

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

## INTENTIONAL RADIATOR CERTIFICATION TO

## FCC PART 22 SUBPART H, PART 24 SUBPART E

OF

**Product Name:** TG03

**FCC ID:** YUW-TU12-J01

**Report No.:** EH/2010/80010

**Issue Date:** Aug. 25, 2010

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

**Prepared for:** Fujitsu Toshiba Mobile Communications Limited  
1-1, Kamiodanaka 4, Nakahara, Kawasaki,  
211-8588, JAPAN

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

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**CERTIFICATION OF COMPLIANCE**

**Applicant:** Fujitsu Toshiba Mobile Communications Limited  
1-1, Kamiodanaka 4, Nakahara, Kawasaki, 211-8588, JAPAN

**Product Name:** TG03

**FCC ID:** YUW-TU12-J01

**File Number:** EH/2010/80010

**Date of test:** Aug. 05, 2010 ~ Aug. 20, 2010

**Date of EUT Received:** Aug. 05, 2010

**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:**

Aug. 25, 2010

Jason Wu / Asst. Supervisor

**Prepared By:**

Tiffany Kao

**Date:**

Aug. 25, 2010

Tiffany Kao / Clerk

**Approved By:**

Arno Hsieh

**Date:**

Aug. 25, 2010

Arno Hsieh / Asst. Supervisor

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## Version

Version No.	Date	Description
00	Aug. 25, 2010	Initial creation of document

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## 1. GENERAL INFORMATION

### 1.1 Product Description

#### General:

Product Name:	TG03	
FCC ID:	SP2-TU12-J01	
Data Cable (USB)	Model: HPC1579-010910(Type B), Supplier: Hoshiden	
Power Supply:	3.9 Vdc re-chargeable battery	
	Battery:	Model No.: UF424261F-HMN, Supplier: Sanyo

#### GSM / WCDMA:

Cellular Phone Standards Frequency Range and Power	Operating Frequency		Rated Power
	GSM/GPRS/EDGE 850, Class 12	824.2 MHz– 848.8MHz	33 dBm
	GSM/GPRS/EDGE 1900, Class 12	1850.2MHz – 1909.8MHz	30 dBm
	EDGE 850 Class 12	824.2 MHz– 848.8MHz	27 dBm
	EDGE 1900 Class 12	1850.2MHz – 1909.8MHz	26 dBm
	WCDMA/HSUPA/HSDPA Band V	826.4MHz –846.6MHz	24 dBm
IMEI:	353861040000133		

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### Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GSM 850	3.9Vdc	340
DCS 1900	3.9Vdc	265
EDGE 850	3.9Vdc	205
EDGE 1900	3.9Vdc	180
WCDMA B5	3.9Vdc	535
HSUPA B5	3.9Vdc	530

### WLAN:

Frequency Range & Channel number:	802.11 b/g: 2412 – 2462 MHz
Rated Power:	802.11 b: 15.94 dBm 802.11 g: 21.89 dBm
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transmission Rate:	802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps
Antenna Designation:	Chip Antenna / Gain: -0.85 dBi

The EUT is compliance with IEEE 802.11 b/g Standard.

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**Bluetooth:**

Frequency Range:	2402 – 2480MHz
Bluetooth Version:	V2.1 + EDR (GFSK + $\pi$ /4DQPSK + 8DPSK)
Channel number:	79 channels
Transmit Power:	8.52 dBm (Peak)
Modulation type:	Frequency Hopping Spread Spectrum
Antenna Designation:	Chip Antenna / antenna gain: -0.85dBi

The EUT is compliance with Bluetooth 2.1 + EDR Standard.

**GPS:**

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

FeliCa Receive Frequency:	13.56MHz
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The FeliCa only support receiving function.

This test report applies for GSM/GPRS/EDGE 850/1900 and WCDMA Band V.

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

This submittal(s) (test report) is intended for **FCC ID: YUW-TU12-J01** filing to comply with Section Part 22 subpart H , Part 24 subpart E of the FCC CFR 47 Rules.

## 1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures of FCC 47 CFR 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

## 1.4 Test Facility

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

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

## 1.5 Special Accessories

Not available for this EUT intended for grant.

## 1.6 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 Fujitsu Toshiba TG03 FCC ID: YUW-TU12-J01 was Tested With AC Adapter. The EUT was stayed in normal operation mode with CMU200. 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. 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	04/19/2010	04/18/2012
Spectrum Analyzer	Agilent	E4440A	US41160416	01/25/2010	01/24/2011
Radio Communication Analyzer	R&S	CMU200	111787	10/31/2008	10/30/2010
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2010	01/04/2011
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2010	01/04/2011
Temperature Chamber	TERCHY	MHG-120LF	911009	04/30/2010	04/29/2012
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/24/2010	02/23/2012
DC Block	Agilent	BLK-18	155452	07/05/2010	07/04/2011
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2010	07/04/2011
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2010	07/04/2011
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2010	07/04/2011
Splitter	Agilent	11636B	N/A	07/05/2010	07/04/2011
DC Power Supply	Chroma	41901	777188	04/15/2010	04/14/2012

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ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2011
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2009	11/18/2010
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/17/2010	07/16/2012
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/17/2010	07/16/2012
Horn antenna	SCHWAZBECK	BBHA 9120D	309/320	03/09/2009	03/08/2011
Signal Generator	R&S	SMR40	100210	02/10/2010	02/09/2012
Signal Generator	Agilent	E4438C	MY45093613	07/08/2010	07/07/2011
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2009	11/27/2010
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2011
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2010	07/04/2011
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2010	07/04/2011
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2010	07/04/2011
Radio Communication Analyzer	R&S	CMU200	111787	10/31/2008	10/30/2010
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	01/05/2010	01/04/2011
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2010	01/04/2011
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2010	01/04/2011
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2010	01/04/2011
3m Site	SGS	966 chamber	N/A	11/08/2009	11/09/2010

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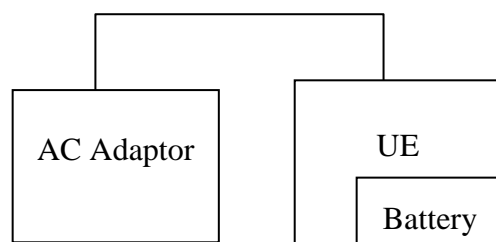
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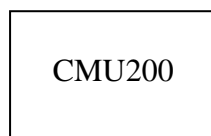
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## 2.5 Configuration of Tested System

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



**Remote Side**



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

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Adapter	Cosmos HosiDEN	0203PQA	N/A	N/A	Un-shielded
2.	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 Power Output	Compliant
§2.1046(a) §22.913(a)(2) §24.232(c)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% Occupied Bandwidth	Compliant
§2.1051 §22.917(a) §24.238(a)	Out of Band Emissions at Antenna Terminals and Band Edge	Compliant
§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation	Compliant
§2.1055(a)(1) §22.355 §24.235	Frequency Stability vs. Temperature	Compliant
§2.1055(d)(2) §22.355 §24.235	Frequency Stability vs. Voltage	Compliant

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#### 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Set EUT power control “all up bits” for all test mode through base station.

Channel Low, Mid and High for each type of bands with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for GSM 850 and PCS 1900 with power adaptor. The worst-case of H position for GSM 850 band and E2 position for PCS 1900 band were reported.

Max ERP/EIRP measurement result:

	dBm		W
GPRS 850 Band	32.10	ERP	1.622
GPRS 1900 Band	29.17	EIRP	0.826
EDGE 850 Band	30.40	ERP	1.096
EDGE 1900 Band	29.11	EIRP	0.815
WCDMA Band V	22.62	EIRP	0.183
HSUPA Band V	23.57	EIRP	0.228

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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 limited to 2W

3GPP Power limitation for HSDPA and HSUPA

#### Maximum Output Powers for HSDPA

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

#### Maximum Output Powers for HSUPA

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

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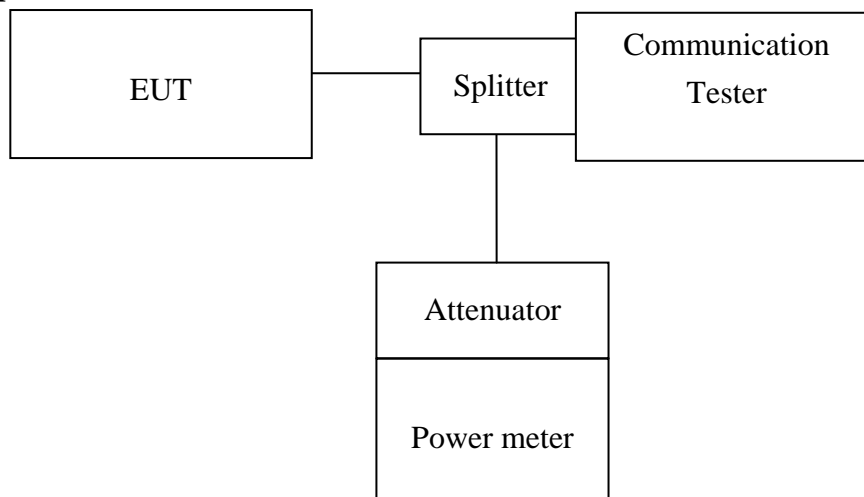
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## 5.2 Test Set-up:



*Note: Measurement setup for testing on Antenna connector*

## 5.3 Measurement Procedure:

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. The Procedure of KDB941225 KDB941125(SAR Measurement Procedures for 3G devices, WCDMA/HSDPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing

## 5.4 Measurement Equipment Used:

Refer to section 2.4 in this report

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## 5.5 Measurement Result:

### 5.5.1 RF Conducted Output Power

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

##### Result:

Fre- quency (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	33.20	33.10	31.40	28.30	31.10	31.00	29.00	26.00
836.6	190	32.90	32.80	31.10	28.00	30.80	30.70	28.80	25.80
848.8	251	33.00	32.90	31.30	28.20	31.00	30.90	28.90	25.90
1850.2	512	29.10	29.00	29.30	26.10	27.60	27.50	26.80	23.70
1880.0	661	29.30	29.10	29.50	25.90	27.30	27.20	26.50	23.30
1909.8	810	29.40	29.30	29.70	26.10	27.50	27.30	26.60	23.50

Fre- quency (MHz)	CH	3 Time Slot				4 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	29.70	29.60	27.50	24.50	27.30	27.20	26.60	23.60
836.6	190	29.50	29.40	27.30	24.40	27.10	27.00	26.40	23.40
848.8	251	29.60	29.50	27.40	24.50	27.30	27.10	26.50	23.60
1850.2	512	26.00	25.90	25.20	22.20	25.00	24.90	24.20	21.20
1880.0	661	25.70	25.60	24.90	21.80	24.70	24.60	23.90	20.90
1909.8	810	25.90	25.70	25.00	21.90	24.90	24.70	24.00	21.00

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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 V	826.4	4132	26.18	22.74
	836.6	4183	26.30	22.76
	846.6	4233	25.51	22.08

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

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### 5.5.1.3.:HSDPA Release 6 mode

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

### HSDPA SUB-TEST Setting

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

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

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

### Results:

Mode	Sub-test	RMS Power (dBm) Channel			Power Class 3 Limita- tion (dBm)	Comments
		1312	1413	1513		
HSDPA	1	22.96	23.01	22.27	20.3dBm – 25.7dBm	Pass
	2	22.67	22.65	21.95	20.3dBm – 25.7dBm	Pass
	3	22.50	22.53	21.78	19.8dBm – 25.7dBm	Pass
	4	22.55	22.57	21.84	19.8dBm – 25.7dBm	Pass

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### 5.5.1.3.: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 RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table 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)	$\beta_e/\beta_d$	$\beta_{HS}$	$\beta_{ec}$	$\beta_{ed}$	$\beta_{ed}$ (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 MPRs are implemented as per following sub-tests.**

### Results:

Results:

Mode	Sub-test	RMS Power (dBm)			Power Class 3 Limita- tion (dBm)	Comments
		Channel				
		1312	1413	1513		
HSUPA	1	22.70	22.69	22.00	18.8dBm – 25.7dBm	Pass
	2	20.76	20.77	20.04	16.8dBm – 25.7dBm	Pass
	3	21.74	21.75	21.08	17.8dBm – 25.7dBm	Pass
	4	20.81	20.83	20.12	16.8dBm – 25.7dBm	Pass
	5	22.56	22.52	22.89	18.8dBm – 25.7dBm	Pass

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### 5.5.2. Minimum Communications Power Measurement

#### PCS 1900 band

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.1	27.8	25.6	23.6	21.7	19.8	18.1	16.6	14.9
PCL	9	10	11	12	13	14	15	16	17
Output power (dBm)	13.3	11.7	10.2	8.8	7.6	6.5	5.6		

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 V

N/A

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## 6. ERP/EIRP MEASUREMENT

### 6.1 Standard Applicable

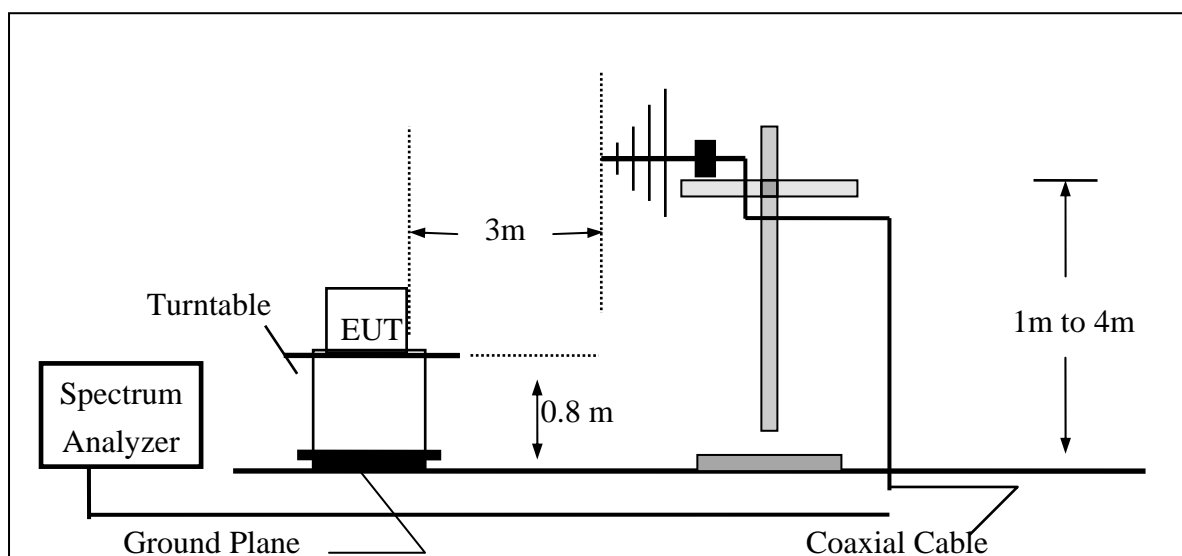
According to FCC §2.1046

FCC 22.913(a)(2) 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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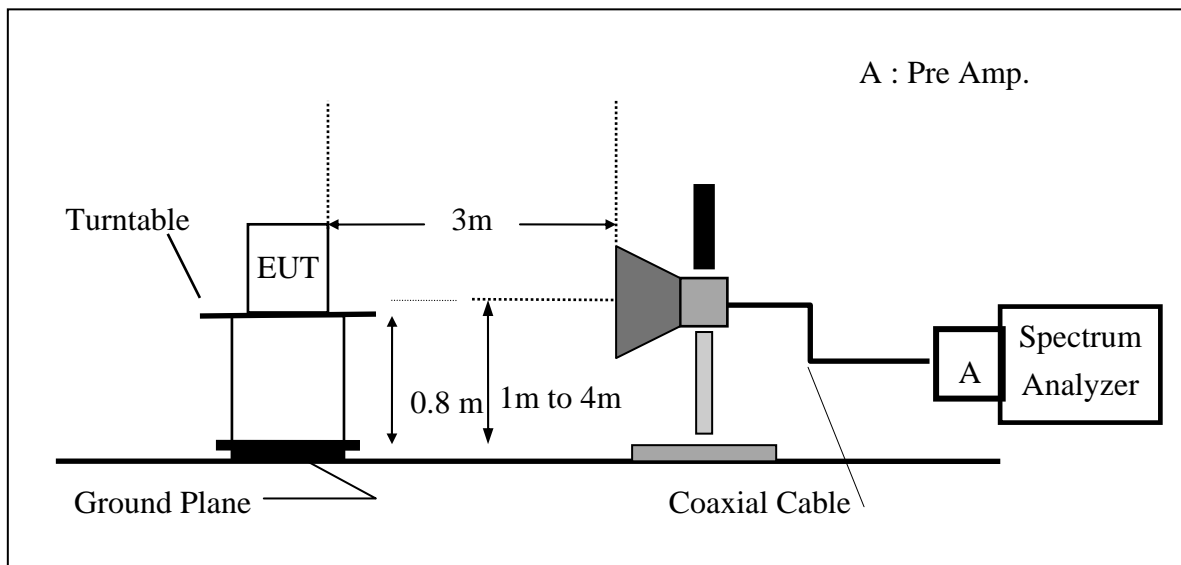
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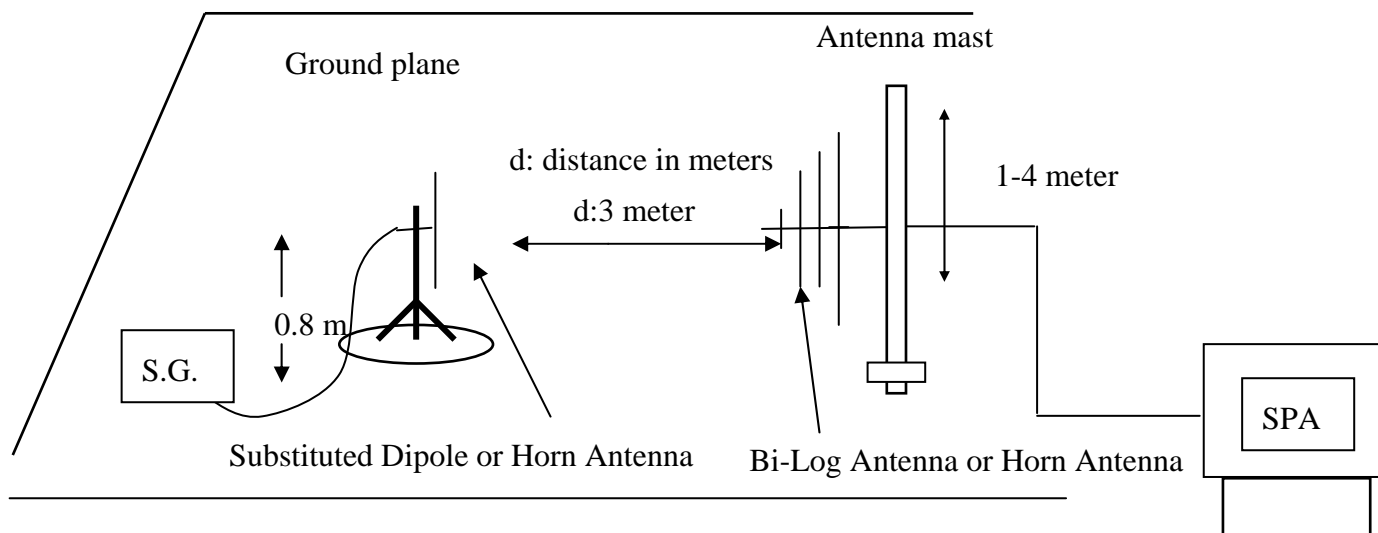
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### (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



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

ERP in frequency band 824.2 – 848.8 MHz were measured using a substitution method. The EUT was replaced by a dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1850.2 – 1909.8 MHz 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

### 6.5 Measurement Result

Refer to following pages for detail.

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### 6.5.1. Measurement Result:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBdi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
GSM 850	824.20	128	H	V	129.99	43.60	-7.87	3.62	<b>32.10</b>	38.45
				H	117.14	30.87	-7.87	3.62	19.37	38.45
			E1	V	118.23	31.84	-7.87	3.62	20.34	38.45
				H	129.72	43.45	-7.87	3.62	31.95	38.45
			E2	V	117.59	31.20	-7.87	3.62	19.70	38.45
				H	128.98	42.71	-7.87	3.62	31.21	38.45
	836.60	190	H	V	128.66	42.41	-7.88	3.65	30.88	38.45
				H	115.31	29.08	-7.88	3.65	17.55	38.45
			E1	V	116.52	30.27	-7.88	3.65	18.74	38.45
				H	128.16	41.93	-7.88	3.65	30.40	38.45
			E2	V	116.29	30.04	-7.88	3.65	18.51	38.45
				H	127.87	41.64	-7.88	3.65	30.11	38.45
	848.80	251	H	V	127.46	41.34	-7.88	3.68	29.78	38.45
				H	115.08	28.89	-7.88	3.68	17.33	38.45
			E1	V	115.06	28.94	-7.88	3.68	17.38	38.45
				H	126.81	40.62	-7.88	3.68	29.06	38.45
			E2	V	115.85	29.73	-7.88	3.68	18.17	38.45
				H	126.43	40.24	-7.88	3.68	28.68	38.45

#### Remark :

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

RBW=300KHz, 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 (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
PCS 1900	1850.20	512	H	V	121.10	16.71	9.90	5.56	21.05	33.00
				H	123.64	19.46	9.90	5.56	23.80	33.00
			E1	V	126.04	21.65	9.90	5.56	25.99	33.00
				H	119.76	15.58	9.90	5.56	19.92	33.00
			E2	V	113.71	9.32	9.90	5.56	13.66	33.00
				H	125.70	21.52	9.90	5.84	25.58	33.00
	1880.00	661	H	V	122.25	17.89	9.99	5.61	22.27	33.00
				H	125.22	21.08	9.99	5.61	25.45	33.00
			E1	V	127.64	23.28	9.99	5.61	27.66	33.00
				H	120.21	16.07	9.99	5.61	20.44	33.00
			E2	V	115.50	11.14	9.99	5.61	15.52	33.00
				H	127.69	23.55	9.99	5.61	27.92	33.00
	1909.80	810	H	V	123.15	18.82	10.08	5.66	23.24	33.00
				H	126.73	22.62	10.08	5.66	27.04	33.00
			E1	V	128.89	24.56	10.08	5.66	28.98	33.00
				H	121.38	17.27	10.08	5.66	21.69	33.00
			E2	V	117.15	12.82	10.08	5.66	17.24	33.00
				H	128.86	24.75	10.08	5.66	<b>29.17</b>	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 (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
EDGE 850	824.20	128	H	V	128.22	41.83	-7.87	3.62	30.33	38.45
				H	115.47	29.20	-7.87	3.62	17.70	38.45
			E1	V	116.63	30.24	-7.87	3.62	18.74	38.45
				H	128.17	41.90	-7.87	3.62	<b>30.40</b>	38.45
			E2	V	116.14	29.75	-7.87	3.62	18.25	38.45
				H	127.33	41.06	-7.87	3.62	29.56	38.45
	836.60	190	H	V	126.87	40.62	-7.88	3.65	29.09	38.45
				H	113.55	27.32	-7.88	3.65	15.79	38.45
			E1	V	114.84	28.59	-7.88	3.65	17.06	38.45
				H	126.58	40.35	-7.88	3.65	28.82	38.45
			E2	V	114.61	28.36	-7.88	3.65	16.83	38.45
				H	125.89	39.66	-7.88	3.65	28.13	38.45
	848.80	251	H	V	125.69	39.57	-7.88	3.68	28.01	38.45
				H	113.42	27.23	-7.88	3.68	15.67	38.45
			E1	V	113.31	27.19	-7.88	3.68	15.63	38.45
				H	125.00	38.81	-7.88	3.68	27.25	38.45
			E2	V	114.11	27.99	-7.88	3.68	16.43	38.45
				H	124.39	38.20	-7.88	3.68	26.64	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 (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
EDGE 1900	1850.20	512	H	V	121.67	17.28	9.90	5.56	21.62	33.00
				H	124.37	20.19	9.90	5.56	24.53	33.00
			E1	V	125.70	21.31	9.90	5.56	25.65	33.00
				H	119.18	15.00	9.90	5.56	19.34	33.00
			E2	V	113.73	9.34	9.90	5.56	13.68	33.00
				H	126.87	22.69	9.90	5.84	26.75	33.00
	1880.00	661	H	V	122.68	18.32	9.99	5.61	22.70	33.00
				H	126.11	21.97	9.99	5.61	26.34	33.00
			E1	V	127.73	23.37	9.99	5.61	27.75	33.00
				H	120.76	16.62	9.99	5.61	20.99	33.00
			E2	V	116.05	11.69	9.99	5.61	16.07	33.00
				H	128.58	24.44	9.99	5.61	28.81	33.00
	1909.80	810	H	V	123.44	19.11	10.08	5.66	23.53	33.00
				H	127.14	23.03	10.08	5.66	27.45	33.00
			E1	V	129.02	24.69	10.08	5.66	<b>29.11</b>	33.00
				H	121.74	17.63	10.08	5.66	22.05	33.00
			E2	V	117.61	13.28	10.08	5.66	17.70	33.00
				H	128.49	24.38	10.08	5.66	28.80	33.00

## Remark :

- 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 (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
WCDMA V	826.40	4132	H	V	120.35	33.99	-7.88	3.63	22.48	38.45
				H	107.98	21.72	-7.88	3.63	10.22	38.45
			E1	V	106.99	20.63	-7.88	3.63	9.12	38.45
				H	118.14	31.88	-7.88	3.63	20.38	38.45
			E2	V	108.16	21.80	-7.88	3.63	10.29	38.45
				H	119.70	33.44	-7.88	3.63	21.94	38.45
	836.60	4183	H	V	120.40	34.15	-7.88	3.65	<b>22.62</b>	38.45
				H	107.63	21.40	-7.88	3.65	9.87	38.45
			E1	V	108.21	21.96	-7.88	3.65	10.43	38.45
				H	119.66	33.43	-7.88	3.65	21.90	38.45
			E2	V	108.29	22.04	-7.88	3.65	10.51	38.45
				H	119.54	33.31	-7.88	3.65	21.78	38.45
	846.60	4233	H	V	118.82	32.67	-7.88	3.67	21.12	38.45
				H	106.43	20.23	-7.88	3.67	8.68	38.45
			E1	V	109.46	23.31	-7.88	3.67	11.76	38.45
				H	120.30	34.10	-7.88	3.67	22.55	38.45
			E2	V	107.06	20.91	-7.88	3.67	9.36	38.45
				H	117.96	31.76	-7.88	3.67	20.21	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 Band V	826.40	4132	H	V	121.08	34.72	-7.88	3.63	23.21	38.45
				H	108.86	22.60	-7.88	3.63	11.10	38.45
			E1	V	108.11	21.75	-7.88	3.63	10.24	38.45
				H	119.25	32.99	-7.88	3.63	21.49	38.45
			E2	V	109.43	23.07	-7.88	3.63	11.56	38.45
				H	120.60	34.34	-7.88	3.63	22.84	38.45
	836.60	4183	H	V	121.36	35.10	-7.88	3.65	<b>23.57</b>	38.45
				H	108.72	22.49	-7.88	3.65	10.96	38.45
			E1	V	109.50	23.24	-7.88	3.65	11.71	38.45
				H	120.83	34.60	-7.88	3.65	23.07	38.45
			E2	V	109.64	23.38	-7.88	3.65	11.85	38.45
				H	120.48	34.25	-7.88	3.65	22.72	38.45
	846.60	4233	H	V	119.82	33.67	-7.88	3.67	22.12	38.45
				H	107.31	21.11	-7.88	3.67	9.56	38.45
			E1	V	109.78	23.62	-7.88	3.67	12.07	38.45
				H	120.97	34.77	-7.88	3.67	23.22	38.45
			E2	V	108.43	22.28	-7.88	3.67	10.73	38.45
				H	118.90	32.70	-7.88	3.67	21.15	38.45

## Remark :

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

RBW= 5MHz , VBW= 8MHz

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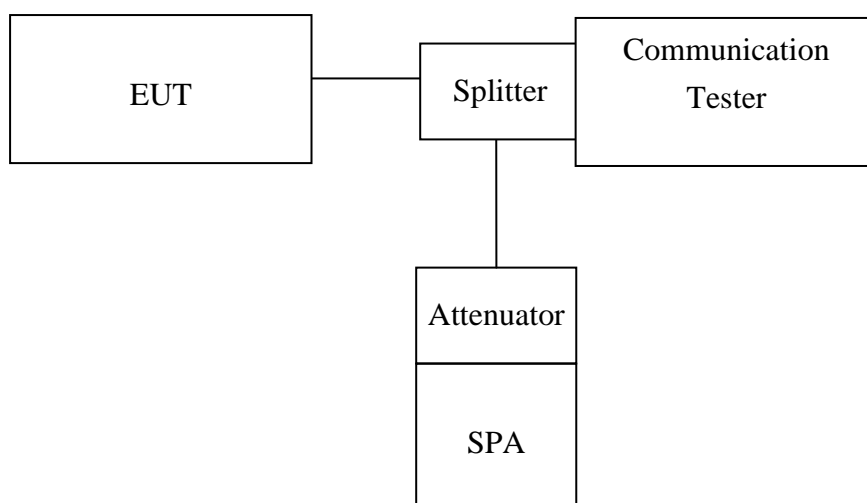
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## 7. 99% OCCUPIED BANDWIDTH MEASUREMENT

### 7.1 Standard Applicable

According to §FCC 2.1049.

### 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) was set to about 1% of emission BW, VBW= 3 times RBW(30/100KHz), -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

### 7.4 Measurement Equipment Used:

Refer to section 2.4 in this report

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## 7.5 Measurement Result:

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
GSM 850	824.20	128	0.2448
	836.60	190	0.2452
	848.80	251	0.2452

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
PCS 1900	1850.20	512	0.2435
	1880.00	661	0.2438
	1909.80	810	0.2439

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EDGE 850	824.20	128	0.2452
	836.60	190	0.2451
	848.80	251	0.2451

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EDGE 1900	1850.20	512	0.2477
	1880.00	661	0.2477
	1909.80	810	0.2474

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EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
WCDMA V	826.4	4132	4.1718
	836.6	4183	4.1724
	846.6	4233	4.1721

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSUPA V	826.40	4132	4.1754
	836.60	4183	4.1735
	846.60	4233	4.1723

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Figure 7-1: GSM Channel Low

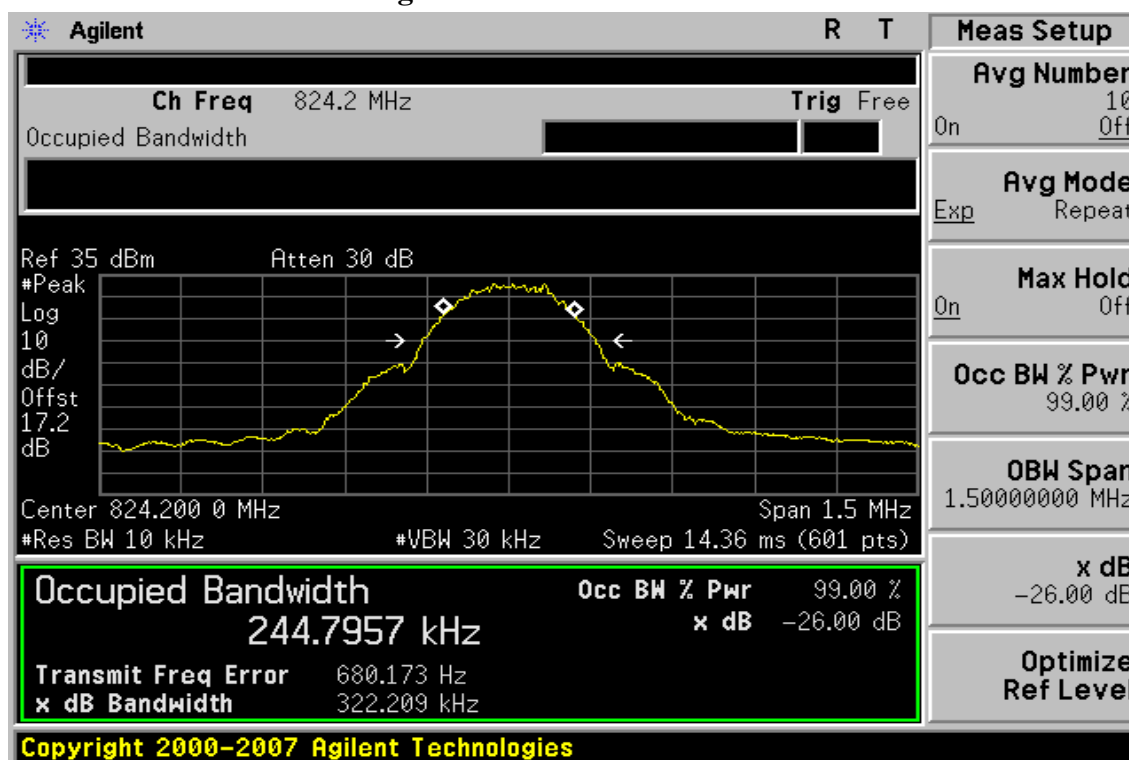
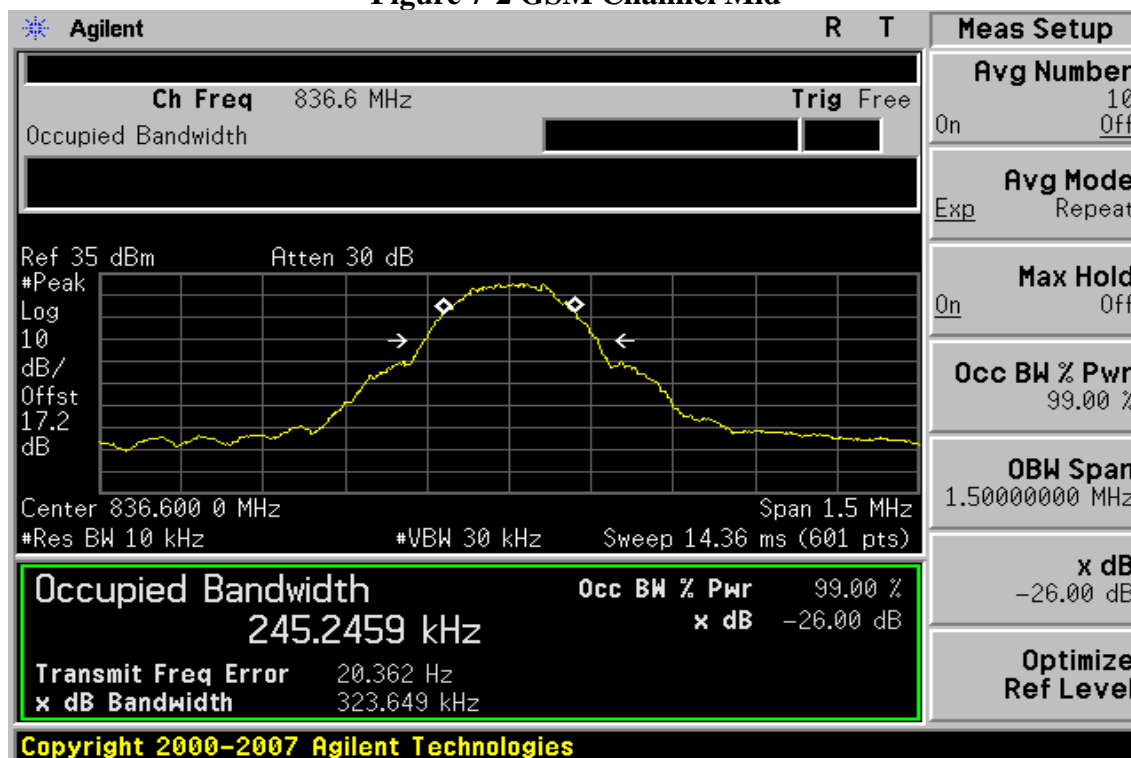


Figure 7-2 GSM Channel Mid



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Figure 7-3: GSM Channel High

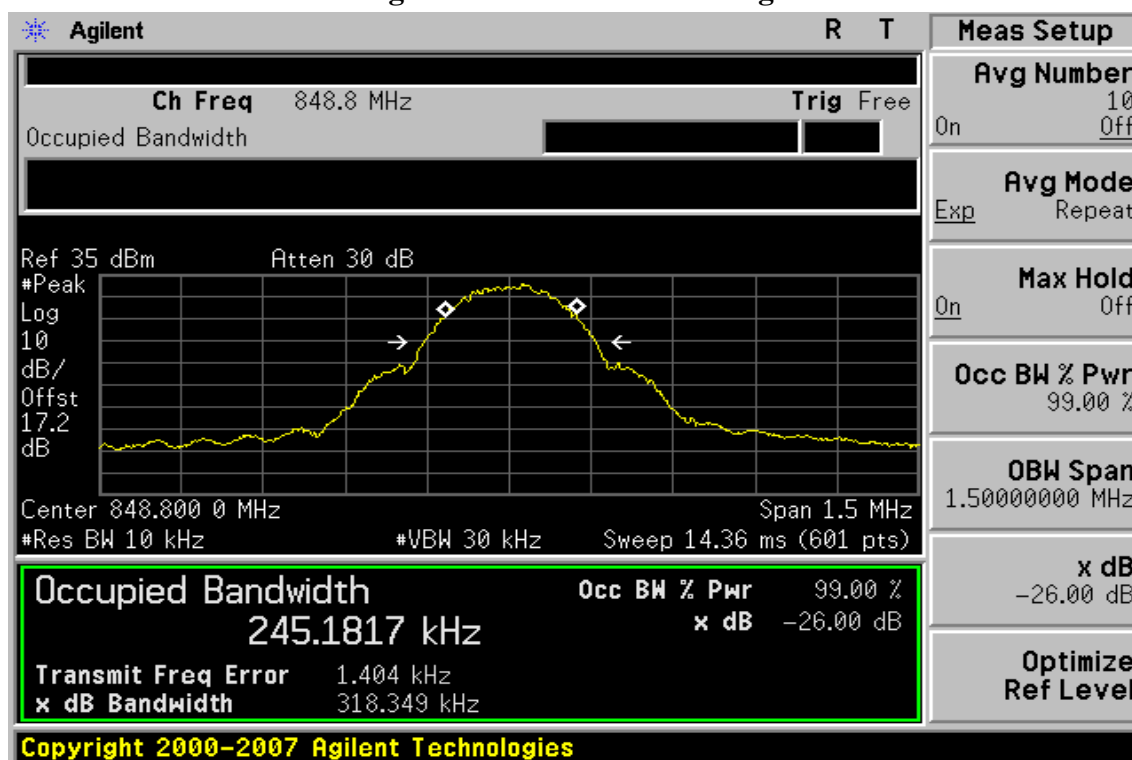
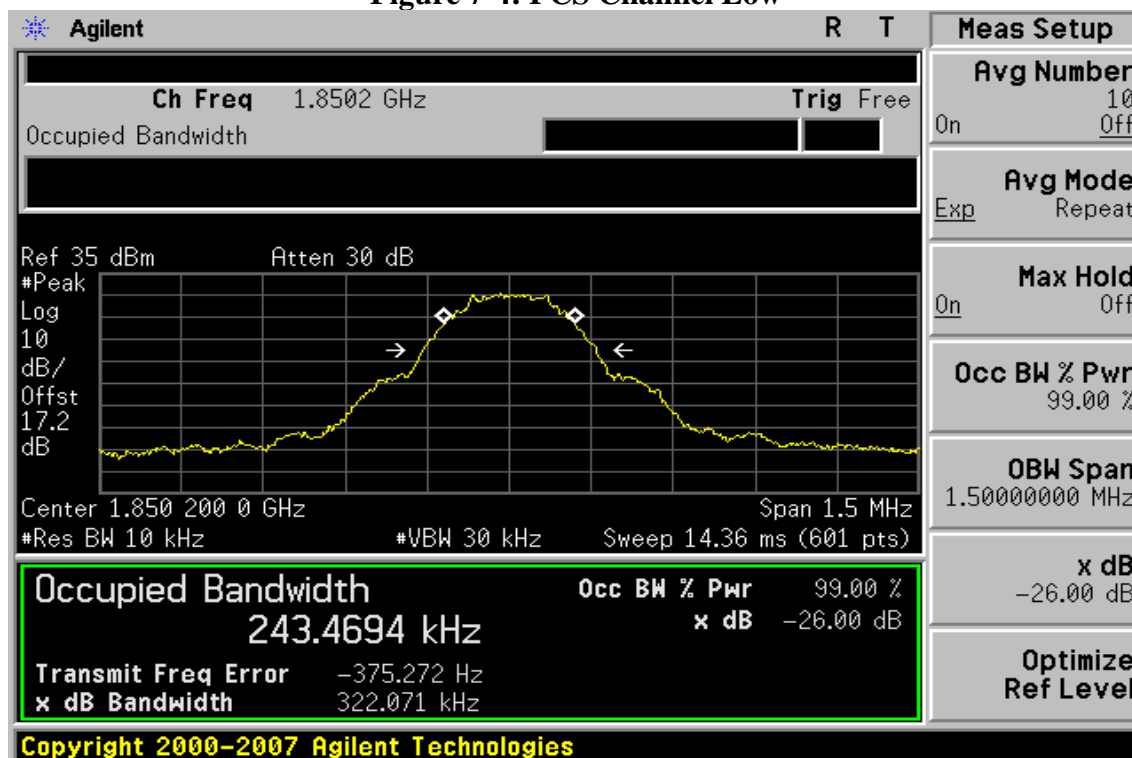


Figure 7-4: PCS Channel Low



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Figure 7-5 PCS Channel Mid

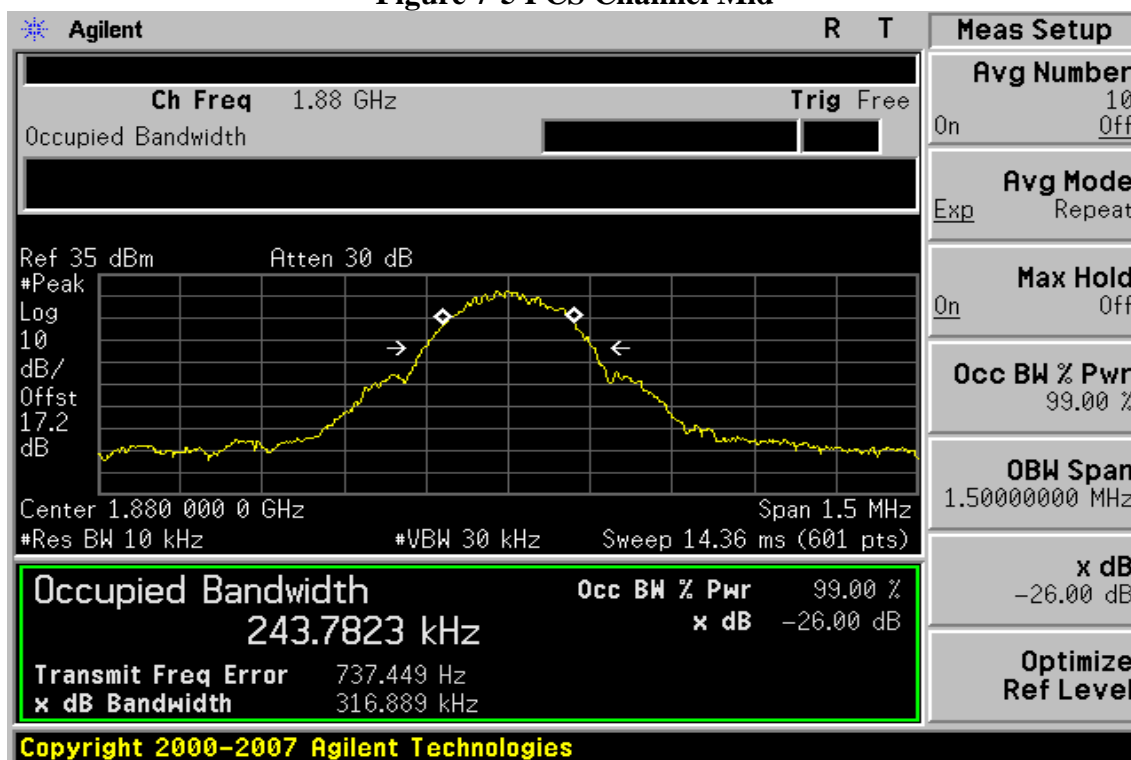
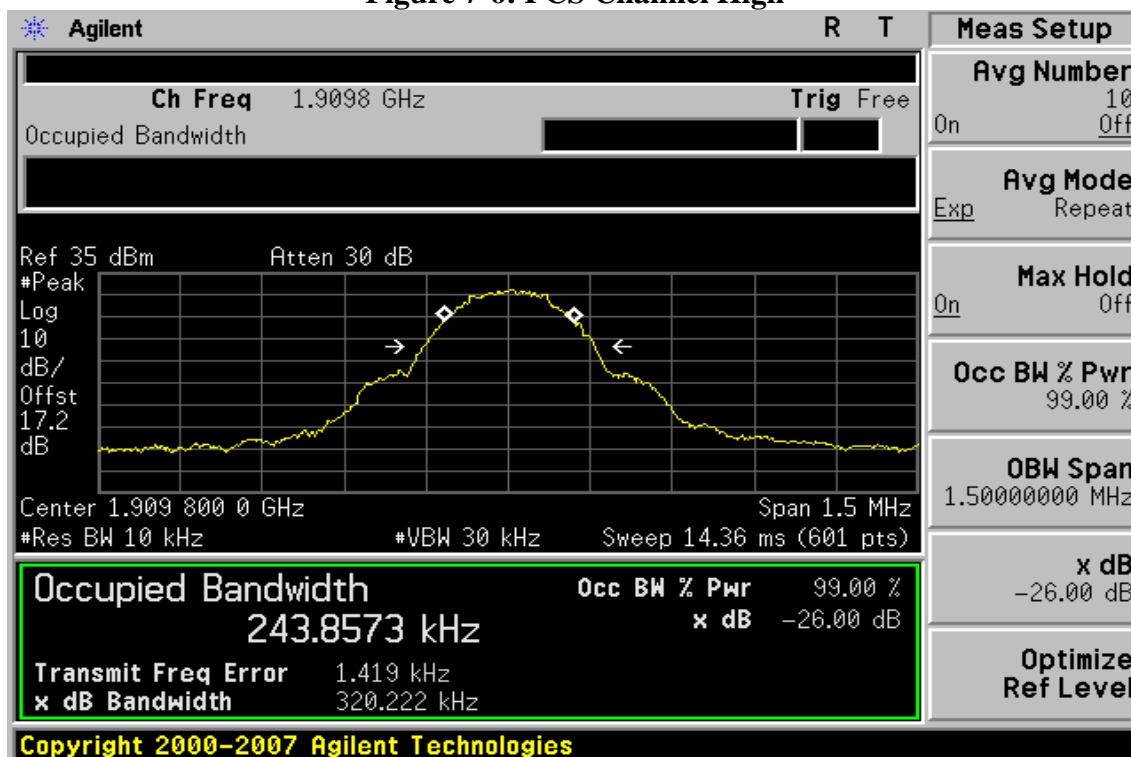


Figure 7-6: PCS Channel High



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Figure 7-7: EDGE 850 Channel Low

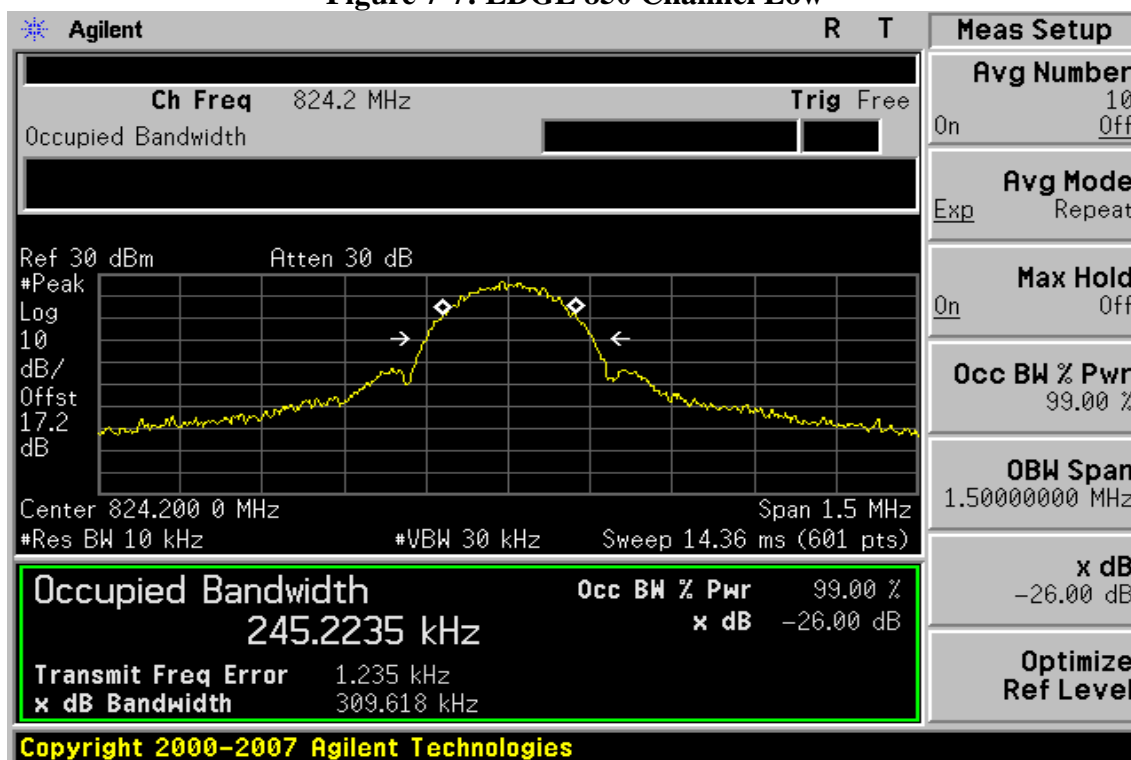
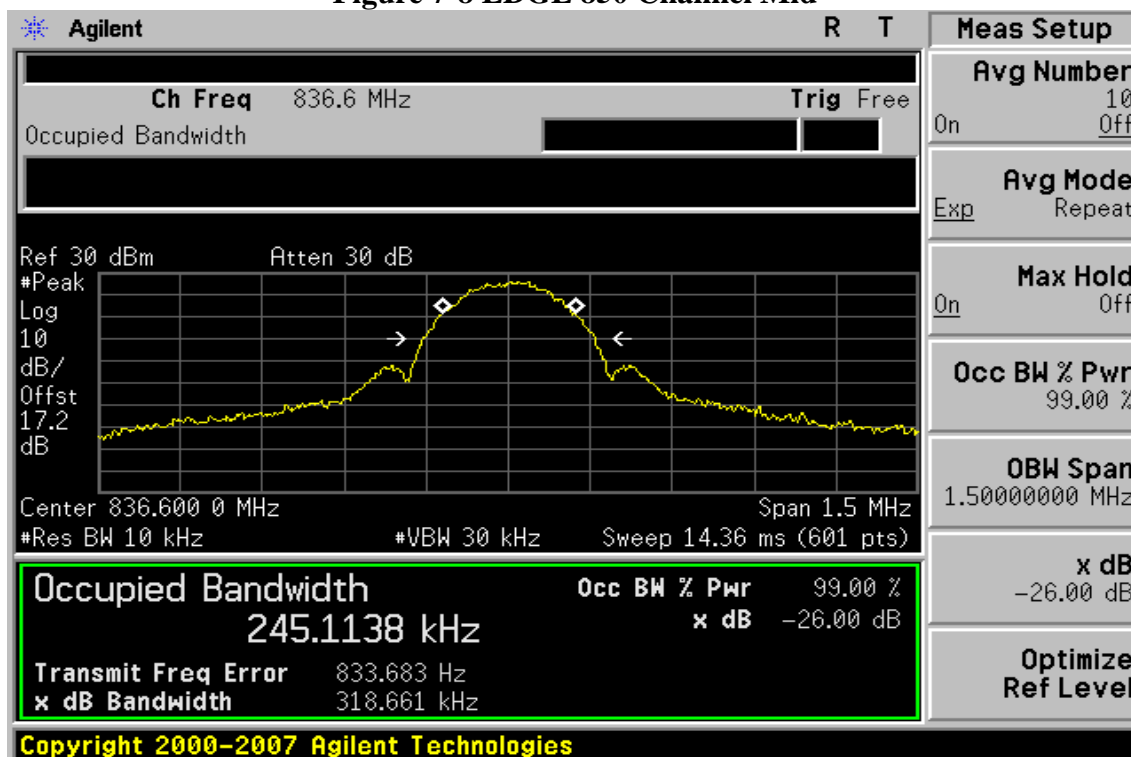


Figure 7-8 EDGE 850 Channel Mid



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Figure 7-9: EDGE 850 Channel High

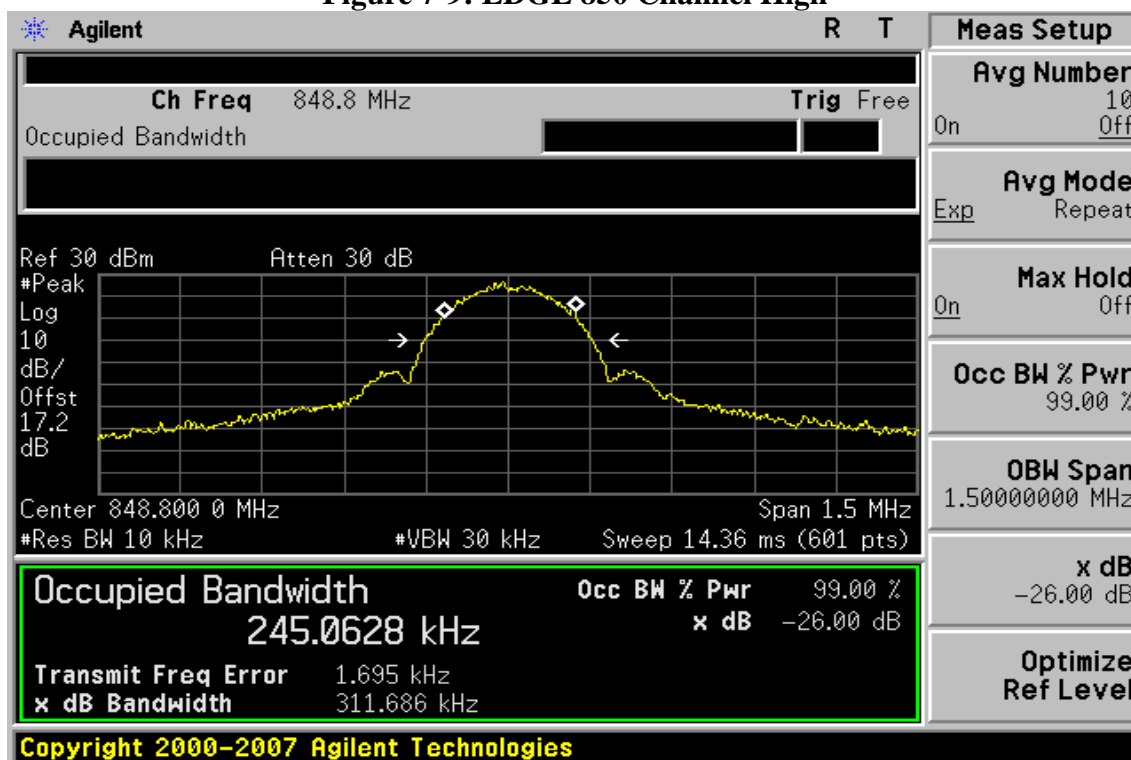
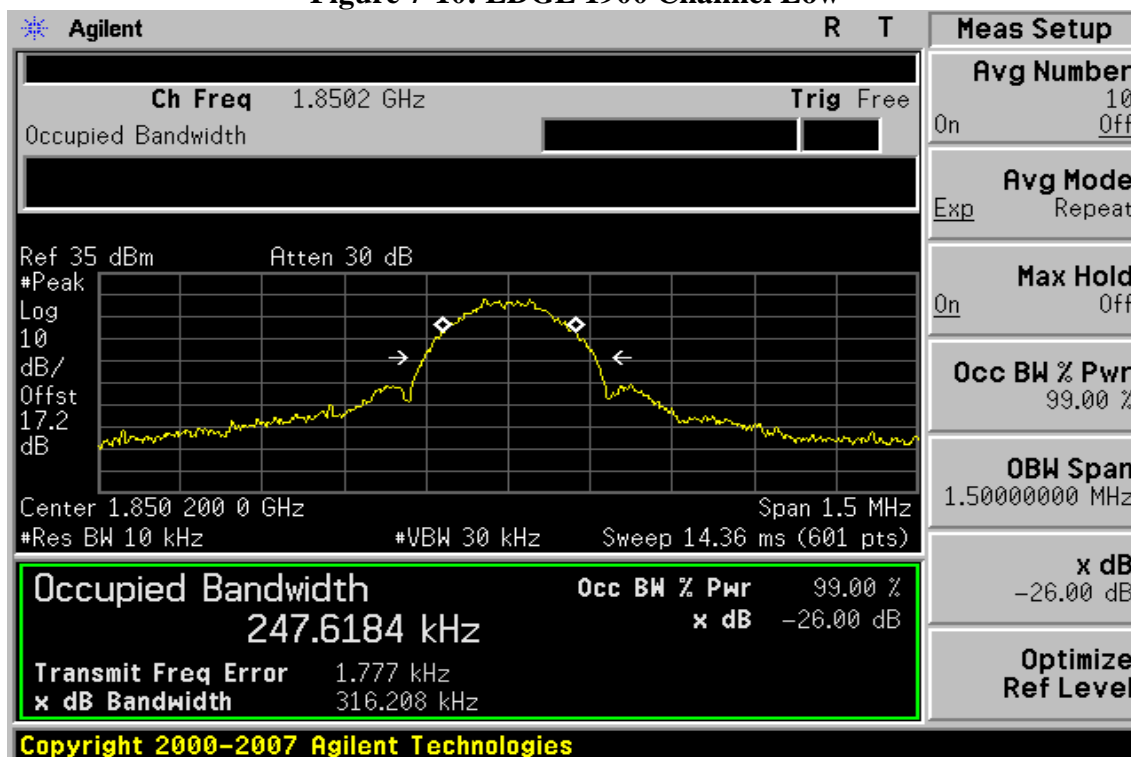


Figure 7-10: EDGE 1900 Channel Low



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Figure 7-11 EDGE 1900 Channel Mid

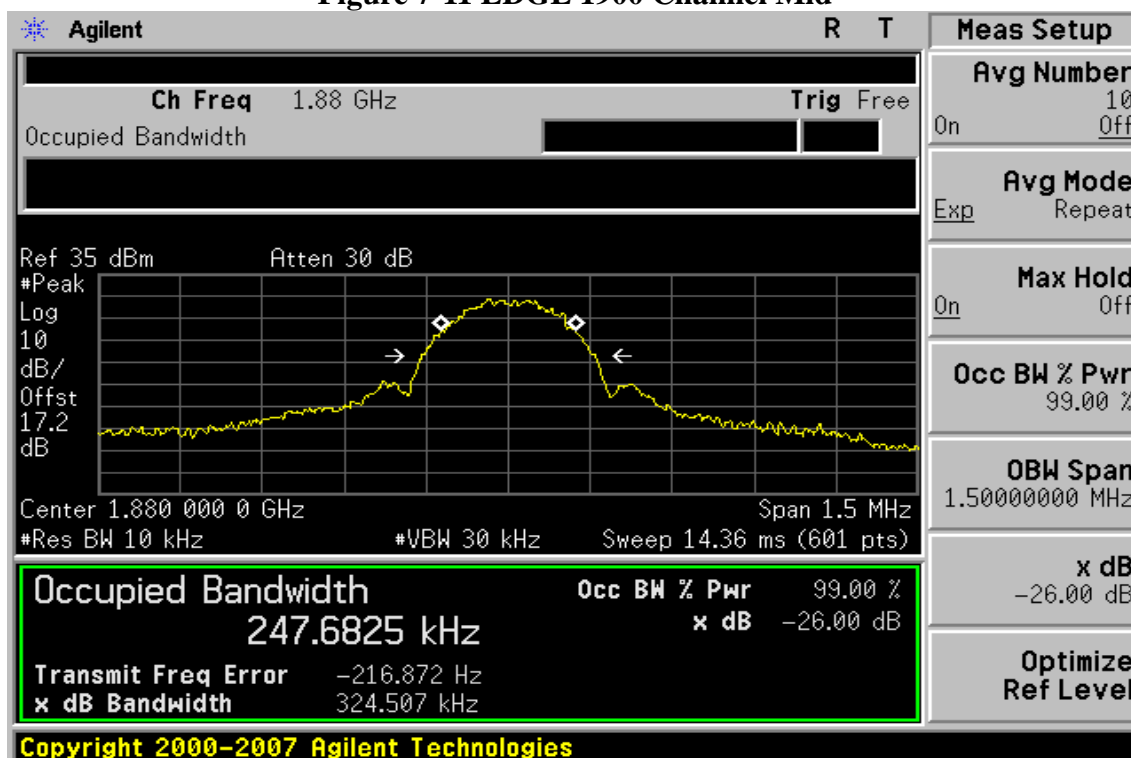
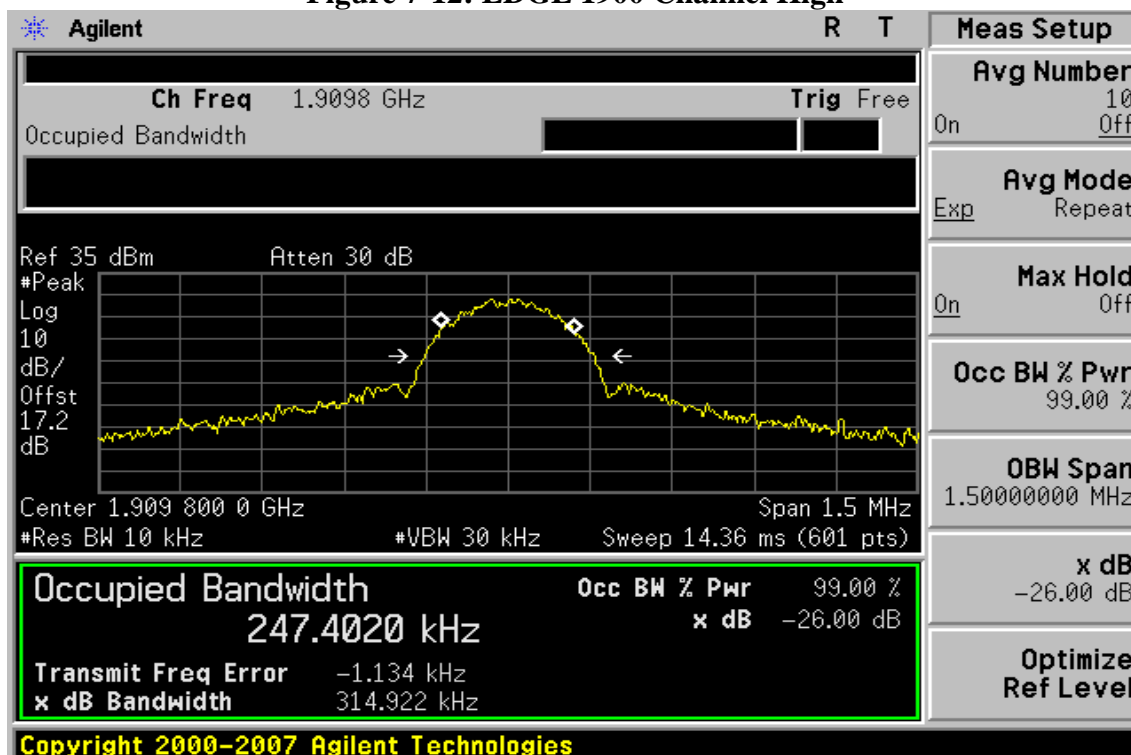


Figure 7-12: EDGE 1900 Channel High



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Figure 7-13 WCDMA V Channel Low

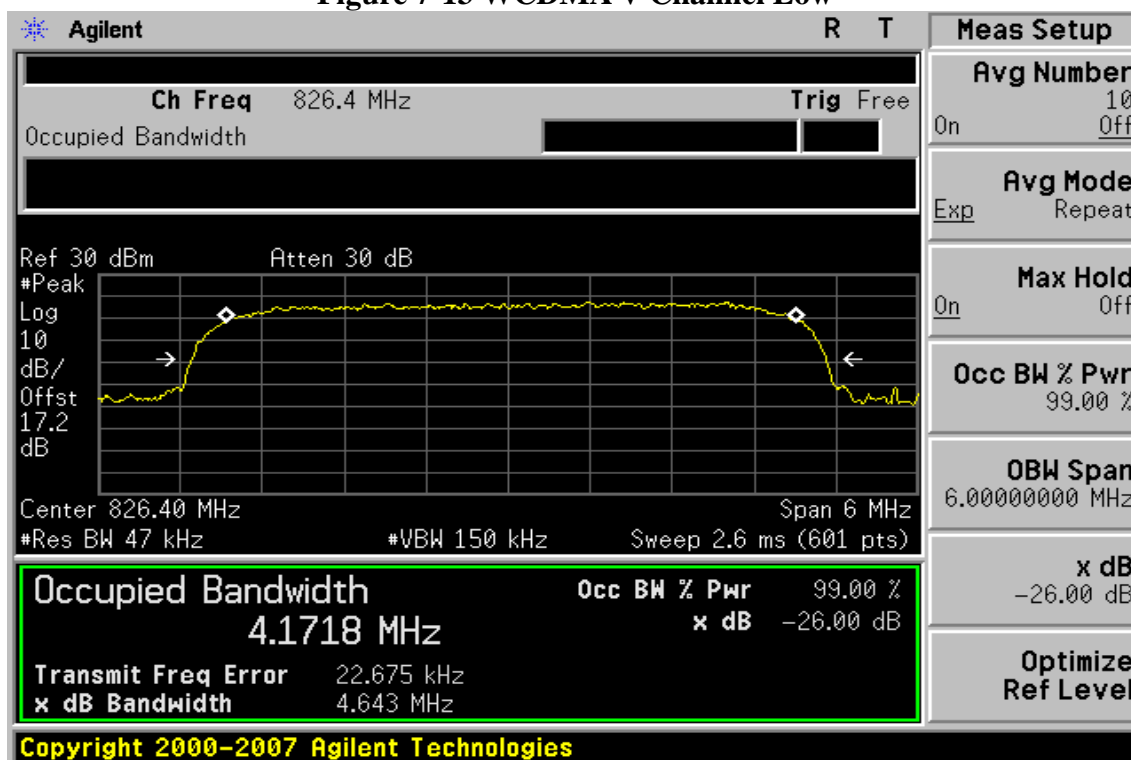
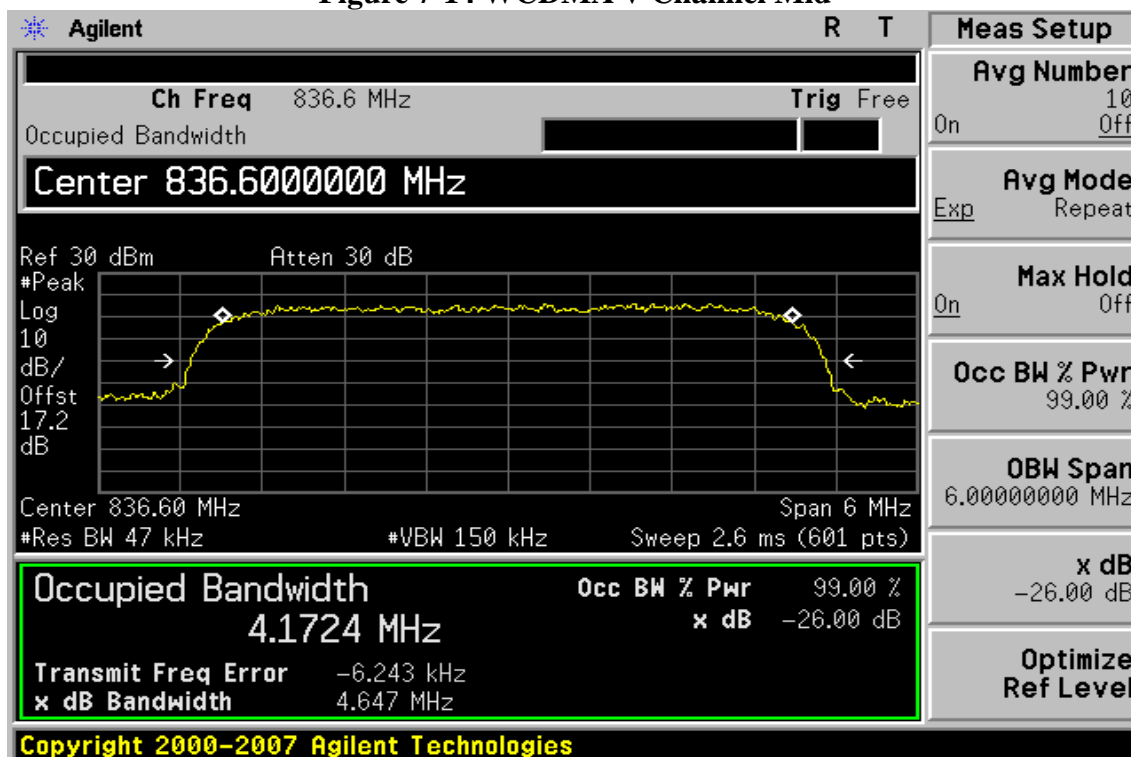


Figure 7-14 WCDMA V Channel Mid



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Figure 7-15 WCDMA V Channel High

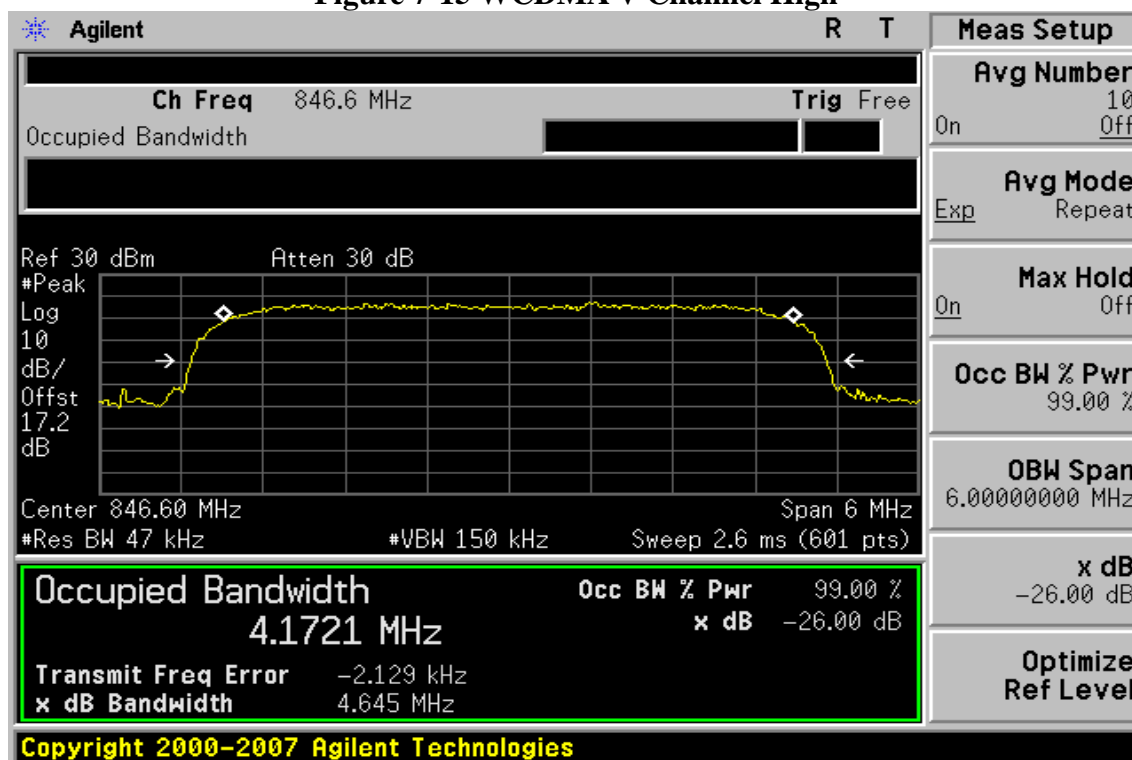
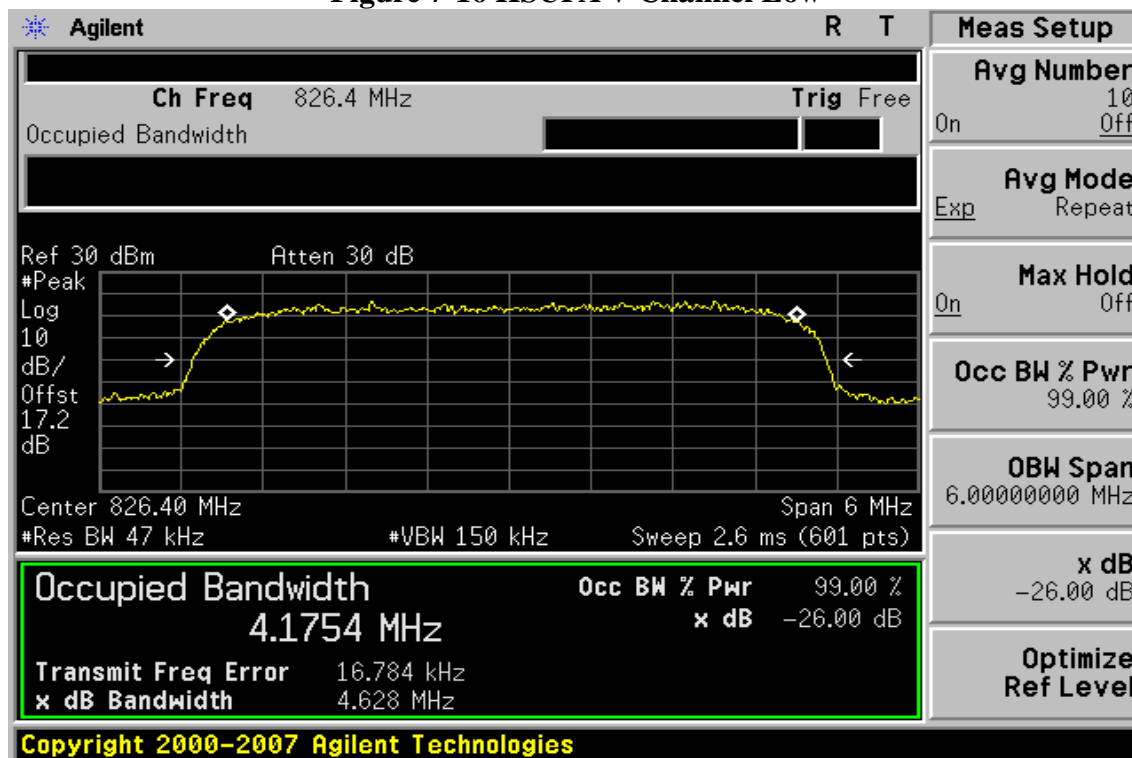


Figure 7-16 HSUPA V Channel Low



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Figure 7-17 HSUPA V Channel Mid

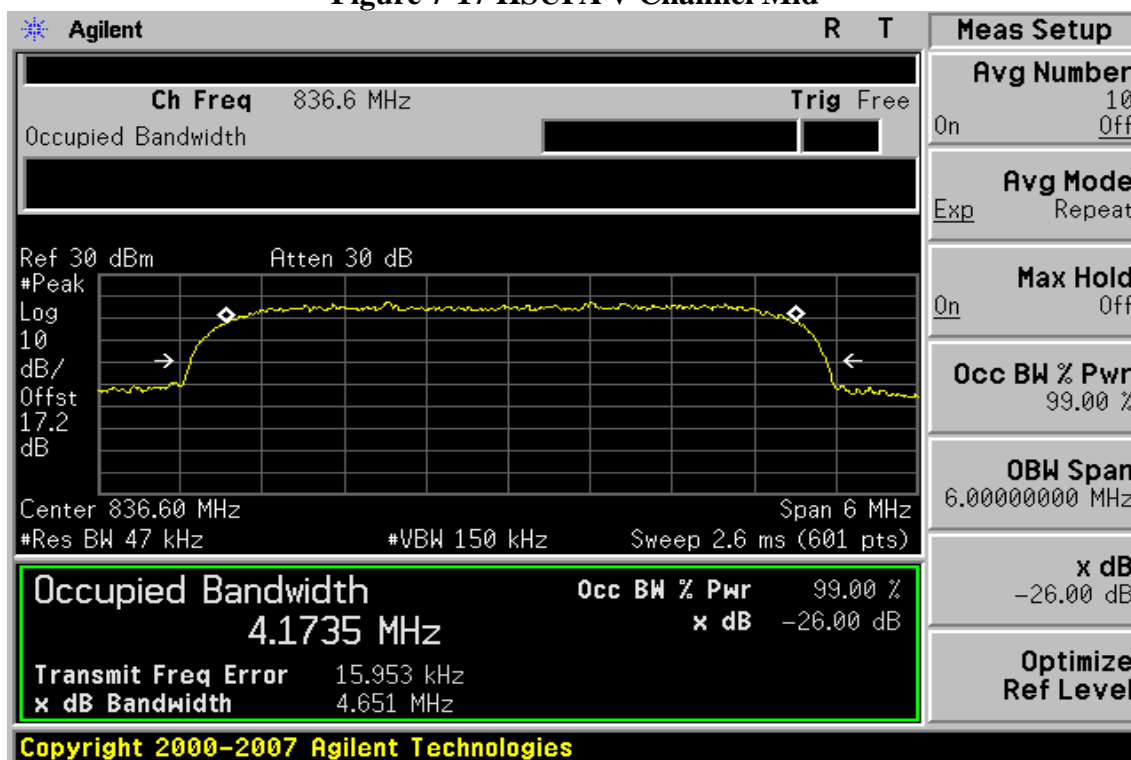
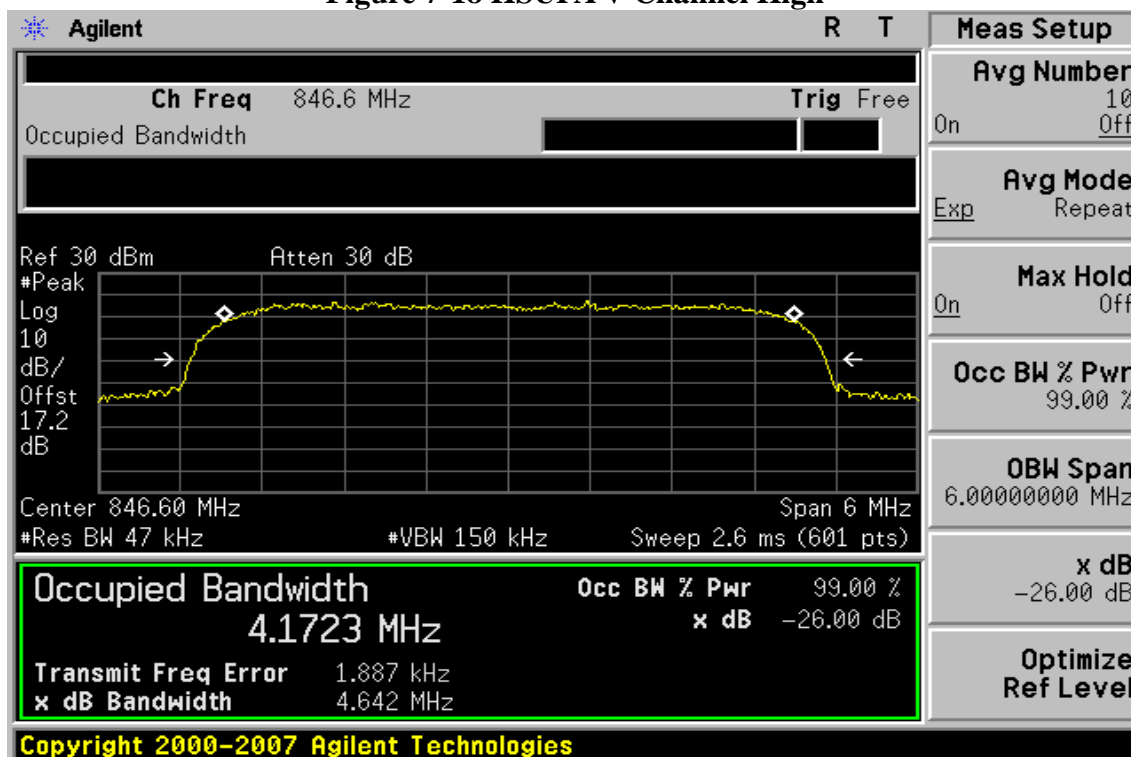


Figure 7-18 HSUPA V Channel High



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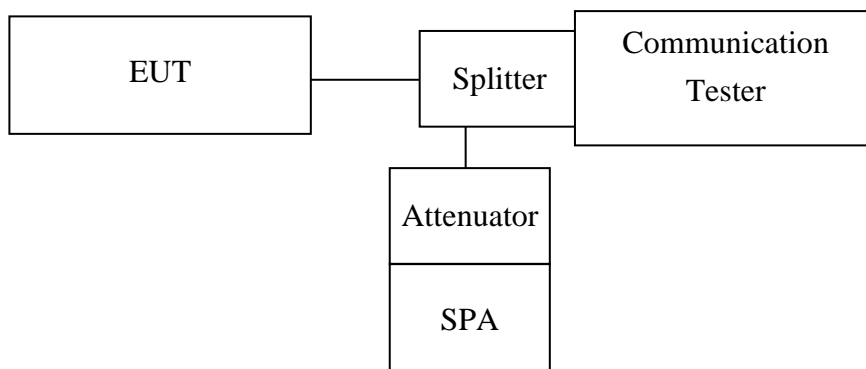
## 8. OUT OF BAND EMISSION AT ANTENNA TERMINALS

### 8.1 Standard Applicable

According to FCC §2.1051.

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

### 8.2 Test SET-UP



*Note: Measurement setup for testing on Antenna connector*

### 8.3 Measurement Procedure

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

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

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

### 8.4 Measurement Equipment Used:

Refer to section 2.4 in this report

### 8.5 Measurement Result

Refer to next page for plots.

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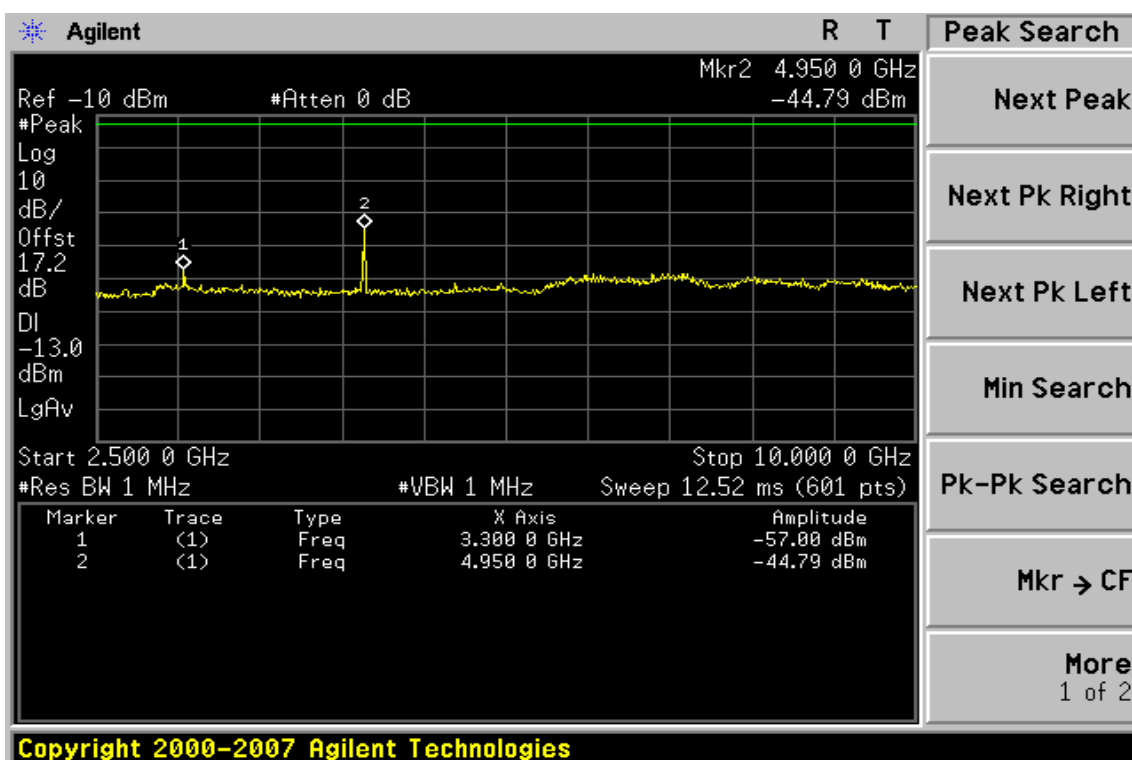
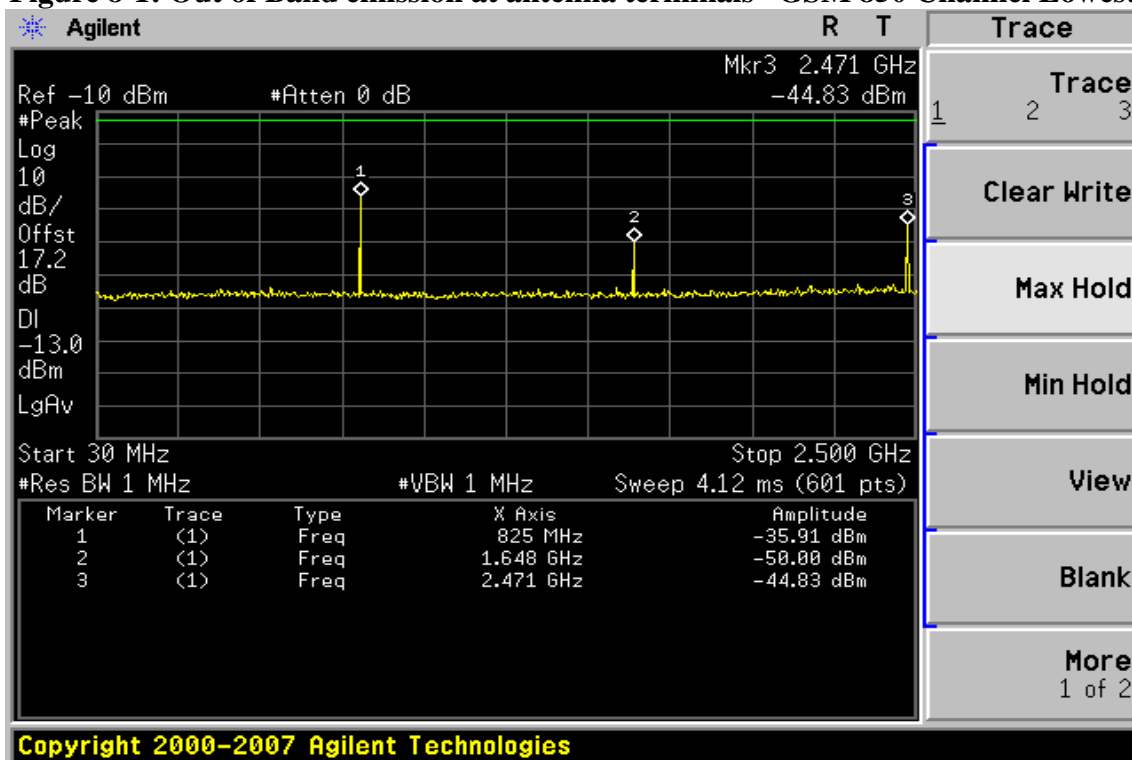
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**Figure 8-1: Out of Band emission at antenna terminals– GSM 850 Channel Lowest**



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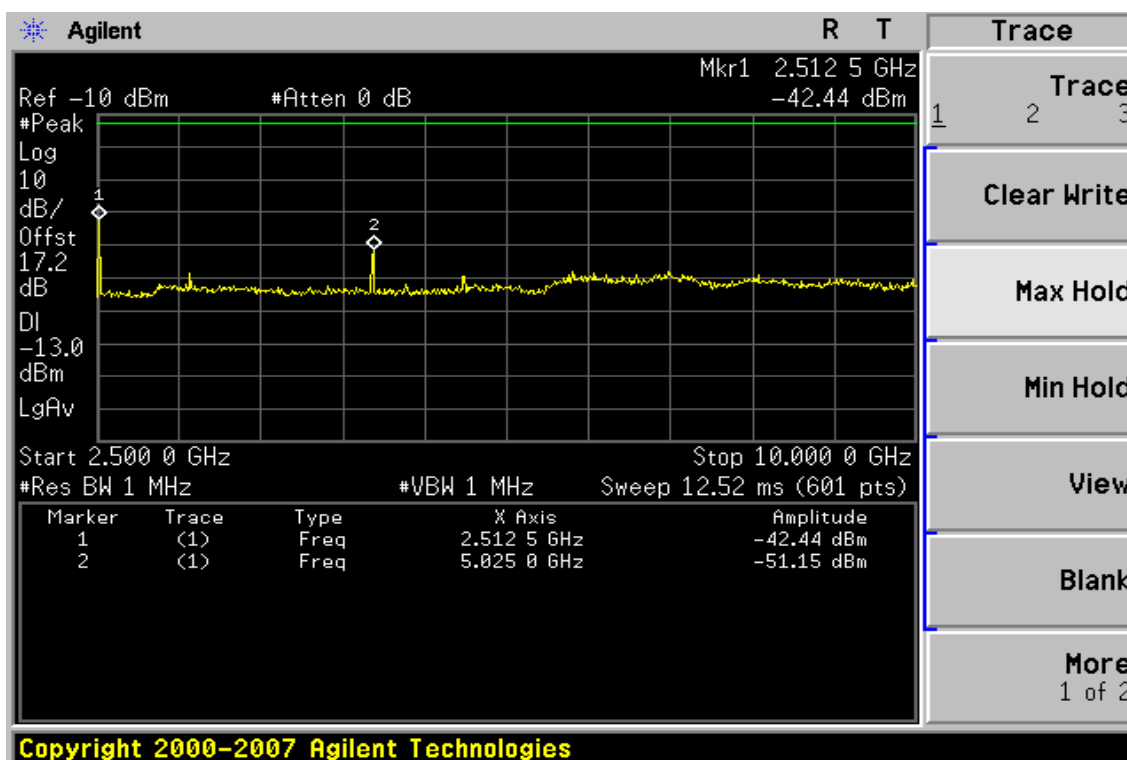
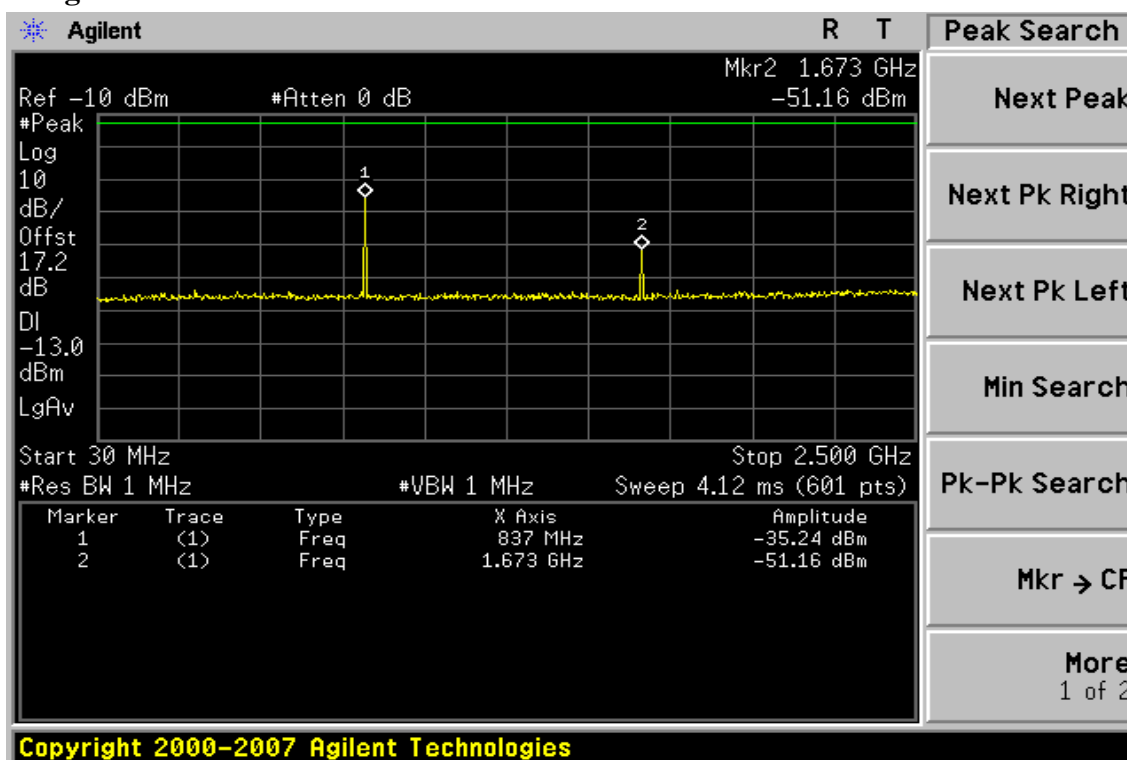
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Figure 8-2: Out of Band emission at antenna terminals –GSM 850 Channel Mid



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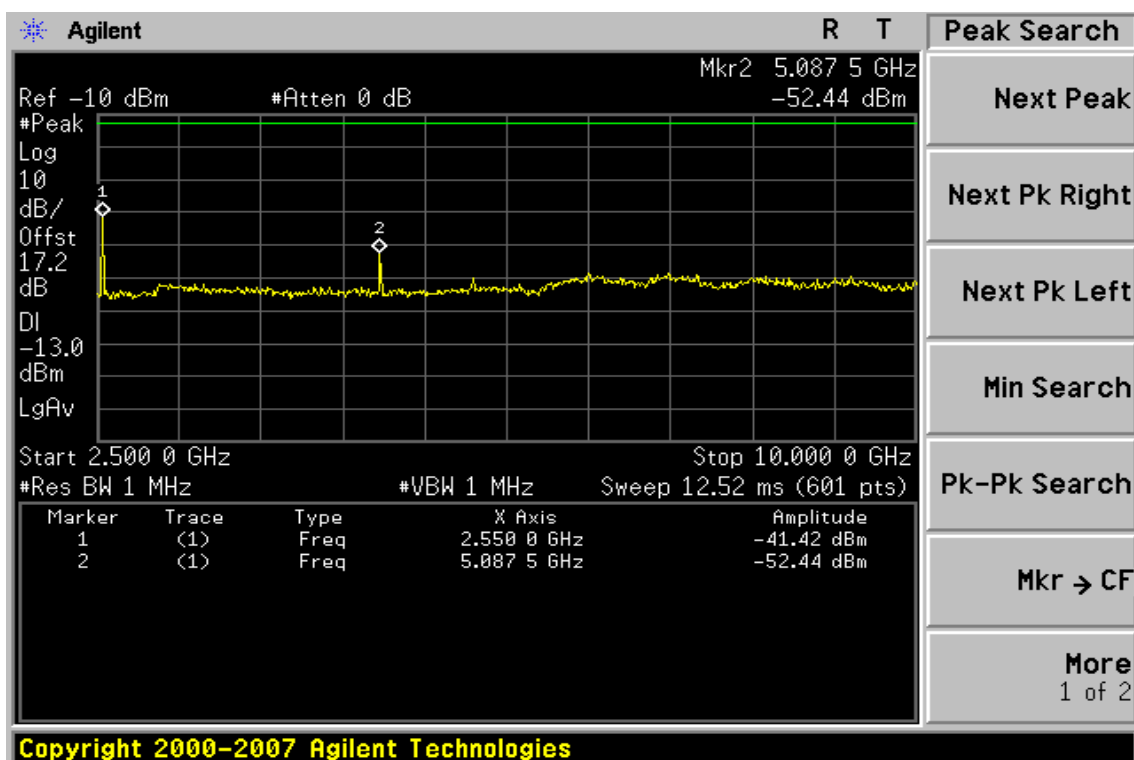
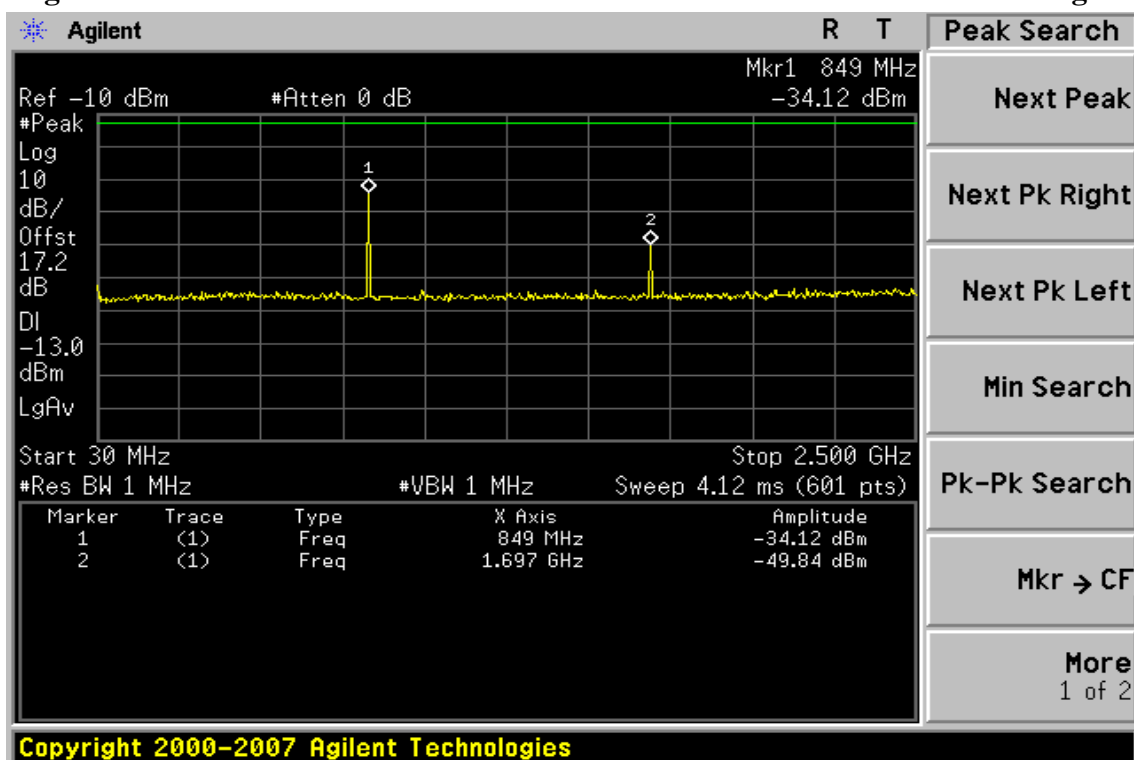
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Figure 8-3: Out of Band emission at antenna terminals–GSM 850 Channel Highest



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

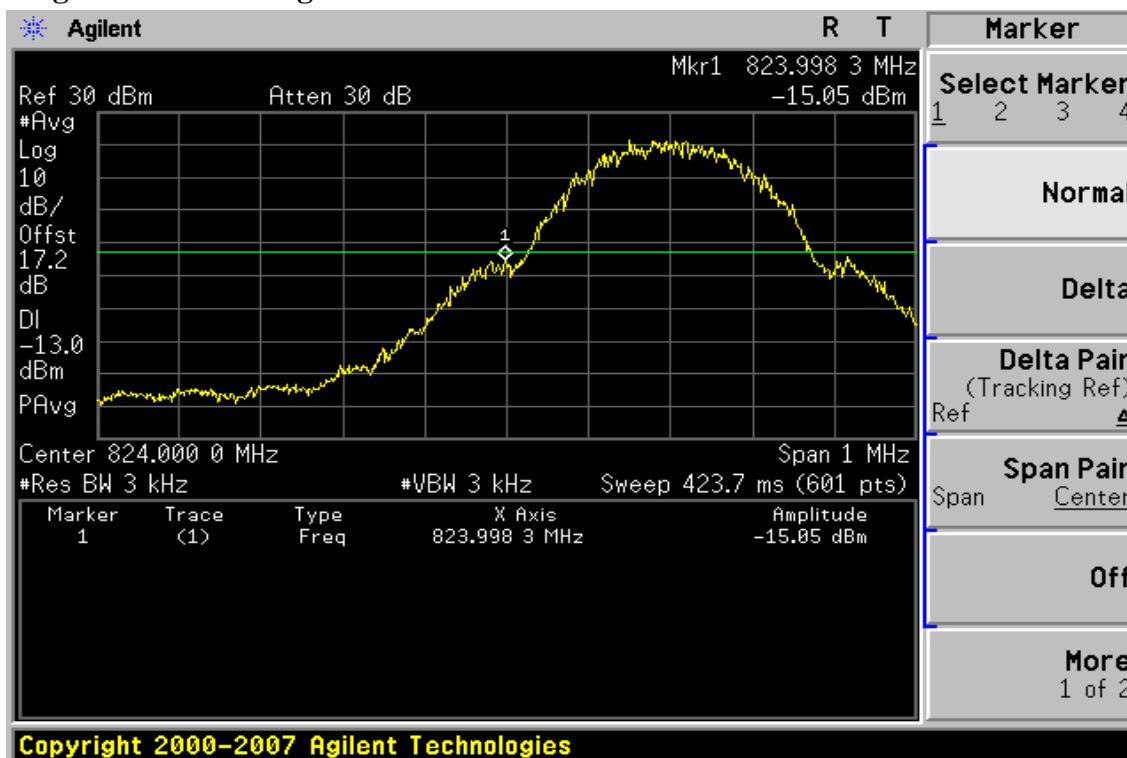
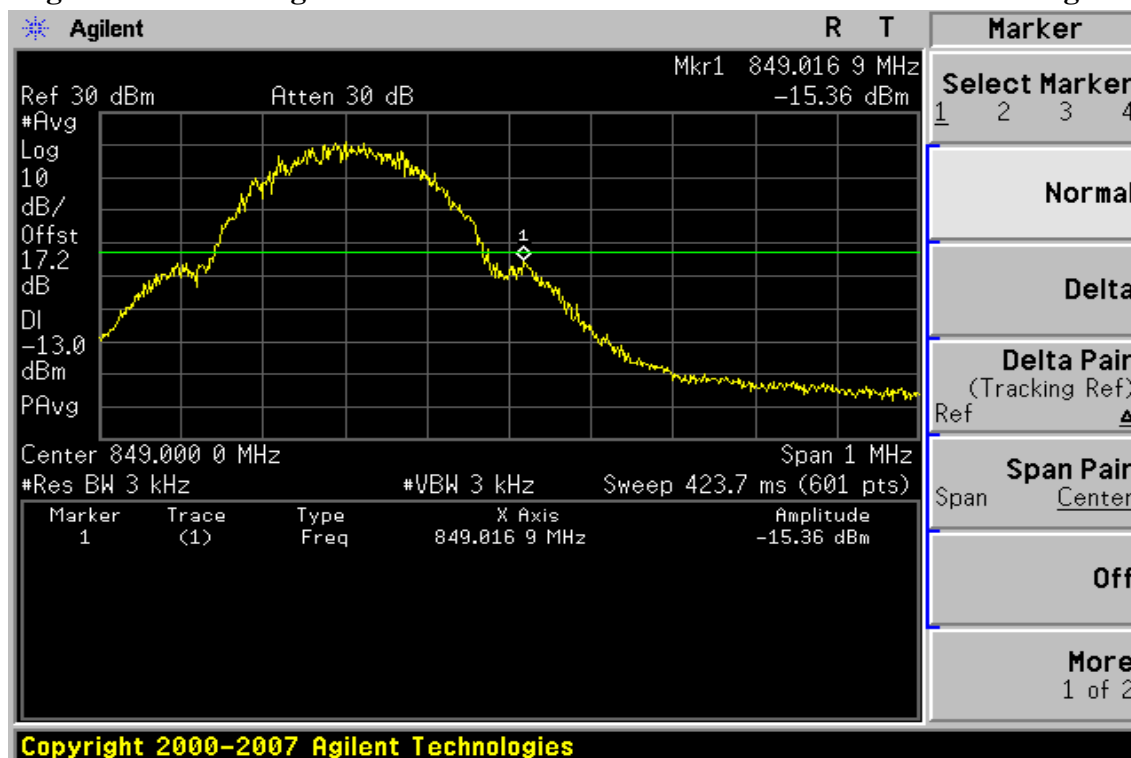


Figure 8-5: Band edge emission at antenna terminals – GSM 850 Channel Highest



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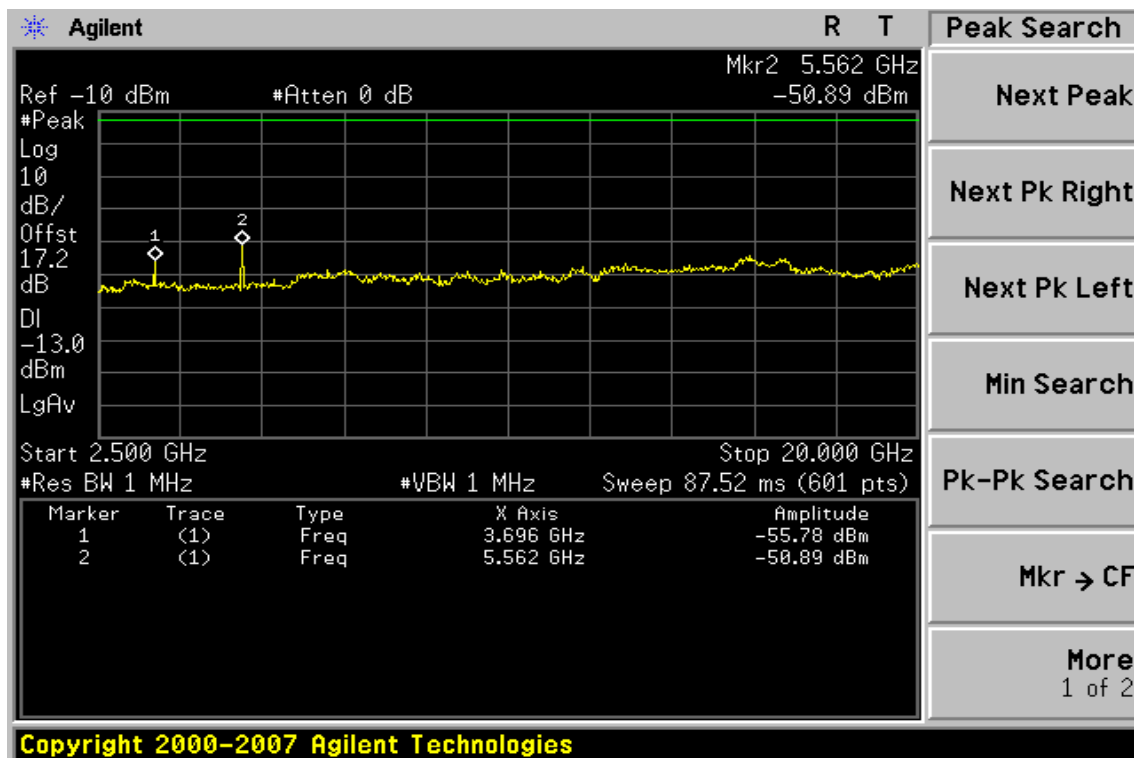
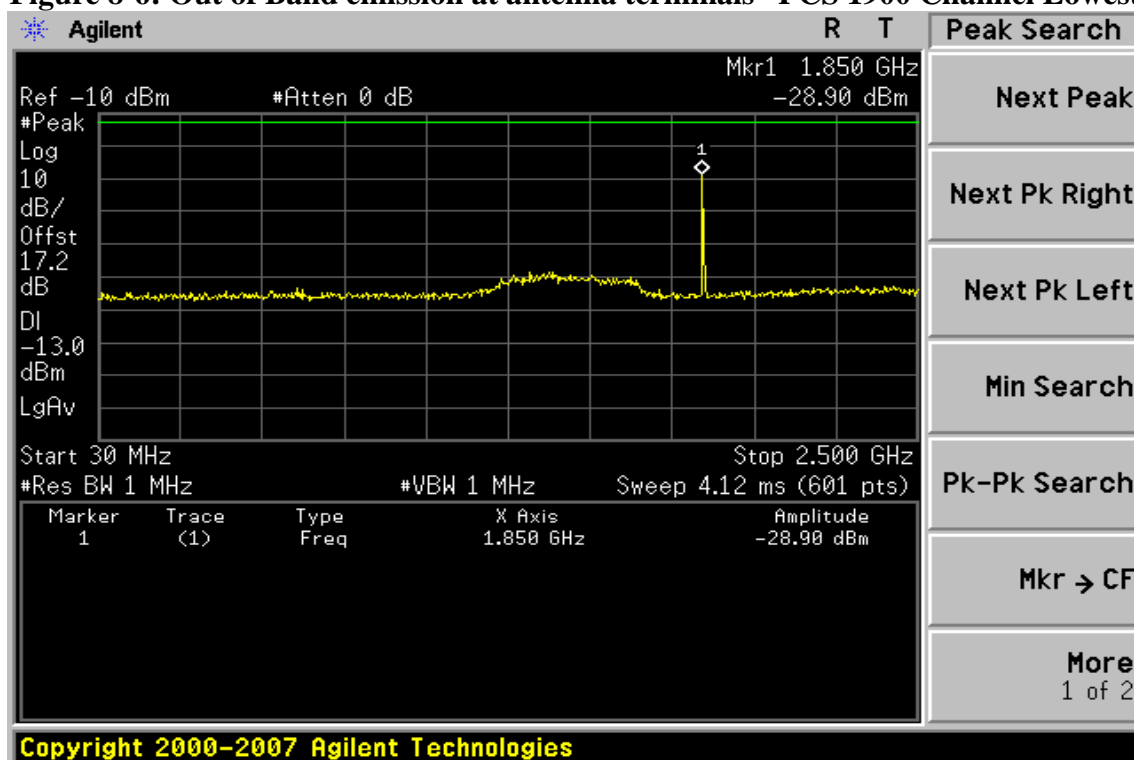
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Figure 8-6: Out of Band emission at antenna terminals– PCS 1900 Channel Lowest



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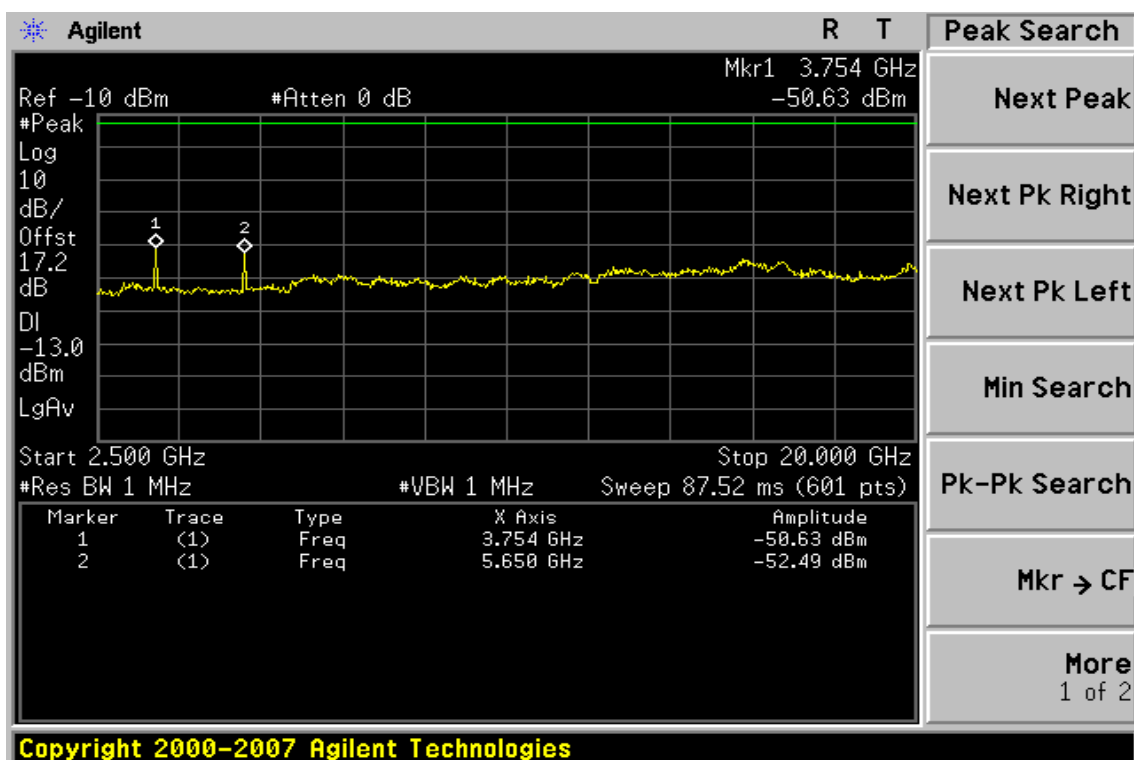
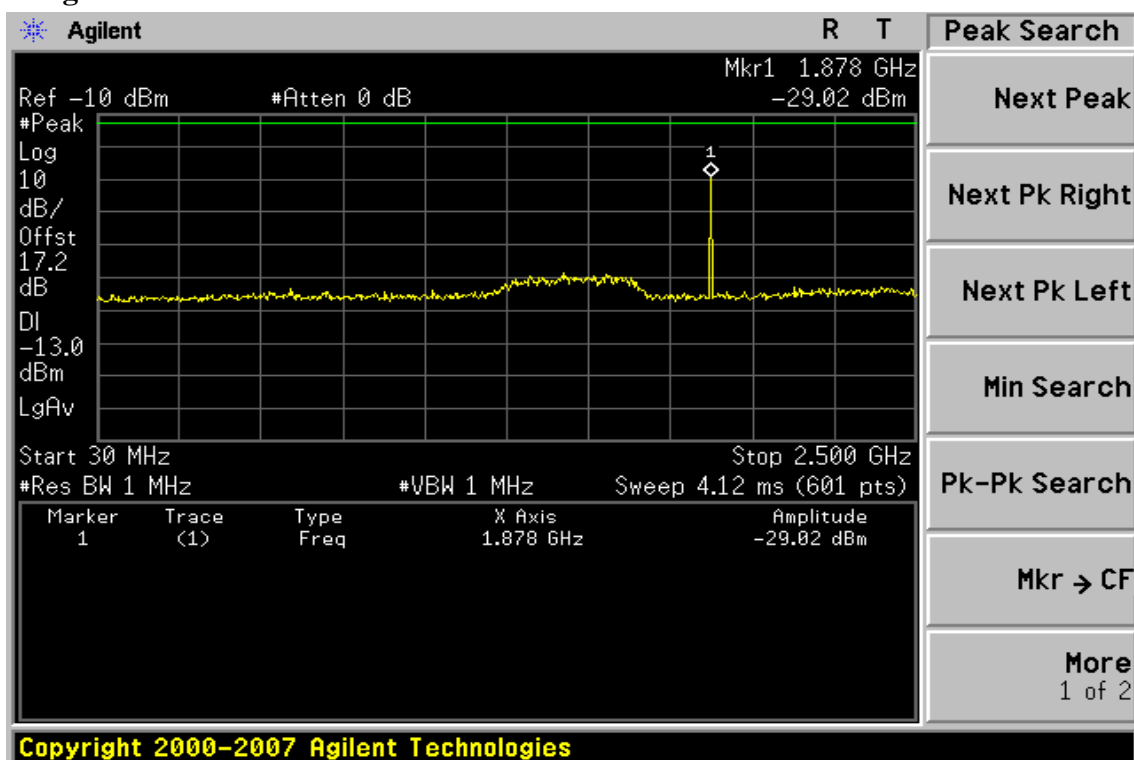
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Figure 8-7: Out of Band emission at antenna terminals –PCS 1900 Channel Mid



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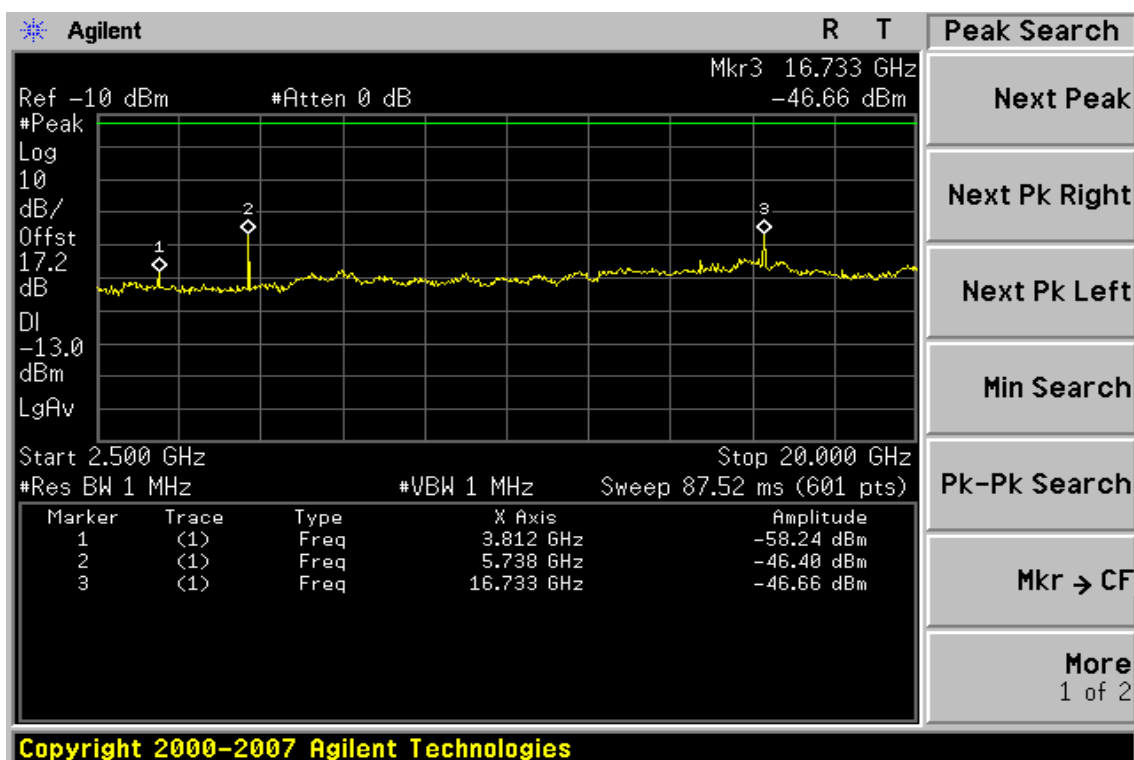
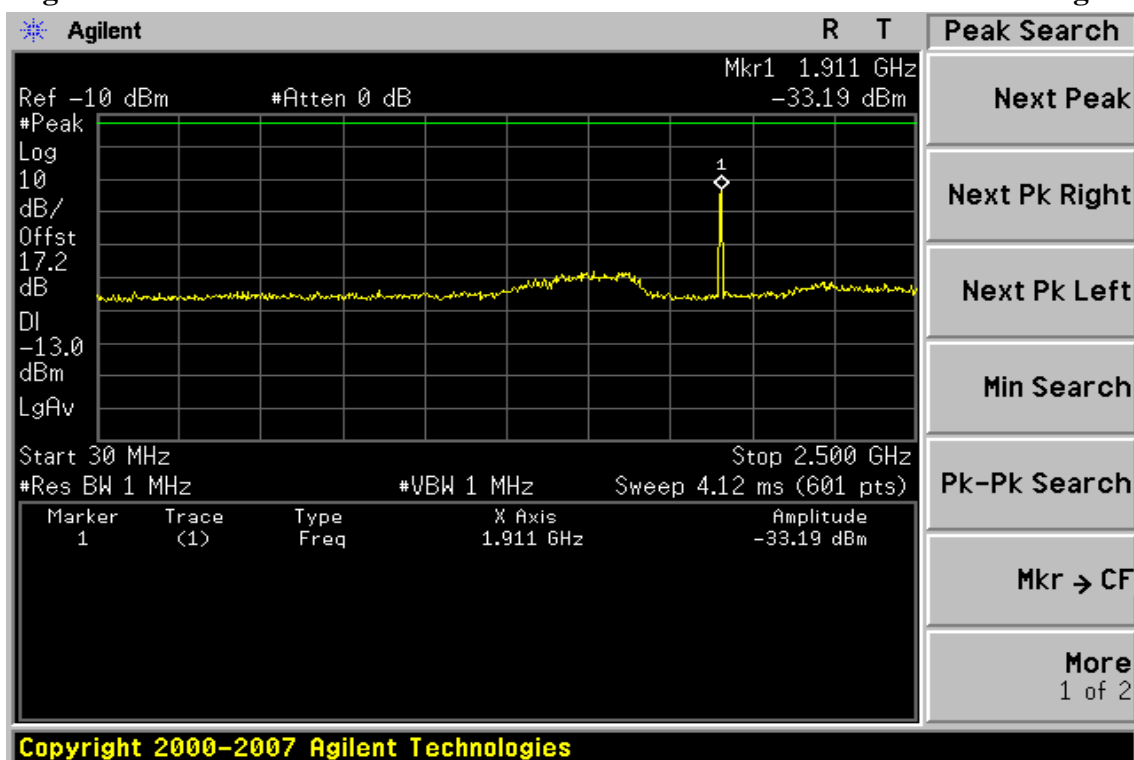
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Figure 8-8: Out of Band emission at antenna terminals–PCS 1900 Channel Highest



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

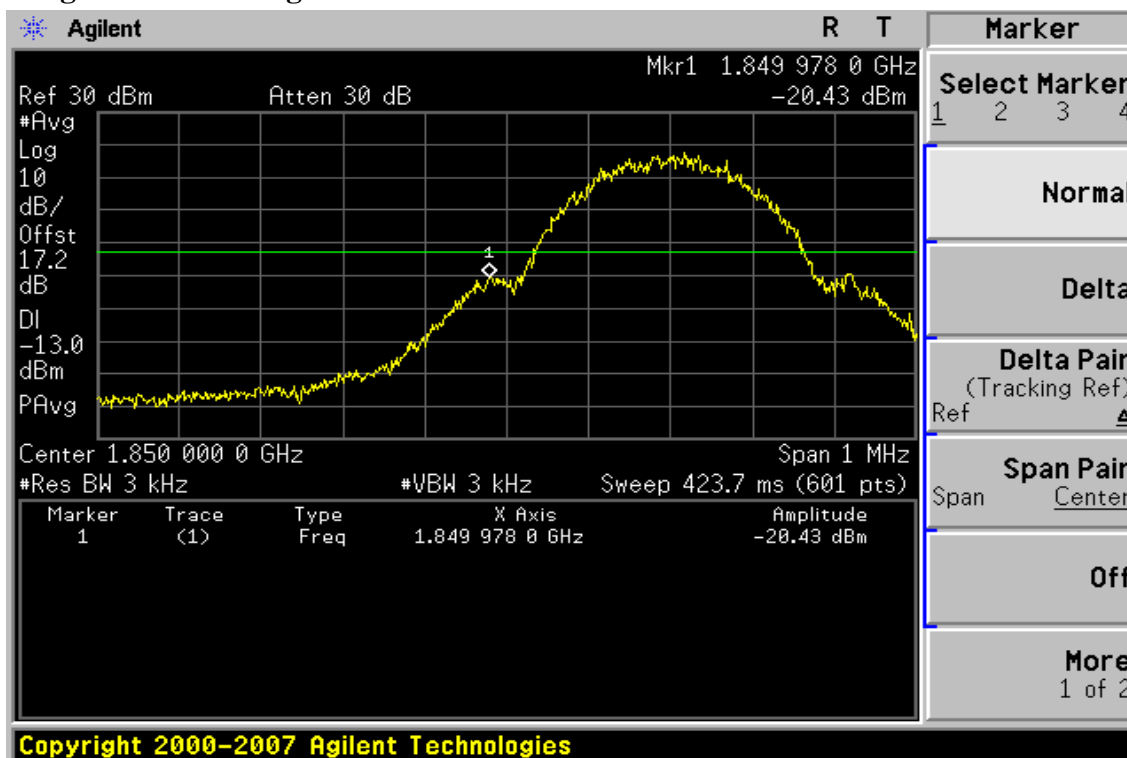
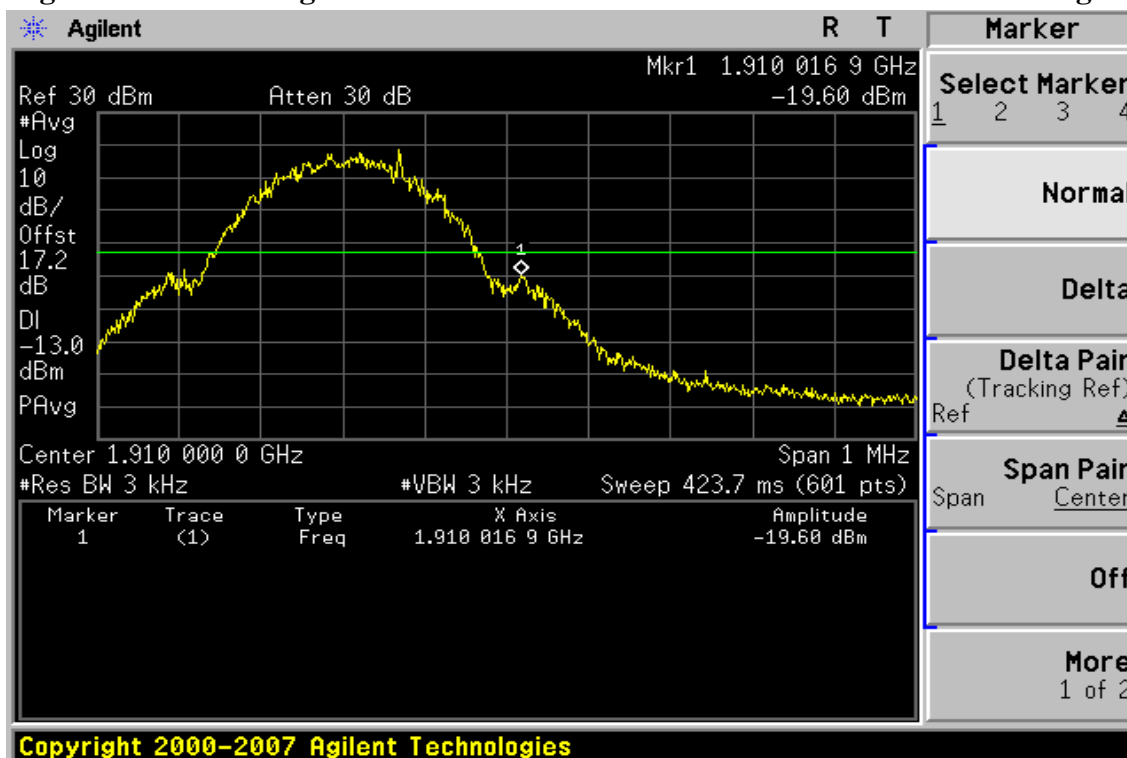


Figure 8-10: Band edge emission at antenna terminals – PCS 1900 Channel Highest



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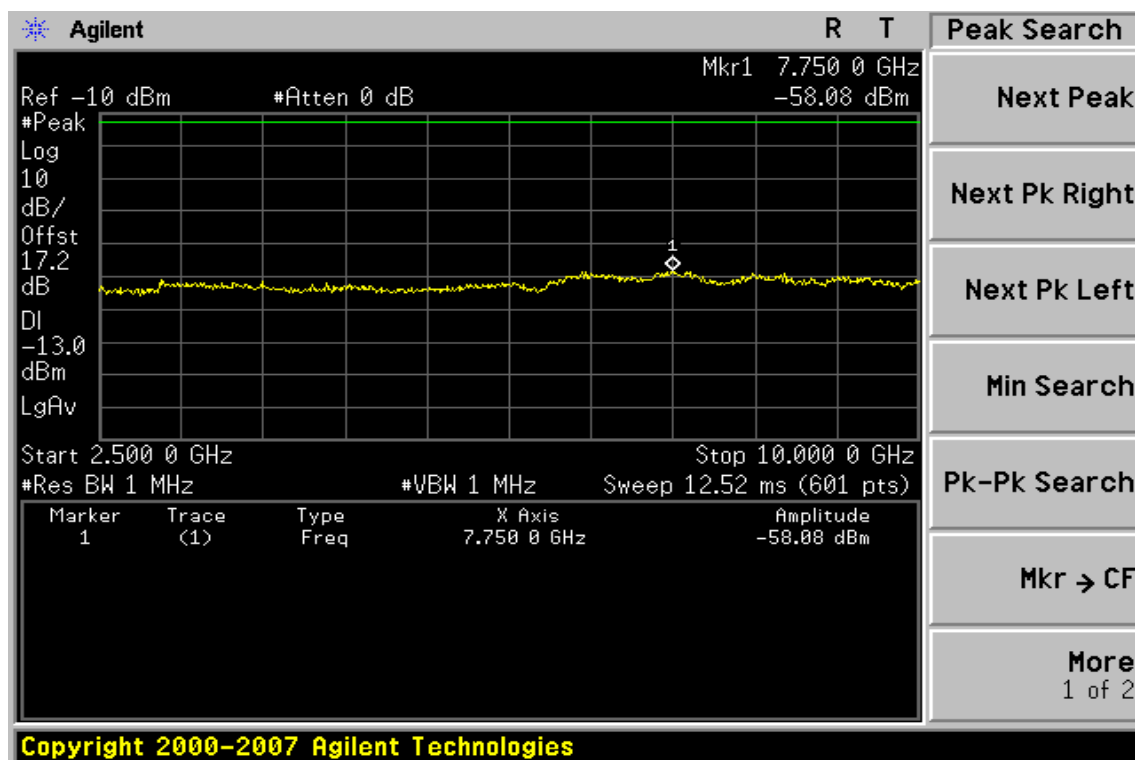
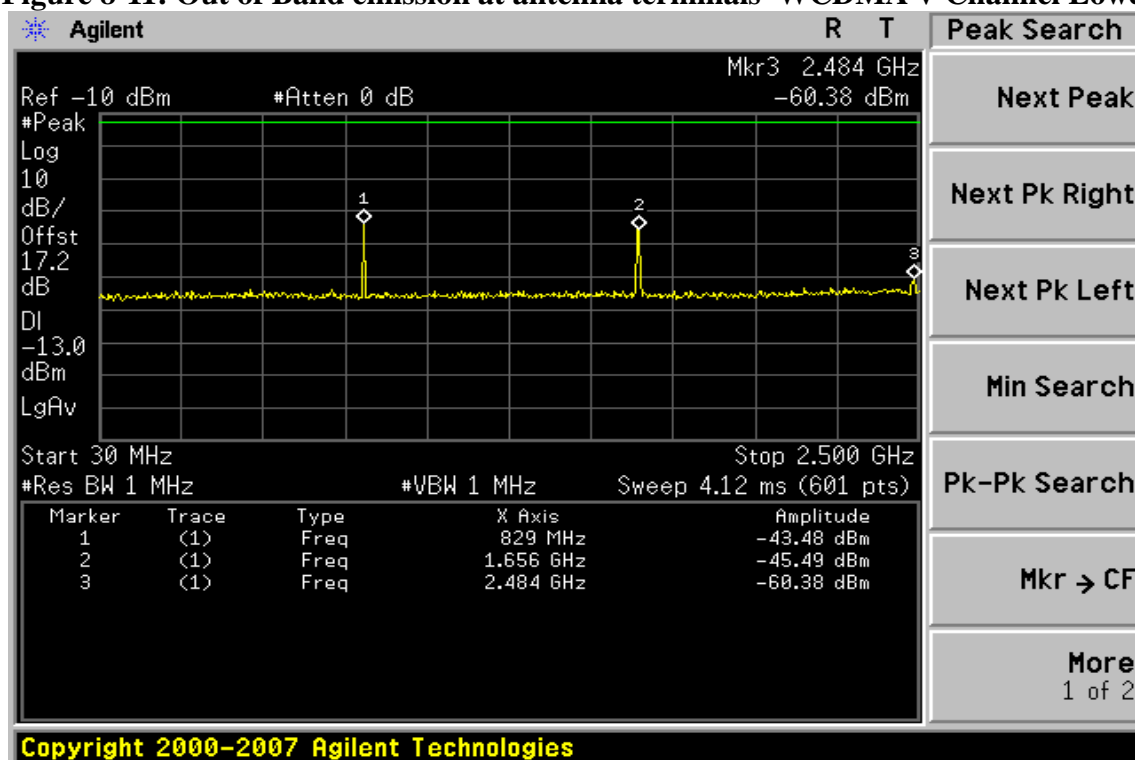
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Figure 8-11: Out of Band emission at antenna terminals–WCDMA V Channel Lowest



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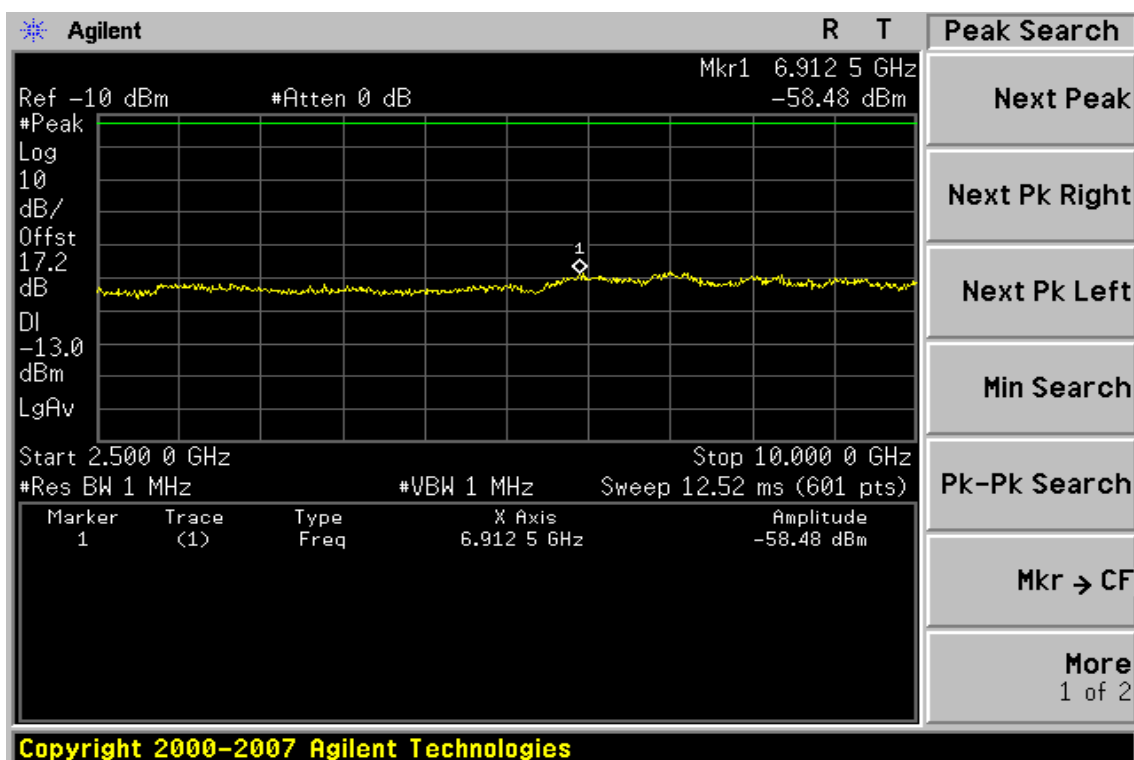
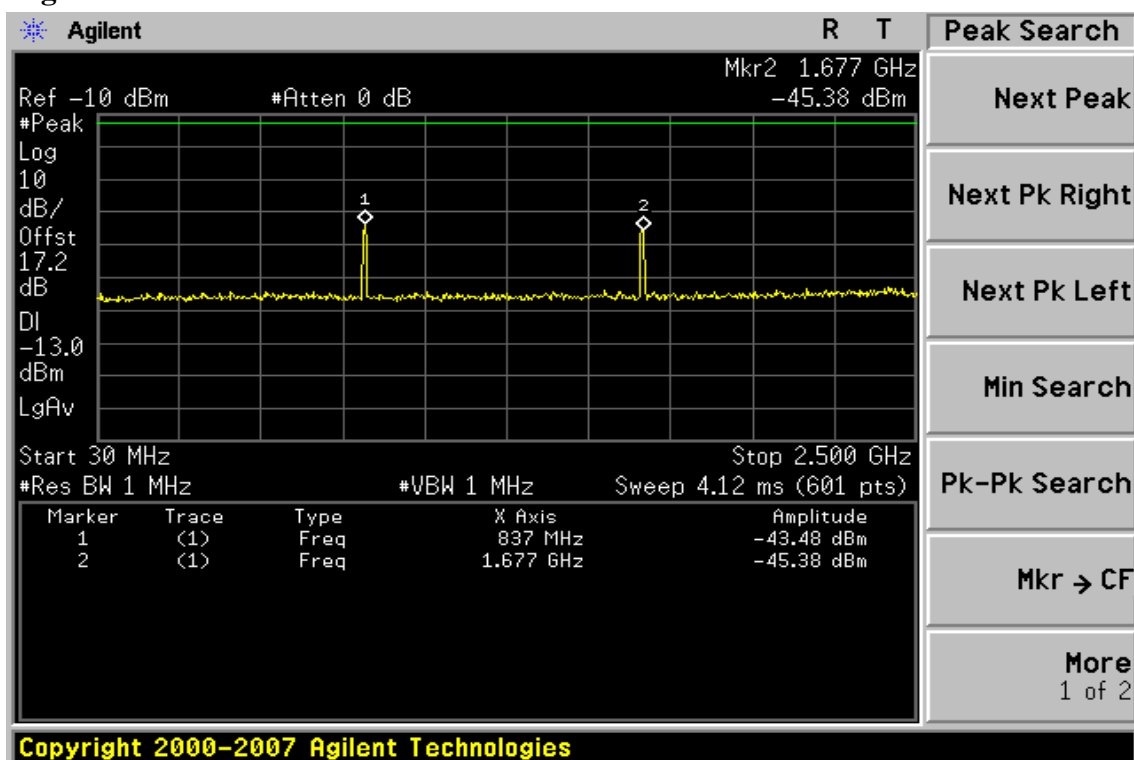
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Figure 8-12: Out of Band emission at antenna terminals –WCDMA V Channel Mid



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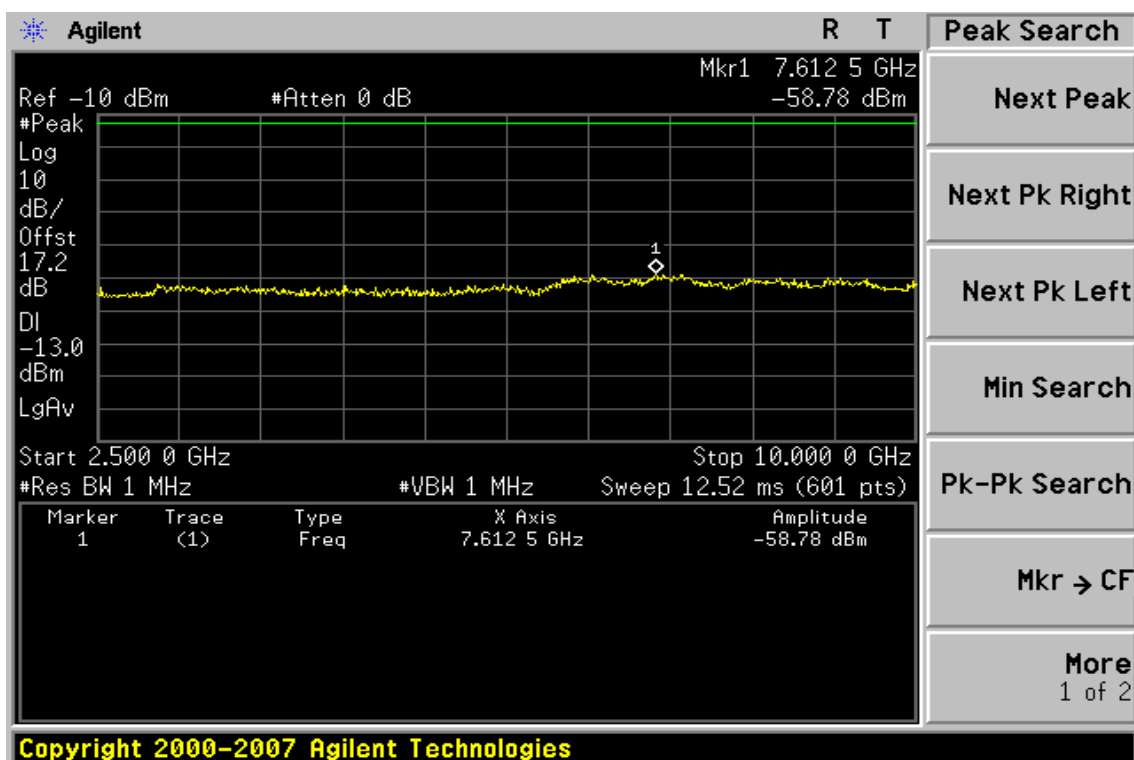
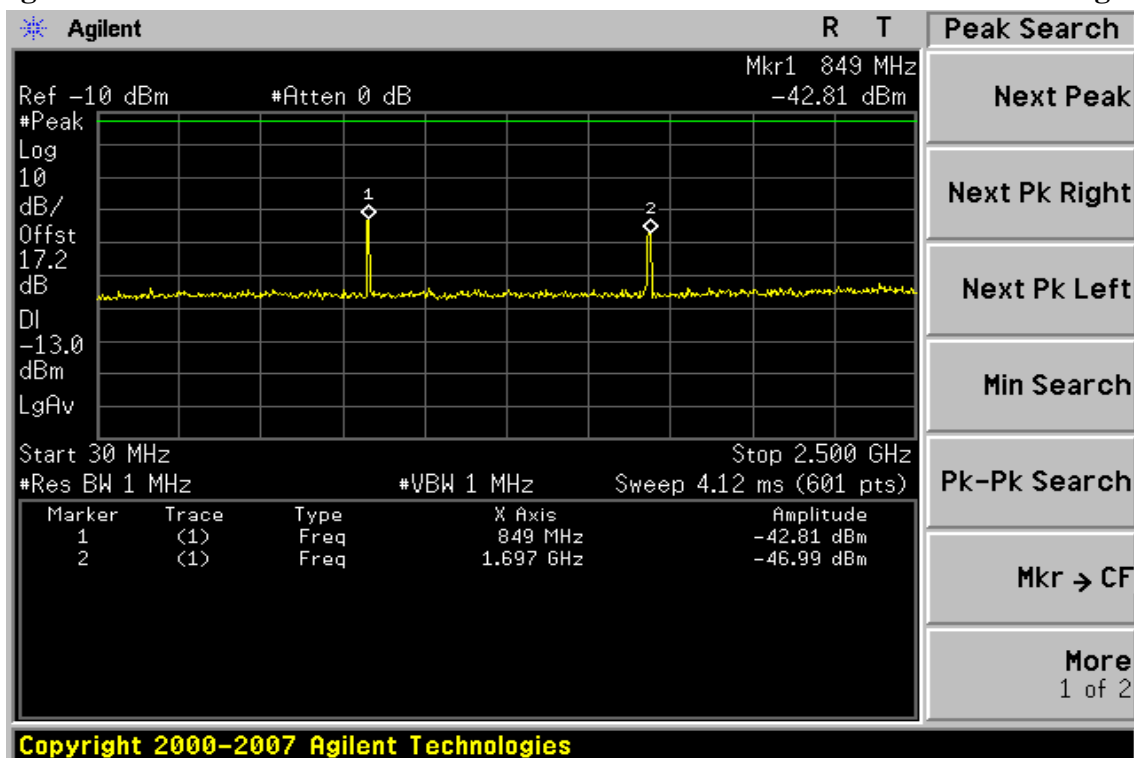
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Figure 8-13: Out of Band emission at antenna terminals–WCDMA V Channel Highest



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

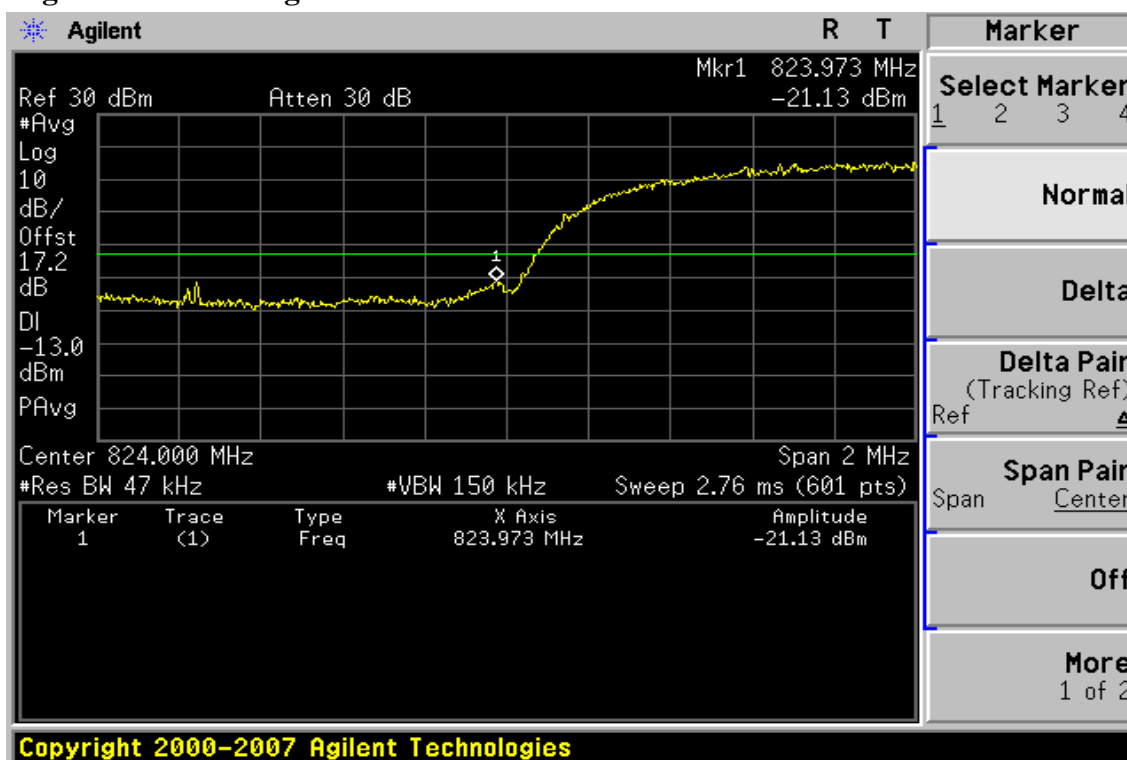
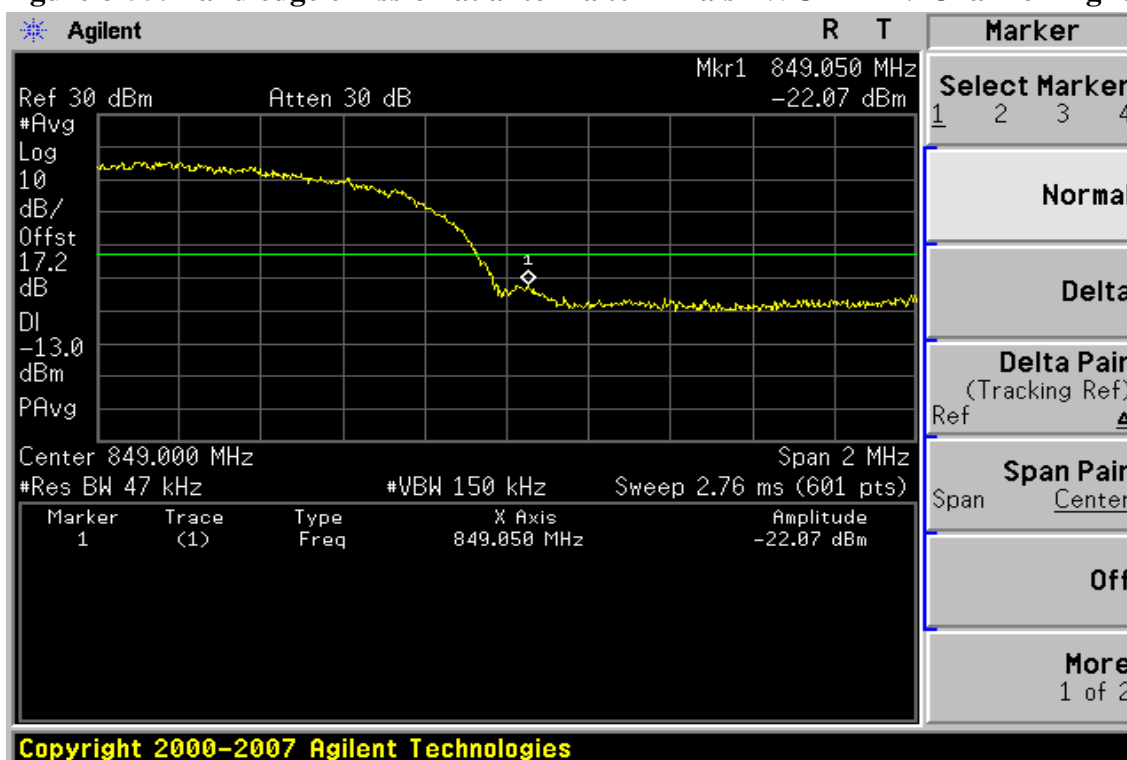


Figure 8-55: Band edge emission at antenna terminals –WCDMA V Channel Highest



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## 9. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

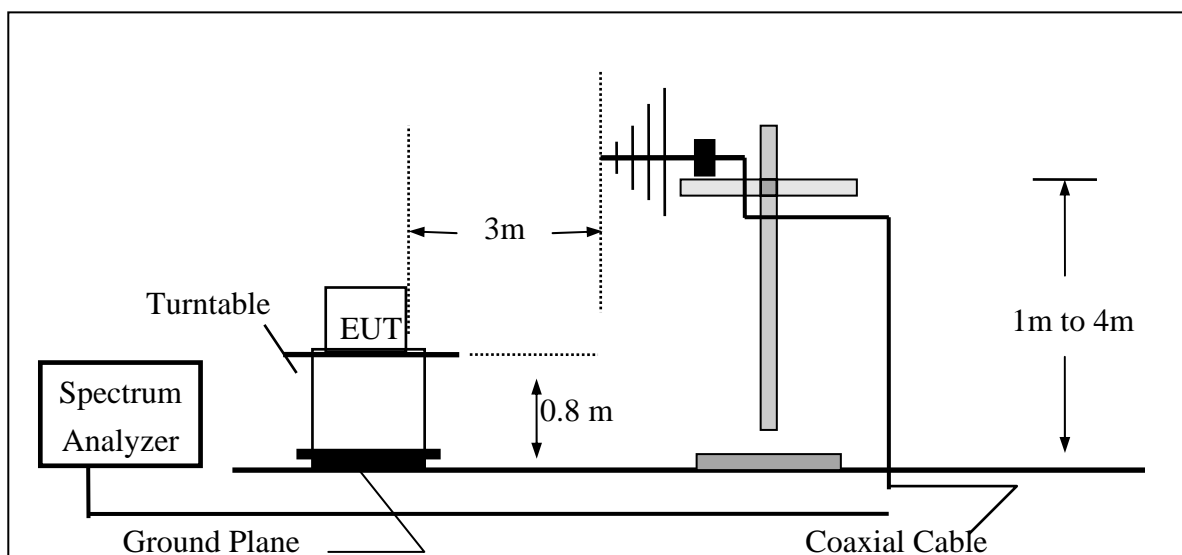
### 9.1 Standard Applicable

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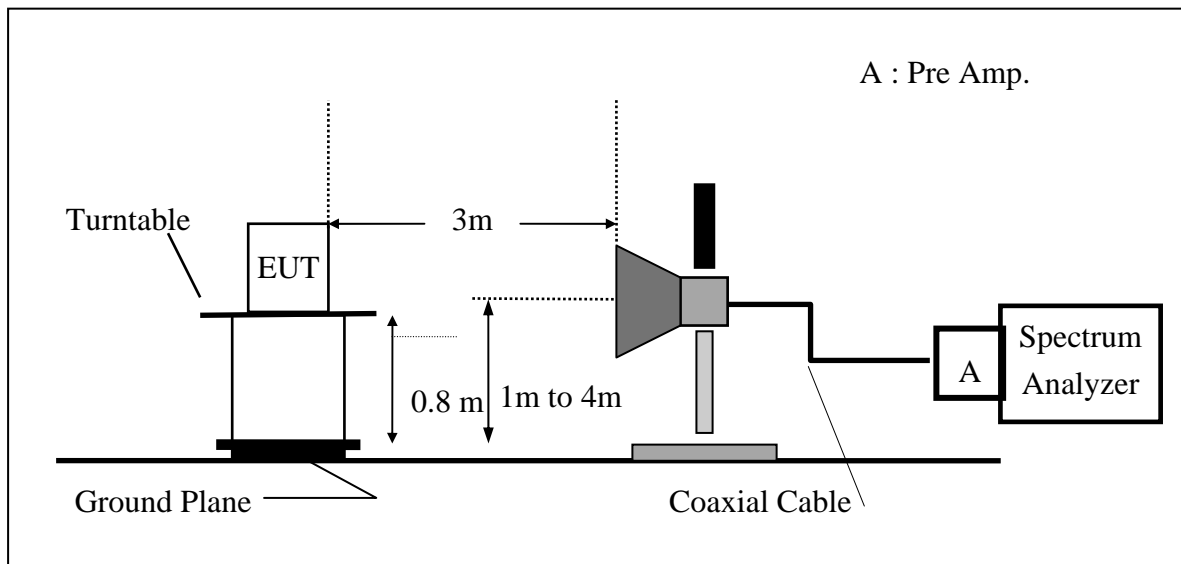
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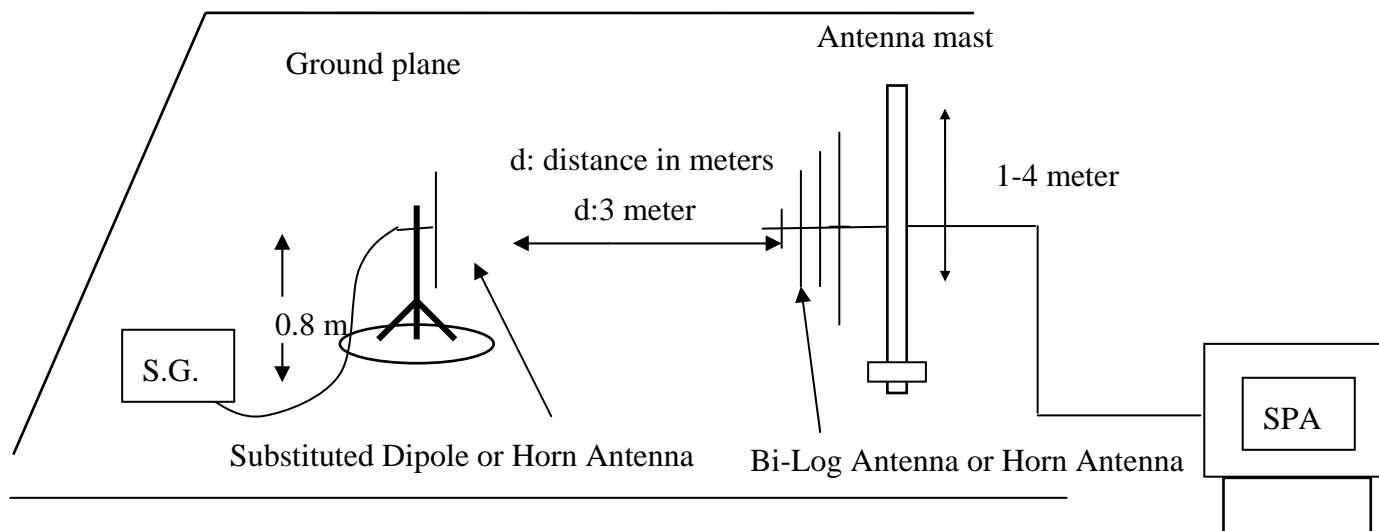
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### (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



### (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 –848.8MHz 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 1850.2 –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.

ERP = S.G. output (dBm) + Antenna Gain(dBd) – Cable Loss (dB)

EIRP = S.G. output (dBm) + Antenna Gain(dBi) – Cable Loss (dB)

### 9.4 Measurement Equipment Used:

Refer to section 2.4 in this report

### 9.5 Measurement Result

Refer to attach tabular data sheets.

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

Operation Mode : TX CH Low Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	49.69	V	-53.04	-4.16	0.91	-58.11	-13.00	-45.11
67.83	44.69	V	-67.00	-0.95	1.14	-69.09	-13.00	-56.09
90.14	47.62	V	-55.56	-7.75	1.27	-64.58	-13.00	-51.58
101.78	45.01	V	-56.75	-7.76	1.37	-65.87	-13.00	-52.87
153.19	33.44	V	-64.14	-7.80	1.60	-73.54	-13.00	-60.54
557.68	33.47	V	-58.57	-7.76	2.97	-69.31	-13.00	-56.31
824.00	81.90	V	-4.49	-7.87	3.62	-15.99	-13.00	-2.99
1644.00	46.30	V	-58.29	9.27	5.22	-54.23	-13.00	-41.23
2463.00	45.40	V	-55.67	10.08	6.51	-52.11	-13.00	-39.11
3289.00	36.40	V	-62.47	12.15	7.70	-58.02	-13.00	-45.02
4164.00	35.72	V	-60.24	12.62	8.91	-56.53	-13.00	-43.53
4934.00	36.18	V	-56.35	12.65	9.73	-53.42	-13.00	-40.42
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 Mode	Test Date:	Aug. 20, 2010
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 (dBd/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	46.10	H	-57.09	-3.25	0.90	-61.24	-13.00	-48.24
70.74	46.26	H	-66.05	-1.18	1.16	-68.39	-13.00	-55.39
90.14	43.52	H	-60.21	-7.75	1.27	-69.23	-13.00	-56.23
101.78	40.82	H	-61.99	-7.76	1.37	-71.12	-13.00	-58.12
148.34	33.42	H	-64.52	-7.80	1.58	-73.90	-13.00	-60.90
385.99	35.97	H	-60.68	-7.65	2.47	-70.80	-13.00	-57.80
824.00	68.60	H	-17.67	-7.87	3.62	-29.17	-13.00	-16.17
1644.00	44.47	H	-59.94	9.27	5.22	-55.88	-13.00	-42.88
2463.00	48.88	H	-52.09	10.08	6.51	-48.53	-13.00	-35.53
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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

Operation Mode : TX CH Mid Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	49.99	V	-52.74	-4.16	0.91	-57.81	-13.00	-44.81
67.83	44.83	V	-66.86	-0.95	1.14	-68.95	-13.00	-55.95
90.14	48.50	V	-54.68	-7.75	1.27	-63.70	-13.00	-50.70
101.78	45.55	V	-56.21	-7.76	1.37	-65.33	-13.00	-52.33
153.19	34.04	V	-63.54	-7.80	1.60	-72.94	-13.00	-59.94
620.73	33.42	V	-55.88	-7.80	3.08	-66.76	-13.00	-53.76
1679.00	40.28	V	-64.27	9.38	5.28	-60.17	-13.00	-47.17
2498.00	46.68	V	-54.15	10.06	6.57	-50.66	-13.00	-37.66
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  $ERP/EIRP \text{ (dBm)} = SG \text{ Setting (dBm)} + \text{Antenna Gain (dB/dBi)} - \text{Cable loss (dB)}$

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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

Operation Mode : TX CH Mid Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	45.36	H	-57.83	-3.25	0.90	-61.98	-13.00	-48.98
70.74	44.80	H	-67.51	-1.18	1.16	-69.85	-13.00	-56.85
90.14	44.06	H	-59.67	-7.75	1.27	-68.69	-13.00	-55.69
101.78	41.01	H	-61.80	-7.76	1.37	-70.93	-13.00	-57.93
145.43	33.27	H	-64.98	-7.80	1.57	-74.34	-13.00	-61.34
392.78	34.96	H	-61.58	-7.66	2.49	-71.73	-13.00	-58.73
1679.00	40.54	H	-63.83	9.38	5.28	-59.73	-13.00	-46.73
2498.00	47.74	H	-53.00	10.06	6.57	-49.51	-13.00	-36.51
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 Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	49.80	V	-52.93	-4.16	0.91	-58.00	-13.00	-45.00
67.83	44.83	V	-66.86	-0.95	1.14	-68.95	-13.00	-55.95
90.14	48.05	V	-55.13	-7.75	1.27	-64.15	-13.00	-51.15
101.78	48.72	V	-53.04	-7.76	1.37	-62.16	-13.00	-49.16
155.13	32.83	V	-64.92	-7.80	1.60	-74.33	-13.00	-61.33
664.38	33.73	V	-55.34	-7.82	3.20	-66.36	-13.00	-53.36
850.00	78.87	V	-7.24	-7.88	3.68	-18.80	-13.00	-5.80
1693.00	39.39	V	-65.15	9.42	5.30	-61.03	-13.00	-48.03
2533.00	41.37	V	-59.33	10.16	6.61	-55.78	-13.00	-42.78
3394.00	---	V		12.38	7.86		-13.00	
4213.00	35.28	V	-60.49	12.63	8.97	-56.84	-13.00	-43.84
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 Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	45.84	H	-57.35	-3.25	0.90	-61.50	-13.00	-48.50
70.74	48.61	H	-63.70	-1.18	1.16	-66.04	-13.00	-53.04
90.14	43.55	H	-60.18	-7.75	1.27	-69.20	-13.00	-56.20
101.78	43.49	H	-59.32	-7.76	1.37	-68.45	-13.00	-55.45
395.69	37.42	H	-59.08	-7.66	2.50	-69.23	-13.00	-56.23
604.24	33.11	H	-57.51	-7.79	3.04	-68.34	-13.00	-55.34
850.00	68.16	H	-18.03	-7.88	3.68	-29.59	-13.00	-16.59
1693.00	39.93	H	-64.42	9.42	5.30	-60.30	-13.00	-47.30
2533.00	45.74	H	-54.90	10.16	6.61	-51.35	-13.00	-38.35
3394.00	---	H		12.38	7.86		-13.00	
4234.00	38.30	H	-57.55	12.63	8.99	-53.91	-13.00	-40.91
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dB/dBi) - Cable \text{ loss} (dB)$

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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

Operation Mode : TX CH Low Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	50.69	V	-52.04	-4.16	0.91	-57.11	-13.00	-44.11
67.83	43.17	V	-68.52	-0.95	1.14	-70.61	-13.00	-57.61
92.08	48.42	V	-54.51	-7.75	1.29	-63.55	-13.00	-50.55
101.78	46.00	V	-55.76	-7.76	1.37	-64.88	-13.00	-51.88
155.13	32.75	V	-65.00	-7.80	1.60	-74.41	-13.00	-61.41
499.04	32.45	V	-61.69	-7.72	2.80	-72.20	-13.00	-59.20
1850.00	80.21	V	-24.18	9.90	5.56	-19.84	-13.00	-6.84
3688.00	39.61	V	-58.37	12.61	8.29	-54.06	-13.00	-41.06
5543.00	44.89	V	-45.97	13.21	10.32	-43.08	-13.00	-30.08
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 Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	45.79	H	-57.40	-3.25	0.90	-61.55	-13.00	-48.55
70.74	42.15	H	-70.16	-1.18	1.16	-72.50	-13.00	-59.50
92.08	44.08	H	-59.51	-7.75	1.29	-68.55	-13.00	-55.55
104.69	42.05	H	-60.46	-7.76	1.38	-69.60	-13.00	-56.60
140.58	33.91	H	-64.85	-7.79	1.55	-74.18	-13.00	-61.18
439.34	32.48	H	-61.95	-7.69	2.63	-72.27	-13.00	-59.27
1850.00	73.94	H	-30.24	9.90	5.56	-25.90	-13.00	-12.90
3688.00	38.38	H	-59.72	12.61	8.29	-55.40	-13.00	-42.40
5543.00	40.87	H	-50.21	13.21	10.32	-47.31	-13.00	-34.31
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 Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	50.32	V	-51.85	-3.25	0.90	-55.99	-13.00	-42.99
67.83	43.66	V	-68.03	-0.95	1.14	-70.12	-13.00	-57.12
92.08	49.16	V	-53.77	-7.75	1.29	-62.81	-13.00	-49.81
101.78	46.29	V	-55.47	-7.76	1.37	-64.59	-13.00	-51.59
153.19	33.36	V	-64.22	-7.80	1.60	-73.62	-13.00	-60.62
458.74	32.48	V	-61.49	-7.70	2.68	-71.87	-13.00	-58.87
3793.00	34.93	V	-62.58	12.60	8.43	-58.41	-13.00	-45.41
5634.00	41.17	V	-49.43	13.35	10.41	-46.48	-13.00	-33.48
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 Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	45.93	H	-57.26	-3.25	0.90	-61.41	-13.00	-48.41
70.74	42.64	H	-69.67	-1.18	1.16	-72.01	-13.00	-59.01
92.08	44.13	H	-59.46	-7.75	1.29	-68.50	-13.00	-55.50
140.58	33.61	H	-65.15	-7.79	1.55	-74.48	-13.00	-61.48
478.14	32.80	H	-60.84	-7.71	2.74	-71.29	-13.00	-58.29
737.13	33.18	H	-61.39	-7.87	3.42	-72.68	-13.00	-59.68
3758.00	37.65	H	-60.13	12.60	8.39	-55.92	-13.00	-42.92
5634.00	41.57	H	-49.20	13.35	10.41	-46.26	-13.00	-33.26
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  $ERP/EIRP \text{ (dBm)} = SG \text{ Setting(dBm)} + \text{Antenna Gain (dB/dBi)} - \text{Cable loss (dB)}$

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

Operation Mode : TX CH High Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	50.06	V	-52.67	-4.16	0.91	-57.74	-13.00	-44.74
67.83	42.94	V	-68.75	-0.95	1.14	-70.84	-13.00	-57.84
92.08	49.06	V	-53.87	-7.75	1.29	-62.91	-13.00	-49.91
104.69	45.57	V	-55.92	-7.76	1.38	-65.06	-13.00	-52.06
465.53	33.23	V	-60.77	-7.71	2.70	-71.17	-13.00	-58.17
662.44	32.69	V	-56.36	-7.82	3.19	-67.37	-13.00	-54.37
1910.00	77.37	V	-26.96	10.08	5.66	-22.54	-13.00	-9.54
3814.00	36.09	V	-61.33	12.60	8.46	-57.19	-13.00	-44.19
5718.00	40.52	V	-49.83	13.48	10.49	-46.84	-13.00	-33.84
7629.00	37.38	V	-43.12	11.41	12.27	-43.98	-13.00	-30.98
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 Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	46.33	H	-56.86	-3.25	0.90	-61.01	-13.00	-48.01
56.19	38.33	H	-71.31	-0.51	1.09	-72.91	-13.00	-59.91
70.74	41.81	H	-70.50	-1.18	1.16	-72.84	-13.00	-59.84
92.08	43.65	H	-59.94	-7.75	1.29	-68.98	-13.00	-55.98
318.09	32.84	H	-64.65	-7.82	2.24	-74.71	-13.00	-61.71
565.44	32.93	H	-58.48	-7.77	2.98	-69.23	-13.00	-56.23
1910.00	83.81	H	-20.30	10.08	5.66	-15.88	-13.00	-2.88
3814.00	36.01	H	-61.52	12.60	8.46	-57.38	-13.00	-44.38
5718.00	42.10	H	-48.39	13.48	10.49	-45.40	-13.00	-32.40
7629.00	35.48	H	-44.97	11.41	12.27	-45.82	-13.00	-32.82
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: HSUPA BandV Mode (Worst Case)

Operation Mode : TX CH Low Mode

Test Date: Aug. 20, 2010

Fundamental Frequency : 826.4 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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	50.16	V	-52.57	-4.16	0.91	-57.64	-13.00	-44.64
67.83	44.16	V	-67.53	-0.95	1.14	-69.62	-13.00	-56.62
90.14	47.83	V	-55.35	-7.75	1.27	-64.37	-13.00	-51.37
101.78	46.55	V	-55.21	-7.76	1.37	-64.33	-13.00	-51.33
153.19	33.20	V	-64.38	-7.80	1.60	-73.78	-13.00	-60.78
431.58	36.48	V	-58.03	-7.69	2.60	-68.32	-13.00	-55.32
824.00	69.81	V	-16.58	-7.87	3.62	-28.08	-13.00	-15.08
1644.00	39.25	V	-65.34	9.27	5.22	-61.28	-13.00	-48.28
2479.20	35.80	V	-65.16	10.07	6.54	-61.63	-13.00	-48.63
3305.60	35.18	V	-63.69	12.19	7.73	-59.23	-13.00	-46.23
4132.00	---	V		12.62	8.87		-13.00	
4958.40	---	V		12.65	9.75		-13.00	
5784.80	---	V		13.58	10.55		-13.00	
6611.20	---	V		12.03	11.31		-13.00	
7437.60	---	V		11.48	12.12		-13.00	
8264.00	---	V		11.50	12.73		-13.00	

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

#### Remark:

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

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

Operation Mode : TX CH Low Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	45.32	H	-57.87	-3.25	0.90	-62.02	-13.00	-49.02
70.74	44.03	H	-68.28	-1.18	1.16	-70.62	-13.00	-57.62
90.14	44.22	H	-59.51	-7.75	1.27	-68.53	-13.00	-55.53
104.69	41.13	H	-61.38	-7.76	1.38	-70.52	-13.00	-57.52
155.13	33.56	H	-64.61	-7.80	1.60	-74.01	-13.00	-61.01
546.04	33.56	H	-58.30	-7.76	2.95	-69.00	-13.00	-56.00
824.00	62.19	H	-24.08	-7.87	3.62	-35.58	-13.00	-22.58
1644.00	37.05	H	-67.36	9.27	5.22	-63.30	-13.00	-50.30
2463.00	36.61	H	-64.36	10.08	6.51	-60.80	-13.00	-47.80
3324.00	35.92	H	-63.16	12.23	7.76	-58.69	-13.00	-45.69
4132.00	---	H		12.62	8.87		-13.00	
4958.40	---	H		12.65	9.75		-13.00	
5784.80	---	H		13.58	10.55		-13.00	
6611.20	---	H		12.03	11.31		-13.00	
7437.60	---	H		11.48	12.12		-13.00	
8264.00	---	H		11.50	12.73		-13.00	

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

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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

Operation Mode : TX CH Mid Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	49.67	V	-53.06	-4.16	0.91	-58.13	-13.00	-45.13
67.83	44.05	V	-67.64	-0.95	1.14	-69.73	-13.00	-56.73
90.14	47.20	V	-55.98	-7.75	1.27	-65.00	-13.00	-52.00
101.78	46.45	V	-55.31	-7.76	1.37	-64.43	-13.00	-51.43
162.89	33.90	V	-64.55	-7.81	1.62	-73.98	-13.00	-60.98
657.59	33.54	V	-55.46	-7.82	3.18	-66.46	-13.00	-53.46
1673.20	36.67	V	-67.89	9.36	5.27	-63.79	-13.00	-50.79
2509.80	35.71	V	-65.07	10.09	6.58	-61.57	-13.00	-48.57
3394.00	36.67	V	-62.18	12.38	7.86	-57.67	-13.00	-44.67
4183.00	---	V		12.62	8.93		-13.00	
5019.60	---	V		12.67	9.81		-13.00	
5856.20	---	V		13.68	10.62		-13.00	
6692.80	---	V		11.95	11.39		-13.00	
7529.40	---	V		11.45	12.20		-13.00	
8366.00	---	V		11.59	12.81		-13.00	

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

**Remark:**

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

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

Operation Mode : TX CH Mid Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	45.28	H	-57.91	-3.25	0.90	-62.06	-13.00	-49.06
70.74	44.37	H	-67.94	-1.18	1.16	-70.28	-13.00	-57.28
90.14	43.59	H	-60.14	-7.75	1.27	-69.16	-13.00	-56.16
104.69	41.18	H	-61.33	-7.76	1.38	-70.47	-13.00	-57.47
155.13	33.06	H	-65.11	-7.80	1.60	-74.51	-13.00	-61.51
266.68	33.88	H	-64.82	-7.90	2.05	-74.77	-13.00	-61.77
1673.20	36.23	H	-68.15	9.36	5.27	-64.05	-13.00	-51.05
2509.80	35.30	H	-65.40	10.09	6.58	-61.90	-13.00	-48.90
3346.40	35.05	H	-64.01	12.28	7.79	-59.53	-13.00	-46.53
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  $ERP/EIRP \text{ (dBm)} = SG \text{ Setting(dBm)} + \text{Antenna Gain (dB/dBi)} - \text{Cable loss (dB)}$

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

Operation Mode : TX CH High Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	50.30	V	-52.43	-4.16	0.91	-57.50	-13.00	-44.50
67.83	44.38	V	-67.31	-0.95	1.14	-69.40	-13.00	-56.40
90.14	47.77	V	-55.41	-7.75	1.27	-64.43	-13.00	-51.43
101.78	46.33	V	-55.43	-7.76	1.37	-64.55	-13.00	-51.55
153.19	33.64	V	-63.94	-7.80	1.60	-73.34	-13.00	-60.34
470.38	33.05	V	-60.97	-7.71	2.72	-71.39	-13.00	-58.39
850.00	68.32	V	-17.79	-7.88	3.68	-29.35	-13.00	-16.35
1749.00	38.07	V	-66.42	9.59	5.39	-62.22	-13.00	-49.22
2519.00	37.93	V	-62.82	10.12	6.60	-59.30	-13.00	-46.30
3386.40	34.51	V	-64.34	12.36	7.85	-59.83	-13.00	-46.83
4233.00	---	V		12.63	8.99		-13.00	
5079.60	---	V		12.73	9.87		-13.00	
5926.20	---	V		13.79	10.69		-13.00	
6772.80	---	V		11.87	11.47		-13.00	
7619.40	---	V		11.41	12.26		-13.00	
8466.00	---	V		11.68	12.89		-13.00	

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: HSUPA V Mode**

Operation Mode : TX CH High Mode

Test Date: Aug. 20, 2010

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 (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	45.63	H	-57.56	-3.25	0.90	-61.71	-13.00	-48.71
70.74	44.35	H	-67.96	-1.18	1.16	-70.30	-13.00	-57.30
90.14	44.25	H	-59.48	-7.75	1.27	-68.50	-13.00	-55.50
101.78	41.46	H	-61.35	-7.76	1.37	-70.48	-13.00	-57.48
155.13	33.03	H	-65.14	-7.80	1.60	-74.54	-13.00	-61.54
426.73	33.68	H	-61.39	-7.68	2.59	-71.66	-13.00	-58.66
850.00	60.92	H	-25.27	-7.88	3.68	-36.83	-13.00	-23.83
1693.20	36.30	H	-68.05	9.42	5.30	-63.93	-13.00	-50.93
2539.80	36.00	H	-64.62	10.18	6.62	-61.06	-13.00	-48.06
3386.40	34.68	H	-64.35	12.36	7.85	-59.84	-13.00	-46.84
4233.00	---	H		12.63	8.99		-13.00	
5079.60	---	H		12.73	9.87		-13.00	
5926.20	---	H		13.79	10.69		-13.00	
6772.80	---	H		11.87	11.47		-13.00	
7619.40	---	H		11.41	12.26		-13.00	
8466.00	---	H		11.68	12.89		-13.00	

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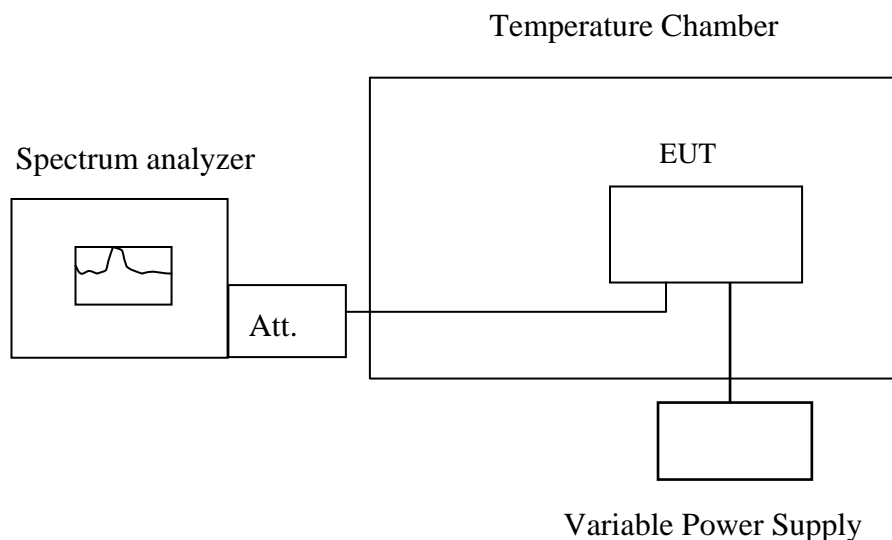
## 10. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

### 10.1 Standard Applicable

According to FCC §2.1055(a)(1)

Frequency Tolerance:  $\pm 2.5$  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 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to  $-30^{\circ}\text{C}$ . After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with  $10^{\circ}\text{C}$  increased per stage until the highest temperature of  $+50^{\circ}\text{C}$  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 <sup>°C</sup>				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.9	-30	836.59999	-15.00	2091
3.9	-20	836.599984	-9.00	2091
3.9	-10	836.599987	-12.00	2091
3.9	0	836.599978	-3.00	2091
3.9	10	836.599982	-7.00	2091
3.9	20	836.599975	0.00	2091
3.9	30	836.599981	-6.00	2091
3.9	40	836.599971	4.00	2091
3.9	50	836.599983	-8.00	2091

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)		
3.9	-30	1879.999968	-7.00	4700
3.9	-20	1879.999957	4.00	4700
3.9	-10	1879.999934	27.00	4700
3.9	0	1879.999947	14.00	4700
3.9	10	1879.999971	-10.00	4700
3.9	20	1879.999961	0.00	4700
3.9	30	1879.999972	-11.00	4700
3.9	40	1879.999956	5.00	4700
3.9	50	1879.999962	-1.00	4700

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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)		
3.9	-30	836.599992	5.00	2091
3.9	-20	836.599985	12.00	2091
3.9	-10	836.599991	6.00	2091
3.9	0	836.599994	3.00	2091
3.9	10	836.599998	-1.00	2091
3.9	20	836.599997	0.00	2091
3.9	30	836.599986	11.00	2091
3.9	40	836.599981	16.00	2091
3.9	50	836.599999	-2.00	2091

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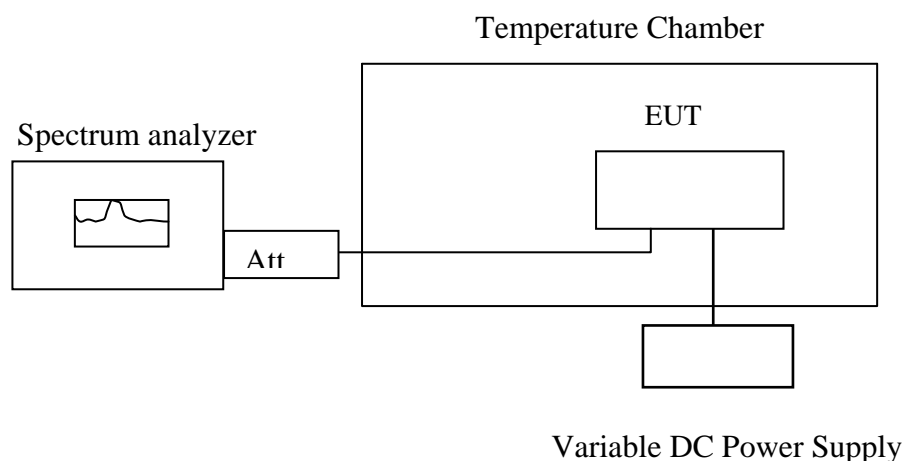
## 11. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

### 11.1 Standard Applicable

According to FCC §2.1055(d)(2)

Frequency Tolerance: +/- 2.5 ppm

### 11.2 Test Set-up:



*Note: Measurement setup for testing on Antenna connector*

### 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	836.599979	-4.00	2091.00
3.9	25.00	836.599975	0.00	2091.00
3.315	25.00	836.599971	4.00	2091.00
2.8 (End Point)	25.00	836.599618	357.00	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)		
4.2	25	1879.999974	-13.00	4700
3.9	25	1879.999961	0.00	4700
3.315	25	1879.999977	-16.00	4700
2.8 (Endpoint)	25	1879.999071	890.00	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	836.5999990	-2.00	2091
3.9	25	836.5999970	0.00	2091
3.315	25	836.6000030	-6.00	2091
2.8 (Endpoint)	25	836.5999910	6.00	2091

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