FCC Report (GSM & WCDMA)

Applicant:	NEG TECHNOLOGY CO., LIMITED
Address of Applicant:	Rm 1406, Block B, Jinsejiari, Jingtian south road, Futian district, Shenzhen, China
Equipment Under Test (EUT)	
Product Name:	Mobile Phone
Model No.:	S3001D
Trade Mark:	OWN
FCC ID:	2AAZ8-S3001D
Applicable standards:	FCC CFR Title 47 Part 2:2013 FCC CFR Title 47 Part22 Subpart H:2013 FCC CFR Title 47 Part24 Subpart E:2013
Date of sample receipt:	December 17, 2014
Date of Test:	December 17-31, 2014
Date of report issued:	January 04, 2015
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the GTS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of GTS or testing done by GTS in connection with, distribution or use of the product described in this report must be approved by GTS in writing.
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2 Version

Version No.	Date	Description
00	*January 04, 2015*	*Original*

Prepared By:	Edward.Pan	***Date:***	*January 04, 2015*
	Project Engineer		
Check By:	Hank. yan	***Date:***	*January 04, 2015*
	Reviewer		

3 Contents

Page

1 COVER PAGE 1

2 VERSION 2

3 CONTENTS 3

4 TEST SUMMARY 4

5 GENERAL INFORMATION 5

5.1 CLIENT INFORMATION 5
5.2 GENERAL DESCRIPTION OF EUT 5
5.3 RELATED SUBMITTAL(S) / GRANT (S) 7
5.4 TEST METHODOLOGY 7
5.5 TEST FACILITY 7
5.6 TEST LOCATION 7

6 TEST INSTRUMENTS LIST 8

7 SYSTEM TEST CONFIGURATION 9

7.1 TEST MODE 9
7.2 CONFIGURATION OF TESTED SYSTEM 10
7.3 CONDUCTED PEAK OUTPUT POWER 11
7.4 OCCUPY BANDWIDTH 13
7.5 MODULATION CHARACTERISTIC 22
7.6 OUT OF BAND EMISSION AT ANTENNA TERMINALS 22
7.7 ERP, EIRP MEASUREMENT 33
7.8 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT 42
7.9 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT 47
7.10 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT 51

8 TEST SETUP PHOTO 54

9 EUT CONSTRUCTIONAL DETAILS 55

4 Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass* (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(2) Part 24.232 (c)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917 Part 24.238	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a)	Pass
Out of band emission, Band Edge	Part 22.917 (a) Part 24.238 (a)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

Pass: The EUT complies with the essential requirements in the standard.

5 General Information

5.1 Client Information

Applicant:	NEG TECHNOLOGY CO., LIMITED
Address of Applicant:	Rm 1406, Block B, Jinsejiari, Jingtian south road, Futian district, Shenzhen, China
Manufacturer:	NEG TECHNOLOGY CO., LIMITED
Address of Manufacturer:	Rm 1406, Block B, Jinsejiari, Jingtian south road, Futian district, Shenzhen, China

5.2 General Description of EUT

Product Name:	Mobile Phone
Model No.:	S3001D
Support Networks:	GSM, GPRS, EGPRS, WCDMA
Support Bands:	GSM850, PCS1900, WCDMA Band II
TX Frequency:	GSM850: 824.20MHz-848.80MHz PCS1900: 1850.20MHz-1909.80MHz WCDMA Band II: 1852.40MHz -1907.60MHz
GPRS Class:	12
EGPRS Class:	12
Modulation type:	GSM/GPRS: GMSK EGPRS: GMSK/8PSK WCDMA Band II: QPSK
IMEI:	358688020000123, 358688020000456
Hardware Version:	DR018-MB-V0.3
Software Version:	A30_OWN_S3001D_V04_20141212_135723
Antenna type:	PIFA antenna
Antenna gain:	0dBi(GSM850) 0dBi(DCS1900) 0dBi(WCDMA1900)
Power supply:	Model No.: S3001D Input: AC 100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 1A DC 3.7V Li-ion Battery, 1100mAh

Operation Frequency List:

GSM 850		PCS1900		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20	9262	1852.40
129	824.40	513	1850.40	9263	1852.60
⋮	⋮	⋮	⋮	⋮	⋮
189	836.40	660	1879.80	9399	1879.80
190	836.60	661	1880.00	9400	1880.00
191	836.80	662	1880.20	9401	1880.20
⋮	⋮	⋮	⋮	⋮	⋮
250	848.60	809	1909.60	9537	1907.40
251	848.80	810	1909.80	9538	1907.60

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Final test channel:

GSM 850		PCS1900		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20	9262	1852.40
190	836.60	661	1880.00	9400	1880.00
251	848.80	810	1909.80	9538	1907.60

5.3 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 22 subpart H and Part 24 subpart E of the FCC CFR 47 Rules.

5.4 Test Methodology

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

5.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **CNAS —Registration No.: CNAS L5775**

CNAS has accredited Global United Technology Services Co., Ltd. To ISO/IEC 17025 General Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 28, 2013.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, June 26, 2013.

5.6 Test Location

All tests were performed at:
Global United Technology Services Co., Ltd. Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China Tel: 0755-27798480 Fax: 0755-27798960

6 Test Instruments list

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 28 2014	Mar. 27 2015
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	July 01 2014	June 30 2015
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	July 01 2014	June 30 2015
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 27 2014	June 26 2015
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 28 2014	Mar. 27 2015
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Mar. 29 2014	Mar. 28 2015
9	Coaxial Cable	GTS	N/A	GTS211	Mar. 29 2014	Mar. 28 2015
10	Coaxial cable	GTS	N/A	GTS210	Mar. 29 2014	Mar. 28 2015
11	Coaxial Cable	GTS	N/A	GTS212	Mar. 29 2014	Mar. 28 2015
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	July 01 2014	June 30 2015
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	July 01 2014	June 30 2015
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 27 2014	June 26 2015
15	Band filter	Amindeon	82346	GTS219	Mar. 29 2014	Mar. 28 2015
16	Universal radio communication tester	Rohde & Schwarz	CMU200	GTS235	May 09 2014	May 08 2015
17	Signal Generator	Rohde & Schwarz	SML03	GTS236	May 09 2014	May 08 2015
18	Temp. Humidity/ Barometer	Oregon Scientific	BA-888	GTS248	May 09 2014	May 08 2015
19	D.C. Power Supply	Instek	PS-3030	GTS232	NA	NA
20	Splitter	Agilent	11636B	GTS237	May 09 2014	May 08 2015
21	Power meter	Rohde & Schwarz	NRVS	GTS238	May 09 2014	May 08 2015
22	Spectrum Analyzer	Agilent	E4440A	GTS533	Dec. 4 2014	Dec. 3 2015

7 System test configuration

7.1 Test mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Test modes		
Band	Radiated	Conducted
GSM 850	■ GSM link ■ GPRS 1 link ■ EGPRS 1 link	■ GSM link ■ GPRS 1 link ■ EGPRS 1 link
PCS 1900	■ GSM link ■ GPRS 1 link ■ EGPRS 1 link	■ GSM link ■ GPRS 1 link ■ EGPRS 1 link
WCDMA Band II	■ RMC 12.2Kbps link	■ RMC 12.2Kbps link

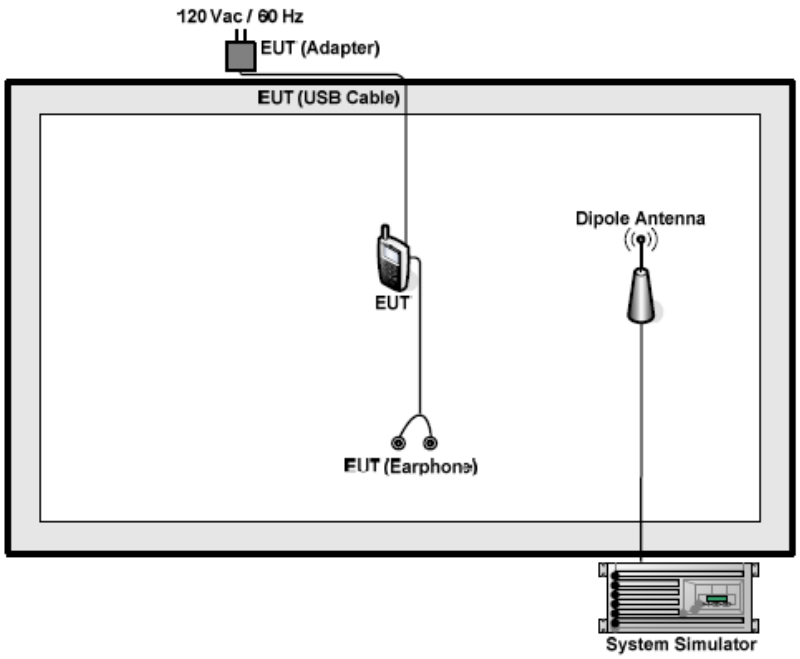
Note: The maximum power levels are GSM mode for GMSK link, GPRS multi-slot class 8 mode for GMSK link, EGPRS multi-slot class 8 mode for 8PSK link, RMC12.2Kbps mode for WCDMA Band II. Only these modes were used for all tests.

The conducted power tables are as follows:

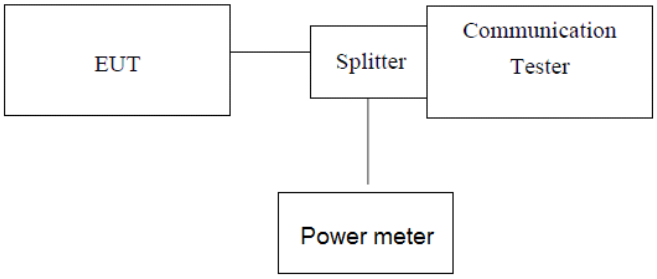
Conducted Power (dBm)						
Band	GSM850			PCS1900		
Channel	128	190	251	512	661	810
Frequency	824.20	836.60	848.80	1850.20	1880.00	1909.80
GSM (GMSK, 1 TX slot)	32.66	32.55	32.54	29.75	29.83	29.98
GPRS (GMSK, 1 TX slot)	32.62	32.52	32.49	29.69	29.76	29.94
GPRS (GMSK, 2 TX slot)	32.00	31.91	31.87	29.03	29.21	29.48
GPRS (GMSK, 3 TX slot)	30.40	30.23	30.18	27.44	27.71	28.13
GPRS (GMSK, 4 TX slot)	29.08	28.93	28.92	26.22	26.61	27.15
EGPRS (8PSK, 1 TX slot)	30.39	30.26	30.00	24.69	24.93	25.16
EGPRS (8PSK, 2 TX slot)	29.04	28.79	28.71	22.92	23.13	23.45
EGPRS (8PSK, 3 TX slot)	26.86	26.76	26.27	20.67	20.95	20.82
EGPRS (8PSK, 4 TX slot)	25.22	25.03	24.77	18.54	18.73	18.99

Conducted Power (dBm)			
Band	WCDMA Band II		
Channel	9262	9400	9538
Frequency	1852.4	1880.0	1907.6
RMC 12.2Kbps	23.59	23.64	23.35
HSDPA Subtest-1	22.55	22.58	22.43
HSDPA Subtest-2	21.81	21.54	21.66
HSDPA Subtest-3	21.83	21.74	21.80
HSDPA Subtest-4	21.67	21.60	21.62
HSUPA Subtest-1	22.70	22.55	22.41
HSUPA Subtest-2	21.89	21.53	21.79
HSUPA Subtest-3	21.76	21.45	21.58
HSUPA Subtest-4	21.55	21.49	21.53
HSUPA Subtest-5	21.65	21.59	21.62
AMR	22.78	22.86	22.49

7.2 Configuration of Tested System



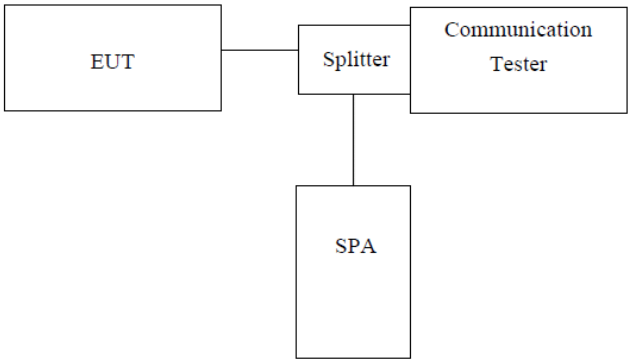
7.3 Conducted Peak Output Power

Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1046
Limit:	GSM850,: 7W PCS1900, WCDMA Band V: 2W
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst average power.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

EUT Mode	Channel	Frequency (MHz)	PK power (dBm)	Limit (dBm)	Result
GSM 850 (GSM link)	128	824.20	32.66	38.45	Pass
	190	836.60	32.56		
	251	848.80	32.54		
GSM 850 (GPRS 1 link)	128	824.20	32.62	38.45	Pass
	190	836.60	32.52		
	251	848.80	32.49		
GSM 850 (EGPRS 1 link)	128	824.20	30.39	38.45	Pass
	190	836.60	30.26		
	251	848.80	30.00		
PCS 1900 (GSM link)	512	1850.20	29.75	33.01	Pass
	661	1880.00	29.83		
	810	1909.80	29.98		
PCS 1900 (GPRS 1 link)	512	1850.20	29.69	33.01	Pass
	661	1880.00	29.76		
	810	1909.80	29.94		
PCS 1900 (EGPRS 1 link)	512	1850.20	24.69	33.01	Pass
	661	1880.00	24.93		
	810	1909.80	25.16		
WCDMA Band II (RMC 12.2Kbps link)	9262	1852.4	23.59	33.01	Pass
	9400	1880.0	23.64		
	9538	1907.6	23.35		

7.4 Occupy Bandwidth

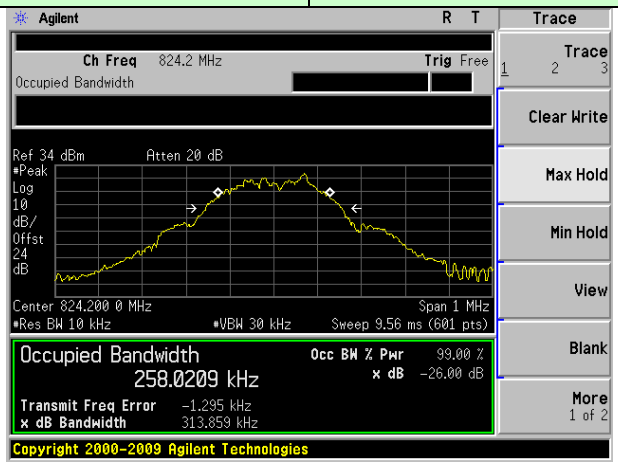
Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1049
Test setup:	 ***Note:*** *Measurement setup for testing on Antenna connector*
Test Procedure:	1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of emission BW, VBW= 3 times RBW. 3. -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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

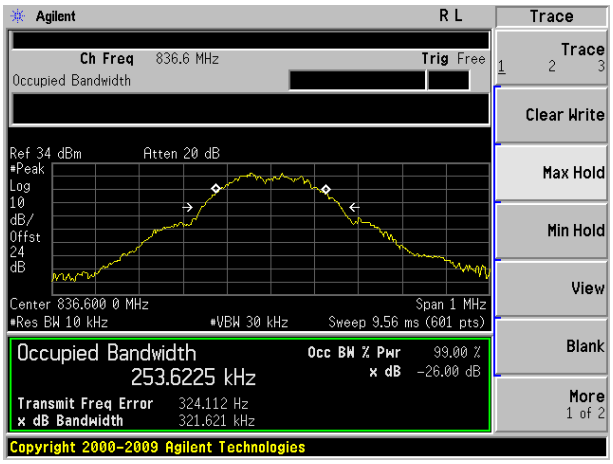
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GSM link)	128	824.20	258.021	313.859
	190	836.60	253.623	321.621
	251	848.80	246.482	311.795
GSM 850 (GPRS 1 link)	128	824.20	253.655	329.048
	190	836.60	257.101	331.165
	251	848.80	242.166	331.524
GSM 850 (EGPRS 1 link)	128	824.20	258.721	290.742
	190	836.60	253.915	284.001
	251	848.80	251.514	284.850
PCS 1900 (GSM link)	512	1850.20	260.773	340.580
	661	1880.00	237.471	313.630
	810	1909.80	250.023	324.669
PCS 1900 (GPRS 1 link)	512	1850.20	253.371	323.458
	661	1880.00	243.399	317.601
	810	1909.80	243.053	321.022
PCS 1900 (EGPRS 1 link)	512	1850.20	244.219	309.948
	661	1880.00	260.901	322.468
	810	1909.80	245.671	323.481
WCDMA Band II (RMC 12.2Kbps link)	9262	1852.40	4163.20	4752.00
	9400	1880.00	4144.00	4693.00
	9538	1907.60	4162.10	4711.00

Test plot as follows:

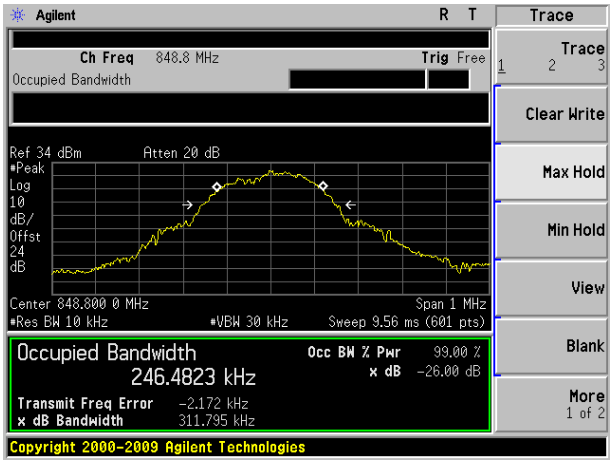
Test band:	GSM 850 (GSM link)



Lowest channel

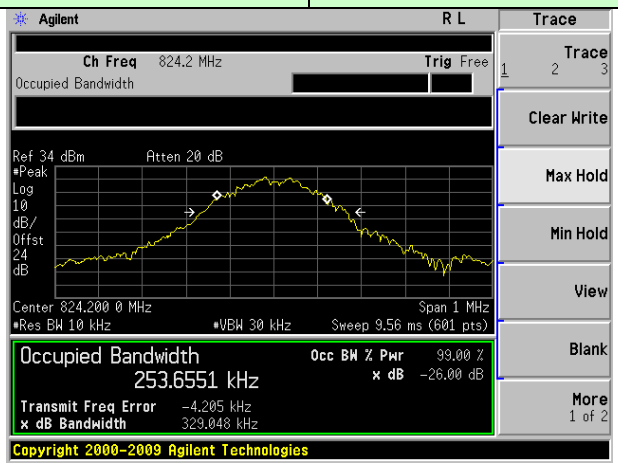


Middle channel

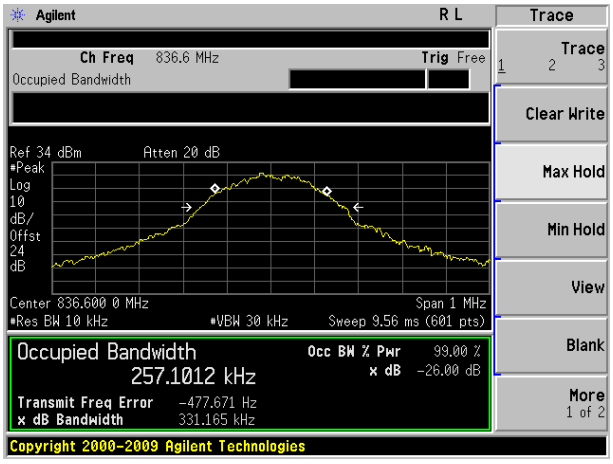


Highest channel

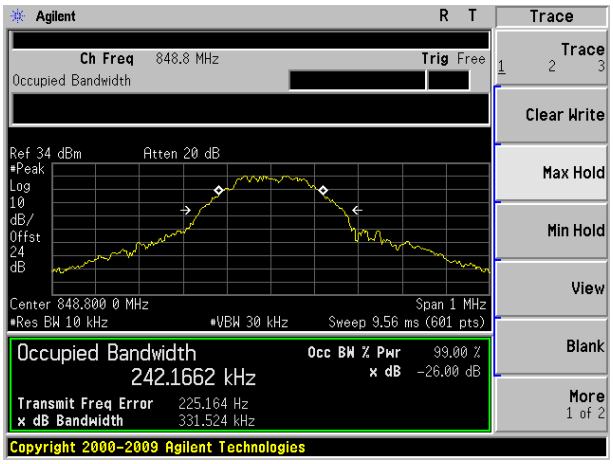
Test band:	GSM 850 (GPRS 1 link)



Lowest channel

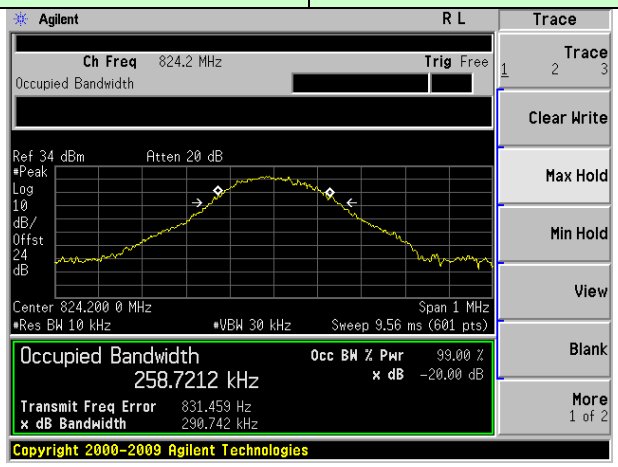


Middle channel

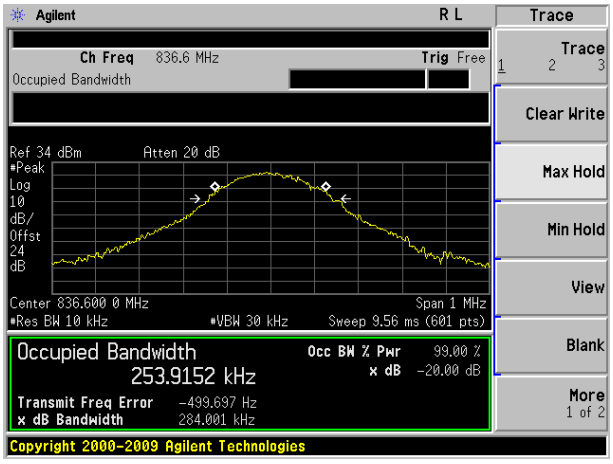


Highest channel

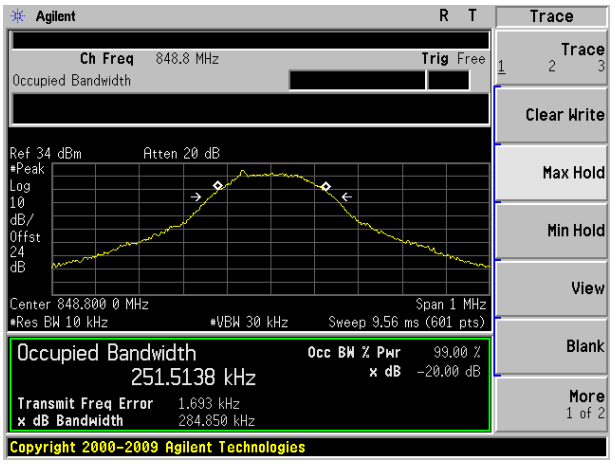
Test band:	GSM 850 (EGPRS 1 link)



Lowest channel

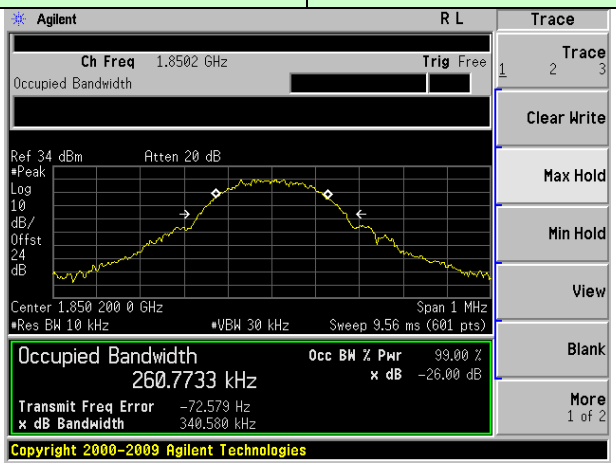


Middle channel

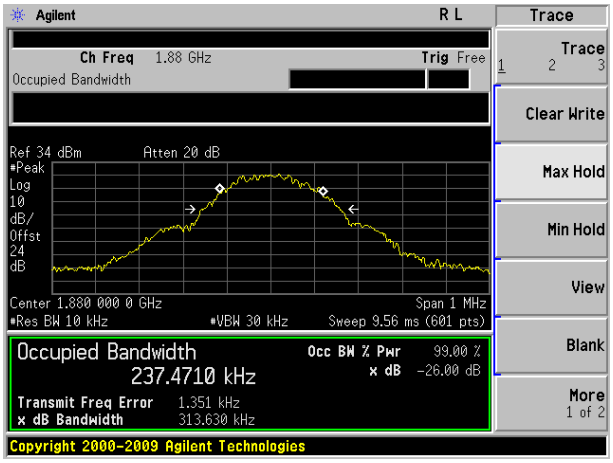


Highest channel

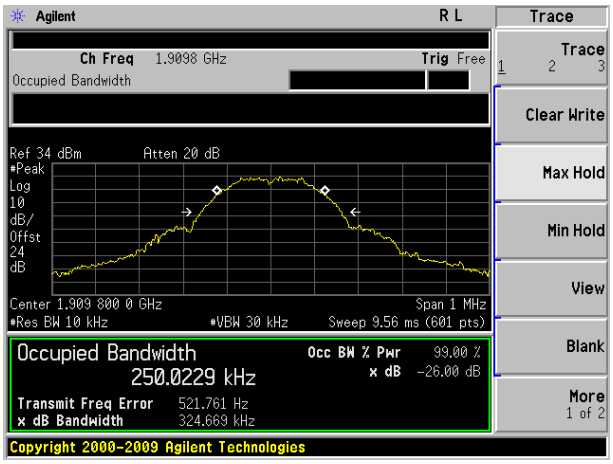
Test band:	PCS 1900 (GSM link)



Lowest channel

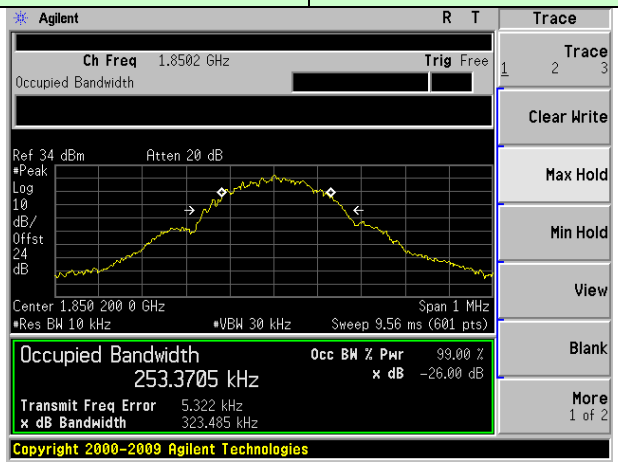


Middle channel

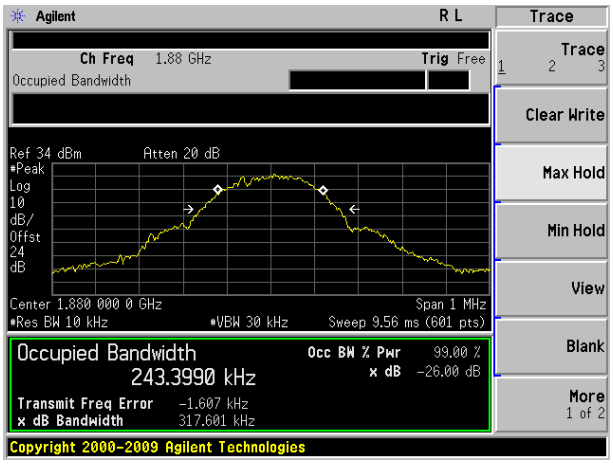


Highest channel

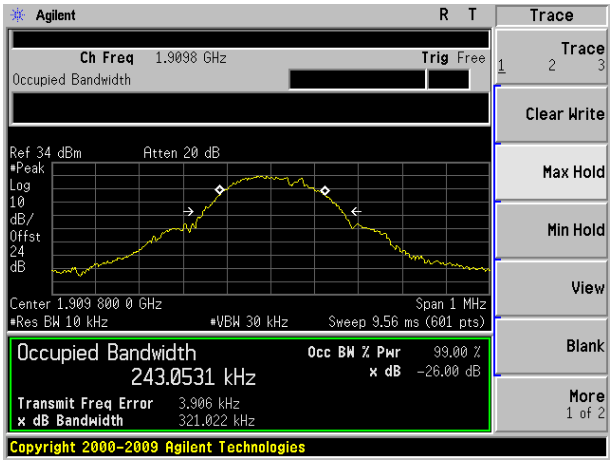
Test band:	PCS 1900 (GPRS 1 link)



Lowest channel

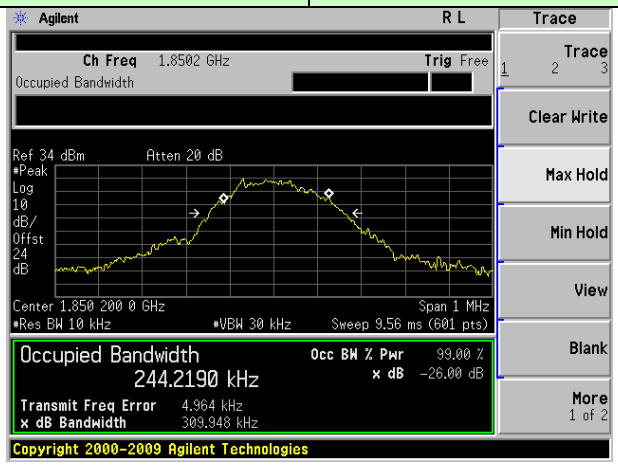


Middle channel

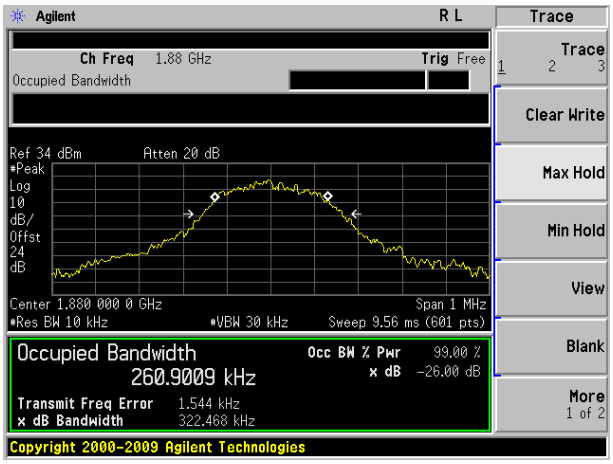


Highest channel

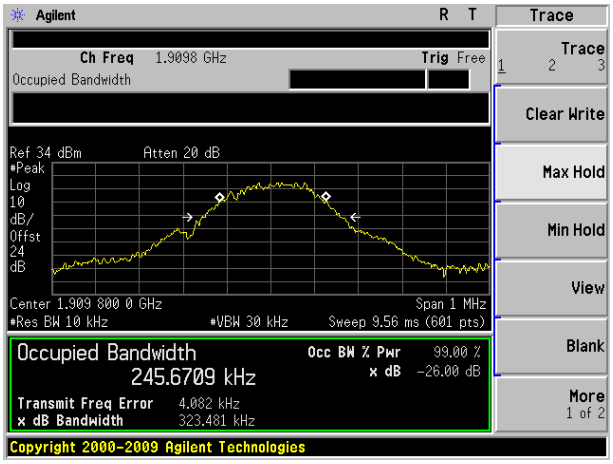
Test band:	PCS 1900 (EGPRS 1 link)



Lowest channel

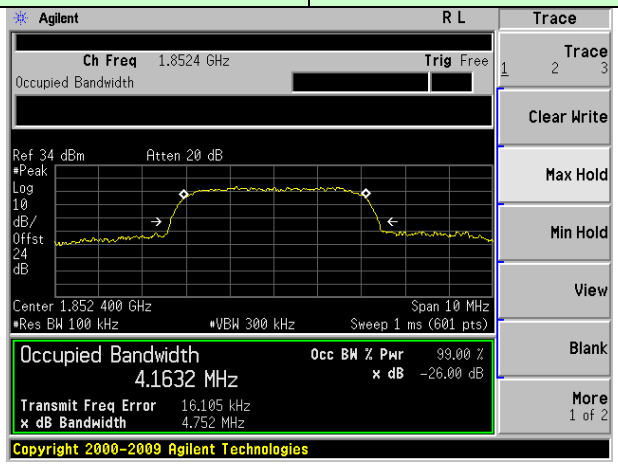


Middle channel

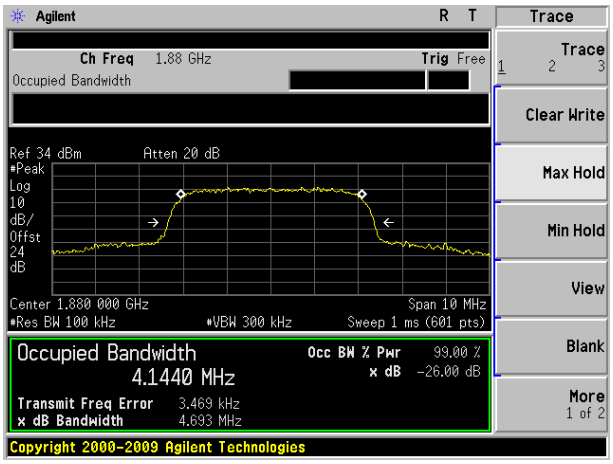


Highest channel

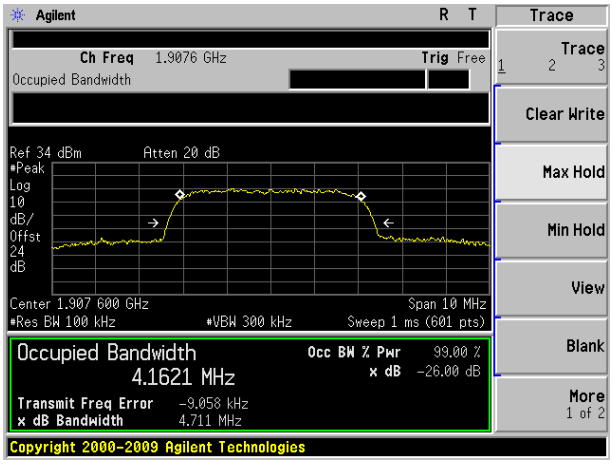
Test band:	WCDMA Band II (RMC 12.2Kbps link)



Lowest channel



Middle channel

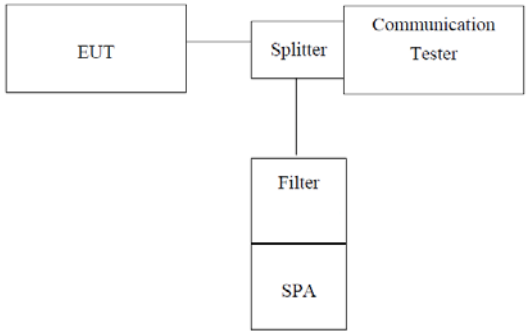


Highest channel

7.5 MODULATION CHARACTERISTIC

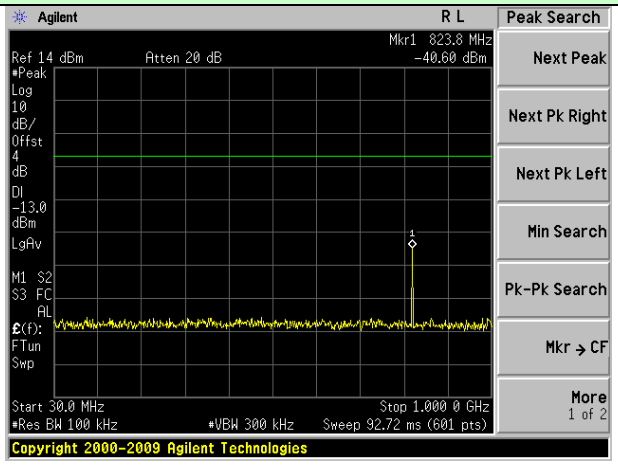
According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

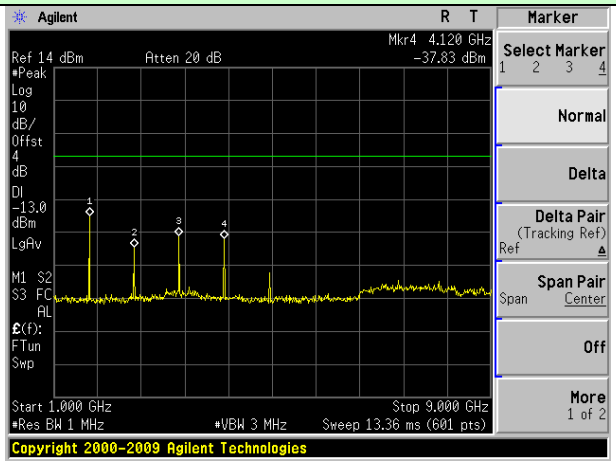
7.6 Out of band emission at antenna terminals

Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC part2.1051
Limit:	-13dBm
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 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. 3 For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic. 4 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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

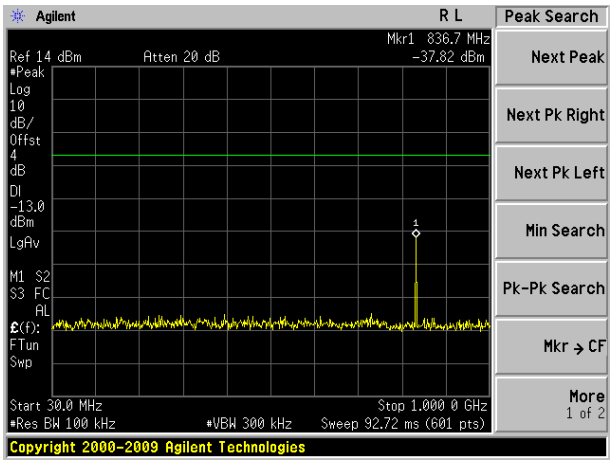
Test plot as follows:

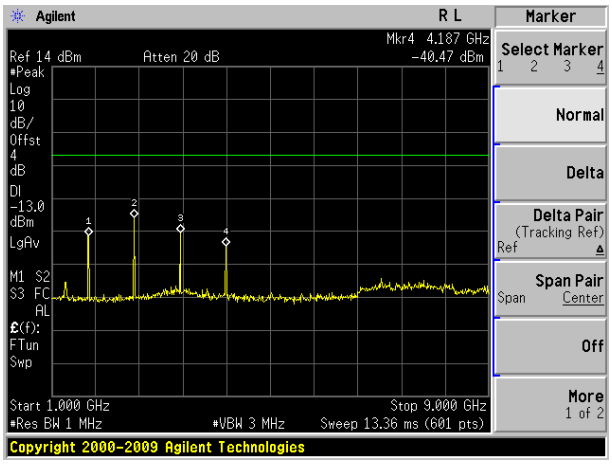
Test Mode: Traffic mode	GSM 850 (GSM link)



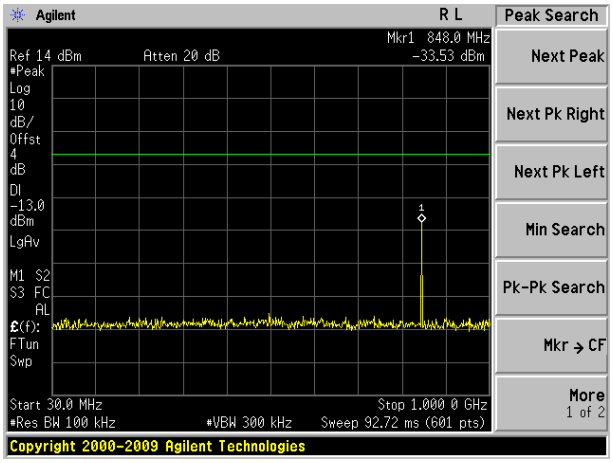


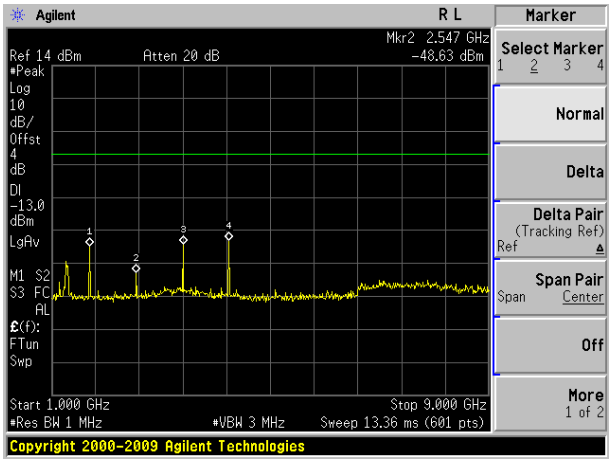
Lowest channel





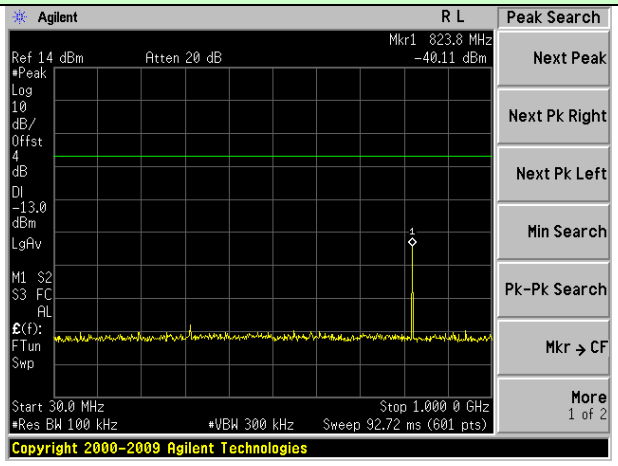
Middle channel

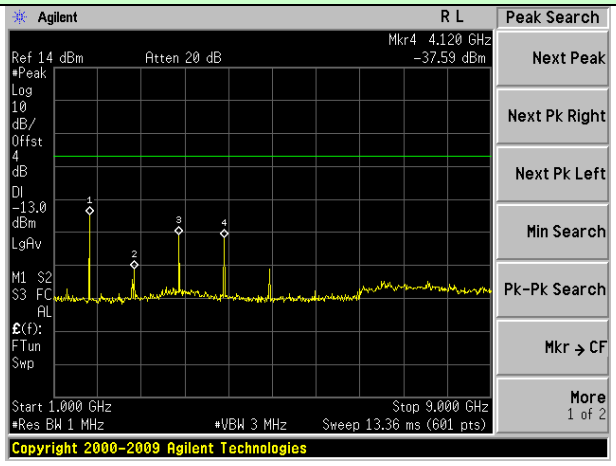




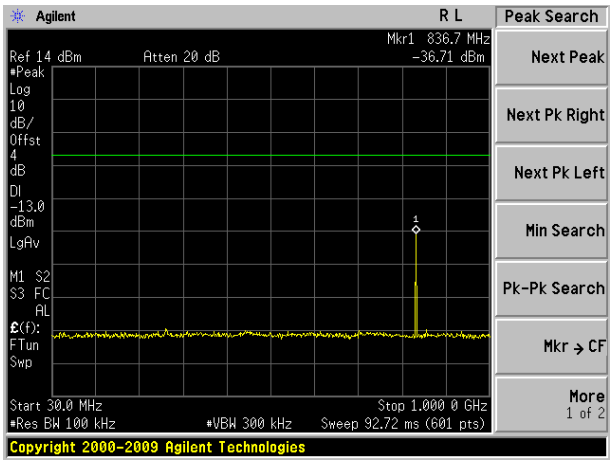
Highest channel

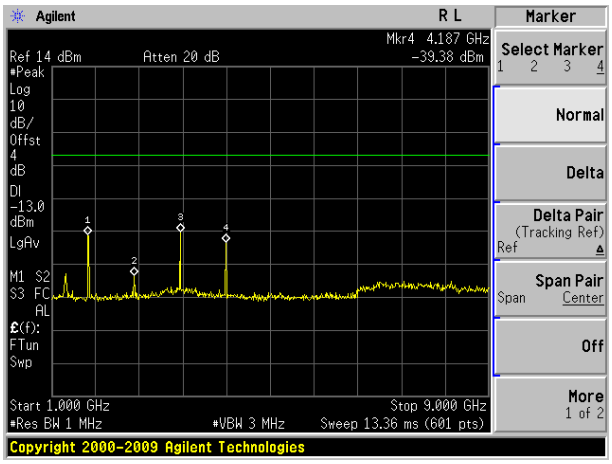
Test Mode: Traffic mode	GSM 850 (GPRS 1 link)



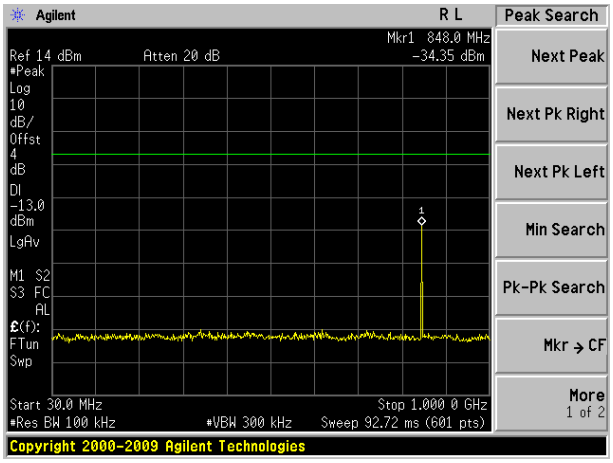


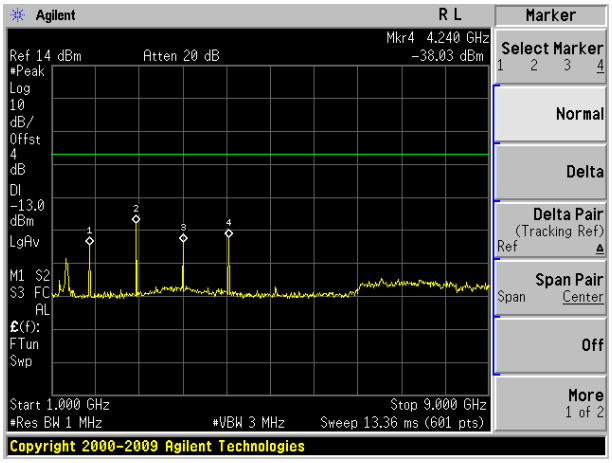
Lowest channel





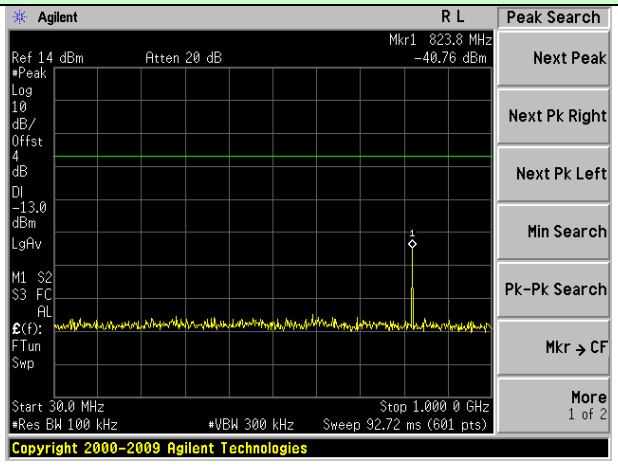
Middle channel

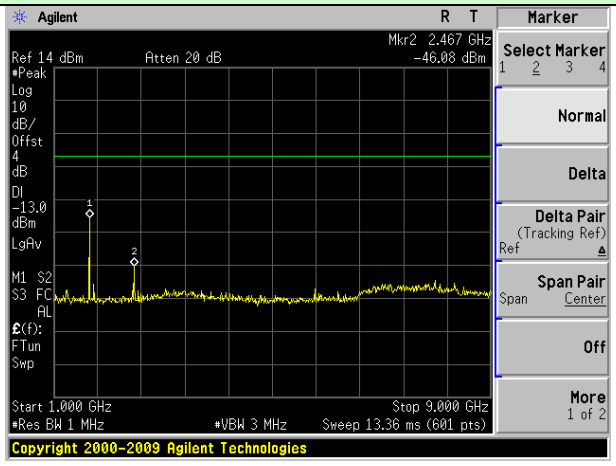




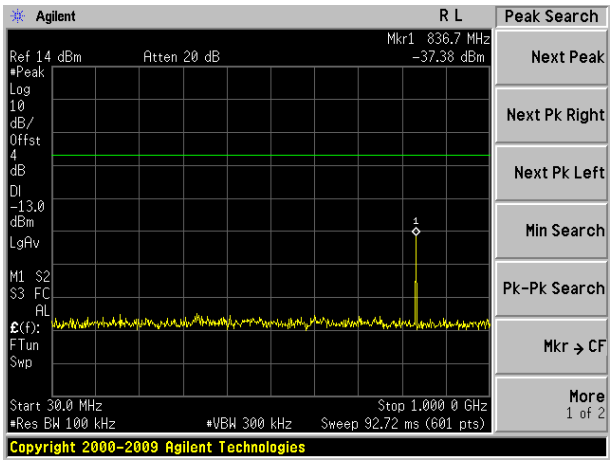
Highest channel

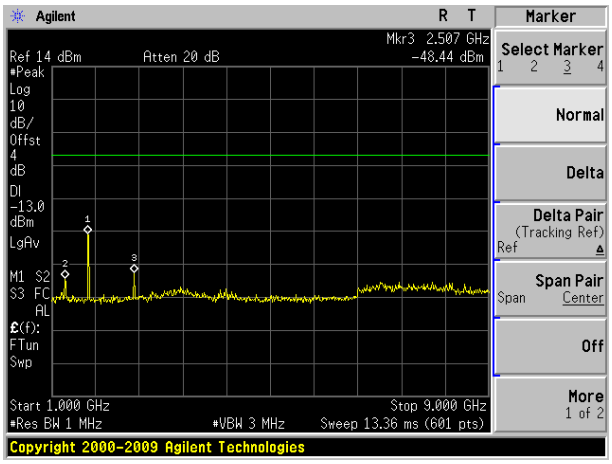
Test Mode: Traffic mode	GSM 850 (EGPRS 1 link)



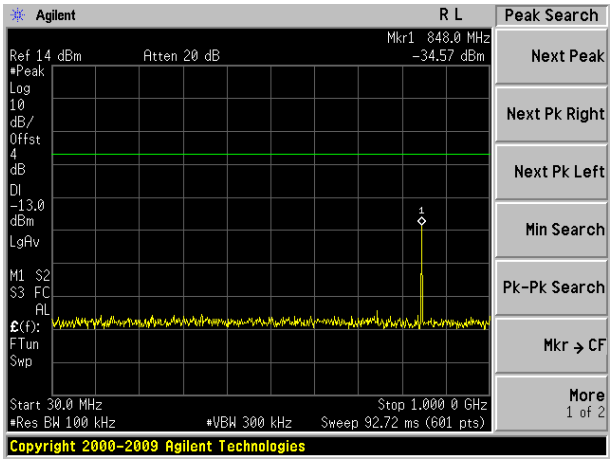


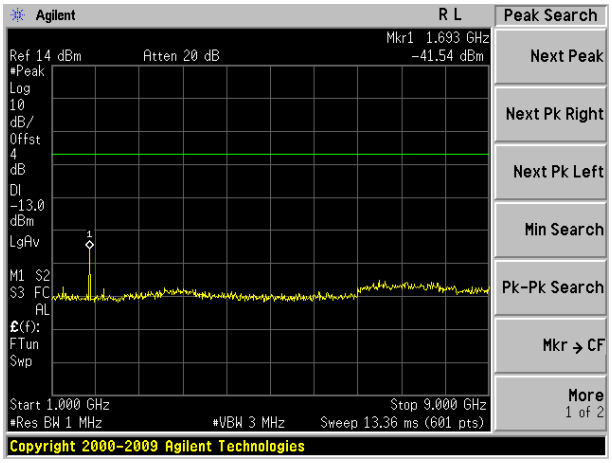
Lowest channel





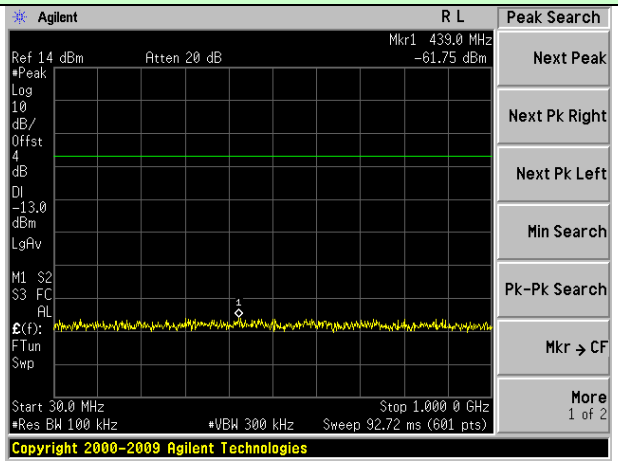
Middle channel

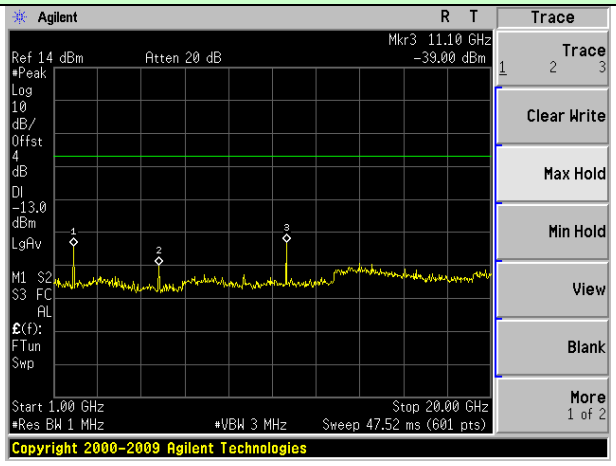




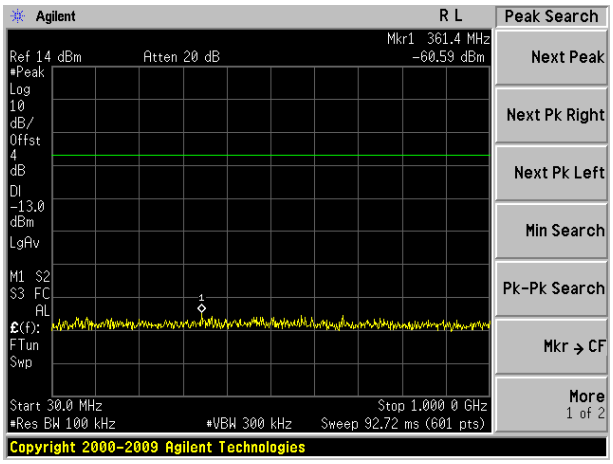
Highest channel

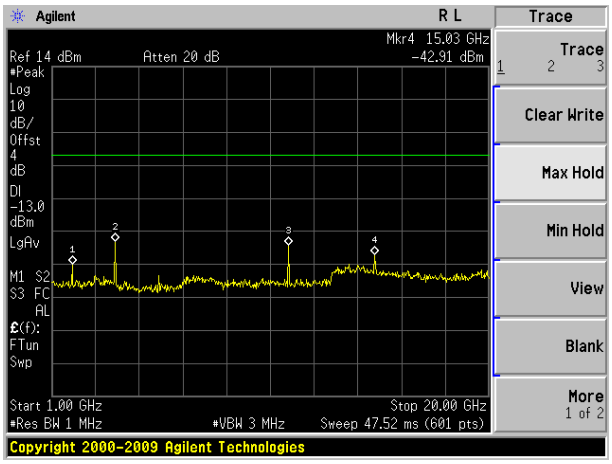
Test Mode: Traffic mode	PCS1900 (GSM link)



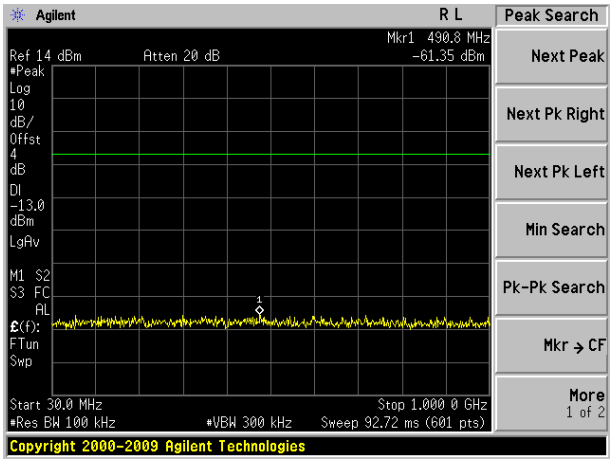


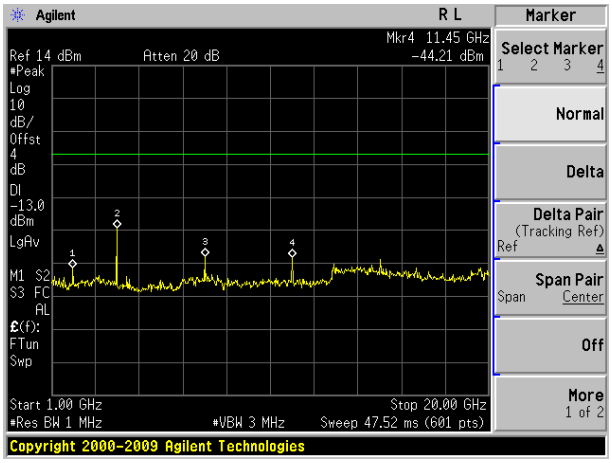
Lowest channel





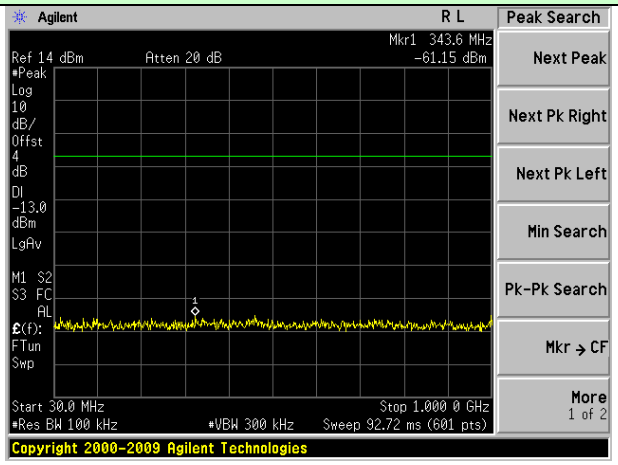
Middle channel

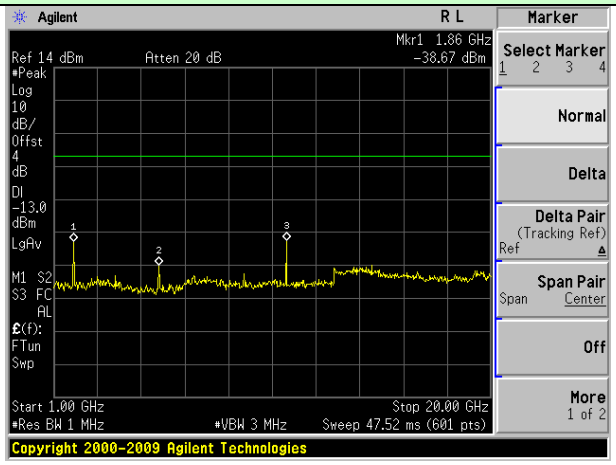




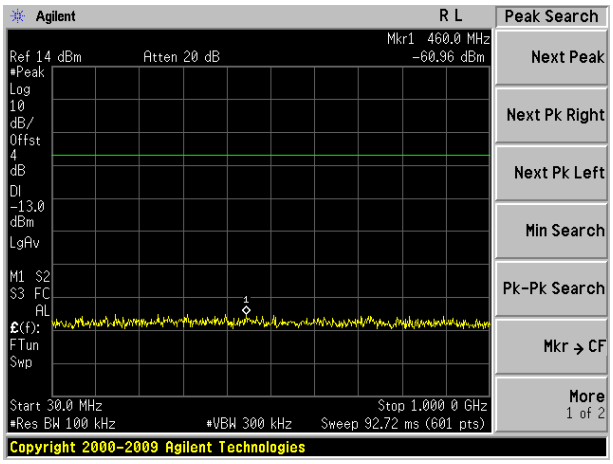
Highest channel

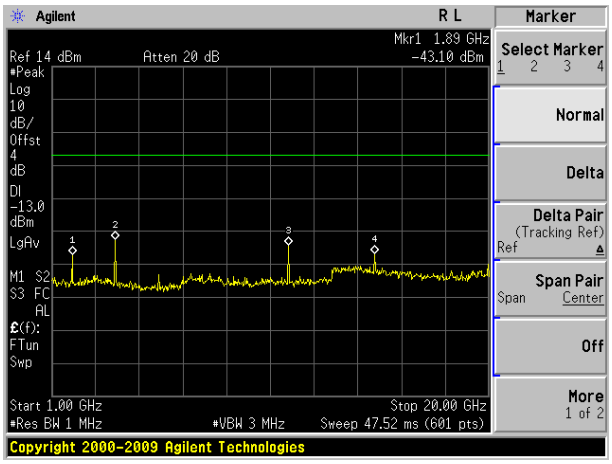
Test Mode: Traffic mode	PCS1900 (GPRS 1 link)



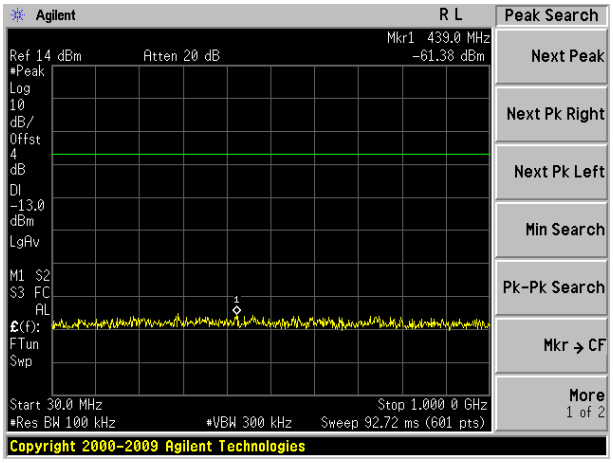


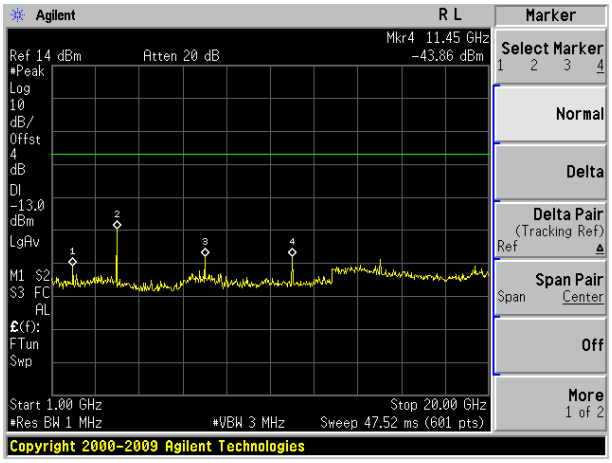
Lowest channel





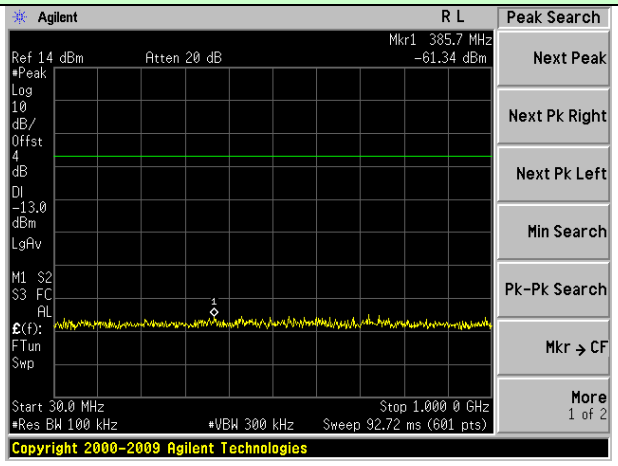
Middle channel

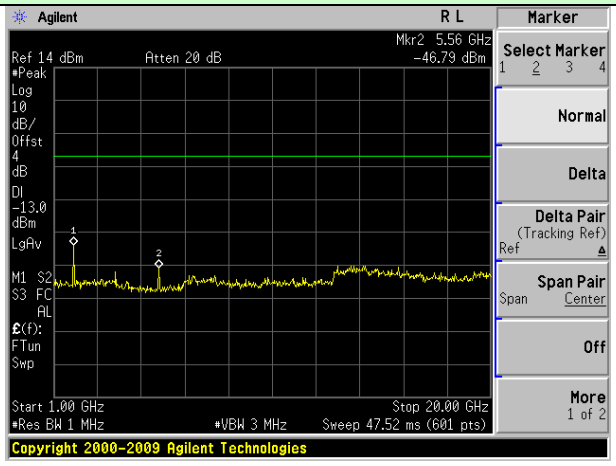




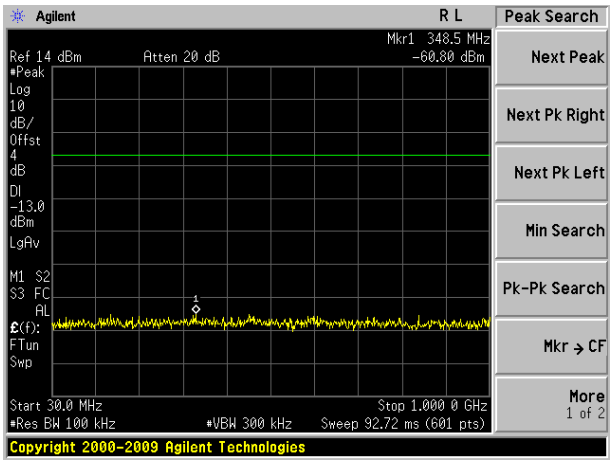
Highest channel

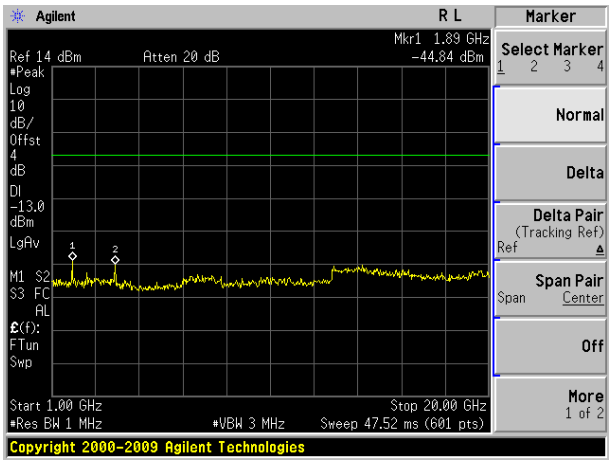
Test Mode: Traffic mode	PCS1900 (EGPRS 1 link)



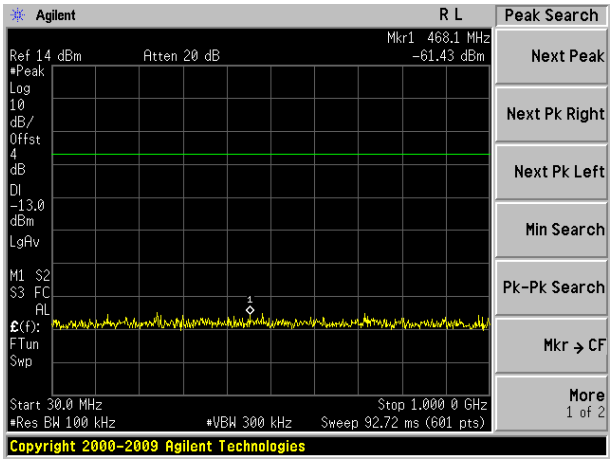


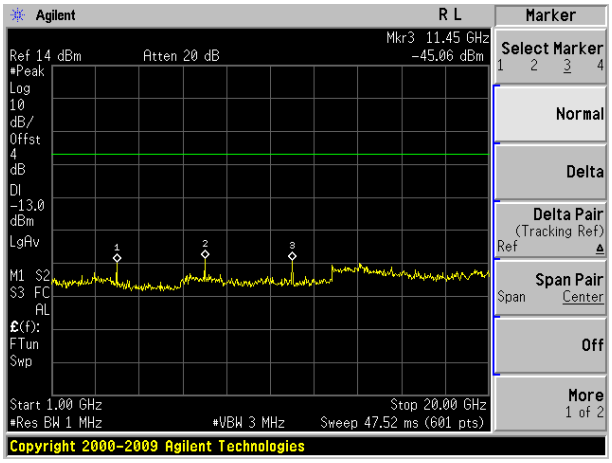
Lowest channel





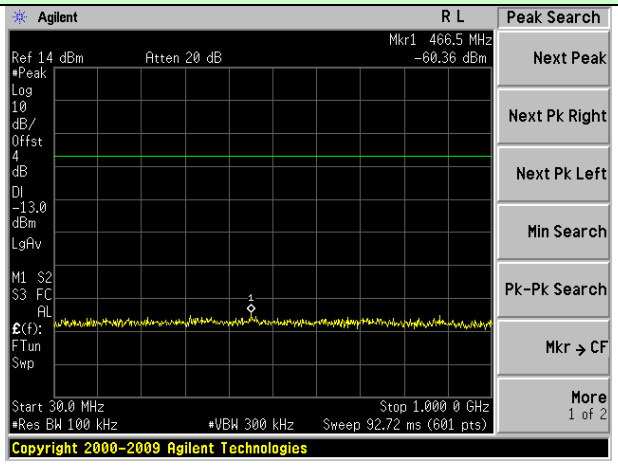
Middle channel

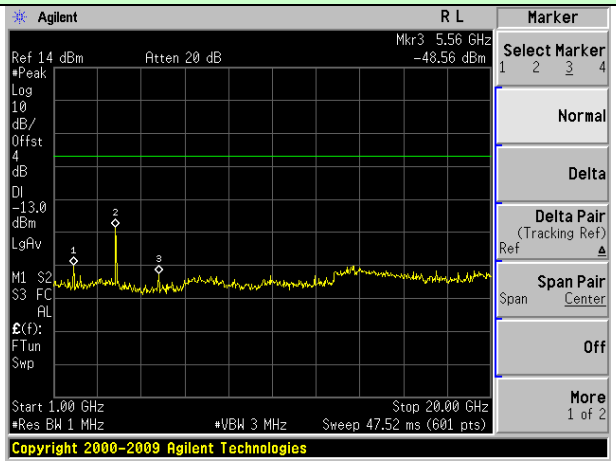




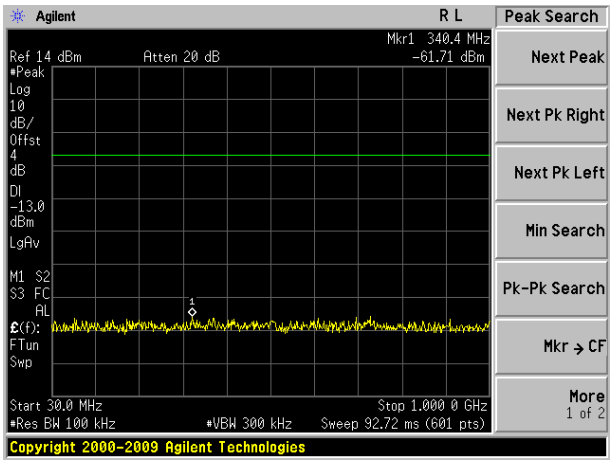
Highest channel

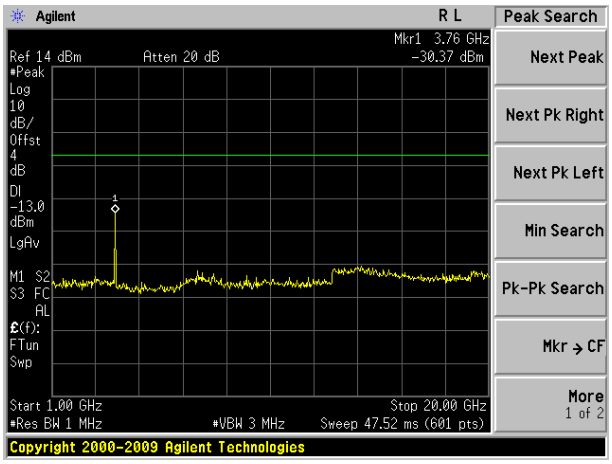
Test Mode: Traffic mode	WCDMA Band II (RMC 12.2Kbps link)



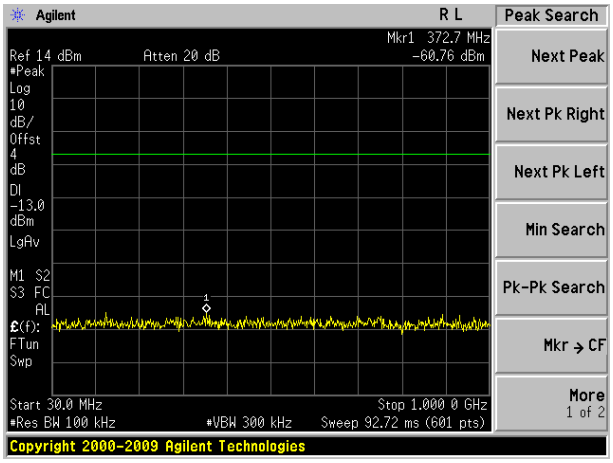


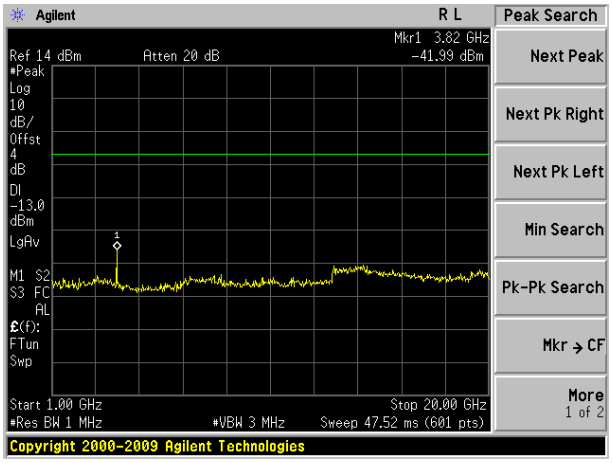
Lowest channel





Middle channel

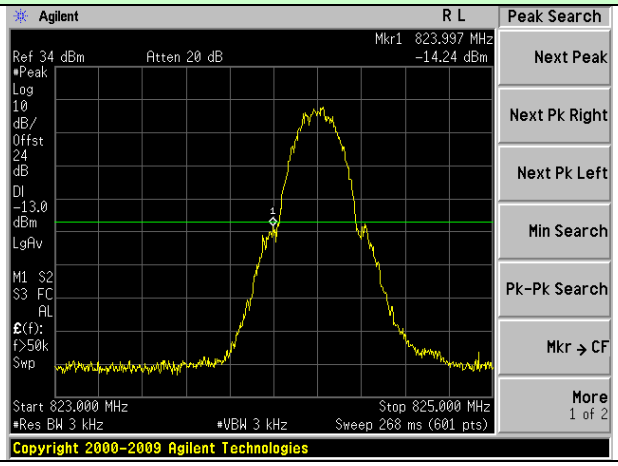




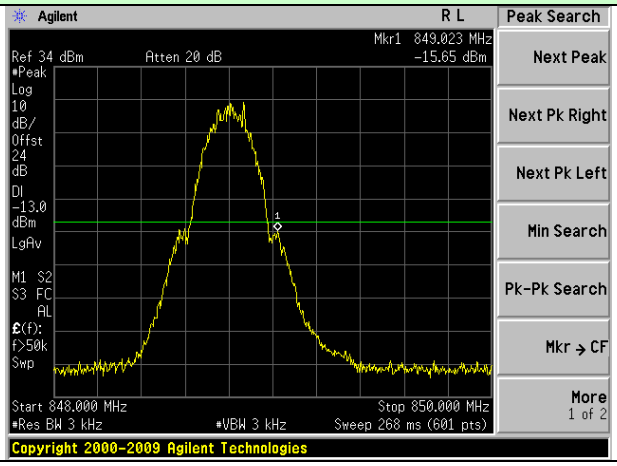
Highest channel

Band Edge:

Test Mode: Traffic mode	GSM850 (GSM link)

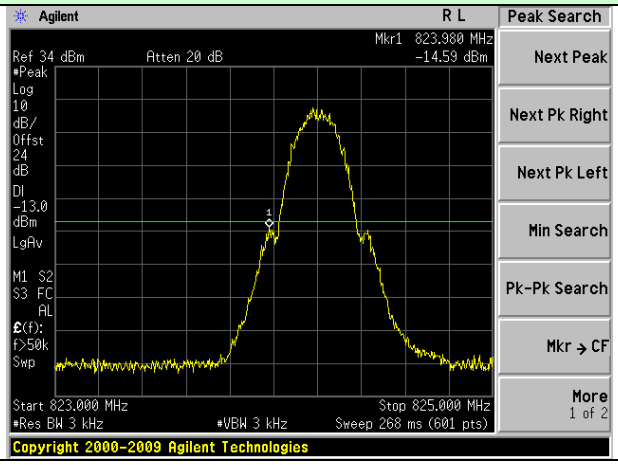


Lowest channel

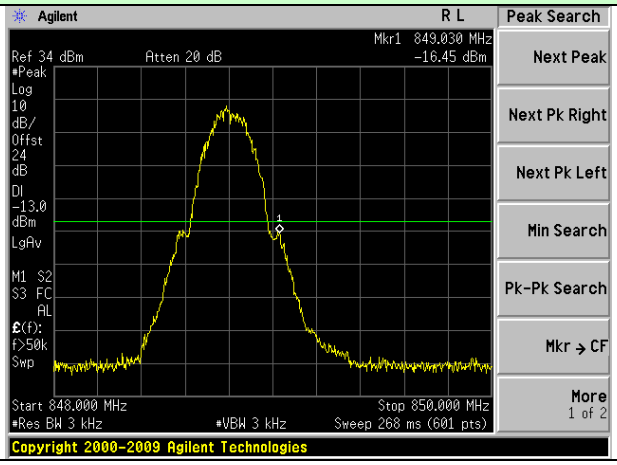


Highest channel

Test Mode: Traffic mode	GSM850 (GPRS 1 link)

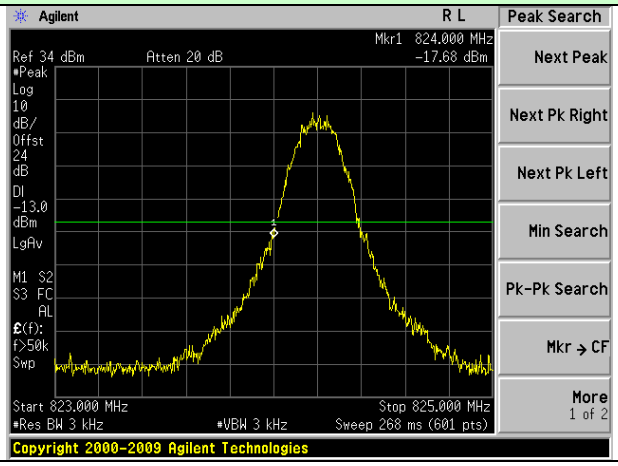


Lowest channel

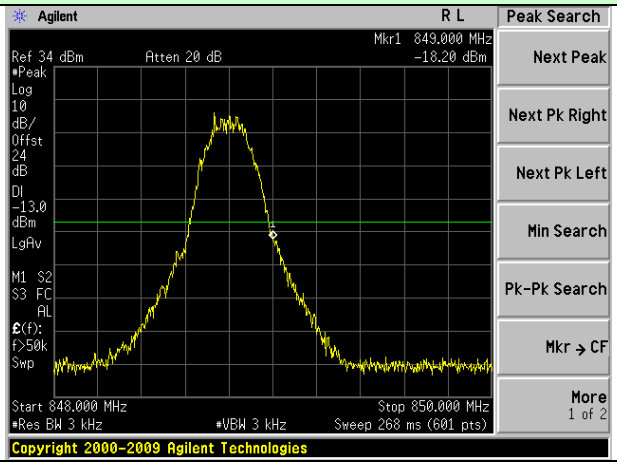


Highest channel

Test Mode: Traffic mode	GSM850 (EGPRS 1 link)

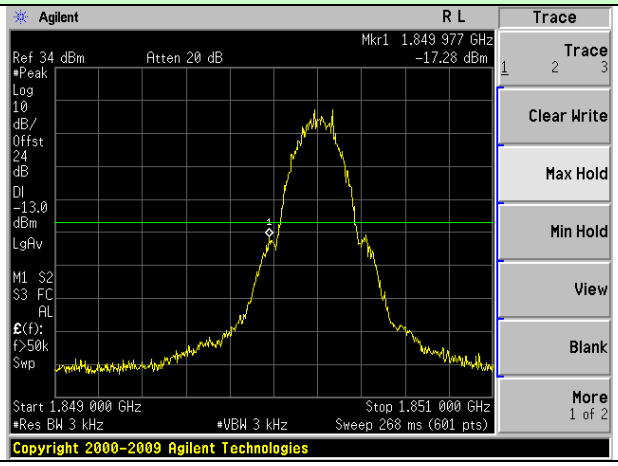


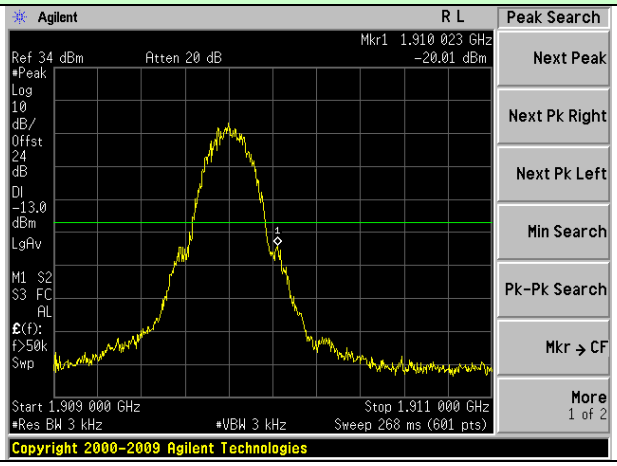
Lowest channel



Highest channel

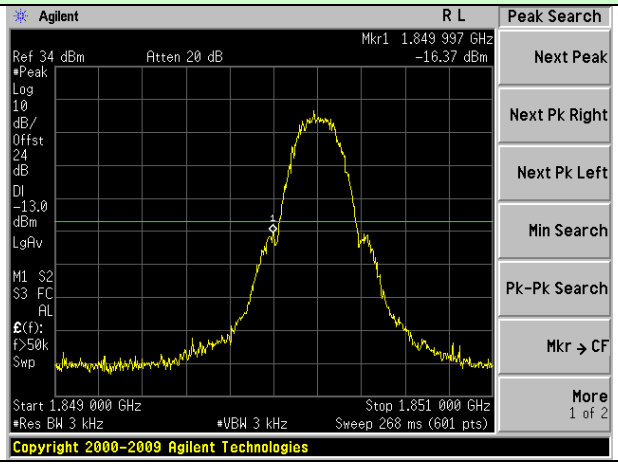
Test Mode: Traffic mode	PCS1900 (GSM link)

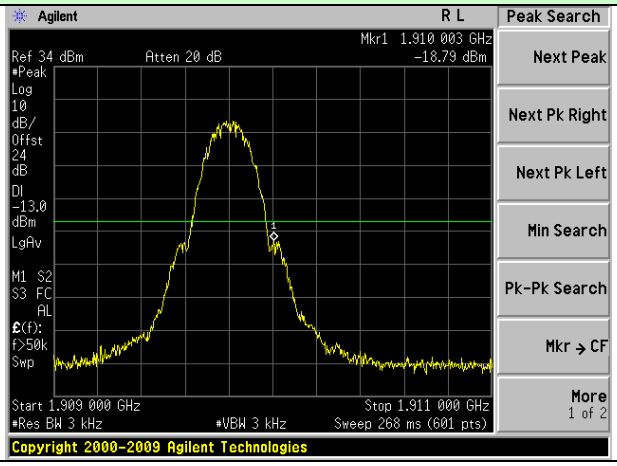




Lowest channel | Highest channel

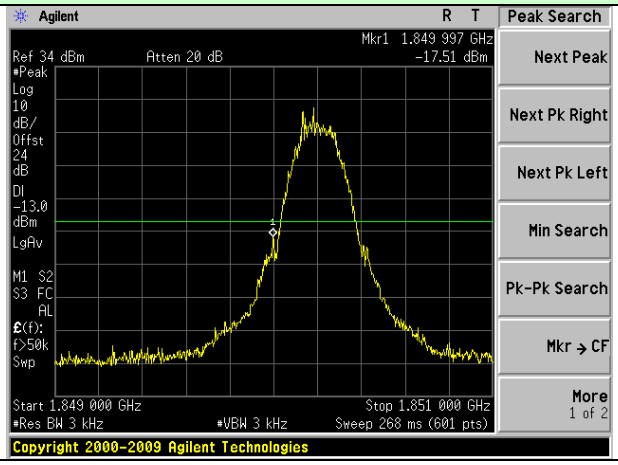
Test Mode: Traffic mode	PCS1900 (GPRS 1 link)

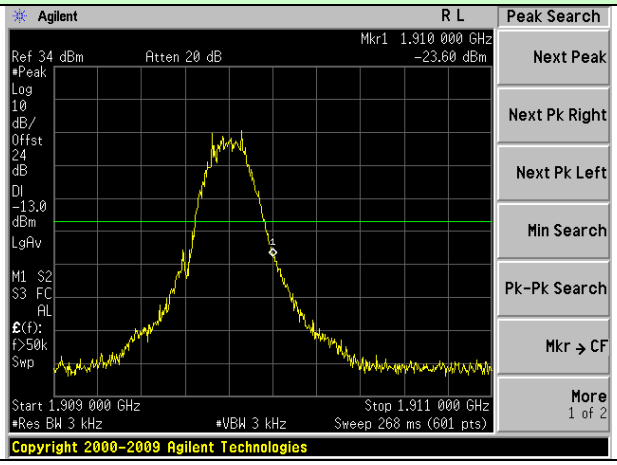




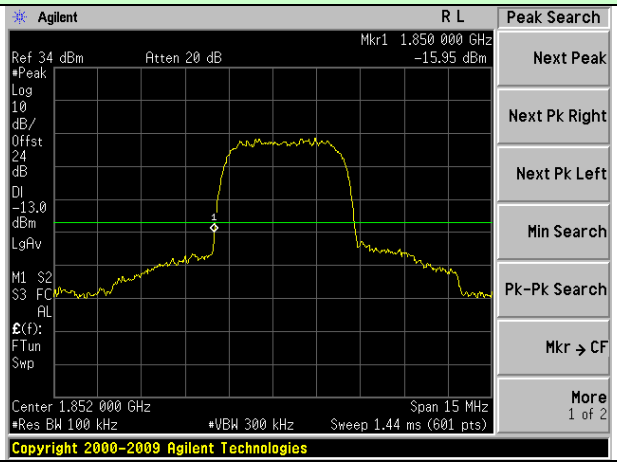
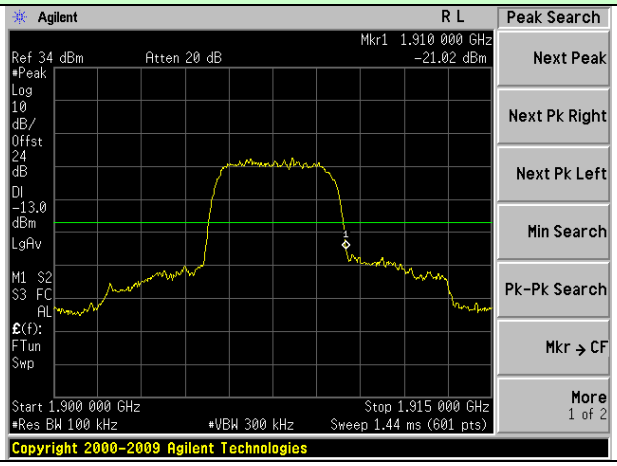
Lowest channel | Highest channel

Test Mode: Traffic mode	PCS1900 (EGPRS 1 link)

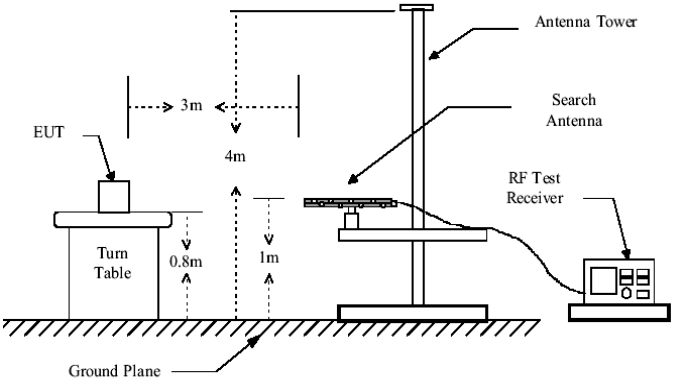
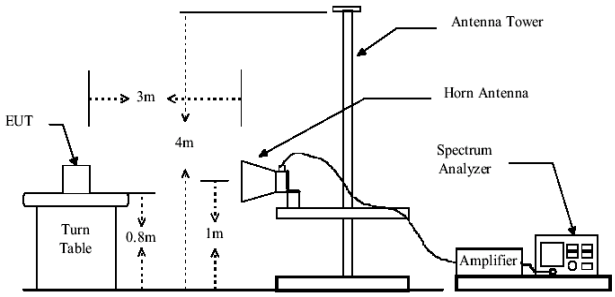
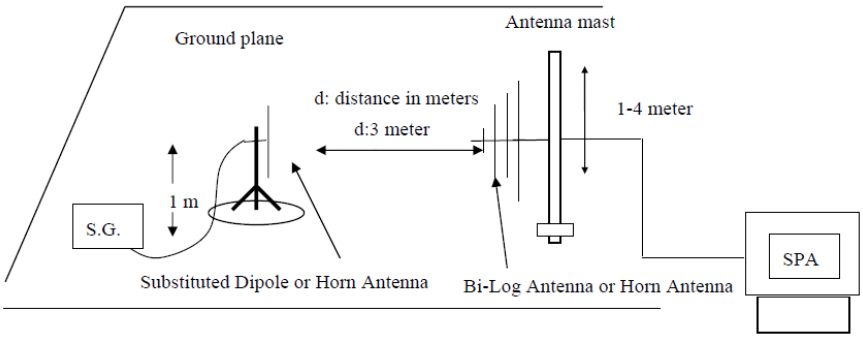




Lowest channel | Highest channel

Test Mode: Traffic mode	WCDMA Band II (RMC 12.2Kbps link)
	
Lowest channel	Highest channel

7.7 ERP, EIRP Measurement

Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1046
Limit:	GSM850 7W ERP PCS1900 2W EIRP
Test setup:	Below 1GHz  Above 1GHz  Substituted method: 

Test Procedure:	1. 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. 2. 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. 3. 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 asfollows: ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB) 4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows: EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB)
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (GSM link)	Lowest	H	V	31.65	38.45	Pass
			H	28.49		
		E1	V	23.09		
			H	28.58		
		E2	V	22.07		
			H	26.12		
	Middle	H	V	31.39	38.45	Pass
			H	28.14		
		E1	V	22.81		
			H	28.34		
		E2	V	23.63		
			H	26.60		
	Highest	H	V	31.82	38.45	Pass
			H	28.02		
		E1	V	22.92		
			H	27.40		
		E2	V	22.06		
			H	27.40		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (GPRS 1 link)	Lowest	H	V	31.13	38.45	Pass
			H	27.93		
		E1	V	22.48		
			H	27.93		
		E2	V	21.38		
			H	25.38		
	Middle	H	V	30.71	38.45	Pass
			H	27.37		
		E1	V	21.99		
			H	27.47		
		E2	V	22.87		
			H	25.79		
	Highest	H	V	31.16	38.45	Pass
			H	27.31		
		E1	V	22.17		
			H	26.61		
		E2	V	21.47		
			H	26.76		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (EGPRS 1 link)	Lowest	H	V	27.70	38.45	Pass
			H	24.69		
		E1	V	19.34		
			H	25.25		
		E2	V	18.76		
			H	23.19		
	Middle	H	V	28.06	38.45	Pass
			H	25.24		
		E1	V	20.04		
			H	25.99		
		E2	V	20.53		
			H	23.83		
	Highest	H	V	28.27	38.45	Pass
			H	24.58		
		E1	V	19.55		
			H	24.41		
		E2	V	17.84		
			H	23.60		

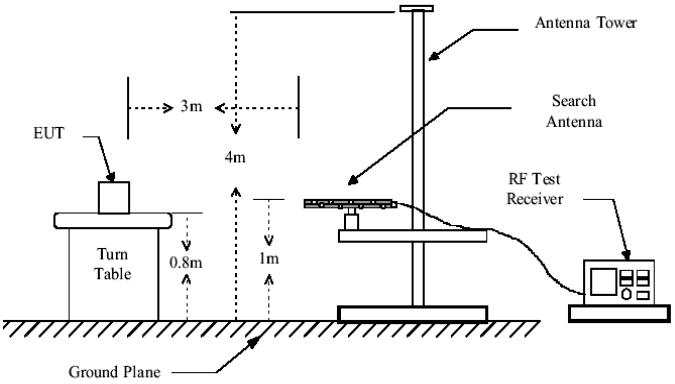
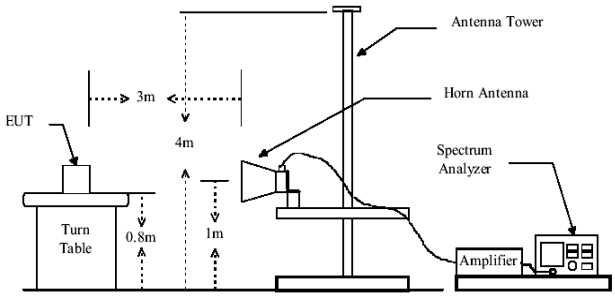
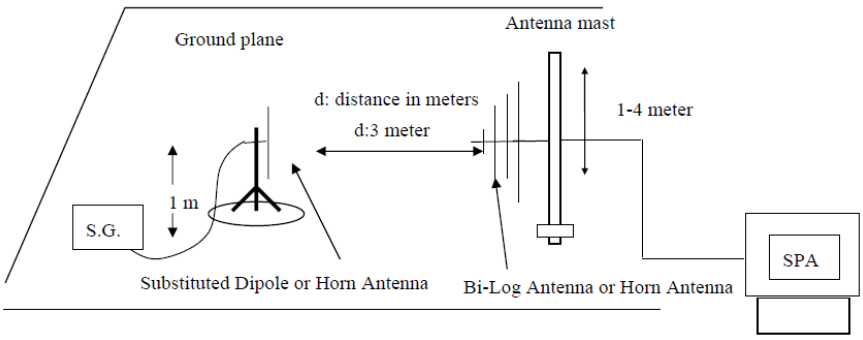
EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (GSM link)	Lowest	H	V	28.29	33.01	Pass
			H	25.50		
		E1	V	20.71		
			H	25.68		
		E2	V	19.89		
			H	23.56		
	Middle	H	V	28.27	33.01	Pass
			H	25.47		
		E1	V	20.76		
			H	25.76		
		E2	V	21.41		
			H	24.12		
	Highest	H	V	28.75	33.01	Pass
			H	25.38		
		E1	V	20.87		
			H	24.92		
		E2	V	19.94		
			H	24.77		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (GPRS 1 link)	Lowest	H	V	27.77	33.01	Pass
			H	24.94		
		E1	V	20.10		
			H	25.03		
		E2	V	19.19		
			H	22.83		
	Middle	H	V	27.60	33.01	Pass
			H	24.69		
		E1	V	19.93		
			H	24.89		
		E2	V	20.65		
			H	23.31		
	Highest	H	V	28.09	33.01	Pass
			H	24.68		
		E1	V	20.12		
			H	24.13		
		E2	V	19.34		
			H	24.13		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (EGPRS 1 link)	Lowest	H	V	23.24	33.01	Pass
			H	18.70		
		E1	V	12.74		
			H	18.50		
		E2	V	11.36		
			H	15.57		
	Middle	H	V	21.41	33.01	Pass
			H	17.59		
		E1	V	11.69		
			H	17.48		
		E2	V	12.77		
			H	15.83		
	Highest	H	V	21.86	33.01	Pass
			H	17.62		
		E1	V	12.01		
			H	16.68		
		E2	V	11.59		
			H	17.20		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
WCDMA Band II	Lowest	H	V	22.76	33.01	Pass
			H	20.53		
		E1	V	16.87		
			H	20.17		
		E2	V	15.80		
			H	18.19		
	Middle	H	V	22.00	33.01	Pass
			H	19.46		
		E1	V	15.80		
			H	19.12		
		E2	V	16.62		
			H	18.31		
	Highest	H	V	20.94	33.01	Pass
			H	18.31		
		E1	V	14.83		
			H	17.49		
		E2	V	15.02		
			H	18.22		

7.8 Field strength of spurious radiation measurement

Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC part2.1053
Limit:	-13dBm
Test setup:	Below 1GHz  Above 1GHz  Substituted method: 

Test Procedure:	1. 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. 2. 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. 3. 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. 4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB)
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

Test mode:	GSM850		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1648.40	Vertical	-34.41	-13.00	Pass
2472.60	V	-37.22		
3296.80	V	-39.55		
4121.00	V	-41.74		
4945.20	V	---		
1648.40	Horizontal	-39.77	-13.00	Pass
2472.60	H	-43.73		
3296.80	H	-45.37		
4121.00	H	-48.20		
4945.20	H	---		
Test mode:	**GSM850**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.20	Vertical	-36.06	-13.00	Pass
2509.80	V	-38.40		
3346.40	V	-40.35		
4183.00	V	-42.17		
5019.60	V	---		
1673.20	Horizontal	-40.53	-13.00	Pass
2509.80	H	-43.83		
3346.40	H	-45.20		
4183.00	H	-47.55		
5019.60	H	---		
Test mode:	**GSM850**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1697.60	Vertical	-36.53	-13.00	Pass
2546.40	V	-38.60		
3395.20	V	-40.32		
4244.00	V	-41.95		
5092.80	V	---		
1697.60	Horizontal	-40.49	-13.00	Pass
2546.40	H	-43.43		
3395.20	H	-44.63		
4244.00	H	-46.72		
5092.80	H	---		

Remark：

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

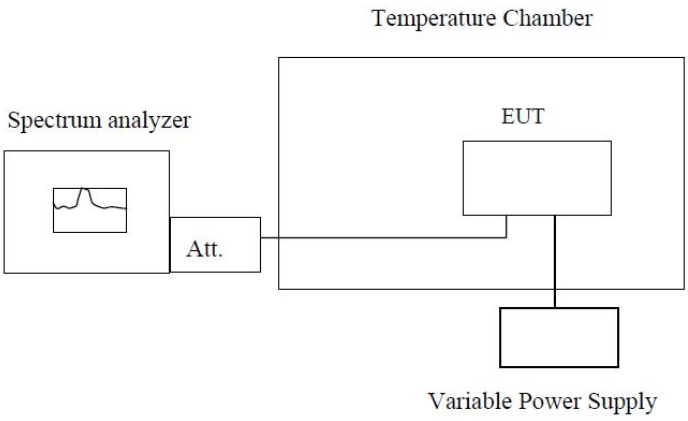
Test mode:	PCS1900		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3700.40	Vertical	-36.78	-13.00	Pass
5550.60	V	-39.17		
7400.80	V	-41.16		
9251.00	V	-43.06		
11101.20	V	---		
3700.40	Horizontal	-41.38	-13.00	Pass
5550.60	H	-44.77		
7400.80	H	-46.13		
9251.00	H	-48.51		
11101.20	H	---		
Test mode:	**PCS1900**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-34.36	-13.00	Pass
5640.00	V	-36.84		
7520.00	V	-38.89		
9400.00	V	-40.87		
11280.00	V	---		
3760.00	Horizontal	-39.13	-13.00	Pass
5640.00	H	-42.63		
7520.00	H	-44.06		
9400.00	H	-46.54		
11280.00	H	---		
Test mode:	**PCS1900**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3819.60	Vertical	-35.61	-13.00	Pass
5729.40	V	-38.01		
7639.20	V	-40.00		
9549.00	V	-41.90		
11458.80	V	---		
3819.60	Horizontal	-40.22	-13.00	Pass
5729.40	H	-43.62		
7639.20	H	-44.99		
9549.00	H	-47.38		
11458.80	H	---		

Remark：
1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	WCDMA Band II		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3704.46	Vertical	-38.86	-13.00	Pass
5556.86	V	-41.94		
7409.26	V	-44.48		
9261.66	V	-46.94		
11114.4	V	---		
3704.46	Horizontal	-44.77	-13.00	Pass
5556.86	H	-49.12		
7409.26	H	-50.88		
9261.66	H	-53.95		
11114.4	H	---		
Test mode:	**WCDMA Band II**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3759.83	Vertical	-39.60	-13.00	Pass
5639.83	V	-42.53		
7519.83	V	-44.93		
9399.83	V	-47.26		
11280	V	---		
3759.83	Horizontal	-45.21	-13.00	Pass
5639.83	H	-49.34		
7519.83	H	-51.00		
9399.83	H	-53.91		
11280	H	---		
Test mode:	**WCDMA Band II**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3815.03	Vertical	-38.84	-13.00	Pass
5722.63	V	-41.57		
7630.23	V	-43.81		
9537.83	V	-45.99		
11445.6	V	---		
3815.03	Horizontal	-44.07	-13.00	Pass
5722.63	H	-47.92		
7630.23	H	-49.47		
9537.83	H	-52.17		
11445.6	H	---		

Remark：
1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

7.9 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part2.1055(a)(1)(b)
Test Method:	FCC Part2.1055(a)(1)(b)
Limit:	2.5ppm
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test procedure:	1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to –20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	34	0.0400	2.5	Pass
	-20	37	0.0445		
	-10	32	0.0385		
	0	27	0.0326		
	10	31	0.0371		
	20	27	0.0326		
	30	42	0.0505		
	40	39	0.0460		
	50	37	0.0445		

Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	53	0.0631	2.5	Pass
	-20	62	0.0738		
	-10	51	0.0609		
	0	44	0.0522		
	10	49	0.0591		
	20	42	0.0508		
	30	75	0.0896		
	40	65	0.0773		
	50	61	0.0728		

Reference Frequency: GSM850 (EGPRS 1 link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	29	0.0344	2.5	Pass
	-20	31	0.0371		
	-10	28	0.0331		
	0	26	0.0305		
	10	27	0.0318		
	20	24	0.0292		
	30	37	0.0436		
	40	32	0.0384		
	50	31	0.0371		

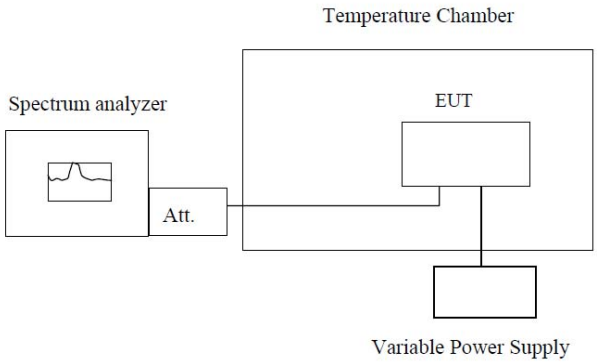
Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error			Result
		Hz	ppm		
3.70	-30	38	0.0201	2.5	Pass
	-20	47	0.0252		
	-10	38	0.0201		
	0	30	0.0159		
	10	38	0.0201		
	20	32	0.0168		
	30	59	0.0311		
	40	49	0.0261		
	50	49	0.0261		

Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error			Result
		Hz	ppm		
3.70	-30	96	0.0508	2.5	Pass
	-20	111	0.0592		
	-10	92	0.0489		
	0	77	0.0409		
	10	93	0.0495		
	20	79	0.0420		
	30	124	0.0661		
	40	105	0.0558		
	50	110	0.0585		

Reference Frequency: PCS1900 (EGPRS 1 link) Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error			Result
		Hz	ppm		
3.70	-30	33	0.0177	2.5	Pass
	-20	41	0.0220		
	-10	30	0.0159		
	0	22	0.0116		
	10	32	0.0168		
	20	22	0.0116		
	30	49	0.0263		
	40	38	0.0203		
	50	41	0.0220		

Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880.0MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	121	0.0641	2.5	Pass
	-20	107	0.0568		
	-10	92	0.0487		
	0	85	0.0454		
	10	78	0.0414		
	20	67	0.0357		
	30	85	0.0454		
	40	96	0.0511		
	50	92	0.0487		

7.10 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part2.1055(d)(1)(2)
Test Method:	FCC Part2.1055(d)(1)(2)
Limit:	2.5ppm
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test procedure:	1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

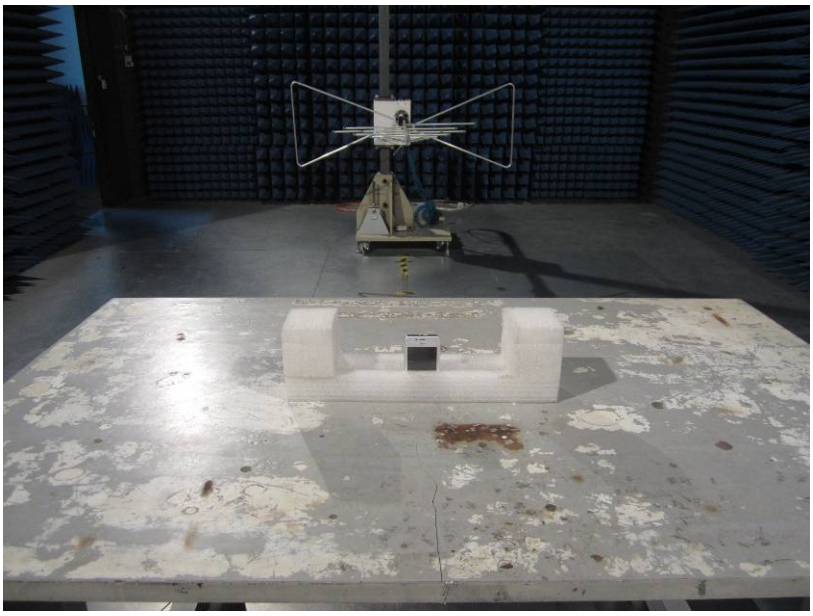
Measurement Data

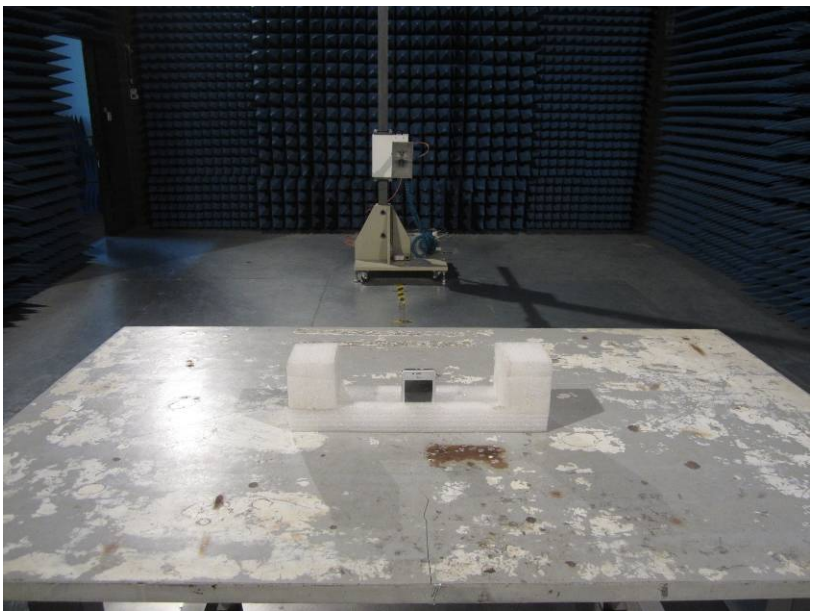
Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	21	0.0256	2.5	Pass
	3.70	24	0.0284		
	3.40	26	0.0313		
Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	37	0.0444	2.5	Pass
	3.70	42	0.0501		
	3.40	46	0.0555		
Reference Frequency: GSM850 (EGPRS 1 link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	26	0.0314	2.5	Pass
	3.70	18	0.0215		
	3.40	21	0.0248		

Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	24	0.0125	2.5	Pass
	3.70	29	0.0156		
	3.40	29	0.0156		
Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	61	0.0322	2.5	Pass
	3.70	74	0.0392		
	3.40	74	0.0395		
Reference Frequency: PCS1900 (EGPRS 1 link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	43	0.0227	2.5	Pass
	3.70	33	0.0175		
	3.40	35	0.0186		
Reference Frequency: WCDMA Band II Middle channel=940 channel=1880.0MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	68	0.0362	2.5	Pass
	3.70	55	0.0294		
	3.40	63	0.0333		

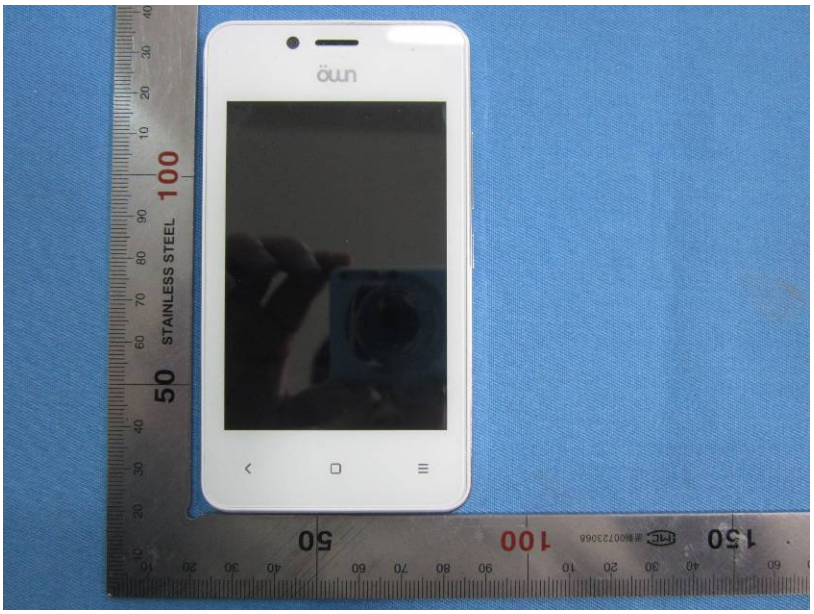
8 Test Setup Photo

Radiated Emission

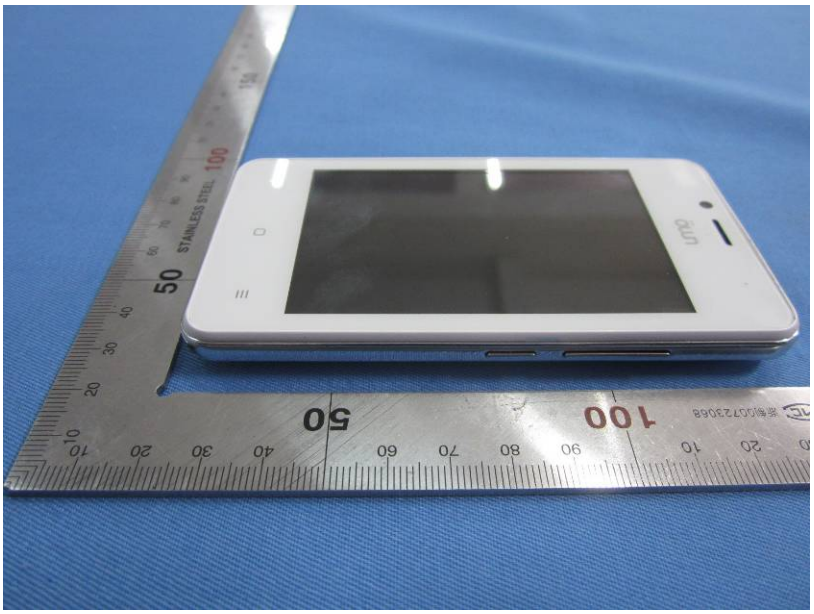




9 EUT Constructional Details



STAINLESS STEEL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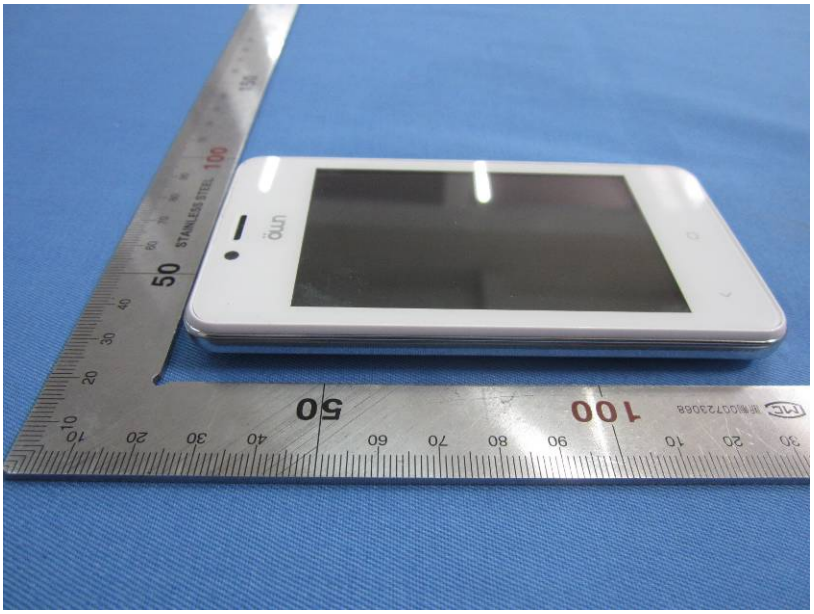
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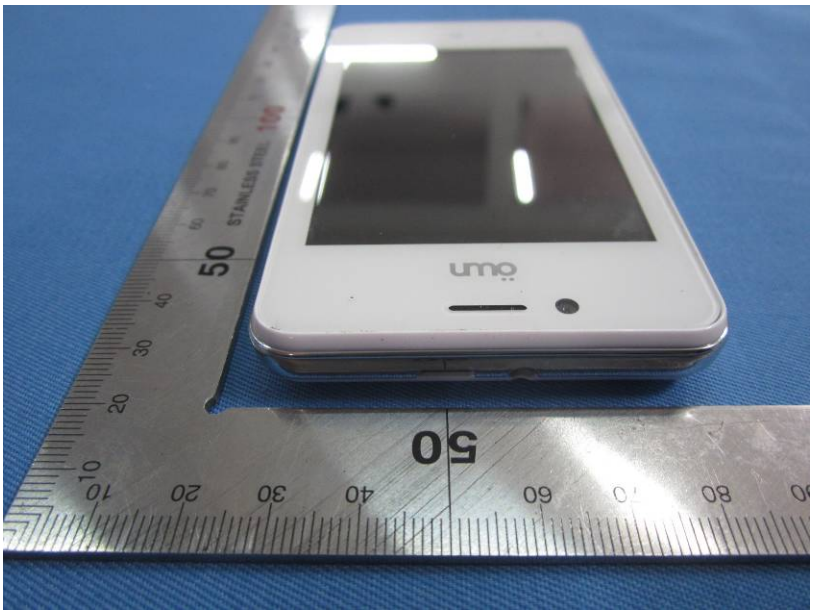
100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STAINLESS STEEL
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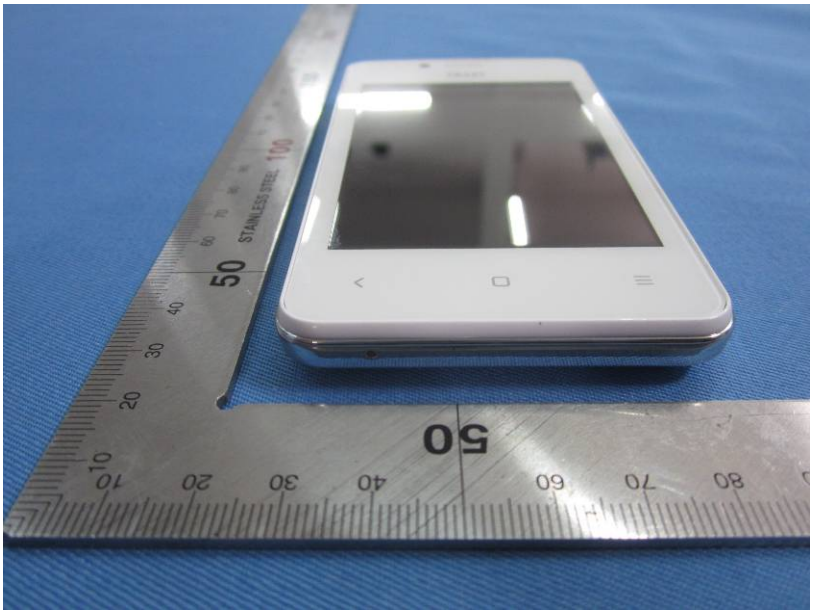
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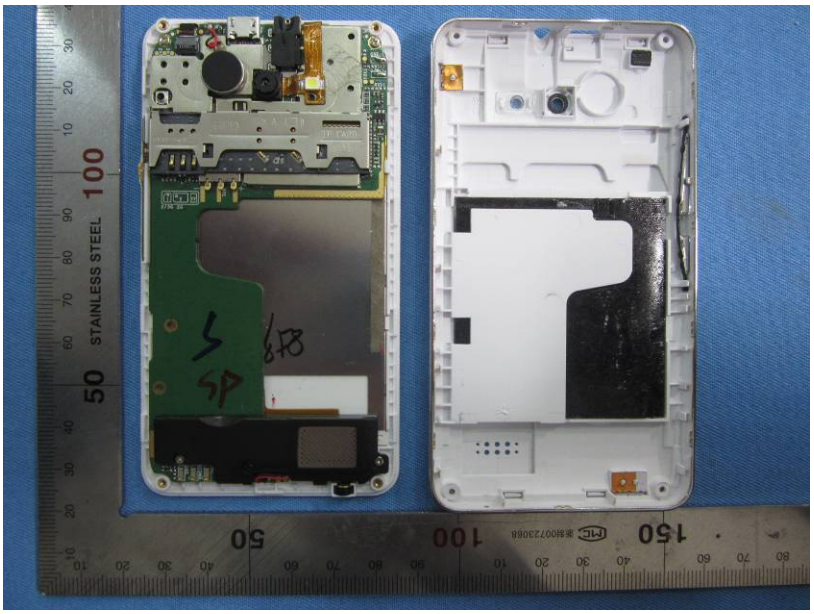
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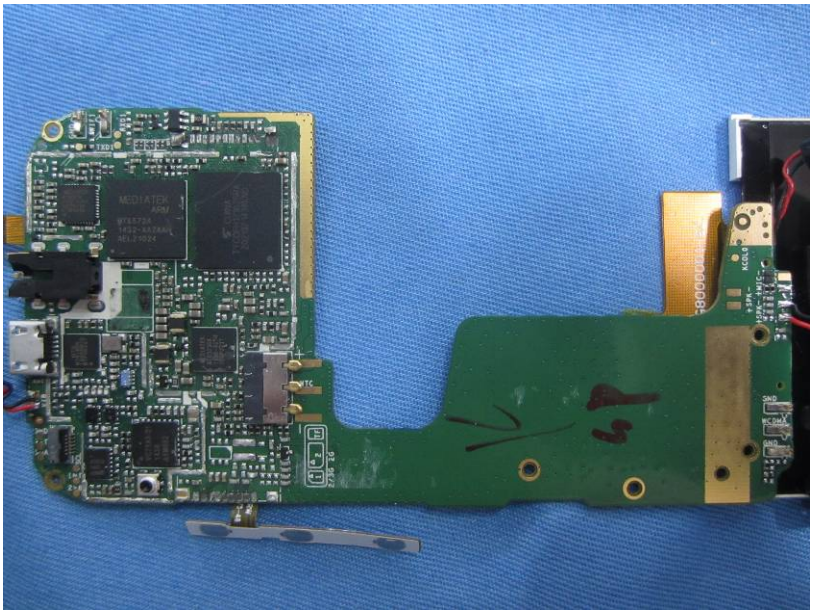

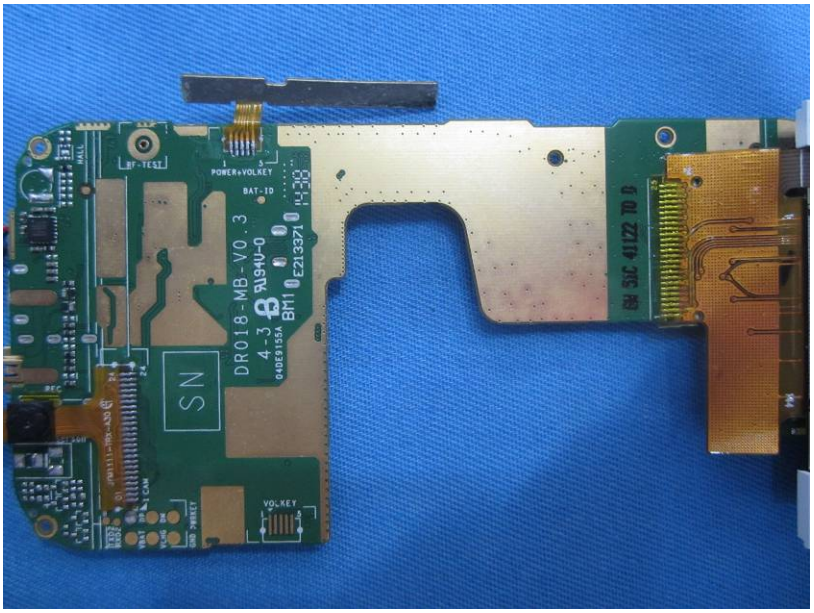

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