

**FCC LISTED, REGISTRATION  
NUMBER: 905266**

**IC LISTED REGISTRATION NUMBER  
IC 4621**

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Libro 82, Folio 133, Hoja MA3729

**TEST REPORT**

**REFERENCE STANDARD:**

**USA FCC Part 22, Part 24, 15.109, 15.107 and 15.207**

**CANADA IC RSS-132, RSS-133**

<b>NIE</b> ..... :	31014RET.001
Approved by (name / position & signature) .....	J.C. Soler/Consultant .....
Elaboration date .....	25/03/2010
<b>Identification of item tested</b> .....	Mobile Broadband Module
Brand name .....	Ericsson
Model and/or type reference .....	C3607w
Other identification of the product .....	Type designation: KRD 131 17/1 FCC ID: VV7-MBMC3607W IC Type Approval #: 287AG-MBMC3607W
Final HW version .....	FP1 (for 2G), R1 (for 3G)
Final SW version .....	R1A08 (for 2G), R1A11 (for 3G)
Features .....	QUAD BAND 850/900/1800/1900 GSM/GPRS/EGPRS class 10, WCDMA Bands I/II/V HSDPA Cat. 8 HSUPA Cat. 5
Description .....	Consumer Electronics Wireless WAN module
<b>Applicant</b> .....	Ericsson AB
Address .....	Lindholmspiren 11 SE-417 56, Gothenburg, Sweden
CIF/NIF/Passport..... :	SE556056625801
Contact person: .....	Bernie Fuller
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e-mail: .....	bernie.fuller@ericsson.com
<b>Test samples supplier</b> .....	Same as applicant
<b>Manufacturer</b> .....	Same as applicant

Test method requested .....	See Standard
Standard .....	USA FCC Part 10-01-09 Edition. USA FCC Part 10-01-09 Edition. CANADA IC RSS-132 Issue 2, Sep. 2005. CANADA IC RSS-133 Issue 5, Feb. 2009. USA FCC part 15.207 10-01-09 Edition: Conducted limits. USA FCC Part 15.109 10-01-09 Edition: Receiver spurious emissions. USA FCC part 15.107 10-01-09 Edition: Conducted limits.
Test procedure .....	1. PEET000: Medidas de equipos radioeléctricos en condiciones radiadas. 2. PEET003: Medidas conducidas de equipos radioeléctricos. 3. PEEM001: Medida de la tensión perturbadora en bornes de alimentación según EN 55022. 4. PEEM001: Medida del campo perturbador radiado según EN 55022.
Non-standardized test method .....	N/A

Used instrumentation .....

				Last Cal.	Cal. due date
1.	Semianechoic Chamber IR 11. BS	Absorber	Lined	N.A.	N.A.
2.	Control Chamber IR 12.BC			N.A.	N.A.
3.	Hybrid Bilog Sciences Corporation JB6	antenna	Sunol	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 1-18 GHz HP 11966E	Horn antenna		2008-03	2011-03
7.	Double-ridge Guide 18-40 GHz Agilent 119665J	Horn antenna		2008-09	2011-09
8.	EMI Test Receiver R&S ESIB26			2009-09	2011-09
9.	Universal Radio Tester R&S CMU200	communication		2009-02	2011-02
10.	Multi Device Controller 2090		EMCO	N.A.	N.A.
11.	Spectrum Analyzer R&S ESU40			2009-11	2011-11
12.	Spectrum Analyzer Agilent E4440A			2010-02	2012-02
13.	Power amplifier 00400600-50-30P		AMF-4D-	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.	Climatic chamber 07/100		HERAEUS VM	2010-02	2013-02
17.	Transient limiter. HP 11947A			2009-06	2011-06
18.	Line Impedance Network (L.I.S.N.) R&S. ESH2-Z5	Stabilization		2008-04	2010-04
19.	RF pre-amplifier 04001300-15-10P-6.		Miteq AFS5-	2008-07	2010-07
20.	RF pre-amplifier 9231.		Schaffner CPA	2009-03	2011-03
21.	RF pre-amplifier 12002600-30-5A.		Miteq JS4-	2008-07	2010-07

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 conjunction 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 document PODT000.

## Usage of samples

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

Sample M/01 is composed of the following elements

<u>Control No.</u>	<u>Description</u>	<u>Model</u>	<u>Serial No.</u>	<u>Date of reception</u>
31014/16	Wireless module in Cradle test board	C3607w	IMEI: 004401700378058	18/01/2010
31014/18	AC Adaptor	04151V-050300	---	18/01/2010
30576/26	Antenna	---	---	18/01/2010

Sample M/02 is composed of the following elements

<u>Control No.</u>	<u>Description</u>	<u>Model</u>	<u>Serial No.</u>	<u>Date of reception</u>
31014/01	Wireless module in Cradle test board	C3607w	IMEI: 004401700378322	18/01/2010
31014/18	AC Adaptor	04151V-050300	---	18/01/2010

Sample M/03 is composed of the following elements

<u>Control No.</u>	<u>Description</u>	<u>Model</u>	<u>Serial No.</u>	<u>Date of reception</u>
31014/37	Wireless module in Cradle test board	C3607w	IMEI: 0044017384460	04/03/2010
31014/22	AC Adaptor	04151V-050300	---	27/01/2010
30576/26	Antenna	---	---	18/01/2010

Sample S/01 is composed of the following elements:

<u>Control N°</u>	<u>Description</u>	<u>Model</u>	<u>Serial N°</u>	<u>Date of reception</u>
30576/26	Antenna	---	---	18/01/2010
31014/36	Wireless module in Cradle test board	C3607w	IMEI TAC: 35883703	2010-03-04

Auxiliary elements used with the sample S/01:

<u>Control N°</u>	<u>Description</u>	<u>Model</u>	<u>Serial N°</u>	<u>Date of reception</u>
30576C /12	AC/DC Power supply adapter	EGSTON 24W N2EFSW	003 90830 0	2010-01-18

1. Sample M/01 has undergone the following test(s) specified in subclause "Test method requested":  
All tests indicated in appendix A regarding GPRS and EDGE modulation except Clause 22.355/RSS-132 Clause 4.3: "Frequency stability" and Clause 24.235/RSS-133 Clause 6.3: "Frequency stability".
2. Sample M/02 has undergone the following test(s) specified in subclause "Test method requested":  
Clause 22.355/RSS-132 Clause 4.3: "Frequency stability" and Clause 24.235/RSS-133 Clause 6.3: "Frequency stability" for GPRS and EDGE modulation in appendix A.
3. Sample M/03 has undergone the following test(s) specified in subclause "Test method requested":  
All tests indicated in appendix A regarding WCDMA and HSUPA modulation.
4. Samples S/01 has undergone the next test(s) in appendix B:  
  
Continuous conducted emission, power leads:  
Standard: FCC Rules and Regulations 47 CFR Part 15  
Method: FCC Rules and Regulations 47 CFR Part 15, Subpart B (Class B)  
  
Radiated emission, electromagnetic field:  
Standard: FCC Rules and Regulations 47 CFR Part 15  
Method: FCC Rules and Regulations 47 CFR Part 15, Subpart B (Class B)

### **Testing period**

The performed test started on 2010-01-21 and finished on. 2010-03-15.

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. = 22.1 °C Max. = 25.2 °C
Relative humidity	Min. = 39.5 % Max. = 53.7 %
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. = 20.6 °C Max. = 21.6 °C
Relative humidity	Min. = 39.0 % Max. = 53.2 %
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. = 23.5 °C Max. = 24.3 °C
Relative humidity	Min. = 49.6 % Max. = 50.2 %
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, Part 15.107, Part 15.109, 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

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.

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
Section 15.107. Conducted limits		P		
Section 15.109. Radiated emission limits for receiver		P		
Section 15.207. Conducted limits		P		

## **APPENDIX A: Test results for FCC parts 22 & 24**

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## TEST RESULTS FOR FCC PART 22 AND IC RSS-132

### ***TEST CONDITIONS***

Power supply (V):

$$V_{\text{nom}} = 3.7 \text{ Vdc}$$

$$V_{\text{max}} = 4.2 \text{ Vdc}$$

$$V_{\text{min}} = 3.2 \text{ Vdc}$$

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 external power supply

Type of antenna = external connectable antenna

### TEST FREQUENCIES:

#### GPRS AND EDGE MODULATION

Lowest channel (128): 824.2 MHz

Middle channel (190): 836.6 MHz

Highest channel (251): 848.8 MHz

#### WCDMA AND HSUPA MODULATION

Lowest channel (4132): 826.4 MHz

Middle channel (4182): 836.4 MHz

Highest channel (4233): 846.6 MHz

## ***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)	32.64	32.45	32.52
Maximum peak power (W)	1.84	1.76	1.79
Measurement uncertainty (dB)	±0.5		

#### EDGE MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	32.12	32.10	32.36
Maximum peak power (W)	1.63	1.62	1.72
Measurement uncertainty (dB)	±0.5		

#### WCDMA MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	27.03	27.15	27.30
Maximum peak power (W)	0.50	0.52	0.54
Measurement uncertainty (dB)	±0.5		

### HSUPA MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	28.14	27.79	28.13
Maximum peak power (W)	0.65	0.60	0.65
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 $\lambda/2$ dipole) (dB)	E.R.P. (dBm) = (1) – (2) + (3)
824.1899	-10.37	Horizontal	27.13	0.3	6.3	33.13
836.6701	-11.31	Horizontal	26.79	0.3	6.2	32.69
848.8100	-11.85	Horizontal	26.25	0.3	6.1	32.05

RBW = VBW = 1 MHz

Channel	Lowest	Middle	Highest
Maximum peak power E.R.P. (dBm)	33.13	32.69	32.05
Maximum peak power (W)	2.05	1.86	1.60
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 $\lambda/2$ dipole) (dB)	E.R.P. (dBm) = (1) – (2) + (3)
824.1698	-11.06	Horizontal	26.44	0.3	6.3	32.44
836.6501	-11.62	Horizontal	26.48	0.3	6.2	32.38
848.8134	-11.99	Horizontal	26.11	0.3	6.1	31.91

RBW = VBW = 1 MHz

Channel	Lowest	Middle	Highest
Maximum peak power E.R.P. (dBm)	32.44	32.38	31.91
Maximum peak power (W)	1.75	1.73	1.55
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 $\lambda/2$ dipole) (dB)	E.R.P. (dBm) = (1) – (2) + (3)
827.0513	-18,24	Horizontal	19,26	0.3	6.3	25.26
838.3539	-19,11	Horizontal	18,99	0.3	6.2	24.89
849.3555	-18,08	Horizontal	20,02	0.3	6.1	25.82

RBW = VBW = 8 MHz

Channel	Lowest	Middle	Highest
Maximum peak power E.R.P. (dBm)	25.26	24.89	25.82
Maximum peak power (W)	0.33	0.31	0.38
Measurement uncertainty (dB)	± 3.8		

## HSUPA 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 $\lambda/2$ dipole) (dB)	E.R.P. (dBm) = (1) – (2) + (3)
828.0533	-18.46	Horizontal	19.04	0.3	6.3	25.04
839.2557	-18.82	Horizontal	19.28	0.3	6.2	25.18
849.8565	-18.58	Horizontal	19.52	0.3	6.1	25.32

RBW = VBW = 8 MHz

Channel	Lowest	Middle	Highest
Maximum peak power E.R.P. (dBm)	25.04	25.18	25.32
Maximum peak power (W)	0.32	0.33	0.34
Measurement uncertainty (dB)	± 3.8		

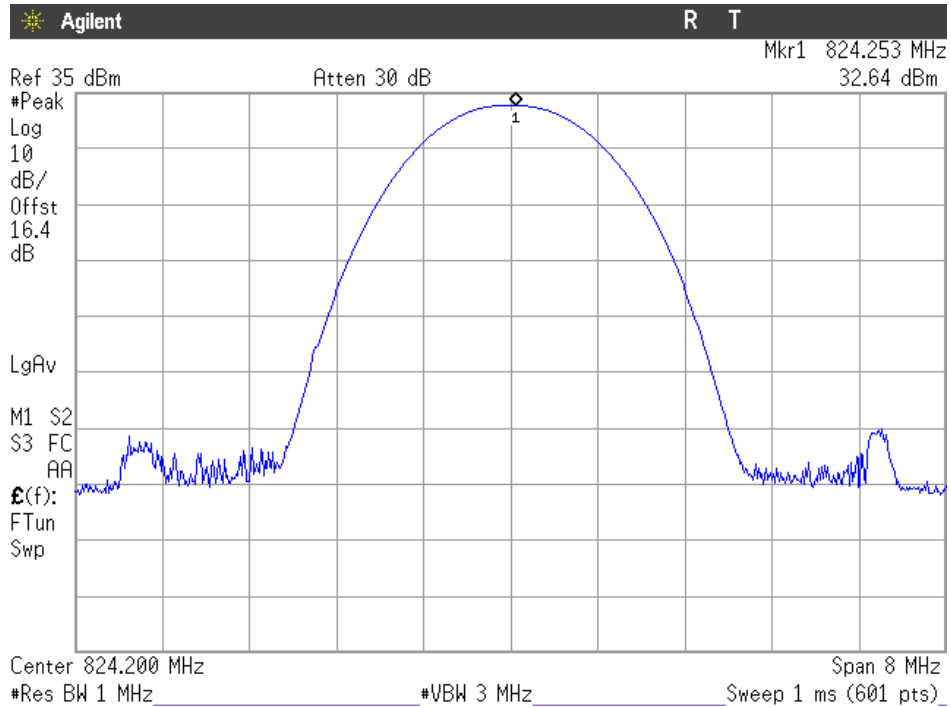
Verdict: PASS



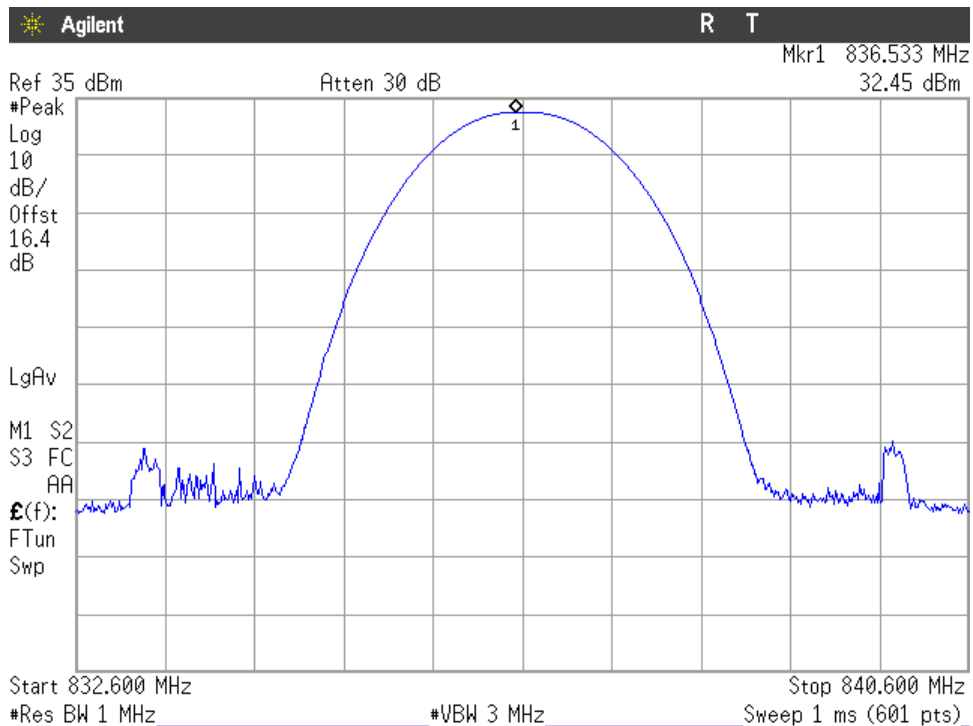
PEAK OUTPUT POWER (CONDUCTED).

GPRS MODULATION

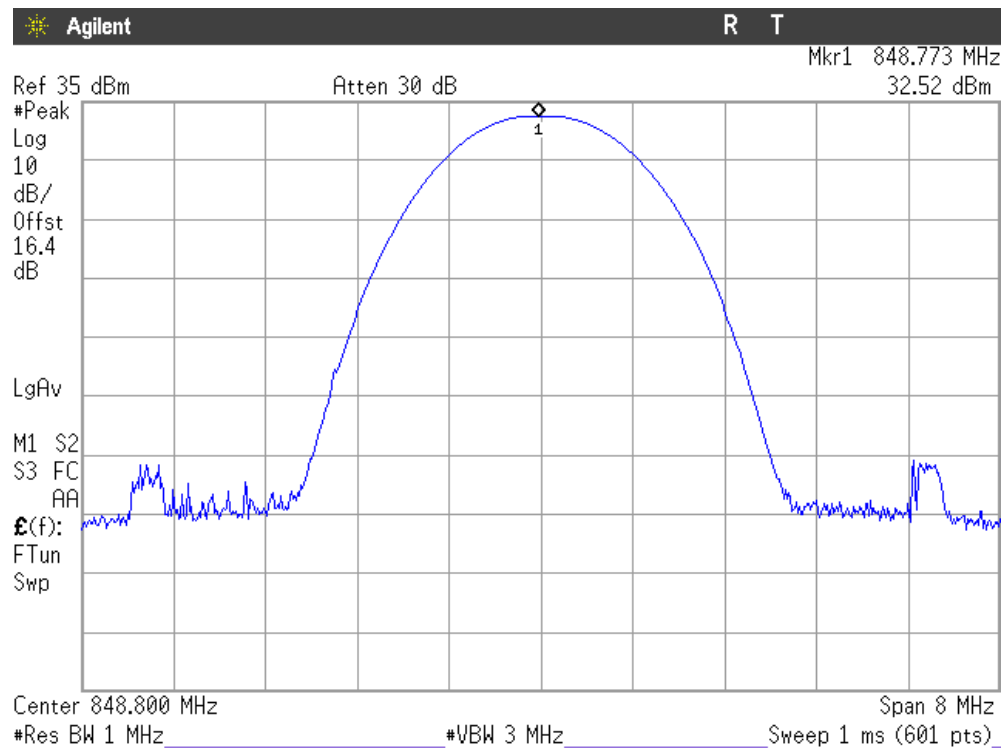
Lowest Channel.



Middle Channel.

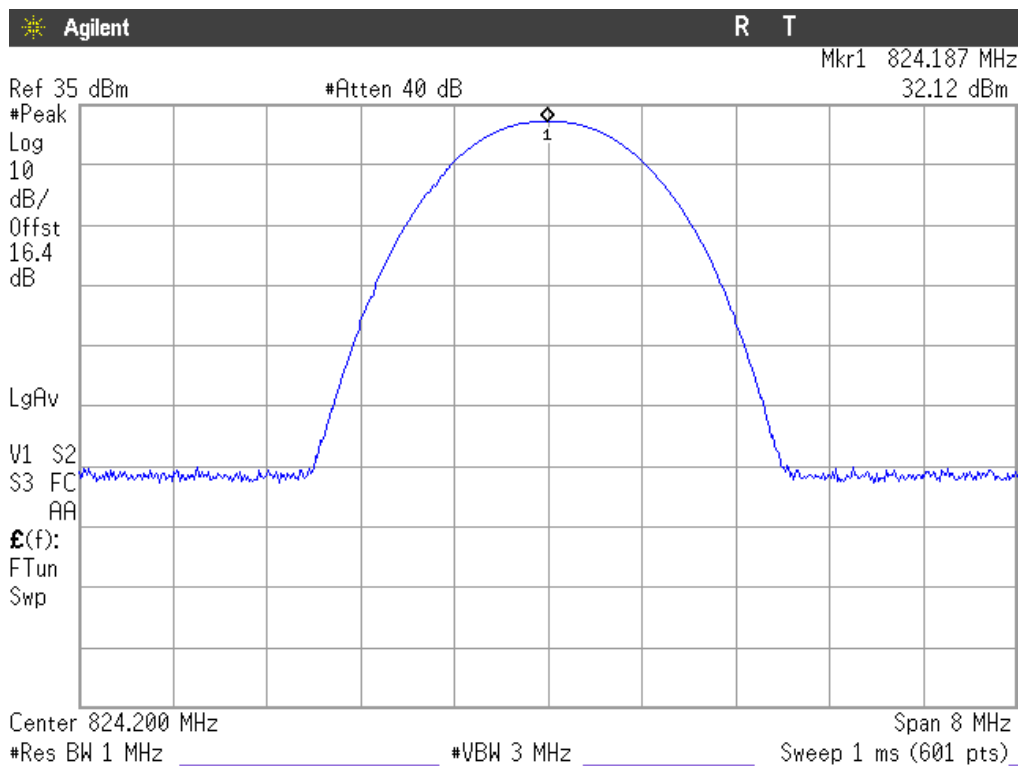


Highest Channel.

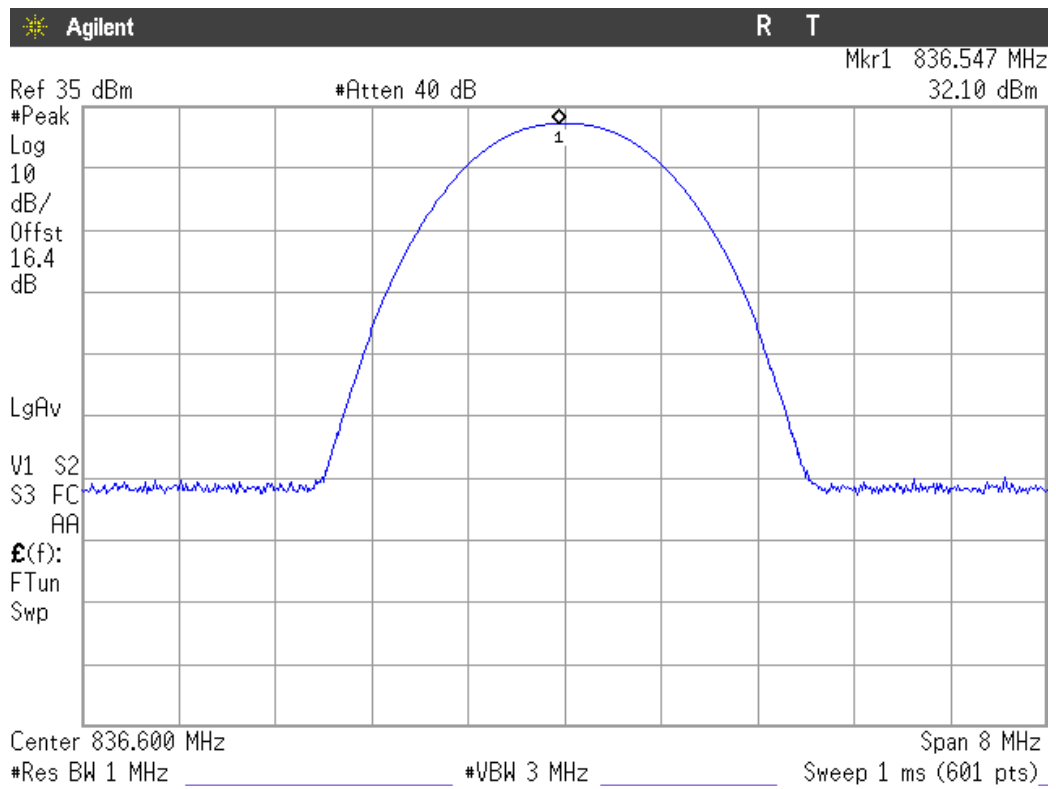


EDGE MODULATION

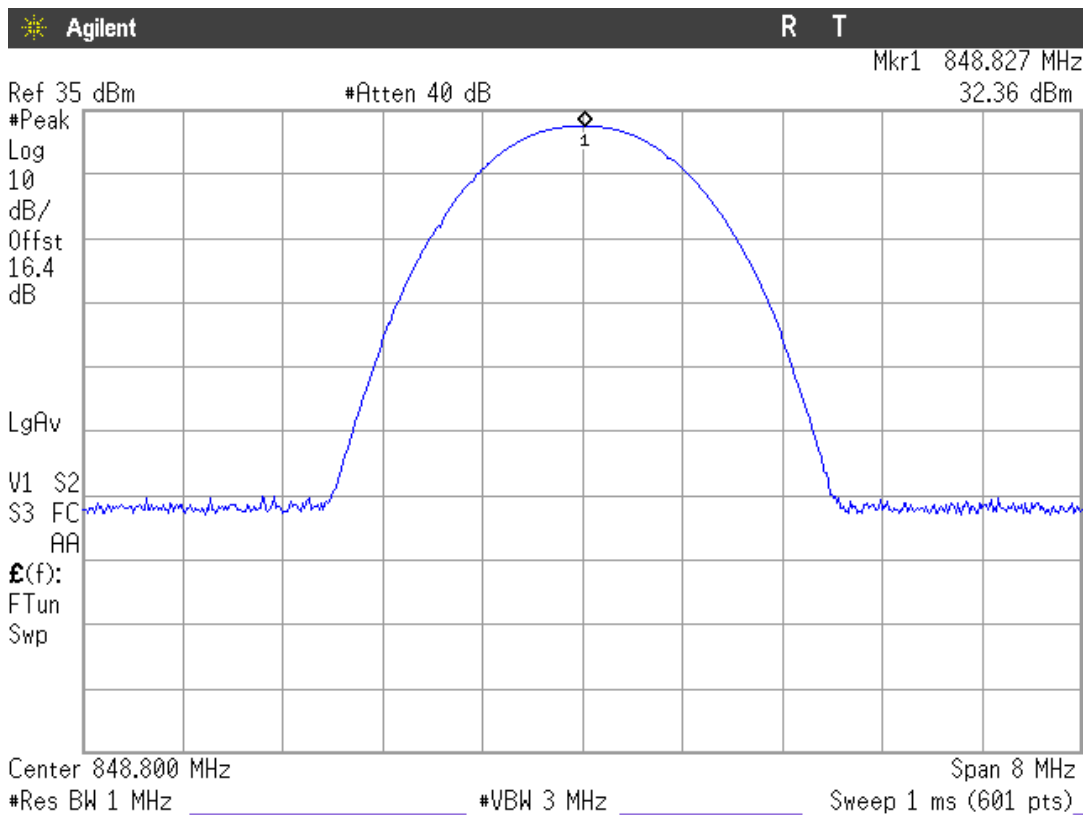
Lowest Channel.



Middle Channel.

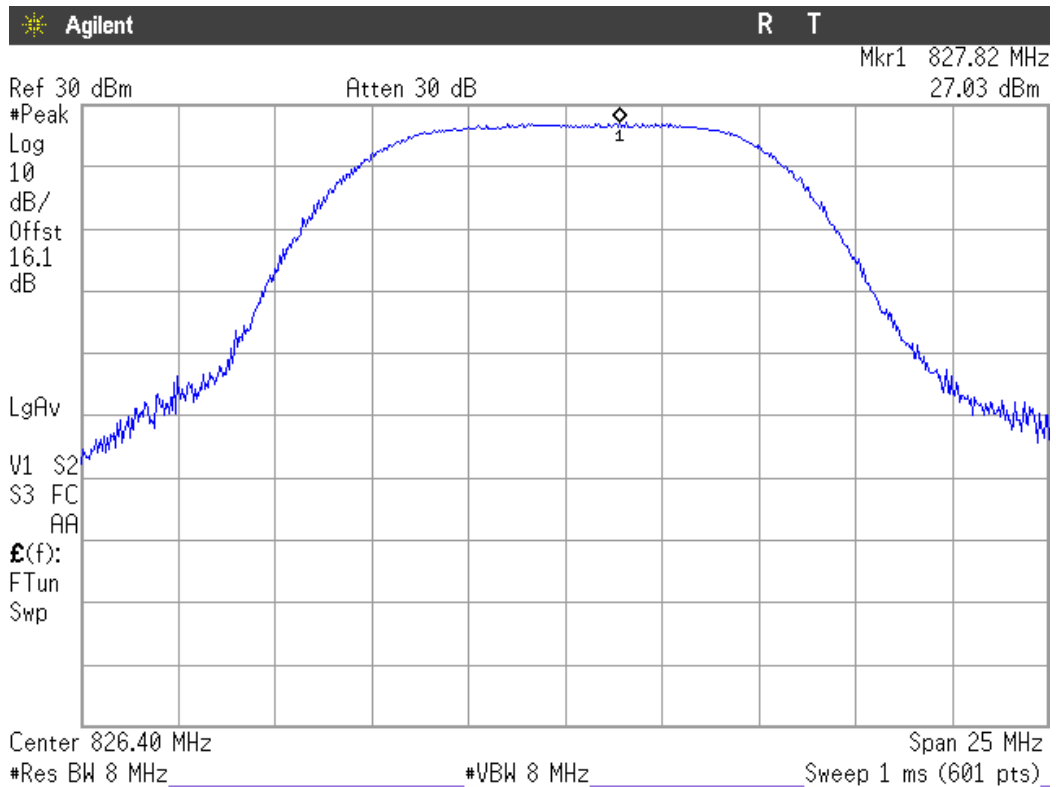


Highest Channel.

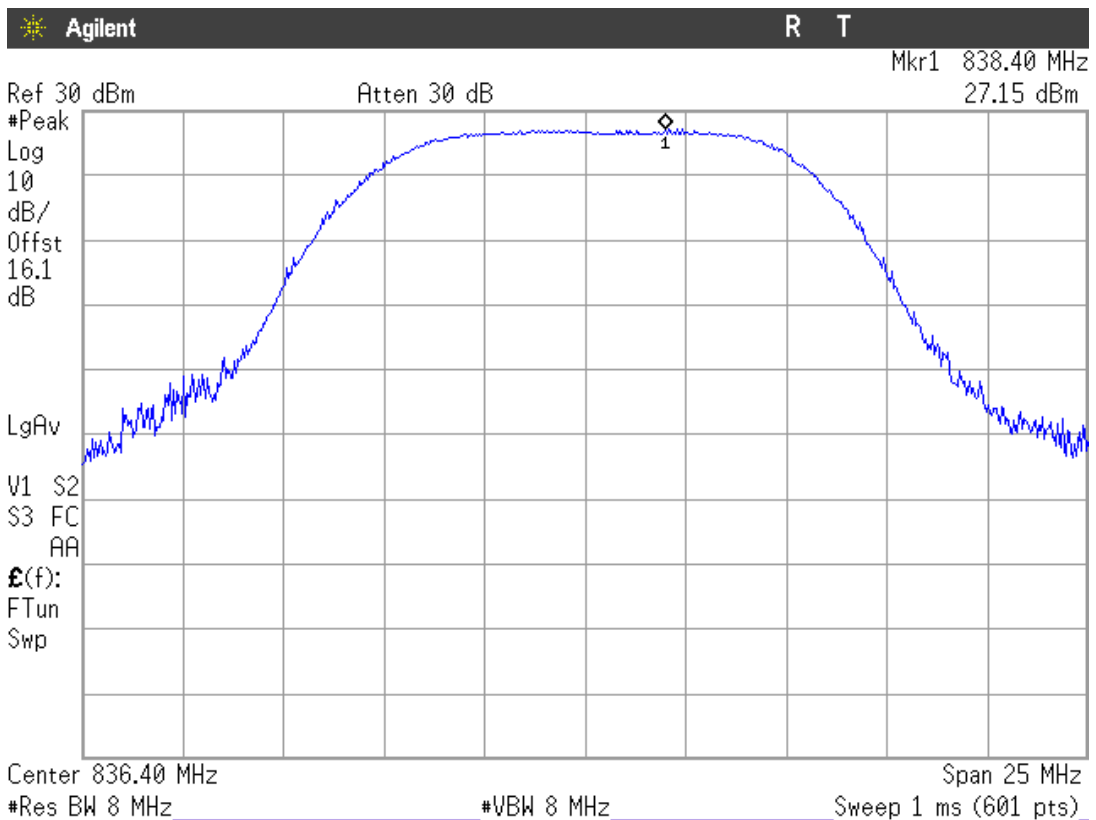


## WCDMA MODULATION

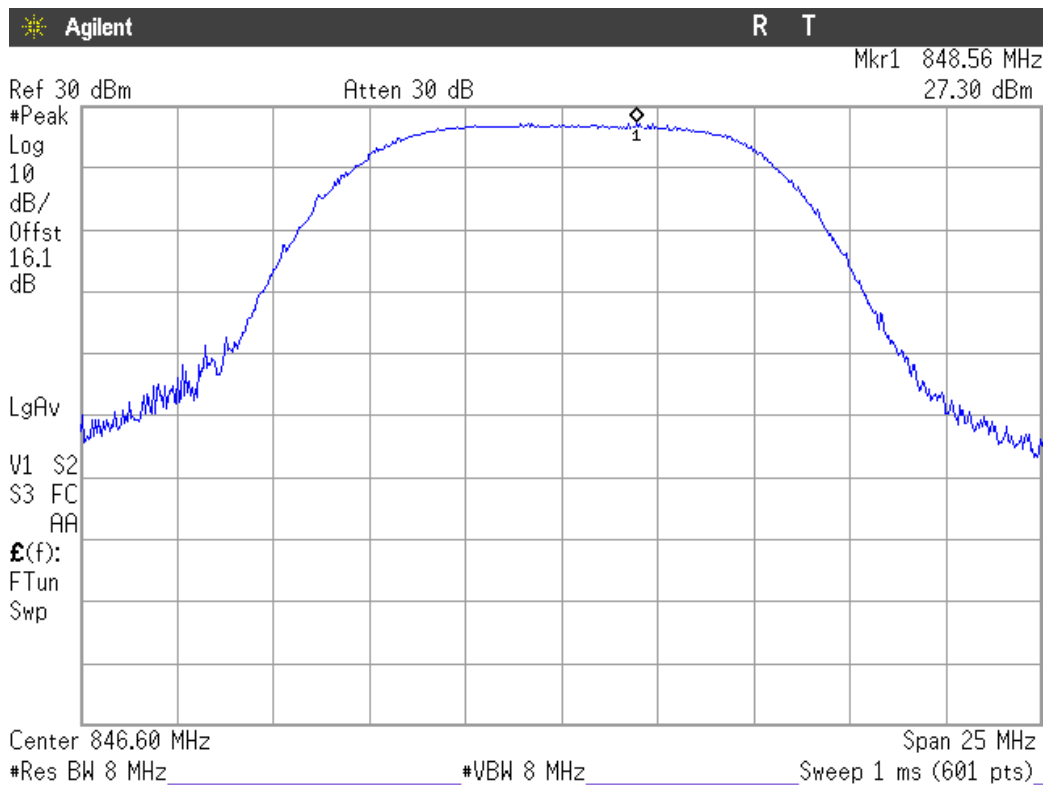
### Lowest Channel.



### Middle Channel.

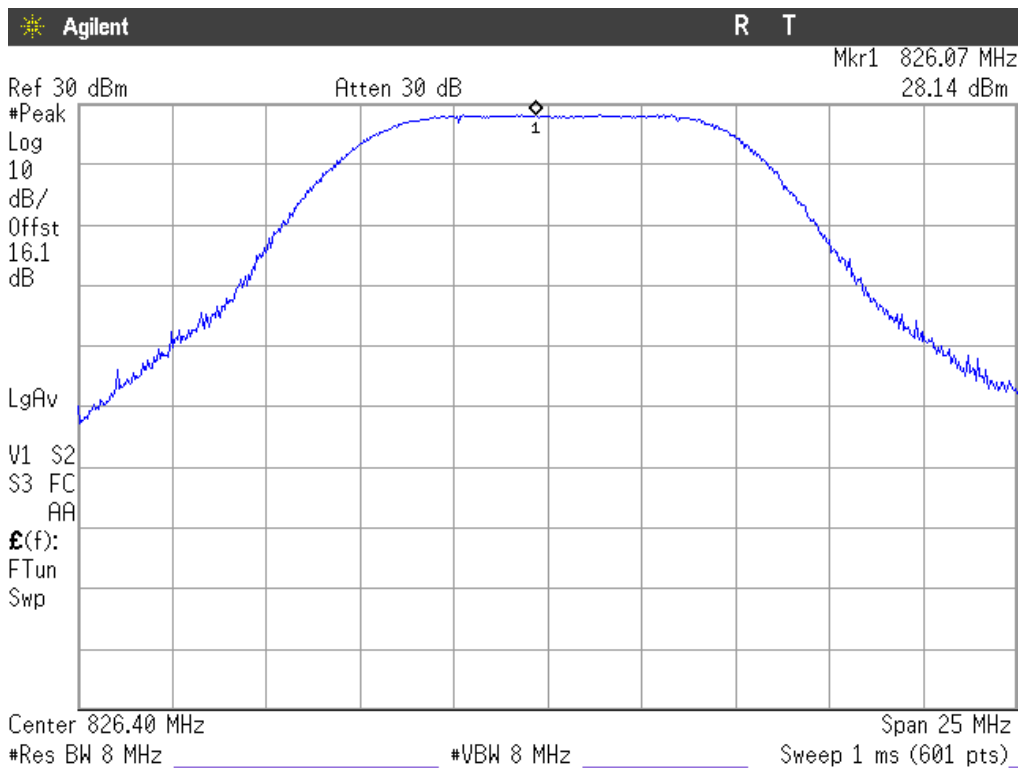


Highest Channel.

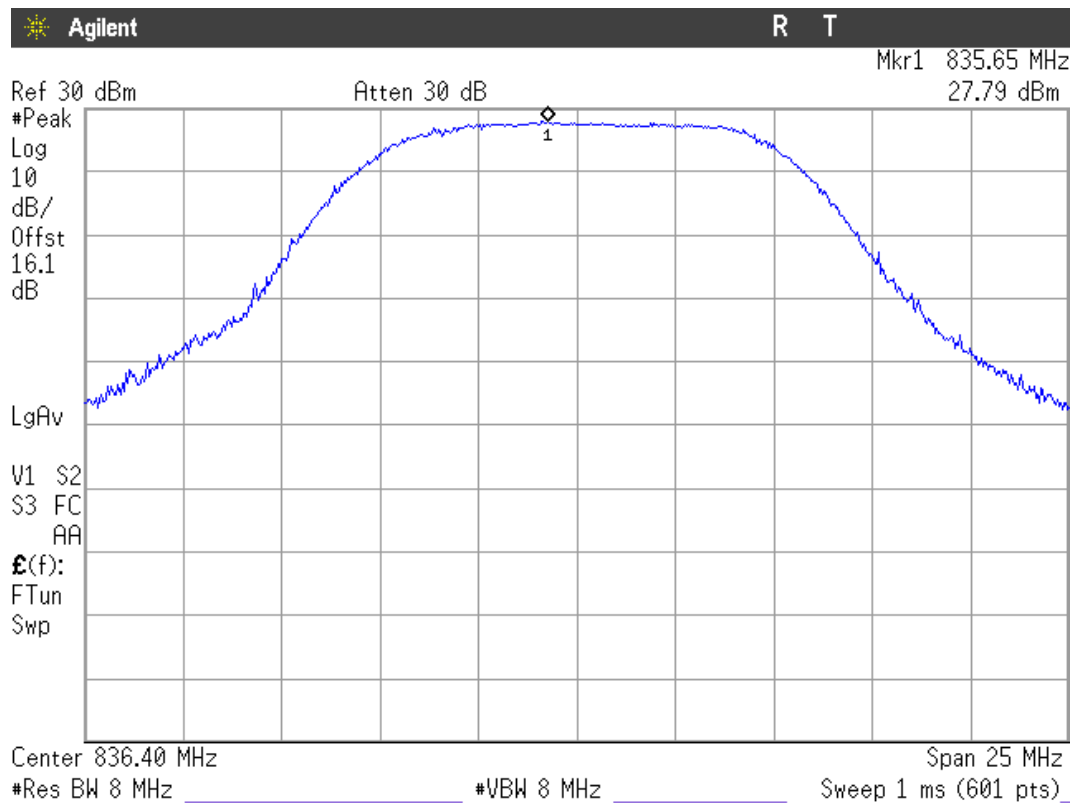


HSUPA MODULATION

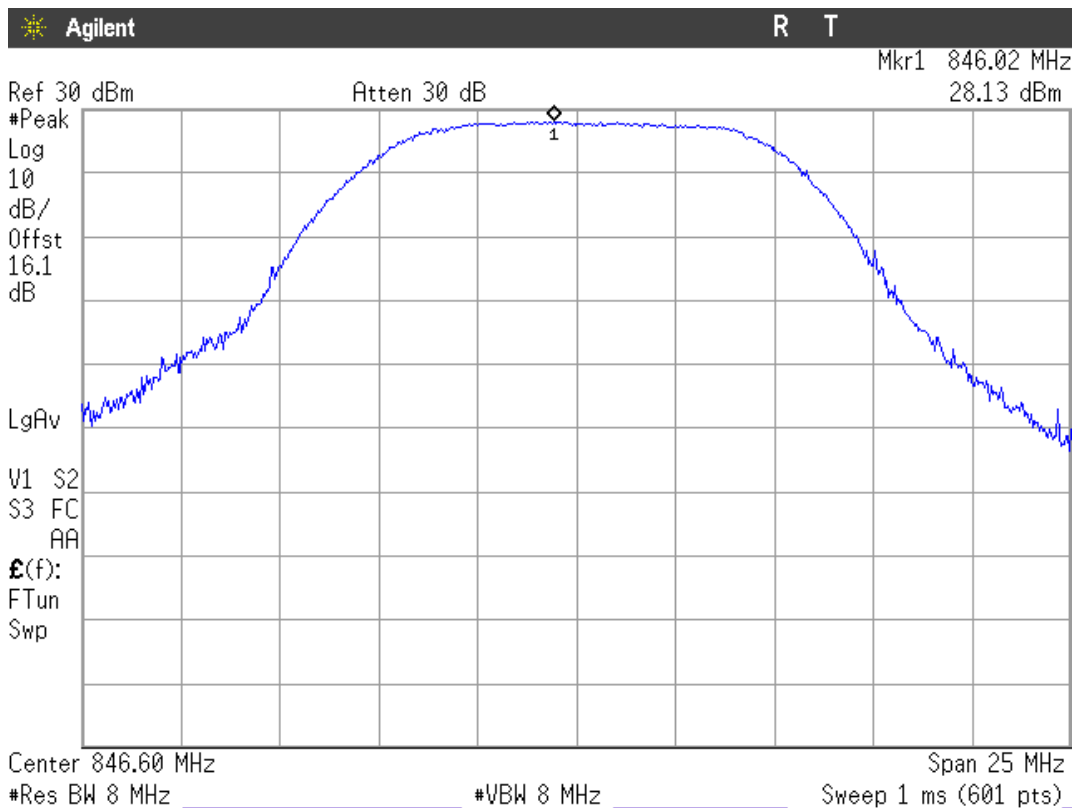
Lowest Channel



### Middle Channel



### Highest Channel



## Modulation Characteristics

### SPECIFICATION

§2.1047

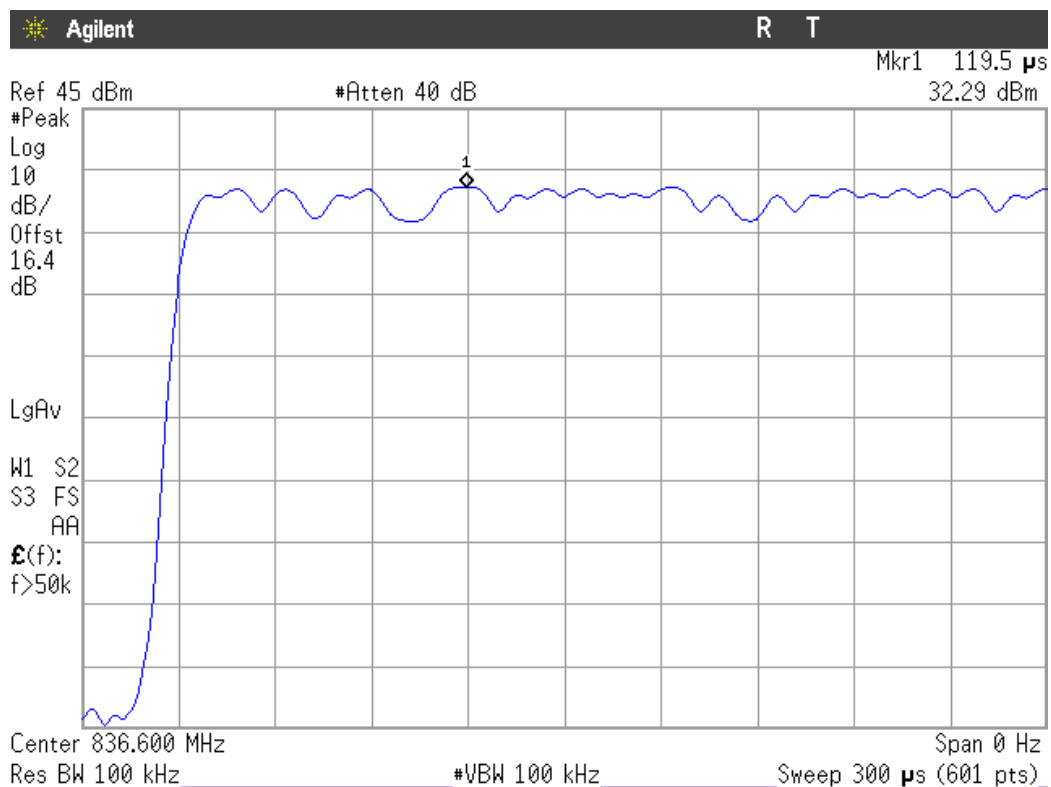
### METHOD

The EUT operates with GPRS (GMSK), EDGE (GMSK/8-PSK), WCDMA/HSDPA (QPSK) and HSUPA (QPSK/16QAM) modes, in which the information is digitised and coded into a bit stream.

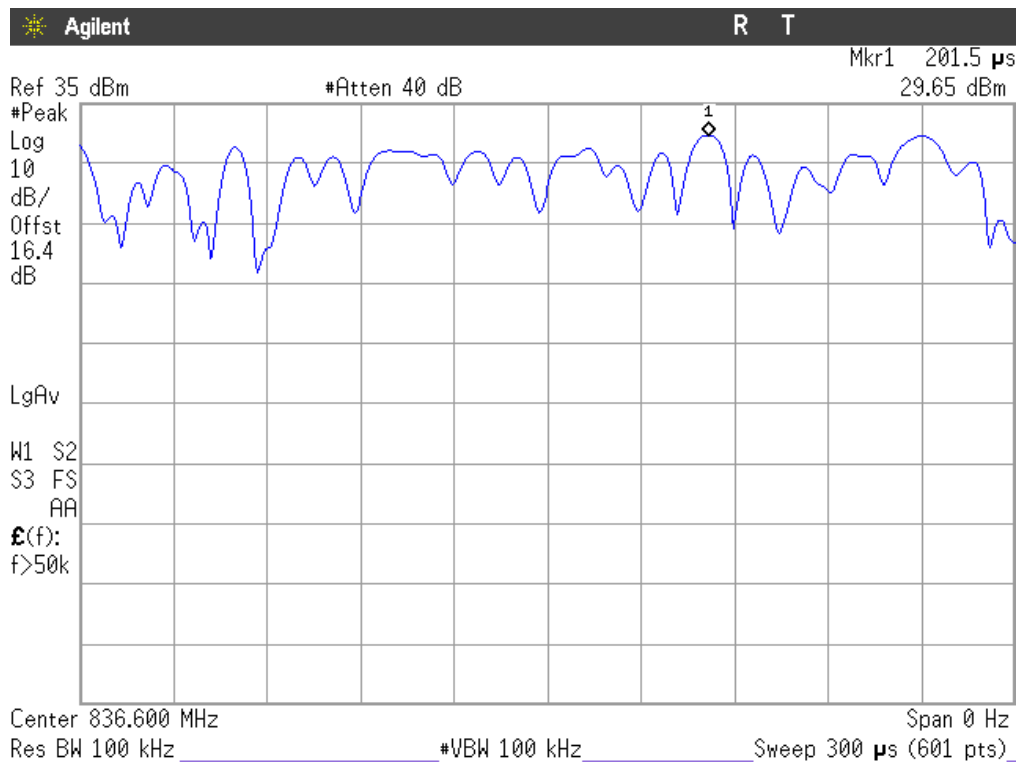
### RESULTS

The following plot shows the modulation schemes in the EUT.

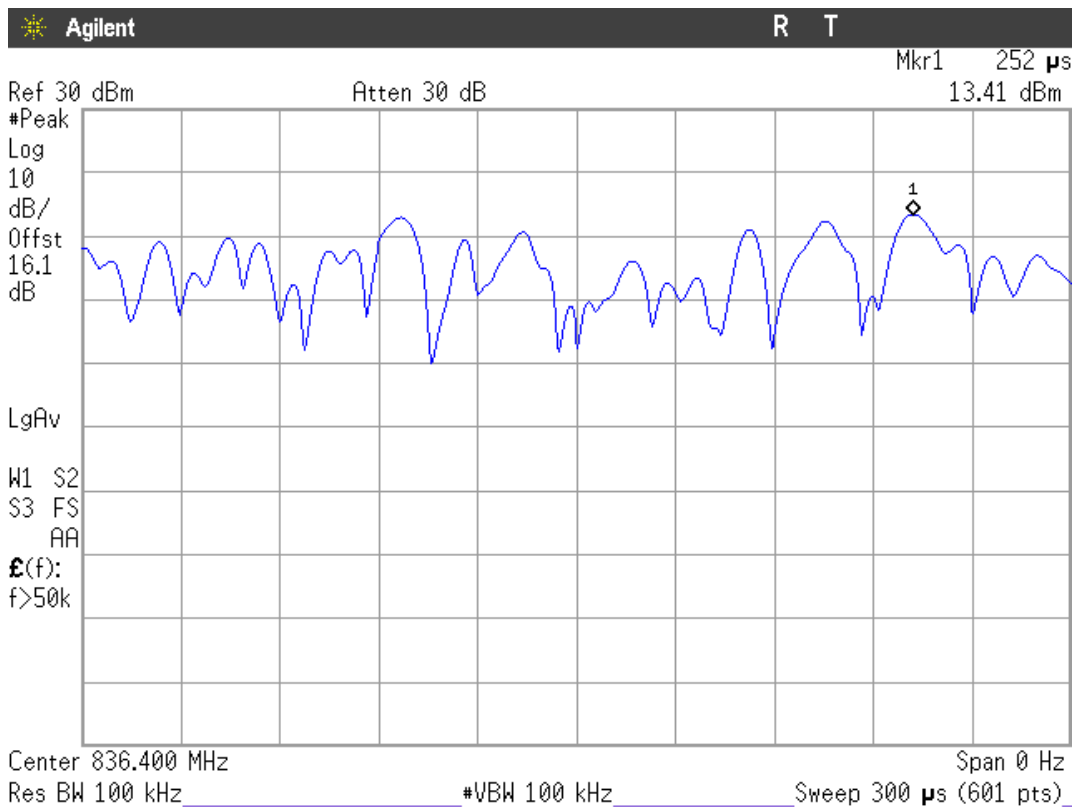
#### GPRS MODULATION



### EDGE MODULATION

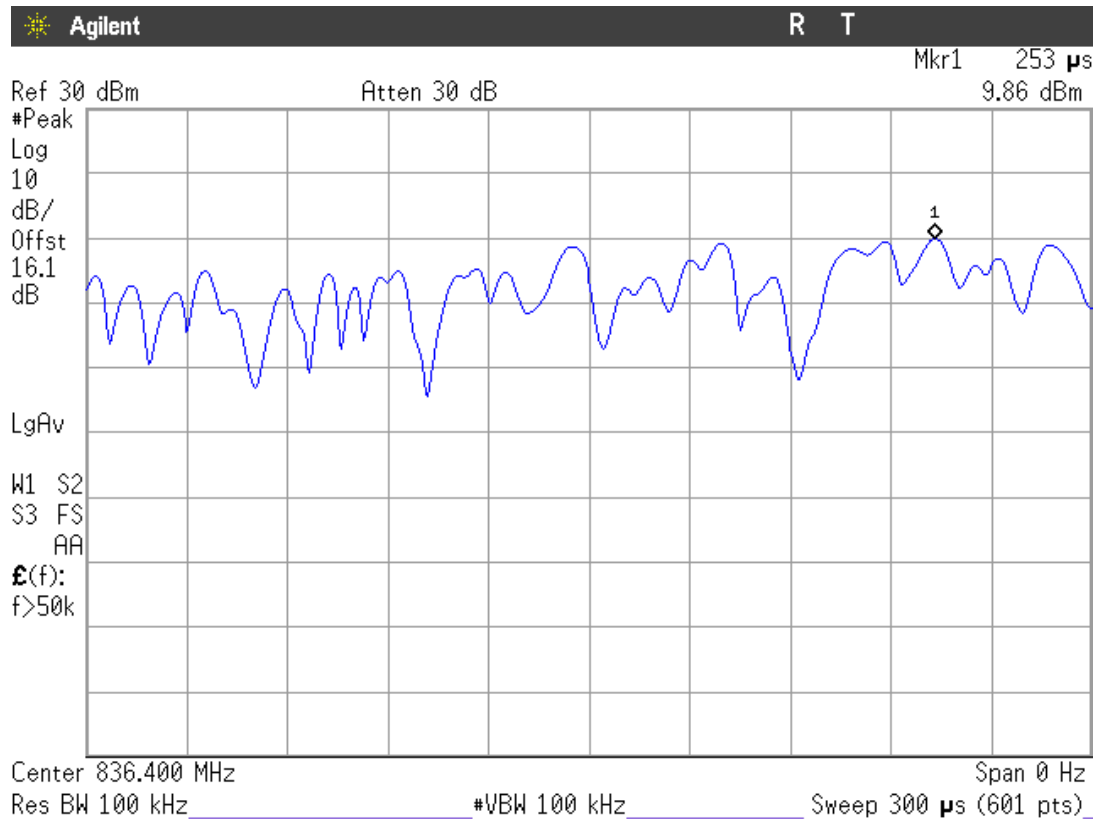


### WCDMA MODULATION





# HSUPA MODULATION



## *Frequency Stability*

### SPECIFICATION

§2.1055 and §22.355

### METHOD

The frequency tolerance measurements over temperature variations were made over the temperature range of  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ . The EUT was placed inside a climatic chamber and the temperature was raised hourly in  $10^{\circ}\text{C}$  steps from  $-30^{\circ}\text{C}$  up to  $+50^{\circ}\text{C}$ .

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

### RESULTS

Frequency stability over temperature variations.

#### GPRS MODULATION

<b>Temperature (<math>^{\circ}\text{C}</math>)</b>	<b>Frequency Error (Hz)</b>	<b>Frequency Error (ppm)</b>	<b>Frequency Error (%)</b>
+50	-11	-0.0131	-0.00000131
+40	10	0.0120	0.00000120
+30	5	0.0060	0.00000060
+20	-21	-0.0251	-0.00000251
+10	-17	-0.0203	-0.00000203
0	13	0.0155	0.00000155
-10	8	0.0096	0.00000096
-20	30	0.0359	0.00000359
-30	26	0.0311	0.00000311

EDGE MODULATION

Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	-15	-0.0179	-0.00000179
+40	18	0.0215	0.00000215
+30	13	0.0155	0.00000155
+20	-5	-0.0060	-0.00000060
+10	21	0.0251	0.00000251
0	11	0.0131	0.00000131
-10	-4	-0.0048	-0.00000048
-20	-23	-0.0275	-0.00000275
-30	-21	-0.0251	-0.00000251

WCDMA MODULATION

Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	-7	-0.0084	-0.00000084
+40	-16	-0.0191	-0.00000191
+30	8	0.0096	0.00000096
+20	-18	-0.0215	-0.00000215
+10	15	0.0179	0.00000179
0	-19	-0.0227	-0.00000227
-10	-16	-0.0191	-0.00000191
-20	14	0.0167	0.00000167
-30	18	0.0215	0.00000215

HSUPA MODULATION

Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	-10	-0.0120	-0.00000120
+40	-21	-0.0251	-0.00000251
+30	-5	-0.0060	-0.00000060
+20	-9	-0.0108	-0.00000108
+10	-10	-0.0120	-0.00000120
0	-22	-0.0263	-0.00000263
-10	-12	-0.0143	-0.00000143
-20	-13	-0.0155	-0.00000155
-30	11	0.0132	0.00000132

Frequency stability over voltage variations.

GPRS MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	-23	-0.0275	-0.00000275
Vmin	3.2	-19	-0.0227	-0.00000227

EDGE MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	14	0.0167	0.00000167
Vmin	3.2	10	0.0120	0.00000120

WCDMA MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	-8	-0.0096	-0.00000096
Vmin	3.2	-21	-0.0251	-0.00000251

HSUPA MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	-14	-0.0167	-0.00000167
Vmin	3.2	-8	-0.0096	-0.00000096

## *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 determine the occupied bandwidth of the modulated emission for GPRS and EDGE modulation and 50 kHz for WCDMA and HSUPA modulation.

### RESULTS

#### GPRS MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	273.3	274.8	273.8
-26 dBc bandwidth (kHz)	313.8	316.9	316.1
Measurement uncertainty (kHz)	<±6.5		

#### EDGE MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	273.3	271.4	270.5
-26 dBc bandwidth (kHz)	310.4	315.3	311.1
Measurement uncertainty (kHz)	<±6.5		

#### WCDMA MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	4653	4653	4640
-26 dBc bandwidth (kHz)	4827	4813	4800
Measurement uncertainty (kHz)	<±52		

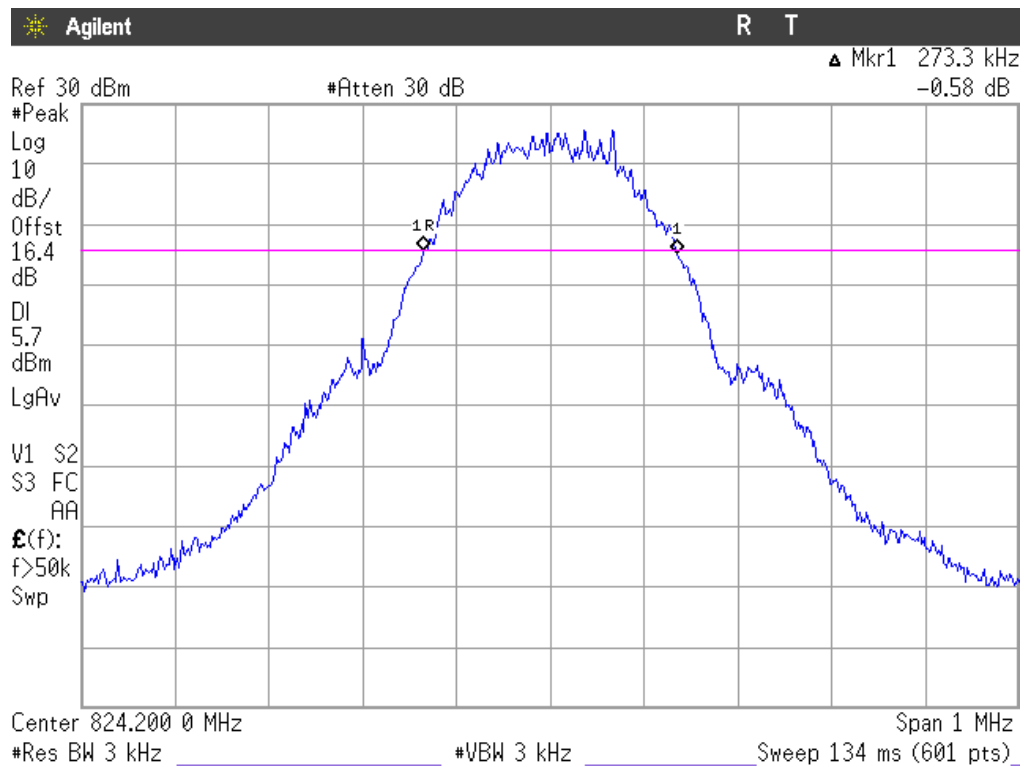
#### HSUPA MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	4653	4680	4640
-26 dBc bandwidth (kHz)	5640	5787	5920
Measurement uncertainty (kHz)	<±52		

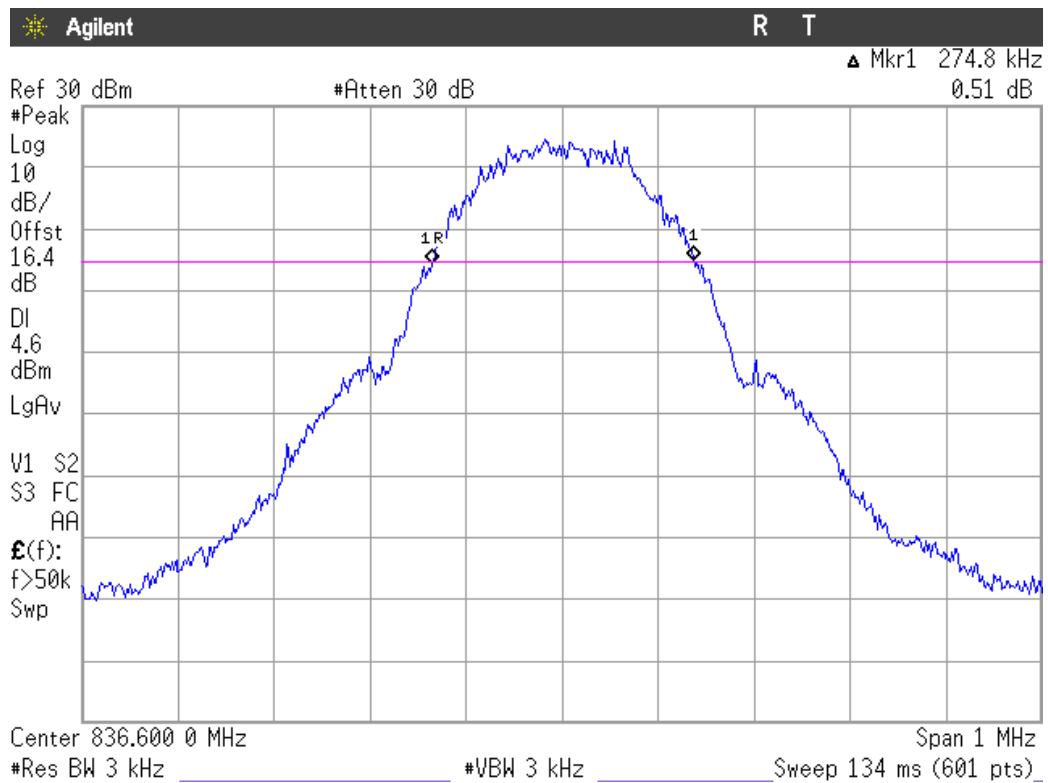
99% OCCUPIED BANDWIDTH

GPRS MODULATION

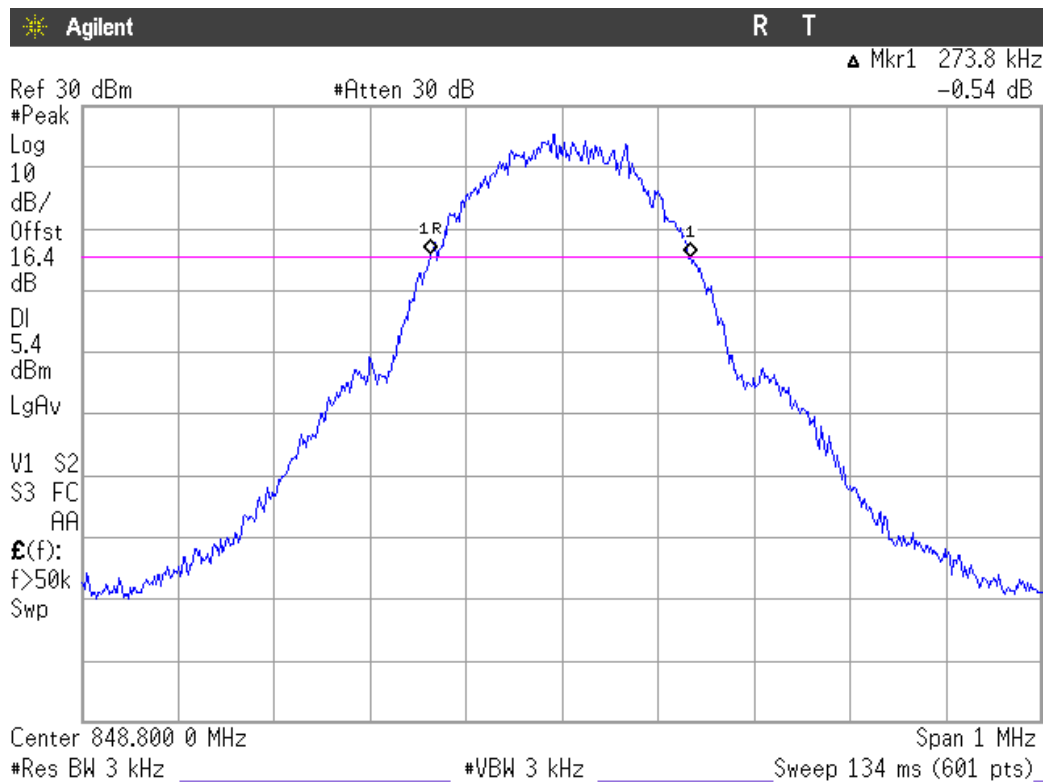
Lowest Channel



Middle Channel

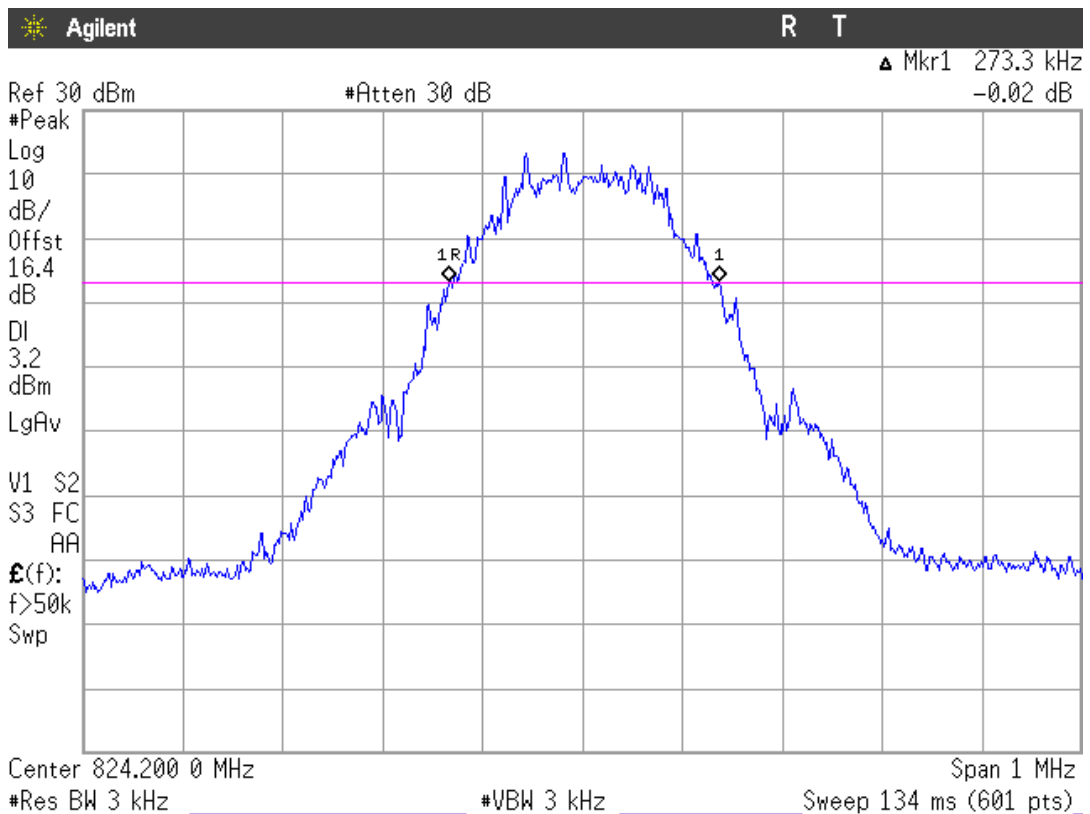


### Highest Channel

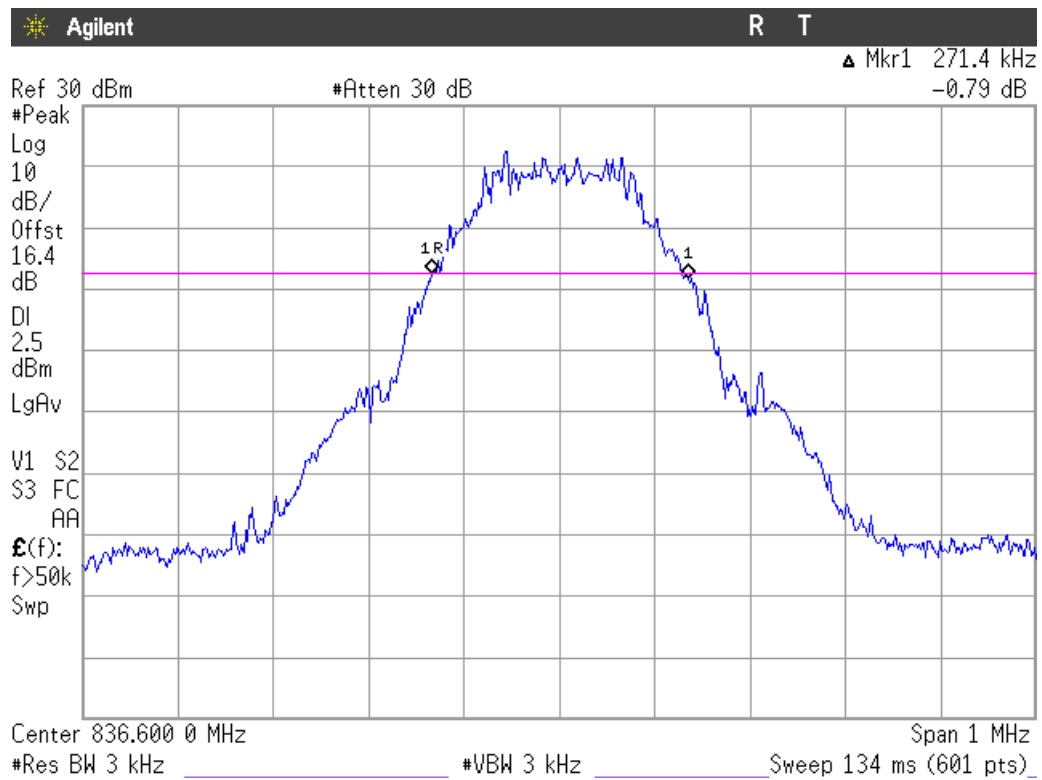


### EDGE MODULATION

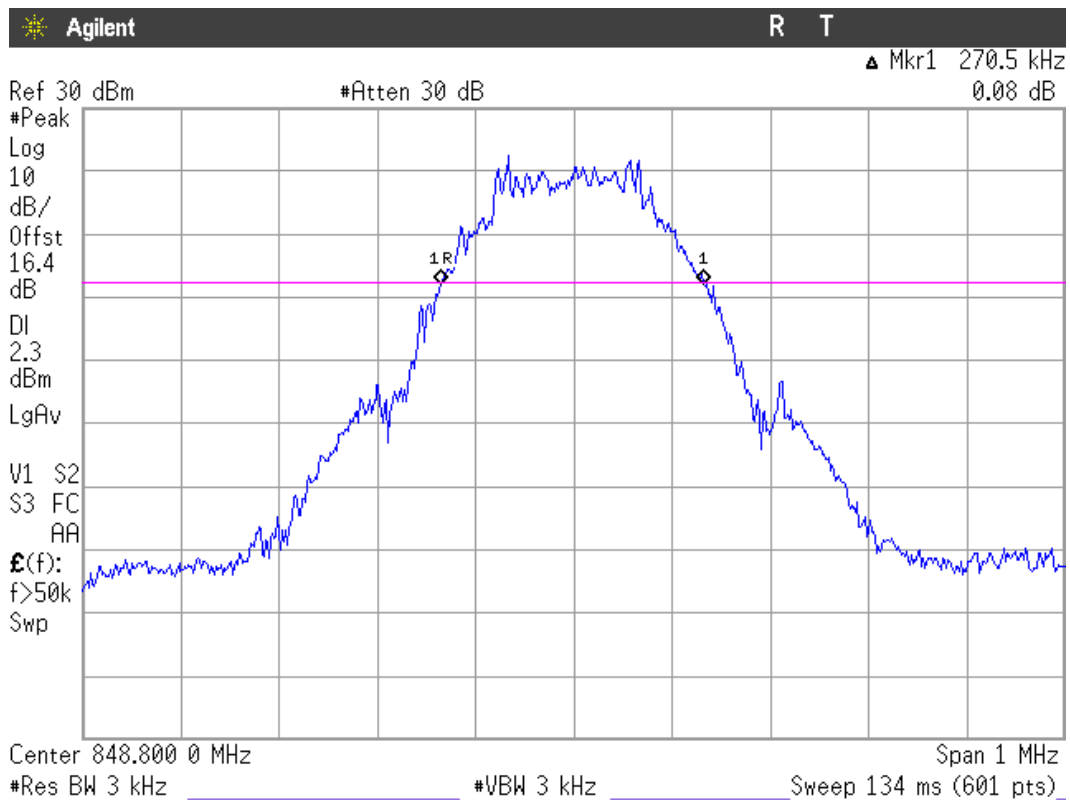
#### Lowest Channel



### Middle Channel



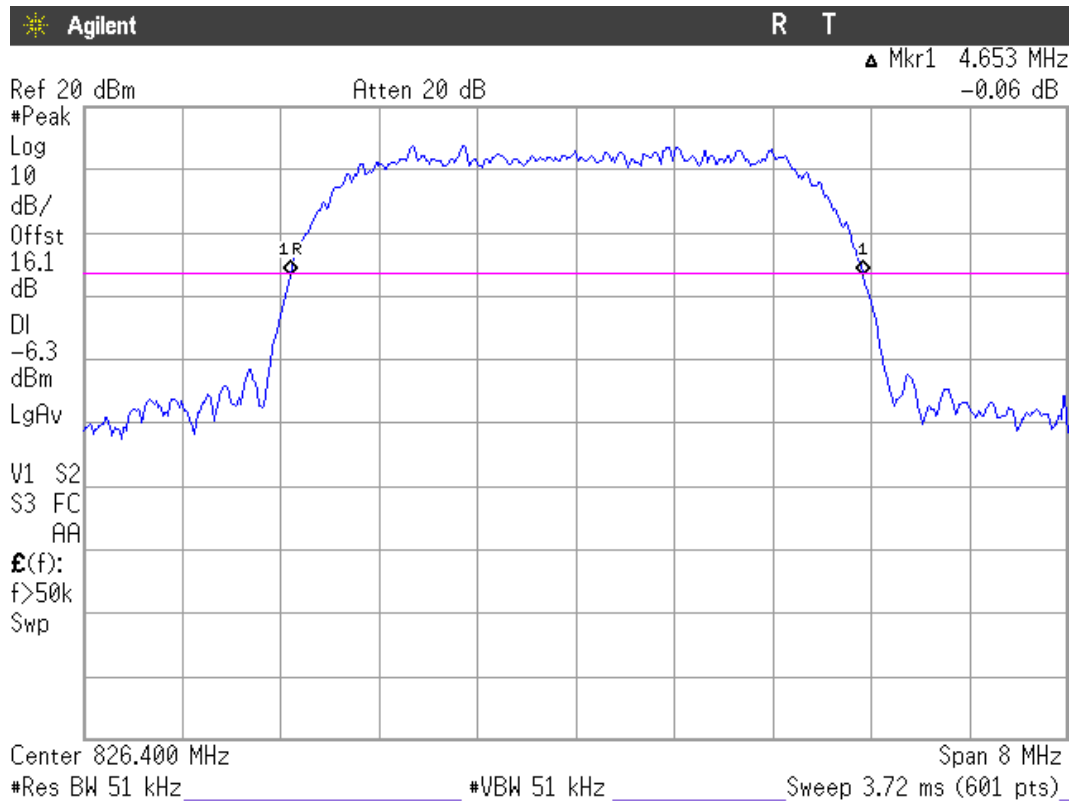
### Highest Channel



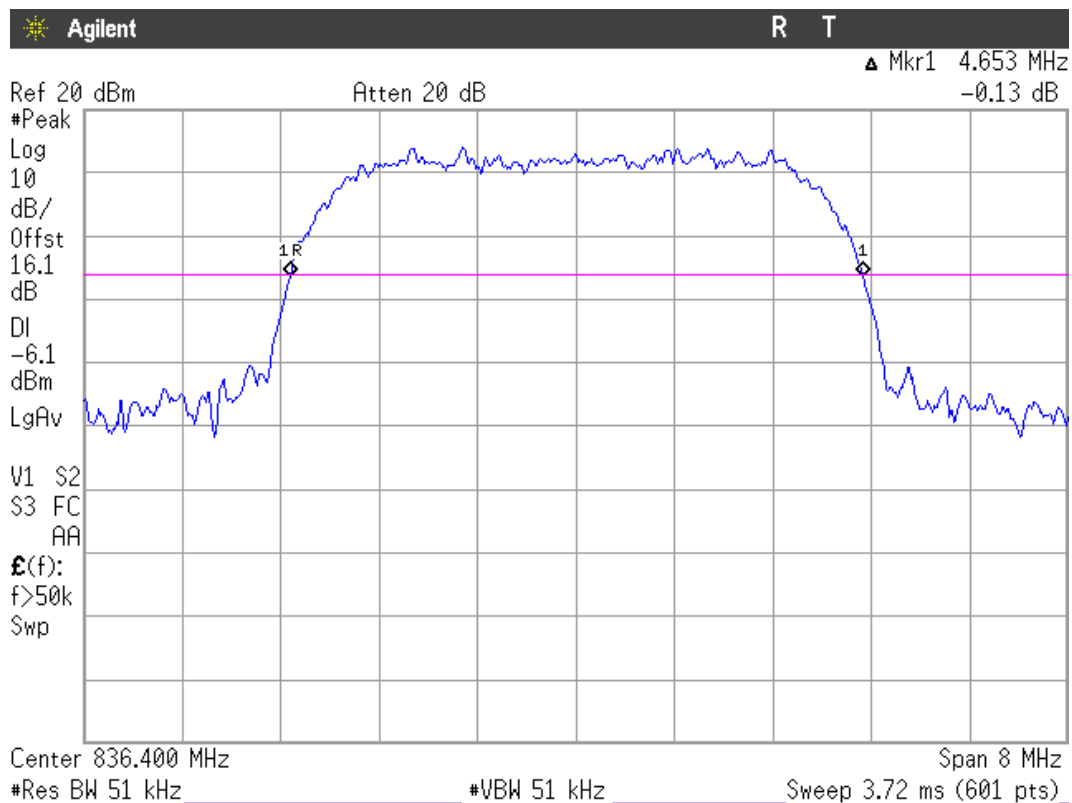


## WCDMA MODULATION

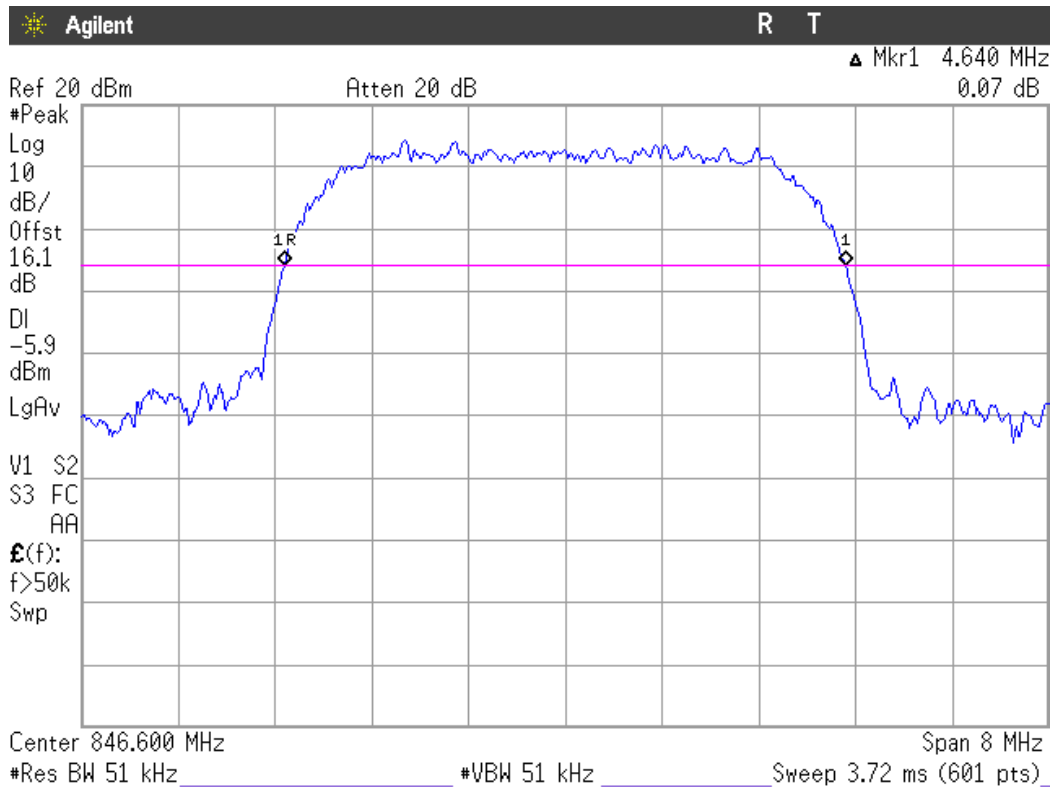
### Lowest Channel



### Middle Channel

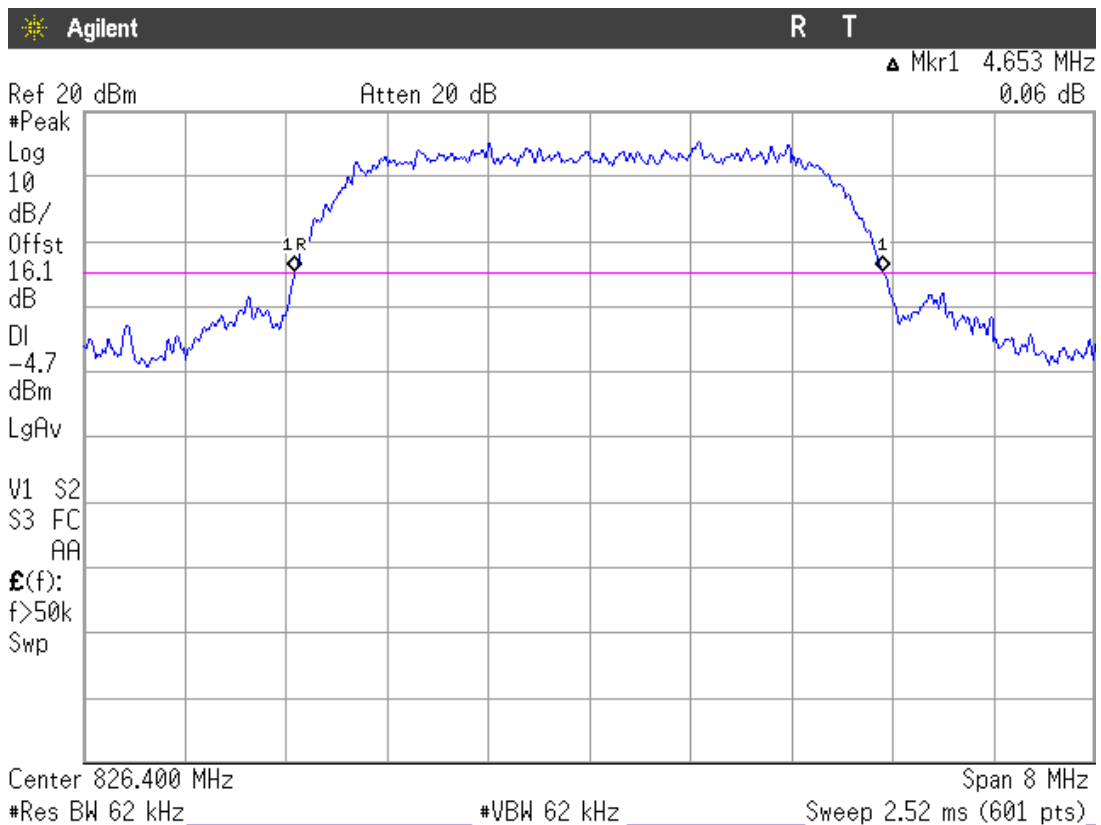


### Highest Channel

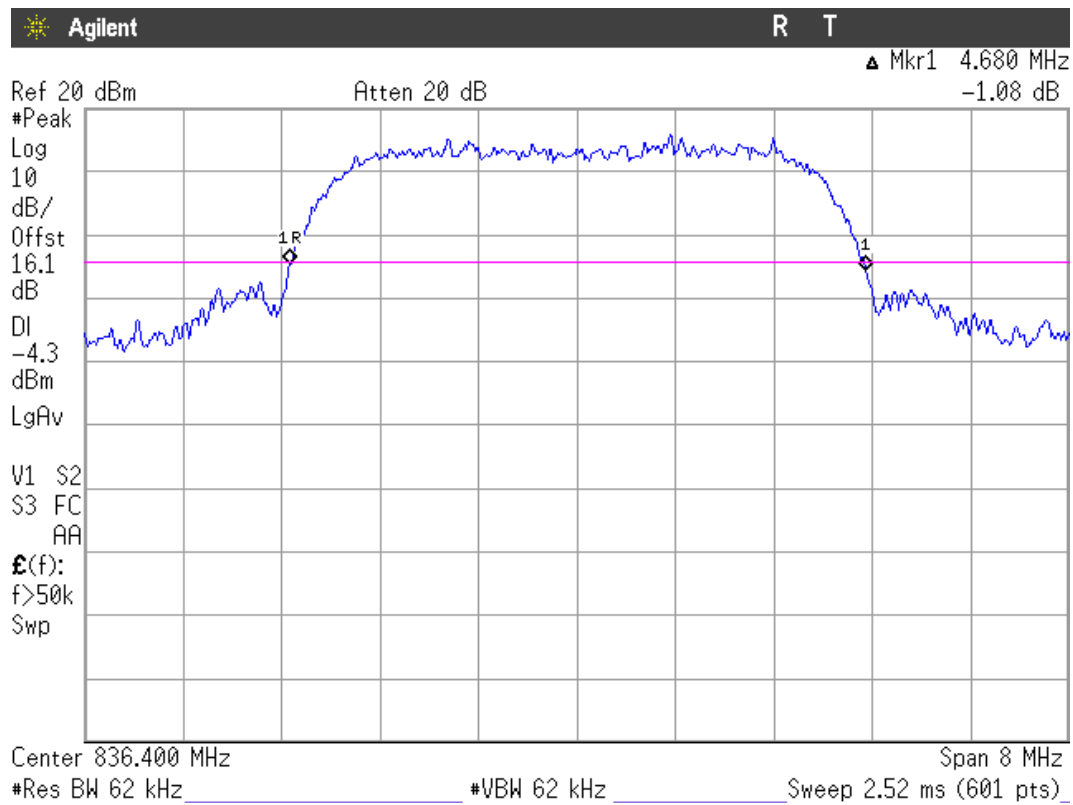


### HSUPA MODULATION

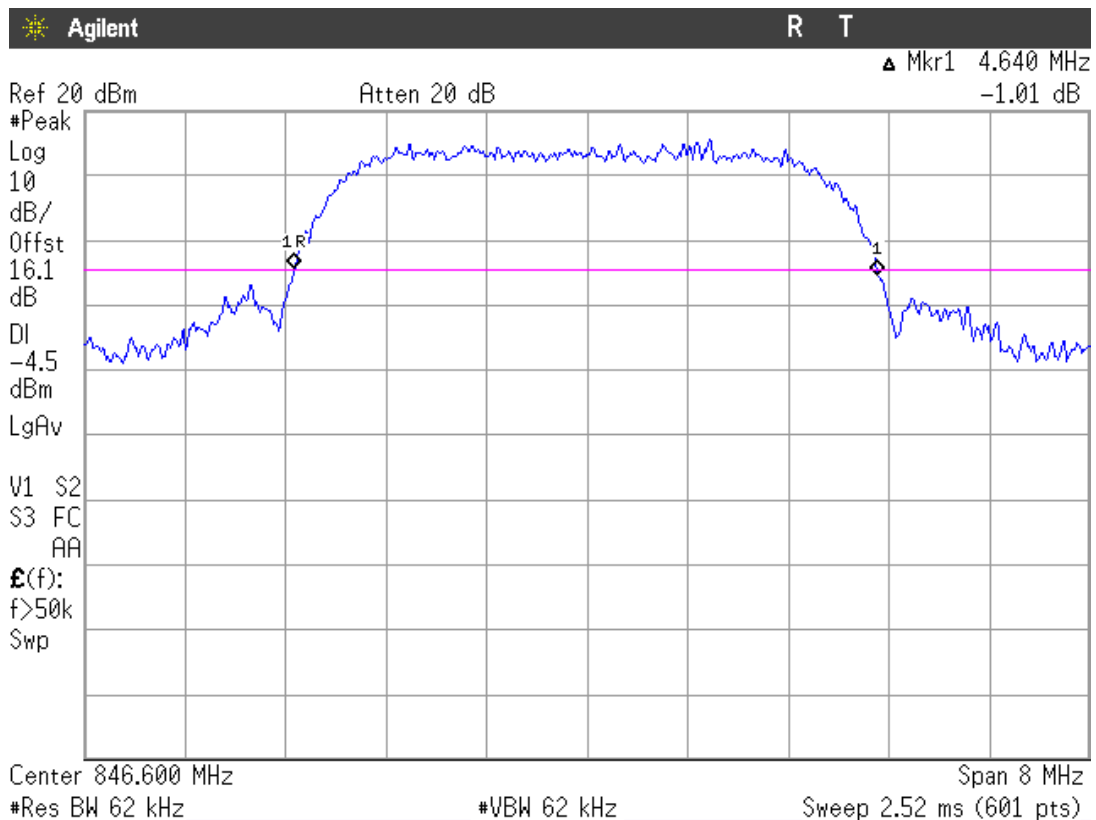
#### Lowest Channel



### Middle Channel



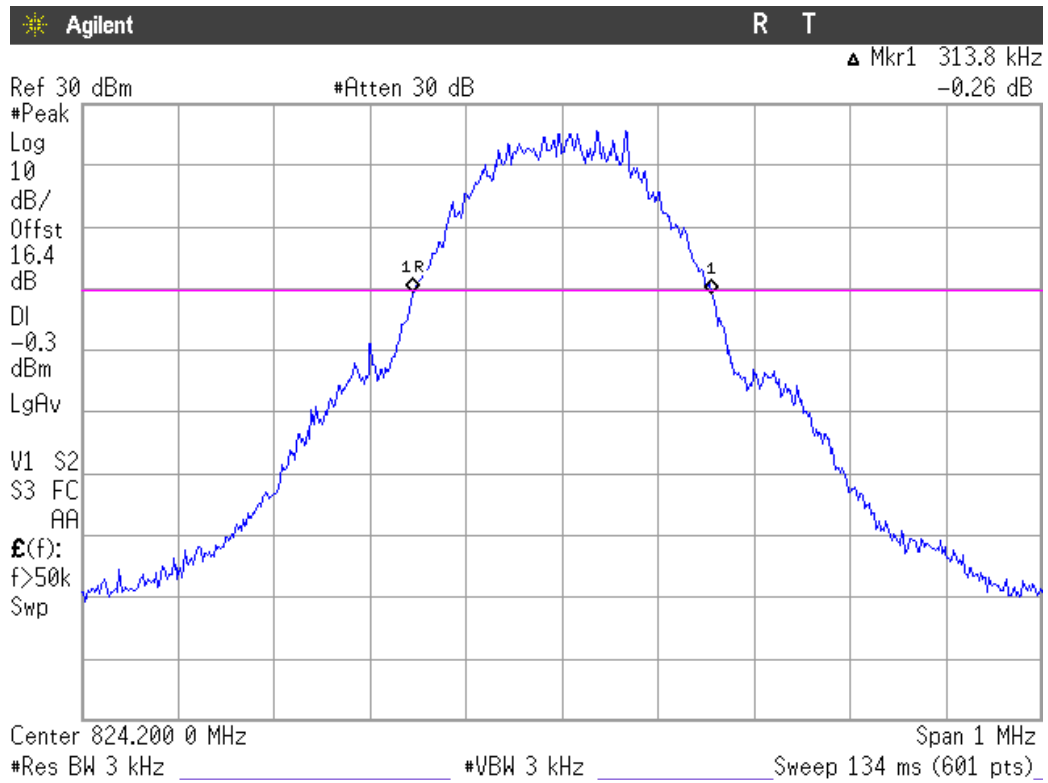
### Highest Channel



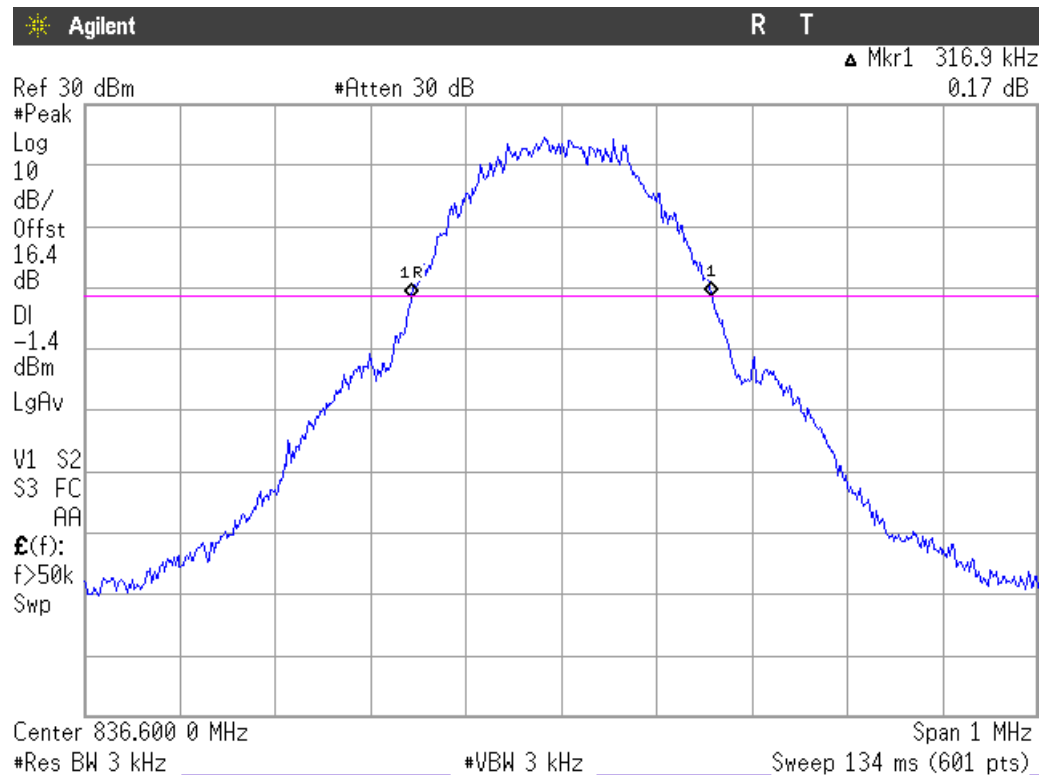
-26 dBc BANDWIDTH

GPRS MODULATION

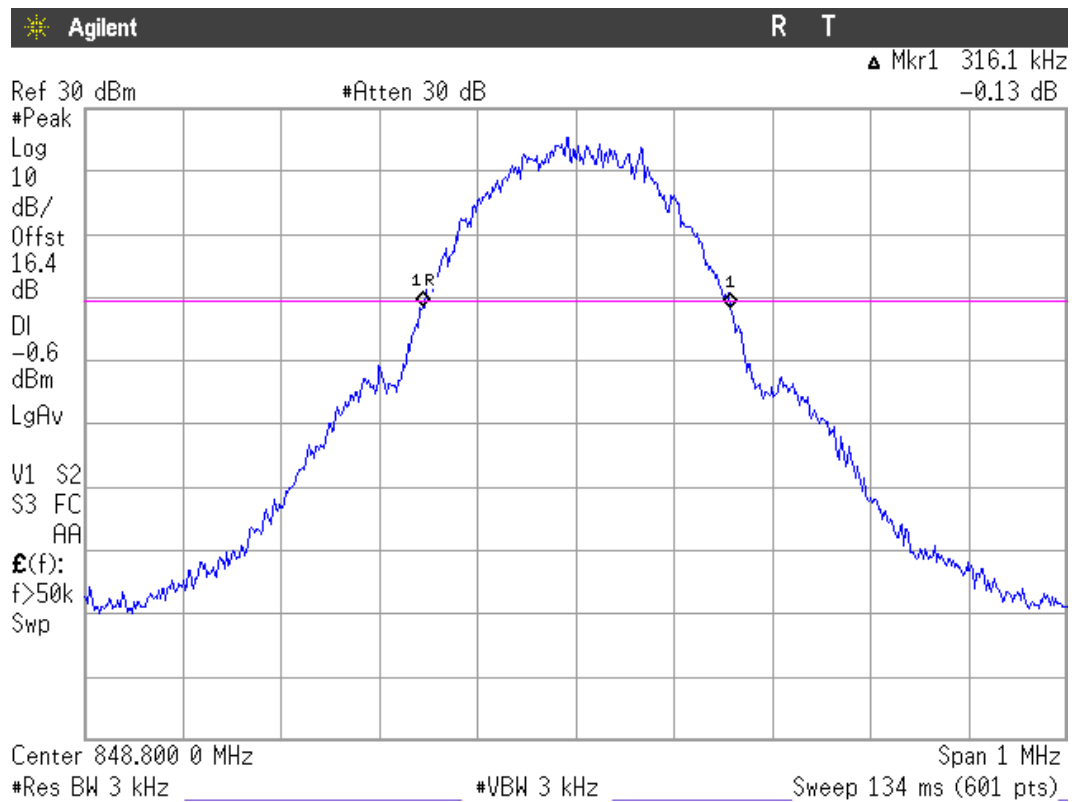
Lowest Channel



Middle Channel

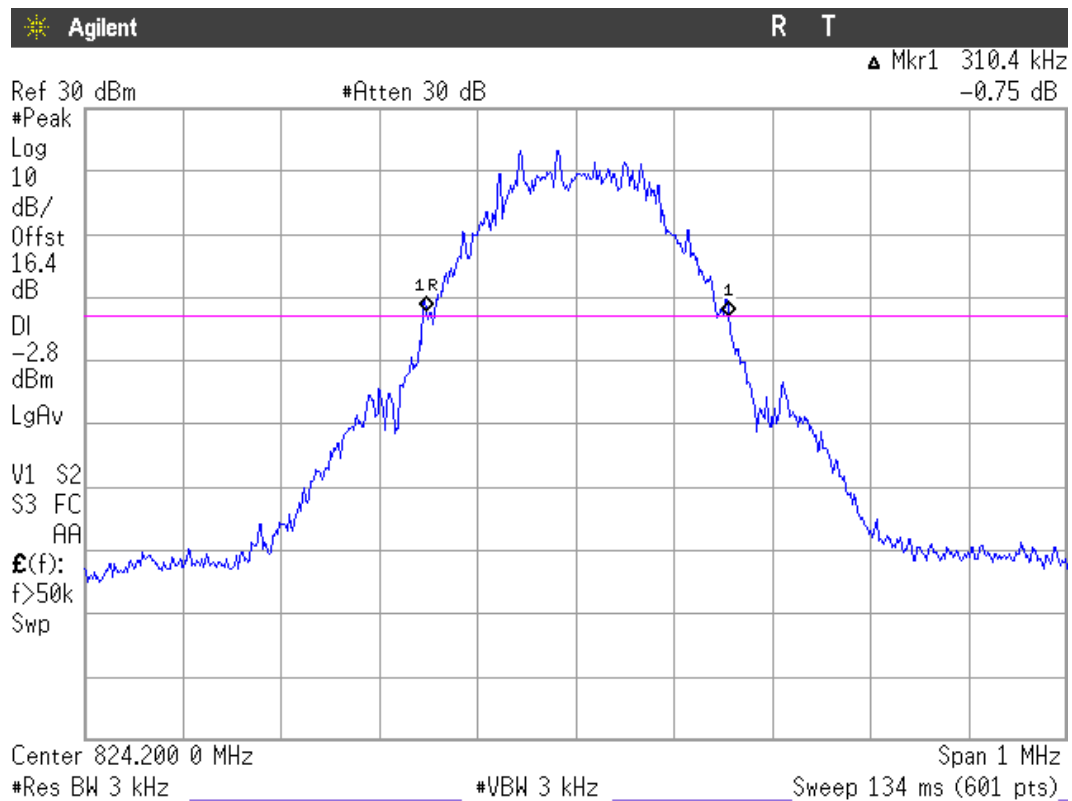


### Highest Channel

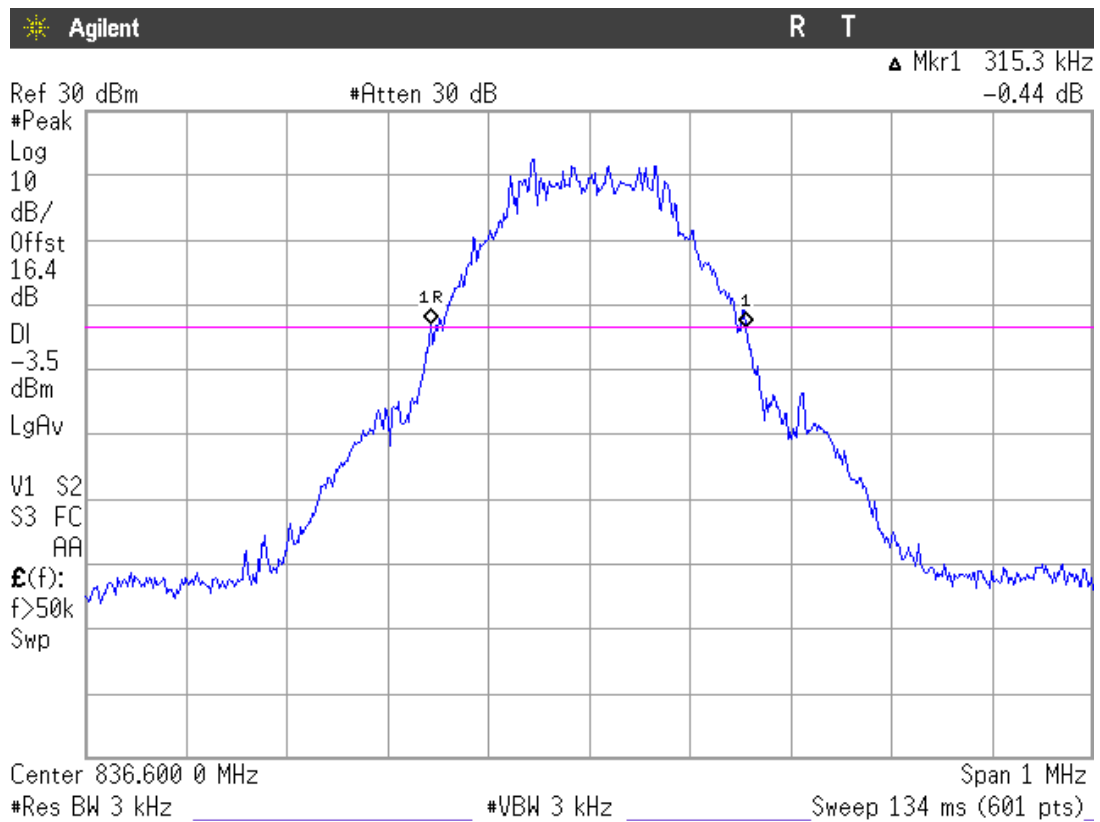


### EDGE MODULATION

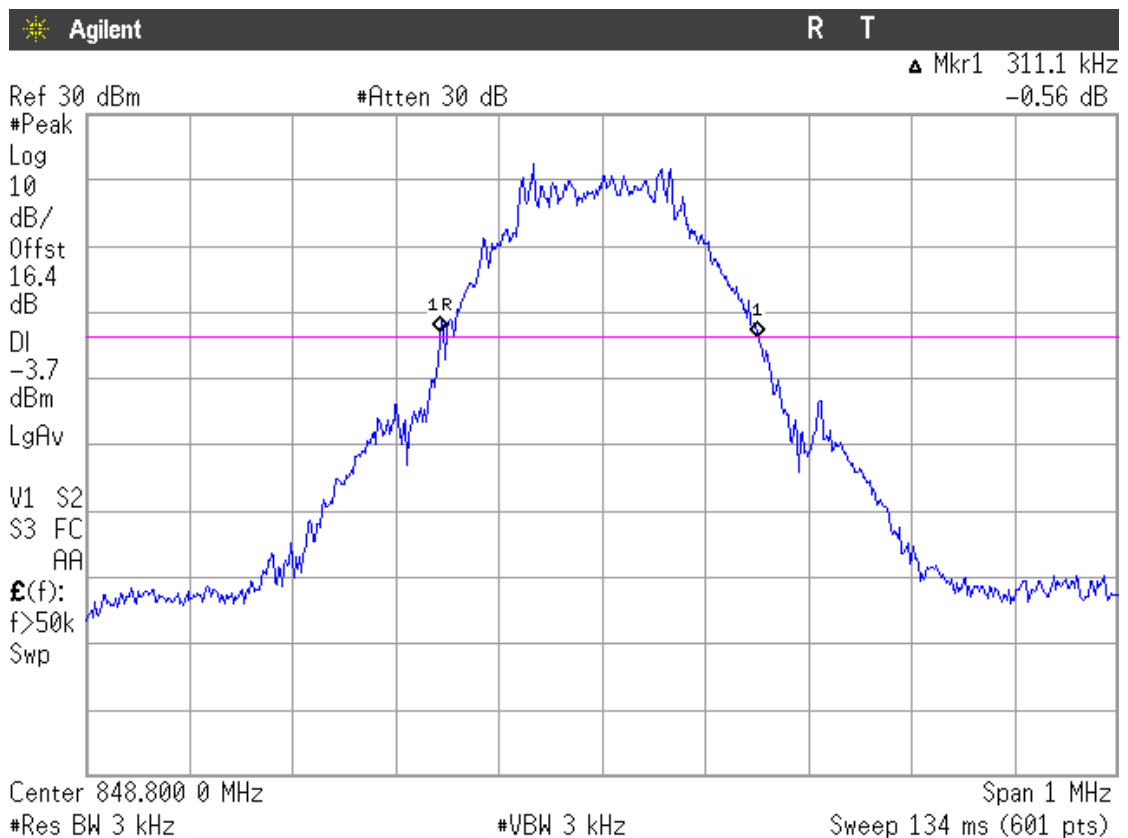
#### Lowest Channel



### Middle Channel

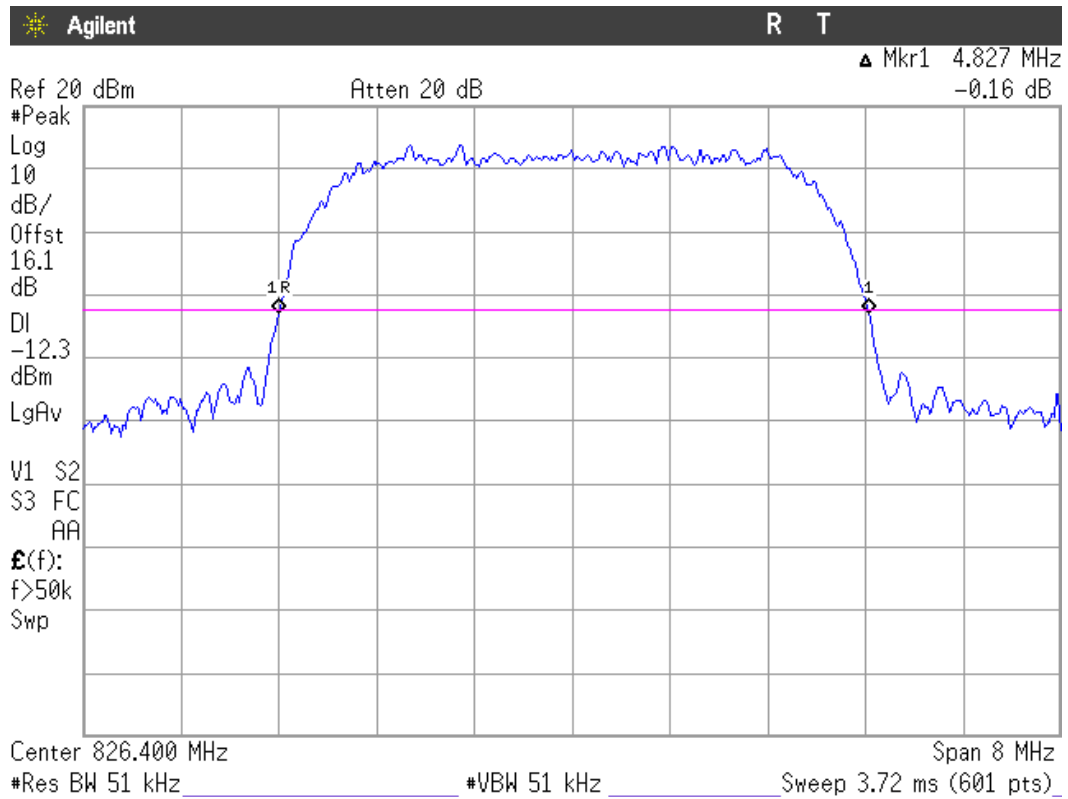


### Highest Channel

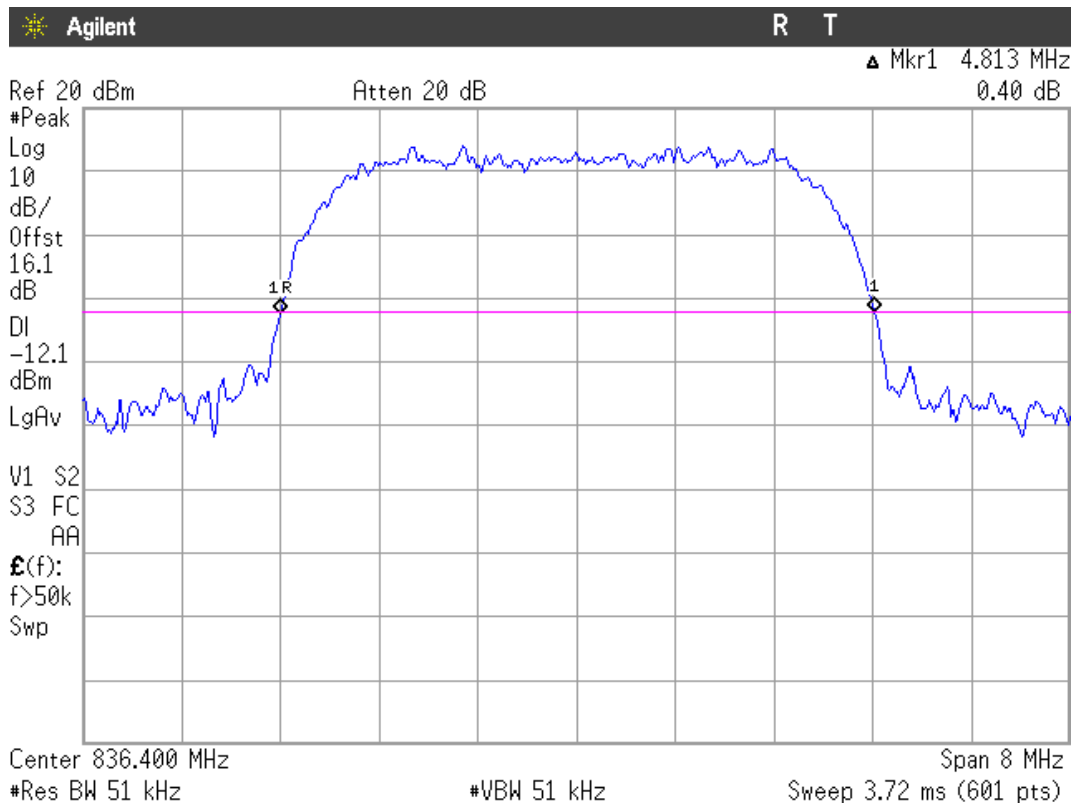


## WCDMA MODULATION

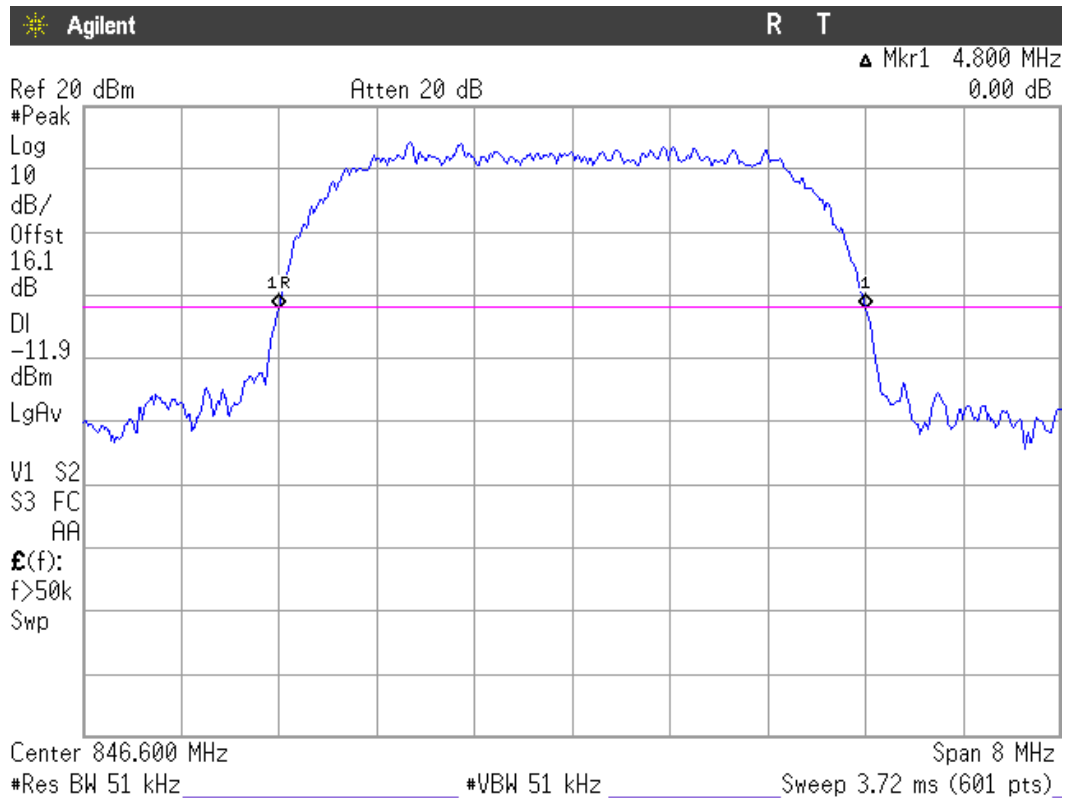
### Lowest Channel



### Middle Channel

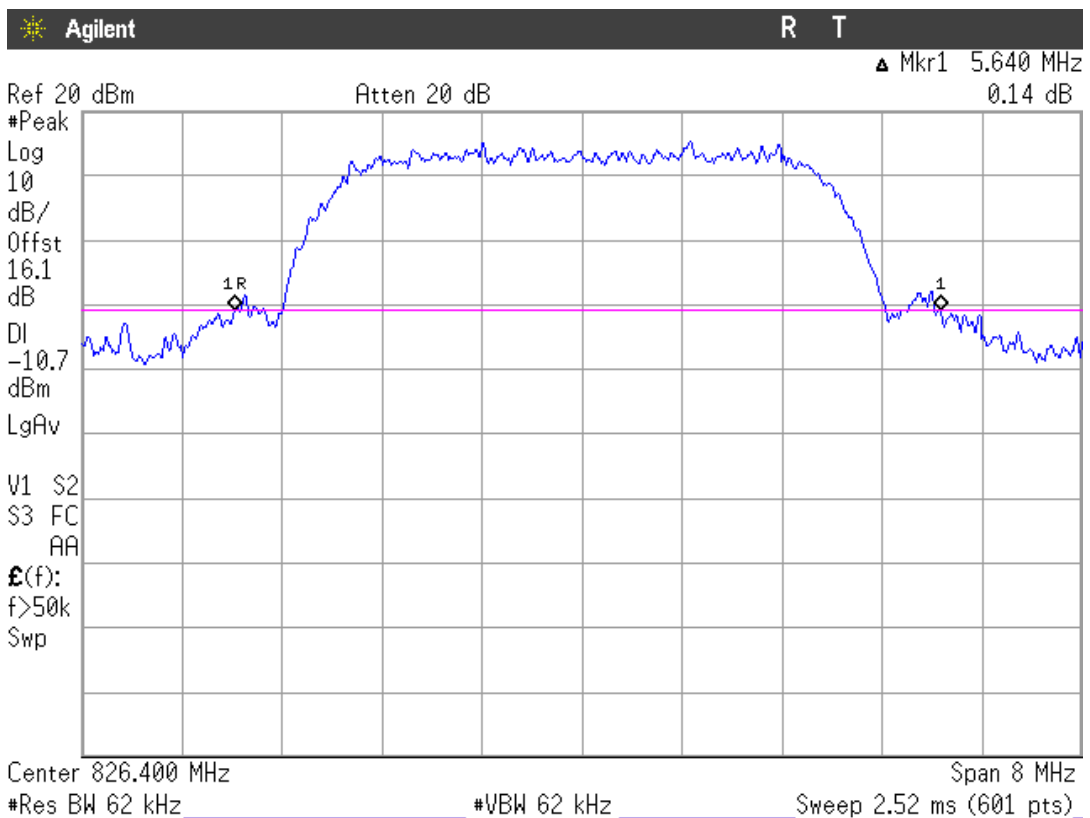


### Highest Channel



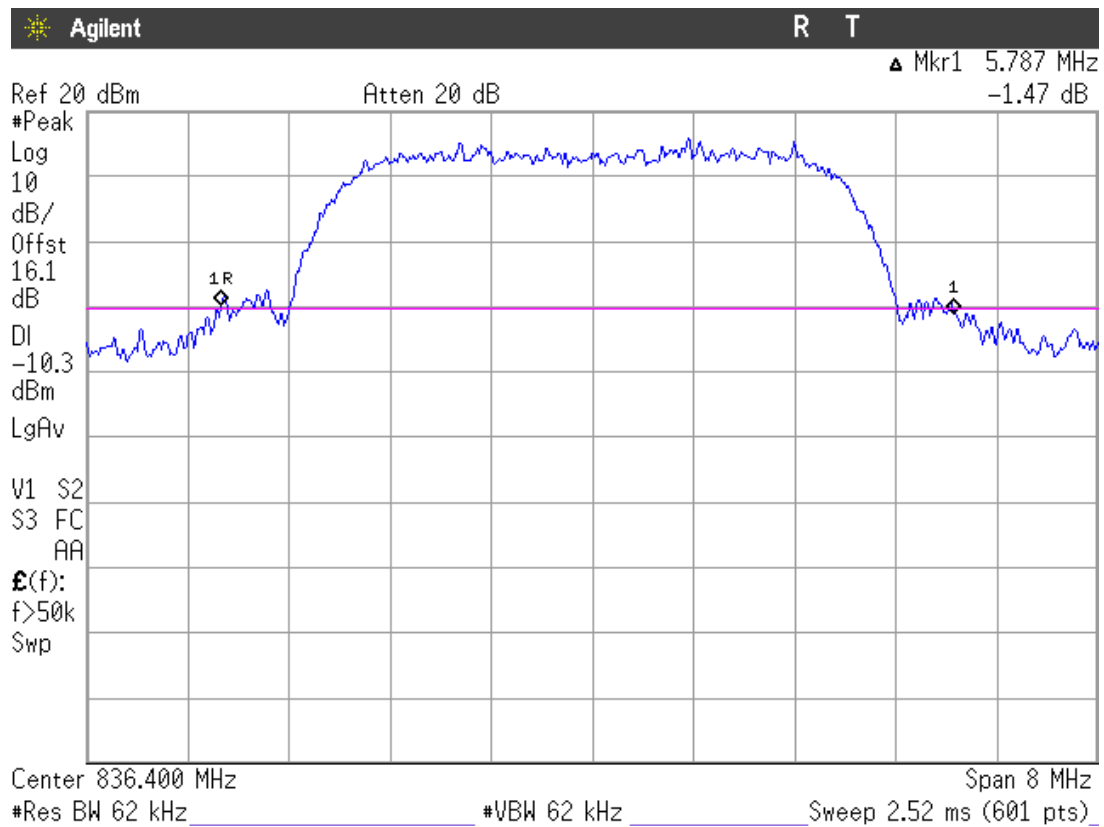
### HSUPA MODULATION

#### Lowest Channel

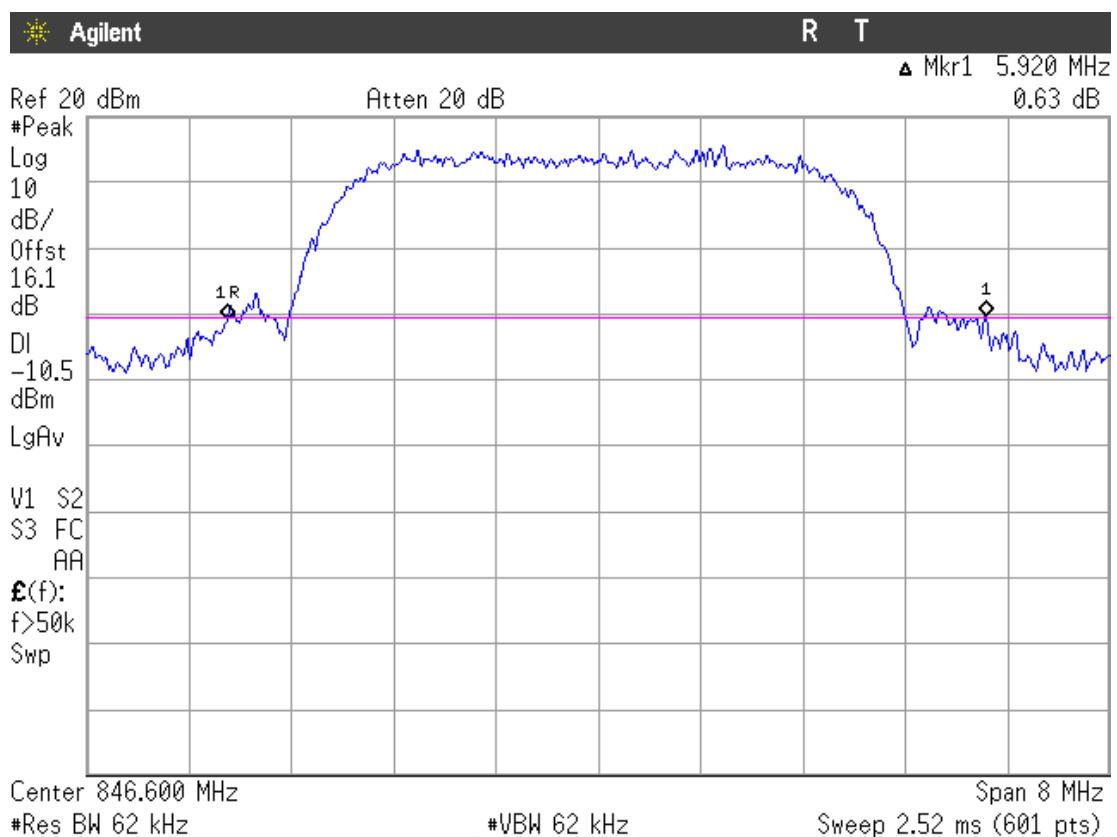




### Middle Channel



### 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  $P_o$  transmitting power, the specified minimum attenuation becomes  $43+10\log (P_o)$ , and the level in dBm relative  $P_o$  becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = - 13 \text{ dBm}$$

### 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.

#### HSUPA 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.

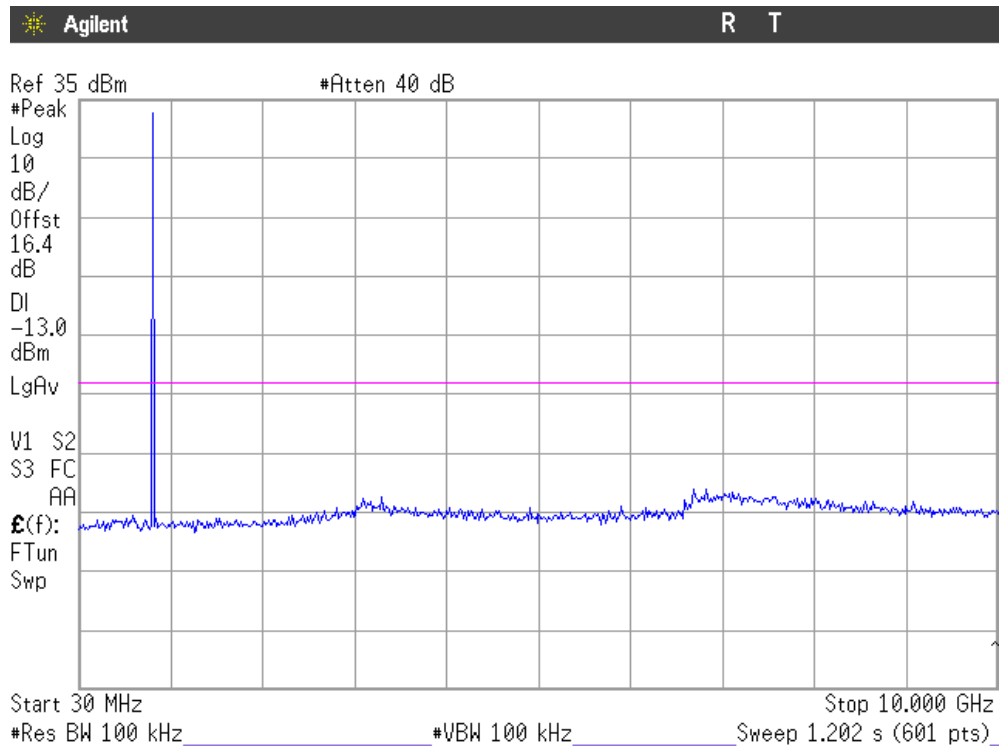
3. CHANNEL: HIGHEST

No spurious signals were found in all the range.

Verdict: PASS

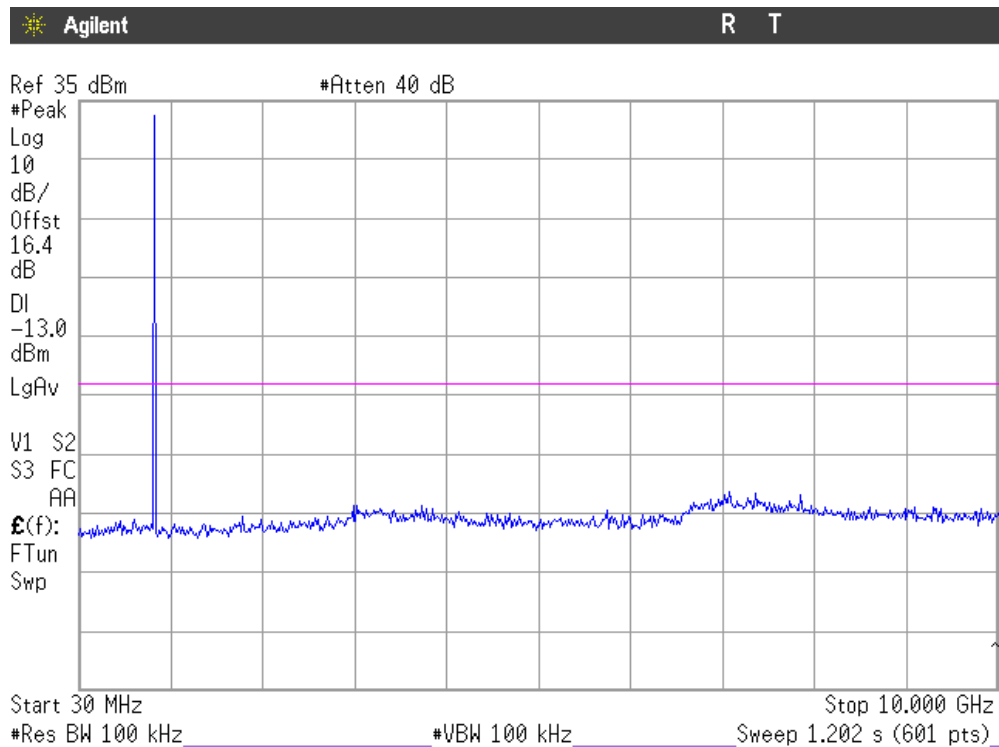
## GPRS MODULATION

### 1. CHANNEL: LOWEST



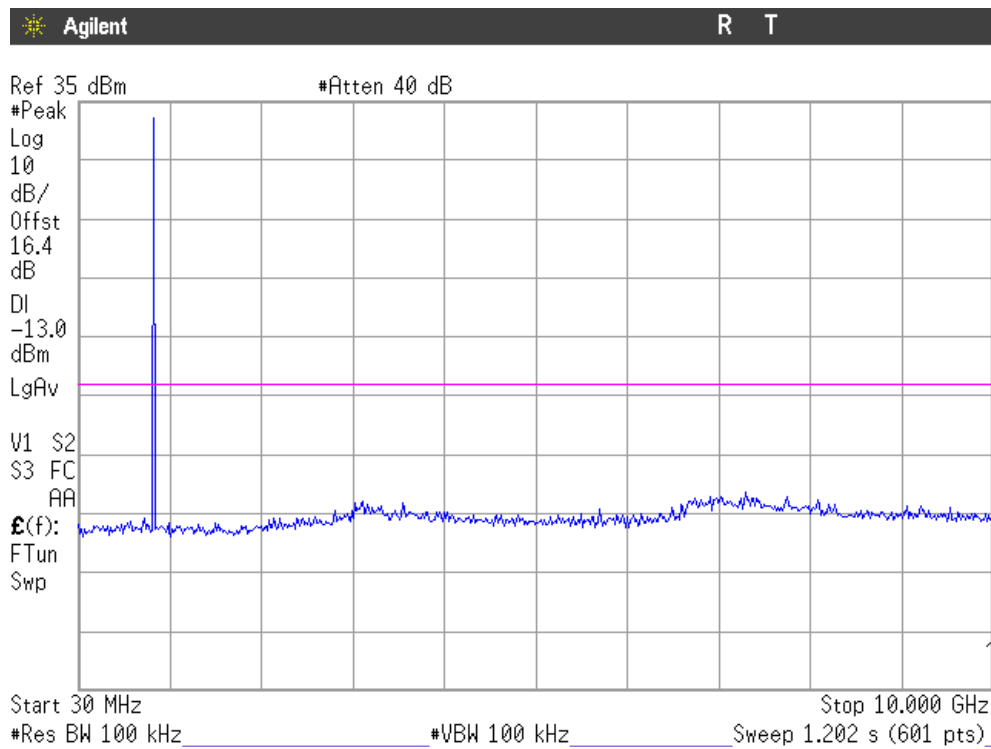
Note: The peak above the limit is the carrier frequency.

### 2. CHANNEL: MIDDLE



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

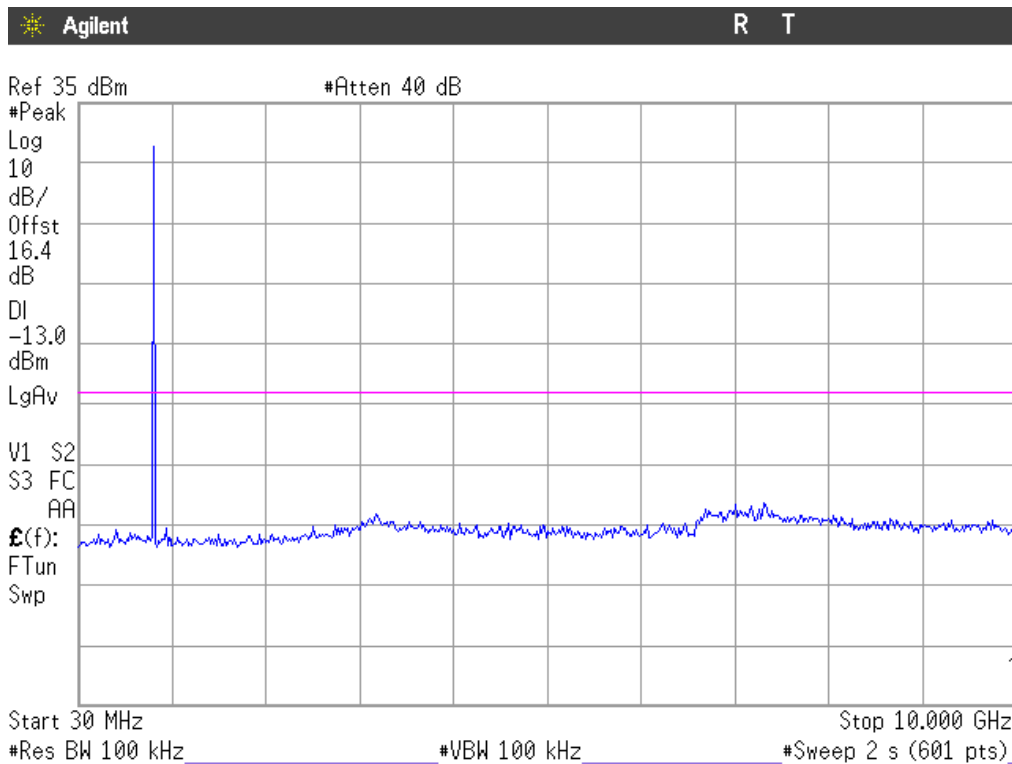
### 3. CHANNEL: HIGHEST



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

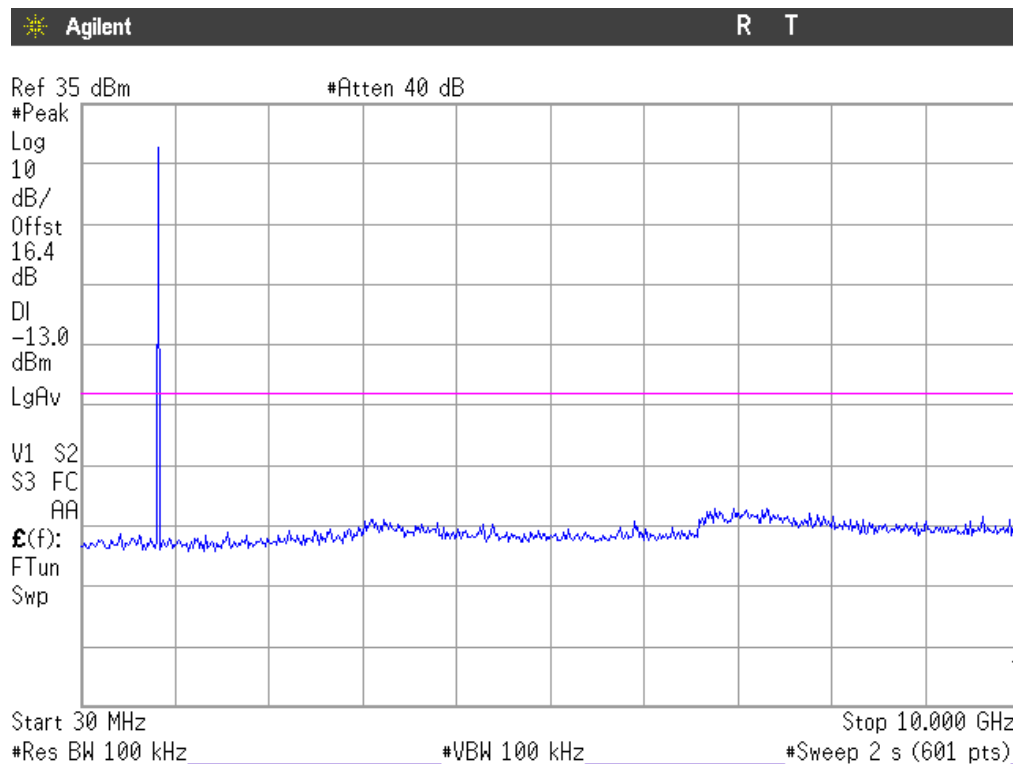
### EDGE MODULATION

#### 1. CHANNEL: LOWEST



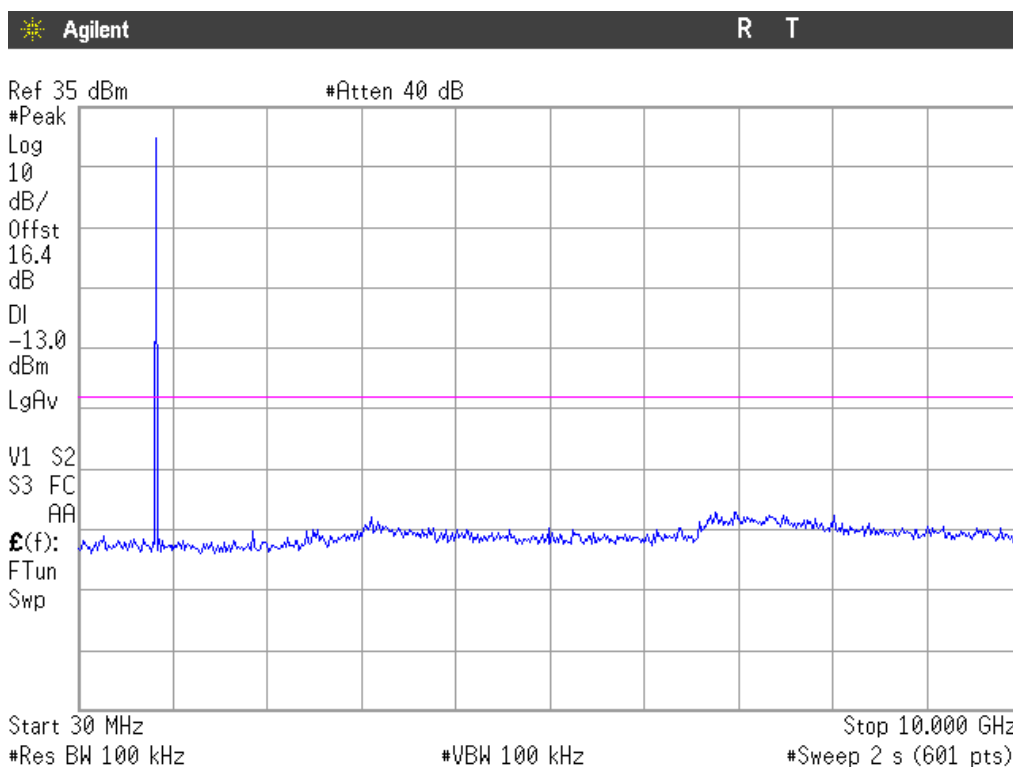
Note: The peak above the limit is the carrier frequency.

## 2. CHANNEL: MIDDLE



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

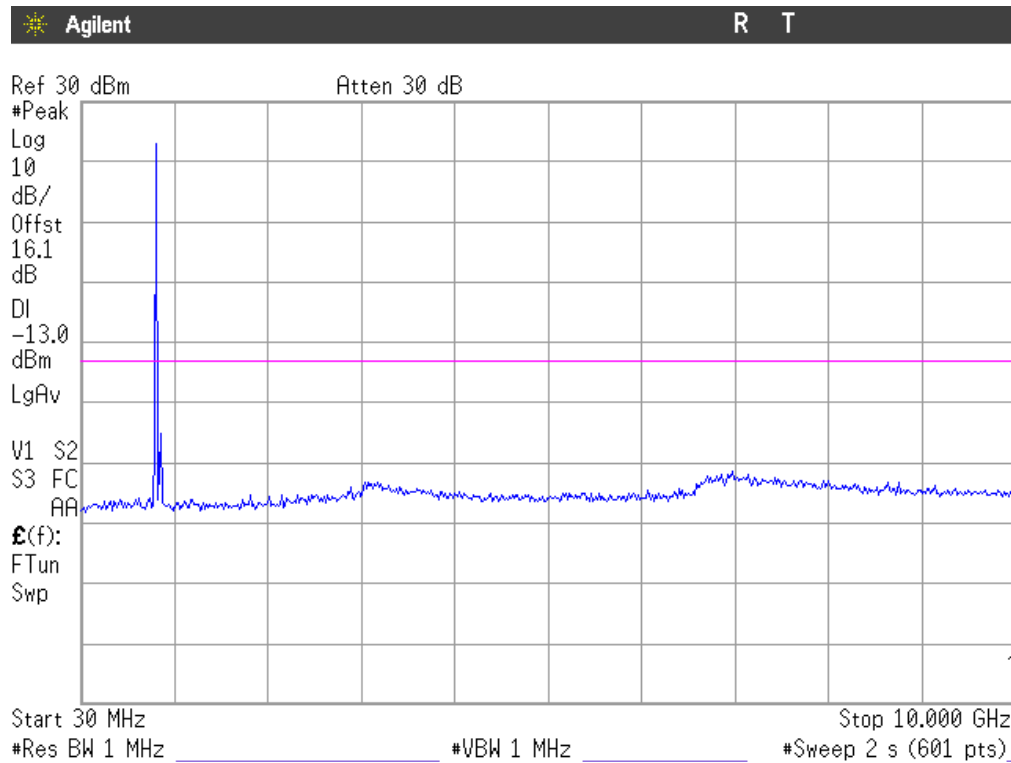
## 3. CHANNEL: HIGHEST



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

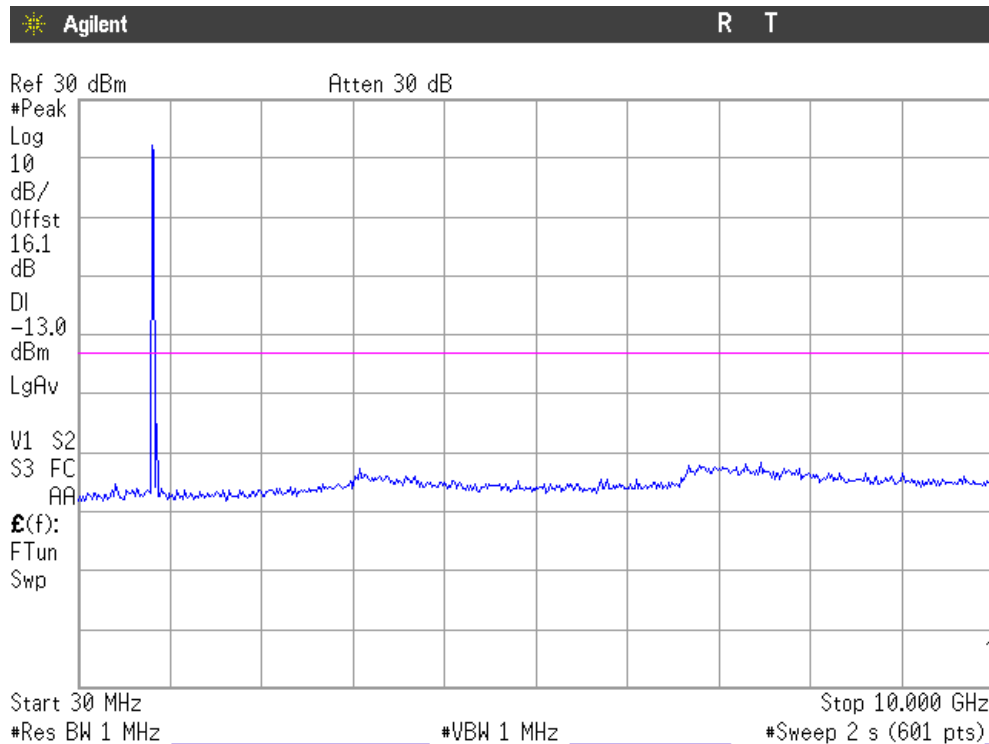
## WCDMA MODULATION

### 1. CHANNEL: LOWEST



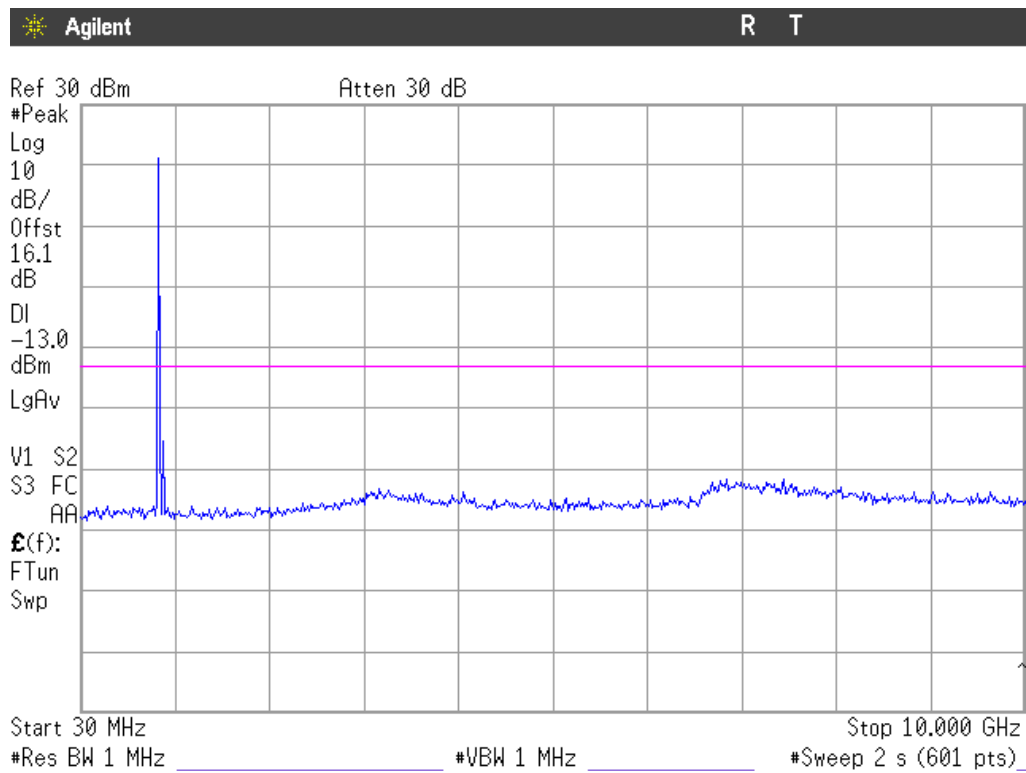
Note: The peak above the limit is the carrier frequency.

### 2. CHANNEL: MIDDLE



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

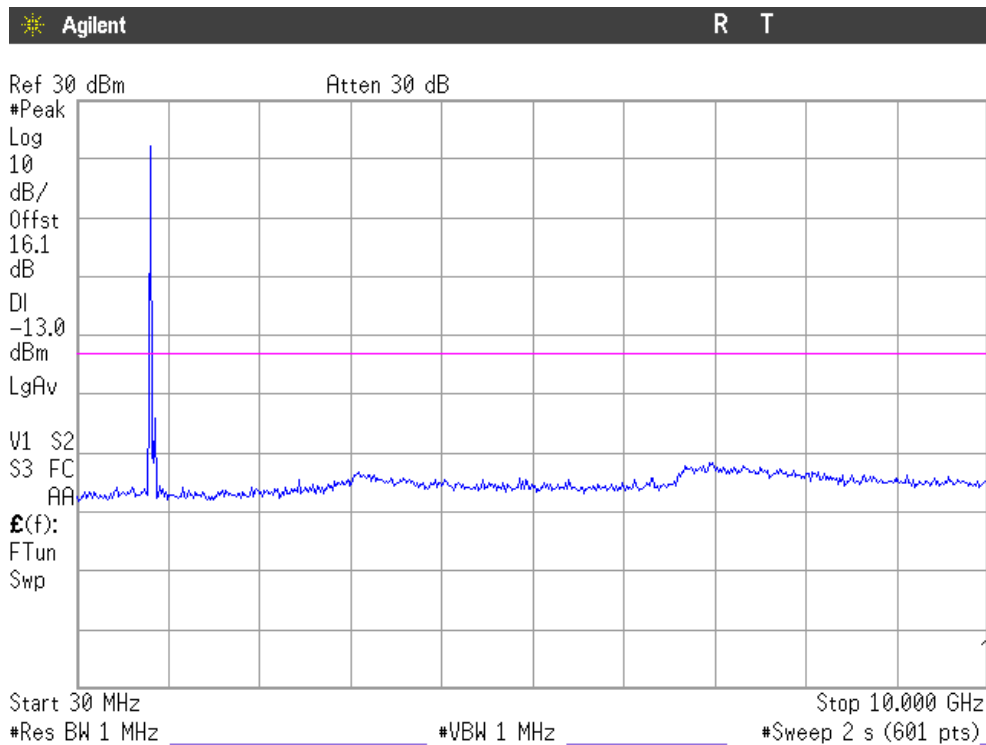
### 3. CHANNEL: HIGHEST



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

### HSUPA MODULATION

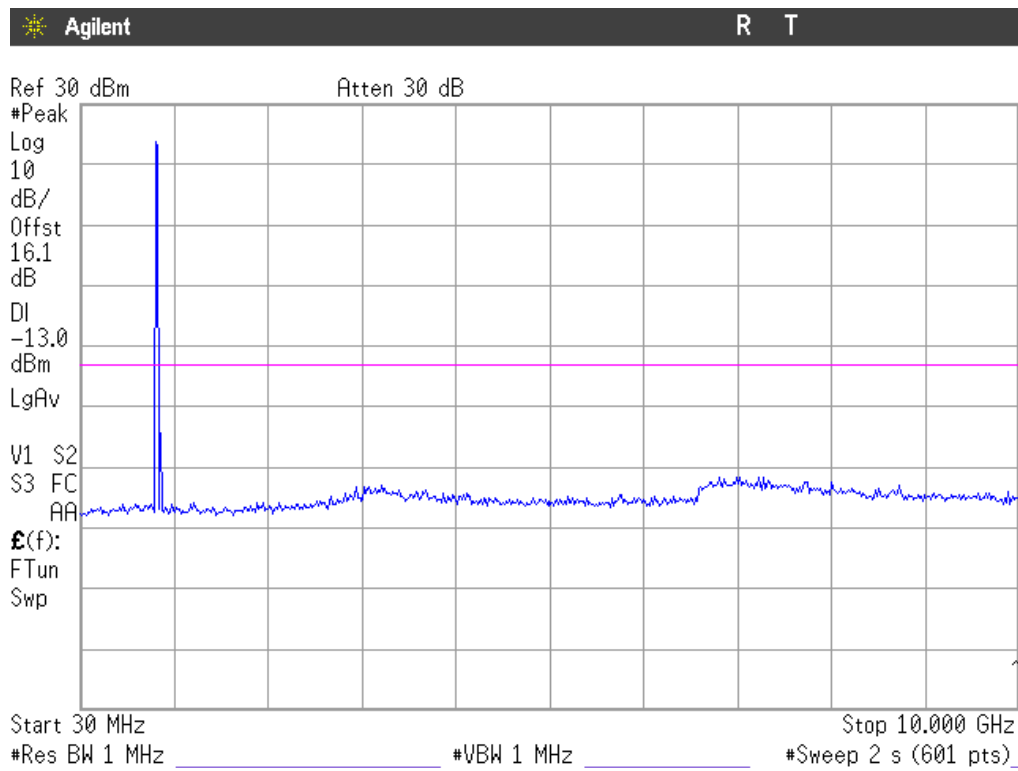
#### 1. CHANNEL: LOWEST



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

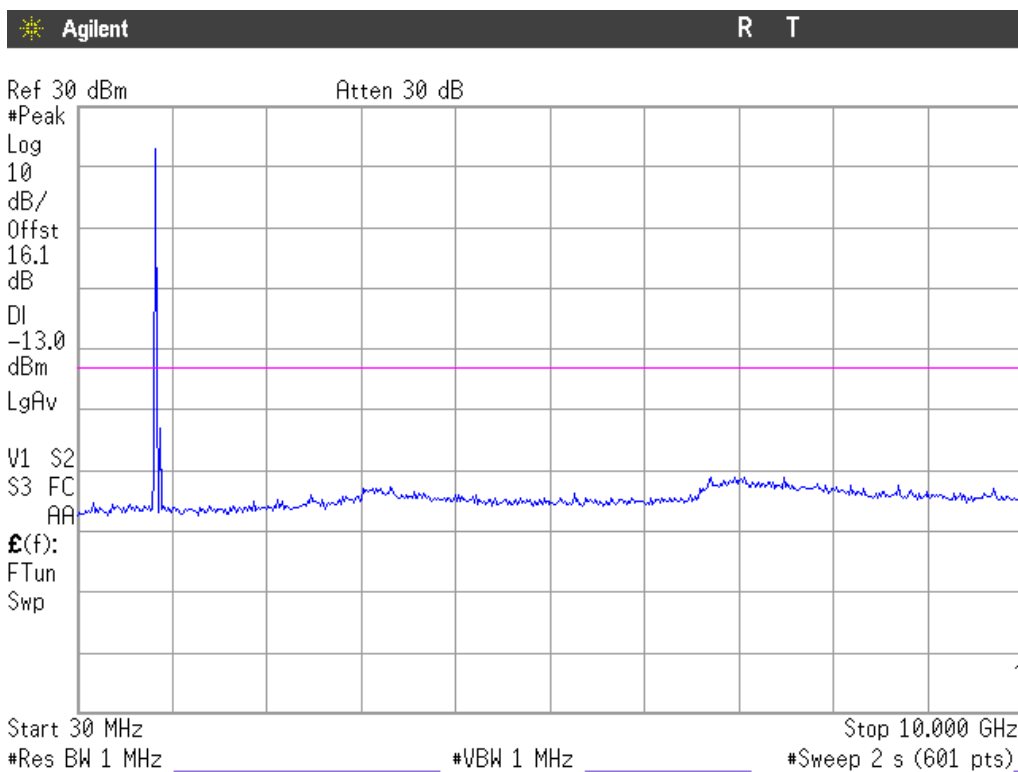


## 2. CHANNEL: MIDDLE



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 50 kHz for WCDMA and HSUPA modulations.

#### 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  $P_o$  transmitting power, the specified minimum attenuation becomes  $43+10\log (P_o)$ , and the level in dBm relative  $P_o$  becomes:

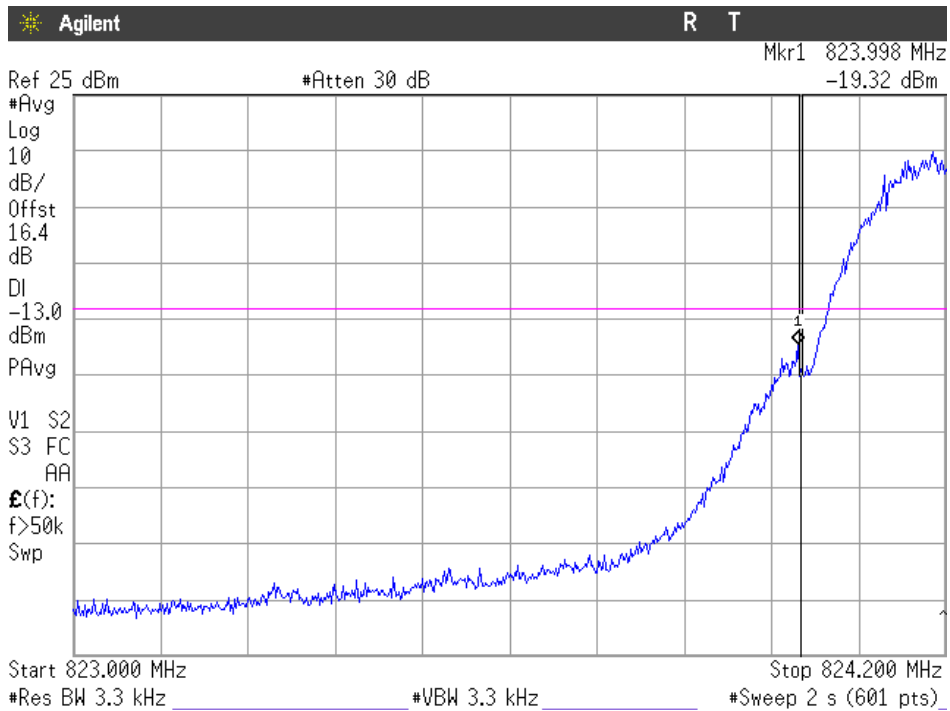
$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = - 13 \text{ dBm}$$

### RESULTS (see plots in next pages)

MODULATION	Maximum level at lowest Block Edge (dBm)	Maximum level at highest Block Edge (dBm)
GPRS	-19.32	-22.82
EDGE	-26.92	-29.80
WCDMA	-21.27	-20.61
HSUPA	-18.79	-18.70

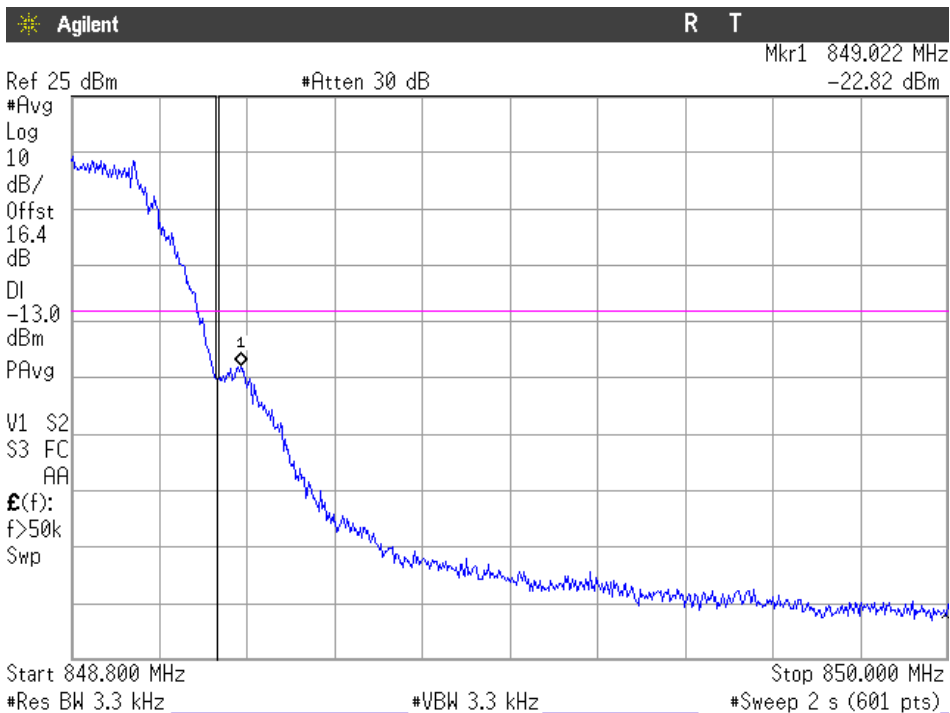
Measurement uncertainty =  $\pm 1.57$  dB.

GPRS MODULATION  
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

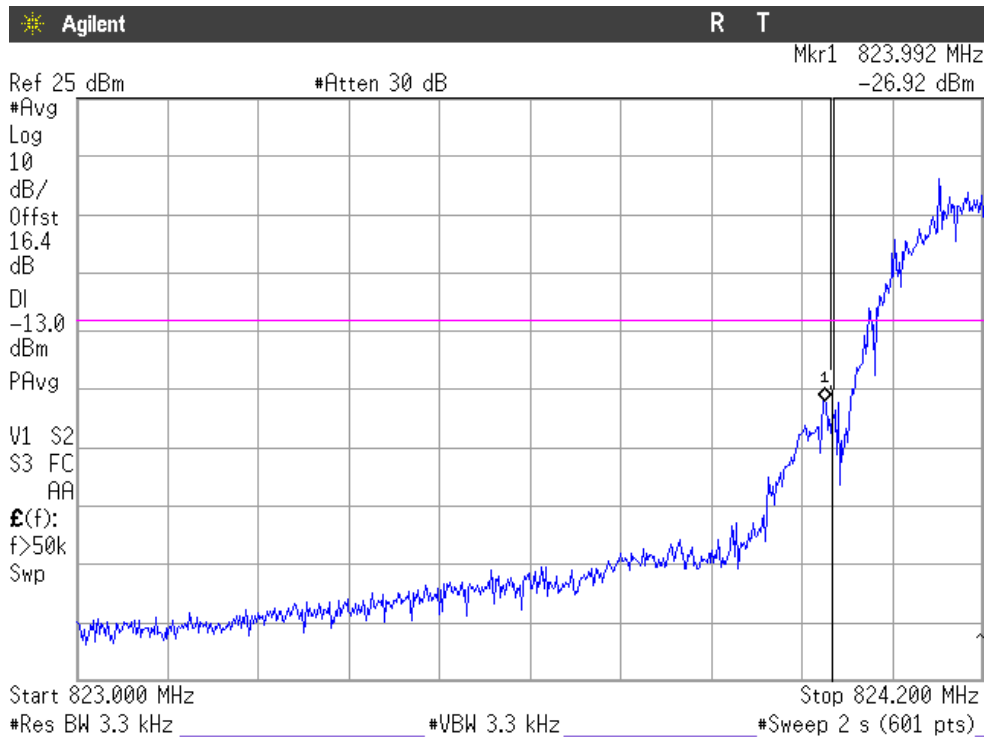
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

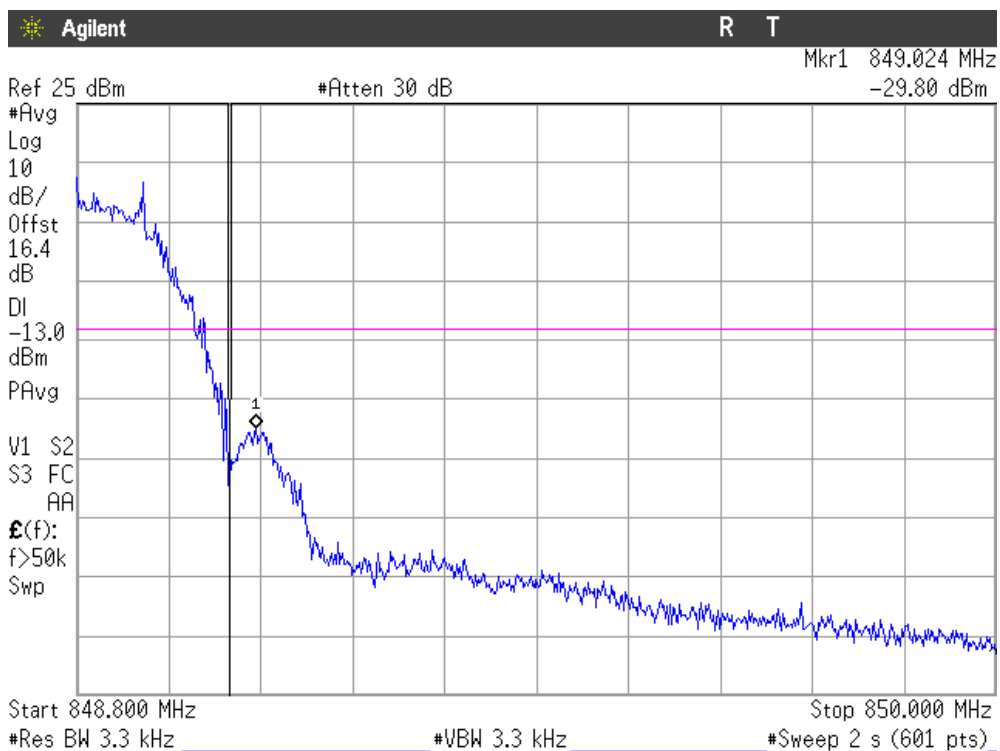
Verdict: PASS

EDGE MODULATION  
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

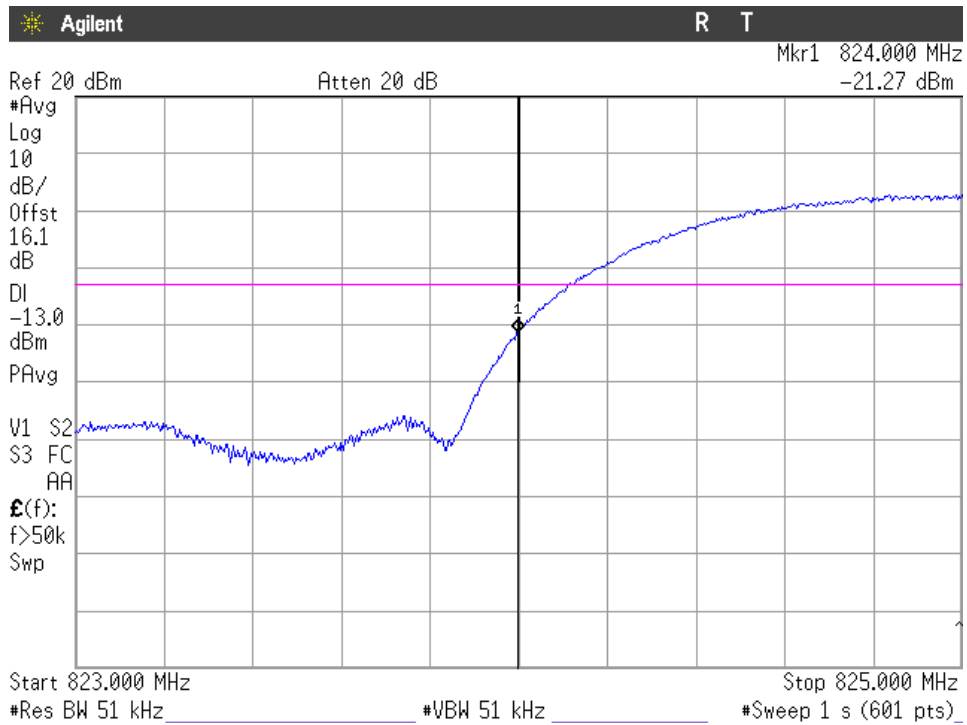
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

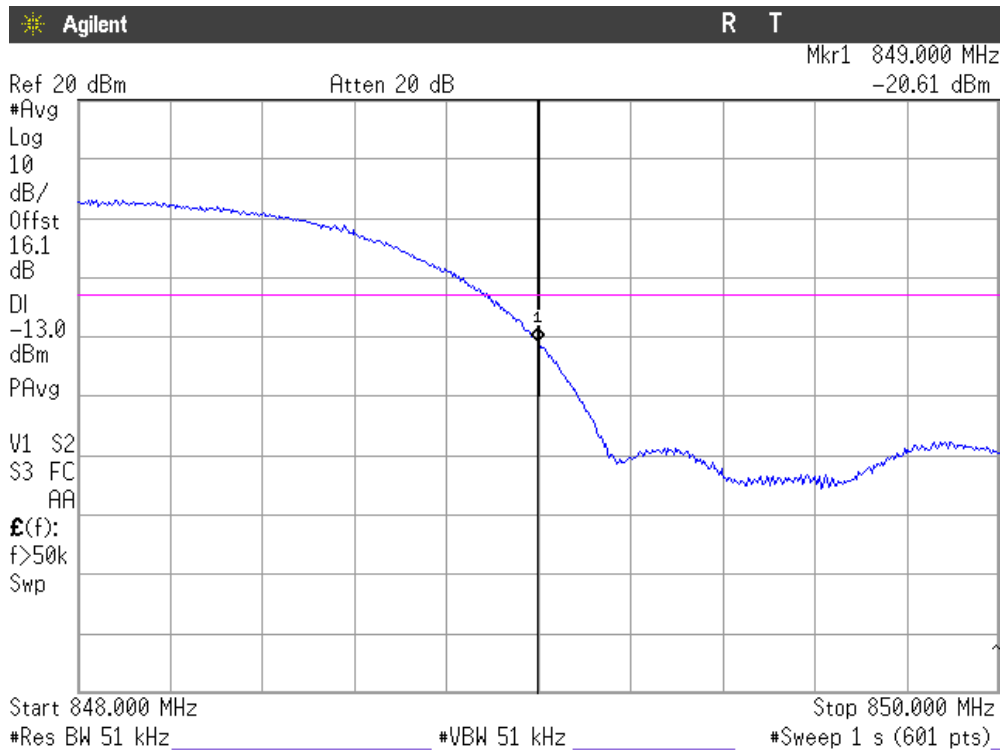
Verdict: PASS

WCDMA MODULATION  
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

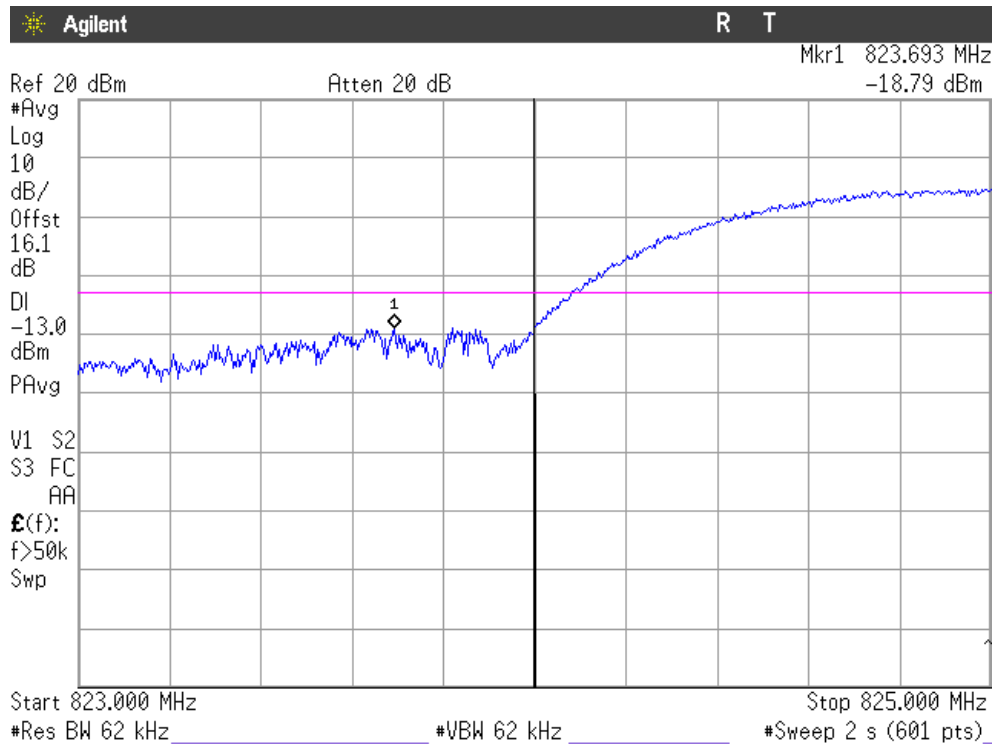
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

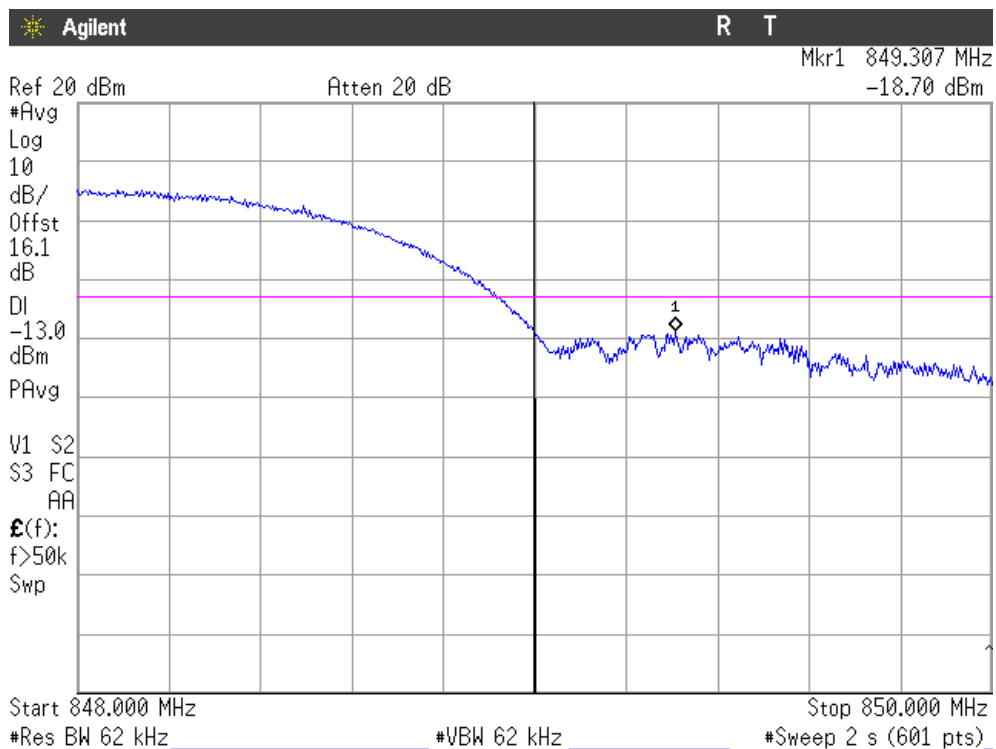
Verdict: PASS

HSUPA 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  $P_o$  transmitting power, the specified minimum attenuation becomes  $43+10\log (P_o)$ , and the level in dBm relative  $P_o$  becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = - 13 \text{ dBm}$$

### 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.



## HSUPA 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.**

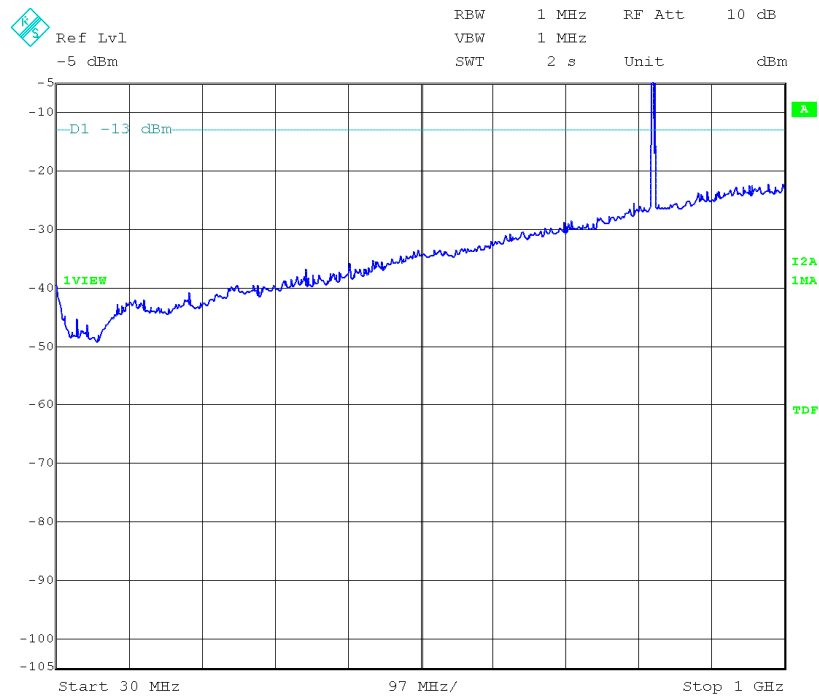
No spurious signals were found in all the range.

Verdict: PASS

FREQUENCY RANGE 30 MHz-1000 MHz.

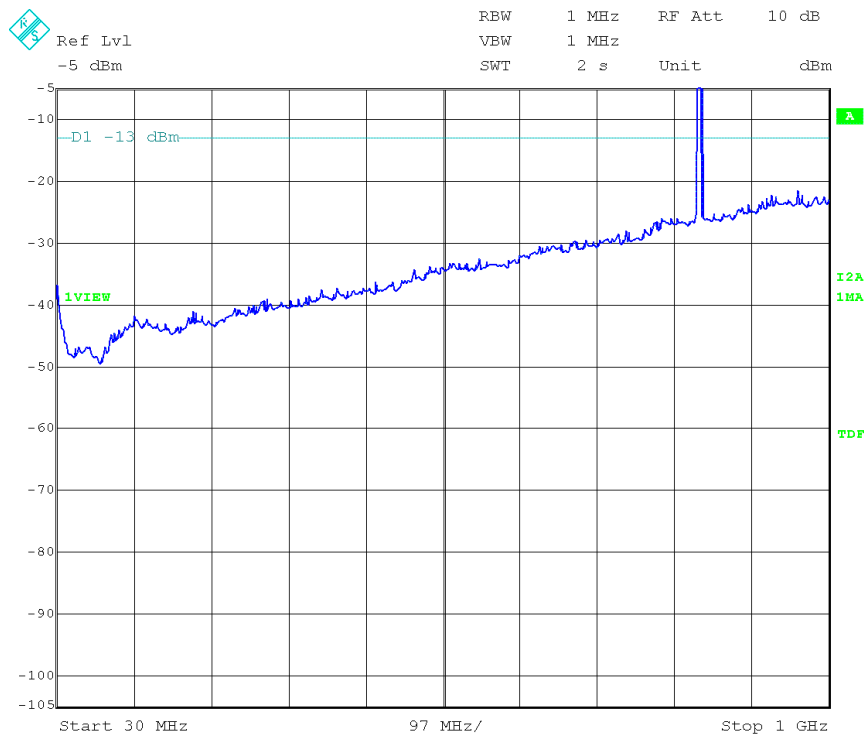
**GPRS MODULATION**

**CHANNEL: LOWEST**



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

**CHANNEL: MIDDLE**



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



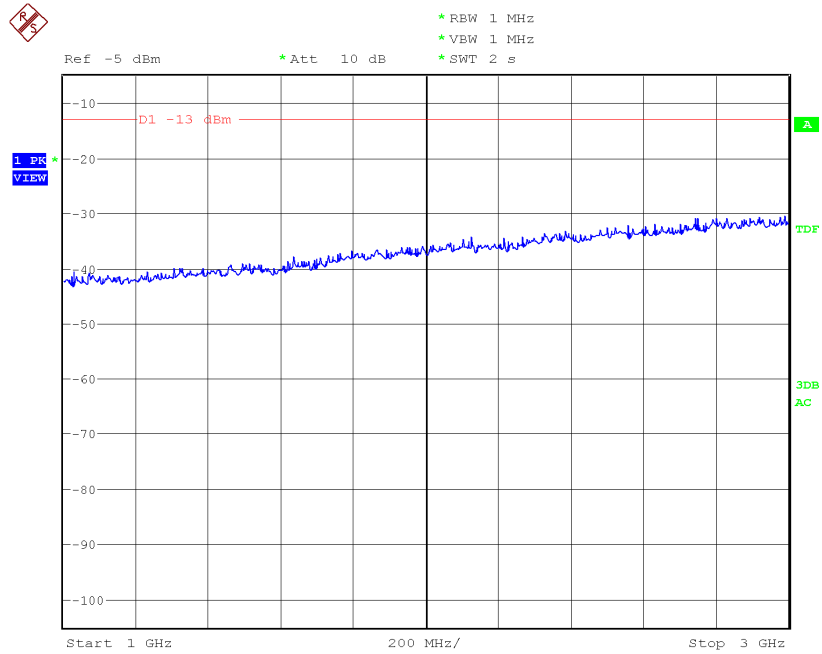






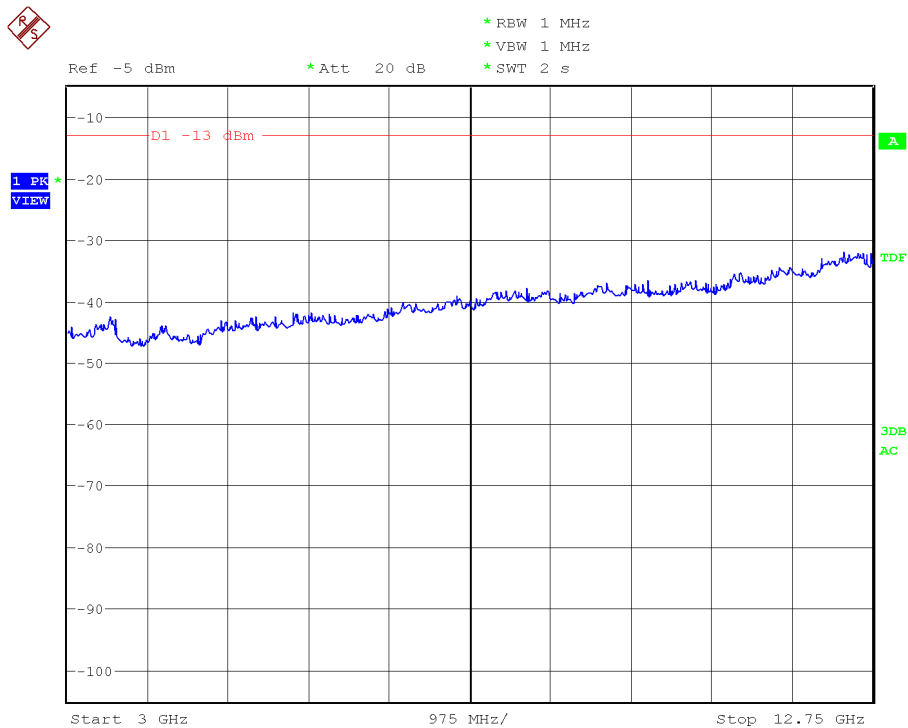


FREQUENCY RANGE 1 GHz to 3 GHz.



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

FREQUENCY RANGE 3 GHz to 12.75 GHz.



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



## TEST RESULTS FOR FCC PART 24 AND RSS-133

### ***TEST CONDITIONS***

Power supply (V):

$$V_{\text{nom}} = 3.7 \text{ Vdc}$$

$$V_{\text{max}} = 4.2 \text{ Vdc}$$

$$V_{\text{min}} = 3.2 \text{ Vdc}$$

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 external power supply

Type of antenna = external connectable antenna

#### TEST FREQUENCIES:

##### GPRS AND EDGE MODULATION

Lowest channel (512): 1850.2 MHz

Middle channel (662): 1880.2 MHz

Highest channel (810): 1909.8 MHz

##### WCDMA AND HSUPA MODULATION

Lowest channel (9262): 1852.4 MHz

Middle channel (9400): 1880.0 MHz

Highest channel (9538): 1907.6 MHz

## *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)	29.10	28.85	28.49
Maximum peak power (W)	0.81	0.77	0.71
Measurement uncertainty (dB)	±0.5		

#### EDGE MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	28.96	29.19	29.02
Maximum peak power (W)	0.79	0.83	0.80
Measurement uncertainty (dB)	±0.5		

### WCDMA MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	26.24	26.50	25.70
Maximum peak power (W)	0.42	0.45	0.37
Measurement uncertainty (dB)	±0.5		

### HSUPA MODULATION

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	27.13	27.37	26.72
Maximum peak power (W)	0.52	0.55	0.47
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) RF Generator +power amplifier output (dBm)	(2) Cable loss (dB)	(3) Substitution antenna gain $G_i$ (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
1850.3283	-4.53	Horizontal	19.87	0.5	8.6	27.97
1880.1200	-4.25	Horizontal	20.65	0.5	8.3	28.45
1909.8737	-4.15	Horizontal	21.15	0.5	8.0	28.65

RBW = VBW = 1 MHz

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	27.97	28.45	28.65
Maximum peak power (W)	0.63	0.70	0.73
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 $G_i$ (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) – (2) + (3)
1850.2401	-4.95	Horizontal	19.45	0.5	8.6	27.55
1880.1279	-4.12	Horizontal	20.78	0.5	8.3	28.58
1909.7199	-4.25	Horizontal	21.05	0.5	8.0	28.55

RBW = VBW = 1 MHz

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	27.55	28.58	28.55
Maximum peak power (W)	0.57	0.72	0.72
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 $G_i$ (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) - (2) + (3)
1851.1513	-7.09	Horizontal	17.31	0.5	8.6	25.41
1879.1072	-6.77	Horizontal	18.13	0.5	8.3	25.93
1906.8043	-6.69	Horizontal	18.61	0.5	8.0	26.11

RBW = VBW = 8 MHz

Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	25.41	25.93	26.11
Maximum peak power (W)	0.35	0.39	0.41
Measurement uncertainty (dB)	± 4.0		

### HSUPA 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 $G_i$ (respect to isotropic radiator) (dB)	E.I.R.P. (dBm) = (1) - (2) + (3)
1851.8032	-7.87	Horizontal	16.53	0.5	8.6	24.63
1879.6532	-7.68	Horizontal	17.22	0.5	8.3	25.02
1907.0043	-8.48	Horizontal	16.82	0.5	8.0	24.32

RBW = VBW = 8 MHz

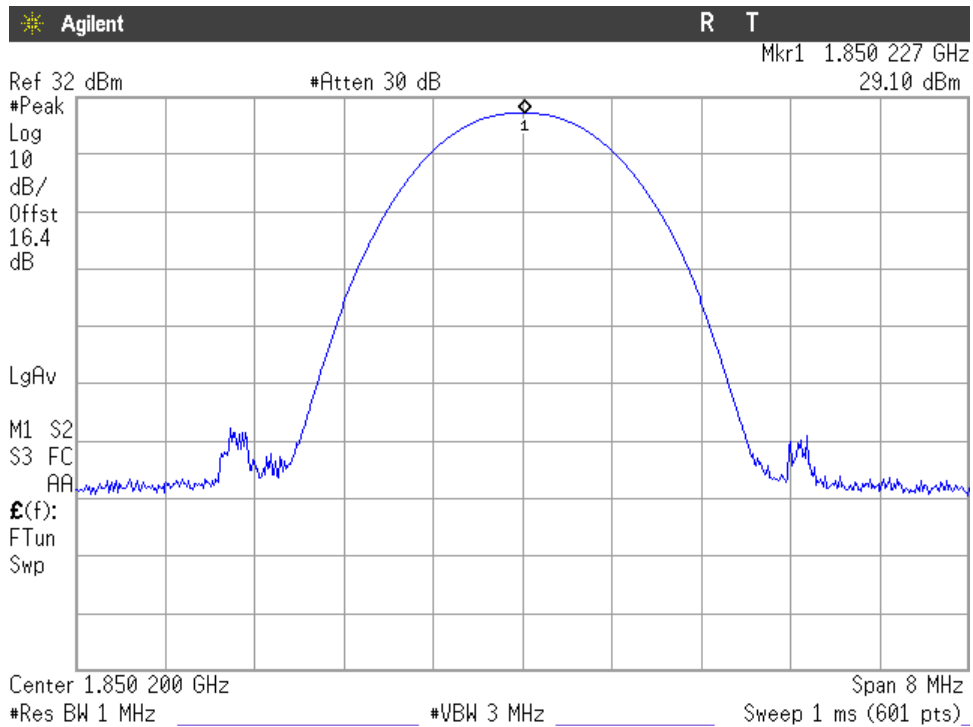
Channel	Lowest	Middle	Highest
Maximum peak power (dBm)	24.63	25.02	24.32
Maximum peak power (W)	0.29	0.32	0.27
Measurement uncertainty (dB)	± 4.0		

Verdict: PASS

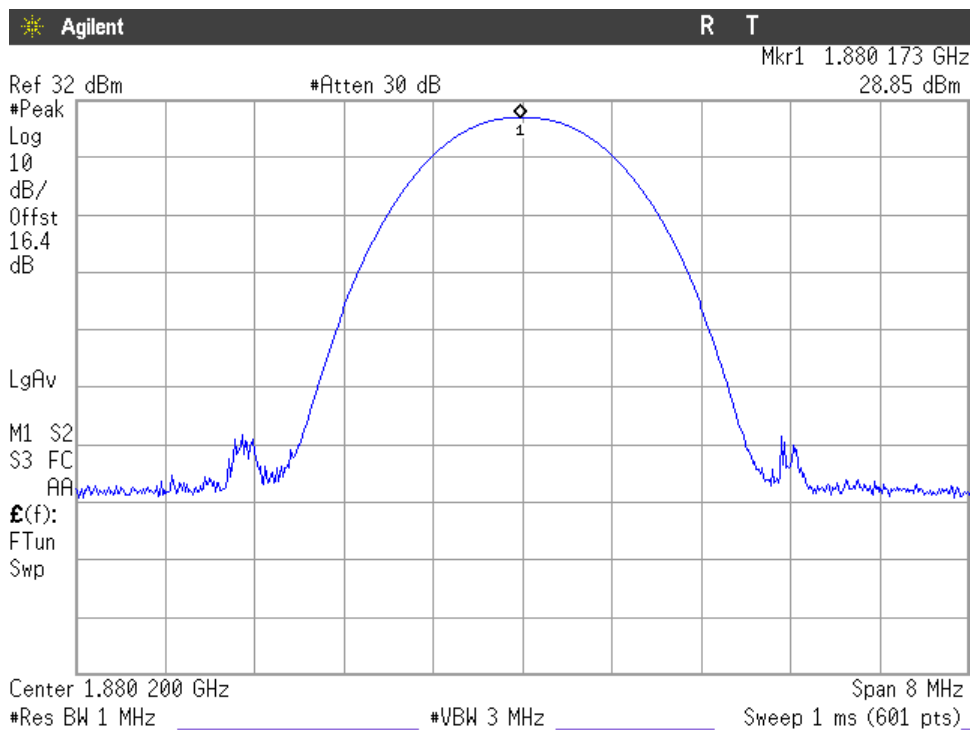
PEAK OUTPUT POWER (CONDUCTED).

GPRS MODULATION

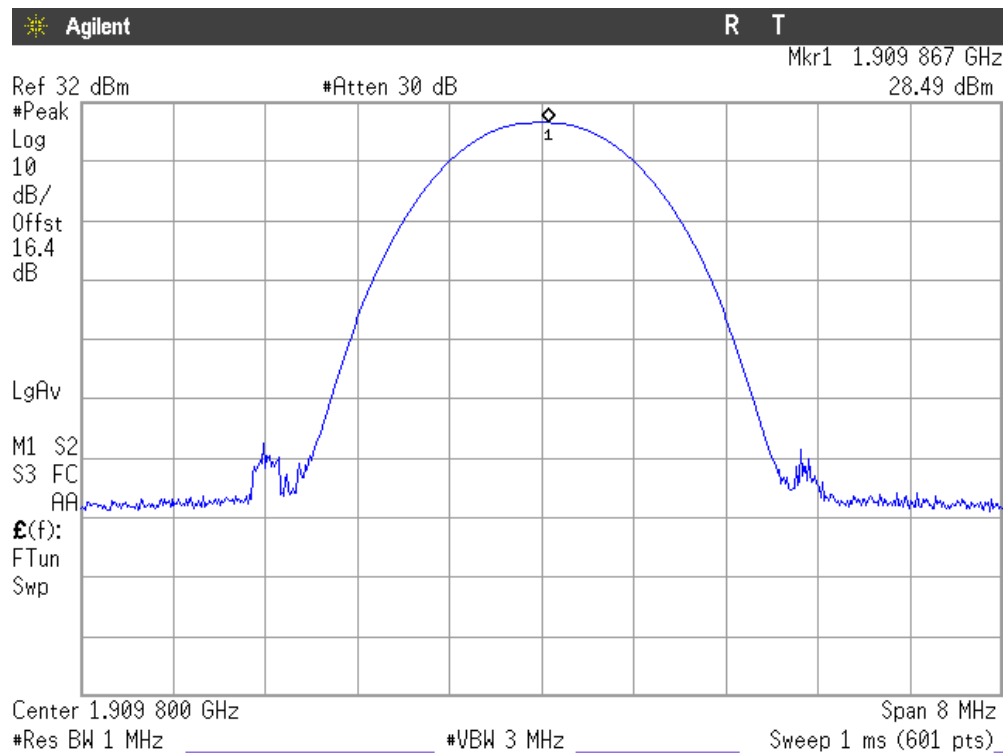
Lowest Channel.



Middle Channel.

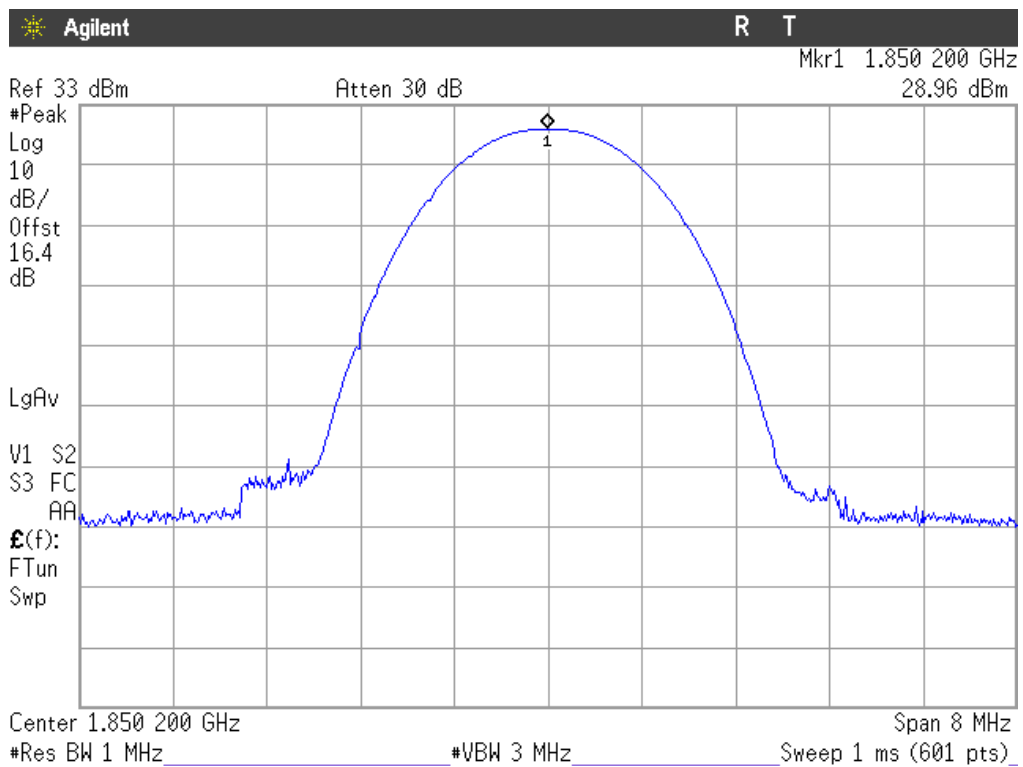


Highest Channel.

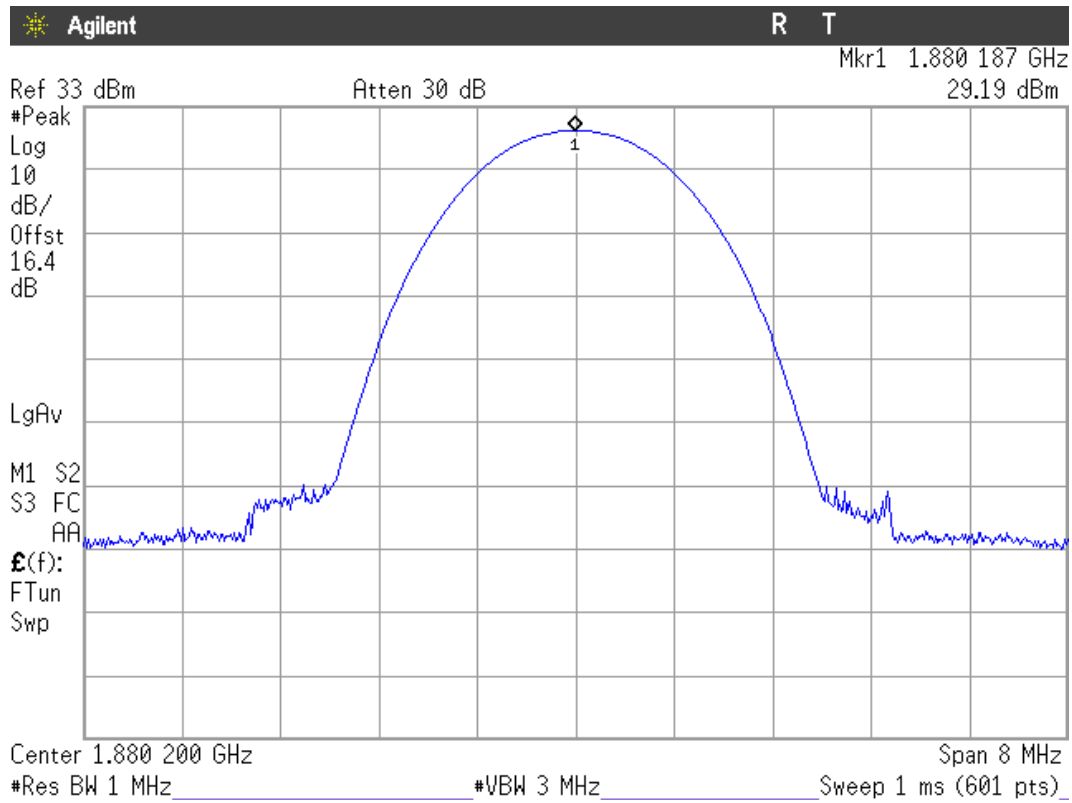


EDGE MODULATION

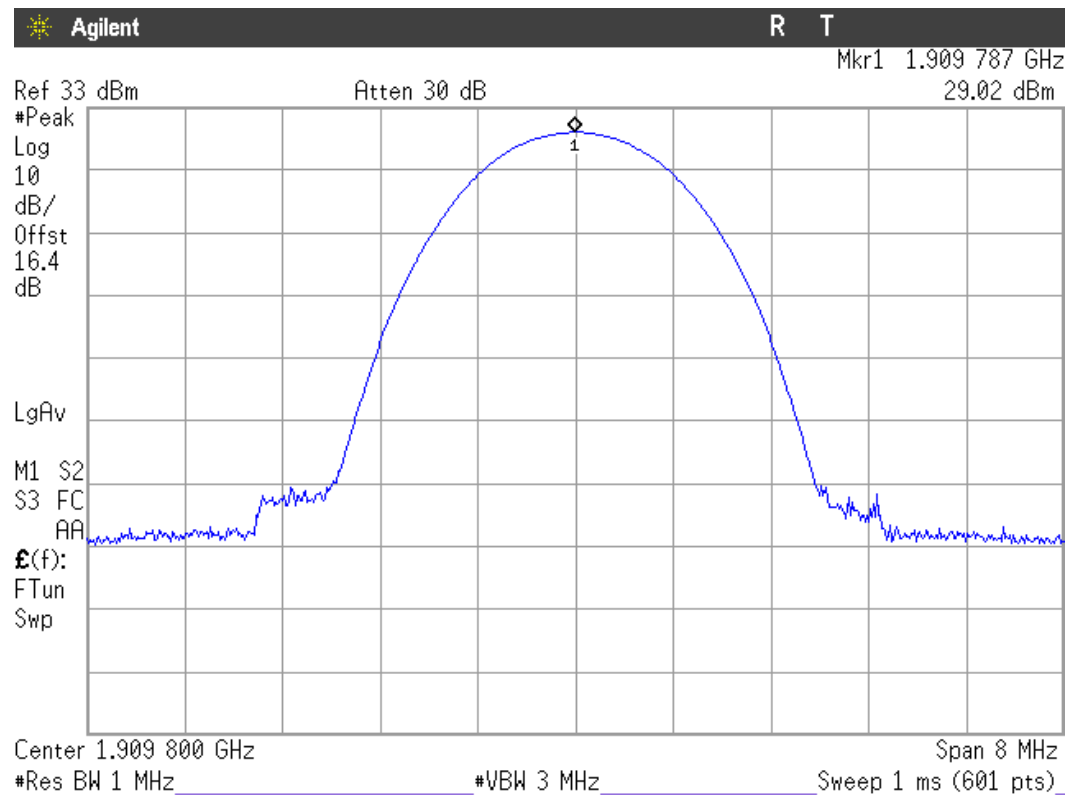
Lowest Channel.



Middle Channel.

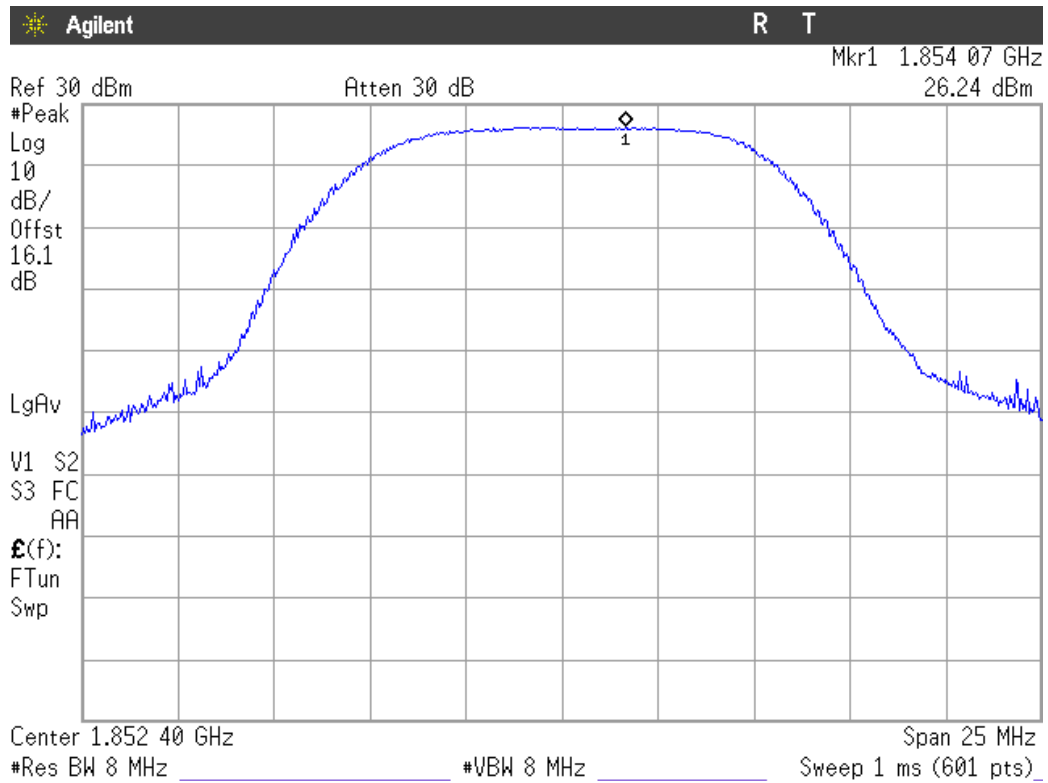


Highest Channel.

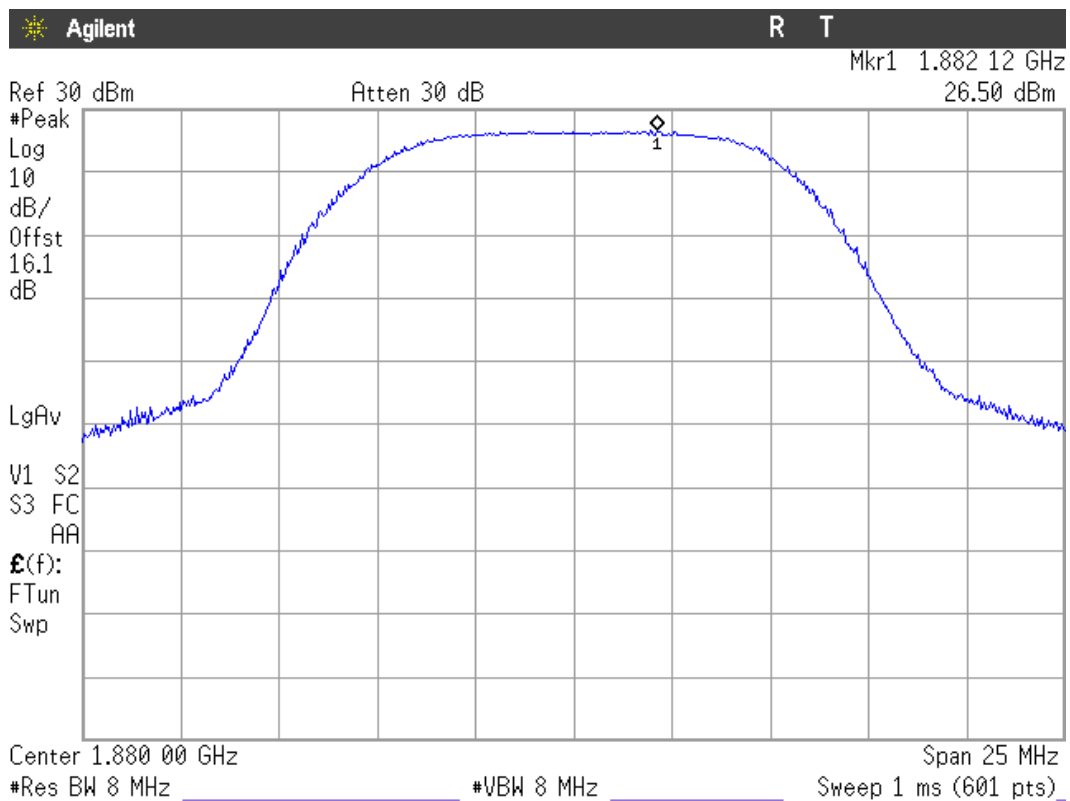


### WCDMA MODULATION

#### Lowest Channel.

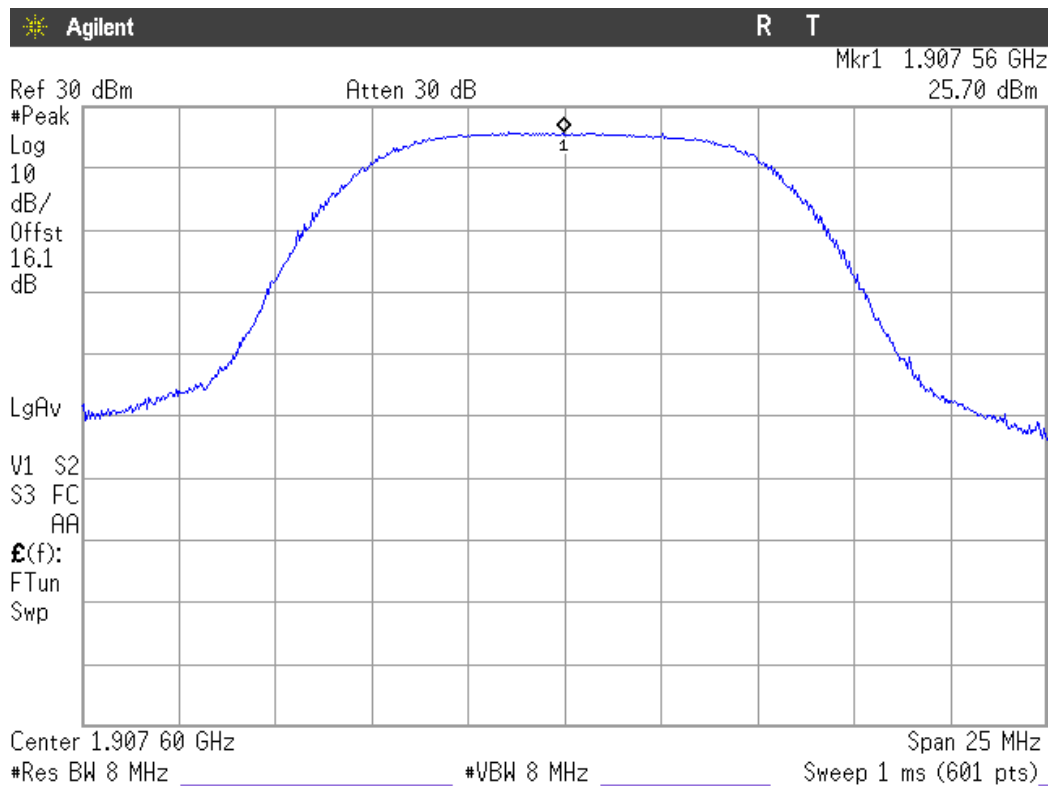


#### Middle Channel.



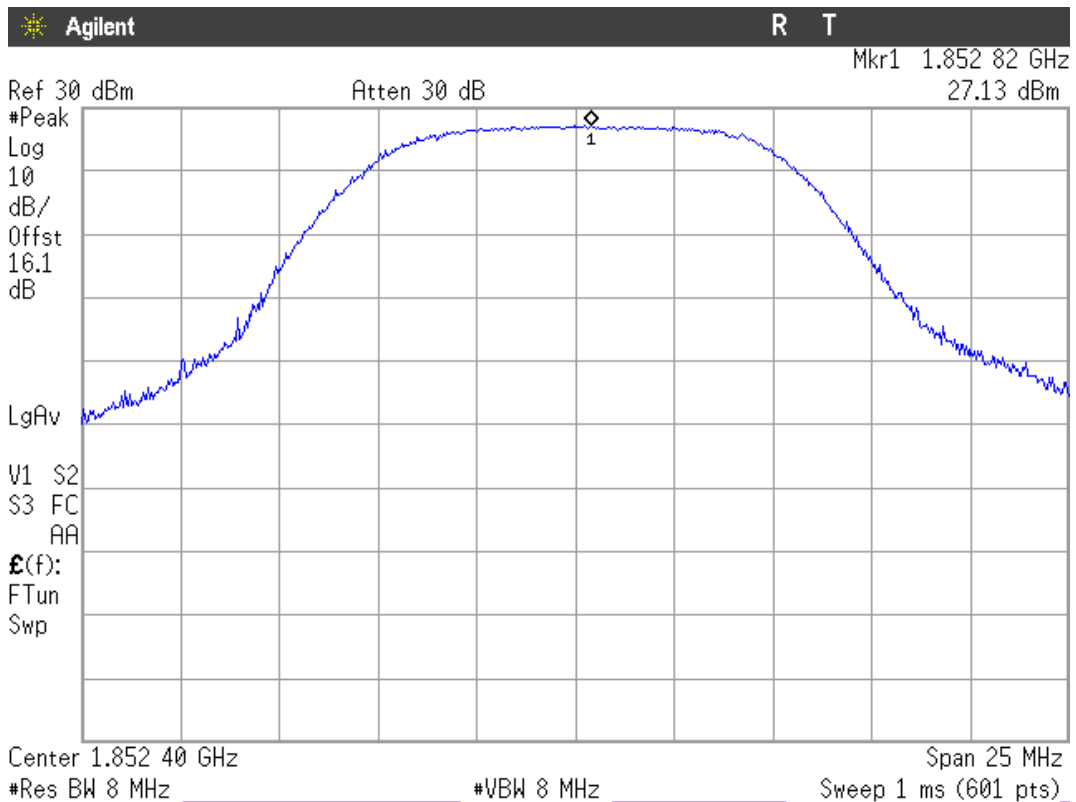


Highest Channel.

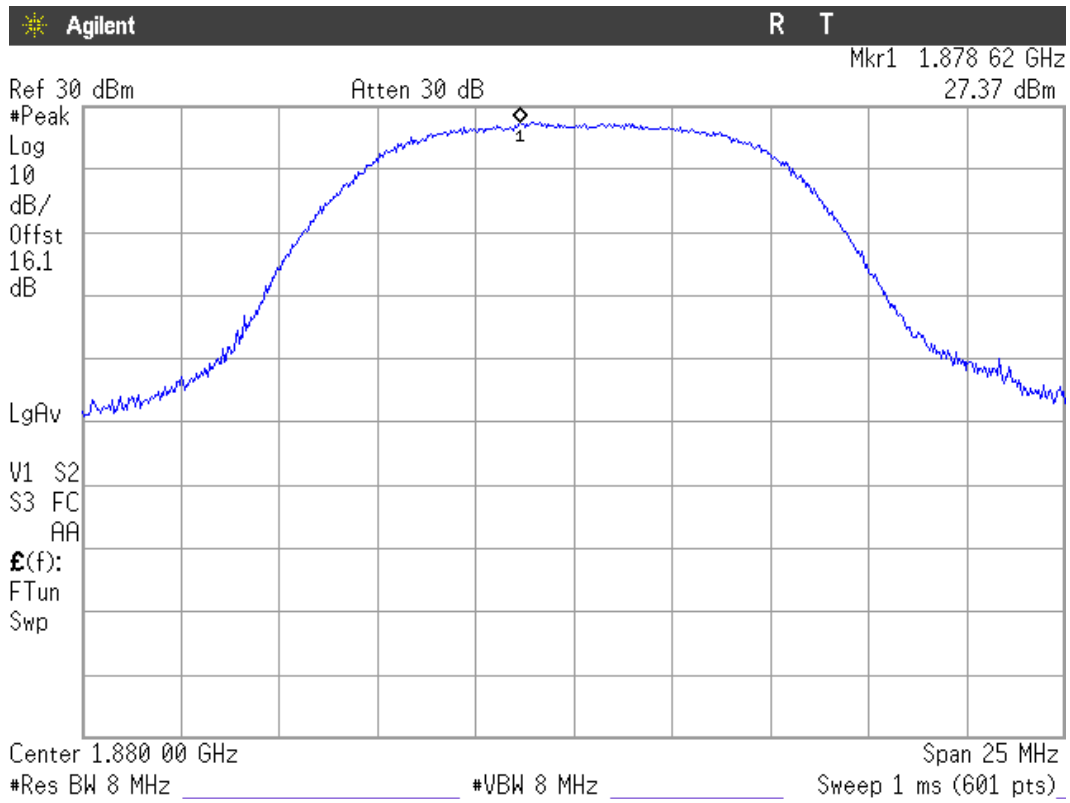


HSUPA MODULATION

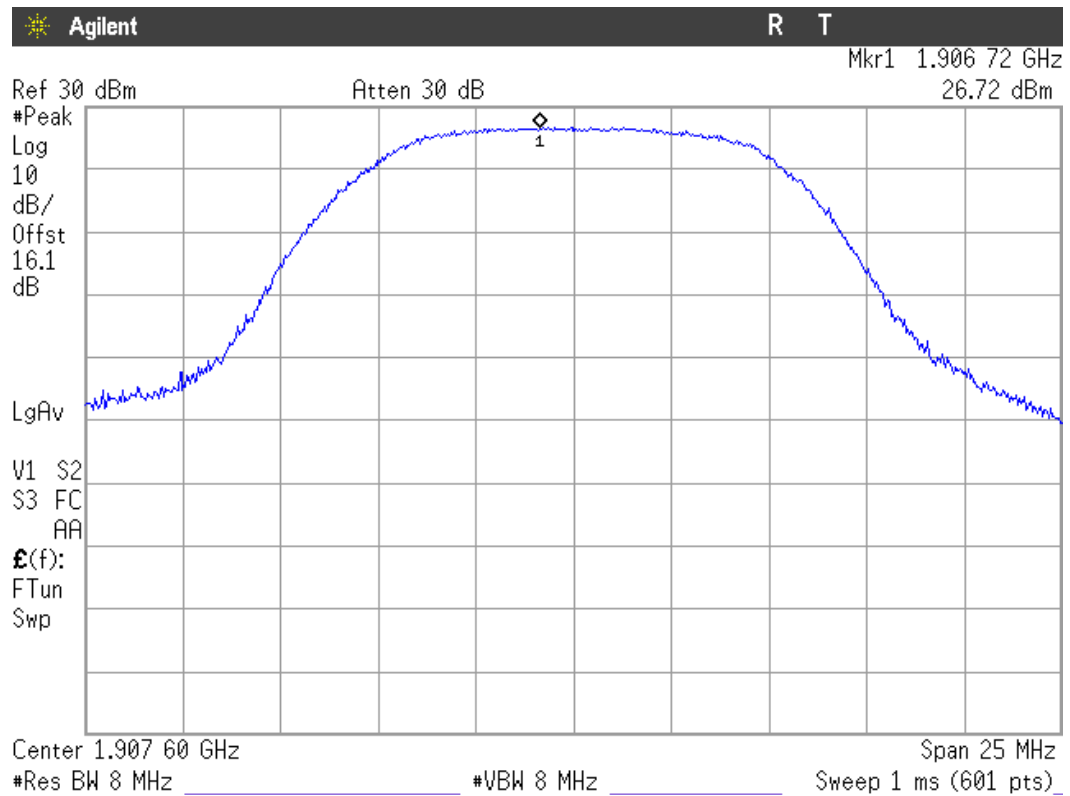
Lowest Channel



### Middle Channel



### Highest Channel



## Modulation Characteristics

### SPECIFICATION

§2.1047

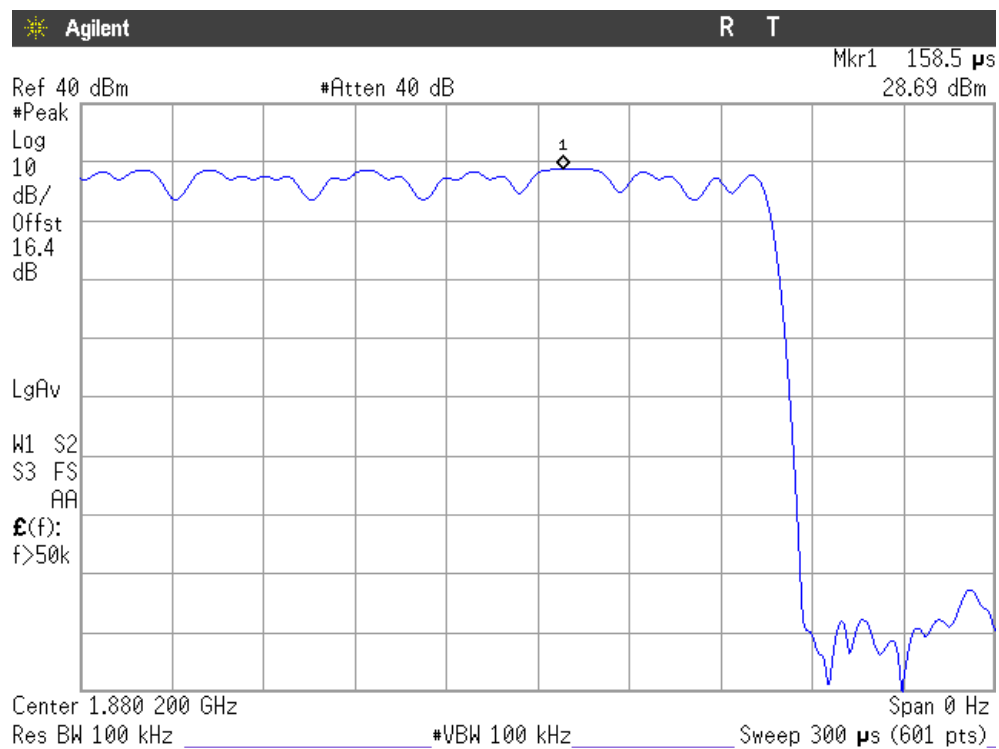
### METHOD

The EUT operates with GPRS (GMSK), EDGE (GMSK/8-PSK), WCDMA/HSDPA (QPSK) and HSUPA (QPSK/16QAM) modes, in which the information is digitised and coded into a bit stream.

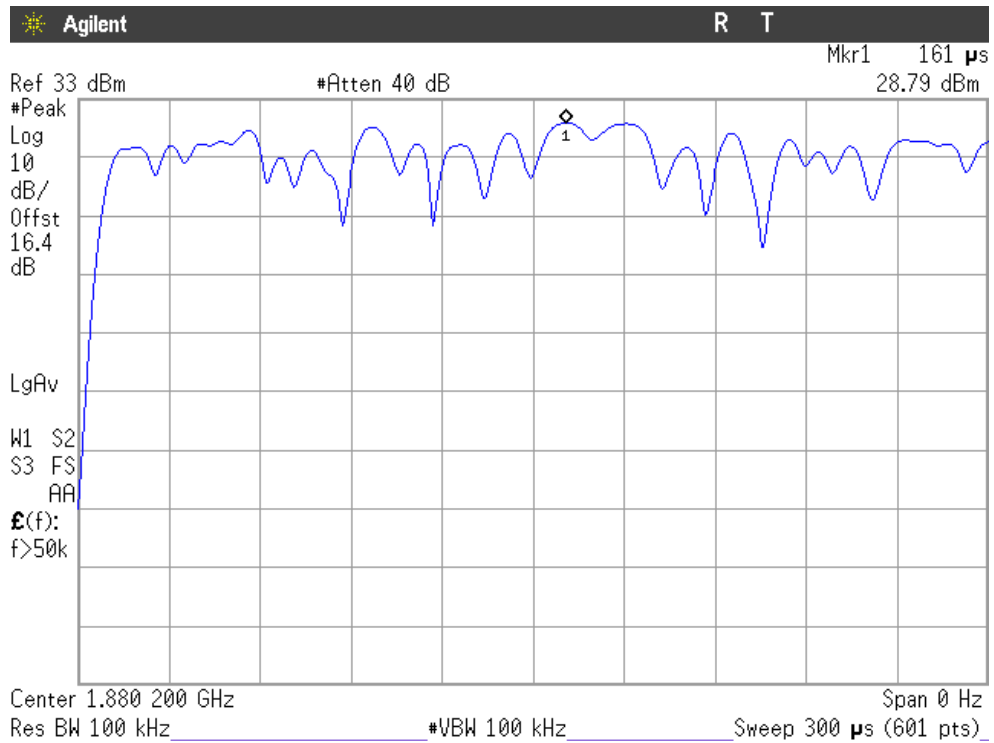
### RESULTS

The following plot shows the modulation schemes in the EUT.

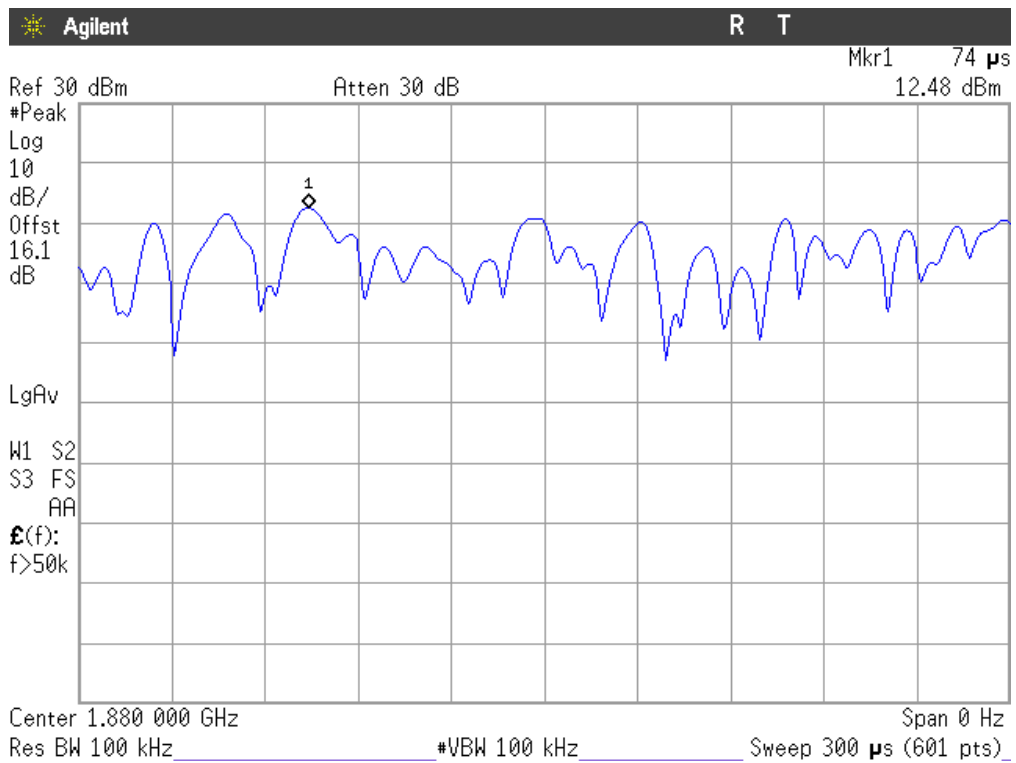
#### GPRS MODULATION



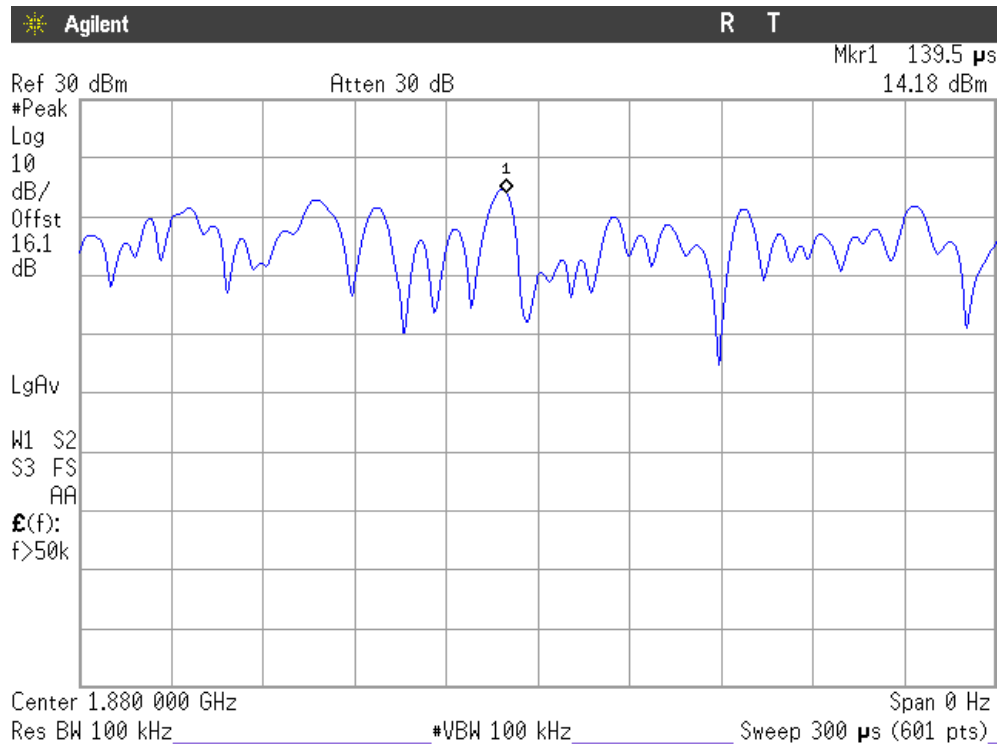
### EDGE MODULATION



### WCDMA MODULATION



# HSUPA MODULATION



## *Frequency Stability*

### SPECIFICATION

§2.1055 and 24.235

### METHOD

The frequency tolerance measurements over temperature variations were made over the temperature range of  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ . The EUT was placed inside a climatic chamber and the temperature was raised hourly in  $10^{\circ}\text{C}$  steps from  $-30^{\circ}\text{C}$  up to  $+50^{\circ}\text{C}$ .

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

### RESULTS

Frequency stability over temperature variations.

#### GPRS MODULATION

<b>Temperature (<math>^{\circ}\text{C}</math>)</b>	<b>Frequency Error (Hz)</b>	<b>Frequency Error (ppm)</b>	<b>Frequency Error (%)</b>
+50	22	0.0117	0.00000117
+40	10	0.0053	0.00000053
+30	9	0.0048	0.00000048
+20	10	0.0053	0.00000053
+10	-26	-0.0138	-0.00000138
0	17	0.0090	0.00000090
-10	18	0.0096	0.00000096
-20	23	0.0122	0.00000122
-30	31	0.0165	0.00000165

EDGE MODULATION

Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	18	0.0096	0.00000096
+40	31	0.0165	0.00000165
+30	11	0.0059	0.00000059
+20	-18	-0.0096	-0.00000096
+10	-11	-0.0059	-0.00000059
0	21	0.0112	0.00000112
-10	22	0.0117	0.00000117
-20	19	0.0101	0.00000101
-30	26	0.0138	0.00000138

WCDMA MODULATION

Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	20	0.0106	0.00000106
+40	-41	-0.0218	-0.00000218
+30	-31	-0.0165	-0.00000165
+20	-25	-0.0133	-0.00000133
+10	-32	-0.0170	-0.00000170
0	20	0.0106	0.00000106
-10	15	0.0080	0.00000080
-20	28	0.0149	0.00000149
-30	21	0.0112	0.00000112

HSUPA MODULATION

Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	-17	-0.0090	-0.00000090
+40	-50	-0.0266	-0.00000266
+30	-39	-0.0207	-0.00000207
+20	-36	-0.0191	-0.00000191
+10	-12	-0.0064	-0.00000064
0	-14	-0.0074	-0.00000074
-10	-13	-0.0069	-0.00000069
-20	31	0.0165	0.00000165
-30	18	0.0096	0.00000096

Frequency stability over voltage variations.

GPRS MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	14	0.0074	0.00000074
Vmin	3.2	13	0.0069	0.00000069

EDGE MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	-11	-0.0059	-0.00000059
Vmin	3.2	-10	-0.0053	-0.00000053

WCDMA MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	-13	-0.0069	-0.00000069
Vmin	3.2	-18	-0.0096	-0.00000096

HSUPA MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	-21	-0.0112	-0.00000112
Vmin	3.2	-5	-0.0027	-0.00000027



## *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 determine the occupied bandwidth of the modulated emission for GPRS and EDGE modulation and 50 kHz for WCDMA and HSUPA modulation.

### RESULTS

#### GPRS MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	276.7	278.2	276.9
-26 dBc bandwidth (kHz)	310.5	315.3	314.1
Measurement uncertainty (kHz)	<±6.5		

#### EDGE MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	276.8	278.2	277.0
-26 dBc bandwidth (kHz)	317.3	315.3	309.0
Measurement uncertainty (kHz)	<±6.5		

#### WCDMA MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	4680	4667	4653
-26 dBc bandwidth (kHz)	4867	4827	4813
Measurement uncertainty (kHz)	<±52		

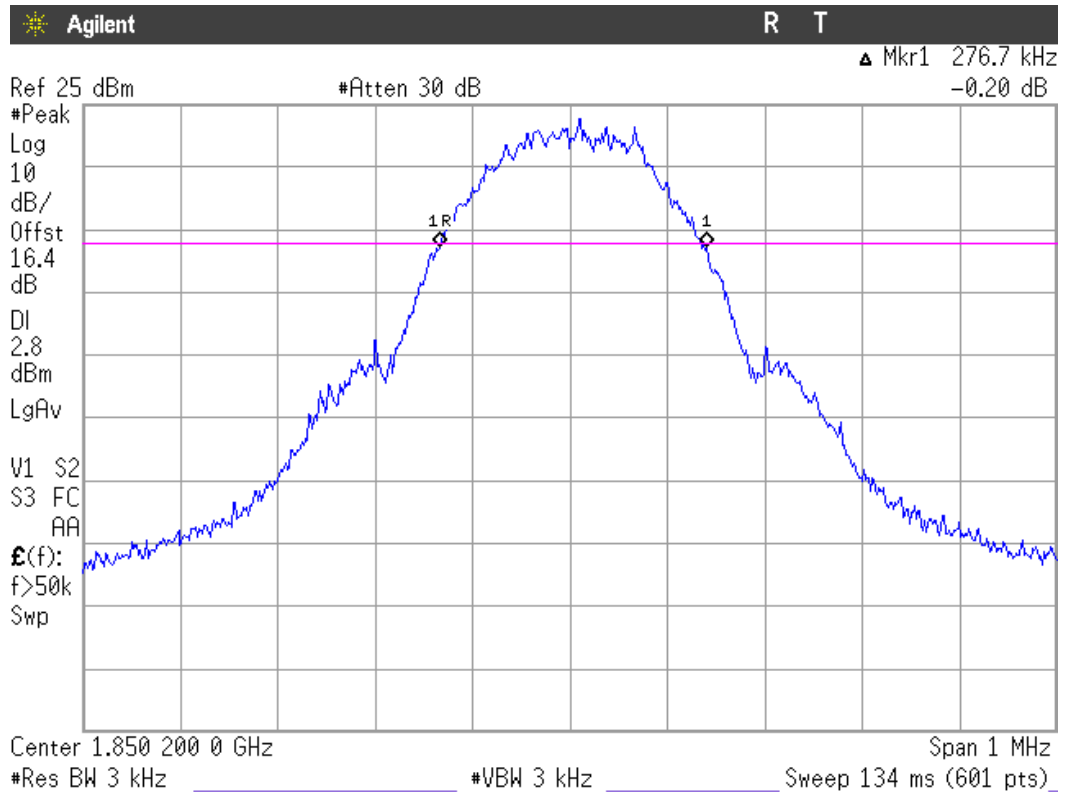
#### HSUPA MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	4640	4667	4653
-26 dBc bandwidth (kHz)	4813	4840	4813
Measurement uncertainty (kHz)	<±52		

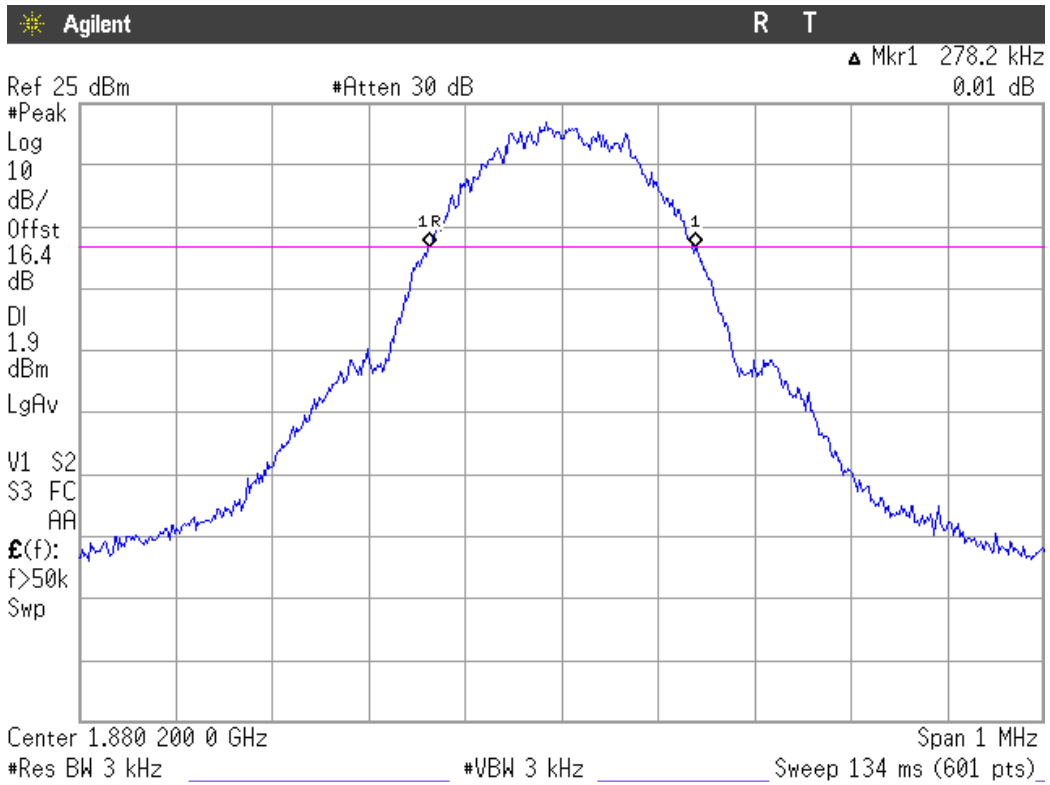
99% OCCUPIED BANDWIDTH

GPRS MODULATION

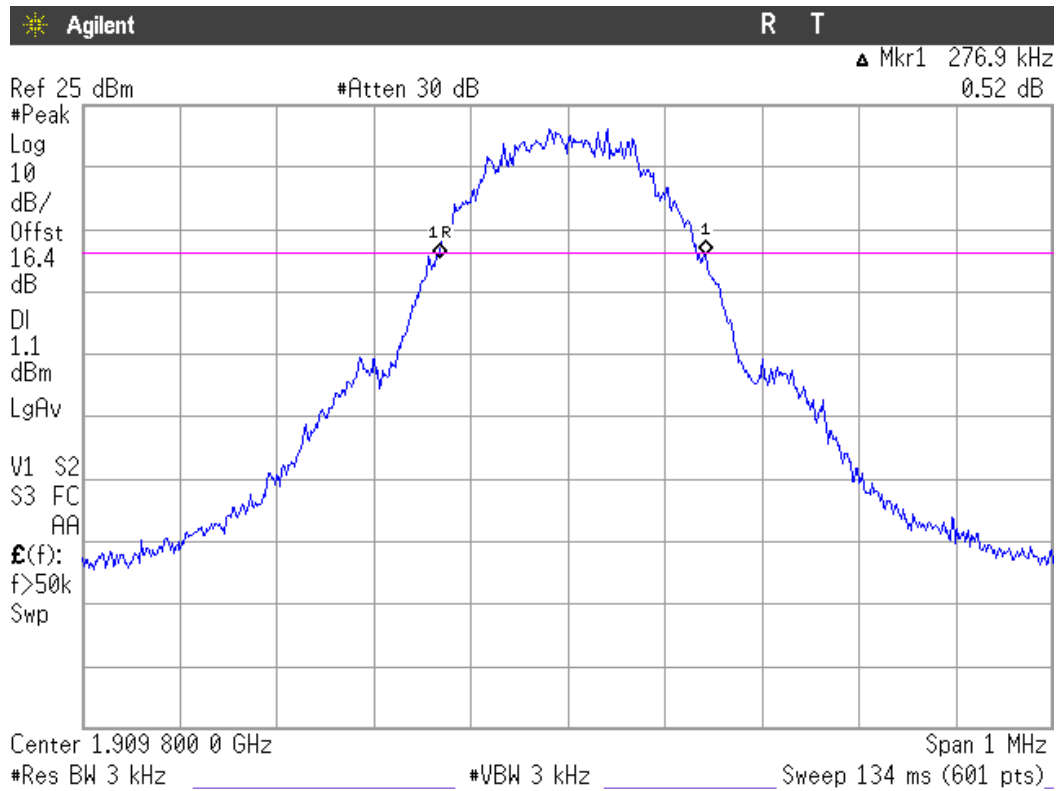
Lowest Channel



Middle Channel

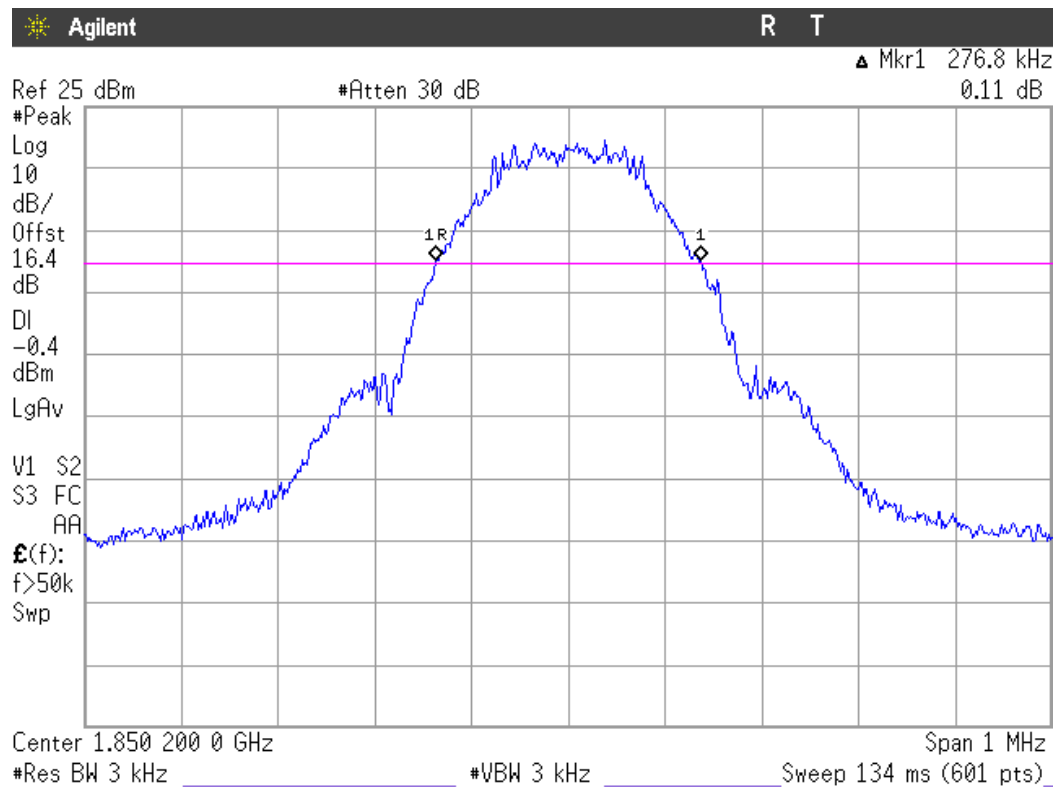


### Highest Channel

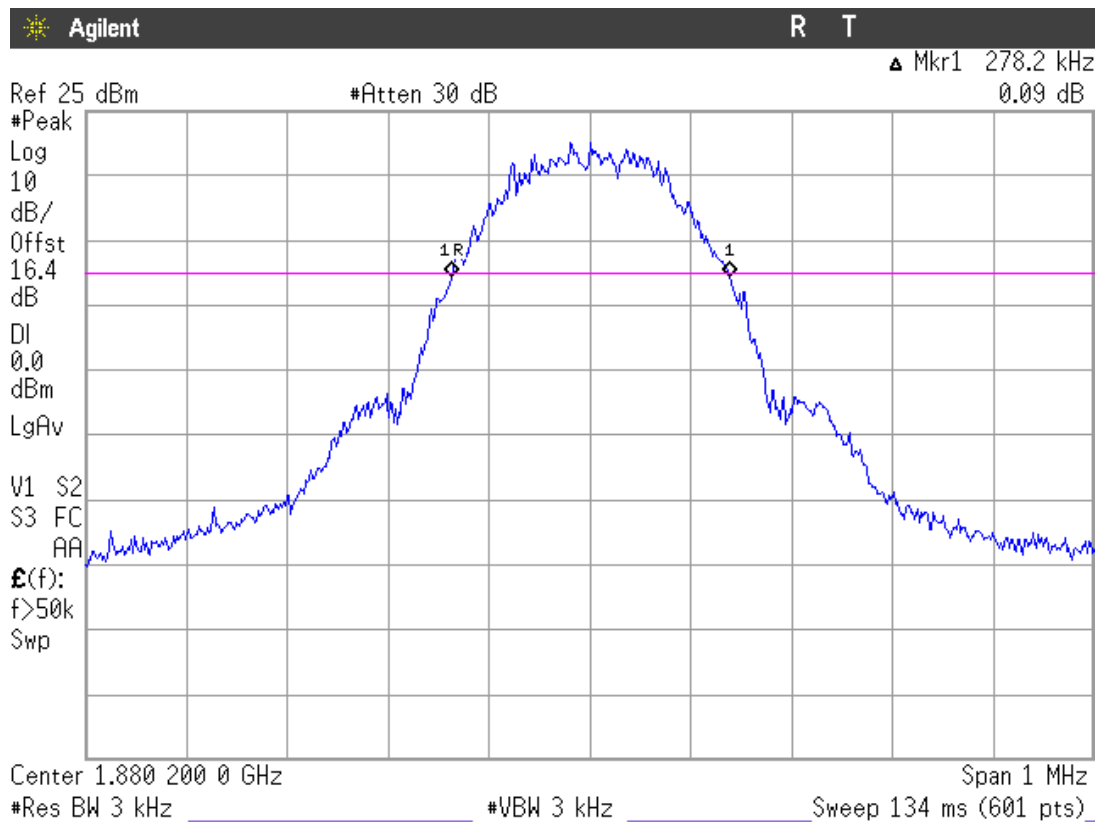


### EDGE MODULATION

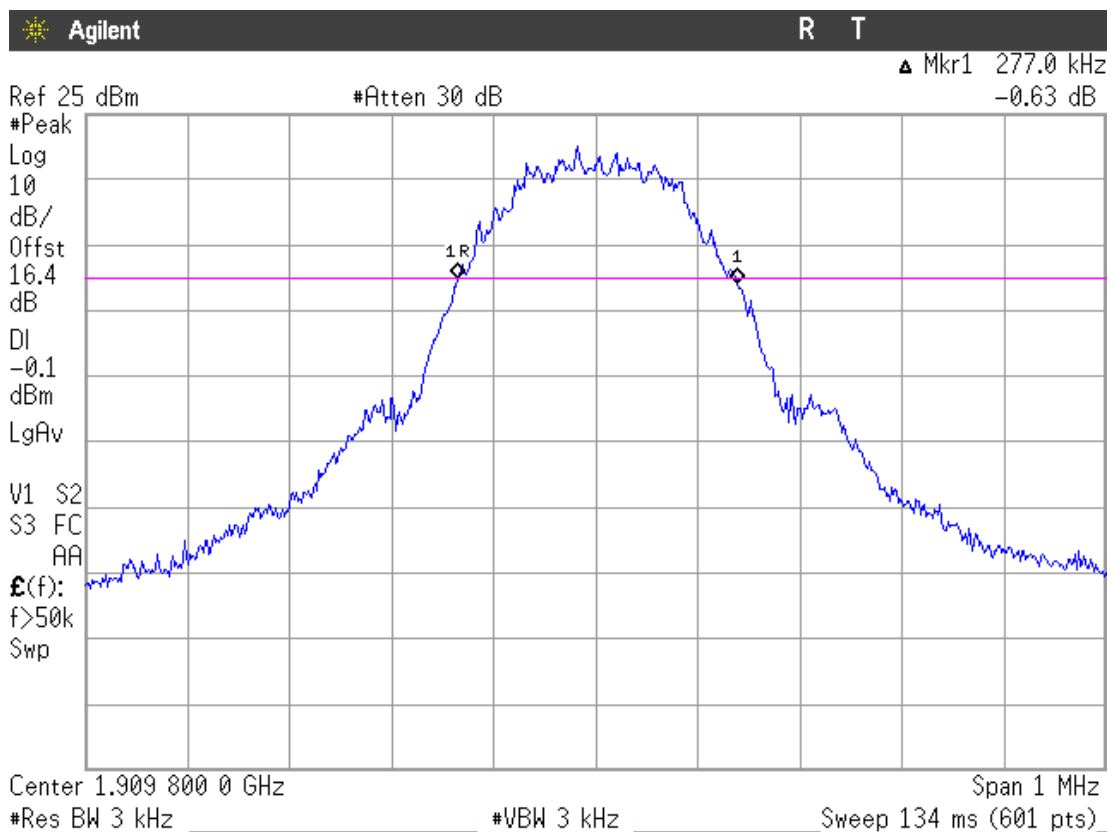
#### Lowest Channel



### Middle Channel

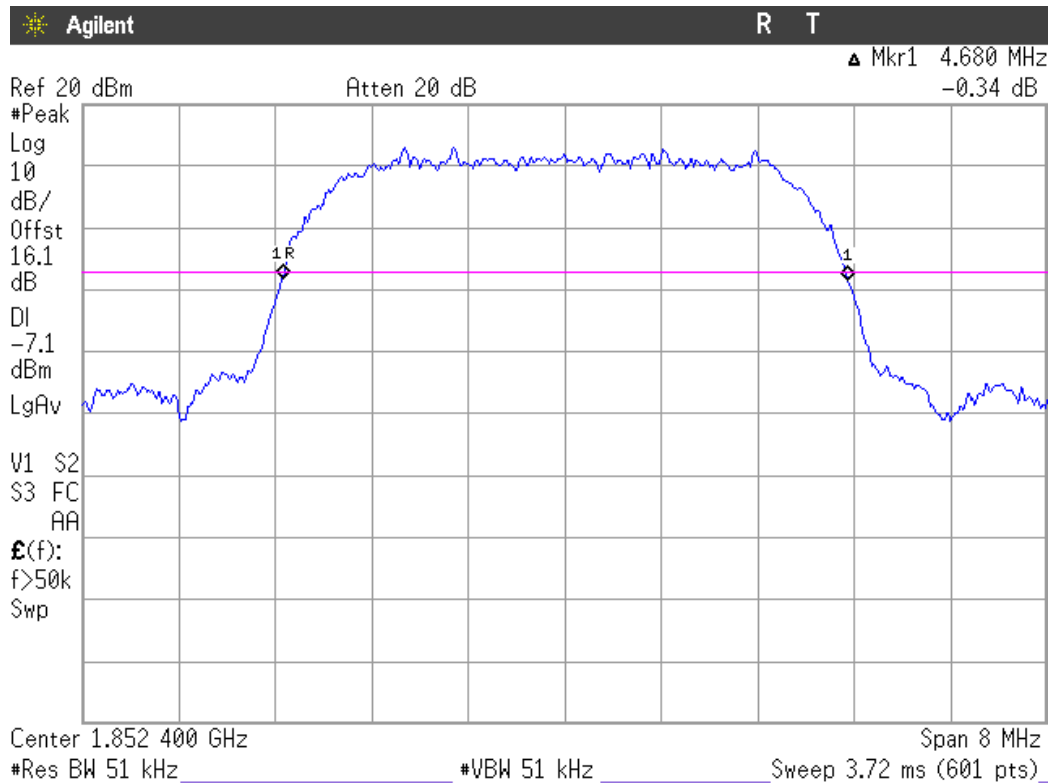


### Highest Channel

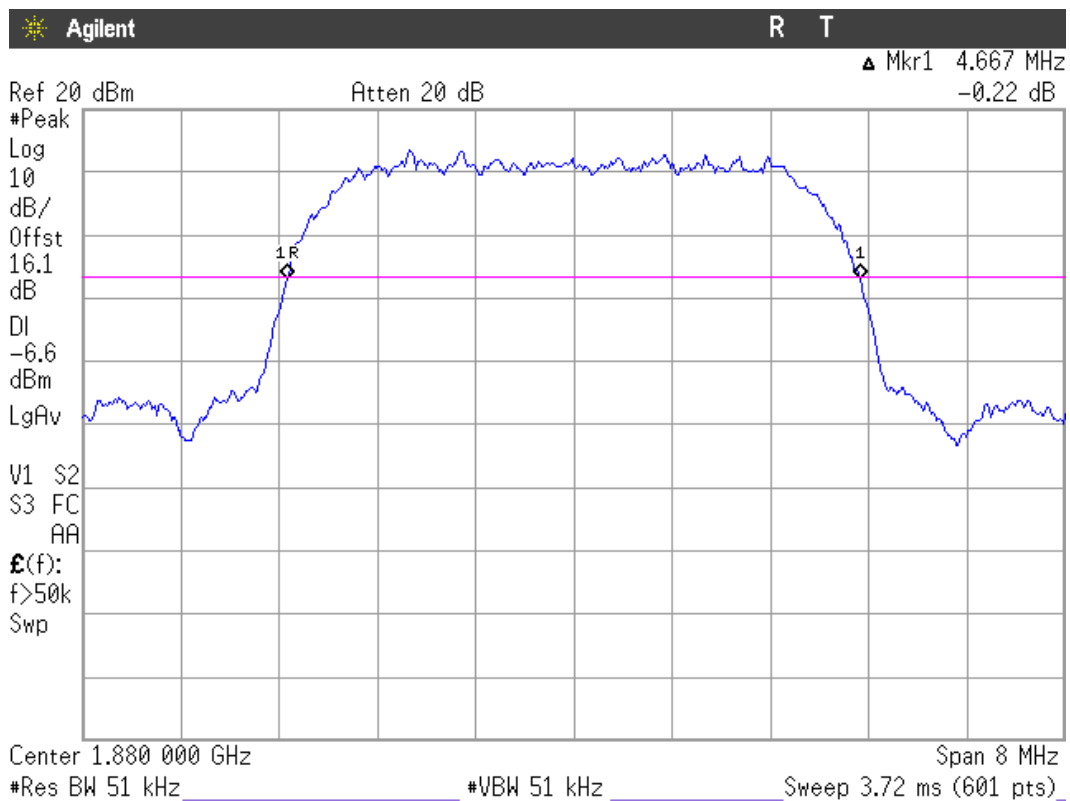


## WCDMA MODULATION

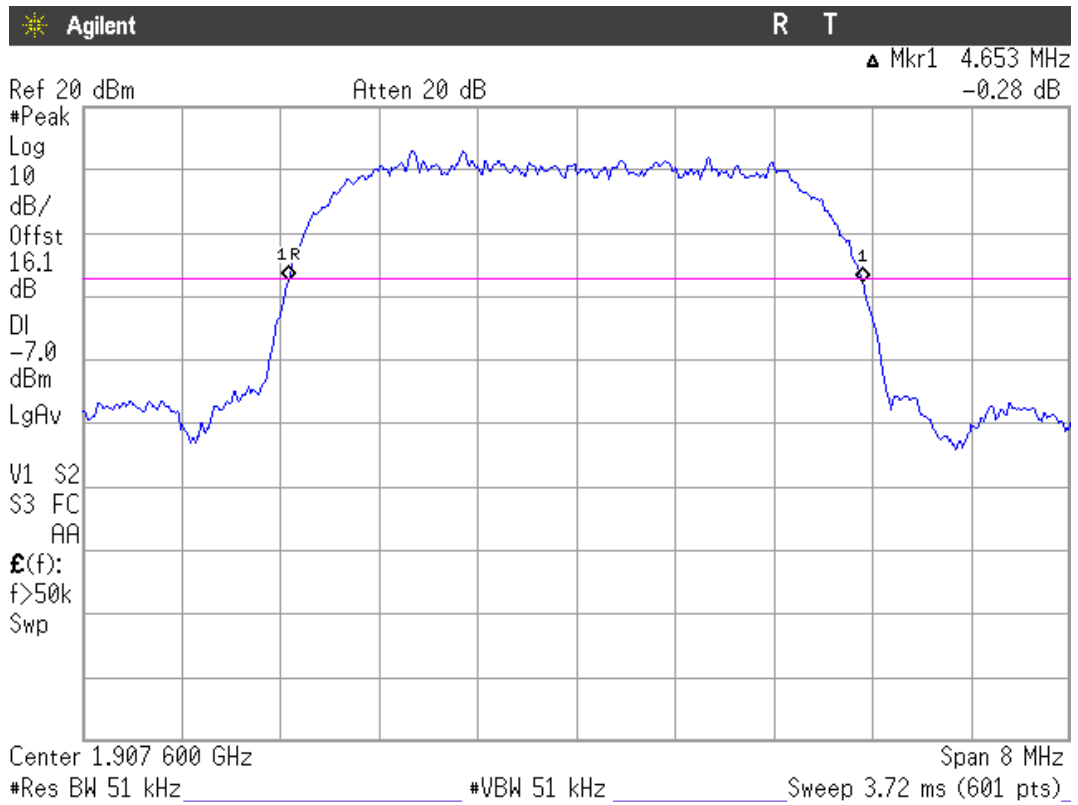
### Lowest Channel



### Middle Channel

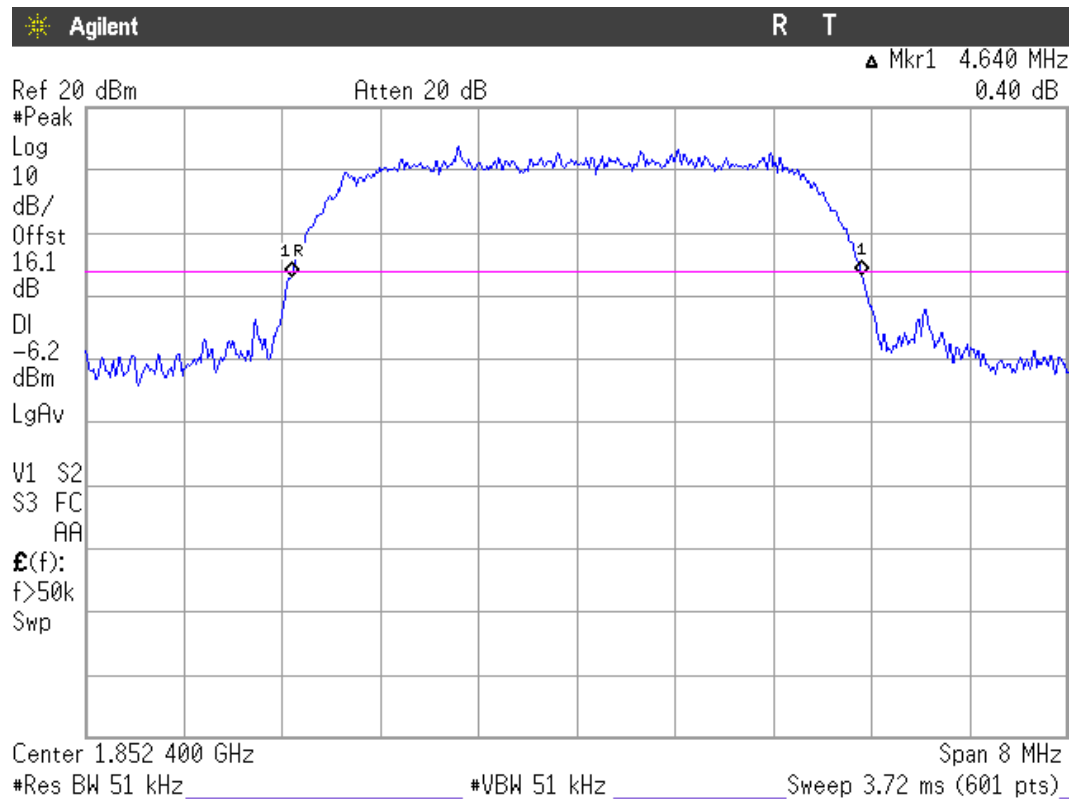


### Highest Channel

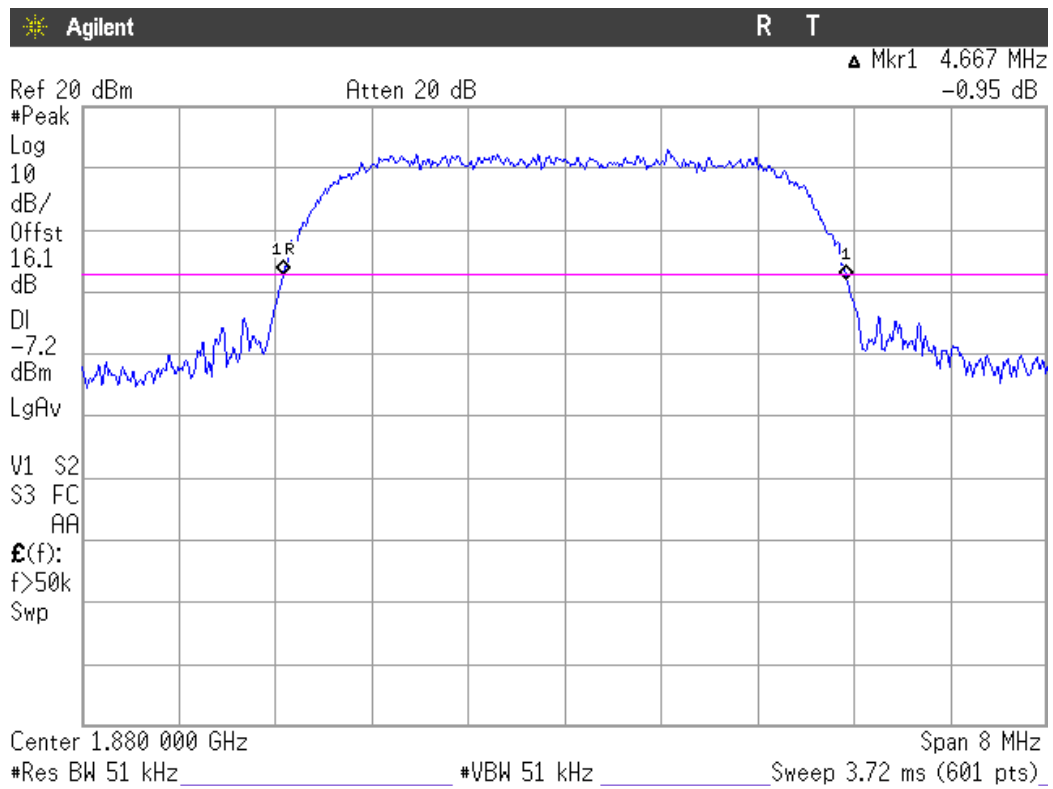


### HSUPA MODULATION

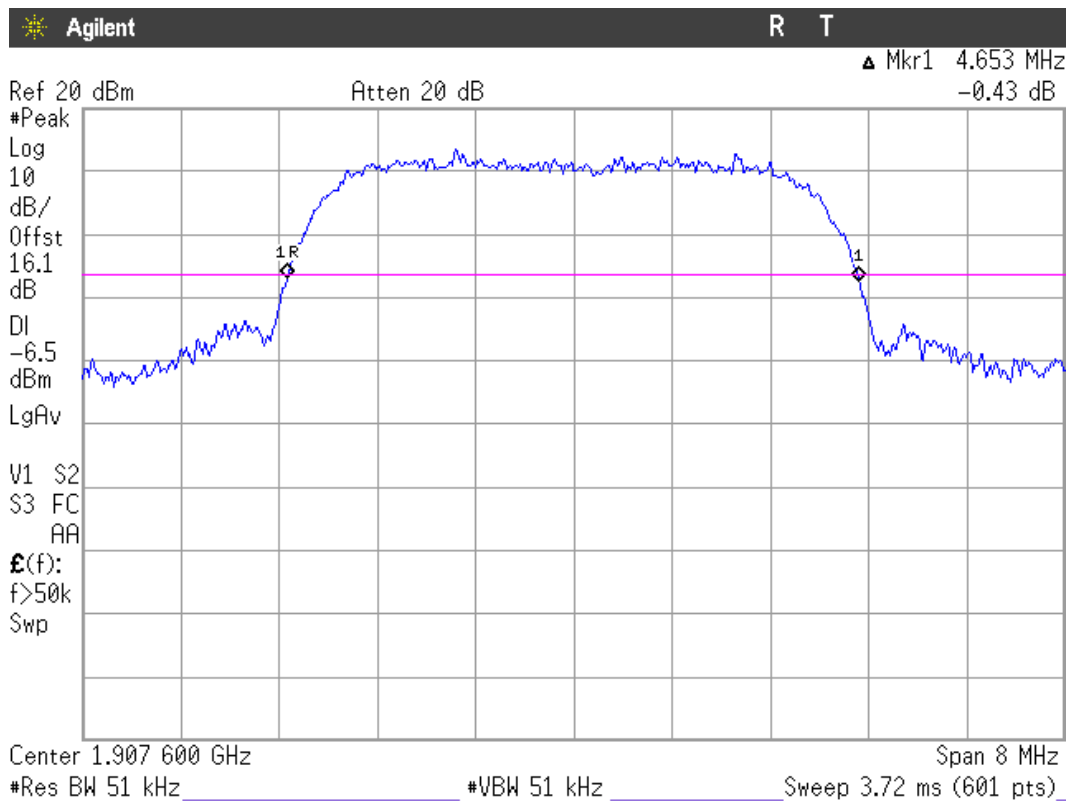
#### Lowest Channel



### Middle Channel



### Highest Channel

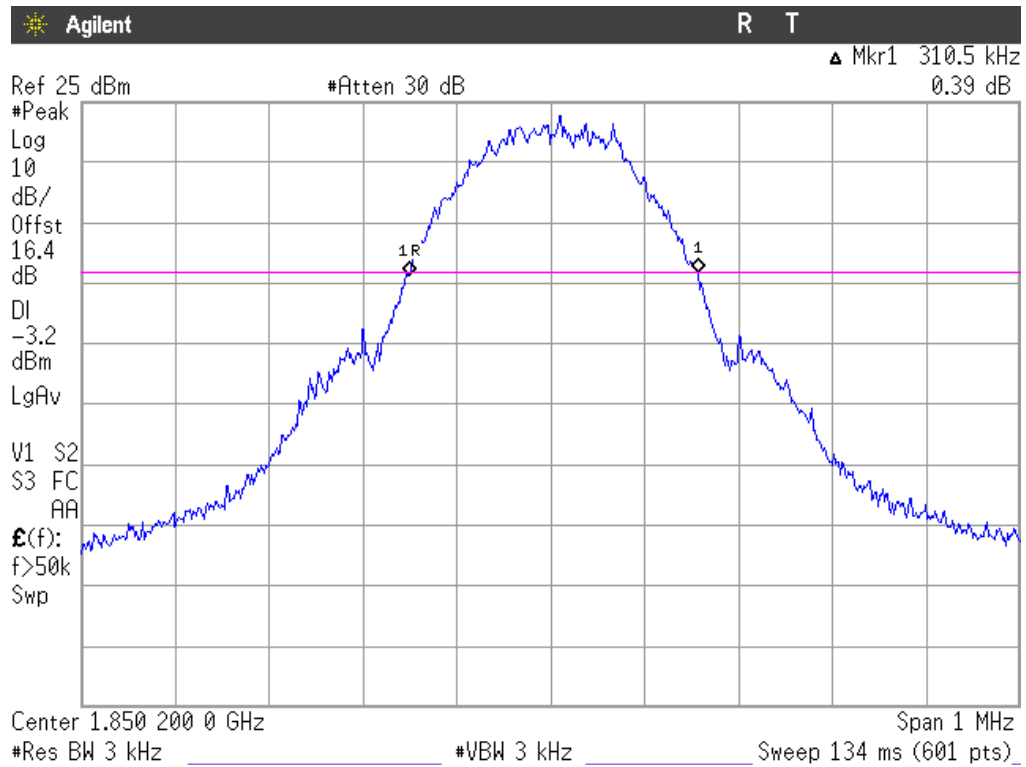




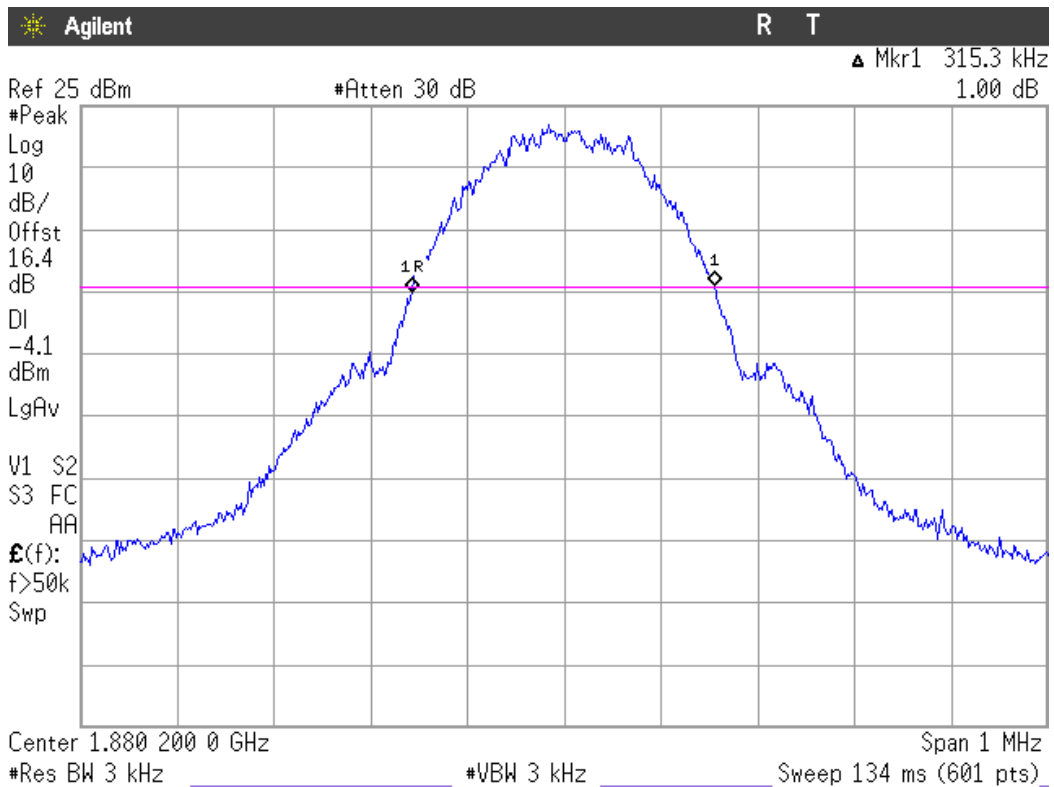
-26 dBc BANDWIDTH

GPRS MODULATION

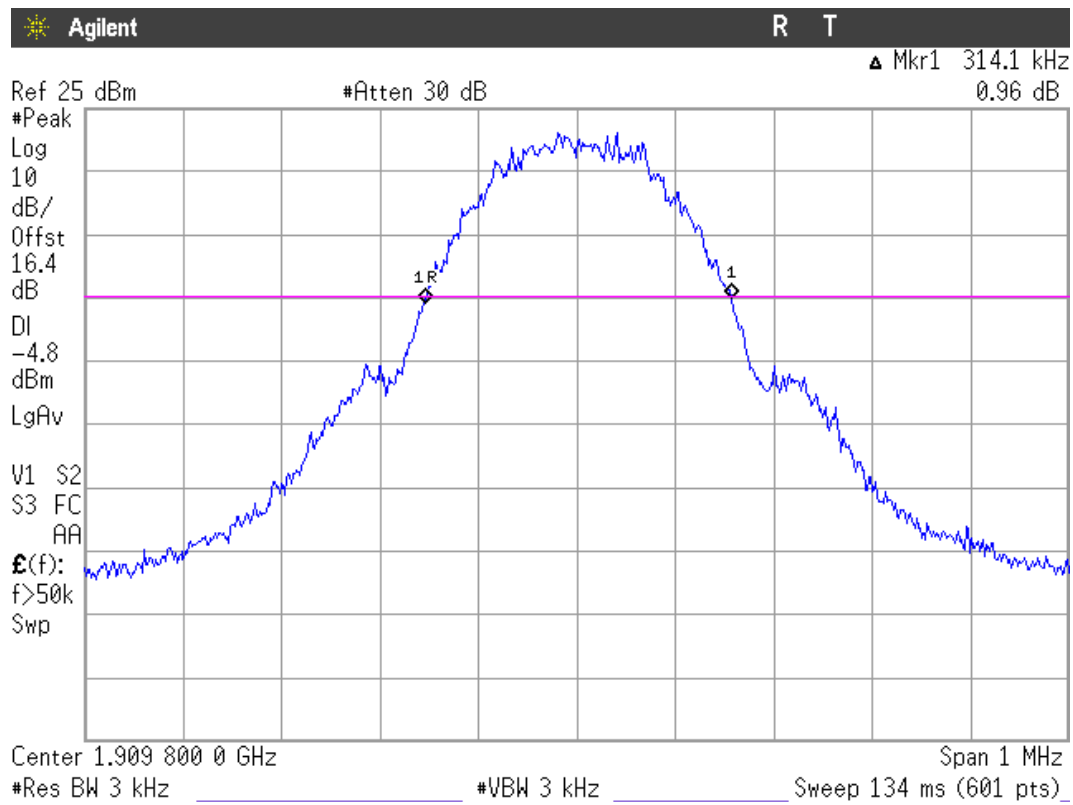
Lowest Channel



Middle Channel

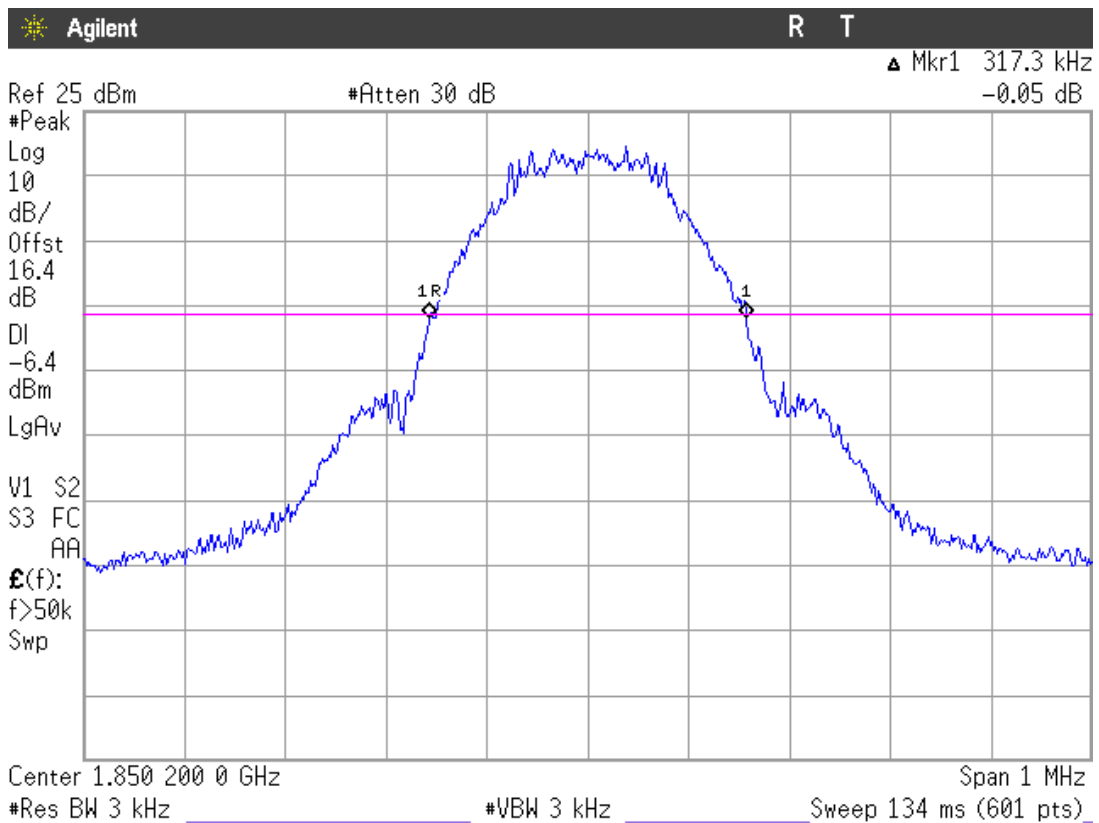


### Highest Channel

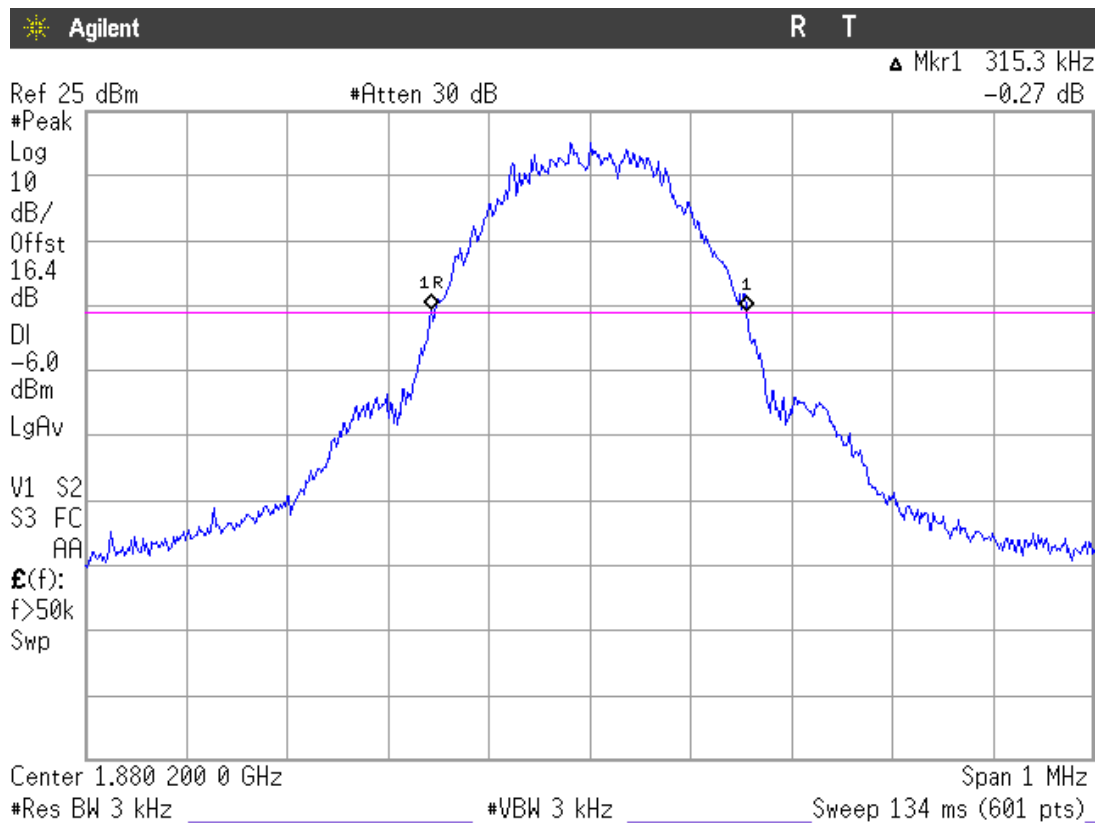


### EDGE MODULATION

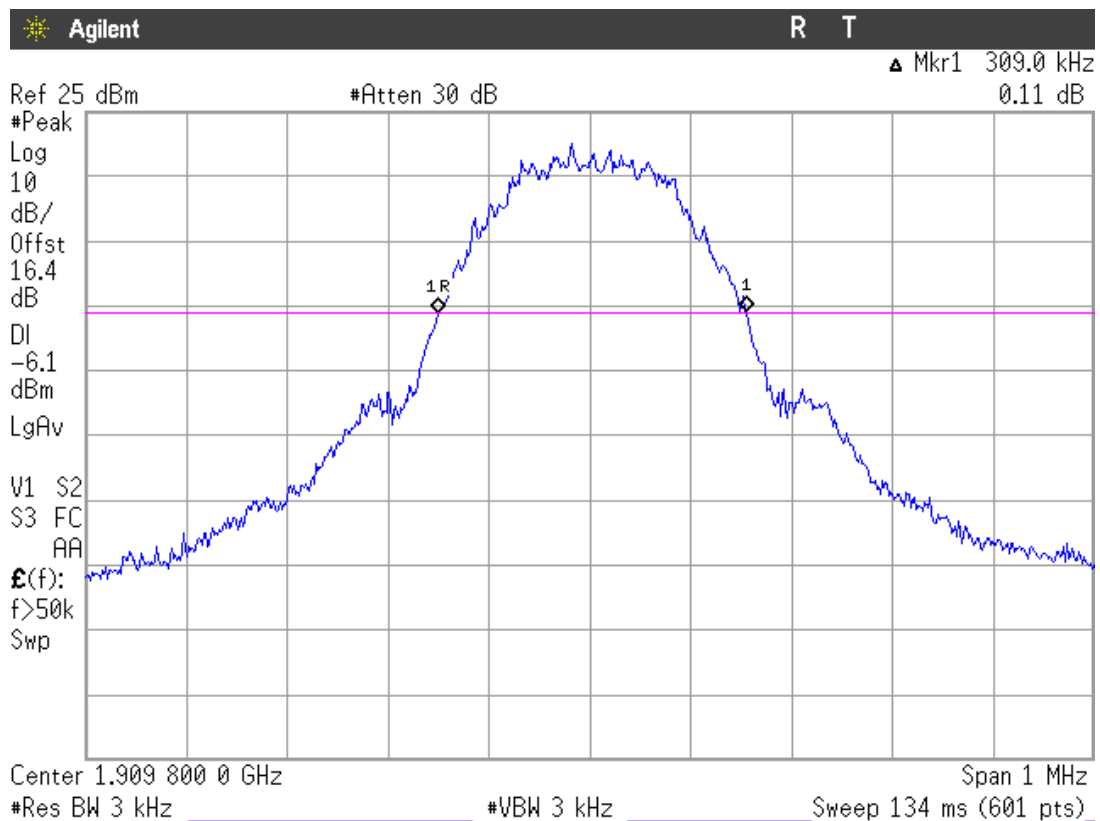
#### Lowest Channel



### Middle Channel

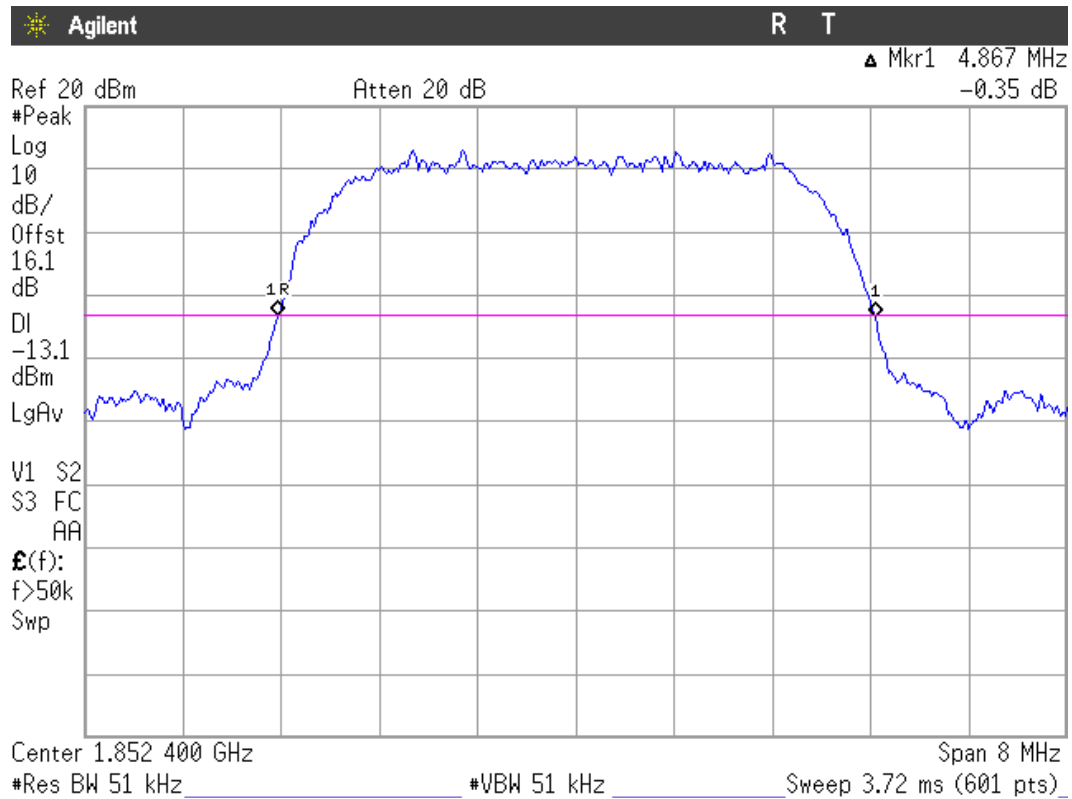


### Highest Channel

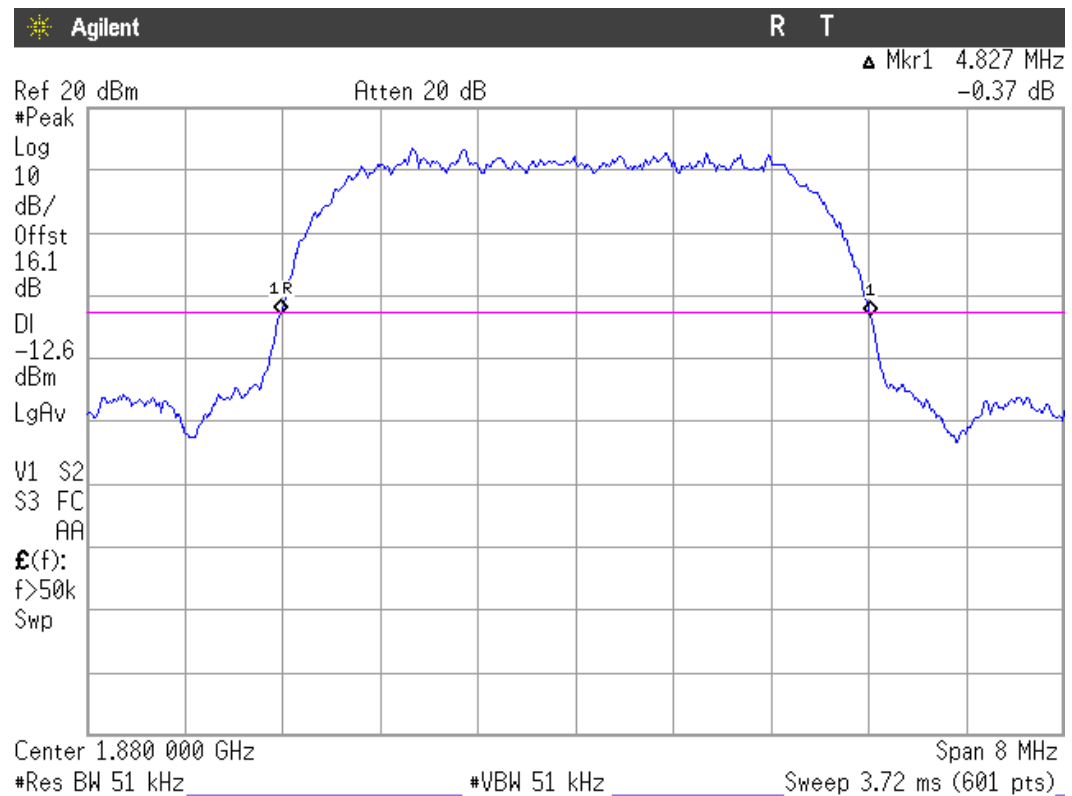


## WCDMA MODULATION

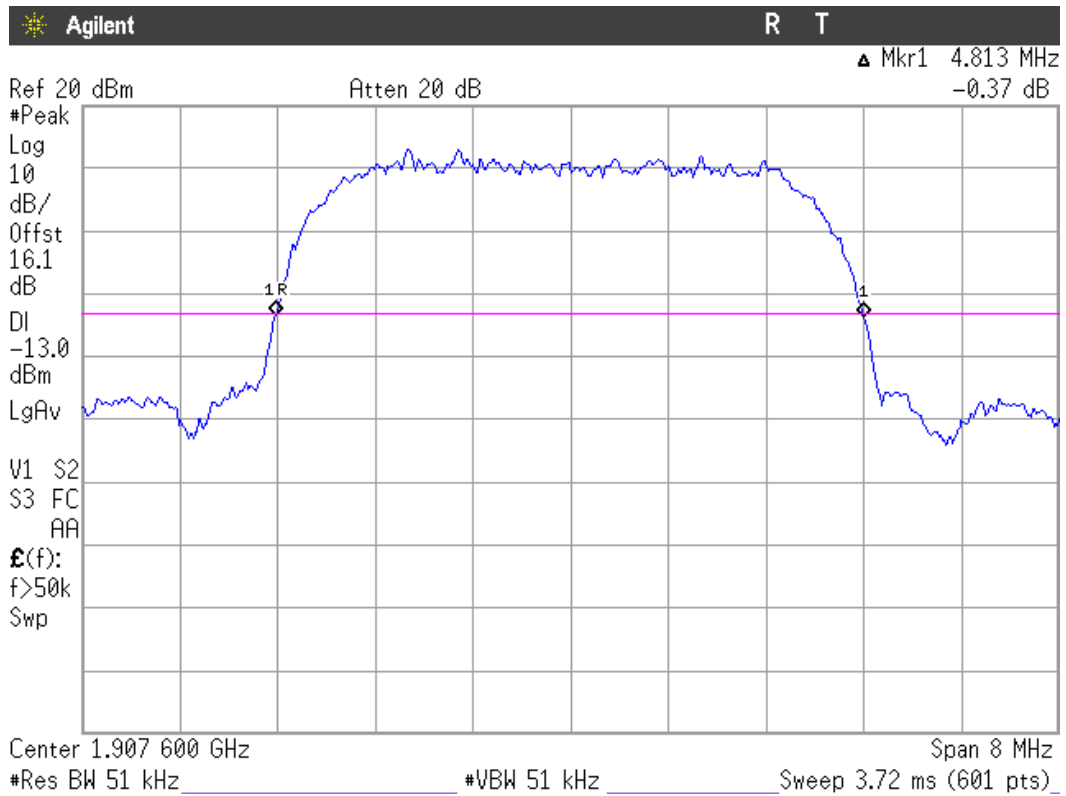
### Lowest Channel



### Middle Channel

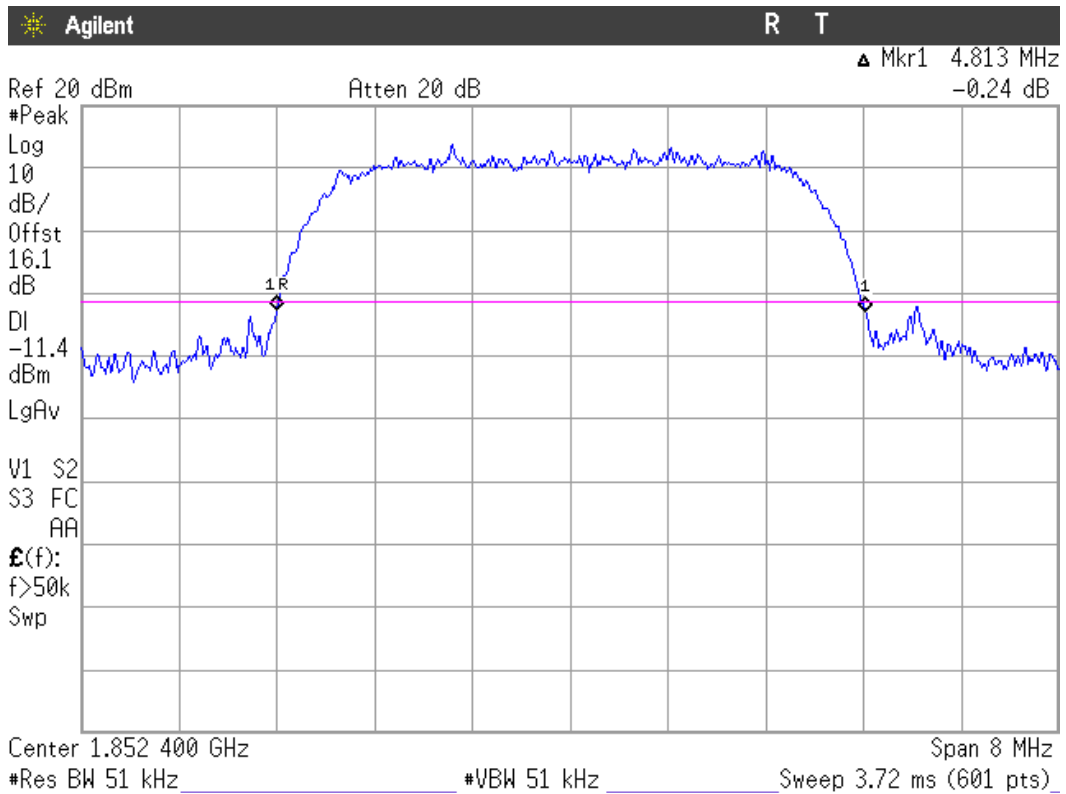


### Highest Channel

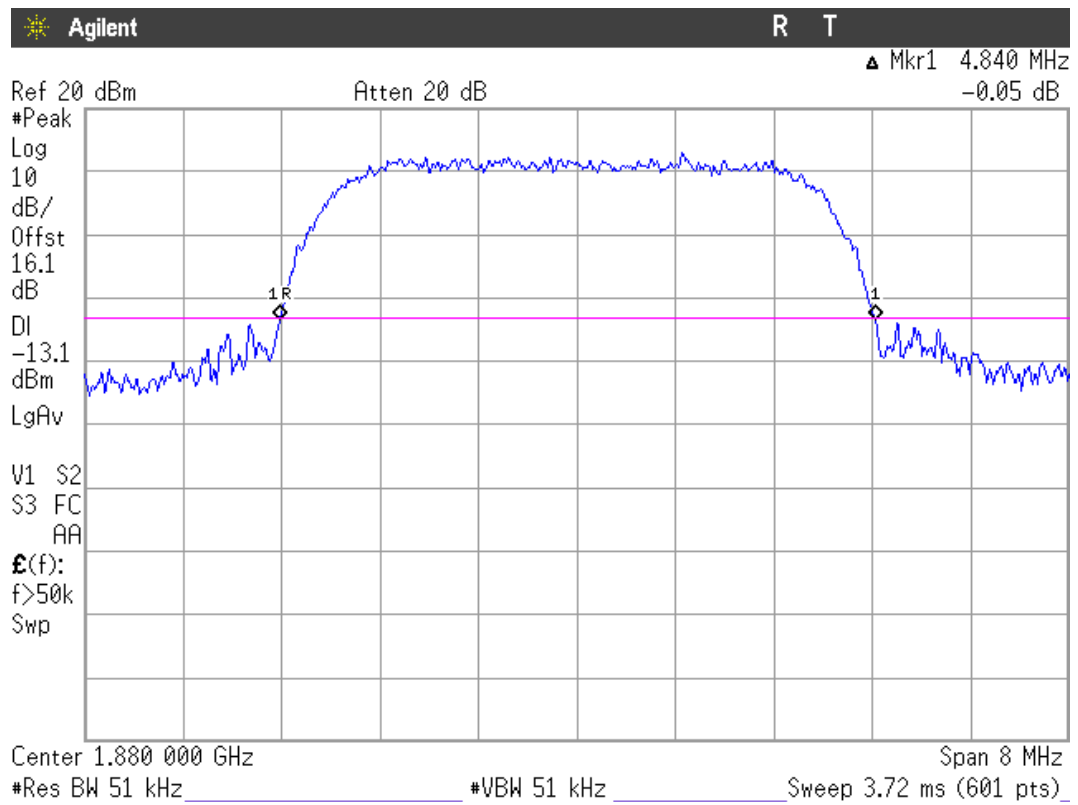


### HSUPA MODULATION

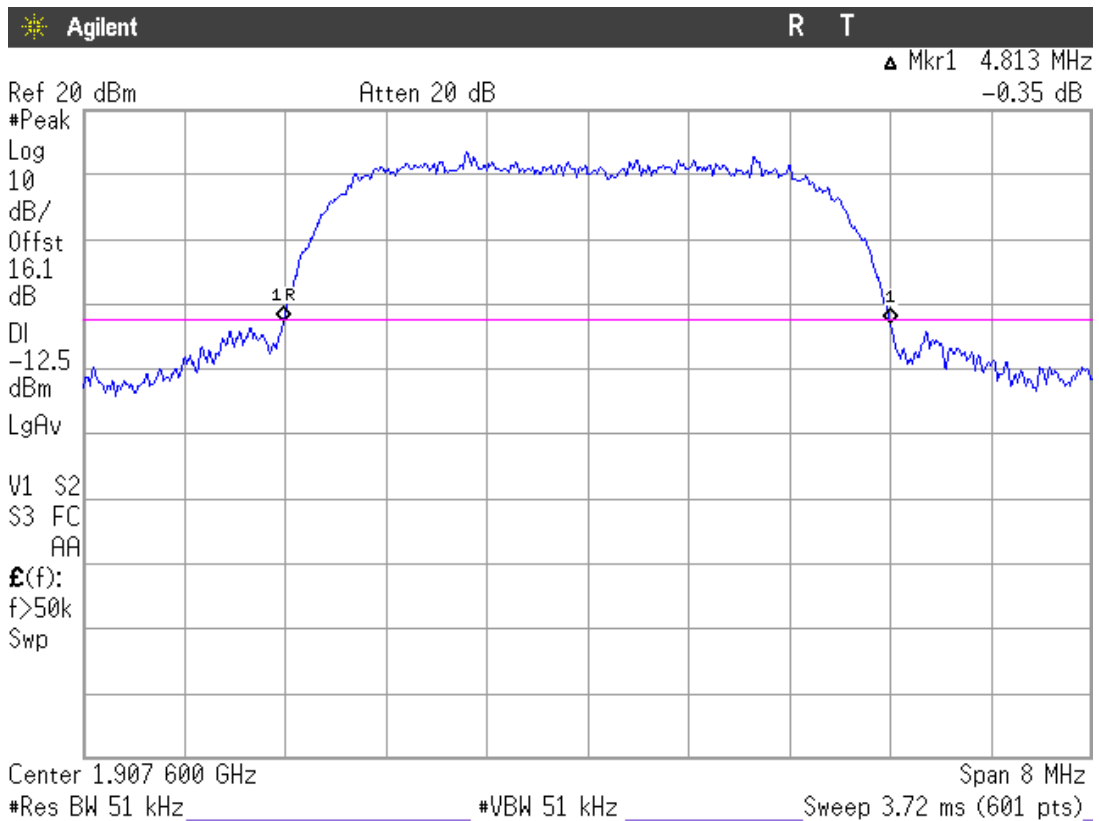
#### Lowest Channel



### Middle Channel



### Highest Channel



## *Spurious emissions at antenna terminals*

### SPECIFICATION

§2.1051 and §24.238

### METHOD

The EUT RF output connector was connected to a 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  $P_o$  transmitting power, the specified minimum attenuation becomes  $43+10\log (P_o)$ , and the level in dBm relative  $P_o$  becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = - 13 \text{ dBm}$$

### 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.

#### HSUPA 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

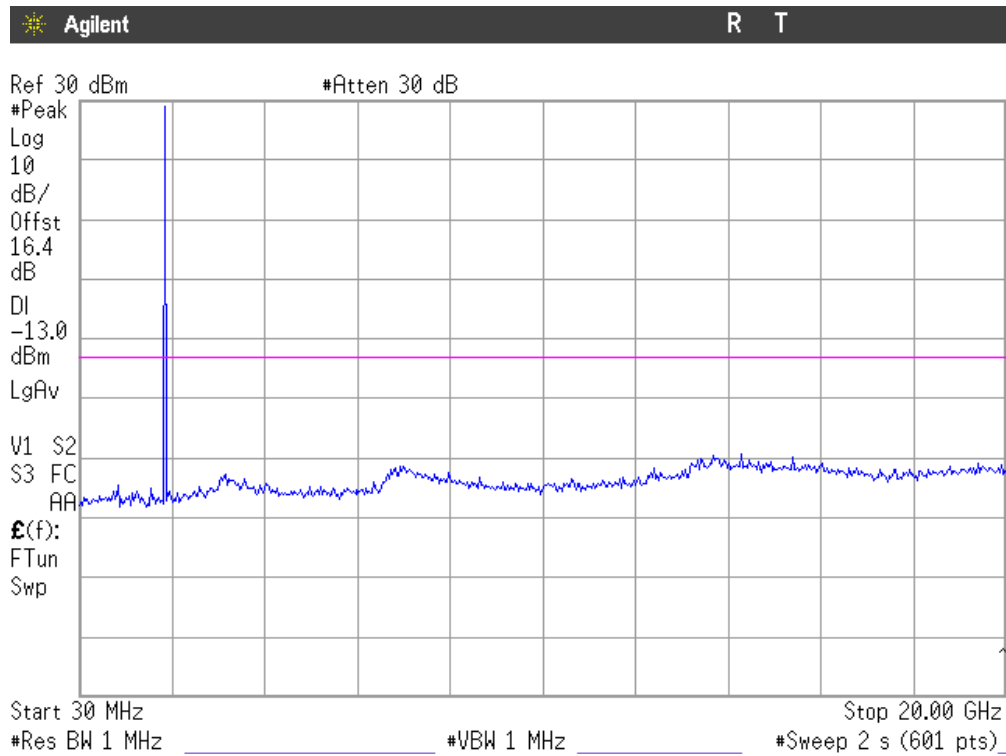
No spurious signals were found in all the range.

Verdict: PASS



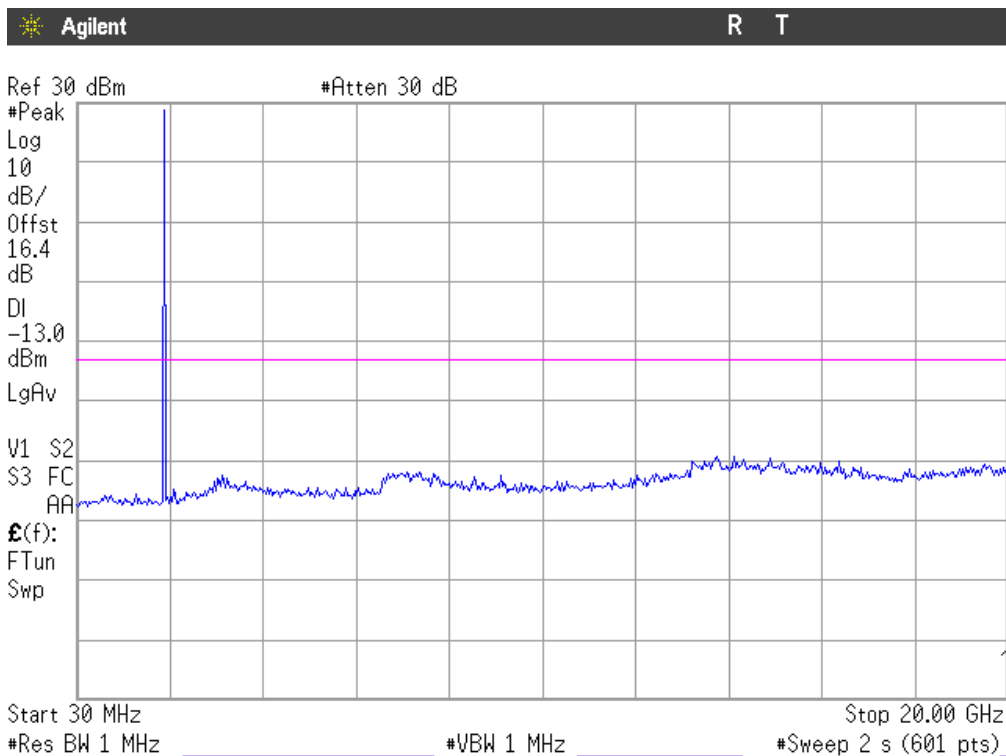
## GPRS MODULATION

### 1. CHANNEL: LOWEST



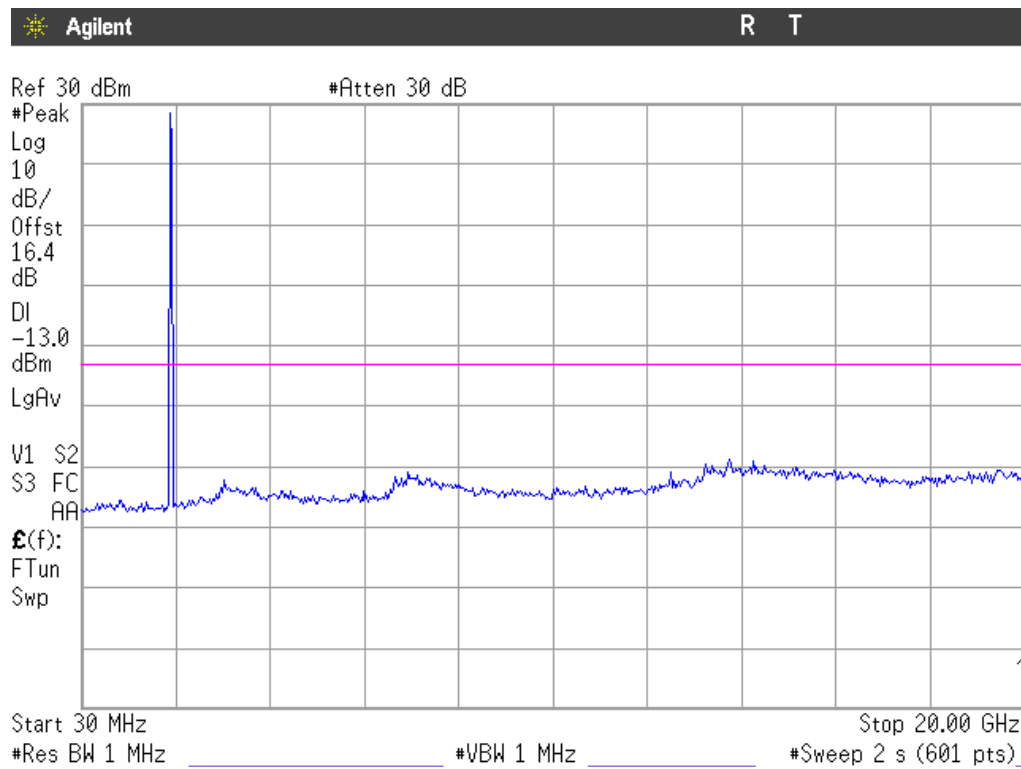
Note: The peak above the limit is the carrier frequency.

### 2. CHANNEL: MIDDLE



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

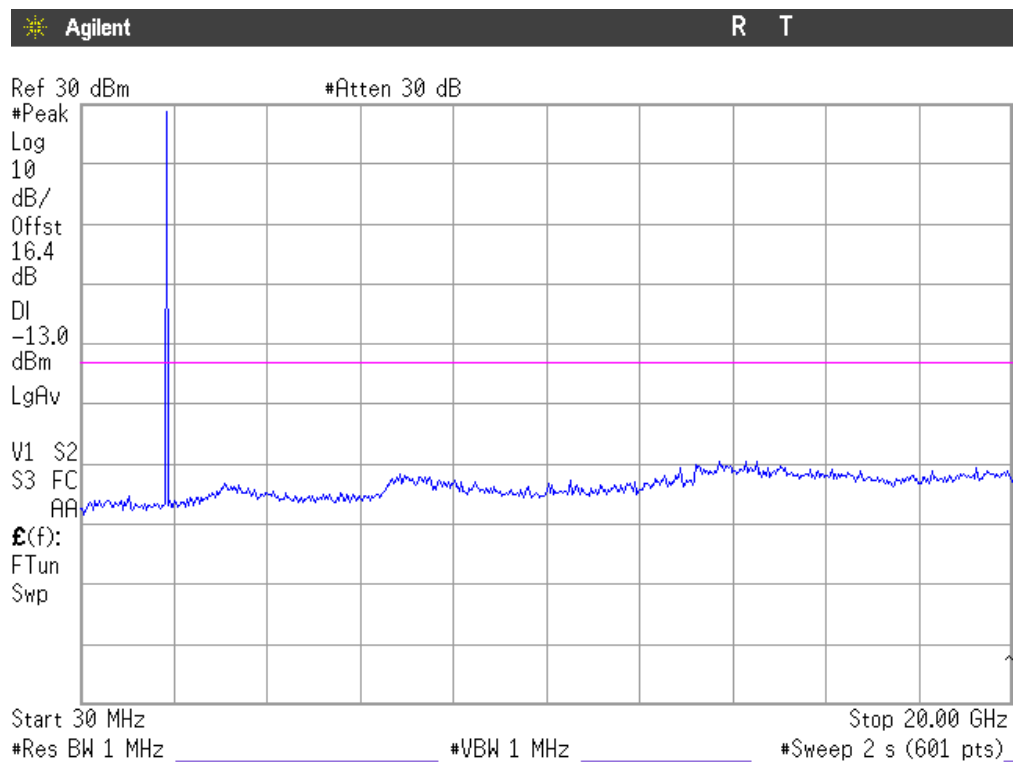
### 3. CHANNEL: HIGHEST



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

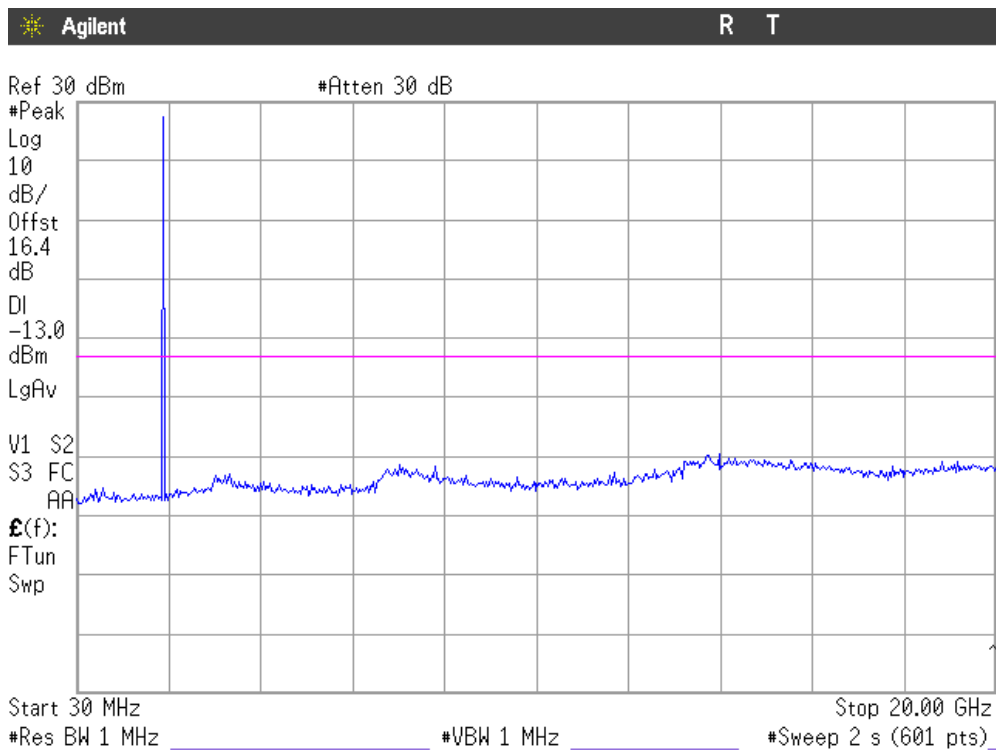
### EDGE MODULATION

#### 1. CHANNEL: LOWEST



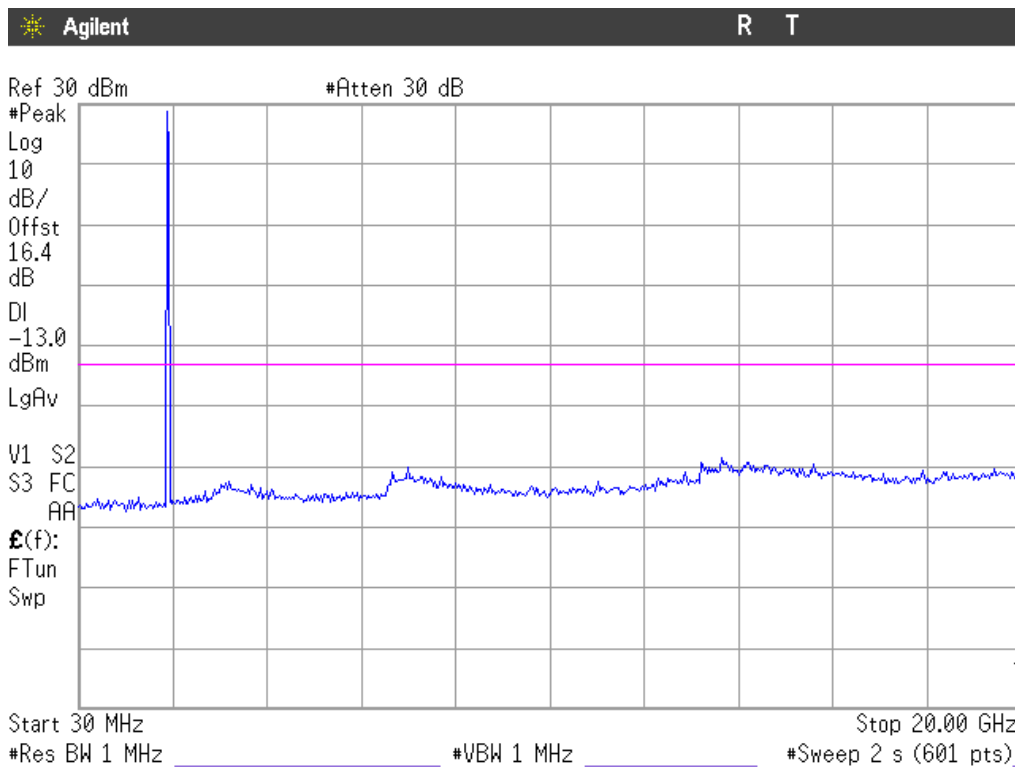
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



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

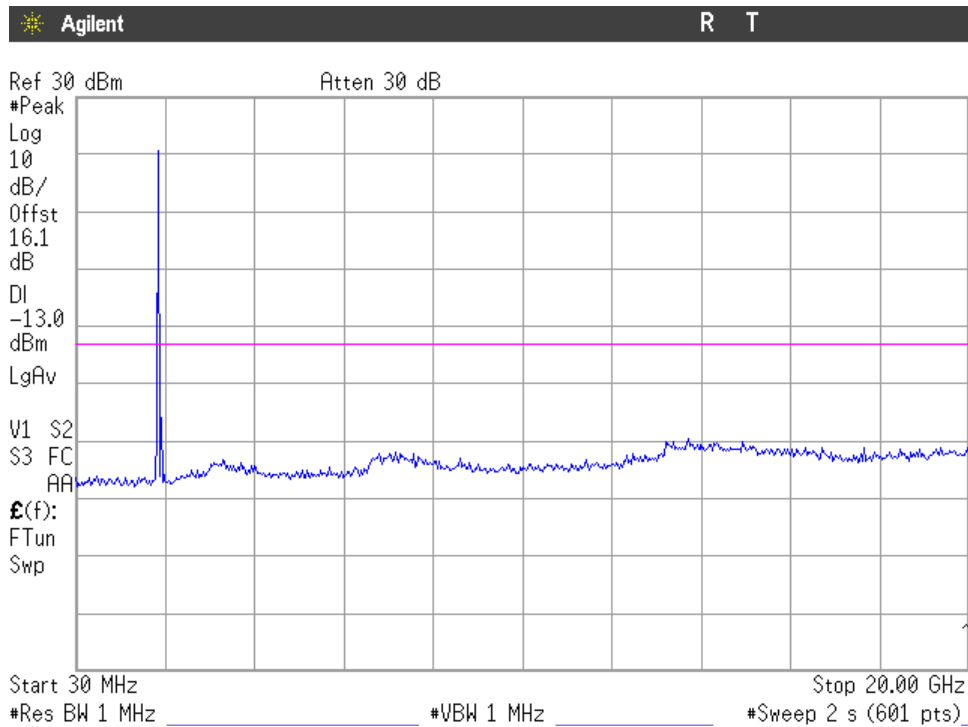
3. CHANNEL: HIGHEST



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

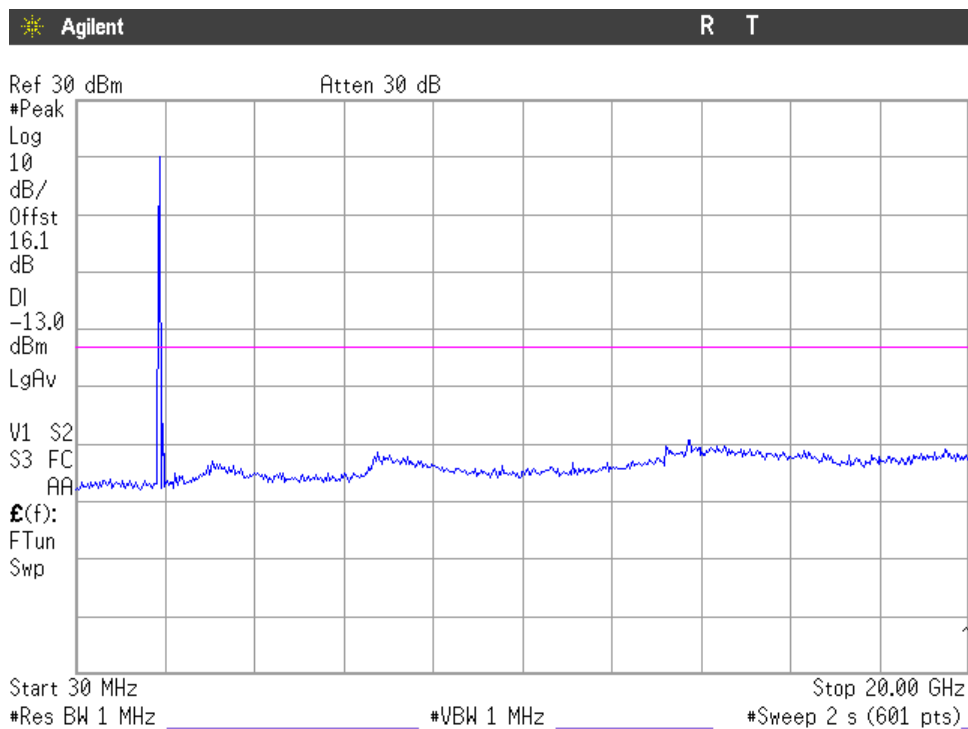
## WCDMA MODULATION

### 1. CHANNEL: LOWEST



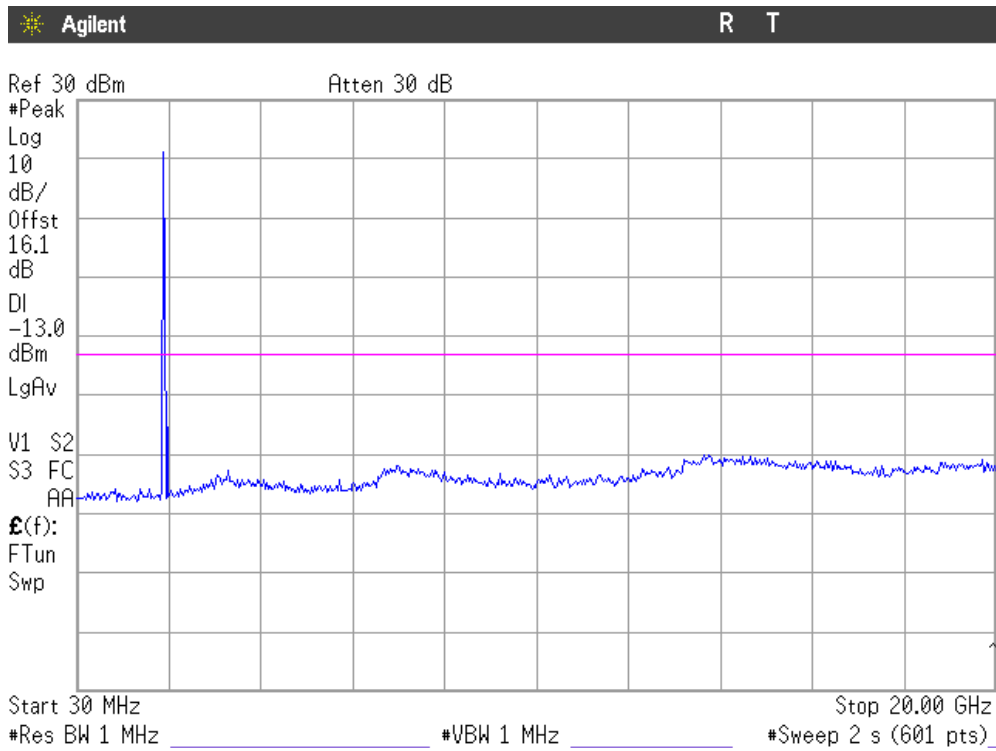
Note: The peak above the limit is the carrier frequency.

### 2. CHANNEL: MIDDLE



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

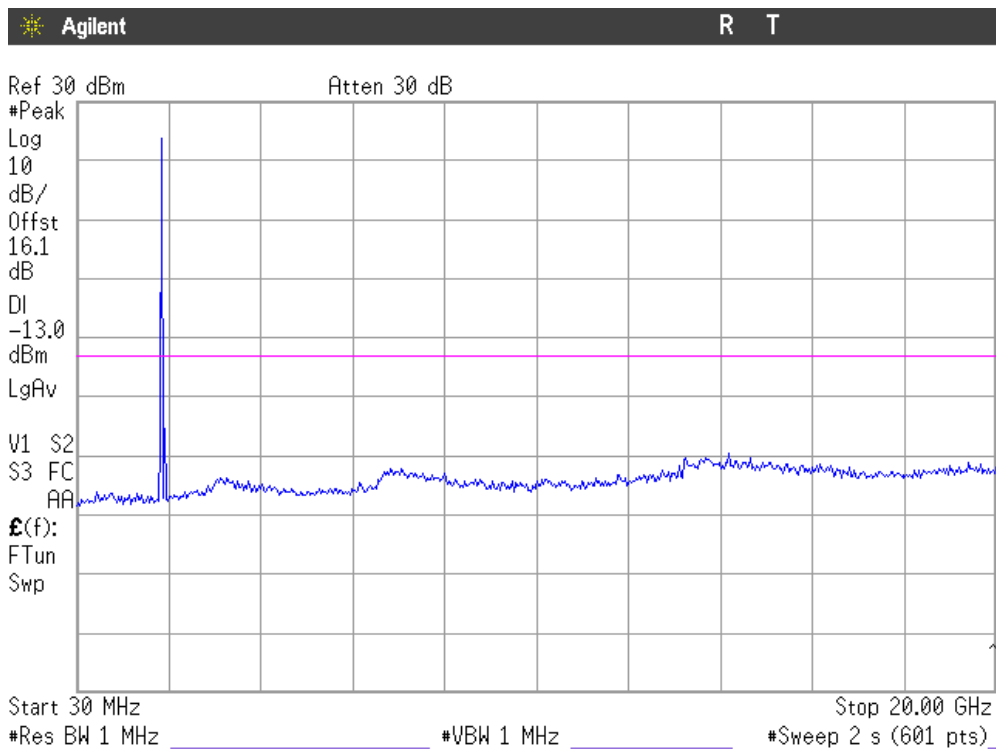
### 3. CHANNEL: HIGHEST



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

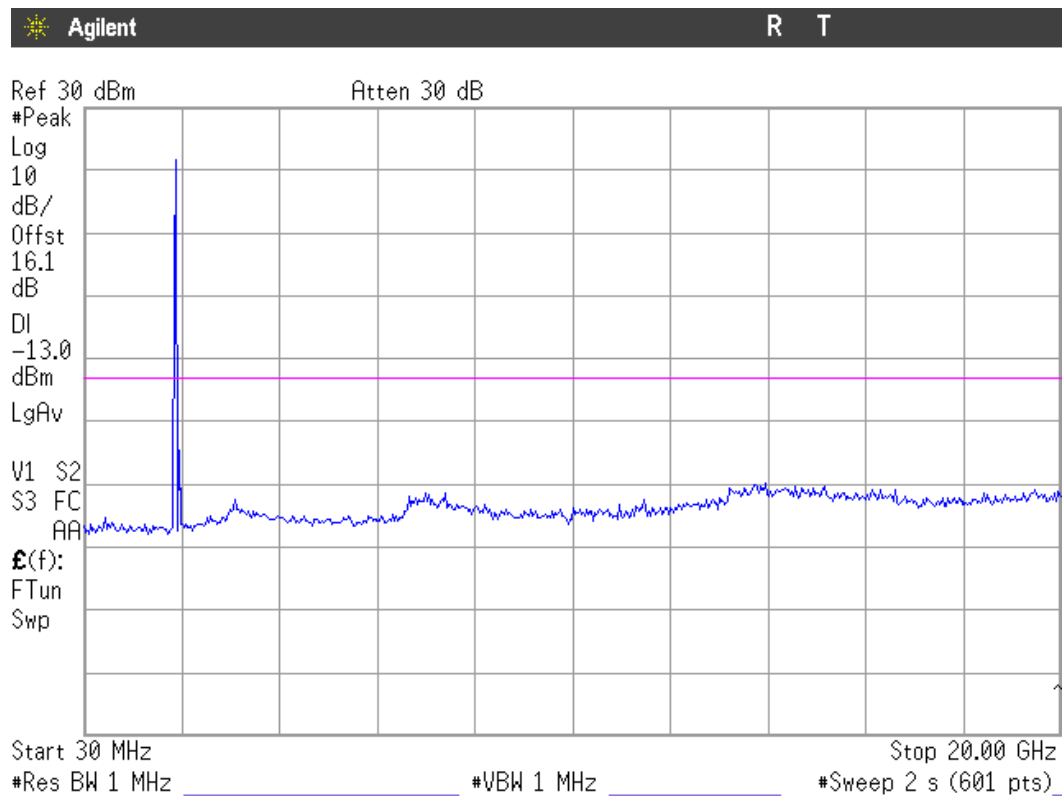
### HSUPA MODULATION

#### 1. CHANNEL: LOWEST



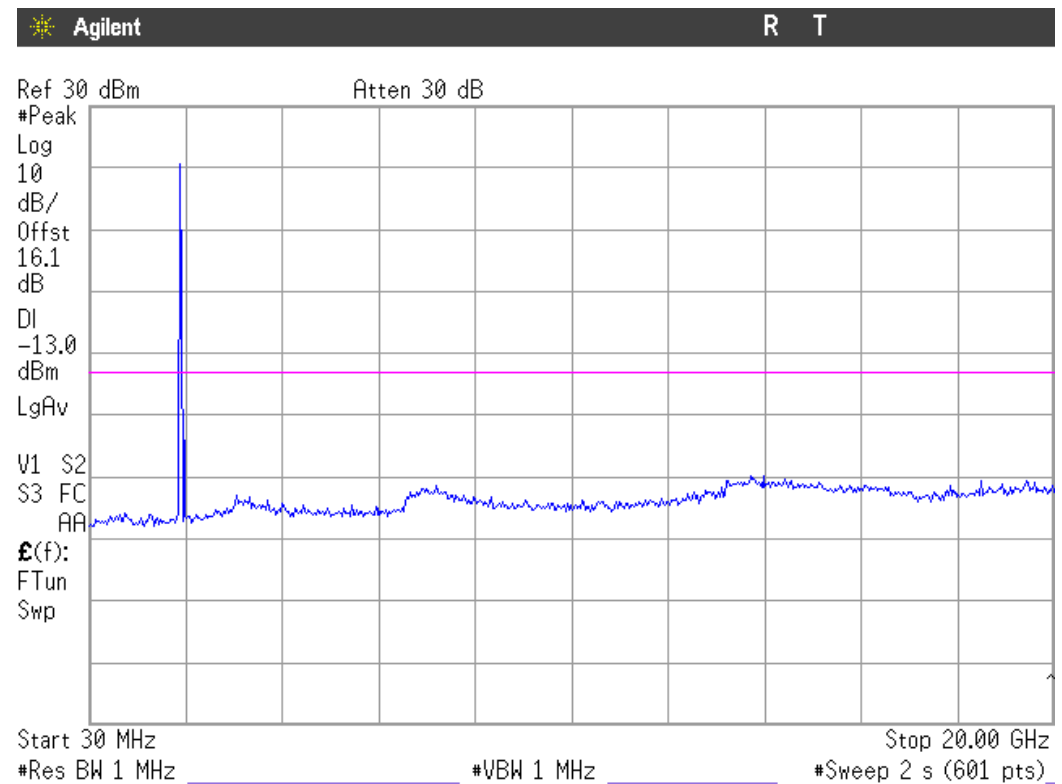
Note: The peak above the limit is the carrier frequency.

## 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 5 kHz/3.3 kHz was used for GPRS and EDGE modulations, and 50 kHz for WCDMA and HSUPA modulations.

#### 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  $P_o$  transmitting power, the specified minimum attenuation becomes  $43+10\log (P_o)$ , and the level in dBm relative  $P_o$  becomes:

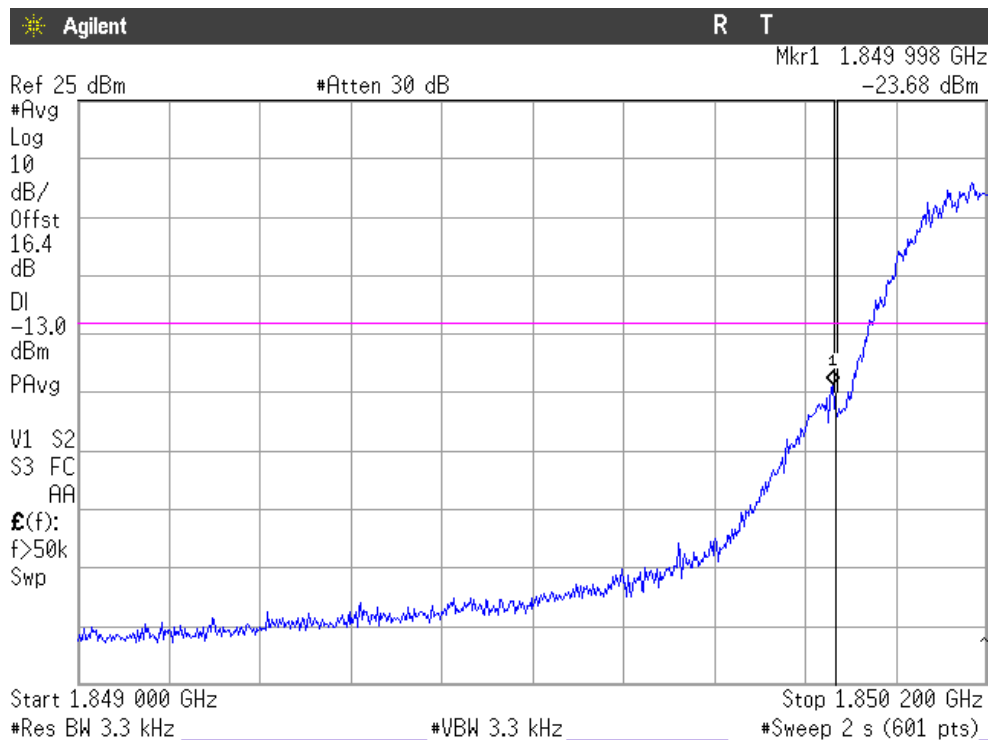
$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = - 13 \text{ dBm}$$

### RESULTS (see plots in next pages)

MODULATION	Maximum level at lowest Block Edge (dBm)	Maximum level at highest Block Edge (dBm)
GPRS	-23.68	-27.94
EDGE	-27.30	-30.08
WCDMA	-21.00	-22.95
HSUPA	-20.82	-21.16

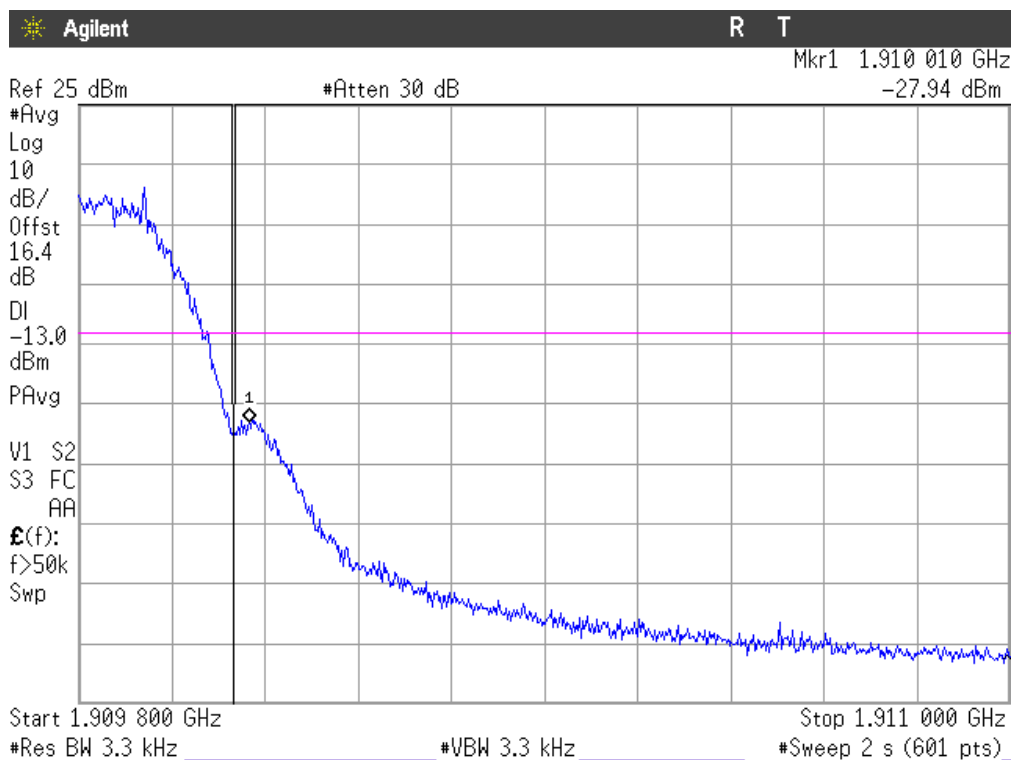
Measurement uncertainty =  $\pm 1.57$  dB.

GPRS MODULATION  
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

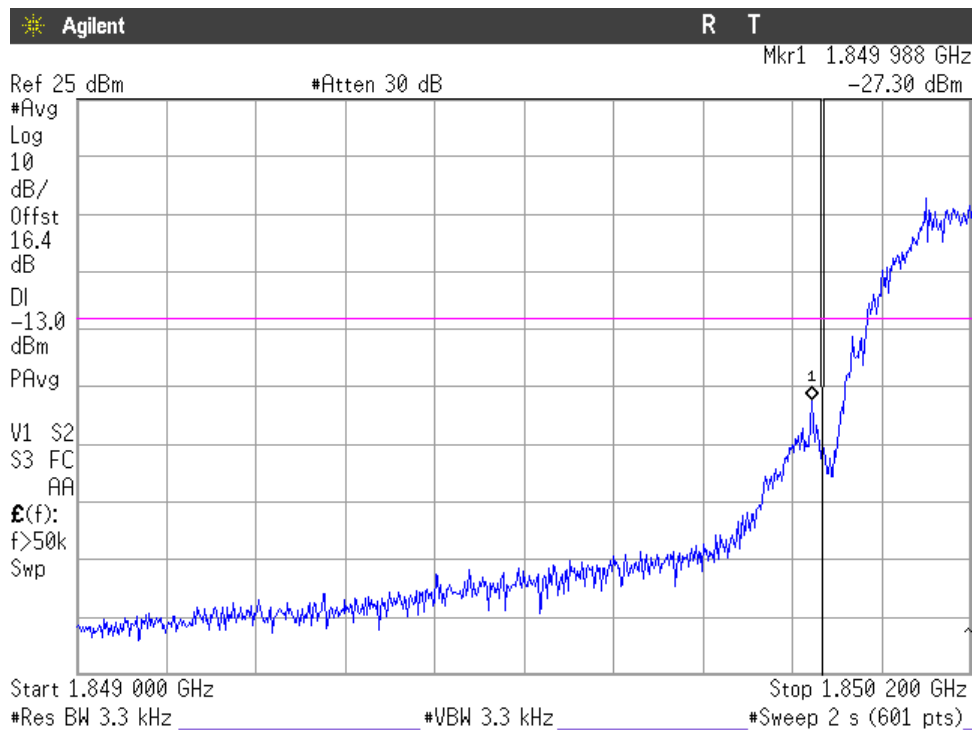


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

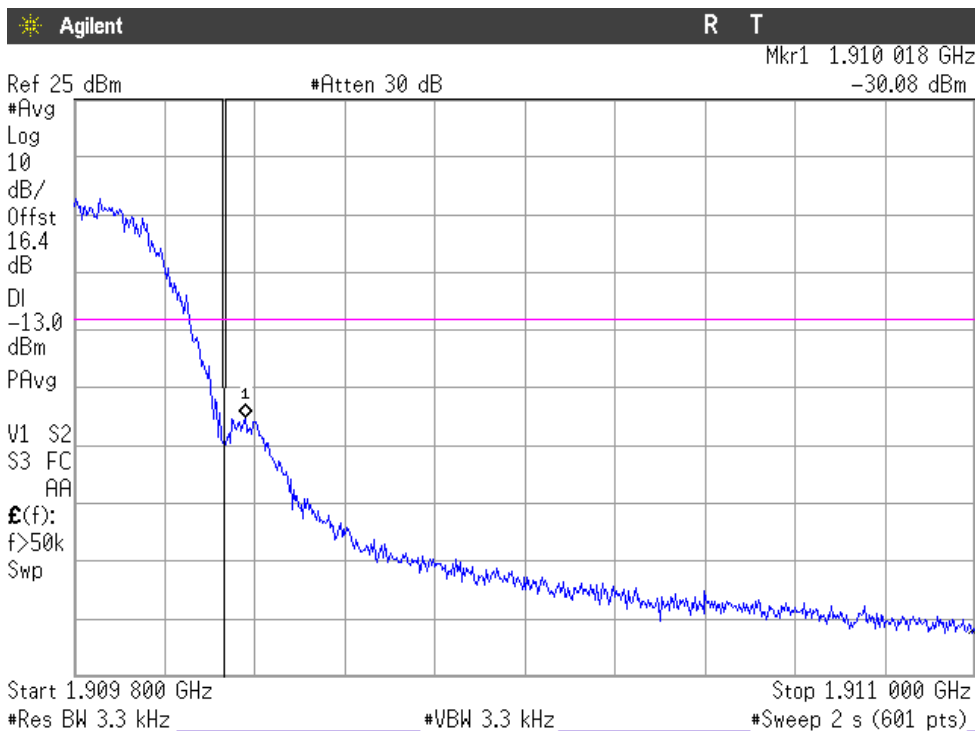


EDGE MODULATION  
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

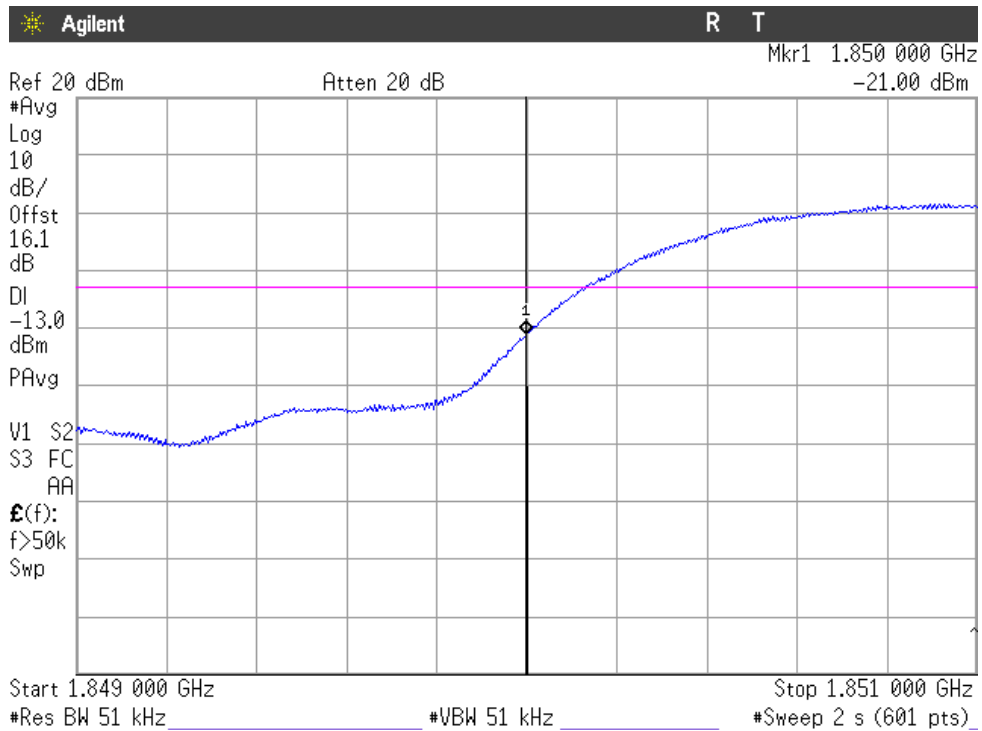
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

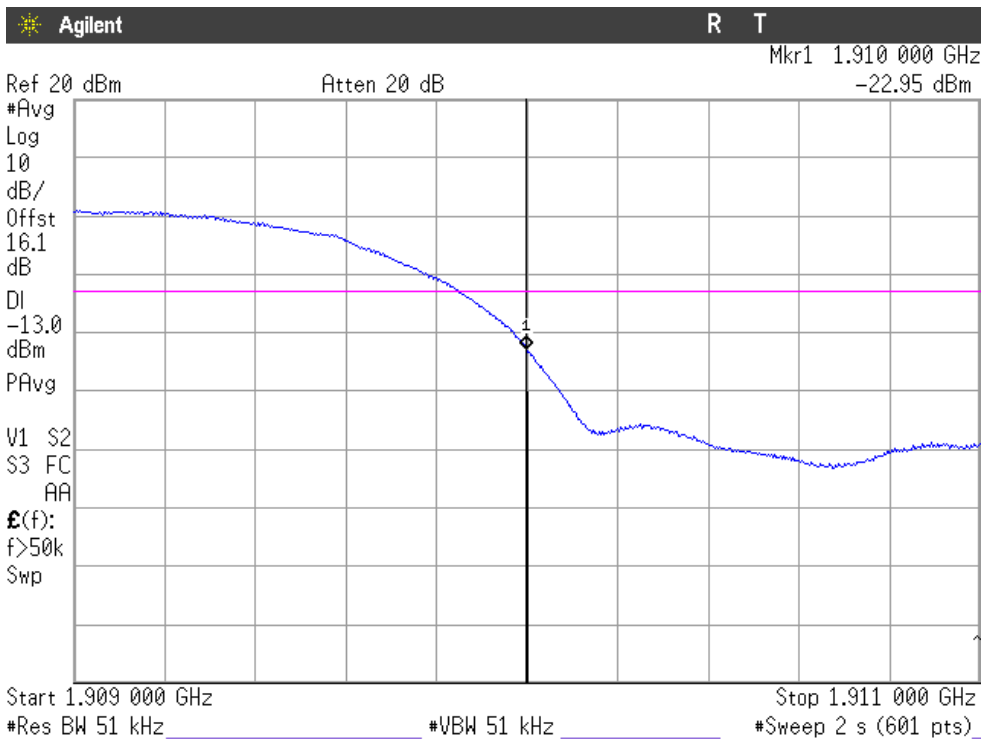
Verdict: PASS

WCDMA MODULATION  
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

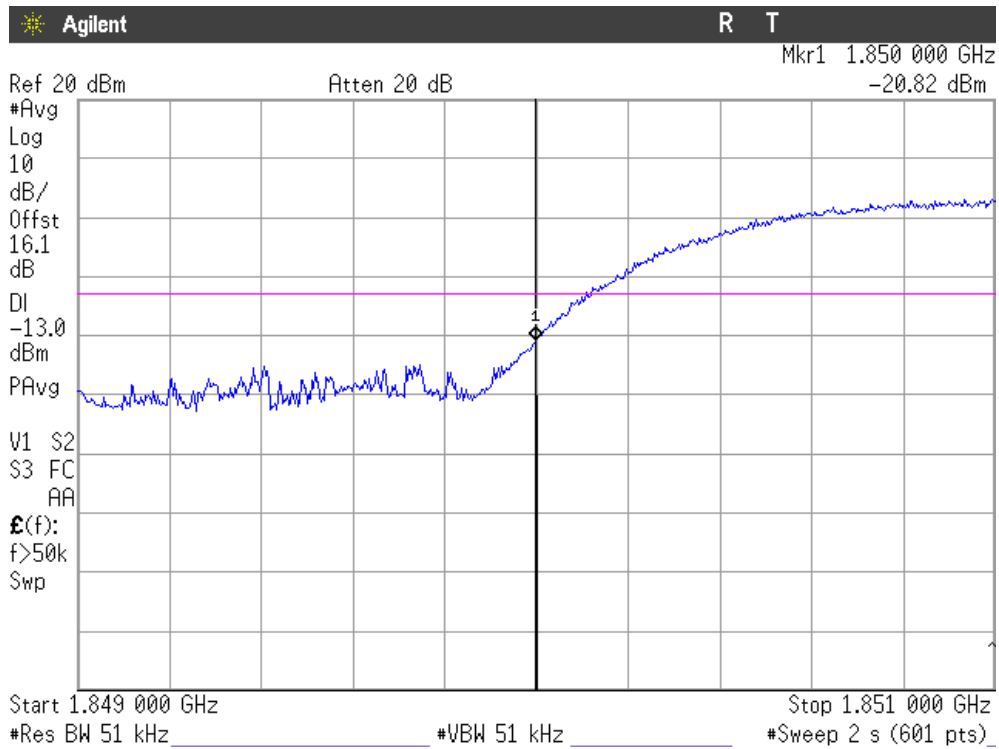
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

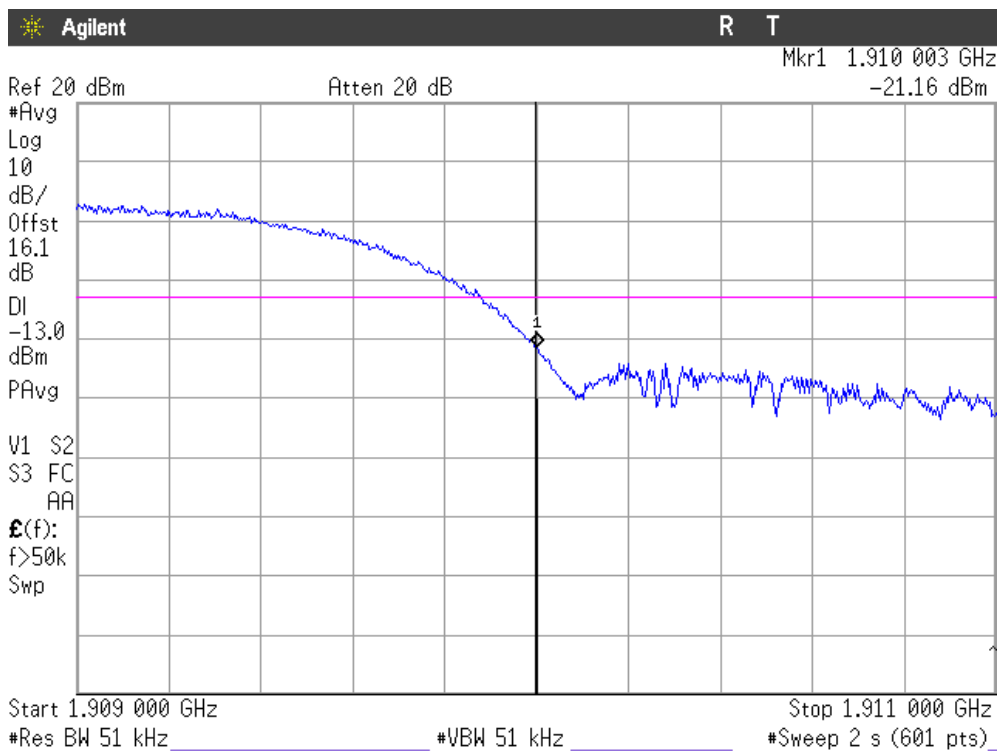
Verdict: PASS

HSUPA 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  $P_o$  transmitting power, the specified minimum attenuation becomes  $43+10\log (P_o)$ , and the level in dBm relative  $P_o$  becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = - 13 \text{ dBm}$$

## 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.

## HSUPA 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.

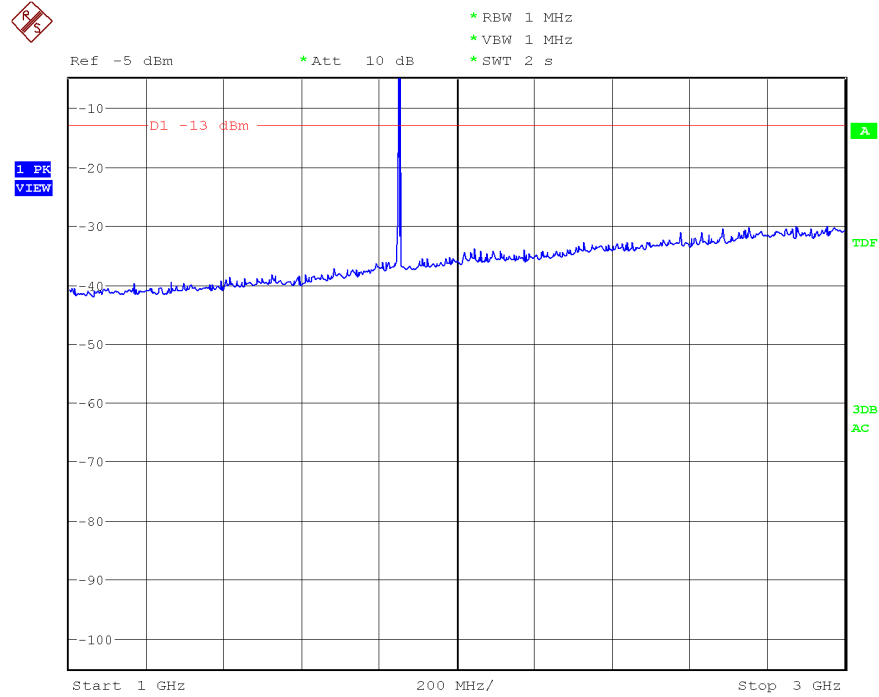
Verdict: PASS



FREQUENCY RANGE 1 GHz to 3 GHz.

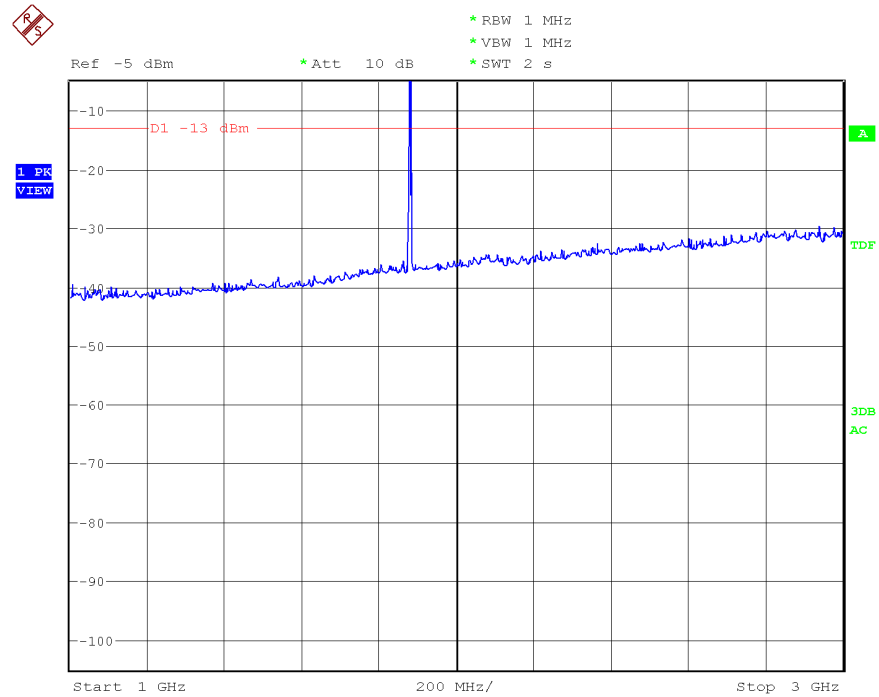
**GPRS MODULATION**

CHANNEL: LOWEST



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

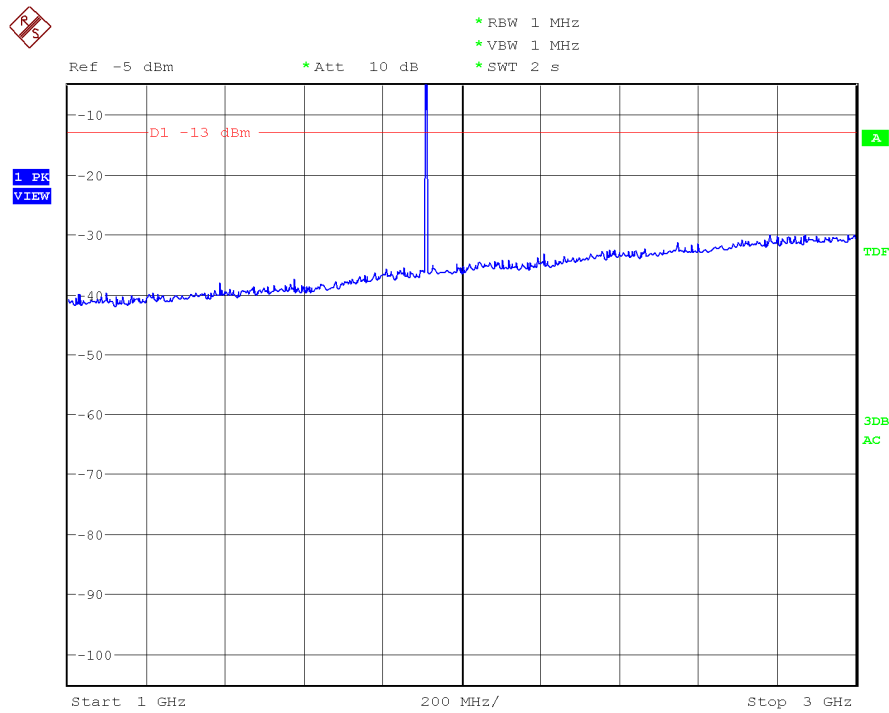
CHANNEL: MIDDLE



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



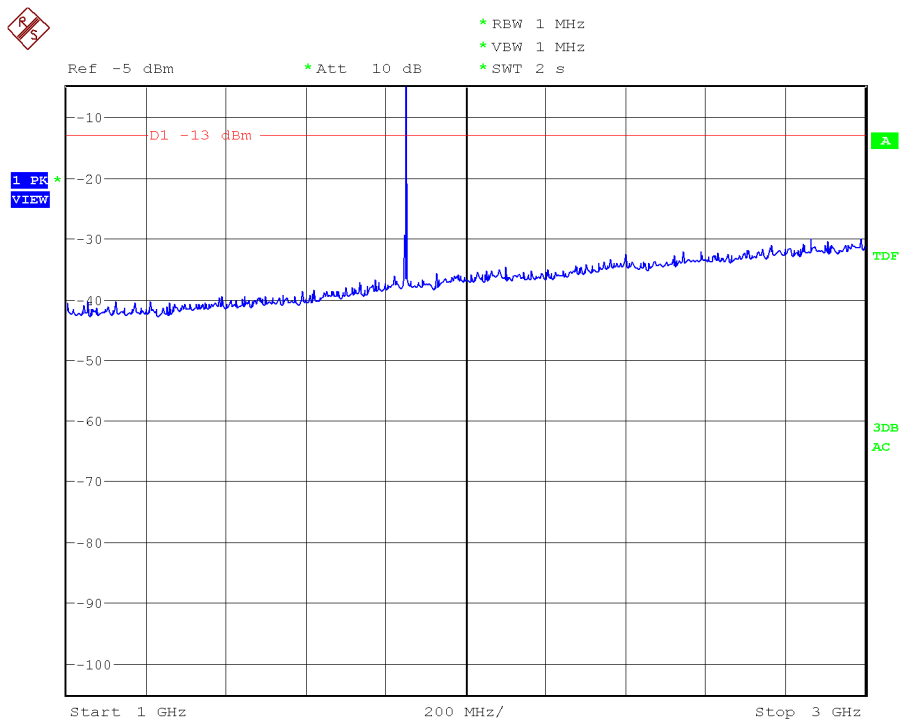
CHANNEL: HIGHEST



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

EDGE MODULATION

CHANNEL: LOWEST

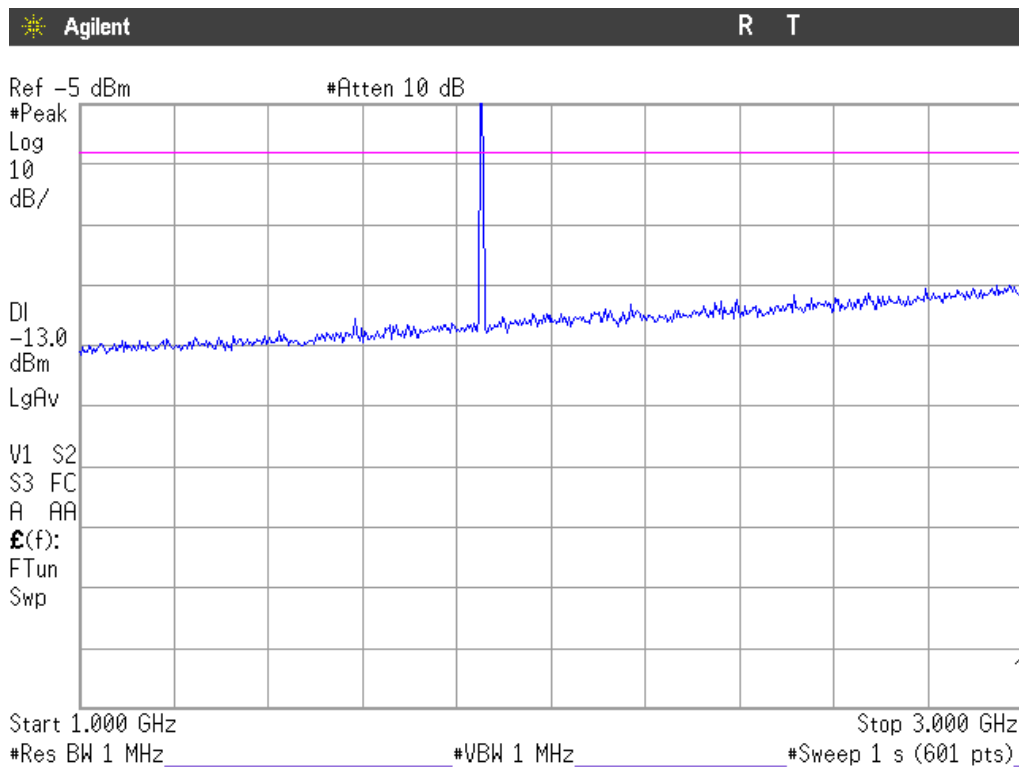


Note: The peak above the limit is the carrier frequency.



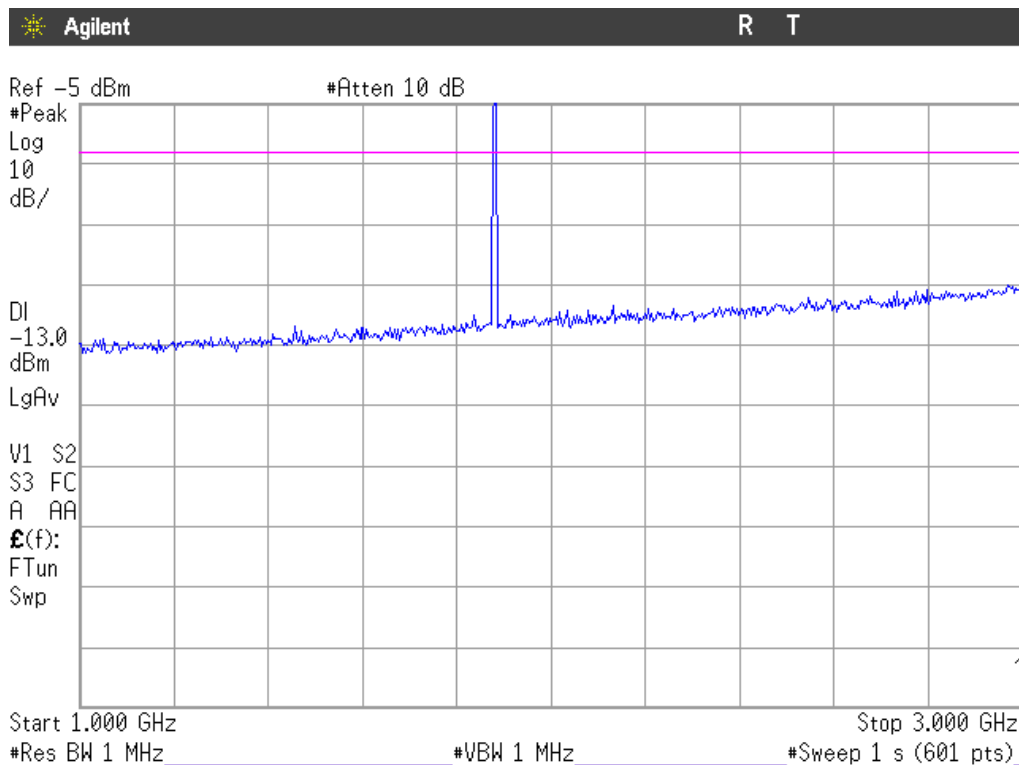
## WCDMA MODULATION

CHANNEL: LOWEST



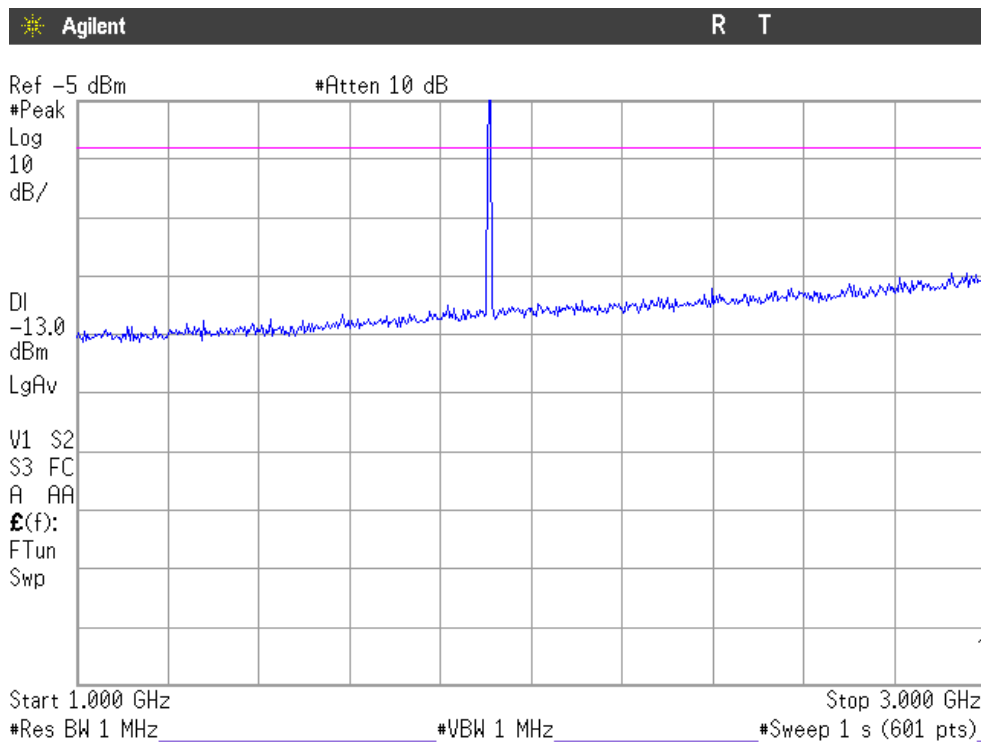
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



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

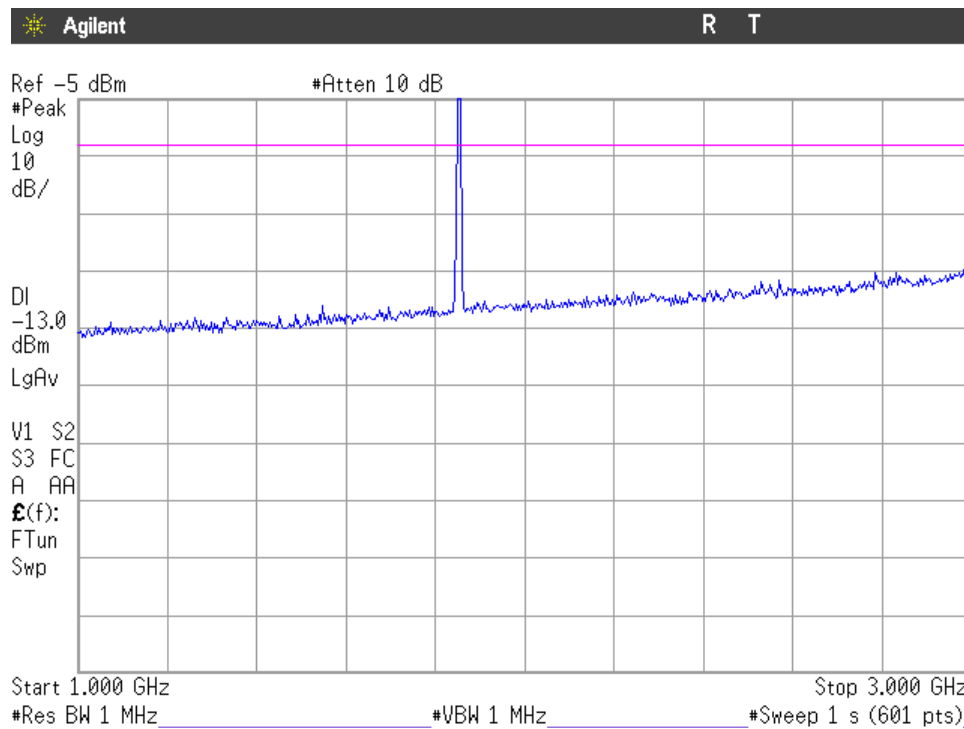
CHANNEL: HIGHEST



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

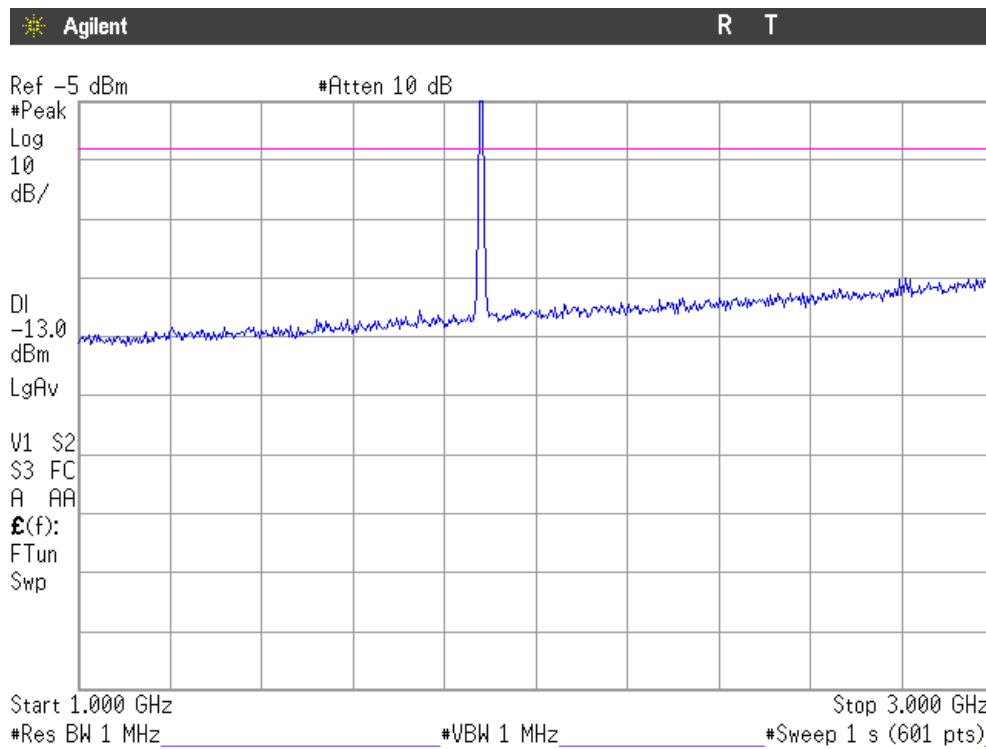
HSUPA MODULATION

CHANNEL: LOWEST



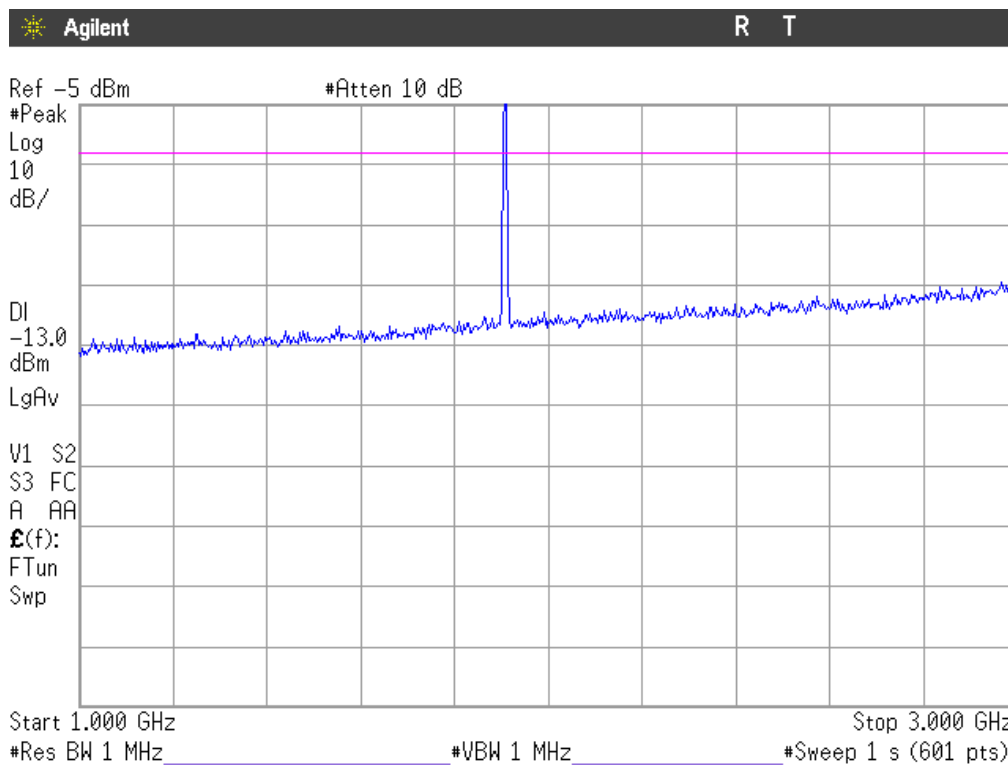
Note: The peak above the limit is the carrier frequency.

CHANNEL: MIDDLE



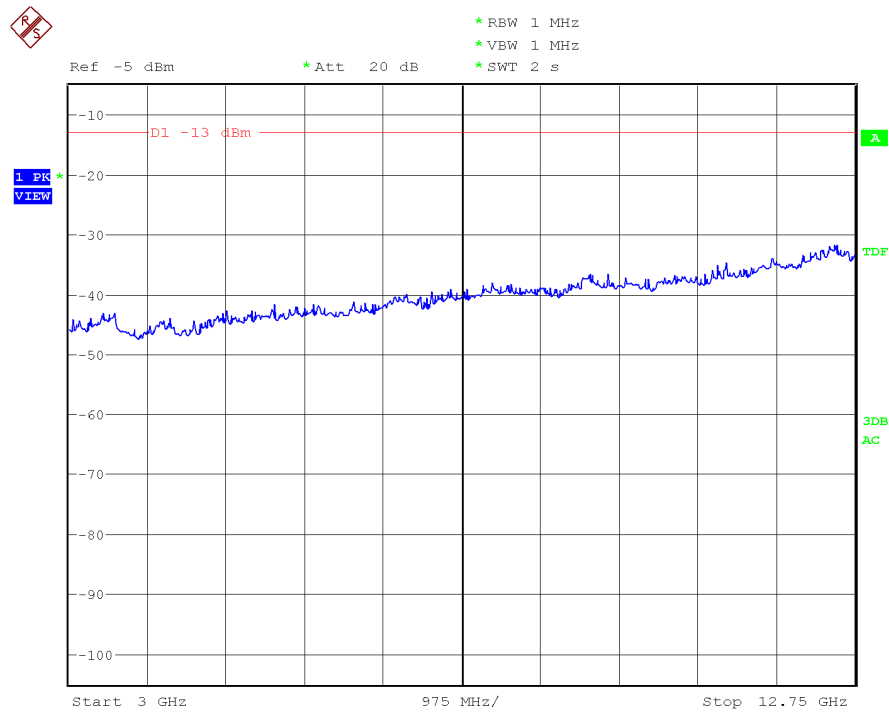
Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST



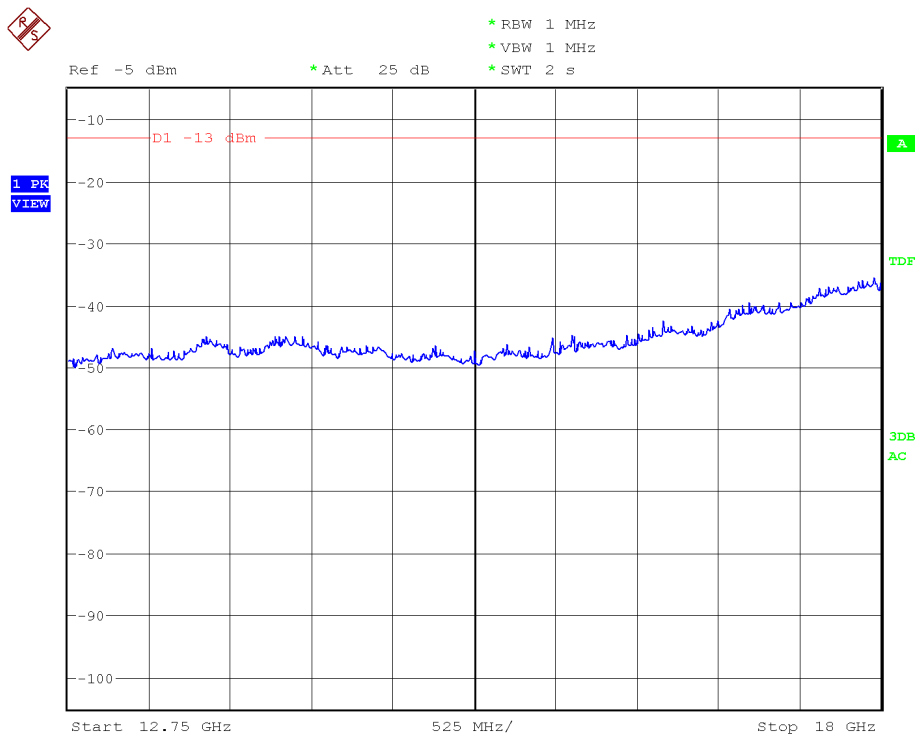
Note: The peak above the limit is the carrier frequency.

FREQUENCY RANGE 3 GHz to 12.75 GHz.



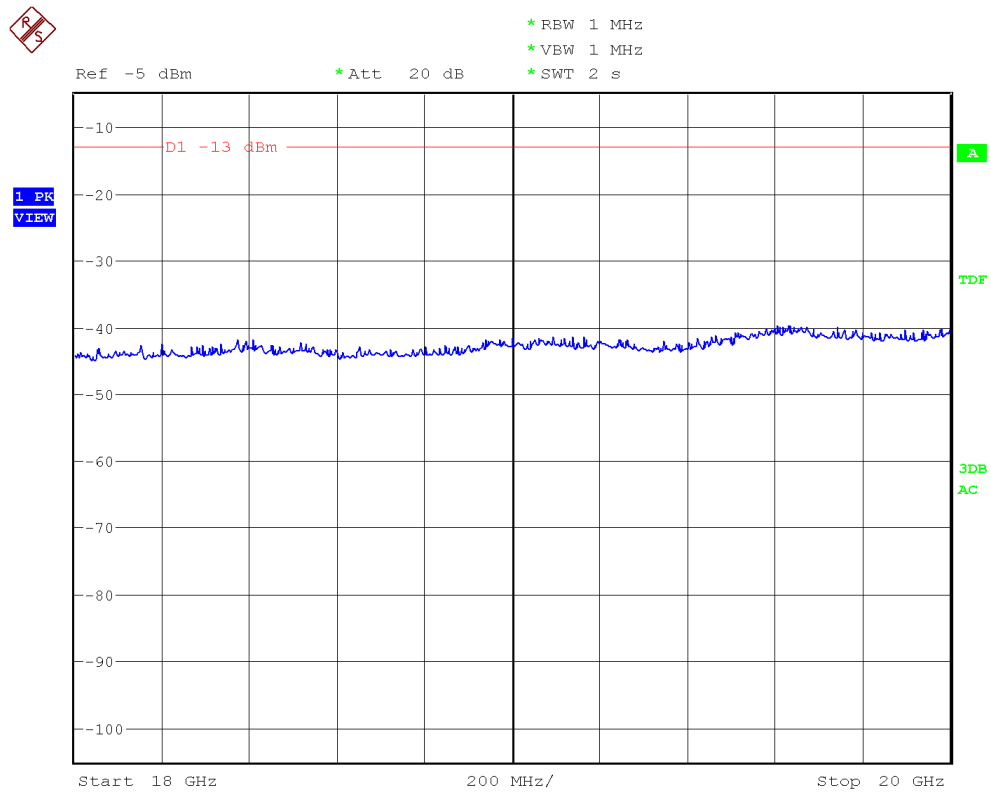
(This plot is valid for all three channels and all modulations).

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).

## **APPENDIX B: Measuring results for electromagnetic emission**



**CONTENT:**

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RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE. ....	123
CONTINUOUS CONDUCTED EMISSION ON POWER LEADS .....	136

## 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#01	EUT ON. IDLE 850 MHz. *
OM#02	EUT ON. IDLE 1900 MHz. *
OM#03	EUT ON. IDLE UMTS FDD II. *
OM#04	EUT ON. IDLE UMTS FDD V. *
OM#05	EUT ON. TCH 850 MHz. *
OM#06	EUT ON. TCH 1900 MHz. *
OM#07	EUT ON. TCH UMTS FDD II. *
OM#08	EUT ON. TCH UMTS FDD V. *

\* PCB configured for nominal voltage. EUT powered by the AC/DC adapter.

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 150 kHz to 30 MHz is  $I = \pm 3,60$  dB for quasi-peak measurements,  $I = \pm 3,48$  dB for peak measurements ( $k = 2$ ).

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 1 GHz is  $I = \pm 4,57$  dB for quasi-peak measurements,  $I = \pm 4,48$  dB for peak measurements ( $k = 2$ ) and from 1 to 12,75 GHz is  $I = \pm 3,43$  dB for average and peak measurements.

**RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE.**

<b>LIMITS:</b>	Product standard :	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART B
	Test standard :	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART B

**LIMITS OF INTERFERENCE CLASS B**

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B & IC RSS-Gen Issue 2, June 2007 in the frequency range 30 MHz to 12,5 GHz, for Class B equipment, which is a transmitter in a band over 500 MHz, was:

Frequency range (MHz)	Limit for 3 m (µV/m)	Limit for 3 m (dBµV/m)
30 to 88	100	40
88 to 216	150	43,52
216 to 960	200	46,02
Above 960	500	53,98

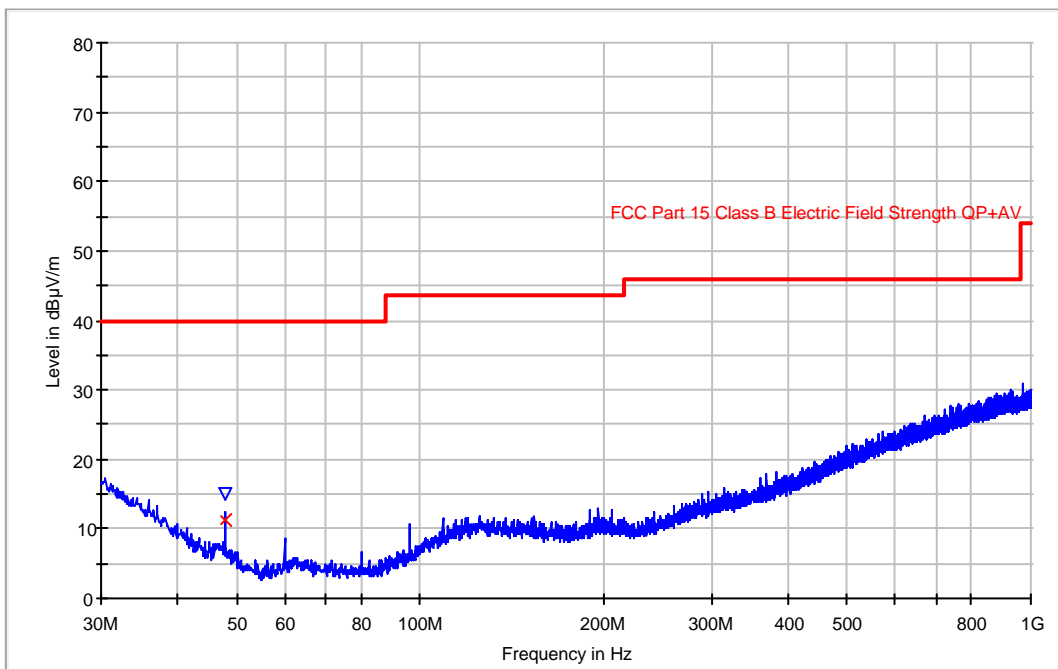
<b>TESTED SAMPLES:</b>	S/01
<b>TESTED OPERATION MODES:</b>	OM#01 to 04
<b>TEST RESULTS :</b>	CRmmnn: CR, Radiation Condition; mm: Sample number; nn: Operation mode, xx: Polarisation.

CRmmnn	Description	Result
CR0101	EUT ON. Idle 850 MHz. Range 30 - 1000 MHz.	P
CR0102	EUT ON. Idle 1900 MHz. Range 30 - 1000 MHz.	P
CR0103	EUT ON. Idle UMTS FDD II. Range 30 - 1000 MHz.	P
CR0104	EUT ON. Idle UMTS FDD V. Range 30 - 1000 MHz.	P
CR0101PH	EUT ON. Idle 850 MHz. Range 1 – 12.5 GHz. Horizontal polarisation.	P
CR0101PV	EUT ON. Idle 850 MHz. Range 1 – 12.5 GHz. Vertical polarization	P
CR0102PH	EUT ON. Idle 1900 MHz. Range 1 – 12.5 GHz. Horizontal polarization	P
CR0102PV	EUT ON. Idle 1900 MHz. Range 1 – 12.5 GHz. Vertical polarization	P
CR0103PH	EUT ON. Idle UMTS FDD II. Range 1 – 12.5 GHz. Horizontal polarization	P
CR0103PV	EUT ON. Idle UMTS FDD II. Range 1 – 12.5 GHz. Vertical polarization	P
CR0104PH	EUT ON. Idle UMTS FDD V. Range 1 – 12.5 GHz. Horizontal polarization	P
CR0104PV	EUT ON. Idle UMTS FDD V. Range 1 – 12.5 GHz. Vertical polarization	P

**Radiated Emission: CR0101 (30MHz to 1GHz)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#01  
 Setup: EMI radiated  
 Mode: EUT ON. Idle 850MHz. Vnom.

**FCC class B Bilog Hybrid**



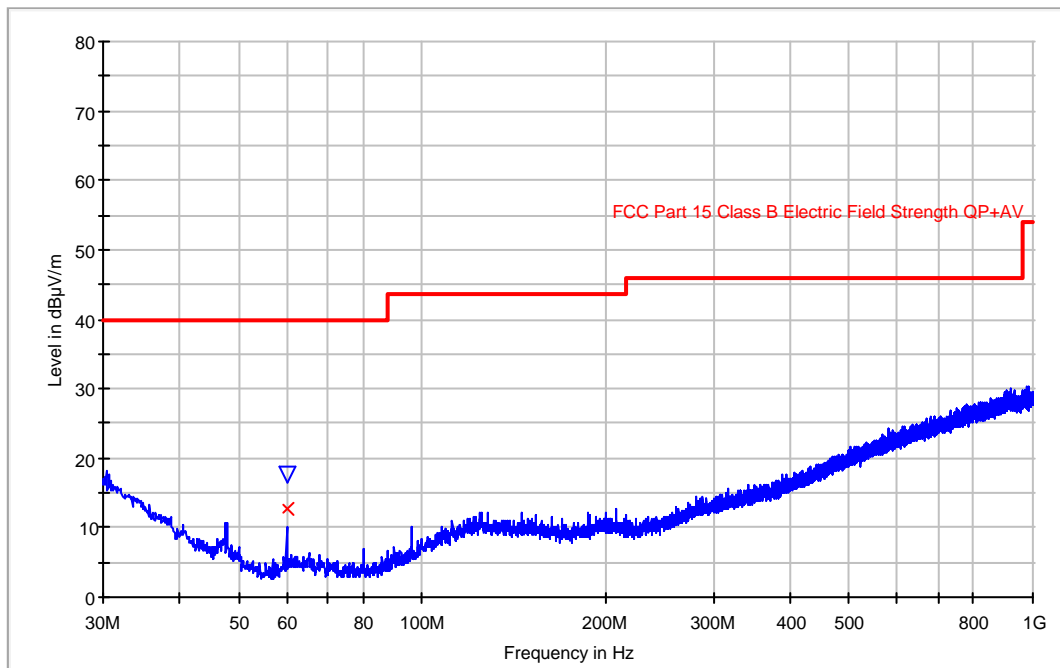
**Maximized**

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Antenna height (cm)	Polarity	Turntable position (deg)
47.993587	11.4	15.1	113.00	V	325.0

**Radiated Emission: CR0102 (30MHz to 1GHz)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#02  
 Setup: EMI radiated  
 Mode: EUT ON. Idle 1900MHz. Vnom.

**FCC class B Bilog Hybrid**



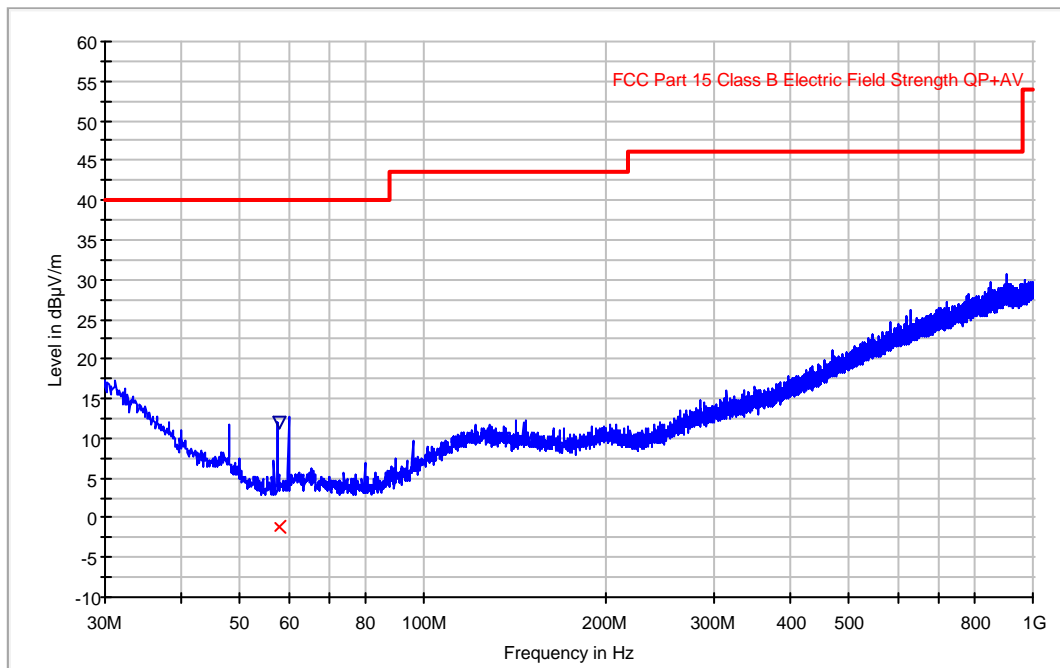
**Maximized**

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Antenna height (cm)	Polarity	Turntable position (deg)
59.986974	12.6	17.5	128.00	V	117.0

**Radiated Emission: CR0103 (30MHz to 1GHz)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#3  
 Setup: EMI radiated  
 Mode: EUT ON. Idle UMTS FDD Band II. Vnom.

**FCC class B Bilog Hybrid**



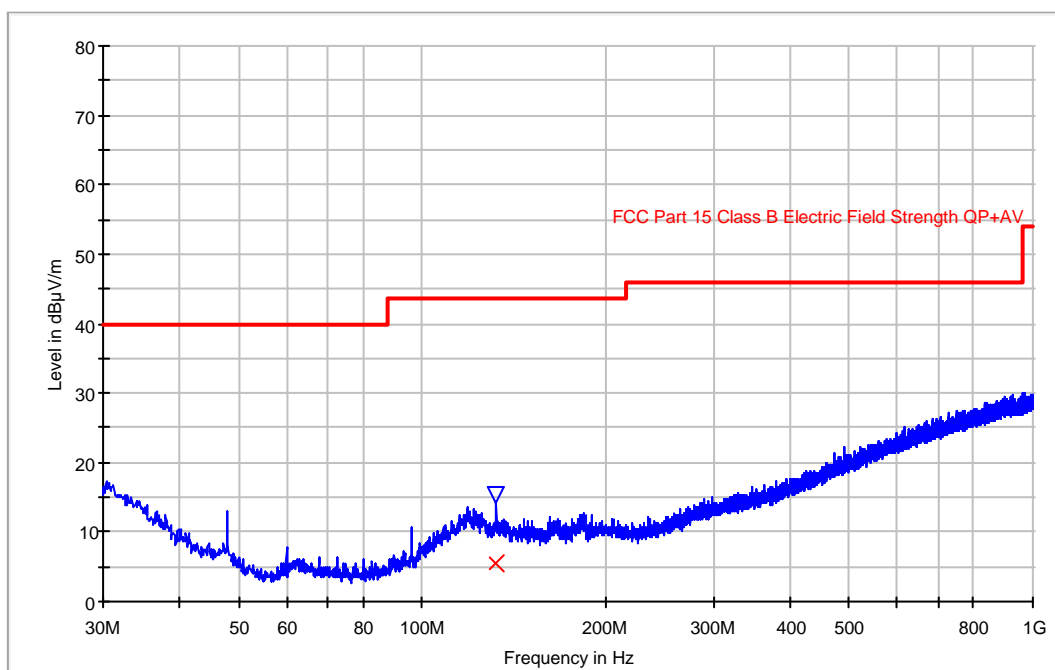
**Maximized**

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Antenna height (cm)	Polarity	Turntable position (deg)
57.899599	-1.0	12.0	265.00	H	112.0

**Radiated Emission: CR0104 (30MHz to 1GHz)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#04  
 Setup: EMI radiated  
 Mode: EUT ON. Idle UMTS FDD Band V. Vnom.

**FCC class B Bilog Hybrid**



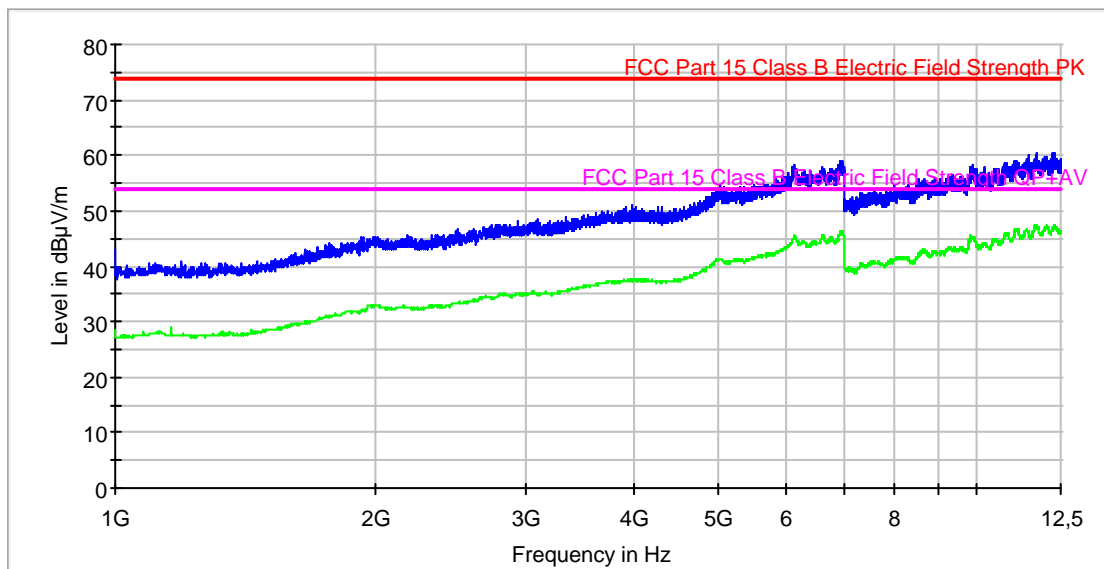
**Maximized**

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Antenna height (cm)	Polarity	Turntable position (deg)
132.144489	5.4	15.4	338.00	H	149.0

**Radiated Emission: CR0101 (1GHz to 12.5GHz Horizontal polarisation)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#01  
 Setup: 2010-03-11 14:07  
 Mode: EMI radiated  
 EUT ON. Idle 850MHz. Vnom. Horizontal polarization.

**FCC 1-12.5GHz class B**

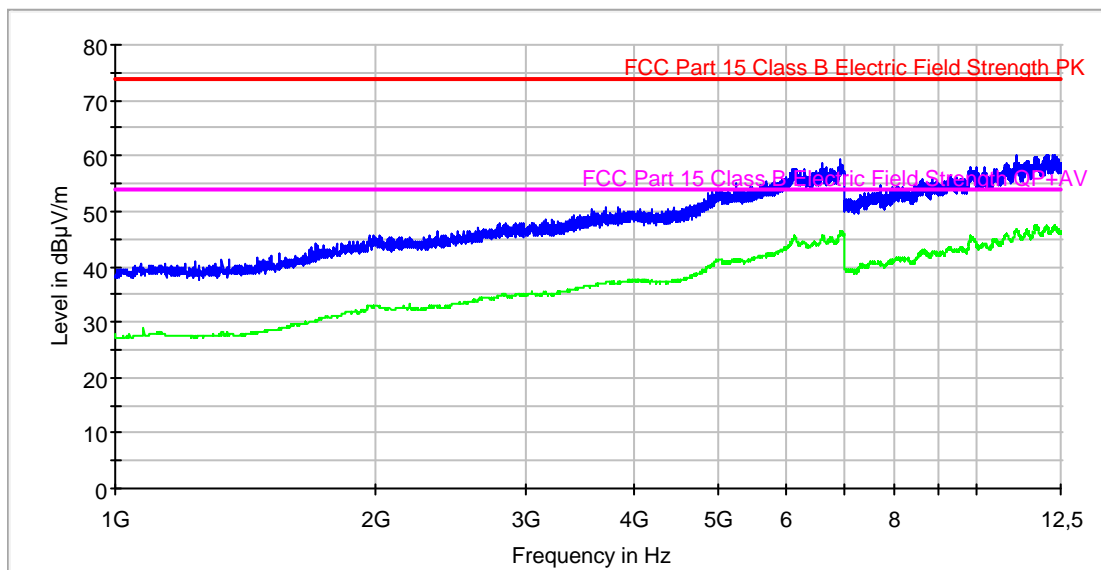




**Radiated Emission: CR0101 (1GHz to 12.5GHz Vertical polarisation)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#01  
 Setup: 2010-03-11 14:04  
 Mode: EMI radiated  
 EUT ON. Idle 850MHz. Vnom. Vertical polarization.

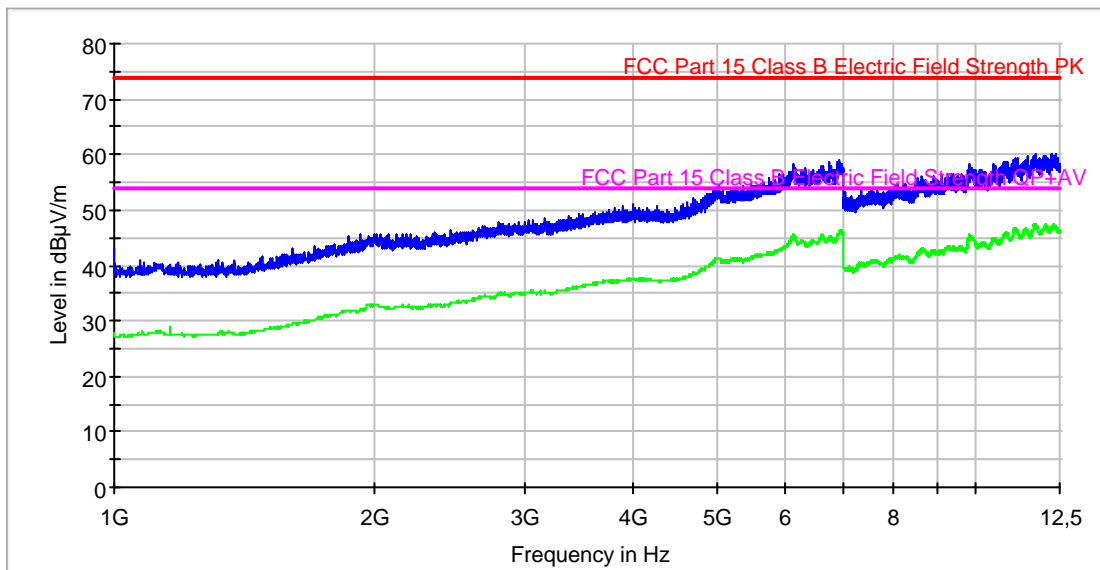
**FCC 1-12.5GHz class B**



**Radiated Emission: CR0102 (1GHz to 12.5GHz Horizontal polarisation)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#02  
 Setup: 2010-03-11 14:12  
 Mode: EMI radiated  
 EUT ON. Idle 1900MHz. Vnom. Horizontal polarization.

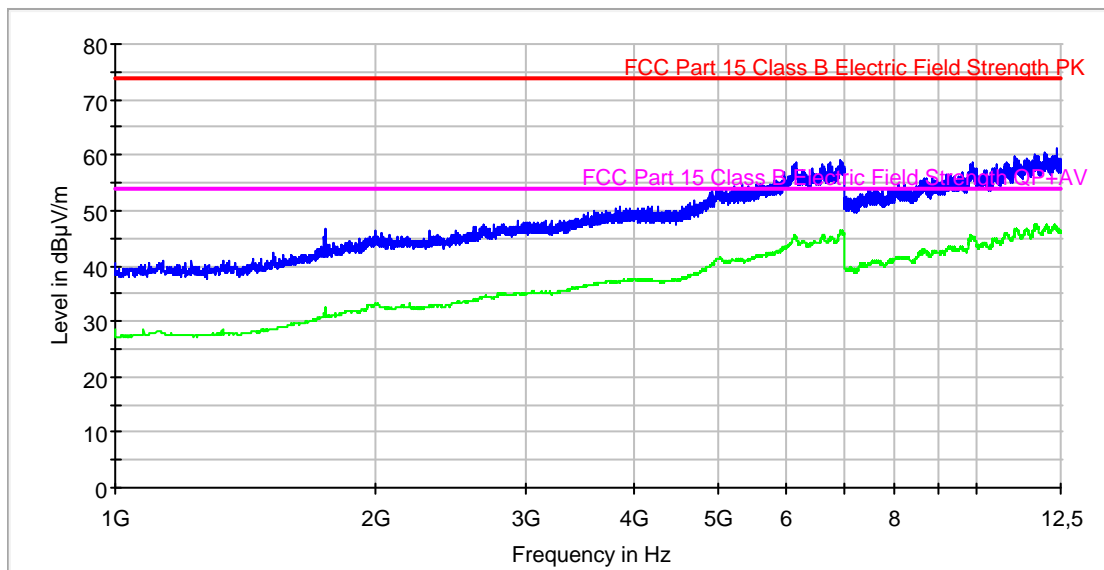
**FCC 1-12.5GHz class B**



**Radiated Emission: CR0102 (1GHz to 12.5GHz Vertical polarisation)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#02  
 Setup: 2010-03-11 14:16  
 Mode: EMI radiated  
 EUT ON. Idle 1900MHz. Vnom. Vertical polarization.

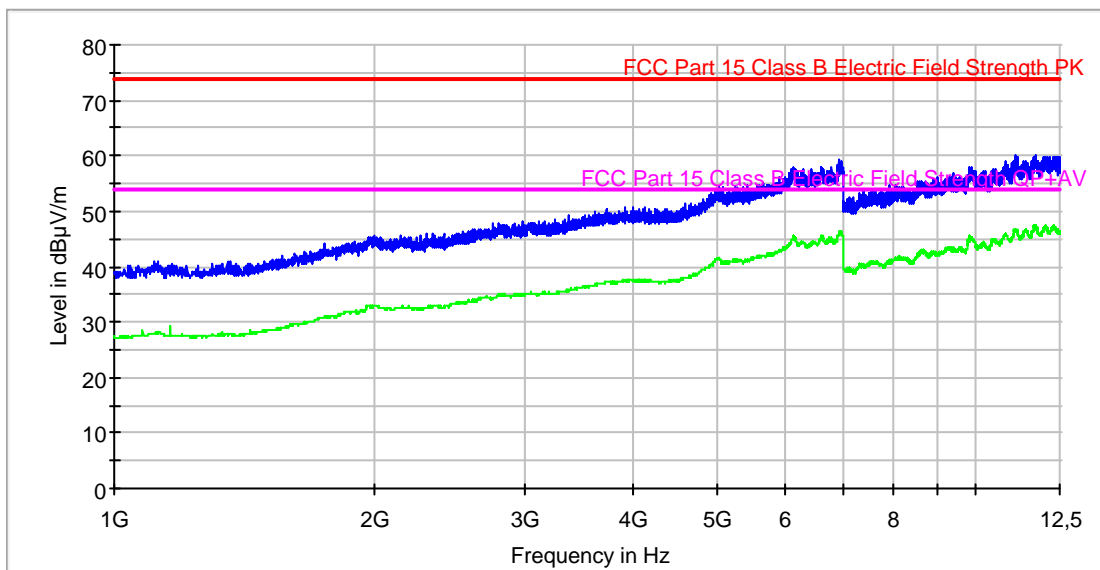
**FCC 1-12.5GHz class B**



**Radiated Emission: CR0103 (1GHz to 12.5GHz Horizontal polarisation)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#03  
 Setup: 2010-03-11 14:36  
 Mode: EMI radiated  
 EUT ON. Idle UMTS FDD II. Vnom. Horizontal polarization.

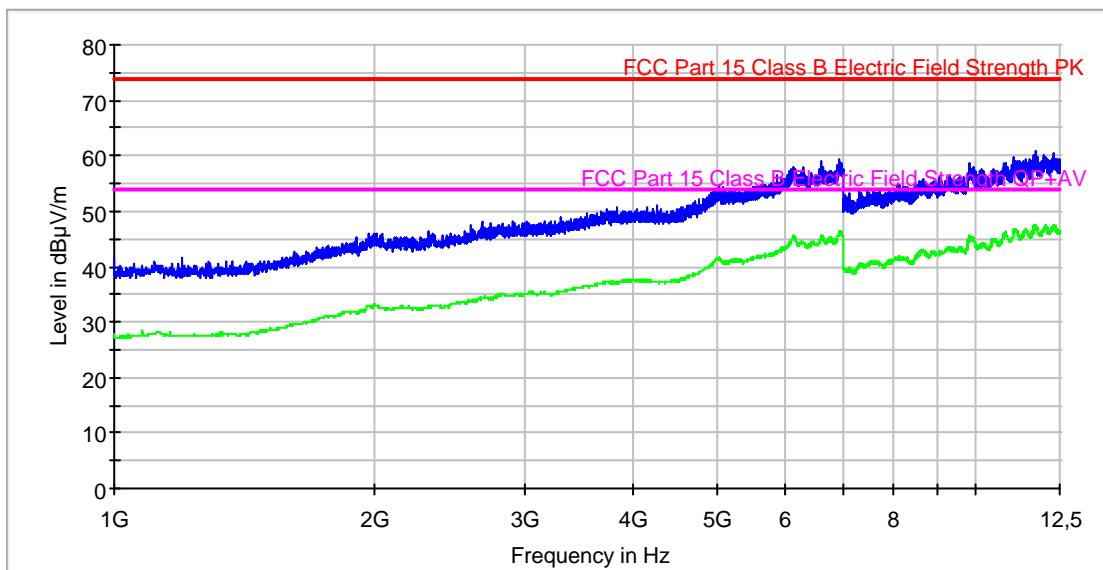
**FCC 1-12.5GHz class B**



**Radiated Emission: CR0103 (1GHz to 12.5GHz Vertical polarisation)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#03  
 Setup: 2010-03-11 14:21  
 Mode: EMI radiated  
 EUT ON. Idle UMTS FDD Band II. Vnom. Vertical polarization.

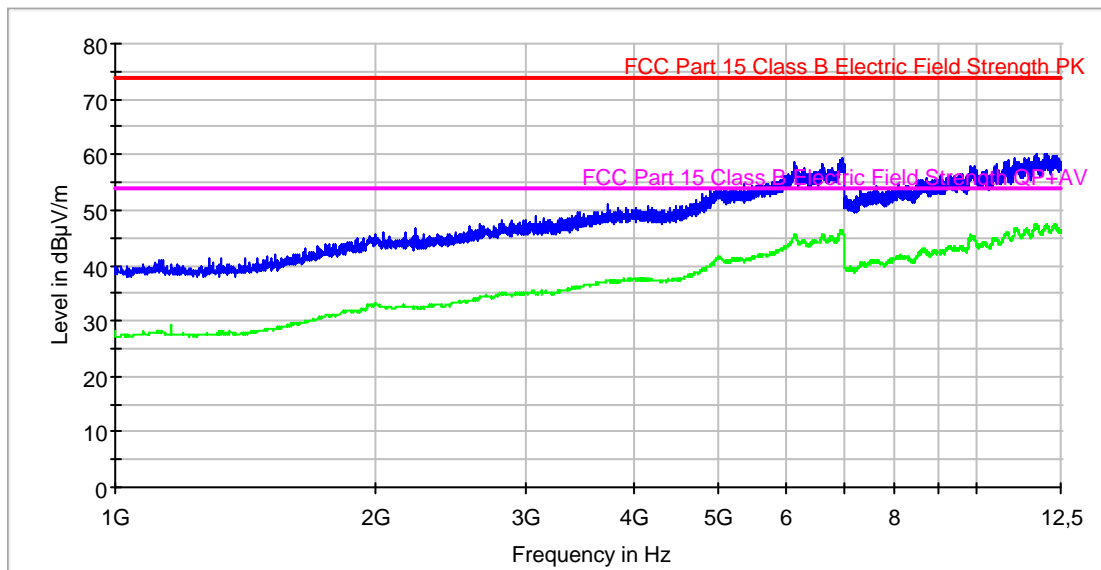
**FCC 1-12.5GHz class B**



**Radiated Emission: CR0104 (1GHz to 12.5GHz Horizontal polarisation)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#04  
 Setup: 2010-03-11 14:31  
 Mode: EMI radiated  
 EUT ON. Idle UMTS FDD Band V. Vnom. Horizontal polarization.

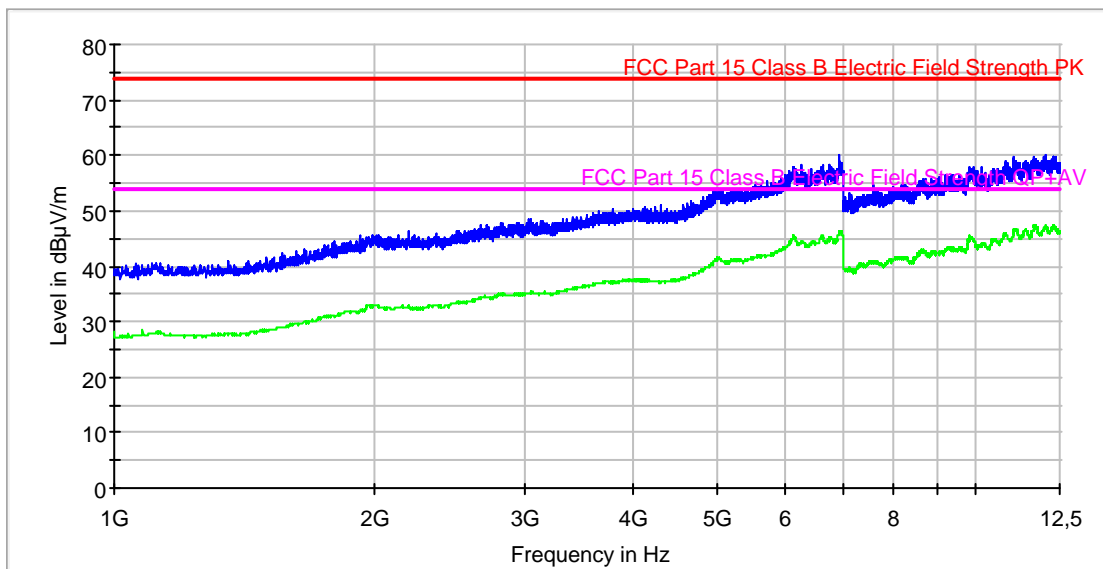
**FCC 1-12.5GHz class B**



**Radiated Emission: CR0104 (1GHz to 12.5GHz Vertical polarisation)**

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: MO#04  
 Setup: 2010-03-11 14:35  
 Mode: EMI radiated  
 EUT ON. Idle UMTS Fdd Band V. Vnom. Vertical polarization.

**FCC 1-12.5GHz class B**



## CONTINUOUS CONDUCTED EMISSION ON POWER LEADS

<b>LIMITS:</b>	Product standard :	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART B & IC RSS-GEN ISSUE 2, JUNE 2007
	Test standard :	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART B & IC RSS-GEN ISSUE 2, JUNE 2007

### 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 B IC RSS-Gen Issue 2, June 2007 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

<b>TESTED SAMPLES:</b>	S/01
<b>TESTED OPERATION MODES:</b>	OM#01 to OM#08
<b>TEST RESULTS :</b>	CCmmnnhh: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire

CCmmnnhh	Description	Result
CC0101L1	Phase wire noise	P
CC01010N	Neutral wire noise	P
CC0102L1	Phase wire noise	P
CC01020N	Neutral wire noise	P
CC0103L1	Phase wire noise	P
CC01030N	Neutral wire noise	P
CC0104L1	Phase wire noise	P
CC01040N	Neutral wire noise	P
CC0105L1	Phase wire noise	P
CC01050N	Neutral wire noise	P
CC0106L1	Phase wire noise	P
CC01060N	Neutral wire noise	P
CC0107L1	Phase wire noise	P
CC01070N	Neutral wire noise	P
CC0108L1	Phase wire noise	P
CC01080N	Neutral wire noise	P

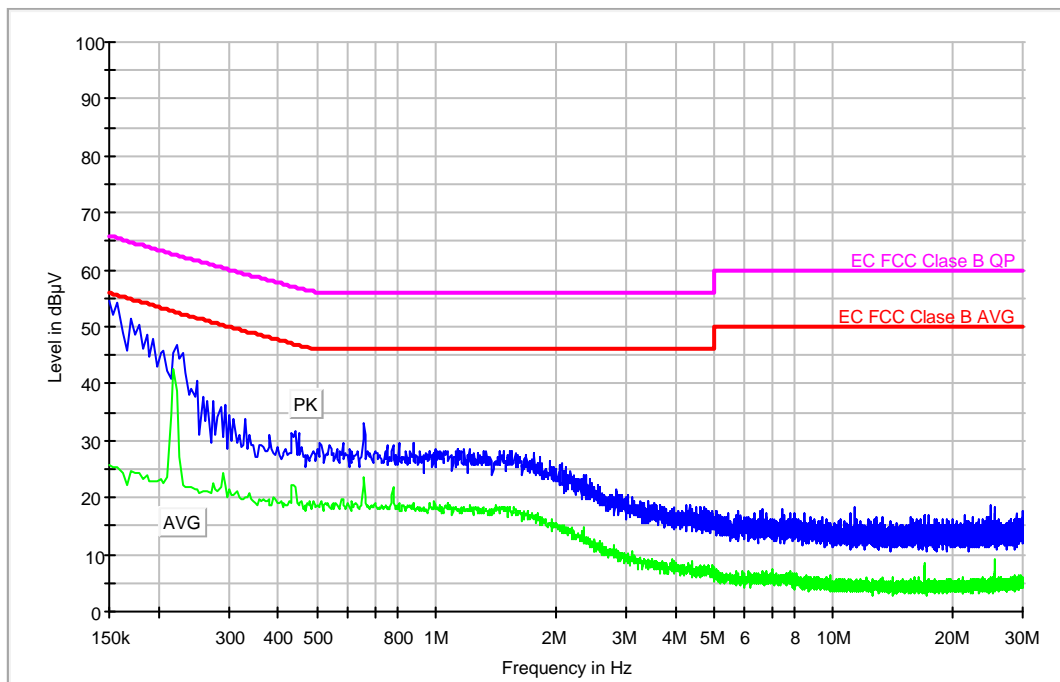


Continuous Conducted emission : CC0101L1

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#01  
 Date: 2010-03-12 17:27  
 Setup: EMI conducted  
 Mode: EUT ON. Idle 850MHz. Phase noise.

### EC FCC Class B ESPI CC



### Maximized

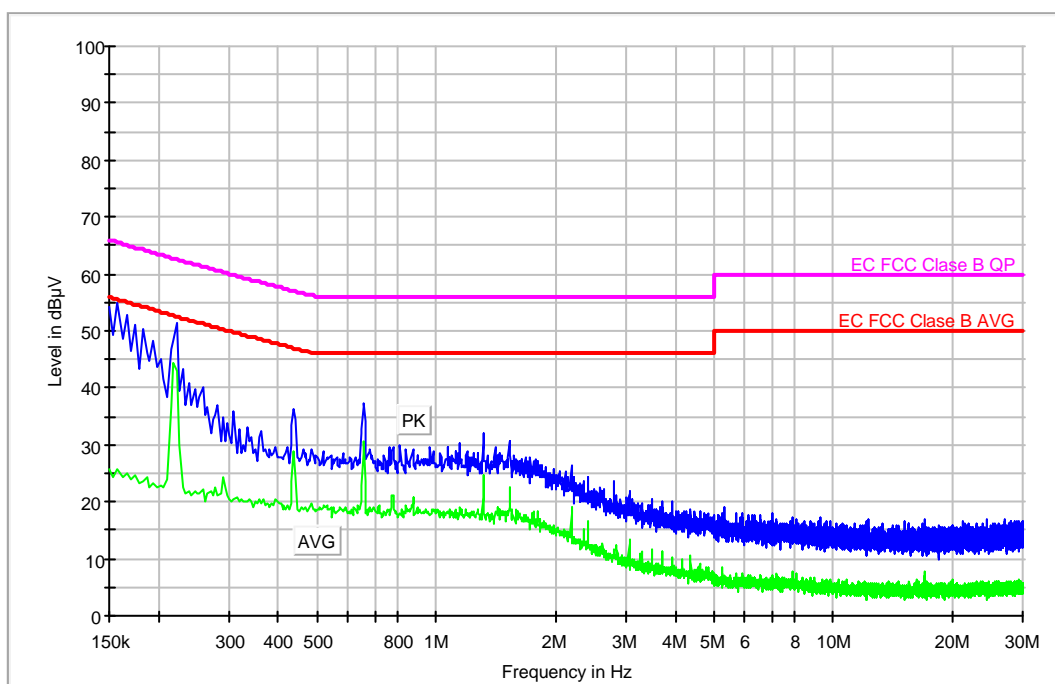
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.158000	54.3	25.3
0.150000	54.6	25.5
0.170000	51.5	24.8
0.154000	52.2	25.3
0.178000	50.4	24.5
0.186000	48.6	23.9
0.194000	48.0	23.1
0.222000	46.7	38.6
0.174000	48.7	24.1
0.162000	49.0	24.2

Continuous Conducted emission : CC01010N

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#01  
 Date: 2010-03-12 17:24  
 Setup: EMI conducted  
 Mode: EUT ON. Idle 850MHz. Neutral noise.

### EC FCC Class B ESPI CC



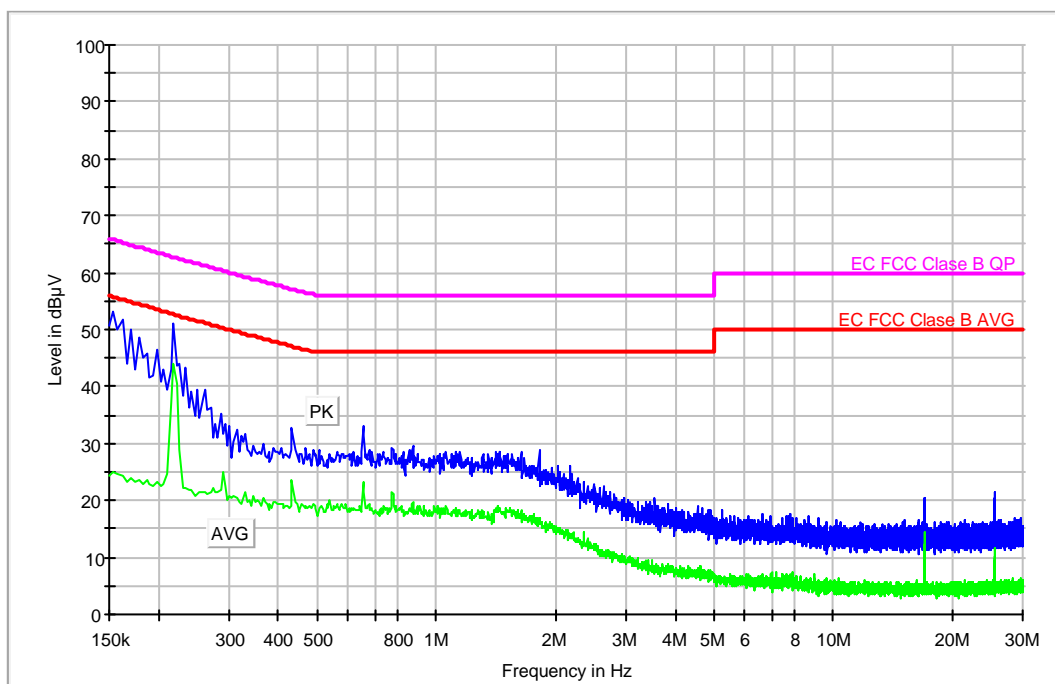
### Maximized

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.158000	54.9	25.8
0.222000	51.3	42.9
0.150000	54.4	25.6
0.166000	52.9	24.9
0.174000	50.9	24.6
0.182000	50.3	23.6
0.218000	48.3	44.4
0.194000	48.3	23.2
0.214000	46.7	36.6
0.154000	49.2	24.3

Continuous Conducted emission : CC0102L1	Detector : Peak / Average / Cuasi-peak
--	--

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#02  
 Date: 2010-03-12 17:51  
 Setup: EMI conducted  
 Mode: EUT ON. Idle 1900MHz. Phase noise.

### EC FCC Class B ESPI CC



### Maximized

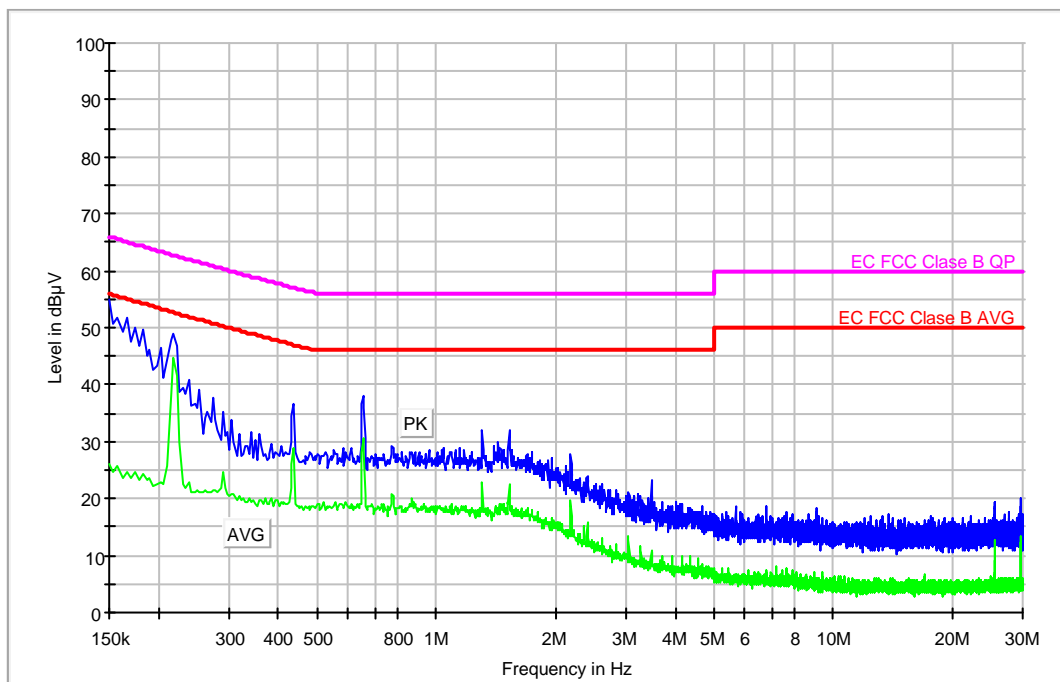
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.218000	51.1	44.0
0.154000	53.3	25.0
0.162000	51.8	24.5
0.170000	50.1	24.0
0.150000	50.5	24.2
0.158000	50.0	24.7
0.178000	48.6	23.6
0.198000	46.6	23.3
0.186000	45.9	23.4
0.226000	44.0	28.8

Continuous Conducted emission : CC01020N

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#02  
 Date: 2010-03-12 17:47  
 Setup: EMI conducted  
 Mode: EUT ON. Idle 1900MHz. Neutral noise.

### EC FCC Class B ESPI CC



### Maximized

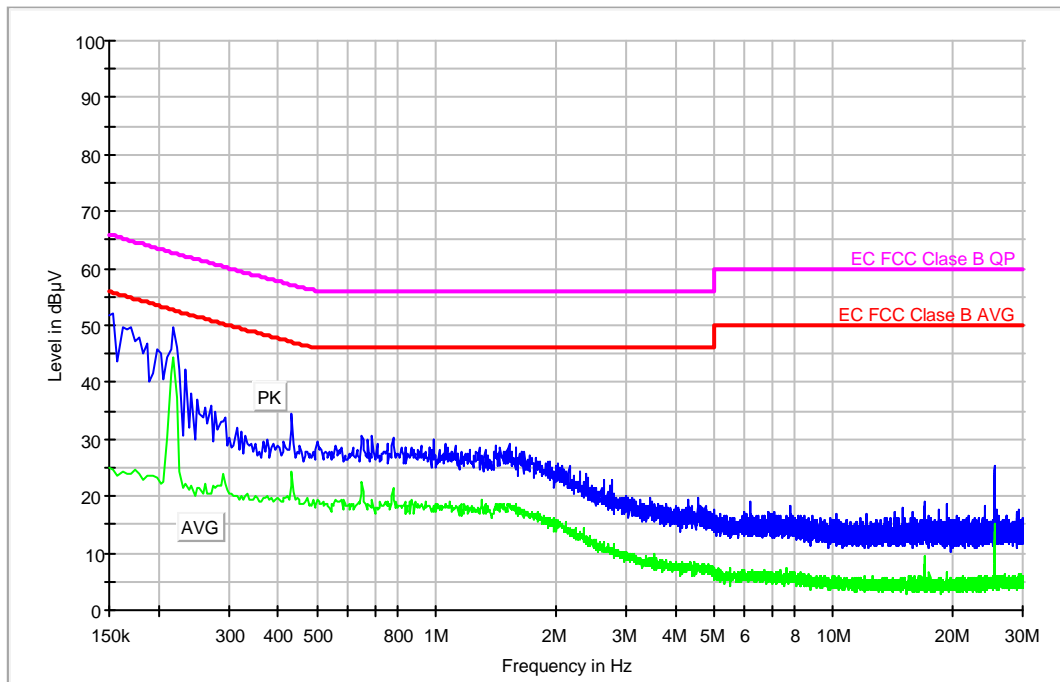
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	55.1	25.9
0.166000	51.9	24.5
0.218000	49.1	44.8
0.158000	51.7	25.8
0.174000	50.1	24.7
0.182000	49.5	24.1
0.214000	48.0	38.5
0.154000	50.8	24.7
0.222000	47.0	41.7
0.162000	49.4	23.4

Continuous Conducted emission : CC0103L1

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#03  
 Date: 2010-03-12 18:22  
 Setup: EMI conducted  
 Mode: EUT ON. Idle UMTS FDD II. Phase noise.

### EC FCC Class B ESPI CC



### Maximized

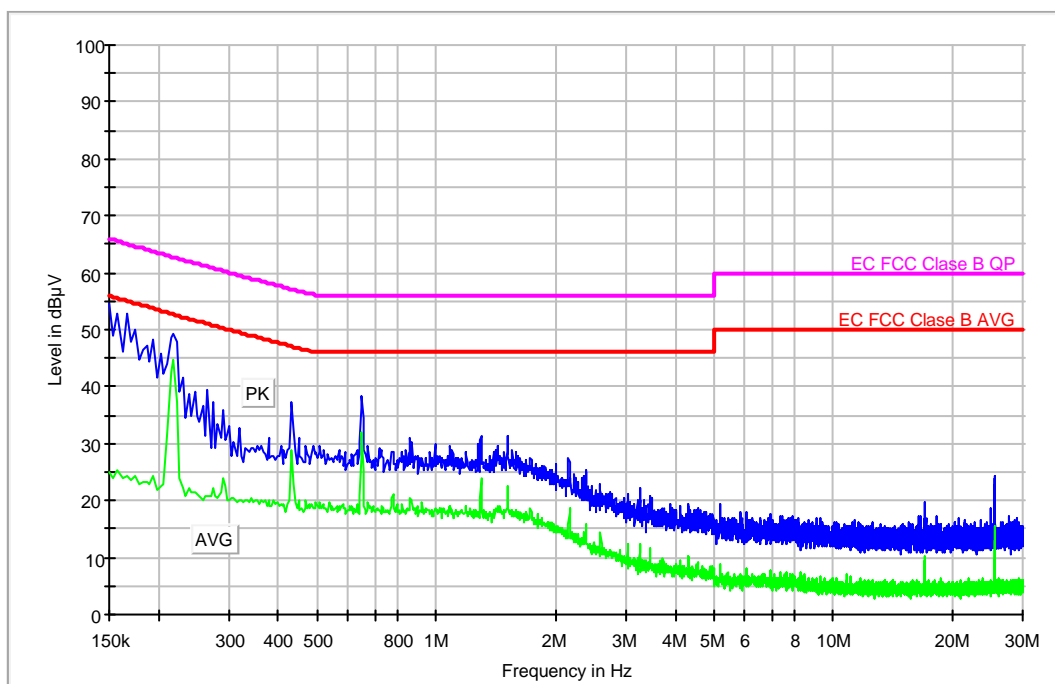
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.218000	49.6	44.4
0.154000	52.0	24.7
0.150000	51.7	25.0
0.170000	49.6	23.9
0.162000	49.8	24.1
0.166000	49.2	23.9
0.222000	46.3	37.5
0.178000	47.8	23.8
0.214000	45.8	41.4
0.186000	47.0	23.5

Continuous Conducted emission : CC01030N

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#03  
 Date: 2010-03-12 18:13  
 Setup: EMI conducted  
 Mode: EUT ON. Idle UMTS FDD II. Neutral noise.

### EC FCC Class B ESPI CC



### Maximized

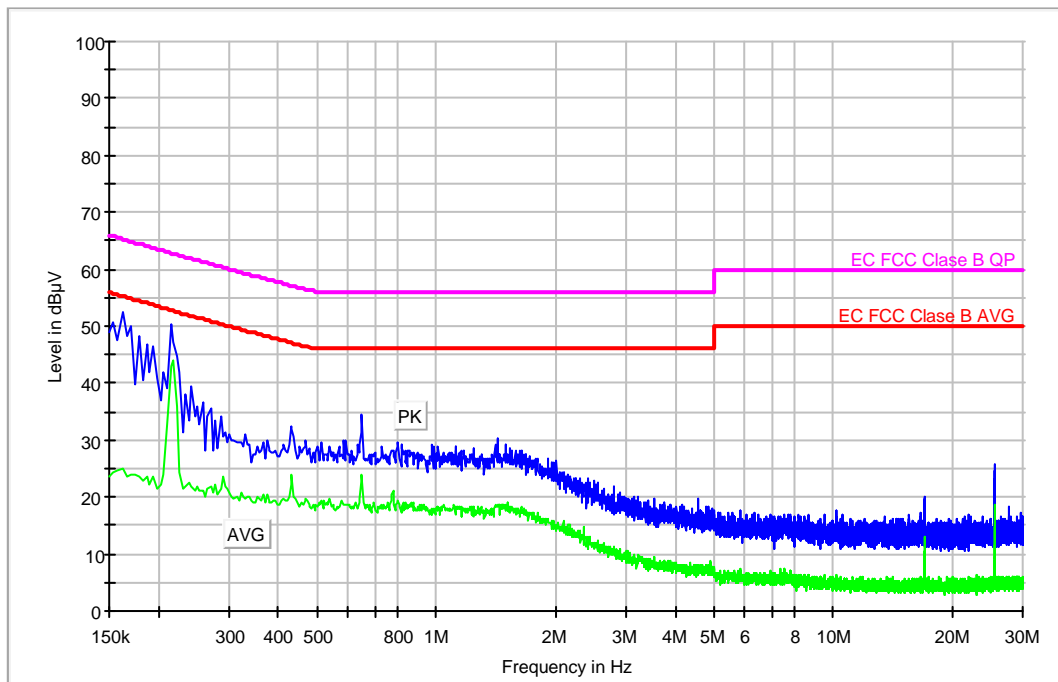
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	54.5	25.0
0.166000	52.9	24.4
0.158000	52.7	25.4
0.218000	49.4	44.6
0.214000	48.5	42.7
0.174000	50.1	24.2
0.222000	48.0	37.4
0.194000	48.2	24.1
0.186000	47.2	23.3
0.154000	48.8	23.8

Continuous Conducted emission : CC0104L1

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#04  
 Date: 2010-03-12 18:42  
 Setup: EMI conducted  
 Mode: EUT ON. Idle UMTS FDD V. Phase noise.

### EC FCC Class B ESPI CC



### Maximized

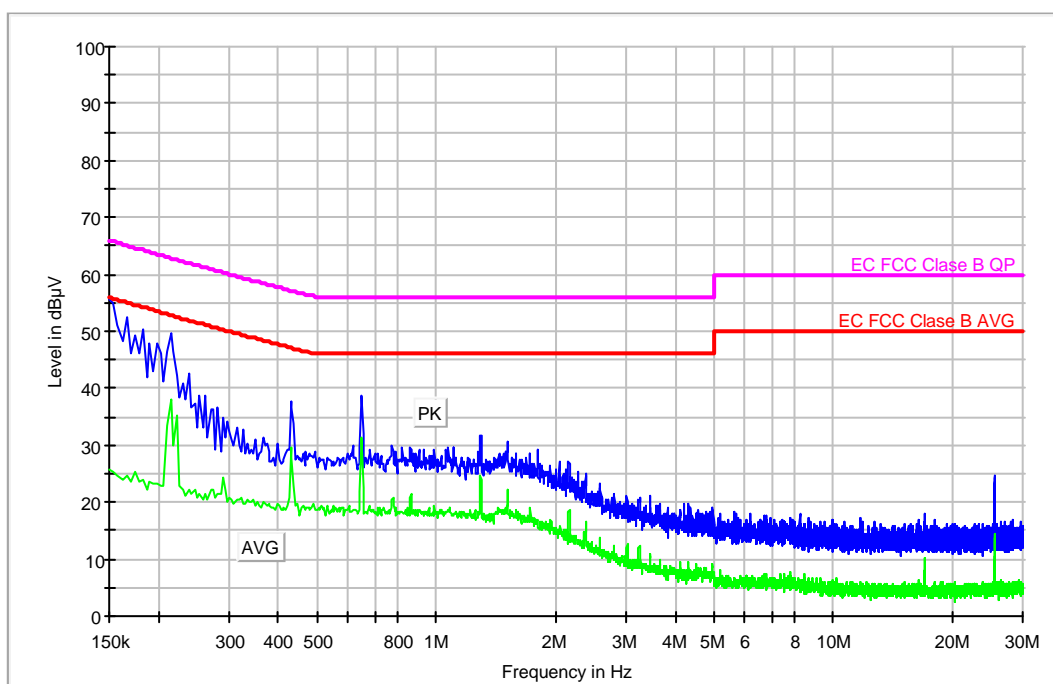
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.214000	50.3	43.0
0.162000	52.3	24.8
0.170000	50.1	24.1
0.154000	50.6	24.3
0.218000	47.0	44.2
0.178000	48.3	23.6
0.166000	48.1	23.5
0.150000	48.9	23.5
0.186000	47.0	23.5
0.194000	46.4	23.5

Continuous Conducted emission : CC01040N

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#04  
 Date: 2010-03-12 18:38  
 Setup: EMI conducted  
 Mode: EUT ON. Idle UMTS FDD V. Neutral noise.

### EC FCC Class B ESPI CC



### Maximized

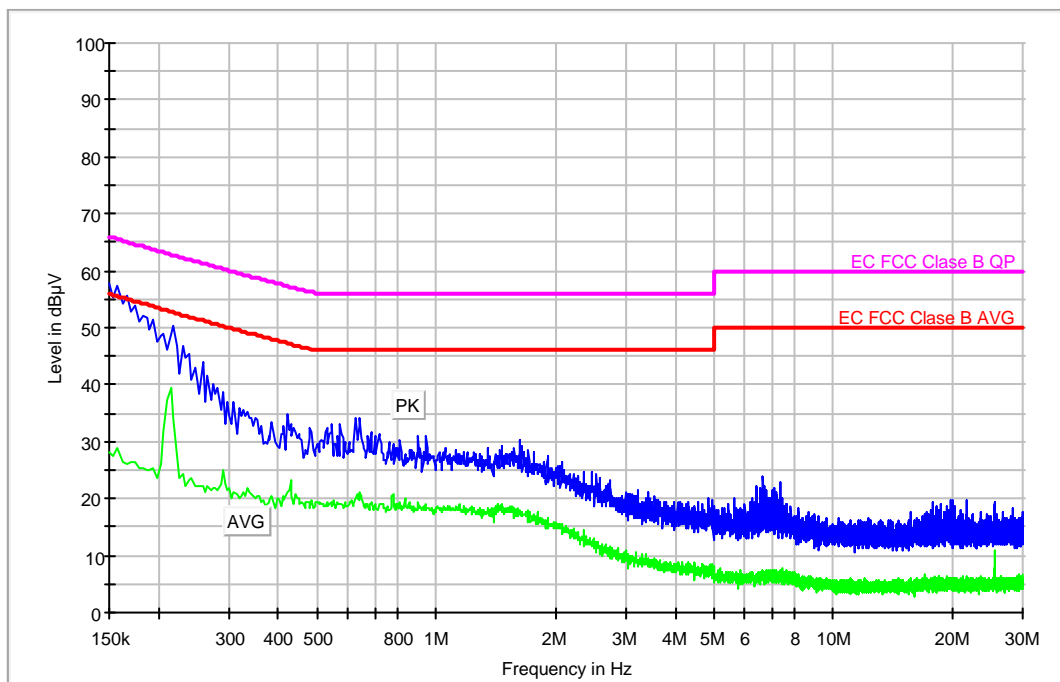
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	55.6	25.8
0.154000	55.0	25.2
0.166000	52.5	24.6
0.214000	49.8	37.9
0.182000	50.2	24.0
0.158000	50.9	24.7
0.174000	49.1	25.2
0.198000	47.7	23.4
0.190000	47.9	23.4
0.218000	46.5	29.8



Continuous Conducted emission : CC0105L1	Detector : Peak / Average / Cuasi-peak
--	--

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#05  
 Date: 2010-03-12 17:36  
 Setup: EMI conducted  
 Mode: EUT ON. TCH 850MHz. Phase noise.

### EC FCC Class B ESPI CC



### Maximized

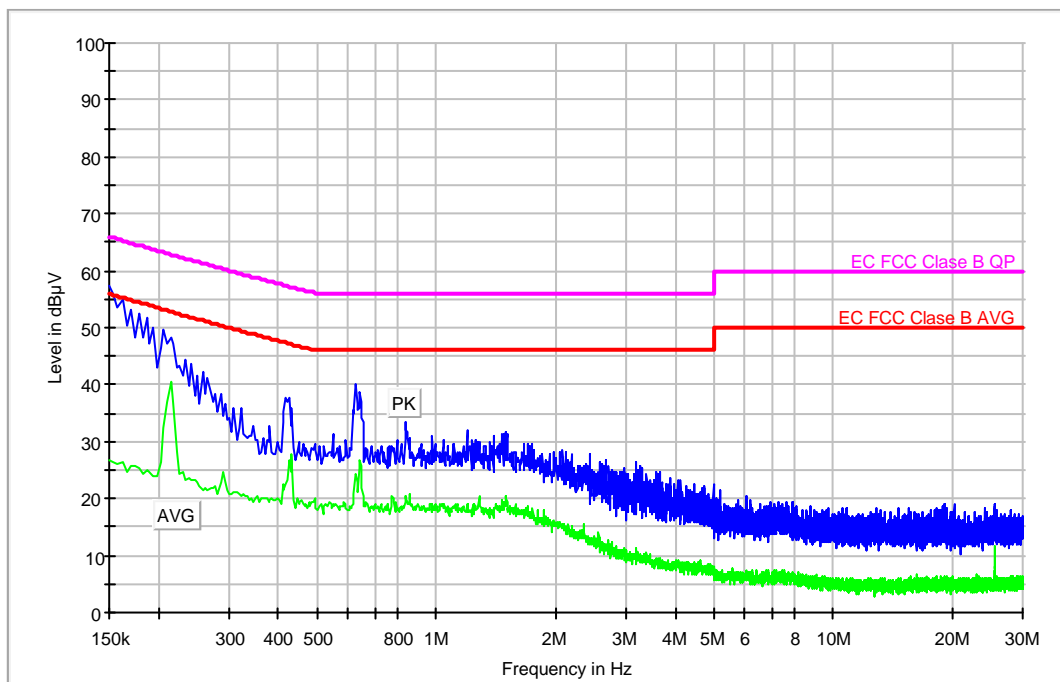
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	57.8	28.0
0.158000	57.2	29.0
0.166000	55.7	26.2
0.154000	55.3	27.6
0.174000	53.8	26.3
0.162000	54.3	26.4
0.170000	52.8	26.5
0.182000	52.2	25.3
0.194000	51.6	25.4
0.186000	51.8	24.9

Continuous Conducted emission : CC01050N

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#05  
 Date: 2010-03-12 17:32  
 Setup: EMI conducted  
 Mode: EUT ON. TCH 850MHz. Neutral noise.

### EC FCC Class B ESPI CC



### Maximized

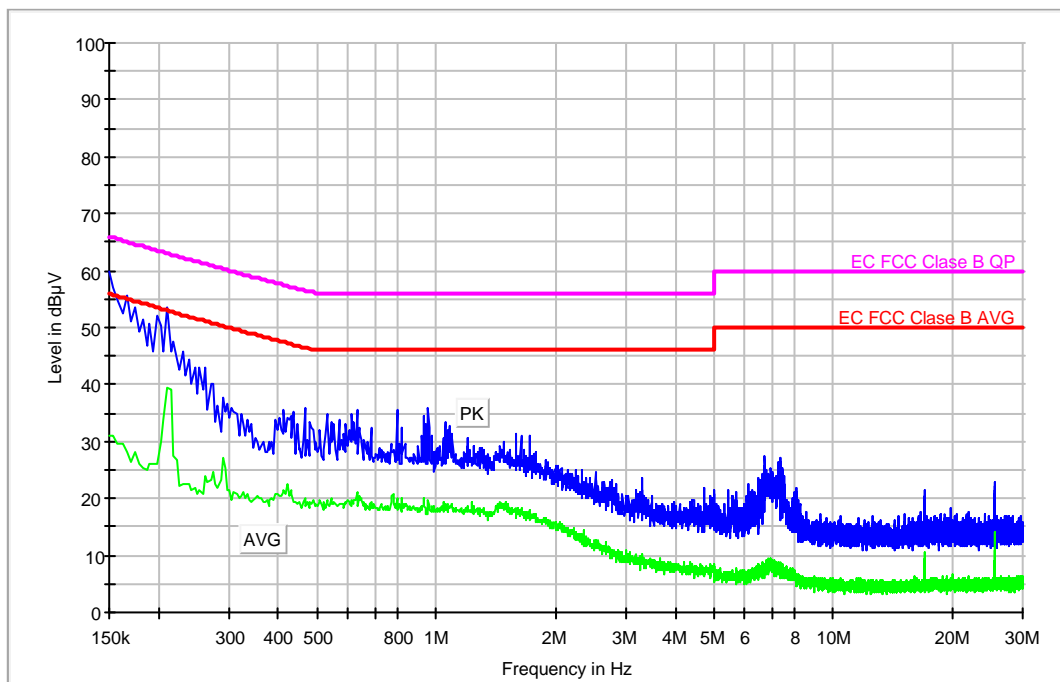
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	57.5	26.7
0.154000	56.1	26.5
0.162000	55.0	26.5
0.170000	53.1	25.6
0.178000	52.6	25.3
0.158000	53.4	25.9
0.186000	51.9	25.1
0.206000	49.8	32.5
0.194000	50.1	23.9
0.214000	48.1	40.7

Continuous Conducted emission : CC0106L1

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#06  
 Date: 2010-03-12 18:03  
 Setup: EMI conducted  
 Mode: EUT ON. TCH 1900MHz. Phase noise.

### EC FCC Class B ESPI CC



### Maximized

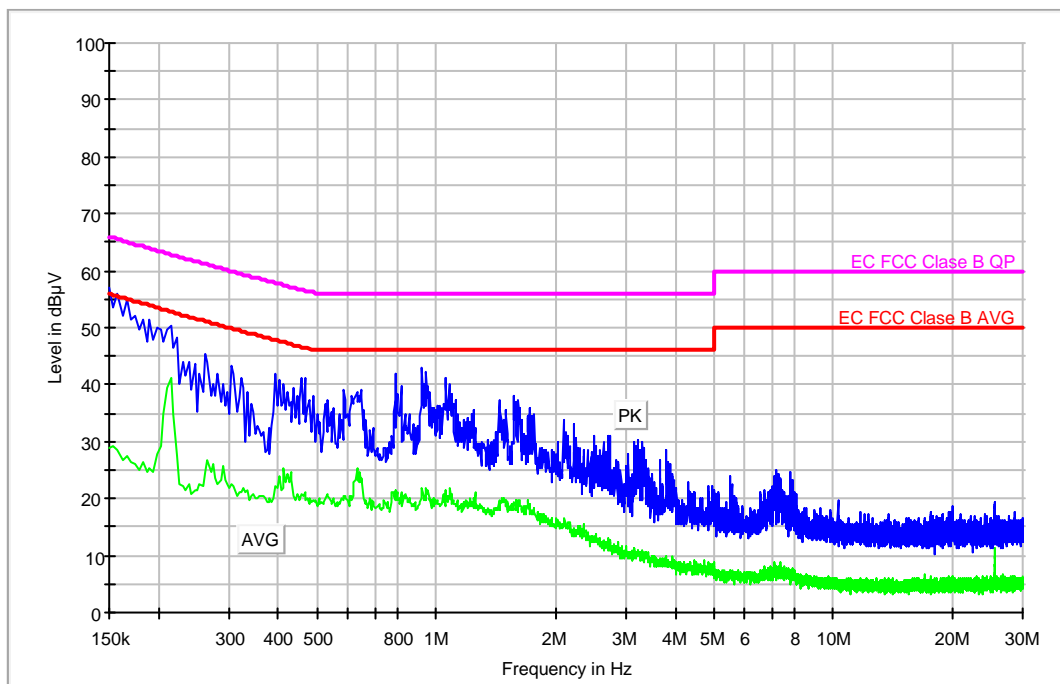
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	59.7	30.8
0.154000	57.2	31.0
0.166000	55.7	28.3
0.210000	53.6	39.3
0.158000	54.9	29.7
0.174000	53.5	28.0
0.198000	52.3	26.2
0.162000	52.6	29.4
0.182000	51.4	25.4
0.190000	50.8	26.2

Continuous Conducted emission : CC01060N

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#06  
 Date: 2010-03-12 17:59  
 Setup: EMI conducted  
 Mode: EUT ON. TCH 1900MHz. Neutral noise.

### EC FCC Class B ESPI CC



### Maximized

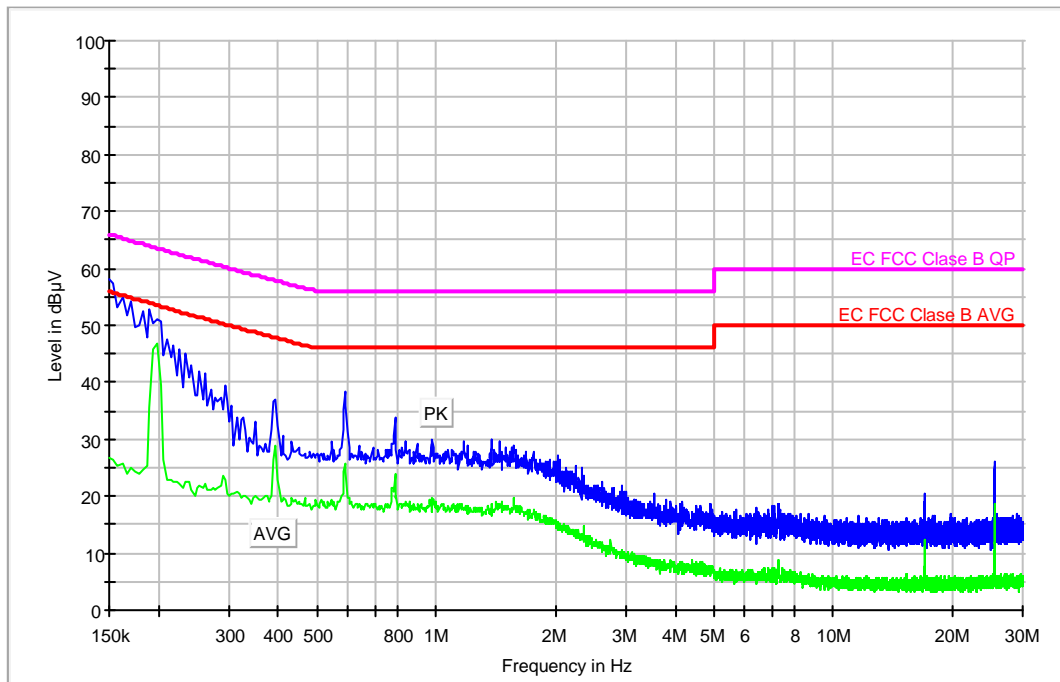
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	57.0	28.8
0.158000	56.1	28.7
0.166000	54.9	27.5
0.154000	53.5	29.1
0.174000	52.2	26.1
0.190000	51.4	25.5
0.214000	50.2	41.3
0.182000	51.5	26.3
0.922000	43.1	21.9
0.162000	52.3	26.9

Continuous Conducted emission : CC0107L1

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#07  
 Date: 2010-03-12 18:30  
 Setup: EMI conducted  
 Mode: EUT ON. TCH UNITS FDD II. Phase noise.

### EC FCC Class B ESPI CC



### Maximized

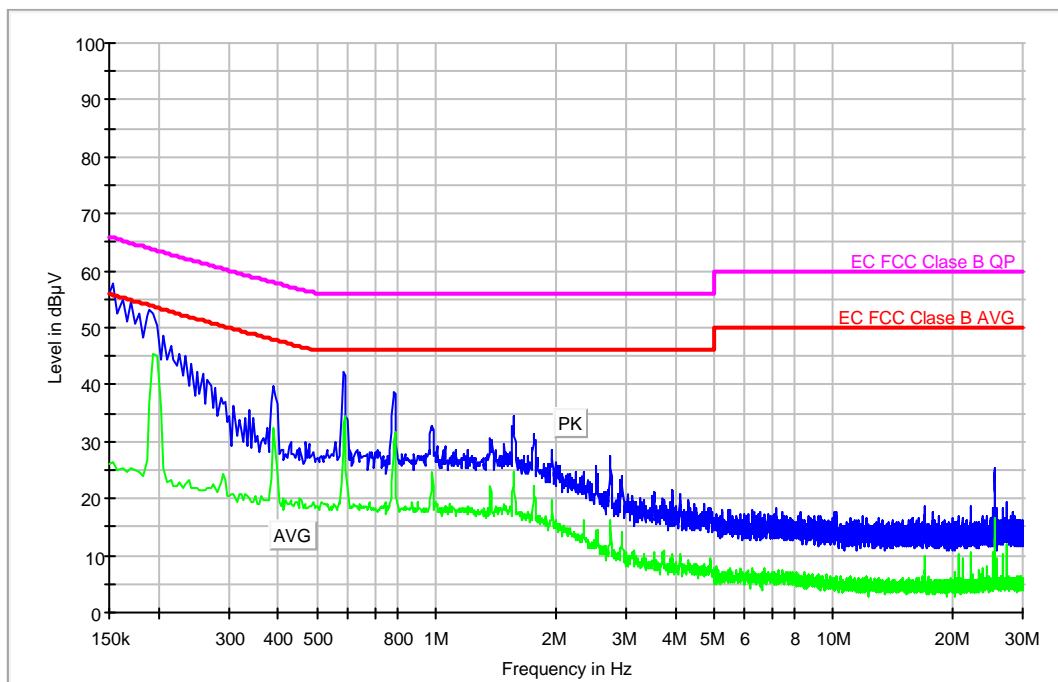
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	58.2	26.6
0.154000	57.5	26.5
0.162000	54.9	25.6
0.170000	54.1	25.1
0.190000	52.8	35.4
0.182000	52.3	24.6
0.158000	53.3	25.4
0.198000	51.0	46.9
0.202000	50.7	39.3
0.166000	51.9	24.0

Continuous Conducted emission : CC01070N

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#07  
 Date: 2010-03-12 18:26  
 Setup: EMI conducted  
 Mode: EUT ON. TCH UMTS FDD II. Neutral noise.

### EC FCC Class B ESPI CC



### Maximized

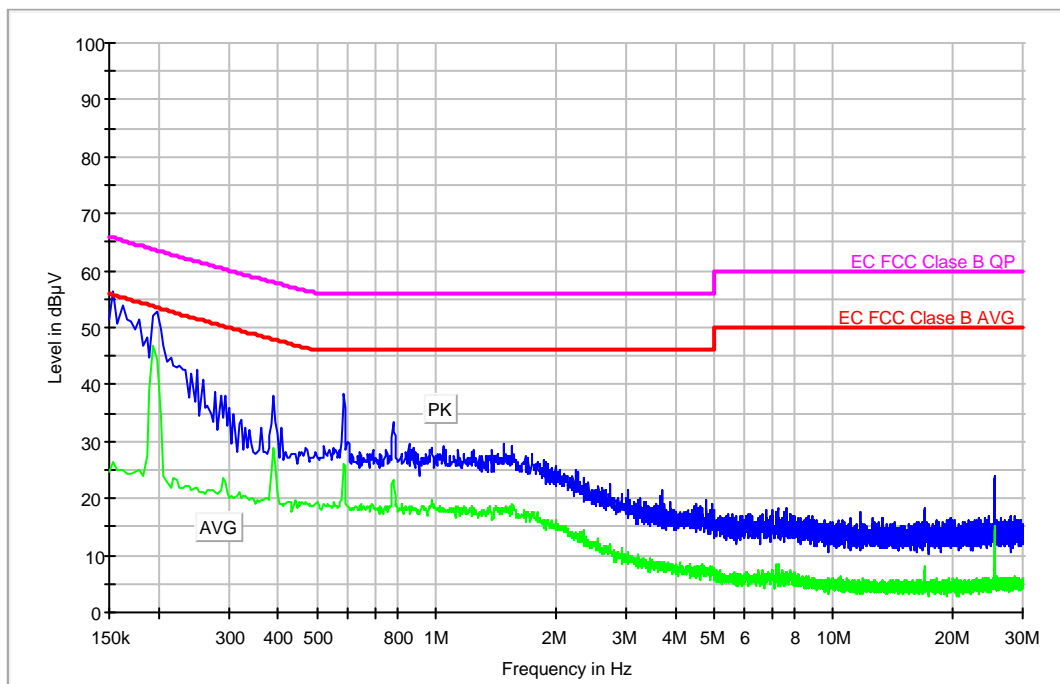
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.154000	57.7	26.5
0.150000	56.0	26.1
0.170000	54.6	25.3
0.162000	54.8	25.4
0.190000	53.1	36.6
0.194000	52.3	45.5
0.186000	52.3	26.8
0.178000	52.5	24.8
0.158000	52.5	24.9
0.198000	50.3	44.9

Continuous Conducted emission : CC0108L1

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#08  
 Date: 2010-03-12 18:49  
 Setup: EMI conducted  
 Mode: EUT ON. TCH UMTS FDD V. Phase noise.

### EC FCC Class B ESPI CC



### Maximized

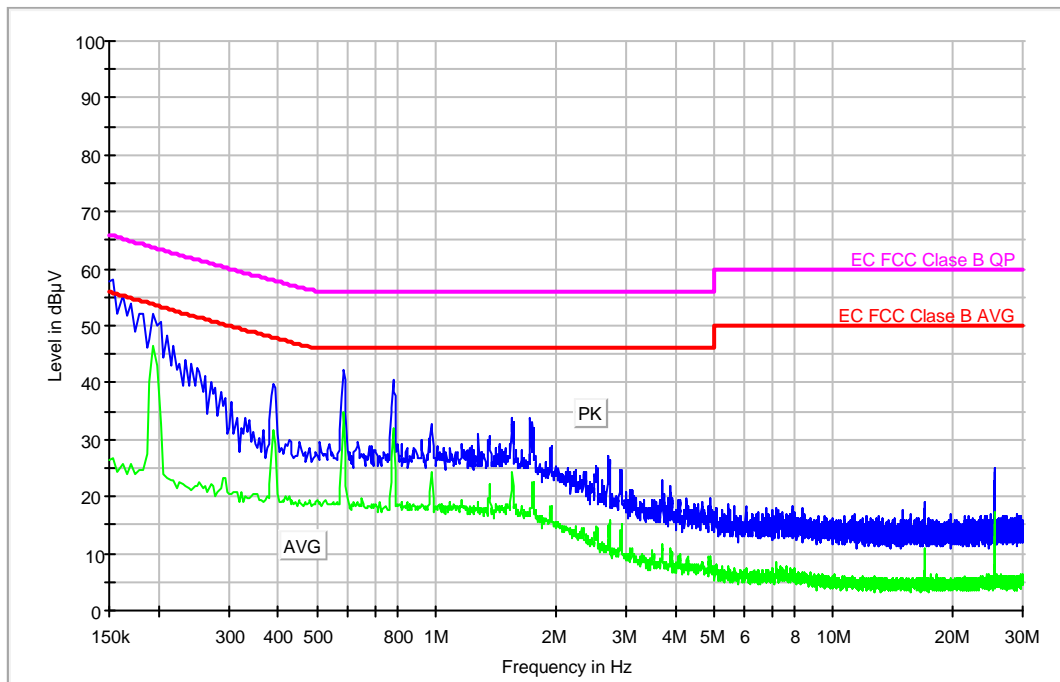
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.154000	56.3	26.3
0.198000	52.9	44.4
0.194000	52.2	46.9
0.162000	53.7	25.0
0.178000	51.3	24.9
0.166000	51.5	24.4
0.170000	51.1	24.2
0.202000	49.5	34.0
0.150000	51.5	24.8
0.158000	50.7	24.9

Continuous Conducted emission : CC01080N

Detector : Peak / Average / Cuasi-peak

Project: 31014BREM.003  
 Company: Ericsson  
 Sample: S/01  
 Operation mode: OM#08  
 Date: 2010-03-12 18:45  
 Setup: EMI conducted  
 Mode: EUT ON. TCH UMTS FDD V. Neutral noise.

### EC FCC Class B ESPI CC



### Maximized

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.154000	58.0	26.8
0.150000	57.8	26.3
0.162000	55.1	25.7
0.170000	54.0	25.8
0.194000	52.0	46.4
0.182000	52.0	24.6
0.178000	52.1	24.8
0.202000	50.5	32.8
0.166000	51.9	24.0
0.158000	51.9	24.3