FCC LISTED, REGISTRATION NUMBER: 905266 **IC LISTED REGISTRATION NUMBER IC 4621A-1**	**AT4 wireless, S.A.** Parque Tecnológico de Andalucía, c/ Severo Ochoa nº 2 29590 Campanillas/ Málaga/ España Tel. 952 61 91 00 - Fax 952 61 91 13 MÁLAGA, C.I.F. A29 507 456 Registro Mercantil de Málaga,Tomo 1169, Libro 82, Folio 133, Hoja MA3729

TEST REPORT

REFERENCE STANDARD:

USA FCC Part 22, Part 24 & Part 27

CANADA IC RSS-132, RSS-133, RSS-139

NIE ..... :	33812RRF.001
Approved by (name / position & signature) ..... :	A. Llamas / RF Lab. manager
Elaboration date ..... :	2012-01-16

Alejandro Llamas Rodríguez
Firmado digitalmente por Alejandro Llamas Rodríguez
Fecha: 2012.01.16 15:19:44 +01'00'

Identification of item tested ..... :	2G/3.5G module
Brand name ..... :	TELIT
Model and/or type reference ..... :	UC864-AWS-AUTO
Other identification of the product ..... :	Commercial name: UC864-AWS-AUTO Final HW version: 1.01 Final SW version: 08.02.540-B002 (SVN=02) FCC ID: RI7UC864AWA IC ID: 5131A-UC864AWA
IMEI TAC ..... :	35212704
Features ..... :	WCDMA/HSDPA FDD IV and GSM/GPRS/EDGE 850/900/1800/1900
Description ..... :	HSDPA single band module

Applicant ..... :	Telit Communications S.p.A.
Address..... :	Via Stazione di Prosecco, 5/B 34010 Sgonico [TS] Italy
CIF/NIF/Passport..... :	N/A
Contact person:..... :	Andrea Fragiacomo
Telephone / Fax ..... :	+39 040 4192 362
e-mail: ..... :	Andrea.fragiacomo@telit.com

Test samples supplier ..... :	Same as applicant

Manufacturer ..... :	Same as applicant

Test method requested .....:	See Standard
Standard .....:	USA FCC Part 22 10-1-09 Edition / CANADA IC RSS-132 Issue 2, Sep. 2005: -Clause 22.913/RSS-132 Clause 4.4: RF output power (Radiated). -Clause 22.917/RSS-132 Clause 4.5: Radiated emissions. USA FCC Part 24 10-1-09 Edition /CANADA IC RSS-133 Issue 5, Feb. 2009: -Clause 24.232/RSS-133 Clause 6.4: RF output power (Radiated). -Clause 24.238/RSS-133 Clause 6.5: Radiated emissions. USA FCC part 27 10-01-09 Edition / CANADA IC RSS-139 Issue 2, Feb. 2009: -Clause 27.50/RSS-139 Clause 6.4.: RF output power (Radiated). -Clause 27.53/RSS-139 Clause 6.5.: Radiated emissions.
Test procedure .....:	PERF000
Non-standardized test method .....:	N/A
Used instrumentation .....:	

		Last Cal.	Cal. due date
1.	Semianechoic Absorber Lined Chamber IR 11. BS	N.A.	N.A.
2.	Control Chamber IR 12.BC	N.A.	N.A.
3.	Hybrid Bilog antenna Sunol Sciences Corporation JB6	2011-05	2014-05
4.	Antenna mast EM 1072 NMT	N.A.	N.A.
5.	Rotating table EM 1084-4. ON	N.A.	N.A.
6.	Double-ridge Guide Horn antenna 1-18 GHz HP 11966E	2011-05	2014-05
7.	Double-ridge Guide Horn antenna 18-40 GHz Agilent 119665J	2008-09	2011-09
8.	EMI Test Receiver R&S ESIB26	2009-09	2011-09
9.	Universal Radio communication Tester R&S CMU200	2011-05	2013-05
10.	Multi Device Controller EMCO 2090	N.A.	N.A.
11.	Spectrum Analyzer Agilent E4440A	2010-02	2012-02
12.	Power amplifier AMF-4D-00400600-50-30P	2011-04	2013-04
13.	Log-Periodic antenna R&S HL 040	2009-10	2012-10
14.	RF generator Agilent ESG E4438C	2010-09	2012-09
15.	RF pre-amplifier Miteq AFS5-04001300-15-10P-6.	2010-07	2012-07
16.	RF pre-amplifier Schaffner CPA 9231A.	2011-06	2013-06
17.	RF pre-amplifier Miteq JS4-12002600-30-5A.	2010-07	2012-07

Report template No. .....: FDT08_12

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Competences and guarantees

AT4 wireless, S.A. 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: 905266.

AT4 wireless, S.A. 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 programme 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.

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 M/01 is composed of the following elements

Control No.	Description	Model	Serial No.	Date of reception
33812/26	HSDPA module	UC864-AWS-AUTO	IMEI: 352127040156171	07/09/2011
33812/13	Test board	---	---	30/08/2011
33812/02	Antenna	---	---	30/08/2011

1. Sample M/01 has undergone the test(s) specified in subclause “Test method requested”.

Testing period

The performed test started on 2011-09-21 and finished on. 2011-09-22.

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. = 21.3 ºC Max. = 22.4 ºC
Relative humidity	Min. = 40.5 % Max. = 41.7 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

In the semianechoic chamber (21 meters x 11 meters x 8 meters), the following limits were not exceeded during the test.

Temperature	Min. = 22.2 ºC Max. = 23.1 ºC
Relative humidity	Min. = 45.0 % Max. = 47.0 %
Air pressure	Min. = 1020 mbar Max. = 1020 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 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).

Summary

Considering the results of the performed test according to standards USA FCC Part 22, Part 24 and Part 27 and Canada IC RSS-132, RSS-133 and RSS-139, the item under test is **IN COMPLIANCE** with the requested specifications specified in the standard.

NOTE: The results presented in this Test Report apply only to the particular item under test established in page 1 of this document, as presented for test on the date(s) shown in section, "USAGE OF SAMPLES, TESTING PERIOD AND ENVIRONMENTAL CONDITIONS".

Remarks and comments

1. Test not requested.

2. GSM mode has not been tested to prove USA FCC Part 22 and Part 24 and Canada IC RSS-132 and RSS-133 compliance because the modulation scheme and the power maximum levels are the same as for GPRS mode.

Taking into account the above comments, testing in GSM mode is redundant for FCC Parts 22 and Part 24 and IC RSS-132 and RSS-133 as it is the same as GPRS mode. GPRS mode has been tested as indicated on the present test report.

3. HSDPA modulation mode has not been tested to prove USA FCC Part 27 and Canada IC RSS-139 compliance because it is an improved mode of operation only for Downlink (UE reception), but using the normal WCDMA mode for UL (Up Link, UE transmission). Therefore HSDPA has no associated a Power class or modulation scheme different than WCDMA mode for the UL transmission.

Taking into account the above comments, testing in HSDPA modulation mode is redundant for FCC Part 27 and IC RSS-139 as it is the same as WCDMA mode as long as UE transmission is concerned. WCDMA modulation mode has been tested as indicated on the present test report.

Testing verdicts

Not applicable ..... : NA

Pass..... : P

Fail ..... : F

Not measured..... : NM

FCC PART 22/IC RSS-132 PARAGRAPH	VERDICT			
	NA	P	F	NM
Clause 22.913/RSS-132 Clause 4.4: RF output power (Radiated)		P		
Clause 2.1047/RSS-132 Clause 4.2: Modulation characteristics				NM[1]
Clause 22.355/RSS-132 Clause 4.3: Frequency stability				NM[1]
Clause 2.1049: Occupied Bandwidth				NM[1]
Clause 22.917/RSS-132 Clause 4.5: Spurious emissions at antenna terminals				NM[1]
Clause 22.917/RSS-132 Clause 4.5: Radiated emissions		P		

1: See point "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 (Radiated)		P		
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 point “Remarks and comments.

FCC PART 27 /IC RSS-139 PARAGRAPH	VERDICT			
	NA	P	F	NM
Clause 27.50 / RSS-139 Clause 6.4: RF output power (Radiated)		P		
Clause 2.1047 / RSS-139 Clause 6.2: Modulation characteristics				NM[1]
Clause 27.54 / RSS-139 Clause 6.3: Frequency stability				NM[1]
Clause 2.1049: Occupied Bandwidth				NM[1]
Clause 27.53 / RSS-139 Clause 6.5: Spurious emissions at antenna terminals				NM[1]
Clause 27.53 / RSS-139 Clause 6.5: Radiated emissions		P		

1: See point “Remarks and comments.

APPENDIX A: Test results

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TEST CONDITIONS

Power supply (V):

V_{nom} = 3.8 Vdc

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 = DC Voltage from external power supply.

Type of antenna = external connectable antenna with sma type connector.

TEST FREQUENCIES:

GSM AND EDGE MODULATION

Lowest channel (128): 824.2 MHz

Middle channel (190): 836.6 MHz

Highest channel (251): 848.8 MHz

RF Output Power (E.R.P.)

SPECIFICATION

§2.1046 and 22.913.

The Effective Radiated Power (E.R.P.) of mobile transmitter and auxiliary test transmitter must not exceed 7 Watts (38.45 dBm).

METHOD

For radiated measurements the EUT was placed on a 1 m high non-conductive stand inside an anechoic chamber. The measuring antenna was placed at 3 m distance and the maximum field strength was measured for the three channels. The EUT was controlled via the Universal Radio Communication tester R&S CMU200 selecting maximum transmission power of the EUT and different modes of modulation.

The Effective Radiated Power (E.R.P.) is obtained by using the Substitution Method according to ANSI/TIA/EIA-603-C: 2004.

RESULTS

MAXIMUM EFFECTIVE RADIATED POWER E.R.P. (RADIATED).

GSM MODULATION

Substitution method data

Frequency (MHz) at max. reading	Max. Instrument reading (dBm)	Polarization	(1) RF Generator +power amplifier output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gd (respect to λ/2 dipole) (dB)	E.R.P. (dBm) = (1) – (2) + (3)
824.18998	-13.25	Vertical	24.25	0.3	6.3	30.25
836.63006	-13.68	Vertical	24.42	0.3	6.2	30.32
848.87014	-14.07	Vertical	24.03	0.3	6.1	29.83

RBW = VBW = 1 MHz

Channel	Lowest	Middle	Highest
Maximum peak power E.R.P. (dBm)	30.25	30.32	29.83
Maximum peak power (W)	1.06	1.08	0.96
Measurement uncertainty (dB)	± 4.12		

EDGE MODULATION

Substitution method data

Frequency (MHz) at max. reading	Max. Instrument reading (dBm)	Polarization	(1) RF Generator +power amplifier output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gd (respect to λ/2 dipole) (dB)	E.R.P. (dBm) = (1) – (2) + (3)
824.21002	-16.00	Vertical	21.50	0.3	6.3	27.50
836.65010	-17.68	Vertical	20.42	0.3	6.2	26.32
848.76994	-18.15	Vertical	19.95	0.3	6.1	25.75

RBW = VBW = 1 MHz

Channel	Lowest	Middle	Highest
Maximum peak power E.R.P. (dBm)	27.50	26.32	25.75
Maximum peak power (W)	0.56	0.43	0.38
Measurement uncertainty (dB)	± 4.12		

Verdict: PASS

Radiated emissions

SPECIFICATION

§ 22.917

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 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 emissions were substituted by the Substitution method, in accordance with the ANSI/TIA/EIA-603-C: 2004.

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

RESULTS

GSM 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.

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)
1648.383	-64.04	Horizontal	-37.04	1.90	6.40	-32.54
4121.200	-53.11	Vertical	-46.03	2.50	10.51	-38.02

Measurement uncertainty: ± 4.09 dB

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.

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)
1673.183	-64.17	Horizontal	-37.17	1.90	6.40	-32.67
4182.667	-51.43	Vertical	-44.35	2.50	10.51	-36.34

Measurement uncertainty: ± 4.09 dB

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.

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)
1697.717	-65.10	Horizontal	-38.10	1.90	6.40	-33.60
4243.934	-52.65	Vertical	-45.57	2.50	10.51	-37.56

Measurement uncertainty: ± 4.09 dB

EDGE 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.

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)
1648.475	-65.16	Horizontal	-38.16	1.90	6.40	-33.66

Measurement uncertainty: ± 4.09 dB

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.

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)
1673.205	-65.24	Horizontal	-38.24	1.90	6.40	-33.74

Measurement uncertainty: ± 4.09 dB

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.

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)
1697.683	-67.03	Horizontal	-40.03	1.90	6.40	-35.53

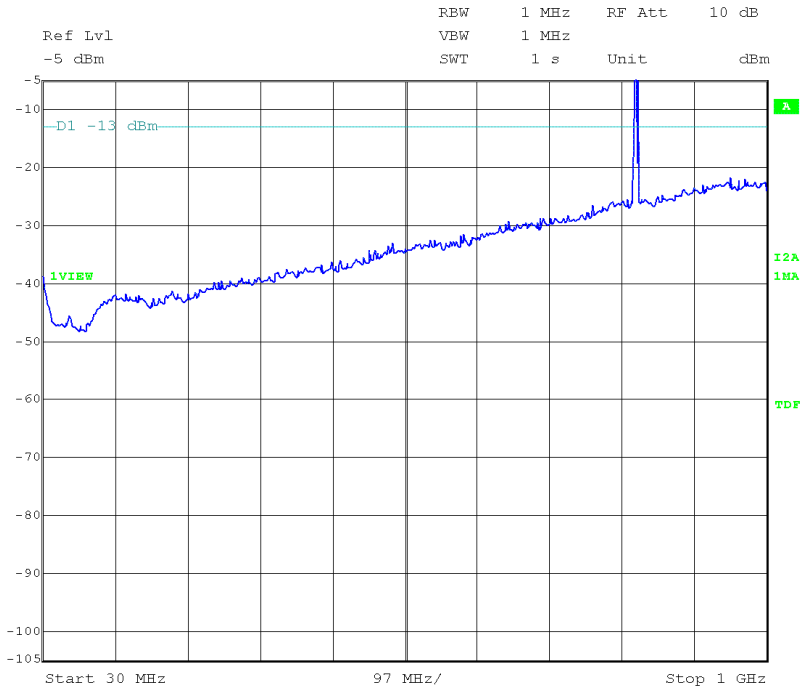
Measurement uncertainty: ± 4.09 dB

Verdict: PASS

FREQUENCY RANGE 30 MHz-1000 MHz.

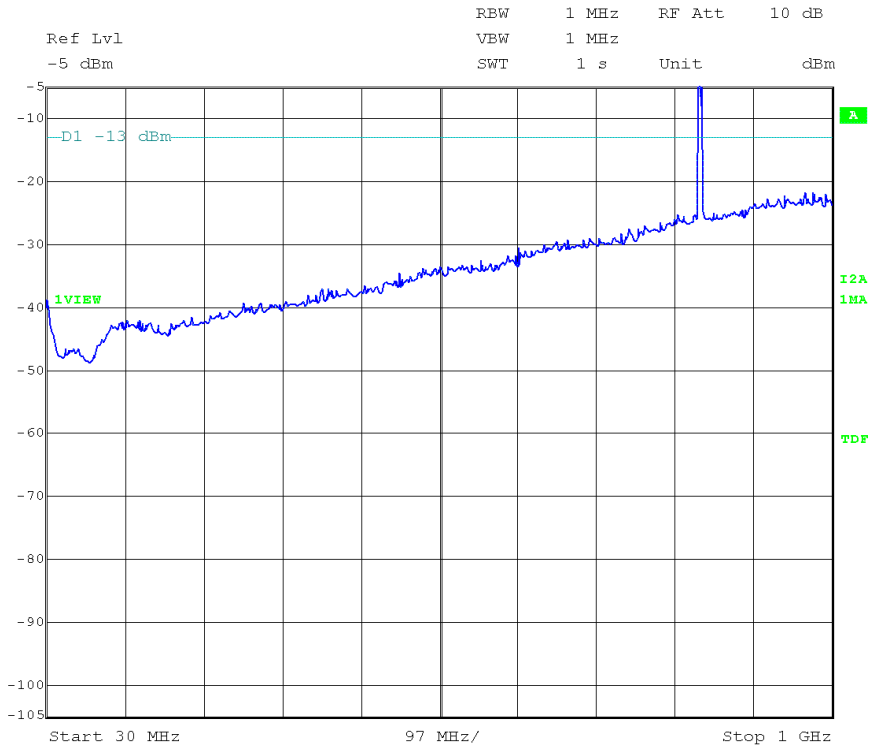
GSM MODULATION

CHANNEL: LOWEST



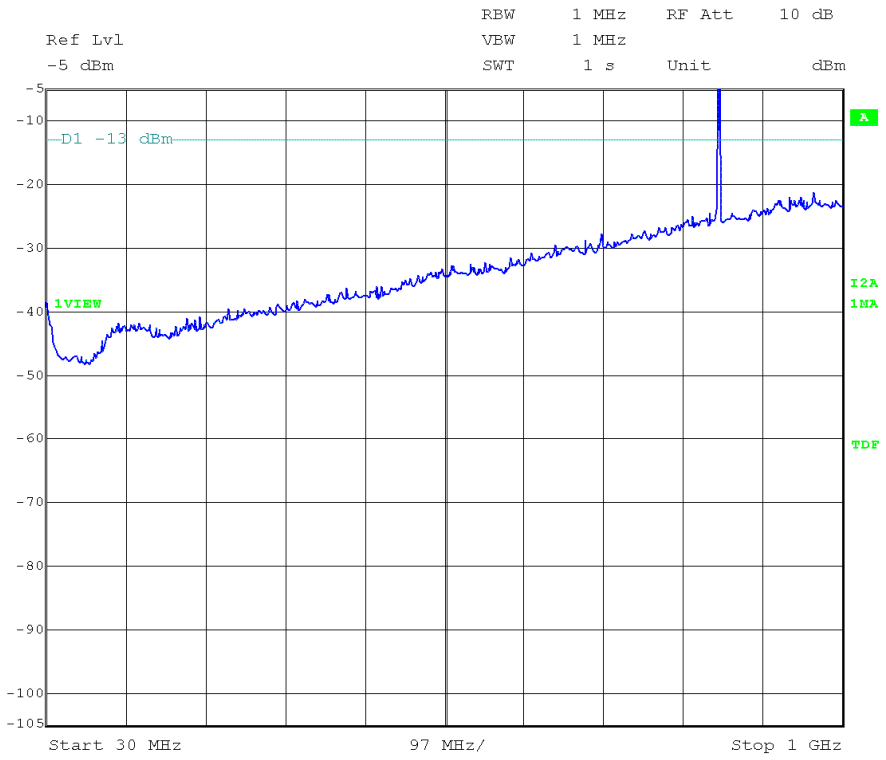
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



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

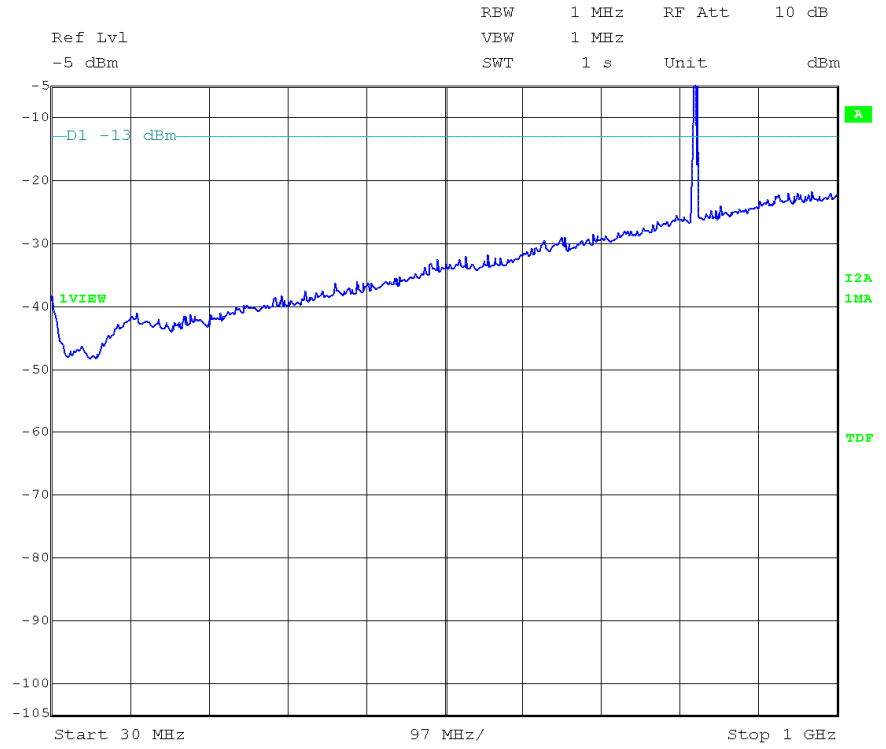
CHANNEL: HIGHEST



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

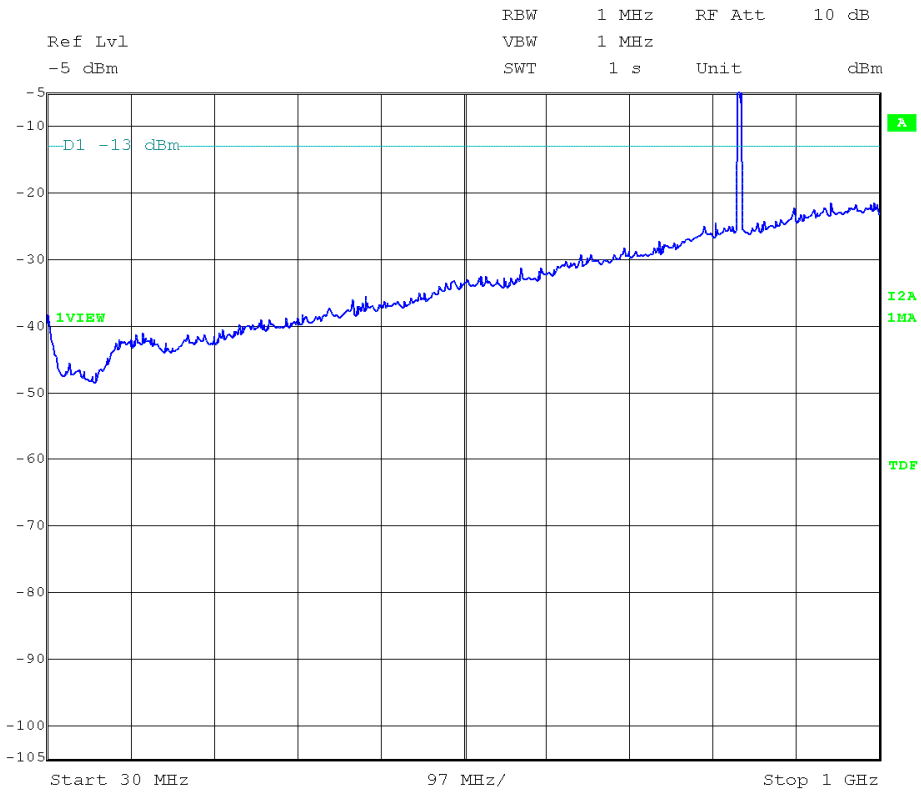
EDGE MODULATION

CHANNEL: LOWEST



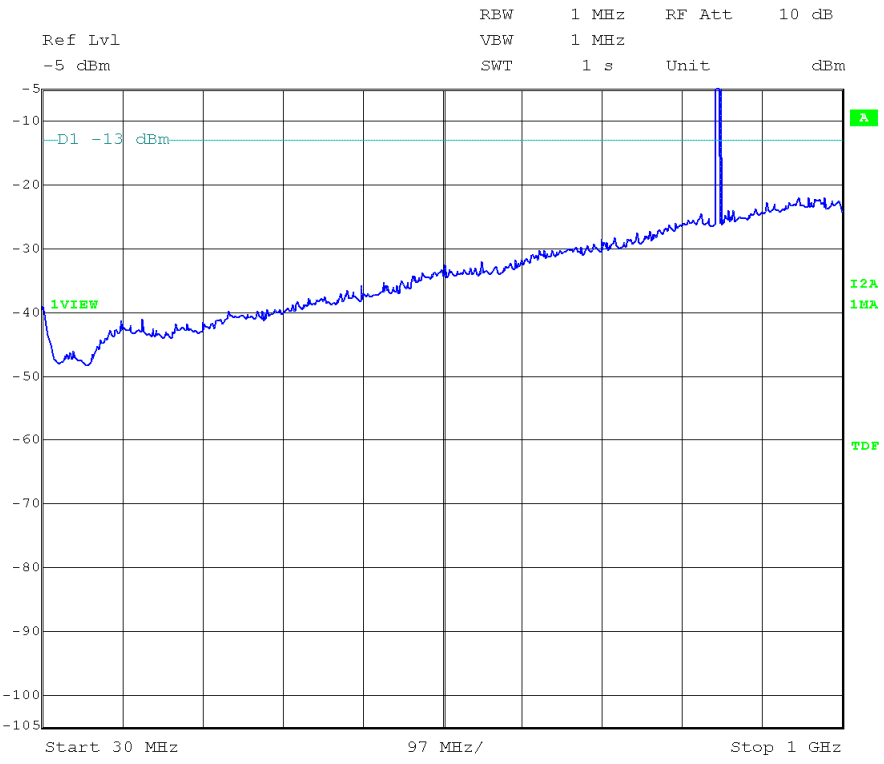
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



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

CHANNEL: HIGHEST

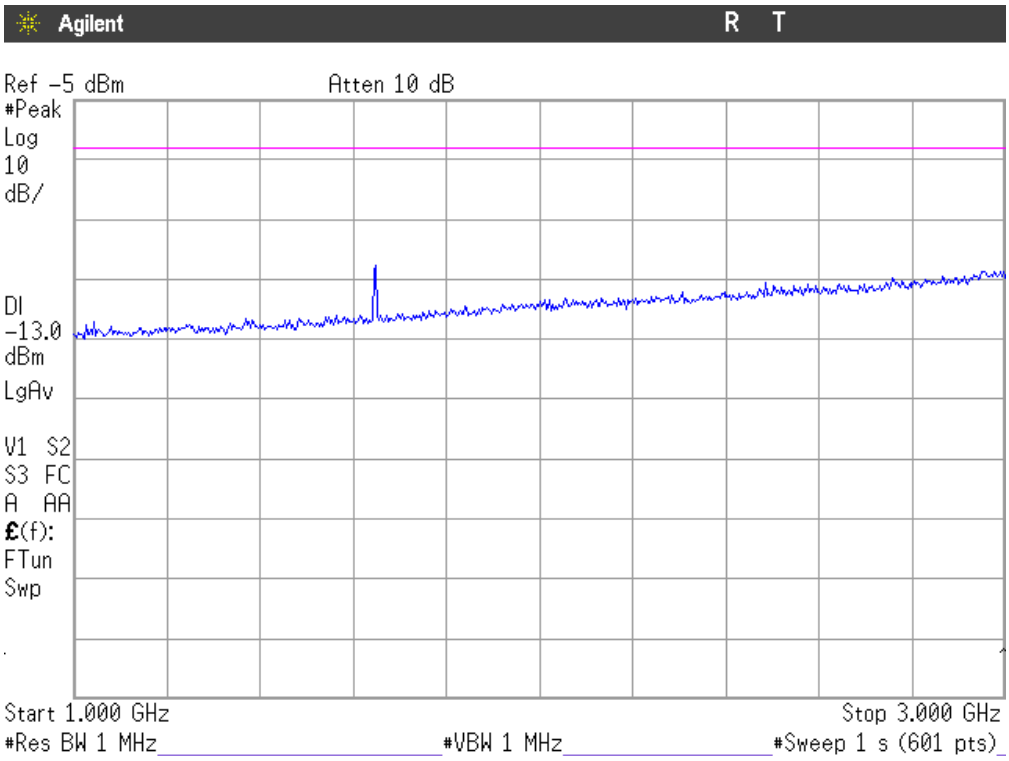


Note: The peak above the limit is the carrier frequency.

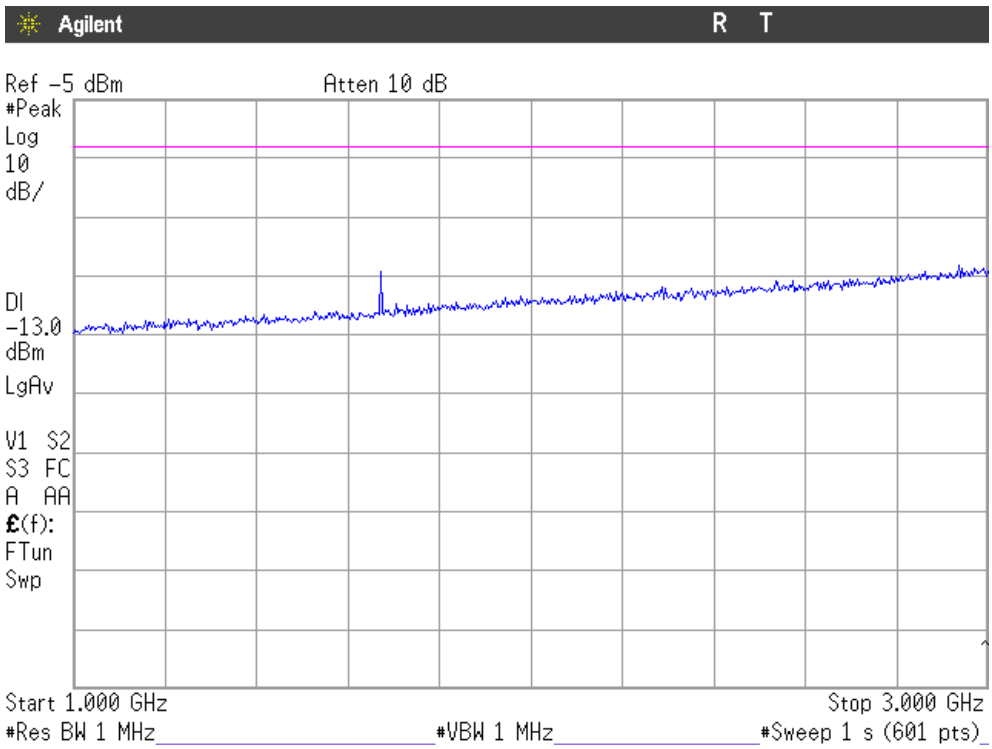
FREQUENCY RANGE 1 GHz to 3 GHz.

GSM MODULATION

CHANNEL: LOWEST



CHANNEL: MIDDLE



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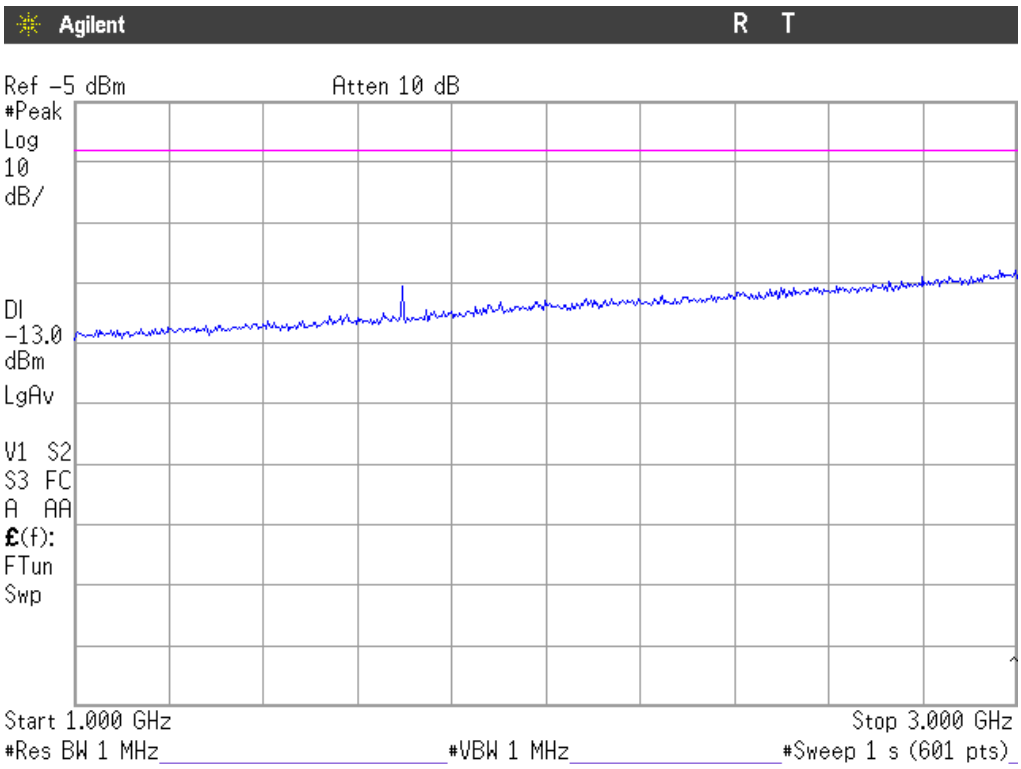
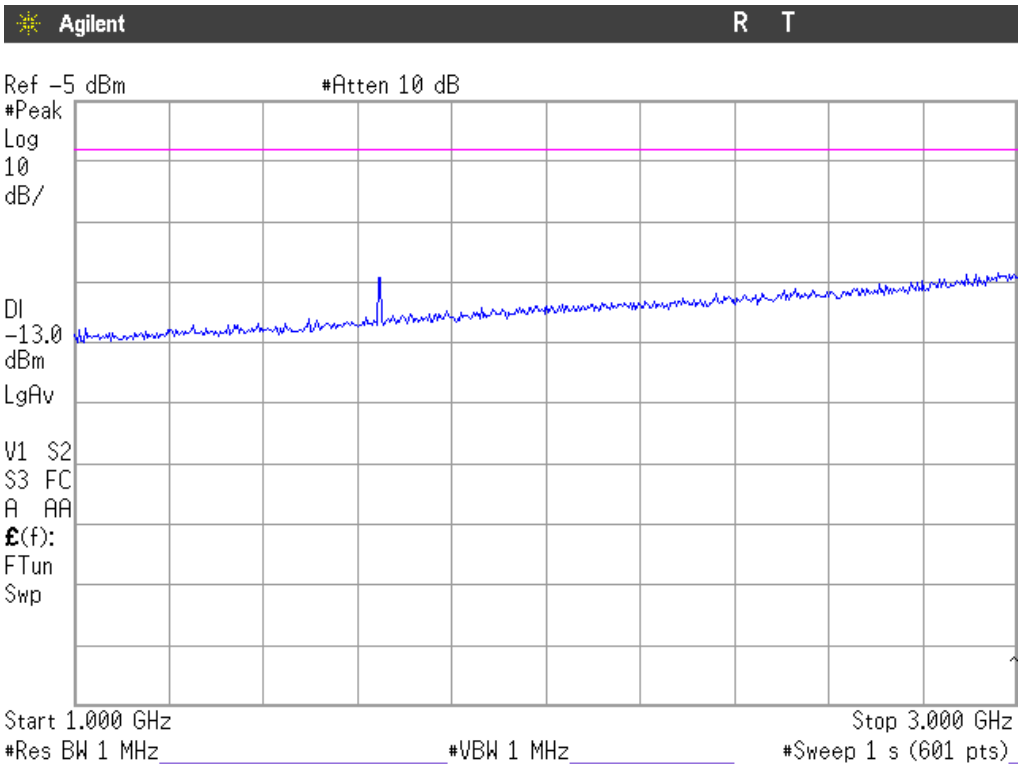


EDGE MODULATION

CHANNEL: LOWEST



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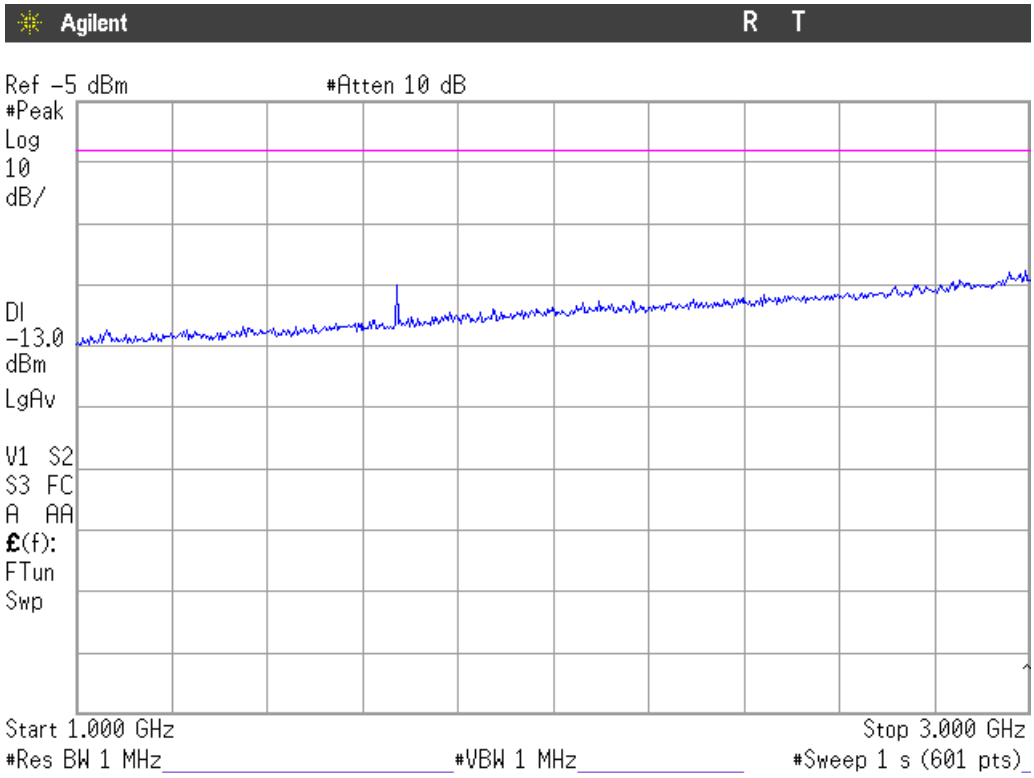

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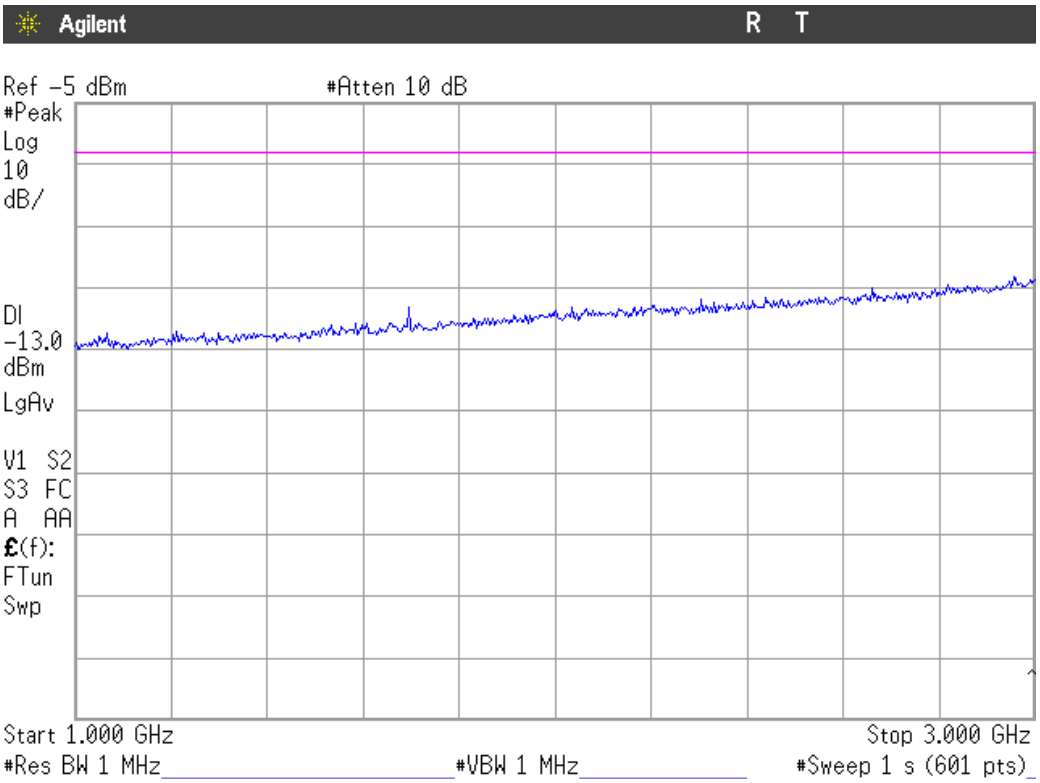
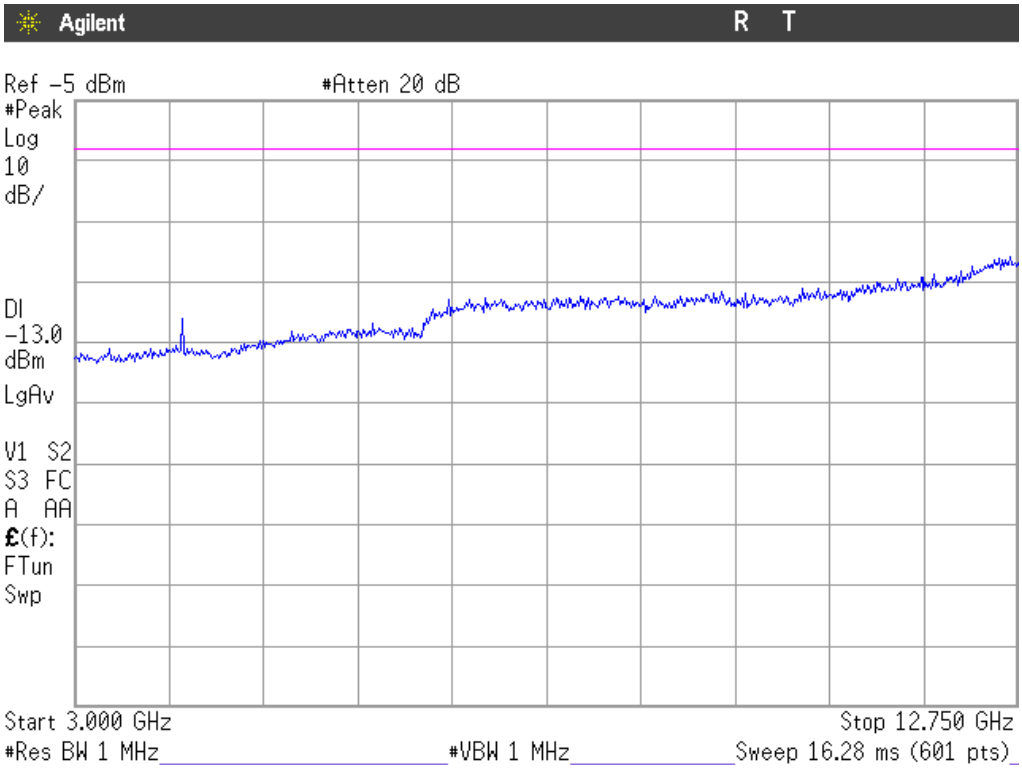


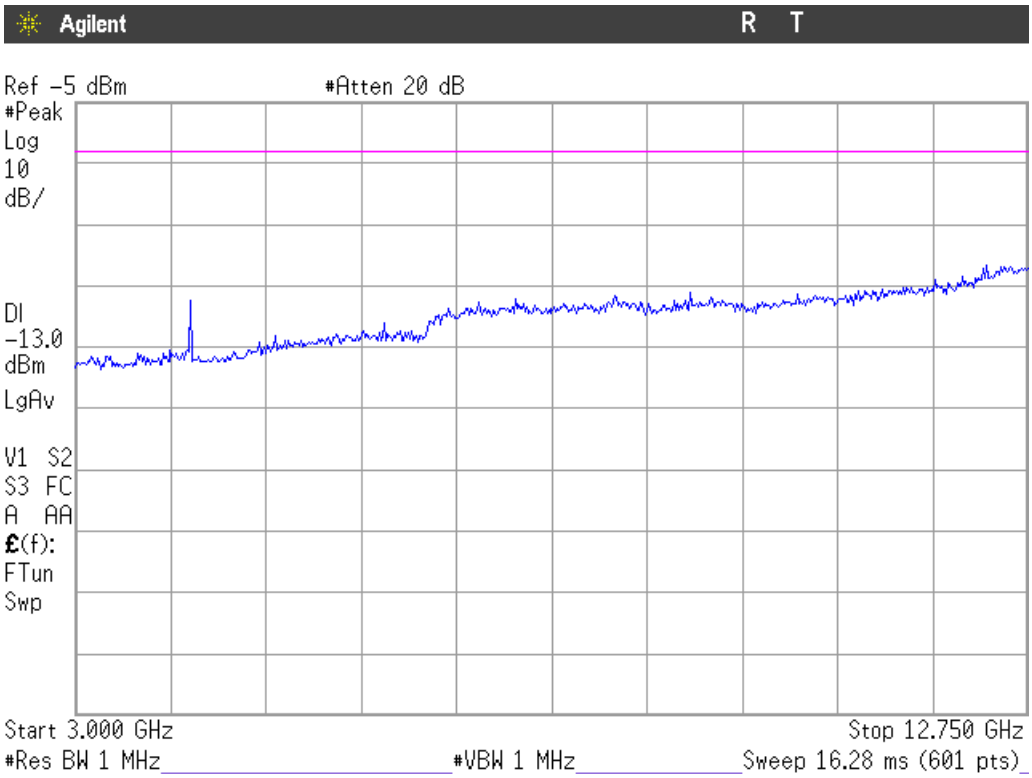
FREQUENCY RANGE 3 GHz to 12.75 GHz.

GSM MODULATION

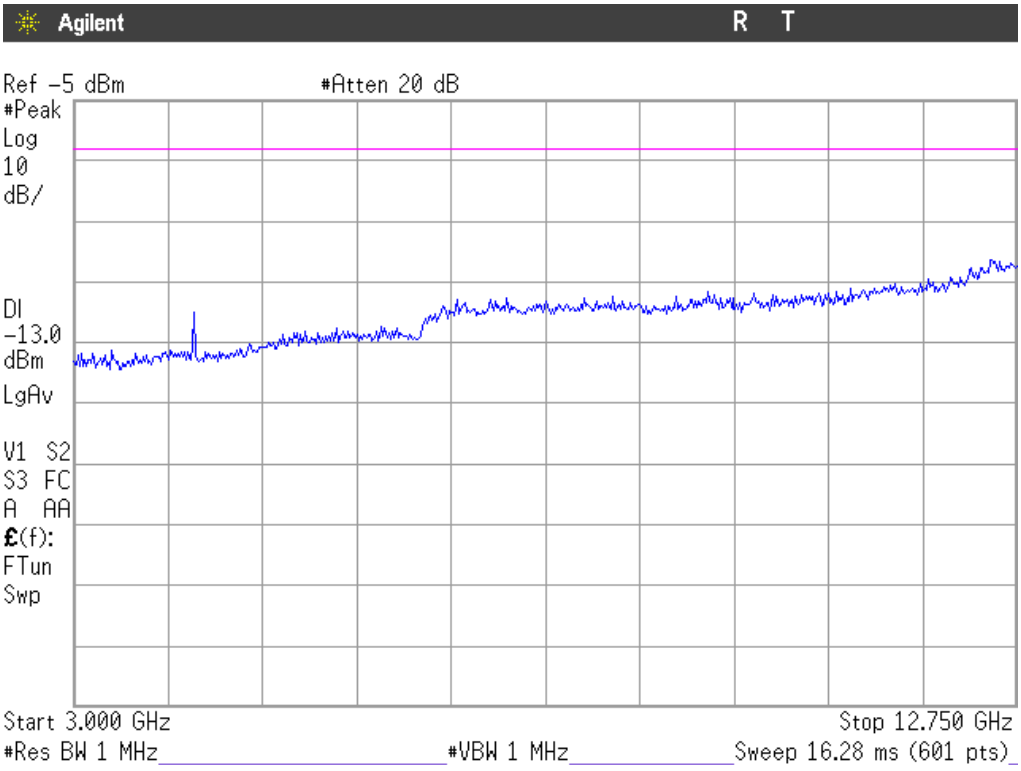
CHANNEL: LOWEST



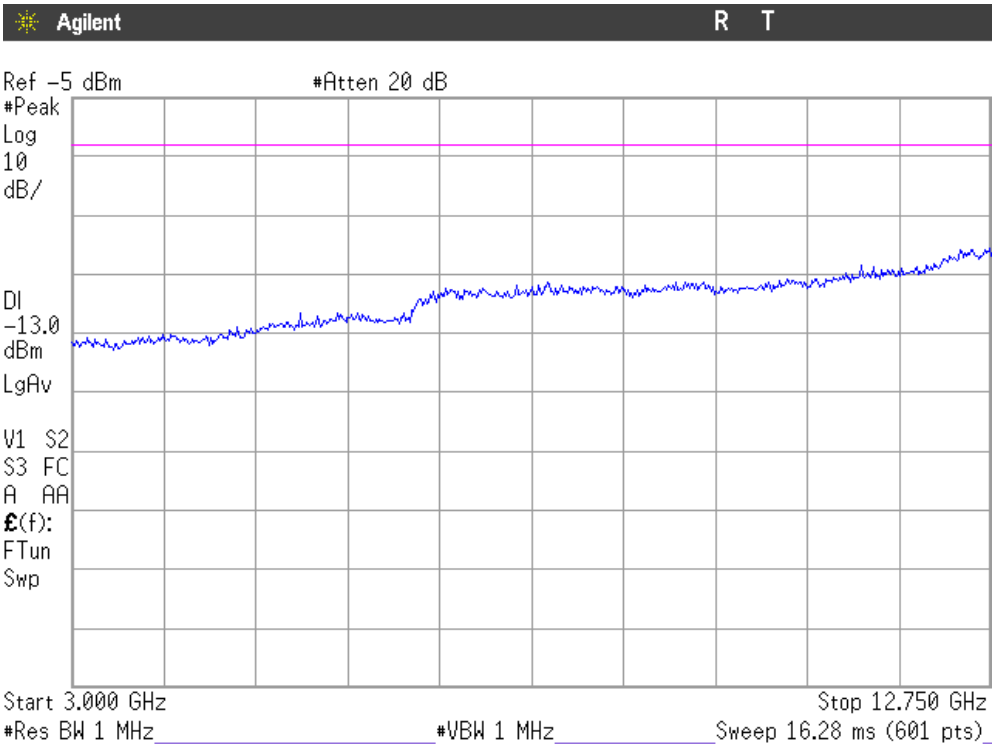
CHANNEL: MIDDLE



CHANNEL: HIGHEST



EDGE MODULATION



This plot is valid for all three channels

TEST CONDITIONS

Power supply (V):

V_{nom} = 3.8 Vdc

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 = DC Voltage from external power supply.

Type of antenna = external connectable antenna with sma type connector.

TEST FREQUENCIES:

GSM AND EDGE MODULATION

Lowest channel (512): 1850.2 MHz

Middle channel (662): 1880.2 MHz

Highest channel (810): 1909.8 MHz

RF Output Power (conducted and E.I.R.P.)

SPECIFICATION

§2.1046 and 24.232

Mobile/portable stations are limited to 2 Watts (33 dBm) Effective Isotropic Radiated Power (E.I.R.P.) peak power.

METHOD

For radiated measurements the EUT was placed on a 1 m high non-conductive stand inside an anechoic chamber. The measuring antenna was placed at 1 m distance and the maximum field strength was measured for the three channels. The EUT was controlled via the Universal Radio Communication tester R&S CMU200 selecting maximum transmission power of the EUT and different modes of modulation.

The Effective Isotropic Radiated Power (E.I.R.P.) is obtained by using the Substitution Method according to ANSI/TIA/EIA-603-C: 2004.

RESULTS

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER E.I.R.P. (RADIATED).

GSM MODULATION

Substitution method data

Frequency (MHz) at max. reading	Max. Instrument reading (dBm)	Polarization	(1) RF Generator +power amplifier output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gi (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
1850.1835	-4.31	Vertical	20.09	0.5	8.6	28.19
1880.2172	-3.81	Vertical	21.09	0.5	8.3	28.89
1909.7583	-3.69	Vertical	21.61	0.5	8.0	29.11

RBW = VBW = 1 MHz

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	28.19	28.89	29.11
Maximum peak power (W)	0.66	0.77	0.81
Measurement uncertainty (dB)	± 4.09		

EDGE MODULATION

Substitution method data

Frequency (MHz) at max. reading	Max. 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)
1850.1585	-5.49	Vertical	18.91	0.5	8.6	27.01
1880.2083	-5.27	Vertical	19.63	0.5	8.3	27.43
1909.7677	-4.92	Vertical	20.38	0.5	8.0	27.88

RBW = VBW = 1 MHz

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	27.01	27.43	27.88
Maximum peak power (W)	0.50	0.55	0.61
Measurement uncertainty (dB)	± 4.09		

Verdict: PASS

Radiated emissions

SPECIFICATION

§ 24.238

METHOD

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment.

The EUT was placed on a 1 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 emissions were substituted by the Substitution method, in accordance with the ANSI/TIA/EIA-603-C: 2004.

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

RESULTS

GSM 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 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-20 GHz.

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)
5640.550	-54.16	Vertical	-46.26	2.70	10.80	-38.16

Measurement uncertainty: ± 4.09 dB

3. CHANNEL: HIGHEST

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

Frequency range 1 GHz-20 GHz.

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)
5729.483	-54.85	Vertical	-46.95	2.70	10.80	-38.85
7639.150	-52.49	Vertical	-40.12	3.10	10.03	-33.19

Measurement uncertainty: ± 4.09 dB

EDGE 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 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-20 GHz.
No spurious signals were found in all the range.

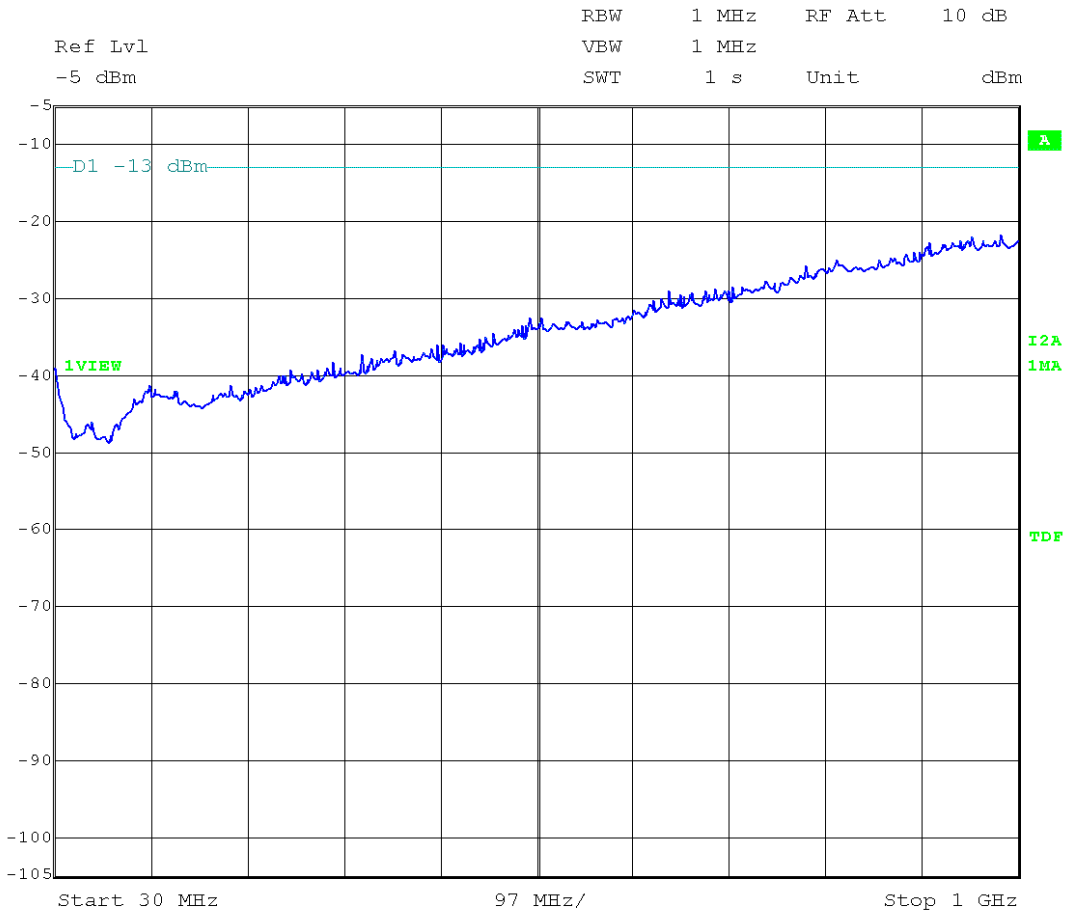
3. CHANNEL: HIGHEST

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

Frequency range 1 GHz-20 GHz.
No spurious signals were found in all the range.

Verdict: PASS

FREQUENCY RANGE 30 MHz-1000 MHz.

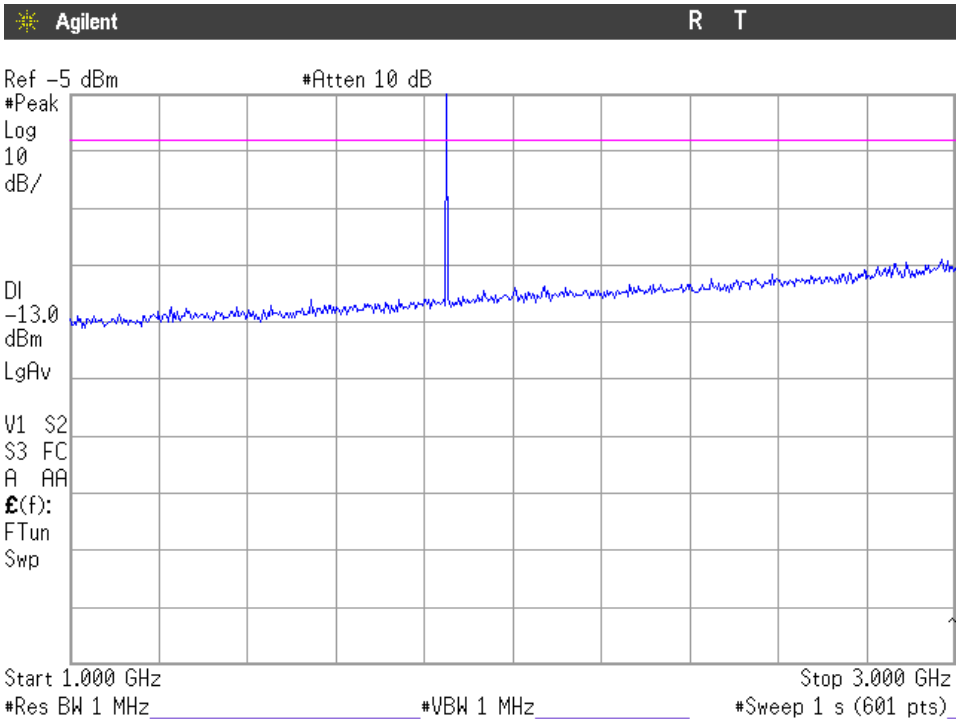


(This plot is valid for all three channels and all modulations).

FREQUENCY RANGE 1 GHz to 3 GHz.

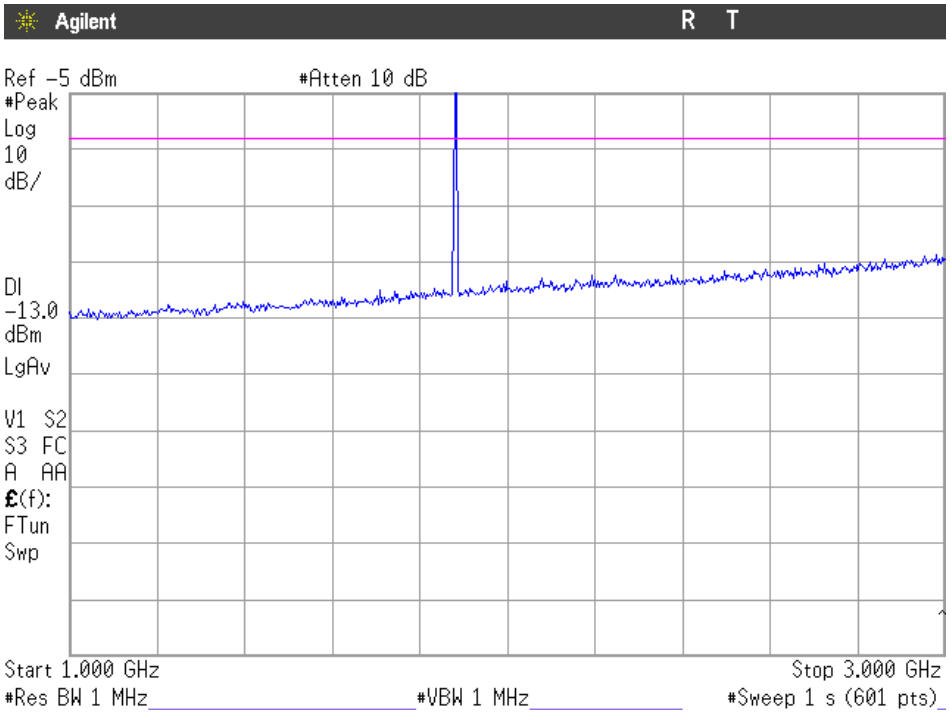
GSM MODULATION

CHANNEL: LOWEST



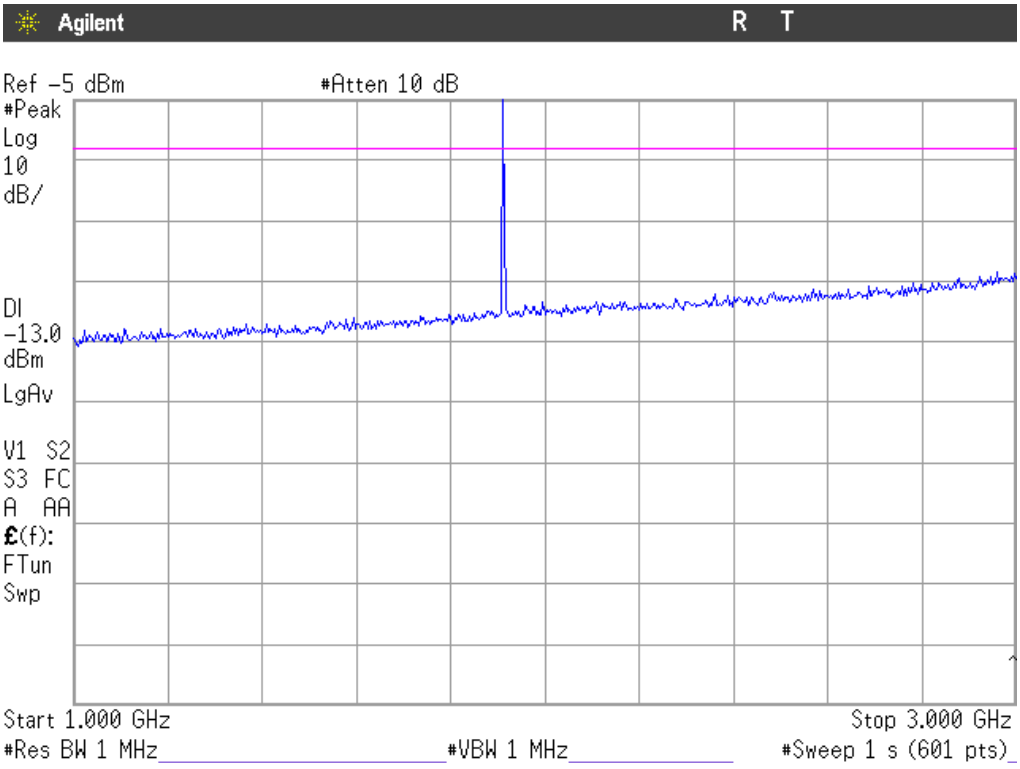
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



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

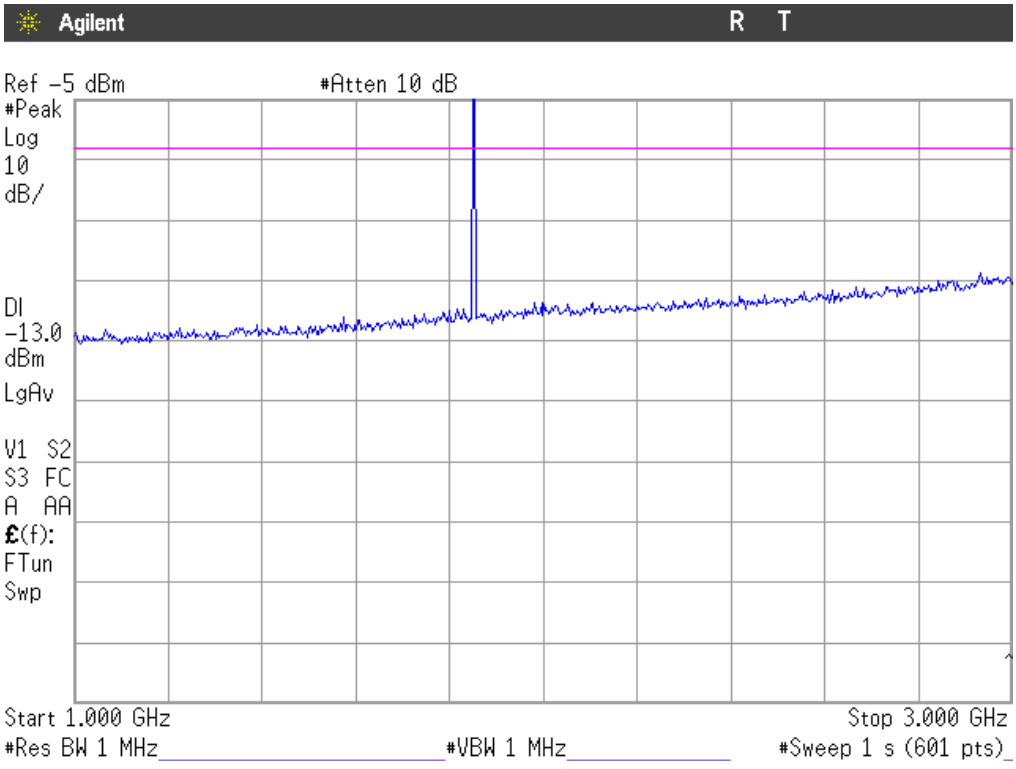
CHANNEL: HIGHEST



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

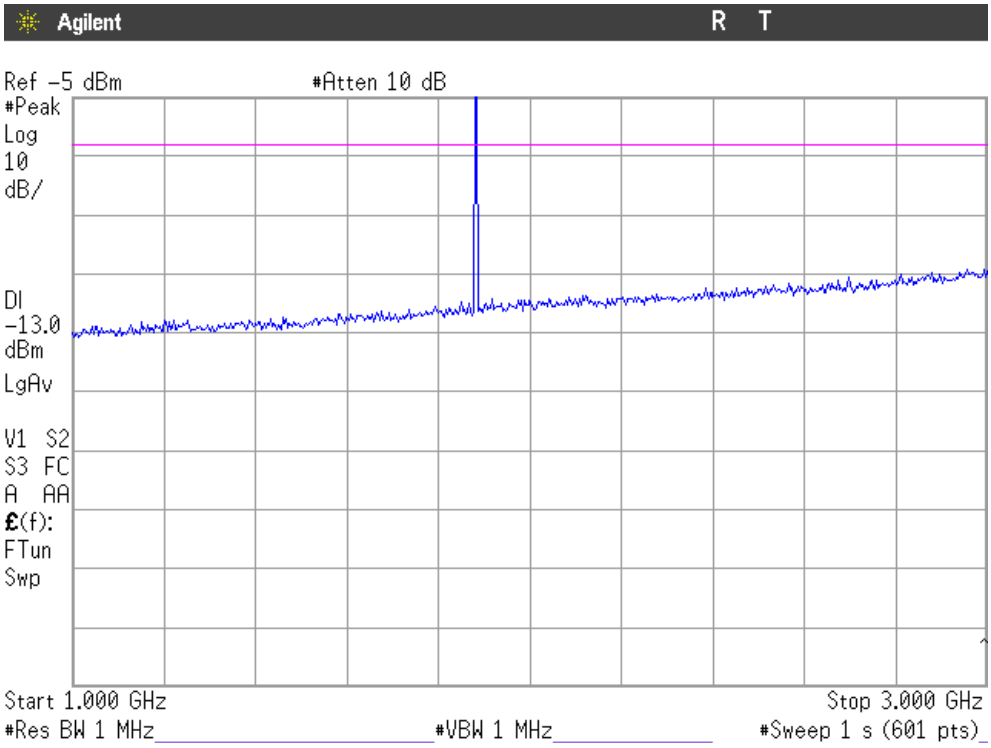
EDGE MODULATION

CHANNEL: LOWEST



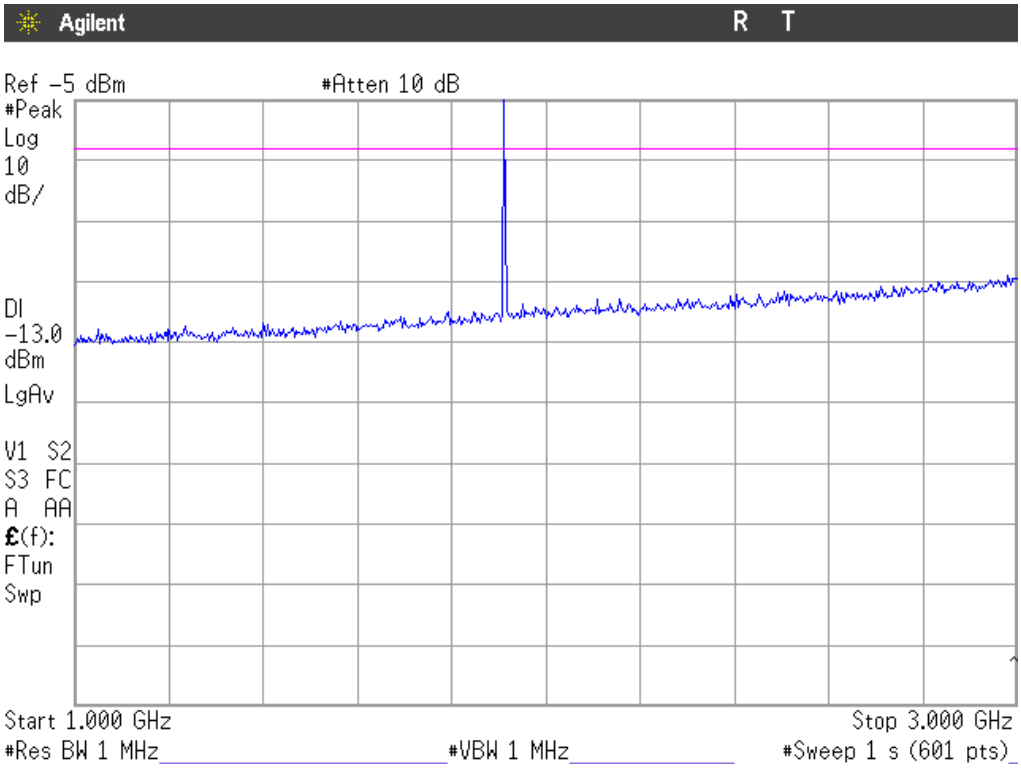
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



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

CHANNEL: HIGHEST

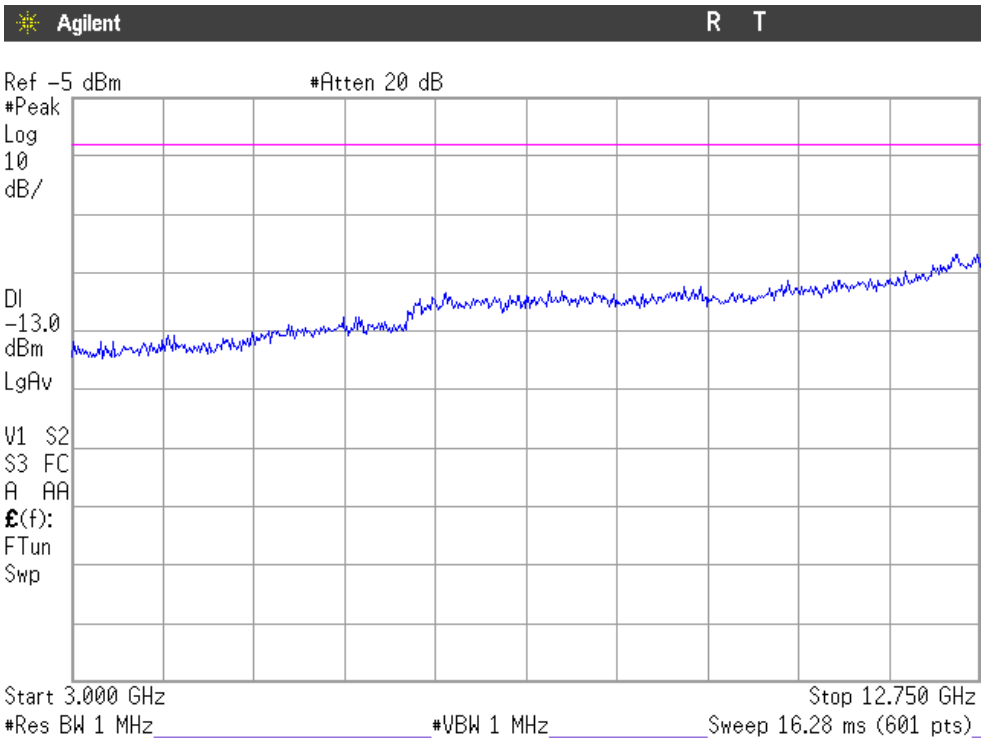


Note: The peak above the limit is the carrier frequency.

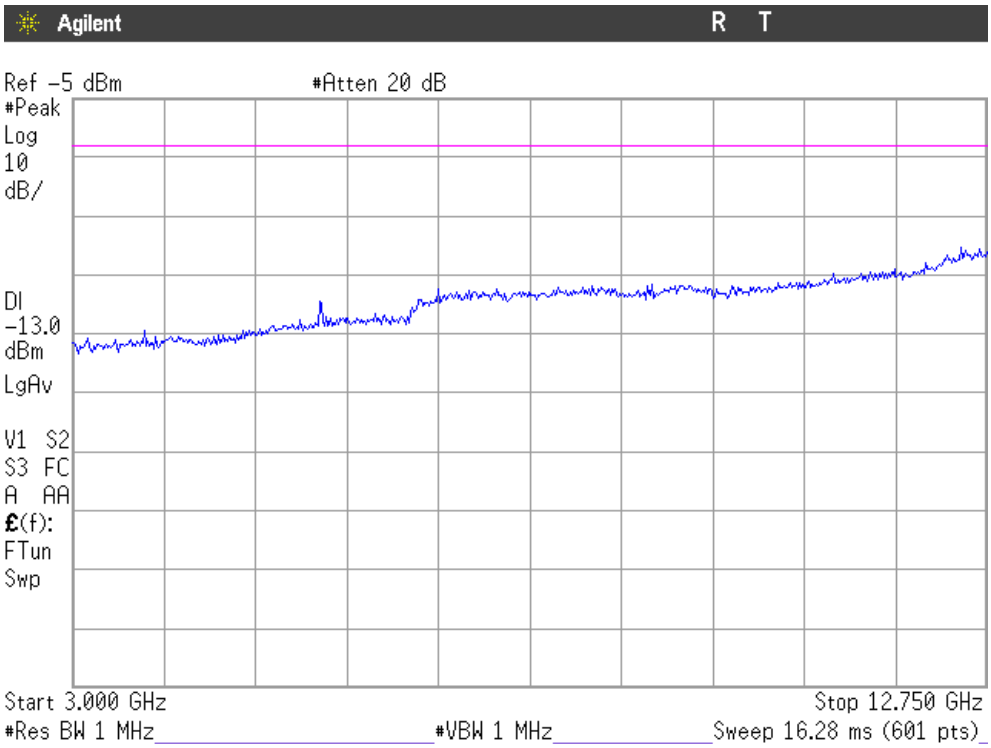
FREQUENCY RANGE 3 GHz to 12.75 GHz.

GSM MODULATION

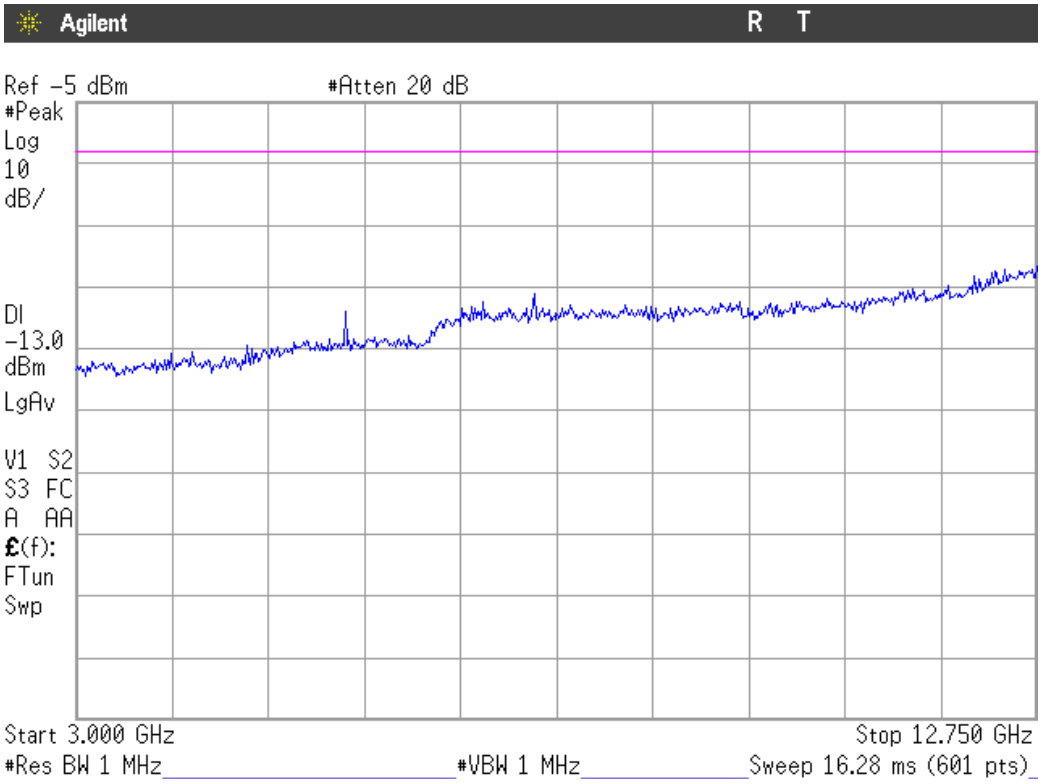
CHANNEL: LOWEST



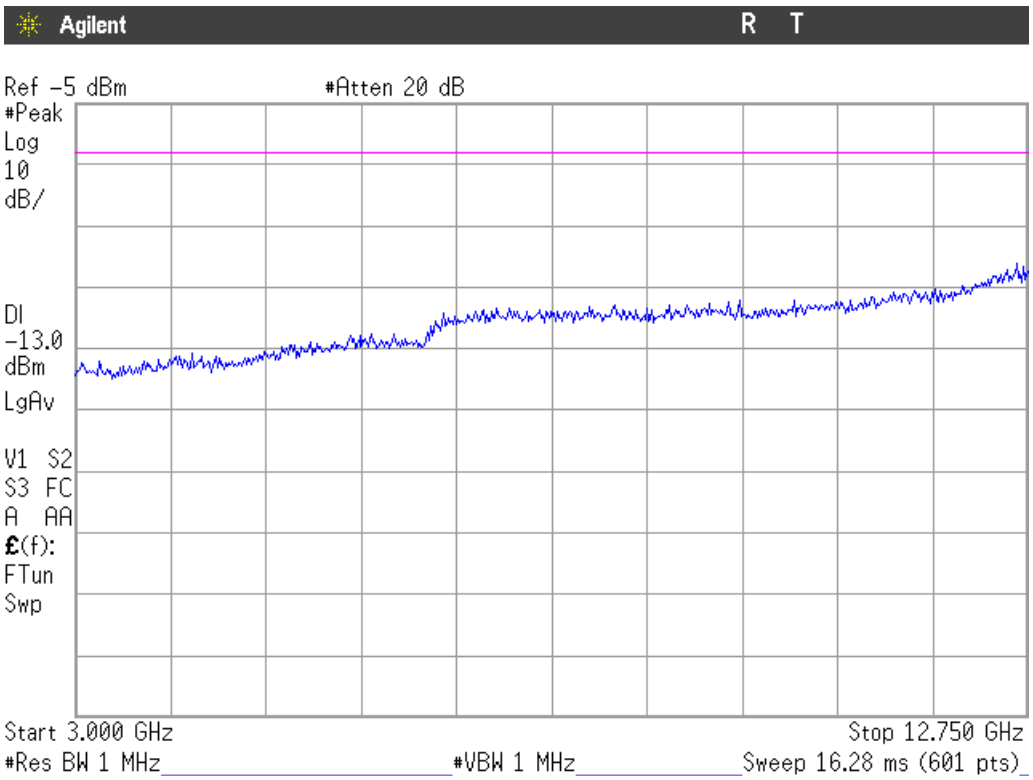
CHANNEL: MIDDLE



CHANNEL: HIGHEST

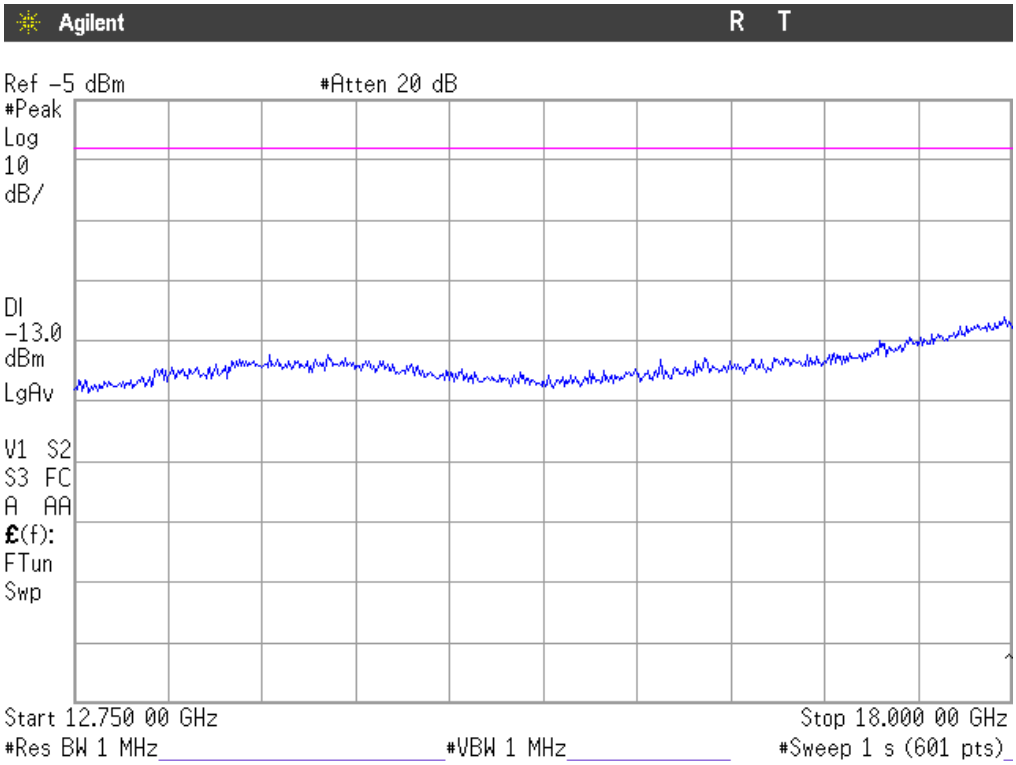


EDGE MODULATION



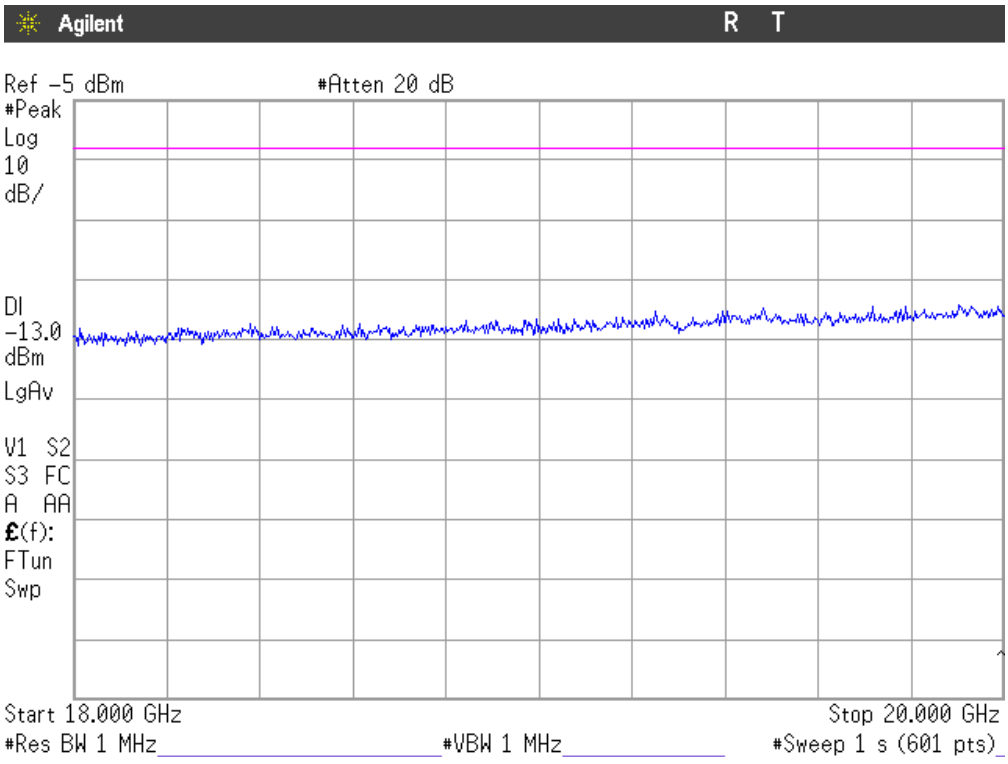
(This plot is valid for all three channels).

FREQUENCY RANGE 12.75 GHz TO 18 GHz.



(This plot is valid for all three channels and all modulations).

FREQUENCY RANGE 18 GHz TO 20 GHz.



(This plot is valid for all three channels and all modulations).

TEST RESULTS FOR FCC PART 27 AND RSS-139

TEST CONDITIONS

Power supply (V):

V_{nom} = 3.8 Vdc

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 = DC Voltage from external power supply.

Type of antenna = external connectable antenna with sma type connector.

TEST FREQUENCIES:

Lowest channel (1312): 1712.4 MHz

Middle channel (1762): 1732.5 MHz

Highest channel (1513): 1752.6 MHz

RF Output Power (E.I.R.P.)

SPECIFICATION

§2.1046 and 27.50

Fixed, mobile and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to a peak Effective Isotropic Radiated Power (E.I.R.P.) of 1 Watt (30 dBm).

METHOD

For radiated measurements the EUT was placed on a 1 m high non-conductive stand inside an anechoic chamber. The measuring antenna was placed at 1 m distance and the maximum field strength was measured for the three channels. The EUT was controlled via the Universal Radio Communication tester R&S CMU200 selecting maximum transmission power of the EUT.

The Effective Isotropic Radiated Power (E.I.R.P.) is obtained by using the Substitution Method according to ANSI/TIA/EIA-603-C: 2004.

RESULTS

MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER E.I.R.P. (RADIATED).

Substitution method data

Frequency (MHz) at max. reading	Max. Instrument reading (dBm)	Polarization	(1) RF Generator (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain Gi (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
1710.4093	-7.39	Vertical	17.21	0.3	8.2	25.11
1732.4075	-6.97	Vertical	17.93	0.3	8.1	25.73
1753.0755	-8.70	Vertical	16.30	0.3	8.1	24.10

RBW = VBW = 8 MHz

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	25.11	25.73	24.10
Maximum peak power (W)	0.32	0.37	0.26
Measurement uncertainty (dB)	± 4.09		

Verdict: PASS

Radiated emissions

SPECIFICATION

§ 27.53

METHOD

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment.

The EUT was placed on a 1 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 emissions were substituted by the Substitution method, in accordance with the ANSI/TIA/EIA-603-C: 2004.

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

RESULTS

1. CHANNEL: LOWEST

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

Frequency range 1 GHz-18 GHz.

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)
3422.783	-49.66	Vertical	-45.36	2.20	10.40	-37.16

2. CHANNEL: MIDDLE

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

Frequency range 1 GHz-18 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)
3467.033	-53.61	Vertical	-49.31	2.20	10.40	-41.11

3. CHANNEL: HIGHEST

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

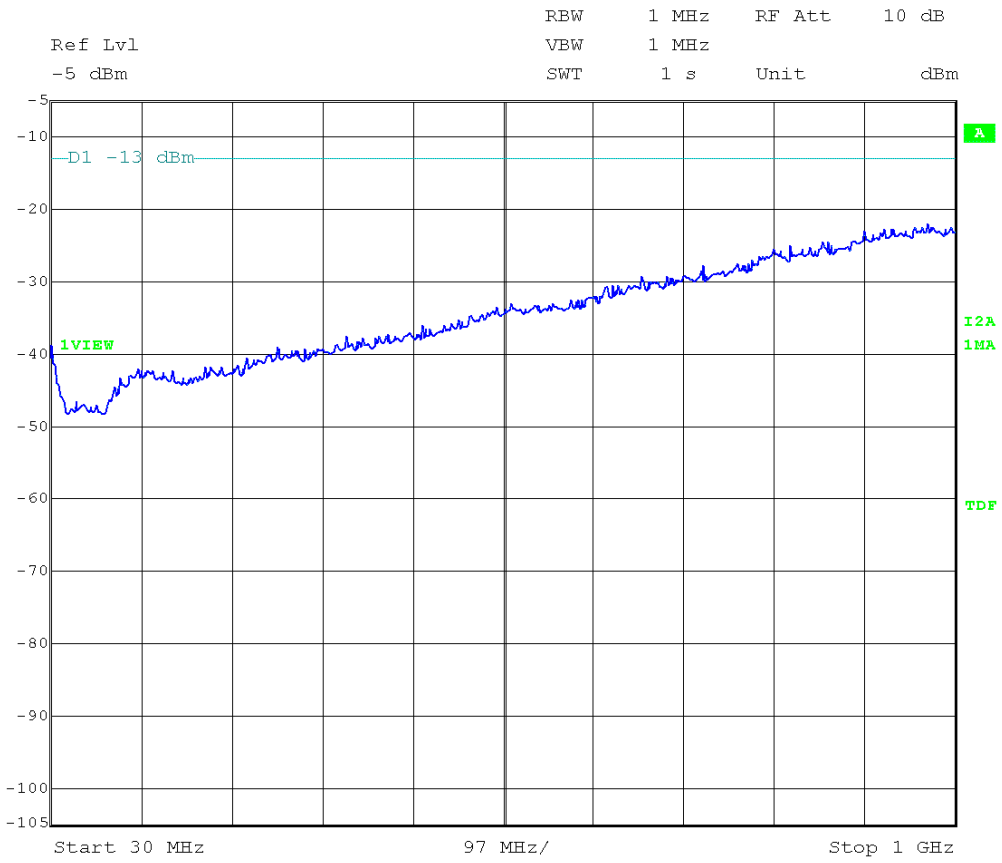
Frequency range 1 GHz-18 GHz.

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)
3503.550	-50.83	Vertical	-46.53	2.20	10.40	-38.33

Verdict: PASS

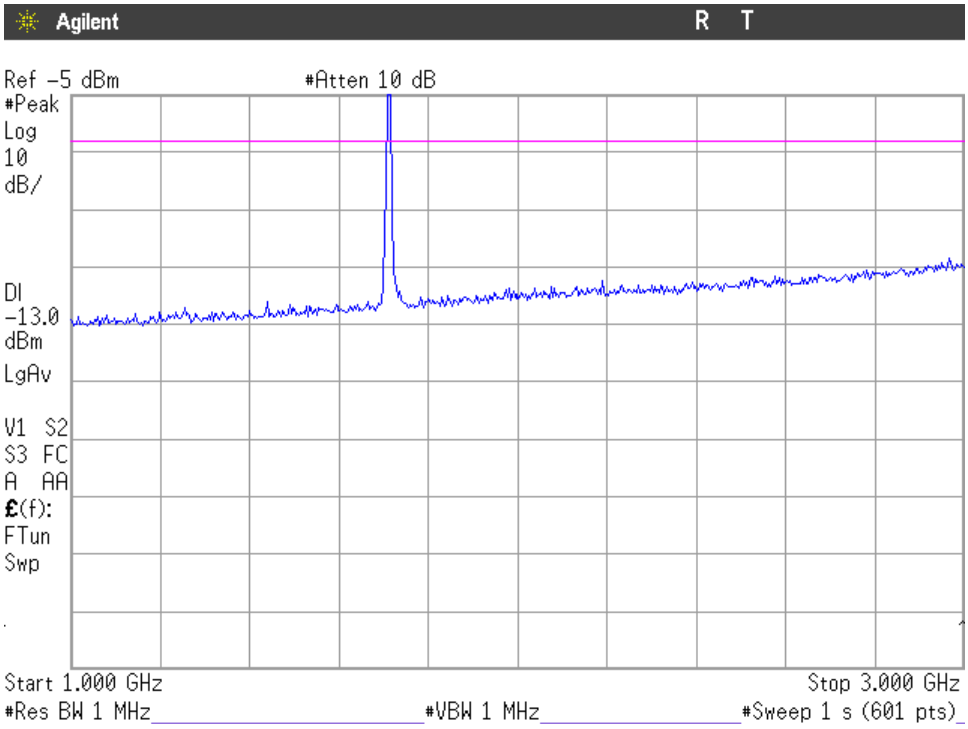
FREQUENCY RANGE 30 MHz-1000 MHz.



(This plot is valid for all three channels).

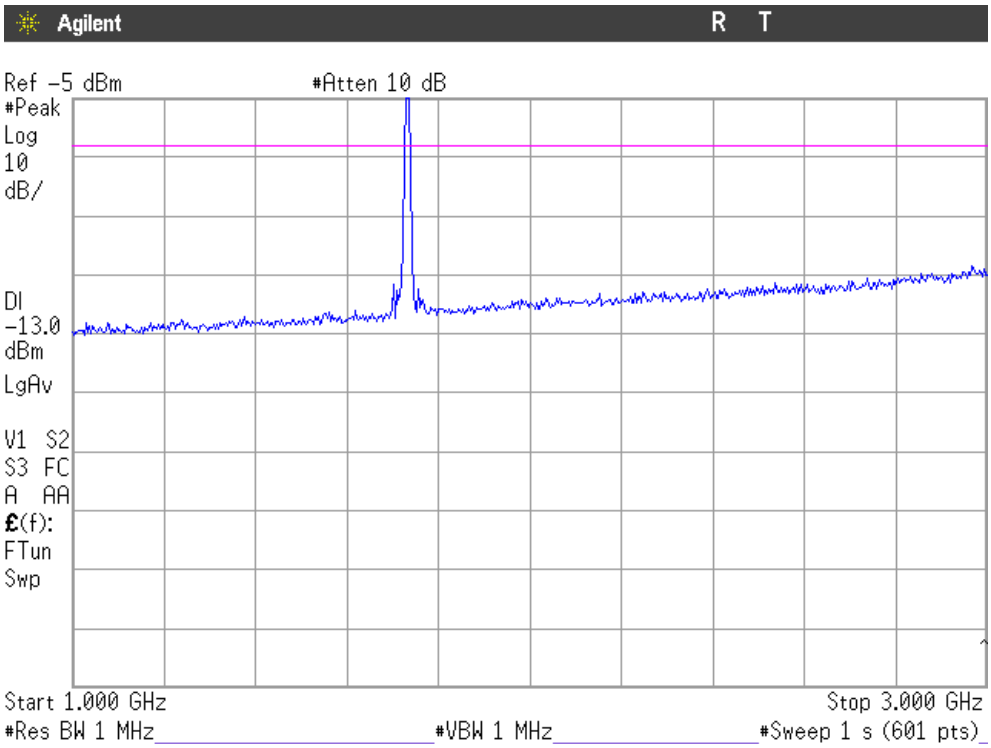
FREQUENCY RANGE 1 GHz to 3 GHz.

CHANNEL: LOWEST



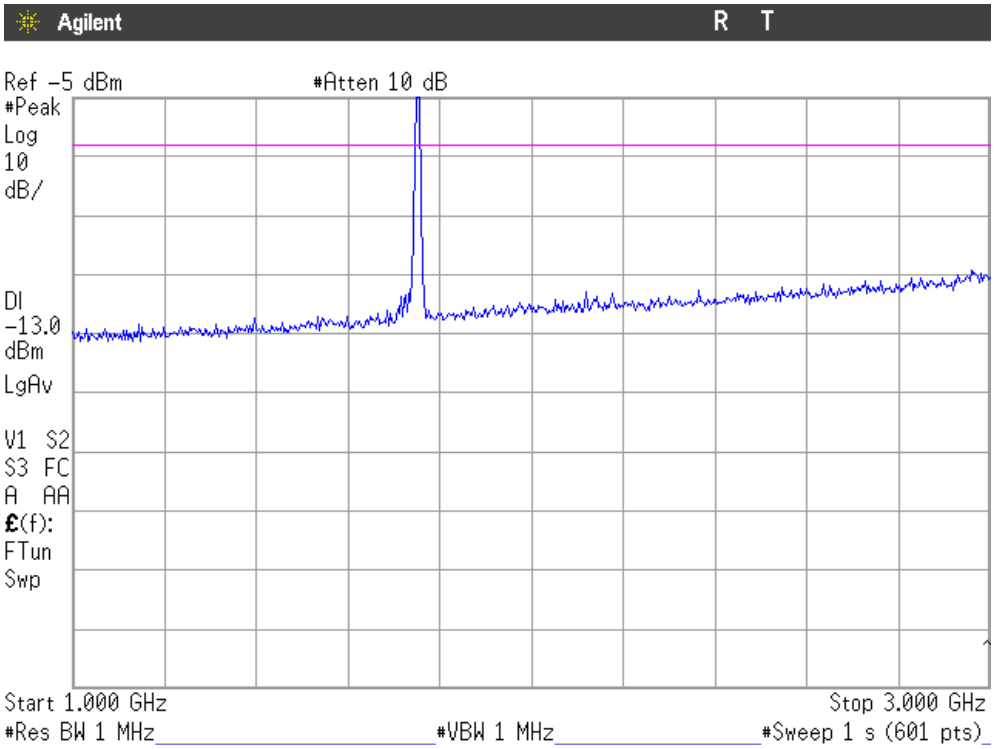
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



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

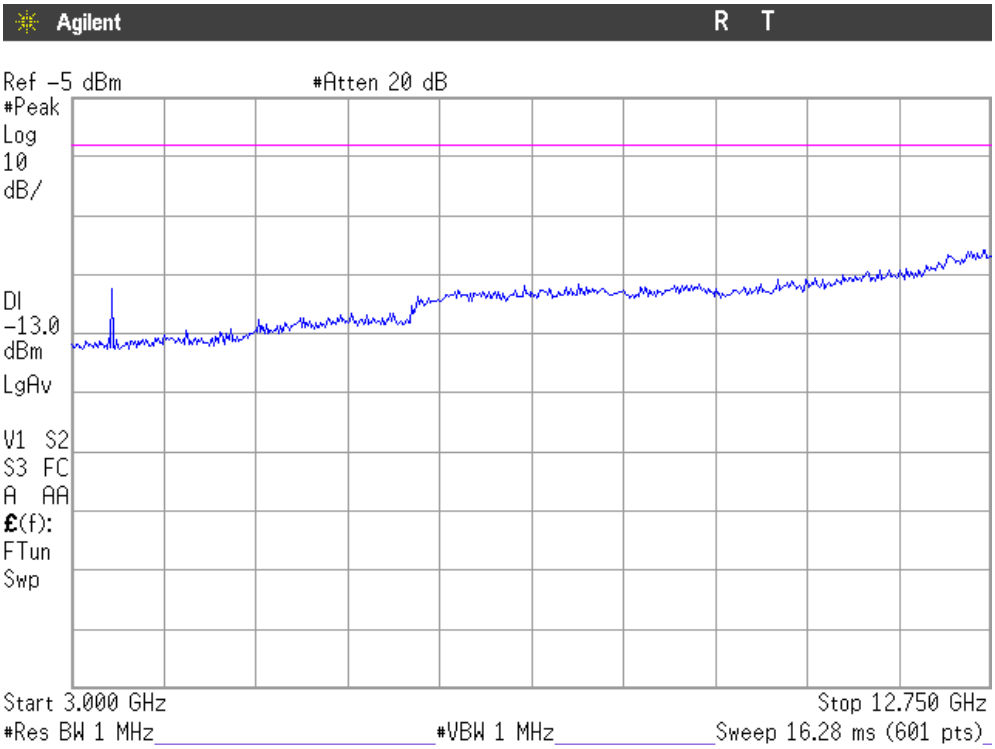
CHANNEL: HIGHEST



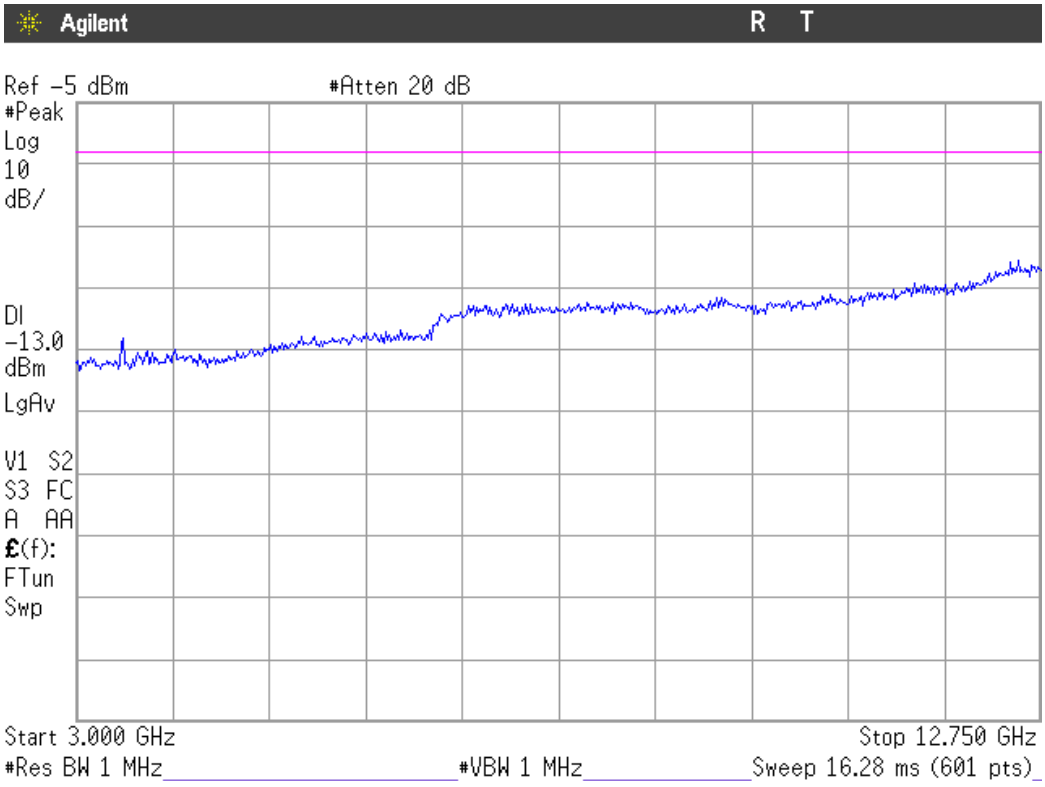
Note: The peak above the limit is the carrier frequency.

FREQUENCY RANGE 3 GHz to 12.75 GHz.

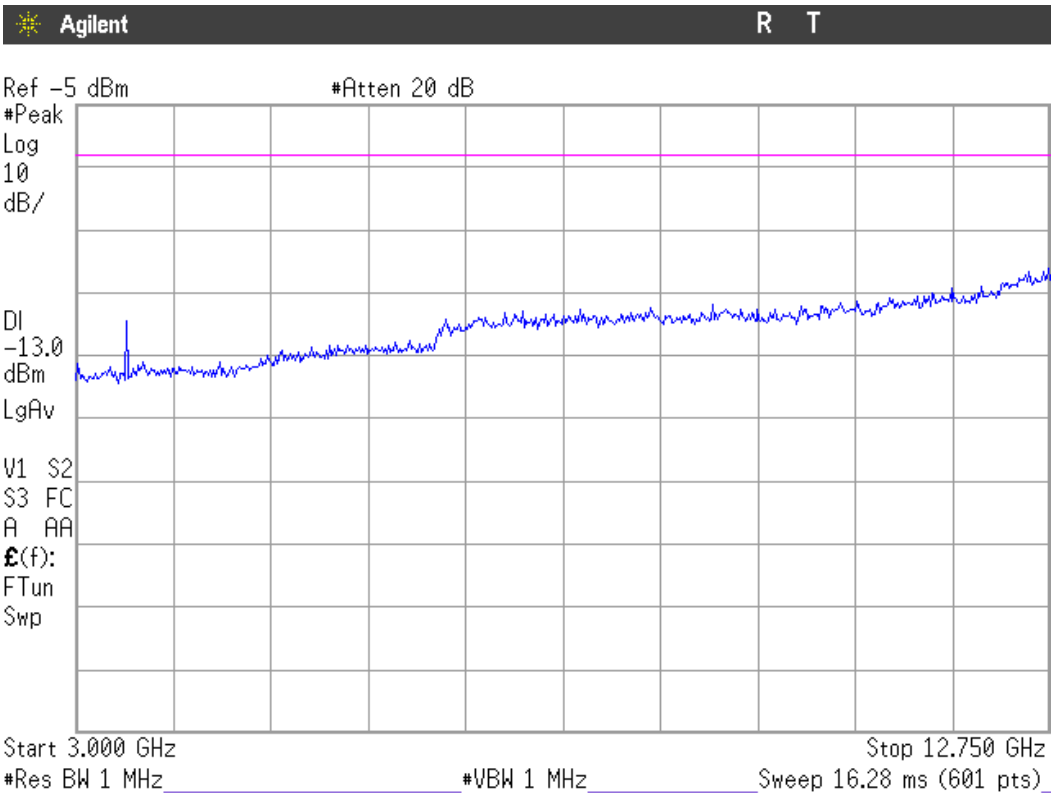
CHANNEL: LOWEST



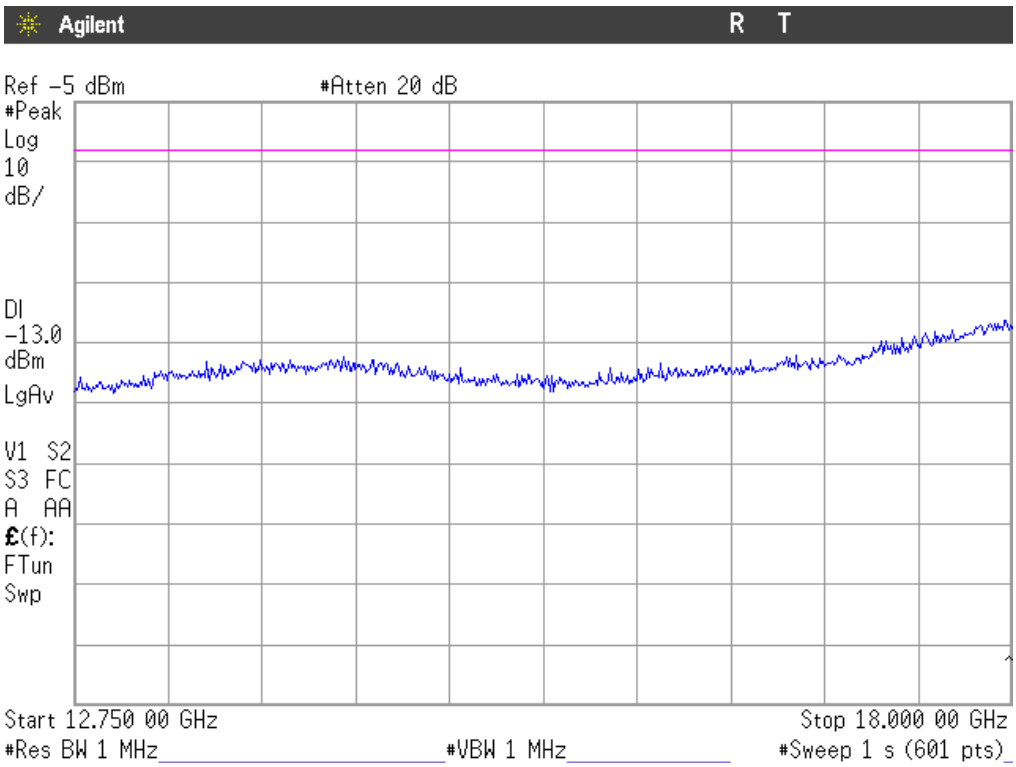
CHANNEL: MIDDLE



CHANNEL: HIGHEST



FREQUENCY RANGE 12.75 GHz TO 18 GHz.



(This plot is valid for all three channels).