

FCC Radio Test Report

FCC ID: 2AX4E-Q8108L

Original Grant

Report No. : TB-FCC176098
Applicant : Vitek Electronics International Co., Ltd
Equipment Under Test (EUT)
EUT Name : 8 inch Tablet PC
Model No. : Q8108L-ME
Series Model No. : VK801G, VK802G, VK803G, VK804G, VK805G, VK806G, VK807G, VK808G
Brand Name : AOC, VTEX
Sample ID : TBBJ-20200916-08-3##& TBBJ-20200916-08-4#
Receipt Date : 2020-09-14
Test Date : 2020-09-15 to 2020-11-15
Issue Date : 2020-11-16
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 :

Jack

Jack Deng

Engineer Supervisor :

IVAN SU

Ivan Su

Engineer Manager :

Ray Lai

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-FCC176098	Rev.01	Initial issue of report	2020-11-16

1. General Information about EUT

1.1 Client Information

Applicant	:	Vitek Electronics International Co., Ltd
Address	:	Room 1104, 11/F., Witty Commercial Building, 1A-1L, Tung Choit St, Mong Kok, Kowloon, Hong Kong
Manufacturer	:	Vitek Electronics International Co., Ltd
Address	:	Room 1104, 11/F., Witty Commercial Building, 1A-1L, Tung Choit St, Mong Kok, Kowloon, Hong Kong

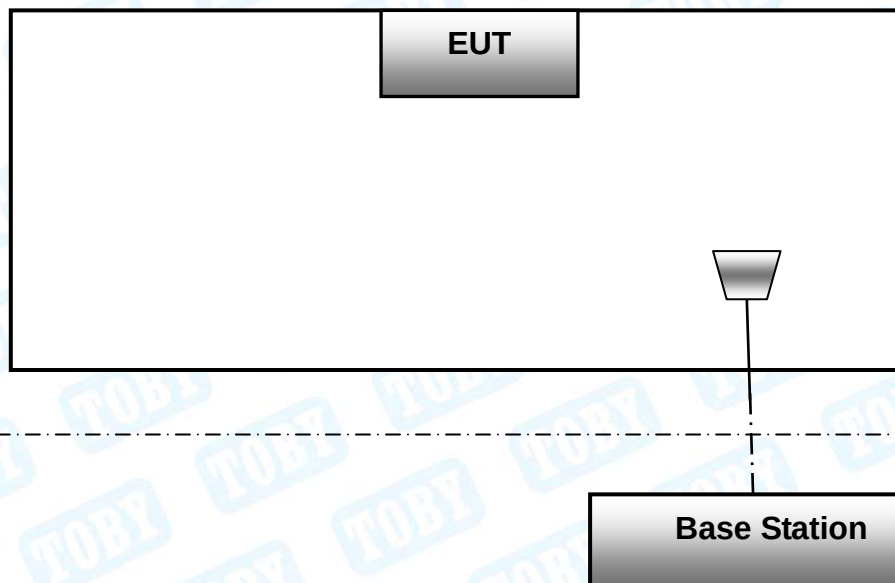
1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	8 inch Tablet PC	
Models No.	:	Q8108L-ME, VK801G, VK802G, VK803G, VK804G, VK805G, VK806G, VK807G, VK808G	
Model Difference	:	All these models are identical in the same PCB, layout and electrical circuit, The only difference is appearance.	
Product Description	:	GSM 850 Power :	Cond:33.41dBm ERP:32.64dBm
		PCS 1900 Power :	Cond:28.27dBm EIRP:26.68dBm
		UMTS Band II Power:	Cond:22.07dBm EIRP:20.56dBm
		UMTS Band V Power:	Cond:23.50dBm ERP:22.85dBm
		Antenna Gain:	2.1dB PIFA 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	:	Adapter(HTY15-0502000U) Input: AC 100-240V, 50/60Hz Output: DC 5V 2A DC 3.85V by 5000mAh Li-ion battery	
Software Version	:	android 10.0 S806	
Hardware Version	:	S706-9832E	
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(TBBJ-20200916-08-3#).	
For the RF Conduction test used the EUT-2(TBBJ-20200916-08-3#).	

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 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: 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.

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	17I00015SNO26	Sep. 11, 2020	Sep. 10, 2021
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO29	Sep. 11, 2020	Sep. 10, 2021
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO31	Sep. 11, 2020	Sep. 10, 2021
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO33	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:

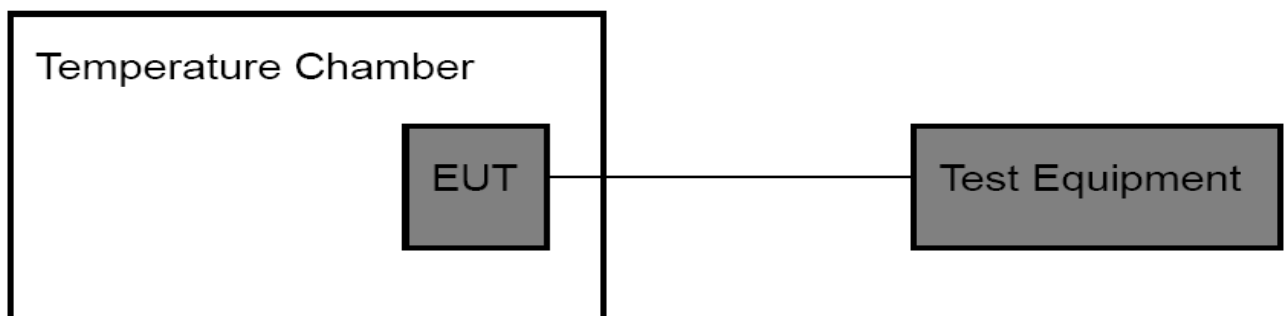
The temperature is varied from -30°C to $+50^{\circ}\text{C}$ at intervals of not more than 10°C .

(2) Primary Supply Voltage:

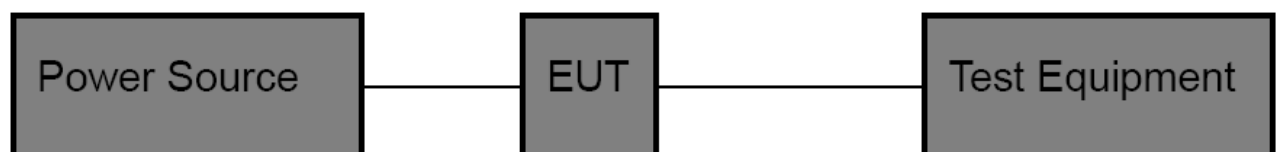
For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at input to the cable normally provide with the equipment, or at the power supply terminals if cables 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

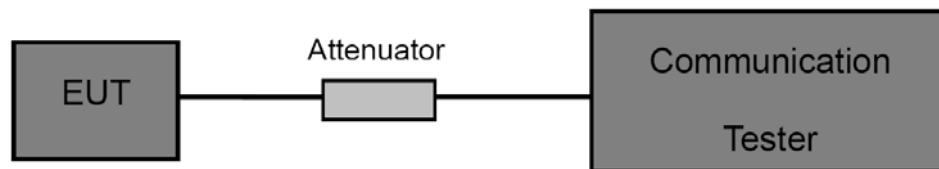
FCC Part 22H : 22.913 (a)

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.

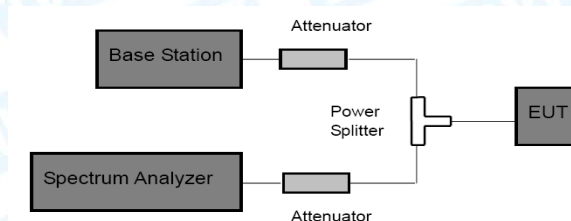
6. Peak-Average Ratio

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)

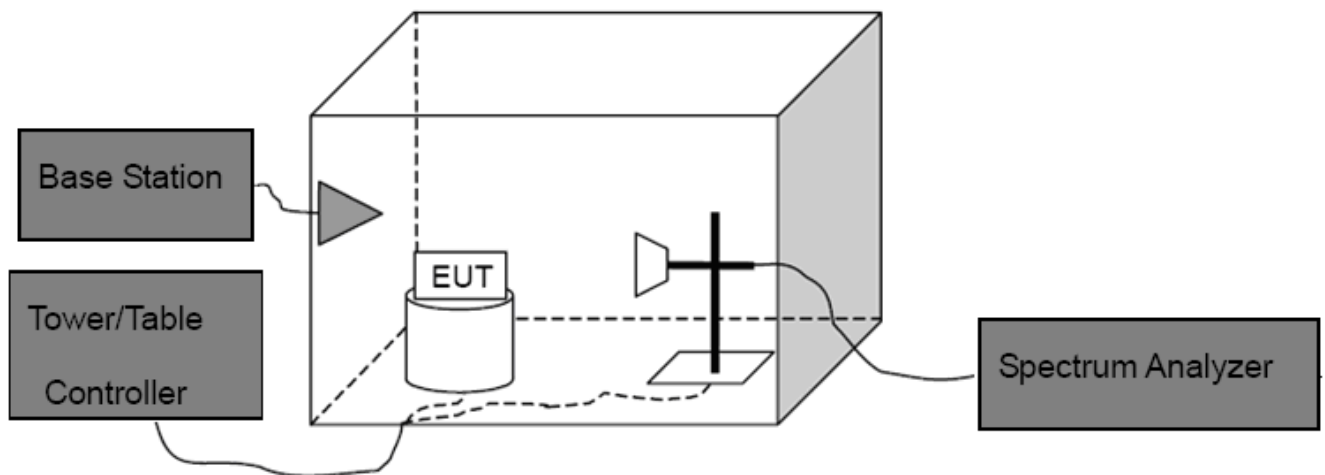
7.1.2 Test Limit

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

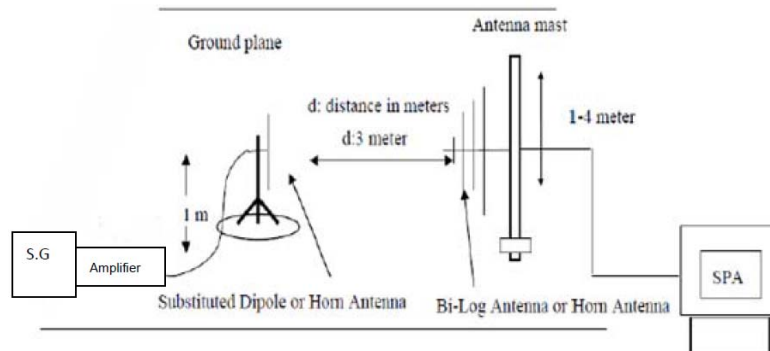
According to FCC Part 24.232 (c), the Mobile/portable stations are limited to 2 Watts(33 dBm) EIRP peak power.

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 a 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:

$$\text{ERP} = \text{S.G. Level} + \text{Antenna Gain Cord. (dBd)} - \text{Cable Loss (dB)}$$

$$\text{EIRP} = \text{S.G. Level} + \text{Antenna Gain Cord. (dBi)} - \text{Cable Loss (dB)}$$

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)

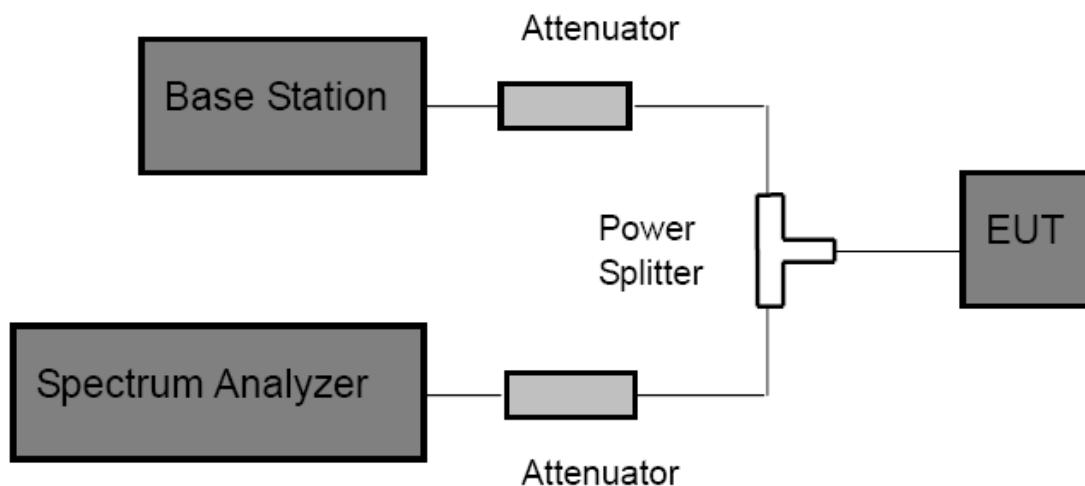
FCC Part 24E: 24.232 (c)

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 -26dB 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

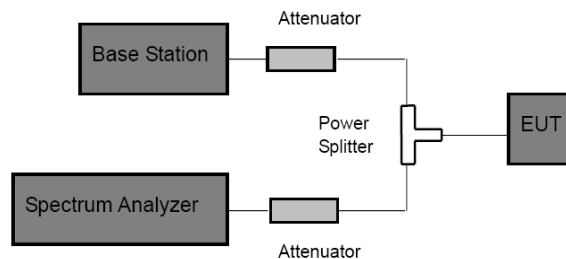
FCC Part 22H: 22.917(a)

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

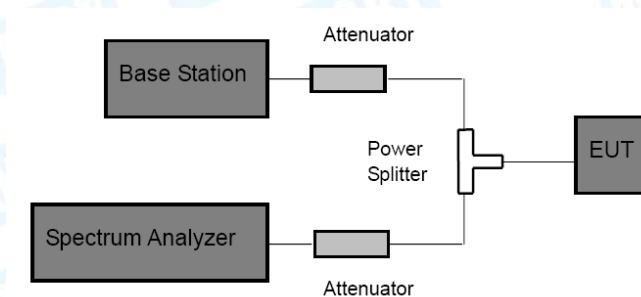
FCC Part 22H: 22.917(a)

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

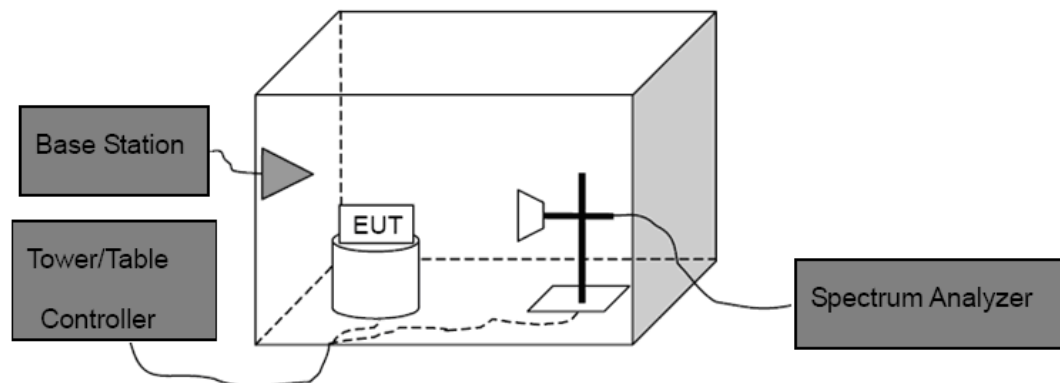
FCC Part 22H: 22.917

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 10^{th} 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= $10 \log(\text{TX power in Watts}/0.001)$ -the absolute level

Spurious attenuation limit in dB= $43+10 \log(\text{power out in Watts})$

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)	GSM		GPRS		EDGE	
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)
-30	10	0.012	11	0.013	10	0.012
-20	8	0.010	15	0.018	9	0.011
-10	6	0.007	10	0.012	9	0.011
0	5	0.006	20	0.024	12	0.014
10	12	0.014	16	0.019	11	0.013
20	13	0.016	5	0.006	10	0.012
30	11	0.013	7	0.008	12	0.014
40	9	0.011	10	0.012	10	0.012
50	10	0.012	6	0.007	13	0.016
60	12	0.014	9	0.011	14	0.017
Limit	2.5 (ppm)					
Result	PASS					

Temperature Variation GSM 1900 (CH661)						
Temperature (°C)	GSM		GPRS		EDGE	
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)
-30	13	0.020	21	0.032	13	0.020
-20	9	0.014	10	0.015	10	0.015
-10	15	0.023	19	0.029	10	0.015
0	10	0.015	16	0.024	9	0.014
10	13	0.020	10	0.015	13	0.020
20	14	0.021	16	0.024	15	0.023
30	13	0.020	18	0.027	11	0.017
40	10	0.015	14	0.021	13	0.020
50	9	0.014	12	0.018	18	0.027
60	7	0.011	11	0.017	17	0.026
Limit	2.5 (ppm)					
Result	PASS					

Temperature Variation UMTS Band V (CH 4183)		
Temperature (°C)	RMC Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
-30	9	0.011
-20	8	0.010
-10	10	0.012
0	11	0.013
10	8	0.010
20	4	0.005
30	3	0.004
40	9	0.011
50	5	0.006
60	8	0.010
Limit	2.5 (ppm)	
Result	PASS	

Temperature Variation UMTS Band II (CH 9400)		
Temperature (°C)	RMC Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
-30	10	0.005
-20	16	0.009
-10	12	0.006
0	10	0.005
10	9	0.005
20	5	0.003
30	7	0.004
40	9	0.005
50	9	0.005
60	11	0.006
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)
3.50	12	0.014	9	0.011	10	0.012
3.85	10	0.012	11	0.013	12	0.014
4.20	14	0.017	13	0.016	14	0.017
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)
3.50	12	0.018	13	0.020	11	0.017
3.85	11	0.017	10	0.015	9	0.014
4.20	9	0.014	13	0.020	12	0.018
Limit	2.5 (ppm)					
Result	PASS					

Voltage Variation UMTS Band V (CH 4182)		
Voltage (V)	RMC Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
3.50	10	0.012
3.85	9	0.011
4.20	8	0.010
Limit	2.5 (ppm)	
Result	PASS	

Voltage Variation UMTS Band II (CH 9400)		
Voltage (V)	RMC Mode	
	Freq. Dev. (Hz)	Deviation (ppm)
3.50	12	0.006
3.85	13	0.007
4.20	14	0.007
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	128	824.2	33.41	2.193
	190	836.6	33.11	2.046
	251	848.8	32.92	1.959
GPRS 850 (1 Slot)	128	824.2	31.50	1.413
	190	836.6	31.51	1.416
	251	848.8	31.98	1.578
GPRS 850 (2 Slot)	128	824.2	30.96	1.247
	190	836.6	30.86	1.219
	251	848.8	30.75	1.189
GPRS 850 (3 Slot)	128	824.2	30.25	1.059
	190	836.6	30.52	1.127
	251	848.8	30.45	1.109
GPRS 850 (4 Slot)	128	824.2	29.88	0.973
	190	836.6	29.86	0.968
	251	848.8	29.50	0.891
EDGE 850 (1 Slot)	128	824.2	25.64	0.366
	190	836.6	25.95	0.394
	251	848.8	25.63	0.366
EDGE 850 (2 Slot)	128	824.2	25.36	0.344
	190	836.6	25.63	0.366
	251	848.8	25.13	0.326
EDGE 850 (3 Slot)	128	824.2	24.56	0.286
	190	836.6	24.29	0.269
	251	848.8	24.36	0.273
EDGE 850 (4 Slot)	128	824.2	23.89	0.245
	190	836.6	24.74	0.298
	251	848.8	23.76	0.238

PCS 1900				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
GSM 1900	512	1850.2	27.86	0.611
	661	1880.0	27.83	0.607
	810	1909.8	27.93	0.621
GPRS 1900 (1 Slot)	512	1850.2	28.27	0.671
	661	1880.0	27.95	0.623
	810	1909.8	27.95	0.624
GPRS 1900 (2 Slot)	512	1850.2	28.16	0.655
	661	1880.0	27.32	0.540
	810	1909.8	27.65	0.582
GPRS 1900 (3 Slot)	512	1850.2	27.98	0.628
	661	1880.0	26.86	0.485
	810	1909.8	26.88	0.488
GPRS 1900 (4 Slot)	512	1850.2	26.47	0.444
	661	1880.0	24.45	0.279
	810	1909.8	26.12	0.409
EDGE 1900 (1 Slot)	512	1850.2	24.35	0.272
	661	1880.0	24.64	0.291
	810	1909.8	23.87	0.244
EDGE 1900 (2 Slot)	512	1850.2	23.68	0.233
	661	1880.0	24.64	0.291
	810	1909.8	23.87	0.244
EDGE 1900 (3 Slot)	512	1850.2	22.87	0.194
	661	1880.0	23.87	0.244
	810	1909.8	22.39	0.173
EDGE 1900 (4 Slot)	512	1850.2	21.94	0.156
	661	1880.0	22.67	0.185
	810	1909.8	21.99	0.158

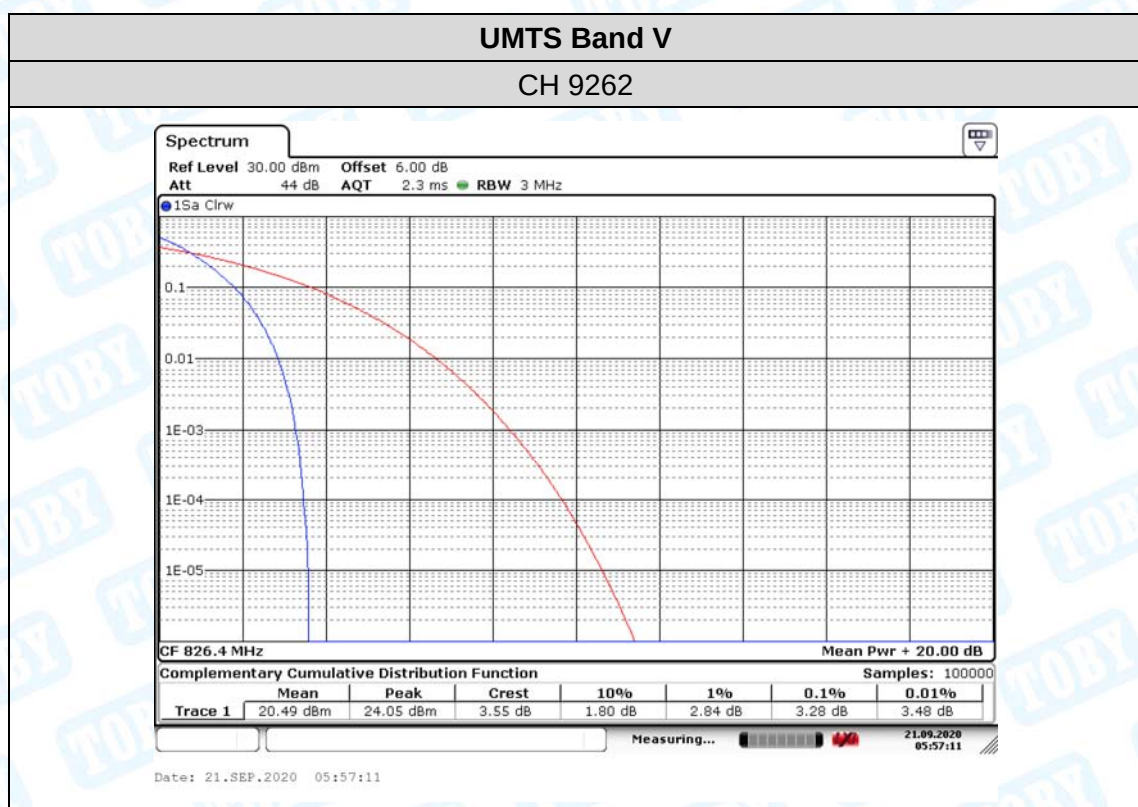
UMTS Band V				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
Band V RMC	4132	826.4	23.19	0.208
	4183	836.6	23.39	0.218
	4233	846.6	23.50	0.224
HSDPA Subtest 1	4132	826.4	21.19	0.132
	4183	836.6	20.96	0.125
	4233	846.6	20.86	0.122
HSDPA Subtest 2	4132	826.4	20.86	0.122
	4183	836.6	20.58	0.114
	4233	846.6	20.75	0.119
HSDPA Subtest 3	4132	826.4	20.34	0.108
	4183	836.6	20.16	0.104
	4233	846.6	20.54	0.113
HSDPA Subtest 4	4132	826.4	20.11	0.103
	4183	836.6	20.01	0.100
	4233	846.6	20.12	0.103
HSUPA Subtest 1	4132	826.4	21.32	0.136
	4183	836.6	21.18	0.131
	4233	846.6	21.16	0.131
HSUPA Subtest 2	4132	826.4	21.06	0.128
	4183	836.6	21.08	0.128
	4233	846.6	21.08	0.128
HSUPA Subtest 3	4132	826.4	20.86	0.122
	4183	836.6	20.95	0.124
	4233	846.6	20.84	0.121
HSUPA Subtest 4	4132	826.4	20.50	0.112
	4183	836.6	20.68	0.117
	4233	846.6	20.54	0.113
HSUPA Subtest 5	4132	826.4	20.48	0.112
	4183	836.6	20.37	0.109
	4233	846.6	20.18	0.104

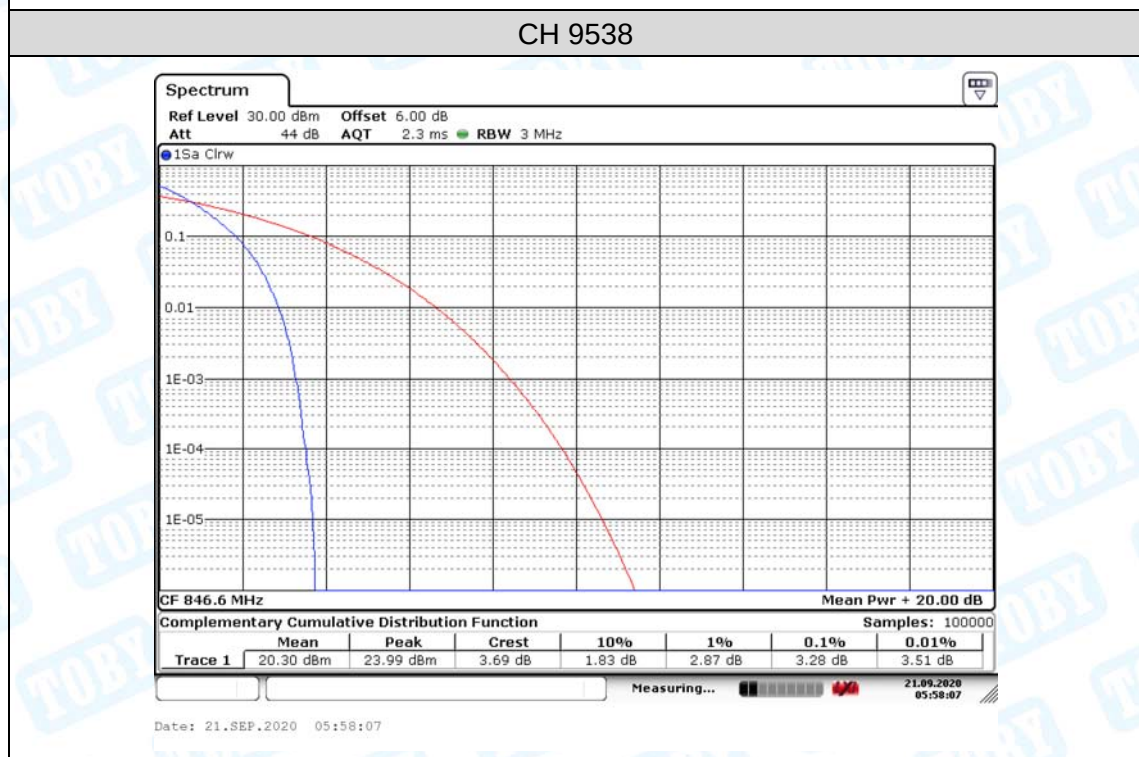
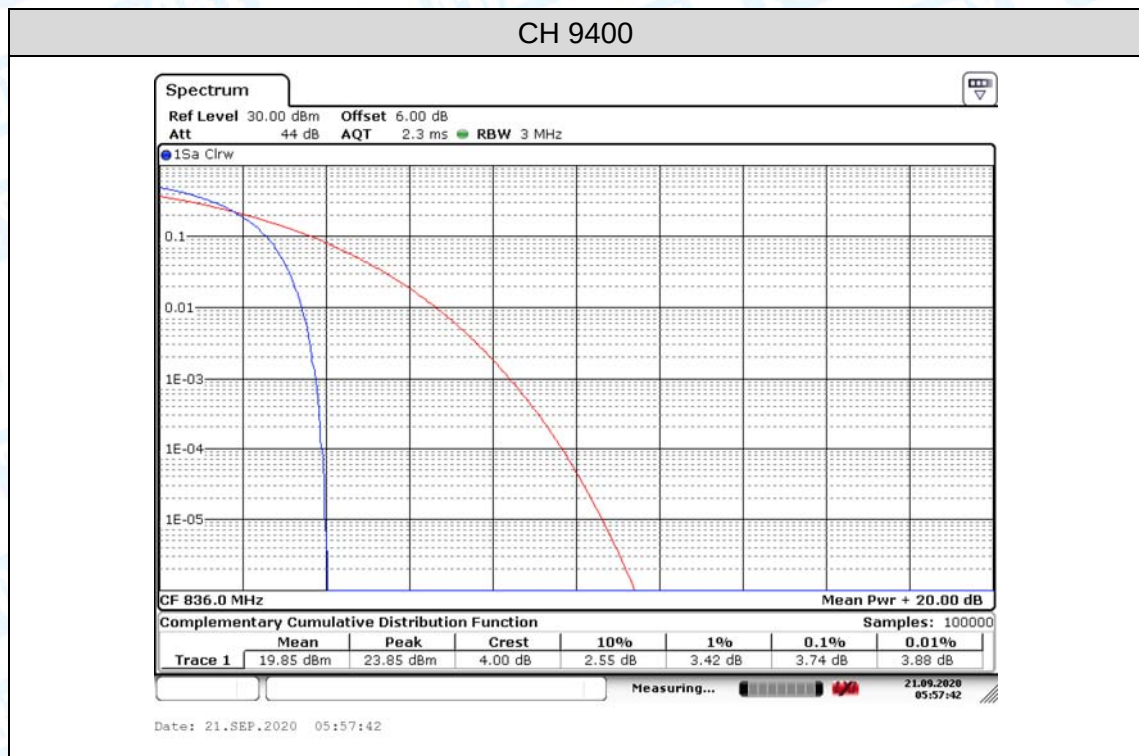
UMTS Band II				
Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
Band II RMC	9262	1852.4	21.42	0.139
	9400	1880.0	21.65	0.146
	9538	1907.6	21.60	0.145
HSDPA Subtest 1	9262	1852.4	22.07	0.161
	9400	1880.0	21.43	0.139
	9538	1907.6	21.47	0.140
HSDPA Subtest 2	9262	1852.4	21.99	0.158
	9400	1880.0	21.12	0.129
	9538	1907.6	21.04	0.127
HSDPA Subtest 3	9262	1852.4	21.58	0.144
	9400	1880.0	21.04	0.127
	9538	1907.6	20.89	0.123
HSDPA Subtest 4	9262	1852.4	21.26	0.134
	9400	1880.0	20.87	0.122
	9538	1907.6	20.45	0.111
HSUPA Subtest 1	9262	1852.4	22.00	0.158
	9400	1880.0	21.27	0.134
	9538	1907.6	21.60	0.145
HSUPA Subtest 2	9262	1852.4	21.66	0.147
	9400	1880.0	21.03	0.127
	9538	1907.6	21.36	0.137
HSUPA Subtest 3	9262	1852.4	21.32	0.136
	9400	1880.0	20.87	0.122
	9538	1907.6	20.96	0.125
HSUPA Subtest 4	9262	1852.4	21.03	0.127
	9400	1880.0	20.56	0.114
	9538	1907.6	20.67	0.117
HSUPA Subtest 5	9262	1852.4	20.85	0.122
	9400	1880.0	20.04	0.101
	9538	1907.6	20.14	0.103

Attachment C--Peak-Average Ratio

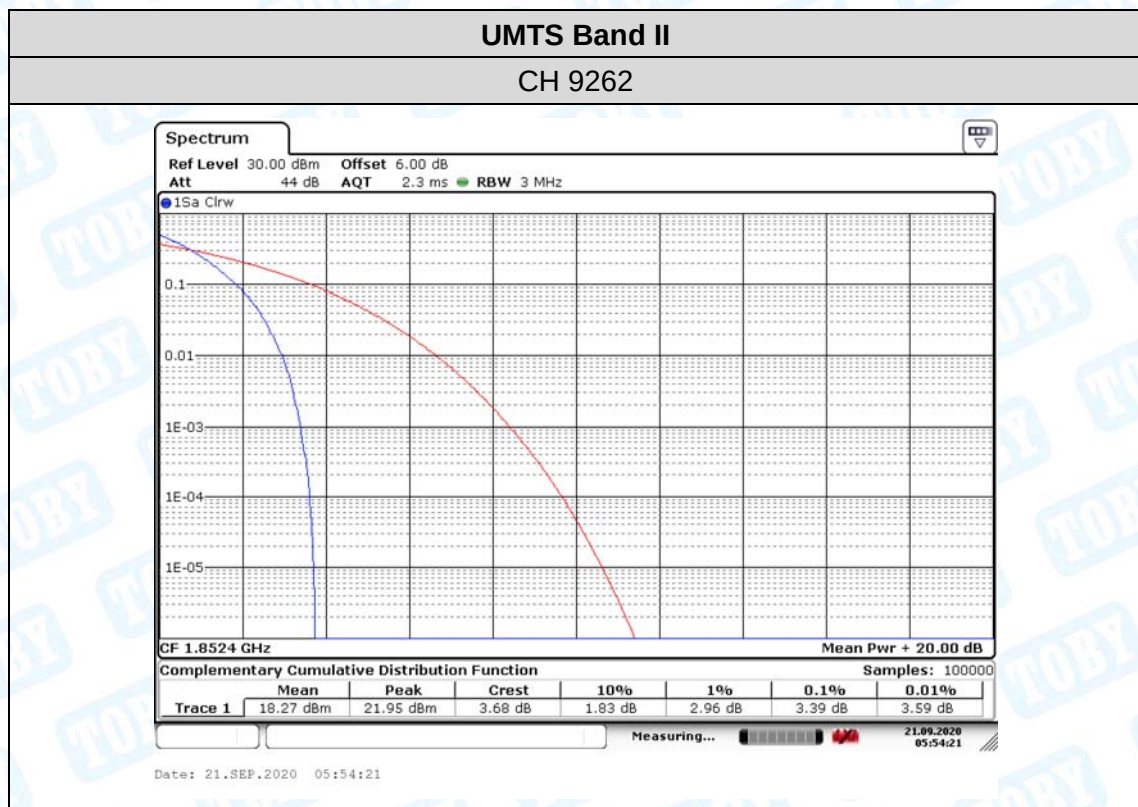
Mode	Channel	Frequency (MHz)	Peak Power (dBm)	AVG Power (dBm)	PAPR (dB)	Limit (dB)	Result
GSM 850	128	824.2	33.68	33.41	0.27	13	PASS
	190	836.6	33.25	33.11	0.14	13	PASS
	251	848.8	32.98	32.92	0.06	13	PASS
GPRS 850	128	824.2	31.56	31.50	0.06	13	PASS
	190	836.6	31.65	31.51	0.14	13	PASS
	251	848.8	32.08	31.98	0.10	13	PASS
EGPRS 850	128	824.2	28.76	25.64	3.12	13	PASS
	190	836.6	28.96	25.95	3.01	13	PASS
	251	848.8	28.83	25.63	3.20	13	PASS
PCS 1900	512	1850.2	27.93	27.86	0.07	13	PASS
	661	1880.0	27.95	27.83	0.12	13	PASS
	810	1909.8	27.98	27.93	0.05	13	PASS
GPRS 1900	512	1850.2	28.35	28.27	0.08	13	PASS
	661	1880.0	27.97	27.95	0.02	13	PASS
	810	1909.8	27.98	27.95	0.03	13	PASS
EGPRS 1900	512	1850.2	27.69	24.35	3.34	13	PASS
	661	1880.0	27.72	24.64	0.27	13	PASS
	810	1909.8	26.89	23.87	0.14	13	PASS

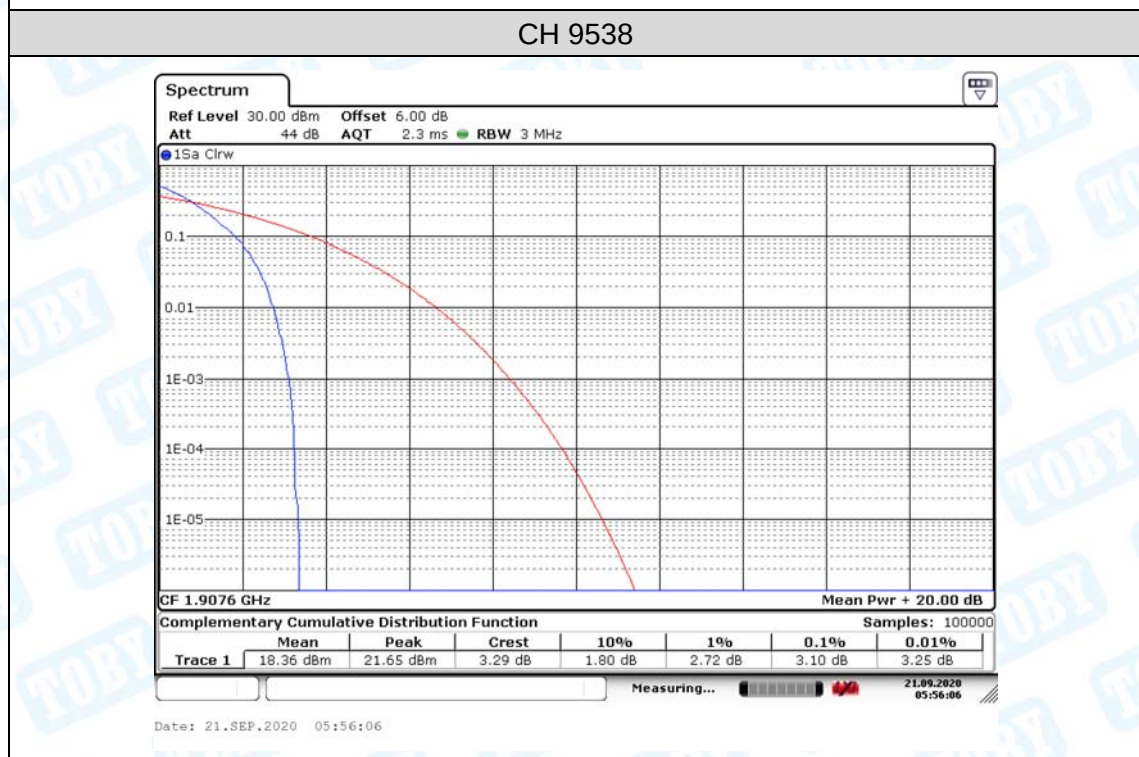
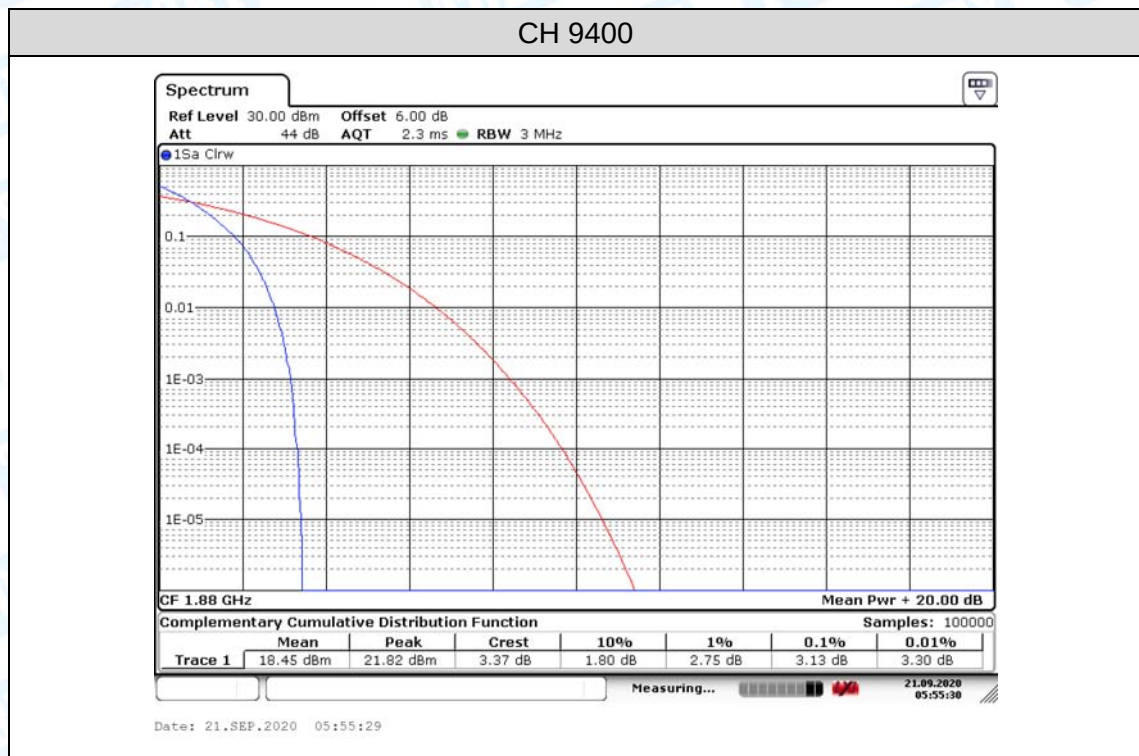
UMTS Band V			
Mode	Channel	Frequency (MHz)	PAPR with 0.1% probability (dB)
UMTS Band V	4132	826.4	3.28
	4183	836.6	3.74
	4233	846.6	3.28
Limit ≤ 13dB			





UMTS Band II			
Mode	Channel	Frequency (MHz)	PAPR with 0.1% probability (dB))
UMTS Band II	9262	1852.4	3.39
	9400	1880.0	3.13
	9538	1907.6	3.10
Limit ≤ 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	30.44	3.46	1.26	32.64	1.837
			V	28.05	3.46	1.26	30.25	1.059
	190	836.6	H	29.63	3.82	1.26	32.19	1.656
			V	27.20	3.82	1.26	29.76	0.946
	251	848.8	H	29.08	4.16	1.26	31.98	1.578
			V	26.06	4.16	1.26	28.96	0.787
GPRS 850 (1 Slot)	128	824.2	H	28.38	3.46	1.26	30.58	1.143
			V	25.69	3.46	1.26	27.89	0.615
	190	836.6	H	28.12	3.82	1.26	30.68	1.169
			V	25.60	3.82	1.26	28.16	0.655
	251	848.8	H	27.16	4.16	1.26	30.06	1.014
			V	25.06	4.16	1.26	27.96	0.625
EDGE 850 (1 Slot)	128	824.2	H	22.65	3.46	1.26	24.85	0.305
			V	18.65	3.46	1.26	20.85	0.122
	190	836.6	H	22.11	3.82	1.26	24.67	0.293
			V	18.89	3.82	1.26	21.45	0.140
	251	848.8	H	20.95	4.16	1.26	23.85	0.243
			V	18.06	4.16	1.26	20.96	0.125
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	24.26	5.01	2.59	26.68	0.466
			V	21.16	5.01	2.59	23.58	0.228
	661	1880.0	H	23.90	4.82	2.59	26.13	0.410
			V	20.45	4.82	2.59	22.68	0.185
	810	1909.8	H	24.55	4.45	2.59	26.41	0.438
			V	21.28	4.45	2.59	23.14	0.206
GPRS 1900 (1 Slot)	512	1850.2	H	23.26	5.01	2.59	25.68	0.370
			V	19.26	5.01	2.59	21.68	0.147
	661	1880.0	H	23.46	4.82	2.59	25.69	0.371
			V	21.35	4.82	2.59	23.58	0.228
	810	1909.8	H	23.10	4.45	2.59	24.96	0.313
			V	19.99	4.45	2.59	21.85	0.153
EDGE 1900 (1 Slot)	512	1850.2	H	20.25	5.01	2.59	22.67	0.185
			V	18.21	5.01	2.59	20.63	0.116
	661	1880.0	H	21.31	4.82	2.59	23.54	0.226
			V	18.45	4.82	2.59	20.68	0.117
	810	1909.8	H	21.30	4.45	2.59	23.16	0.207
			V	19.01	4.45	2.59	20.87	0.122
Limit							33	2

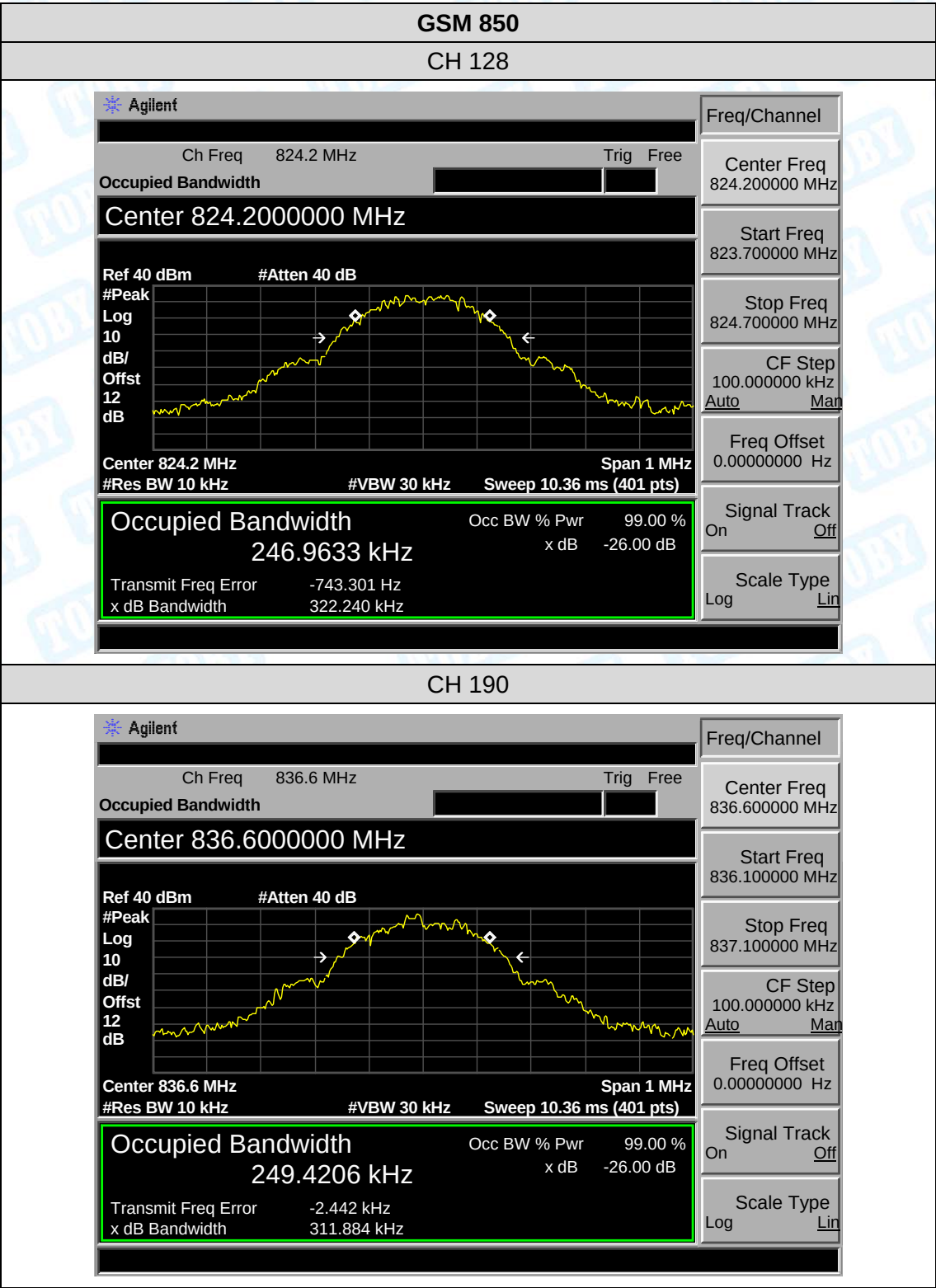
UMTS Band V								
Mode	Channel	Frequency (MHz)	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBi)	Cable Loss (dB)	EIRP Power (dBm)	EIRP Power (W)
Band V RMC	4132	826.4	H	20.16	3.46	1.26	22.36	0.172
			V	17.45	3.46	1.26	19.65	0.092
	4183	836.6	H	20.29	3.82	1.26	22.85	0.193
			V	17.12	3.82	1.26	19.68	0.093
	4233	846.6	H	19.09	4.16	1.26	21.99	0.158
			V	16.07	4.16	1.26	18.97	0.079
Limit							38.5	7

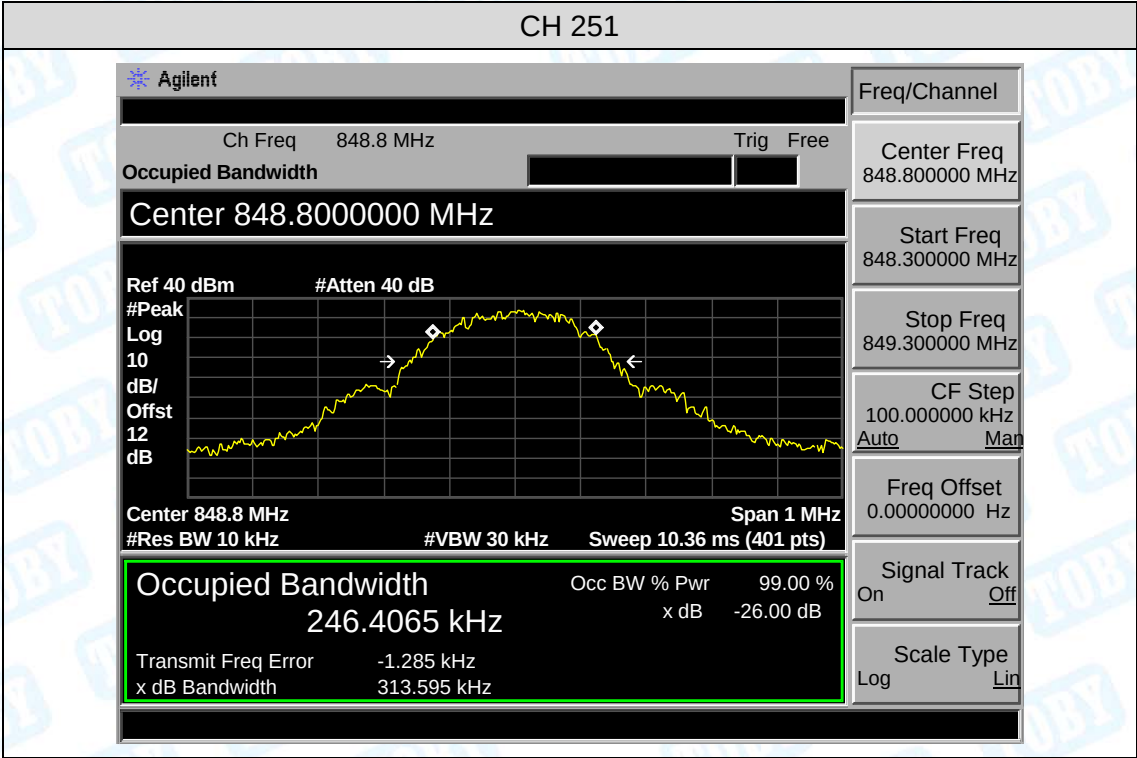
UMTS Band II								
Mode	Channel	Frequency (MHz)	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBi)	Cable Loss (dB)	EIRP Power (dBm)	EIRP Power (W)
Band II RMC	9262	1852.4	H	17.94	5.01	2.59	20.36	0.109
			V	15.93	5.01	2.59	18.35	0.068
	9400	1880.0	H	18.33	4.82	2.59	20.56	0.114
			V	16.42	4.82	2.59	18.65	0.073
	9538	1907.6	H	18.70	4.45	2.59	20.56	0.114
			V	16.60	4.45	2.59	18.46	0.070
Limit							33	2

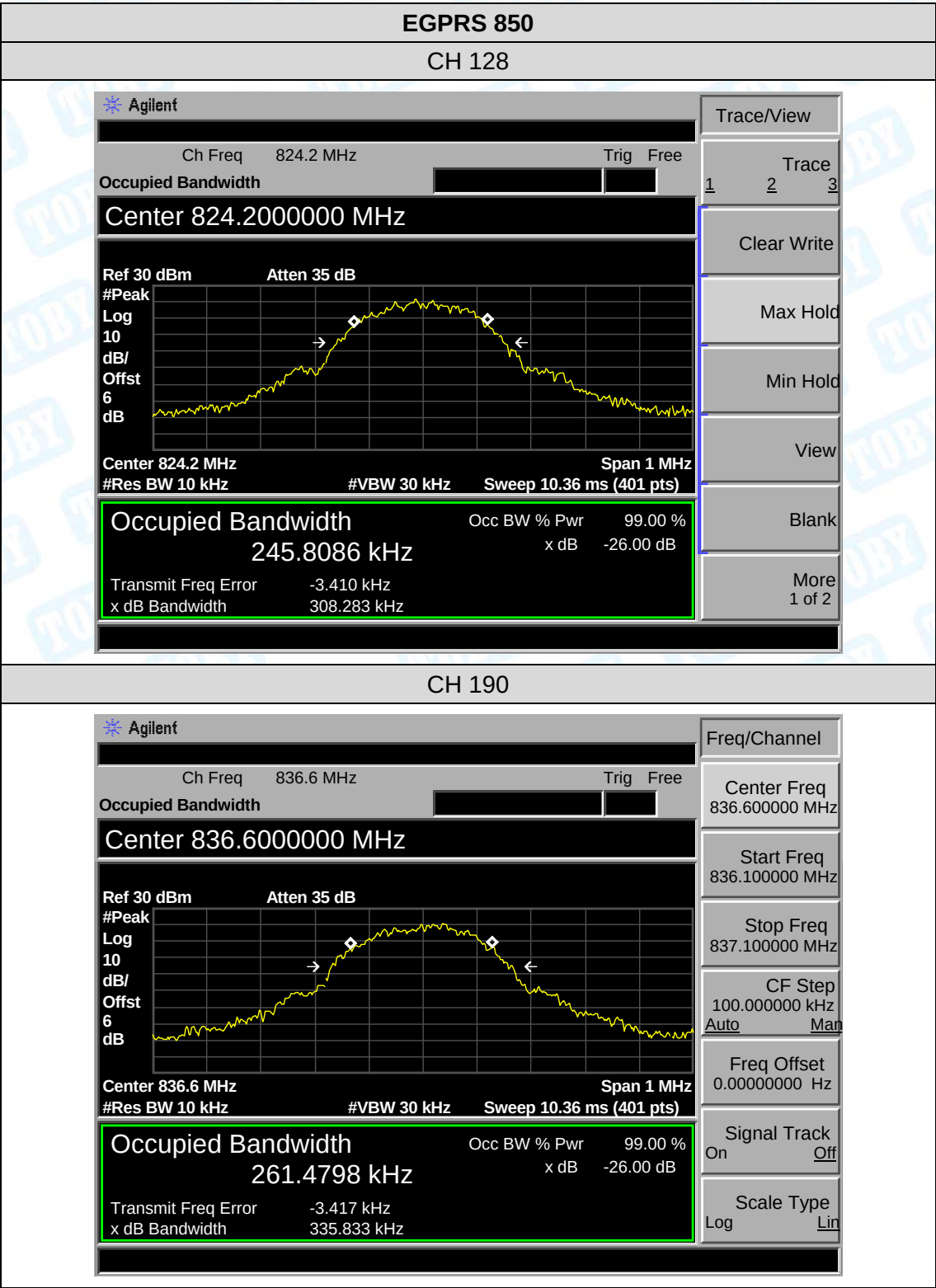
Attachment E--Occupied Bandwidth

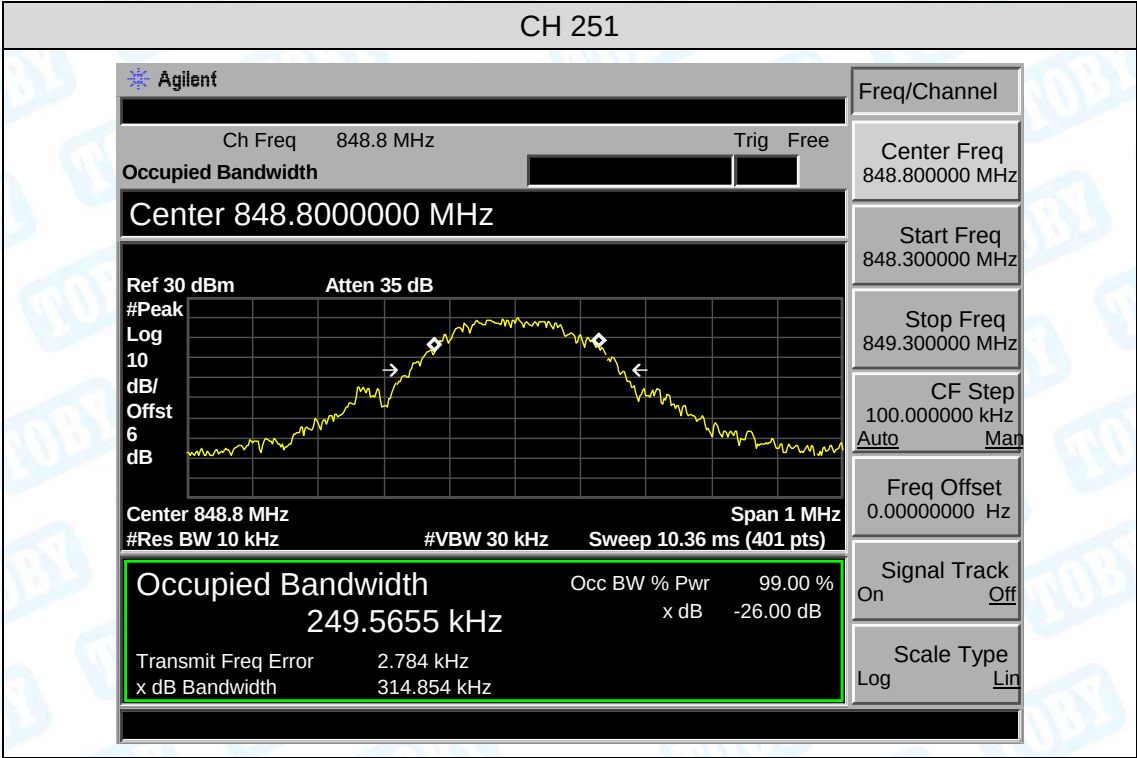
Measurement Data (worst case)

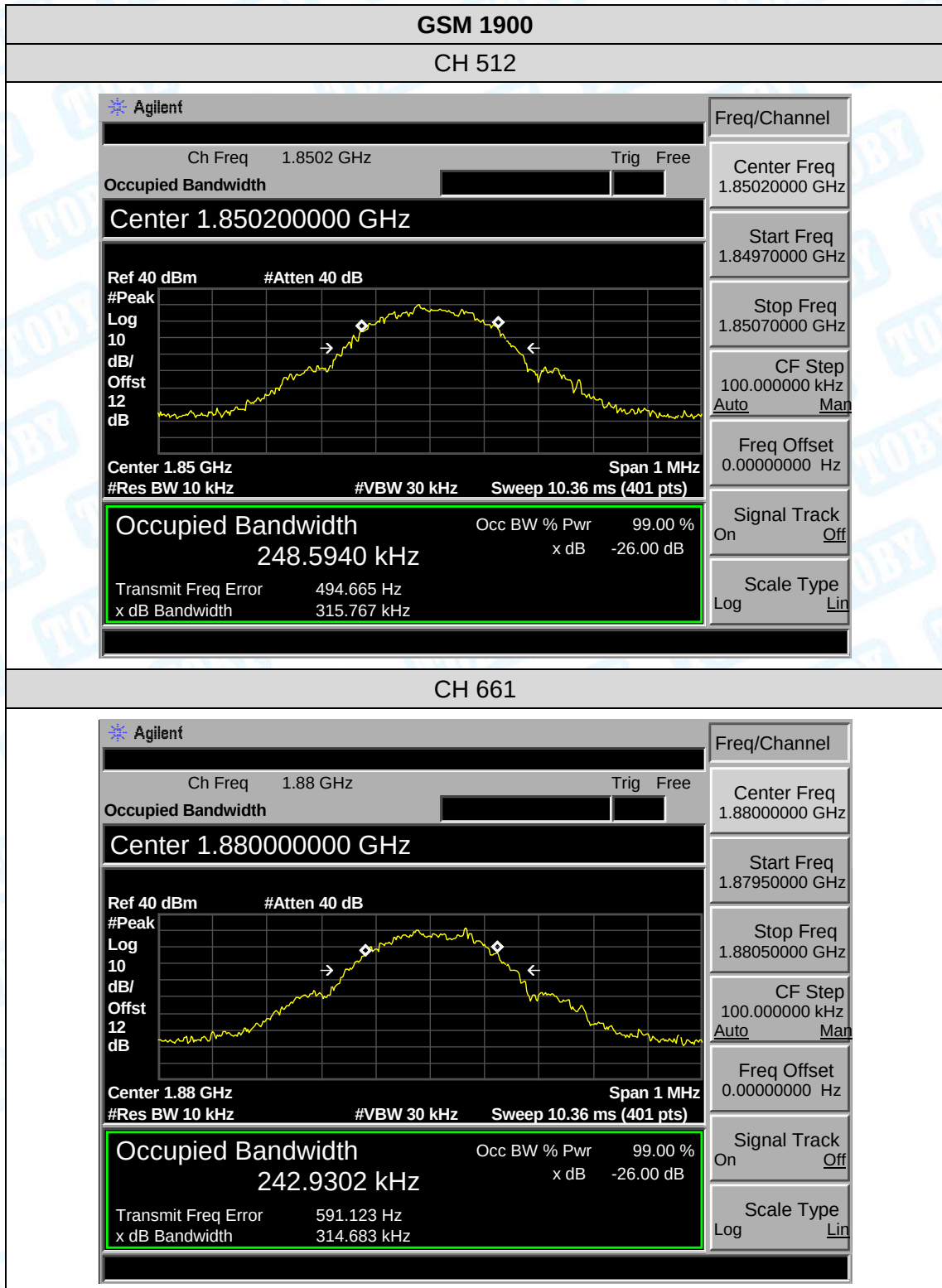
GSM 850				
Mode	Channel	Frequency (MHz)	99% OBW (KHz)	-26dB Bandwidth (kHz)
GSM 850	128	824.2	246.9633	322.240
	190	836.6	249.4206	311.884
	251	848.8	246.4065	313.595
EGPRS 850	128	824.2	245.8086	308.283
	190	836.6	261.4798	335.833
	251	848.8	249.5655	314.854
PCS 1900				
Mode	Channel	Frequency (MHz)	99% OBW (KHz)	-26dB Bandwidth (kHz)
GSM 1900	512	1850.2	248.5940	315.767
	661	1880.0	242.9302	314.683
	810	1909.8	250.5079	318.808
EGPRS 1900	512	1850.2	231.3913	296.186
	661	1880.0	237.9805	303.380
	810	1909.8	237.4412	311.933
UMTS Band V				
Mode	Channel	Frequency (MHz)	99% OBW (MHz)	-26dB Bandwidth (MHz)
Band V RMC	4132	826.4	4.1691	5.088
	4183	836.6	4.1976	5.613
	4233	846.6	4.1593	5.772
UMTS Band II				
Mode	Channel	Frequency (MHz)	99% OBW (MHz)	-26dB Bandwidth (MHz)
Band II RMC	9262	1852.4	4.1398	4.748
	9400	1880.0	4.1346	4.724
	9538	1907.6	4.1466	4.766

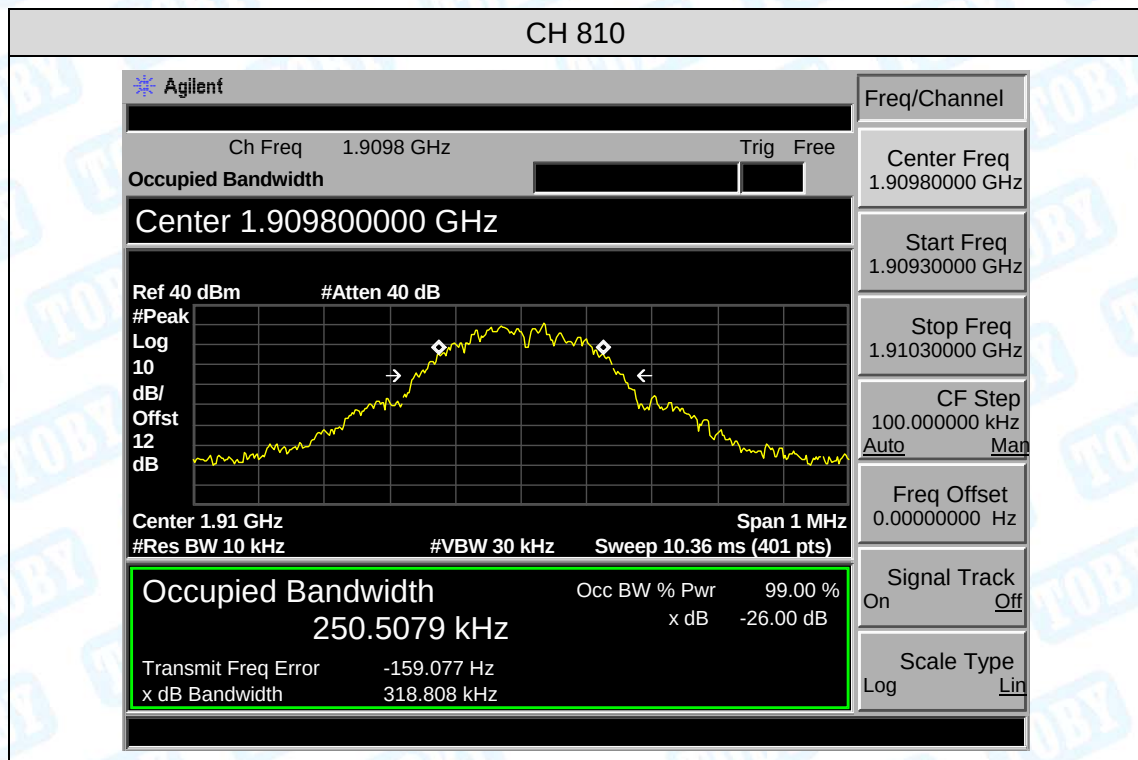


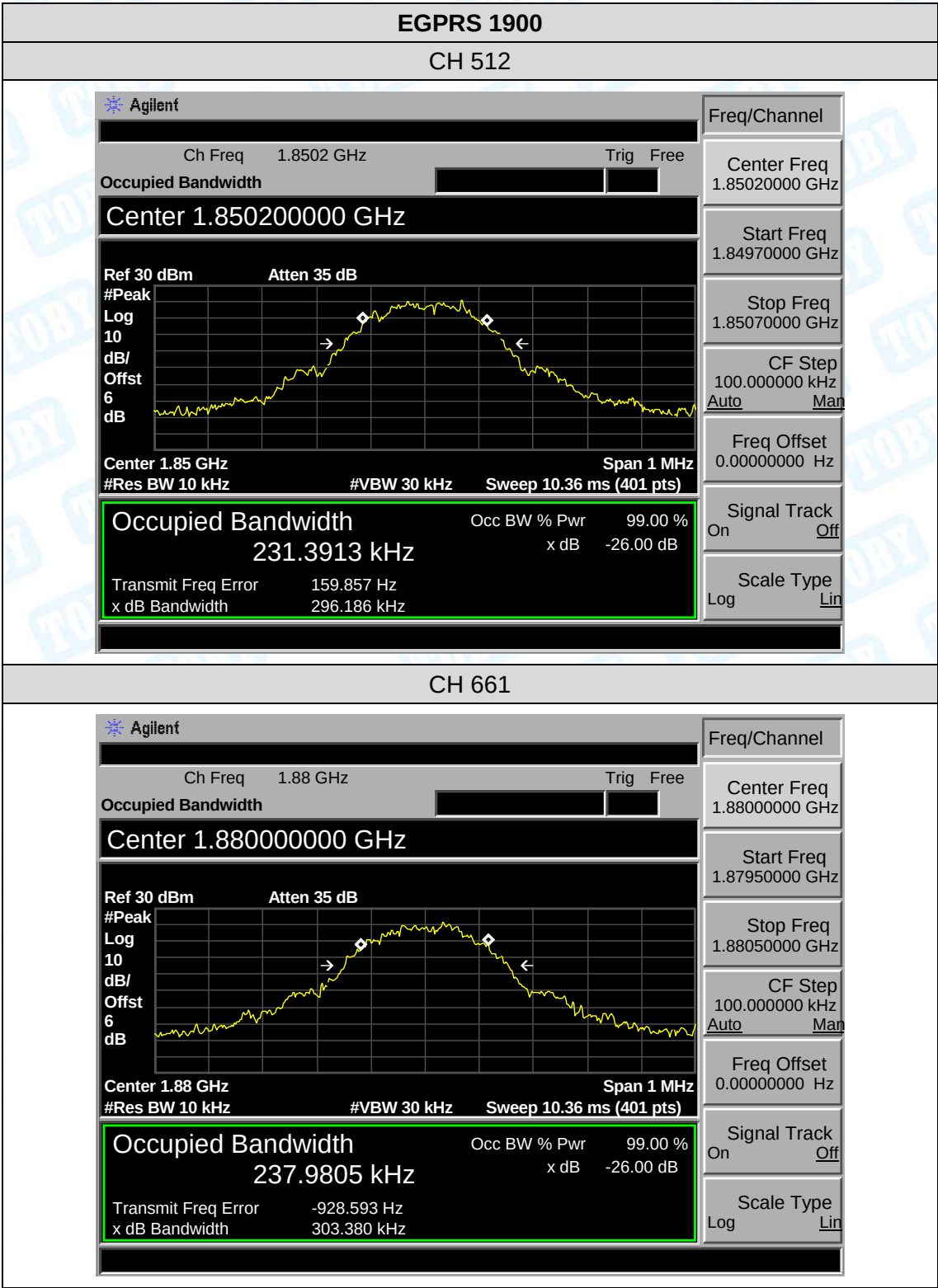


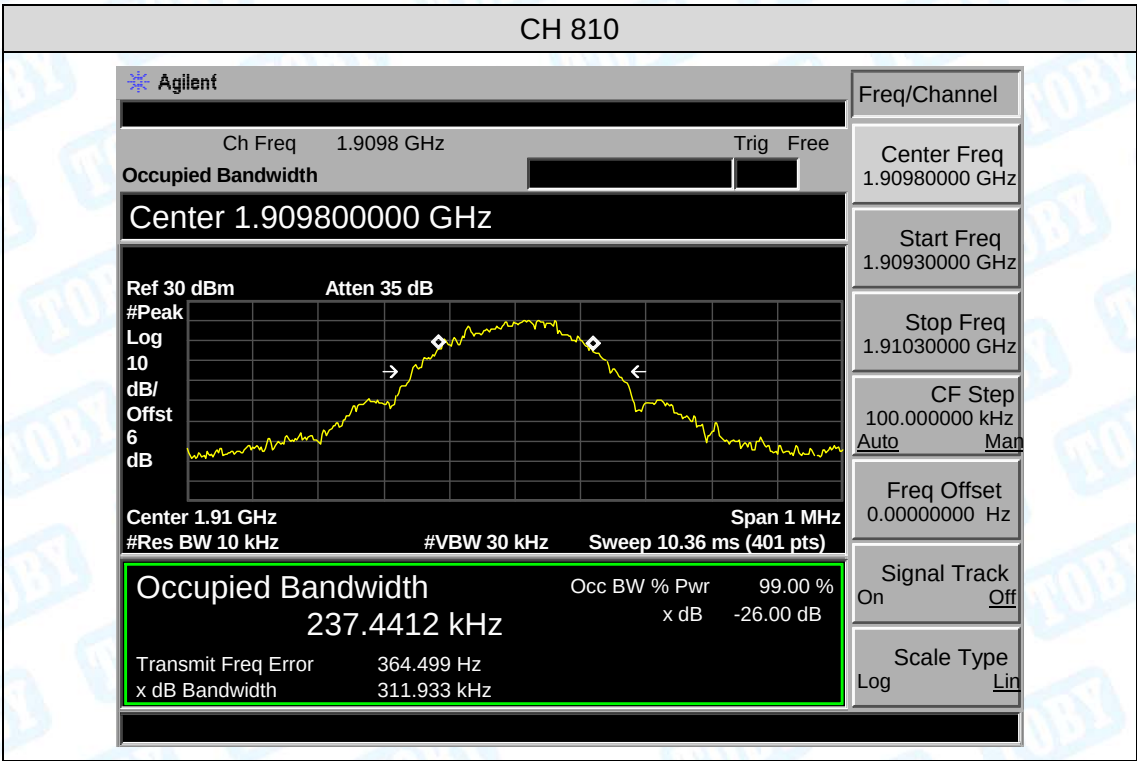


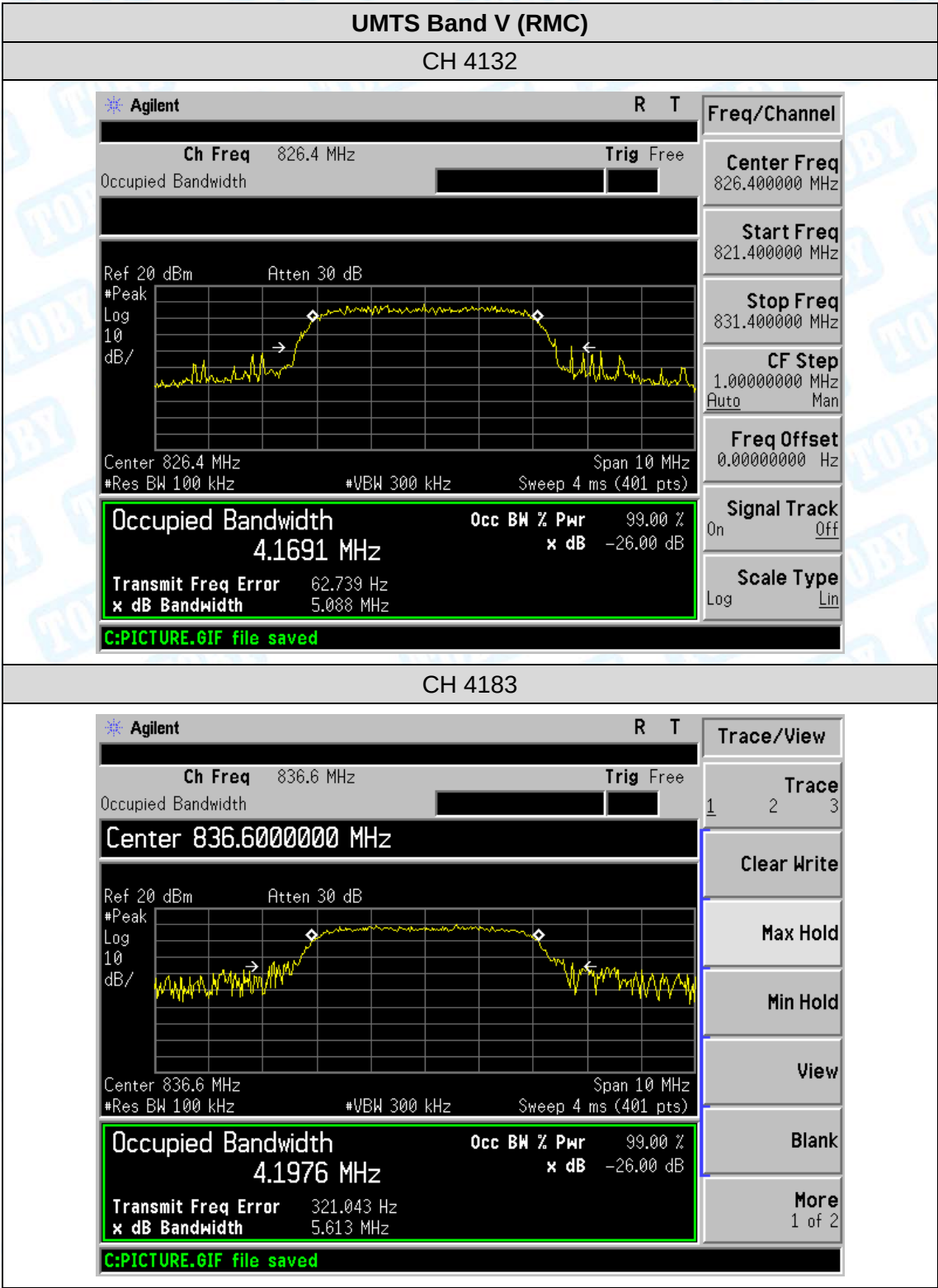


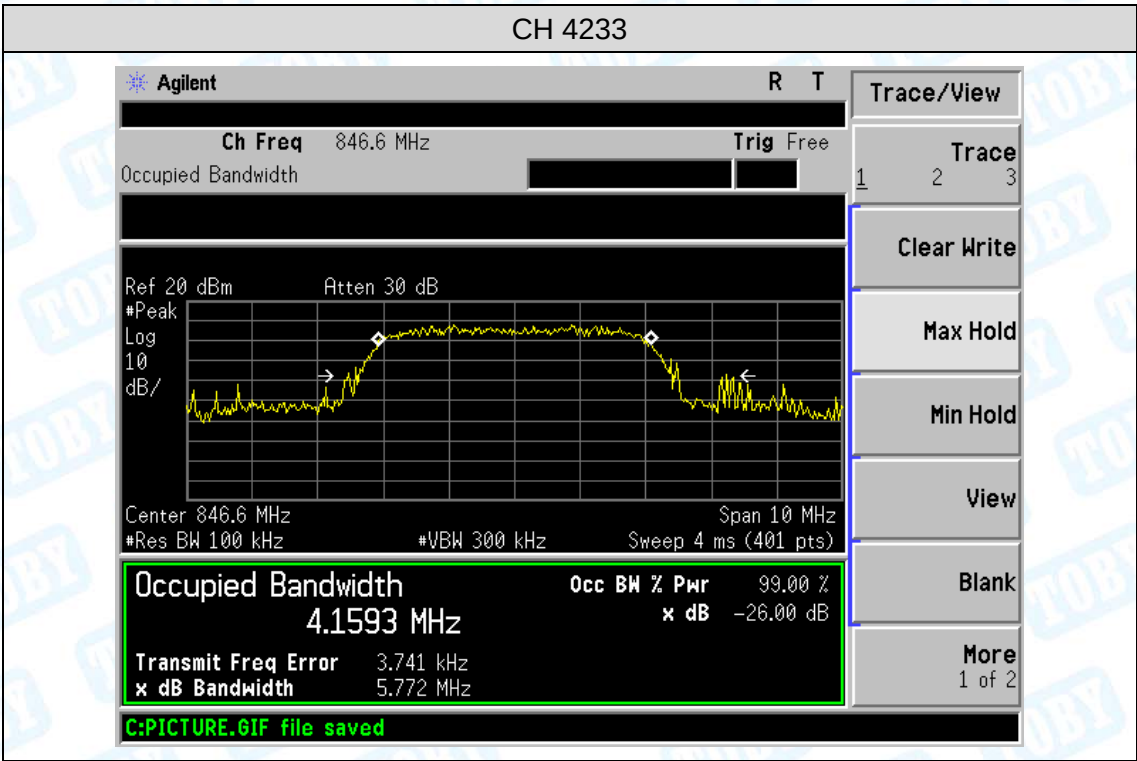


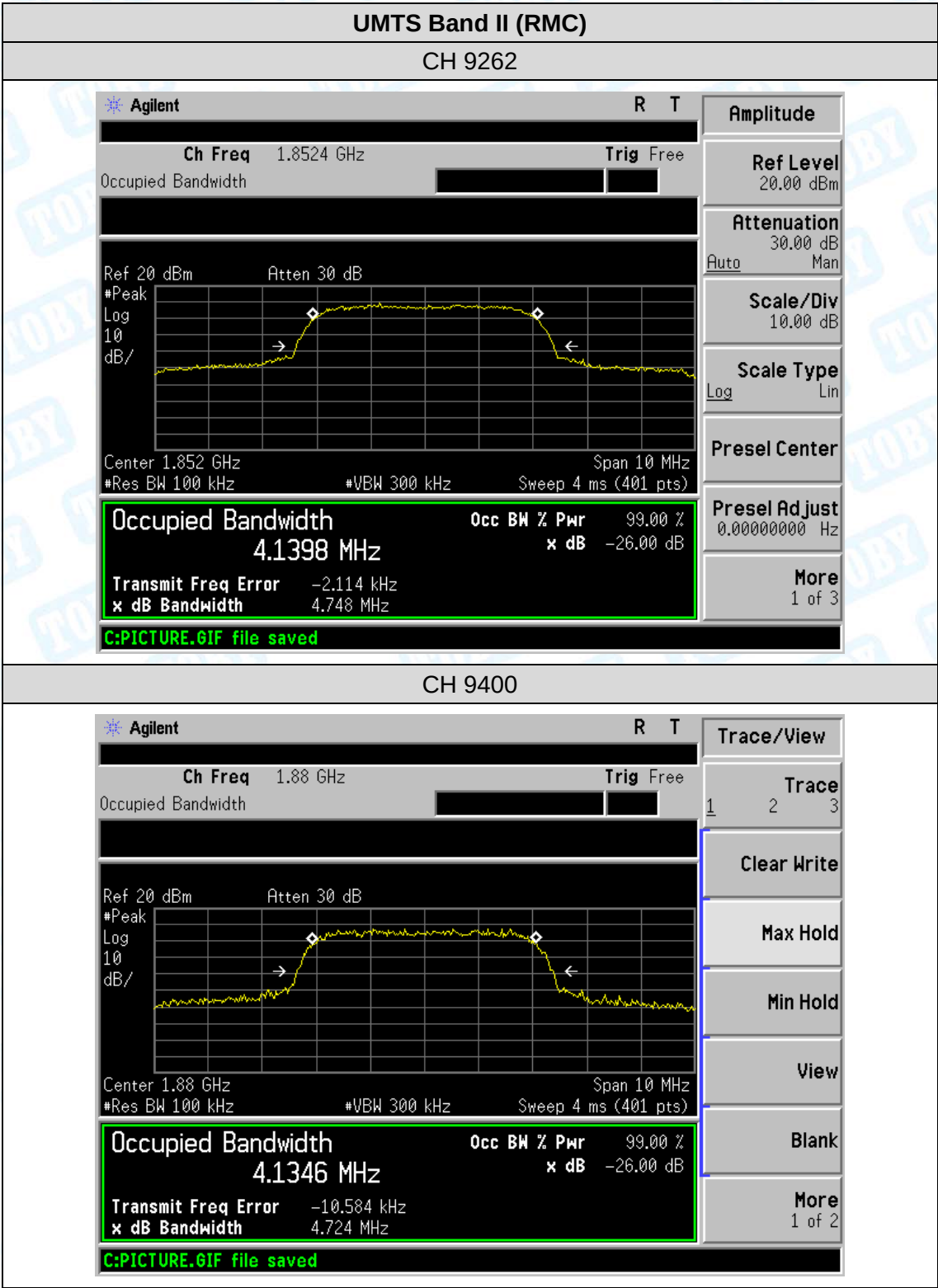


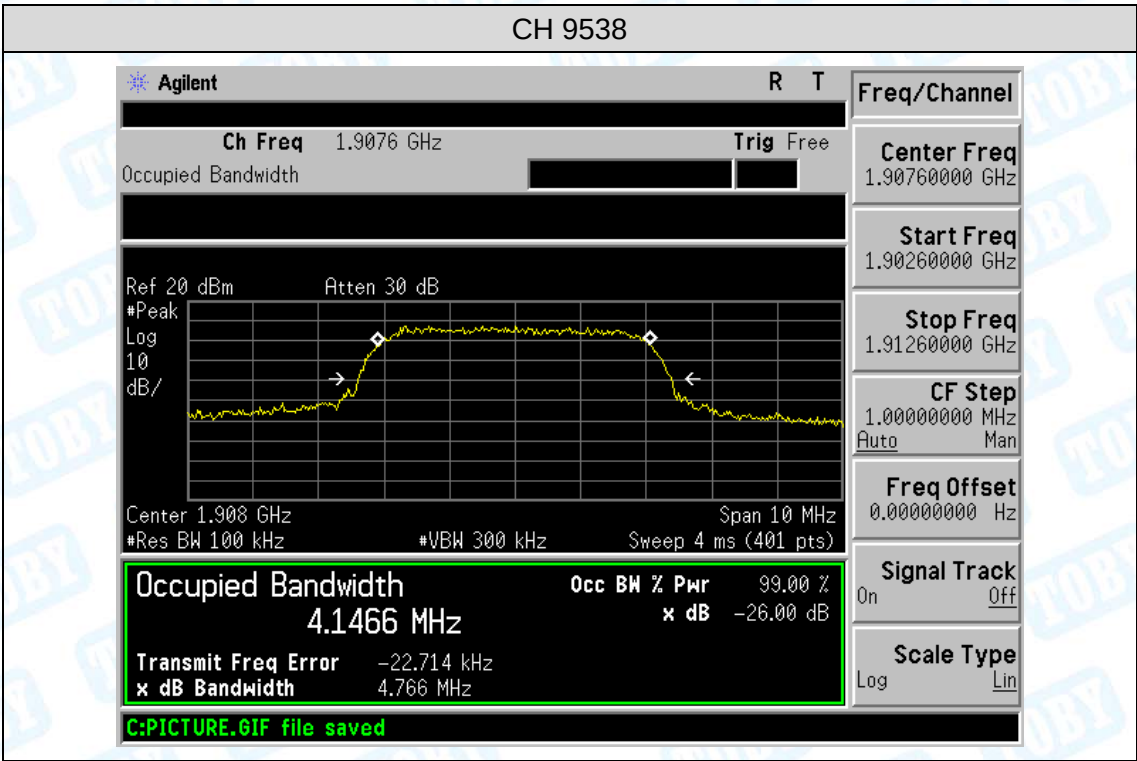












Freq/Channel

Center Freq

1.90760000 GHz

Start Freq

1.90260000 GHz

Stop Freq

1.91260000 GHz

CF Step

1.00000000 MHz

Auto

Man

Freq Offset

0.00000000 Hz

Signal Track

On

Off

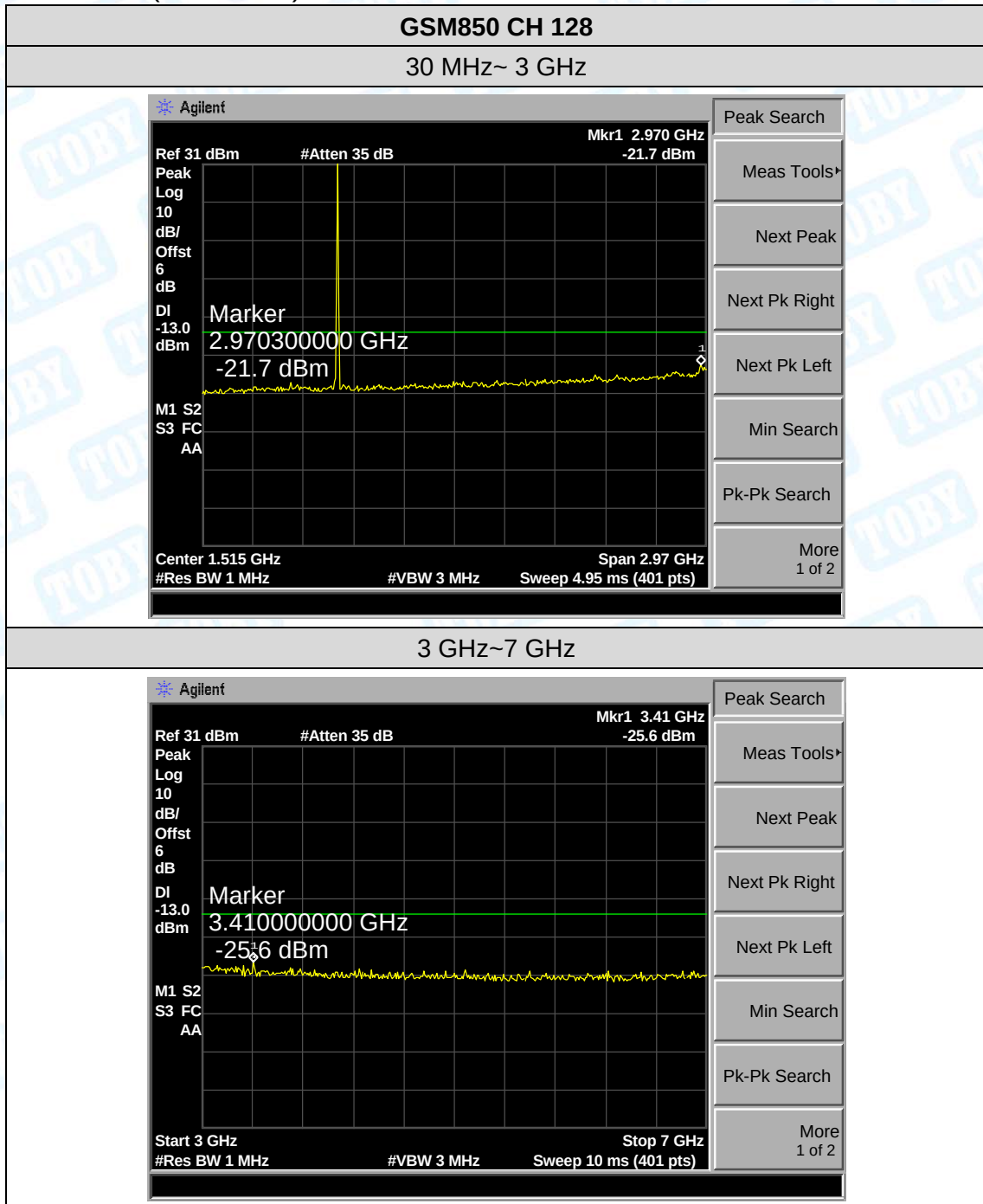
Scale Type

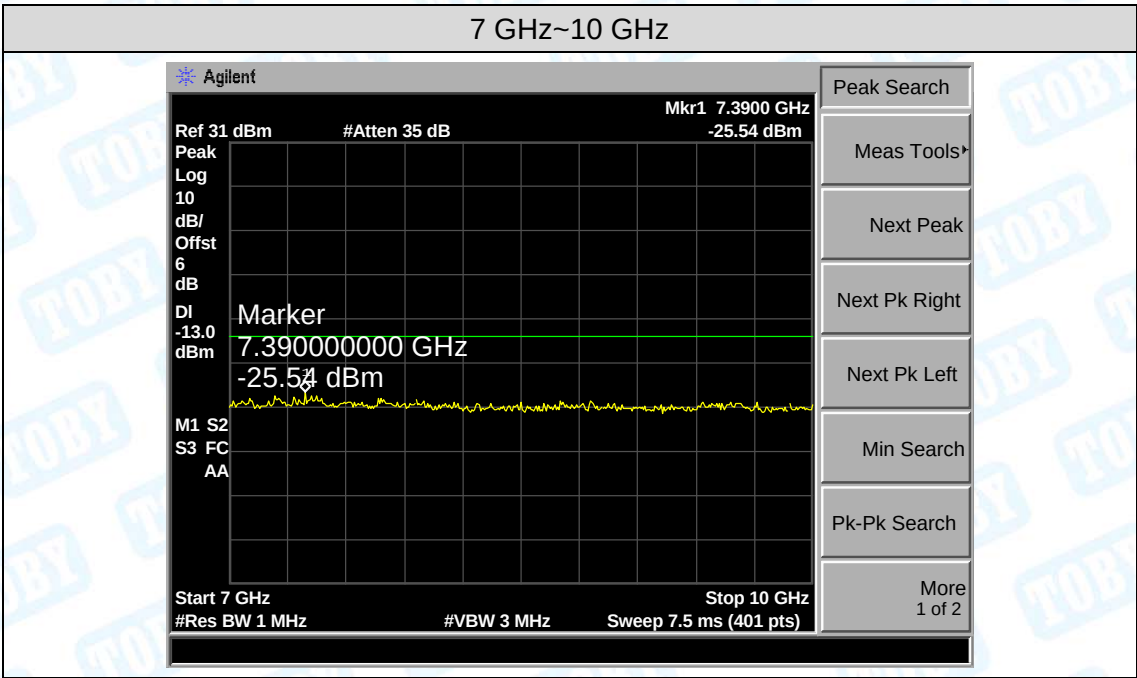
Log

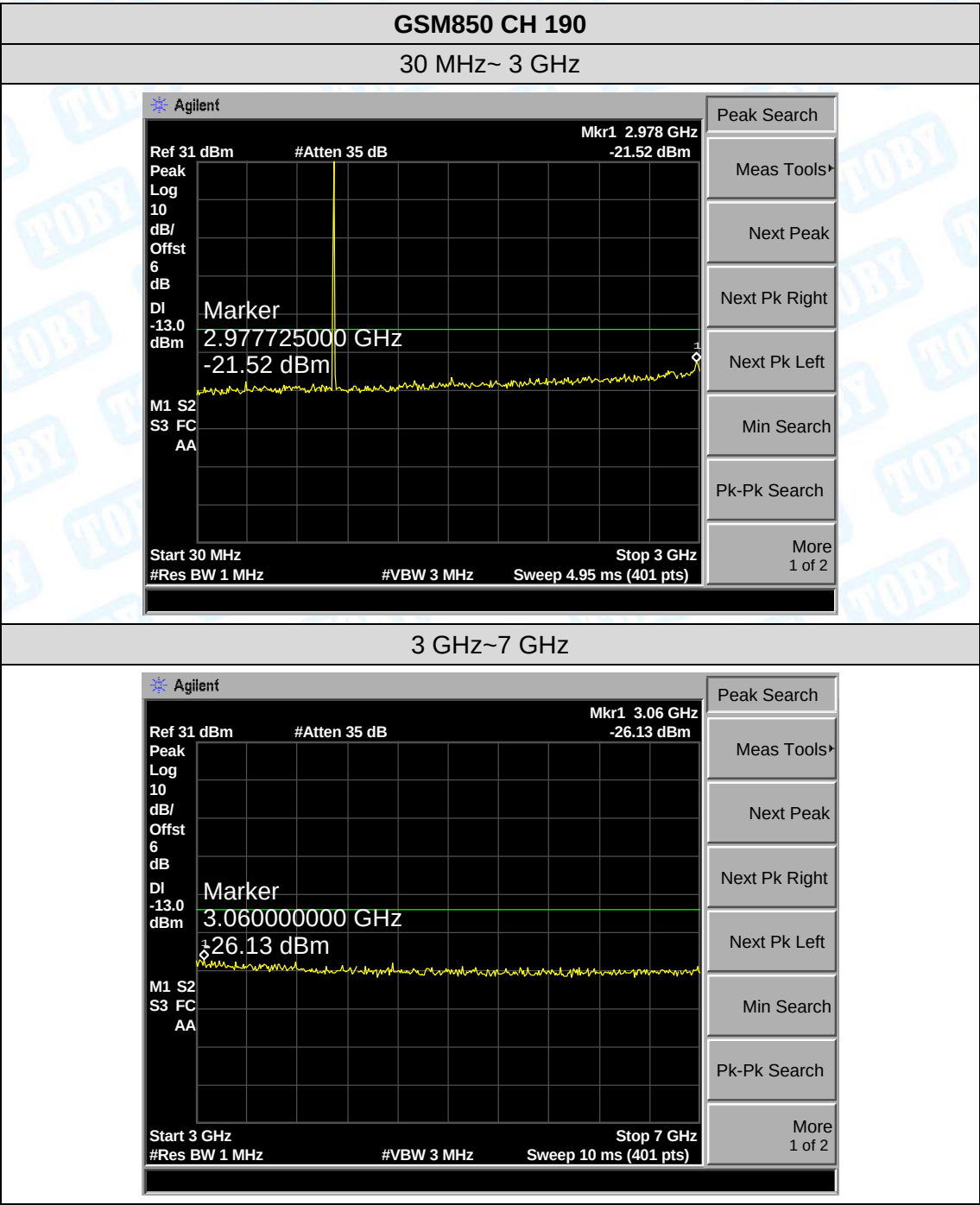
Lin

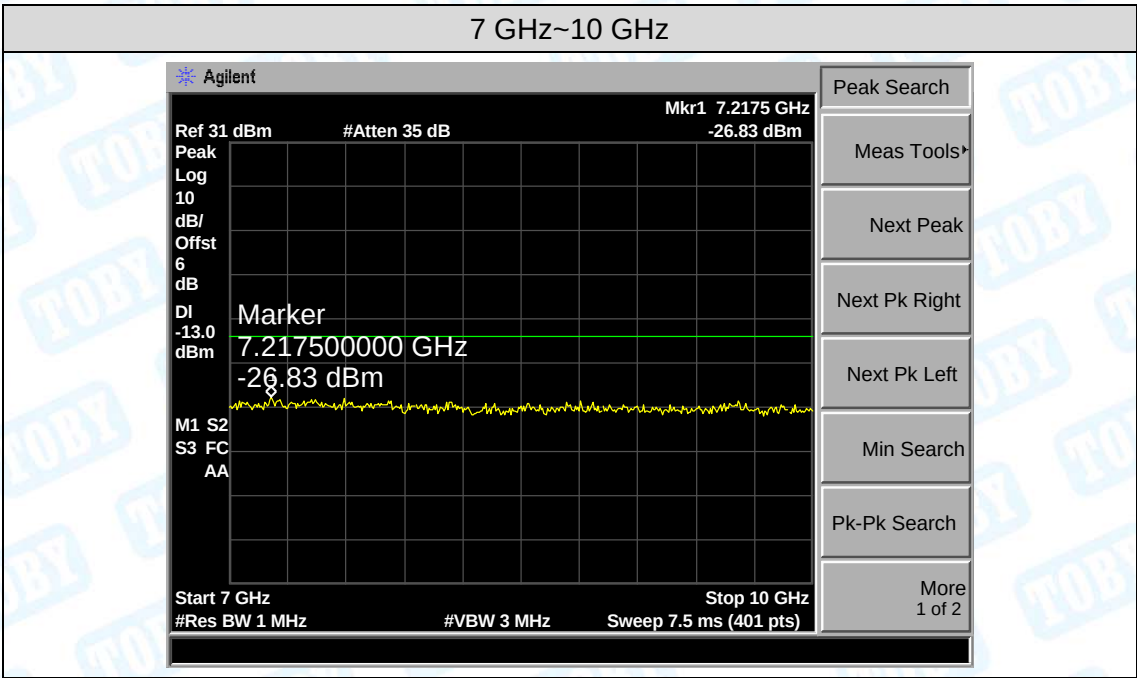
Attachment F--Conducted Out of Band Emissions

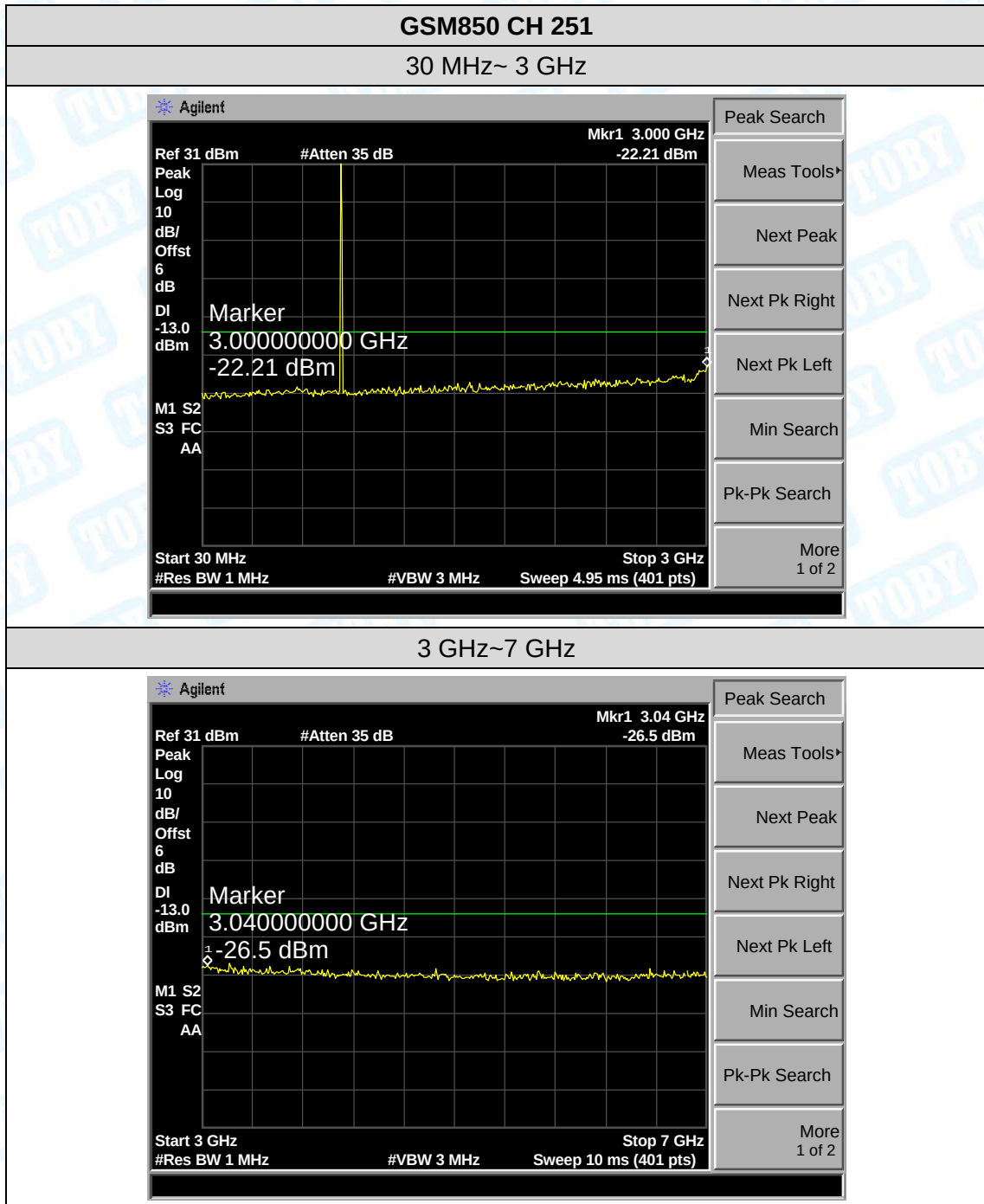
Measurement Data (worst case)

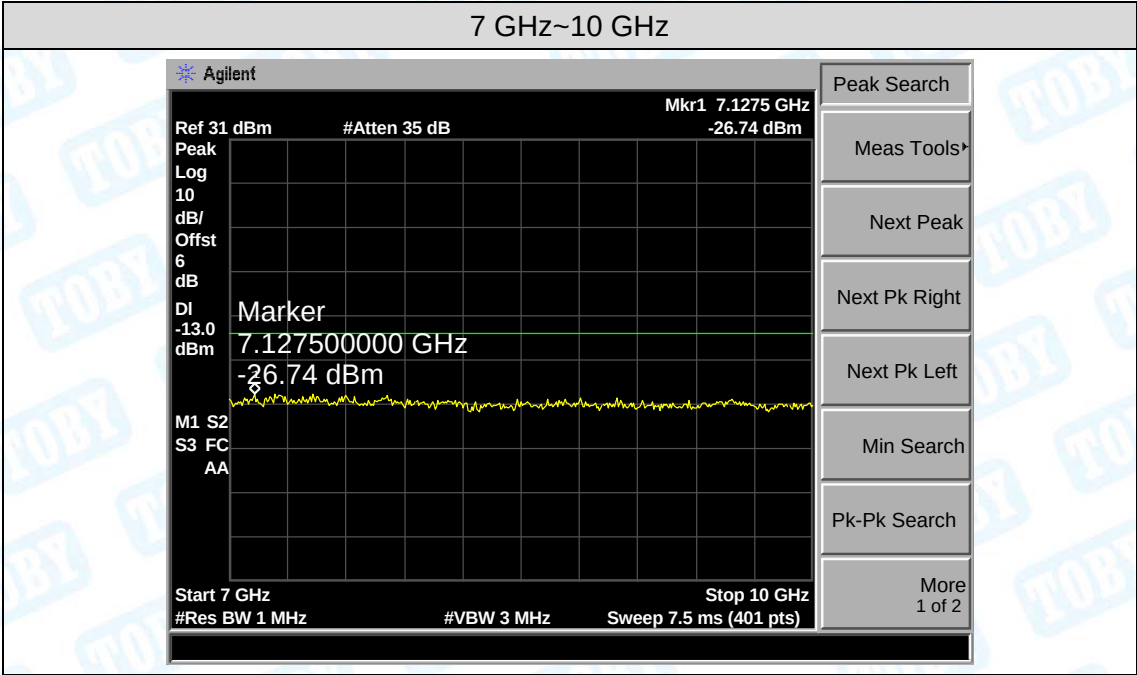


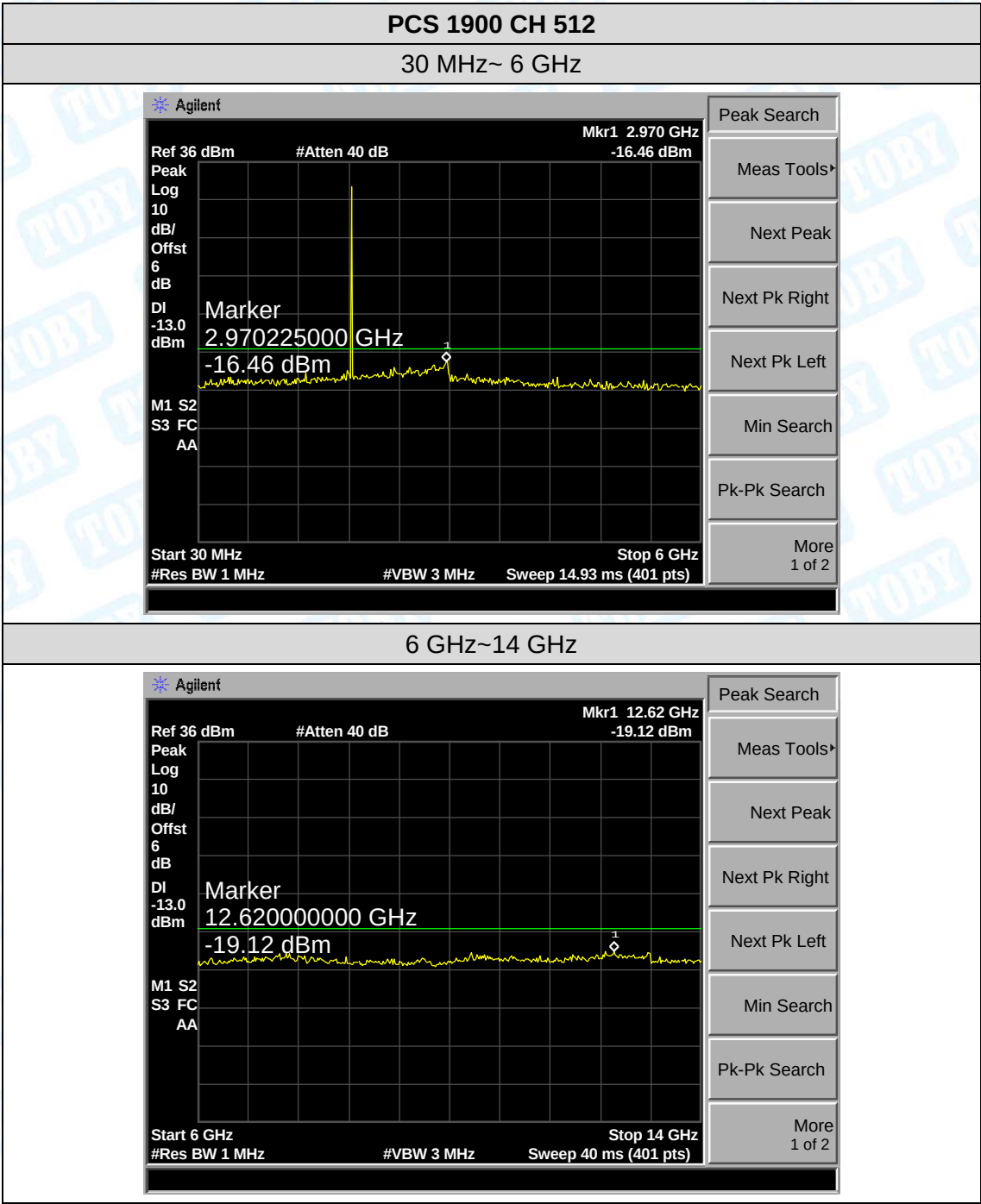


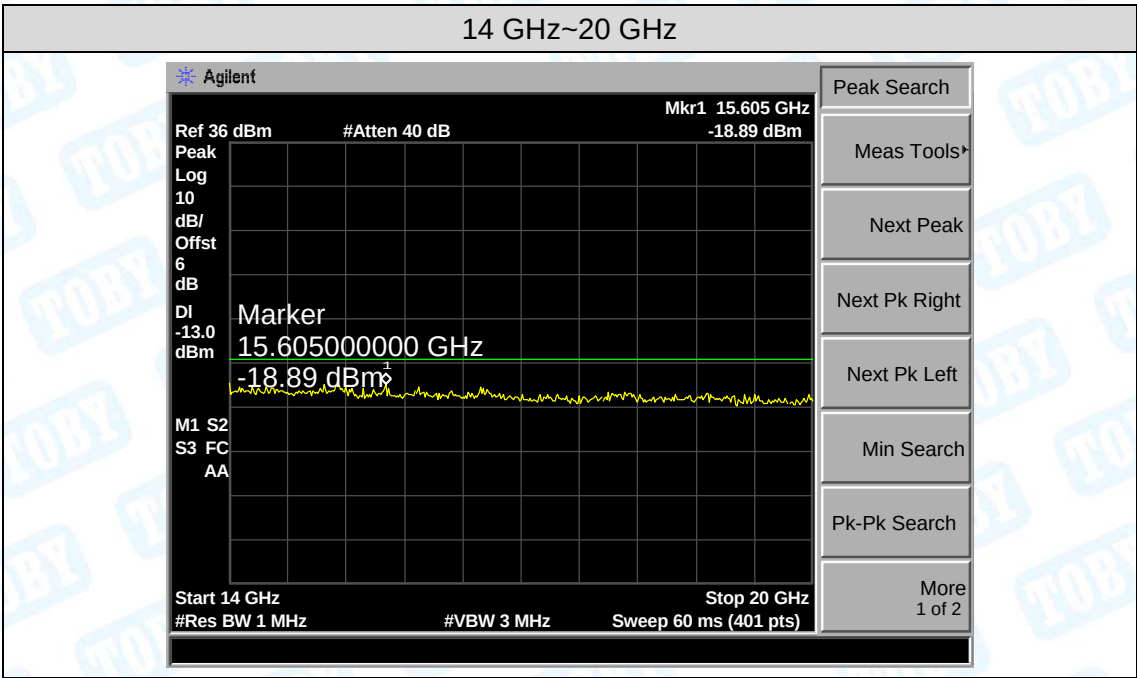


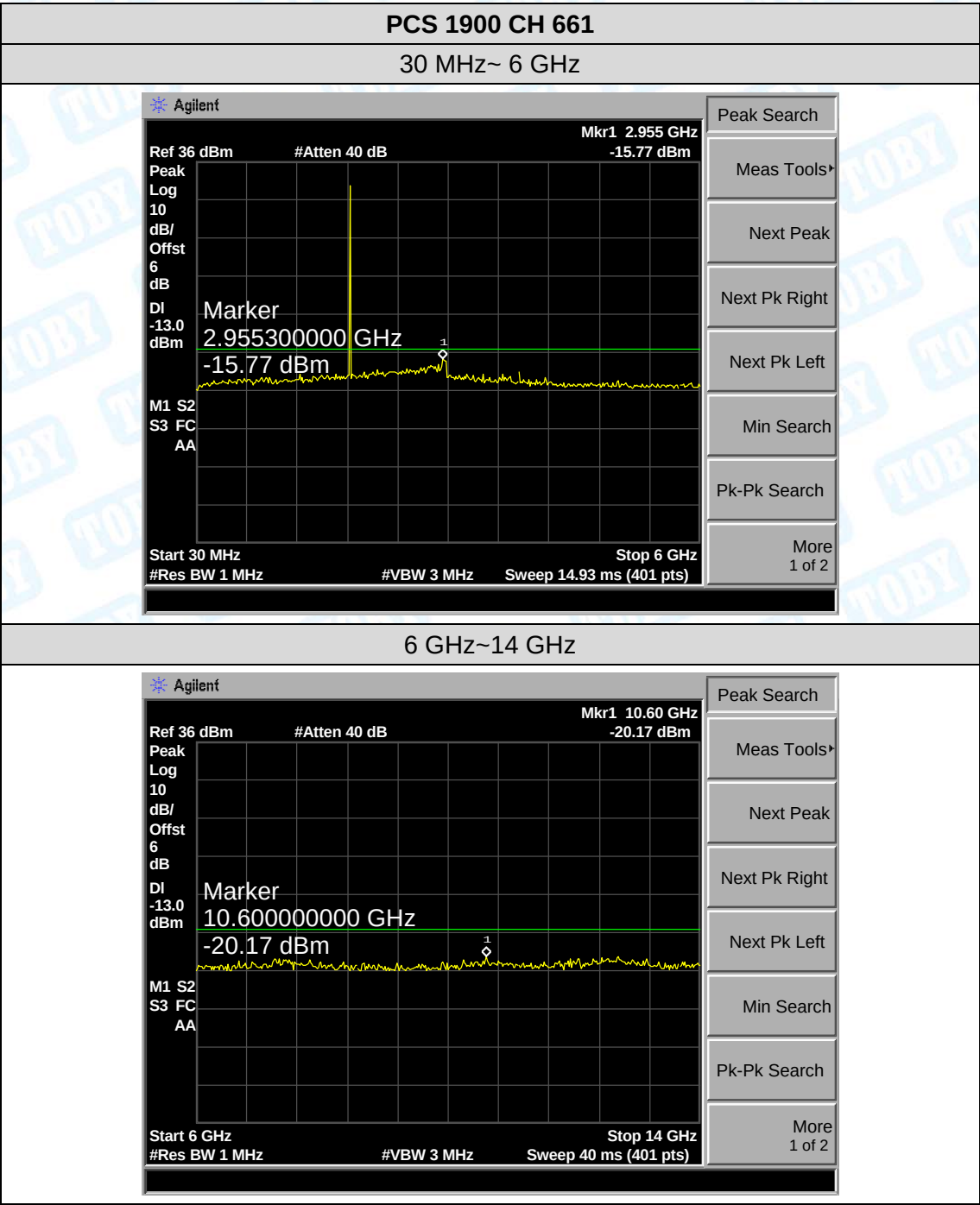


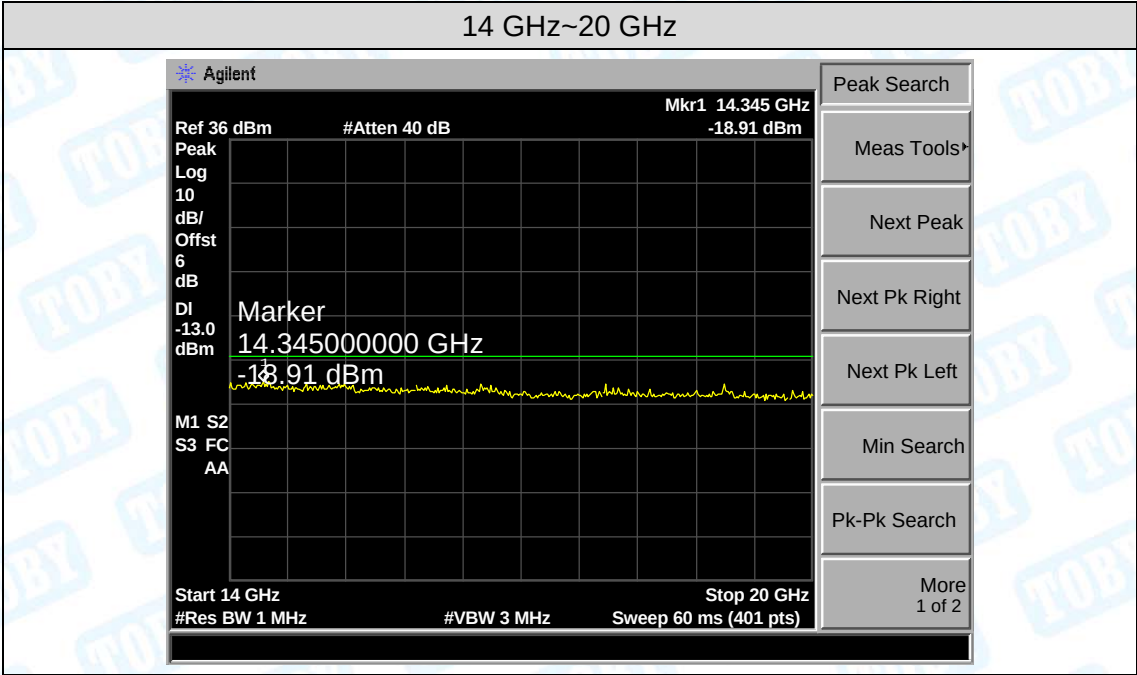


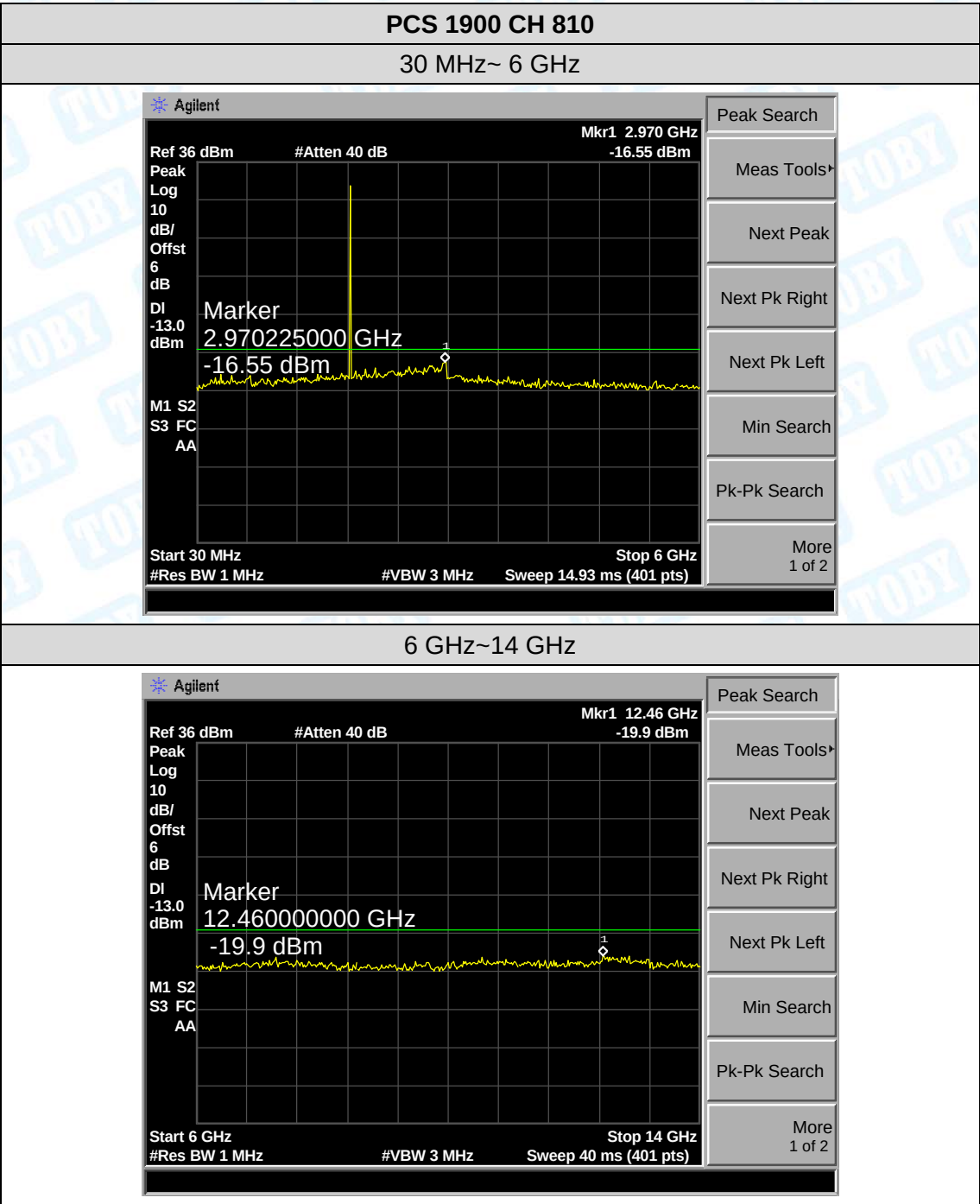


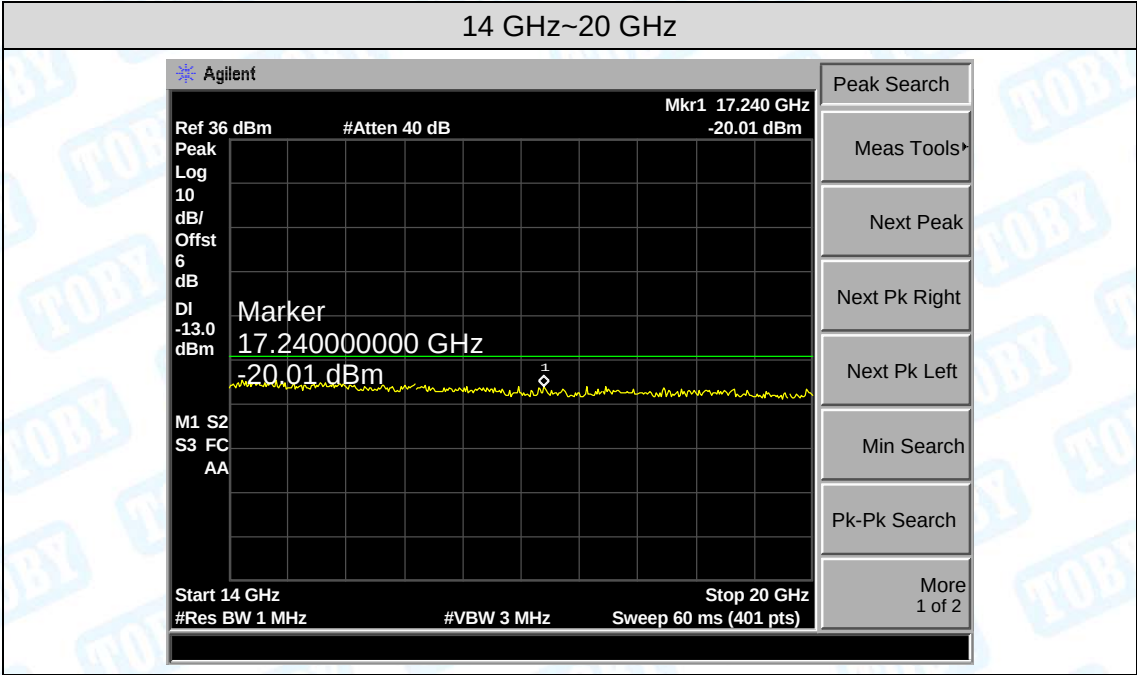


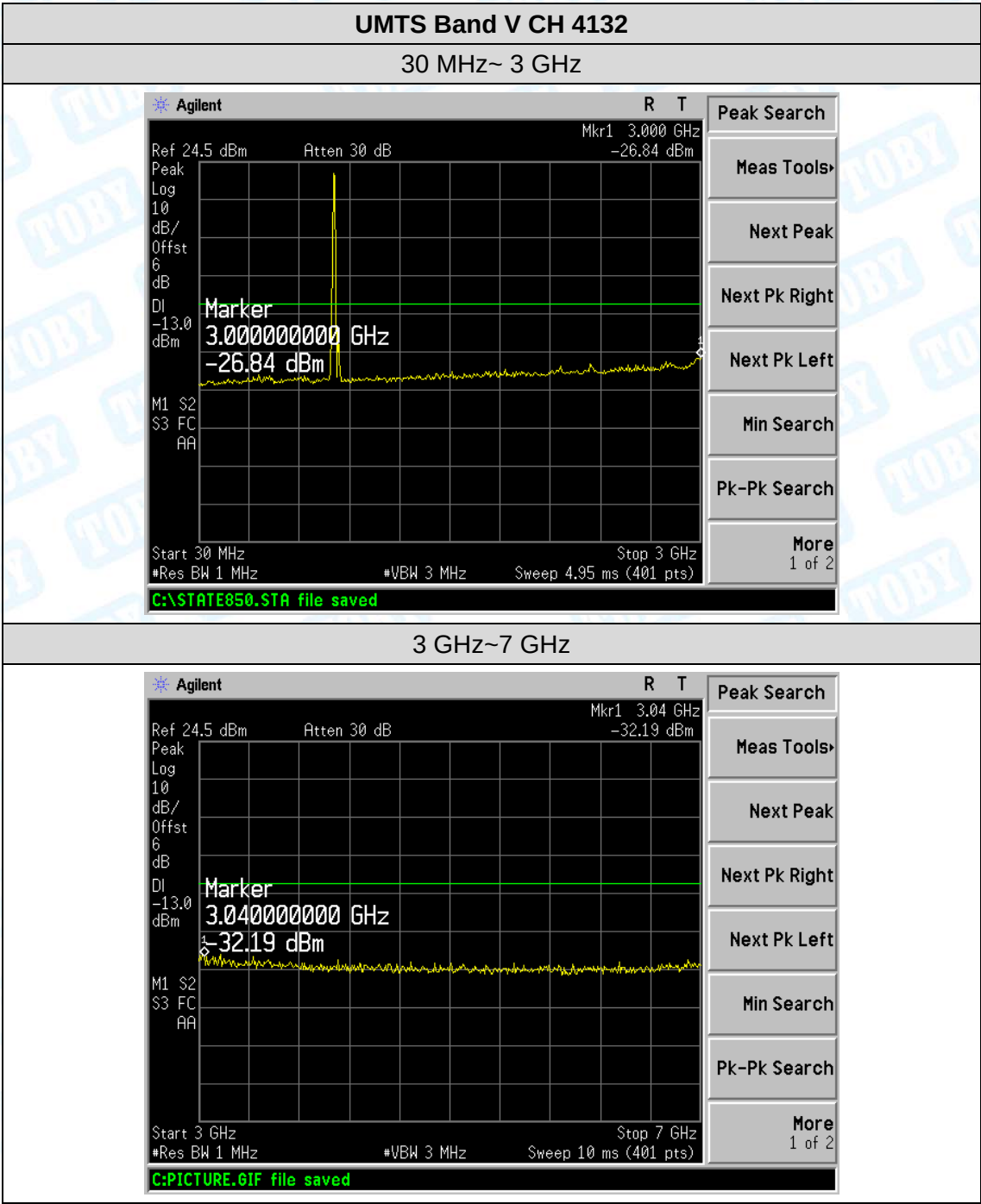


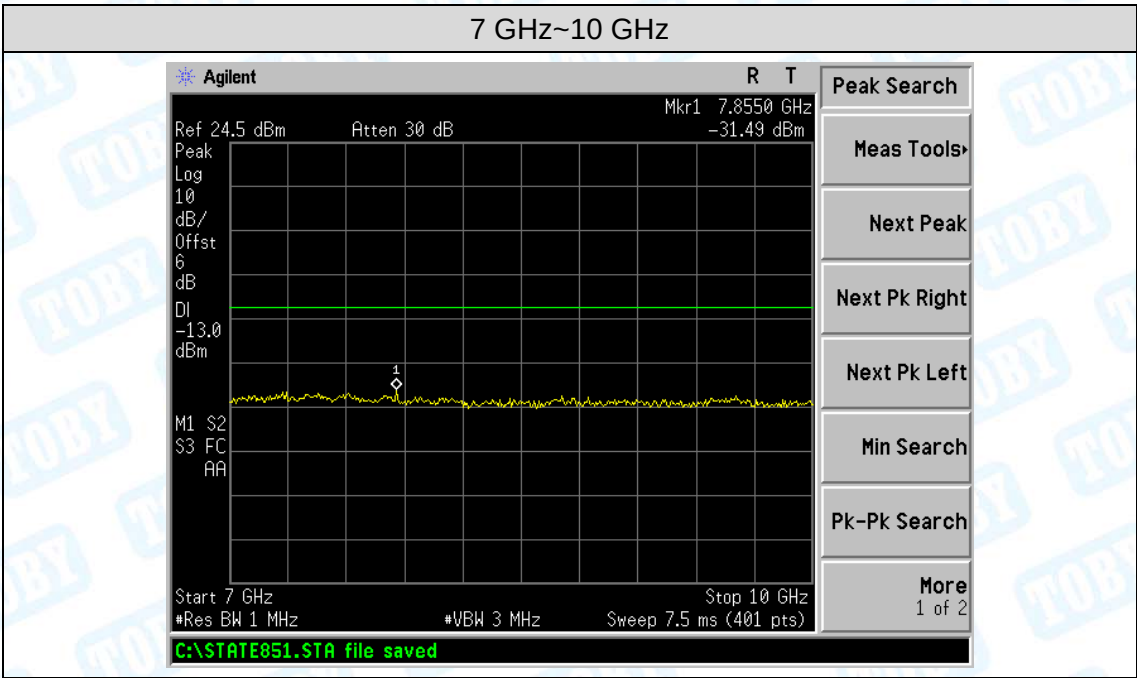


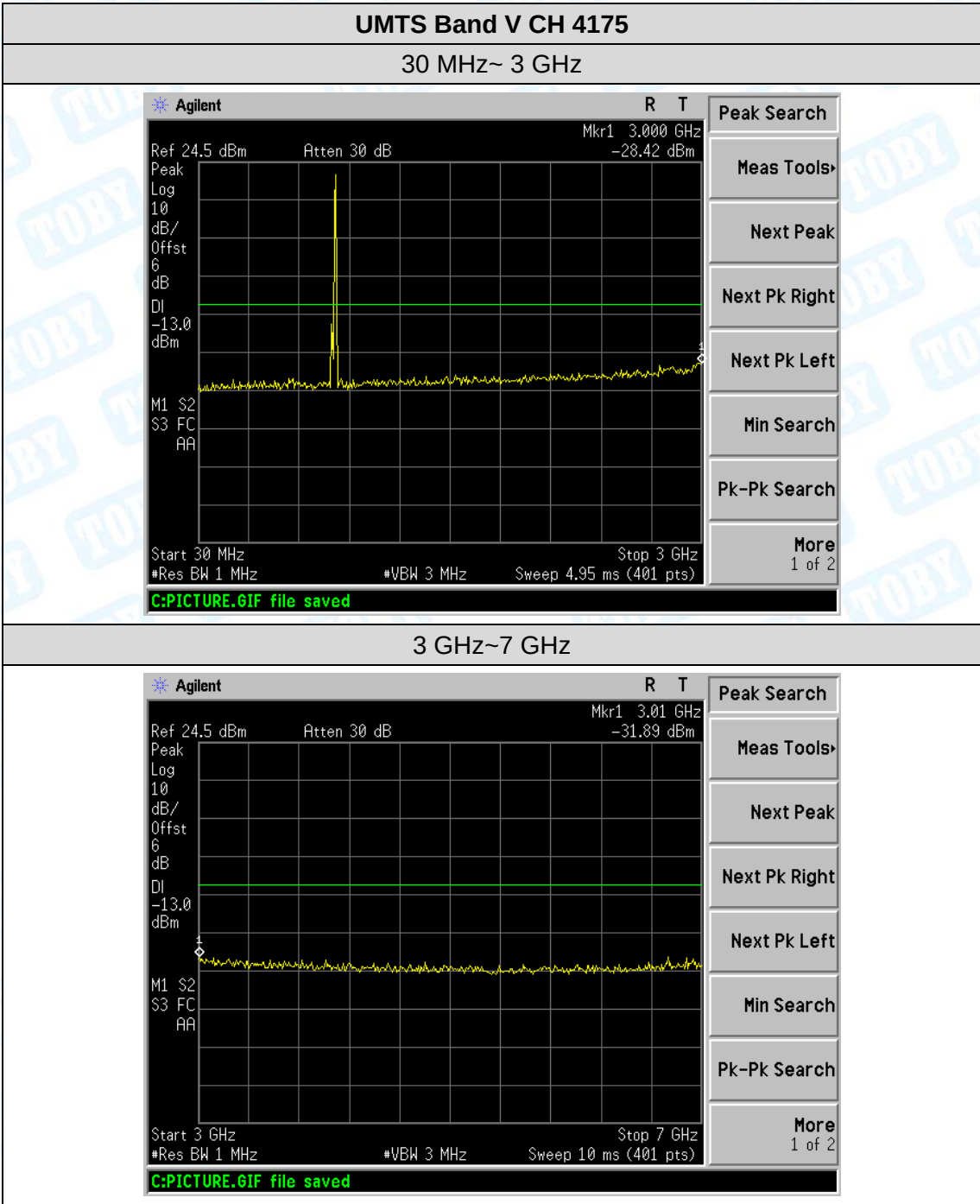


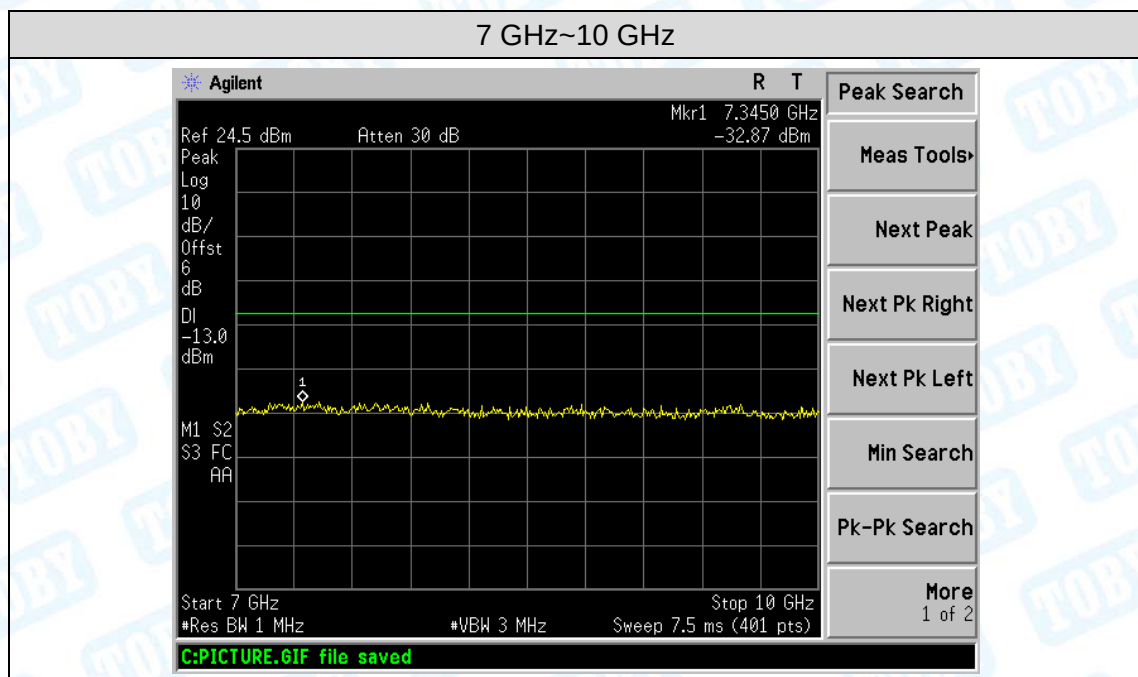


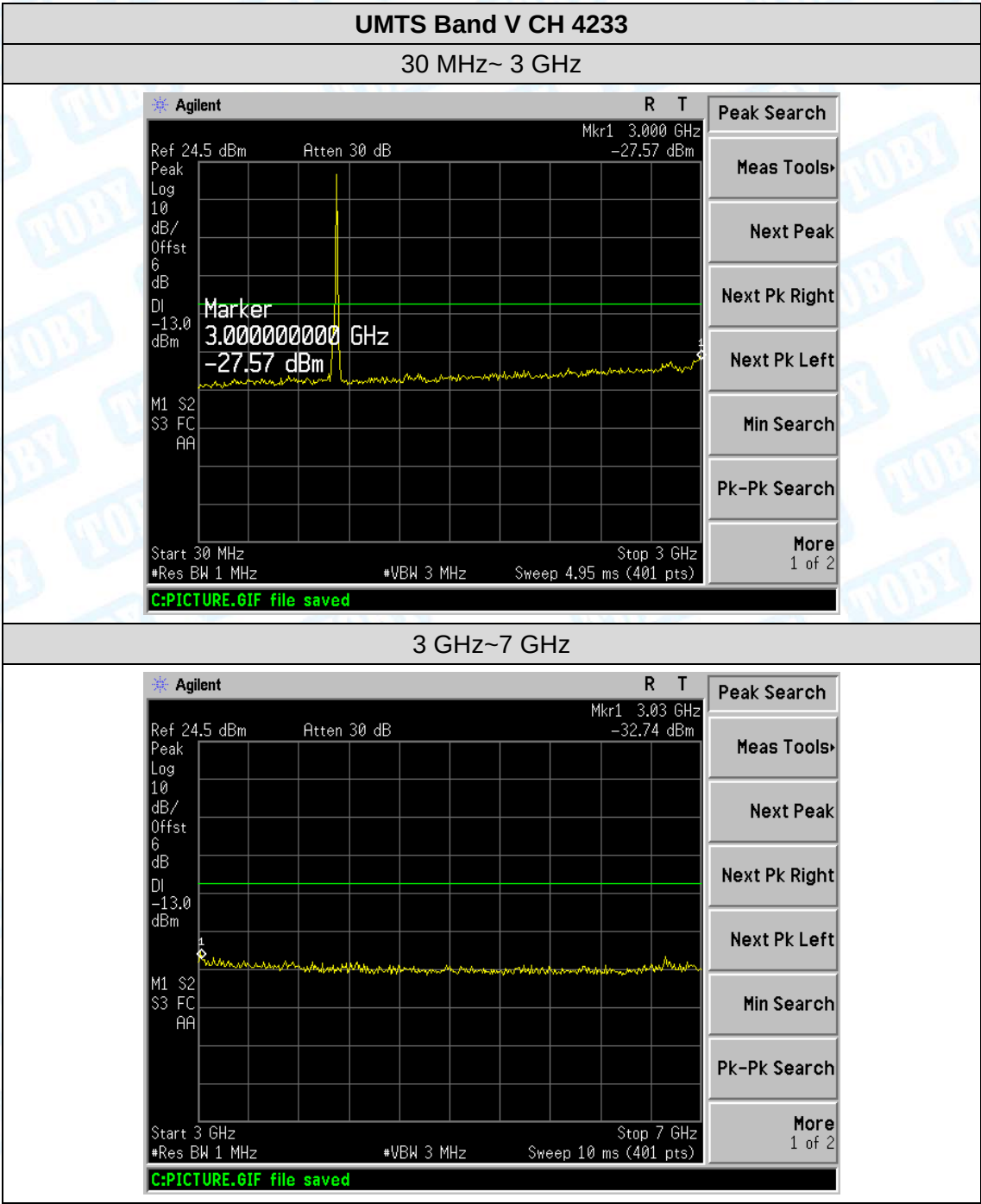


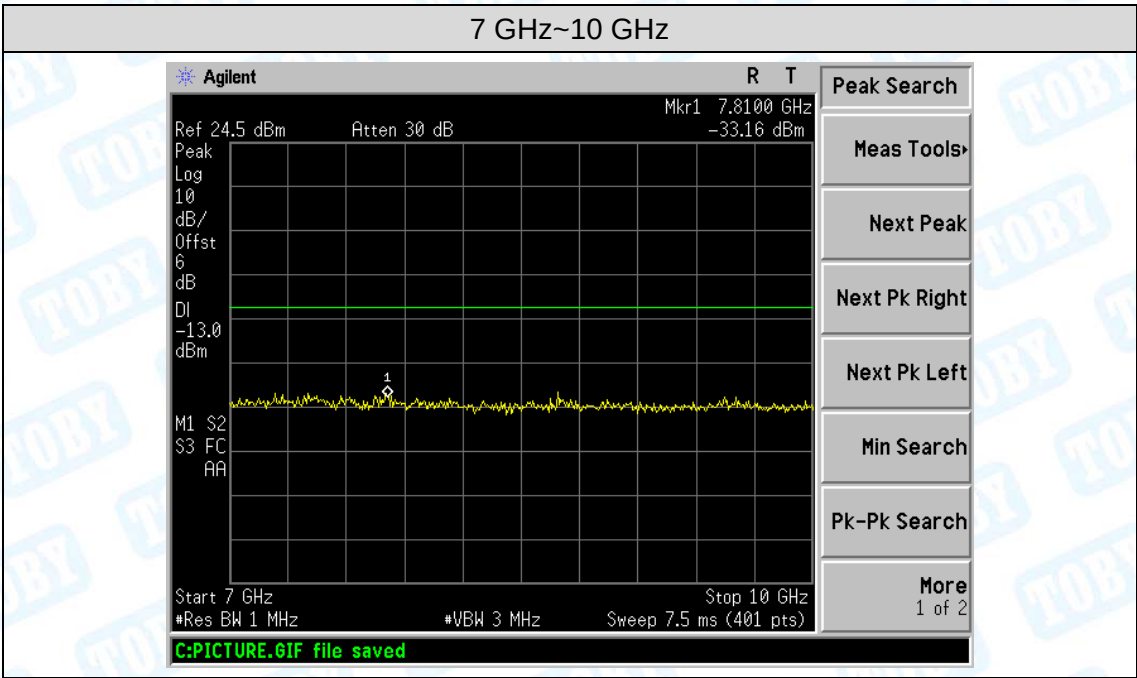


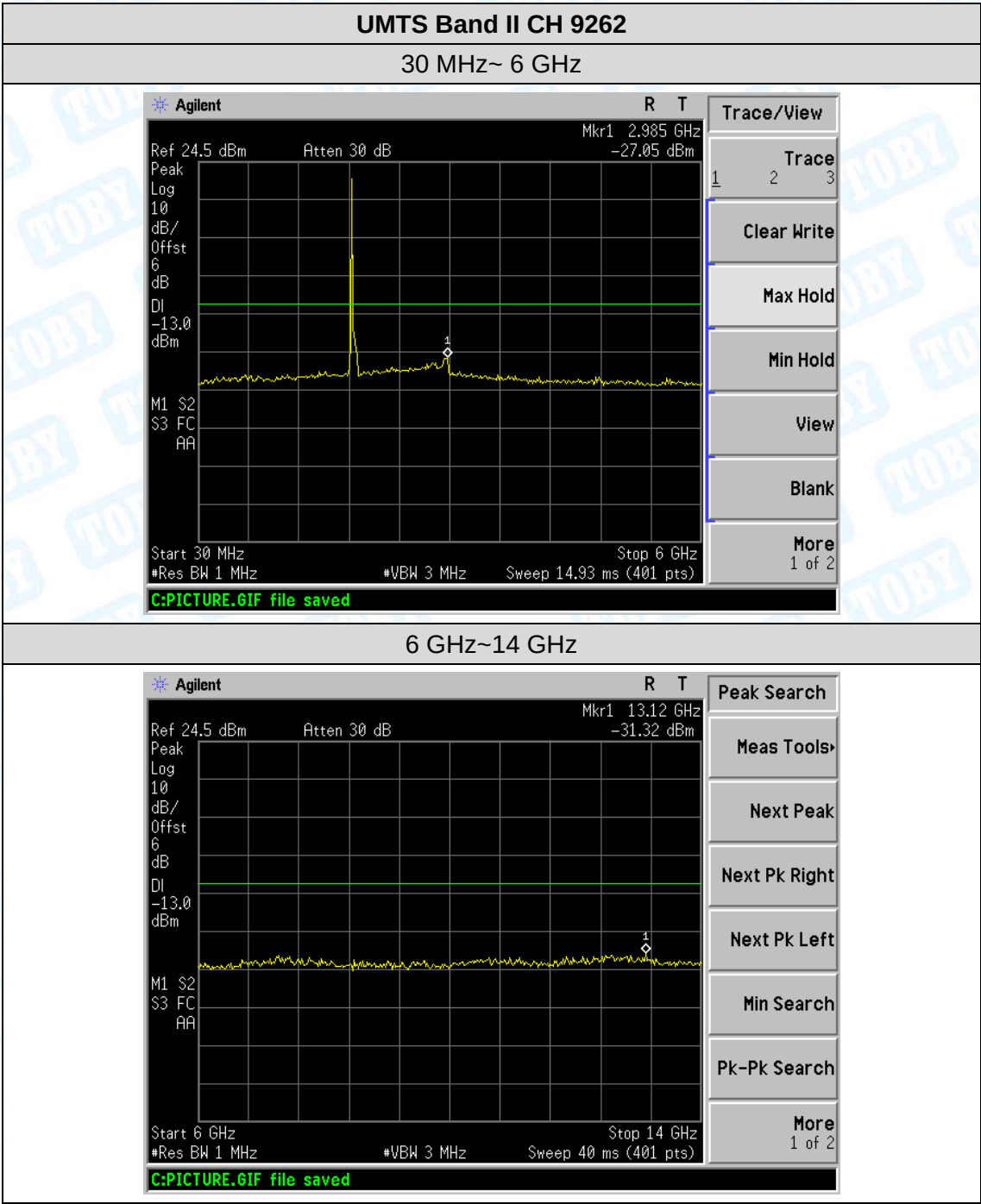


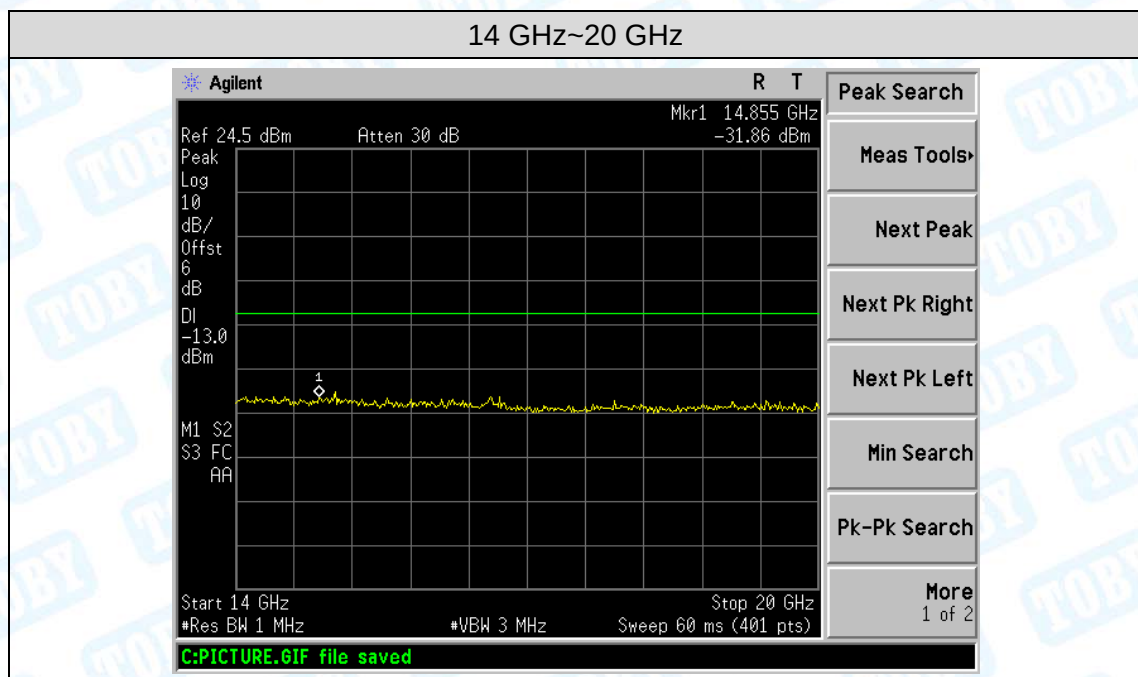


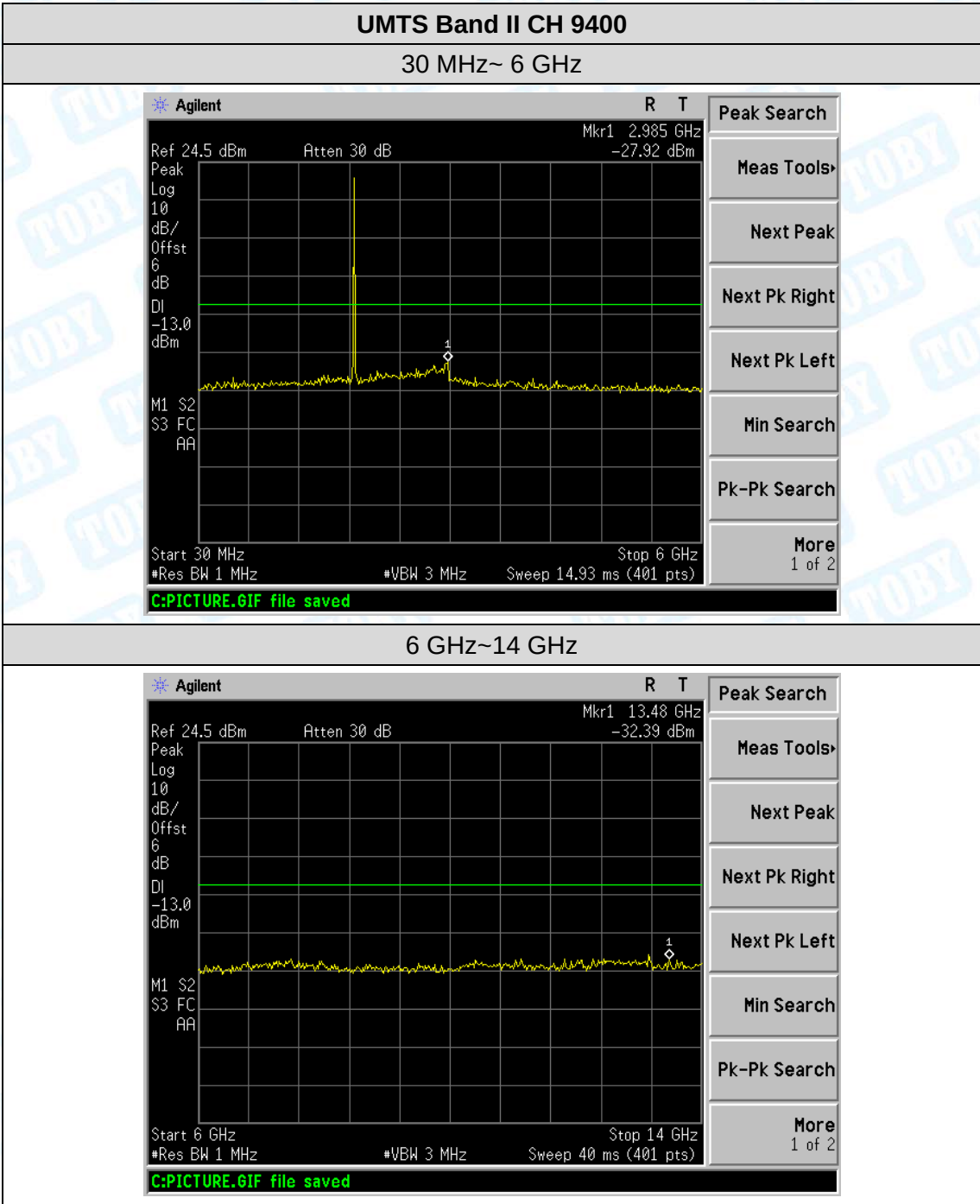


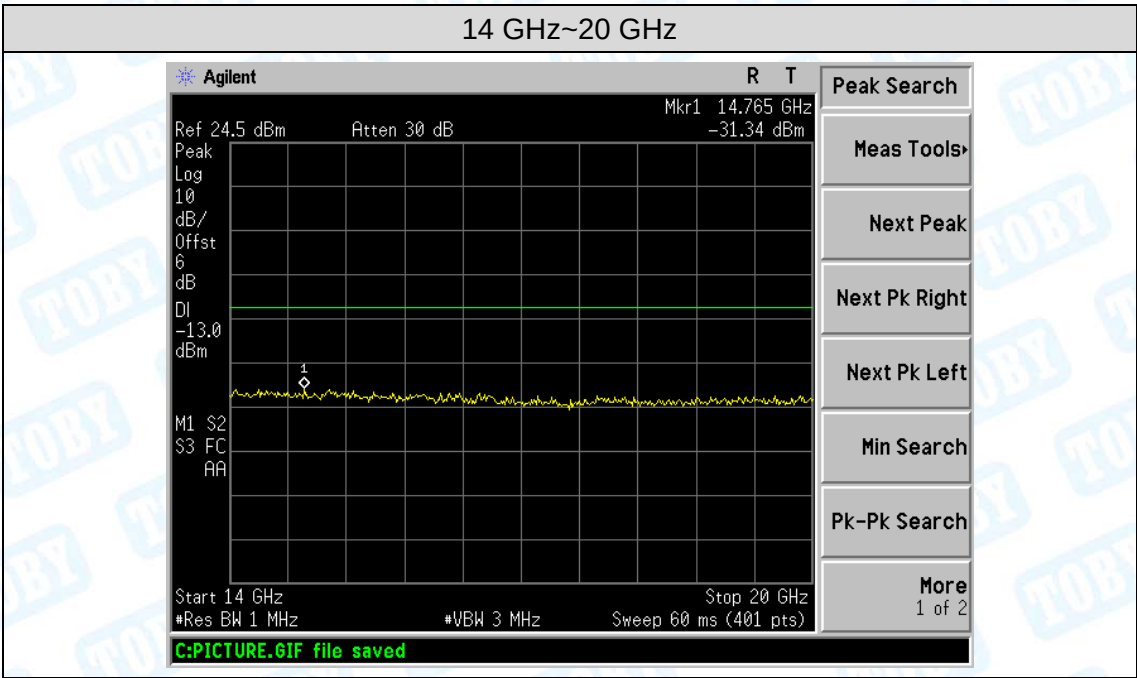


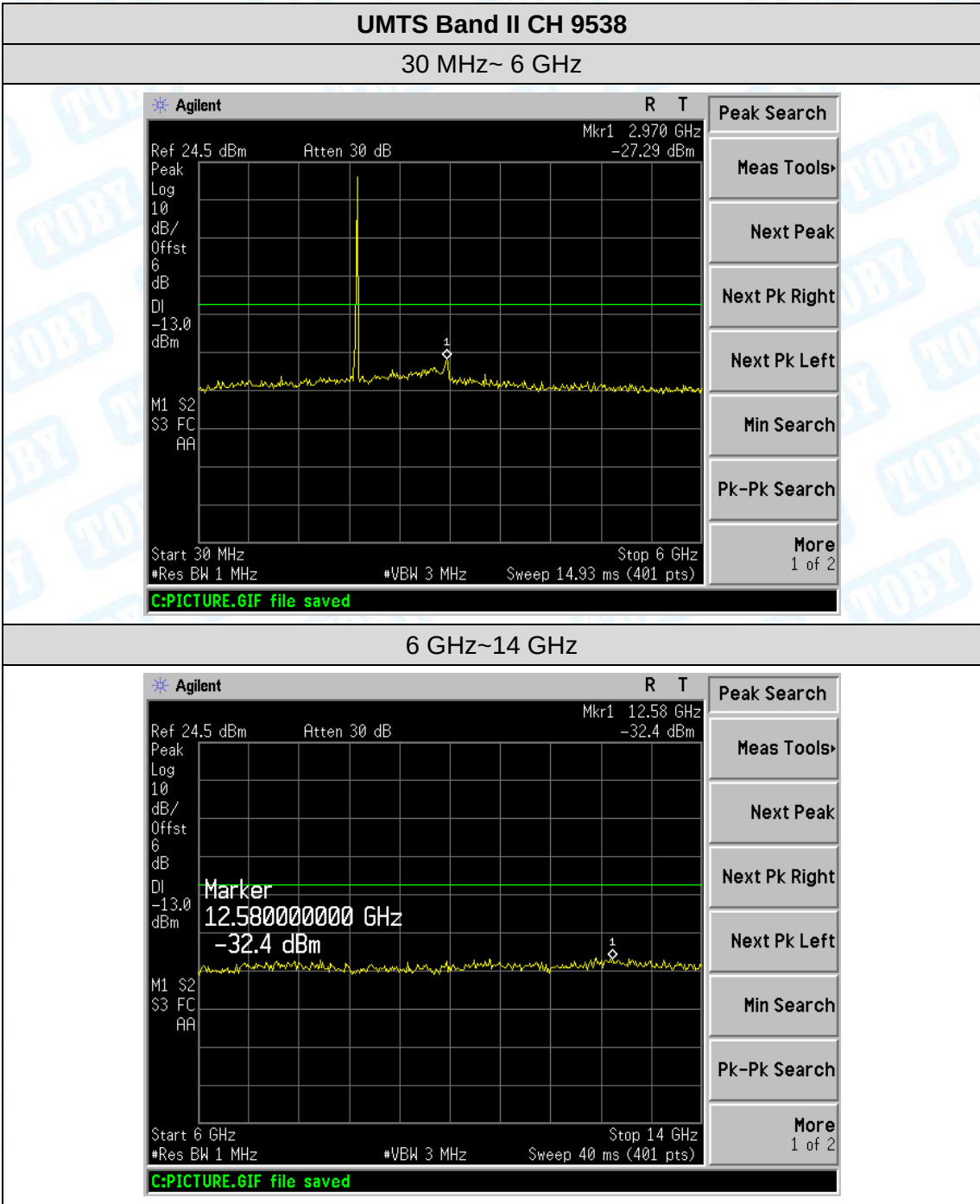


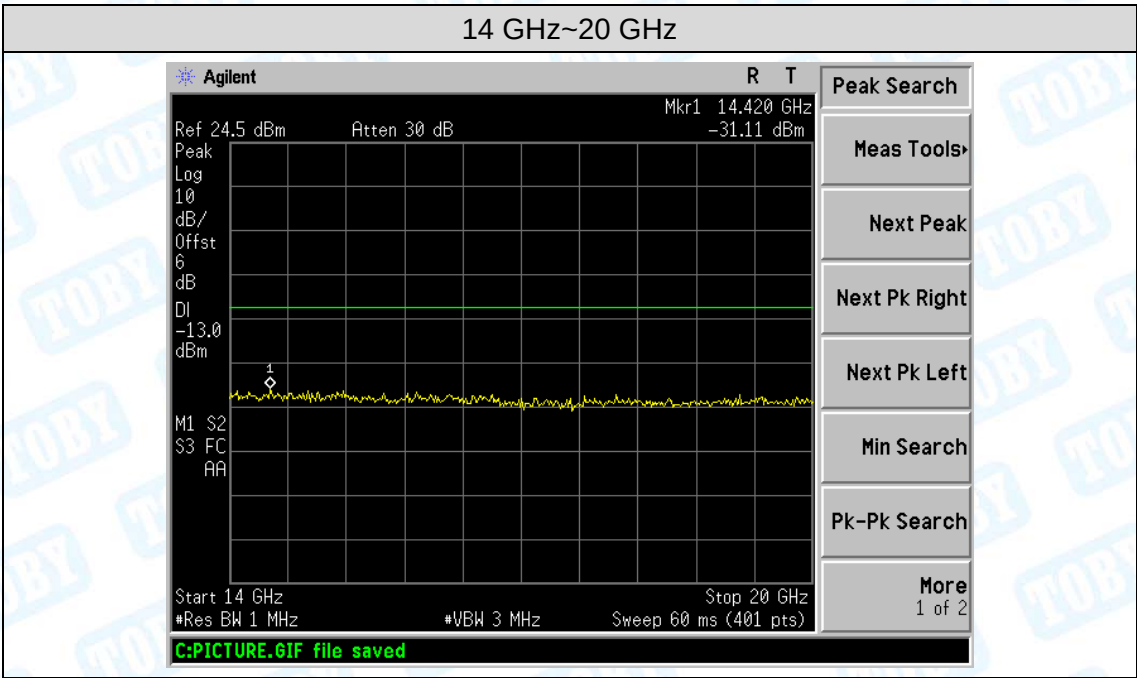








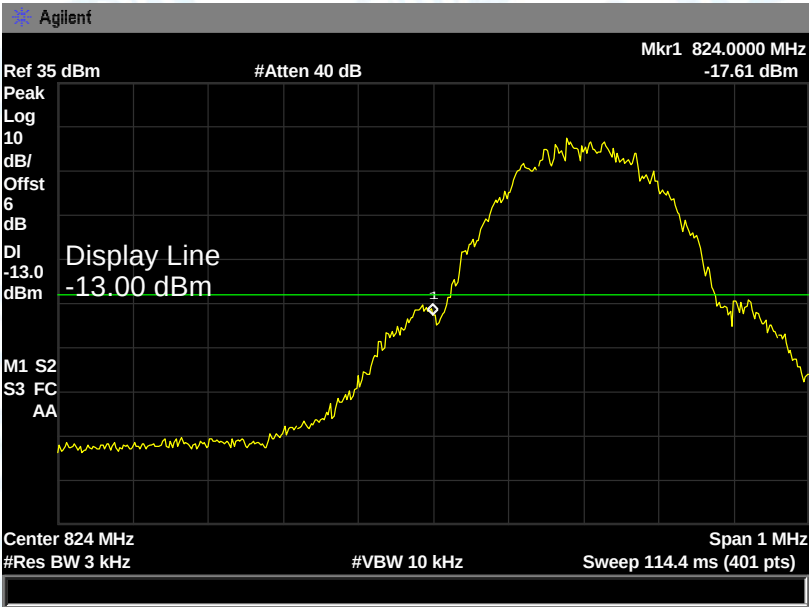




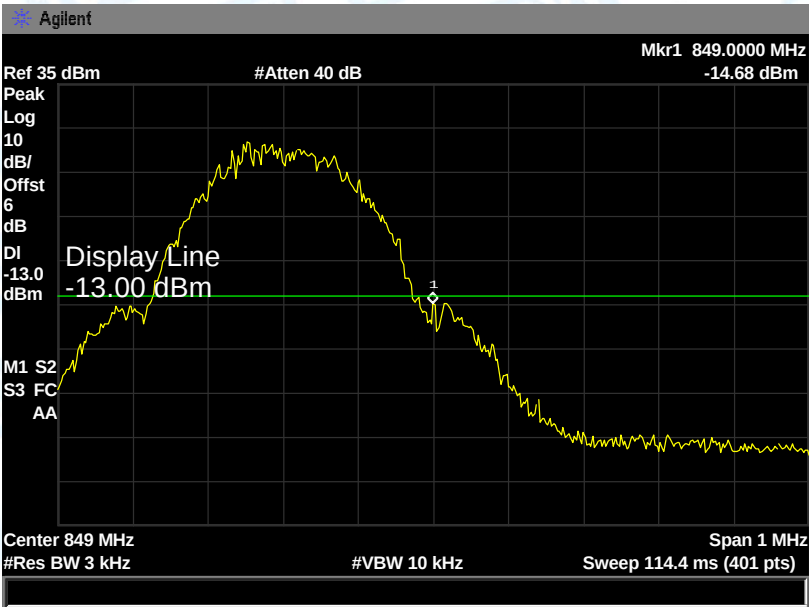
Attachment G-- Band Edge Test

Measurement Data (worst case)

Test Mode:	GSM 850
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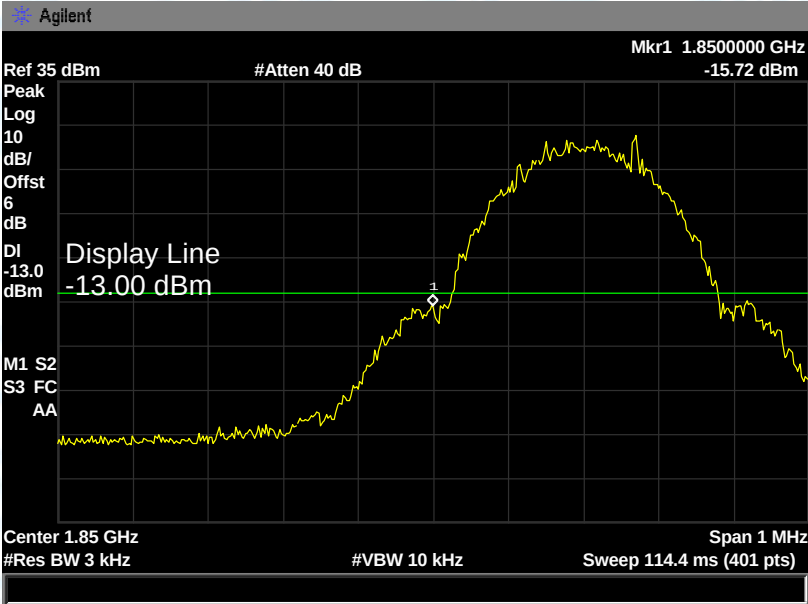


Lowest channel

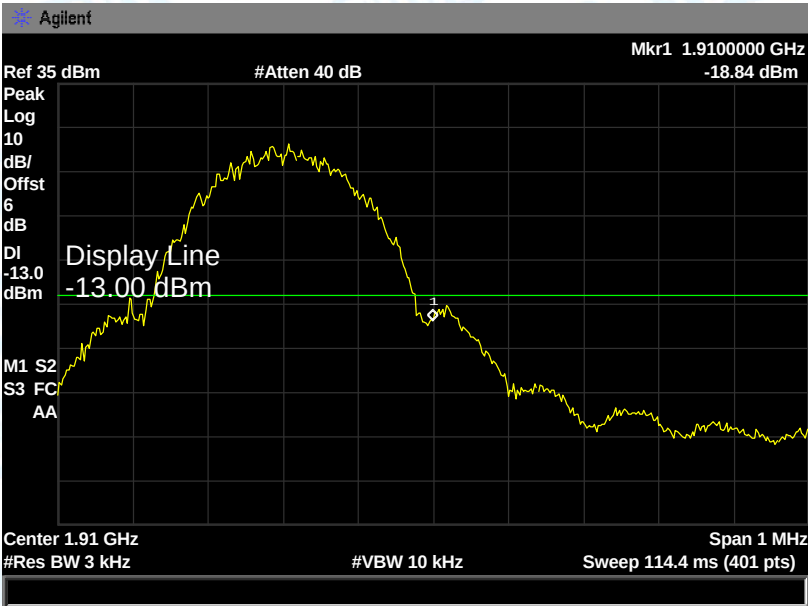


Highest channel

Test Mode:	GSM1900
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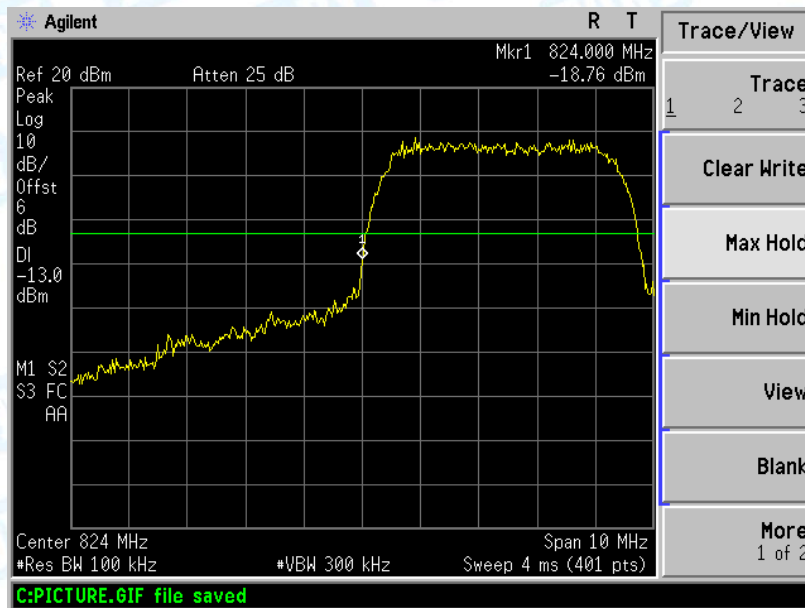


Lowest channel

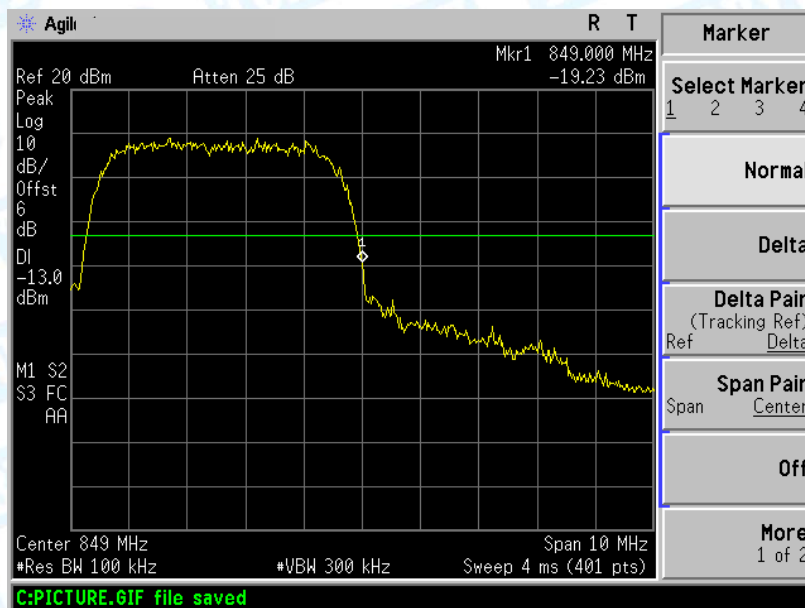


Highest channel

Test Mode:	UMTS Band V RMC
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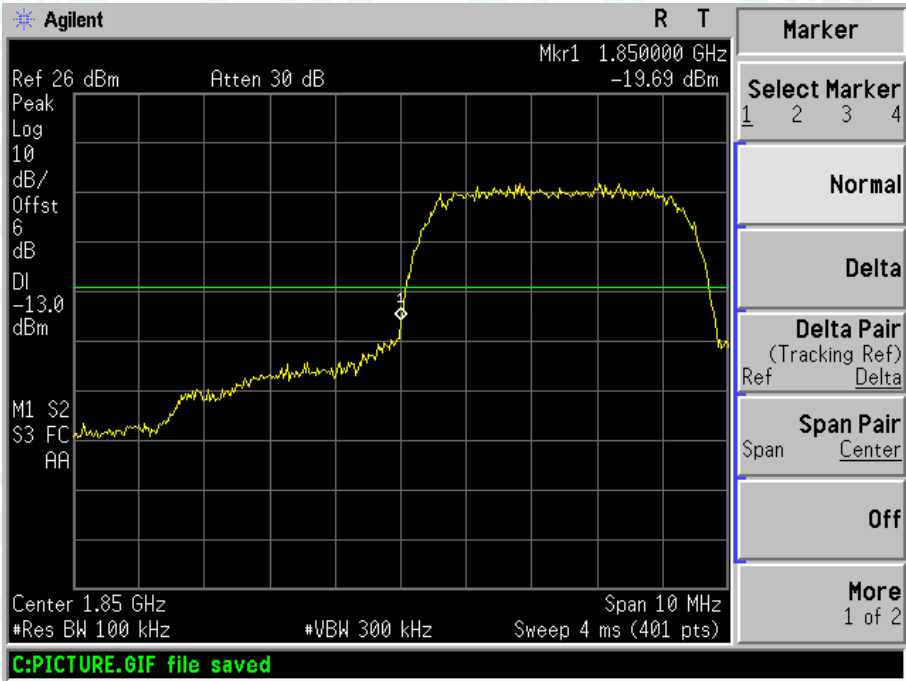


Lowest channel

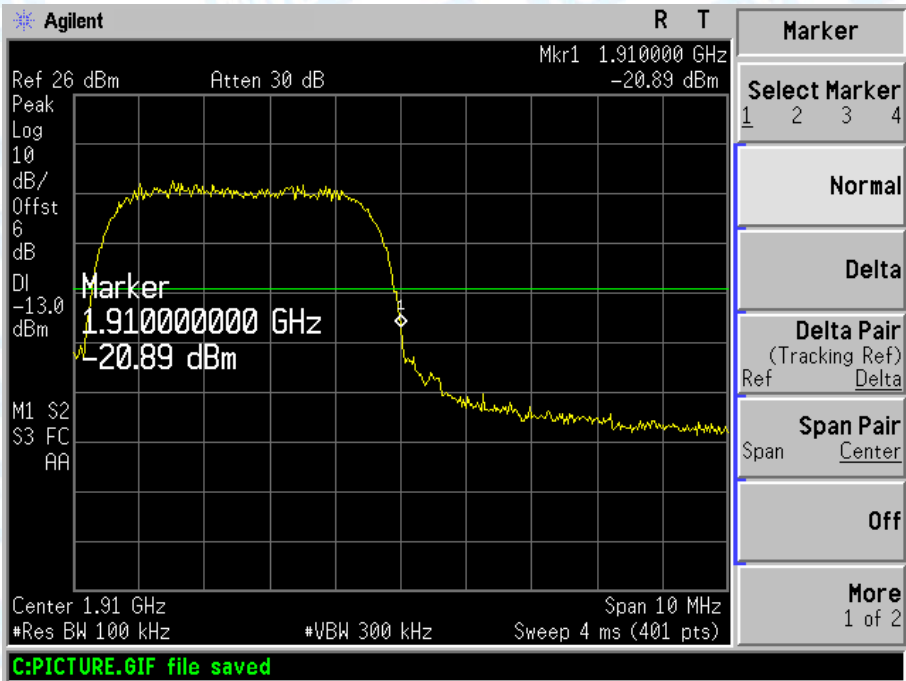


Highest channel

Test Mode:	UMTS Band II RMC
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Lowest channel



Highest channel

Attachment H--Radiated Out Band of Emissions

Measurement Data (worst case)

Test mode:	GSM 850						
Channel:	Middle			Date of Test:		2020-09-25	
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
1673.20	Horizontal	-48.04	7.49	3.97	-36.58	-13.00	Pass
2509.80	H	-41.93	7.03	5.05	-29.85		
3346.40	H	-44.21	12.48	5.98	-25.75		
4183.00	H		---	---	---		
5019.60	H	---	---	---	---		
5856.20	H	---	---	---	---		
1673.20	Vertical	-51.86	8.02	3.97	-39.87	-13.00	Pass
2509.80	V	-43.20	10.47	5.05	-27.68		
3346.40	V	-46.77	16.92	5.98	-23.87		
4183.00	V	---	---	---	---		
5019.60	V	---	---	---	---		
5856.20	V	---	---	---	---		
Remark: 1, The testing has been conformed to 10*836.6MHz=8,366MHz. 2, All other emissions more than 30 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss							

Test mode:	GSM 1900						
Channel:	Middle			Date of Test:	2020-09-25		
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
3760.00	Horizontal	-65.53	14.94	6.24	-44.35	-13.00	Pass
5640.00	H	-56.43	13.87	7.98	-34.58		
7520.00	H	-47.92	14.49	9.68	-23.75		
9400.00	H	---	---	---	---		
11280.00	H	---	---	---	---		
13160.00	H	---	---	---	---		
3760.00	Vertical	-68.06	15.97	6.24	-45.85	-13.00	Pass
5640.00	V	-56.78	13.94	7.98	-34.86		
7520.00	V	-51.13	13.87	9.68	-27.58		
9400.00	V	---	---	---	---		
11280.00	V	---	---	---	---		
13160.00	V	---	---	---	---		
Remark: 1, The testing has been conformed to 10*1880.0MHz=18,800MHz. 2, All other emissions more than 30 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss							

Test mode:	UMTS Band V RMC						
Channel:	Middle			Date of Test:	2020-09-25		
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
1673.20	Horizontal	-49.88	7.49	3.97	-38.42	-13.00	Pass
2509.80	H	-40.66	7.03	5.05	-28.58		
3346.40	H	-43.32	12.48	5.98	-24.86		
4183.00	H		---	---	---		
5019.60	H	---	---	---	---		
5856.20	H	---	---	---	---		
1673.20	Vertical	-51.75	8.02	3.97	-39.76	-13.00	Pass
2509.80	V	-44.99	10.47	5.05	-29.47		
3346.40	V	-47.58	16.92	5.98	-24.68		
4183.00	V	---	---	---	---		
5019.60	V	---	---	---	---		
5856.20	V	---	---	---	---		
Remark: 1, The testing has been conformed to 10*836.6MHz=8,366MHz. 2, All other emissions more than 30 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss							

Test mode:	UMTS Band II RMC						
Channel:	Middle			Date of Test:	2020-09-25		
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
3760.00	Horizontal	-68.03	14.94	6.24	-46.85	-13.00	Pass
5640.00	H	-57.31	13.87	7.98	-35.46		
7520.00	H	-48.92	14.49	9.68	-24.75		
9400.00	H	---	---	---	---		
11280.00	H	---	---	---	---		
13160.00	H	---	---	---	---		
3760.00	Vertical	-67.18	15.97	6.24	-44.97	-13.00	Pass
5640.00	V	-58.17	13.94	7.98	-36.25		
7520.00	V	-50.33	13.87	9.68	-26.78		
9400.00	V	---	---	---	---		
11280.00	V	---	---	---	---		
13160.00	V	---	---	---	---		
Remark: 1, The testing has been conformed to 10*1880.0MHz=18,800MHz. 2, All other emissions more than 30 dB below the limit. 3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss							

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