FCC LISTED, REGISTRATION NUMBER: 905266 **IC LISTED REGISTRATION NUMBER IC 4621**	**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 and 15.207

CANADA IC RSS-132, RSS-133

NIE ..... :	29742RET.001
Approved by (name / position & signature) ..... :	A. Llamas / RF Lab. Manager Alejandro Llamas Rodríguez Firmado digitalmente por Alejandro Llamas Rodríguez Fecha: 2009.11.16 14:31:42 +01'00'
Elaboration date ..... :	16/11/2009
Identification of item tested ..... :	PDA
Trademark ..... :	Genus
Model and/or type reference ..... :	TSN-1
Serial number ..... :	Serial number (PSN): EBL0001281, EBL 0001277
Other identification of the product ..... :	Commercial name: TERRESTAR GENUS FCC ID: OBW120897 IC: 3282A-120897
Features ..... :	GSM850/GSM900/GSM1800/GSM1900/WCDMA FDD V/ WCDMA FDD II / GMR-1 3G / BT / WiFi / A-GPS
Description ..... :	PDA
Applicant ..... :	ELEKTROBIT INC.
Address ..... :	22745 29TH DRIVE SE, SUITE 200 BOTHELL, WASHINGTON 98021 USA
CIF/NIF/Passport ..... :	91-1746142
Contact person:	Tuomo Väinämö
Telephone / Fax ..... :	+358 40 3442000 / : +358 8 343 032
e-mail: ..... :	tuomo.vainamo@elektrobit.com
Test samples supplier ..... :	Same as applicant
Manufacturer ..... :	Same as applicant

Test method requested .....:	See Standard
Standard .....:	USA FCC Part 22 10-1-08 Edition USA FCC Part 24 10-1-08 Edition USA FCC Part 15.207 07-10-08 Edition: Conducted limits CANADA IC RSS-132 Issue 2, Sep. 2005 CANADA IC RSS-133 Issue 5, Feb. 2009
Test procedure .....:	1. PEET000: Medidas de equipos radioeléctricos en condiciones radiadas. 2. PEET003: Medidas conducidas de equipos radioeléctricos. 3. PEEM002: Medida de la emisión conducida según EN55022.
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	2008-10	2011-10
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	2008-03	2011-03
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	2009-02	2011-02
10.	Multi Device Controller EMCO 2090	N.A.	N.A.
11.	Spectrum Analyzer R&S ESU40	2007-11	2009-11
12.	Spectrum Analyzer Agilent E4440A	2008-01	2010-01
13.	Power amplifier AMF-4D-00400600-50-30P	2009-04	2011-04
14.	Log-Periodic antenna R&S HL 040	2009-10	2012-10
15.	RF generator Agilent ESG E4438C	2008-09	2010-09
16.	Transient limiter. HP 11947A	2007/01	2010-01
17.	Line Impedance Stabilization Network (L.I.S.N.) R&S. ESH2-Z5	2008/01	2010-01

Report template No. .....: FDT08_11

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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 4621.

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 documents:

PODT000: : Procedimiento para el cálculo de incertidumbres de medida

FEM12_07: Formato de cálculo de incertidumbre a aplicar en la medida de la tensión perturbadora en bornes de alimentación según EN 55022.

Usage of samples

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

Sample M/01 is formed by the following elements:

Control No.	Description	Model	Serial No.	Date of reception
29742/28	Mobile phone with integral antenna	TSN-1	EBL 0001281	30/09/09

Sample M/02 is formed by the following elements:

Control No.	Description	Model	Serial No.	Date of reception
29742/32	Mobile phone with antenna connector	TSN-1	EBL 0001277	30/09/09
29742/19	Dummy battery	---	---	28/09/09

Sample S/03 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
29609/73	PDA	TSN-1	EBL0001821	2009-11-05
29609/74	AC/DC adapter	FN10-UB	---	2009-11-09
29609/79	Battery	---	---	2009-11-09

Sample S/04 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
29609/73	PDA	TSN-1	EBL0001821	2009-11-05
29609/79	Battery	---	---	2009-11-09
29609/64	USB Cable	---	---	2009-11-02

With the sample S/04 it was used the next auxiliary element:

Control Nº	Description	Manufacturer	Model	Serial Nº	Date of reception
2914	Laptop PC	DELL	N5543C	MY4728E801	Property of AT4 wireless.

1. Sample M/01 has undergone following test(s).
   Radiated tests indicated in appendix A .

2. Sample M/02 has undergone following test(s).
   All tests indicated in appendix A, except radiated tests.

3. Samples S/03 & S/04 have undergone the next test(s):
   Continuous conducted emission, power leads, in appendix B.

Testing period

The performed test started on 2009-10-02 and finished on. 2009-11-11.

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. = 23,6 ºC Max. = 24,2 ºC
Relative humidity	Min. = 51,4 % Max. = 52,1 %
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. = 23.6 ºC Max. = 24.2 ºC
Relative humidity	Min. = 51,4 % Max. = 52,1 %
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).

In the chamber for conducted measurements the following limits were not exceeded during the test:

Temperature	Min. = 24.8 ºC Max. = 25.2 ºC
Relative humidity	Min. = 48.3 % Max. = 50.4 %
Air pressure	Min. = 1020 mbar Max. = 1020 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

Summary

Considering the results of the performed test according to standards USA FCC Part 22, Part 24 and Part 15.207, Canada IC RSS-132 and RSS-133, 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

HSDPA modulation mode has not been tested to prove USA FCC Part 22 and Part 24 and Canada IC RSS-132 and RSS-133 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 Parts 22 and Part 24 and IC RSS-132 and RSS-133 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		P		
Clause 2.1047/RSS-132 Clause 4.2: Modulation characteristics		P		
Clause 22.355/RSS-132 Clause 4.3: Frequency stability		P		
Clause 2.1049: Occupied Bandwidth		P		
Clause 22.917/RSS-132 Clause 4.5: Spurious emissions at antenna terminals		P		
Clause 22.917/RSS-132 Clause 4.5: Radiated emissions		P		

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

FCC PART 15 PARAGRAPH	VERDICT			
	NA	P	F	NM
Clause 15.207. Conducted limits		P		

APPENDIX A: Test results

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TEST RESULTS FOR FCC PART 22 AND IC RSS-132

TEST CONDITIONS

Power supply (V):

V_{nom} = 3.7 Vdc

V_{max} = 4.2Vdc

V_{min} = 3.5 Vdc

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

Type of power supply = DC Voltage from rechargeable Li-ion polymer battery

Type of antenna = Integral 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 MODULATION

Lowest channel (4132): 826.4 MHz

Middle channel (4182): 836.4 MHz

Highest channel (4233): 846.6 MHz

RF Output Power (conducted and 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

The conducted RF output power measurements were made at the RF output terminals of the EUT using an attenuator, power splitter and spectrum analyser. 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.

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 OUTPUT POWER (CONDUCTED). See plots in next pages.

GPRS MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	32.51	32.49	32.55
Maximum peak power (W)	1.78	1.77	1.80
Measurement uncertainty (dB)	±0.5		

EDGE MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	32.10	32.16	32.36
Maximum peak power (W)	1.62	1.64	1.72
Measurement uncertainty (dB)	±0.5		

WCDMA MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	29.15	29.21	28.73
Maximum peak power (W)	0.82	0.83	0.75
Measurement uncertainty (dB)	±0.5		

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

GPRS 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)
824.211	-11.95	Vertical	25.55	0.3	6.3	31.55
836.609	-12.98	Vertical	25.12	0.3	6.2	31.02
848.797	-12.68	Vertical	25.42	0.3	6.1	31.22

Channel	Lowest	Middle	Highest
Maximum peak power E.R.P. (dBm)	31.55	31.02	31.22
Maximum peak power (W)	1.43	1.26	1.32
Measurement uncertainty (dB)	± 3.8		

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)
824.208	-11.98	Vertical	25.52	0.3	6.3	31.52
836.611	-13.14	Vertical	24.96	0.3	6.2	30.86
848.813	-12.98	Vertical	25.12	0.3	6.1	30.92

Channel	Lowest	Middle	Highest
Maximum peak power E.R.P. (dBm)	31.52	30.86	30.92
Maximum peak power (W)	1.42	1.22	1.24
Measurement uncertainty (dB)	± 3.8		

WCDMA 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)
826.397	-11.41	Vertical	26.09	0.3	6.3	32.09
836.408	-12.35	Vertical	25.75	0.3	6.2	31.65
846.603	-12.45	Vertical	25.65	0.3	6.1	31.45

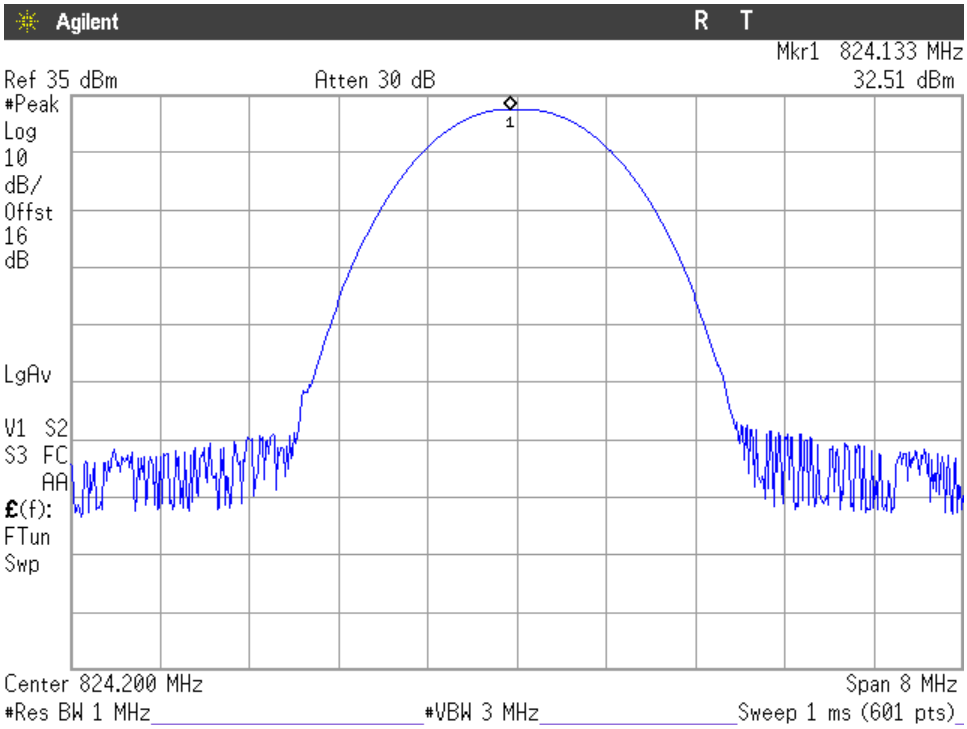
Channel	Lowest	Middle	Highest
Maximum peak power E.R.P. (dBm)	32.09	31.65	31.45
Maximum peak power (W)	1.62	1.46	1.40
Measurement uncertainty (dB)	± 3.8		

Verdict: PASS

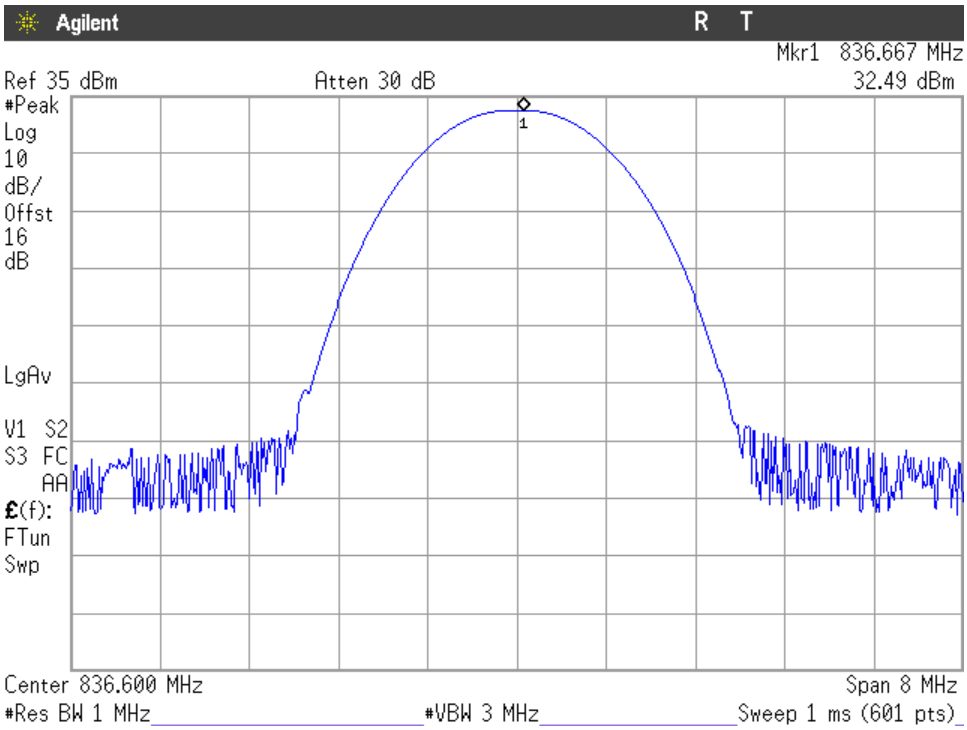
PEAK OUTPUT POWER (CONDUCTED).

GPRS MODULATION

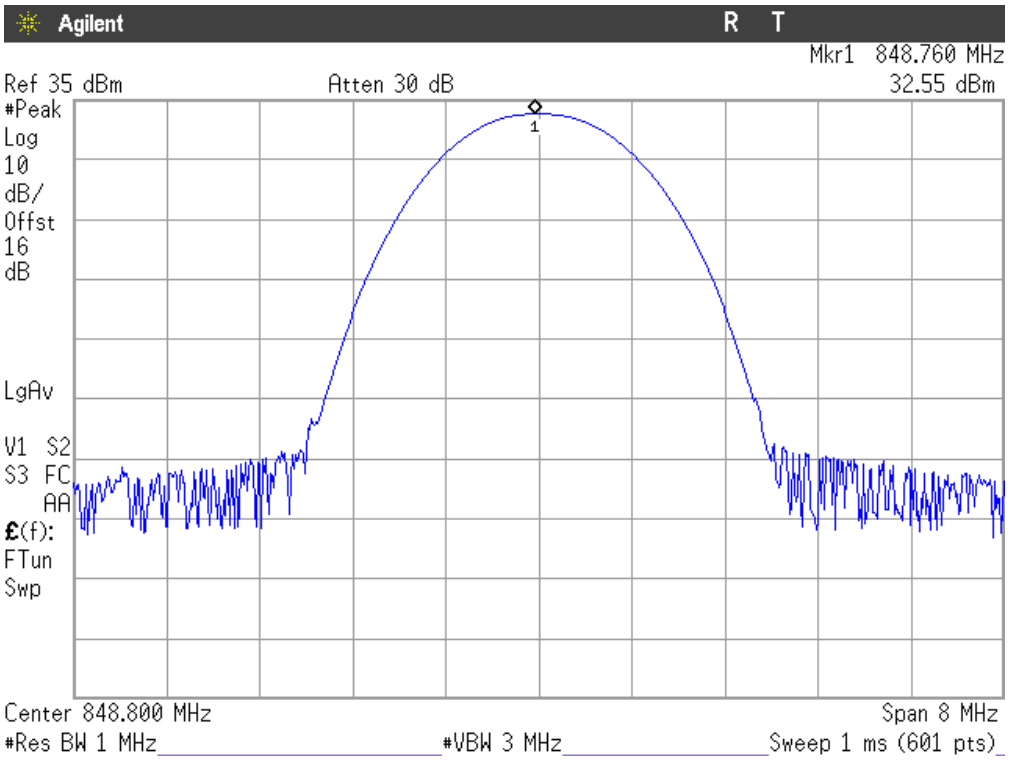
Lowest Channel.



Middle Channel.

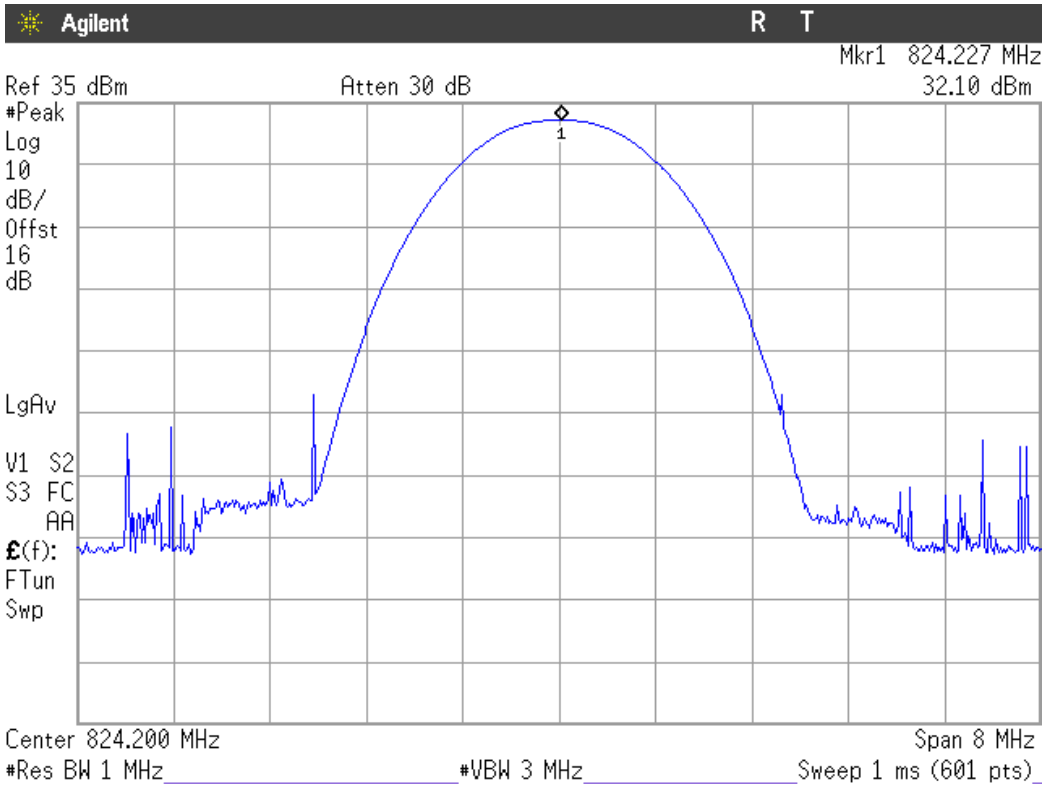


Highest Channel.

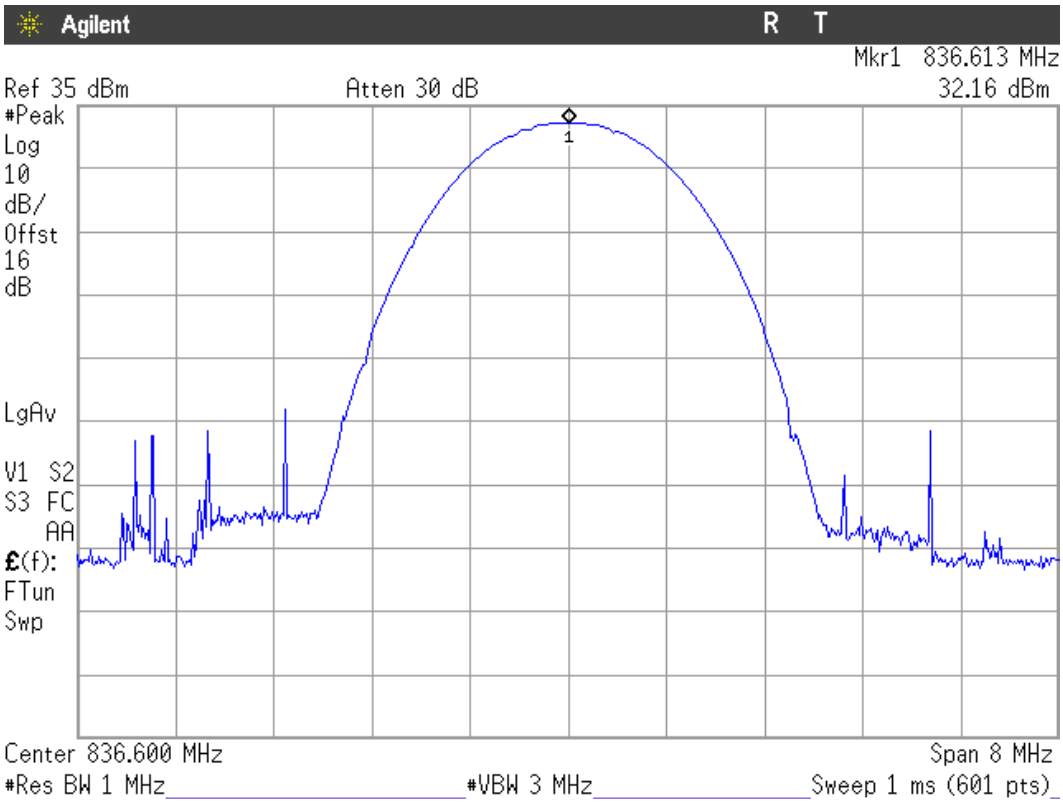


EDGE MODULATION

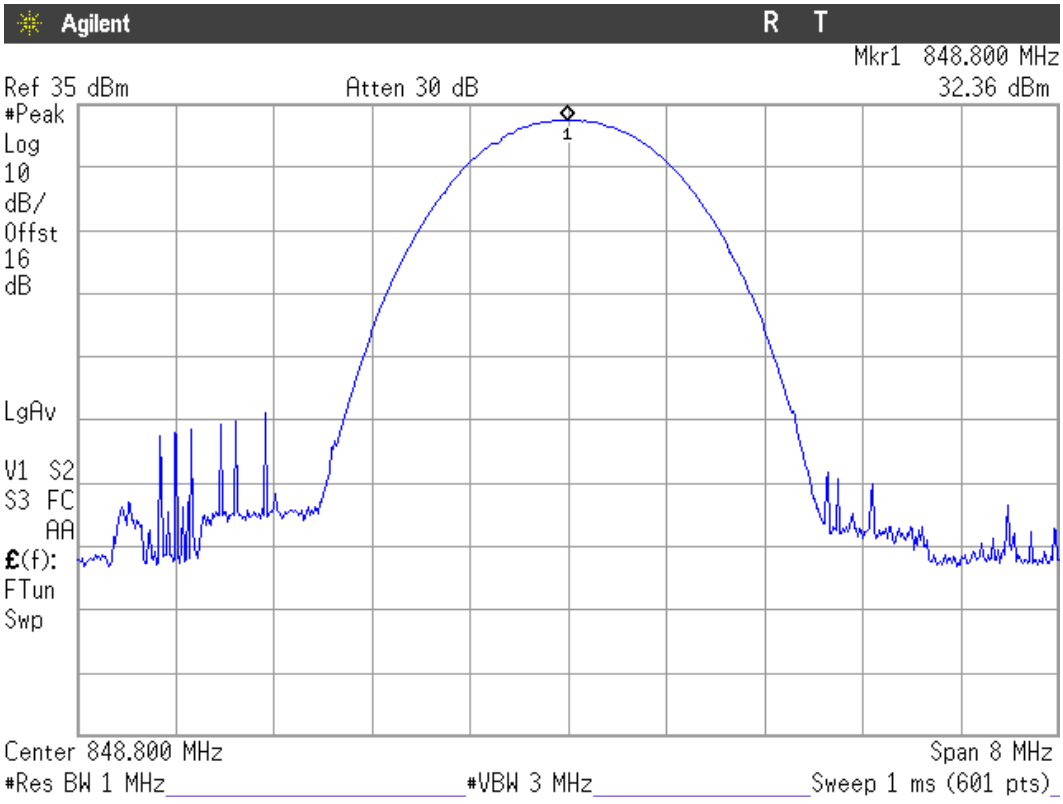
Lowest Channel.



Middle Channel.

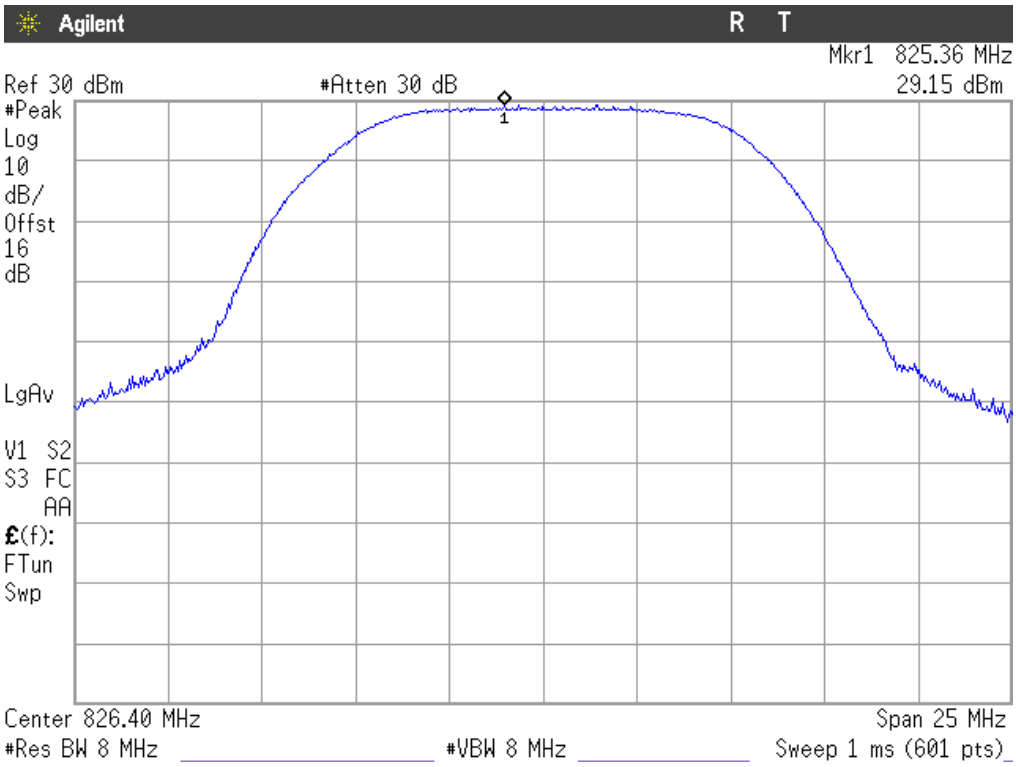


Highest Channel.

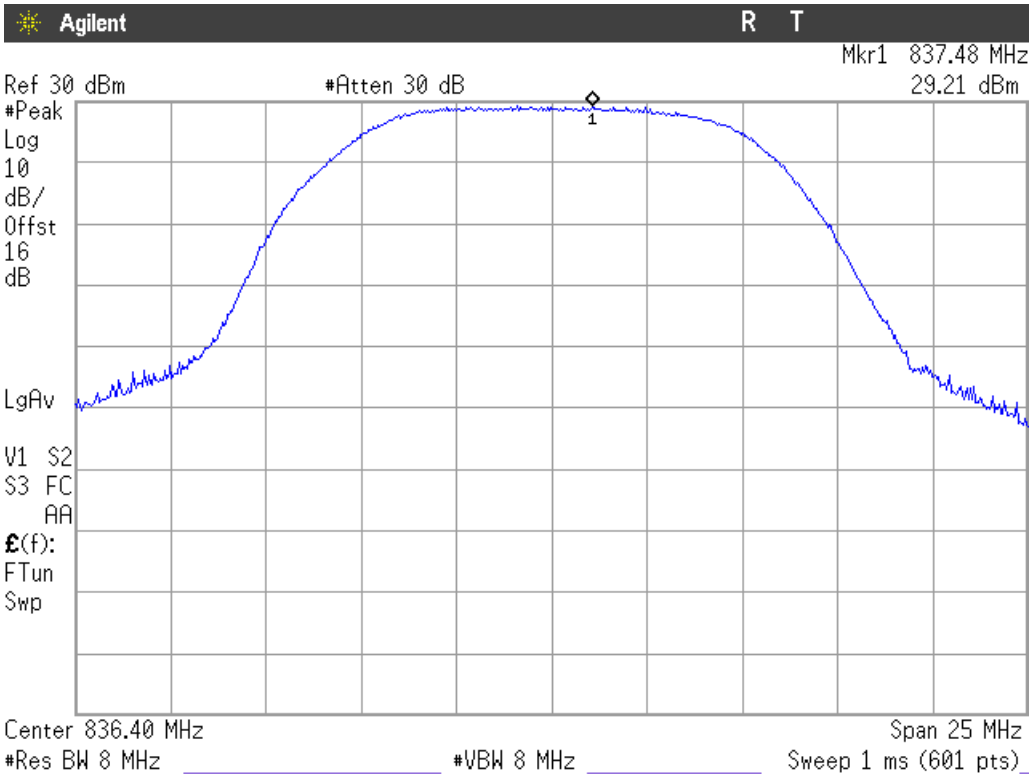


WCDMA MODULATION

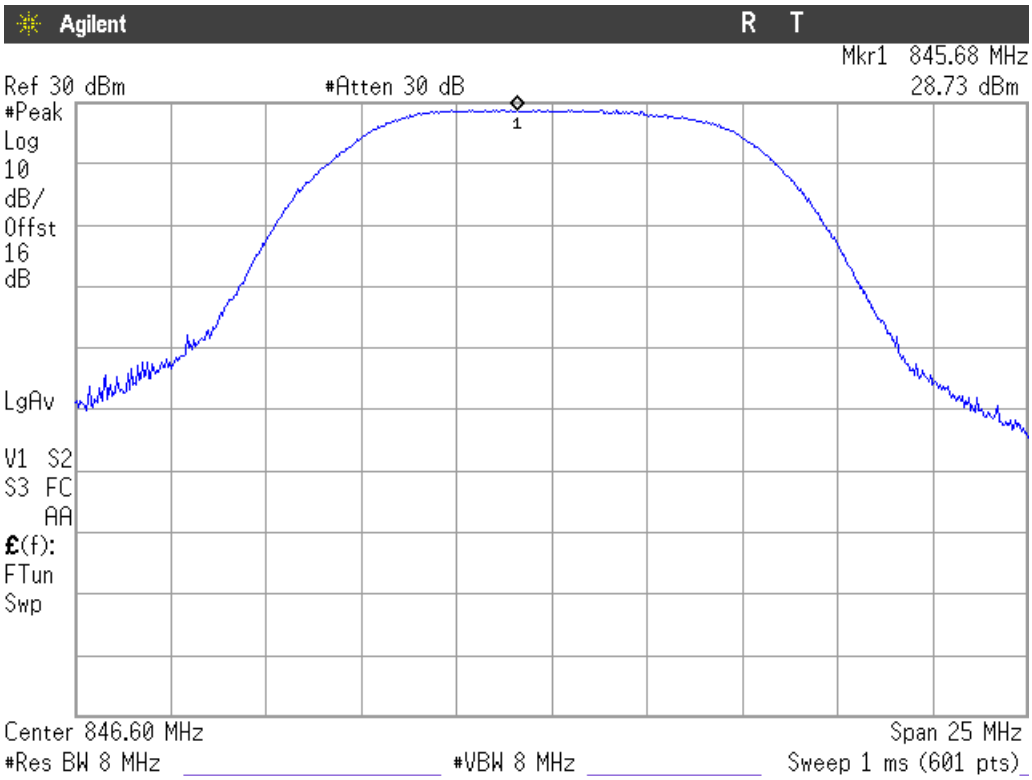
Lowest Channel.



Middle Channel.



Highest Channel.



Modulation Characteristics

SPECIFICATION

§2.1047

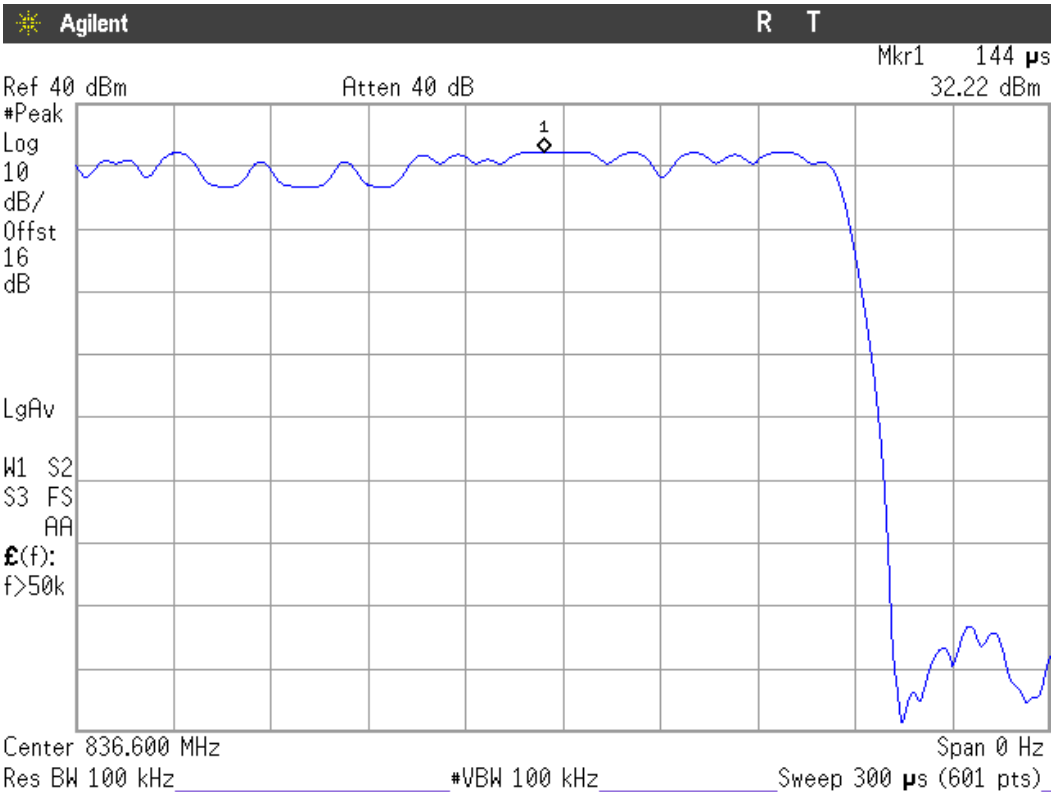
METHOD

The EUT operates with GPRS (GMSK), EDGE (GMSK/8-PSK) and WCDMA/HSDPA (QPSK) modes, in which the information is digitised and coded into a bit stream.

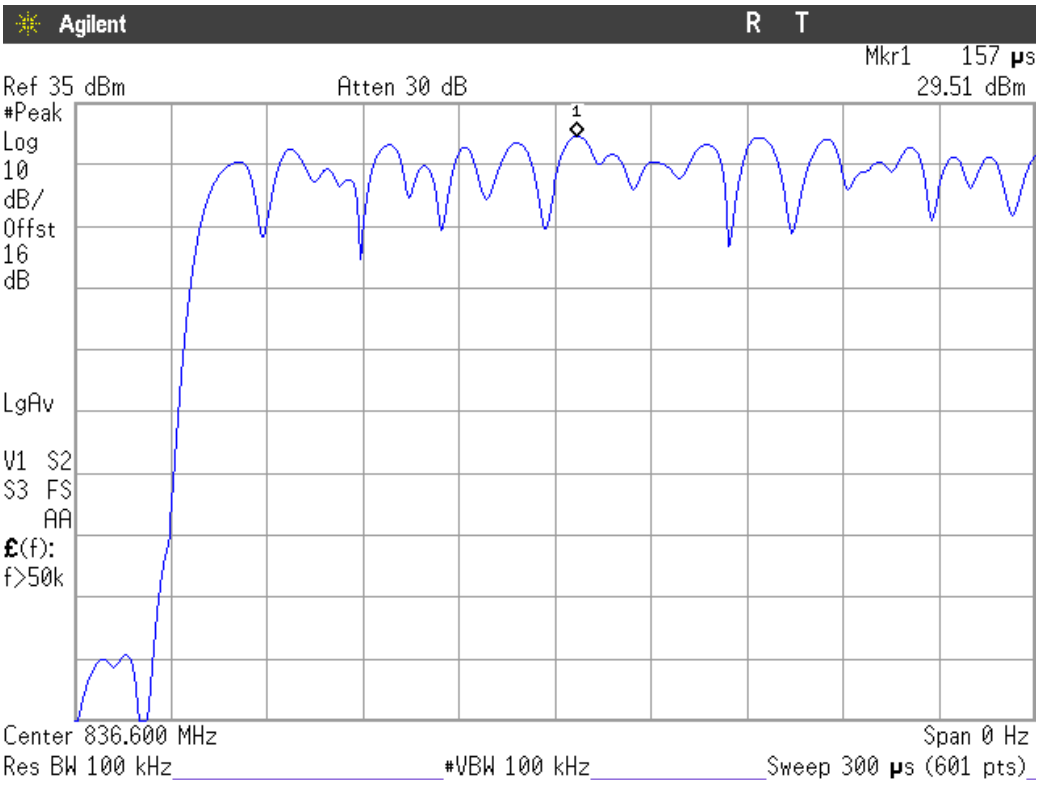
RESULTS

The following plot shows the modulation schemes in the EUT.

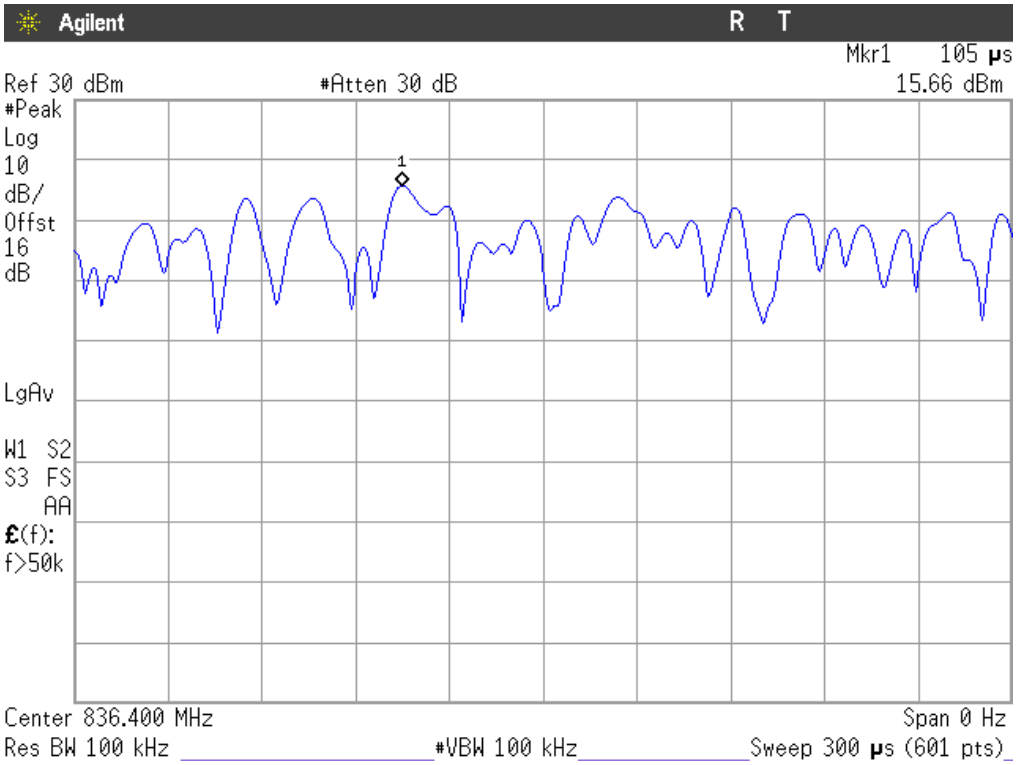
GPRS MODULATION



EDGE MODULATION



WCDMA MODULATION



Frequency Stability

SPECIFICATION

§2.1055 and §22.355

METHOD

The frequency tolerance measurements over temperature variations were made over the temperature range of –30ºC to +50ºC. The EUT was placed inside a climatic chamber and the temperature was raised hourly in 10ºC steps from –30ºC up to +50ºC.

The EUT was set in "call mode" in the middle channel using the Universal Radio Communication tester R&S CMU200 (for modulations GPRS, EDGE and WCDMA) and the maximum frequency error was measured using the frequency meter of CMU200.

RESULTS

Frequency stability over temperature variations.

GPRS MODULATION

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	-17	-0.0203	-0.00000203
+40	-13	-0.0155	-0.00000155
+30	-10	-0.0120	-0.00000120
+20	-12	-0.0143	-0.00000143
+10	-8	-0.0096	-0.00000096
0	-14	-0.0167	-0.00000167
-10	-15	-0.0179	-0.00000179
-20	-13	-0.0155	-0.00000155
-30	-10	-0.0120	-0.00000120

EDGE MODULATION

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	-14	-0.0167	-0.00000167
+40	-15	-0.0179	-0.00000179
+30	-12	-0.0143	-0.00000143
+20	-15	-0.0179	-0.00000179
+10	-17	-0.0203	-0.00000203
0	-9	-0.0108	-0.00000108
-10	-10	-0.0120	-0.00000120
-20	-11	-0.0131	-0.00000131
-30	-9	-0.0108	-0.00000108

WCDMA MODULATION

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	8	0.0096	0.00000096
+40	6	0.0072	0.00000072
+30	5	0.0060	0.00000060
+20	4	0.0048	0.00000048
+10	5	0.0060	0.00000060
0	4	0.0048	0.00000048
-10	6	0.0072	0.00000072
-20	6	0.0072	0.00000072
-30	2	0.0024	0.00000024

Frequency stability over voltage variations.

GPRS MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	-13	-0.0155	-0.00000155
Vmin	3.5	-11	-0.0131	-0.00000131

EDGE MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	-15	-0.0179	-0.00000179
Vmin	3.5	5	0.0060	0.00000060

WCDMA MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	7	0.0084	0.00000084
Vmin	3.5	4	0.0048	0.00000048

Occupied Bandwidth

SPECIFICATION

§2.1049

METHOD

The EUT was configured to transmit a modulated carrier signal. An IF bandwidth of 3 kHz was used to determined the occupied bandwidth of the modulated emission for GPRS and EDGE modulation and 51 kHz for WCDMA modulation.

RESULTS

GPRS MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	276.7	279.9	275.5
-26 dBc bandwidth (kHz)	313.8	315.3	312.7
Measurement uncertainty (kHz)	<±6.5		

EDGE MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	254.8	268.0	265.3
-26 dBc bandwidth (kHz)	307.0	308.5	310.9
Measurement uncertainty (kHz)	<±6.5		

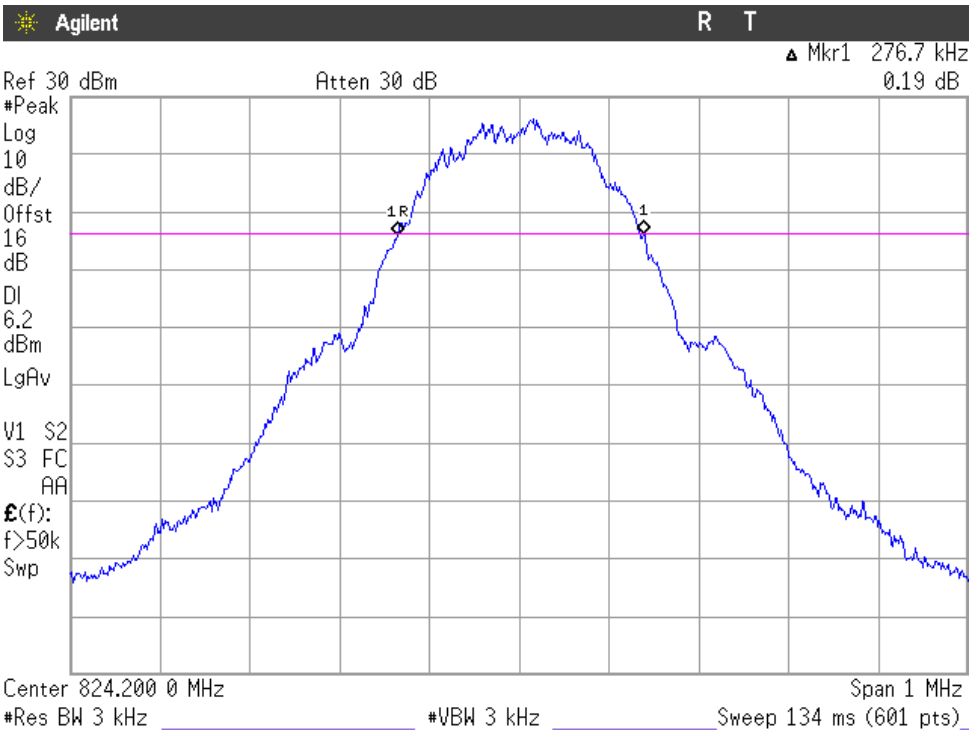
WCDMA MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	4560	4560	4547
-26 dBc bandwidth (kHz)	4667	4693	4680
Measurement uncertainty (kHz)	<±52		

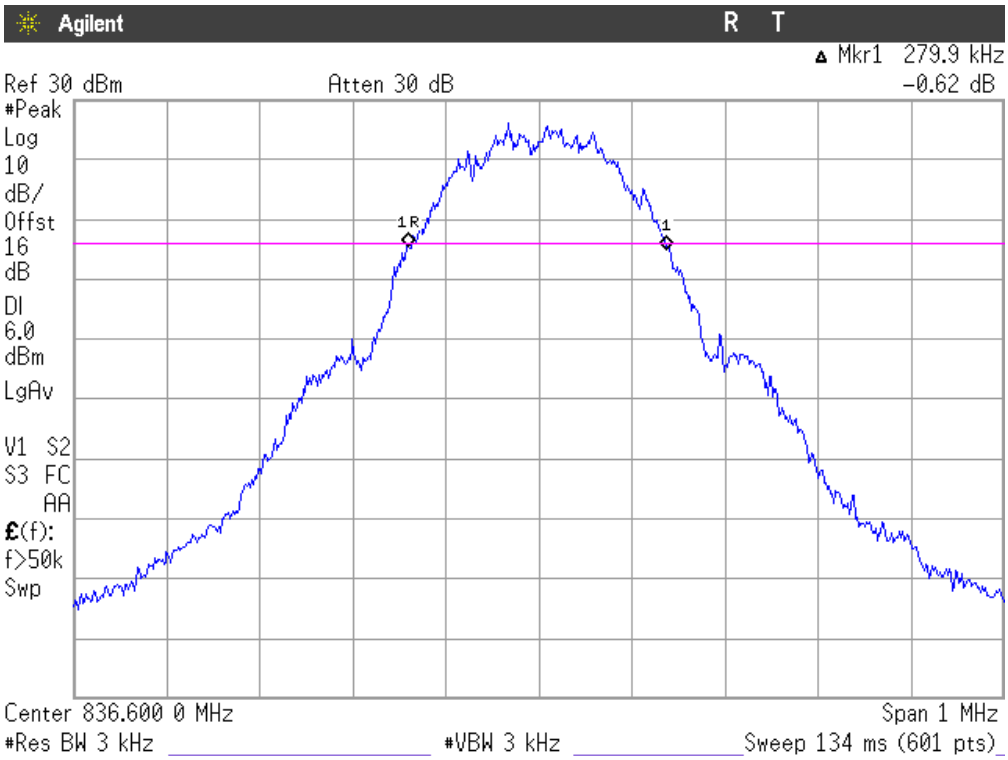
99% OCCUPIED BANDWIDTH

GPRS MODULATION

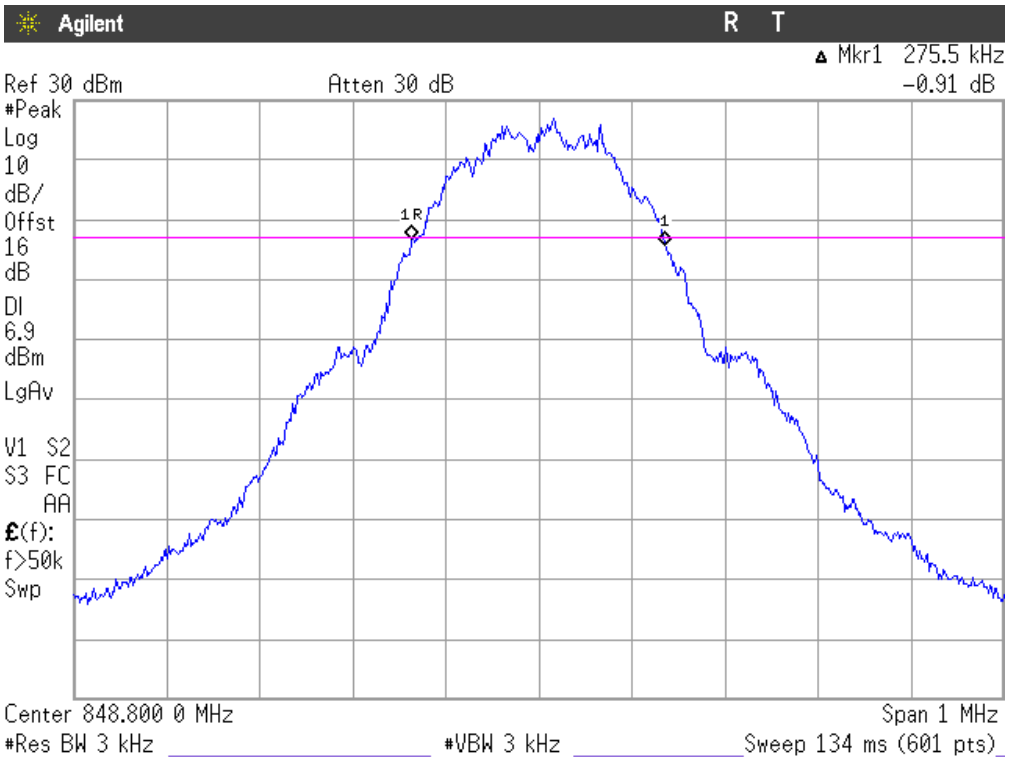
Lowest Channel



Middle Channel

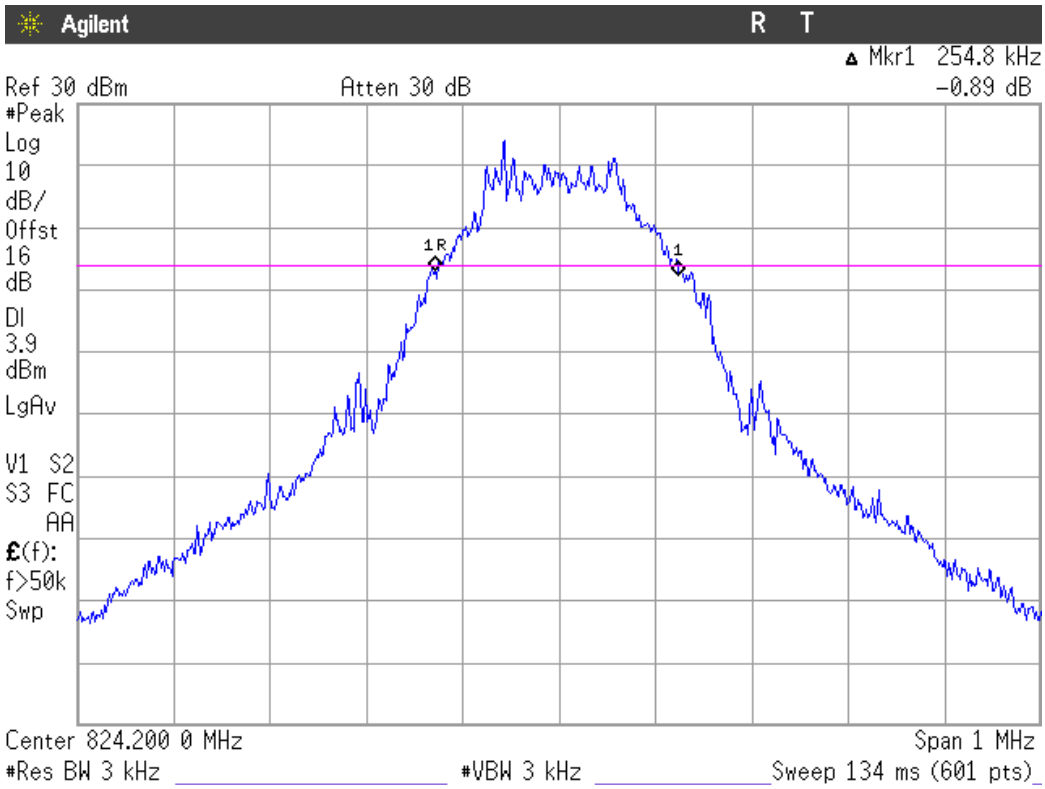


Highest Channel

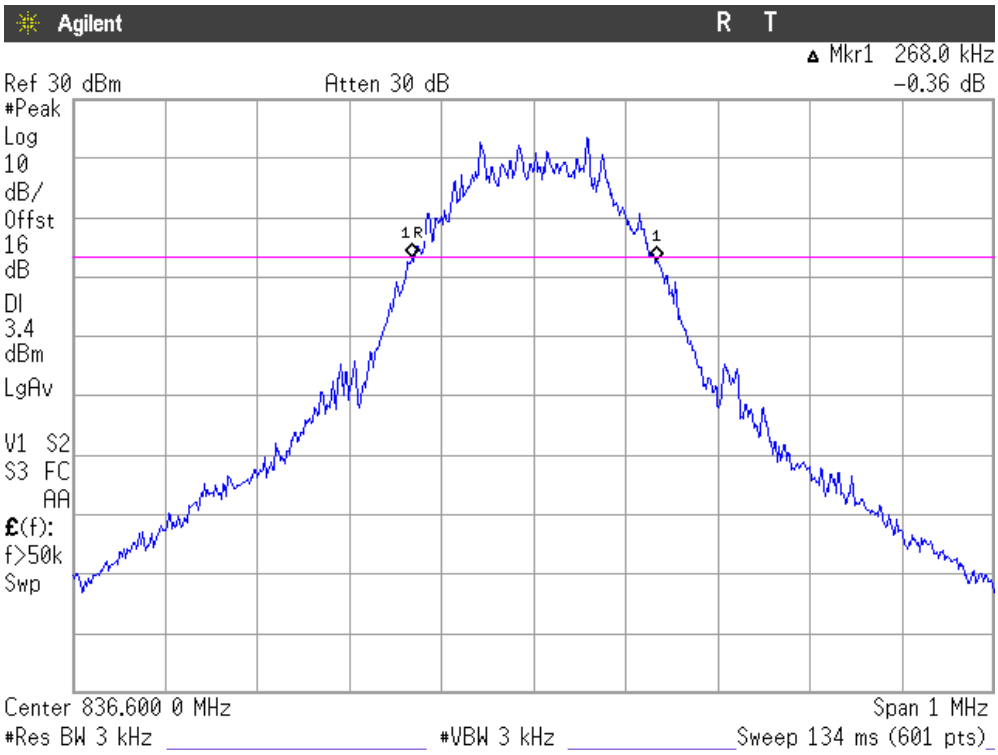


EDGE MODULATION

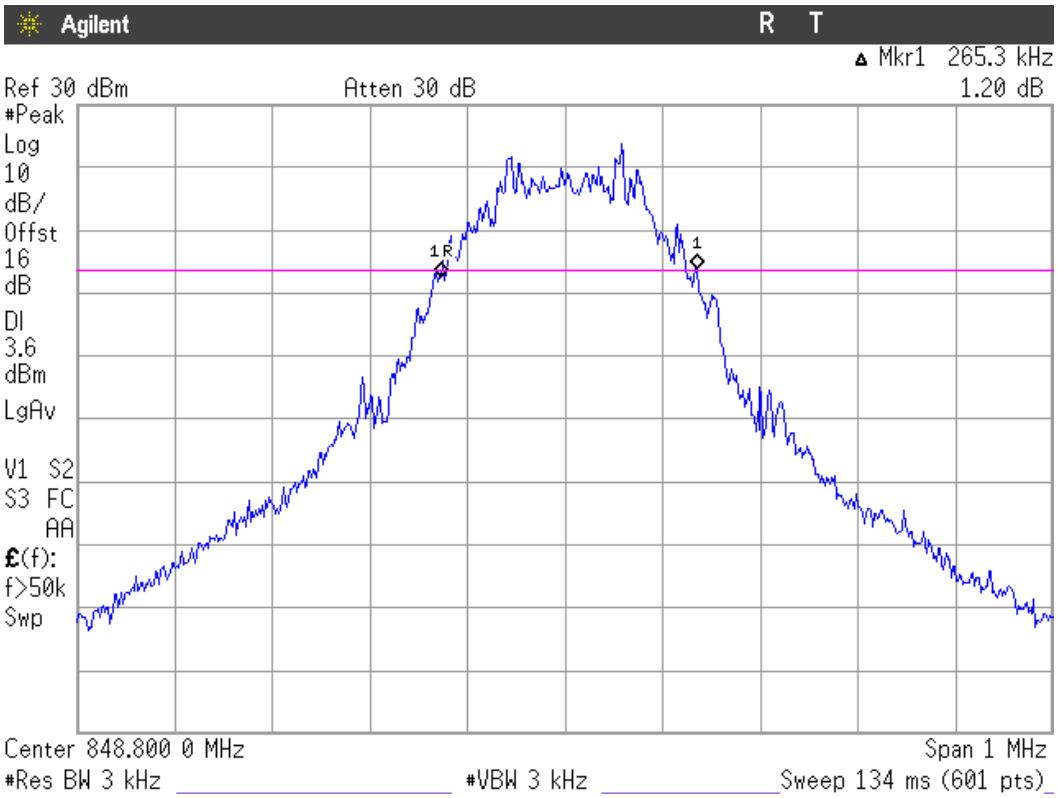
Lowest Channel



Middle Channel

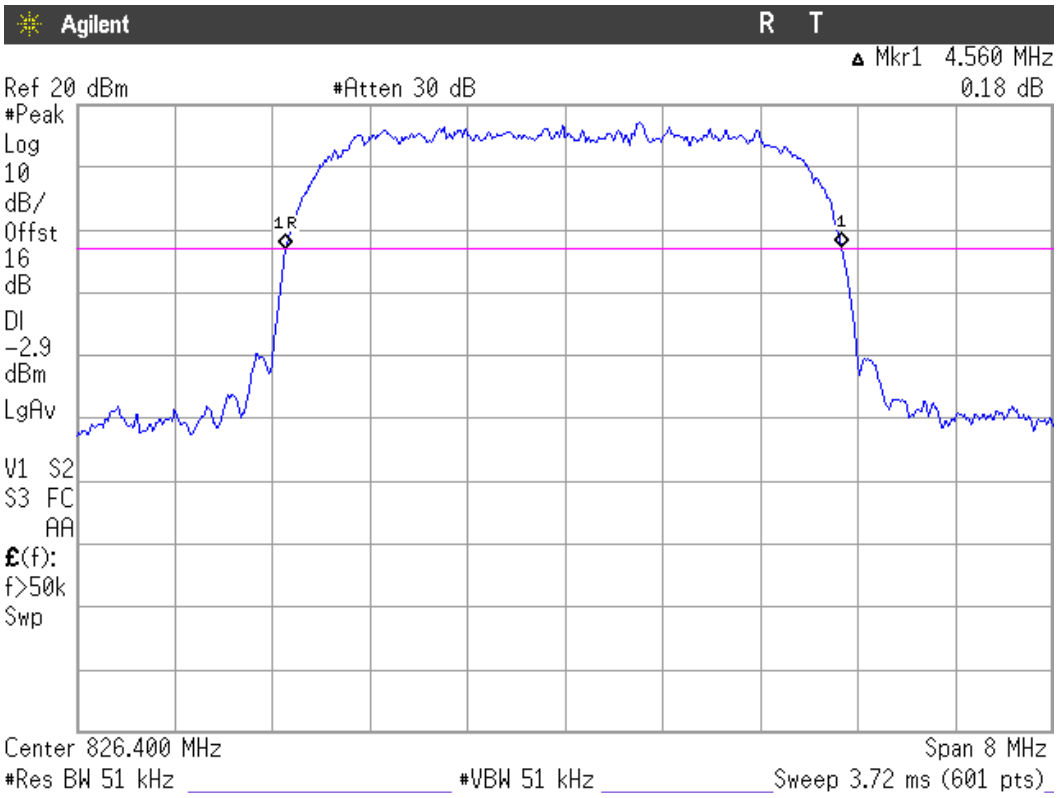


Highest Channel

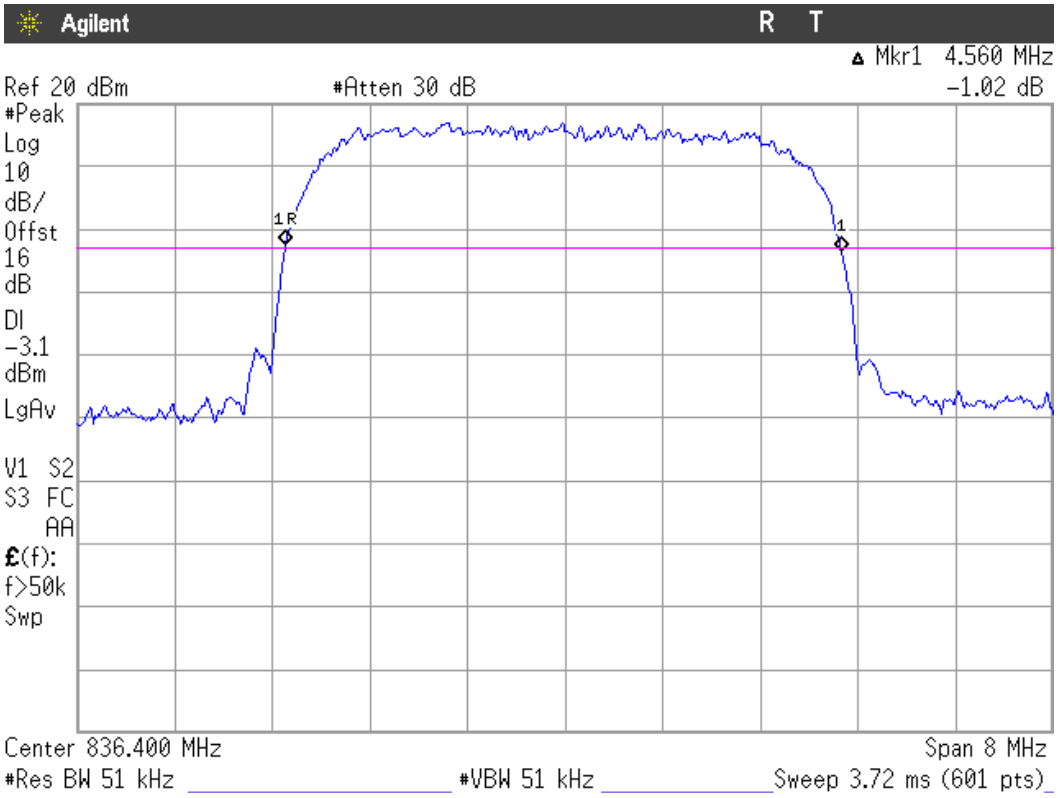


WCDMA MODULATION

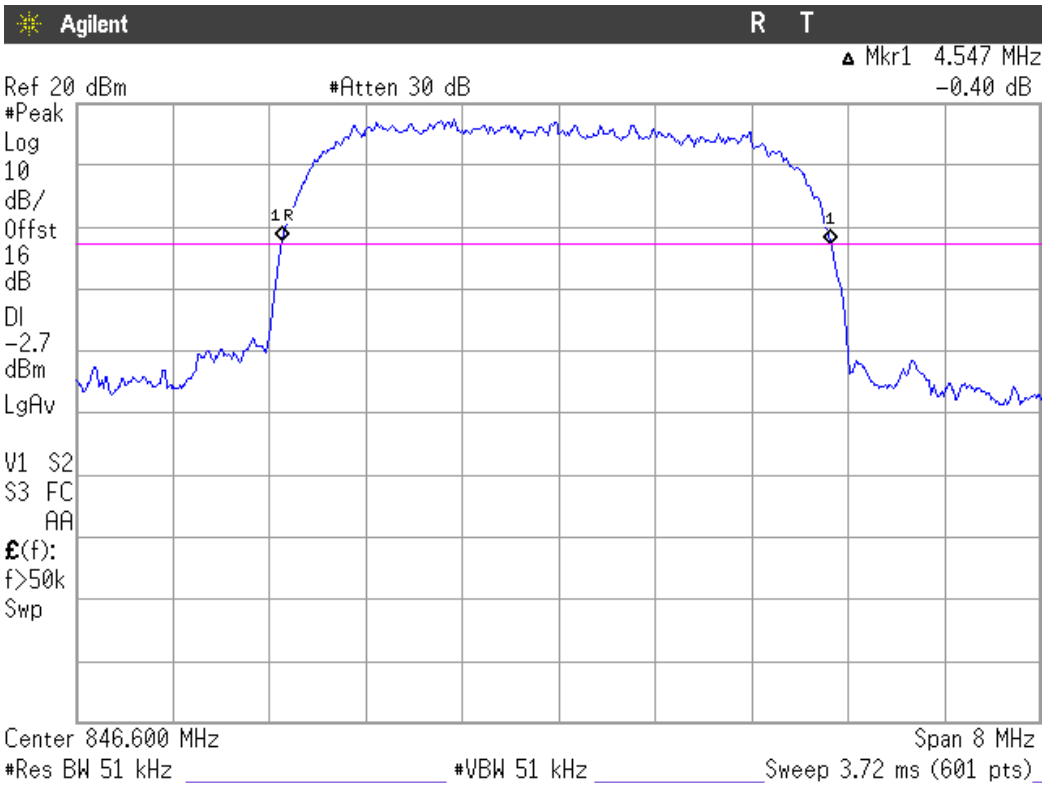
Lowest Channel



Middle Channel



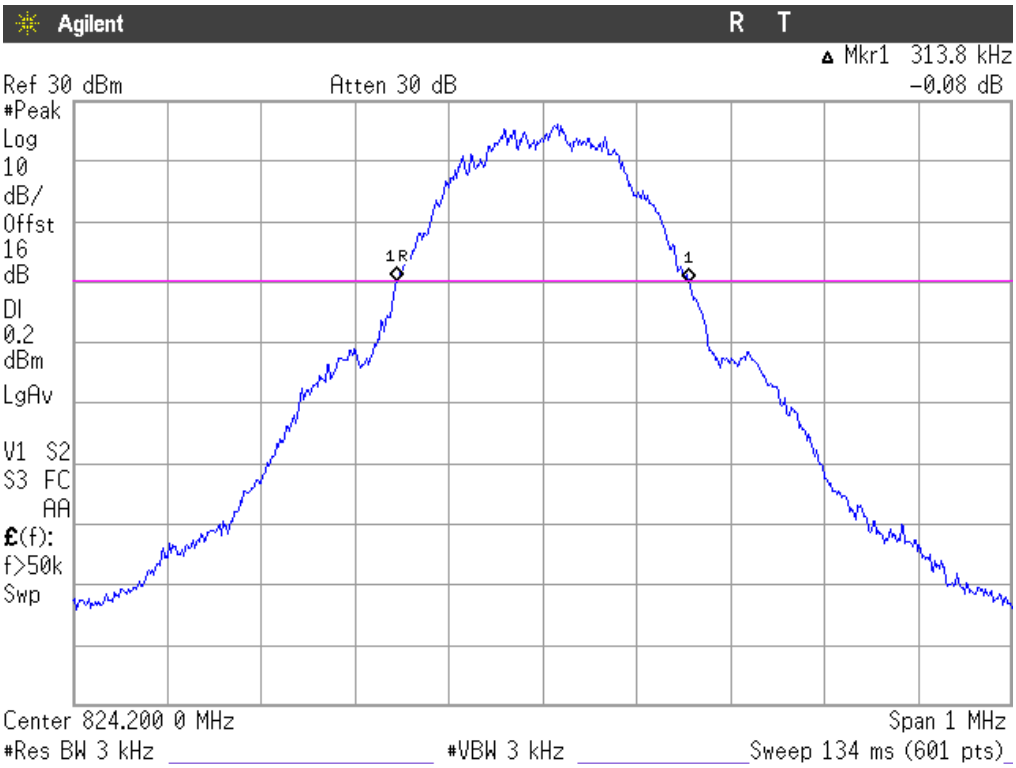
Highest Channel



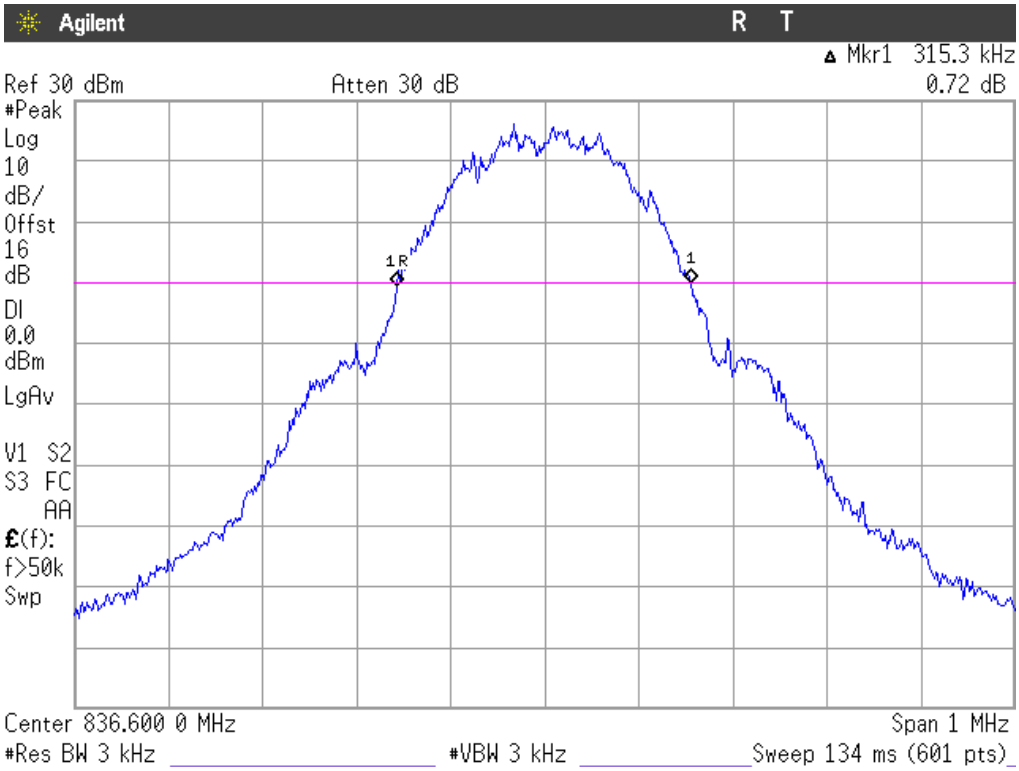
-26 dBc BANDWIDTH

GPRS MODULATION

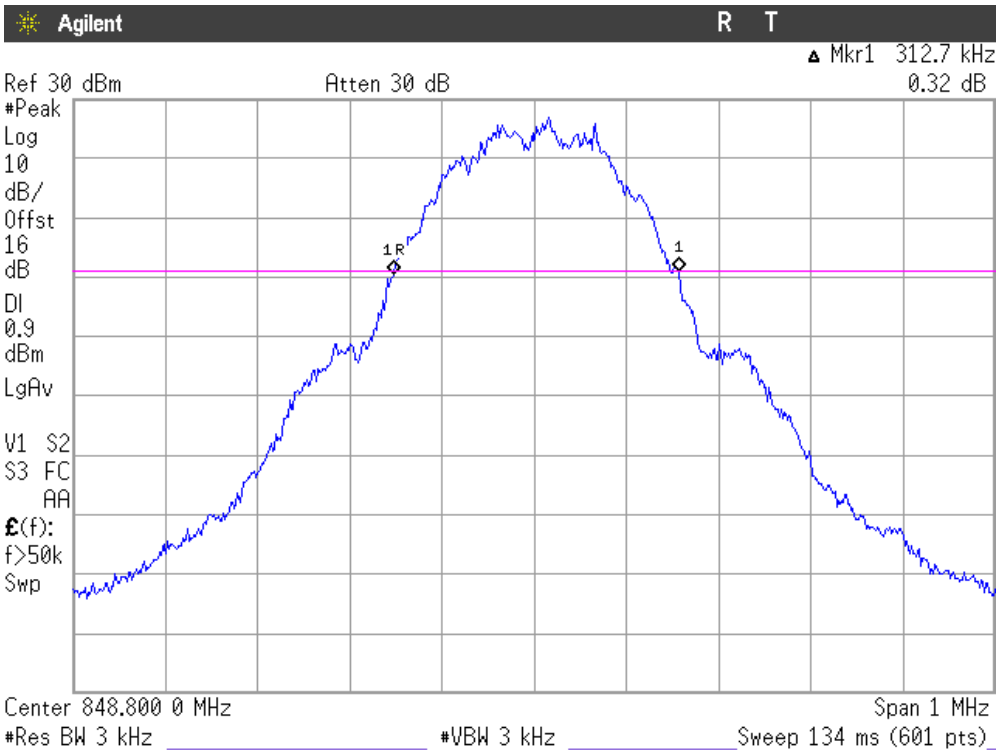
Lowest Channel



Middle Channel

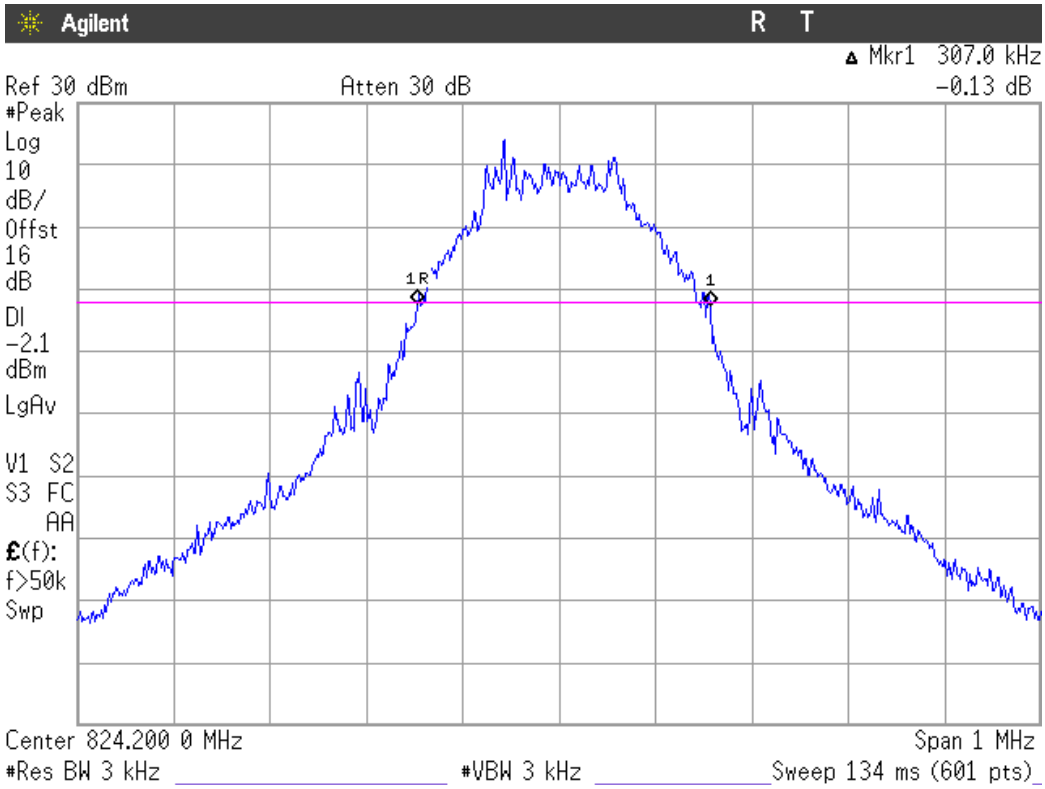


Highest Channel

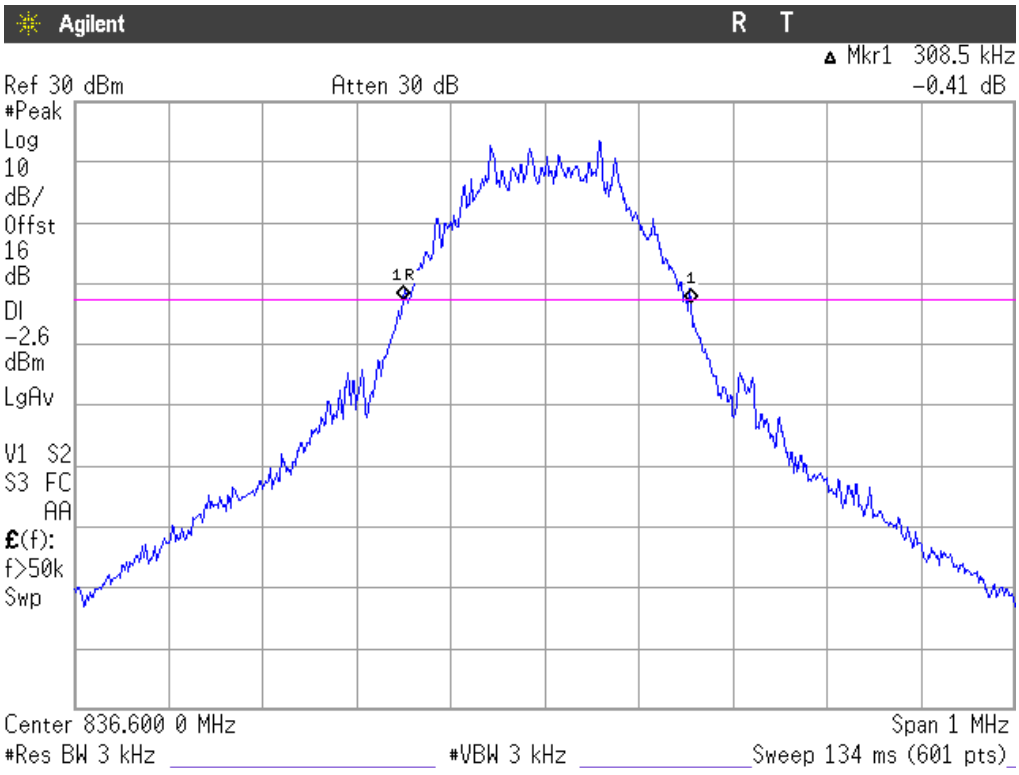


EDGE MODULATION

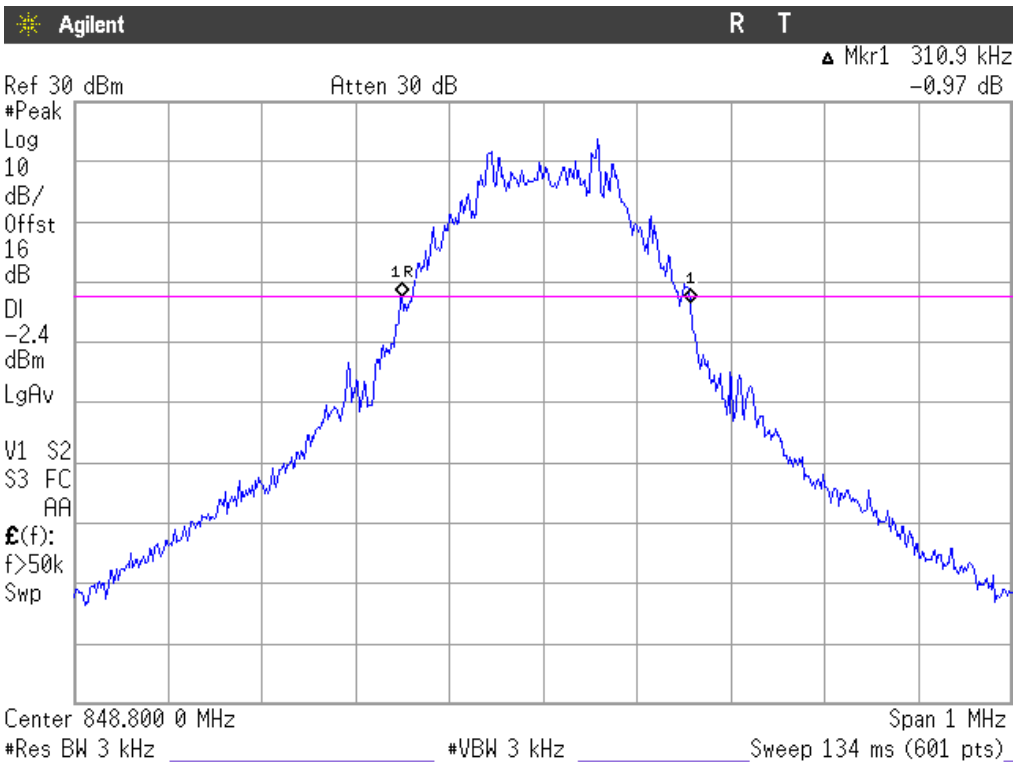
Lowest Channel



Middle Channel

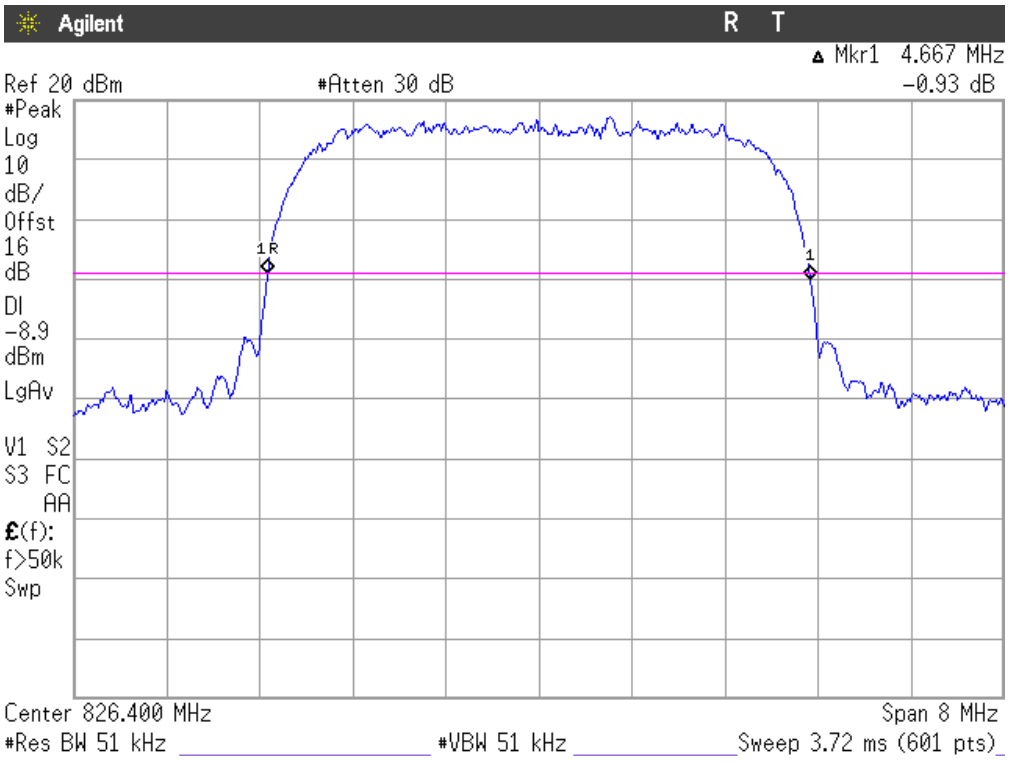


Highest Channel

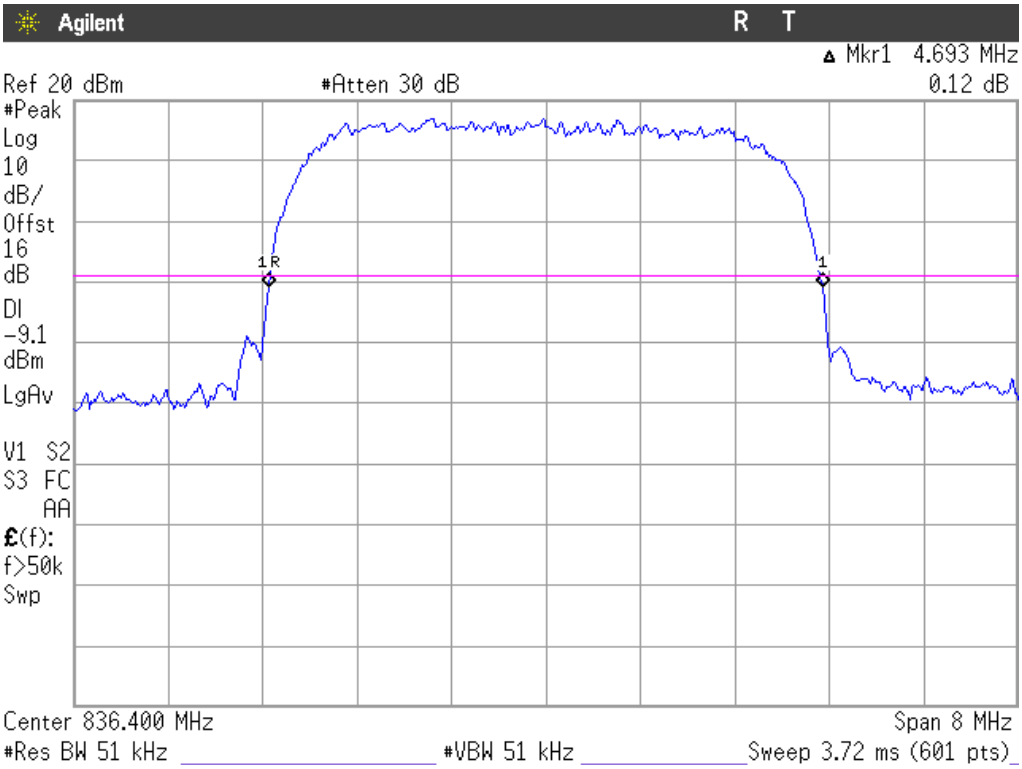


WCDMA MODULATION

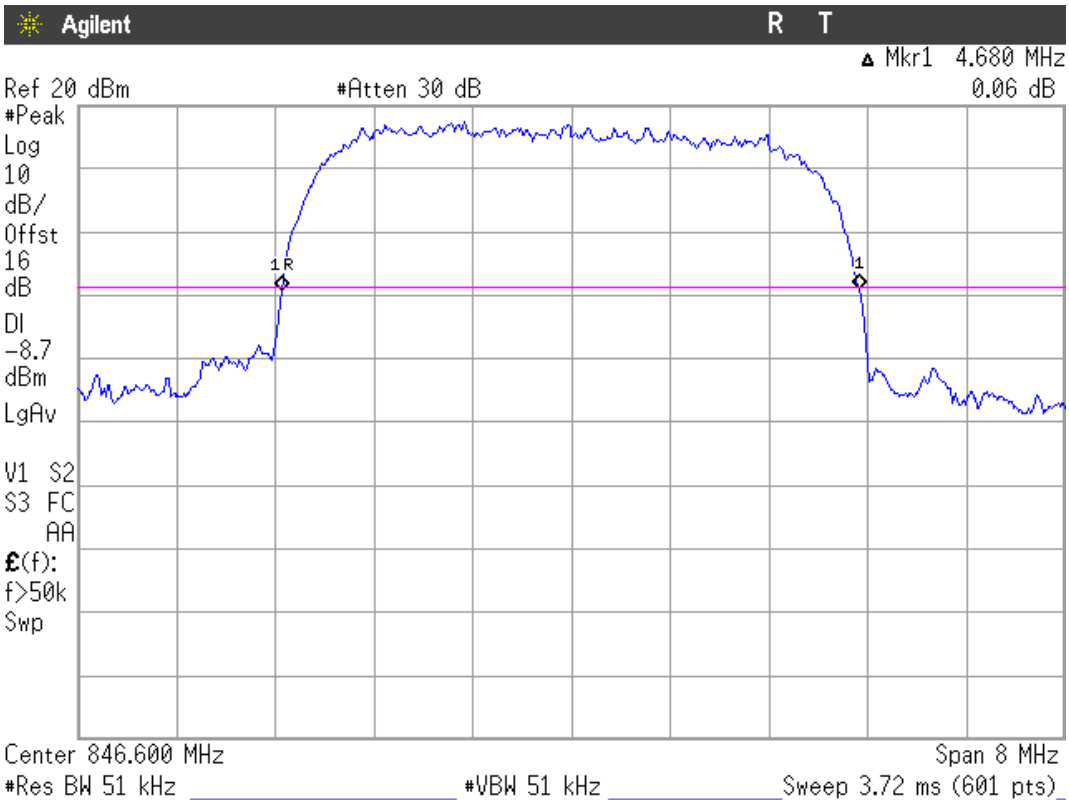
Lowest Channel



Middle Channel



Highest Channel



Spurious emissions at antenna terminals

SPECIFICATION

§2.1051 and §22.917

METHOD

The EUT RF output connector was connected to an spectrum analyser using an 50 ohm attenuator and the resolution bandwidth of the spectrum analyser was set to at least 100 kHz. The spectrum was investigated from 30 MHz to 10 GHz.

The reading of the spectrum analyser is corrected with the attenuation loss of connection between output terminal of EUT and input of the spectrum analyser.

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 (see plots in next pages)

GPRS MODULATION

1. CHANNEL: LOWEST
No spurious signals were found in all the range.

2. CHANNEL: MIDDLE

No spurious signals were found in all the range.

3. CHANNEL: HIGHEST

No spurious signals were found in all the range.

EDGE MODULATION

1. CHANNEL: LOWEST
No spurious signals were found in all the range.

2. CHANNEL: MIDDLE

No spurious signals were found in all the range.

3. CHANNEL: HIGHEST

No spurious signals were found in all the range.

WCDMA MODULATION

1. CHANNEL: LOWEST
No spurious signals were found in all the range.

2. CHANNEL: MIDDLE

No spurious signals were found in all the range.

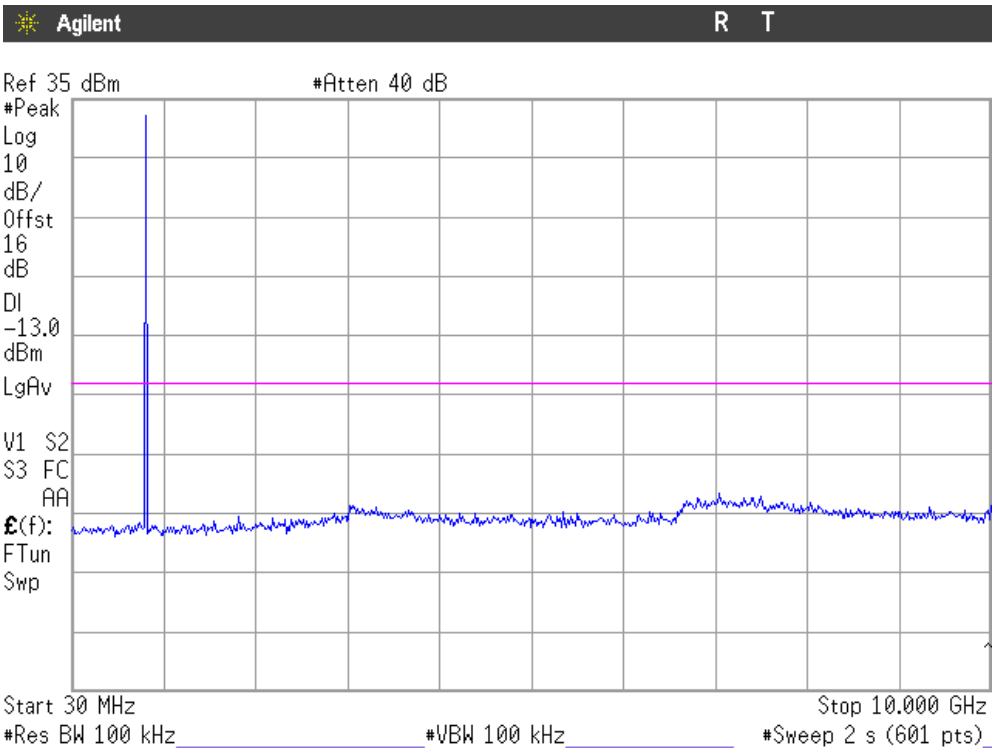
3. CHANNEL: HIGHEST

No spurious signals were found in all the range.

Verdict: PASS

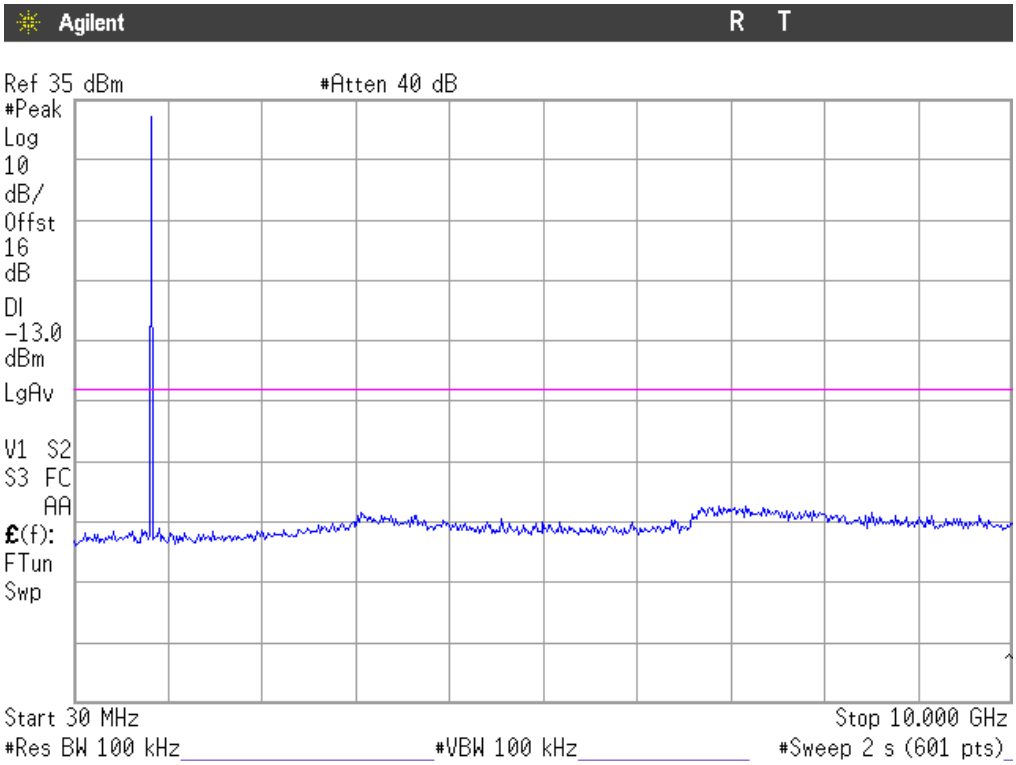
GPRS MODULATION

1. CHANNEL: LOWEST



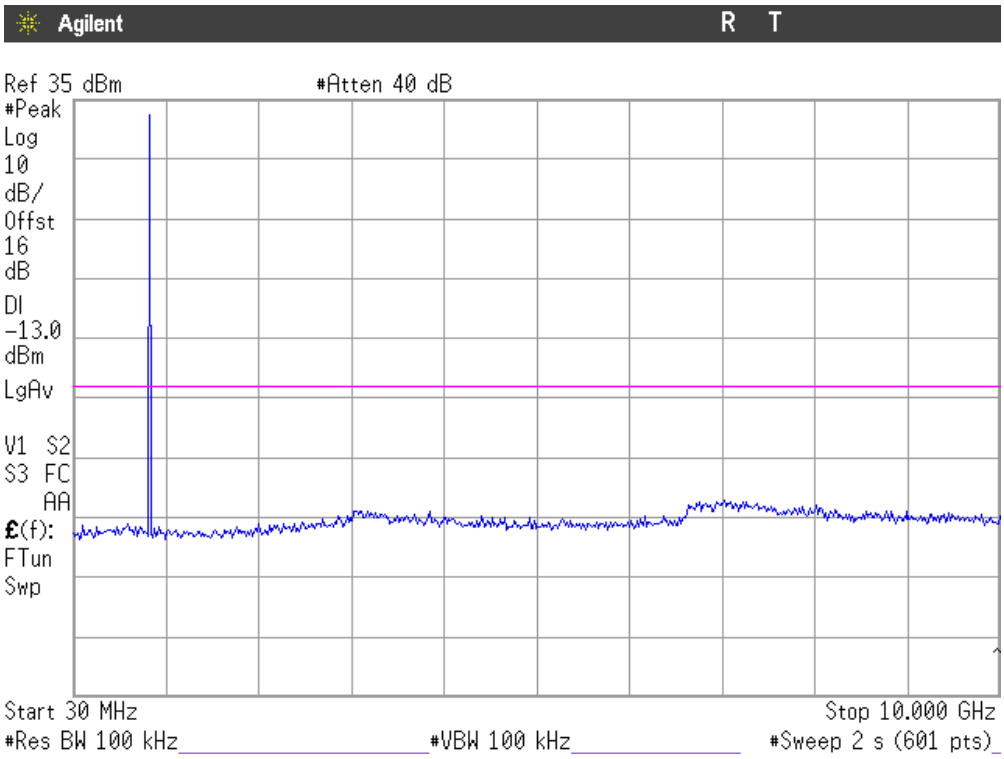
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



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

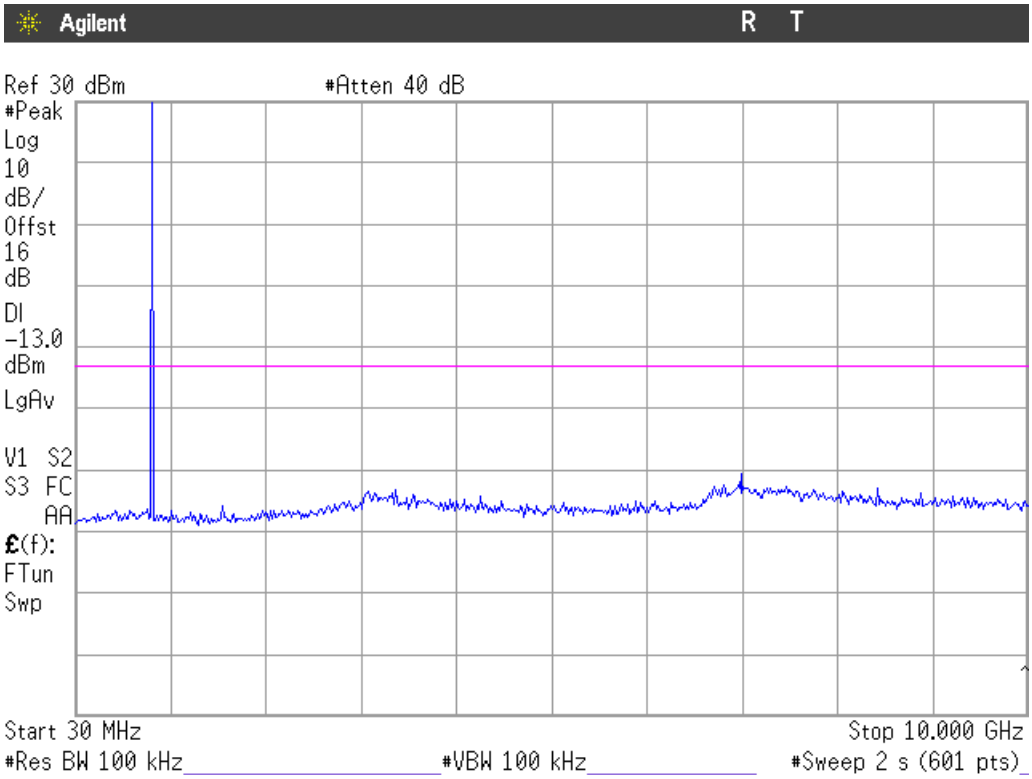
3. CHANNEL: HIGHEST



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

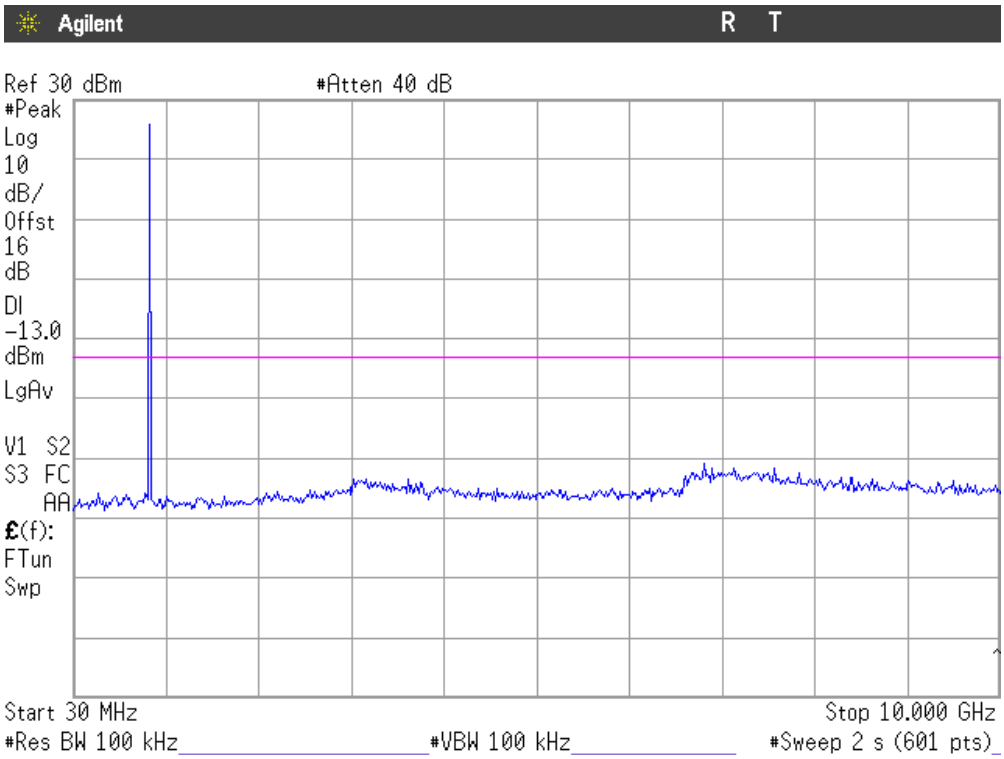
EDGE MODULATION

1. CHANNEL: LOWEST



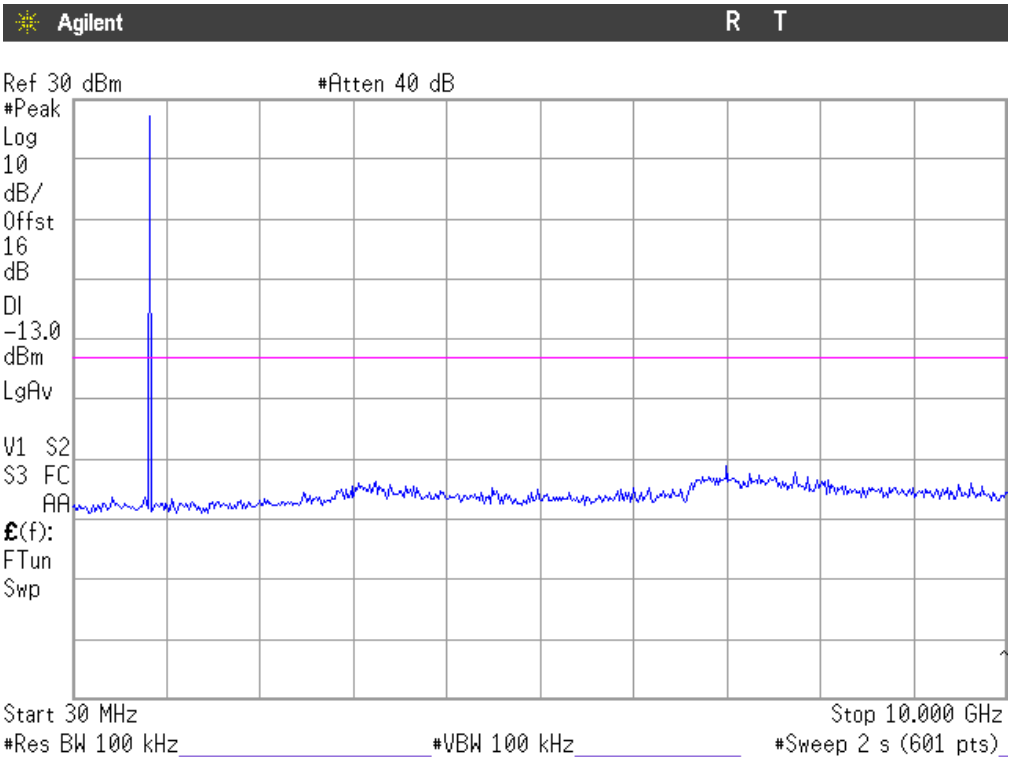
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



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

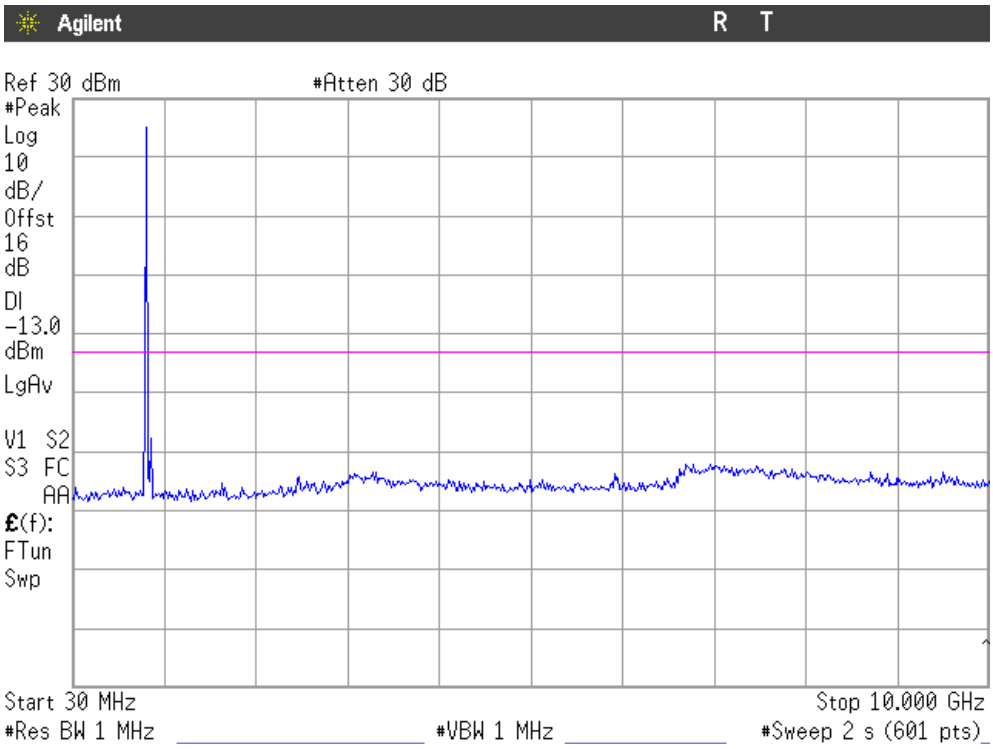
3. CHANNEL: HIGHEST



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

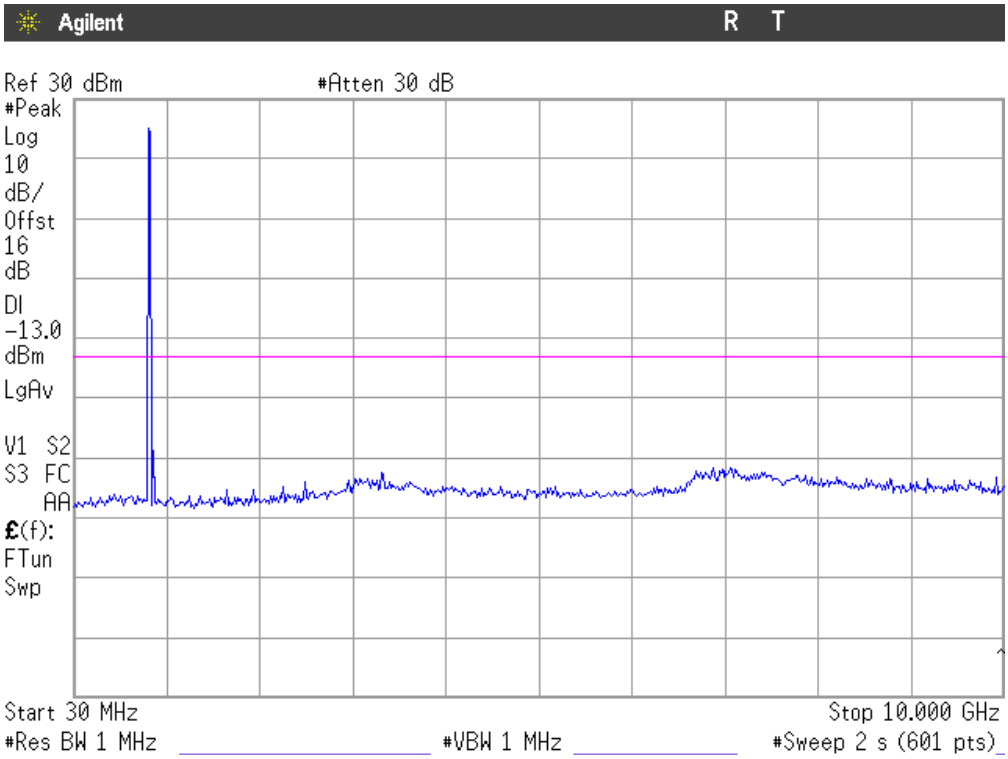
WCDMA MODULATION

1. CHANNEL: LOWEST



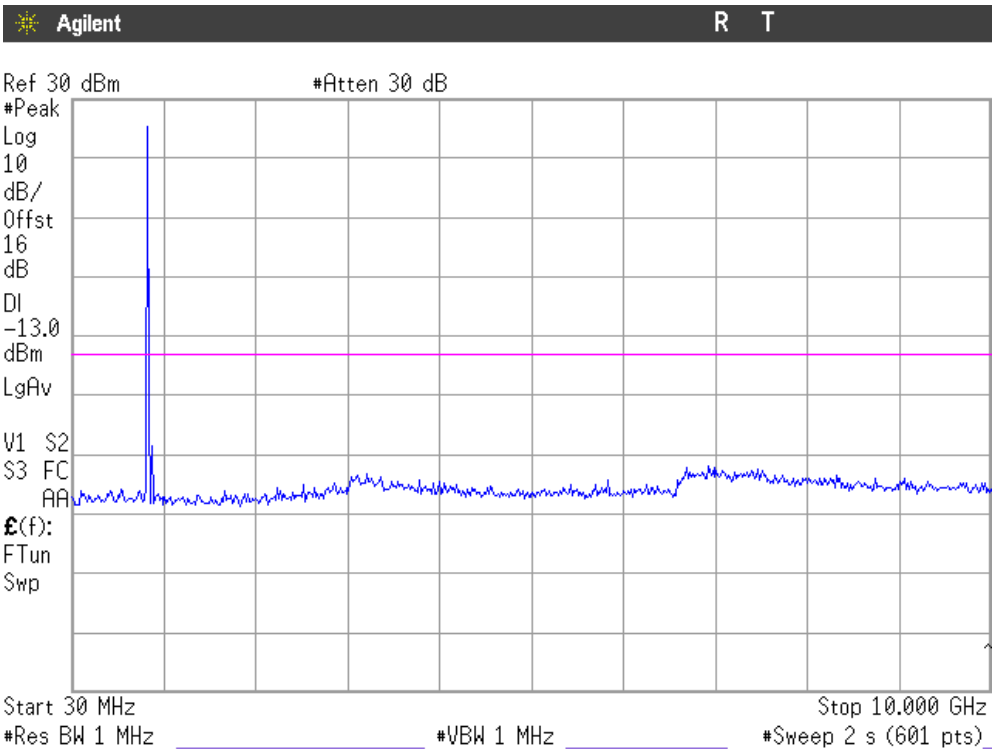
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



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

3. CHANNEL: HIGHEST



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

Spurious emissions at antenna terminals at Block Edges

SPECIFICATION

§2.1051 and §22.917

METHOD

As indicated in FCC part 22, in the 1 MHz bands immediately outside and adjacent to the frequency block or band a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A resolution bandwidth of 3.3 kHz was used for GPRS and EDGE modulations and 51 kHz for WCDMA modulation.

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

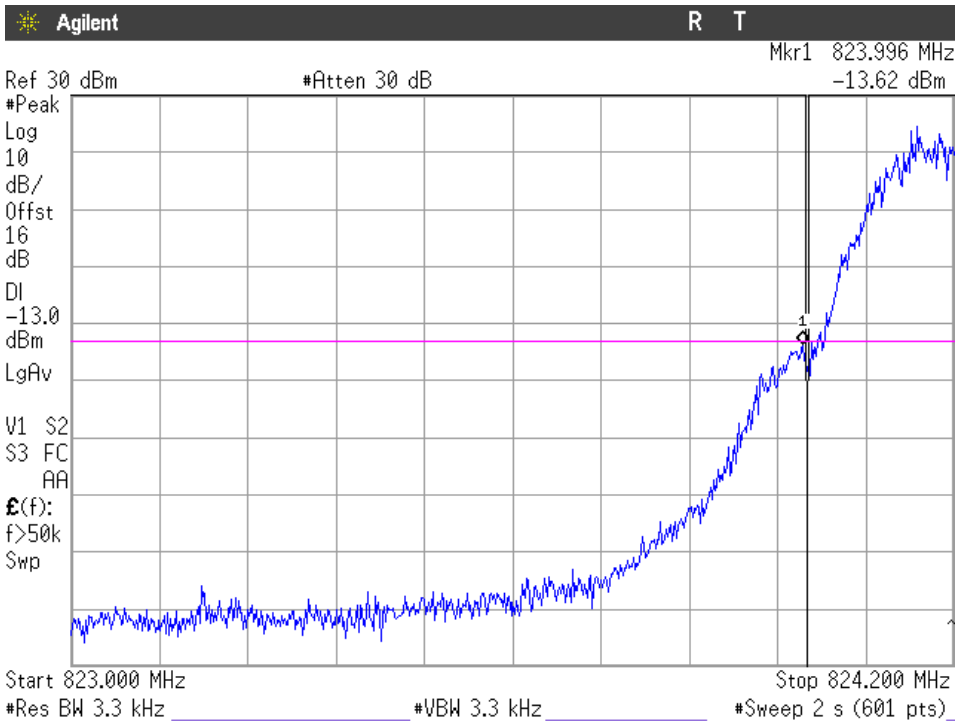
RESULTS (see plots in next pages)

MODULATION	Maximum level at lowest Block Edge (dBm)	Maximum level at highest Block Edge (dBm)
GPRS	-13.62	-13.64
EDGE	-18.69	-13.77
WCDMA	-19.57	-20.85

Measurement uncertainty = ±1.57 dB.

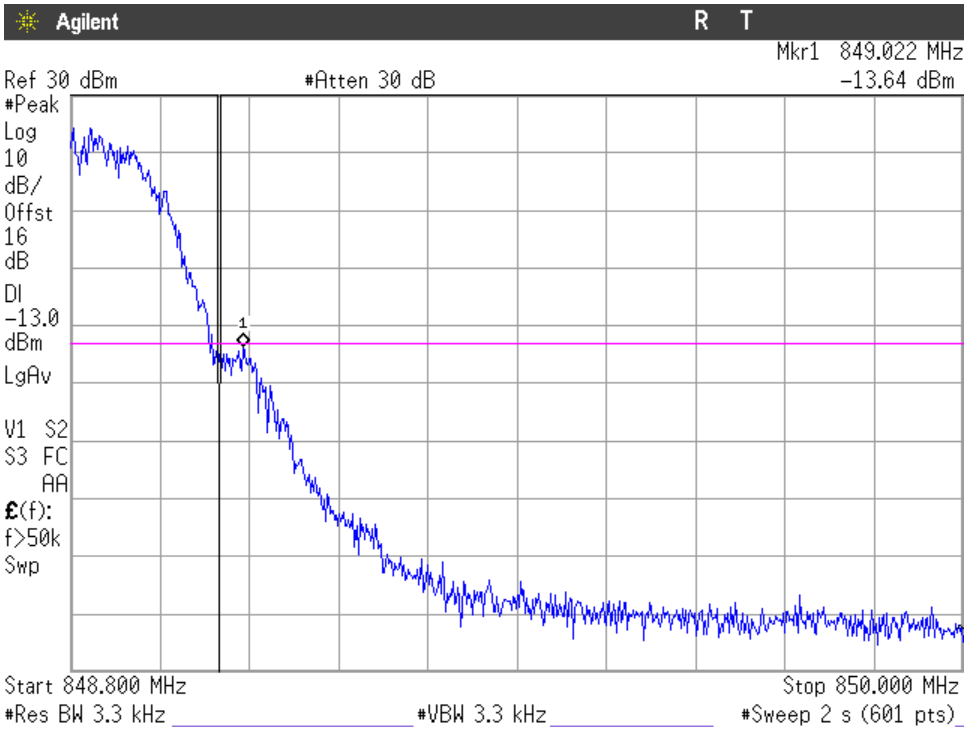
GPRS MODULATION

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

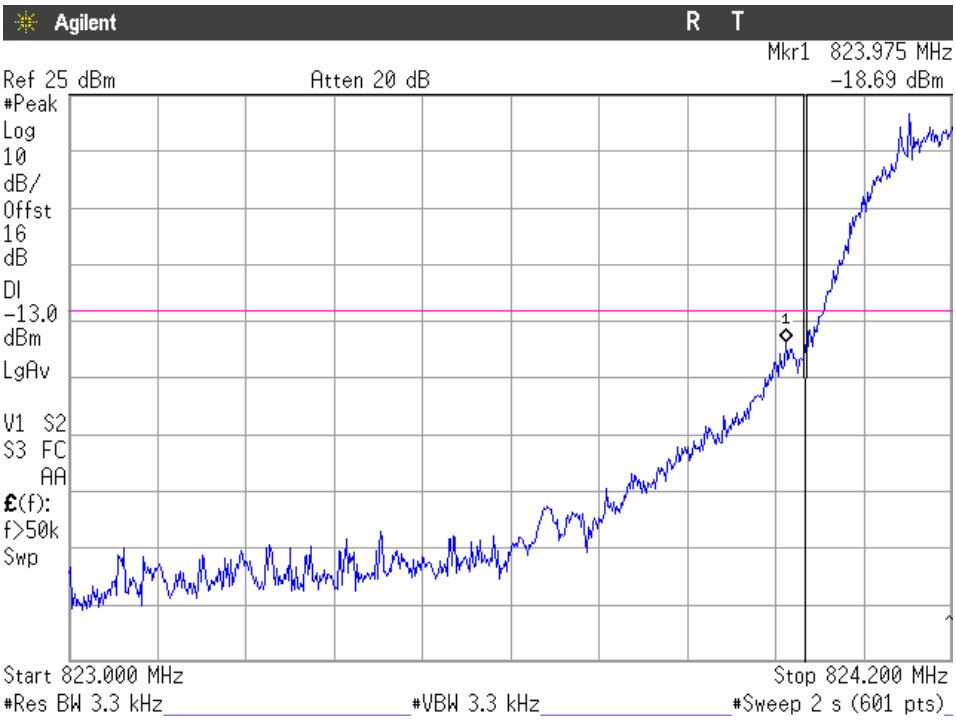


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

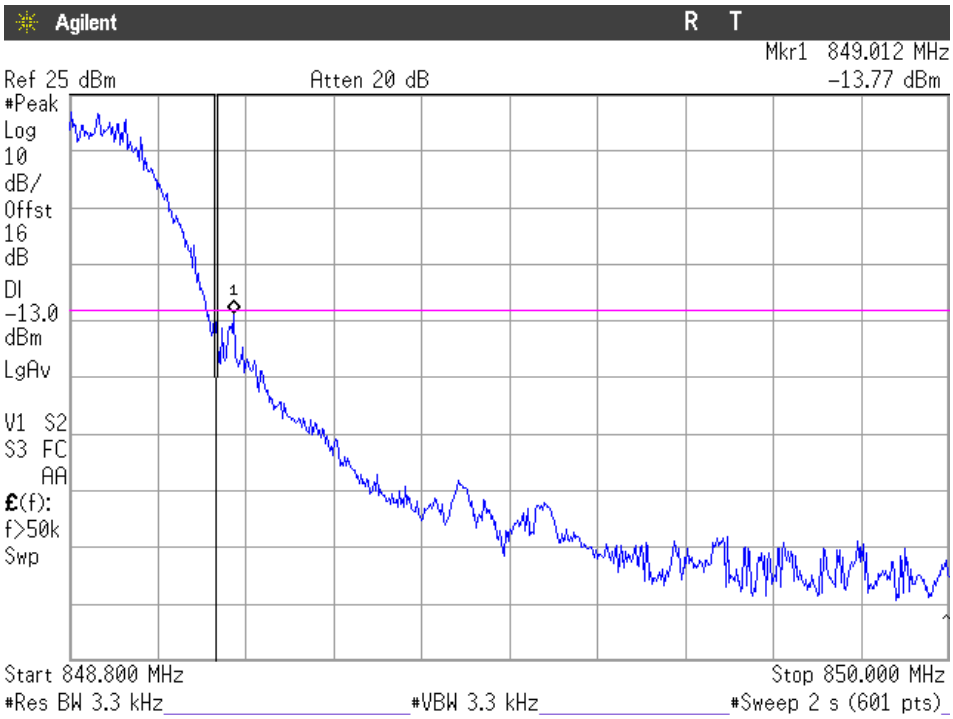
EDGE MODULATION

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

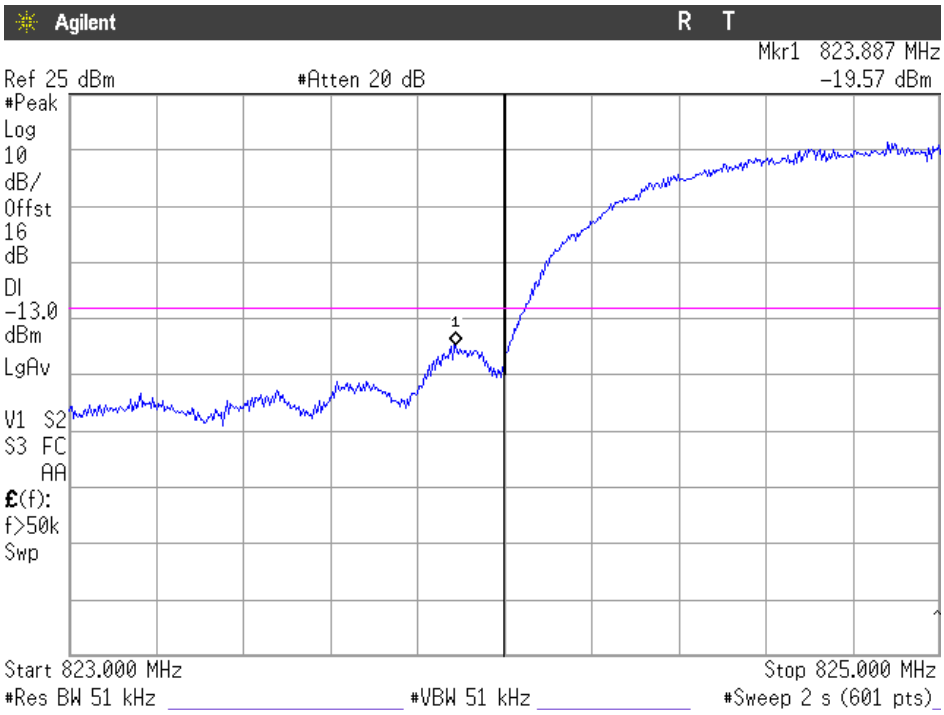


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

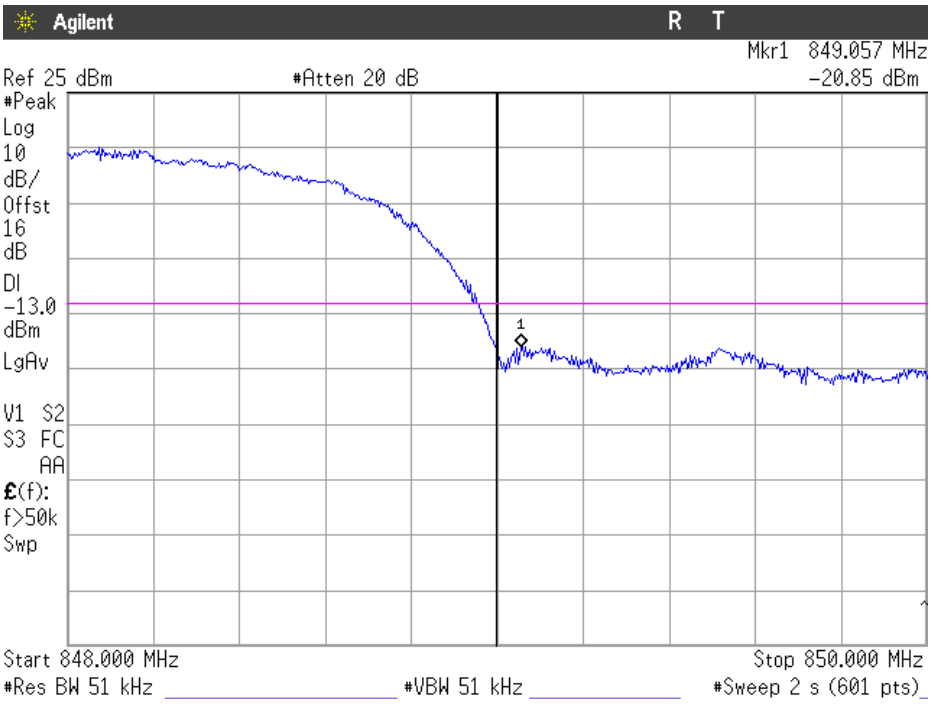
WCDMA MODULATION

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

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

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

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

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 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.
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-12.75 GHz.

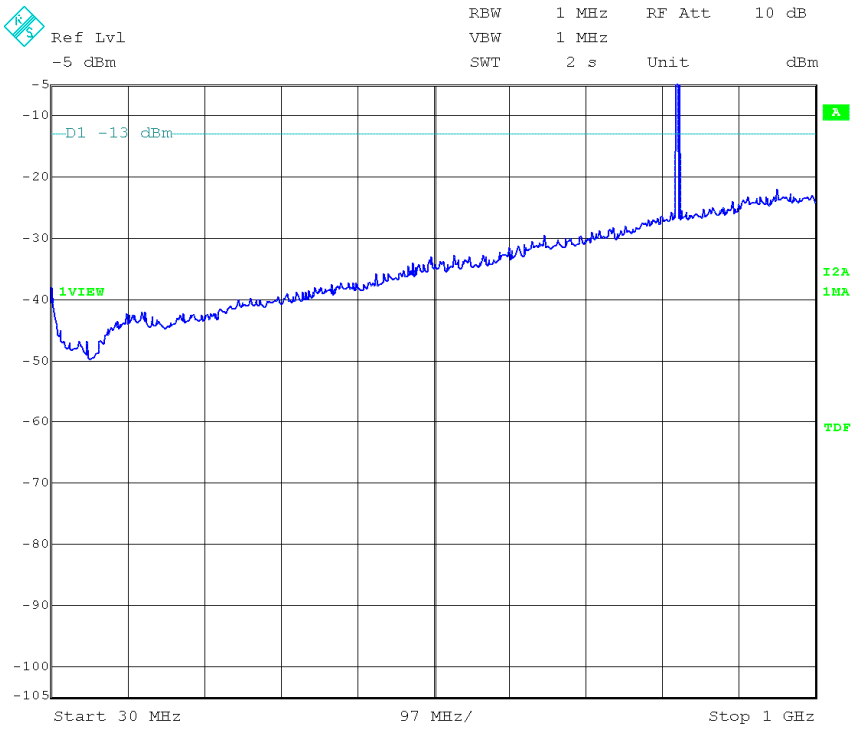
No spurious signals were found in all the range.

Verdict: PASS

GPRS MODULATION

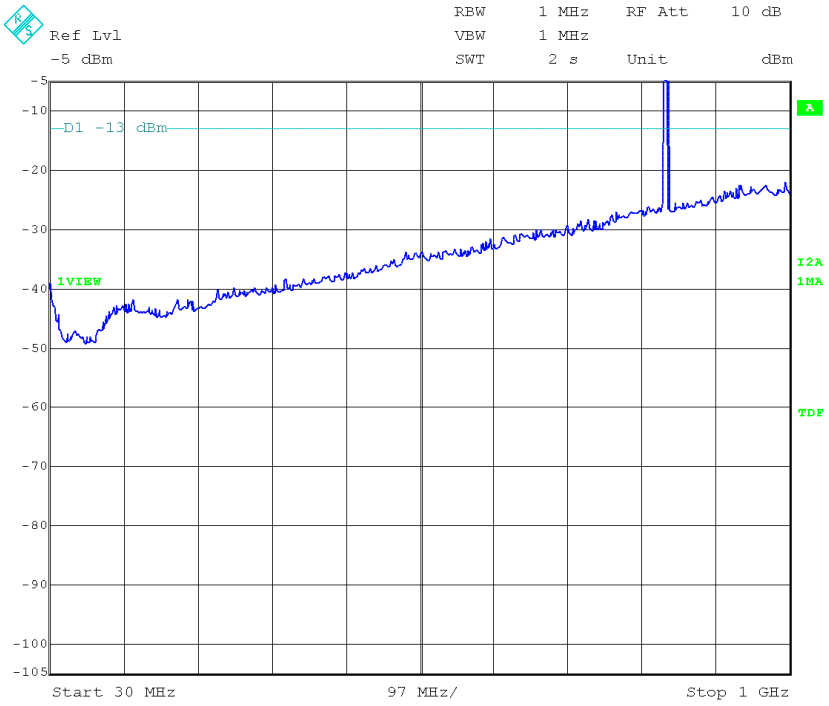
FREQUENCY RANGE 30 MHz-1000 MHz.

CHANNEL: LOWEST



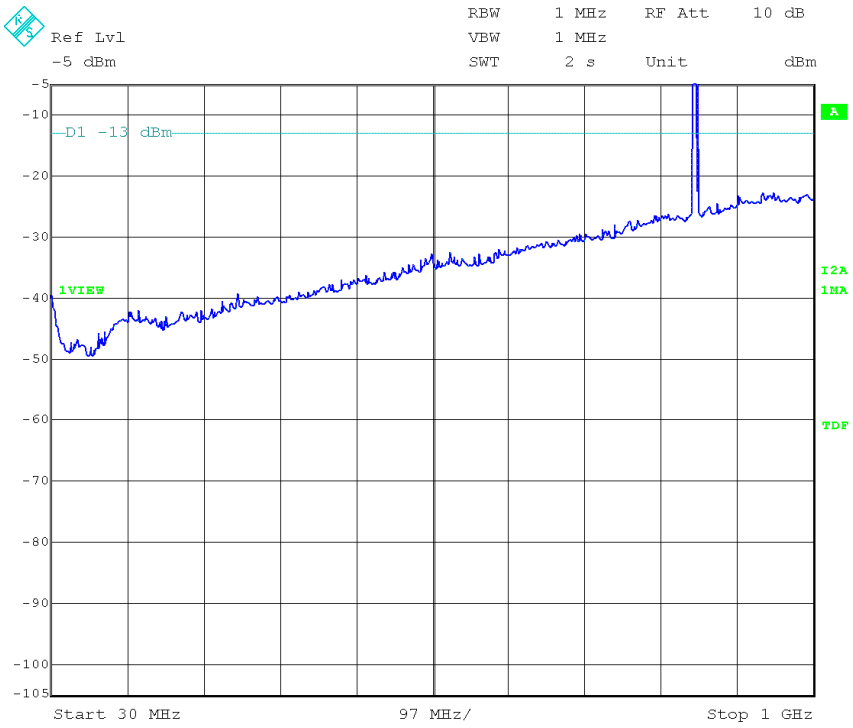
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



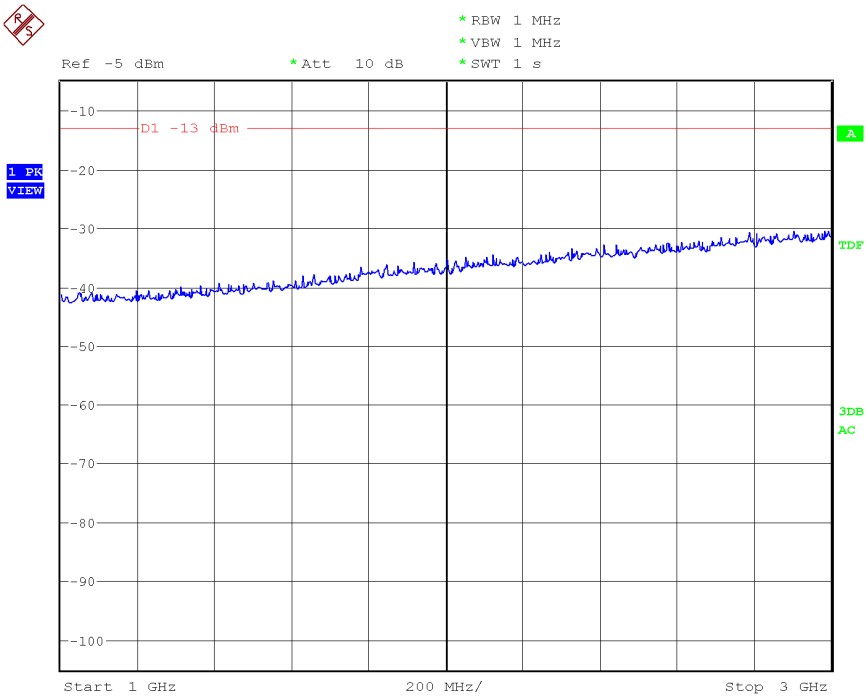
Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST



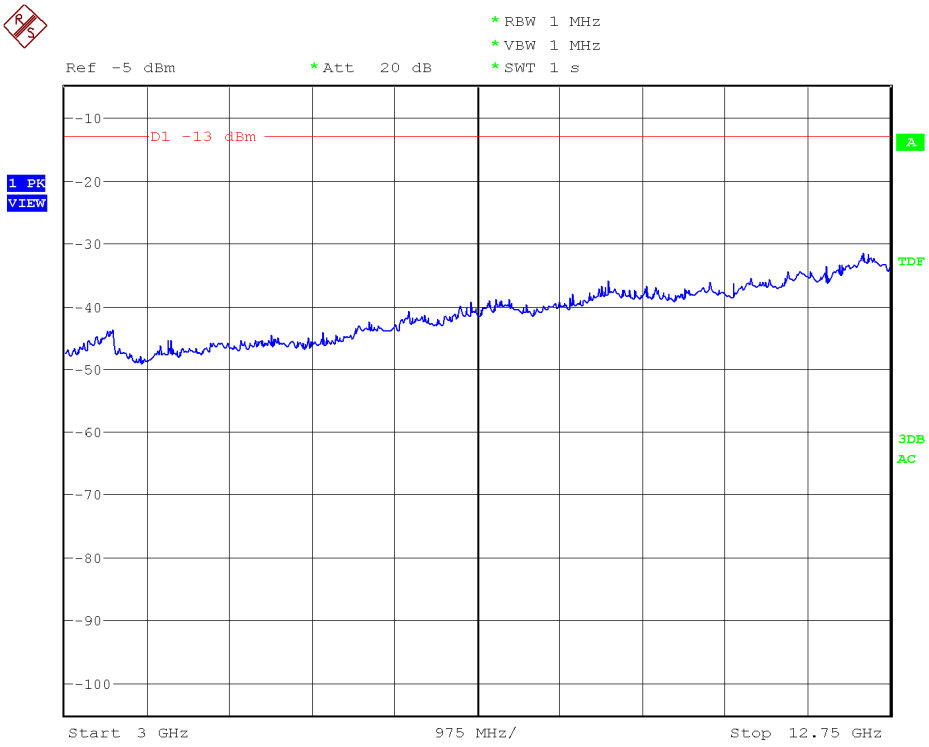
Note: The peak above the limit is the carrier frequency.

FREQUENCY RANGE 1 GHz to 3 GHz.



(This plot is valid for all three channels)

FREQUENCY RANGE 3 GHz to 12.75 GHz.

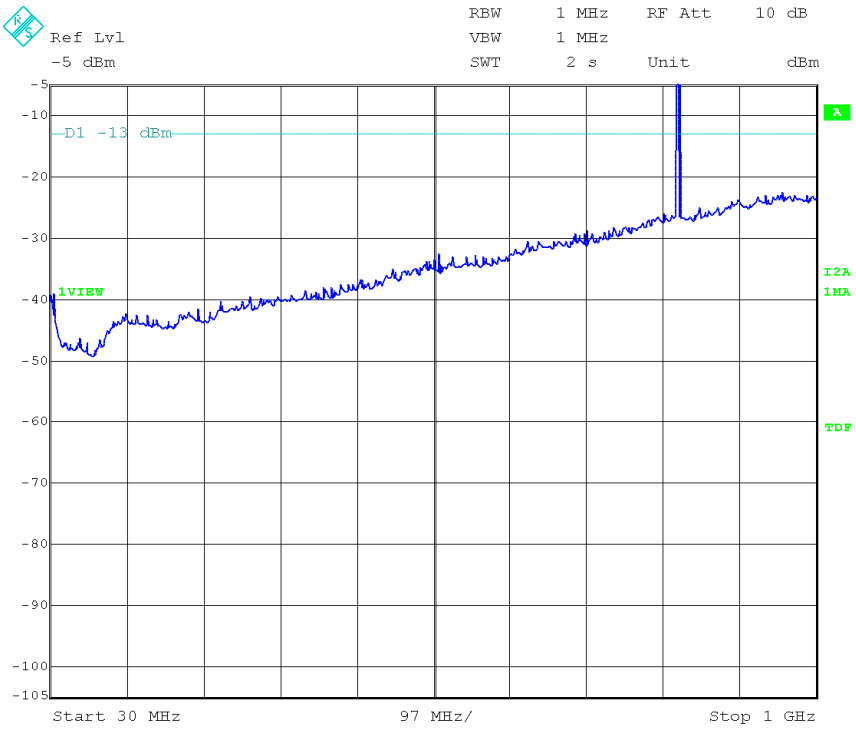


(This plot is valid for all three channels)

EDGE MODULATION

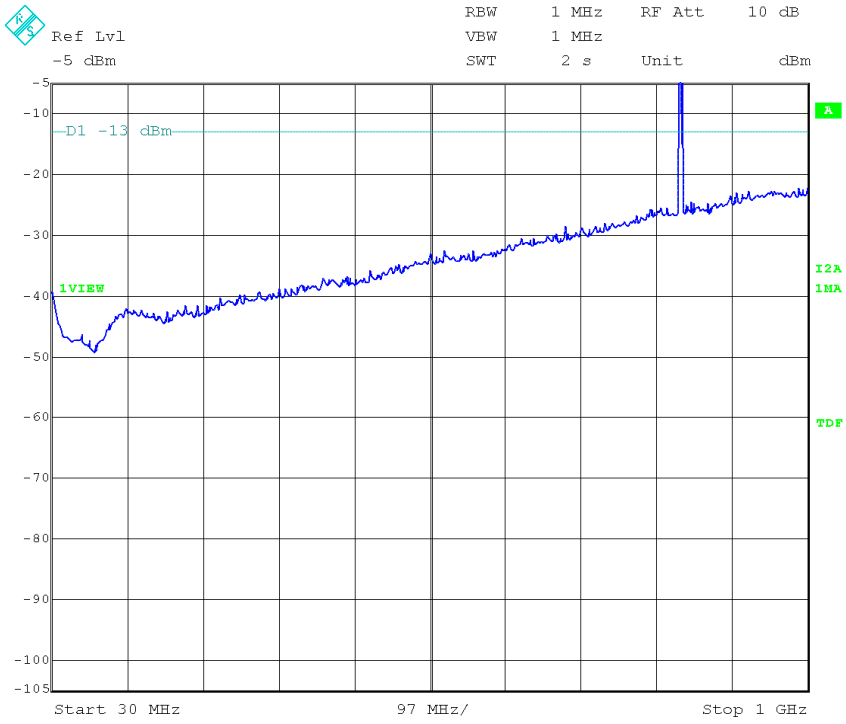
FREQUENCY RANGE 30 MHz-1000 MHz.

CHANNEL: LOWEST



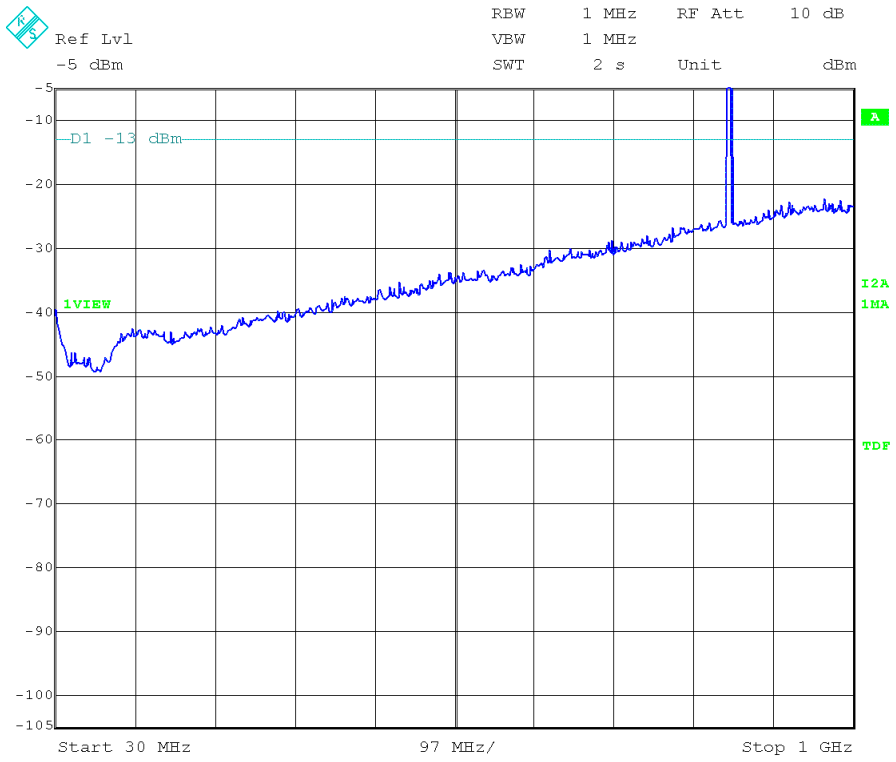
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



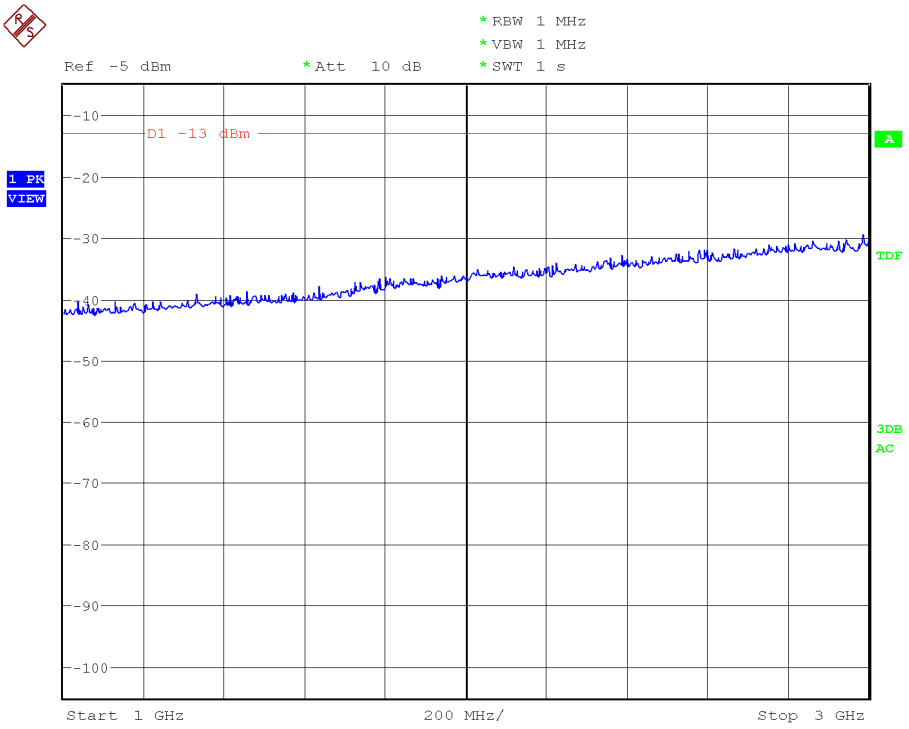
Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST



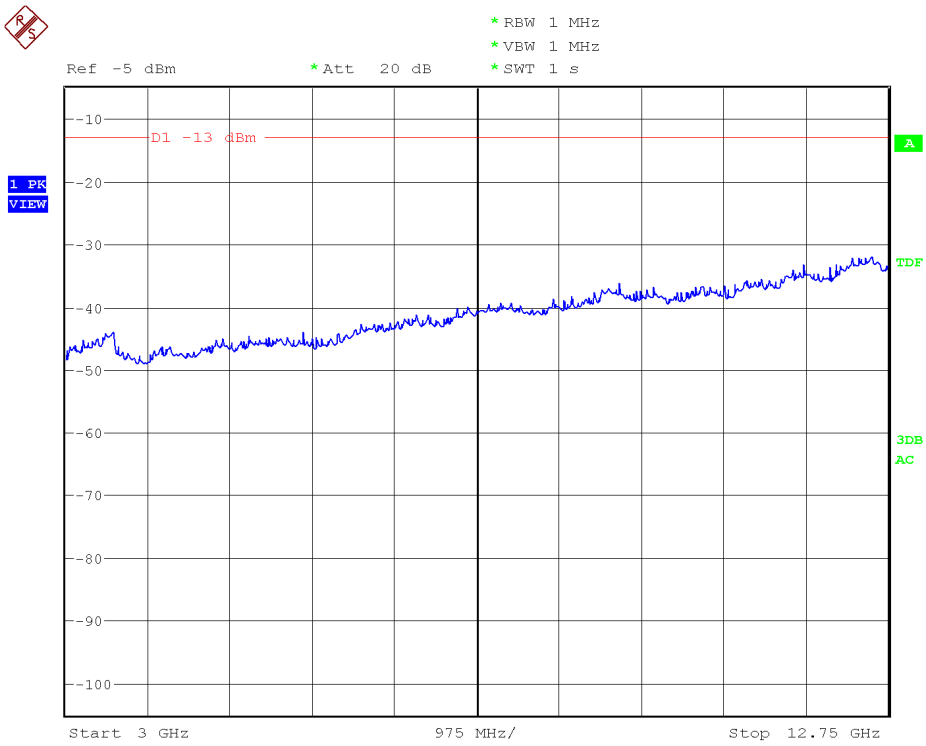
Note: The peak above the limit is the carrier frequency.

FREQUENCY RANGE 1 GHz to 3 GHz.



(This plot is valid for all three channels)

FREQUENCY RANGE 3 GHz to 12.75 GHz.

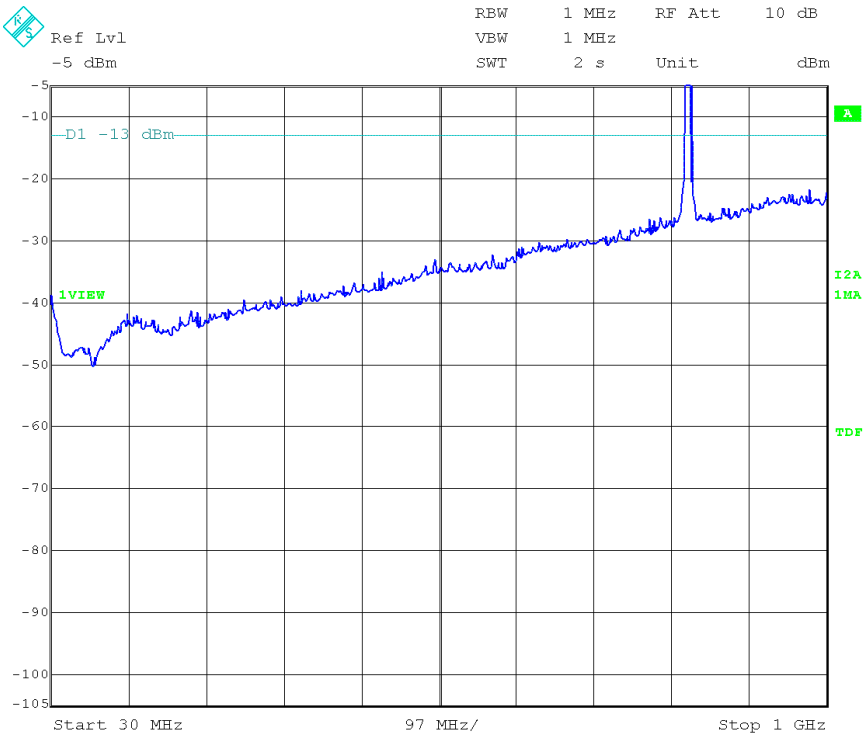


(This plot is valid for all three channels)

WCDMA MODULATION

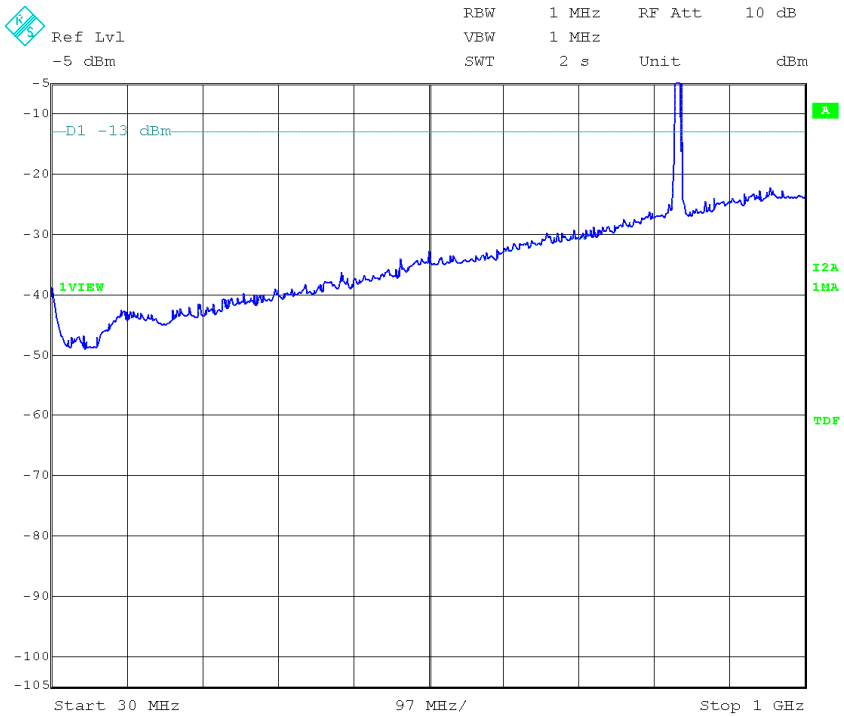
FREQUENCY RANGE 30 MHz-1000 MHz.

CHANNEL: LOWEST



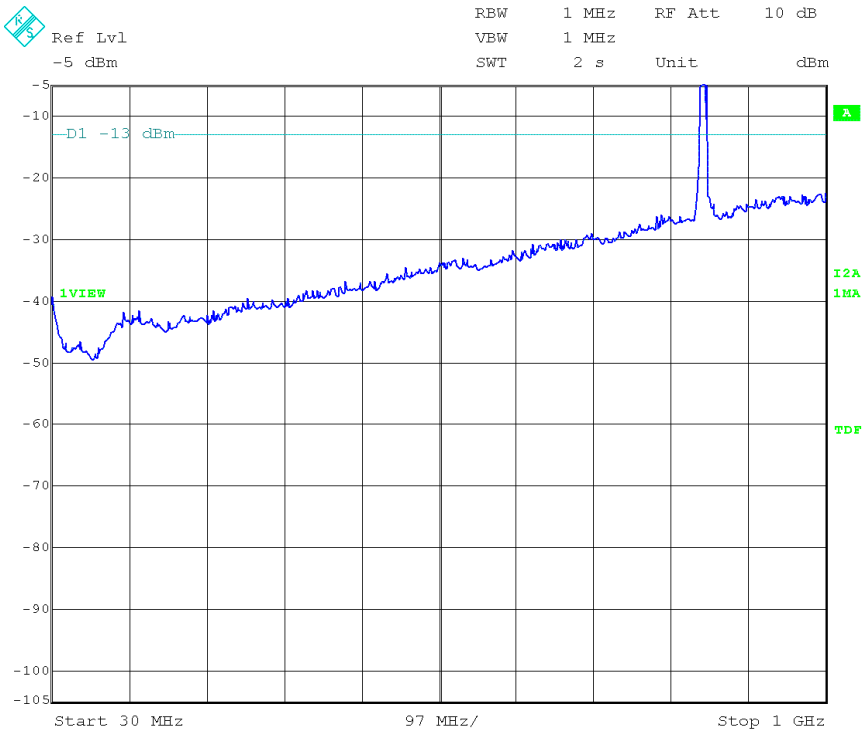
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



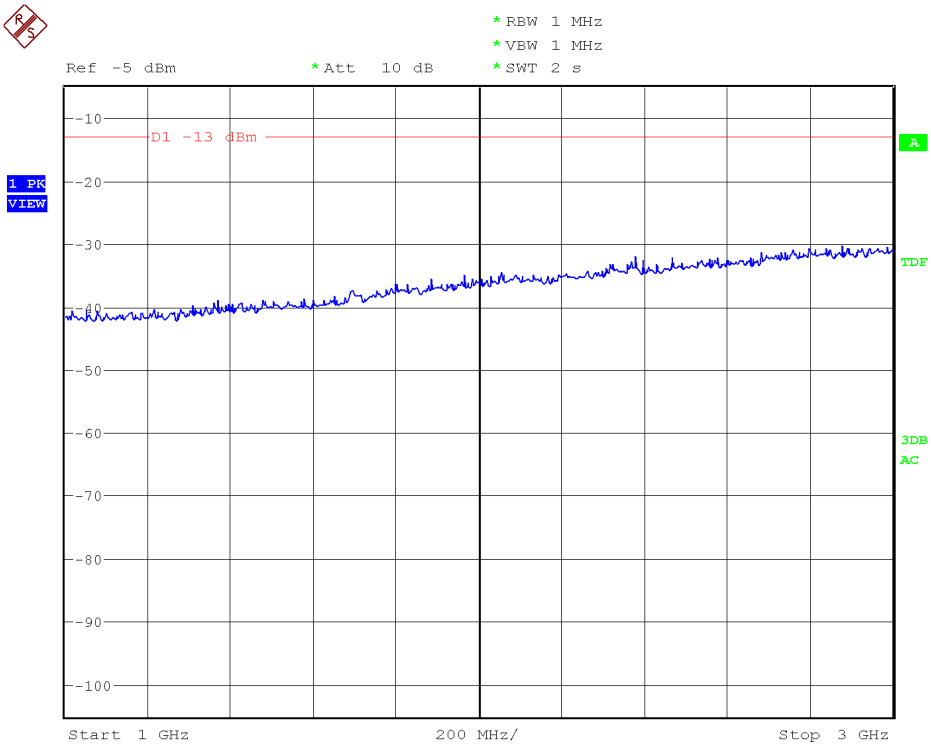
Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST



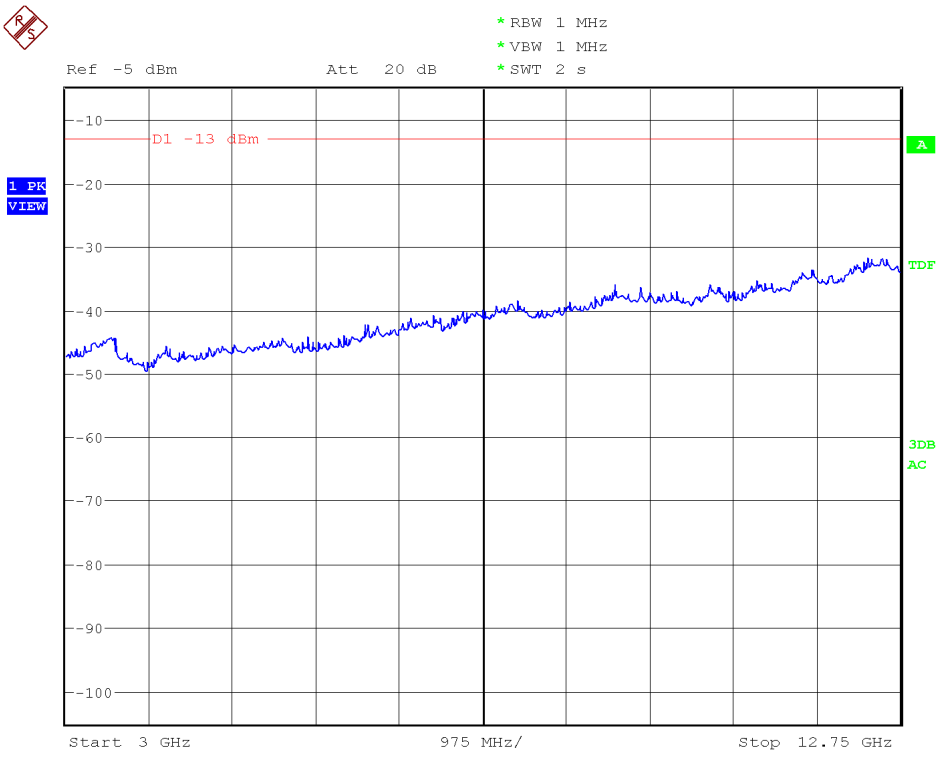
Note: The peak above the limit is the carrier frequency.

FREQUENCY RANGE 1 GHz to 3 GHz.



(This plot is valid for all three channels)

FREQUENCY RANGE 3 GHz to 12.75 GHz.



(This plot is valid for all three channels)

TEST RESULTS FOR FCC PART 24 AND RSS-133

TEST CONDITIONS

Power supply (V):

V_{nom} = 3.7 Vdc

V_{max} = 4.2 Vdc

V_{min} = 3.5 Vdc

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

Type of power supply = DC Voltage from rechargeable Li-ion polymer battery

Type of antenna = Integral 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 MODULATION

Lowest channel (9262): 1852.4 MHz

Middle channel (9400): 1880.0 MHz

Highest channel (9538): 1907.6 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

The conducted RF output power measurements were made at the RF output terminals of the EUT using an attenuator, power splitter and spectrum analyser. 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.

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 OUTPUT POWER (CONDUCTED). See plots in next pages.

GPRS MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	28.33	28.29	28.26
Maximum peak power (W)	0.68	0.67	0.67
Measurement uncertainty (dB)	±0.5		

EDGE MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	23.73	23.86	23.61
Maximum peak power (W)	0.24	0.24	0.23
Measurement uncertainty (dB)	±0.5		

WCDMA MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	29.16	28.57	27.96
Maximum peak power (W)	0.82	0.72	0.62
Measurement uncertainty (dB)	±0.5		

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

GPRS 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)
1850.209	-7.36	Vertical	17.04	0.5	8.6	25.14
1880.211	-8.01	Vertical	16.89	0.5	8.3	24.69
1909.805	-8.70	Vertical	16.60	0.5	8.0	24.10

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	25.14	24.69	24.10
Maximum peak power (W)	0.33	0.29	0.26
Measurement uncertainty (dB)	± 4.0		

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)
1850.211	-5.40	Vertical	19.00	0.5	8.6	27.10
1880.215	-6.22	Vertical	18.68	0.5	8.3	26.48
1909.803	-7.28	Vertical	18.02	0.5	8.0	25.52

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	27.10	26.48	25.52
Maximum peak power (W)	0.51	0.44	0.36
Measurement uncertainty (dB)	± 4.0		

WCDMA 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)
1852.398	-7.41	Vertical	16.99	0.5	8.6	25.09
1880.003	-8.10	Vertical	16.80	0.5	8.3	24.60
1907.589	-10.2	Vertical	15.10	0.5	8.0	22.60

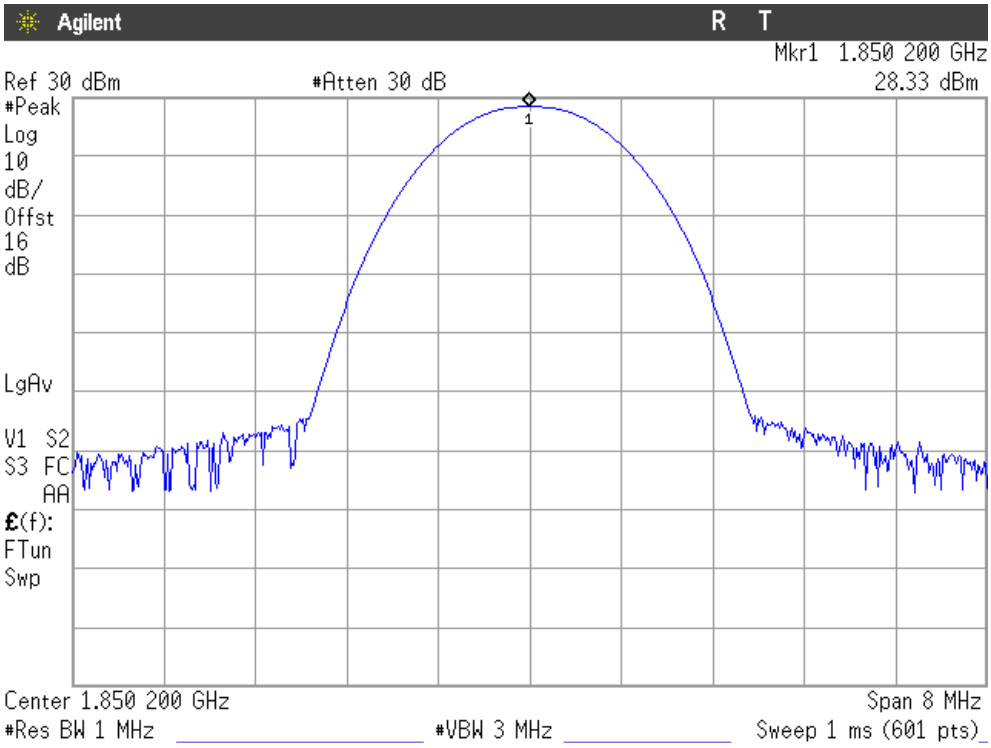
Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	25.09	24.60	22.60
Maximum peak power (W)	0.32	0.29	0.18
Measurement uncertainty (dB)	± 4.0		

Verdict: PASS

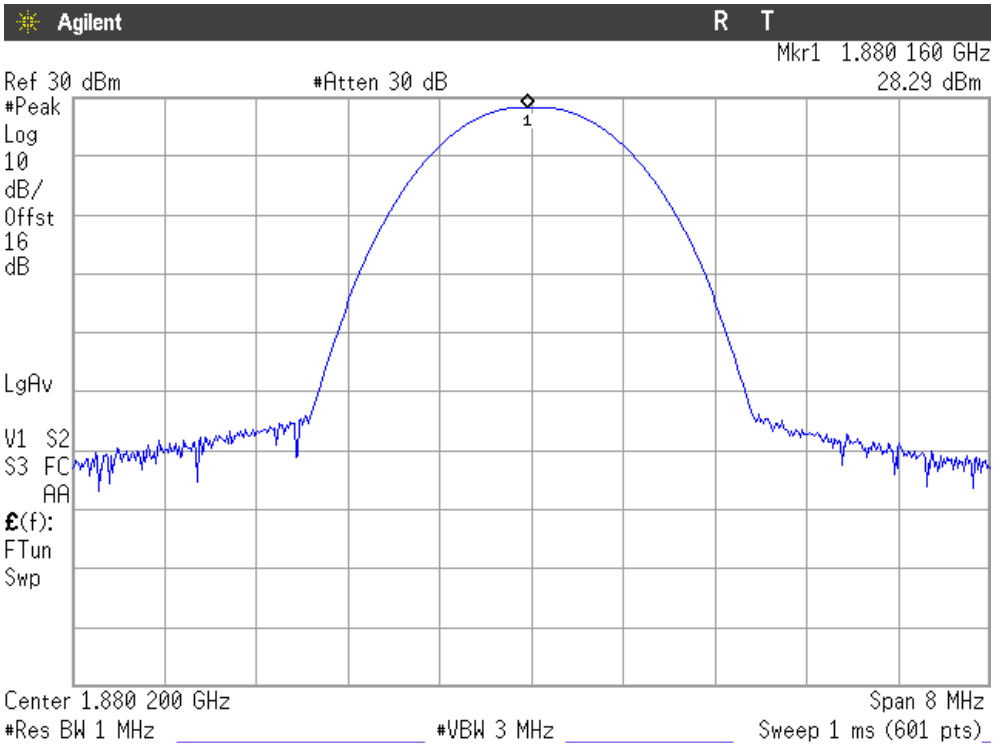
PEAK OUTPUT POWER (CONDUCTED).

GPRS MODULATION

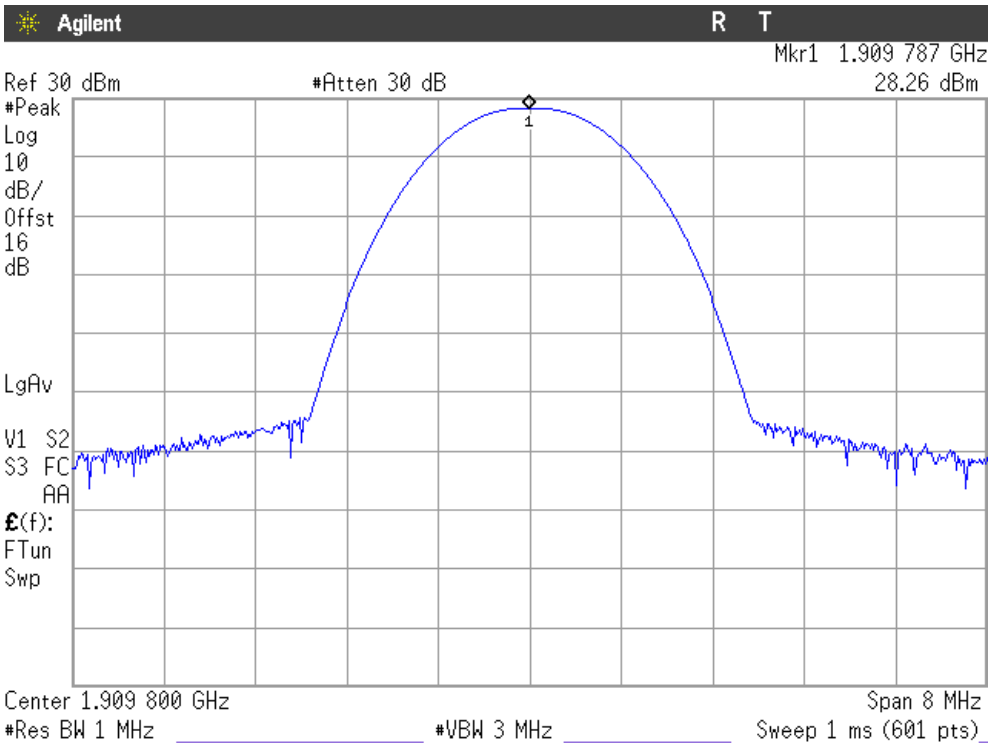
Lowest Channel.



Middle Channel.

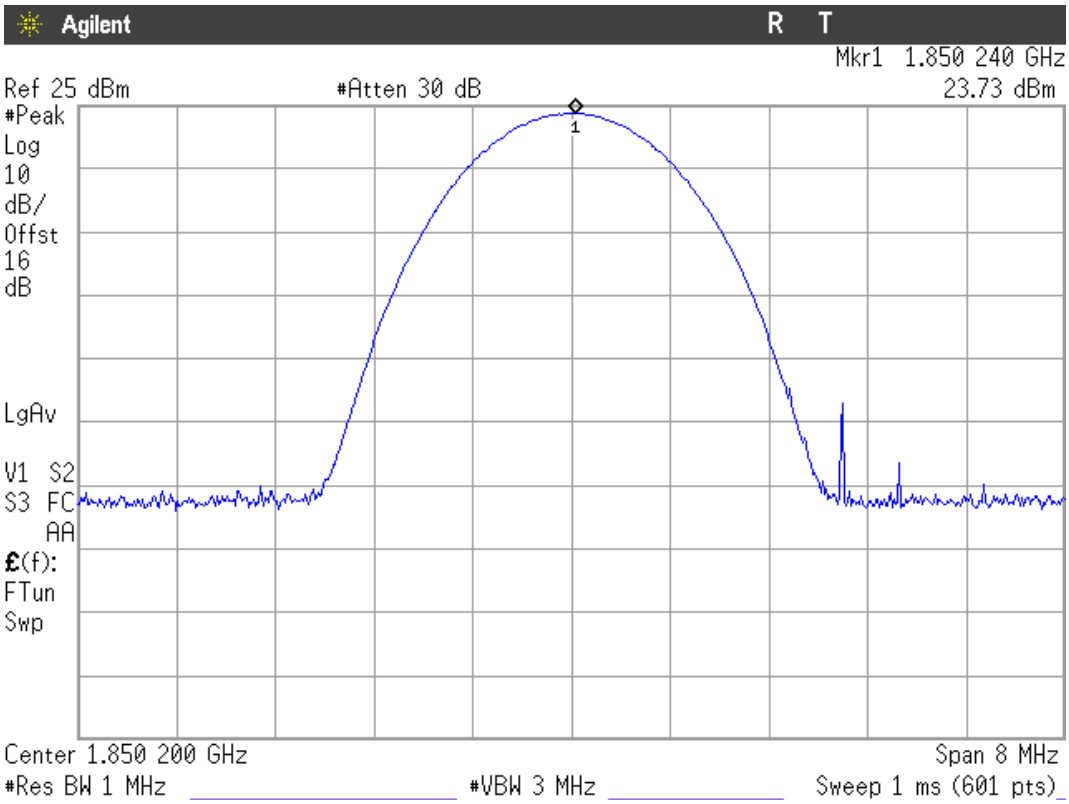


Highest Channel.

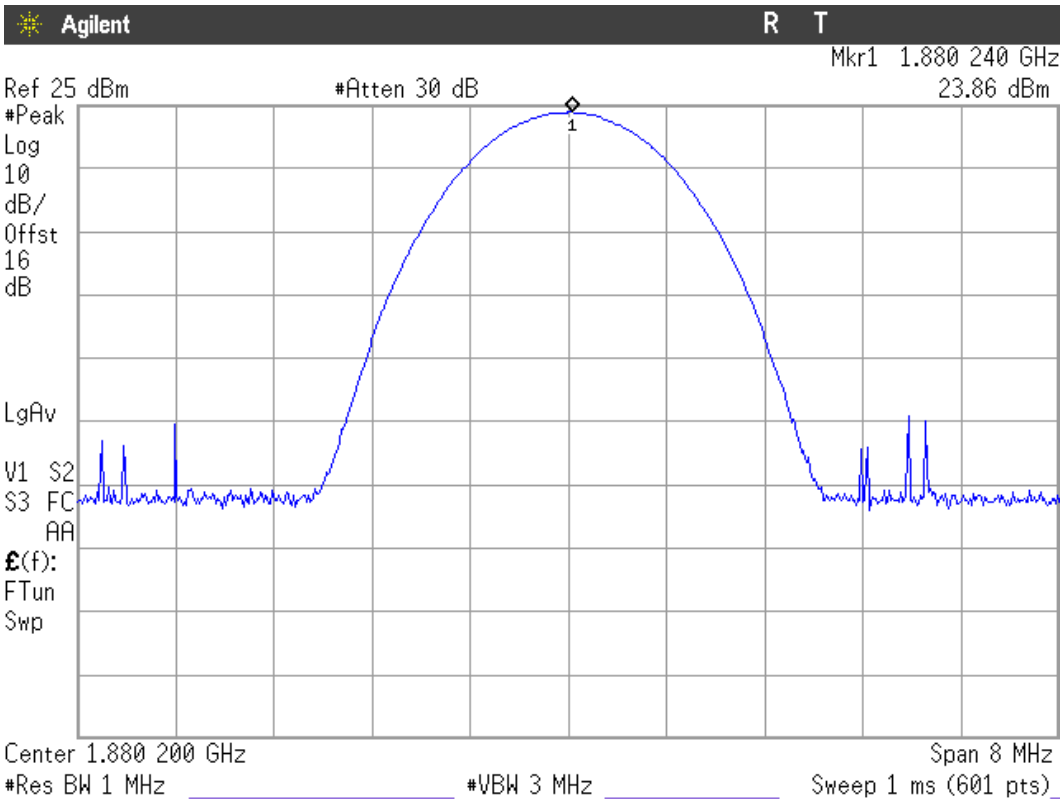


EDGE MODULATION

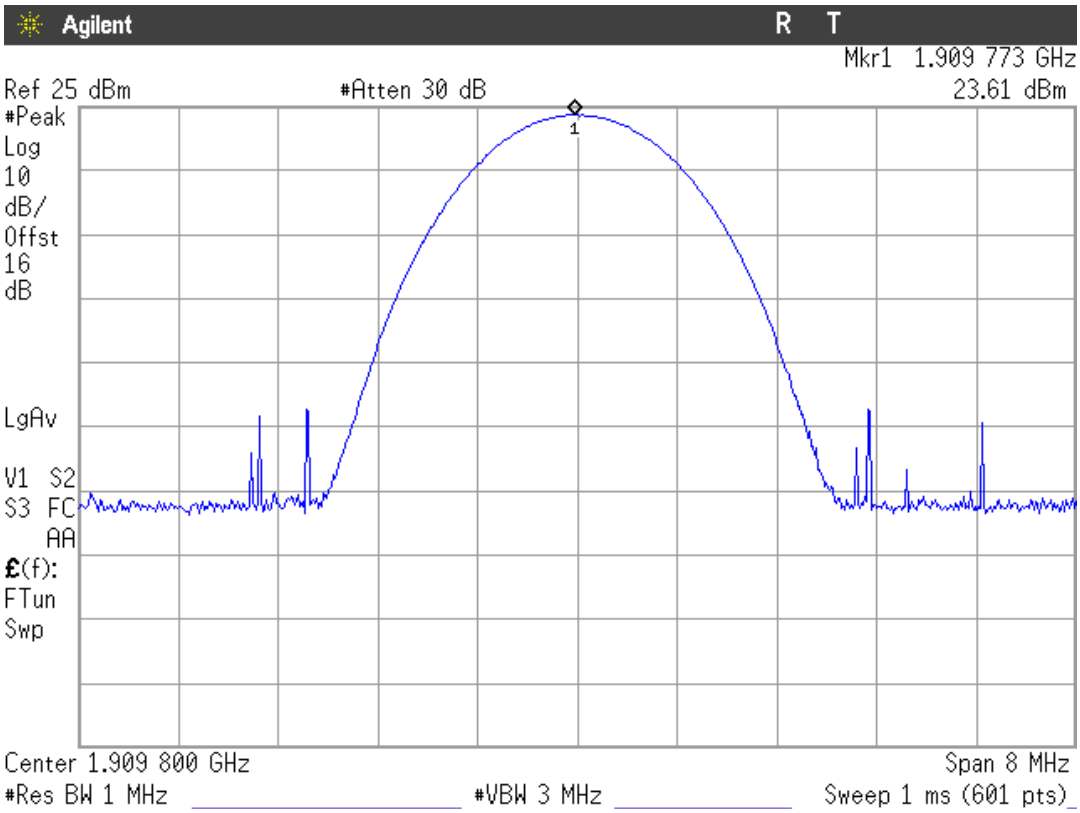
Lowest Channel.



Middle Channel.

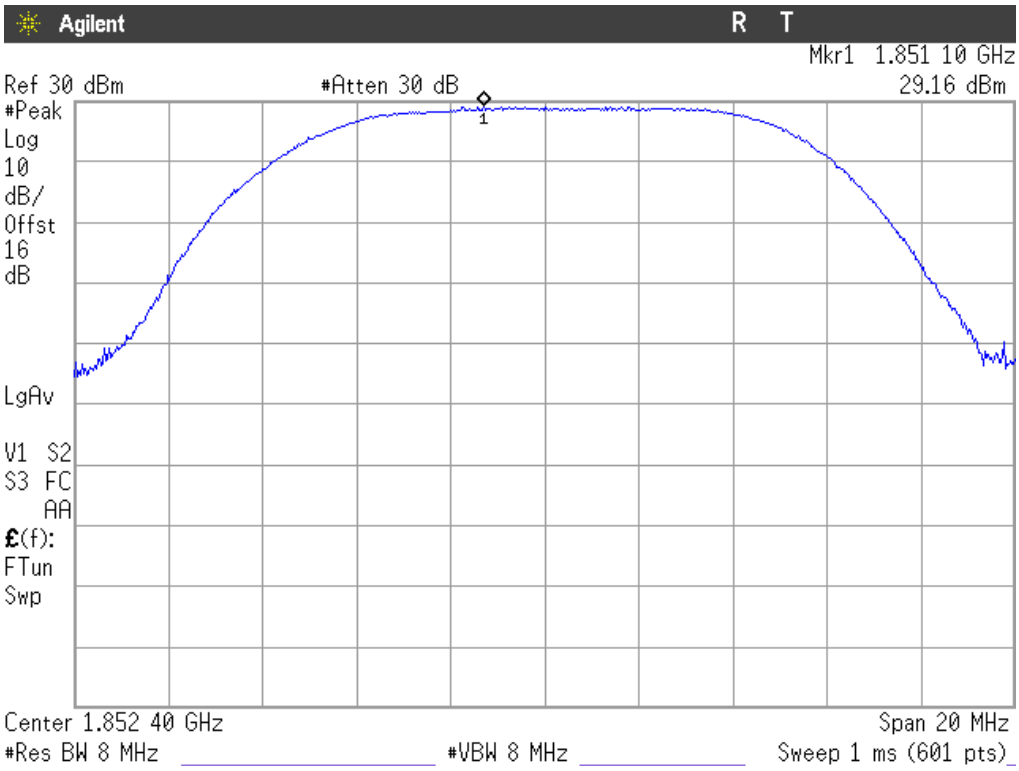


Highest Channel.

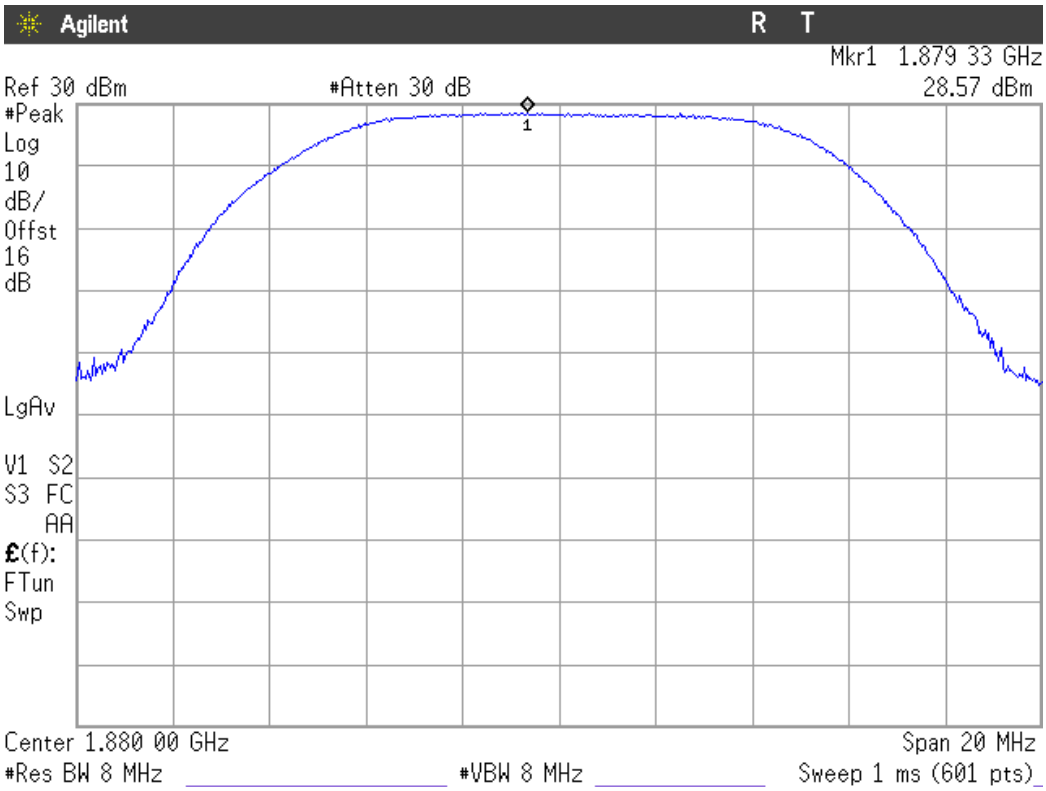


WCDMA MODULATION

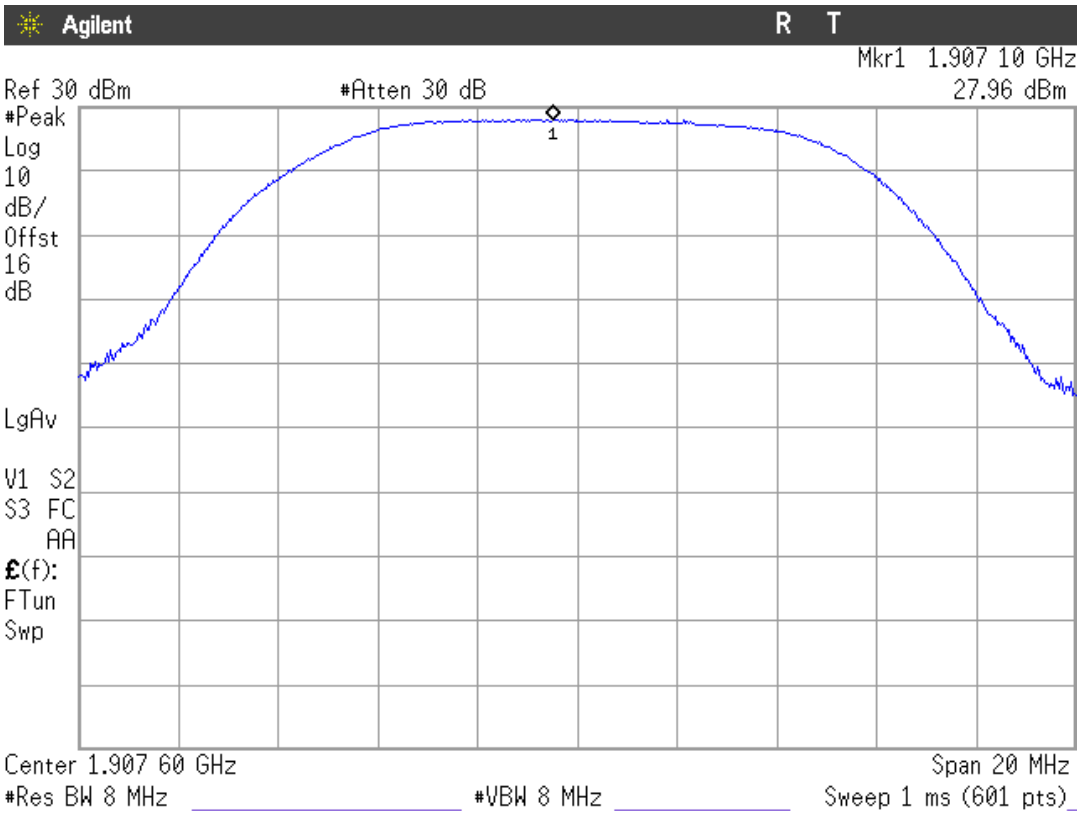
Lowest Channel.



Middle Channel.



Highest Channel.



Modulation Characteristics

SPECIFICATION

§2.1047

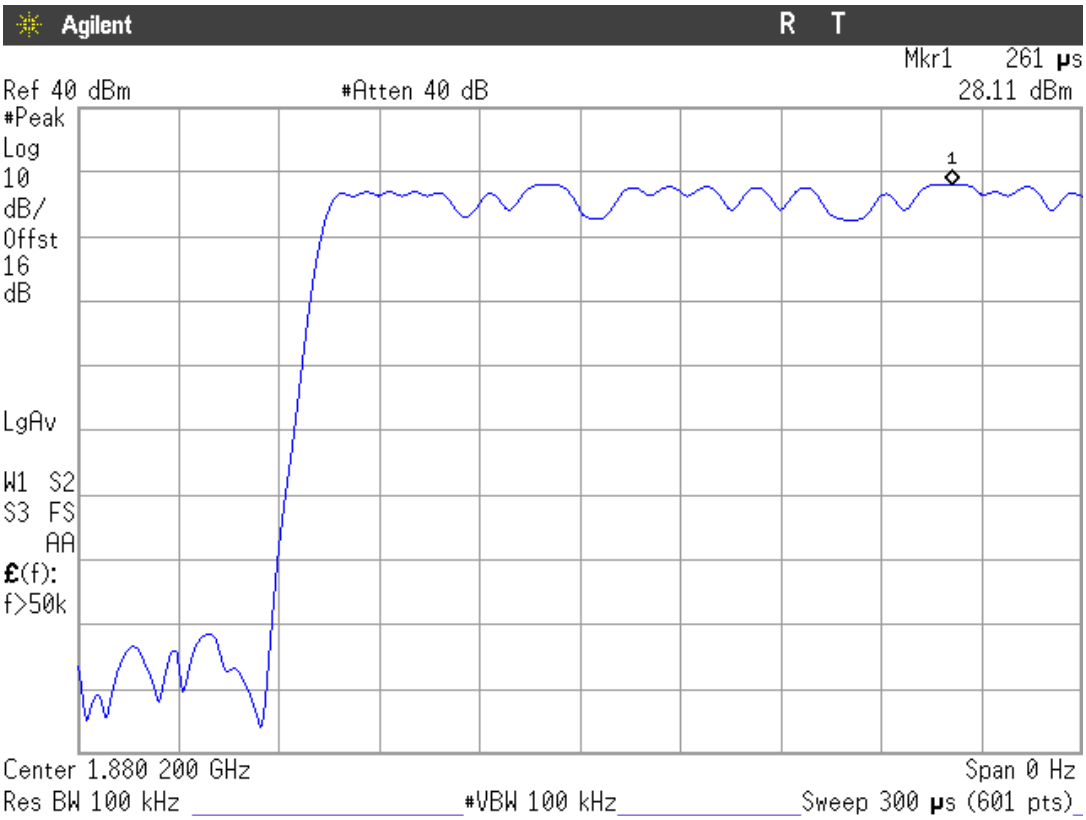
METHOD

The EUT operates with GPRS (GMSK), EDGE (GMSK/8-PSK) and WCDMA/HSDPA (QPSK) modes, in which the information is digitised and coded into a bit stream.

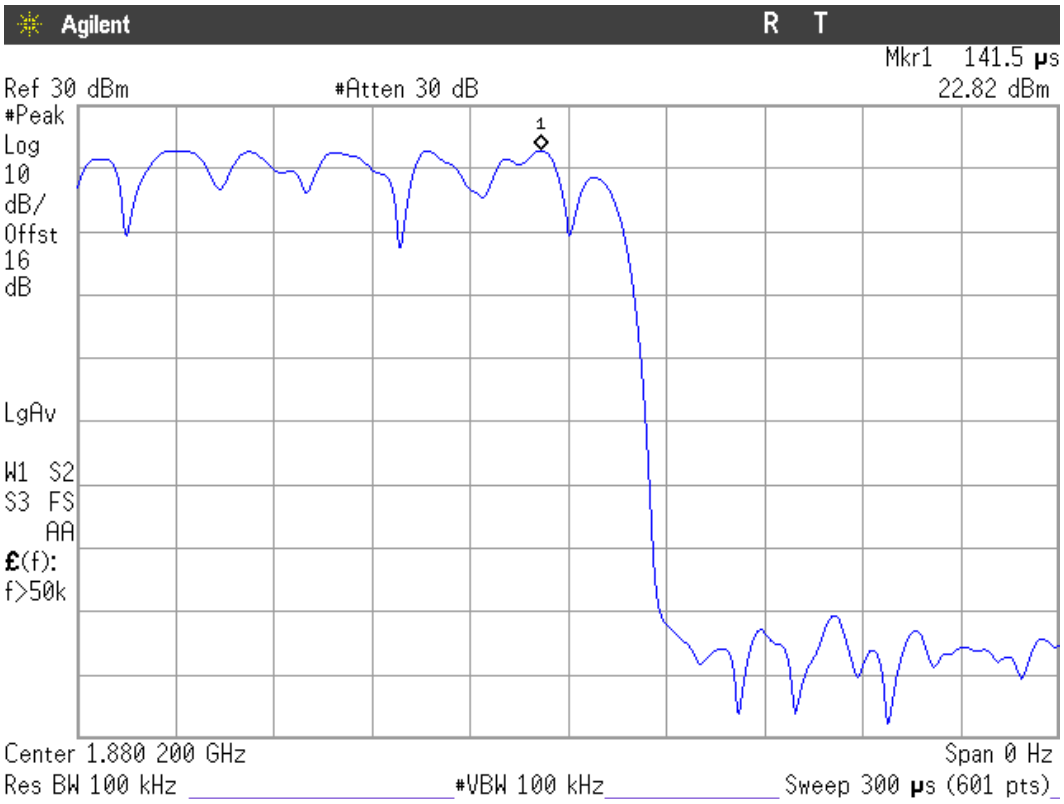
RESULTS

The following plot shows the modulation schemes in the EUT.

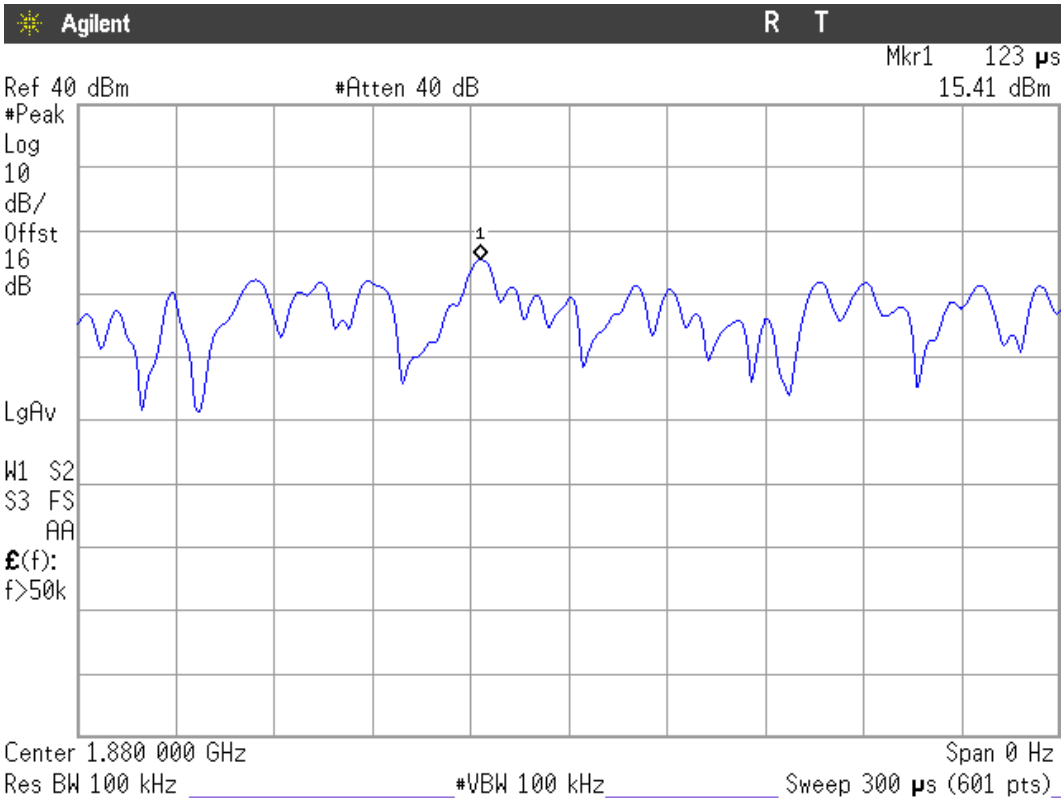
GPRS MODULATION



EDGE MODULATION



WCDMA MODULATION



Frequency Stability

SPECIFICATION

§2.1055 and 24.235

METHOD

The frequency tolerance measurements over temperature variations were made over the temperature range of –30ºC to +50ºC. The EUT was placed inside a climatic chamber and the temperature was raised hourly in 10ºC steps from –30ºC up to +50ºC.

The EUT was set in "call mode" in the middle channel using the Universal Radio Communication tester R&S CMU200 (for modulations GPRS, EDGE and WCDMA) and the maximum frequency error was measured using the frequency meter of CMU200.

RESULTS

Frequency stability over temperature variations.

GPRS MODULATION

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	-15	-0.0080	-0.00000080
+40	-9	-0.0048	-0.00000048
+30	-13	-0.0069	-0.00000069
+20	-8	-0.0043	-0.00000043
+10	-17	-0.0090	-0.00000090
0	-14	-0.0074	-0.00000074
-10	-16	-0.0085	-0.00000085
-20	-13	-0.0069	-0.00000069
-30	-16	-0.0085	-0.00000085

EDGE MODULATION

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	-17	-0.0090	-0.00000090
+40	-15	-0.0080	-0.00000080
+30	-17	-0.0090	-0.00000090
+20	-19	-0.0101	-0.00000101
+10	-21	-0.0112	-0.00000112
0	-13	-0.0069	-0.00000069
-10	-14	-0.0074	-0.00000074
-20	-13	-0.0069	-0.00000069
-30	-17	-0.0090	-0.00000090

WCDMA MODULATION

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	-8	-0.0043	-0.00000043
+40	-6	-0.0032	-0.00000032
+30	-11	-0.0059	-0.00000059
+20	-10	-0.0053	-0.00000053
+10	-2	-0.0011	-0.00000011
0	-8	-0.0043	-0.00000043
-10	-2	-0.0011	-0.00000011
-20	-9	-0.0048	-0.00000048
-30	-6	-0.0032	-0.00000032

Frequency stability over voltage variations.

GPRS MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	-16	-0.0085	-0.00000085
Vmin	3.5	-3	-0.0016	-0.00000016

EDGE MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	-16	-0.0085	-0.00000085
Vmin	3.5	-18	-0.0096	-0.00000096

WCDMA MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	-6	-0.0032	-0.00000032
Vmin	3.5	-13	-0.0069	-0.00000069

Occupied Bandwidth

SPECIFICATION

§2.1049

METHOD

The EUT was configured to transmit a modulated carrier signal. An IF bandwidth of 3 kHz was used to determined the occupied bandwidth of the modulated emission for GPRS and EDGE modulation and 51 kHz for WCDMA modulation.

RESULTS

GPRS MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	281.9	273.2	273.6
-26 dBc bandwidth (kHz)	317.3	317.0	317.5
Measurement uncertainty (kHz)	<±6.5		

EDGE MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	281.8	283.3	280.4
-26 dBc bandwidth (kHz)	313.9	312.0	309.1
Measurement uncertainty (kHz)	<±6.5		

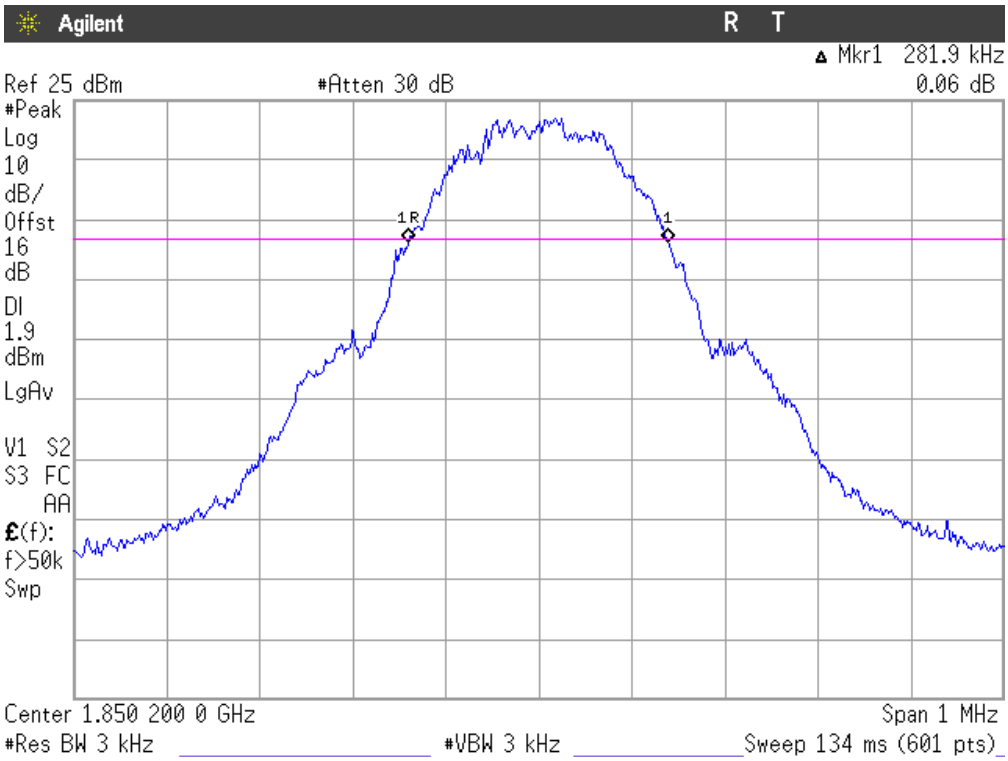
WCDMA MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	4560	4560	4547
-26 dBc bandwidth (kHz)	4667	4667	4667
Measurement uncertainty (kHz)	<±52		

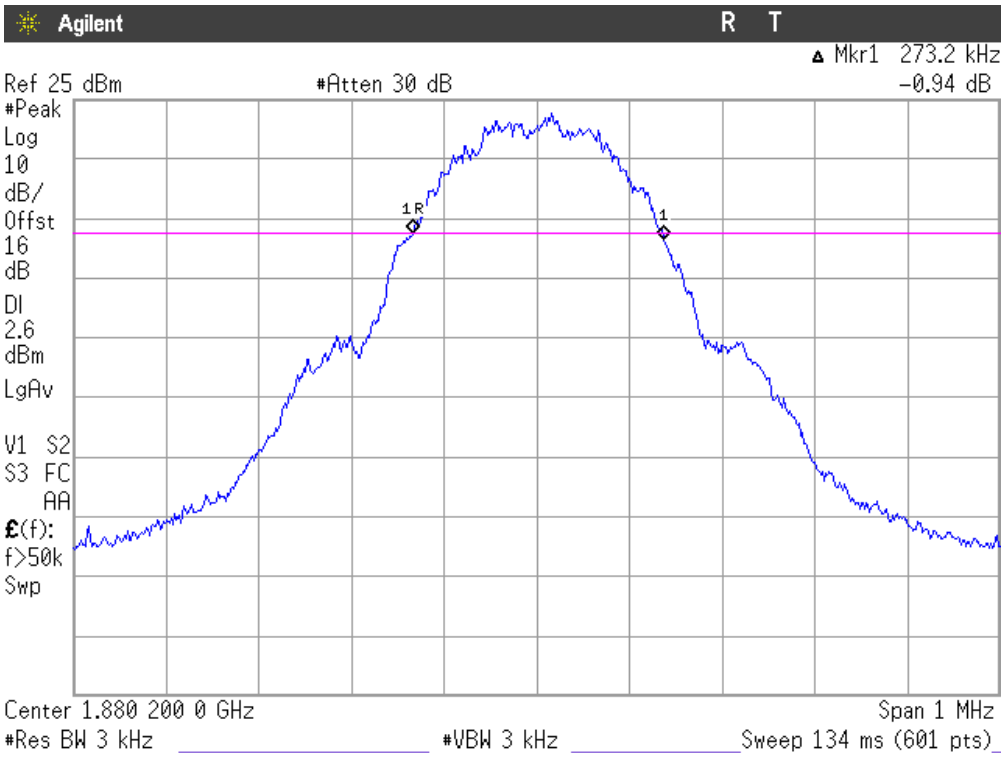
99% OCCUPIED BANDWIDTH

GPRS MODULATION

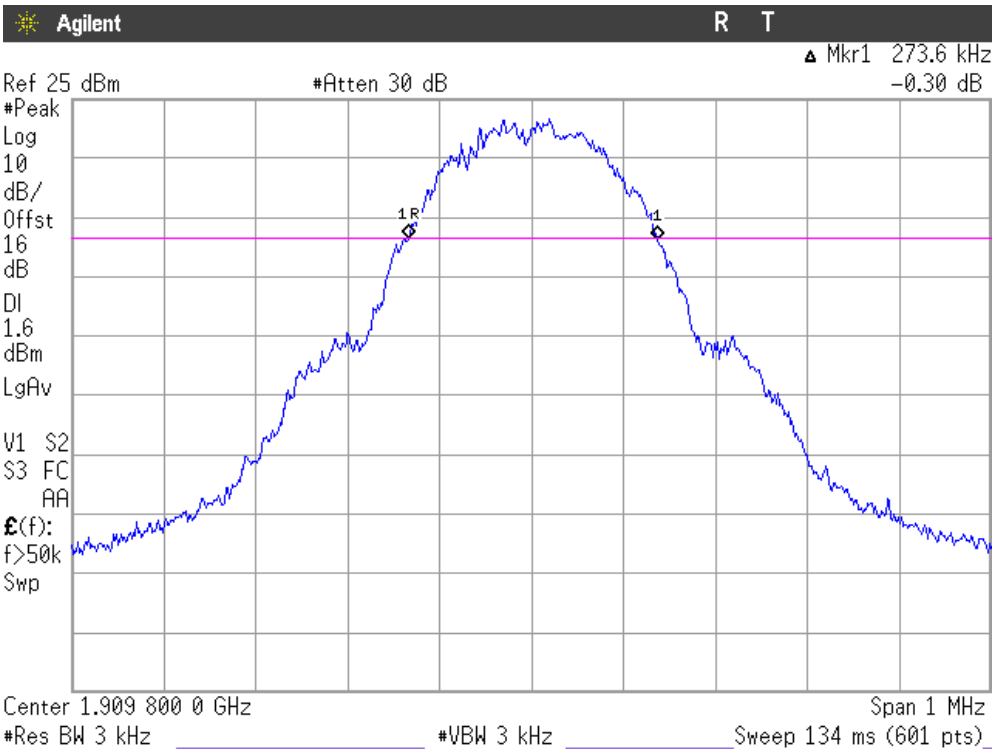
Lowest Channel



Middle Channel

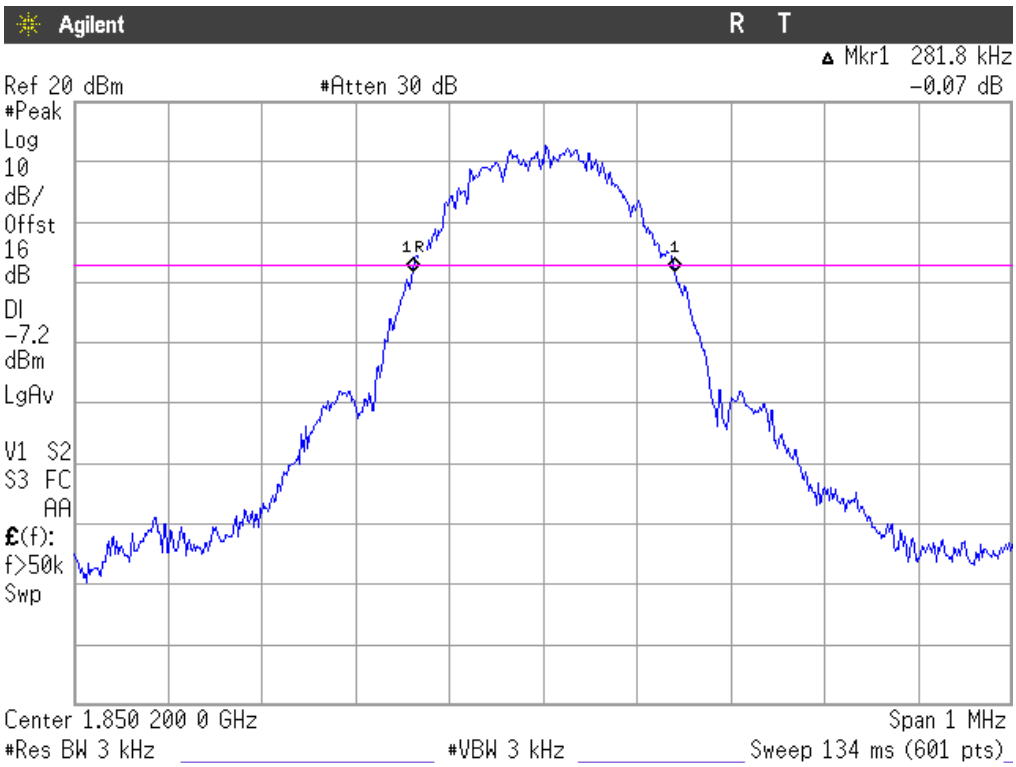


Highest Channel

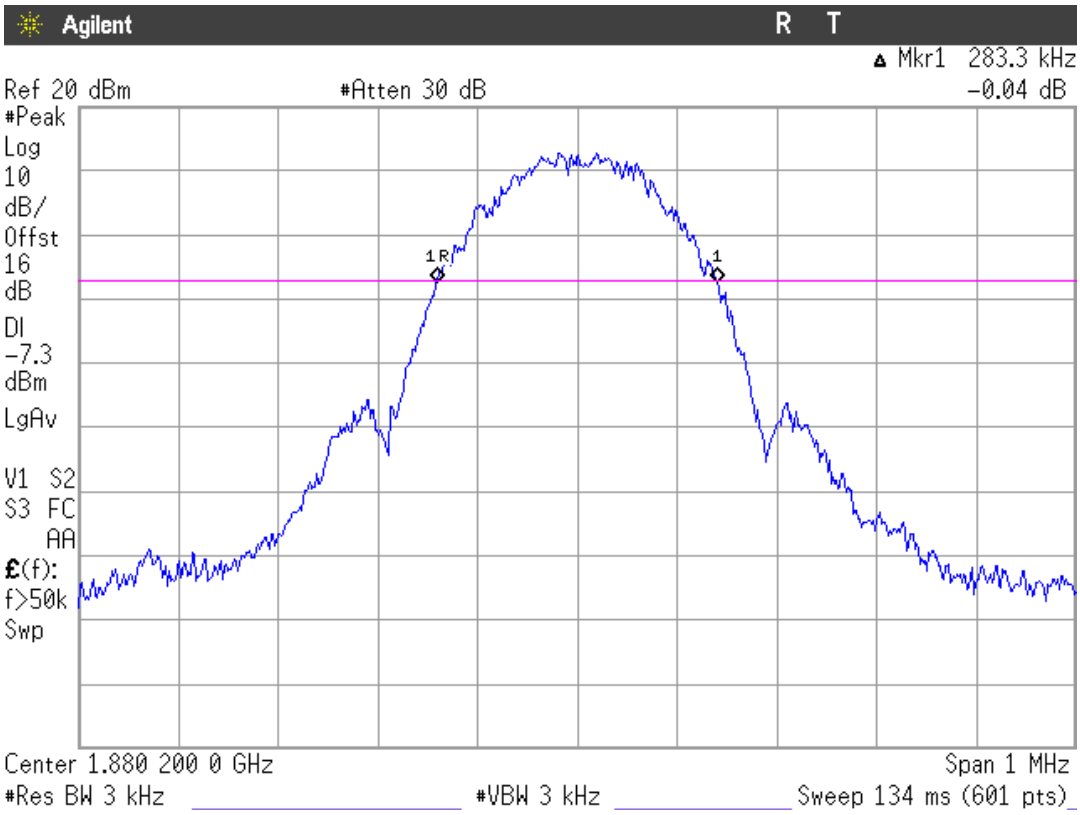


EDGE MODULATION

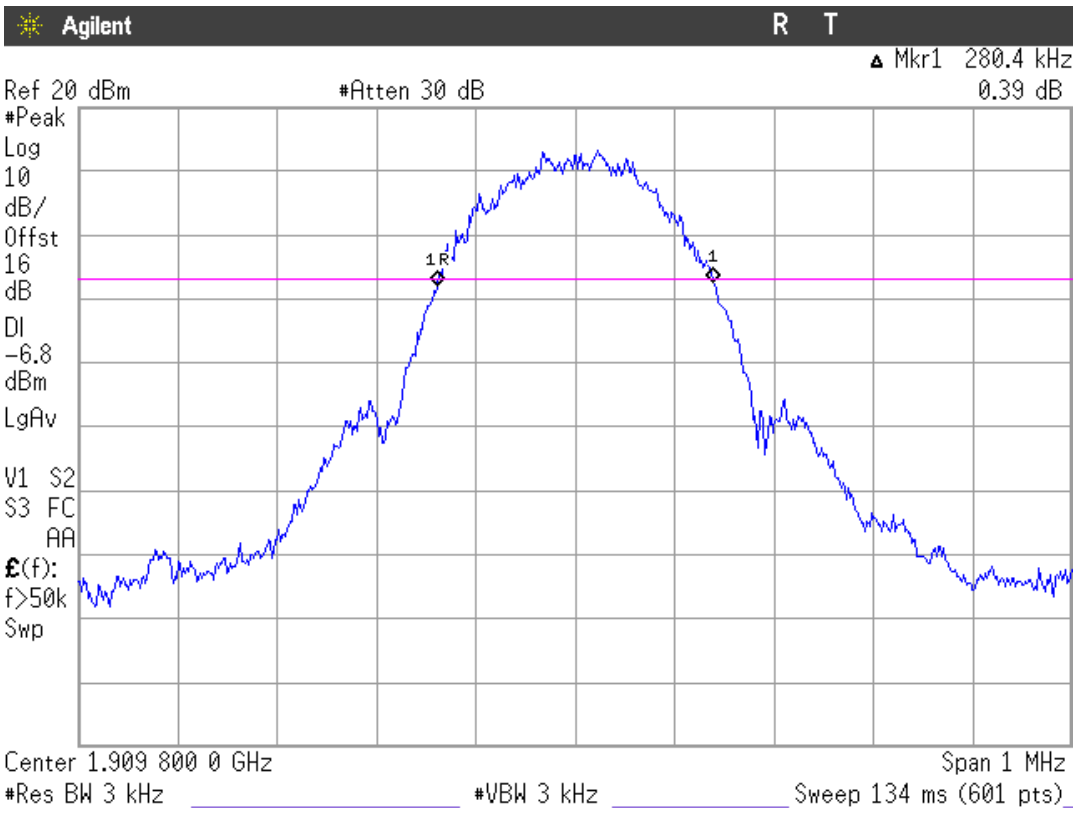
Lowest Channel



Middle Channel

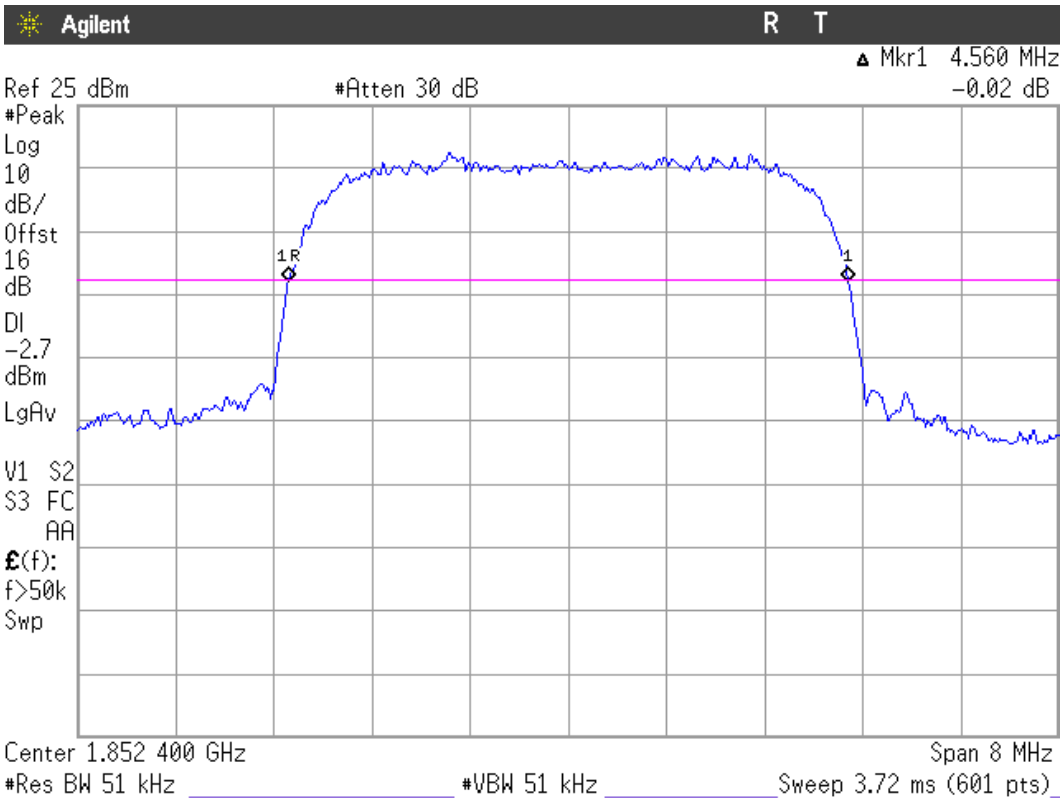


Highest Channel

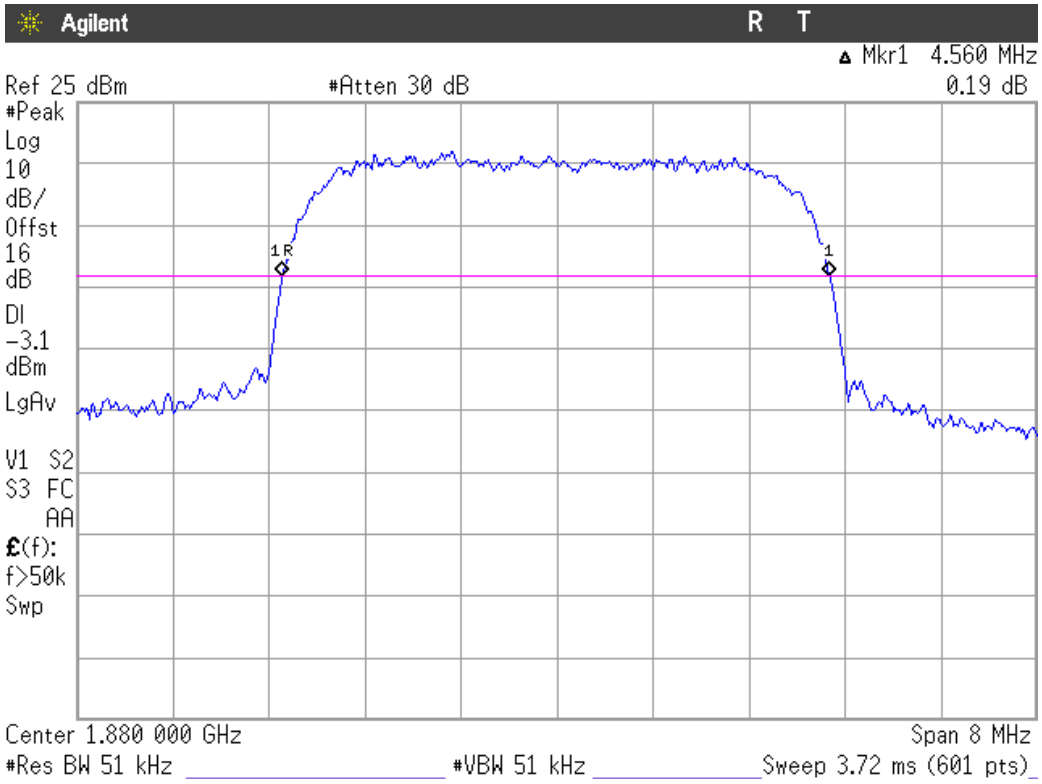


WCDMA MODULATION

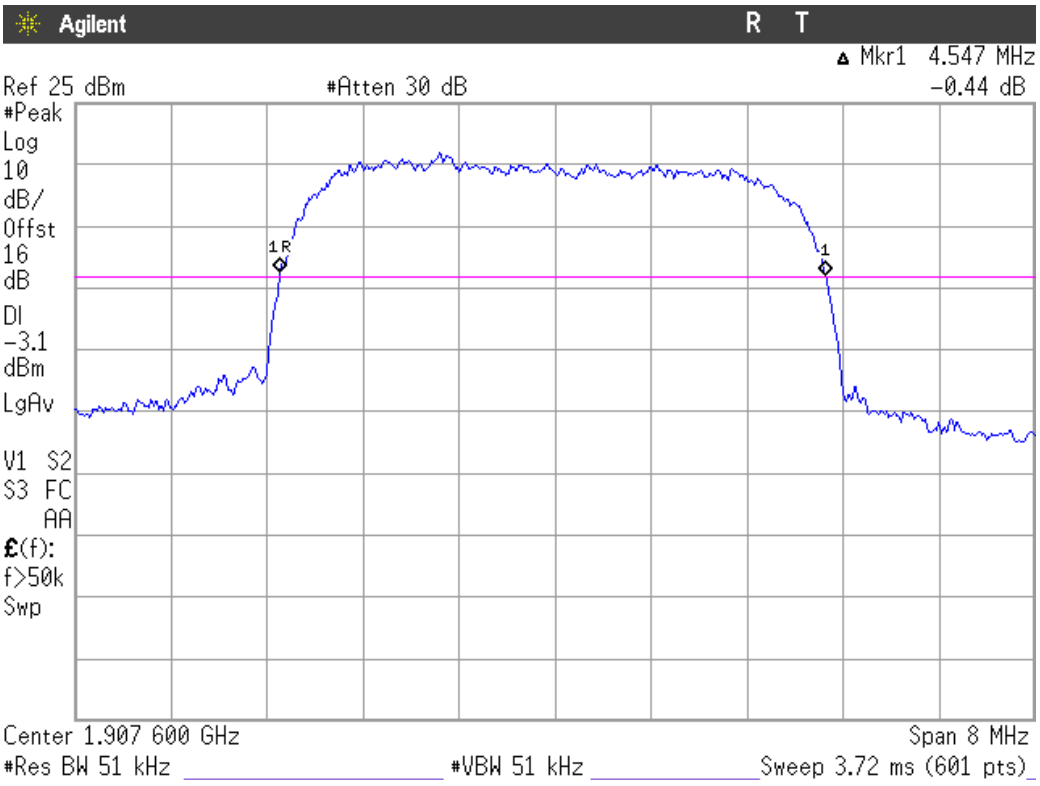
Lowest Channel



Middle Channel



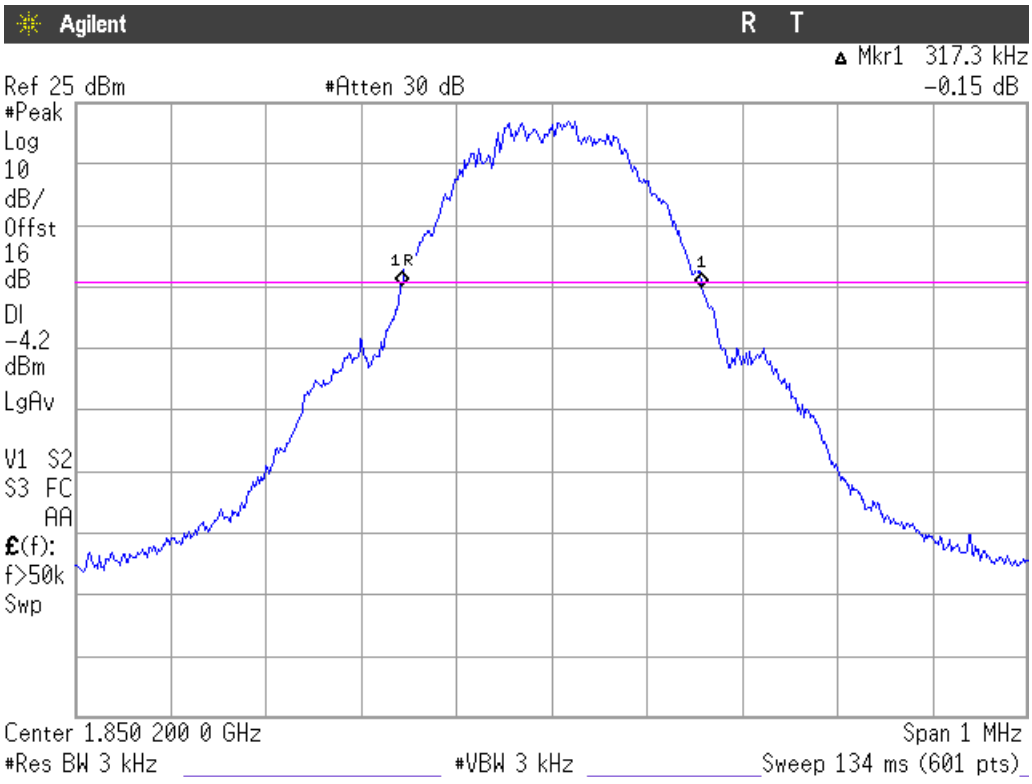
Highest Channel



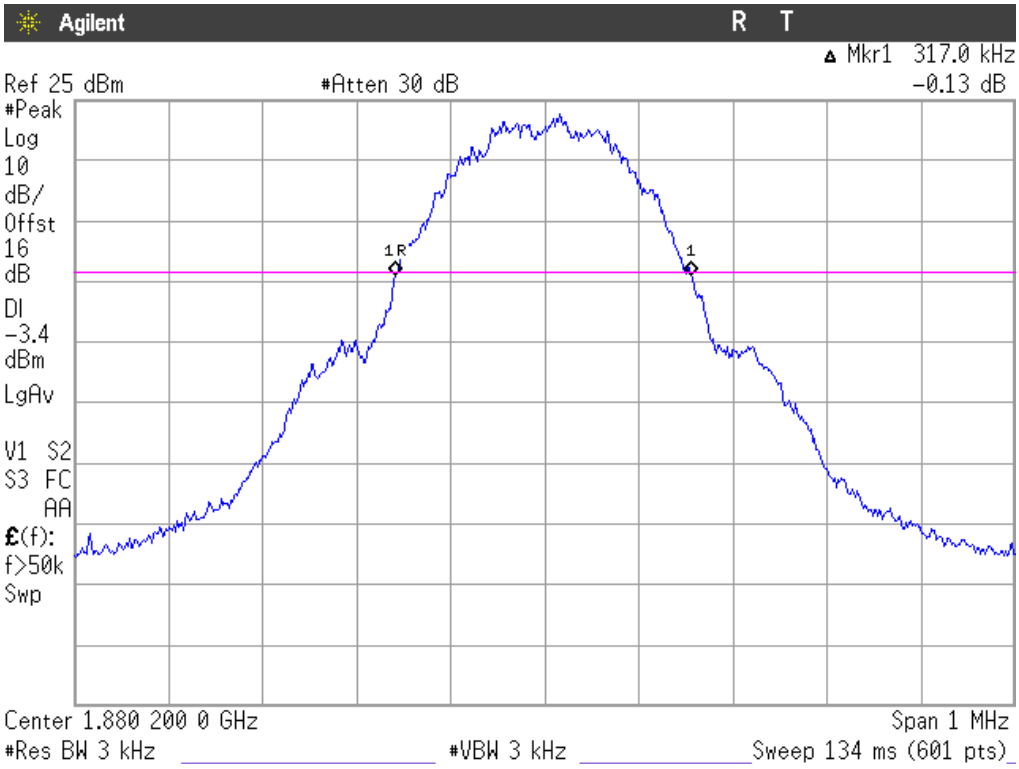
-26 dBc BANDWIDTH

GPRS MODULATION

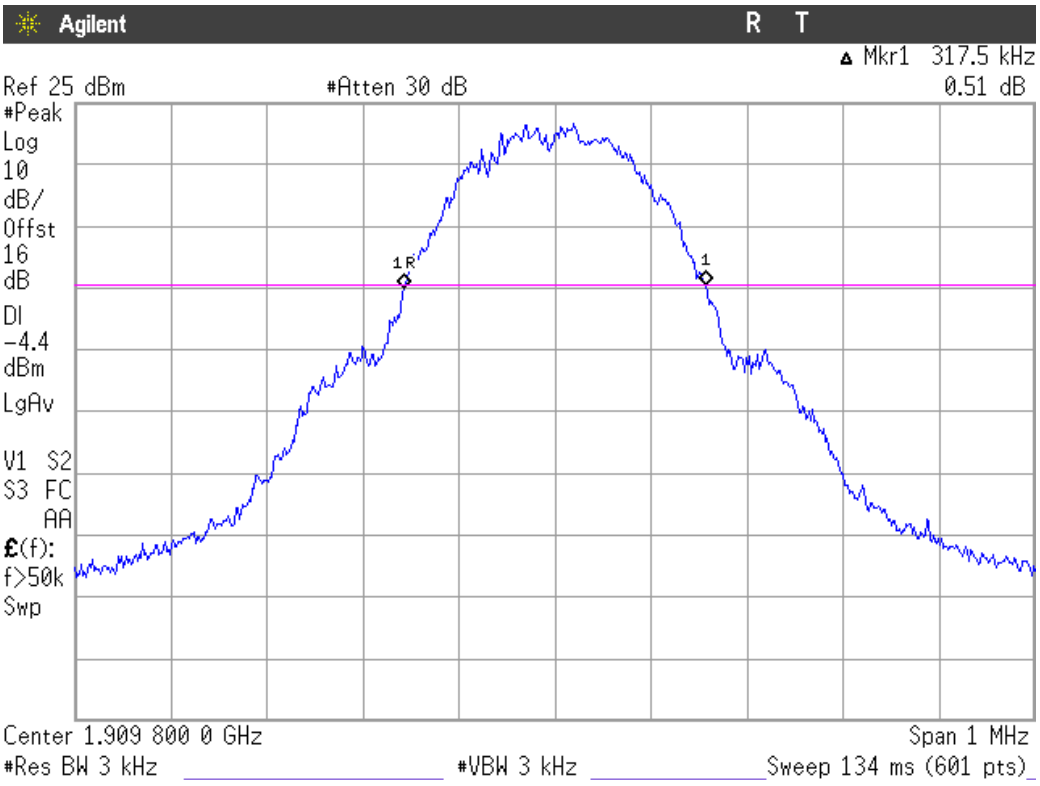
Lowest Channel



Middle Channel

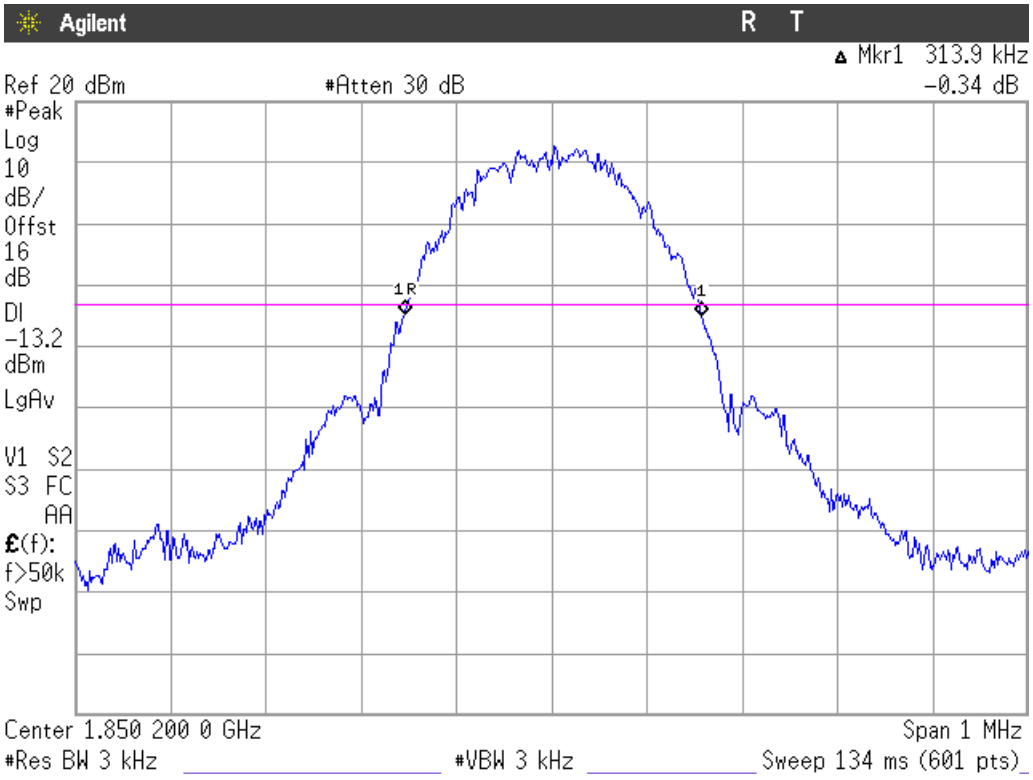


Highest Channel

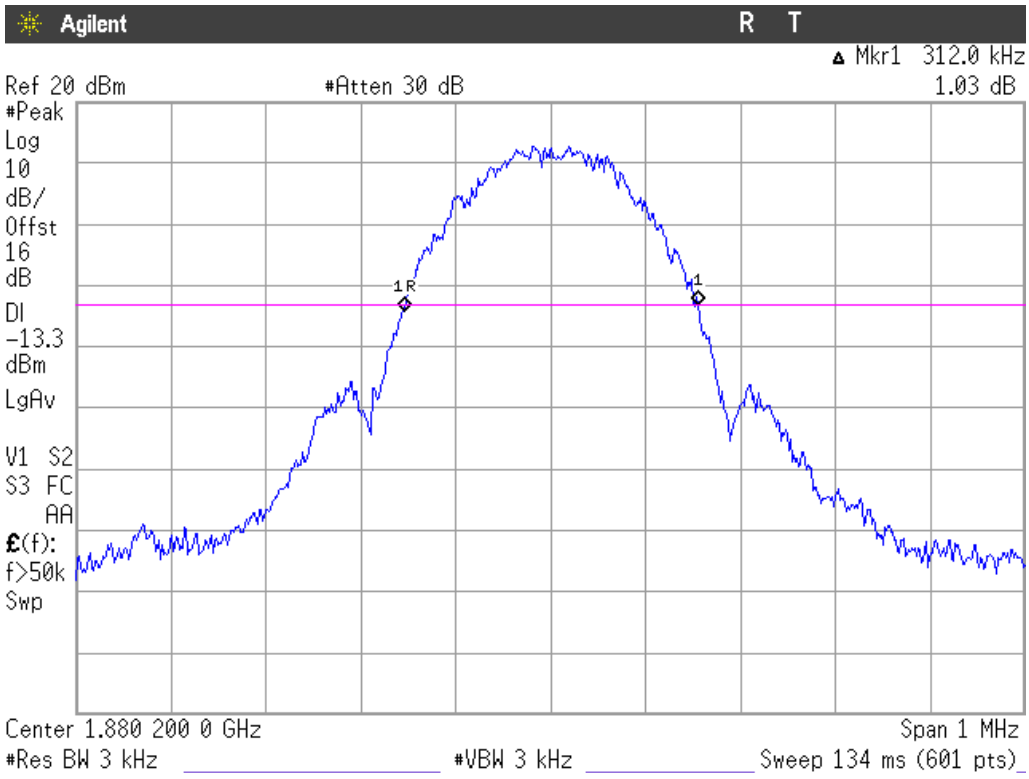


EDGE MODULATION

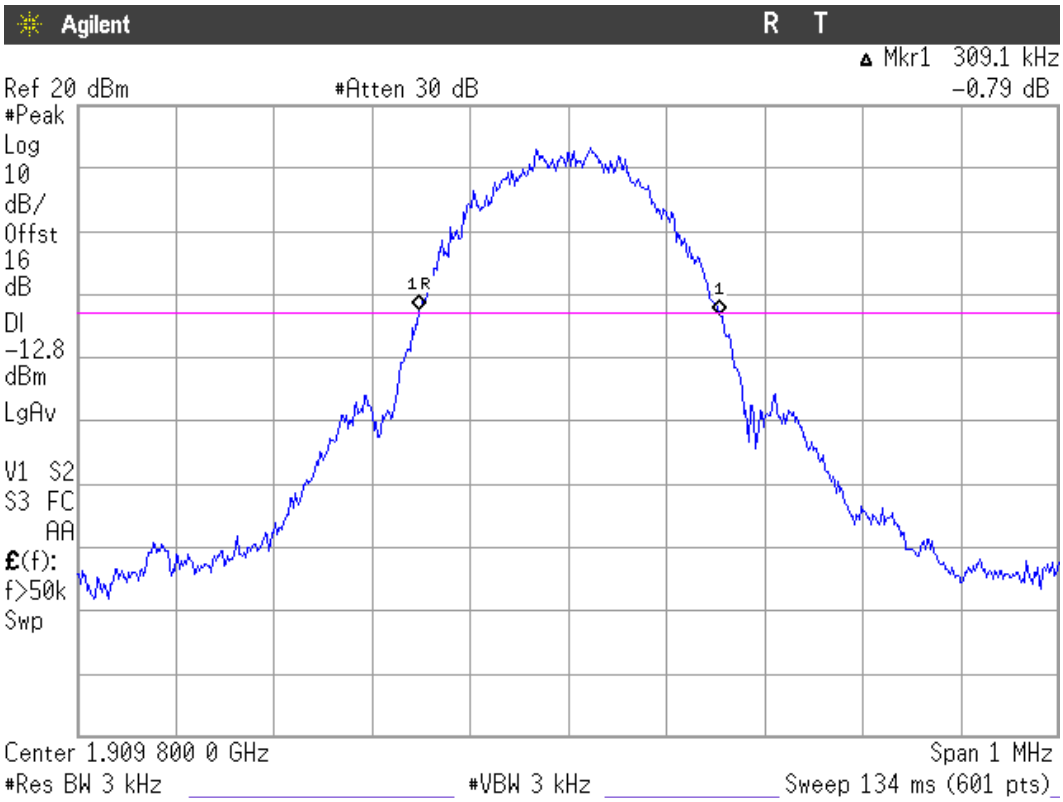
Lowest Channel



Middle Channel

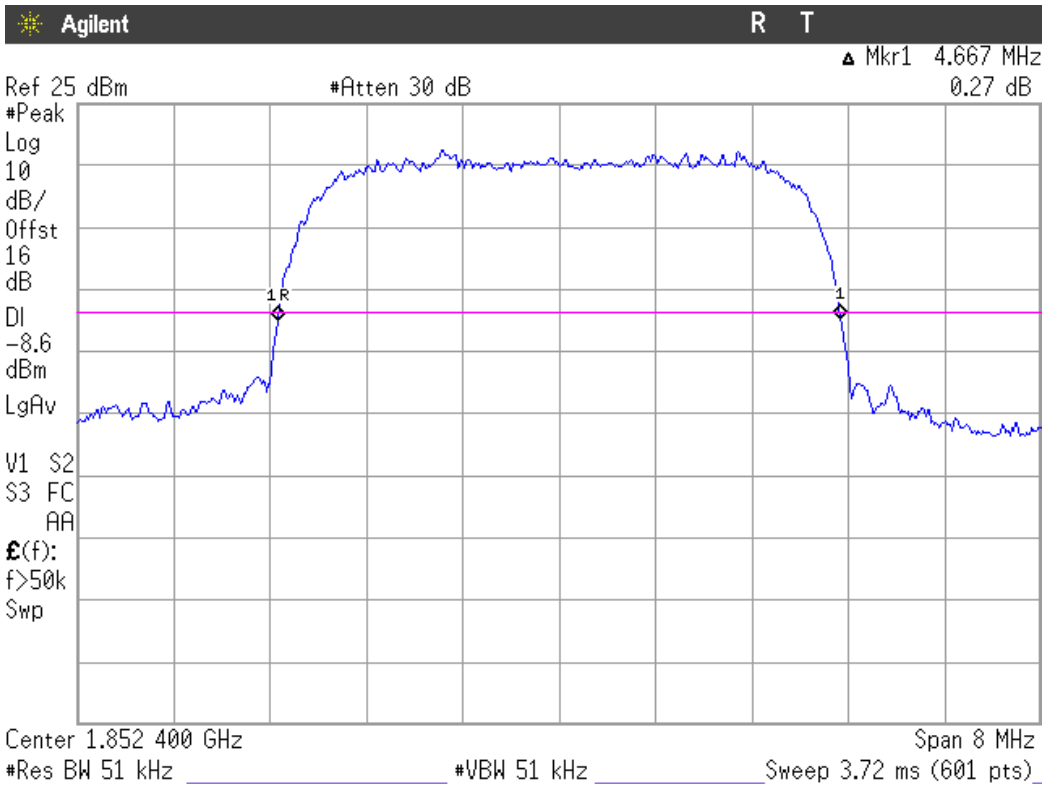


Highest Channel

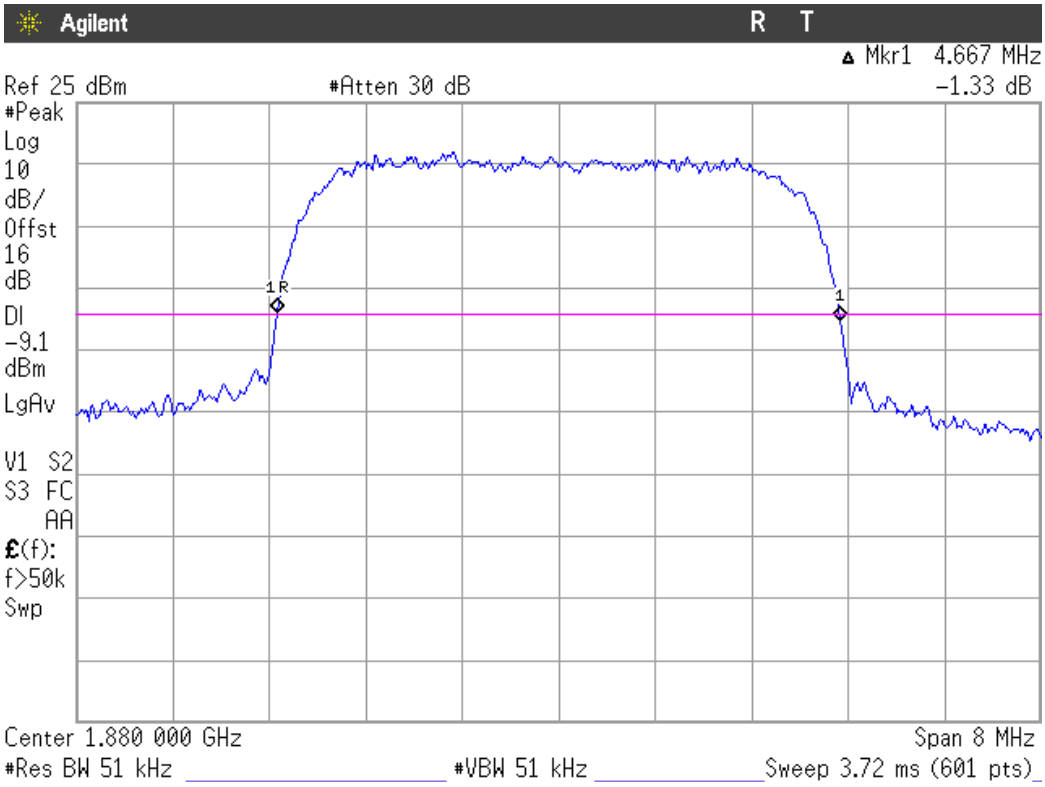


WCDMA MODULATION

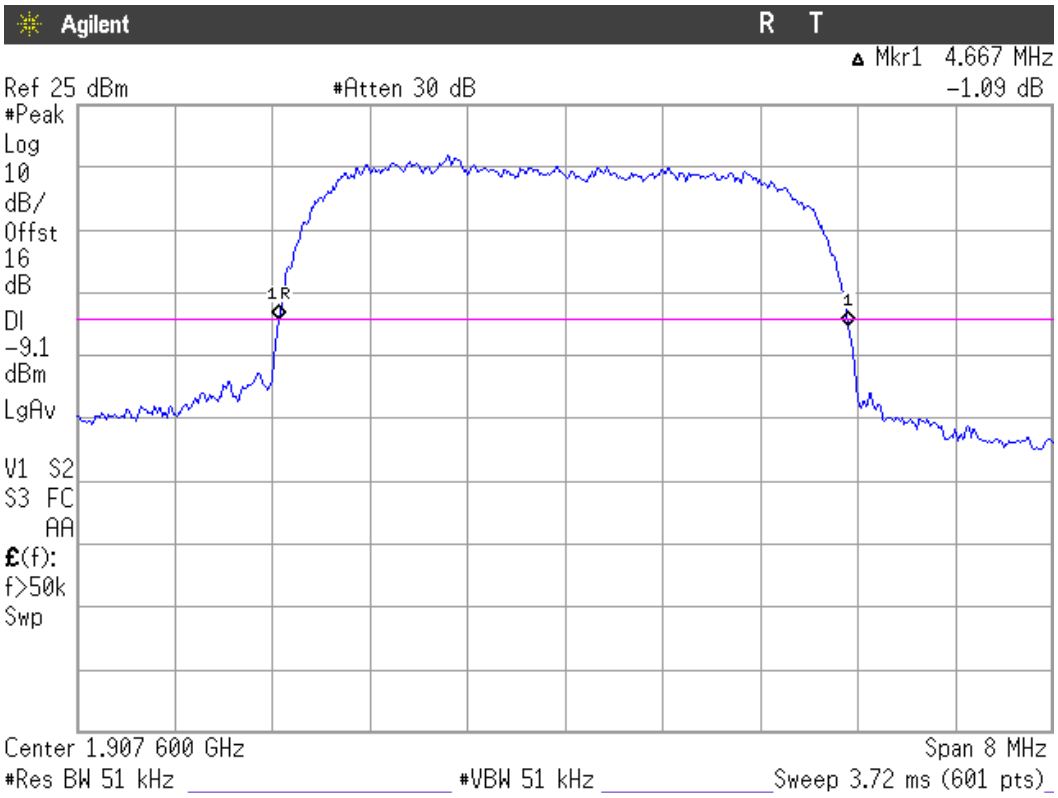
Lowest Channel



Middle Channel



Highest Channel



Spurious emissions at antenna terminals

SPECIFICATION

§2.1051 and §24.238

METHOD

The EUT RF output connector was connected to an spectrum analyser using an 50 ohm attenuator and the resolution bandwidth of the spectrum analyser was set to 1 MHz. The spectrum was investigated from 30 MHz to 20 GHz.

The reading of the spectrum analyser is corrected with the attenuation loss of connection between output terminal of EUT and input of the spectrum analyser.

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 (see plots in next pages)

GPRS MODULATION

1. CHANNEL: LOWEST
No spurious signals were found in all the range.

2. CHANNEL: MIDDLE

No spurious signals were found in all the range.

3. CHANNEL: HIGHEST

No spurious signals were found in all the range.

EDGE MODULATION

1. CHANNEL: LOWEST
No spurious signals were found in all the range.

2. CHANNEL: MIDDLE

No spurious signals were found in all the range.

3. CHANNEL: HIGHEST

No spurious signals were found in all the range.

WCDMA MODULATION

1. CHANNEL: LOWEST
No spurious signals were found in all the range.

2. CHANNEL: MIDDLE

No spurious signals were found in all the range.

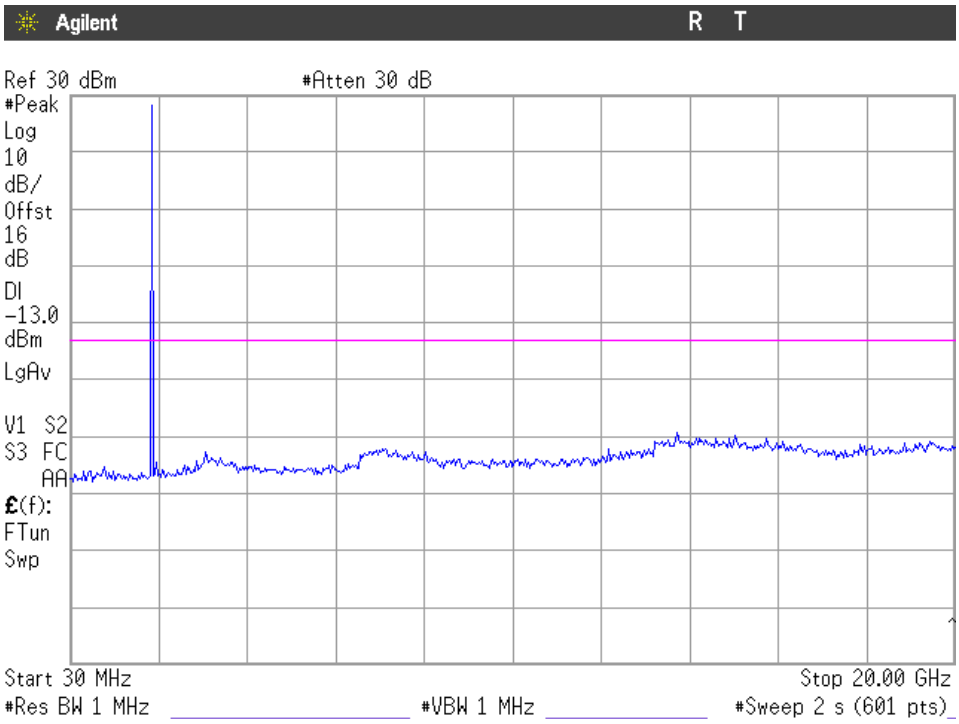
3. CHANNEL: HIGHEST

No spurious signals were found in all the range.

Verdict: PASS

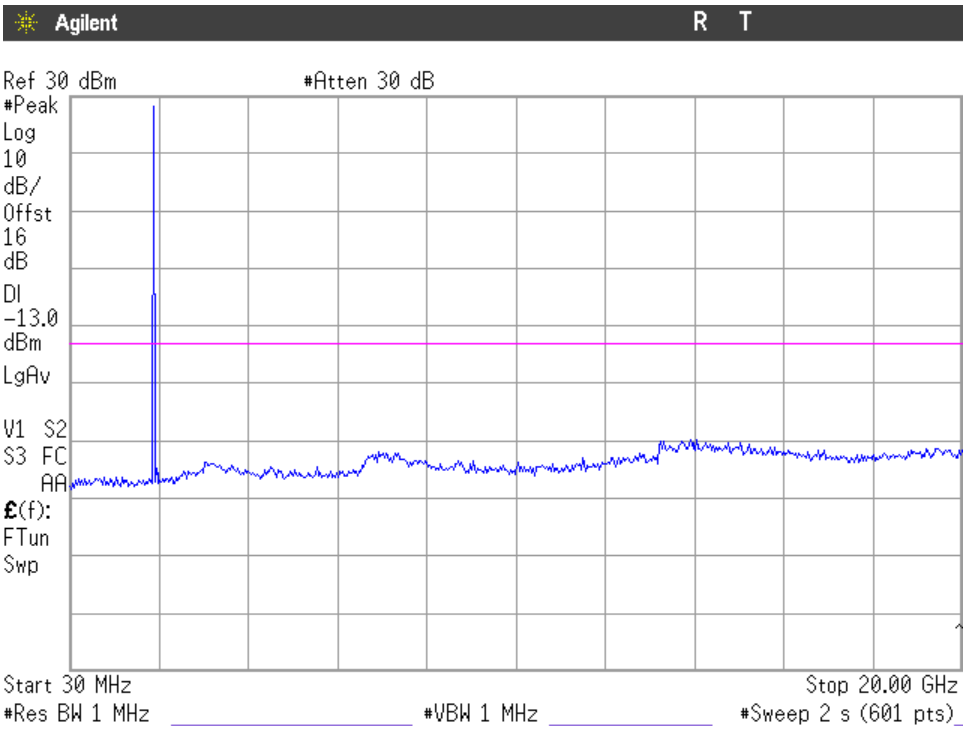
GPRS MODULATION

1. CHANNEL: LOWEST



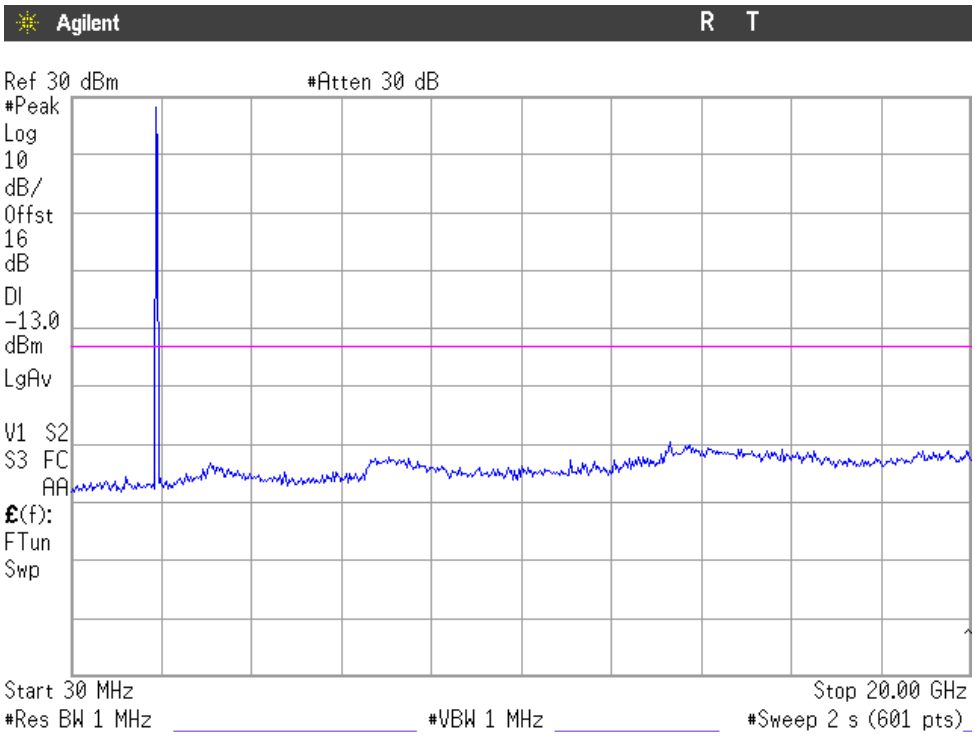
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



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

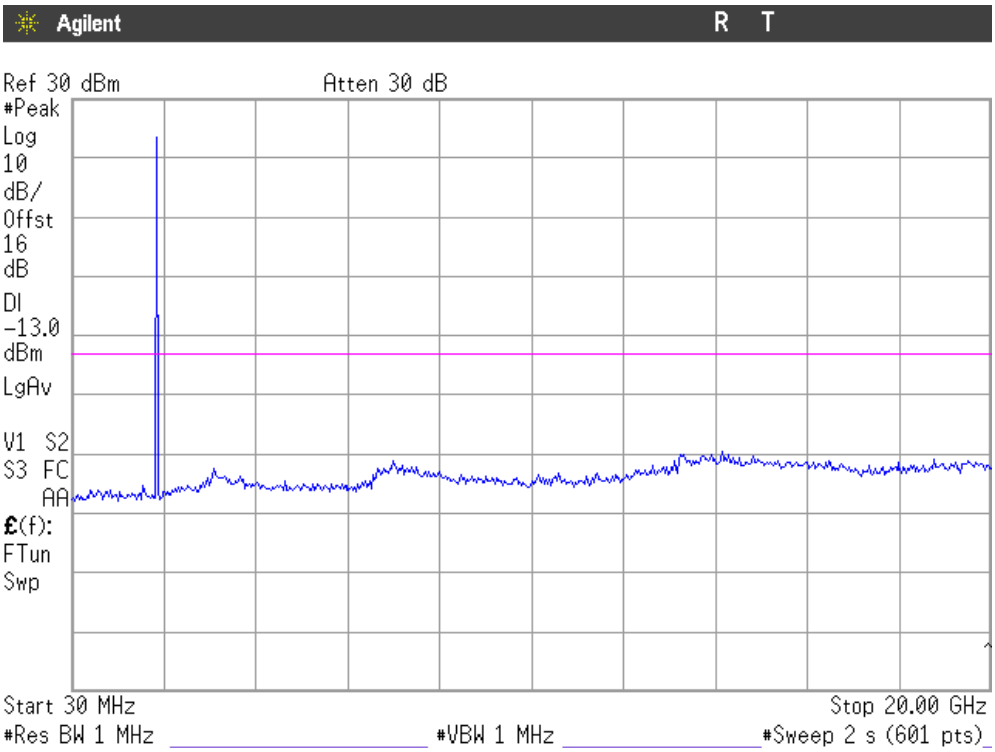
3. CHANNEL: HIGHEST



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

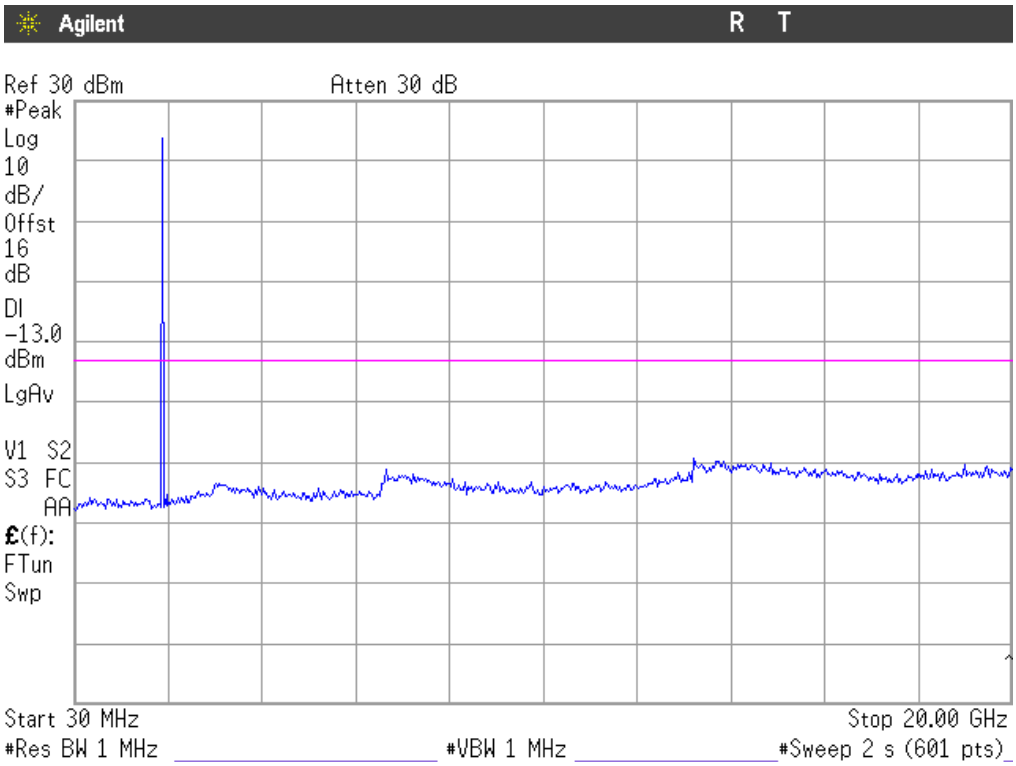
EDGE MODULATION

1. CHANNEL: LOWEST



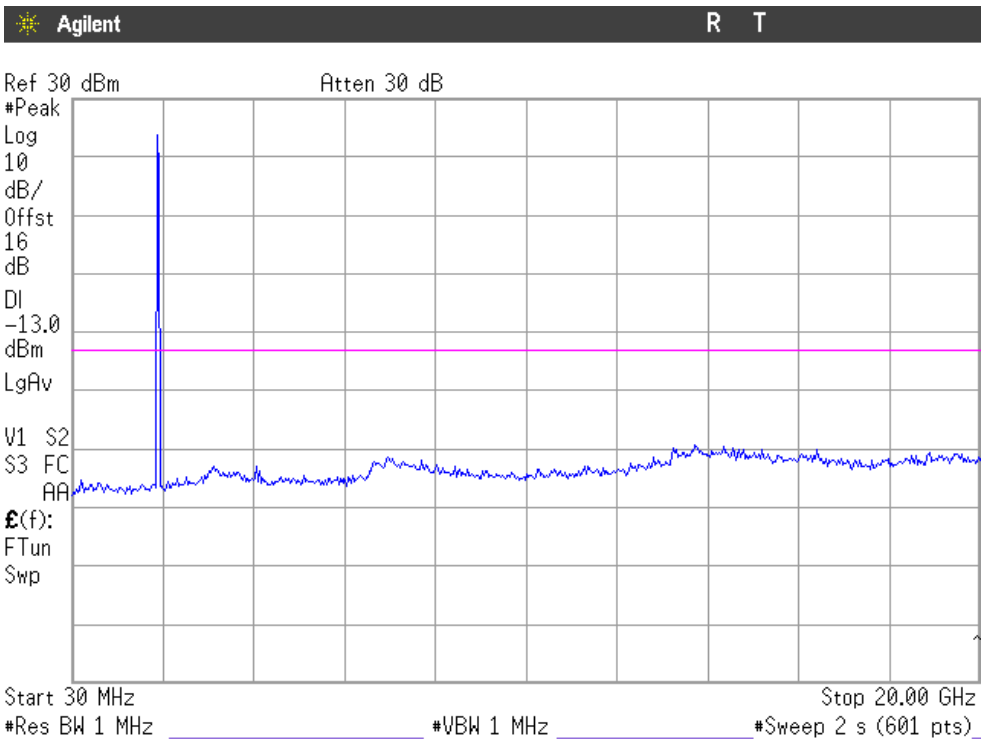
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



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

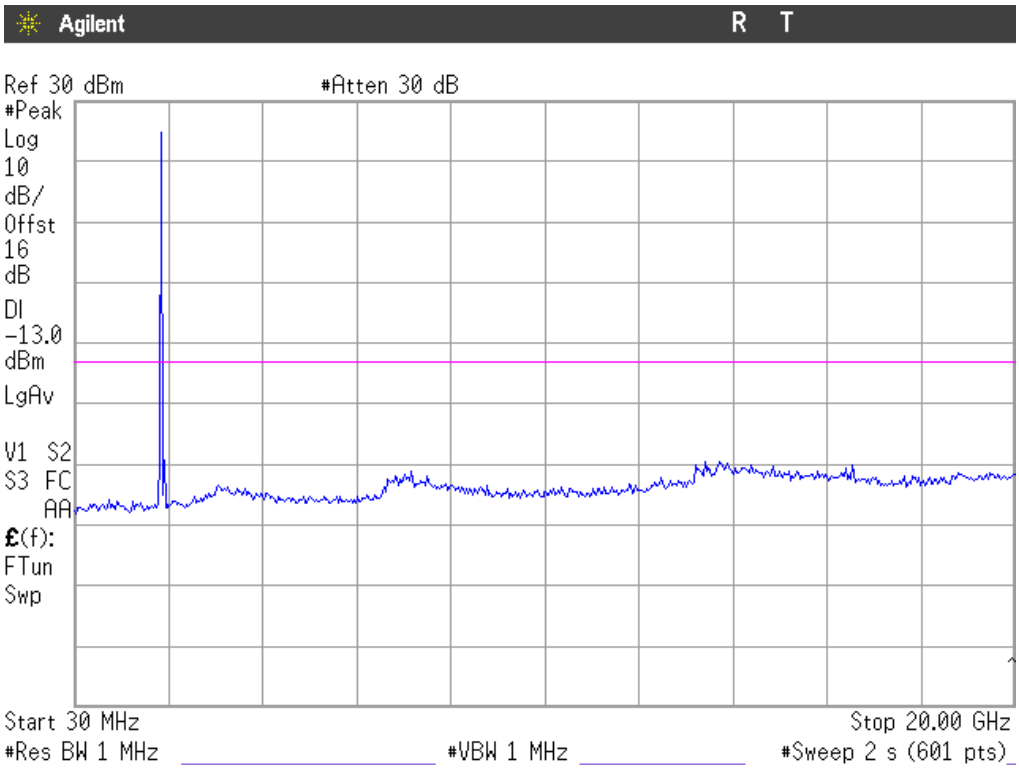
3. CHANNEL: HIGHEST



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

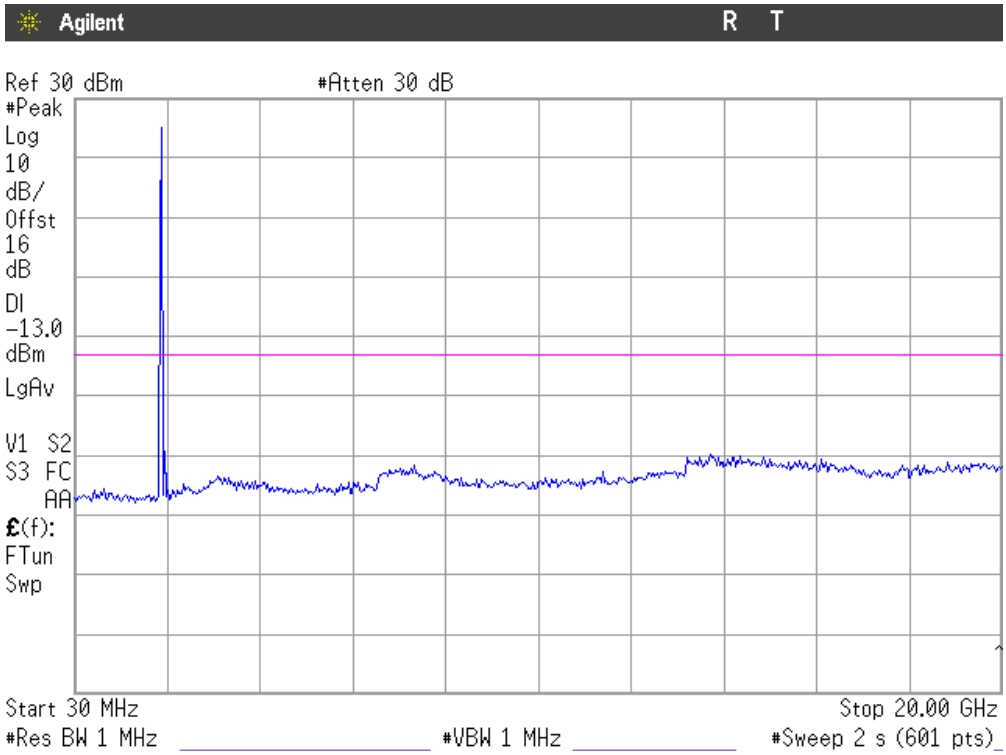
WCDMA MODULATION

1. CHANNEL: LOWEST



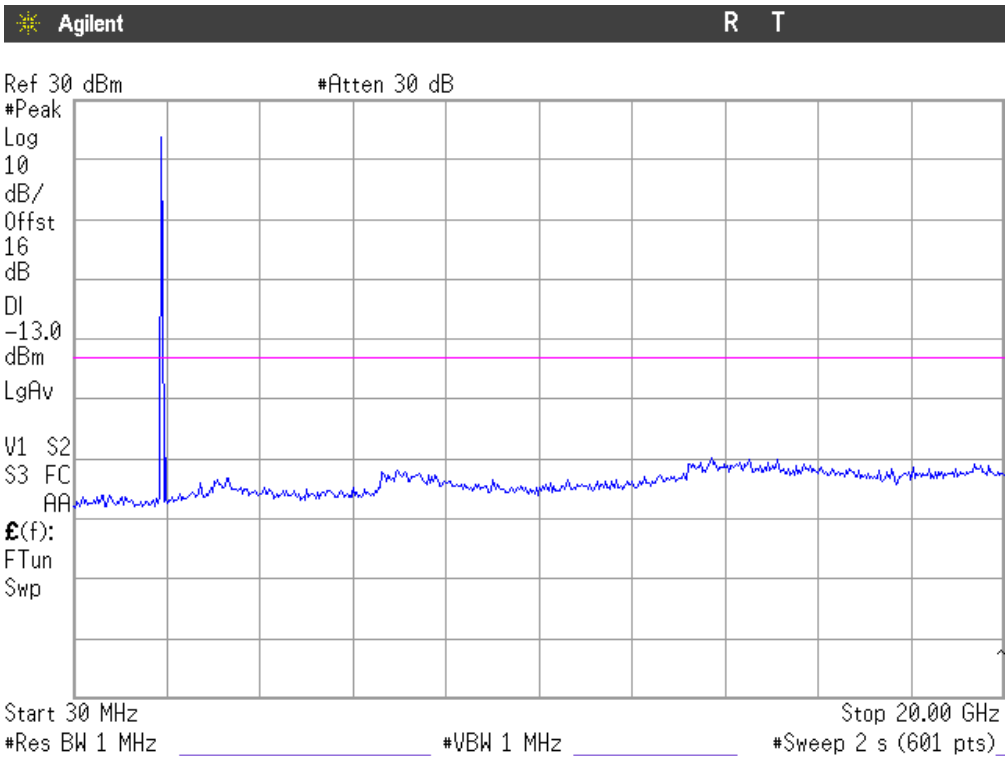
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



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

3. CHANNEL: HIGHEST



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

Spurious emissions at antenna terminals at Block Edges

SPECIFICATION

§2.1051 and §24.238

METHOD

As indicated in FCC part 24, in the 1 MHz bands immediately outside and adjacent to the frequency block or band a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A resolution bandwidth of 3.3 kHz was used for GPRS and EDGE modulations, and 51 kHz for WCDMA modulation.

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

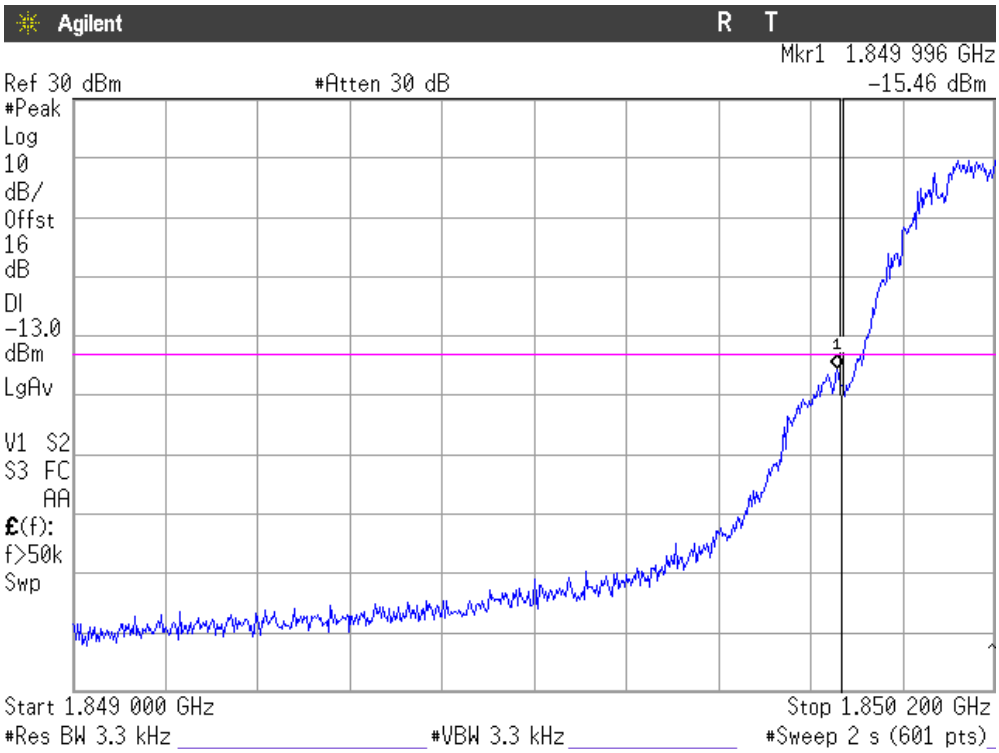
RESULTS (see plots in next pages)

MODULATION	Maximum level at lowest Block Edge (dBm)	Maximum level at highest Block Edge (dBm)
GPRS	-15.46	-16.27
EDGE	-26.45	-27.51
WCDMA	-18.60	-21.13

Measurement uncertainty = ±1.57 dB.

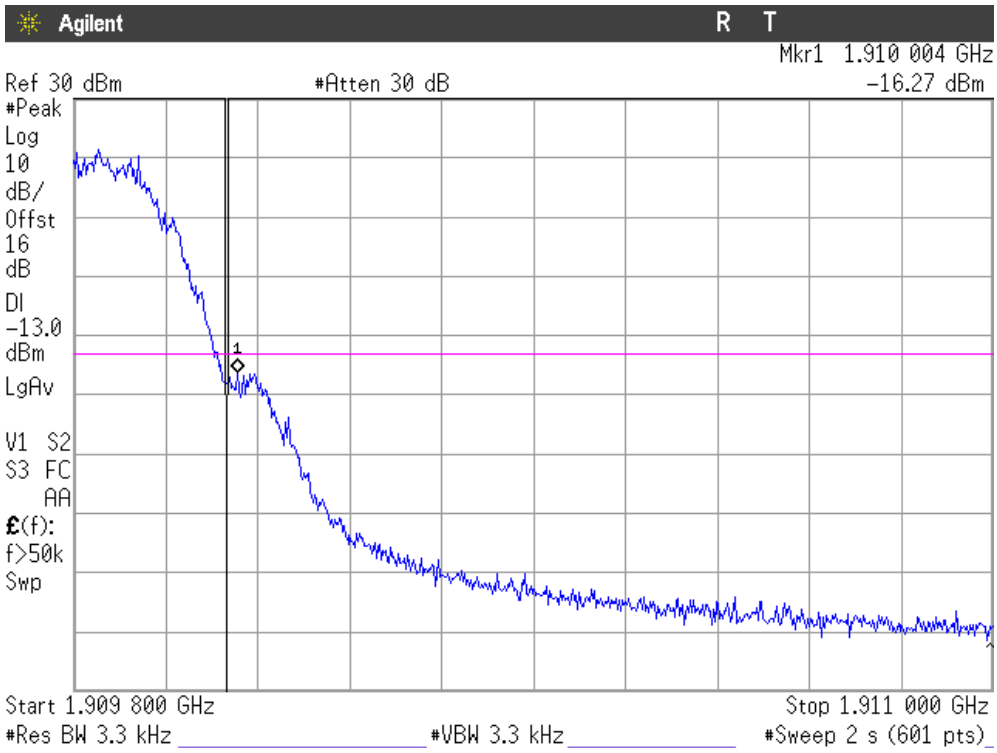
GPRS MODULATION

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

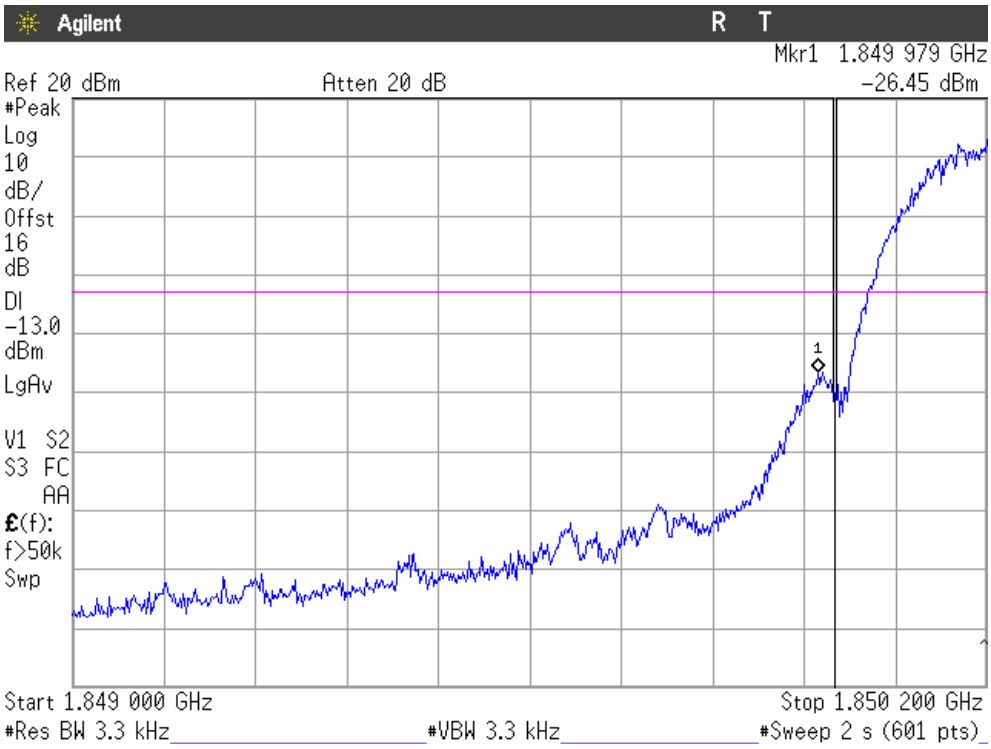


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

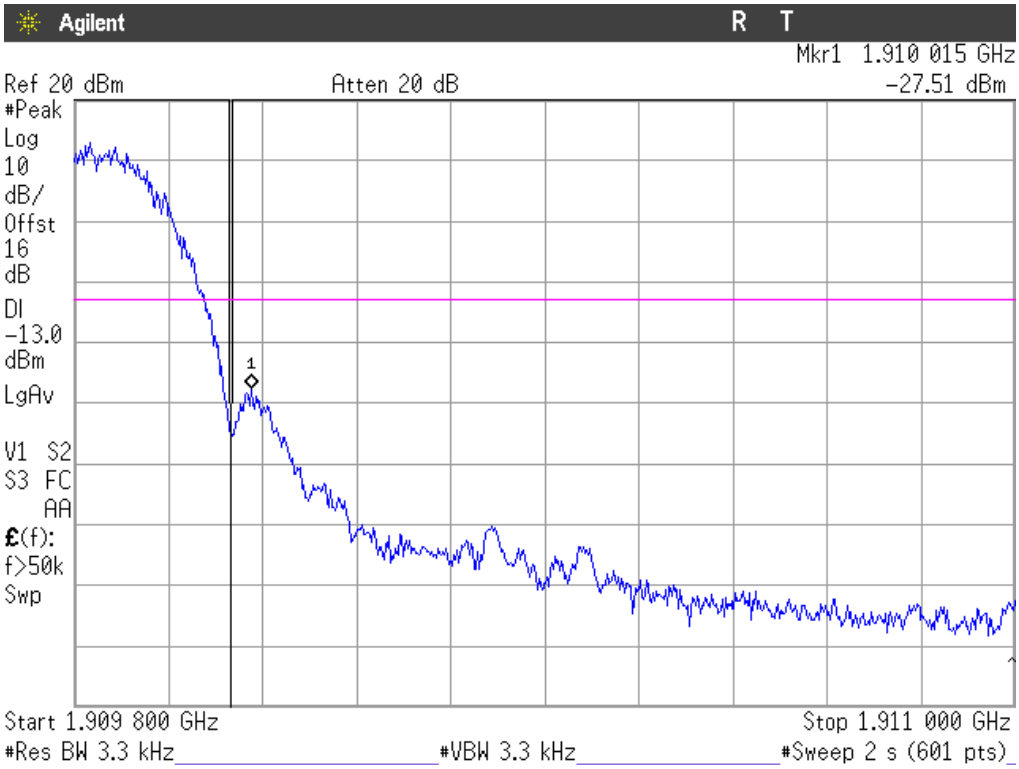
EDGE MODULATION

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

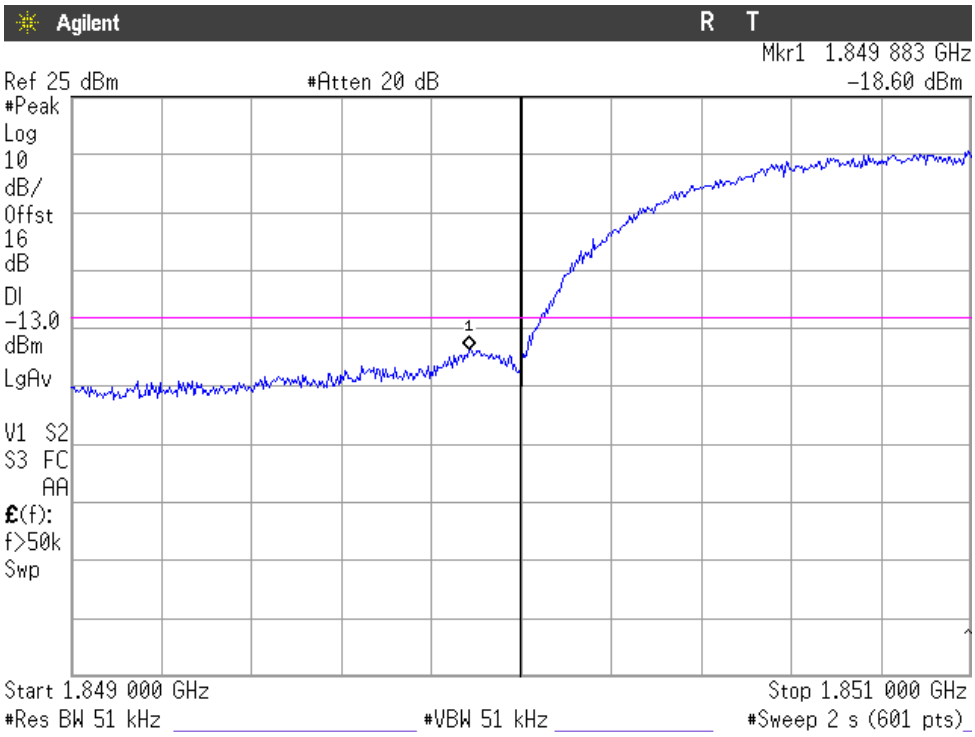


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

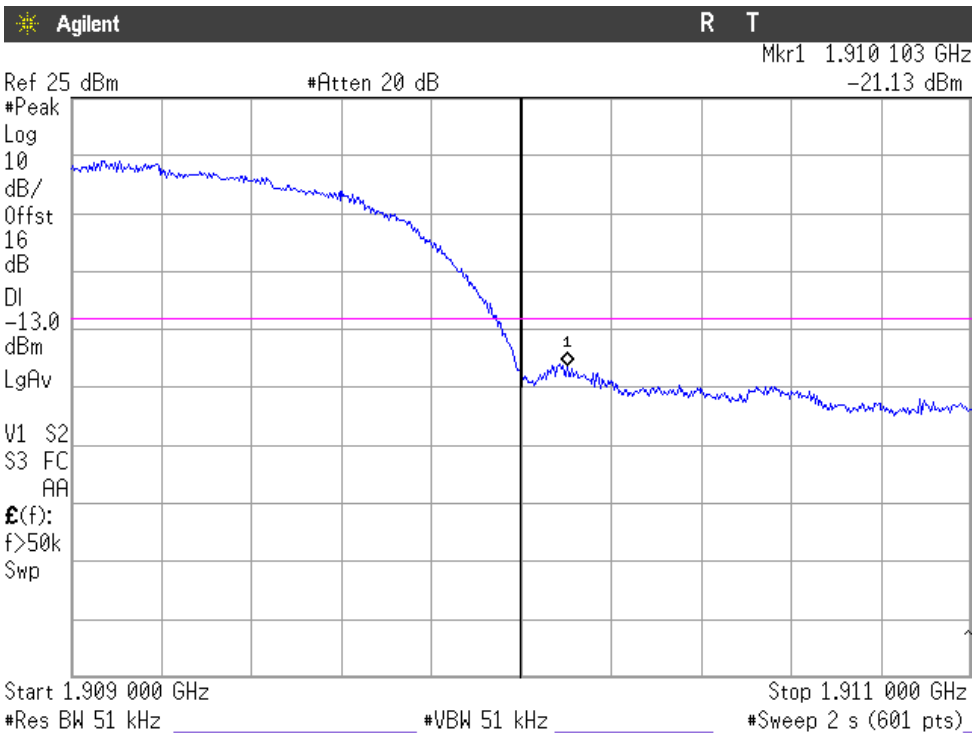
WCDMA MODULATION

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

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

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 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.

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.

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 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

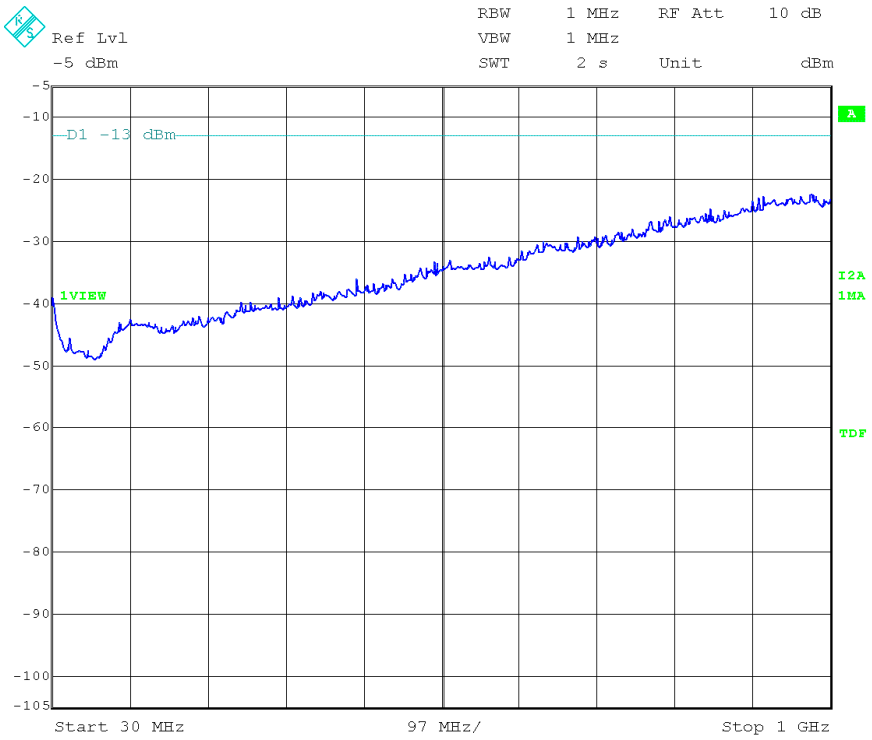
Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

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

Verdict: PASS

GPRS MODULATION

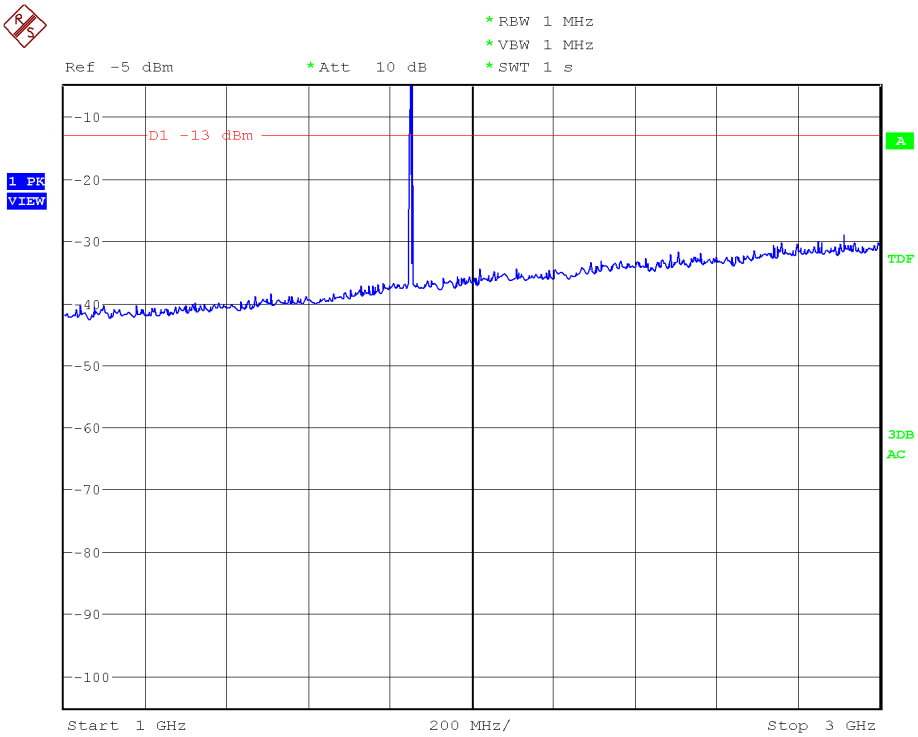
FREQUENCY RANGE 30 MHz-1000 MHz.



(This plot is valid for all three channels).

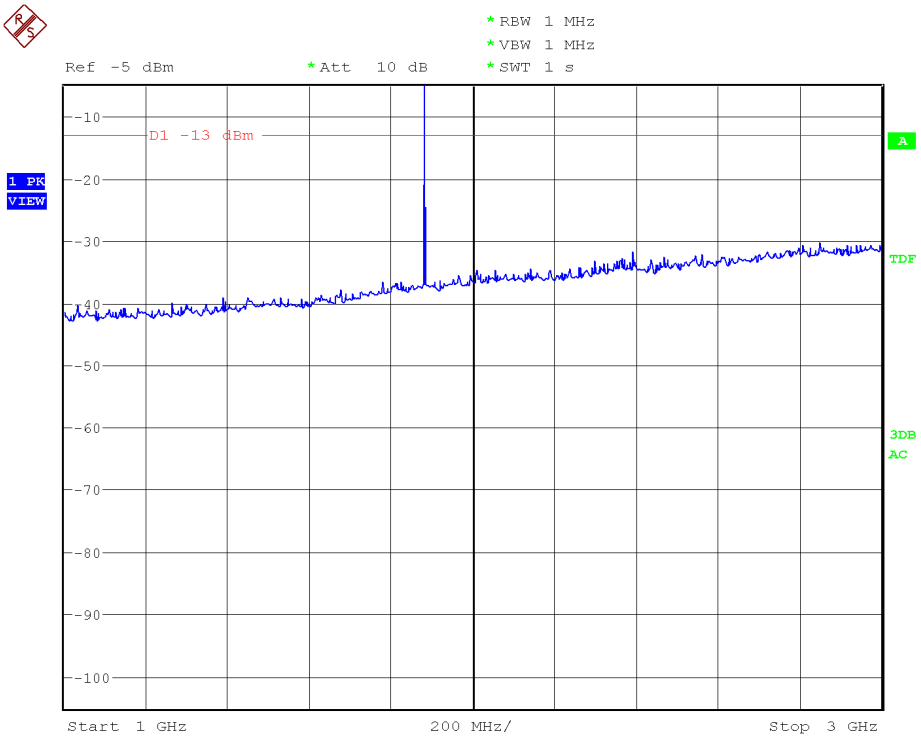
FREQUENCY RANGE 1 GHz to 3 GHz.

CHANNEL: LOWEST



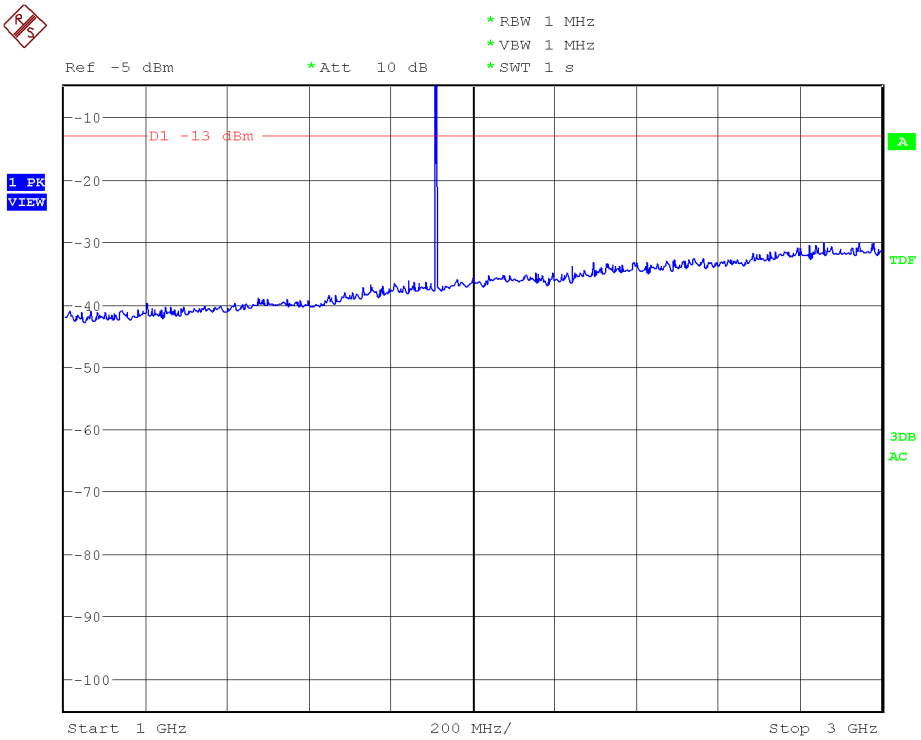
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



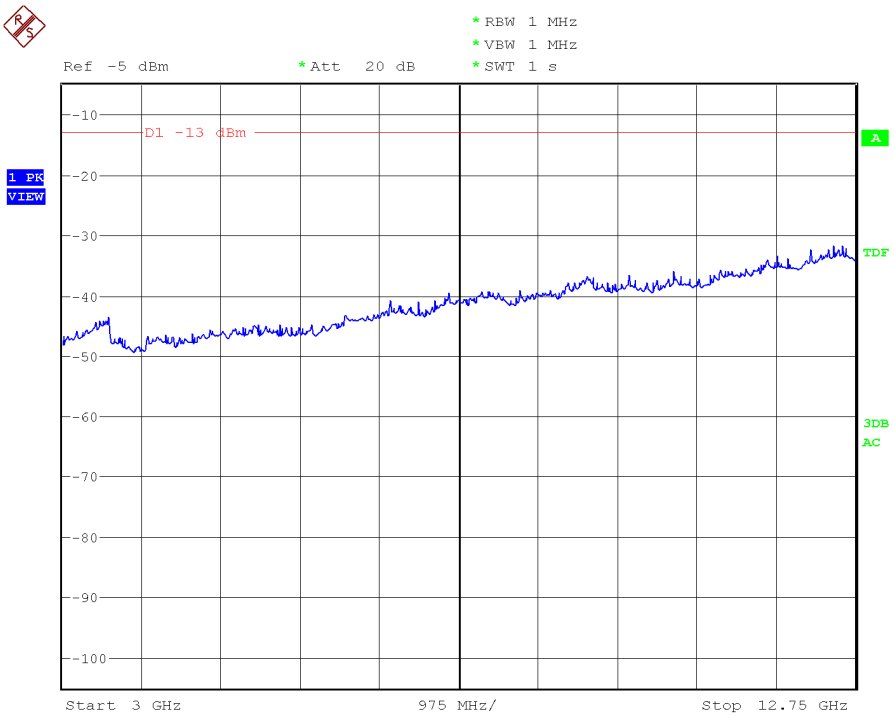
Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST



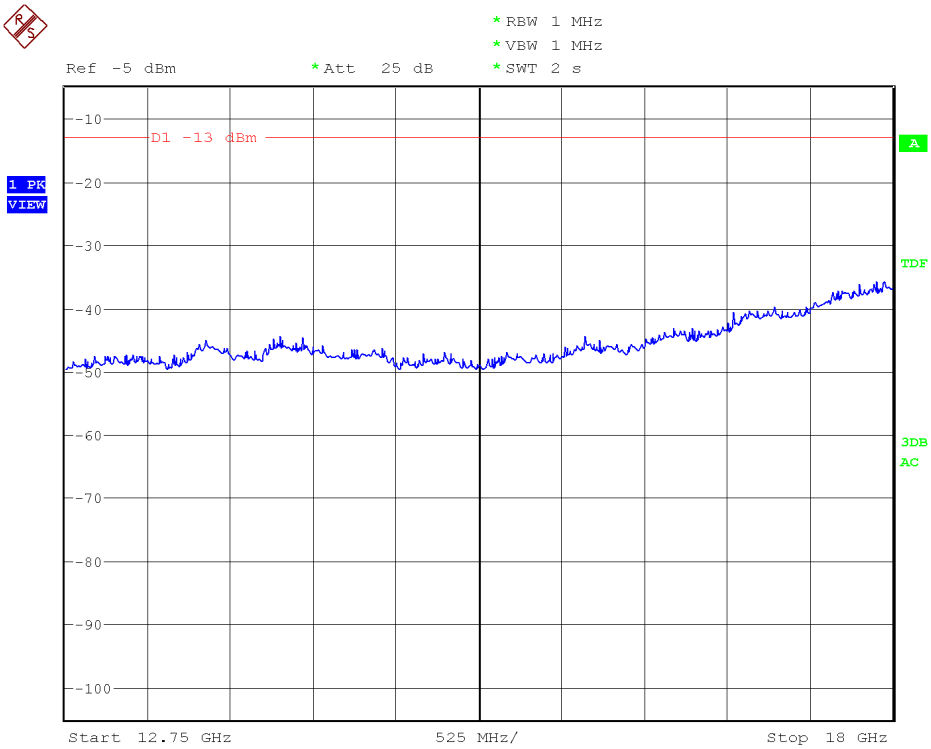
Note: The peak above the limit is the carrier frequency.

FREQUENCY RANGE 3 GHz to 12.75 GHz.



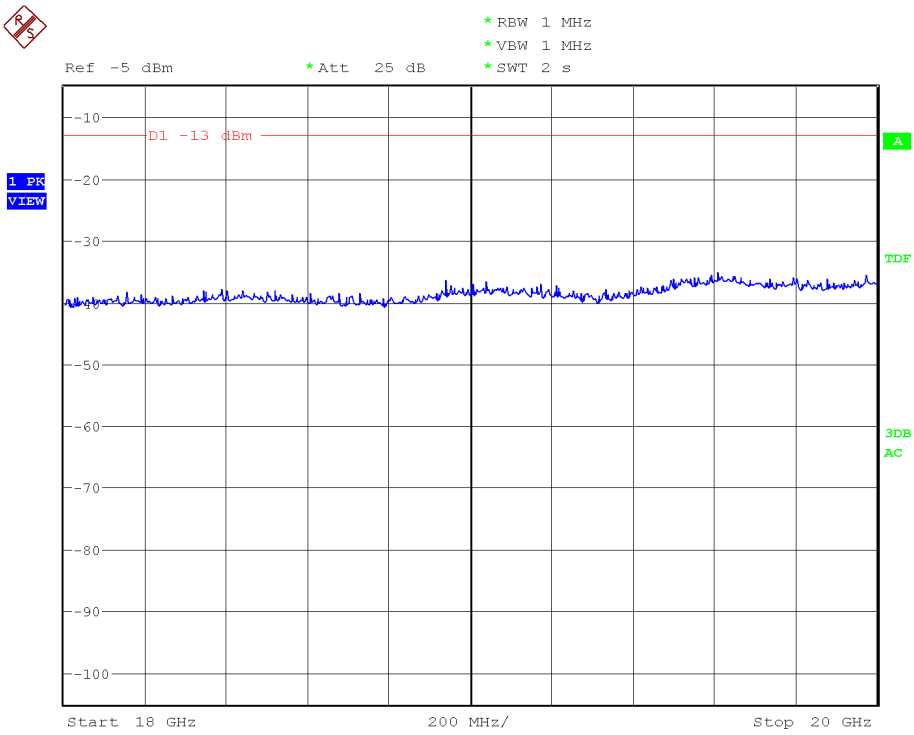
(This plot is valid for all three channels).

FREQUENCY RANGE 12.75 GHz TO 18 GHz.



(This plot is valid for all three channels).

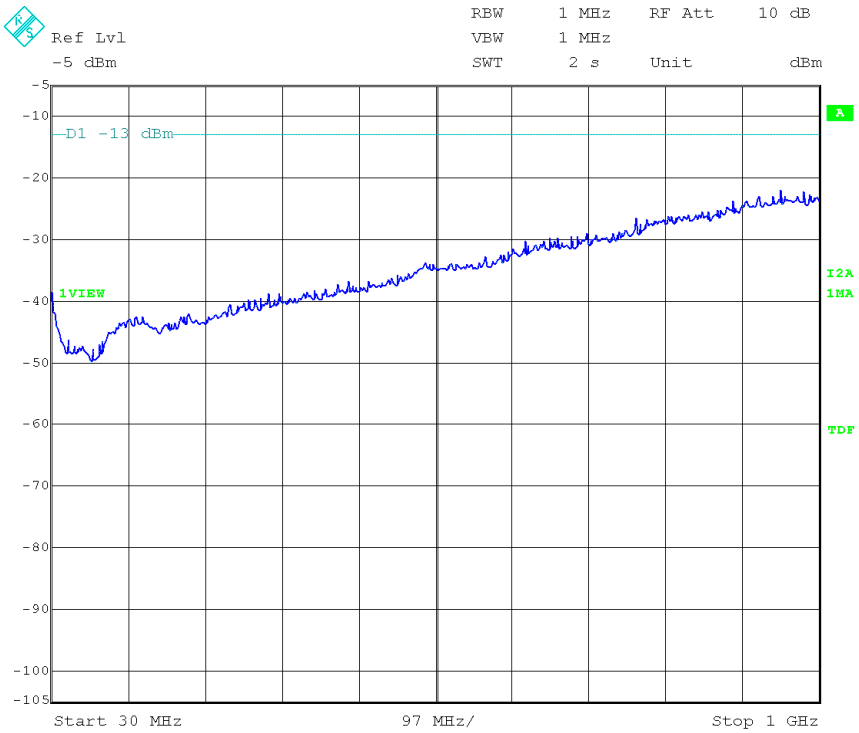
FREQUENCY RANGE 18 GHz TO 20 GHz.



(This plot is valid for all three channels).

EDGE MODULATION

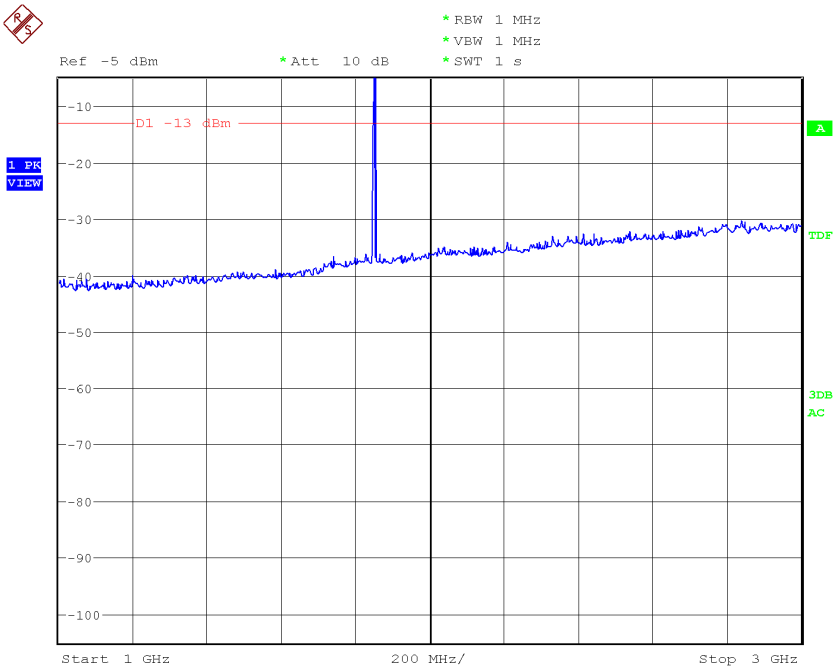
FREQUENCY RANGE 30 MHz-1000 MHz.



(This plot is valid for all three channels).

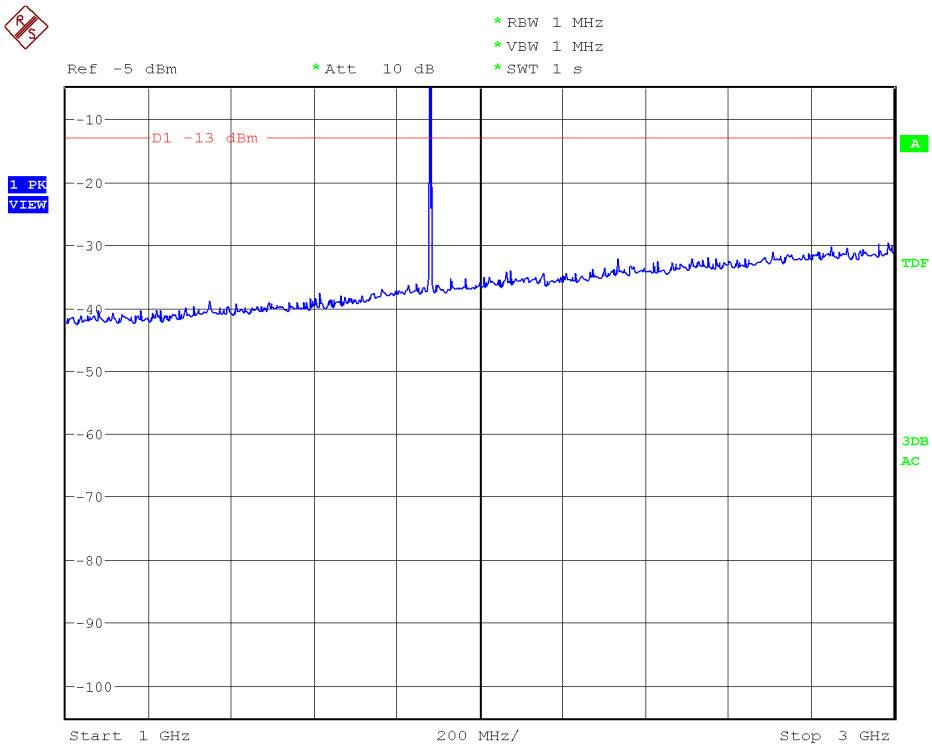
FREQUENCY RANGE 1 GHz to 3 GHz.

CHANNEL: LOWEST



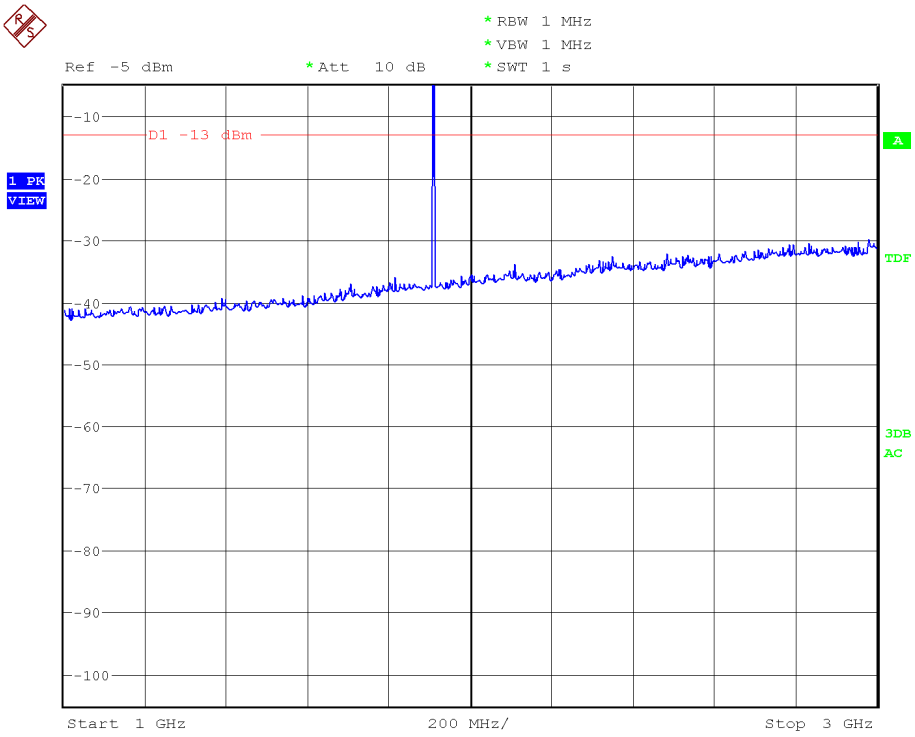
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



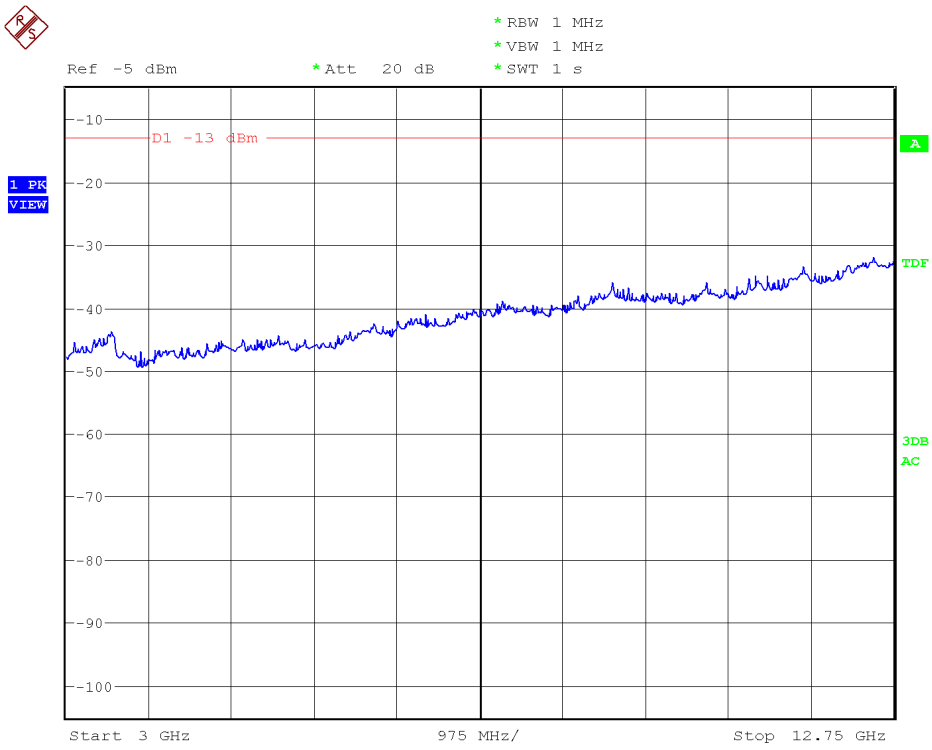
Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST



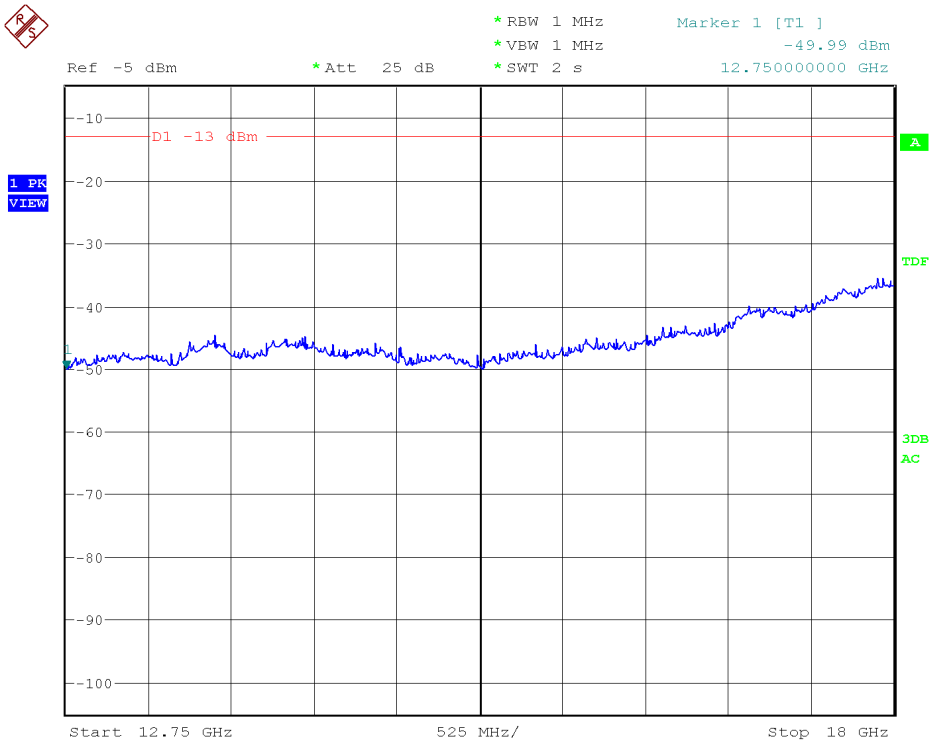
Note: The peak above the limit is the carrier frequency.

FREQUENCY RANGE 3 GHz to 12.75 GHz.



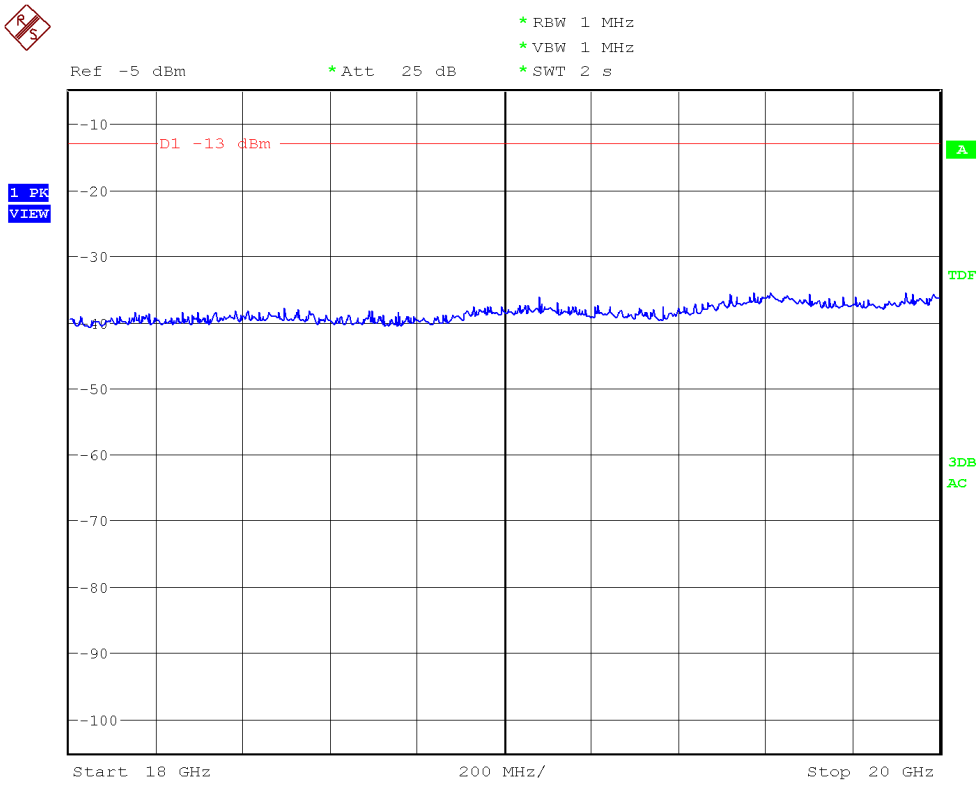
(This plot is valid for all three channels).

FREQUENCY RANGE 12.75 GHz TO 18 GHz.



(This plot is valid for all three channels).

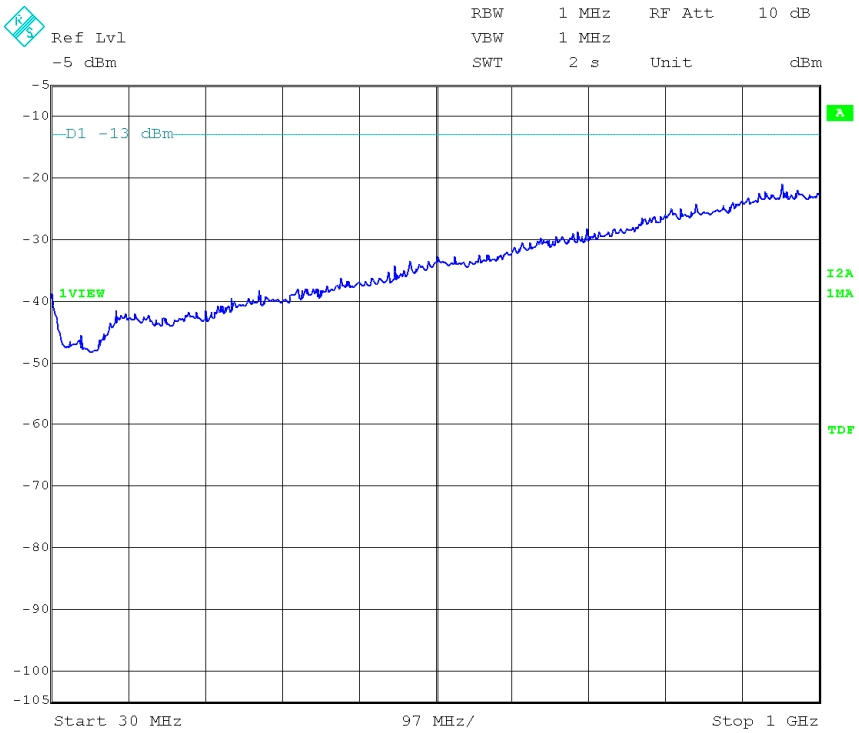
FREQUENCY RANGE 18 GHz TO 20 GHz.



(This plot is valid for all three channels).

WCDMA MODULATION

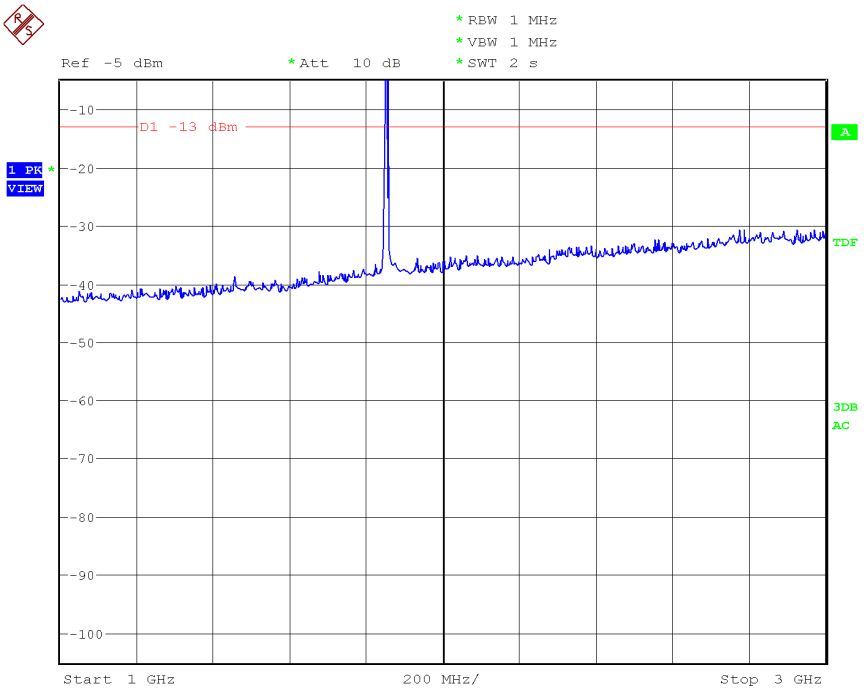
FREQUENCY RANGE 30 MHz-1000 MHz.



(This plot is valid for all three channels).

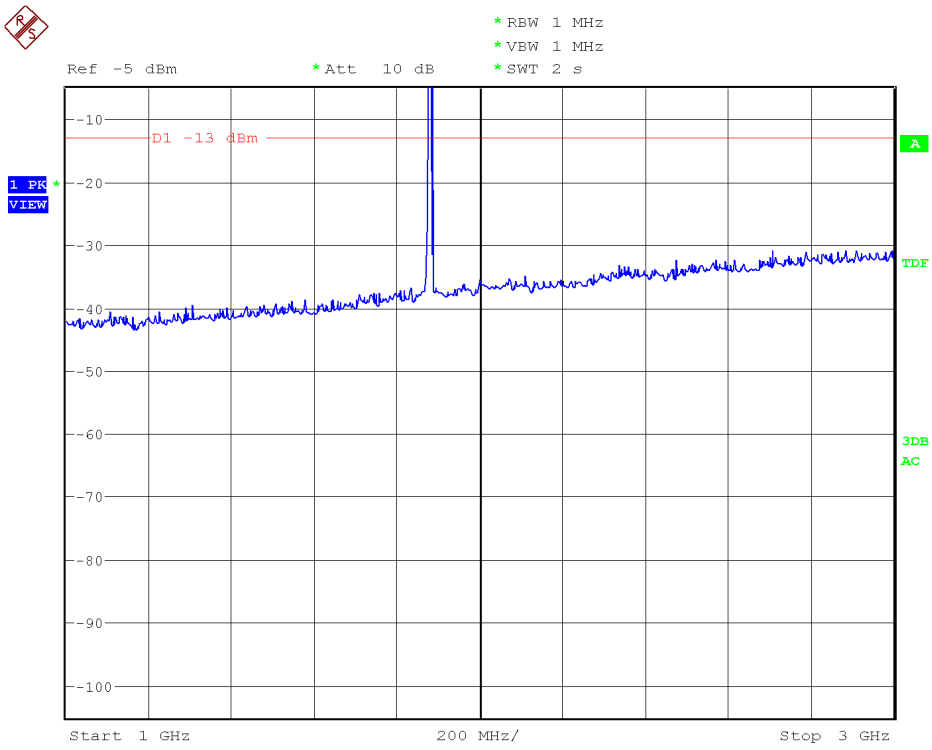
FREQUENCY RANGE 1 GHz to 3 GHz.

CHANNEL: LOWEST



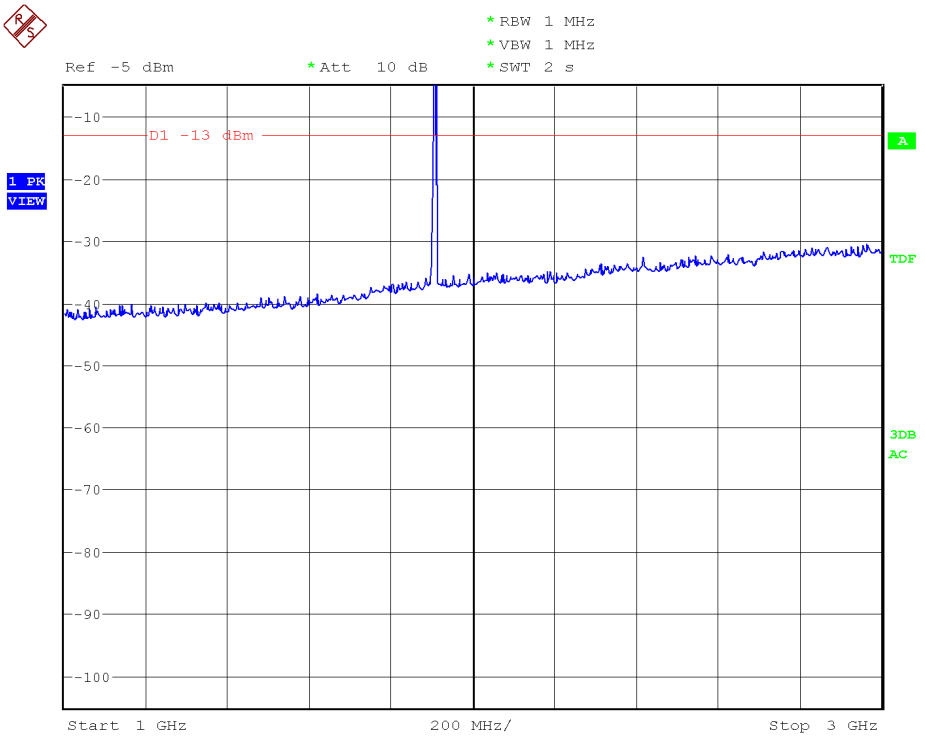
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



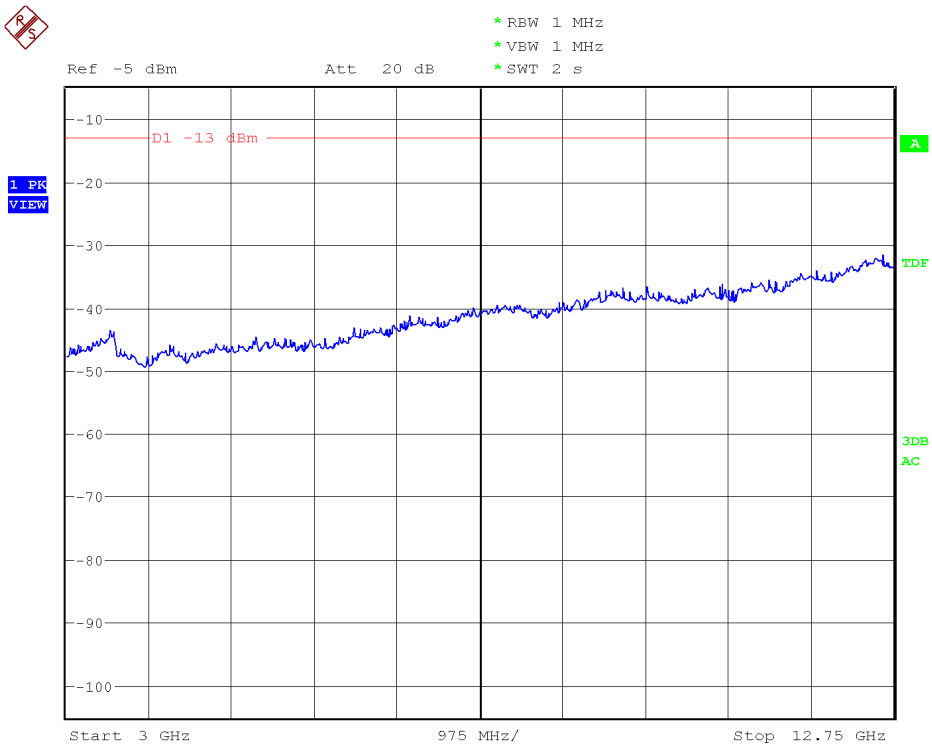
Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST



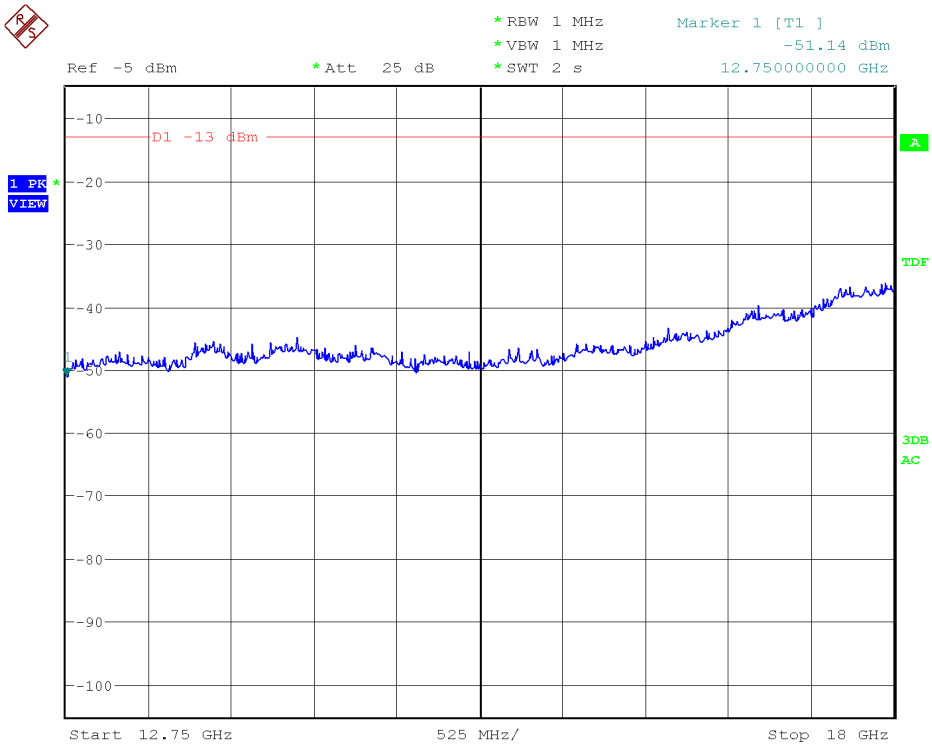
Note: The peak above the limit is the carrier frequency.

FREQUENCY RANGE 3 GHz to 12.75 GHz.



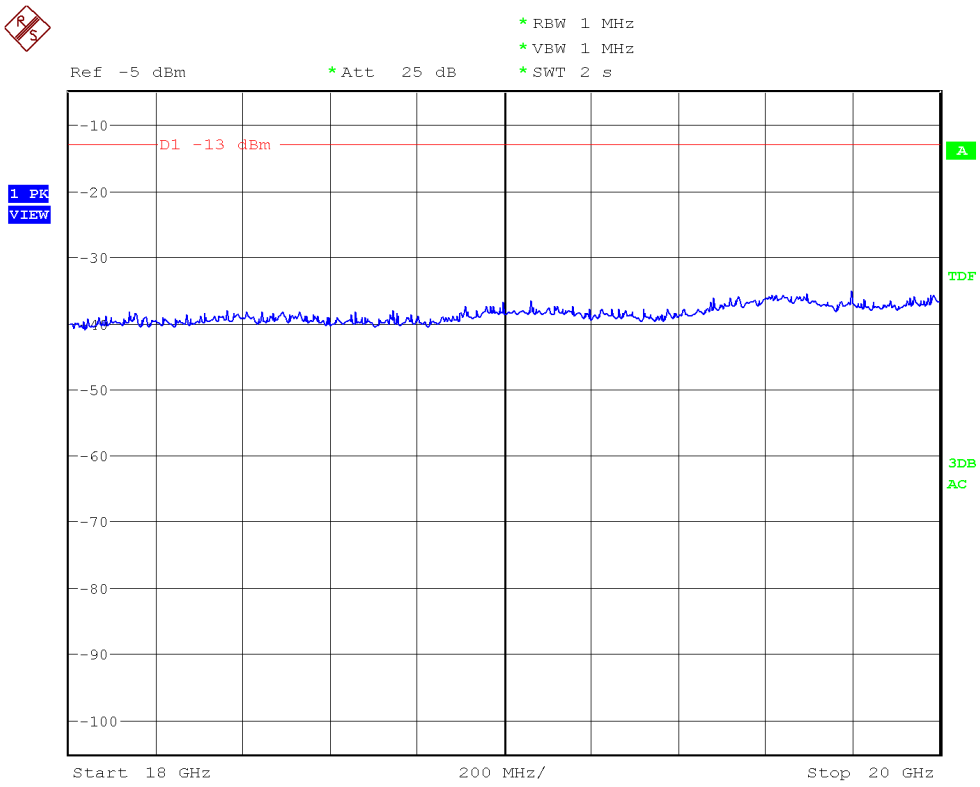
(This plot is valid for all three channels).

FREQUENCY RANGE 12.75 GHz TO 18 GHz.



(This plot is valid for all three channels).

FREQUENCY RANGE 18 GHz TO 20 GHz.



(This plot is valid for all three channels).

APPENDIX B: Measuring results for electromagnetic conducted emission

CONTENT:

DESCRIPTION OF THE OPERATION MODES..... 112
CONTINUOUS CONDUCTED EMISSION ON POWER LEADS 113

DESCRIPTION OF THE OPERATION MODES

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. Every operation mode takes a failure criteria for the immunity test that they were applying to it and a monitoring to guarantee performance of the same ones.

In the following table appears the operation modes used by the samples tested to that it refers the present test report.

OPERATION MODE	DESCRIPTION
OM#07	EUT ON. TCH 850 MHz. Bluetooth Tx. Charging batteries.
OM#08	EUT ON. TCH 1900MHz. Bluetooth Tx. Charging batteries.
OM#09	EUT ON. TCH UMTS FDD II. Bluetooth Tx. Charging batteries.
OM#010	EUT ON. TCH UMTS FDD V. Bluetooth Tx. Charging batteries.

*Power supply: 115Vac / 60 Hz or by means of the laptop PC USB port, depending of the used sample.

CONTINUOUS CONDUCTED EMISSION ON POWER LEADS

LIMITS:	Product standard :	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART C.
	Test standard :	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART C.

CLASS B

The applied limit for continuous conducted emissions in power leads, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart C in the frequency range 0,15 to 30 MHz, for Class B equipment was:

Frequency range (MHz)	**Limit (dBµV)**	
	Quasi-peak	**Average**
0,15 to 0,5	66-56	56-46
0,5 to 5	56	46
5 to 30	60	50

TESTED SAMPLES:	S/03 & 04
TESTED OPERATION MODES:	OM#07 to OM#10
TEST RESULTS :	CCmmnnhh: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire

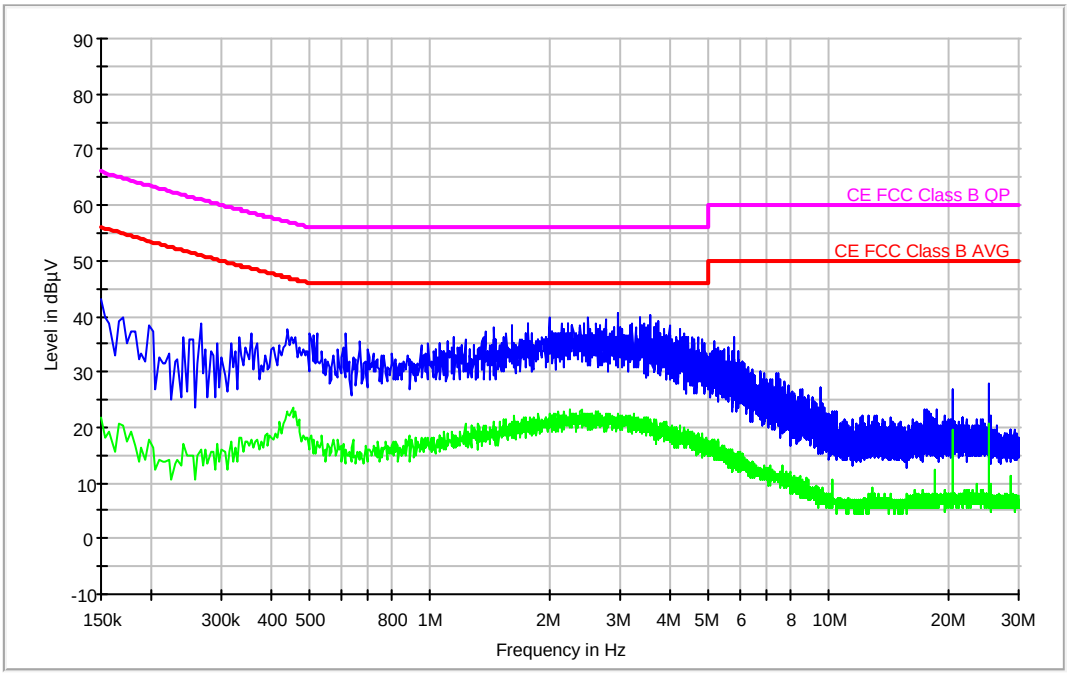
CCmmnnhh	**Description**	**Result**
CC03070N	Neutral wire noise.	P
CC0307L1	Phase wire noise.	P
CC03080N	Neutral wire noise.	P
CC0308L1	Phase wire noise.	P
CC03090N	Neutral wire noise.	P
CC0309L1	Phase wire noise.	P
CC03100N	Neutral wire noise.	P
CC0310L1	Phase wire noise.	P
CC04070N	Neutral wire noise.	P
CC0407L1	Phase wire noise.	P
CC04080N	Neutral wire noise.	P
CC0408L1	Phase wire noise.	P

CC04090N	Neutral wire noise.	P
CC0409L1	Phase wire noise.	P
CC04100N	Neutral wire noise.	P
CC0410L1	Phase wire noise.	P

Continuous Conducted emission : CC03070N	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/03
Operation mode: OM#07
Date: 2009-11-10 20:09
Setup: EMI conducted
Mode: EUT ON. TCH mode 850MHz + BT Tx. Neutral noise.

EC FCC Class B ESIB26 CC



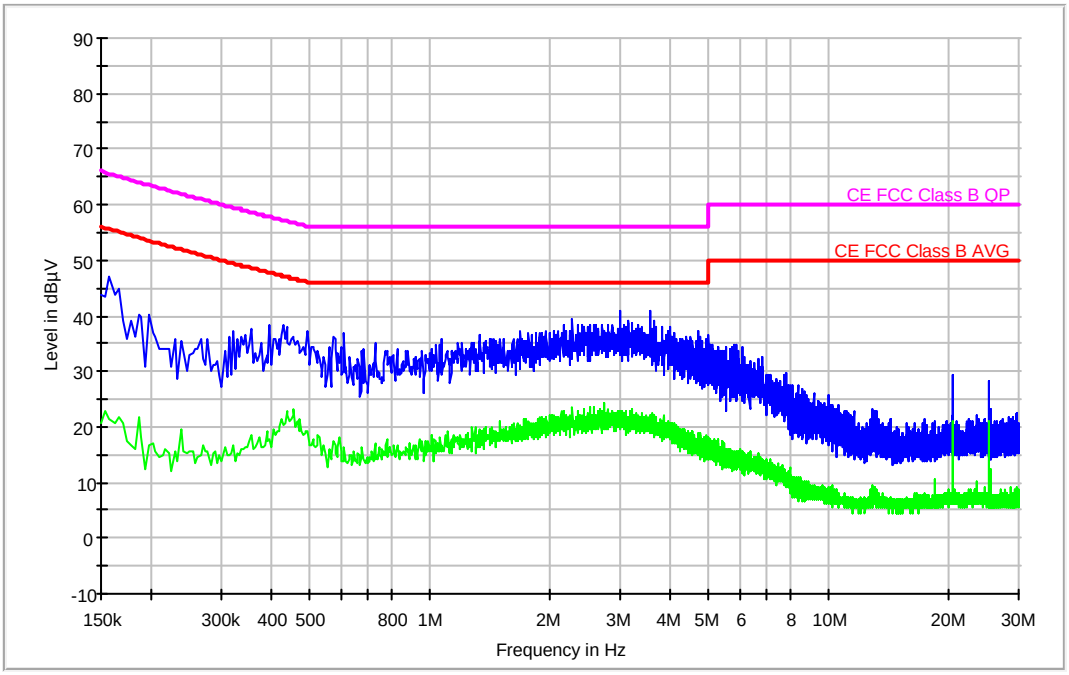
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	43.2	21.7
0.358000	37.1	17.9
0.522000	36.8	17.5
0.618000	36.9	16.0
1.150000	36.4	18.6
1.994000	39.8	21.6
2.962000	40.5	21.3
3.582000	40.1	21.2
5.810000	36.1	15.1
9.566000	27.1	8.0
18.758000	23.3	7.5
25.254000	28.0	20.8

Continuous Conducted emission : CC0307L1	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/03
Operation mode: OM#07
Date: 2009-11-10 19:59
Setup: EMI conducted
Mode: EUT ON. TCH mode 850MHz + BT Tx. Phase noise.

EC FCC Class B ESIB26 CC



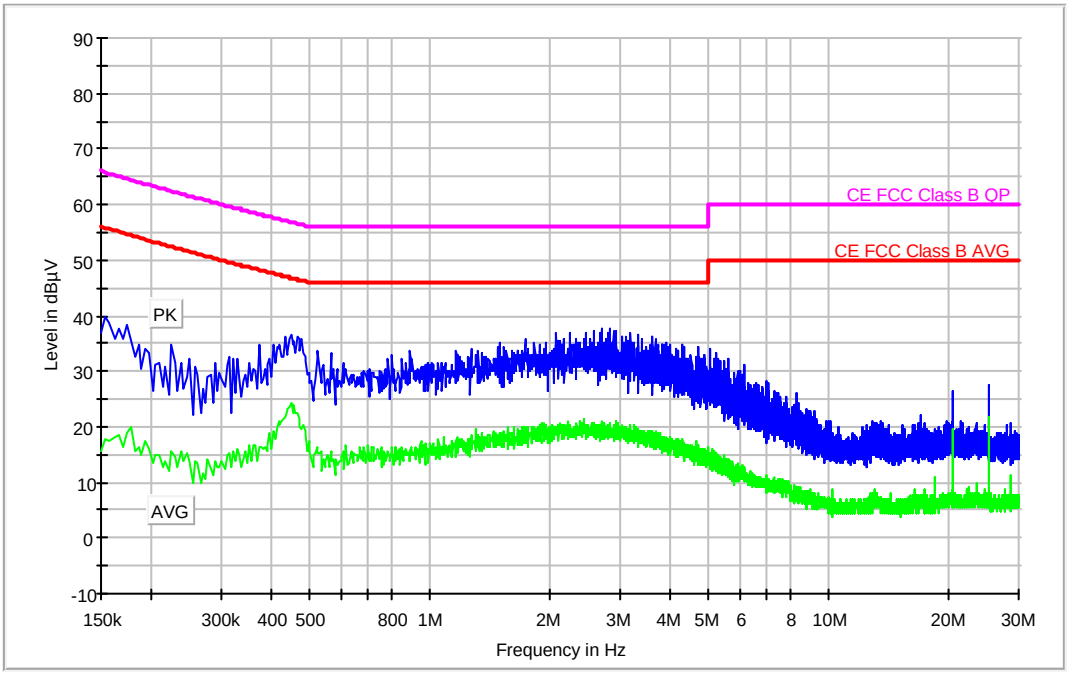
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.158000	46.9	21.6
0.358000	37.6	18.4
0.494000	37.4	19.1
0.610000	37.1	16.5
1.334000	36.5	19.1
2.054000	37.5	21.2
2.998000	40.8	22.6
3.566000	40.8	22.0
5.782000	34.8	15.1
8.162000	27.5	10.9
12.838000	23.2	9.7
20.482000	29.5	20.3

Continuous Conducted emission : CC03080N	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/03
Operation mode: OM#08
Date: 2009-11-10 20:14
Setup: EMI conducted
Mode: EUT ON. TCH mode 1900MHz + BT Tx. Neutral noise.

EC FCC Class B ESIB26 CC



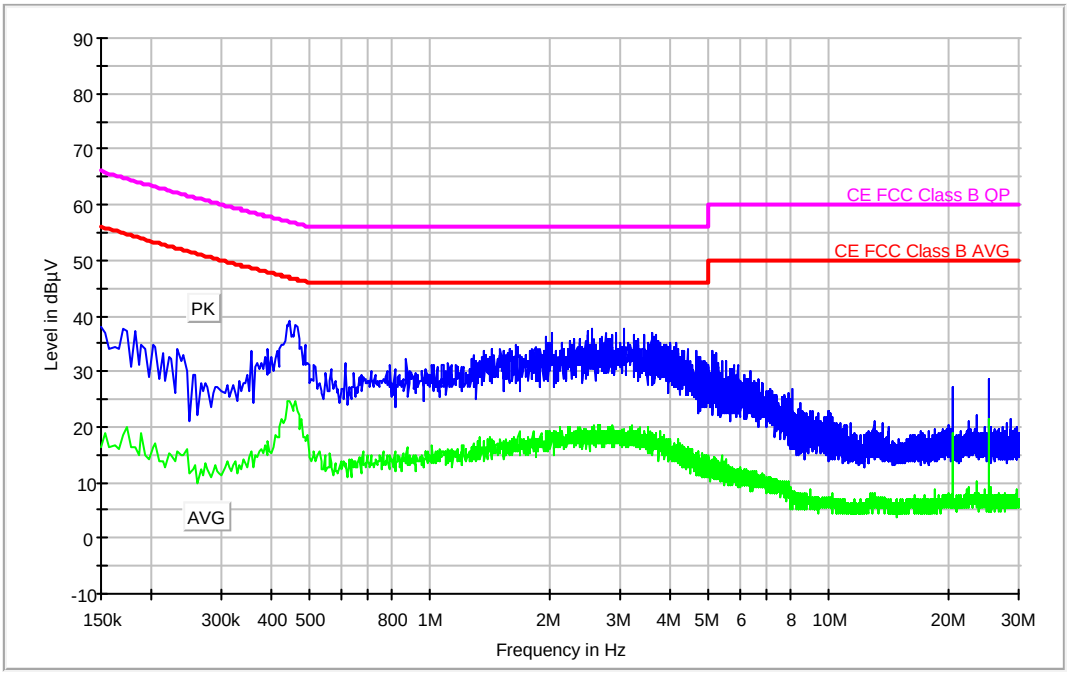
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.154000	39.7	17.9
0.330000	32.3	16.0
0.450000	36.5	24.4
0.566000	33.2	15.8
1.270000	33.9	18.4
2.082000	36.8	20.1
2.842000	37.7	20.7
3.326000	36.7	19.6
5.222000	33.4	14.3
8.266000	26.0	8.6
17.058000	22.1	7.5
25.254000	27.5	21.8

Continuous Conducted emission : CC0308L1	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/03
Operation mode: OM#08
Date: 2009-11-10 20:16
Setup: EMI conducted
Mode: EUT ON. TCH mode 1900MHz + BT Tx. Phase noise.

EC FCC Class B ESIB26 CC



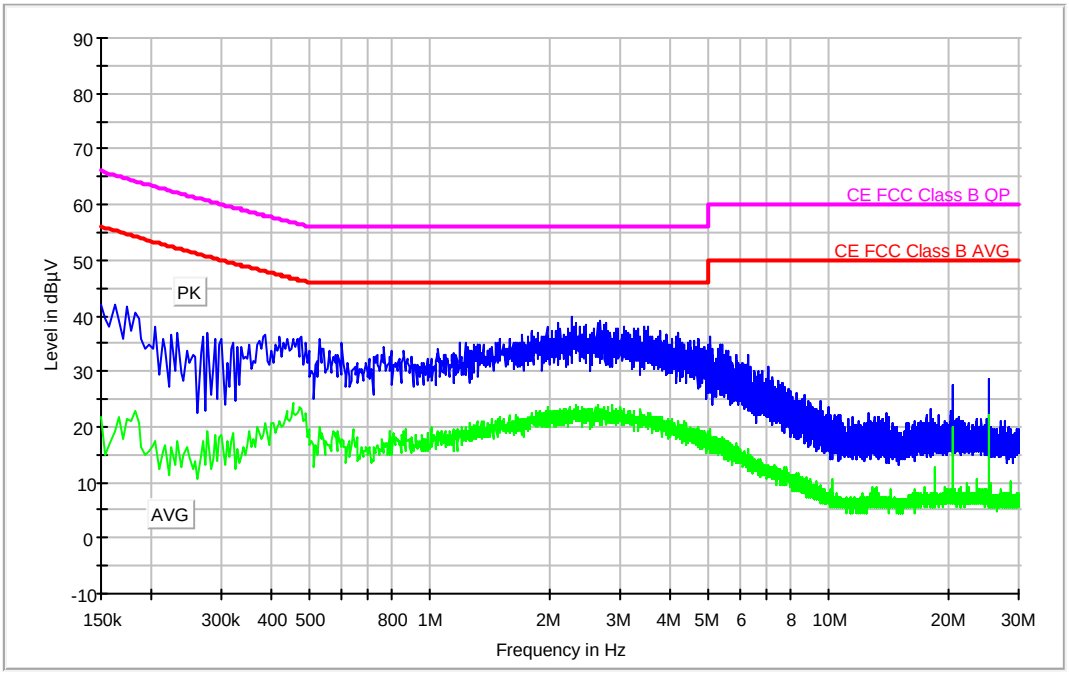
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.182000	37.3	16.2
0.358000	33.5	15.5
0.446000	39.0	24.8
0.874000	32.1	15.1
1.286000	33.0	17.1
2.030000	37.1	18.9
3.058000	37.6	19.1
3.626000	37.0	18.8
5.234000	33.2	14.0
8.142000	26.8	8.6
13.042000	21.2	6.8
25.254000	28.6	21.4

Continuous Conducted emission : CC03090N	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/03
Operation mode: OM#09
Date: 2009-11-10 20:32
Setup: EMI conducted
Mode: EUT ON. TCH mode UMTS FDD II+ BT Tx. Neutral wire noise.

EC FCC Class B ESIB26 CC



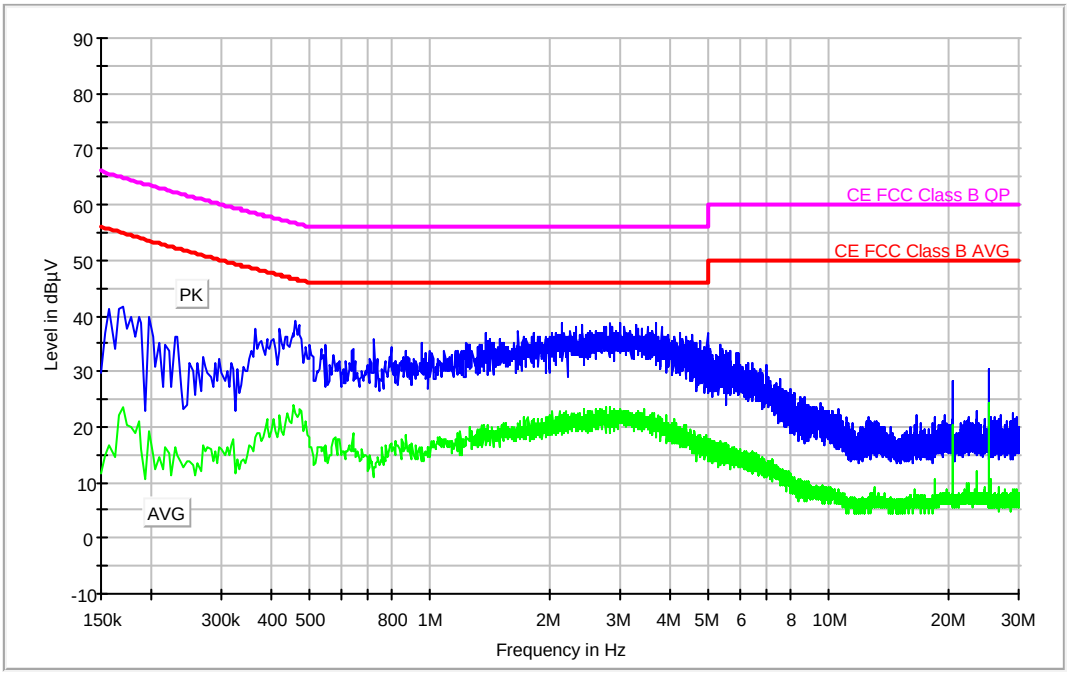
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.162000	42.1	19.4
0.278000	37.1	19.2
0.478000	36.2	23.1
0.602000	35.0	17.7
1.226000	35.0	19.8
2.098000	38.6	23.0
2.270000	39.9	22.6
3.522000	37.9	22.4
5.398000	34.7	16.7
8.042000	26.3	10.5
17.942000	23.1	7.5
25.254000	28.5	22.2

Continuous Conducted emission : CC0309L1	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/03
Operation mode: OM#09
Date: 2009-11-10 20:35
Setup: EMI conducted
Mode: EUT ON. TCH mode UMTS FDD II+ BT Tx. Phase noise.

EC FCC Class B ESIB26 CC



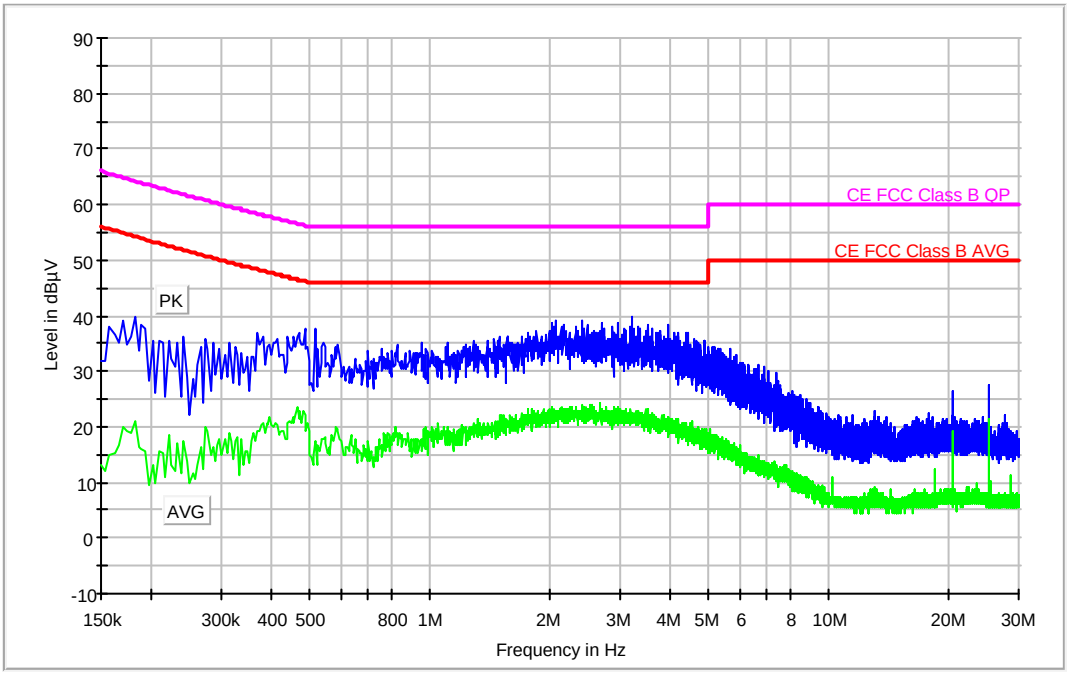
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.170000	41.4	23.4
0.358000	33.5	16.5
0.462000	39.1	22.4
0.726000	35.7	12.7
1.238000	35.2	18.2
1.670000	37.5	20.6
3.002000	38.9	21.8
3.706000	38.6	21.1
5.358000	34.7	17.3
8.066000	26.9	10.1
16.554000	22.1	7.5
25.254000	30.6	24.2

Continuous Conducted emission : CC03100N	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/03
Operation mode: OM#10
Date: 2009-11-10 20:44
Setup: EMI conducted
Mode: EUT ON. TCH mode UMTS FDD V+ BT Tx. Neutral noise.

EC FCC Class B ESIB26 CC



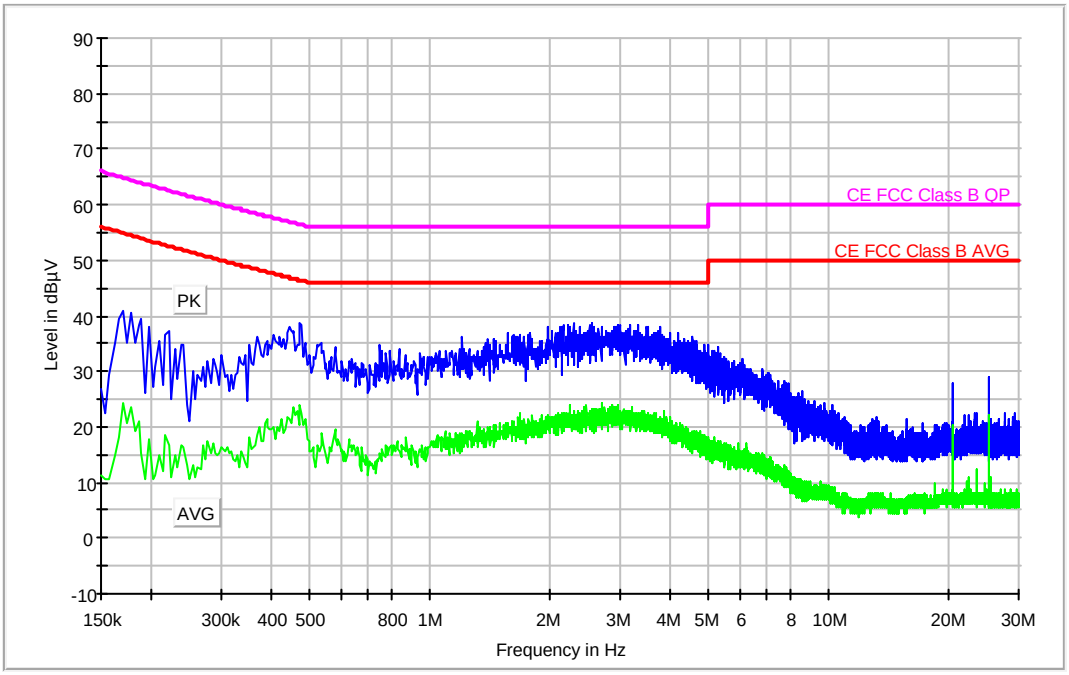
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.182000	39.7	20.9
0.314000	35.1	18.9
0.518000	37.8	17.3
0.830000	34.9	18.9
1.286000	35.6	20.7
2.070000	39.3	21.0
3.218000	39.7	22.3
3.958000	38.2	20.8
5.198000	34.4	18.6
8.122000	26.4	10.9
12.978000	22.7	8.6
25.254000	27.7	21.3

Continuous Conducted emission : CC0310L1	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/03
Operation mode: OM#10
Date: 2009-11-10 20:41
Setup: EMI conducted
Mode: EUT ON. TCH mode UMTS FDD V + BT Tx. Phase noise.

EC FCC Class B ESIB26 CC



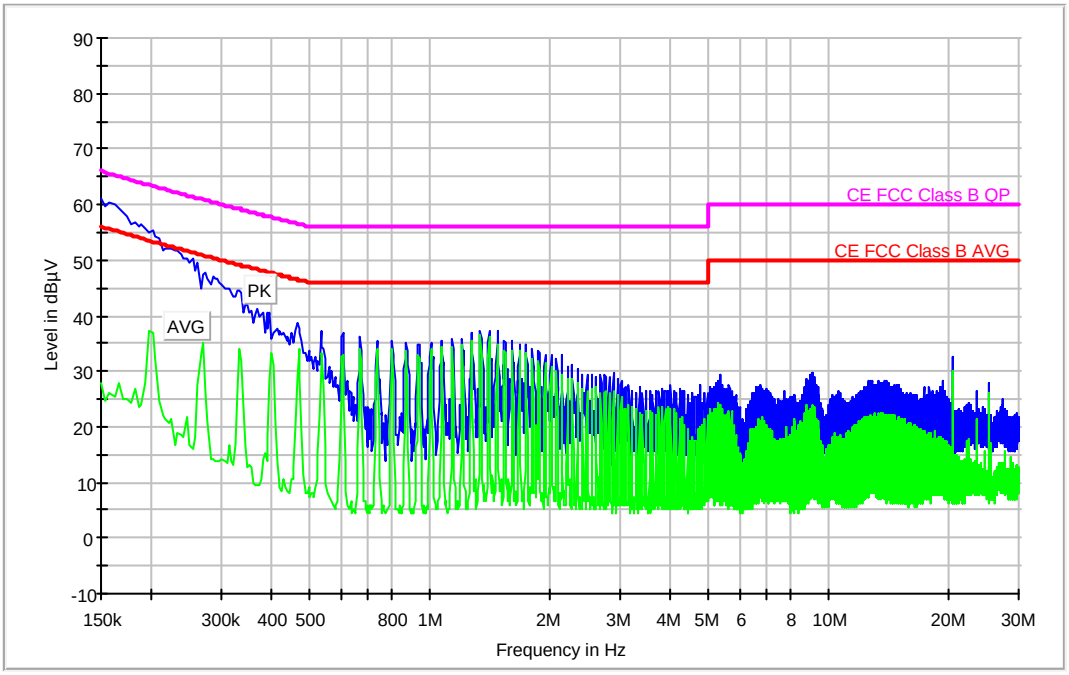
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.170000	41.1	24.2
0.354000	34.9	18.2
0.474000	38.8	23.9
0.750000	34.7	15.3
1.210000	36.4	18.9
1.978000	37.8	21.6
2.542000	38.7	21.7
3.326000	38.4	22.6
5.302000	34.5	16.3
8.566000	26.4	9.6
13.214000	21.8	7.5
25.254000	29.1	22.2

Continuous Conducted emission : CC04070N	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/04
Operation mode: OM#07
Date: 2009-11-11 01:05
Setup: EMI conducted
Mode: EUT ON. TCH mode 850MHz + BT Tx. Neutral noise.

EC FCC Class B ESIB26 CC



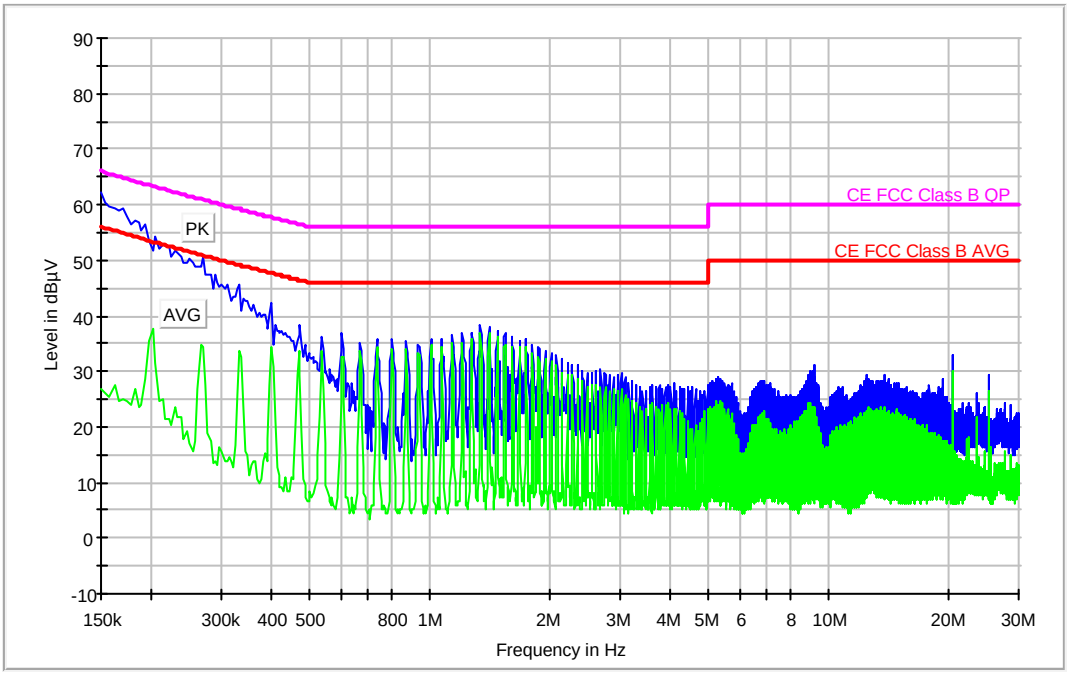
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.150000	61.1	27.9	
0.534000	37.4	31.4	
0.606000	37.1	32.9	
1.342000	37.3	36.5	
1.410000	37.5	36.3	
2.150000	33.0	29.2	
4.030000	27.5	20.6	
5.370000	29.3	24.0	
9.066000	29.8	20.8	
12.550000	28.4	19.5	
20.478000	32.7	29.9	

Continuous Conducted emission : CC0407L1	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/04
Operation mode: OM#07
Date: 2009-11-11 01:06
Setup: EMI conducted
Mode: EUT ON. TCH mode 850MHz + BT Tx. Phase noise.

EC FCC Class B ESIB26 CC



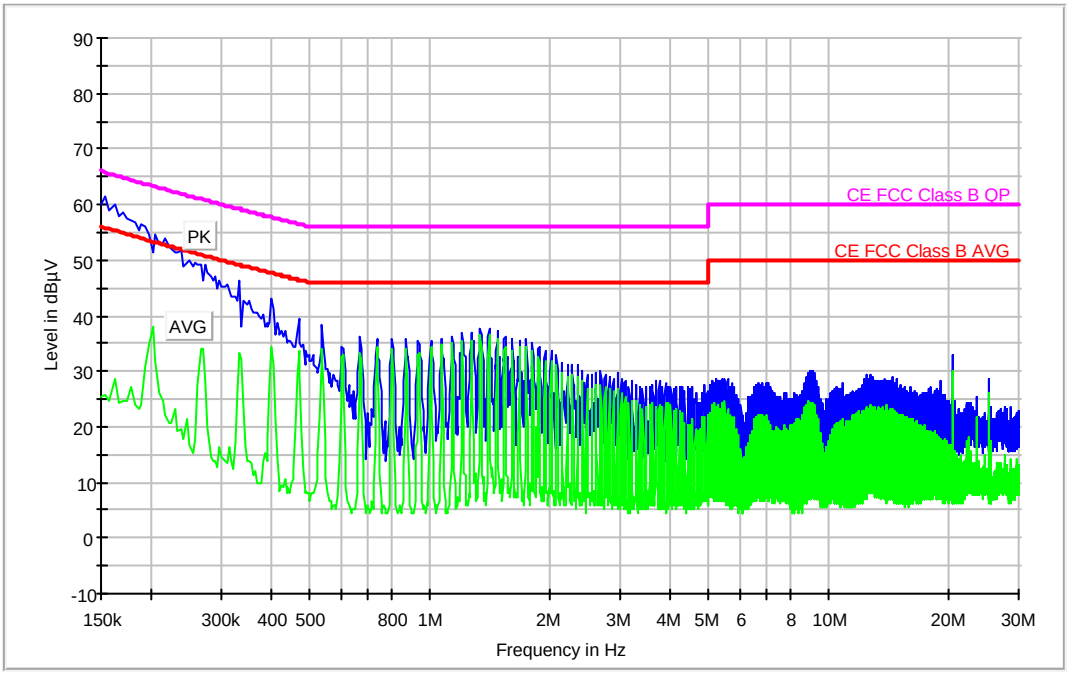
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.150000	62.0	26.9	
0.538000	36.2	33.8	
0.602000	37.1	32.7	
1.342000	38.2	36.8	
1.410000	38.0	36.9	
2.150000	32.1	29.5	
4.094000	27.9	23.3	
5.302000	28.9	24.1	
9.202000	31.1	23.5	
12.486000	29.5	21.8	
20.478000	32.9	30.0	

Continuous Conducted emission : CC04080N	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/04
Operation mode: OM#08
Date: 2009-11-11 01:07
Setup: EMI conducted
Mode: EUT ON. TCH mode 1900MHz + BT ON. Neutral noise.

EC FCC Class B ESIB26 CC



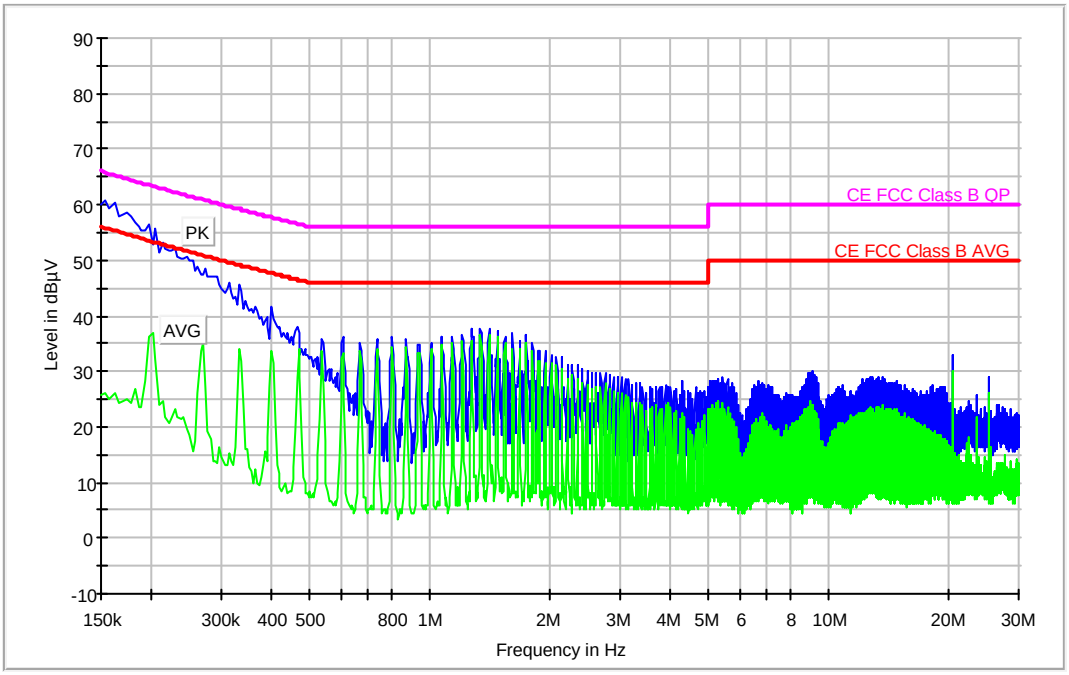
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.154000	61.4	25.8	
0.538000	38.4	34.1	
0.670000	36.1	33.5	
1.342000	37.8	36.7	
1.410000	37.6	36.7	
2.150000	31.6	29.9	
3.694000	28.4	23.5	
5.574000	28.8	23.2	
9.066000	30.2	24.2	
12.758000	29.5	24.1	
20.482000	33.1	29.8	

Continuous Conducted emission : CC0408L1	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/04
Operation mode: OM#08
Date: 2009-11-11 01:08
Setup: EMI conducted
Mode: EUT ON. TCH mode 1900MHz + BT ON. Phase noise.

EC FCC Class B ESIB26 CC



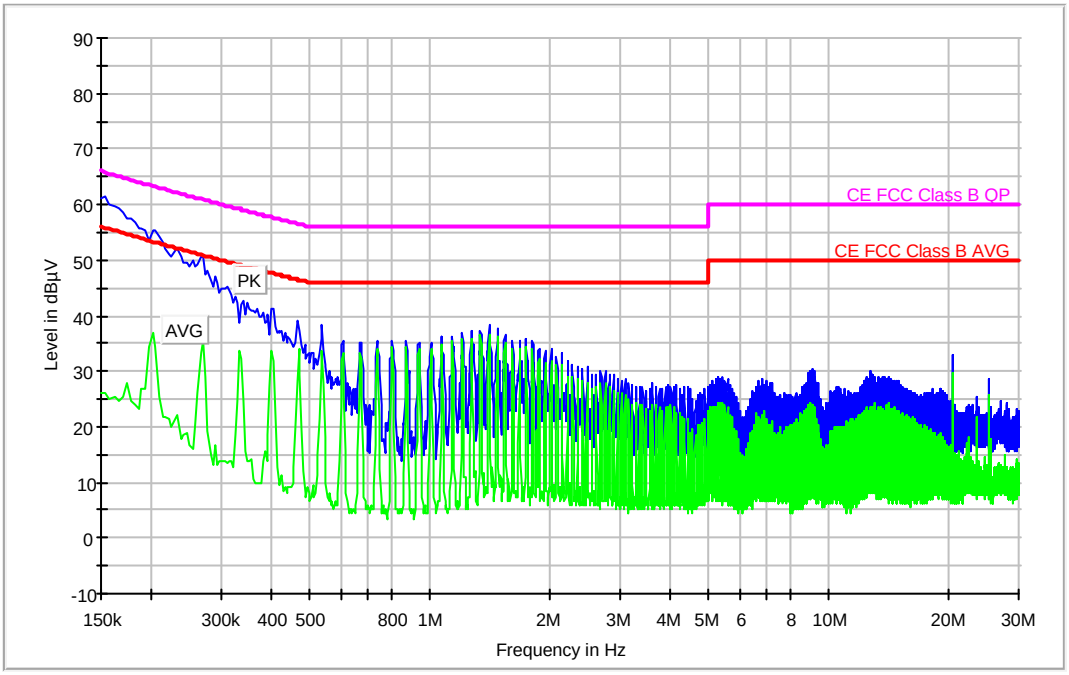
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.154000	60.8	26.2	
0.402000	41.7	33.7	
0.606000	36.4	33.2	
1.274000	37.8	35.3	
1.410000	37.8	36.6	
2.150000	32.5	30.3	
4.298000	28.2	22.6	
5.442000	29.0	23.1	
9.066000	30.2	24.1	
12.758000	29.0	22.1	
20.482000	33.1	29.9	

Continuous Conducted emission : CC04090N	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/04
Operation mode: OM#09
Date: 2009-11-11 01:10
Setup: EMI conducted
Mode: EUT ON. TCH mode UMTS FDD II + BT ON. Neutral noise.

EC FCC Class B ESIB26 CC



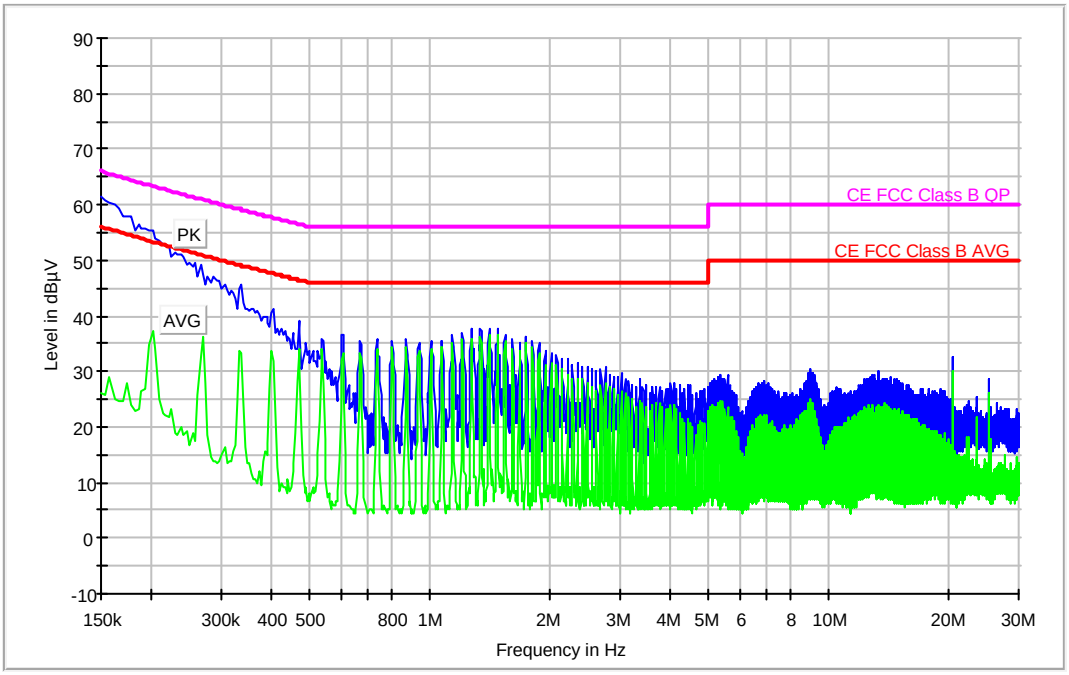
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.154000	61.4	26.0	
0.538000	38.4	33.8	
0.806000	35.5	34.3	
1.342000	37.5	36.4	
1.410000	38.3	36.7	
2.150000	33.4	31.0	
3.626000	27.8	24.0	
5.442000	28.9	24.3	
9.066000	30.4	23.8	
12.690000	29.9	19.4	
20.482000	32.9	29.9	

Continuous Conducted emission : CC0409L1	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/04
Operation mode: OM#09
Date: 2009-11-11 01:11
Setup: EMI conducted
Mode: EUT ON. TCH mode UMTS FDD II + BT ON. Phase noise.

EC FCC Class B ESIB26 CC



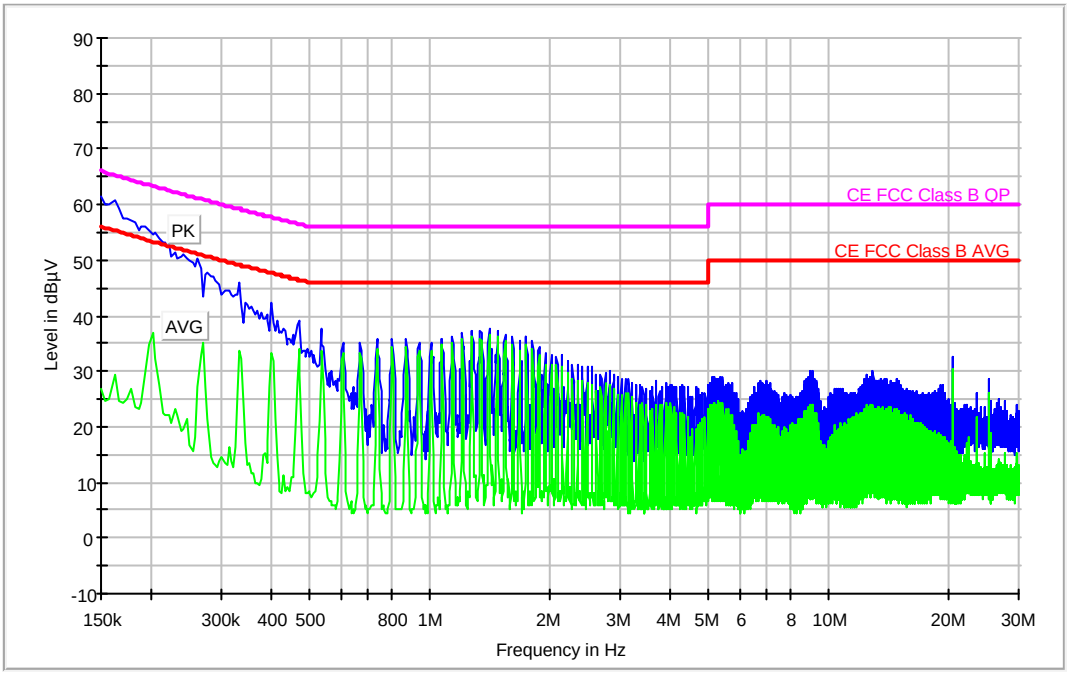
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.150000	61.6	26.2	
0.602000	36.7	31.9	
1.342000	37.6	36.3	
1.410000	37.8	36.5	
2.218000	32.4	29.4	
3.358000	28.7	24.6	
5.574000	29.3	23.5	
9.002000	30.3	24.9	
13.366000	29.9	23.1	
20.482000	32.4	30.0	

Continuous Conducted emission : CC04100N	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/04
Operation mode: OM#10
Date: 2009-11-11 01:12
Setup: EMI conducted
Mode: EUT ON. TCH mode UMTS FDD V + BT ON. Neutral noise.

EC FCC Class B ESIB26 CC



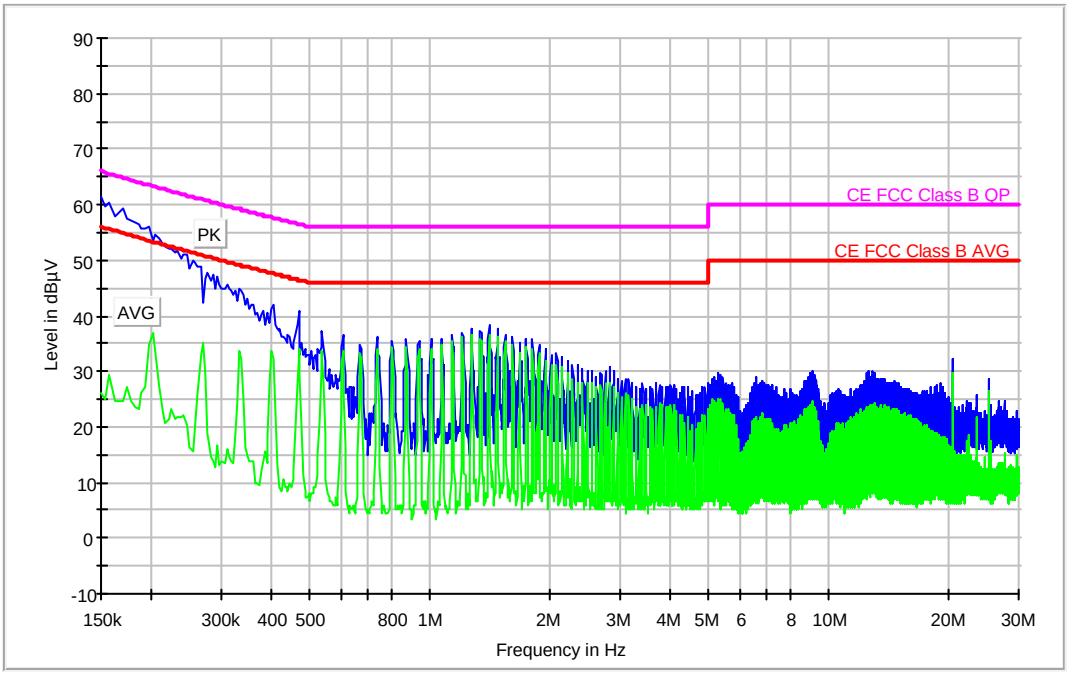
Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.150000	61.6	26.7	
0.534000	37.6	30.8	
0.874000	35.7	34.4	
1.342000	37.3	36.0	
1.410000	37.6	36.6	
2.150000	32.9	30.9	
3.694000	28.4	23.9	
5.374000	29.0	24.1	
9.138000	29.9	23.9	
12.834000	29.9	22.8	
20.478000	32.6	30.5	

Continuous Conducted emission : CC0410L1	Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
Company: ELEKTROBIT
Sample: S/04
Operation mode: OM#10
Date: 2009-11-11 01:13
Setup: EMI conducted
Mode: EUT ON. TCH mode UMTS FDD V + BT ON. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.150000	61.4	26.2	
0.470000	40.8	34.1	
0.606000	36.5	33.5	
1.278000	37.6	36.6	
1.410000	38.2	36.4	
2.150000	32.6	30.6	
4.974000	27.8	23.4	
5.310000	29.7	25.1	
9.138000	29.9	24.8	
12.966000	30.2	23.8	
20.482000	32.2	29.7	

APPENDIX C: Photographs

EQUIPMENT FOR CONDUCTED MEASUREMENTS (


TSN
OK
Ref. 101 050
SPAIN
PATENTADO


KEEP HAND BELOW THIS LINE DURING SATELLITE CALLS
Ref. 101 050
SPAIN
PATENTADO