FCC Radio Test Report

FCC ID: YXK-S400

Original Grant

Report No.	:	TB-FCC144562
Applicant	:	Shenzhen Huaruian Technology Co.,Ltd
Equipment Under Test (EUT)		
EUT Name	:	Mobile phone
Model No.	:	S400
Brand Name	:	N/A
Receipt Date	:	2015-09-21
Test Date	:	2015-09-22 to 2015-10-12
Issue Date	:	2015-10-13
Standards	:	FCC Part 2 FCC Part 22 Subpart H, FCC Part 24 Subpart E, 2015 ANSI/TIAC603D: 2010
Conclusions	:	**PASS** In the configuration tested, the EUT complied with the standards specified above, The EUT technically complies with the FCC requirements

Test/Witness Engineer : IVAN SU

Approved& Authorized :

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Contents

1. General Information about EUT

1.1 Client Information

Applicant	:	Shenzhen Huaruian Technology Co.,Ltd
Address	:	4th Floor of Yuxing, Sanwei Science and Technology, Park,Hangcheng Road,Bao'an District, Shenzhen, China
Manufacturer	:	Shenzhen Huaruian Technology Co.,Ltd
Address	:	4th Floor of Yuxing, Sanwei Science and Technology, Park,Hangcheng Road,Bao'an District, Shenzhen, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Mobile phone	
Model No.	:	S400	
Product Description	:	Frequency Bands: GSM850; PCS1900; UMTS FDD Band II; UMTS FDD Band V	
		GSM 850 Power :	Cond:32.32 dBm ERP:31.85 dBm
		PCS 1900 Power :	Cond:29.68 dBm EIRP:32.51 dBm
		UMTS Band II Power:	Cond:23.10 dBm EIRP:22.14 dBm
		UMTS Band V Power:	Cond:22.97 dBm ERP:21.55 dBm
		Antenna Gain:	GSM 850: -1.66 dBi PCS 1900: 2.22 dBi WCDMA Band V: -1.66 dBi WCDMA Band II: 2.22 dBi
		Modulation Type:	GSM/GPRS:GMSK EDGE: 8PSK UMTS:QPSK
FCC Operating Frequency	:	GSM 850: 824.20MHz-848.80MHz PCS1900: 1850.20MHz-1909.80MHz UMTS Band II: 1852.40MHz-1907.60MHz UMTS Band V:826.40MHz-846.60MHz	
Emission Designator	:	GSM 850: 245KGXW, PCS 1900: 253KGXW GPRS 850: 249KG7W, GPRS 1900: 251KG7W EGPRS 850: 247KG7W, EGPRS 1900: 248KG7W UMTS Band V: 4M08F9W, UMTS Band II: 4M10F9W	
Power Supply	:	DC power supplied by AC/DC Adapter. DC Voltage supplied from Li-ion battery.	
Power Rating	:	Input: AC 100~240V 50/60Hz 0.3A Output: 5V/1A	

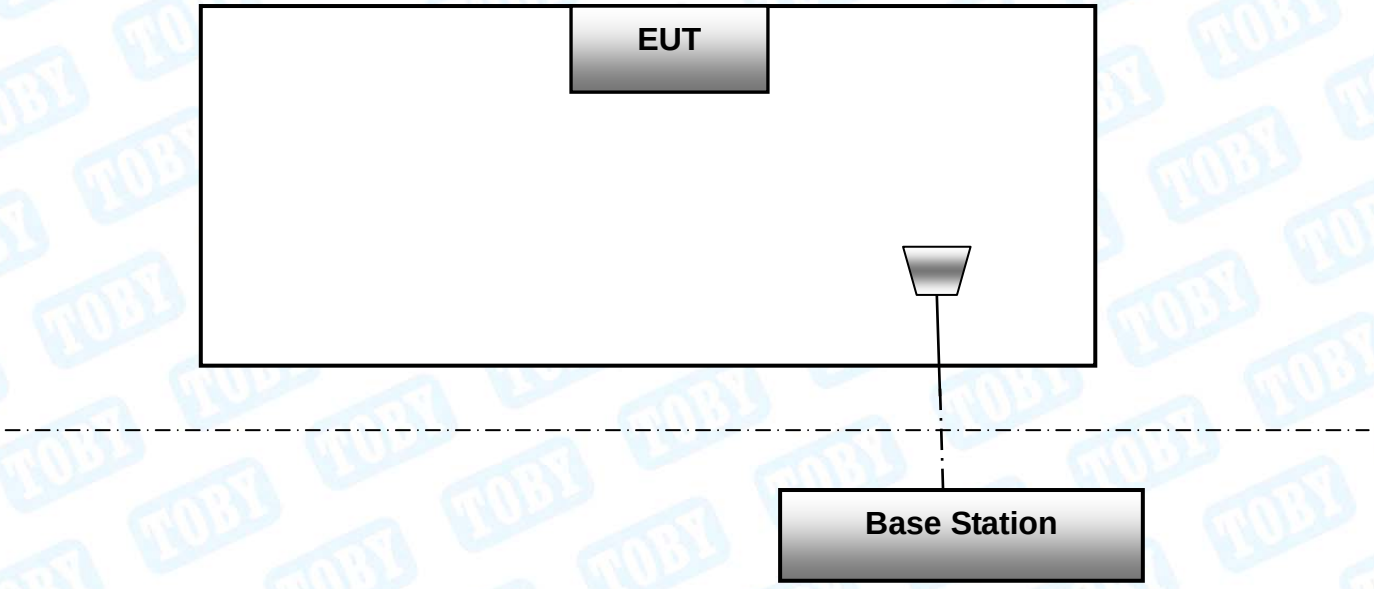
		DC 3.7V from 2600mA Li-ion battery
Connecting I/O Port(S)	:	Please refer to the User's Manual

Note:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(2) This test report only product for PCS Licensed Transmitter (PCB).

1.3 Block Diagram Showing the Configuration of System Tested



The above block diagram of setup is the normal mode. And more detail please refer to the test setup of each test item of bellow.

1.4 Description of Support Units

The EUT has been tested as an independent unit.

1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

During all testing, EUT is link mode with base station at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range. Frequency range investigated for radiated emission as below:

1. 9kHz~10GHz for GSM850 and UMTS Band V.
2. 9kHz~20GHz for PCS1900 and UMTS Band II.

Test Channel		
Mode	**Channel**	**Frequency(MHz)**
GSM 850	128	824.20
	190	836.60
	251	848.80
PCS 1900	512	1850.20
	661	1880.00
	810	1909.80
UMTS Band V	4132	826.40
	4175	835.00
	4233	846.60
UMTS Band II	9262	1852.40
	9400	1880.00
	9538	1907.60

Pre-scanning test Mode	Description
GSM 850	highest , middle, lowest channels
GPRS 850	highest , middle, lowest channels
GSM 1900	highest , middle, lowest channels
GPRS 1900	highest , middle, lowest channels
RMC UMTS Band V	highest , middle, lowest channels
HSDPA UMTS Band V	highest , middle, lowest channels
HSUPA UMTS Band V	highest , middle, lowest channels
RMC UMTS Band II	highest , middle, lowest channels
HSDPA UMTS Band II	highest , middle, lowest channels
HSUPA UMTS Band II	highest , middle, lowest channels
Final test Mode	**Description**
GSM 850	highest , middle, lowest channels
GSM 1900	highest , middle, lowest channels
RMC UMTS 850	highest , middle, lowest channels
RMC UMTS Band II	highest , middle, lowest channels

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.
(2) During the testing procedure, the EUT is in link mode with base station emulator at maximum power level in each test mode.
(3) The EUT has GSM, GPRS, EDGE functions, and after pre-testing, GSM function is the worst case for all the emission tests.
(4) The EUT has RMC, HSDP, HSUP functions in UMTS band II and UMTS band V, and after pre-testing, RMC mode is the worst case for all the emission tests.
(5) The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis, X-plane, Y-plane and Z-plane. The worst case was found positioned on Z-plane as the normal use. Therefore only the test data of this Z-plane was used for radiated emission measurement test.

1.6 Measurement Uncertainty

Test Item	Parameters	Expanded Uncertainty (U_{Lab})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	 ±3.42 dB ±3.42 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB

1.7 Test Facility

The testing was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at: 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.
At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)
The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

FCC List No.: (811562)
The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

IC Registration No.: (11950A-1)
The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

2. Test Summary

Test Standards and Test Results			
Standard	**Document Title**		
FCC Part 2 (10-1-05 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations		
FCC Part 22 (10-1-05 Edition)	Public Mobile Services		
FCC Part 24 (10-1-05 Edition)	Personal Communications Services		
Standard Section	**Test Item**	**Judgment**	**Remark**
2.1046	Conducted RF Output Power	PASS	N/A
24.232(d)	Peak-Average Ratio	PASS	N/A
2.1049; 22.917; 24.238	99% & -26 dB Occupied Bandwidth	PASS	N/A
2.1055; 22.355; 24.235	Frequency Stability	PASS	N/A
2.1051; 2.1057; 22.917; 24.238	Conducted Out of Band Emissions	PASS	N/A
2.1051; 2.1057; 22.917; 24.238	Band Edge	PASS	N/A
22.913; 24.238	Transmitter Radiated Power (EIRP/ERP)	PASS	N/A
2.1053; 2.1057; 22.917; 24.238	Radiated Out of Band Emissions	PASS	N/A
Note: N/A is an abbreviation for Not Applicable.			

3. Test Equipment

AC Main Conducted Emission					
Description	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Cal. Due Date**
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	100321	Aug. 07, 2015	Aug. 06, 2016
50ΩCoaxial Switch	Anritsu	MP59B	X10321	Aug. 07, 2015	Aug. 06, 2016
L.I.S.N	Rohde & Schwarz	ENV216	101131	Aug. 07, 2015	Aug. 06, 2016
L.I.S.N	SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 07, 2015	Aug. 06, 2016
Radiation Spurious Emission					
Description	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 29, 2015	Aug. 28, 2016
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 07, 2015	Aug. 06, 2016
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 28, 2015	Mar. 27, 2016
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 28, 2015	Mar. 27, 2016
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 28, 2015	Mar. 27, 2016
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 28, 2015	Mar. 27, 2016
Pre-amplifier	Sonoma	310N	185903	Mar. 28, 2015	Mar. 27, 2016
Pre-amplifier	HP	8447B	3008A00849	Mar. 28, 2015	Mar. 27, 2016
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 28, 2015	Mar. 27, 2016
Signal Generator	Rohde & Schwarz	SML03	IKW682-054	Mar. 28, 2015	Mar. 27, 2016
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Universal Radio Communication Tester	Rohde&Schwarz	CMU200	103903	Mar. 21, 2015	Mar. 20, 2016
Antenna Conducted Emission					
Description	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 29, 2015	Aug. 28, 2016
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 07, 2015	Aug. 06, 2016
Universal Radio Communication Tester	Rohde&Schwarz	CMU200	103903	Jun. 24, 2015	Jun. 23, 2016
Power Divider	HP	11636A	07669	Aug. 07, 2015	Aug. 06, 2016
Temp. & Humidity Chamber	ZHONG ZHI	CZ-A-225D	HW08053	Aug. 07, 2015	Aug. 06, 2016
DC Power Supply	MATRIX	MPS-3005L-3	D806050W	Aug. 07, 2015	Aug. 06, 2016
AC Power Supply	Heng Jie	HPC-1110	2010007	Aug. 07, 2015	Aug. 06, 2016

4. Frequency Stability

4.1 Test Standard and Requirement

4.1.1 Test Standard

FCC Part 2.1055
FCC Part 22.355
FCC Part 24.235

4.1.2 Requirement

According to FCC section 22.355 and FCC section 24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(1) Temperature:

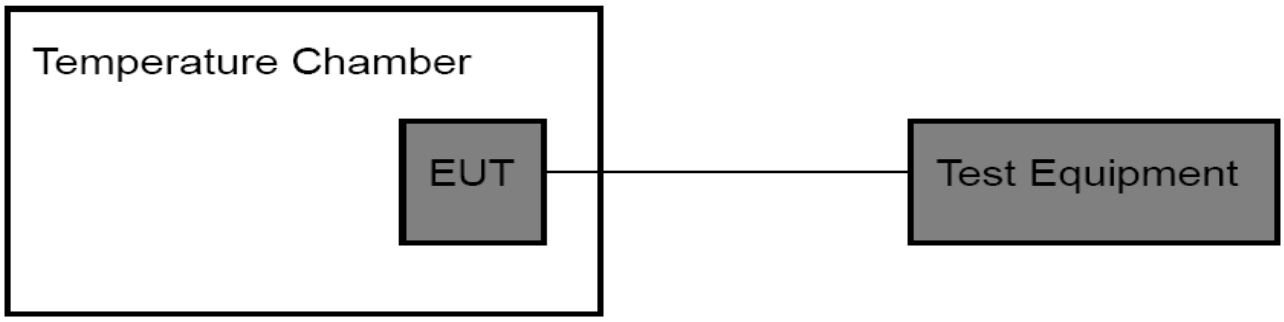
The temperature is varied from -30℃ to +50℃ at intervals of not more than 10℃.

(2) Primary Supply Voltage:

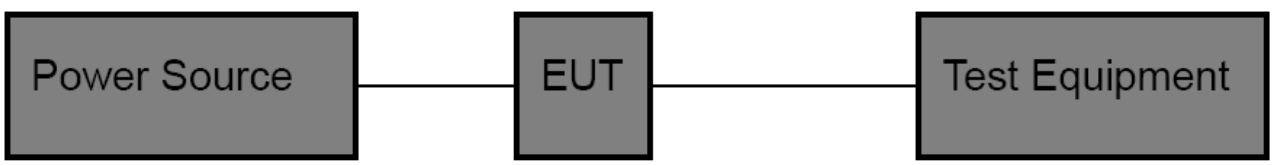
For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at input to the cable normally provide with the equipment, or at the power supply terminals if cables are not normally provided.

4.2 Test Setup

For Temperature Test:



For Voltage Test:



4.3 Test Procedure

Test Procedures for Temperature Variation:

(1) The EUT was set up in the thermal chamber and connected with the base station.

(2) With power off, the temperature was decreased to -30℃ and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.

(3) With power off, the temperature was raised in 10℃ set up to 50℃ and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.

(4) If the EUT cannot be turned on at -30℃, the testing lowest temperature will be raised in 10℃ step until the EUT can be turned on.

Test Procedures for Voltage Variation:

(1) The EUT was placed in a temperature chamber at 25±5℃ and connected with the base station.

(2) Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

(3) The variation in frequency was measured for the worst case.

4.4 EUT Operating Condition

The Equipment Under Test was set to Communication with the Base Station.

3.5 Test Data

Please refer the following pages.

Temperature Variation

Temperature Variation GSM 850 (CH190)						
Temperature (℃)	GSM		GPRS		EDGE	
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)
-30	-17	-0.020	-10	-0.012	-11	-0.013
-20	-15	-0.018	-8	-0.010	-12	-0.014
-10	-16	-0.019	-11	-0.013	-9	-0.011
0	-18	-0.022	-12	-0.014	-8	-0.010
10	-19	-0.023	-9	-0.011	-12	-0.014
20	-17	-0.020	-10	-0.012	-11	-0.013
30	-18	-0.022	-12	-0.014	-13	-0.016
40	-15	-0.018	-11	-0.013	-12	-0.014
50	-18	-0.022	-13	-0.016	-10	-0.012
60	-17	-0.020	-12	-0.014	-12	-0.014
Limit	2.5 (ppm)					
Result	PASS					

Temperature Variation GSM 1900 (CH661)						
Temperature (℃)	GSM		GPRS		EDGE	
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)
-30	-20	-0.030	-27	-0.041	-21	-0.032
-20	-18	-0.027	-26	-0.039	-23	-0.035
-10	-21	-0.032	-28	-0.042	-20	-0.030
0	-17	-0.026	-26	-0.039	-22	-0.033
10	-19	-0.029	-25	-0.038	-19	-0.029
20	-20	-0.030	-27	-0.041	-20	-0.030
30	-19	-0.029	-28	-0.042	-19	-0.029
40	-17	-0.026	-29	-0.044	-24	-0.036
50	-19	-0.029	-24	-0.036	-22	-0.033
60	-18	-0.027	-29	-0.044	-20	-0.030
Limit	2.5 (ppm)					
Result	PASS					

Temperature Variation UMTS Band V (CH 4182)		
Temperature (℃)	RMC Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
-30	17	0.020
-20	16	0.019
-10	18	0.022
0	17	0.020
10	18	0.022
20	16	0.019
30	18	0.022
40	17	0.020
50	19	0.023
60	16	0.019
Limit	2.5 (ppm)	
Result	PASS	

Temperature Variation UMTS Band II (CH 9400)		
Temperature (℃)	RMC Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
-30	-54	-0.029
-20	-52	-0.028
-10	-55	-0.029
0	-53	-0.028
10	-54	-0.029
20	-52	-0.028
30	-53	-0.028
40	-55	-0.029
50	-53	-0.028
60	-52	-0.028
Limit	2.5 (ppm)	
Result	PASS	

Voltage Variation

Voltage Variation GSM 850 (CH190)						
Voltage (V)	GSM		GPRS		EDGE	
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)
3.15	-14	-0.017	-11	-0.013	-10	-0.012
3.70	-16	-0.019	-13	-0.016	-12	-0.014
4.26	-18	-0.022	-12	-0.014	-11	-0.013
Limit	2.5 (ppm)					
Result	PASS					

Voltage Variation GSM 1900 (CH661)						
Voltage (V)	GSM		GPRS		EDGE	
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)
3.15	-18	-0.027	-25	-0.038	-19	-0.029
3.70	-21	-0.032	-26	-0.039	-22	-0.033
4.26	-20	-0.030	-28	-0.042	-21	-0.032
Limit	**2.5 (ppm)**					
Result	**PASS**					

Voltage Variation UMTS Band V (CH 4182)		
Voltage (V)	RMC Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
3.15	16	0.019
3.70	18	0.022
4.26	19	0.023
Limit	**2.5 (ppm)**	
Result	**PASS**	

Voltage Variation UMTS Band II (CH 9400)		
Voltage (V)	RMC Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
3.15	-48	-0.026
3.70	-51	-0.027
4.26	-53	-0.028
Limit	**2.5 (ppm)**	
Result	**PASS**	

5. Conducted RF Output Power

5.1 Test Standard and Limit

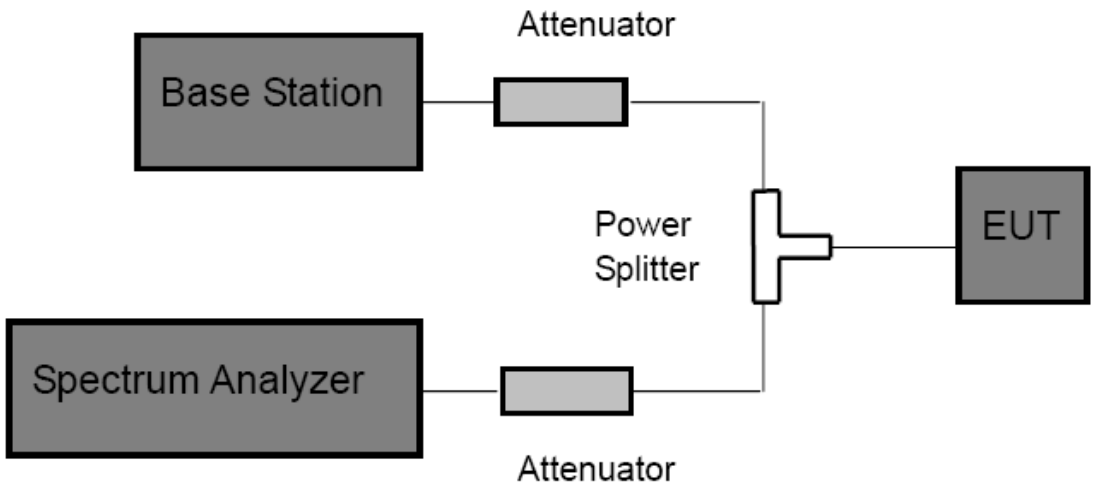
5.1.1 Test Standard

FCC Part 2: 2.1046
FCC Part 22H : 22.913 (a)
FCC Part 24E: 24.232 (c)

5.1.2 Test Limit

GSM850/UMTS Band V	PCS 1900/UMTS Band II
38.5 dBm (ERP)	33 dBm (EIRP)

5.2 Test Setup



5.3 Test Procedure

(1) The EUT is coupled to the Spectrum Analyzer and the Base Station with the suitable Attenuators through the Power Splitter, the path loss is calibrated to correct the reading.
(2) A call is set up by the Base Station to the generic call set up procedure.
(3) Set EUT at maximum power level through base station by power level command.
(4) Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.

5.4 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

5.5 EUT Operating Condition

GSM 850				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
GSM 850	128	824.2	32.32	1.706
	190	836.6	32.21	1.663
	251	848.8	32.18	1.652
GPRS 850 (1 Slot)	128	824.2	31.78	1.507
	190	836.6	31.67	1.469
	251	848.8	31.56	1.432
GPRS 850 (2 Slot)	128	824.2	31.69	1.476
	190	836.6	31.54	1.426
	251	848.8	31.45	1.396
GPRS 850 (3 Slot)	128	824.2	31.86	1.535
	190	836.6	31.64	1.459
	251	848.8	31.51	1.416
GPRS 850 (4 Slot)	128	824.2	31.55	1.429
	190	836.6	31.49	1.409
	251	848.8	31.65	1.462
EDGE 850 (1 Slot)	128	824.2	30.45	1.109
	190	836.6	30.42	1.102
	251	848.8	30.47	1.114
EDGE 850 (2 Slot)	128	824.2	30.43	1.104
	190	836.6	30.3	1.072
	251	848.8	30.28	1.067
EDGE 850 (3 Slot)	128	824.2	30.5	1.122
	190	836.6	30.41	1.099
	251	848.8	30.44	1.107
EDGE 850 (4 Slot)	128	824.2	30.48	1.117
	190	836.6	30.38	1.091
	251	848.8	30.36	1.086

PCS 1900				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
GSM 1900	512	1850.2	29.68	0.929
	661	1880.0	29.58	0.908
	810	1909.8	29.49	0.889
GPRS 1900 (1 Slot)	512	1850.2	28.65	0.733
	661	1880.0	28.55	0.716
	810	1909.8	28.47	0.703
GPRS 1900 (2 Slot)	512	1850.2	28.54	0.714
	661	1880.0	28.48	0.705
	810	1909.8	28.39	0.690
GPRS 1900 (3 Slot)	512	1850.2	28.46	0.701
	661	1880.0	28.43	0.697
	810	1909.8	28.56	0.718
GPRS 1900 (4 Slot)	512	1850.2	28.44	0.698
	661	1880.0	28.36	0.685
	810	1909.8	28.51	0.710
EDGE 1900 (1 Slot)	512	1850.2	27.52	0.565
	661	1880.0	27.46	0.557
	810	1909.8	27.48	0.560
EDGE 1900 (2 Slot)	512	1850.2	27.39	0.548
	661	1880.0	27.33	0.541
	810	1909.8	27.30	0.537
EDGE 1900 (3 Slot)	512	1850.2	27.61	0.577
	661	1880.0	27.55	0.569
	810	1909.8	27.51	0.564
EDGE 1900 (4 Slot)	512	1850.2	27.53	0.566
	661	1880.0	27.35	0.543
	810	1909.8	27.43	0.553

UMTS Band V				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
Band V RMC	4132	826.4	22.62	0.285
	4175	835.0	22.79	0.258
	4233	846.6	22.97	0.243
HSDPA Subtest 1	4132	826.4	21.61	0.221
	4175	835.0	21.82	0.204
	4233	846.6	21.96	0.211
HSDPA Subtest 2	4132	826.4	21.73	0.164
	4175	835.0	21.71	0.191
	4233	846.6	21.68	0.192
HSDPA Subtest 3	4132	826.4	20.96	0.165
	4175	835.0	20.52	0.193
	4233	846.6	20.36	0.198
HSDPA Subtest 4	4132	826.4	20.78	0.159
	4175	835.0	20.16	0.187
	4233	846.6	20.51	0.195
HSUPA Subtest 1	4132	826.4	21.14	0.167
	4175	835.0	21.68	0.163
	4233	846.6	21.32	0.161
HSUPA Subtest 2	4132	826.4	19.61	0.171
	4175	835.0	19.98	0.151
	4233	846.6	20.03	0.133
HSUPA Subtest 3	4132	826.4	20.6	0.177
	4175	835.0	20.78	0.170
	4233	846.6	20.91	0.167
HSUPA Subtest 4	4132	826.4	20.95	0.171
	4175	835.0	20.37	0.152
	4233	846.6	20.17	0.129
HSUPA Subtest 5	4132	826.4	19.95	0.130
	4175	835.0	20.22	0.157
	4233	846.6	20.44	0.129

UMTS Band II				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
Band II RMC	9262	1852.4	23.10	0.227
	9400	1880.0	22.72	0.221
	9538	1907.6	22.91	0.206
HSDPA Subtest 1	9262	1852.4	22.77	0.181
	9400	1880.0	21.48	0.129
	9538	1907.6	21.97	0.114
HSDPA Subtest 2	9262	1852.4	21.67	0.170
	9400	1880.0	21.77	0.121
	9538	1907.6	21.91	0.109
HSDPA Subtest 3	9262	1852.4	21.18	0.169
	9400	1880.0	20.75	0.117
	9538	1907.6	21.54	0.110
HSDPA Subtest 4	9262	1852.4	21.20	0.167
	9400	1880.0	20.40	0.116
	9538	1907.6	21.64	0.110
HSUPA Subtest 1	9262	1852.4	21.11	0.180
	9400	1880.0	21.35	0.118
	9538	1907.6	21.23	0.102
HSUPA Subtest 2	9262	1852.4	19.83	0.171
	9400	1880.0	20.55	0.121
	9538	1907.6	20.52	0.110
HSUPA Subtest 3	9262	1852.4	20.04	0.187
	9400	1880.0	20.56	0.129
	9538	1907.6	19.98	0.111
HSUPA Subtest 4	9262	1852.4	20.11	0.178
	9400	1880.0	20.09	0.123
	9538	1907.6	20.45	0.108
HSUPA Subtest 5	9262	1852.4	20.63	0.181
	9400	1880.0	20.33	0.127
	9538	1907.6	20.13	0.116

6. Peak-Average Ratio

6.1 Test Standard and Limit

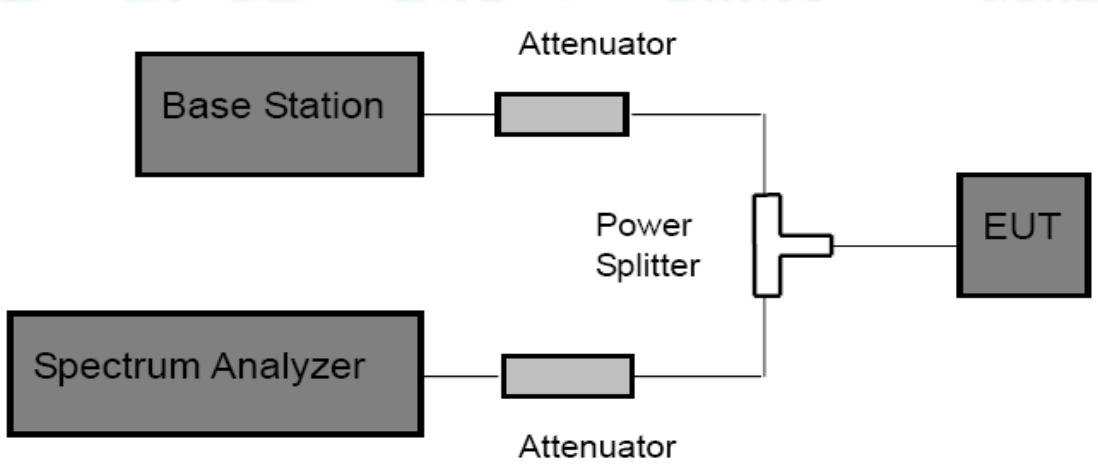
6.1.1 Test Standard

FCC Part 24E: 24.232 (d)

6.1.2 Test Limit

PCS 1900 /UMTS Band II
The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

6.2 Test Setup



6.3 Test Procedure

According with KDB 971168

(1) The signal analyzer's CCDF measurement profile is enabled.
(2) Frequency = carrier center frequency.
(3) Measurement BW>Emission bandwidth of signal.
(4) The signal analyzer was set to collect one million samples to generate the CCDF curve.
(5) The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which of the transmitter is operating at maximum power.

6.4 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

6.5 Test Data

PCS 1900					
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)		Peak-Average Ratio (PAR)
			Peak	Average	
PCS 1900	512	1850.2	33.55	32.64	0.91
	661	1880.0	33.44	32.56	0.88
	810	1909.8	33.41	32.47	0.94

UMTS Band II					
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)		Peak-Average Ratio (PAR)
			Peak	Average	
UMTS Band II	9262	1852.4	25.66	23.56	2.10
	9400	1880.0	25.53	23.44	2.09
	9538	1907.6	25.24	23.14	2.10

7. Radiated Output Power

7.1 Test Standard and Limit

7.1.1 Test Standard

FCC Part 22H : 22.913 (a)

FCC Part 24E: 24.232 (c)

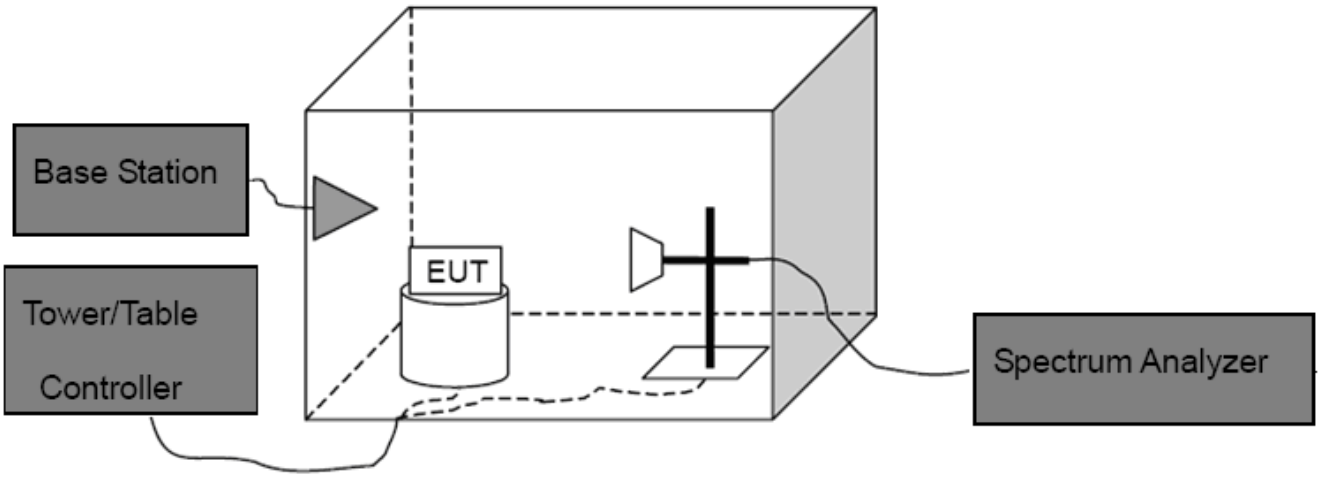
7.1.2 Test Limit

According to FCC Part 22.913 (a), the ERP of Cellular mobile transmitters must not exceed 7 Watts(38.5 dBm).

According to FCC Part 24.232 (c), the Mobile/portable stations are limited to 2 Watts(33 dBm) EIRP peak power.

Cellular Band		PCS Band	
GSM850	UMTS Band V	PCS 1900	UMTS Band II
38.5 dBm (ERP)		33 dBm (EIRP)	

7.2 Test Setup



7.3 Test Procedure

(1) The EUT was placed on an non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW=3 MHz, VBW=3 MHz and peak detector settings.

(2) During the measurement, the EUT was enforced in maximum power and linked with the Base

Station. The highest was recorded from analyzer power level (LVT) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.

(3) Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-D. The EUT was replaced by dipole antenna (for frequency below 1 GHz) or Horn antenna (for frequency above 1 GHz) at same location with same polarize of receiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a TX cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna.
Then the EUT's EIRP and ERP was calculated with the correction factor:
ERP=S.G.Level +Antenna Gain Cord.(dBd)-Cable Loss(dB)
EIRP=S.G.Level+Antenna Gain Cord.(dBi)-Cable Loss(dB)

7.4 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

7.5 Test Data

Measurement Data (worst case)

GSM 850					
Mode	**Channel**	**Frequency (MHz)**	**Antenna (H&V)**	**ERP Power (dBm)**	**ERP Power (W)**
GSM 850	128	824.2	H	31.85	1.531
			V	31.02	1.265
	190	836.6	H	31.63	1.455
			V	30.75	1.189
	251	848.8	H	31.57	1.435
			V	30.70	1.175
GPRS 850 (1 Slot)	128	824.2	H	30.82	1.208
			V	29.44	0.879
	190	836.6	H	30.63	1.156
			V	29.51	0.893
	251	848.8	H	30.52	1.127
			V	30.32	1.076
EDGE 850 (1 Slot)	128	824.2	H	29.55	0.902
			V	28.47	0.703
	190	836.6	H	29.43	0.877
			V	28.26	0.670
	251	848.8	H	29.30	0.851
			V	28.16	0.655
Limit				**38.5**	**7**

PCS 1900					
Mode	**Channel**	**Frequency (MHz)**	**Antenna (H&V)**	**EIRP Power (dBm)**	**EIRP Power (W)**
GSM 1900	512	1850.2	H	32.51	1.782
			V	31.25	1.334
	661	1880.0	H	32.41	1.742
			V	31.02	1.265
	810	1909.8	H	32.05	1.603
			V	30.89	1.227
GPRS 1900 (1 Slot)	512	1850.2	H	30.57	1.140
			V	29.34	0.859
	661	1880.0	H	29.47	0.885
			V	28.69	0.740
	810	1909.8	H	29.41	0.873
			V	28.50	0.708
EDGE 1900 (1 Slot)	512	1850.2	H	29.31	0.853
			V	28.49	0.706
	661	1880.0	H	29.14	0.820
			V	28.12	0.649
	810	1909.8	H	29.03	0.800
			V	27.94	0.622
Limit				**33**	**2**

UMTS Band V					
Mode	Channel	Frequency (MHz)	Antenna (H&V)	ERP Power (dBm)	ERP Power (W)
Band V RMC	4132	826.4	H	21.55	0.143
			V	19.74	0.094
	4175	835.0	H	21.36	0.137
			V	19.55	0.090
	4233	846.6	H	21.25	0.133
			V	19.40	0.087
Limit				38.5	7

UMTS Band II					
Mode	Channel	Frequency (MHz)	Antenna (H&V)	ERP Power (dBm)	ERP Power (W)
Band II RMC	9262	1852.4	H	22.14	0.164
			V	20.30	0.107
	9400	1880.0	H	22.06	0.161
			V	20.15	0.104
	9538	1907.6	H	21.98	0.158
			V	20.06	0.101
Limit				33	2

8. Occupied Bandwidth

8.1 Test Standard and Limit

8.1.1 Test Standard

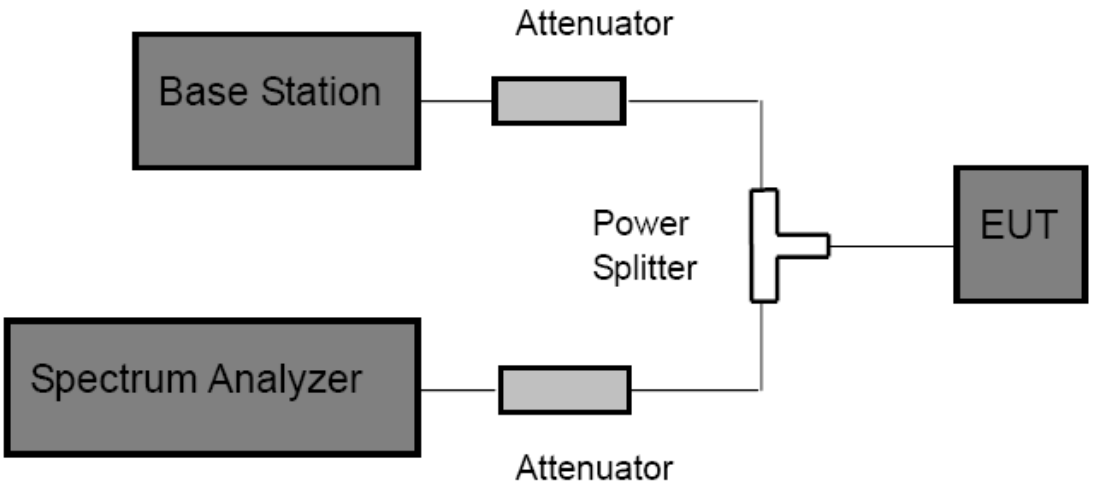
FCC Part 2: 2.1049
FCC Part 22H : 22.913 (a)
FCC Part 24E: 24.232 (c)

8.1.2 Test Requirement

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as 99% power and -26dBC occupied bandwidths.

8.2 Test Setup



8.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and Base station via power splitter as show in the block diagram above.
(2) The resolution bandwidth of the Spectrum Analyzer is set to at least 1% of the occupied bandwidth.
(3) The low, middle and the high channels are selected to perform tests respectively.
(4) Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak; make a line whose value is 26dB lower than the peak; mark two points which the line intersected the waveform at; finally record the delta of the two points as the occupied bandwidth and the plot.
(5) Set the Spectrum Analyzer Occupied Bandwidth function to measure the 99% occupied bandwidth.

8.4 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

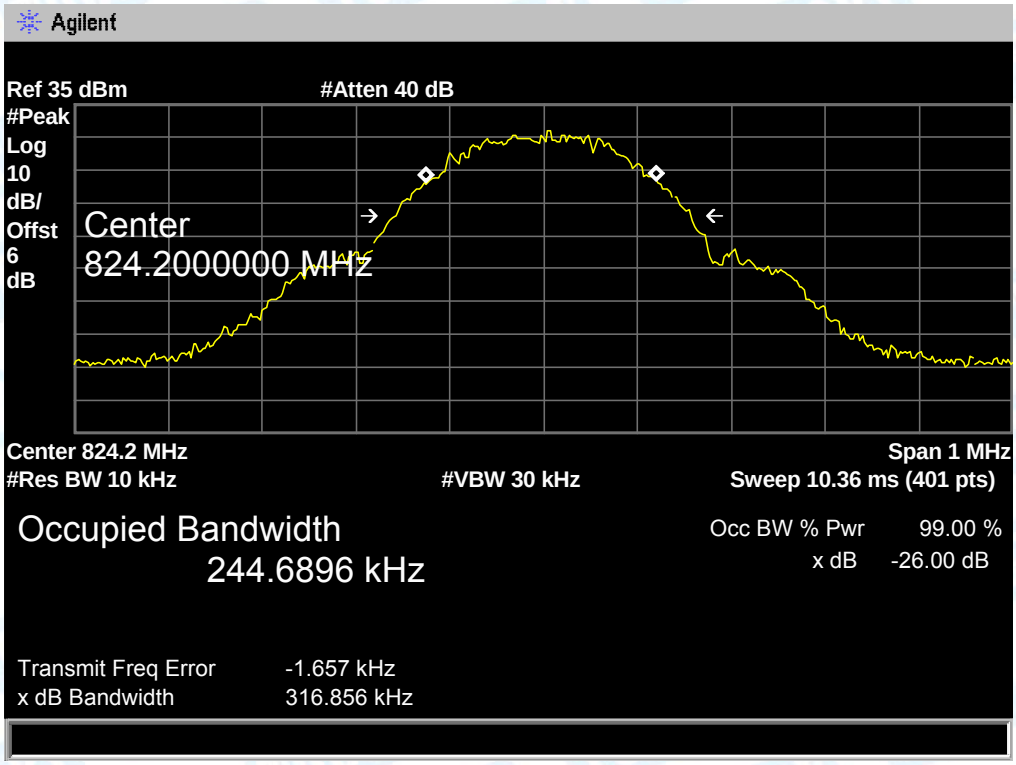
8.5 Test Data

Please refer following pages.

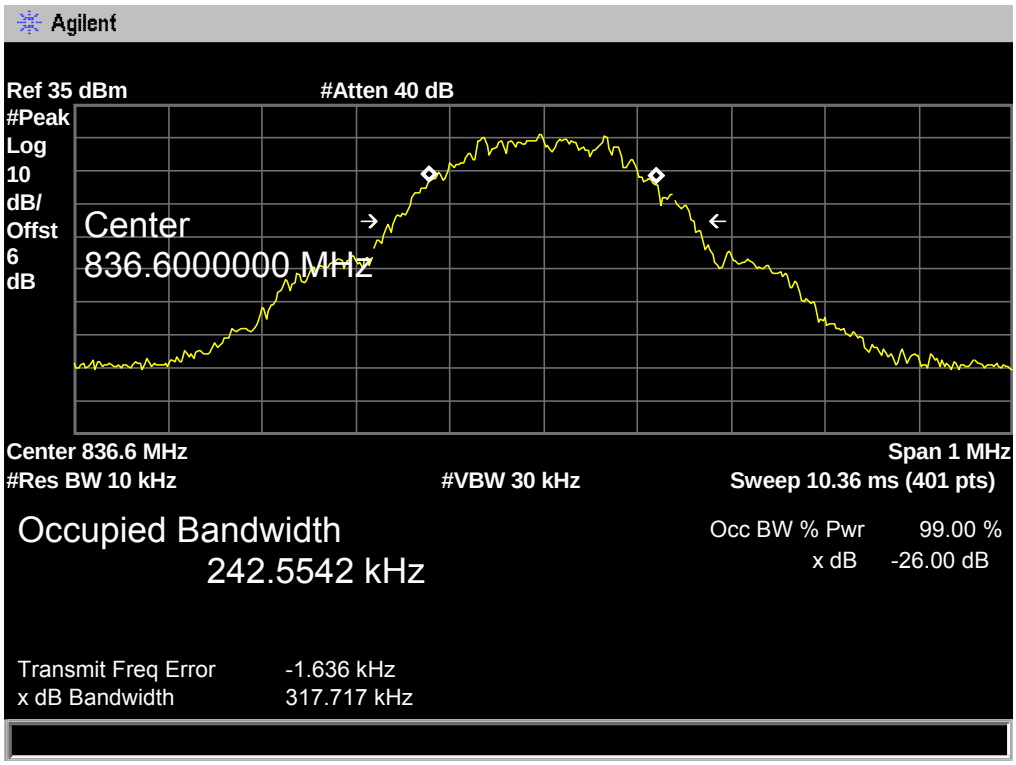
GSM 850				
Mode	**Channel**	**Frequency (MHz)**	**99% OBW (kHz)**	**-26dB Bandwidth (kHz)**
GSM 850	128	824.2	244.6896	316.856
	190	836.6	242.5542	317.717
	251	848.8	244.5652	315.074
GPRS 850 (1 Slot)	128	824.2	247.1619	320.471
	190	836.6	248.9278	320.283
	251	848.8	243.4386	318.585
EDGE 850 (1 Slot)	128	824.2	243.8087	303.086
	190	836.6	245.5018	312.75
	251	848.8	247.0552	311.402
PCS 1900				
Mode	**Channel**	**Frequency (MHz)**	**99% OBW (kHz)**	**-26dB Bandwidth (kHz)**
GSM 1900	512	1850.2	245.4273	322.009
	661	1880.0	252.8108	315.358
	810	1909.8	248.6089	315.897
GPRS 1900 (1 Slot)	512	1850.2	245.808	308.109
	661	1880.0	250.8466	318.408
	810	1909.8	243.8249	315.968
EDGE 1900 (1 Slot)	512	1850.2	240.4758	317.92
	661	1880.0	245.6923	314.423
	810	1909.8	248.0089	319.58

UMTS Band V				
Mode	**Channel**	**Frequency (MHz)**	**99% OBW (MHz)**	**-26dB Bandwidth (MHz)**
Band V RMC	4132	826.4	4.057	4.59
	4175	835.0	4.0762	4.715
	4233	846.6	4.0552	4.593
Band V HSDPA	4132	826.4	4.0733	4.66
	4175	835.0	4.0448	4.632
	4233	846.6	4.0647	4.638
Band V HSUPA	4132	826.4	4.0586	4.615
	4175	835.0	4.0679	4.637
	4233	846.6	4.062	4.612
UMTS Band II				
Mode	**Channel**	**Frequency (MHz)**	**99% OBW (MHz)**	**-26dB Bandwidth (MHz)**
Band II RMC	9262	1852.4	4.0775	4.656
	9400	1880.0	4.0679	4.684
	9538	1907.6	4.1036	4.719
Band II HSDPA	9262	1852.4	4.0818	4.674
	9400	1880.0	4.078	4.699
	9538	1907.6	4.0858	4.698
Band II HSUPA	9262	1852.4	4.061	4.63
	9400	1880.0	4.0662	4.619
	9538	1907.6	4.093	4.632

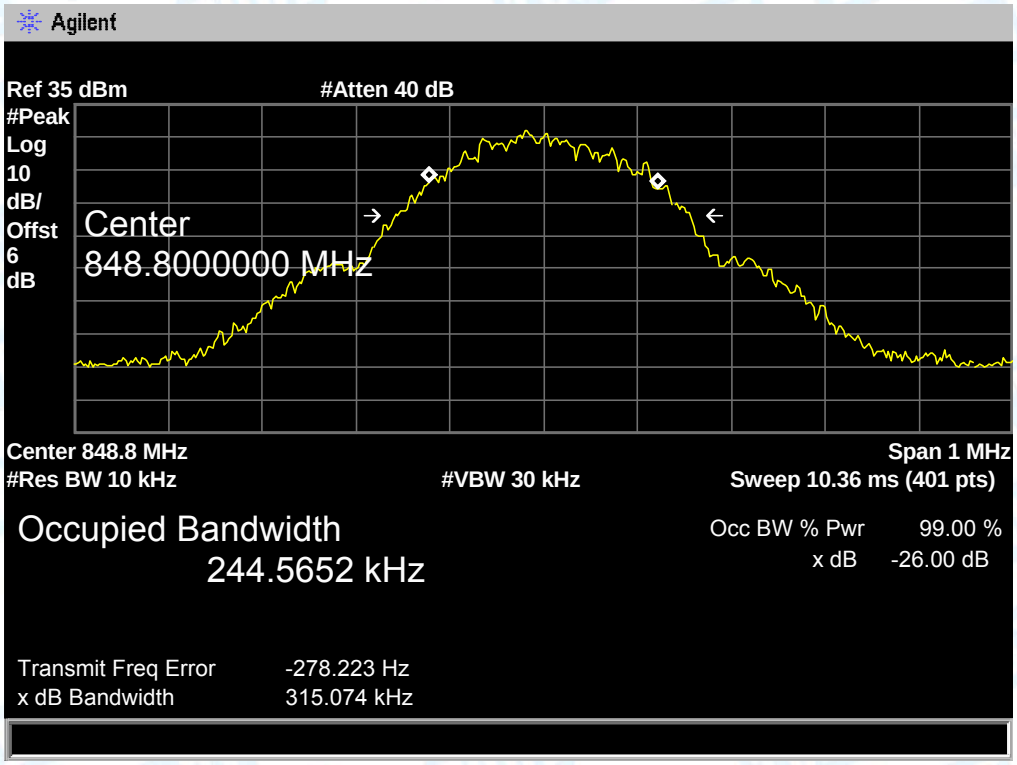
GSM850
CH 128



CH 190



CH 251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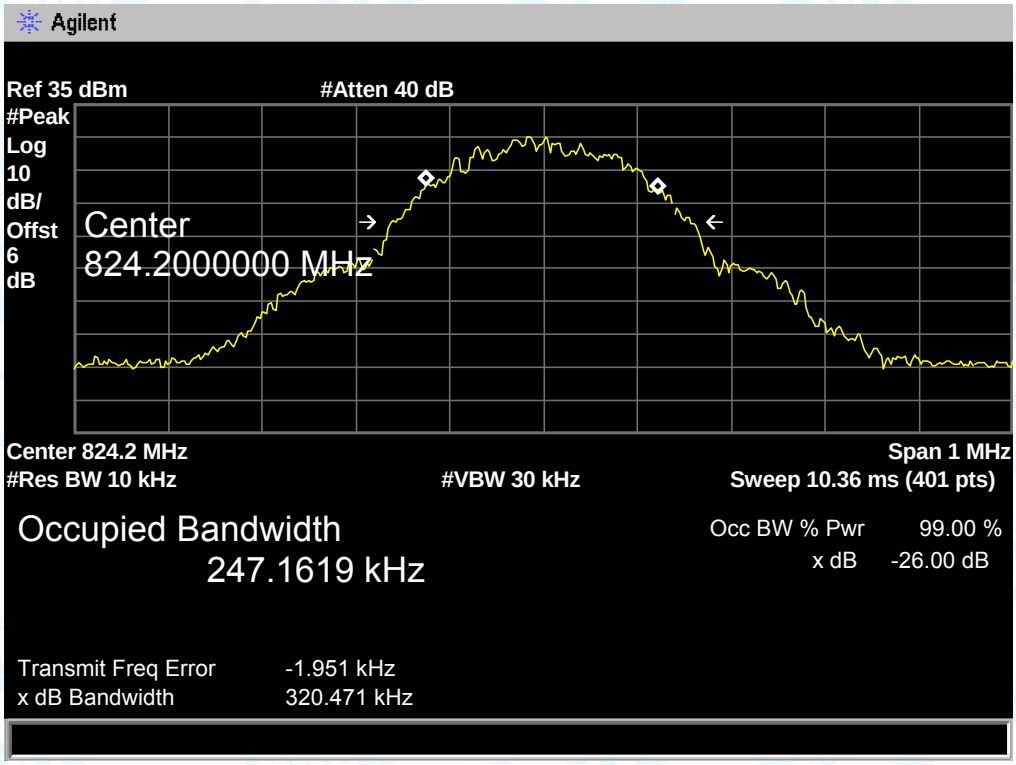
Ref 35 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
848.8000000 MHz
Center 848.8 MHz
#Res BW 10 kHz
#VBW 30 kHz
Span 1 MHz
Sweep 10.36 ms (401 pts)
Occupied Bandwidth
244.5652 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -278.223 Hz
x dB Bandwidth 315.074 kHz

GPRS 850
CH 128



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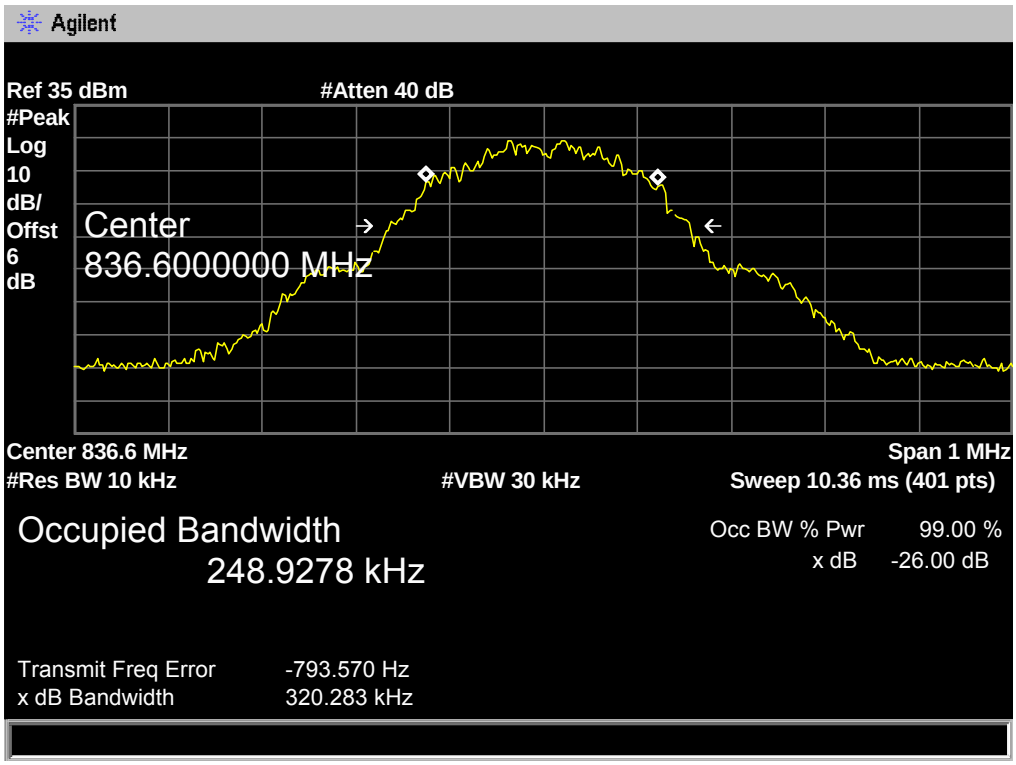
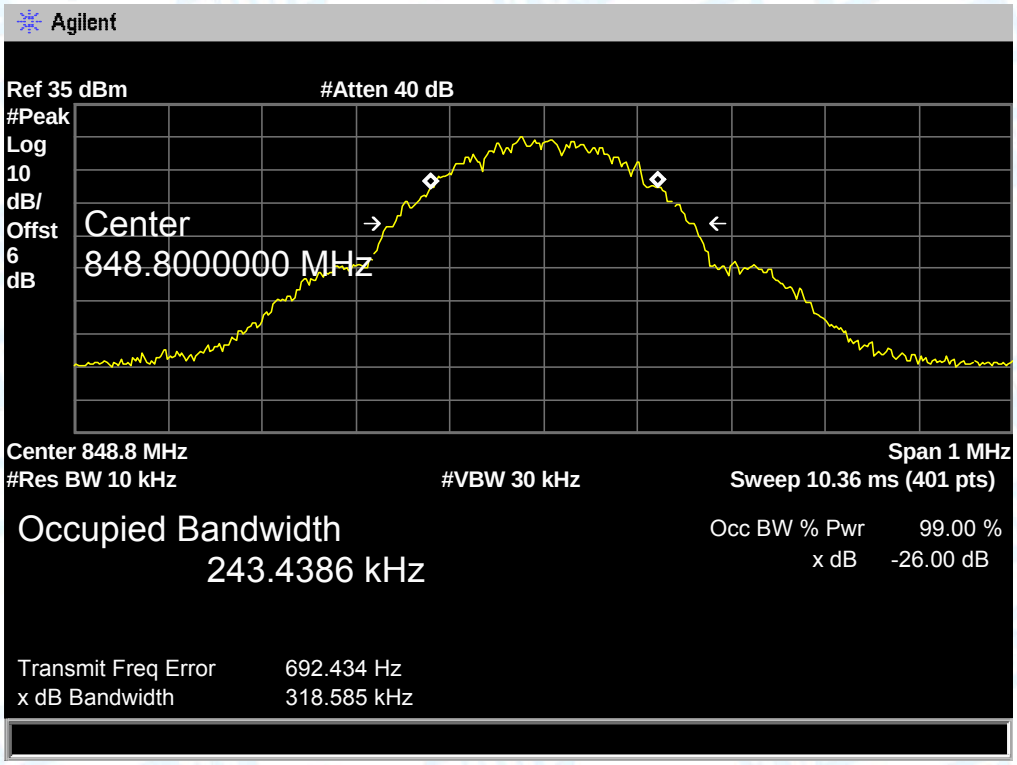
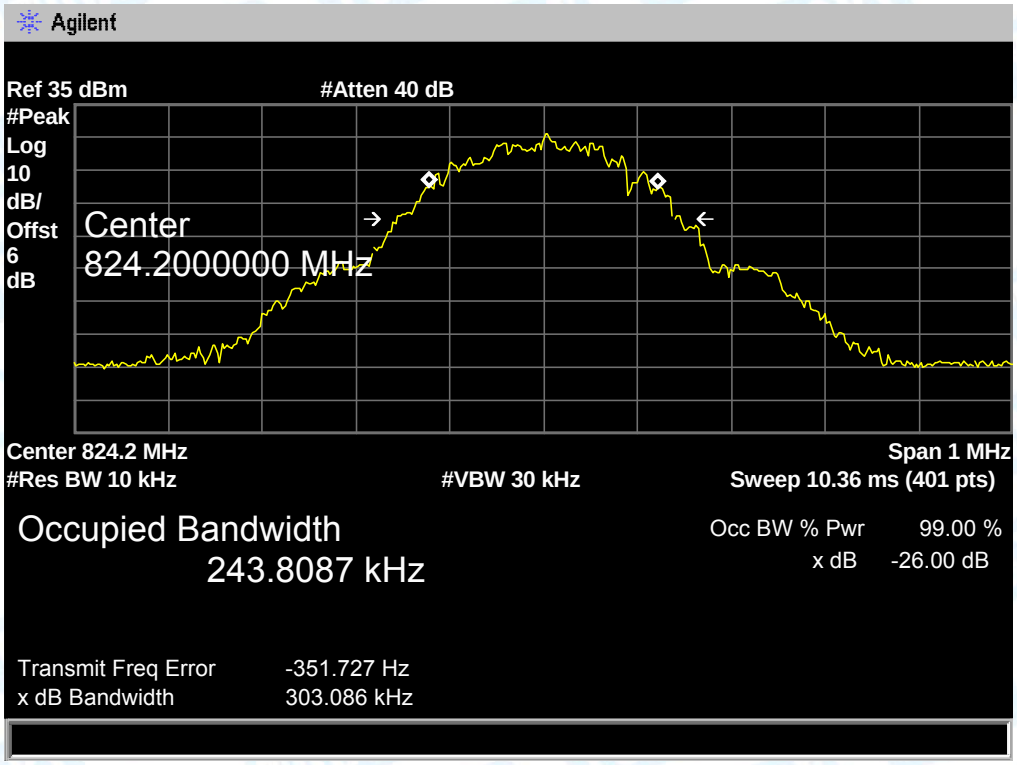


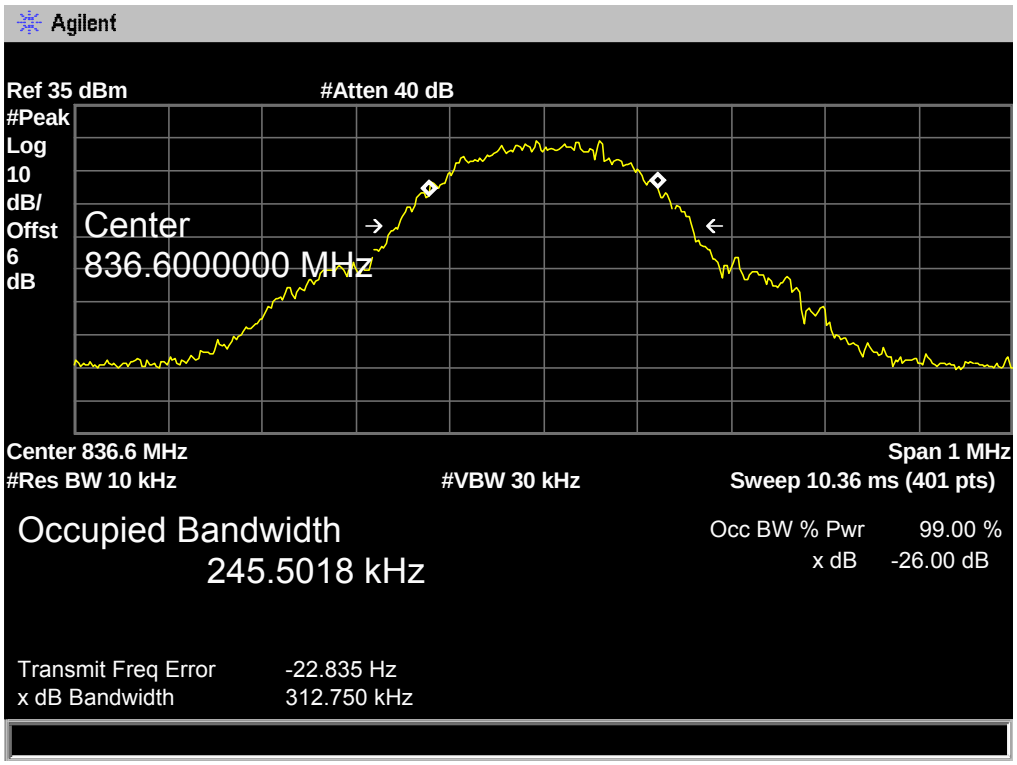
CH 251


Agilent
Ref 35 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
848.8000000 MHz
Center 848.8 MHz
#Res BW 10 kHz
#VBW 30 kHz
Span 1 MHz
Sweep 10.36 ms (401 pts)
Occupied Bandwidth
243.4386 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 692.434 Hz
x dB Bandwidth 318.585 kHz

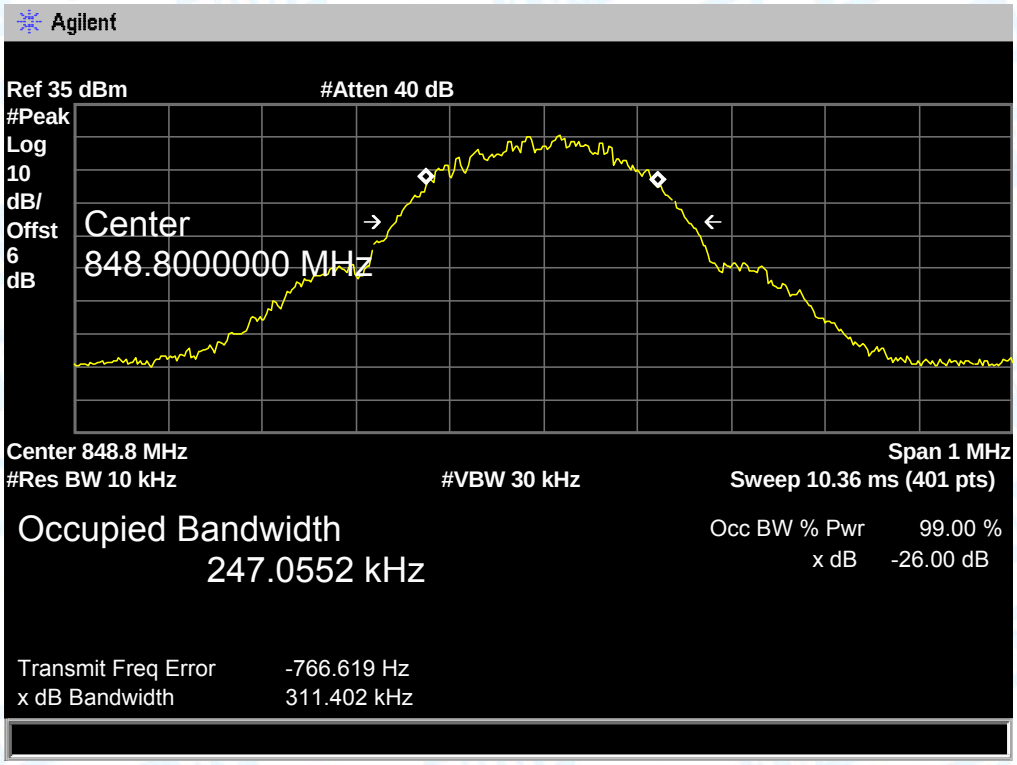
EDGE 850
CH 128



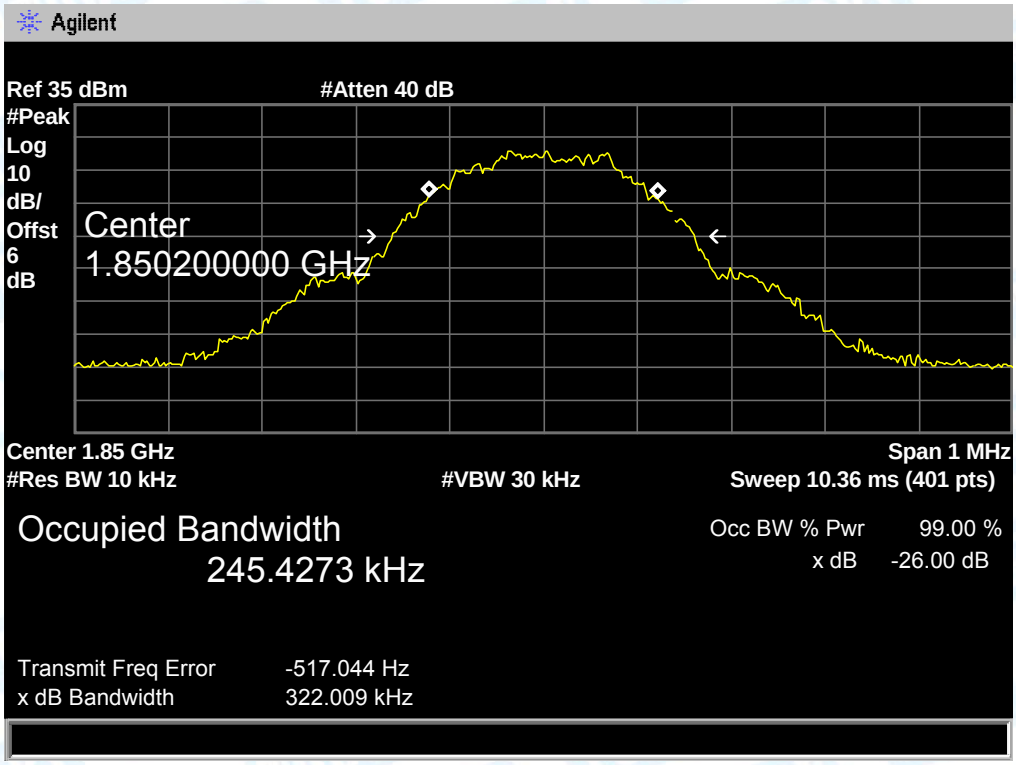
CH 190



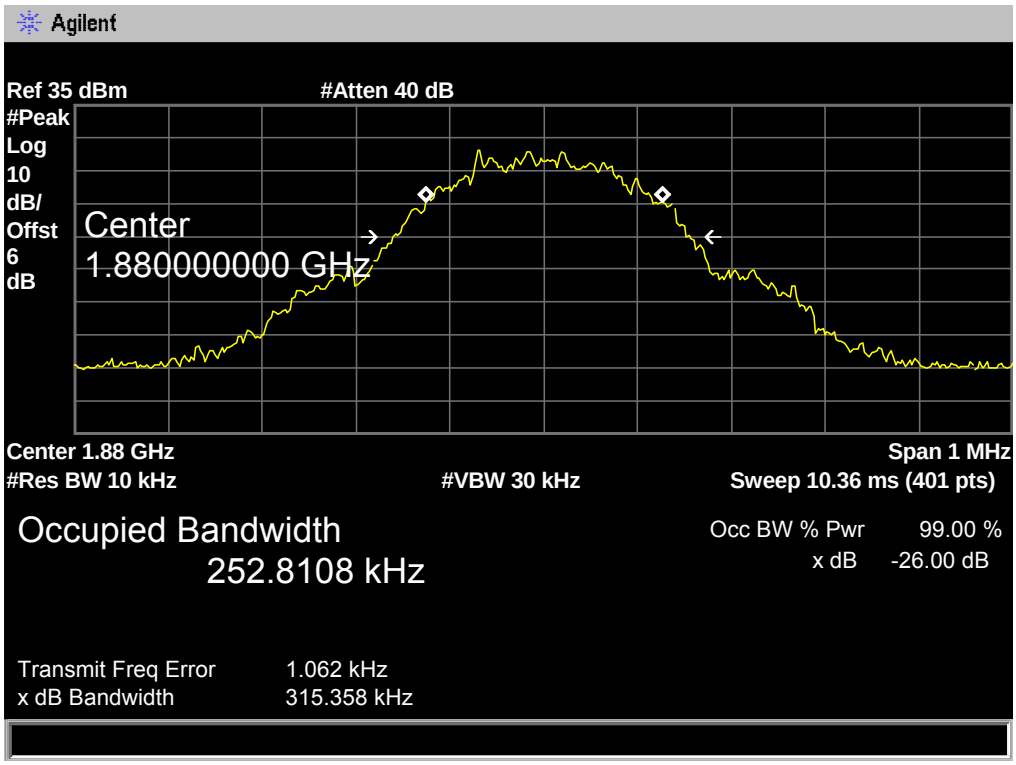
CH 251


Agilent
Ref 35 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
848.8000000 MHz
Center 848.8 MHz
#Res BW 10 kHz
#VBW 30 kHz
Span 1 MHz
Sweep 10.36 ms (401 pts)
Occupied Bandwidth
247.0552 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -766.619 Hz
x dB Bandwidth 311.402 kHz

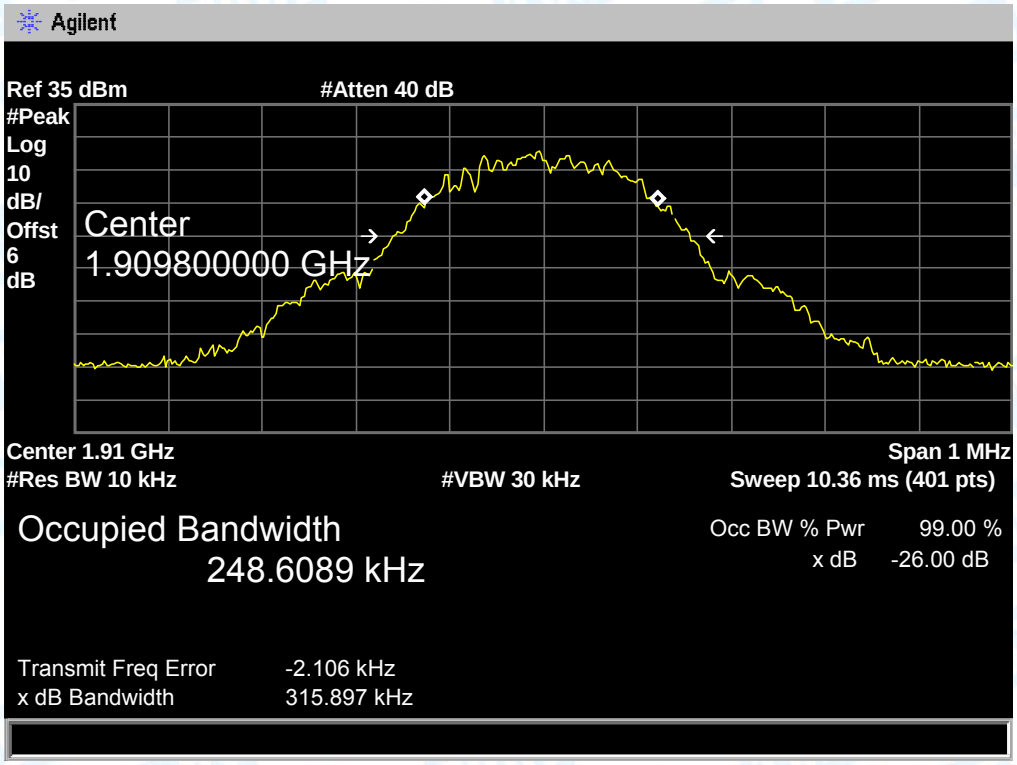
PCS 1900
CH 512



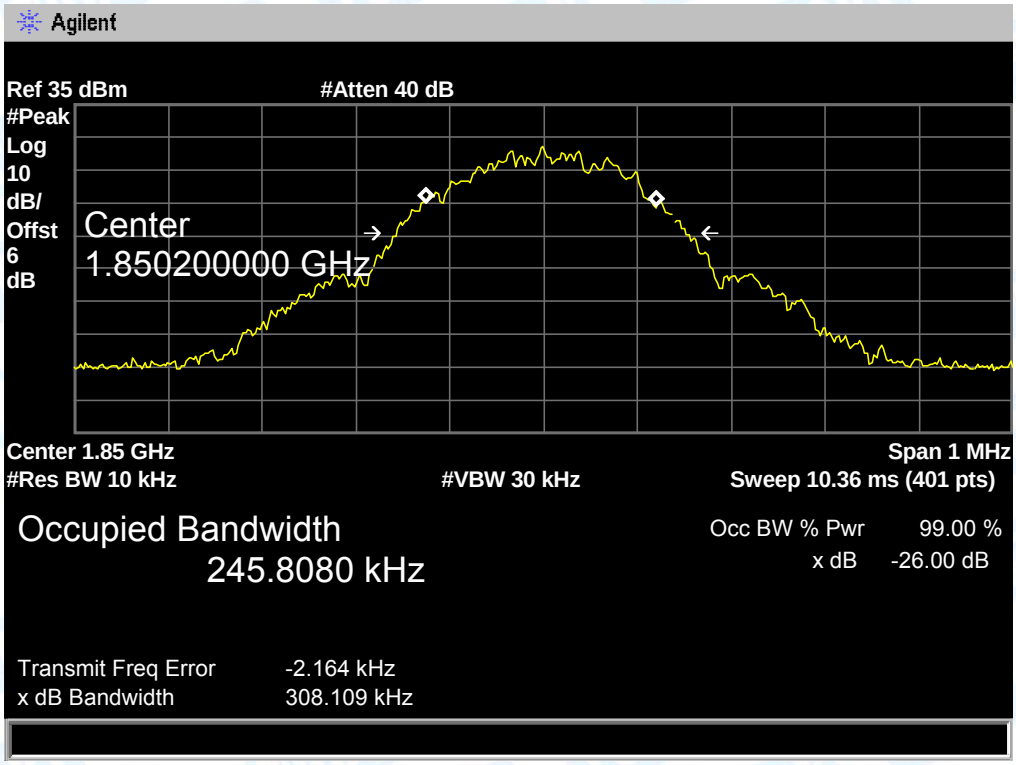
CH 661



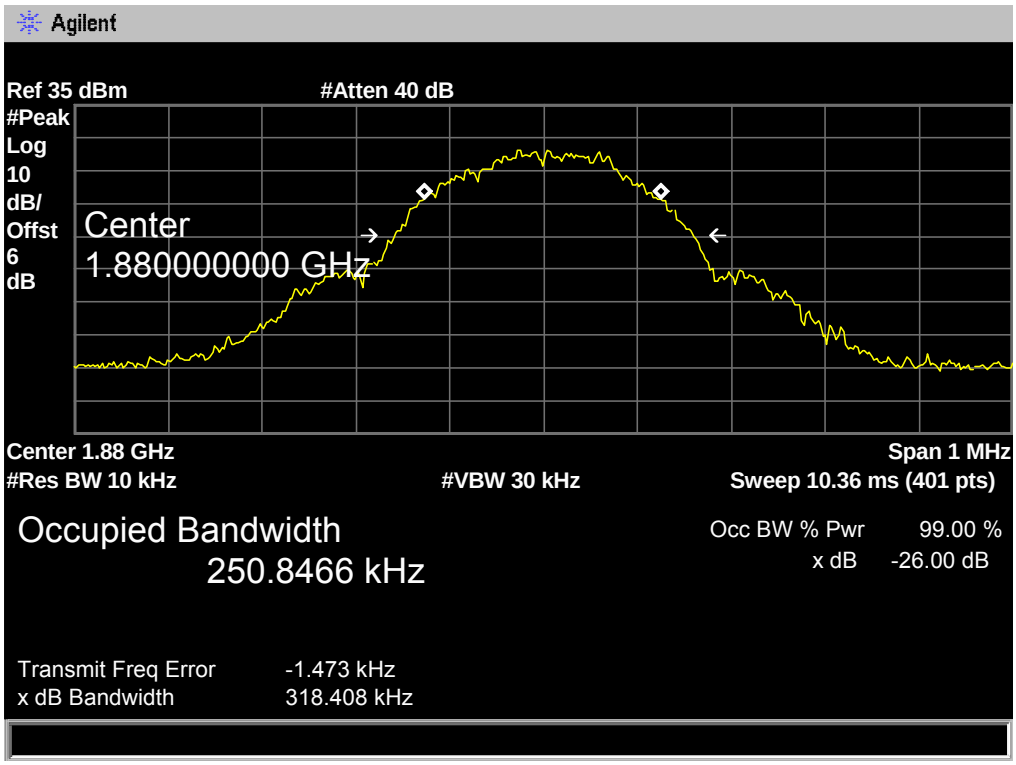
CH 810


Agilent
Ref 35 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
1.909800000 GHz
Center 1.91 GHz
#Res BW 10 kHz
#VBW 30 kHz
Span 1 MHz
Sweep 10.36 ms (401 pts)
Occupied Bandwidth
248.6089 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -2.106 kHz
x dB Bandwidth 315.897 kHz

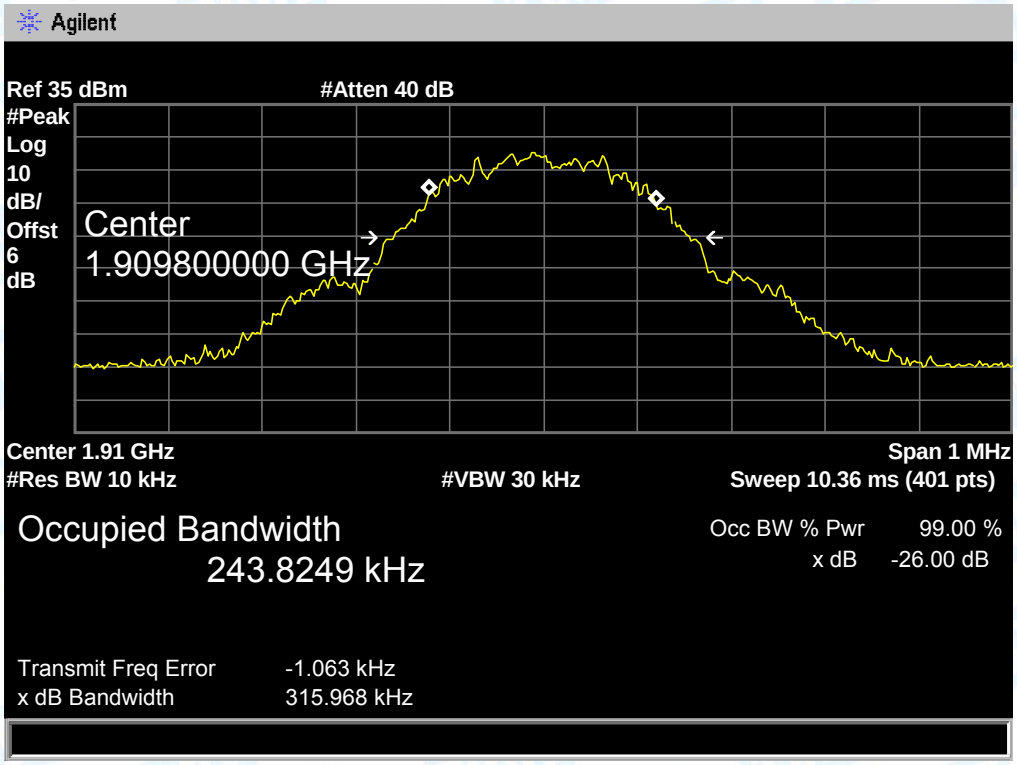
GPRS 1900
CH 512



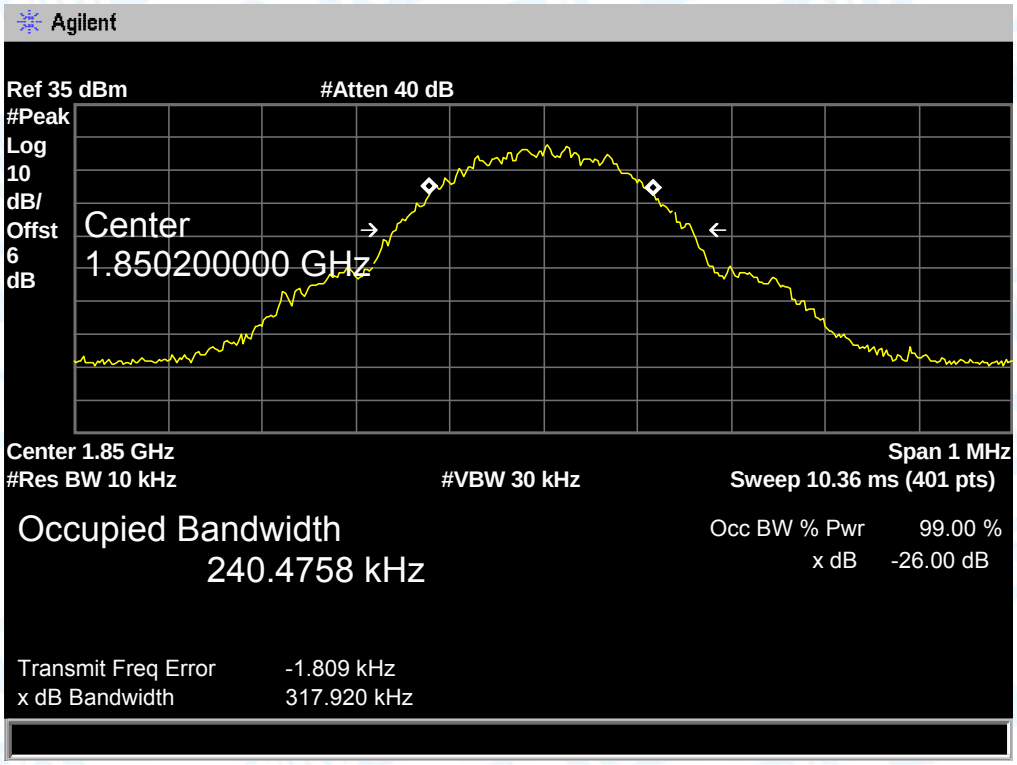
CH 661



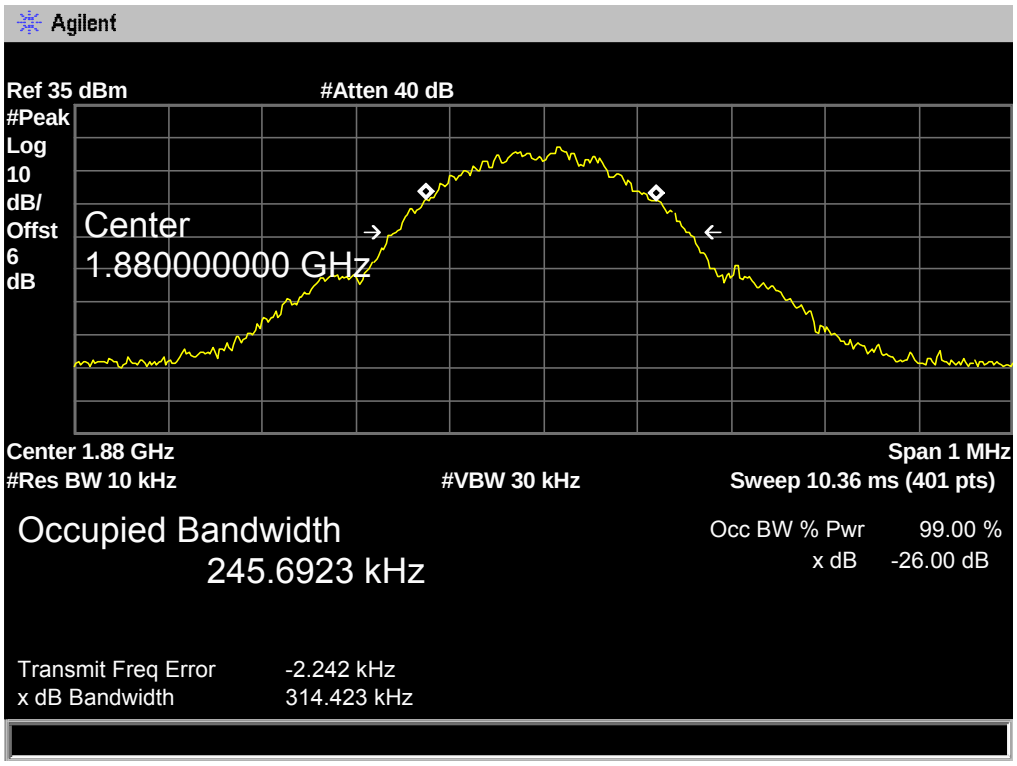
CH 810


Agilent
Ref 35 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
1.909800000 GHz
Center 1.91 GHz
#Res BW 10 kHz
#VBW 30 kHz
Span 1 MHz
Sweep 10.36 ms (401 pts)
Occupied Bandwidth
243.8249 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -1.063 kHz
x dB Bandwidth 315.968 kHz

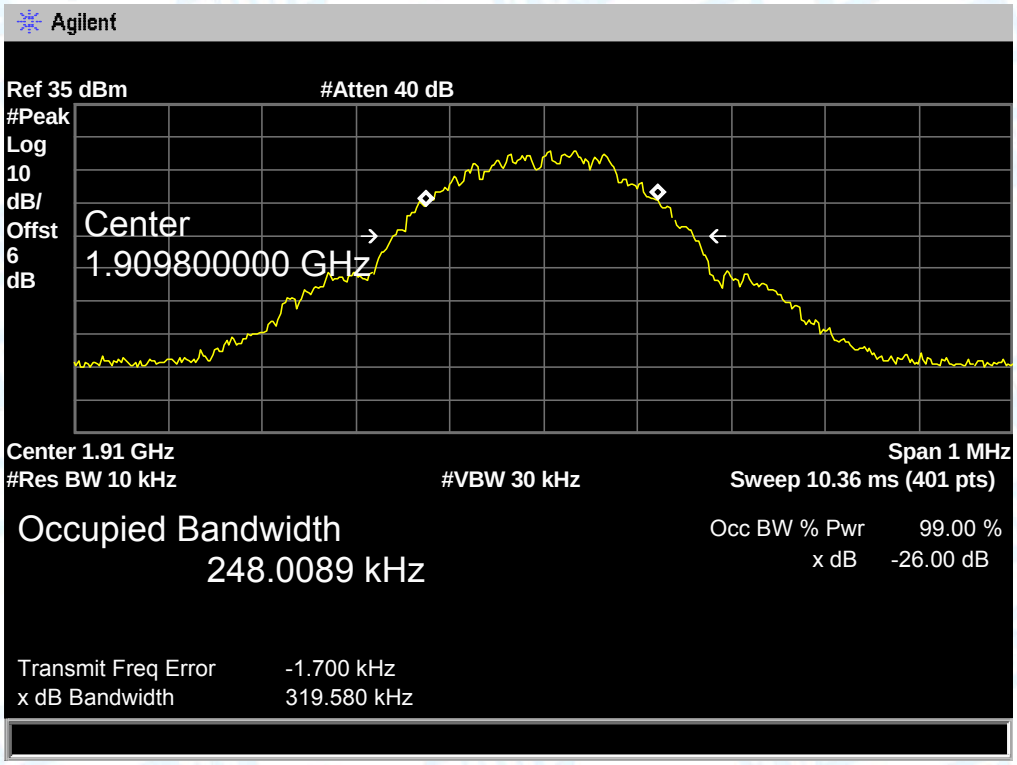
EDGE 1900
CH 512



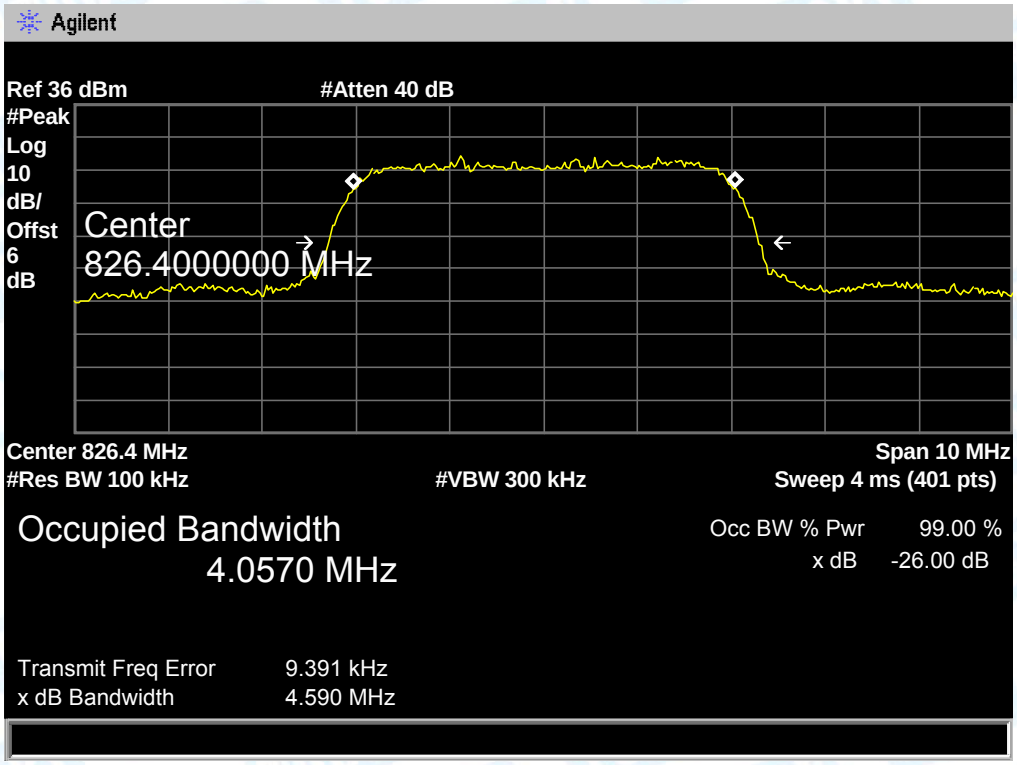
CH 661



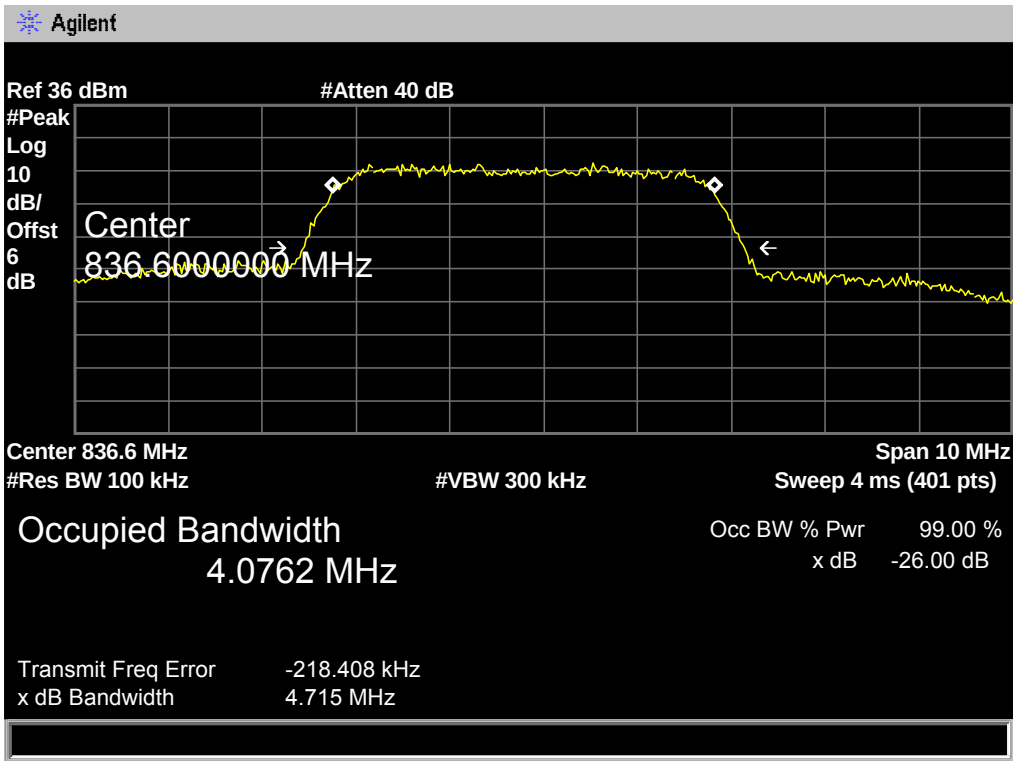
CH 810


Agilent
Ref 35 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
1.909800000 GHz
Center 1.91 GHz
#Res BW 10 kHz
#VBW 30 kHz
Span 1 MHz
Sweep 10.36 ms (401 pts)
Occupied Bandwidth
248.0089 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -1.700 kHz
x dB Bandwidth 319.580 kHz

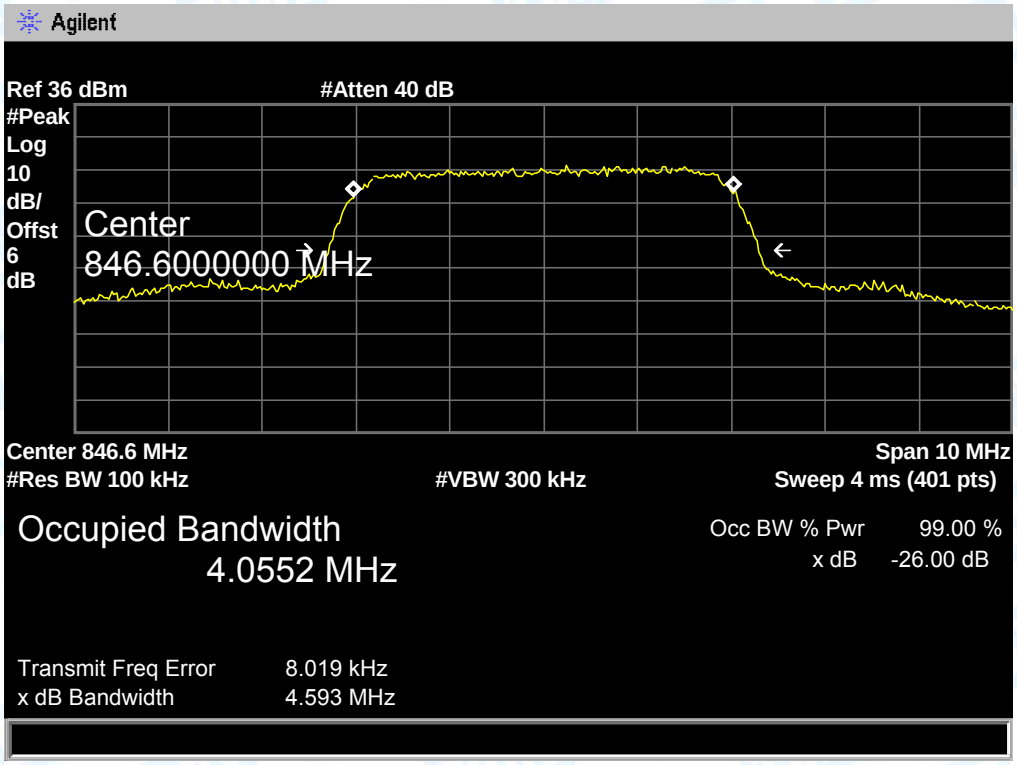
UMTS Band V (RMC)
CH 4132



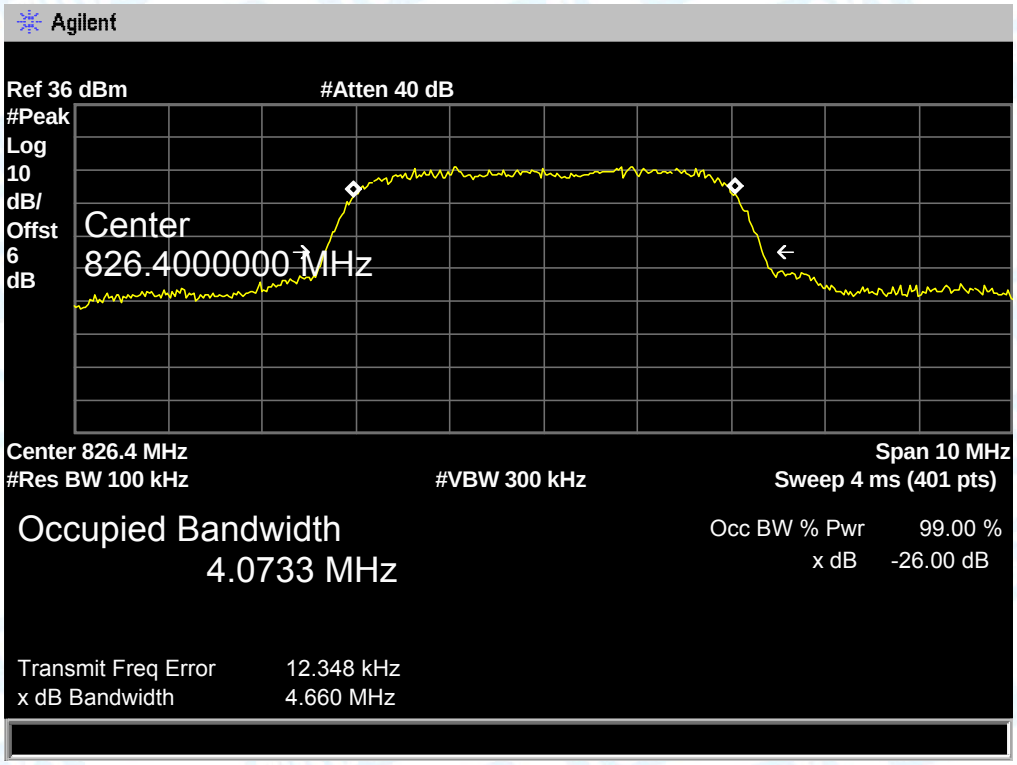
CH 4175



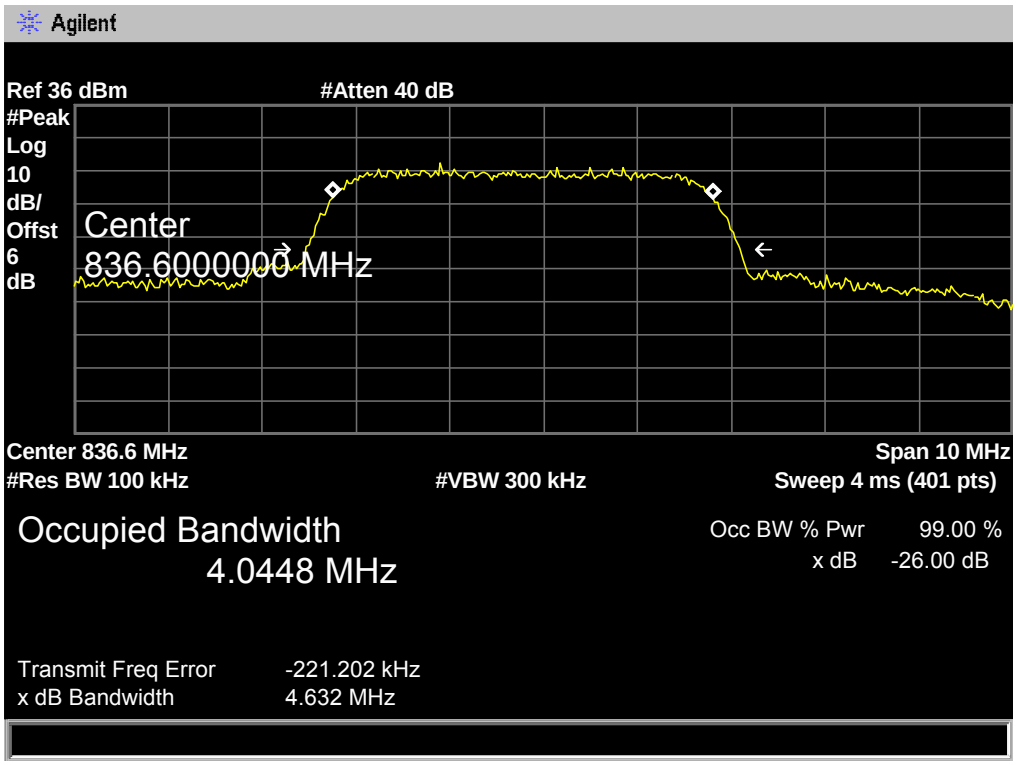
CH 4233


Agilent
Ref 36 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
846.6000000 MHz
Center 846.6 MHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
4.0552 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 8.019 kHz
x dB Bandwidth 4.593 MHz

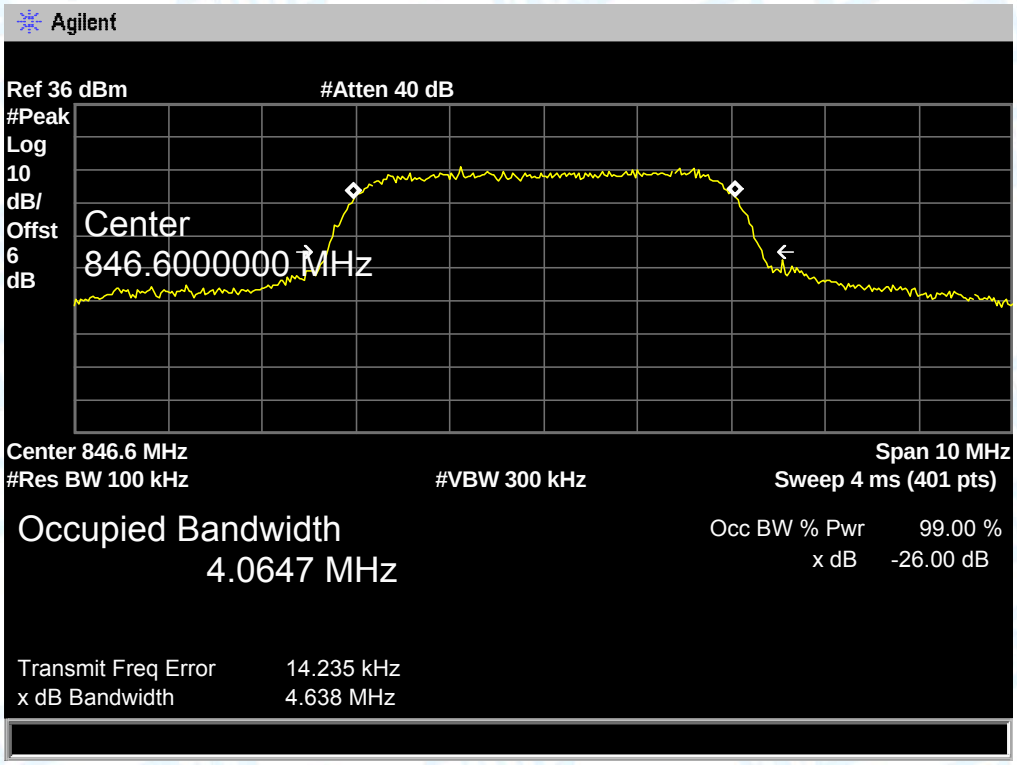
UMTS Band V (HSDPA)
CH 4132



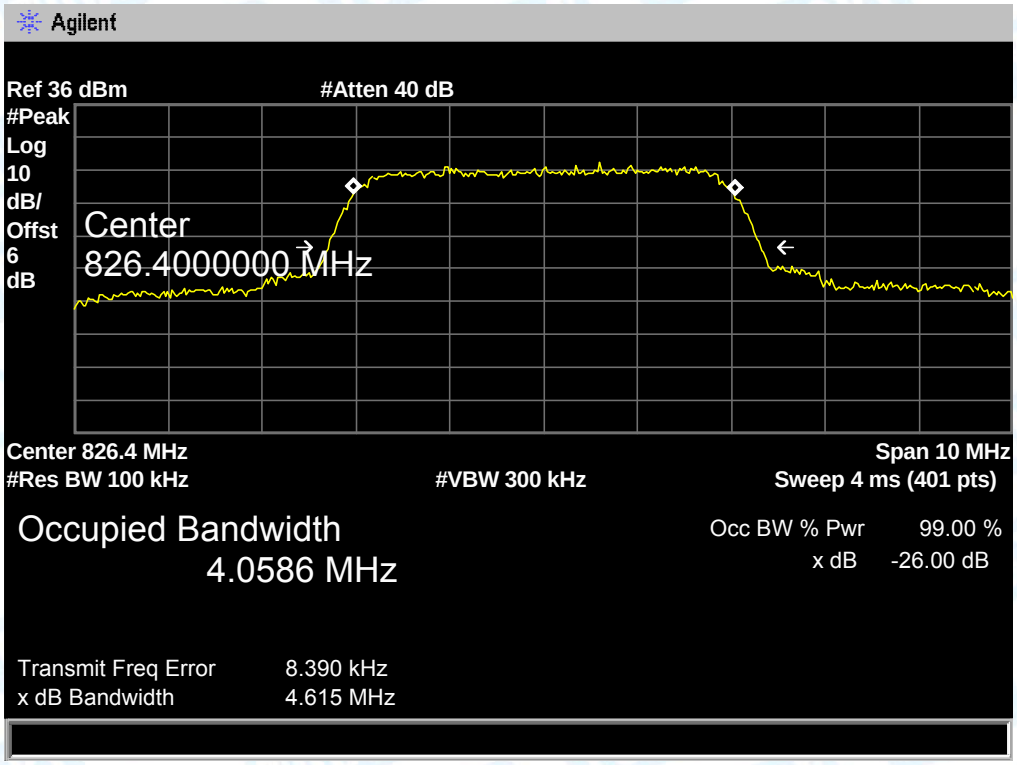
CH 4175



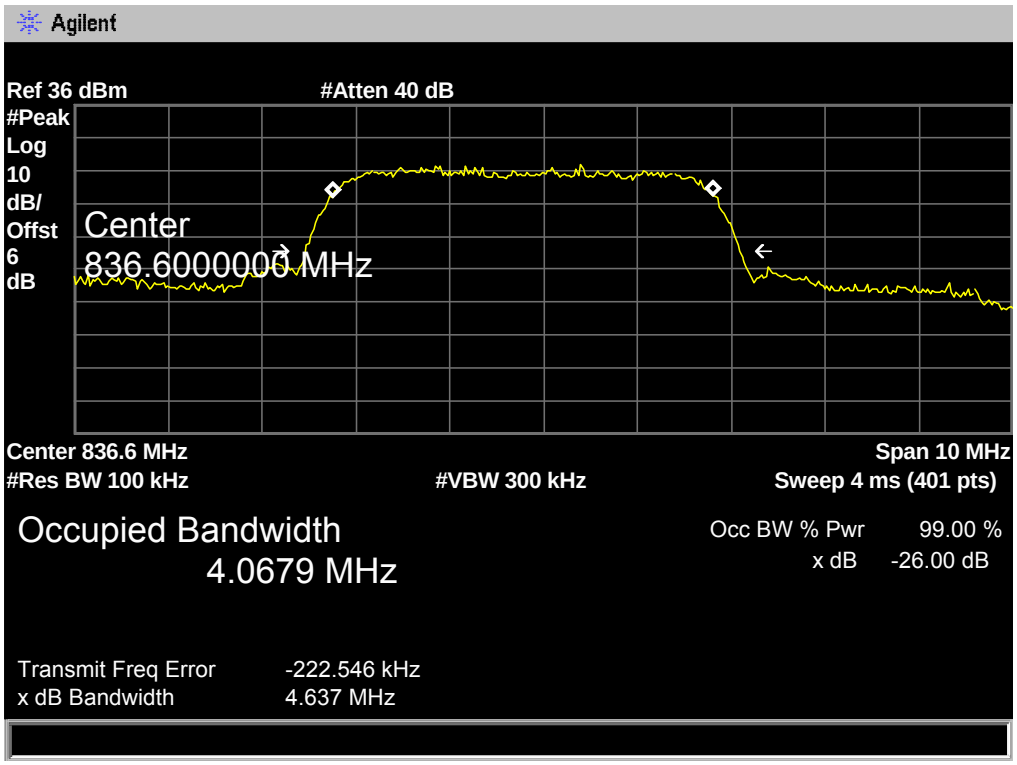
CH 4233


Agilent
Ref 36 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
846.6000000 MHz
Center 846.6 MHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
4.0647 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 14.235 kHz
x dB Bandwidth 4.638 MHz

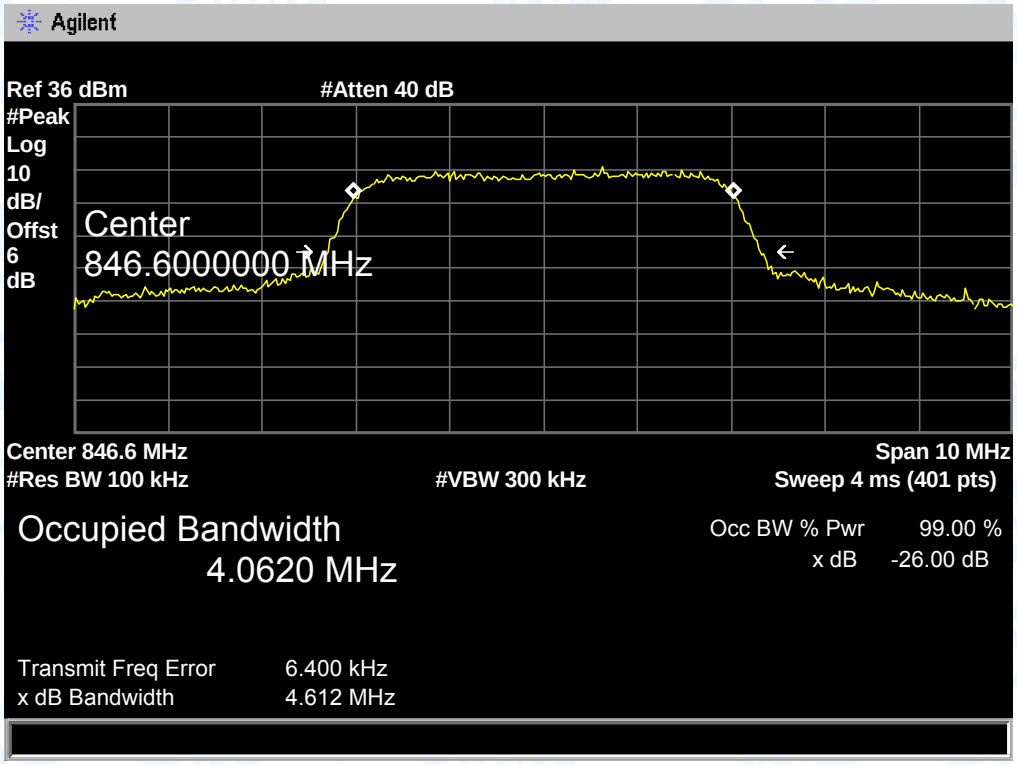
UMTS Band V (HSUPA)
CH 4132



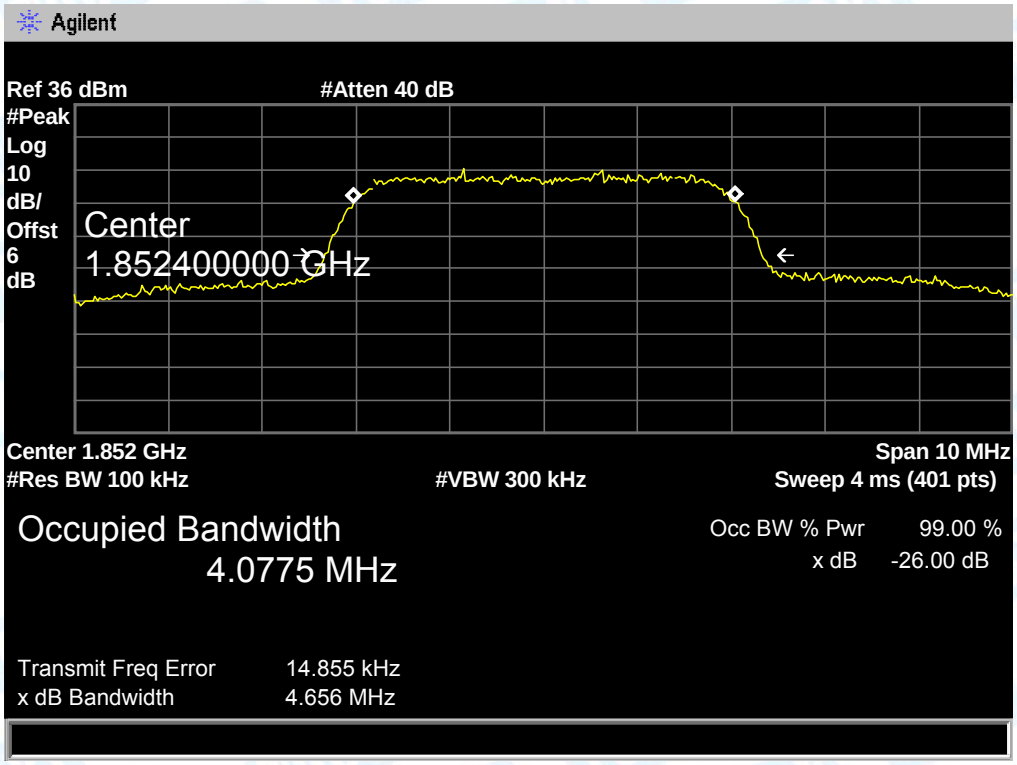
CH 4175



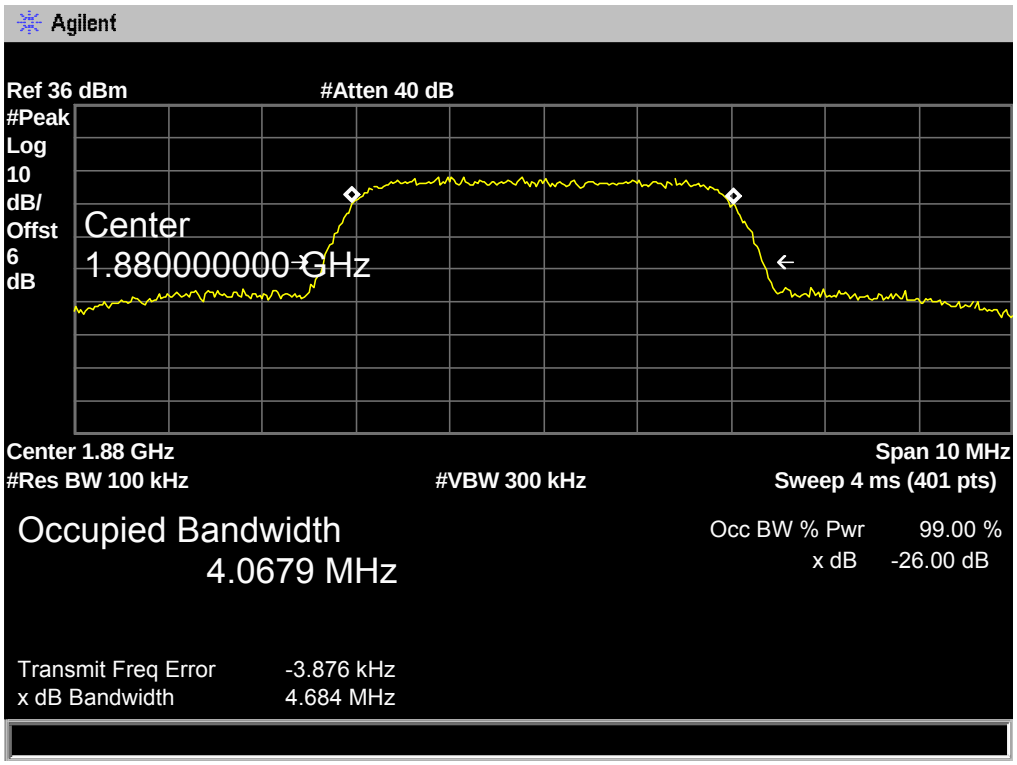
CH 4233


Agilent
Ref 36 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
846.6000000 MHz
Center 846.6 MHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
4.0620 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 6.400 kHz
x dB Bandwidth 4.612 MHz

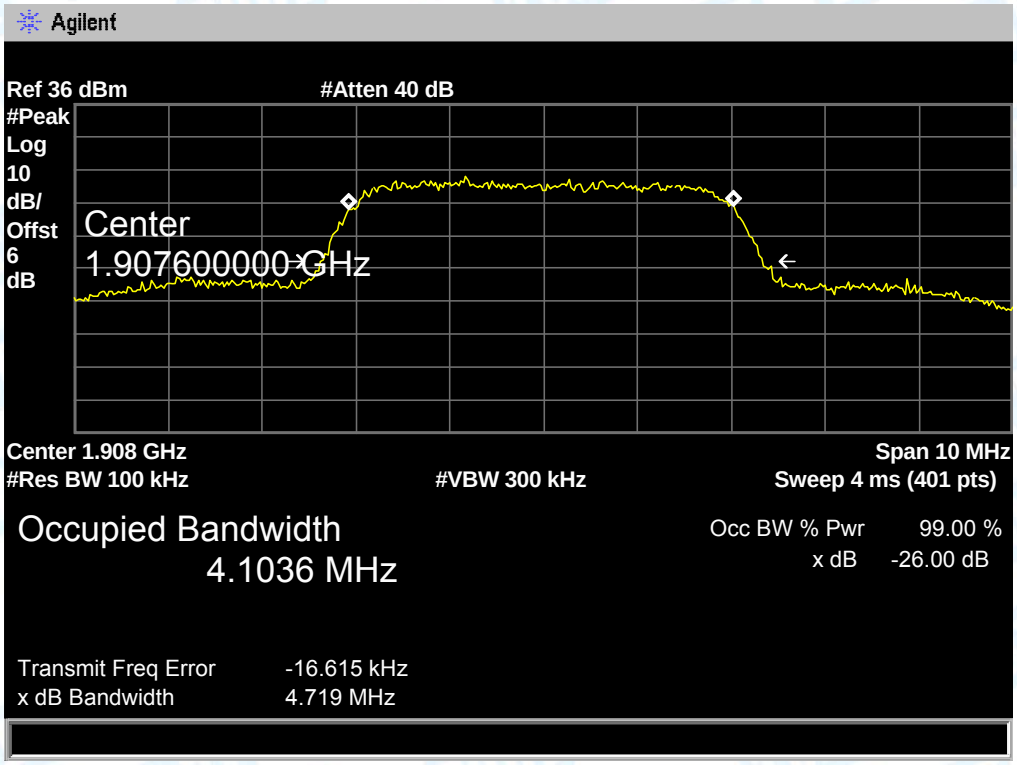
UMTS Band II (RMC)
CH 9262



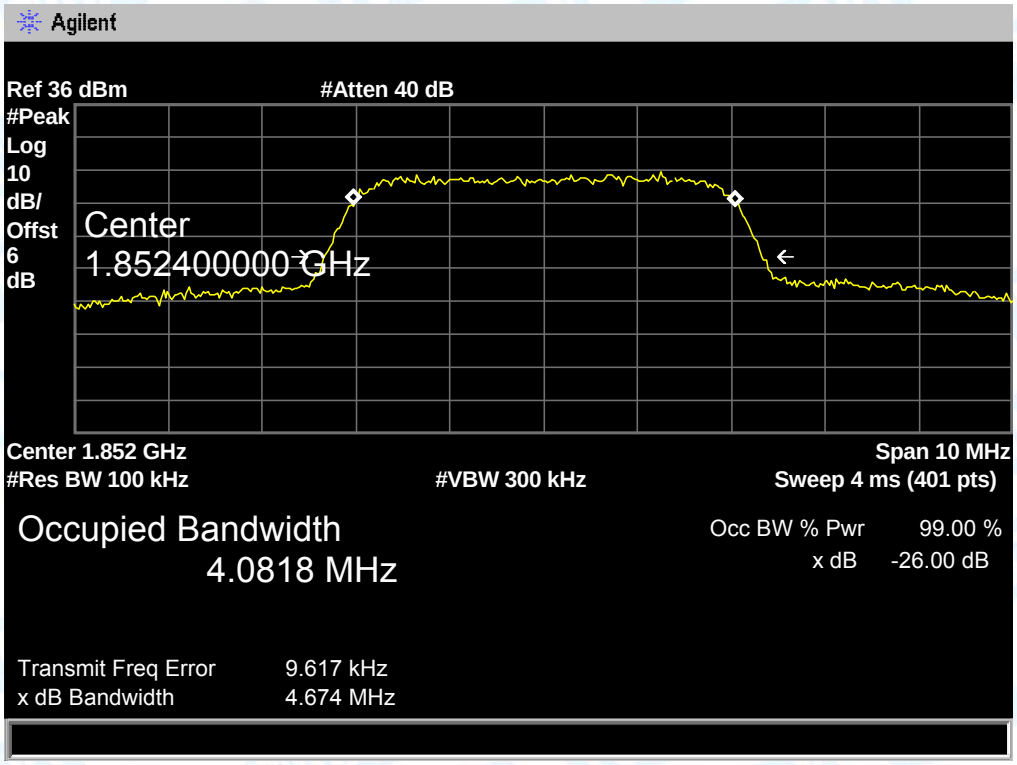
CH 9400



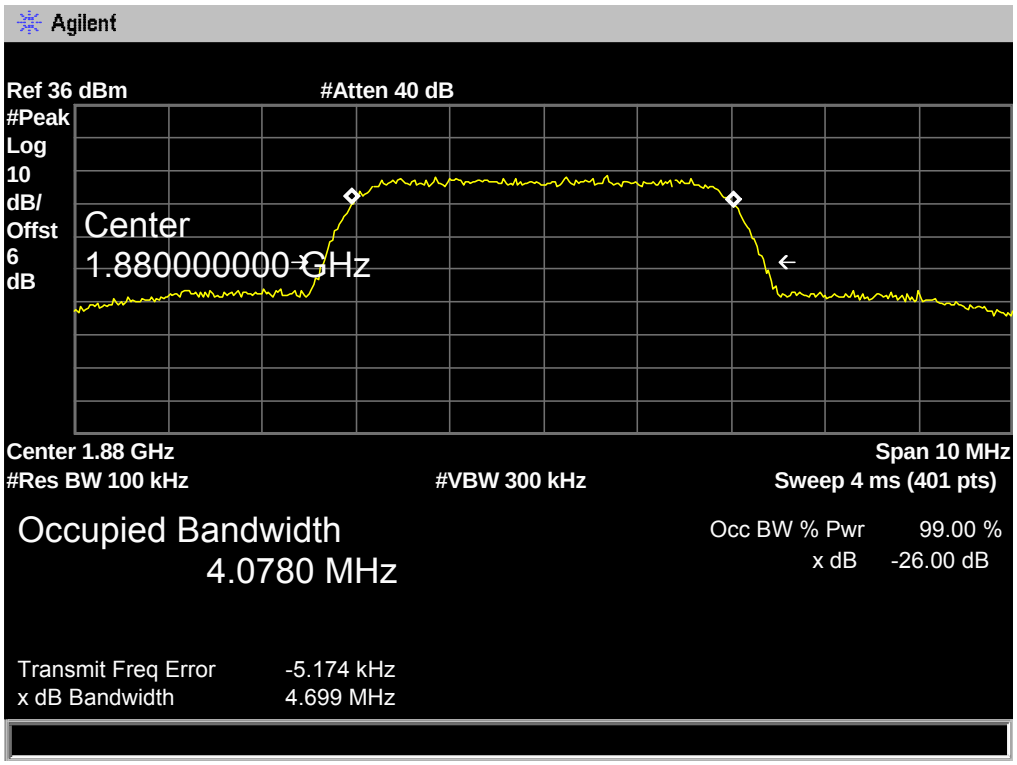
CH 9538


Agilent
Ref 36 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
1.907600000 GHz
Center 1.908 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
4.1036 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -16.615 kHz
x dB Bandwidth 4.719 MHz

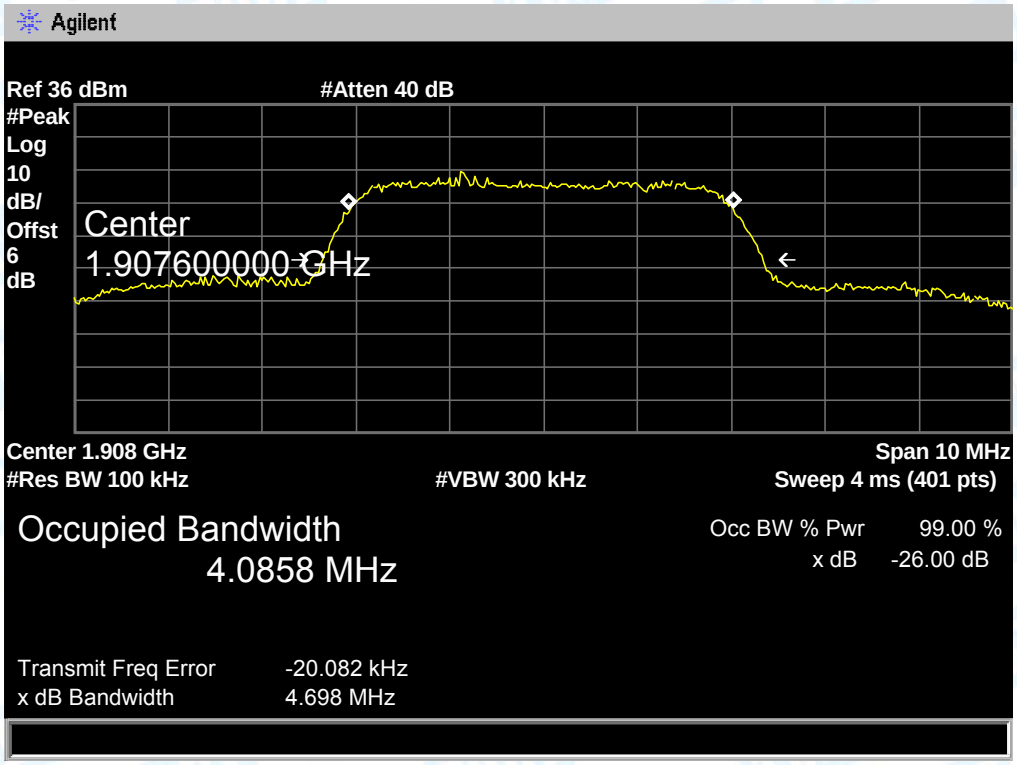
UMTS Band II (HSDPA)
CH 9262



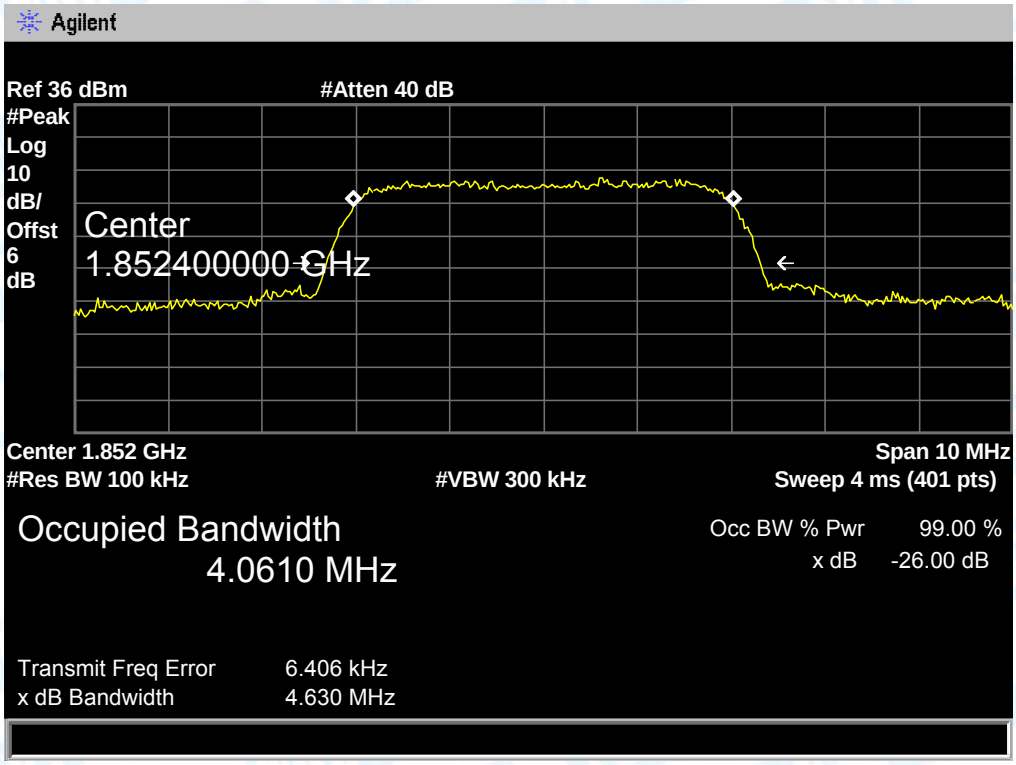
CH 9400



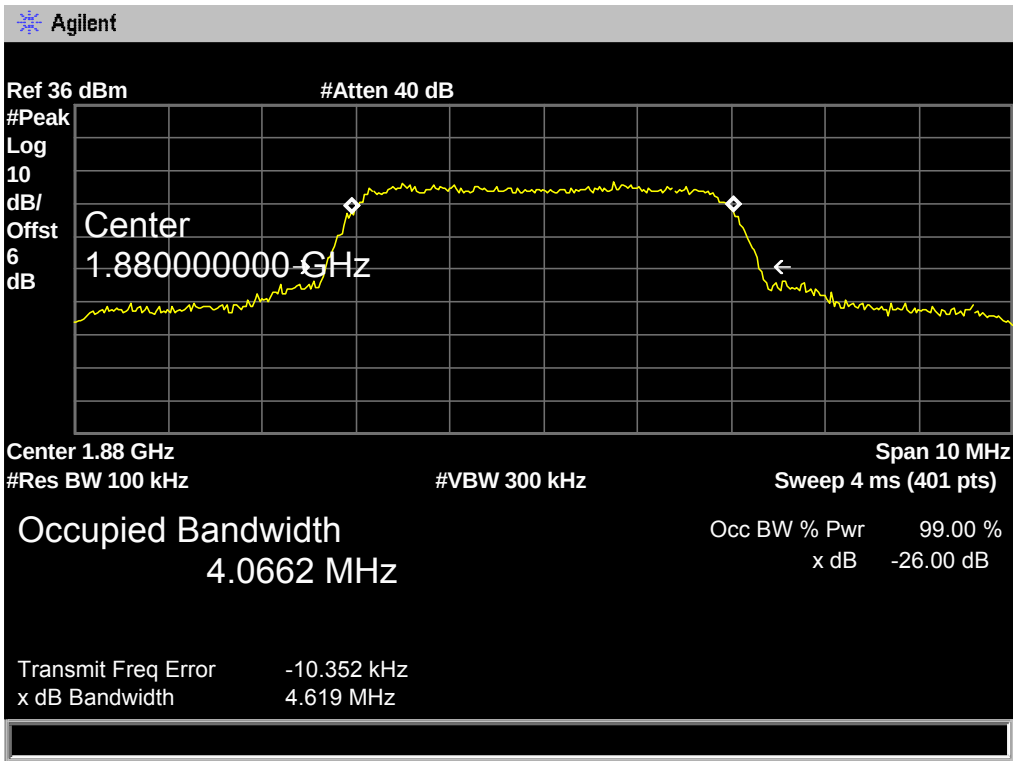
CH 9538


Agilent
Ref 36 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
1.907600000 GHz
Center 1.908 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
4.0858 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -20.082 kHz
x dB Bandwidth 4.698 MHz

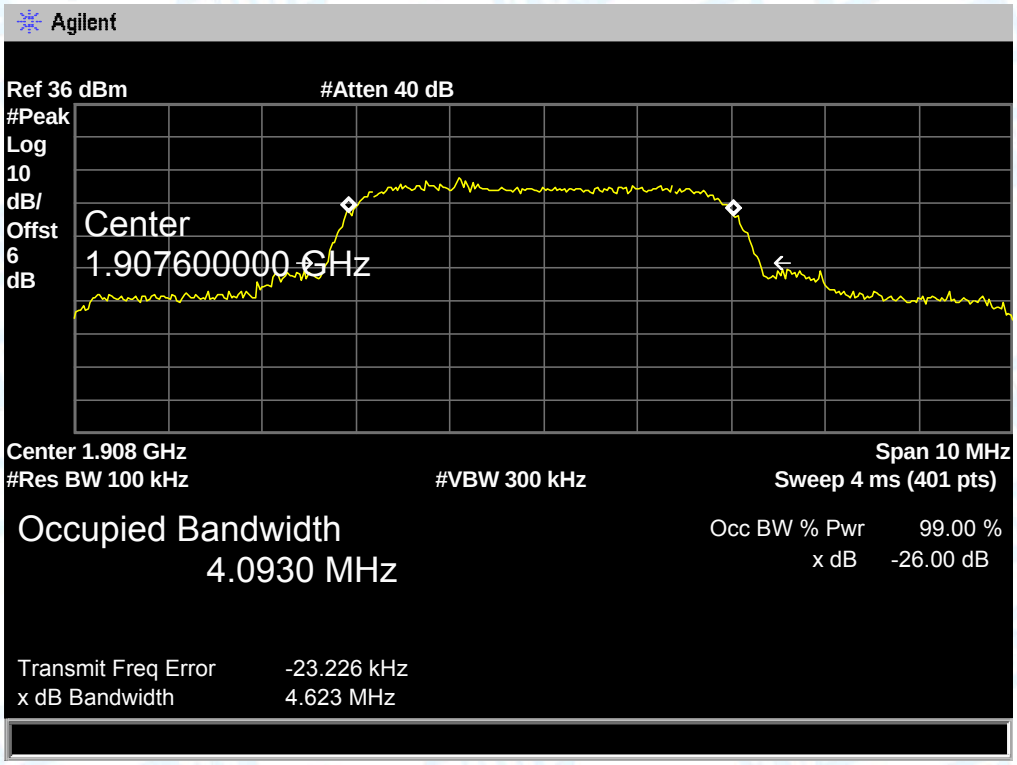
UMTS Band II (HSUPA)
CH 9262



CH 9400



CH 9538


Agilent
Ref 36 dBm
#Atten 40 dB
#Peak
Log
10
dB/
Offst
6
dB
Center
1.907600000 GHz
Center 1.908 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
4.0930 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -23.226 kHz
x dB Bandwidth 4.623 MHz

9. Conducted Out of Band Emissions

9.1 Test Standard and Limit

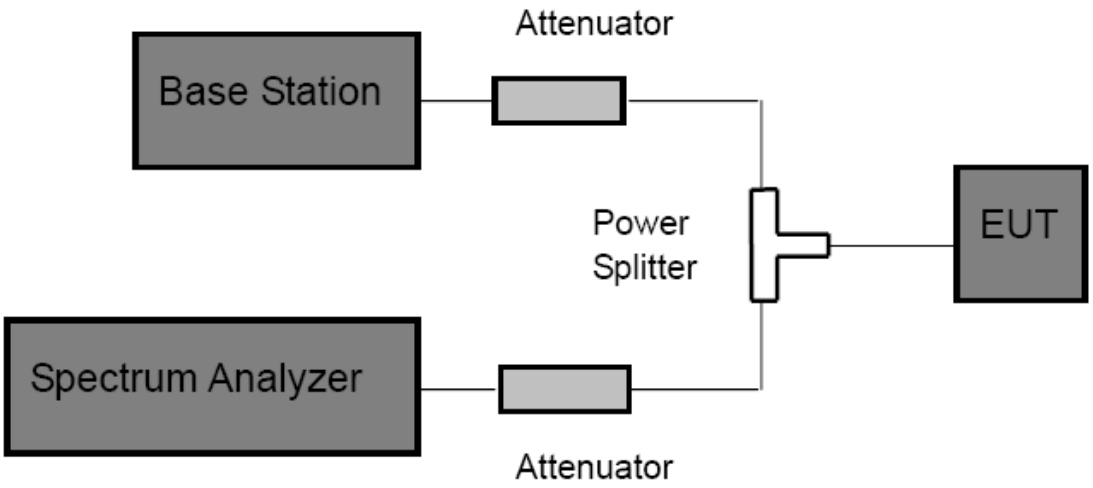
9.1.1 Test Standard

FCC Part 2: 2.1051, 2.1057
FCC Part 22H: 22.917(a)
FCC Part 24E: 24.238(a)

9.1.2 Test Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power(P) by a factor of at least 43+10log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

9.2 Test Setup



9.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and Base station via power splitter as show in the block diagram above.
(2) Spectrum Setting:
Frequency bellow 1 GHz: RBW=100 kHz, VBW=300 kHz.
Frequency above 1 GHz: RBW=1 MHz, VBW=3 MHz.
(3) The low, middle and high channels of each band and mode's spurious emissions for 30 MHz to 10th Harmonic were measured by Spectrum analyzer.

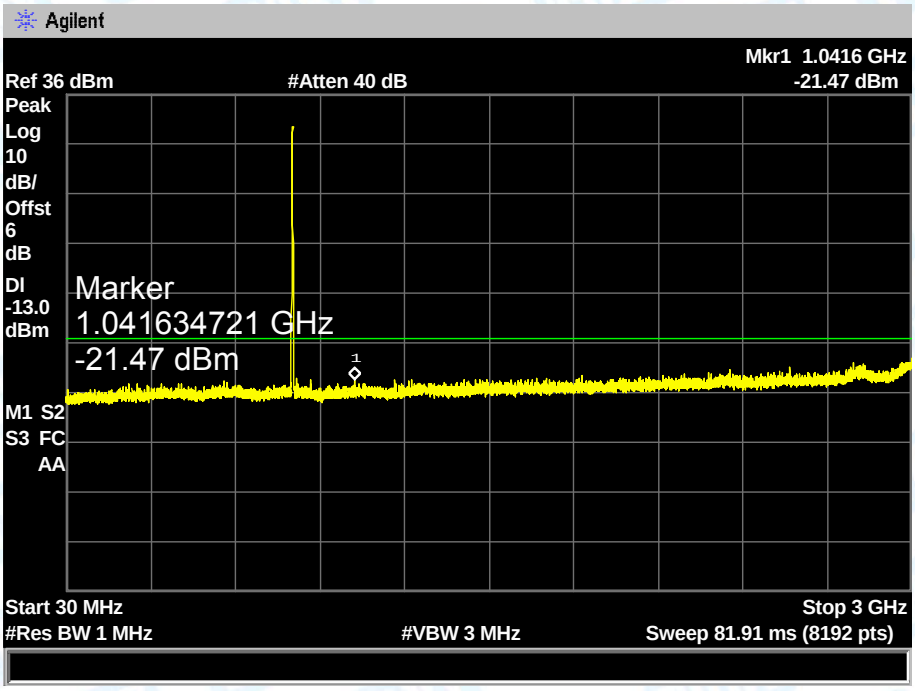
9.4 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

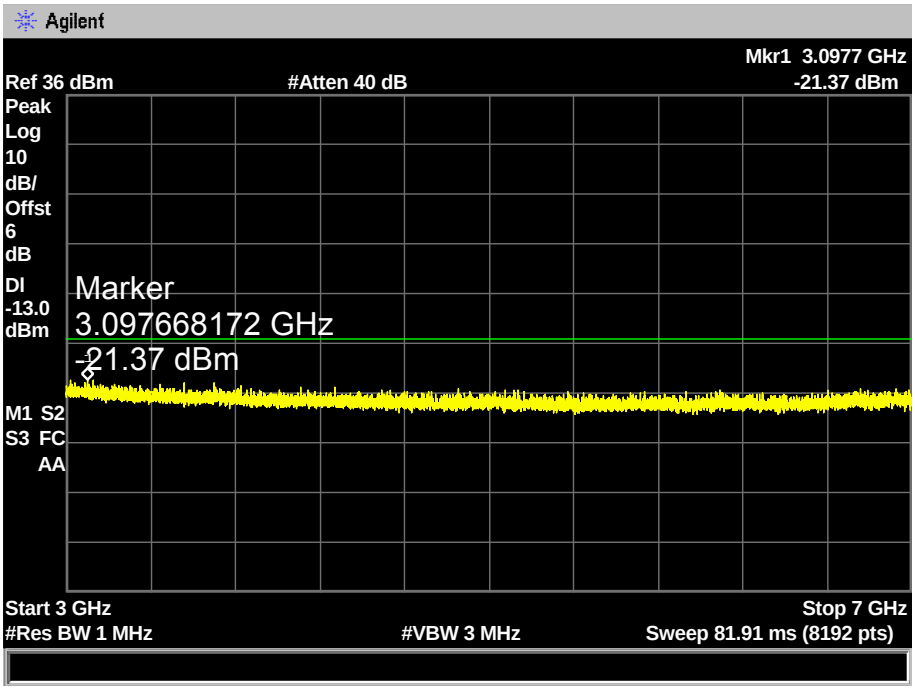
9.5 Test Data

Please refer following plots:

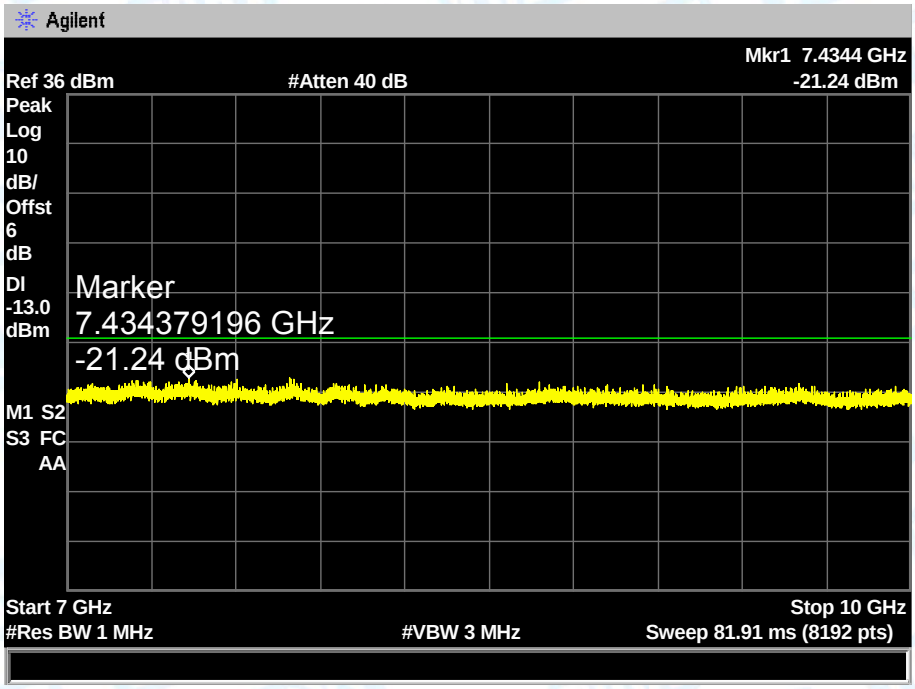
GSM850 CH 128
30 MHz~ 3 GHz



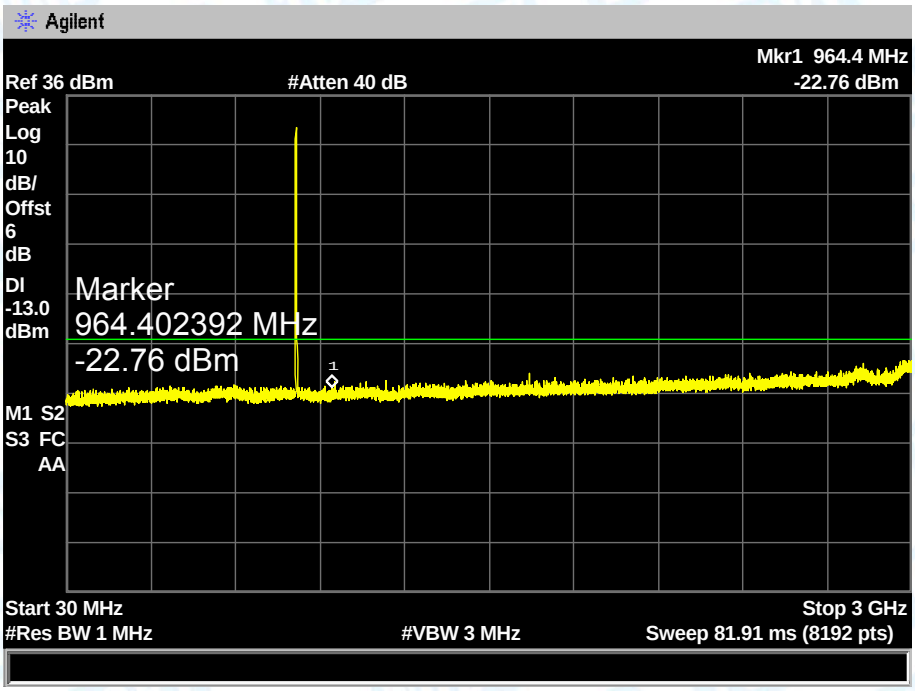
3 GHz~7 GHz



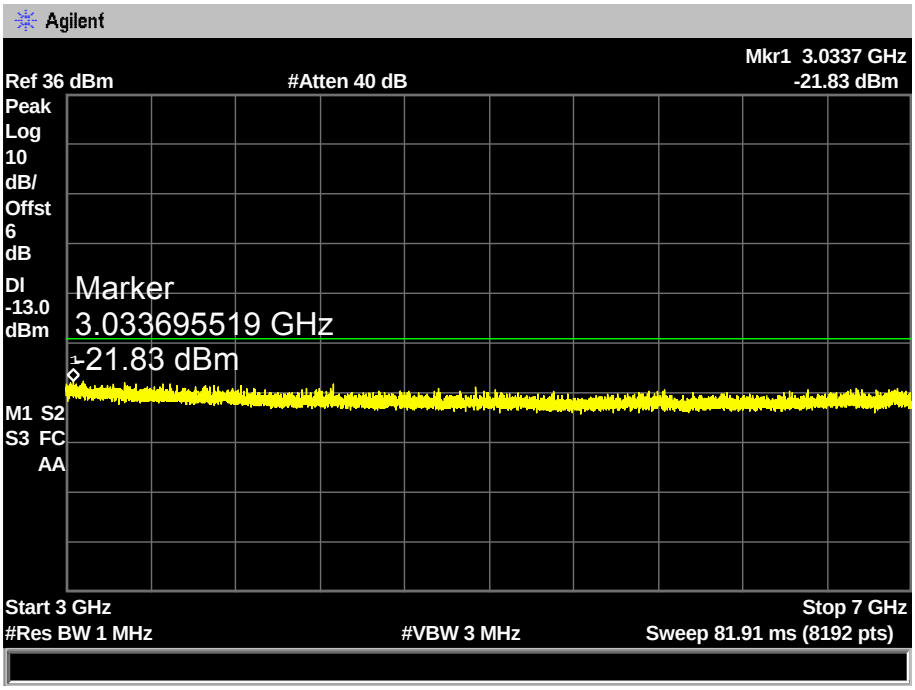
7 GHz~10 GHz


Agilent
Mkr1 7.4344 GHz
Ref 36 dBm
#Atten 40 dB
-21.24 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.434379196 GHz
-21.24 dBm
M1 S2
S3 FC
AA
Start 7 GHz
Stop 10 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 81.91 ms (8192 pts)

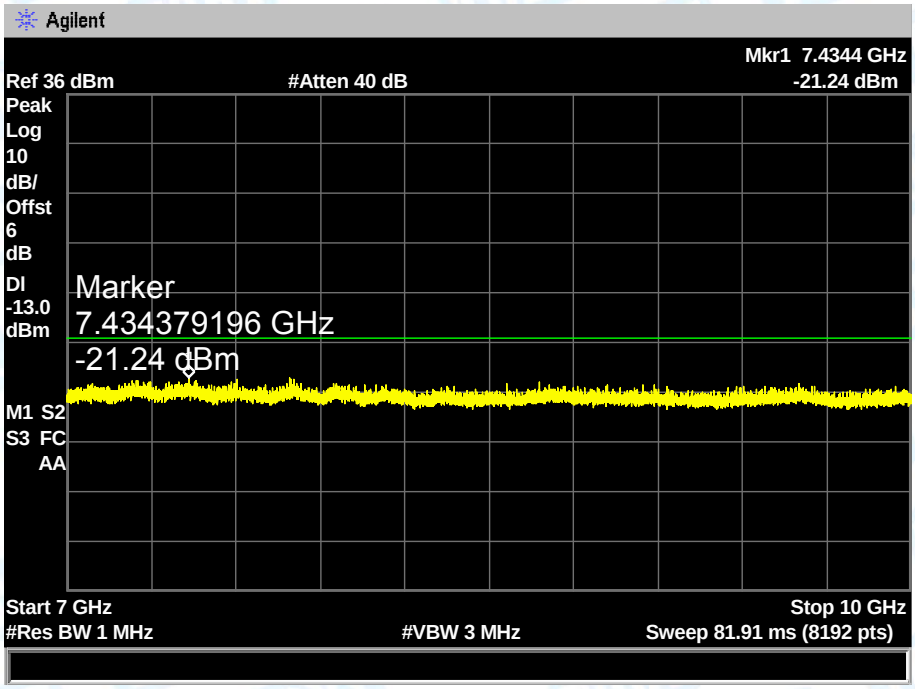
GSM850 CH 190
30 MHz~ 3 GHz



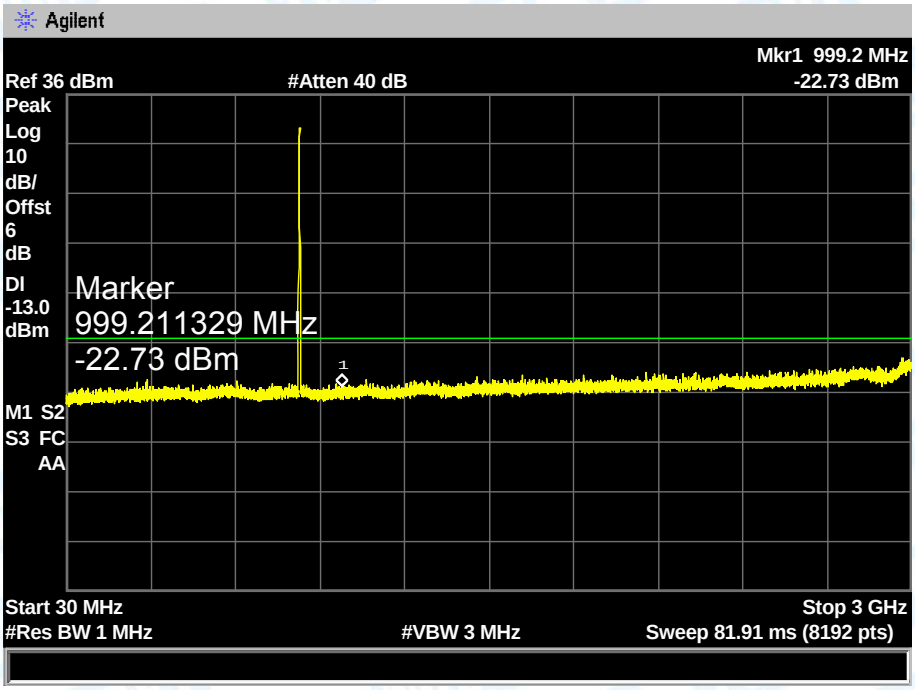
3 GHz~7 GHz



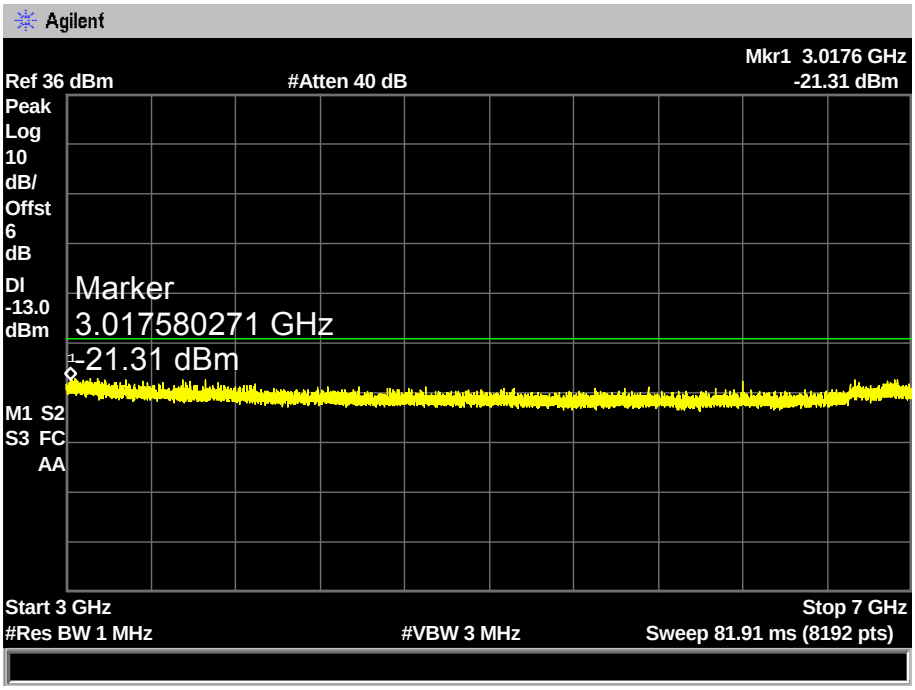
7 GHz~10 GHz


Agilent
Mkr1 7.4344 GHz
Ref 36 dBm
#Atten 40 dB
-21.24 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.434379196 GHz
-21.24 dBm
M1 S2
S3 FC
AA
Start 7 GHz
Stop 10 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 81.91 ms (8192 pts)

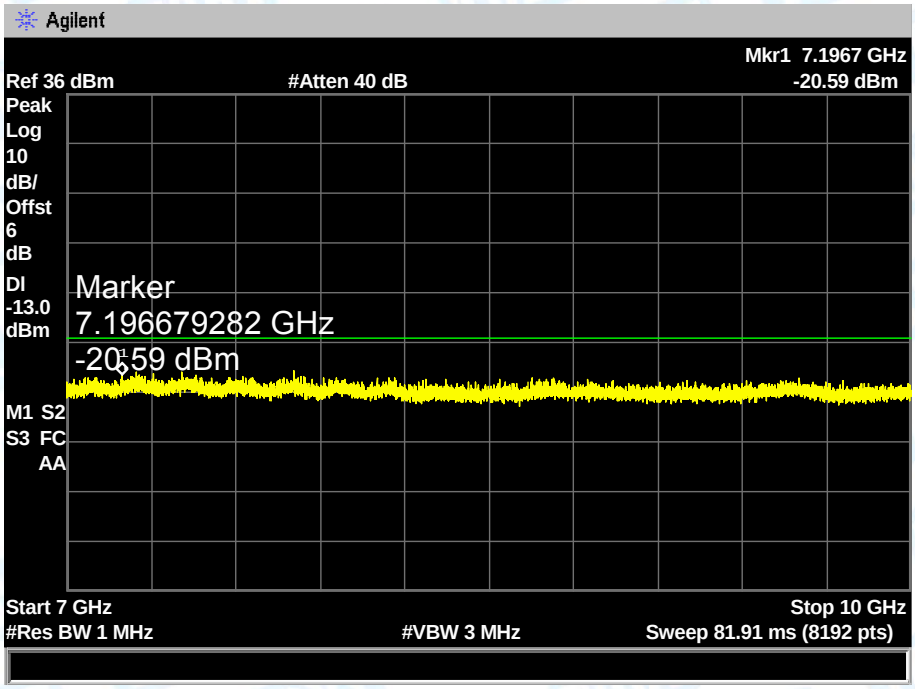
GSM850 CH 251
30 MHz~ 3 GHz



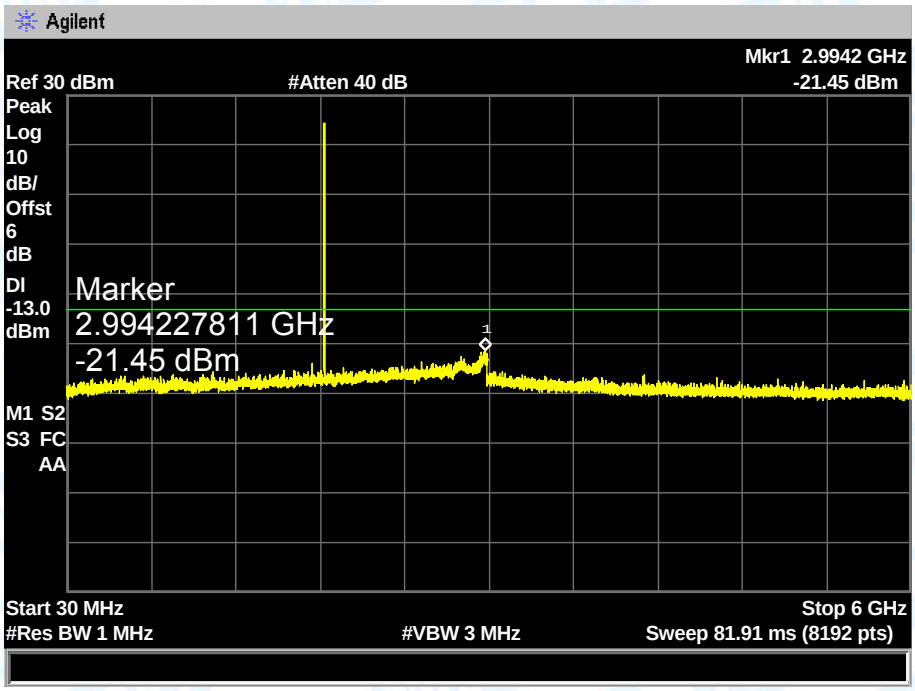
3 GHz~7 GHz



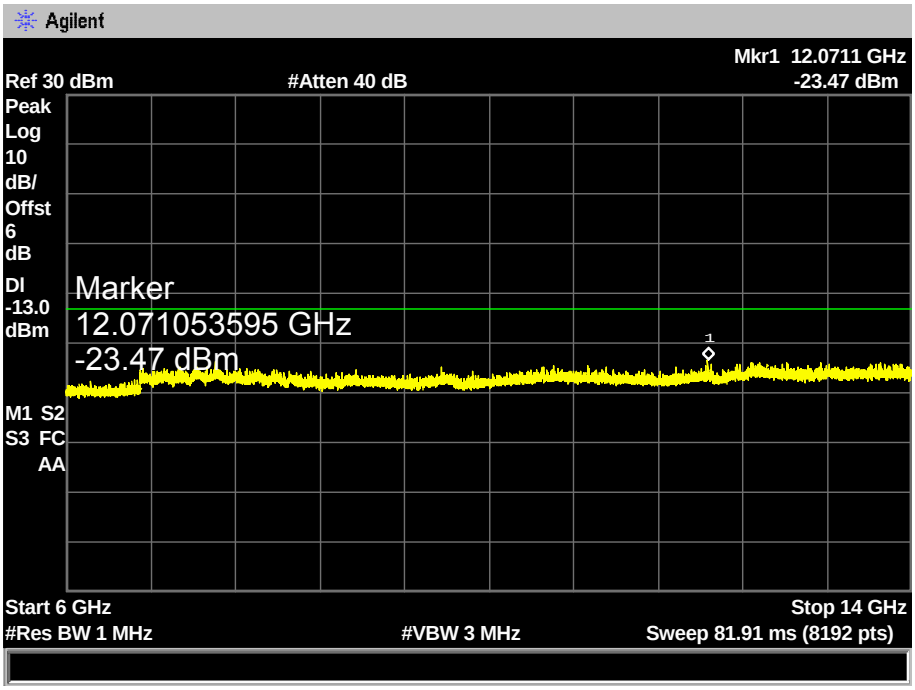
7 GHz~10 GHz


Agilent
Mkr1 7.1967 GHz
Ref 36 dBm
#Atten 40 dB
-20.59 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.196679282 GHz
-20.59 dBm
M1 S2
S3 FC
AA
Start 7 GHz
Stop 10 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 81.91 ms (8192 pts)

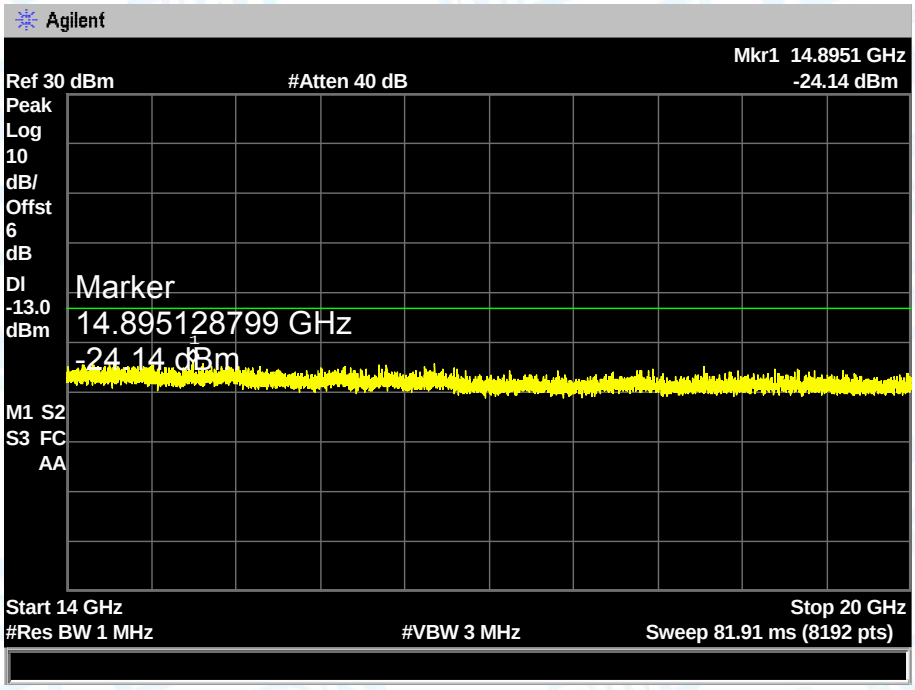
PCS 1900 CH 512
30 MHz~ 6 GHz



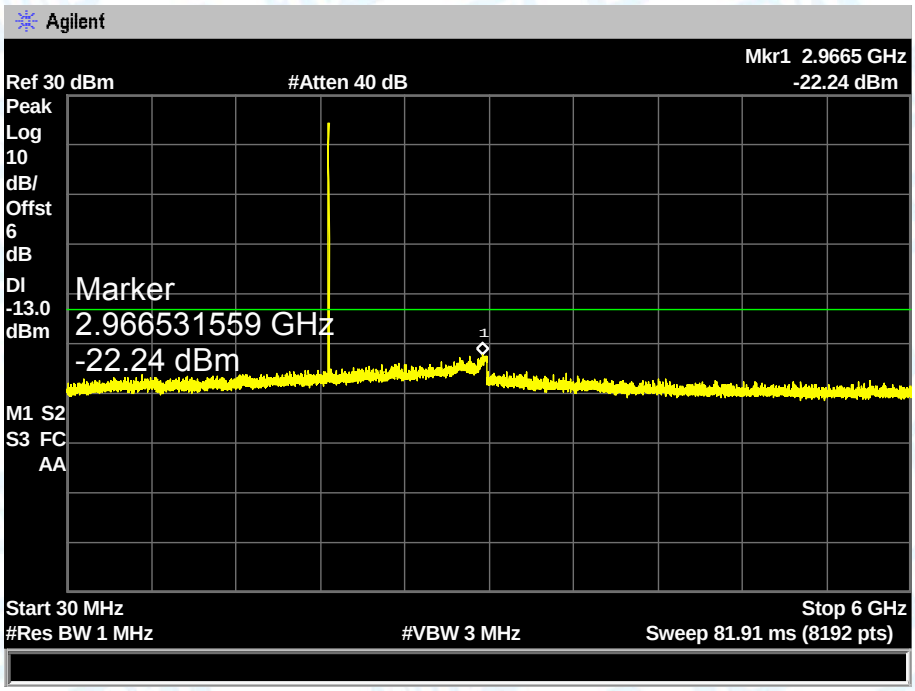
6 GHz~14 GHz



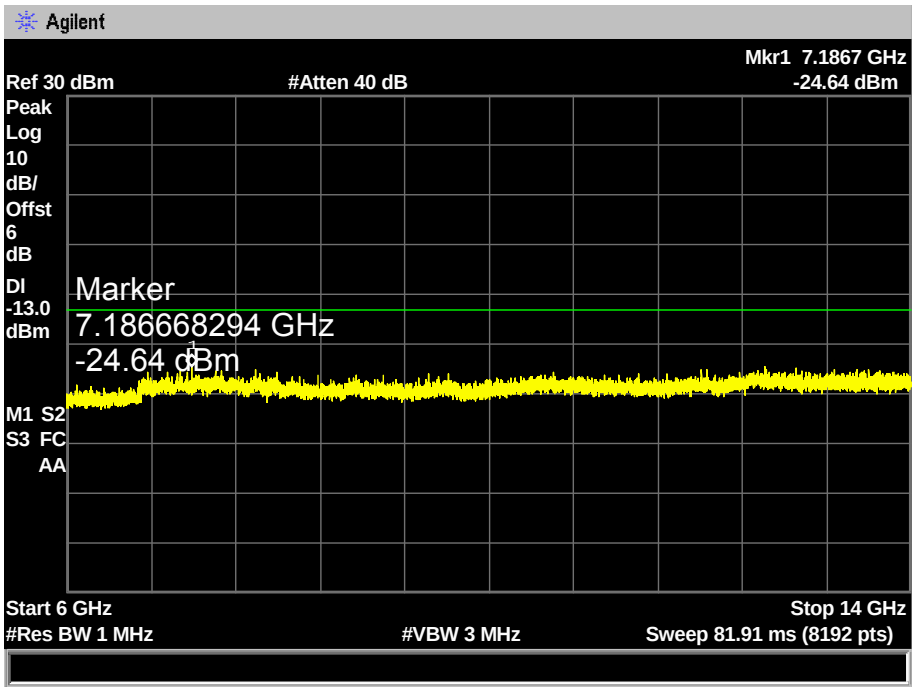
14 GHz~20 GHz


Agilent
Mkr1 14.8951 GHz
Ref 30 dBm
#Atten 40 dB
-24.14 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
14.895128799 GHz
-24.14 dBm
M1 S2
S3 FC
AA
Start 14 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 20 GHz
Sweep 81.91 ms (8192 pts)

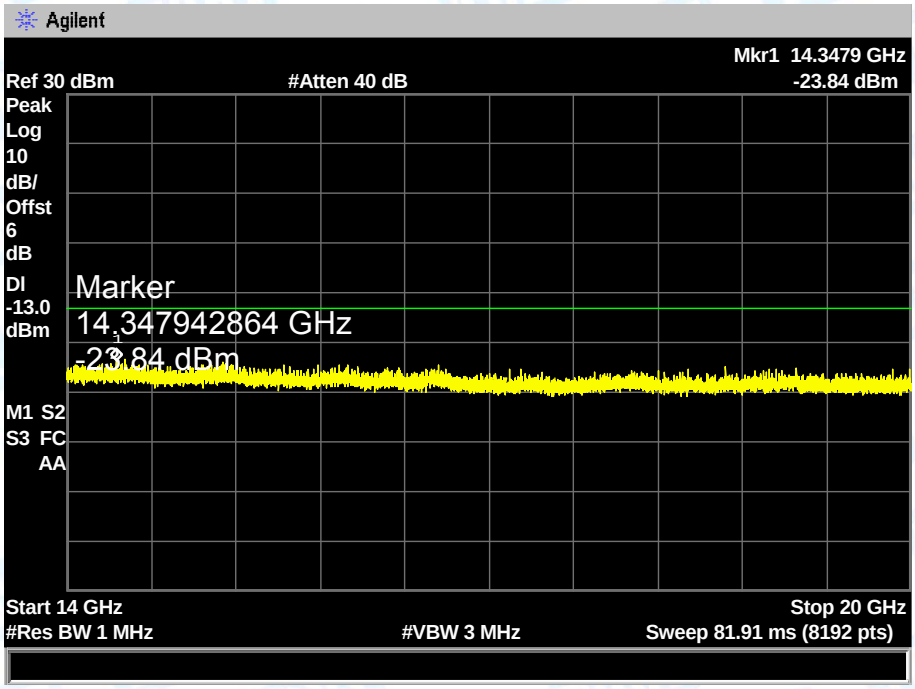
PCS 1900 CH 661
30 MHz~ 6 GHz



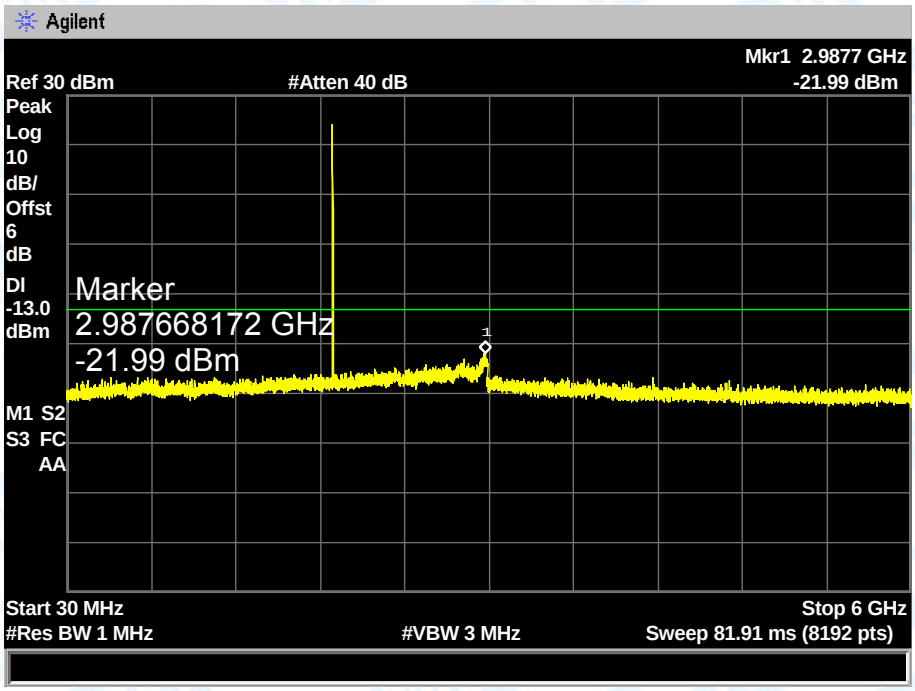
6 GHz~14 GHz



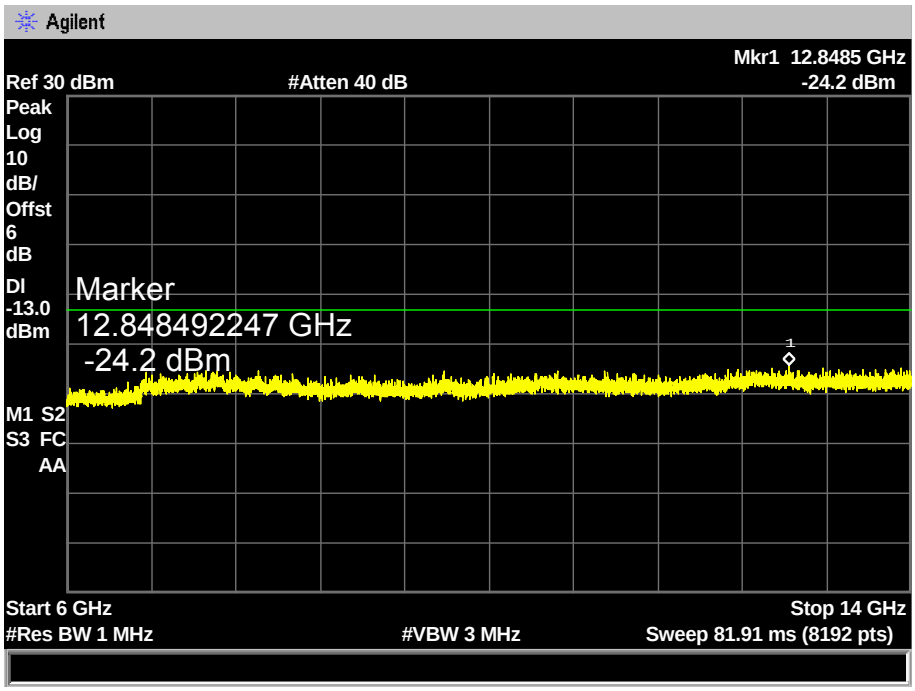
14 GHz~20 GHz


Agilent
Mkr1 14.3479 GHz
Ref 30 dBm
#Atten 40 dB
-23.84 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
14.347942864 GHz
-23.84 dBm
M1 S2
S3 FC
AA
Start 14 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 20 GHz
Sweep 81.91 ms (8192 pts)

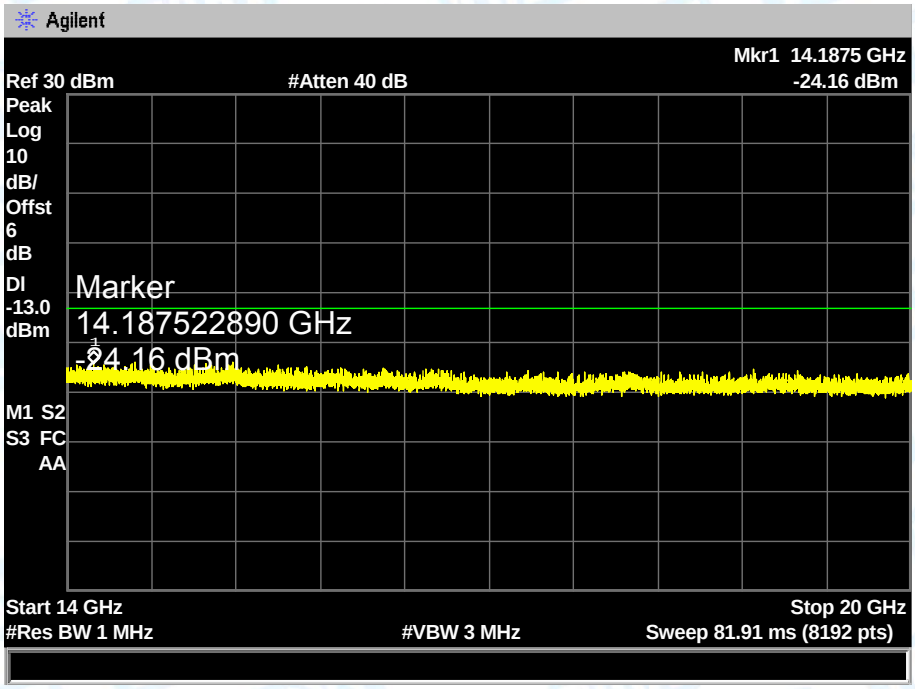
PCS 1900 CH 810
30 MHz~ 6 GHz



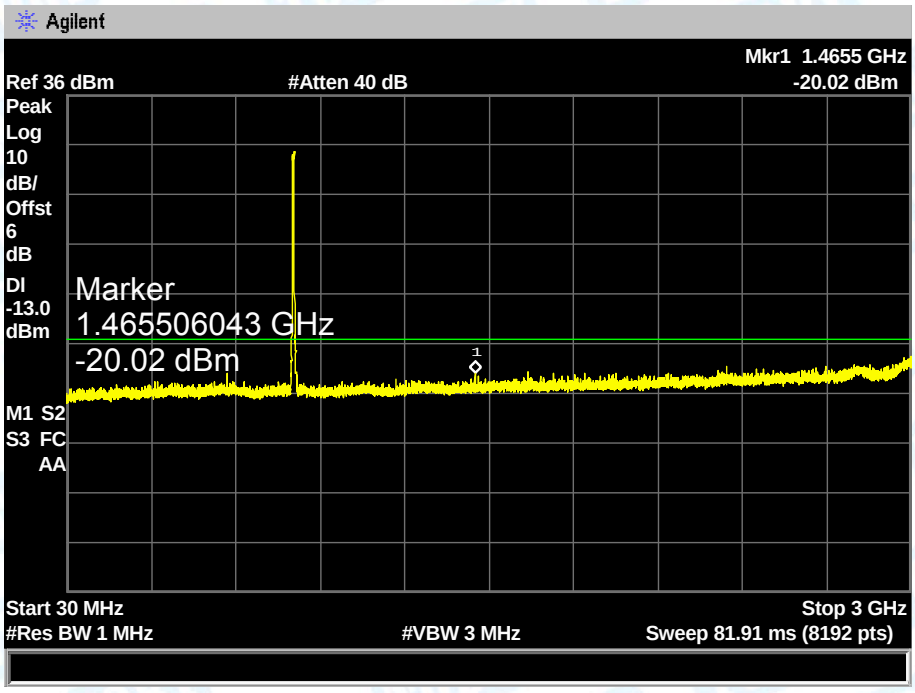
6 GHz~14 GHz



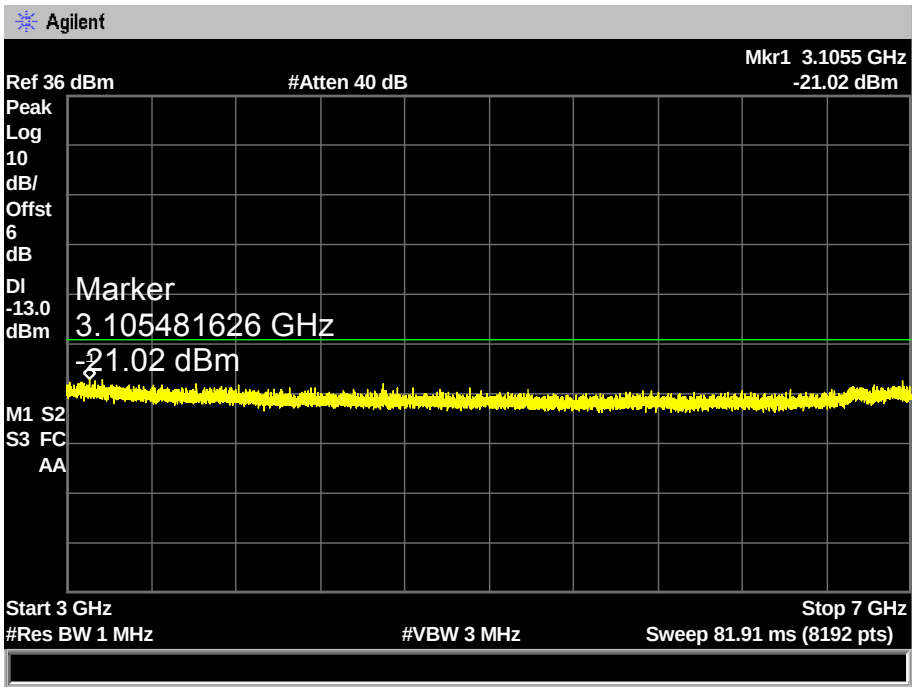
14 GHz~20 GHz


Agilent
Mkr1 14.1875 GHz
Ref 30 dBm
#Atten 40 dB
-24.16 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
14.187522890 GHz
-24.16 dBm
M1 S2
S3 FC
AA
Start 14 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 20 GHz
Sweep 81.91 ms (8192 pts)

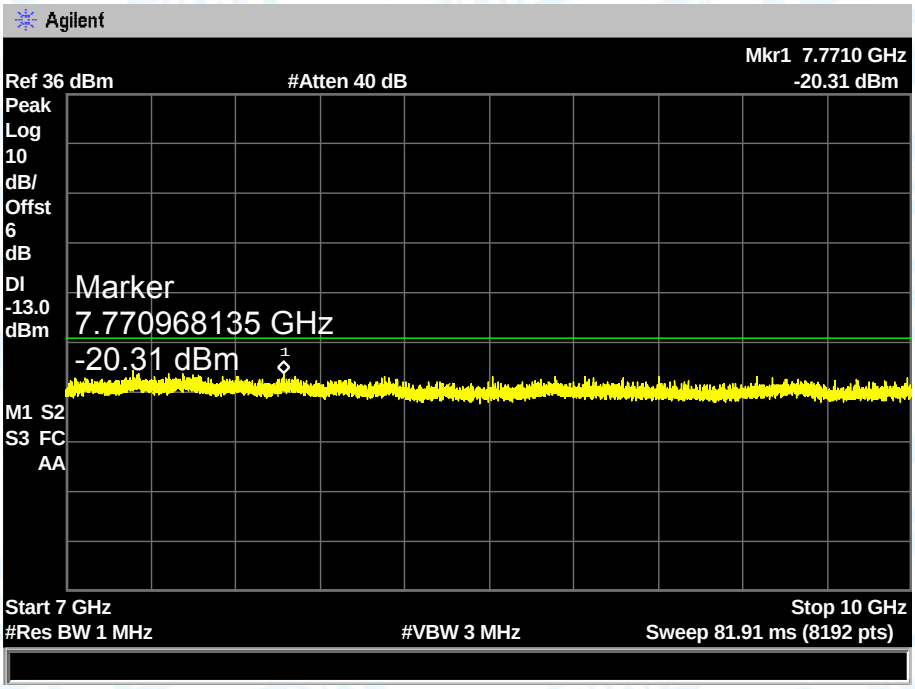
UMTS Band V CH 4132
30 MHz~ 3 GHz



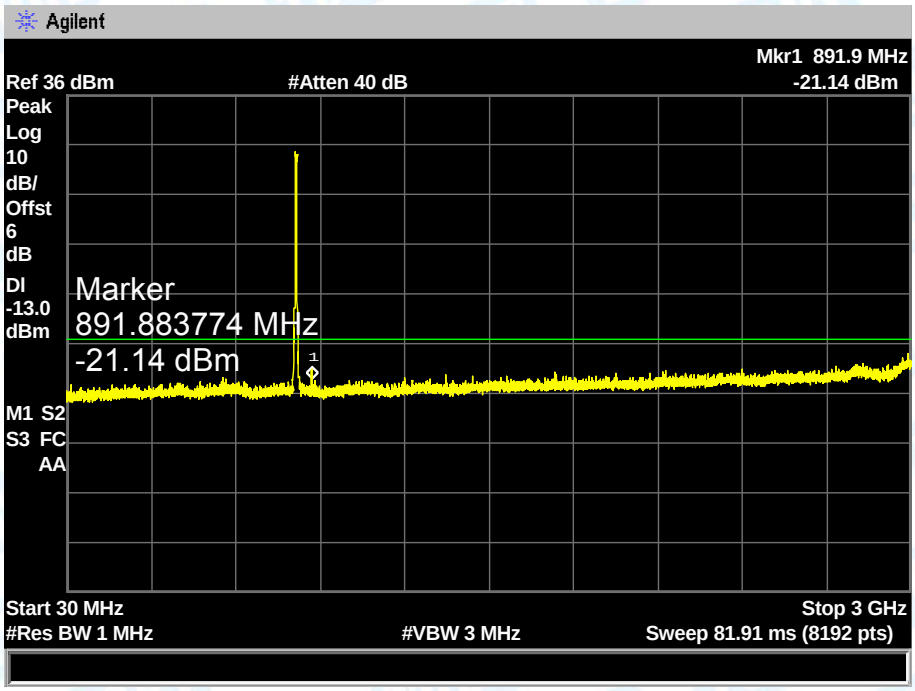
3 GHz~7 GHz



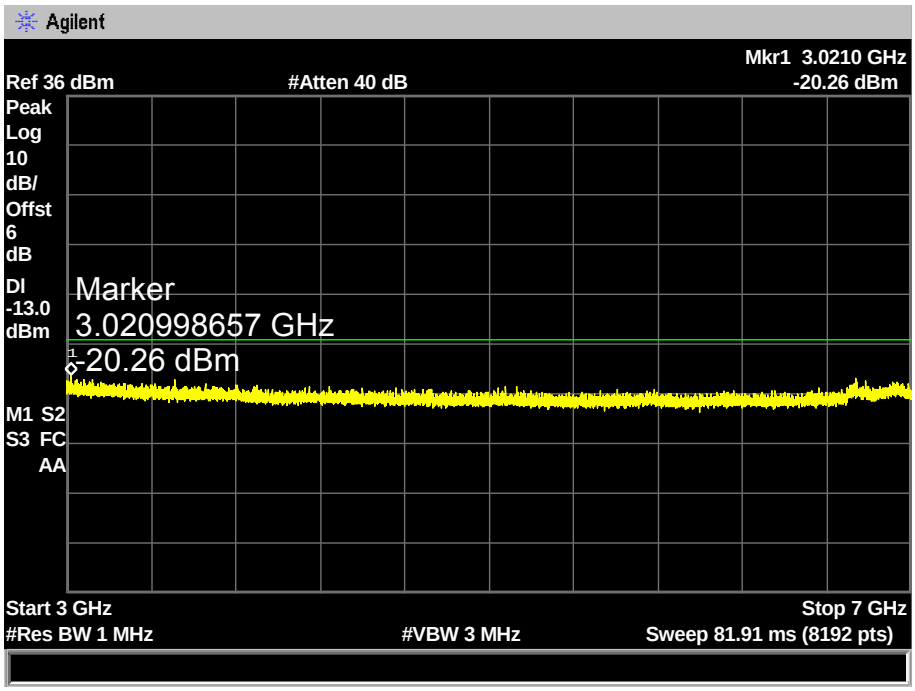
7 GHz~10 GHz


Agilent
Mkr1 7.7710 GHz
Ref 36 dBm
#Atten 40 dB
-20.31 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.770968135 GHz
-20.31 dBm
M1 S2
S3 FC
AA
Start 7 GHz
Stop 10 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 81.91 ms (8192 pts)

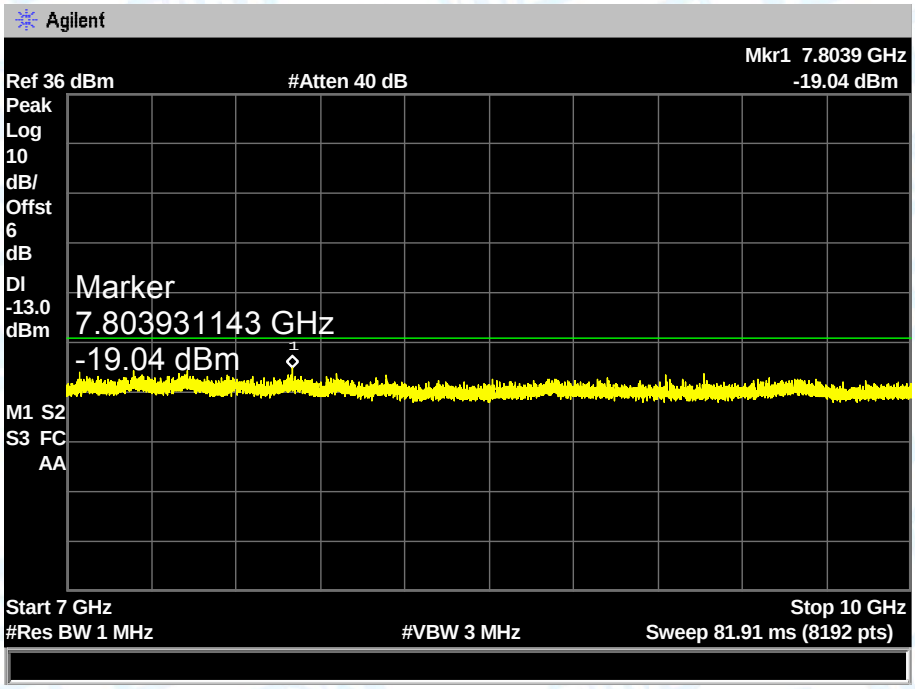
UMTS Band V CH 4175
30 MHz~ 3 GHz



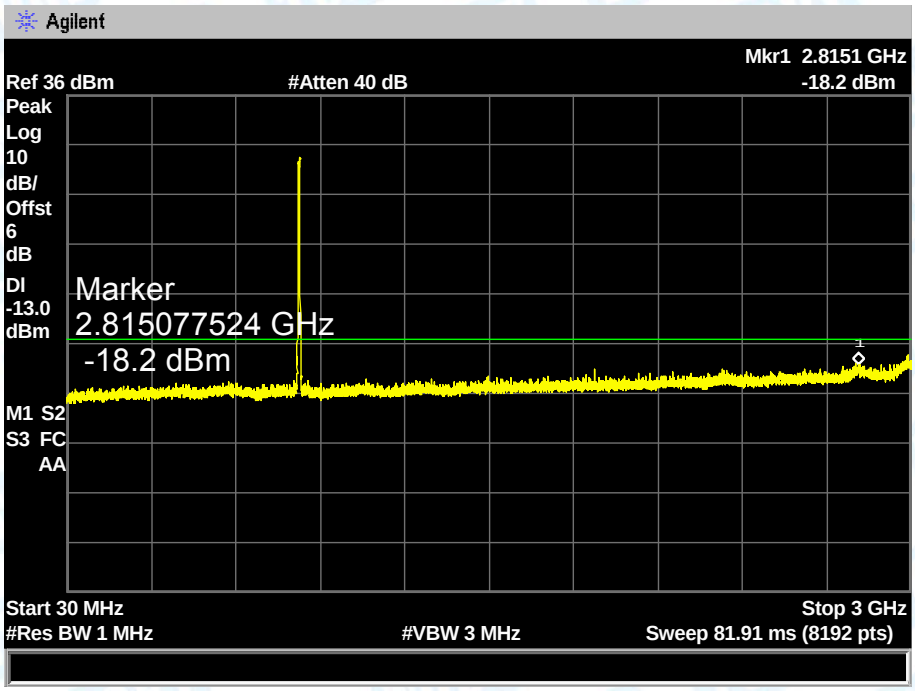
3 GHz~7 GHz



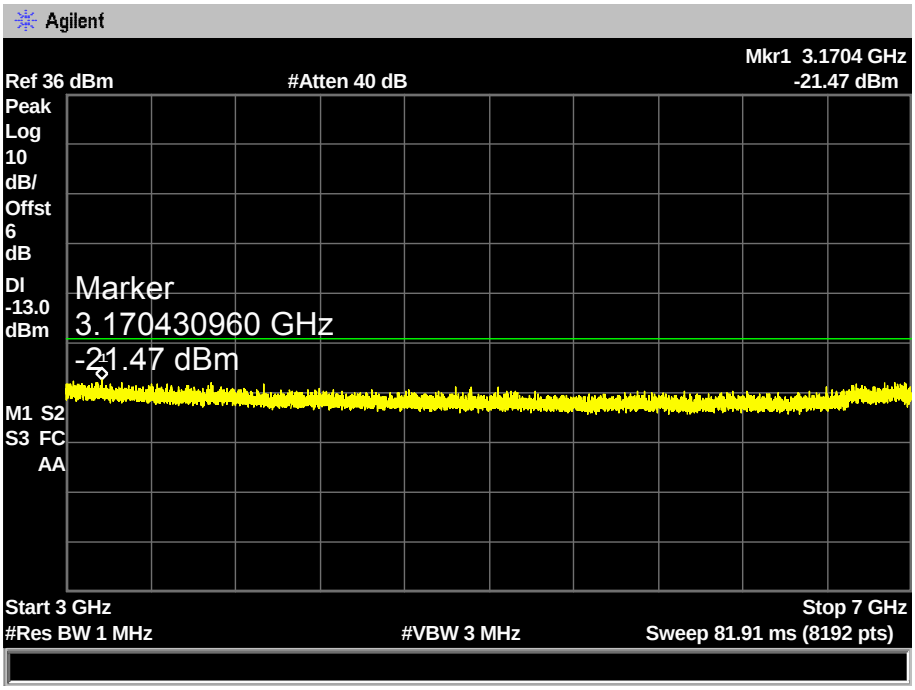
7 GHz~10 GHz


Agilent
Mkr1 7.8039 GHz
Ref 36 dBm
#Atten 40 dB
-19.04 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.803931143 GHz
-19.04 dBm
M1 S2
S3 FC
AA
Start 7 GHz
Stop 10 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 81.91 ms (8192 pts)

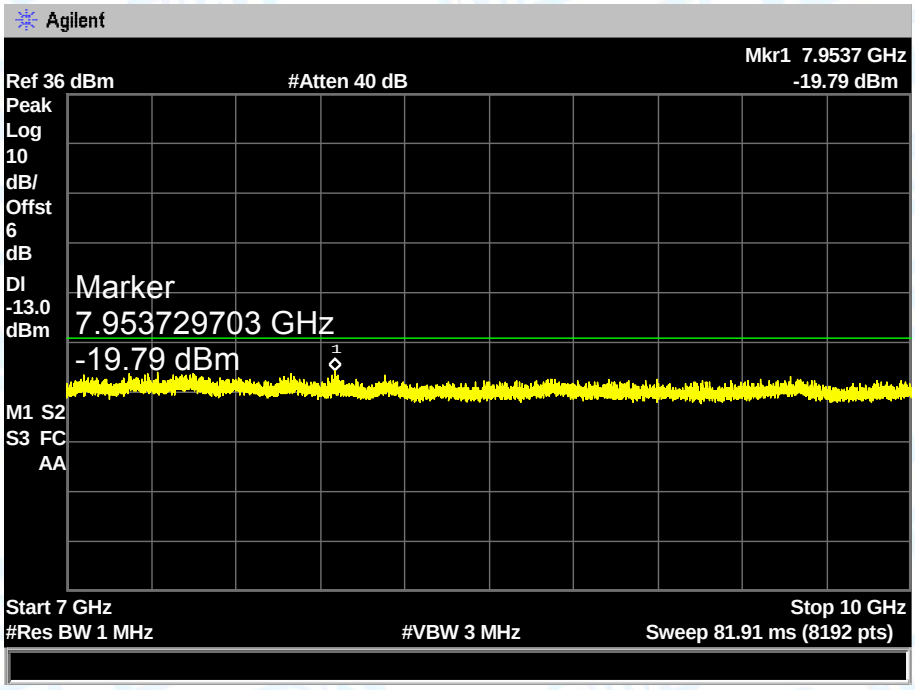
UMTS Band V CH 4233
30 MHz~ 3 GHz



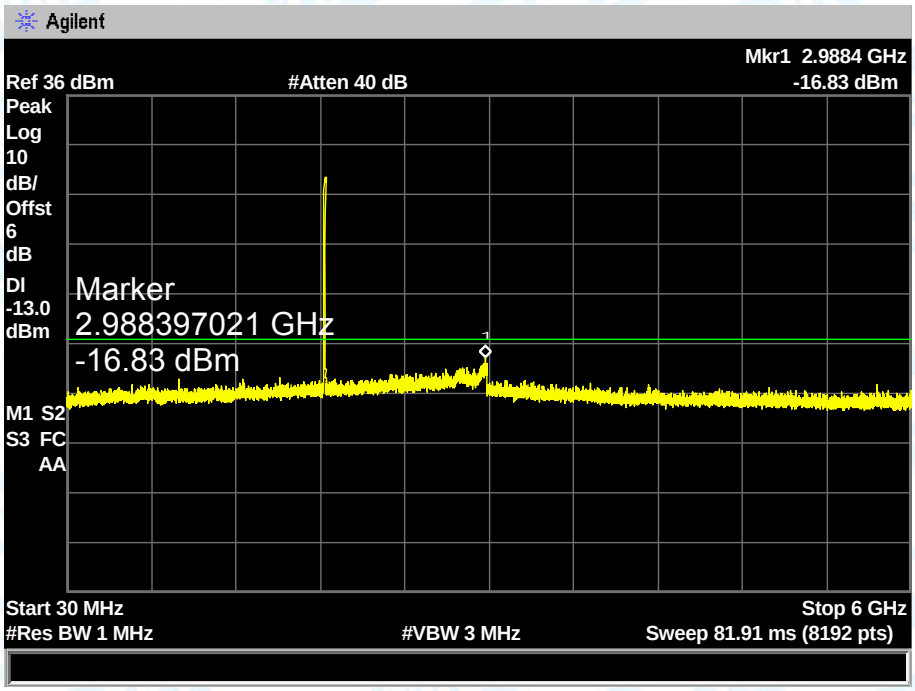
3 GHz~7 GHz



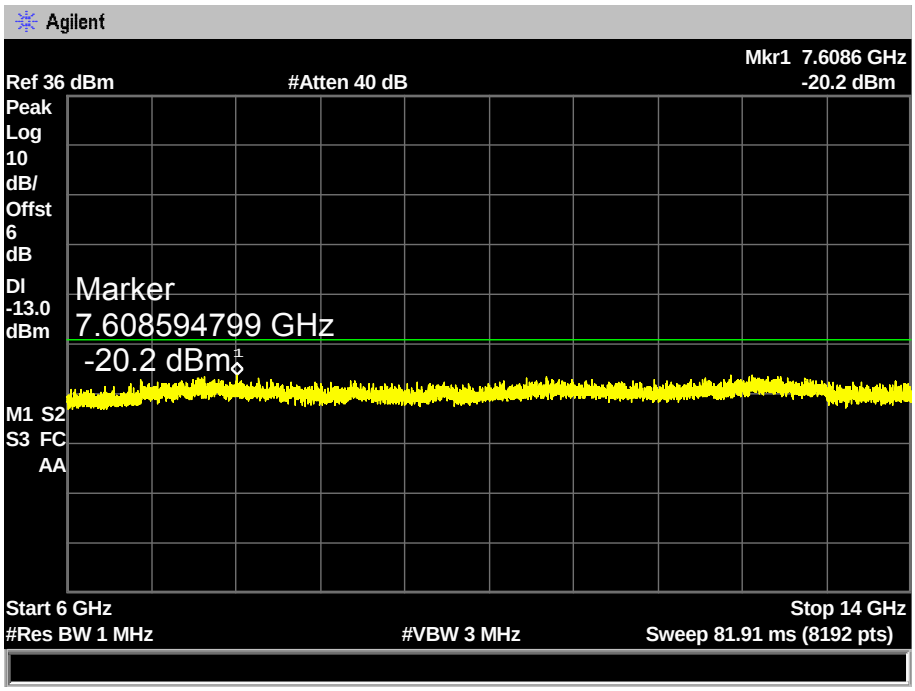
7 GHz~10 GHz


Agilent
Mkr1 7.9537 GHz
Ref 36 dBm
#Atten 40 dB
-19.79 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.953729703 GHz
-19.79 dBm
M1 S2
S3 FC
AA
Start 7 GHz
Stop 10 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 81.91 ms (8192 pts)

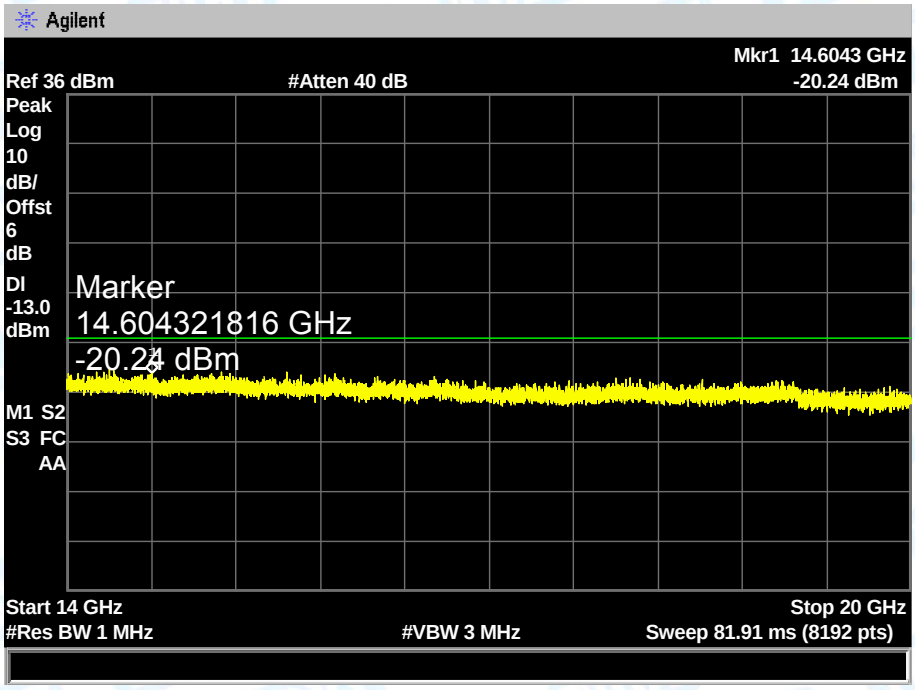
UMTS Band II CH 9262
30 MHz~ 6 GHz



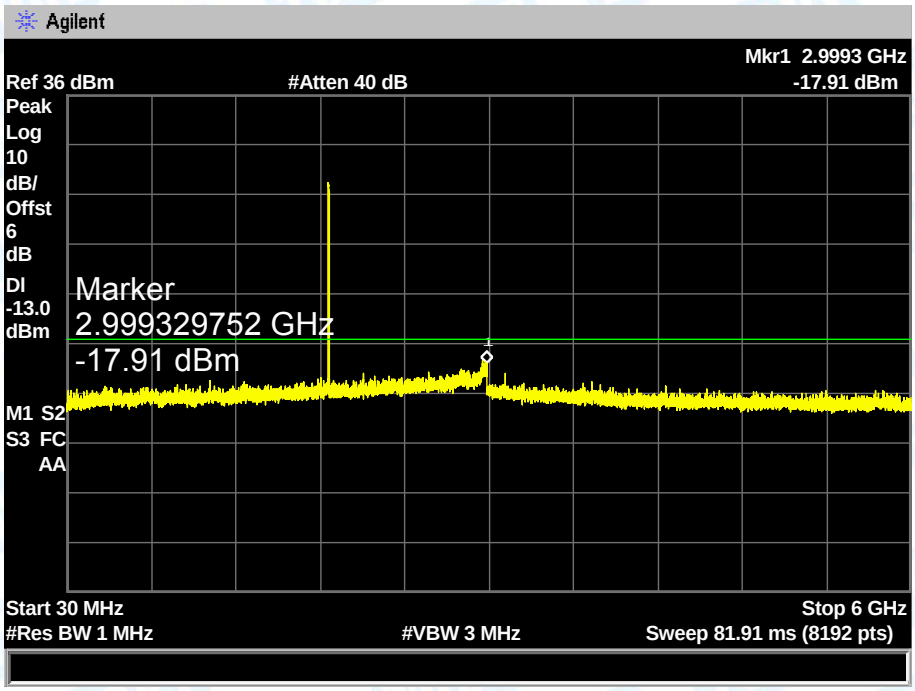
6 GHz~14 GHz



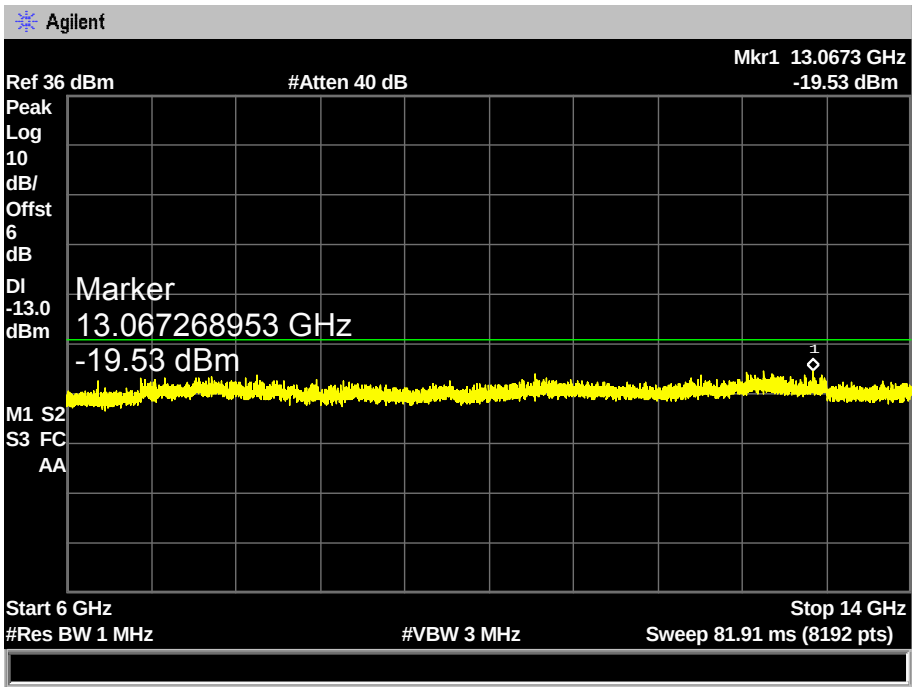
14 GHz~20 GHz


Agilent
Mkr1 14.6043 GHz
Ref 36 dBm
#Atten 40 dB
-20.24 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
14.604321816 GHz
-20.24 dBm
M1 S2
S3 FC
AA
Start 14 GHz
Stop 20 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 81.91 ms (8192 pts)

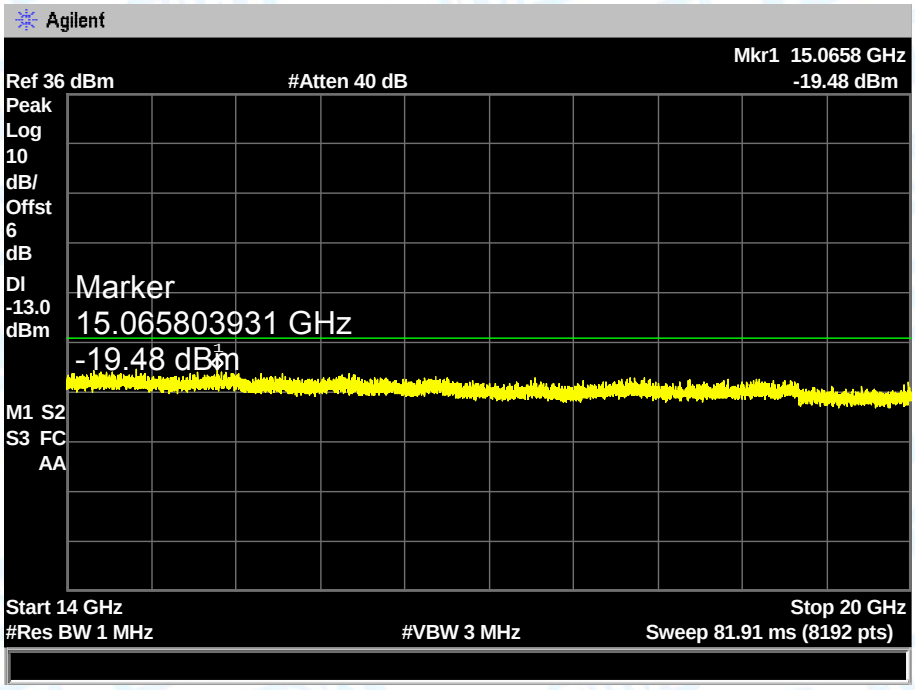
UMTS Band II CH 9400
30 MHz~ 6 GHz



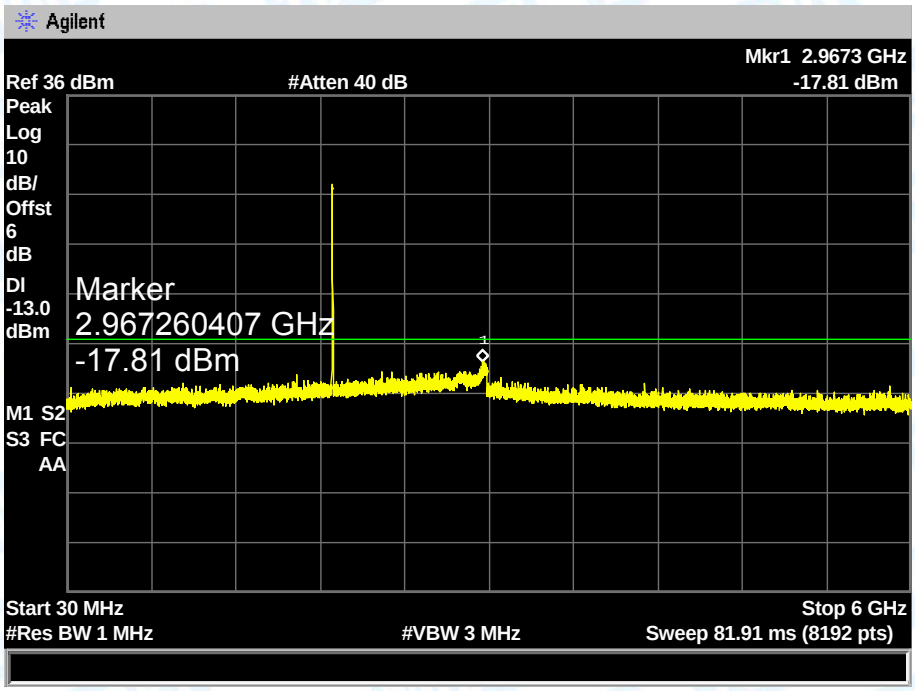
6 GHz~14 GHz



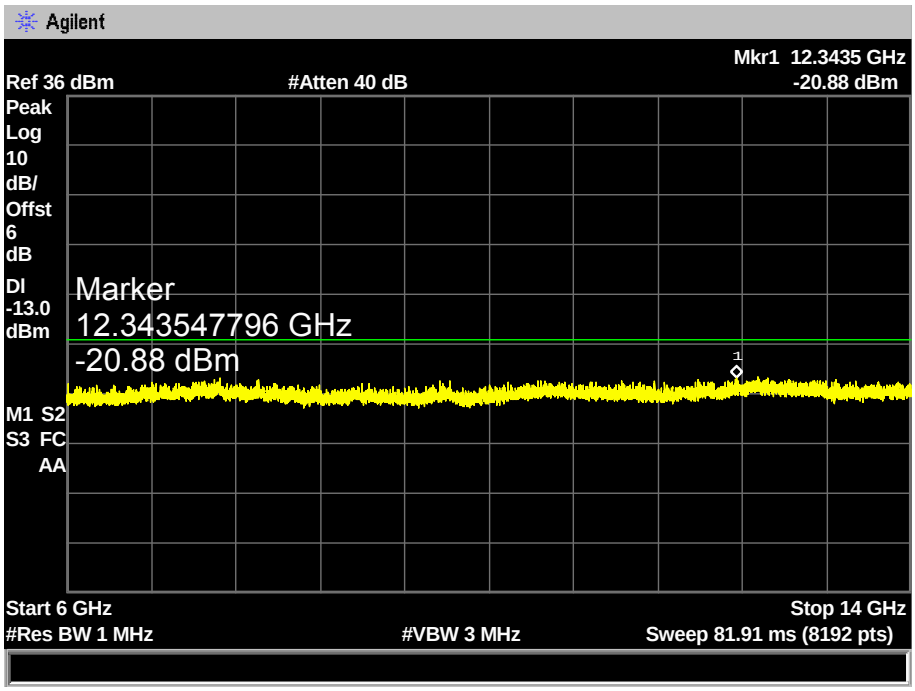
14 GHz~20 GHz


Agilent
Mkr1 15.0658 GHz
Ref 36 dBm
#Atten 40 dB
-19.48 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
15.065803931 GHz
-19.48 dBm
M1 S2
S3 FC
AA
Start 14 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 20 GHz
Sweep 81.91 ms (8192 pts)

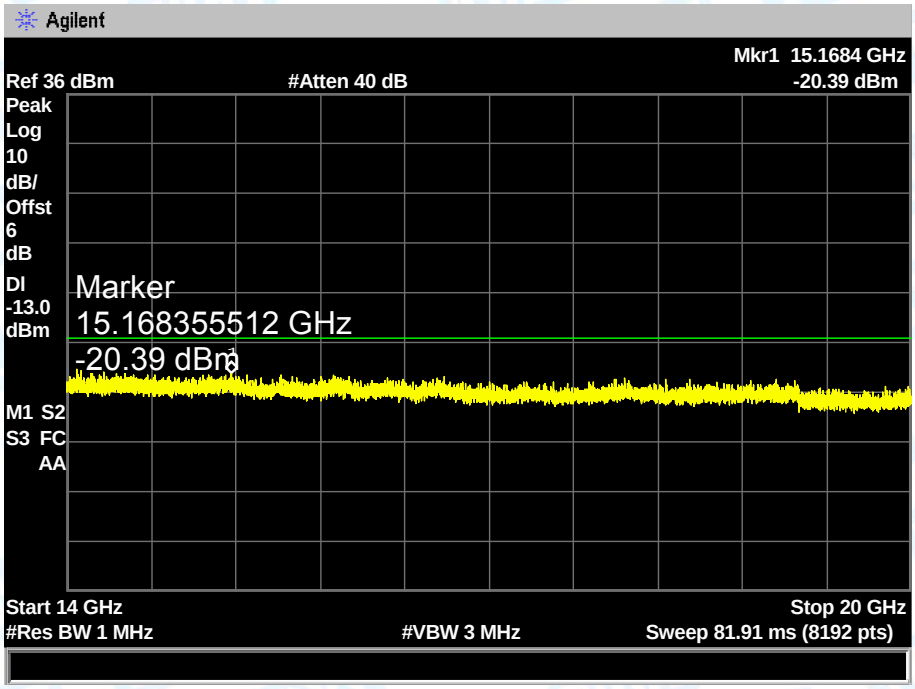
UMTS Band II CH 9538
30 MHz~ 6 GHz



6 GHz~14 GHz



14 GHz~20 GHz


Agilent
Mkr1 15.1684 GHz
Ref 36 dBm
#Atten 40 dB
-20.39 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
15.168355512 GHz
-20.39 dBm
M1 S2
S3 FC
AA
Start 14 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 20 GHz
Sweep 81.91 ms (8192 pts)

10. Band Edge Test

10.1 Test Standard and Limit

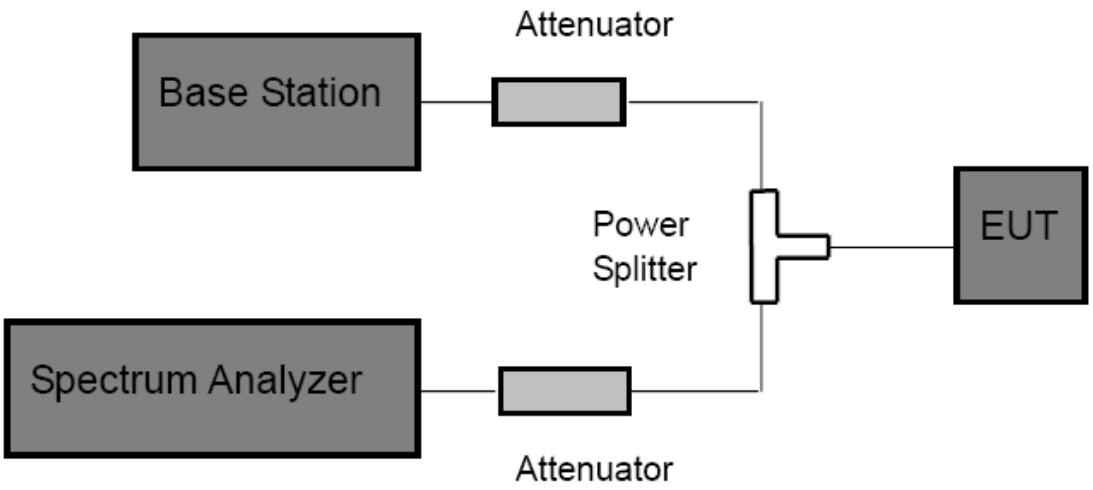
10.1.1 Test Standard

FCC Part 2: 2.1051, 2.1057
FCC Part 22H: 22.917(a)
FCC Part 24E: 24.238(a)

10.1.2 Test Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power(P) by a factor of at least 43+10log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

10.2 Test Setup



10.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and Base station via power splitter as show in the block diagram above.
(2) Spectrum Setting:
GSM and PCS: RBW=3 kHz, VBW=10 kHz, Span 1 MHz, Detector: Peak Mode.
WCDMA: RBW=100 kHz, VBW=300 kHz, Span 5 MHz, Detector: Peak Mode.
(3) The band edges of low and high channels for the highest RF powers were measured.

10.4 EUT Operating Condition

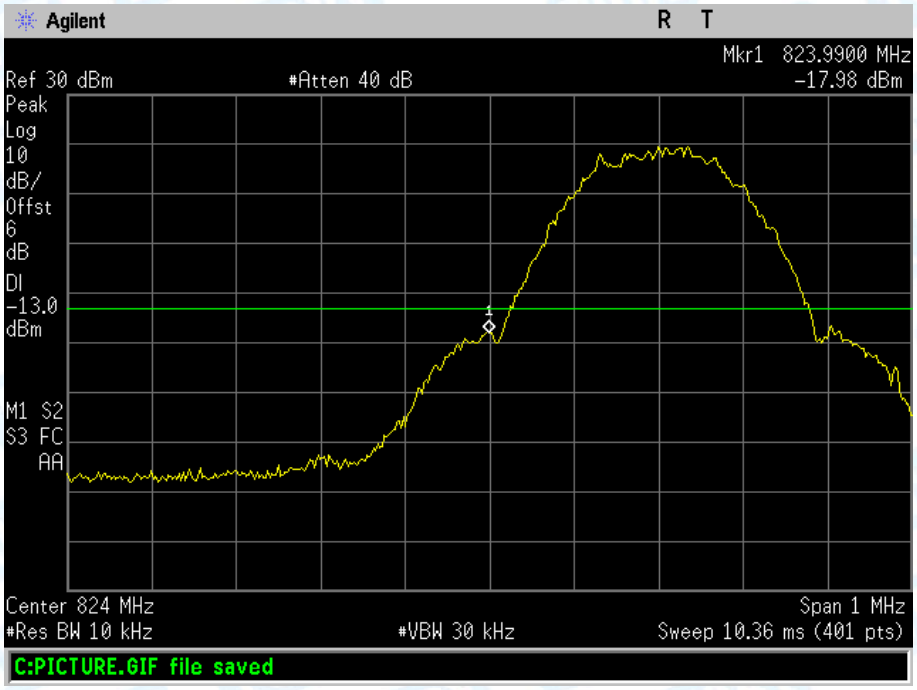
The EUT was continuously connected with the Base station and transmitting in the max power during the test.

10.5 Test Data

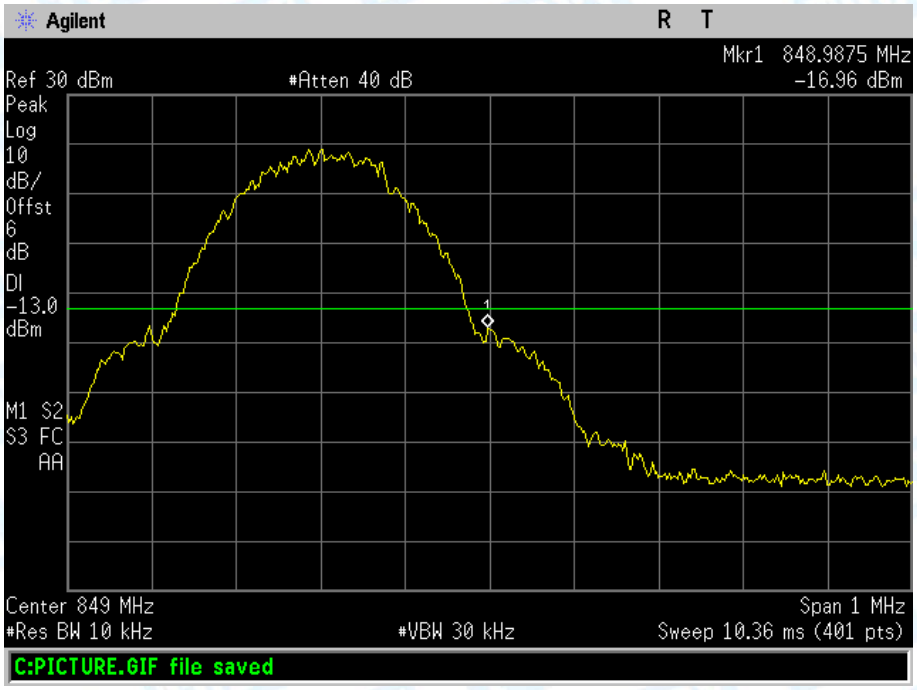
Please refer the following plots:

Band edge emission:

Test Mode:	GSM850

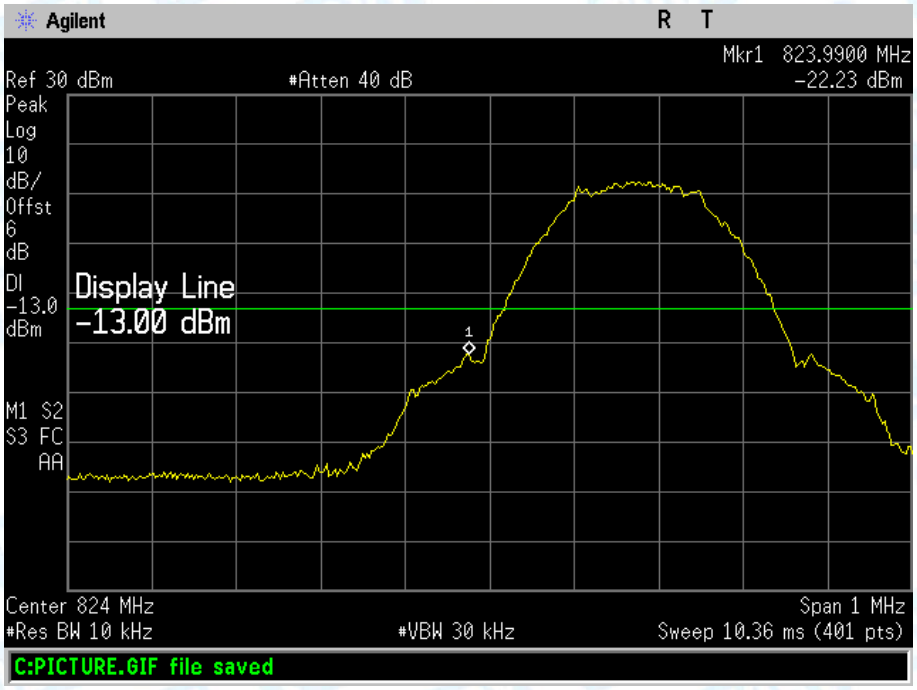


Lowest channel

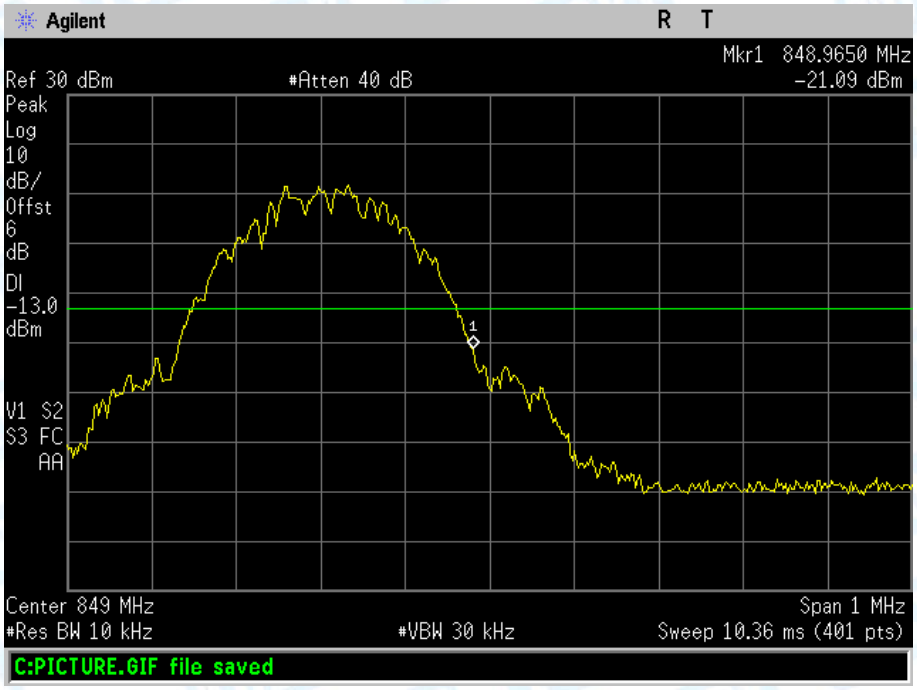


Highest channel

Test Mode:	GPRS850

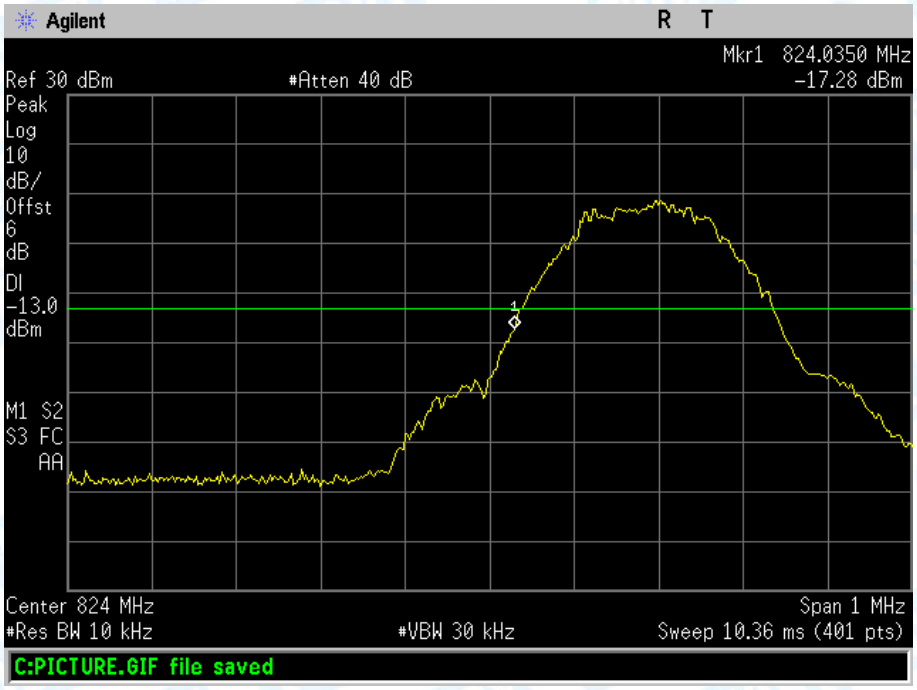


Lowest channel

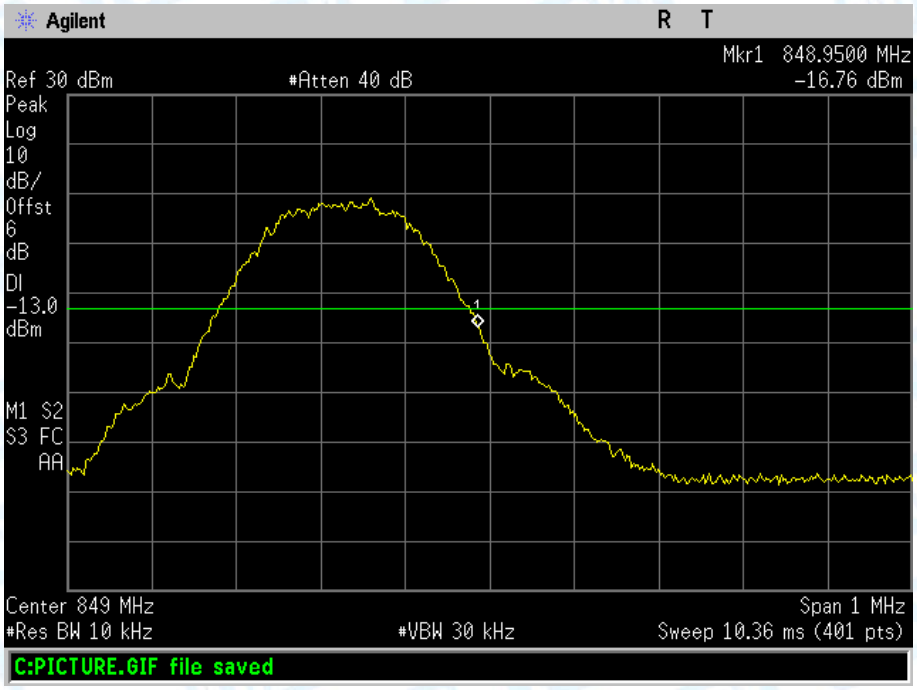


Highest channel

Test Mode:	EGPRS850

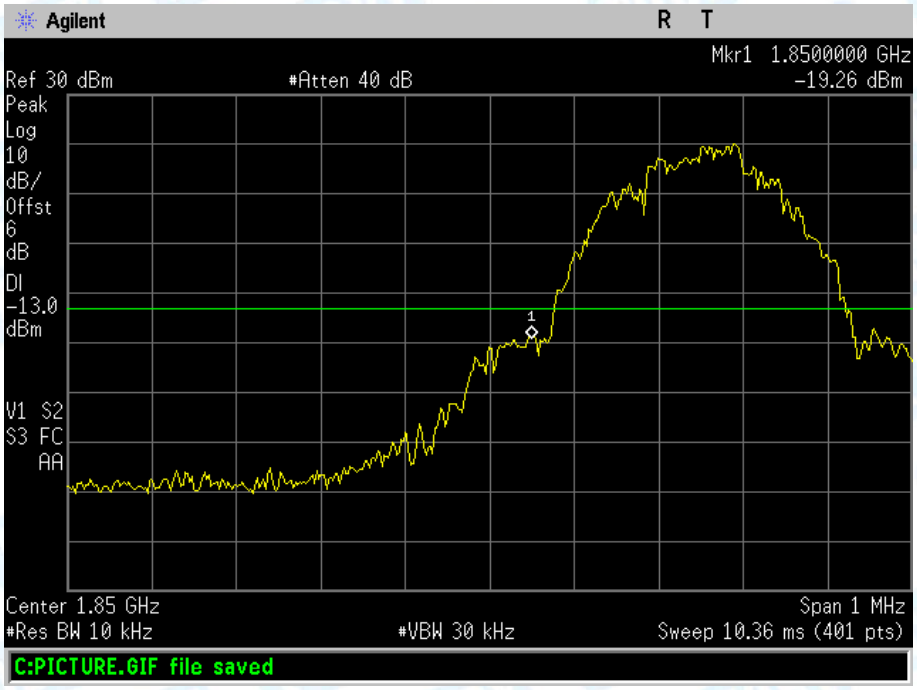


Lowest channel

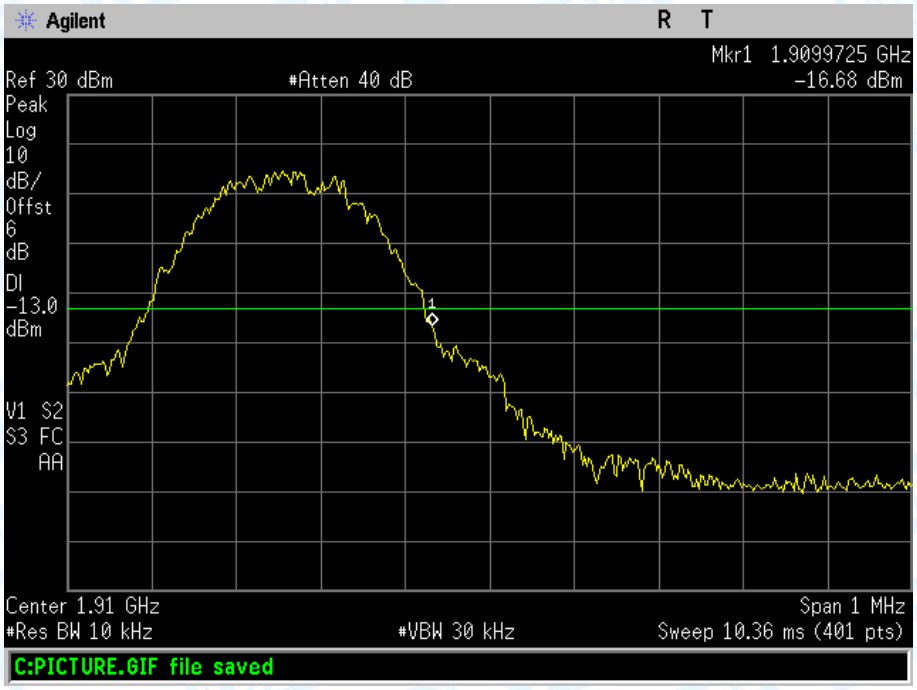


Highest channel

Test Mode:	PCS1900

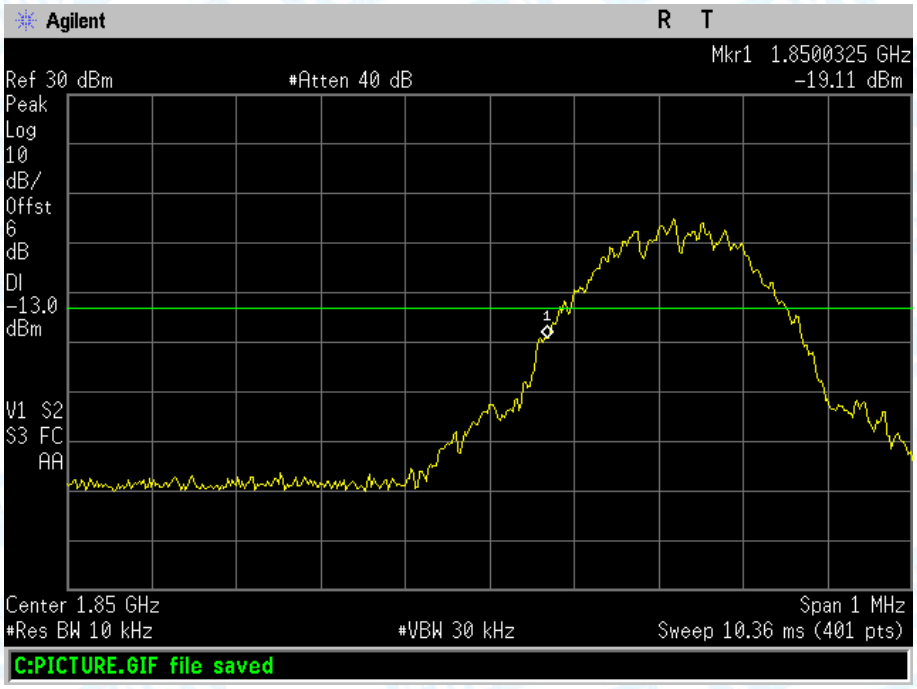


Lowest channel

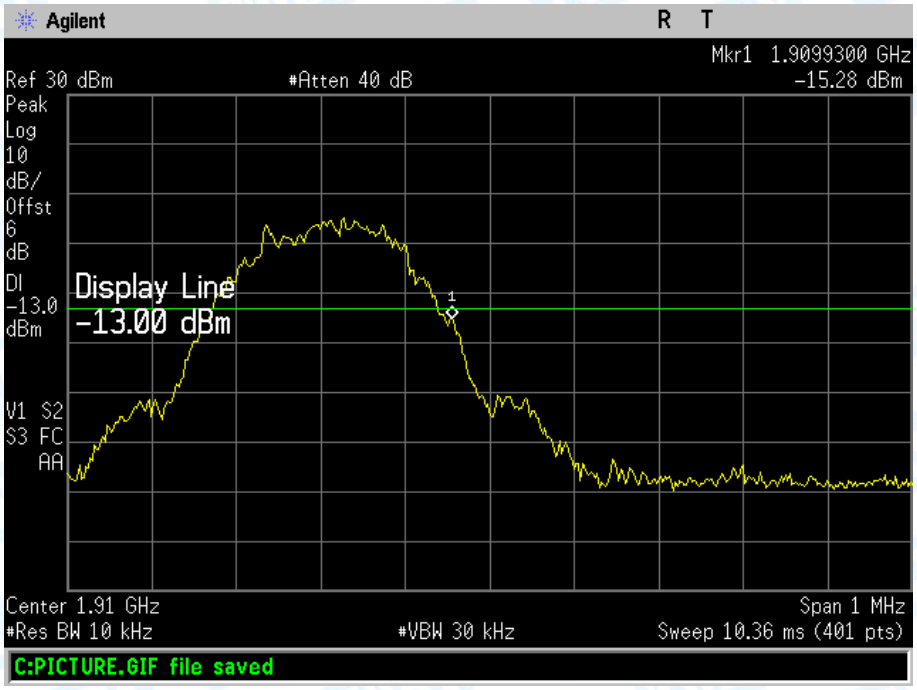


Highest channel

Test Mode:	GPRS1900

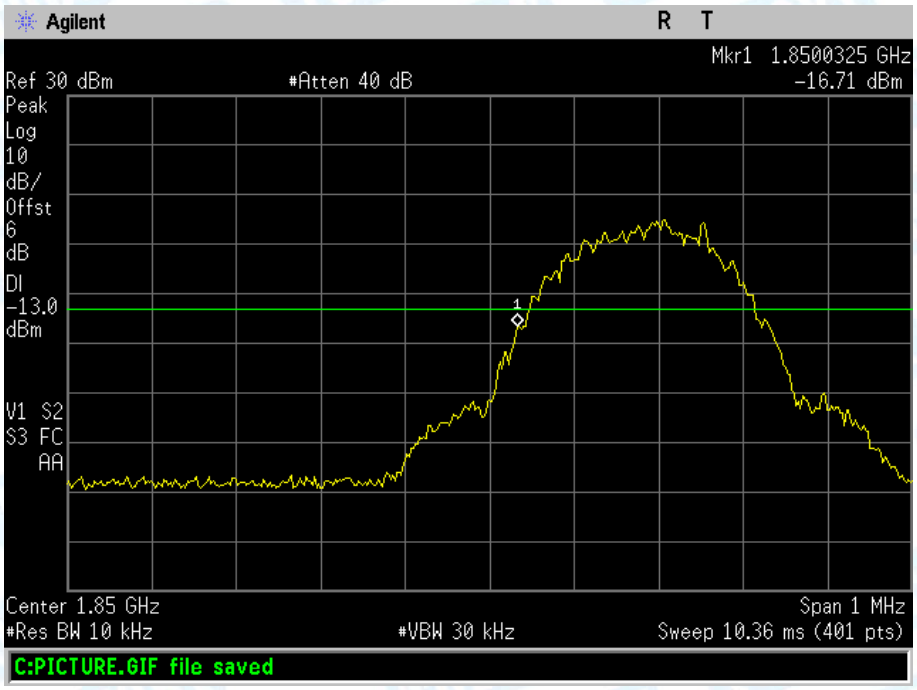


Lowest channel

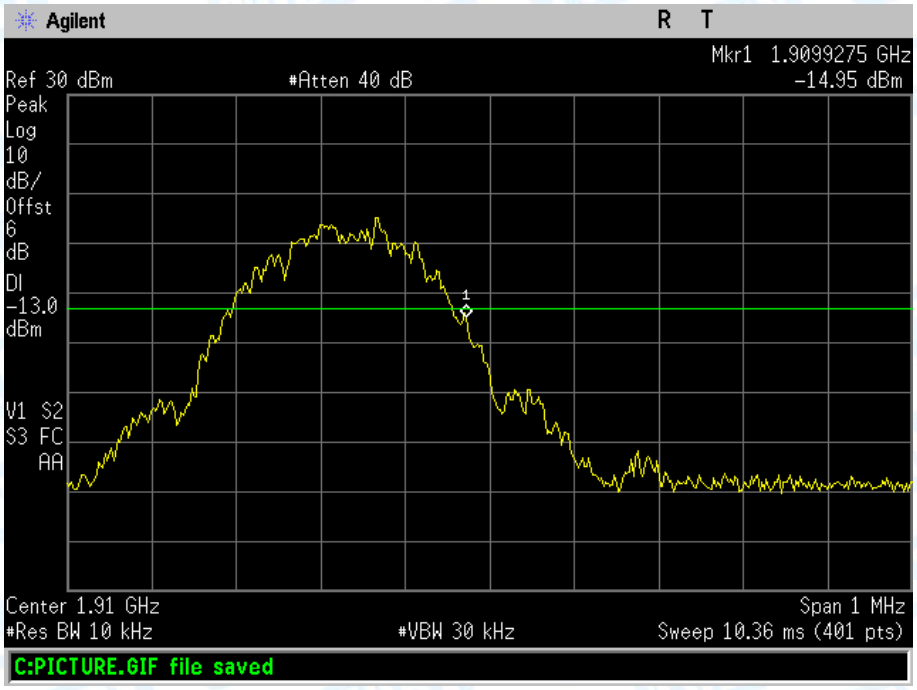


Highest channel

Test Mode:	EGPRS1900

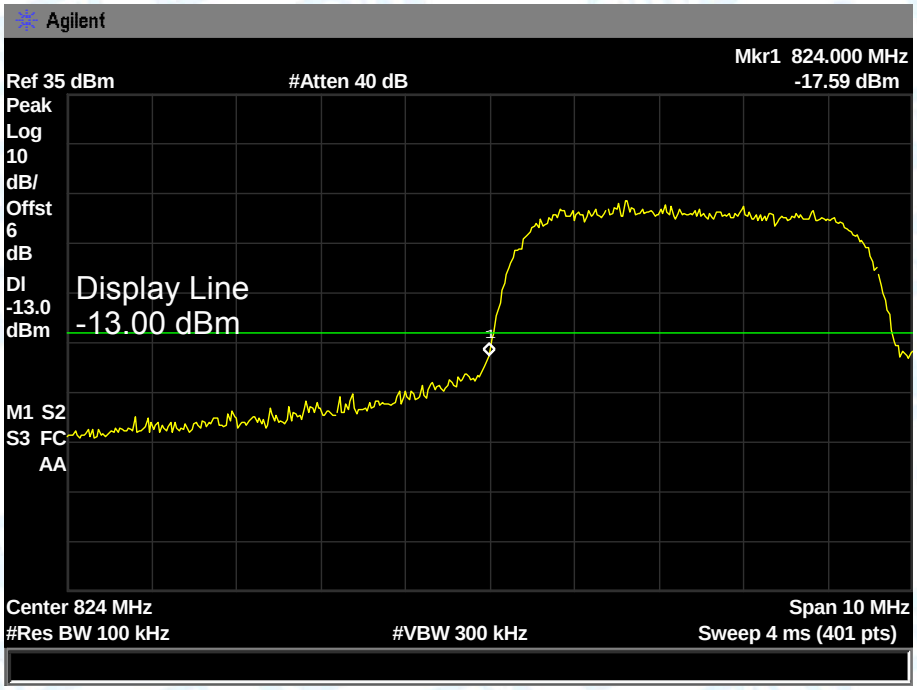


Lowest channel

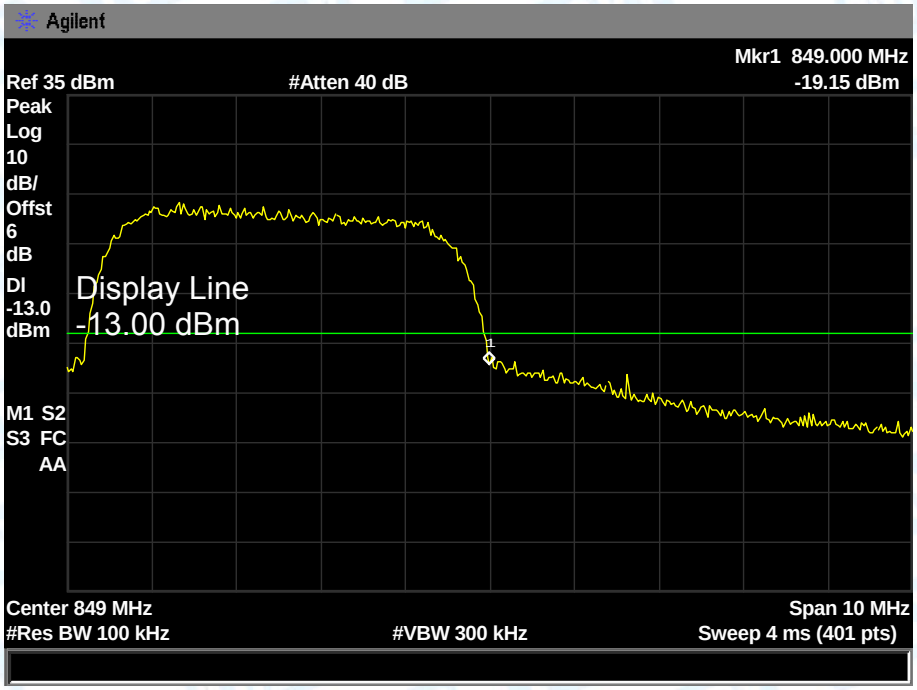


Highest channel

Test Mode:	UMTS Band V 12.2k RMC

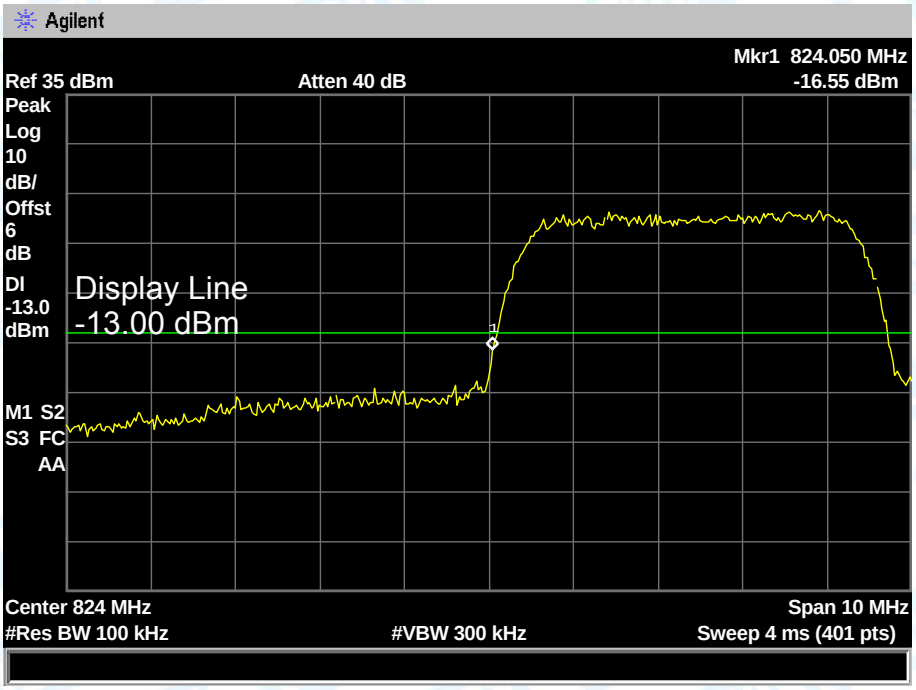


Lowest channel

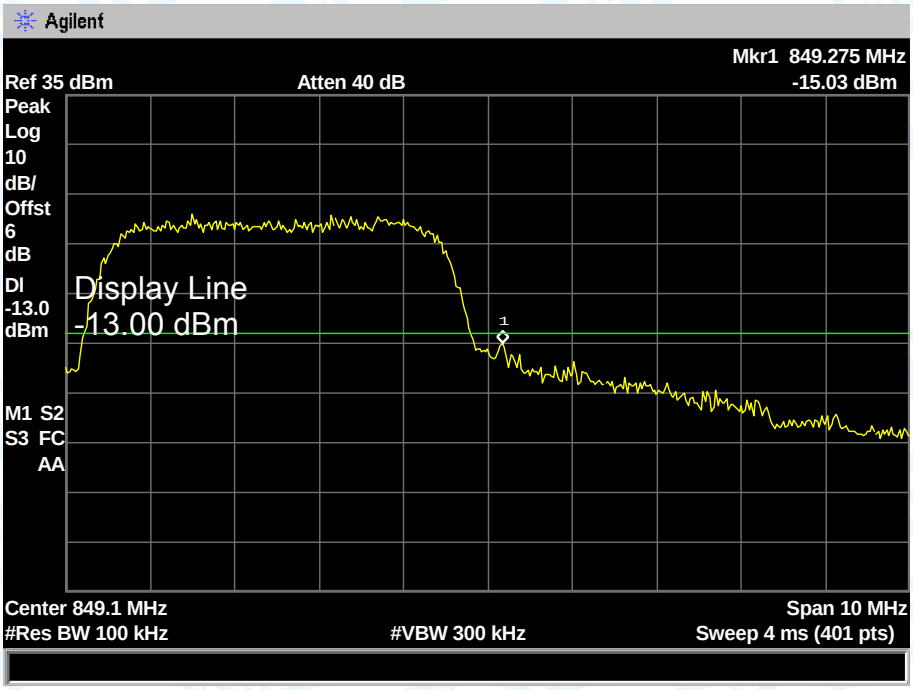


Highest channel

Test Mode:	UMTS Band V HSDPA

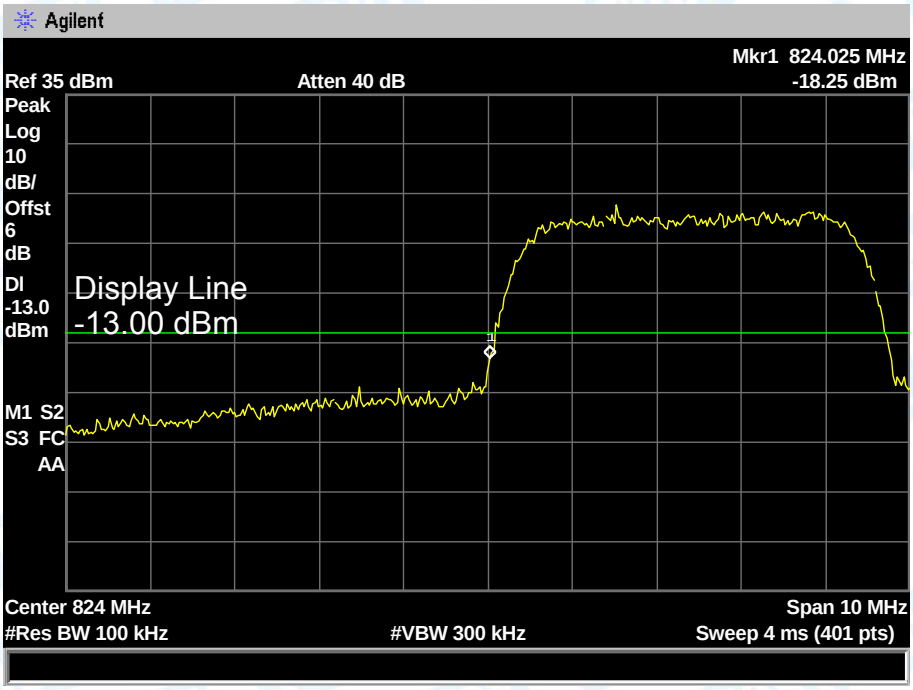


Lowest channel

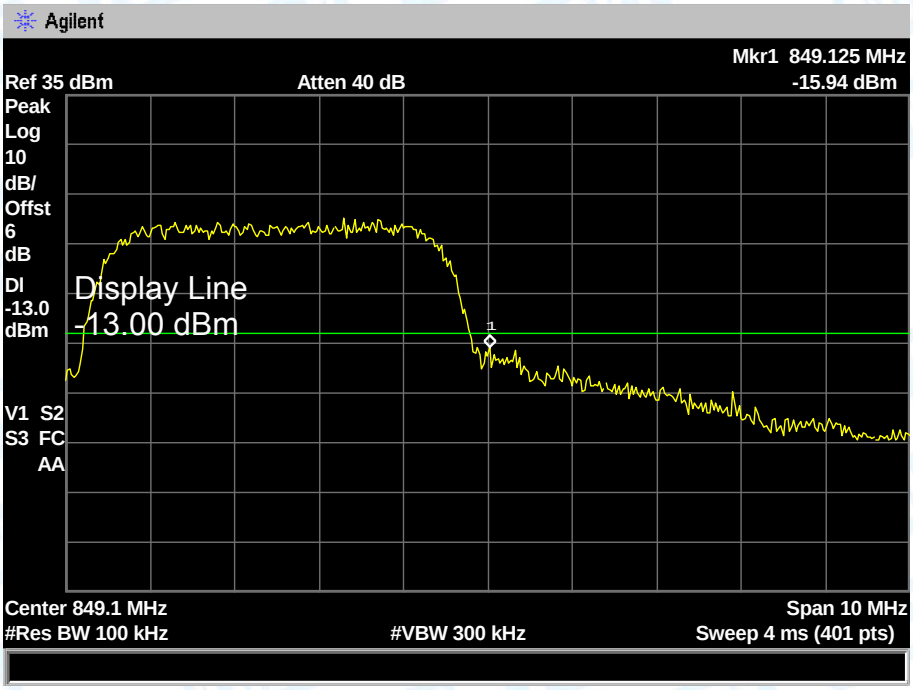


Highest channel

Test Mode:	UMTS Band V HSUPA

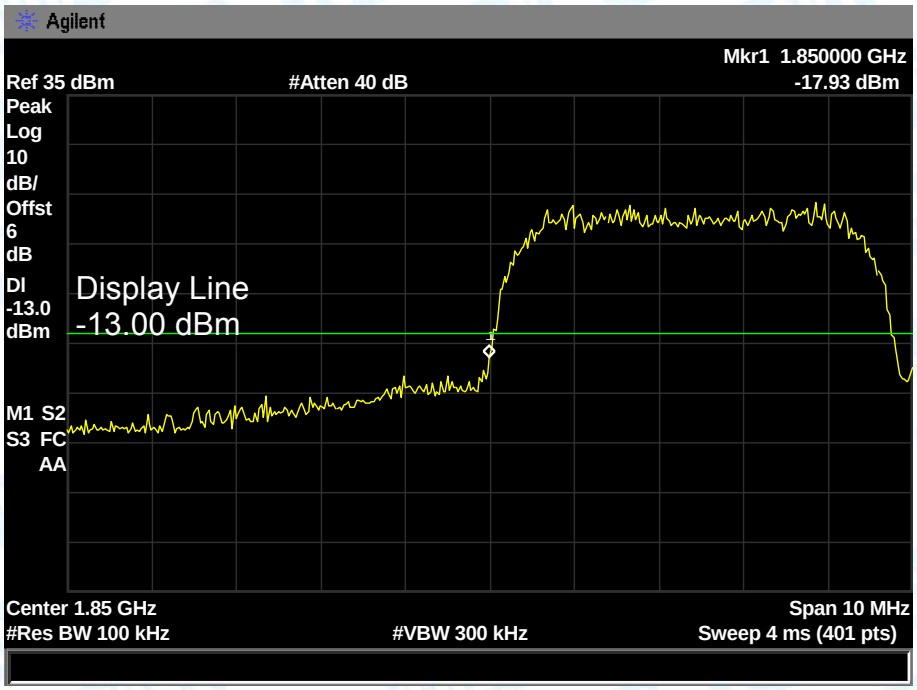


Lowest channel

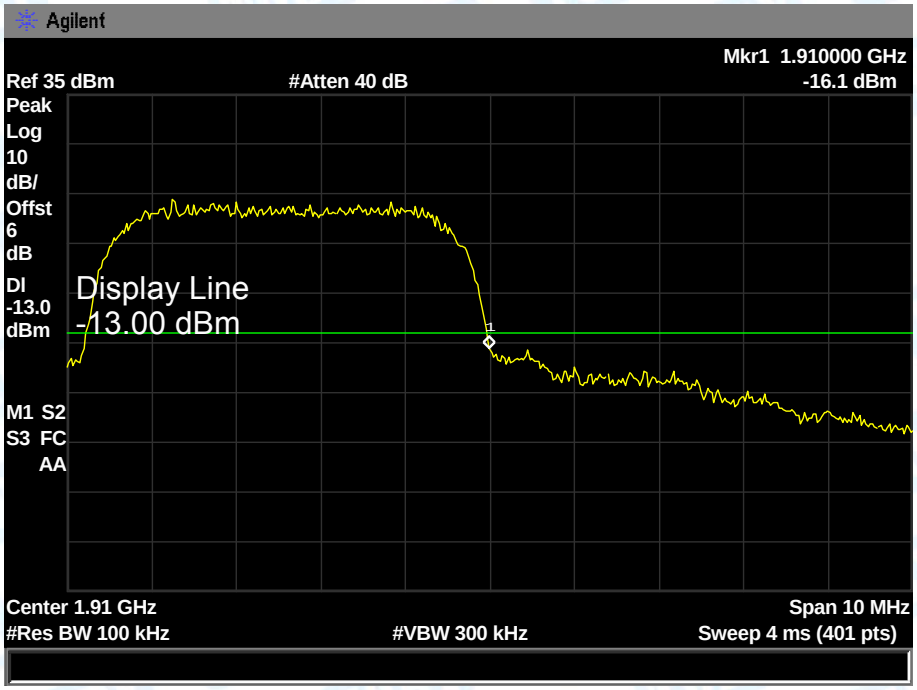


Highest channel

Test Mode:	UMTS Band II 12.2k RMC

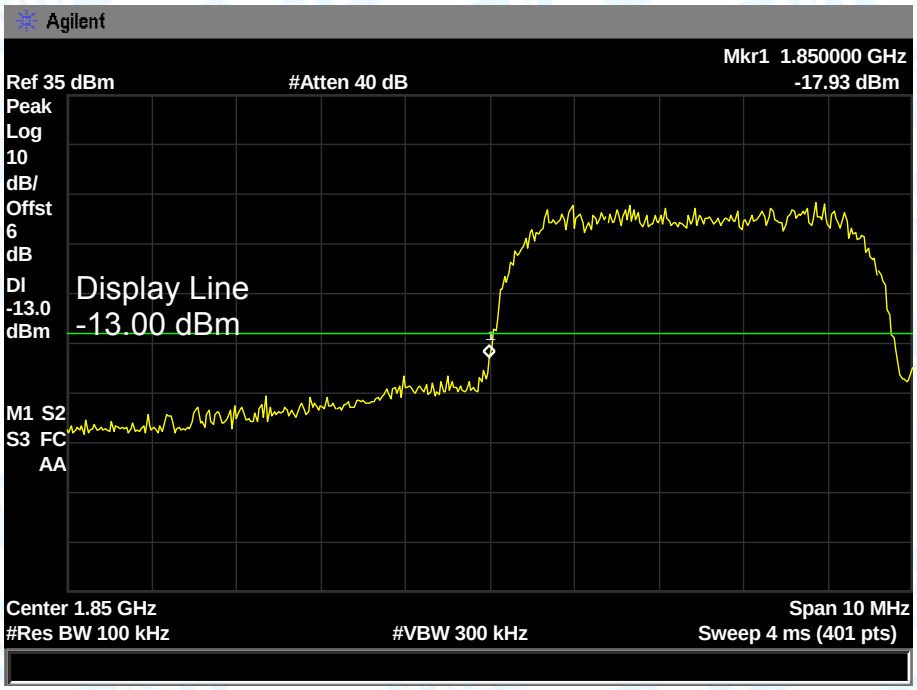


Lowest channel

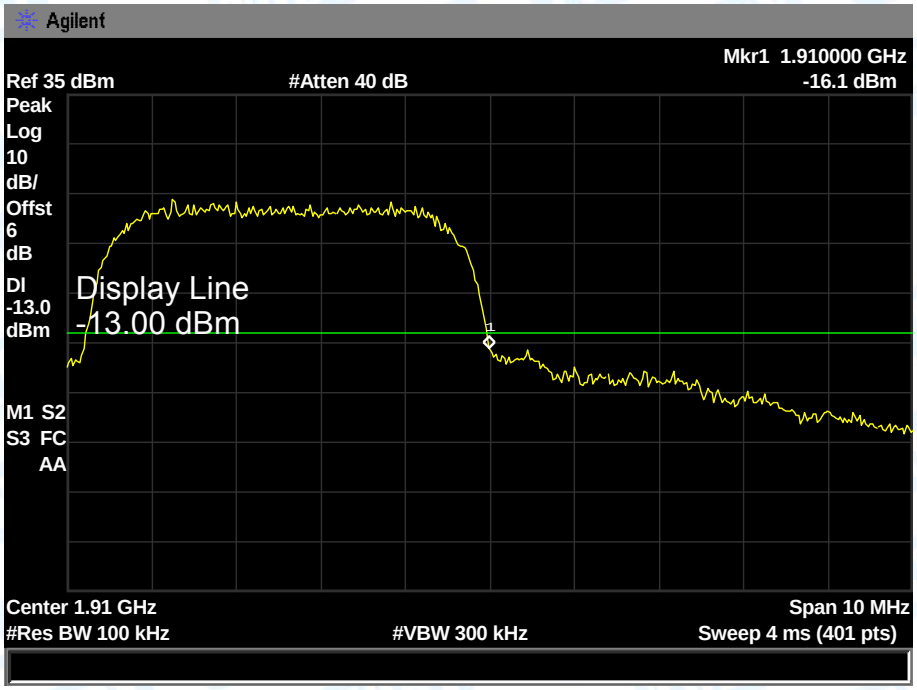


Highest channel

Test Mode:	UMTS Band II 12.2k RMC



Lowest channel



Highest channel

11. Radiated Out Band of Emissions

11.1 Test Standard and Limit

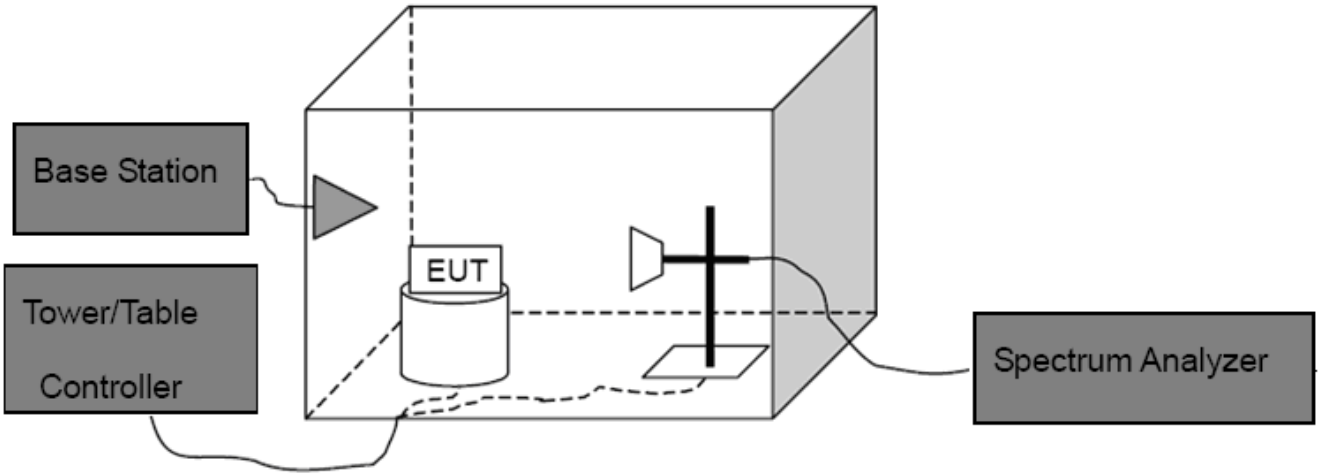
11.1.1 Test Standard

FCC Part 2: 2.1053, 2.1057
FCC Part 22H: 22.917
FCC Part 24E: 24.238

11.1.2 Test Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power(P) by a factor of at least 43+10log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

11.2 Test Setup



11.3 Test Procedure

(1) The test system setup as show in the block diagram above.
(2) The EUT was placed on an non-conductive rotating platform in an anechoic chamber. The radiated spurious emissions from 30MHz to 10th harmonious of fundamental frequency were measured at 3 m with a test antenna and a spectrum analyzer with RBW=1 MHz, VBW=1 MHz, peak detector settings.
(3) During the measurement, the EUT was enforced in maximum power and linked with a base station. All the spurious emissions at 3m were measured by rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
(4) When found the maximum level of emissions from the EUT. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB=10 log(TX power in Watts/0.001)-the absolute level
Spurious attenuation limit in dB=43+10 log(power out in Watts)

11.4 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

11.5 Test Data

Please refer the following pages.

Measurement Data (worst case)

Test mode:	GSM850		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1648.40	Vertical	-24.05	-13.00	Pass
2472.60	V	-36.57		
3297.00	V	-37.41		
4121.00	V	---		
4945.20	V	---		
5769.40	V	---		
1648.40	Horizontal	-20.63	-13.00	Pass
2472.60	H	-31.54		
3297.00	H	-36.28		
4121.00	H	---		
4945.20	H	---		
5769.40	H	---		
Test mode:	**GSM850**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.20	Vertical	-26.24	-13.00	Pass
2509.80	V	-34.56		
3346.40	V	-35.17		
4183.00	V	---		
5019.60	V	---		
5856.20	V	---		
1673.20	Horizontal	-21.62	-13.00	Pass
2509.80	H	-31.39		
3346.40	H	-34.18		
4183.00	H	---		
5019.60	H	---		
5856.20	H	---		

Remark：

1. The emission behavior belongs to narrowband spurious emission.
2. Remark”---“ means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	GSM850		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1696.60	Vertical	-22.04	-13.00	Pass
2546.40	V	-33.35		
3395.20	V	-36.44		
4244.00	V	---		
5092.80	V	---		
5941.60	V	---		
1697.60	Horizontal	-20.41	-13.00	Pass
2546.40	H	-35.06		
3395.20	H	-37.05		
4244.00	H	---		
5092.80	H	---		
5941.60	H	---		
Test mode:	**PCS1900**		**Test channel:**	**Lowest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3700.40	Vertical	-26.51	-13.00	Pass
5550.60	V	-21.33		
7400.80	V	-29.62		
9251.00	V	---		
11101.20	V	---		
12951.40	V	---		
3700.40	Horizontal	-22.71	-13.00	Pass
5550.60	H	-24.67		
7400.80	H	-28.62		
9251.00	H	---		
11101.20	H	---		
12951.40	H	---		

Remark：

1. The emission behavior belongs to narrowband spurious emission.
2. Remark”---“ means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	PCS1900		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-25.08	-13.00	Pass
5640.00	V	-20.36		
7520.00	V	-29.41		
9400.00	V	---		
11280.00	V	---		
13160.00	V	---		
3760.00	Horizontal	-23.71	-13.00	Pass
5640.00	H	-18.22		
7520.00	H	-27.08		
9400.00	H	---		
11280.00	H	---		
13160.00	H	---		
Test mode:	**PCS1900**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3819.60	Vertical	-25.36	-13.00	Pass
5729.40	V	-23.01		
7639.20	V	-26.38		
9549.00	V	---		
11458.80	V	---		
13368.60	V	---		
3819.60	Horizontal	-21.57	-13.00	Pass
5729.40	H	-19.42		
7639.20	H	-22.06		
9549.00	H	---		
11458.80	H	---		
13368.60	H	---		

Remark：

1. The emission behavior belongs to narrowband spurious emission.
2. Remark”---“ means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	UMTS Band V 12.2k RMC		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1652.80	Vertical	-32.05	-13.00	Pass
2479.20	V	-36.11		
3305.60	V	---		
4132.00	V	---		
4958.40	V	---		
5784.80	V	---		
1652.80	Horizontal	-30.14	-13.00	Pass
2479.20	H	-33.71		
3305.60	H	---		
4132.00	H	---		
4958.40	H	---		
5784.80	H	---		
Test mode:	**UMTS Band V 12.2k RMC**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1672.00	Vertical	-31.88	-13.00	Pass
2508.00	V	-35.47		
3344.00	V	---		
4180.00	V	---		
5016.00	V	---		
5852.00	V	---		
1672.00	Horizontal	-29.17	-13.00	Pass
2508.00	H	-33.06		
3344.00	H	---		
4180.00	H	---		
5016.00	H	---		
5852.00	H	---		

Remark：

4. The emission behavior belongs to narrowband spurious emission.
5. Remark”---“ means that the emission level is too low to be measured
6. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	UMTS Band V 12.2k RMC		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1693.20	Vertical	-32.06	-13.00	Pass
2539.80	V	-36.59		
3386.40	V	---		
4233.00	V	---		
5079.60	V	---		
5926.20	V	---		
1693.20	Horizontal	-30.12	-13.00	Pass
2539.80	H	-34.28		
3386.40	H	---		
4233.00	H	---		
5079.60	H	---		
5926.20	H	---		
Test mode:	**UMTS Band II 12.2k RMC**		**Test channel:**	**Lowest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1693.20	Vertical	-31.06	-13.00	Pass
2539.80	V	-20.05		
3386.40	V	---		
4233.00	V	---		
5079.60	V	---		
5926.20	V	---		
1693.20	Horizontal	-27.55	-13.00	Pass
2539.80	H	-16.17		
3386.40	H	---		
4233.00	H	---		
5079.60	H	---		
5926.20	H	---		

Remark：

1. The emission behavior belongs to narrowband spurious emission.
2. Remark”---“ means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	UMTS Band II 12.2k RMC		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1693.20	Vertical	-32.30	-13.00	Pass
2539.80	V	-21.32		
3386.40	V	---		
4233.00	V	---		
5079.60	V	---		
5926.20	V	---		
1693.20	Horizontal	-27.89	-13.00	Pass
2539.80	H	-17.05		
3386.40	H	---		
4233.00	H	---		
5079.60	H	---		
5926.20	H	---		
Test mode:	**UMTS Band II 12.2k RMC**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1693.20	Vertical	-33.02	-13.00	Pass
2539.80	V	-22.36		
3386.40	V	---		
4233.00	V	---		
5079.60	V	---		
5926.20	V	---		
1693.20	Horizontal	-27.15	-13.00	Pass
2539.80	H	-18.10		
3386.40	H	---		
4233.00	H	---		
5079.60	H	---		
5926.20	H	---		

Remark：

4. The emission behavior belongs to narrowband spurious emission.
5. Remark”---“ means that the emission level is too low to be measured
6. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

------End of report------