

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

**Product Name:** Smartphone

**Brand Name:** HTC

**Model Name:** PG59100

**Model Difference:** N/A

**FCC ID:** NM8PG59100

**Report No.:** EH/2011/20015

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

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## Version

Version No.	Date	Description
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## 1. GENERAL PRODUCT INFORMATION

### General:

Product Name:	Smartphone	
Brand Name:	HTC	
Model Name:	PG59100	
Model Difference:	N/A	
Data Cable (USB):	<ol style="list-style-type: none"> <li>1. M/N: DC M420, Supplier: MEC</li> <li>2. M/N: DC M420, Supplier: Chant Sincere Co., LTD (COXOC)</li> <li>3. M/N: DC M410, Supplier: Chant Sincere Co., LTD (COXOC)</li> <li>4. M/N: DC M410, Supplier: Foxlink</li> <li>5. M/N: DC M410, Supplier: MEC</li> </ol>	
SHF:	<ol style="list-style-type: none"> <li>1. M/N: RC E170, Supplier: COTRON Corporation (Cotron)</li> <li>2. M/N: RC E160, Supplier: Foster</li> <li>3. M/N: RC E160, Supplier: Merry</li> <li>4. M/N: RC E160, Supplier: Cotron</li> </ol>	
Power Supply	3.7 Vdc re-chargeable battery or 5Vdc by AC/DC power adapter	
	Battery:	<ol style="list-style-type: none"> <li>1. M/N: BG58100, Supplier: HT ENERGY</li> <li>2. M/N: BG58100, Supplier: TOTAL WIRELESS SOLUTIONS INDUSTRIAL Ltd. (TWS)</li> <li>3. M/N: BG58100, Supplier: Samsung SDI</li> </ol>
	Adapter:	<ol style="list-style-type: none"> <li>1. M/N: TC U260, Supplier: DELTA Electronics Inc (Delta)</li> <li>2. M/N: TC U250, Supplier: Delta</li> <li>3. M/N: TC U250, Supplier: Emerson</li> <li>4. M/N: TC U250, Supplier: Phihong</li> </ol>

### Other Source:

Camera:	<ol style="list-style-type: none"> <li>1. M/N: 11P1BA806, Supplier: Lite-On technology Corp. (LiteOn)</li> <li>2. M/N: CMHT-8AA02D, Supplier: Foxconn</li> </ol>
Video Camera:	<ol style="list-style-type: none"> <li>1. M/N: 10P1BF007, Supplier: Lite-On technology Corp. (LiteOn)</li> <li>2. M/N: FM03FF-290H, Supplier: FOXLINK Technology Ltd (Foxlink)</li> </ol>

The EUT is compliance with Bluetooth 3.0 and IEEE 802.11 b/g/n Standard.

GSM and WCDMA:

Cellular Phone Standards Frequency Range and Power:	Operating Frequency		Rated Power
	GSM/GPRS/EDGE 850, Class 10	824.2 MHz– 848.8 MHz	33 dBm
	GSM/GPRS / EDGE1900, Class 10	1850.2MHz – 1909.8MHz	30 dBm
	WCDMA/HSUPA Band IV	1712.4MHz–1752.6MHz	23.5 dBm
IMEI:	355213040018095		

WLAN:

Wi-Fi	Frequency Range	Channels	Rated Power	Modulation Technology	Type of Emission
11b/g	2412-2462	11	b : 22.01dBm g : 17.30dBm	DSSS, OFDM	b : 8M15G1D g : 15M23G1D
11n	HT20 2412-2462	11	n : 17.30dBm	OFDM	15M23G1D
Antenna Designation:			PIFA Antenna with 0.52 dBi peak gain		
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 802.11 n 20MHz: 6.5 – 65Mbps		

Bluetooth:

Bluetooth Version:	<input type="checkbox"/> V1.1 (GFSK) <input type="checkbox"/> V1.2 (GFSK) <input type="checkbox"/> V2.0 (GFSK) <input type="checkbox"/> V2.0 + EDR (GFSK + $\pi/4$ DQPSK + 8DPSK) <input type="checkbox"/> V2.1 + EDR (GFSK + $\pi/4$ DQPSK + 8DPSK) <input checked="" type="checkbox"/> V3.0
Channel number:	79 channels
Modulation type:	GFSK + $\pi/4$ DQPSK + 8DPSK
Output Power:	-0.62 dBm (Max. EDR mode)
Frequency Range:	2.402GHz – 2.480GHz
Dwell Time:	<= 0.4s
Operating Mode:	Point-to-Point
Antenna Designation:	PIFA Antenna with 0.52 dBi peak gain

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Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GSM 850	3.7 Vdc	420
DCS 1900	3.7 Vdc	530
EDGE 850	3.7 Vdc	360
EDGE 1900	3.7 Vdc	460
WCDMA B4	3.7 Vdc	660
HSUPA B4	3.7 Vdc	695

This test report applies for GSM/GPRS/EDGE 850/1900, WCDMA/HSUPA band IV.

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

This submittal(s) (test report) is intended for **FCC ID: NM8PG59100** filing to comply with Section Part 22 subpart H, Part 24 subpart E and Part 27 of the FCC CFR 47 Rules.

### 1.2. Test Methodology

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

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

### 1.3. Test Facility

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

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

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

### 1.4. Special Accessories

Not available for this EUT intended for grant.

### 1.5. Equipment Modifications

Not available for this EUT intended for grant.

## 2. SYSTEM TEST CONFIGURATION

### 2.1. EUT Configuration

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

### 2.2. EUT Exercise

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

### 2.3. Test Procedure

#### 2.3.1 AC Power Line Conducted Emissions

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

#### 2.3.2 Conducted Measurement at Antenna Port:

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

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

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

**2.4. Measurement Equipment Used:**

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2010	04/18/2012
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2010	01/22/2012
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2010	05/13/2012
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2011	01/04/2012
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2011	01/04/2012
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2010	04/13/2012
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/05/2010	02/04/2012
DC Block	Agilent	BLK-18	155452	07/05/2010	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	HP	6038A	2929A-07548	06/27/2010	06/26/2011
DC Power Supply	Topward	3303D	981327	10/26/2010	10/25/2011

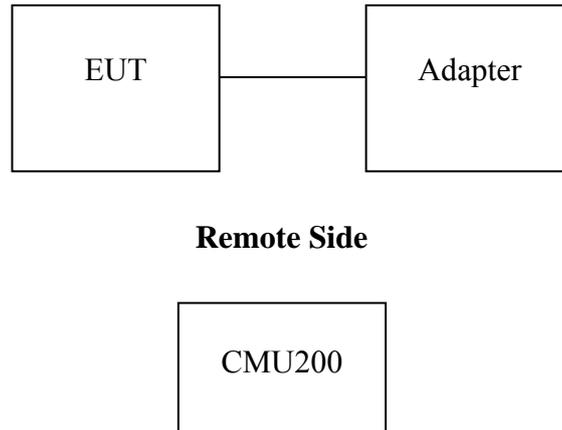
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ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2012
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2010	11/14/2011
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/10/2010	07/09/2012
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/10/2010	07/09/2012
Hor.n antenna	SCHWAZBECK	BBHA 9120D	309/320	01/22/2010	01/21/2012
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2010	05/08/2012
Signal Generator	R&S	SMR40	100210	01/22/2010	01/21/2012
Signal Generator	Agilent	E4438C	MY45093613	06/11/2010	06/10/2011
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2010	11/29/2011
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2011	01/04/2012
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	102189	05/13/2010	05/12/2012
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2011	01/04/2012
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2011	01/04/2012
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2011	01/04/2012
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2011	01/04/2012
3m Site	SGS	966 chamber	N/A	11/08/2010	11/09/2011

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## 2.5. Configuration of Tested System

**Fig. 2-1 Configuration of Tested System (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	shielded	Un-shielded

### 3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§2.1046(a) §22.913(a)(2) §24.232(c) §27.50(d)(2)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% Occupied Bandwidth	Compliant
§2.1051 §22.917(a) §24.238(a) §27.53(g)	Out of Band Emissions at Antenna Terminals and Band Edge	Compliant
§2.1053 §22.917(a) §24.238(a) §27.53(g)	Field Strength of Spurious Radiation	Compliant
§2.1055(a)(1) §22.355 §24.235 §27.54	Frequency Stability vs. Temperature	Compliant
§2.1055(d)(2) §22.355 §24.235 §27.54	Frequency Stability vs. Voltage	Compliant
§15.107;§15.207	AC Power Line Conducted Emission	Compliant

Max ERP/EIRP measurement result:

	dBm		W
GSM 850 Band	31.75	ERP	1.496
GSM 1900 Band	28.49	EIRP	0.706
EDGE 850 Band	27.09	ERP	0.512
EDGE 1900 Band	25.61	EIRP	0.364
WCDMA Band IV	20.20	EIRP	0.105
HSUPA Band IV	20.59	EIRP	0.115

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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 type band with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position(H mode)and lie down position (E1, E2 mode) for GSM/EDGE and WCDMA Band IV with power adaptor.The worst-case of E2 position for GSM850/ GSM1900/ WCDMA Band IV /HSUPA Band IV band were reported.

## 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

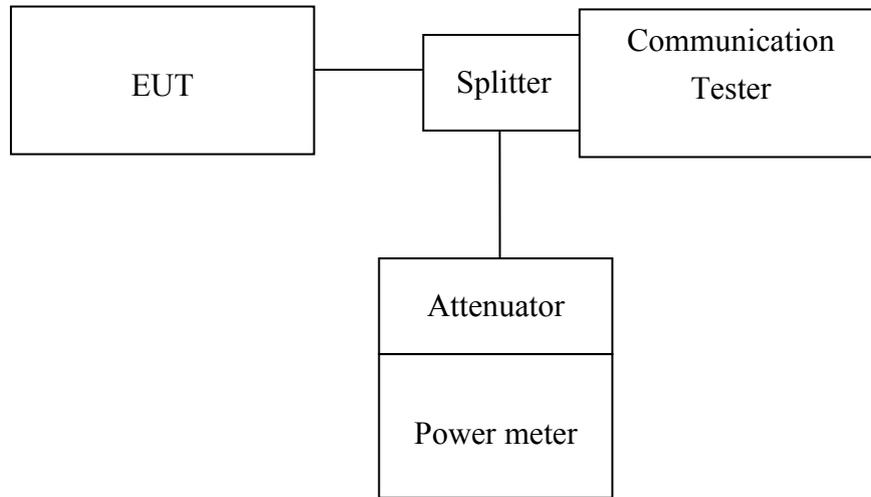
#### Maximum Output Powers for HSDPA

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

## 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

**5.5 Measurement Result:**

**5.1 RF Conducted Output Power**

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

**Result:**

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Average Power (dBm)
GSM 850	824.2	128	34.40	33.50
	836.6	190	34.60	33.60
	848.8	251	34.30	33.50

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Average Power (dBm)
GSM 1900	1850.2	512	29.20	28.90
	1880.0	661	29.20	28.90
	1909.8	810	29.20	28.90

EUT Mode	Frequency (MHz)	CH	Peak Power (1TS) (dBm)	Peak Power (2TS) (dBm)
GPRS 850	824.2	128	34.30	34.20
	836.6	190	34.50	34.40
	848.8	251	34.20	34.50

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EUT Mode	Frequency (MHz)	CH	Average Power (1TS) (dBm)	Average Power (2TS) (dBm)
GPRS 850	824.2	128	33.40	33.20
	836.6	190	33.50	33.40
	848.8	251	33.50	33.50

EUT Mode	Frequency (MHz)	CH	Peak Power (1TS) (dBm)	Peak Power (2TS) (dBm)
EDGE 850	824.2	128	29.50	28.30
	836.6	190	29.70	28.50
	848.8	251	29.70	28.50

EUT Mode	Frequency (MHz)	CH	Average Power (1TS) (dBm)	Average Power (2TS) (dBm)
EDGE 850	824.2	128	26.30	25.10
	836.6	190	26.40	25.20
	848.8	251	26.40	25.20

EUT Mode	Frequency (MHz)	CH	Peak Power (1TS) (dBm)	Peak Power (2TS) (dBm)
GPRS 1900	1850.2	512	29.20	29.20
	1880.0	661	29.20	29.20
	1909.8	810	29.20	29.20

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EUT Mode	Frequency (MHz)	CH	Average Power (1TS) (dBm)	Average Power (2TS) (dBm)
GPRS 1900	1850.2	512	28.90	28.90
	1880.0	661	28.90	28.90
	1909.8	810	28.90	28.90

EUT Mode	Frequency (MHz)	CH	Peak Power (1TS) (dBm)	Peak Power (2TS) (dBm)
EDGE 1900	1850.2	512	28.20	27.10
	1880.0	661	28.20	27.00
	1909.8	810	28.10	26.90

EUT Mode	Frequency (MHz)	CH	Average Power (1TS) (dBm)	Average Power (2TS) (dBm)
EDGE 1900	1850.2	512	25.00	23.90
	1880.0	661	24.90	23.80
	1909.8	810	24.80	23.70

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Average Power (dBm)
HSUPA Band 4	1712.4	1312	25.86	22.48
	1732.6	1413	25.98	22.52
	1752.6	1513	25.78	22.27

offset : 0.5 dBm

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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 IV	1712.4	1312	26.45	23.82
	1732.6	1413	26.39	23.56
	1752.6	1513	26.17	23.33

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

**5.1.3. Maximum Power Reduction: PCS1900 band**

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.2	27	24.9	22.9	20.7	19.2	16.9	15.3	13.2
PCL	9	10	11	12	13	14	15		
Output power (dBm)	11.1	9.4	7.4	5.4	3.3	1.3	-0.8		

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

## 6. ERP, EIRP MEASUREMENT

### 6.1. Standard Applicable:

According to FCC §2.1046

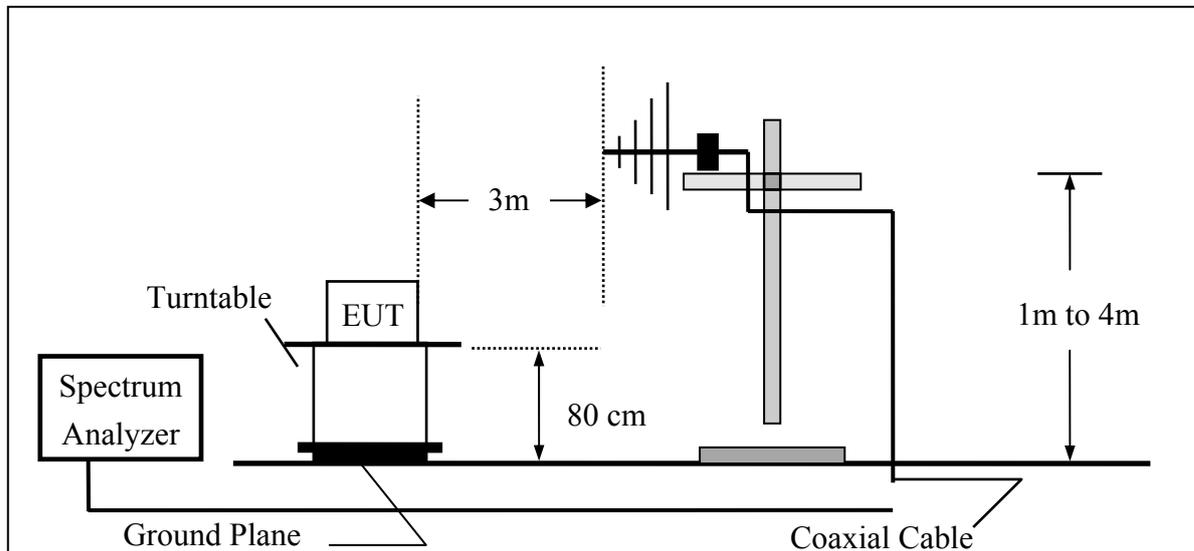
FCC 22.913(a) Mobile station are limited to 7W ERP.

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

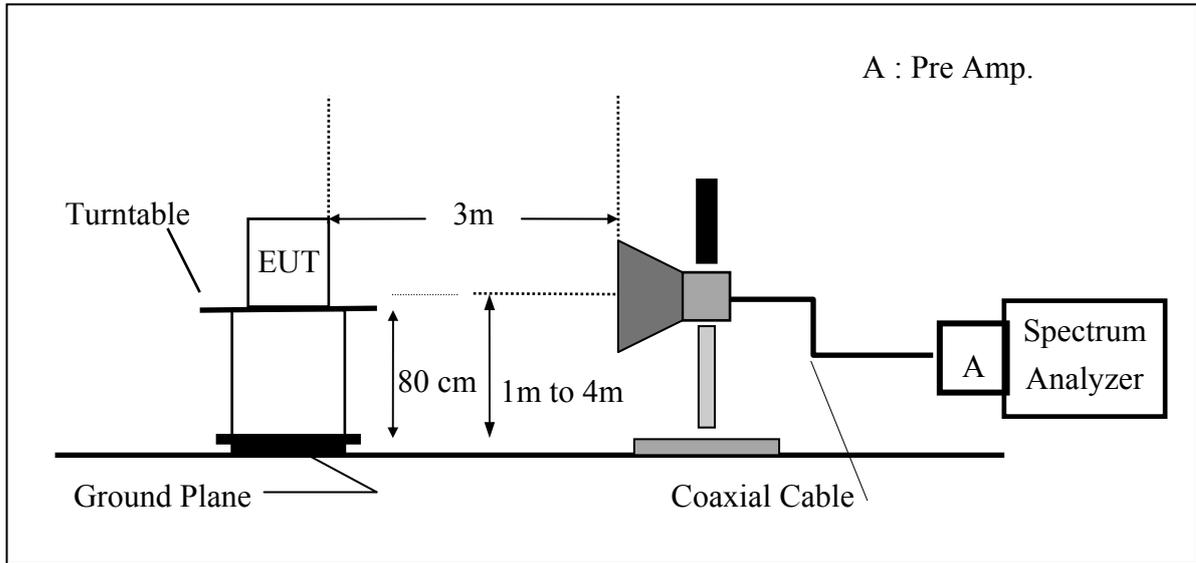
FCC 27.50(d)(2) Fixed, mobile, and portable (hand-held) stations are limited to 1W EIRP.

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

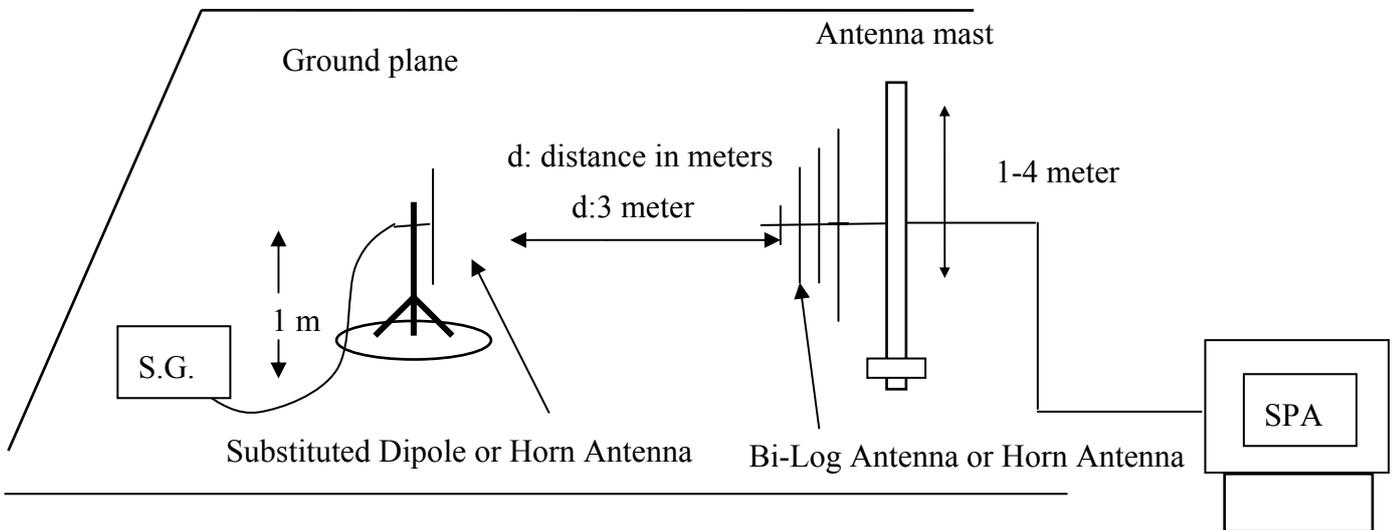
(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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



(C) Substituted Method Test Set-UP



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### 6.3. Measurement Procedure:

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

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

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

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

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

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

### 6.4. Measurement Equipment Used:

Refer to section 2.4 in this report

**6.5. Measurement Result:**

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
GSM 850	824.20	128	H	V	127.99	41.60	-7.87	3.62	30.10	38.45
				H	124.67	38.40	-7.87	3.62	26.90	38.45
			E1	V	120.57	34.18	-7.87	3.62	22.68	38.45
				H	128.71	42.44	-7.87	3.62	30.94	38.45
			E2	V	118.97	32.58	-7.87	3.62	21.08	38.45
				H	129.52	43.25	-7.87	3.62	<b>31.75</b>	38.45
	836.60	190	H	V	127.91	41.66	-7.88	3.65	30.13	38.45
				H	124.51	38.28	-7.88	3.65	26.75	38.45
			E1	V	120.94	34.69	-7.88	3.65	23.16	38.45
				H	128.25	42.02	-7.88	3.65	30.49	38.45
			E2	V	118.20	31.95	-7.88	3.65	20.42	38.45
				H	128.88	42.65	-7.88	3.65	31.12	38.45
	848.80	251	H	V	127.94	41.82	-7.88	3.68	30.26	38.45
				H	124.51	38.32	-7.88	3.68	26.76	38.45
			E1	V	121.17	35.05	-7.88	3.68	23.49	38.45
				H	128.24	42.05	-7.88	3.68	30.49	38.45
			E2	V	117.33	31.21	-7.88	3.68	19.65	38.45
				H	128.06	41.87	-7.88	3.68	30.31	38.45

**Remark :**

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

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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	127.16	22.77	9.90	5.56	27.11	33.00
				H	128.06	23.88	9.90	5.56	28.22	33.00
			E1	V	127.83	23.44	9.90	5.56	27.78	33.00
				H	122.47	18.29	9.90	5.56	22.63	33.00
			E2	V	123.83	19.44	9.90	5.56	23.78	33.00
				H	126.71	22.53	9.90	5.84	26.59	33.00
	1880.00	661	H	V	127.19	22.83	9.99	5.61	27.21	33.00
				H	128.14	24.00	9.99	5.61	28.37	33.00
			E1	V	128.16	23.80	9.99	5.61	28.18	33.00
				H	122.03	17.89	9.99	5.61	22.26	33.00
			E2	V	124.49	20.13	9.99	5.61	24.51	33.00
				H	127.20	23.06	9.99	5.61	27.43	33.00
	1909.80	810	H	V	126.69	22.36	10.08	5.66	26.78	33.00
				H	127.82	23.71	10.08	5.66	28.13	33.00
			E1	V	127.96	23.63	10.08	5.66	28.05	33.00
				H	121.41	17.30	10.08	5.66	21.72	33.00
			E2	V	124.93	20.60	10.08	5.66	25.02	33.00
				H	128.18	24.07	10.08	5.66	<b>28.49</b>	33.00

**Remark :**

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

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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	124.63	38.24	-7.87	3.62	26.74	38.45
				H	120.76	34.49	-7.87	3.62	22.99	38.45
			E1	V	116.59	30.20	-7.87	3.62	18.70	38.45
				H	123.46	37.19	-7.87	3.62	25.69	38.45
			E2	V	119.60	33.21	-7.87	3.62	21.71	38.45
				H	124.83	38.56	-7.87	3.62	27.06	38.45
	836.60	190	H	V	124.21	37.96	-7.88	3.65	26.43	38.45
				H	120.55	34.32	-7.88	3.65	22.79	38.45
			E1	V	117.10	30.85	-7.88	3.65	19.32	38.45
				H	123.53	37.30	-7.88	3.65	25.77	38.45
			E2	V	120.36	34.11	-7.88	3.65	22.58	38.45
				H	124.08	37.85	-7.88	3.65	26.32	38.45
	848.80	251	H	V	124.77	38.65	-7.88	3.68	<b>27.09</b>	38.45
				H	120.97	34.78	-7.88	3.68	23.22	38.45
			E1	V	117.20	31.08	-7.88	3.68	19.52	38.45
				H	123.15	36.96	-7.88	3.68	25.40	38.45
			E2	V	118.17	32.05	-7.88	3.68	20.49	38.45
				H	124.26	38.07	-7.88	3.68	26.51	38.45

**Remark :**

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

RBW=300 KHz, VBW=1MHz

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EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
EDGE 1900	1850.20	512	H	V	124.55	20.16	9.90	5.56	24.50	33.00
				H	119.17	14.99	9.90	5.56	19.33	33.00
			E1	V	125.66	21.27	9.90	5.56	<b>25.61</b>	33.00
				H	124.33	20.15	9.90	5.56	24.49	33.00
			E2	V	117.35	12.96	9.90	5.56	17.30	33.00
				H	122.88	18.70	9.90	5.84	22.76	33.00
	1880.00	661	H	V	124.92	20.56	9.99	5.61	24.94	33.00
				H	121.88	17.74	9.99	5.61	22.11	33.00
			E1	V	125.57	21.21	9.99	5.61	25.59	33.00
				H	123.89	19.75	9.99	5.61	24.12	33.00
			E2	V	117.93	13.57	9.99	5.61	17.95	33.00
				H	122.85	18.71	9.99	5.61	23.08	33.00
	1909.80	810	H	V	124.91	20.58	10.08	5.66	25.00	33.00
				H	122.21	18.10	10.08	5.66	22.52	33.00
			E1	V	122.09	17.76	10.08	5.66	22.18	33.00
				H	120.99	16.88	10.08	5.66	21.30	33.00
			E2	V	117.39	13.06	10.08	5.66	17.48	33.00
				H	123.20	19.09	10.08	5.66	23.51	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 IV	1712.40	1312	H	V	118.46	11.44	9.48	5.17	15.76	33.00
				H	117.05	10.08	9.48	5.17	14.39	33.00
			E1	V	118.53	11.51	9.48	5.17	15.83	33.00
				H	116.98	10.01	9.48	5.17	14.32	33.00
			E2	V	112.05	5.03	9.48	5.17	9.35	33.00
				H	121.62	14.65	9.90	5.84	18.71	33.00
	1732.60	1413	H	V	119.30	12.29	9.54	5.20	16.63	33.00
				H	118.10	11.14	9.54	5.20	15.48	33.00
			E1	V	119.41	12.40	9.54	5.20	16.74	33.00
				H	118.18	11.22	9.54	5.20	15.56	33.00
			E2	V	112.94	5.93	9.54	5.20	10.27	33.00
				H	122.82	15.86	9.54	5.20	<b>20.20</b>	33.00
	1752.60	1513	H	V	118.55	11.55	9.60	5.24	15.92	33.00
				H	117.63	10.68	9.60	5.24	15.05	33.00
			E1	V	119.10	12.10	9.60	5.24	16.47	33.00
				H	117.69	10.74	9.60	5.24	15.11	33.00
			E2	V	112.17	5.17	9.60	5.24	9.54	33.00
				H	119.78	12.83	9.60	5.24	17.20	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 IV	1712.40	1312	H	V	118.58	11.56	9.48	5.17	15.88	33.00
				H	117.22	10.25	9.48	5.17	14.56	33.00
			E1	V	119.28	12.26	9.48	5.17	16.58	33.00
				H	117.86	10.89	9.48	5.17	15.20	33.00
			E2	V	113.28	6.26	9.48	5.17	10.58	33.00
				H	122.16	15.19	9.90	5.84	19.25	33.00
	1732.60	1413	H	V	119.54	12.53	9.54	5.20	16.87	33.00
				H	118.24	11.28	9.54	5.20	15.62	33.00
			E1	V	120.41	13.40	9.54	5.20	17.74	33.00
				H	118.92	11.96	9.54	5.20	16.30	33.00
			E2	V	113.36	6.35	9.54	5.20	10.69	33.00
				H	123.21	16.25	9.54	5.20	<b>20.59</b>	33.00
	1752.60	1513	H	V	118.95	11.95	9.60	5.24	16.32	33.00
				H	118.03	11.08	9.60	5.24	15.45	33.00
			E1	V	119.92	12.92	9.60	5.24	17.29	33.00
				H	118.11	11.16	9.60	5.24	15.53	33.00
			E2	V	112.50	5.50	9.60	5.24	9.87	33.00
				H	122.63	15.68	9.60	5.24	20.05	33.00

**Remark:**

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

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## 7. 99% OCCUPIED BANDWIDTH MEASUREMENT

### 7.1. Standard Applicable:

According to §FCC 2.1049.

### 7.2. Test Set-up:

Refer to section 5.2 in this report

### 7.3. Measurement Procedure:

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

### 7.4. Measurement Equipment Used:

Refer to section 2.4 in this report

**7.5. Measurement Result:**

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
GSM 850	824.20	128	0.2456
	836.60	190	0.2444
	848.80	251	0.2448

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
GSM 1900	1850.20	512	0.2457
	1880.00	661	0.2456
	1909.80	810	0.2461

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EDGE 850	824.20	128	0.2452
	836.60	190	0.2452
	848.80	251	0.2455

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EDGE 1900	1850.20	512	0.2444
	1880.00	661	0.2445
	1909.80	810	0.2452

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
WCDMA IV	1712.40	1312	4.1422
	1732.60	1413	4.1417
	1752.60	1513	4.1401

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
HSUPA IV	1712.40	1312	4.1404
	1732.60	1413	4.1430
	1752.60	1513	4.1481

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Figure 7-1: GSM 850 Channel Low

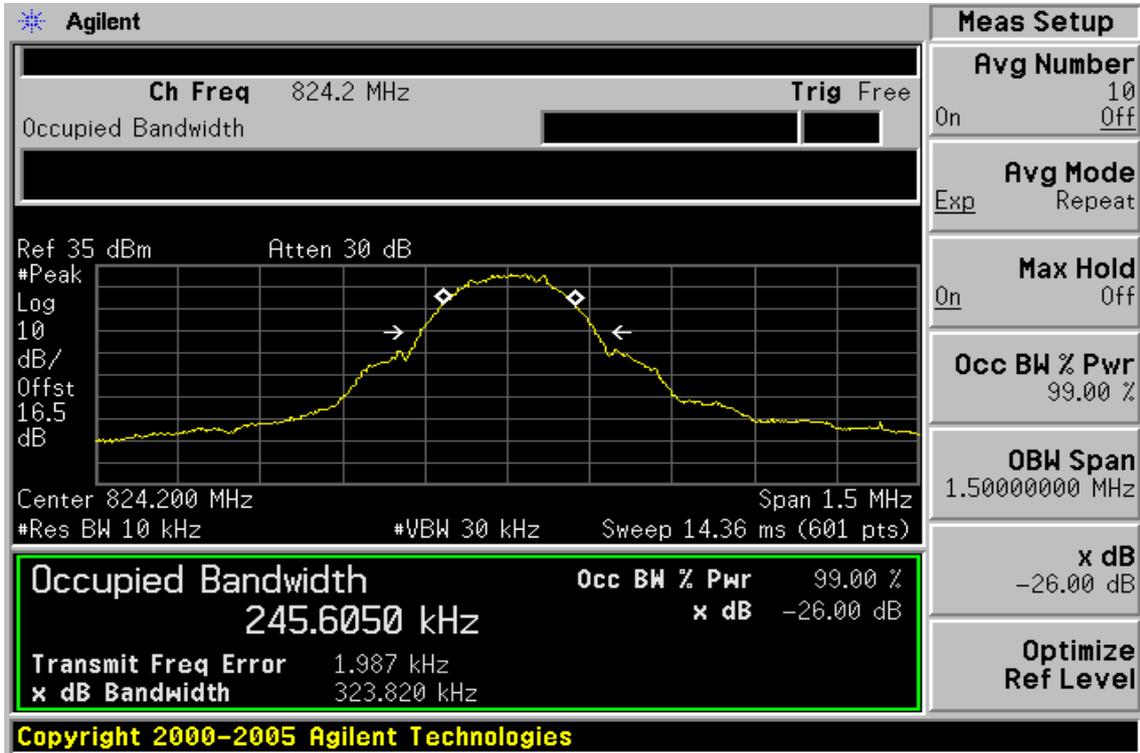
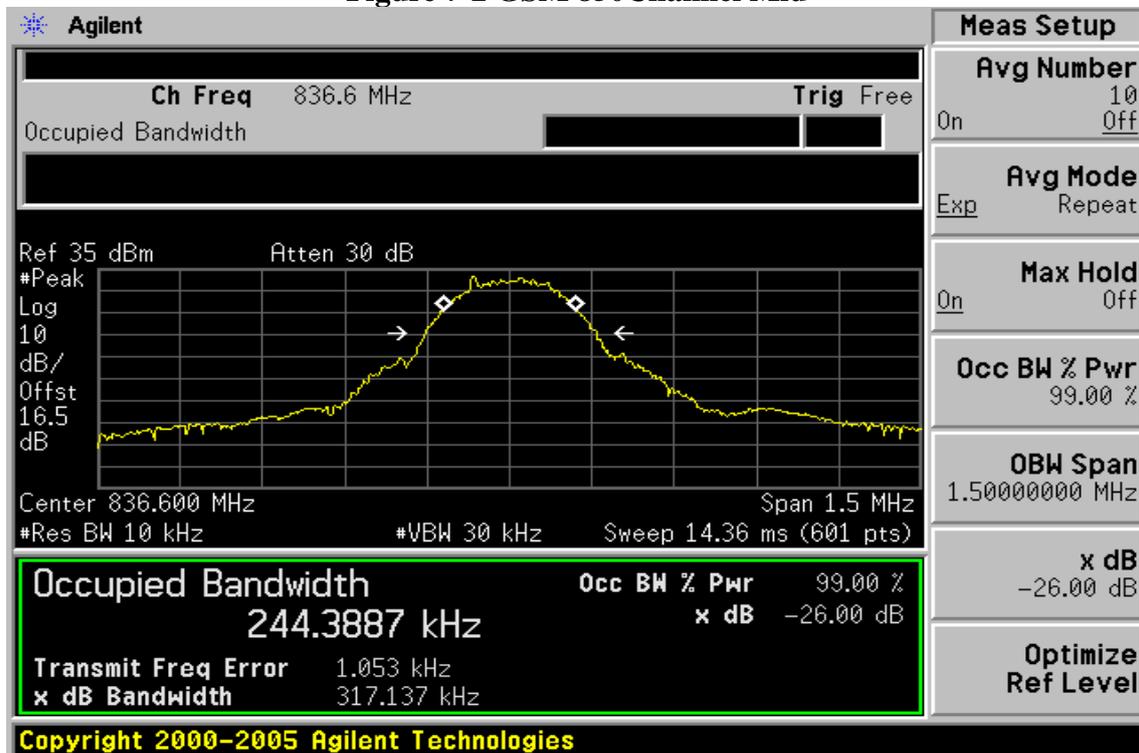


Figure 7-2 GSM 850 Channel Mid



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GPRS Figure 7-3: GSM 850 Channel High

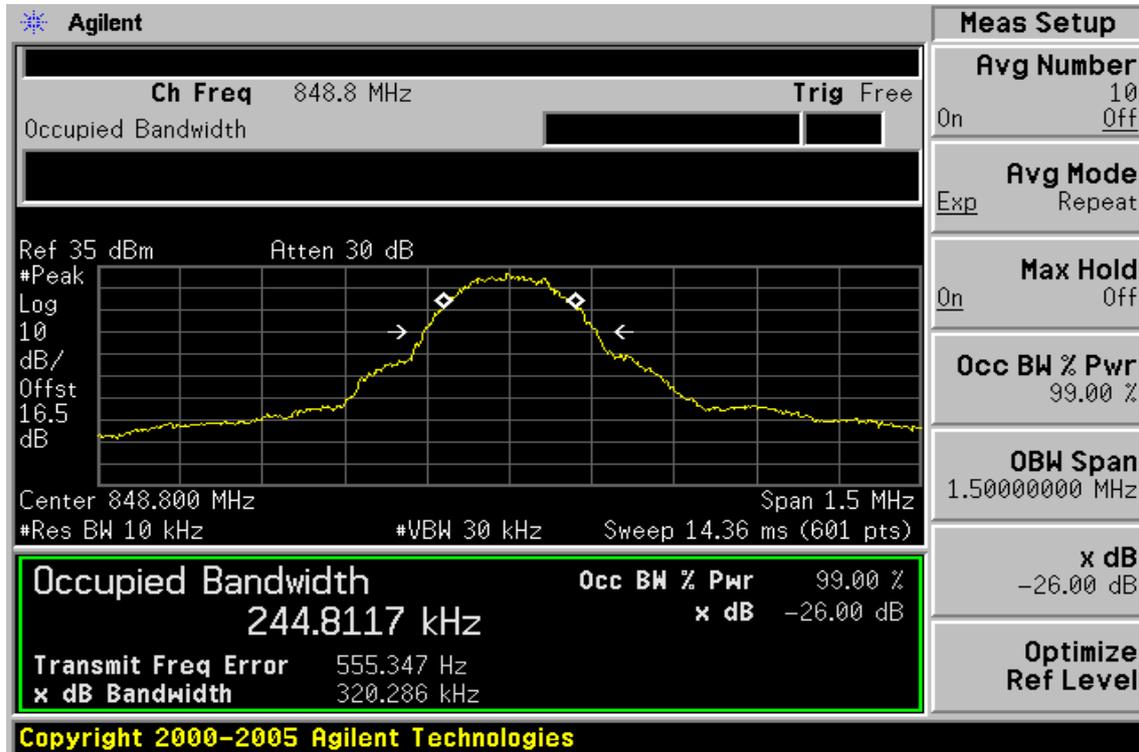
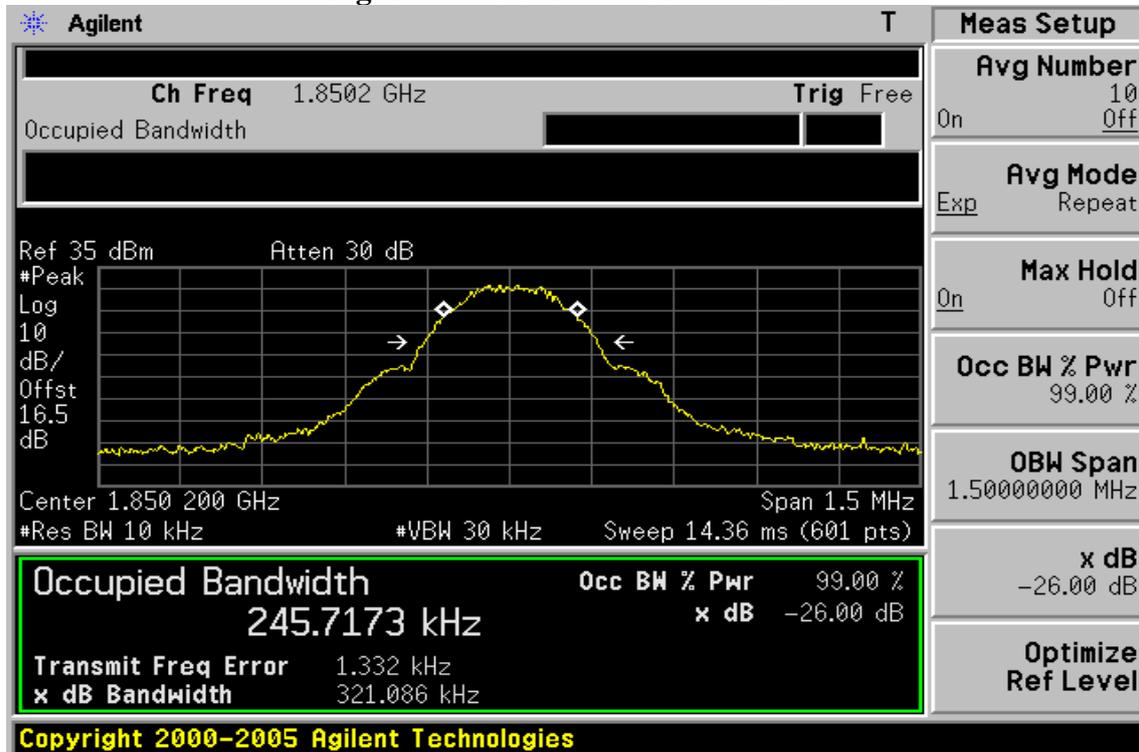


Figure 7-4: GSM 1900 Channel Low



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Figure 7-5 GSM 1900 Channel Mid

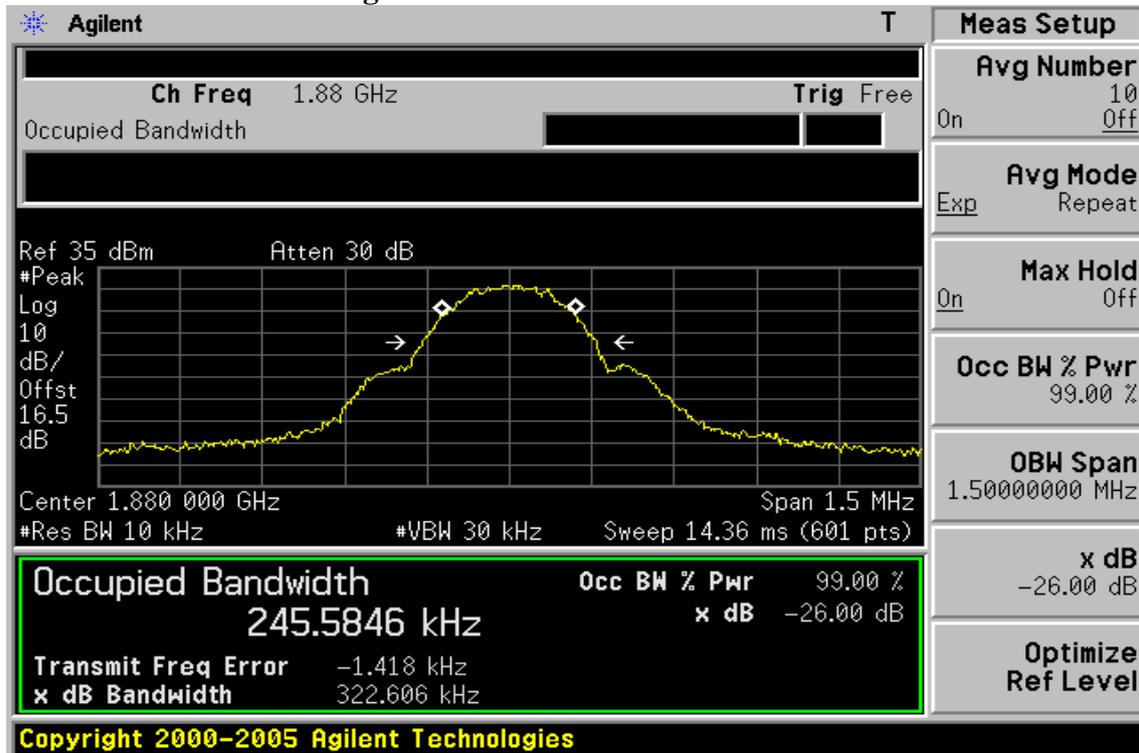
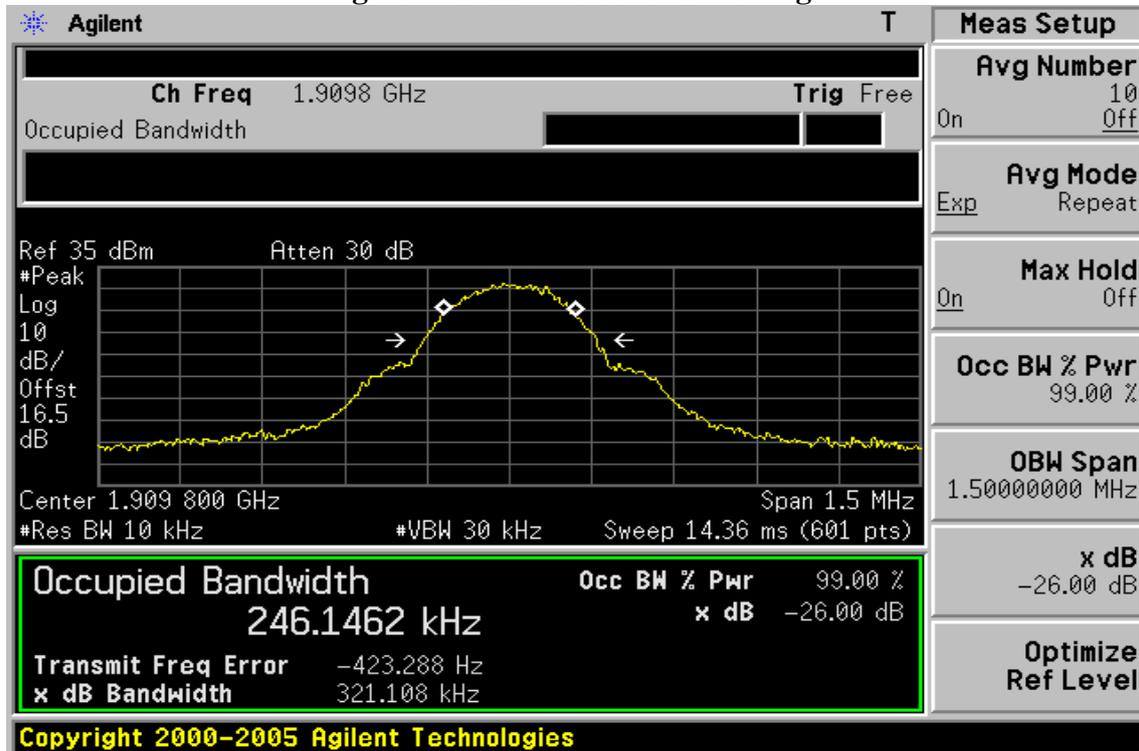


Figure 7-6: GSM 1900 Channel High



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Figure 7-7: EDGE 850 Channel Low

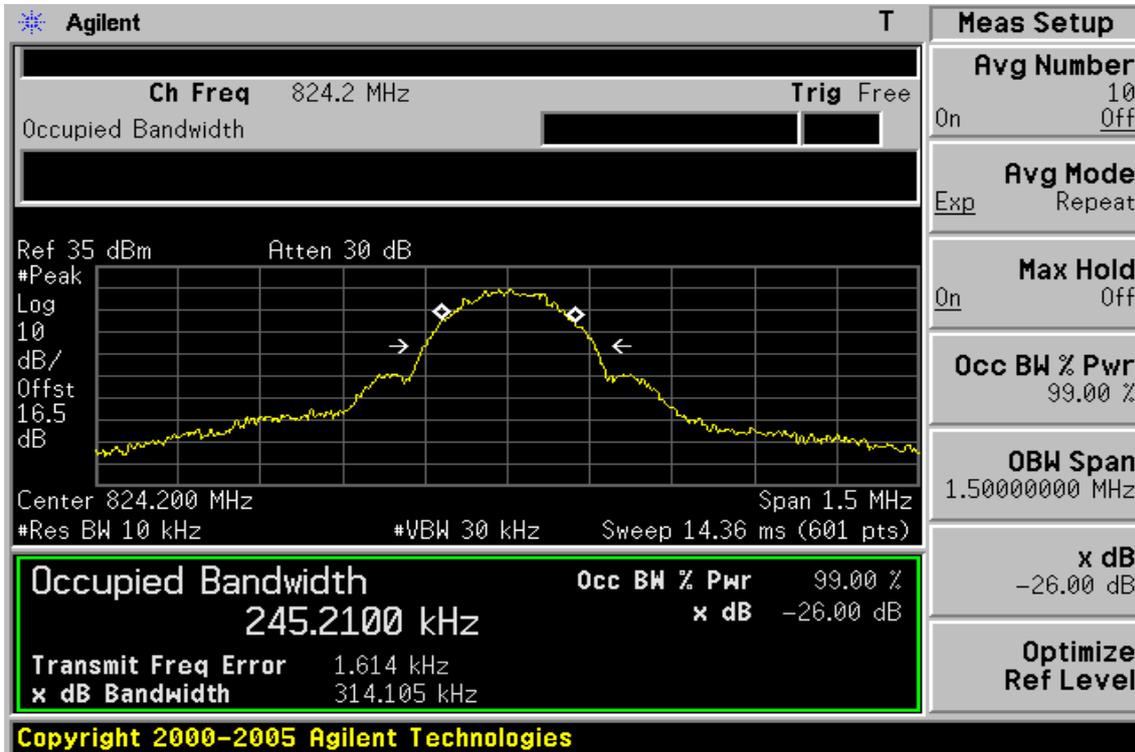
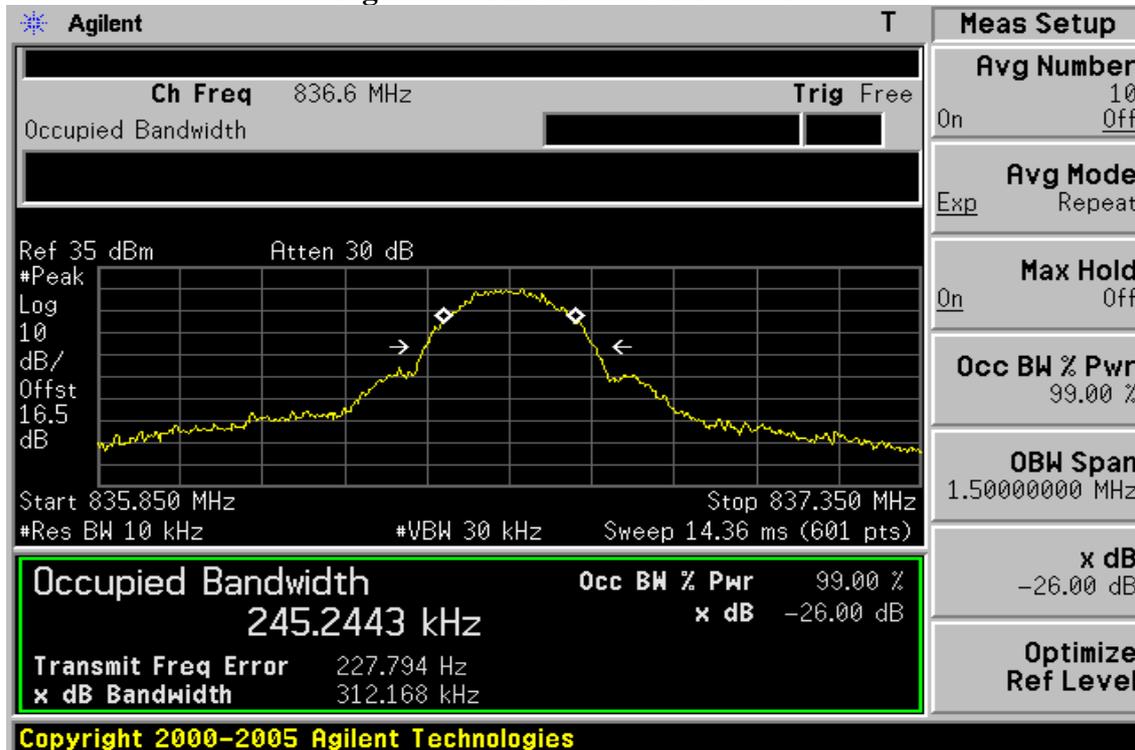


Figure 7-8 EDGE 850 Channel Mid



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GPRS Figure 7-9: EDGE 850 Channel High

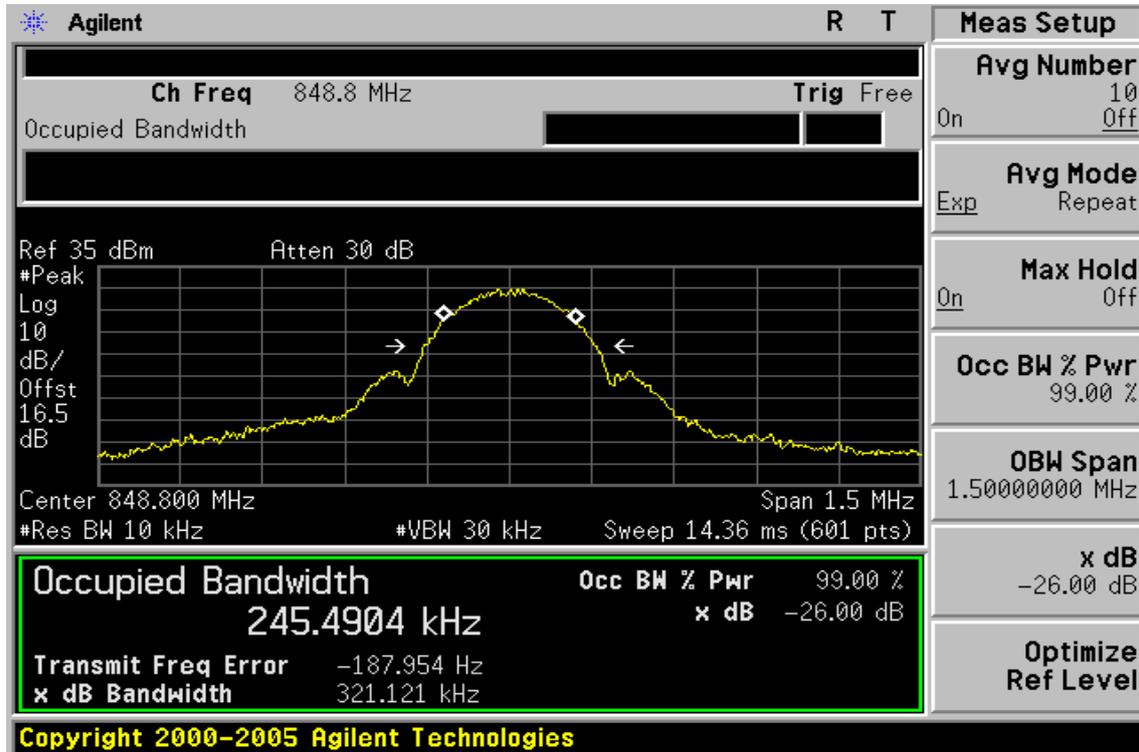
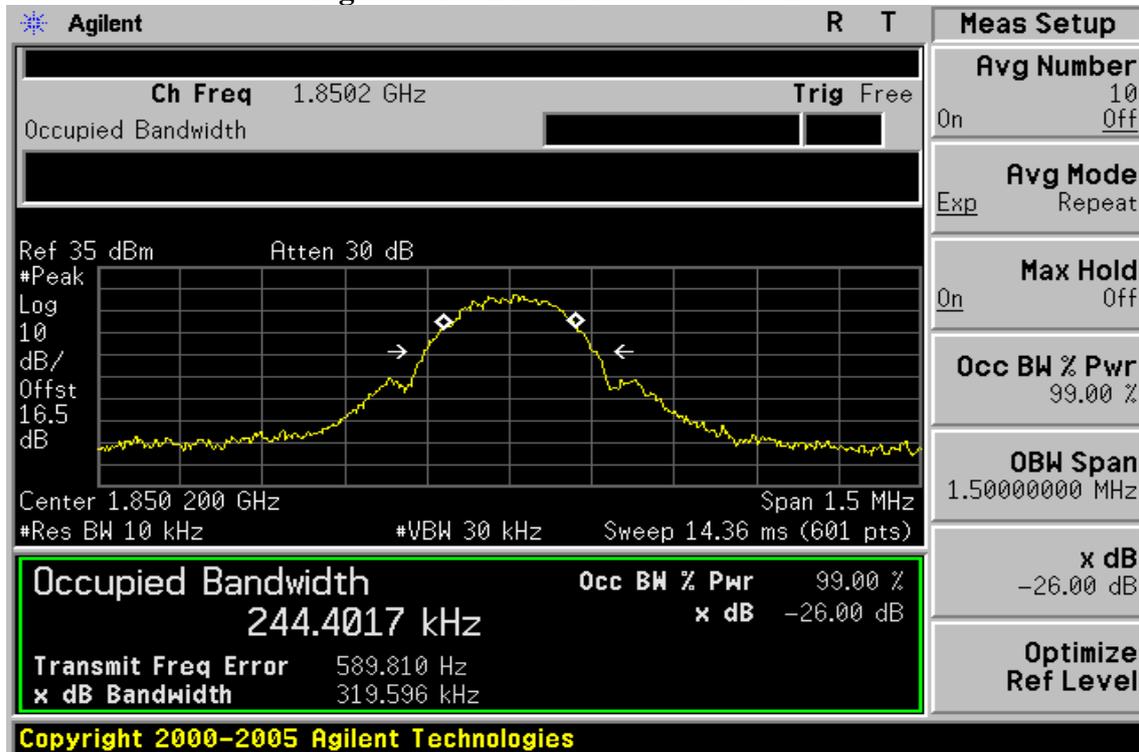


Figure 7-10: EDGE 1900 Channel Low



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Figure 7-11 EDGE 1900 Channel Mid

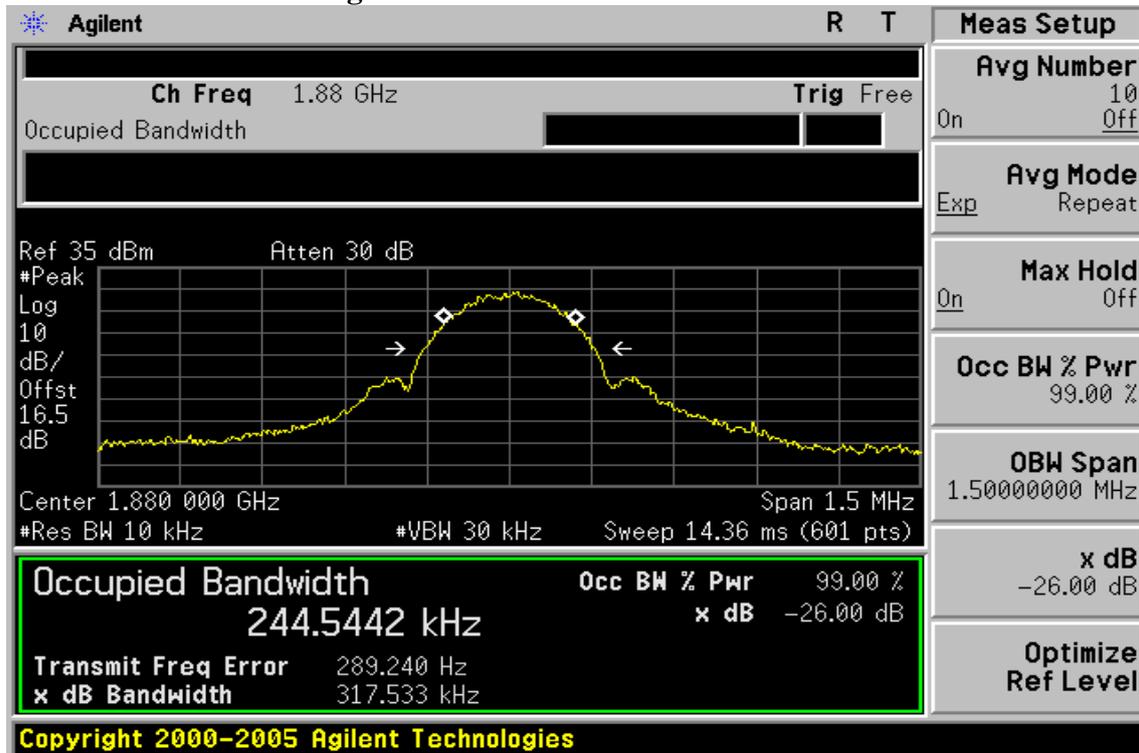
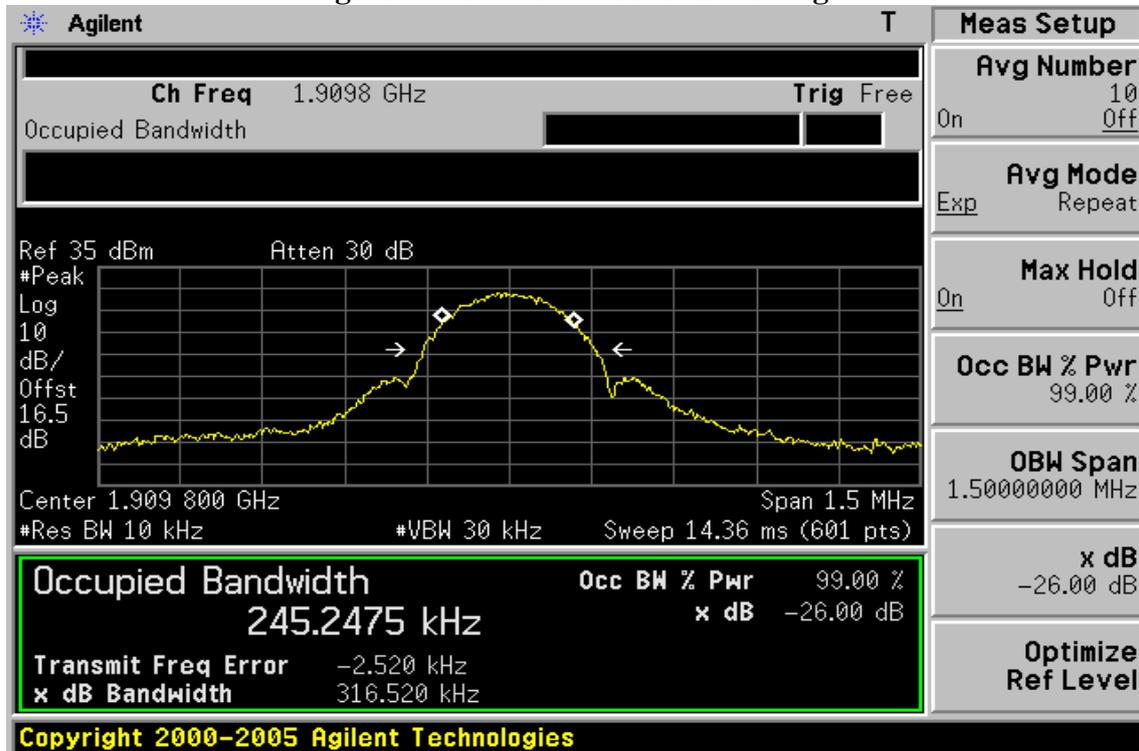


Figure 7-12: EDGE 1900 Channel High



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Figure 7-13 WCDMA B4 Channel Low

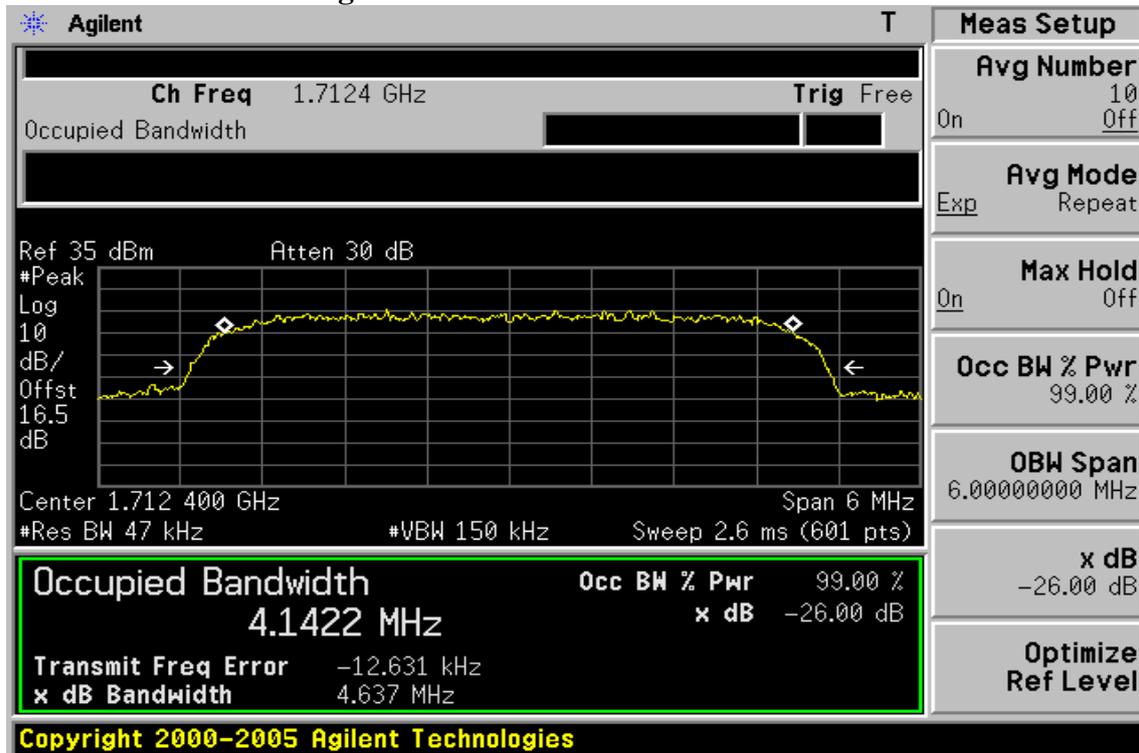
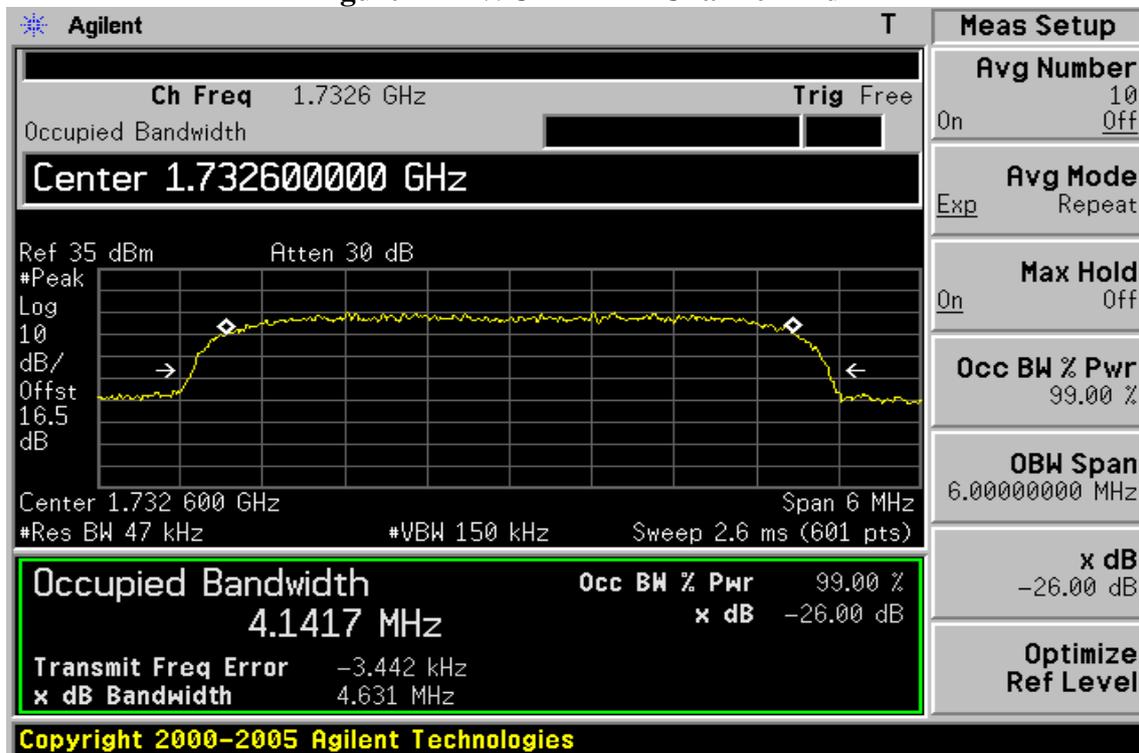


Figure 7-14 WCDMA B4 Channel Mid



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Figure 7-15: WCDMA B4 Channel High

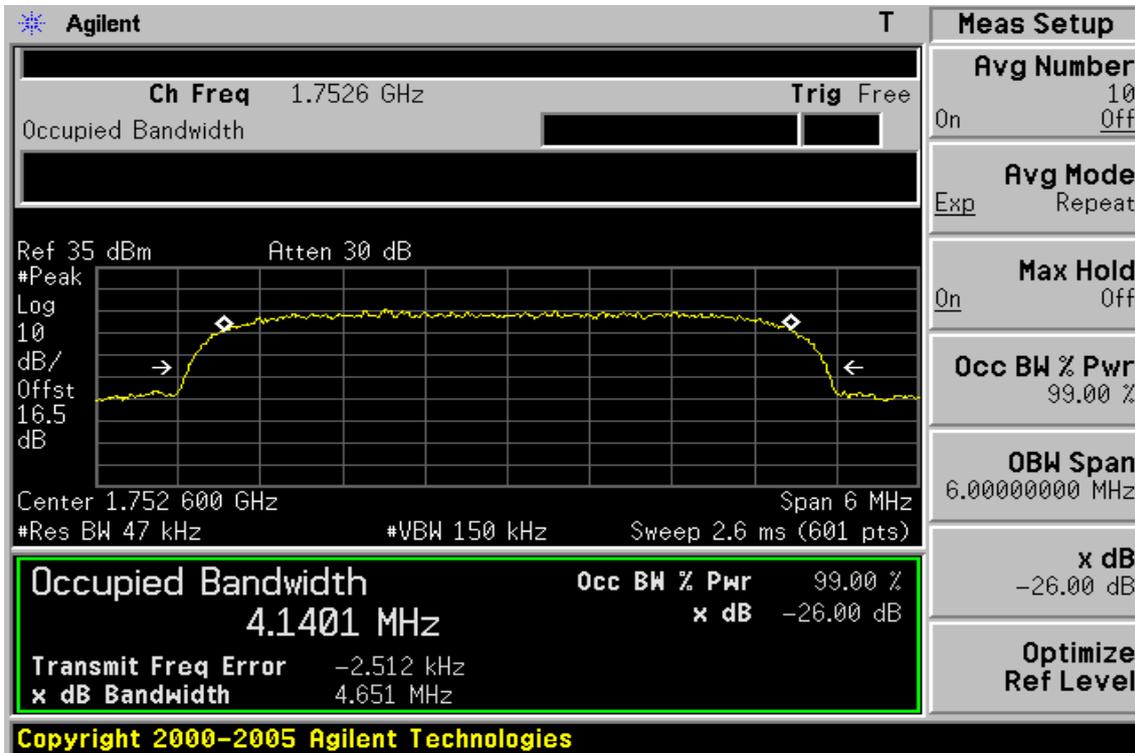
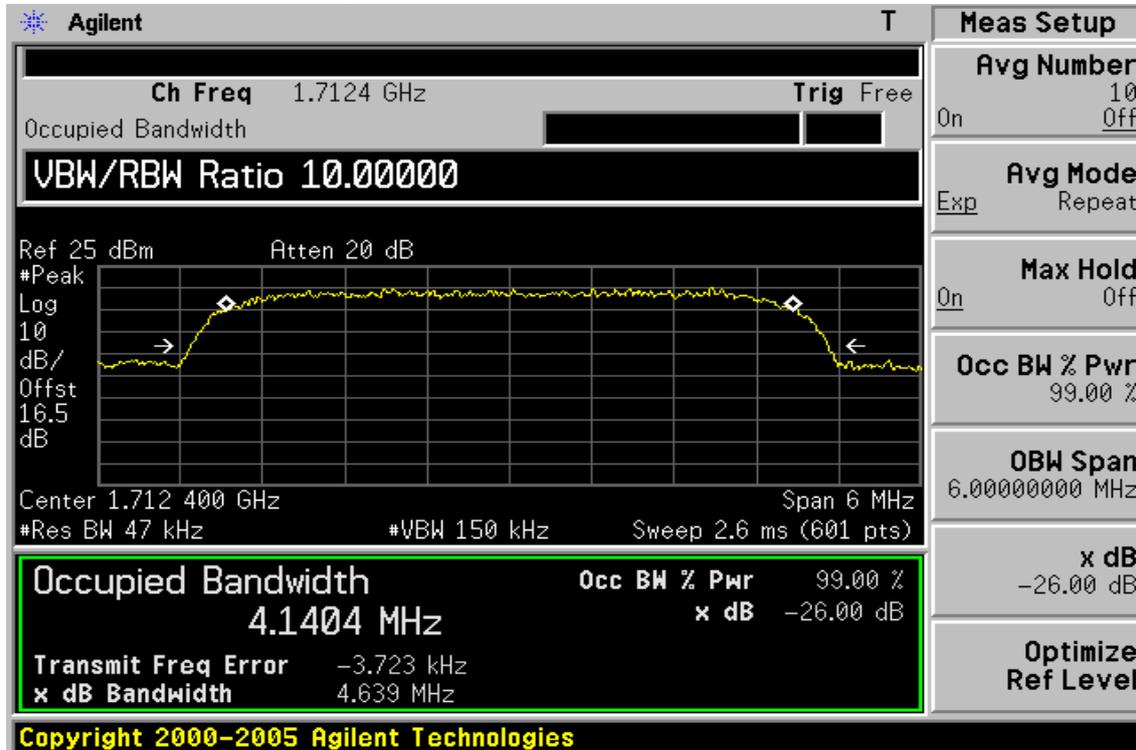


Figure 7-16 HSUPA B4 Channel Low



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Figure 7-17 HSUPA B4 Channel Mid

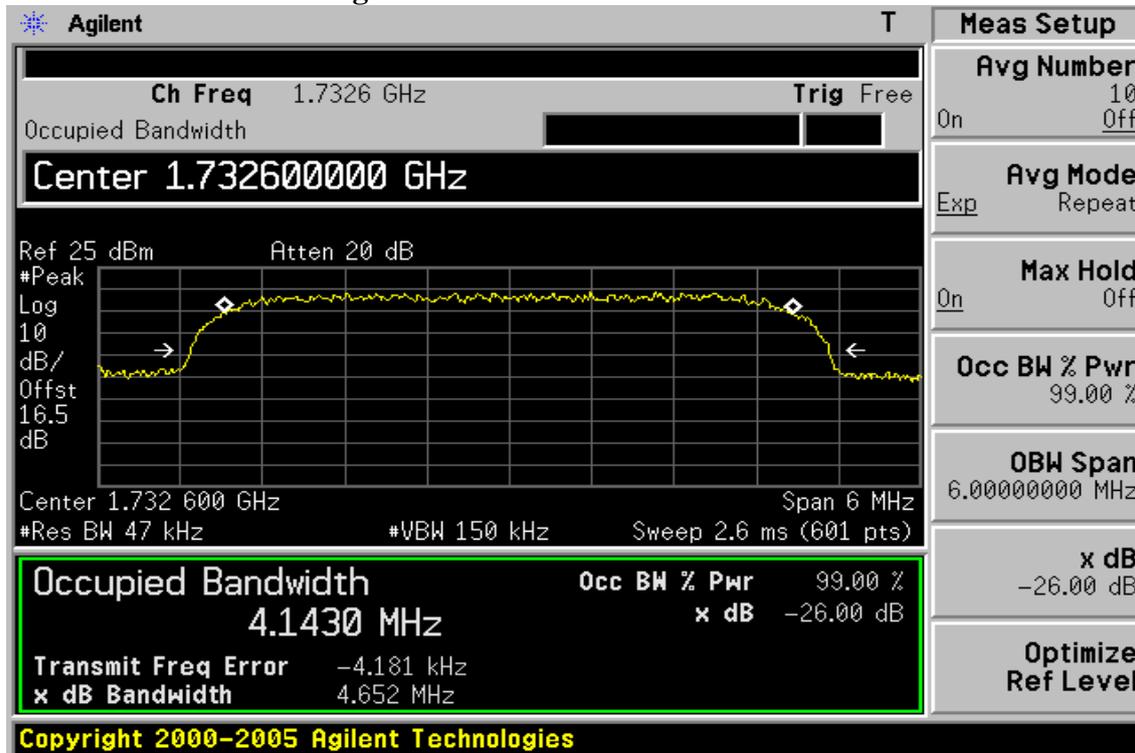
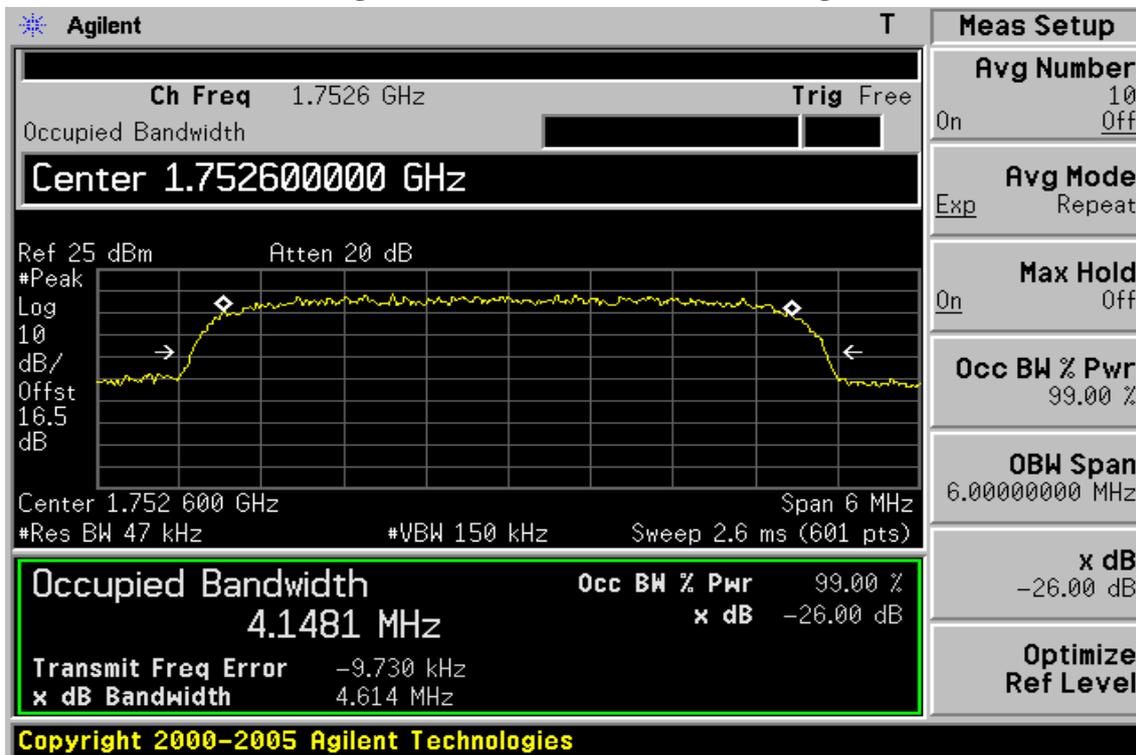


Figure 7-18: HSUPA B4 Channel High



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## 8. OUT OF BAND EMISSION AT ANTENNA TERMINALS

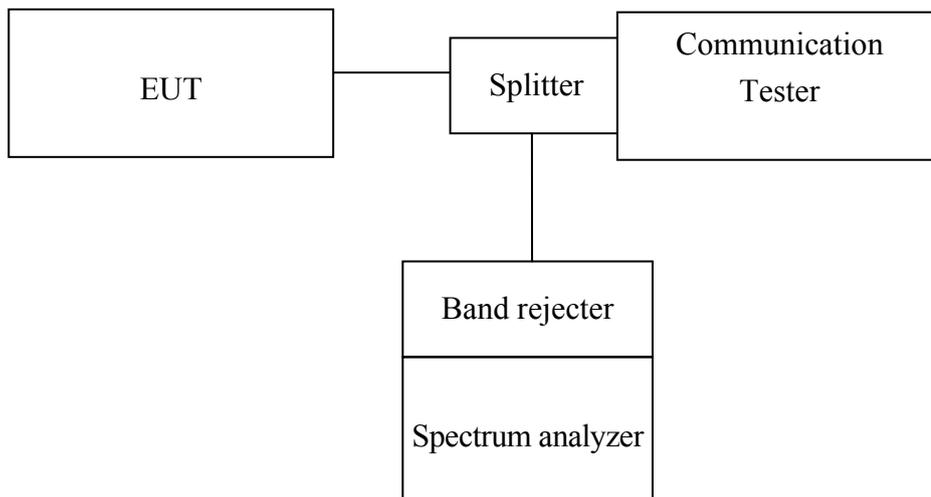
### 8.1. Standard Applicable:

According to FCC §2.1051.

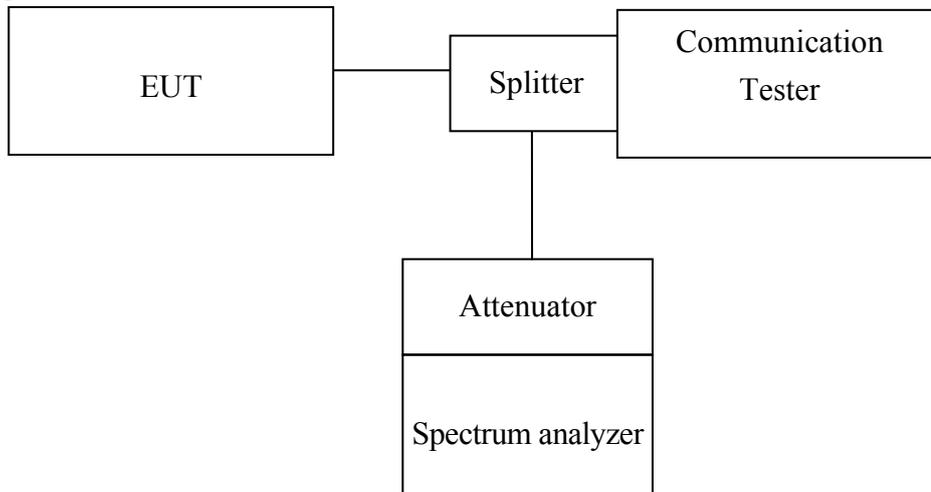
FCC §22.917(a), §24.238(a), §27.53(g) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc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

### 8.2. Test SET-UP:

#### Out of band emission



#### Band Edge



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### 8.3. Measurement Procedure:

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

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

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

### Conducted Emission:

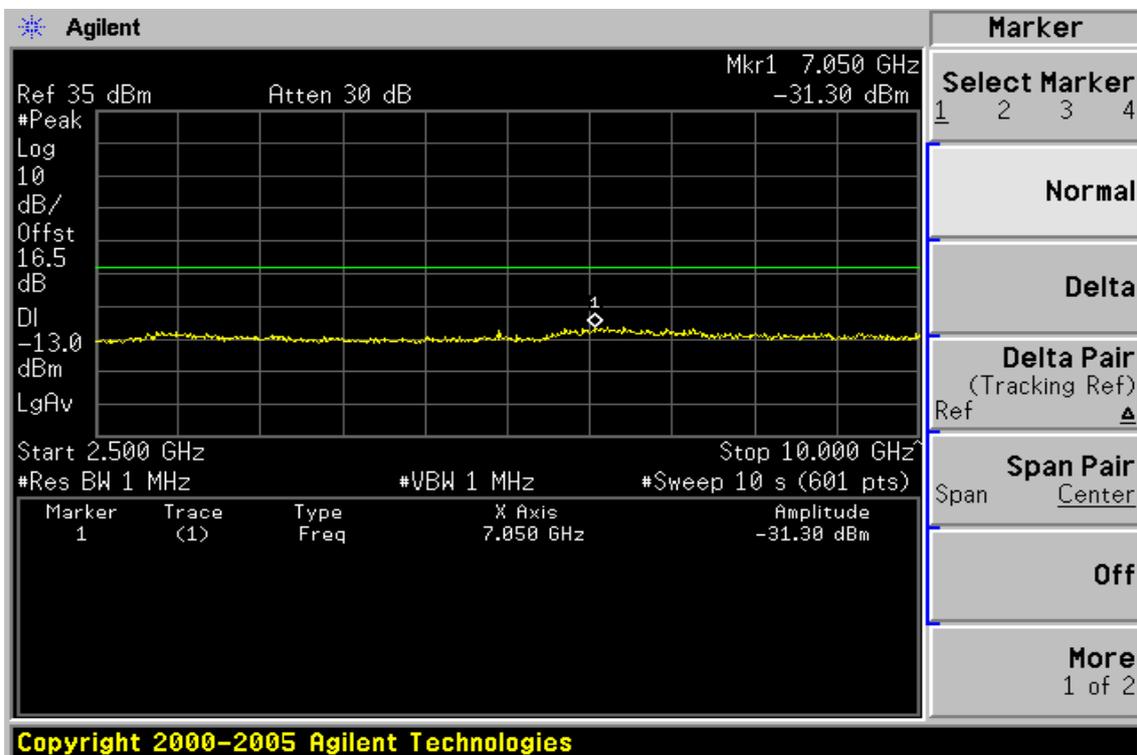
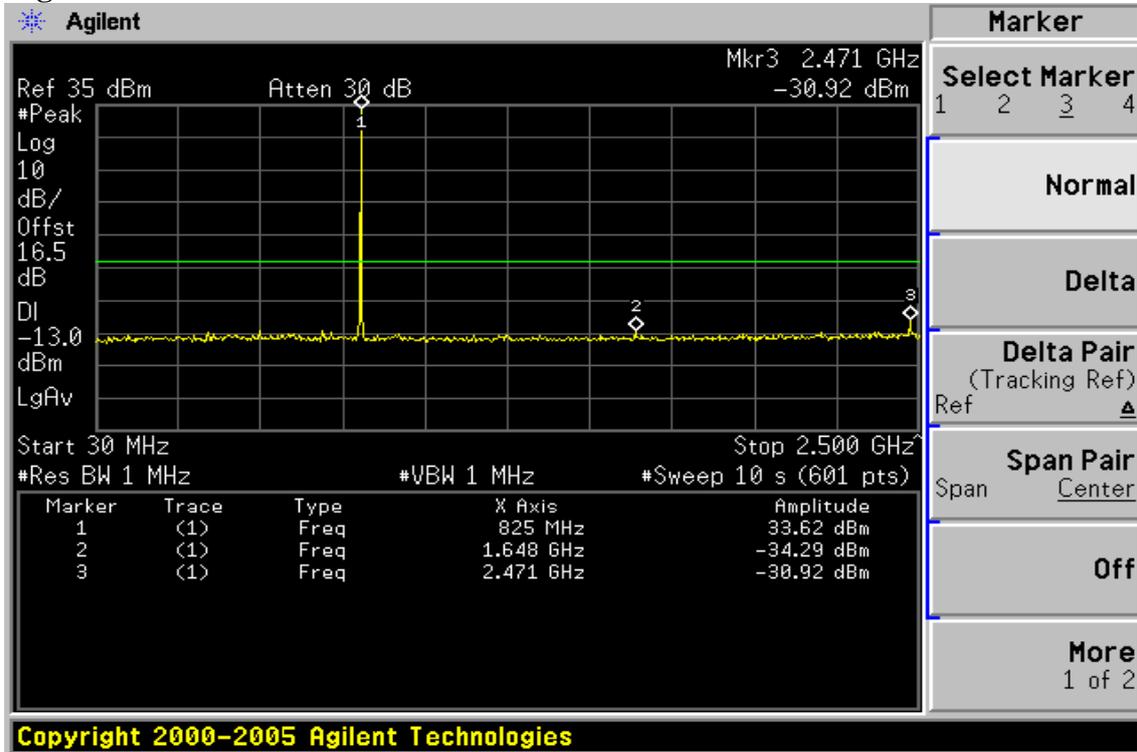
- 1、 To connect Antenna Port of EUT to Spectrum.
- 2、 Set RBW = 1MHz & VBW = 1MHz on Spectrum.
- 3、 Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 1G, 1G to 2.5G, 2.5G to 7.5G, 7.5G to 10G, 10G to 15G and 15G to 20GHz
- 4、 Via Software, combine 6 spans of frequency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

### 8.4. Measurement Equipment Used:

Refer to section 2.4 in this report

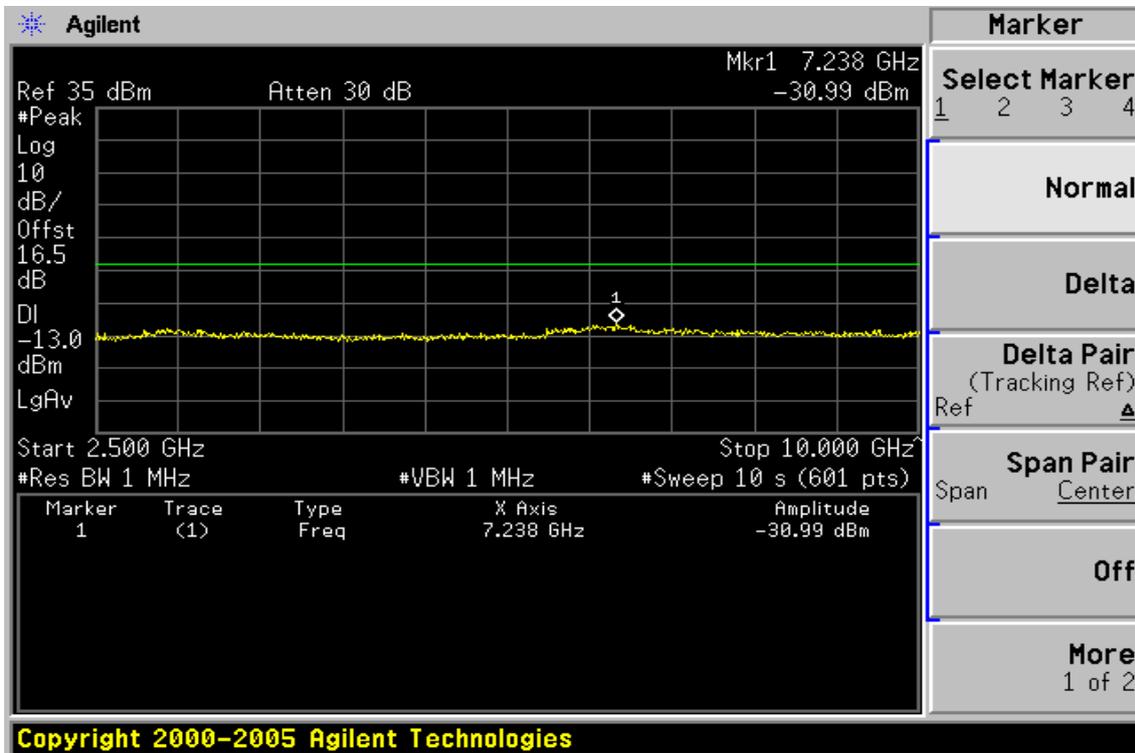
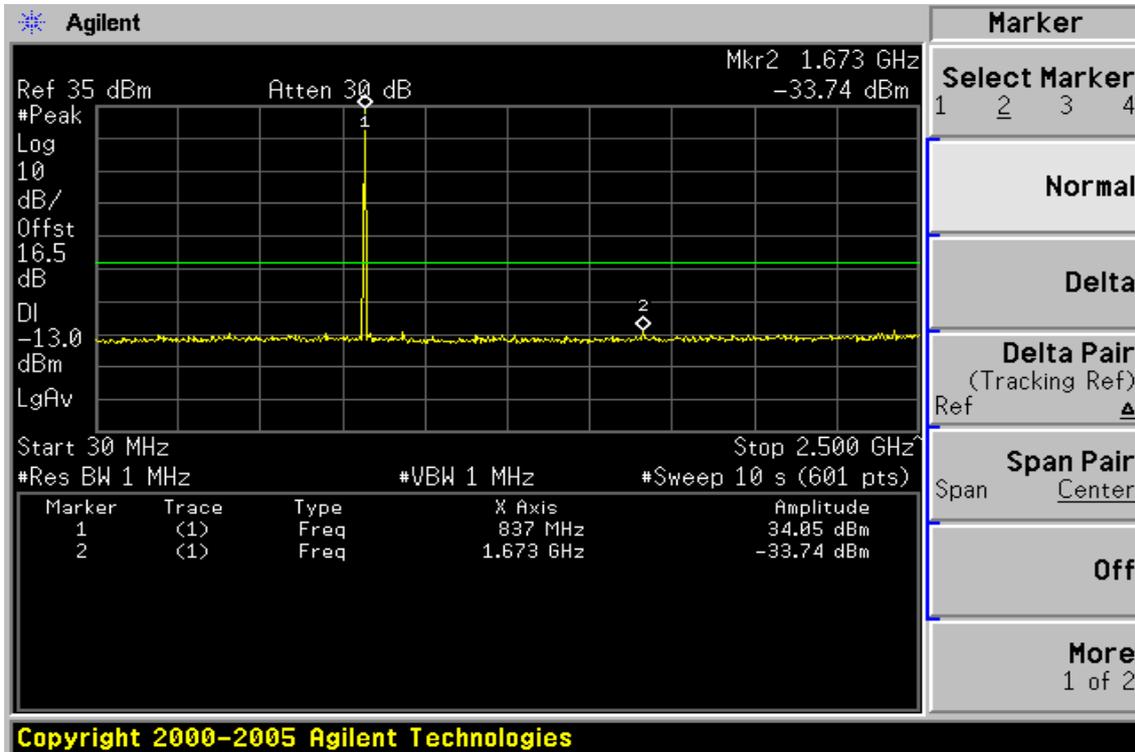
8.5. Measurement Result:

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



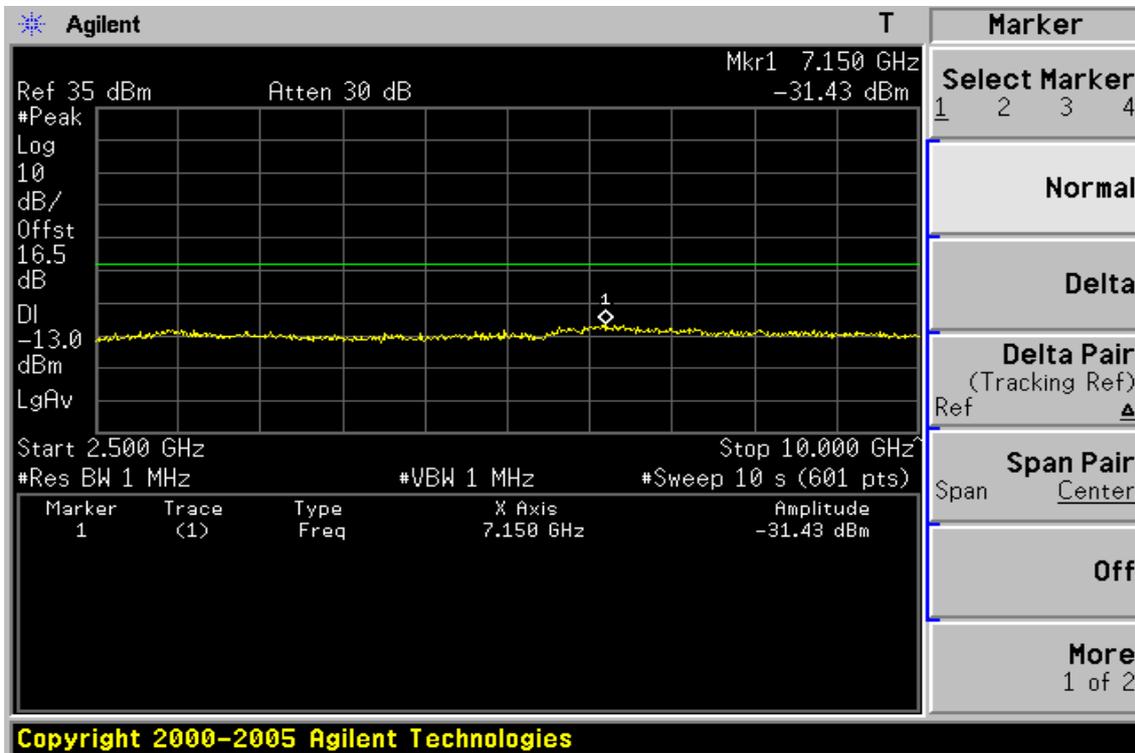
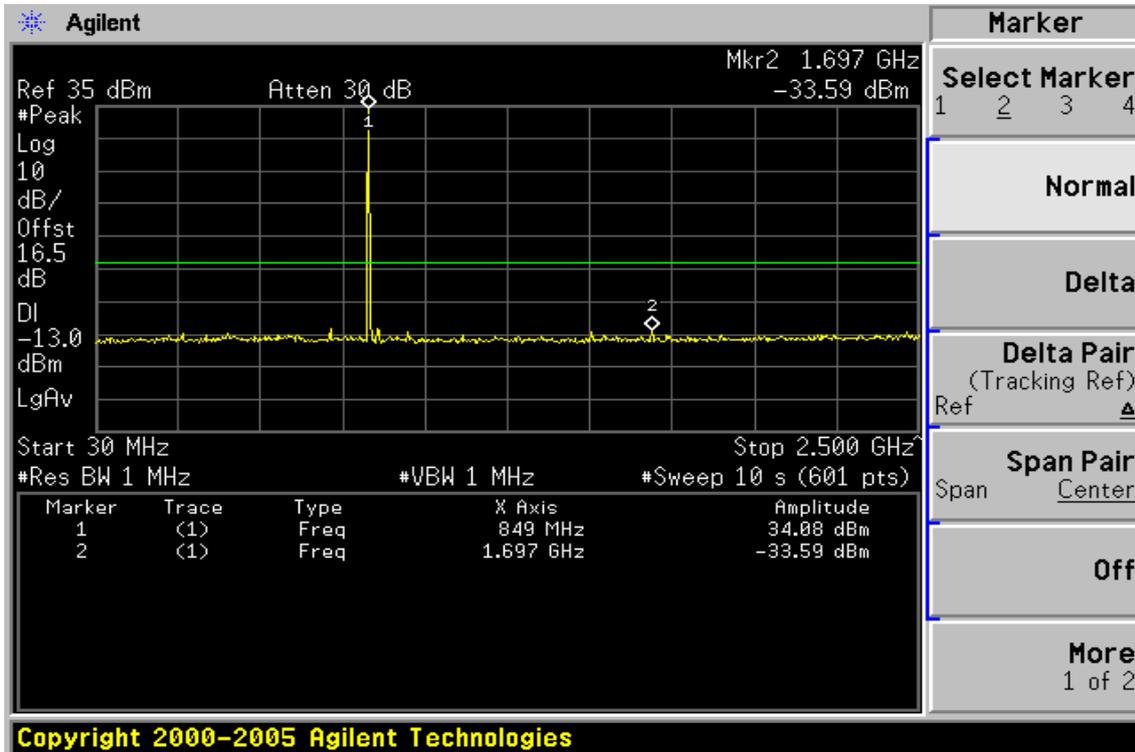
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Figure 8-2: Out of Band emission at antenna terminals –GSM 850 Channel Mid



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



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

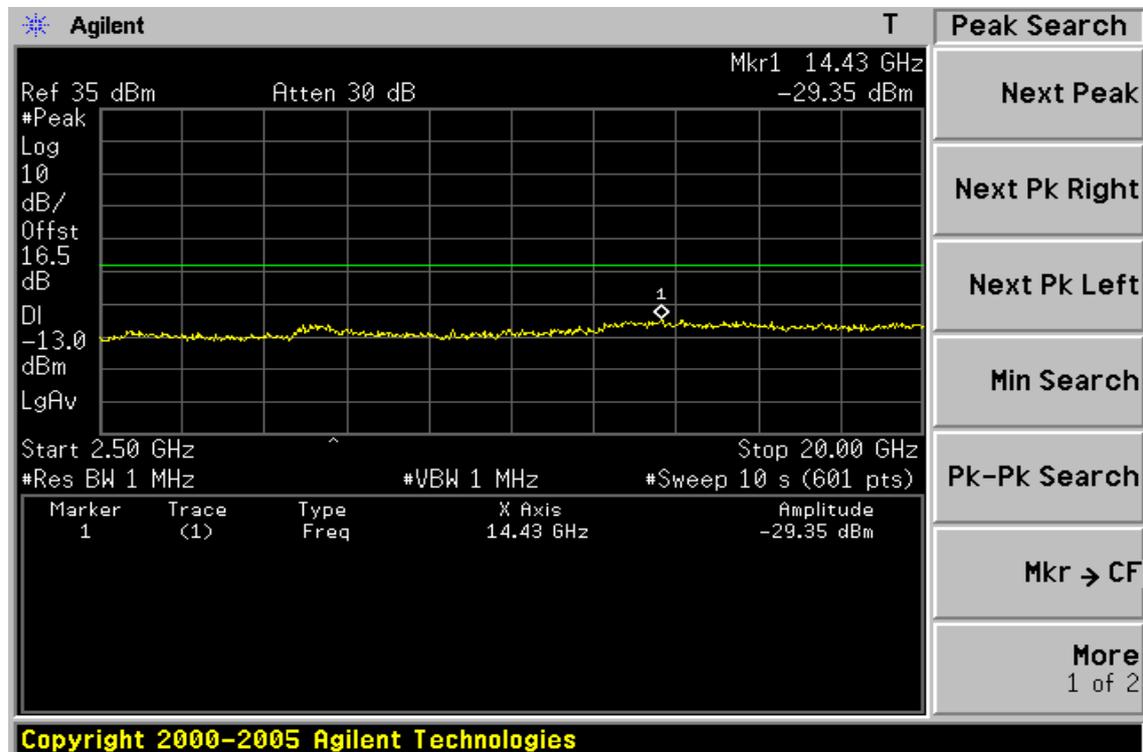
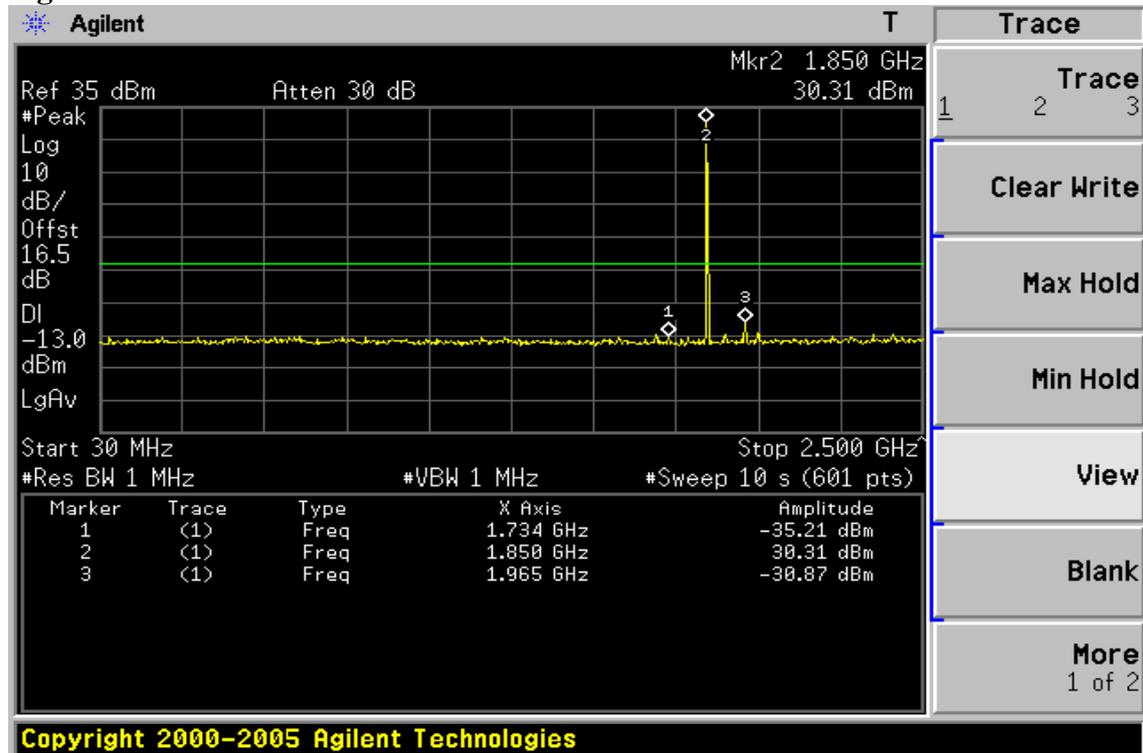


Figure 8-5: Band edge emission at antenna terminals –GSM 850 Channel Highest



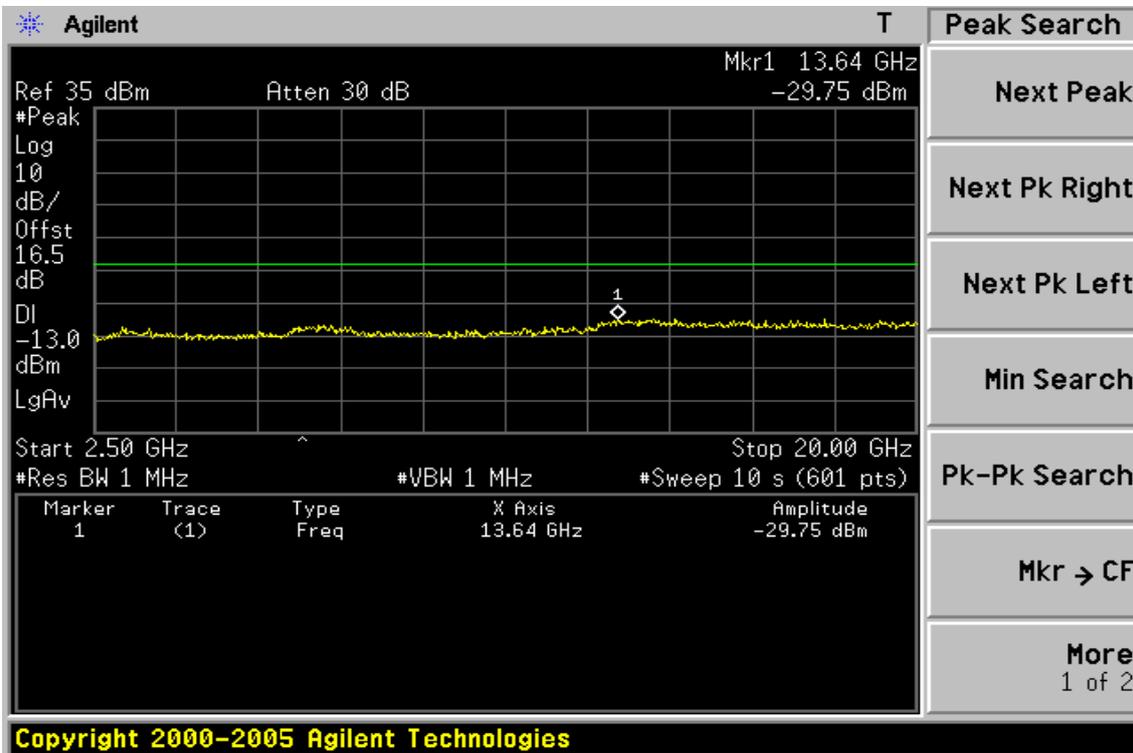
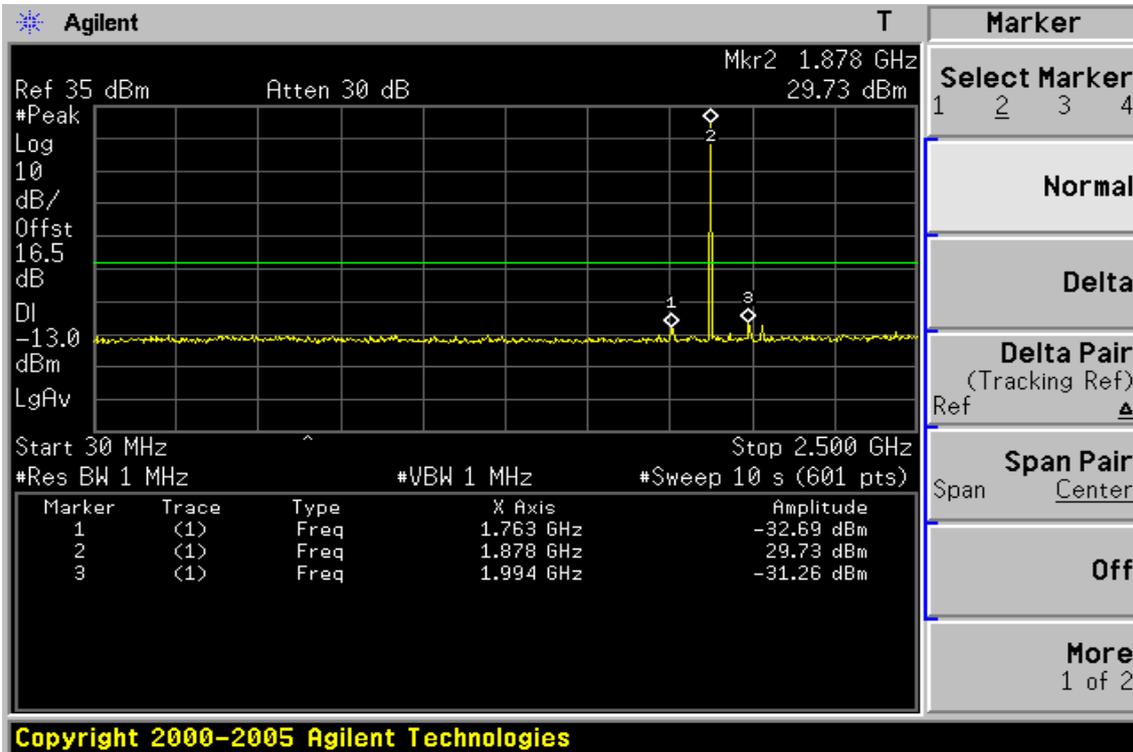
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Figure 8-6: Out of Band emission at antenna terminals–GSM 1900 Channel Lowest



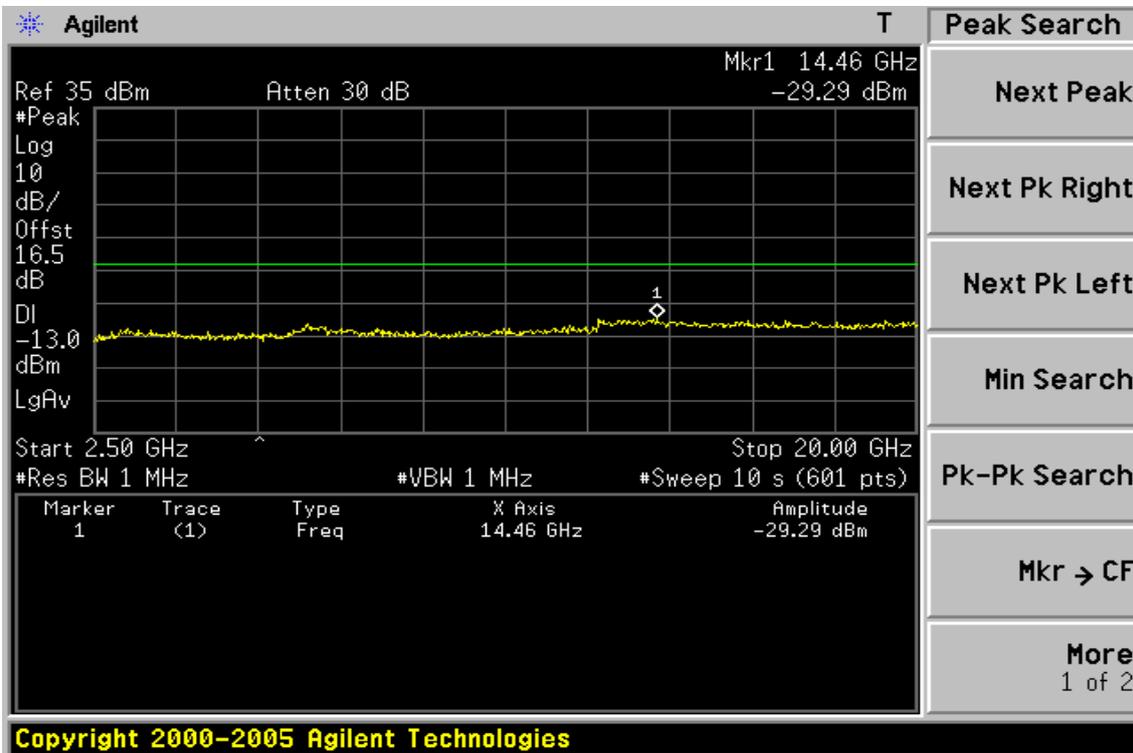
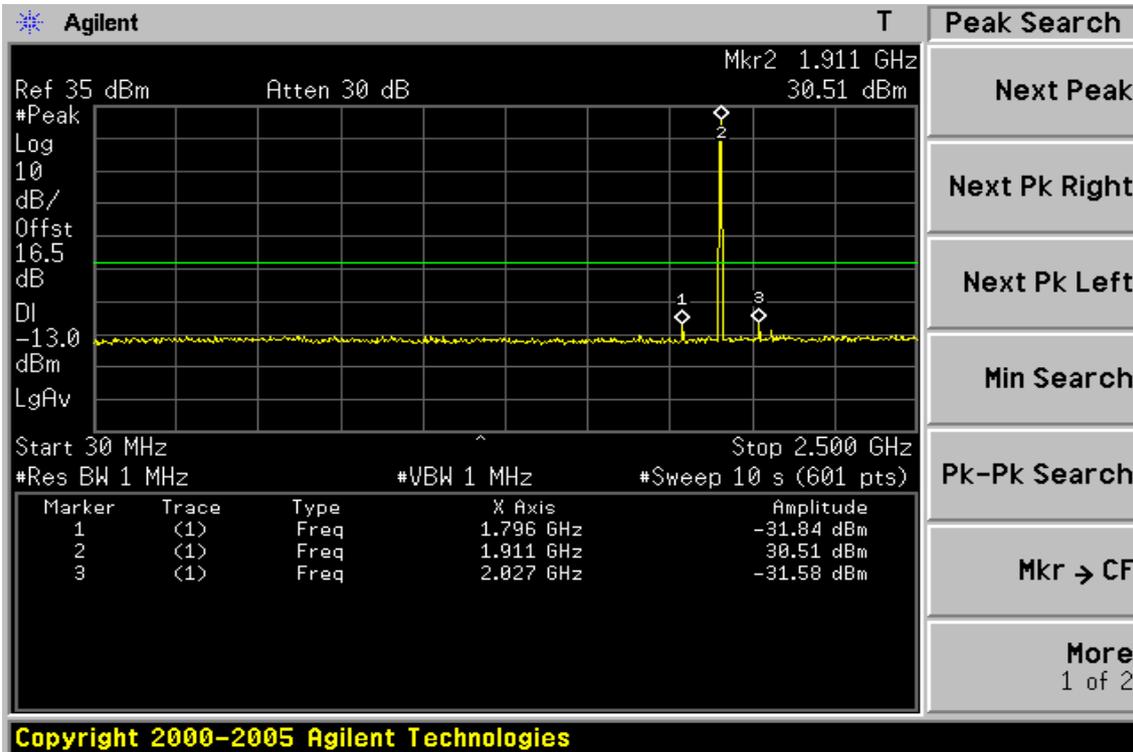
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Figure 8-7: Out of Band emission at antenna terminals –GSM 1900 Channel Mid



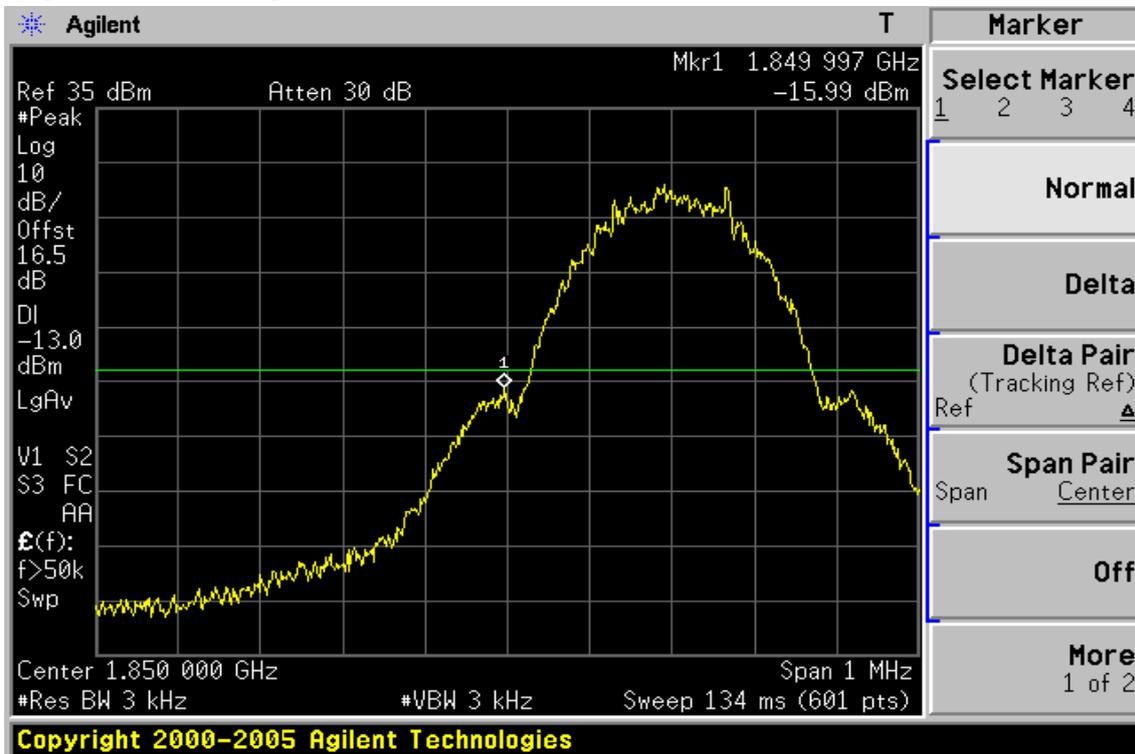
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Figure 8-8: Out of Band emission at antenna terminals –GSM 1900 Channel Highest

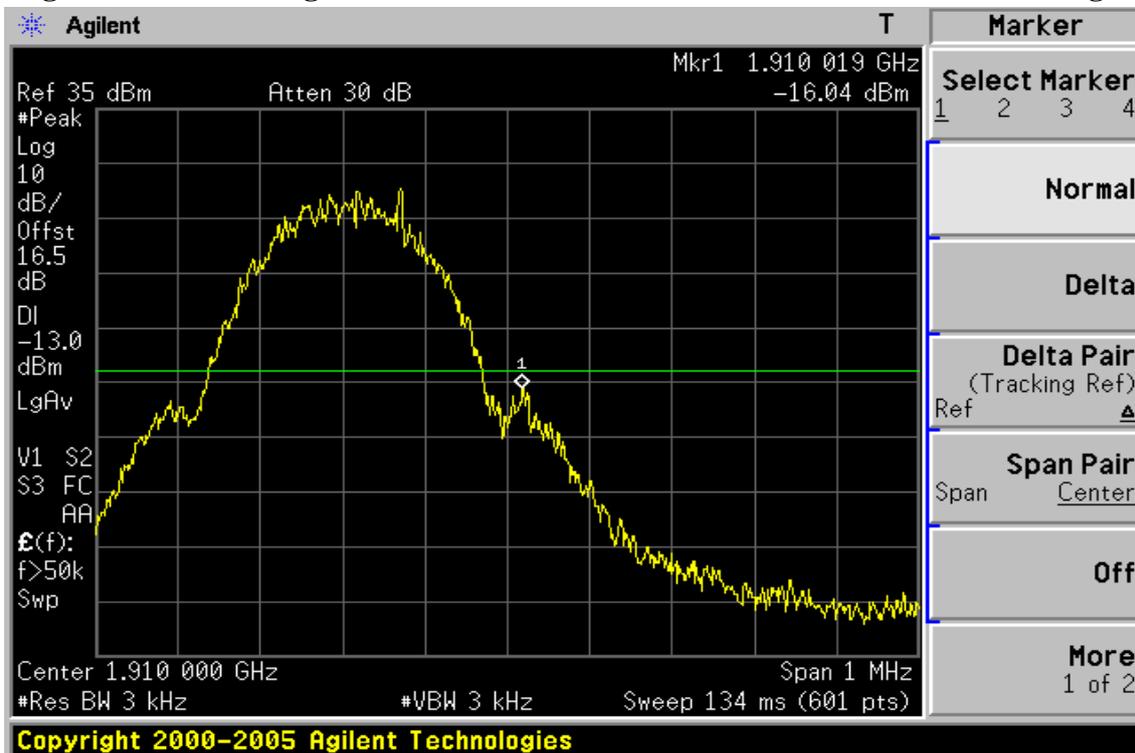


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**Figure 8-9: Bad edge emission at antenna terminals –GSM 1900 Channel Lowest**

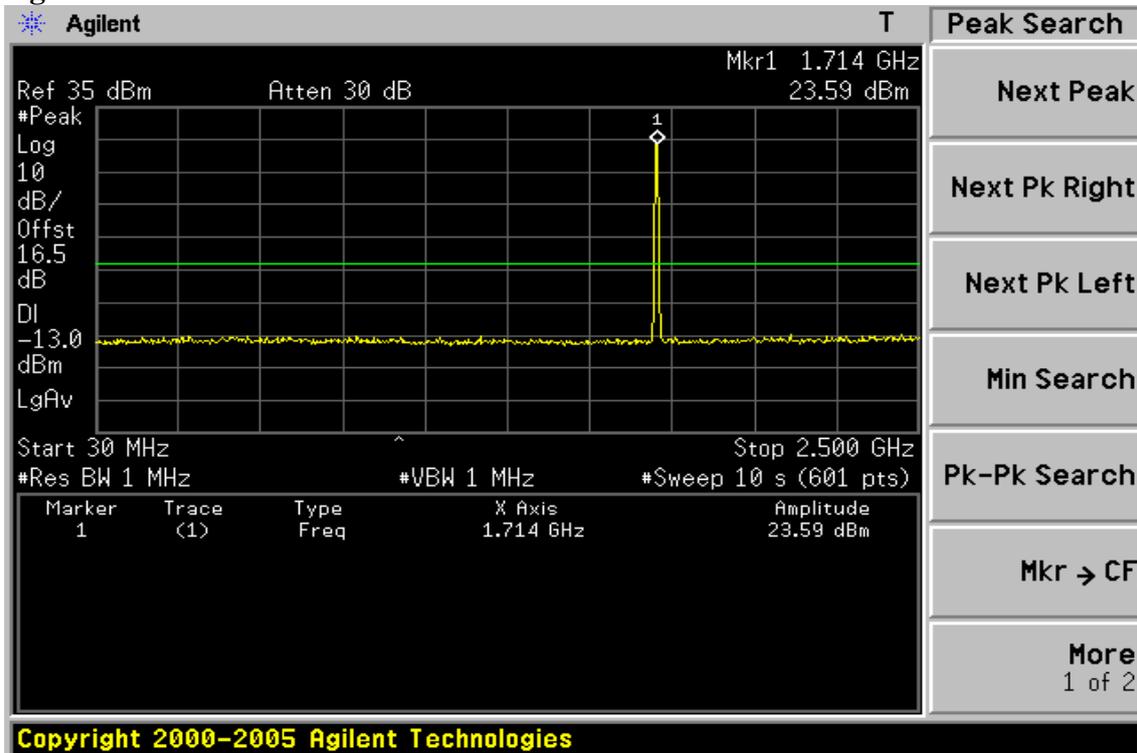


**Figure 8-10: Band edge emission at antenna terminals –GSM 1900 Channel Highest**

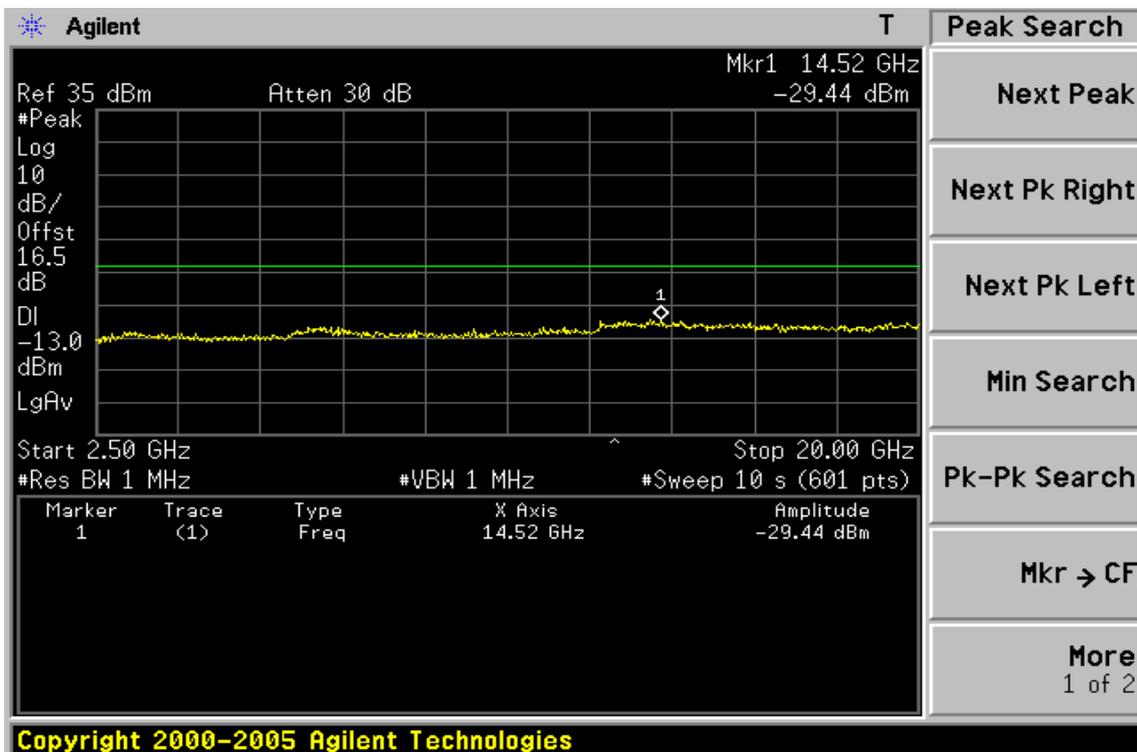


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Figure 8-11: Out of Band emission at antenna terminals–WCDMA B4 Channel Lowest



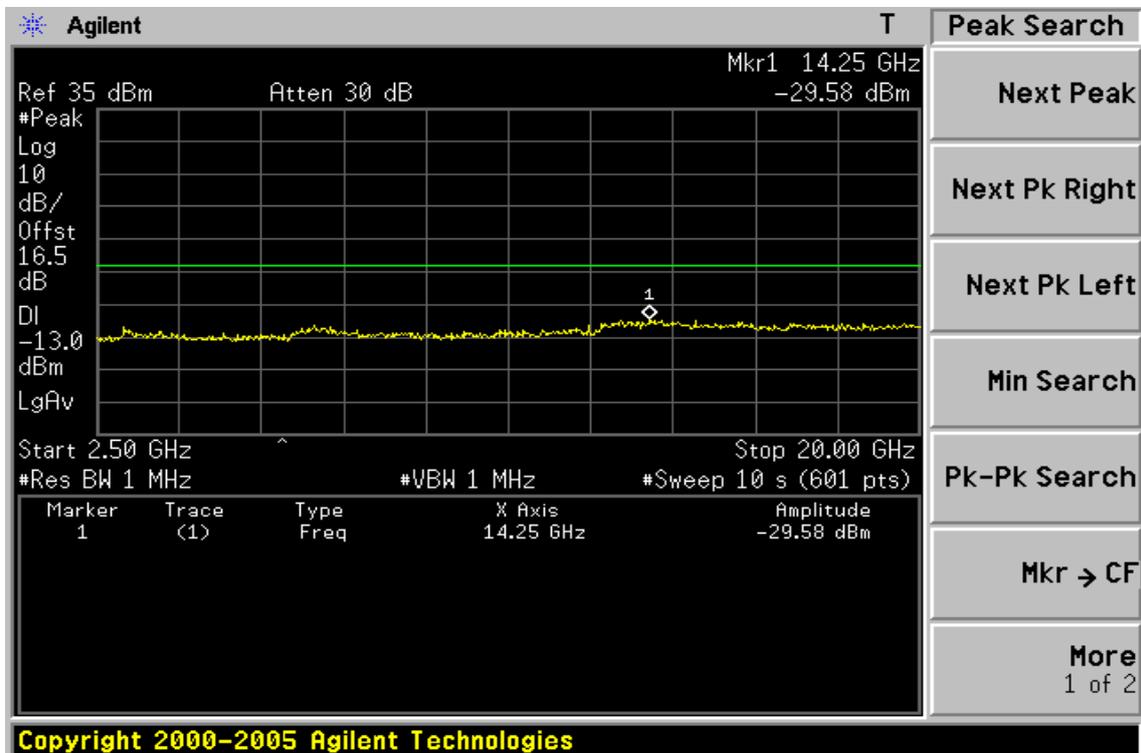
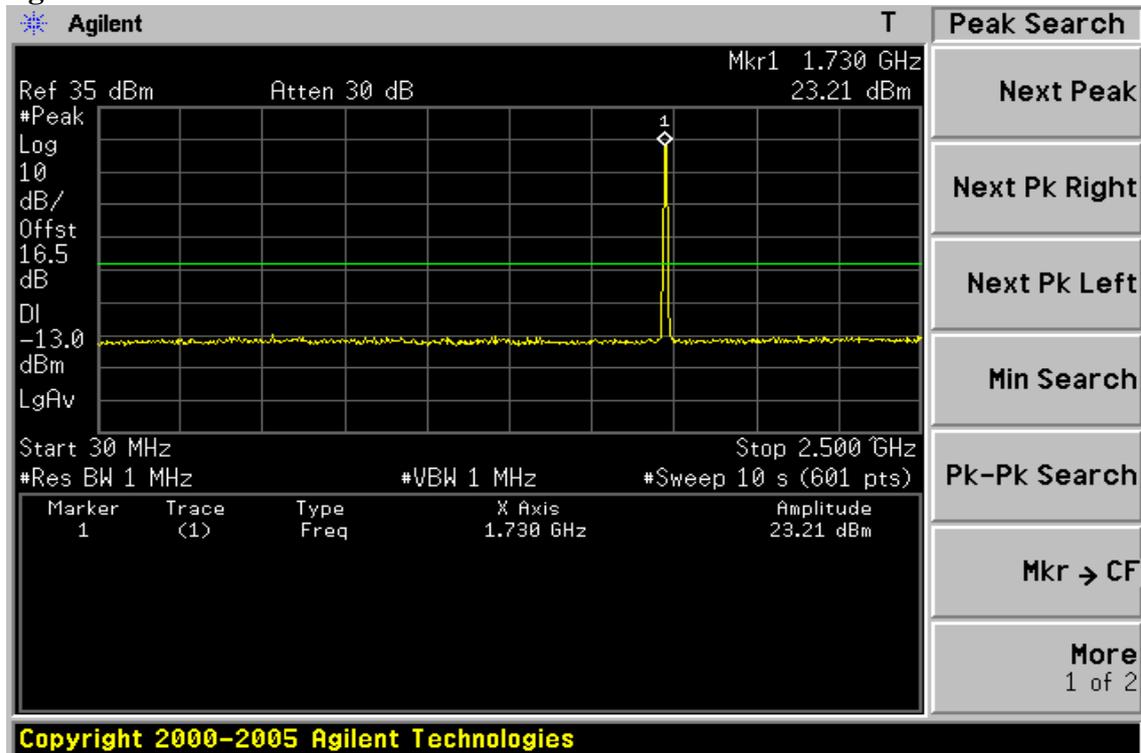
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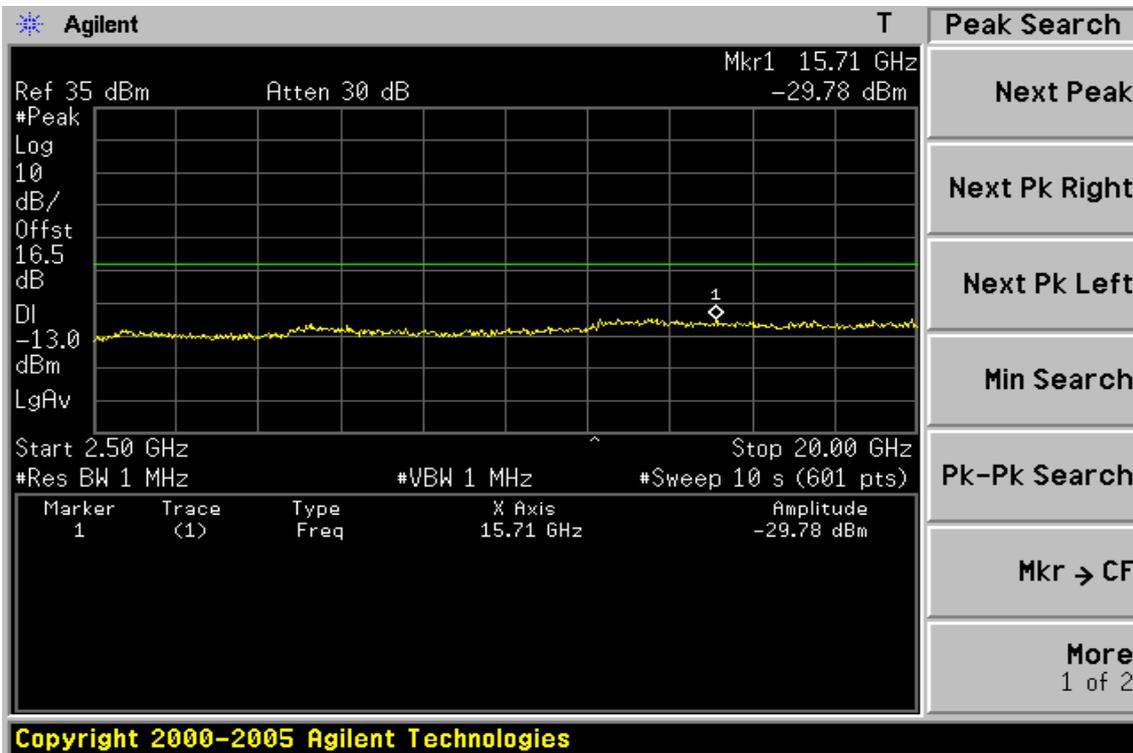
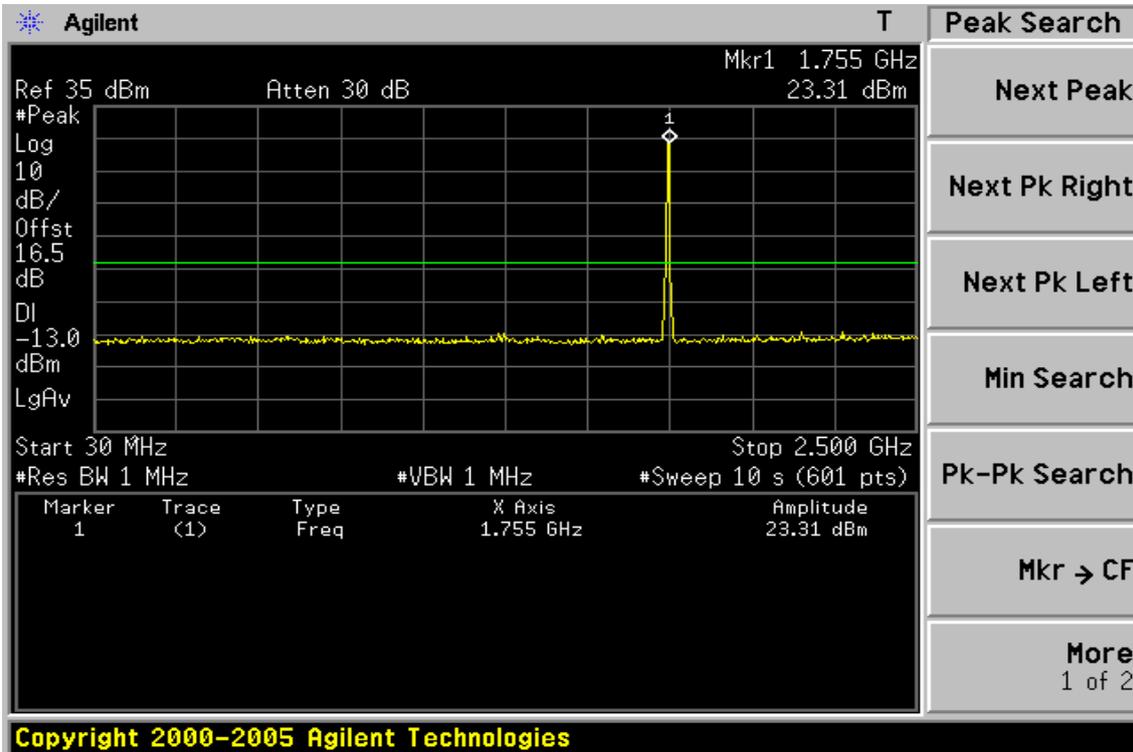
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Figure 8-12: Out of Band emission at antenna terminals –WCDMA B4 Channel Mid



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Figure 8-13: Out of Band emission at antenna terminals–WCDMA B4 Channel Highest



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Figure 8-14: Band edge emission at antenna terminals –WCDMA B4 Channel Lowest

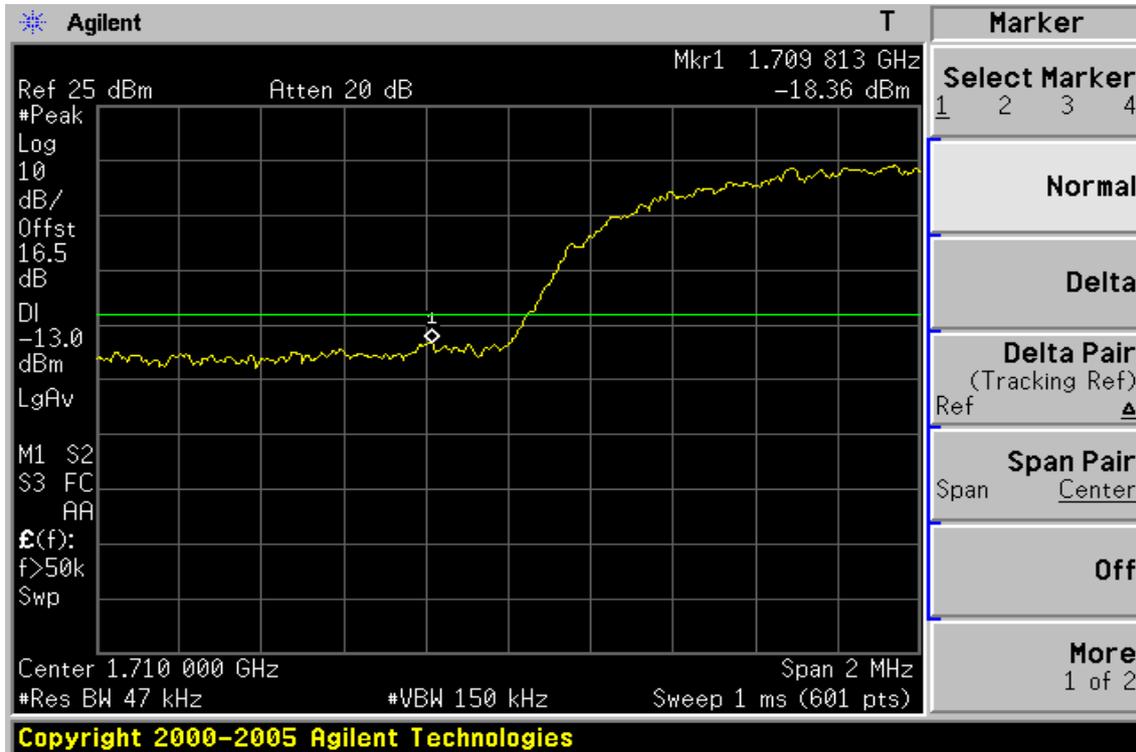
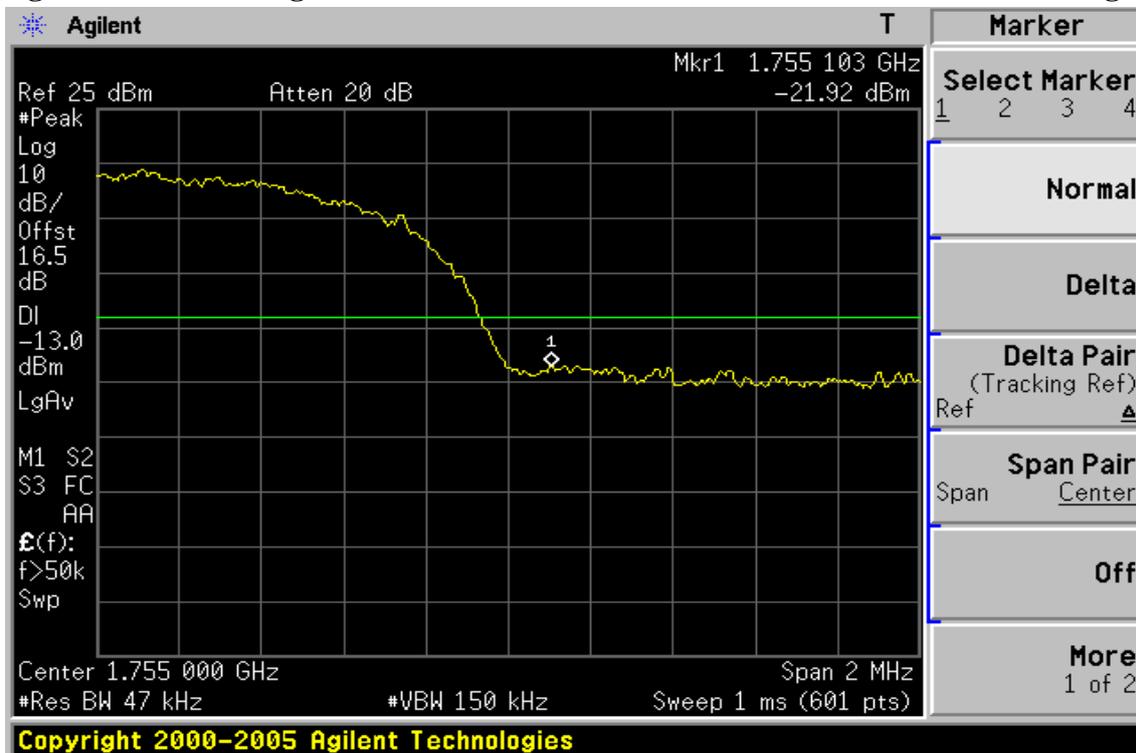


Figure 8-15: Band edge emission at antenna terminals –WCDMA B4 Channel Highest



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## 9. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

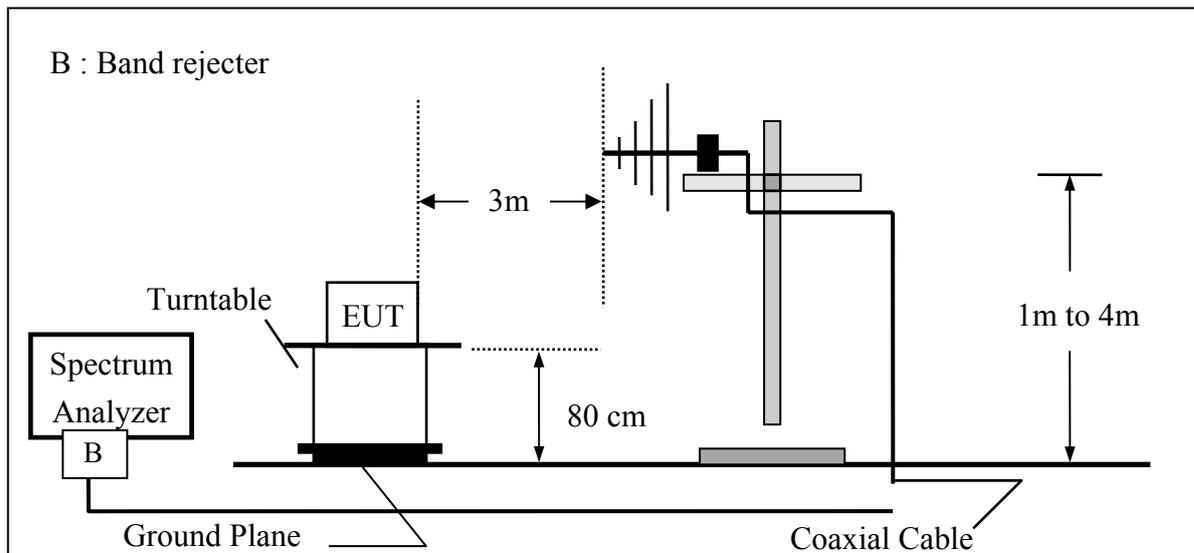
### 9.1. Standard Applicable:

According to FCC §2.1053,

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

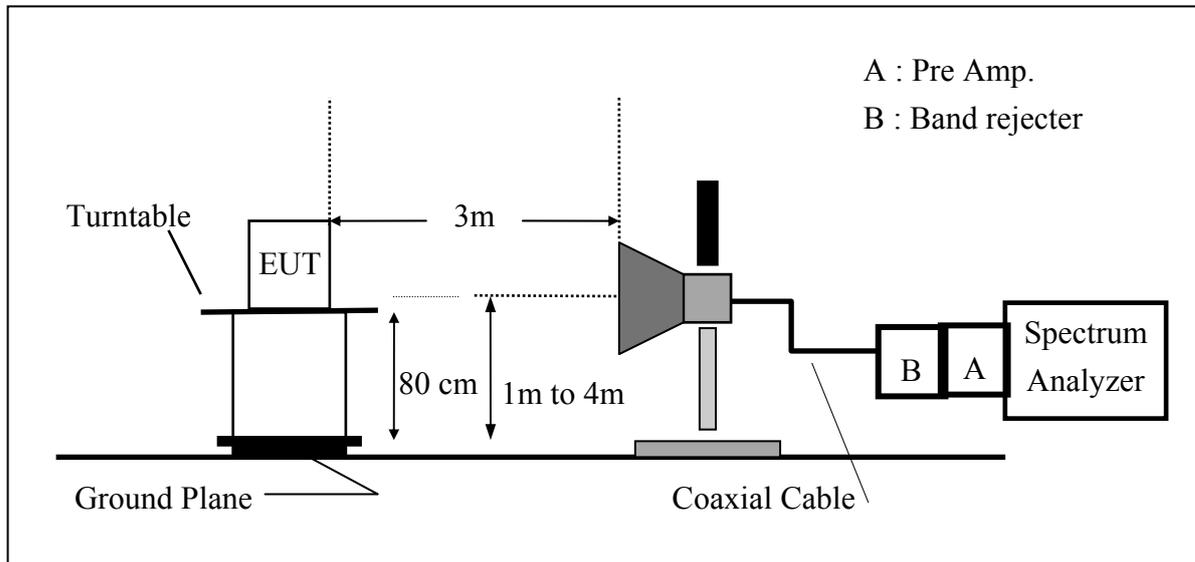
### 9.2. EUT Setup (Block Diagram of Configuration):

Radiated Emission Test Set-Up, Frequency Below 1000MHz



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Radiated Emission Test Set-UP Frequency Over 1 GHz



**9.3. Measurement Procedure:**

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

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

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

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

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

**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:	Mar. 07, 2011
Fundamental Frequency	: 824.20 MHz	Test By:	Sky
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
93.05	47.10	V	-55.71	-7.75	1.30	-64.76	-13.00	-51.76
156.10	44.22	V	-53.62	-7.80	1.60	-63.03	-13.00	-50.03
187.14	44.77	V	-55.86	-7.83	1.68	-65.36	-13.00	-52.36
255.04	44.88	V	-54.84	-7.89	2.01	-64.75	-13.00	-51.75
371.44	39.94	V	-56.78	-7.65	2.42	-66.85	-13.00	-53.85
616.85	32.98	V	-56.37	-7.80	3.07	-67.24	-13.00	-54.24
824.00	75.73	V	-10.66	-7.87	3.62	-22.16	-13.00	-9.16
1648.40	46.27	V	-58.13	9.29	5.23	-54.07	-13.00	-41.07
2472.60	45.14	V	-55.87	10.08	6.53	-52.32	-13.00	-39.32
3296.80	---	V		12.17	7.71		-13.00	
4121.00	---	V		12.61	8.86		-13.00	
4945.20	---	V		12.65	9.74		-13.00	
5769.40	---	V		13.55	10.54		-13.00	
6593.60	---	V		12.05	11.30		-13.00	
7417.80	---	V		11.49	12.10		-13.00	
8242.00	---	V		11.48	12.71		-13.00	

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

Remark:

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

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

Operation Mode	: TX CH Low E2 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 824.20 MHz	Test By:	Sky
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBUV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
41.64	44.64	H	-58.87	-2.31	0.93	-62.11	-13.00	-49.11
97.90	46.57	H	-56.59	-7.76	1.34	-65.68	-13.00	-52.68
156.10	44.58	H	-53.66	-7.80	1.60	-63.07	-13.00	-50.07
267.65	43.23	H	-55.44	-7.90	2.05	-65.39	-13.00	-52.39
357.86	37.32	H	-59.76	-7.64	2.38	-69.79	-13.00	-56.79
670.20	33.64	H	-55.24	-7.83	3.21	-66.28	-13.00	-53.28
824.00	81.13	H	-5.14	-7.87	3.62	-16.64	-13.00	-3.64
1648.40	53.26	H	-51.14	9.29	5.23	-47.08	-13.00	-34.08
2472.60	53.57	H	-47.34	10.08	6.53	-43.79	-13.00	-30.79
3296.80	38.38	H	-60.72	12.17	7.71	-56.26	-13.00	-43.26
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 836.60 MHz	Test By:	Sky
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)
93.05	47.32	V	-55.49	-7.75	1.30	-64.54	-13.00	-51.54
154.16	43.90	V	-53.76	-7.80	1.60	-63.17	-13.00	-50.17
185.20	44.41	V	-56.04	-7.83	1.67	-65.54	-13.00	-52.54
255.04	45.11	V	-54.61	-7.89	2.01	-64.52	-13.00	-51.52
357.86	38.77	V	-58.53	-7.64	2.38	-68.55	-13.00	-55.55
610.06	33.52	V	-55.92	-7.79	3.06	-66.77	-13.00	-53.77
1673.20	47.50	V	-57.06	9.36	5.27	-52.96	-13.00	-39.96
2509.80	50.13	V	-50.65	10.09	6.58	-47.15	-13.00	-34.15
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 836.60 MHz	Test By:	Sky
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)
41.64	45.00	H	-58.51	-2.31	0.93	-61.75	-13.00	-48.75
97.90	47.04	H	-56.12	-7.76	1.34	-65.21	-13.00	-52.21
154.16	44.52	H	-53.57	-7.80	1.60	-62.98	-13.00	-49.98
267.65	43.84	H	-54.83	-7.90	2.05	-64.78	-13.00	-51.78
361.74	35.80	H	-61.22	-7.64	2.40	-71.26	-13.00	-58.26
602.30	33.42	H	-57.23	-7.79	3.04	-68.06	-13.00	-55.06
1673.20	49.24	H	-55.32	9.36	5.27	-51.22	-13.00	-38.22
2509.80	56.28	H	-44.42	10.09	6.58	-40.92	-13.00	-27.92
3346.40	38.07	H	-60.99	12.28	7.79	-56.51	-13.00	-43.51
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH High E2 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 848.80 MHz	Test By:	Sky
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
97.90	45.95	V	-56.24	-7.76	1.34	-65.34	-13.00	-52.34
154.16	44.07	V	-53.59	-7.80	1.60	-63.00	-13.00	-50.00
185.20	43.16	V	-57.29	-7.83	1.67	-66.79	-13.00	-53.79
241.46	43.40	V	-56.81	-7.88	1.94	-66.64	-13.00	-53.64
359.80	38.64	V	-58.57	-7.64	2.39	-68.61	-13.00	-55.61
707.06	33.81	V	-55.30	-7.86	3.32	-66.48	-13.00	-53.48
849.02	73.85	V	-12.27	-7.88	3.68	-23.83	-13.00	-10.83
1697.60	38.44	V	-66.10	9.44	5.31	-61.97	-13.00	-48.97
2546.40	40.92	V	-59.72	10.20	6.63	-56.16	-13.00	-43.16
3395.20	37.72	V	-61.13	12.38	7.87	-56.62	-13.00	-43.62
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH High E2 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 848.80 MHz	Test By:	Sky
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)
39.70	43.92	H	-58.97	-2.79	0.89	-62.66	-13.00	-49.66
97.90	46.33	H	-56.83	-7.76	1.34	-65.92	-13.00	-52.92
146.40	42.60	H	-55.55	-7.80	1.57	-64.92	-13.00	-51.92
264.74	41.58	H	-57.18	-7.90	2.04	-67.12	-13.00	-54.12
604.24	33.40	H	-57.22	-7.79	3.04	-68.05	-13.00	-55.05
658.56	35.40	H	-53.96	-7.82	3.18	-64.96	-13.00	-51.96
849.02	80.98	H	-5.21	-7.88	3.68	-16.77	-13.00	-3.77
1697.60	46.91	H	-57.44	9.44	5.31	-53.31	-13.00	-40.31
2546.40	43.60	H	-57.00	10.20	6.63	-53.44	-13.00	-40.44
3395.20	40.13	H	-58.90	12.38	7.87	-54.38	-13.00	-41.38
4244.00	---	H		12.63	9.00		-13.00	
5092.80	---	H		12.74	9.88		-13.00	
5941.60	---	H		13.81	10.70		-13.00	
6790.40	---	H		11.86	11.48		-13.00	
7639.20	---	H		11.40	12.27		-13.00	
8488.00	---	H		11.70	12.91		-13.00	

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

Remark:

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

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

Operation Mode	: TX CH Low E2 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 1850.20MHz	Test By:	Sky
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)
93.05	46.56	V	-56.25	-7.75	1.30	-65.30	-13.00	-52.30
156.10	42.79	V	-55.05	-7.80	1.60	-64.46	-13.00	-51.46
187.14	43.56	V	-57.07	-7.83	1.68	-66.57	-13.00	-53.57
241.46	42.93	V	-57.28	-7.88	1.94	-67.11	-13.00	-54.11
369.50	36.14	V	-60.66	-7.65	2.42	-70.73	-13.00	-57.73
626.55	33.07	V	-56.15	-7.80	3.10	-67.05	-13.00	-54.05
1850.00	71.92	V	-32.47	9.90	5.56	-28.13	-13.00	-15.13
3700.40	36.45	V	-61.48	12.61	8.31	-57.18	-13.00	-44.18
5550.60	36.36	V	-54.48	13.23	10.33	-51.58	-13.00	-38.58
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Low E2 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 1850.20MHz	Test By:	Sky
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)
41.64	43.81	H	-59.70	-2.31	0.93	-62.94	-13.00	-49.94
97.90	46.58	H	-56.58	-7.76	1.34	-65.67	-13.00	-52.67
156.10	43.14	H	-55.10	-7.80	1.60	-64.51	-13.00	-51.51
267.65	42.52	H	-56.15	-7.90	2.05	-66.10	-13.00	-53.10
354.95	37.60	H	-59.52	-7.64	2.37	-69.54	-13.00	-56.54
568.35	32.79	H	-58.56	-7.77	2.99	-69.31	-13.00	-56.31
1850.00	76.37	H	-27.81	9.90	5.56	-23.47	-13.00	-10.47
3700.40	38.38	H	-59.66	12.61	8.31	-55.36	-13.00	-42.36
5550.60	---	H		13.23	10.33		-13.00	
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 1880MHz	Test By:	Sky
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)
107.60	45.62	V	-55.60	-7.77	1.39	-64.76	-13.00	-51.76
156.10	42.53	V	-55.31	-7.80	1.60	-64.72	-13.00	-51.72
183.26	42.86	V	-57.42	-7.83	1.67	-66.91	-13.00	-53.91
243.40	42.78	V	-57.36	-7.88	1.95	-67.20	-13.00	-54.20
361.74	36.11	V	-61.02	-7.64	2.40	-71.06	-13.00	-58.06
658.56	33.00	V	-56.01	-7.82	3.18	-67.01	-13.00	-54.01
3760.00	37.19	V	-60.47	12.60	8.39	-56.25	-13.00	-43.25
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 1880MHz	Test By:	Sky
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)
41.64	44.65	H	-58.86	-2.31	0.93	-62.10	-13.00	-49.10
97.90	47.53	H	-55.63	-7.76	1.34	-64.72	-13.00	-51.72
154.16	42.27	H	-55.82	-7.80	1.60	-65.23	-13.00	-52.23
267.65	41.85	H	-56.82	-7.90	2.05	-66.77	-13.00	-53.77
352.04	36.38	H	-60.79	-7.64	2.37	-70.80	-13.00	-57.80
660.50	33.19	H	-56.09	-7.82	3.19	-67.10	-13.00	-54.10
3760.00	40.84	H	-56.93	12.60	8.39	-52.72	-13.00	-39.72
5640.00	36.13	H	-54.62	13.36	10.41	-51.67	-13.00	-38.67
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH High E2 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 1909.8 MHz	Test By:	Sky
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)
93.05	46.77	V	-56.04	-7.75	1.30	-65.09	-13.00	-52.09
107.60	45.57	V	-55.65	-7.77	1.39	-64.81	-13.00	-51.81
156.10	43.29	V	-54.55	-7.80	1.60	-63.96	-13.00	-50.96
251.16	41.82	V	-58.03	-7.89	1.99	-67.92	-13.00	-54.92
361.74	37.14	V	-59.99	-7.64	2.40	-70.03	-13.00	-57.03
610.06	32.89	V	-56.55	-7.79	3.06	-67.40	-13.00	-54.40
1910.02	69.01	V	-35.32	10.08	5.66	-30.90	-13.00	-17.90
3819.60	39.14	V	-58.25	12.60	8.47	-54.12	-13.00	-41.12
5729.40	---	V		13.49	10.50		-13.00	
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH High E2 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 1909.8 MHz	Test By:	Sky
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)
41.64	43.80	H	-59.71	-2.31	0.93	-62.95	-13.00	-49.95
97.90	46.93	H	-56.23	-7.76	1.34	-65.32	-13.00	-52.32
158.04	41.74	H	-56.65	-7.81	1.61	-66.07	-13.00	-53.07
270.56	42.38	H	-56.20	-7.90	2.06	-66.16	-13.00	-53.16
381.14	35.76	H	-60.96	-7.65	2.45	-71.07	-13.00	-58.07
558.65	33.57	H	-57.97	-7.77	2.97	-68.71	-13.00	-55.71
1910.02	76.90	H	-27.21	10.08	5.66	-22.79	-13.00	-9.79
3819.60	42.97	H	-54.54	12.60	8.47	-50.40	-13.00	-37.40
5729.40	36.57	H	-53.88	13.49	10.50	-50.89	-13.00	-37.89
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  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$

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

Operation Mode	: TX CH Low E2 Mode	Test Date:	Mar. 22, 2011
Fundamental Frequency	: 1712.40MHz	Test By:	Sky
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)
90.14	50.98	V	-53.41	-7.75	1.16	-62.32	-13.00	-49.32
107.60	47.47	V	-55.30	-7.77	1.26	-64.33	-13.00	-51.33
173.56	35.07	V	-64.66	-7.82	1.51	-73.99	-13.00	-60.99
291.90	33.61	V	-66.15	-7.92	1.99	-76.05	-13.00	-63.05
464.56	33.28	V	-61.34	-7.71	2.61	-71.65	-13.00	-58.65
742.95	33.12	V	-55.37	-7.87	3.42	-66.66	-13.00	-53.66
1709.92	66.44	V	-40.58	9.47	5.16	-36.26	-13.00	-23.26
3424.80	45.54	V	-56.99	12.45	7.35	-51.90	-13.00	-38.90
5137.20	---	V		12.79	9.36		-13.00	
6849.60	---	V		11.80	10.94		-13.00	
8562.00	---	V		11.73	12.66		-13.00	
10274.40	---	V		11.85	13.80		-13.00	
11986.80	---	V		13.15	15.25		-13.00	
13699.20	---	V		12.32	16.55		-13.00	
15411.60	---	V		15.69	18.06		-13.00	
17124.00	---	V		14.68	19.79		-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 Band IV Mode**

Operation Mode	: TX CH Low E2 Mode	Test Date:	Mar. 22, 2011
Fundamental Frequency	: 1712.40MHz	Test By:	Sky
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)
90.14	44.72	H	-58.97	-7.75	1.16	-67.89	-13.00	-54.89
141.55	34.35	H	-65.01	-7.79	1.42	-74.23	-13.00	-61.23
425.76	33.33	H	-62.53	-7.68	2.49	-72.70	-13.00	-59.70
602.30	33.18	H	-58.40	-7.79	2.95	-69.14	-13.00	-56.14
650.80	33.57	H	-56.75	-7.81	3.00	-67.57	-13.00	-54.57
875.84	33.33	H	-53.04	-7.92	3.79	-64.74	-13.00	-51.74
1709.66	76.26	H	-30.71	9.47	5.16	-26.40	-13.00	-13.40
3424.80	64.47	H	-37.79	12.45	7.35	-32.70	-13.00	-19.70
5137.20	---	H		12.79	9.36		-13.00	
6849.60	---	H		11.80	10.94		-13.00	
8562.00	---	H		11.73	12.66		-13.00	
10274.40	---	H		11.85	13.80		-13.00	
11986.80	---	H		13.15	15.25		-13.00	
13699.20	---	H		12.32	16.55		-13.00	
15411.60	---	H		15.69	18.06		-13.00	
17124.00	---	H		14.68	19.79		-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 Band IV Mode**

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Mar. 22, 2011
Fundamental Frequency	: 1732.6MHz	Test By:	Sky
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)
90.14	51.42	V	-52.97	-7.75	1.16	-61.88	-13.00	-48.88
107.60	47.19	V	-55.58	-7.77	1.26	-64.61	-13.00	-51.61
398.60	33.38	V	-62.73	-7.66	2.41	-72.81	-13.00	-59.81
471.35	33.55	V	-61.07	-7.71	2.63	-71.41	-13.00	-58.41
648.86	32.51	V	-57.92	-7.81	3.00	-68.73	-13.00	-55.73
791.45	32.61	V	-55.35	-7.87	3.52	-66.74	-13.00	-53.74
3465.20	51.28	V	-51.23	12.53	7.38	-46.08	-13.00	-33.08
5197.80	---	V		12.85	9.41		-13.00	
6930.40	---	V		11.72	11.05		-13.00	
8663.00	---	V		11.77	12.74		-13.00	
10395.60	---	V		11.75	13.95		-13.00	
12128.20	---	V		13.35	15.32		-13.00	
13860.80	---	V		11.98	16.77		-13.00	
15593.40	---	V		16.35	18.21		-13.00	
17326.00	---	V		14.02	19.68		-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 Band IV Mode**

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Mar. 22, 2011
Fundamental Frequency	: 1732.6MHz	Test By:	Sky
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)
90.14	46.02	H	-57.67	-7.75	1.16	-66.59	-13.00	-53.59
150.28	32.39	H	-66.21	-7.80	1.47	-75.48	-13.00	-62.48
422.85	32.59	H	-63.32	-7.68	2.48	-73.48	-13.00	-60.48
510.15	33.05	H	-60.51	-7.73	2.73	-70.97	-13.00	-57.97
610.06	33.26	H	-58.12	-7.79	2.95	-68.86	-13.00	-55.86
844.80	32.70	H	-54.42	-7.88	3.73	-66.03	-13.00	-53.03
3465.20	66.93	H	-35.30	12.53	7.38	-30.15	-13.00	-17.15
5197.80	53.11	H	-42.77	12.85	9.41	-39.33	-13.00	-26.33
6930.40	---	H		11.72	11.05		-13.00	
8663.00	---	H		11.77	12.74		-13.00	
10395.60	---	H		11.75	13.95		-13.00	
12128.20	---	H		13.35	15.32		-13.00	
13860.80	---	H		11.98	16.77		-13.00	
15593.40	---	H		16.35	18.21		-13.00	
17326.00	---	H		14.02	19.68		-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 Band IV Mode**

Operation Mode	: TX CH High E2 Mode	Test Date:	Mar. 22, 2011
Fundamental Frequency	: 1752.6 MHz	Test By:	Sky
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)
90.14	50.70	V	-53.69	-7.75	1.16	-62.60	-13.00	-49.60
107.60	47.79	V	-54.98	-7.77	1.26	-64.01	-13.00	-51.01
175.50	36.56	V	-63.34	-7.82	1.52	-72.68	-13.00	-59.68
439.34	32.79	V	-62.14	-7.69	2.53	-72.36	-13.00	-59.36
610.06	33.50	V	-56.98	-7.79	2.95	-67.73	-13.00	-54.73
875.84	33.78	V	-52.75	-7.92	3.79	-64.45	-13.00	-51.45
1755.22	64.31	V	-42.69	9.61	5.24	-38.32	-13.00	-25.32
3505.20	51.40	V	-51.08	12.61	7.42	-45.88	-13.00	-32.88
5257.80	---	V		12.91	9.46		-13.00	
7010.40	---	V		11.65	11.14		-13.00	
8763.00	---	V		11.80	12.82		-13.00	
10515.60	---	V		11.66	14.08		-13.00	
12268.20	---	V		13.54	15.39		-13.00	
14020.80	---	V		11.67	16.95		-13.00	
15773.40	---	V		16.75	18.27		-13.00	
17526.00	---	V		13.21	19.62		-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 Band IV Mode**

Operation Mode	: TX CH High E2 Mode	Test Date:	Mar. 22, 2011
Fundamental Frequency	: 1752.6 MHz	Test By:	Sky
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)
90.14	45.07	H	-58.62	-7.75	1.16	-67.54	-13.00	-54.54
245.34	33.53	H	-67.45	-7.89	1.95	-77.29	-13.00	-64.29
503.36	32.74	H	-61.04	-7.72	2.73	-71.49	-13.00	-58.49
607.15	33.20	H	-58.25	-7.79	2.95	-69.00	-13.00	-56.00
691.54	32.83	H	-56.98	-7.85	3.27	-68.10	-13.00	-55.10
825.40	33.27	H	-54.35	-7.88	3.65	-65.88	-13.00	-52.88
1755.50	74.49	H	-32.46	9.61	5.24	-28.09	-13.00	-15.09
3505.20	66.36	H	-35.82	12.61	7.42	-30.63	-13.00	-17.63
5257.80	52.34	H	-43.42	12.91	9.46	-39.97	-13.00	-26.97
7010.40	---	H		11.65	11.14		-13.00	
8763.00	---	H		11.80	12.82		-13.00	
10515.60	---	H		11.66	14.08		-13.00	
12268.20	---	H		13.54	15.39		-13.00	
14020.80	---	H		11.67	16.95		-13.00	
15773.40	---	H		16.75	18.27		-13.00	
17526.00	---	H		13.21	19.62		-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:

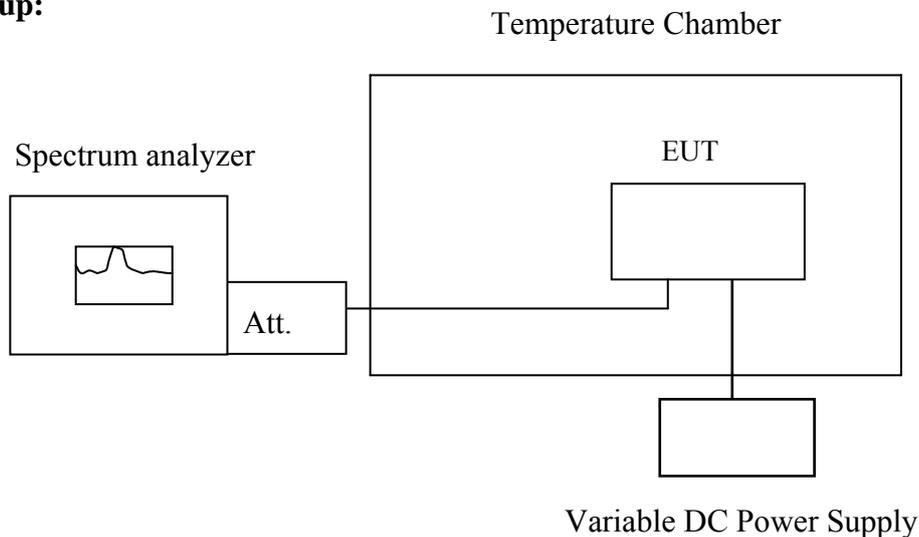
According to FCC §2.1055(a) (1)

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

+/-2.5ppm for 1900MHz band

+/-2.5ppm for 1700MHz band

### 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

**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	836.600034	-38.00	2091
3.7	-20	836.600027	-31.00	2091
3.7	-10	836.600015	-19.00	2091
3.7	0	836.600005	-9.00	2091
3.7	10	836.599988	8.00	2091
3.7	20	836.599996	0.00	2091
3.7	30	836.599988	8.00	2091
3.7	40	836.599994	2.00	2091
3.7	50	836.599998	-2.00	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	1880.000022	-4.00	4700
3.7	-20	1880.000035	-17.00	4700
3.7	-10	1880.000057	-39.00	4700
3.7	0	1880.000029	-11.00	4700
3.7	10	1880.000001	17.00	4700
3.7	20	1880.000018	0.00	4700
3.7	30	1880.000008	10.00	4700
3.7	40	1880.000005	13.00	4700
3.7	50	1880.000009	9.00	4700

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Reference Frequency: WCDMA IV Mid Channel 1732.6 (ARFCN1413) MHz @ 20°C				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.7	-30	1732.599988	7.00	4331.5
3.7	-20	1732.599999	-4.00	4331.5
3.7	-10	1732.599983	12.00	4331.5
3.7	0	1732.599986	9.00	4331.5
3.7	10	1732.599991	4.00	4331.5
3.7	20	1732.599995	0.00	4331.5
3.7	30	1732.599985	10.00	4331.5
3.7	40	1732.600005	-10.00	4331.5
3.7	50	1732.600007	-12.00	4331.5

**Note: The battery is rated 3.7V dc.**

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

### 11.1. Standard Applicable:

According to FCC §2.1055(a) (1)

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

+/-2.5ppm for 1900MHz band

+/-2.5ppm for 1700MHz band

### 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

**11.5. 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)		
4.2	25.00	836.599988	8.00	2091.00
3.7	25.00	836.599996	0.00	2091.00
3.6	25.00	836.000006	599990.00	2091.00
3.0 (End Point)	25.00	836.599977	19.00	2091.00

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)		
4.2	25	1880.000006	12.00	4700
3.7	25	1880.000018	0.00	4700
3.6	25	1880.000004	14.00	4700
3.0 (End Point)	25	1879.999986	32.00	4700

Reference Frequency: WCDMA IV Mid Channel 1732.6 MHz(ARFCN1413) @ 25°C				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25	1732.599979	16.00	4331.5
3.7	25	1732.599995	0.00	4331.5
3.6	25	1732.600012	-17.00	4331.5
3.0 (Endpoint)	25	1732.599966	29.00	4331.5

**Note: The battery is rated 3.7V dc.**

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