





# FCC PART 15C TEST REPORT No.I21Z61147-IOT02

for

**HMD Global Oy** 

**Smart Phone** 

TA-1399

With

FCC ID: 2AJOTTA-1399

Hardware Version: V1.0

Software Version: 04US\_0\_033

Issued Date: 2021-09-06

#### Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

#### **Test Laboratory:**

# CTTL-Telecommunication Technology Labs, CAICT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: cttl terminals@caict.ac.cn, website: www.caict.ac.cn





# **REPORT HISTORY**

Report Number	Revision	Description	Issue Date	
I21Z61147-IOT02	Rev.0	1st edition	2021-09-06	
I21Z61147-IOT02	Rev.1	Change P.5.Testing	2021-09-09	
		Location 1		





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# 1. Test Laboratory

#### 1.1.Introduction & Accreditation

**Telecommunication Technology Labs, CAICT** is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

# 1.2. Testing Location

Location 1:CTTL(Huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,

P. R. China100191

Location 2:CTTL(BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology

Development Area, Beijing, P. R. China 100176





# 1.3. Testing Environment

Normal Temperature:

15-35°C

Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2021-07-15
Testing End Date: 2021-09-06

1.5. Signature

谢为药

Xie Xiuzhen

(Prepared this test report)

Zheng Wei

(Reviewed this test report)

Hu Xiaoyu

(Approved this test report)





# 2. Client Information

# 2.1. Applicant Information

Company Name: HMD Global Oy

Address: Bertel Jungin aukio 9, 02600 Espoo, Finland

City: /
Postal Code: /

Country: Finland

Telephone: +393 316272922

Fax: /

#### 2.2. Manufacturer Information

Company Name: HMD Global Oy

Address: Bertel Jungin aukio 9, 02600 Espoo, Finland

City: /
Postal Code: /

Country: Finland

Telephone: +393 316272922

Fax: /





# 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

# 3.1. About EUT

Description Smart Phone Model name TA-1399

FCC ID 2AJOTTA-1399

With WLAN Function Yes

Frequency Band ISM 2400MHz~2483.5MHz

Type of Modulation DSSS/CCK/OFDM

Number of Channels 11

Antenna Integral Antenna

MAX Conducted Power 27.26dBm Power Supply 3.8V

#### 3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	<b>HW Version</b>	SW Version
EUT1	354773220015030	V1.0	04US_0_033
EUT2	354773220017127	V1.0	04US_0_033

<sup>\*</sup>EUT ID: is used to identify the test sample in the lab internally.

# 3.3. Internal Identification of AE

AE ID*	Description	NOTE
AE1	Battery	1
AE2	Adapter	1
AE3	<b>USB</b> Cable	1
AE1		
Model		1
Manufactu	urer	TIANJIN LISHEN BATTERY JOINT-STOCK CO.,LTD.
Capacitan	ice	4370mAh
Nominal v	oltage	3.87V
AE2		
Model		1-CHUSQ302-097
Manufactu	urer	HUIZHOU PUAN ELECTRONICS CO.,LTD
Length		1
AE3		
Model		/
Manufactu	urer	Huizhou Washin Electronics Co.,Ltd

<sup>\*</sup>AE ID: is used to identify the test sample in the lab internally.

Length





# 3.4. General Description

The Equipment under Test (EUT) is a model of Smart Phone with integrated antenna and inbuilt battery.

It has Bluetooth (EDR) function.

It consists of normal options: travel charger, USB cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

### 3.5. Interpretation of the Test Environment

For the test methods, the test environment uncertainty figures correspond to an expansion factor k=2.

Measurement Uncertainty

Parameter	Uncertainty	
temperature	0.48°C	
humidity	2 %	
DC voltages	0.003V	

# 4. Reference Documents

# 4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

# 4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
	FCC CFR 47, Part 15, Subpart C:	
	15.205 Restricted bands of operation;	
FCC Part15	15.209 Radiated emission limits, general requirements;	2018
	15.247 Operation within the bands 902-928MHz, 2400-	
	2483.5 MHz, and 5725-5850 MHz.	
ANSI C63.10	American National Standard of Procedures for Compliance	2013
ANSI C03.10	Testing of Unlicensed Wireless Devices	2013
	Federal Communications Commission Office of	
	Engineering and Technology Laboratory Division	
	GUIDANCE FOR COMPLIANCE MEASUREMENTS ON	
KDB 558074 D01	DIGITAL TRANSMISSION SYSTEM, FREQUENCY	2019
	HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID	
	SYSTEM DEVICES OPERATING UNDER SECTION	
	15.247 OF THE FCC RULES	
KDB-662911 D01	Emissions Testing of Transmitters with Multiple Outputs in	2013
NDD-002911 D01	the Same Band (e.g. MIMO Smart Antenna etc)	2013





# 5. Test Results

# 5.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247 (b)	1	Р
Peak Power Spectral Density	15.247 (e)	1	Р
Occupied 6dB Bandwidth	15.247 (a)	1	Р
Band Edges Compliance	15.247 (d)	1	Р
Transmitter Spurious Emission - Conducted	15.247 (d)	1	Р
Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	1	Р
AC Powerline Conducted Emission	15.107, 15.207	1	Р

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

Р	Pass, The EUT complies with the essential requirements in the standard.		
NP	Not Perform, The test was not performed by CTTL		
NA	Not Applicable, The test was not applicable		
F	Fail, The EUT does not comply with the essential requirements in the		
	standard		

# 5.2. Statements

The test cases as listed in section 5.1 of this report for the EUT specified in section 3 was performed by CTTL and according to the standards or reference documents listed in section 4.2

The EUT met all requirements of the standards or reference documents, and only the WLAN function was tested in this report.

# 5.3. Test Conditions

T nom	Normal Temperature	
T min	_ow Temperature	
T max	High Temperature	
V nom	Normal Voltage	

For this report, if the test cases listed above are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	T nom 26℃	
Voltage	V nom	3.8V
Humidity	H nom	20-75%





# 6. Test Facilities Utilized

# **Conducted test system**

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal	FSQ40	200089	Rohde &	1 year	2022-05-24
	Analyzer			Schwarz		
2	Vector Signal	FSW67	104051	Rohde &	1 year	2021-12-08
	Analyzer	1 00007	104031	Schwarz	i yeai	2021-12-00
3	LISN	ENV216	101459	Rohde &	1 year	2022-03-22
٥	LION	ENVZIO	101459	Schwarz	1 year	2022-03-22
_	Toot Doopiyer	LCCI	100766	Rohde &	1 4005	2022 02 00
4	Test Receiver	ESCI	100766	Schwarz	1 year	2022-03-09
5	Shielding Room	S81	/	ETS-Lindgren	/	/

# Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Antenna	3117	139065	ETS	1 year	2021-09-22
2	Antenna	VULB 9163	9163-482	SCHWARZBECK	1 year	2021-11-04
3	Test Receiver	ESU26	100376	R&S	1 year	2021-09-04
4	Test Receiver	FSV40	101047	R&S	1 year	2022-06-02
5	Universal Radio Communication Tester	CMW500	159408	R&S	1 year	2022-03-08
6	Test Receiver	FSV30	101525	R&S	1 year	2022-02-20
7	Antenna	LB-7180-NF	J203001300 005	A-INFO	1 year	2022-02-28
8	Antenna	HFH2-Z2	829324	R&S	1 year	2021-12-10
9	Antenna	LB-180400- 25-C-KF	2110084000 006	A-INFO	1 year	2022-02-28
10	Anechoic Chamber	FACT-3	Ct000332- 1074	ETS	1 year	2022-01-21

### Note:

The test dates were before the calibration due dates of equipment used (the Test Receiver which series number is 100376).





# 7. Measurement Uncertainty

# 7.1. Maximum Output Power

Measurement Uncertainty: 0.387dB,k=1.96

# 7.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

# 7.3. DTS 6-dB Signal Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

# 7.4. Band Edges Compliance

Measurement Uncertainty: 0.62dB,k=1.96

# 7.5. Transmitter Spurious Emission

#### Conducted (k=1.96)

Frequency Range	Uncertainty(dB)
30MHz ≤ f ≤ 2GHz	1.22
2GHz ≤ f ≤3.6GHz	1.22
3.6GHz ≤ f ≤8GHz	1.22
8GHz ≤ f ≤12.75GHz	1.51
12.75GHz ≤ f ≤26GHz	1.51
26GHz ≤ f ≤40GHz	1.59

#### Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	1
30MHz ≤ f ≤ 1GHz	5.84
1GHz ≤ f ≤18GHz	5.82
18GHz ≤ f ≤40GHz	3.78

#### 7.6. AC Power-line Conducted Emission

Measurement Uncertainty: 3.1dB,k=2





# **ANNEX A: Detailed Test Results**

# A.1. Measurement Method

### A.1.1. Conducted Measurements

Connect the EUT to the test system as Fig.A.1.1.1 shows.

Set the EUT to the required work mode.

Set the EUT to the required channel.

Set the Vector Signal Analyzer and start measurement.

Record the values. Vector Signal Analyzer

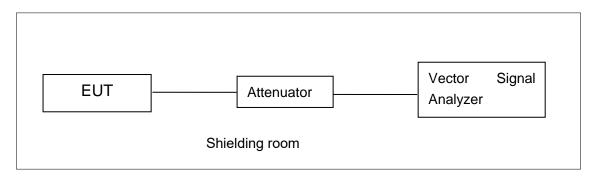


Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

#### A.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows, Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz; Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 10Hz;

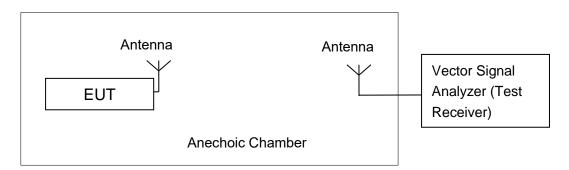


Fig.A.1.2.1: Test Setup Diagram for Radiated Measurements





# A.2. Maximum Output Power

Method of Measurement: See ANSI C63.10-2013-clause 11.9.1.2

- a) Set the RBW = 1 MHz.
- b) Set the VBW = 3 MHz.
- c) Set the span  $\geq$  [1.5  $\times$  DTS bandwidth].
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select the peak detector).

#### **Measurement Limit:**

Standard	Limit (dBm)
FCC CRF Part 15.247(b)	< 30

**EUT ID: EUT2** 

#### A.2.1. Peak Output Power-conducted

#### **Measurement Results:**

#### SISO-Chain1

#### 802.11b/g mode

	Data Bata	Test Result (dBm)			
Mode	Data Rate (Mbps)	2412MHz	2437MHz	2462 MHz	
	(Wibps)	(Ch1)	(Ch6)	(Ch11)	
802.11b	1	21.12	21.62	21.12	
802.11g	6	23.92	24.15	23.74	

The data rate 1Mbps and 6Mbps are selected as worse condition, and the following cases are performed with this condition.

#### 802.11n-HT20 mode

	Data	Test Result (dBm)			
Mode	Rate	2412MHz	2437MHz	2462 MHz	
	(Index)	(Ch1)	(Ch6)	(Ch11)	
802.11n(20MHz)	MCS0	23.43	23.58	23.13	

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.





#### 802.11n-HT40 mode

	Data	Test Result (dBm)				
Mode	Rate	2422MHz	2437MHz	2452 MHz		
	(Index)	(Ch3)	(Ch6)	(Ch9)		
802.11n(40MHz)	MCS0	23.65	23.48	23.72		

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

#### SISO- Chain2

# 802.11b/g mode

	Data Bata	Test Result (dBm)			
Mode	Data Rate (Mbps)	2412MHz	2437MHz	2462 MHz	
		(Ch1)	(Ch6)	(Ch11)	
802.11b	1	21.71	20.72	20.72	
802.11g	6	24.64	24.28	23.76	

The data rate 1Mbps and 6Mbps are selected as worse condition, and the following cases are performed with this condition.

# 802.11n-HT20 mode

	Data	Test Result (dBm)				
Mode	Rate	2412MHz	2437MHz	2462 MHz		
	(Index)	(Ch1)	(Ch6)	(Ch11)		
802.11n(20MHz)	MCS0	24.23	22.92	23.33		

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

### 802.11n-HT40 mode

	Data		Test Result (dBm)		
Mode	Rate	2422MHz 2437MHz 2452 MHz			
	(Index)	(Ch3)	(Ch6)	(Ch9)	
802.11n(40MHz)	MCS0	23.33	23.18	23.32	

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

#### MIMO&CDD

# 802.11b/g mode

	Data Rate	Test Result (dBm)			
Mode	(Mbps)	2412MHz	2437MHz	2462 MHz	
		(Ch1)	(Ch6)	(Ch11)	
802.11b	1	23.75	23.38	23.28	
802.11g	6	27.26	26.70	26.68	





The data rate 1Mbps and 6Mbps are selected as worse condition, and the following cases are performed with this condition.

#### 802.11n-HT20 mode

	Data	Test Result (dBm)			
Mode	Rate	2412MHz	2437MHz	2462 MHz	
	(Index)	(Ch1)	(Ch6)	(Ch11)	
802.11n(20MHz)	MCS0	26.63	26.01	26.17	

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

#### 802.11n-HT40 mode

	Data	Test Result (dBm)			
Mode	Rate	2422MHz 2437MHz 2452 MHz			
	(Index)	(Ch3) (Ch6) (Ch9)			
802.11n(40MHz)	MCS0	26.27	25.78	26.07	

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

The duty cycle of all mode are greater than or equal to 98%.

**Conclusion: Pass** 





# A.3. Peak Power Spectral Density

# Method of Measurement: See ANSI C63.10-2013-clause 11.10.2

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to RBW = 3 kHz.
- d) Set the VBW = 10 kHz.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.

#### **Measurement Limit:**

Standard	Limit
FCC CRF Part 15.247(e)	< 8 dBm/3 kHz

#### **Measurement Results:**

#### SISO-chain2

#### 802.11b/g mode

Mode	Channel	-	ctral Density /3 kHz )	Conclusion
	1	Fig.A.3.1	3.49	Р
802.11b	6	Fig.A.3.2	-8.59	Р
	11	Fig.A.3.3	-9.03	Р
	1	Fig.A.3.4	-10.58	Р
802.11g	6	Fig.A.3.5	-11.49	Р
	11	Fig.A.3.6	-11.20	Р

#### 802.11n-HT20 mode

Mode	Channel	•	ctral Density /3 kHz )	Conclusion
000 44	1	Fig.A.3.7	-11.53	Р
802.11n	6	Fig.A.3.8	-13.04	Р
(HT20)	11	Fig.A.3.9	-11.96	Р

# 802.11n-HT40 mode

Mode	Channel	-	ctral Density /3 kHz )	Conclusion
902 11n	3	Fig.A.3.10	-14.71	Р
802.11n	6	Fig.A.3.11	-14.96	Р
(HT40)	9	Fig.A.3.12	-15.46	Р





#### MIMO&CDD

# 802.11b/g mode

Mode	Channel	Power Spec ( dBm/3	_	Conclusion
	1	Fig.A.3.13	-4.95	Р
802.11b	6	Fig.A.3.14	-5.89	Р
	11	Fig.A.3.15	-6.50	Р
	1	Fig.A.3.16	-8.47	Р
802.11g	6	Fig.A.3.17	-8.26	Р
	11	Fig.A.3.18	-8.57	Р

#### 802.11n-HT20 mode

Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
000 44 =	1	Fig.A.3.19	-9.24	Р
802.11n	6	Fig.A.3.20	-9.14	Р
(HT20)	11	Fig.A.3.21	-9.96	Р

# 802.11n-HT40 mode

Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
000 11m	3	Fig.A.3.22	-11.79	Р
802.11n	6	Fig.A.3.23	-12.37	Р
(HT40)	9	Fig.A.3.24	-12.51	Р

Both of the chain1 and chain2 are measured, as the power of chain2 is the worse case, so the results of chain2 are reflected in the report.

**Conclusion: Pass** 

Test graphs as below:





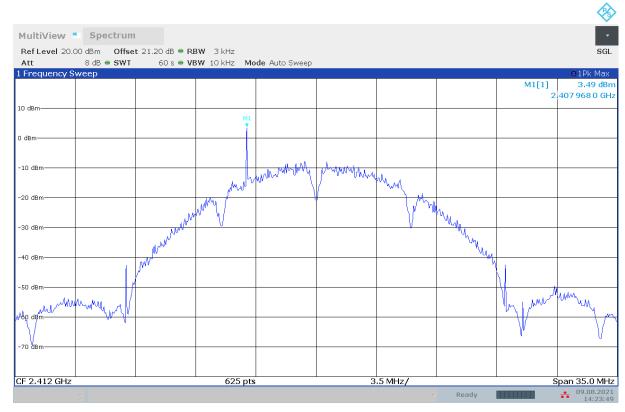


Fig.A.3.1 Power Spectral Density(802.11b,Ch1)

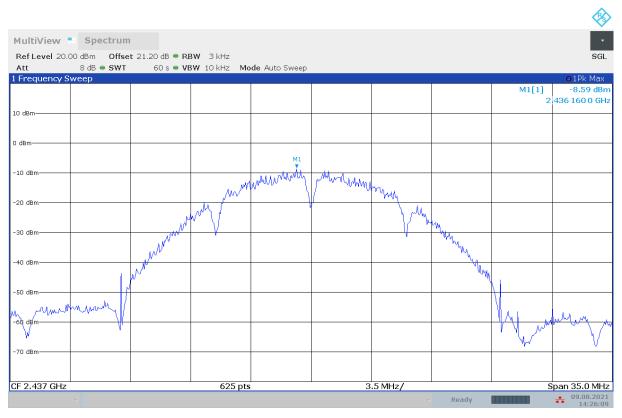


Fig.A.3.2 Power Spectral Density (802.11b, Ch 6)





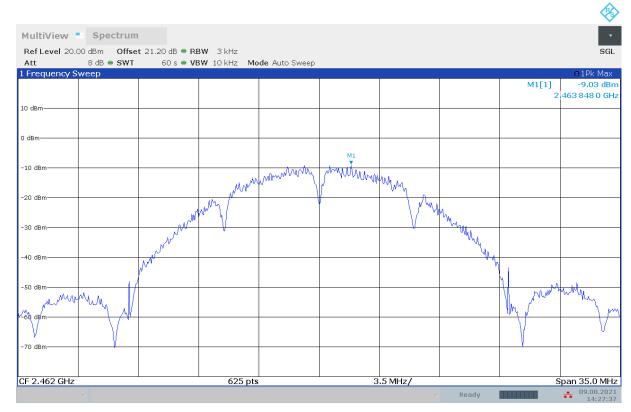


Fig.A.3.3 Power Spectral Density (802.11b, Ch 11)

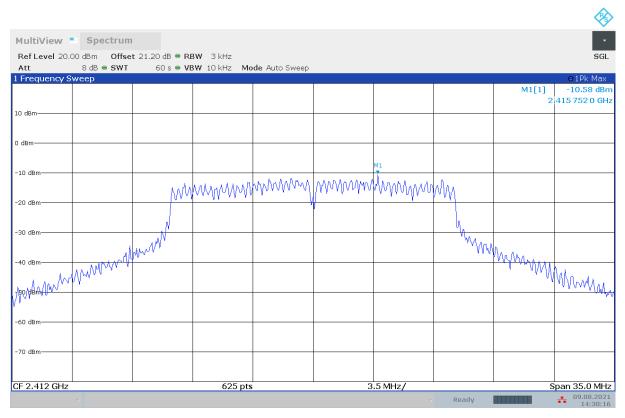


Fig.A.3.4 Power Spectral Density (802.11g, Ch 1)





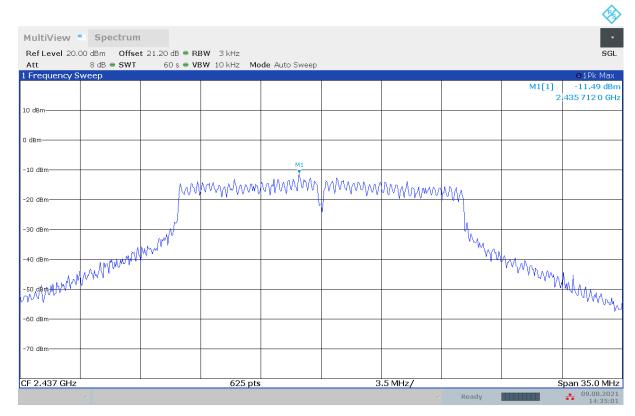


Fig.A.3.5 Power Spectral Density (802.11g, Ch 6)

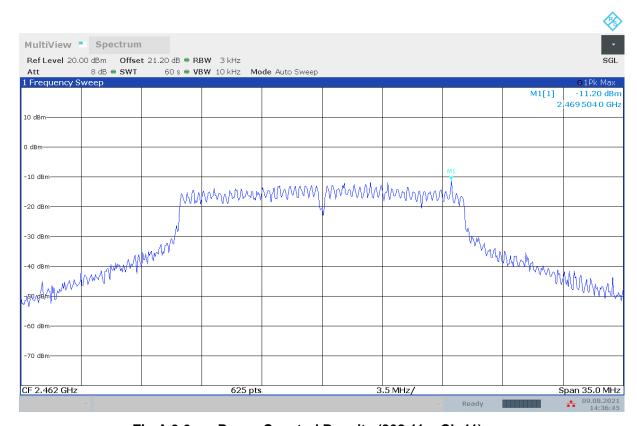


Fig.A.3.6 Power Spectral Density (802.11g, Ch 11)





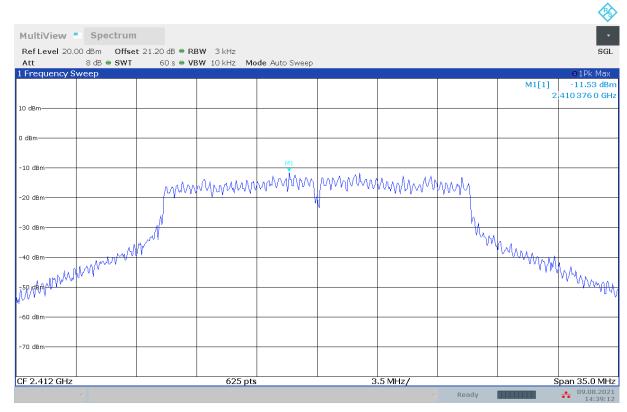


Fig.A.3.7 Power Spectral Density (802.11n-HT20, Ch 1)

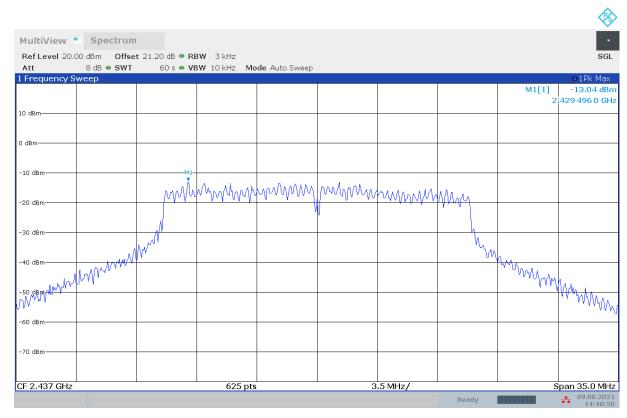


Fig.A.3.8 Power Spectral Density (802.11n-HT20, Ch 6)





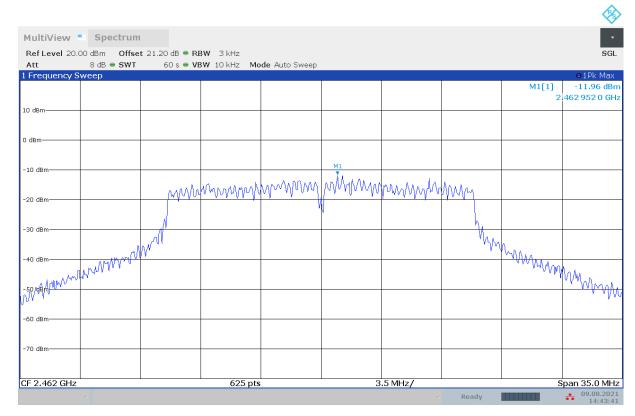


Fig.A.3.9 Power Spectral Density (802.11n-HT20, Ch 11)

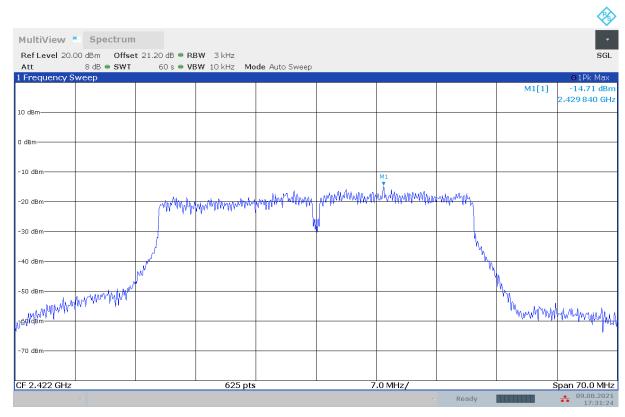


Fig.A.3.10 Power Spectral Density (802.11n-HT40, Ch 3)





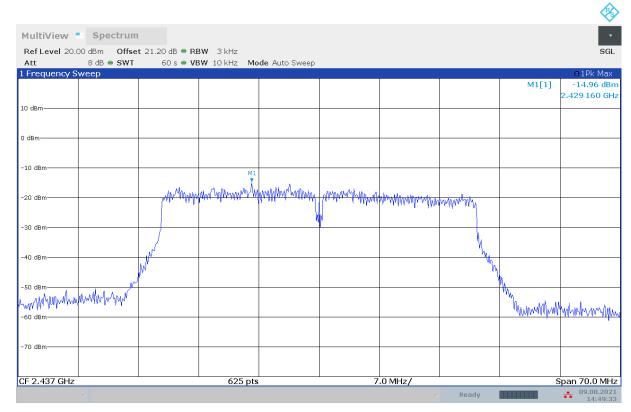


Fig.A.3.11 Power Spectral Density (802.11n-HT40, Ch 6)

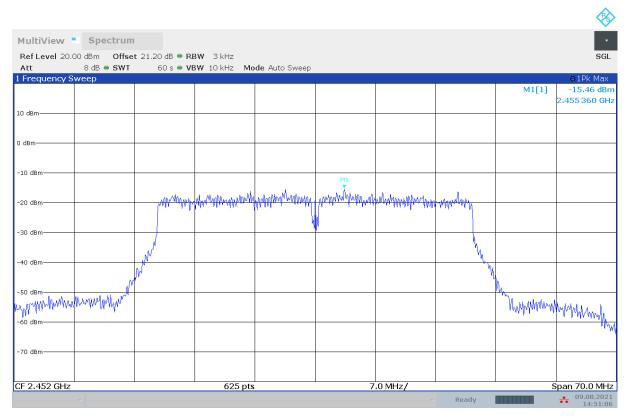


Fig.A.3.12 Power Spectral Density (802.11n-HT40, Ch 9)





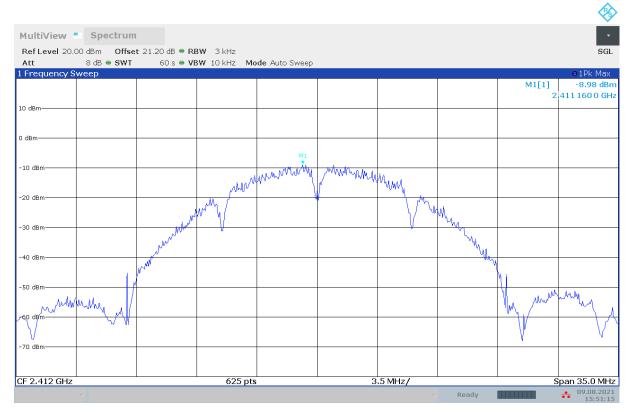


Fig.A.3.13 Power Spectral Density(802.11b,Ch1)



Fig.A.3.14 Power Spectral Density (802.11b, Ch 6)





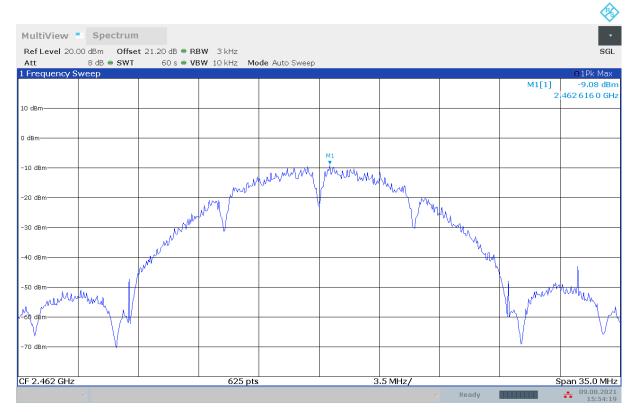


Fig.A.3.15 Power Spectral Density (802.11b, Ch 11)

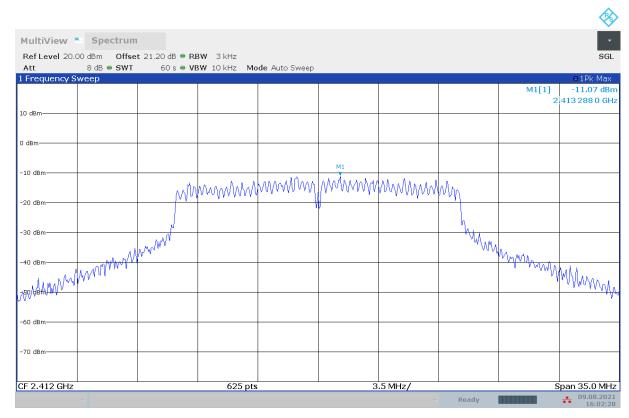


Fig.A.3.16 Power Spectral Density (802.11g, Ch 1)





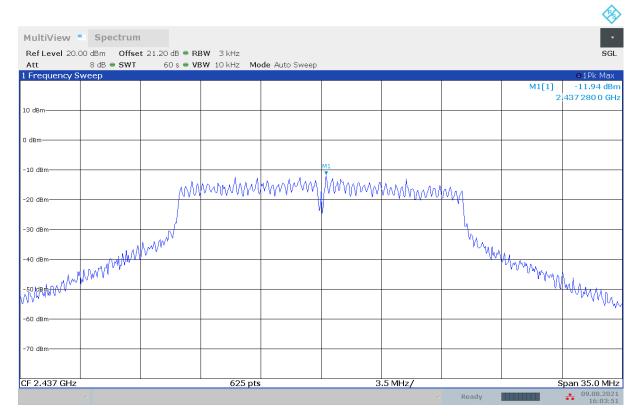


Fig.A.3.17 Power Spectral Density (802.11g, Ch 6)

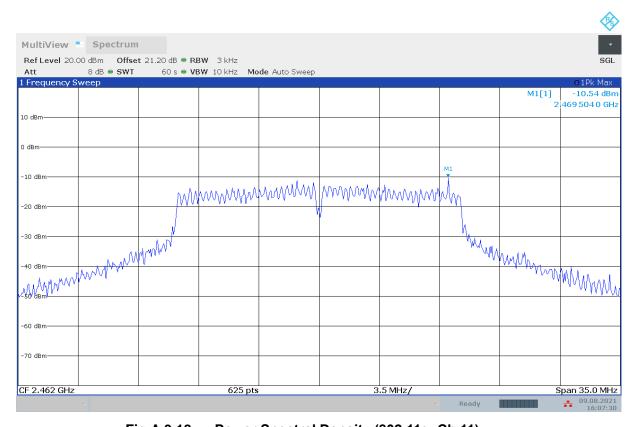


Fig.A.3.18 Power Spectral Density (802.11g, Ch 11)





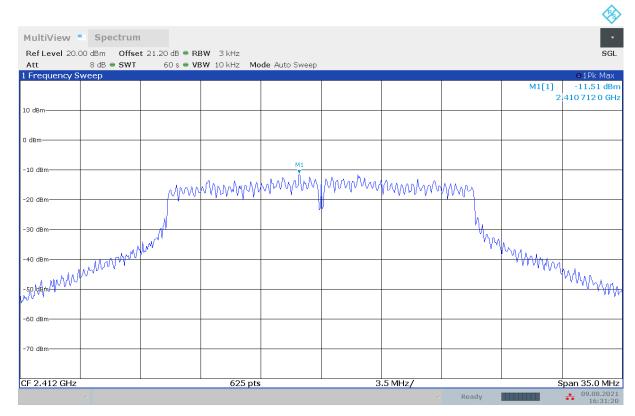


Fig.A.3.19 Power Spectral Density (802.11n-HT20, Ch 1)

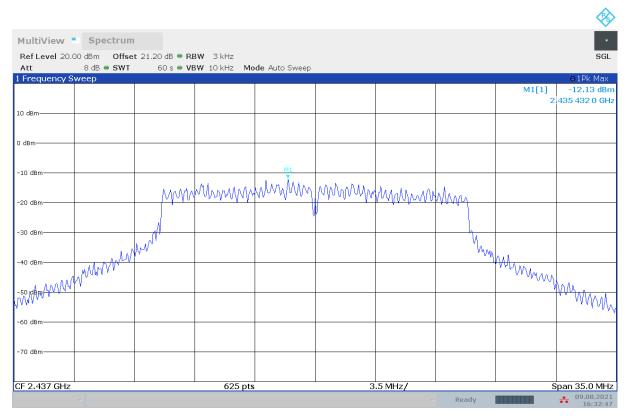


Fig.A.3.20 Power Spectral Density (802.11n-HT20, Ch 6)





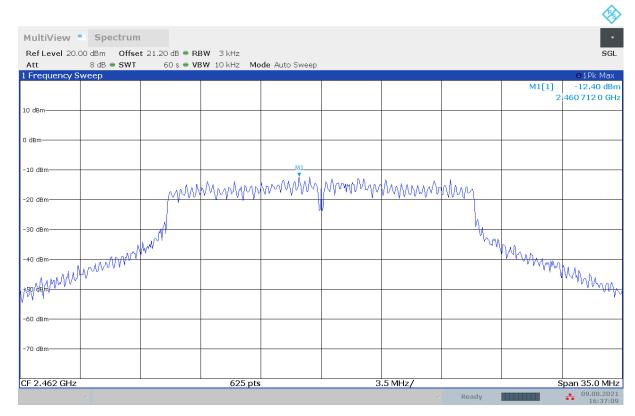


Fig.A.3.21 Power Spectral Density (802.11n-HT20, Ch 11)

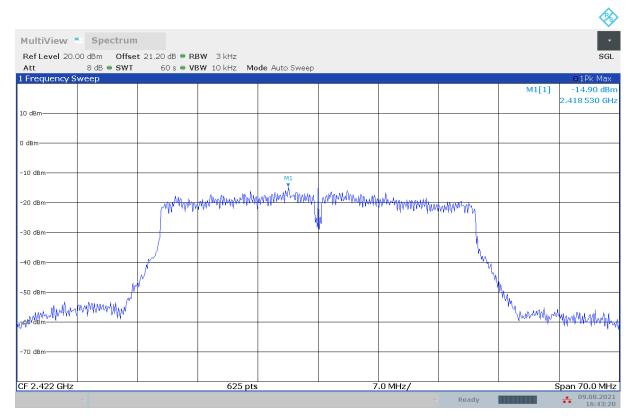


Fig.A.3.22 Power Spectral Density (802.11n-HT40, Ch 3)





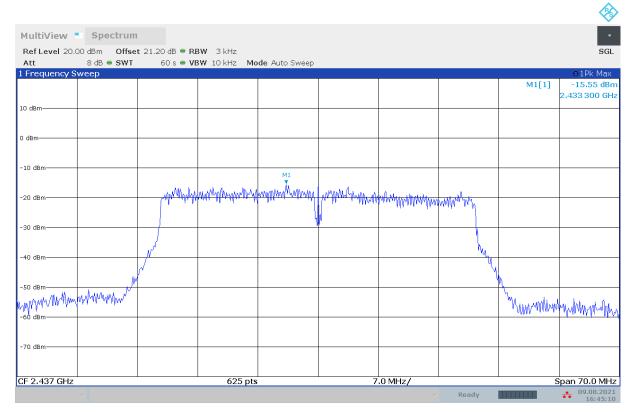


Fig.A.3.23 Power Spectral Density (802.11n-HT40, Ch 6)

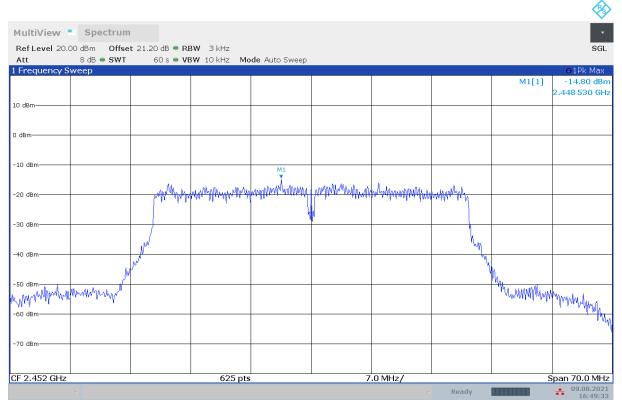


Fig.A.3.24 Power Spectral Density (802.11n-HT40, Ch 9)





# A.4. DTS 6-dB Signal Bandwidth

Method of Measurement: See ANSI C63.10-2013 section 11.8.1.

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) = 300 kHz.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

#### **Measurement Limit:**

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	≥ 500

#### **EUT ID: EUT2**

#### **Measurement Result:**

#### 802.11b/g mode

Mode	Channel	Occupied 6dB Bandwidth ( MHz)		conclusion
	1	Fig.A.4.1	8.05	Р
802.11b	6	Fig.A.4.2	8.05	Р
	11	Fig.A.4.3	8.05	Р
	1	Fig.A.4.4	15.45	Р
802.11g	6	Fig.A.4.5	15.70	Р
	11	Fig.A.4.6	15.45	Р

#### 802.11n-HT20 mode

Mode	Channel	Occupied 6dB Bandwidth ( MHz)		conclusion
000 11 =	1	Fig.A.4.7	16.75	Р
802.11n	6	Fig.A.4.8	16.35	Р
(HT20)	11	Fig.A.4.9	16.75	Р

#### 802.11n-HT40 mode

Mode	Channel	Occupied 6dB Bandwidth ( MHz)		conclusion
000 44 =	3	Fig.A.4.10	35.12	Р
802.11n	6	Fig.A.4.11	35.68	Р
(HT40)	9	Fig.A.4.12	36.32	Р





**Conclusion: Pass** 

#### Test graphs as below:

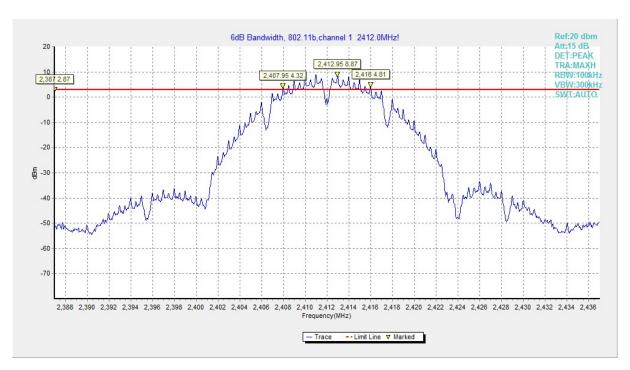


Fig.A.4.1 Occupied 6dB Bandwidth(802.11b,Ch 1)

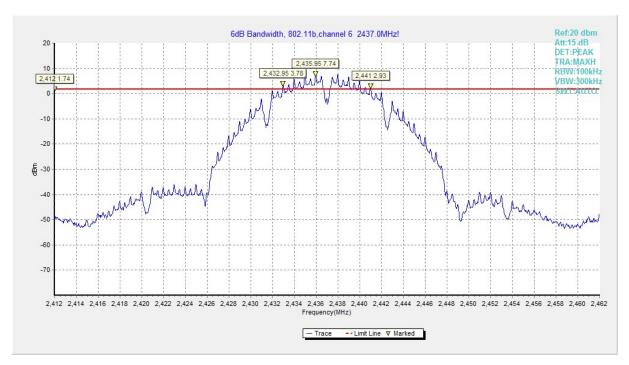


Fig.A.4.2 Occupied 6dB Bandwidth (802.11b, Ch 6)





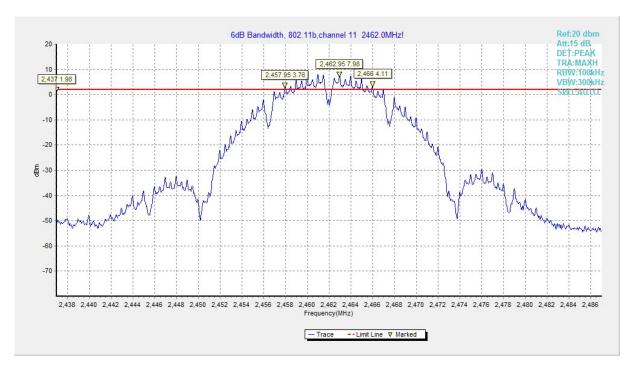


Fig.A.4.3 Occupied 6dB Bandwidth (802.11b, Ch 11)

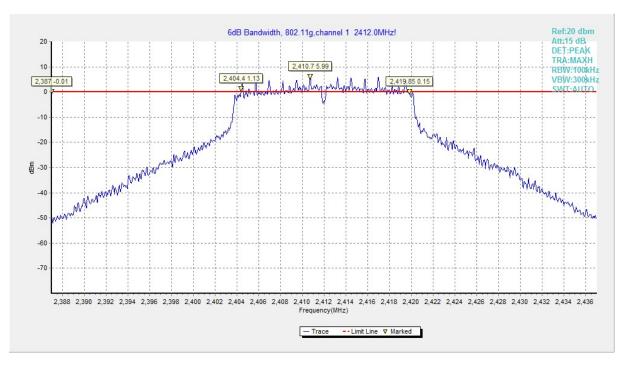


Fig.A.4.4 Occupied 6dB Bandwidth (802.11g, Ch 1)





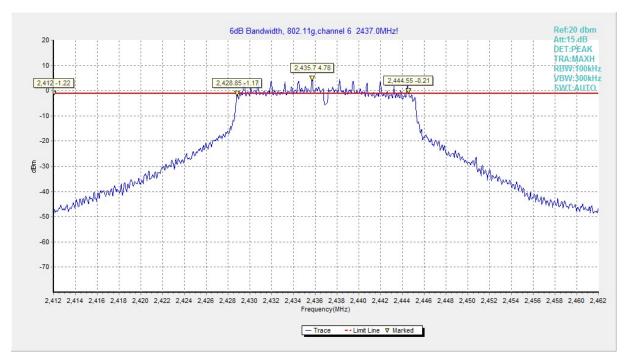


Fig.A.4.5 Occupied 6dB Bandwidth (802.11g, Ch 6)

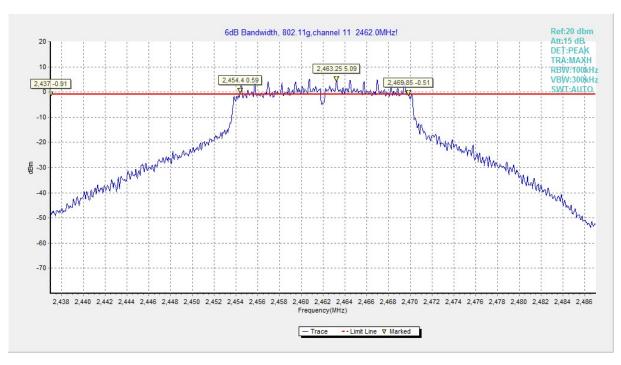


Fig.A.4.6 Occupied 6dB Bandwidth (802.11g, Ch 11)





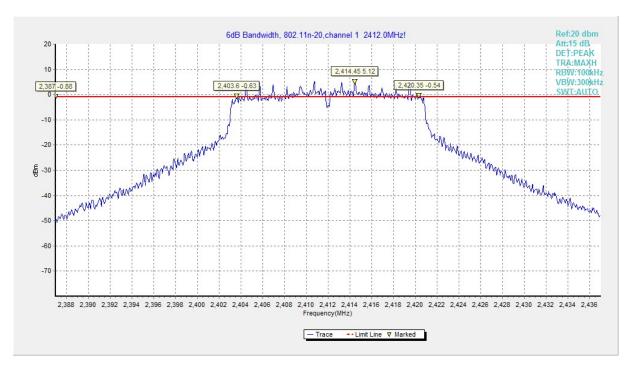


Fig.A.4.7 Occupied 6dB Bandwidth (802.11n-20MHz, Ch 1)

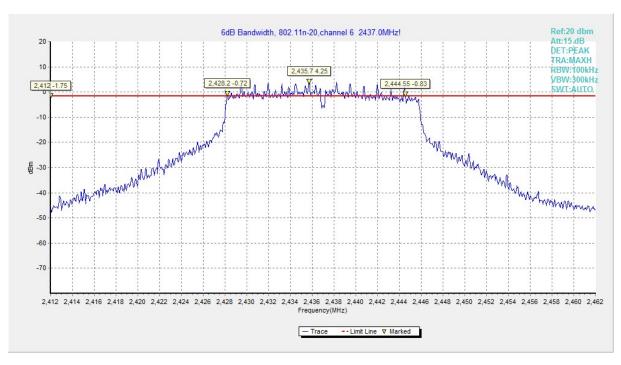


Fig.A.4.8 Occupied 6dB Bandwidth (802.11n-HT20, Ch 6)





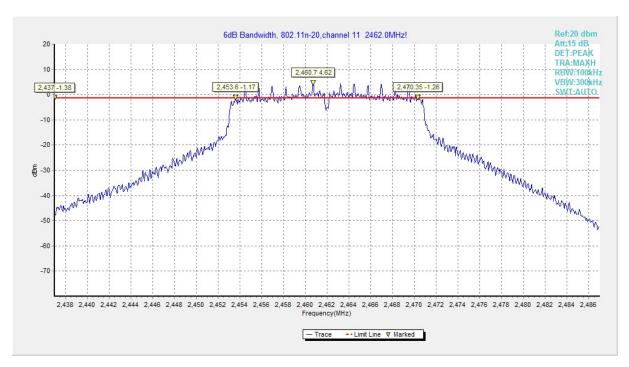


Fig.A.4.9 Occupied 6dB Bandwidth (802.11n-HT20, Ch 11)

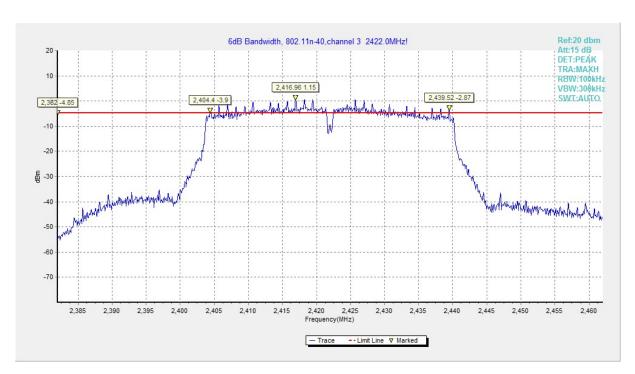


Fig.A.4.10 Occupied 6dB Bandwidth (802.11n-40MHz, Ch 3)





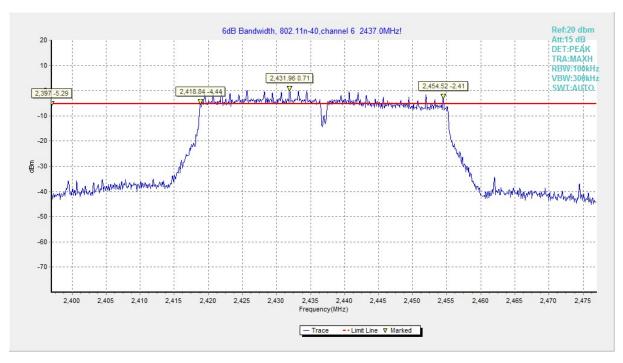


Fig.A.4.11 Occupied 6dB Bandwidth (802.11n-HT40, Ch 6)

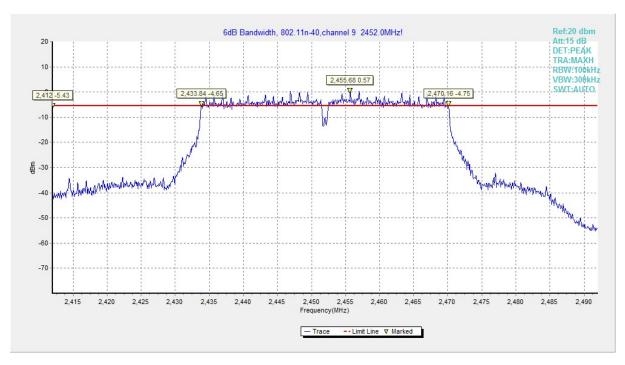


Fig.A.4.12 Occupied 6dB Bandwidth (802.11n-HT40, Ch 9)





# A.5. Band Edges Compliance

#### Method of Measurement: See ANSI C63.10-2013-clause 6.10.4

Connect the spectrum analyzer to the EUT using an appropriate RF cable connected to the EUT output. Configure the spectrum analyzer settings as described below.

a) Set Span = 100MHzb) Sweep Time: coupledc) Set the RBW= 100 kHzc) Set the VBW= 300 kHz

d) Detector: Peake) Trace: Max hold

#### **Measurement Limit:**

Standard	Limit (dBc)	
FCC 47 CFR Part 15.247 (d)	> 20	

#### **EUT ID: EUT2**

#### **Measurement Result:**

#### MIMO-chain2

#### 802.11b/g mode

Mode	Channel	Test Results	Conclusion
802.11b	1	Fig.A.5.1	Р
	11	Fig.A.5.2	Р
802.11g	1	Fig.A.5.3	Р
	11	Fig.A.5.4	Р

# 802.11n-HT20 mode

Mode	Channel	Test Results	Conclusion
802.11n	1	Fig.A.5.5	Р
(HT20)	11	Fig.A.5.6	Р

#### 802.11n-HT40 mode

Mode	Channel	Test Results	Conclusion
802.11n	3	Fig.A.5.7	Р
(HT40)	9	Fig.A.5.8	Р

Both of the chain1 and chain2 are measured, as the power of chain2 is the worse case, so the results of chain2 are reflected in the report.

Conclusion: Pass Test graphs as below:





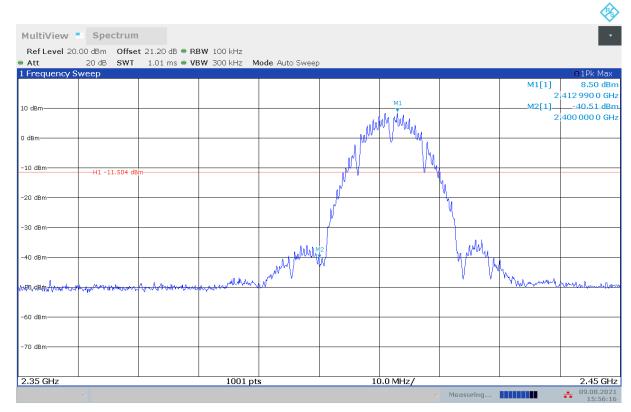


Fig.A.5.1 Band Edges (802.11b, Ch 1)

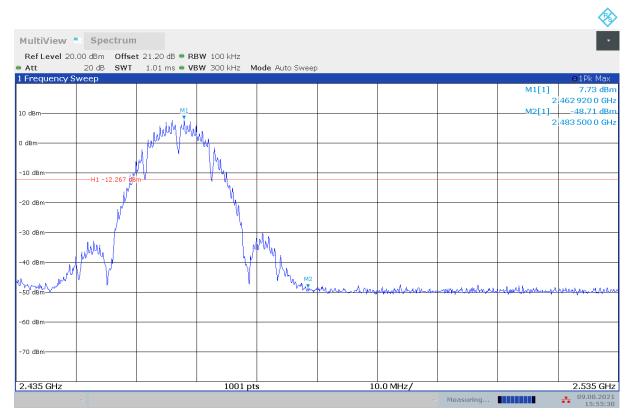


Fig.A.5.2 Band Edges (802.11b, Ch 11)





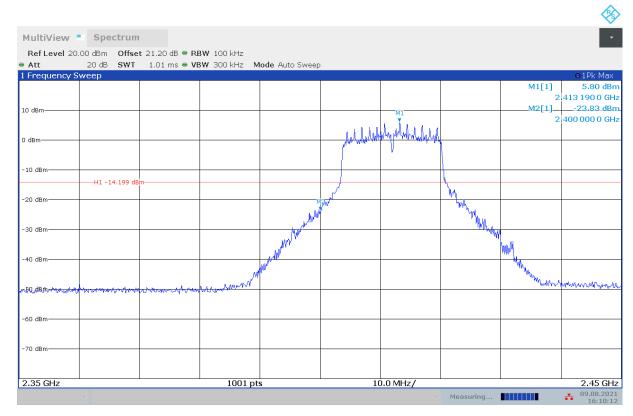


Fig.A.5.3 Band Edges (802.11g, Ch 1)

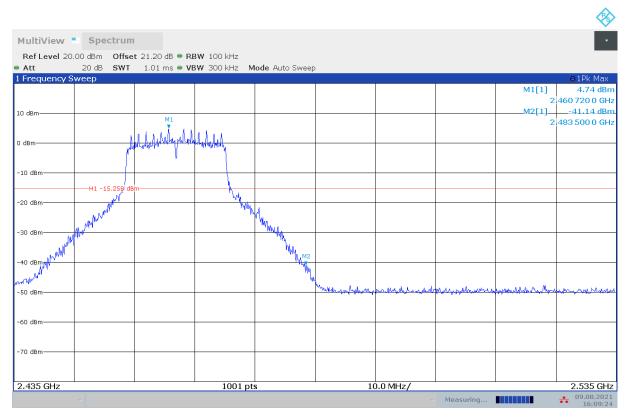


Fig.A.5.4 Band Edges (802.11g, Ch 11)