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

TEST REPORT

For

Product Name: Mobile Phone

Brand Name: HYUNDAI

Model No.: D205

Series Model: N/A

Test Report Number: C140224R02-RP1

Issued for

HYUNDAI CORPORATION

140-2, GYE-DONG, JONGNO-GU, SEOUL, 110-793, KOREA

Issued by

Compliance Certification Services Inc.

Kun shan Laboratory

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ACCREDITED
TESTING CERT #2541.01

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REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	March 6, 2014	Initial Issue	ALL	Jeff.Fang

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1 TEST RESULT CERTIFICATION

Product Name:	Mobile Phone
Trade Name:	HYUNDAI
Model Name.:	D205
Series Model:	N/A
Description Test Modes(worst case):	The product has two SIM, SIM 1 and SIM 2 sharing a chipset does not support simultaneous work, only supports a single transmitter SIM1 or SIM 2, using SIM 1, SIM 2 will be suspended until select SIM 2, stop using the SIM 1, SIM 2 only would working.
Device Category:	PORTABLE DEVICES
Exposure Category:	GENERAL POPULATION/UNCONTROLLED EXPOSURE
Date of Test:	February 28, 2014
Applicant:	**HYUNDAI CORPORATION** 140-2, GYE-DONG, JONGNO-GU, SEOUL, 110-793, KOREA
Manufacturer:	**WASAM TECHNOLOGY (SHEN ZHEN) CO.,LTD.** B,F Building, (Hengqiang Industrial Park), Bogang Taifeng Industrial Zone, Shajing Town, Bao'an District, Shenzhen, China
Application Type:	Certification

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 22 Subpart H & Part 24 Subpart E	No non-compliance noted

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule FCC PART 22 Subpart H and PART 24 Subpart E.

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

Approved by: ***Tested by:***

Jeff.Fang
RF Manager
Compliance Certification Service Inc.

Blent.Wang
Test Engineer
Compliance Certification Service Inc.

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2 EUT DESCRIPTION

Product Name:	Mobile Phone
Brand Name:	HYUNDAI
Model Name:	D205
Series Model:	N/A
Model Discrepancy:	N/A
Power Adapter Power Rating :	Power supply and ADP(rating): Brand:HYUNDAI Model:D205 INPUT:AC100~300V 50/60Hz 0.15A OUTPUT:5.0V --- 500mA Battery(rating): Model:D205 Capacitance:3.7V 800mAh
Frequency Range:	GSM 850: 824.20 ~ 848.80 MHz GSM 1900: 1850.20 ~ 1909.80 MHz
Transmit Power:	GSM 850: 33.04 dBm GSM 1900: 31.01 dBm
Modulation Technique:	GSM: GMSK
Devices supporting GPRS：	N/A
GPRS /EDGE Level:	N/A
Multi-slot Class:	N/A
Antenna Gain:	GSM/WCDMA : 1.73 dBi
Antenna Type:	GSM/WCDMA：PIFA Antenna

Remark:

1. *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*
2. *This submittal(s) (test report) is intended for **FCC ID: RQQHLT-D205** filing to comply with Part 22 and Part 24 of the FCC 47 CFR Rules.*

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3 TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures document on chapter 13 of ANSI C63.4: 2003, TIA/EIA-603-C: 2004 and FCC CFR 47, Part 2, PART 22 SUBPART H AND PART 24 SUBPART E

3.1. 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.

3.2. EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

3.3. GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

RADIATED EMISSIONS

The EUT is placed on a turn table, which is 0.8 m above ground plane. 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 according to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003.

3.4. DESCRIPTION OF TEST MODES

The EUT (model:D205) had been tested under operating condition.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

EUT staying in continuous transmitting mode was programmed.

GSM/GPRS / 850:
Channel Low (CH128), Channel Mid (CH190) and Channel High (CH251) were chosen for full testing.

GSM/GPRS / 1900:
Channel Low (CH512), Channel Mid (CH661) and Channel High (CH810) were chosen for full testing.

The field strength of spurious emission was measured in the following position:EUT stand-up position (Z axis), lie-down position (X,Y axis) with Power adapter. The worst emission was found in stand-up position (Z axis)

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4 INSTRUMENT CALIBRATION

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2. MEASUREMENT EQUIPMENT USED

Conducted Emissions Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY44020154	2014-5-11
DETECTOR NEGATIVE	Agilent	8473B	MY42240176	2014-5-11
OSCILLOSCOPE	Agilent	DSO6104A	MY44002585	2014-3-24
Peak and Avg Power Sensor	Agilent	E9327A	US40441788	2014-3-24
EPM-P Series Power Meter	Agilent	E4416A	GB41292714	2014-5-11
Power SPLITTER	Mini-Circuits	ZN2PD-9G	SF078500430	2014-5-11
DC POWER SUPPLY	GW instek	GPS-3303C	E903131	2014-5-11
Temp. / Humidity Chamber	Kingson	THS-M1	242	2014-3-12
Test Software	EZ-EMC			

977 Chamber				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY44020154	2014-5-11
EMI Test Receiver	R&S	ESPI3	101026	2014-3-15
Pre-Amplfier	MINI	ZFL-1000VH2	d041703	2014-6-29
Pre-Amplfier	Miteq	NSP4000-NF	870629	2014-6-29
Bilog Antenna	Sunol	JB1	A110204-2	2014-6-23
Horn-antenna	SCHWARZBECK	BBHA9120D	266	2014-5-11
TRILOG SUPER BROADBAND TEST ANTENNA	SCHWARZBECK	VULB9160	9160-3342	2015-2-20
TRILOG SUPER BROADBAND TEST ANTENNA	SCHWARZBECK	VULB9160	9160-3343	2015-2-20
Turn Table	CT	CT123	4165	N.C.R
Antenna Tower	CT	CTERG23	3256	N.C.R
Controller	CT	CT1OO	95637	N.C.R
Test Software	EZ-EMC			

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Conducted Emission				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI TEST RECEIVER	R&S	ESCI3	100781	2014-3-15
V (V-LISN)	Schwarzbeck	NNLK 8129	8129-143	2014-3-15
LISN (EUT)	FCC	FCC-LISN-50/250-50-2-02	SN:05012	2014-3-15
TRANSIENT LIMITER	SCHAFFNER	CFL9206	1710	2014-4-8
Test Software	EZ-EMC			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	**Frequency**	***Uncertainty***
Conducted emissions	0.15MHz~30MHz	± 3.43 dB

Measurement	**Polarity**	**Frequency**	**Uncertainty**
Radiated emissions (below 1GHz)	H	30MHz ~ 200MHz	+/- 4.72dB
		200MHz ~1000MHz	+/- 4.72dB
	V	30MHz ~ 200MHz	+/- 4.83dB
		200MHz ~1000MHz	+/- 4.70dB
Radiated emissions (above 1GHz)	H	1000MHz ~5000MHz	+/- 3.94dB
		5000MHz ~6000MHz	+/- 3.94dB
	V	1000MHz ~5000MHz	+/- 3.94dB
		5000MHz ~6000MHz	+/- 3.94dB

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

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5 FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

☒ No.10Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22.

5.2. EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3. ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	A2LA
China	CNAS

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Japan	VCCI
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccsrf.com

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6 SETUP OF EQUIPMENT UNDER TEST

6.1. SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

6.2. SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	FCC ID	Series No.	Data Cable	Power Cord
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Remark:

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

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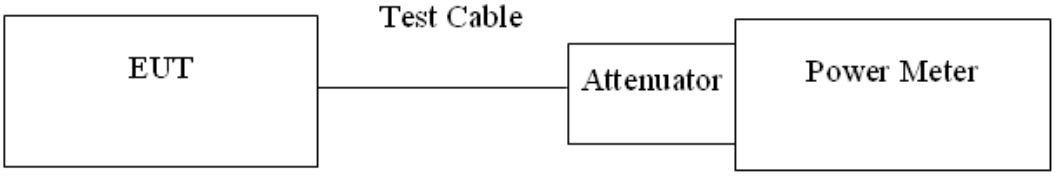
7 FCC PART 22 & 24 REQUIREMENTS

7.1. PEAK POWER

LIMIT

According to FCC §2.1046.

Test Configuration



Remark: *Measurement setup for testing on Antenna connector*

TEST PROCEDURE

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

TEST RESULTS

No non-compliance noted.

Test Data

Test Mode	CH	Frequency (MHz)	Peak Power (dBm)
GSM 850	128	824.40	32.99
	190	836.60	**33.04**
	251	848.80	32.98
GSM 1900	512	1850.20	**31.01**
	661	1880.00	30.24
	810	1909.80	29.78

Remark: *The value of factor includes both the loss of cable and external attenuato*

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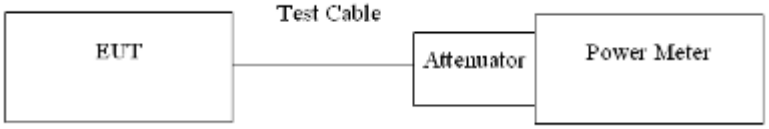
7.2. AVERAGE POWER

LIMIT

For reporting purposes only.

TEST CONFIGURATION



Remark: *Measurement setup for testing on Antenna connector*

TEST PROCEDURE

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

TEST RESULTS

No non-compliance noted.

Test Data

Test Mode	CH	Frequency (MHz)	Average Power (dBm)
GSM 850	128	824.40	32.49
	190	836.60	**32.54**
	251	848.80	32.48
GSM 1900	512	1850.20	**30.51**
	661	1880.00	29.74
	810	1909.80	29.28

Remark: *The value of factor includes both the loss of cable and external attenuator*

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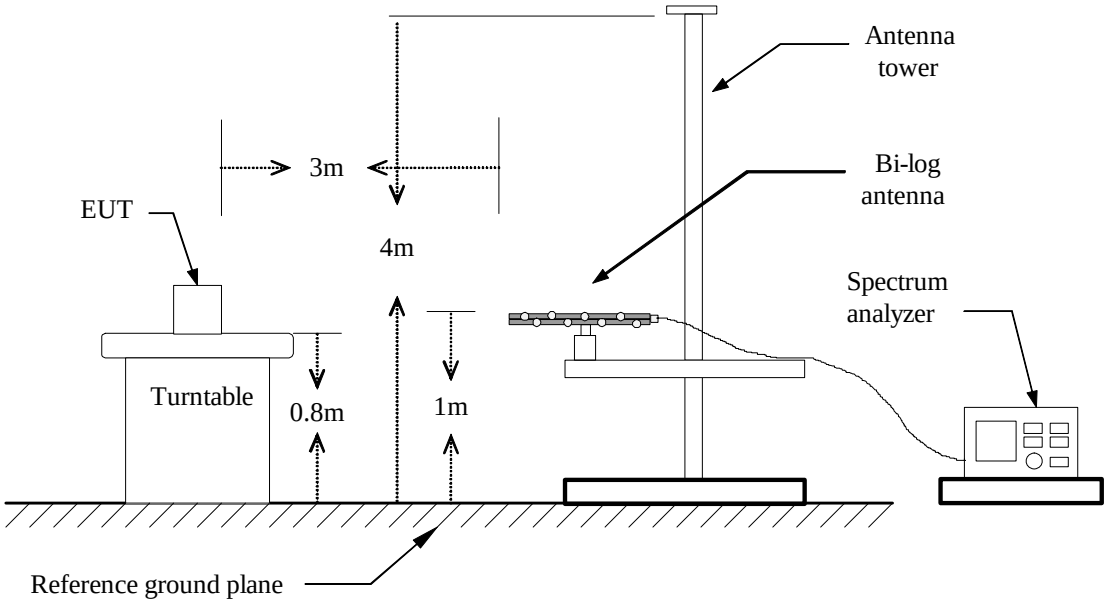
7.3. ERP & EIRP MEASUREMENT

LIMIT

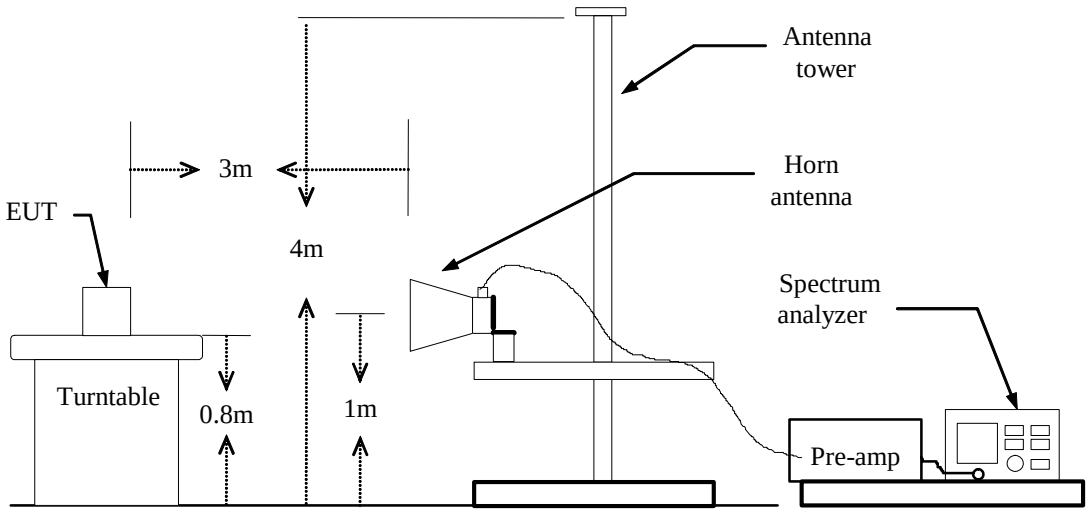
According to FCC §2.1046
FCC 22.913(a): The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.
FCC 24.232(b): The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

TEST CONFIGURATION

Below 1 GHz



Above 1 GHz



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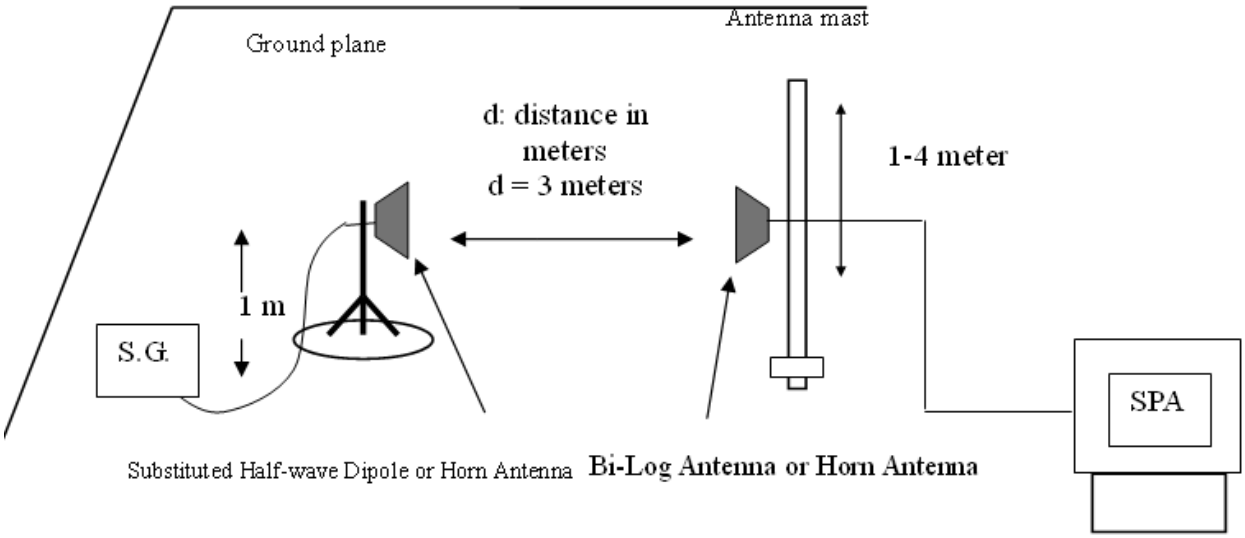
FOR SUBSTITUTED METHOD TEST SET-UP



TEST PROCEDURE

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

During the measurement of the EUT, the resolution bandwidth was set to 3MHz and the average bandwidth was set to 3MHz. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824-849MHz, and EIRP in frequency band 1851.25 –1910MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824-849MHz) or horn antenna (1851.25-1910MHz) connected to a signal generator. The spectrum analyzer reading was recorded and ERP/EIRP was calculated as follows:

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

TEST RESULTS

No non-compliance noted.

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GSM 850 TEST DATA

Channel	Frequency (MHz)	Antenna Pol.	Reading level (dB)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
	824.20	V	26.12	-1.58	24.54	38.50	-13.96
128	824.23	H	27.84	-1.69	26.15	38.50	-12.35
	836.65	V	26.63	-1.56	25.07	38.50	-13.43
190	836.65	H	30.19	-1.73	28.46	38.50	-10.04
	848.83	V	28.73	-1.54	27.19	38.50	-11.31
251	848.86	H	31.54	-1.72	29.82	38.50	-8.68

GSM 1900 TEST DATA

Channel	Frequency (MHz)	Antenna Pol.	Reading level (dB)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
	1850.18	V	21.88	-0.27	21.61	33.00	-11.39
512	1850.18	H	26.51	-0.65	25.86	33.00	-7.14
	1879.93	V	22.94	0.06	23.00	33.00	-10.00
661	1880.07	H	27.05	-0.25	26.80	33.00	-6.20
	1909.75	V	23.19	0.23	23.42	33.00	-9.58
810	1909.75	H	27.38	-0.04	27.34	33.00	-5.66

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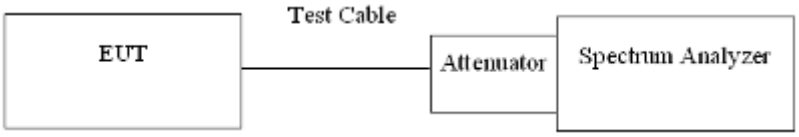
7.4. OCCUPIED BANDWIDTH MEASUREMENT

LIMIT

According to §FCC 2.1049.

TEST CONFIGURATION



Remark: *Measurement setup for testing on Antenna connector*

TEST PROCEDURE

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW is set to 3 times the RBW, -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 RESULTS

No non-compliance noted

Test Data

Test Mode	CH	Frequency (MHz)	99% Bandwidth (kHz)	26dB Bandwidth KHz
GSM 850	128	824.40	241.824	318.094
	190	836.60	244.864	319.223
	251	848.80	241.537	320.704
GSM 1900	512	1850.20	242.968	325.883
	661	1880.00	242.463	317.326
	810	1909.80	244.318	320.659

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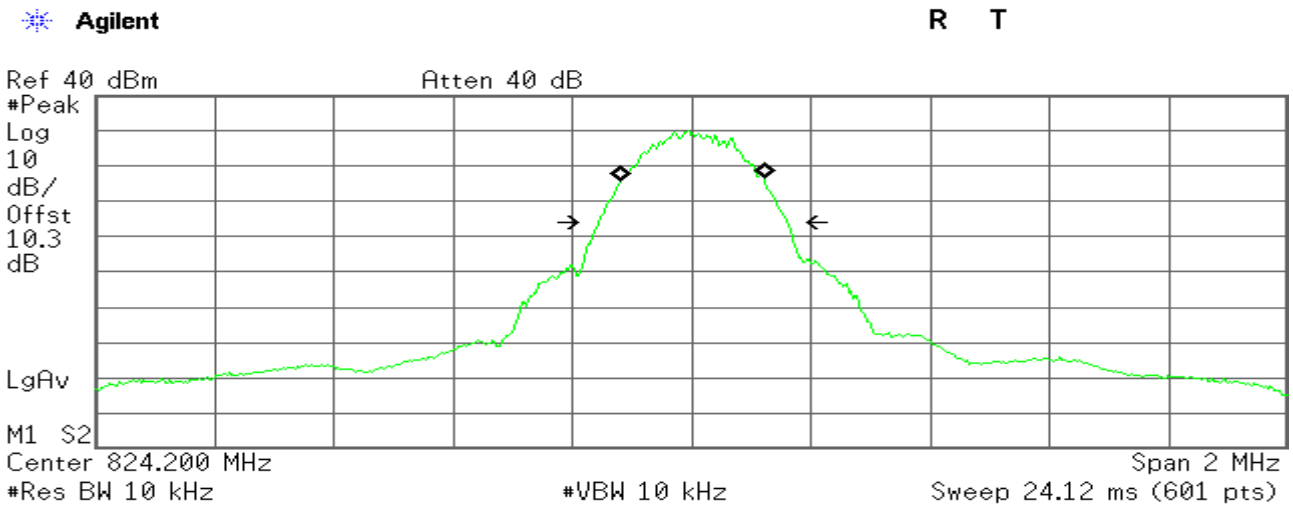
Test Plot

GSM 850 (CH Low)

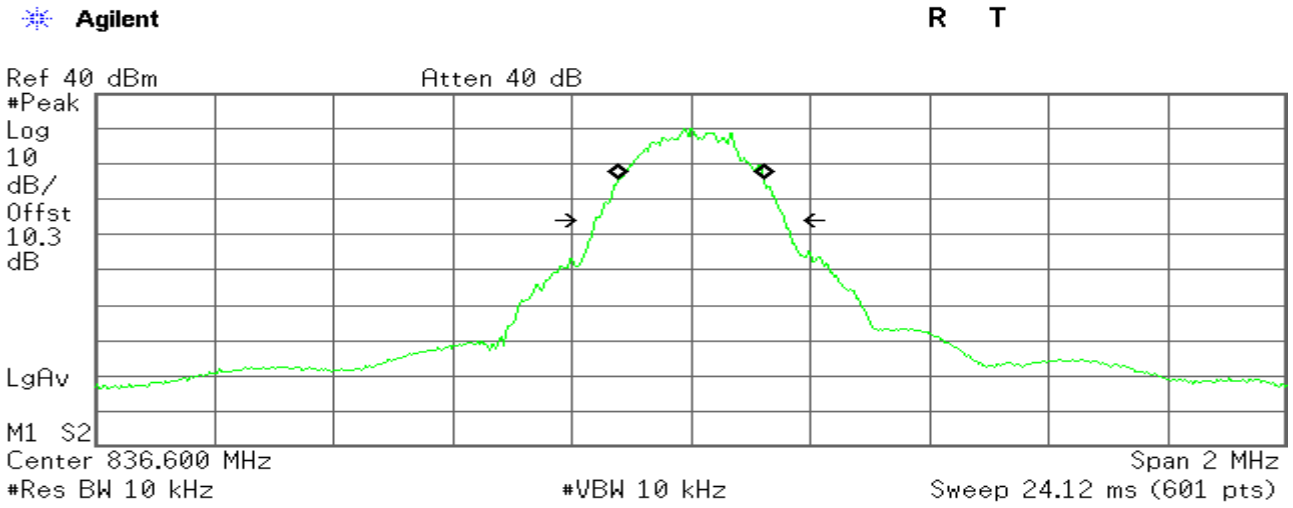


Occupied Bandwidth
241.8240 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 1.043 kHz
x dB Bandwidth 318.094 kHz

GSM 850 (CH Mid)



Occupied Bandwidth
244.8635 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 346.605 Hz
x dB Bandwidth 319.223 kHz

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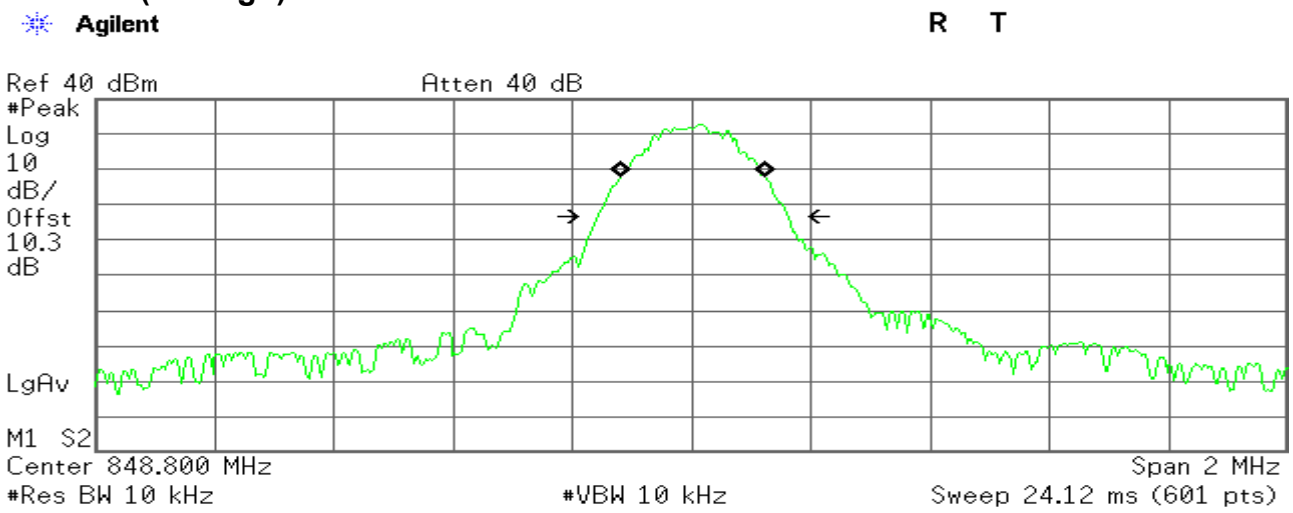
GSM 850(CH High)

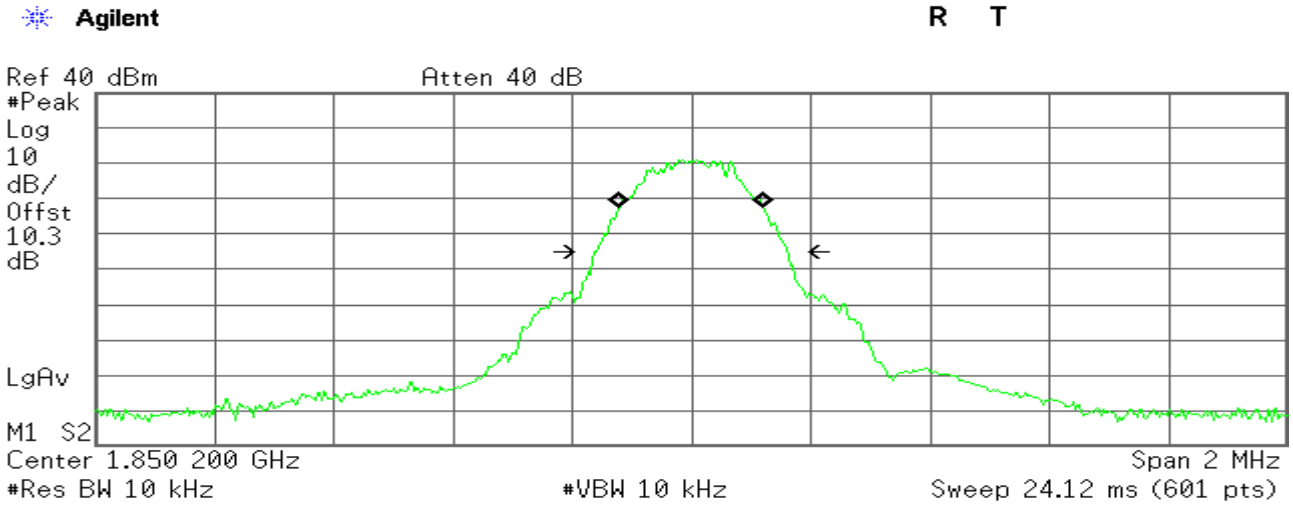


Occupied Bandwidth
241.5374 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 1.361 kHz
x dB Bandwidth 320.704 kHz

GSM 1900 (CH Low)



Occupied Bandwidth
242.9681 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -473.967 Hz
x dB Bandwidth 325.883 kHz

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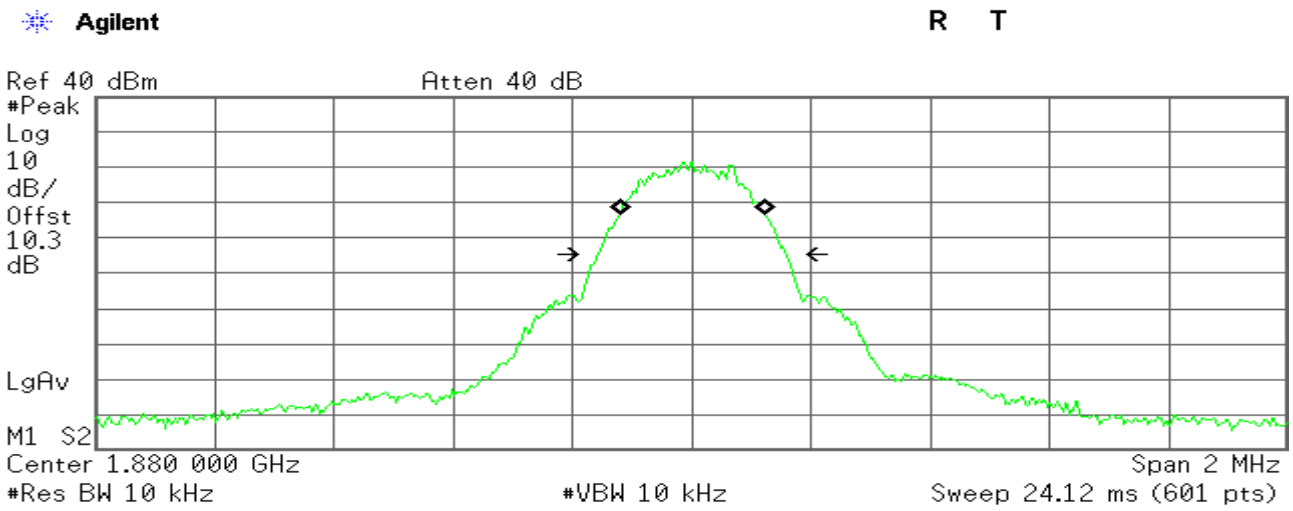
GSM 1900 (CH Mid)

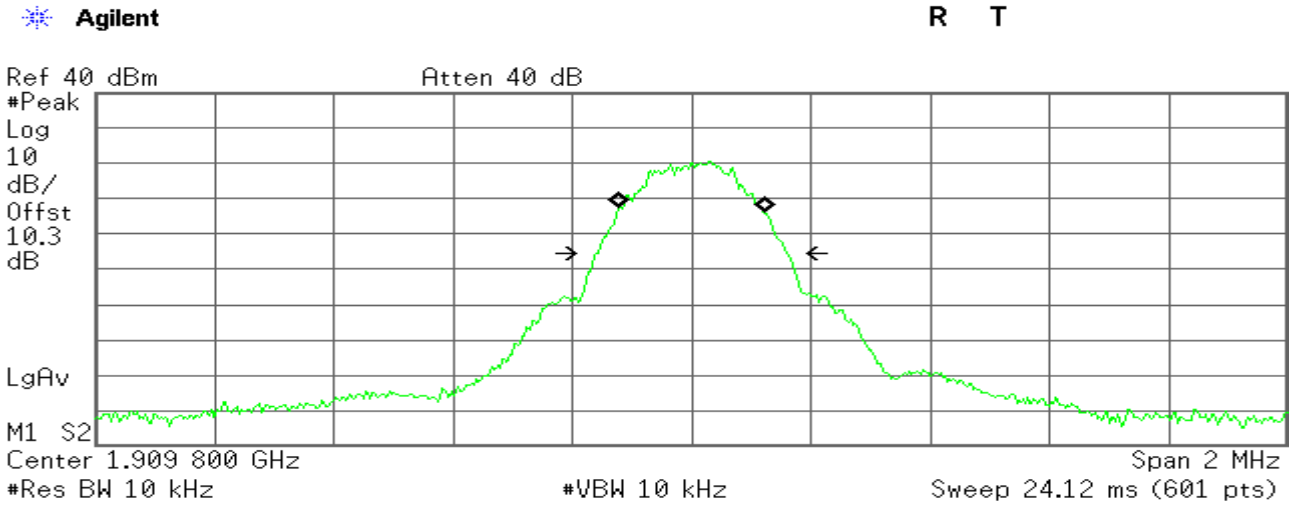


Occupied Bandwidth
242.4634 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 756.143 Hz
x dB Bandwidth 317.326 kHz

GSM 1900 (CH High)



Occupied Bandwidth
244.3184 kHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -159.395 Hz
x dB Bandwidth 320.659 kHz

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7.5. OUT OF BAND EMISSION AT ANTENNA TERMINALS

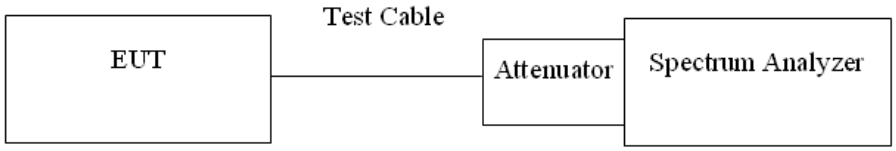
LIMIT

According to FCC §2.1051, FCC §22.917, FCC §24.238(a).

Out of Band Emissions: The mean power of emission must be attenuated below the mean power of the non-modulated carrier (P) on any frequency twice or more than twice the fundamental frequency by at lease 43 + 10 log P dB.

Mobile Emissions in Base Frequency Range: The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not exceed –80 dBm at the transmit antenna connector.
Band Edge Requirements: In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at lease 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the Out of band Emission

TEST CONFIGURATION



TEST PROCEDURE

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

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

Band Edge Requirements (824 MHz and 849 MHz /1850MHz and 1910MHz): In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

TEST RESULTS

No non-compliance noted.

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Test Data

Mode	CH	Location	Description
GSM 850	128	Figure 3-1	Band Edge emissions
	251	Figure 3-2	Band Edge emissions

Mode	CH	Location	Description
GSM 1900	512	Figure 4-1	Band Edge emissions
	810	Figure 4-2	Band Edge emissions

Mode	CH	Location	Description
GSM 850	128	Figure 5-1	Conducted spurious emissions, 30MHz - 20GHz
	190	Figure 5-2	Conducted spurious emissions, 30MHz - 20GHz
	251	Figure 5-3	Conducted spurious emissions, 30MHz - 20GHz

Mode	CH	Location	Description
GSM 1900	512	Figure 6-1	Conducted spurious emissions, 30MHz - 20GHz
	661	Figure 6-2	Conducted spurious emissions, 30MHz - 20GHz
	810	Figure 6-3	Conducted spurious emissions, 30MHz - 20GHz

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Test Plot

GSM 850

Figure 5-1: Out of Band emission at antenna terminals – GSM CH Low

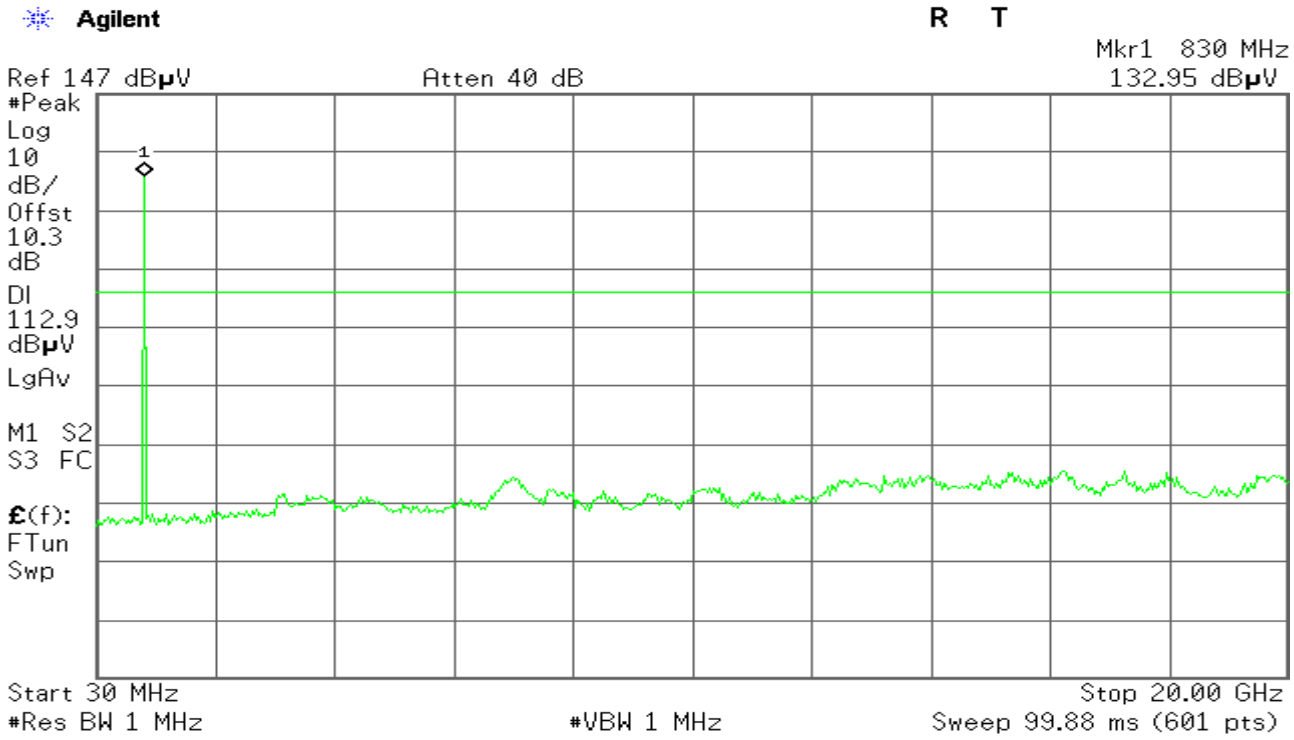

Figure 5-2: Out of Band emission at antenna terminals – GSM CH Mid

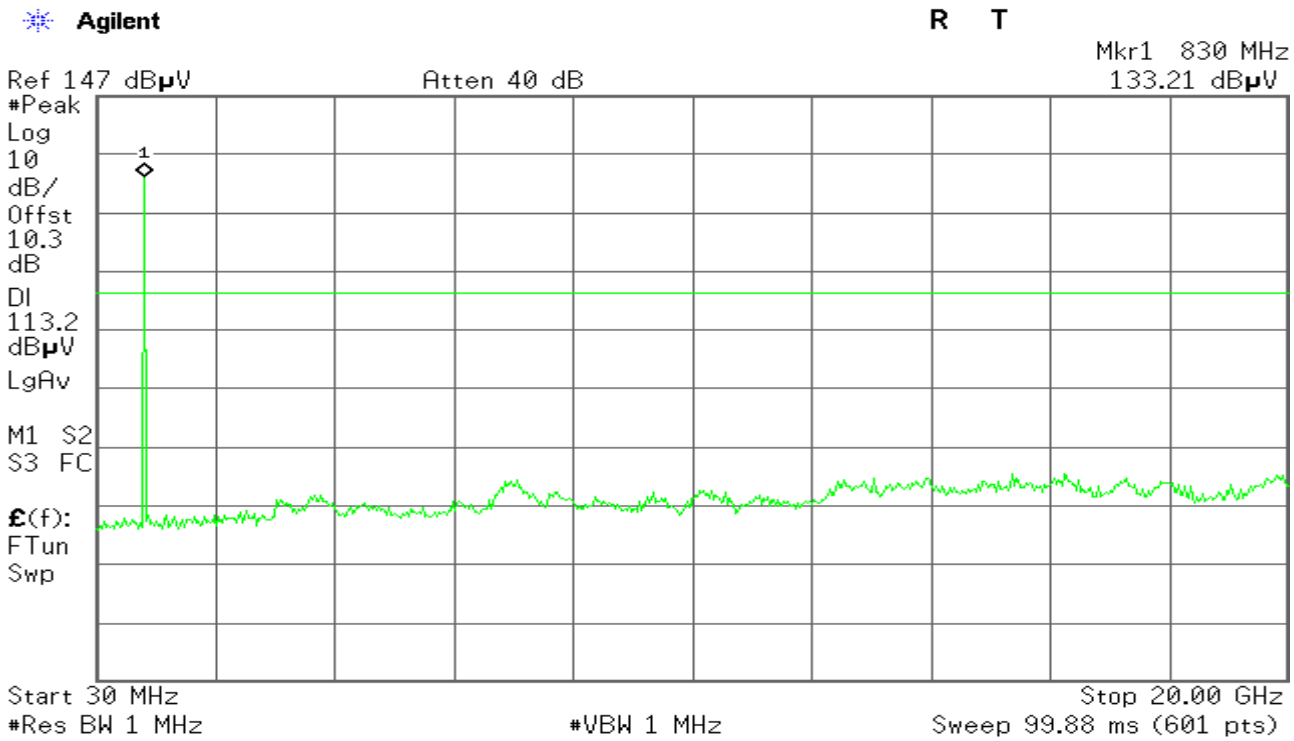

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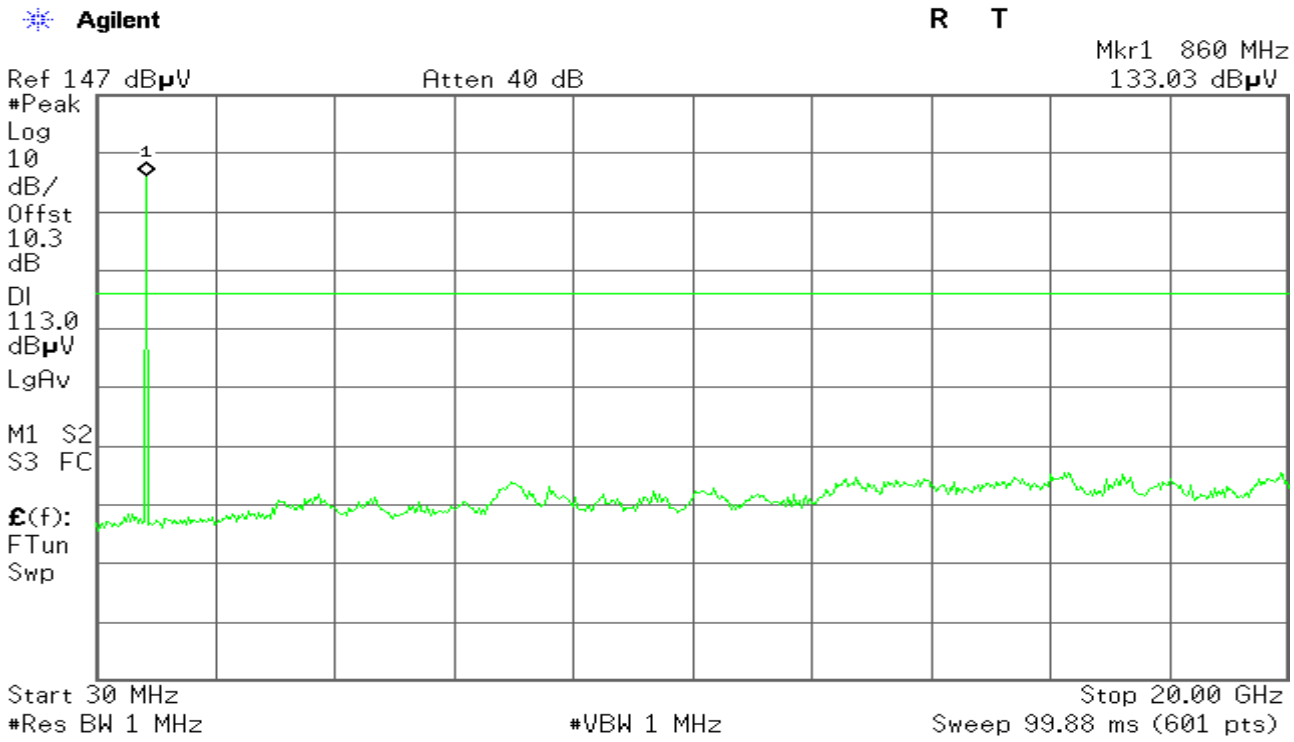
Figure 5-3: Out of Band emission at antenna terminals – GSM CH High



GSM 1900

Figure 6-1: Out of Band emission at antenna terminals – GSM CH Low

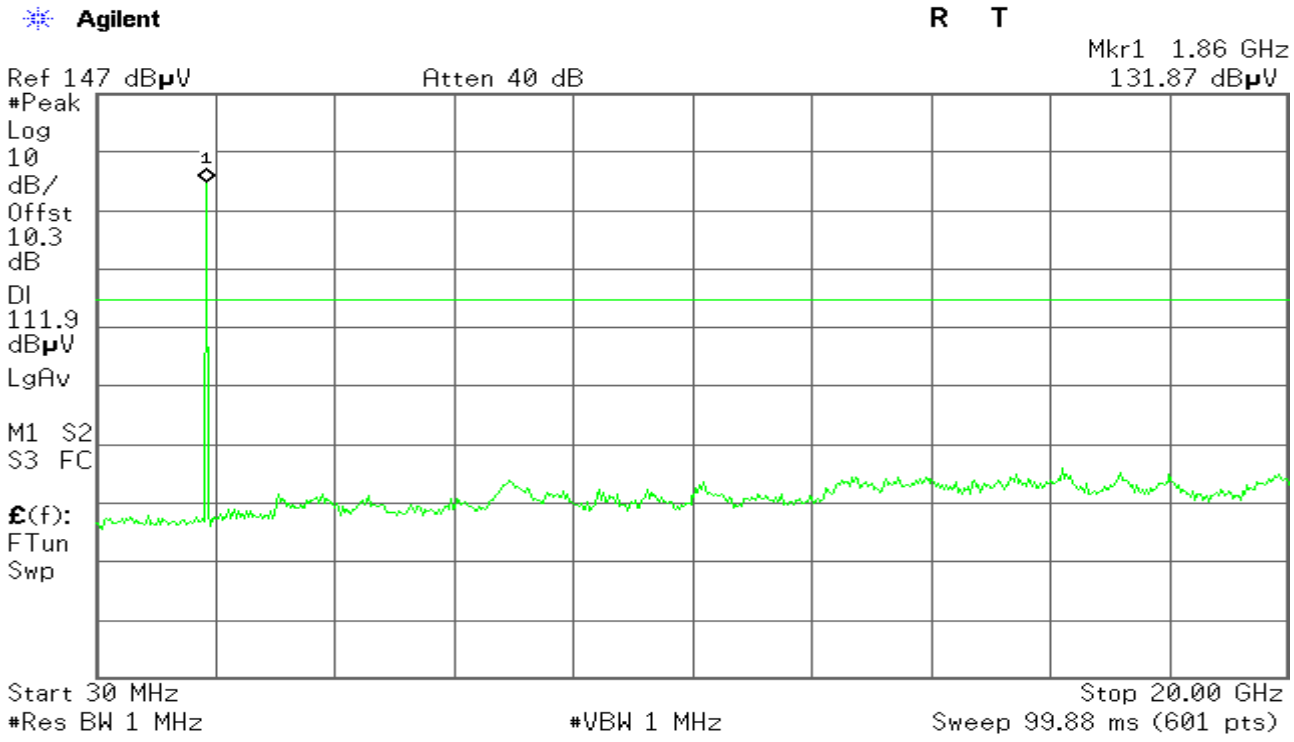


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Figure 6-2: Out of Band emission at antenna terminals – GSM CH Mid

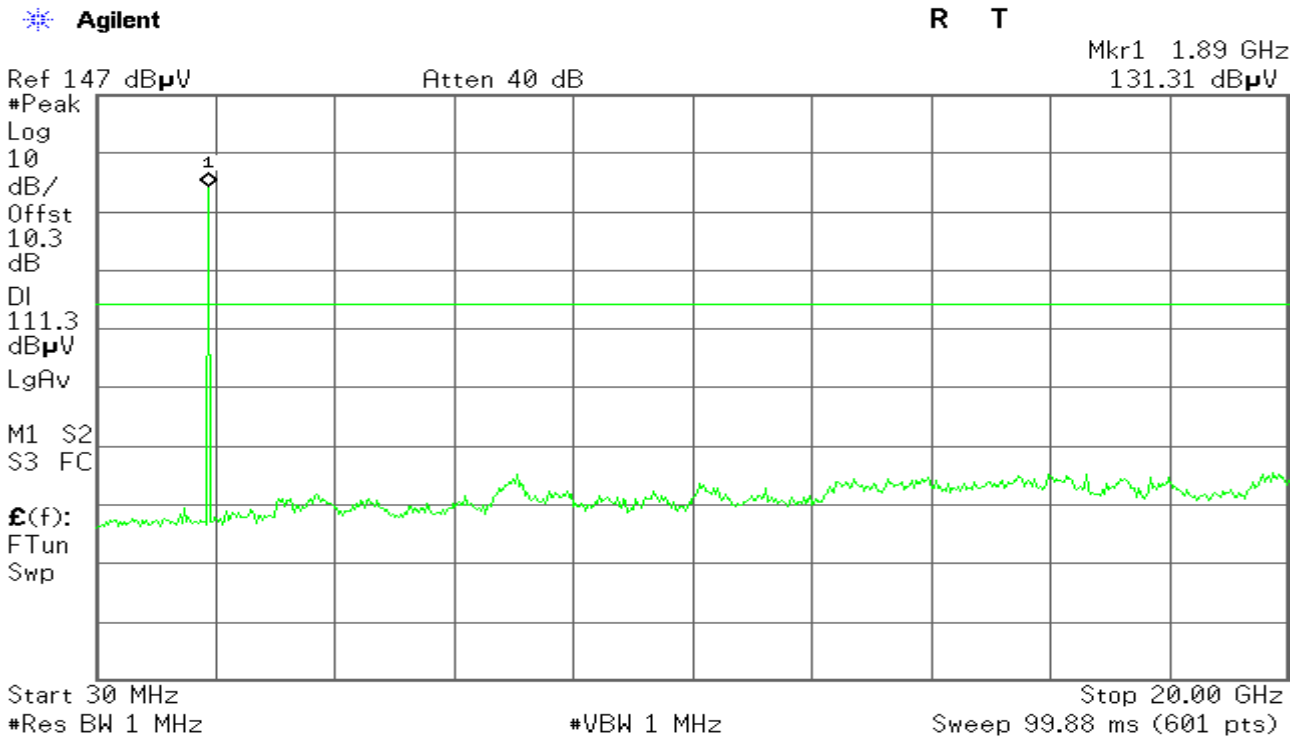
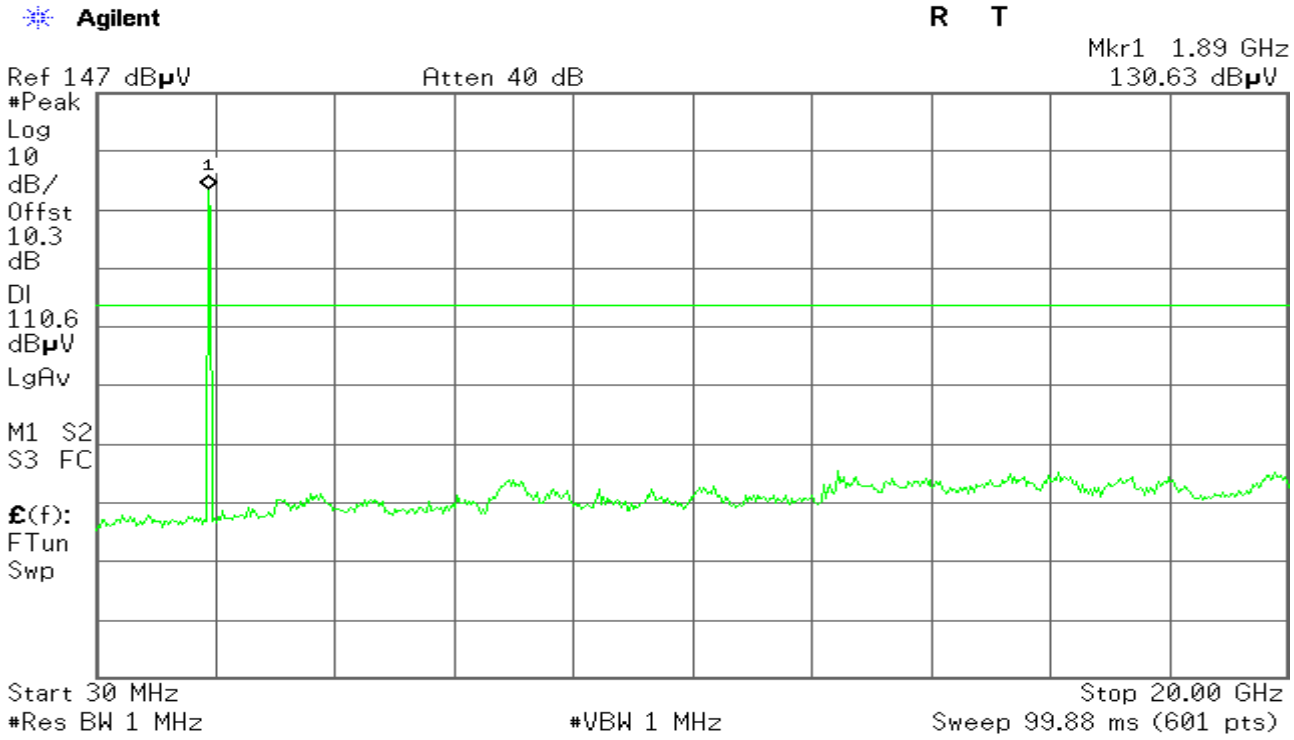


Figure 6-3: Out of Band emission at antenna terminals – GSM CH High



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GSM 850

Figure 3-1: Band Edge emissions – GSM CH Low

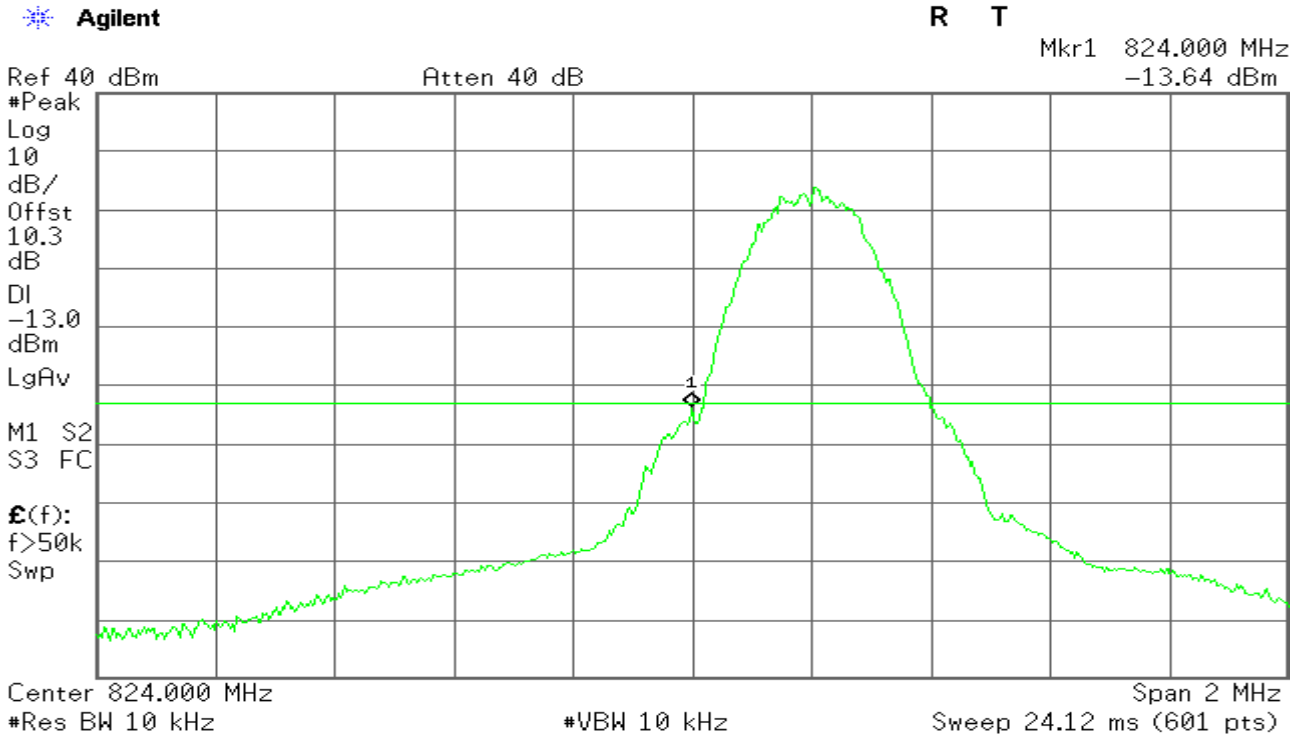
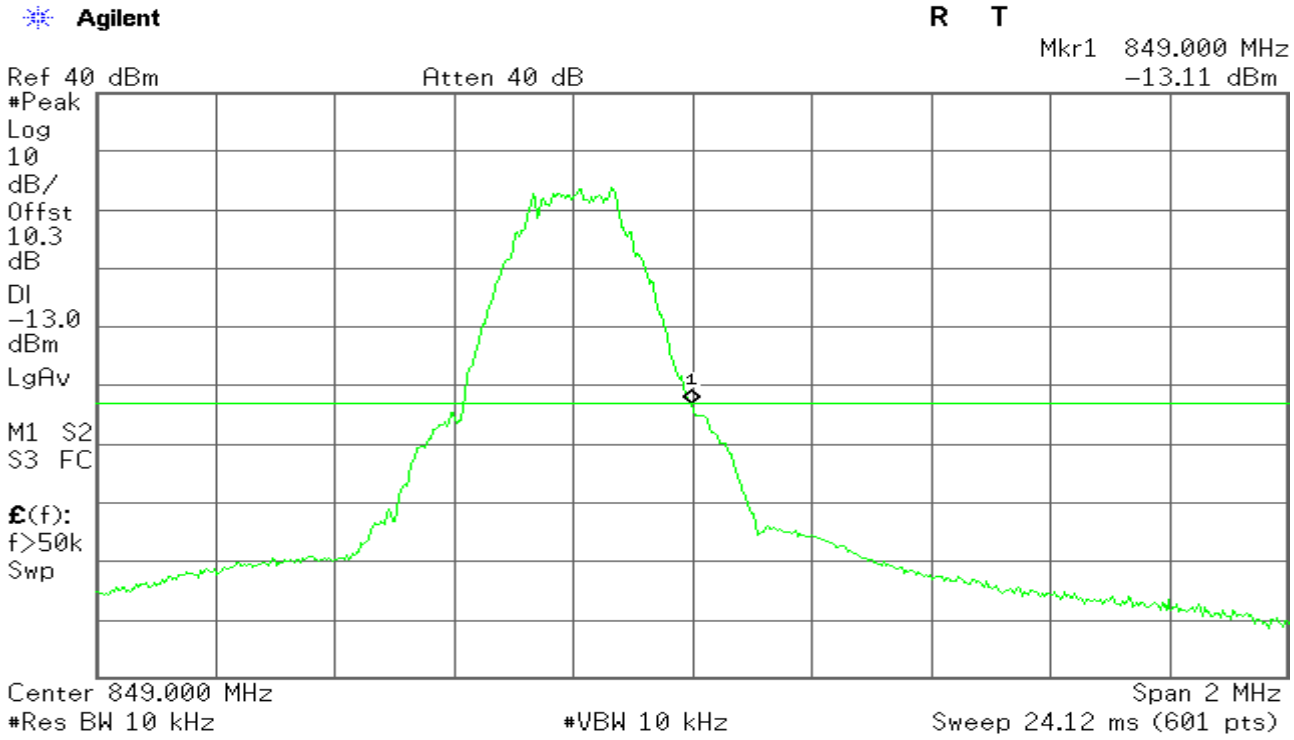


Figure 3-2: Band Edge emissions –GSM CH High



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GSM 1900

Figure 4-1: Band Edge emissions – GSM CH Low

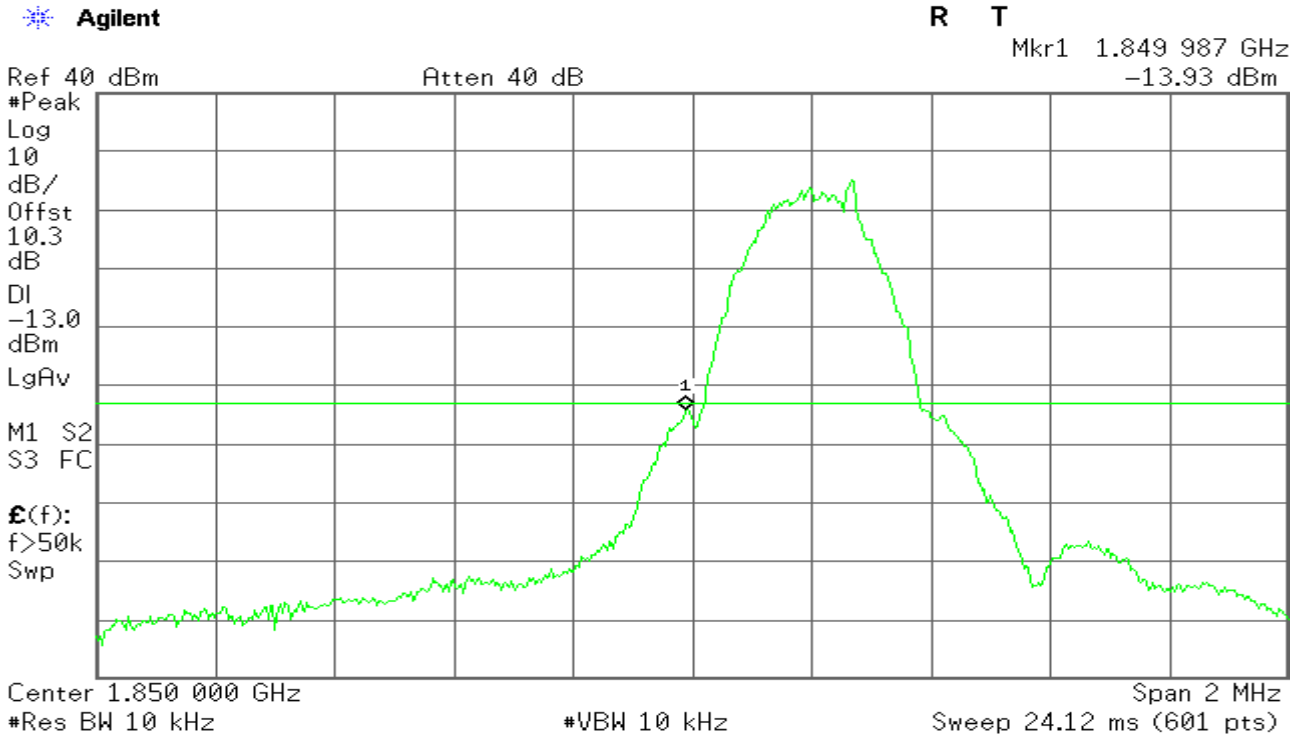
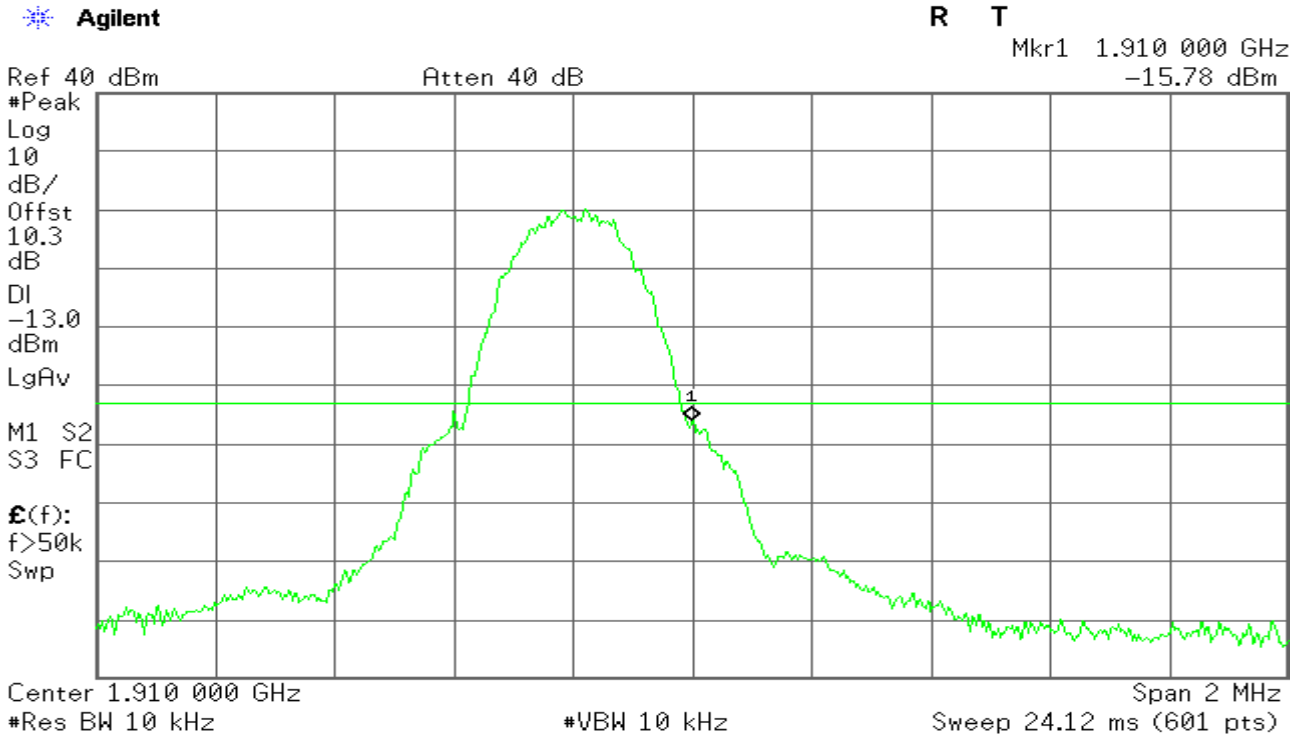


Figure 4-2: Band Edge emissions – GSM CH High



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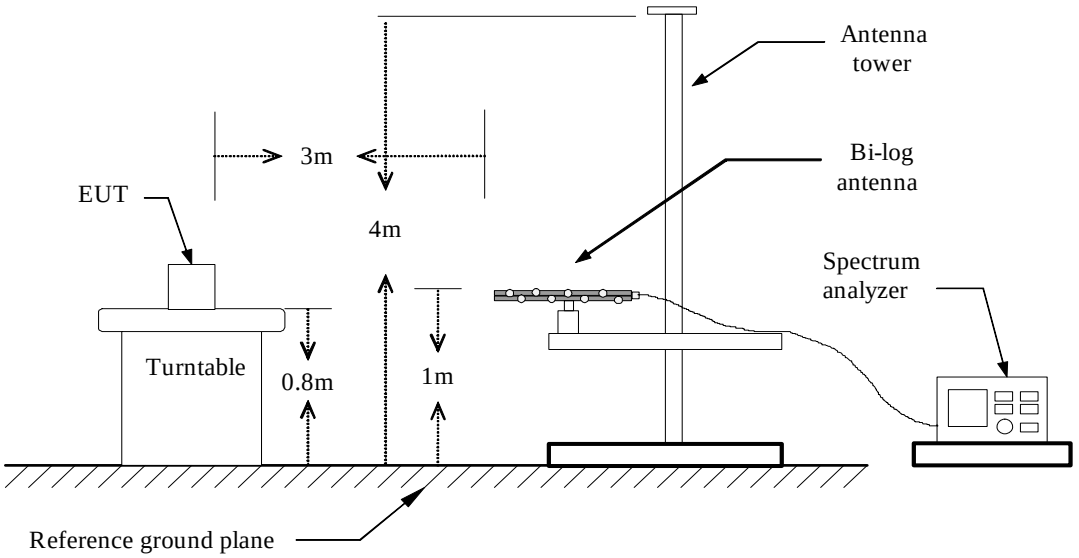
7.6. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

LIMIT

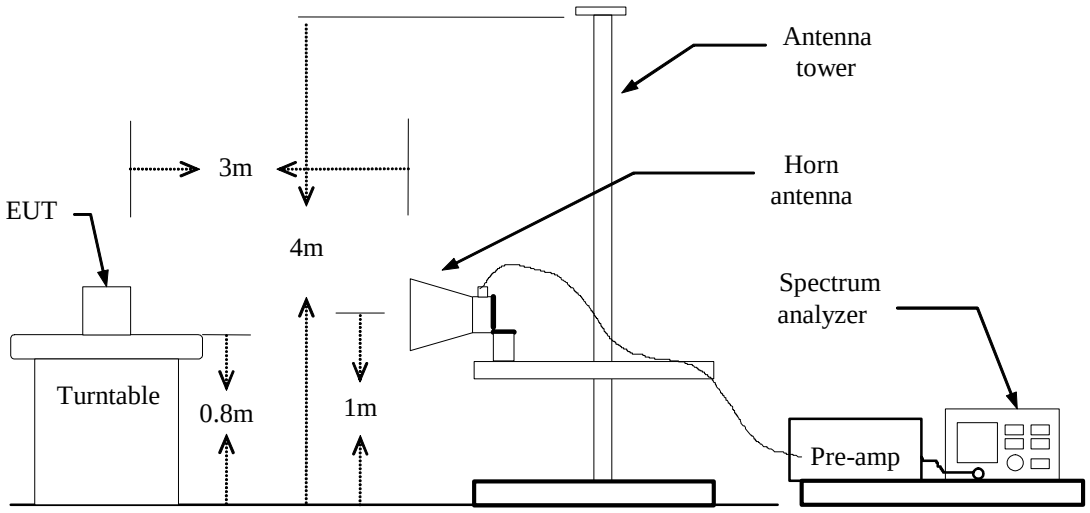
According to FCC §2.1053

TEST CONFIGURATION

Below 1 GHz



Above 1 GHz



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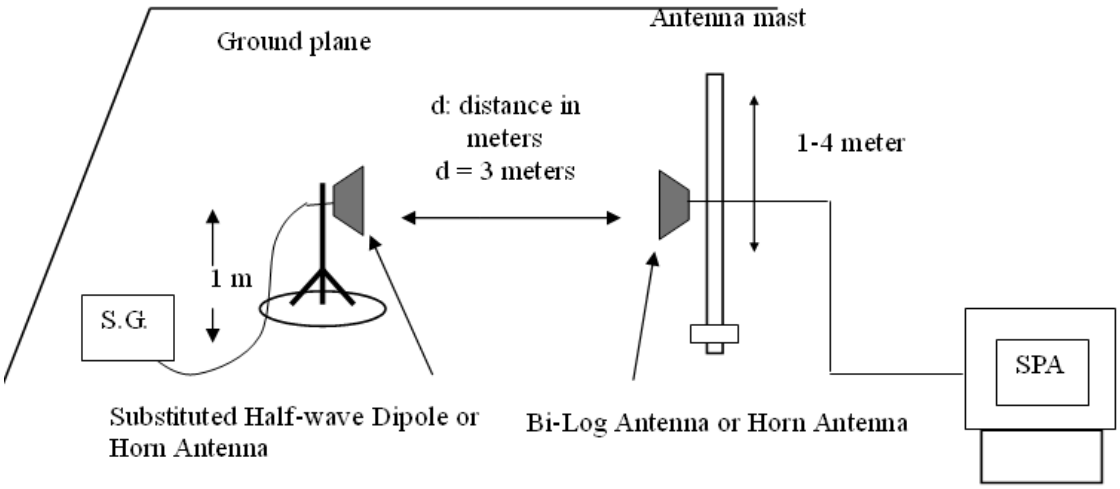
Substituted Method Test Set-up



TEST PROCEDURE

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

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

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

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

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

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TEST RESULTS

Refer to the attached tabular data sheets.

Radiated Spurious Emission Measurement Result / Below 1GHz

Operation Mode:	GSM 850 / TX / CH 128	**Test Date:**	2014-3-5
Temperature:	23°C	**Tested by:**	Blent.Wang
Humidity:	51 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
113.42	V	-54.42	-12.30	-66.72	-13.00	-53.72
267.65	V	-53.74	-10.62	-64.36	-13.00	-51.36
469.41	V	-52.01	-6.10	-58.11	-13.00	-45.11
574.17	V	-52.17	-4.86	-57.03	-13.00	-44.03
795.33	V	-50.25	-1.86	-52.11	-13.00	-39.11
934.04	V	-51.62	-0.47	-52.09	-13.00	-39.09
127.97	H	-54.69	-8.29	-62.98	-13.00	-49.98
500.45	H	-52.16	-5.84	-58.00	-13.00	-45.00
626.55	H	-52.50	-3.53	-56.03	-13.00	-43.03
779.81	H	-52.25	-2.02	-54.27	-13.00	-41.27
929.19	H	-52.99	-0.30	-53.29	-13.00	-40.29
992.24	H	-52.97	0.02	-52.95	-13.00	-39.95

Remark:

1. *The emission behaviour belongs to narrowband spurious emission.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

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Operation Mode:	GSM 850 / TX / CH 190	**Test Date:**	2014-3-5
Temperature:	23°C	**Tested by:**	Blent.Wang
Humidity:	51 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
129.91	V	-54.41	-11.74	-66.15	-13.00	-53.15
350.10	V	-52.68	-9.14	-61.82	-13.00	-48.82
514.03	V	-51.50	-5.83	-57.33	-13.00	-44.33
627.52	V	-52.52	-3.40	-55.92	-13.00	-42.92
747.80	V	-53.46	-2.11	-55.57	-13.00	-42.57
873.90	V	-52.44	-1.02	-53.46	-13.00	-40.46
278.32	H	-52.95	-10.12	-63.07	-13.00	-50.07
443.22	H	-51.60	-6.82	-58.42	-13.00	-45.42
609.09	H	-52.09	-3.99	-56.08	-13.00	-43.08
700.27	H	-54.28	-2.79	-57.07	-13.00	-44.07
872.93	H	-53.07	-1.07	-54.14	-13.00	-41.14
918.52	H	-52.78	-0.65	-53.43	-13.00	-40.43

Remark:

1. *The emission behaviour belongs to narrowband spurious emission.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

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Operation Mode:	GSM 850 / TX / CH 251	**Test Date:**	2014-3-5
Temperature:	23°C	**Tested by:**	Blent.Wang
Humidity:	51 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
66.86	V	-52.92	-13.56	-66.48	-13.00	-53.48
273.47	V	-52.55	-10.42	-62.97	-13.00	-49.97
457.77	V	-54.10	-6.47	-60.57	-13.00	-47.57
576.11	V	-52.79	-4.84	-57.63	-13.00	-44.63
775.93	V	-53.95	-2.02	-55.97	-13.00	-42.97
944.71	V	-53.37	-0.56	-53.93	-13.00	-40.93
118.27	H	-54.12	-9.46	-63.58	-13.00	-50.58
346.22	H	-53.83	-9.55	-63.38	-13.00	-50.38
522.76	H	-53.87	-5.93	-59.80	-13.00	-46.80
735.19	H	-53.97	-2.64	-56.61	-13.00	-43.61
807.94	H	-53.54	-1.62	-55.16	-13.00	-42.16
974.78	H	-53.74	-0.30	-54.04	-13.00	-41.04

Remark:

1. The emission behaviour belongs to narrowband spurious emission.

2 . Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

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Operation Mode:	GSM 1900 / TX / CH 512	**Test Date:**	2014-3-5
Temperature:	21°C	**Tested by:**	Blent.Wang
Humidity:	53 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
94.02	V	-49.76	-12.94	-62.70	-13.00	-49.70
492.69	V	-53.50	-5.81	-59.31	-13.00	-46.31
602.30	V	-52.84	-4.21	-57.05	-13.00	-44.05
754.59	V	-53.50	-2.03	-55.53	-13.00	-42.53
853.53	V	-53.36	-1.44	-54.80	-13.00	-41.80
982.54	V	-53.17	-0.09	-53.26	-13.00	-40.26
52.31	H	-48.84	-16.10	-64.94	-13.00	-51.94
233.70	H	-52.53	-13.14	-65.67	-13.00	-52.67
416.06	H	-54.10	-7.39	-61.49	-13.00	-48.49
581.93	H	-53.73	-4.82	-58.55	-13.00	-45.55
844.80	H	-53.39	-1.73	-55.12	-13.00	-42.12
946.65	H	-54.31	-0.64	-54.95	-13.00	-41.95

Remark:

1. The emission behaviour belongs to narrowband spurious emission.

2 . Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

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Operation Mode:	GSM 1900 / TX / CH 661	**Test Date:**	2014-3-5
Temperature:	21°C	**Tested by:**	Blent.Wang
Humidity:	53 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
85.29	V	-48.45	-13.16	-61.61	-13.00	-48.61
415.09	V	-52.26	-7.27	-59.53	-13.00	-46.53
659.53	V	-52.14	-3.37	-55.51	-13.00	-42.51
712.88	V	-52.34	-2.76	-55.10	-13.00	-42.10
811.82	V	-51.54	-1.59	-53.13	-13.00	-40.13
952.47	V	-52.20	-0.58	-52.78	-13.00	-39.78
135.73	H	-55.00	-8.80	-63.80	-13.00	-50.80
348.16	H	-54.64	-9.54	-64.18	-13.00	-51.18
490.75	H	-54.05	-5.74	-59.79	-13.00	-46.79
610.06	H	-53.31	-3.96	-57.27	-13.00	-44.27
706.09	H	-54.69	-2.73	-57.42	-13.00	-44.42
884.57	H	-54.19	-1.23	-55.42	-13.00	-42.42

Remark:

1. The emission behaviour belongs to narrowband spurious emission.

2 . Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

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Operation Mode:	GSM 1900 / TX / CH 810	**Test Date:**	2014-3-5
Temperature:	21°C	**Tested by:**	Blent.Wang
Humidity:	53 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
187.14	V	-46.98	-11.71	-58.69	-13.00	-45.69
491.72	V	-51.41	-5.81	-57.22	-13.00	-44.22
604.24	V	-51.78	-4.13	-55.91	-13.00	-42.91
764.29	V	-52.11	-2.04	-54.15	-13.00	-41.15
857.41	V	-51.82	-1.33	-53.15	-13.00	-40.15
905.91	V	-52.12	-0.87	-52.99	-13.00	-39.99
31.94	H	-54.33	-4.08	-58.41	-13.00	-45.41
288.02	H	-52.83	-10.19	-63.02	-13.00	-50.02
416.06	H	-54.10	-7.39	-61.49	-13.00	-48.49
559.62	H	-53.44	-5.10	-58.54	-13.00	-45.54
744.89	H	-56.04	-2.42	-58.46	-13.00	-45.46
942.77	H	-55.60	-0.56	-56.16	-13.00	-43.16

Remark:

1. The emission behaviour belongs to narrowband spurious emission.

2 . Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

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Radiated Spurious Emission Measurement Result / Above 1GHz

Operation Mode:	GSM 850 / TX / CH 128	**Test Date:**	2014-3-5
Temperature:	21°C	**Tested by:**	Blent.Wang
Humidity:	53 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
1648.00	V	-23.24	-0.52	-23.76	-13.00	-10.76
2077.00	V	-44.67	0.68	-43.99	-13.00	-30.99
1648.00	H	-25.52	-0.72	-26.24	-13.00	-13.24
2473.00	H	-50.33	1.97	-48.36	-13.00	-35.36

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

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Operation Mode:	GSM 850 / TX / CH 190	**Test Date:**	2014-3-5
Temperature:	21°C	**Tested by:**	Blent.Wang
Humidity:	53 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
1672.00	V	-20.20	-0.32	-20.52	-13.00	-7.52
2509.00	V	-46.39	2.49	-43.90	-13.00	-30.90
1672.00	H	-21.44	-0.61	-22.05	-13.00	-9.05
2509.00	H	-46.13	2.19	-43.94	-13.00	-30.94

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

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Operation Mode:	GSM 850 / TX / CH 251	**Test Date:**	2014-3-5
Temperature:	21°C	**Tested by:**	Blent.Wang
Humidity:	53 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
1699.00	V	-17.52	-0.08	-17.60	-13.00	-4.60
2548.00	V	-42.88	2.20	-40.68	-13.00	-27.68
1699.00	H	-17.31	-0.48	-17.79	-13.00	-4.79
2548.00	H	-40.98	1.83	-39.15	-13.00	-26.15

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

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Operation Mode:	GSM 1900 / TX / CH 512	**Test Date:**	2014-3-5
Temperature:	21°C	**Tested by:**	Blent.Wang
Humidity:	53 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
3700.00	V	-25.35	5.63	-19.72	-13.00	-6.72
5552.00	V	-39.26	7.47	-31.79	-13.00	-18.79
3700.00	H	-27.40	5.28	-22.12	-13.00	-9.12
5552.00	H	-34.87	7.62	-27.25	-13.00	-14.25

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

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Operation Mode:	GSM 1900 / TX / CH 661	**Test Date:**	2014-3-5
Temperature:	21°C	**Tested by:**	Blent.Wang
Humidity:	53 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
3760.00	V	-25.32	6.70	-18.62	-13.00	-5.62
5640.00	V	-39.93	6.98	-32.95	-13.00	-19.95
3760.00	H	-26.18	6.41	-19.77	-13.00	-6.77
5640.00	H	-38.80	7.17	-31.63	-13.00	-18.63

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

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Operation Mode:	GSM 1900 / TX / CH 810	**Test Date:**	2014-3-5
Temperature:	21°C	**Tested by:**	Blent.Wang
Humidity:	53 % RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Antenna Polarization	Reading (dBm)	Correction Factor (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
3820.00	V	-26.80	7.23	-19.57	-13.00	-6.57
5728.00	V	-37.49	6.90	-30.59	-13.00	-17.59
3820.00	H	-25.13	7.07	-18.06	-13.00	-5.06
5728.00	H	-38.19	6.80	-31.39	-13.00	-18.39

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

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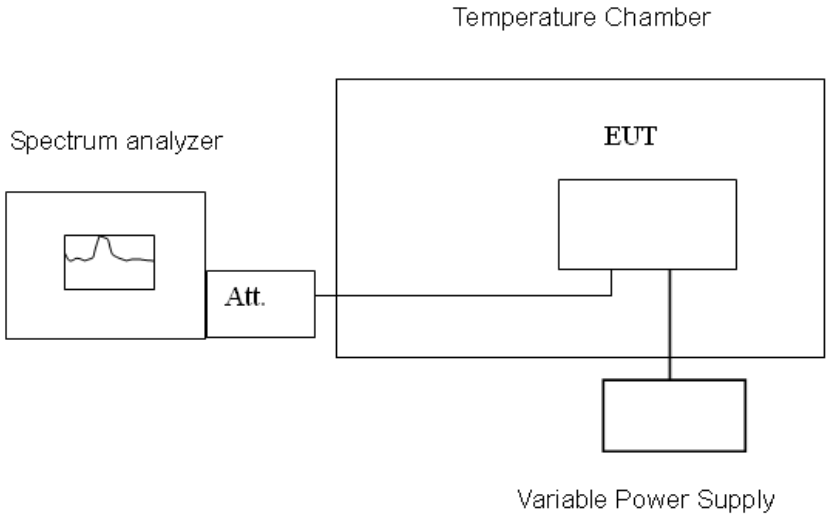
7.7. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

LIMIT

According to FCC §2.1055, FCC §22.355, .FCC §24.235.

Frequency Tolerance: 2.5 ppm

TEST CONFIGURATION



Remark: *Measurement setup for testing on Antenna connector*

TEST PROCEDURE

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20^{o}C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –30^{o}C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10^{o}C increased per stage until the highest temperature of +50^{o}C reached.

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TEST RESULTS

No non-compliance noted.

Reference Frequency: GSM Mid Channel 836.6 MHz @ 20°C				
Limit: ± 2.5 ppm = 2091.5 Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.7	55	836600129	129	2091.5
	50	836600127	127	
	40	836600128	128	
	30	836600127	127	
	20	836600126	126	
	10	836600132	132	
	0	836600131	131	
	-5	836600137	137	
	-10	836600142	142	

Reference Frequency: GSM Mid Channel 1880 MHz @ 20°C				
Limit: ± 2.5 ppm = 4700 Hz				
Power Supply Vdc	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.7	55	1879999895	105	4700
	50	1879999894	106	
	40	1879999897	103	
	30	1879999895	105	
	20	1879999894	106	
	10	1879999897	103	
	0	1879999889	111	
	-5	1879999883	117	
	-10	1879999881	119	

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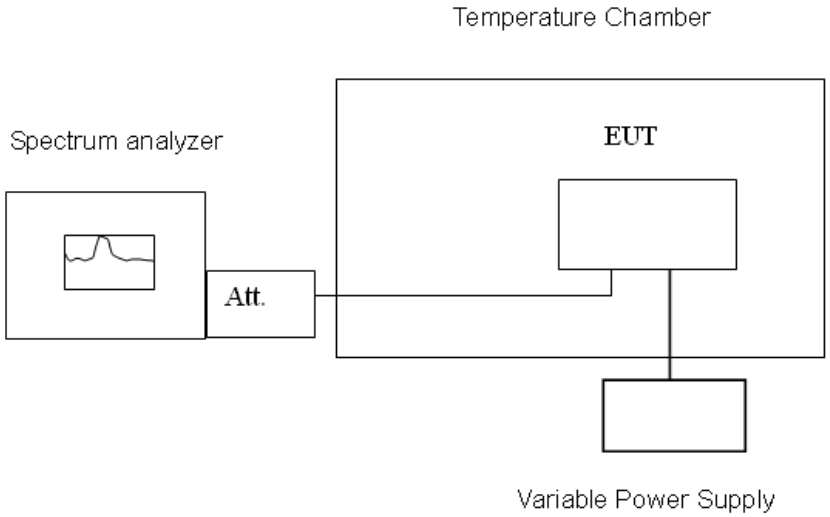
7.8. REQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

LIMIT

According to FCC §2.1055, FCC §22.355, .FCC §24.235,

TEST CONFIGURATION



Remark: *Measurement setup for testing on Antenna connector.*

TEST PROCEDURE

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (± 10%) and endpoint, record the maximum frequency change.

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TEST RESULTS

No non-compliance noted.

Reference Frequency: GSM Mid Channel 836.6 MHz @ 20°C				
Limit: ± 2.5 ppm = 2090Hz				
Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
4.2	20	836599886	114	2090
3.7		836599887	113	
3.6 end		836599880	120	

Reference Frequency: GSM Mid Channel 1880 MHz @ 20°C				
Limit: ± 2.5 ppm = 4700 Hz				
Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
4.2	20	1879999875	125	4700
3.7		1879999871	129	
3.6 end		1879999872	128	

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7.9. POWERLINE CONDUCTED EMISSIONS

LIMIT

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 microvolts (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 (dBµV)	
	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

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

TEST CONFIGURATION

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

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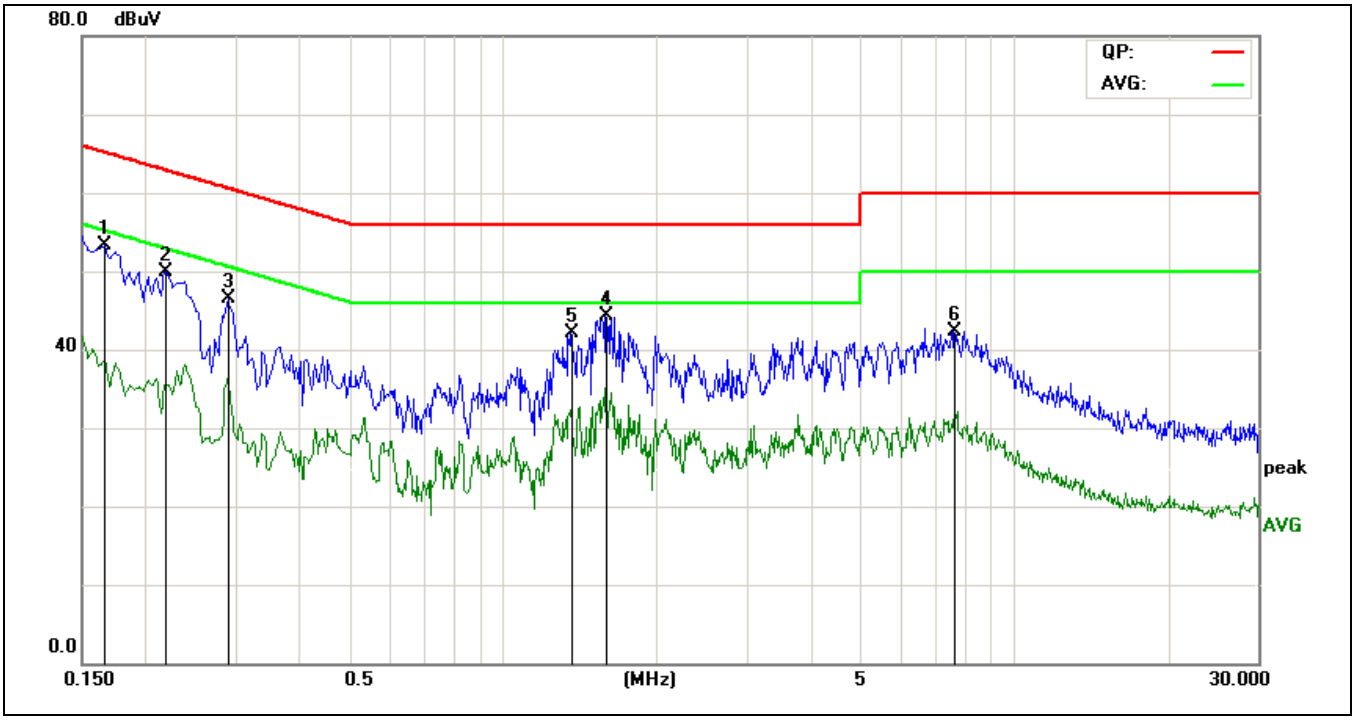
TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Operation Mode:	Normal Link	**Test Date:**	2014-3-5
Temperature:	23°C	**Tested by:**	Blent.Wang
Humidity:	50% RH		

L1



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1652	27.46	15.11	19.75	47.21	34.86	65.20	55.20	-17.99	-20.34	Pass
2	0.2188	24.35	12.28	19.61	43.96	31.89	62.86	52.86	-18.90	-20.97	Pass
3*	0.2900	21.34	10.11	19.67	41.01	29.78	60.52	50.52	-19.51	-20.74	Pass
4	1.5764	20.11	12.12	19.89	40.00	32.01	56.00	46.00	-16.00	-13.99	Pass
5	1.3589	16.41	10.82	19.87	36.28	30.69	56.00	46.00	-19.72	-15.31	Pass
6	7.6639	16.08	6.22	20.55	36.63	26.77	60.00	50.00	-23.37	-23.23	Pass

Remark:

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

"-" means Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessay

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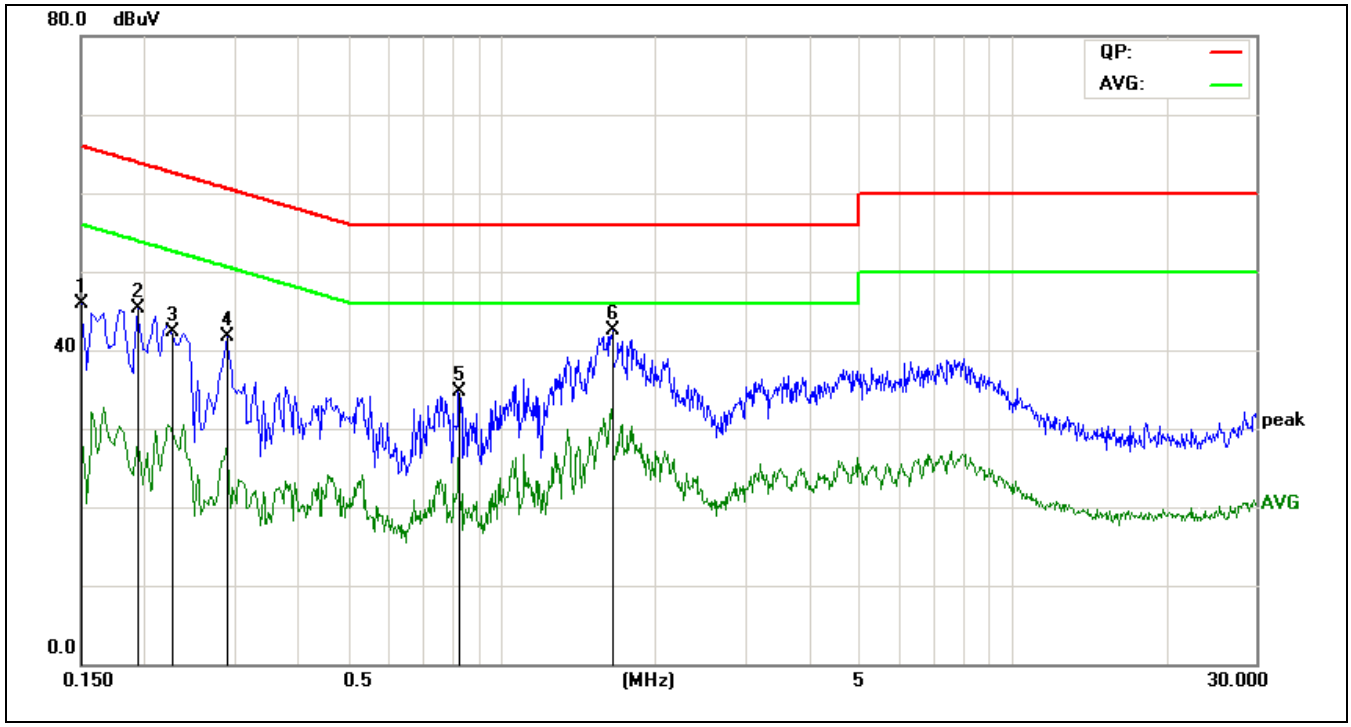
L2



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1512	22.98	8.95	19.73	42.71	28.68	65.93	55.93	-23.22	-27.25	Pass
2	0.1920	17.27	4.36	19.65	36.92	24.01	63.95	53.95	-27.03	-29.94	Pass
3	0.2290	17.71	5.21	19.66	37.37	24.87	62.48	52.48	-25.11	-27.61	Pass
4	0.2869	17.34	5.07	19.70	37.04	24.77	60.61	50.61	-23.57	-25.84	Pass
5*	0.8180	9.92	3.35	19.83	29.75	23.18	56.00	46.00	-26.25	-22.82	Pass
6	1.6359	17.60	9.59	19.92	37.52	29.51	56.00	46.00	-18.48	-16.49	Pass

Remark:

5. Measuring frequencies from 0.15 MHz to 30MHz.
6. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
7. The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;
8. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

"-" means Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessay

END OF REPORT

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