AT4 wireless, S.A.U.
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FCC LISTED, REGISTRATION NUMBER: 720267

IC LISTED REGISTRATION NUMBER IC 4621A-1

Test report No:

NIE: 48530RRF.001

Test report
REFERENCE STANDARD:
USA FCC Part 22 & Part 24
CANADA IC RSS-132, RSS-133

Identificación del objeto ensayado.....: Identification of item tested	3G Cellular Alarm communicator
Marca .....: Trademark	DSC
Modelo y/o referencia tipo .....: Model and /or type reference	TL2803GRE, TL2803GE, 3G2080RE, 3G2080E
Other identification of the product .....:	FCC ID: F5316TL2803GRE IC: 160A-TL2803GRE
Final HW version .....:	UA685 Rev. 01
Final SW version .....:	Ver. 5.0
IMEI TAC .....:	35669406
Características .....: Features	Data transmission in 850/1900MHz bands (2G/3G)
Fabricante .....: Manufacturer	DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD. 95 BRIDGELAND AVE., TORONTO, ON M6A1Y7 CANADA
Método de ensayo solicitado, norma.....: Test method requested, standard	USA FCC Part 22 10-1-15 Edition. USA FCC Part 24 10-1-15 Edition. CANADA IC RSS-132 Issue 3, Jan. 2013. CANADA IC RSS-133 Issue 6, Jan. 2013. Measurement Guidance 971168 D01 v02r02 for certification of Licensed Digital Transmitters. ANSI/TIA-603-D (2010). ANSI C63.26-2015.
Resultado.....: Summary	IN COMPLIANCE
Aprobado por (nombre / cargo y firma) .....: Approved by (name / position & signature)	A. Llamas RF Lab. Manager Firmado digitalmente por ALEJANDRO LLAMAS RODRIGUEZ Fecha: 2016.03.28 15:36:14 +02'00'
Fecha de realización .....: Date of issue	2016-03-28
Formato de informe No. .....: Report template No	FDT08_17

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Competences and guarantees

AT4 wireless is a laboratory with a measurement facility in compliance with the requirements of Section 2.948 of the FCC rules and has been added to the list of facilities whose measurements data will be accepted in conjuction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Registration Number: 720267.

AT4 wireless is a laboratory with a measurement site in compliance with the requirements of RSS 212, Issue 1 (Provisional) and has been added to the list of filed sites of the Canadian Certification and Engineering Bureau. Reference File Number: IC 4621A-1.

In order to assure the traceability to other national and international laboratories, AT4 wireless has a calibration and maintenance program for its measurement equipment.

AT4 wireless guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at AT4 wireless at the time of performance of the test.

AT4 wireless is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of AT4 wireless.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of AT4 wireless and the Accreditation Bodies.

Uncertainty

Uncertainty (factor k=2) was calculated according to the AT4 wireless internal document PODT000.

Usage of samples

Samples undergoing test have been selected by: **the client**.

Sample S/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
48530/012	Display Digital	---	59006AEF	2016-02-15
48530/014	Antenna	---	---	2016-02-15
48530/018	Cellular Alarm communicator	TL2803GRE	---	2016-02-15
48530/004	AC/AC adapter	PTD1640U	---	2016-02-15
48530/006	Battery	---	---	2016-02-15
48530/010	Board	UE910-NAR	356694061522009	2016-02-15
48530/011	Board	HS2032	---	2016-02-15

1. Sample S/01 has undergone the test(s).

   All tests indicated in appendix A and appendix B.

Test sample description

The test sample consists of a 3G Cellular interface used for connection to DSC NEO Alarm System in order to send events to monitoring station. Use integrated Telit radio model UE910-NAR. Module uses external whip antenna.

Identification of the client

DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD.

3301 LANGSTAFF ROAD, CONCORD, ON L4K4L2 CANADA

Testing period

The performed test started on 2016-02-15 and finished on the same day.

The tests have been performed at AT4 wireless.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω

In the semianechoic chamber the following limits were not exceeded during the test.

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω
Normal site attenuation (NSA)	< ±4 dB at 10 m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Field homogeneity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 1000 MHz).

Remarks and comments

1: Test not requested. Only radiated spurious emissions tests were requested.

2: Used instrumentation.

Radiated Measurements

		Last Cal. date	Cal. due date
1.	Semianechoic Absorber Lined Chamber ETS FACT3 200STP	N.A.	N.A.
2.	BiconicalLog antenna ETS LINDGREN 3142E	2014/03	2017/03
3.	Multi Device Controller EMCO 2090	N.A.	N.A.
4.	Double-ridge Guide Horn antenna 1-18 GHz SCHWARZBECK BBHA 9120 D	2013/11	2016/11
5.	Broadband Horn antenna 18-40 GHz Schwarbeck BBHA 9170	2014/03	2017/03
6.	EMI Test Receiver R&S ESU 40	2014/02	2016/02
7.	Spectrum analyser Rohde & Schwarz FSW50	2015/12	2017/12
8.	RF pre-amplifier 10 MHz-6 GHz SCHWARZBECK BBV9743	2015/03	2016/03
9.	RF pre-amplifier 1-18 GHz BONN ELEKTRONIK BLMA 0118-3A	2015/05	2016/05
10.	RF pre-amplifier 18-40 GHz BONN ELEKTRONIK BLMA 1840-1M	2015/12	2017/12
11.	Universal Radio communication Tester R&S CMU200	2016/02	2017/02

3: According to the applicant's information the only differences between the four different marketing model names are:

- Model ***TL2803GRE*** is equipped with an IP and a 3G alarm communication channel and can connect to a third party application through an RS-232 interface.
- Model ***3G2080RE*** is similar to TL2803GRE model but it is equipped only with 3G communication channel (IP circuitry is depopulated).

- Model ***TL2803GE*** is equipped with an IP and a 3G alarm communication channel identical to the TL2803GRE model but it does not have the RS-232 interface populated.

- Model ***3G2080E*** is similar to TL2803GRE model but it is equipped only with a 3G communication channel and it does not have the RS-232 interface populated.

Testing verdicts

Not applicable ..... :	N/A
Pass ..... :	P
Fail ..... :	F
Not measured ..... :	N/M

FCC PART 22/IC RSS-132 PARAGRAPH	VERDICT			
	NA	**P**	**F**	**NM**
Clause 22.913/RSS-132 Clause 5.4: RF output power				NM[1]
Clause 2.1047/RSS-132 Clause 5.2: Modulation characteristics				NM[1]
Clause 22.355/RSS-132 Clause 5.3: Frequency stability				NM[1]
Clause 2.1049: Occupied Bandwidth				NM[1]
Clause 22.917/RSS-132 Clause 5.5: Spurious emissions at antenna terminals				NM[1]
Clause 22.917/RSS-132 Clause 5.5: Radiated emissions		P		

1: See section “Remarks and comments”.

FCC PART 24/IC RSS-133 PARAGRAPH	VERDICT			
	NA	**P**	**F**	**NM**
Clause 24.232/RSS-133 Clause 6.4: RF output power				NM[1]
Clause 2.1047/RSS-133 Clause 6.2: Modulation characteristics				NM[1]
Clause 24.235/RSS-133 Clause 6.3: Frequency stability				NM[1]
Clause 2.1049: Occupied Bandwidth				NM[1]
Clause 24.238/RSS-133 Clause 6.5: Spurious emissions at antenna terminals				NM[1]
Clause 24.238/RSS-133 Clause 6.5: Radiated emissions		P		

1: See section “Remarks and comments”.

Appendix A – Test result for FCC Part 22/IC RSS-132

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TEST RESULTS FOR FCC PART 22 AND IC RSS-132

TEST CONDITIONS

Power supply (V):

V_{nom} = 120 Vac

V_{max} = N/A

V_{min} = N/A

The subscripts nom, min and max indicate voltage test conditions (nominal, minimum and maximum respectively, as declared by the applicant).

N/A: Not Applicable.

Type of power supply = AC voltage from external power supply: AC/AC adapter (120VAC/16.5VAC).

Type of antenna = external whip antenna.

TEST FREQUENCIES:

GPRS AND EDGE MODULATION

Lowest channel (128): 824.2 MHz

Middle channel (190): 836.6 MHz

Highest channel (251): 848.8 MHz

WCDMA AND HSUPA MODULATION

Lowest channel (4132): 826.4 MHz

Middle channel (4182): 836.4 MHz

Highest channel (4233): 846.6 MHz

Radiated emissions

SPECIFICATION

FCC § 22.917

RSS-132. Clause 5.5.

METHOD

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency generated within the equipment.
The EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter distance from the measuring antenna for measurements below 1 GHz and at 1 m distance for measurements above 1 GHz.
Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded. The radiated emissions were measured with peak detector and 1 MHz bandwidth.

Each detected emission at less than 20 dB below the limit is substituted by the Substitution method, in accordance with the ANSI/TIA/EIA-603-D.

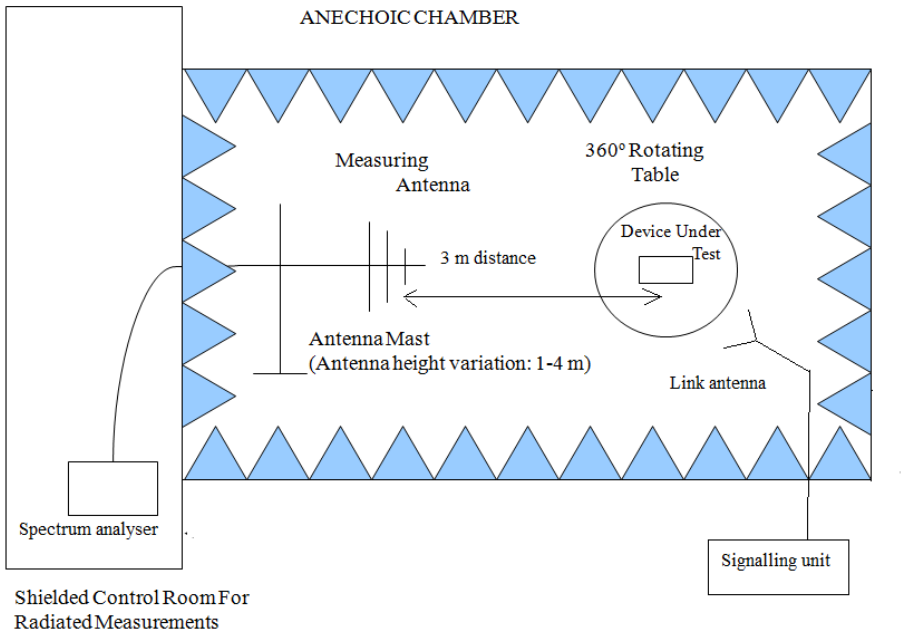
Measurement Limit**:**

According to specification. the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.
At Po transmitting power. the specified minimum attenuation becomes 43+10log (Po) and the level in dBm relative Po becomes:

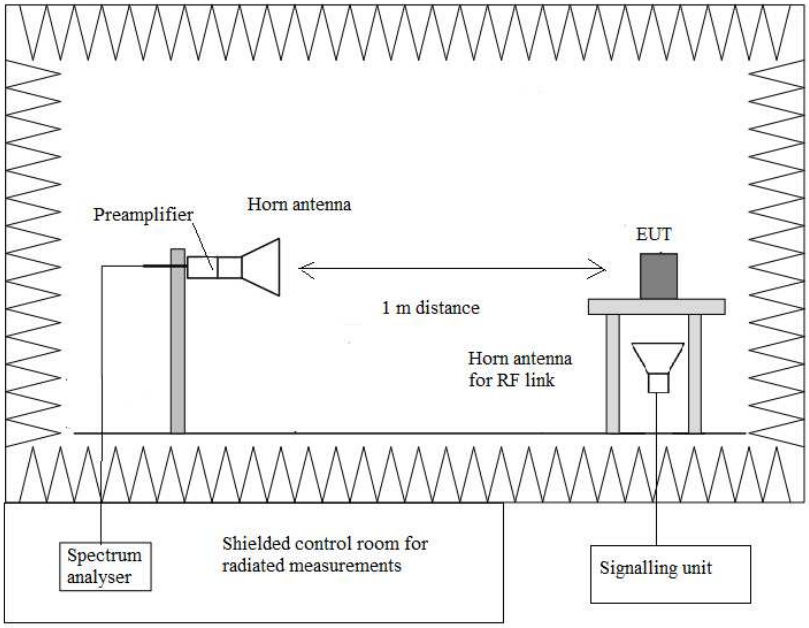
Po (dBm) – [43 + 10 log (Po in mwatts) - 30] = - 13 dBm

TEST SETUP

Radiated measurements below 1 GHz.



Radiated measurements above 1 GHz.



RESULTS

GPRS AND EDGE MODULATION

A preliminary scan determined the GPRS modulation as the worst case. The following tables and plots show the results for GPRS modulation.

1. CHANNEL: LOWEST

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-12.75 GHz.
No spurious signals were found in all the range.

2. CHANNEL: MIDDLE

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-12.75 GHz.

Substitution method data

Frequency (MHz)	Instrument reading (dBm)	Polarization	(1) Generator output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gi (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
2510,05	-29.50	Vertical	-39.12	2.10	10.70	-30.52

3. CHANNEL: HIGHEST

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-12.75 GHz.
No spurious signals were found in all the range.

WCDMA AND HSUPA MODULATION

A preliminary scan determined the WCDMA modulation as the worst case. The following tables and plots show the results for WCDMA modulation.

1. CHANNEL: LOWEST

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-12.75 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

2. CHANNEL: MIDDLE

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-12.75 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

3. CHANNEL: HIGHEST

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

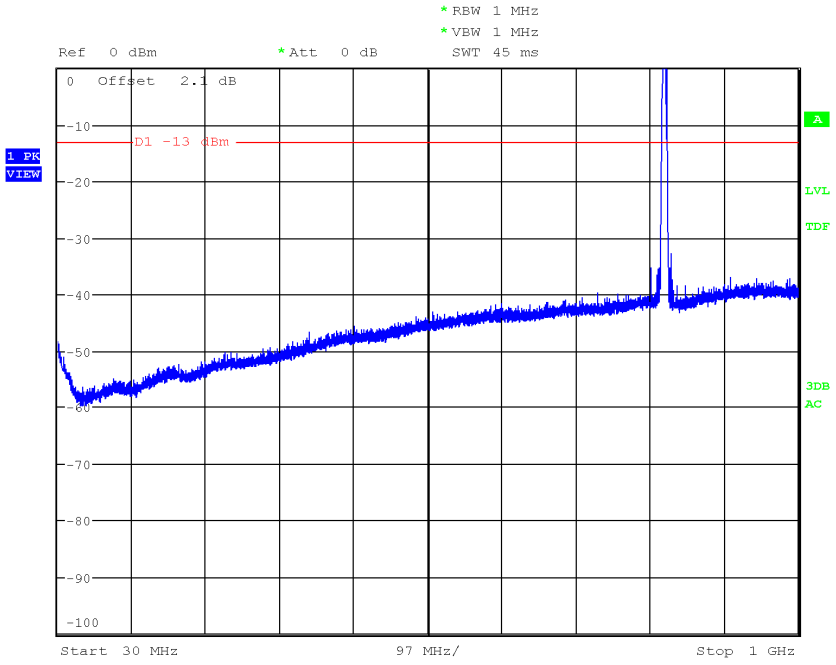
Frequency range 1 GHz-12.75 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

Verdict: PASS

FREQUENCY RANGE 30 MHz-1000 MHz.

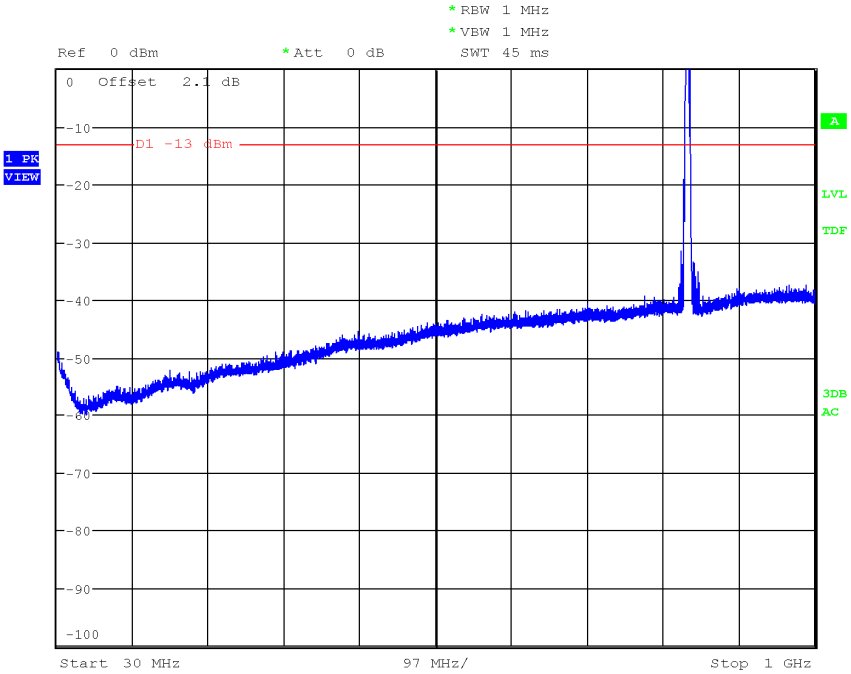
GPRS MODULATION

CHANNEL: LOWEST



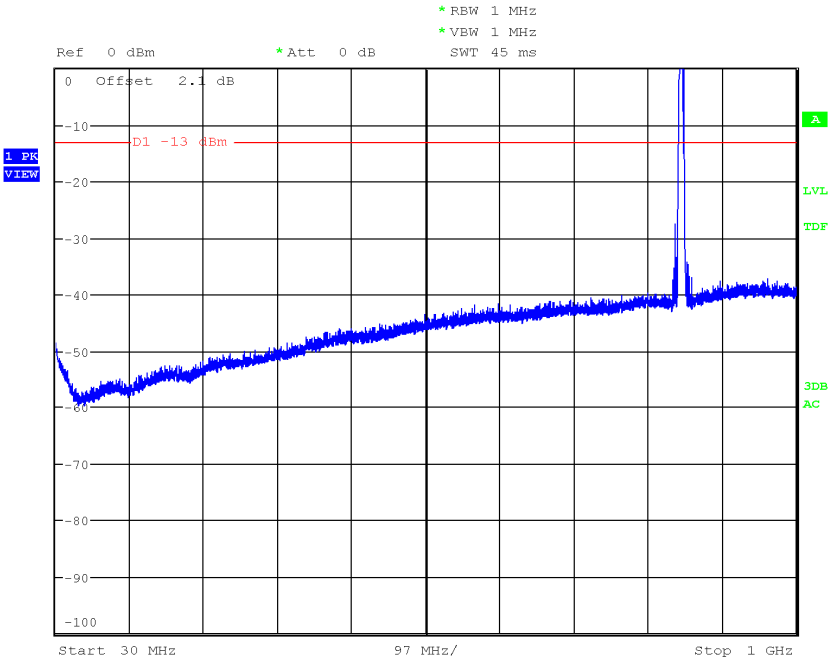
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

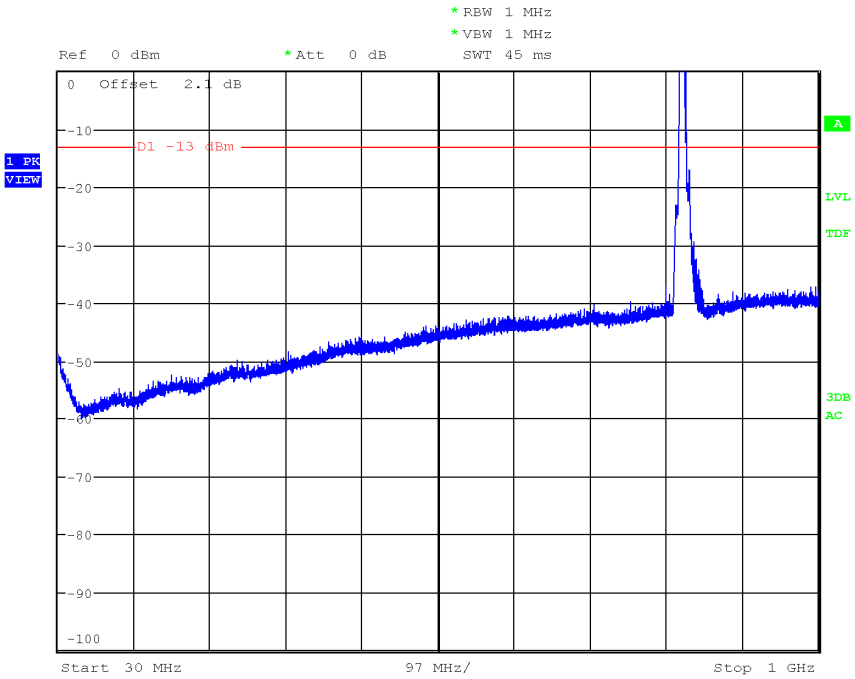
CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

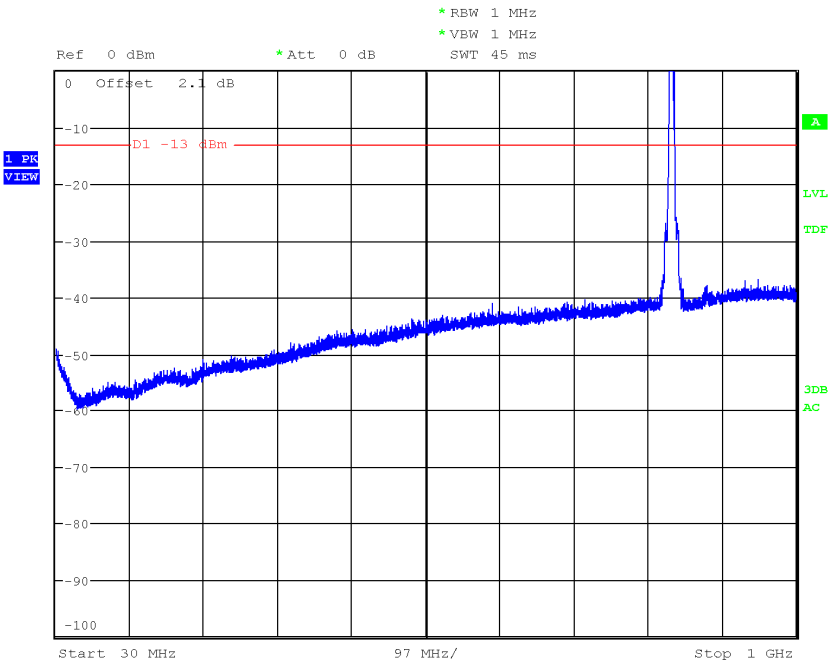
WCDMA MODULATION

CHANNEL: LOWEST



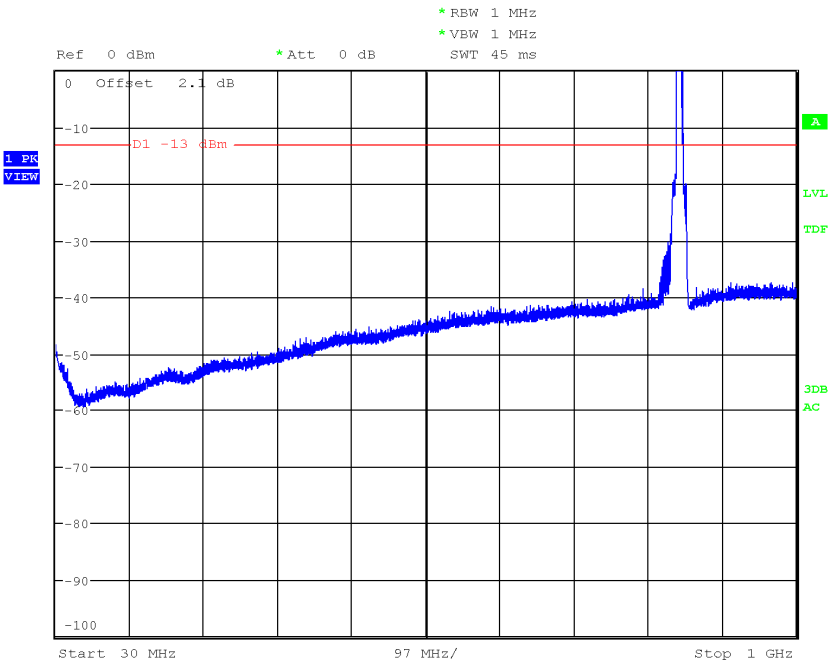
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST

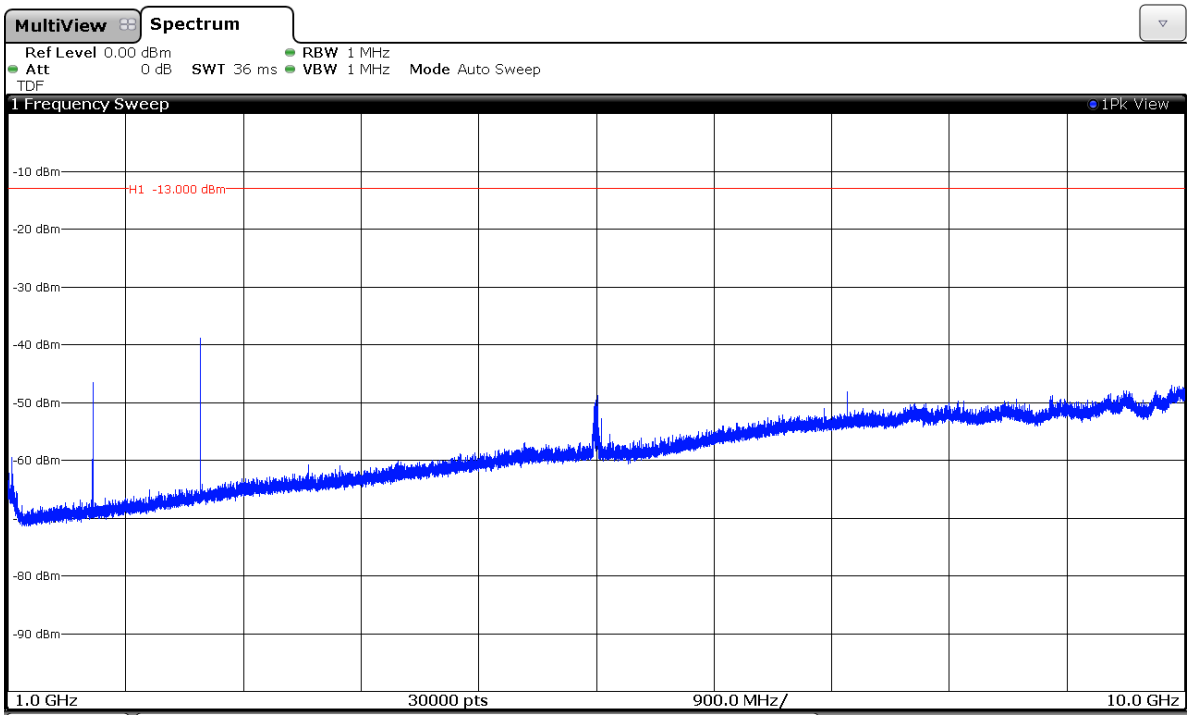


Note: The peak above the limit is the carrier frequency.

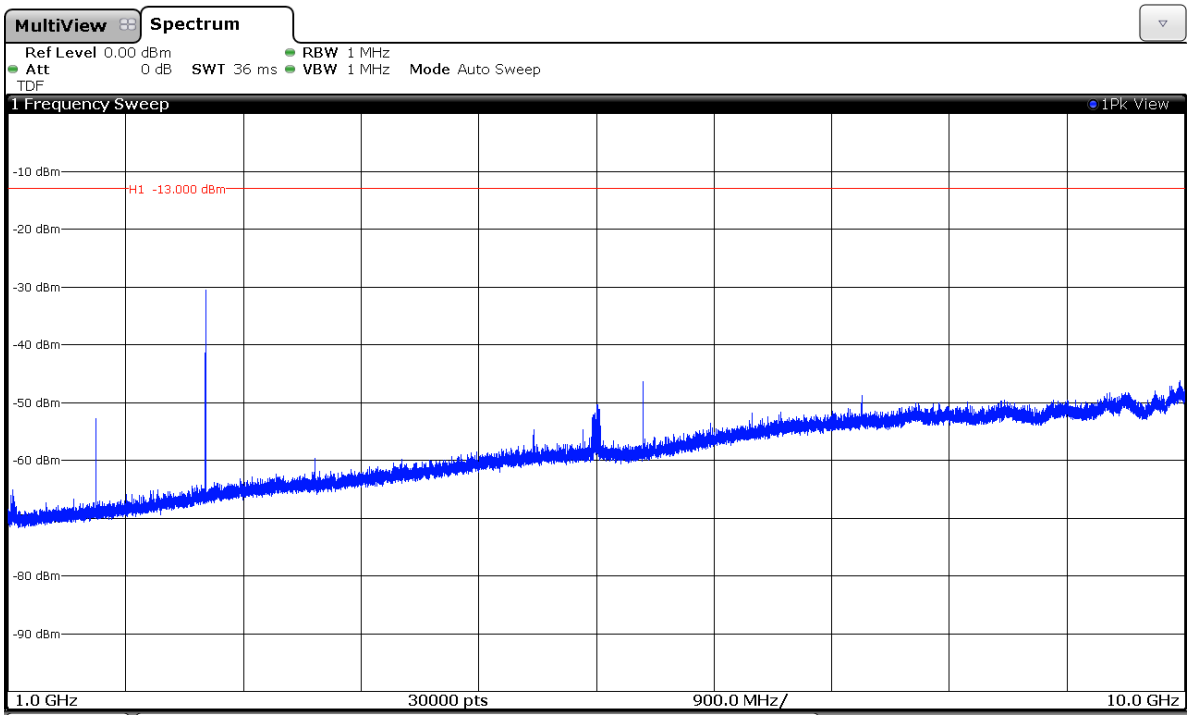
FREQUENCY RANGE 1 GHz to 10 GHz.

GPRS MODULATION

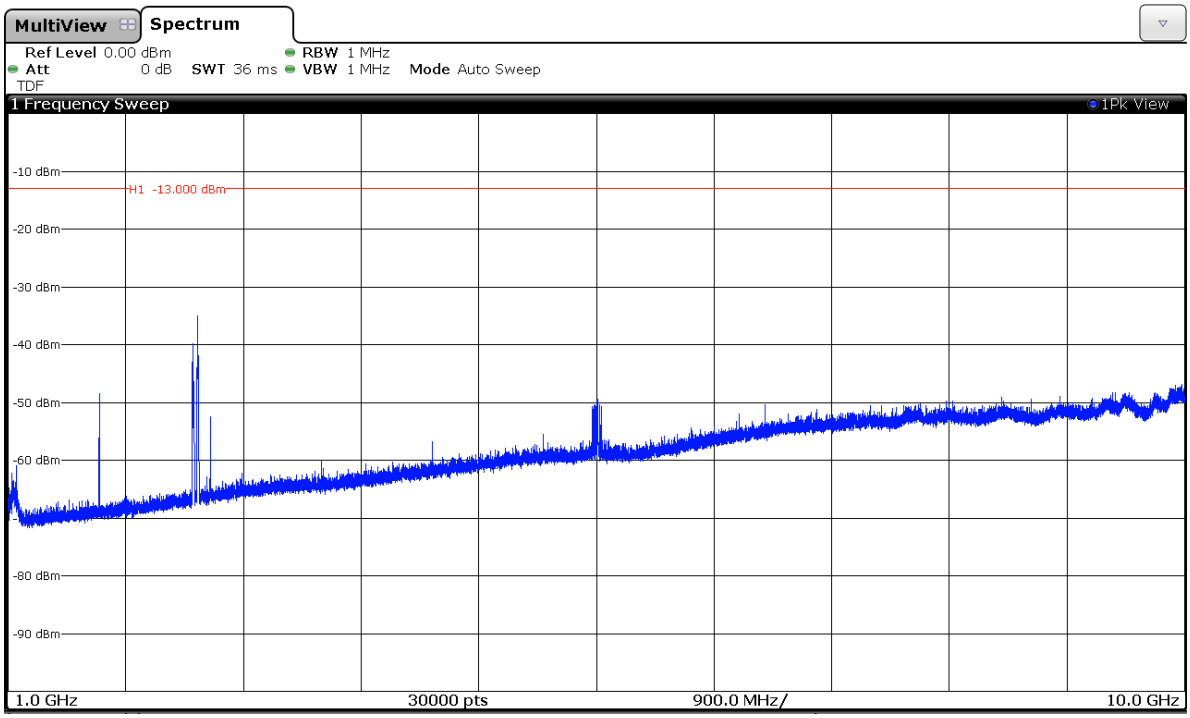
CHANNEL: LOWEST



CHANNEL: MIDDLE

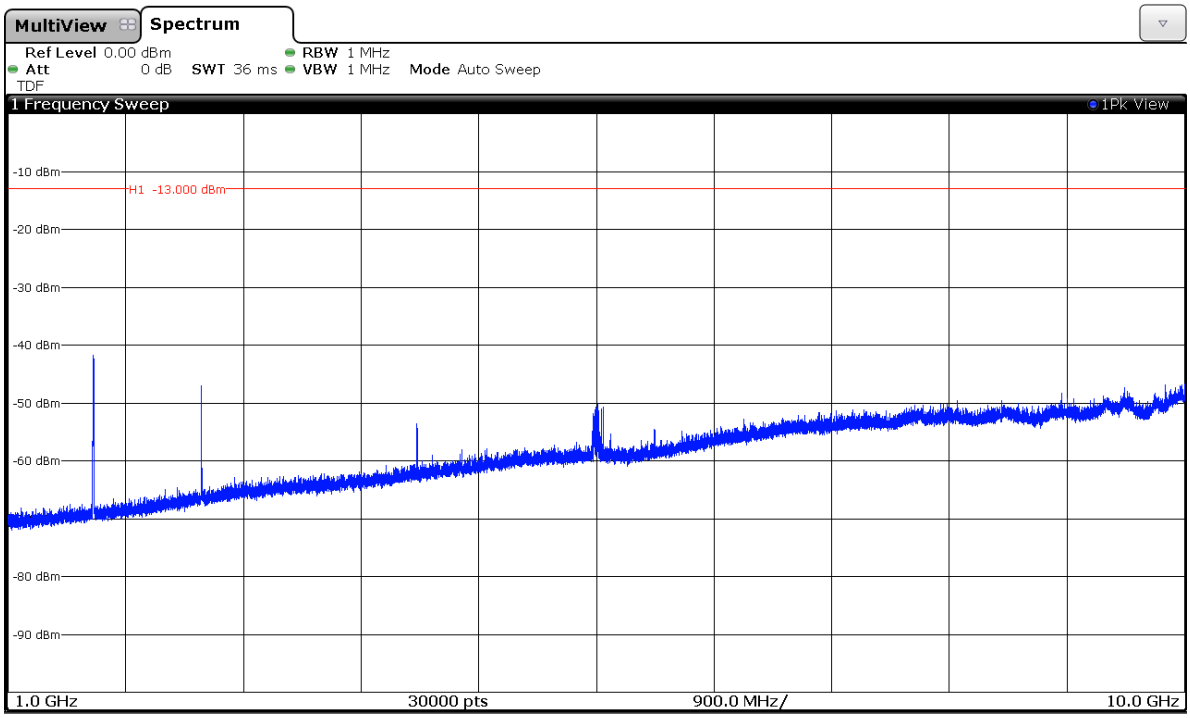


CHANNEL: HIGHEST

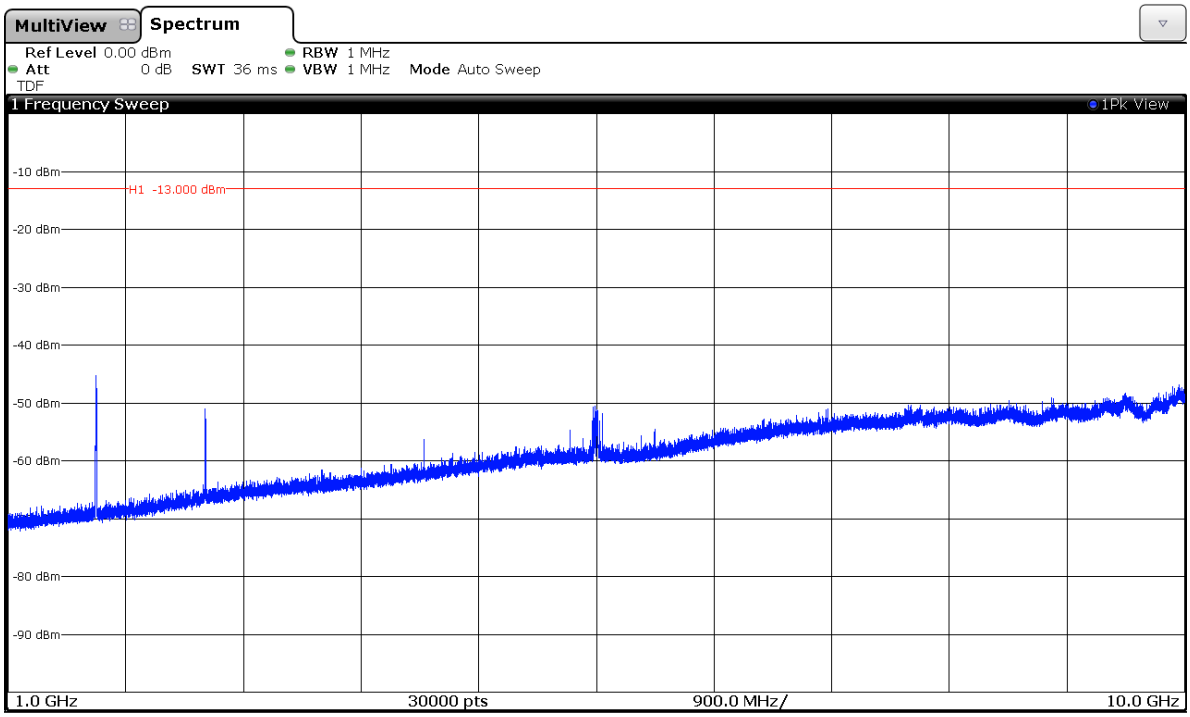


WCDMA MODULATION

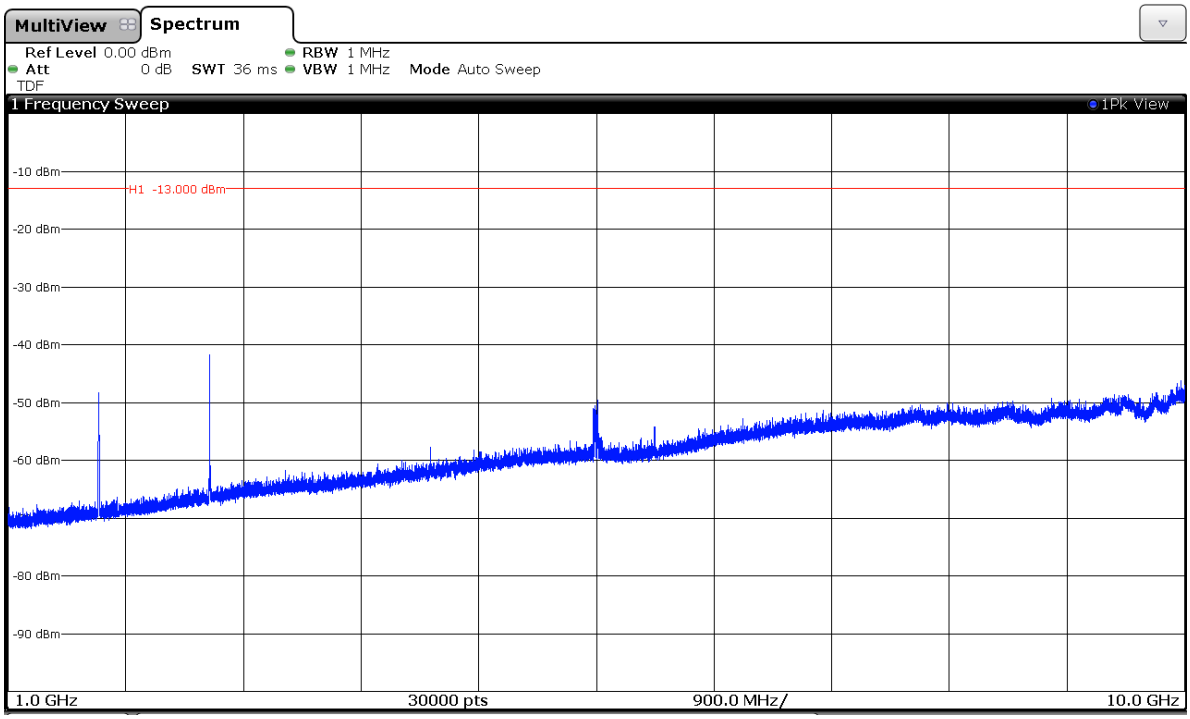
CHANNEL: LOWEST



CHANNEL: MIDDLE



CHANNEL: HIGHEST



Appendix B – Test result for FCC Part 24/IC RSS-133

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TEST RESULTS FOR FCC PART 24 AND IC RSS-133

TEST CONDITIONS

Power supply (V):

V_{nom} = 120 Vac

V_{max} = N/A

V_{min} = N/A

The subscripts nom, min and max indicate voltage test conditions (nominal, minimum and maximum respectively, as declared by the applicant).

N/A: Not Applicable.

Type of power supply = AC voltage from external power supply: AC/AC adapter (120VAC/16.5VAC).

Type of antenna = external whip antenna.

TEST FREQUENCIES:

GPRS AND EDGE MODULATION

Lowest channel (512): 1850.2 MHz

Middle channel (662): 1880.2 MHz

Highest channel (810): 1909.8 MHz

WCDMA AND HSUPA MODULATION

Lowest channel (9262): 1852.4 MHz

Middle channel (9400): 1880.0 MHz

Highest channel (9538): 1907.6 MHz

Radiated emissions

SPECIFICATION

FCC § 24.238

RSS-133. Clause 6.5.

METHOD

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency generated within the equipment.
The EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter distance from the measuring antenna for measurements below 1 GHz and at 1 m distance for measurements above 1 GHz.
Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded. The radiated emissions were measured with peak detector and 1 MHz bandwidth.

Each detected emission at less than 20 dB below the limit is substituted by the Substitution method, in accordance with the ANSI/TIA/EIA-603-D.

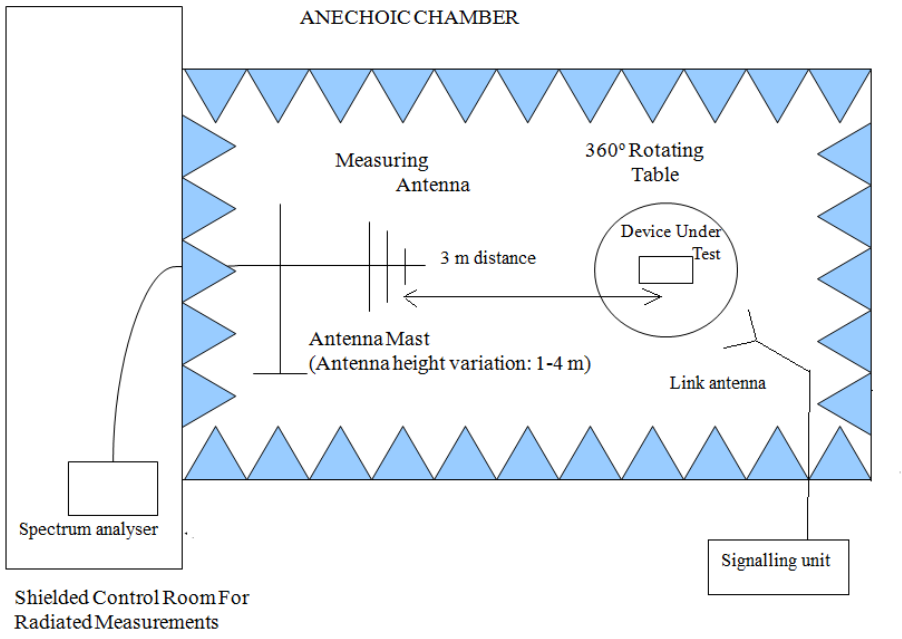
Measurement Limit**:**

According to specification. the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.
At Po transmitting power. the specified minimum attenuation becomes 43+10log (Po) and the level in dBm relative Po becomes:

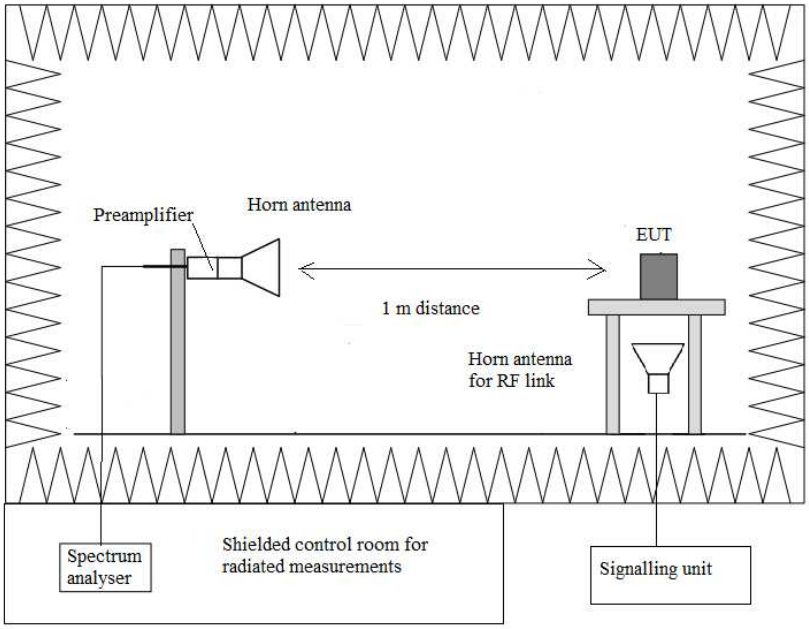
Po (dBm) – [43 + 10 log (Po in mwatts) - 30] = - 13 dBm

TEST SETUP

Radiated measurements below 1 GHz.



Radiated measurements above 1 GHz.



RESULTS

GPRS AND EDGE MODULATION

A preliminary scan determined the GPRS modulation as the worst case. The following plots show the results for GPRS modulation.

1. CHANNEL: LOWEST

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

2. CHANNEL: MIDDLE

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

3. CHANNEL: HIGHEST

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

WCDMA AND HSUPA MODULATION

A preliminary scan determined the WCDMA modulation as the worst case. The following tables and plots show the results for WCDMA modulation.

1. CHANNEL: LOWEST

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

2. CHANNEL: MIDDLE

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

3. CHANNEL: HIGHEST

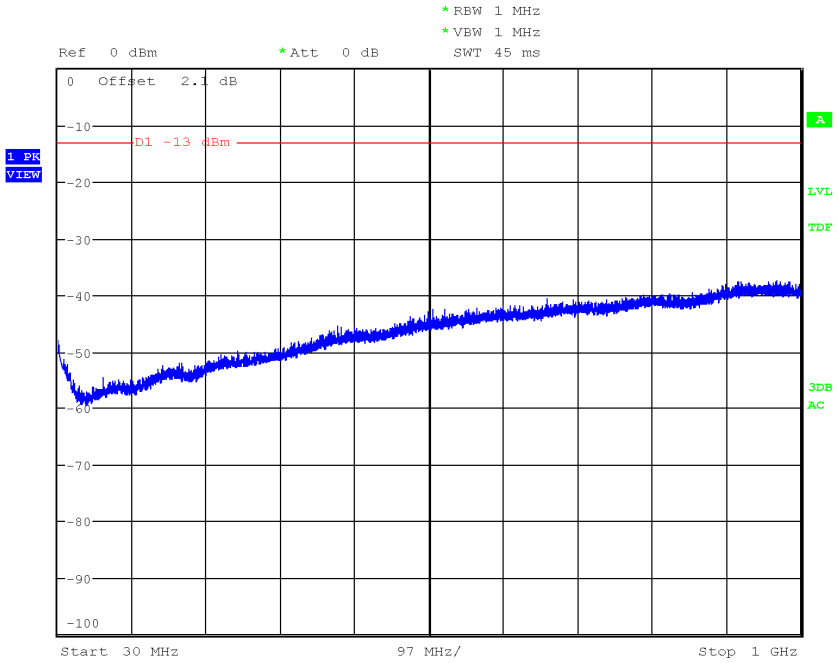
Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

Verdict: PASS

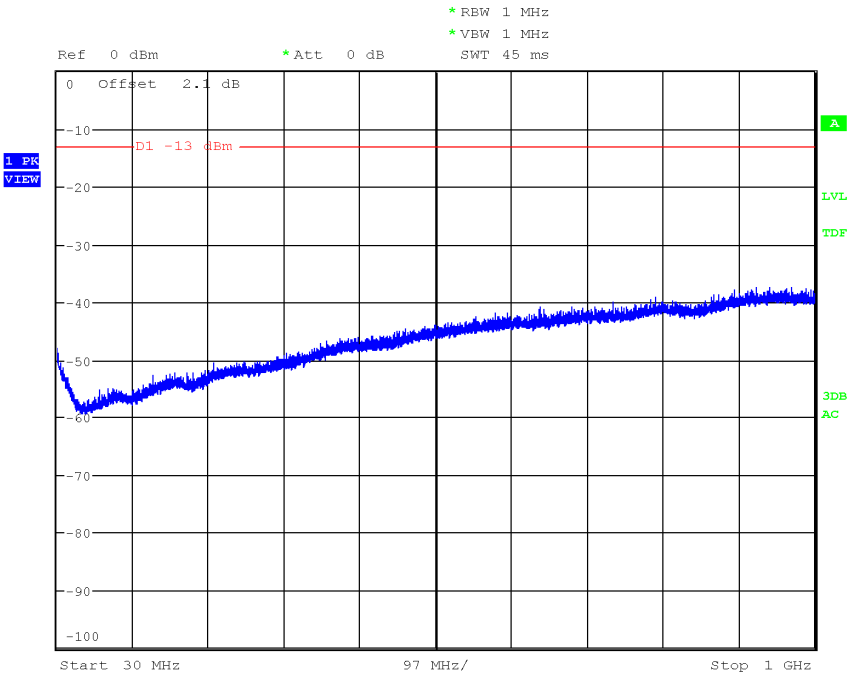
FREQUENCY RANGE 30 MHz-1000 MHz.

GPRS MODULATION



(This plot is valid for all three channels)

WCDMA MODULATION

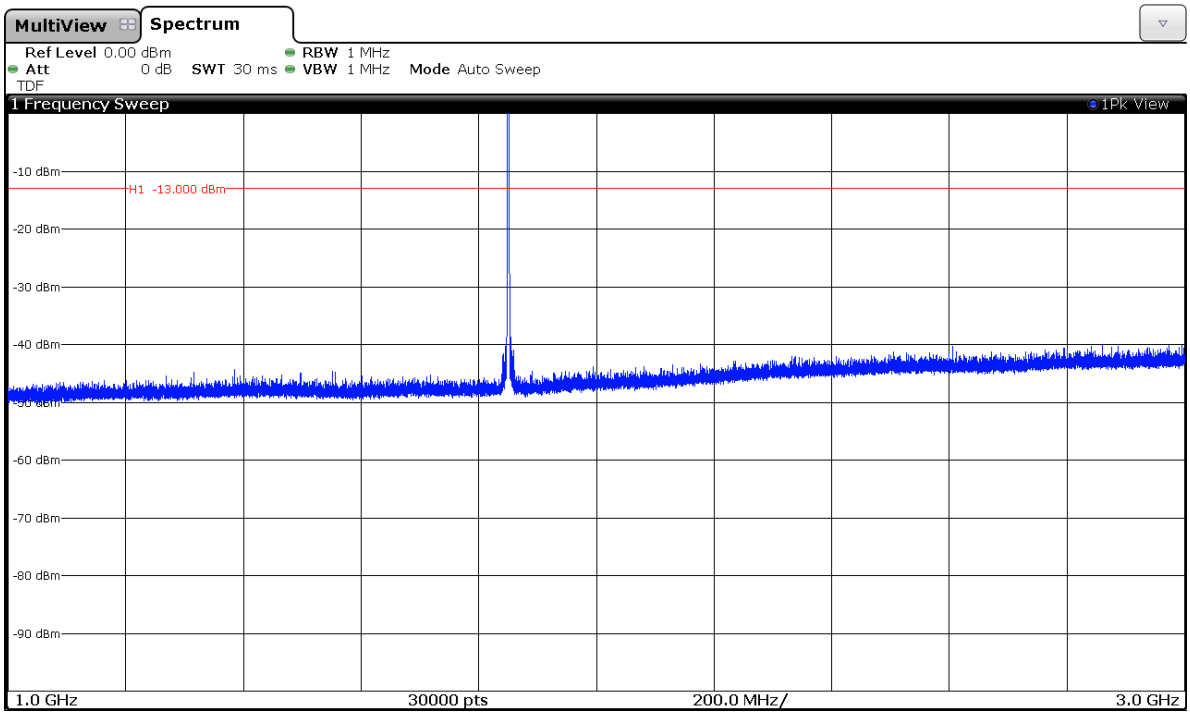


(This plot is valid for all three channels)

FREQUENCY RANGE 1 GHz to 3 GHz.

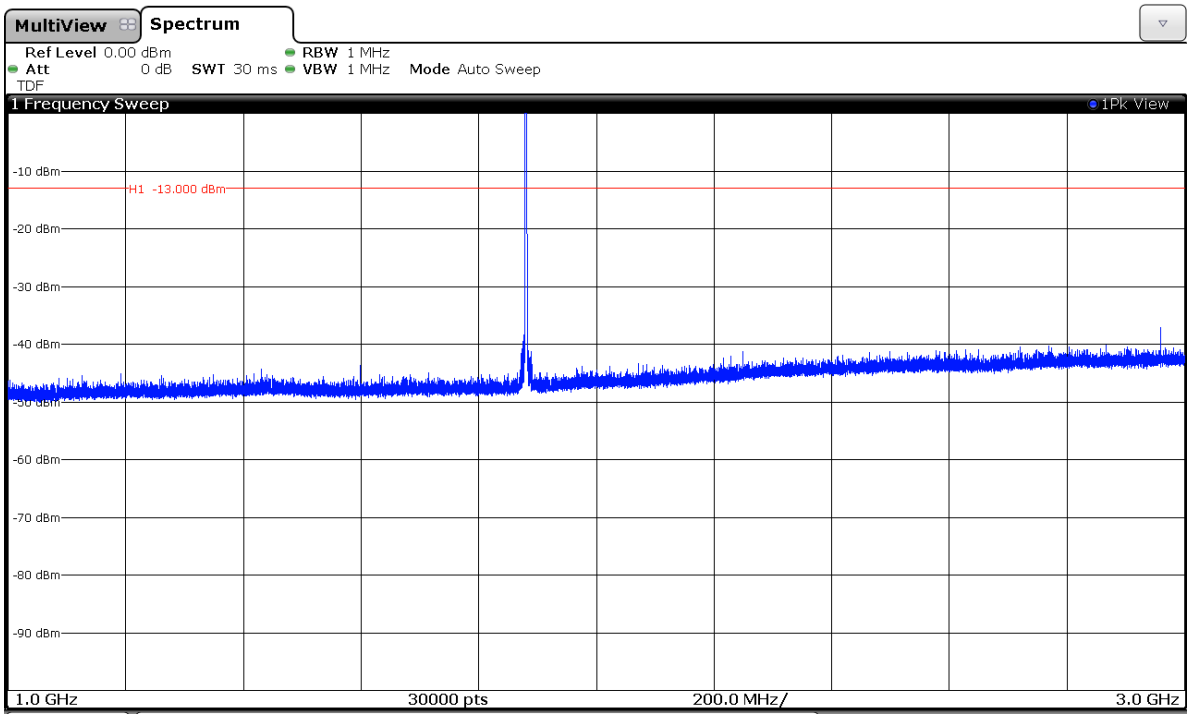
GPRS MODULATION

CHANNEL: LOWEST



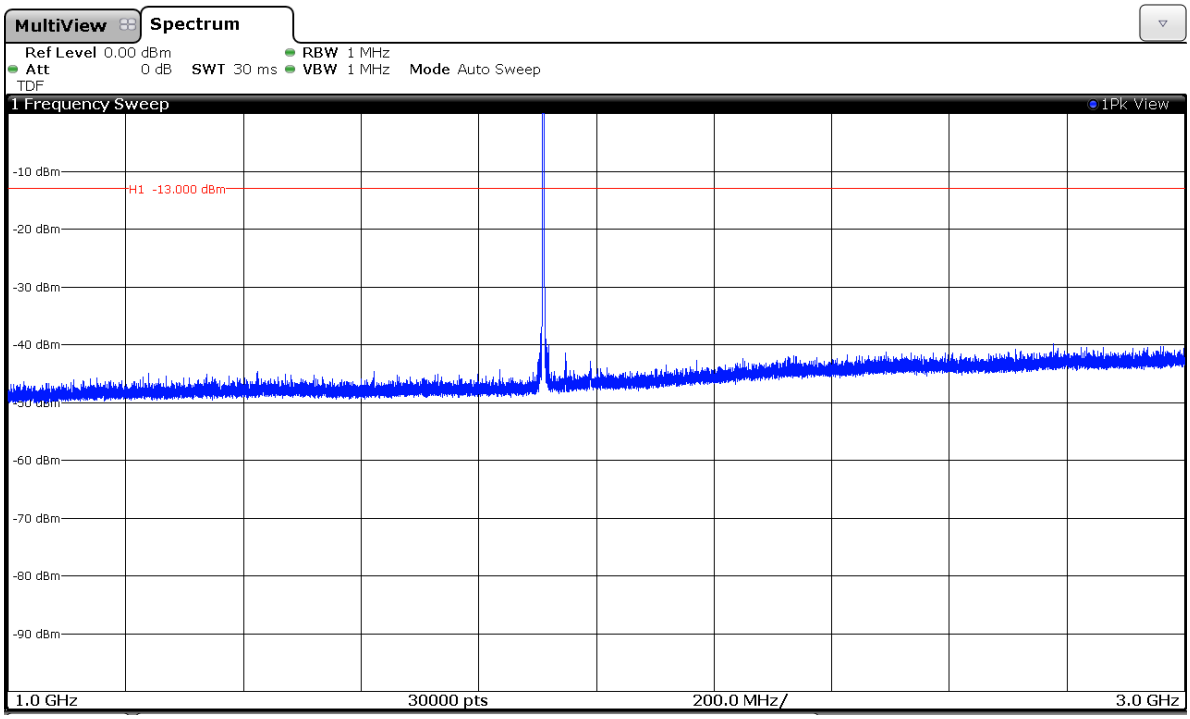
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

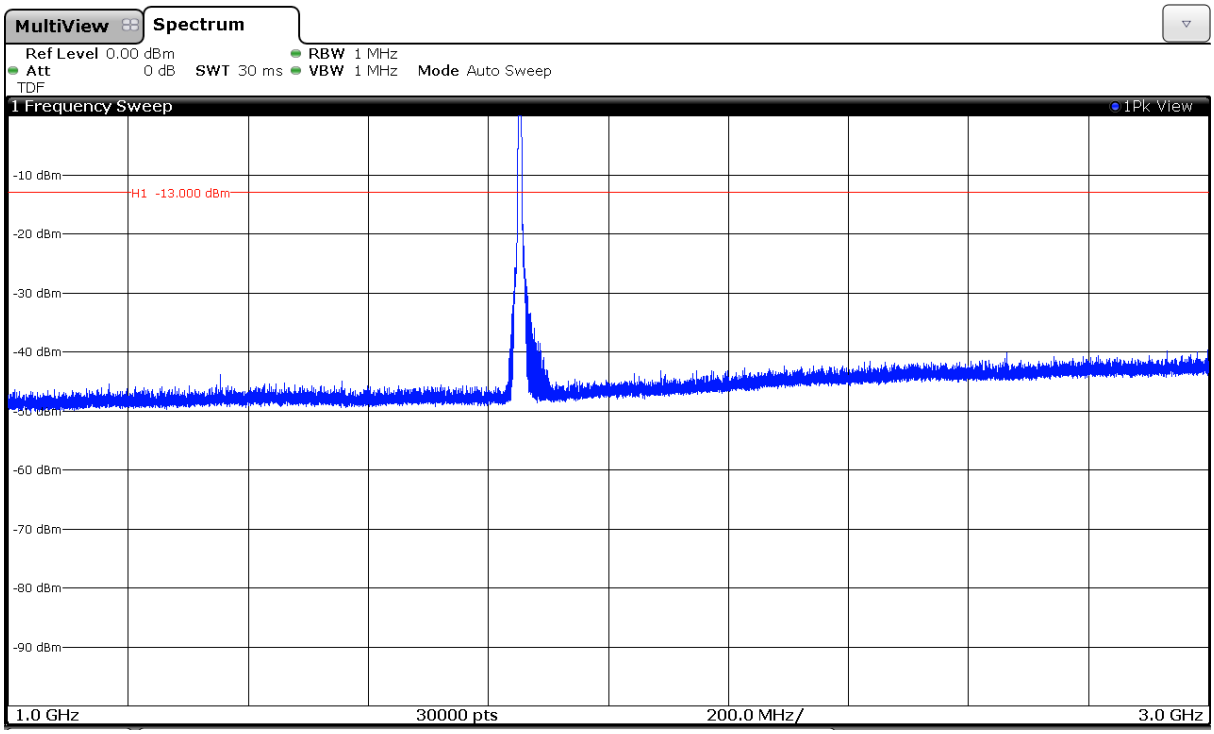
CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

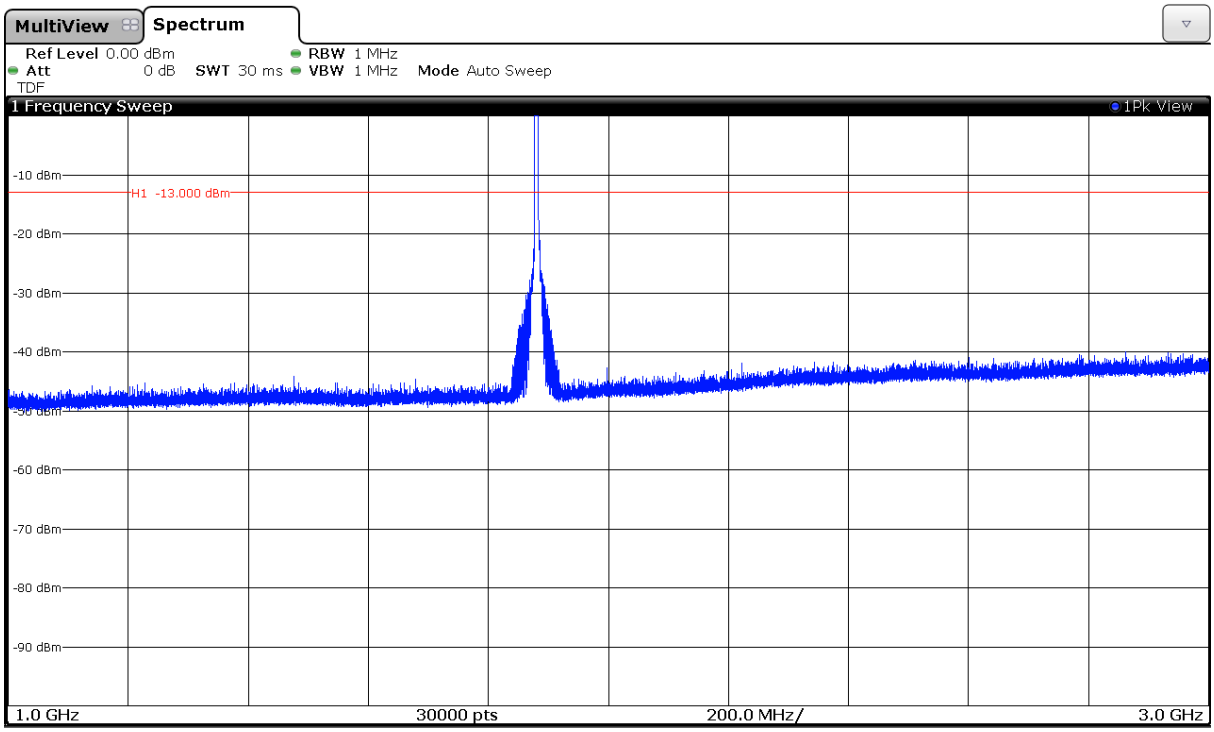
WCDMA MODULATION

CHANNEL: LOWEST



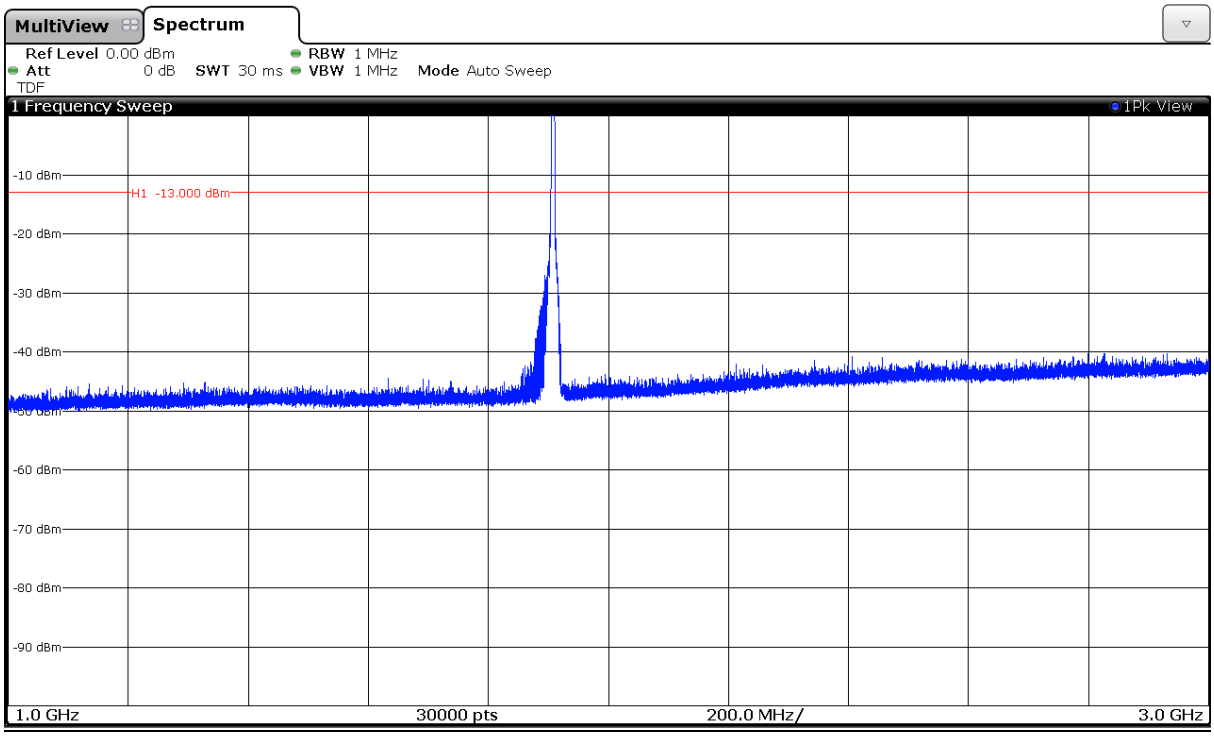
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST

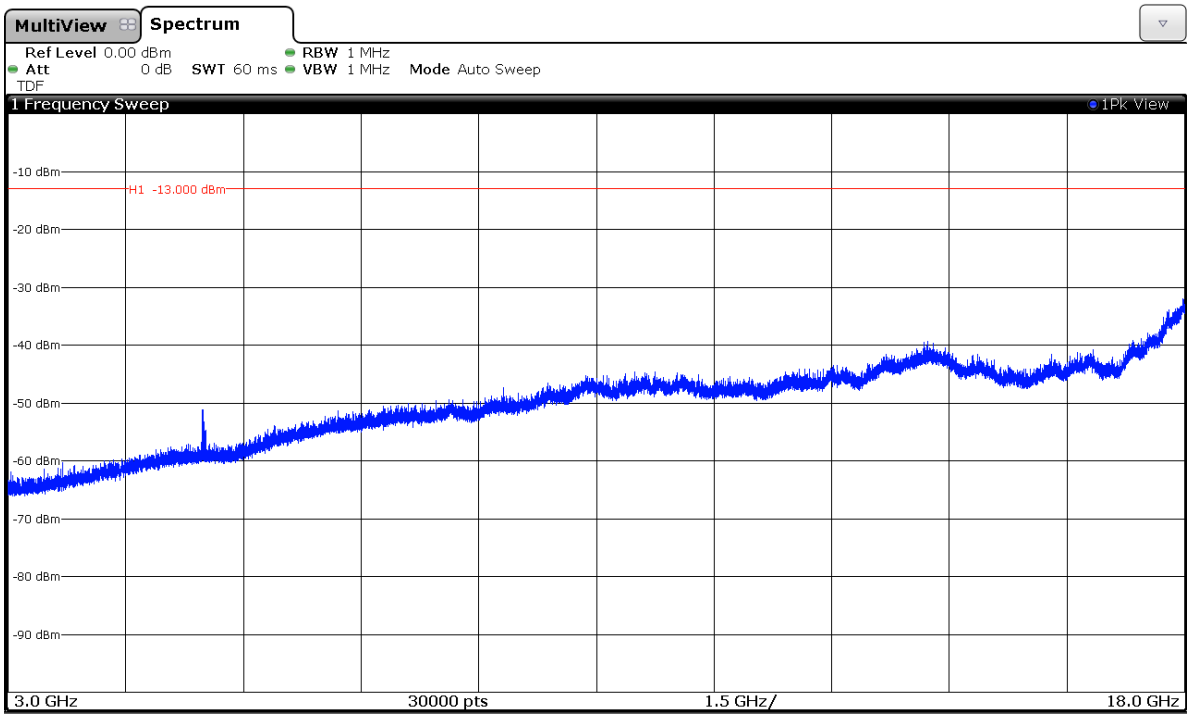


Note: The peak above the limit is the carrier frequency.

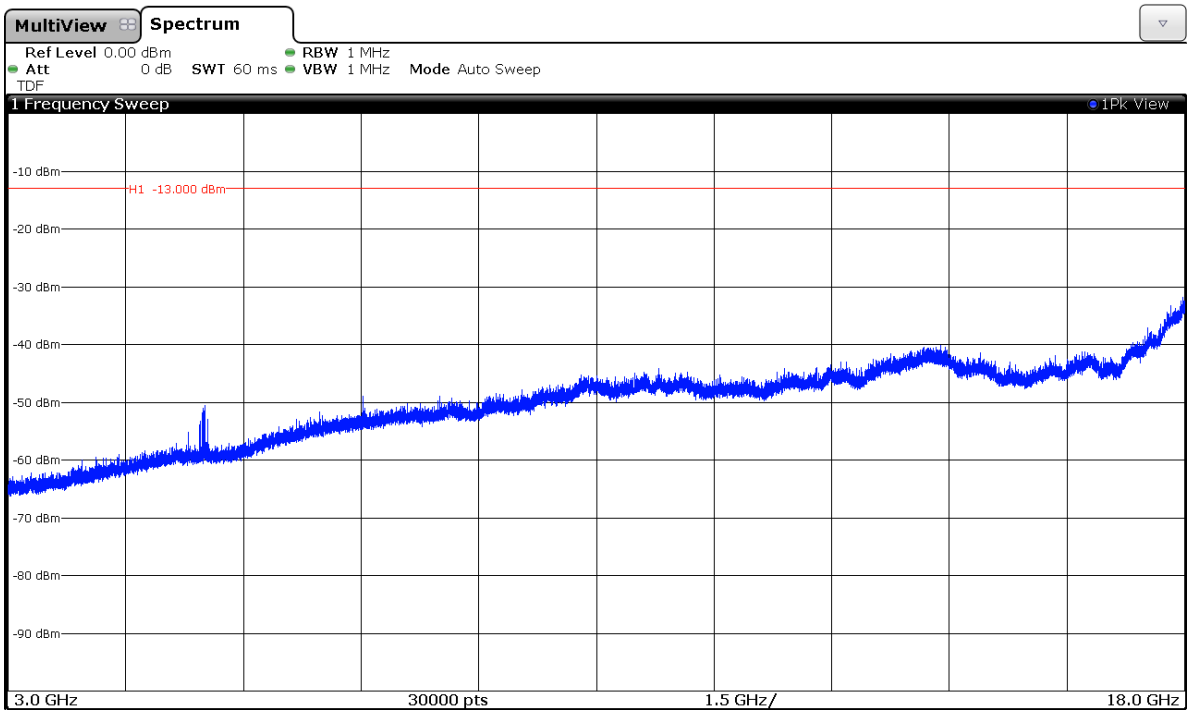
FREQUENCY RANGE 3 GHz to 18 GHz.

GPRS MODULATION

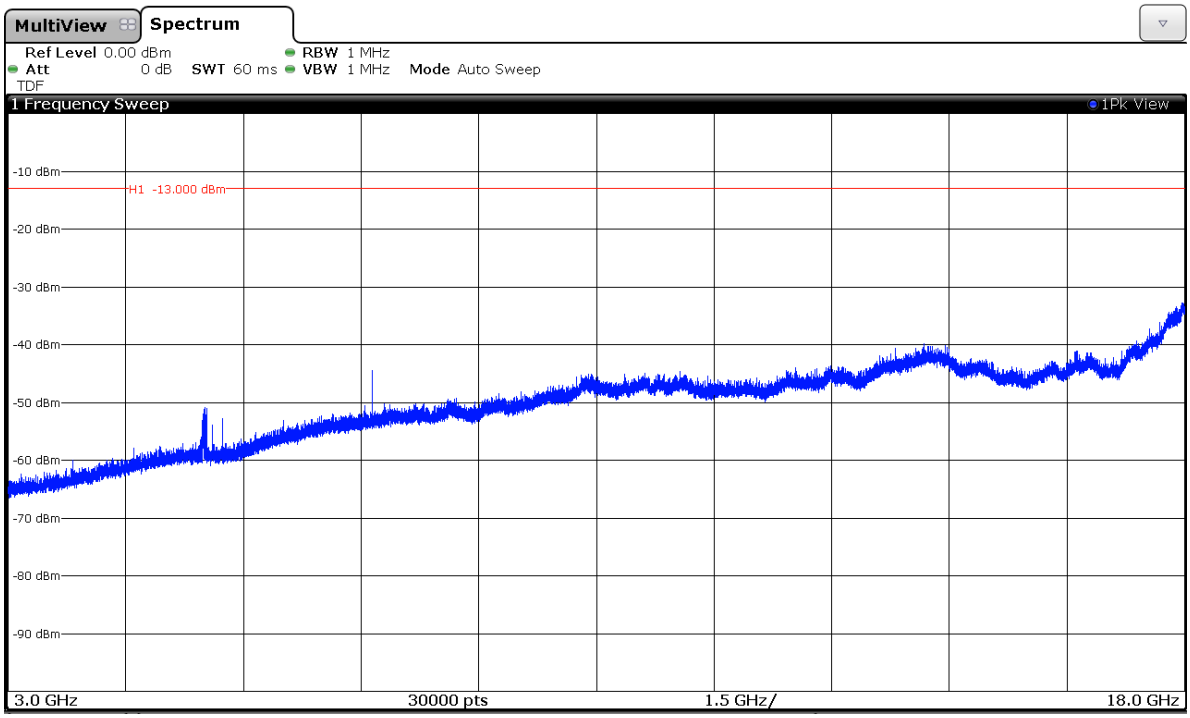
CHANNEL: LOWEST



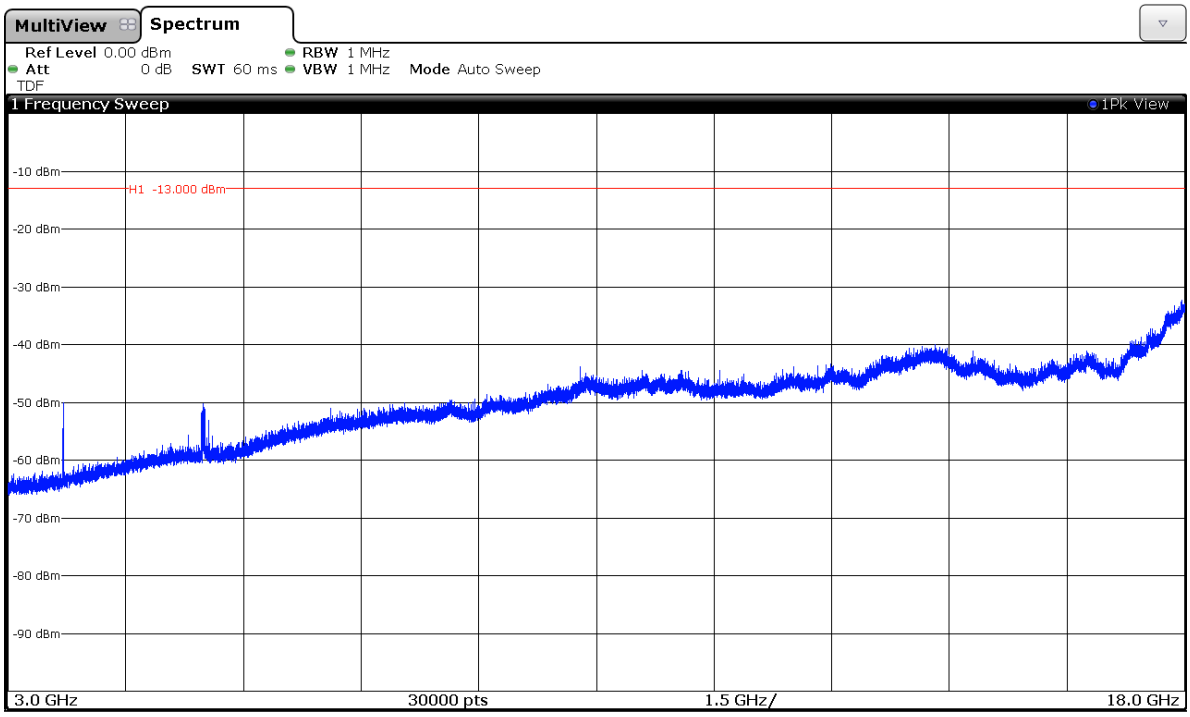
CHANNEL: MIDDLE



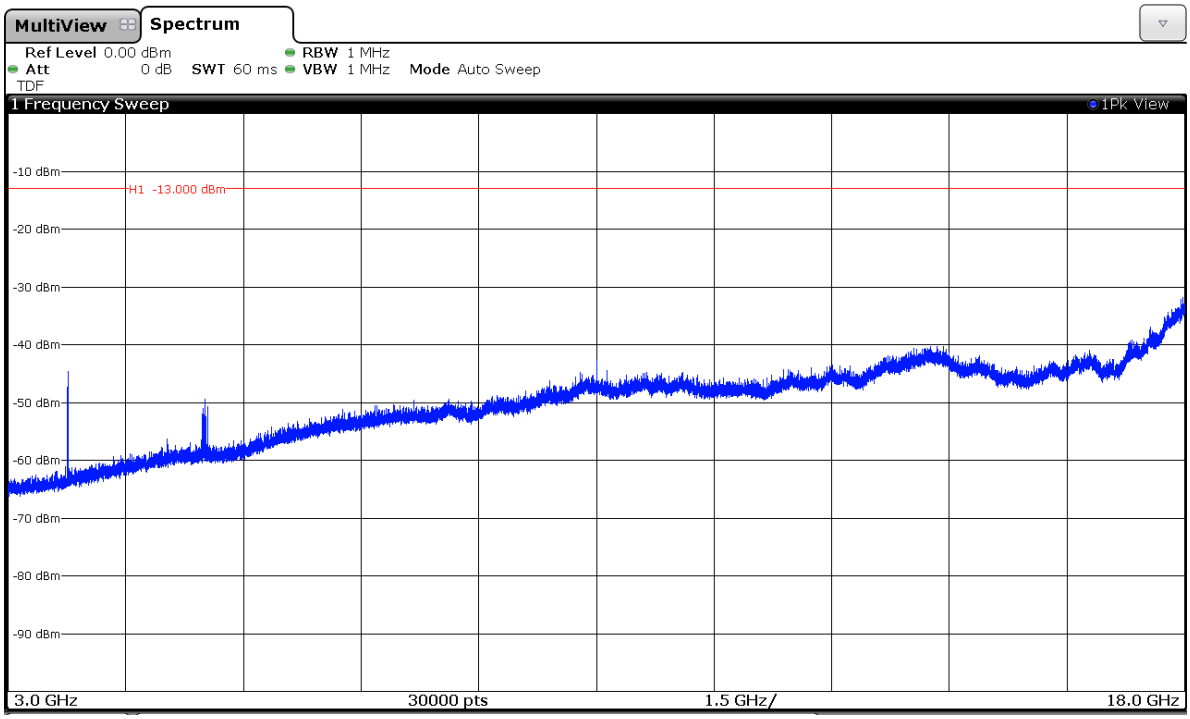
CHANNEL: HIGHEST



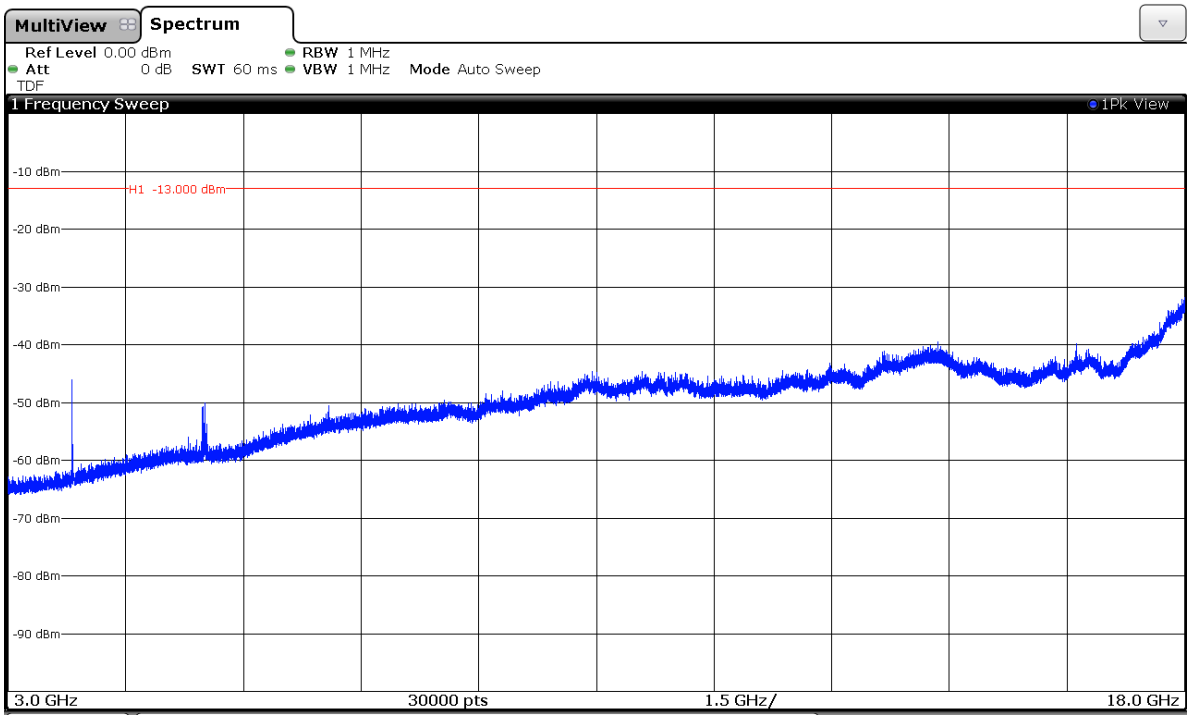
WCDMA MODULATION
CHANNEL: LOWEST



CHANNEL: MIDDLE

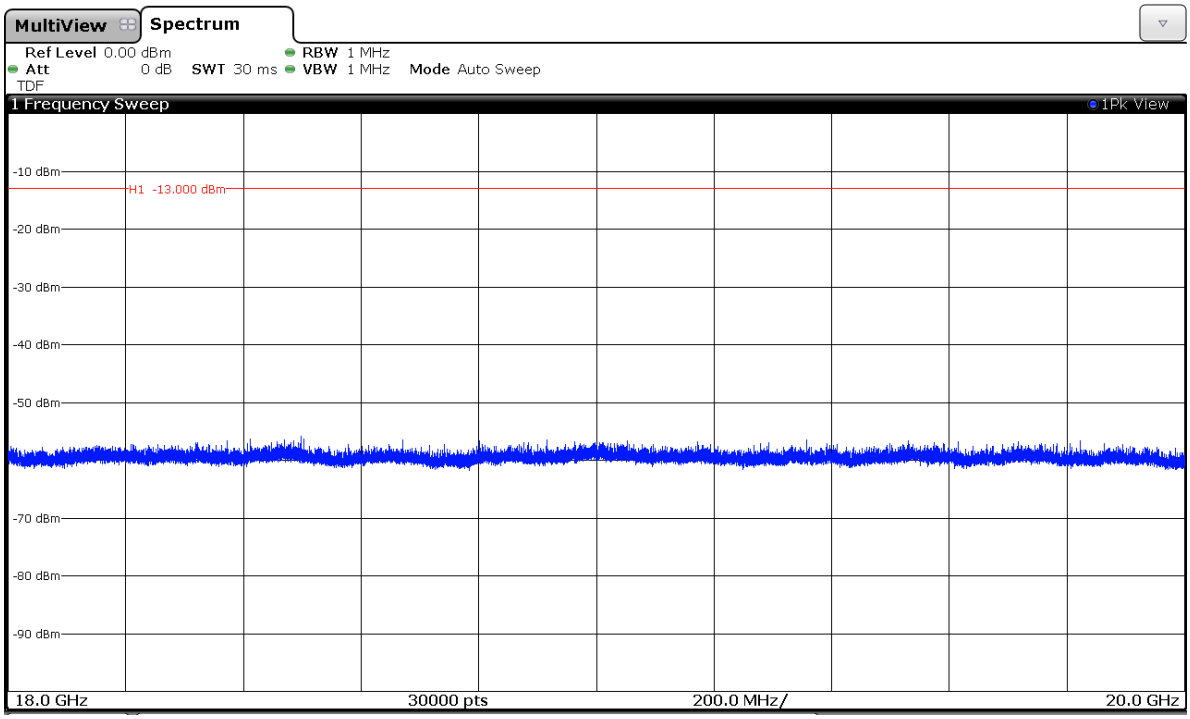


CHANNEL: HIGHEST



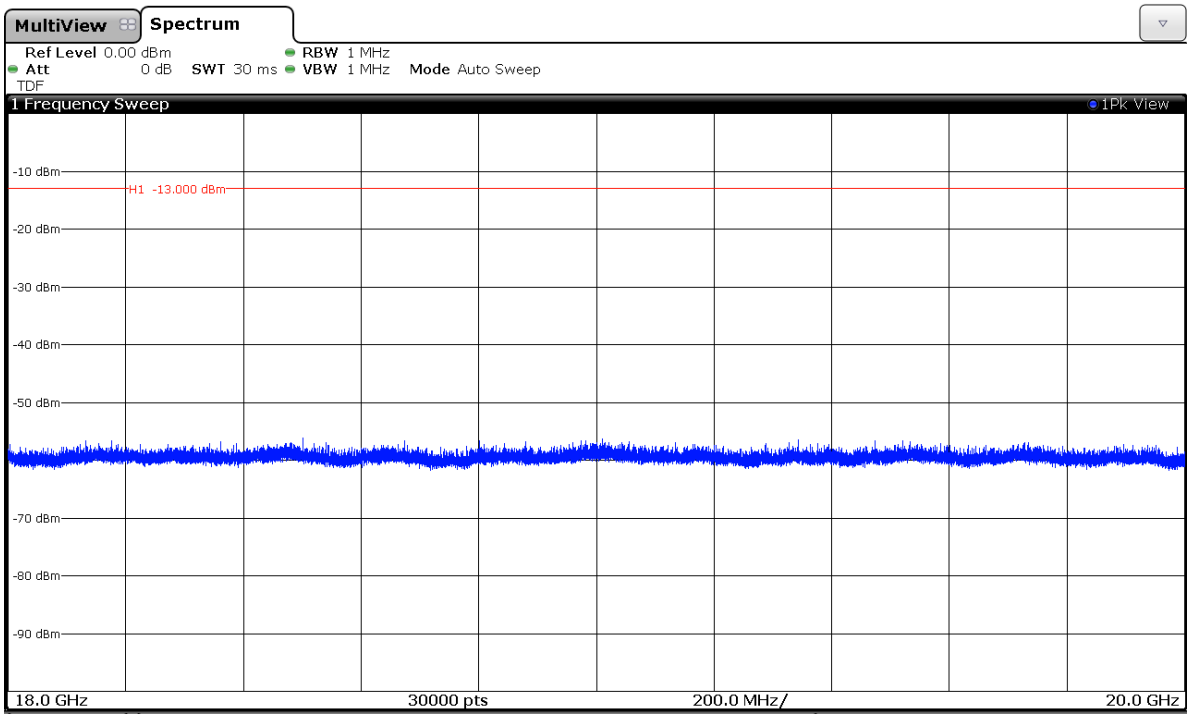
FREQUENCY RANGE 18 GHz TO 20 GHz.

GPRS MODULATION



(This plot is valid for all three channels)

WCDMA MODULATION



(This plot is valid for all three channels)