

FCC TEST REPORT

For

Shenzhen StarWorth Manufacturing Co.,Ltd.

Tablet PC

Test Model: SW-M07E-M08

Prepared for : Shenzhen StarWorth Manufacturing Co.,Ltd.
Address : 1-4 Floor Building No.27 Chentian Industrial Estate ,Xixiang
Town ,Bao' an District ,Shenzhen City ,China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : December 28, 2015
Number of tested samples : 1
Serial number : Prototype
Date of Test : December 28, 2015 – January 20, 2016
Date of Report : January 20, 2016

FCC TEST REPORT

FCC CFR 47 PART 22 SUBPART H AND PART 24 SUBPART E

Report Reference No. : LCS1512292766E

Date of Issue : January 20, 2016

Testing Laboratory Name : Shenzhen LCS Compliance Testing Laboratory Ltd.Address : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue,
Bao'an District, Shenzhen, Guangdong, ChinaTesting Location/ Procedure..... : Full application of Harmonised standards ☒
Partial application of Harmonised standards ☐
Other standard testing method ☐**Applicant's Name..... : Shenzhen StarWorth Manufacturing Co.,Ltd.**Address : 1-4 Floor Building No.27 Chentian Industrial Estate ,Xixiang
Town ,Bao' an District ,Shenzhen City ,China**Test Specification**Standard : FCC CFR 47 PART 2, FCC CFR 47 PART 22 SUBPART H
AND PART 24 SUBPART E**Test Report Form No..... : LCSEMC-1.0**

TRF Originator : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

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Test Item Description. : Tablet PC

Trade Mark : N/A

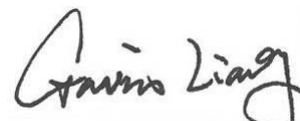
Test Model : SW-M07E-M08

Ratings : DC 3.7-4.2V by Lithium ion polymer battery(3500mAh)
Recharge Voltage: DC 5.0V/2.0AResult : **Positive****Compiled by:**

Kyle Yin / File administrators

Supervised by:

Glin Lu/ Technique principal

Approved by:

Gavin Liang/ Manager

FCC -- TEST REPORT**Test Report No. : LCS1512292766E**January 20, 2016

Date of issue

Test Model..... : SW-M07E-M08

EUT..... : Tablet PC

Applicant..... : Shenzhen StarWorth Manufacturing Co.,Ltd.Address..... : 1-4 Floor Building No.27 Chentian Industrial Estate ,Xixiang
Town ,Bao' an District ,Shenzhen City ,China

Telephone..... : /

Fax..... : /

Manufacturer..... : Shenzhen StarWorth Manufacturing Co.,Ltd.Address..... : 1-4 Floor Building No.27 Chentian Industrial Estate ,Xixiang
Town ,Bao' an District ,Shenzhen City ,China

Telephone..... : /

Fax..... : /

Factory..... : Shenzhen StarWorth Manufacturing Co.,Ltd.Address..... : 1-4 Floor Building No.27 Chentian Industrial Estate ,Xixiang
Town ,Bao' an District ,Shenzhen City ,China

Telephone..... : /

Fax..... : /

Test Result**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: Tablet PC
Test Model	: SW-M07E-M08
Additional Model	PDA1501
Model Declaration	: PCB board, structure and internal of the related model(s) are the same, So no additional models were tested.
Hardware Version	: YTS003_V1.1
Software Version	: V1.1
Power Supply	: DC 3.7-4.2V by Lithium ion polymer battery(3500mAh) Recharge Voltage: DC 5.0V/2.0A
EUT Support Radios Application	: GSM/GPRS/WCDMA/HSUPA/HSDPA/ WIFI/Bluetooth/GPS(Only RX)/NFC(Only RX)
2G Band	:
Support Band	: ☒ GSM 900 (EU-Band) ☒ DCS 1800 (EU-Band) ☒ GSM 850 (U.S.-Band) ☒ PCS 1900 (U.S.-Band)
Release Ver.	: R99
GPRS Class	: Class 12
Uplink	: GSM 850: 824.2MHz ~ 848.8MHz PCS 1900: 1850.2MHz ~ 1909.8MHz
Downlink	: GSM 850: 869.2MHz ~ 893.8MHz PCS 1900: 1930.2MHz ~ 1989.8MHz
Number of Channels	: GSM 850: 128 / 190 / 251 PCS 1900: 512 / 661 / 810
Type Of Modulation	: GMSK for GSM/GPRS
Antenna Description	: PIFA Antenna, 2.1dBi(Max.)
Test PCL/Class	: GSM/GPRS 850: Level 5 / Class 4 PCS/GPRS 1900: Level 0 / Class 1
Maximum RF Output Power	: 32.82dBm for GSM 850 29.99dBm for PCS 1900

3G Band :
Support Band : ☐ WCDMA Band II (U.S.-Band)
☒ WCDMA Band V (U.S.-Band)
☒ WCDMA Band I (EU-Band)
☐ WCDMA Band VIII (EU-Band)
Release Ver. : R99
Uplink : WCDMA Band V: 826.4MHz ~ 846.6MHz
Downlink : WCDMA Band V: 871.4MHz ~ 891.6MHz
Number of Channels : WCDMA Band V: 4132 / 4183 / 4233
Type Of Modulation : WCDMA: QPSK; HSDPA/HSUPA: QPSK
Antenna Description : PIFA Antenna, 1.5dBi(Max.)
Test PCL/Class : Level 3
Maximum :
RF Output Power : 22.78dBm for WCDMA Band V

1.2. Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
SHENZHEN WAN DONG CHANG SHENG TECHNOLOGY CO.,LTD	Charger	YC-25A-052000	--	VOC

1.3. External I/O

I/O Port Description	Quantity	Cable
USB Port	1	N/A
SIM Card Slot	1	N/A
TF Card Slot	1	N/A
Earphone Port	1	N/A

1.4. Description of Test Facility

CNAS Registration Number. is L4595.

FCC Registration Number. is 899208.

Industry Canada Registration Number. is 9642A-1.

VCCI Registration Number. is C-4260 and R-3804.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

1.5. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	3.10dB	(1)
		30MHz~200MHz	2.96dB	(1)
		200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	1.63dB	(1)
Power disturbance	:	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

1.7. Test environment

All tests were performed under the following environmental conditions:

Condition	Minimum value	Maximum value
Barometric pressure	86kPa	106kPa
Temperature	15 ℃	30 ℃
Relative Humidity	20 %	75 %
Power supply range	±5% of rated voltages	

2. TEST METHODOLOGY

All tests and measurements indicated in this document were performed in accordance with Below standards:

[FCC Part 22 \(10-1-16 Edition\)](#): PRIVATE LAND MOBILE RADIO SERVICES.

[FCC Part 24\(10-1-16 Edition\)](#): PUBLIC MOBILE SERVICES

[TIA/EIA 603 D June 2010](#): Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

[47 CFR FCC Part 15 Subpart B](#): - Unintentional Radiators

[FCC Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[ANSI C63.4:2014](#): Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

[FCC KDB971168D01](#) Power Meas License Digital Systems

2.1. EUT Configuration

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

2.2. Objective

This type approval report is prepared on behalf of **Shenzhen StarWorth Manufacturing Co.,Ltd** in accordance with FCC CFR 47 part 2, FCC CFR 47 part 22 subpart H and part 24 subpart E.

The objective is to determine compliance with FCC rules for RF output power, modulation characteristics, occupied bandwidth, spurious emissions at antenna terminal, field strength of spurious radiation, frequency stability, band edge, and conducted and radiated margin.

2.3. General Test Procedures

2.3.1 Conducted Emissions

AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made.

2.4. Test Mode

GSM / GPRS / 850: Channel Low (CH128), Channel Mid (CH190) and Channel High (CH251) were chosen for full testing. The test PCL(Power Control Level)/Class is level 5/class 4.

PCS / GPRS / 1900: Channel Low (CH512), Channel Mid (CH661) and Channel High (CH810) were chosen for full testing. The test PCL(Power Control Level)/Class is level 0/class 1.

WCDMA Band V/HSPA Band V: Channel Low (CH4132), Channel Mid (CH4183) and Channel High (CH4233) were chosen for full testing. The test PCL(Power Control Level)/Class is level 3.

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMU 200) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both GSM and WCDMA frequency band.

GSM/GPRS/ 850, PCS/GPRS/ 1900, WCDMA / HSPA band V mode have been tested during the test.

The EUT has one GSM/WCDMA card slot(SIM1) and one GSM card slot(SIM2). The result for GSM/WCDMA card slot (SIM1) is the worst case which was only recorded.

***Note: Only recorded the worst test case in this test report.

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmit condition.

3.2. EUT Exercise Software

N/A.

3.3. Special Accessories

N/A.

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: 47 CFR FCC Part 22 Subpart H, Part 24 Subpart E			
FCC Rules	Description of Test		Result
§2.1046, §22.913 / §24.232	RF Output Power	Conducted Output Power	Compliant
		Radiated Output Power	
§24.232(d)	Peak-to-Average Ratio		Compliant
§2.1049, §22.905 §22.917, §24.238	Occupied Bandwidth		Compliant
§2.1053 §22.917, §24.238	Spurious Radiated Emissions		Compliant
§2.1051 §22.917, §24.238	Spurious Emissions at Antenna Terminals		Compliant
§22.917, §24.238	Band Edge		Compliant
§2.1055 §22.355, §24.235	Frequency Stability		Compliant
§15.107 / §15.207	AC power line conducted emissions		Compliant
§1.1310, §2.1091	RF Exposure Information		Compliant

5. TEST RESULT

5.1. RF OUTPUT POWER

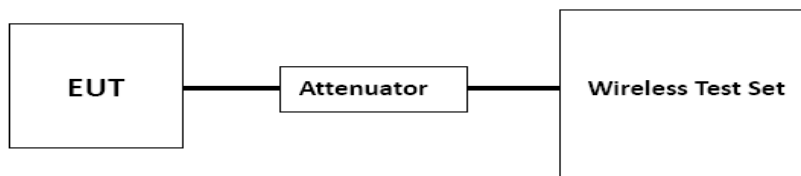
5.1.1. Standard Applicable

According to FCC §2.1046 and §22.913, the maximum effective radiated power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to FCC §2.1046 and §24.232, mobile and portable stations are limited to 2 Watts and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

5.1.2. Test Procedures

Conducted method:



Radiated method:

TIA 603-D section 2.2.17

5.1.3. Test Results

Temperature	25°C	Humidity	60%
ATM Pressure:	101.4kPa	Test Engineer	Kyle

Conducted Output Power:

Mode	Channel	Frequency (MHz)	RF Output Power (dBm, Average)	Limit (dBm)
GSM 850	128	824.2	32.52	38.45
	190	836.6	32.82	38.45
	251	848.8	32.59	38.45
GPRS 850 (1 uplink), GMSK	128	824.2	32.22	38.45
	190	836.6	32.09	38.45
	251	848.8	32.13	38.45
GPRS 850 (2 uplink), GMSK	128	824.2	31.21	38.45
	190	836.6	30.35	38.45
	251	848.8	30.78	38.45
GPRS 850 (4 uplink), GMSK	128	824.2	27.62	38.45
	190	836.6	27.33	38.45
	251	848.8	27.41	38.45

Mode	Channel	Frequency (MHz)	RF Output Power (dBm, Average)	Limit (dBm)
PCS 1900	512	1850.2	29.87	33
	661	1880.0	29.99	33
	810	1909.8	29.87	33
GPRS 1900 (1 uplink), GMSK	512	1850.2	29.55	33
	661	1880.0	29.67	33
	810	1909.8	29.59	33
GPRS 1900 (2 uplink), GMSK	512	1850.2	28.54	33
	661	1880.0	28.74	33
	810	1909.8	28.45	33
GPRS 1900 (4 uplink), GMSK	512	1850.2	24.32	33
	661	1880.0	24.21	33
	810	1909.8	24.52	33

***Note: Since the GSM mode has higher power, so the test items below were not performed to GPRS mode.

Mode	Channel	Frequency (MHz)	RF Output Power (dBm, Average)	Limit (dBm)
WCDMA Band V RMC 12.2K	4132	826.4	22.56	38.45
	4183	836.6	22.78	38.45
	4233	846.6	22.58	38.45
HSDPA Subtest 1	4132	826.4	22.46	38.45
	4183	836.6	22.35	38.45
	4233	846.6	21.52	38.45
HSDPA Subtest 2	4132	826.4	21.46	38.45
	4183	836.6	21.58	38.45
	4233	846.6	21.57	38.45
HSDPA Subtest 3	4132	826.4	21.45	38.45
	4183	836.6	21.65	38.45
	4233	846.6	21.78	38.45
HSDPA Subtest 4	4132	826.4	21.30	38.45
	4183	836.6	21.27	38.45
	4233	846.6	21.36	38.45
HSUPA Subtest 1	4132	826.4	21.38	38.45
	4183	836.6	21.24	38.45
	4233	846.6	21.43	38.45
HSUPA Subtest 2	4132	826.4	21.30	38.45
	4183	836.6	21.23	38.45
	4233	846.6	21.37	38.45
HSUPA Subtest 3	4132	826.4	21.39	38.45
	4183	836.6	21.22	38.45
	4233	846.6	21.45	38.45
HSUPA Subtest 4	4132	826.4	21.31	38.45
	4183	836.6	21.25	38.45
	4233	846.6	21.37	38.45
HSUPA Subtest 5	4132	826.4	21.35	38.45
	4183	836.6	21.26	38.45
	4233	846.6	21.45	38.45

Radiated Power:

The worst test data as follow:

Mode	Channel	Frequency (MHz)	Test Result		Limit (dBm)
			Max. ERP & EIRP (dBm)	Polarization	
GSM 850	128	824.2	29.56	H	38.45
	190	836.6	29.78	H	38.45
	251	848.8	29.67	H	38.45
	128	824.2	31.32	V	38.45
	190	836.6	31.25	V	38.45
	251	848.8	31.66	V	38.45
PCS 1900	512	1850.2	28.56	H	33
	661	1880.0	28.74	H	33
	810	1909.8	28.59	H	33
	512	1850.2	28.53	V	33
	661	1880.0	29.66	V	33
	810	1909.8	28.78	V	33
WCDMA Band V RMC 12.2K	4132	826.4	19.34	H	38.45
	4183	836.6	19.56	H	38.45
	4233	846.6	19.47	H	38.45
	4132	826.4	21.09	V	38.45
	4183	836.6	21.06	V	38.45
	4233	846.6	21.43	V	38.45

5.2. PEAK-TO-AVERAGE RATIO

5.2.1. Standard Applicable

According to FCC §2.1046 and §24.232(d), the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

5.2.2. Test Procedures

The following steps outline the procedure used to measure the Peak-to-Average Ratio from the EUT.

- 1) The EUT was connected to Spectrum Analyzer and Base Station via power divider.
- 2) For GSM/EGPRS operating modes:
 - a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
 - b. Set EUT in maximum power output, and triggered the burst signal.
 - c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
- 3) For UMTS operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

5.2.3. Test Results

Modes	GSM 850		
Channel	128	190	251
	Low	Mid	High
Frequency(MHz)	824.2	836.6	848.8
Peak-To-Average Ratio (dB)	0.17	0.15	0.22
Modes	PCS 1900		
Channel	512	661	810
	Low	Mid	High
Frequency(MHz)	1850.2	1880	1909.8
Peak-To-Average Ratio (dB)	0.21	0.13	0.16
Modes	WCDMA Band V		
Channel	4132	4183	4233
	Low	Mid	High
Frequency(MHz)	826.4	836.6	846.6
Peak-To-Average Ratio (dB)	2.25	2.47	2.22

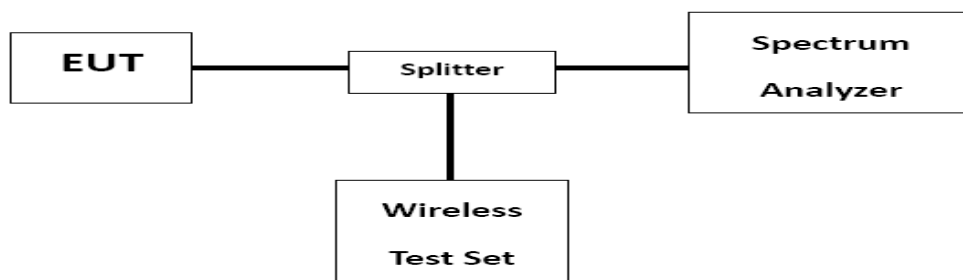
5.3. OCCUPIED BANDWIDTH

5.3.1. Standard Applicable

FCC §2.1049, §22.917, §22.905 and §24.238.

5.3.2. Test Procedures

The RF output of the transmitter was connected to the wireless communication tester and spectrum analyzer through attenuation.



The -26dB & 99% bandwidth was recorded.

5.3.3. Test Results

Temperature	25°C	Humidity	60%
ATM Pressure:	101.4kPa	Test Engineer	Kyle

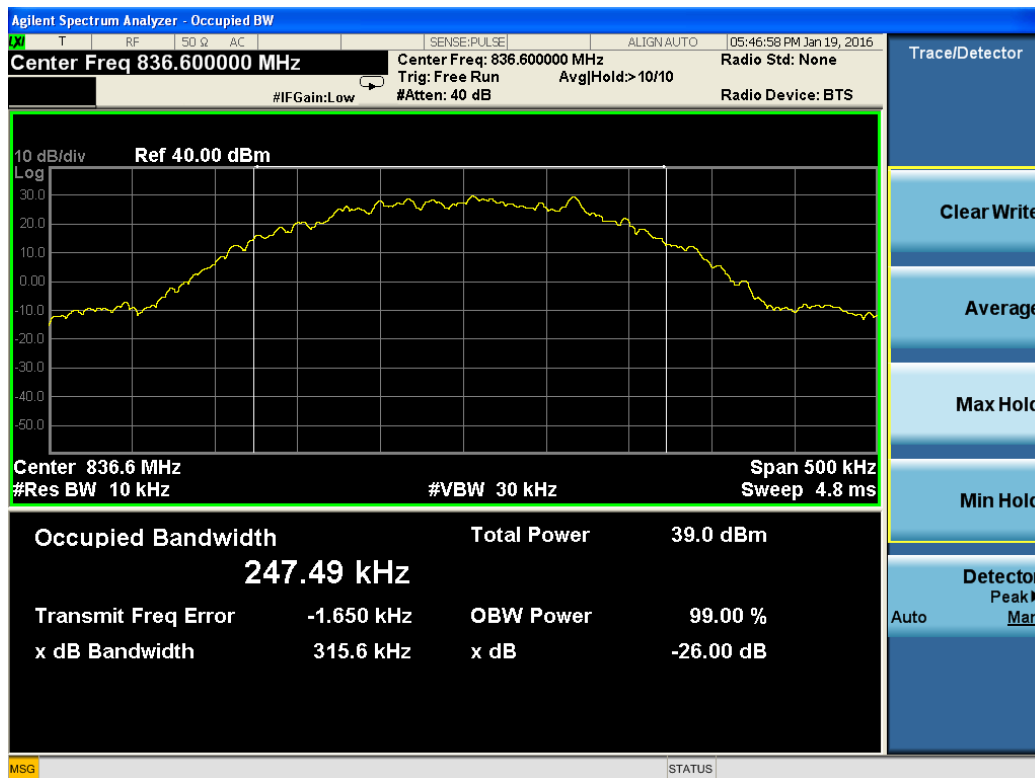
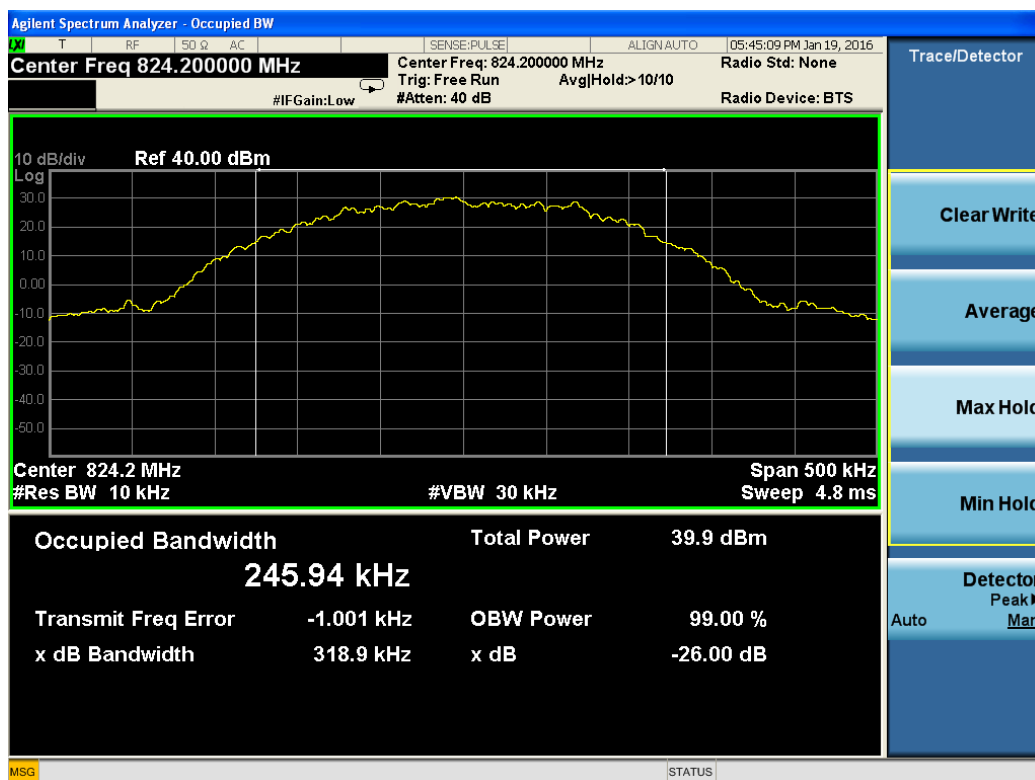
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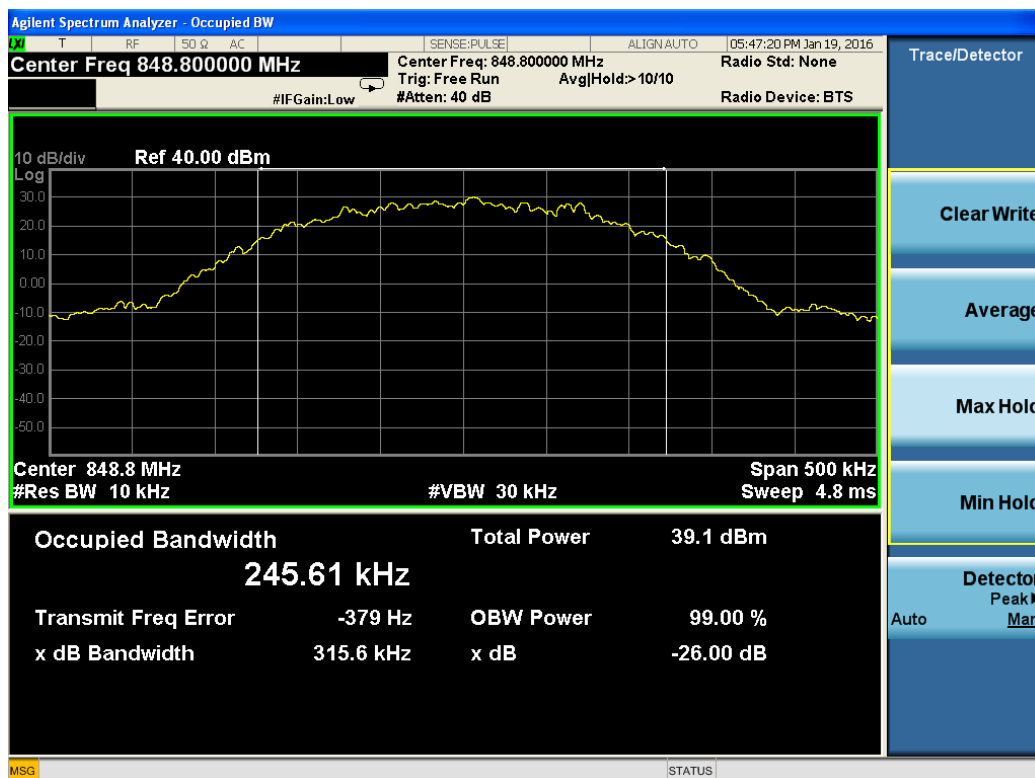
Mode	Channel	Frequency (MHz)	Emission Bandwidth (-26dBc) (kHz)	Occupied Bandwidth (99%) (kHz)
GSM 850	128	824.2	318.9	245.94
	190	836.6	315.6	247.49
	251	848.8	315.6	245.61

Mode	Channel	Frequency (MHz)	Emission Bandwidth (-26dBc) (kHz)	Occupied Bandwidth (99%) (kHz)
PCS 1900	512	1850.2	316.3	243.86
	661	1880.0	315.3	244.79
	810	1909.8	322.7	244.24

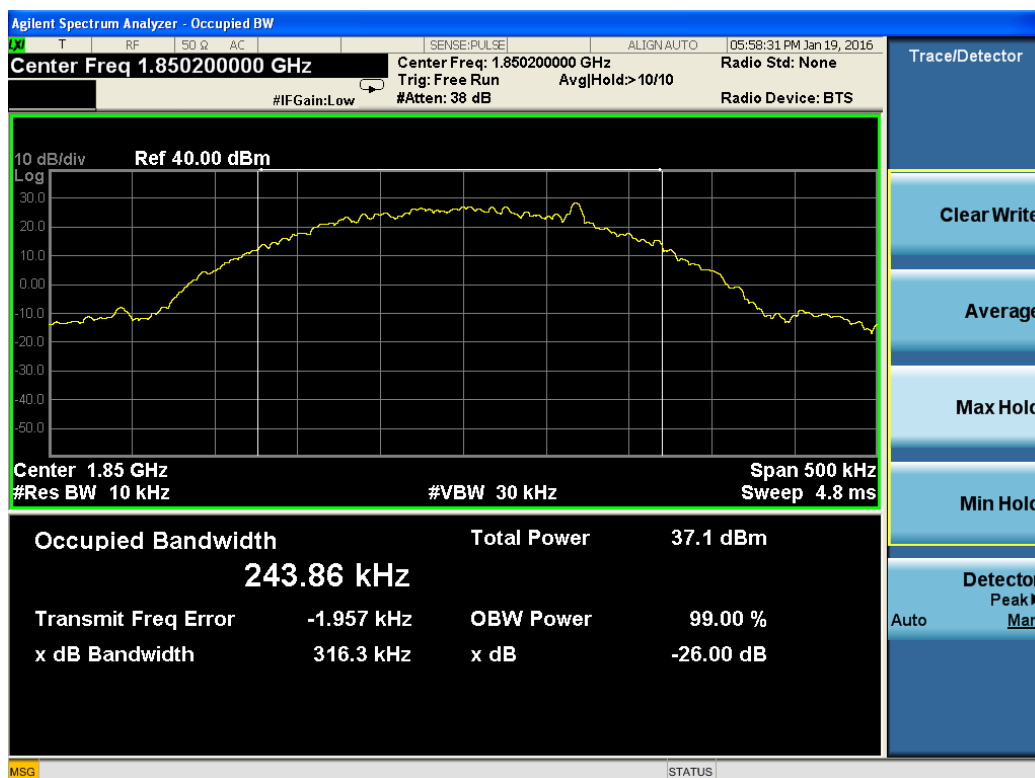
Mode	Channel	Frequency (MHz)	Emission Bandwidth (-26dBc) (MHz)	Occupied Bandwidth (99%) (MHz)
WCDMA Band V	4132	826.4	4.67	4.14
	4183	836.6	4.68	4.16
	4233	846.6	4.67	4.16

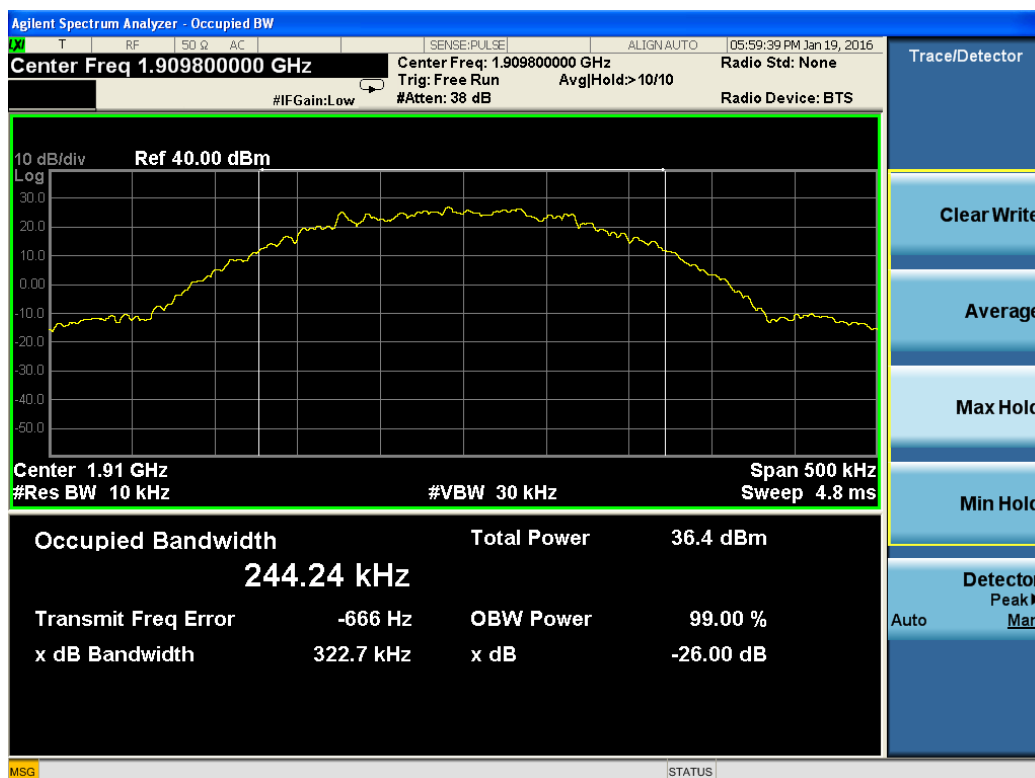
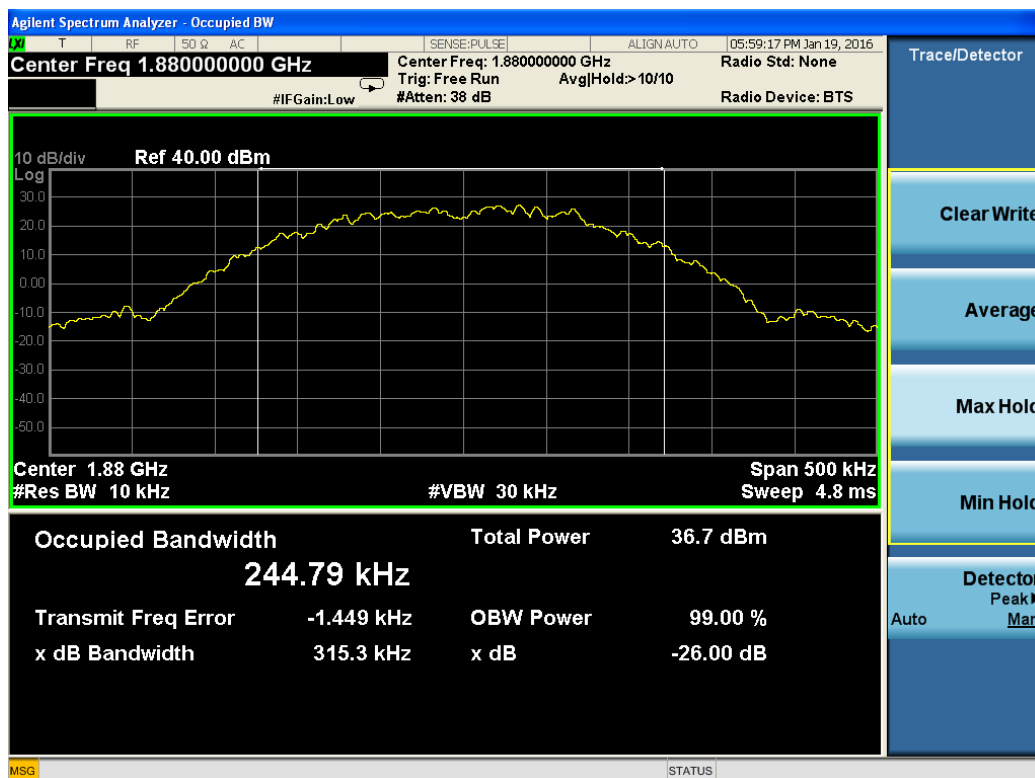
Test Plots For GSM 850



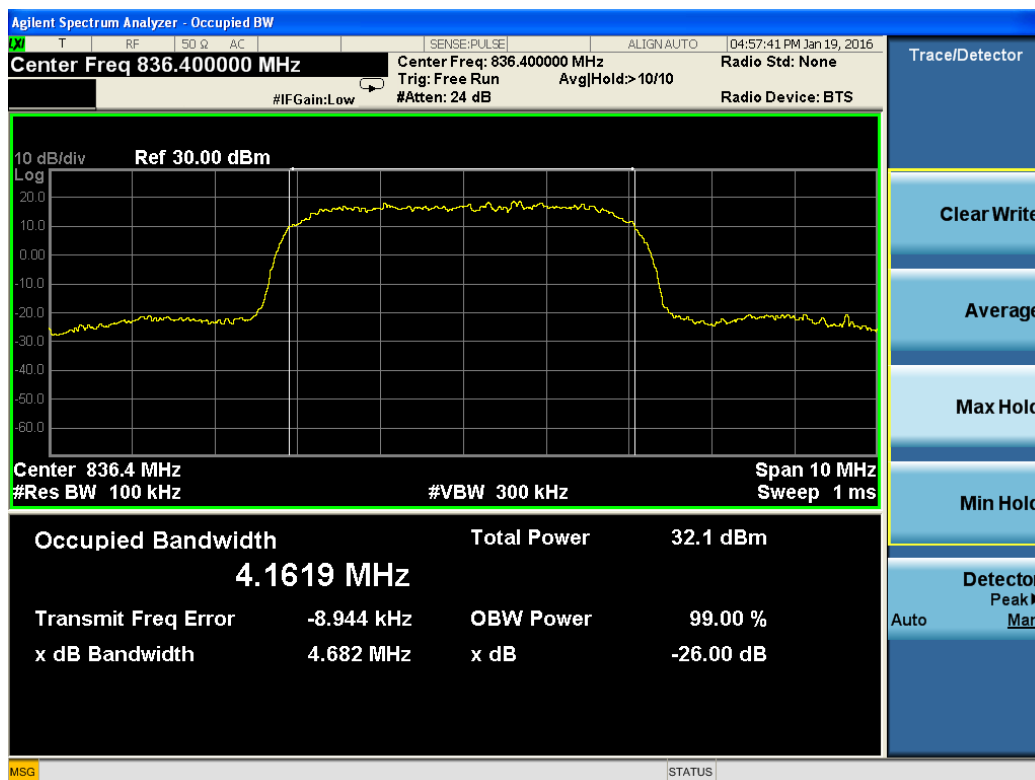
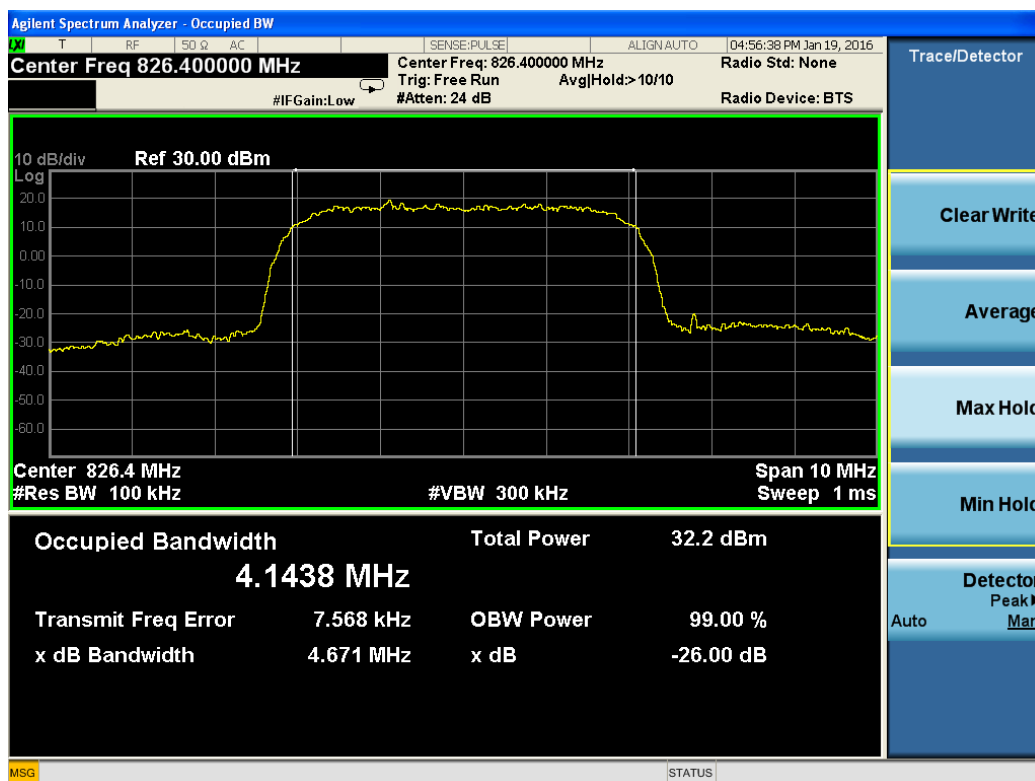


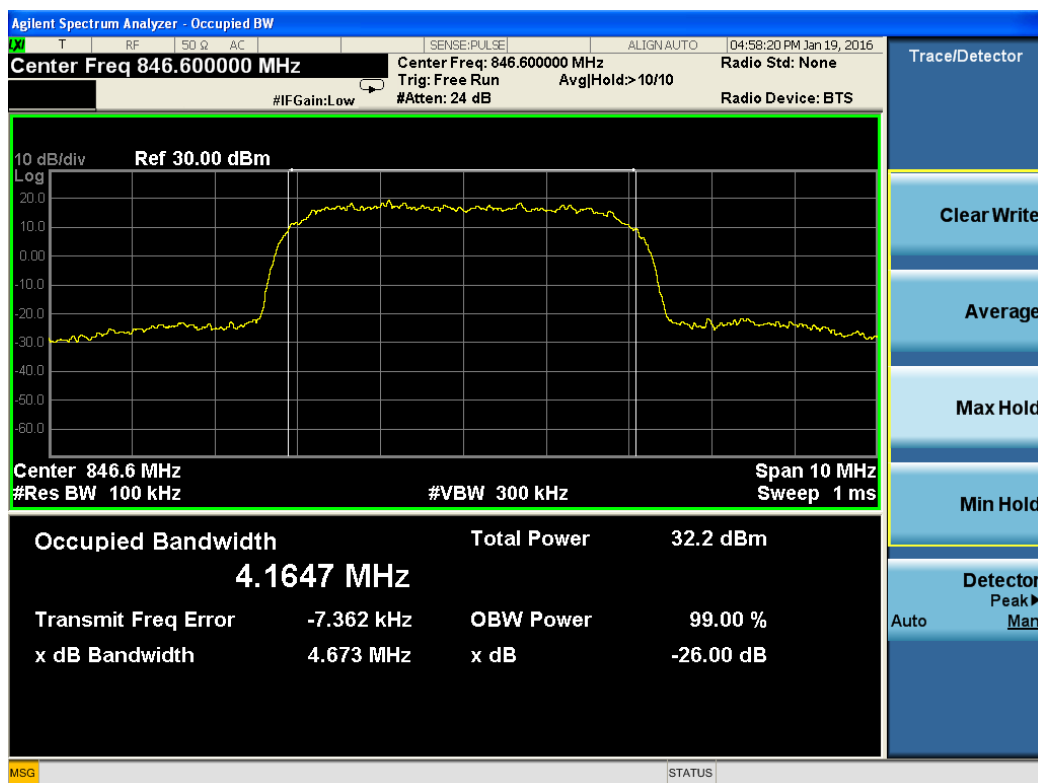
Test Plots For PCS 1900





Test Plots For WCDMA Band V





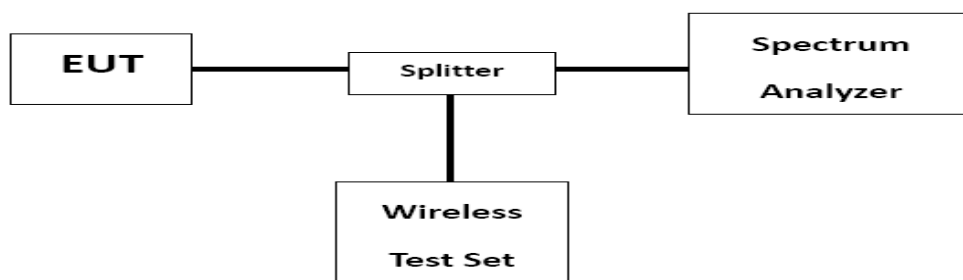
5.4. SPURIOUS AND HARMONIC EMISSION AT ANTENNA TERMINAL

5.4.1. Standard Applicable

FCC §2.1051, §22.917 and §24.238.

5.4.2. Test Procedures

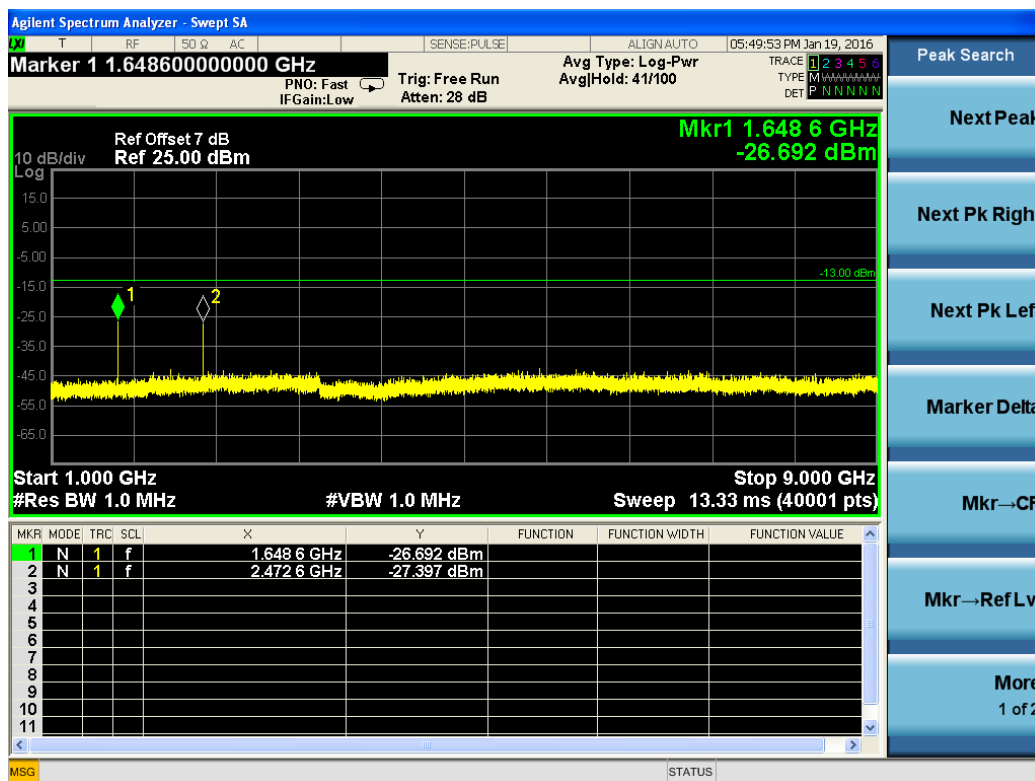
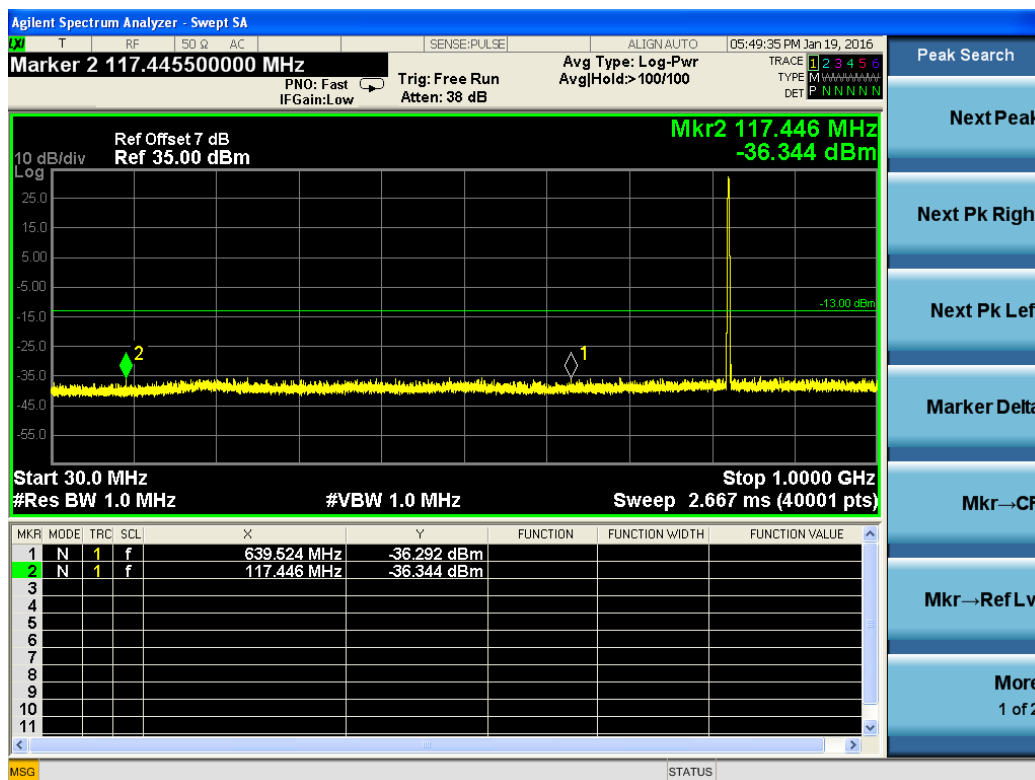
The RF output of the transmitter was connected to the wireless communication tester and spectrum analyzer through attenuation.



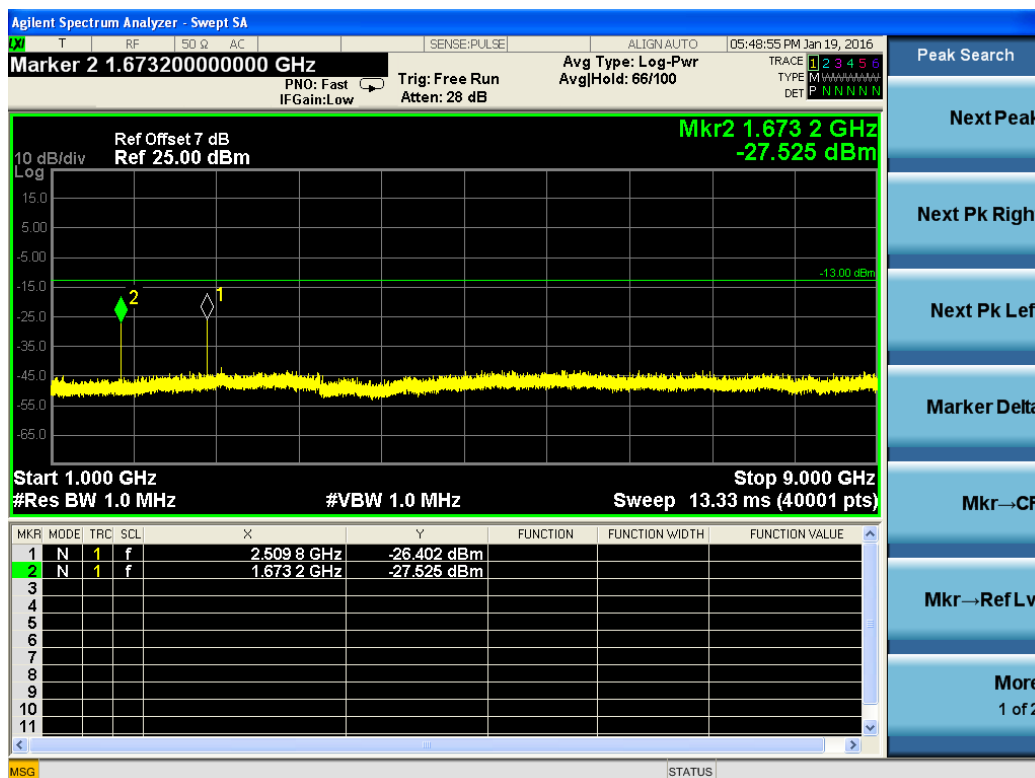
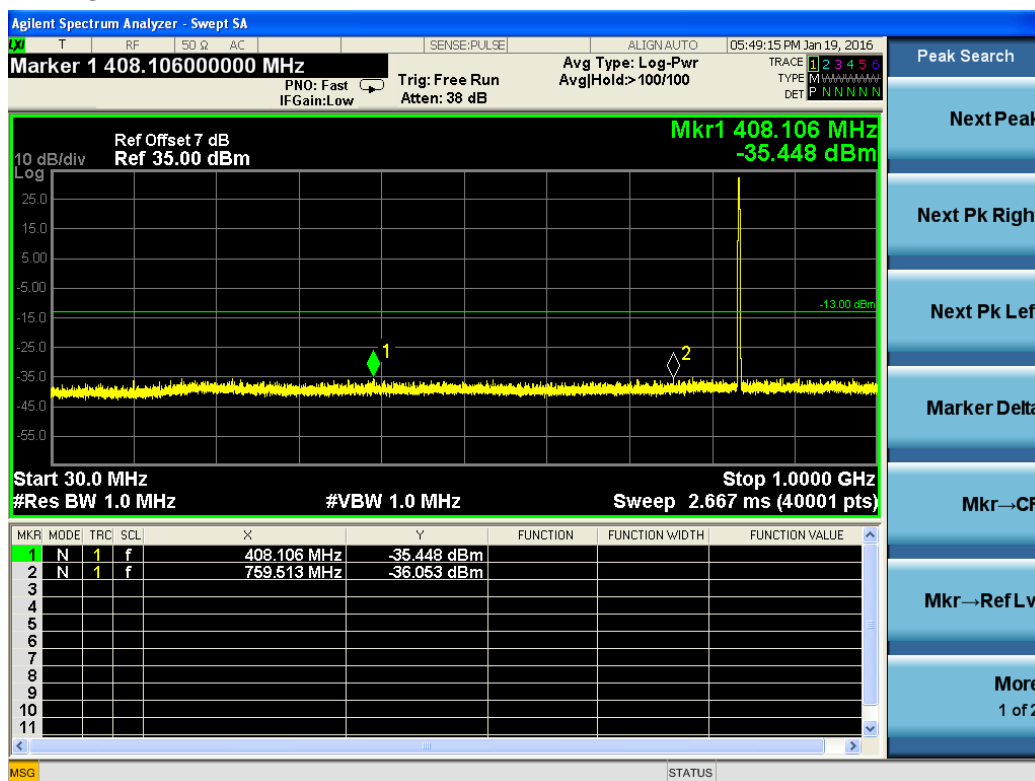
5.4.3. Test Results

Please refer to the following plots.

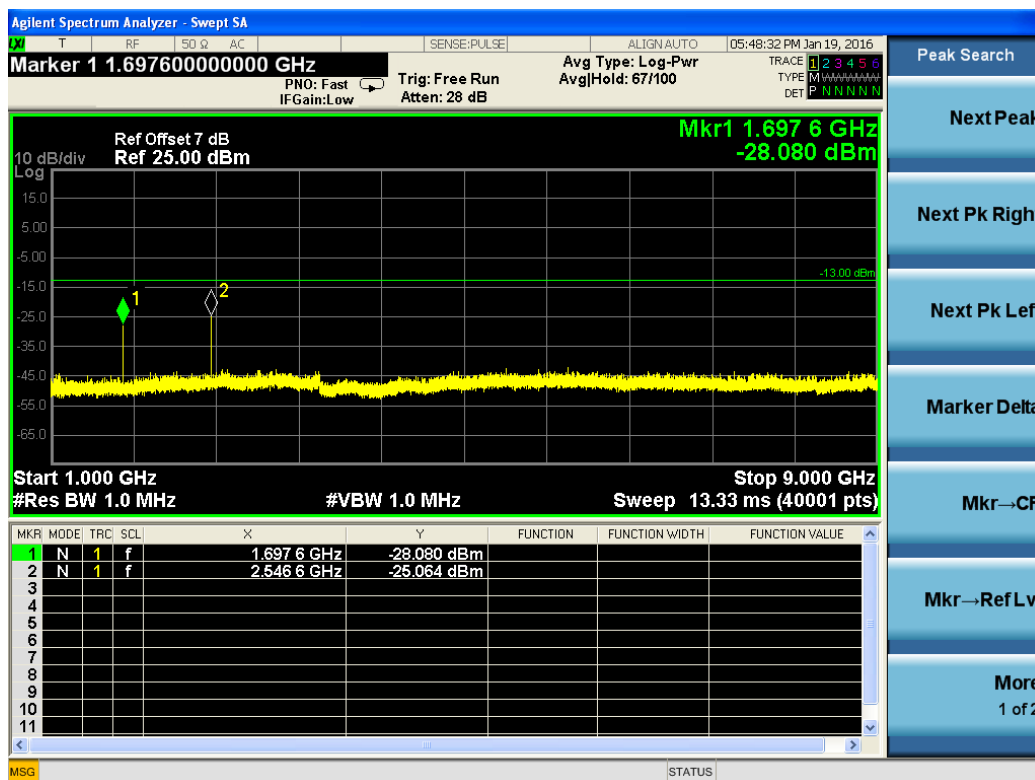
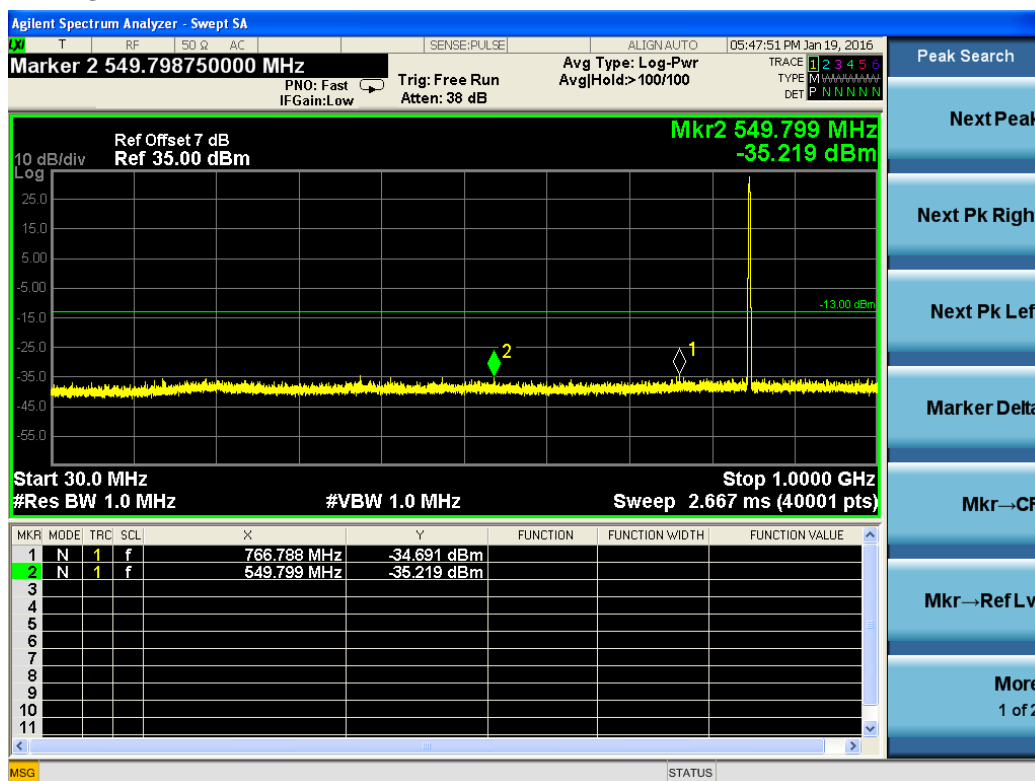
Transmitting Mode, CH 128, GSM 850



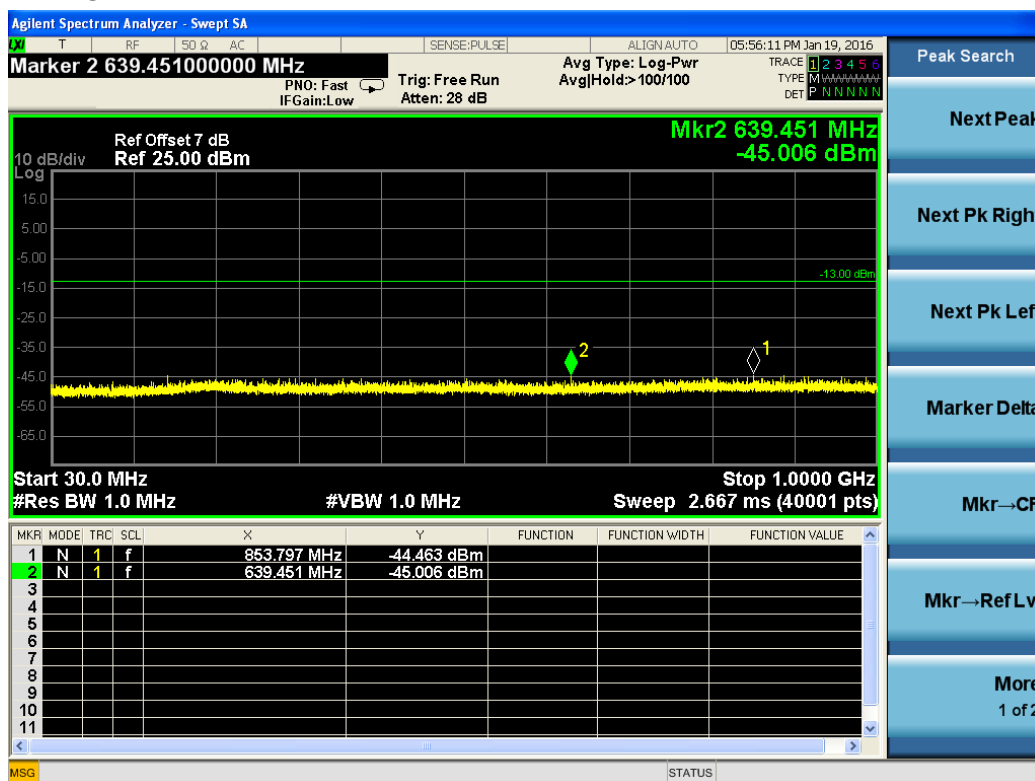
Transmitting Mode, CH 190, GSM 850



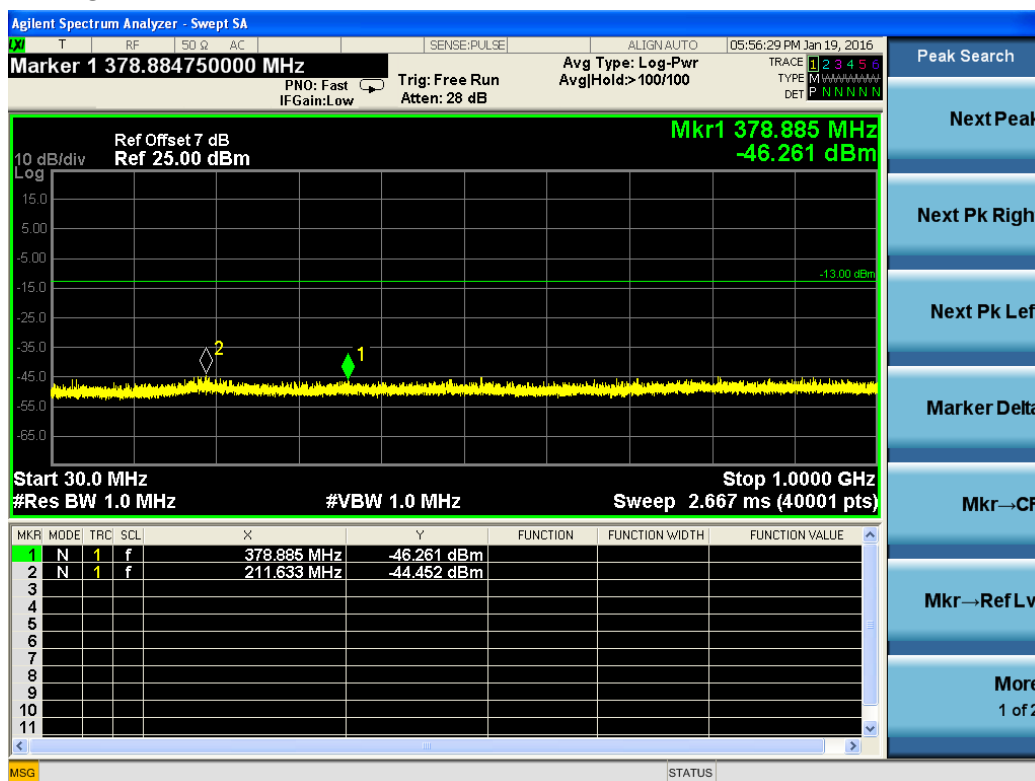
Transmitting Mode, CH 251, GSM 850



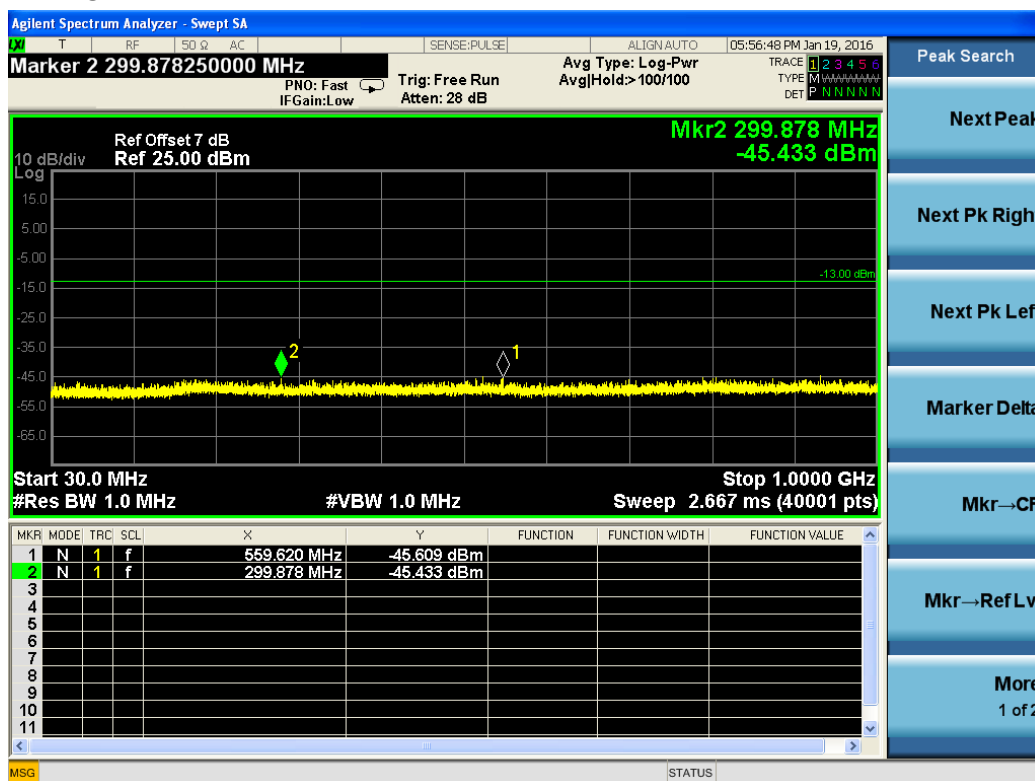
Transmitting Mode, CH 512, PCS 1900



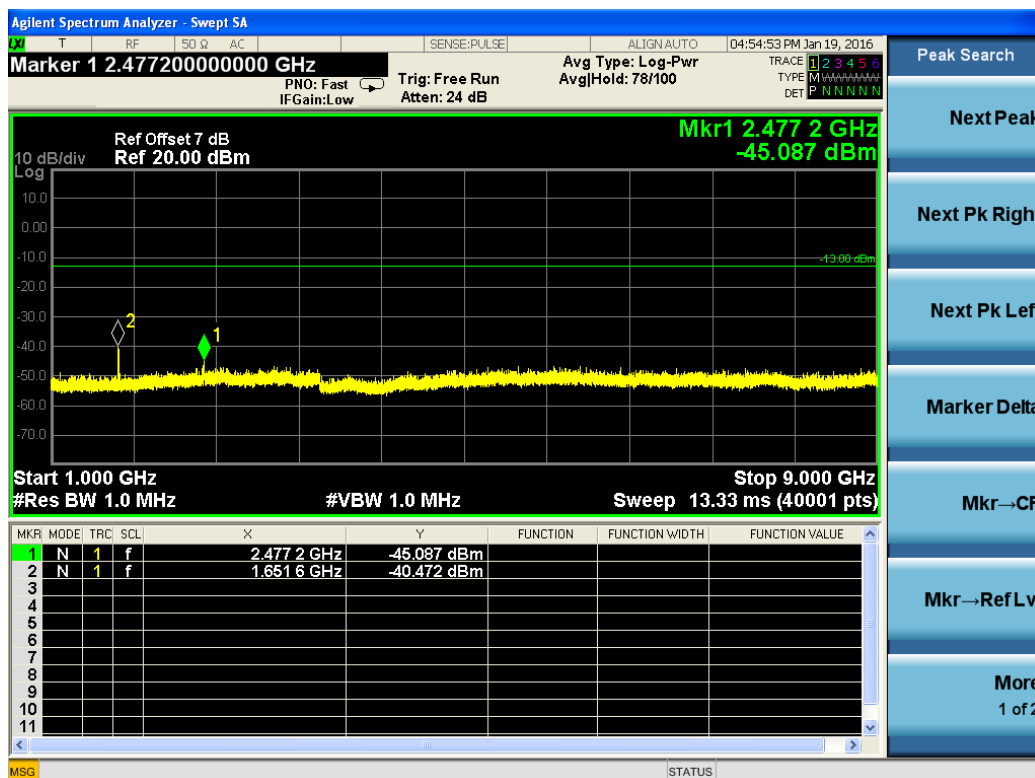
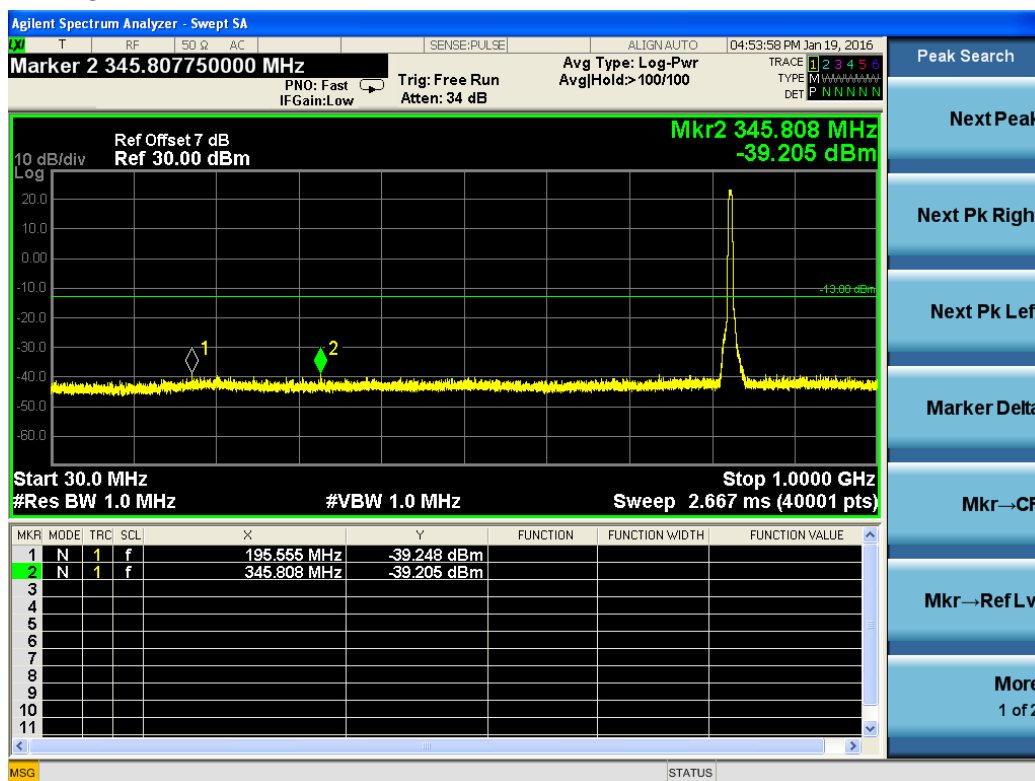
Transmitting Mode, CH 661, PCS 1900



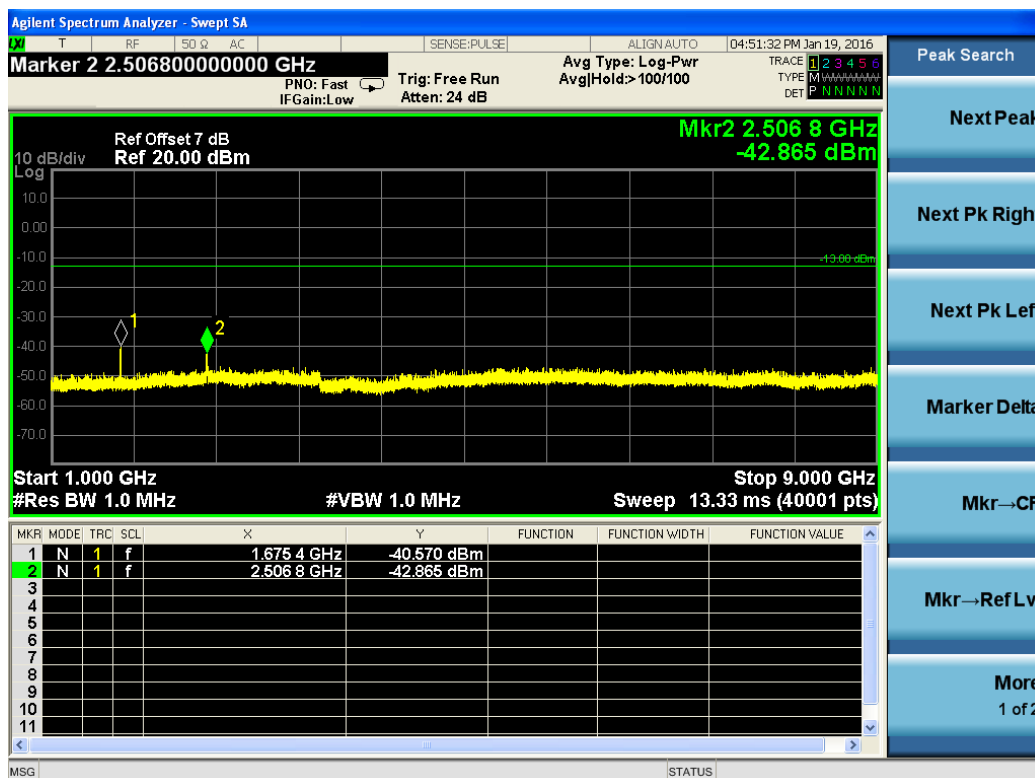
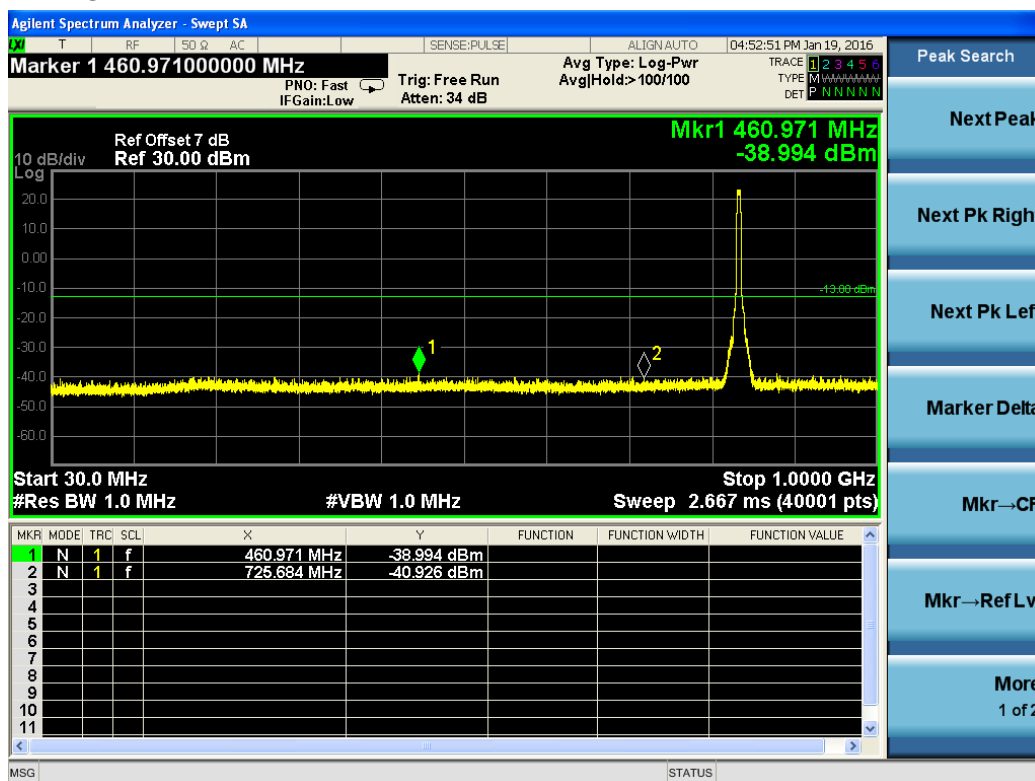
Transmitting Mode, CH 810, PCS 1900



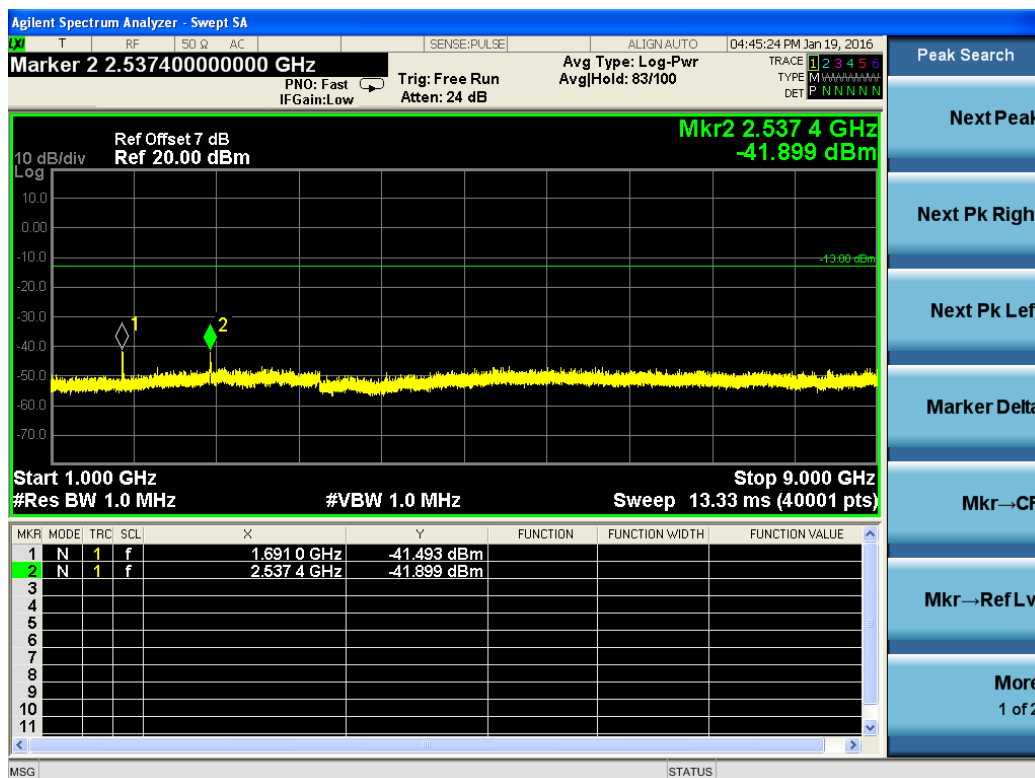
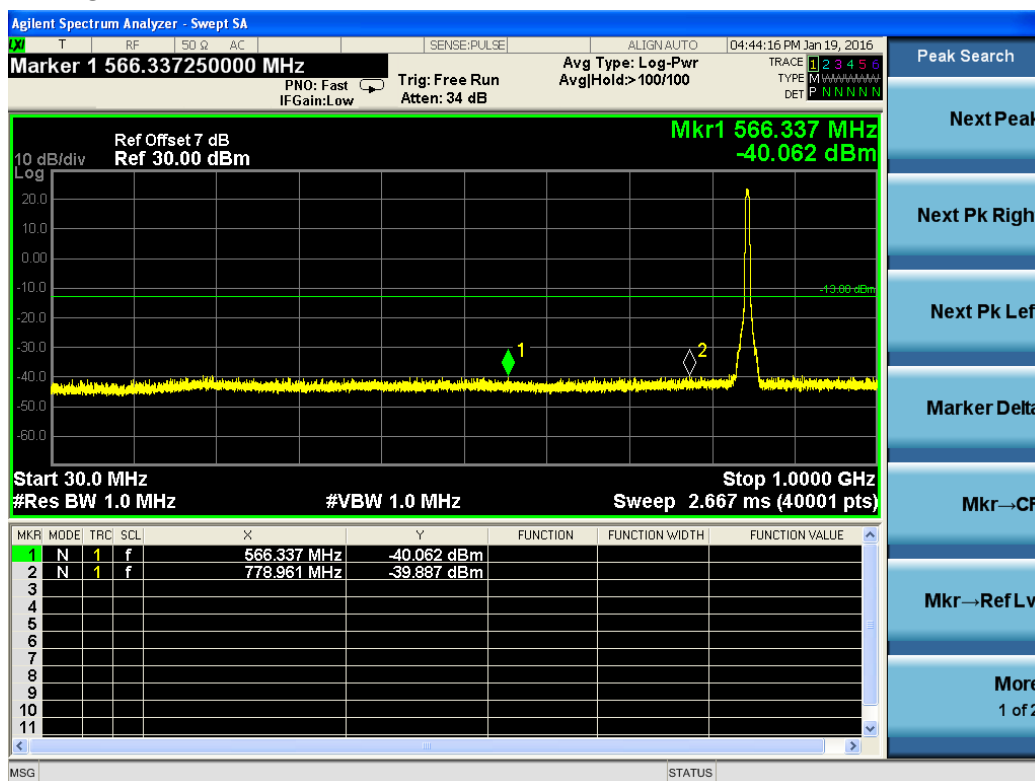
Transmitting Mode, CH 4132, WCDMA Band V



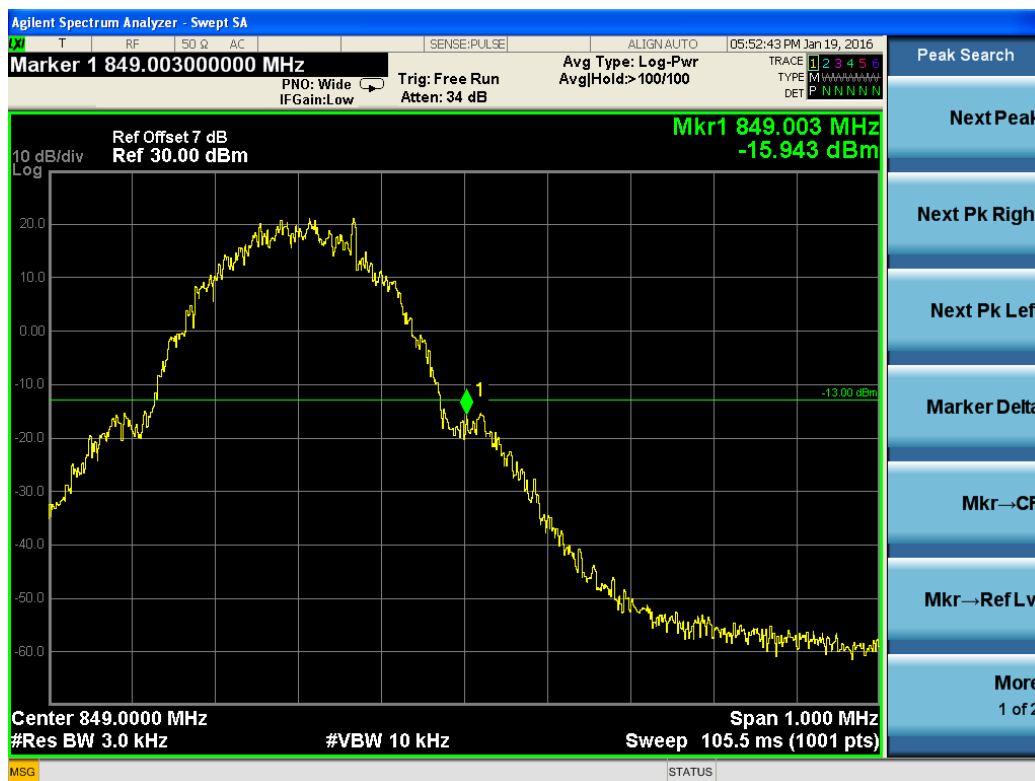
Transmitting Mode, CH 4183, WCDMA Band V



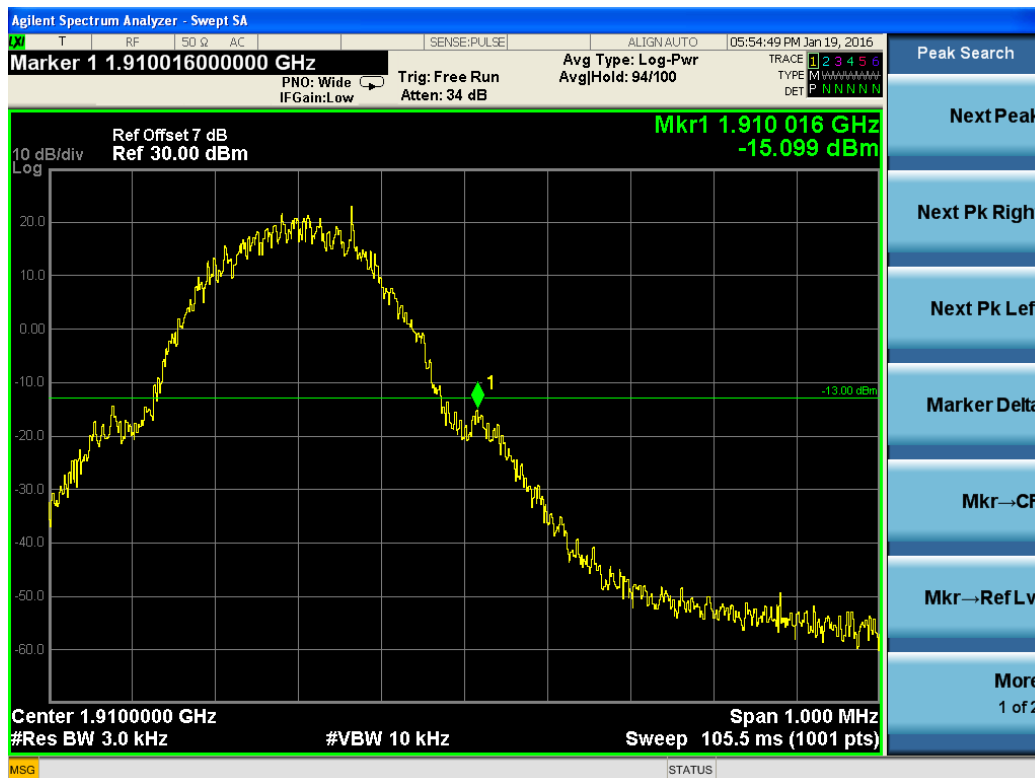
Transmitting Mode, CH 4233, WCDMA Band V



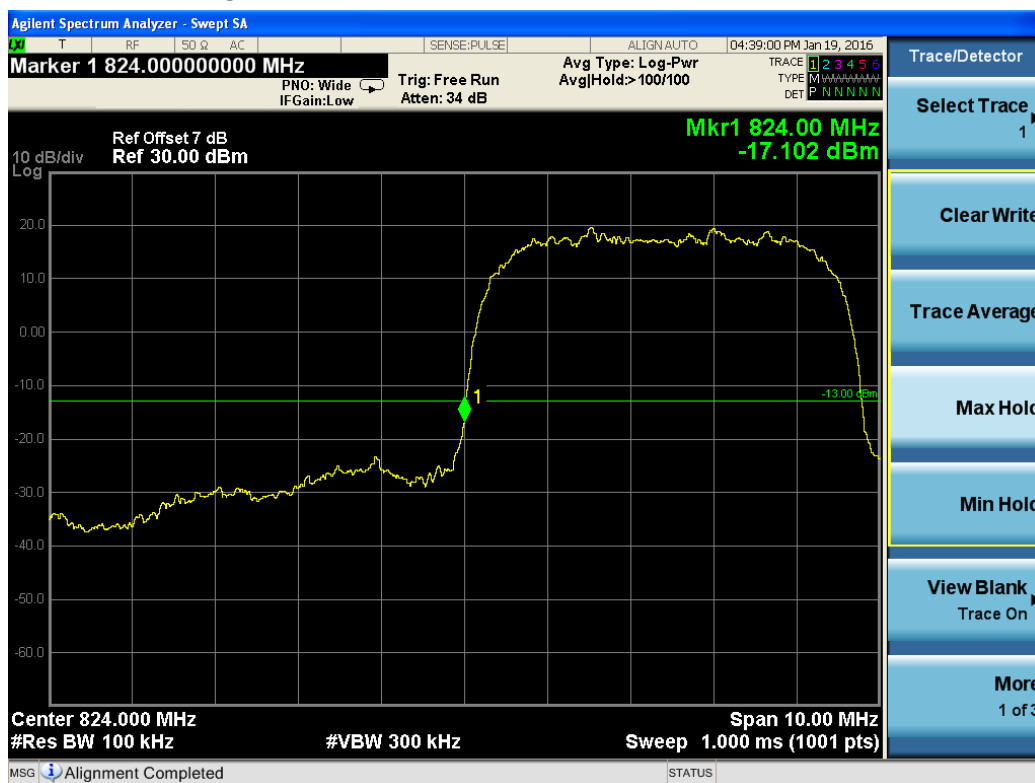
Test Result of Band Edge Emissions, GSM 850



Test Result of Band Edge Emissions, PCS 1900



Test Result of Band Edge Emissions, WCDMA Band V



5.5. RADIATED SPURIOUS EMISSIONS MEASUREMENT

5.5.1. Standard Applicable

FCC §2.1053, §22.917 and §24.238.

5.5.2. Test Procedures

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

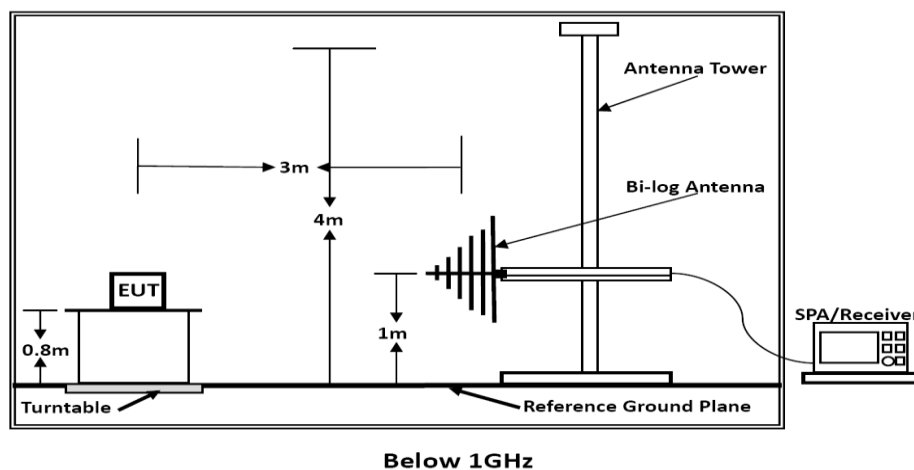
The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission were identified, the power of the emission was determined using the substitution method.

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

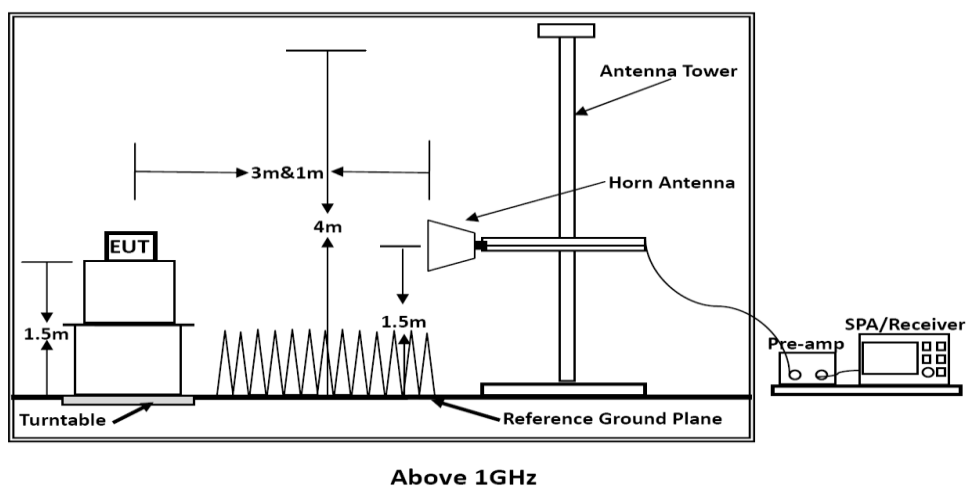
$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable (dB)}$$

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

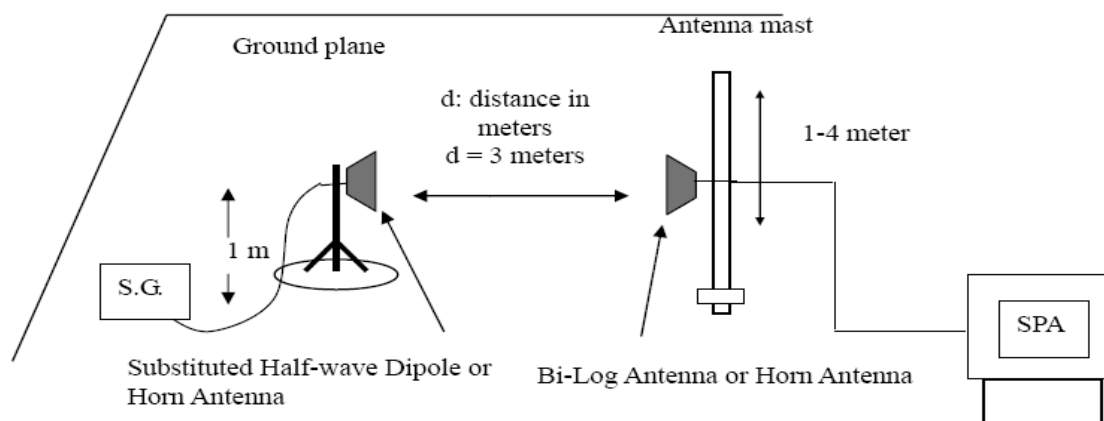
For radiated spurious emissions below 1GHz



For radiated spurious emissions above 1GHz



Substituted Method



5.5.3. Test Results

The worst test data as follow:
30MHz~10GHz

The Worst Test Result For GSM 850, CH 128				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
90.55	-71.89	-13	-58.89	H
188.03	-77.22	-13	-64.22	H
644.11	-82.14	-13	-69.14	H
1805.26	-23.10	-13	-10.10	H
2567.24	-33.37	-13	-20.37	H
86.36	-74.94	-13	-61.94	V
197.44	-69.30	-13	-56.30	V
465.51	-75.72	-13	-62.72	V
1789.56	-28.84	-13	-15.84	V
2489.66	-31.40	-13	-18.40	V

The Worst Test Result For GSM 850, CH 190				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
80.52	-71.82	-13	-58.82	H
187.94	-77.07	-13	-64.07	H
643.99	-81.94	-13	-68.94	H
1705.26	-23.07	-13	-10.07	H
2567.24	-33.34	-13	-20.34	H
86.22	-75.06	-13	-62.06	V
197.49	-69.14	-13	-56.14	V
465.80	-75.77	-13	-62.77	V
1689.56	-28.72	-13	-15.72	V
2489.66	-31.37	-13	-18.37	V

The Worst Test Result For GSM 850, CH 251				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
90.52	-71.55	-13	-58.55	H
187.79	-77.01	-13	-64.01	H
644.11	-81.92	-13	-68.92	H
1765.26	-23.03	-13	-10.03	H
2567.24	-33.43	-13	-20.43	H
86.10	-75.00	-13	-62.00	V
197.18	-69.26	-13	-56.26	V
465.51	-75.81	-13	-62.81	V
1789.56	-29.00	-13	-16.00	V
2489.66	-31.36	-13	-18.36	V

30MHz~20GHz

The Worst Test Result For PCS 1900, CH 512				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
85.52	-71.59	-13	-58.59	H
188.04	-77.02	-13	-64.02	H
644.16	-82.08	-13	-69.08	H
1665.26	-23.04	-13	-10.04	H
2567.24	-33.42	-13	-20.42	H
86.28	-75.02	-13	-62.02	V
197.36	-69.22	-13	-56.22	V
465.84	-75.62	-13	-62.62	V
1689.56	-28.90	-13	-15.90	V
2489.66	-31.42	-13	-18.42	V

The Worst Test Result For PCS 1900, CH 661				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
68.56	-71.79	-13	-58.79	H
187.74	-77.03	-13	-64.03	H
644.01	-81.95	-13	-68.95	H
3565.26	-22.99	-13	-9.99	H
5467.24	-33.46	-13	-20.46	H
86.32	-74.69	-13	-61.69	V
197.16	-69.16	-13	-56.16	V
465.55	-75.69	-13	-62.69	V
3689.56	-28.89	-13	-15.89	V
5689.66	-31.25	-13	-18.25	V

The Worst Test Result For PCS 1900, CH 810				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
85.62	-71.60	-13	-58.60	H
187.80	-77.37	-13	-64.37	H
644.26	-82.16	-13	-69.16	H
3465.26	-23.23	-13	-10.23	H
5477.24	-33.52	-13	-20.52	H
86.41	-75.01	-13	-62.01	V
197.49	-69.32	-13	-56.32	V
465.77	-75.82	-13	-62.82	V
3589.56	-28.99	-13	-15.99	V
5589.66	-31.19	-13	-18.19	V

30MHz~10GHz

The Worst Test Result For WCDMA Band V, CH 4132				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
89.72	-71.63	-13	-58.63	H
187.99	-77.31	-13	-64.31	H
644.16	-82.13	-13	-69.13	H
3565.26	-23.09	-13	-10.09	H
5587.24	-33.42	-13	-20.42	H
86.15	-74.67	-13	-61.67	V
197.22	-69.21	-13	-56.21	V
465.63	-75.87	-13	-62.87	V
3589.56	-29.06	-13	-16.06	V
5456.20	-31.18	-13	-18.18	V

The Worst Test Result For WCDMA Band V, CH 4183				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
89.72	-71.70	-13	-58.70	H
187.90	-77.34	-13	-64.34	H
705.32	-81.83	-13	-68.83	H
1875.32	-23.05	-13	-10.05	H
2562.33	-33.35	-13	-20.35	H
86.37	-74.94	-13	-61.94	V
197.36	-69.04	-13	-56.04	V
723.23	-75.94	-13	-62.94	V
1799.57	-29.00	-13	-16.00	V
2602.39	-31.55	-13	-18.55	V

The Worst Test Result For WCDMA Band V, CH 4233				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
87.32	-71.67	-13	-58.67	H
187.94	-77.30	-13	-64.30	H
705.32	-82.12	-13	-69.12	H
1565.32	-23.34	-13	-10.34	H
2502.03	-33.57	-13	-20.57	H
86.16	-74.84	-13	-61.84	V
197.29	-69.20	-13	-56.20	V
723.23	-75.72	-13	-62.72	V
1786.45	-28.88	-13	-15.88	V
2602.79	-31.33	-13	-18.33	V

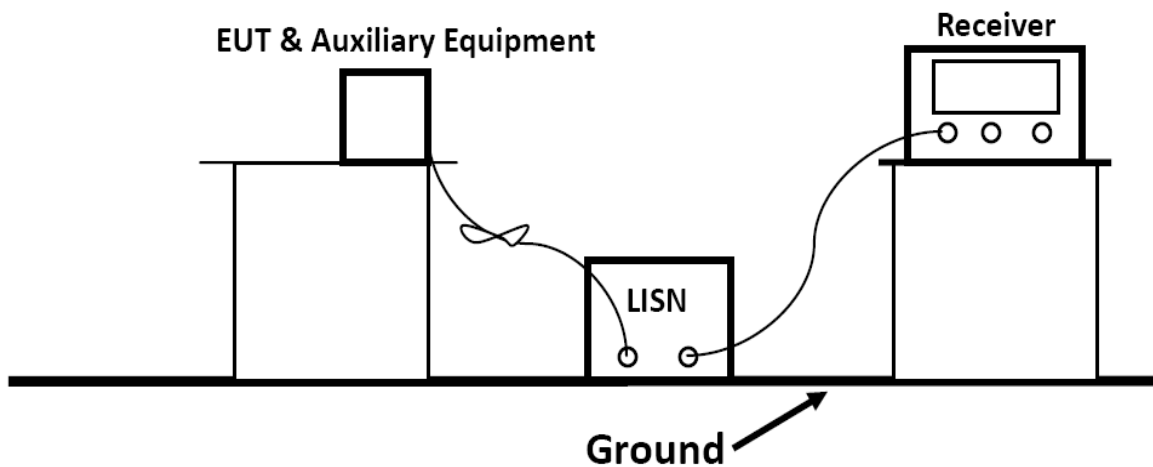
5.6. POWER LINE CONDUCTED EMISSIONS

5.6.1 Standard Applicable

According to §15.107 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolt (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

5.6.2 Block Diagram of Test Setup

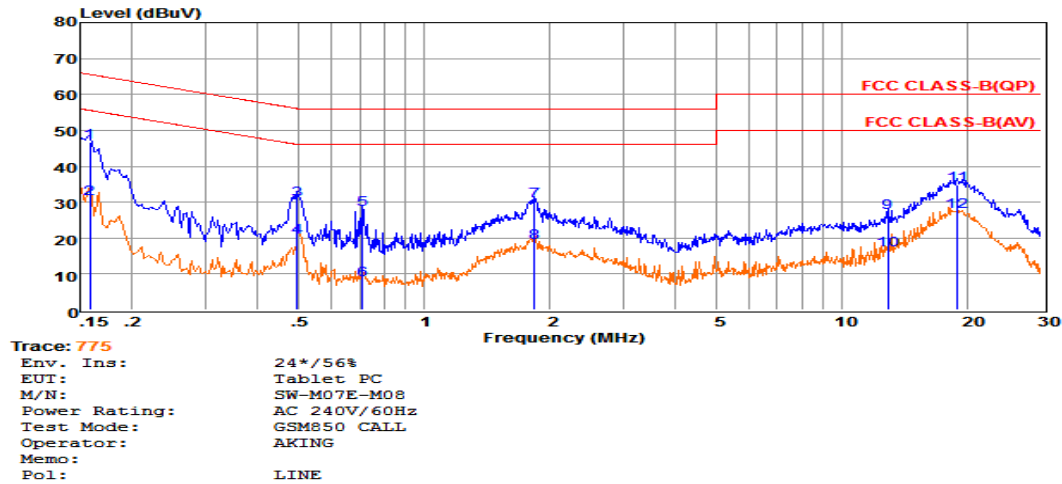


5.6.3 Test Results

PASS.

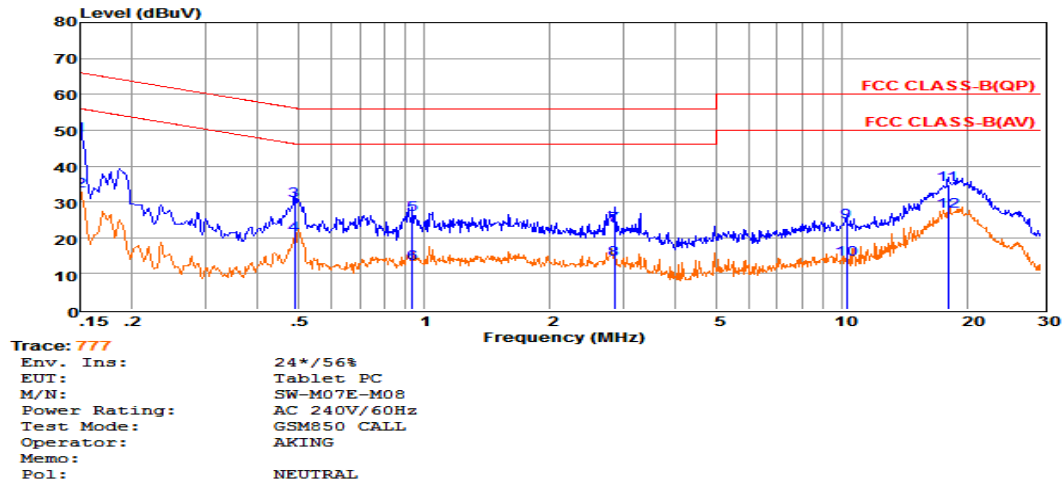
The test data please refer to following page.

Test Result For Line Power Input AC 240V/60Hz



	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.15816	26.98	9.58	0.02	10.00	46.58	65.56	-18.98	QP
2	0.15826	11.19	9.58	0.02	10.00	30.79	55.55	-24.76	Average
3	0.49673	10.93	9.62	0.04	10.00	30.59	56.05	-25.46	QP
4	0.49683	0.51	9.62	0.04	10.00	20.17	46.05	-25.88	Average
5	0.71219	8.14	9.64	0.04	10.00	27.82	56.00	-28.18	QP
6	0.71229	-11.39	9.64	0.04	10.00	8.29	46.00	-37.71	Average
7	1.83856	10.78	9.64	0.05	10.00	30.47	56.00	-25.53	QP
8	1.83956	-0.94	9.64	0.05	10.00	18.75	46.00	-27.25	Average
9	12.85158	7.32	9.70	0.09	10.00	27.11	60.00	-32.89	QP
10	12.85258	-3.00	9.70	0.09	10.00	16.79	50.00	-33.21	Average
11	118.92046	14.85	9.75	0.11	10.00	34.71	60.00	-25.29	QP
12	1218.92146	7.40	9.75	0.11	10.00	27.26	50.00	-22.74	Average

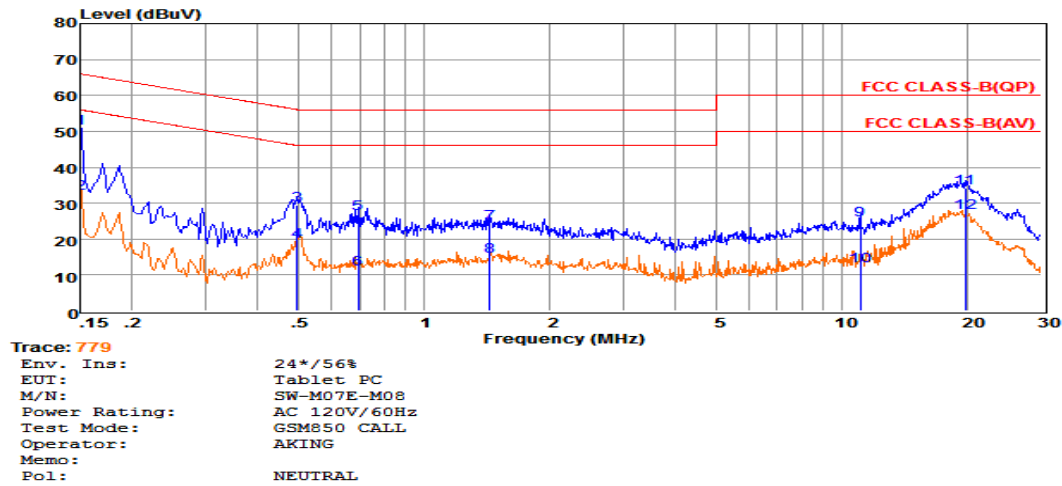
Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.



	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.15000	28.65	9.70	0.02	10.00	48.37	66.00	-17.63	QP
2	0.15010	13.20	9.70	0.02	10.00	32.92	55.99	-23.07	Average
3	0.48890	10.70	9.62	0.04	10.00	30.36	56.19	-25.83	QP
4	0.48900	1.25	9.62	0.04	10.00	20.91	46.18	-25.27	Average
5	0.93810	6.81	9.63	0.05	10.00	26.49	56.00	-29.51	QP
6	0.93820	-6.95	9.63	0.05	10.00	12.73	46.00	-33.27	Average
7	2.85407	3.91	9.64	0.06	10.00	23.61	56.00	-32.39	QP
8	2.85507	-5.78	9.64	0.06	10.00	13.92	46.00	-32.08	Average
9	10.23322	4.45	9.72	0.08	10.00	24.25	60.00	-35.75	QP
10	10.23422	-5.79	9.72	0.08	10.00	14.01	50.00	-35.99	Average
11	1117.94409	14.88	9.80	0.11	10.00	34.79	60.00	-25.21	QP
12	1217.94509	7.32	9.80	0.11	10.00	27.23	50.00	-22.77	Average

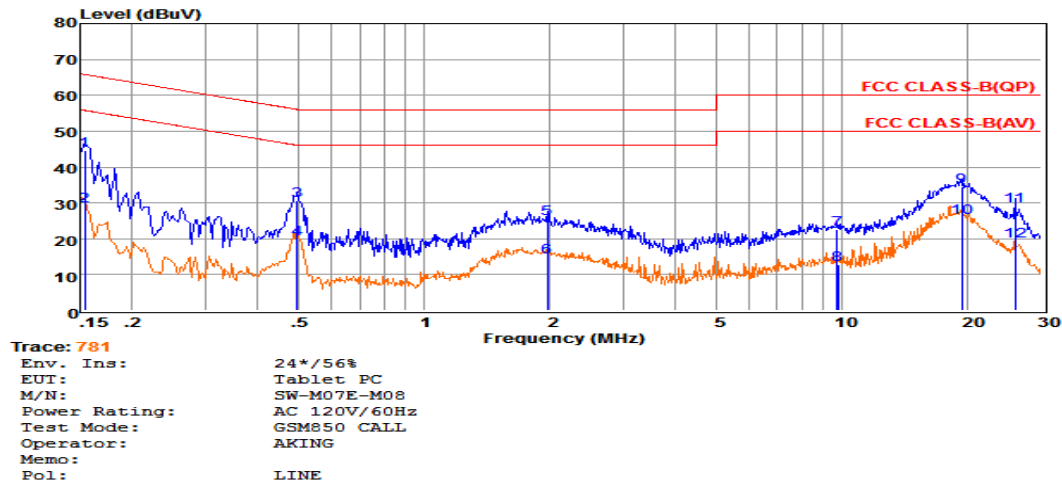
Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

Test Result For Line Power Input AC 120V/60Hz



	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.15000	31.03	9.70	0.02	10.00	50.75	66.00	-15.25	QP
2	0.15010	13.07	9.70	0.02	10.00	32.79	55.99	-23.20	Average
3	0.49673	9.92	9.62	0.04	10.00	29.58	56.05	-26.47	QP
4	0.49683	-0.38	9.62	0.04	10.00	19.28	46.05	-26.77	Average
5	0.69357	7.29	9.63	0.04	10.00	26.96	56.00	-29.04	QP
6	0.69367	-8.06	9.63	0.04	10.00	11.61	46.00	-34.39	Average
7	1.43328	4.67	9.63	0.05	10.00	24.35	56.00	-31.65	QP
8	1.43428	-4.48	9.63	0.05	10.00	15.20	46.00	-30.80	Average
9	1.07969	5.39	9.73	0.09	10.00	25.21	60.00	-34.79	QP
10	1.08069	-7.36	9.73	0.09	10.00	12.46	50.00	-37.54	Average
11	9.73967	14.22	9.88	0.12	10.00	34.22	60.00	-25.78	QP
12	9.74067	7.29	9.88	0.12	10.00	27.29	50.00	-22.71	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.



	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.15403	25.01	9.58	0.02	10.00	44.61	65.78	-21.17	QP
2	0.15413	9.45	9.58	0.02	10.00	29.05	55.77	-26.72	Average
3	0.49673	11.11	9.62	0.04	10.00	30.77	56.05	-25.28	QP
4	0.49683	0.12	9.62	0.04	10.00	19.78	46.05	-26.27	Average
5	1.96966	5.93	9.64	0.05	10.00	25.62	56.00	-30.38	QP
6	1.97066	-4.92	9.64	0.05	10.00	14.77	46.00	-31.23	Average
7	9.75670	2.78	9.69	0.08	10.00	22.55	60.00	-37.45	QP
8	9.75770	-6.90	9.69	0.08	10.00	12.87	50.00	-37.13	Average
9	9.32572	14.69	9.75	0.12	10.00	34.56	60.00	-25.44	QP
10	9.32672	5.87	9.75	0.12	10.00	25.74	50.00	-24.26	Average
11	1126.00120	9.38	9.71	0.13	10.00	29.22	60.00	-30.78	QP
12	1126.00220	-0.53	9.71	0.13	10.00	19.31	50.00	-30.69	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

Note: Pre-scan all mode and recorded the worst case results in this report (GSM 850)

5.7. FREQUENCY STABILITY OVER TEMPERATURE AND VOLTAGE VARIATIONS

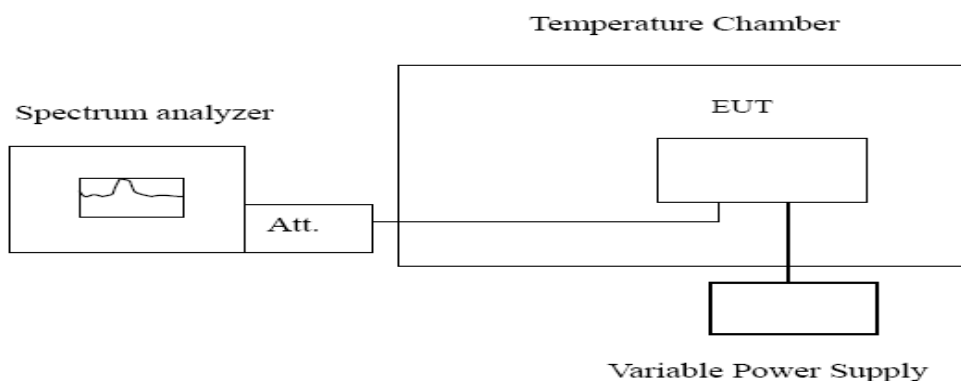
5.7.1. Standard Applicable

FCC §2.1055, §22.355 and §24.235, Frequency Tolerance: $\pm 2.5\text{ppm}$

5.7.2. Test Procedures

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency.

Turn EUT off and set the chamber temperature to -30°C . After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of $+50^{\circ}\text{C}$ reached.



5.7.3. Test Results

Pass

The worst test data as follow:

The Worst Test Result For GSM 850, CH 190, $f_o = 836.6\text{MHz}$				
Temperature (°C)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	17	0.020320	±2.5
-20		18	0.021516	±2.5
-10		15	0.017930	±2.5
0		16	0.019125	±2.5
10		14	0.016734	±2.5
20		15	0.017930	±2.5
30		17	0.020320	±2.5
40		19	0.022711	±2.5
50		18	0.021516	±2.5
25	4.07	17	0.020320	±2.5
25	3.33	14	0.016730	±2.5

The Worst Test Result For PCS 1900, CH 661, $f_o = 1880.0\text{MHz}$				
Temperature (°C)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	17	0.009043	±2.5
-20		16	0.008511	±2.5
-10		18	0.009574	±2.5
0		13	0.006915	±2.5
10		14	0.007447	±2.5
20		17	0.009043	±2.5

30		16	0.008511	±2.5
40		15	0.007979	±2.5
50		19	0.010106	±2.5
25	4.07	19	0.010116	±2.5
25	3.33	18	0.009570	±2.5

The Worst Test Result For WCDMA Band V, CH 4183, $f_o = 836.6\text{MHz}$				
Temperature (°C)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	23	0.027492	±2.5
-20		18	0.021516	±2.5
-10		17	0.02032	±2.5
0		16	0.019125	±2.5
10		17	0.02032	±2.5
20		18	0.021516	±2.5
30		19	0.022711	±2.5
40		15	0.01793	±2.5
50		15	0.01793	±2.5
25	4.07	16	0.019125	±2.5
25	3.33	14	0.016734	±2.5

6. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	June 18,2015	June 17,2016
Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	9kHz~40GHz	July 16,2015	July 15,2016
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	June 18,2015	June 17,2016
LISN (Support Unit)	EMCO	3819/2NM	9703-1839	9KHz-30MHz	June 18,2015	June 17,2016
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 18,2015	June 17,2016
ISN	SCHAFFNER	ISN ST08	21653	9KHz-30MHz	June 18,2015	June 17,2016
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-1GHz 3m	June 18,2015	June 17,2016
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHz	June 18,2015	June 17,2016
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 16,2015	July 15,2016
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	July 16,2015	July 15,2016
Spectrum Analyzer	Agilent	E4407B	MY41440292	9k-26.5GHz	July 16,2015	July 15,2016
MAX Signal Analyzer	Agilent	N9020A	MY50510140	20Hz~26.5GHz	Oct. 27, 2014	Oct. 26, 2015
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	June 18,2015	June 17,2016
By-log Antenna	SCHWARZBECK	VULB9163	9163-470	30MHz-1GHz	June 10,2015	June 09,2016
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 10,2015	June 09,2016
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz-40GHz	June 10,2015	June 09,2016
By-log Antenna	SCHWARZBECK	VULB9163	9163-471	30MHz-1GHz	June 10,2015	June 09,2016
Horn Antenna	EMCO	3115	6742	1GHz-18GHz	June 10,2015	June 09,2016
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170156	15GHz-40GHz	June 10,2015	June 09,2016
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18,2015	June 17,2016
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18,2015	June 17,2016
Spectrum Meter	R&S	FSP 30	100023	9kHz-30GHz	July 16,2015	July 15,2016
Power Meter	R&S	NRVS	100444	DC-40GHz	June 18,2015	June 17,2016
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	June 18,2015	June 17,2016
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	June 18,2015	June 17,2016
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18,2015	June 17,2016
RF CABLE-2m	JYE Bao	RG142	CB035-2m	20MHz-1GHz	June 18,2015	June 17,2016
Vector signal Generator	R&S	SMU200A	102098	100kHz~6GHz	June 18,2015	June 17,2016
Signal Generator	R&S	SMR40	10016	10MHz~40GHz	July 16,2015	July 15,2016
Universal Radio Communication Tester	R&S	CMU200	112012	N/A	July 18,2015	July 17,2016
DC power Source	GW	GPC-6030D	C671845	/	June 18,2015	June 17,2016
Temperature & Humidity Chamber	Wuhuan	HTP205	/	/	June 18,2015	June 17,2016

Note: All equipment through GRGT EST calibration

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