ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

Product Name:	**PTD2000**
Brand Name:	**Daviscomms**
Marketing Name:	**EaziTrack2000**
Model Name:	**PTD2000-GSAP, PTD2000-NNNP, PTD2000-NSNN, PTD2000-GNAP, PTD2000-GSAN**
Model Difference:	**Please refer to page 8**
FCC ID:	**VDQPTD-01**
Report No.:	**EH/2011/30001**
Issue Date:	**Mar. 10, 2011**
FCC Rule Part:	**2 , 22H & 24E**
Prepared for:	**Daviscomms (S) Pte. Ltd** **Block 70 Ubi Crescent # 01-07. Ubi Techpark. Singapore. 408570**
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:	Daviscomms (S) Pte. Ltd Block 70 Ubi Crescent＃01-07. Ubi Techpark. Singapore. 408570
Product Name:	PTD2000
Brand Name:	Daviscomms
Marketing Name:	EaziTrack2000
Model No.:	PTD2000-GSAP, PTD2000-NNNP, PTD2000-NSNN, PTD2000-GNAP, PTD2000-GSAN
Model Difference:	Please refer to page 8
FCC ID:	VDQPTD-01
File Number:	EH/2011/30001
Date of test:	Mar. 01, 2011 ~ Mar. 09, 2011
Date of EUT Received:	Mar. 01, 2011

We hereby certify that:

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

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

Test By:	Jazz Huang	***Date:***	Mar. 10, 2011
	Jazz Huang / Engineer		
Prepared By:	Judy Hsu	***Date:***	Mar. 10, 2011
	Judy Hsu / General Admin.		
Approved By:	Jim Chang	***Date:***	Mar. 10, 2011
	Jim Chang / Supervisor		

Version

Version No.	Date	Description
00	Mar. 10, 2011	Initial creation of document

Table of Contents

1. GENERAL PRODUCT INFORMATION

General:

Product Name:	PTD2000	
Brand Name:	Daviscomms	
Marketing Name:	EaziTrack2000	
Model Name:	PTD2000-GSAP, PTD2000-NNNP, PTD2000-NSNN, PTD2000-GNAP,PTD2000-GSAN	
Model Difference:	Please refer to page 8	
Power Supply	DC 3.7V from Li-rechargeable battery or 5VDC by adapter	
	Battery:	M/N:BAT00004R01, Supplier: SHENZHENB&K
	Adapter:	M/N: OK-W05-0600 Supplier: OKEY

GSM:

Cellular Phone Standards Frequency Range and Power:	Operating Frequency		Rated Power
	GSM 850, Class 10	824.2 MHz– 848.8 MHz	33 dBm
	GSM 1900, Class 10	1850.2MHz – 1909.8MHz	30 dBm
Hardware Version:	R04		
Software Version:	99.27		
IMEI:	357852031609038		

GPS:

Receiver Frequency:	L1 Band, 1575.42MHz
Frequency Conversion oscillator:	32.768KHz
Antenna Designation:	Chip type of antenna

Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GSM 850	3.7Vdc	510
DCS 1900	3.7Vdc	450
GPRS 850	3.7Vdc	230
GPRS 1900	3.7Vdc	220

This test report applies for GSM 850/1900.

Model difference:

Product Diversity Description Table

Model No:						Remarks
PTD2000	-	G	S	A	P	➢PTD2000 with GSM Module, GPS, Accelerometer & Pager. ➢This is for location finding and two ways paging operation.
PTD2000	-	N	N	N	P	➢PTD2000 with Pager module only ➢No GSM, No GPS, No Accelerometer ➢This is for one way paging operation.
PTD2000	-	N	S	N	N	➢PTD2000 with GPS module only ➢No GSM, No Accelerometer, No Pager ➢This is for data logging operation.
PTD2000	-	G	N	A	P	➢PTD2000 with GSM module, Accelerometer & Pager ➢No GPS ➢This is for two ways paging operation with SMS as a backup to paging system.
PTD2000	-	G	S	A	N	➢PTD2000 with GSM, GPS & Accelerometer ➢No Pager ➢This is for location finding and SMS operation.

(1) GSM

		GSM
"G"	=	√
"N"	=	

(3) Accelerometer

		Accelerometer
"A"	=	√
"N"	=	

(2) GPS

		GPS
"S"	=	√
"N"	=	

(4) Pager

		Pager
"P"	=	√
"N"	=	

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

This submittal(s) (test report) is intended for FCC ID: **VDQPTD-01** 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 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.

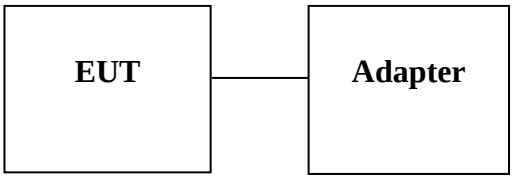
2.4. Measurement Equipment Used:

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

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	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
3m Site	SGS	966 chamber	N/A	11/08/2010	11/09/2011

2.5. Configuration of Tested System

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



Remote Side

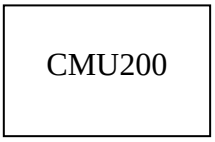


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	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)	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		W
GSM 850 Band	29.63	ERP	0.918
GSM 1900 Band	26.22	EIRP	0.419

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 with power adaptor.The worst-case of E2 position for GSM850 band, E1 position for GSM1900 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

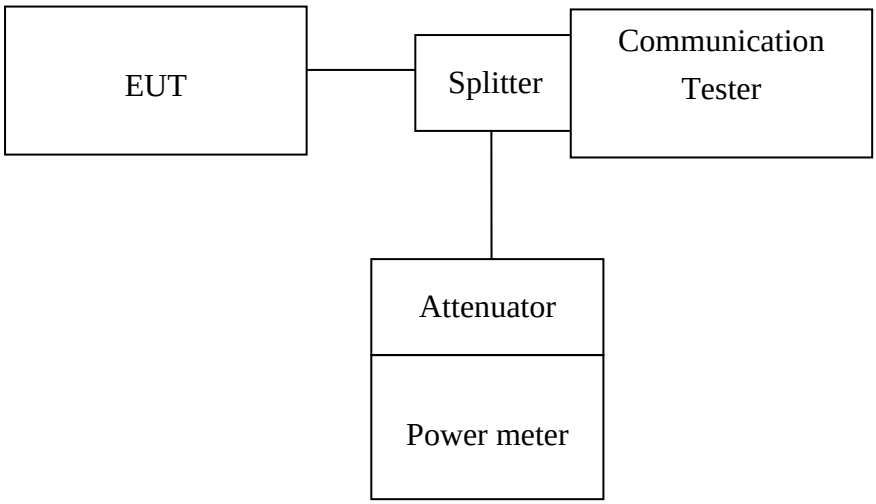
Maximum Output Powers for HSDPA

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 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

Result:

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Average Power (dBm)
GSM 850	824.2	128	32.20	32.10
	836.6	190	32.00	31.90
	848.8	251	32.10	32.00

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Average Power (dBm)
GSM 1900	1850.2	512	28.00	27.90
	1880.0	661	28.10	28.00
	1909.8	810	28.10	28.00

offset : 1 dBm

5.2 Maximum Power Reduction: PCS1900 band

PCL	0	1	2	3	4	5	6	7	8	
Output power (dBm)	28	26.4	24.9	22.9	21	19.1	16.8	14.8	12.7	
PCL	**9**	**10**	**11**	**12**	**13**	**14**	**15**			
Output power (dBm)	10.6	8.7	6.9	5.4	3.5	2	0.4			

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:

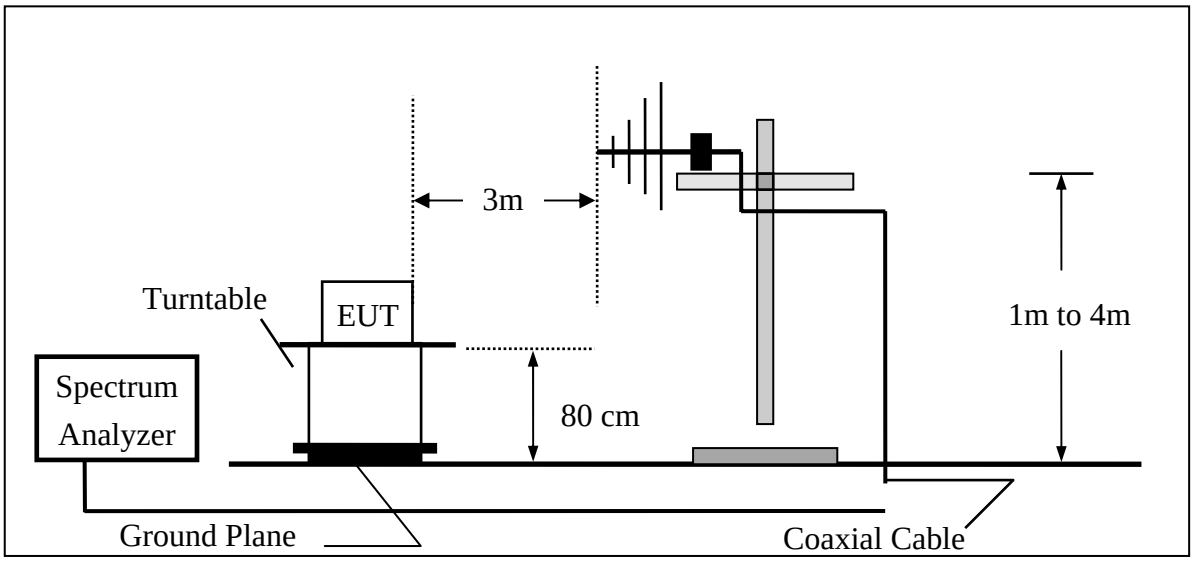
According to FCC §2.1046

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

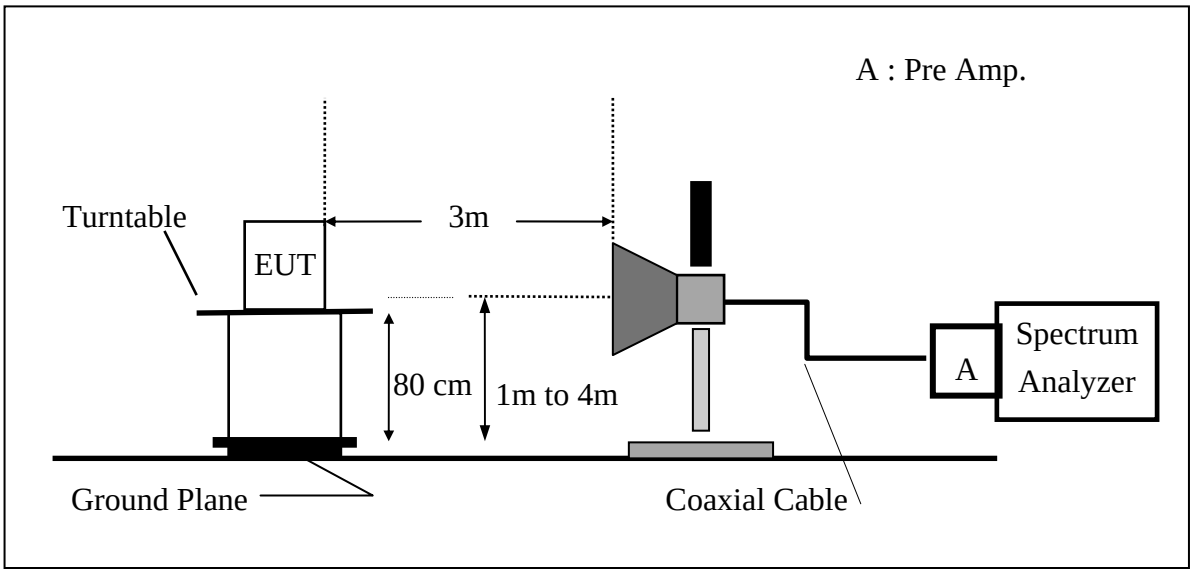
FCC 24.232(b) Mobile station are limited to 2W EIRP.

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

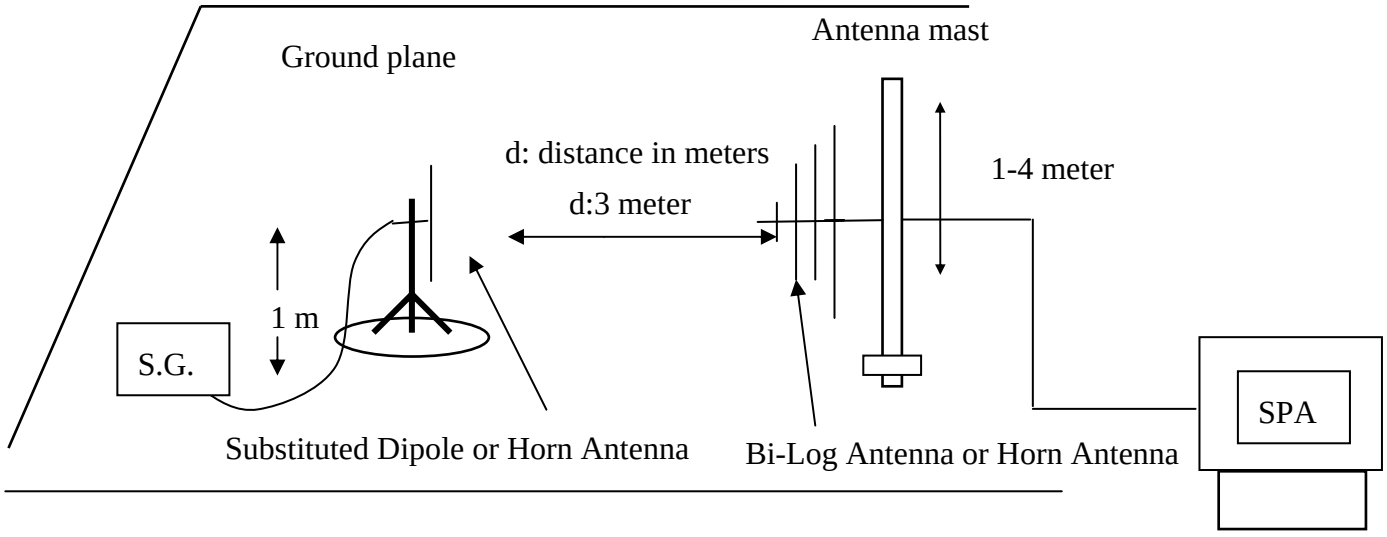
(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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



(C) Substituted Method Test Set-UP



6.3. Measurement Procedure:

The EUT was placed on an 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 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:

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

EIRP = S.G. output (dBm) + Antenna Gain (dBi) – 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	123.54	37.15	-7.87	3.62	25.65	38.45
				H	116.78	30.51	-7.87	3.62	19.01	38.45
			E1	V	121.64	35.25	-7.87	3.62	23.75	38.45
				H	124.97	38.70	-7.87	3.62	27.20	38.45
			E2	V	122.99	36.60	-7.87	3.62	25.10	38.45
				H	126.15	39.88	-7.87	3.62	28.38	38.45
	836.60	190	H	V	124.74	38.49	-7.88	3.65	26.96	38.45
				H	117.70	31.47	-7.88	3.65	19.94	38.45
			E1	V	121.48	35.23	-7.88	3.65	23.70	38.45
				H	125.73	39.50	-7.88	3.65	27.97	38.45
			E2	V	123.37	37.12	-7.88	3.65	25.59	38.45
				H	127.16	40.93	-7.88	3.65	29.40	38.45
	848.80	251	H	V	124.61	38.49	-7.88	3.68	26.93	38.45
				H	118.03	31.84	-7.88	3.68	20.28	38.45
			E1	V	122.34	36.22	-7.88	3.68	24.66	38.45
				H	125.68	39.49	-7.88	3.68	27.93	38.45
			E2	V	123.59	37.47	-7.88	3.68	25.91	38.45
				H	127.38	41.19	-7.88	3.68	**29.63**	38.45

Remark：

(1) The RBW,VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz

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	123.10	18.71	9.90	5.56	23.05	33.00
				H	122.16	17.98	9.90	5.56	22.32	33.00
			E1	V	124.96	20.57	9.90	5.56	24.91	33.00
				H	119.25	15.07	9.90	5.56	19.41	33.00
			E2	V	118.48	14.09	9.90	5.56	18.43	33.00
				H	125.20	21.02	9.90	5.84	25.08	33.00
	1880.00	661	H	V	124.41	20.05	9.99	5.61	24.43	33.00
				H	123.52	19.38	9.99	5.61	23.75	33.00
			E1	V	126.20	21.84	9.99	5.61	**26.22**	33.00
				H	120.09	15.95	9.99	5.61	20.32	33.00
			E2	V	119.25	14.89	9.99	5.61	19.27	33.00
				H	125.72	21.58	9.99	5.61	25.95	33.00
	1909.80	810	H	V	124.24	19.91	10.08	5.66	24.33	33.00
				H	123.56	19.45	10.08	5.66	23.87	33.00
			E1	V	125.80	21.47	10.08	5.66	25.89	33.00
				H	120.19	16.08	10.08	5.66	20.50	33.00
			E2	V	119.22	14.89	10.08	5.66	19.31	33.00
				H	125.59	21.48	10.08	5.66	25.90	33.00

Remark：

(1) The RBW,VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz

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	0.2495
	836.60	190	0.2485
	848.80	251	0.2467

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
GSM 1900	1850.20	512	0.2419
	1880.00	661	0.2429
	1909.80	810	0.2419

Figure 7-1: GSM 850 Channel Low

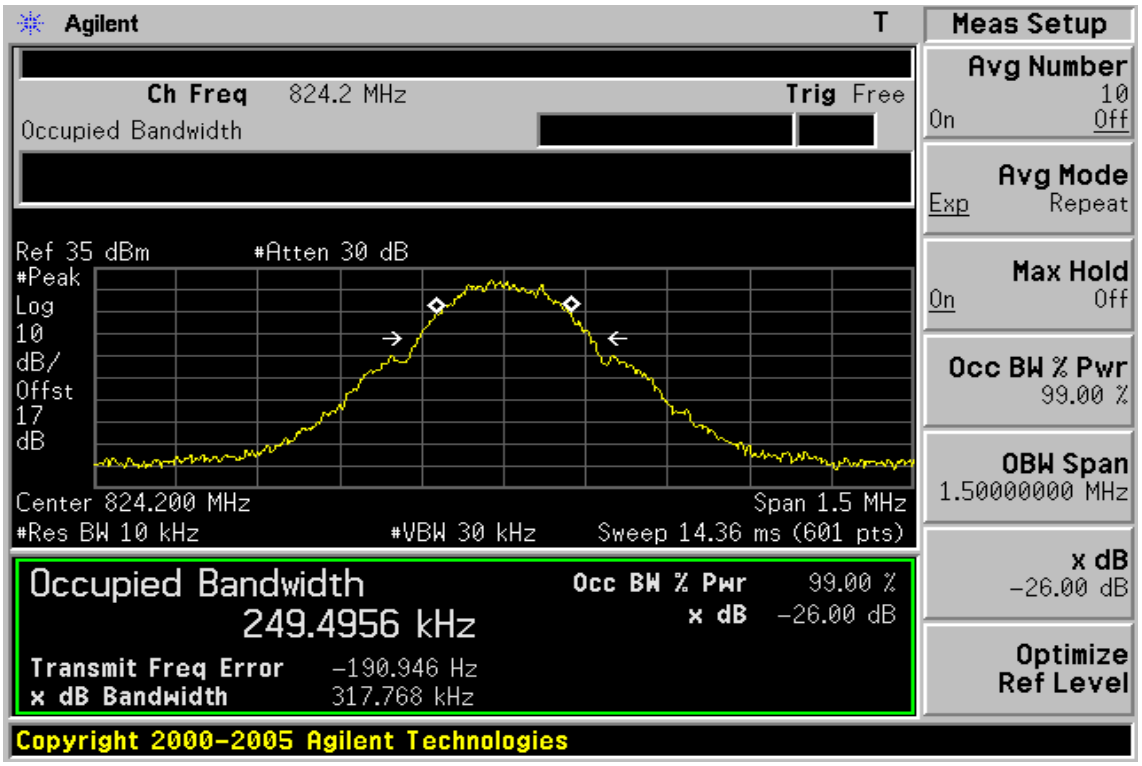
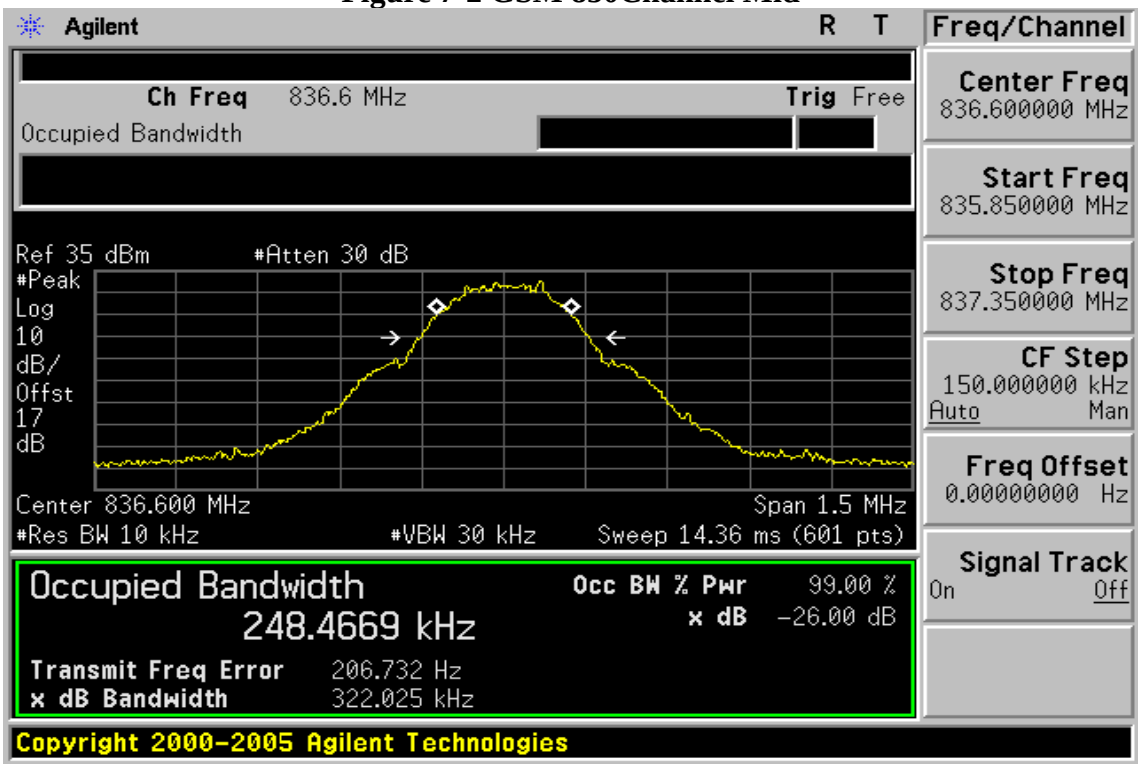


Figure 7-2 GSM 850Channel Mid



GPRS Figure 7-3: GSM 850 Channel High

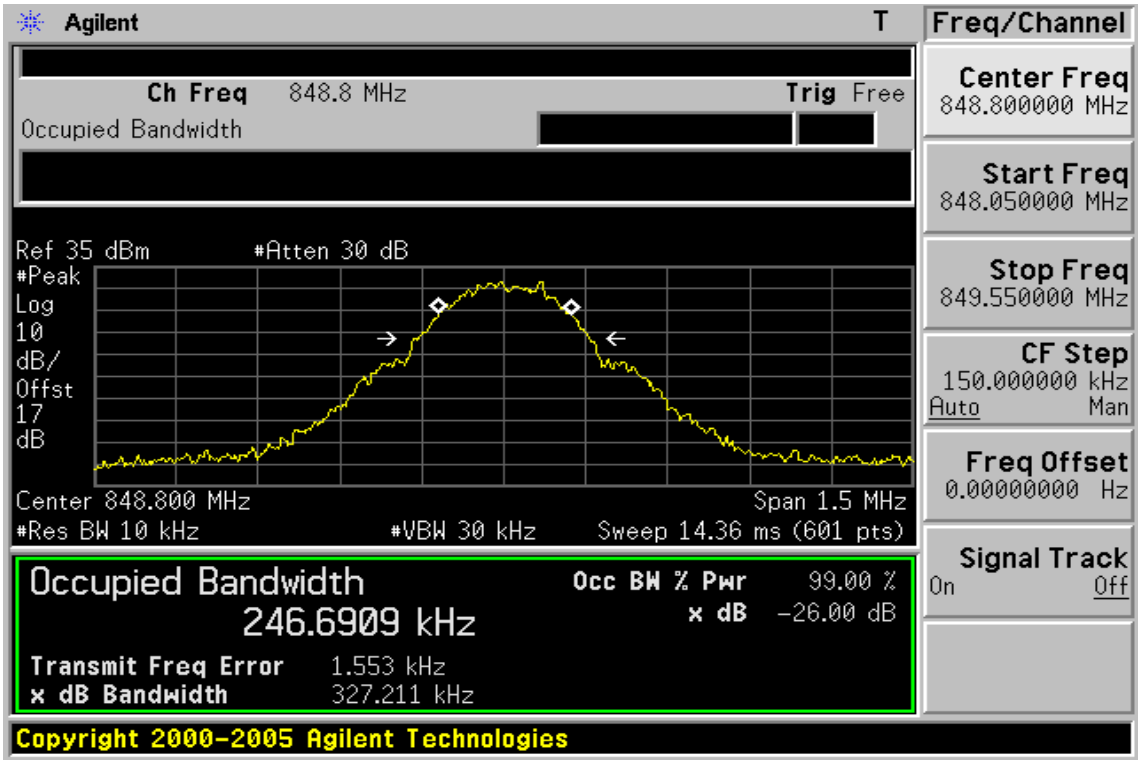


Figure 7-4: GSM 1900 Channel Low

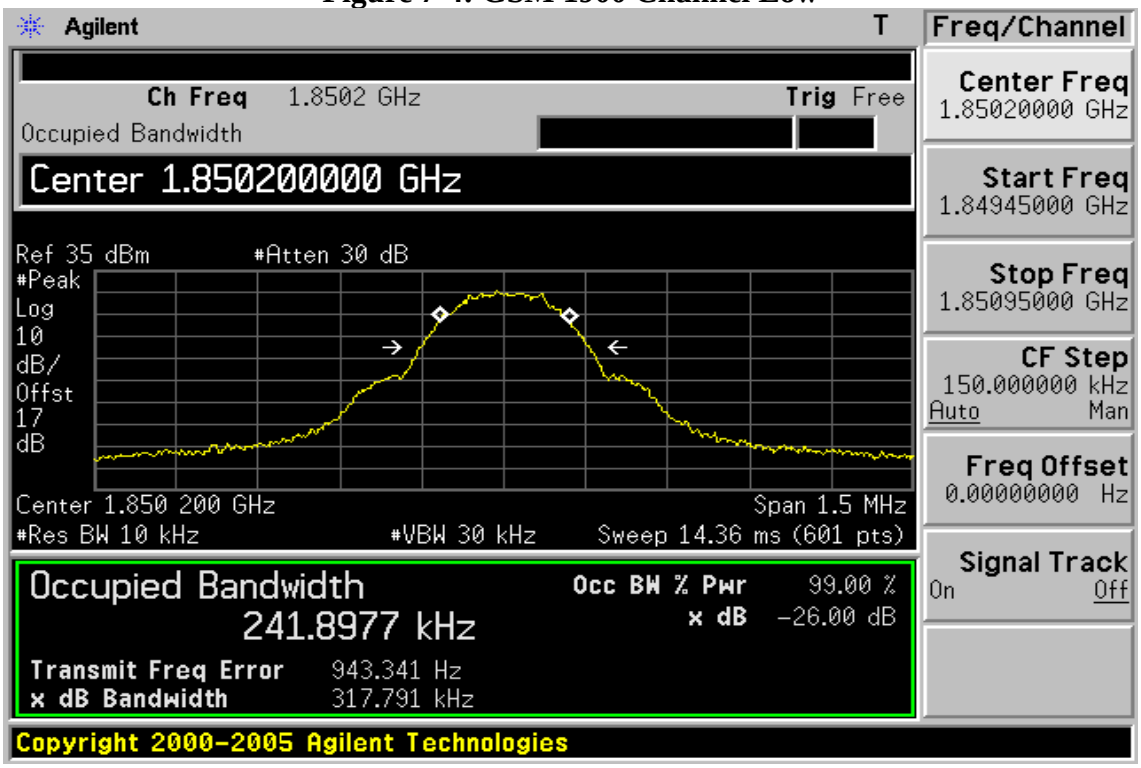


Figure 7-5 GSM 1900 Channel Mid

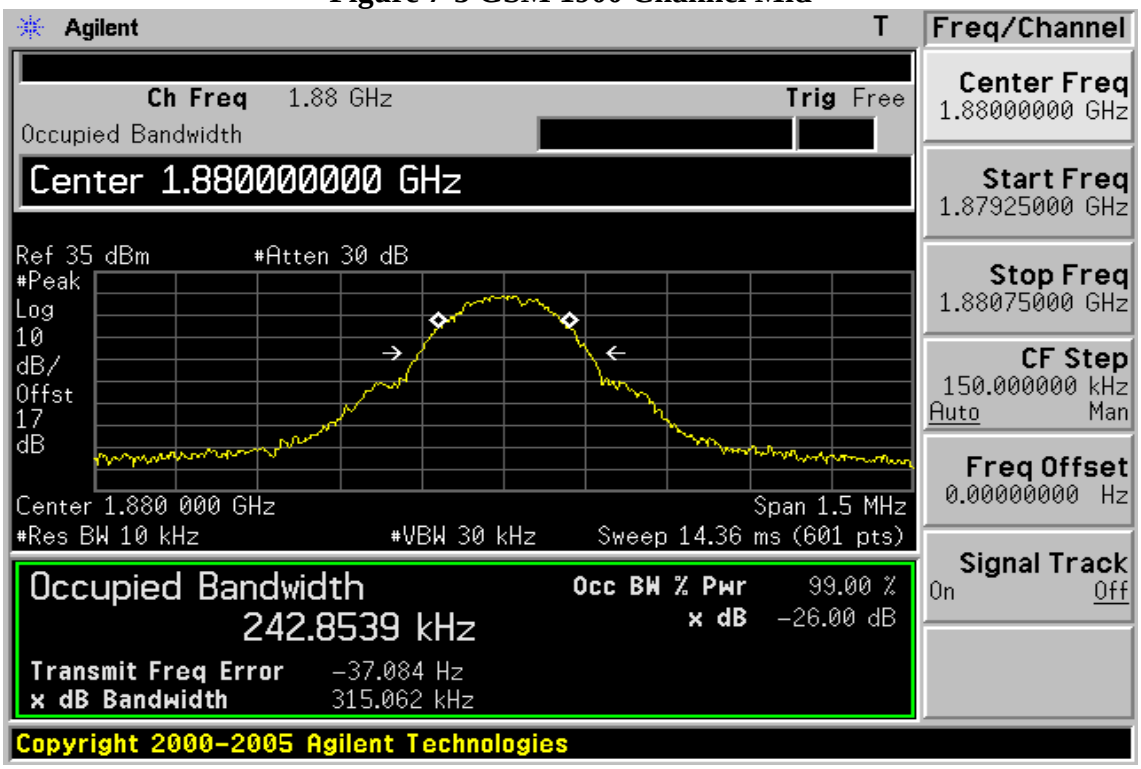
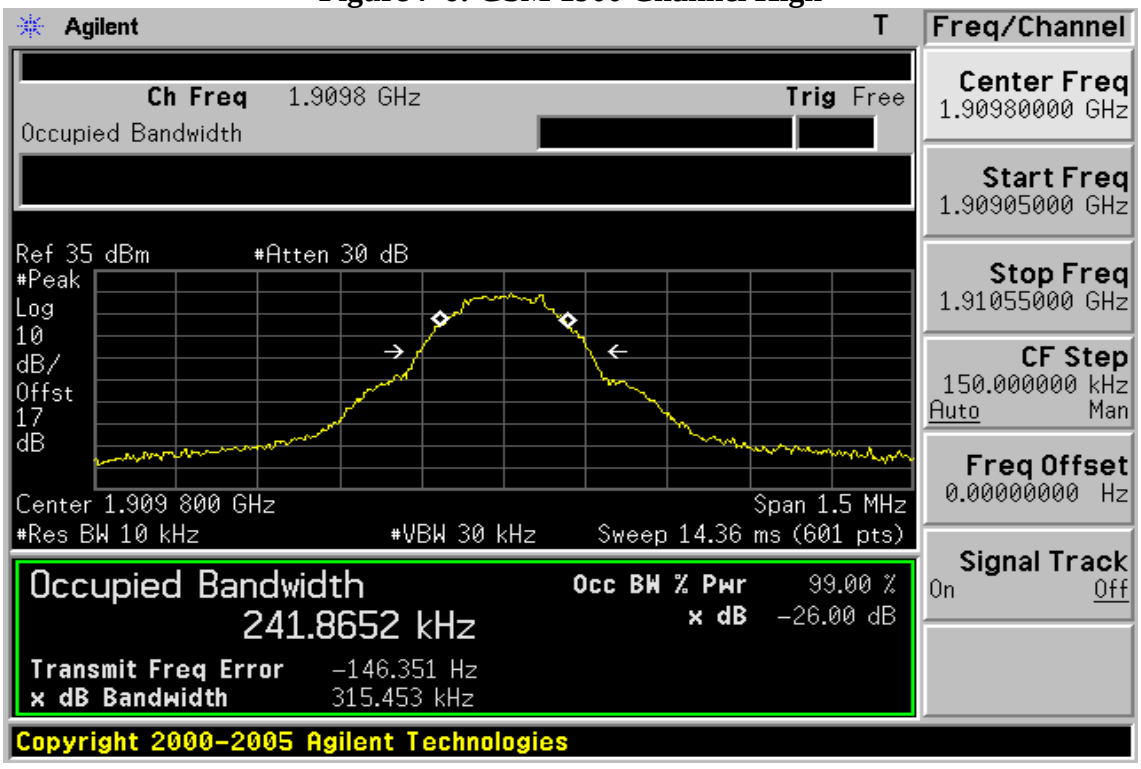


Figure 7-6: GSM 1900 Channel High



8. OUT OF BAND EMISSION AT ANTENNA TERMINALS

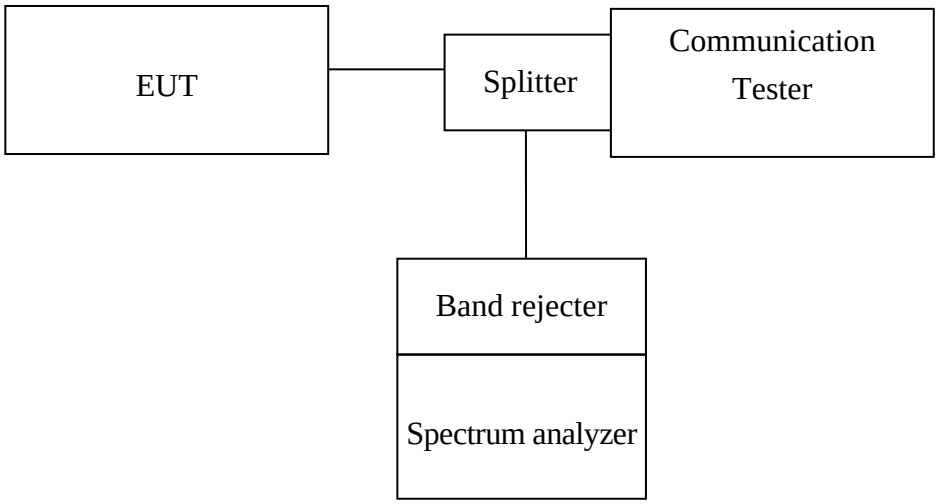
8.1. Standard Applicable:

According to FCC §2.1051.

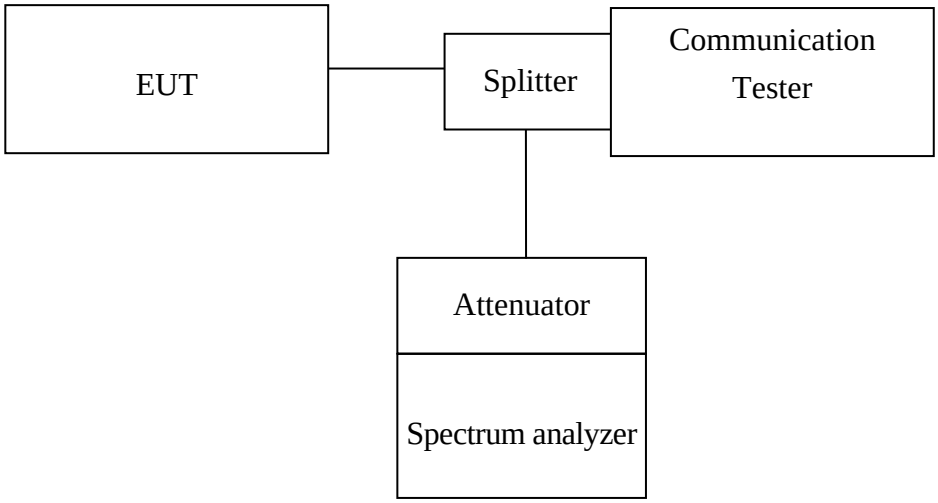
FCC §22.917(a),§24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than 43 + 10 log (mean output power in watts) dBc below the mean power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

8.2. Test SET-UP:

Out of band emission



Band Edge



8.3. Measurement Procedure:

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

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

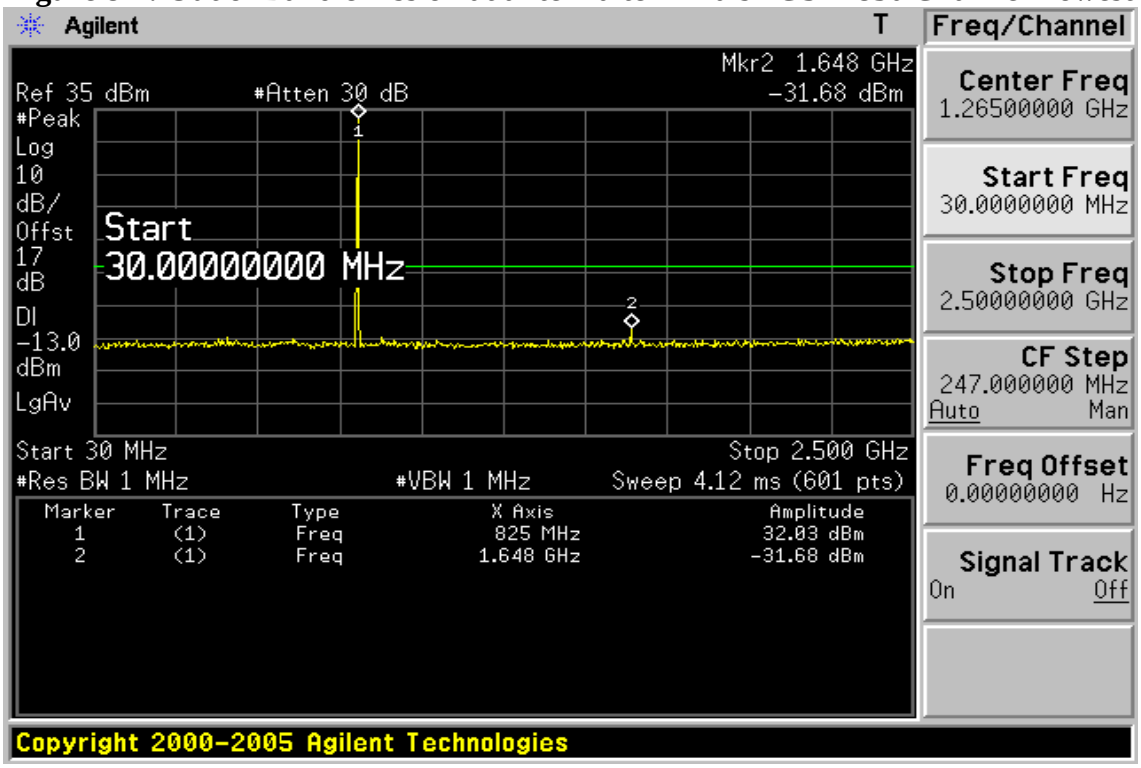
Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

8.4. Measurement Equipment Used:

Refer to section 2.4 in this report

8.5. Measurement Result:

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



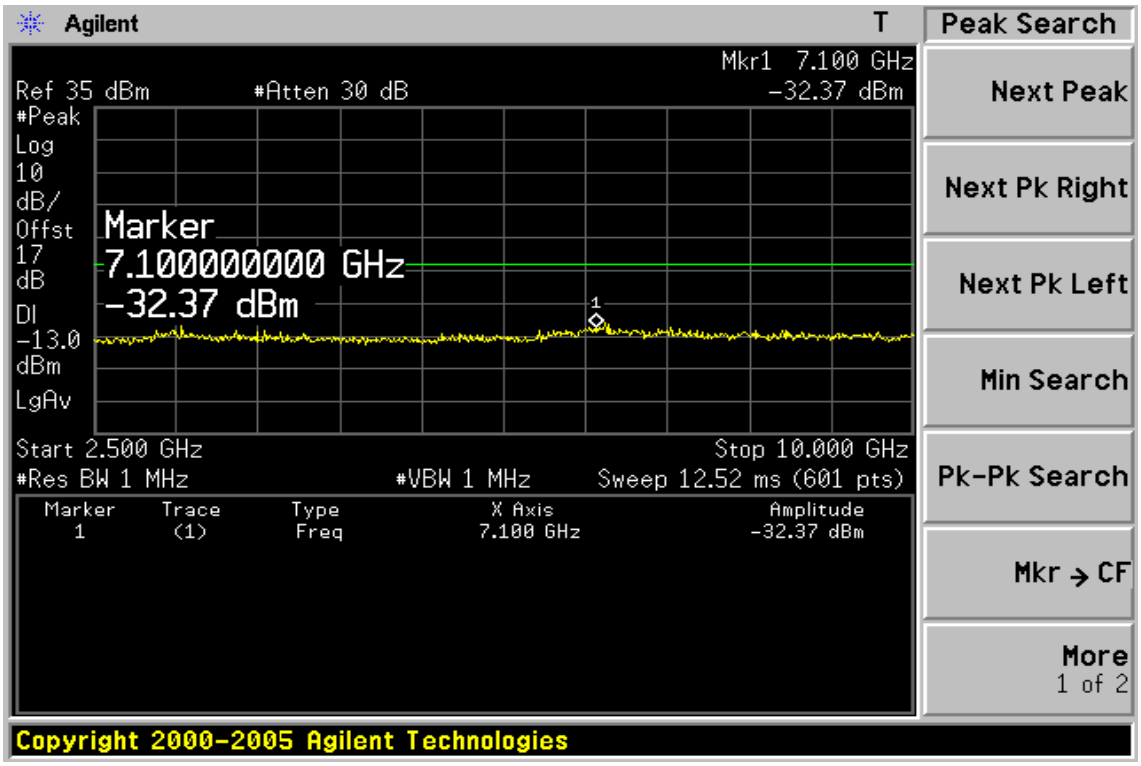
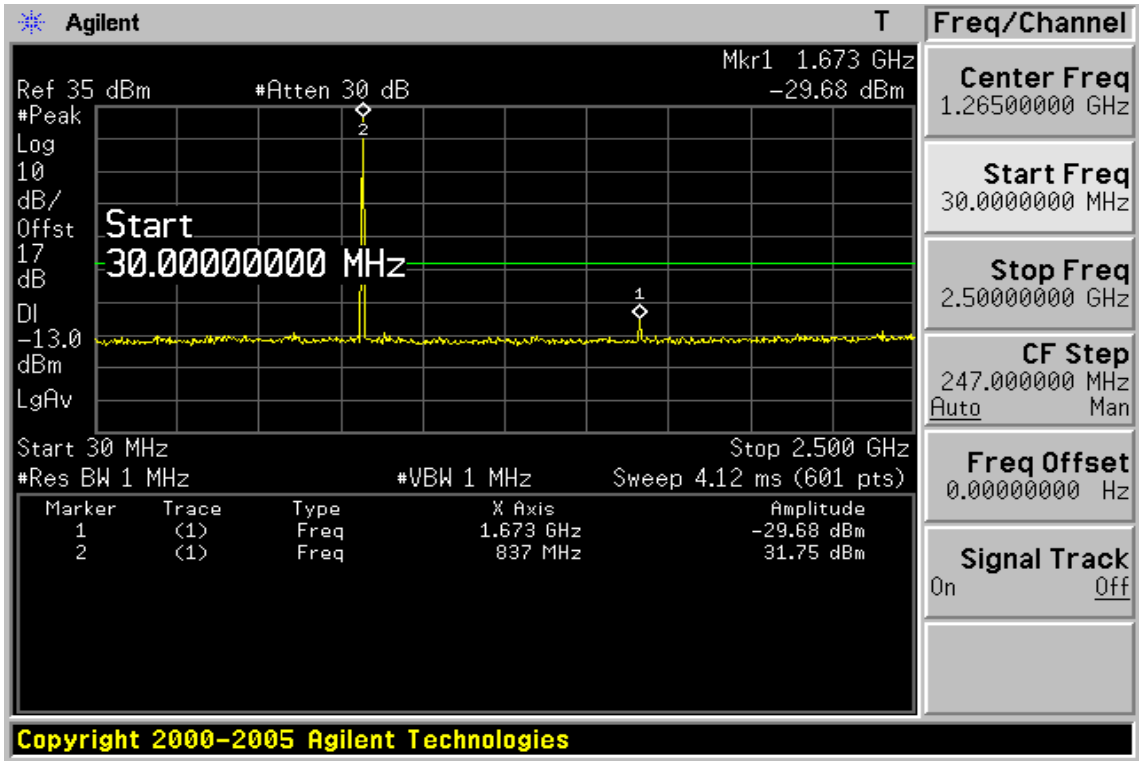


Figure 8-2: Out of Band emission at antenna terminals –GSM 850 Channel Mid



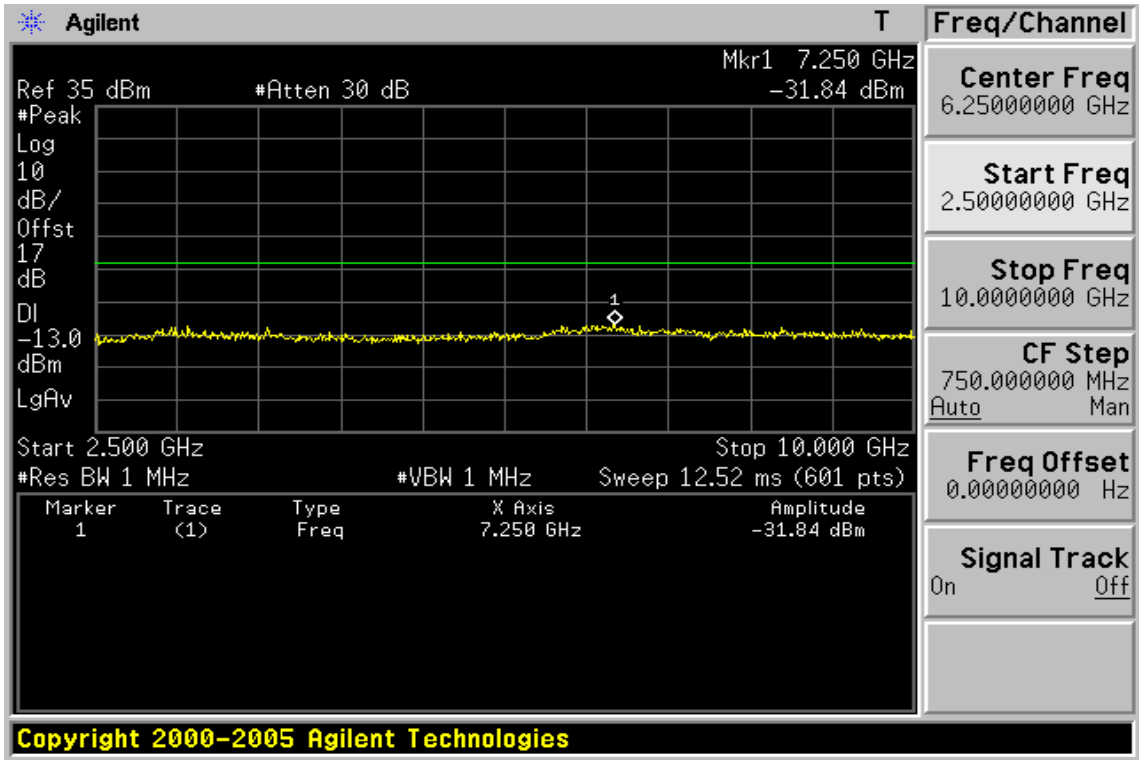
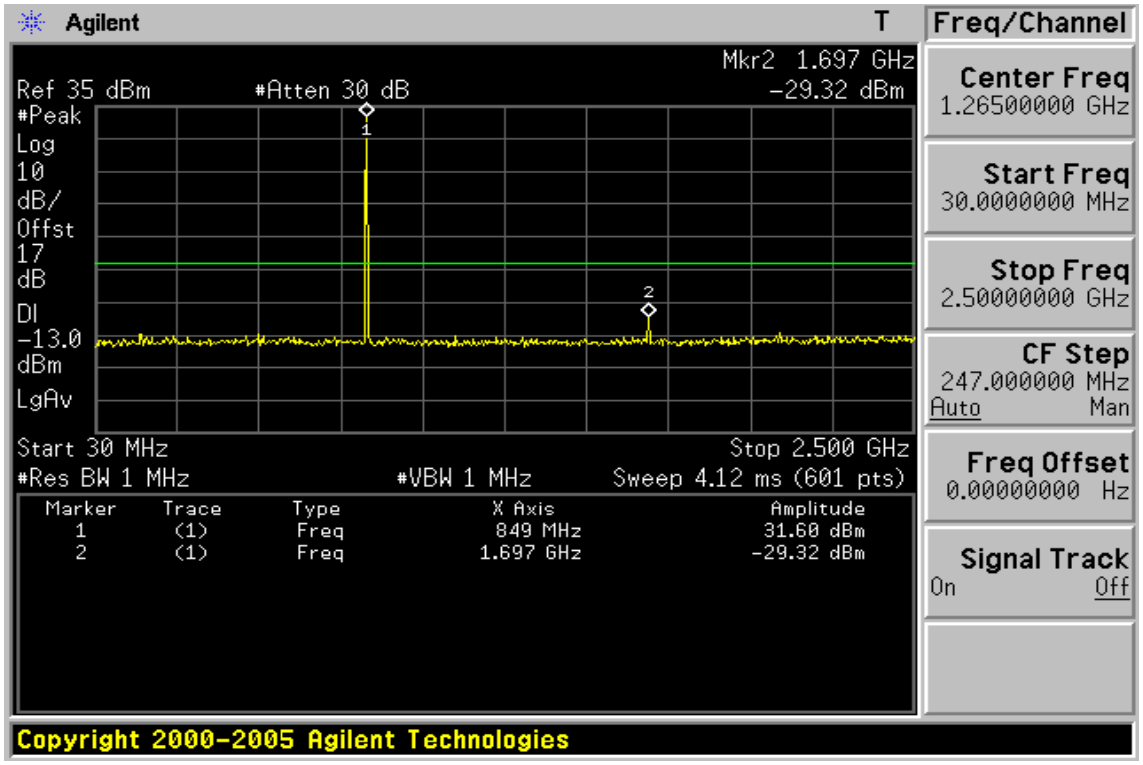


Figure 8-3: Out of Band emission at antenna terminals–GSM 850 Channel Highest



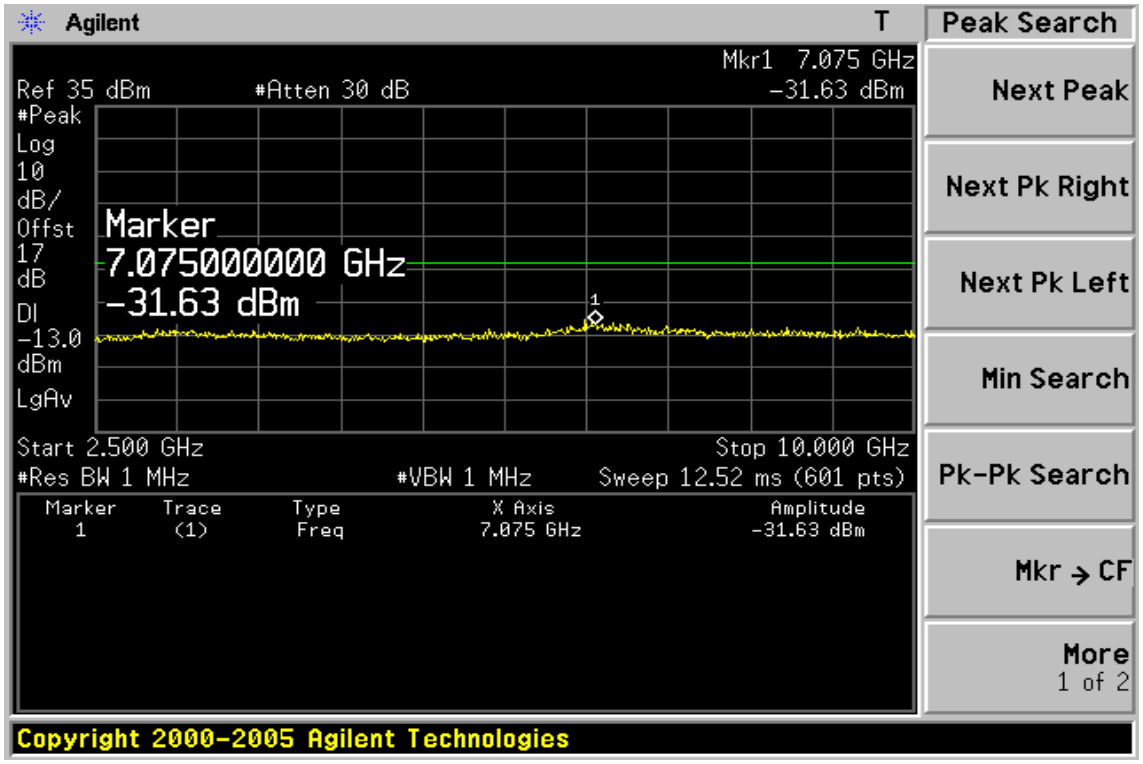


Figure 8-4: Band edge emission at antenna terminals –GSM 850 Channel Lowest

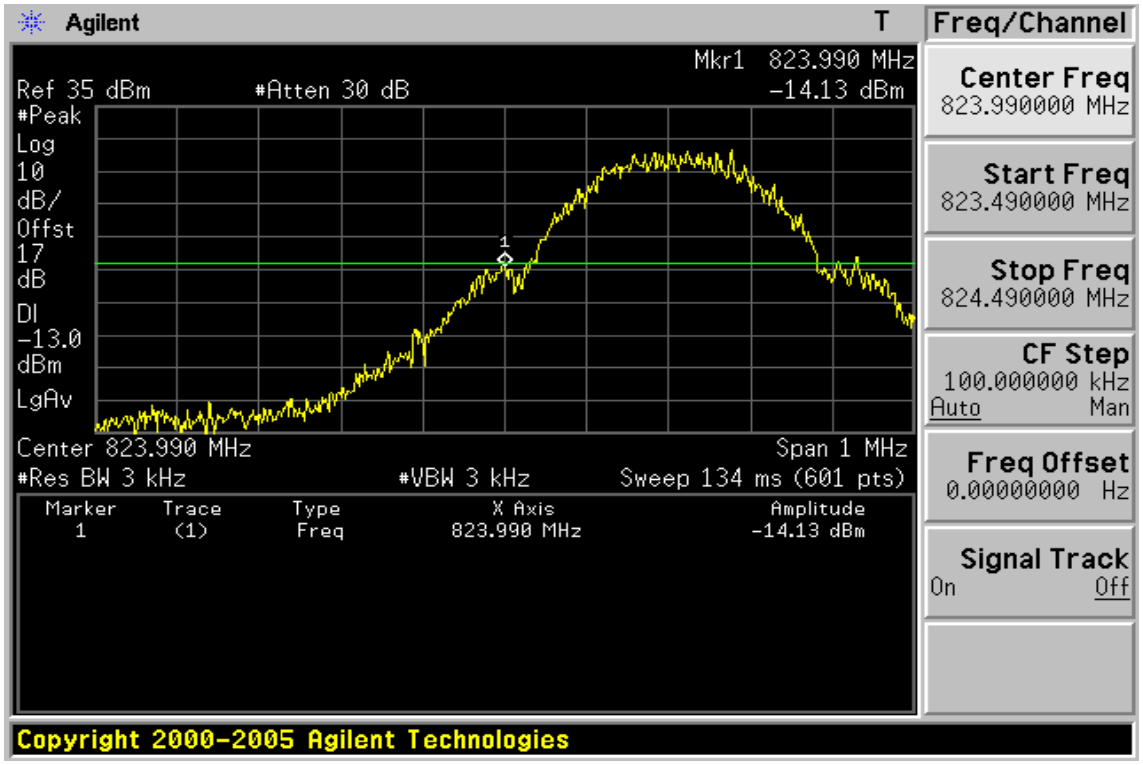


Figure 8-5: Band edge emission at antenna terminals –GSM 850 Channel Highest

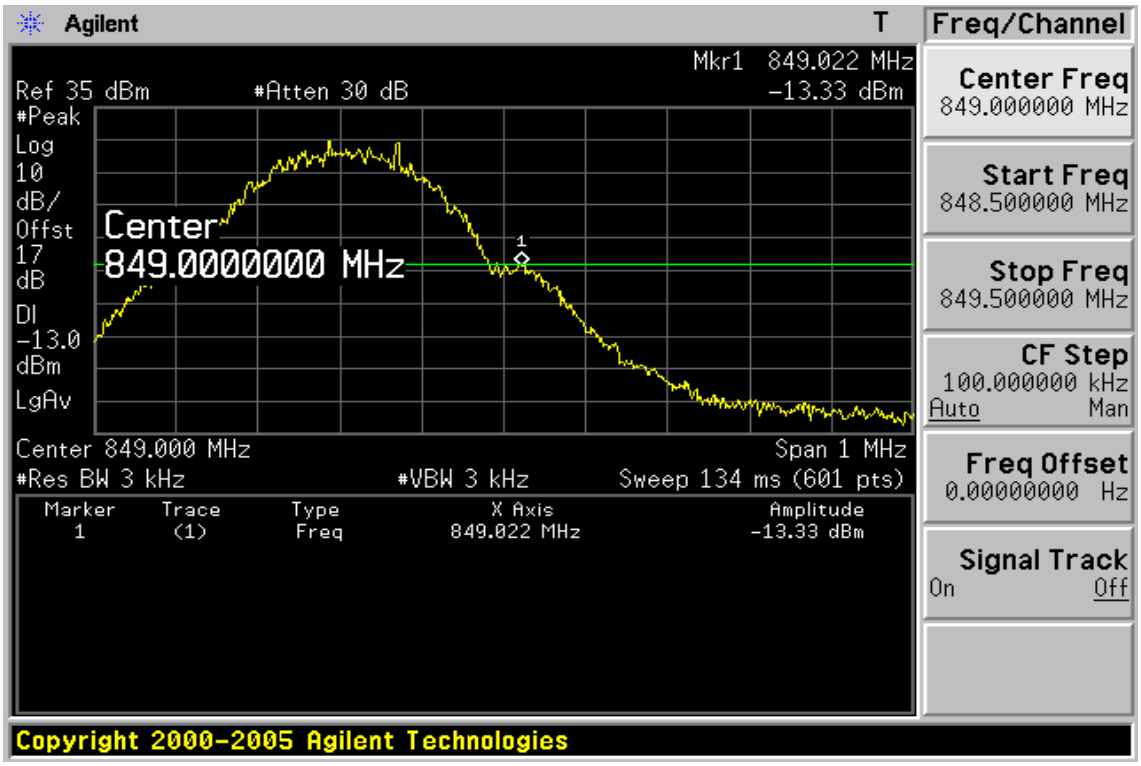
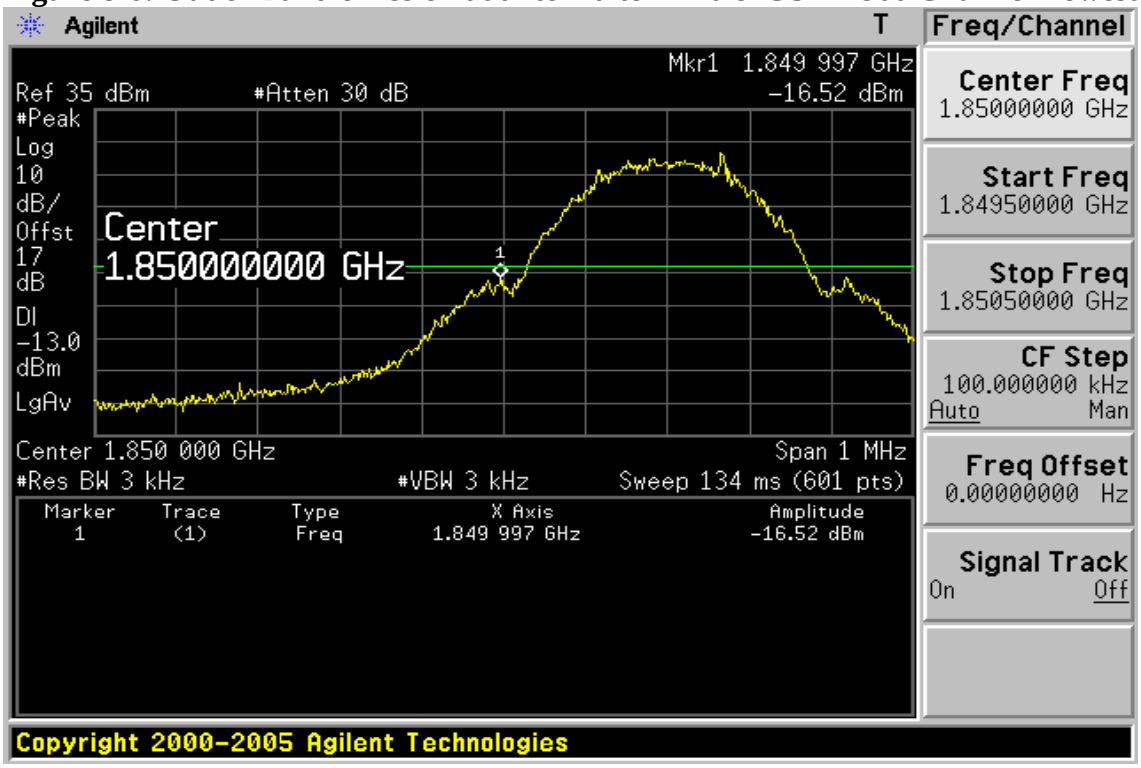


Figure 8-6: Out of Band emission at antenna terminals–GSM 1900 Channel Lowest



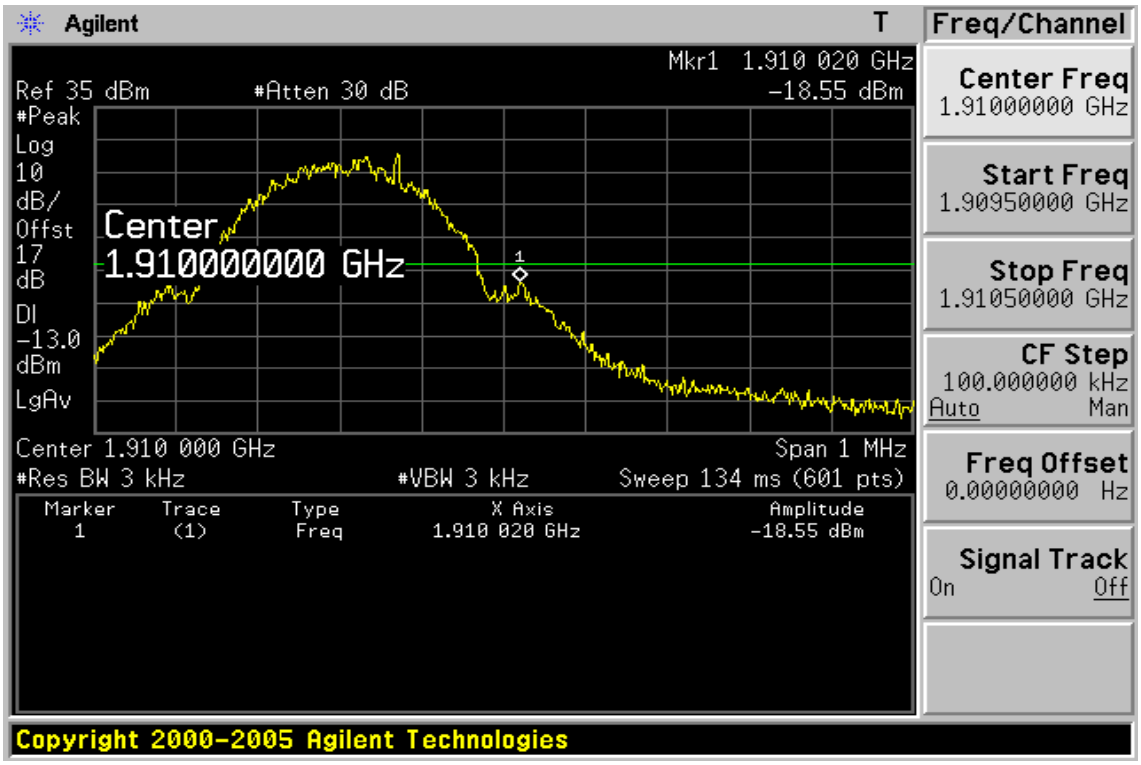
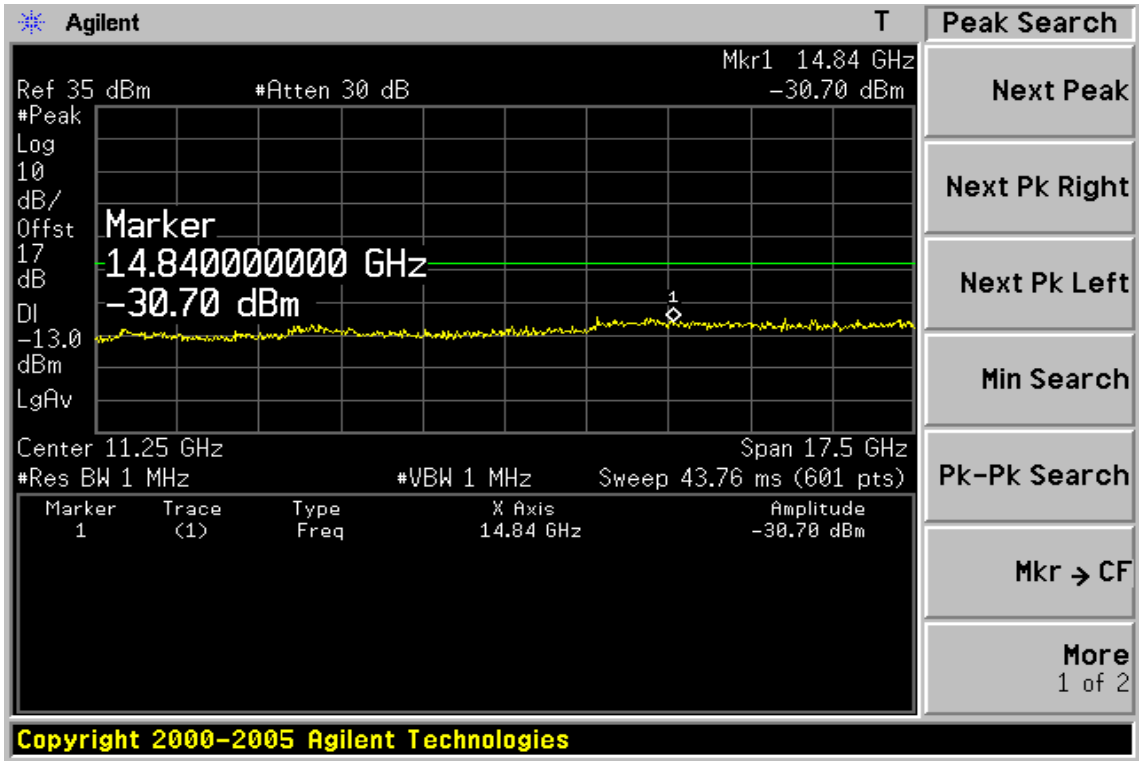


Figure 8-7: Out of Band emission at antenna terminals –GSM 1900 Channel Lowest



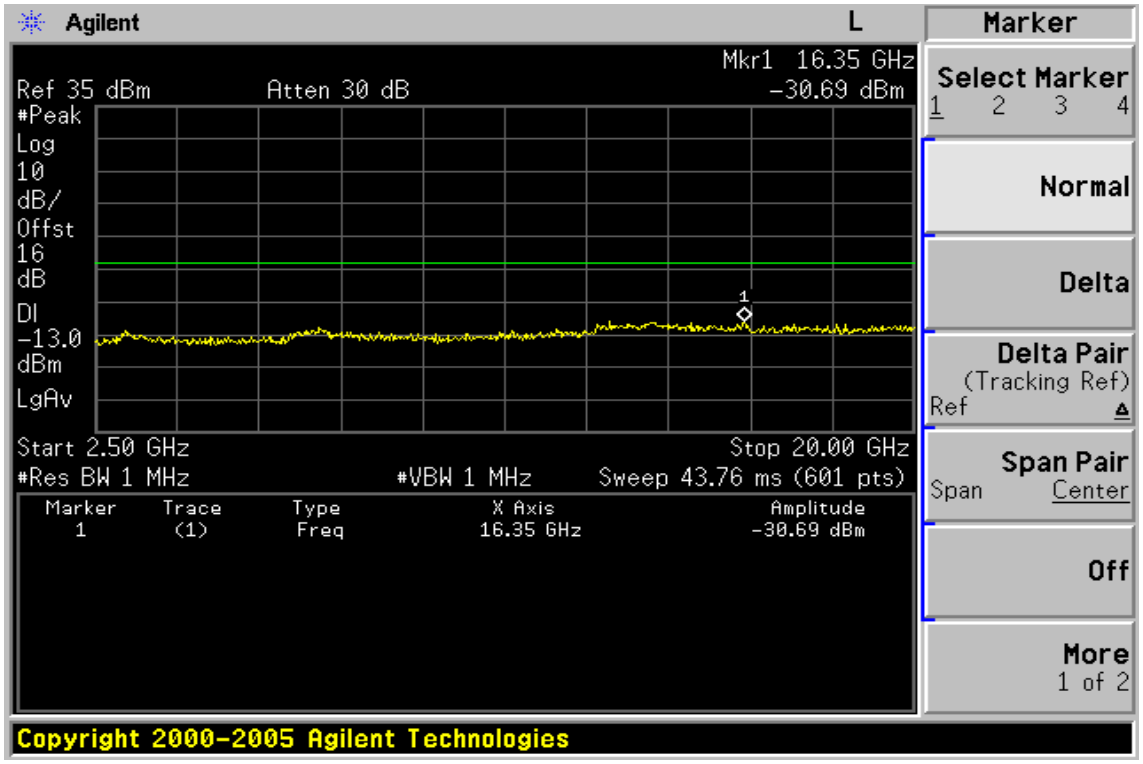
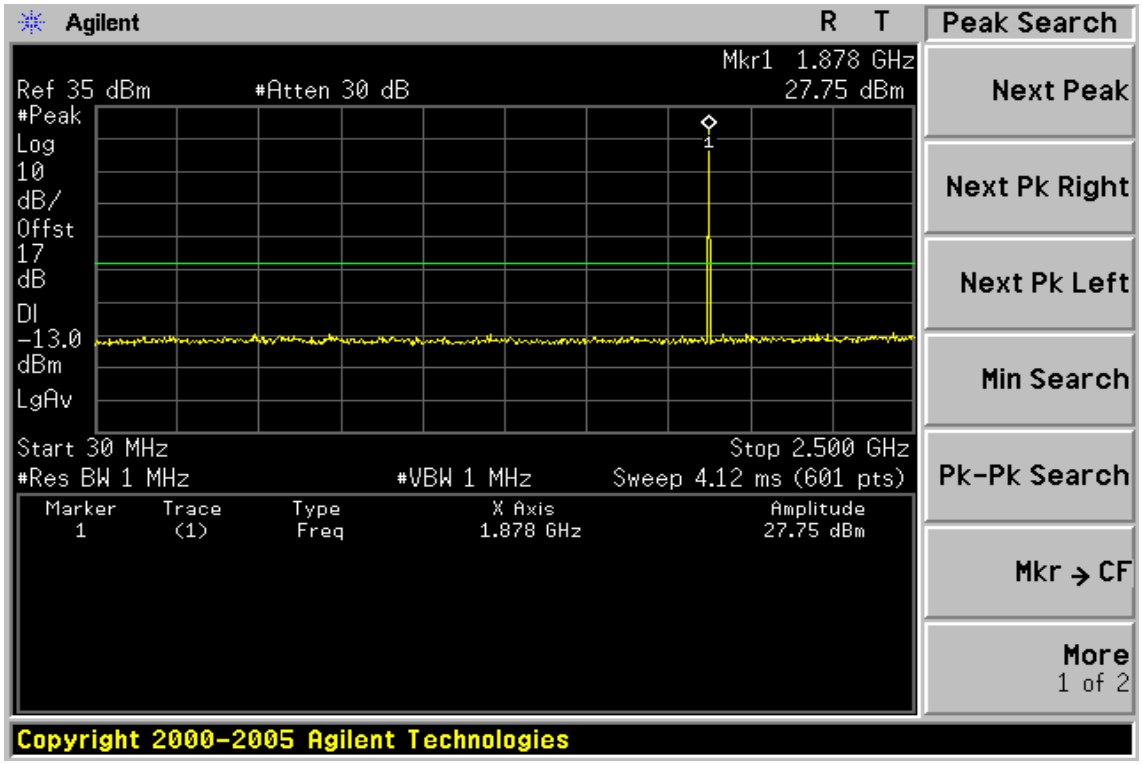


Figure 8-8: Out of Band emission at antenna terminals –GSM 1900 Channel Mid



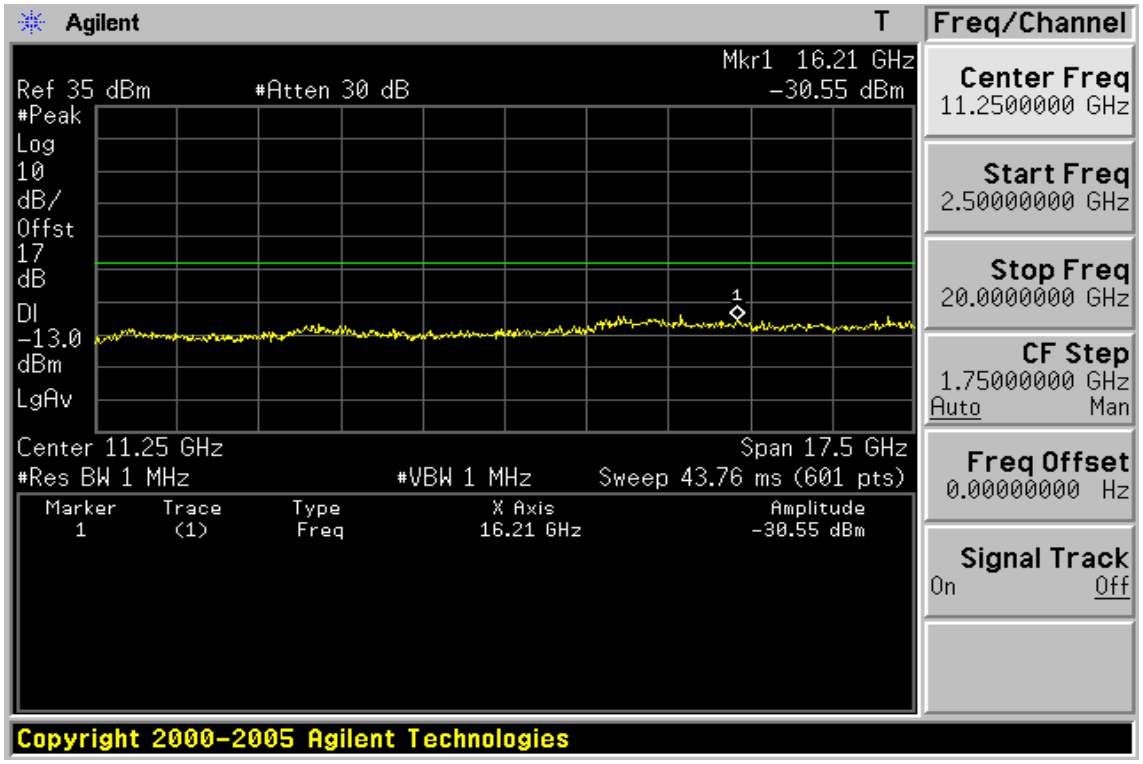
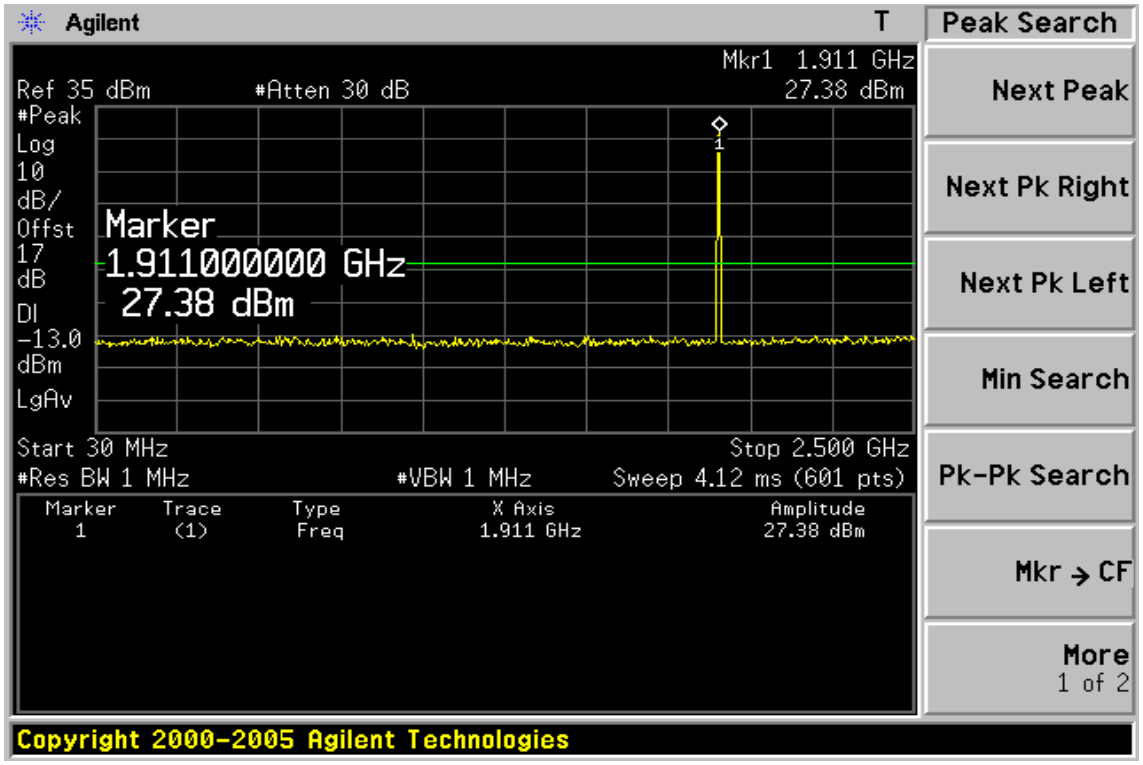


Figure 8-9: Out of Band emission at antenna terminals–GSM 1900 Channel Highest



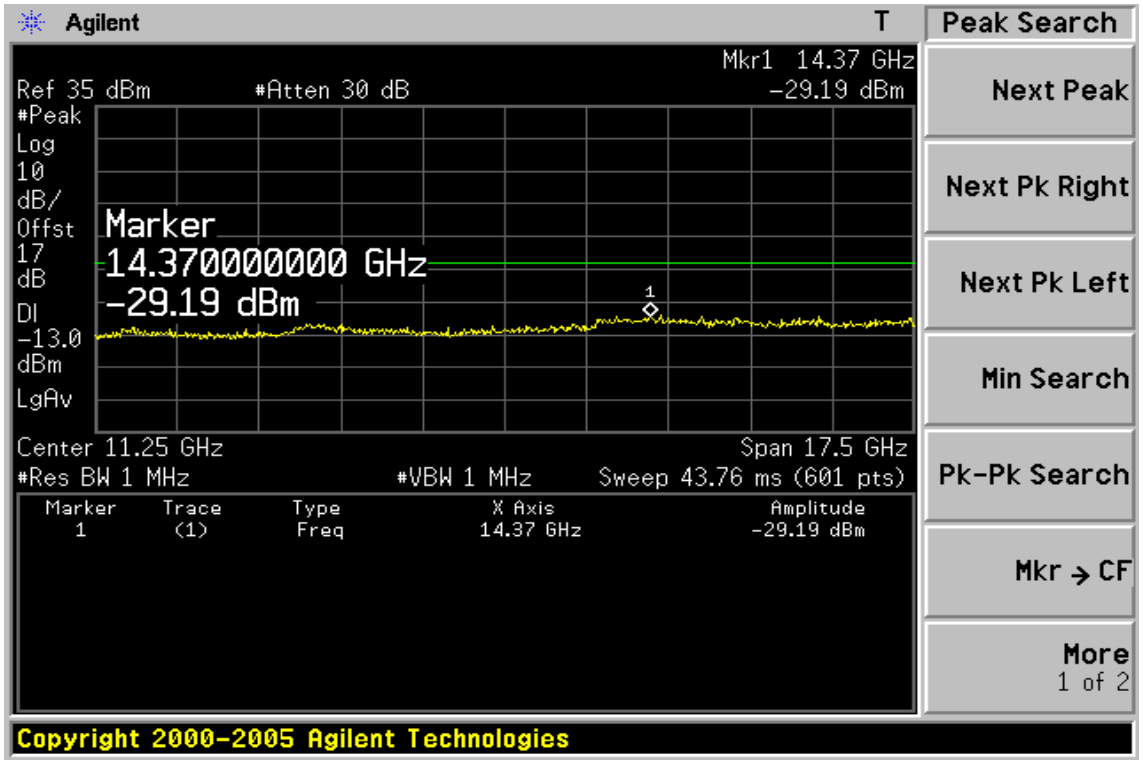


Figure 8-10: Bad edge emission at antenna terminals –GSM 1900 Channel Lowest

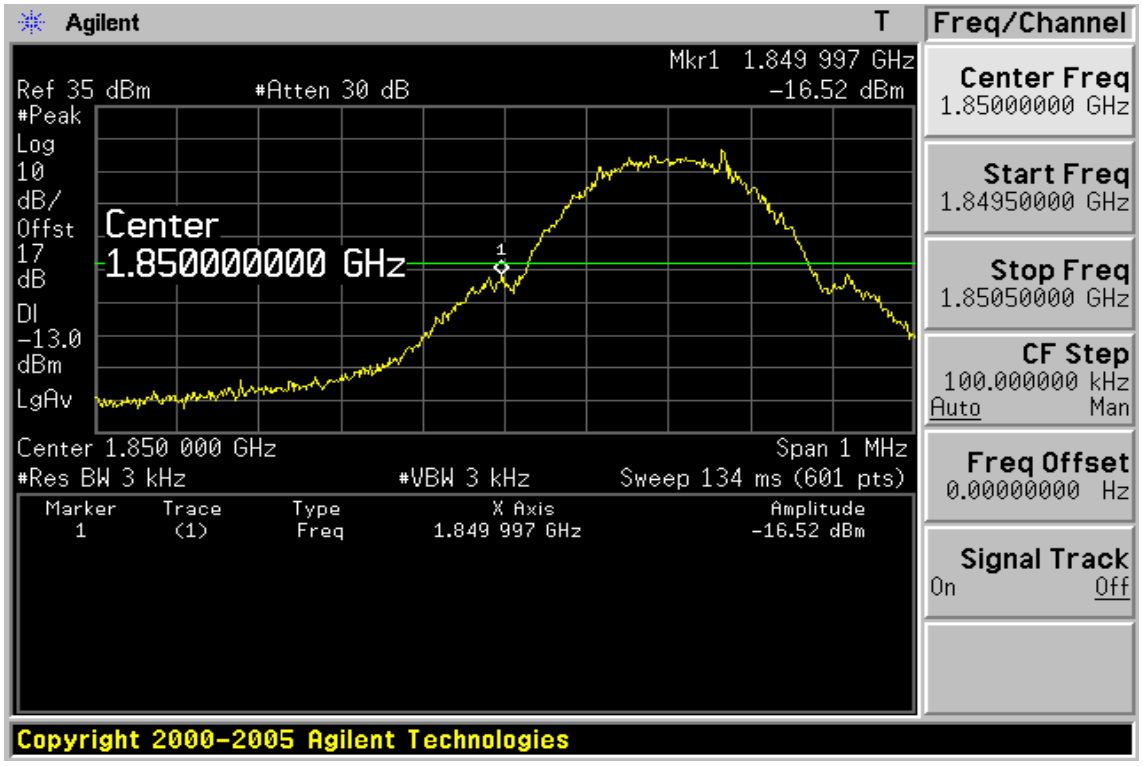
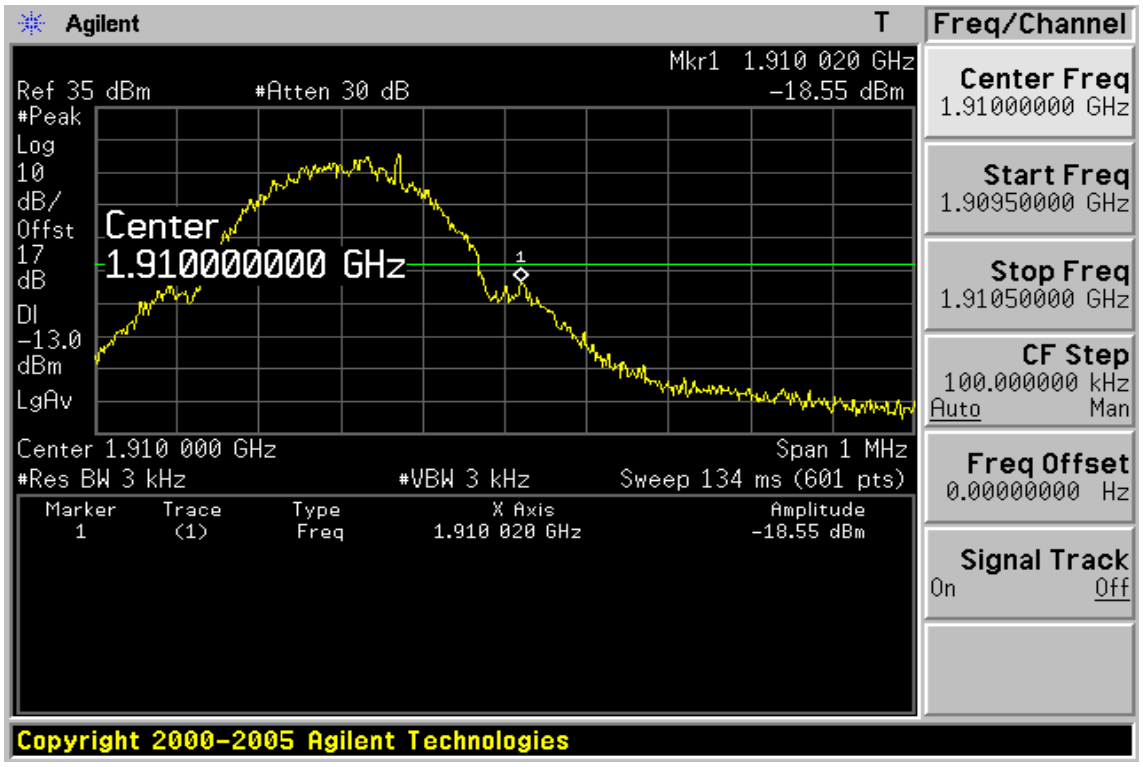


Figure 8-11: Band edge emission at antenna terminals –GSM 1900 Channel Highest



9. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

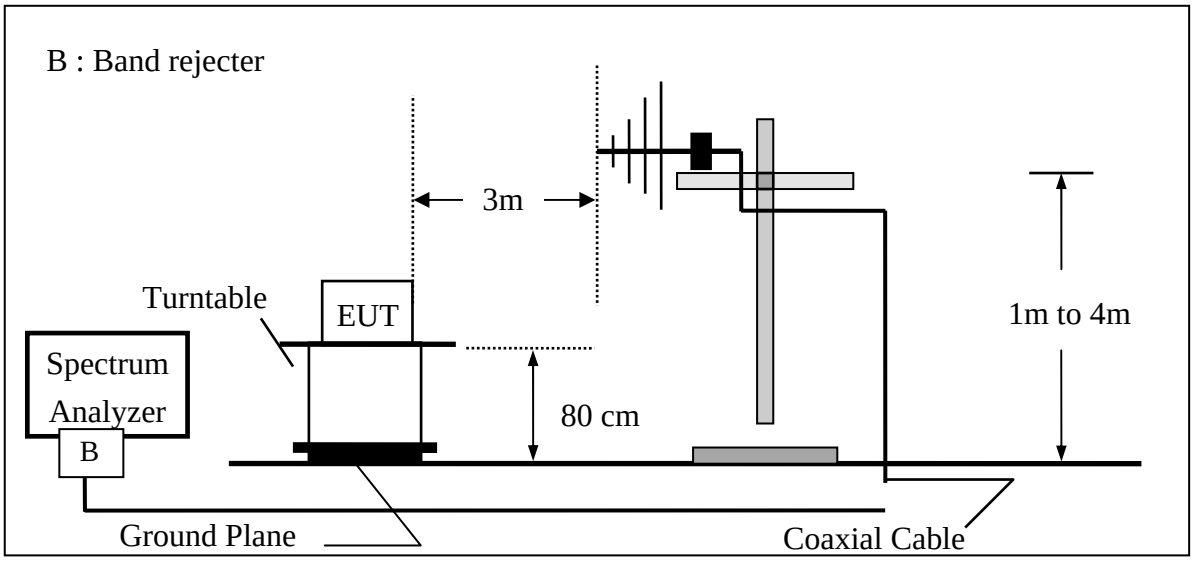
9.1. Standard Applicable:

According to FCC §2.1053,

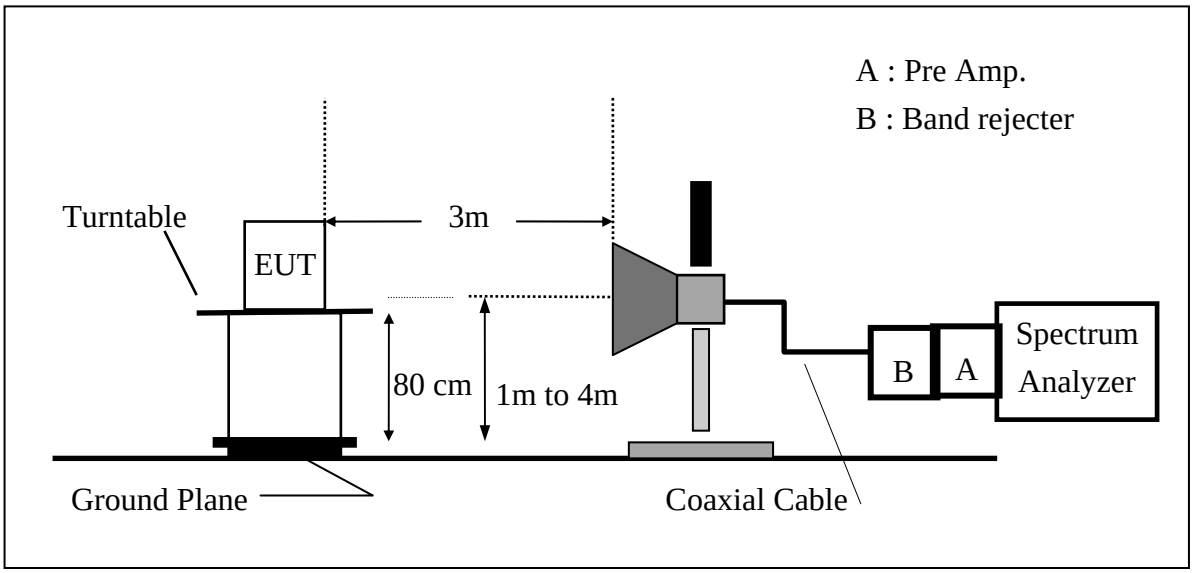
FCC §22.917(a),§24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than 43 + 10 log (mean output power in watts) dBc below the mean power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

9.2. EUT Setup (Block Diagram of Configuration):

Radiated Emission Test Set-Up, Frequency Below 1000MHz



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. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB)

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

9.4. Measurement Equipment Used:

Refer to section 2.4 in this report

9.5. Measurement Result:

Refer to attach tabular data sheets.

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:	Jazz
Temperature	: 25℃	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)
70.74	43.07	V	-68.69	-1.18	1.16	-71.04	-13.00	-58.04
90.14	45.40	V	-57.78	-7.75	1.27	-66.80	-13.00	-53.80
107.60	47.29	V	-53.93	-7.77	1.39	-63.09	-13.00	-50.09
187.14	35.04	V	-65.59	-7.83	1.68	-75.09	-13.00	-62.09
439.34	32.21	V	-62.05	-7.69	2.63	-72.37	-13.00	-59.37
697.36	34.21	V	-55.20	-7.86	3.28	-66.34	-13.00	-53.34
823.98	71.57	V	-14.82	-7.87	3.62	-26.32	-13.00	-13.32
1648.40	52.17	V	-52.23	9.29	5.23	-48.17	-13.00	-35.17
2472.60	48.30	V	-52.71	10.08	6.53	-49.16	-13.00	-36.16
3296.80	---	V		12.17	7.71		-13.00	
4121.00	---	V		12.61	8.86		-13.00	
4945.20	---	V		12.65	9.74		-13.00	
5769.40	---	V		13.55	10.54		-13.00	
6593.60	---	V		12.05	11.30		-13.00	
7417.80	---	V		11.49	12.10		-13.00	
8242.00	---	V		11.48	12.71		-13.00	

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

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

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:	Jazz
Temperature	: 25℃	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	42.50	H	-60.39	-2.79	0.89	-64.08	-13.00	-51.08
90.14	43.10	H	-60.63	-7.75	1.27	-69.65	-13.00	-56.65
192.96	36.82	H	-64.28	-7.83	1.69	-73.81	-13.00	-60.81
384.05	33.24	H	-63.44	-7.65	2.46	-73.55	-13.00	-60.55
474.26	32.75	H	-60.93	-7.71	2.73	-71.36	-13.00	-58.36
707.06	34.97	H	-53.98	-7.86	3.32	-65.16	-13.00	-52.16
824.00	78.76	H	-7.51	-7.87	3.62	-19.01	-13.00	-6.01
1648.40	54.97	H	-49.43	9.29	5.23	-45.37	-13.00	-32.37
2472.60	52.21	H	-48.70	10.08	6.53	-45.15	-13.00	-32.15
3296.80	---	H		12.17	7.71		-13.00	
4121.00	---	H		12.61	8.86		-13.00	
4945.20	---	H		12.65	9.74		-13.00	
5769.40	---	H		13.55	10.54		-13.00	
6593.60	---	H		12.05	11.30		-13.00	
7417.80	---	H		11.49	12.10		-13.00	
8242.00	---	H		11.48	12.71		-13.00	

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

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

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:	Jazz
Temperature	: 25℃	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)
54.25	42.20	V	-66.63	-0.54	1.10	-68.27	-13.00	-55.27
107.60	46.11	V	-55.11	-7.77	1.39	-64.27	-13.00	-51.27
151.25	33.57	V	-63.83	-7.80	1.59	-73.23	-13.00	-60.23
447.10	32.89	V	-61.13	-7.70	2.65	-71.48	-13.00	-58.48
578.05	32.83	V	-58.02	-7.78	3.00	-68.80	-13.00	-55.80
684.75	32.64	V	-56.64	-7.84	3.25	-67.74	-13.00	-54.74
1673.20	56.84	V	-47.72	9.36	5.27	-43.62	-13.00	-30.62
2509.80	62.44	V	-38.34	10.09	6.58	-34.84	-13.00	-21.84
3346.40	---	V		12.28	7.79		-13.00	
4183.00	---	V		12.62	8.93		-13.00	
5019.60	---	V		12.67	9.81		-13.00	
5856.20	---	V		13.68	10.62		-13.00	
6692.80	---	V		11.95	11.39		-13.00	
7529.40	---	V		11.45	12.20		-13.00	
8366.00	---	V		11.59	12.81		-13.00	

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

Remark:

1 The emission behaviors belongs to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

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:	Jazz
Temperature	: 25℃	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	41.32	H	-61.57	-2.79	0.89	-65.26	-13.00	-52.26
90.14	43.93	H	-59.80	-7.75	1.27	-68.82	-13.00	-55.82
190.05	37.09	H	-63.79	-7.83	1.69	-73.31	-13.00	-60.31
439.34	36.31	H	-58.12	-7.69	2.63	-68.44	-13.00	-55.44
600.36	35.10	H	-55.59	-7.79	3.03	-66.41	-13.00	-53.41
707.06	33.53	H	-55.42	-7.86	3.32	-66.60	-13.00	-53.60
1673.20	69.32	H	-35.24	9.36	5.27	-31.14	-13.00	-18.14
2509.80	57.84	H	-42.86	10.09	6.58	-39.36	-13.00	-26.36
3346.40	---	H		12.28	7.79		-13.00	
4183.00	---	H		12.62	8.93		-13.00	
5019.60	---	H		12.67	9.81		-13.00	
5856.20	---	H		13.68	10.62		-13.00	
6692.80	---	H		11.95	11.39		-13.00	
7529.40	---	H		11.45	12.20		-13.00	
8366.00	---	H		11.59	12.81		-13.00	

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

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

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:	Jazz
Temperature	: 25℃	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)
70.74	43.59	V	-68.17	-1.18	1.16	-70.52	-13.00	-57.52
107.60	47.01	V	-54.21	-7.77	1.39	-63.37	-13.00	-50.37
204.60	35.51	V	-66.10	-7.84	1.74	-75.68	-13.00	-62.68
419.94	32.82	V	-62.05	-7.68	2.57	-72.30	-13.00	-59.30
524.70	33.95	V	-59.37	-7.74	2.88	-69.99	-13.00	-56.99
697.36	33.71	V	-55.70	-7.86	3.28	-66.84	-13.00	-53.84
849.02	72.82	V	-13.30	-7.88	3.68	-24.86	-13.00	-11.86
1697.60	53.01	V	-51.53	9.44	5.31	-47.40	-13.00	-34.40
2546.40	53.06	V	-47.58	10.20	6.63	-44.02	-13.00	-31.02
3395.20	---	V		12.38	7.87		-13.00	
4244.00	---	V		12.63	9.00		-13.00	
5092.80	---	V		12.74	9.88		-13.00	
5941.60	---	V		13.81	10.70		-13.00	
6790.40	---	V		11.86	11.48		-13.00	
7639.20	---	V		11.40	12.27		-13.00	
8488.00	---	V		11.70	12.91		-13.00	

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

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

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:	Jazz
Temperature	: 25℃	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	41.62	H	-61.27	-2.79	0.89	-64.96	-13.00	-51.96
107.60	40.98	H	-61.23	-7.77	1.39	-70.39	-13.00	-57.39
194.90	37.32	H	-63.93	-7.84	1.70	-73.47	-13.00	-60.47
507.24	32.76	H	-60.44	-7.73	2.82	-70.99	-13.00	-57.99
600.36	34.82	H	-55.87	-7.79	3.03	-66.69	-13.00	-53.69
733.25	32.99	H	-60.86	-7.87	3.41	-72.13	-13.00	-59.13
849.02	79.36	H	-6.83	-7.88	3.68	-18.39	-13.00	-5.39
1697.60	63.92	H	-40.43	9.44	5.31	-36.30	-13.00	-23.30
2546.40	60.26	H	-40.34	10.20	6.63	-36.78	-13.00	-23.78
3395.20	---	H		12.38	7.87		-13.00	
4244.00	---	H		12.63	9.00		-13.00	
5092.80	---	H		12.74	9.88		-13.00	
5941.60	---	H		13.81	10.70		-13.00	
6790.40	---	H		11.86	11.48		-13.00	
7639.20	---	H		11.40	12.27		-13.00	
8488.00	---	H		11.70	12.91		-13.00	

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

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: GSM 1900 Mode

Operation Mode	: TX CH Low E1 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 1850.20MHz	Test By:	Jazz
Temperature	: 25℃	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	49.73	V	-53.45	-7.75	1.27	-62.47	-13.00	-49.47
163.86	41.63	V	-56.90	-7.81	1.62	-66.34	-13.00	-53.34
272.50	37.22	V	-61.93	-7.90	2.07	-71.91	-13.00	-58.91
432.55	32.95	V	-61.53	-7.69	2.61	-71.82	-13.00	-58.82
600.36	35.81	V	-53.76	-7.79	3.03	-64.58	-13.00	-51.58
716.76	33.28	V	-55.38	-7.86	3.35	-66.59	-13.00	-53.59
1850.00	77.92	V	-26.47	9.90	5.56	-22.13	-13.00	-9.13
3700.40	59.86	V	-38.07	12.61	8.31	-33.77	-13.00	-20.77
5550.60	---	V		13.23	10.33		-13.00	
7400.80	---	V		11.50	12.08		-13.00	
9251.00	---	V		11.92	13.50		-13.00	
11101.20	---	V		11.66	15.11		-13.00	
12951.40	---	V		13.63	16.60		-13.00	
14801.60	---	V		12.76	17.95		-13.00	
16651.80	---	V		15.92	19.14		-13.00	
18502.00	---	V		18.75	10.40		-13.00	

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

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: GSM 1900 Mode

Operation Mode : TX CH Low E1 Mode
Fundamental Frequency : 1850.20MHz
Temperature : 25℃
Humidity : 65%

Test Date: Mar. 07, 2011
Test By: Jazz
Pol: Hor

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)
37.76	46.46	H	-57.03	-3.70	0.90	-61.64	-13.00	-48.64
90.14	48.34	H	-55.39	-7.75	1.27	-64.41	-13.00	-51.41
151.25	42.72	H	-55.15	-7.80	1.59	-64.54	-13.00	-51.54
209.45	47.09	H	-54.10	-7.85	1.76	-63.71	-13.00	-50.71
458.74	31.98	H	-61.83	-7.70	2.68	-72.22	-13.00	-59.22
600.36	35.72	H	-54.97	-7.79	3.03	-65.79	-13.00	-52.79
1850.00	71.23	H	-32.95	9.90	5.56	-28.61	-13.00	-15.61
3700.40	59.83	H	-38.21	12.61	8.31	-33.91	-13.00	-20.91
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 Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: GSM 1900 Mode

Operation Mode	: TX CH Mid E1 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 1880MHz	Test By:	Jazz
Temperature	: 25℃	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	49.12	V	-54.06	-7.75	1.27	-63.08	-13.00	-50.08
151.25	40.19	V	-57.21	-7.80	1.59	-66.61	-13.00	-53.61
277.35	36.97	V	-62.02	-7.91	2.09	-72.02	-13.00	-59.02
445.16	31.80	V	-62.28	-7.70	2.65	-72.62	-13.00	-59.62
600.36	36.75	V	-52.82	-7.79	3.03	-63.64	-13.00	-50.64
815.70	32.27	V	-54.21	-7.87	3.60	-65.69	-13.00	-52.69
3760.00	62.29	V	-35.37	12.60	8.39	-31.15	-13.00	-18.15
5640.00	---	V		13.36	10.41		-13.00	
7520.00	---	V		11.45	12.19		-13.00	
9400.00	---	V		11.93	13.61		-13.00	
11280.00	---	V		11.92	15.27		-13.00	
13160.00	---	V		13.33	16.71		-13.00	
15040.00	---	V		13.76	18.15		-13.00	
16920.00	---	V		15.27	19.32		-13.00	
18800.00	---	V		18.68	16.58		-13.00	

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

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: GSM 1900 Mode

Operation Mode	: TX CH Mid E1 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 1880MHz	Test By:	Jazz
Temperature	: 25℃	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)
40.67	45.03	H	-58.06	-2.51	0.91	-61.48	-13.00	-48.48
97.90	47.47	H	-55.69	-7.76	1.34	-64.78	-13.00	-51.78
141.55	46.82	H	-51.83	-7.79	1.55	-61.18	-13.00	-48.18
209.45	47.20	H	-53.99	-7.85	1.76	-63.60	-13.00	-50.60
471.35	32.83	H	-60.87	-7.71	2.72	-71.30	-13.00	-58.30
600.36	35.53	H	-55.16	-7.79	3.03	-65.98	-13.00	-52.98
3760.00	59.08	H	-38.69	12.60	8.39	-34.48	-13.00	-21.48
5640.00	---	H		13.36	10.41		-13.00	
7520.00	---	H		11.45	12.19		-13.00	
9400.00	---	H		11.93	13.61		-13.00	
11280.00	---	H		11.92	15.27		-13.00	
13160.00	---	H		13.33	16.71		-13.00	
15040.00	---	H		13.76	18.15		-13.00	
16920.00	---	H		15.27	19.32		-13.00	
18800.00	---	H		18.68	16.58		-13.00	

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

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: GSM 1900 Mode

Operation Mode	: TX CH High E1 Mode	Test Date:	Mar. 07, 2011
Fundamental Frequency	: 1909.8 MHz	Test By:	Jazz
Temperature	: 25℃	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)
97.90	48.10	V	-54.09	-7.76	1.34	-63.19	-13.00	-50.19
115.36	45.45	V	-55.05	-7.77	1.43	-64.25	-13.00	-51.25
192.96	41.84	V	-59.31	-7.83	1.69	-68.84	-13.00	-55.84
270.56	37.07	V	-62.15	-7.90	2.06	-72.11	-13.00	-59.11
468.44	32.01	V	-62.00	-7.71	2.71	-72.42	-13.00	-59.42
600.36	34.59	V	-54.98	-7.79	3.03	-65.80	-13.00	-52.80
1910.02	77.52	V	-26.81	10.08	5.66	-22.39	-13.00	-9.39
3819.60	64.54	V	-32.85	12.60	8.47	-28.72	-13.00	-15.72
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 Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: GSM 1900 Mode

Operation Mode : TX CH High E1 Mode
Fundamental Frequency : 1909.8 MHz
Temperature : 25℃
Humidity : 65%

Test Date: Mar. 07, 2011
Test By: Jazz
Pol: Hor

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)
37.76	46.61	H	-56.88	-3.70	0.90	-61.49	-13.00	-48.49
90.14	48.70	H	-55.03	-7.75	1.27	-64.05	-13.00	-51.05
151.25	42.20	H	-55.67	-7.80	1.59	-65.06	-13.00	-52.06
209.45	47.04	H	-54.15	-7.85	1.76	-63.76	-13.00	-50.76
449.04	33.05	H	-60.89	-7.70	2.66	-71.25	-13.00	-58.25
600.36	36.11	H	-54.58	-7.79	3.03	-65.40	-13.00	-52.40
1910.02	70.09	H	-34.02	10.08	5.66	-29.60	-13.00	-16.60
3819.60	57.15	H	-40.36	12.60	8.47	-36.22	-13.00	-23.22
5729.40	---	H		13.49	10.50		-13.00	
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 Setting(dBm) + Antenna Gain (dBd/dBi) – Cable loss (dB)

10. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

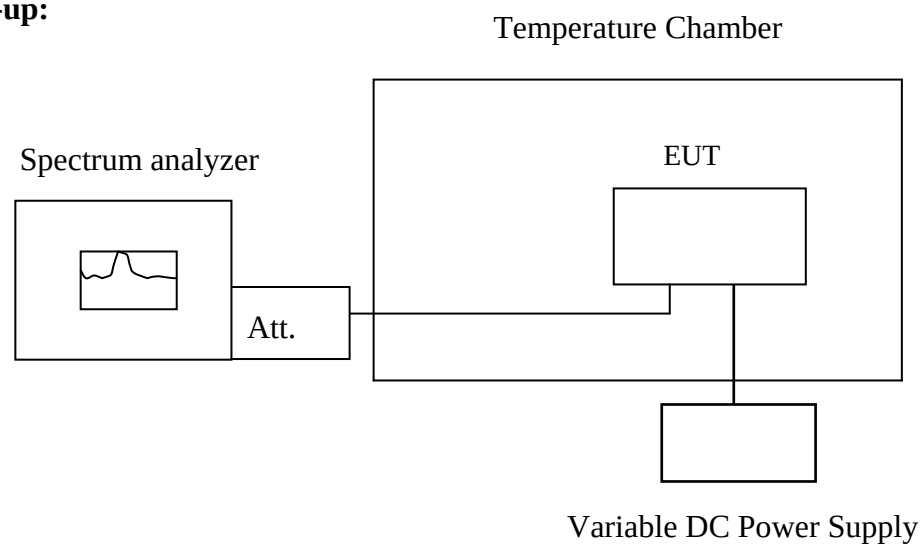
10.1. Standard Applicable:

According to FCC §2.1055(a) (1)

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

+/-2.5ppm for 1900MHz band

10.2. Test Set-up:



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^{o}C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –30^{o}C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10^{o}C increased per stage until the highest temperature of +50^{o}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℃				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (℃)	(MHz)		
3.7	-30	836.600003	-8.00	2091
3.7	-20	836.600002	-7.00	2091
3.7	-10	836.599997	-2.00	2091
3.7	0	836.599992	3.00	2091
3.7	10	836.599999	-4.00	2091
3.7	20	836.599995	0.00	2091
3.7	30	836.599998	-3.00	2091
3.7	40	836.599994	1.00	2091
3.7	50	836.599995	0.00	2091

Reference Frequency: PCS Mid Channel 1880 MHz @ 25℃				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (℃)	(MHz)		
3.7	-30	1880.000020	-18.00	4700
3.7	-20	1880.000018	-16.00	4700
3.7	-10	1880.000010	-8.00	4700
3.7	0	1880.000008	-6.00	4700
3.7	10	1880.000005	-3.00	4700
3.7	20	1880.000002	0.00	4700
3.7	30	1880.000008	-6.00	4700
3.7	40	1880.000004	-2.00	4700
3.7	50	1880.000001	1.00	4700

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

11.2. Test Set-up:

Refer to section 10.2 in this report

11.3. Measurement Procedure:

Set chamber temperature to 25℃. 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℃				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (℃)	(MHz)		
4.2	25.00	836.599993	2.00	2091.00
3.7	25.00	836.599995	0.00	2091.00
3.4	25.00	836.599990	5.00	2091.00
3.3 (Endpoint)	25.00	836.599988	7.00	2091.00

Reference Frequency: PCS Mid Channel 1880 MHz @ 25℃				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (℃)	(MHz)		
4.2	25	1880.000001	3.00	4700
3.7	25	1880.000004	0.00	4700
3.4	25	1880.000011	-7.00	4700
3.3 (Endpoint)	25	1879.999998	6.00	4700

Note: The battery is rated 3.7V dc.