ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

Product Name:	**TQ5-E01**
FCC ID:	**SP2-TQ5-E01**
Report No.:	**EH/2009/A0016**
Issue Date:	**Nov. 09, 2009**
FCC Rule Part:	**2 , 22H, 24E**
Prepared for:	**Toshiba Information Systems (UK) Ltd, Mobile Communications Division** **Delta House, The crescent Southwood Business Park, Farnborough, GU14 0NL, UK**
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:	Toshiba Information Systems (UK) Ltd, Mobile Communications Division Delta House, The crescent Southwood Business Park, Farnborough, GU14 0NL, UK
Product Name:	TQ5-E01
FCC ID:	SP2-TQ5-E01
File Number:	EH/2009/A0019
Date of test:	Oct. 14, 2009 ~ Oct. 27, 2009
Date of EUT Received:	Oct. 14, 2009

We hereby certify that:

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

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

Test By:	Sky Wang	***Date:***	Nov. 09, 2009
	Sky Wang / Asst. Supervisor		
Prepared By:	Eva Kao	***Date:***	Nov. 09, 2009
	Eva Kao / Asst. Supervisor		
Approved By:	Vincent Su	***Date:***	Nov. 09, 2009
	Vincent Su / Manager		

Version

Version No.	Date	Description
00	Nov. 09, 2009	Initial creation of document

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1 GENERAL INFORMATION

General:

Product Name	TQ5-E01	
Data Cable (USB)	Two provides, Model: HPC1508-010010, HPC1519-010010, Supplier: Hoshiden	
Simple Hands-free (SHF)	Model: HDH0669-010221(EARPHONE), KRJ0003-010020 (MIC), Supplier: Hoshiden	
Power Supply	3.7 Vdc re-chargeable battery or 5Vdc by AC/DC power adapter	
	Battery:	Model No.: ES032ECJ (TS-BTR008), Supplier: Sanyo GS
	Adapter:	Model: TS-ACC001-EU, TS-ACC001-UK Supplier: BYD Company Limited

GSM and WCDMA:

Cellular Phone Standards Frequency Range and Power:	Operating Frequency		Rated Power
	GSM/GPRS/EDGE 850, Class 12	824.2 MHz– 848.8 MHz	33 dBm
	GSM/GPRS/EDGE 900, Class 12	880.2MHz – 914.8MHz	33 dBm
	GSM/GPRS/EDGE 1800, Class 12	1710.2MHz – 1784.8MHz	30 dBm
	GSM/GPRS/EDGE 1900, Class 12	1850.2MHz – 1909.8MHz	30 dBm
	WCDMA/HSUPA/HSDPA Band I	1922.4MHz –1977.6MHz	24 dBm
	WCDMA/HSUPA/HSDPA Band VIII	882.4MHz –912.6MHz	24 dBm
Hardware Version:	CS1		
Software Version:	N/A		
IMEI:	004401127000901		

WLAN: 802.11 b/g:

Frequency Range:	2412 – 2462 MHz
Channel number:	11 channels
Transmit Power:	☒802.11 b: 17.33dBm (Peak) ☒802.11 g: 15.87dBm (Peak)
Modulation Technology:	☒DSSS, ☒OFDM
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM. 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps
Antenna Designation:	PIFA Antenna, 0.7dBi.

Bluetooth:

Bluetooth Version:	V2.0 + EDR (GFSK + π/4DQPSK + 8DPSK)
Channel number:	79 channels
Modulation type:	Frequency Hopping Spread Spectrum
Transmit Power:	-0.12 dBm (Peak)
Frequency Range:	2.402GHz – 2.480GHz
Dwell Time:	<= 0.4s
Operating Mode:	Point-to-Point
Antenna Designation:	PIFA Antenna, 0.7dBi.

GPS:

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

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

1.1 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: SP2-TQ5-E01** filing to comply with Section Part 22 subpart H, Part 24 subpart E and Part27 of the FCC CFR 47 Rules.

1.2 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on chapter 13 of ANSI C63.4 (2003) and FCC 47 CFR 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

1.3 Test Facility

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

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

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

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

2.2 EUT Exercise

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

2.3 Test Procedure

2.3.1 Conducted Measurement at Antenna Port:

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

2.3.2 Radiated Emissions (ERP/EIRP):

According to measurement procured TIA/EIA 603C and TIA/EIA IS-98 for Mobile stations. The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements.

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

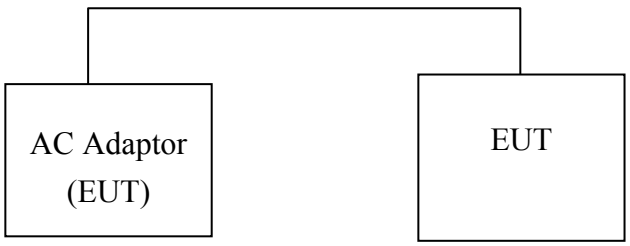
2.4 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2008	01/22/2010
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/13/2010
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2009	01/04/2010
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2009	01/04/2010
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2008	04/13/2010
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/05/2008	02/04/2010
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2009	07/04/2010
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010
DC Power Supply	HP	6038A	2929A-07548	06/27/2009	06/26/2011
DC Power Supply	Chroma	41901	777188	04/17/2008	04/16/2010

ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2009	02/11/2010
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2008	11/14/2009
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/10/2008	07/09/2010
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/10/2008	07/09/2010
Hor.n antenna	SCHWAZBECK	BBHA 9120D	309	05/09/2008	05/10/2010
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010
Signal Generator	R&S	SMR40	100210	01/22/2008	01/21/2010
Signal Generator	Agilent	E4438C	MY45093613	05/22/2009	05/21/2010
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2008	11/29/2009
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2009	01/04/2010
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2009	07/04/2010
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/13/2010
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2009	01/04/2010
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2009	01/04/2010
3m Site	SGS	966 chamber	N/A	11/08/2008	11/09/2009

2.5 Configuration of Tested System

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



Remote Side

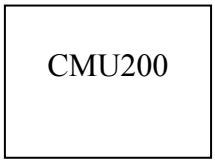


Table 2-1 Equipment Used in Tested System

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

3 SUMMARY OF TEST RESULTS

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

4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

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

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

Max ERP/EIRP measurement result:

	dBm	dB	W
GSM 850 Band	30.47	ERP	1.114
GSM 1900 Band	27.49	EIRP	0.561
EDGE 850 Band	28.66	ERP	0.735
EDGE 1900 Band	25.95	EIRP	0.394

5 RF POWER OUTPUT MEASUREMENT

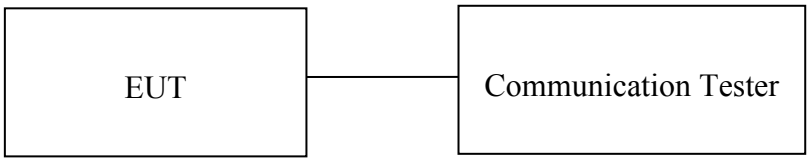
5.1 Standard Applicable

According to FCC §2.1046.

FCC 22.913(a) (2) Mobile station is limited to 7W.

FCC 24.232(d) Peak Power Measurement, FCC 24.232(c)Maximum Power Reduction.

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 Communication Tester by a low lost RF cable. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the reading from tester.

5.4 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Communication Test	R&S	CMU200	102189	05/13/208	05/12/2010
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	02/13/2009	02/12/2010

5.5 Measurement Result

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
GSM 850	824.2	128	32.60	32.40
	836.6	190	32.60	32.50
	848.8	251	32.60	32.50

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
GSM 1900	1850.2	512	29.30	29.30
	1880.0	661	29.10	29.10
	1909.8	810	29.20	29.20

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)	Peak Power (1DN 3UP) (dBm)	Avg. Power (1DN 3UP) (dBm)	Peak Power (1DN 4UP) (dBm)	Avg. Power (1DN 4UP) (dBm)
GPRS 850 (Class 12)	824.2	128	32.60	32.40	30.40	30.30	30.40	30.30	30.40	30.30
	836.6	190	32.60	32.50	30.40	30.30	30.40	30.30	30.40	30.30
	848.8	251	32.60	32.40	30.40	30.30	30.40	30.30	30.40	30.30

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)	Peak Power (1DN 3UP) (dBm)	Avg. Power (1DN 3UP) (dBm)	Peak Power (1DN 4UP) (dBm)	Avg. Power (1DN 4UP) (dBm)
GPRS 1900 (Class 12)	1850.2	512	29.00	28.80	27.30	27.20	27.30	27.20	27.30	27.20
	1880.0	661	29.70	29.50	28.10	27.90	28.00	27.90	28.00	27.90
	1909.8	810	29.50	29.40	28.00	27.90	28.00	27.90	28.00	27.90

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)	Peak Power (1DN 3UP) (dBm)	Avg. Power (1DN 3UP) (dBm)	Peak Power (1DN 4UP) (dBm)	Avg. Power (1DN 4UP) (dBm)
EDGE 850 (Class 12)	824.2	128	30.80	27.60	28.30	25.10	28.30	25.10	28.30	25.10
	836.6	190	30.80	27.60	28.30	25.20	28.30	25.10	28.30	25.10
	848.8	251	30.90	27.70	28.30	25.10	28.30	25.10	28.30	25.10

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)	Peak Power (1DN 3UP) (dBm)	Avg. Power (1DN 3UP) (dBm)	Peak Power (1DN 4UP) (dBm)	Avg. Power (1DN 4UP) (dBm)
EDGE 1900 (Class 12)	1850.2	512	29.60	26.40	26.90	23.80	26.90	23.80	26.90	23.70
	1880.0	661	29.40	26.20	26.80	23.60	26.70	23.50	26.70	23.50
	1909.8	810	29.40	26.20	26.80	23.60	26.80	23.60	26.80	23.60

offset : 1dB

6 ERP, EIRP MEASUREMENT

6.1 Standard Applicable

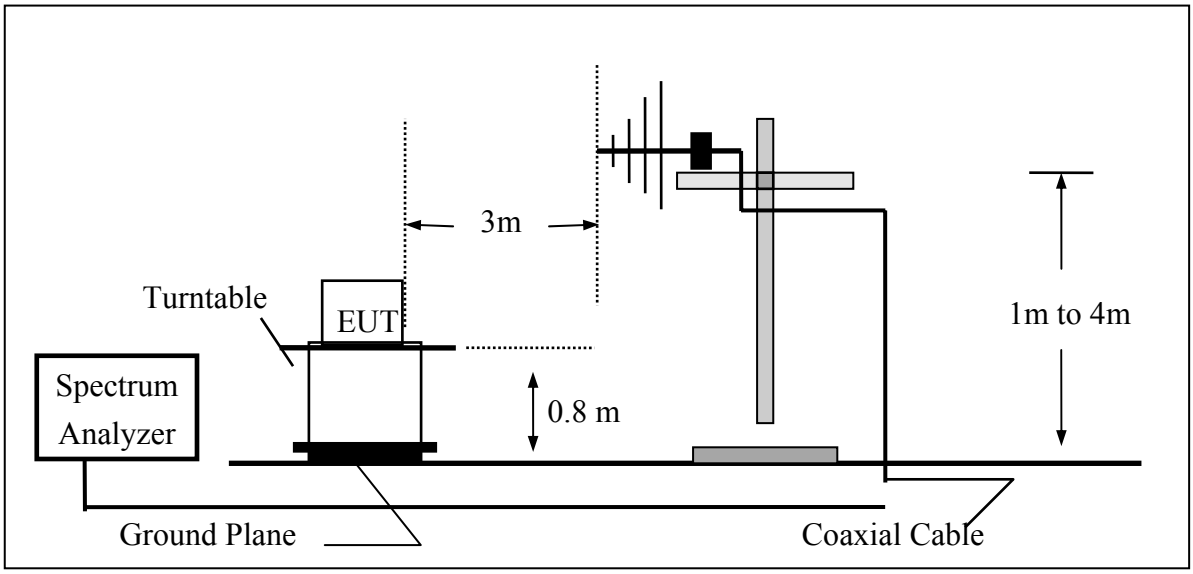
According to FCC §2.1046

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

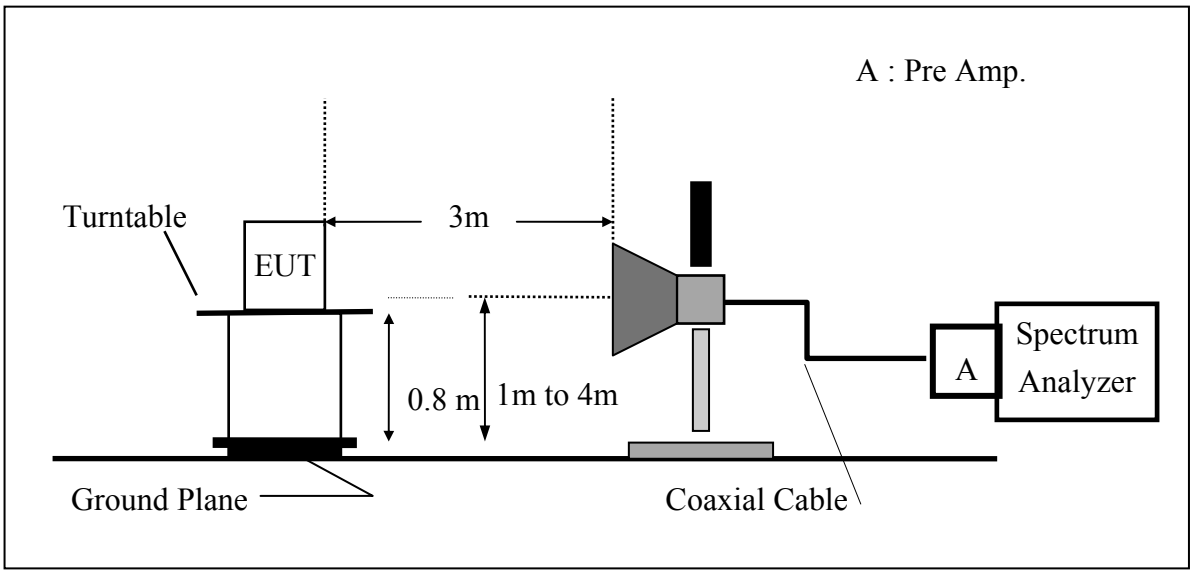
FCC 24.232(b) Mobile station are limited to 2W EIRP.

6.2 Test SET-UP (Block Diagram of Configuration)

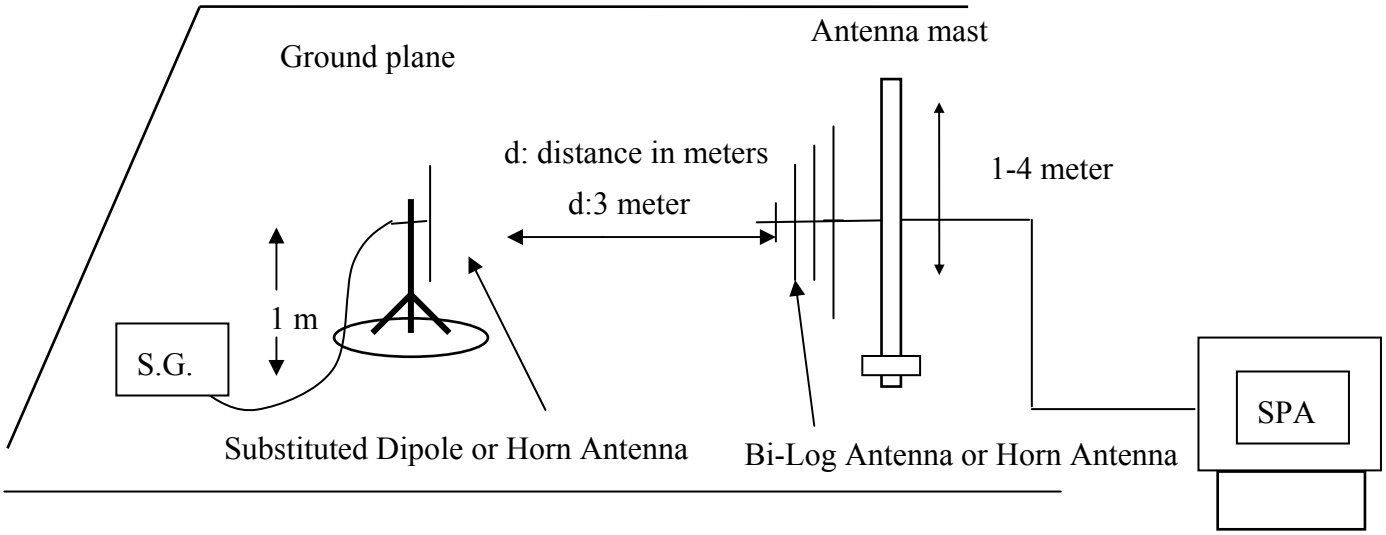
(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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

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

ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1850 –1910MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

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 (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
GSM 850	824.20	128	H	V	118.09	31.70	-7.87	3.62	20.20	38.45
				H	127.68	41.41	-7.87	3.62	29.91	38.45
			E1	V	128.36	41.97	-7.87	3.62	**30.47**	38.45
				H	117.25	30.98	-7.87	3.62	19.48	38.45
			E2	V	118.51	32.12	-7.87	3.62	20.62	38.45
				H	126.39	40.12	-7.87	3.62	28.62	38.45
	836.60	190	H	V	116.91	30.66	-7.88	3.65	19.13	38.45
				H	126.95	40.72	-7.88	3.65	29.19	38.45
			E1	V	127.49	41.24	-7.88	3.65	29.71	38.45
				H	115.81	29.58	-7.88	3.65	18.05	38.45
			E2	V	118.33	32.08	-7.88	3.65	20.55	38.45
				H	125.30	39.07	-7.88	3.65	27.54	38.45
	848.80	251	H	V	115.54	29.42	-7.88	3.68	17.86	38.45
				H	125.57	39.38	-7.88	3.68	27.82	38.45
			E1	V	126.90	40.78	-7.88	3.68	29.22	38.45
				H	114.33	28.14	-7.88	3.68	16.58	38.45
			E2	V	117.95	31.83	-7.88	3.68	20.27	38.45
				H	124.07	37.88	-7.88	3.68	26.32	38.45

Remark：

(1) The RBW,VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz,

Measurement Result:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
GSM 1900	1850.20	512	H	V	115.92	11.53	9.90	5.56	15.87	33.00
				H	125.79	21.61	9.90	5.56	25.95	33.00
			E1	V	122.59	18.20	9.90	5.56	22.54	33.00
				H	120.79	16.61	9.90	5.56	20.95	33.00
			E2	V	125.51	21.12	9.90	5.56	25.46	33.00
				H	119.30	15.12	9.90	5.84	19.18	33.00
	1880.00	661	H	V	114.58	10.22	9.99	5.61	14.60	33.00
				H	125.71	21.57	9.99	5.61	25.94	33.00
			E1	V	123.84	19.48	9.99	5.61	23.86	33.00
				H	122.37	18.23	9.99	5.61	22.60	33.00
			E2	V	126.75	22.39	9.99	5.61	26.77	33.00
				H	118.24	14.10	9.99	5.61	18.47	33.00
	1909.80	810	H	V	115.71	11.38	10.08	5.66	15.80	33.00
				H	127.00	22.89	10.08	5.66	27.31	33.00
			E1	V	124.59	20.26	10.08	5.66	24.68	33.00
				H	124.30	20.19	10.08	5.66	24.61	33.00
			E2	V	127.40	23.07	10.08	5.66	**27.49**	33.00
				H	116.51	12.40	10.08	5.66	16.82	33.00

Remark：

(1) The RBW,VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz,

Measurement Result:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
EDGE 850	824.20	128	H	V	116.13	29.74	-7.87	3.62	18.24	38.45
				H	126.43	40.16	-7.87	3.62	**28.66**	38.45
			E1	V	126.00	39.61	-7.87	3.62	28.11	38.45
				H	119.63	33.36	-7.87	3.62	21.86	38.45
			E2	V	119.93	33.54	-7.87	3.62	22.04	38.45
				H	123.31	37.04	-7.87	3.62	25.54	38.45
	836.60	190	H	V	115.02	28.77	-7.88	3.65	17.24	38.45
				H	125.60	39.37	-7.88	3.65	27.84	38.45
			E1	V	125.23	38.98	-7.88	3.65	27.45	38.45
				H	119.58	33.35	-7.88	3.65	21.82	38.45
			E2	V	119.72	33.47	-7.88	3.65	21.94	38.45
				H	121.58	35.35	-7.88	3.65	23.82	38.45
	848.80	251	H	V	113.22	27.10	-7.88	3.68	15.54	38.45
				H	124.51	38.32	-7.88	3.68	26.76	38.45
			E1	V	124.55	38.43	-7.88	3.68	26.87	38.45
				H	119.25	33.06	-7.88	3.68	21.50	38.45
			E2	V	118.43	32.31	-7.88	3.68	20.75	38.45
				H	119.89	33.70	-7.88	3.68	22.14	38.45

Remark：

(1) The RBW,VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz,

Measurement Result:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
EDGE 1900	1850.20	512	H	V	110.67	6.28	9.90	5.56	10.62	33.00
				H	125.23	21.05	9.90	5.56	25.39	33.00
			E1	V	120.97	16.58	9.90	5.56	20.92	33.00
				H	120.28	16.10	9.90	5.56	20.44	33.00
			E2	V	123.63	19.24	9.90	5.56	23.58	33.00
				H	114.76	10.58	9.90	5.84	14.64	33.00
	1880.00	661	H	V	111.97	7.61	9.99	5.61	11.99	33.00
				H	125.72	21.58	9.99	5.61	**25.95**	33.00
			E1	V	122.32	17.96	9.99	5.61	22.34	33.00
				H	122.42	18.28	9.99	5.61	22.65	33.00
			E2	V	124.77	20.41	9.99	5.61	24.79	33.00
				H	115.68	11.54	9.99	5.61	15.91	33.00
	1909.80	810	H	V	110.82	6.49	10.08	5.66	10.91	33.00
				H	124.01	19.90	10.08	5.66	24.32	33.00
			E1	V	123.40	19.07	10.08	5.66	23.49	33.00
				H	124.15	20.04	10.08	5.66	24.46	33.00
			E2	V	125.58	21.25	10.08	5.66	25.67	33.00
				H	117.37	13.26	10.08	5.66	17.68	33.00

Remark：

(1) The RBW,VBW of SPA for frequency

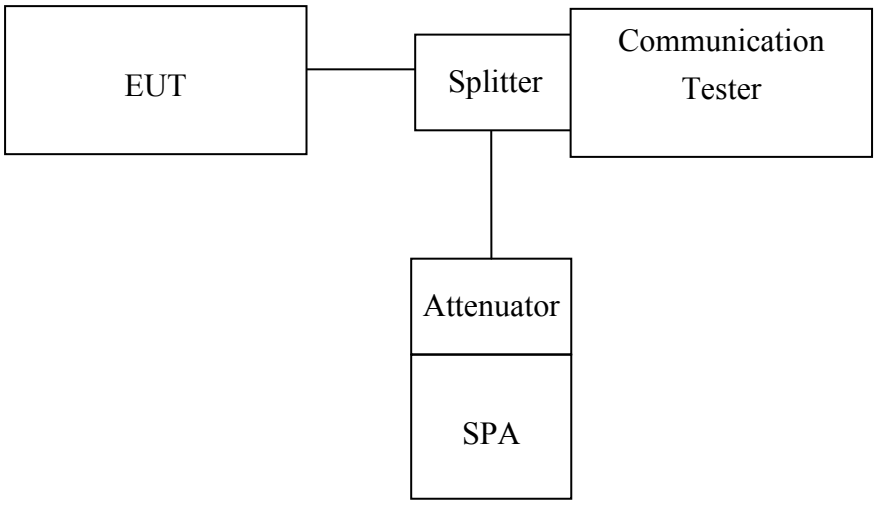
RBW=300 KHz, VBW=1MHz,

7 99% OCCUPIED BANDWIDTH MEASUREMENT

7.1 Standard Applicable

According to FCC§2.1049(h).

7.2 Test Set-up:



Note: *Measurement setup for testing on Antenna connector*

7.3 Measurement Procedure

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW (10/30KHz) 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	0.2449
	836.60	190	0.2436
	848.80	251	0.2464

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EDGE 850	824.20	128	0.2466
	836.60	190	0.2473
	848.80	251	0.2450

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
PCS 1900	1850.20	512	0.2469
	1880.00	661	0.2424
	1909.80	810	0.2471

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EDGE 1900	1850.20	512	0.2464
	1880.00	661	0.2438
	1909.80	810	0.2495

Figure 7-1: GSM 850 Channel Low

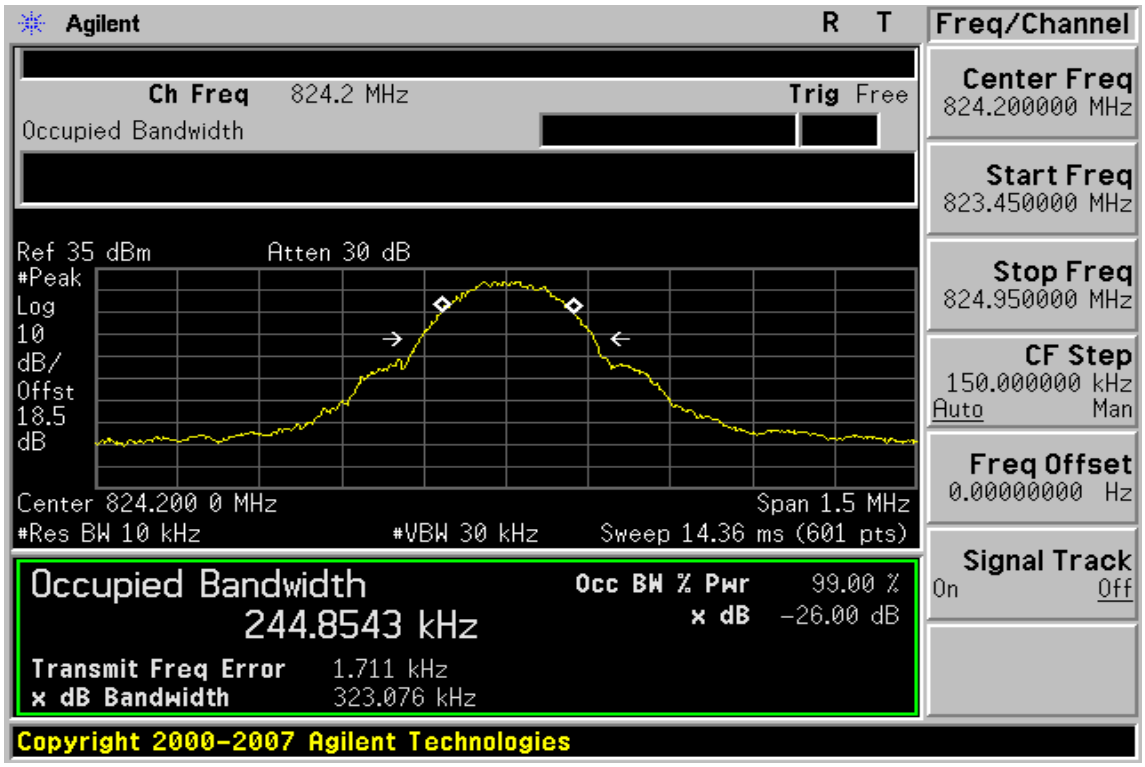


Figure 7-2 GSM 850 Channel Mid

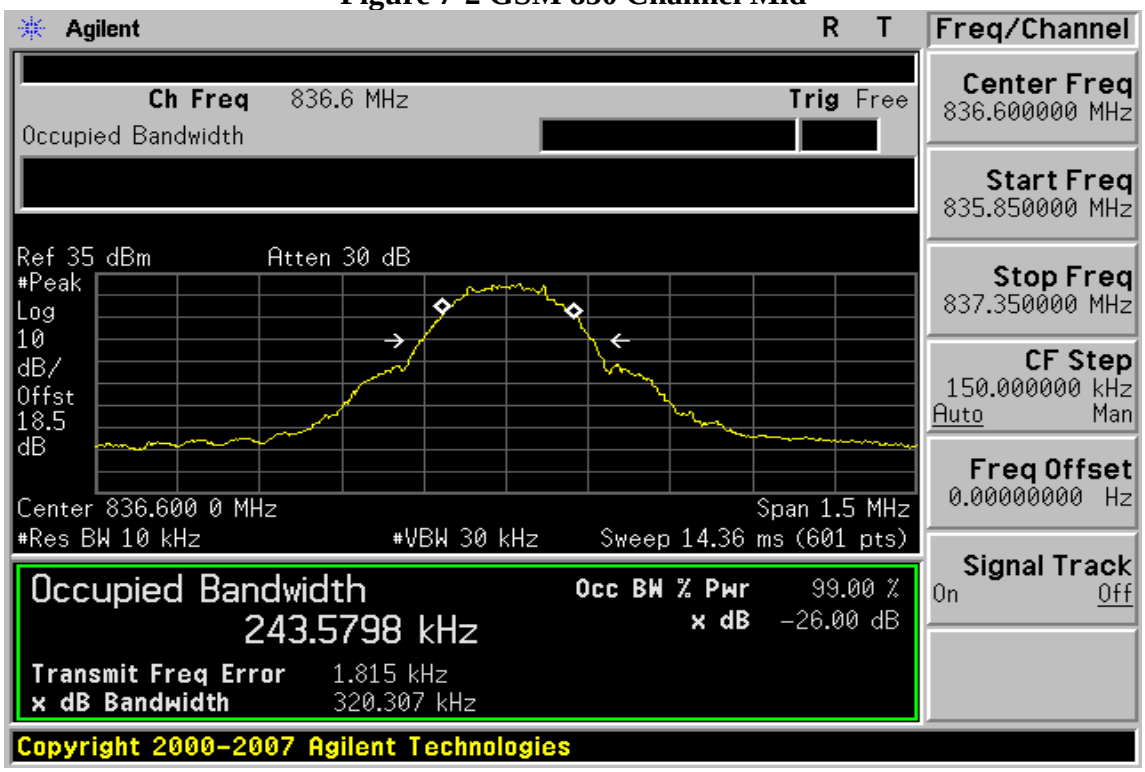


Figure 7-3: GSM 850 Channel High

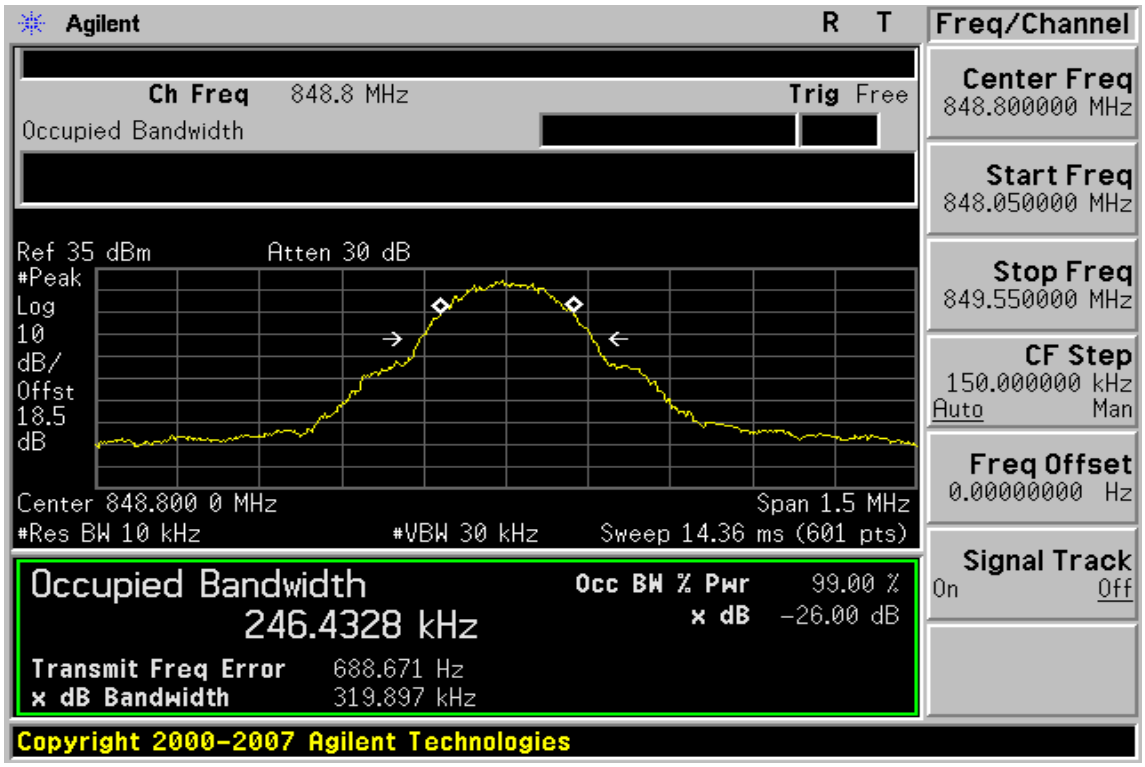


Figure 7-4: EDGE 850 Channel Low

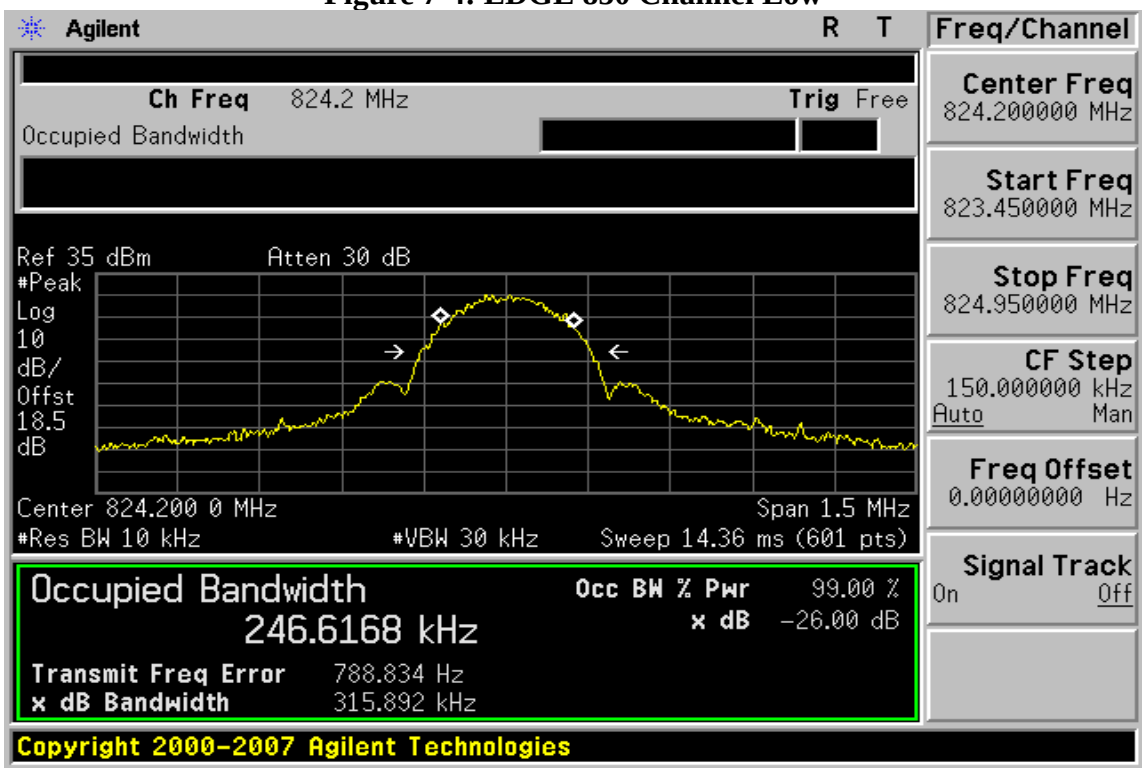


Figure 7-5: EDGE 850 Channel Mid

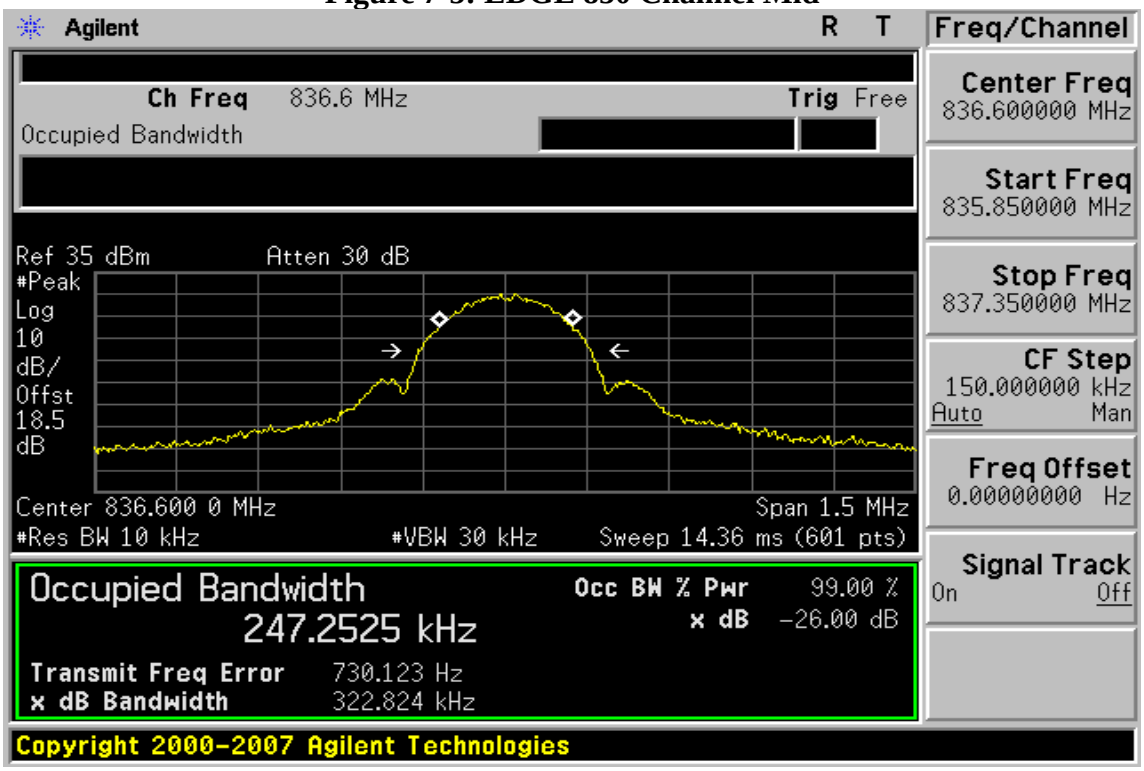


Figure 7-6 EDGE 850 Channel High

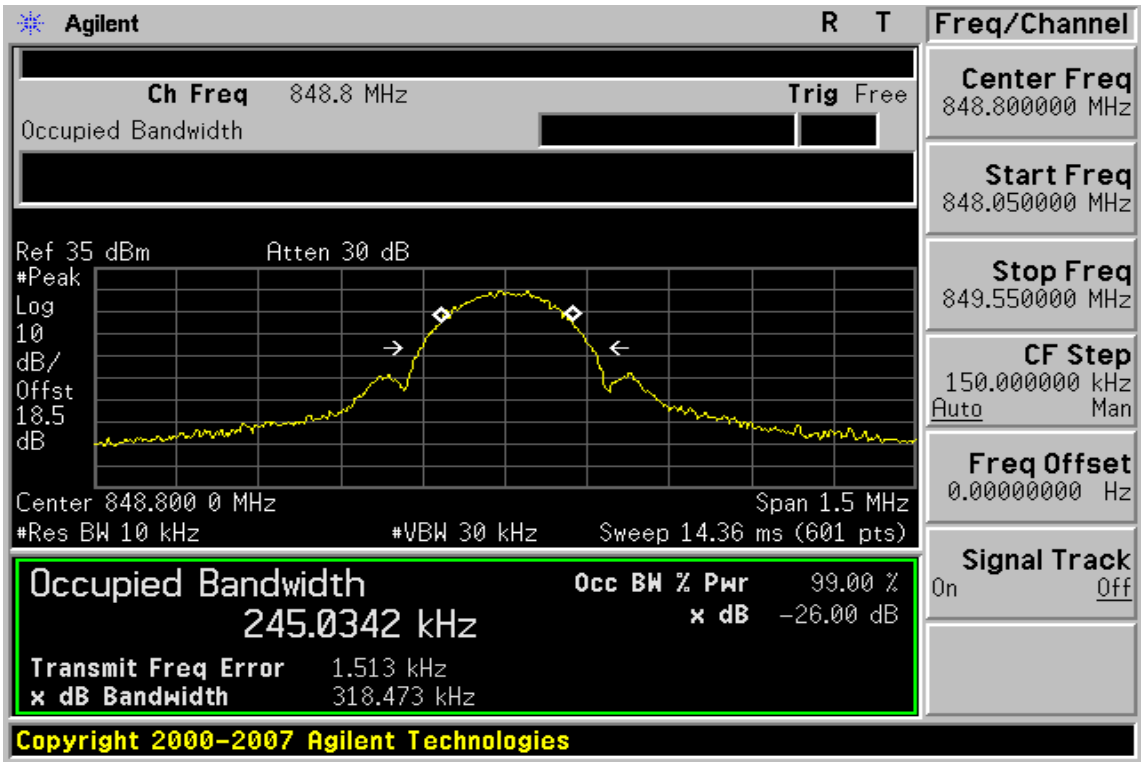


Figure 7-7: PCS 1900 Channel Low

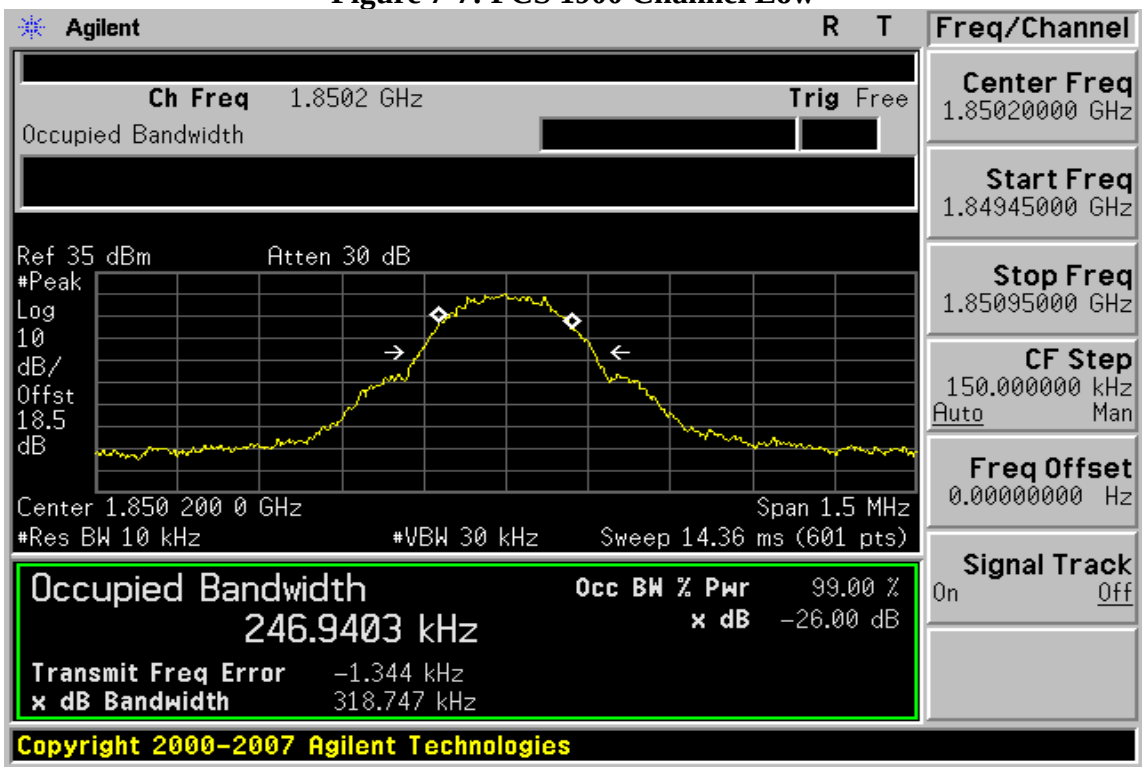


Figure 7-8 PCS 1900 Channel Mid

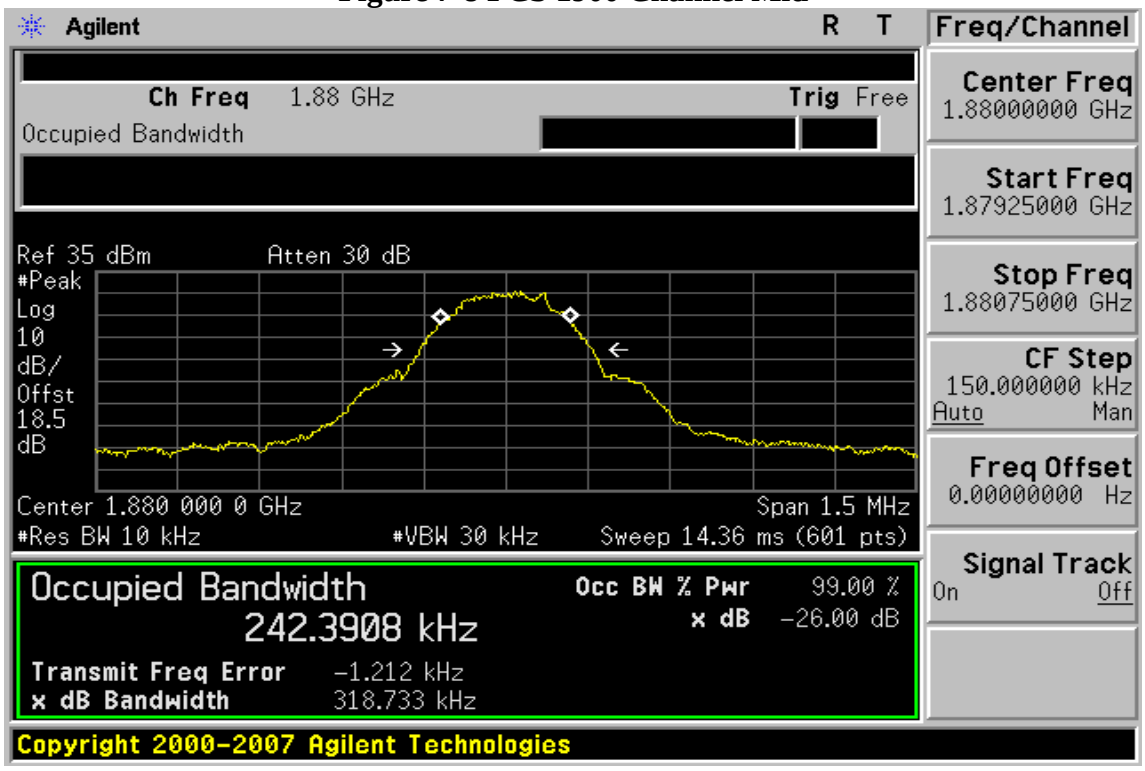


Figure 7-9: PCS 1900 Channel High

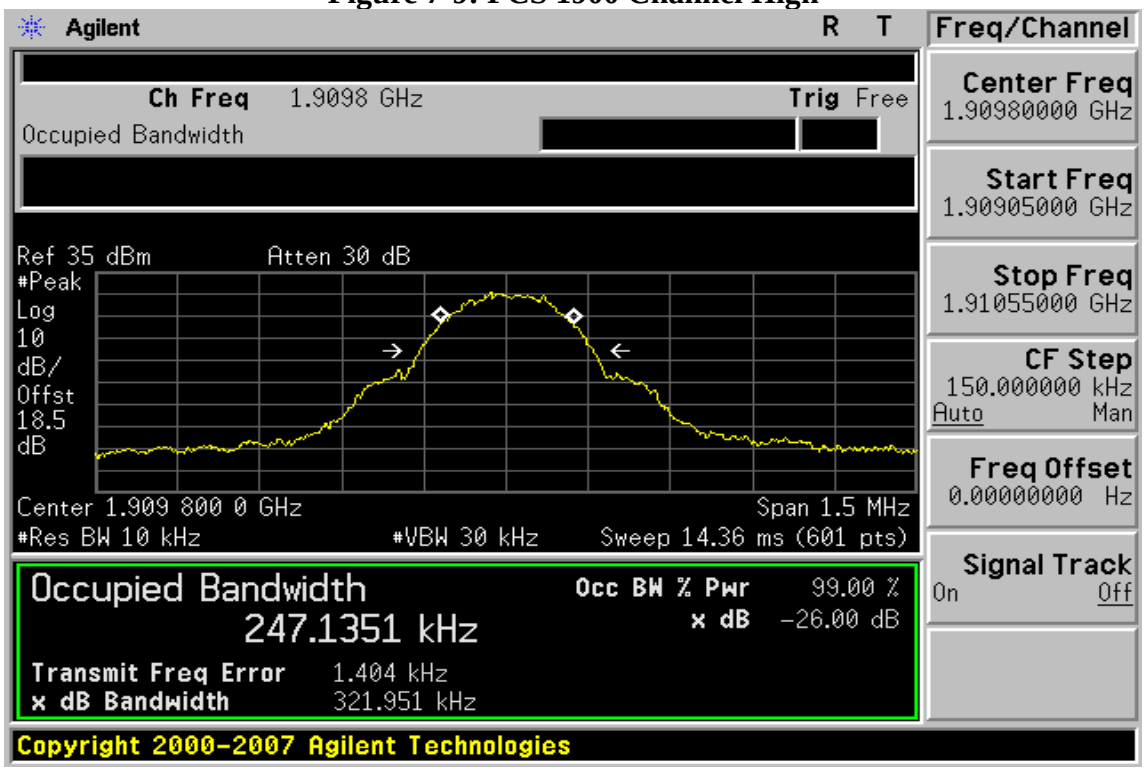


Figure 7-10 EDGE 1900 Channel Low

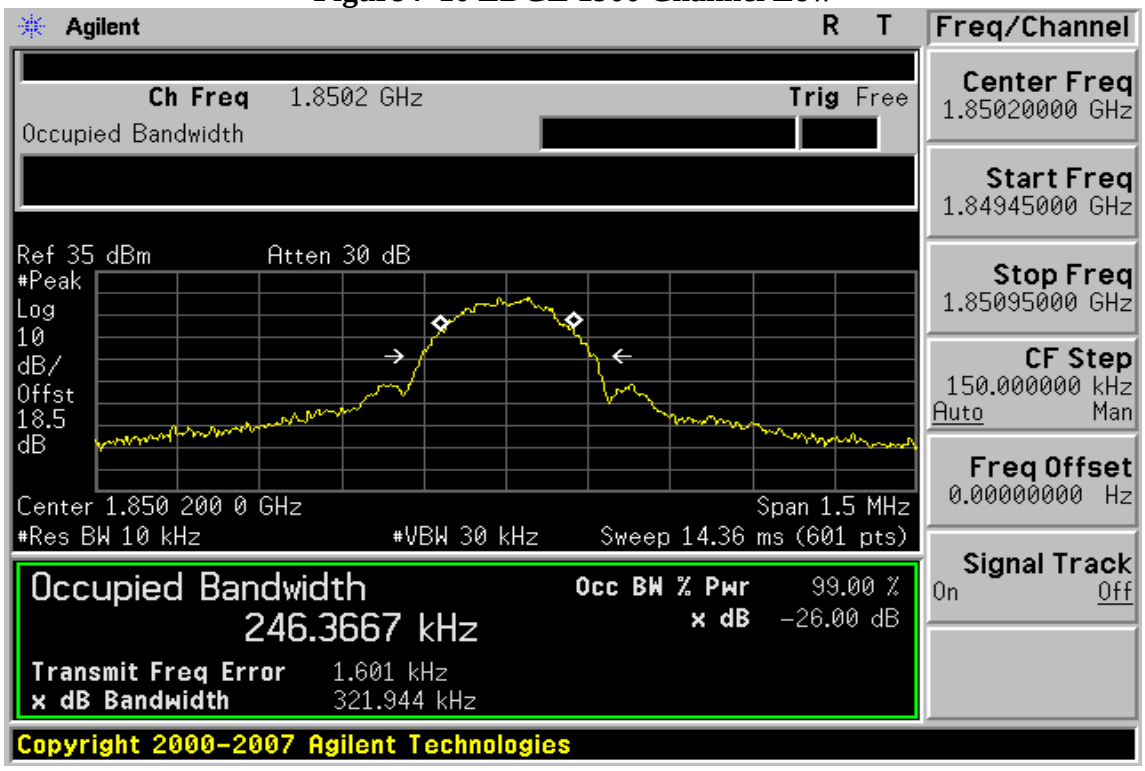


Figure 7-11 EDGE 1900 Channel Mid

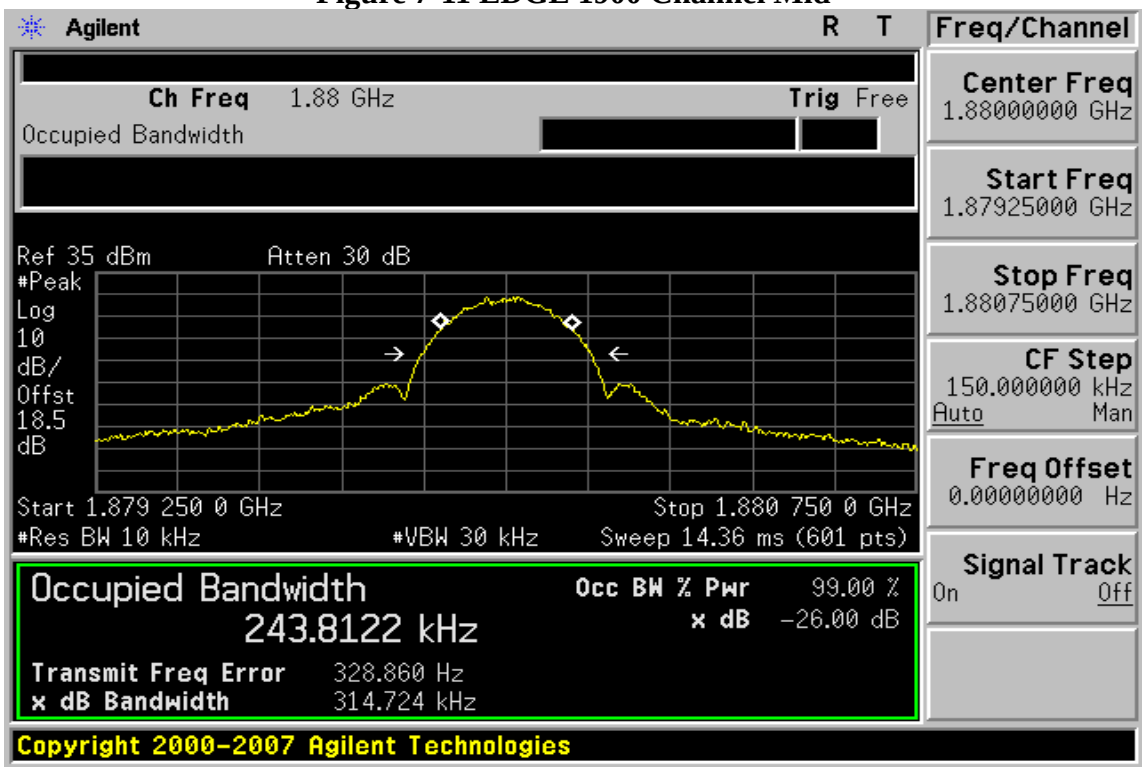
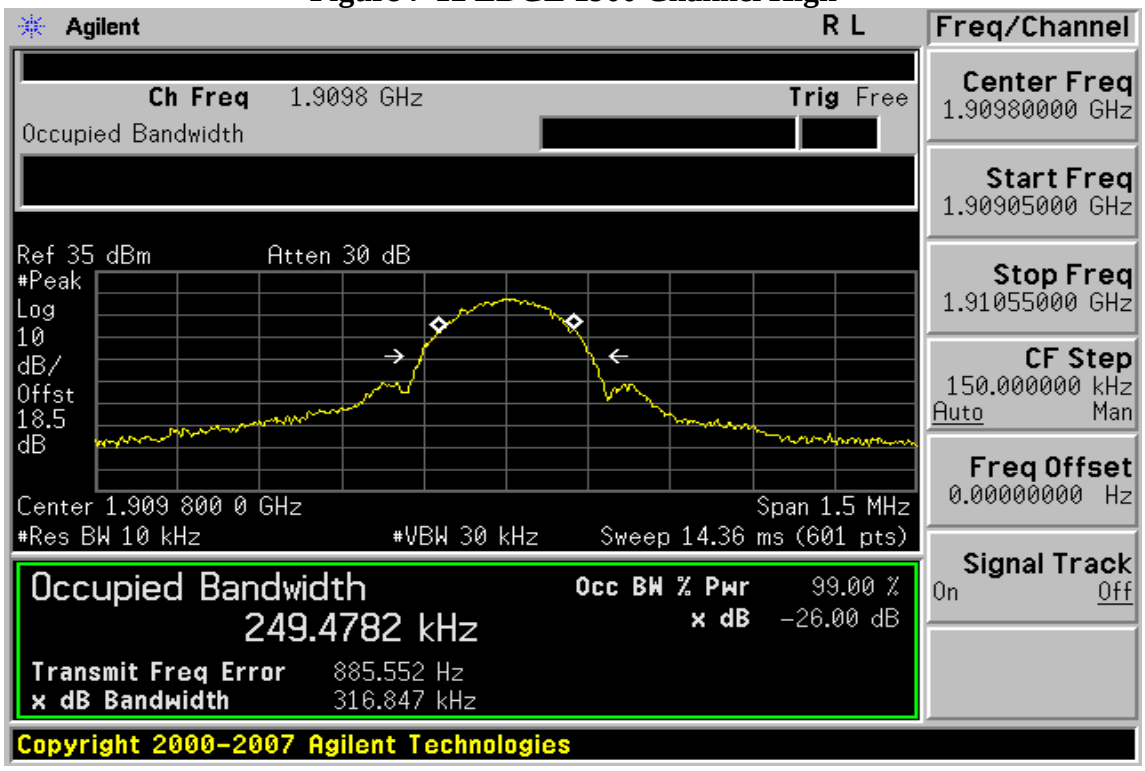


Figure 7-12 EDGE 1900 Channel High



8 OUT OF BAND EMISSION AT ANTENNA TERMINALS (TX)

8.1 Standard Applicable

According to FCC §2.1051.

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

8.2 Test SET-UP

Refer to section 7.2 in this report

8.3 Measurement Procedure

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

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

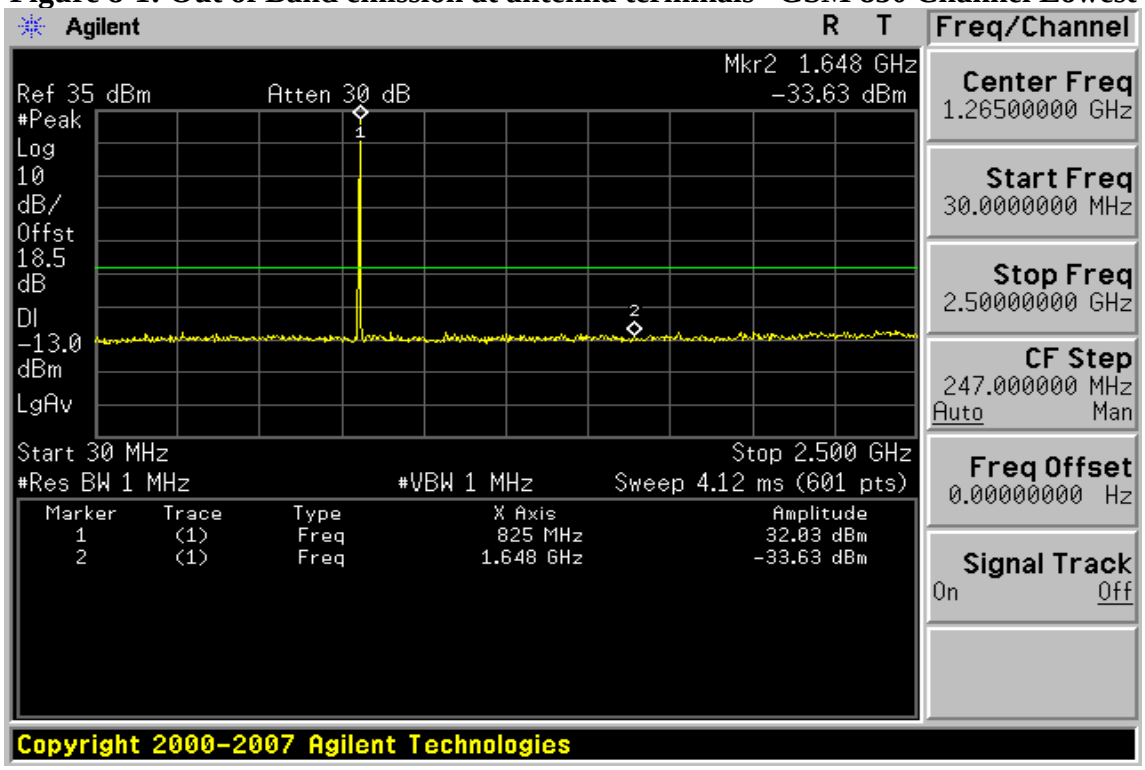
Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

8.4 Measurement Equipment Used:

Refer to section 2.4 in this report

8.5 Measurement Result

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



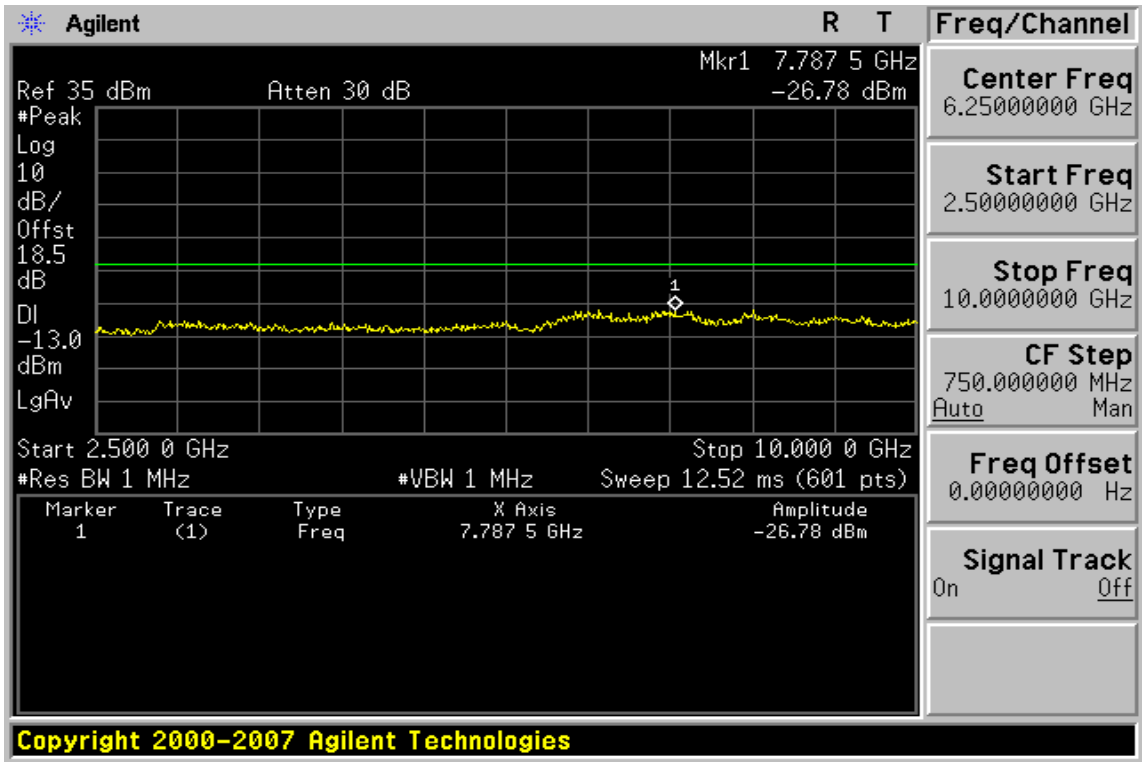
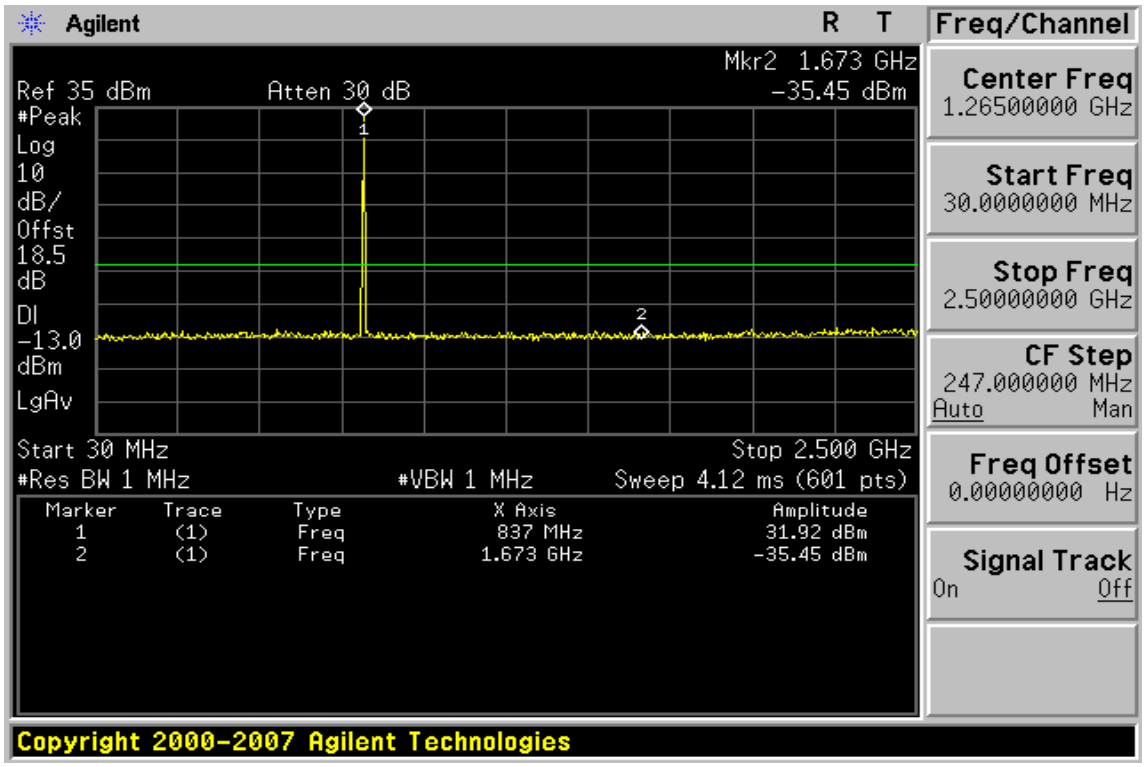


Figure 8-2: Out of Band emission at antenna terminals –GSM 850 Channel Mid



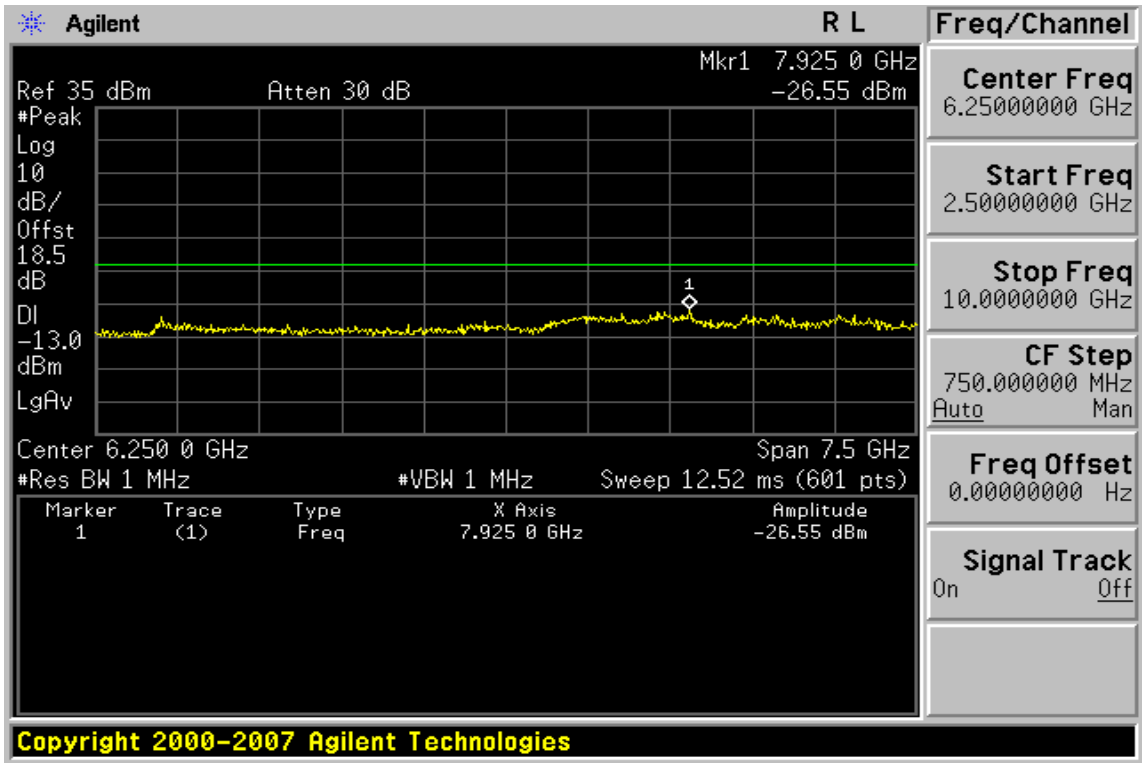
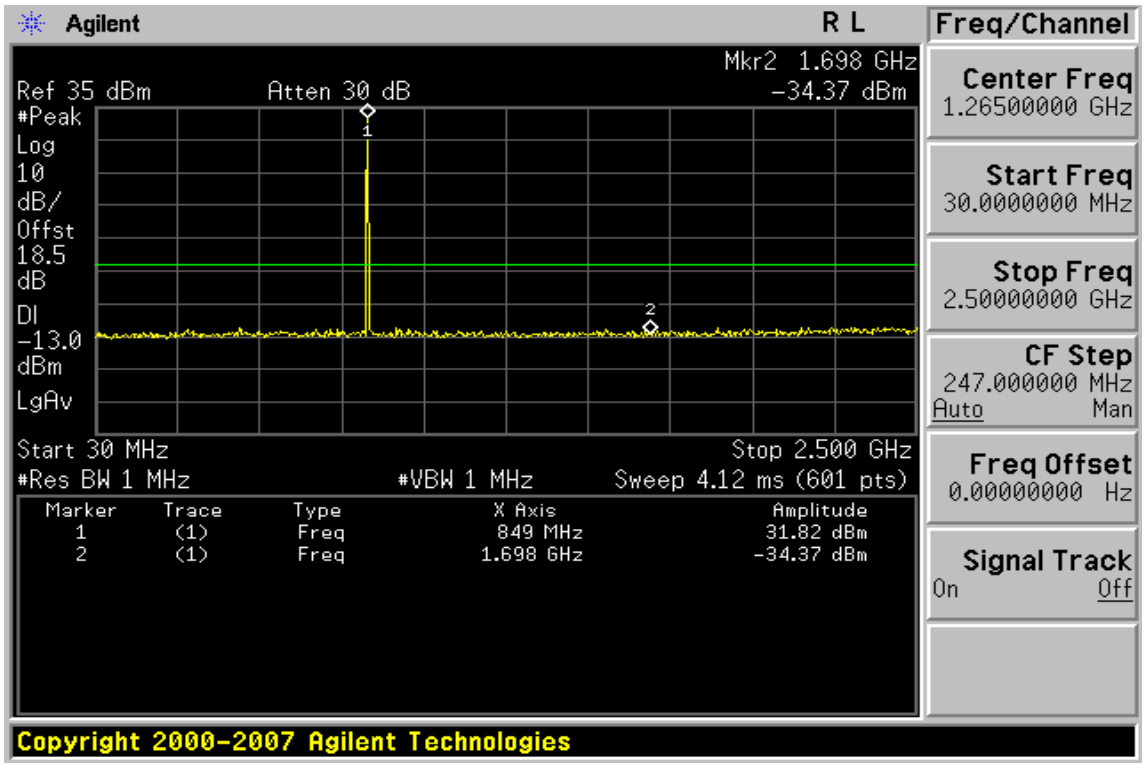


Figure 8-3: Out of Band emission at antenna terminals–GSM 850 Channel Highest



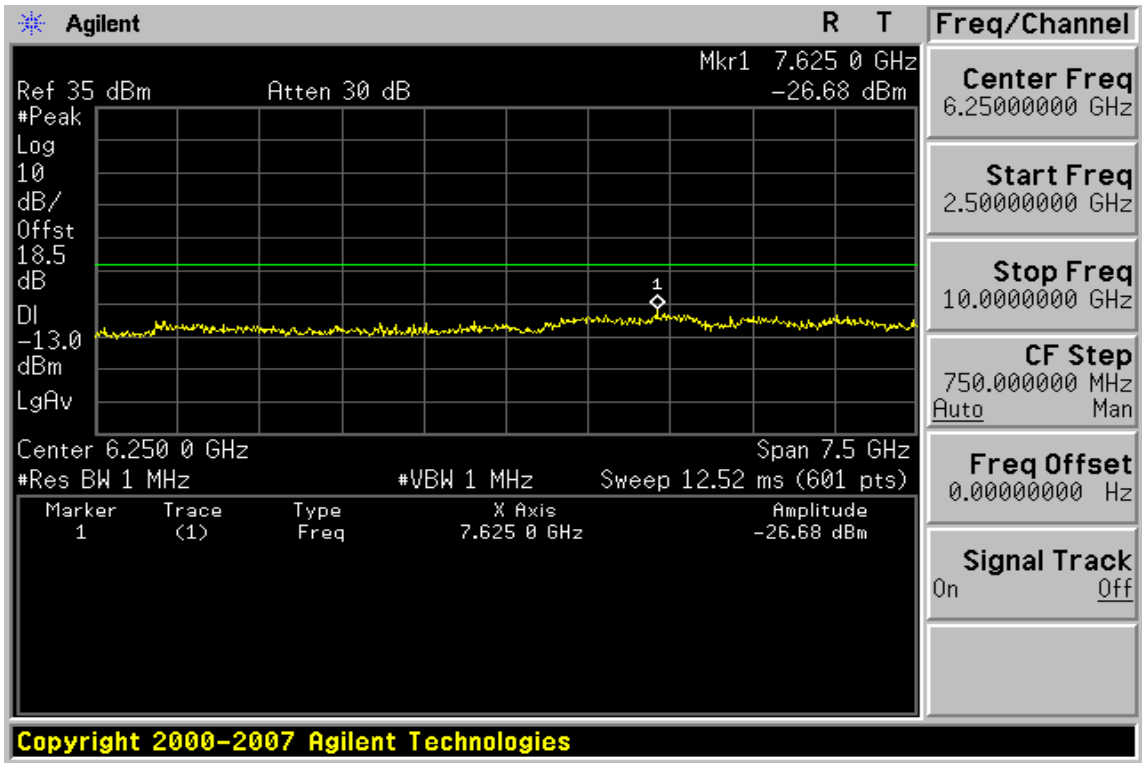


Figure 8-4: Band edge emission at antenna terminals – GSM 850 Channel Lowest

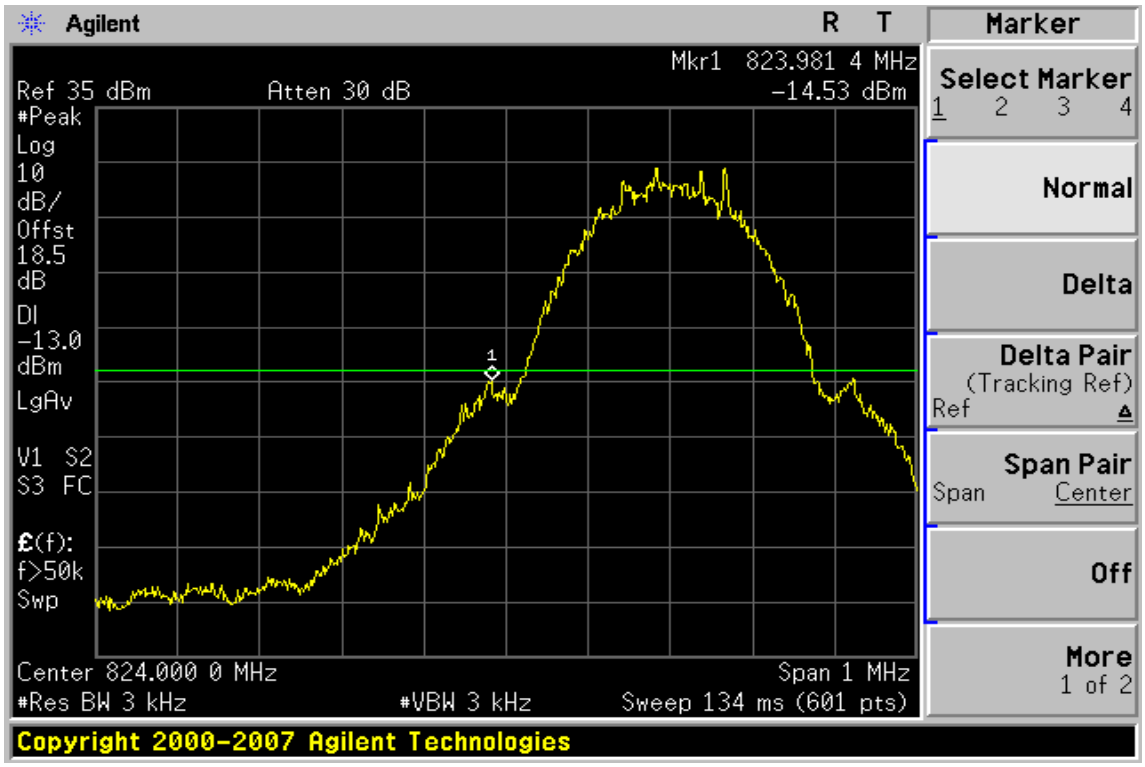


Figure 8-5: Band edge emission at antenna terminals – GSM Channel Highest

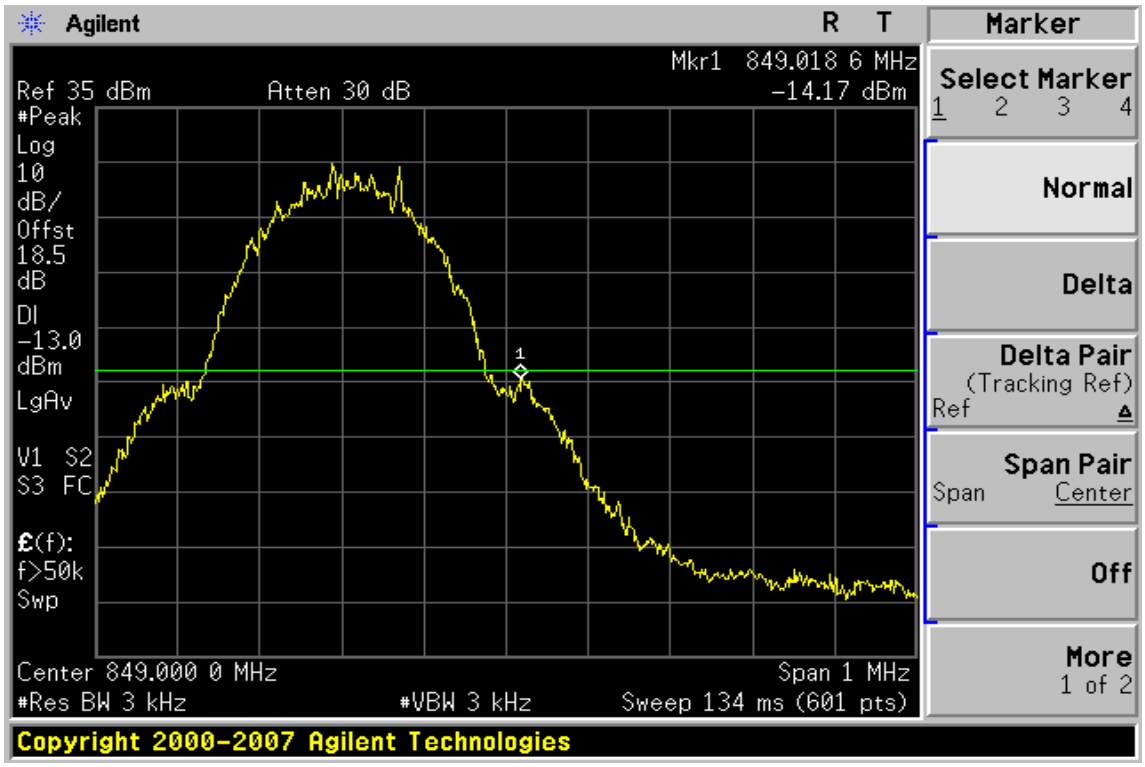
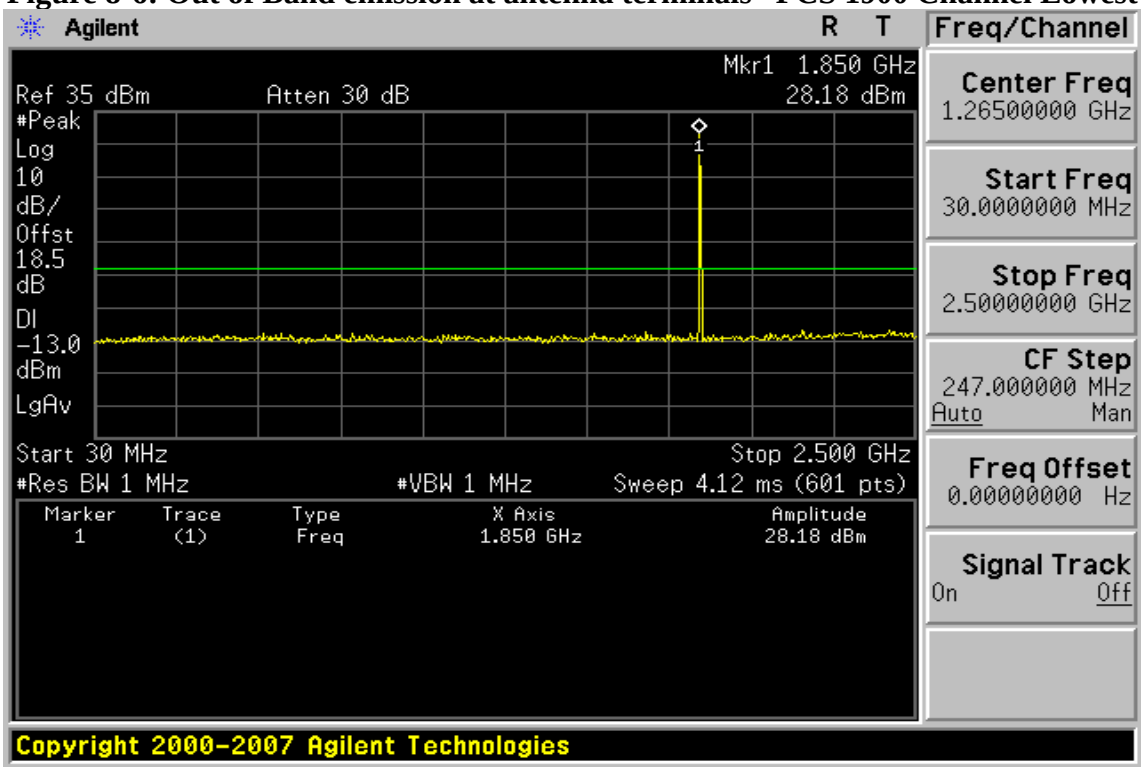


Figure 8-6: Out of Band emission at antenna terminals– PCS 1900 Channel Lowest



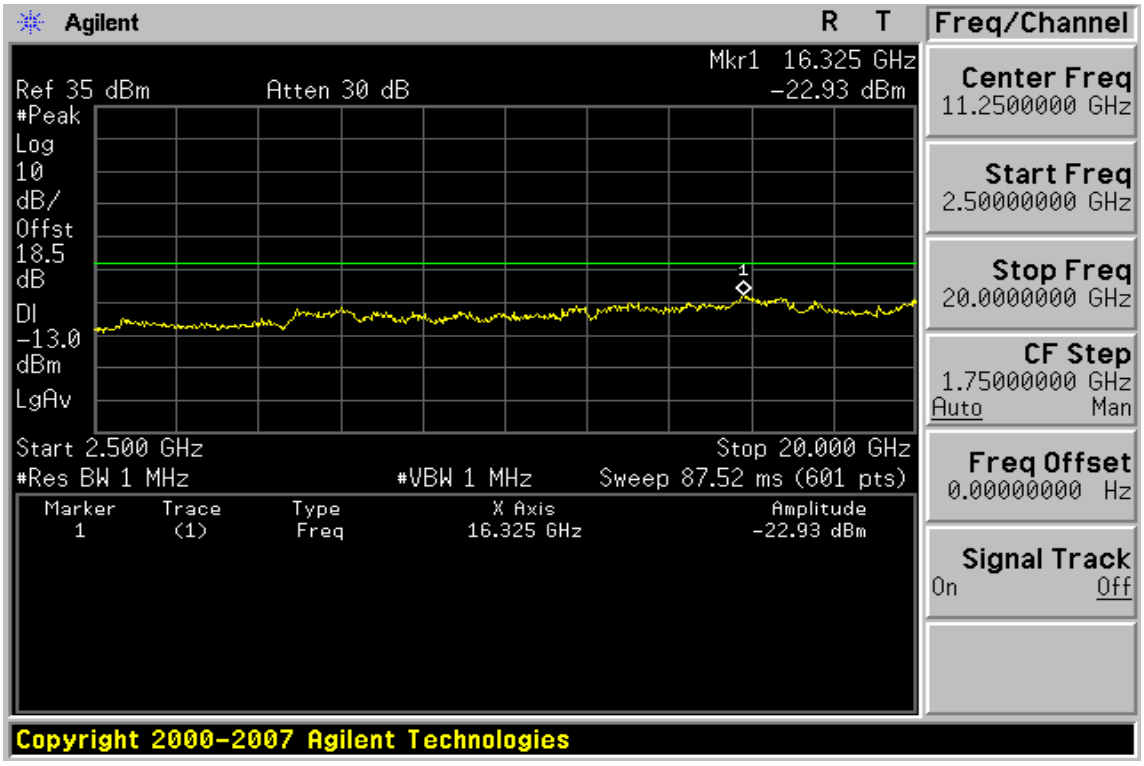
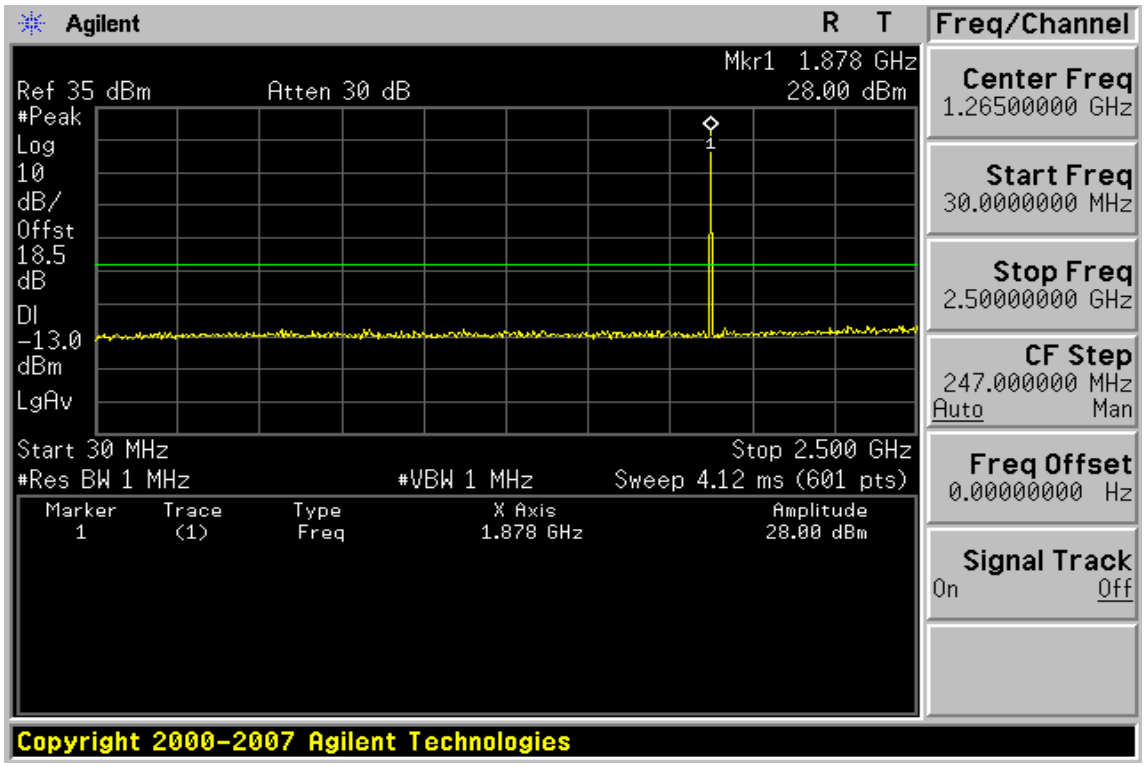


Figure 8-7: Out of Band emission at antenna terminals –PCS 1900 Channel Mid



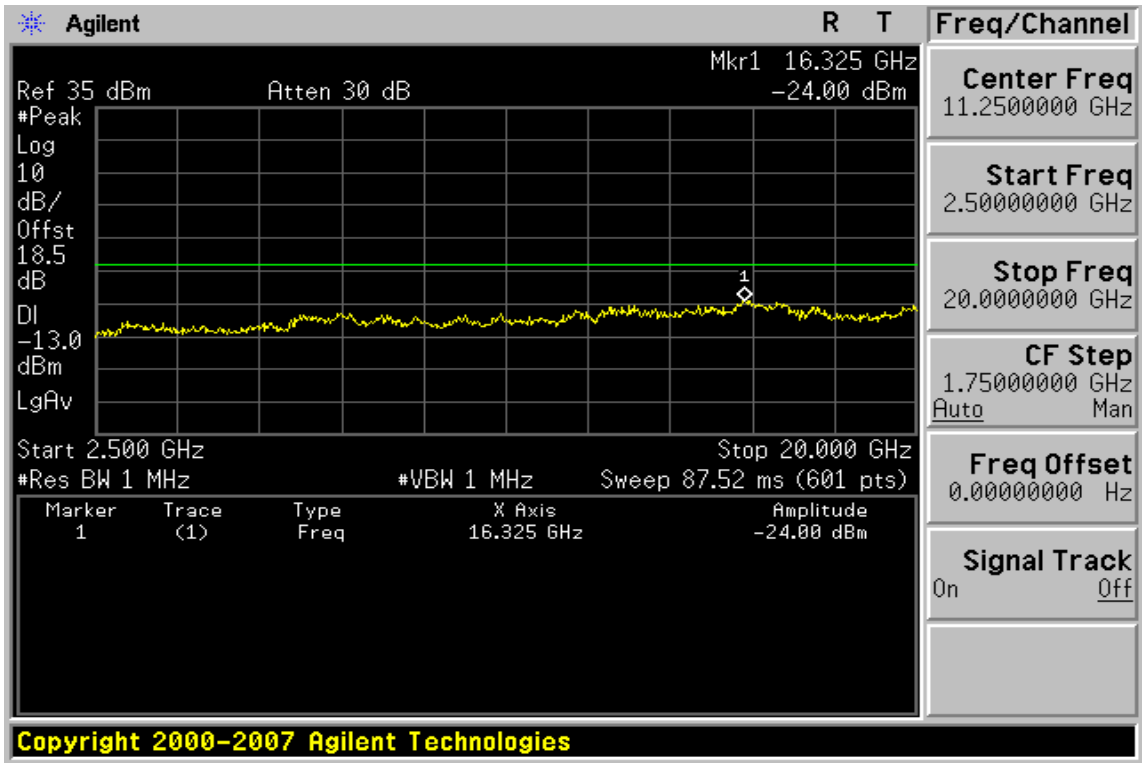
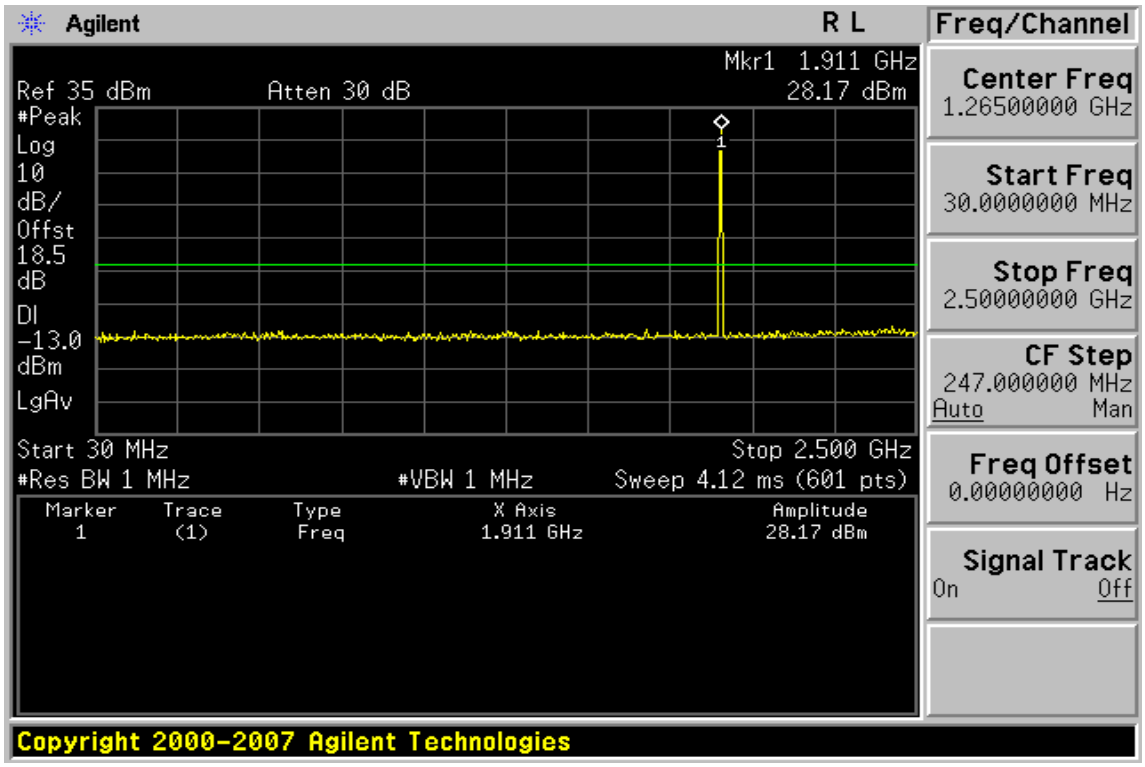


Figure 8-8: Out of Band emission at antenna terminals–PCS 1900 Channel Highest



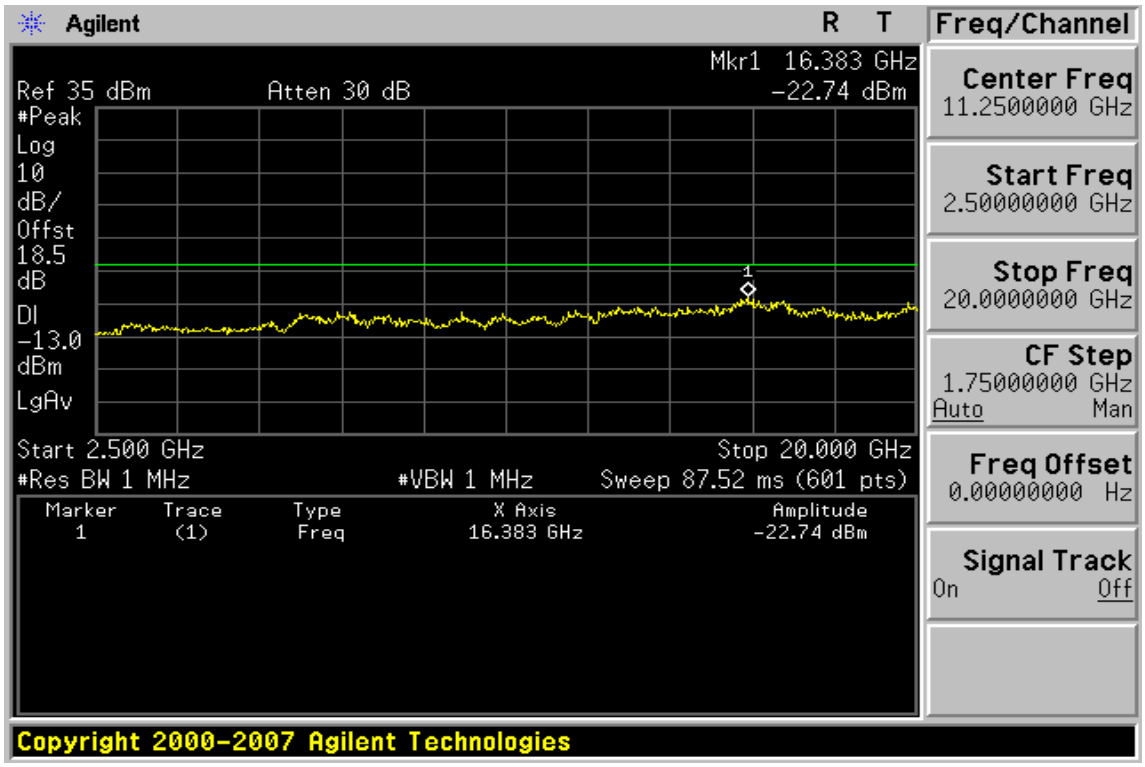


Figure 8-9: Bad edge emission at antenna terminals – PCS 1900 Channel Lowest

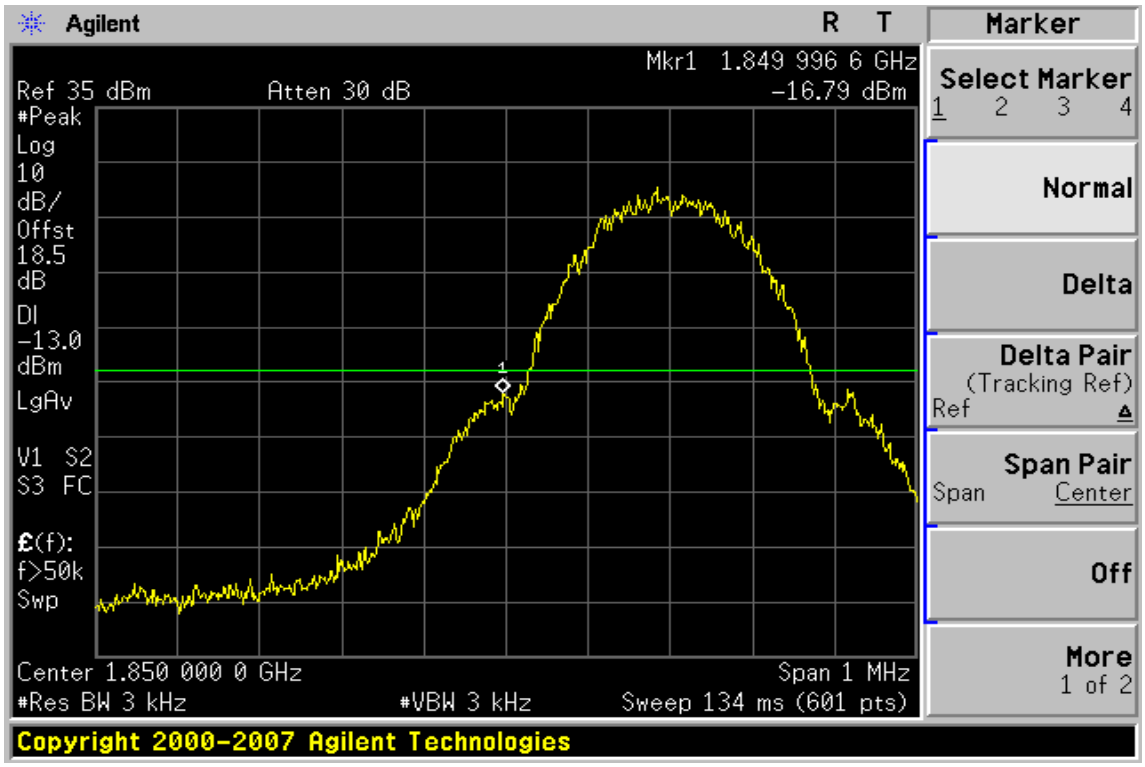
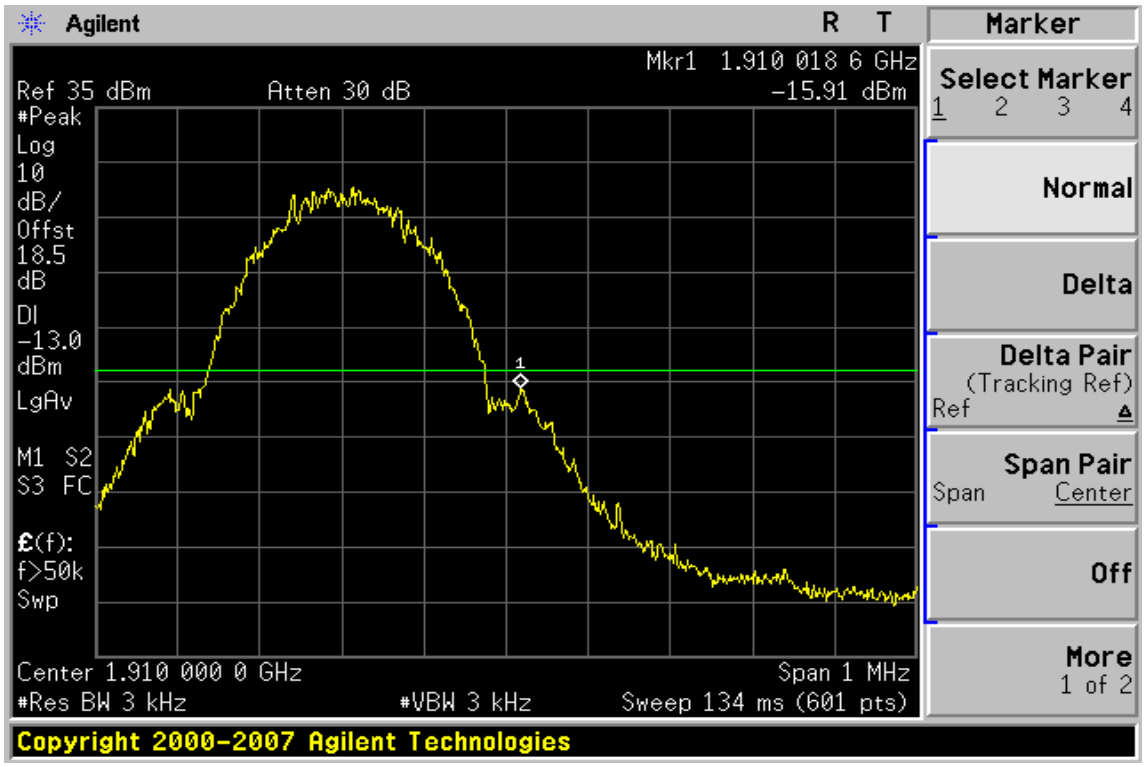


Figure 8-10: Band edge emission at antenna terminals – PCS 1900 Channel Highest



9 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT (TX)

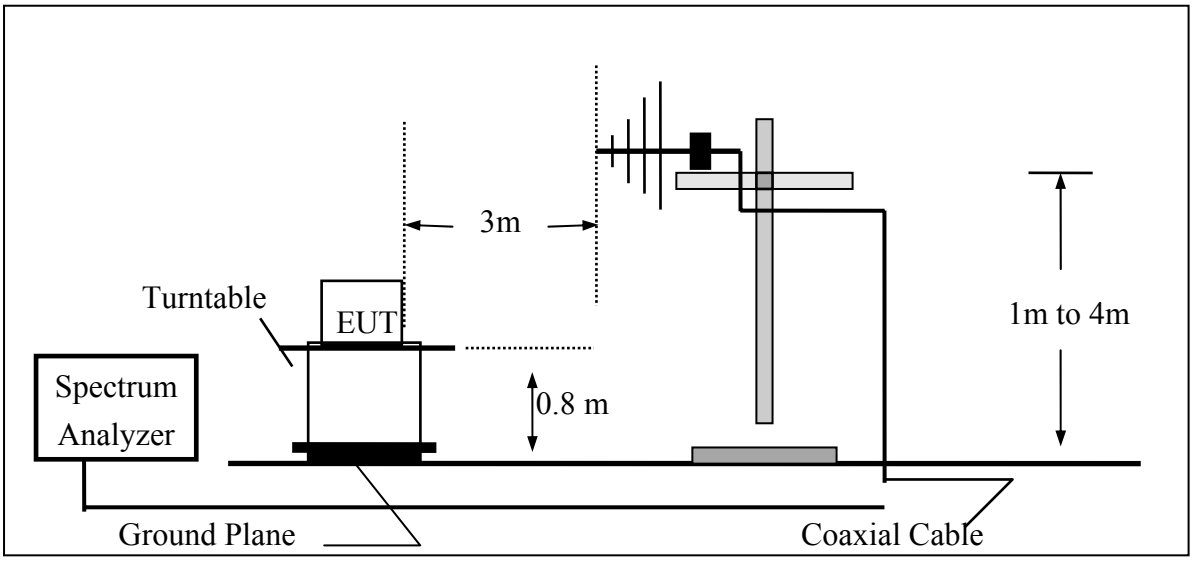
9.1 Standard Applicable

According to FCC §2.1053,

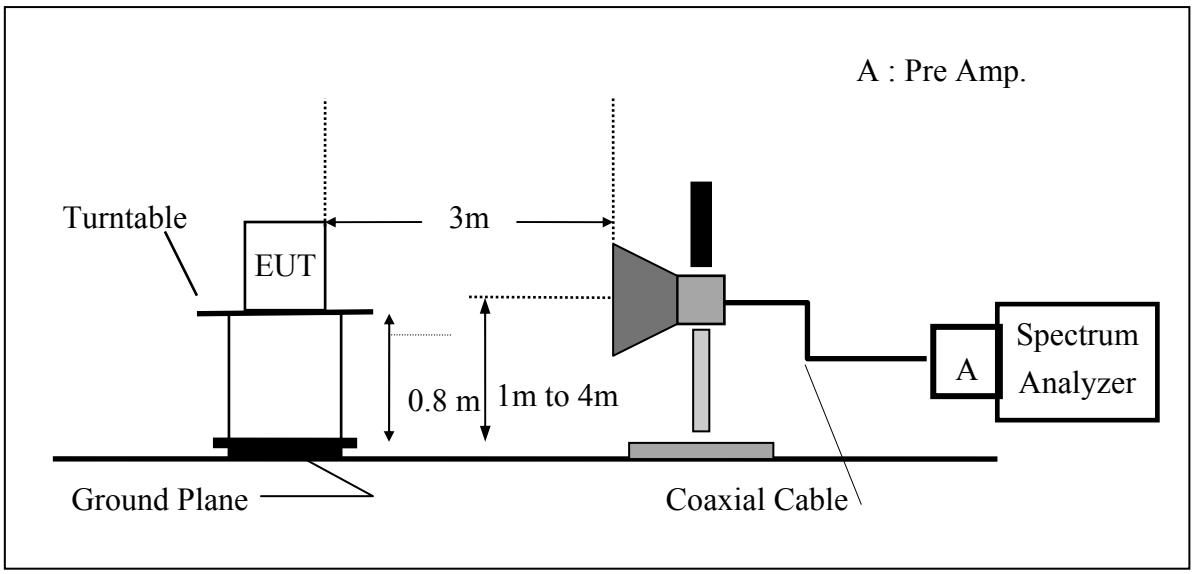
FCC §22.917(a),§24.238(a), §27.53(g) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than 43 + 10 log (mean output power in watts) dBc below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

9.2 EUT Setup (Block Diagram of Configuration)

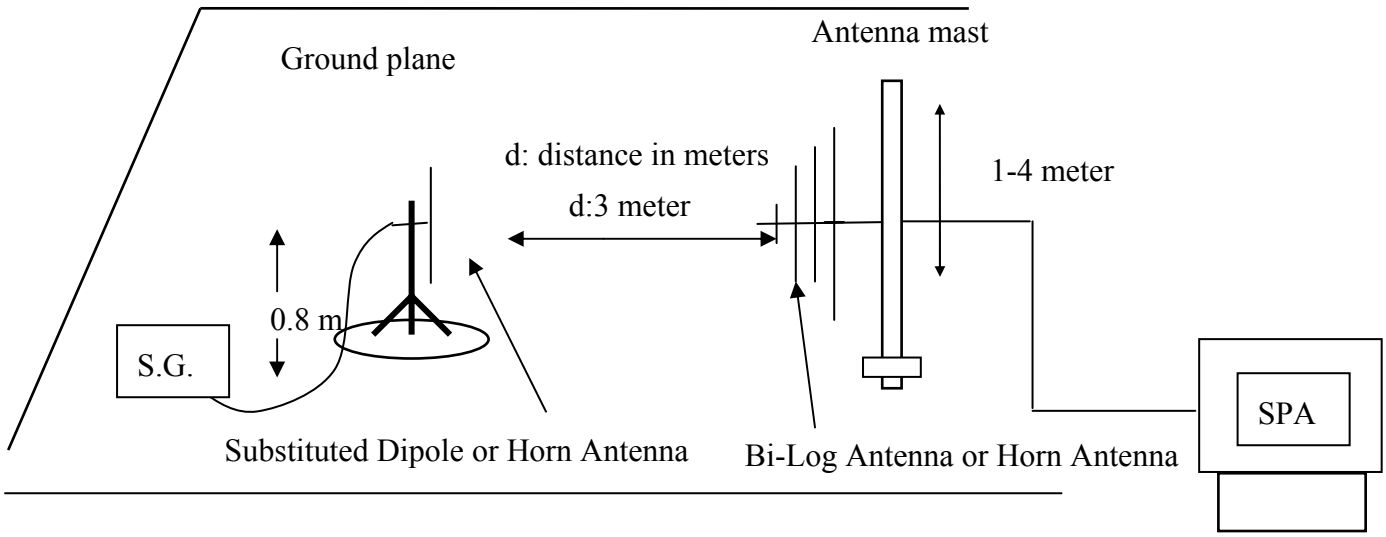
(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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



(C) Substituted Method Test Set-UP



9.3 Measurement Procedure

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

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

ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

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

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

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:	Oct. 26, 2009
Fundamental Frequency	: 824.20 MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	43.05	V	-59.12	-3.25	0.90	-63.26	-13.00	-50.26
92.08	44.31	V	-58.62	-7.75	1.29	-67.66	-13.00	-54.66
824.00	81.40	V	-4.99	-7.87	3.62	-16.49	-13.00	-3.49
1648.40	42.23	V	-62.35	9.29	5.23	-58.29	-13.00	-45.29
2472.60	45.40	V	-55.61	10.08	6.53	-52.06	-13.00	-39.06
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 (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode	: TX CH Low E2 Mode	Test Date:	Oct. 26, 2009
Fundamental Frequency	: 824.20 MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	44.34	H	-58.85	-3.25	0.90	-63.00	-13.00	-50.00
824.00	73.51	H	-12.76	-7.87	3.62	-24.26	-13.00	-11.26
1648.40	40.02	H	-64.38	9.29	5.23	-60.32	-13.00	-47.32
2472.60	48.24	H	-52.67	10.08	6.53	-49.12	-13.00	-36.12
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 (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Oct. 26, 2009
Fundamental Frequency	: 836.60 MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	42.95	V	-59.22	-3.25	0.90	-63.36	-13.00	-50.36
92.08	45.83	V	-57.10	-7.75	1.29	-66.14	-13.00	-53.14
1673.20	39.13	V	-65.43	9.36	5.27	-61.33	-13.00	-48.33
2509.80	44.21	V	-56.57	10.09	6.58	-53.07	-13.00	-40.07
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 (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Oct. 26, 2009
Fundamental Frequency	: 836.60 MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	44.00	H	-59.19	-3.25	0.90	-63.34	-13.00	-50.34
1673.20	40.81	H	-63.57	9.36	5.27	-59.47	-13.00	-46.47
2509.80	38.57	H	-62.13	10.09	6.58	-58.63	-13.00	-45.63
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 (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode	: TX CH High E2 Mode	Test Date:	Oct. 26, 2009
Fundamental Frequency	: 848.80 MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
43.01	45.24	V	-58.13	-2.03	0.96	-61.12	-13.00	-48.12
44.33	51.82	V	-52.23	-1.76	0.99	-54.99	-13.00	-41.99
850.00	78.55	V	-7.56	-7.88	3.68	-19.12	-13.00	-6.12
1697.60	39.87	V	-64.67	9.44	5.31	-60.54	-13.00	-47.54
2546.40	43.73	V	-56.91	10.20	6.63	-53.35	-13.00	-40.35
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 (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode	: TX CH High E2 Mode	Test Date:	Oct. 26, 2009
Fundamental Frequency	: 848.80 MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	43.99	H	-59.20	-3.25	0.90	-63.35	-13.00	-50.35
92.08	41.57	H	-62.02	-7.75	1.29	-71.06	-13.00	-58.06
850.00	80.97	H	-5.22	-7.88	3.68	-16.78	-13.00	-3.78
1697.60	42.13	H	-62.22	9.44	5.31	-58.09	-13.00	-45.09
2546.40	43.07	H	-57.53	10.20	6.63	-53.97	-13.00	-40.97
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 (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: PCS 1900 Mode

Operation Mode	: TX CH Low E1 Mode	Test Date:	Oct. 26, 2009
Fundamental Frequency	: 1850.20MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	42.41	V	-60.32	-4.16	0.91	-65.39	-13.00	-52.39
92.08	44.33	V	-58.60	-7.75	1.29	-67.64	-13.00	-54.64
1850.00	66.65	V	-37.74	9.90	5.56	-33.40	-13.00	-20.40
3700.40	50.46	V	-47.47	12.61	8.31	-43.17	-13.00	-30.17
5550.60	35.45	V	-55.39	13.23	10.33	-52.49	-13.00	-39.49
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 (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: PCS 1900 Mode

Operation Mode	: TX CH Low E1 Mode	Test Date:	Oct. 26, 2009
Fundamental Frequency	: 1850.20MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	43.94	H	-59.86	-4.16	0.91	-64.92	-13.00	-51.92
58.13	40.63	H	-69.80	-0.49	1.08	-71.37	-13.00	-58.37
1850.00	76.94	H	-27.24	9.90	5.56	-22.90	-13.00	-9.90
3700.40	48.23	H	-49.81	12.61	8.31	-45.51	-13.00	-32.51
5550.60	36.95	H	-54.10	13.23	10.33	-51.20	-13.00	-38.20
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 (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: PCS 1900 Mode

Operation Mode	: TX CH Mid E1 Mode	Test Date:	Oct. 26, 2009
Fundamental Frequency	: 1880MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	42.13	V	-60.04	-3.25	0.90	-64.18	-13.00	-51.18
92.08	43.84	V	-59.09	-7.75	1.29	-68.13	-13.00	-55.13
3760.00	49.15	V	-48.51	12.60	8.39	-44.29	-13.00	-31.29
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 (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: PCS 1900 Mode

Operation Mode	: TX CH Mid E1 Mode	Test Date:	Oct. 26, 2009
Fundamental Frequency	: 1880MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	43.69	H	-60.11	-4.16	0.91	-65.17	-13.00	-52.17
92.08	40.12	H	-63.47	-7.75	1.29	-72.51	-13.00	-59.51
3760.00	47.44	H	-50.33	12.60	8.39	-46.12	-13.00	-33.12
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 (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: PCS 1900 Mode

Operation Mode	: TX CH High E1 Mode	Test Date:	Oct. 26, 2009
Fundamental Frequency	: 1909.8 MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	43.06	V	-59.11	-3.25	0.90	-63.25	-13.00	-50.25
92.08	44.00	V	-58.93	-7.75	1.29	-67.97	-13.00	-54.97
1910.00	65.90	V	-38.43	10.08	5.66	-34.01	-13.00	-21.01
3819.60	45.67	V	-51.72	12.60	8.47	-47.59	-13.00	-34.59
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 (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: PCS 1900 Mode

Operation Mode	: TX CH High E1 Mode	Test Date:	Oct. 26, 2009
Fundamental Frequency	: 1909.8 MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	43.25	H	-59.94	-3.25	0.90	-64.09	-13.00	-51.09
1910.00	80.93	H	-23.18	10.08	5.66	-18.76	-13.00	-5.76
3819.60	42.36	H	-55.15	12.60	8.47	-51.01	-13.00	-38.01
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 (dB/dBi) – Cable loss (dB)

10 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

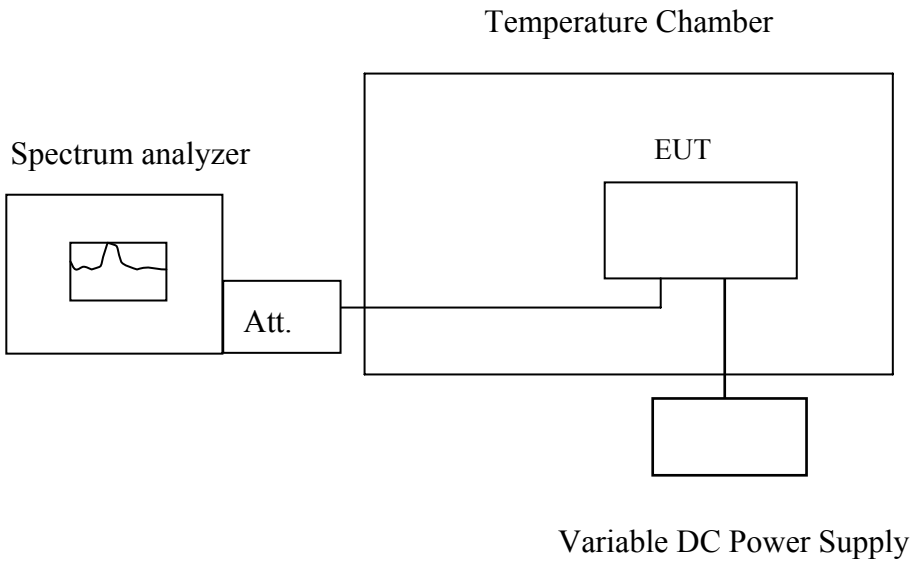
10.1 Standard Applicable

According to FCC §2.1055(a)(1)

Frequency Tolerance: +/- 2.5 ppm

§27.54: The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

10.2 Test Set-up:



Note : Measurement setup for testing on Antenna connector

10.3 Measurement Procedure

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

10.4 Measurement Equipment Used:

Refer to section 2.4 in this report

10.5 Measurement Result

Reference Frequency: GSM Mid Channel 836.6 MHz @ 25℃				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (℃)	(MHz)		
3.7	-30	836.599962	20.00	2091
3.7	-20	836.599974	8.00	2091
3.7	-10	836.599965	17.00	2091
3.7	0	836.599971	11.00	2091
3.7	10	836.599978	4.00	2091
3.7	20	836.599982	0.00	2091
3.7	30	836.599988	-6.00	2091
3.7	40	836.599986	-4.00	2091
3.7	50	836.599972	10.00	2091
3.7	60	836.599979	3.00	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	1879.999969	9.00	4700
3.7	-20	1879.999953	25.00	4700
3.7	-10	1879.999959	19.00	4700
3.7	0	1879.999964	14.00	4700
3.7	10	1879.999971	7.00	4700
3.7	20	1879.999978	0.00	4700
3.7	30	1879.999972	6.00	4700
3.7	40	1879.999980	-2.00	4700
3.7	50	1879.999981	-3.00	4700
3.7	60	1879.999975	3.00	4700

11 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

11.1 Standard Applicable

According to FCC §2.1055(d)(2)

Frequency Tolerance: +/- 2.5 ppm

§27.54: The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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)		
4.26	25.00	836.599980	2.00	2091.00
3.70	25.00	836.599982	0.00	2091.00
3.20	25.00	836.599979	3.00	2091.00
3.20 (End Point)	25.00	836.599979	3.00	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)		
4.26	25	1879.999972	6.00	4700
3.70	25	1879.999978	0.00	4700
3.20	25	1879.999952	26.00	4700
3.20 (End Point)	25	1879.999952	26.00	4700