

LECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

Product Name: ARGON MINI

Marketing Name: MOTOSMART

Brand Name: Motorola

Model No.: XT389 (GPPD:3345)

Model Differences: N/A

FCC ID: IHDT56NN3

Report No.: EH/2012/20074

Issue Date: May. 15, 2012

FCC Rule Part: 2 , 22H & 24E

Prepared for: Motorola Mobility Inc.
9 F., No.9, Songgao Rd., Taipei 110, Taiwan,
R.O.C.

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

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VERIFICATION OF COMPLIANCE

Applicant: Motorola Mobility Inc.
 9 F., No.9, Songgao Rd., Taipei 110, Taiwan, R.O.C.

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Marketing Name: MOTOSMART

Brand Name: Motorola

Model No.: XT389 (GPPD:3345)

Model Different: N/A

FCC ID: IHDT56NN3

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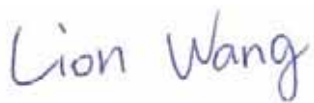
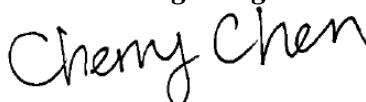
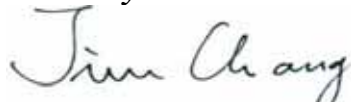
Date of test: Feb. 24, 2012 ~ May. 13, 2012

Date of EUT Received: Feb. 24, 2012

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C-2004 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule FCC PART 22 subpart H, PART 24 subpart E.

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

Test By:		Date:	May. 15, 2012
	_____ <i>Lion Wang / Engineer</i>		
Prepared By:		Date:	May. 15, 2012
	_____ <i>Cherry Chen / Clerk</i>		
Approved By:		Date:	May. 15, 2012
	_____ <i>Jim Chang / Supervisor</i>		

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Version

Version No.	Date	Description
00	Mar. 15, 2012	Initial creation of document
01	Apr. 30, 2012	Revise Model No. & Marketing Name
02	May. 15, 2012	Update SW version on page 6

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1. GENERAL PRODUCT INFORMATION

General:

Product Name:	ARGON MINI		
Marketing Name:	MOTOSMART		
Brand Name:	N/A		
Model No.:	XT389 (GPPD:3345)		
Model Difference:	N/A		
Simple Hands-Free:	M/N: SJYN0760A, Supplier: Motorola		
Data Cable:	M/N: SKN6378A, Supplier: Motorola		
Power Supply:	3.7Vdc from rechargeable battery or 5.1Vdc from adapter		
	Adaptor:	M/N: FMP5727A, Supplier: Motorola	
	Battery:	M/N: BP6X, Supplier: Motorola	

GSM:

Cellular Phone Standards Frequency Range and Power:	Operating Frequency		Rated Power
	GSM/GPRS 850, Class 10	824.2 MHz– 848.8 MHz	33 dBm
	GSM/GPRS 1900, Class 10	1850.2MHz – 1909.8MHz	30 dBm
Type of Emission:	GSM850: 248KGXW, GSM1900: 248KGXW GPRS850: 243KGXW, GPRS1900: 247KGXW		
Hardware Version:	P2		
Software Version:	ARGONM_W_0A.10.00R_S		
IMEI:	359500040015014		

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Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GSM 850	3.7 Vdc	350
GSM 1900	3.7 Vdc	410
GPRS 850	3.7 Vdc	340
GPRS 1900	3.7 Vdc	420

This test report applies for GSM/GPRS 850/1900

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

This submittal(s) (test report) is intended for **FCC ID: IHDT56NN3** filing to comply with Section Part 22 subpart H, Part 24 subpart E of the FCC CFR 47 Rules.

1.2. Test Methodology

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

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

1.3. Test Facility

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

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

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

1.4. Special Accessories

Not available for this EUT intended for grant.

1.5. Equipment Modifications

Not available for this EUT intended for grant.

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2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

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

2.2. EUT Exercise

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

2.3. Test Procedure

2.3.1 AC Power Line Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in TIA/EIA 603C. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

2.3.2 Conducted Measurement at Antenna Port:

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

2.3.3 Radiated Emissions (ERP/EIRP):

According to measurement procured TIA/EIA 603C and RSS-Gen, The EUT is placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13 of ANSI C63.4:2003.

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2.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2011	04/14/2013
Spectrum Analyzer	Agilent	E4440A	US41160416	03/17/2010	03/16/2012
Radio Communication Analyzer	R & S	CMU200	102189	08/12/2010	08/11/2012
WIDEB. RADIO COMIN. TESTER	R & S	CMW500	101582	07/12/2010	07/11/2012
Temperature Chamber	TERCHY	MHG-120LF	911009	04/30/2010	04/29/2012
DC Block	Mini-Circuits	BLK-18-S+	1	02/28/2012	02/27/2013
Attenuator	Mini-Circuit	BW-S10W2+	002	02/28/2012	02/27/2013
Splitter	Agilent	11636B	N/A	02/28/2012	02/27/2013
DC Power Supply	Agilent	E3640A	MY40005907	07/15/2011	07/14/2013

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ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100759	05/20/2011	05/19/2013
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2011	04/14/2013
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	02/15/2011	02/14/2013
Spectrum Analyzer	R&S	FSV-30	101398	10/18/2011	10/17/2013
Bilog Antenna	SCHWAZBECK	VULB9168	378	01/10/2012	01/09/2014
Bilog Antenna	SCHWAZBECK	VULB9160	3158	11/24/2011	11/23/2013
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/17/2010	07/16/2012
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/17/2010	07/16/2012
Horn antenna	ETS.LINDGREN	3117	123995	03/19/2011	03/18/2013
Horn antenna	Schwarzbeck	BBHA9120D	9120D-673	05/05/2010	05/04/2012
Horn Antenna	Schwarzbeck	BBHA9170	184	01/17/2012	01/17/2014
Horn Antenna	Schwarzbeck	BBHA9170	185	07/11/2011	07/10/2013
RF amplifier	Miteq	AMF-6F-260040 0-40-8P	971576	12/28/2011	12/27/2012
Signal Generator	R&S	SMR40	100210	02/02/2012	02/01/2014
Signal Generator	Agilent	E4438C	MY45093613	07/15/2011	07/14/2013
Pre-Amplifier	Agilent	8447D	1937A02834	01/04/2012	01/03/2013
Pre-Amplifier	Agilent	8449B	3008A01973	01/04/2012	01/03/2013
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/04/2012	01/03/2013
Attenuator	Mini-Circuit	BW-S10W2+	004	02/28/2012	02/27/2013
Radio Communication Analyzer	R & S	CMU200	102189	08/12/2010	08/11/2012
WIDEB. RADIO COMIN. TESTER	R & S	CMW500	101582	07/12/2010	07/11/2012
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/04/2012	01/03/2013
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/04/2012	01/03/2013
Filter 800-1000	Micro-Tronics	EWT	M2	05/25/2011	05/24/2013
Filter 1800-2000	Micro-Tronics	EWT	M2	05/25/2011	05/24/2013
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	02/28/2012	02/27/2013
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	02/28/2012	02/27/2013
3m Site	SGS	966 chamber	N/A	07/15/2011	07/14/2012

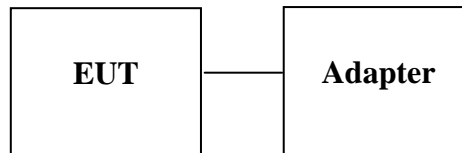
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2.5. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



Remote Side

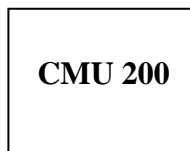


Table 2-1 Equipment Used in Tested System

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

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3. SUMMARY OF TEST RESULTS

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

Max ERP/EIRP measurement result:

	dBm	dB	W
GSM 850 Band	25.04	ERP	0.319
GSM 1900 Band	30.35	EIRP	1.084
GPRS 850 Band	24.99	ERP	0.316
GPRS 1900 Band	29.10	EIRP	0.813

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4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

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

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

5. MEASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SPURIOUS RADIATION

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

Measurement uncertainty (Polarization : Horizontal)	30MHz - 167MHz: 4.22dB
	167MHz -500MHz: 3.44dB
	0.5GHz-1GHz: 3.39dB
	1GHz - 18GHz: 4.08dB
	18GHz - 40GHz: 4.08dB

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6. RF POWER OUTPUT MEASUREMENT

6.1. Standard Applicable:

According to FCC §2.1046.

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

FCC 24.232(C) Peak Power Measurement to 2W.

3GPP Power limitation for HSDPA and HSUPA

Maximum Output Powers for HSDPA

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

Maximum Output Powers for HSUPA

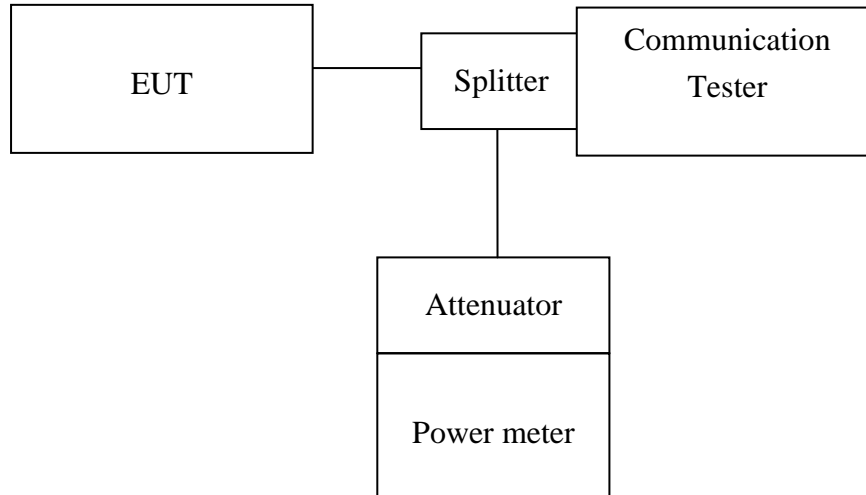
Sub-test in table C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+1.7/-6.7	+21	+2.7/-5.7
2	+22	+3.7/-5.2	+19	+4.7/-4.2
3	+23	+2.7/-5.2	+20	+3.7/-4.2
4	+22	+3.7/-5.2	+19	+4.7/-4.2
5	+24	+1.7/-6.7	+21	+2.7/-5.7

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6.2. Test Set-up:



Note: Measurement setup for testing on Antenna connector

6.3. Measurement Procedure:

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

6.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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6.5. Measurement Result:

6.5.1. RF Conducted Output Power

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

Result:

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
GSM 850 (Class 10)	824.2	128	33.00	32.80
	836.6	190	33.00	32.80
	848.8	251	33.00	32.80

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
GSM 1900 (Class 10)	1850.2	512	30.00	29.90
	1880.0	661	30.00	29.90
	1909.8	810	30.00	29.90

EUT Mode	Frequency (MHz)	CH	Peak Power (1DN 1UP) (dBm)	Avg. Power (1DN 1UP) (dBm)	Peak Power (1DN 2UP) (dBm)	Avg. Power (1DN 2UP) (dBm)
GPRS 850 (Class 10)	824.2	128	33.00	32.80	32.30	32.20
	836.6	190	33.00	32.80	32.20	32.10
	848.8	251	33.00	32.80	32.10	32.00

EUT Mode	Frequency (MHz)	CH	Peak Power (1DN 1UP) (dBm)	Avg. Power (1DN 1UP) (dBm)	Peak Power (1DN 2UP) (dBm)	Avg. Power (1DN 2UP) (dBm)
GPRS 1900 (Class 10)	1850.2	512	29.90	29.80	29.00	28.80
	1880.0	661	29.90	29.80	29.00	28.80
	1909.8	810	30.00	29.90	29.00	28.80

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6.5.1.2: WCDMA mode

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.4.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1/-3). RMC 12.2kps is used for this testing.

Results: N/A for this testing item.

6.5.13: HSDPA Release 6 mode

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

HSDPA SUB-TEST Setting

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

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

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

Results: N/A for this testing item.

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6.5.1.4: HSPA (HSDPA & HSUPA) Release 6 mode

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

HSPA SUB-TEST Setting

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

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

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

Results: N/A for this testing item.

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7. ERP, EIRP MEASUREMENT

7.1. Standard Applicable:

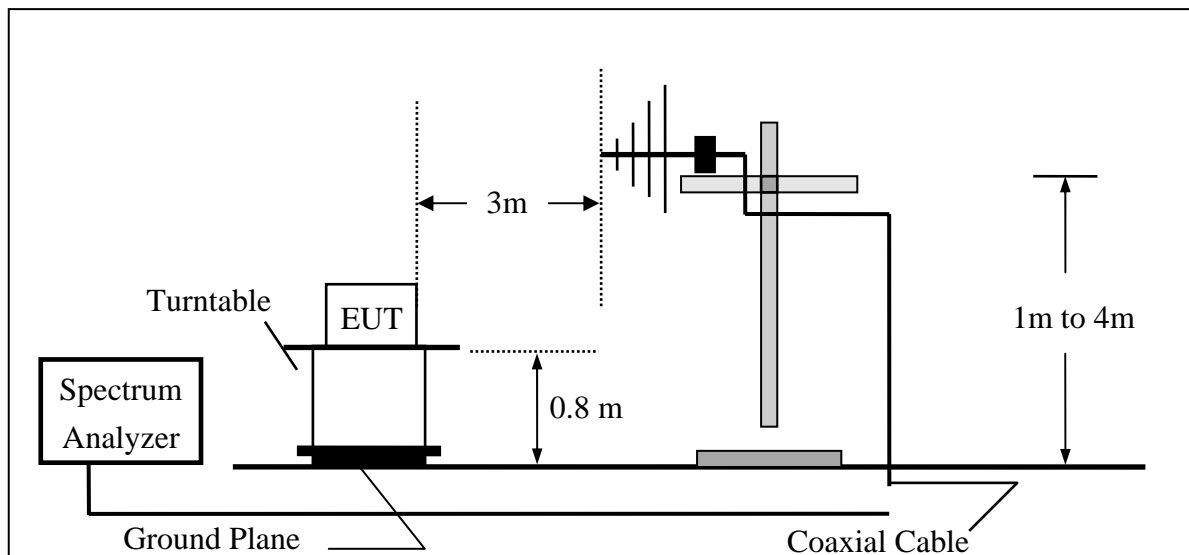
According to FCC §2.1046

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

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

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

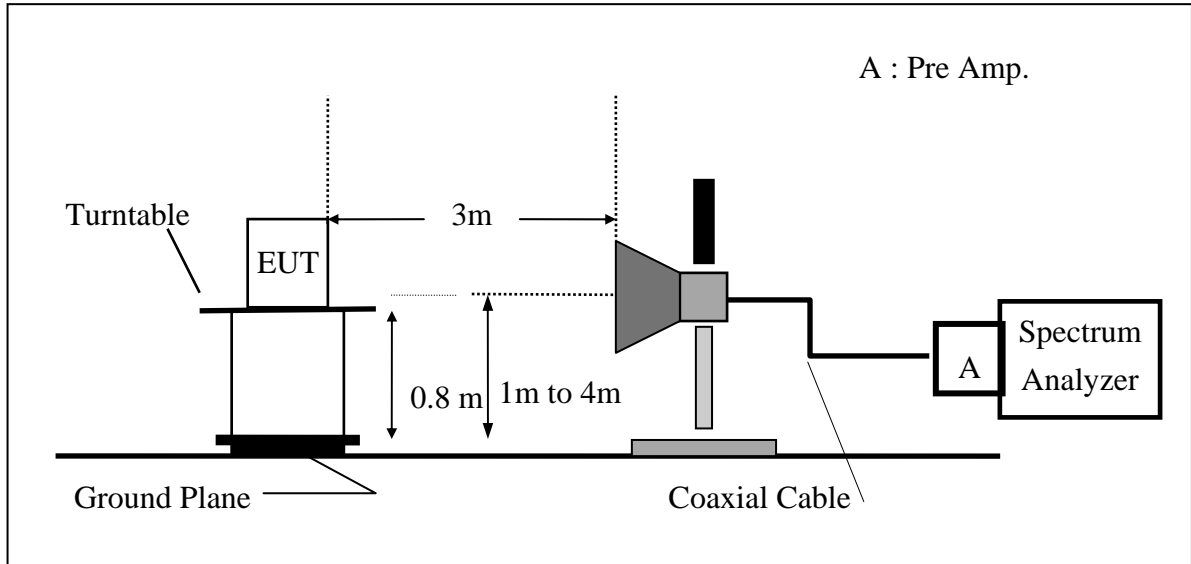
(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



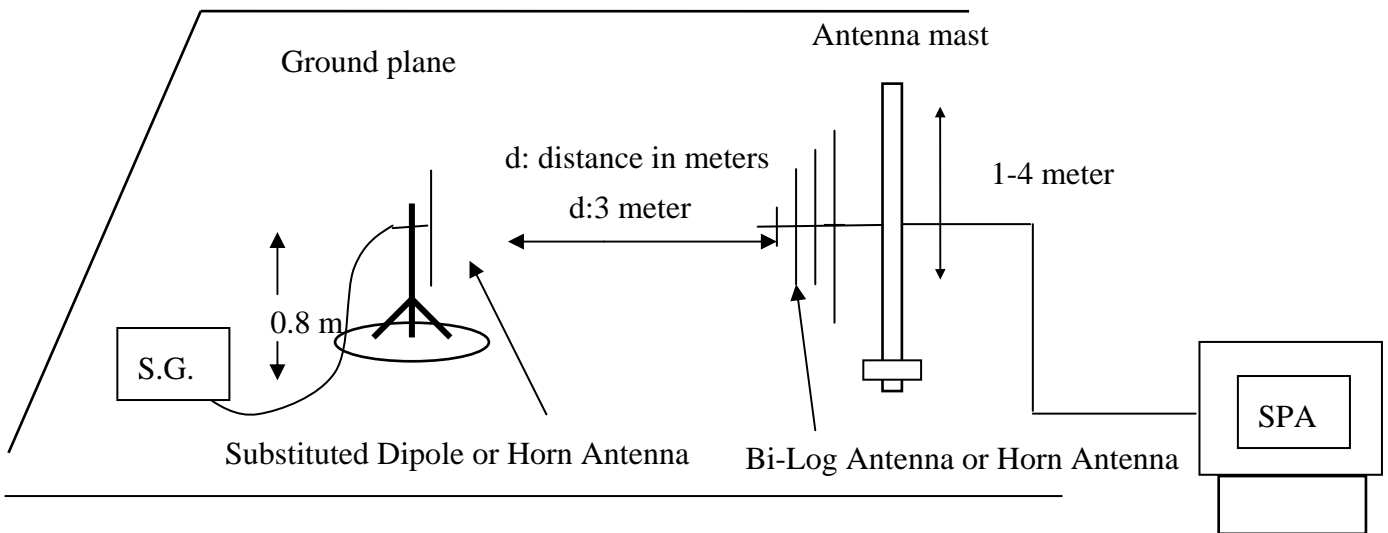
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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



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7.3. Measurement Procedure:

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

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

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

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

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

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

7.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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7.5. Measurement Result:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
GSM 850	H	824.20	128	V	23.59	3.96	-4.22	23.33	38.45
				H	18.18	3.96	-4.22	17.92	38.45
		836.60	190	V	24.57	4.00	-4.24	24.33	38.45
				H	18.37	4.00	-4.24	18.13	38.45
		848.80	251	V	25.34	4.03	-4.33	25.04	38.45
				H	19.59	4.03	-4.33	19.29	38.45
	E1	824.20	128	V	22.10	3.96	-4.22	21.84	38.45
				H	24.55	3.96	-4.22	24.29	38.45
		836.60	190	V	22.89	4.00	-4.24	22.65	38.45
				H	24.83	4.00	-4.24	24.59	38.45
		848.80	251	V	23.13	4.03	-4.33	22.83	38.45
				H	24.89	4.03	-4.33	24.59	38.45
	E2	824.20	128	V	19.70	3.96	-4.22	19.44	38.45
				H	24.27	3.96	-4.22	24.01	38.45
		836.60	190	V	20.77	4.00	-4.24	20.53	38.45
				H	24.77	4.00	-4.24	24.53	38.45
		848.80	251	V	20.37	4.03	-4.33	20.06	38.45
				H	25.00	4.03	-4.33	24.70	38.45

Remark :

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

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
GSM 1900	H	1850.20	512	V	30.26	4.17	-5.49	28.95	33.00
				H	29.02	4.51	-5.49	28.05	33.00
		1880.00	661	V	29.04	4.13	-5.56	27.61	33.00
				H	27.98	4.44	-5.56	26.85	33.00
		1909.80	810	V	28.34	4.09	-5.56	26.88	33.00
				H	26.72	4.36	-5.56	25.53	33.00
	E1	1850.20	512	V	31.25	4.17	-5.49	29.93	33.00
				H	27.46	4.51	-5.49	26.49	33.00
		1880.00	661	V	28.07	4.13	-5.56	26.65	33.00
				H	27.21	4.44	-5.56	26.09	33.00
		1909.80	810	V	29.45	4.10	-5.56	27.98	33.00
				H	26.70	4.36	-5.56	25.51	33.00
	E2	1850.20	512	V	30.98	4.17	-5.49	29.67	33.00
				H	31.32	4.51	-5.49	30.35	33.00
		1880.00	661	V	30.12	4.13	-5.56	28.69	33.00
				H	29.02	4.44	-5.56	27.90	33.00
		1909.80	810	V	28.88	4.09	-5.56	27.42	33.00
				H	28.20	4.36	-5.56	27.01	33.00

Remark :

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

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
GPRS 850	H	824.20	128	V	23.52	3.96	-4.22	23.26	38.45
				H	18.07	3.96	-4.22	17.82	38.45
		836.60	190	V	24.55	4.00	-4.24	24.31	38.45
				H	18.24	4.00	-4.24	18.00	38.45
		848.80	251	V	25.29	4.03	-4.33	24.99	38.45
				H	19.34	4.03	-4.33	19.04	38.45
	E1	824.20	128	V	21.87	3.96	-4.22	21.61	38.45
				H	24.32	3.96	-4.22	24.06	38.45
		836.60	190	V	22.56	4.00	-4.24	22.32	38.45
				H	24.82	4.00	-4.24	24.58	38.45
		848.80	251	V	22.98	4.03	-4.33	22.68	38.45
				H	24.88	4.03	-4.33	24.57	38.45
	E2	824.20	128	V	19.27	3.96	-4.22	19.02	38.45
				H	24.16	3.96	-4.22	23.90	38.45
		836.60	190	V	19.68	4.00	-4.24	19.44	38.45
				H	24.42	4.00	-4.24	24.18	38.45
		848.80	251	V	19.47	4.03	-4.33	19.17	38.45
				H	23.96	4.03	-4.33	23.66	38.45

Remark :

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

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
GPRS 1900	H	1850.20	512	V	29.81	4.17	-5.49	28.50	33.00
				H	28.04	4.51	-5.49	27.07	33.00
		1880.00	661	V	28.50	4.13	-5.56	27.08	33.00
				H	26.74	4.44	-5.56	25.62	33.00
		1909.80	810	V	28.00	4.09	-5.56	26.54	33.00
				H	26.48	4.36	-5.56	25.29	33.00
	E1	1850.20	512	V	30.07	4.17	-5.49	28.76	33.00
				H	26.73	4.51	-5.49	25.75	33.00
		1880.00	661	V	27.37	4.13	-5.56	25.94	33.00
				H	26.18	4.44	-5.56	25.06	33.00
		1909.80	810	V	28.55	4.09	-5.56	27.09	33.00
				H	26.06	4.36	-5.56	24.87	33.00
	E2	1850.20	512	V	27.37	4.17	-5.49	26.06	33.00
				H	30.07	4.51	-5.49	29.10	33.00
		1880.00	661	V	28.82	4.44	-5.56	27.70	33.00
				H	28.79	4.13	-5.56	27.36	33.00
		1909.80	810	V	27.99	4.09	-5.56	26.52	33.00
				H	27.69	4.36	-5.56	26.50	33.00

Remark :

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

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8. 99% OCCUPIED BANDWIDTH MEASUREMENT

8.1. Standard Applicable:

According to §FCC 2.1049.

8.2. Test Set-up:

Refer to section 6.2 in this report

8.3. Measurement Procedure:

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

8.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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8.5. Measurement Result:

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
GSM 850	824.20	128	245.5209
	836.60	190	243.4899
	848.80	251	248.0312

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
GSM 1900	1850.20	512	248.4238
	1880.00	661	247.2546
	1909.80	810	247.6616

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
GPRS 850	824.20	128	241.8601
	836.60	190	243.0334
	848.80	251	242.0081

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
GPRS 1900	1850.20	512	244.6377
	1880.00	661	247.1002
	1909.80	810	246.0379

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Figure 8-1: GSM 850 Channel Low

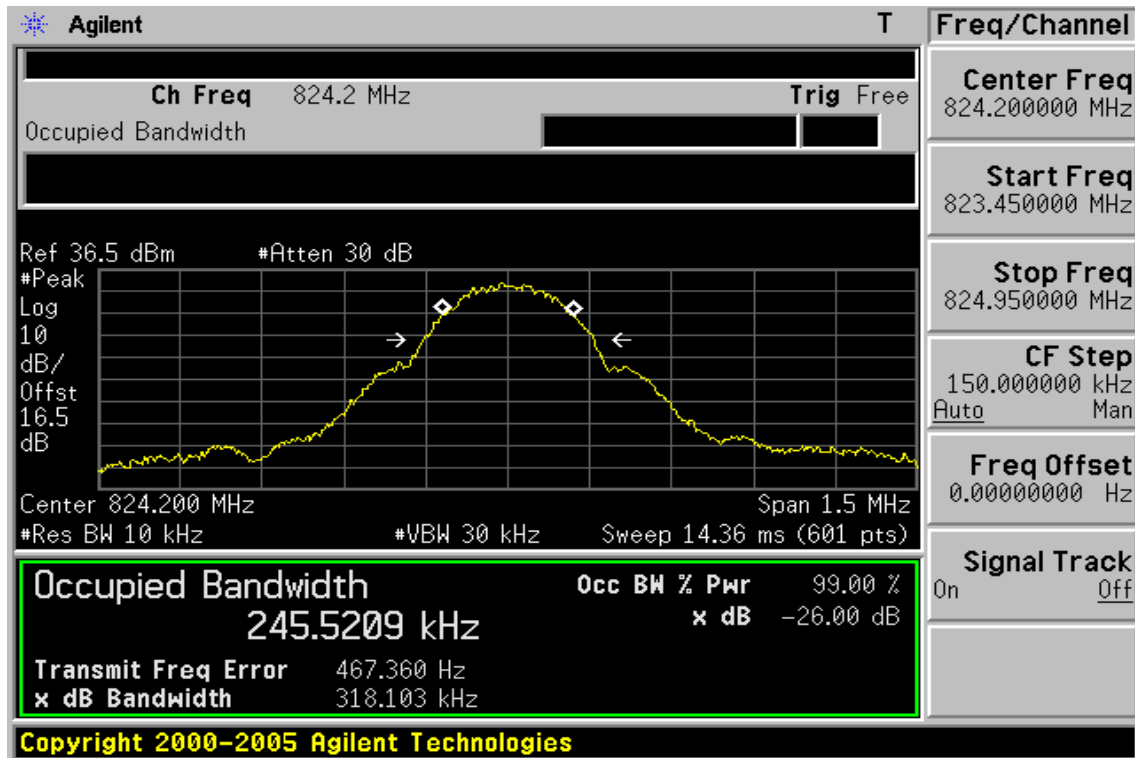
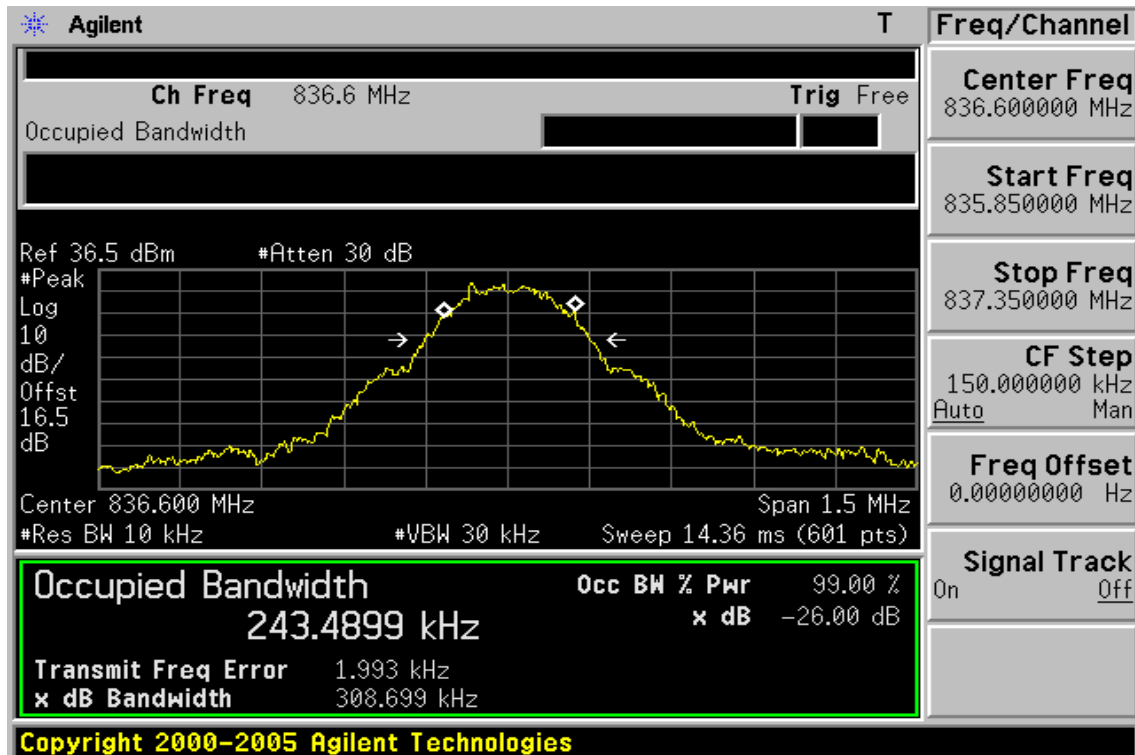


Figure 8-2 GSM 850 Channel Mid



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Figure 8-3: GSM 850 Channel High

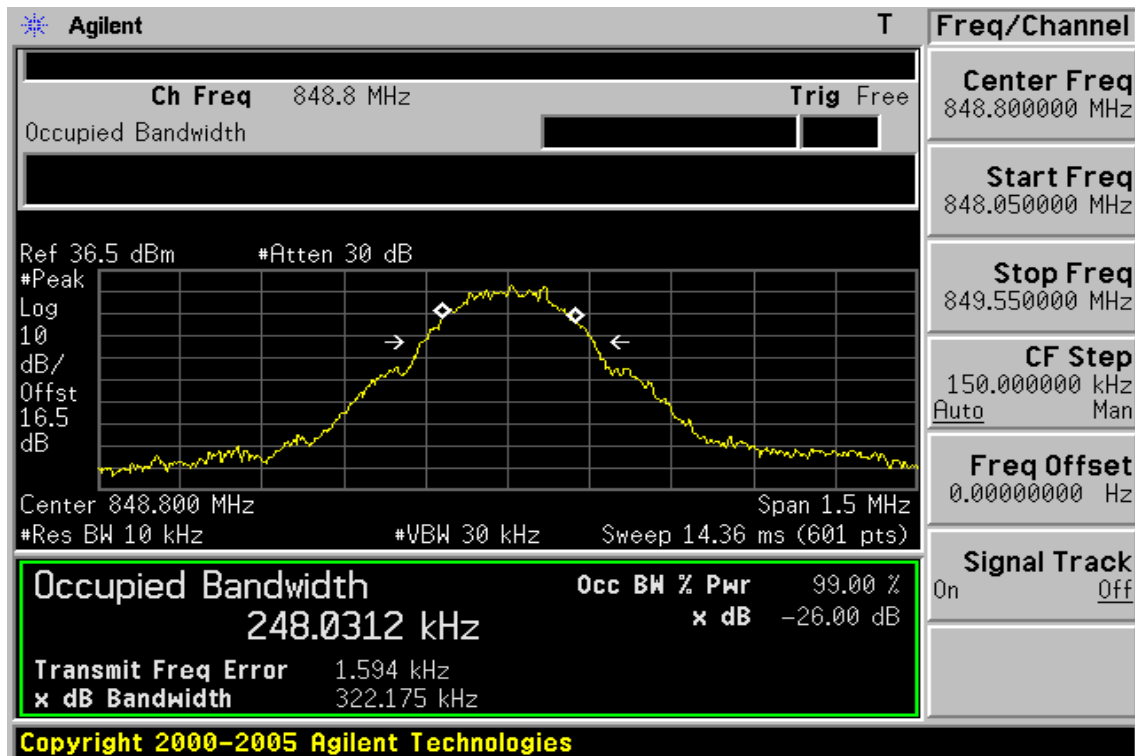
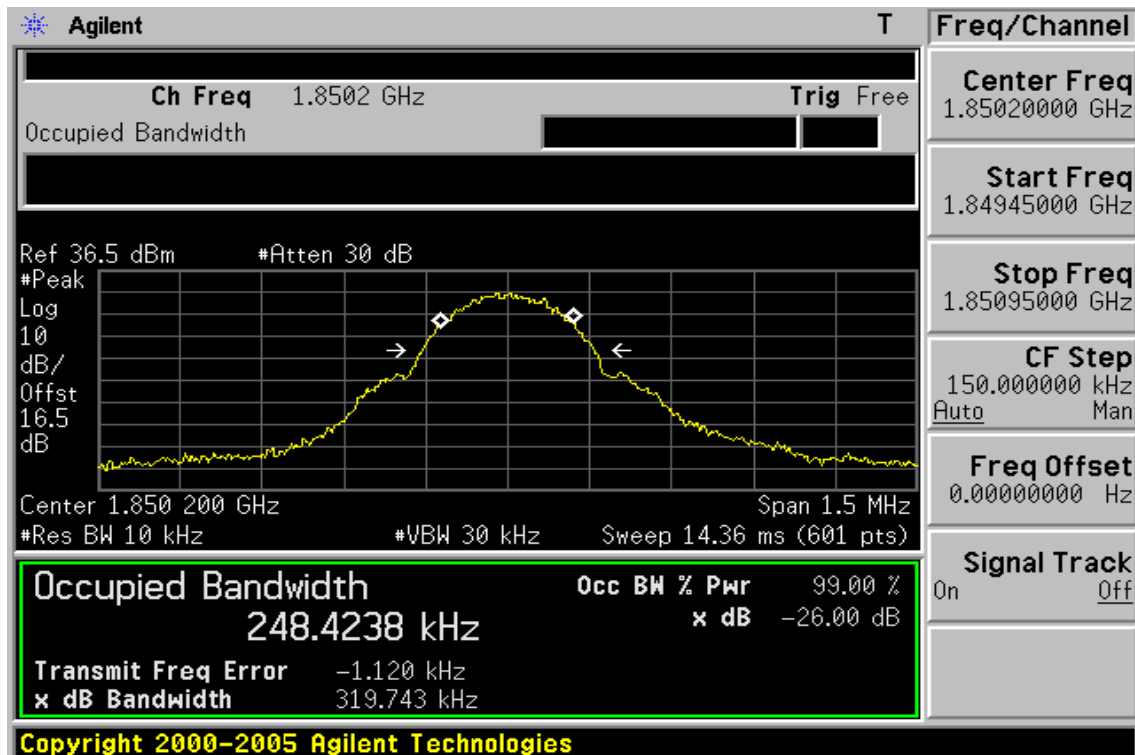


Figure 8-4: GSM 1900 Channel Low



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Figure 8-5 GSM 1900 Channel Mid

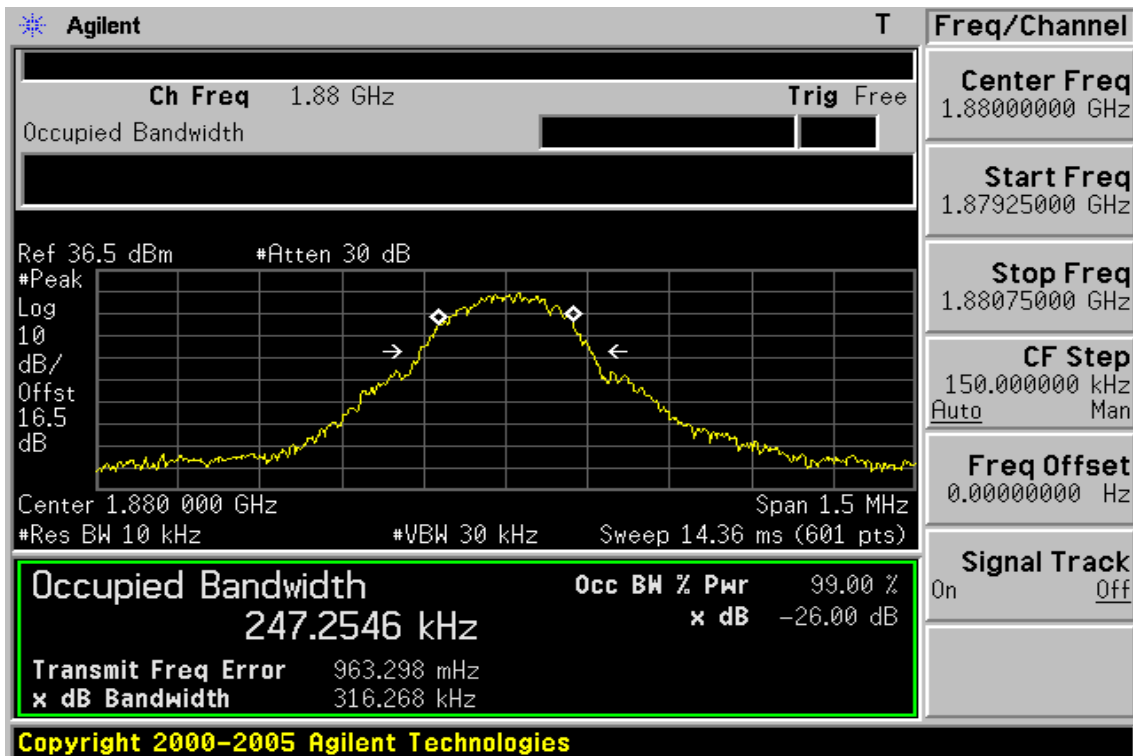
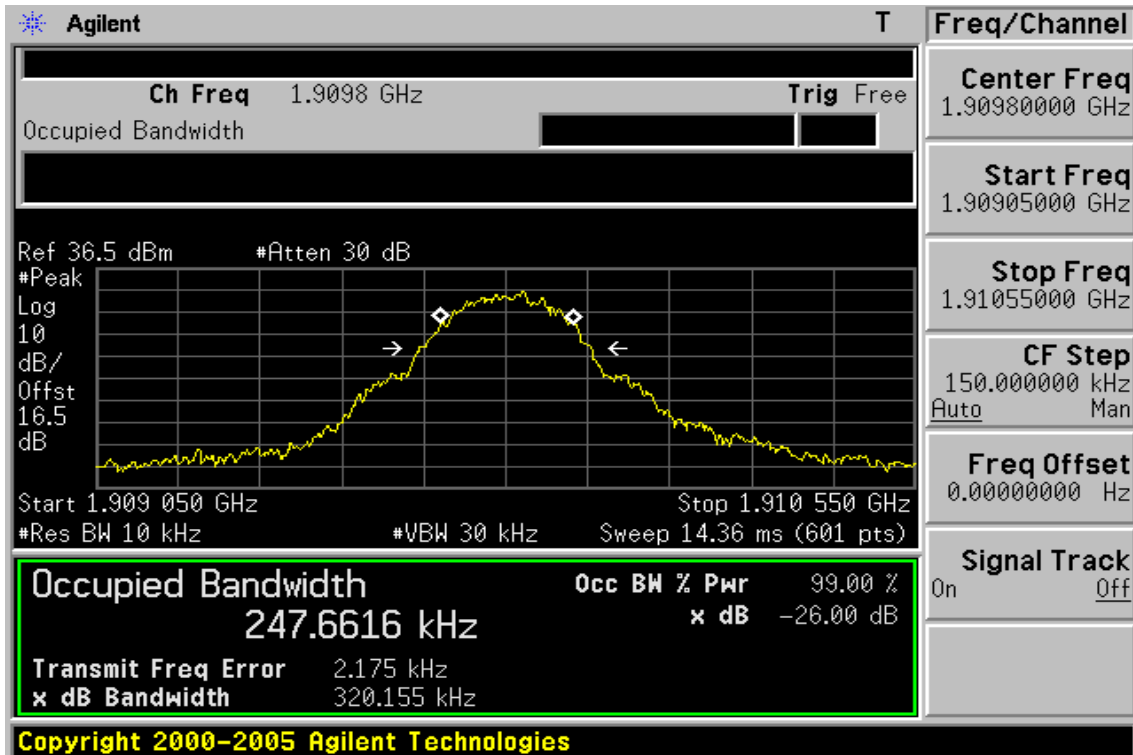


Figure 8-6: GSM 1900 Channel High



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Figure 8-7: GPRS 850 Channel Low

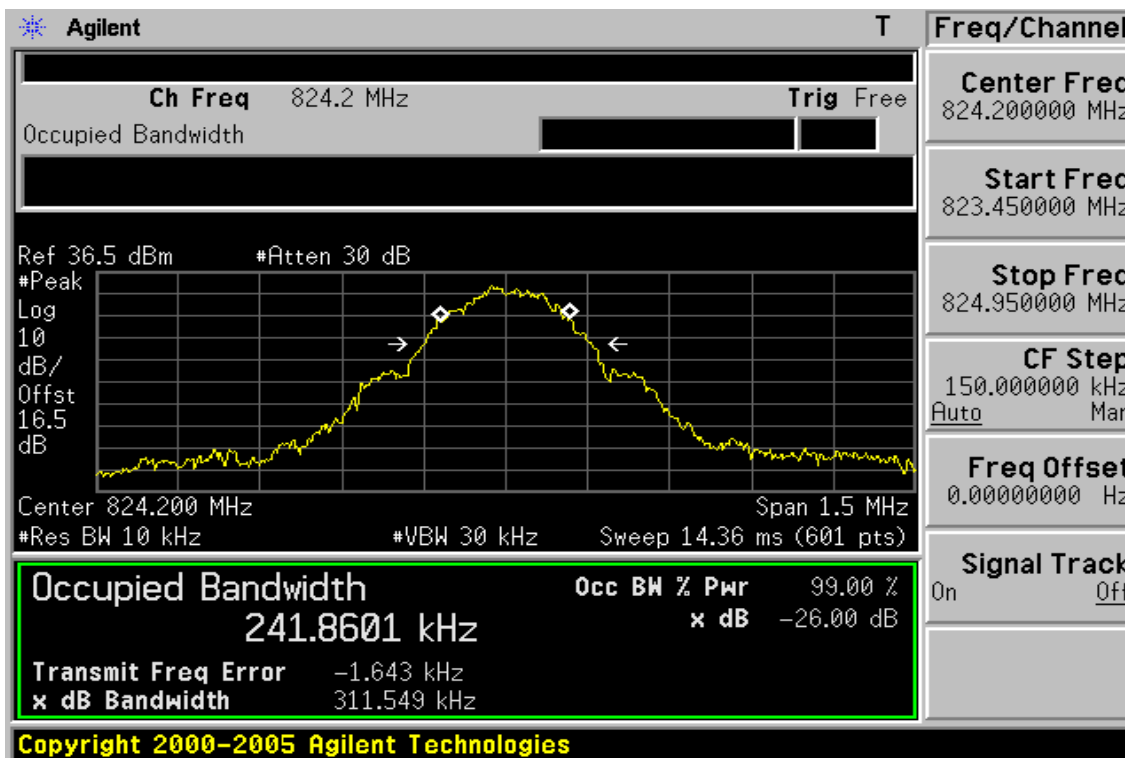
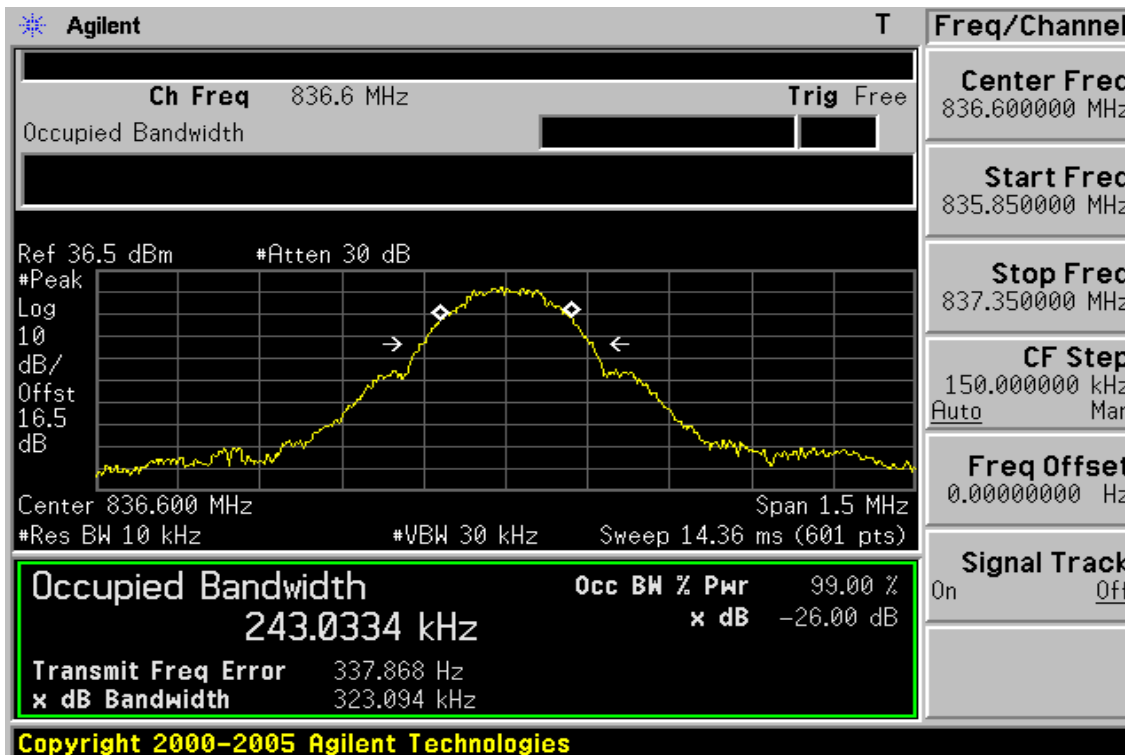


Figure 8-8 GPRS 850 Channel Mid



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Figure 8-9: GPRS 850 Channel High

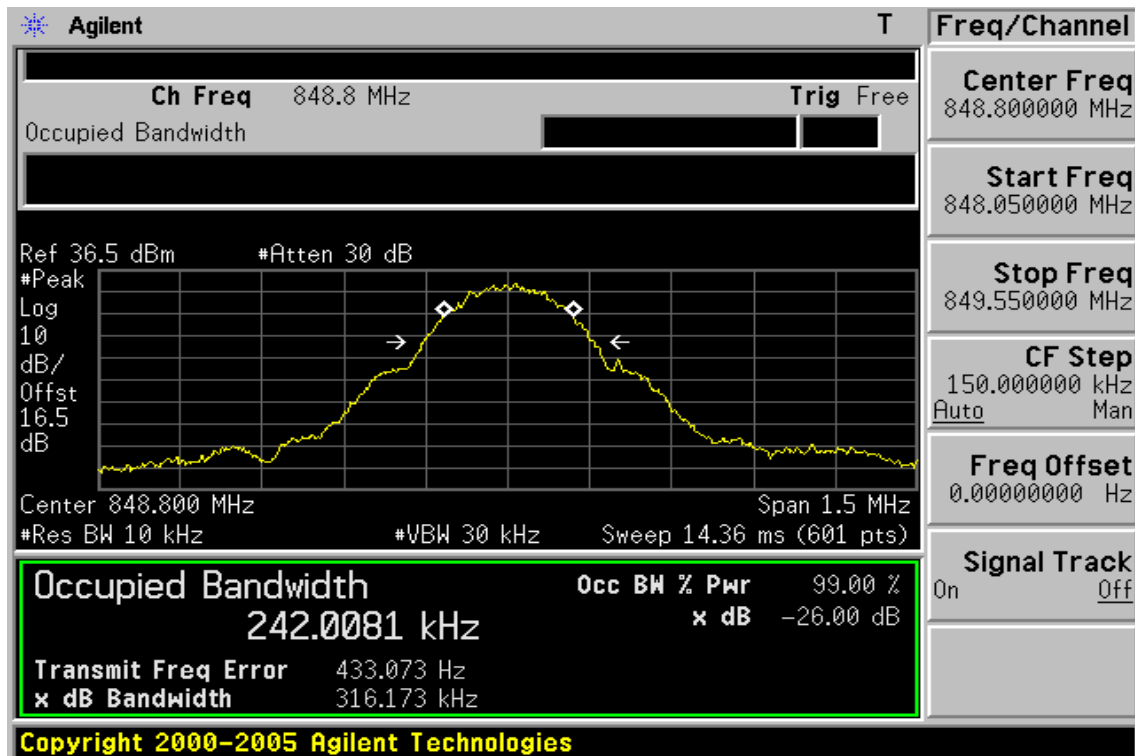
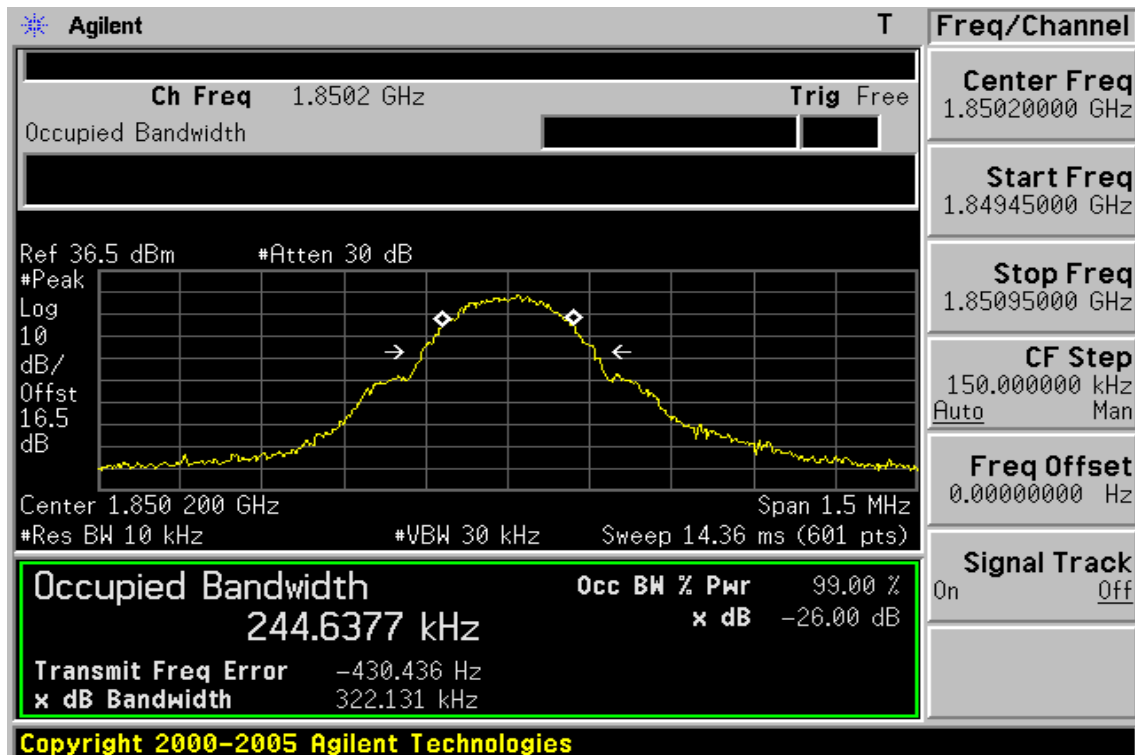


Figure 8-10: GPRS 1900 Channel Low



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Figure 8-11: GPRS 1900 Channel Mid

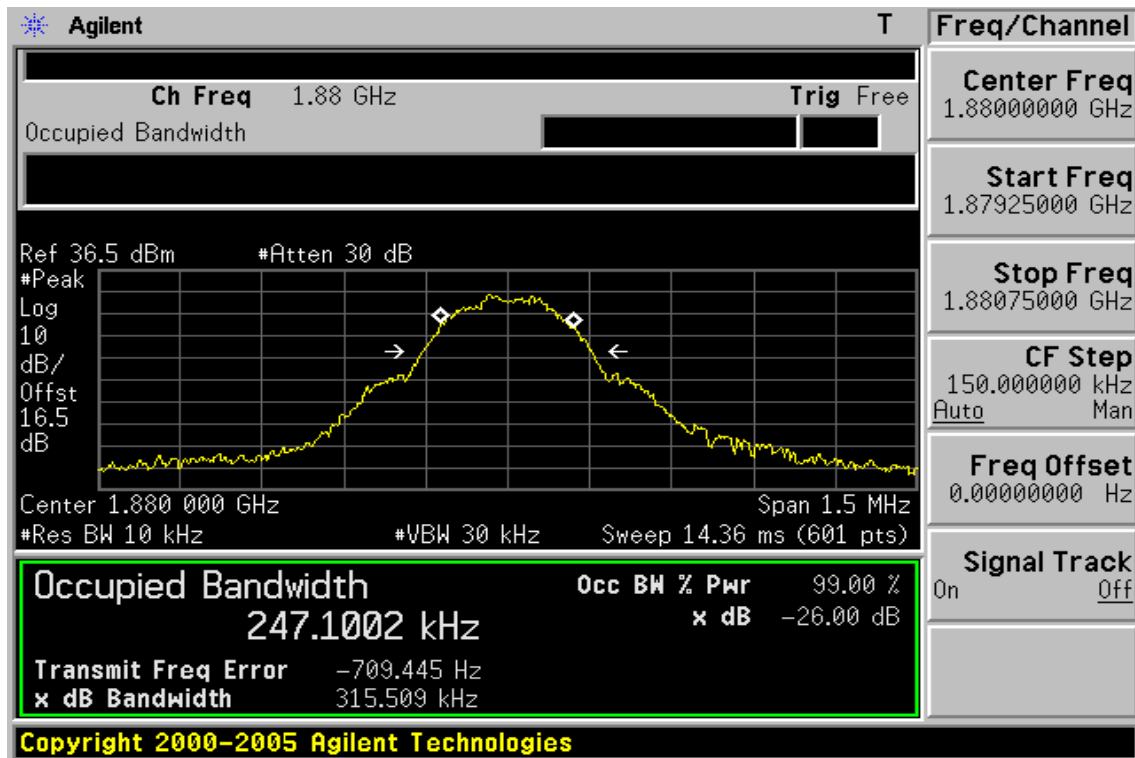
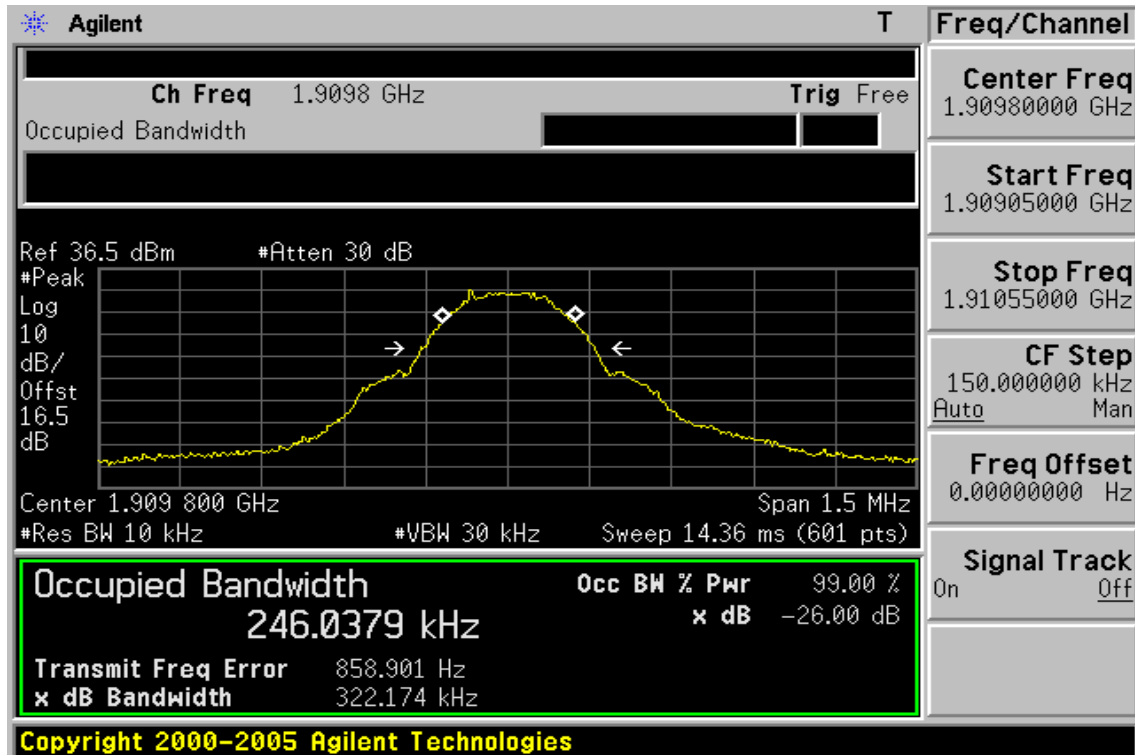


Figure 8-12: GPRS 1900 Channel High



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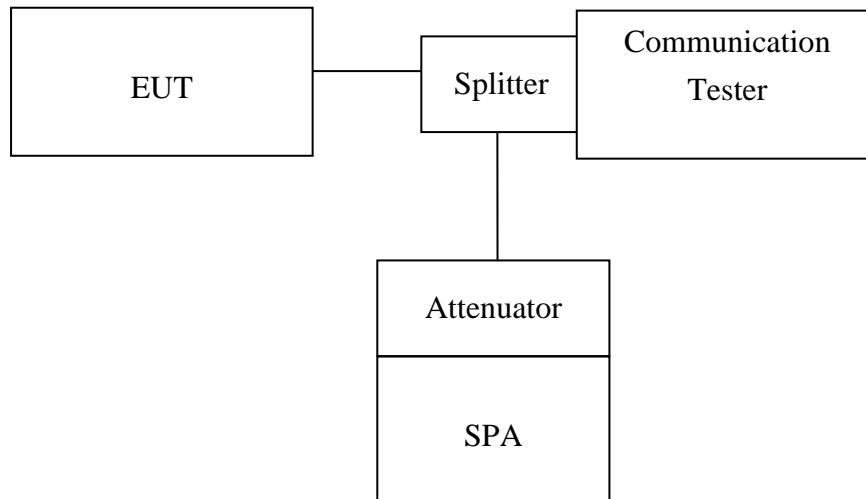
9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

9.1. Standard Applicable:

According to FCC §2.1051.

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

9.2. Test SET-UP:



Note: Measurement setup for testing on Antenna connector

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9.3. Measurement Procedure:

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

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

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

Conducted Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 100K & VBW = 100K on Spectrum.
3. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 3G, 3G to 8G, 8G to 13G, 13G to 18G and 18G to 26.5GHz
4. Via Software, combine 5 spans of frequency range into one plot

9.4. Measurement Equipment Used:

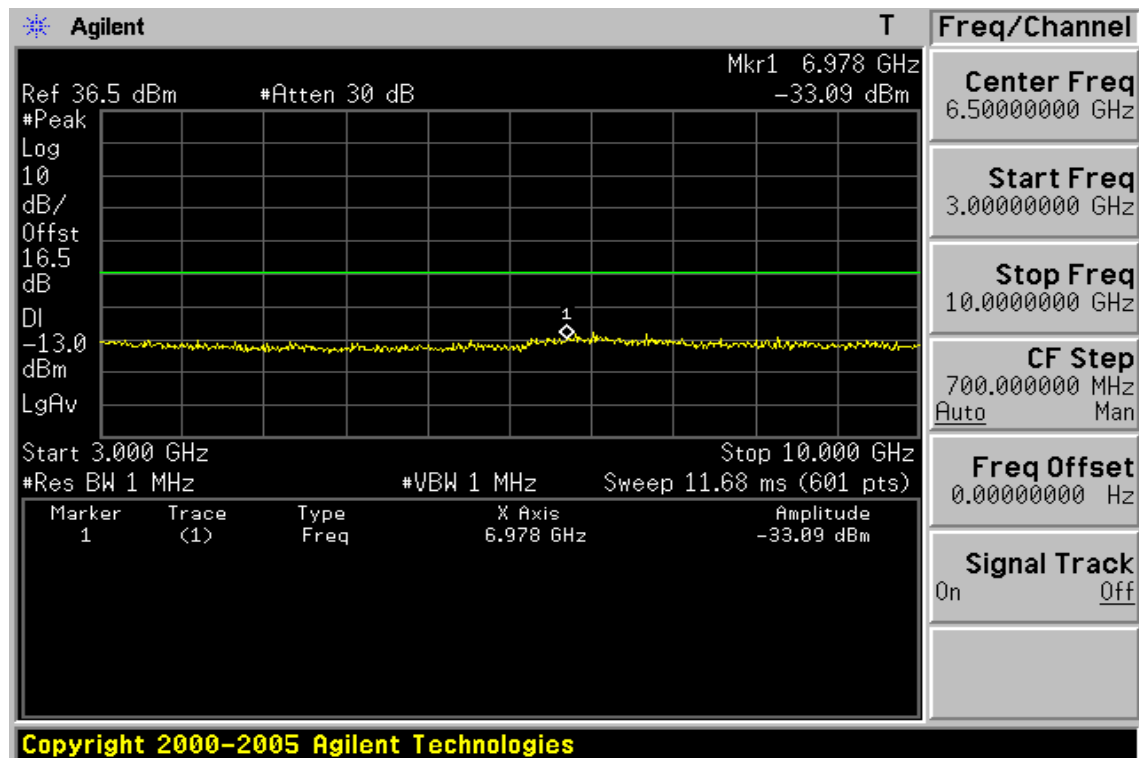
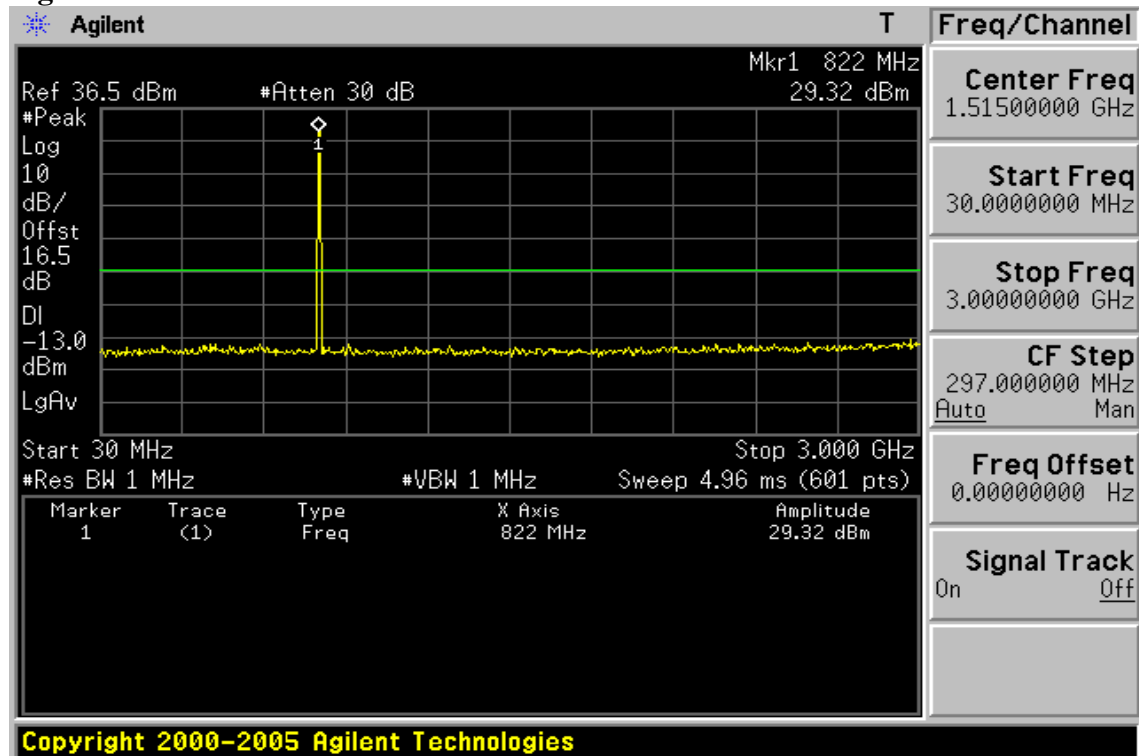
Refer to section 2.4 in this report

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9.5. Measurement Result:

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

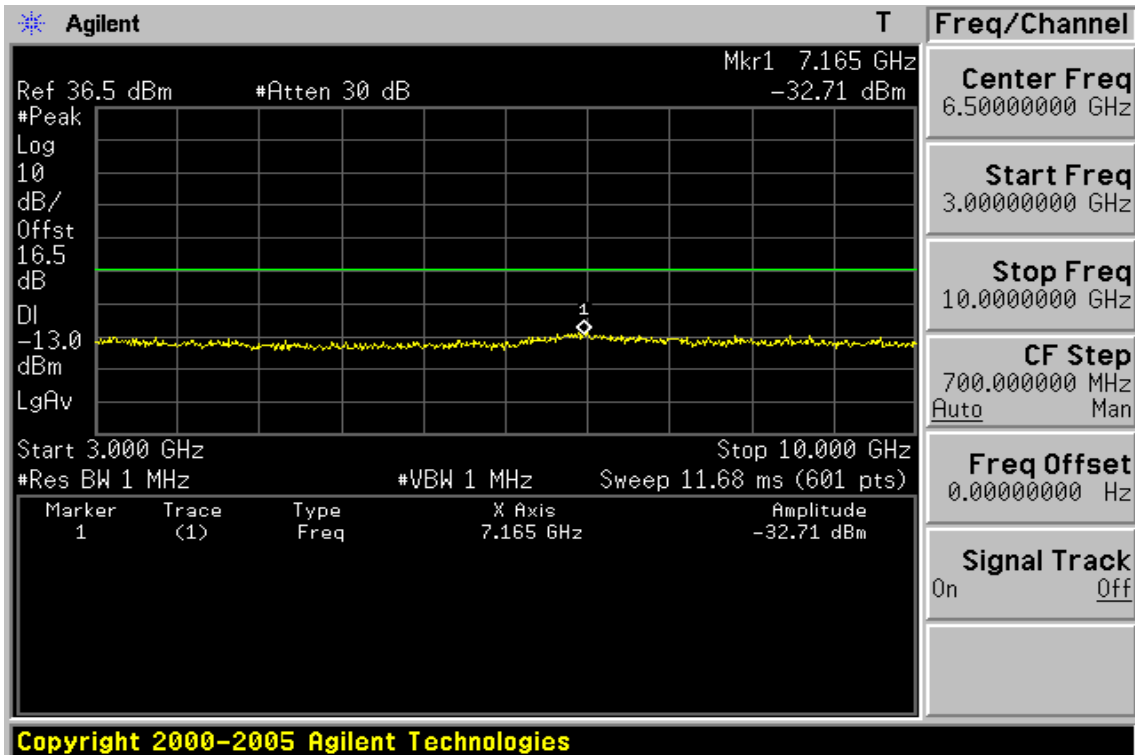
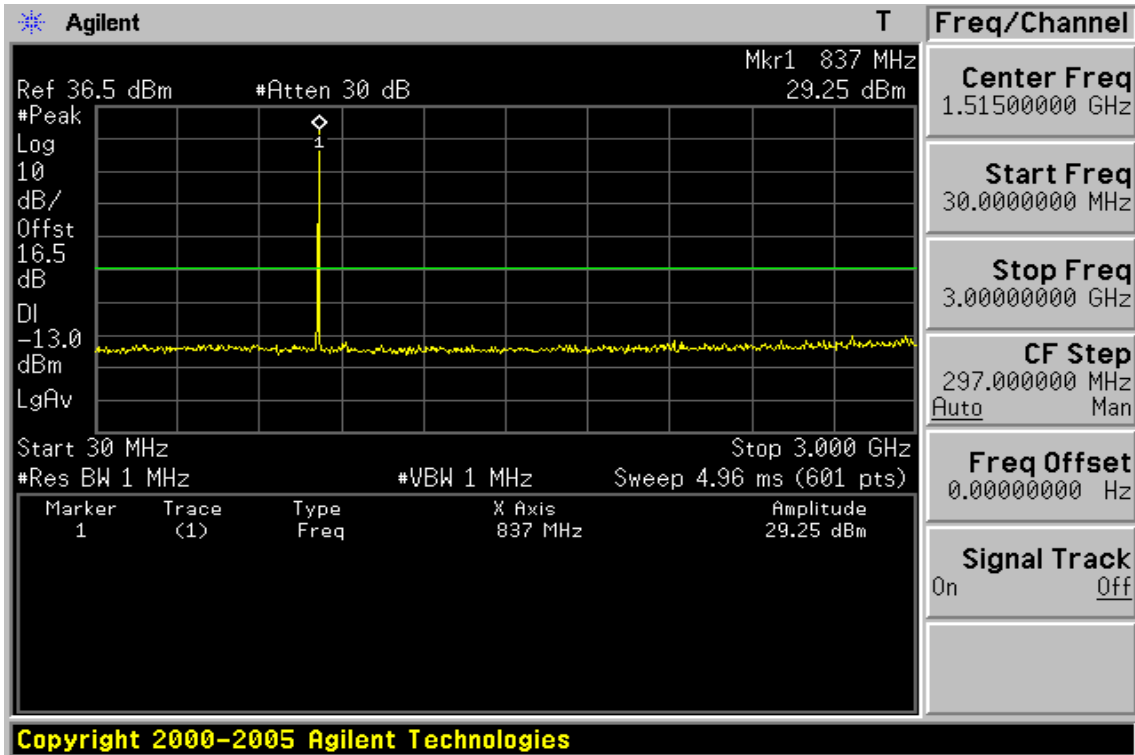


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Figure 9-2: Out of Band emission at antenna terminals – GSM 850 Channel Mid



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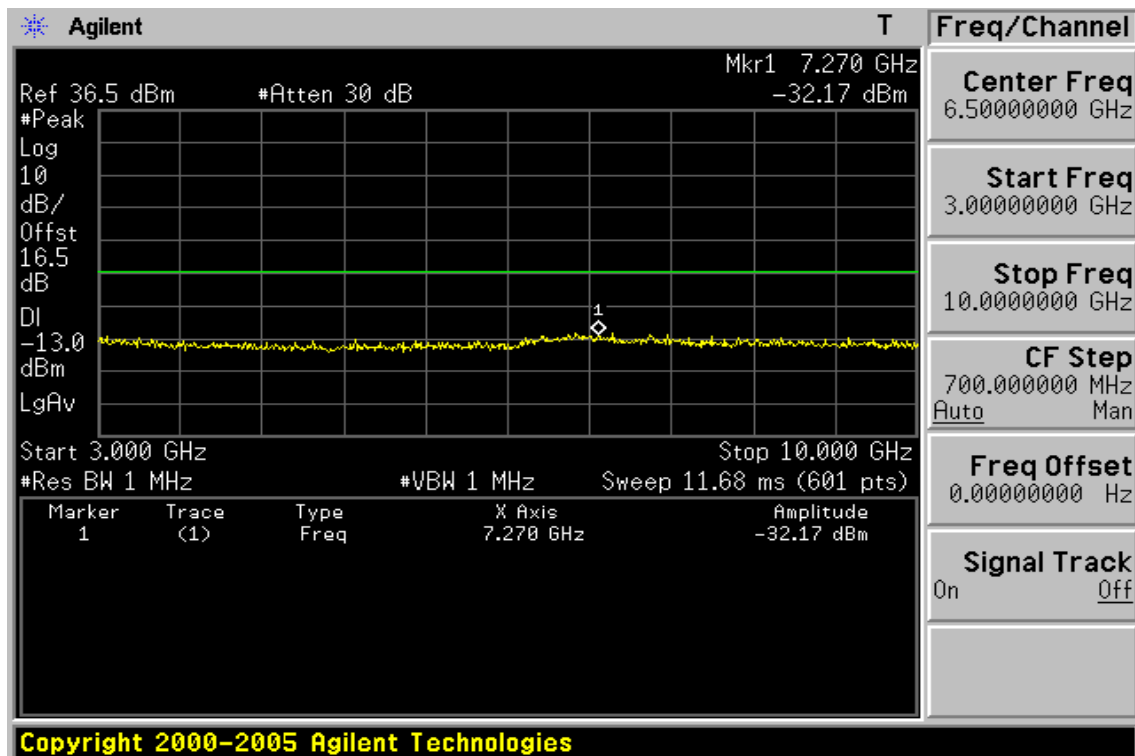
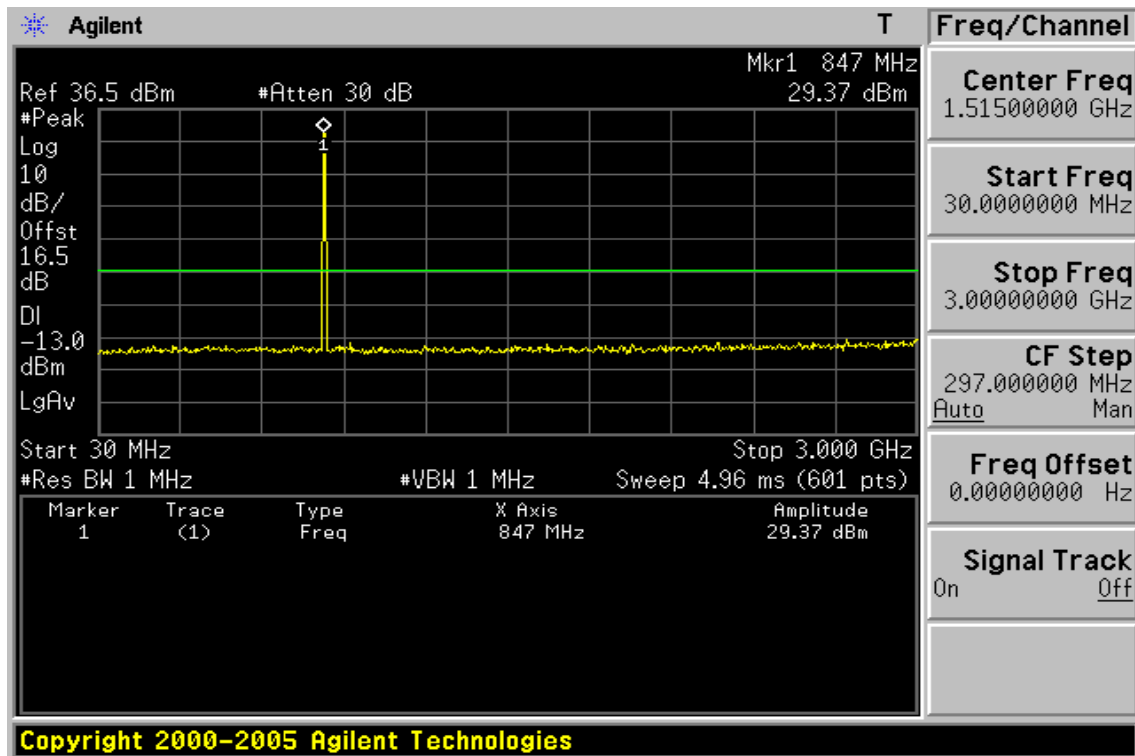
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Figure 9-3: Out of Band emission at antenna terminals – GSM 850 Channel Highest



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

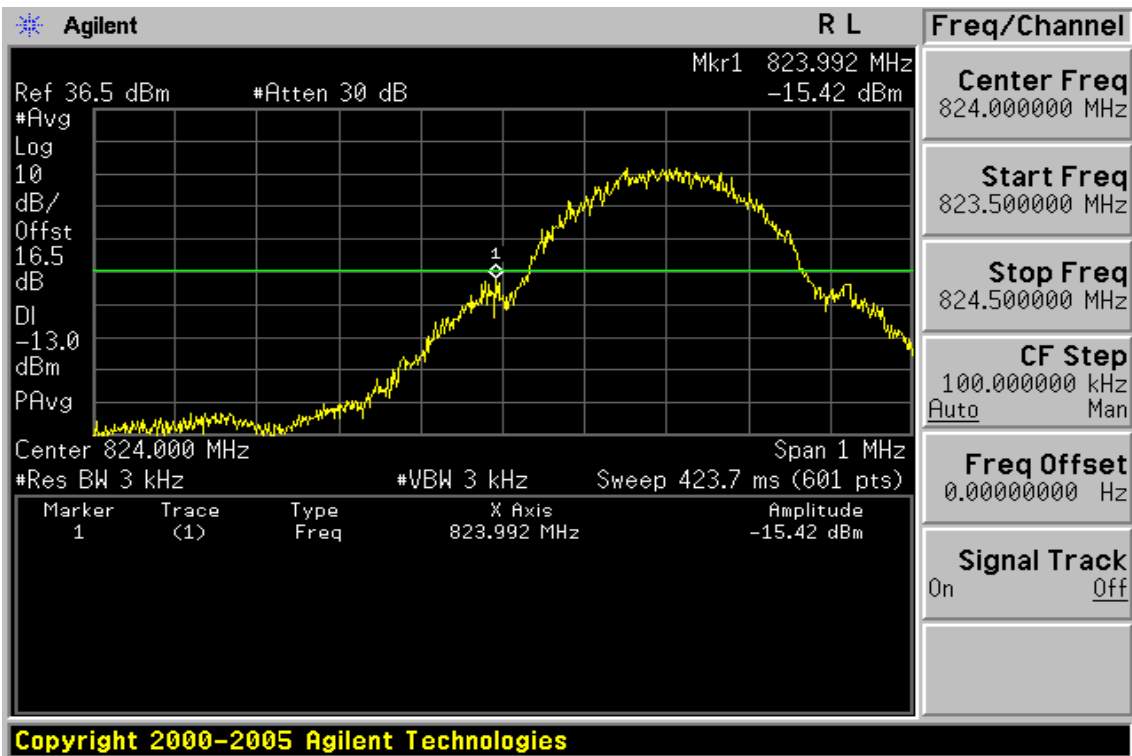
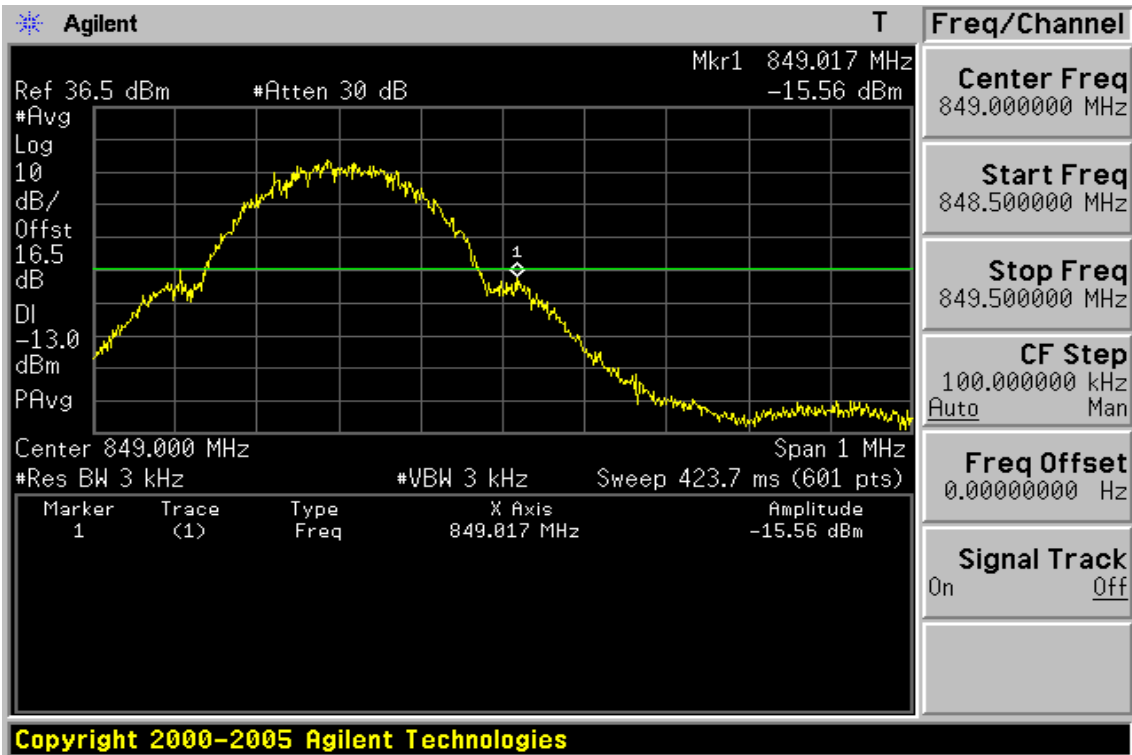


Figure 9-5: Band edge emission at antenna terminals – GSM 850 Channel Highest

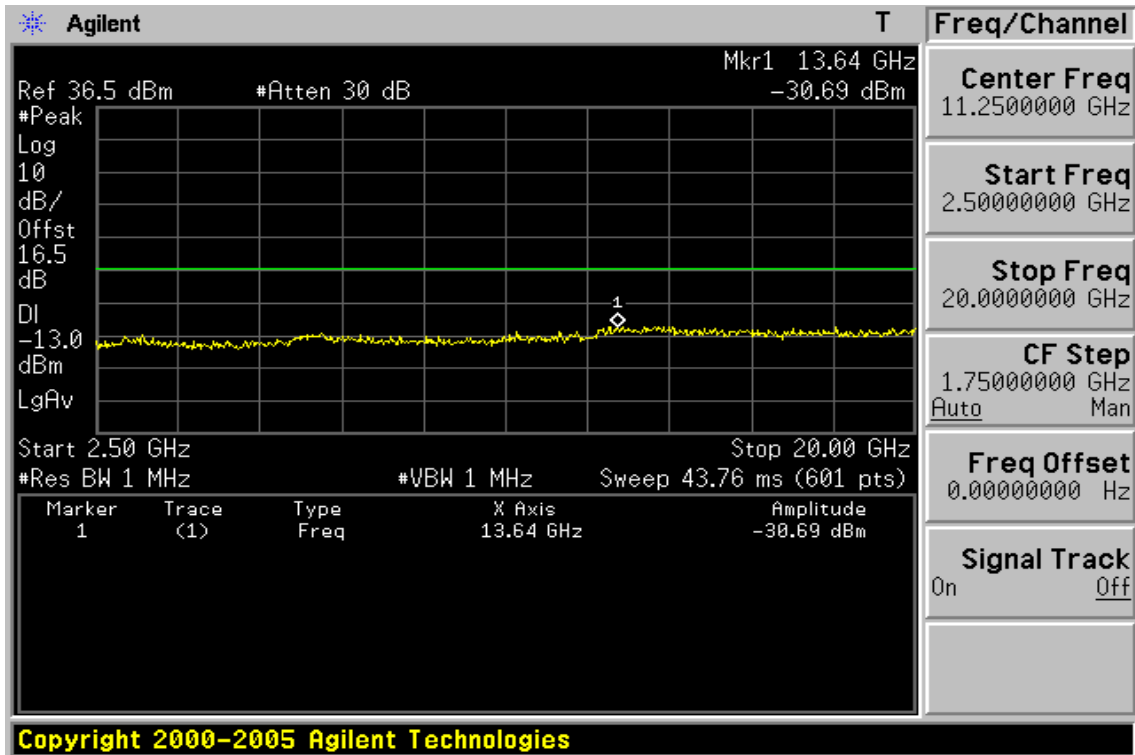
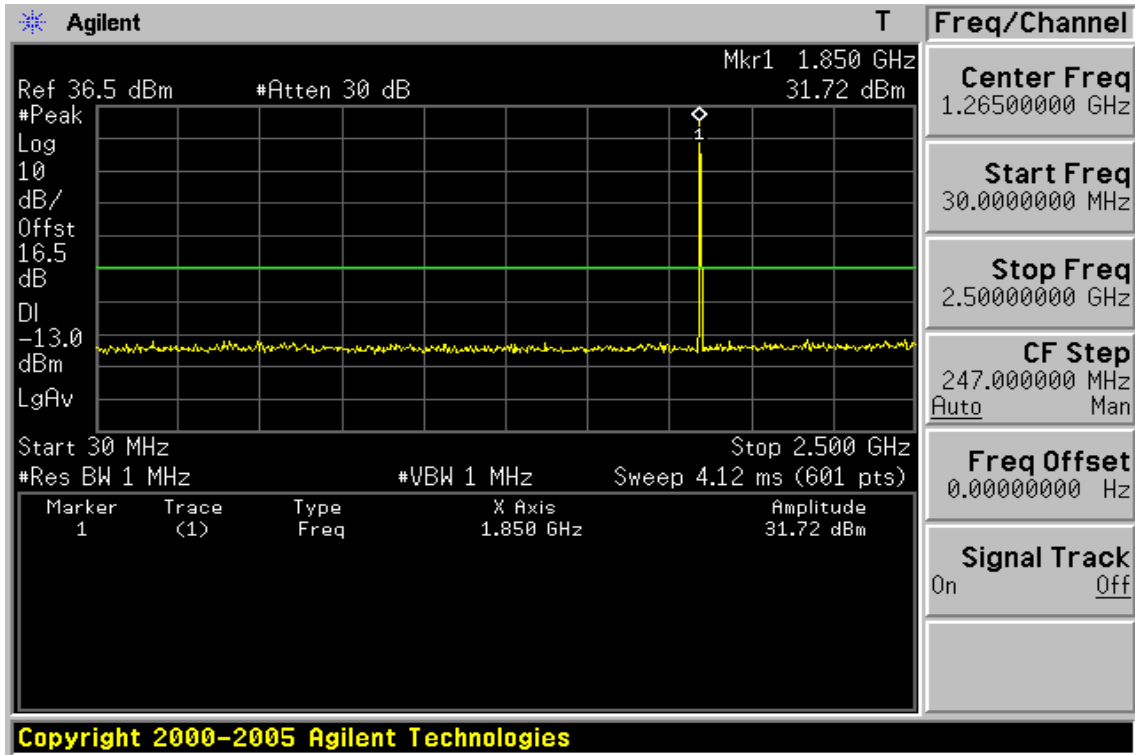


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Figure 9-6: Out of Band emission at antenna terminals – GSM 1900 Channel Lowest



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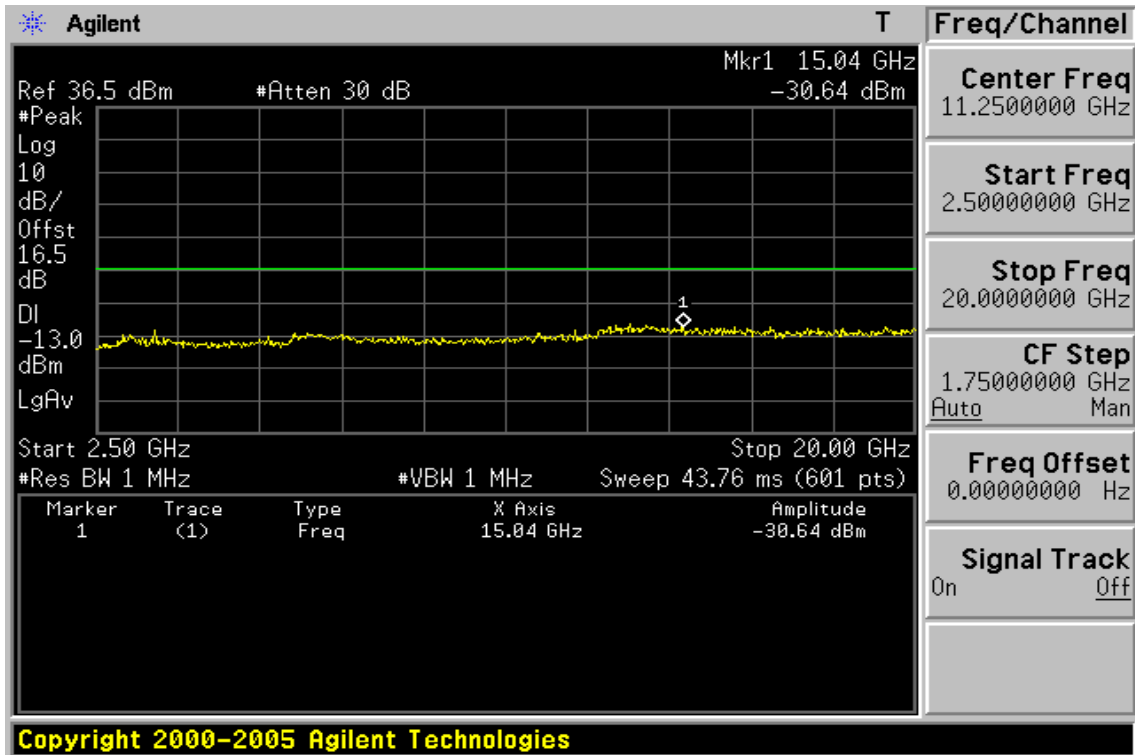
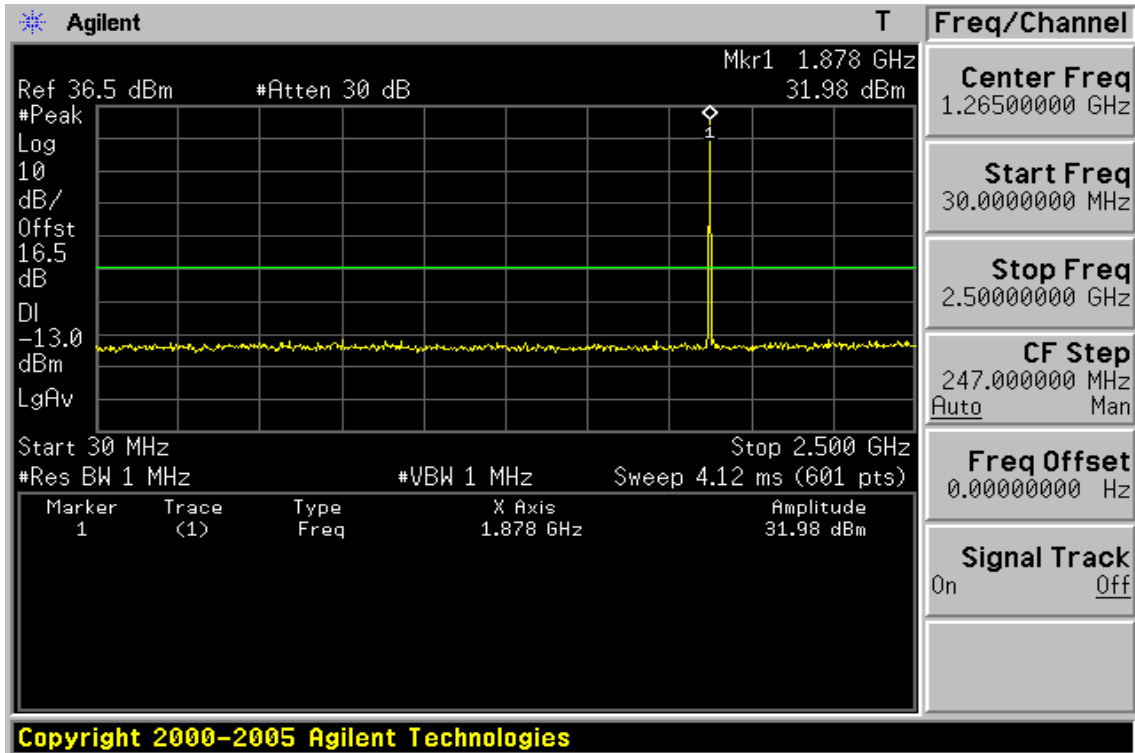
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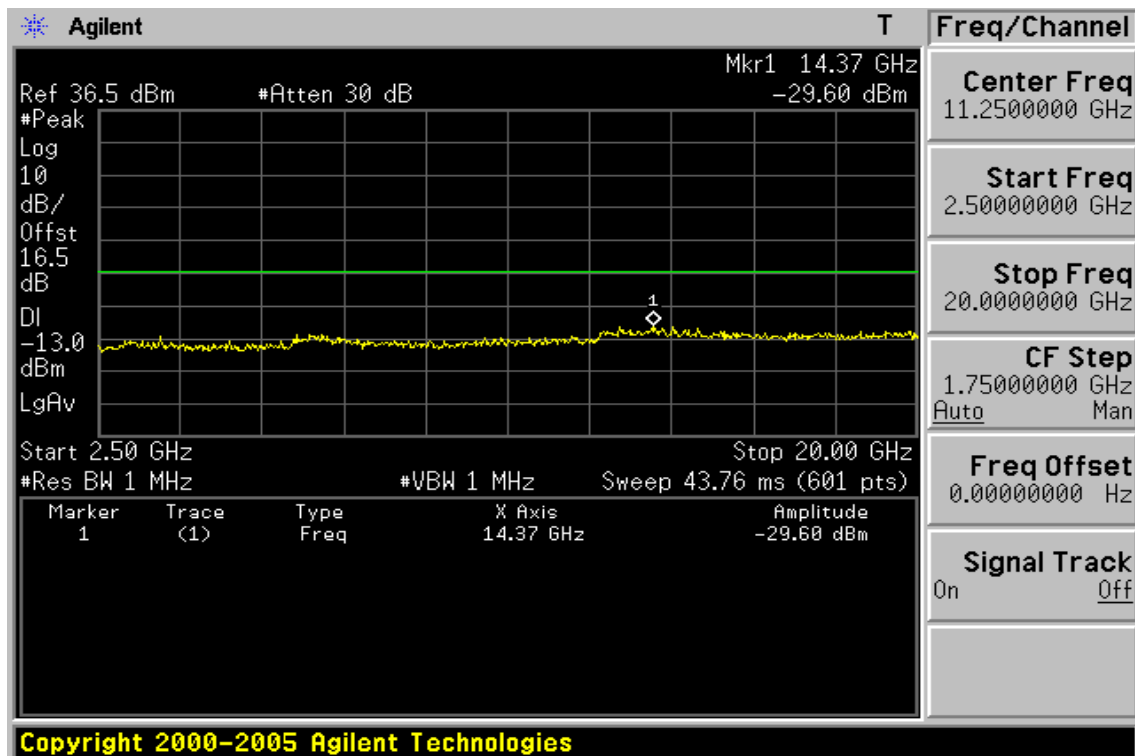
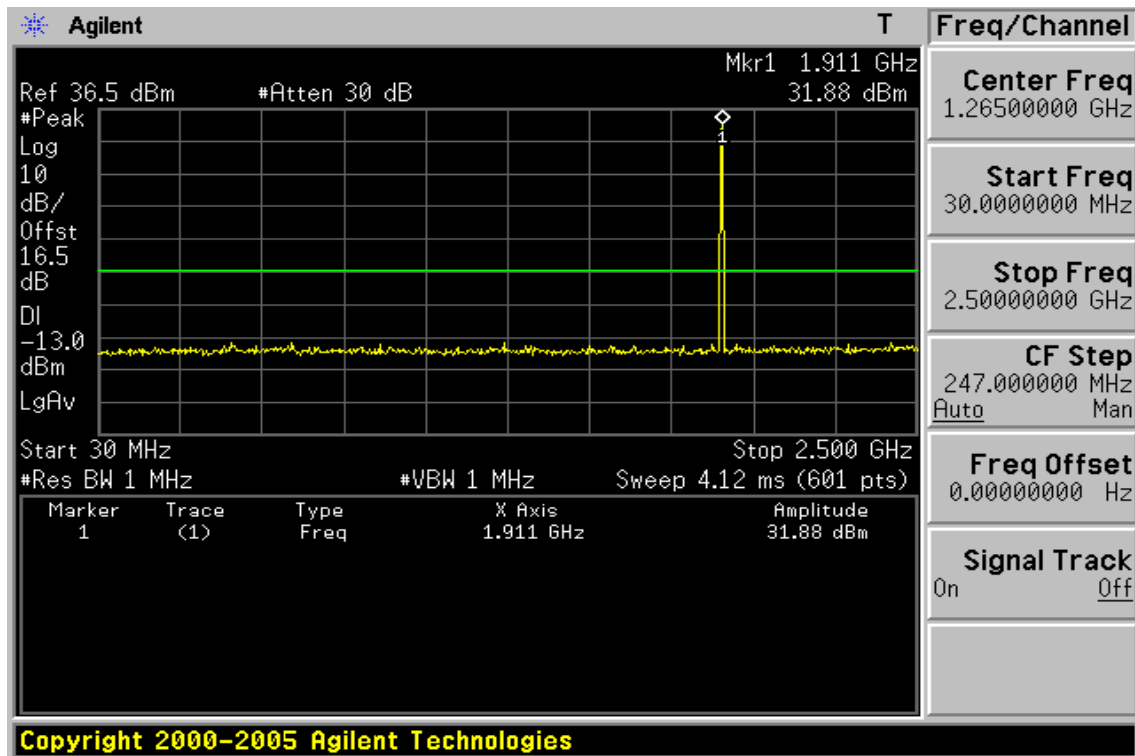
Figure 9-7: Out of Band emission at antenna terminals – GSM 1900 Channel Mid



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



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

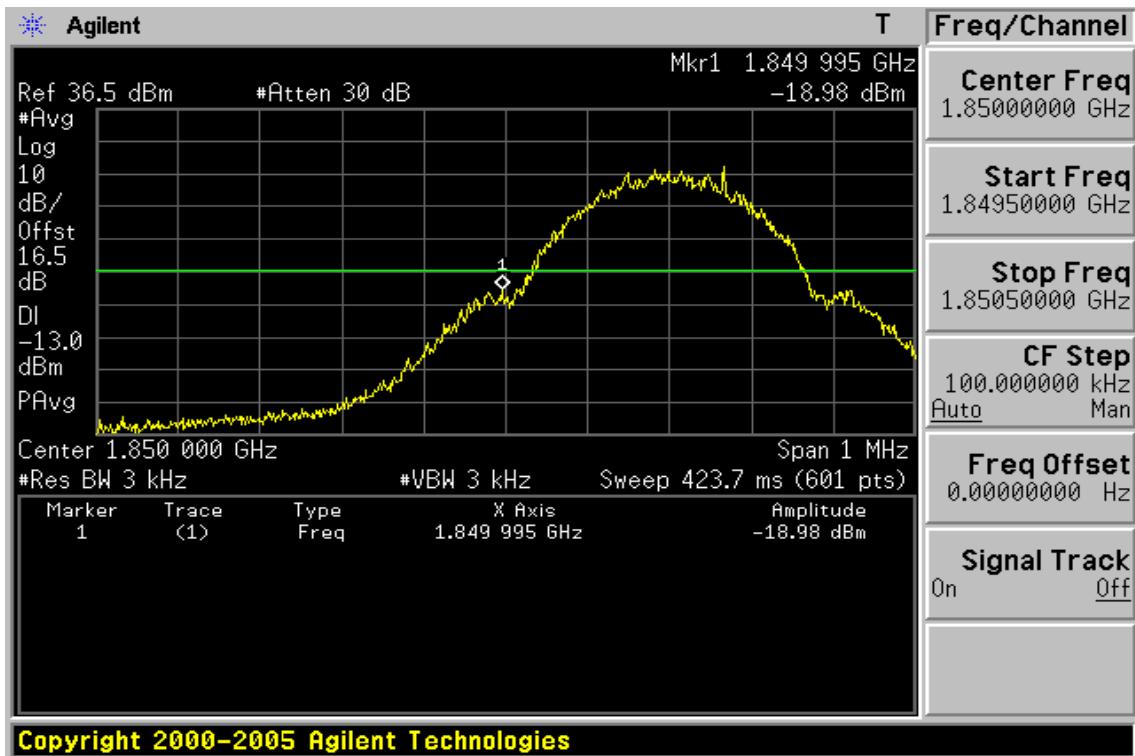
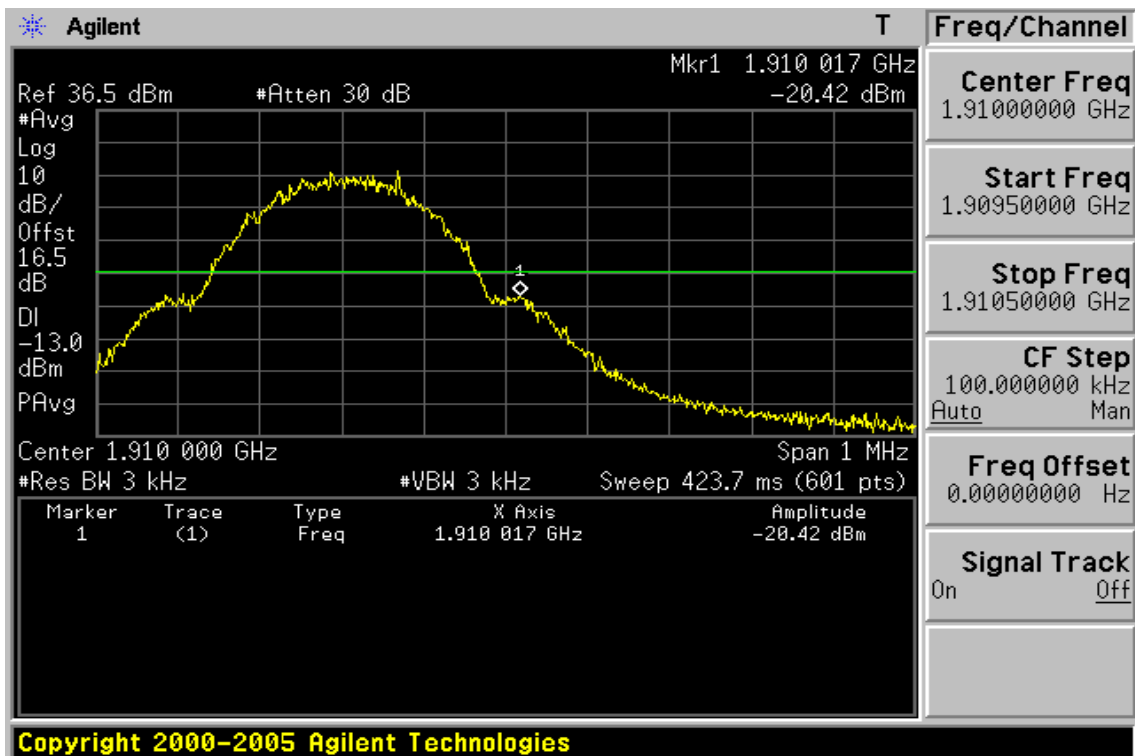


Figure 9-10: Band edge emission at antenna terminals – GSM 1900 Channel Highest

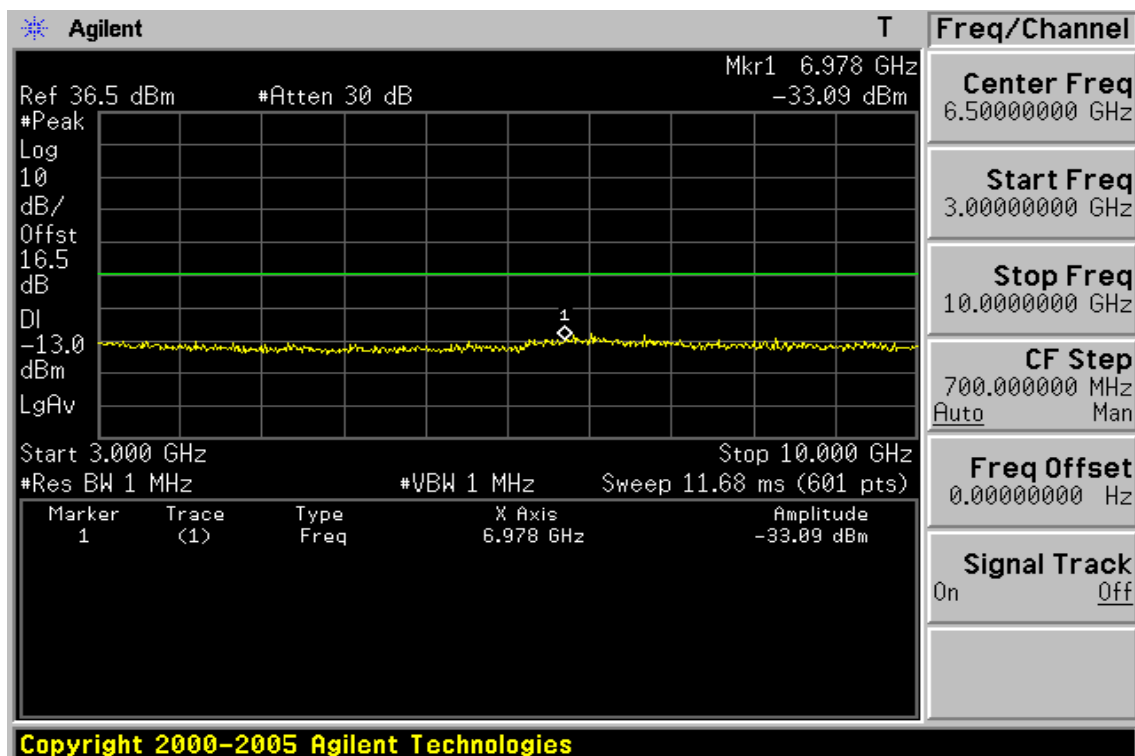
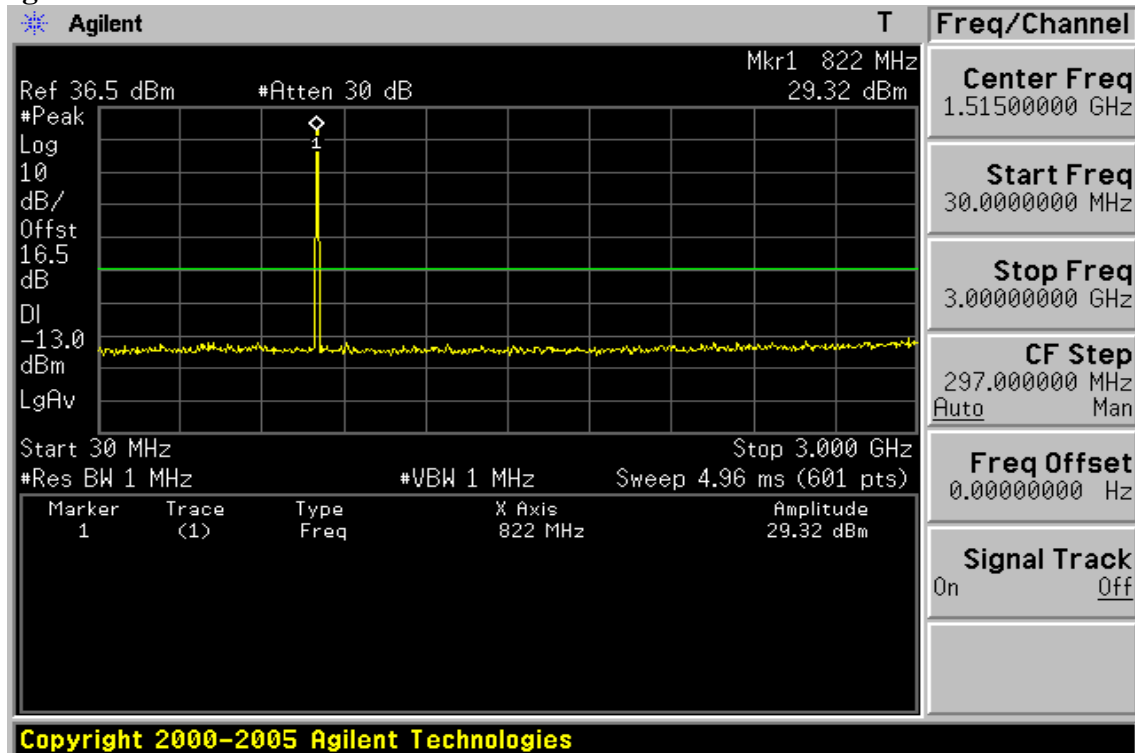


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Figure 9-11: Out of Band emission at antenna terminals – GPRS 850 Channel Lowest



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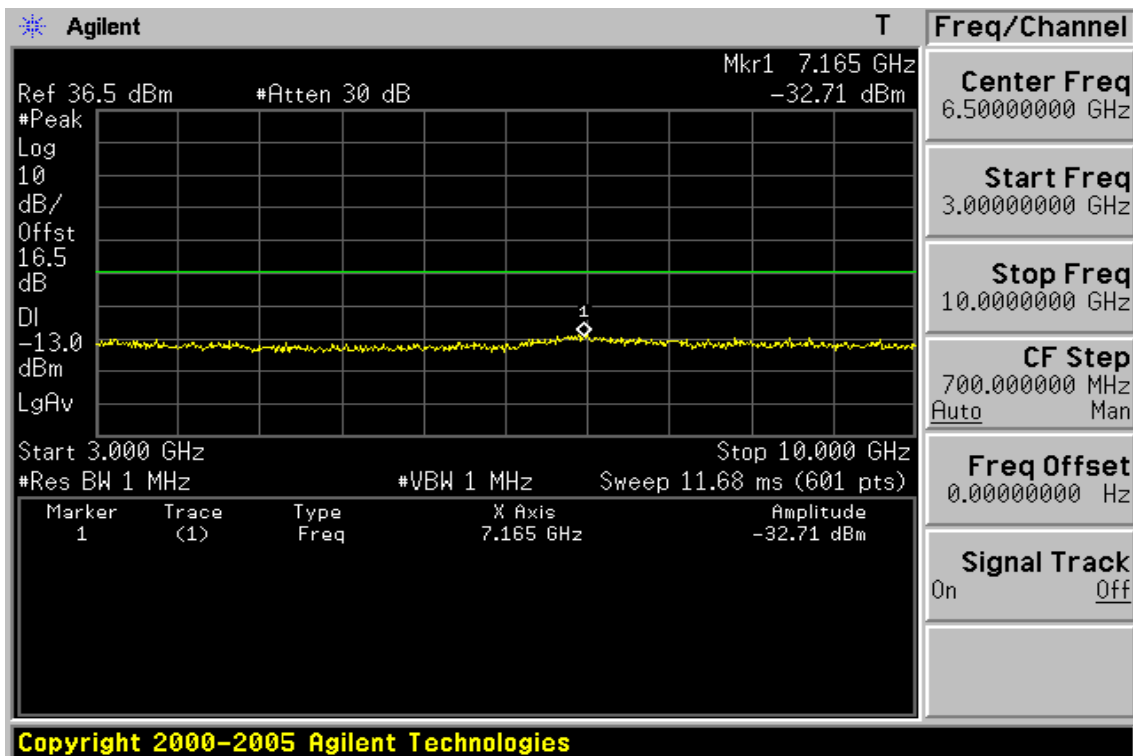
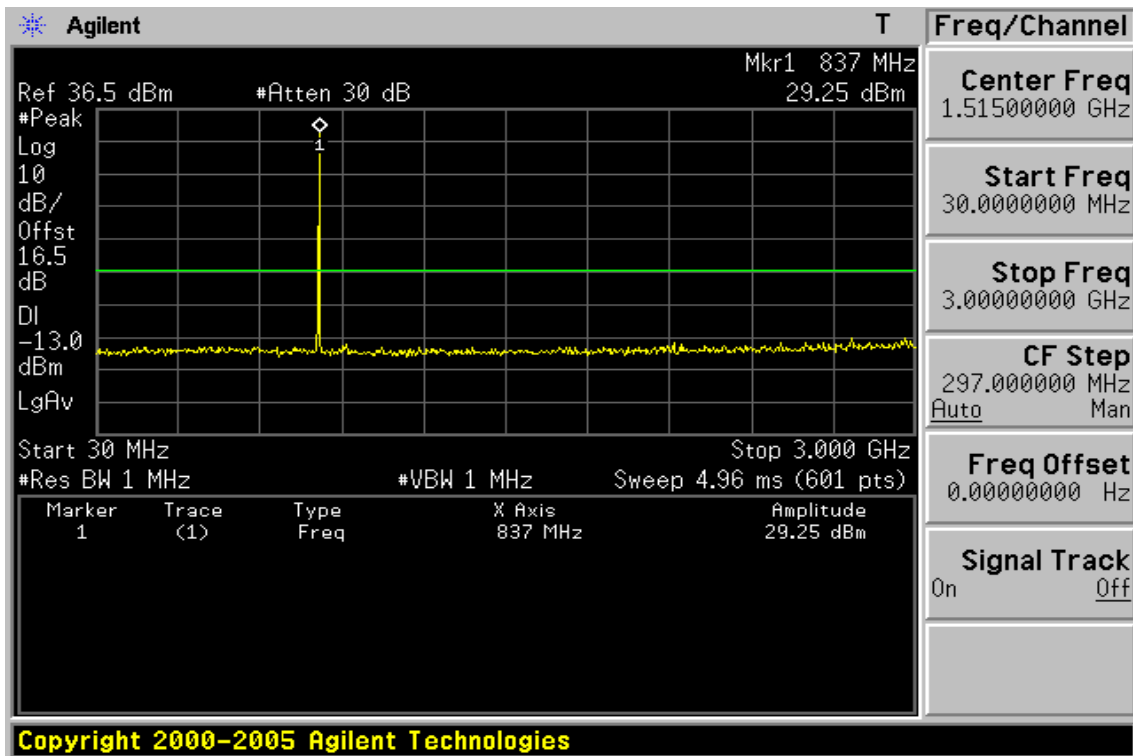
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Figure 9-12: Out of Band emission at antenna terminals – GPRS 850 Channel Mid



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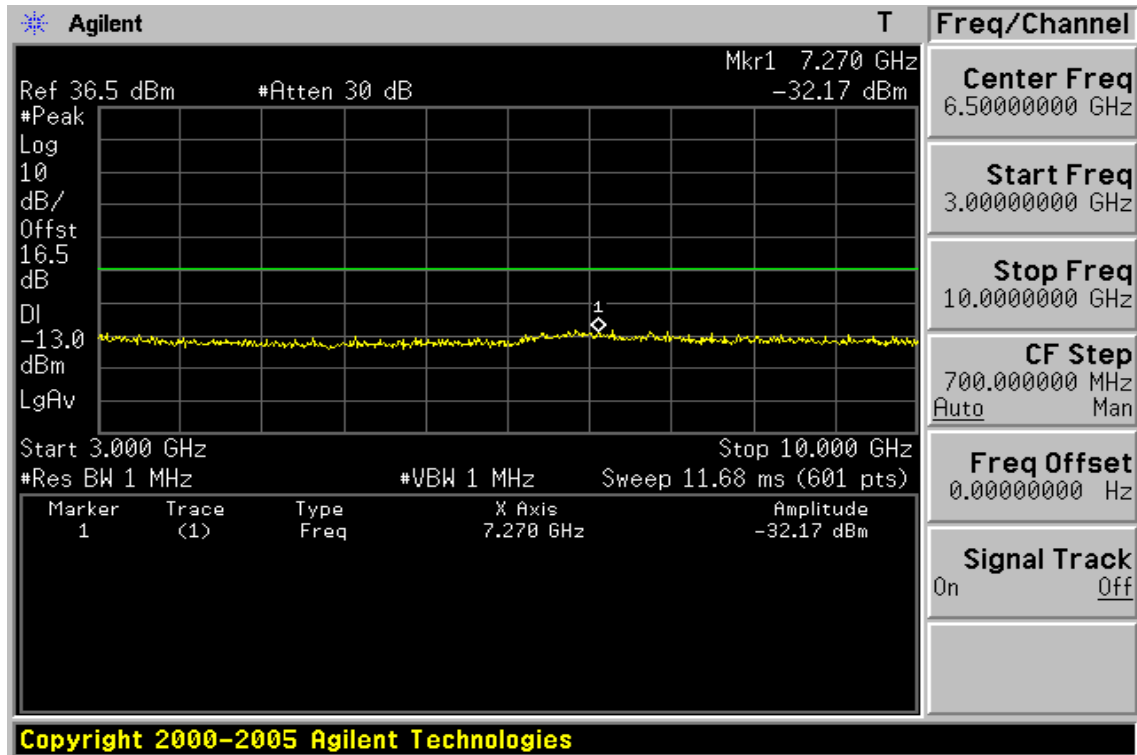
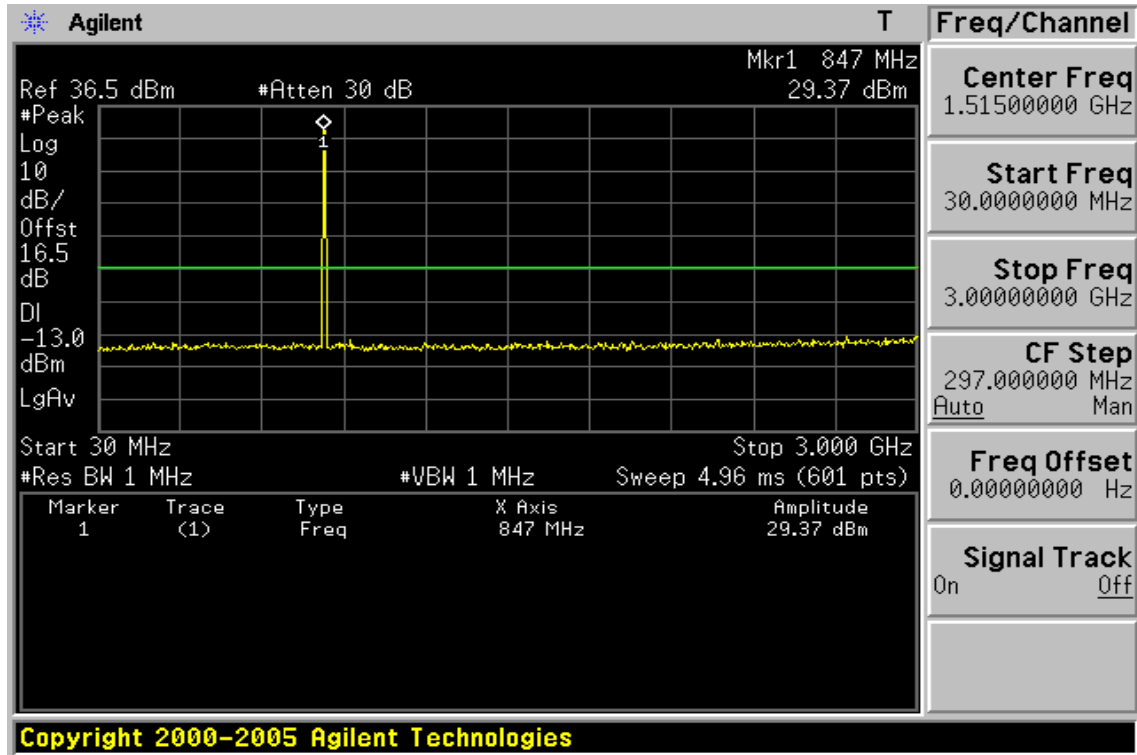
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Figure 9-13: Out of Band emission at antenna terminals – GPRS 850 Channel Highest



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

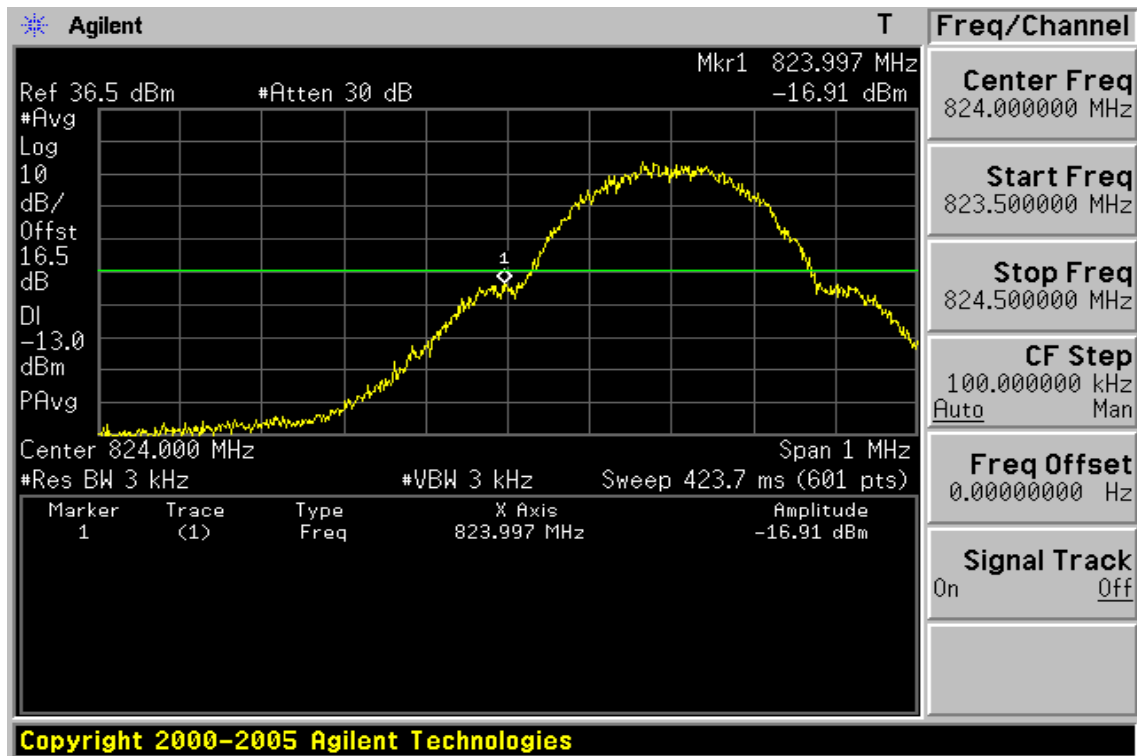
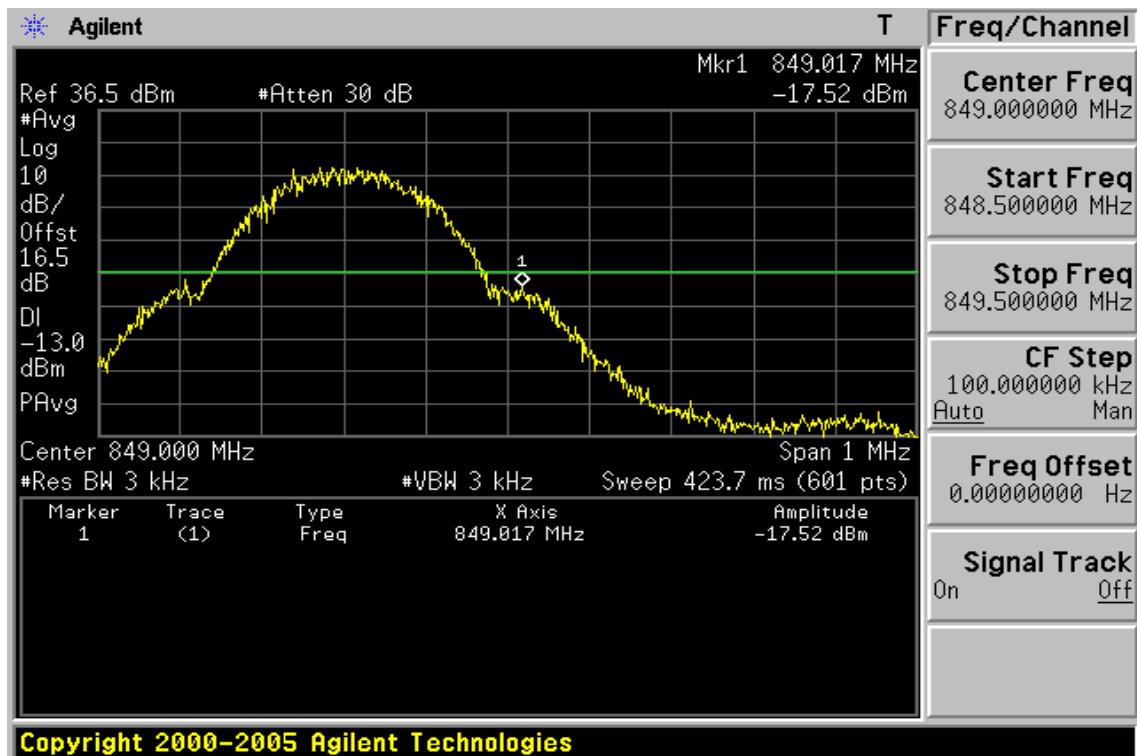


Figure 9-15: Band edge emission at antenna terminals – GPRS 850 Channel Highest



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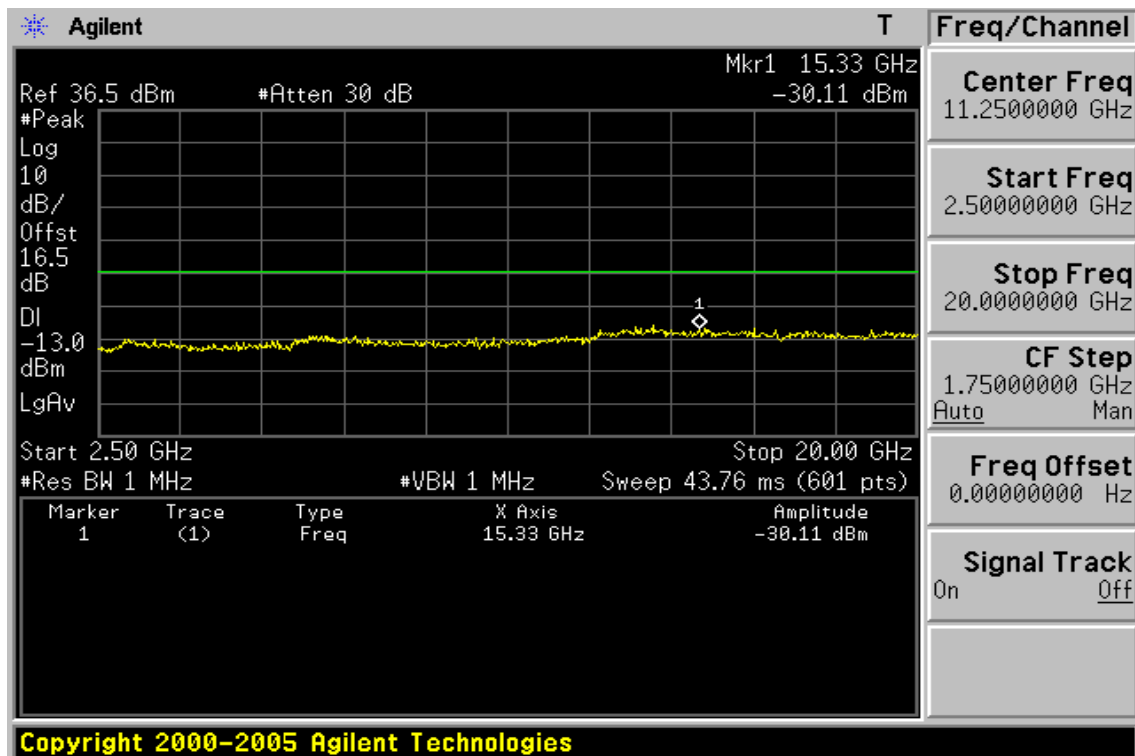
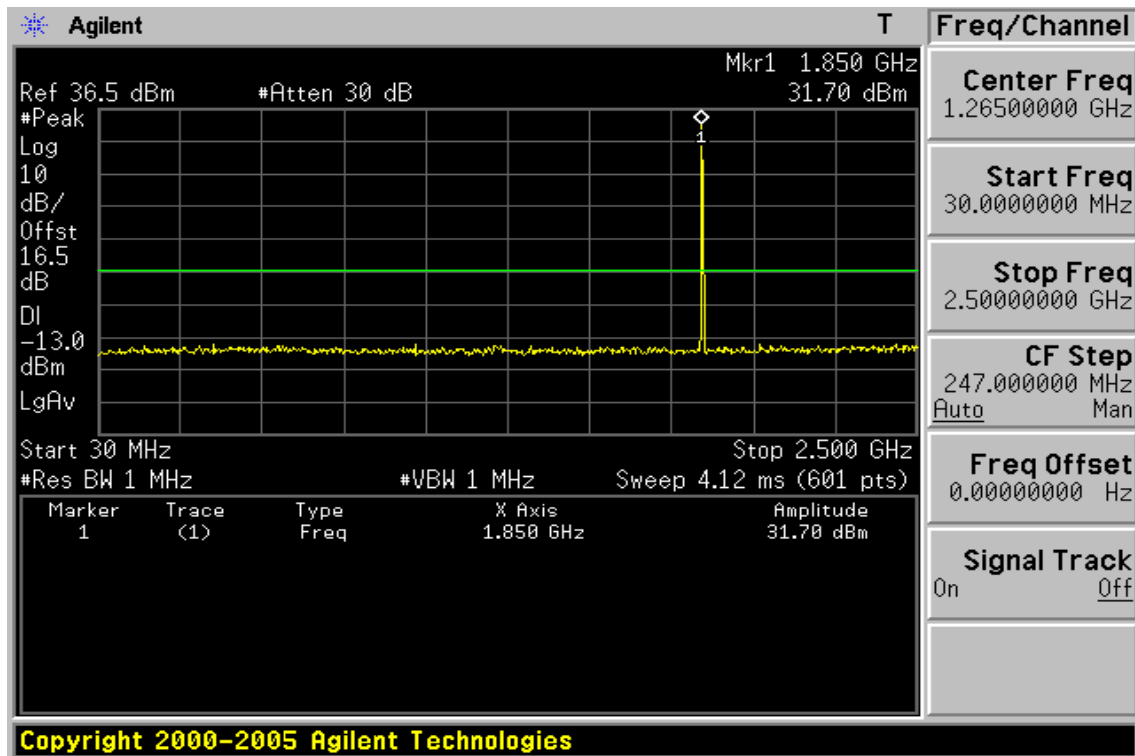
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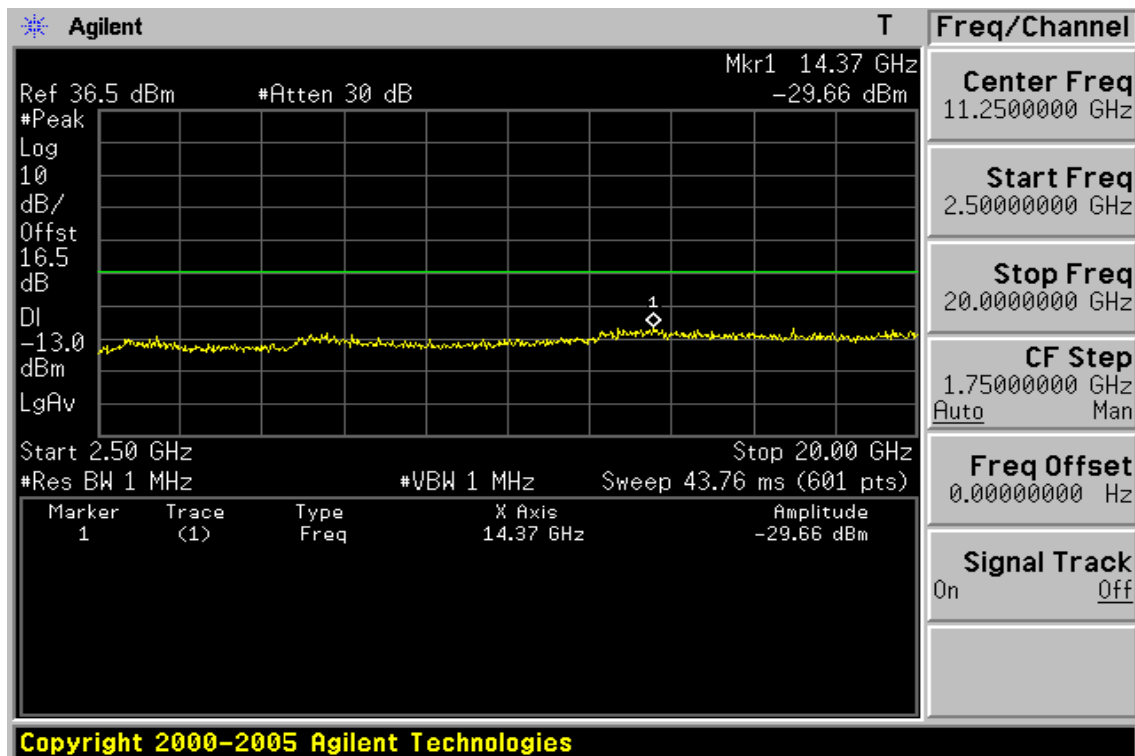
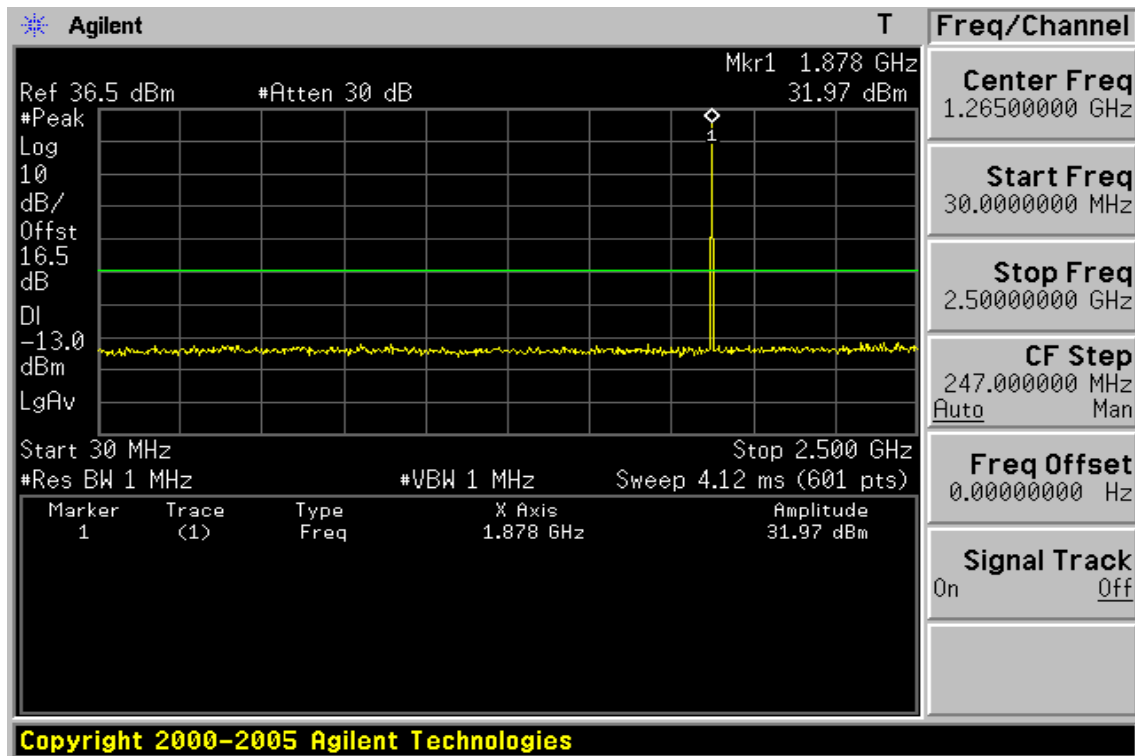
Figure 9-16: Out of Band emission at antenna terminals – GPRS 1900 Channel Lowest



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



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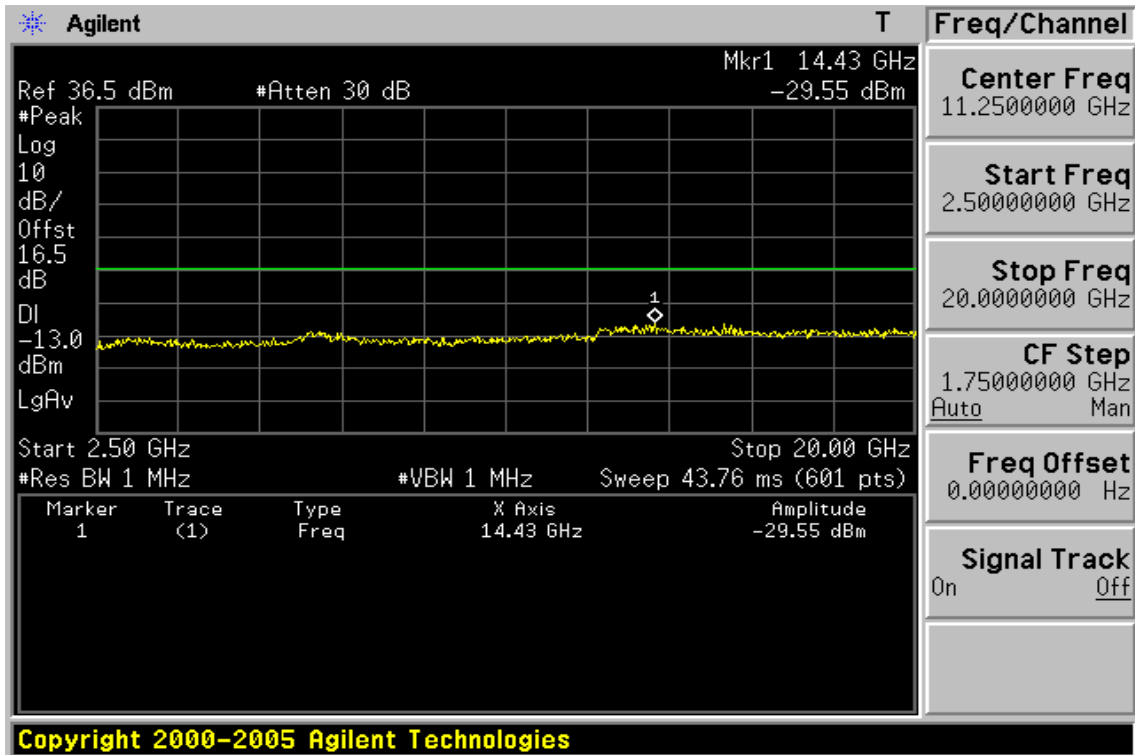
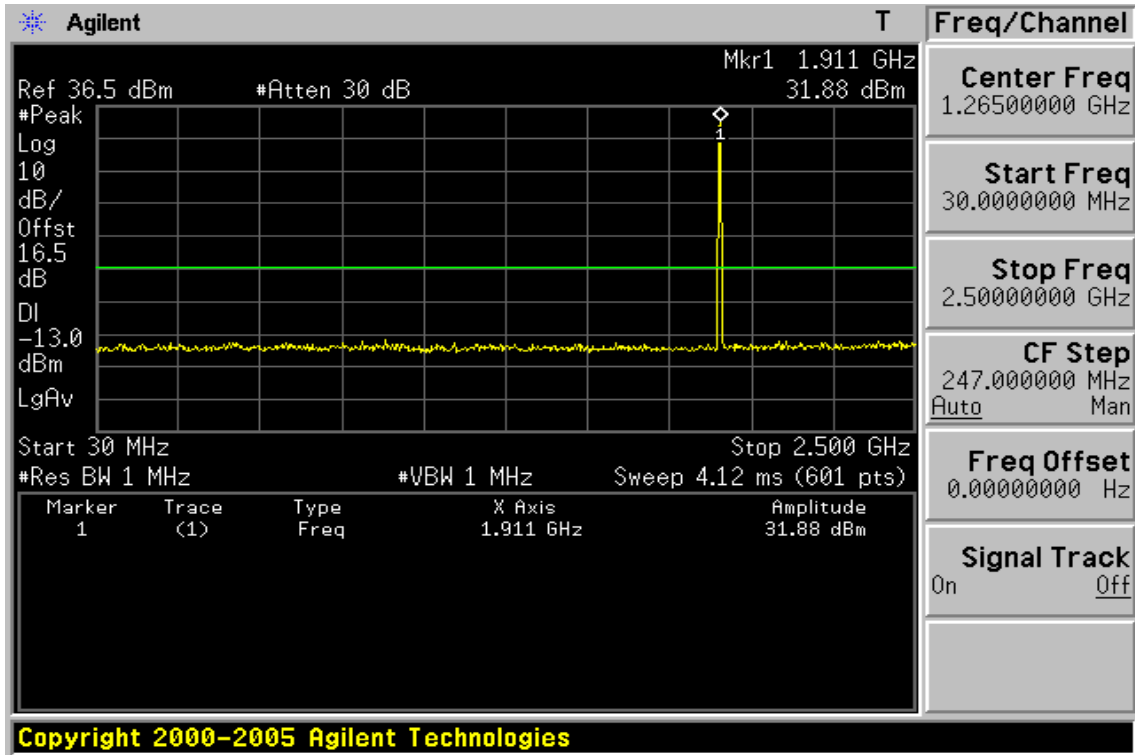
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Figure 9-18: Out of Band emission at antenna terminals – GPRS 1900 Channel Highest



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

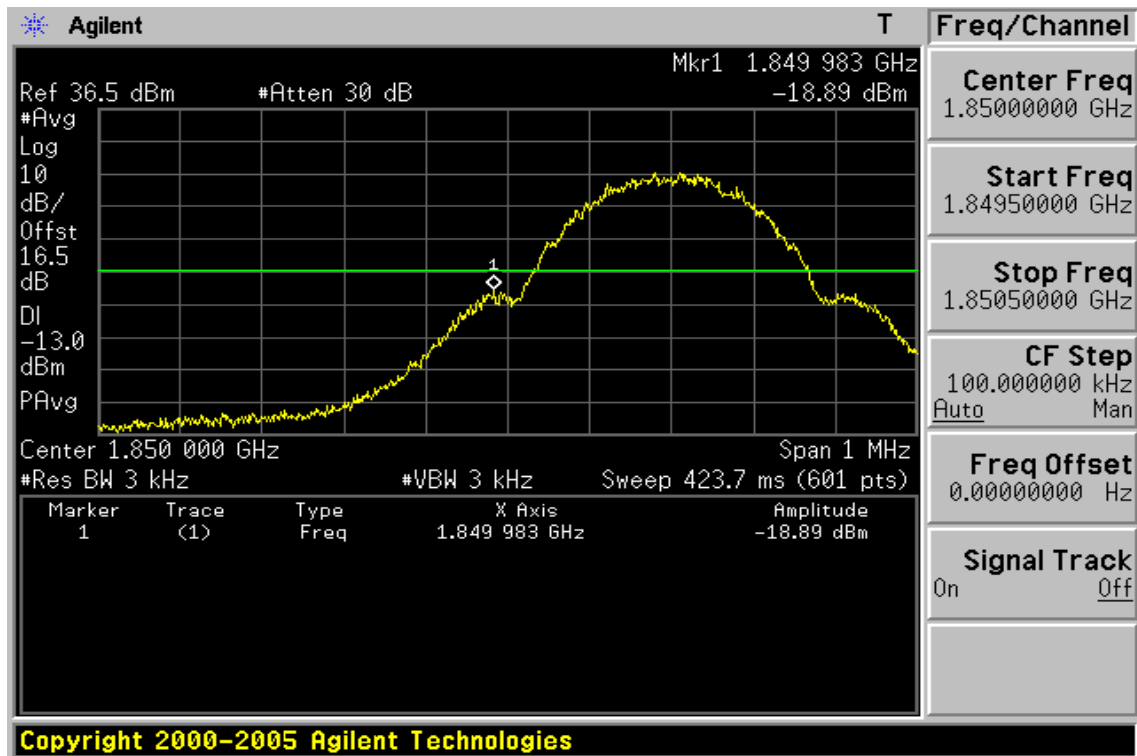
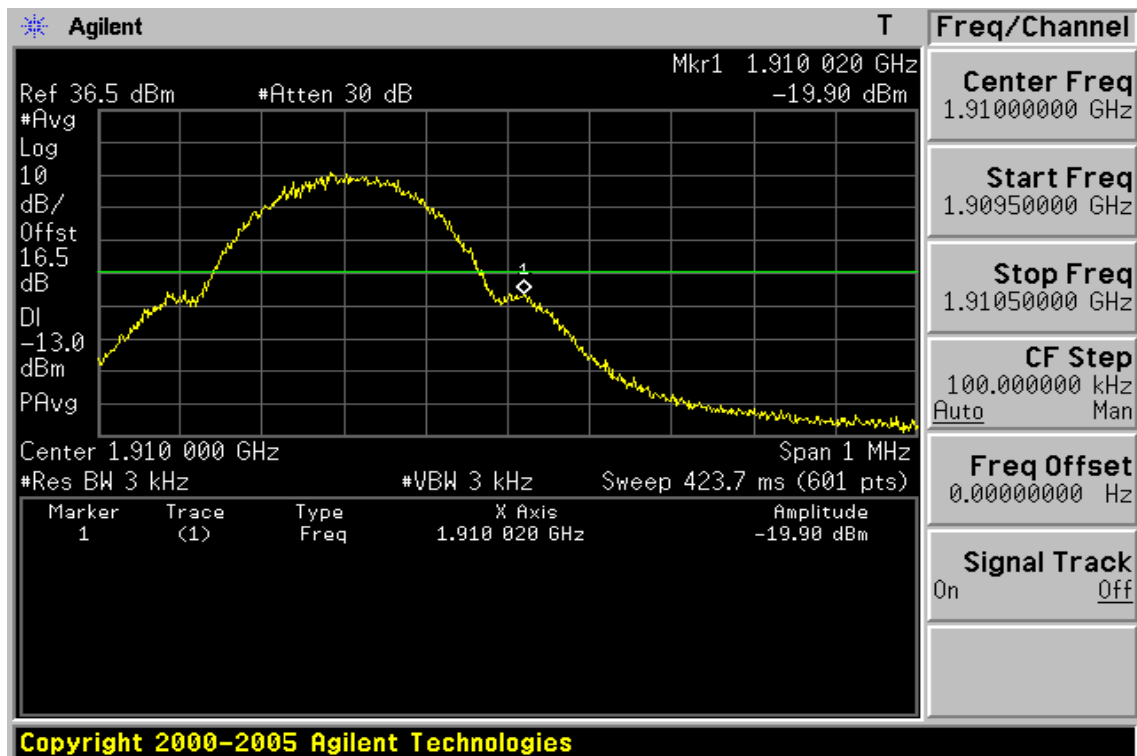


Figure 9-20: Band edge emission at antenna terminals – GPRS 1900 Channel Highest



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10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT (TX)

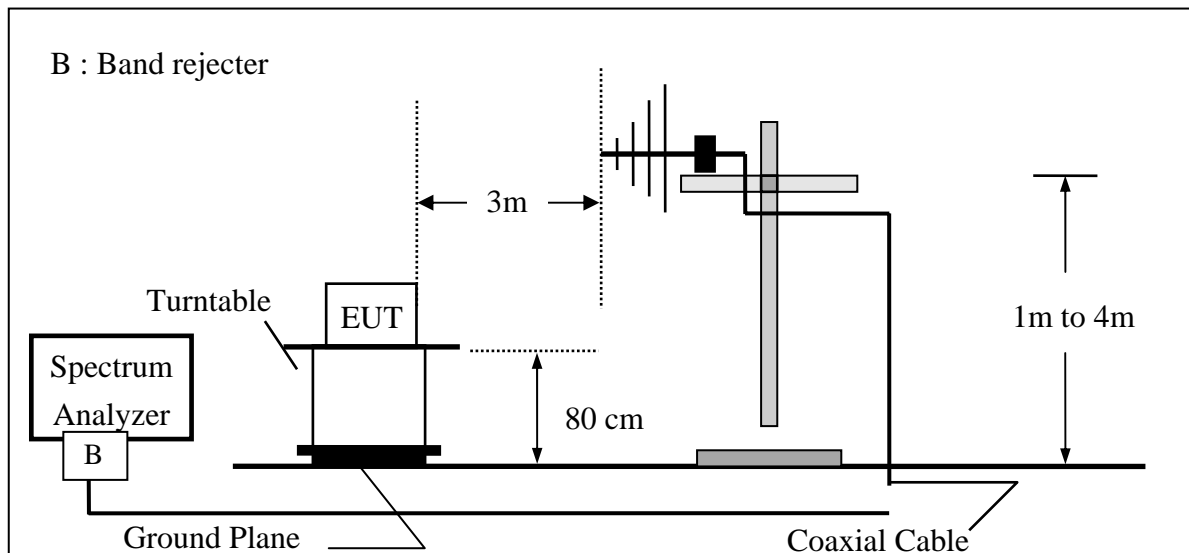
10.1. Standard Applicable:

According to FCC §2.1053,

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

10.2. EUT Setup (Block Diagram of Configuration):

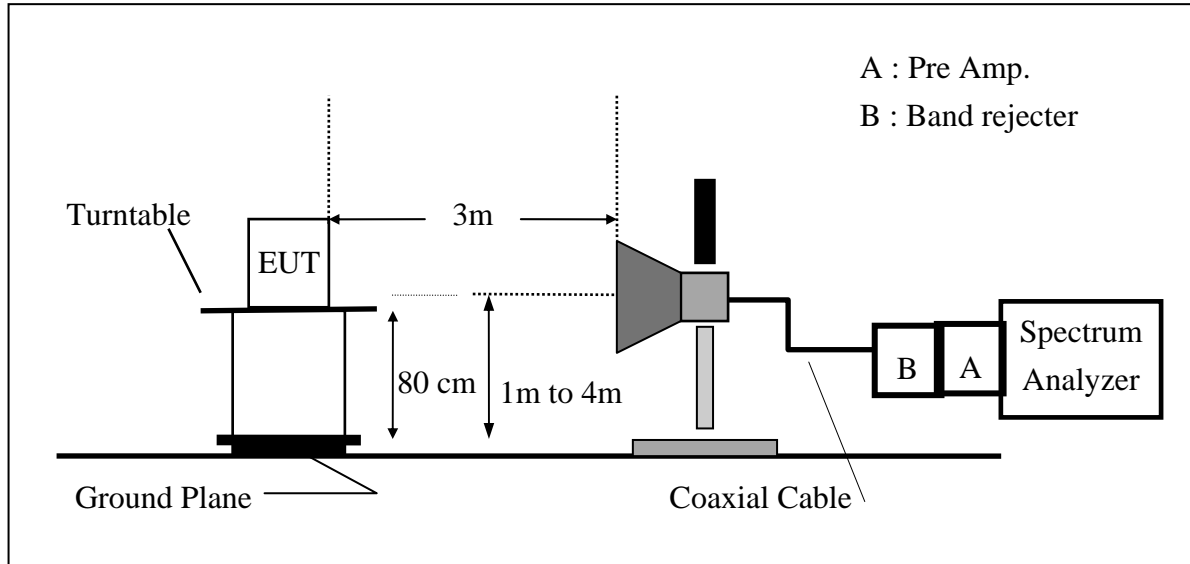
Radiated Emission Test Set-Up, Frequency Below 1000MHz



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Radiated Emission Test Set-UP Frequency Over 1 GHz



10.3. Measurement Procedure:

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

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

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

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

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

10.4. Measurement Equipment Used:

Refer to section 2.4 in this report

10.5. Measurement Result:

Refer to attach tabular data sheets.

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Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Band	:GSM 850	Test Date	:2012-03-13
ARFCN	:CH 128	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:824.2 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
39.70	S	-74.60	-58.43	-13.45	-2.73	-13.00	-61.60
71.71	S	-74.18	-66.52	-5.10	-2.59	-13.00	-61.18
93.05	S	-81.90	-78.10	-1.09	-2.72	-13.00	-68.90
126.03	S	-84.62	-80.89	-0.97	-2.77	-13.00	-71.62
162.89	S	-83.34	-80.28	-0.15	-2.93	-13.00	-70.34
187.14	S	-83.29	-83.55	3.31	-3.09	-13.00	-70.29
1648.40	H	-39.34	-36.61	2.39	-5.36	-13.00	-26.34
2472.60	H	-55.01	-52.43	3.14	-6.15	-13.00	-42.01
3288.00	H	-57.24	-55.28	4.70	-6.83	-13.00	-44.24
4121.00	H	-51.19	-49.73	5.80	-7.31	-13.00	-38.19
4945.20	H	-47.26	-46.08	6.58	-7.87	-13.00	-34.26
5769.40	H	---					
6593.60	H	-45.84	-44.61	7.44	-8.73	-13.00	-32.84
7417.80	H	---					
8242.00	H	---					

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.
 “---” : denotes Noise Floor.

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Operation Band	:GSM 850	Test Date	:2012-03-13
ARFCN	:CH 128	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:824.2 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
91.11	S	-80.20	-76.42	-1.12	-2.67	-13.00	-67.20
112.45	S	-85.44	-81.53	-1.15	-2.77	-13.00	-72.44
187.14	S	-80.88	-81.14	3.31	-3.09	-13.00	-67.88
201.69	S	-82.29	-83.95	4.74	-3.14	-13.00	-69.29
286.08	S	-81.92	-83.26	4.50	-3.22	-13.00	-68.92
304.51	S	-82.38	-83.88	4.66	-3.25	-13.00	-69.38
1648.40	H	-41.80	-39.35	2.68	-5.36	-13.00	-28.80
2472.60	H	-54.28	-52.08	3.52	-6.15	-13.00	-41.28
3288.00	H	---					
4121.00	H	---					
4945.20	H	---					
5769.40	H	---					
6593.60	H	---					
7417.80	H	---					
8242.00	H	---					

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:GSM 850	Test Date	:2012-03-13
ARFCN	:CH 190	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:836.6 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
39.70	S	-74.40	-58.24	-13.45	-2.73	-13.00	-61.40
69.77	S	-74.80	-66.39	-5.84	-2.59	-13.00	-61.80
92.08	S	-80.34	-76.57	-1.11	-2.67	-13.00	-67.34
186.17	S	-83.50	-83.64	3.19	-3.09	-13.00	-70.50
618.79	S	-77.82	-78.25	4.06	-3.97	-13.00	-64.82
708.03	S	-76.97	-78.07	4.05	-3.98	-13.00	-63.97
1673.20	H	-37.48	-34.75	2.33	-5.34	-13.00	-24.48
2509.80	H	-51.40	-48.78	3.19	-6.13	-13.00	-38.40
3346.40	H	-58.00	-56.31	4.88	-6.79	-13.00	-45.00
4183.00	H	-50.39	-48.91	5.89	-7.47	-13.00	-37.39
5019.60	H	-44.69	-43.60	6.66	-7.87	-13.00	-31.69
5856.20	H	---					
6692.80	H	-45.73	-44.69	7.53	-8.64	-13.00	-32.73
7529.40	H	---					
8366.00	H	---					

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:GSM 850	Test Date	:2012-03-13
ARFCN	:CH 190	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:836.6 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
92.08	S	-81.47	-77.70	-1.11	-2.67	-13.00	-68.47
184.23	S	-82.13	-82.03	2.96	-3.09	-13.00	-69.13
304.51	S	-79.98	-81.48	4.66	-3.25	-13.00	-66.98
416.06	S	-83.67	-84.80	4.65	-3.62	-13.00	-70.67
478.14	S	-82.42	-83.47	4.61	-3.70	-13.00	-69.42
708.03	S	-77.79	-78.90	4.05	-3.98	-13.00	-64.79
1673.20	H	-45.49	-43.09	2.66	-5.34	-13.00	-32.49
2509.80	H	-52.64	-50.37	3.55	-6.13	-13.00	-39.64
3346.40	H	-57.81	-56.04	4.86	-6.88	-13.00	-44.81
4183.00	H	-53.26	-51.43	5.54	-7.47	-13.00	-40.26
5019.60	H	-49.56	-47.86	6.05	-7.87	-13.00	-36.56
5856.20	H	---					
6692.80	H	---					
7529.40	H	---					
8366.00	H	---					

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

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Operation Band	:GSM 850	Test Date	:2012-03-13
ARFCN	:CH 251	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:848.8 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
40.67	S	-74.39	-58.38	-13.29	-2.73	-13.00	-61.39
70.74	S	-73.74	-65.68	-5.49	-2.59	-13.00	-60.74
93.05	S	-81.02	-77.21	-1.09	-2.72	-13.00	-68.02
165.80	S	-83.40	-80.76	0.27	-2.93	-13.00	-70.40
436.43	S	-83.02	-83.96	4.53	-3.70	-13.00	-70.02
566.41	S	-78.89	-79.61	4.39	-3.87	-13.00	-65.89
1697.60	H	-41.07	-38.22	2.29	-5.40	-13.00	-28.07
2546.40	H	-51.78	-49.07	3.30	-6.24	-13.00	-38.78
3395.20	H	-56.57	-55.05	4.98	-6.85	-13.00	-43.57
4244.00	H	-52.03	-50.61	5.97	-7.43	-13.00	-39.03
5092.80	H	-49.36	-48.01	6.66	-8.06	-13.00	-36.36
5941.60	H	---					
6790.40	H	-47.24	-45.88	7.63	-9.13	-13.00	-34.24
7639.20	H	---					
8488.00	H	---					

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:GSM 850	Test Date	:2012-03-13
ARFCN	:CH 251	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:848.8 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
70.74	S	-84.97	-76.92	-5.49	-2.59	-13.00	-71.97
90.14	S	-80.00	-76.21	-1.14	-2.67	-13.00	-67.00
199.75	S	-82.42	-84.09	4.70	-3.09	-13.00	-69.42
298.69	S	-81.68	-83.16	4.65	-3.25	-13.00	-68.68
458.74	S	-82.77	-83.70	4.51	-3.72	-13.00	-69.77
622.67	S	-78.59	-79.04	4.07	-3.97	-13.00	-65.59
1697.60	H	-43.87	-41.38	2.65	-5.40	-13.00	-30.87
2546.40	H	-53.13	-50.78	3.66	-6.24	-13.00	-40.13
3395.20	H	---					
4244.00	H	---					
5095.00	H	-49.75	-47.82	6.07	-8.06	-13.00	-36.75
5941.60	H	---					
6790.40	H	---					
7639.20	H	---					
8488.00	H	---					

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.
 “E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.
 “---“ : denotes Noise Floor.

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Radiated Spurious Emission Measurement Result: GSM 1900 Mode

Operation Band	:GSM 1900	Test Date	:2012-03-13
ARFCN	:CH 512	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1850.2 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
38.73	S	-73.35	-59.53	-11.38	-2.47	-13.00	-60.35
72.68	S	-70.28	-65.14	-2.57	-2.59	-13.00	-57.28
118.27	S	-79.68	-77.74	0.83	-2.77	-13.00	-66.68
170.65	S	-82.28	-82.46	3.12	-2.93	-13.00	-69.28
289.96	S	-82.21	-85.70	6.70	-3.22	-13.00	-69.21
431.58	S	-80.36	-83.42	6.70	-3.66	-13.00	-67.36
3700.40	H	-46.70	-47.24	7.40	-6.98	-13.00	-33.70
5550.60	H	-49.12	-50.04	8.99	-8.37	-13.00	-36.12
7400.80	H	---					
9251.00	H	---					
11101.20	H	---					
12951.40	H	---					
14801.60	H	---					
16651.80	H	---					
18502.00	H	---					

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:GSM 1900	Test Date	:2012-03-13
ARFCN	:CH 512	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1850.2 MHz	Engineer	:Nick
Operation Mode	:TX LOW		
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
88.20	S	-76.84	-75.05	0.86	-2.67	-13.00	-63.84
164.83	S	-81.43	-80.78	2.28	-2.93	-13.00	-68.43
187.14	S	-80.20	-82.60	5.46	-3.09	-13.00	-67.20
218.18	S	-80.91	-84.77	7.00	-3.14	-13.00	-67.91
286.08	S	-80.06	-83.50	6.65	-3.22	-13.00	-67.06
615.88	S	-77.09	-79.38	6.21	-3.97	-13.00	-64.09
3700.40	H	-48.91	-48.96	6.92	-6.98	-13.00	-35.91
5550.60	H	---					
7400.80	H	---					
9251.00	H	---					
11101.20	H	---					
12951.40	H	---					
14801.60	H	---					
16651.80	H	---					
18502.00	H	---					

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

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

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Operation Band	:GSM 1900	Test Date	:2012-03-13
ARFCN	:CH 661	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1880 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
38.73	S	-72.80	-58.98	-11.38	-2.47	-13.00	-59.80
71.71	S	-72.29	-66.77	-2.95	-2.59	-13.00	-59.29
121.18	S	-80.69	-78.78	0.86	-2.77	-13.00	-67.69
165.80	S	-81.37	-80.85	2.42	-2.93	-13.00	-68.37
263.77	S	-82.73	-86.27	6.80	-3.27	-13.00	-69.73
715.79	S	-75.91	-78.08	6.10	-3.98	-13.00	-62.91
3760.00	H	-44.70	-45.30	7.42	-7.12	-13.00	-31.70
5640.00	H	-45.53	-46.42	9.01	-8.26	-13.00	-32.53
7520.00	H	---					
9400.00	H	---					
11280.00	H	---					
13160.00	H	---					
15040.00	H	---					
16920.00	H	---					
18800.00	H	---					

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:GSM 1900	Test Date	:2012-03-13
ARFCN	:CH 661	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1880 MHz	Engineer	:Nick
Operation Mode	:TX MID		
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
86.26	S	-78.44	-76.49	0.70	-2.67	-13.00	-65.44
187.14	S	-81.14	-83.53	5.46	-3.09	-13.00	-68.14
200.72	S	-79.95	-83.71	6.88	-3.14	-13.00	-66.95
286.08	S	-80.45	-83.89	6.65	-3.22	-13.00	-67.45
483.96	S	-80.27	-83.40	6.79	-3.70	-13.00	-67.27
584.84	S	-76.84	-79.34	6.34	-3.90	-13.00	-63.84
3762.50	H	-46.48	-46.52	6.85	-7.12	-13.00	-33.48
5640.00	H	---					
7520.00	H	---					
9400.00	H	---					
11280.00	H	---					
13160.00	H	---					
15040.00	H	---					
16920.00	H	---					
18800.00	H	---					

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

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

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Operation Band	:GSM 1900	Test Date	:2012-03-13
ARFCN	:CH 810	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1909.8 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Freq. MHz	Note F/H/E/S	EIRP dBm	SG Output Level dBm	Antenna Gain dBi	Cable Loss dB	Limit dBm	Safe Margin dB
41.64	S	-73.73	-60.07	-10.95	-2.73	-13.00	-60.73
72.68	S	-70.90	-65.76	-2.57	-2.59	-13.00	-57.90
89.17	S	-78.42	-76.71	0.94	-2.67	-13.00	-65.42
117.30	S	-80.90	-78.99	0.86	-2.77	-13.00	-67.90
159.98	S	-81.76	-80.41	1.58	-2.93	-13.00	-68.76
555.74	S	-76.95	-79.81	6.66	-3.85	-13.00	-63.95
3819.60	H	-47.41	-47.91	7.51	-7.20	-13.00	-34.41
5729.40	H	-44.50	-45.21	9.03	-8.44	-13.00	-31.50
7639.20	H	---					
9549.00	H	---					
11458.80	H	---					
13368.60	H	---					
15278.40	H	---					
17188.20	H	---					
19098.00	H	---					

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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Operation Band	:GSM 1900	Test Date	:2012-03-13
ARFCN	:CH 810	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1909.8 MHz	Engineer	:Nick
Operation Mode	:TX HIGH		
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
71.71	S	-82.67	-77.15	-2.95	-2.59	-13.00	-69.67
89.17	S	-77.98	-76.27	0.94	-2.67	-13.00	-64.98
184.23	S	-80.30	-82.34	5.11	-3.09	-13.00	-67.30
201.69	S	-80.59	-84.36	6.89	-3.14	-13.00	-67.59
300.63	S	-80.21	-83.80	6.82	-3.25	-13.00	-67.21
622.67	S	-76.72	-79.01	6.22	-3.97	-13.00	-63.72
3821.00	H	-51.51	-51.55	7.05	-7.20	-13.00	-38.51
5729.40	H	---					
7639.20	H	---					
9549.00	H	---					
11458.80	H	---					
13368.60	H	---					
15278.40	H	---					
17188.20	H	---					
19098.00	H	---					

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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11. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

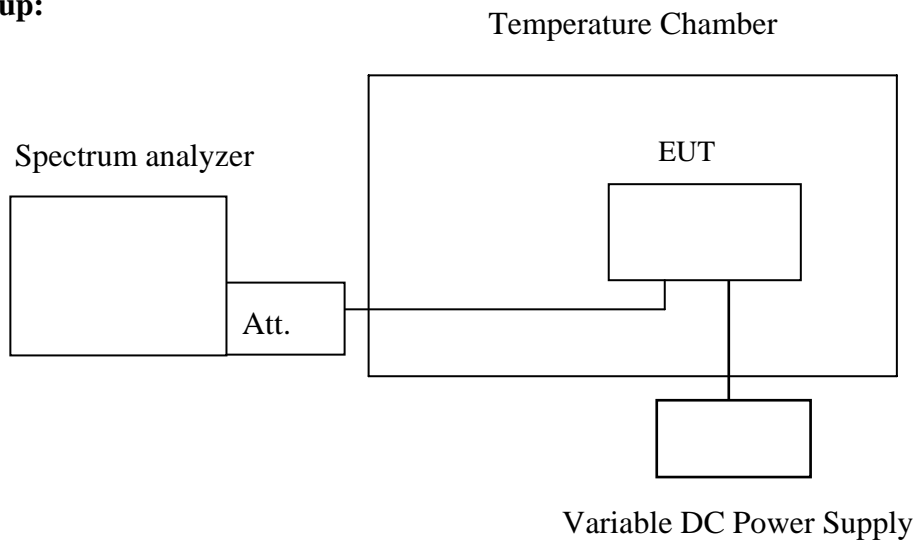
11.1. Standard Applicable:

According to FCC §2.1055(a) (1)

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

+/-2.5ppm for 1900MHz band

11.2. Test Set-up:



Note : Measurement setup for testing on Antenna connector

11.3. Measurement Procedure:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

11.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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11.5. Measurement Result:

Reference Frequency: GPRS 850 Mid Channel 836.6 MHz @ 20°C				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ()	(MHz)		
3.7	-30	836.600012	-2.00	2091
3.7	-20	836.600011	-1.00	2091
3.7	-10	836.600004	6.00	2091
3.7	0	836.600009	1.00	2091
3.7	10	836.600008	2.00	2091
3.7	20	836.600010	0.00	2091
3.7	30	836.600015	-5.00	2091
3.7	40	836.600009	1.00	2091
3.7	50	836.600012	-2.00	2091

Reference Frequency: GPRS 1900 Mid Channel 1880 MHz				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.7	-30	1880.000010	-3.00	4700
3.7	-20	1880.000012	-5.00	4700
3.7	-10	1880.000006	1.00	4700
3.7	0	1880.000009	-2.00	4700
3.7	10	1880.000011	-4.00	4700
3.7	20	1880.000007	0.00	4700
3.7	30	1880.000019	-12.00	4700
3.7	40	1880.000013	-6.00	4700
3.7	50	1880.000008	-1.00	4700

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12. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

12.1. Standard Applicable:

According to FCC §2.1055(a) (1)

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

+/-2.5ppm for 1900MHz band

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

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

12.2. Test Set-up:

Refer to section 11.2 in this report

12.3. Measurement Procedure:

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

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

12.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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12.5. Measurement Result:

Reference Frequency: GPRS 850 Mid Channel 836.6 MHz				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25.00	836.600004	4.00	2091.00
3.7	25.00	836.600008	0.00	2091.00
3.2	25.00	836.600007	1.00	2091.00
3.1 (End Point)	25.00	836.600005	3.00	2091.00

Reference Frequency: GPRS 1900 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	1880.000011	-5.00	4700
3.7	25	1880.000006	0.00	4700
3.2	25	1880.000008	-2.00	4700
3.1 (End Point)	25	1880.000007	-1.00	4700

~ End of Report ~

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