

TEST REPORT

Applicant: GSM GLOBE.COM INC
Address of Applicant: 8212 NW 30 TERRACE, DORAL, Florida 33122, United States
Manufacturer/Factory: Z-TECH COMMUNICATION(SZ)CO LTD
Address of 7/F BLK D BAO'AN ZHI'GU YIN'TIAN RD. NO.4 XI'XIANG ST'
Manufacturer/Factory: BAO'AN SZ CN
Equipment Under Test (EUT)
Product Name: MOBILE PHONES
Model No.: F11
Trade mark: GOL
FCC ID: 2AEJAF11
Applicable standards: FCC CFR Title 47 Part 2
FCC CFR Title 47 Part 22 Subpart H
FCC CFR Title 47 Part 24 Subpart E
Date of sample receipt: August 18, 2020
Date of Test: August 18-28, 2020
Date of report issued: August 28, 2020
Test Result : PASS *

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

Authorized Signature:

A circular blue ink stamp from GTS (Global United Technology Services) is visible. The stamp contains the text "GTS", "GLOBAL UNITED TECHNOLOGY SERVICES", "LABORATORY TESTING", and "TV8019". Overlaid on the stamp is a handwritten signature in black ink that appears to read "Robinson Lo".

Robinson Lo

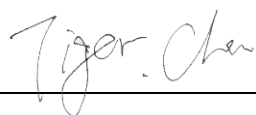
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

1 Version

Version No.	Date	Description
00	August 28, 2020	Original

Prepared By:



Project Engineer

Date:

August 28, 2020

Check By:



Reviewer

Date:

August 28, 2020

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3 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) Part 24.232(c)	Pass
Peak-to-Average Ratio	Part 2.1046 Part 22.913(d) Part 24.232(d)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% Occupied Bandwidth & 26dB Bandwidth	Part 2.1049 Part 22.917(b) Part 24.238(b)	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 Part 24.238	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 Part 24.238	Pass
Out of band emission, Band Edge	Part 2.1051 Part 22.917 Part 24.238	Pass
ERP and EIRP	Part 22.913(a) Part 24.232(b)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b) Part 22.355 Part 24.235	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2) Part 22.355 Part 24.235	Pass

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

4 General Information

4.1 General Description of EUT

Product Name:	MOBILE PHONES
Model No.:	F11
Test sample(s) ID:	GTS202008000140-1
Sample(s) Status:	Engineer sample
Serial No.:	JY200721000036
Hardware Version:	Y891_MB_V2
Software Version:	GOL_F11_V03
Support Networks:	GSM, GPRS, WCDMA
Support Bands:	GSM850, PCS1900, WCDMA Band V, WCDMA Band II
TX Frequency:	GSM850: 824.20MHz-848.80MHz PCS1900: 1850.20MHz-1909.80MHz WCDMA Band V: 826.40MHz-846.60MHz WCDMA Band II: 1852.40MHz-1907.60MHz
Modulation type:	GSM/GPRS: GMSK WCDMA Band II/V: QPSK
Antenna type:	PIFA antenna
Antenna gain:	GSM850:-4.03dBi PCS1900:1.31dBi WCDMA Band V: -4.03dBi WCDMA Band II: 1.31dBi
Power supply:	Adaptor Model: F10 Input: AC 100-240V, 50/60Hz, 0.15A Output: DC 5.0V, 1Amp Or Battery: DC 3.8V, 3000mAh

Operation Frequency List:

GSM 850		PCS1900		WCDMA Band V		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20	4132	826.40	9262	1852.40
129	824.40	513	1850.40	4133	826.60	9263	1852.60
· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴
189	836.40	660	1879.80	4181	836.20	9399	1879.80
190	836.60	661	1880.00	4182	836.40	9400	1880.00
191	836.80	662	1880.20	4183	836.60	9401	1880.20
· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴
250	848.60	809	1909.60	4232	846.40	9537	1907.40
251	848.80	810	1909.80	4233	846.60	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 V		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20	4132	826.40	9262	1852.40
190	836.60	661	1880.00	4183	836.60	9400	1880.00
251	848.80	810	1909.80	4233	846.60	9538	1907.60

4.2 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.

4.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on ANSI C63.26:2015 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Test Facility

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

- **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383.

- **IC —Registration No.: 9079A**

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.

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

4.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

5 Test Instruments list

Radiated Emission:						
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	July. 02 2020	July. 01 2025
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	June. 25 2020	June. 24 2021
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 25 2020	June. 24 2021
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 25 2020	June. 24 2021
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 25 2020	June. 24 2021
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 25 2020	June. 24 2021
9	Coaxial Cable	GTS	N/A	GTS211	June. 25 2020	June. 24 2021
10	Coaxial cable	GTS	N/A	GTS210	June. 25 2020	June. 24 2021
11	Coaxial Cable	GTS	N/A	GTS212	June. 25 2020	June. 24 2021
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 25 2020	June. 24 2021
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 25 2020	June. 24 2021
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 25 2020	June. 24 2021
15	Band filter	Amindeon	82346	GTS219	June. 25 2020	June. 24 2021
16	Power Meter	Anritsu	ML2495A	GTS540	June. 25 2020	June. 24 2021
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 25 2020	June. 24 2021
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 25 2020	June. 24 2021
19	Splitter	Agilent	11636B	GTS237	June. 25 2020	June. 24 2021
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 25 2020	June. 24 2021
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 19 2019	Oct. 18 2020
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 19 2019	Oct. 18 2020
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 19 2019	Oct. 18 2020
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 25 2020	June. 24 2021

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 25 2020	June. 24 2021
2	Barometer	ChangChun	DYM3	GTS255	June. 25 2020	June. 24 2021

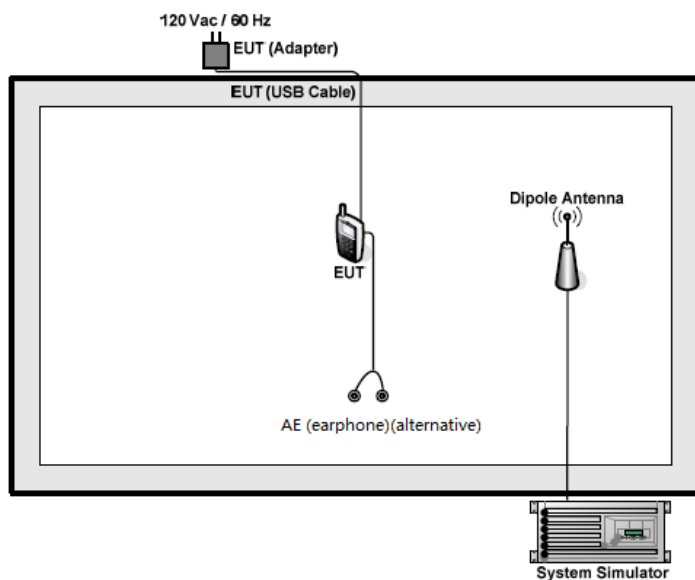
6 System test configuration

6.1 Test mode

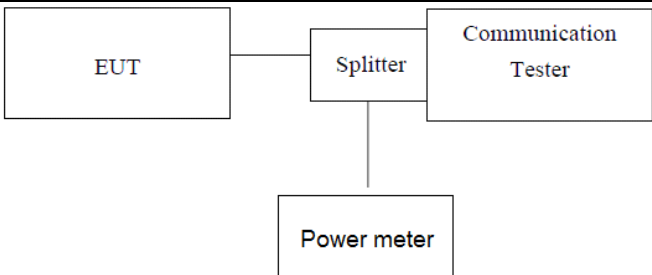
During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

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

6.2 Configuration of Tested System



6.3 Conducted Average Output Power and ERP/EIRP

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(c)
Test Method:	FCC part2.1046
Limit:	GSM850, WCDMA Band V: 7W(38.45dBm) PCS1900, WCDMA Band II: 2W(33dBm)
Test setup:	 <i>Note: Measurement setup for testing on Antenna connector</i>
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 power. 6. EIRP=measured power+ antenna gain ERP=EIRP-2.15
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data

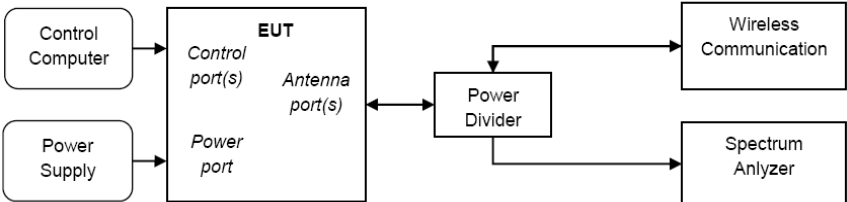
Conducted Power (dBm)						
Band	GSM850			PCS1900		
Channel	128	190	251	512	661	810
Frequency	824.20	836.60	848.80	1850.20	1880.00	1909.80
GSM (GMSK, 1 TX slot)	32.51	32.38	32.13	30.16	29.75	29.61
GPRS (GMSK, 1 TX slot)	32.57	32.47	32.20	30.23	29.75	29.62
GPRS (GMSK, 2 TX slot)	32.13	32.03	31.70	29.82	29.11	28.85
GPRS (GMSK, 3 TX slot)	30.88	30.72	30.37	28.71	27.62	27.10
GPRS (GMSK, 4 TX slot)	29.87	29.73	29.35	27.79	26.52	26.98

Conducted Power (dBm)						
Band	WCDMA Band II			WCDMA Band V		
Channel	9262	9400	9538	4132	4183	4233
Frequency	1852.4	1880.0	1907.6	826.4	836.6	846.6
RMC 12.2Kbps	23.93	23.83	24.48	24.31	24.27	24.30
HSDPA Subtest-1	23.71	23.68	23.65	23.83	23.82	23.71
HSDPA Subtest-2	23.72	23.69	23.64	23.76	23.74	23.68
HSDPA Subtest-3	23.69	23.67	23.65	23.75	23.68	23.65
HSDPA Subtest-4	23.68	23.66	23.65	23.78	23.72	23.69
HSUPA Subtest-1	23.96	23.93	23.89	23.84	23.90	23.83
HSUPA Subtest-2	23.95	23.90	23.89	23.85	23.86	23.83
HSUPA Subtest-3	23.94	23.92	23.91	23.89	23.90	23.86
HSUPA Subtest-4	23.97	23.95	23.91	23.87	23.86	23.85
HSUPA Subtest-5	23.96	23.92	23.90	23.88	23.87	23.89
AMR	23.84	23.83	23.82	23.86	23.85	23.84

ERP/EIRP 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)	26.33	26.20	25.95	31.47	31.06	30.92
GPRS (GMSK, 1 TX slot)	26.39	26.29	26.02	31.54	31.06	30.93
GPRS (GMSK, 2 TX slot)	25.95	25.85	25.52	31.13	30.42	30.16
GPRS (GMSK, 3 TX slot)	24.70	24.54	24.19	30.02	28.93	28.41
GPRS (GMSK, 4 TX slot)	23.69	23.55	23.17	29.10	27.83	28.29

ERP/EIRP Power (dBm)						
Band	WCDMA Band II			WCDMA Band V		
Channel	9262	9400	9538	4132	4183	4233
Frequency	1852.4	1880.0	1907.6	826.4	836.6	846.6
RMC 12.2Kbps	25.24	25.14	25.79	18.13	18.09	18.12
HSDPA Subtest-1	25.02	24.99	24.96	17.65	17.64	17.53
HSDPA Subtest-2	25.03	25.00	24.95	17.58	17.56	17.50
HSDPA Subtest-3	25.00	24.98	24.96	17.57	17.50	17.47
HSDPA Subtest-4	24.99	24.97	24.96	17.60	17.54	17.51
HSUPA Subtest-1	25.27	25.24	25.20	17.66	17.72	17.65
HSUPA Subtest-2	25.26	25.21	25.20	17.67	17.68	17.65
HSUPA Subtest-3	25.25	25.23	25.22	17.71	17.72	17.68
HSUPA Subtest-4	25.28	25.26	25.22	17.69	17.68	17.67
HSUPA Subtest-5	25.27	25.23	25.21	17.70	17.69	17.71
AMR	25.15	25.14	25.13	17.68	17.67	17.66

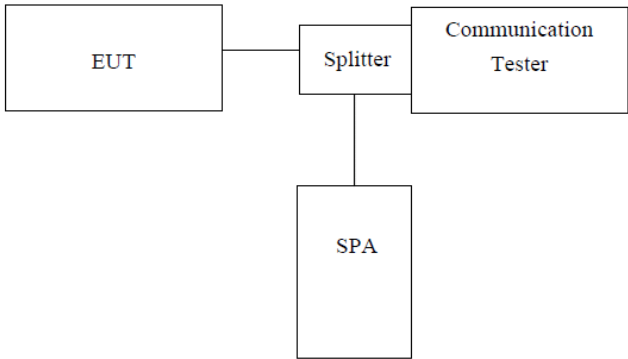
6.4 Peak-to-Average Ratio

Test Requirement:	FCC Part 22.913(d) and FCC Part 24.232(d)
Test Method:	FCC part2.1046
Limit:	13db
Test setup:	 <pre> graph LR CC[Control Computer] --> EUT[EUT] PS[Power Supply] --> EUT subgraph EUT_ports [EUT] direction TB CP[Control port(s)] AP[Antenna port(s)] PP[Power port] end AP <--> PD[Power Divider] PD --> WC[Wireless Communication] PD --> SA[Spectrum Analyzer] </pre>
Test Procedure:	A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode. Test Settings 1. The signal analyzer's CCDF measurement profile enabled 2. Frequency= carrier center frequency 3. Measurement BW > EBW of signal 4. for continuous transmissions, set to 1ms 5. Record the maximum PAPR level associated with a probability of 0.1%.
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement data

Test Band	Peak to Average Ratio (dB)			Limit (dB)	Result
	Low Ch.	Middle Ch.	High Ch.		
GSM850	6.33	6.47	6.04	13	PASS
GSM1900	6.99	7.13	9.87	13	PASS
WCDMA Band V	3.25	3.85	3.47	13	PASS
WCDMA Band II	2.87	3.08	3.11	13	PASS

6.5 Occupy Bandwidth

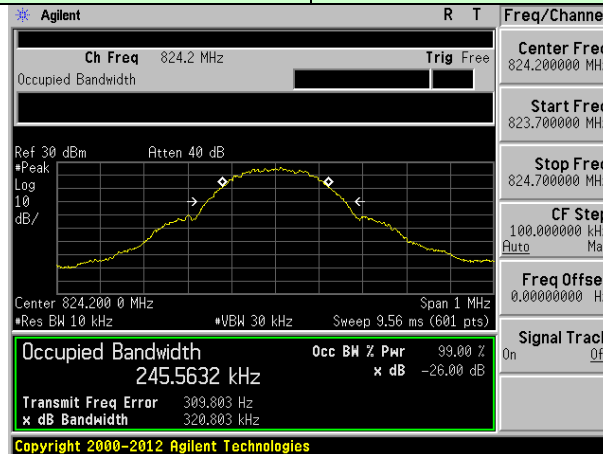
Test Requirement:	FCC part 22.917(b) and FCC part 24.238(b)
Test Method:	FCC part2.1049
Test setup:	 <i>Note: Measurement setup for testing on Antenna connector</i>
Test Procedure:	1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of 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 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data

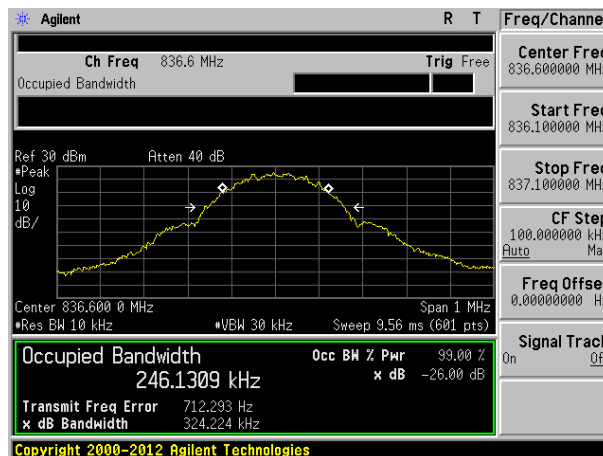
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GSM link)	128	824.20	245.5632	320.803
	190	836.60	246.1309	324.224
	251	848.80	246.9452	322.563
GSM 850 (GPRS 1 link)	128	824.20	246.1462	322.258
	190	836.60	245.1735	317.481
	251	848.80	146.6045	316.617
PCS 1900 (GSM link)	512	1850.20	243.8843	324.020
	661	1880.00	245.5452	298.577
	810	1909.80	247.1298	320.255
PCS 1900 (GPRS 1 link)	512	1850.20	244.8311	320.308
	661	1880.00	246.3560	324.972
	810	1909.80	245.5011	317.767
WCDMA Band II (RMC 12.2Kbps link)	9262	1852.4	4161.50	4711.0
	9400	1880.0	4157.30	4710.0
	9538	1907.6	4175.31	4715.0
4684WCDMA Band V (RMC 12.2Kbps link)	4132	826.40	4165.60	4720.0
	4183	836.60	4136.80	4708.0
	4233	846.60	4161.30	4705.0

Test plot as follows:

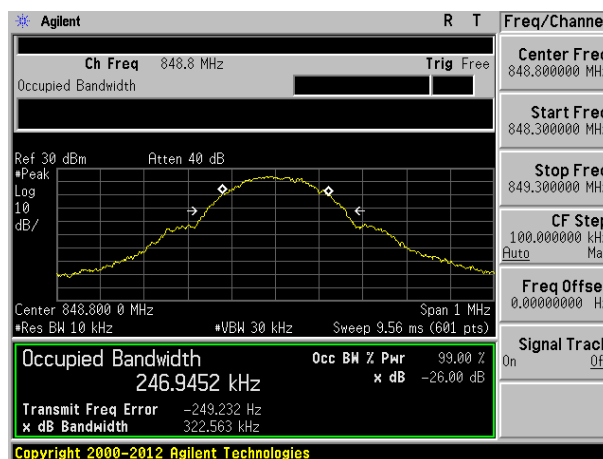
Test band:	GSM 850 (GSM link)
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Lowest channel

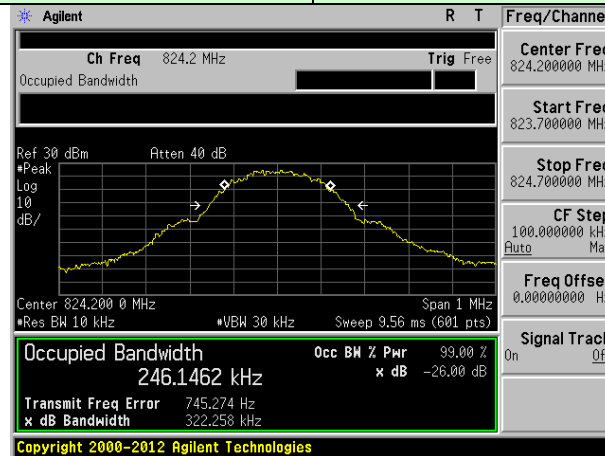


Middle channel

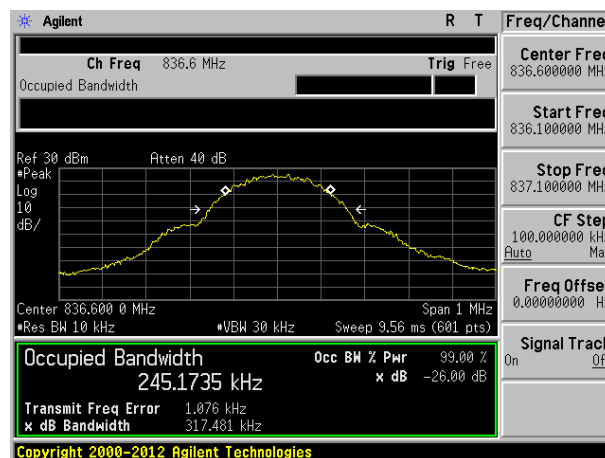


Highest channel

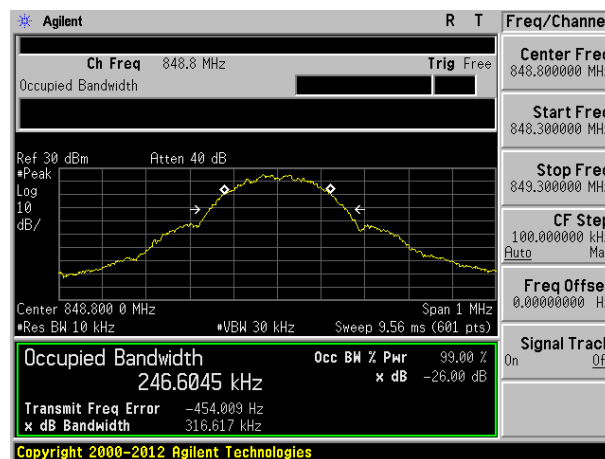
Test band:	GSM 850 (GPRS 1 link)
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Lowest channel



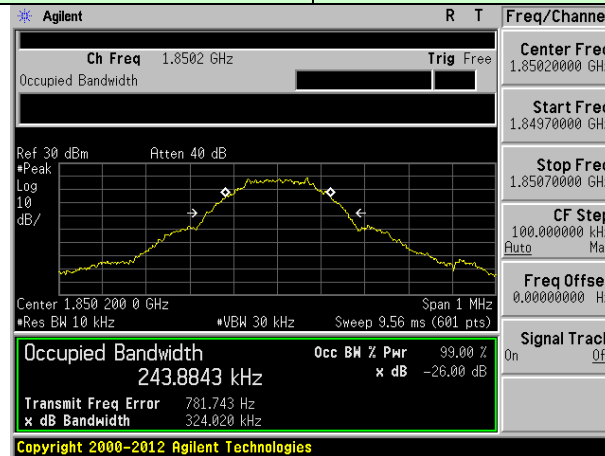
Middle channel



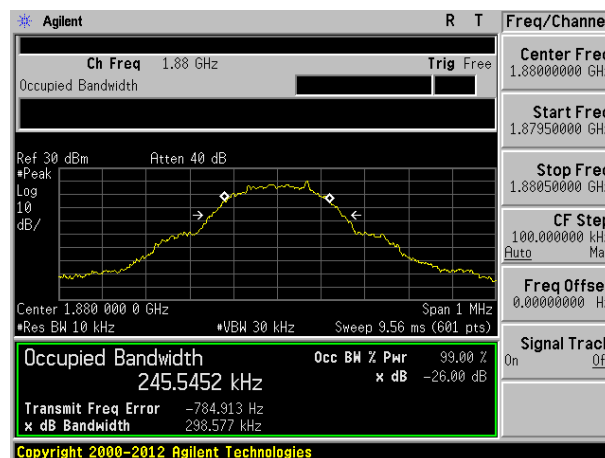
Highest channel

Test band:

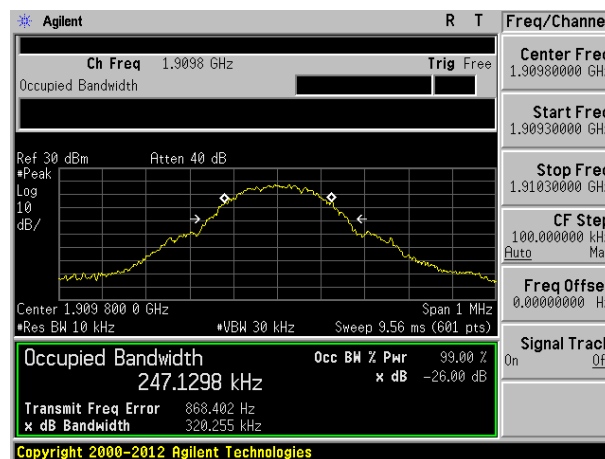
PCS 1900 (GSM link)



Lowest channel

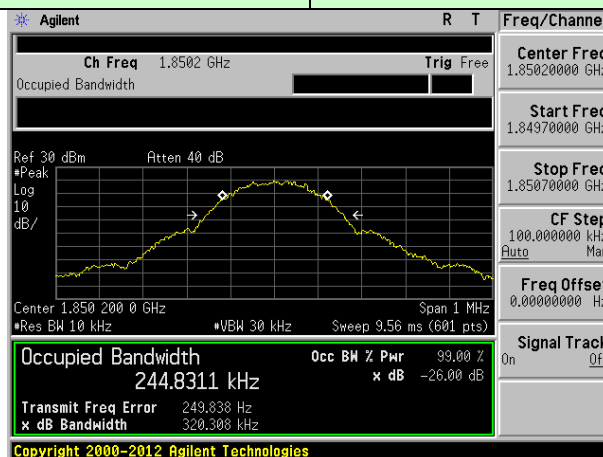


Middle channel

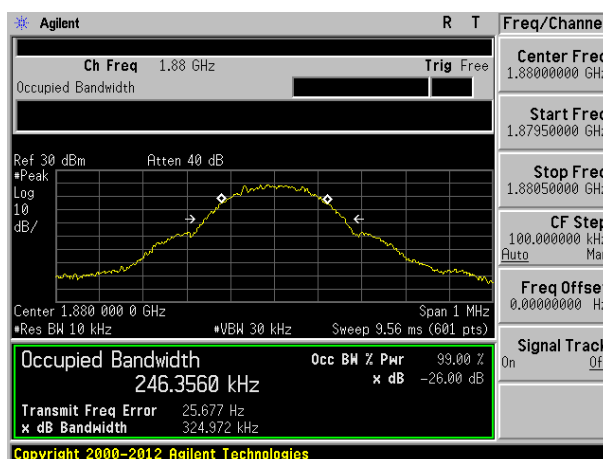


Highest channel

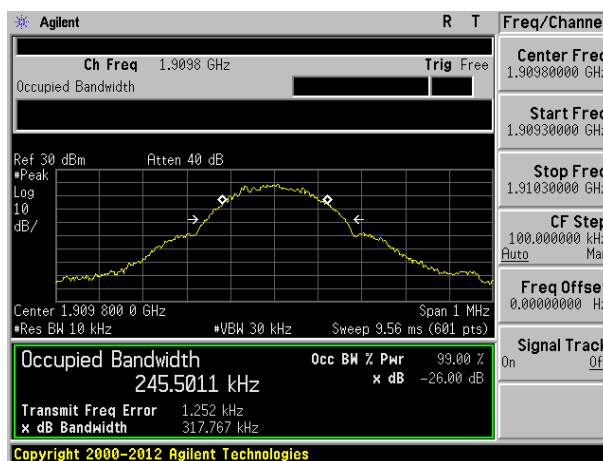
Test band:	PCS 1900 (GPRS 1 link)
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Lowest channel

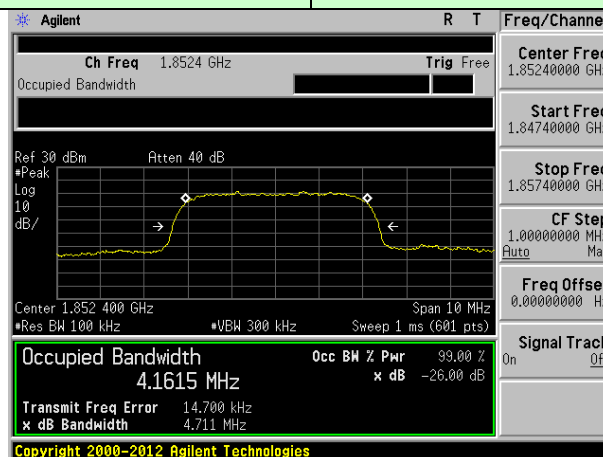


Middle channel

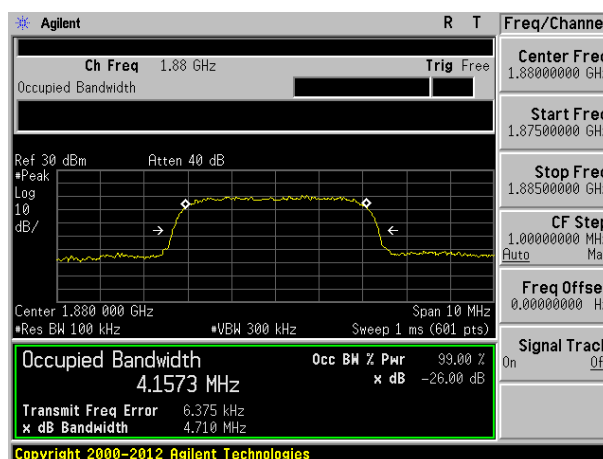


Highest channel

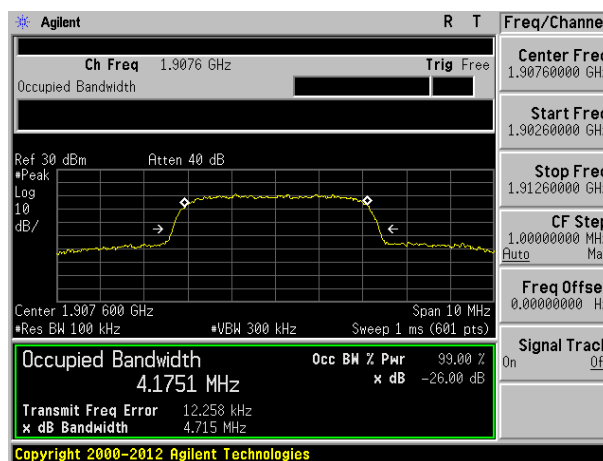
Test band:	WCDMA Band II (RMC 12.2Kbps link)
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Lowest channel

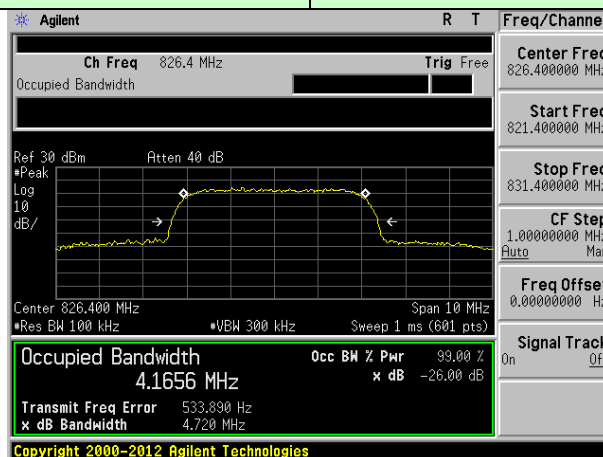


Middle channel

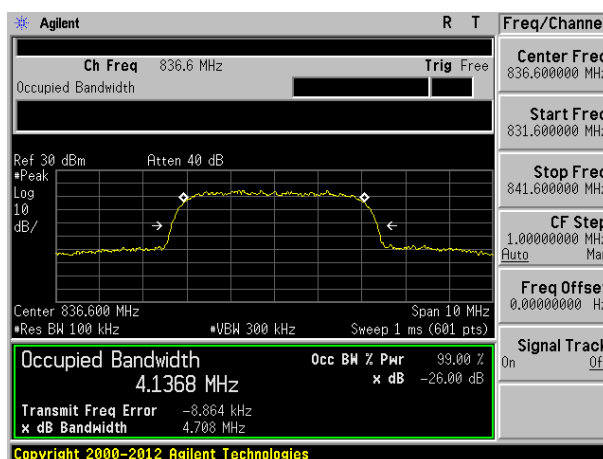


Highest channel

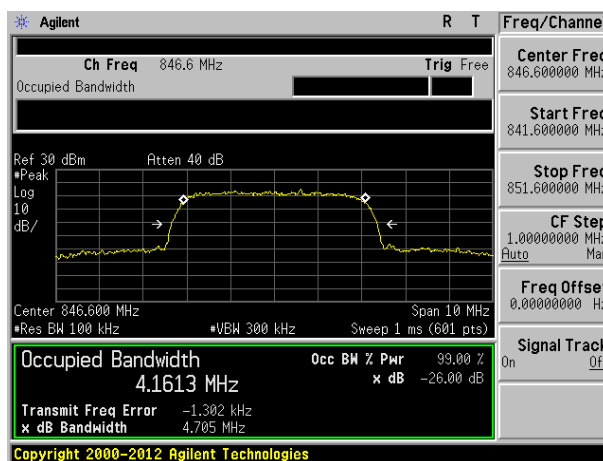
Test band:	WCDMA Band V (RMC 12.2Kbps link)
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Lowest channel



Middle channel

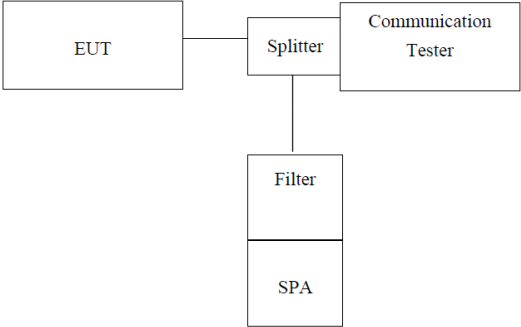


Highest channel

6.6 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.

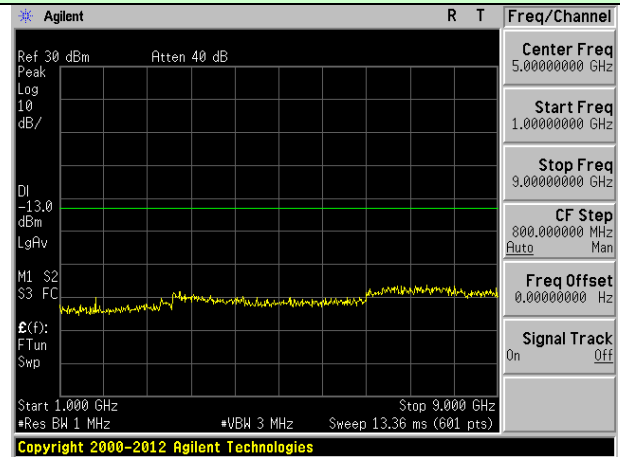
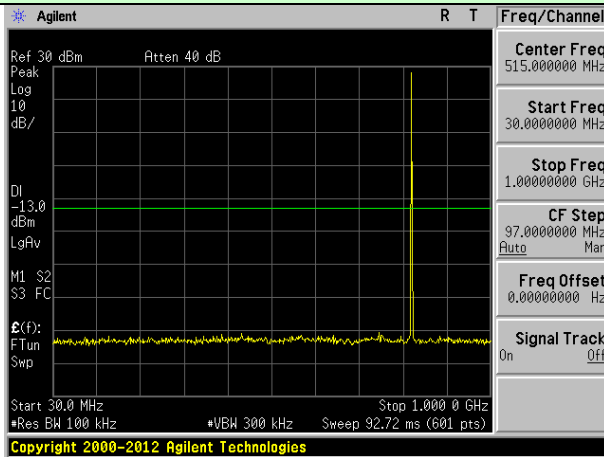
6.7 Out of band emission at antenna terminals

Test Requirement:	FCC part 22.917 and FCC part 24.238
Test Method:	FCC part 2.1051
Limit:	-13dBm
Test setup:	 <i>Note: Measurement setup for testing on Antenna connector</i>
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 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

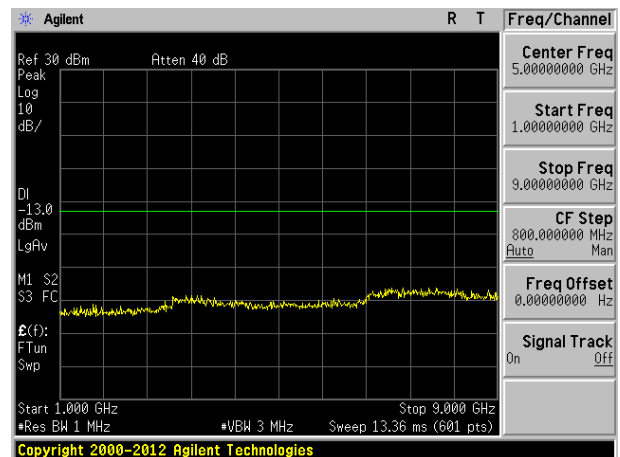
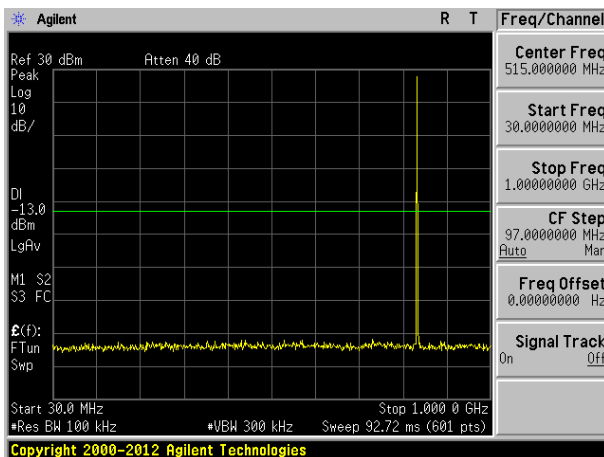
Test plot as follows:

Test Mode: Traffic mode

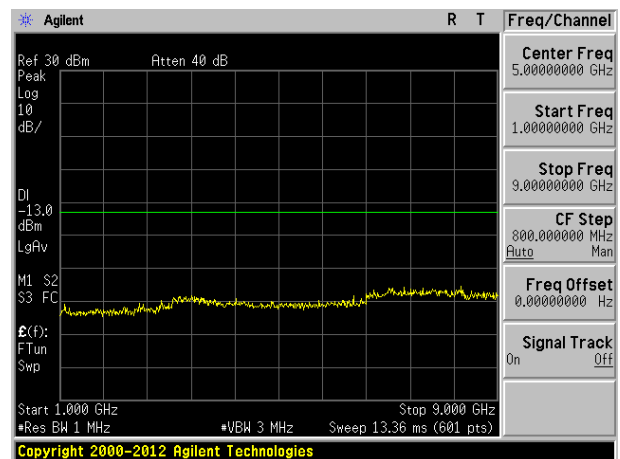
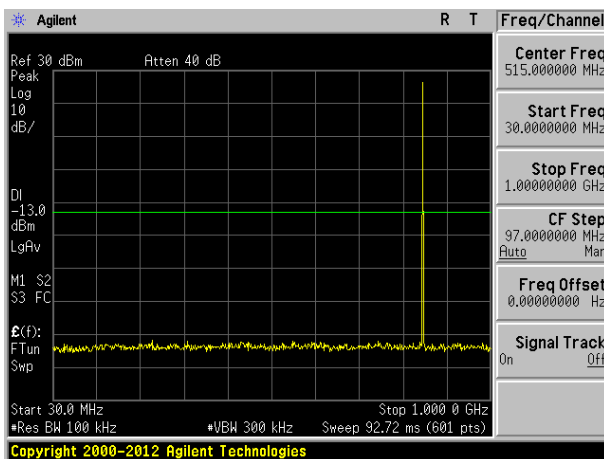
GSM 850 (GSM link)



Lowest channel



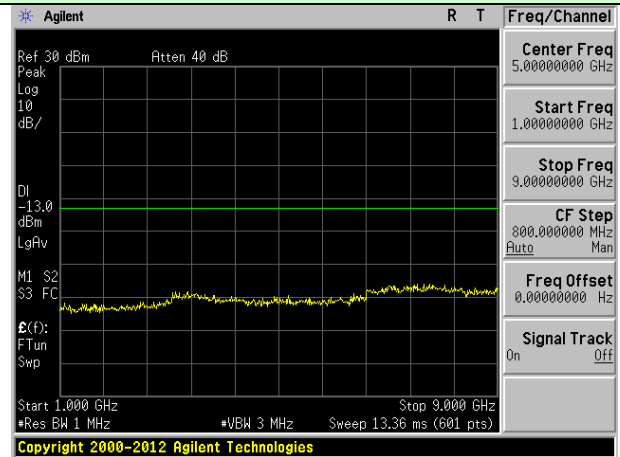
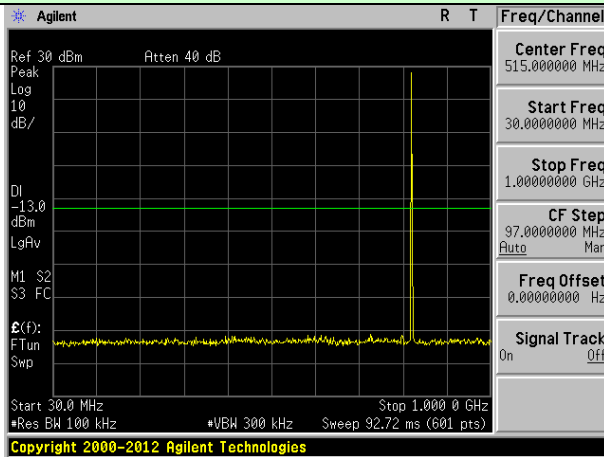
Middle channel



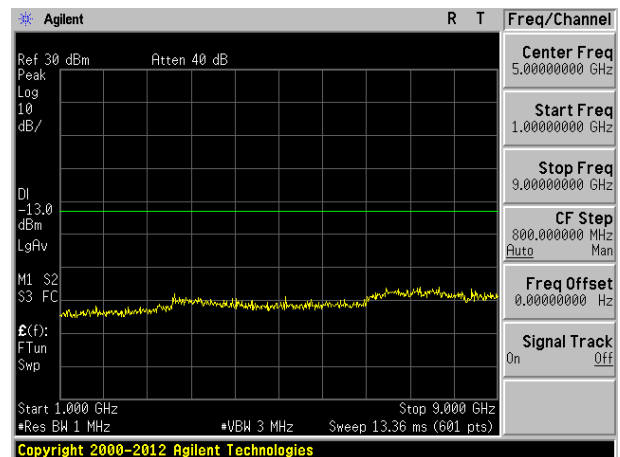
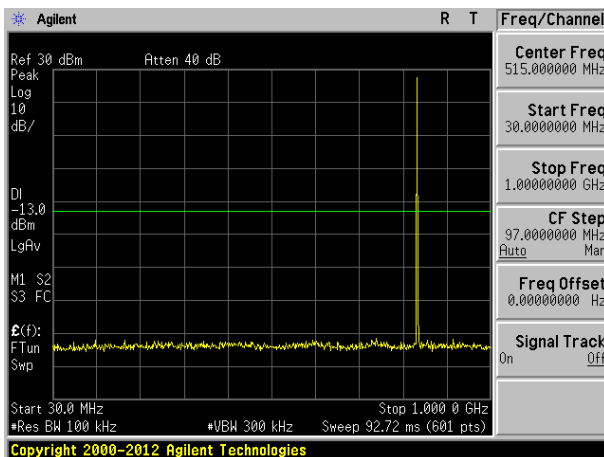
Highest channel

Test Mode: Traffic mode

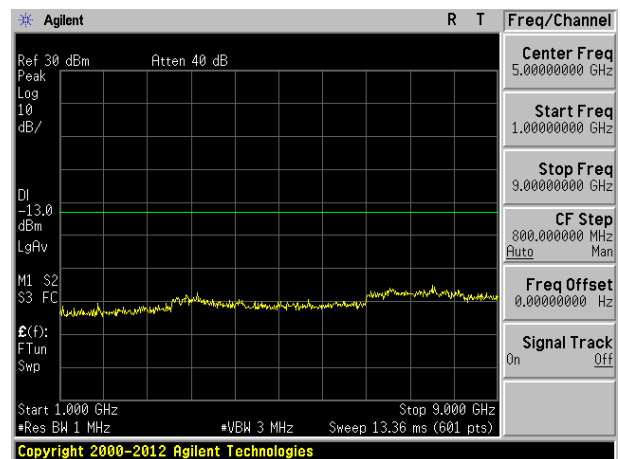
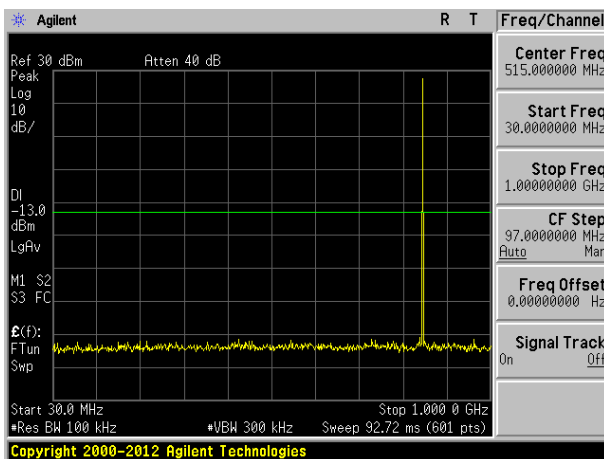
GSM 850 (GPRS 1 link)



Lowest channel



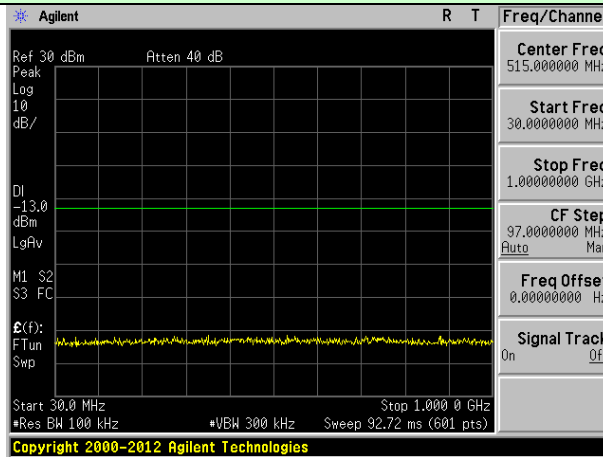
Middle channel



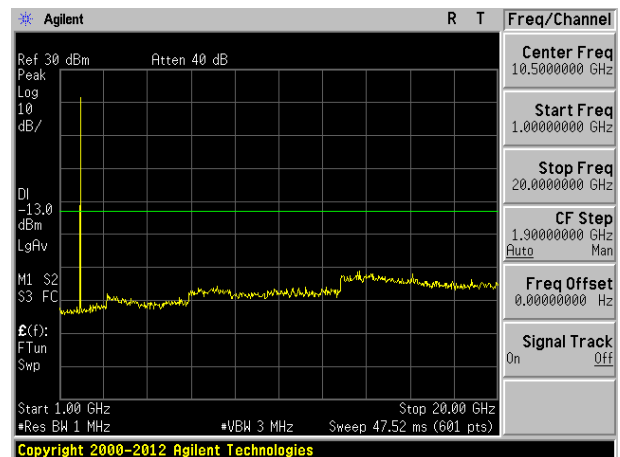
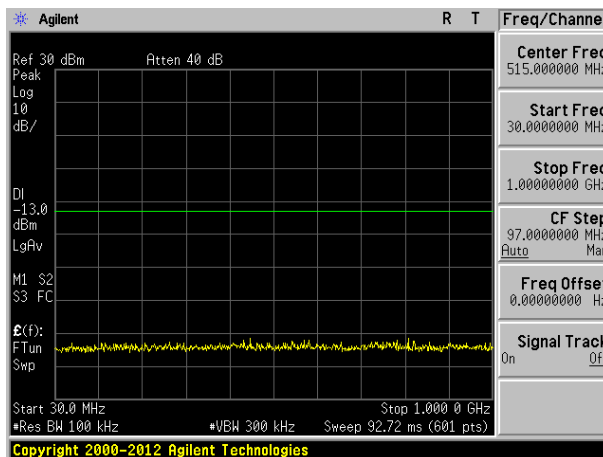
Highest channel

Test Mode: Traffic mode

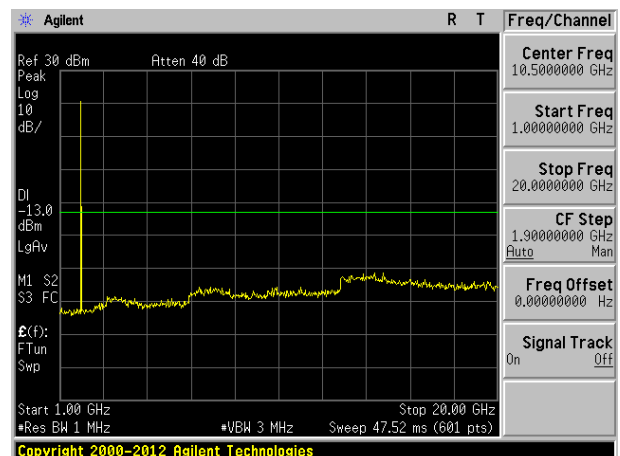
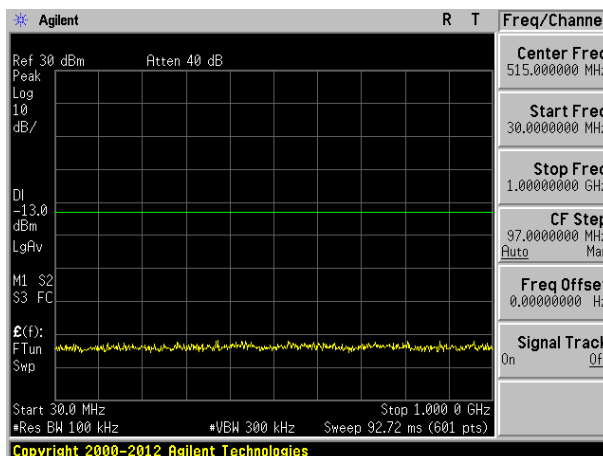
PCS1900 (GSM link)



Lowest channel



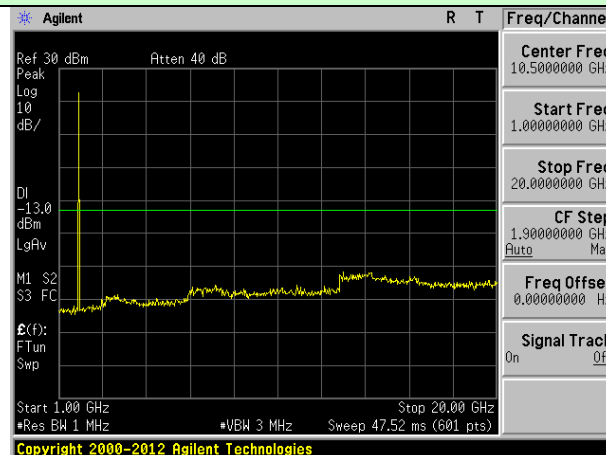
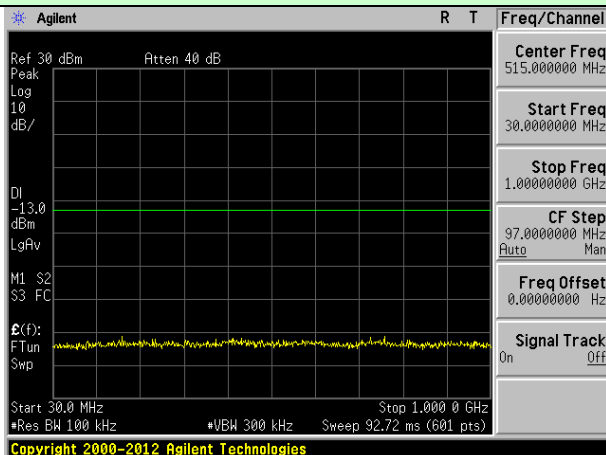
Middle channel



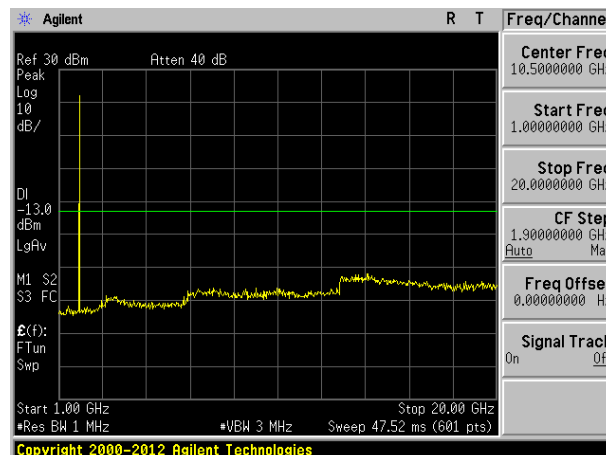
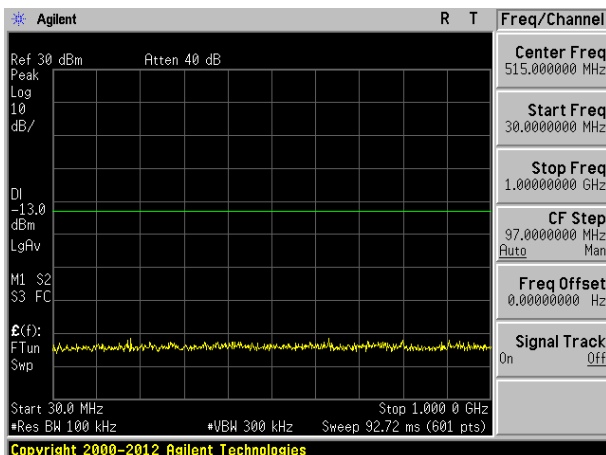
Highest channel

Test Mode: Traffic mode

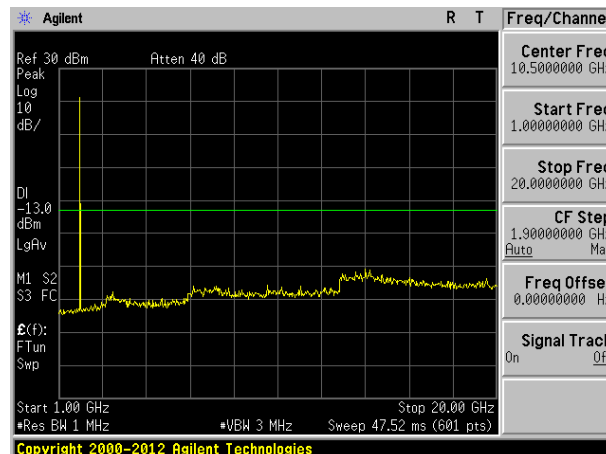
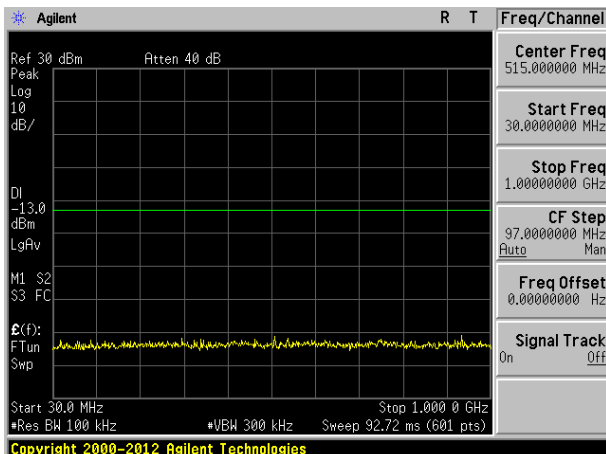
PCS1900 (GPRS 1 link)



Lowest channel



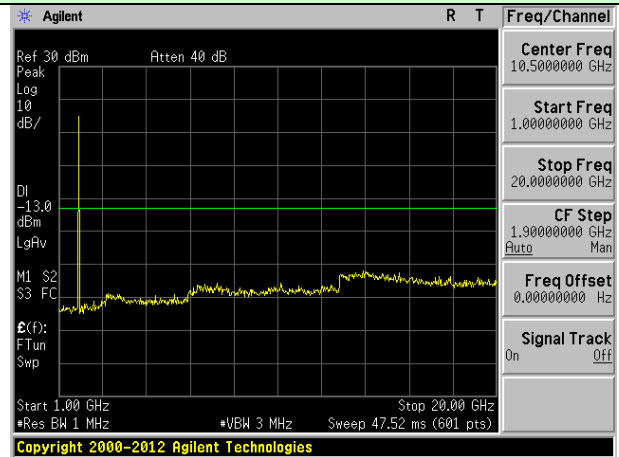
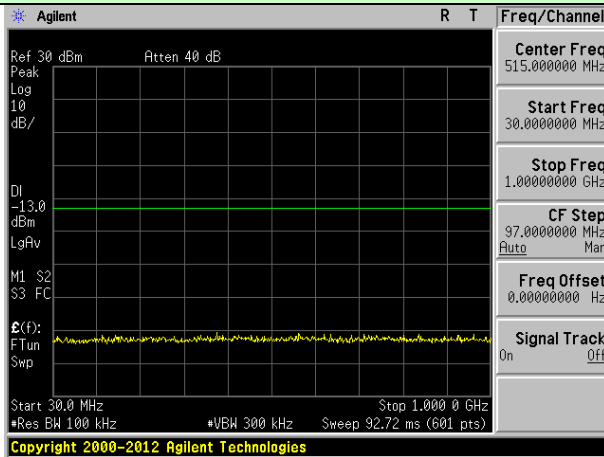
Middle channel



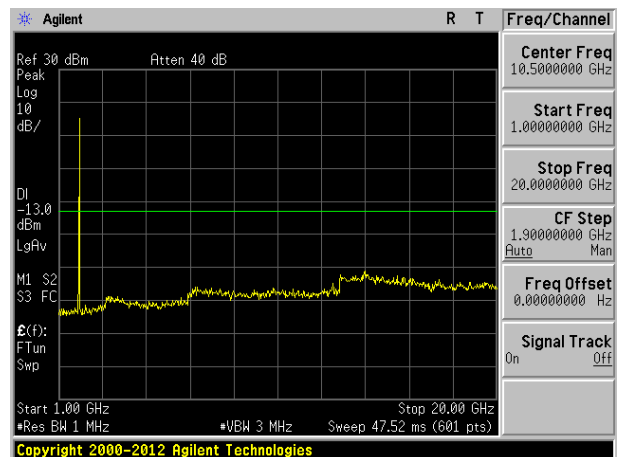
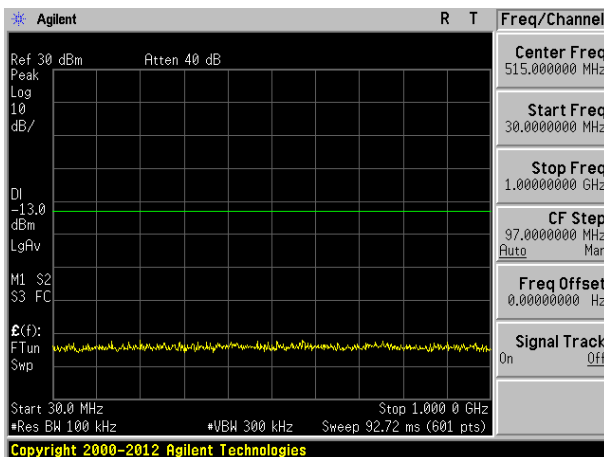
Highest channel

Test Mode: Traffic mode

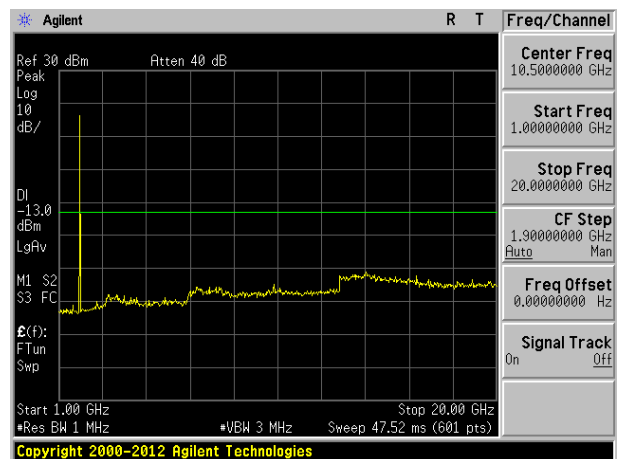
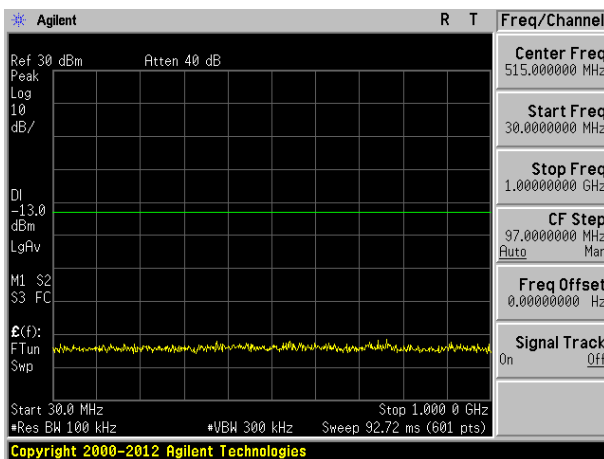
WCDMA Band II (RMC 12.2Kbps link)



Lowest channel



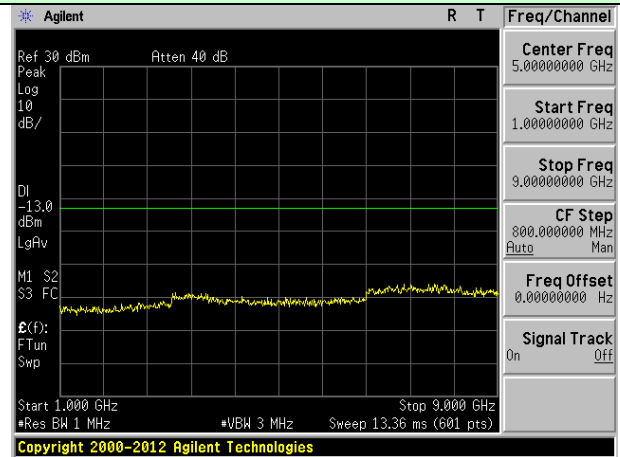
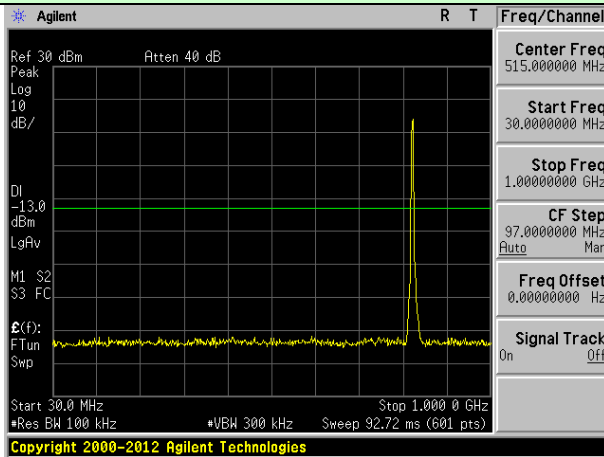
Middle channel



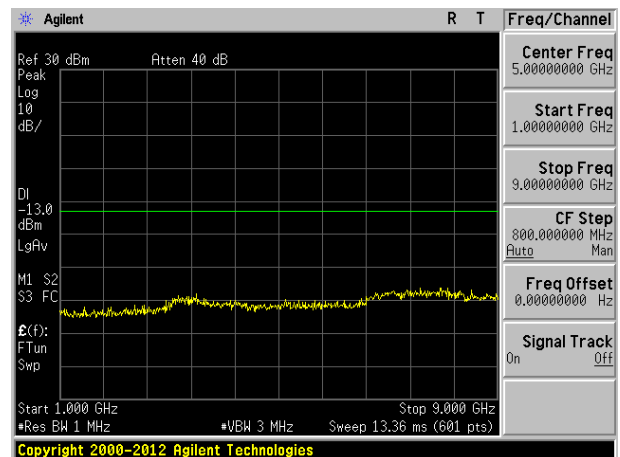
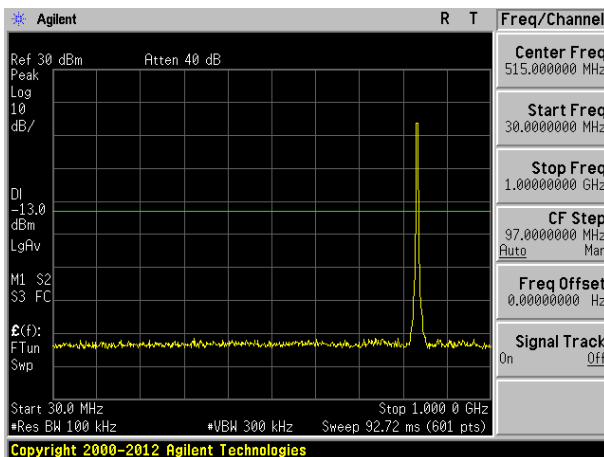
Highest channel

Test Mode: Traffic mode

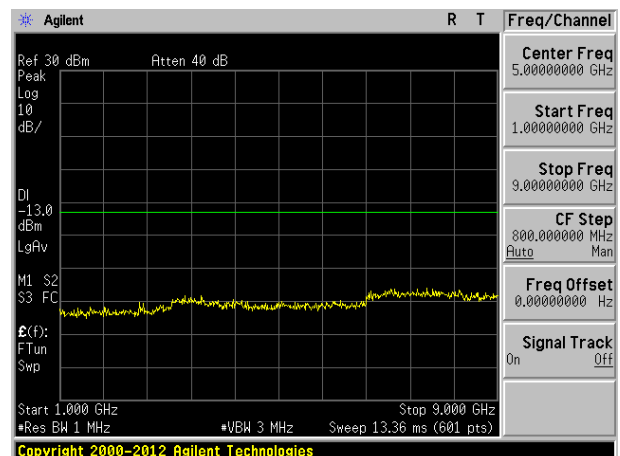
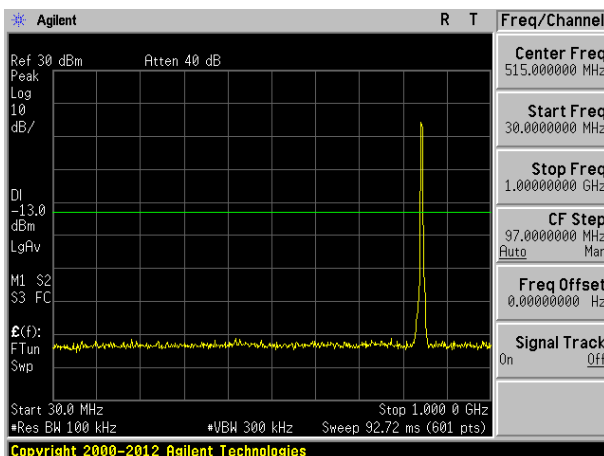
WCDMA Band V (RMC 12.2Kbps link)



Lowest channel



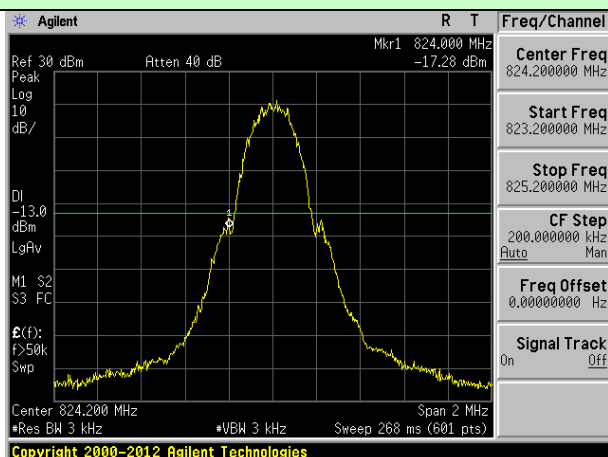
Middle channel



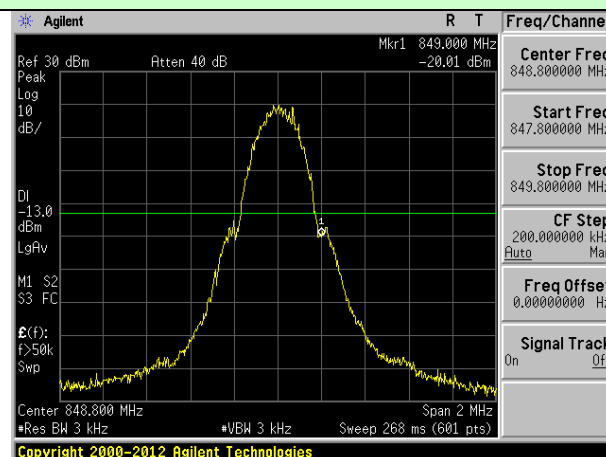
Highest channel

Band Edge:

Test Mode: Traffic mode	GSM850 (GSM link)
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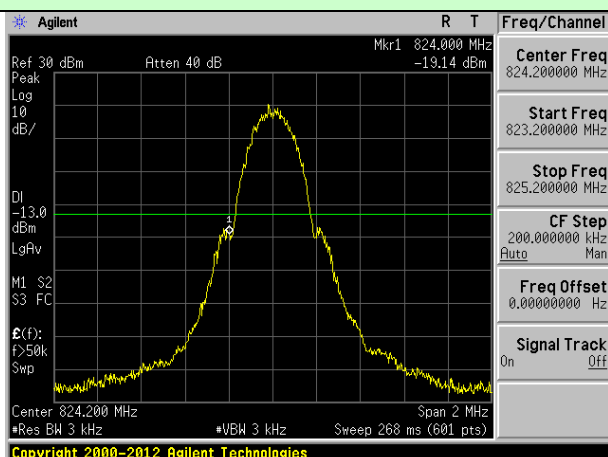


Lowest channel

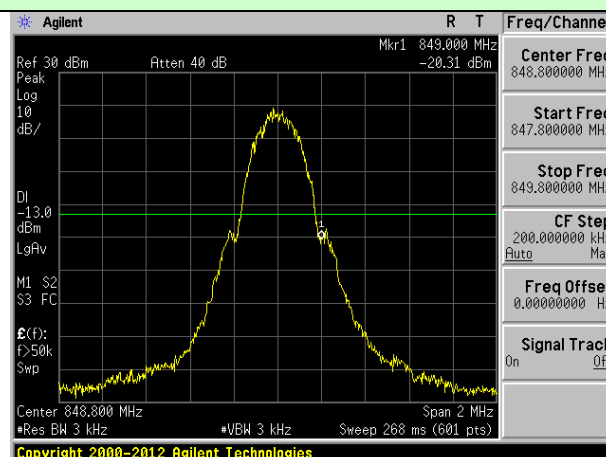


Highest channel

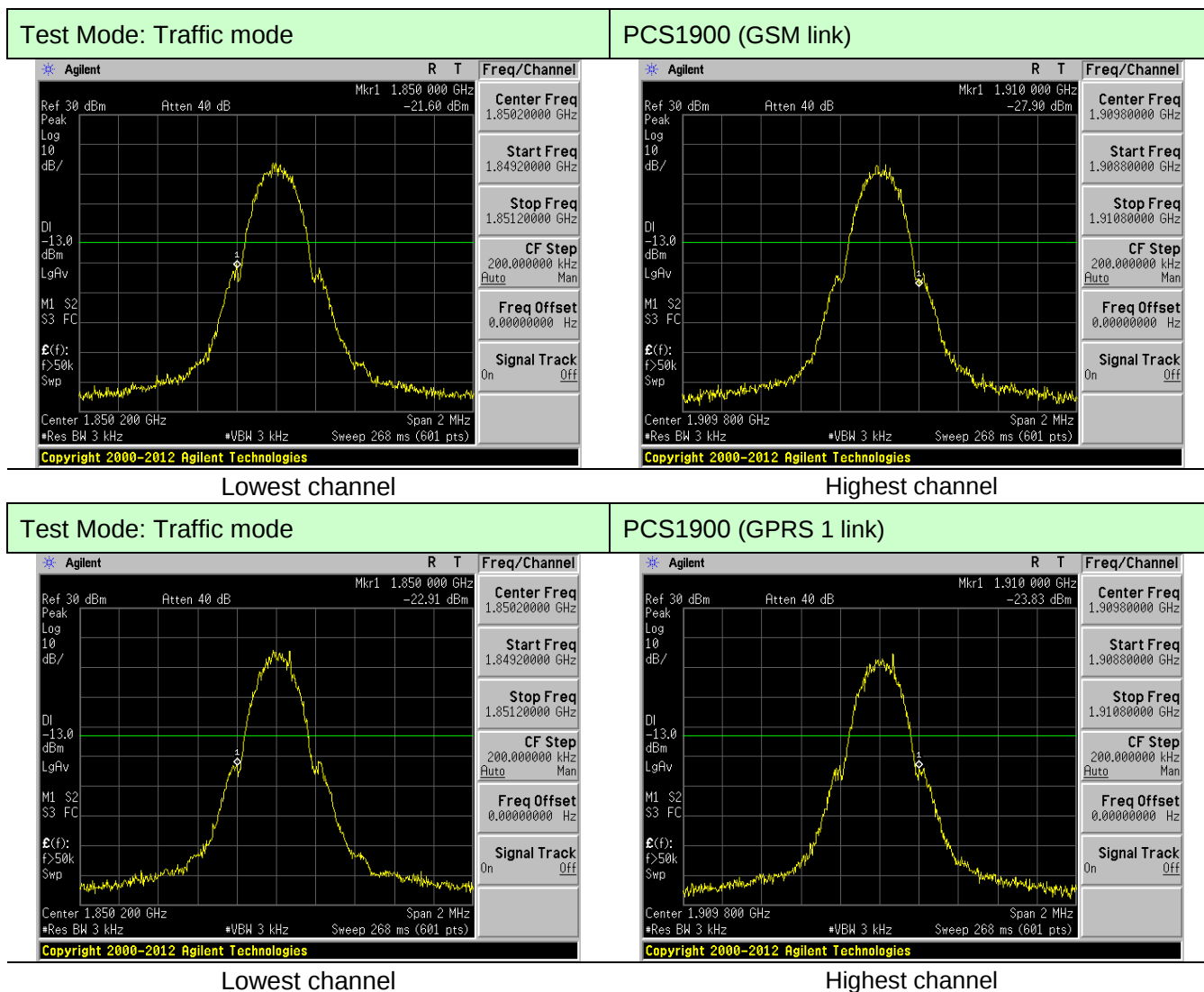
Test Mode: Traffic mode	GSM850 (GPRS 1 link)
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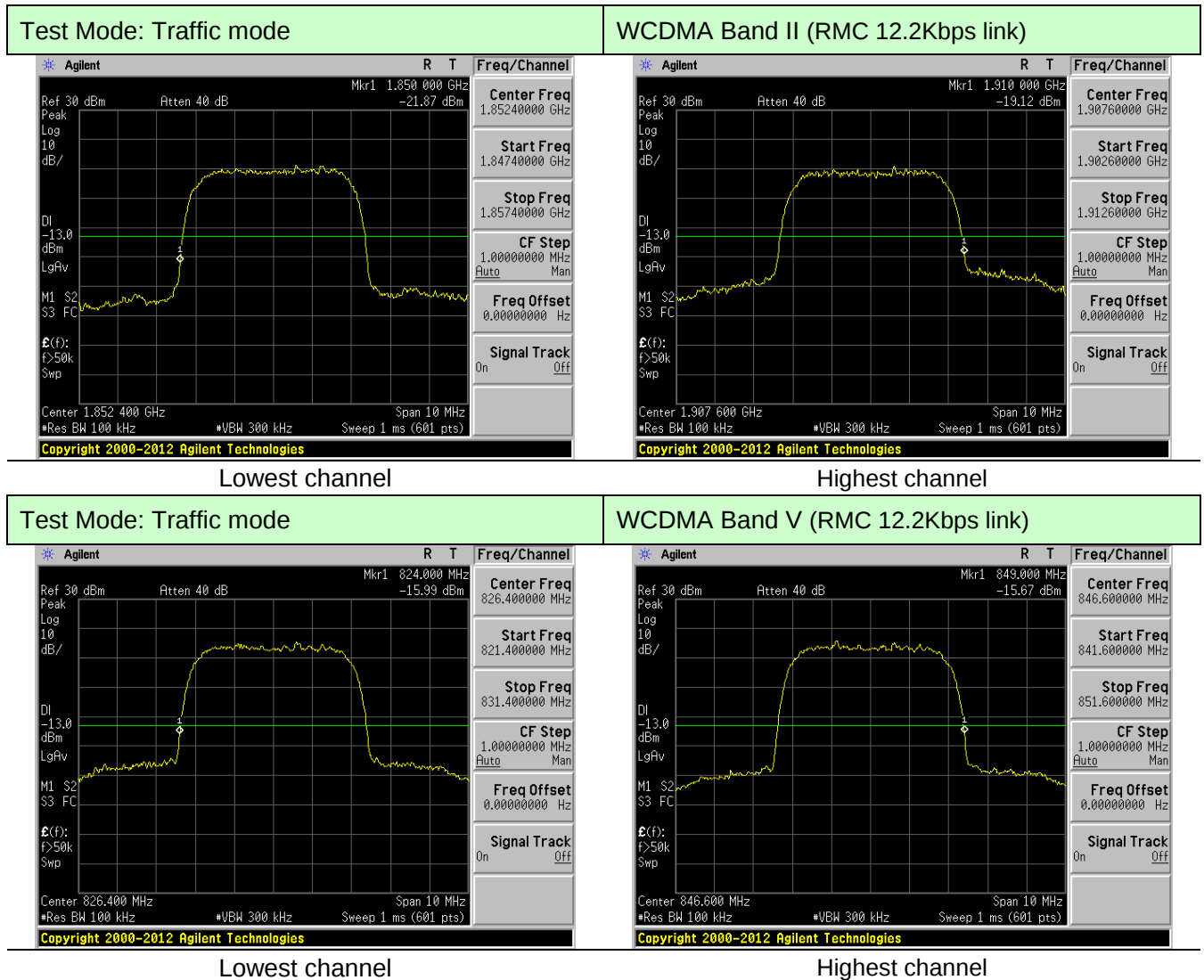


Lowest channel

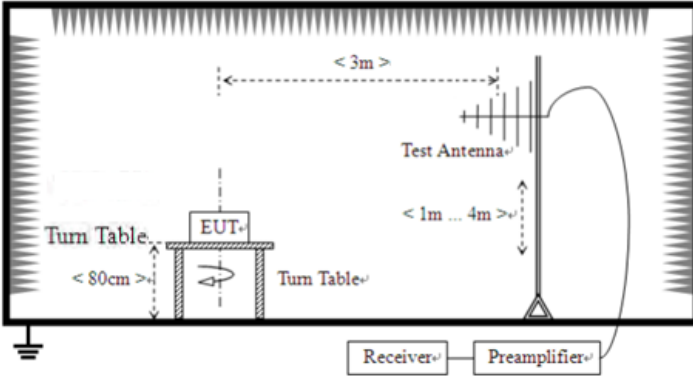
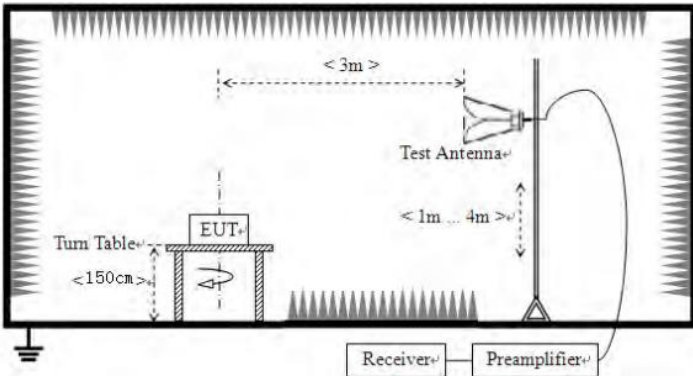
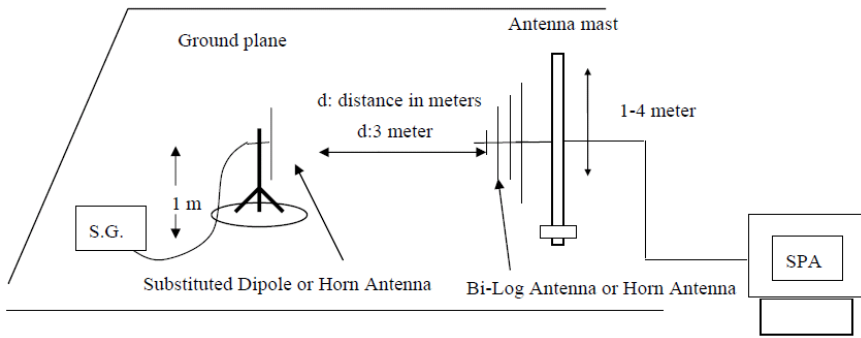


Highest channel





6.8 Field strength of spurious radiation measurement

Test Requirement:	FCC part22.917 and FCC part24.238
Test Method:	FCC part 2.1053 and ANSI C63.26:2015
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. $\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}$ $\text{ERP} = \text{EIRP} - 2.15$
Test Instruments:	Refer to section 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data

GSM 850								
Channel	Frequency(MHz)	Polarization	SGP [dBm]	Substitution Gain[dBi]	Cable loss[dB]	ERP (dBm)	Limit (dBm)	Over Limit (dBm)
Lowest	1648.40	H	-62.00	6.74	2.37	-59.78	-13.00	-46.78
	2472.60	H	-62.86	8.94	3.18	-59.25	-13.00	-46.25
	3296.80	H	-57.10	10.62	3.62	-52.25	-13.00	-39.25
	1648.40	V	-57.35	6.74	2.37	-55.13	-13.00	-42.13
	2472.60	V	-64.82	8.94	3.18	-61.21	-13.00	-48.21
	3296.80	V	-60.67	10.62	3.62	-55.82	-13.00	-42.82
Middle	1673.20	H	-62.53	6.74	2.39	-60.33	-13.00	-47.33
	2509.80	H	-58.90	8.94	3.03	-55.14	-13.00	-42.14
	3346.40	H	-57.81	10.62	3.63	-52.97	-13.00	-39.97
	1673.20	V	-58.19	6.74	2.39	-55.99	-13.00	-42.99
	2509.80	V	-60.69	8.94	3.03	-56.93	-13.00	-43.93
	3346.40	V	-58.06	10.62	3.63	-53.22	-13.00	-40.22
Highest	1697.60	H	-61.71	6.74	2.40	-59.52	-13.00	-46.52
	2546.40	H	-64.74	8.94	3.06	-61.01	-13.00	-48.01
	3395.20	H	-63.37	10.62	3.64	-58.54	-13.00	-45.54
	1697.60	V	-64.65	6.74	2.40	-62.46	-13.00	-49.46
	2546.40	V	-60.39	8.94	3.06	-56.66	-13.00	-43.66
	3395.20	V	-57.50	10.62	3.64	-52.67	-13.00	-39.67

The emission levels of below 1 GHz are very lower than the limit so not show in test report

GSM 1900								
Channel	Frequency(MHz)	Polarization	SGP [dBm]	Substitution Gain[dBi]	Cable loss[dB]	EIRP (dBm)	Limit (dBm)	Over Limit (dBm)
Lowest	3700.40	H	-58.07	13.13	3.88	-48.82	-13.00	-35.82
	5550.60	H	-60.69	11.62	5.27	-54.34	-13.00	-41.34
	7400.80	H	-60.83	10.22	6.73	-57.34	-13.00	-44.34
	3700.40	V	-61.53	13.13	3.88	-52.28	-13.00	-39.28
	5550.60	V	-62.29	11.62	5.27	-55.94	-13.00	-42.94
	7400.80	V	-60.24	10.22	6.73	-56.75	-13.00	-43.75
Middle	3760.00	H	-59.07	13.13	3.9	-49.84	-13.00	-36.84
	5640.00	H	-57.30	11.62	5.33	-51.01	-13.00	-38.01
	7520.00	H	-58.63	10.22	6.82	-55.23	-13.00	-42.23
	3760.00	V	-60.53	13.13	3.9	-51.30	-13.00	-38.30
	5640.00	V	-59.10	11.62	5.33	-52.81	-13.00	-39.81
	7520.00	V	-58.68	10.22	6.82	-55.28	-13.00	-42.28
Highest	3819.60	H	-57.47	13.13	3.92	-48.26	-13.00	-35.26
	5729.40	H	-57.91	11.62	5.4	-51.69	-13.00	-38.69
	7639.20	H	-59.29	10.22	6.8	-55.87	-13.00	-42.87
	3819.60	V	-59.66	13.13	3.92	-50.45	-13.00	-37.45
	5729.40	V	-60.46	11.62	5.4	-54.24	-13.00	-41.24
	7639.20	V	-64.38	10.22	6.8	-60.96	-13.00	-47.96

The emission levels of below 1 GHz are very lower than the limit so not show in test report

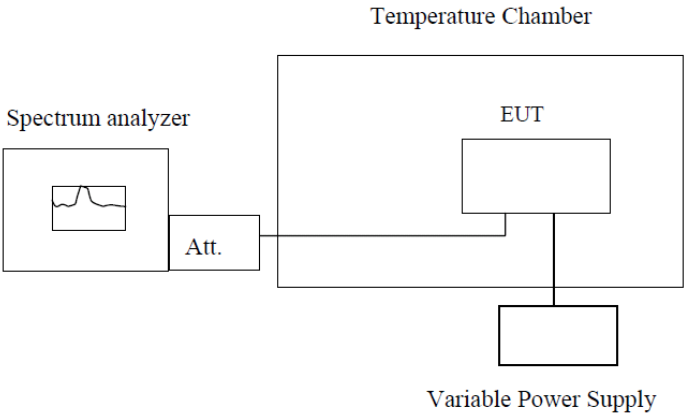
WCDMA Band V								
Channel	Frequency(MHz)	Polarization	SGP [dBm]	Substitution Gain[dBi]	Cable loss[dB]	ERP (dBm)	Limit (dBm)	Over Limit (dBm)
Lowest	1652.80	H	-59.12	6.74	2.37	-56.90	-13.00	-43.90
	2479.20	H	-57.90	8.94	3.18	-54.29	-13.00	-41.29
	3305.60	H	-60.59	10.62	3.62	-55.74	-13.00	-42.74
	1652.80	V	-60.37	6.74	2.37	-58.15	-13.00	-45.15
	2479.20	V	-63.47	8.94	3.18	-59.86	-13.00	-46.86
	3305.60	V	-57.12	10.62	3.62	-52.27	-13.00	-39.27
Middle	1672.80	H	-60.39	6.74	2.39	-58.19	-13.00	-45.19
	2509.20	H	-63.31	8.94	3.03	-59.55	-13.00	-46.55
	3345.60	H	-59.02	10.62	3.63	-54.18	-13.00	-41.18
	1672.80	V	-60.29	6.74	2.39	-58.09	-13.00	-45.09
	2509.20	V	-59.67	8.94	3.03	-55.91	-13.00	-42.91
	3345.60	V	-64.96	10.62	3.63	-60.12	-13.00	-47.12
Highest	1693.20	H	-60.45	6.74	2.4	-58.26	-13.00	-45.26
	2539.80	H	-58.18	8.94	3.06	-54.45	-13.00	-41.45
	3386.40	H	-61.28	10.62	3.64	-56.45	-13.00	-43.45
	1693.20	V	-58.89	6.74	2.4	-56.70	-13.00	-43.70
	2539.80	V	-62.74	8.94	3.06	-59.01	-13.00	-46.01
	3386.40	V	-58.75	10.62	3.64	-53.92	-13.00	-40.92

The emission levels of below 1 GHz are very lower than the limit so not show in test report

WCDMA Band II								
Channel	Frequency(MHz)	Polarization	SGP [dBm]	Substitution Gain[dBi]	Cable loss[dB]	EIRP (dBm)	Limit (dBm)	Over Limit (dBm)
Lowest	3704.80	H	-62.34	13.13	3.88	-53.09	-13.00	-40.09
	5557.20	H	-61.18	11.62	5.27	-54.83	-13.00	-41.83
	7409.60	H	-58.92	10.22	6.73	-55.43	-13.00	-42.43
	3704.80	V	-60.52	13.13	3.88	-51.27	-13.00	-38.27
	5557.20	V	-57.06	11.62	5.27	-50.71	-13.00	-37.71
	7409.60	V	-57.51	10.22	6.73	-54.02	-13.00	-41.02
Middle	3760.00	H	-58.06	13.13	3.9	-48.83	-13.00	-35.83
	5640.00	H	-57.44	11.62	5.33	-51.15	-13.00	-38.15
	7520.00	H	-59.20	10.22	6.82	-55.80	-13.00	-42.80
	3760.00	V	-57.36	13.13	3.9	-48.13	-13.00	-35.13
	5640.00	V	-59.48	11.62	5.33	-53.19	-13.00	-40.19
	7520.00	V	-61.57	10.22	6.82	-58.17	-13.00	-45.17
Highest	3815.20	H	-61.02	13.13	3.92	-51.81	-13.00	-38.81
	5722.80	H	-60.14	11.62	5.4	-53.92	-13.00	-40.92
	7630.40	H	-62.72	10.22	6.8	-59.30	-13.00	-46.30
	3815.20	V	-63.32	13.13	3.92	-54.11	-13.00	-41.11
	5722.80	V	-62.74	11.62	5.4	-56.52	-13.00	-43.52
	7630.40	V	-60.38	10.22	6.8	-56.96	-13.00	-43.96

The emission levels of below 1 GHz are very lower than the limit so not show in test report

6.9 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC part 22.355 and FCC part 24.235
Test Method:	FCC Part2.1055(a)(1)(b)
Limit:	$\pm 2.5\text{ppm}$
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 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

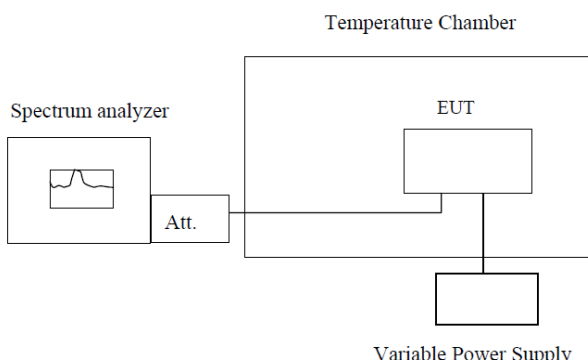
Measurement Data

Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-30	77	0.0925	±2.5	Pass
	-20	87	0.1045		
	-10	74	0.0885		
	0	61	0.0726		
	10	71	0.0846		
	20	61	0.0726		
	30	101	0.1204		
	40	91	0.1084		
	50	87	0.1045		
Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-30	22	0.0258	±2.5	Pass
	-20	24	0.0290		
	-10	20	0.0242		
	0	18	0.0211		
	10	19	0.0227		
	20	16	0.0195		
	30	31	0.0370		
	40	26	0.0306		
	50	24	0.0290		

Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-30	49	0.0583	±2.5	Pass
	-20	56	0.0670		
	-10	47	0.0565		
	0	41	0.0494		
	10	46	0.0550		
	20	40	0.0482		
	30	67	0.0799		
	40	58	0.0699		
	50	55	0.0663		
Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-30	34	0.0181	±2.5	Pass
	-20	41	0.0218		
	-10	34	0.0181		
	0	28	0.0151		
	10	34	0.0181		
	20	30	0.0157		
	30	49	0.0260		
	40	42	0.0224		
	50	40	0.0212		

Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	97	0.1159	± 2.5	Pass
	-20	139	0.1658		
	-10	158	0.1885		
	0	70	0.0841		
	10	108	0.1295		
	20	120	0.1431		
	30	181	0.2158		
	40	169	0.2022		
	50	203	0.2431		
Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880.0MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	93	0.0493	± 2.5	Pass
	-20	83	0.0439		
	-10	71	0.0379		
	0	67	0.0355		
	10	61	0.0325		
	20	53	0.0283		
	30	67	0.0355		
	40	75	0.0397		
	50	71	0.0379		

6.10 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC part 22.355 and FCC part 24.235
Test Method:	FCC Part2.1055(d)(1)(2)
Limit:	$\pm 2.5\text{ppm}$
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 5.0 for details
Test mode:	Refer to section 6.1 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	4.37	59	0.0707	± 2.5	Pass
	3.80	68	0.0816		
	3.23	77	0.0925		
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	4.37	118	0.1406	± 2.5	Pass
	3.80	85	0.1017		
	3.23	96	0.1147		

Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.37	115	0.1375	± 2.5	Pass
	3.80	131	0.1566		
	3.23	147	0.1751		
Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.37	46	0.0244	± 2.5	Pass
	3.80	56	0.0298		
	3.23	56	0.0298		

Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.37	43	0.0230	± 2.5	Pass
	3.80	32	0.0171		
	3.23	34	0.0183		
Reference Frequency: WCDMA Band II Middle channel=940 channel=1880.0MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.37	62	0.0329	± 2.5	Pass
	3.80	71	0.0378		
	3.23	71	0.0380		

7 Test Setup Photo

Reference to the **appendix I** for details.

8 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----