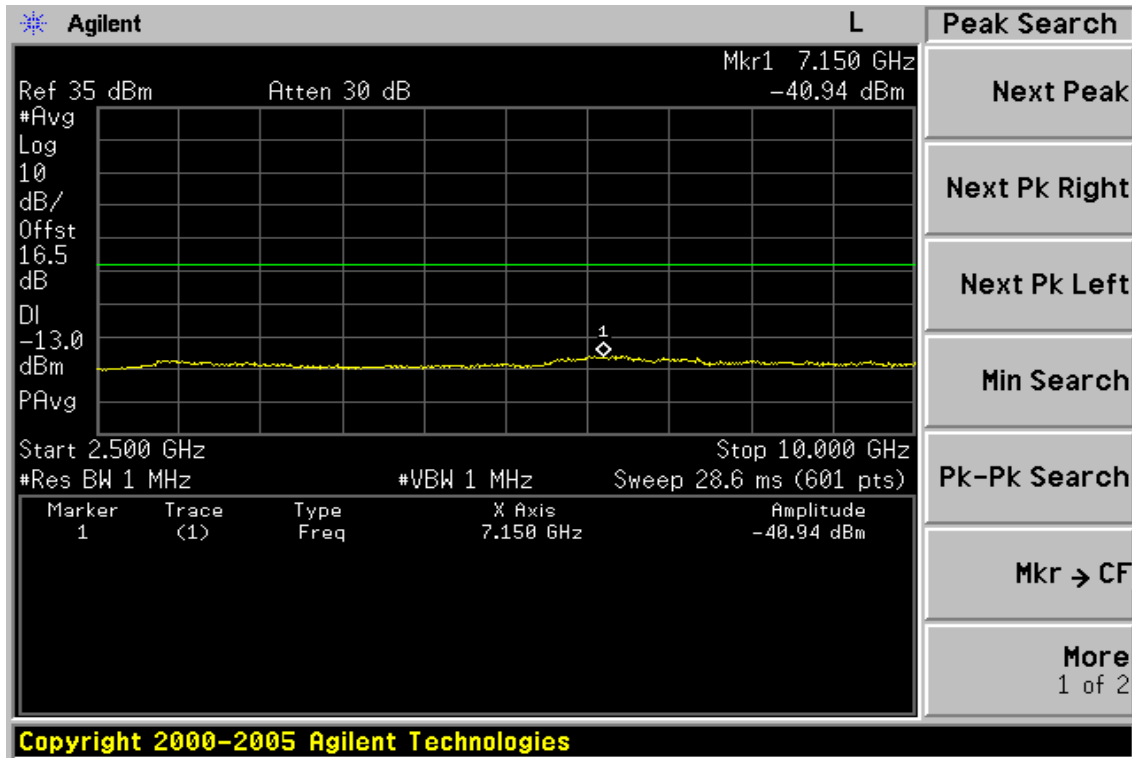
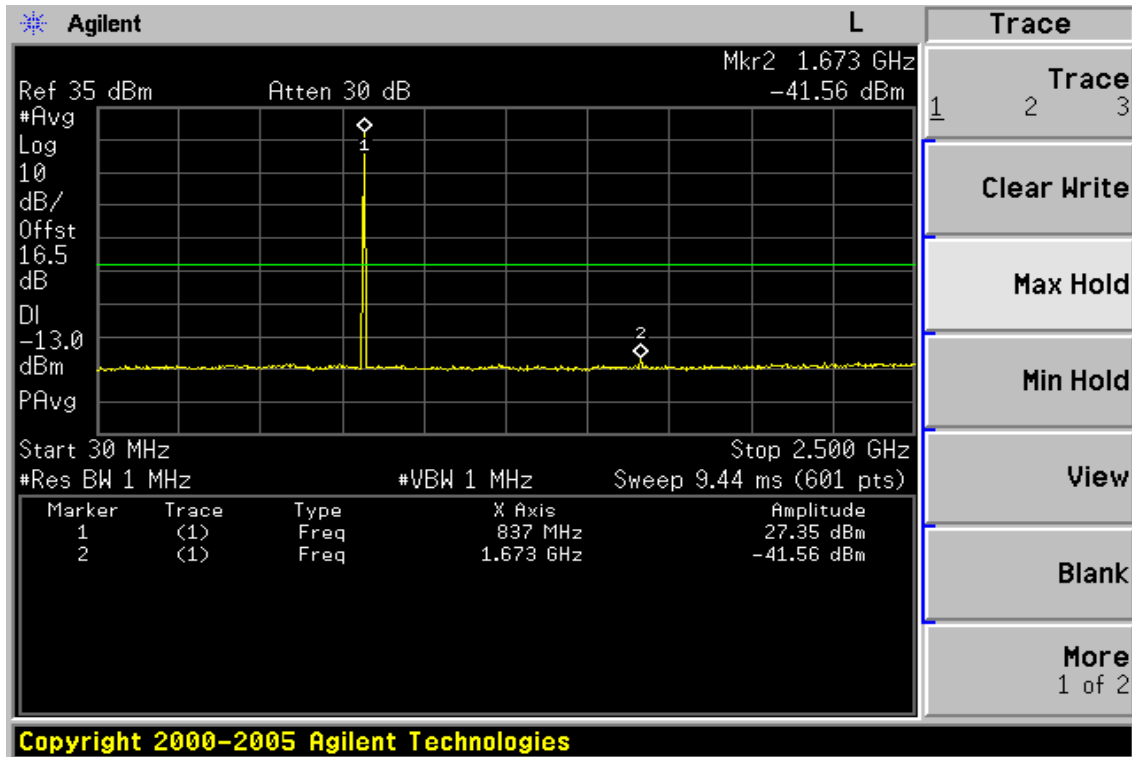


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Figure 8-2: Out of Band emission at antenna terminals –GSM 850 Channel Mid

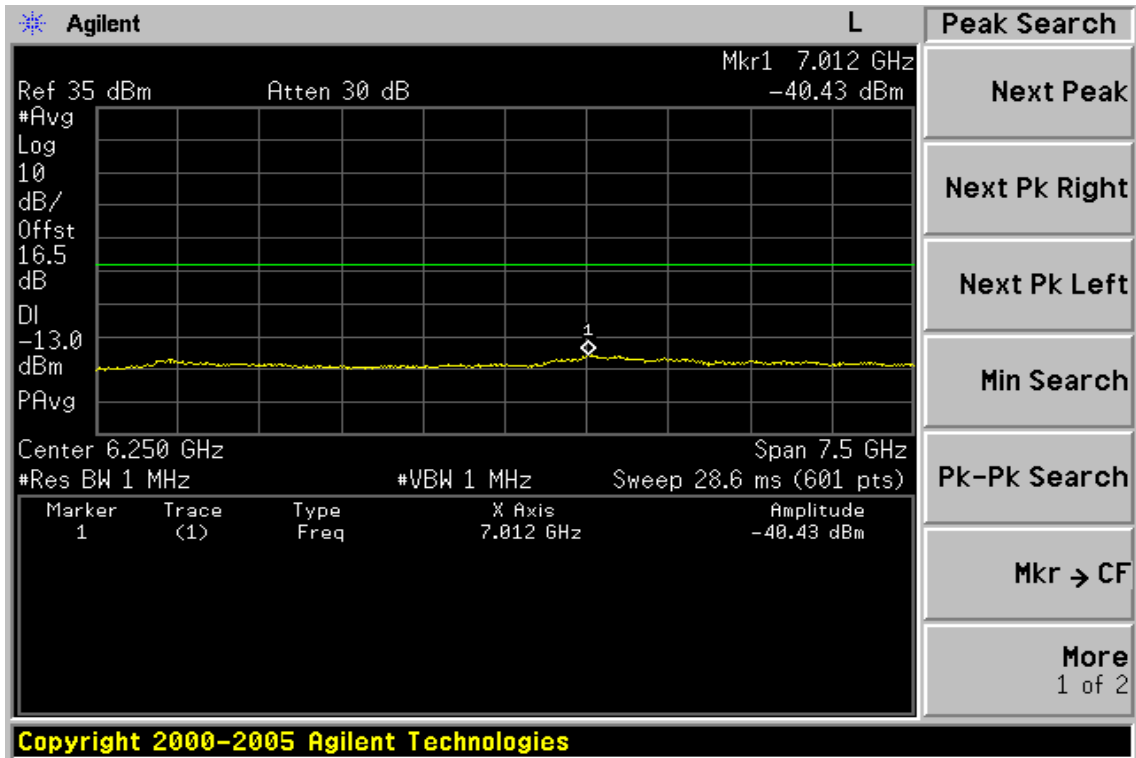
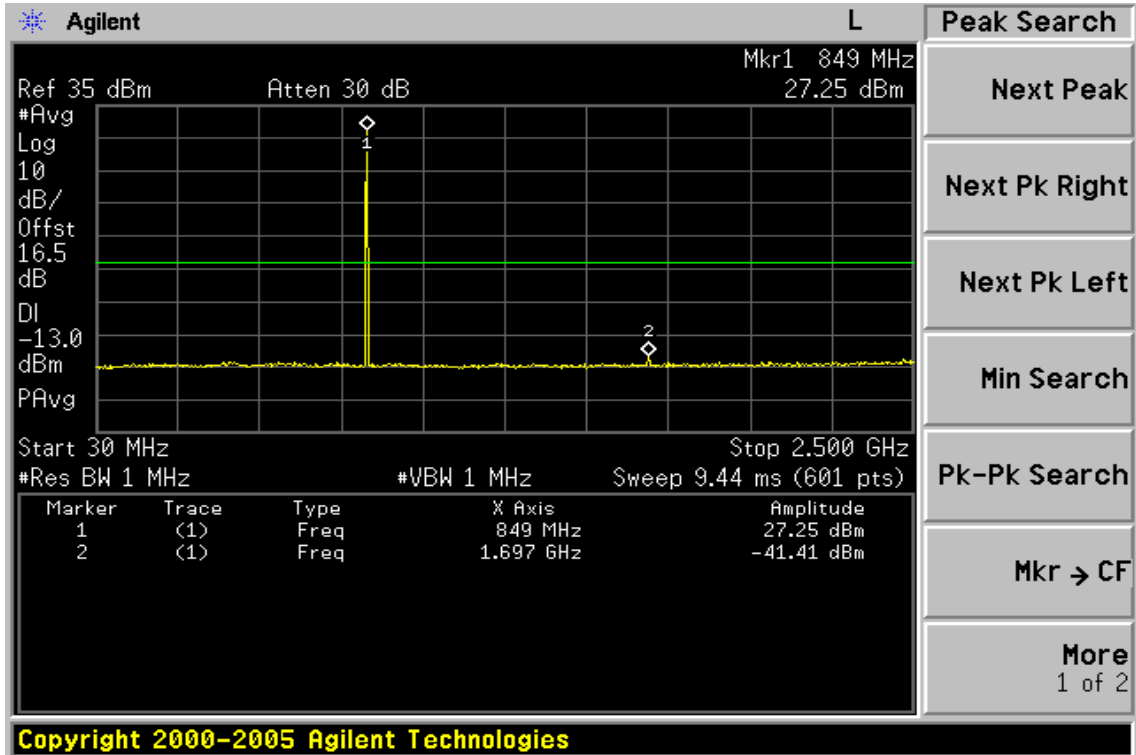


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**Figure 8-3: Out of Band emission at antenna terminals–GSM 850 Channel Highest**

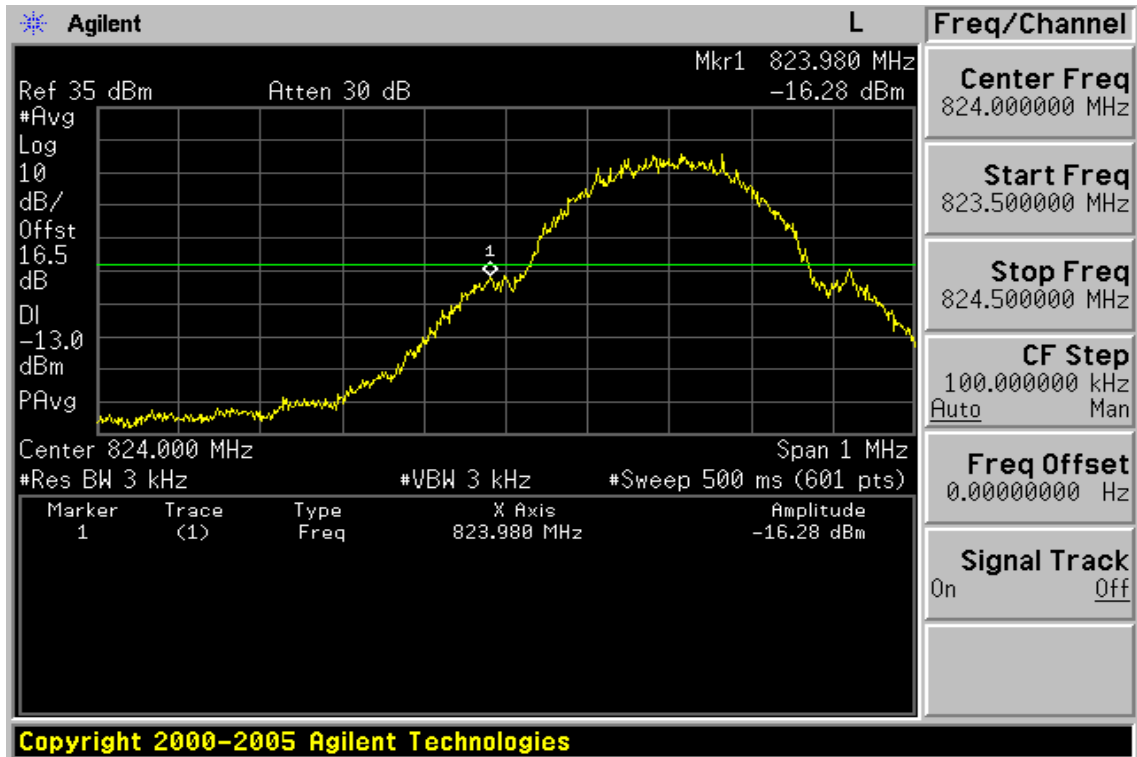


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**Figure 8-4: Band edge emission at antenna terminals – GSM 850 Channel Lowest**



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

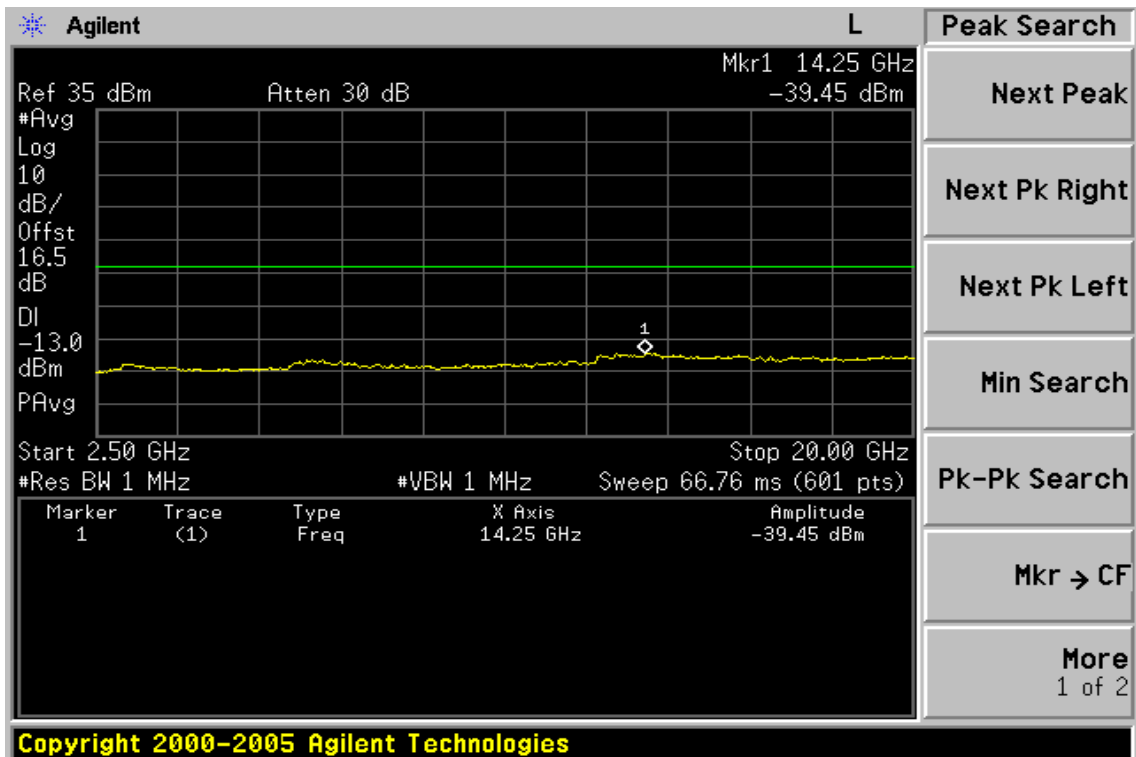
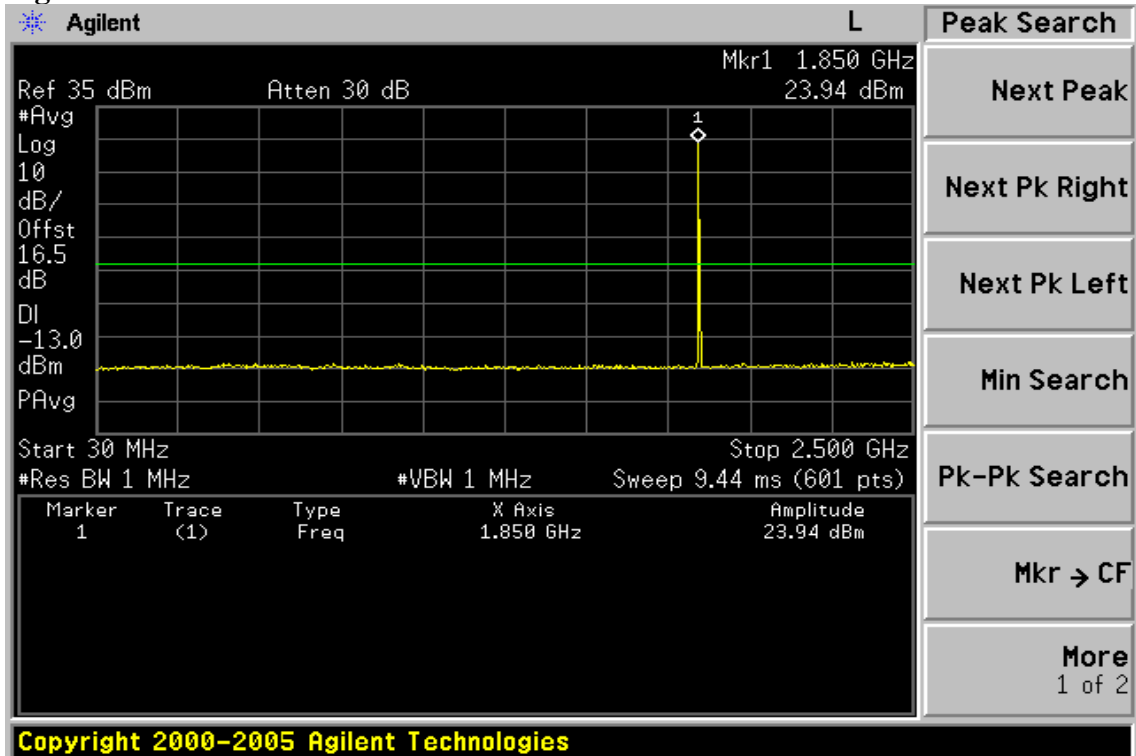


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**Figure 8-6: Out of Band emission at antenna terminals– PCS 1900 Channel Lowest**

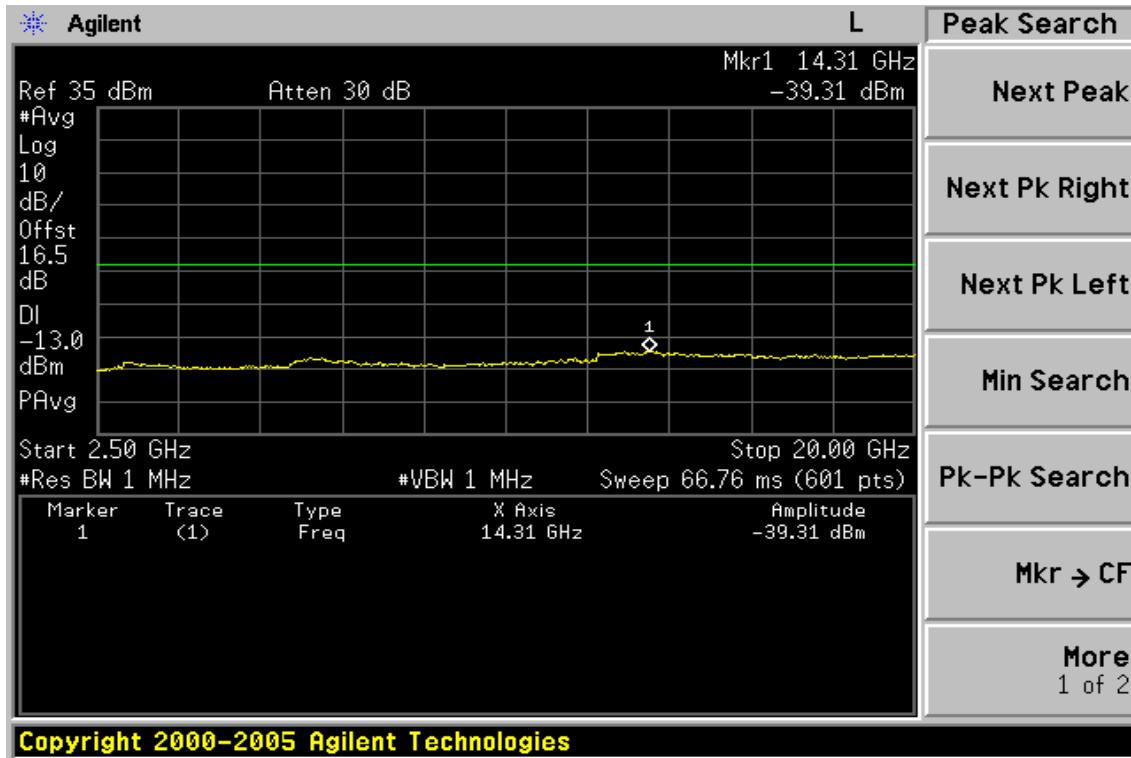
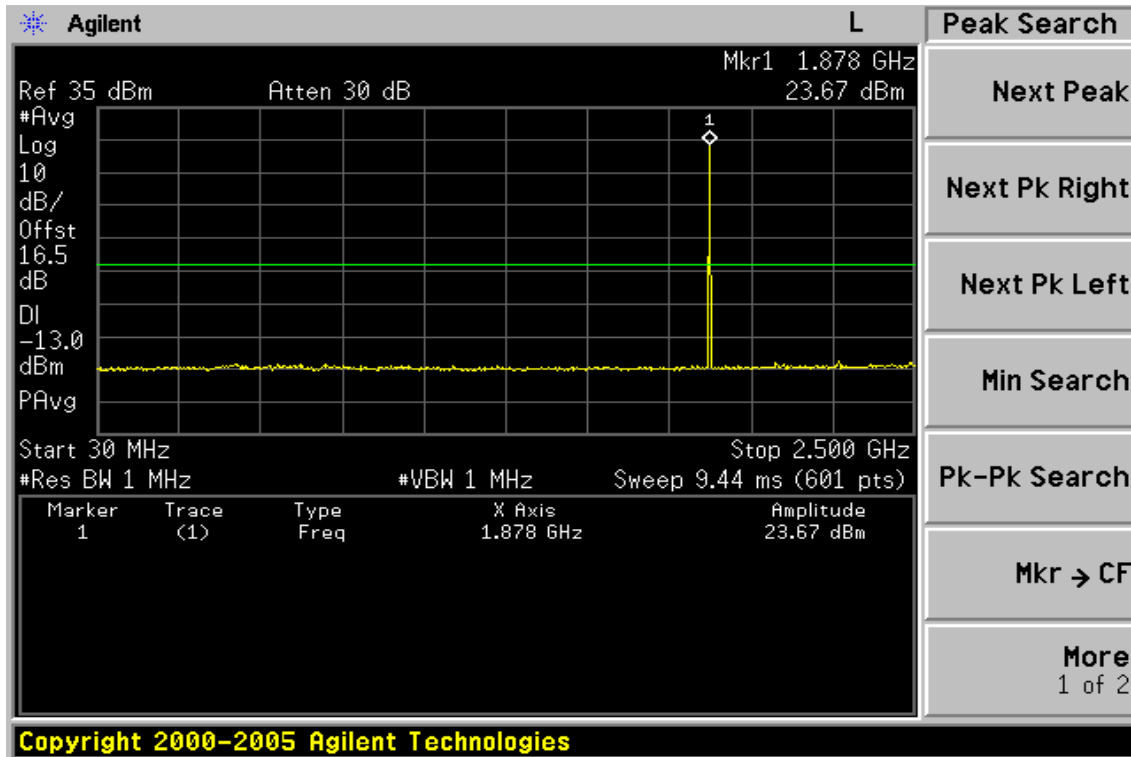


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Figure 8-7: Out of Band emission at antenna terminals –PCS 1900 Channel Mid



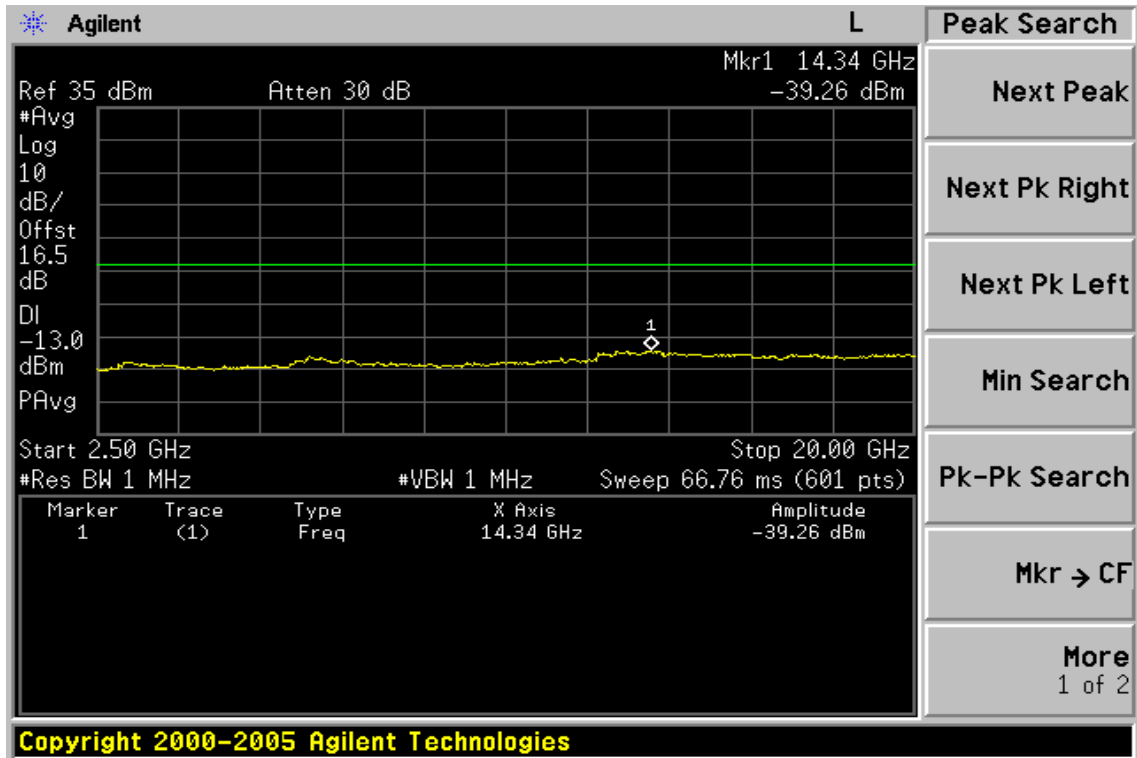
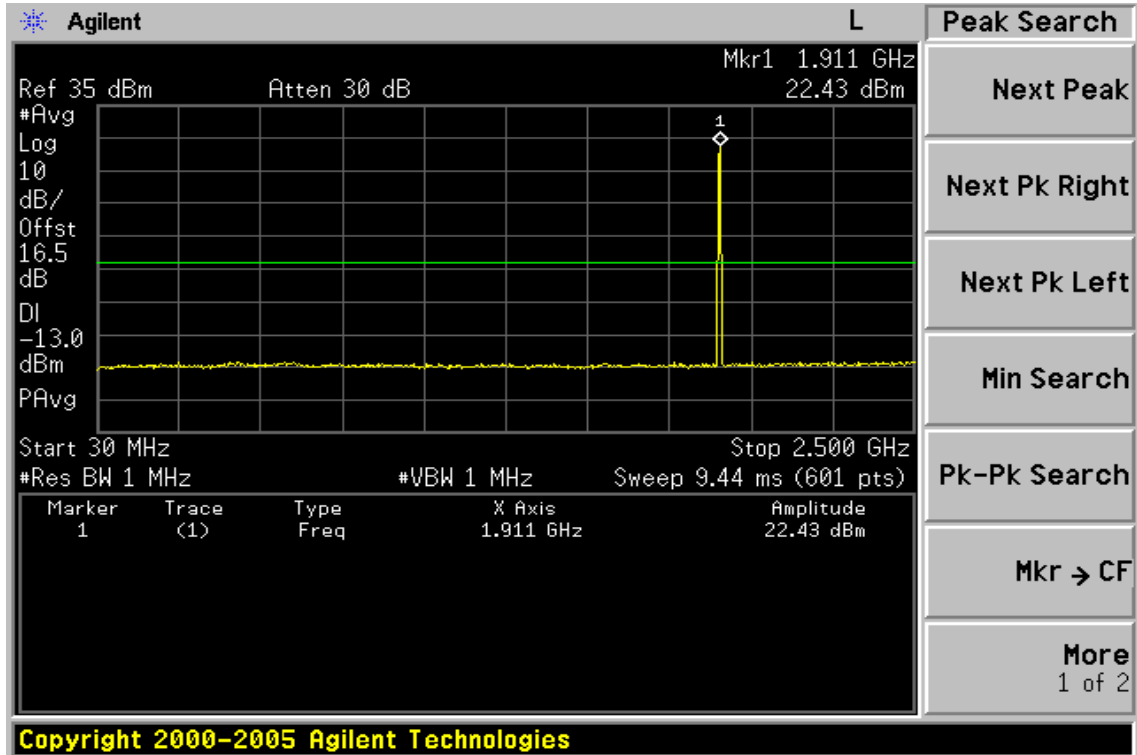
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Figure 8-8: Out of Band emission at antenna terminals–PCS 1900 Channel Highest

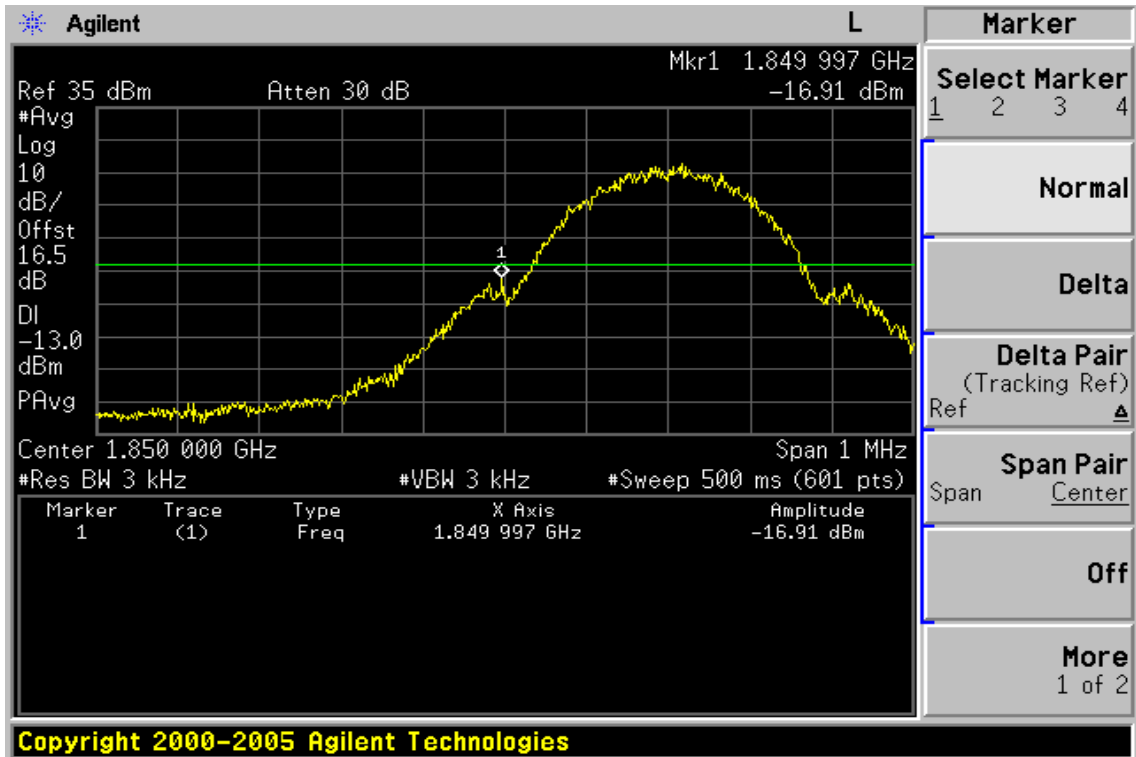


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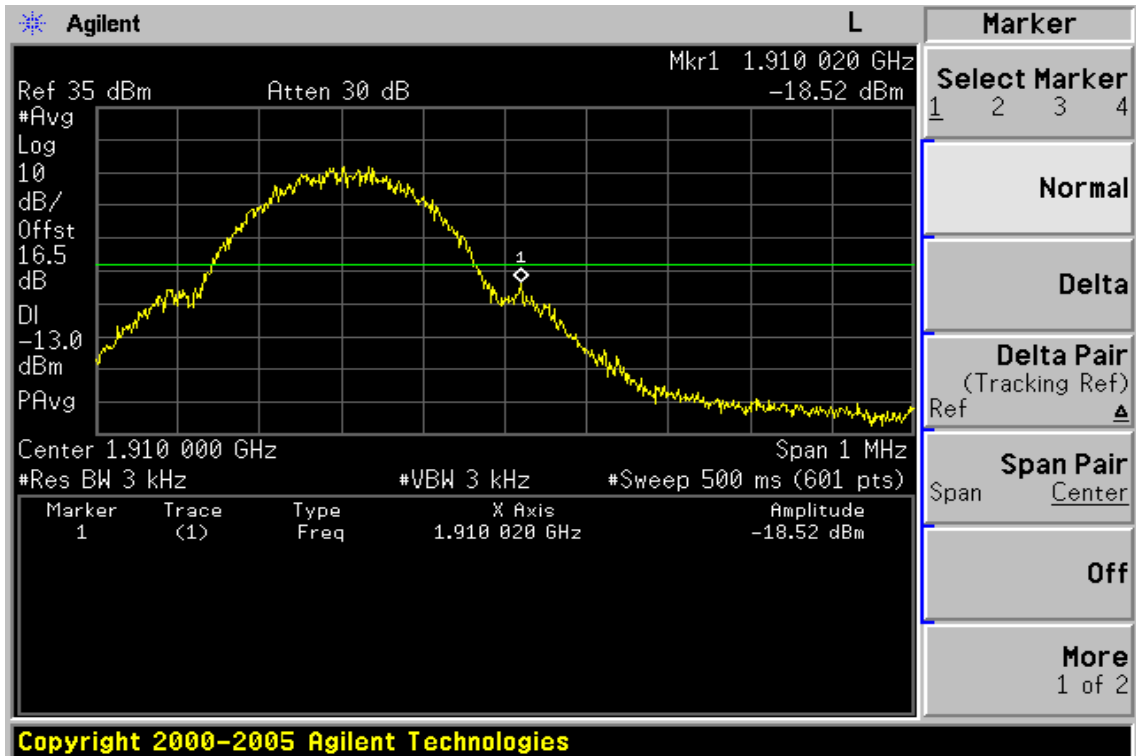
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**Figure 8-9: Bad edge emission at antenna terminals – PCS 1900 Channel Lowest**



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

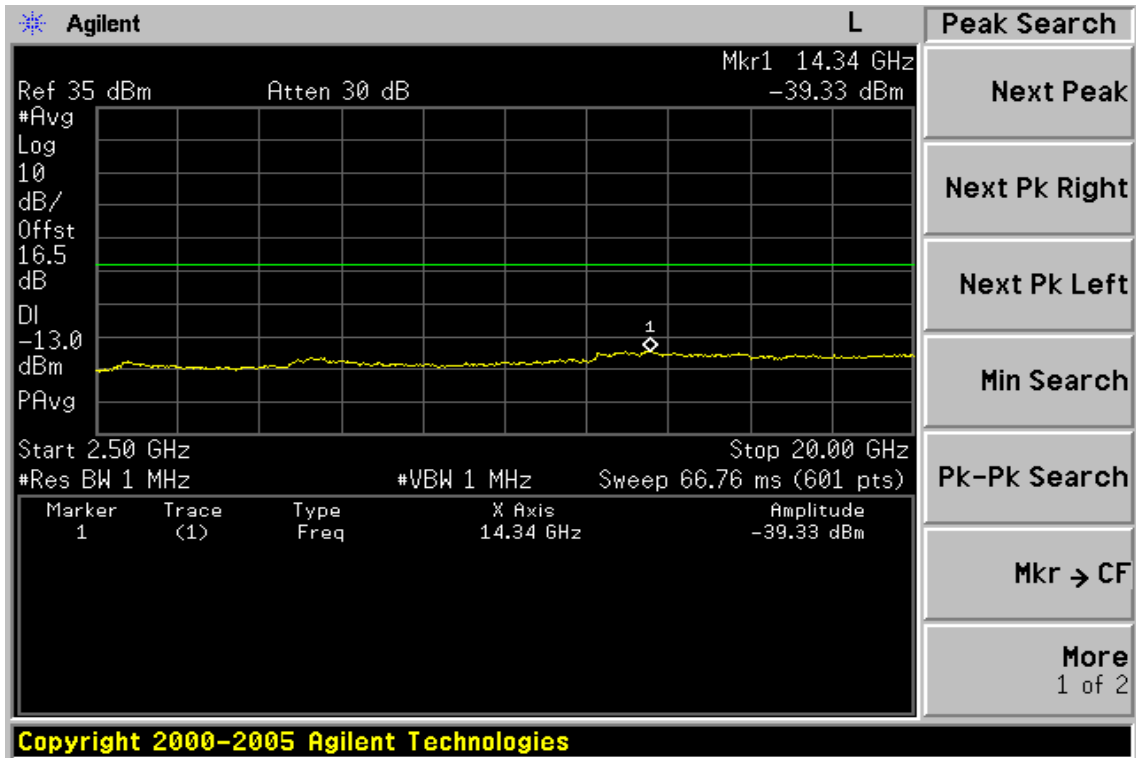
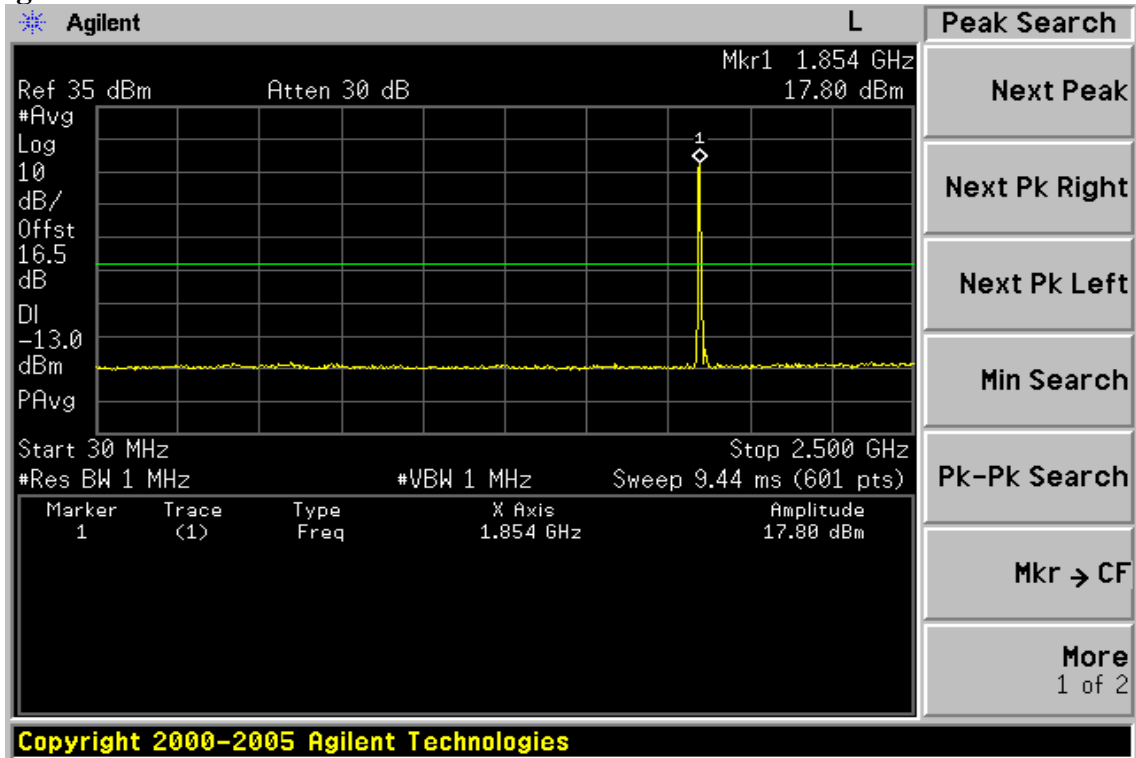


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**Figure 8-11: Out of Band emission at antenna terminals–WCDMA II Channel Lowest**

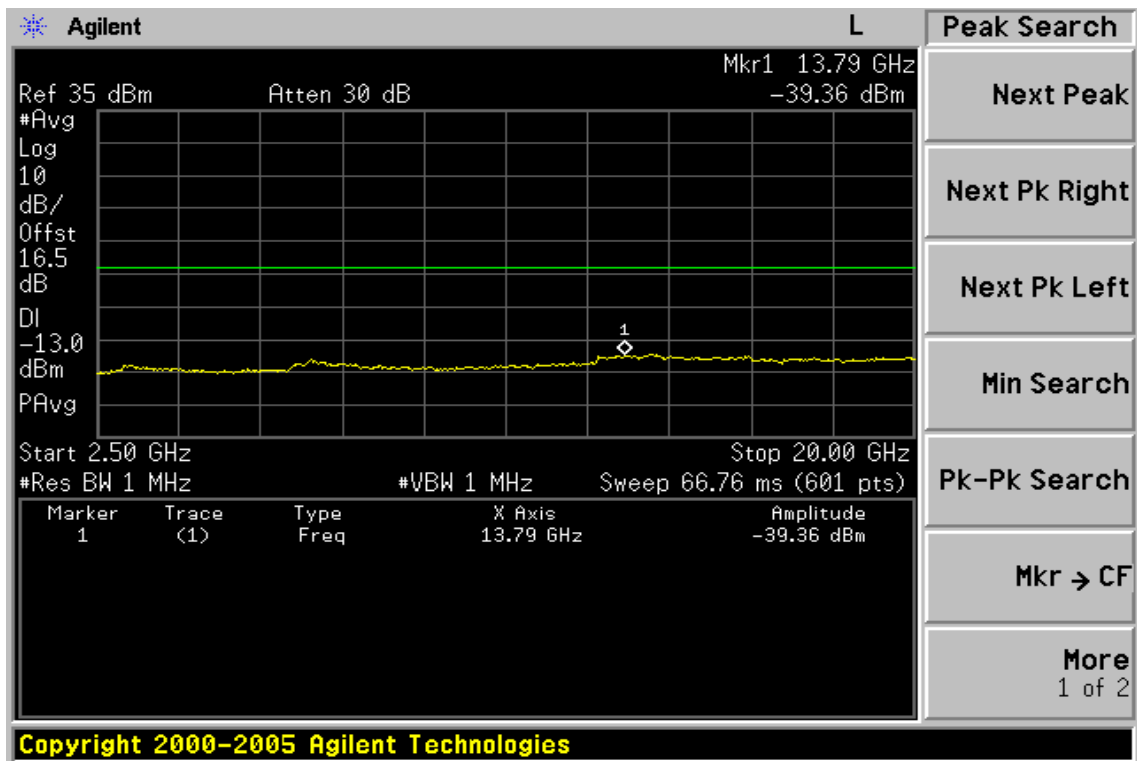
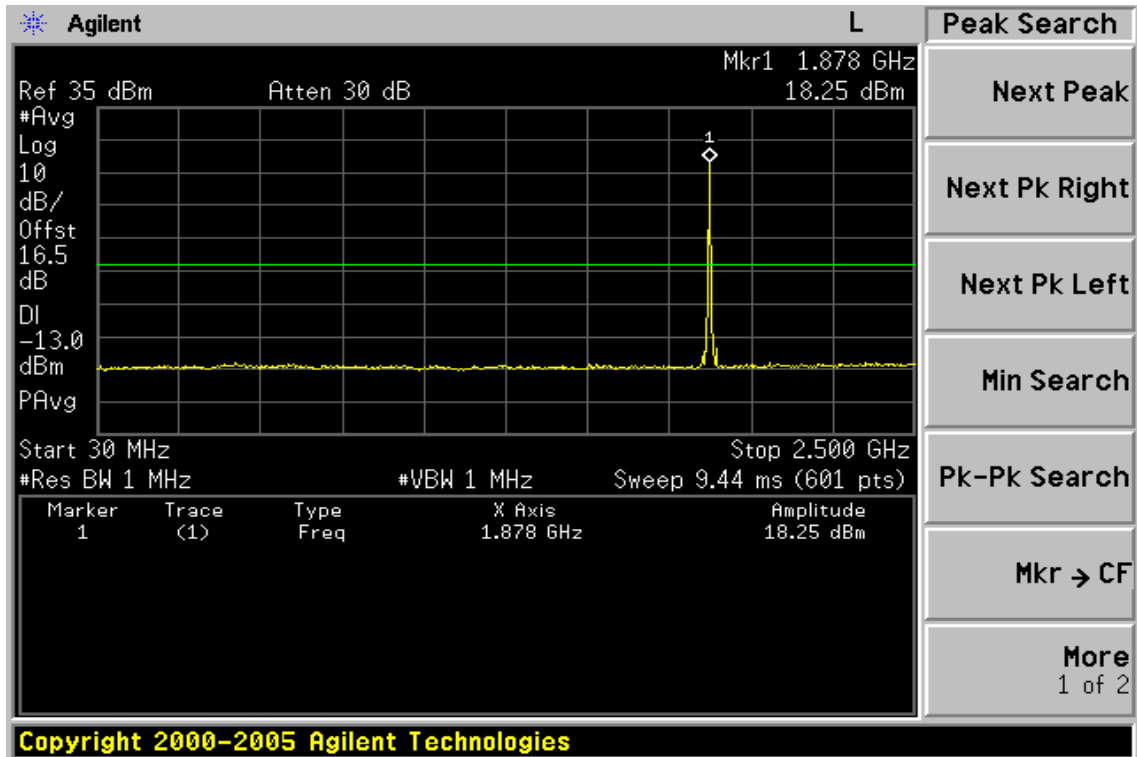


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Figure 8-12: Out of Band emission at antenna terminals –WCDMA II Channel Mid

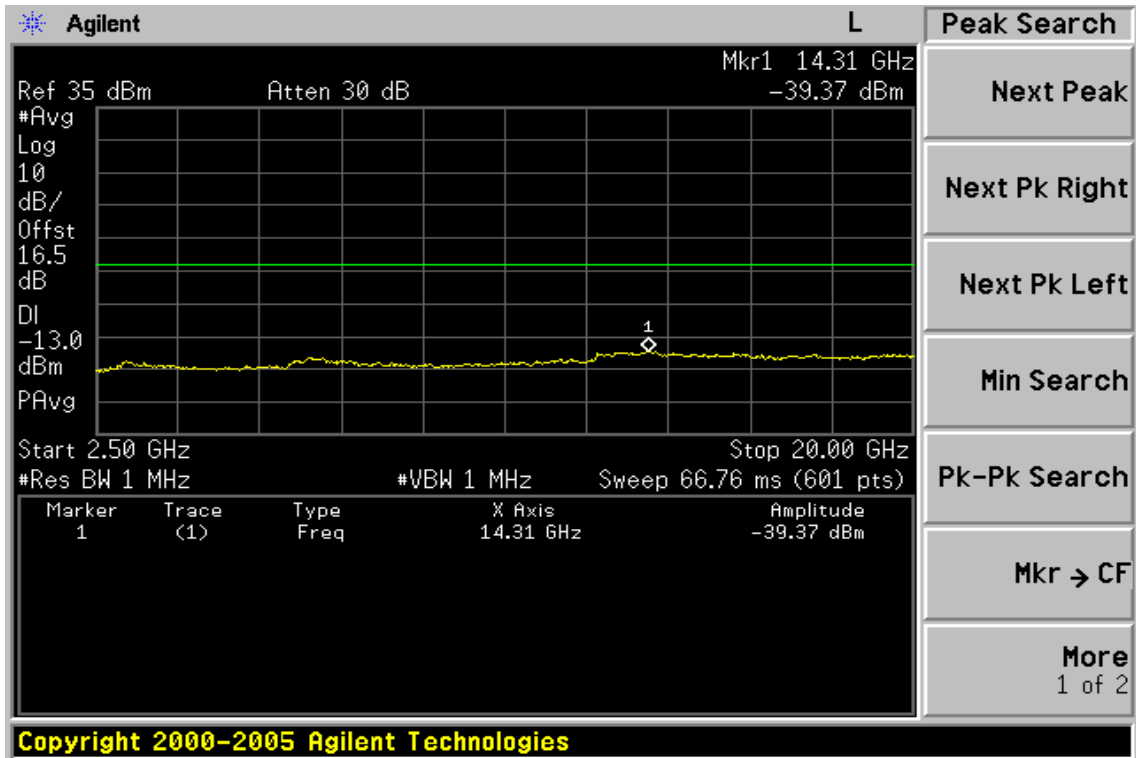
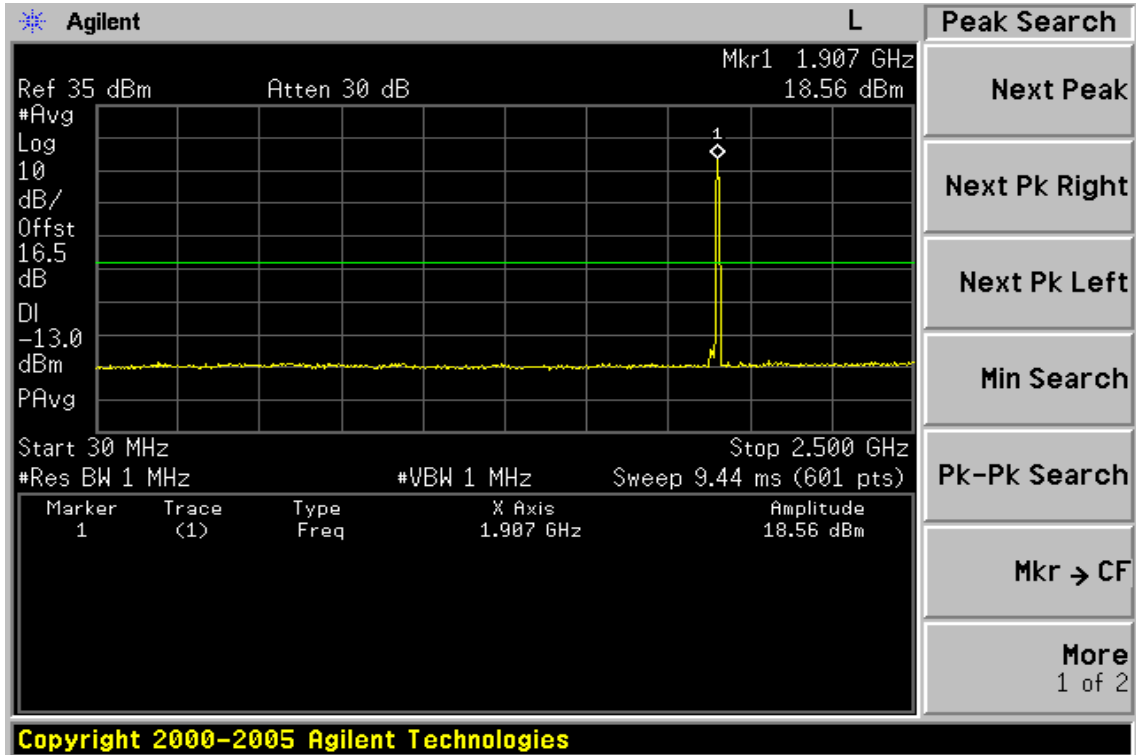


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Figure 8-13: Out of Band emission at antenna terminals–WCDMA II Channel Highest



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Figure 8-14: Bad edge emission at antenna terminals –WCDMA II Channel Lowest

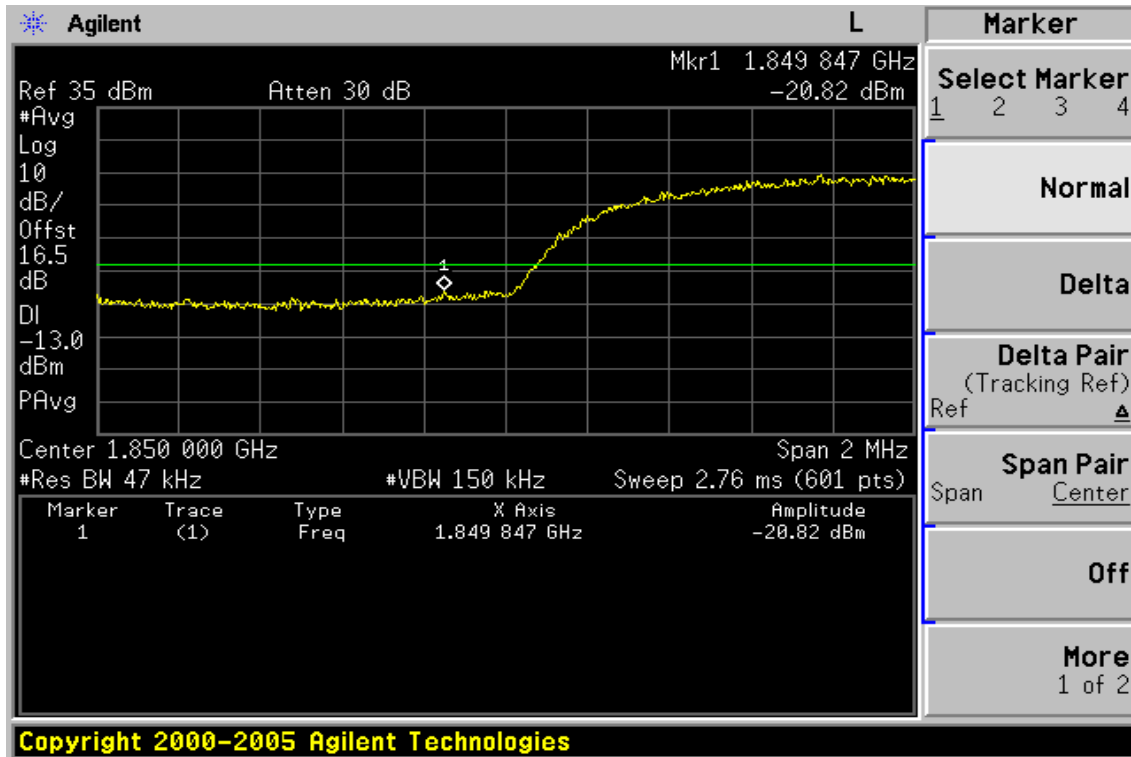


Figure 8-15: Band edge emission at antenna terminals –WCDMA II Channel Highest

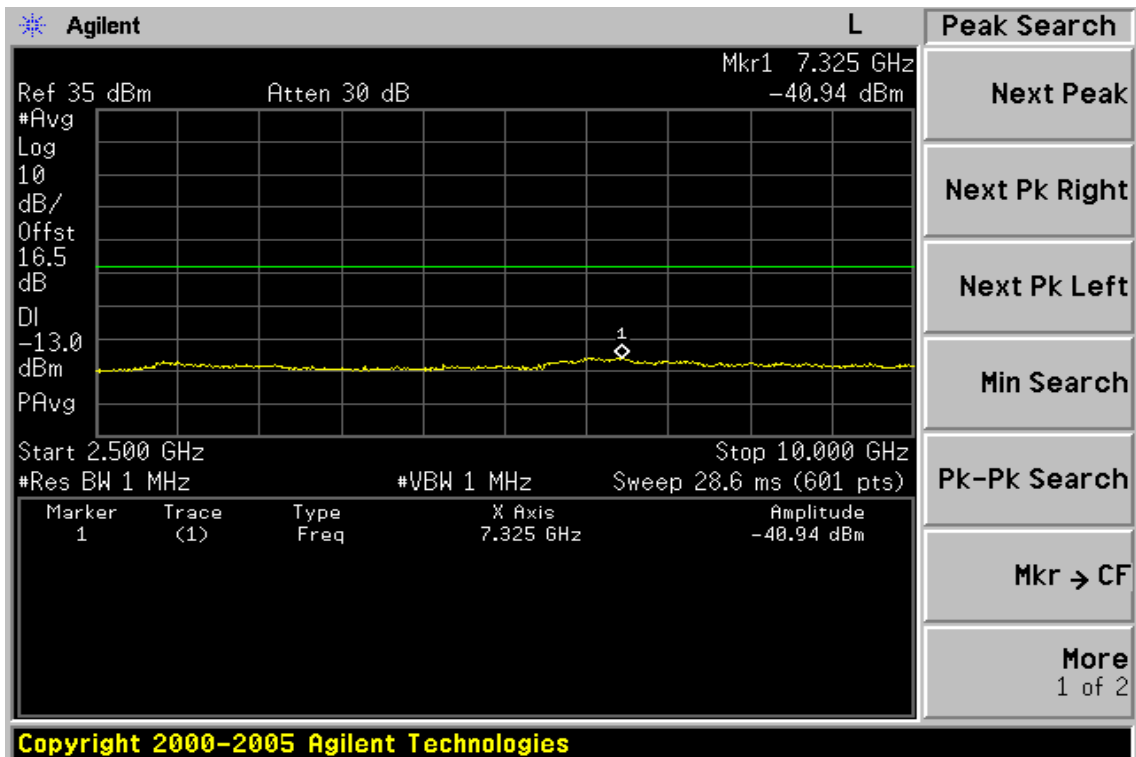
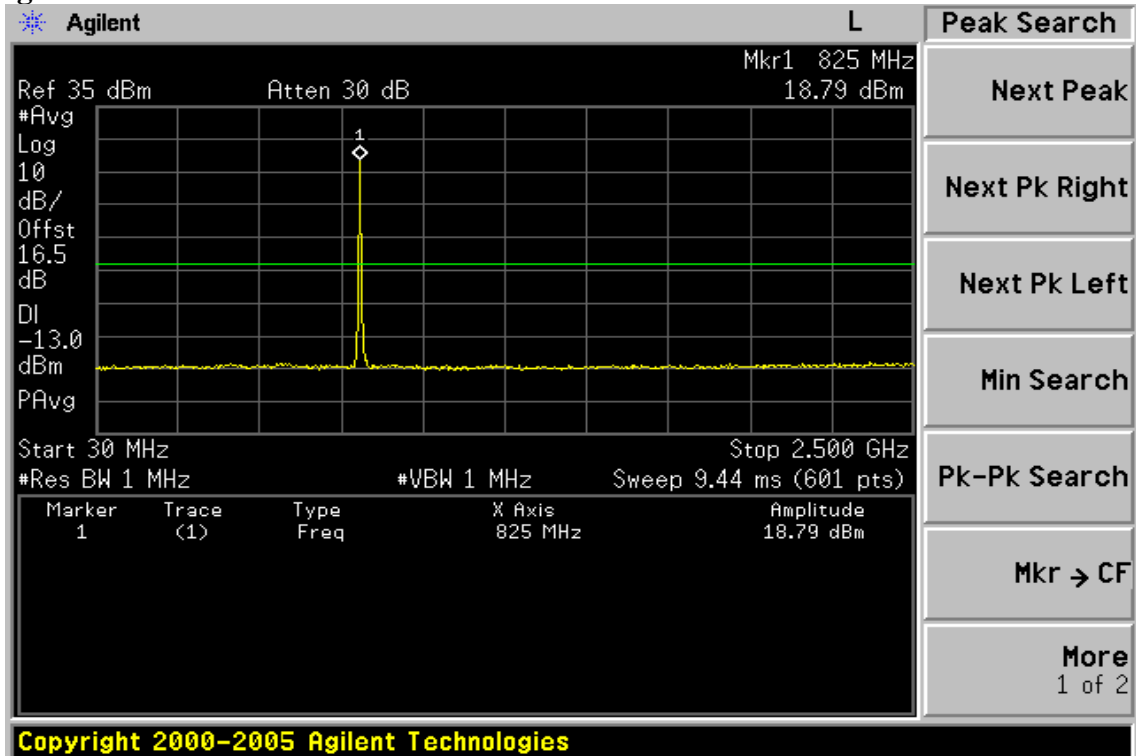


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Figure 8-21: Out of Band emission at antenna terminals–WCDMA V Channel Lowest

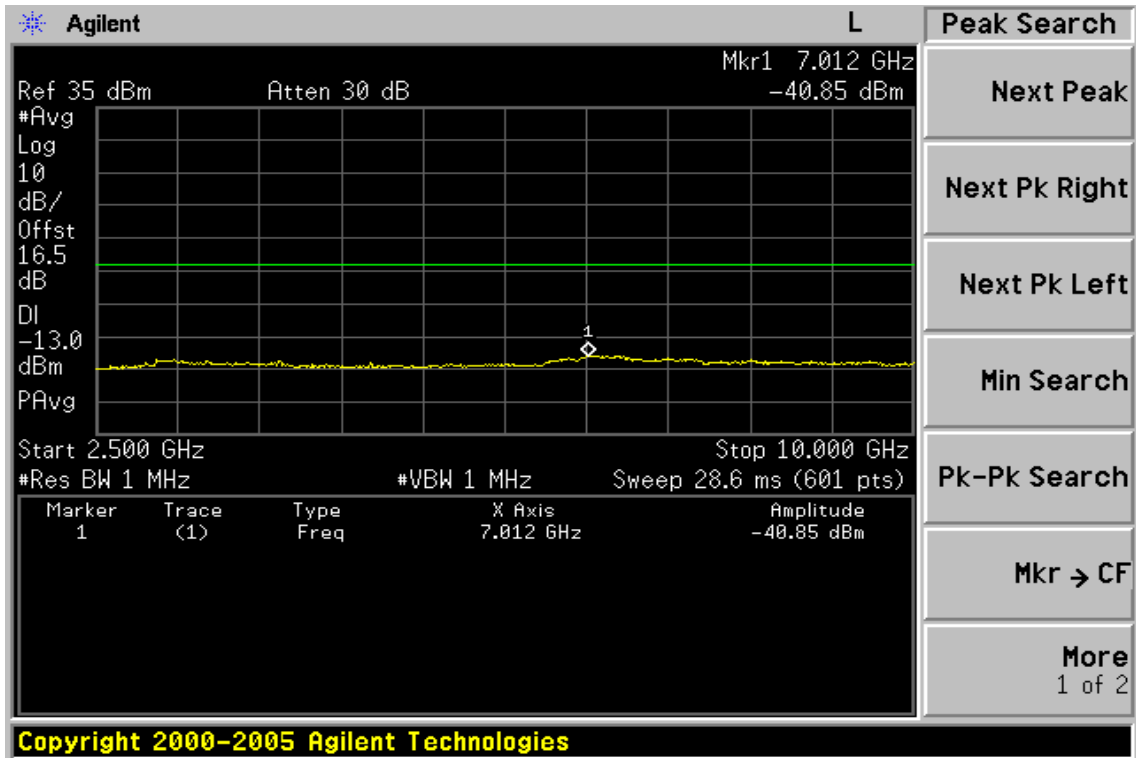
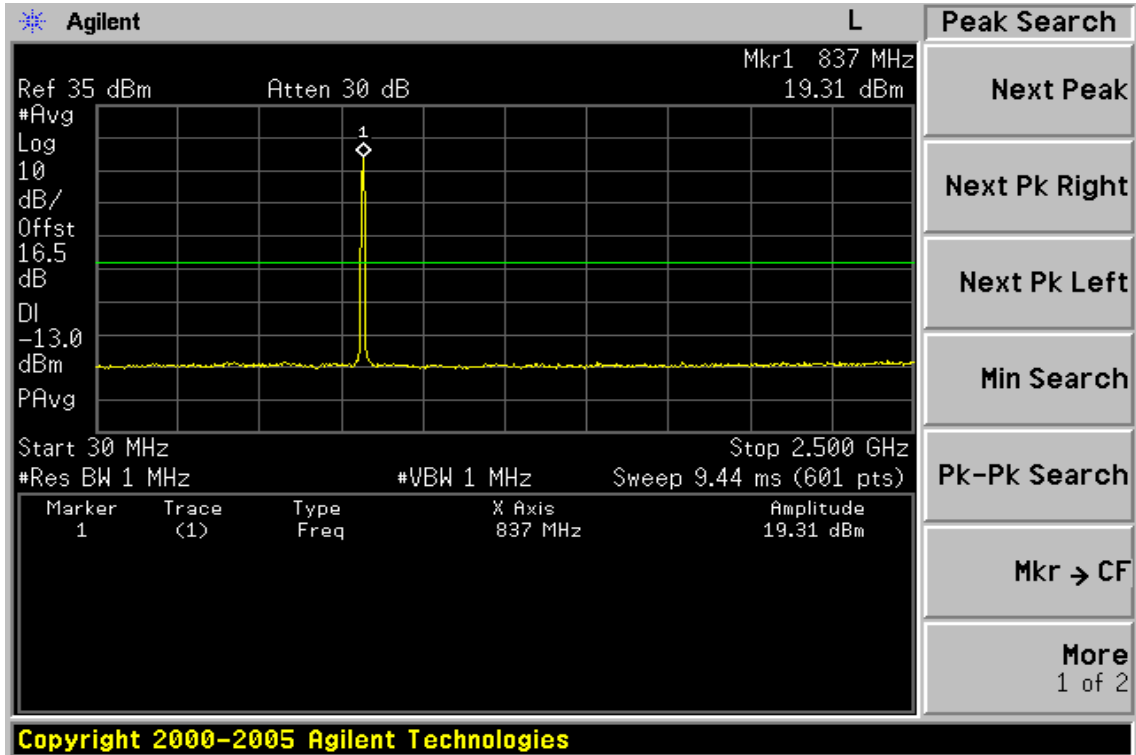


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Figure 8-22: Out of Band emission at antenna terminals –WCDMA V Channel Mid



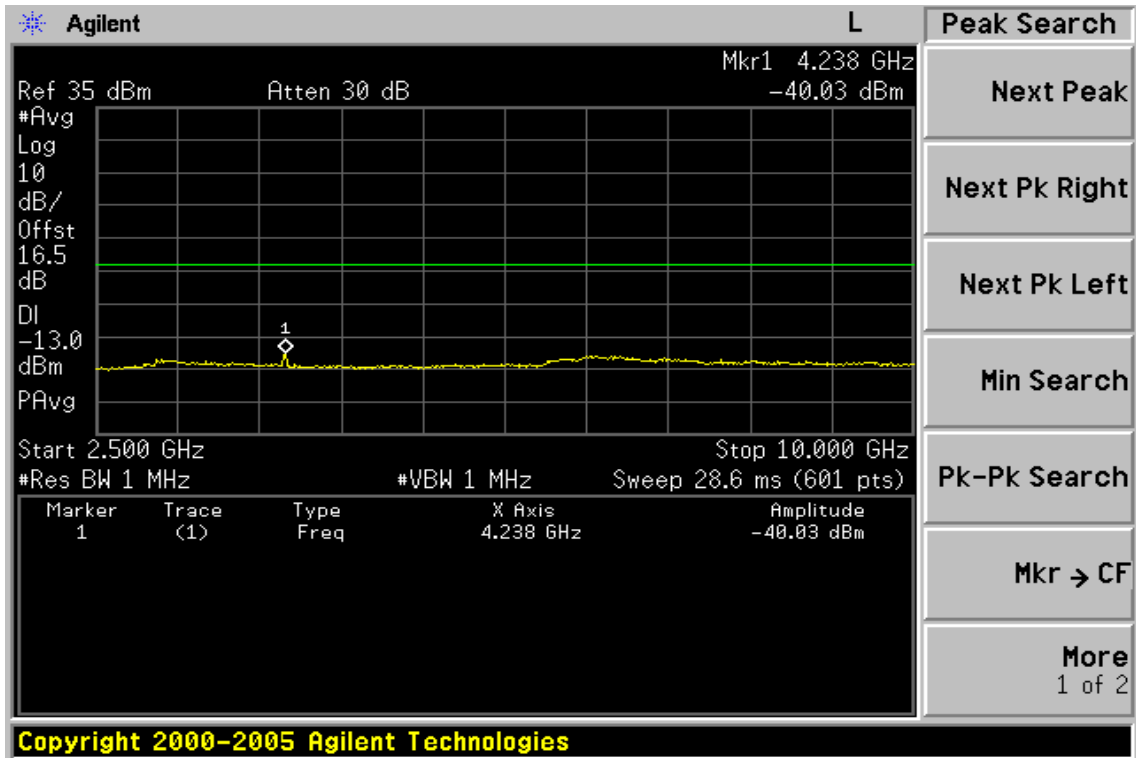
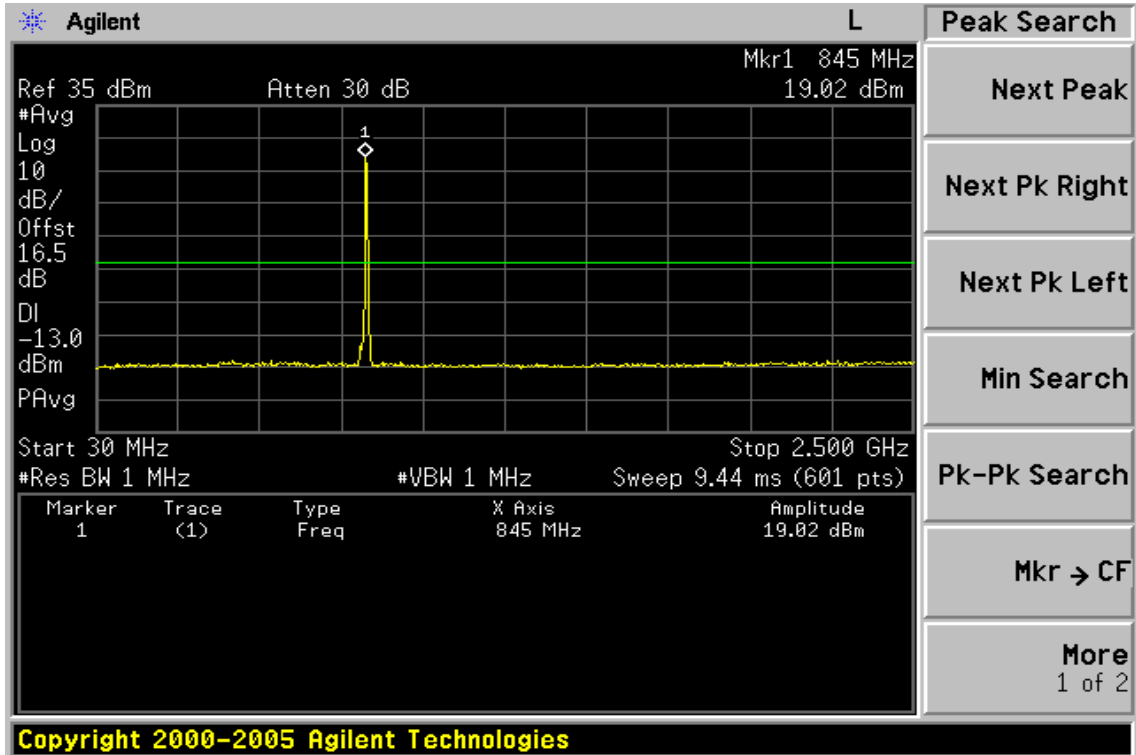
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Figure 8-23: Out of Band emission at antenna terminals–WCDMA V Channel Highest



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Figure 8-24: Bad edge emission at antenna terminals –WCDMA V Channel Lowest

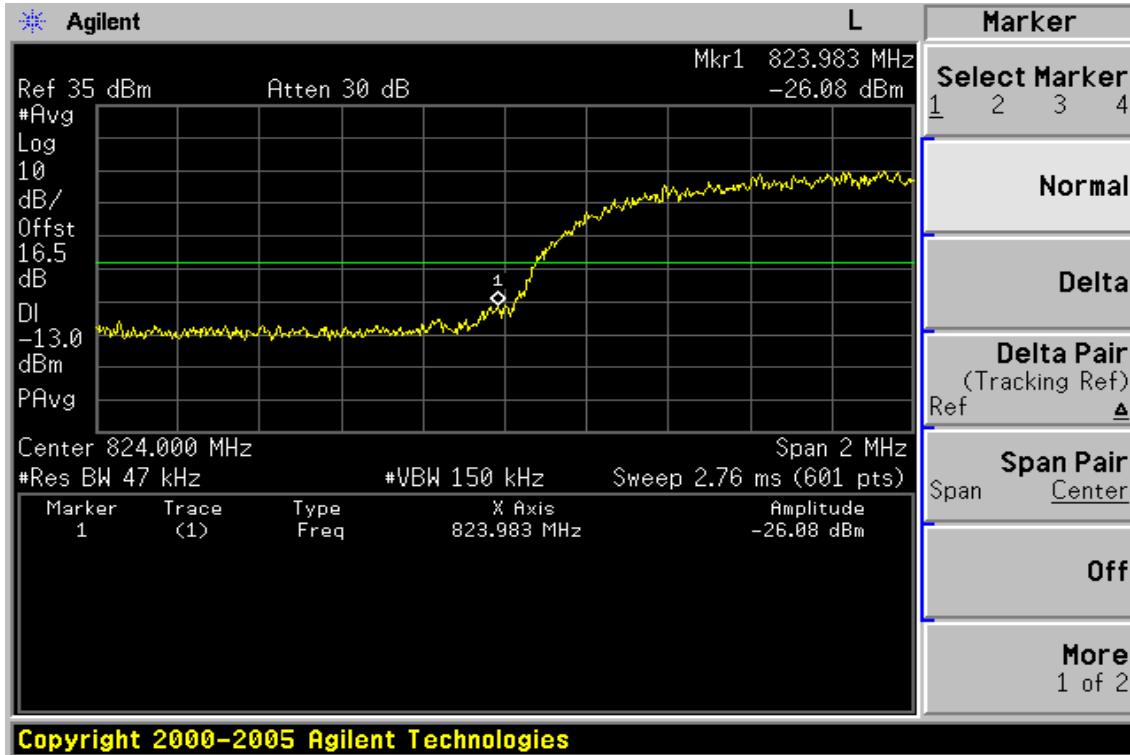
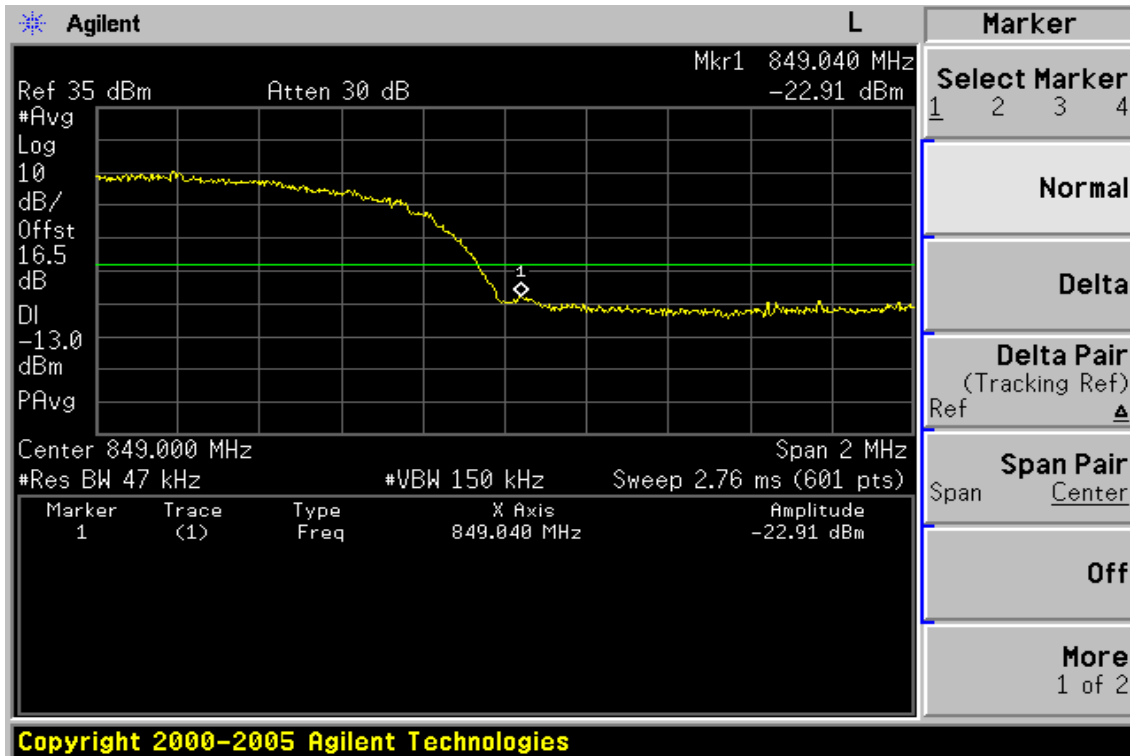


Figure 8-25: Band edge emission at antenna terminals –WCDMA V Channel Highest



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

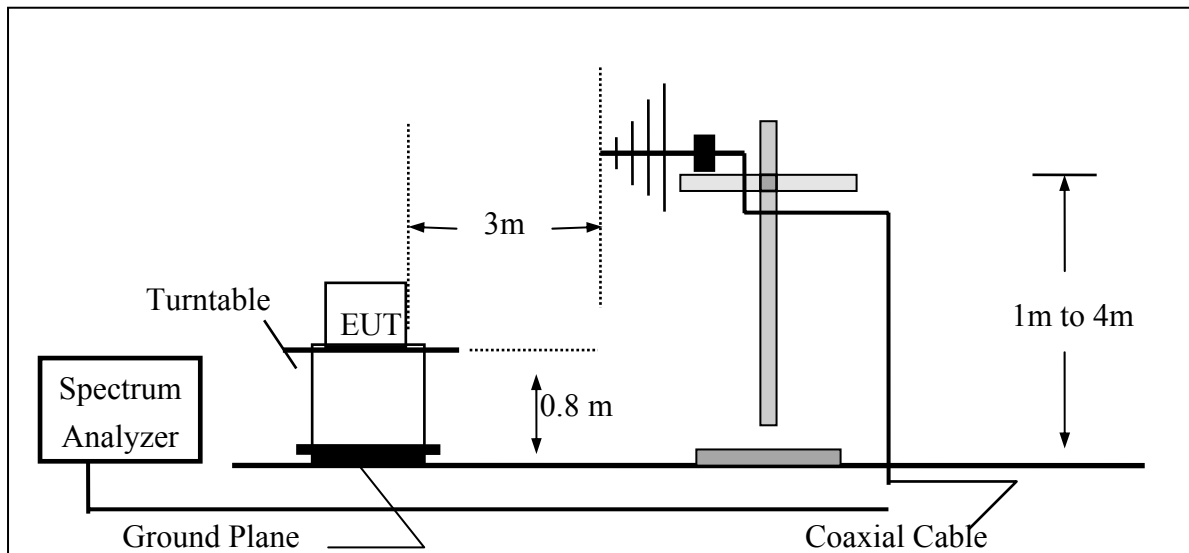
### 9.1 Standard Applicable

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)

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

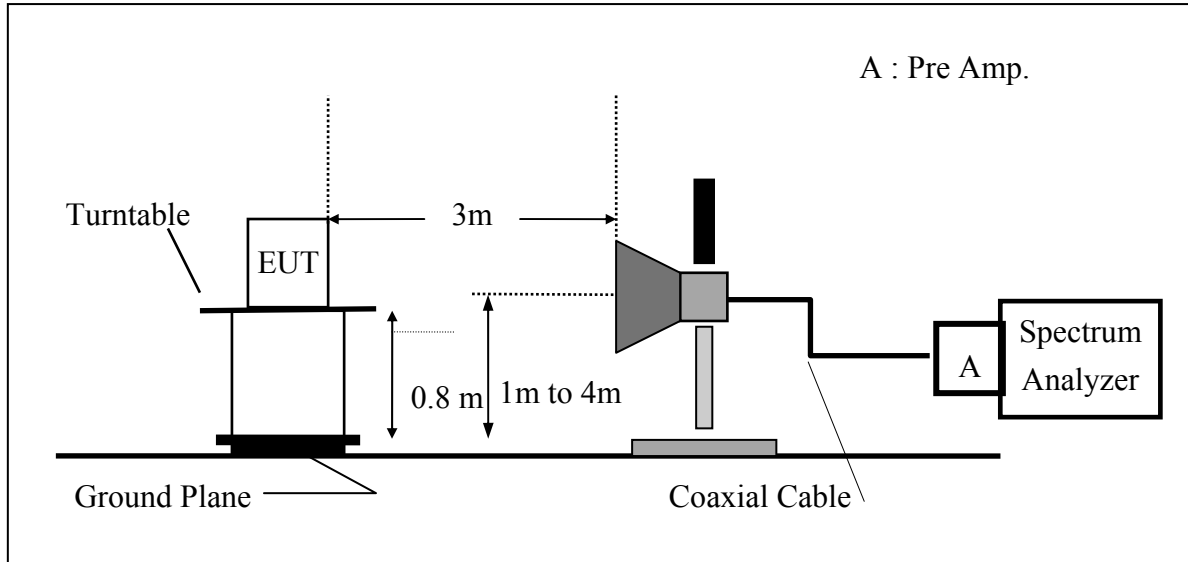


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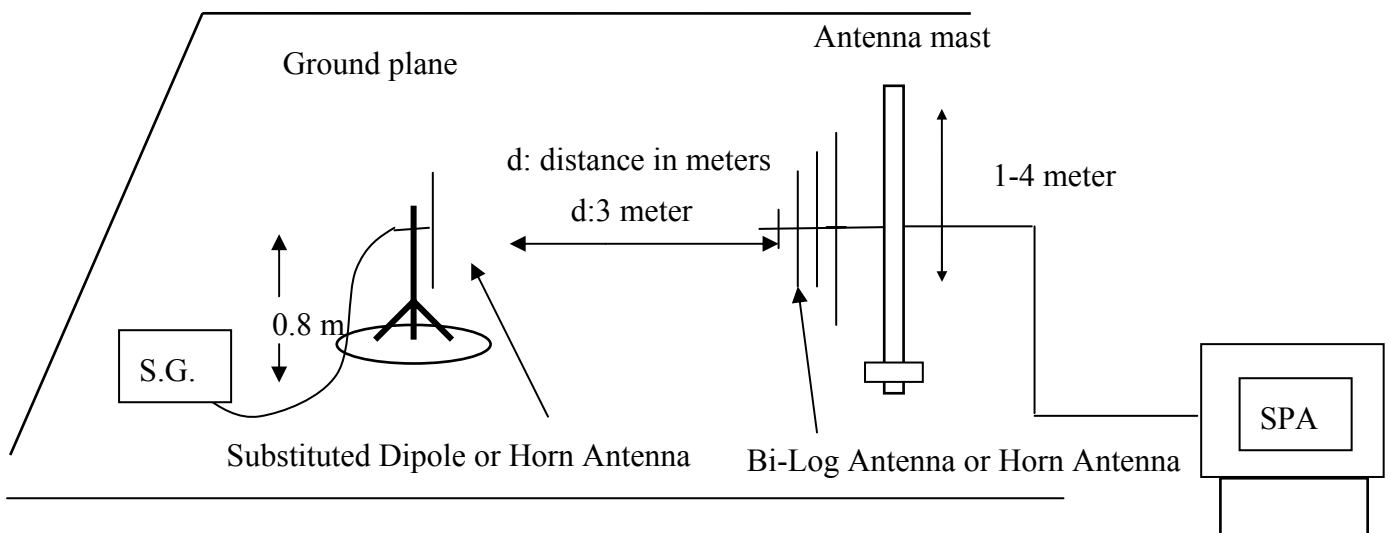
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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



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### 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 were identified, the power of the emission was determined using the substitution method.

ERP in frequency band 824.2 –848.80.8MHz 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:

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 E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 824.20 MHz	Test By:	Jason
Temperature	: 25°C	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)
33.88	49.88	V	-53.69	-5.52	0.93	-60.14	-13.00	-47.14
92.08	53.67	V	-49.26	-7.75	1.29	-58.30	-13.00	-45.30
284.14	45.58	V	-53.19	-7.91	2.11	-63.21	-13.00	-50.21
332.64	45.62	V	-52.23	-7.74	2.29	-62.26	-13.00	-49.26
824.00	80.68	V	-5.71	-7.87	3.62	-17.21	-13.00	-4.21
1648.40	56.58	V	-48.00	9.29	5.23	-43.94	-13.00	-30.94
2472.60	47.70	V	-53.31	10.08	6.53	-49.76	-13.00	-36.76
3296.80	---	V		12.17	7.71		-13.00	
4121.00	35.95	V	-60.17	12.61	8.86	-56.42	-13.00	-43.42
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Low E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 824.20 MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
92.08	47.35	H	-56.24	-7.75	1.29	-65.28	-13.00	-52.28
159.98	44.35	H	-54.19	-7.81	1.61	-63.62	-13.00	-50.62
256.98	43.12	H	-55.88	-7.89	2.02	-65.79	-13.00	-52.79
332.64	42.70	H	-54.66	-7.74	2.29	-64.69	-13.00	-51.69
824.00	82.67	H	-3.60	-7.87	3.62	-15.10	-13.00	-2.10
1648.40	50.47	H	-53.93	9.29	5.23	-49.87	-13.00	-36.87
2472.60	49.13	H	-51.78	10.08	6.53	-48.23	-13.00	-35.23
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 836.60 MHz	Test By:	Jason
Temperature	: 25°C	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)
33.88	50.24	V	-53.33	-5.52	0.93	-59.78	-13.00	-46.78
92.08	53.23	V	-49.70	-7.75	1.29	-58.74	-13.00	-45.74
184.23	45.41	V	-54.95	-7.83	1.67	-64.45	-13.00	-51.45
1673.20	53.96	V	-50.60	9.36	5.27	-46.50	-13.00	-33.50
2509.80	46.92	V	-53.86	10.09	6.58	-50.36	-13.00	-37.36
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 836.60 MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
36.79	45.04	H	-58.76	-4.16	0.91	-63.82	-13.00	-50.82
92.08	47.44	H	-56.15	-7.75	1.29	-65.19	-13.00	-52.19
1673.20	49.21	H	-55.17	9.36	5.27	-51.07	-13.00	-38.07
2509.80	49.36	H	-51.34	10.09	6.58	-47.84	-13.00	-34.84
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH High E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 848.80 MHz	Test By:	Jason
Temperature	: 25°C	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)
33.88	49.99	V	-53.58	-5.52	0.93	-60.03	-13.00	-47.03
92.08	52.97	V	-49.96	-7.75	1.29	-59.00	-13.00	-46.00
284.14	46.37	V	-52.40	-7.91	2.11	-62.42	-13.00	-49.42
308.39	45.42	V	-52.73	-7.87	2.20	-62.80	-13.00	-49.80
850.00	82.09	V	-4.02	-7.88	3.68	-15.58	-13.00	-2.58
1697.60	50.78	V	-53.76	9.44	5.31	-49.63	-13.00	-36.63
2546.40	42.24	V	-58.40	10.20	6.63	-54.84	-13.00	-41.84
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH High E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 848.80 MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
33.88	45.06	H	-59.64	-5.52	0.93	-66.08	-13.00	-53.08
92.08	48.33	H	-55.26	-7.75	1.29	-64.30	-13.00	-51.30
850.00	83.36	H	-2.83	-7.88	3.68	-14.39	-13.00	-1.39
1697.60	46.64	H	-57.71	9.44	5.31	-53.58	-13.00	-40.58
2546.40	51.85	H	-48.75	10.20	6.63	-45.19	-13.00	-32.19
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Low E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1850.20MHz	Test By:	Jason
Temperature	: 25°C	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)
33.88	50.59	V	-52.98	-5.52	0.93	-59.43	-13.00	-46.43
92.08	51.84	V	-51.09	-7.75	1.29	-60.13	-13.00	-47.13
880.69	43.60	V	-41.68	-7.92	3.75	-53.35	-13.00	-40.35
1850.00	83.59	V	-20.80	9.90	5.56	-16.46	-13.00	-3.46
3700.40	43.71	V	-54.22	12.61	8.31	-49.92	-13.00	-36.92
5550.60	37.52	V	-53.32	13.23	10.33	-50.42	-13.00	-37.42
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Low E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1850.20MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
36.79	45.59	H	-58.21	-4.16	0.91	-63.27	-13.00	-50.27
92.08	46.58	H	-57.01	-7.75	1.29	-66.05	-13.00	-53.05
880.69	55.85	H	-29.52	-7.92	3.75	-41.19	-13.00	-28.19
1850.00	77.47	H	-26.71	9.90	5.56	-22.37	-13.00	-9.37
3700.40	47.16	H	-50.88	12.61	8.31	-46.58	-13.00	-33.58
5550.60	35.07	H	-55.98	13.23	10.33	-53.08	-13.00	-40.08
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	

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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1880MHz	Test By:	Jason
Temperature	: 25°C	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)
33.88	49.62	V	-53.95	-5.52	0.93	-60.40	-13.00	-47.40
92.08	52.05	V	-50.88	-7.75	1.29	-59.92	-13.00	-46.92
882.63	43.01	V	-42.21	-7.93	3.75	-53.89	-13.00	-40.89
3760.00	48.83	V	-48.83	12.60	8.39	-44.61	-13.00	-31.61
5640.00	36.53	V	-54.05	13.36	10.41	-51.10	-13.00	-38.10
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1880MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
36.79	44.70	H	-59.10	-4.16	0.91	-64.16	-13.00	-51.16
92.08	47.84	H	-55.75	-7.75	1.29	-64.79	-13.00	-51.79
882.63	55.58	H	-29.74	-7.93	3.75	-41.41	-13.00	-28.41
3760.00	46.24	H	-51.53	12.60	8.39	-47.32	-13.00	-34.32
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	

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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH High E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1909.8 MHz	Test By:	Jason
Temperature	: 25°C	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)
33.88	51.12	V	-52.45	-5.52	0.93	-58.90	-13.00	-45.90
92.08	52.17	V	-50.76	-7.75	1.29	-59.80	-13.00	-46.80
880.69	43.04	V	-42.24	-7.92	3.75	-53.91	-13.00	-40.91
1910.00	82.90	V	-21.43	10.08	5.66	-17.01	-13.00	-4.01
3819.60	51.48	V	-45.91	12.60	8.47	-41.78	-13.00	-28.78
5729.40	36.32	V	-54.00	13.49	10.50	-51.00	-13.00	-38.00
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	

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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH High E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1909.8 MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
36.79	45.94	H	-57.86	-4.16	0.91	-62.92	-13.00	-49.92
92.08	48.72	H	-54.87	-7.75	1.29	-63.91	-13.00	-50.91
882.63	55.98	H	-29.34	-7.93	3.75	-41.01	-13.00	-28.01
1910.00	76.58	H	-27.53	10.08	5.66	-23.11	-13.00	-10.11
3819.60	49.97	H	-47.54	12.60	8.47	-43.40	-13.00	-30.40
5729.40	35.32	H	-55.13	13.49	10.50	-52.14	-13.00	-39.14
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	

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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Low E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1852.4MHz	Test By:	Jason
Temperature	: 25°C	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)
36.79	49.62	V	-53.11	-4.16	0.91	-58.18	-13.00	-45.18
92.08	48.62	V	-54.31	-7.75	1.29	-63.35	-13.00	-50.35
1850.00	74.09	V	-30.30	9.90	5.56	-25.96	-13.00	-12.96
3704.80	---	V		12.61	8.31		-13.00	
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Low E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1852.4MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
38.73	44.32	H	-58.87	-3.25	0.90	-63.02	-13.00	-50.02
242.43	42.86	H	-56.73	-7.88	1.95	-66.56	-13.00	-53.56
882.63	35.38	H	-49.94	-7.93	3.75	-61.61	-13.00	-48.61
1850.00	66.49	H	-37.69	9.90	5.56	-33.35	-13.00	-20.35
3704.80	---	H		12.61	8.31		-13.00	
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	

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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1880MHz	Test By:	Jason
Temperature	: 25°C	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)
36.79	48.68	V	-54.05	-4.16	0.91	-59.12	-13.00	-46.12
92.08	47.77	V	-55.16	-7.75	1.29	-64.20	-13.00	-51.20
3760.00	---	V		12.60	8.39		-13.00	
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1880MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
38.73	44.90	H	-58.29	-3.25	0.90	-62.44	-13.00	-49.44
652.74	35.41	H	-54.20	-7.81	3.17	-65.18	-13.00	-52.18
960.23	34.95	H	-49.20	-8.00	3.91	-61.11	-13.00	-48.11
3760.00	---	H		12.60	8.39		-13.00	
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	

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

Operation Mode	: TX CH High H Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1907.6 MHz	Test By:	Jason
Temperature	: 25°C	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)
36.79	49.29	V	-53.44	-4.16	0.91	-58.51	-13.00	-45.51
90.14	49.20	V	-53.98	-7.75	1.27	-63.00	-13.00	-50.00
1910.00	66.78	V	-37.55	10.08	5.66	-33.13	-13.00	-20.13
3815.20	---	V		12.60	8.46		-13.00	
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	

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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH High H Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 1907.6 MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
38.73	44.20	H	-58.99	-3.25	0.90	-63.14	-13.00	-50.14
652.74	36.38	H	-53.23	-7.81	3.17	-64.21	-13.00	-51.21
882.63	35.48	H	-49.84	-7.93	3.75	-61.51	-13.00	-48.51
1910.00	62.70	H	-41.41	10.08	5.66	-36.99	-13.00	-23.99
3815.20	35.32	H	-62.21	12.60	8.46	-58.07	-13.00	-45.07
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	

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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Low E1 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 826.4MHz	Test By:	Jason
Temperature	: 25°C	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)
67.83	47.22	V	-64.47	-0.95	1.14	-66.56	-13.00	-53.56
92.08	48.45	V	-54.48	-7.75	1.29	-63.52	-13.00	-50.52
824.00	74.32	V	-12.07	-7.87	3.62	-23.57	-13.00	-10.57
1652.80	---	V		9.30	5.23		-13.00	
2479.20	---	V		10.07	6.54		-13.00	
3305.60	---	V		12.19	7.73		-13.00	
4132.00	39.65	V	-56.43	12.62	8.87	-52.69	-13.00	-39.69
4958.40	36.12	V	-56.29	12.65	9.75	-53.39	-13.00	-40.39
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Low E1 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 826.4MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
36.79	46.06	H	-57.74	-4.16	0.91	-62.80	-13.00	-49.80
92.08	46.34	H	-57.25	-7.75	1.29	-66.29	-13.00	-53.29
824.00	70.73	H	-15.54	-7.87	3.62	-27.04	-13.00	-14.04
1652.80	---	H		9.30	5.23		-13.00	
2479.20	---	H		10.07	6.54		-13.00	
3305.60	---	H		12.19	7.73		-13.00	
4132.00	36.58	H	-59.63	12.62	8.87	-55.89	-13.00	-42.89
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	

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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E1 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 836.6MHz	Test By:	Jason
Temperature	: 25°C	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)
70.74	47.17	V	-64.59	-1.18	1.16	-66.94	-13.00	-53.94
92.08	48.17	V	-54.76	-7.75	1.29	-63.80	-13.00	-50.80
1673.20	---	V		9.36	5.27		-13.00	
2509.80	---	V		10.09	6.58		-13.00	
3346.40	---	V		12.28	7.79		-13.00	
4183.00	43.82	V	-52.07	12.62	8.93	-48.38	-13.00	-35.38
5019.60	37.09	V	-55.06	12.67	9.81	-52.20	-13.00	-39.20
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E1 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 836.6MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
36.79	46.31	H	-57.49	-4.16	0.91	-62.55	-13.00	-49.55
92.08	46.55	H	-57.04	-7.75	1.29	-66.08	-13.00	-53.08
1673.20	---	H		9.36	5.27		-13.00	
2509.80	---	H		10.09	6.58		-13.00	
3346.40	---	H		12.28	7.79		-13.00	
4183.00	41.26	H	-54.77	12.62	8.93	-51.08	-13.00	-38.08
5019.60	35.53	H	-56.79	12.67	9.81	-53.92	-13.00	-40.92
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH High E1 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 846.6MHz	Test By:	Jason
Temperature	: 25°C	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)
67.83	47.01	V	-64.68	-0.95	1.14	-66.77	-13.00	-53.77
92.08	48.17	V	-54.76	-7.75	1.29	-63.80	-13.00	-50.80
332.64	49.42	V	-48.43	-7.74	2.29	-58.46	-13.00	-45.46
850.00	67.02	V	-19.09	-7.88	3.68	-30.65	-13.00	-17.65
1693.20	---	V		9.42	5.30		-13.00	
2539.80	---	V		10.18	6.62		-13.00	
3386.40	---	V		12.36	7.85		-13.00	
4233.00	45.50	V	-50.20	12.63	8.99	-46.56	-13.00	-33.56
5079.60	36.63	V	-55.38	12.73	9.87	-52.52	-13.00	-39.52
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	

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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH High E1 Mode	Test Date:	Dec. 09, 2009
Fundamental Frequency	: 846.6MHz	Test By:	Jason
Temperature	: 25°C	Pol:	Hor
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)
36.79	47.11	H	-56.69	-4.16	0.91	-61.75	-13.00	-48.75
92.08	45.56	H	-58.03	-7.75	1.29	-67.07	-13.00	-54.07
850.00	63.68	H	-22.51	-7.88	3.68	-34.07	-13.00	-21.07
1693.20	---	H		9.42	5.30		-13.00	
2539.80	---	H		10.18	6.62		-13.00	
3386.40	---	H		12.36	7.85		-13.00	
4233.00	42.91	H	-52.94	12.63	8.99	-49.30	-13.00	-36.30
5079.60	35.24	H	-56.94	12.73	9.87	-54.08	-13.00	-41.08
5926.20	35.21	H	-54.58	13.79	10.69	-51.48	-13.00	-38.48
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	

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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

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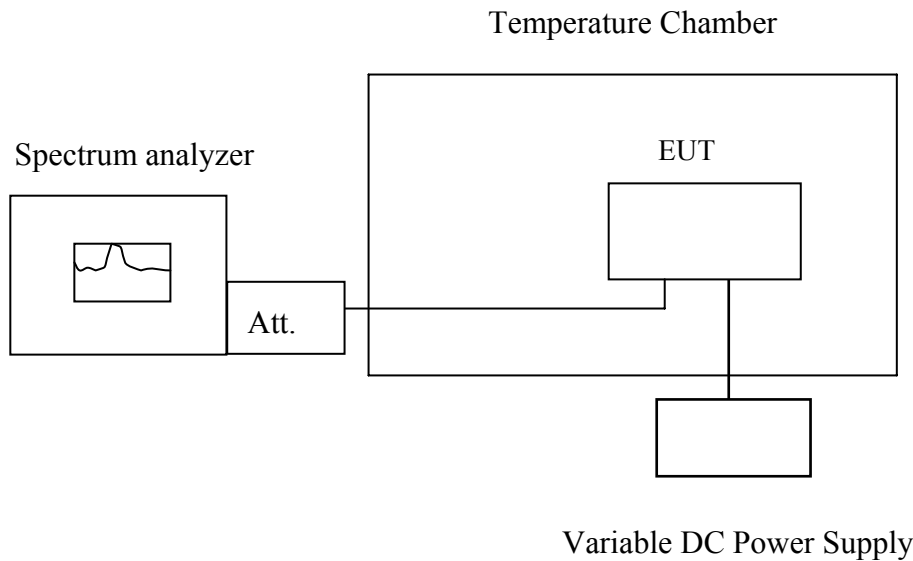
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## 10 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

### 10.1 Standard Applicable

According to FCC §2.1055(a)(1)  
 Frequency Tolerance: +/- 2.5 ppm

### 10.2 Test Set-up:



**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: GSM Mid Channel 836.6 MHz @ 25°C				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.7	-30	836.599969	16.00	2091
3.7	-20	836.599973	12.00	2091
3.7	-10	836.599974	11.00	2091
3.7	0	836.599971	14.00	2091
3.7	10	836.599982	3.00	2091
3.7	20	836.599985	0.00	2091
3.7	30	836.599989	-4.00	2091
3.7	40	836.599998	-13.00	2091
3.7	50	836.599993	-8.00	2091
3.7	60	836.599979	6.00	2091

Reference Frequency: PCS Mid Channel 1880 MHz @ 25°C				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.7	-30	1879.999946	37.00	4700
3.7	-20	1879.999950	33.00	4700
3.7	-10	1879.999953	30.00	4700
3.7	0	1879.999946	37.00	4700
3.7	10	1879.999953	30.00	4700
3.7	20	1879.999983	0.00	4700
3.7	30	1879.999958	25.00	4700
3.7	40	1879.999969	14.00	4700
3.7	50	1879.999977	6.00	4700
3.7	60	1879.999975	8.00	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)		
3.8	-30	1879.999998	-1.00	4700
3.8	-20	1880.000002	-5.00	4700
3.8	-10	1880.000000	-3.00	4700
3.8	0	1880.000001	-4.00	4700
3.8	10	1879.999999	-2.00	4700
3.8	20	1879.999997	0.00	4700
3.8	30	1880.000002	-5.00	4700
3.8	40	1879.999991	6.00	4700
3.8	50	1879.999994	3.00	4700

Reference Frequency: WCDMA V Mid Channel 836.6 MHz (ARFCN4183)				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.8	-30	836.599999	-4.00	2091
3.8	-20	836.600000	-5.00	2091
3.8	-10	836.600005	-10.00	2091
3.8	0	836.600001	-6.00	2091
3.8	10	836.599999	-4.00	2091
3.8	20	836.599995	0.00	2091
3.8	30	836.599998	-3.00	2091
3.8	40	836.599992	3.00	2091
3.8	50	836.599989	6.00	2091

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## 11 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

### 11.1 Standard Applicable

According to FCC §2.1055(d)(2)

Frequency Tolerance: +/- 2.5 ppm

### 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: GSM Mid Channel 836.6 MHz				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25.00	836.599990	-5.00	2091.00
3.7	25.00	836.599985	0.00	2091.00
3.5	25.00	836.599982	3.00	2091.00
3.5 (End Point)	25.00	836.599982	24.00	2091.00

Reference Frequency: PCS Mid Channel 1880 MHz				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.20	25	1879.999988	-5.00	4700
3.70	25	1879.999983	0.00	4700
3.5	25	1879.999986	-3.00	4700
3.5 (End Point)	25	1879.999986	14.00	4700

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Reference Frequency: WCDMA II Mid Channel 1880 MHz				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25	1879.9999980	-1.00	4700
3.7	25	1879.9999970	0.00	4700
3.5	25	1879.9999920	5.00	4700
3.5 (End Point)	25	1879.9999920	29.00	4700

Reference Frequency: WCDMA V Mid Channel 836.6 MHz				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25	836.5999980	-3.00	2091.00
3.7	25	836.5999950	0.00	2091.00
3.5	25	836.5999910	4.00	2091.00
3.5 (End Point)	25	836.5999910	14.00	2091.00

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