FCC Part 15C
Measurement and Test Report

For

Shenzhen QiyueOptronics Company Limited

Flat3,Tower 3, Excellence Meilin Center Plaza, Zhongkang Road 128,

Shangmeilin, Futian District,Shenzhen, China

FCC ID: XOMQ65S218

FCC Rule(s):	FCC Part 15C
Product Description:	65 INCH SMART 4K UHD TV
Tested Model:	Q65S218-U-A-I
Report No.:	WTH20H02005930W
Sample Receipt Date:	2020-02-27
Tested Date:	2020-02-27 to 2020-03-05
Issued Date:	2020-03-06
Tested By:	Rode Liu / Engineer
Reviewed By:	Silin Chen / EMC Manager
Approved & Authorized By:	JandySo / PSQ Manager

Prepared By:

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Report version

Version No.	Date of issue	Description
Rev.00	2020-03-06	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Shenzhen QiyueOptronics Company Limited
Address of applicant:	Flat3,Tower 3, Excellence Meilin Center Plaza, Zhongkang Road 128, Shangmeilin, Futian District, Shenzhen, China
Manufacturer:	SHENZHEN QIYUE OPTRONICS COMPANY LIMITED BRANCH
Address of manufacturer:	SEIYU INDUSTRIAL PARK,DA SAN VILLAGE,DA SHUI KENG,GUANLAN TOWN,LONGHUA NEW DISTRICT, SHENZHEN,P.R.C

General Description of EUT	
Product Name:	65 INCH SMART 4K UHD TV
Trade Name:	RCA, PROSCAN, RCA SCENIUM, TECHNICOLOR, SYLVANIA, RCASMARTVIRTUOSO
Model No.:	Q65S218-U-A-I
Adding Model(s):	RQSM6527, XXXXXXXXXX65XXXXXXXXXXXX (Where “X”can be any alphanumeric of A-Z or 0-9 or blank or -, indicates different client)
Rated Voltage:	AC 100-240V
Power Adapter Model:	N/A
Note: The test data is gathered from a production sample provided by the manufacturer. The appearance of others models listed in the report is different from main-test model Q65S218-U-A-I, but the circuit and the electronic construction do not change, declared by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20) 2422-2452MHz for 802.11n(HT40)
RF Output Power:	25.06dBm (Conducted)
Type of Modulation:	DBPSK,BPSK,DQPSK,QPSK,16QAM,64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 300Mbps
Quantity of Channels:	11 for 802.11b/g/n(HT20); 7 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	Integral
Antenna Gain:	ANT1:4.44dBi ANT2:4.44dBi

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
558074 D01 15.247 Meas Guidance v05r02:Guidance For Compliance Measurements On Digital Transmission System, Frequency Hopping Spread Spectrum System, And Hybrid System Devices Operating Under Section 15.247 Of The Fcc Rules
662911 D01 Multiple Transmitter Output v02r01: Emissions Testing of Transmitters with Multiple Outputs in the Same Band
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 662911 D01 Multiple Transmitter Output v02r01
The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Test Facility

Address of the test laboratory
Laboratory: Shenzhen SEM Test Technology Co., Ltd.
Address: 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road,Bao'an District, Shenzhen, P.R.C. (518101）

FCC – Registration No.: 125990
Shenzhen SEM Test Technology Co., Ltd.
EMC Laboratory has been registered and fully described inareport filed with the FCC (Federal Communications C ommission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A
The 3m Semi-anechoic chamber of Shenzhen SEM Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, with a duty cycle equal to 100%, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11b	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM2	802.11g	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM3	802.11n-HT20	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM4	802.11n-HT40	Low:2422MHz, Middle:2437MHz,High:2452MHz

Test Conditions	
Temperature:	22~25°C
Relative Humidity:	50~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Power Spectral Density	Conducted	±1.8dB
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	9-150kHz ±3.74dB
		0.15-30MHz ±3.34dB
Transmitter Spurious Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

1.7Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2019-04-30	2020-04-29
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2019-04-30	2020-04-29
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2019-04-30	2020-04-29
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2019-04-30	2020-04-29
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2019-04-30	2020-04-29
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
SEMT-1042	Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2019-05-05	2021-05-04
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2019-04-30	2020-04-29
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2019-04-30	2020-04-29
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2019-04-30	2020-04-29
SEMT-1168	Pre-amplifier	Direction Systems Inc.	PAP-0126	14141-12838	2019-04-30	2020-04-29
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2019-04-30	2020-04-29
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2019-04-30	2020-04-29
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2019-05-05	2021-05-04
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2019-04-30	2020-04-29
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2019-04-30	2020-04-29
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2019-04-30	2020-04-29
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2019-03-18	2020-03-17
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2019-03-18	2020-03-17
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2019-03-18	2020-03-17
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2019-03-18	2020-03-17
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2019-03-18	2020-03-17
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2019-03-18	2020-03-17

Software List			
Description	**Manufacturer**	**Model**	**Version**
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§2.1093	RF Exposure	Compliant
§15.203; §15.247(b)(4)(i)	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§15.207(a)	Conducted Emission	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.247(a)(2)	DTS Bandwidth	Compliant
§15.247(b)(3)	RF Output Power	Compliant
§15.209(a)	Radiated Emission	Compliant
§15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

According to §1.1307 and §2.1091, the mobile transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the RF Exposure Report.

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

This product has two integral antennas, fulfill the requirement of this section.

5. Power Spectral Density

5.1 Standard Applicable

According to 15.247(a)(1)(iii),for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.2Test Procedure

According to the KDB 558074 D01 v05r02Subclause 8.4 and ANSI C63.10-2013 Subclause 11.10.2, such specifications require that the same method as used to determine the conducted output power shall also be used to determine the power spectral density. The test method of power spectral density as below:

a)Connect the antenna port(s) to the spectrum analyzer input,

b)Configure the spectrum analyzer as shown below:

c)Center frequency=DTS channel center frequency

d)Span =1.5 times the DTS bandwidth

e)RBW = 3 kHz $\leqslant$ RBW $\leqslant$ 100 kHz, VBW $\geqslant$ 3 $\times$ RBW

f)Sweep time = auto couple

g)Detector = peak

h)Trace mode = max hold

i)Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.

j)Use the peak marker function to determine the maximum amplitude level within the RBW.

k)If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

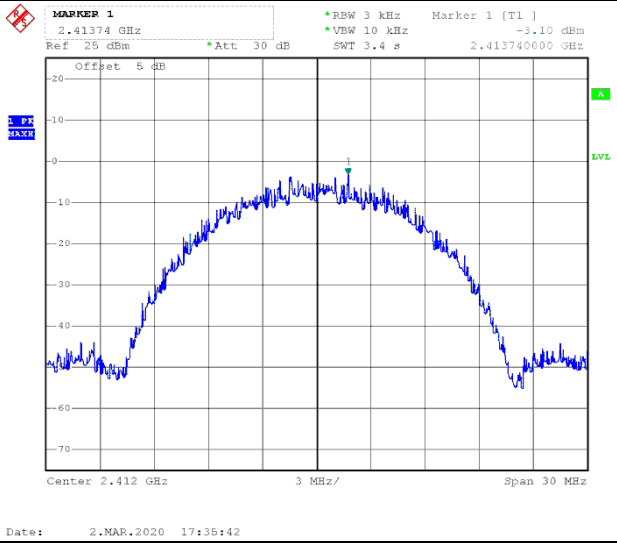
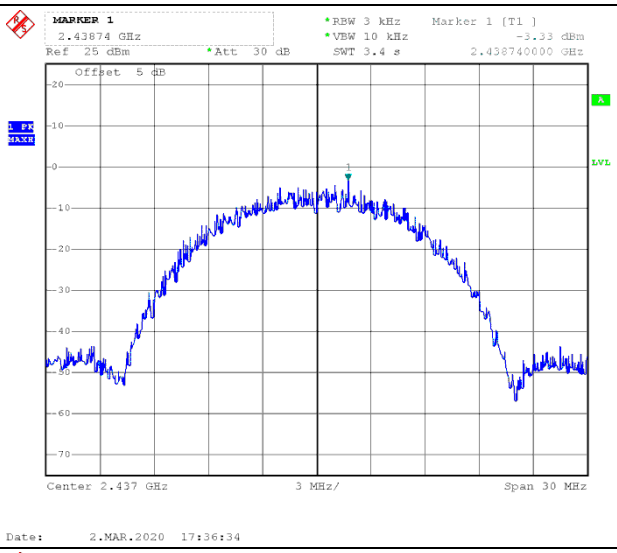
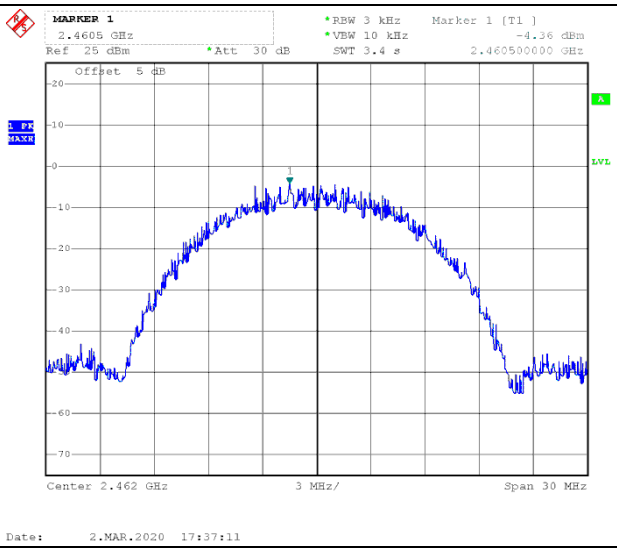
5.3Summary of Test Results/Plots

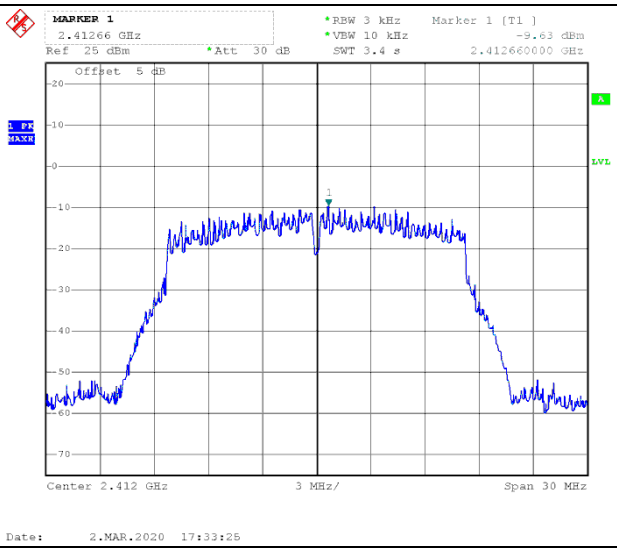
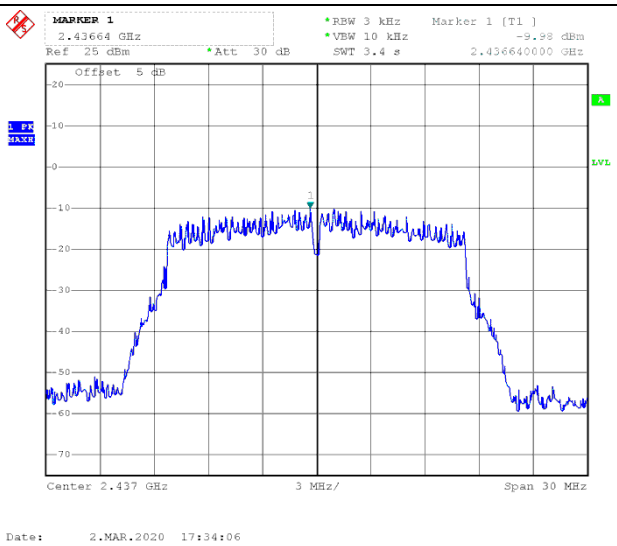
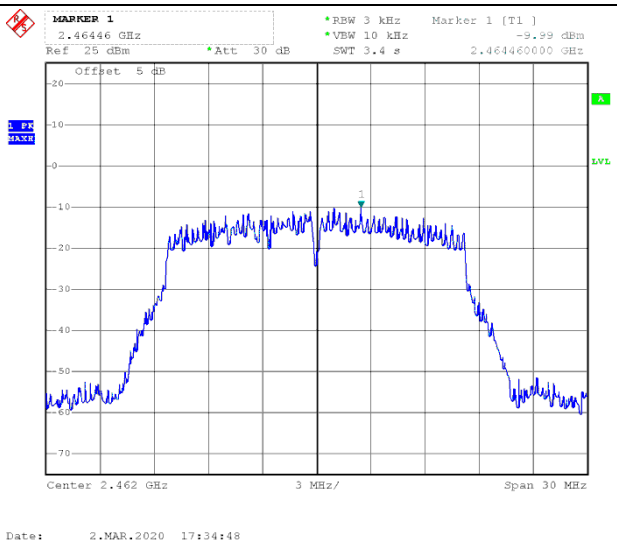
Test Mode	Test Channel MHz	Test Result(dBm/3kHz)		Total dBm	Limit dBm/3kHz
		Antenna 1	Antenna 2		
802.11b_11Mbps	2412	-3.10	-4.32	/	8
	2437	-3.33	-4.18	/	8
	2462	-4.36	-3.44	/	8
802.11g_54Mbps	2412	-9.63	-10.25	/	8
	2437	-9.98	-10.98	/	8
	2462	-9.99	-13.08	/	8
802.11n-HT20_MCS7	2412	-9.93	-9.64	-6.77	6.55
	2437	-10.68	-11.06	-7.86	6.55
	2462	-9.87	-10.21	-7.03	6.55
802.11n-HT40_MCS7	2422	-14.69	-15.81	-12.20	6.55
	2437	-15.40	-14.37	-11.84	6.55
	2452	-15.93	-16.71	-13.29	6.55

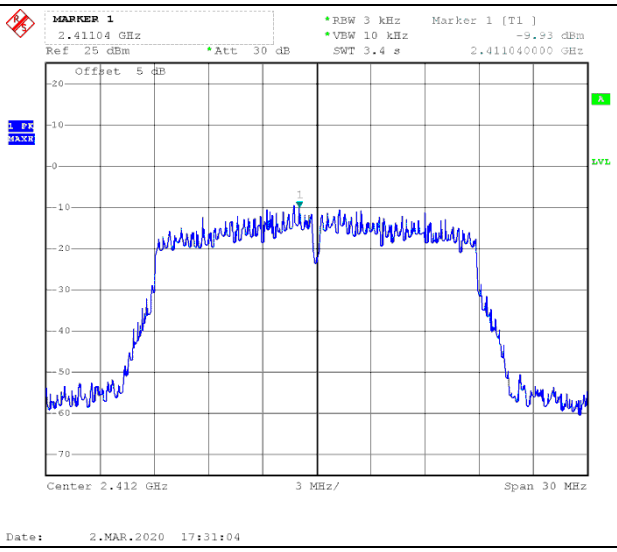
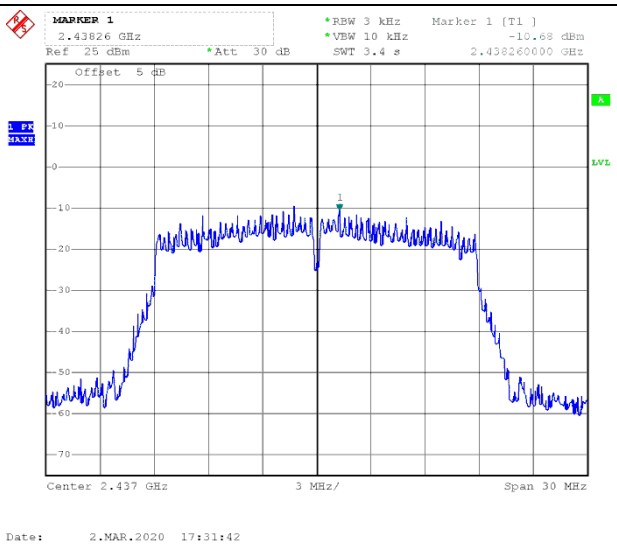
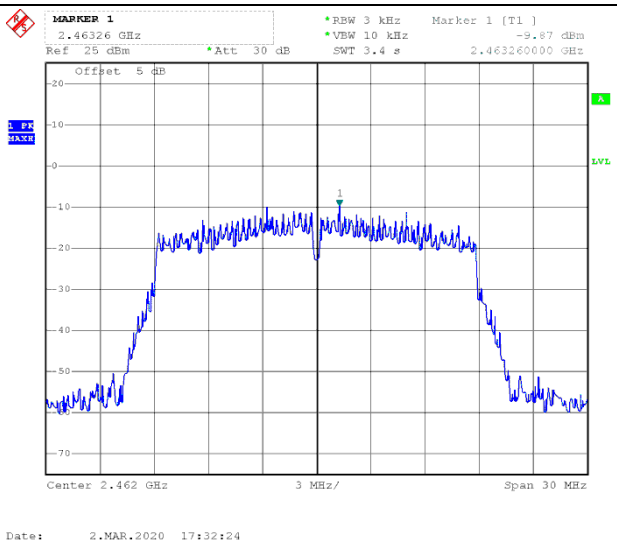
ANT Directional gain = G_{ANT} + 10 log(N_{ANT}) =7.45dBi, so the limit is:8-(7.45-6)=6.55(dBm/3kHz).

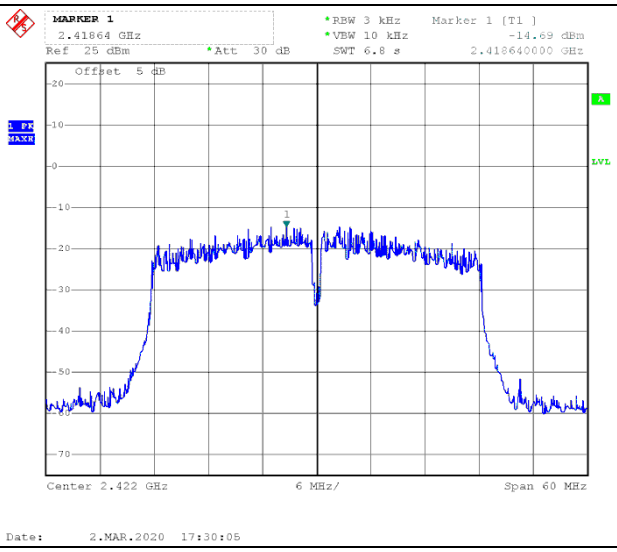
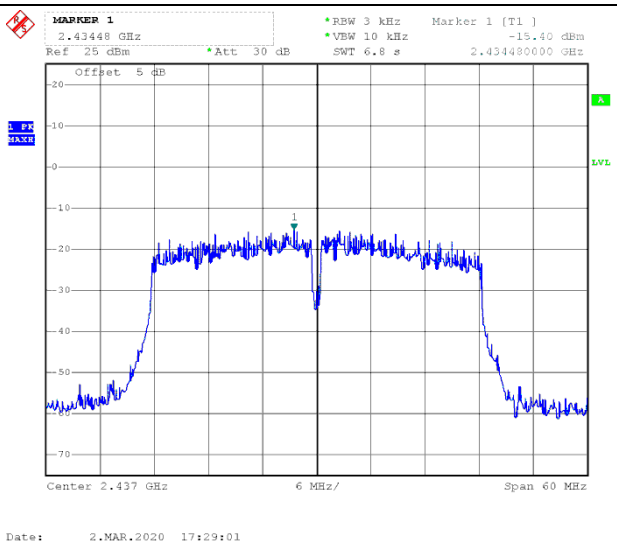
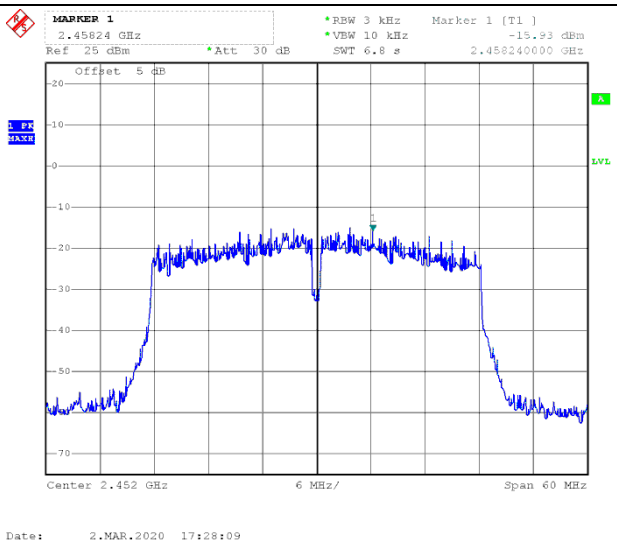
Please refer to the following test plots:

- Antenna 1

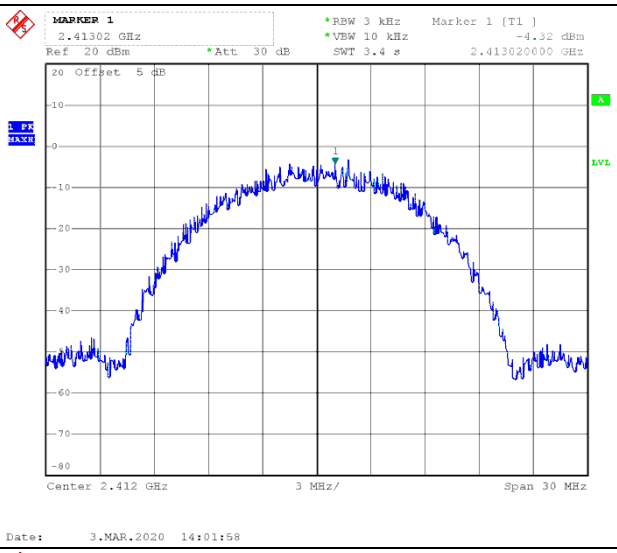
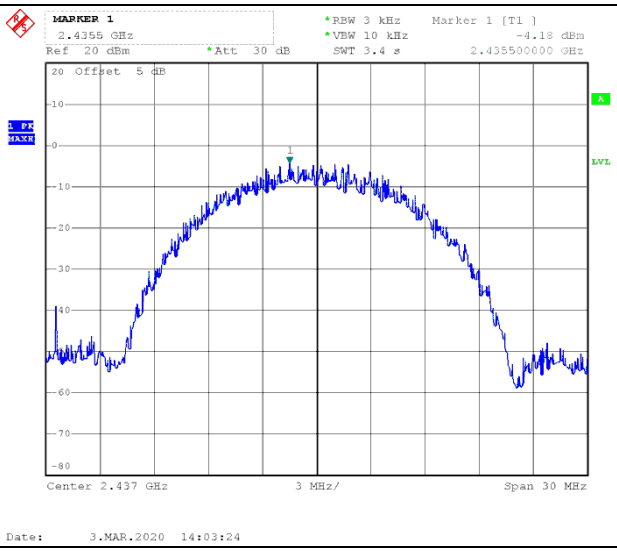
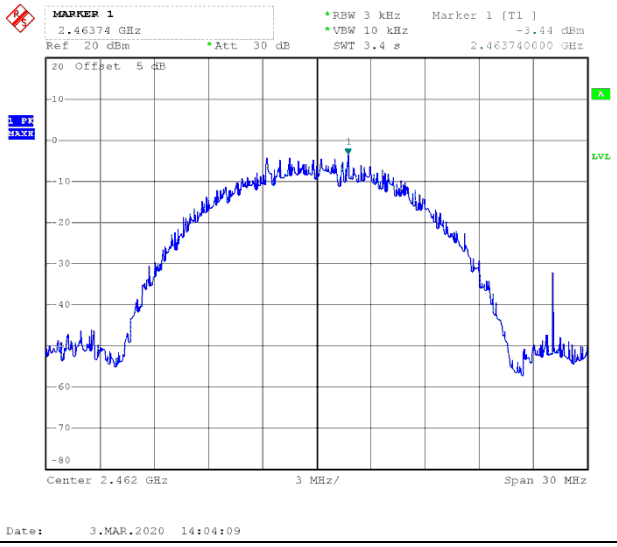
802.11b-Low	
802.11b-Middle	
802.11b-High	

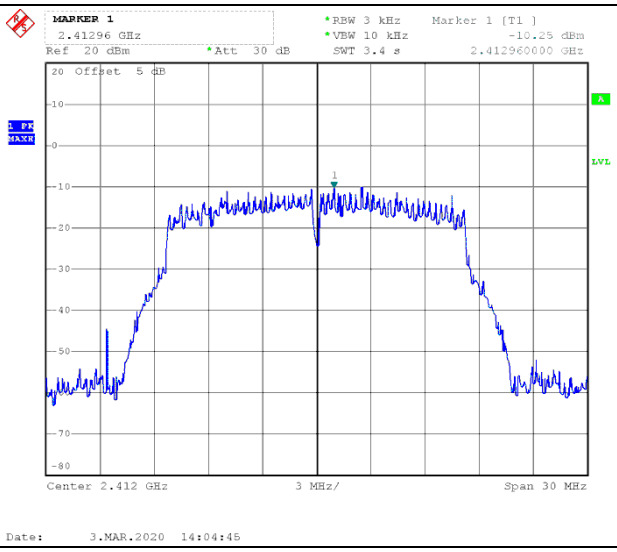
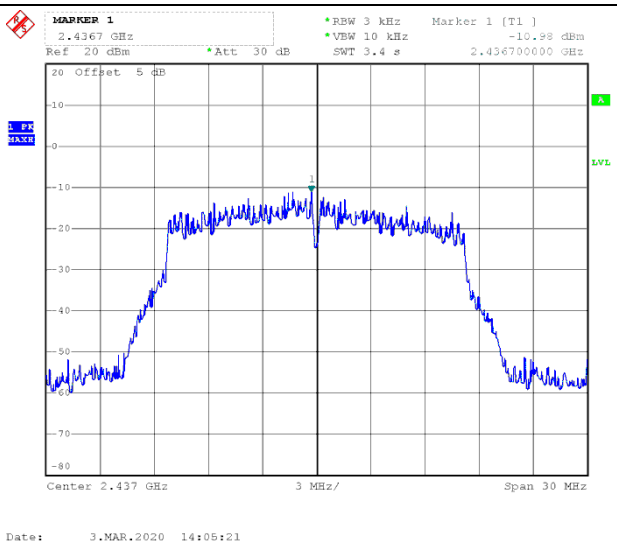
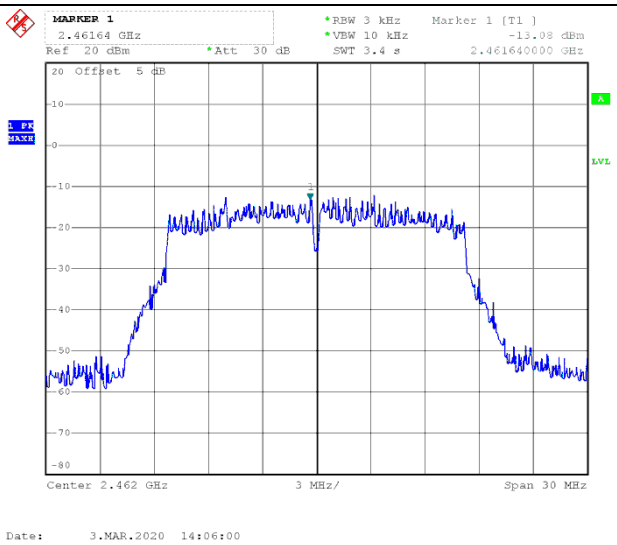
802.11g-Low	
802.11g-Middle	
802.11g-High	

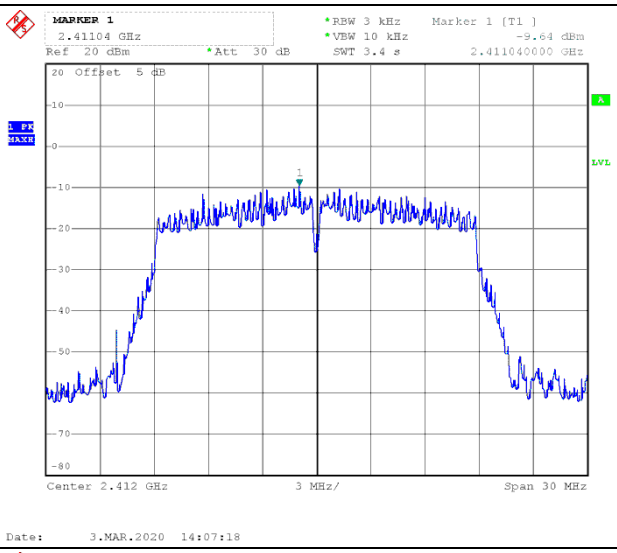
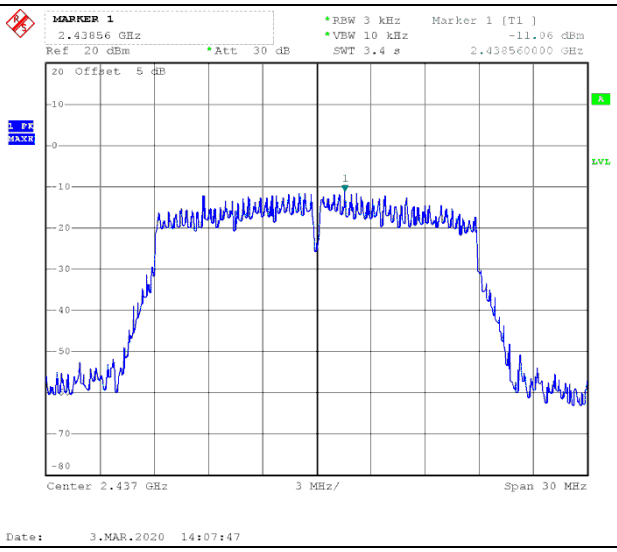
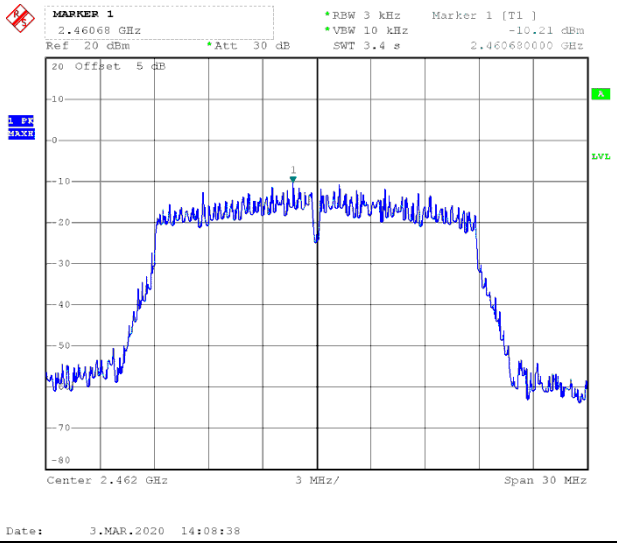
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

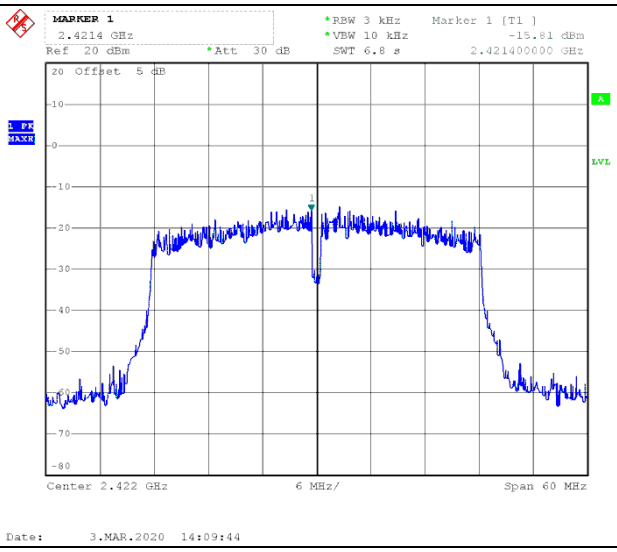
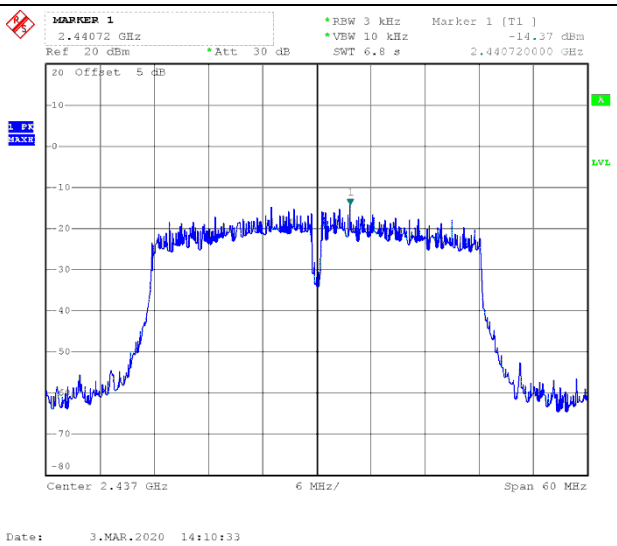
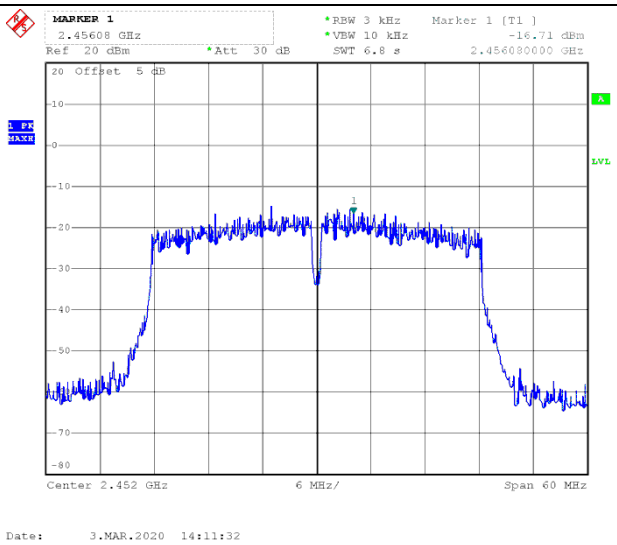
802.11n-HT40-Low	
802.11n-HT40-Middle	
802.11n-HT40-High	

➢ Antenna 2

802.11b-Low	
802.11b-Middle	
802.11b-High	

802.11g-Low	
802.11g-Middle	
802.11g-High	

802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

802.11n-HT40-Low	
802.11n-HT40-Middle	
802.11n-HT40-High	

6. DTS Bandwidth

6.1 Standard Applicable

According to 15.247(a)(2),systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.2Test Procedure

According to the KDB 558074 D01 v05r02Subclause 8.2 and ANSI C63.10-2013 Subclause 11.8.1, the test method of DTS Bandwidth as below:

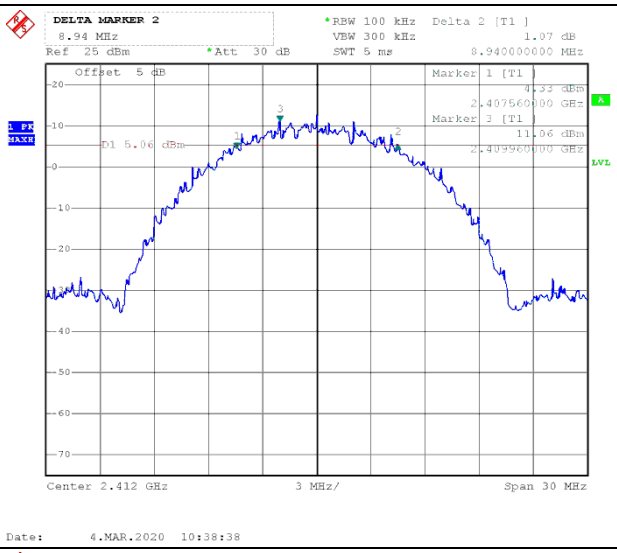
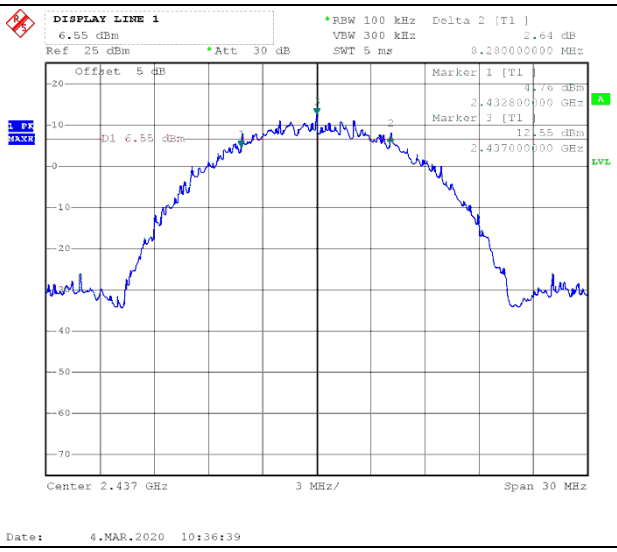
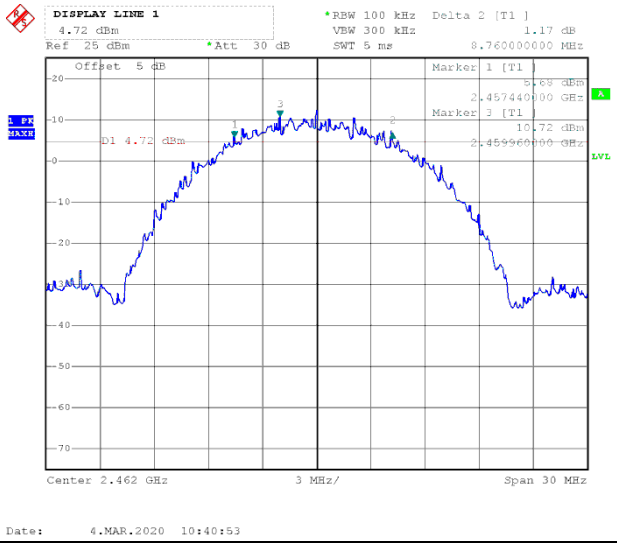
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

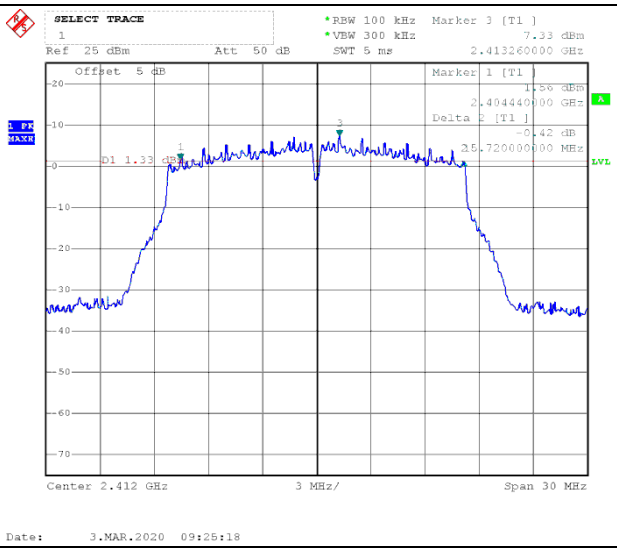
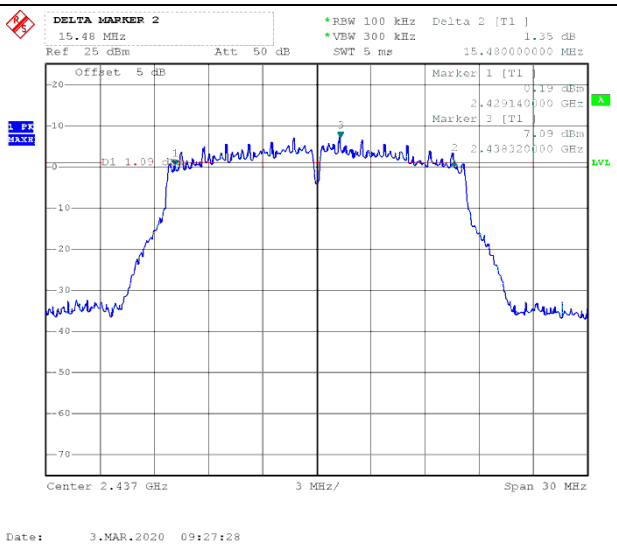
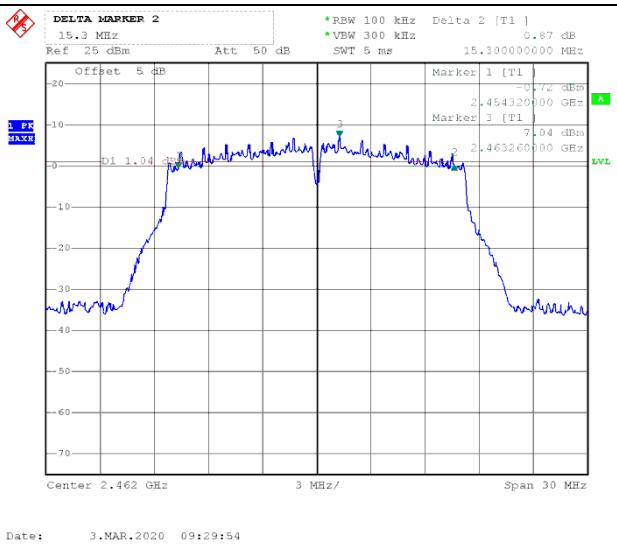
6.3Summary of Test Results/Plots

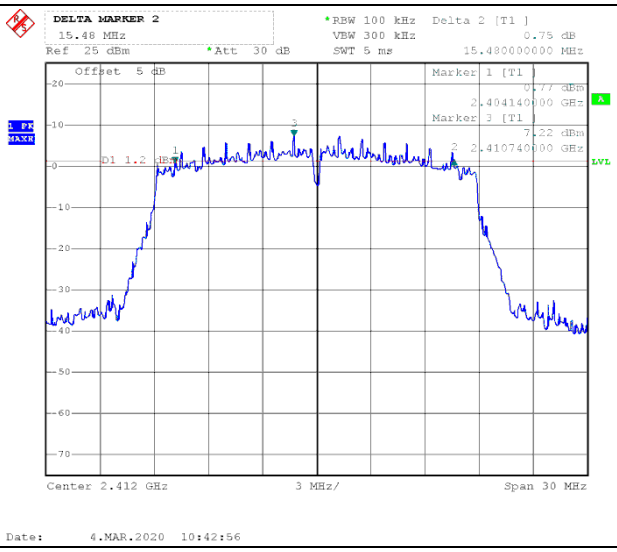
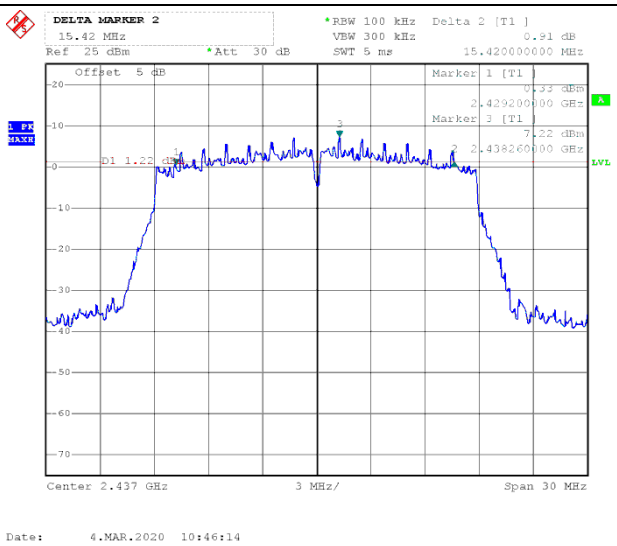
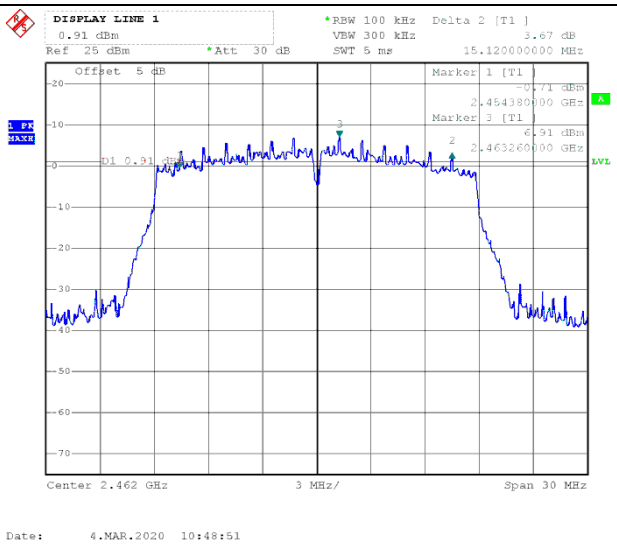
Test Mode	Test Channel MHz	Test Result(MHz)		Limit kHz
		Antenna 1	Antenna 2	
802.11b_11Mbps	2412	8.94	8.40	≥500
	2437	8.28	8.22	≥500
	2462	8.76	8.16	≥500
802.11g_54Mbps	2412	15.72	15.18	≥500
	2437	15.48	15.18	≥500
	2462	15.30	15.00	≥500
802.11n-HT20_MCS7	2412	15.40	16.08	≥500
	2437	15.42	16.08	≥500
	2462	15.12	16.02	≥500
802.11n-HT40_MCS7	2422	34.88	35.40	≥500
	2437	35.04	35.28	≥500
	2452	35.12	35.04	≥500

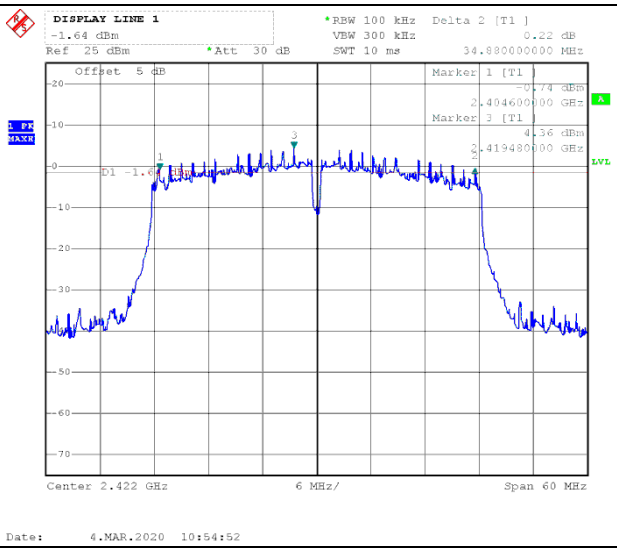
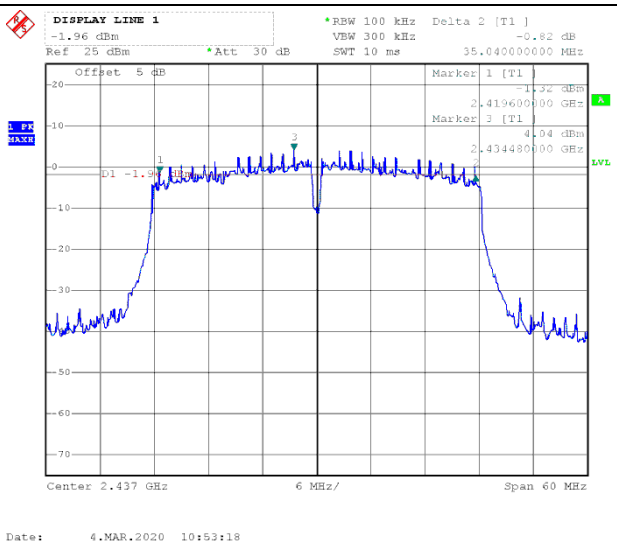
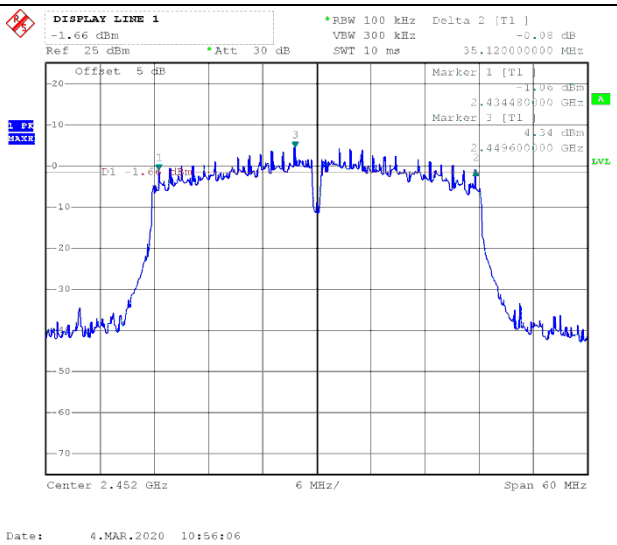
Please refer to the following test plots:

➢ Antenna 1

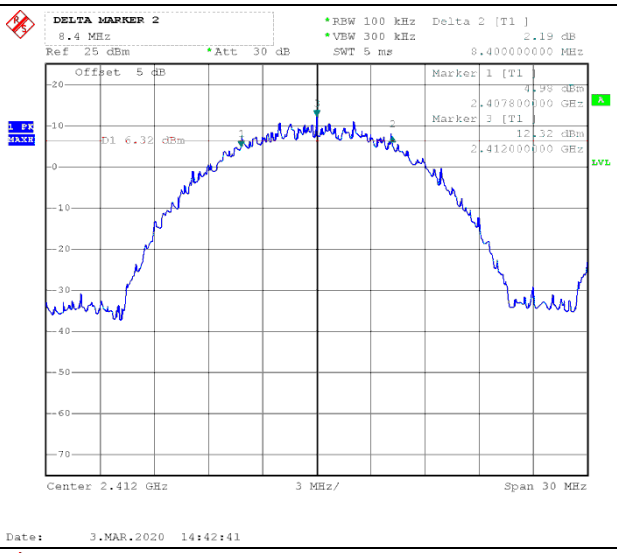
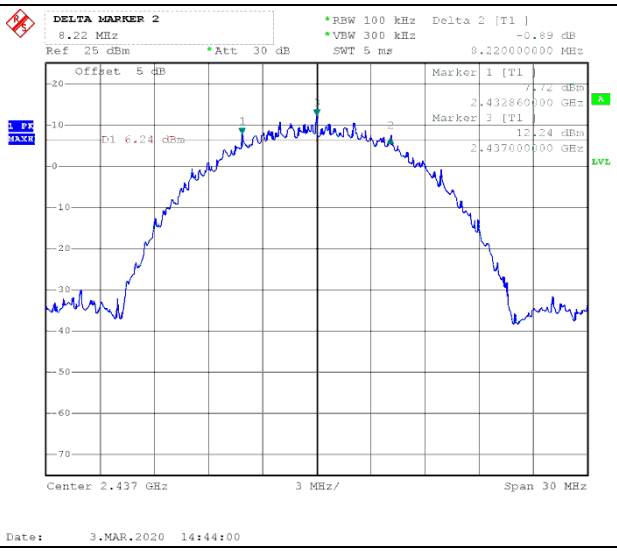
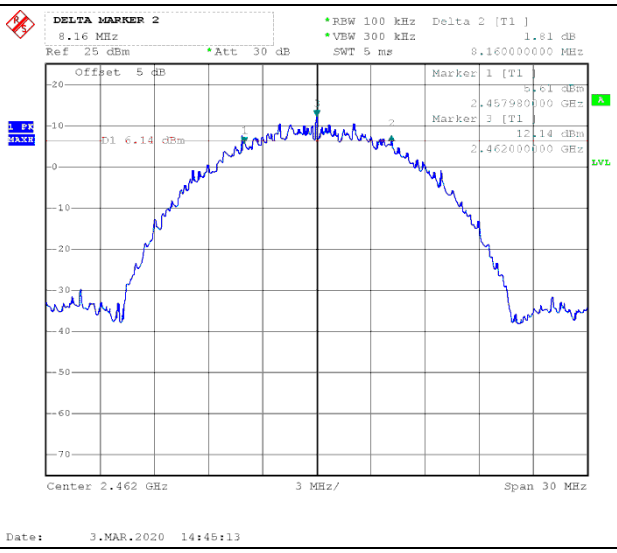
802.11b-Low	
802.11b-Middle	
802.11b-High	

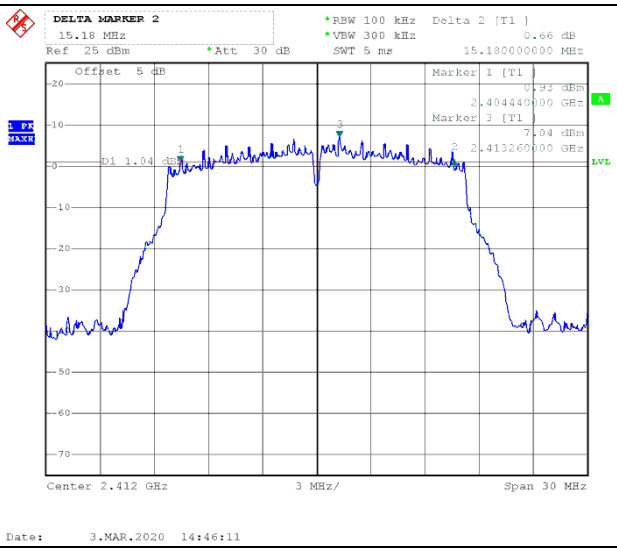
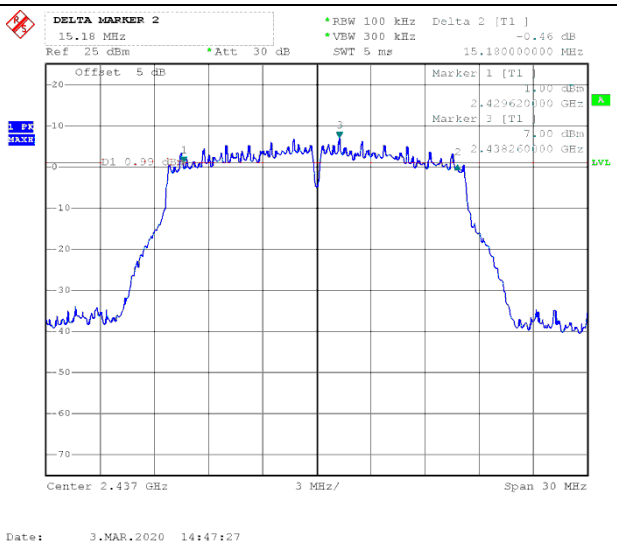
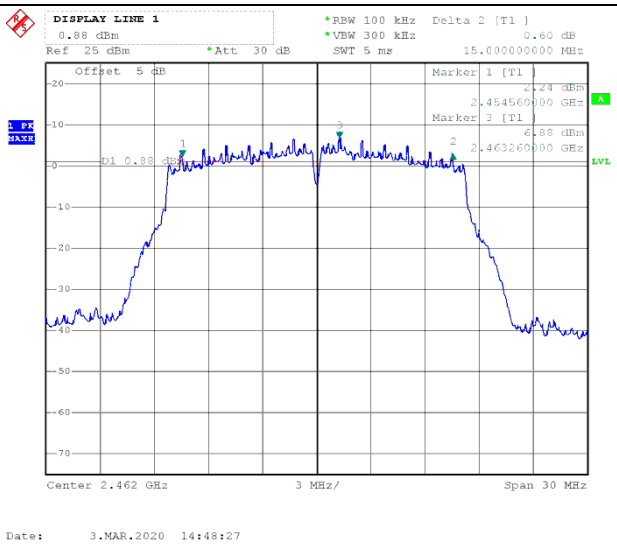
802.11g-Low	
802.11g-Middle	
802.11g-High	

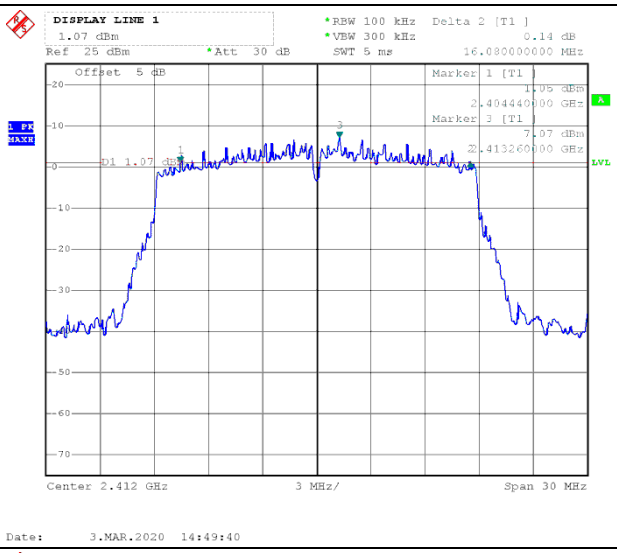
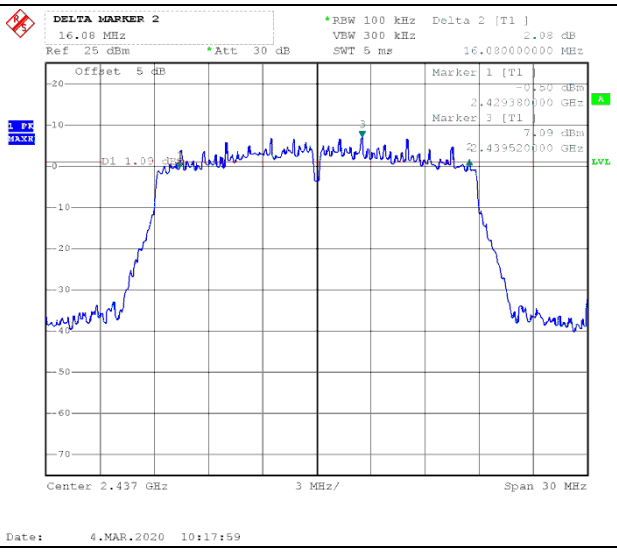
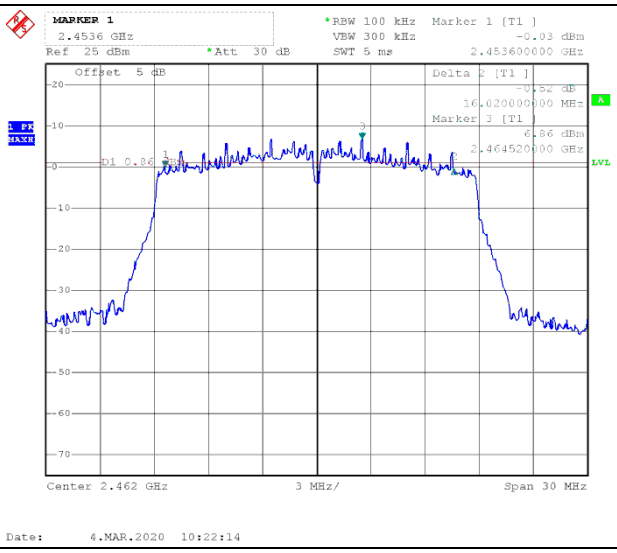
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

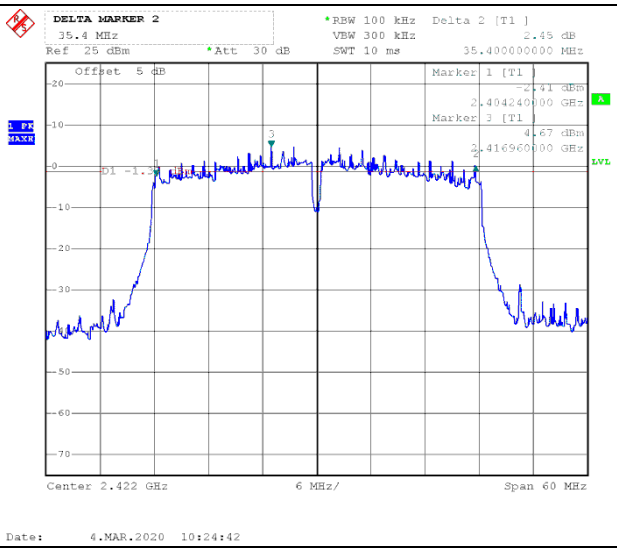
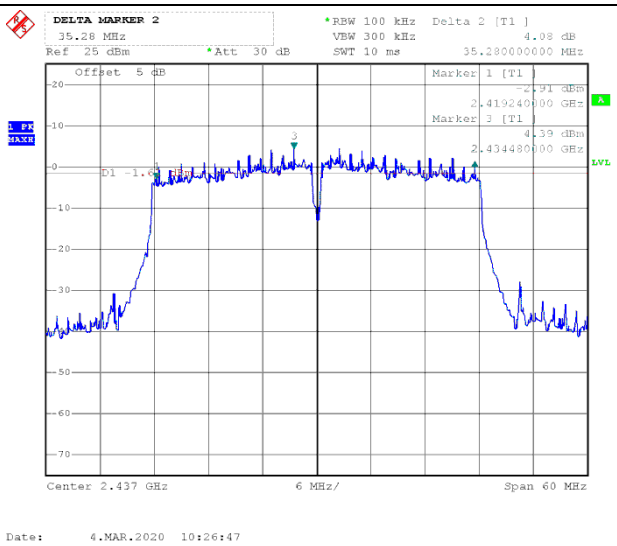
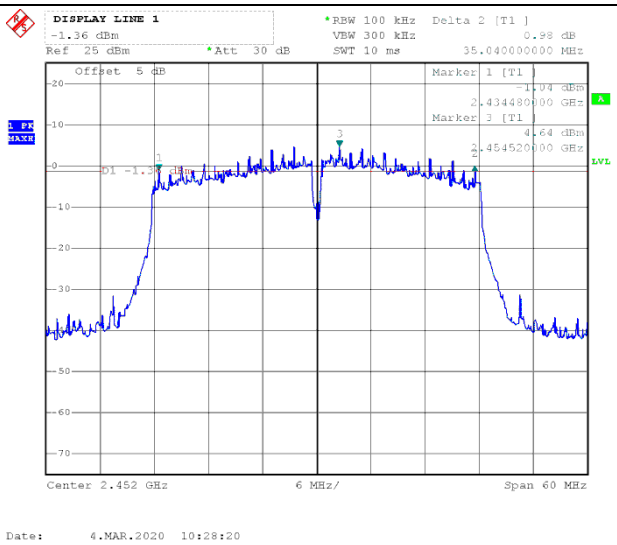
802.11n-HT40-Low	
802.11n-HT40-Middle	
802.11n-HT40-High	

➢ Antenna 2

802.11b-Low	
802.11b-Middle	
802.11b-High	

802.11g-Low	
802.11g-Middle	
802.11g-High	

802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

802.11n-HT40-Low	
802.11n-HT40-Middle	
802.11n-HT40-High	

7. RF Output Power

7.1 Standard Applicable

According to 15.247(b)(3),for systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

7.2Test Procedure

According to the KDB-558074 D01 v05r02 Subclause 8.3.2.2 and ANSI C63.10-2013 Subclause 11.9.2.2, when this option is exercised, the measured power is to be referenced to the OBW rather than the DTS bandwidth

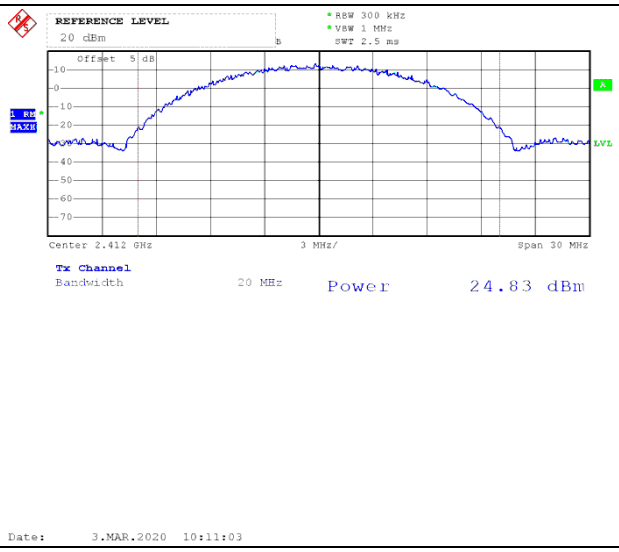
a) Set span to at least 1.5 times the OBW.
b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
c) Set VBW ≥ 3 x RBW.
d) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
e) Sweep time = auto.
f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
g) If transmit duty cycle < 98 %, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 %, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".
h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

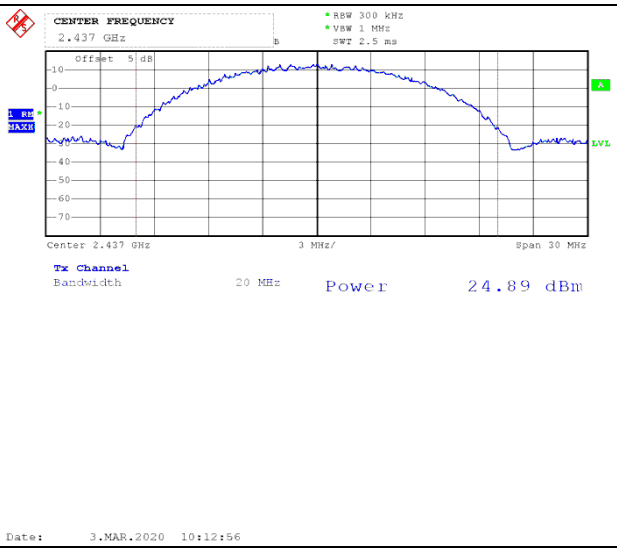
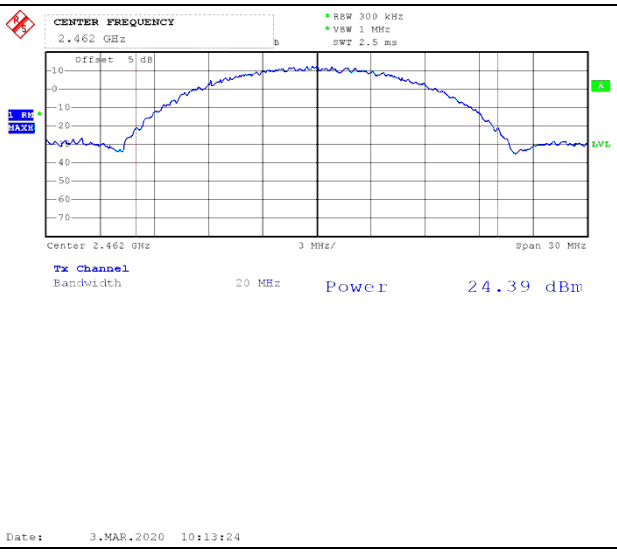
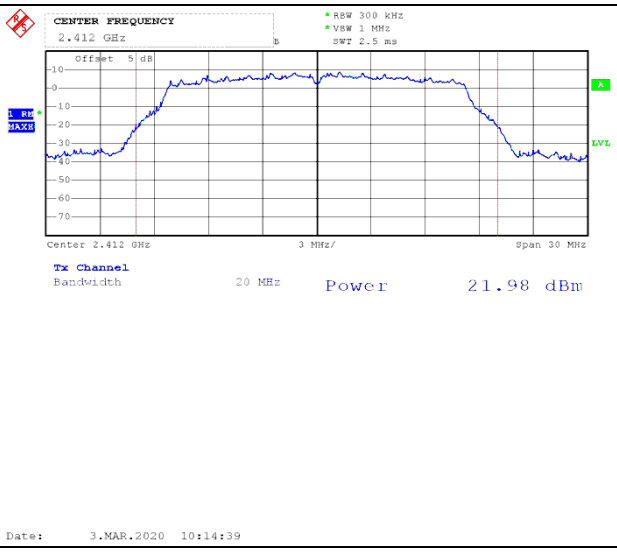
7.3Summary of Test Results/Plots

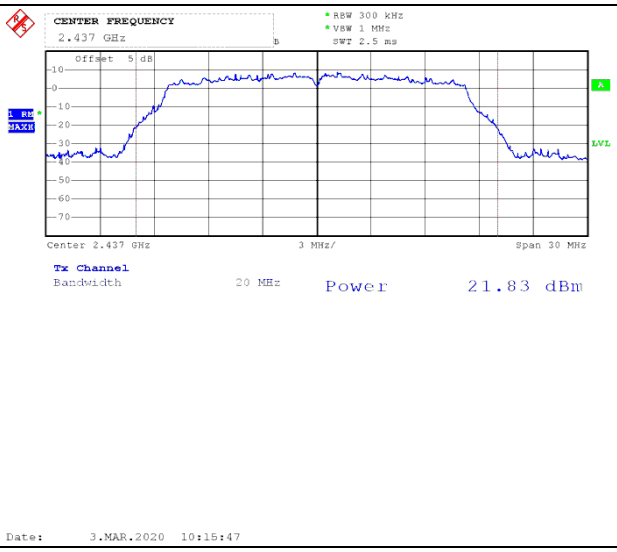
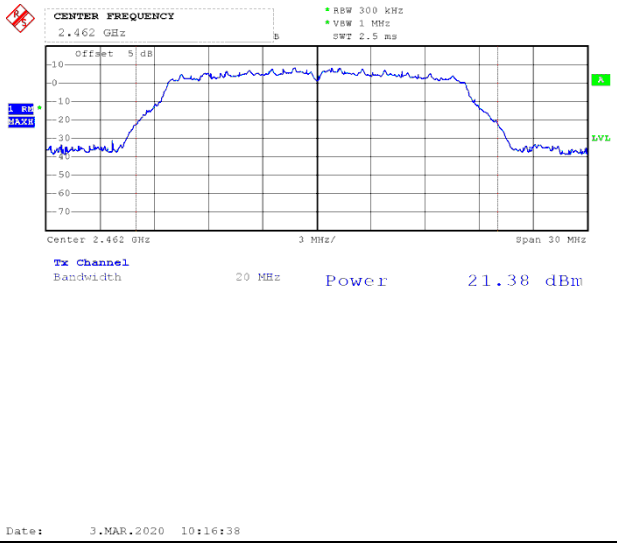
Test Mode	Frequency MHz	Power 1 dBm	Power 2 dBm	Power 1 mW	Power 2 mW	Total Power dBm	Output Power mW	Limit mW
802.11b _11Mbps	2412	24.83	25.06	304.09	320.63	/	/	1000
	2437	24.89	24.92	308.32	310.46	/	/	1000
	2462	24.39	24.30	274.79	269.15	/	/	1000
802.11g _54Mbps	2412	21.98	22.57	157.76	180.72	/	/	1000
	2437	21.83	21.74	152.41	149.28	/	/	1000
	2462	21.38	21.55	137.40	142.89	/	/	1000
802.11n HT20_MCS7	2412	22.01	21.91	158.85	155.24	24.97	314.09	716.14
	2437	21.60	21.66	144.54	146.55	24.64	291.10	716.14
	2462	21.78	21.33	150.66	135.83	24.57	286.49	716.14
802.11n HT40_MCS7	2422	19.52	19.35	89.54	86.10	22.45	175.64	716.14
	2437	19.05	19.11	80.35	81.47	22.09	161.82	716.14
	2452	19.04	18.97	80.17	78.89	22.02	159.05	716.14

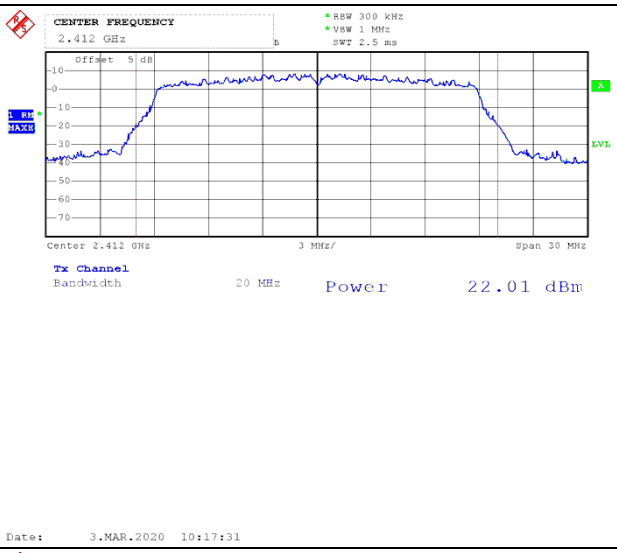
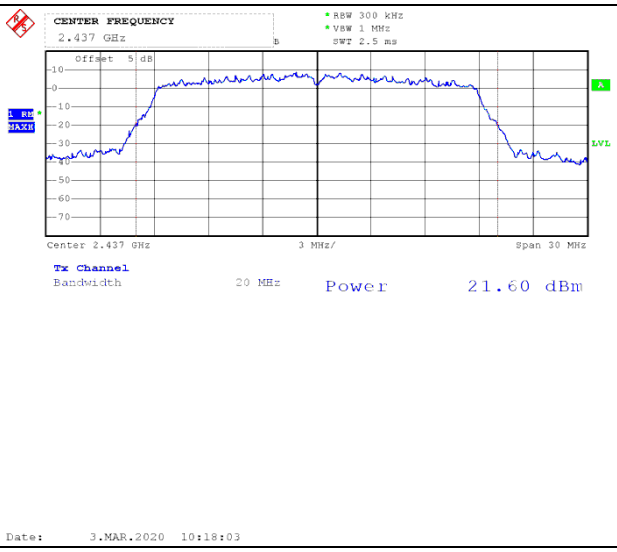
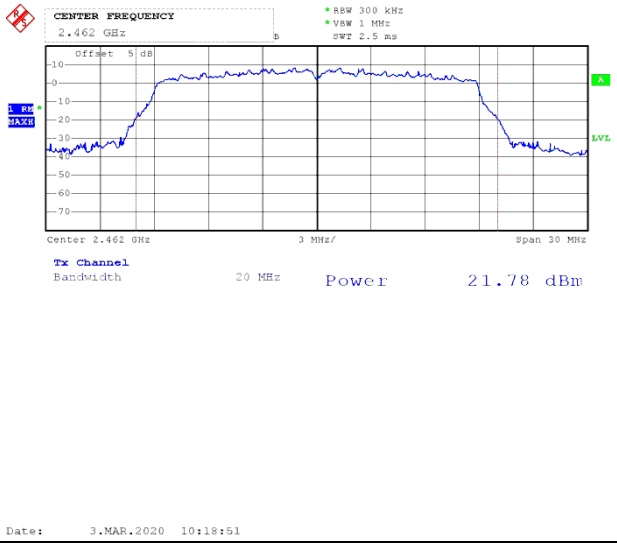
ANT Directional gain = G_{ANT} + 10 log(N_{ANT}) =7.45dBi, so the limit is:30-(7.45-6)=28.55(dBm).

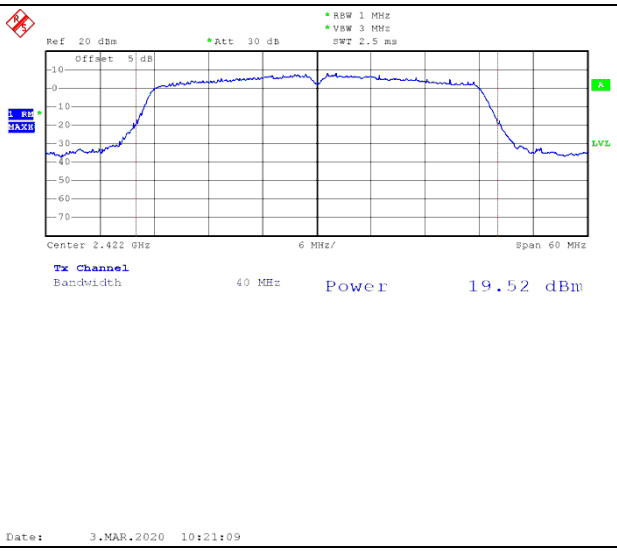
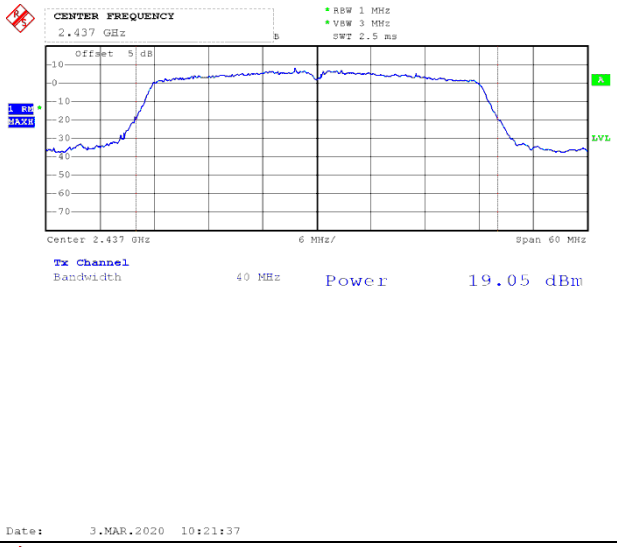
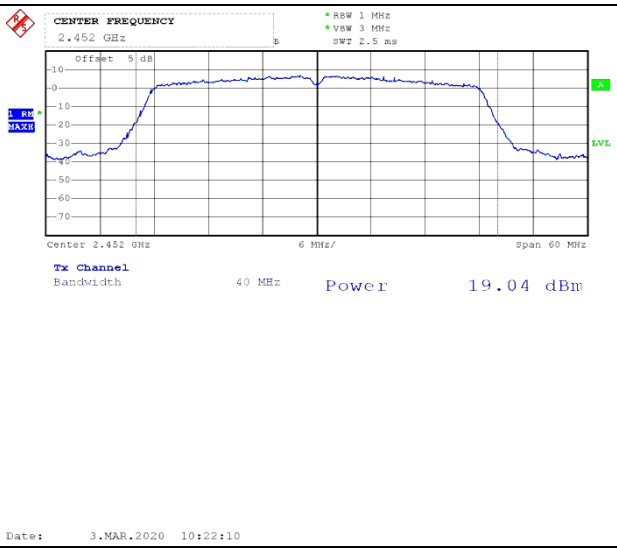
➢ Antenna 1

802.11b-Low 11Mbps	

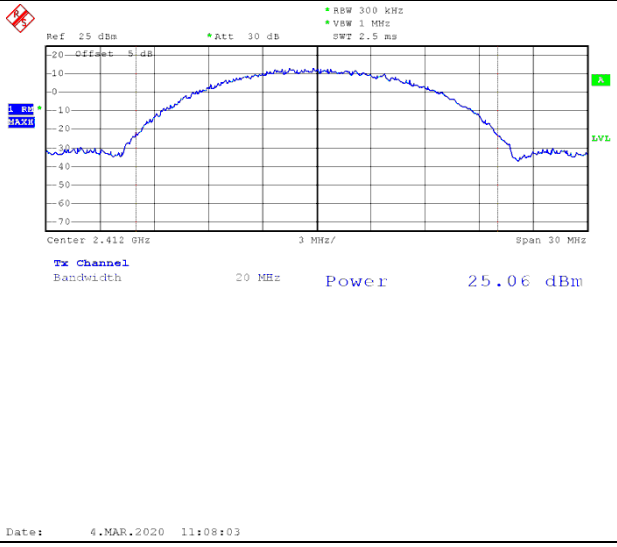
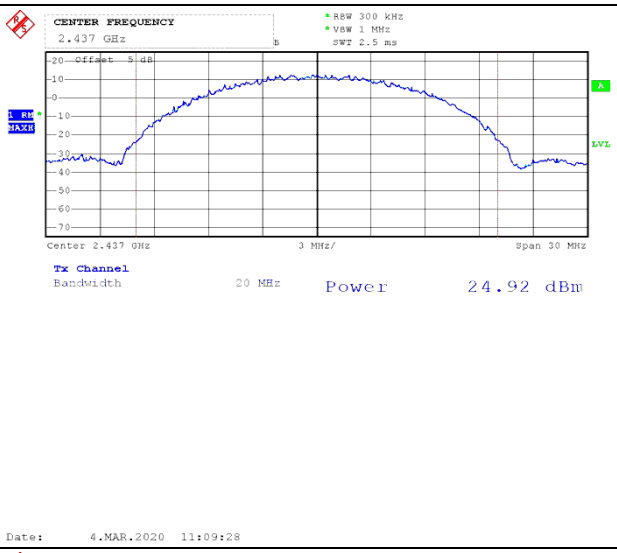
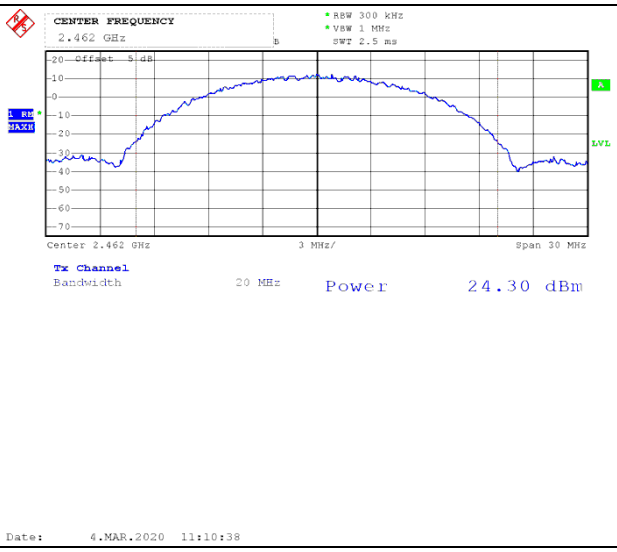
802.11b-Middle 11Mbps	
802.11b-High 11Mbps	
802.11g-Low 54Mbps	

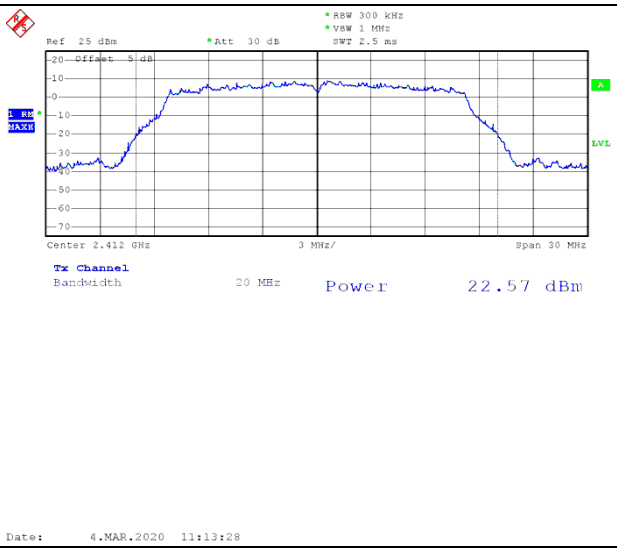
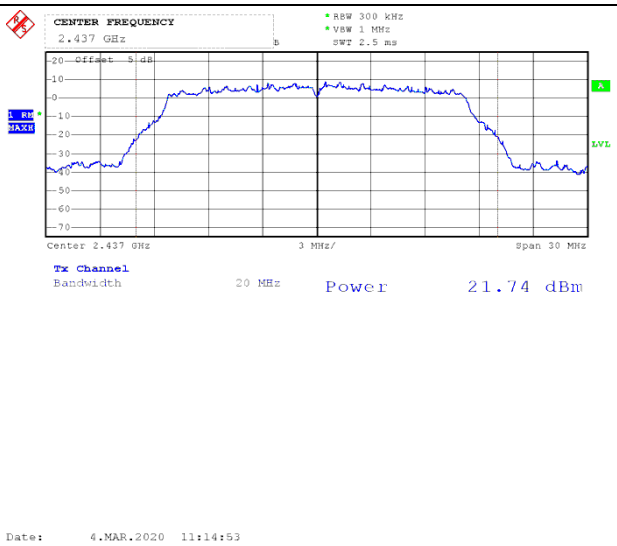
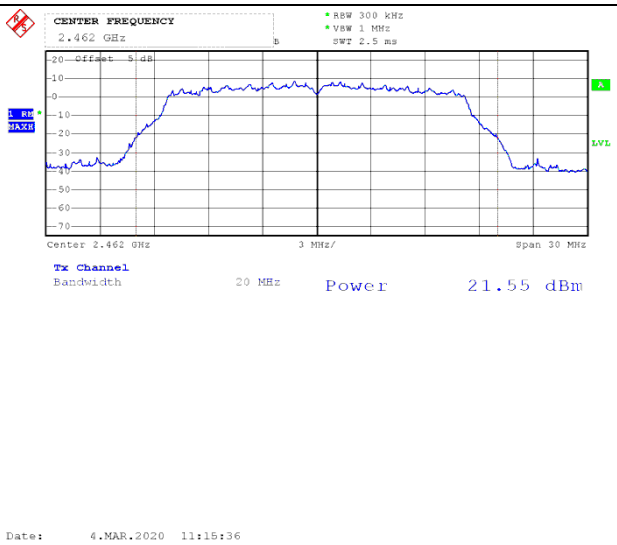
802.11g-Middle 54Mbps	
802.11g-High 54Mbps	

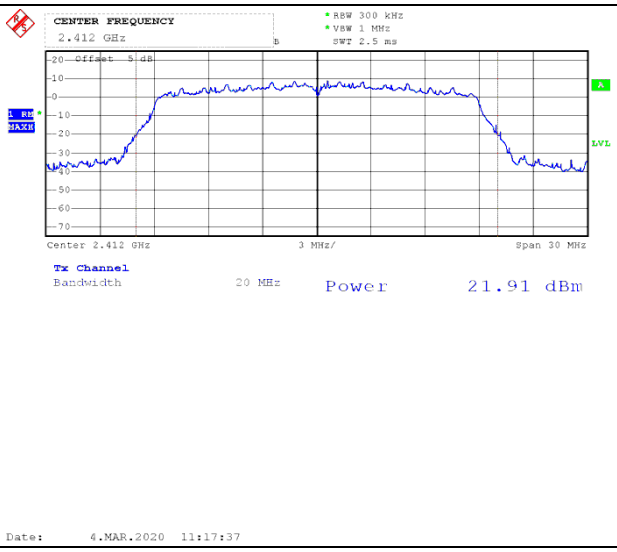
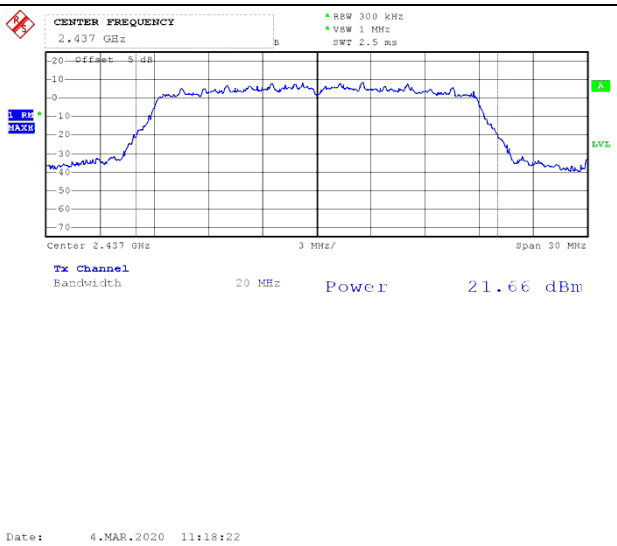
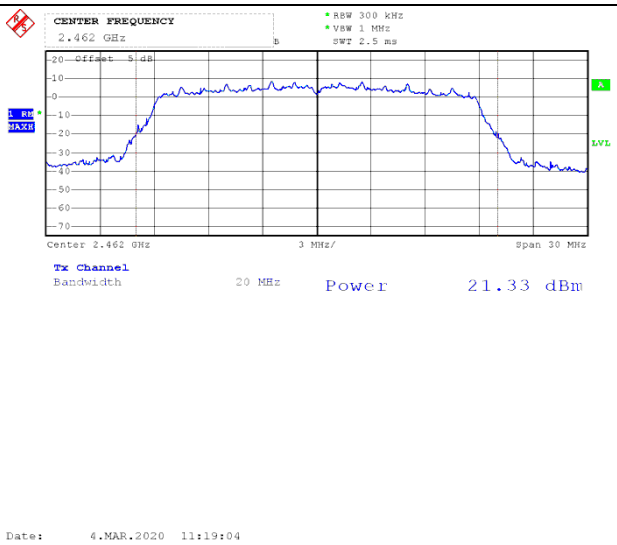
802.11n-HT20-Low MCS7	
802.11n-HT20-Middle MCS7	
802.11n-HT20-High MCS7	

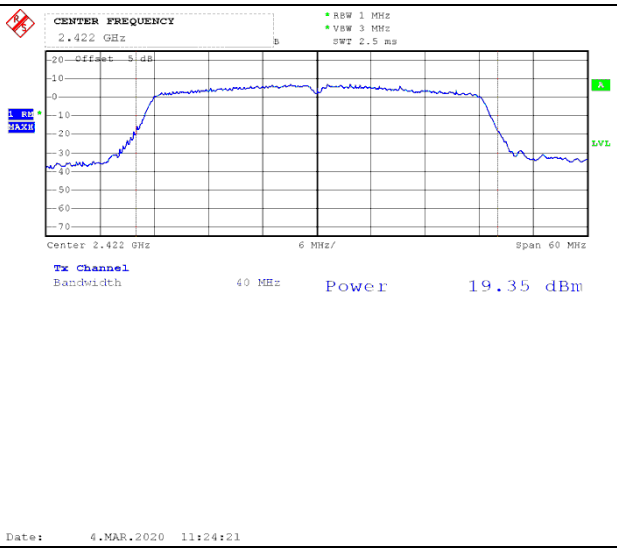
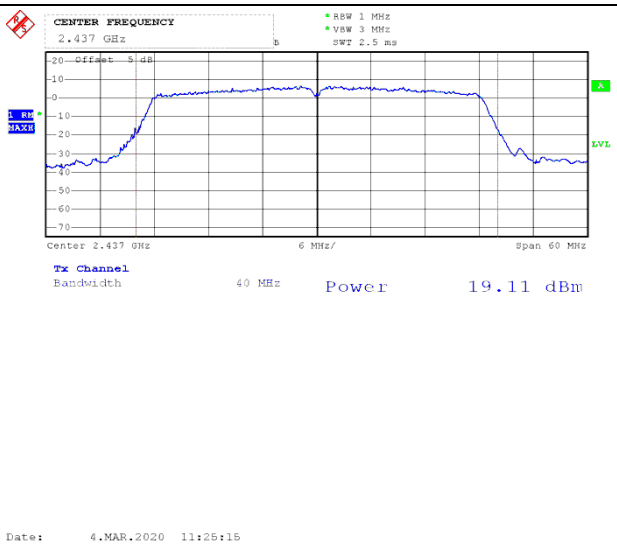
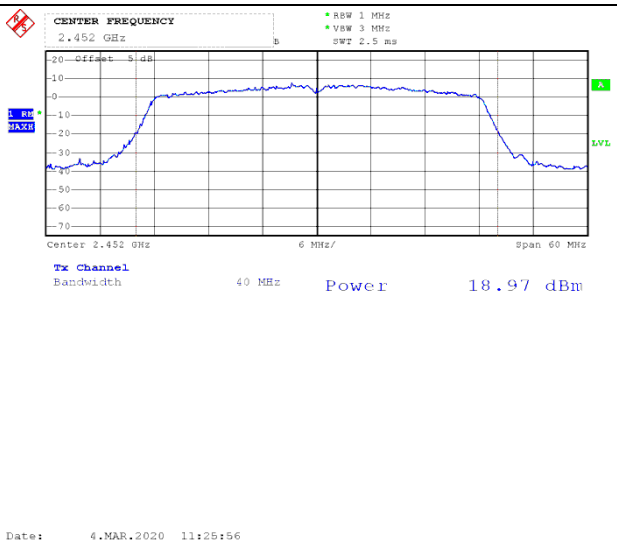
802.11n-HT40-Low MCS7	
802.11n-HT40-Middle MCS7	
802.11n-HT40-High MCS7	

➢ Antenna 2

802.11b-Low 11Mbps	
802.11b-Middle 11Mbps	
802.11b-High 11Mbps	

802.11g-Low 54Mbps	
802.11g-Middle 54Mbps	
802.11g-High 54Mbps	

802.11n-HT20-Low MCS7	
802.11n-HT20-Middle MCS7	
802.11n-HT20-High MCS7	

802.11n-HT40-Low MCS7	
802.11n-HT40-Middle MCS7	
802.11n-HT40-High MCS7	

8. Field Strength of Spurious Emissions

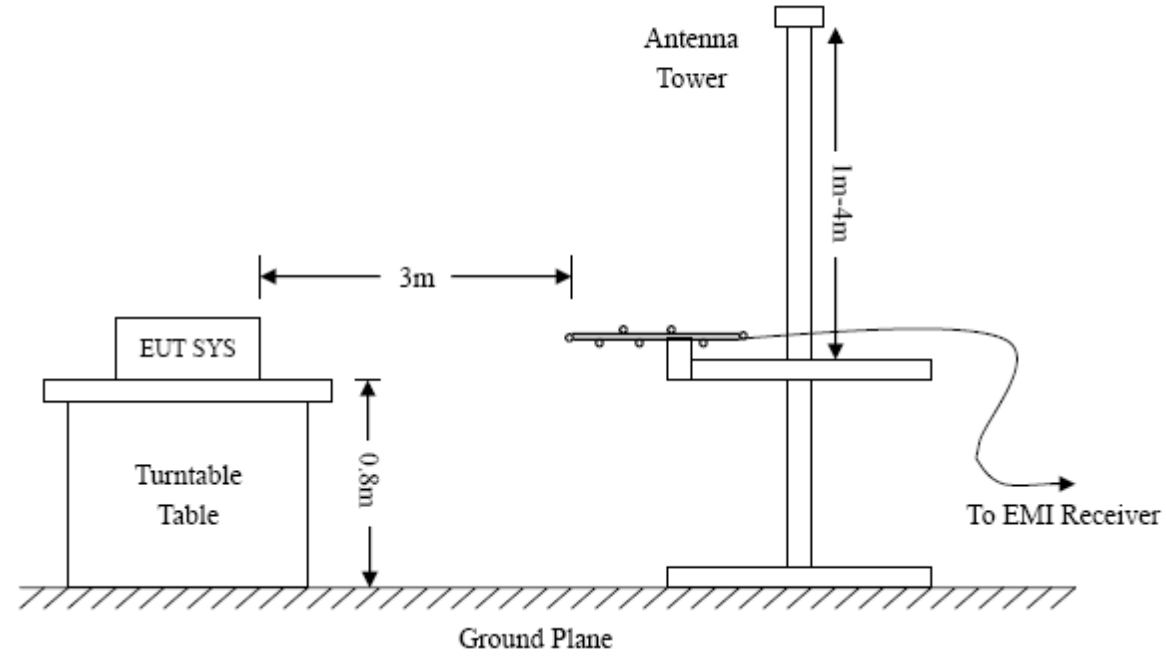
8.1Standard Applicable

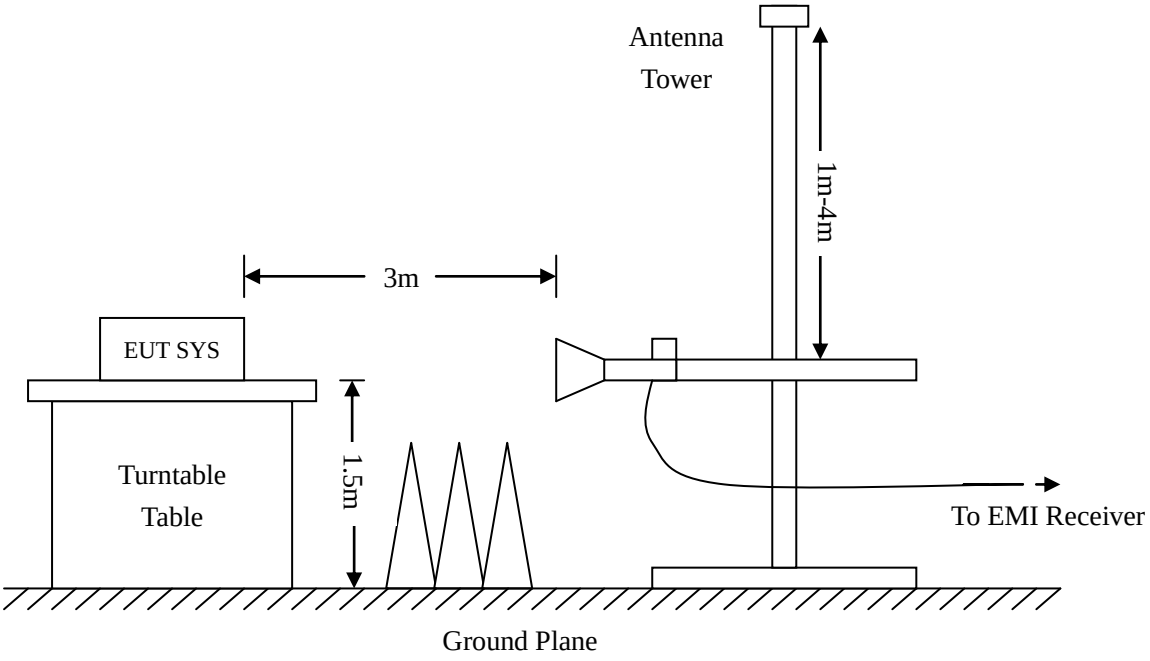
According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

8.2Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.





Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

8.3Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading+ Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part15 Limit

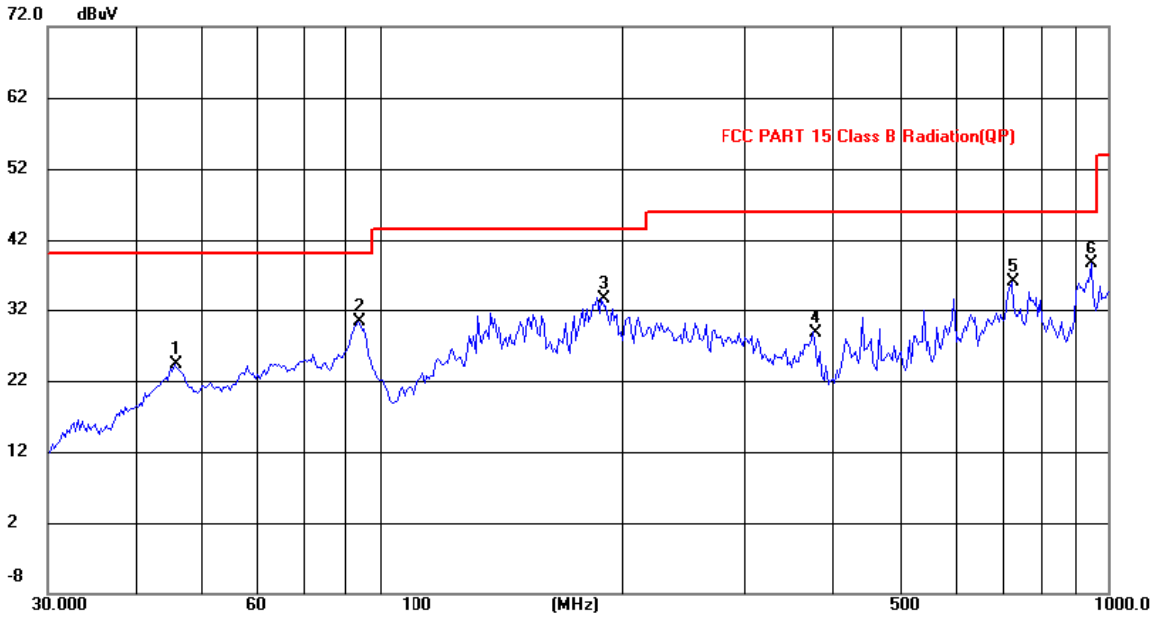
8.4Summary of Test Results/Plots

Note: 1.This EUT was tested in 3 orthogonal positions and the worst case position data was reported.
All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report.
2. For 9kHz ~ 30MHz, The EUT was pre-scanned the frequency band (9kHz~30MHz), found the radiated level lower than the limit, so don't show on the report.
3. For 30MHz ~1000MHz, Have pre-scan all modulation mode and antennas, found the 802.11b mode low channel at antenna 1 which it was worst case, so only the worst case's data on the test report.
4. Above 1000MHz, Have pre-scan all modulation mode and antennas, found the 802.11n20 MIMO mode which it was worst case, so only the worst case's data on the test report.

- Spurious Emissions Below 1GHz
- Worst case Antenna 1(802.11b low channel)

802.11b_11Mbps

Test Channel	Low	Polarity:	Horizontal



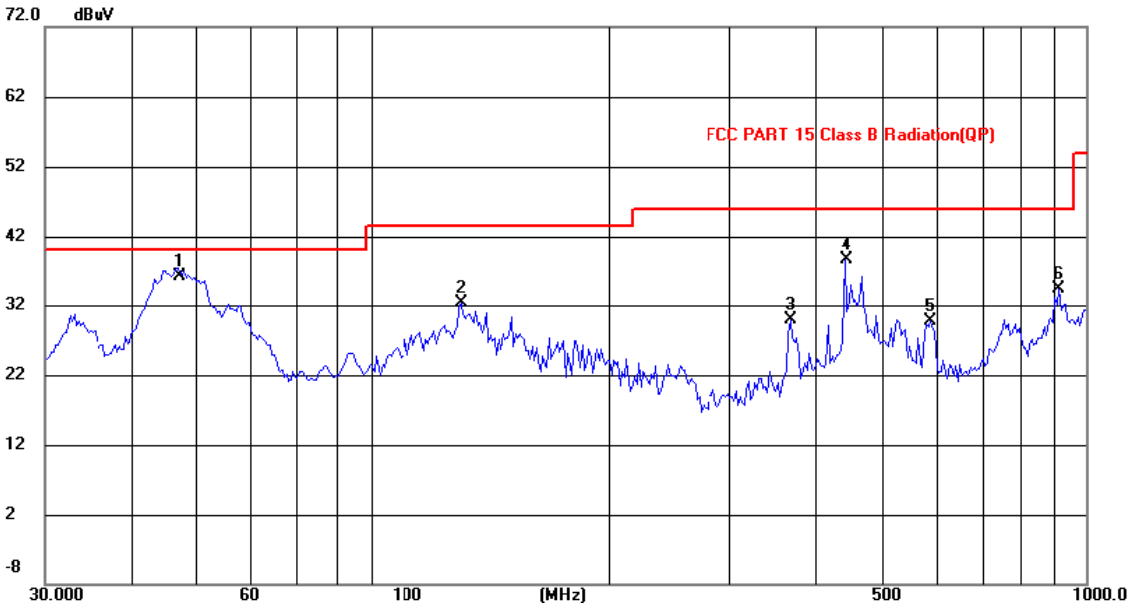
Site
Limit: FCC PART 15 Class B Radiation(QP)
EUT: LED TV 65
M/N: Q65S218-U-A-I
Mode: 2412M
Note:

Polarization: *Horizontal*
Power: AC120/60Hz

Temperature: 23.6
Humidity: 48 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		45.6948	37.94	-13.73	24.21	40.00	-15.79	QP	
2		83.5222	49.14	-18.77	30.37	40.00	-9.63	QP	
3		187.0958	49.82	-16.25	33.57	43.50	-9.93	QP	
4		377.2591	39.86	-11.06	28.80	46.00	-17.20	QP	
5		724.2611	39.92	-3.97	35.95	46.00	-10.05	QP	
6	*	945.4399	40.90	-2.45	38.45	46.00	-7.55	QP	

802.11b_11Mbps			
Test Channel	Low	Polarity:	Vertical



Site
Limit: FCC PART 15 Class B Radiation(QP)
EUT: LED TV 65
M/N: Q65S218-U-A-I
Mode: 2412M
Note:

Polarization: *Vertical*
Power: AC120/60Hz

Temperature: 23.6
Humidity: 48 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	46.9948	49.52	-13.42	36.10	40.00	-3.90	QP	
2		121.9755	50.01	-17.66	32.35	43.50	-11.15	QP	
3		369.4047	41.40	-11.52	29.88	46.00	-16.12	QP	
4		443.2943	48.46	-9.94	38.52	46.00	-7.48	QP	
5		590.9737	36.50	-6.77	29.73	46.00	-16.27	QP	
6		912.8620	35.18	-0.87	34.31	46.00	-11.69	QP	

- Spurious Emissions Above 1GHz
- *Test Mode Antenna 1+Antenna 2: 802.11n20 MIMO _11Mbps*

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	53.90	-3.87	50.03	74	-23.97	H	PK
4824.000	38.45	-3.87	34.58	54	-19.42	H	AV
7236.000	45.71	1.14	46.85	74	-27.15	H	PK
7236.000	34.19	1.19	35.38	54	-18.62	H	AV
4824.000	56.32	-3.86	52.46	74	-21.54	V	PK
4824.000	39.31	-3.86	35.45	54	-18.55	V	AV
7236.000	47.72	1.10	48.82	74	-25.18	V	PK
7236.000	35.85	1.10	36.95	54	-17.05	V	AV
Middle Channel-2437MHz							
4874.000	53.45	-3.74	49.71	74	-24.29	H	PK
4874.000	38.40	-3.74	34.66	54	-19.34	H	AV
7311.000	45.88	1.47	47.35	74	-26.65	H	PK
7311.000	30.91	1.47	32.38	54	-21.62	H	AV
4874.000	51.48	-3.74	47.74	74	-26.26	V	PK
4874.000	38.10	-3.74	34.36	54	-19.64	V	AV
7311.000	44.89	1.47	46.36	74	-27.64	V	PK
7311.000	30.69	1.47	32.16	54	-21.84	V	AV
High Channel-2462MHz							
4924.000	53.63	-3.59	50.04	74	-23.96	H	PK
4924.000	39.27	-3.59	35.68	54	-18.32	H	AV
7386.000	43.59	1.79	45.38	74	-28.62	H	PK
7386.000	31.74	1.79	33.53	54	-20.47	H	AV
4924.000	51.55	-3.59	47.96	74	-26.04	V	PK
4924.000	38.35	-3.59	34.76	54	-19.24	V	AV
7386.000	44.00	1.79	45.79	74	-28.21	V	PK
7386.000	30.89	1.79	32.68	54	-21.32	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

9. Out of Band Emissions

9.1 Standard Applicable

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

9.2 Test Procedure

According to the KDB 558074D01 v05r02Subclause 8.4 and ANSI C63.10-2013 Subclause 11.11, the Emissions in nonrestricted frequency bands test method as follows:

a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ [3 ×RBW].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.

According to the KDB 558074 D01 v05r02Subclause 8.5 and ANSI C63.10-2013 Subclause 11.12, the Emissions in restricted frequency bands test method as follows:

A. Radiated emission measurements:
Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)
RBW = 1MHz, VBW = 1MHz for peak value measured
RBW = 1MHz, VBW = 10Hz for average value measured
Sweep = auto; Detector function = peak/average; Trace = max hold
All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

B. Antenna-port conducted measurements

Peak emission levels are measured by setting the instrument as follows:

a) RBW = as specified in Table 9

b) VBW ≥ [3 × RBW].

c) Detector = peak.

d) Sweep time = auto.

e) Trace mode = max hold.

f) Allow sweeps to continue until the trace stabilizes. (Note that the required measurement timemay be lengthened for low-duty-cycle applications.)

Table 9—RBW as a function of frequency

Frequency	RBW
9 kHz to 150 kHz	200 Hz to 300 Hz
0.15 MHz to 30 MHz	9 kHz to 10 kHz
30 MHz to 1000 MHz	100 kHz to 120 kHz
>1000 MHz	1 MHz

If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

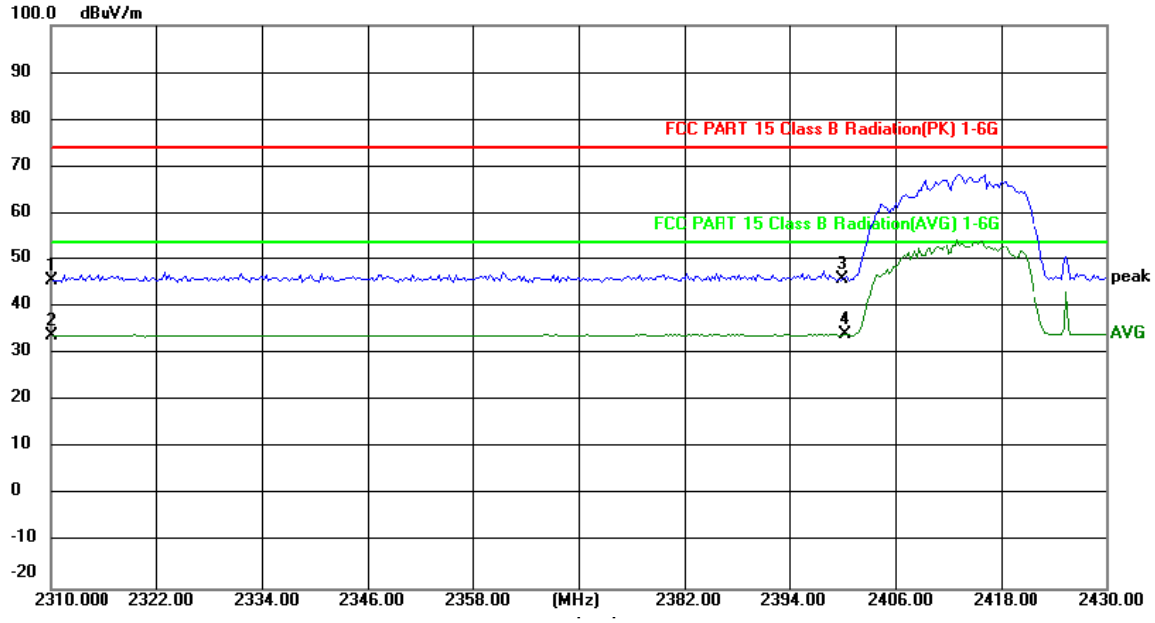
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report thethree highest emissions relative to the limit.

9.3Summary of Test Results/Plots

Note:

1. We pre-scan test all antennas data, and recorded the worst one (802.11n20 MIMO mode) for the report.
2. Measure-ment = Read level + Correct Factor.
   Correct Factor= Antenna Factor+ Cable Loss- Preamp Factor

- Radiated test
- 802.11n20-Lowest Band edge (MIMO mode)
- Vertical



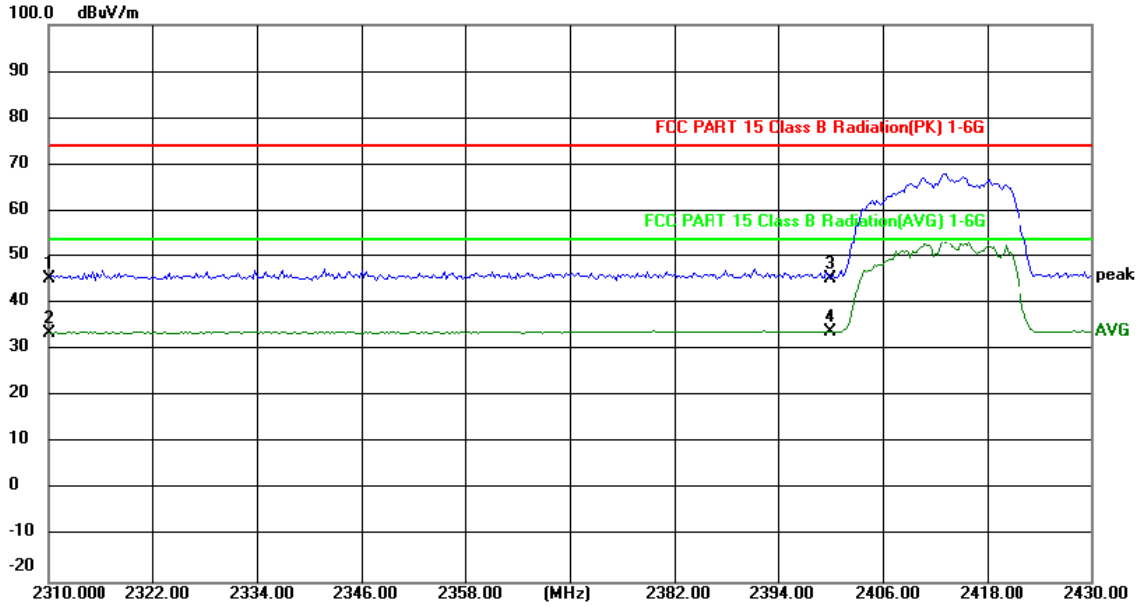
Site
Limit: FCC PART 15 Class B Radiation(PK) 1-6G
EUT: LED TV 65
M/N: Q65S218-U-A-I
Mode: N20-2412M
Note:

Polarization: *Vertical*
Power: AC120/60Hz

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	45.04	0.45	45.49	73.90	-28.41	peak	
2		2310.000	33.30	0.45	33.75	53.90	-20.15	AVG	
3		2400.000	45.26	0.73	45.99	73.90	-27.91	peak	
4	*	2400.240	33.29	0.73	34.02	53.90	-19.88	AVG	

➢ Horizontal



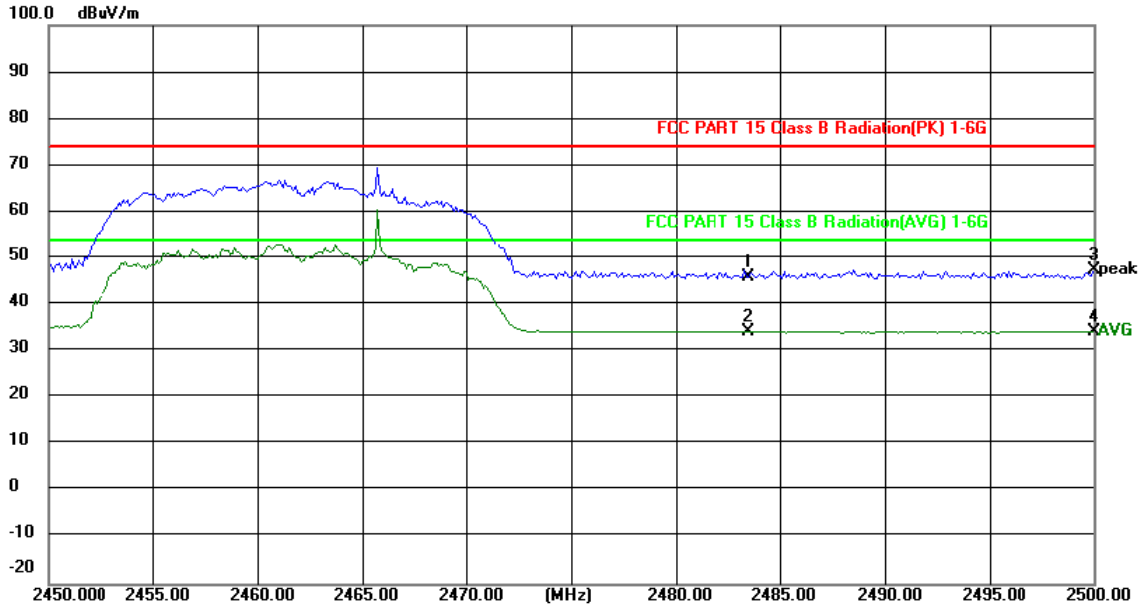
Site
Limit: FCC PART 15 Class B Radiation(PK) 1-6G
EUT: LED TV 65
M/N: Q65S218-U-A-I
Mode: N20-2412M
Note:

Polarization: ***Horizontal***
Power: AC120/60Hz

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	44.98	0.22	45.20	73.90	-28.70	peak	
2		2310.000	33.45	0.22	33.67	53.90	-20.23	AVG	
3		2400.000	44.64	0.55	45.19	73.90	-28.71	peak	
4	*	2400.000	33.32	0.55	33.87	53.90	-20.03	AVG	

- 802.11n-HT20-Highest Band edge(MIMO mode)
- Vertical



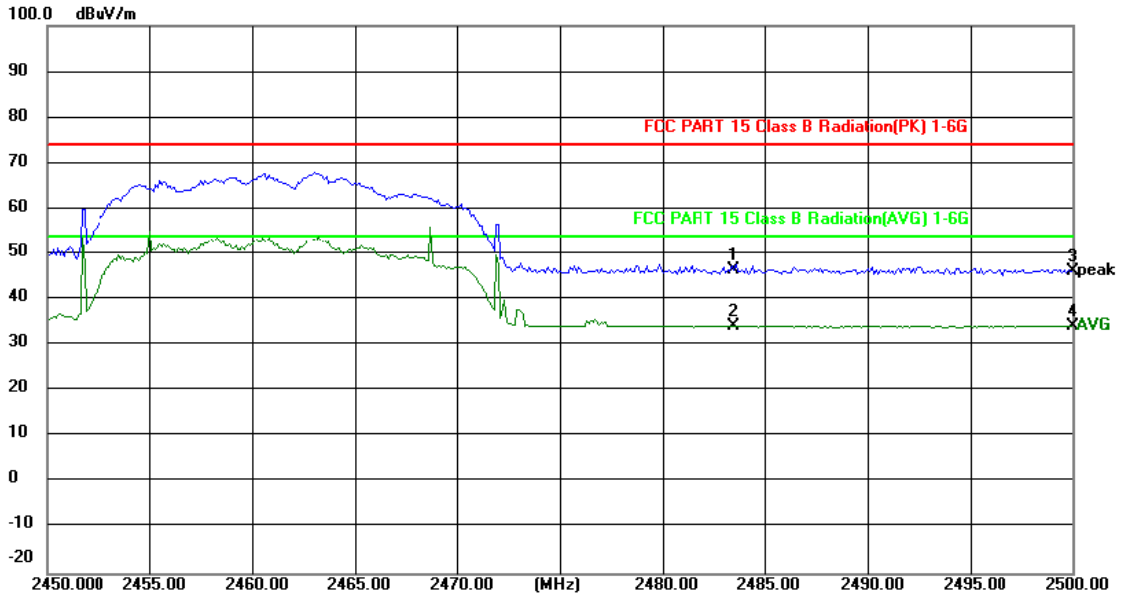
Site
Limit: FCC PART 15 Class B Radiation(PK) 1-6G
EUT: LED TV 65
M/N: Q65S218-U-A-I
Mode: N20-2462M
Note:

Polarization: *Vertical*
Power: AC120/60Hz

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	44.75	0.99	45.74	73.90	-28.16	peak	
2		2483.500	33.07	0.99	34.06	53.90	-19.84	AVG	
3		2500.000	46.18	1.04	47.22	73.90	-26.68	peak	
4	*	2500.000	33.08	1.04	34.12	53.90	-19.78	AVG	

➢ Horizontal



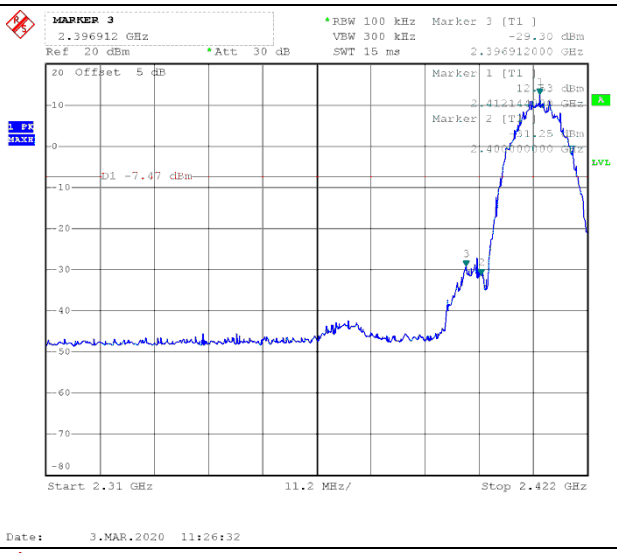
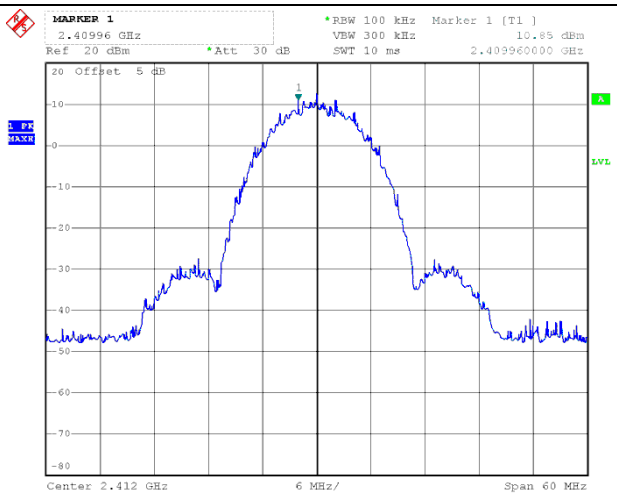
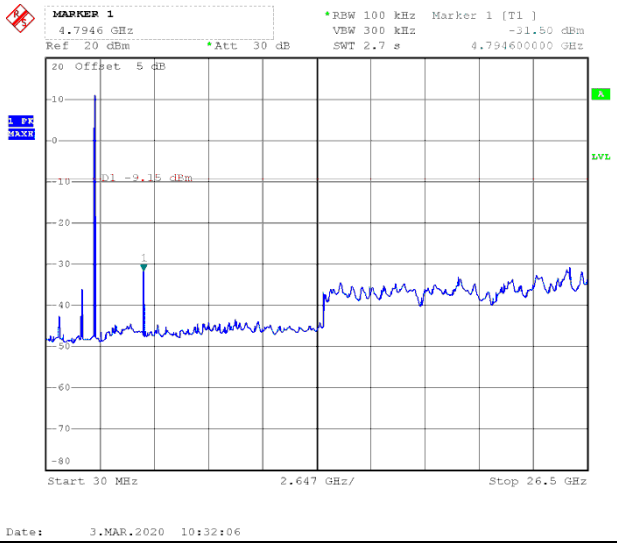
Site
Limit: FCC PART 15 Class B Radiation(PK) 1-6G
EUT: LED TV 65
M/N: Q65S218-U-A-I
Mode: N20-2462M
Note:

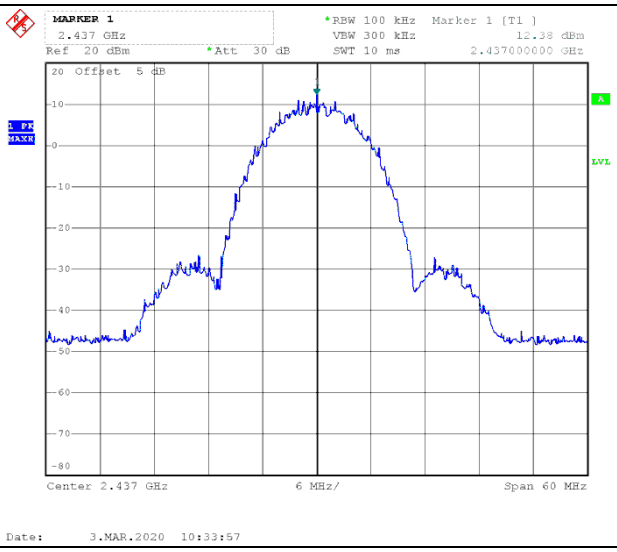
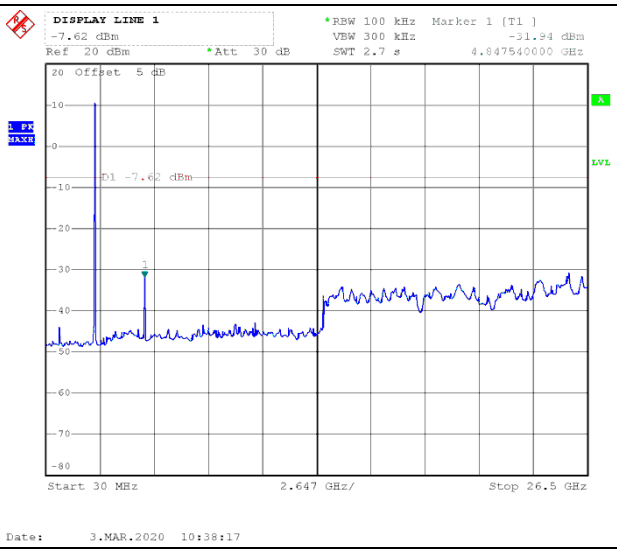
Polarization: *Horizontal*
Power: AC120/60Hz

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	45.44	0.93	46.37	73.90	-27.53	peak	
2	*	2483.500	33.15	0.93	34.08	53.90	-19.82	AVG	
3		2500.000	45.04	1.01	46.05	73.90	-27.85	peak	
4		2500.000	33.04	1.01	34.05	53.90	-19.85	AVG	

➢ Antenna 1

802.11b_11Mbps	
Low	  

802.11b_11Mbps	
Middle	
	
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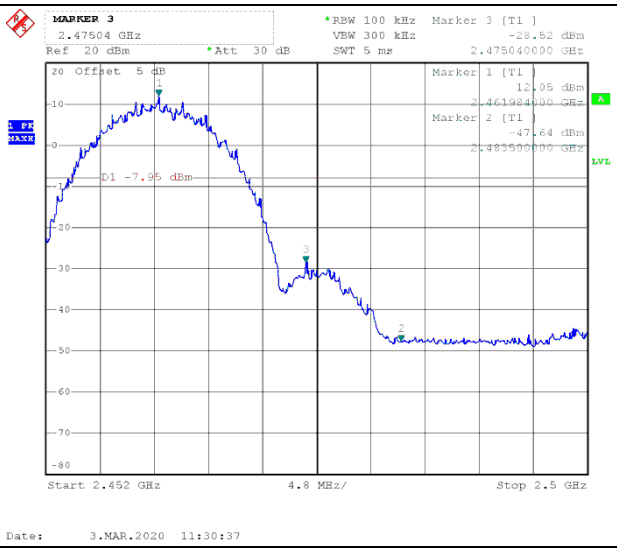
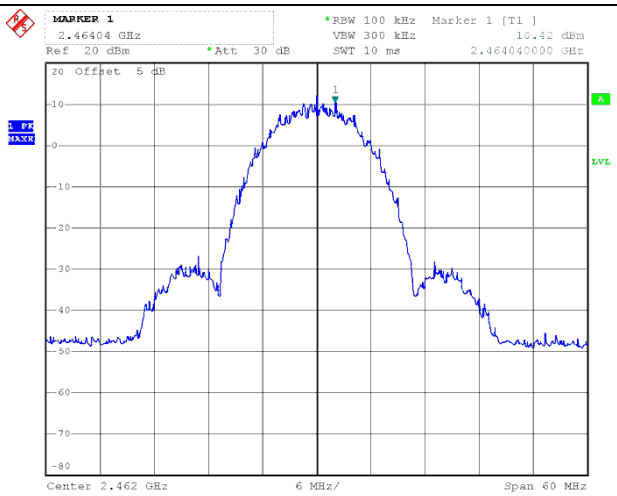
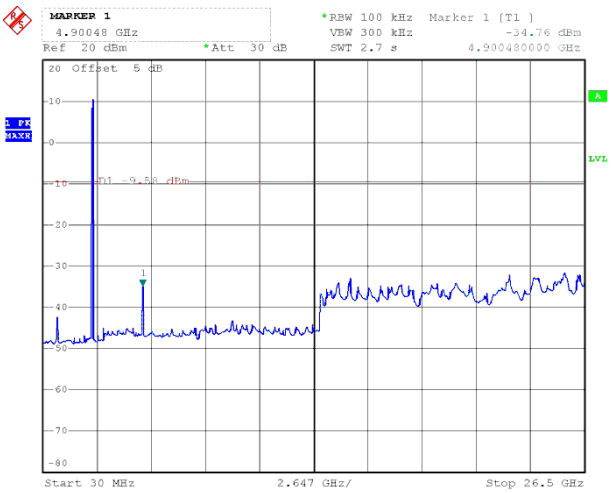
High	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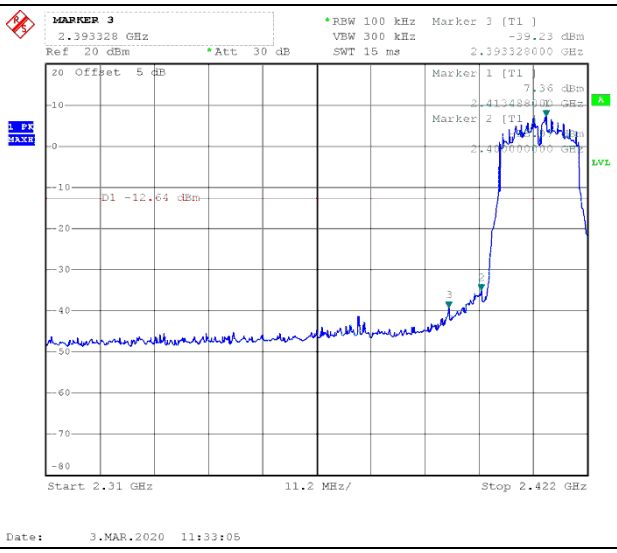
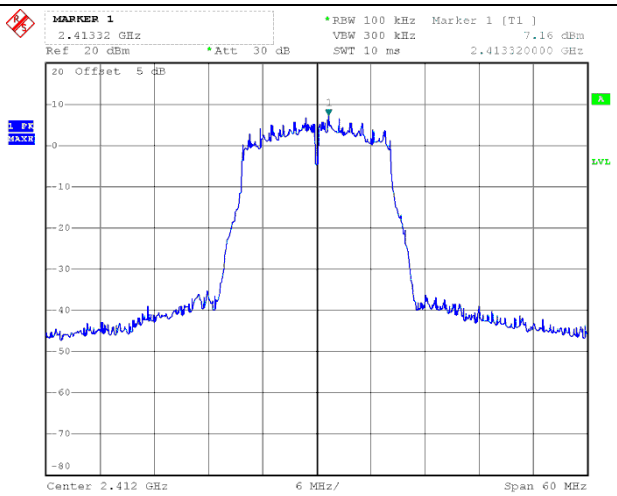
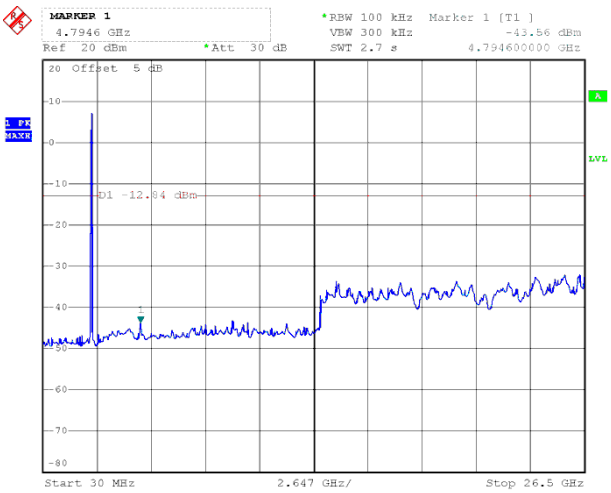
Low	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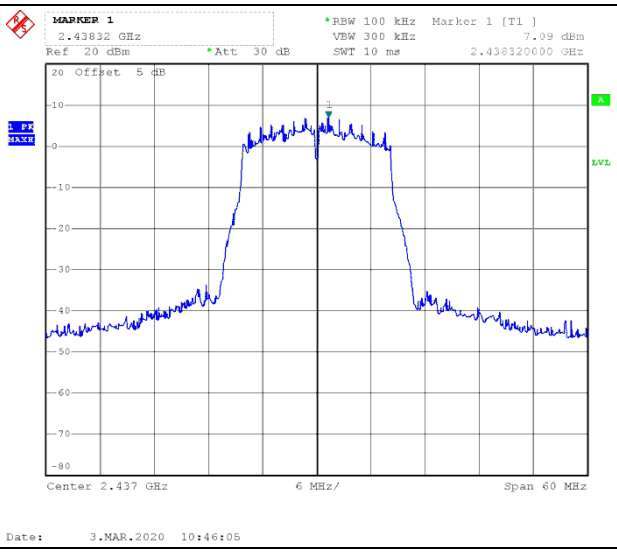
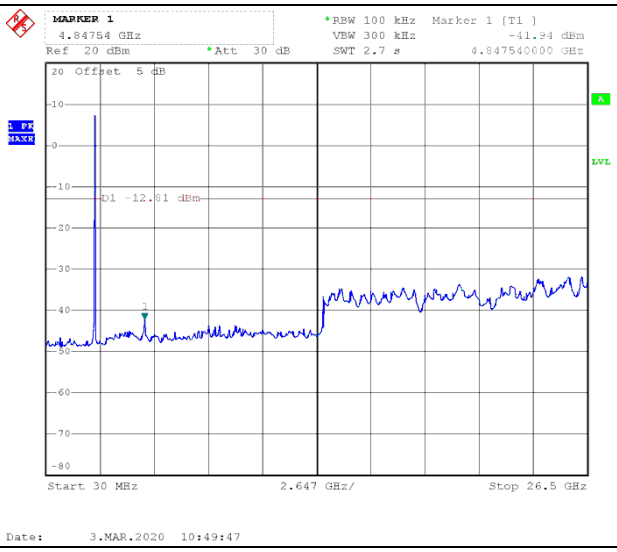
Middle	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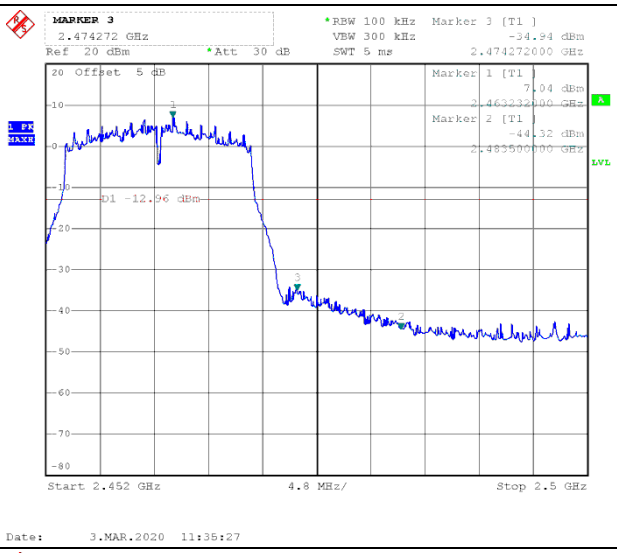
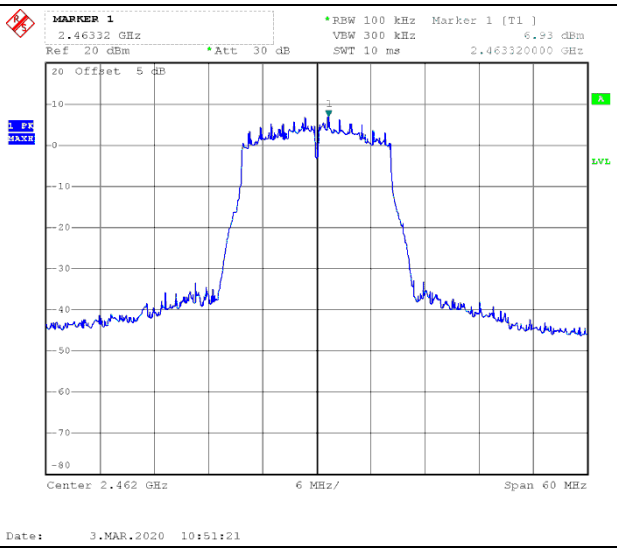
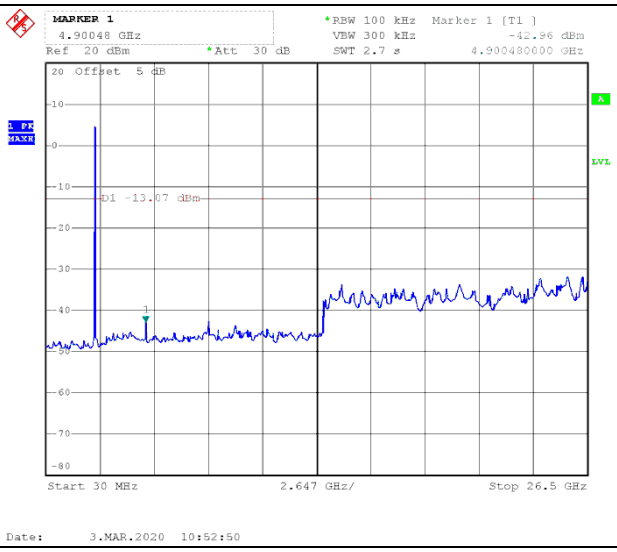
High	
	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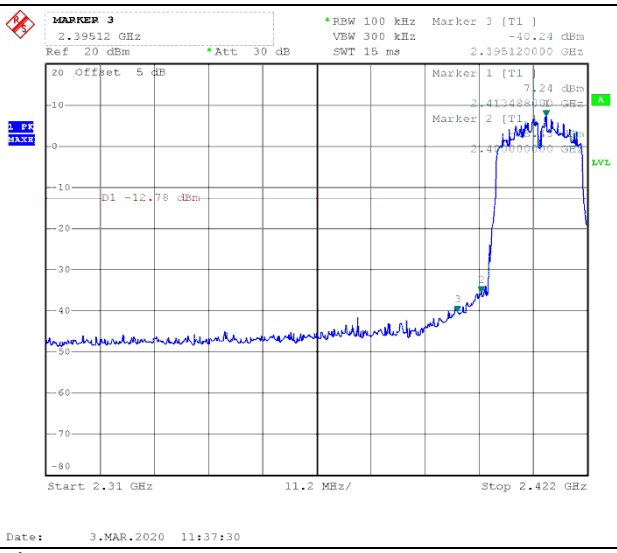
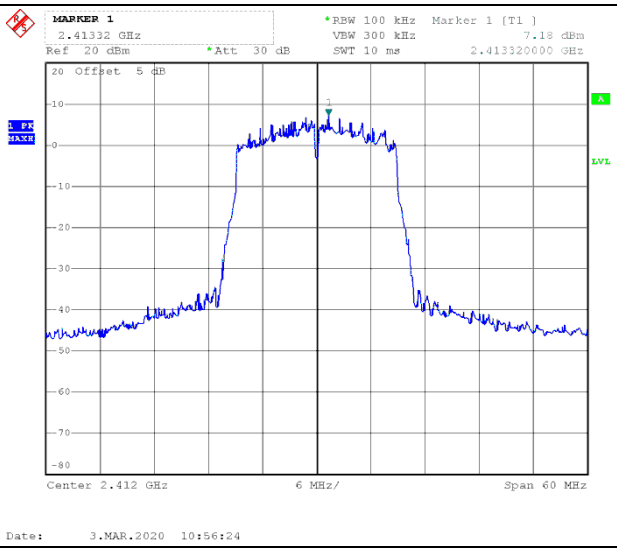
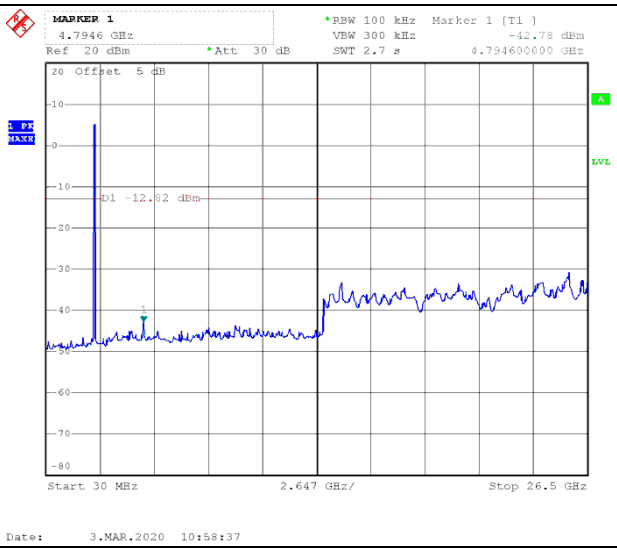
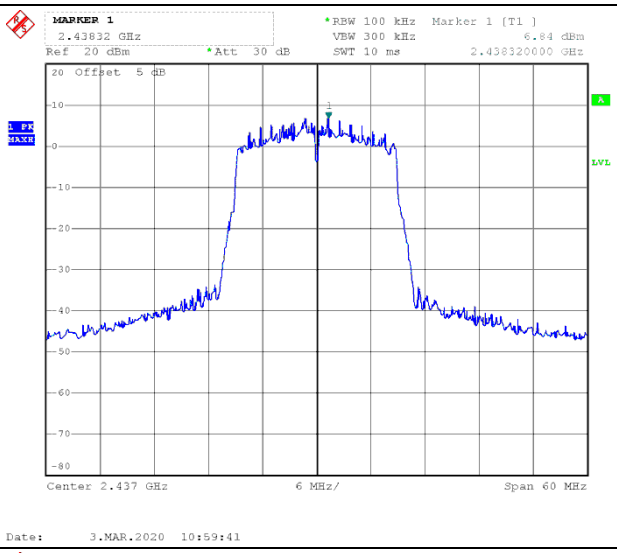
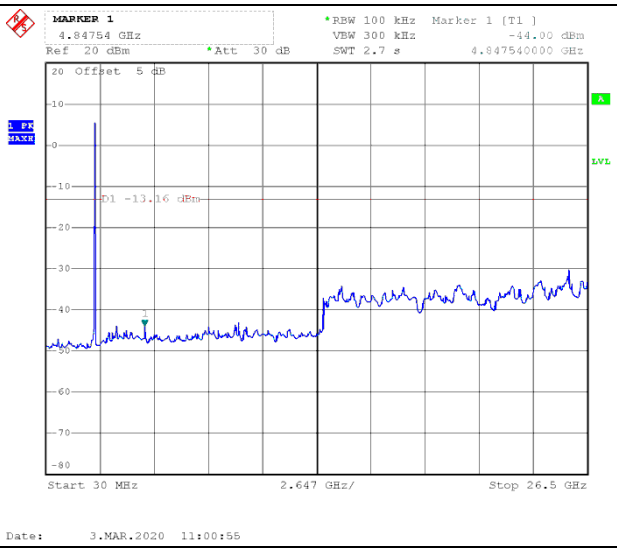
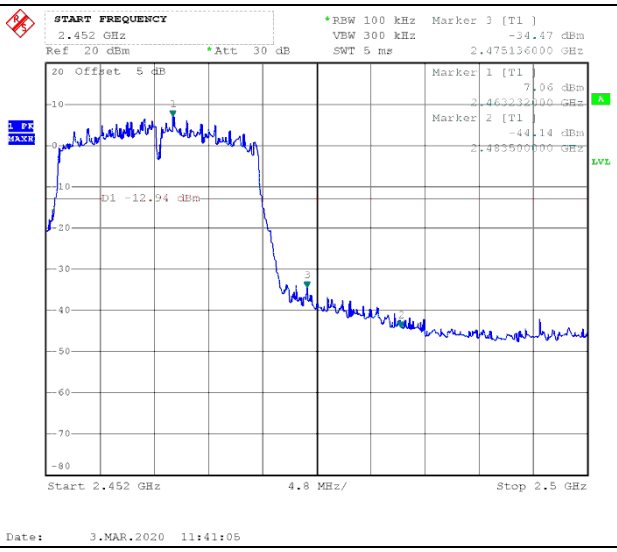
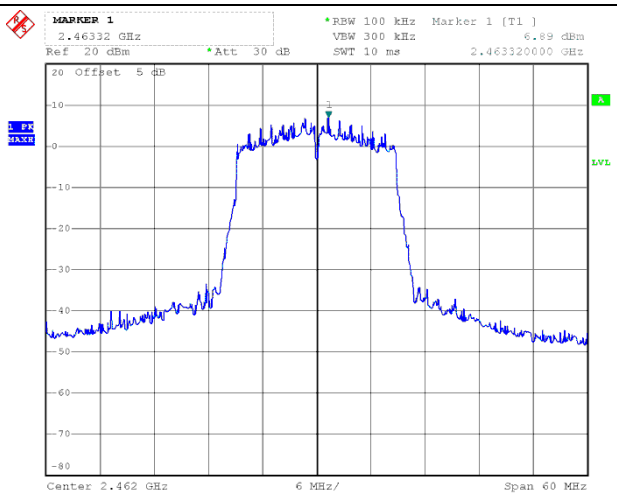
Low	
	

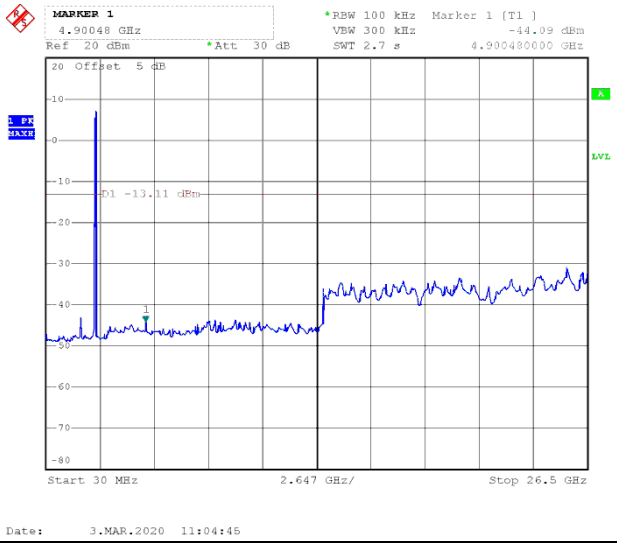
	
802.11n-HT20_MCS7	
Middle	
	

802.11n-HT20_MCS7

High

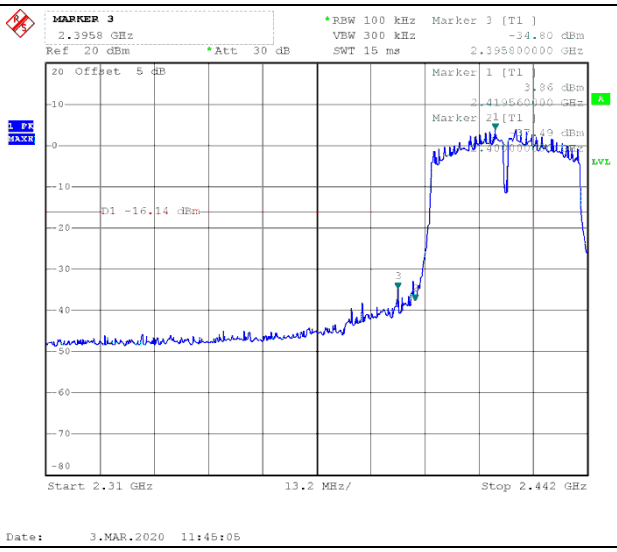


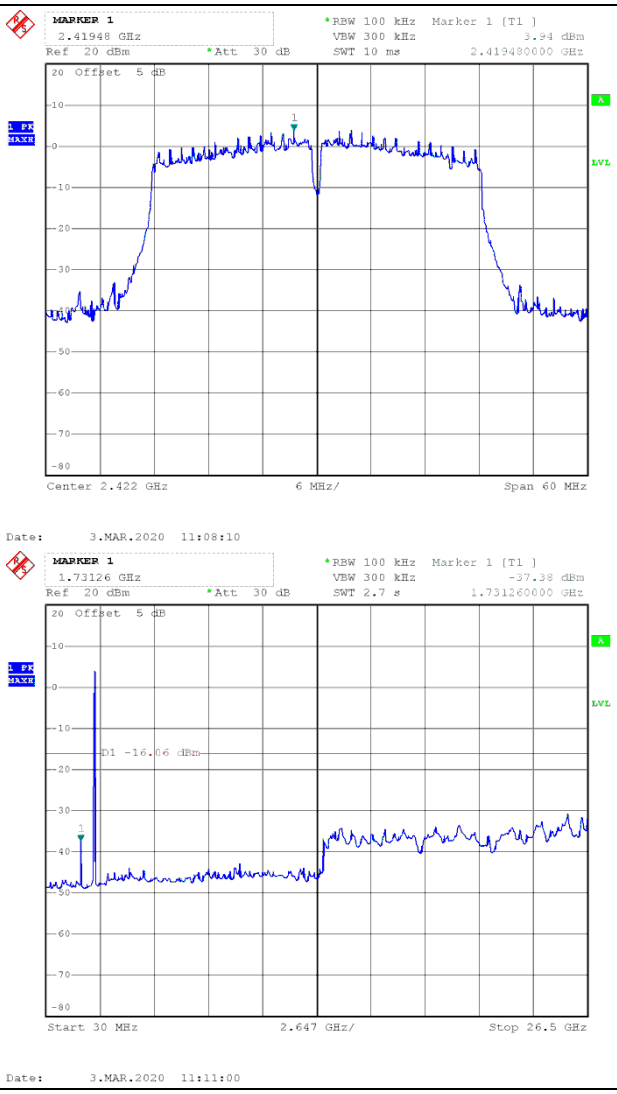


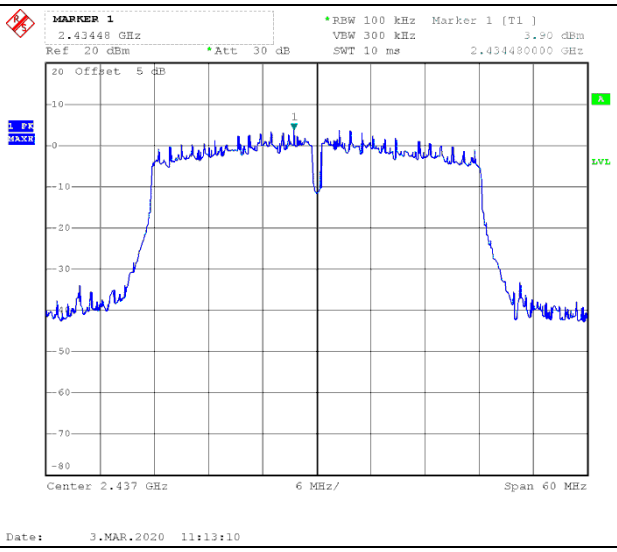
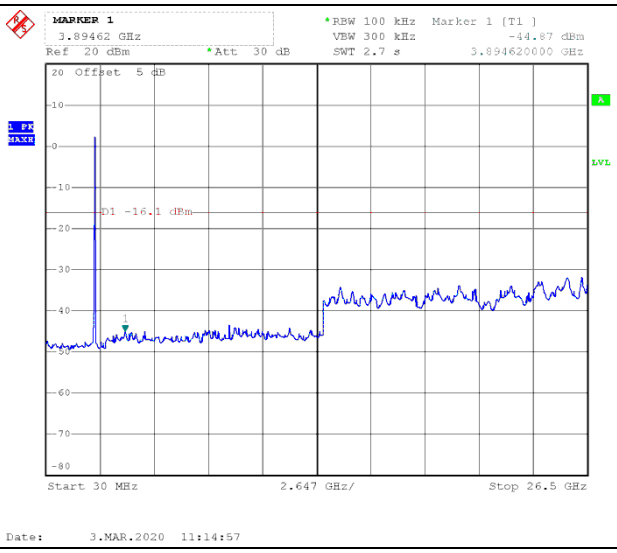
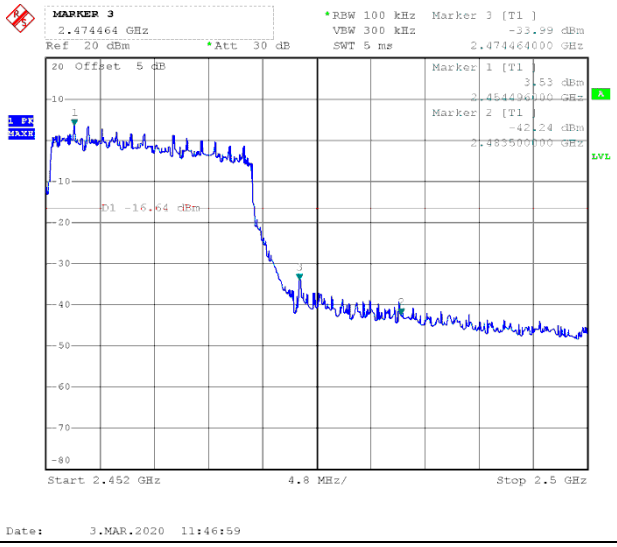


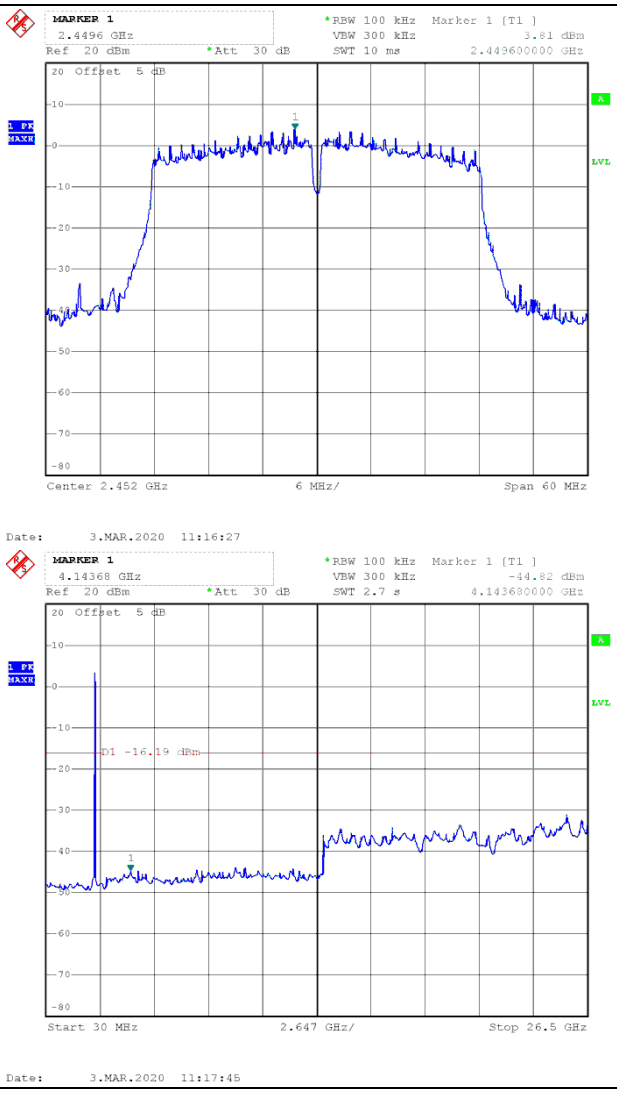
802.11n-HT40_MCS7

Low

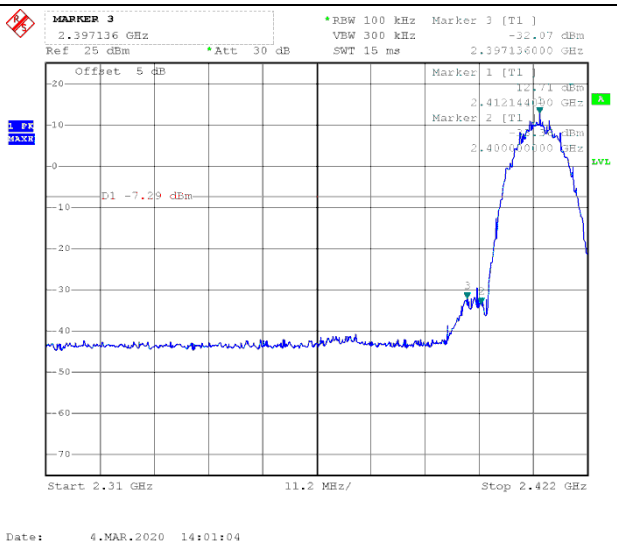


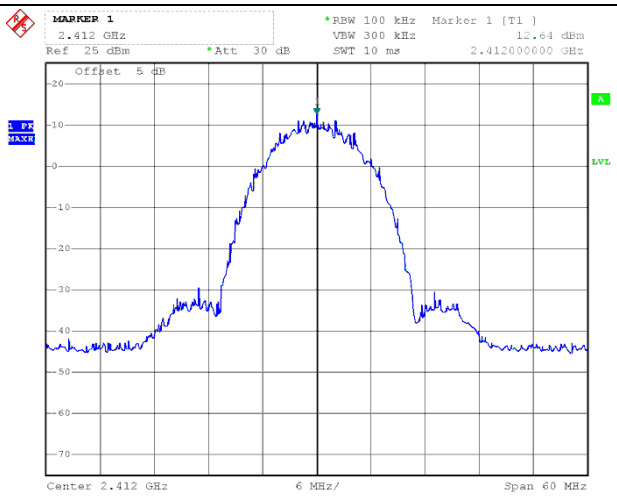
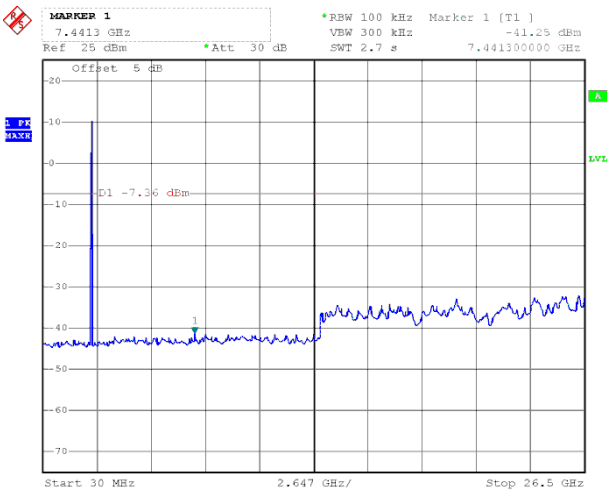
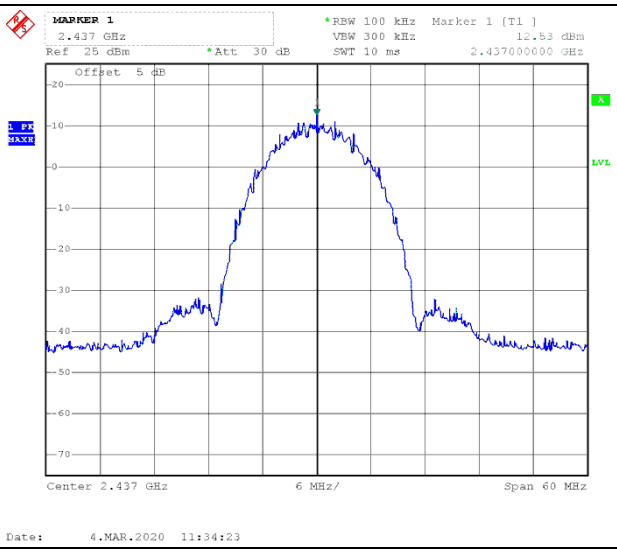


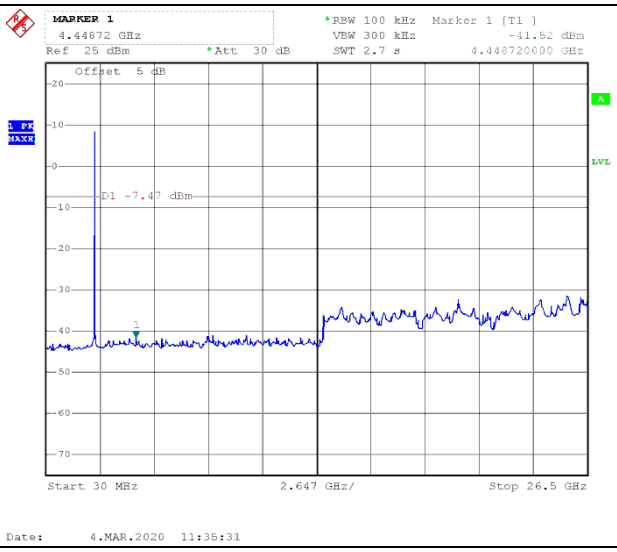
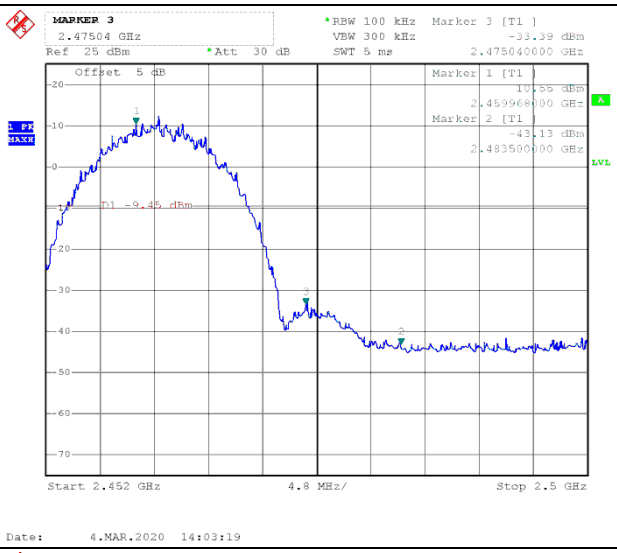
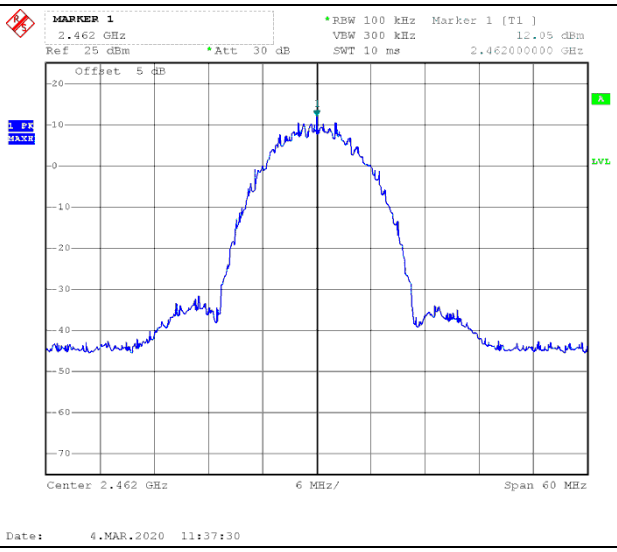
802.11n-HT40_MCS7	
Middle	
	
802.11n-HT40_MCS7	
High	

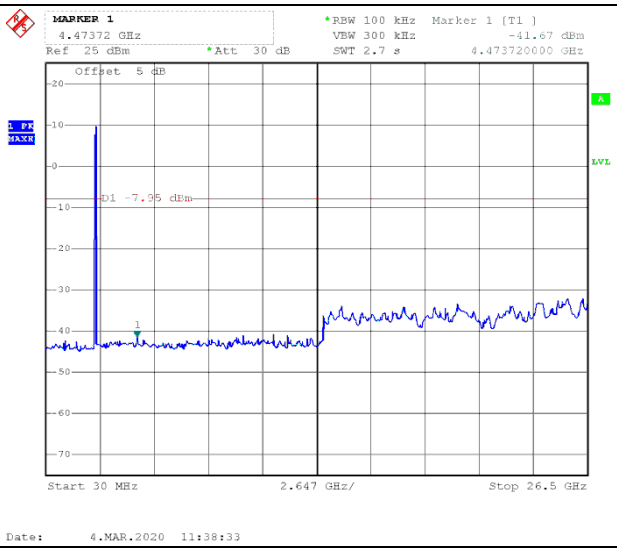
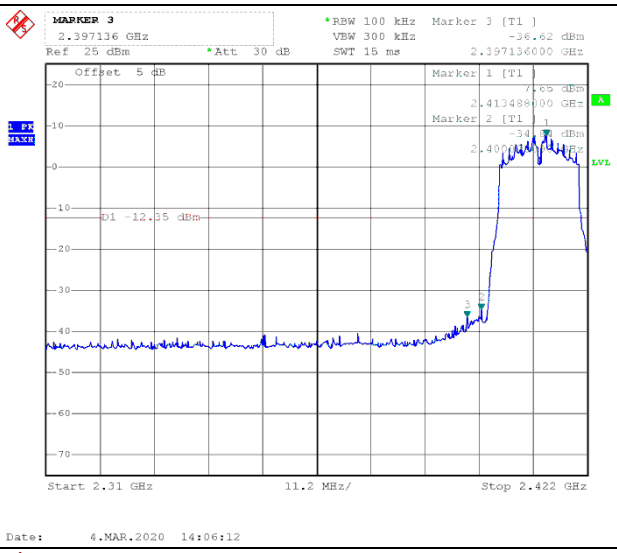
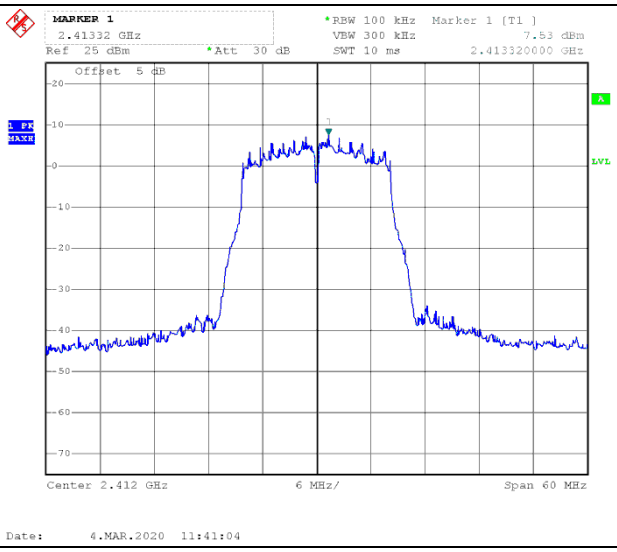
	

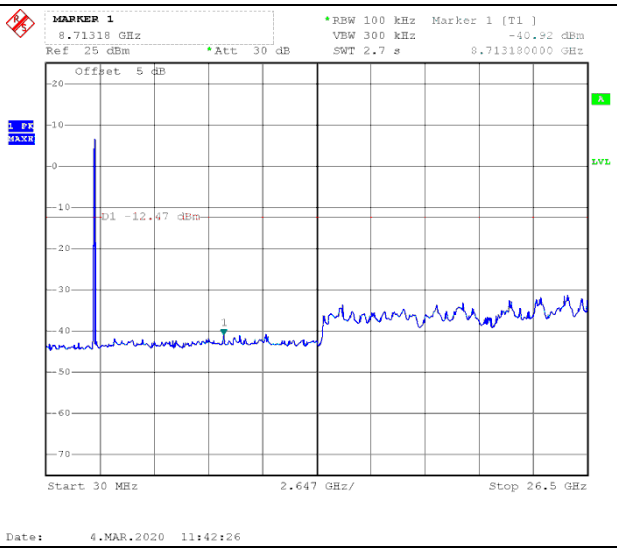
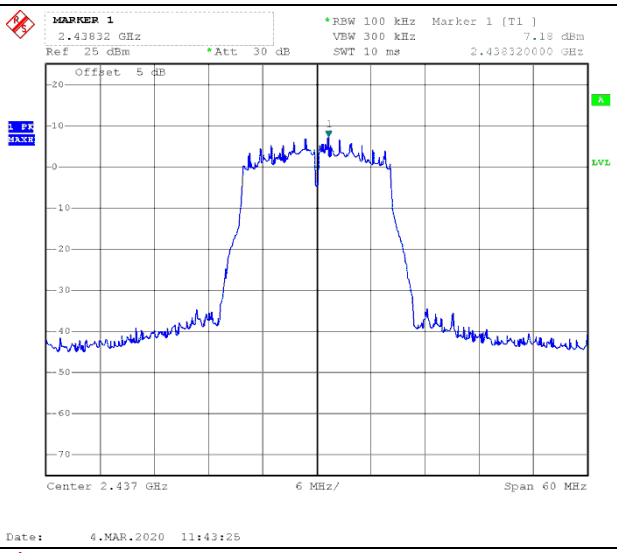
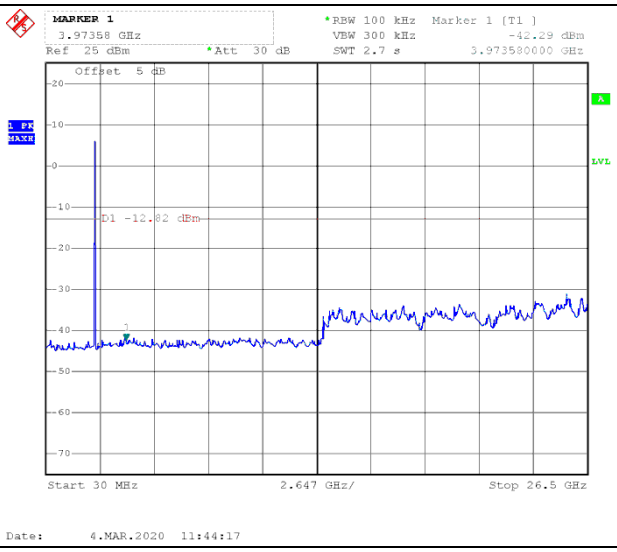
➢ Antenna 2

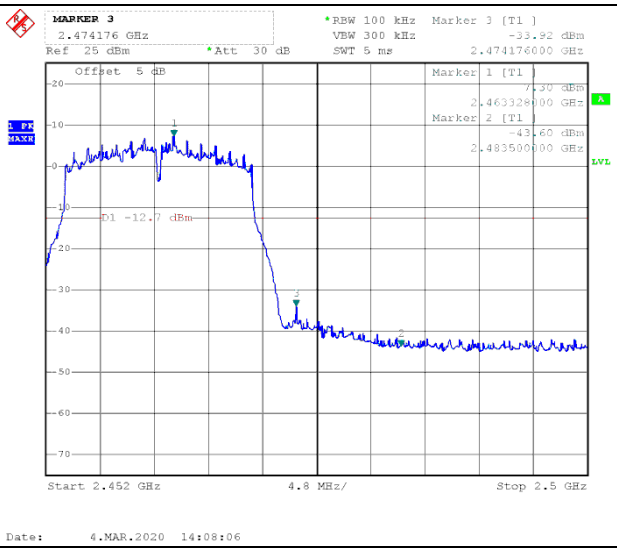
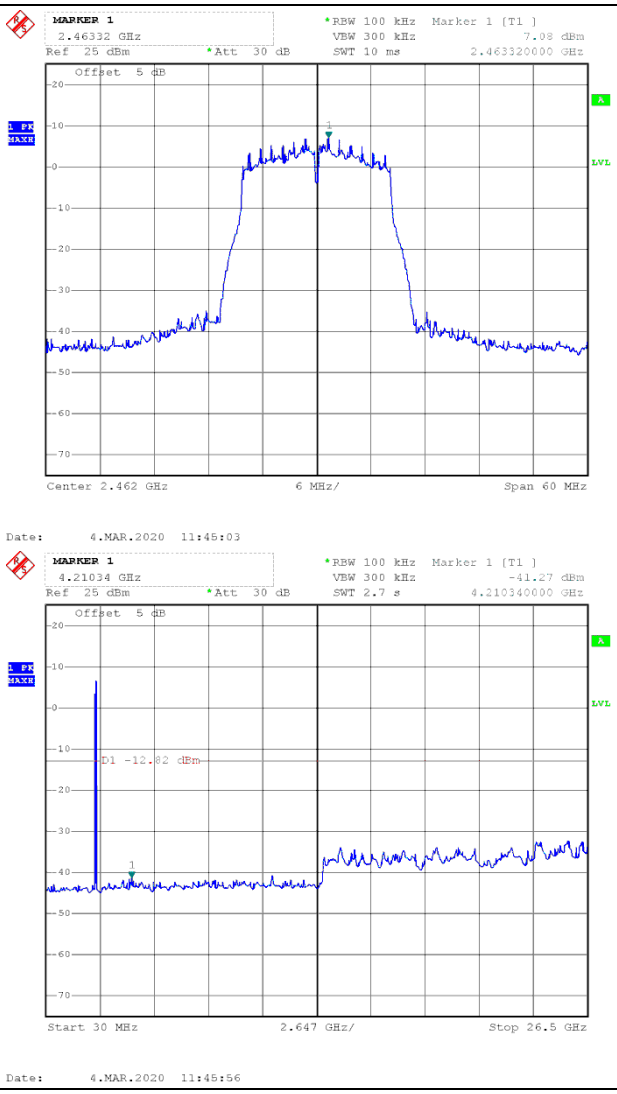
802.11b_11Mbps	
Low	

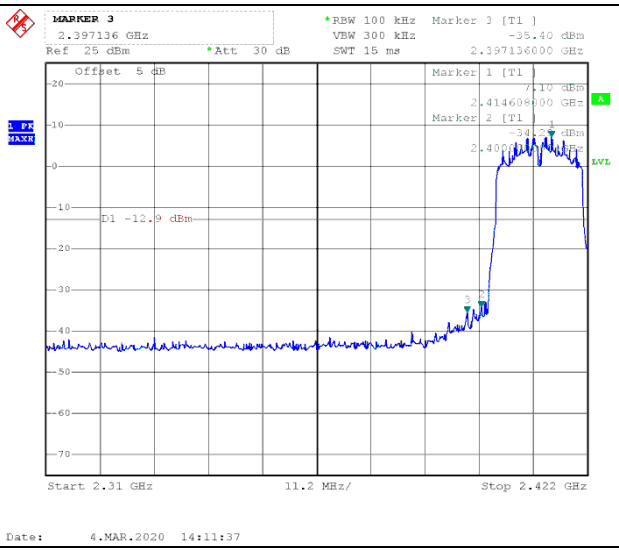
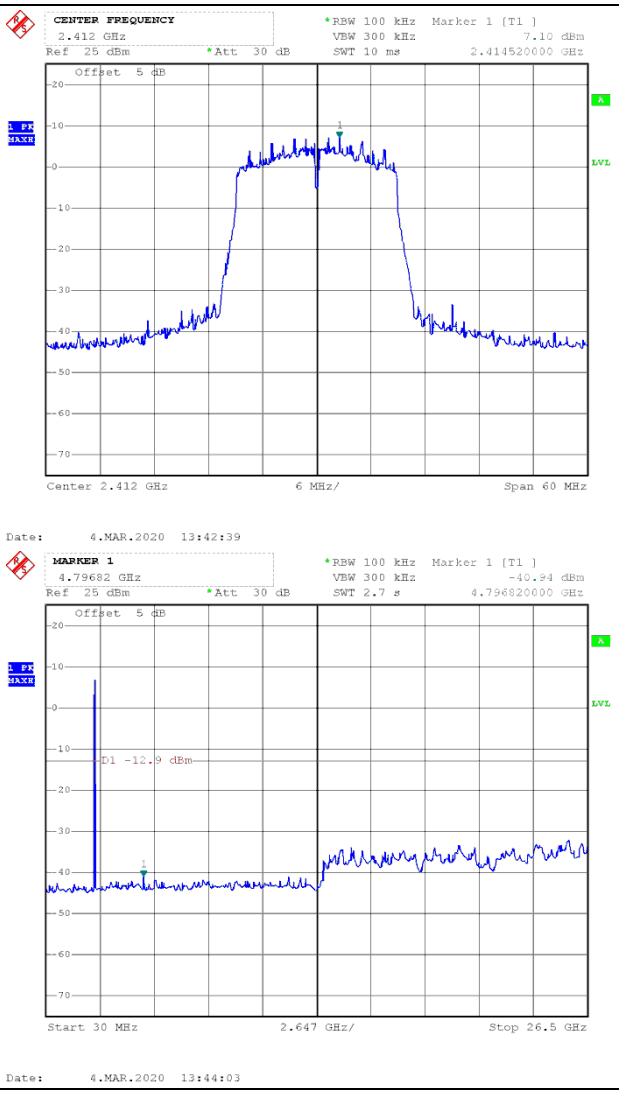
	 
802.11b_11Mbps	
Middle	

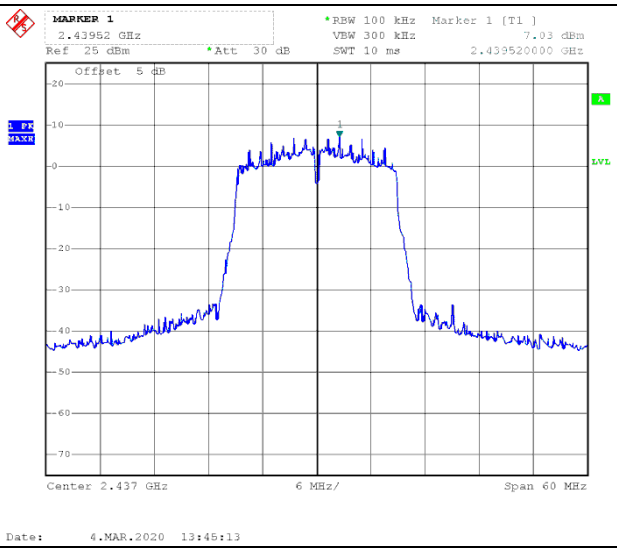
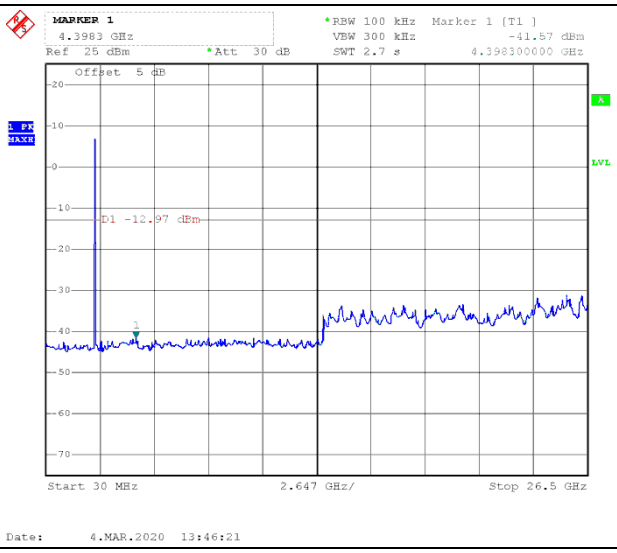
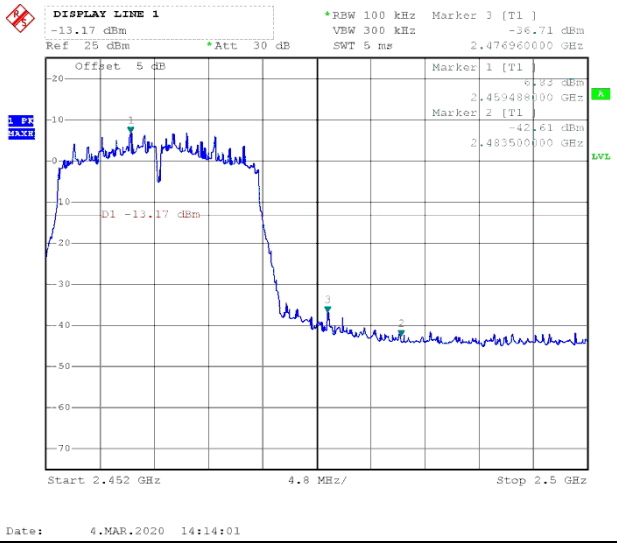
	
802.11b_11Mbps	
High	
	

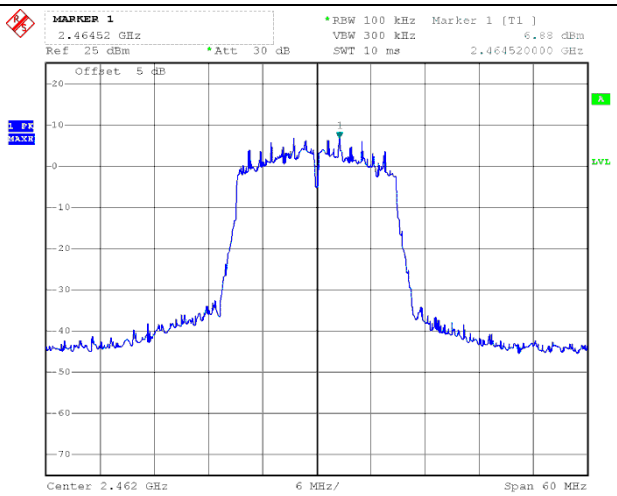
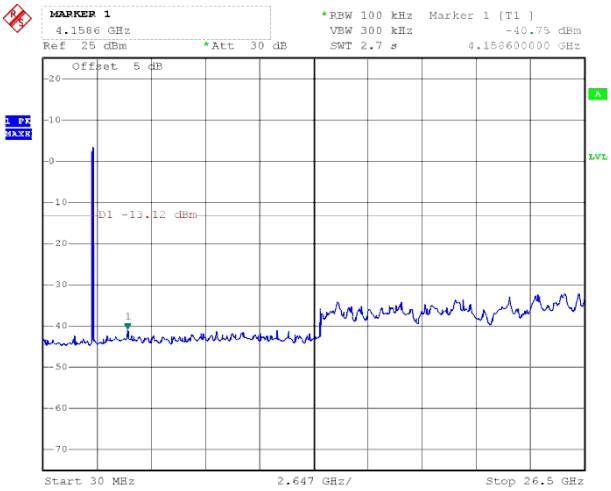
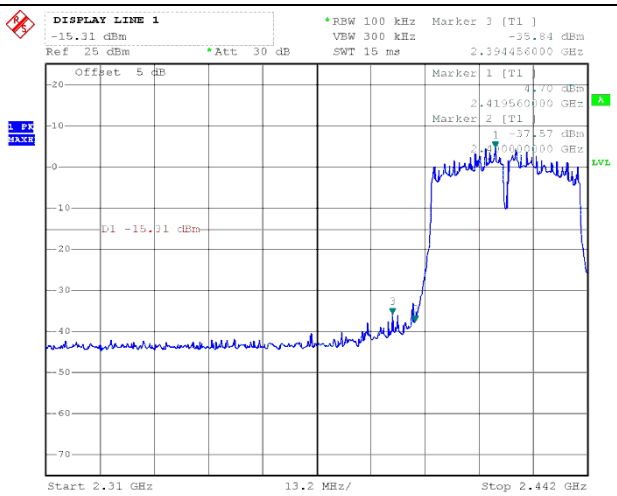
	
802.11g_54Mbps	
Low	
	

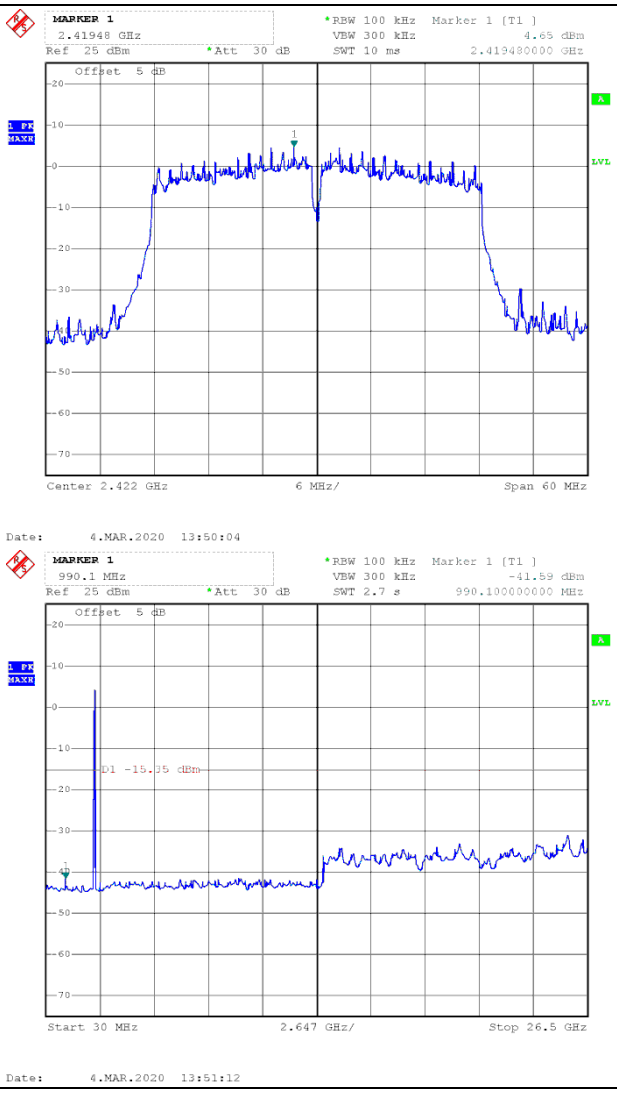
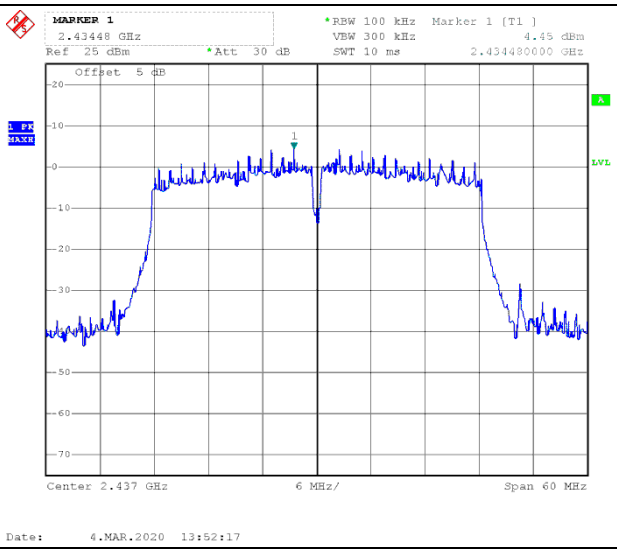
	
802.11g_54Mbps	
Middle	
	

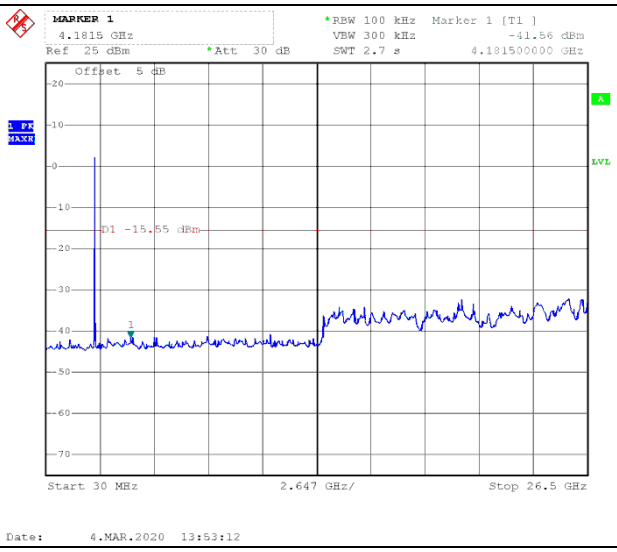
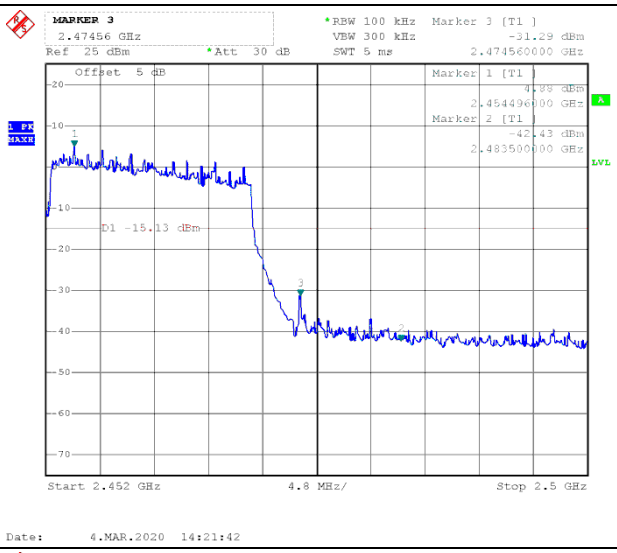
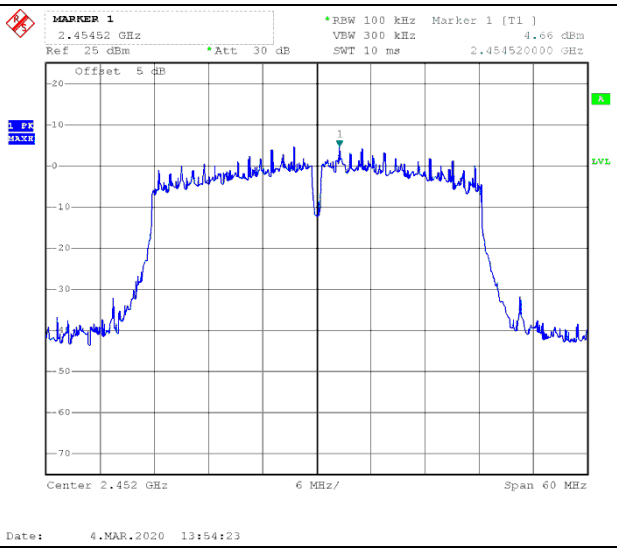
802.11g_54Mbps	
High	 

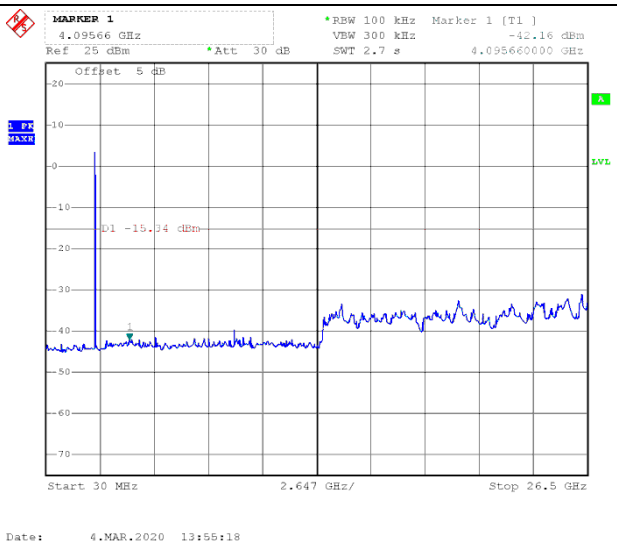
802.11n-HT20_MCS7	
Low	 

802.11n-HT20_MCS7	
Middle	
	
802.11n-HT20_MCS7	
High	

	 Date: 4.MAR.2020 13:47:30  Date: 4.MAR.2020 13:48:38
802.11n-HT40_MCS7	
Low	 Date: 4.MAR.2020 14:18:14

	
802.11n-HT40_MCS7	
Middle	

	
802.11n-HT40_MCS7	
High	
	

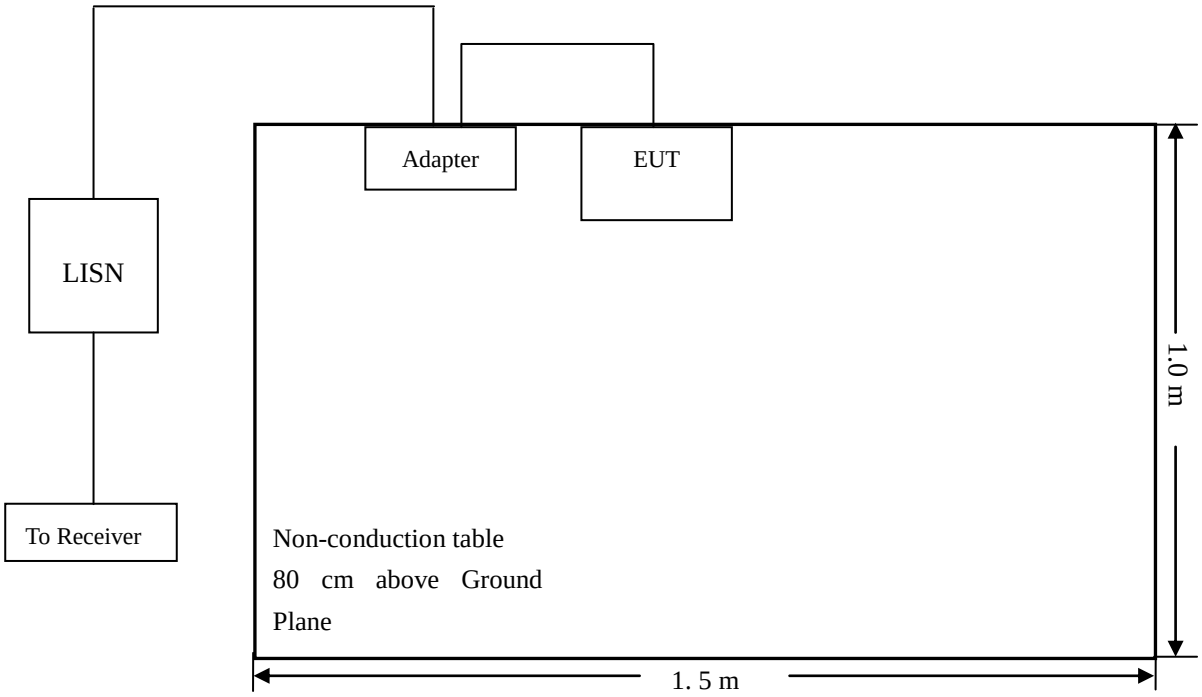
	 MARKER 1 4.09566 GHz Ref 25 dBm *Att 30 dB *RBW 100 kHz VBW 300 kHz SWT 2.7 s Marker 1 [T1] -42.16 dBm 4.095660000 GHz Offset 5 dB D1 -15.04 dBm Start 30 MHz 2.647 GHz/ Stop 26.5 GHz Date: 4.MAR.2020 13:55:18

10. Conducted Emissions

10.1Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.

10.2Basic Test Setup Block Diagram



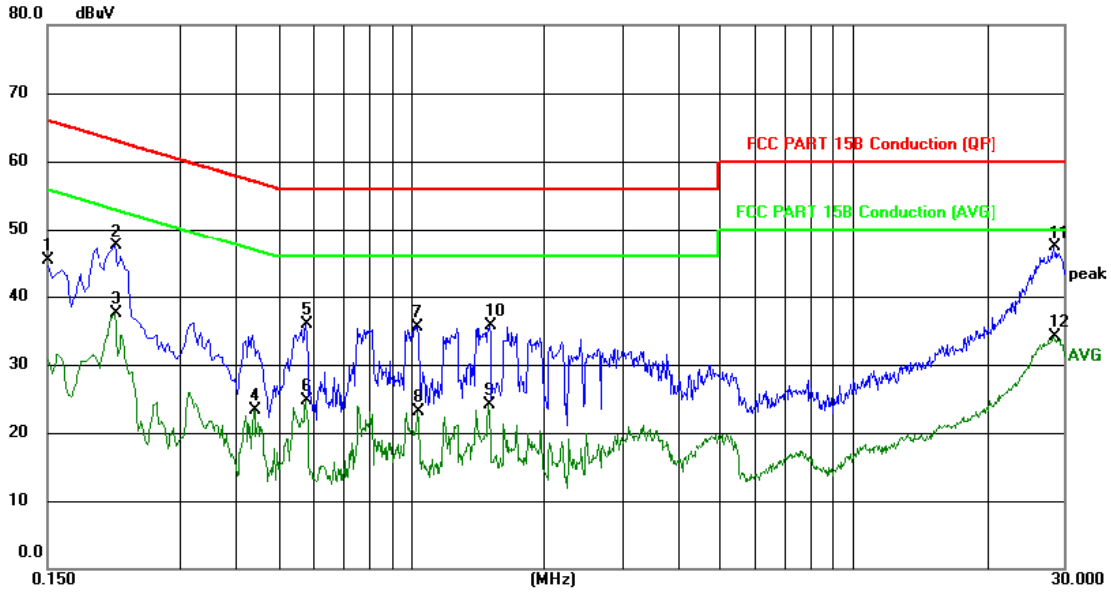
10.3Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz
Stop Frequency ..... 30 MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth ..... 9 kHz
Quasi-Peak Adapter Mode ..... Normal

10.4Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral



Site
Limit: FCC PART 15B Conduction (QP)
EUT: LED TV 65"
M/N: Q65S218-U-A-I
Mode: WIFI
Note:

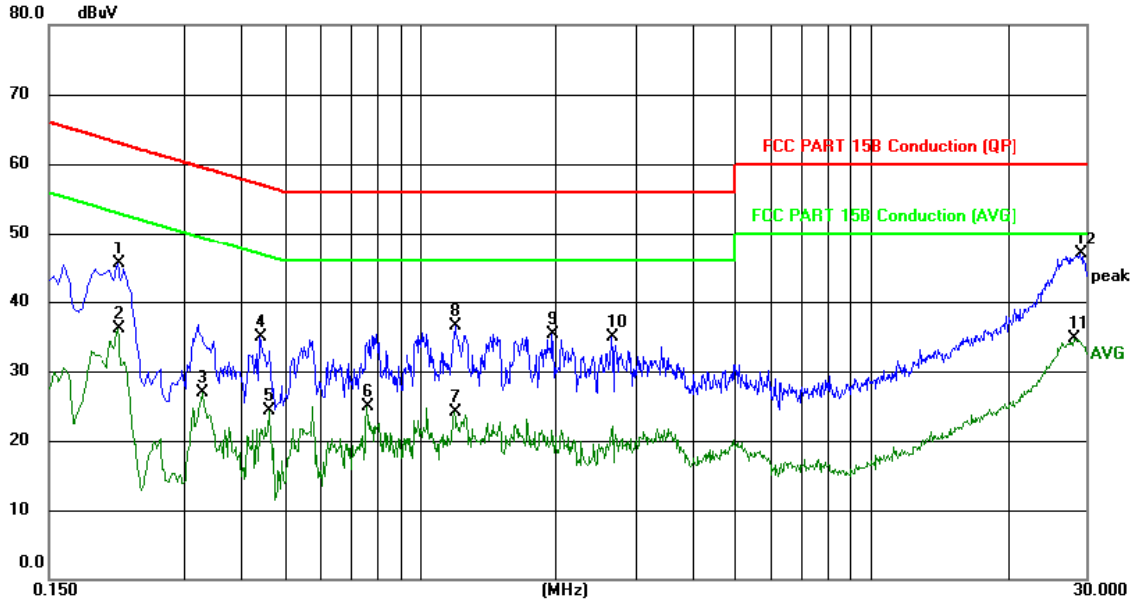
Phase: N
Power: AC120/60Hz

Temperature: 23.8
Humidity: 51 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	35.60	9.61	45.21	66.00	-20.79	QP	
2		0.2140	37.52	9.95	47.47	63.05	-15.58	QP	
3		0.2140	27.52	9.95	37.47	53.05	-15.58	AVG	
4		0.4420	13.33	10.06	23.39	47.02	-23.63	AVG	
5		0.5780	25.69	10.12	35.81	56.00	-20.19	QP	
6		0.5780	14.58	10.12	24.70	46.00	-21.30	AVG	
7		1.0300	25.36	10.24	35.60	56.00	-20.40	QP	
8		1.0420	12.94	10.25	23.19	46.00	-22.81	AVG	
9		1.5020	13.72	10.44	24.16	46.00	-21.84	AVG	
10		1.5060	25.23	10.44	35.67	56.00	-20.33	QP	
11	*	28.5020	36.06	11.20	47.26	60.00	-12.74	QP	
12		28.5020	22.97	11.20	34.17	50.00	-15.83	AVG	

*:Maximum data x:Over limit I:over margin 〈Reference Only

Test Mode	Communication	AC120V 60Hz	Polarity:	Line



Site
Limit: FCC PART 15B Conduction (QP)
EUT: LED TV 65"
M/N: Q65S218-U-A-I
Mode: WIFI
Note:

Phase: *L1*
Power: AC120/60Hz

Temperature: 23.8
Humidity: 51 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2140	35.52	9.96	45.48	63.05	-17.57	QP	
2		0.2140	26.07	9.96	36.03	53.05	-17.02	AVG	
3		0.3300	17.06	9.91	26.97	49.45	-22.48	AVG	
4		0.4420	25.06	9.86	34.92	57.02	-22.10	QP	
5		0.4620	14.45	9.86	24.31	46.66	-22.35	AVG	
6		0.7620	14.88	10.00	24.88	46.00	-21.12	AVG	
7		1.1940	14.19	9.91	24.10	46.00	-21.90	AVG	
8		1.1980	26.57	9.91	36.48	56.00	-19.52	QP	
9		1.9660	25.24	10.03	35.27	56.00	-20.73	QP	
10		2.6620	24.71	10.24	34.95	56.00	-21.05	QP	
11		28.2820	23.63	11.04	34.67	50.00	-15.33	AVG	
12	*	29.1420	35.80	11.05	46.85	60.00	-13.15	QP	

*:Maximum data x:Over limit !:over margin 〈Reference Only

******* END OF REPORT *******