FCC Radio Test Report

FCC ID: 2AEXP-BRAVO

Original Grant

Report No.	:	TB-FCC144254
Applicant	:	AFFIX, LLC
Equipment Under Test (EUT)		
EUT Name	:	Ranger
Model No.	:	Bravo
Brand Name	:	AFFIX
Receipt Date	:	2015-05-19
Test Date	:	2015-05-20 to 2015-06-01
Issue Date	:	2015-06-03
Standards	:	FCC Part 2 FCC Part 22 Subpart H, FCC Part 24 Subpart E, 2014 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.

1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, China
Tel: +86 75526509301 Fax: +86 75526509195

Contents

CONTENTS 2
1. GENERAL INFORMATION ABOUT EUT 4
1.1 Client Information 4
1.2 General Description of EUT (Equipment Under Test) 4
1.3 Block Diagram Showing the Configuration of System Tested 5
1.4 Description of Support Units 5
1.5 Description of Test Mode 5
1.6 Measurement Uncertainty 7
1.7 Test Facility 7
2. TEST SUMMARY 8
3. TEST EQUIPMENT 9
4. FREQUENCY STABILITY 11
4.1 Test Standard and Requirement 11
4.2 Test Setup 11
4.3 Test Procedure 12
4.4 EUT Operating Condition 12
5. CONDUCTED RF OUTPUT POWER 16
5.1 Test Standard and Limit 16
5.2 Test Setup 16
5.3 Test Procedure 16
5.4 EUT Operating Condition 16
5.5 EUT Operating Condition 16
6. PEAK-AVERAGE RATIO 21
6.1 Test Standard and Limit 21
6.2 Test Setup 21
6.3 Test Procedure 21
6.4 EUT Operating Condition 21
6.5 Test Data 22
7. RADIATED OUTPUT POWER 23
7.1 Test Standard and Limit 23
7.2 Test Setup 23
7.3 Test Procedure 23
7.4 EUT Operating Condition 24
7.5 Test Data 24
8. OCCUPIED BANDWIDTH 28
8.1 Test Standard and Limit 28
8.2 Test Setup 28
8.3 Test Procedure 28
8.4 EUT Oper ating Condition 29

8.5 Test Data....29
9. CONDUCTED OUT OF BAND EMISSIONS....56
9.1 Test Standard and Limit....56
9.2 Test Setup....56
9.3 Test Procedure....56
9.4 EUT Operating Condition....56
9.5 Test Data....57
Please refer following plots:....57
10. BAND EDGE TEST....81
10.1 Test Standard and Limit....81
10.2 Test Setup....81
10.3 Test Procedure....81
10.4 EUT Operating Condition....81
10.5 Test Data....82
11. RADIATED OUT BAND OF EMISSIONS....86
11.1 Test Standard and Limit....86
11.2 Test Setup....86
11.3 Test Procedure....86
11.4 EUT Operating Condition....87
11.5 Test Data....87

1. General Information about EUT

1.1 Client Information

Applicant	:	AFFIX, LLC
Address	:	2170 N.W. 87 Avenue. Doral Florida, 33172
Manufacturer	:	AFFIX, LLC
Address	:	2170 N.W. 87 Avenue. Doral Florida, 33172

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Ranger	
Model No.	:	Bravo	
Product Description	:	Frequency Bands: GSM850; PCS1900; UMTS FDD Band II; UMTS FDD Band V	
		GSM 850 Power :	Cond:34.28 dBm ERP:31.84 dBm
		PCS 1900 Power :	Cond:29.72 dBm EIRP:26.37 dBm
		UMTS Band II Power:	Cond:22.97 dBm EIRP:17.98 dBm
		UMTS Band V Power:	Cond:23.10 dBm ERP:18.54 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: 249KGXW, PCS 1900: 246KGXW GPRS 850: 246KG7W, GPRS 1900: 248KG7W EGPRS 850: 245KG7W, EGPRS 1900: 247KG7W UMTS Band V: 4M20F9W, UMTS Band II: 4M20F9W	
Power Supply	:	DC power supplied by AC/DC Adapter. DC Voltage supplied from Li-ion battery.	
Power Rating	:	Input: AC 100~240V 50/60Hz 0.2A Output: 5V/1A DC 3.7V from 2600mA Li-ion battery	

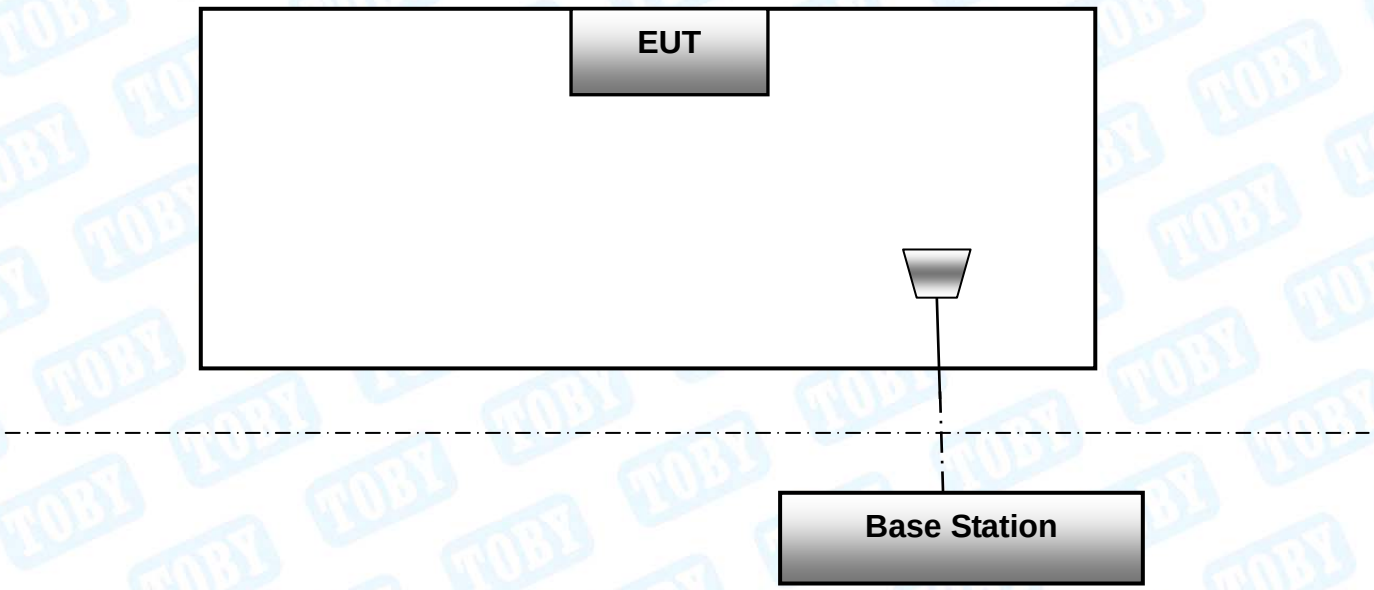
Connecting I/O Port(S)	:	Please refer to the User's Manual

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. 08, 2014	Aug. 07, 2015
50ΩCoaxial Switch	Anritsu	MP59B	X10321	Aug. 08, 2014	Aug. 07, 2015
L.I.S.N	Rohde & Schwarz	ENV216	101131	Aug. 08, 2014	Aug. 07, 2015
L.I.S.N	SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 08, 2014	Aug. 07, 2015

Radiation Spurious Emission

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Sep. 01, 2014	Aug. 31, 2015
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 08, 2014	Aug. 07, 2015
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	Sep. 01, 2014	Aug. 31, 2015
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 08, 2014	Aug. 07, 2015
Universal Radio Communication	Rohde&Schwarz	CMU200	103903	Mar. 21, 2015	Mar. 20, 2016

Tester					
Power Divider	HP	11636A	07669	Aug. 08, 2014	Aug. 07, 2015
Temp. & Humidity Chamber	ZHONG ZHI	CZ-A-225D	HW08053	Aug. 08, 2014	Aug. 07, 2015
DC Power Supply	MATRIX	MPS-3005L-3	D806050W	Aug. 08, 2014	Aug. 07, 2015
AC Power Supply	Heng Jie	HPC-1110	2010007	Aug. 08, 2014	Aug. 07, 2015

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:

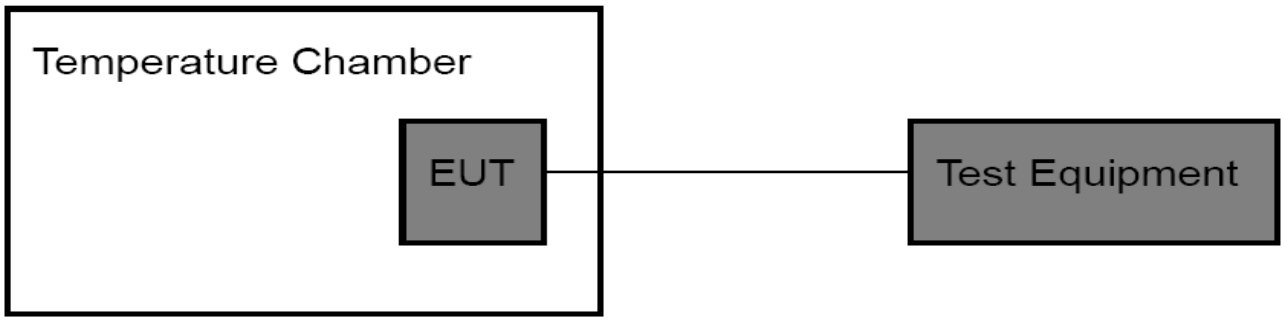
The temperature is varied from -30℃ to +50℃ at intervals of not more than 10℃.

(2) Primary Supply Voltage:

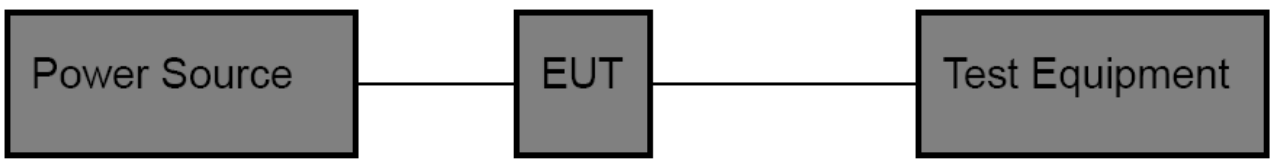
For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at input to the cable normally provide with the equipment, or at the power supply terminals if cables 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	53	0.063	28	0.033	25	0.030
-20	54	0.065	25	0.030	26	0.031
-10	56	0.067	23	0.027	28	0.033
0	52	0.062	24	0.029	25	0.030
10	53	0.063	27	0.032	29	0.035
20	51	0.061	26	0.031	27	0.032
30	54	0.065	25	0.030	26	0.031
40	52	0.062	27	0.032	27	0.032
50	57	0.068	24	0.029	28	0.033
60	53	0.063	29	0.035	29	0.035
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	57	0.086	42	0.064	50	0.076
-20	59	0.089	47	0.071	48	0.073
-10	56	0.085	44	0.067	51	0.077
0	57	0.086	43	0.065	52	0.079
10	56	0.085	46	0.070	47	0.071
20	53	0.080	44	0.067	49	0.074
30	55	0.083	43	0.065	53	0.080
40	54	0.082	45	0.068	49	0.074
50	56	0.085	47	0.071	51	0.077
60	57	0.086	48	0.073	52	0.079
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	14	0.017
-10	13	0.016
0	15	0.018
10	13	0.016
20	12	0.014
30	15	0.018
40	13	0.016
50	14	0.017
60	11	0.013
Limit	2.5 (ppm)	
Result	PASS	

Temperature Variation UMTS Band II (CH 9400)		
Temperature (℃)	RMC Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
-30	32	0.017
-20	30	0.016
-10	29	0.015
0	33	0.018
10	32	0.017
20	31	0.016
30	30	0.016
40	29	0.015
50	32	0.017
60	33	0.018
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	49	0.059	32	0.038	28	0.033
3.70	50	0.060	31	0.037	29	0.035
4.26	53	0.063	30	0.036	26	0.031
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	56	0.085	48	0.073	50	0.076
3.70	53	0.080	46	0.070	51	0.077
4.26	55	0.083	49	0.074	53	0.080
Limit	**2.5 (ppm)**					
Result	**PASS**					

Voltage Variation UMTS Band V (CH 4182)		
Voltage (V)	RMC Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
3.15	18	0.022
3.70	15	0.018
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	39	0.021
3.70	35	0.019
4.26	38	0.020
Limit	**2.5 (ppm)**	
Result	**PASS**	

5. Conducted RF Output Power

5.1 Test Standard and Limit

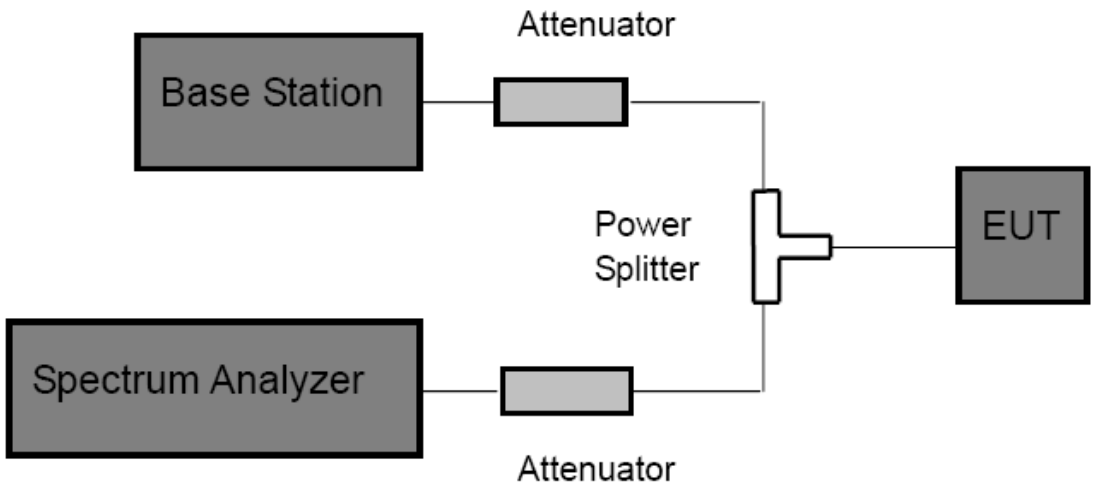
5.1.1 Test Standard

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	33.53	2.254
	190	836.6	33.88	2.443
	251	848.8	34.28	2.679
GPRS 850 (1 Slot)	128	824.2	31.54	1.426
	190	836.6	31.90	1.549
	251	848.8	32.21	1.663
GPRS 850 (2 Slot)	128	824.2	31.58	1.439
	190	836.6	31.90	1.549
	251	848.8	32.20	1.660
GPRS 850 (3 Slot)	128	824.2	31.50	1.413
	190	836.6	31.95	1.567
	251	848.8	32.20	1.660
GPRS 850 (4 Slot)	128	824.2	31.55	1.429
	190	836.6	31.92	1.556
	251	848.8	32.28	1.690
EDGE 850 (1 Slot)	128	824.2	31.51	1.416
	190	836.6	31.89	1.545
	251	848.8	32.23	1.671
EDGE 850 (2 Slot)	128	824.2	31.50	1.413
	190	836.6	31.87	1.538
	251	848.8	32.24	1.675
EDGE 850 (3 Slot)	128	824.2	31.52	1.419
	190	836.6	31.98	1.578
	251	848.8	32.22	1.667
EDGE 850 (4 Slot)	128	824.2	31.58	1.439
	190	836.6	31.90	1.549
	251	848.8	32.24	1.675

PCS 1900				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
GSM 1900	512	1850.2	29.72	0.938
	661	1880.0	29.59	0.910
	810	1909.8	29.33	0.857
GPRS 1900 (1 Slot)	512	1850.2	28.56	0.718
	661	1880.0	28.62	0.728
	810	1909.8	28.29	0.675
GPRS 1900 (2 Slot)	512	1850.2	28.66	0.735
	661	1880.0	28.58	0.721
	810	1909.8	28.40	0.692
GPRS 1900 (3 Slot)	512	1850.2	28.60	0.724
	661	1880.0	28.57	0.719
	810	1909.8	28.38	0.689
GPRS 1900 (4 Slot)	512	1850.2	28.61	0.726
	661	1880.0	28.57	0.719
	810	1909.8	28.28	0.673
EDGE 1900 (1 Slot)	512	1850.2	28.68	0.738
	661	1880.0	28.59	0.723
	810	1909.8	28.29	0.675
EDGE 1900 (2 Slot)	512	1850.2	28.56	0.718
	661	1880.0	28.58	0.721
	810	1909.8	28.34	0.682
EDGE 1900 (3 Slot)	512	1850.2	28.66	0.735
	661	1880.0	28.67	0.736
	810	1909.8	28.27	0.671
EDGE 1900 (4 Slot)	512	1850.2	28.64	0.731
	661	1880.0	28.56	0.718
	810	1909.8	28.52	0.711

UMTS Band V				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
Band V RMC	4132	826.4	22.62	0.1828
	4175	835.0	22.79	0.1901
	4233	846.6	22.97	0.1982
HSDPA Subtest 1	4132	826.4	21.61	0.1449
	4175	835.0	21.82	0.1521
	4233	846.6	21.96	0.1570
HSDPA Subtest 2	4132	826.4	21.73	0.1489
	4175	835.0	21.71	0.1483
	4233	846.6	21.68	0.1472
HSDPA Subtest 3	4132	826.4	20.96	0.1247
	4175	835.0	20.52	0.1127
	4233	846.6	20.36	0.1086
HSDPA Subtest 4	4132	826.4	20.78	0.1197
	4175	835.0	20.16	0.1038
	4233	846.6	20.51	0.1125
HSUPA Subtest 1	4132	826.4	21.14	0.1300
	4175	835.0	21.68	0.1472
	4233	846.6	21.32	0.1355
HSUPA Subtest 2	4132	826.4	19.61	0.0914
	4175	835.0	19.98	0.0995
	4233	846.6	20.03	0.1007
HSUPA Subtest 3	4132	826.4	20.60	0.1148
	4175	835.0	20.78	0.1197
	4233	846.6	20.91	0.1233
HSUPA Subtest 4	4132	826.4	20.95	0.1245
	4175	835.0	20.37	0.1089
	4233	846.6	20.17	0.1040
HSUPA Subtest 5	4132	826.4	19.95	0.0989
	4175	835.0	20.22	0.1052
	4233	846.6	20.44	0.1107

UMTS Band II				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
Band II RMC	9262	1852.4	23.10	0.2042
	9400	1880.0	22.72	0.1871
	9538	1907.6	22.91	0.1954
HSDPA Subtest 1	9262	1852.4	22.77	0.1892
	9400	1880.0	21.48	0.1406
	9538	1907.6	21.97	0.1574
HSDPA Subtest 2	9262	1852.4	21.67	0.1469
	9400	1880.0	21.77	0.1503
	9538	1907.6	21.91	0.1552
HSDPA Subtest 3	9262	1852.4	21.18	0.1312
	9400	1880.0	20.75	0.1189
	9538	1907.6	21.54	0.1426
HSDPA Subtest 4	9262	1852.4	21.20	0.1318
	9400	1880.0	20.40	0.1096
	9538	1907.6	21.64	0.1459
HSUPA Subtest 1	9262	1852.4	21.11	0.1291
	9400	1880.0	21.35	0.1365
	9538	1907.6	21.23	0.1327
HSUPA Subtest 2	9262	1852.4	19.83	0.0962
	9400	1880.0	20.55	0.1135
	9538	1907.6	20.52	0.1127
HSUPA Subtest 3	9262	1852.4	20.04	0.1009
	9400	1880.0	20.56	0.1138
	9538	1907.6	19.98	0.0995
HSUPA Subtest 4	9262	1852.4	20.11	0.1026
	9400	1880.0	20.09	0.1021
	9538	1907.6	20.45	0.1109
HSUPA Subtest 5	9262	1852.4	20.63	0.1156
	9400	1880.0	20.33	0.1079
	9538	1907.6	20.13	0.1030

6. Peak-Average Ratio

6.1 Test Standard and Limit

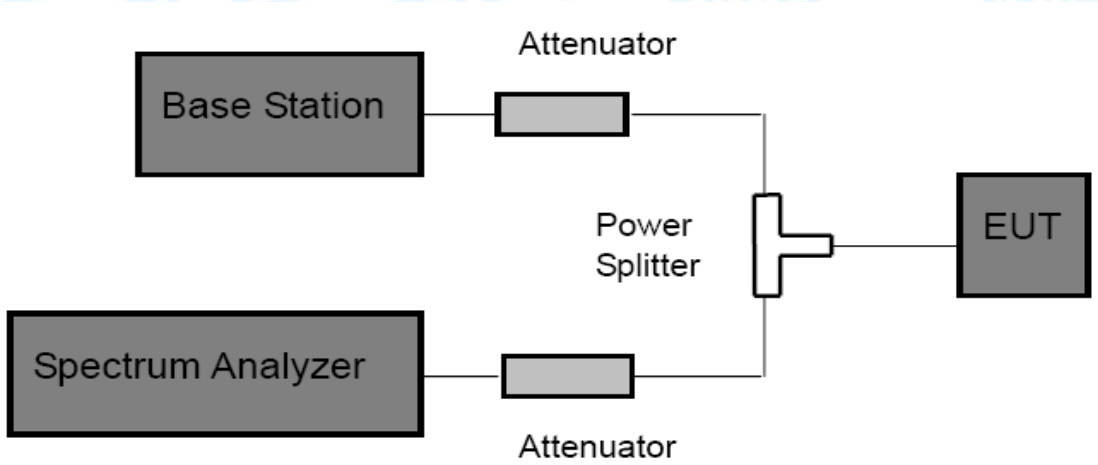
6.1.1 Test Standard

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	30.35	29.72	0.63
	661	1880.0	30.18	29.59	0.59
	810	1909.8	29.90	29.33	0.57

UMTS Band II					
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)		Peak-Average Ratio (PAR)
			Peak	Average	
UMTS Band II	9262	1852.4	25.45	23.10	2.35
	9400	1880.0	25.33	22.72	2.61
	9538	1907.6	25.25	22.91	2.34

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)

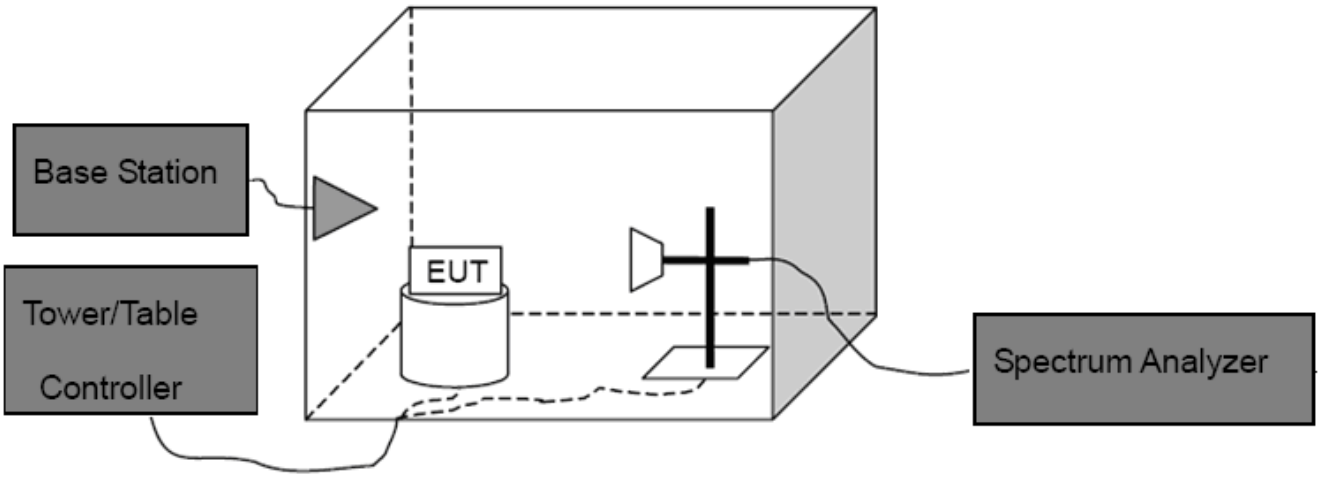
7.1.2 Test Limit

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	31.84	1.528
			V	30.71	1.178
	190	836.6	H	30.57	1.140
			V	29.39	0.869
	251	848.8	H	30.25	1.059
			V	29.65	0.923
GPRS 850 (1 Slot)	128	824.2	H	28.36	0.685
			V	27.53	0.566
	190	836.6	H	28.13	0.650
			V	26.89	1.528
	251	848.8	H	27.68	1.178
			V	26.03	1.140
EDGE 850 (1 Slot)	128	824.2	H	26.98	0.869
			V	25.32	1.059
	190	836.6	H	27.21	0.923
			V	25.68	0.685
	251	848.8	H	27.86	0.566
			V	26.52	0.650
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	25.36	0.344
			V	24.24	0.265
	661	1880.0	H	25.18	0.330
			V	24.24	0.265
	810	1909.8	H	26.37	0.434
			V	24.87	0.307
GPRS 1900 (1 Slot)	512	1850.2	H	25.86	0.385
			V	23.99	0.251
	661	1880.0	H	25.59	0.362
			V	24.11	0.344
	810	1909.8	H	26.03	0.265
			V	24.96	0.330
EDGE 1900 (1 Slot)	512	1850.2	H	25.76	0.265
			V	24.10	0.434
	661	1880.0	H	25.68	0.307
			V	24.23	0.385
	810	1909.8	H	25.74	0.251
			V	24.32	0.362
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	17.65	0.0582
			V	16.36	0.0433
	4175	835.0	H	17.98	0.0628
			V	16.52	0.0449
	4233	846.6	H	17.89	0.0615
			V	16.53	0.0450
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	18.24	0.0667
			V	17.24	0.0530
	9400	1880.0	H	17.98	0.0628
			V	16.39	0.0436
	9538	1907.6	H	18.54	0.0714
			V	17.03	0.0505
Limit				33	2

8. Occupied Bandwidth

8.1 Test Standard and Limit

8.1.1 Test Standard

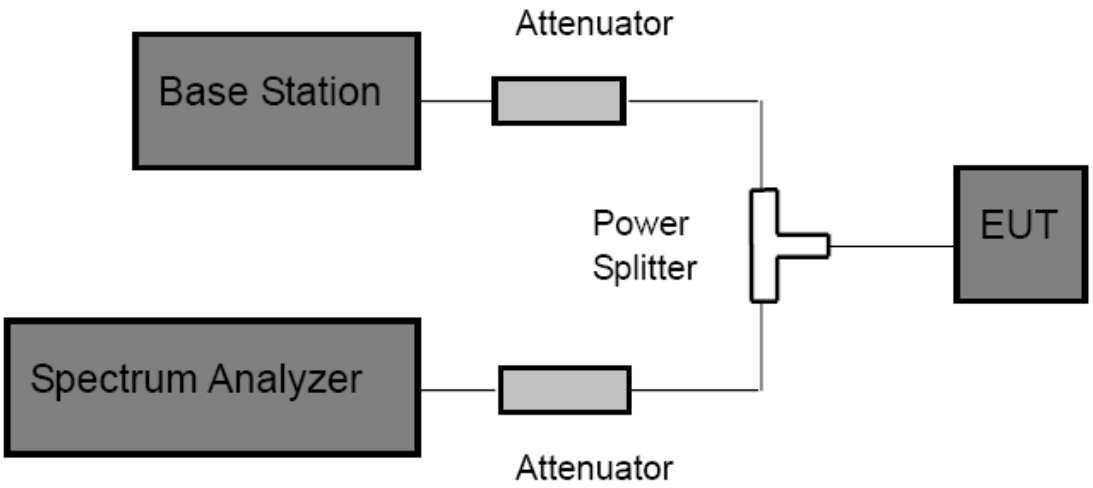
FCC Part 2: 2.1049
FCC Part 22H : 22.913 (a)
FCC Part 24E: 24.232 (c)

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.

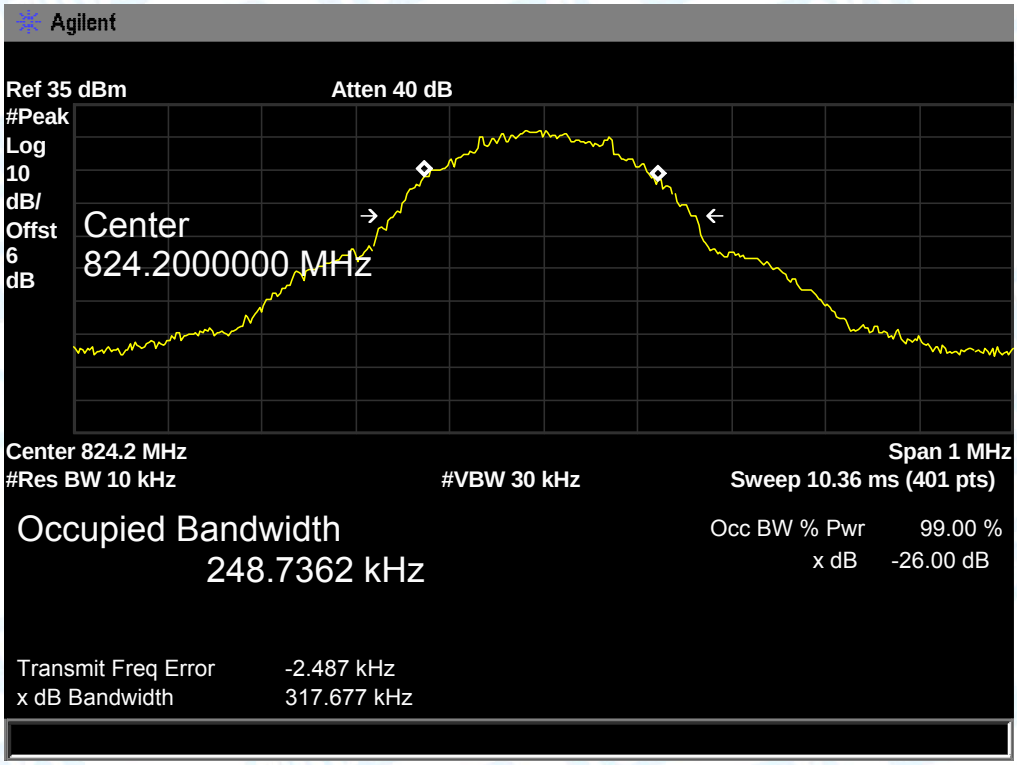
8.5 Test Data

Please refer following pages.

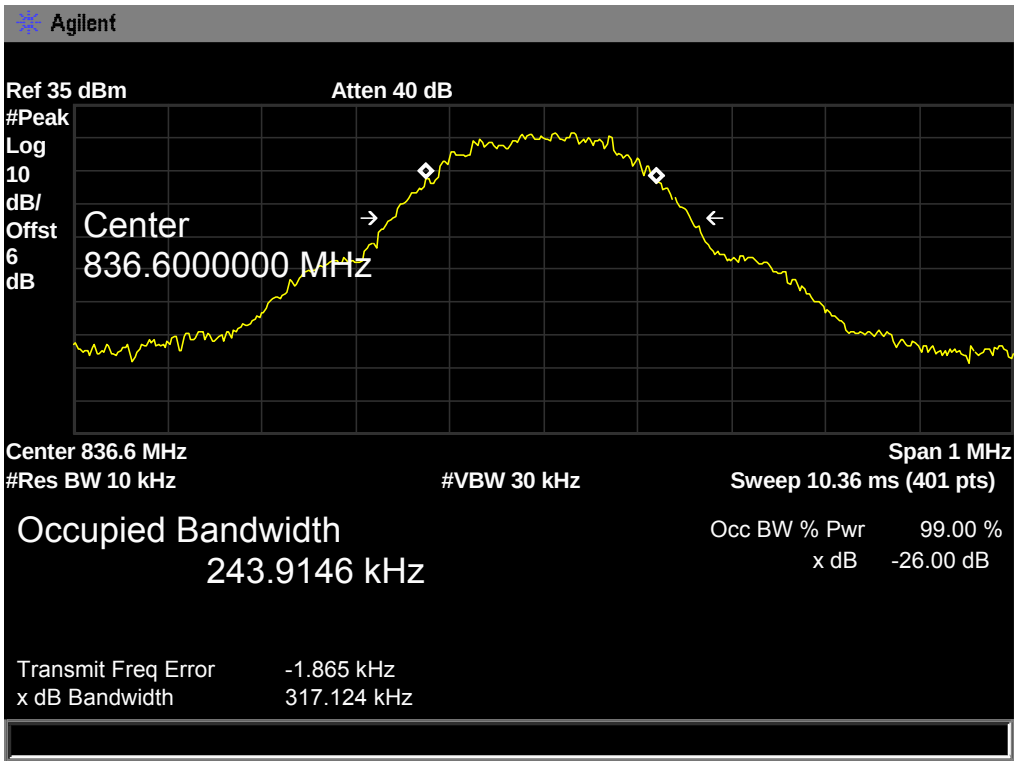
GSM 850				
Mode	**Channel**	**Frequency (MHz)**	**99% OBW (MHz)**	**-26dB Bandwidth (kHz)**
GSM 850	128	824.2	248.7362	317.677
	190	836.6	243.9146	317.124
	251	848.8	249.0710	323.352
GPRS 850 (1 Slot)	128	824.2	244.4205	323.353
	190	836.6	244.4778	326.478
	251	848.8	246.4859	326.056
EDGE 850 (1 Slot)	128	824.2	244.3440	324.825
	190	836.6	244.8110	325.734
	251	848.8	244.4793	320.779
PCS 1900				
Mode	**Channel**	**Frequency (MHz)**	**99% OBW (MHz)**	**-26dB Bandwidth (kHz)**
GSM 1900	512	1850.2	244.7815	314.403
	661	1880.0	245.0248	314.259
	810	1909.8	245.6431	317.162
GPRS 1900 (1 Slot)	512	1850.2	248.4847	329.930
	661	1880.0	246.0920	319.630
	810	1909.8	246.5569	315.357
EDGE 1900 (1 Slot)	512	1850.2	243.5879	317.020
	661	1880.0	246.5049	320.128
	810	1909.8	246.5933	318.529

UMTS Band V				
Mode	**Channel**	**Frequency (MHz)**	**99% OBW (MHz)**	**-26dB Bandwidth (kHz)**
Band V RMC	4132	826.4	4.1545	4746
	4175	835.0	4.1944	4736
	4233	846.6	4.1561	4745
Band V HSDPA	4132	826.4	4.1448	4710
	4175	835.0	4.1782	4728
	4233	846.6	4.1669	4963
Band V HSUPA	4132	826.4	4.1472	4718
	4175	835.0	4.2011	4732
	4233	846.6	4.1430	4688
UMTS Band II				
Mode	**Channel**	**Frequency (MHz)**	**99% OBW (MHz)**	**-26dB Bandwidth (kHz)**
Band II RMC	9262	1852.4	4.1922	5082
	9400	1880.0	4.1742	4739
	9538	1907.6	4.1734	4747
Band II HSDPA	9262	1852.4	4.2055	5146
	9400	1880.0	4.1708	4727
	9538	1907.6	4.1879	4742
Band II HSUPA	9262	1852.4	4.1979	4737
	9400	1880.0	4.1970	4690
	9538	1907.6	4.1886	4718

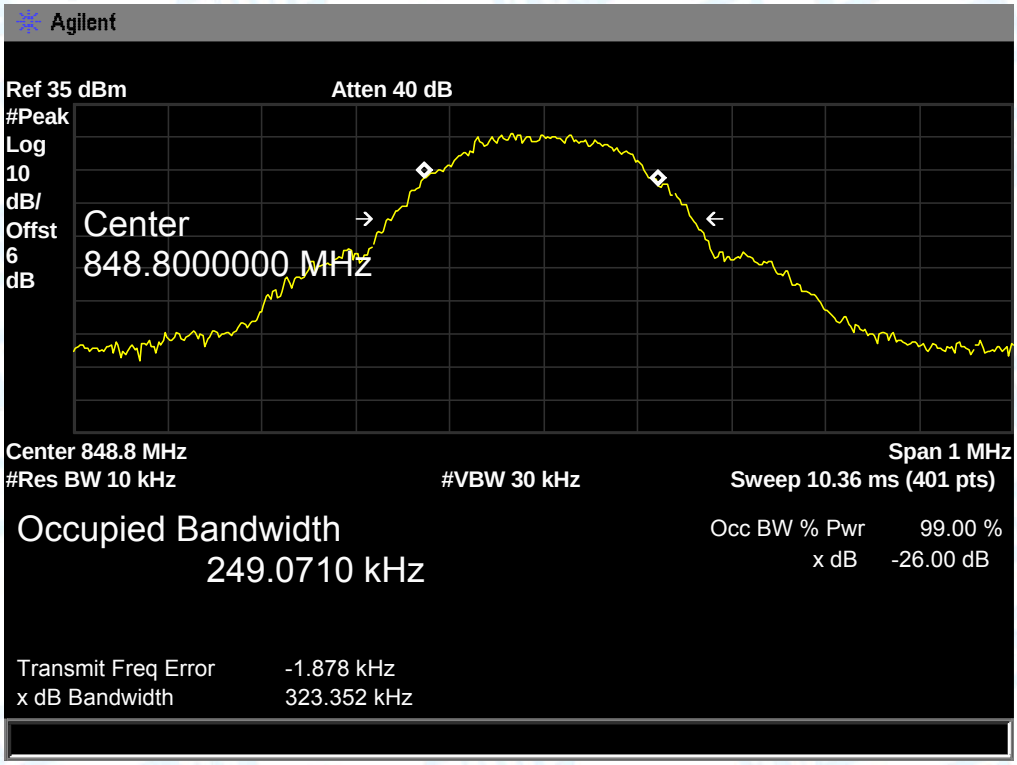
GSM850
CH 128



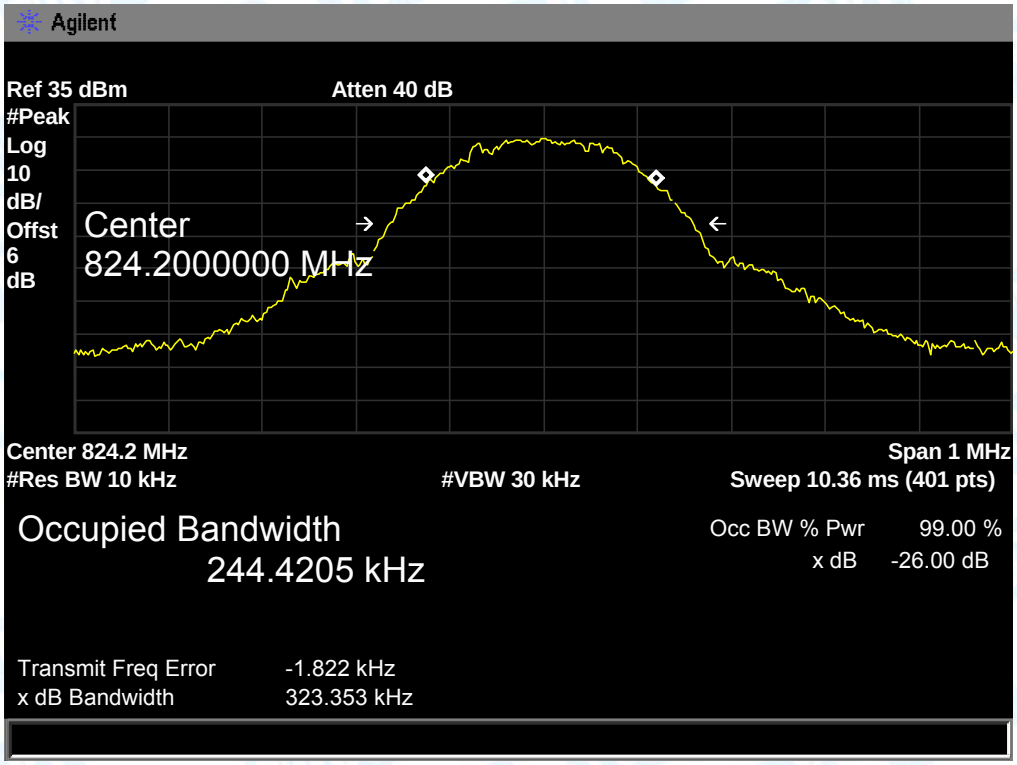
CH 190



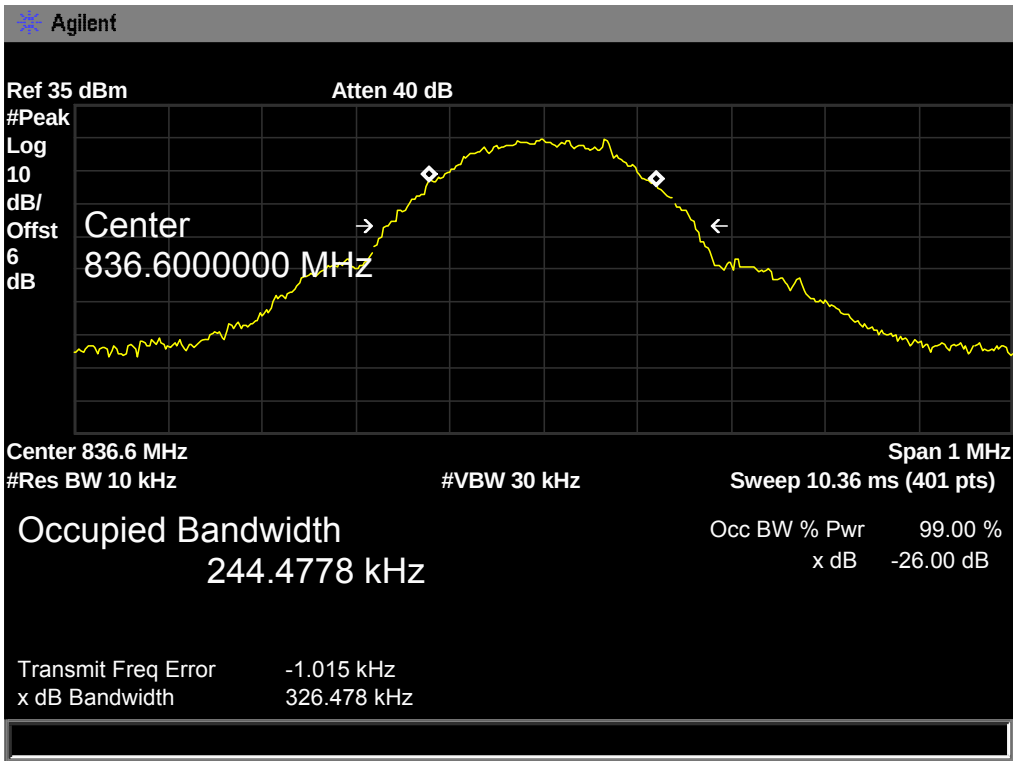
CH 251


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
249.0710 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -1.878 kHz
x dB Bandwidth 323.352 kHz

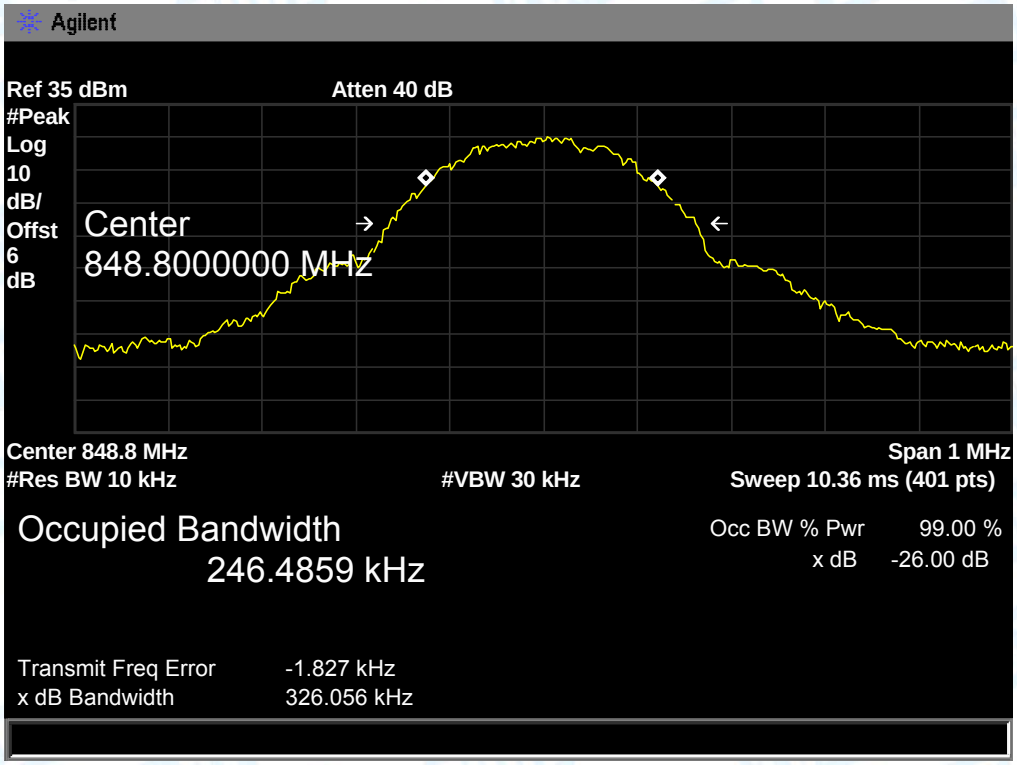
GPRS 850
CH 128



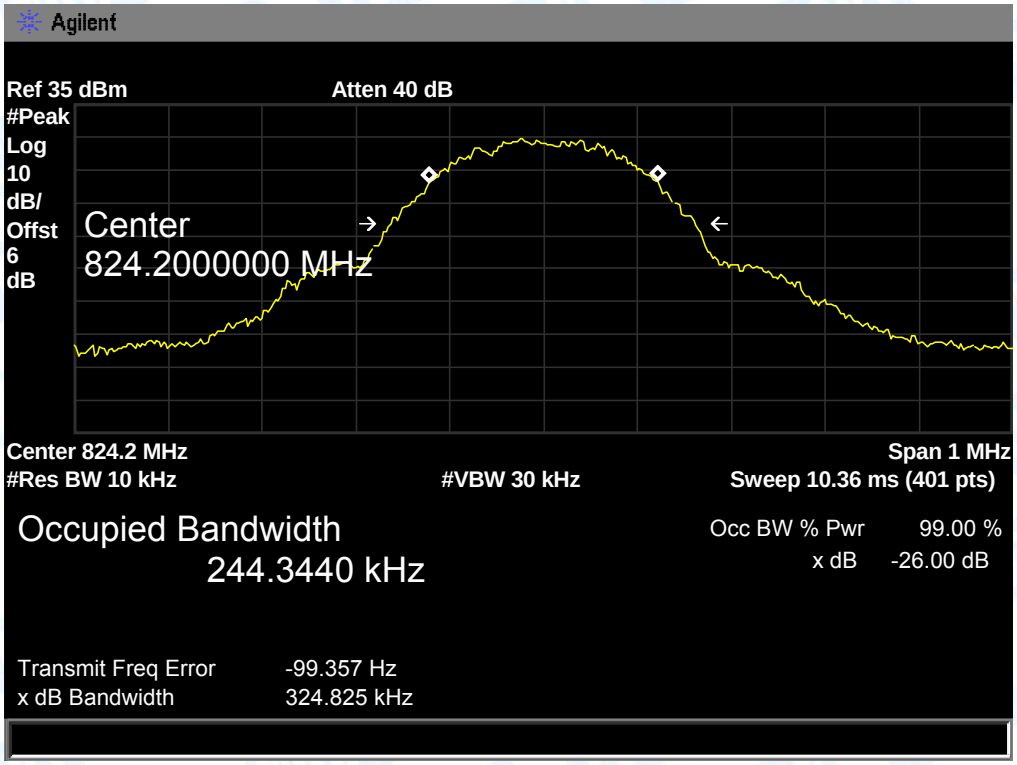
CH 190



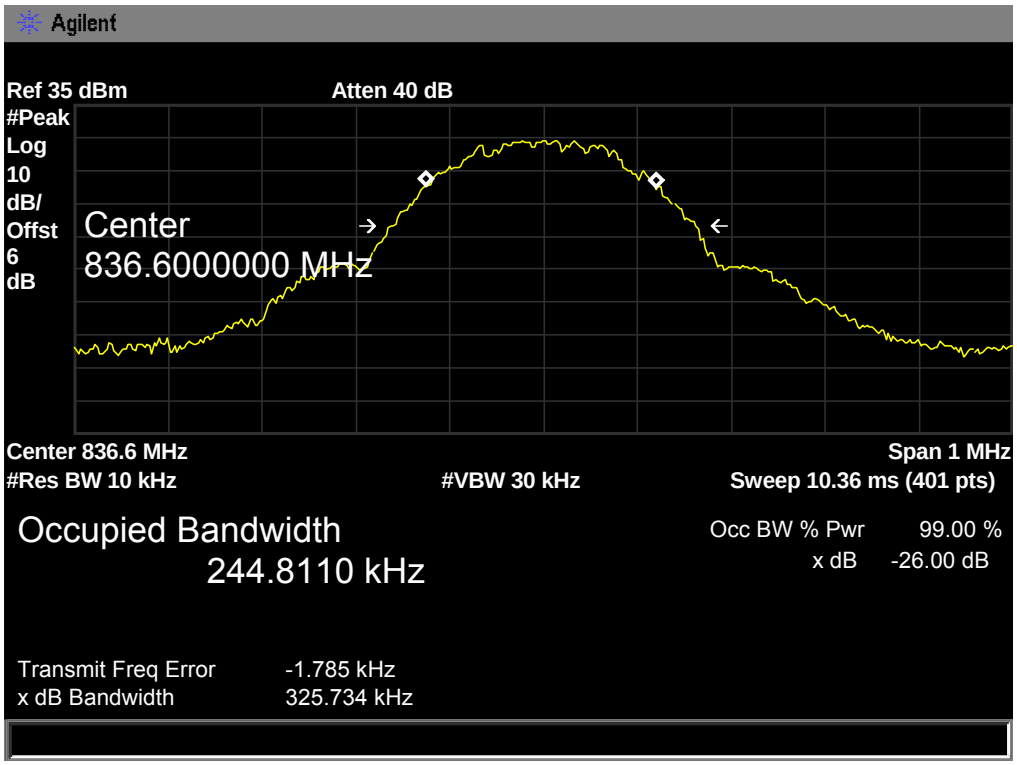
CH 251


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
246.4859 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -1.827 kHz
x dB Bandwidth 326.056 kHz

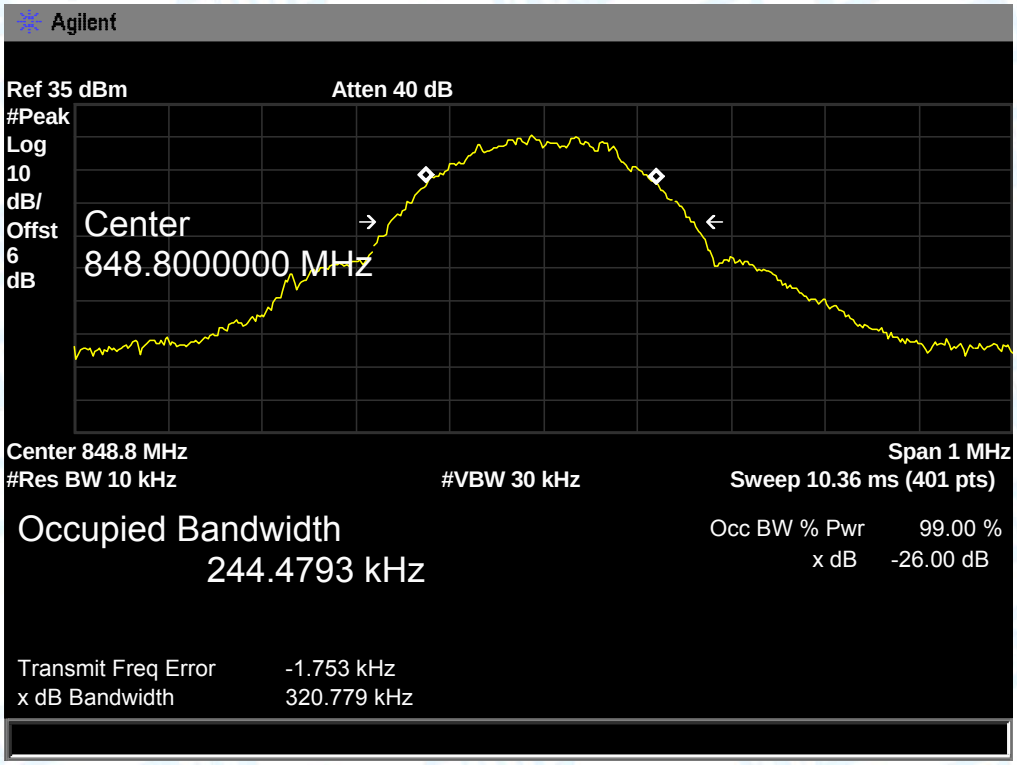
EDGE 850
CH 128



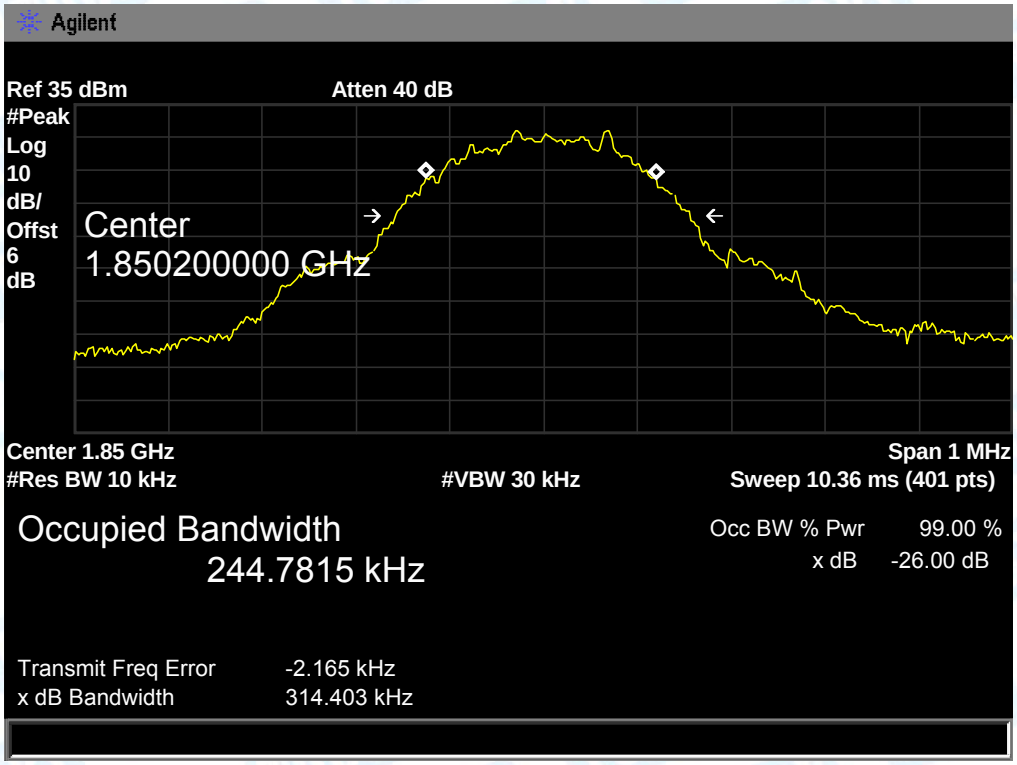
CH 190



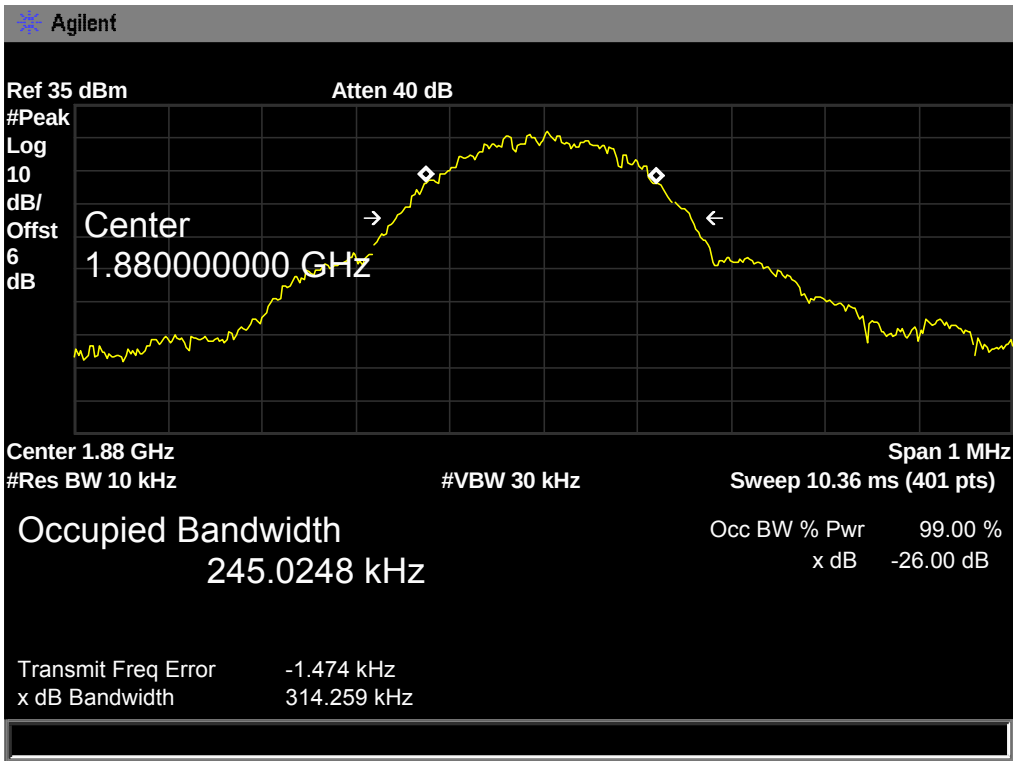
CH 251


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
244.4793 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -1.753 kHz
x dB Bandwidth 320.779 kHz

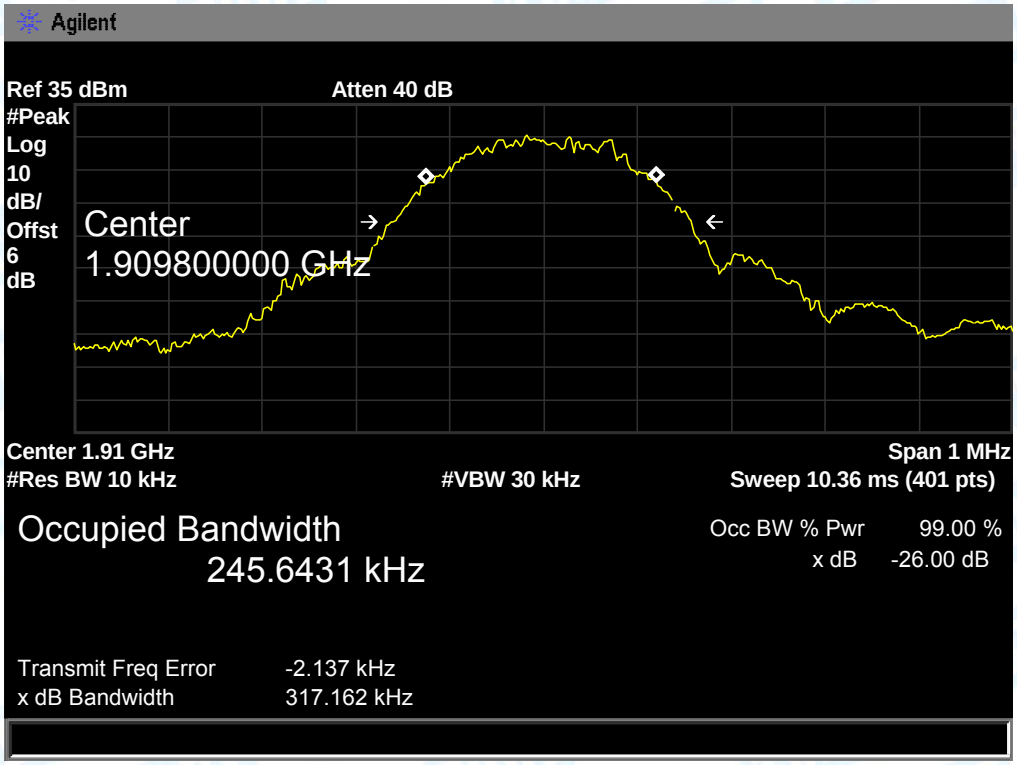
PCS 1900
CH 512



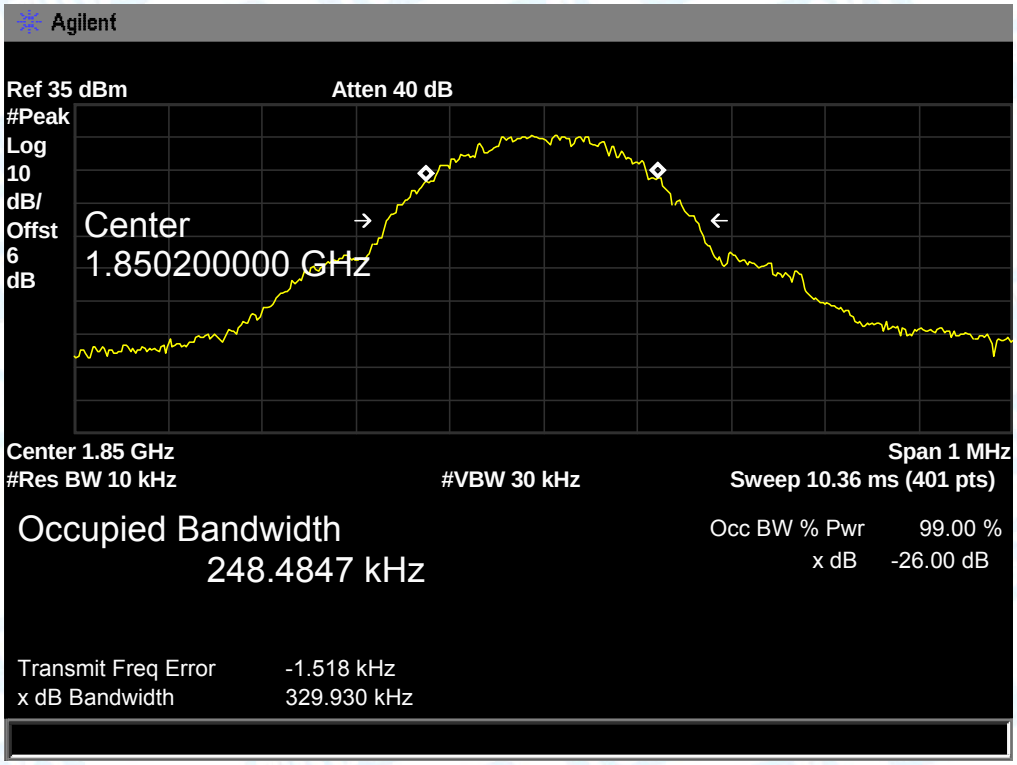
CH 661



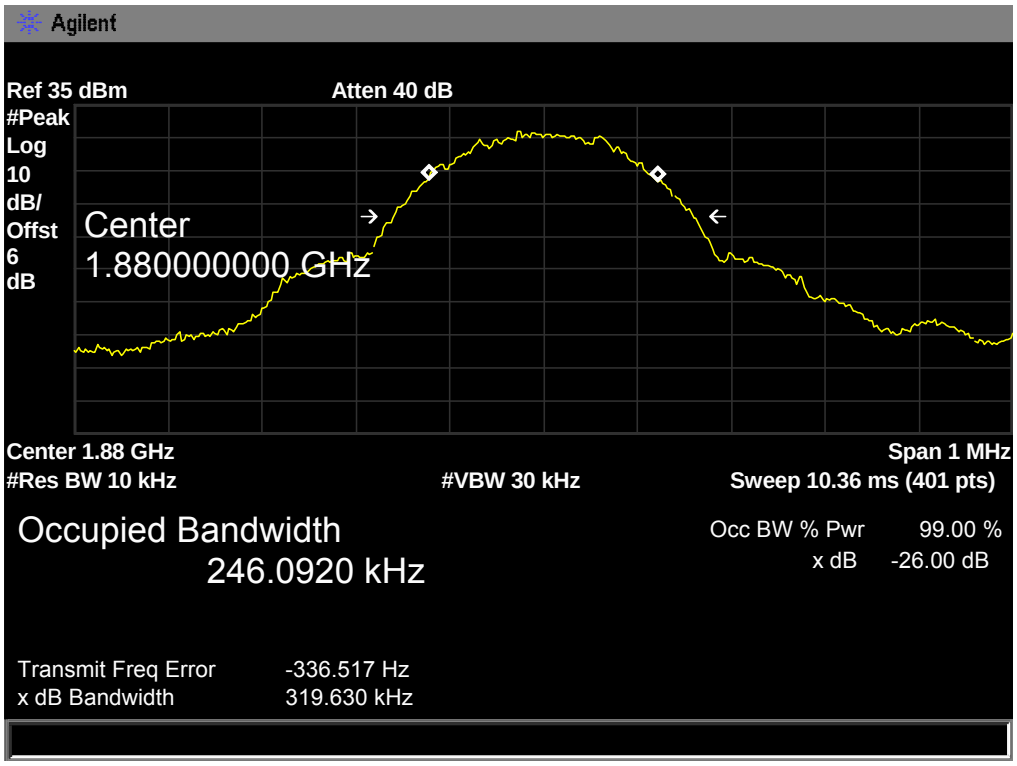
CH 810


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
245.6431 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -2.137 kHz
x dB Bandwidth 317.162 kHz

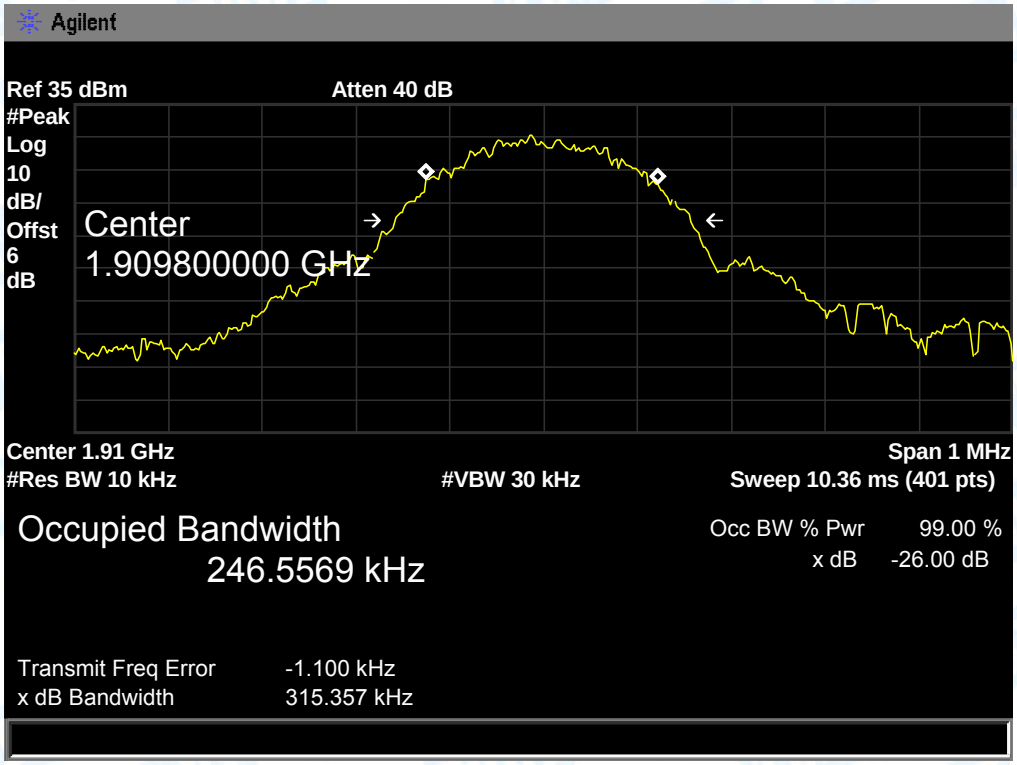
GPRS 1900
CH 512



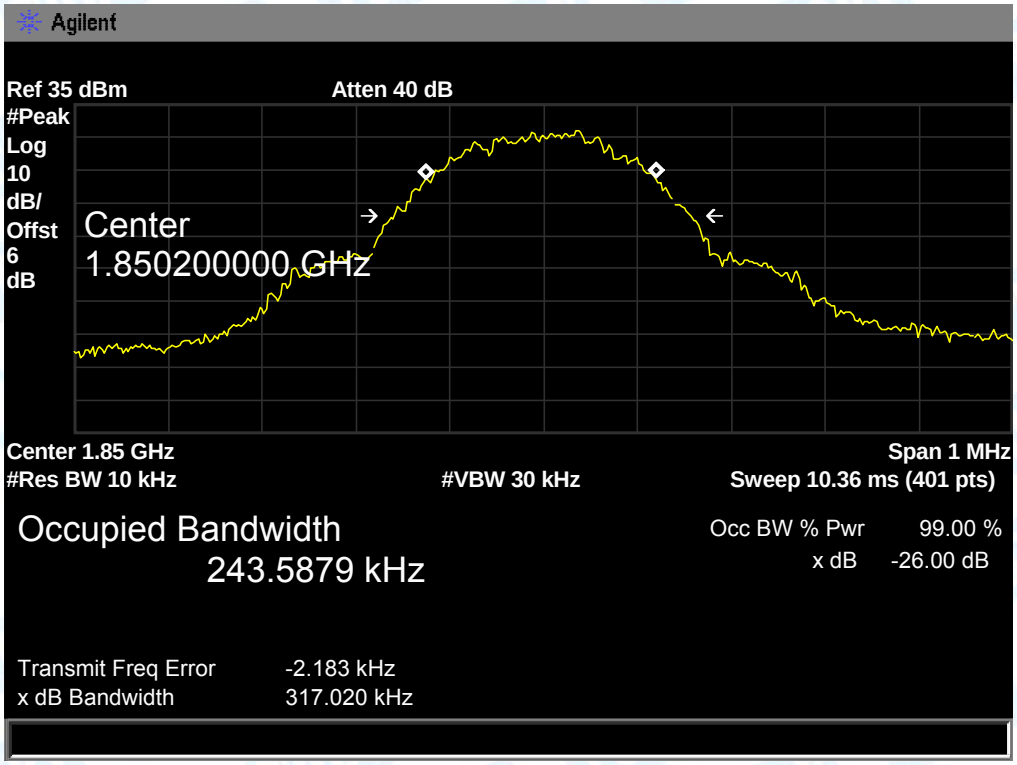
CH 661



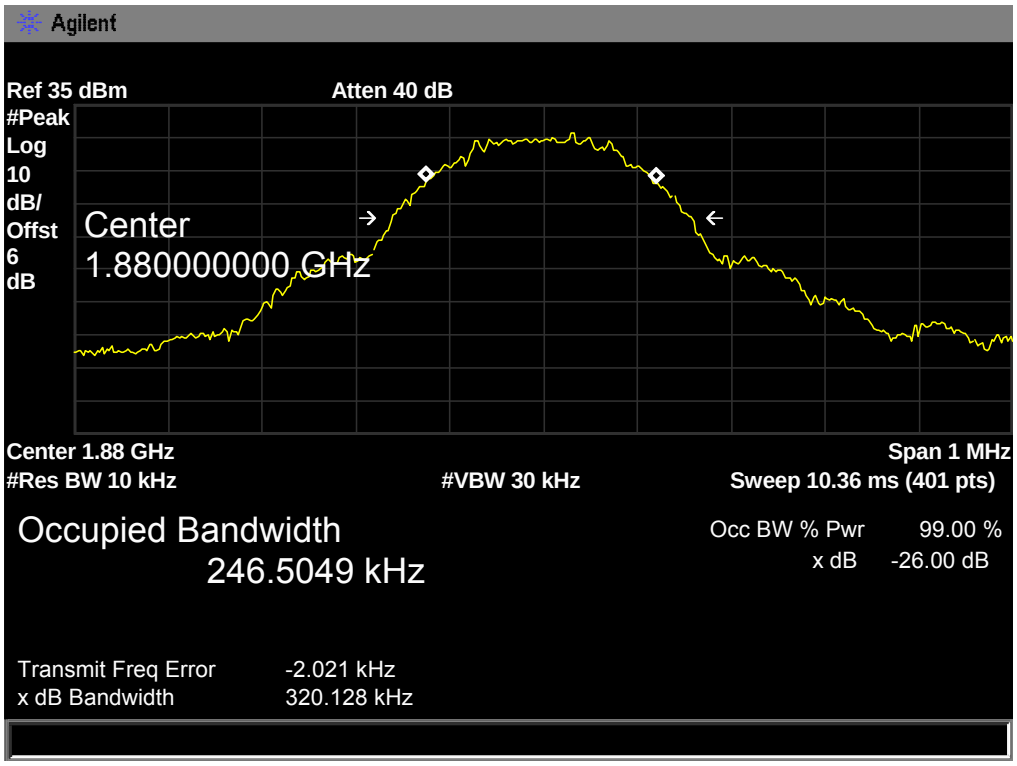
CH 810


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
246.5569 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -1.100 kHz
x dB Bandwidth 315.357 kHz

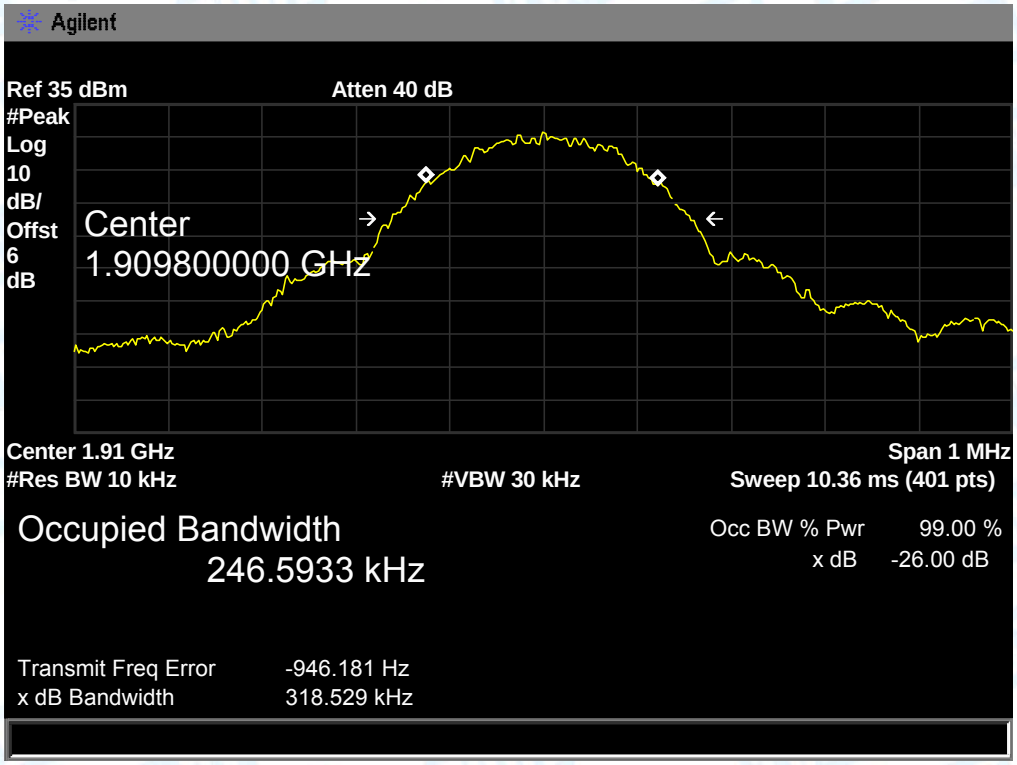
EDGE 1900
CH 512



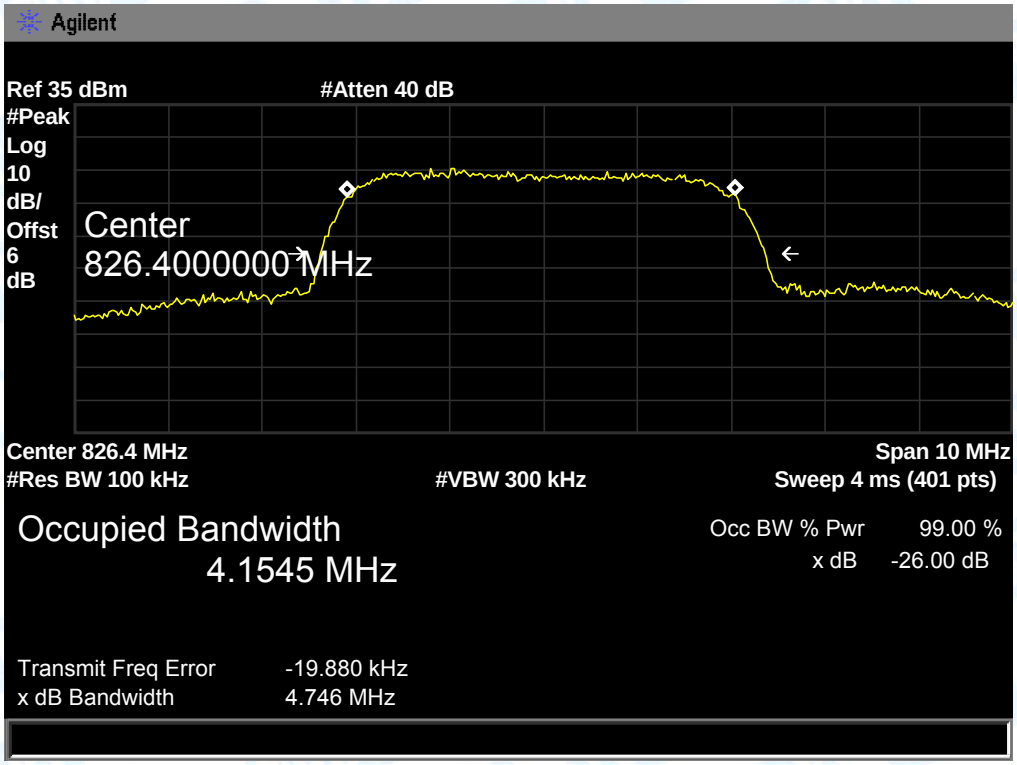
CH 661



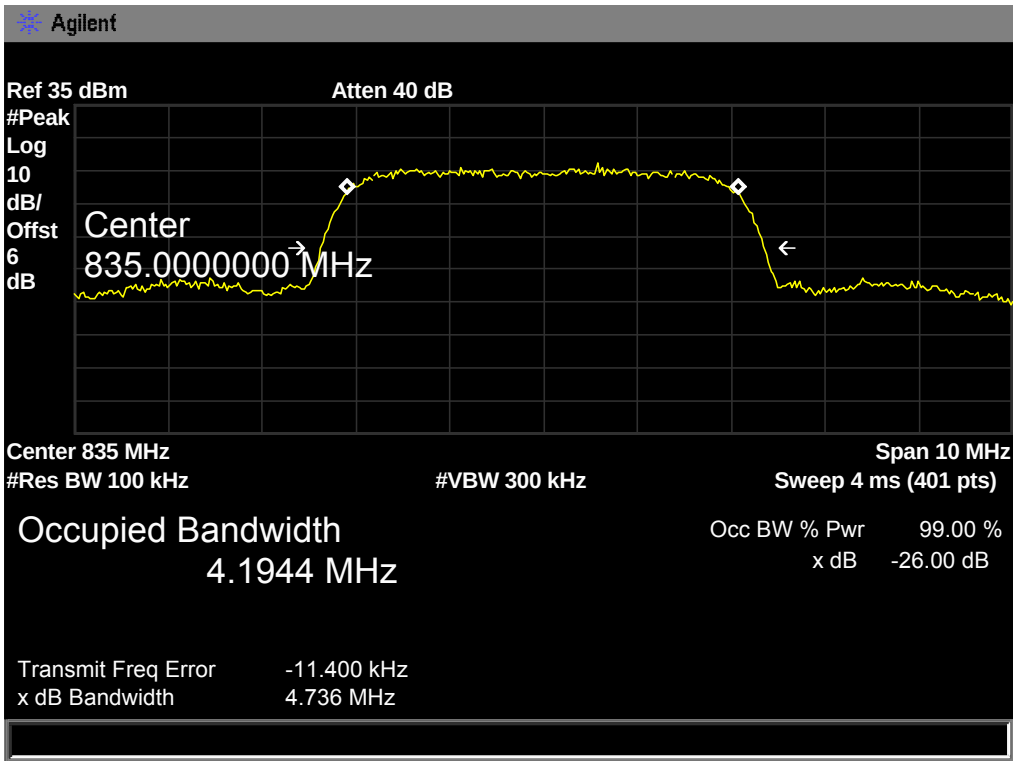
CH 810


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
246.5933 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -946.181 Hz
x dB Bandwidth 318.529 kHz

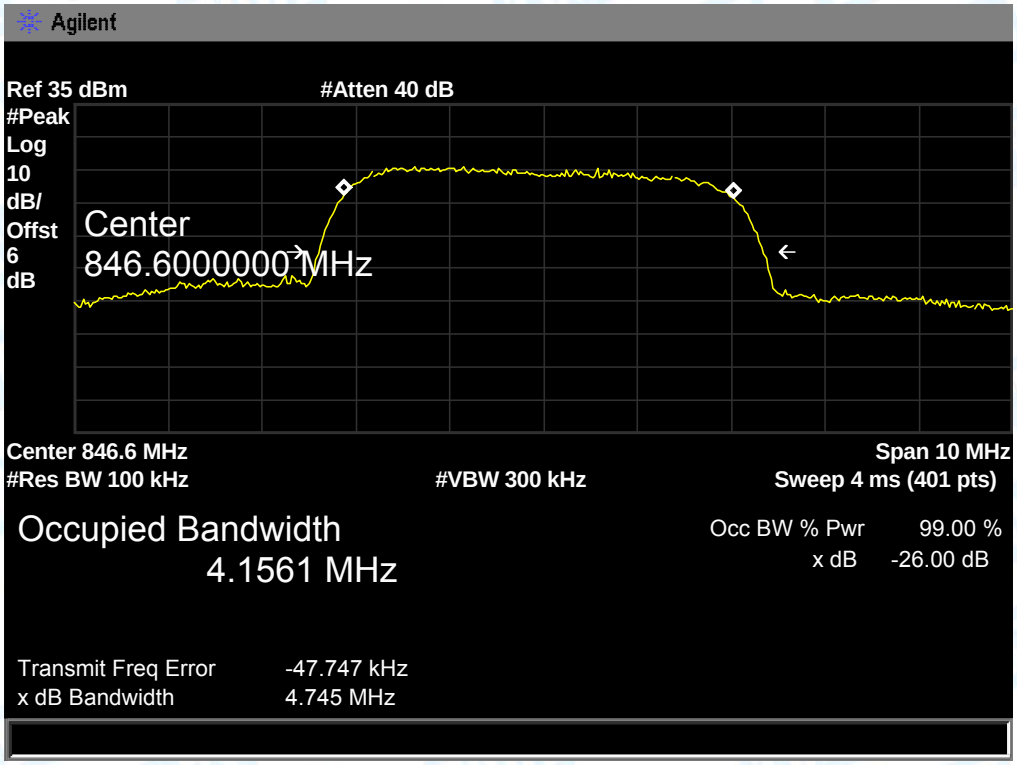
UMTS Band V (RMC)
CH 4132



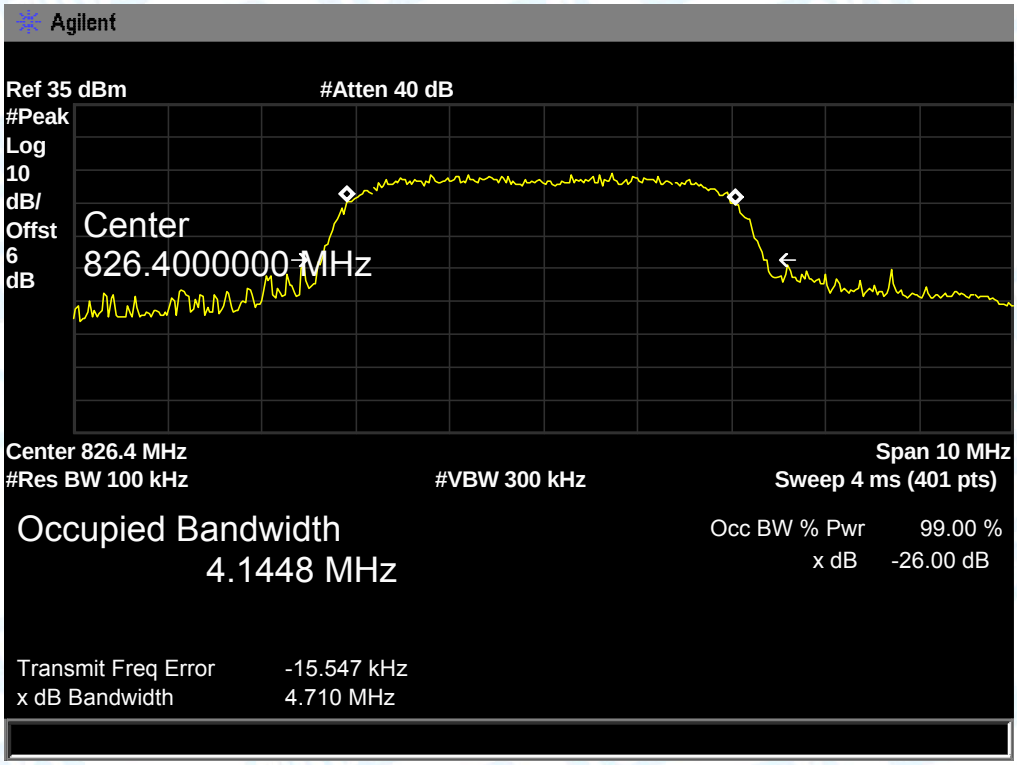
CH 4175



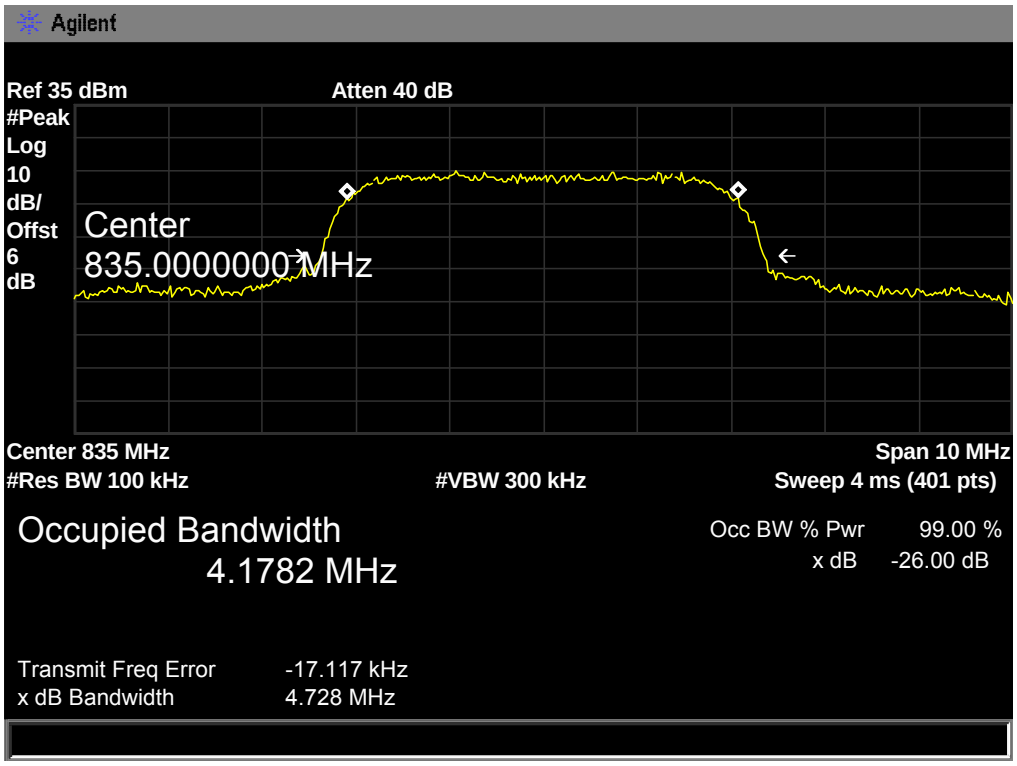
CH 4233


Agilent
Ref 35 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
4.1561 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -47.747 kHz
x dB Bandwidth 4.745 MHz

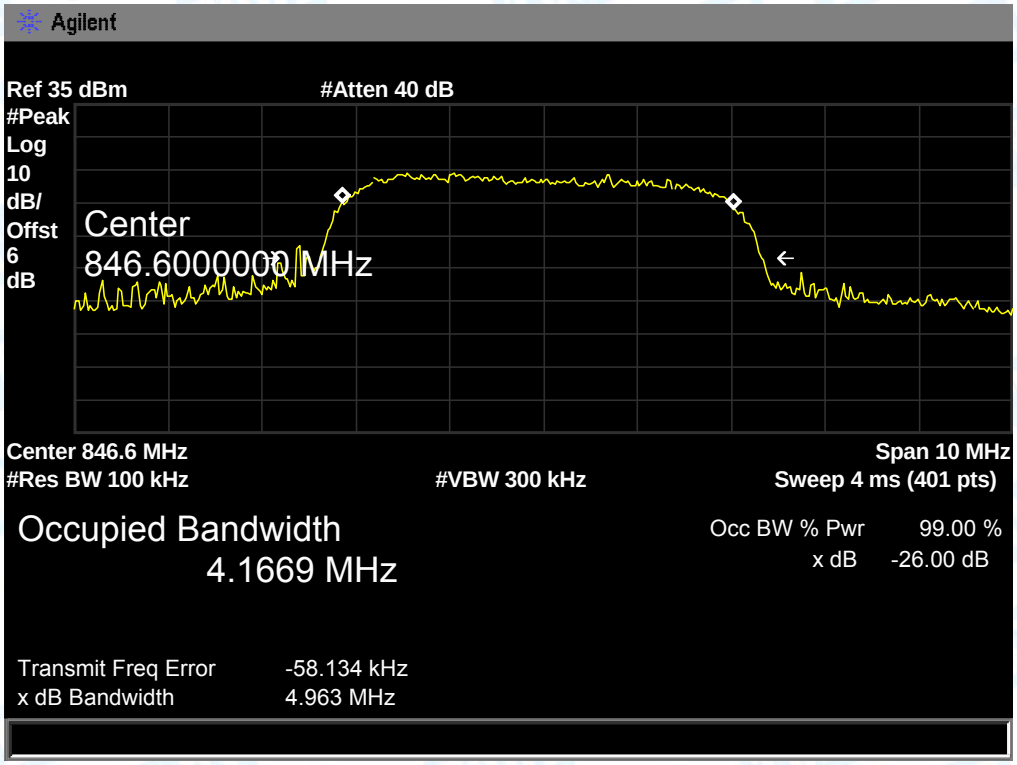
UMTS Band V (HSDPA)
CH 4132



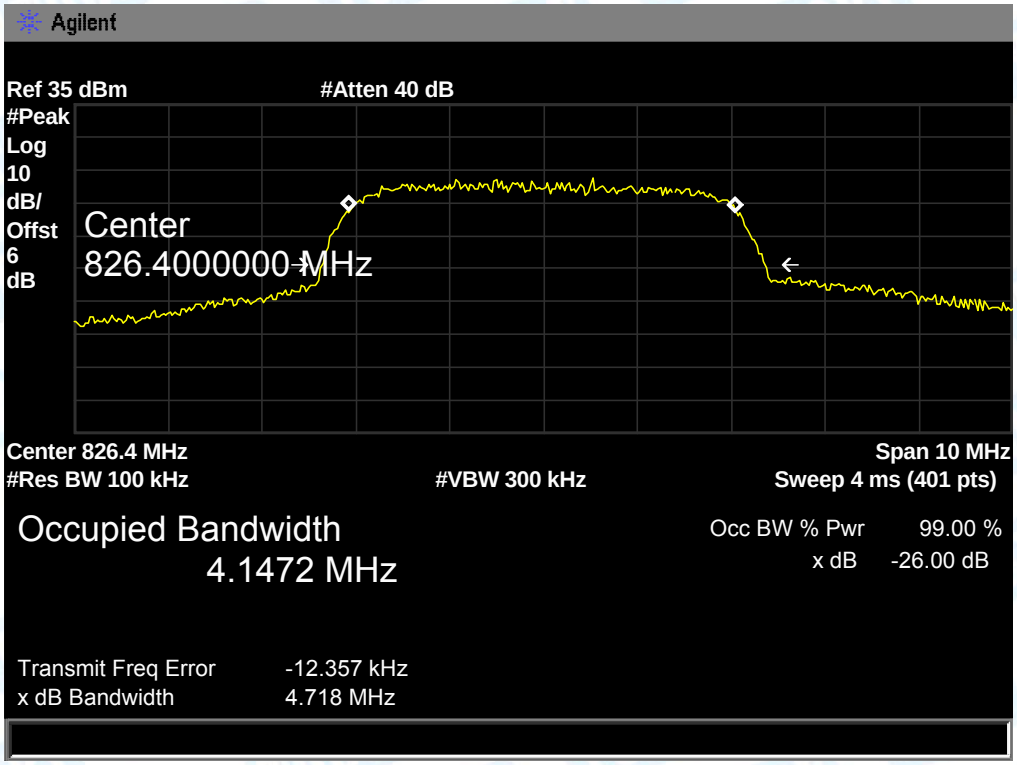
CH 4175



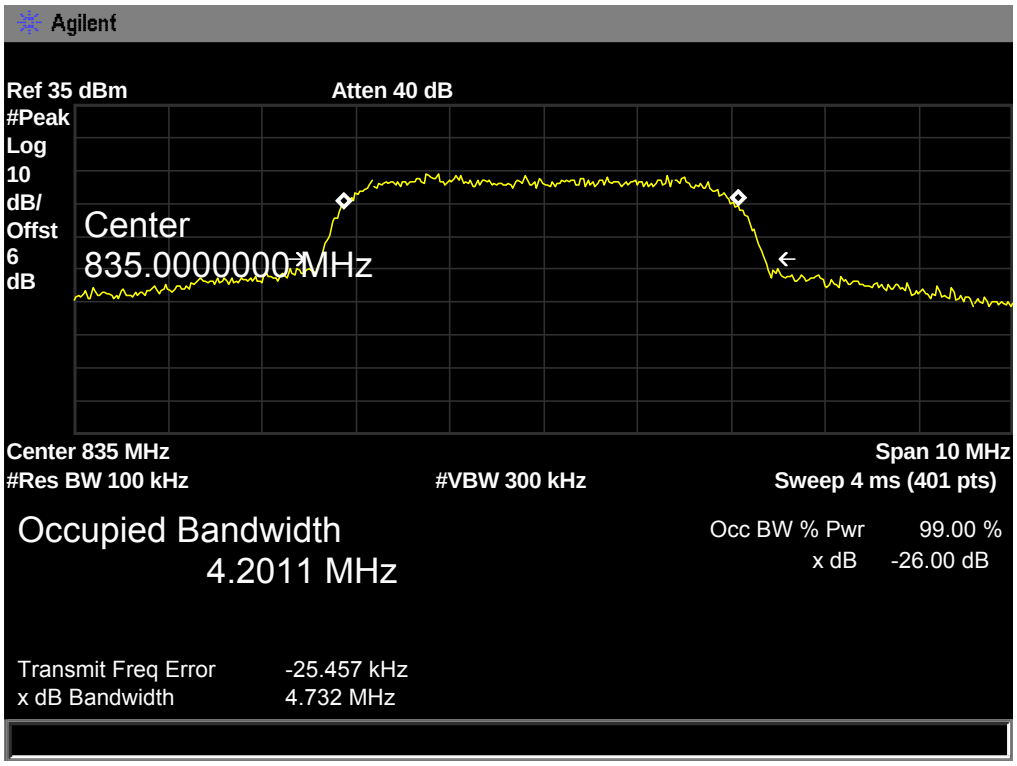
CH 4233


Agilent
Ref 35 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
4.1669 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -58.134 kHz
x dB Bandwidth 4.963 MHz

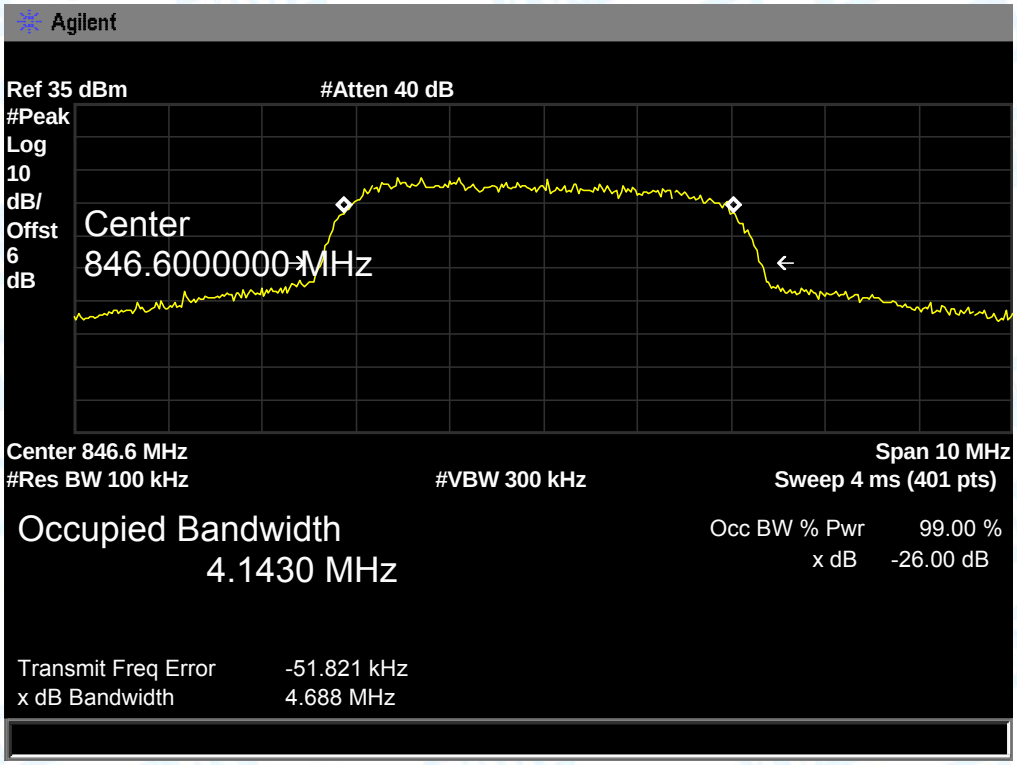
UMTS Band V (HSUPA)
CH 4132



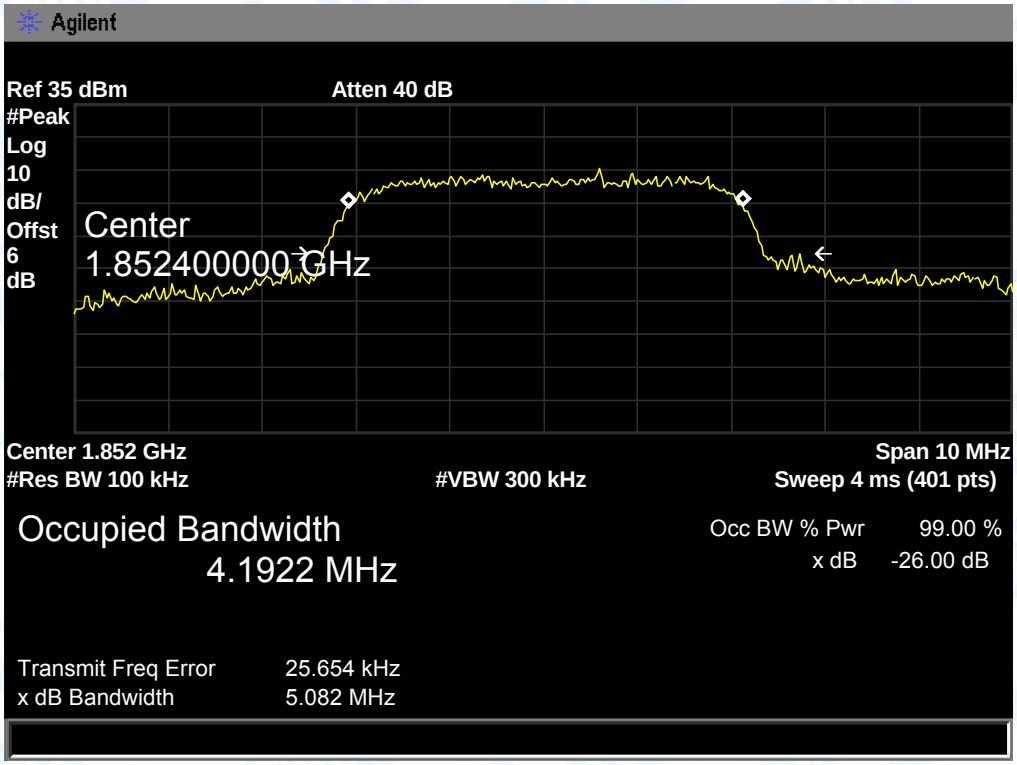
CH 4175



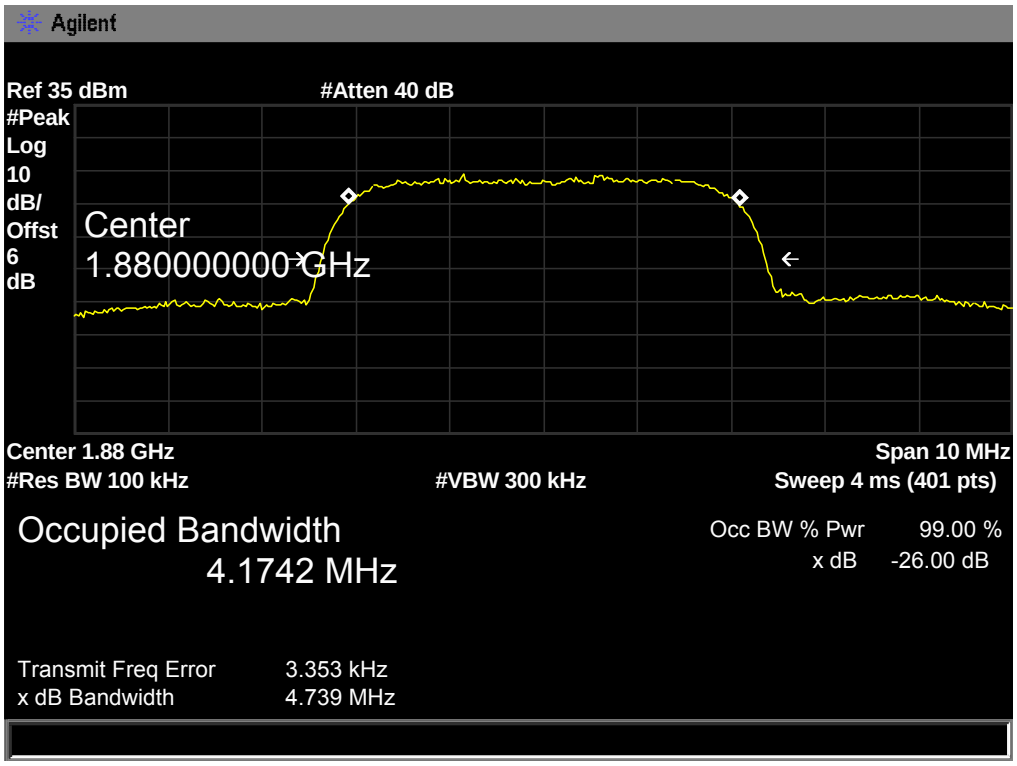
CH 4233


Agilent
Ref 35 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
4.1430 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -51.821 kHz
x dB Bandwidth 4.688 MHz

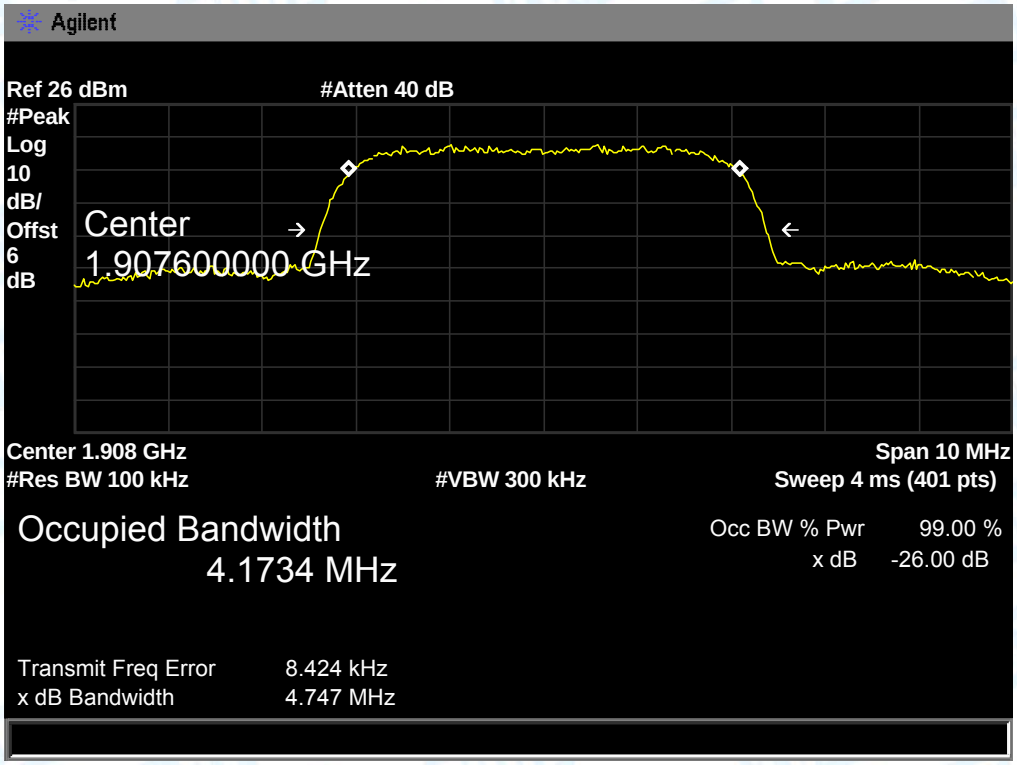
UMTS Band II (RMC)
CH 9262



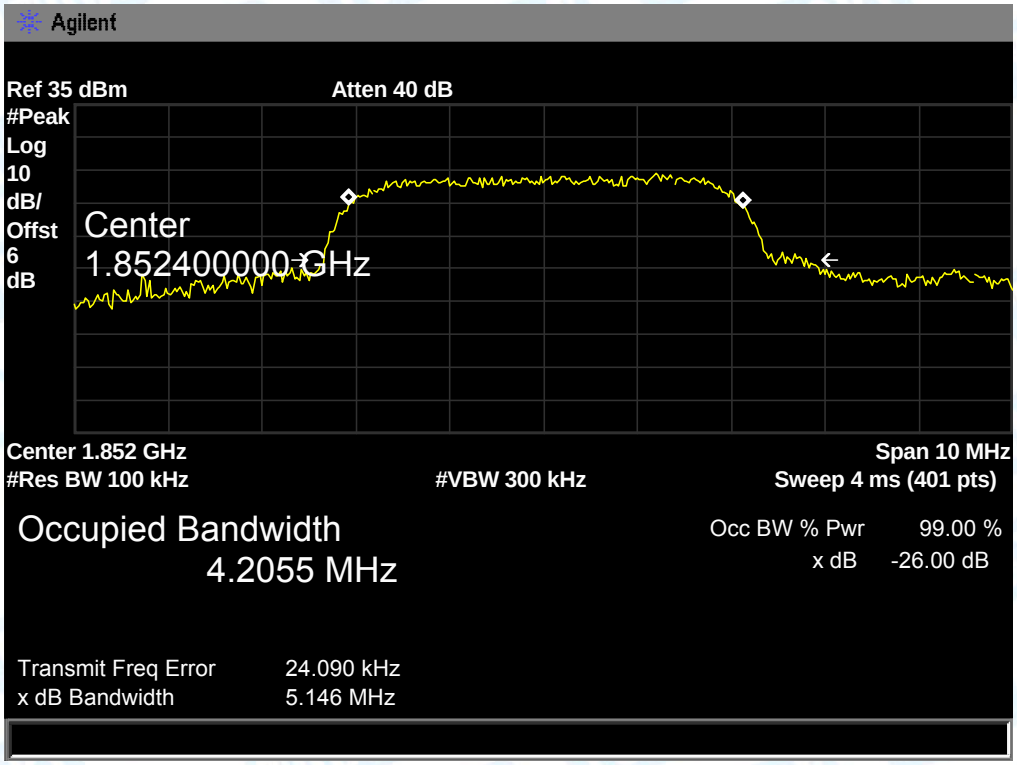
CH 9400



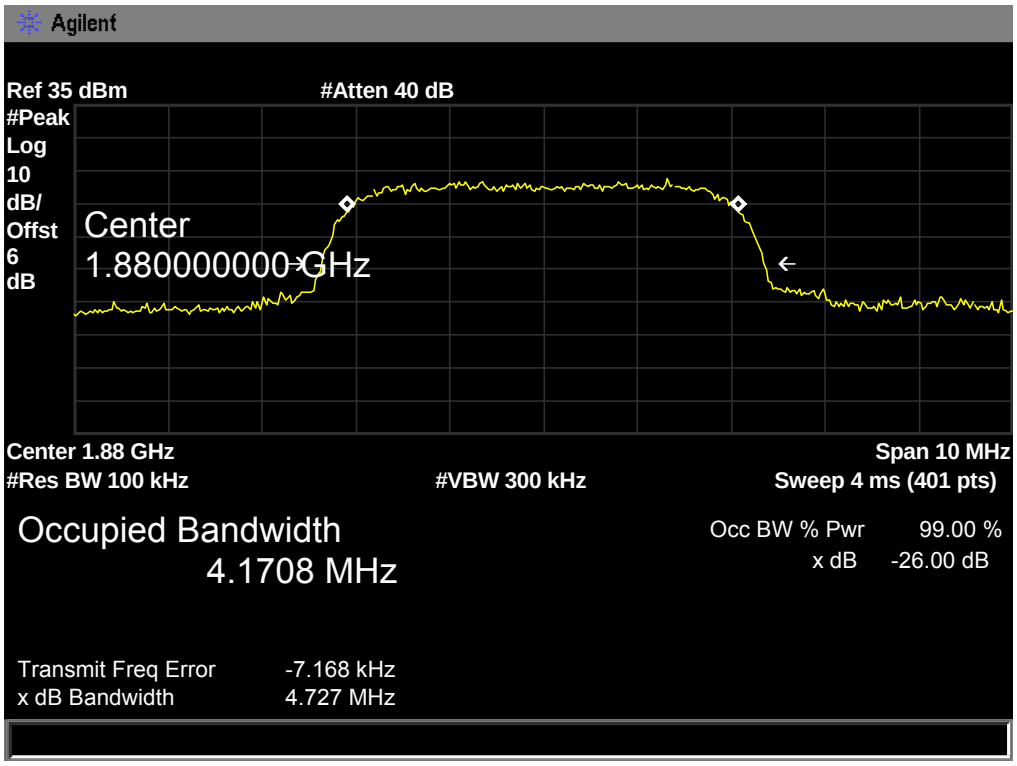
CH 9538


Agilent
Ref 26 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
4.1734 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 8.424 kHz
x dB Bandwidth 4.747 MHz

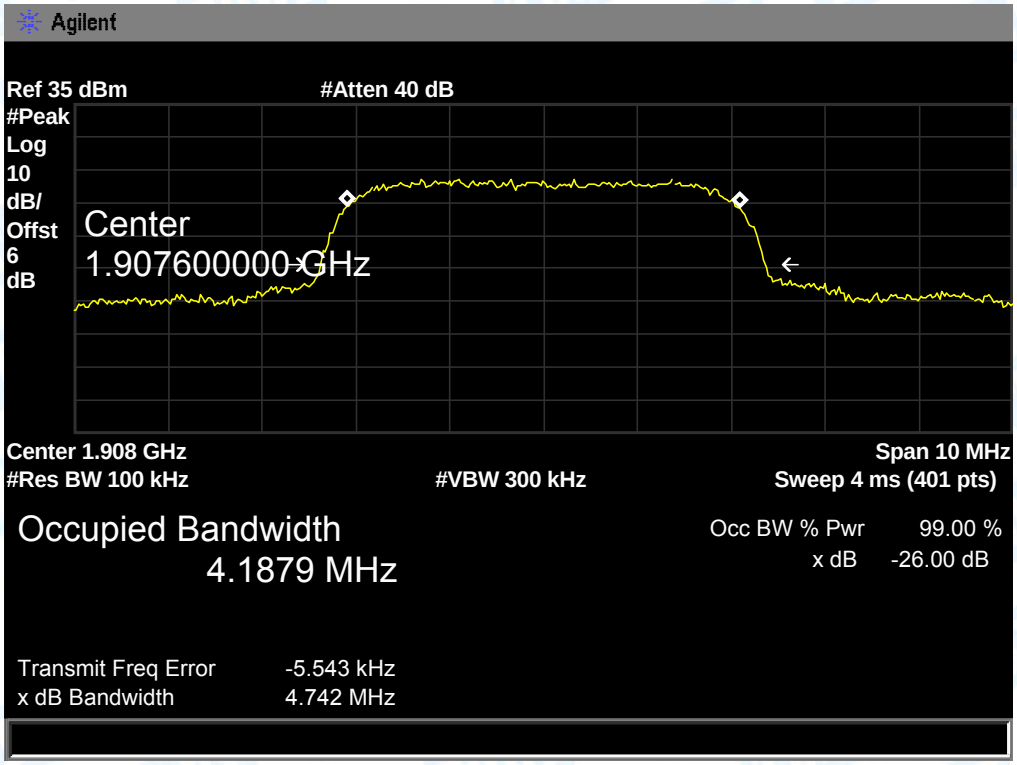
UMTS Band II (HSDPA)
CH 9262



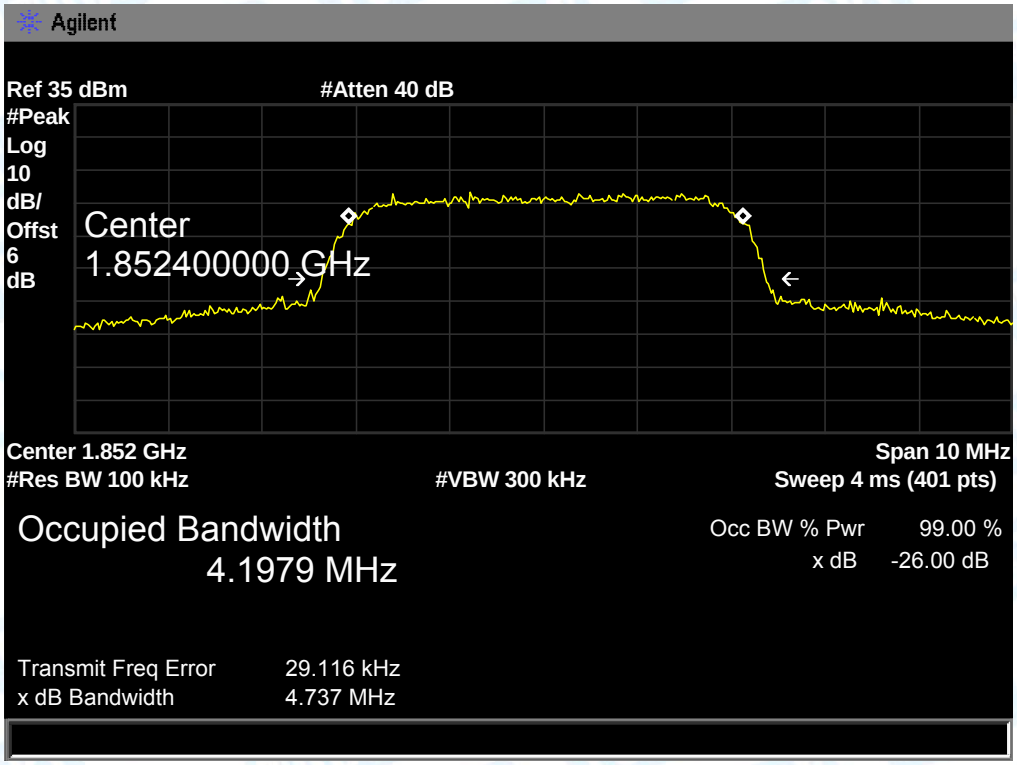
CH 9400



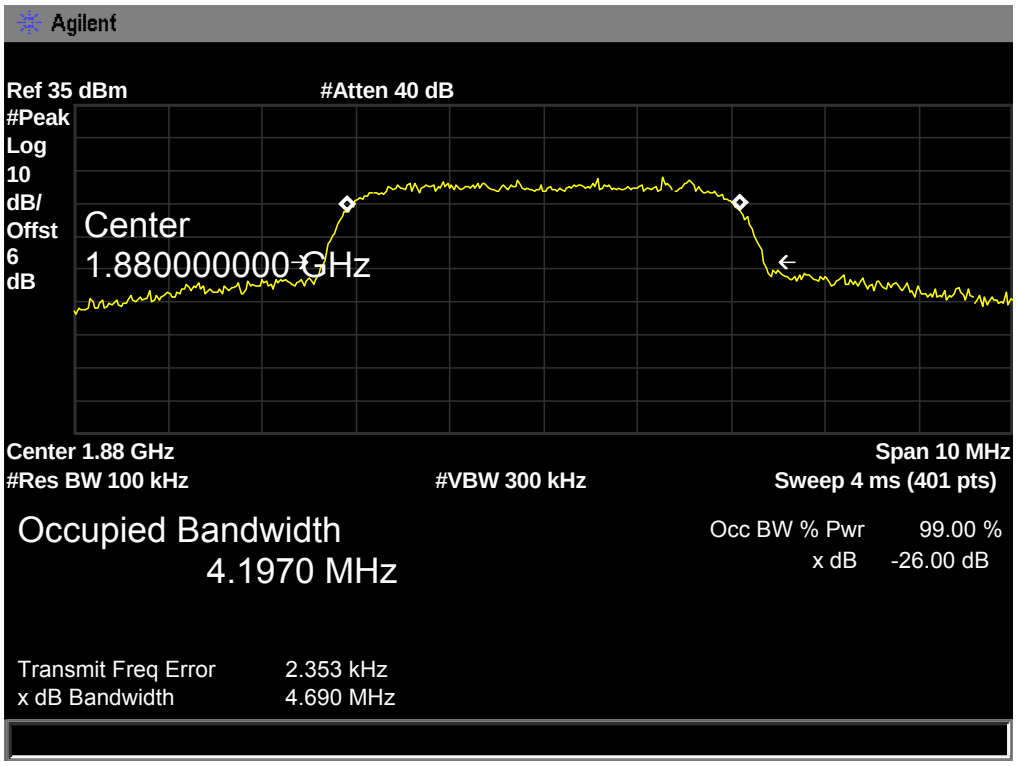
CH 9538


Agilent
Ref 35 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
4.1879 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -5.543 kHz
x dB Bandwidth 4.742 MHz

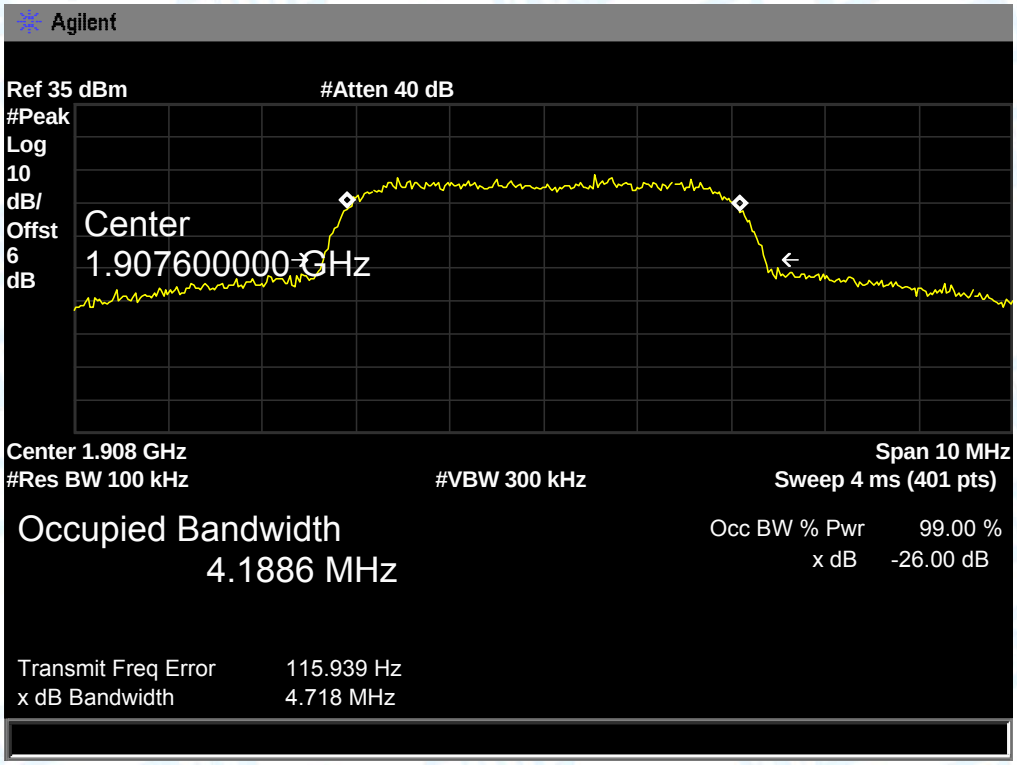
UMTS Band II (HSUPA)
CH 9262



CH 9400



CH 9538


Agilent
Ref 35 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
4.1886 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 115.939 Hz
x dB Bandwidth 4.718 MHz

9. Conducted Out of Band Emissions

9.1 Test Standard and Limit

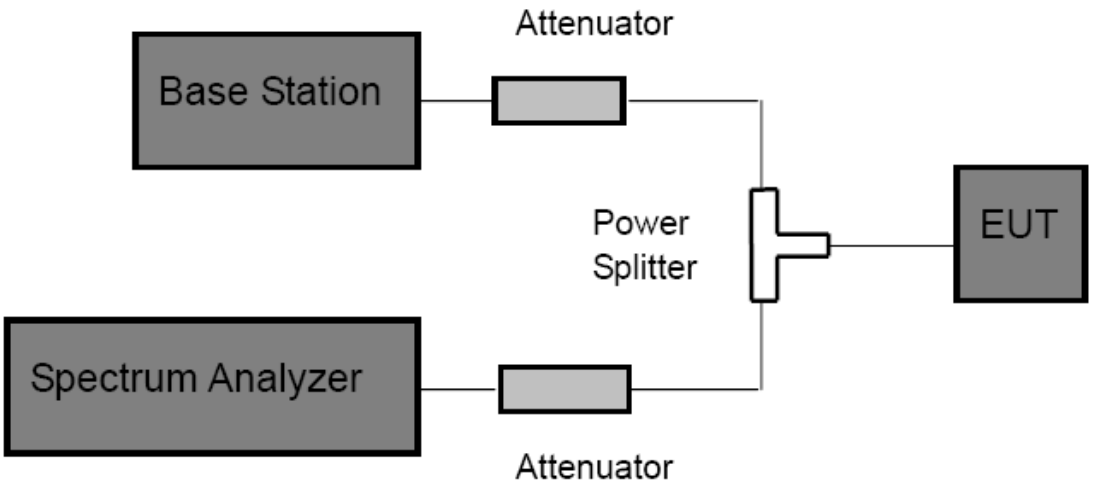
9.1.1 Test Standard

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.

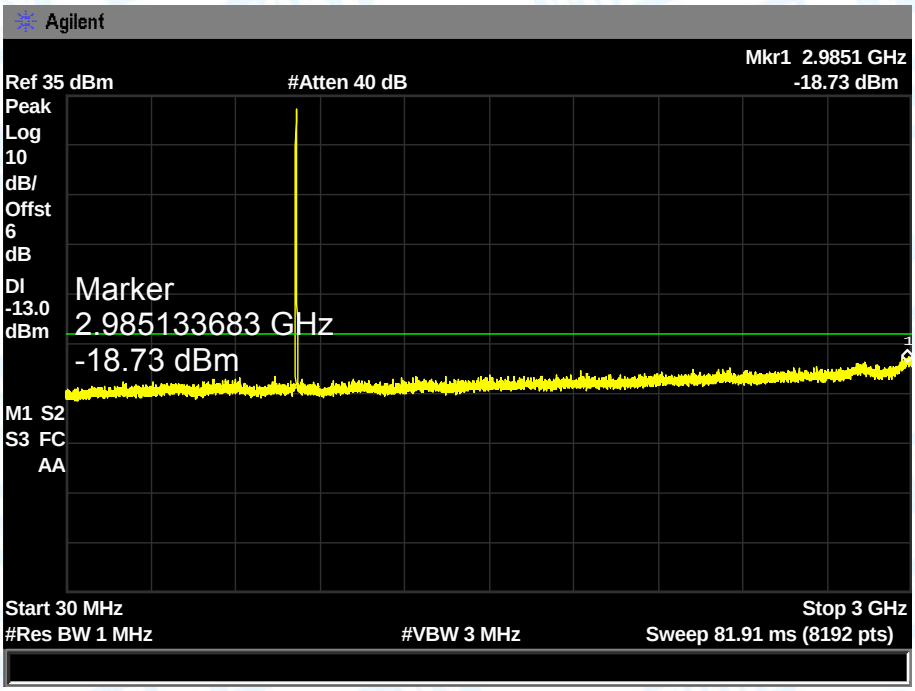
9.4 EUT Operating Condition

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

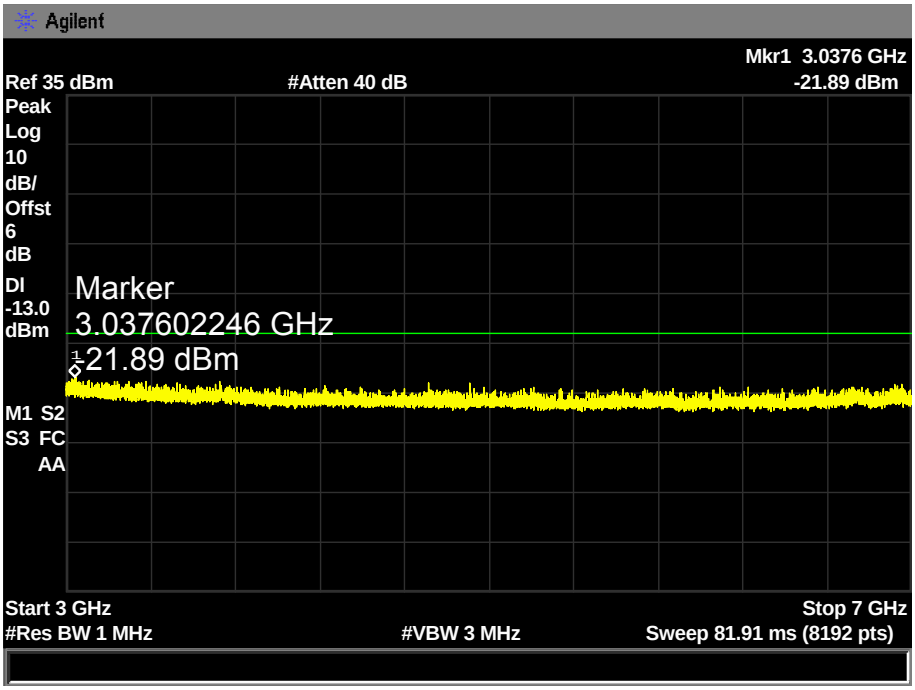
9.5 Test Data

Please refer following plots:

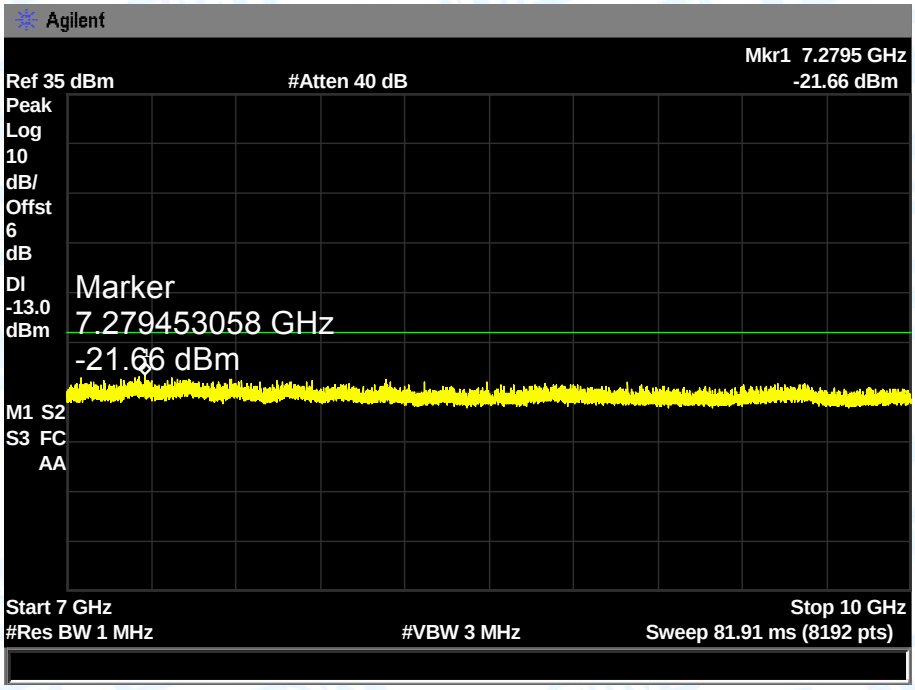
GSM850 CH 128
30 MHz~ 3 GHz



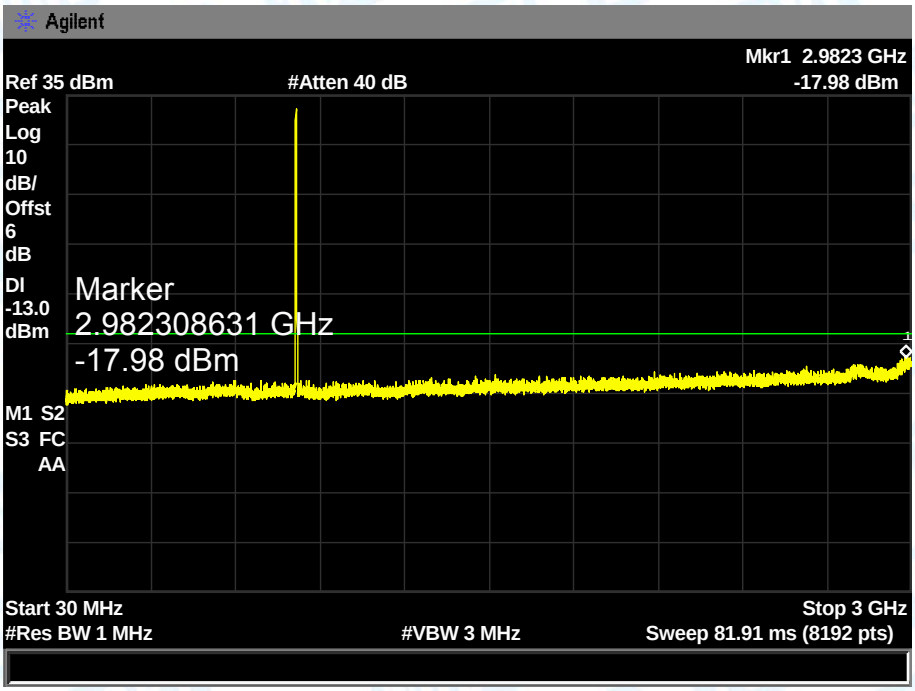
3 GHz~7 GHz



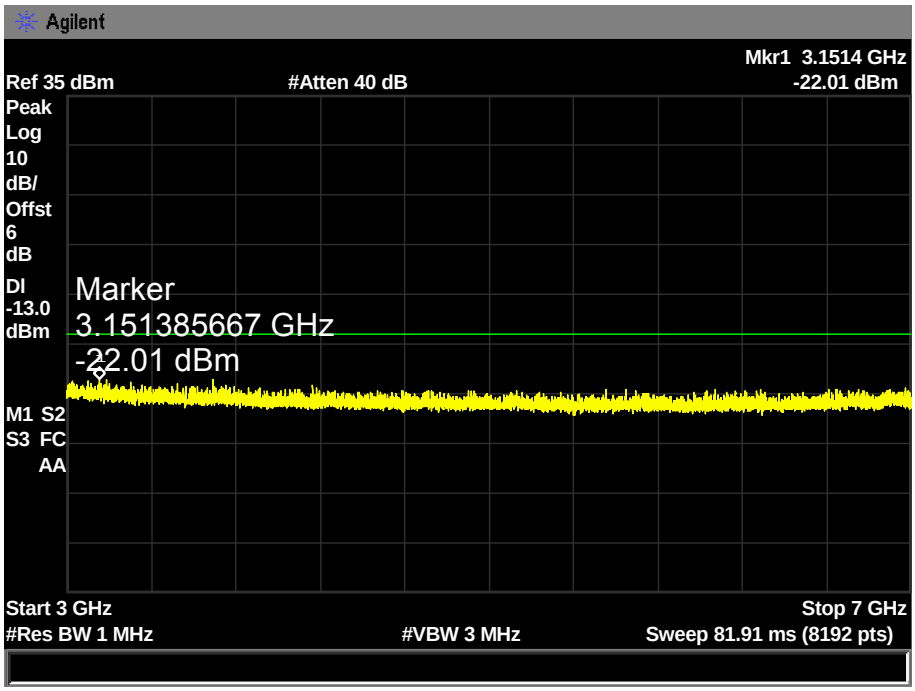
7 GHz~10 GHz


Agilent
Mkr1 7.2795 GHz
Ref 35 dBm
#Atten 40 dB
-21.66 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.279453058 GHz
-21.66 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)

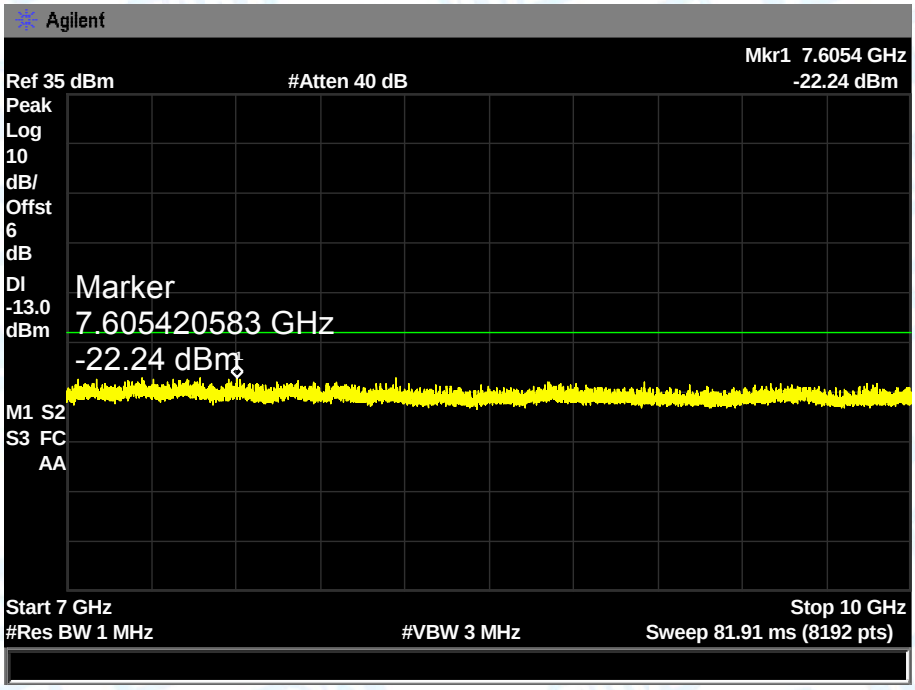
GSM850 CH 190
30 MHz~ 3 GHz



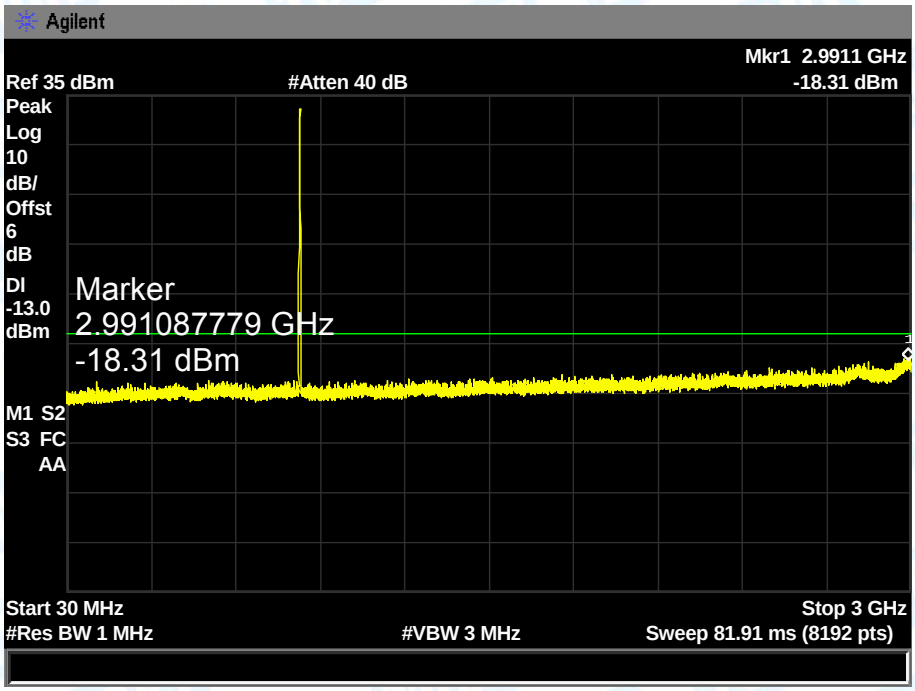
3 GHz~7 GHz



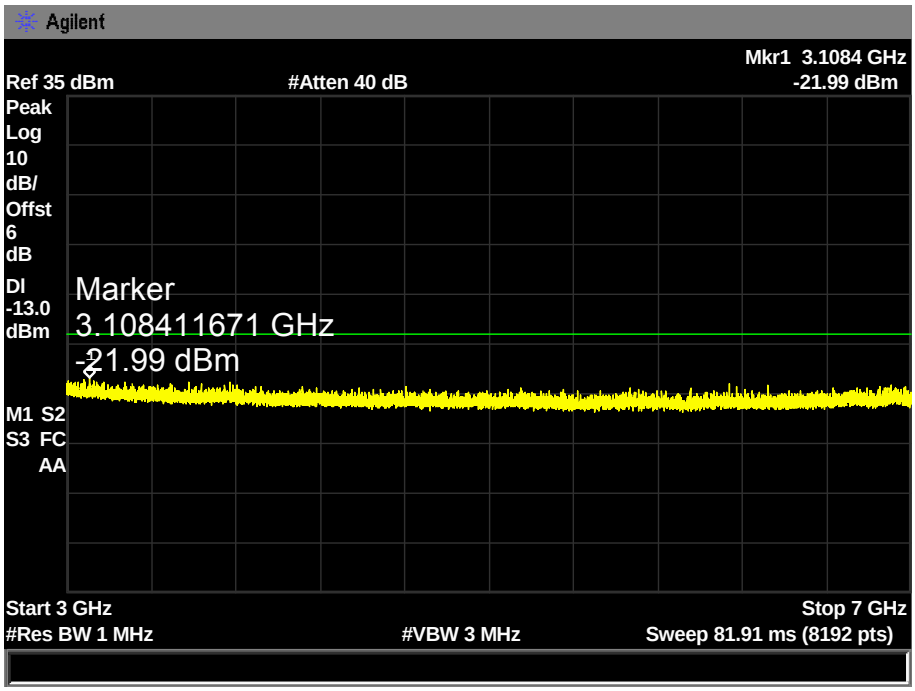
7 GHz~10 GHz


Agilent
Mkr1 7.6054 GHz
Ref 35 dBm
#Atten 40 dB
-22.24 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.605420583 GHz
-22.24 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)

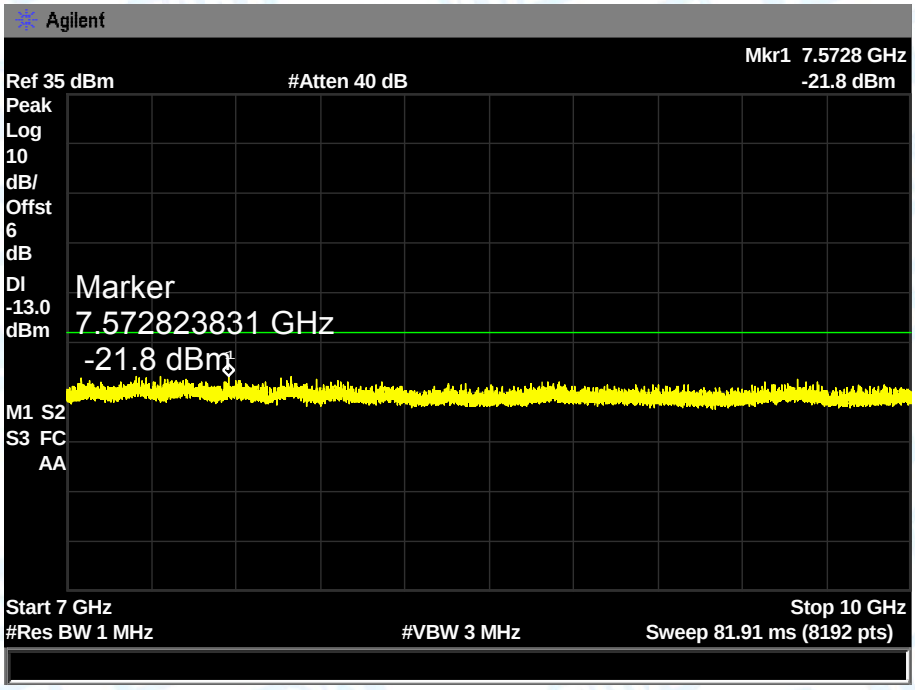
GSM850 CH 251
30 MHz~ 3 GHz



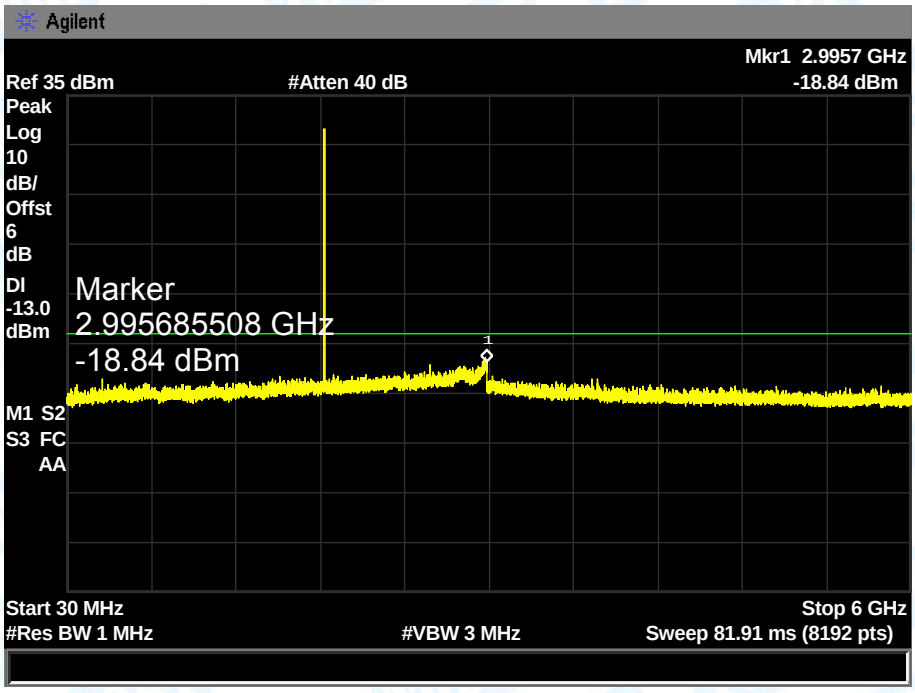
3 GHz~7 GHz



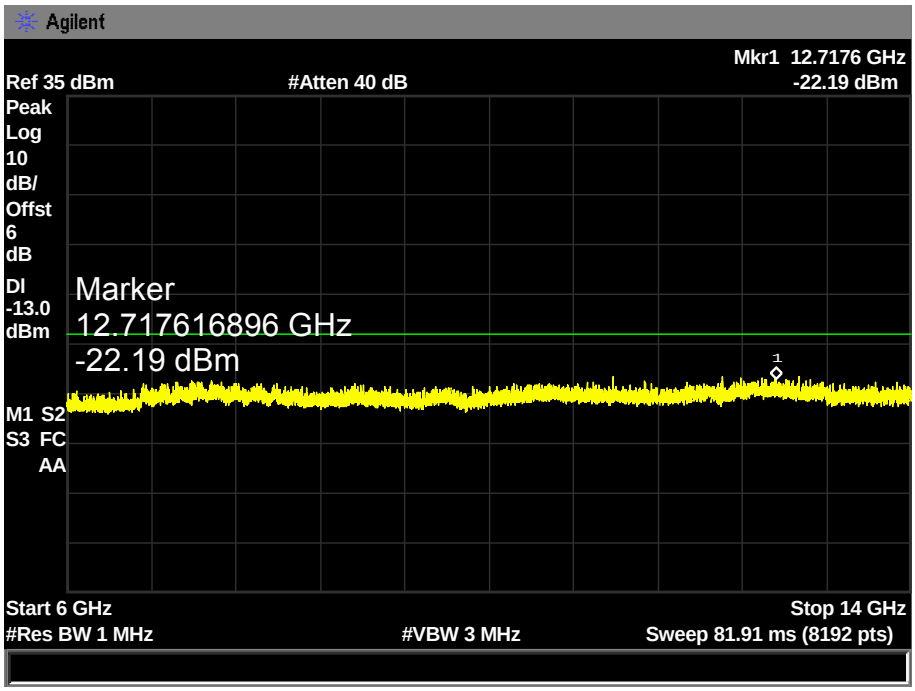
7 GHz~10 GHz


Agilent
Mkr1 7.5728 GHz
Ref 35 dBm
#Atten 40 dB
-21.8 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.572823831 GHz
-21.8 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)

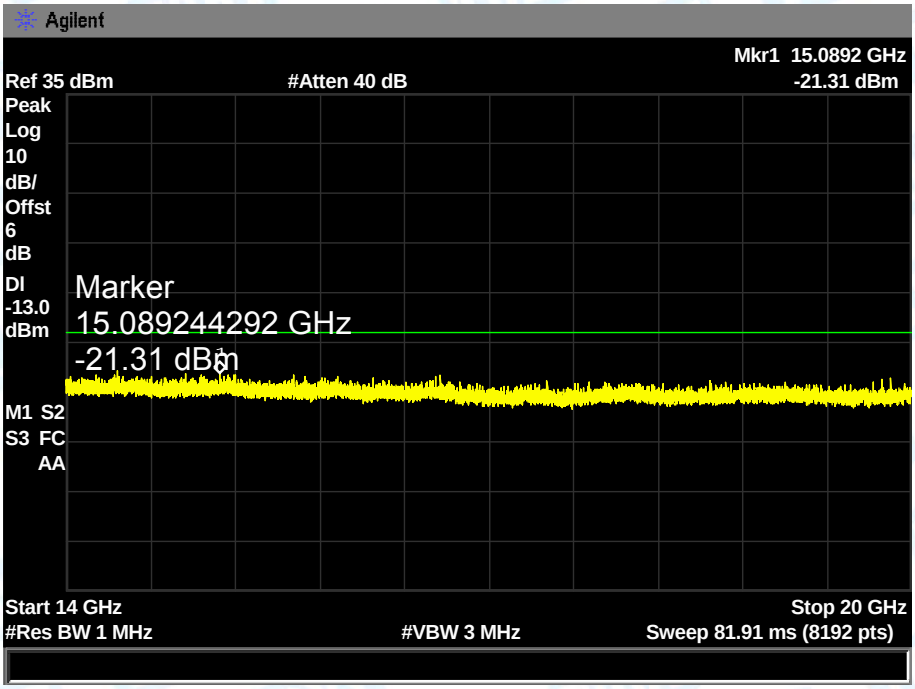
PCS 1900 CH 512
30 MHz~ 6 GHz



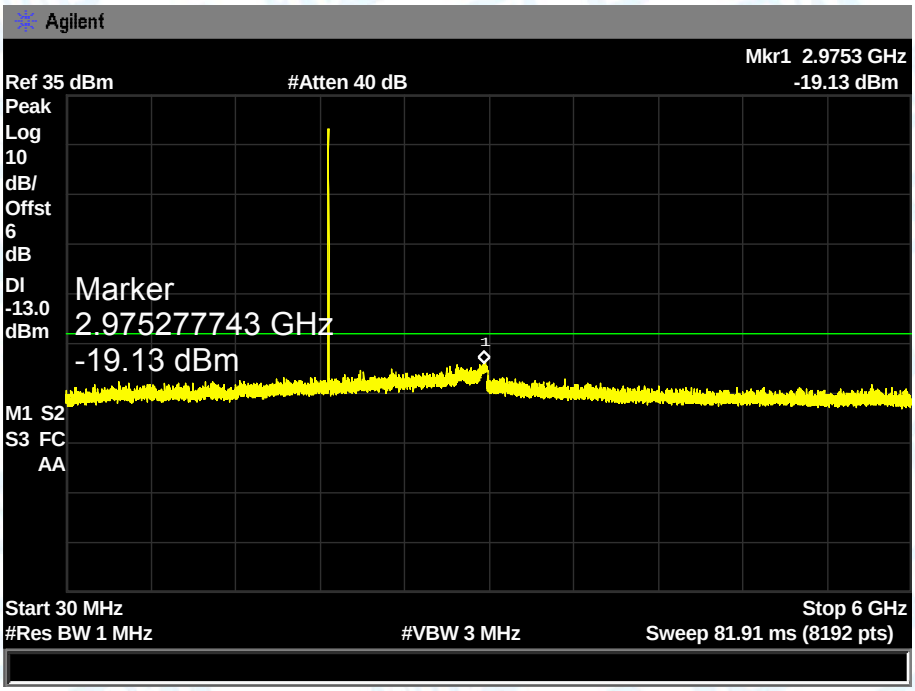
6 GHz~14 GHz



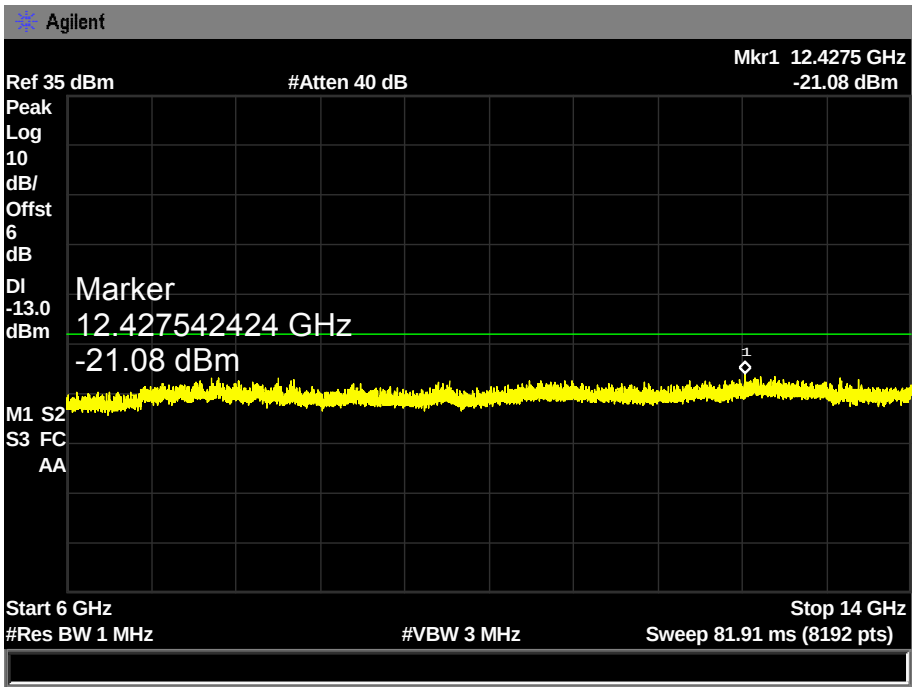
14 GHz~20 GHz


Agilent
Mkr1 15.0892 GHz
Ref 35 dBm
#Atten 40 dB
-21.31 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
15.089244292 GHz
-21.31 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)

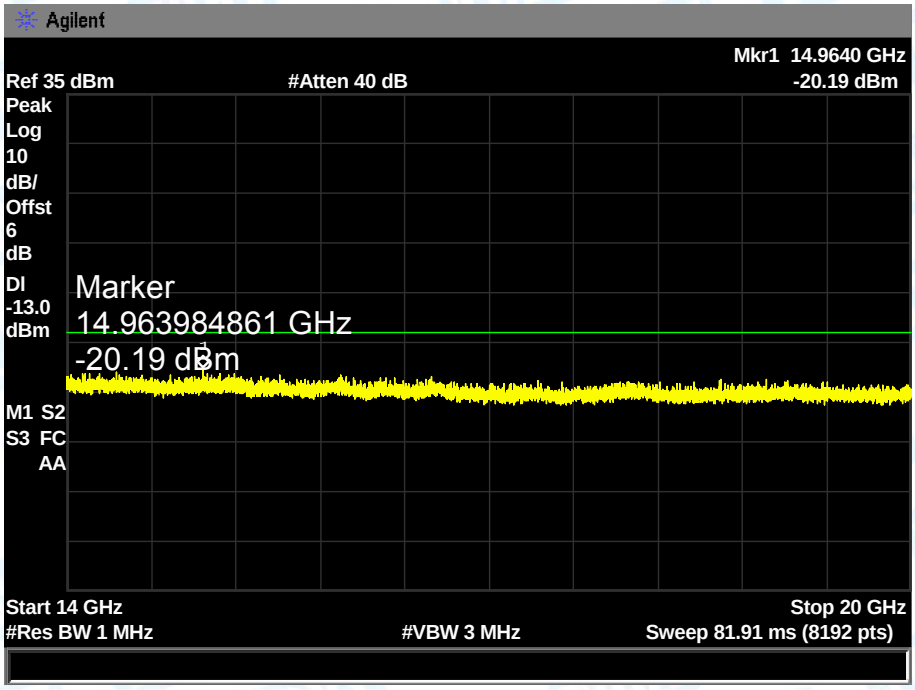
PCS 1900 CH 661
30 MHz~ 6 GHz



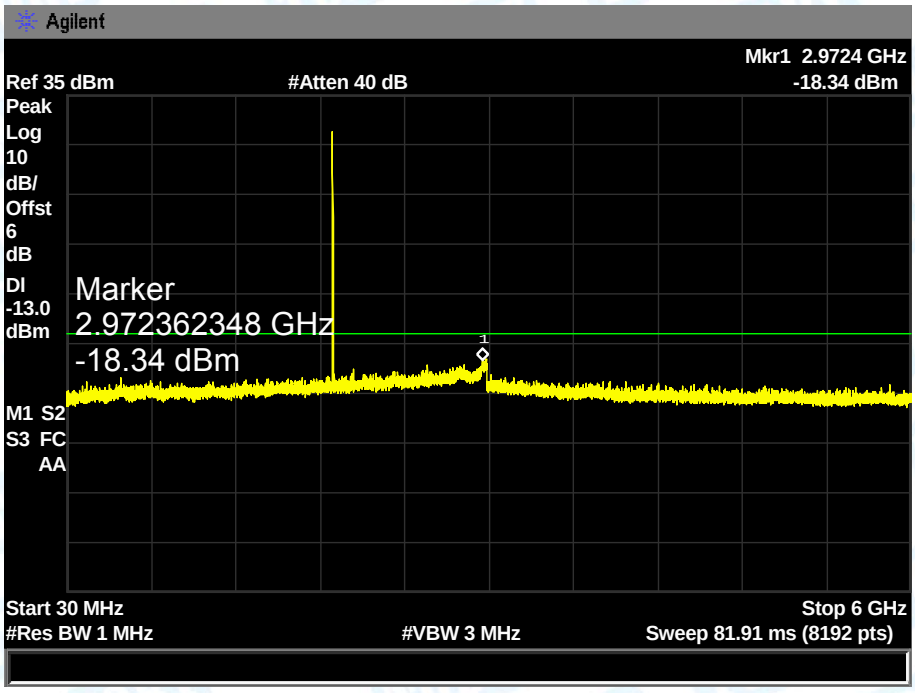
6 GHz~14 GHz



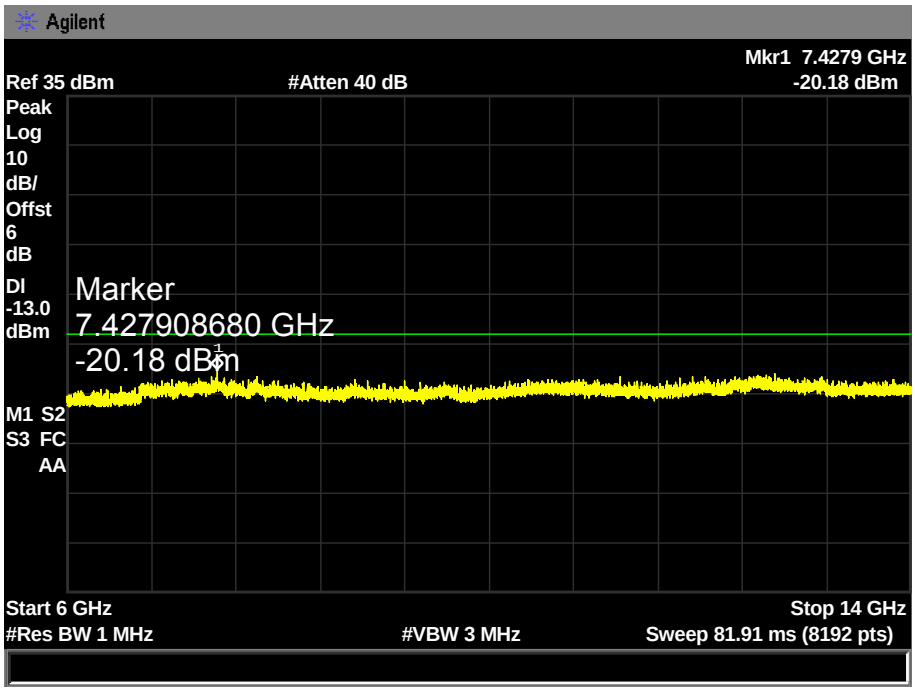
14 GHz~20 GHz


Agilent
Mkr1 14.9640 GHz
Ref 35 dBm
#Atten 40 dB
-20.19 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
14.963984861 GHz
-20.19 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)

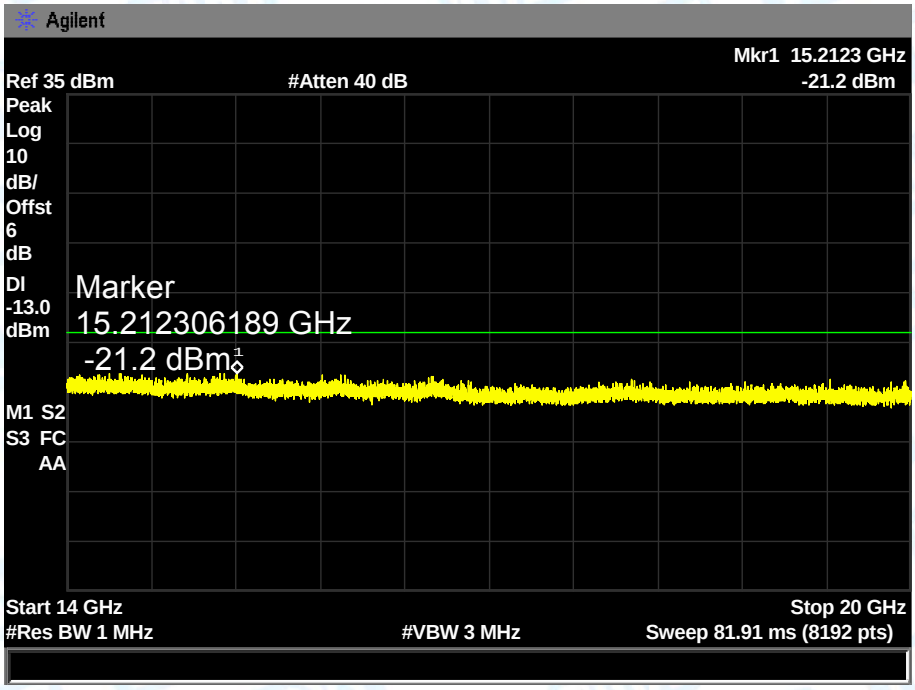
PCS 1900 CH 810
30 MHz~ 6 GHz



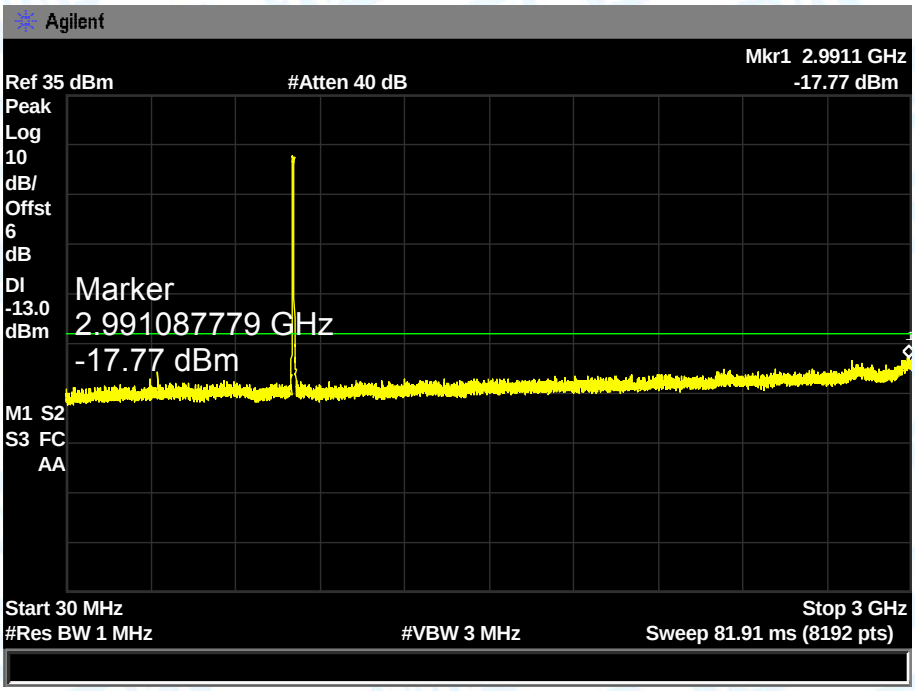
6 GHz~14 GHz



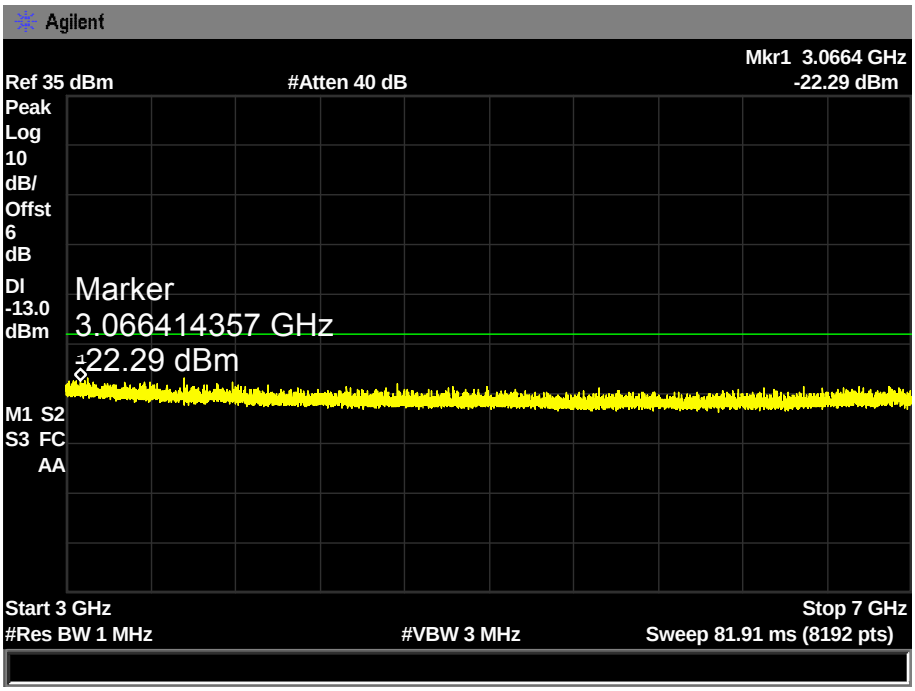
14 GHz~20 GHz


Agilent
Mkr1 15.2123 GHz
Ref 35 dBm
#Atten 40 dB
-21.2 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
15.212306189 GHz
-21.2 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)

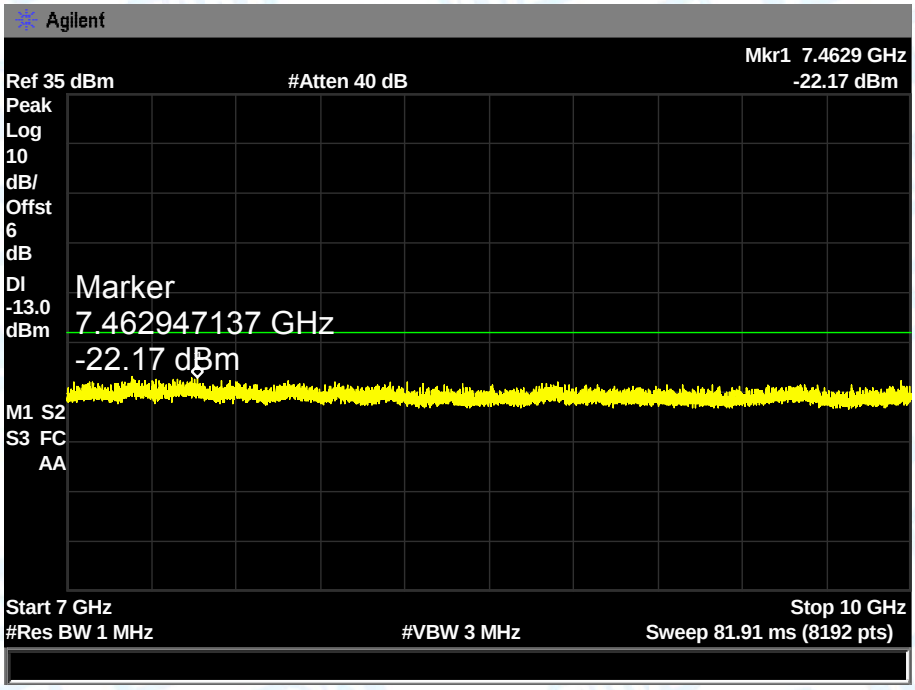
UMTS Band V CH 4132
30 MHz~ 3 GHz



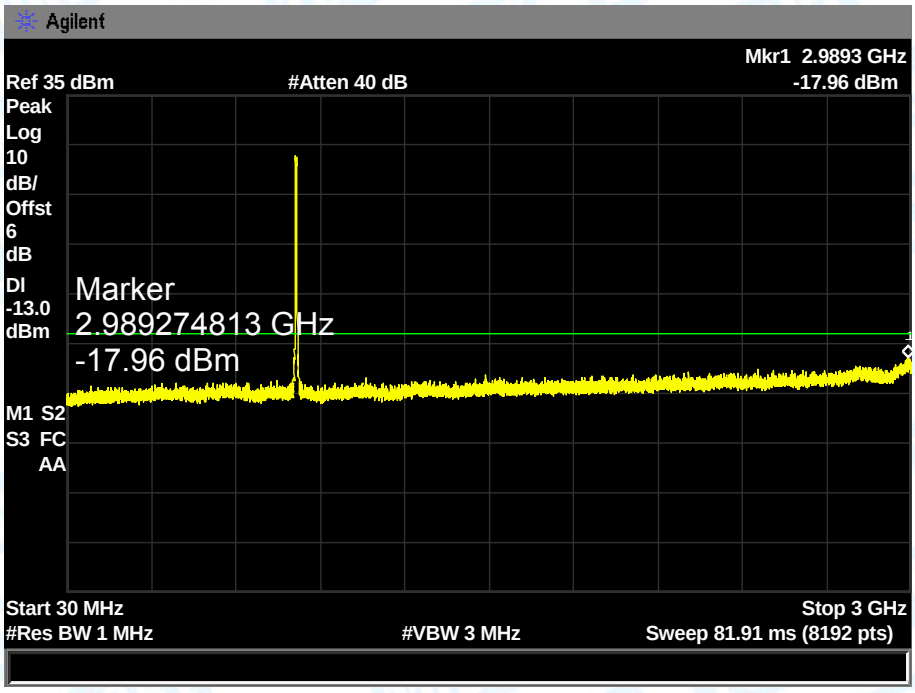
3 GHz~7 GHz



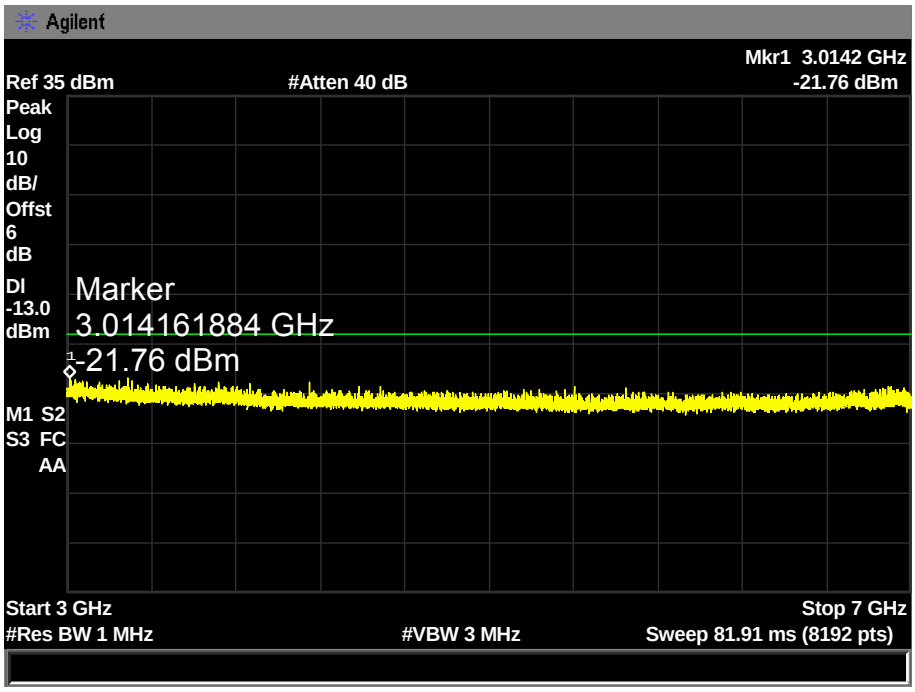
7 GHz~10 GHz


Agilent
Mkr1 7.4629 GHz
Ref 35 dBm
#Atten 40 dB
-22.17 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.462947137 GHz
-22.17 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)

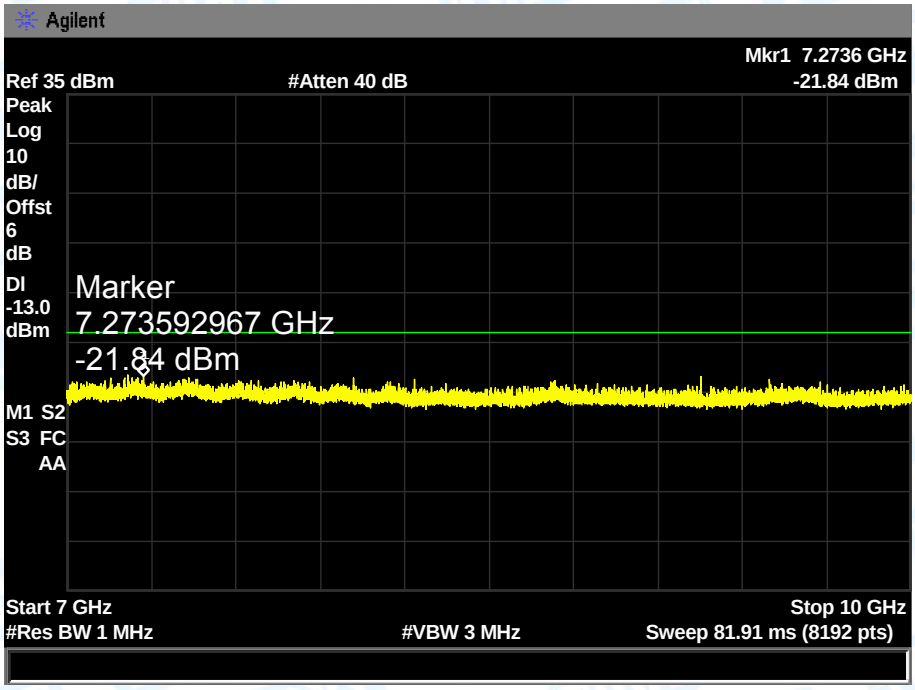
UMTS Band V CH 4175
30 MHz~ 3 GHz



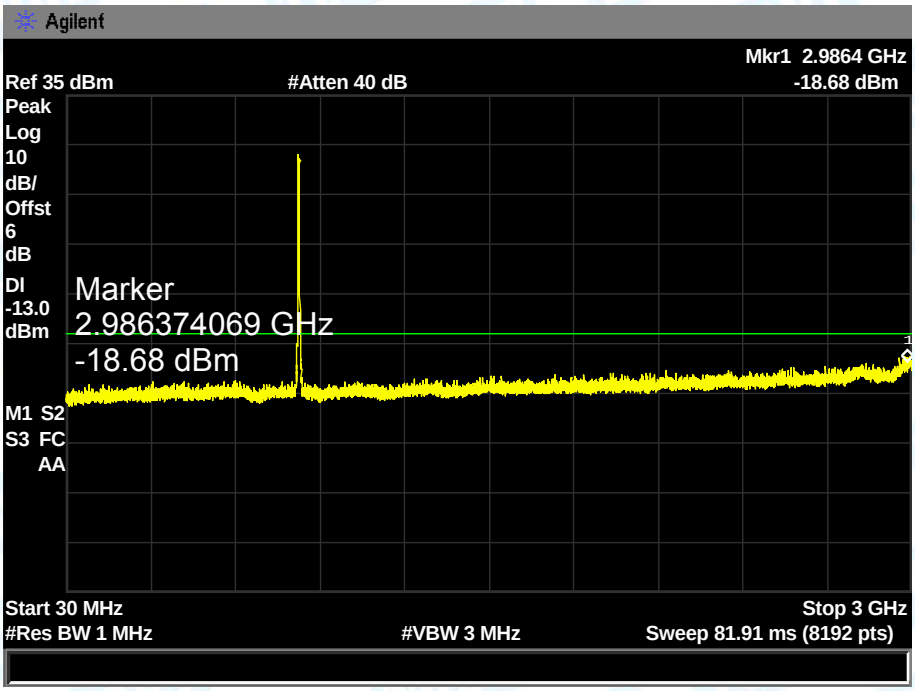
3 GHz~7 GHz



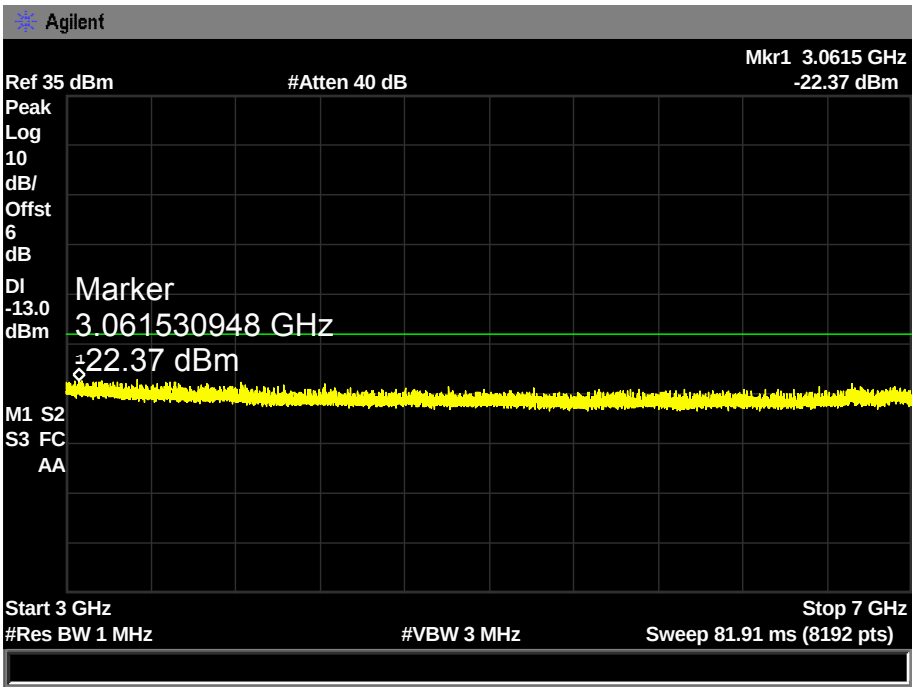
7 GHz~10 GHz


Agilent
Mkr1 7.2736 GHz
Ref 35 dBm
#Atten 40 dB
-21.84 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.273592967 GHz
-21.84 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)

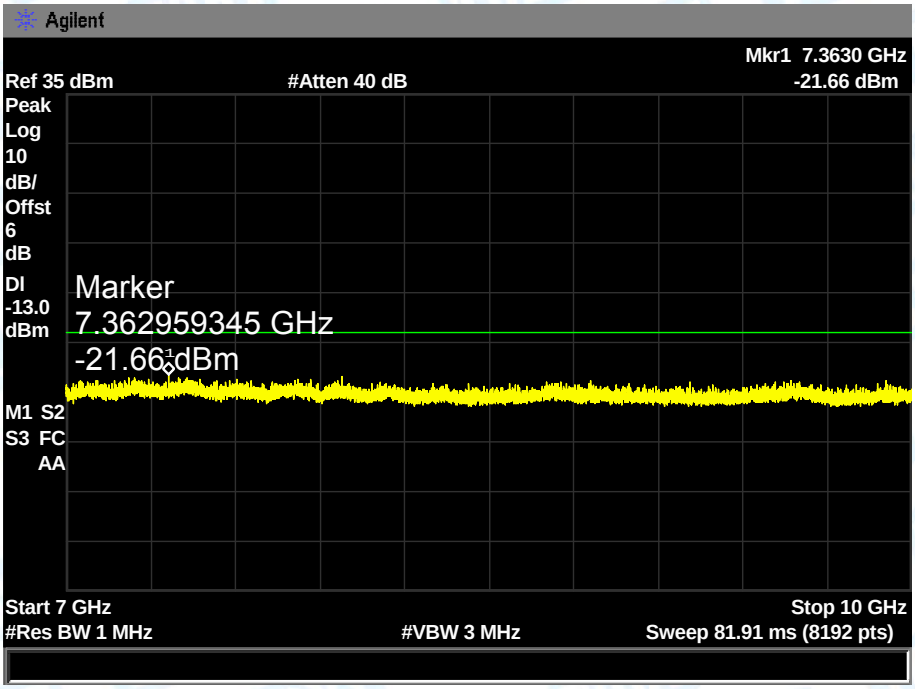
UMTS Band V CH 4233
30 MHz~ 3 GHz



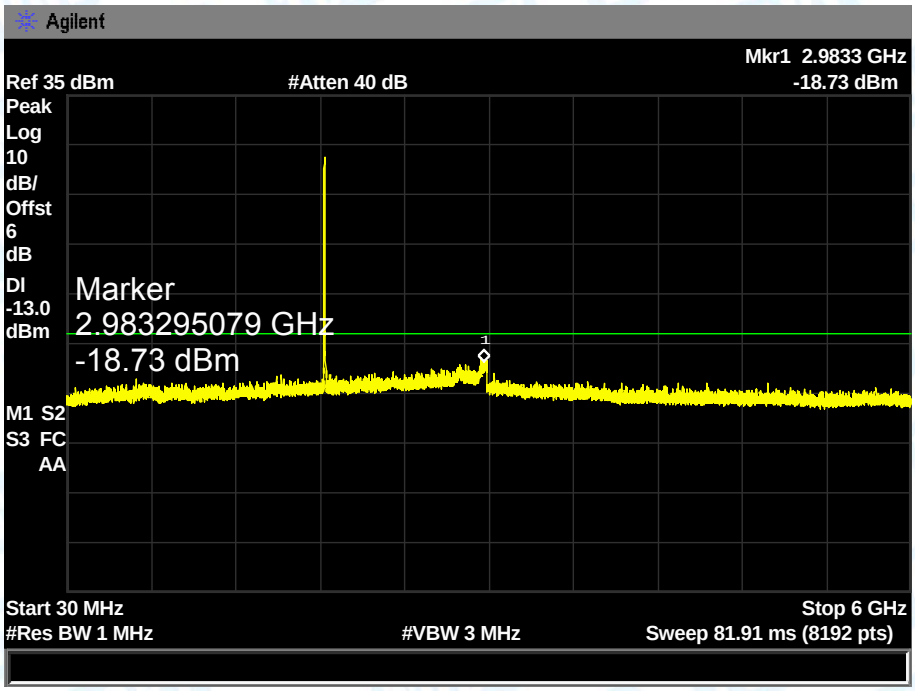
3 GHz~7 GHz



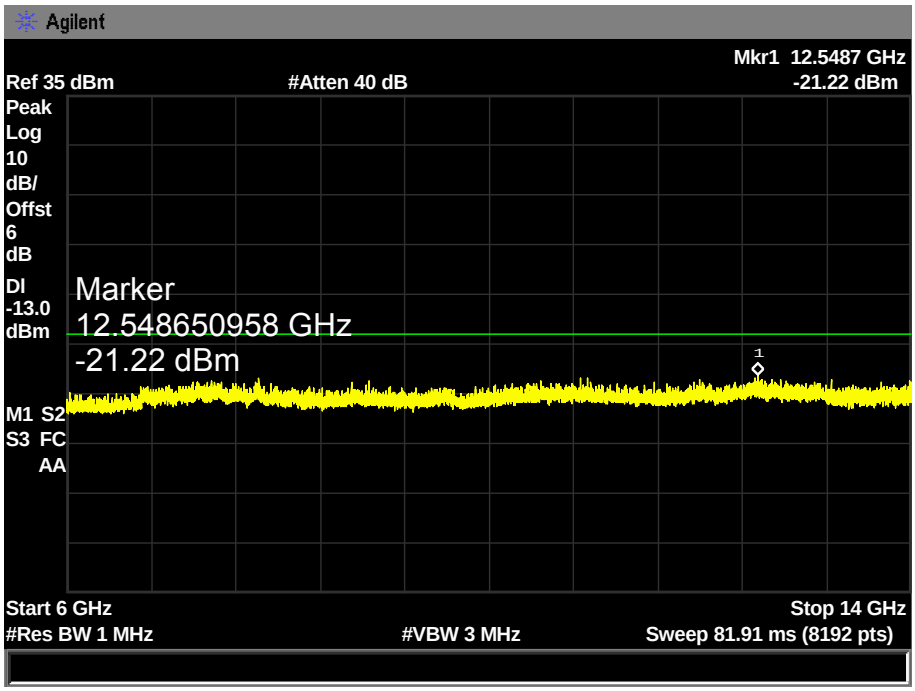
7 GHz~10 GHz


Agilent
Mkr1 7.3630 GHz
Ref 35 dBm
#Atten 40 dB
-21.66 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
7.362959345 GHz
-21.66 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)

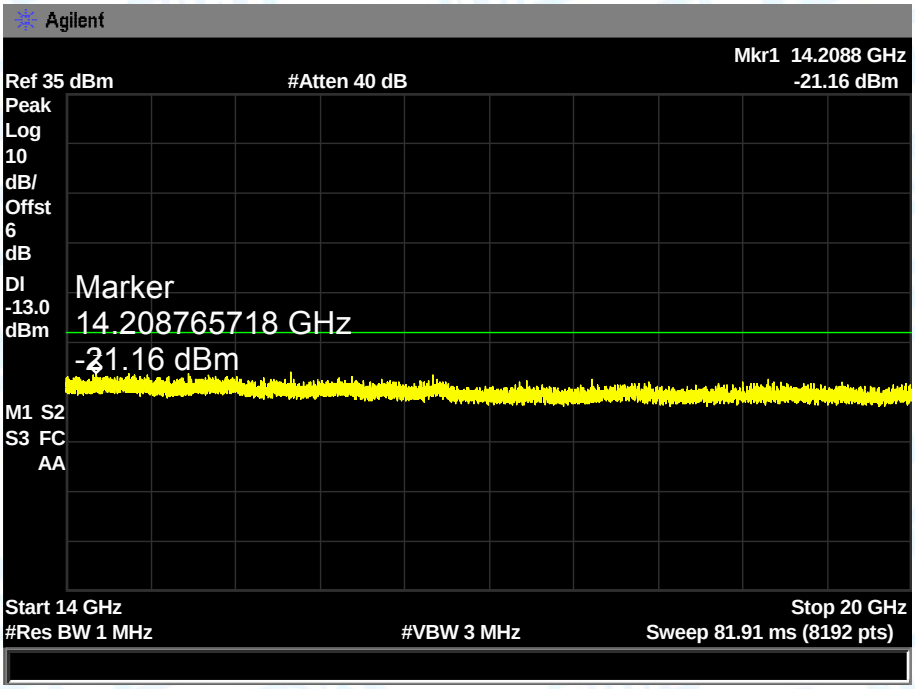
UMTS Band II CH 9262
30 MHz~ 6 GHz



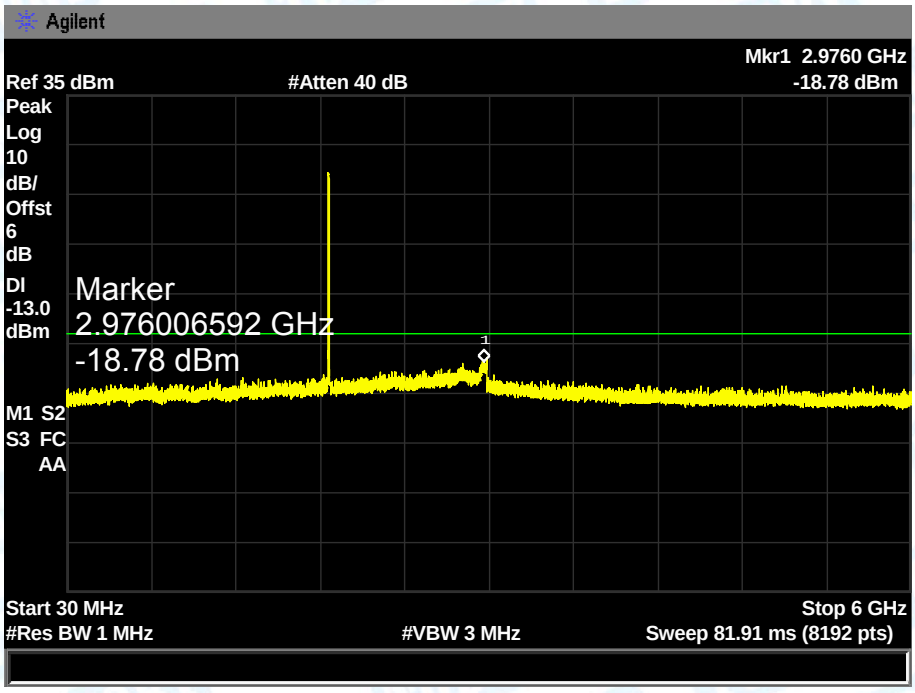
6 GHz~14 GHz



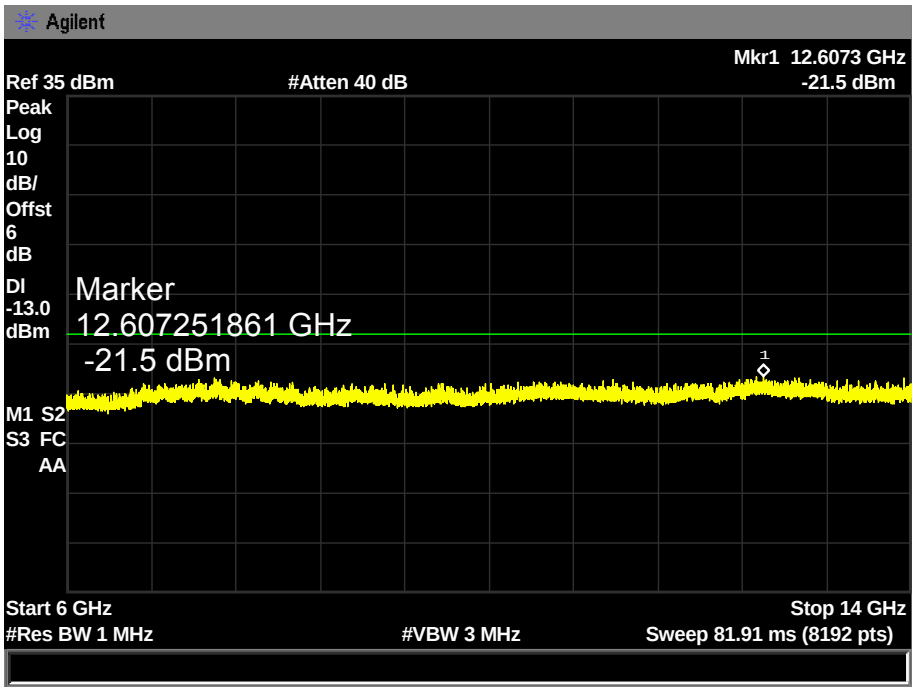
14 GHz~20 GHz


Agilent
Mkr1 14.2088 GHz
Ref 35 dBm
#Atten 40 dB
-21.16 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
14.208765718 GHz
-21.16 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)

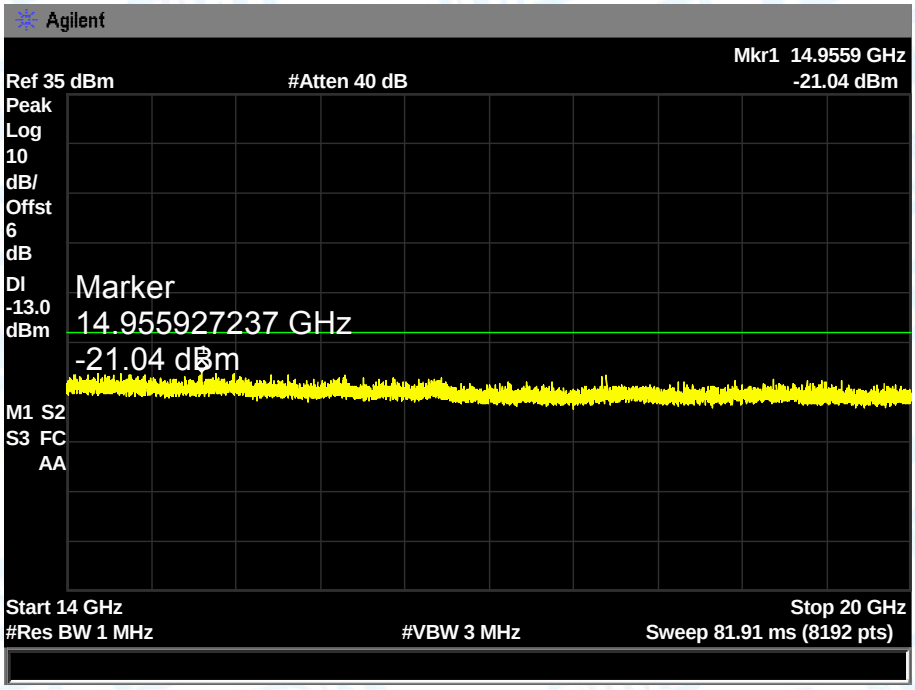
UMTS Band II CH 9400
30 MHz~ 6 GHz



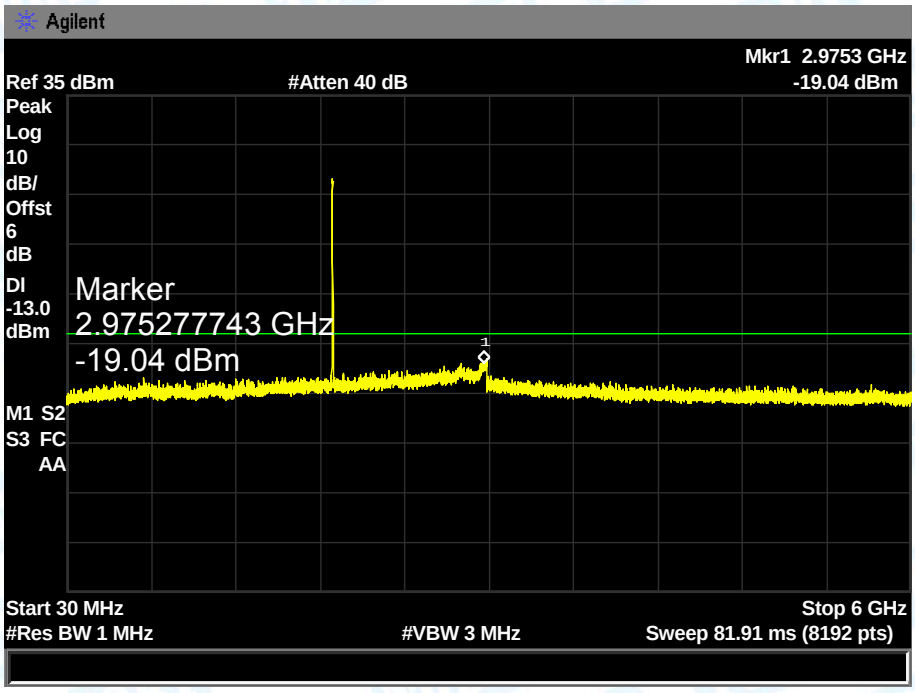
6 GHz~14 GHz



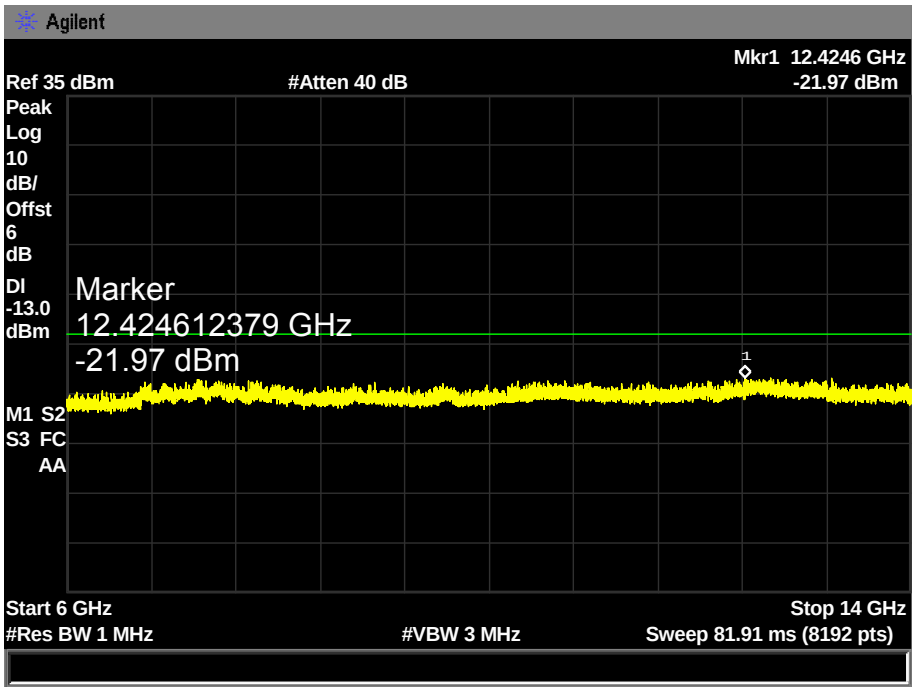
14 GHz~20 GHz


Agilent
Mkr1 14.9559 GHz
Ref 35 dBm
#Atten 40 dB
-21.04 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
14.955927237 GHz
-21.04 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)

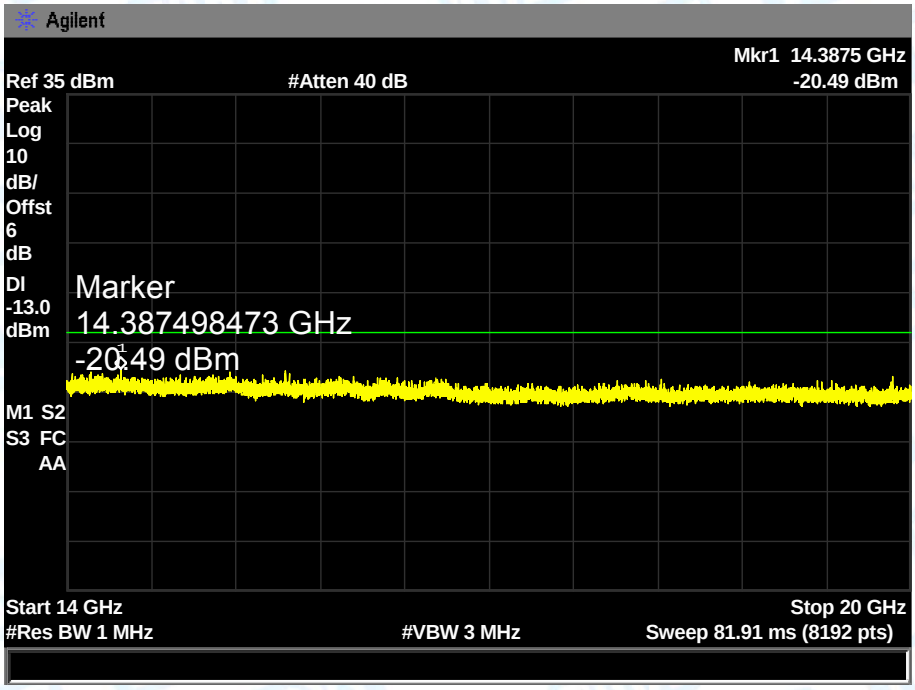
UMTS Band II CH 9538
30 MHz~ 6 GHz



6 GHz~14 GHz



14 GHz~20 GHz


Agilent
Mkr1 14.3875 GHz
Ref 35 dBm
#Atten 40 dB
-20.49 dBm
Peak
Log
10
dB/
Offst
6
dB
Dl
-13.0
dBm
Marker
14.387498473 GHz
-20.49 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)

10. Band Edge Test

10.1 Test Standard and Limit

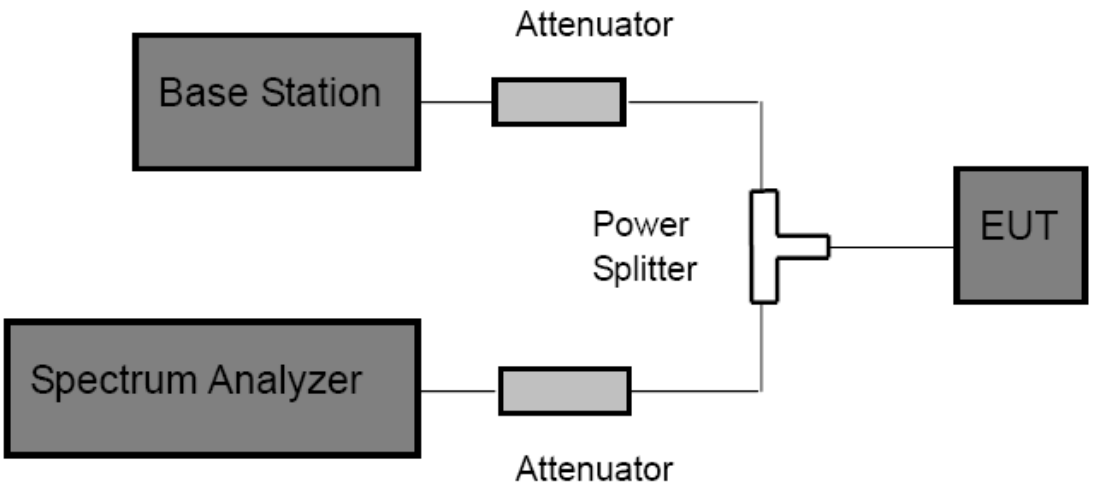
10.1.1 Test Standard

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

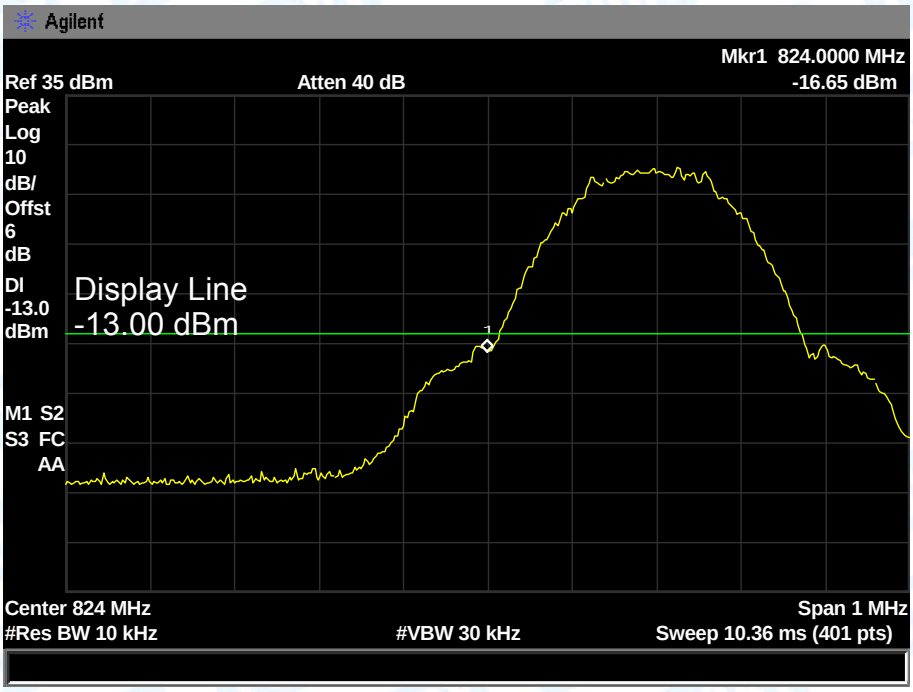
The EUT was continuously connected with the Base station and transmitting in the max power during the test.

10.5 Test Data

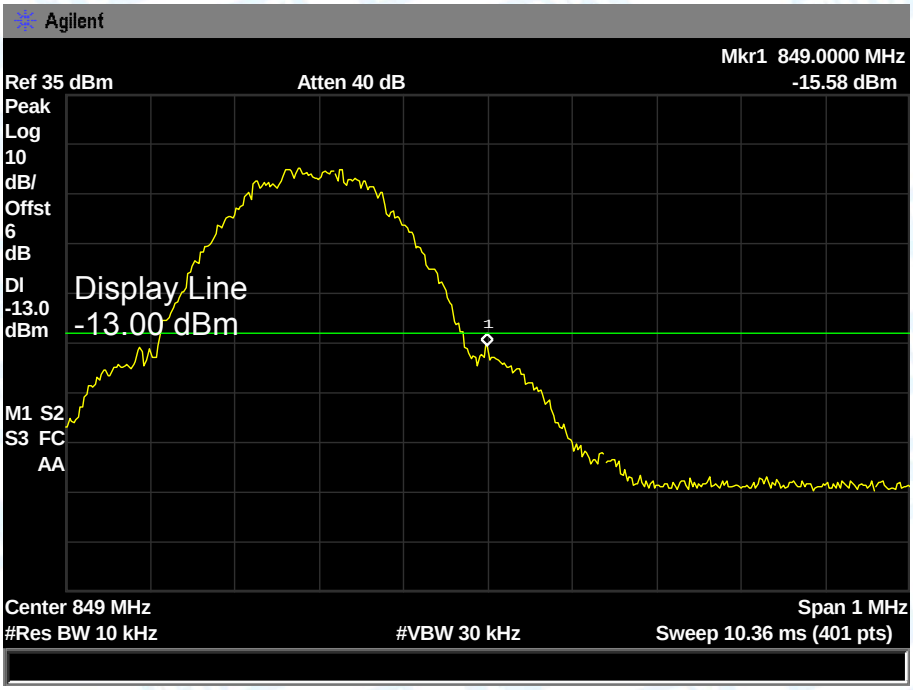
Please refer the following plots:

Band edge emission:

Test Mode:	GSM850

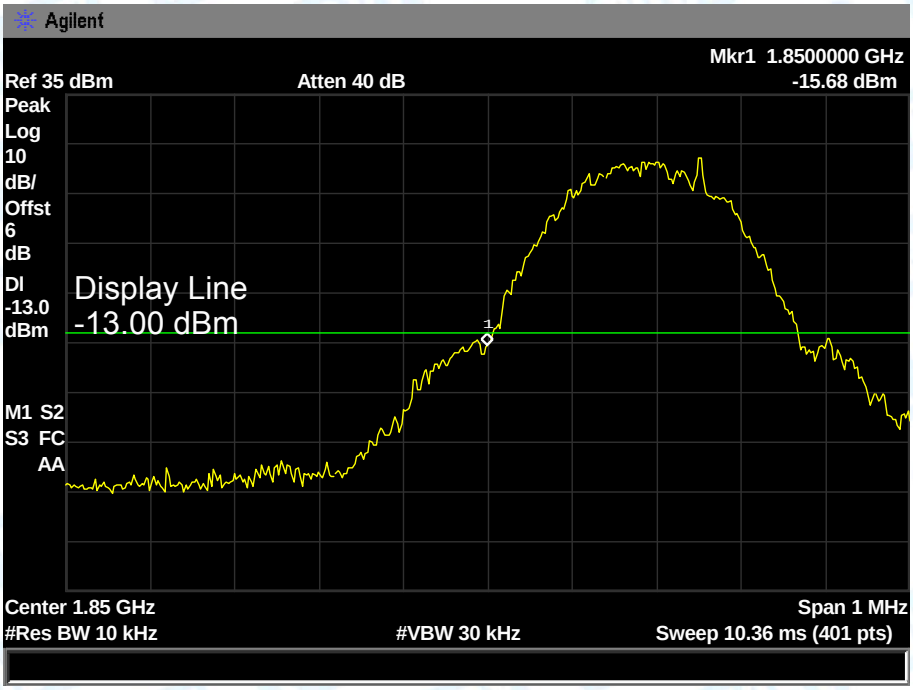


Lowest channel

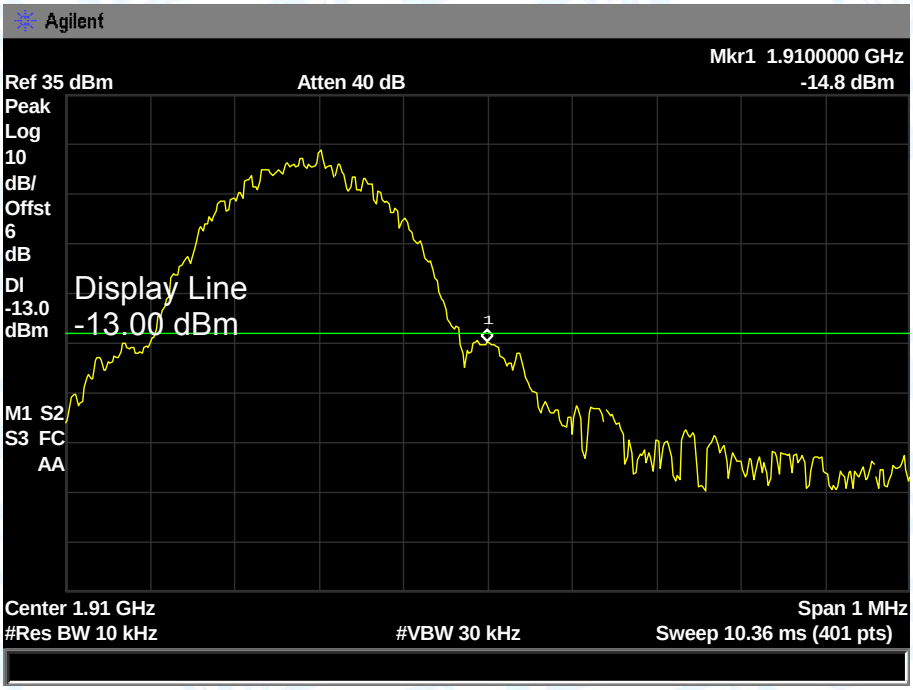


Highest channel

Test Mode:	PCS1900

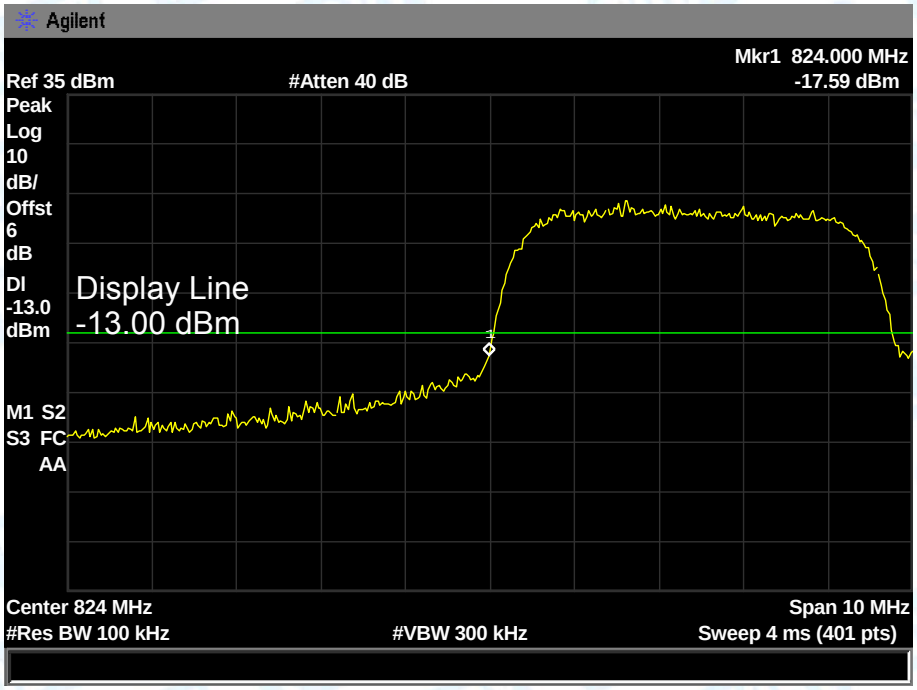


Lowest channel

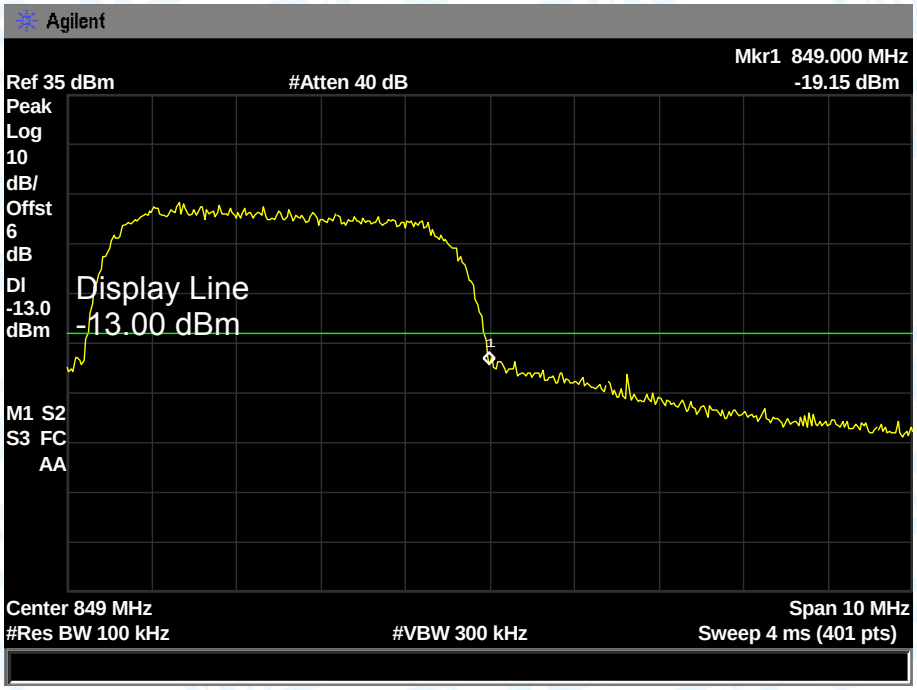


Highest channel

Test Mode:	UMTS Band V 12.2k RMC

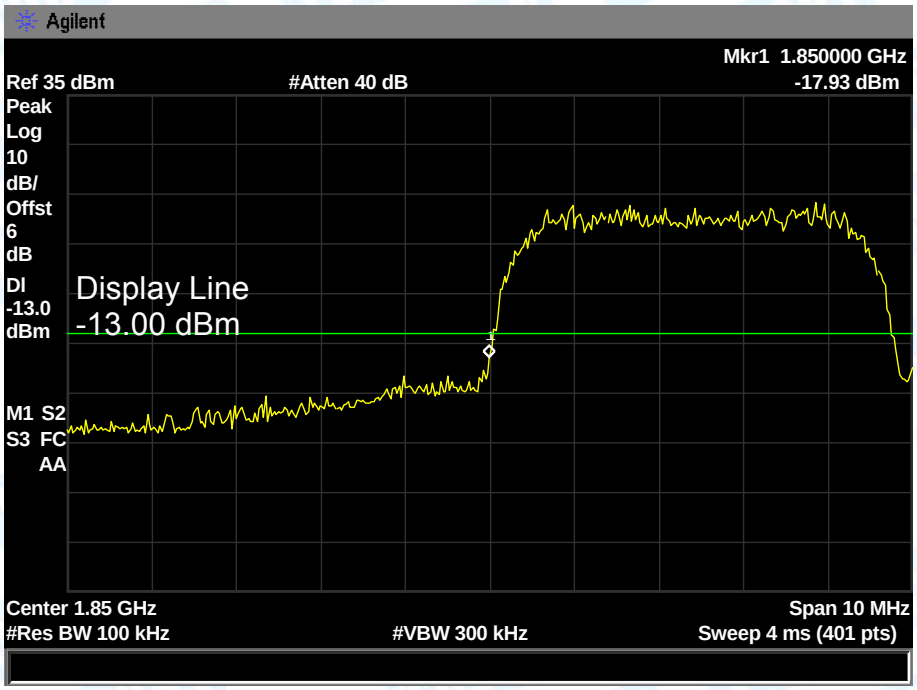


Lowest channel

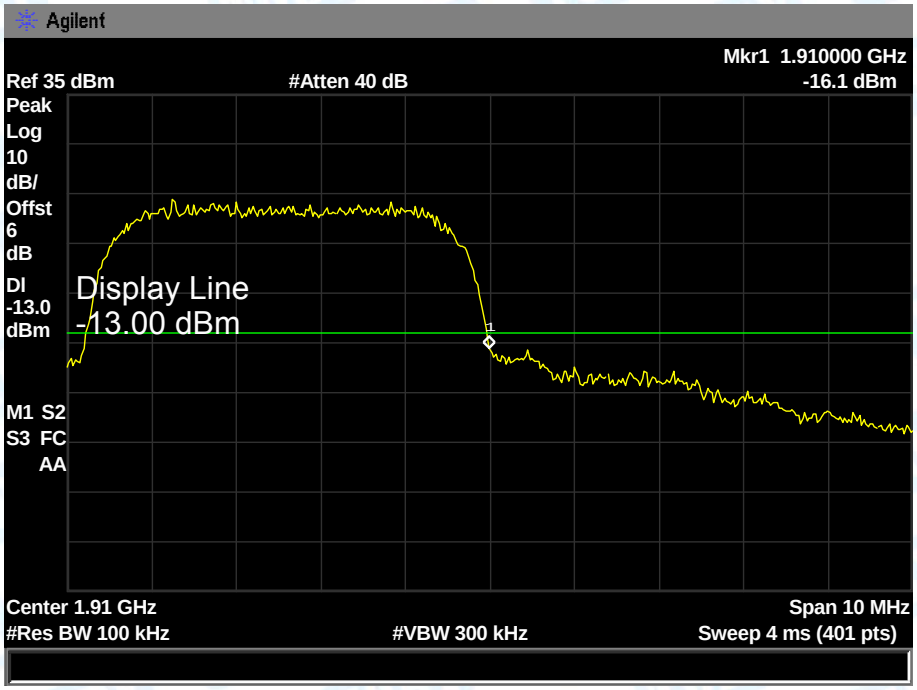


Highest channel

Test Mode:	UMTS Band II 12.2k RMC



Lowest channel



Highest channel

11. Radiated Out Band of Emissions

11.1 Test Standard and Limit

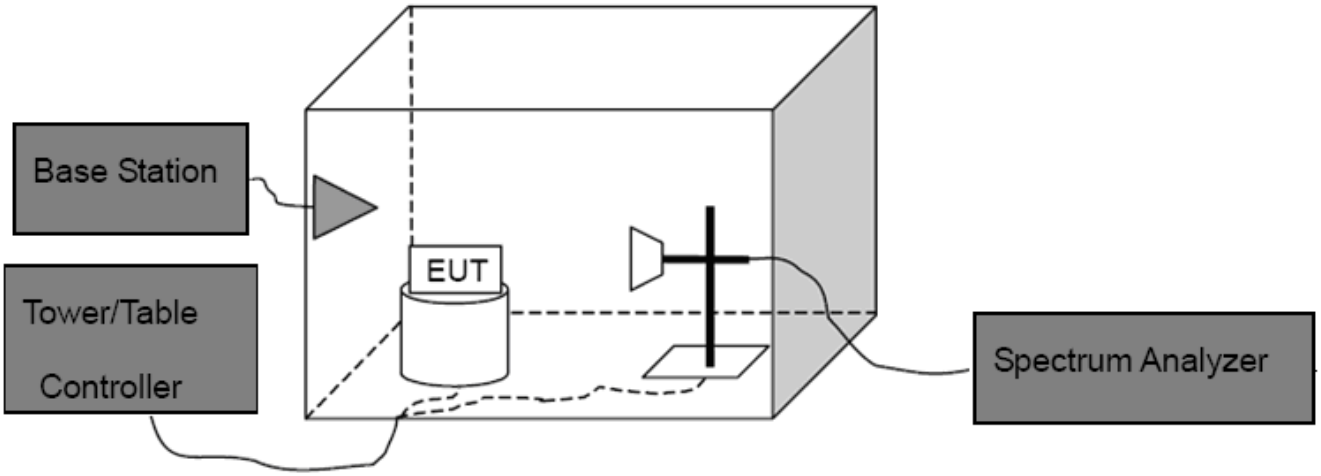
11.1.1 Test Standard

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	-44.41	-13.00	Pass
2472.60	V	-35.31		
3297.00	V	-23.81		
4121.00	V	---		
4945.20	V	---		
5769.40	V	---		
1648.40	Horizontal	-32.72	-13.00	Pass
2472.60	H	-33.78		
3297.00	H	-32.49		
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	-26.99	-13.00	Pass
2509.80	V	-34.49		
3346.40	V	-23.95		
4183.00	V	---		
5019.60	V	---		
5856.20	V	---		
1673.20	Horizontal	-29.36	-13.00	Pass
2509.80	H	-36.30		
3346.40	H	-28.07		
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	-26.96	-13.00	Pass
2546.40	V	-35.62		
3395.20	V	-28.94		
4244.00	V	---		
5092.80	V	---		
5941.60	V	---		
1697.60	Horizontal	-28.37	-13.00	Pass
2546.40	H	-36.28		
3395.20	H	-29.33		
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	-27.15	-13.00	Pass
5550.60	V	-18.20		
7400.80	V	-20.35		
9251.00	V	---		
11101.20	V	---		
12951.40	V	---		
3700.40	Horizontal	-30.52	-13.00	Pass
5550.60	H	-16.29		
7400.80	H	-18.32		
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	-28.23	-13.00	Pass
5640.00	V	-17.86		
7520.00	V	-19.25		
9400.00	V	---		
11280.00	V	---		
13160.00	V	---		
3760.00	Horizontal	-25.32	-13.00	Pass
5640.00	H	-20.88		
7520.00	H	-22.25		
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	-25.25	-13.00	Pass
5729.40	V	-16.98		
7639.20	V	-19.12		
9549.00	V	---		
11458.80	V	---		
13368.60	V	---		
3819.60	Horizontal	-29.94	-13.00	Pass
5729.40	H	-19.86		
7639.20	H	-20.35		
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	-30.72	-13.00	Pass
2479.20	V	-34.13		
3305.60	V	---		
4132.00	V	---		
4958.40	V	---		
5784.80	V	---		
1652.80	Horizontal	-31.53	-13.00	Pass
2479.20	H	-33.50		
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	-31.42	-13.00	Pass
2508.00	V	-34.69		
3344.00	V	---		
4180.00	V	---		
5016.00	V	---		
5852.00	V	---		
1672.00	Horizontal	-36.43	-13.00	Pass
2508.00	H	-33.54		
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	-37.02	-13.00	Pass
2539.80	V	-33.08		
3386.40	V	---		
4233.00	V	---		
5079.60	V	---		
5926.20	V	---		
1693.20	Horizontal	-35.94	-13.00	Pass
2539.80	H	-35.06		
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	-28.71	-13.00	Pass
2539.80	V	-19.52		
3386.40	V	---		
4233.00	V	---		
5079.60	V	---		
5926.20	V	---		
1693.20	Horizontal	-30.52	-13.00	Pass
2539.80	H	-17.14		
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	-28.60	-13.00	Pass
2539.80	V	-15.35		
3386.40	V	---		
4233.00	V	---		
5079.60	V	---		
5926.20	V	---		
1693.20	Horizontal	-28.05	-13.00	Pass
2539.80	H	-16.54		
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	-27.87	-13.00	Pass
2539.80	V	-18.53		
3386.40	V	---		
4233.00	V	---		
5079.60	V	---		
5926.20	V	---		
1693.20	Horizontal	-28.21	-13.00	Pass
2539.80	H	-17.68		
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------