

FCC Radio Test Report

FCC ID: 2AYVV-PHD20

Original Grant

Report No. : TB-FCC178595
Applicant : INNOVATIVE CONCEPTS GROUP SAC
Equipment Under Test (EUT)
EUT Name : Tablet PC
Model No. : PHD20
Series Model No. : N/A
Brand Name : Blackline
Sample ID : 20201217-21-1#& 20201217-21-2#
Receipt Date : 2021-01-26
Test Date : 2021-01-26 to 2021-02-27
Issue Date : 2021-03-03
Standards : 47 CFR Part 2, 22(H), 24(E)
Test Method : ANSI C63.26 2015
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 :

Rebecca

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Engineer Manager :

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Ray Lai



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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Revision History

Report No.	Version	Description	Issued Date
TB-FCC178595	Rev.01	Initial issue of report	2021-03-03

1. General Information about EUT

1.1 Client Information

Applicant	:	INNOVATIVE CONCEPTS GROUP SAC
Address	:	Av. El Derby 254 Of. 1603, Santiago de Surco, Lima, Peru
Manufacturer	:	Shenzhen Ployer Electronics Co., Ltd.
Address	:	6F and 7F, Building 8, Rundongsheng Industrial Area, Longzhu Community, Xixiang Street, Bao'an District, Shenzhen, China

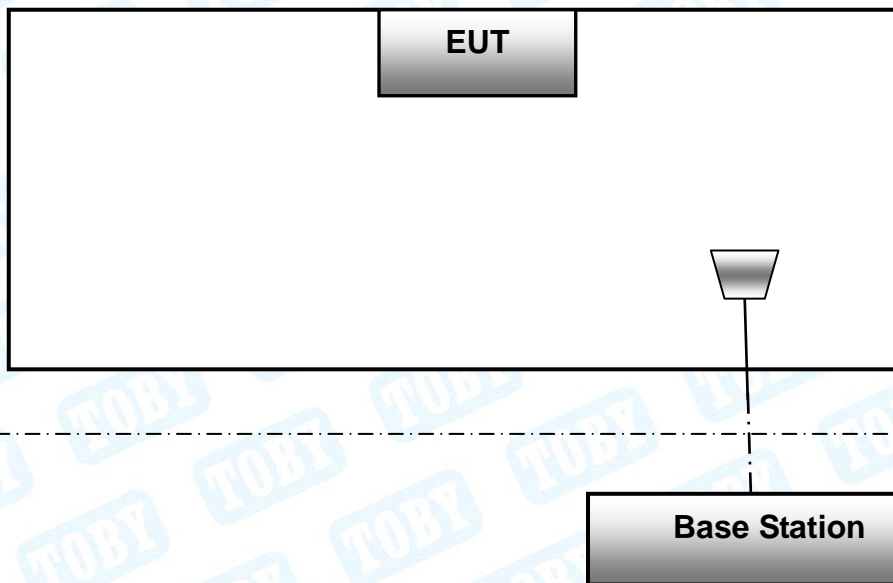
1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Tablet PC	
Models No.	:	PHD20	
Model Difference	:	N/A	
Product Description	:	GSM 850 Power :	Cond:32.62dBm ERP:32.78dBm
	:	PCS 1900 Power :	Cond:28.90dBm EIRP:27.69dBm
	:	UMTS Band II Power:	Cond:22.54dBm EIRP:22.04dBm
	:	UMTS Band V Power:	Cond:21.29dBm ERP:20.89dBm
	:	Antenna Gain:	GSM: 0.46dB FPC Antenna WCDMA: 1.31dB FPC Antenna
	:	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	
Power Rating	:	DC 5V from Adapter(EE-0502500UZ) Input: AC 100-240V, 50/60Hz, 0.5A Output: DC 5V 2.5A DC 3.8V by 6000mAh rechargeable Li-ion battery	
Software Version	:	V01	
Hardware Version	:	V01	
Remark	:	The antenna gain and adapter provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.	

Note:

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

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
	4183	836.60
	4233	846.60
UMTS Band II	9262	1852.40
	9400	1880.00
	9538	1907.60

Test Mode	Description
GSM 850	highest , middle, lowest channels
GPRS 850	highest , middle, lowest channels
EGPRS 850	highest , middle, lowest channels
GSM 1900	highest , middle, lowest channels
GPRS 1900	highest , middle, lowest channels
EGPRS 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

For the Conducted Emission and Radiated test used the EUT-1(20201217-21-1#).
For the RF Conduction test used the EUT-2(20201217-21-2#).

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, HSDPA, HSUPA 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})
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.50 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB

1.7 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1/F.,Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, 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: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01. FCC Accredited Test Site Number: 854351. Designation Number: CN1223.

IC Registration No.: (11950A)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A.

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

Radiation Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 06, 2020	Jul. 05, 2021
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 06, 2020	Jul. 05, 2021
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jul. 06, 2020	Jul. 05, 2021
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	144382	Sep. 11, 2020	Sep. 10, 2021
Universal Radio Communication Tester	Rohde&Schwarz	CMU200	103903	Jul. 06, 2020	Jul. 05, 2021
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar.01, 2020	Feb. 28, 2022
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar.01, 2020	Feb. 28, 2022
Horn Antenna	ETS-LINDGREN	BBHA 9170	BBHA9170582	Mar.01, 2020	Feb. 28, 2022
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 07, 2020	Jul. 06, 2021
Pre-amplifier	Sonoma	310N	185903	Mar.01, 2020	Feb. 28, 2021
Pre-amplifier	HP	8449B	3008A00849	Mar.01, 2020	Feb. 28, 2021
Pre-amplifier	SKET	LNPA_1840G-50	SK201904032	Mar.01, 2020	Feb. 28, 2021
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar.01, 2020	Feb. 28, 2021
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna Conducted Emission					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 06, 2020	Jul. 05, 2021
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	144382	Sep. 11, 2020	Sep. 10, 2021
Universal Radio Communication Tester	Rohde&Schwarz	CMU200	103903	Jul. 06, 2020	Jul. 05, 2021
Spectrum Analyzer	Rohde & Schwarz	ESPI	100010/007	Jul. 06, 2020	Jul. 05, 2021
MXA Signal Analyzer	Agilent	N9020A	MY49100060	Sep. 11, 2020	Sep. 10, 2021
Vector Signal Generator	Agilent	N5182A	MY50141294	Sep. 11, 2020	Sep. 10, 2021
Analog Signal Generator	Agilent	N5181A	MY50141953	Sep. 11, 2020	Sep. 10, 2021
RF Power Sensor	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO26	Sep. 11, 2020	Sep. 10, 2021
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO29	Sep. 11, 2020	Sep. 10, 2021
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO31	Sep. 11, 2020	Sep. 10, 2021
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO33	Sep. 11, 2020	Sep. 10, 2021

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:

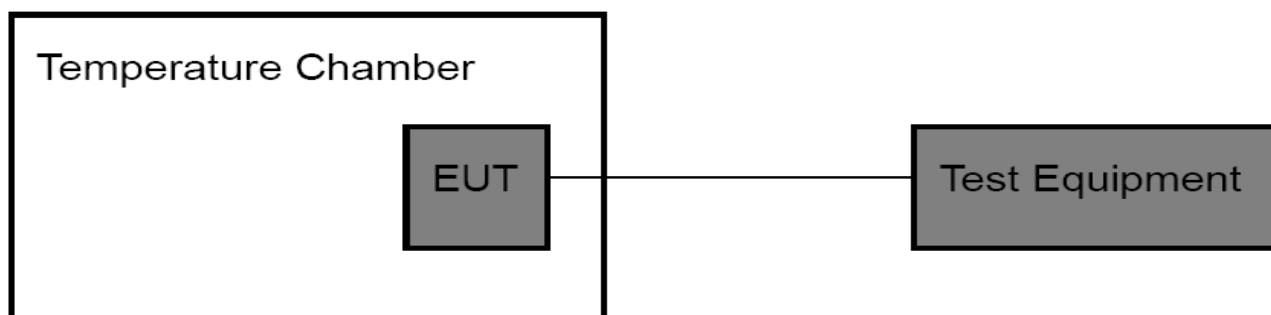
The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.

(2) Primary Supply Voltage:

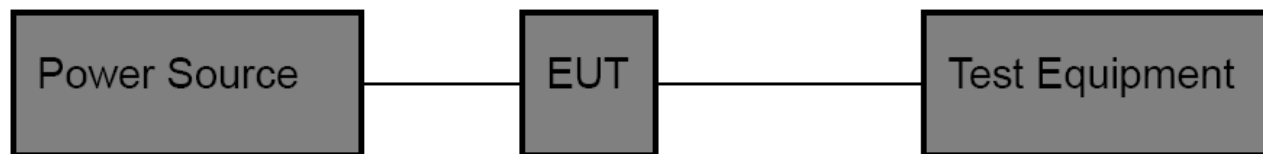
For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at input to the cable normally provide with the equipment, or at the power supply terminals if cables 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°C 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°C set up to 50°C 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°C , the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

Test Procedures for Voltage Variation:

- (1) The EUT was placed in a temperature chamber at $25 \pm 5^{\circ}\text{C}$ and connected with the base station.
- (2) Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) 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.

4.5 Deviation From Test Standard

No deviation

4.6 Test Data

Please refer to the Attachment A.

5. Conducted RF Output Power

5.1 Test Standard and Limit

5.1.1 Test Standard

FCC Part 2: 2.1046

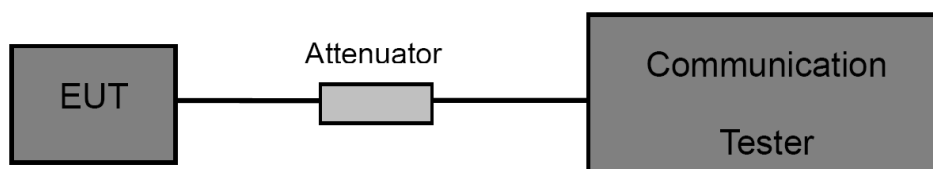
FCC Part 22H : 22.913 (a)

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 Base Station with the suitable Attenuator, 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) Then read record the power value from the Base Station in dBm.

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 Deviation From Test Standard

No deviation

5.6 Test Data

Please refer to the Attachment B.

6. Peak-Average Ratio

6.1 Test Standard and Limit

6.1.1 Test Standard

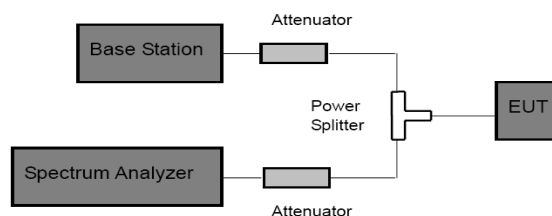
FCC Part 24E: 24.232 (d)

6.1.2 Test Limit

Peak-to-Average Ratio

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 Deviation From Test Standard

No deviation

6.6 Test Data

Please refer to the Attachment C.

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)

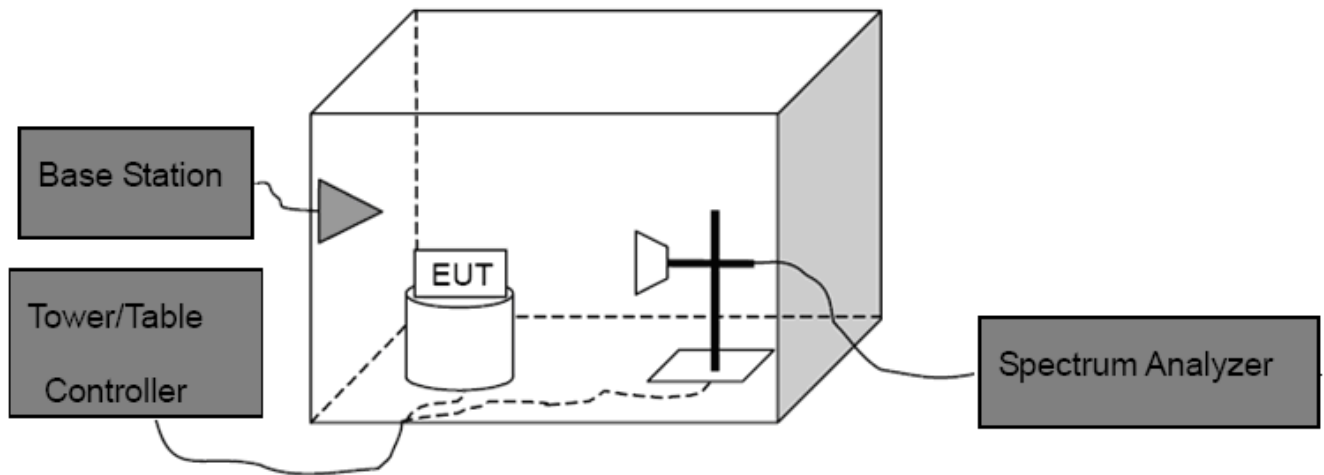
7.1.2 Test Limit

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

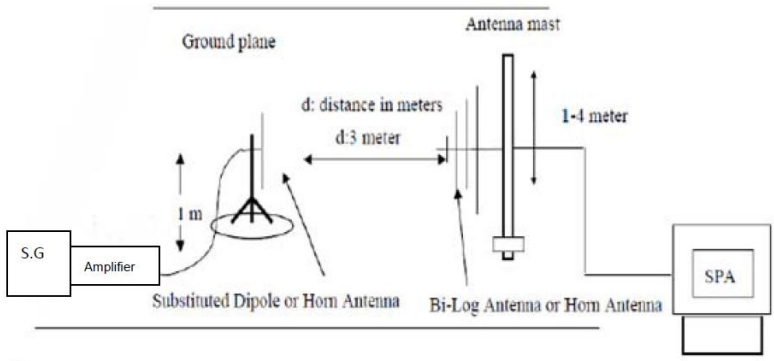
According to FCC Part 24.232 (c), the Mobile/portable stations are limited to 2 Watts(33 dBm) EIRP peak power.

Cellular Band		PCS Band	
GSM 850	UMTS Band V	PCS 1900	UMTS Band II
38.5 dBm (ERP)		33 dBm (EIRP)	

7.2 Test Setup



Above 1G



Substituted Method

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 C63.26. 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.

Note: In test, the S.G Connect the Pre-amplifier(Sonoma 310N Pre-amplifier for frequency below 1 GHz, HP 8449B Pre-amplifier for frequency above 1 GHz)

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 Deviation From Test Standard

No deviation

7.6 Test Data

Please refer to the Attachment D.

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)

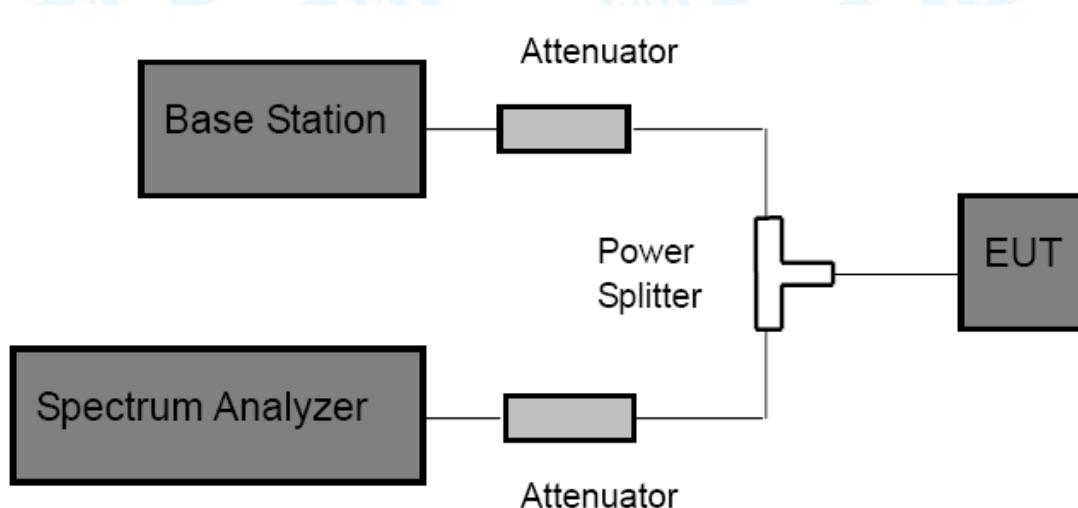
FCC Part 24E: 24.232 (c)

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 Deviation From Test Standard

No deviation

8.6 Test Data

Please refer to the Attachment E.

9. Conducted Out of Band Emissions

9.1 Test Standard and Limit

9.1.1 Test Standard

FCC Part 2: 2.1051, 2.1057

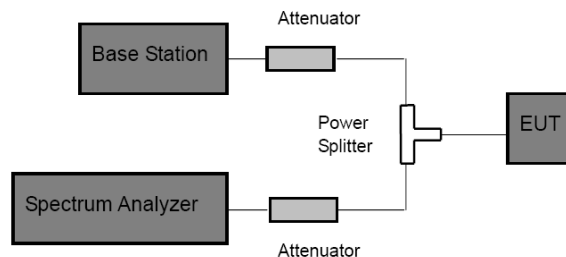
FCC Part 22H: 22.917(a)

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 $43+10\log(P)$ 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 Deviation From Test Standard

No deviation

9.6 Test Data

Please refer to the Attachment F.

10. Band Edge Test

10.1 Test Standard and Limit

10.1.1 Test Standard

FCC Part 2: 2.1051, 2.1057

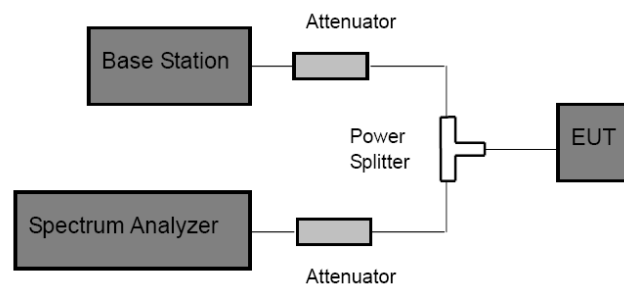
FCC Part 22H: 22.917(a)

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 $43+10\log(P)$ 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: $RBW \geq 1\%$ 26db bandwidth, $VBW=3$ RBW, Span 1 MHz, Detector: Peak Mode.

WCDMA: $RBW \geq 1\%$ 26db bandwidth, $VBW=3$ RBW, Span 10 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 Deviation From Test Standard

No deviation

10.6 Test Data

Please refer to the Attachment G.

11. Radiated Out Band of Emissions

11.1 Test Standard and Limit

11.1.1 Test Standard

FCC Part 2: 2.1053, 2.1057

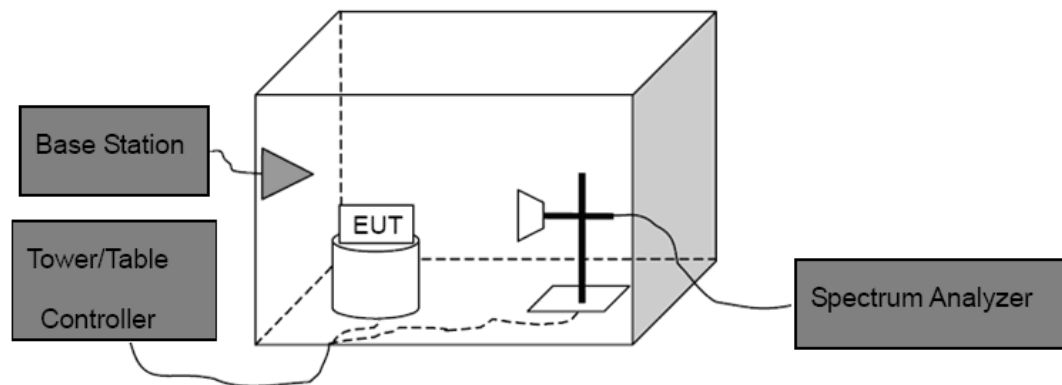
FCC Part 22H: 22.917

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 $43+10\log(P)$ 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 Deviation From Test Standard

No deviation

11.6 Test Data

Please refer to the Attachment H.

Attachment A--Frequency Stability

Temperature Variation

Temperature Variation GSM 850 (CH190)						
Temperature (°C)	Voice		GPRS		EDGE	
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)
-30	6	0.007	9	0.011	9	0.011
-20	9	0.011	11	0.013	8	0.010
-10	4	0.005	12	0.014	8	0.010
0	8	0.010	11	0.013	10	0.012
10	6	0.007	10	0.012	11	0.013
20	5	0.006	6	0.007	7	0.008
30	10	0.012	8	0.010	9	0.011
40	10	0.012	5	0.006	9	0.011
50	8	0.010	7	0.008	8	0.010
60	9	0.011	9	0.011	5	0.006
Limit	2.5 (ppm)					
Result	PASS					

Temperature Variation GSM 1900 (CH661)						
Temperature (°C)	Voice		GPRS		EDGE	
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)
-30	10	0.015	9	0.014	8	0.012
-20	9	0.014	8	0.012	9	0.014
-10	8	0.012	6	0.009	12	0.018
0	9	0.014	4	0.006	10	0.015
10	7	0.011	10	0.015	13	0.020
20	8	0.012	6	0.009	9	0.014
30	9	0.014	12	0.018	10	0.015
40	10	0.015	11	0.017	12	0.018
50	11	0.017	5	0.008	10	0.015
60	7	0.011	12	0.018	11	0.017
Limit	2.5 (ppm)					
Result	PASS					

Temperature Variation UMTS Band V (CH 4183)		
Temperature (°C)	Voice Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
-30	9	0.011
-20	4	0.005
-10	5	0.006
0	7	0.008
10	6	0.007
20	5	0.006
30	10	0.012
40	8	0.010
50	10	0.012
60	8	0.010
Limit	2.5 (ppm)	
Result	PASS	

Temperature Variation UMTS Band II (CH 9400)		
Temperature (°C)	Voice Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
-30	8	0.004
-20	10	0.005
-10	9	0.005
0	9	0.005
10	6	0.003
20	7	0.004
30	12	0.006
40	9	0.005
50	8	0.004
60	9	0.005
Limit	2.5 (ppm)	
Result	PASS	

Voltage Variation

Voltage Variation GSM 850 (CH190)						
Voltage (V)	Voice		GPRS		EDGE	
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)
3.50	7	0.008	8	0.010	8	0.010
3.80	6	0.007	7	0.008	7	0.008
4.20	6	0.007	9	0.011	7	0.008
Limit	2.5 (ppm)					
Result	PASS					

Voltage Variation GSM 1900 (CH661)						
Voltage (V)	Voice		GPRS		EDGE	
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)
3.50	9	0.014	7	0.011	5	0.008
3.80	6	0.009	8	0.012	6	0.009
4.20	8	0.012	5	0.008	7	0.011
Limit	2.5 (ppm)					
Result	PASS					

Voltage Variation UMTS Band V (CH 4182)		
Voltage (V)	Voice Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
3.50	6	0.007
3.80	7	0.008
4.20	7	0.008
Limit	2.5 (ppm)	
Result	PASS	

Voltage Variation UMTS Band II (CH 9400)		
Voltage (V)	Voice Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
3.50	6	0.003
3.80	8	0.004
4.20	7	0.004
Limit	2.5 (ppm)	
Result	PASS	

Attachment B--Conducted RF Output Power

GSM 850				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
GSM 850 (Voice)	128	824.2	32.58	1.811
	190	836.6	32.53	1.791
	251	848.8	32.47	1.766
GPRS 850 (1 Slot)	128	824.2	32.62	1.828
	190	836.6	32.56	1.803
	251	848.8	32.48	1.770
GPRS 850 (2 Slot)	128	824.2	30.44	1.107
	190	836.6	30.38	1.091
	251	848.8	30.31	1.074
GPRS 850 (3 Slot)	128	824.2	28.47	0.703
	190	836.6	28.41	0.693
	251	848.8	28.36	0.685
GPRS 850 (4 Slot)	128	824.2	26.37	0.434
	190	836.6	26.33	0.430
	251	848.8	26.27	0.424
EDGE 850 (1 Slot)	128	824.2	25.37	0.344
	190	836.6	25.85	0.385
	251	848.8	25.37	0.344
EDGE 850 (2 Slot)	128	824.2	24.24	0.265
	190	836.6	24.44	0.278
	251	848.8	24.24	0.265
EDGE 850 (3 Slot)	128	824.2	21.95	0.157
	190	836.6	22.09	0.162
	251	848.8	21.67	0.147
EDGE 850 (4 Slot)	128	824.2	19.44	0.088
	190	836.6	19.67	0.093
	251	848.8	19.10	0.081

PCS 1900				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
GSM 1900 (Voice)	512	1850.2	28.88	0.773
	661	1880.0	28.81	0.760
	810	1909.8	28.74	0.748
GPRS 1900 (1 Slot)	512	1850.2	28.90	0.776
	661	1880.0	28.83	0.764
	810	1909.8	28.75	0.750
GPRS 1900 (2 Slot)	512	1850.2	26.26	0.423
	661	1880.0	26.24	0.421
	810	1909.8	26.08	0.406
GPRS 1900 (3 Slot)	512	1850.2	24.62	0.290
	661	1880.0	24.65	0.292
	810	1909.8	24.43	0.277
GPRS 1900 (4 Slot)	512	1850.2	22.40	0.174
	661	1880.0	22.46	0.176
	810	1909.8	22.23	0.167
EDGE 1900 (1 Slot)	512	1850.2	24.06	0.255
	661	1880.0	24.63	0.290
	810	1909.8	24.46	0.279
EDGE 1900 (2 Slot)	512	1850.2	22.67	0.185
	661	1880.0	23.13	0.206
	810	1909.8	22.75	0.188
EDGE 1900 (3 Slot)	512	1850.2	20.46	0.111
	661	1880.0	20.78	0.120
	810	1909.8	20.15	0.104
EDGE 1900 (4 Slot)	512	1850.2	17.67	0.058
	661	1880.0	17.98	0.063
	810	1909.8	16.84	0.048

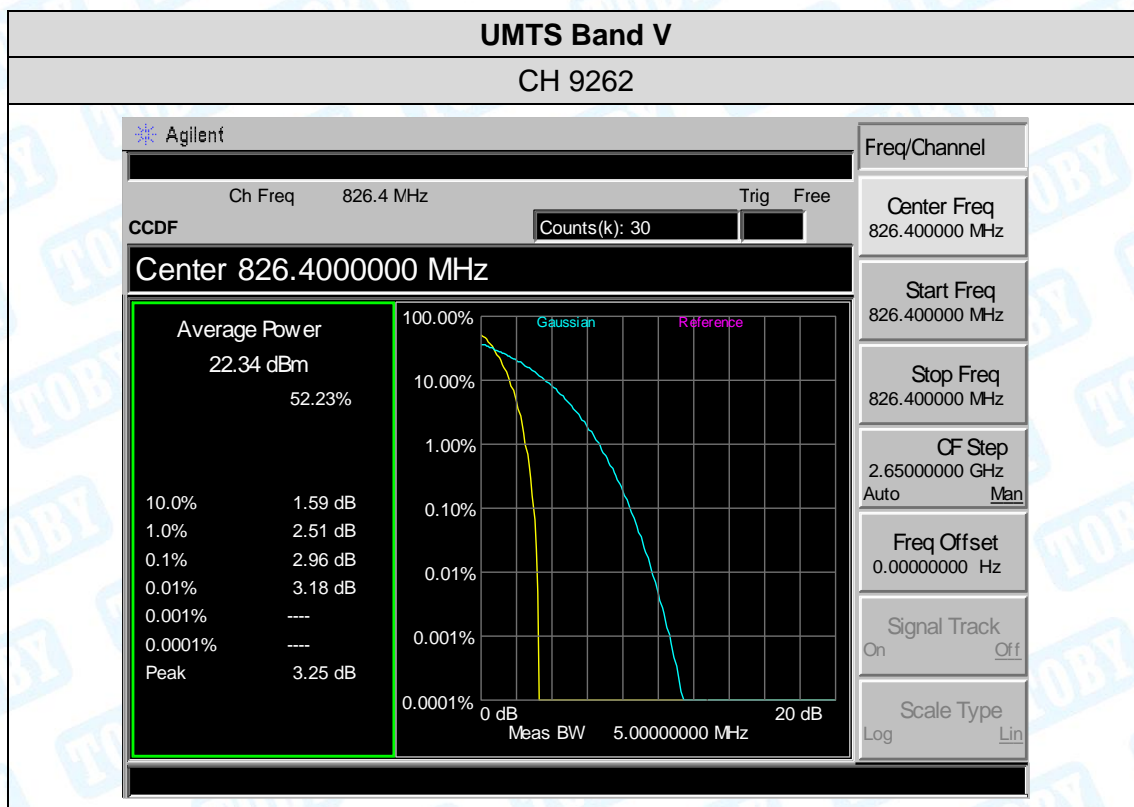
UMTS Band V				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
Band V (Voice)	4132	826.4	22.54	0.179
	4183	836.6	22.41	0.174
	4233	846.6	22.54	0.179
HSDPA Subtest 1	4132	826.4	22.45	0.176
	4183	836.6	22.12	0.163
	4233	846.6	22.22	0.167
HSDPA Subtest 2	4132	826.4	22.50	0.178
	4183	836.6	22.13	0.163
	4233	846.6	22.28	0.169
HSDPA Subtest 3	4132	826.4	22.47	0.177
	4183	836.6	22.07	0.161
	4233	846.6	22.24	0.167
HSDPA Subtest 4	4132	826.4	22.42	0.175
	4183	836.6	22.06	0.161
	4233	846.6	22.22	0.167
HSUPA Subtest 1	4132	826.4	21.31	0.135
	4183	836.6	20.98	0.125
	4233	846.6	21.07	0.128
HSUPA Subtest 2	4132	826.4	21.23	0.133
	4183	836.6	20.93	0.124
	4233	846.6	21.03	0.127
HSUPA Subtest 3	4132	826.4	19.85	0.097
	4183	836.6	19.49	0.089
	4233	846.6	19.75	0.094
HSUPA Subtest 4	4132	826.4	21.24	0.133
	4183	836.6	20.90	0.123
	4233	846.6	21.11	0.129
HSUPA Subtest 5	4132	826.4	20.19	0.104
	4183	836.6	20.45	0.111
	4233	846.6	20.87	0.122

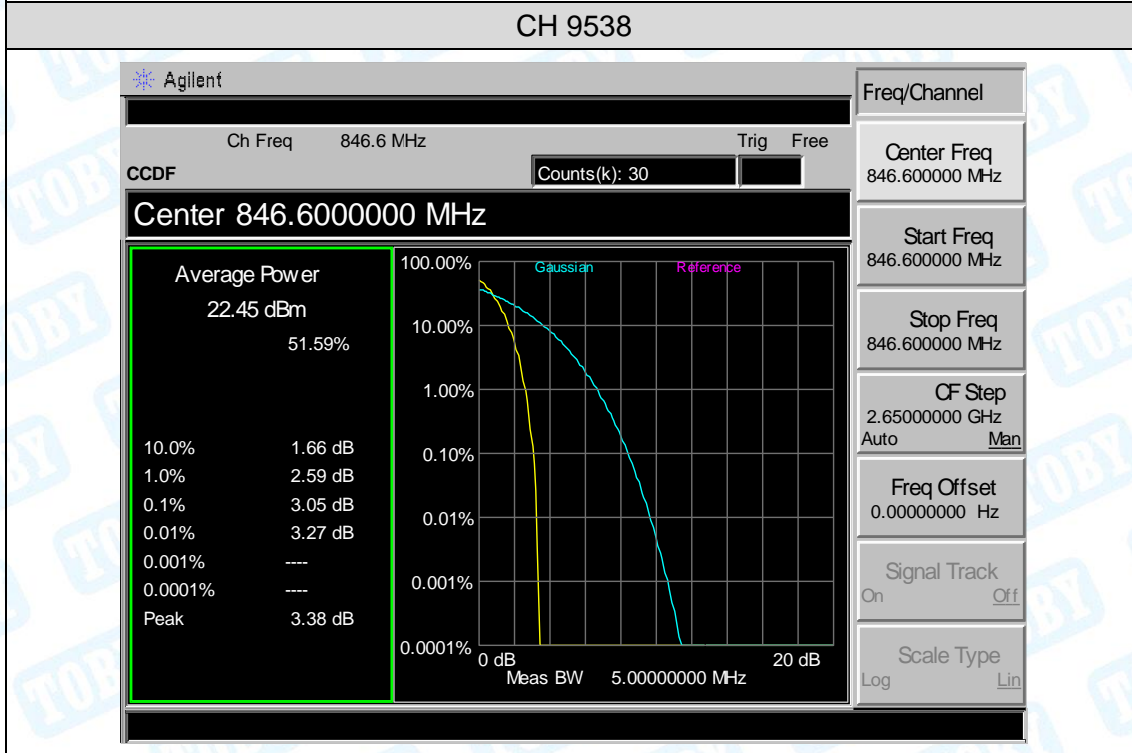
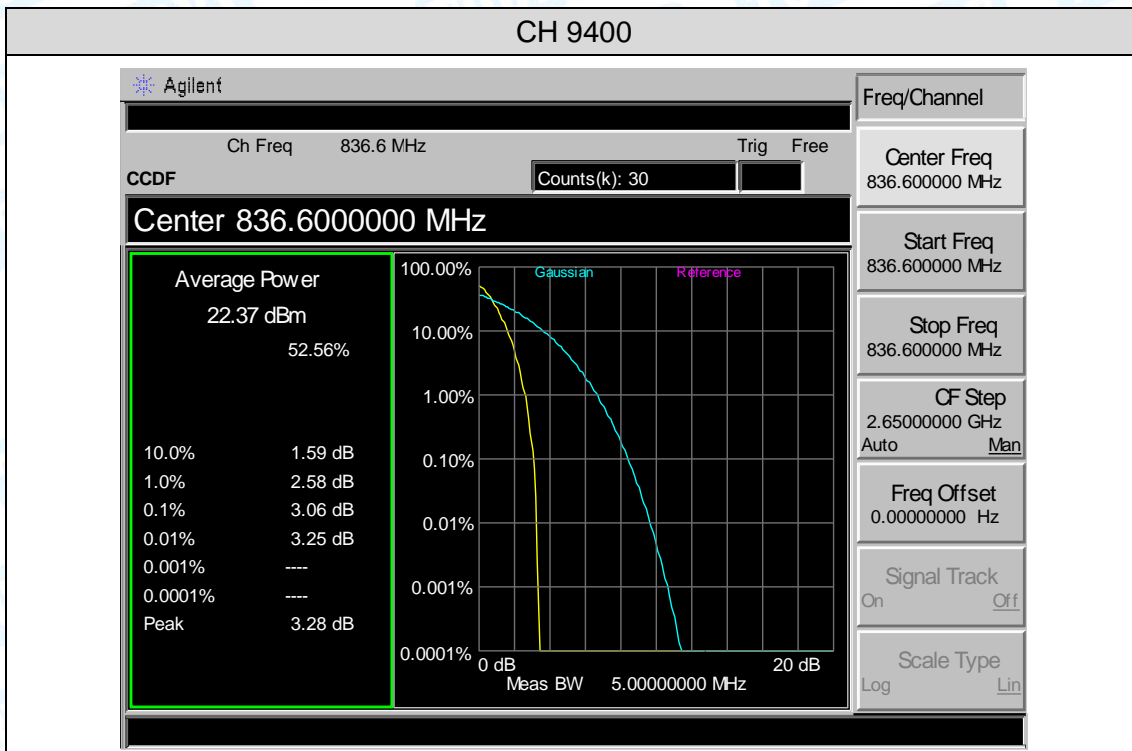
UMTS Band II				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
Band II (Voice)	9262	1852.4	21.25	0.133
	9400	1880.0	21.07	0.128
	9538	1907.6	21.29	0.135
HSDPA Subtest 1	9262	1852.4	20.51	0.112
	9400	1880.0	20.45	0.111
	9538	1907.6	20.13	0.103
HSDPA Subtest 2	9262	1852.4	20.35	0.108
	9400	1880.0	20.71	0.118
	9538	1907.6	20.26	0.106
HSDPA Subtest 3	9262	1852.4	20.58	0.114
	9400	1880.0	20.65	0.116
	9538	1907.6	20.27	0.106
HSDPA Subtest 4	9262	1852.4	20.58	0.114
	9400	1880.0	20.66	0.116
	9538	1907.6	20.24	0.106
HSUPA Subtest 1	9262	1852.4	20.46	0.111
	9400	1880.0	20.59	0.115
	9538	1907.6	20.11	0.103
HSUPA Subtest 2	9262	1852.4	19.15	0.082
	9400	1880.0	20.75	0.119
	9538	1907.6	20.37	0.109
HSUPA Subtest 3	9262	1852.4	20.71	0.118
	9400	1880.0	20.72	0.118
	9538	1907.6	20.36	0.109
HSUPA Subtest 4	9262	1852.4	20.75	0.119
	9400	1880.0	20.75	0.119
	9538	1907.6	20.39	0.109
HSUPA Subtest 5	9262	1852.4	20.16	0.104
	9400	1880.0	20.36	0.109
	9538	1907.6	20.45	0.111

Attachment C--Peak-Average Ratio

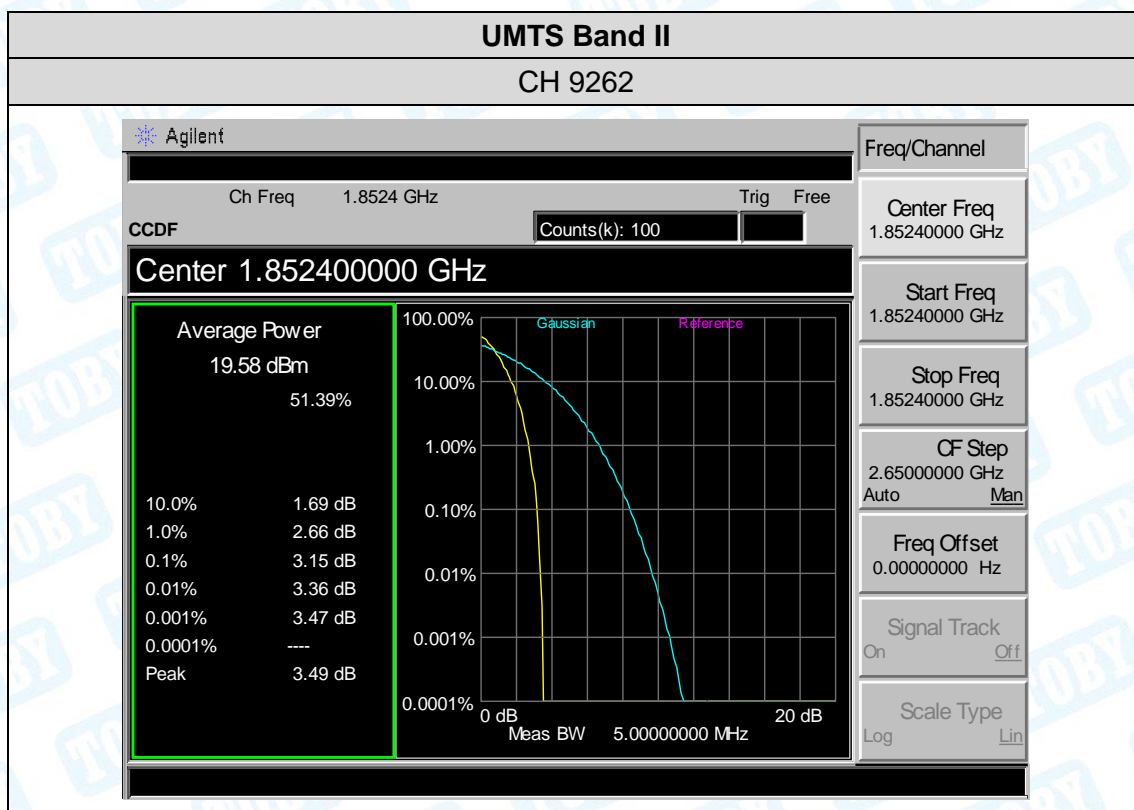
Mode	Channel	Frequency (MHz)	Peak Power (dBm)	AVG Power (dBm)	PAPR (dB)	Limit (dB)	Result
GSM 850	128	824.2	32.71	32.58	0.13	13	PASS
	190	836.6	32.65	32.53	0.12	13	PASS
	251	848.8	32.60	32.47	0.13	13	PASS
GPRS 850	128	824.2	32.73	32.62	0.11	13	PASS
	190	836.6	32.68	32.56	0.12	13	PASS
	251	848.8	32.61	32.48	0.13	13	PASS
EGPRS 850	128	824.2	28.35	24.06	4.29	13	PASS
	190	836.6	28.62	24.63	3.99	13	PASS
	251	848.8	28.38	24.46	3.92	13	PASS
PCS 1900	512	1850.2	29.04	28.88	0.16	13	PASS
	661	1880.0	29.00	28.81	0.19	13	PASS
	810	1909.8	28.95	28.74	0.21	13	PASS
GPRS 1900	512	1850.2	29.07	28.90	0.17	13	PASS
	661	1880.0	29.01	28.83	0.18	13	PASS
	810	1909.8	28.95	28.75	0.20	13	PASS
EGPRS 1900	512	1850.2	26.90	24.06	2.84	13	PASS
	661	1880.0	27.37	24.63	2.74	13	PASS
	810	1909.8	27.27	24.46	2.81	13	PASS

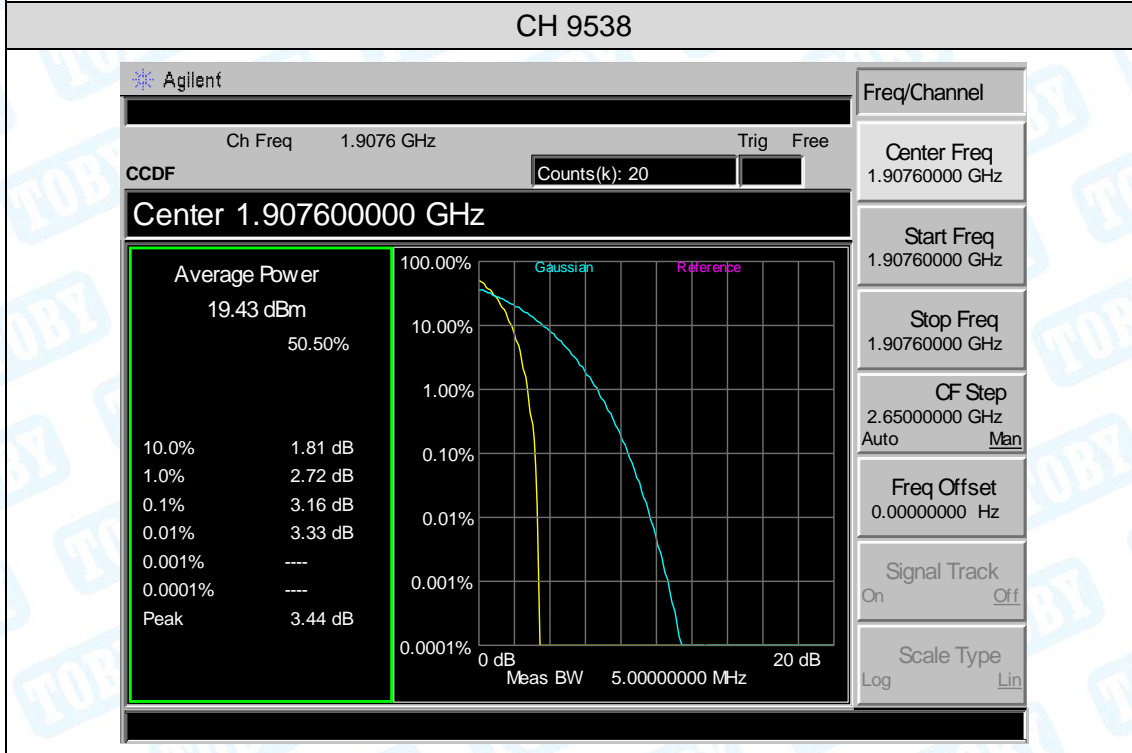
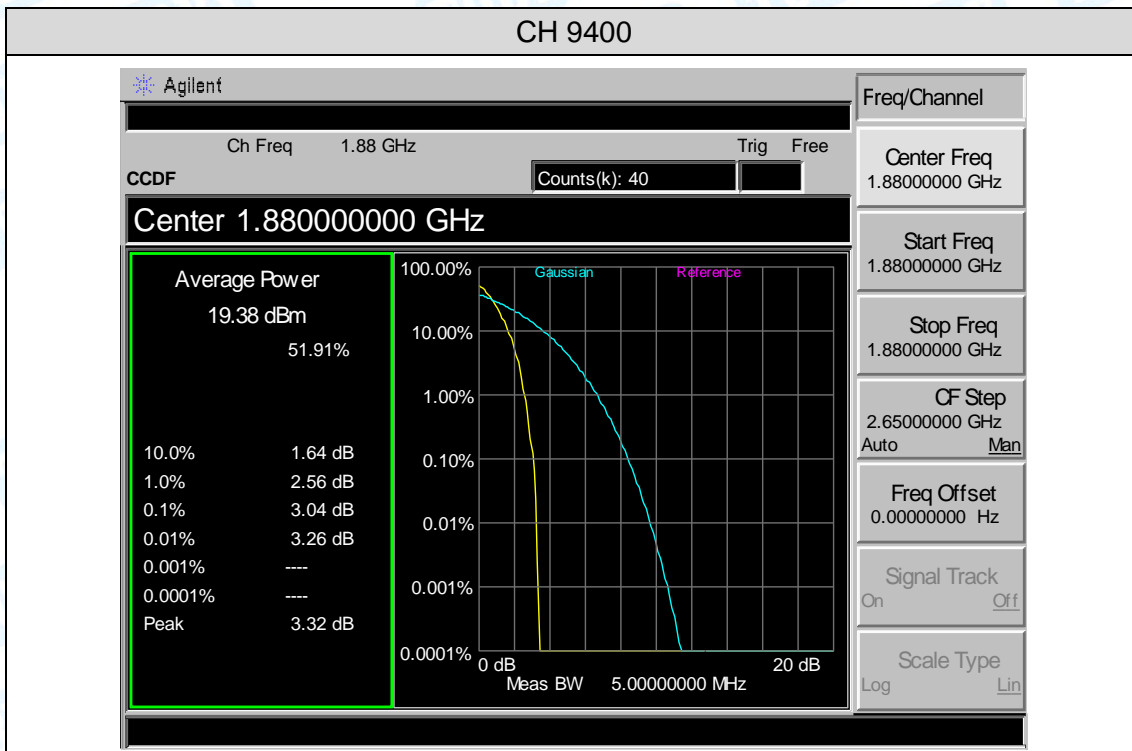
UMTS Band V			
Mode	Channel	Frequency (MHz)	PAPR with 0.1% probability (dB)
UMTS Band V	4132	826.4	2.96
	4183	836.6	3.06
	4233	846.6	3.05
			Limit ≤ 13dB





UMTS Band II			
Mode	Channel	Frequency (MHz)	PAPR with 0.1% probability (dB)
UMTS Band II	9262	1852.4	3.15
	9400	1880.0	3.04
	9538	1907.6	3.16
			Limit \leq 13dB





Attachment D-- Radiated Output Power

Measurement Data (worst case)

GSM 850								
Mode	Channel	Frequency (MHz)	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	ERP Power (dBm)	ERP Power (W)
GSM 850	128	824.2	H	30.48	3.46	1.26	32.68	1.854
			V	28.04	3.46	1.26	30.24	1.057
	190	836.6	H	30.09	3.82	1.26	32.65	1.841
			V	26.69	3.82	1.26	29.25	0.841
	251	848.8	H	29.88	4.16	1.26	32.78	1.897
			V	27.34	4.16	1.26	30.24	1.057
GPRS 850 (1 Slot)	128	824.2	H	30.48	3.46	1.26	32.68	1.854
			V	27.67	3.46	1.26	29.87	0.971
	190	836.6	H	29.91	3.82	1.26	32.47	1.766
			V	27.01	3.82	1.26	29.57	0.906
	251	848.8	H	28.96	4.16	1.26	31.86	1.535
			V	26.34	4.16	1.26	29.24	0.839
EDGE 850 (1 Slot)	128	824.2	H	23.04	3.46	1.26	25.24	0.334
			V	20.92	3.46	1.26	23.12	0.205
	190	836.6	H	22.59	3.82	1.26	25.15	0.327
			V	20.45	3.82	1.26	23.01	0.200
	251	848.8	H	22.77	4.16	1.26	25.67	0.369
			V	20.17	4.16	1.26	23.07	0.203
Limit							38.5	7

PCS 1900								
Mode	Channel	Frequency (MHz)	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBi)	Cable Loss (dB)	EIRP Power (dBm)	EIRP Power (W)
GSM 1900	512	1850.2	H	25.27	5.01	2.59	27.69	0.587
			V	21.83	5.01	2.59	24.25	0.266
	661	1880.0	H	25.13	4.82	2.59	27.36	0.545
			V	21.63	4.82	2.59	23.86	0.243
	810	1909.8	H	25.50	4.45	2.59	27.36	0.545
			V	22.35	4.45	2.59	24.21	0.264
GPRS 1900 (1 Slot)	512	1850.2	H	24.94	5.01	2.59	27.36	0.545
			V	21.43	5.01	2.59	23.85	0.243
	661	1880.0	H	25.45	4.82	2.59	27.68	0.586
			V	21.42	4.82	2.59	23.65	0.232
	810	1909.8	H	25.70	4.45	2.59	27.56	0.570
			V	22.02	4.45	2.59	23.88	0.244
EDGE 1900 (1 Slot)	512	1850.2	H	22.43	5.01	2.59	24.85	0.305
			V	19.43	5.01	2.59	21.85	0.153
	661	1880.0	H	22.15	4.82	2.59	24.38	0.274
			V	18.81	4.82	2.59	21.04	0.127
	810	1909.8	H	21.92	4.45	2.59	23.78	0.239
			V	19.10	4.45	2.59	20.96	0.125
Limit							33	2

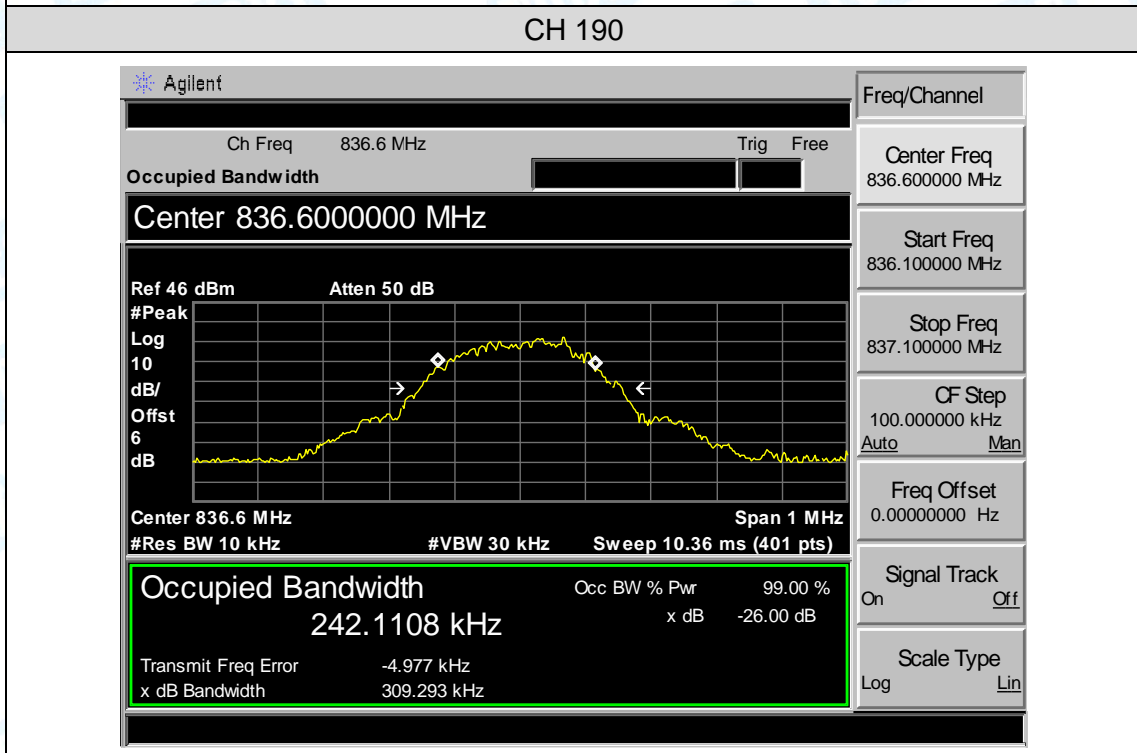
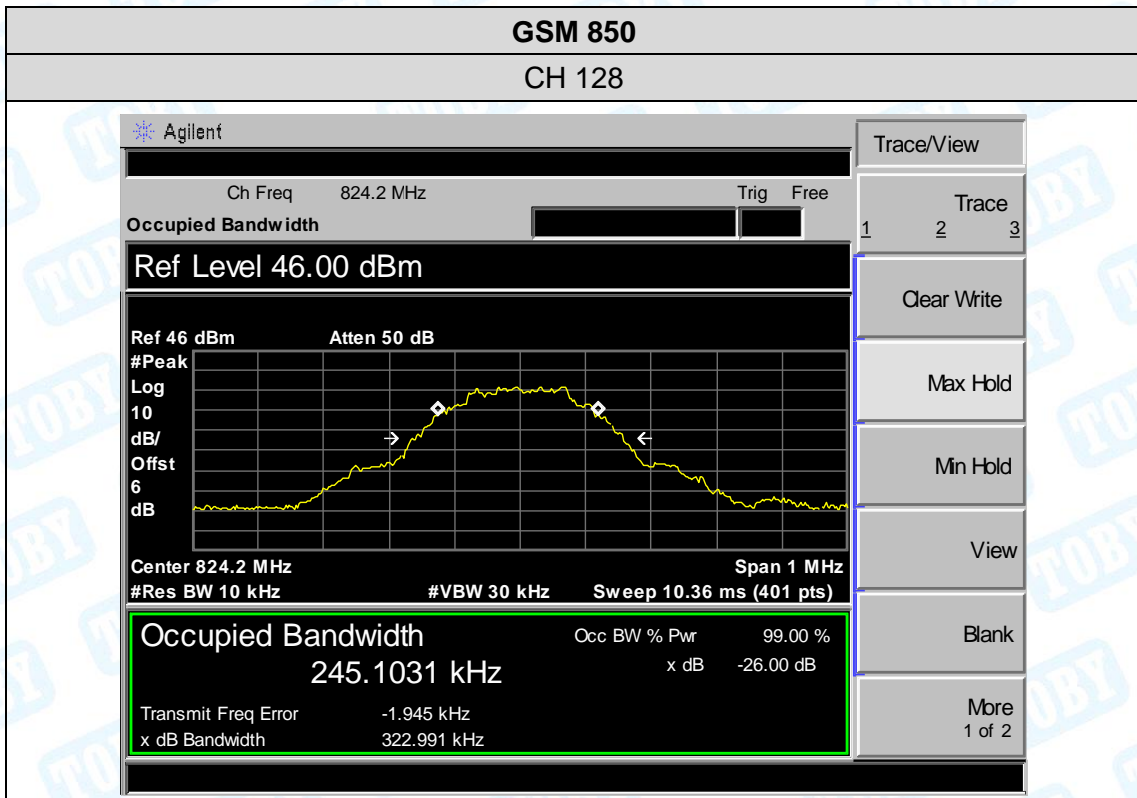
UMTS Band V								
Mode	Channel	Frequency (MHz)	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBi)	Cable Loss (dB)	EIRP Power (dBm)	EIRP Power (W)
Band V Voice	4132	826.4	H	19.38	3.46	1.26	21.58	0.144
			V	16.45	3.46	1.26	18.65	0.073
	4183	836.6	H	19.22	3.82	1.26	21.78	0.151
			V	16.40	3.82	1.26	18.96	0.079
	4233	846.6	H	19.14	4.16	1.26	22.04	0.160
			V	16.34	4.16	1.26	19.24	0.084
Limit							38.5	7

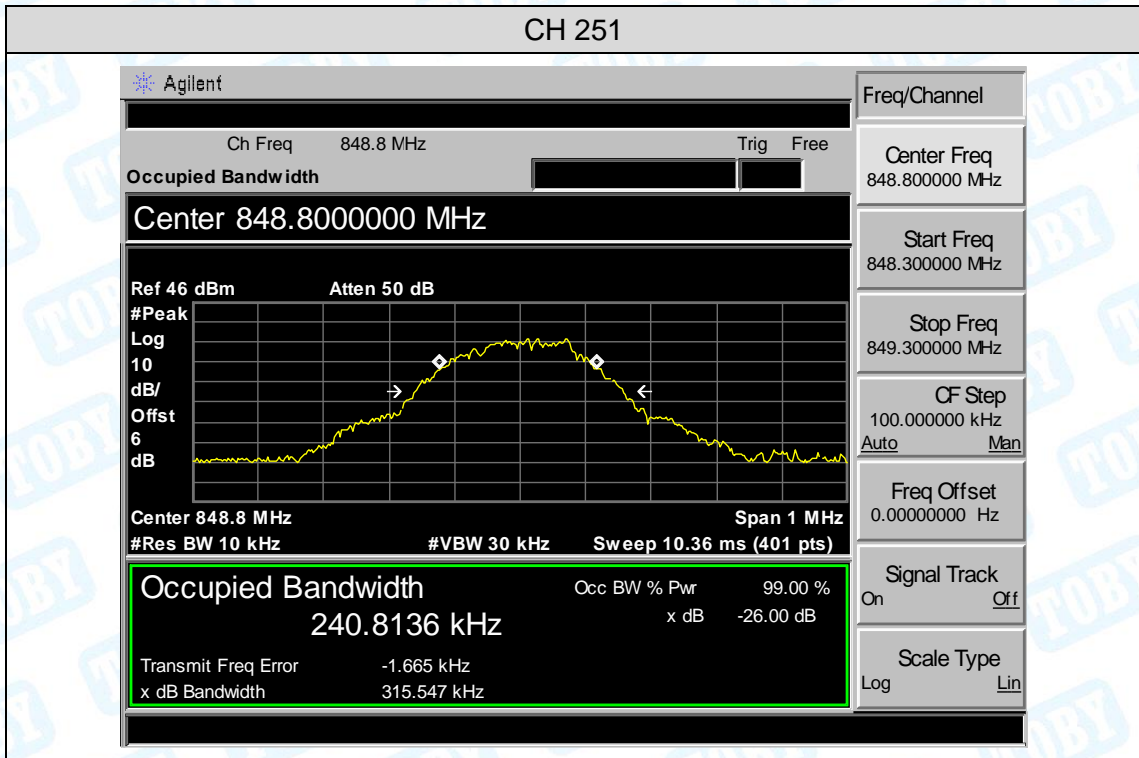
UMTS Band II								
Mode	Channel	Frequency (MHz)	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBi)	Cable Loss (dB)	EIRP Power (dBm)	EIRP Power (W)
Band II Voice	9262	1852.4	H	18.44	5.01	2.59	20.86	0.122
			V	15.27	5.01	2.59	17.69	0.059
	9400	1880.0	H	18.66	4.82	2.59	20.89	0.123
			V	15.63	4.82	2.59	17.86	0.061
	9538	1907.6	H	18.91	4.45	2.59	20.77	0.119
			V	15.49	4.45	2.59	17.35	0.054
Limit							33	2

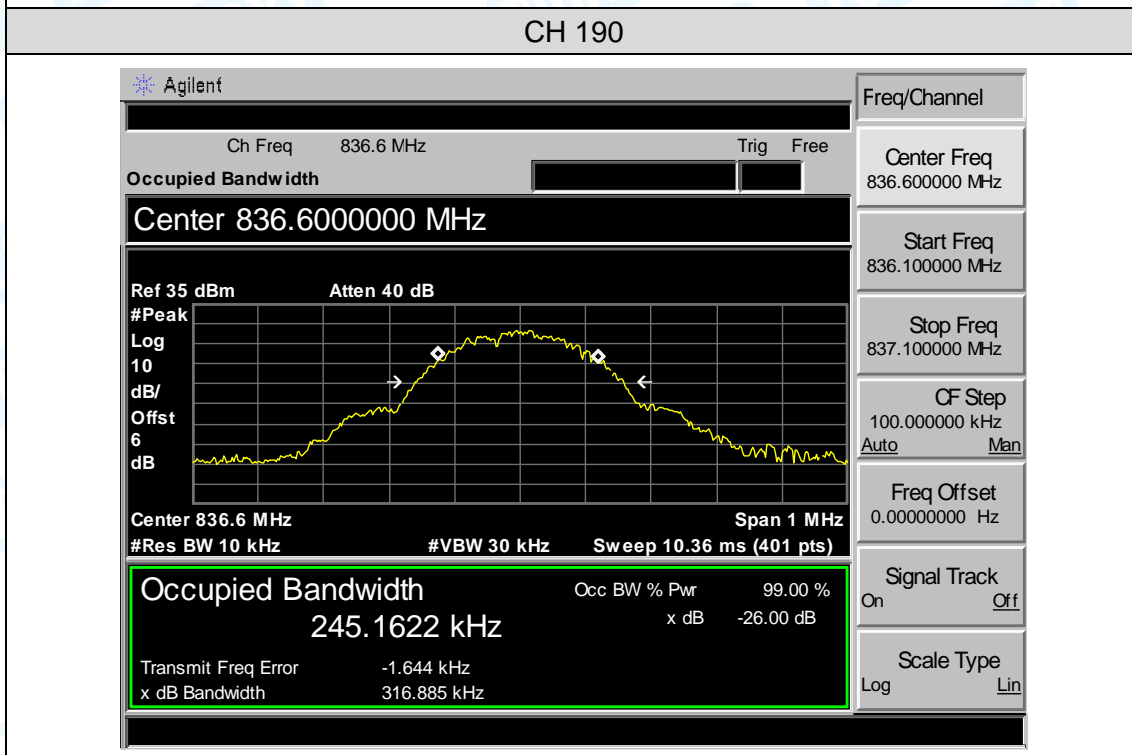
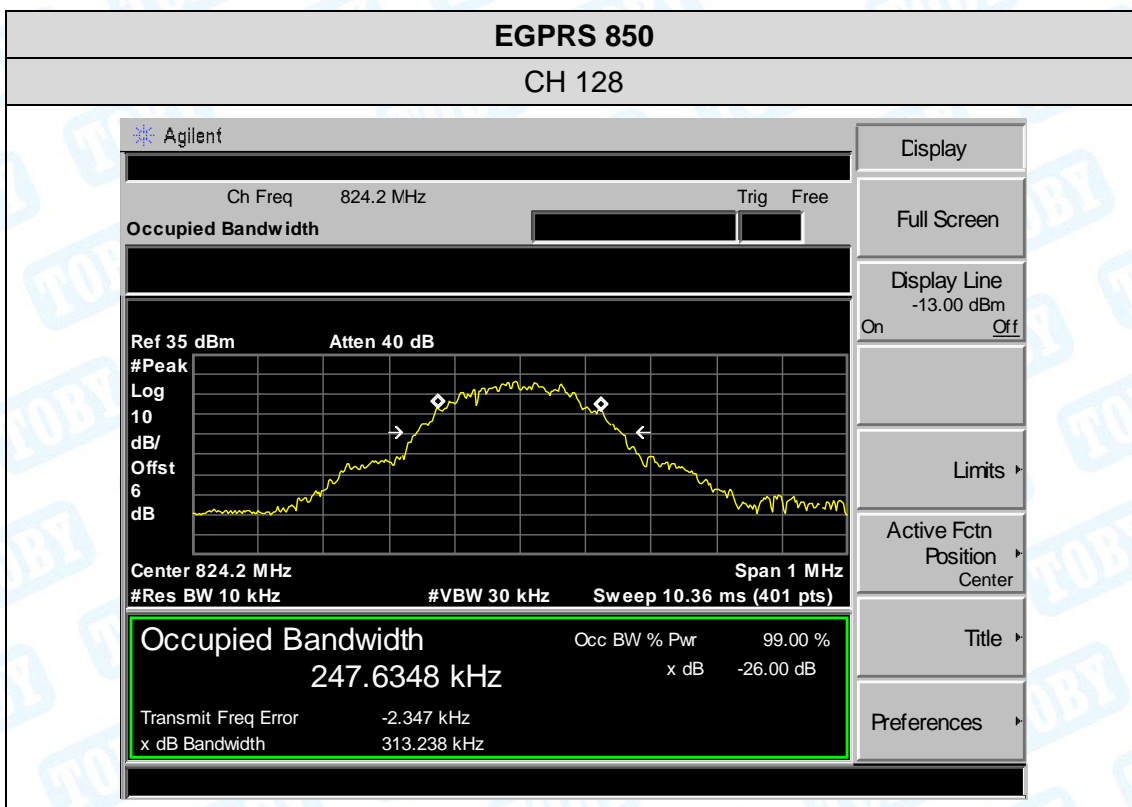
Attachment E--Occupied Bandwidth

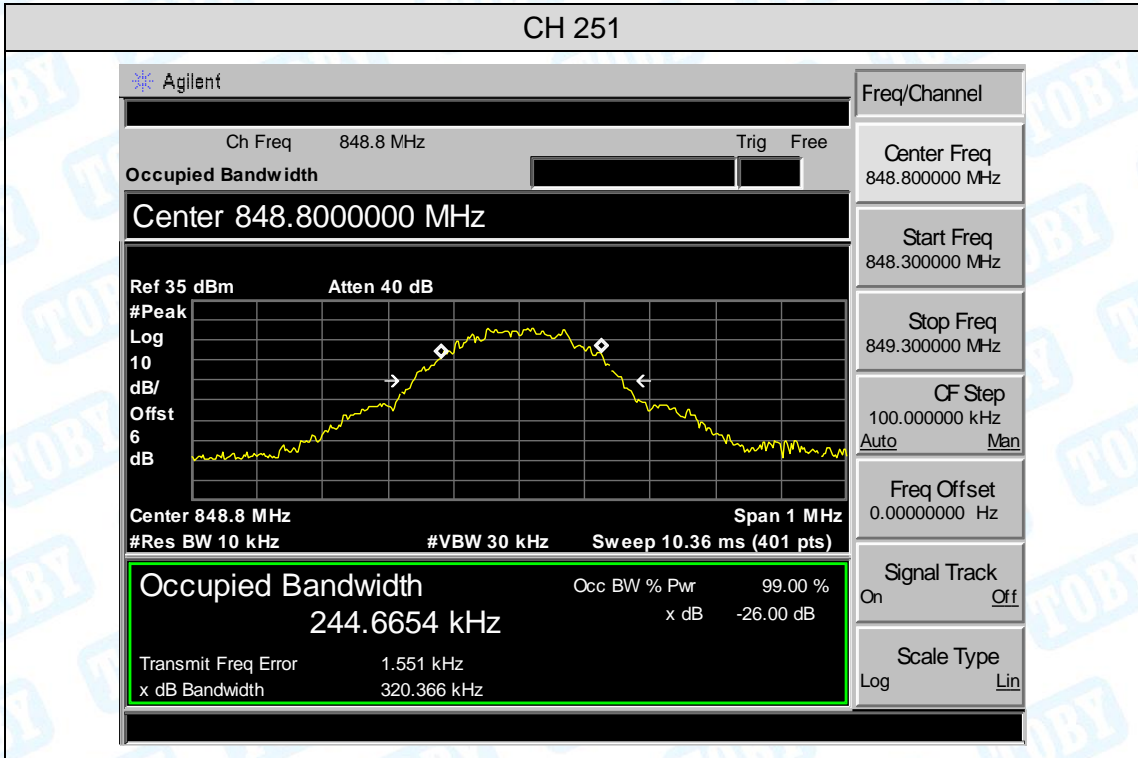
Measurement Data (worst case)

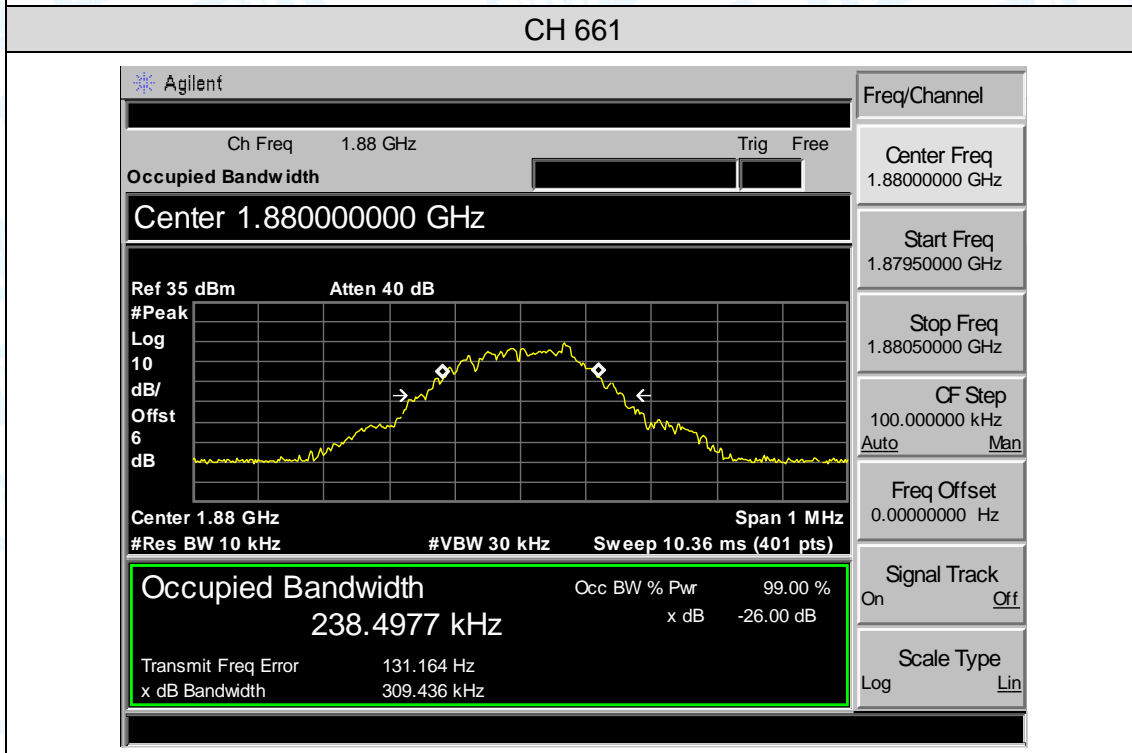
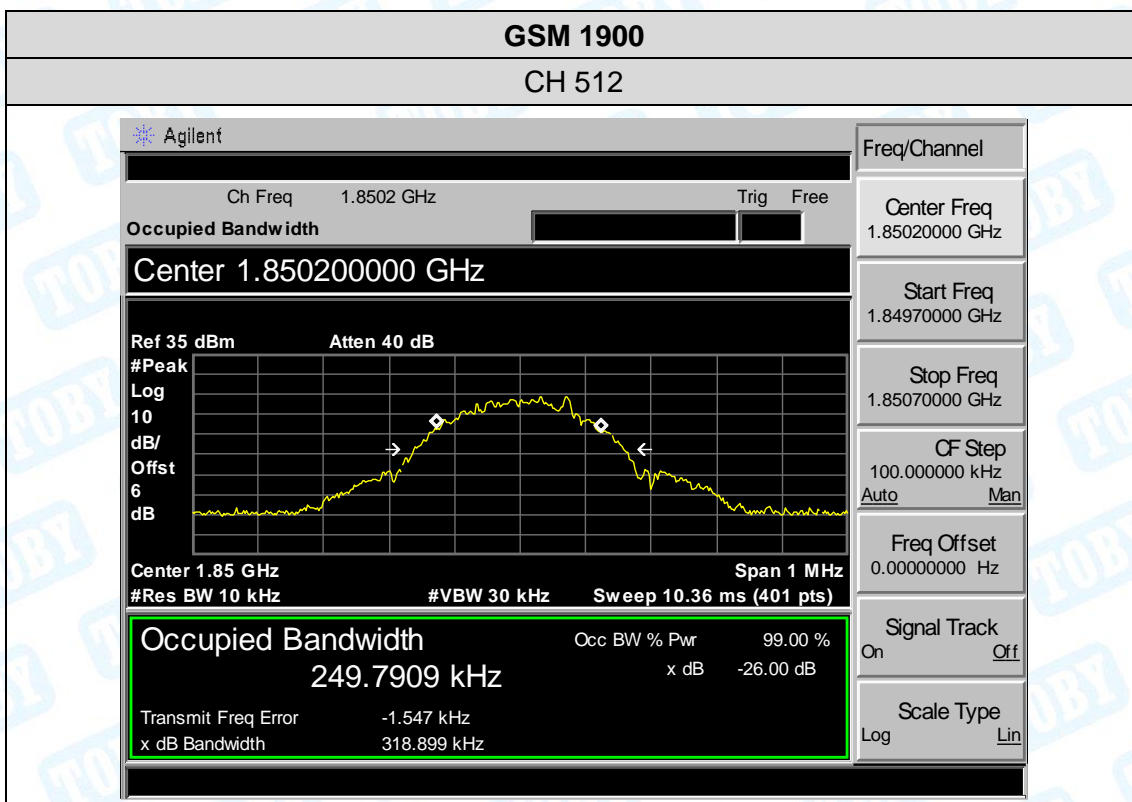
Mode	Channel	Frequency (MHz)	99% OBW (kHz)	-26dB Bandwidth (kHz)
GSM 850	128	824.2	245.1031	322.991
	190	836.6	242.4408	309.293
	251	848.8	240.8136	315.547
EGPRS 850	128	824.2	247.6348	313.238
	190	836.6	245.1622	316.885
	251	848.8	244.6654	320.366
GSM 1900	512	1850.2	249.7909	318.899
	661	1880.0	238.4877	309.436
	810	1909.8	247.8237	314.418
EGPRS 1900	512	1850.2	246.1335	312.056
	661	1880.0	240.5210	305.966
	810	1909.8	242.9585	313.977
Band V Voice	4132	826.4	4138.5	4704
	4183	836.6	4154.7	4706
	4233	846.6	4146.9	4692
Band II Voice	9262	1852.4	4144.8	4694
	9400	1880.0	4171.9	4702
	9538	1907.6	4142.5	4702

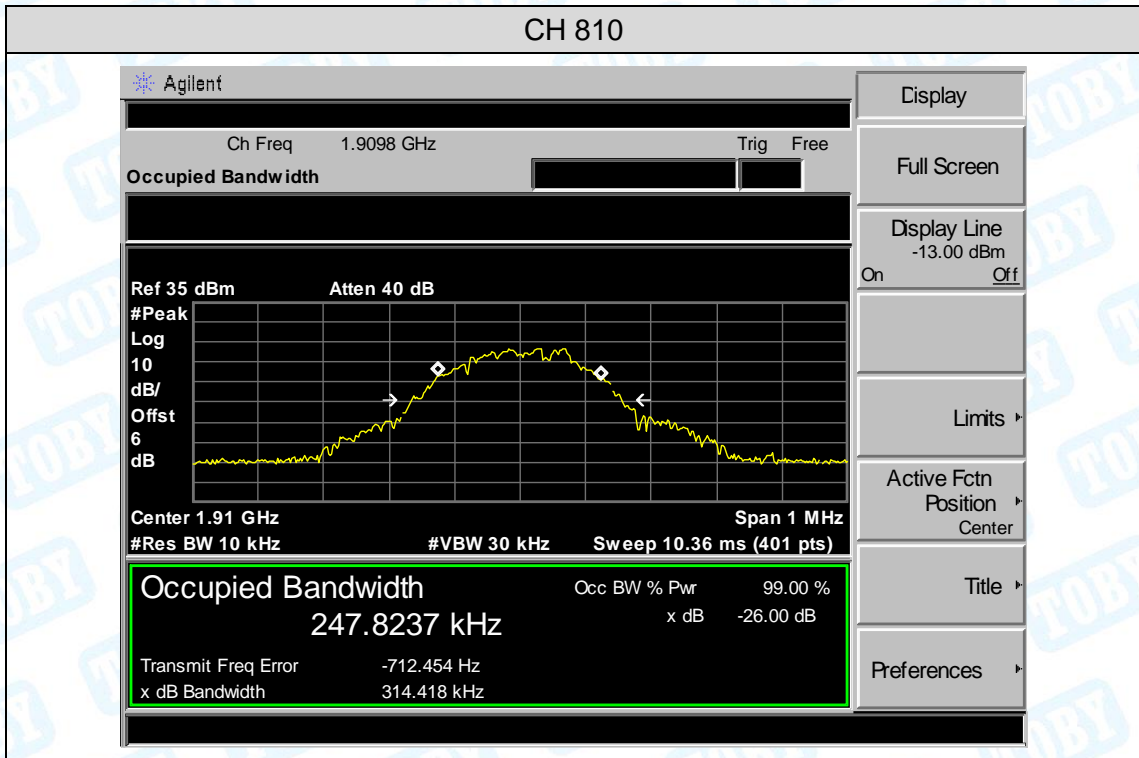


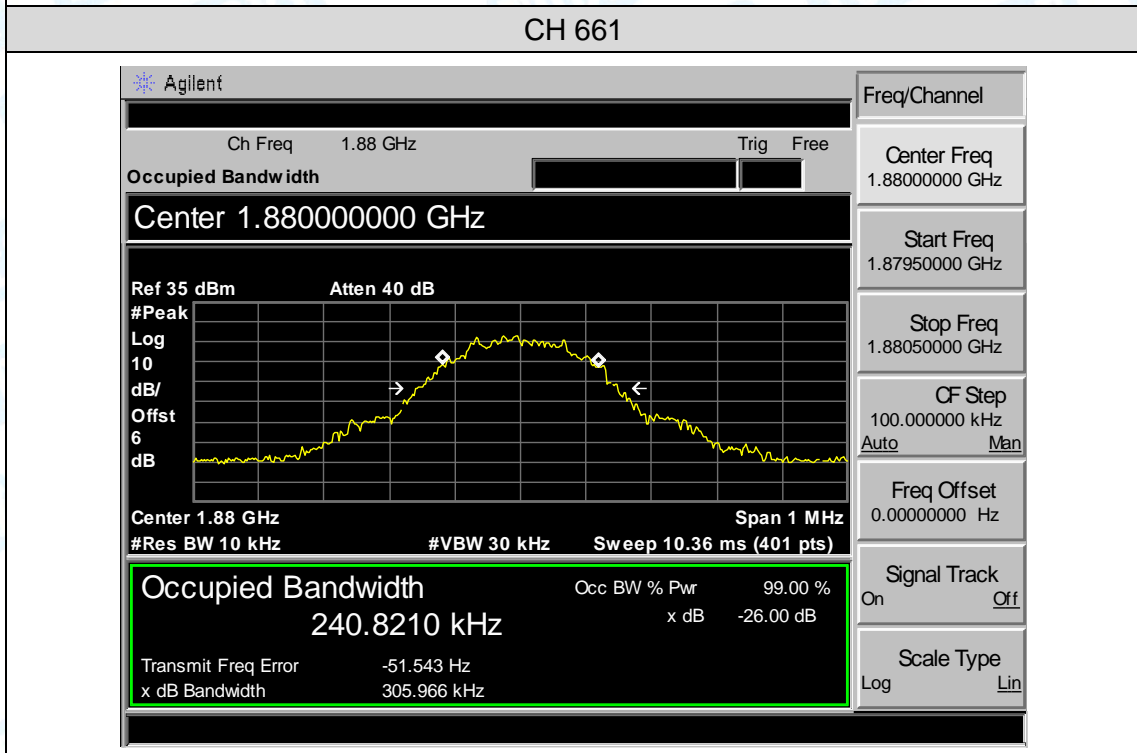
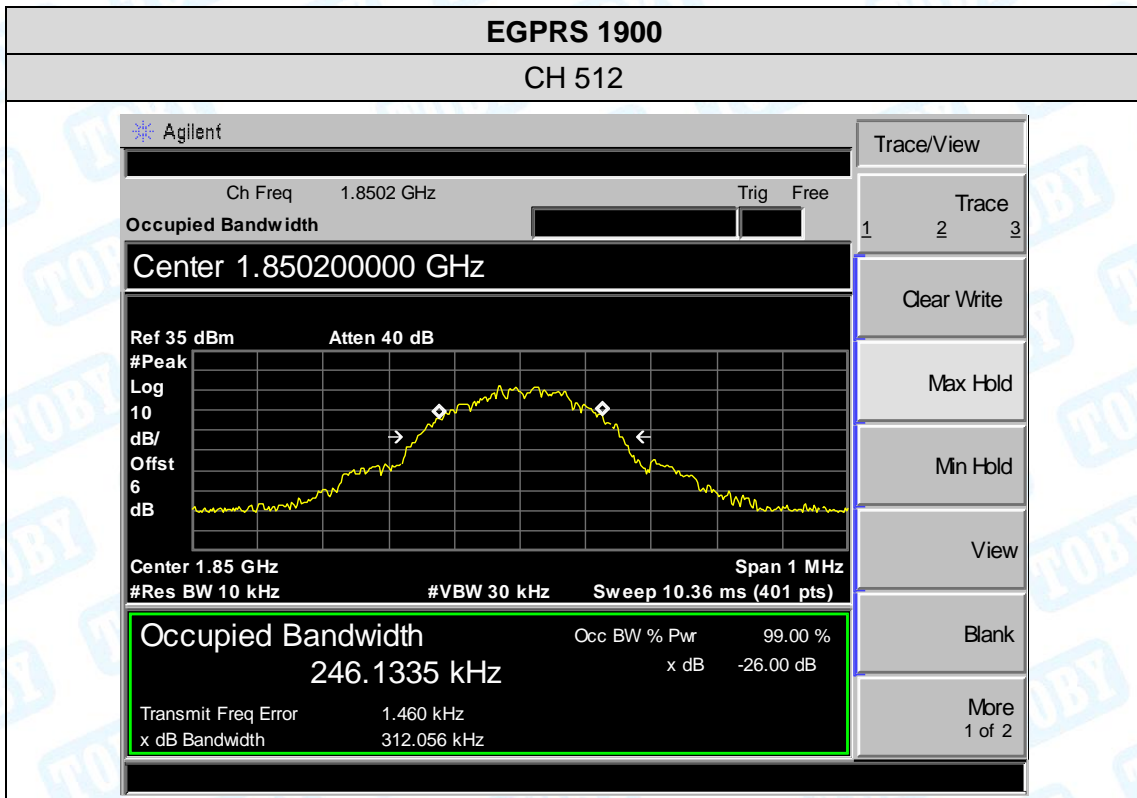


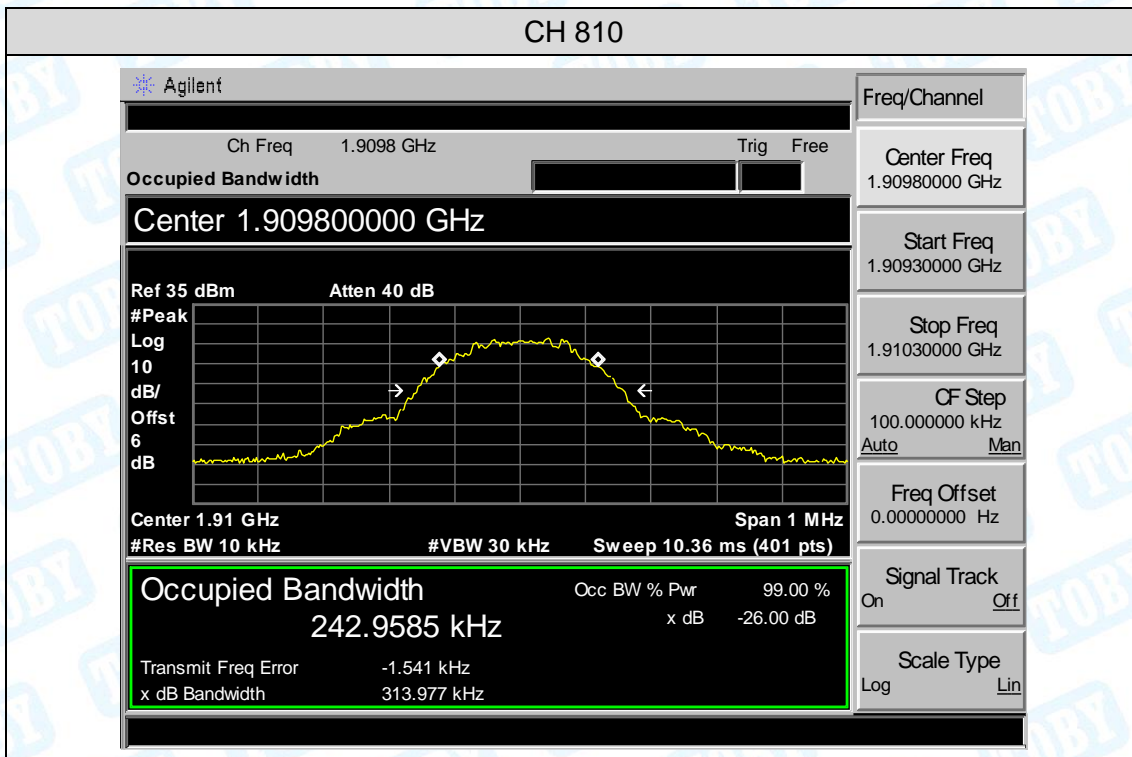


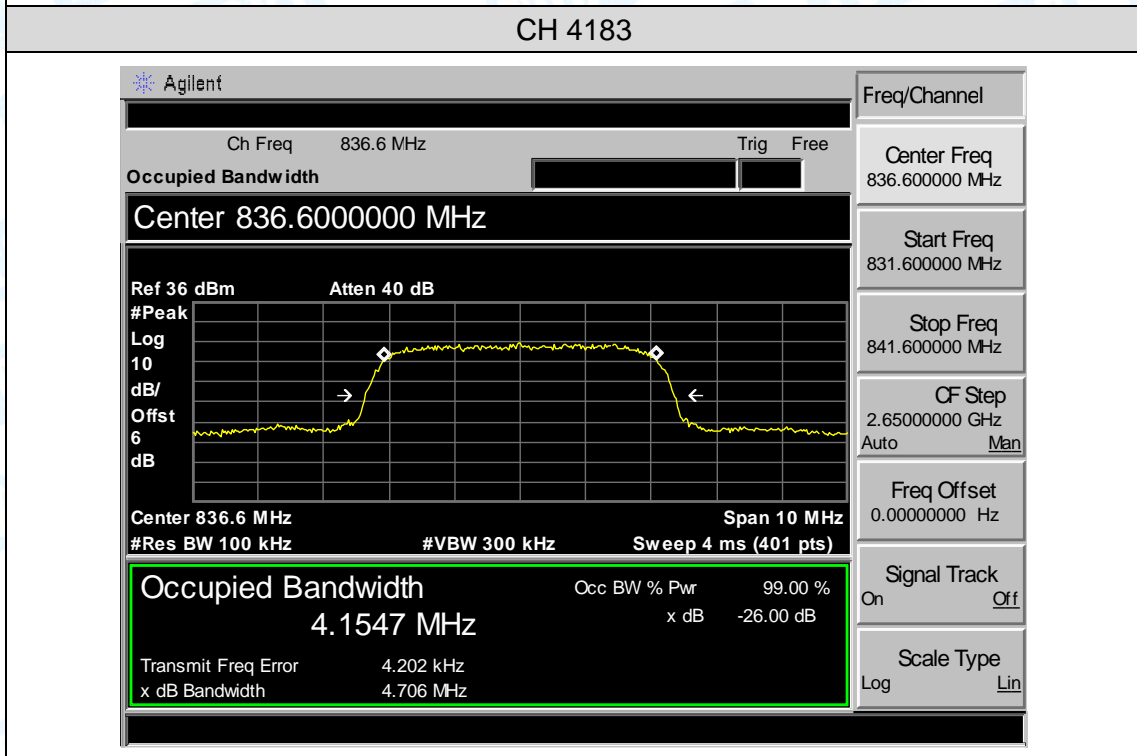
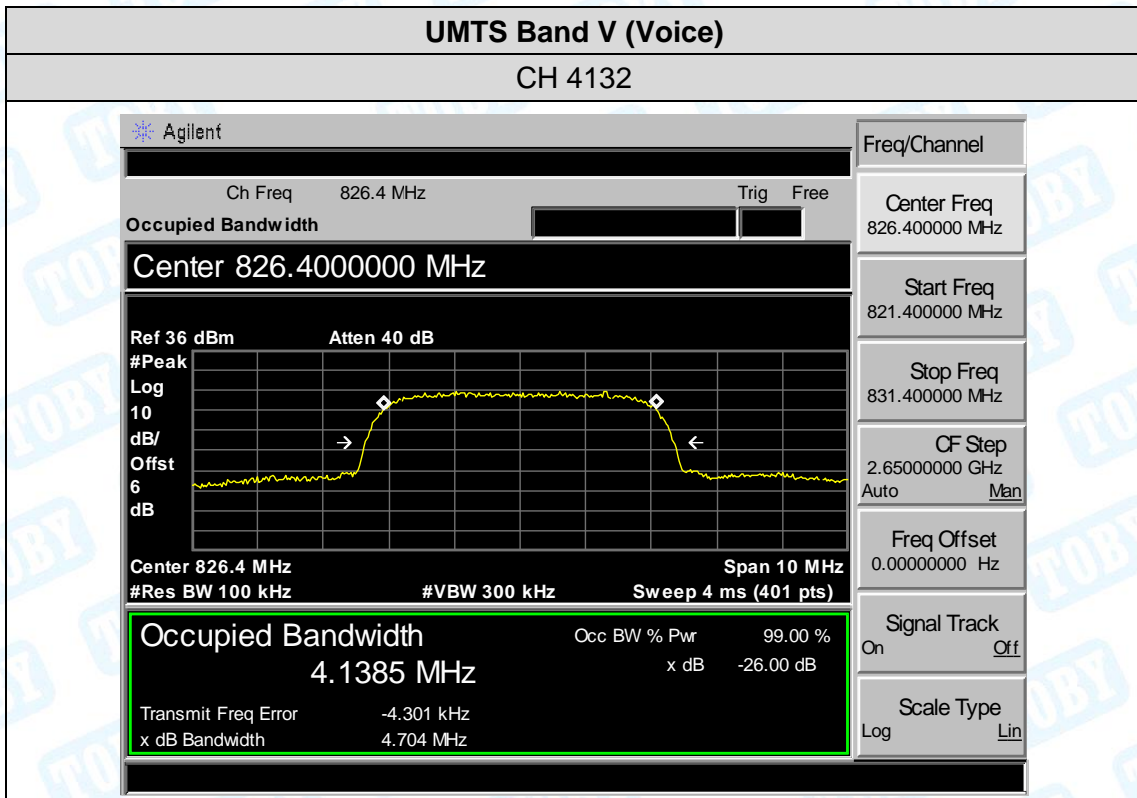


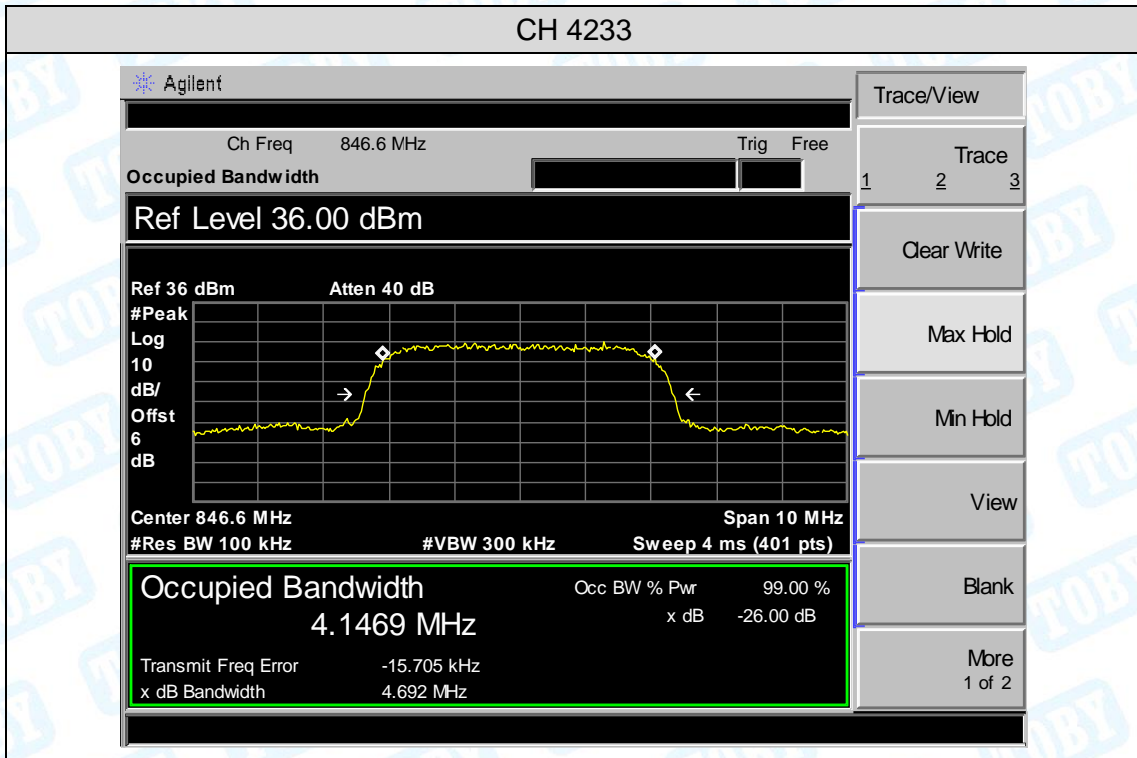


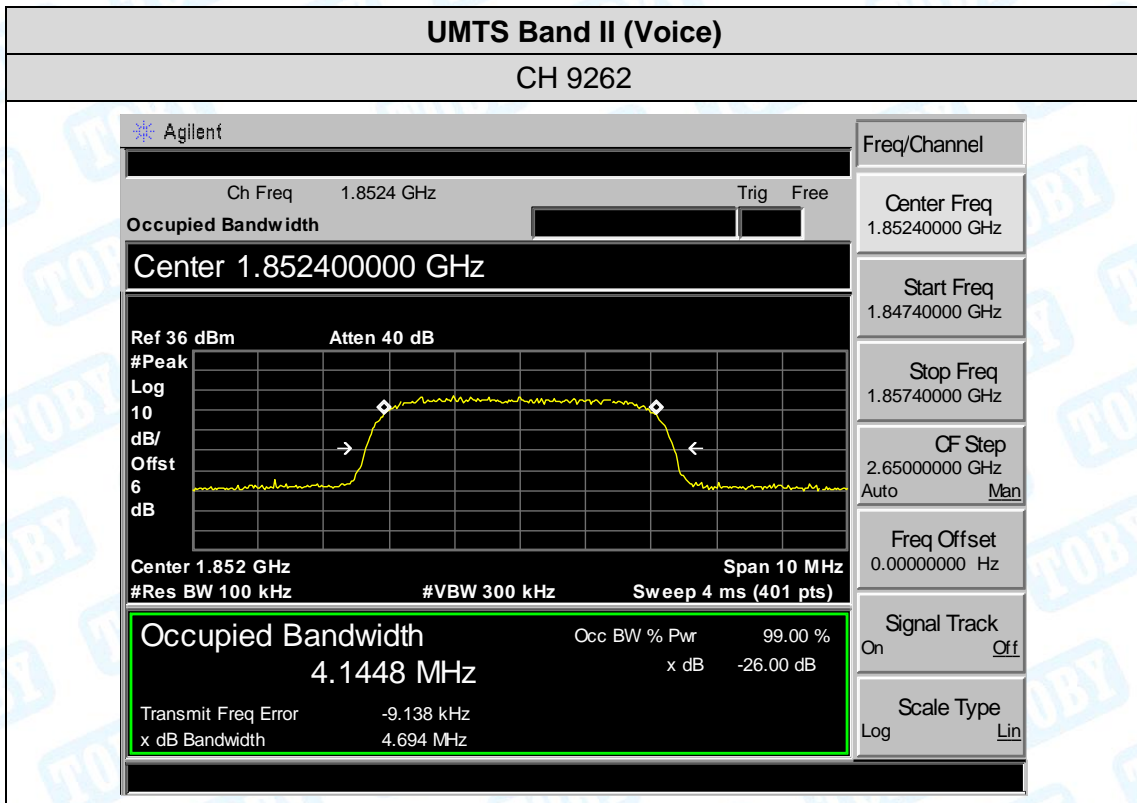


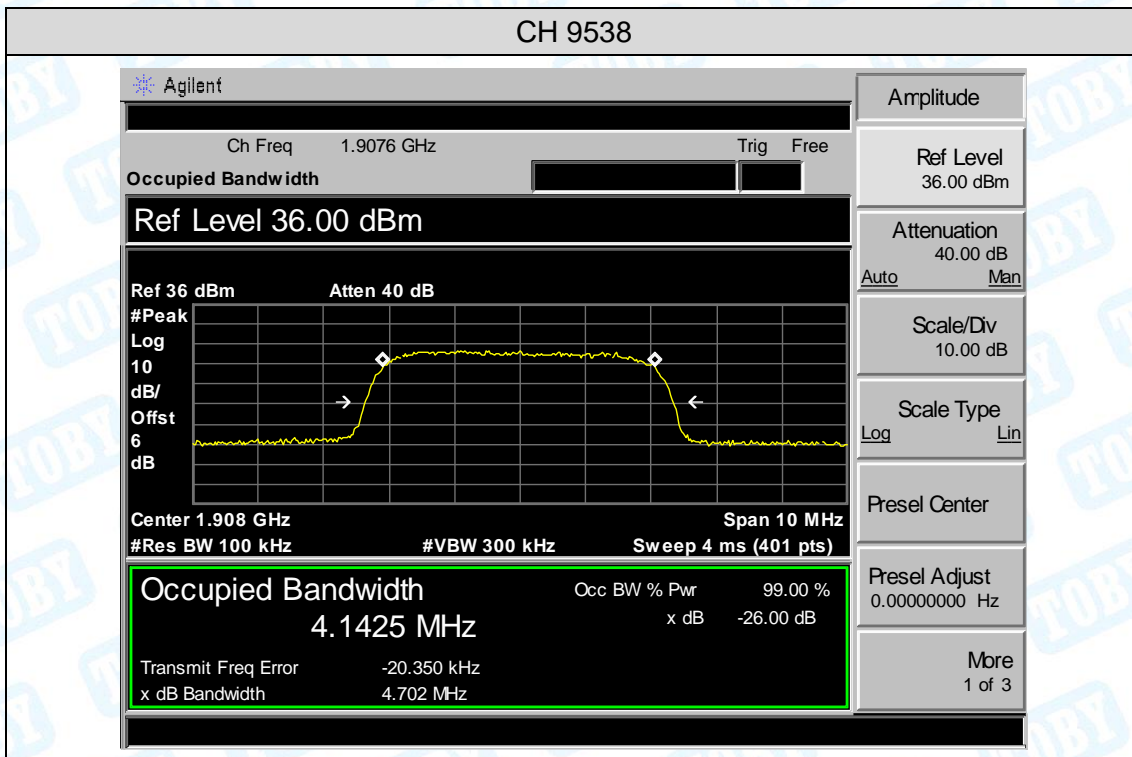






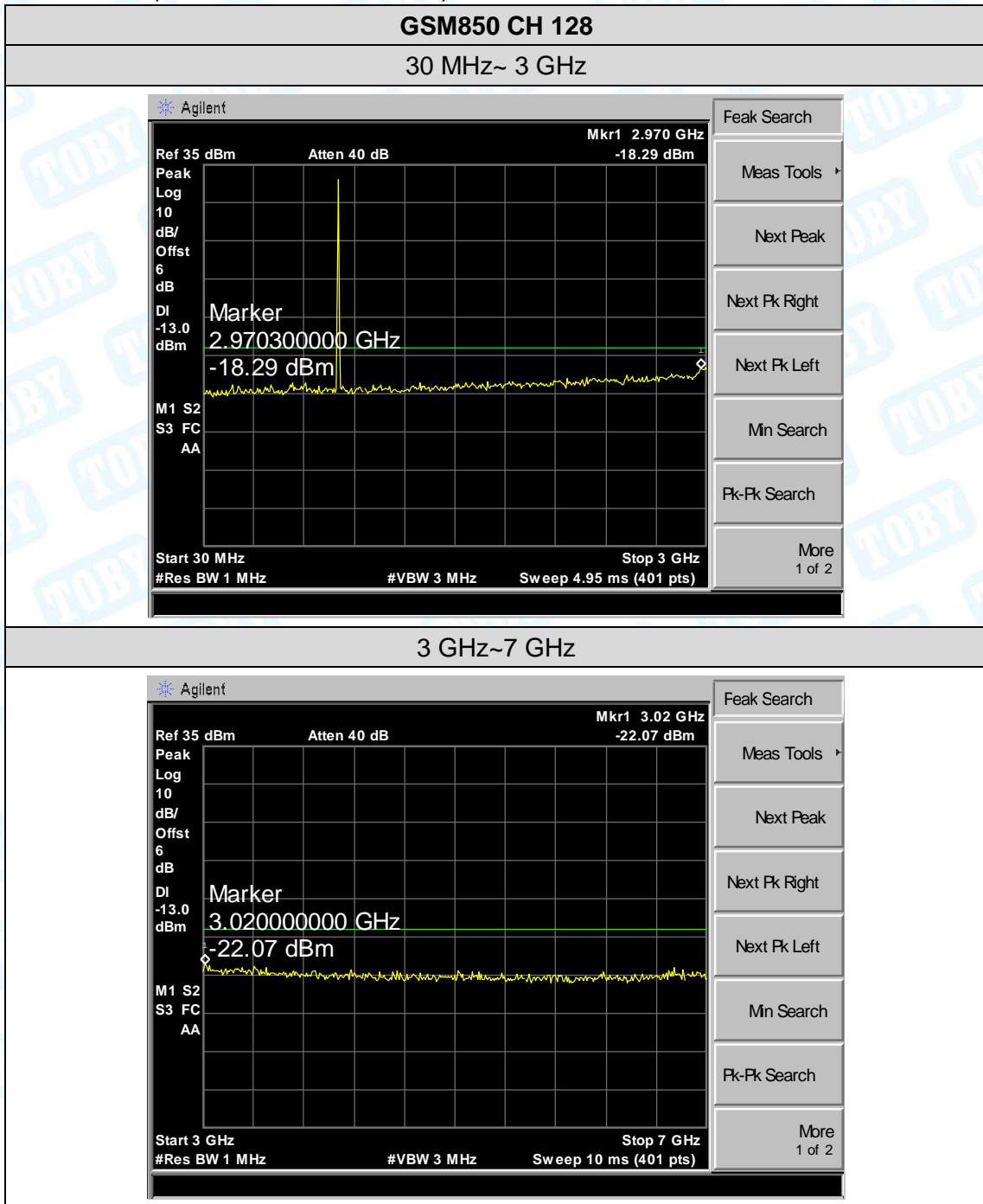


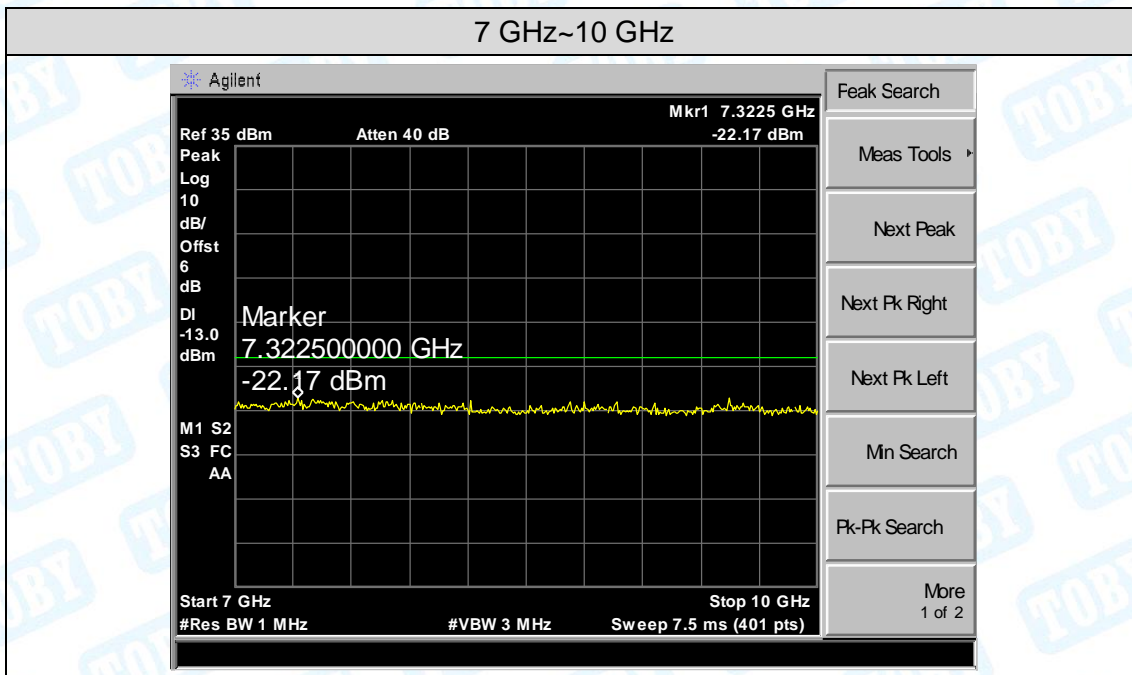


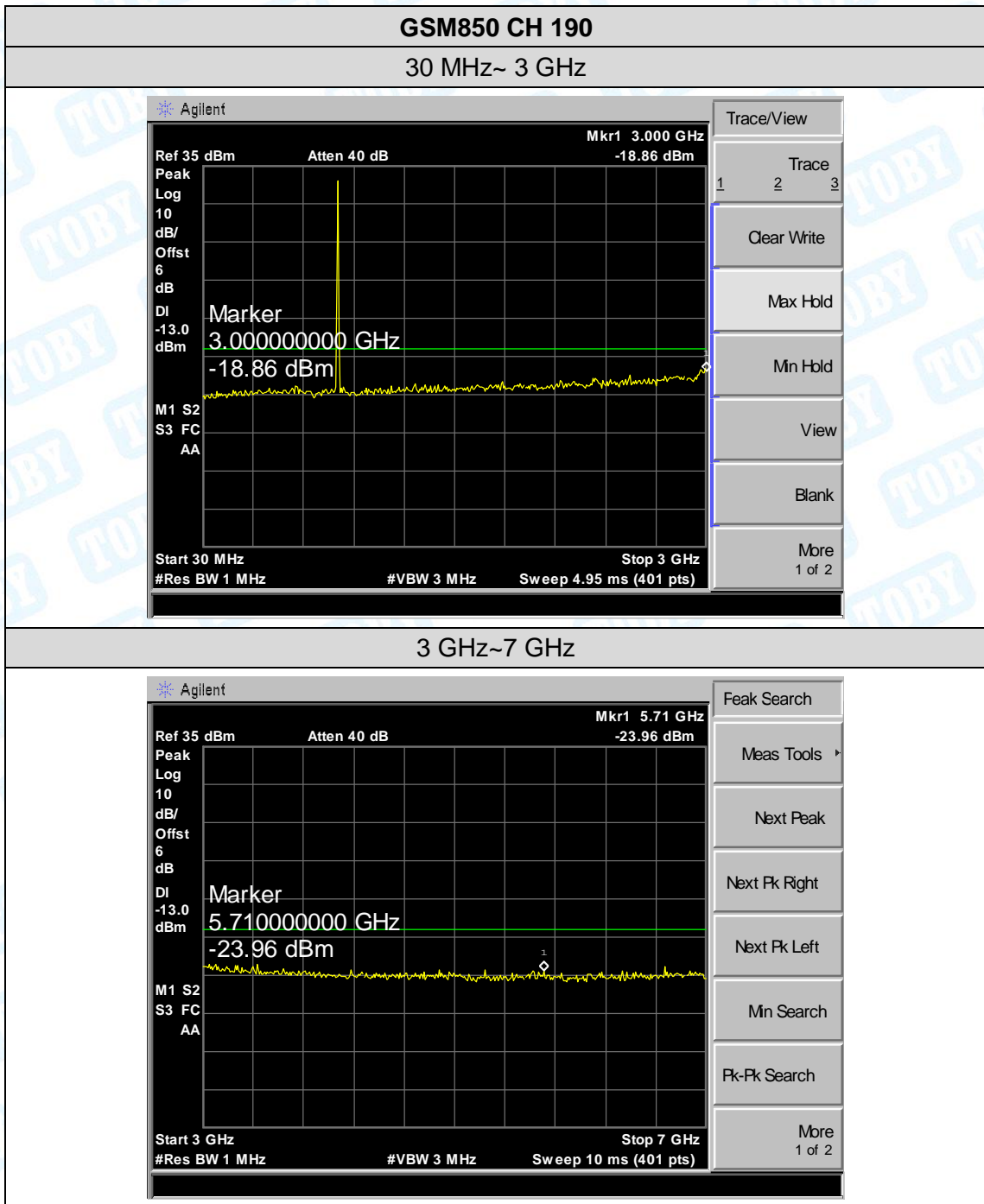


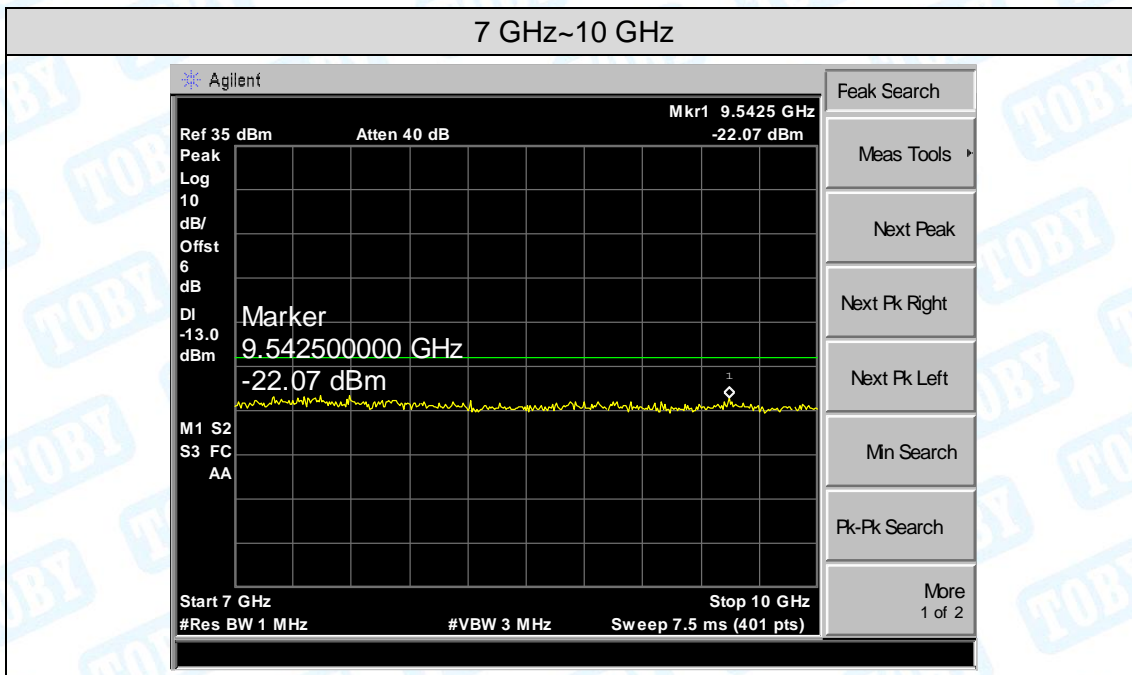
Attachment F--Conducted Out of Band Emissions

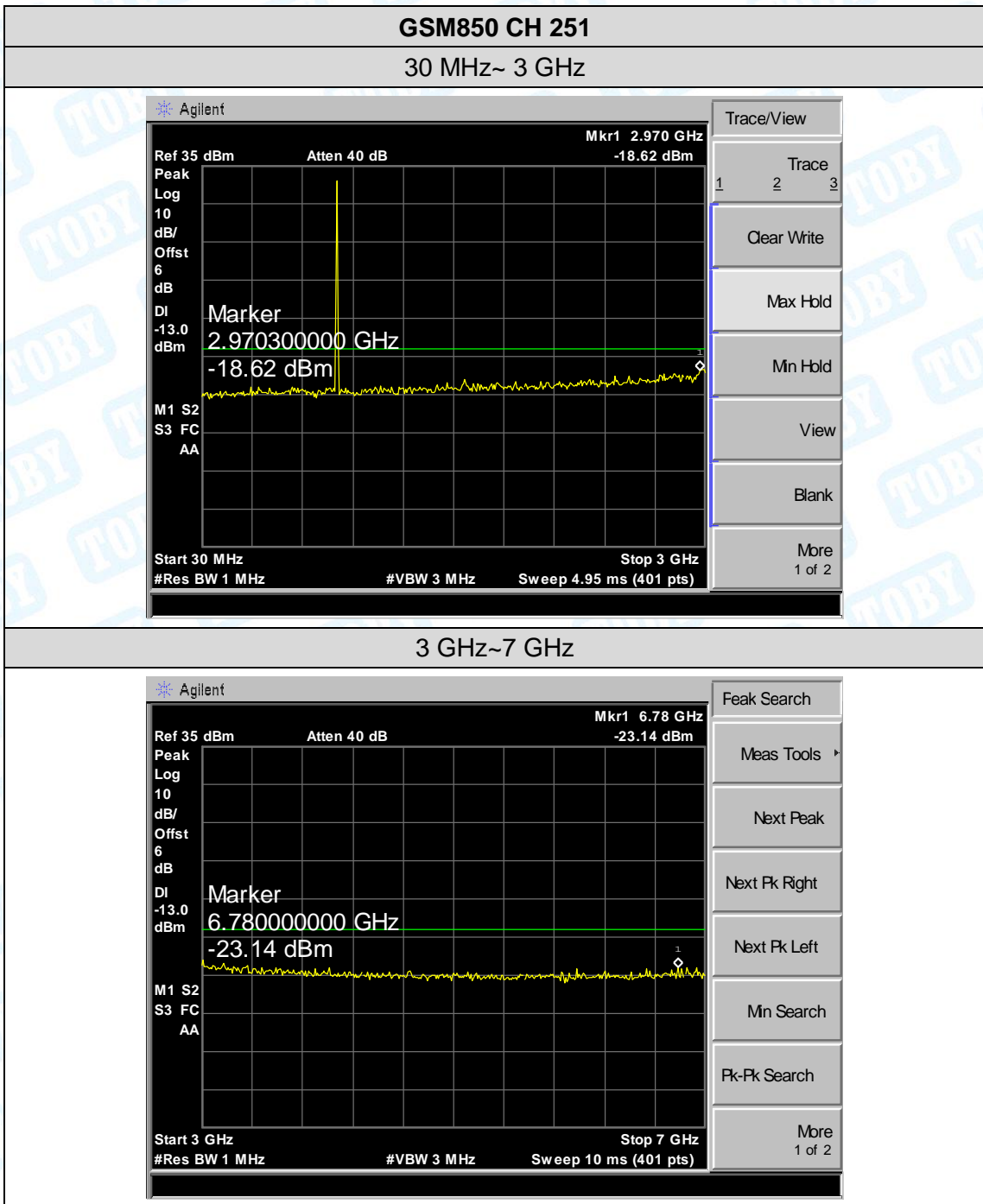
Measurement Data (worst case voice mode)

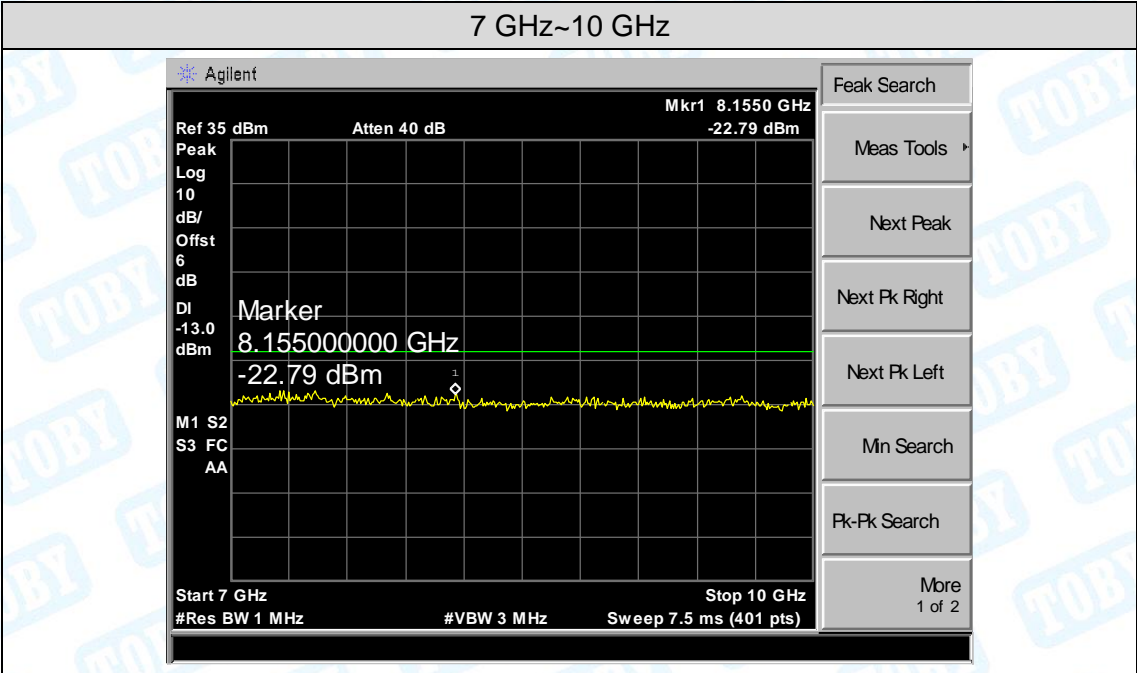


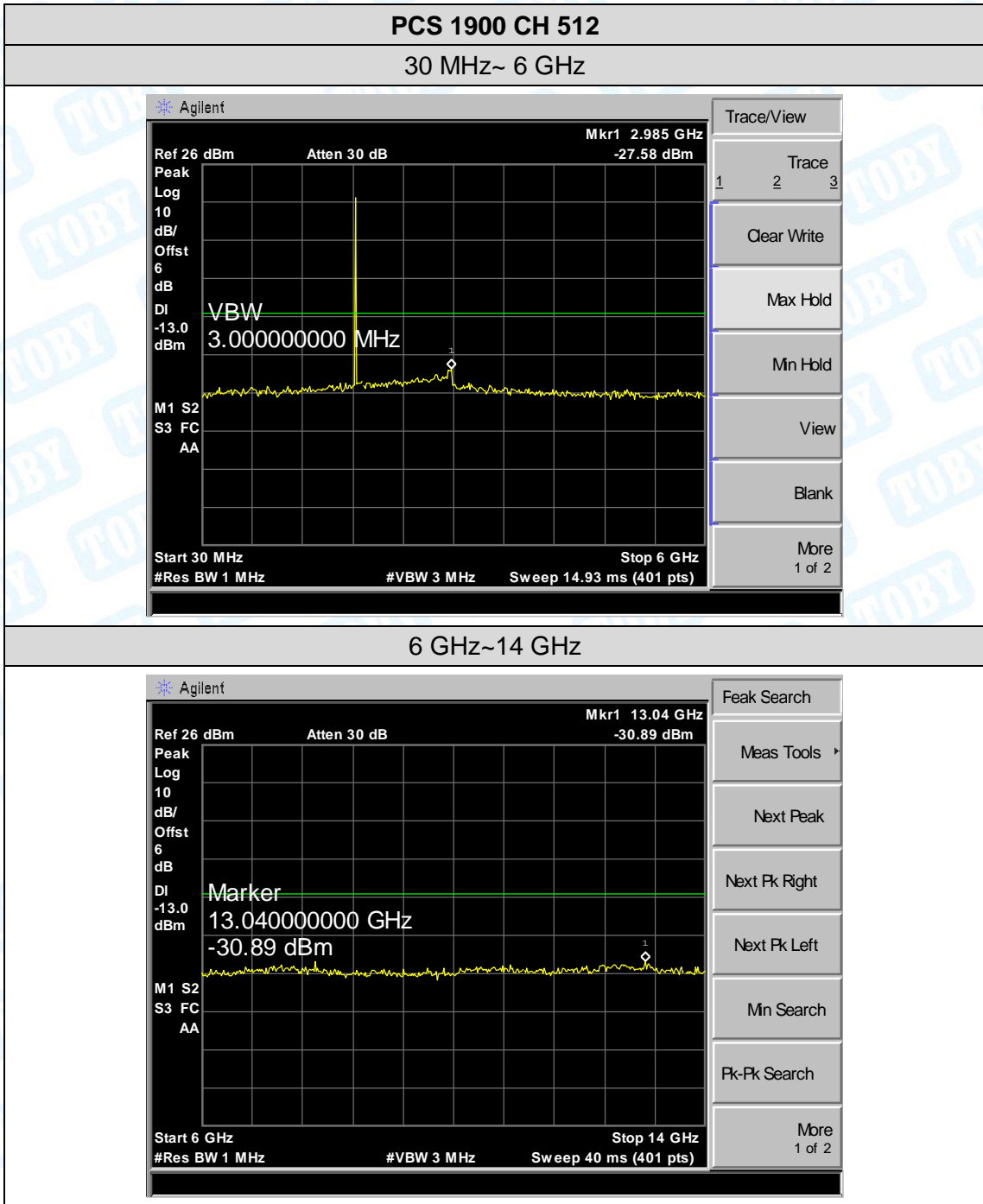


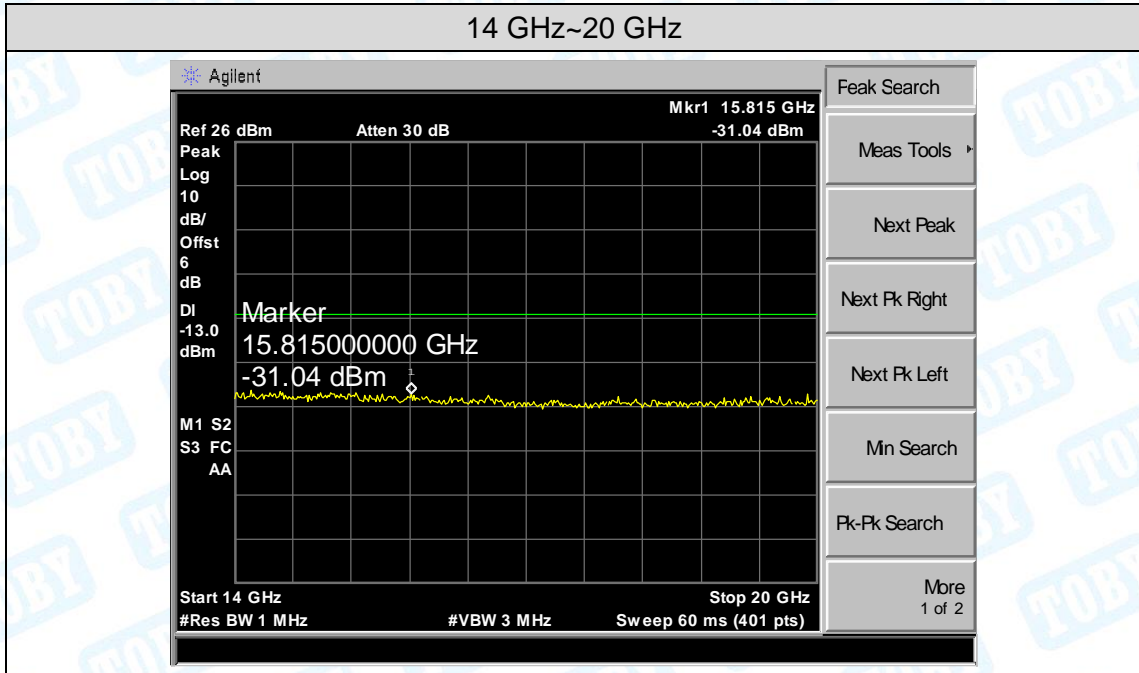


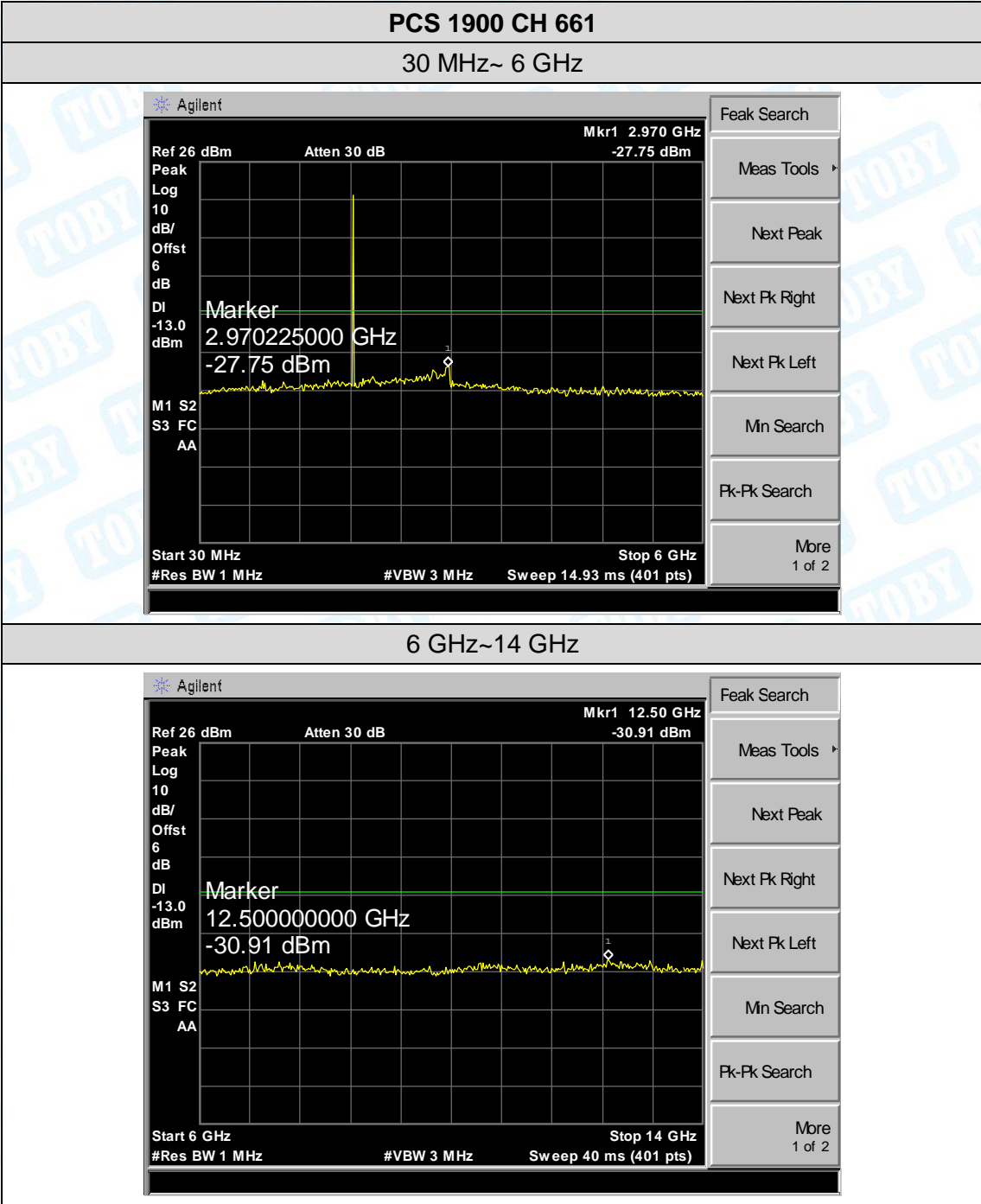


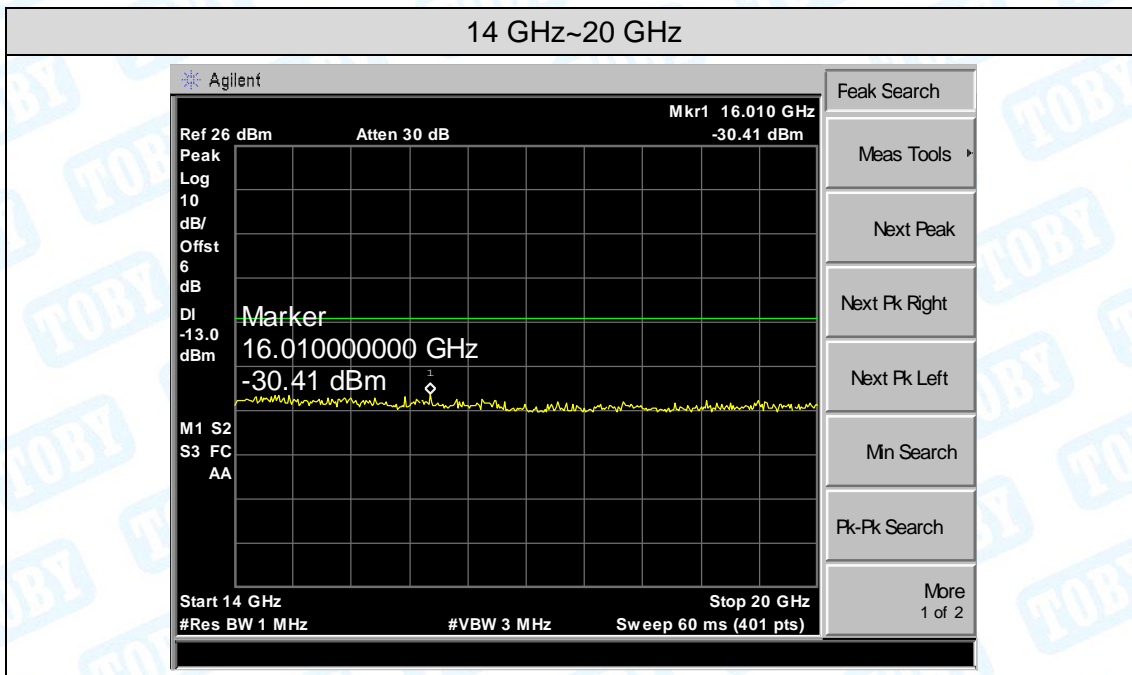


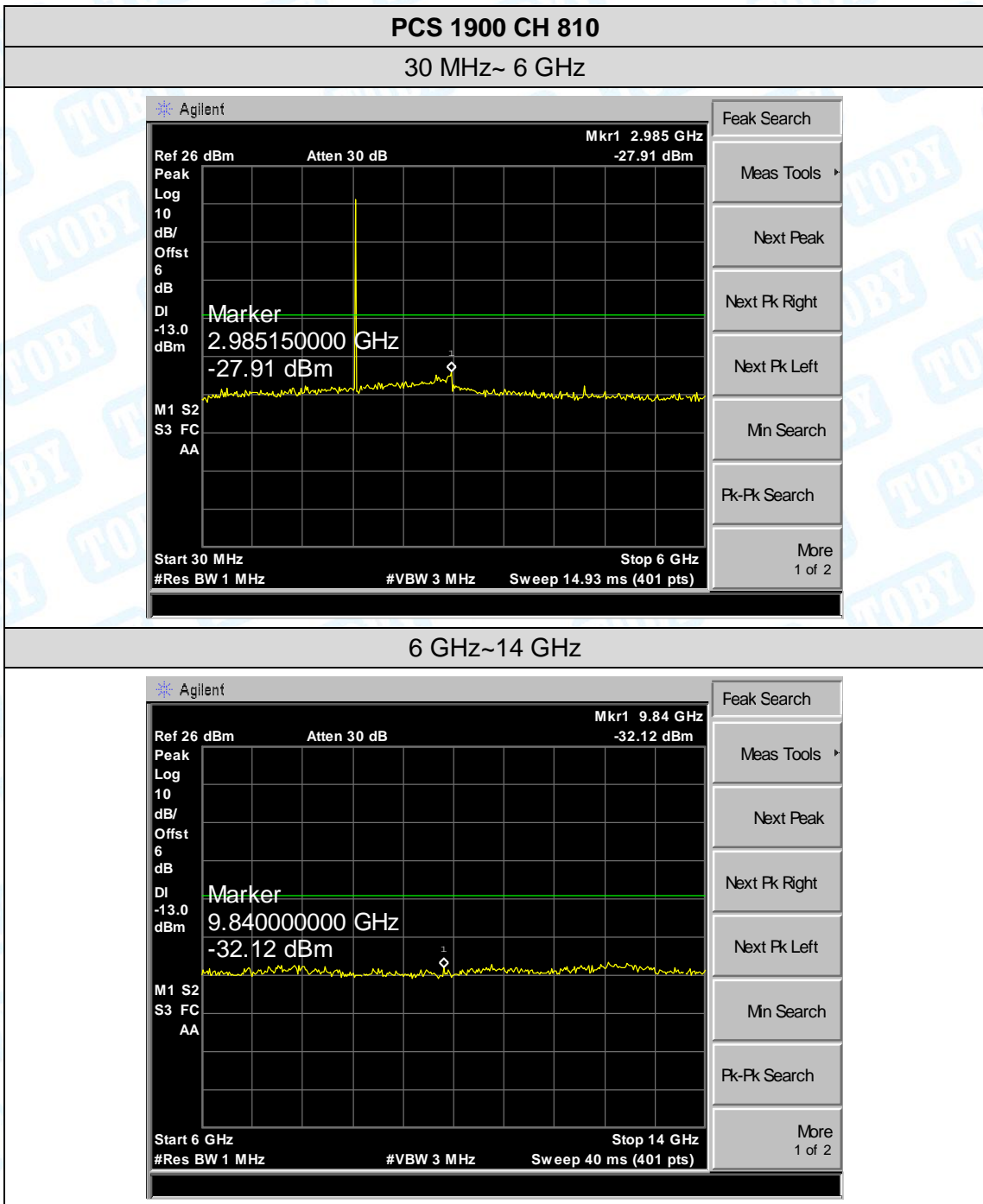


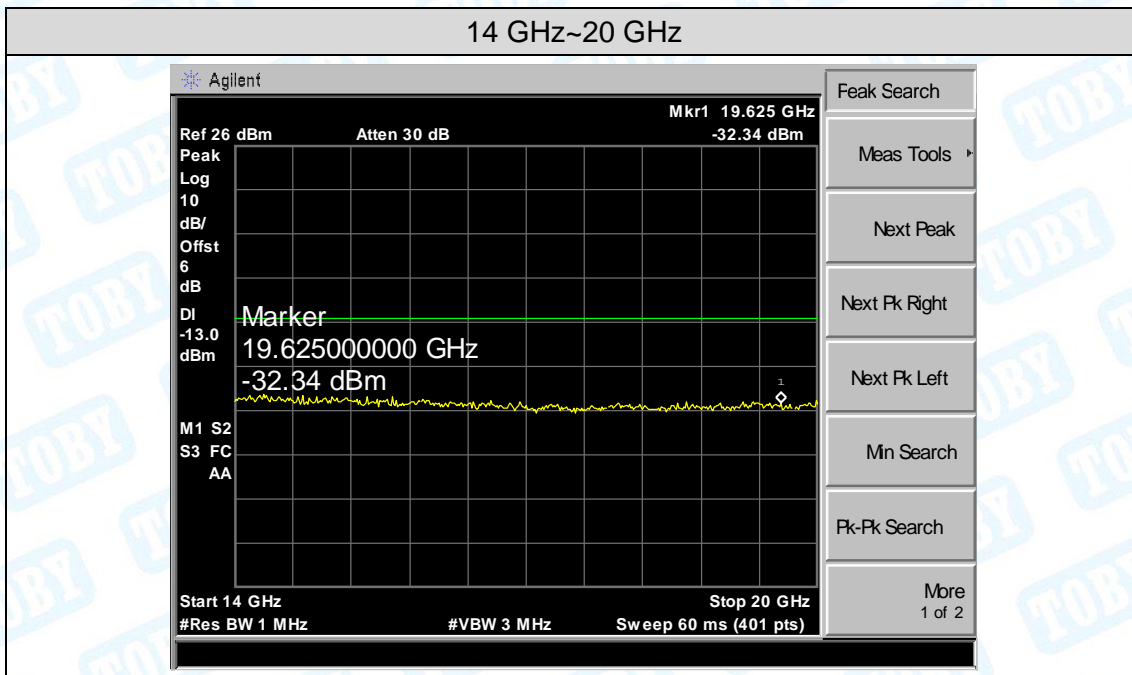


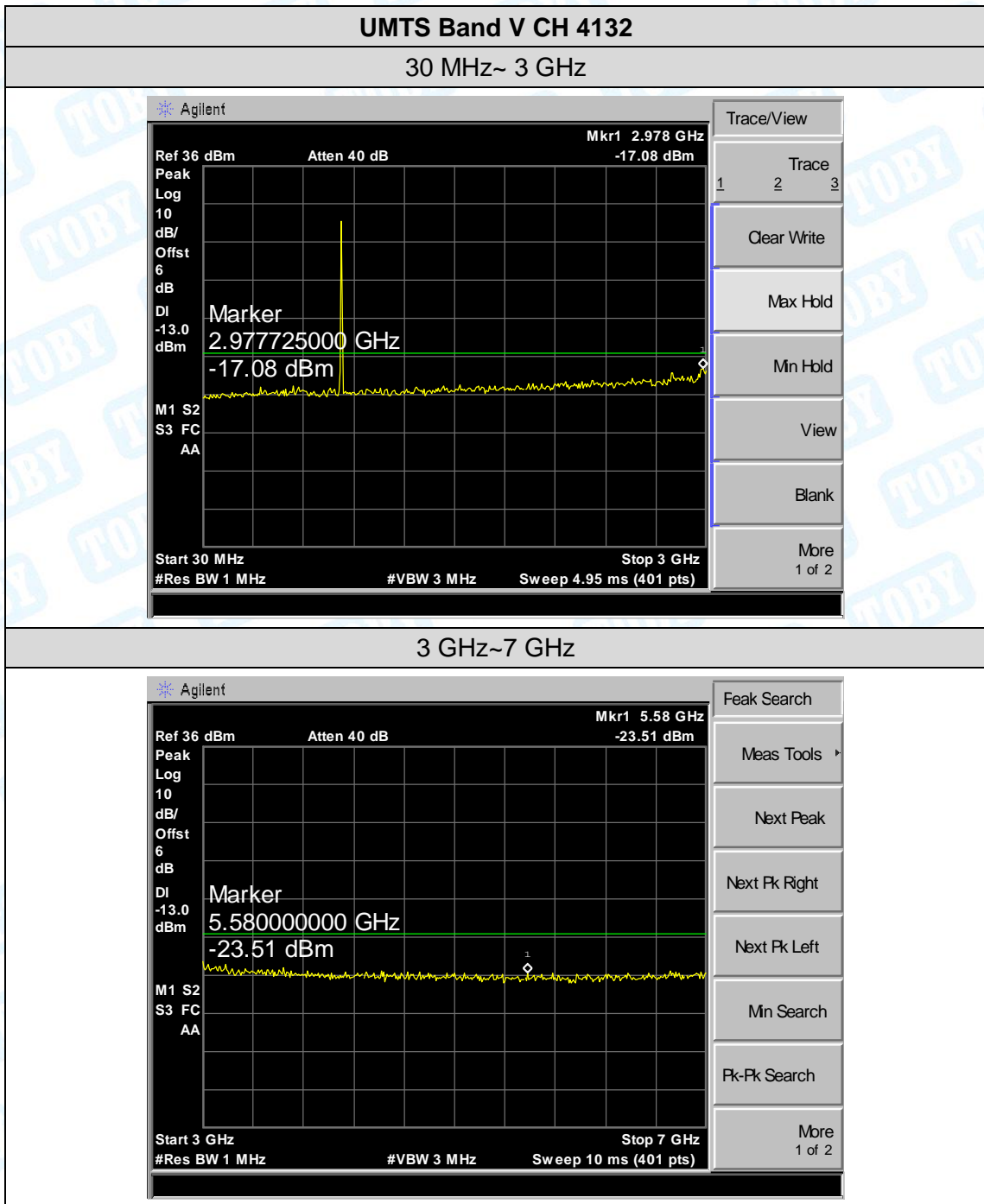


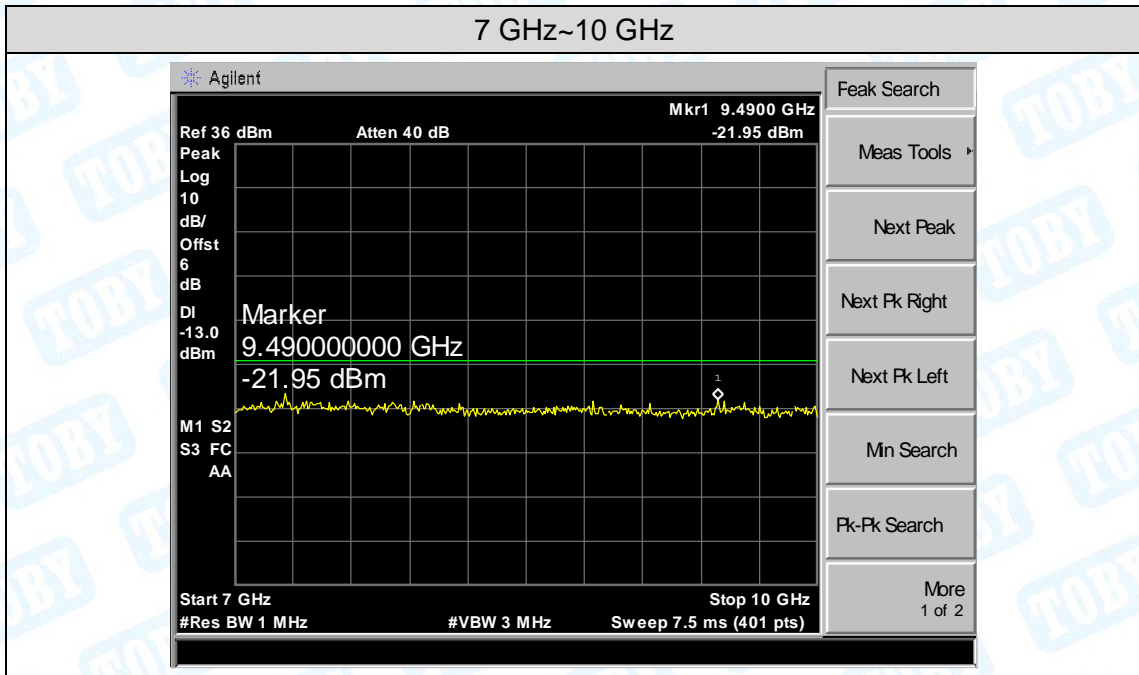


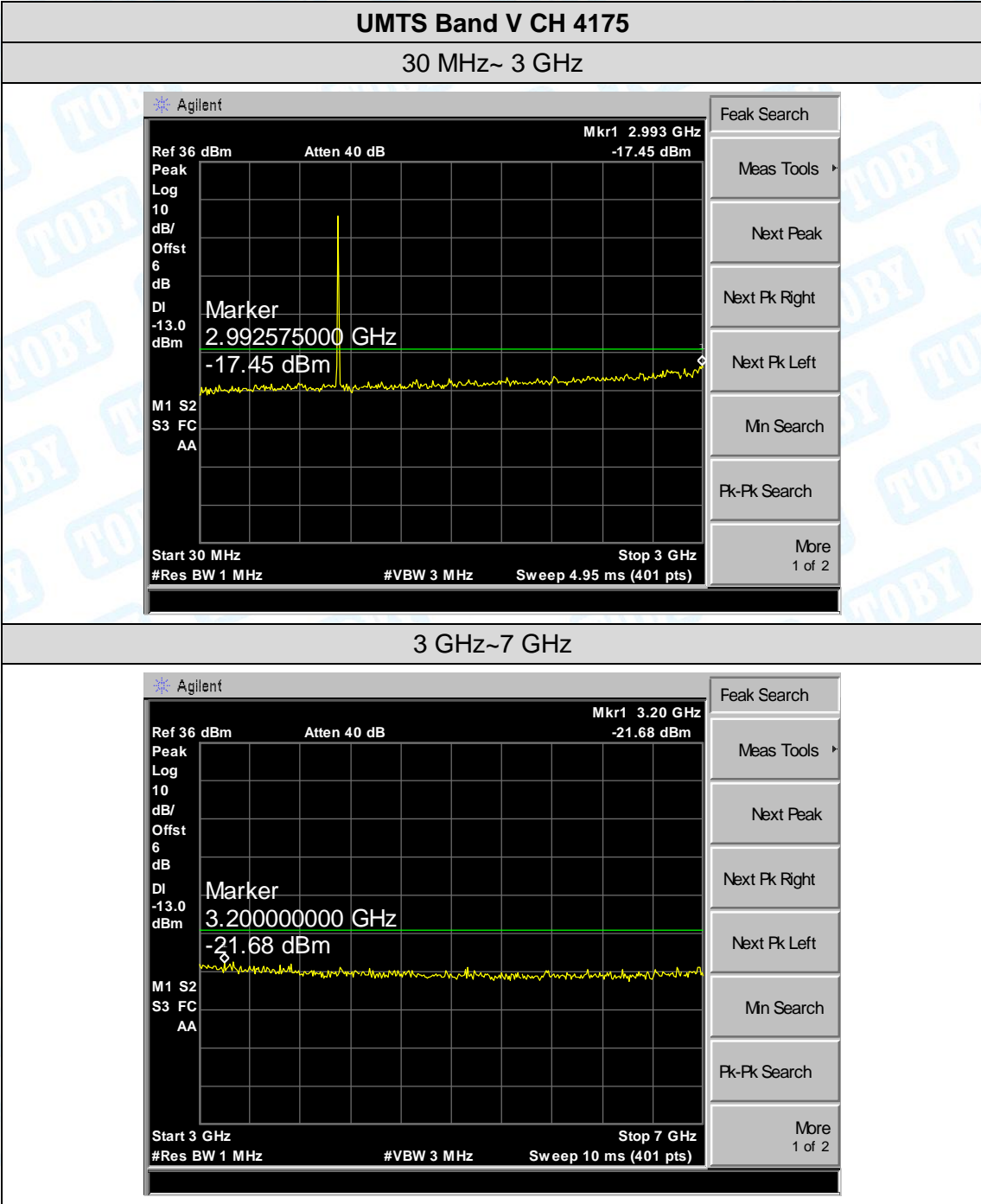


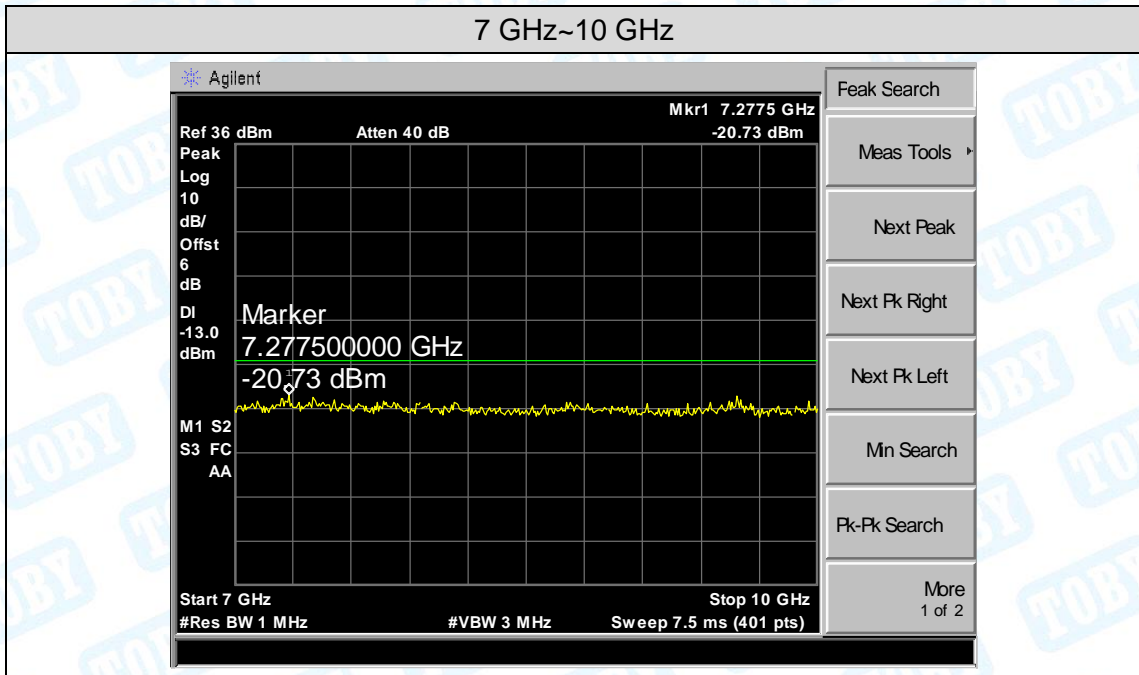


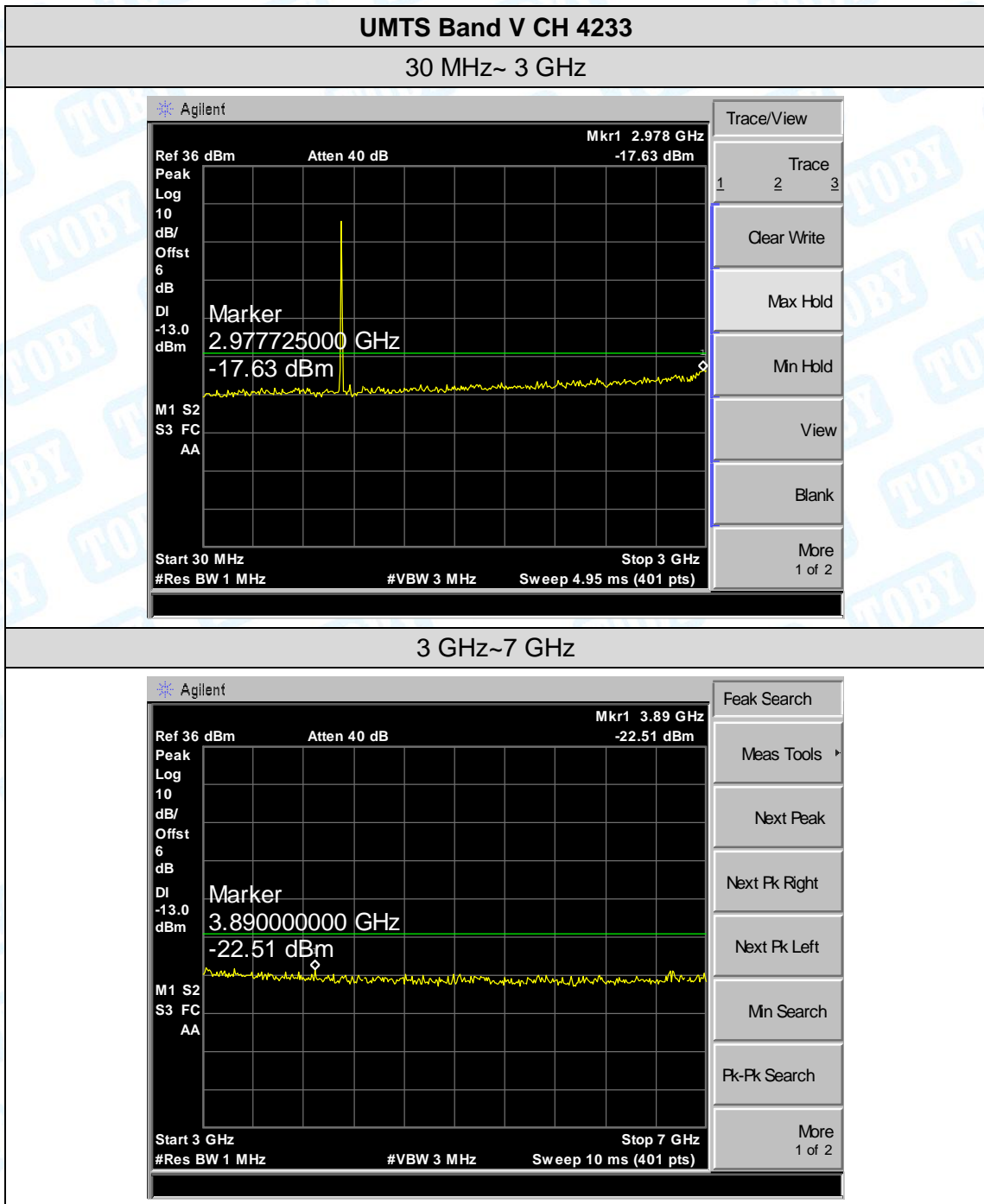


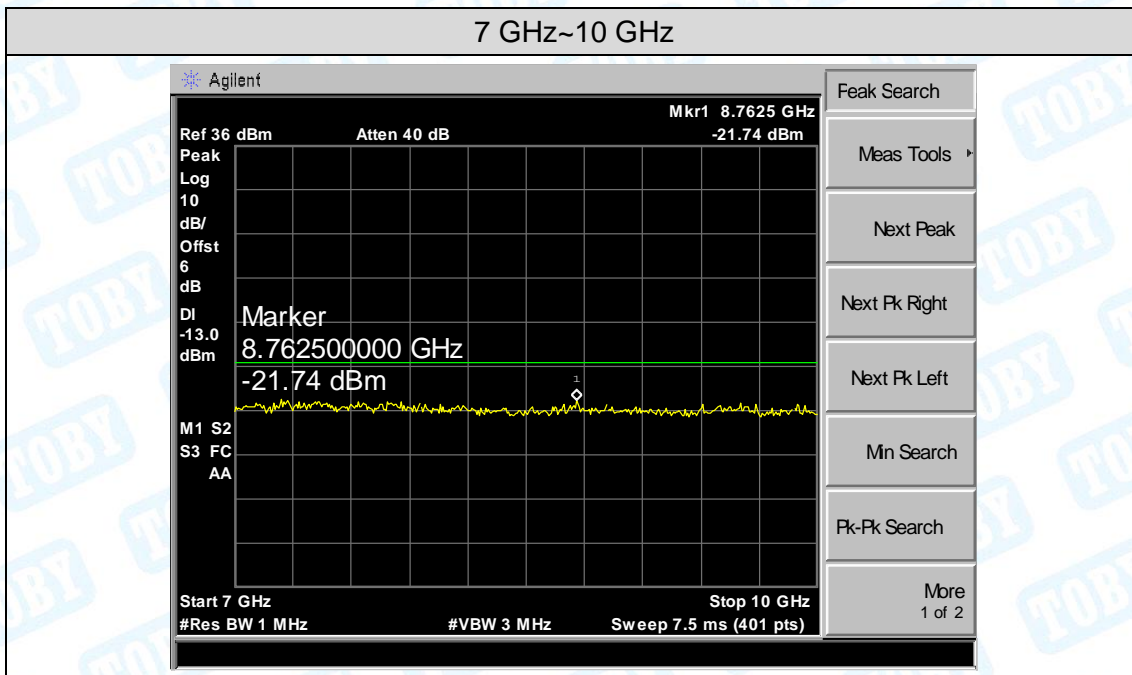


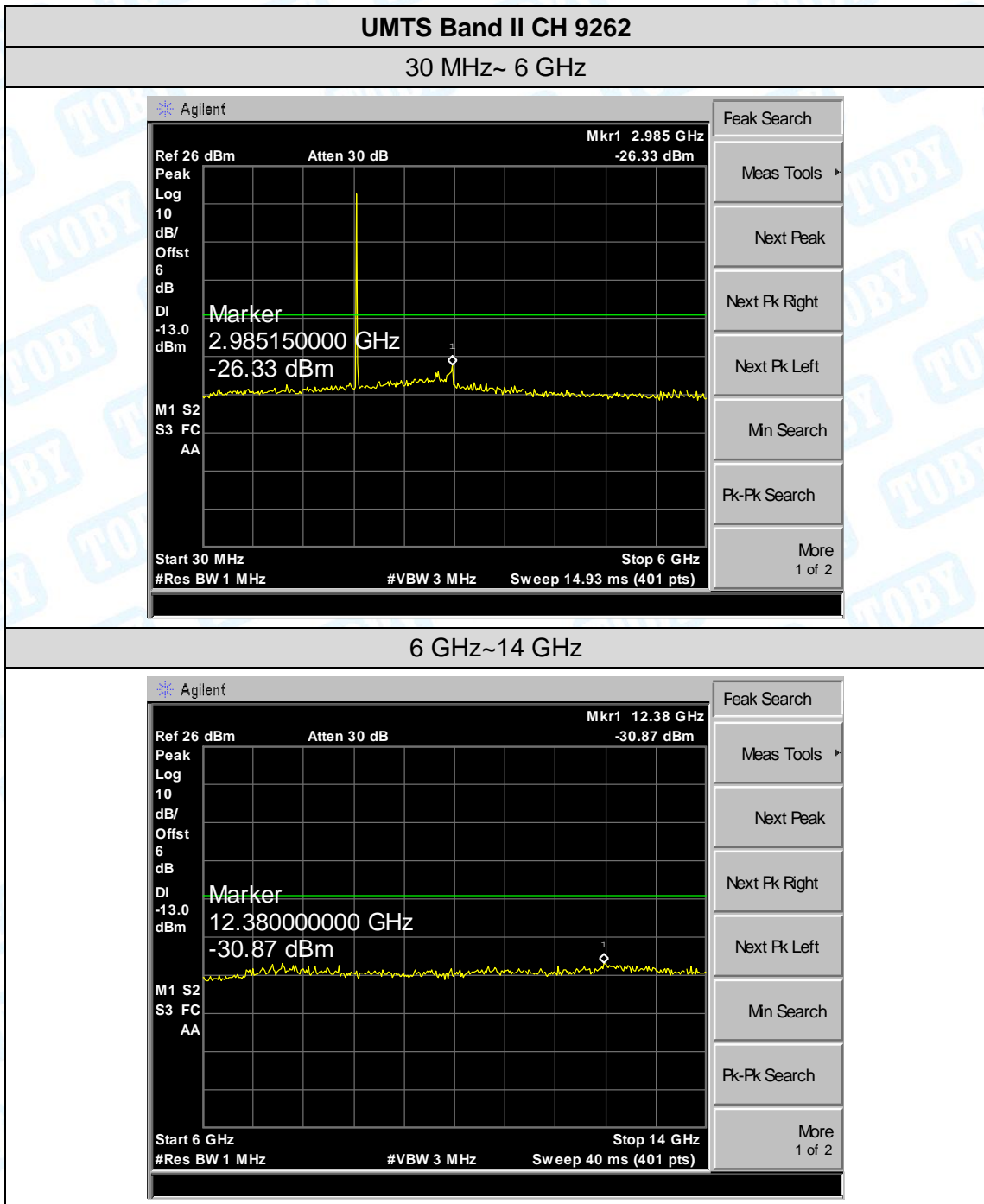


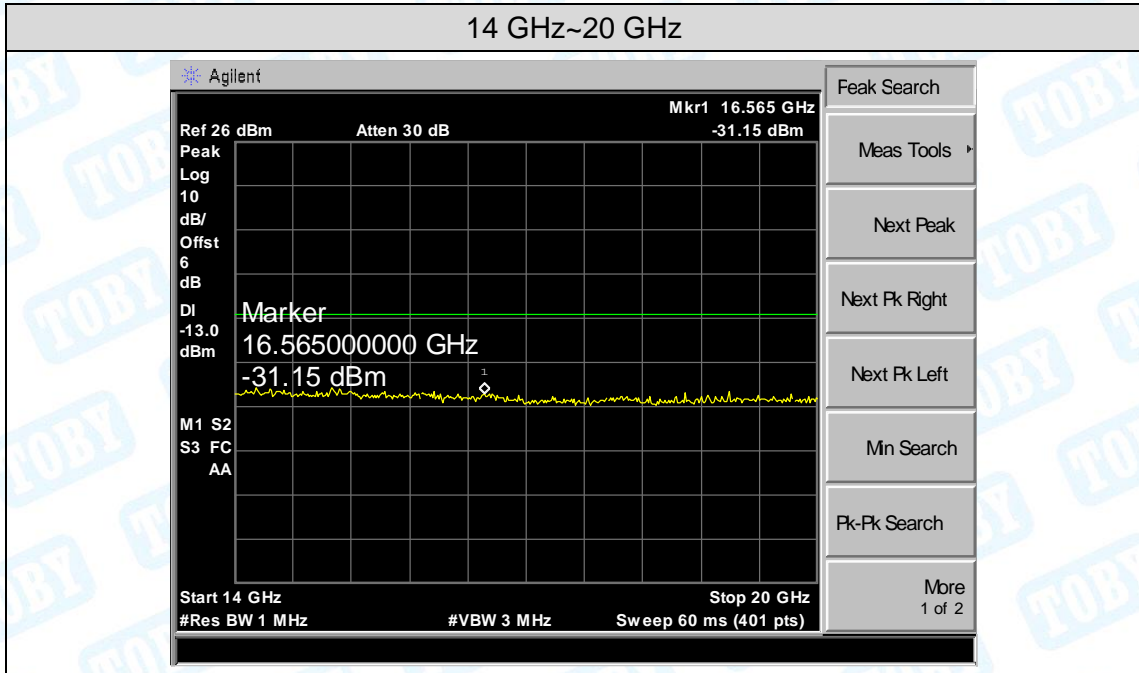


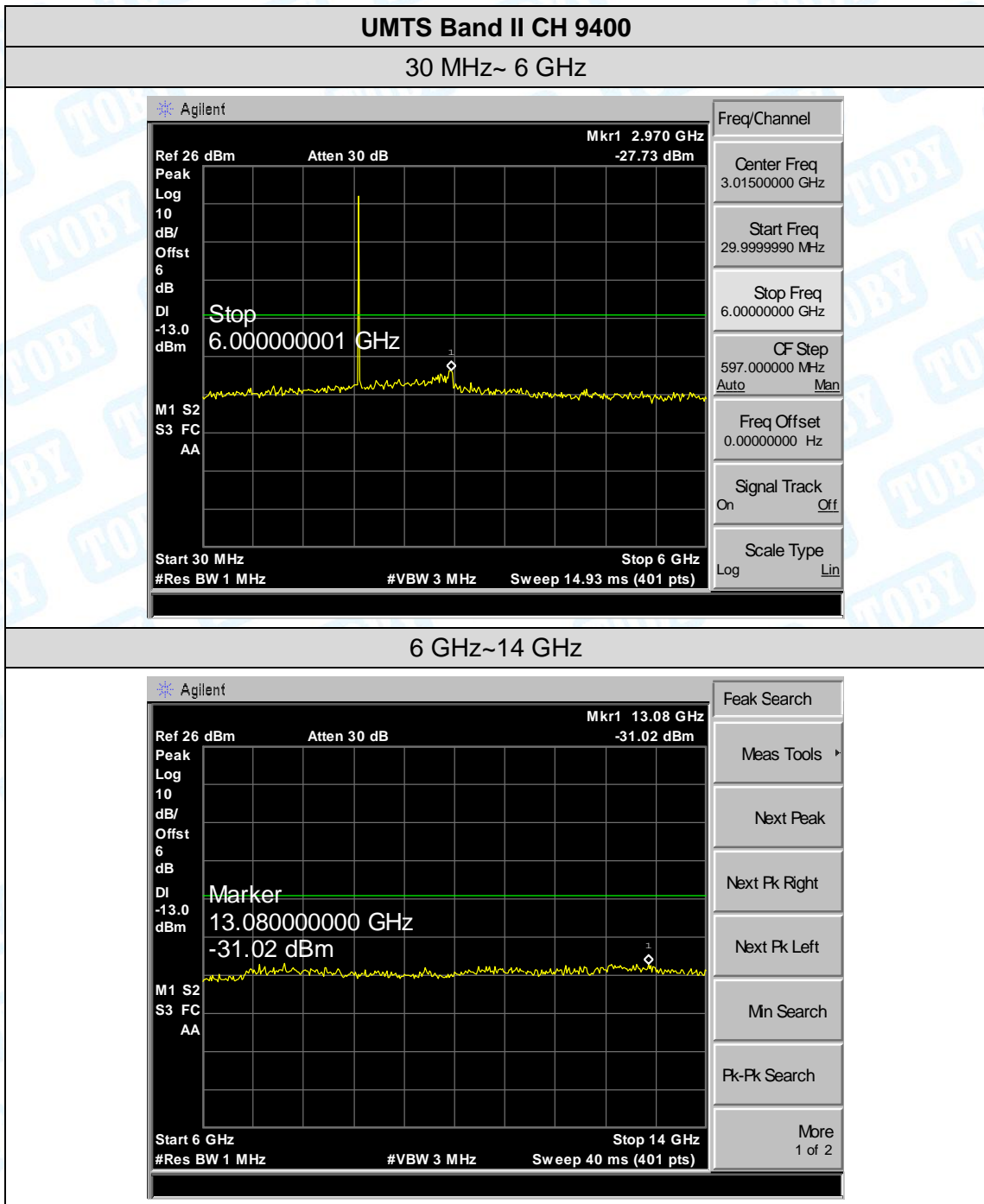


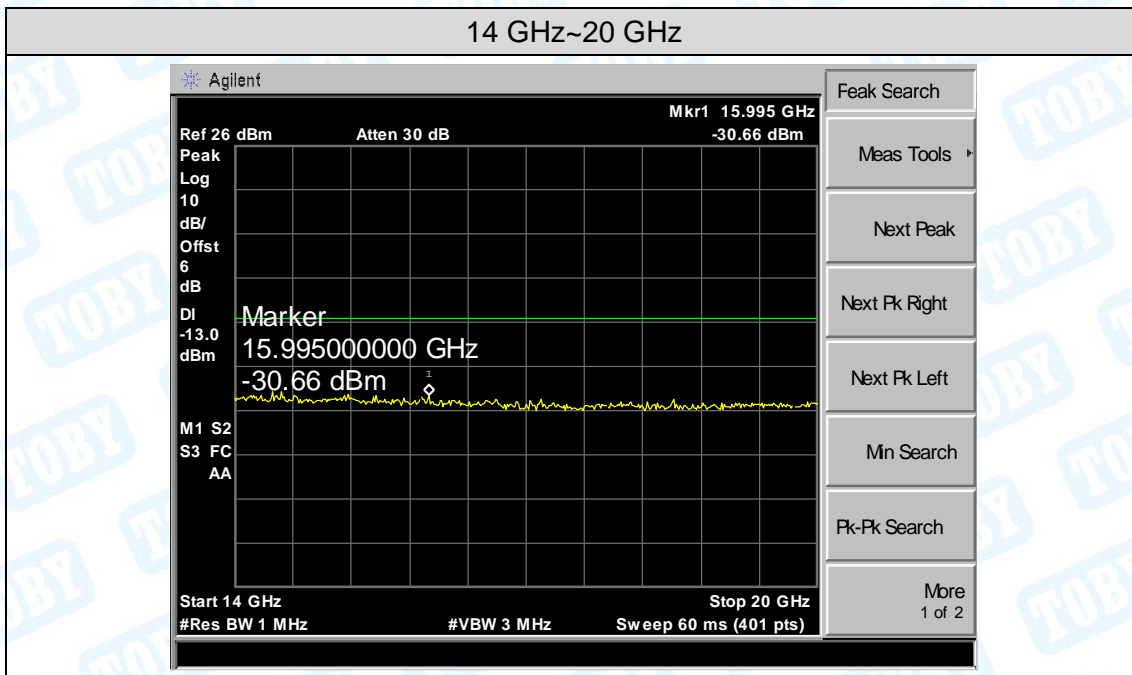


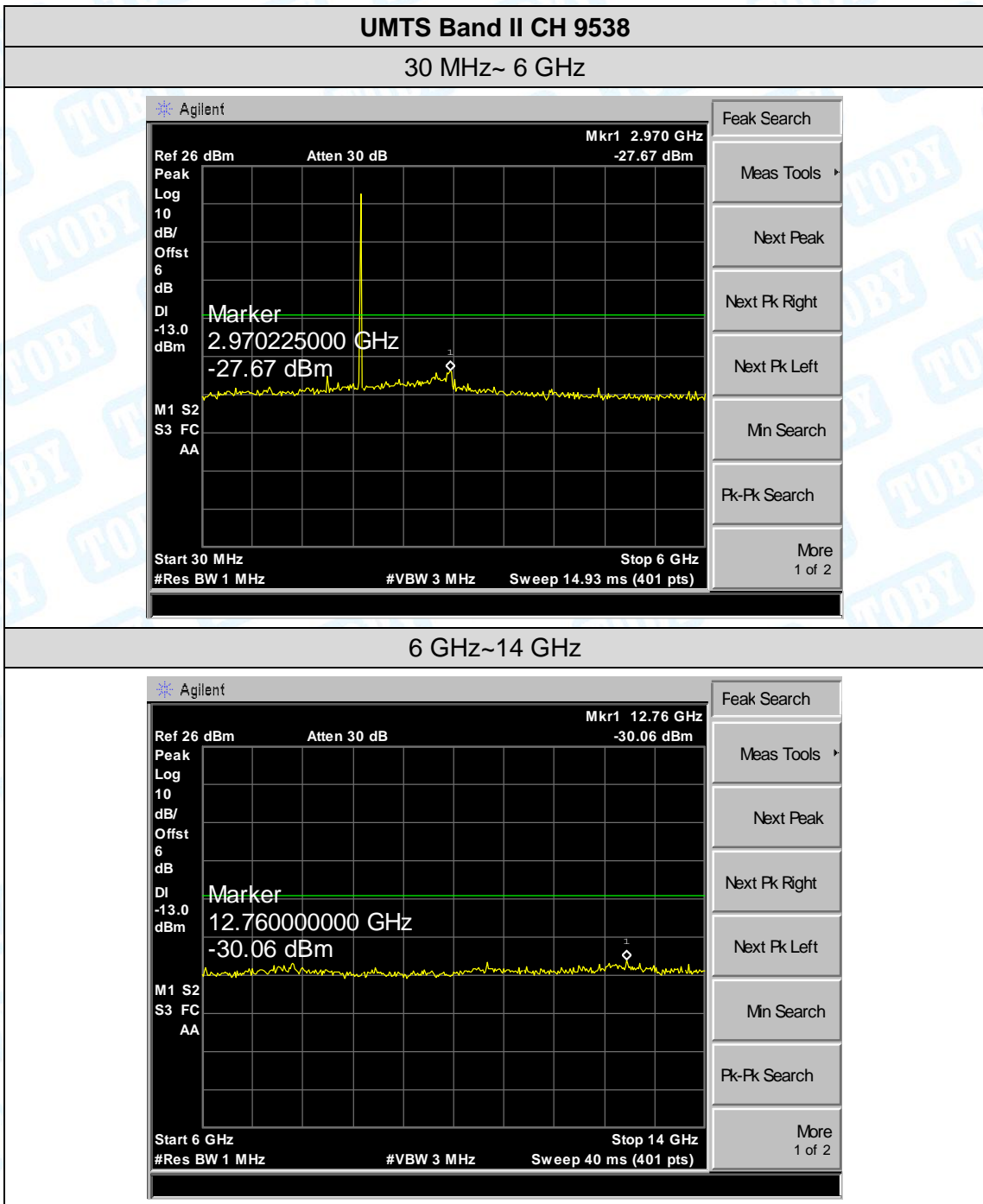


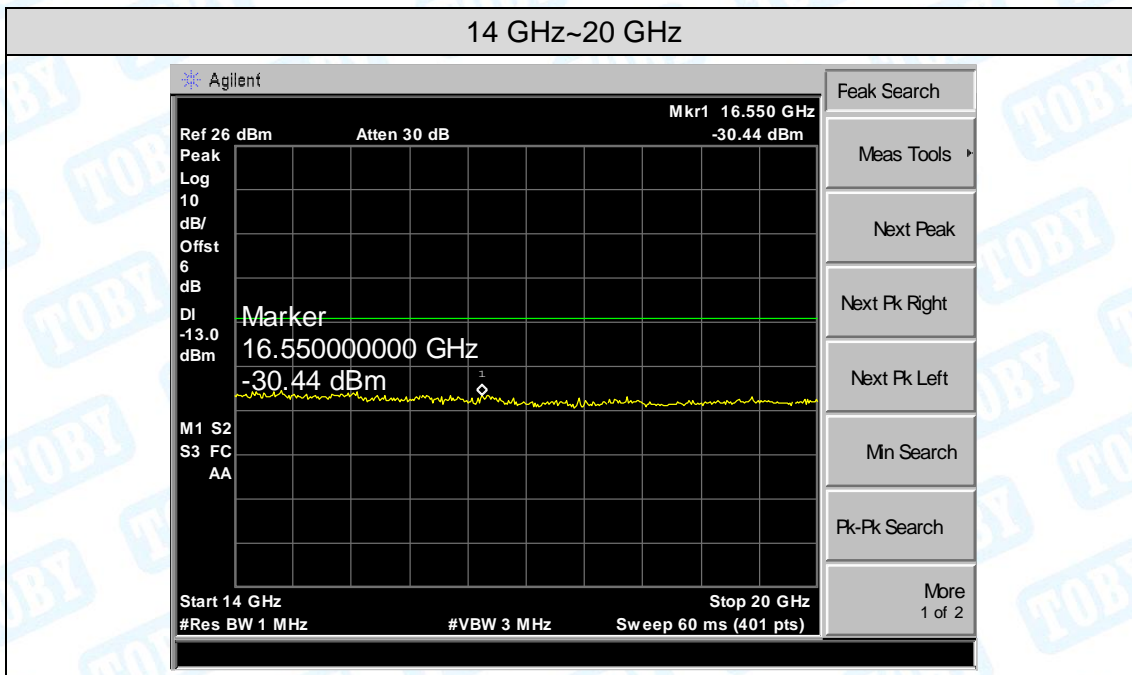








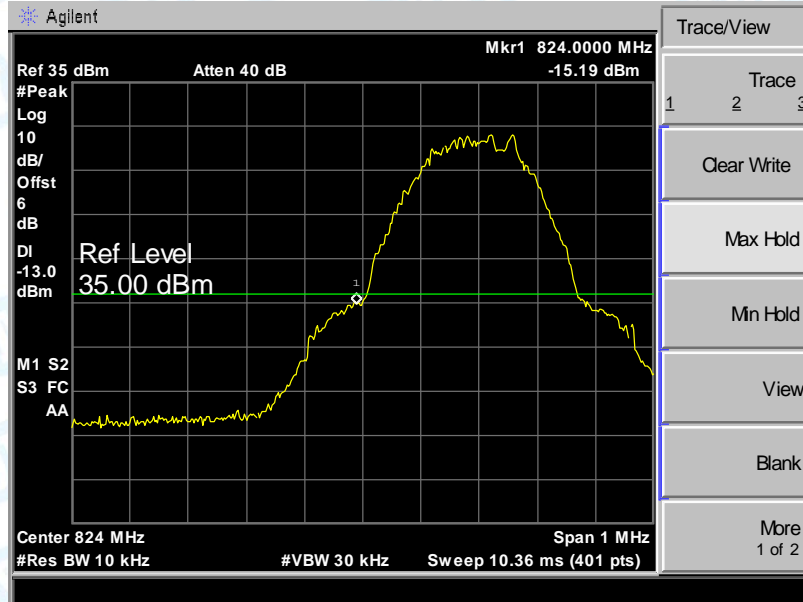




Attachment G-- Band Edge Test

Measurement Data (worst case voice mode)

Test Mode:	GSM 850
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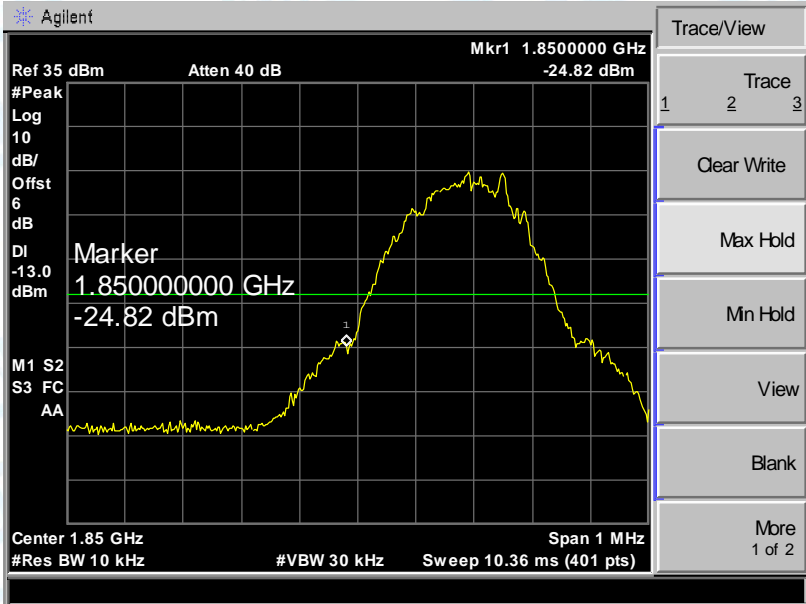


Lowest channel

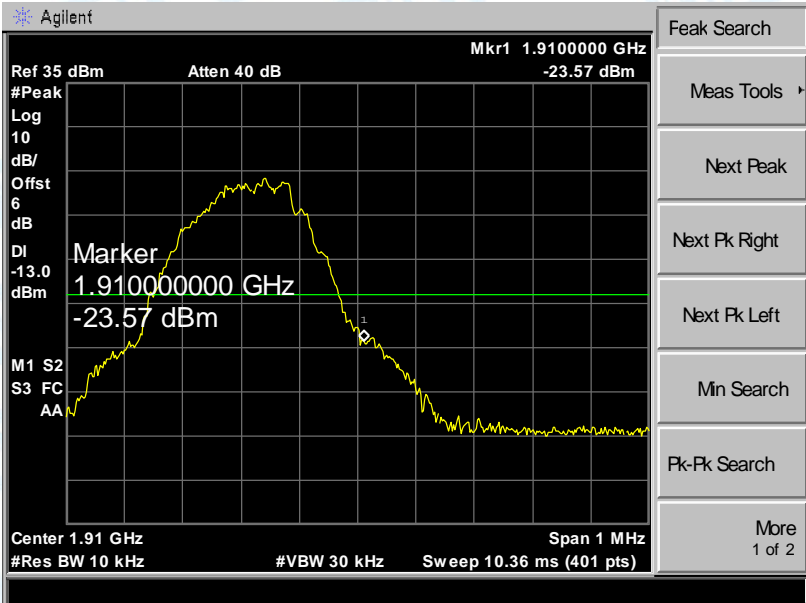


Highest channel

Test Mode:	GSM1900
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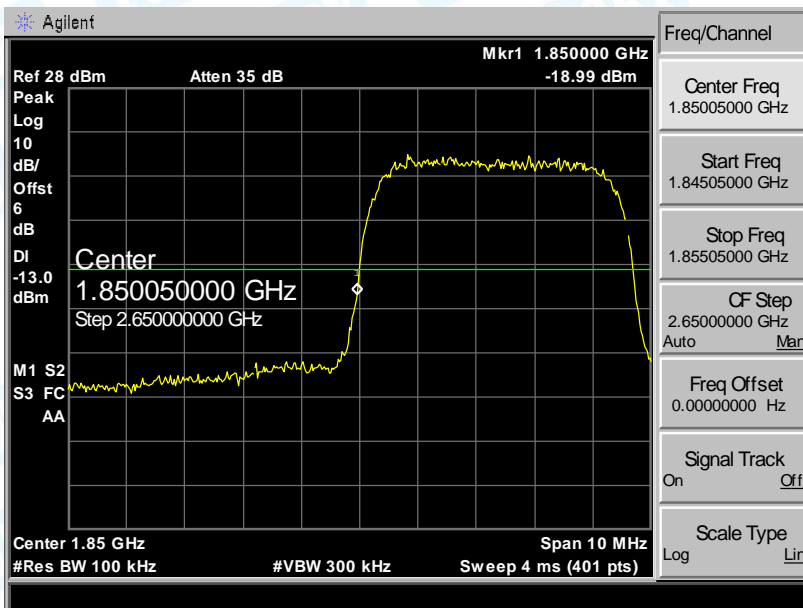


Lowest channel

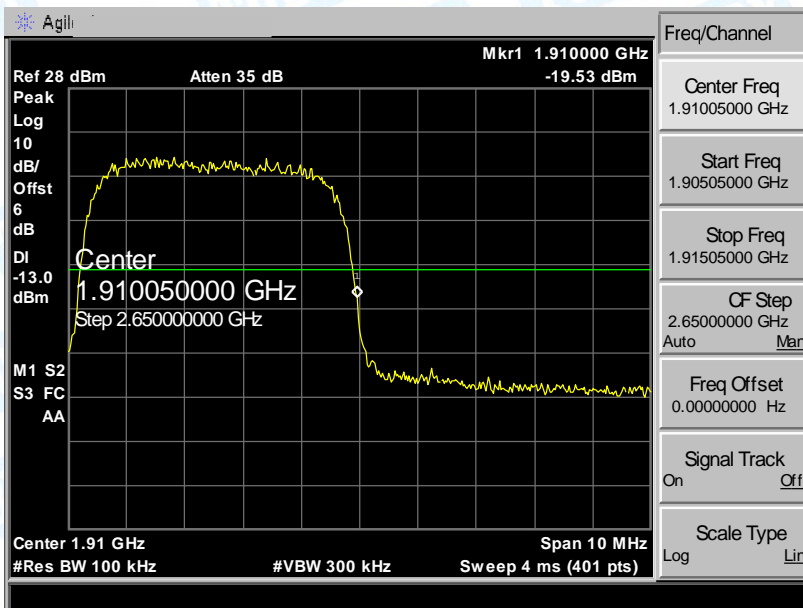


Highest channel

Test Mode: UMTS Band V voice

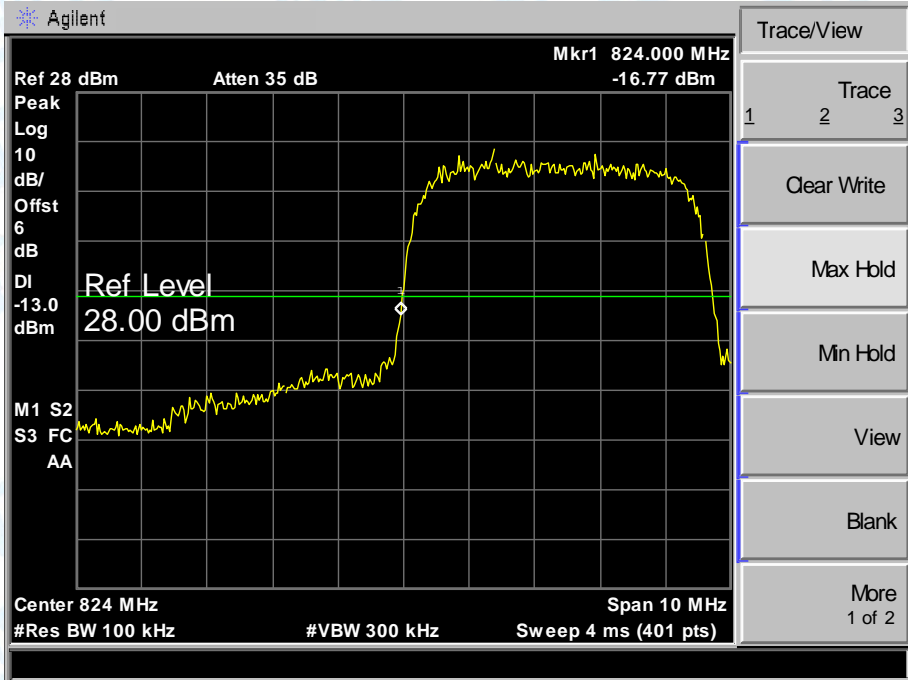


Lowest channel

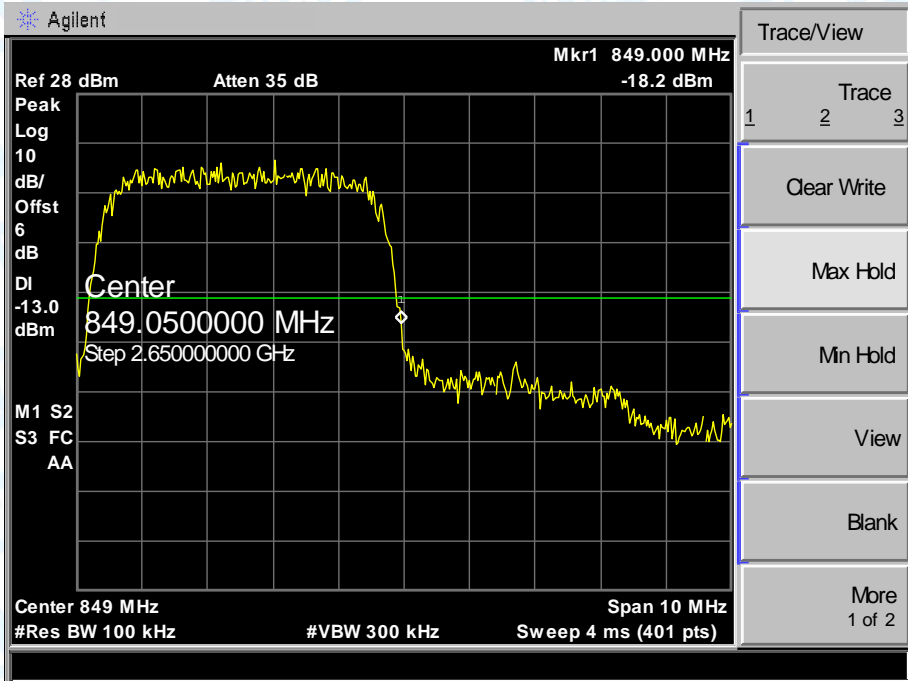


Highest channel

Test Mode: UMTS Band II voice



Lowest channel



Highest channel

Attachment H--Radiated Out Band of Emissions

Measurement Data (worst case voice mode)

Test mode:		GSM 850					
Channel:	Middle	Date of Test:	2021-02-23				
Horizontal							
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	dB
							Detector
1		1670.000	-52.83	8.75	-44.08	-13.00	-31.08 peak
2		2510.000	-47.97	10.49	-37.48	-13.00	-24.48 peak
3	*	3350.000	-55.05	18.12	-36.93	-13.00	-23.93 peak
4		4180.000	-62.86	24.14	-38.72	-13.00	-25.72 peak
Vertical							
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	dB
							Detector
1		1670.000	-53.55	8.29	-45.26	-13.00	-32.26 peak
2	*	2510.000	-54.04	12.39	-41.65	-13.00	-28.65 peak
<p>Remark: 1, The testing has been conformed to $10 \times 836.6\text{MHz} = 8,366\text{MHz}$.</p> <p>2, All other emissions more than 40 dB below the limit.</p> <p>3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss</p>							

Test mode:	GSM 1900						
Channel:	Middle	Date of Test:		2021-02-23			
Horizontal							
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	dB Detector
1		3760.000	-59.27	20.93	-38.34	-13.00	-25.34 peak
2	*	5650.000	-54.22	29.54	-24.68	-13.00	-11.68 peak
Vertical							
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	dB Detector
1		3760.000	-57.60	20.19	-37.41	-13.00	-24.41 peak
2	*	5640.000	-60.32	29.16	-31.16	-13.00	-18.16 peak
<p>Remark: 1, The testing has been conformed to $10 \times 1880.0\text{MHz} = 18,800\text{MHz}$. 2, All other emissions more than 40 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss</p>							

Test mode:		UMTS Band V					
Channel:		Middle		Date of Test:		2021-02-23	
Horizontal							
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	dB
							Detector
1		1670.000	-59.00	8.75	-50.25	-13.00	-37.25 peak
2	*	2500.000	-59.49	10.28	-49.21	-13.00	-36.21 peak
Vertical							
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	dB
							Detector
1		1670.000	-57.74	8.29	-49.45	-13.00	-36.45 peak
2	*	2500.000	-61.54	12.26	-49.28	-13.00	-36.28 peak
<p>Remark: 1, The testing has been conformed to $10 \times 836.6\text{MHz} = 8,366\text{MHz}$.</p> <p>2, All other emissions more than 40 dB below the limit.</p> <p>3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss</p>							

Test mode:		UMTS Band II					
Channel:		Middle	Date of Test:		2021-02-23		
Horizontal							
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	dB
							Detector
1		3760.000	-61.69	20.93	-40.76	-13.00	-27.76 peak
2	*	5640.000	-59.77	29.63	-30.14	-13.00	-17.14 peak
Vertical							
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	dB
							Detector
1		3760.000	-60.40	20.19	-40.21	-13.00	-27.21 peak
2	*	5640.000	-59.80	29.16	-30.64	-13.00	-17.64 peak
Remark: 1, The testing has been conformed to $10 \times 1880.0\text{MHz} = 18,800\text{MHz}$. 2, All other emissions more than 40 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss							

-----End of the Report-----