Test Report

Report No.:	HQ191231EL07-FW
FCC ID:	2AWK4SR200615
Applicant:	Suirui Group Co., Ltd.
Address:	Buildings 18/19, North Olympic Sci.&Tech. Park, 1st Baosheng S. Rd., Haidian, Beijing, P.R.C.
Product:	Zhumu Cloud Video Conferencing Collaboration Kit
Brand:	SUIRUI
Test Model(s):	ZM-3100
Series Model(s):	ZM-**00 (The "**" can be "31" to "69" for market use)
Test Date:	Mar. 24, 2020 ~ May 09, 2020
Issued By:	Hwa-Hsing (Dongguan) Testing Co., Ltd.
Address:	No.101, Bld N1,Yuyuan 2Rd, Yuyuan Industrial Park, HuangJiang Town, Dongguan, China
FCC Designation Number:	CN1255
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10:2013

The above equipmenthas been tested by **Hwa-Hsing (Dongguan) Testing Co., Ltd.**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Scott He , **Date:** Jul. 31, 2020

Scott He/Engineer

Approved by : Harry Li , **Date:** Aug. 14, 2020

Harry Li/ Supervisor

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Release Control Record

Issue No.	Description	Date Issued
HQ191231EL07-FW	Original Release	Aug. 14, 2020

1 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10:2013; KDB 558074 D01 15.247 Meas Guidance v05r02			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit.
15.205 & 209	Radiated Emissions	Pass	Meet the requirement of limit.
15.247(d)	Band Edge Measurement	Pass	Meet the requirement of limit.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB Bandwidth	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Reference only
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Meet the antenna requirement The device is professionally installed

1.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUTas specified in CISPR 16-4-2:
The listed uncertainties are the worst cases uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.66 dB
Radiated Emissions up to 1 GHz	9KHz ~ 30MHz	2.90 dB
	30MHz ~ 1000MHz	3.47 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	4.84 dB
	18GHz ~ 40GHz	4.62 dB

1.2 Modification Record

There were no modifications required for compliance.

2 General Information

2.1 General Description of EUT

Product	Zhumu Cloud Video Conferencing Collaboration Kit
Brand	SUIRUI
Test Model(s)	ZM-3100
Identification No. of EUT	N/A
Series Model(s)	ZM-**00 (The "**" can be "31" to "69" for market use)
Models difference	Only difference for model name
Power Supply Rating	DC19V from Adapter
Status of EUT	Engineering prototype
Modulation Type	CCK, DQPSK,DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation technology	DSSS OFDM
Transfer Rate	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps
Operating Frequency	802.11b, 802.11g, 802.11n (20MHz): 2412 ~ 2462MHz 802.11n (40MHz): 2422 ~ 2452MHz
Number of Channel	11 channels for 802.11b, 802.11g, 802.11n (20MHz) 7channels for 802.11n (40MHz)
Maximum Output Power	19.44dBm
Antenna Type	PCB Antenna with 6.03dBi gain
Antenna Connector	I-PEX

Note:

1. Please refer to the EUT photo document (Reference No.: HQ191231EL07) for detailed product photo.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.
3. The EUT incorporates a MIMO function. The WLAN function supports CDD mode with dual antenna transmission and dual antenna reception.

Support mode	Frequency band	Transmit and receive mode	Transmit and Receive Chain
802.11b	2412~2462MHz	MIMO	2TX,2RX
802.11g	2412~2462MHz	MIMO	2TX,2RX
802.11n HT20	2412~2462MHz	MIMO	2TX,2RX
802.11n HT40	2422~2452MHz	MIMO	2TX,2RX

4. The UUT power supply the adapter as below:

Brand:	Huntkey
Model:	HKA09019047-6U
Input:	AC100-240V~50/60Hz, 1.5A
Output:	DC19V 4.74A

2.2 Description of Channels List

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

Channel	Frequency	Channel	Frequency
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (40MHz):

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

2.3 Test Mode Applicability and Tested Channel Detail

(EUT Positioned Determined)Radiated Emissions Above 1GHz			
EUT Configure Mode	Test channel& Frequency(MHz)	EUT Positioned	Maxmum Emission level of Fundamental frequency (dBuV)
802.11b	CH 1& 2412MHz	X-axis	110.94
		Y-axis	107.58
		Z-axis	109.30
Note: The EUT had been pre-tested on the positioned of each 3 axis. Based on the maxmum emission level to determined the final positioned			

Detail test items	EUT Configure Mode	Modulation Type	Data Rate (Mbps)	EUT Positioned
AC Power Conducted Emission	802.11b 802.11g 802.11n (20MHz) 802.11n (40MHz)	√	√	-
Radiated Emissions		√	√	X-axis
Band Edge Measurement		√	√	-
Antenna Port Emission		√	√	-
6dB Bandwidth		√	√	-
Conducted power		√	√	-
Power Spectral Density		√	√	-
Note: "-"means no effect.				

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data ratesand antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Tested Channel	Modulation Type	Data Rate (Mbps)
802.11b	1, 6, 11	DSSS	1.0
802.11g	1, 6, 11	OFDM	6.0
802.11n (20MHz)	1, 6, 11	OFDM	7.2
802.11n (40MHz)	3, 6, 9	OFDM	15.0

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data ratesand antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Tested Channel	Modulation Type	Data Rate (Mbps)
802.11b	1, 6, 11	DSSS	1

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data ratesand antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Tested Channel	Modulation Type	Data Rate (Mbps)
802.11b	1, 6, 11	DSSS	1

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Tested Channel	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	DSSS	1.0
802.11g	1 to 11	OFDM	6.0
802.11n (20MHz)	1 to 11	OFDM	7.2
802.11n (40MHz)	3 to 9	OFDM	15.0

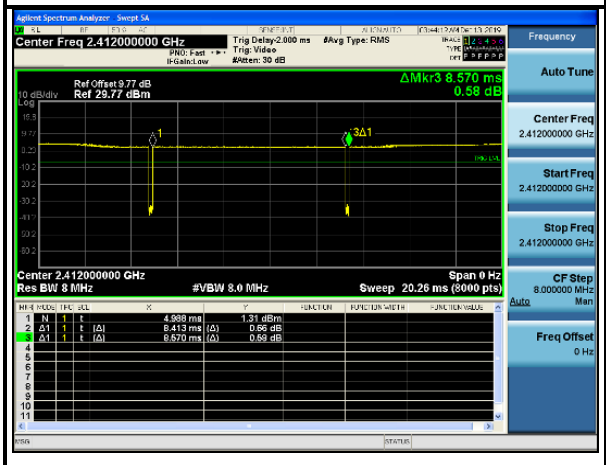
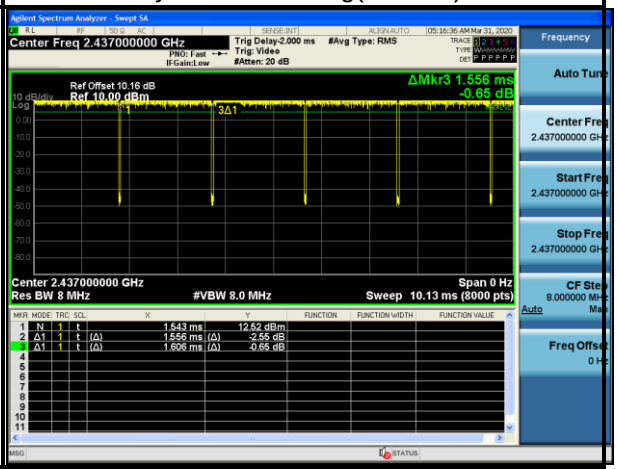
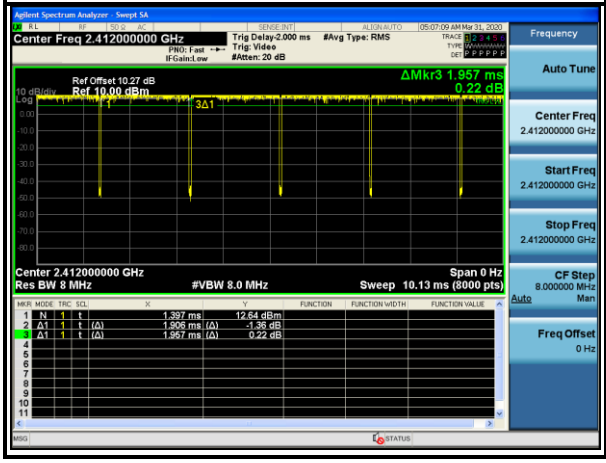
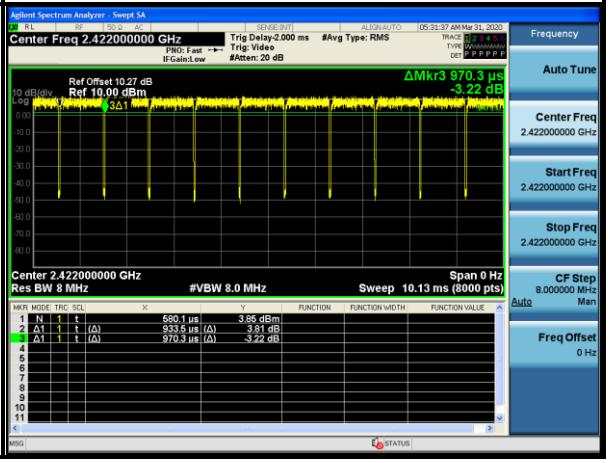
Test Condition:

Applicabletest items	Environmental Conditions	Power supply	Tested by
Radiated Emission Test	25.6deg. C, 62%RH	DC19V from Adaptor	Tank Tan
Power Line Conducted Emission Test	25deg. C, 65 %RH	DC19V from Adaptor	Tank Tan
Antenna Port Conducted Measurement	25deg. C, 65 %RH	DC19V from Adaptor	Harry Li

2.4 Power setting value from test software:

Mode	Channel Number	FREQ. (MHz)	Power Setting	
			Ant 0	Ant 1
802.11b	1	2412	8	8
	6	2437	8	8
	11	2462	8	8
802.11g	1	2412	8	8
	6	2437	8	8
	11	2462	8	8
802.11 n20	1	2412	8	8
	6	2437	8	8
	11	2462	8	8
802.11 n40	1	2422	8	8
	6	2437	8	8
	11	2452	8	8

2.5 DutyCycle of Test Signal

,Test plots	
802.11b: Duty cycle of test signal is >98% Duty cycle = 8.413/8.570 = 98.16 %	802.11g: Duty cycle of test signal is <98% Duty cycle = 1.556/1.606 = 96.88%, Duty factor = 10 *log(1/0.968) = 0.137dB
	
802.11n HT20: Duty cycle of test signal is <98% Duty cycle = 1.906/1.957= 97.39%, Duty factor = 10 *log(1/0.878) = 0.114dB	802.11n HT40: Duty cycle of test signal is <98% Duty cycle = 0.933/0.970= 96.20%, Duty factor = 10 *log(1/0.944) = 0.167dB
	

2.6 Description of Support Units

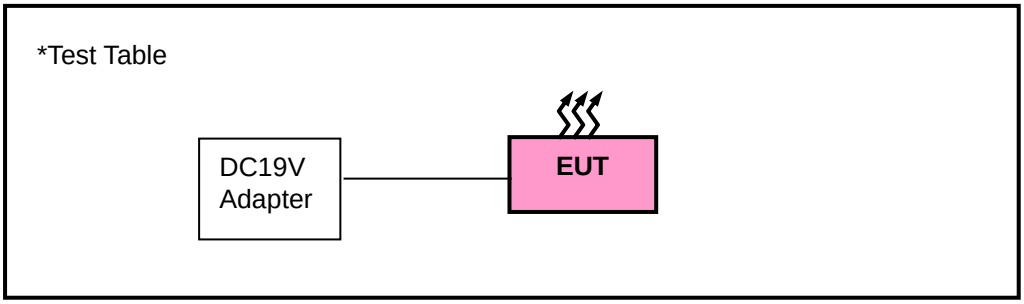
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Mouse	DELL	MS111-L	CN-09RRC7-44751-0C6-04TR	N/A
2.	Keboard	DELL	KDY1202000	N/A	N/A
3.	monitor	DELL	M24ICT	N/A	N/A

Insert Cable Connections to/from EUT provided by test team.

No.	Signal Cable Description Of The Above Support Units
1.	USB Line: Un-shieldin 1.5m
2.	USB Line: Un-shieldin 1.5m

2.7 Configuration of System under Test



2.8 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)
KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 662911 D01 v02r01
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3 Test types and results

3.1 Radiated Emission and Bandedge Measurement

3.1.1 Limits of radiated emission andbandedge measurement

Radiated emissions which fall in the restricted bandsmust comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

3.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Due Date of Calibration
EMI Test Receiver Rohde&Schwarz	ESCI 7	100962	2021-05-13
Broadband antenna Schwarzbeck	VULB 9168	00937	2020-10-17
3m Semi-anechoic Chamber MAORUI	9m*6m*6m	NSEMC003	2021-04-15
Signal Amplifier Com-power	PAM-103	18020051	2020-10-17
Attenuator Rohde&Schwarz	TS2GA-6dB	18101101	N/A
Test software FARAD	FARAD	EZ_EMCV1.1.4.2	N/A
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	2020-10-17
Loop Antenna	HLA 6121	45745	2020-10-17
Preamplifier EMCI	EMC001340	980201	2020-10-17
Digital Multimete FLUKE	15B+	43512617WS	2020-10-17
Horn Antenna Schwarzbeck	BBHA 9170	01959	2020-10-17
Spectrum Analyzer Rohde&Schwarz	FSV-40N	101783	2020-10-17
Broadband Coaxial Preamplifier Schwarzbeck	BBV 9718	00025	2020-10-17
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170242	2020-10-17
Pre-Amplifier EMCI	EMC 184045	980102	2020-10-17
Spectrum Keysight	N9020A	MY51240612	2020-10-17
Antenna Tower MF	MFA-440H	NA	NA
Turn Table MF	MFT-201SS	NA	NA
Antenna Tower&Turn Table Controller MF	MF-7802	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to LISAI/CHINA.

2. The test was performed in Chamber 1.

3.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (below 1GHz) / 1.5 meters (1-18GHz) / 1.5 meters (18-40GHz) above the reference ground. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna (Below 1GHz)& (Above 1-18GHz), which was mounted on the top of a variable-height antenna tower. The EUT was set 1 meters away from the interference-receiving antenna (18-40GHz).
c. The height of antenna is varied from one meter to four meters above the reference ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

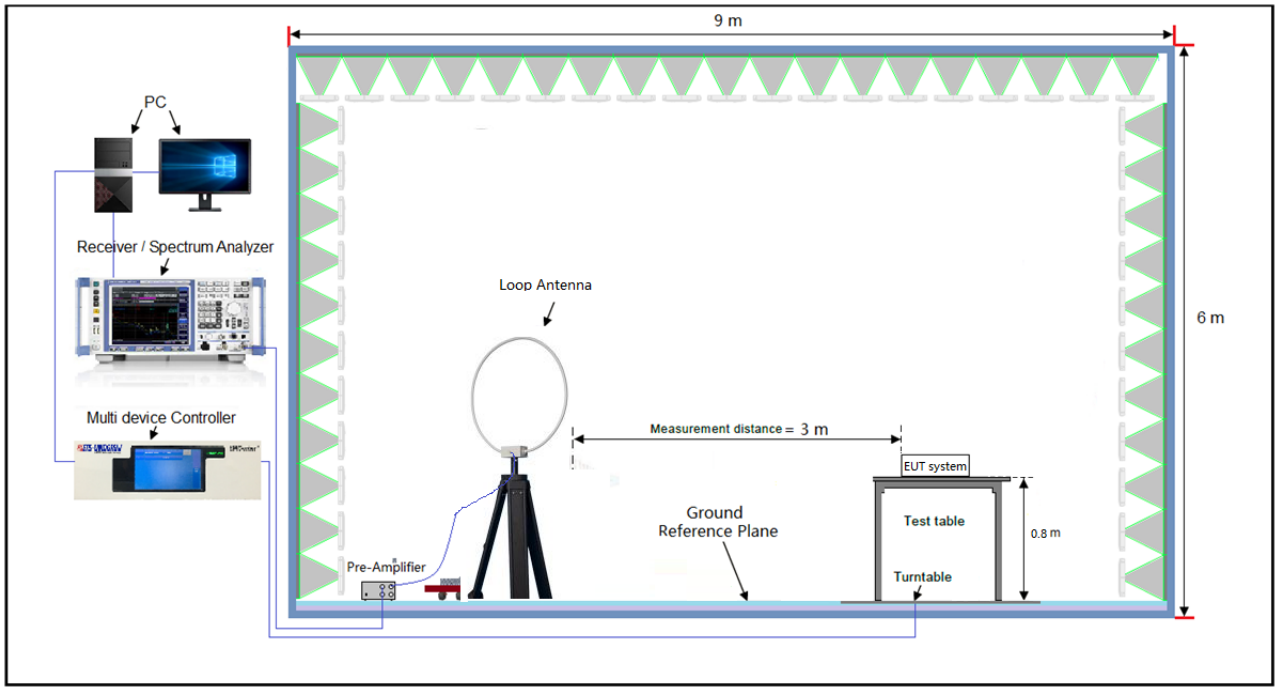
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1/T for Average (Duty cycle < 98 %) detection at frequency above 1 GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

3.1.4 Deviation from Test Standard

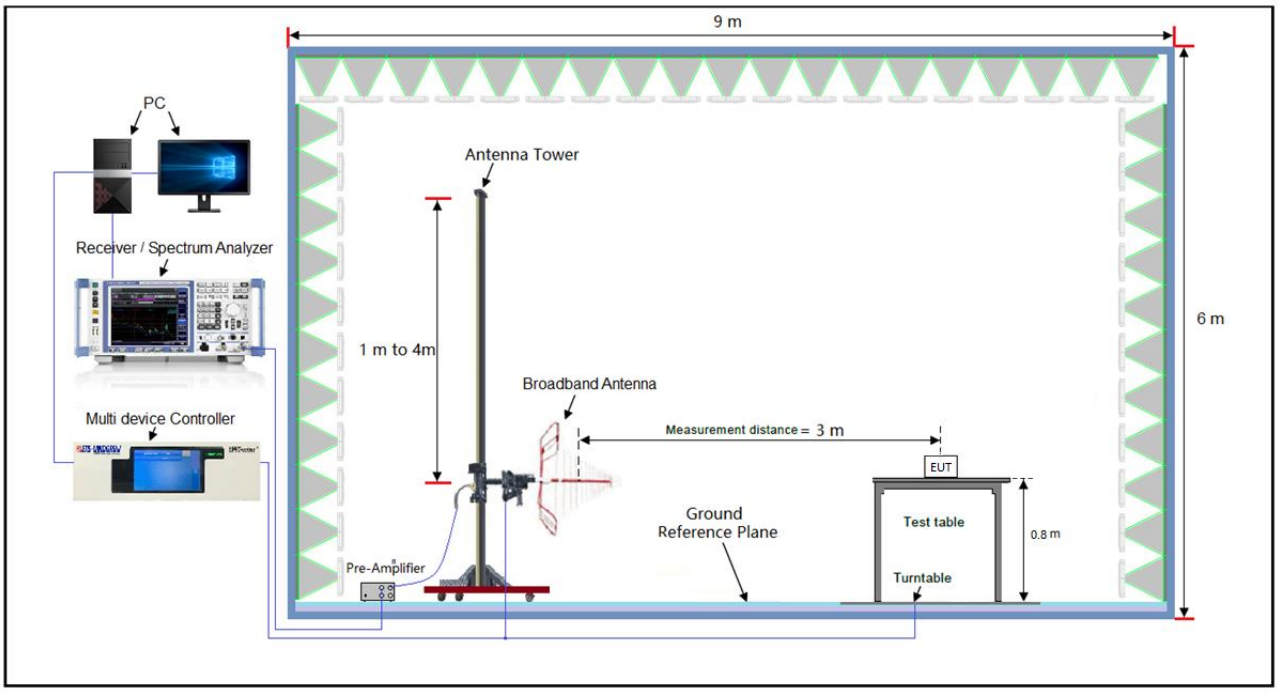
No deviation.

3.1.5 Test Set up

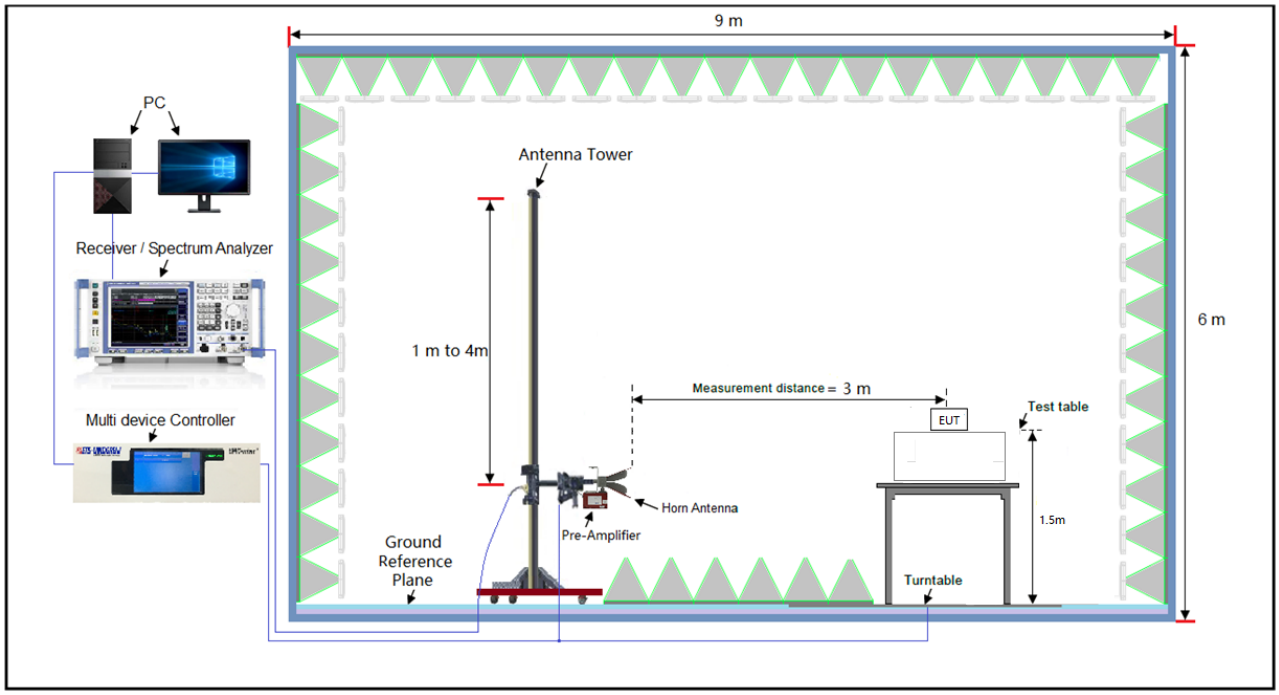
Radiated emission below 30MHz:



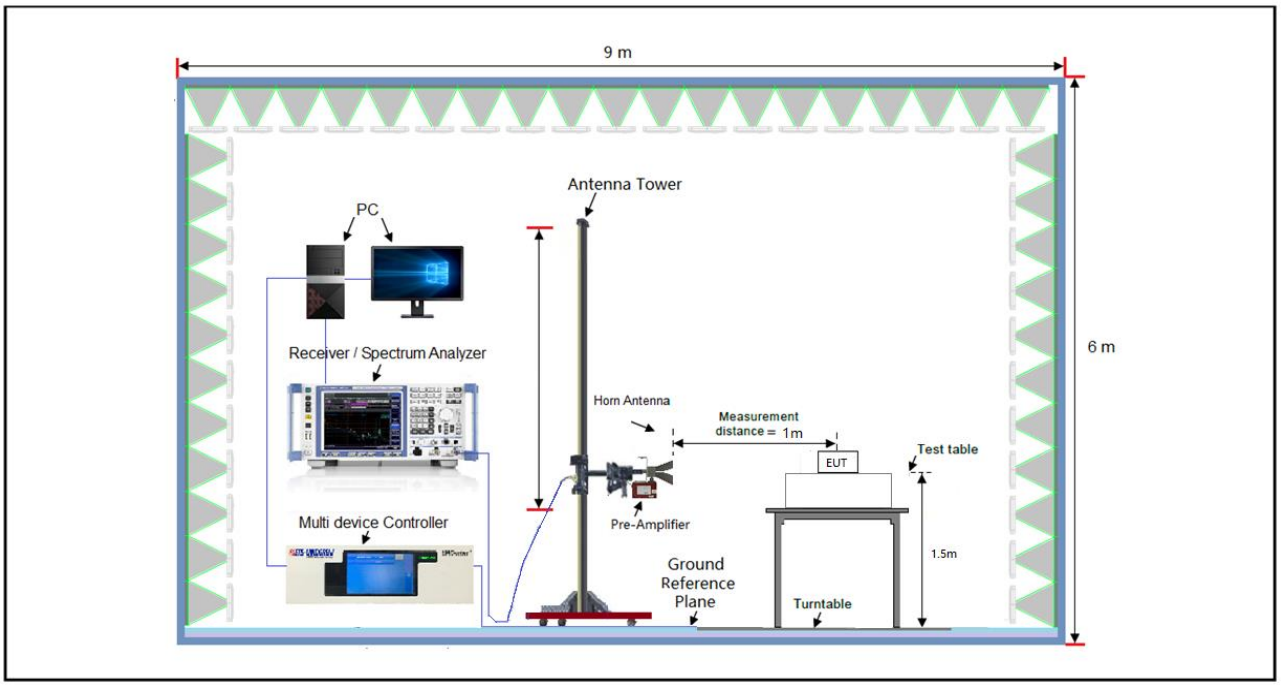
Frequency Range below 1GHz:



Frequency Range above 1-18GHz:



Frequency Range above 18-40GHz:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.1.6 EUT Operating Conditions

a. Placed the EUT on the testing table.
b. Set the EUT under transmission condition continuously at specific channel frequency.

3.1.7 Test Results

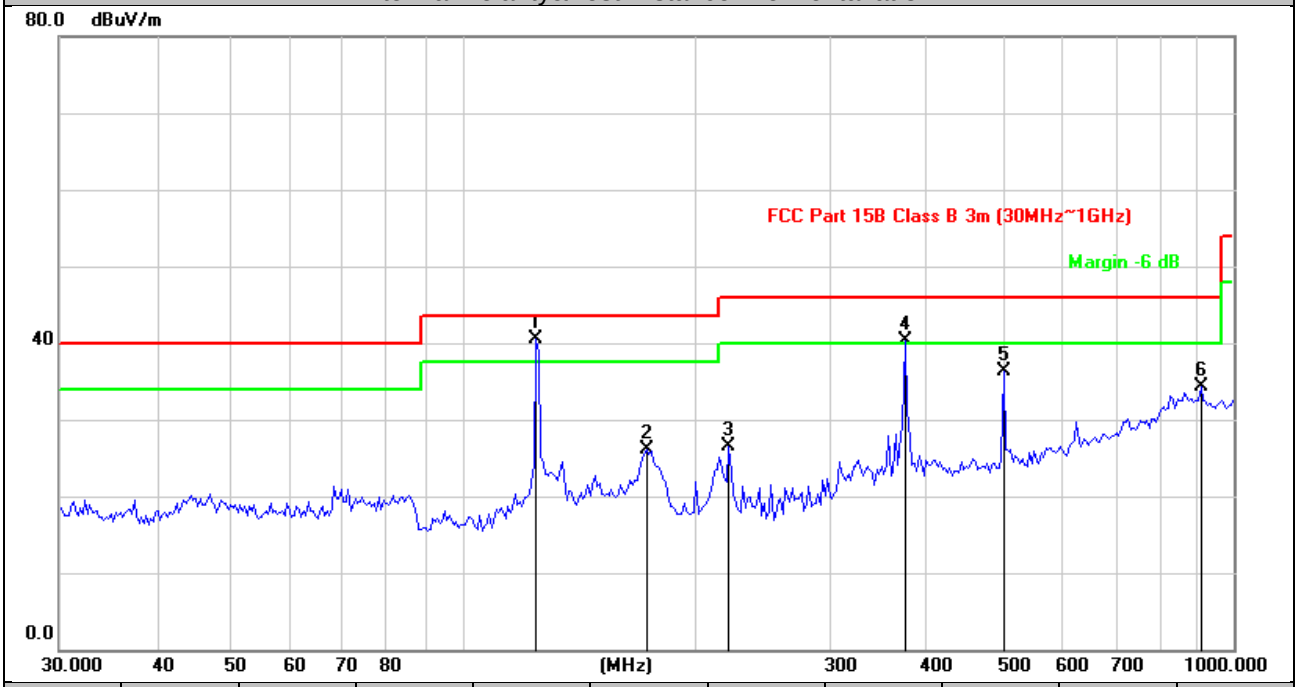
9kHz ~ 30MHz Data:

The amplitude of spurious emissions attenuated more than 20dB below the permissible value is not required to be report.

30MHz ~ 1GHz Worst-Case Data:

EUT Test Condition	802.11b 2462MHz TX		
Test Channel	Channel 11	Frequency Range	30MHz ~ 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m



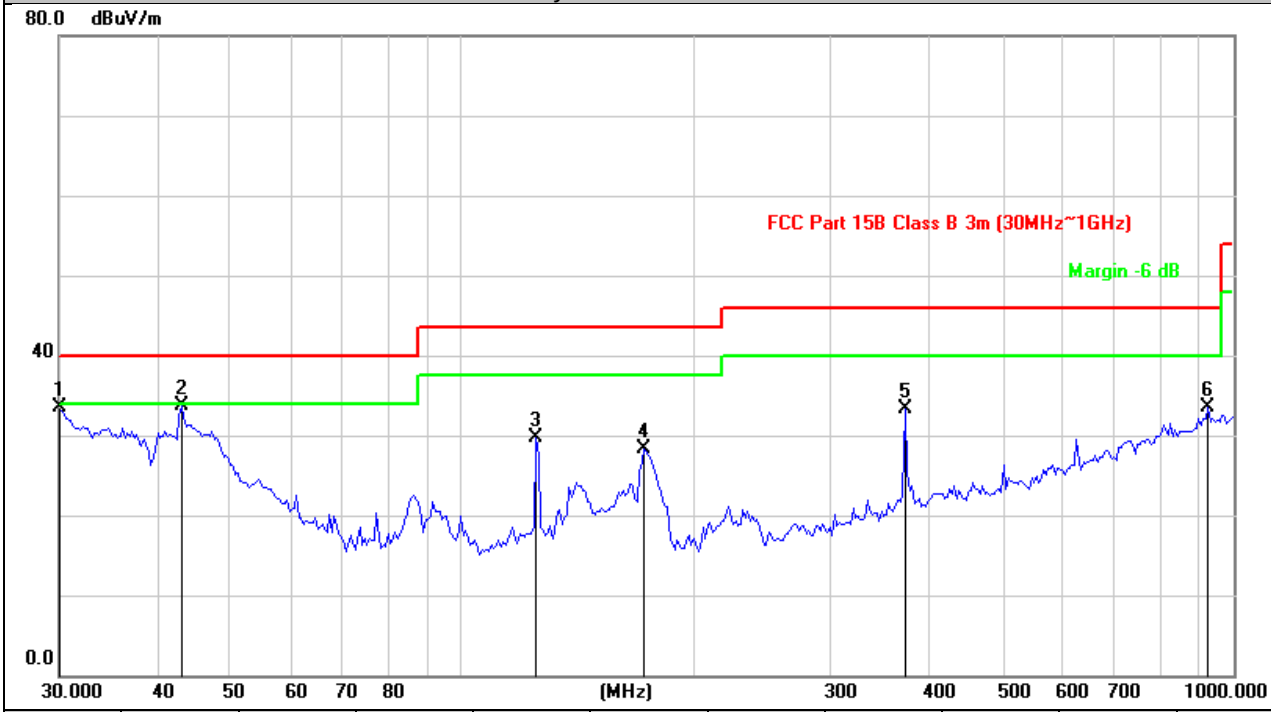
No.	Fre. (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	124.569	55.11	-14.68	40.43	43.50	-3.07	QP	200	147	-
2	173.205	39.33	-13.28	26.05	43.50	-17.45	QP	200	296	-
3	221.392	42.29	-15.82	26.47	46.00	-19.53	QP	200	173	-
4	374.622	50.27	-9.93	40.34	46.00	-5.66	QP	200	230	-
5	502.939	43.90	-7.57	36.33	46.00	-9.67	QP	200	228	-
6	906.482	32.72	1.51	34.23	46.00	-11.77	QP	100	125	-

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value

EUT Test Condition	802.11g:2462MHz TX		
Channel	Channel 11	Frequency Range	30MHz ~ 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank Tan

Antennal Polarity&Test Distance: Vertical at 3 m



No.	Fre. (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	30.000	50.55	-17.12	33.43	40.00	-6.57	QP	100	211	-
2	43.201	48.37	-14.68	33.69	40.00	-6.31	QP	100	132	-
3	124.569	44.43	-14.68	29.75	43.50	-13.75	QP	100	150	-
4	171.994	41.60	-13.27	28.33	43.50	-15.17	QP	100	179	-
5	374.622	43.29	-9.93	33.36	46.00	-12.64	QP	100	266	-
6	925.756	31.73	1.87	33.60	46.00	-12.40	QP	100	231	-

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value

Above 1GHz Data:

EUT Test Condition:	802.11b: 2412MHz TX		
Test Channel	Channel 1	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	48.62	-0.77	47.85	74.00	-26.15	peak	389	355	
2	2390.000	43.34	-0.77	42.57	54.00	-11.43	AVG	389	355	
3 *	2412.000	105.69	-0.71	104.98			peak	389	355	
4 *	2412.000	100.07	-0.71	99.36			AVG	389	355	
5	4824.000	39.15	5.59	44.74	74.00	-29.26	peak	104	115	
6	4824.000	30.77	5.59	36.36	54.00	-17.64	AVG	104	115	
7	7236.000	38.28	11.85	50.13	74.00	-23.87	peak	365	66	
8	7236.000	31.15	11.85	43.00	54.00	-11.00	AVG	365	66	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	45.13	-0.77	44.36	74.00	-29.64	peak	100	162	
2	2390.000	35.34	-0.77	34.57	54.00	-19.43	AVG	100	162	
3 *	2412.000	97.93	-0.71	97.22			peak	100	162	
4 *	2412.000	91.61	-0.71	90.90			AVG	100	162	
5	4824.000	37.35	5.59	42.94	74.00	-31.06	peak	100	243	
6	4824.000	28.61	5.59	34.20	54.00	-19.80	AVG	100	243	
7	7236.000	34.65	11.85	46.50	74.00	-27.50	peak	100	187	
8	7236.000	24.70	11.85	36.55	54.00	-17.45	AVG	100	187	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2412MHz: Fundamental frequency.

EUT Test Condition	802.11b: 2437MHz TX		
Test Channel	Channel 6	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2437.000	104.74	-0.65	104.09			peak	365	11	
2 *	2437.000	100.04	-0.65	99.39			AVG	365	11	
3	4874.000	38.12	6.16	44.28	74.00	-29.72	peak	183	286	
4	4874.000	29.88	6.16	36.04	54.00	-17.96	AVG	183	286	
5	7311.000	38.17	12.10	50.27	74.00	-23.73	peak	347	35	
6	7311.000	30.79	12.10	42.89	54.00	-11.11	AVG	347	35	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2437.000	98.90	-0.65	98.25			peak	124	185	
2 *	2437.000	92.78	-0.65	92.13			AVG	124	185	
3	4874.000	37.53	6.16	43.69	74.00	-30.31	peak	156	141	
4	4874.000	28.19	6.16	34.35	54.00	-19.65	AVG	156	141	
5	7311.000	35.18	12.10	47.28	74.00	-26.72	peak	104	238	
6	7311.000	24.63	12.10	36.73	54.00	-17.27	AVG	104	238	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2437MHz: Fundamental frequency.

EUT Test Condition	802.11b: 2462MHz TX		
Test channel	Channel 11	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2462.000	104.27	-0.58	103.69			peak	288	13	
2 *	2462.000	100.31	-0.58	99.73			AVG	288	13	
3	2483.500	55.69	-0.51	55.18	74.00	-18.82	peak	288	13	
4	2483.500	44.23	-0.51	43.72	54.00	-10.28	AVG	288	13	
5	4924.000	37.95	6.32	44.27	74.00	-29.73	peak	100	231	
6	4924.000	27.43	6.32	33.75	54.00	-20.25	AVG	100	231	
7	7386.000	40.92	12.35	53.27	74.00	-20.73	peak	126	76	
8	7386.000	33.37	12.35	45.72	54.00	-8.28	AVG	126	76	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2462.000	102.44	-0.58	101.86			peak	377	267	
2 *	2462.000	97.89	-0.58	97.31			AVG	377	267	
3	2483.500	49.32	-0.51	48.81	74.00	-25.19	peak	377	267	
4	2483.500	42.24	-0.51	41.73	54.00	-12.27	AVG	377	267	
5	4924.000	38.24	6.32	44.56	74.00	-29.44	peak	100	176	
6	4924.000	26.67	6.32	32.99	54.00	-21.01	AVG	100	176	
7	7386.000	39.48	12.35	51.83	74.00	-22.17	peak	356	117	
8	7386.000	29.52	12.35	41.87	54.00	-12.13	AVG	356	117	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2462MHz: Fundamental frequency.

EUT Test Condition:	802.11g: 2412MHz TX		
Test Channel	Channel 1	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	55.29	-0.77	54.52	74.00	-19.48	peak	363	42	
2	2390.000	42.55	-0.77	41.78	54.00	-12.22	AVG	363	42	
3 *	2412.000	107.01	-0.71	106.30			peak	363	42	
4 *	2412.000	93.32	-0.71	92.61			AVG	363	42	
5	4824.000	39.88	5.59	45.47	74.00	-28.53	peak	100	145	
6	4824.000	27.28	5.59	32.87	54.00	-21.13	AVG	100	145	
7	7236.000	43.25	11.85	55.10	74.00	-18.90	peak	122	79	
8	7236.000	28.05	11.85	39.90	54.00	-14.10	AVG	122	79	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	49.11	-0.77	48.34	74.00	-25.66	peak	100	163	
2	2390.000	33.97	-0.77	33.20	54.00	-20.80	AVG	100	163	
3 *	2412.000	98.96	-0.71	98.25			peak	100	163	
4 *	2412.000	85.90	-0.71	85.19			AVG	100	163	
5	4824.000	39.28	5.59	44.87	74.00	-29.13	peak	100	237	
6	4824.000	27.87	5.59	33.46	54.00	-20.54	AVG	100	237	
7	7236.000	43.51	11.85	55.36	74.00	-18.64	peak	400	118	
8	7236.000	27.54	11.85	39.39	54.00	-14.61	AVG	400	118	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2412MHz: Fundamental frequency.

EUT Test Condition	802.11g: 2437MHz TX		
Test Channel	Channel 6	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2437.000	106.53	-0.65	105.88			peak	384	67	
2 *	2437.000	92.95	-0.65	92.30			AVG	384	67	
3	4874.000	38.69	6.16	44.85	74.00	-29.15	peak	100	112	
4	4874.000	26.27	6.16	32.43	54.00	-21.57	AVG	100	112	
5	7311.000	42.66	12.10	54.76	74.00	-19.24	peak	107	135	
6	7311.000	27.51	12.10	39.61	54.00	-14.39	AVG	107	135	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2437.000	99.49	-0.65	98.84			peak	143	152	
2 *	2437.000	86.38	-0.65	85.73			AVG	143	152	
3	4874.000	39.16	6.16	45.32	74.00	-28.68	peak	100	219	
4	4874.000	27.53	6.16	33.69	54.00	-20.31	AVG	100	219	
5	7311.000	42.68	12.10	54.78	74.00	-19.22	peak	342	185	
6	7311.000	26.44	12.10	38.54	54.00	-15.46	AVG	342	185	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2437MHz: Fundamental frequency.

EUT Test Condition	802.11g: 2462MHz TX		
Test channel	Channel 11	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2462.000	108.05	-0.58	107.47			peak	361	360	
2 *	2462.000	94.29	-0.58	93.71			AVG	361	360	
3	2483.500	54.04	-0.51	53.53	74.00	-20.47	peak	361	360	
4	2483.500	41.74	-0.51	41.23	54.00	-12.77	AVG	361	360	
5	4924.000	36.74	6.32	43.06	74.00	-30.94	peak	100	269	
6	4924.000	25.41	6.32	31.73	54.00	-22.27	AVG	100	269	
7	7386.000	40.24	12.35	52.59	74.00	-21.41	peak	100	75	
8	7386.000	29.03	12.35	41.38	54.00	-12.62	AVG	100	75	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2462.000	105.42	-0.58	104.84			peak	380	266	
2 *	2462.000	92.06	-0.58	91.48			AVG	380	266	
3	2483.500	55.29	-0.51	54.78	74.00	-19.22	peak	380	266	
4	2483.500	43.20	-0.51	42.69	54.00	-11.31	AVG	380	266	
5	4924.000	37.44	6.32	43.76	74.00	-30.24	peak	100	164	
6	4924.000	26.57	6.32	32.89	54.00	-21.11	AVG	100	164	
7	7386.000	38.08	12.35	50.43	74.00	-23.57	peak	361	118	
8	7386.000	26.48	12.35	38.83	54.00	-15.17	AVG	361	118	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2462MHz: Fundamental frequency.

EUT Test Condition:	802.11n HT20: 2412MHz TX		
Test Channel	Channel 1	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	53.37	-0.77	52.60	74.00	-21.40	peak	343	348	
2	2390.000	45.03	-0.77	44.26	54.00	-9.74	AVG	343	348	
3 *	2412.000	108.29	-0.71	107.58			peak	343	348	
4 *	2412.000	94.43	-0.71	93.72			AVG	343	348	
5	4824.000	40.69	5.59	46.28	74.00	-27.72	peak	136	102	
6	4824.000	27.58	5.59	33.17	54.00	-20.83	AVG	136	102	
7	7236.000	43.97	11.85	55.82	74.00	-18.18	peak	275	114	
8	7236.000	28.38	11.85	40.23	54.00	-13.77	AVG	275	114	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	50.59	-0.77	49.82	74.00	-24.18	peak	262	148	
2	2390.000	35.38	-0.77	34.61	54.00	-19.39	AVG	262	148	
3 *	2412.000	100.10	-0.71	99.39			peak	262	148	
4 *	2412.000	87.24	-0.71	86.53			AVG	262	148	
5	4824.000	39.28	5.59	44.87	74.00	-29.13	peak	100	196	
6	4824.000	27.87	5.59	33.46	54.00	-20.54	AVG	100	196	
7	7236.000	42.87	11.85	54.72	74.00	-19.28	peak	128	202	
8	7236.000	26.72	11.85	38.57	54.00	-15.43	AVG	128	202	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2412MHz: Fundamental frequency.

EUT Test Condition	802.11n HT20: 2437MHz TX		
Test Channel	Channel 6	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2437.000	107.43	-0.65	106.78			peak	400	43	
2 *	2437.000	93.91	-0.65	93.26			AVG	400	43	
3	4874.000	39.10	6.16	45.26	74.00	-28.74	peak	152	193	
4	4874.000	27.68	6.16	33.84	54.00	-20.16	AVG	152	193	
5	7311.000	43.11	12.10	55.21	74.00	-18.79	peak	225	247	
6	7311.000	28.29	12.10	40.39	54.00	-13.61	AVG	225	247	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2437.000	98.88	-0.65	98.23			peak	100	176	
2 *	2437.000	86.17	-0.65	85.52			AVG	100	176	
3	4874.000	38.99	6.16	45.15	74.00	-28.85	peak	100	284	
4	4874.000	27.24	6.16	33.40	54.00	-20.60	AVG	100	284	
5	7311.000	42.28	12.10	54.38	74.00	-19.62	peak	249	112	
6	7311.000	25.97	12.10	38.07	54.00	-15.93	AVG	249	112	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2437MHz: Fundamental frequency.

EUT Test Condition	802.11n HT20: 2462MHz TX		
Test channel	Channel 11	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2462.000	107.27	-0.58	106.69			peak	383	278	
2 *	2462.000	93.72	-0.58	93.14			AVG	383	278	
3	2483.500	53.17	-0.51	52.66	74.00	-21.34	peak	383	278	
4	2483.500	41.22	-0.51	40.71	54.00	-13.29	AVG	383	278	
5	4924.000	37.30	6.32	43.62	74.00	-30.38	peak	100	147	
6	4924.000	25.48	6.32	31.80	54.00	-22.20	AVG	100	147	
7	7386.000	41.34	12.35	53.69	74.00	-20.31	peak	365	66	
8	7386.000	29.09	12.35	41.44	54.00	-12.56	AVG	265	66	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2462.000	101.96	-0.58	101.38			peak	243	303	
2 *	2462.000	89.20	-0.58	88.62			AVG	243	303	
3	2483.500	52.15	-0.51	51.64	74.00	-22.36	peak	243	303	
4	2483.500	41.09	-0.51	40.58	54.00	-13.42	AVG	243	303	
5	4924.000	37.99	6.32	44.31	74.00	-29.69	peak	125	242	
6	4924.000	26.87	6.32	33.19	54.00	-20.81	AVG	125	242	
7	7386.000	39.33	12.35	51.68	74.00	-22.32	peak	365	136	
8	7386.000	27.01	12.35	39.36	54.00	-14.64	AVG	365	136	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2462MHz: Fundamental frequency.

EUT Test Condition:	802.11n HT40: 2422MHz TX		
Test Channel	Channel 3	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	64.58	-0.77	63.81	74.00	-10.19	peak	379	60	
2	2390.000	51.28	-0.77	50.51	54.00	-3.49	AVG	379	60	
3 *	2422.000	104.28	-0.68	103.60			peak	379	60	
4 *	2422.000	91.38	-0.68	90.70			AVG	379	60	
5	4844.000	37.53	5.82	43.35	74.00	-30.65	peak	100	189	
6	4844.000	25.23	5.82	31.05	54.00	-22.95	AVG	100	189	
7	7266.000	34.56	11.94	46.50	74.00	-27.50	peak	100	287	
8	7266.000	23.17	11.94	35.11	54.00	-18.89	AVG	100	287	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	54.68	-0.77	53.91	74.00	-20.09	peak	367	312	
2	2390.000	42.35	-0.77	41.58	54.00	-12.42	AVG	367	312	
3 *	2422.000	99.44	-0.68	98.76			peak	367	312	
4 *	2422.000	86.91	-0.68	86.23			AVG	367	312	
5	4844.000	37.72	5.82	43.54	74.00	-30.46	peak	100	141	
6	4844.000	25.31	5.82	31.13	54.00	-22.87	AVG	100	141	
7	7266.000	34.99	11.94	46.93	74.00	-27.07	peak	100	269	
8	7266.000	23.21	11.94	35.15	54.00	-18.85	AVG	100	269	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2422MHz: Fundamental frequency.

EUT Test Condition	802.11n HT40: 2437MHz TX		
Test Channel	Channel 6	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2437.000	104.25	-0.65	103.60			peak	363	229	
2 *	2437.000	91.35	-0.65	90.70			AVG	363	229	
3	4874.000	38.07	6.16	44.23	74.00	-29.77	peak	100	222	
4	4874.000	25.31	6.16	31.47	54.00	-22.53	AVG	100	222	
5	7311.000	35.23	12.10	47.33	74.00	-26.67	peak	100	154	
6	7311.000	23.59	12.10	35.69	54.00	-18.31	AVG	100	154	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2437.000	98.28	-0.65	97.63			peak	389	326	
2 *	2437.000	86.07	-0.65	85.42			AVG	389	326	
3	4874.000	38.20	6.16	44.36	74.00	-29.64	peak	100	182	
4	4874.000	25.71	6.16	31.87	54.00	-22.13	AVG	100	182	
5	7311.000	35.16	12.10	47.26	74.00	-26.74	peak	100	235	
6	7311.000	23.53	12.10	35.63	54.00	-18.37	AVG	100	235	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2437MHz: Fundamental frequency.

EUT Test Condition	802.11n HT40: 2452MHz TX		
Test Channel	Channel 9	Frequency Range	Above 1GHz
Power supply	DC 19V from adapter	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25.6deg. C, 62%RH	Tested By	Tank tan

Antennal Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2452.000	105.24	-0.61	104.63			peak	367	353	
2 *	2452.000	91.75	-0.61	91.14			AVG	367	353	
3	2483.500	62.56	-0.51	62.05	74.00	-11.95	peak	367	353	
4	2483.500	49.42	-0.51	48.91	54.00	-5.09	AVG	367	353	
5	4904.000	41.20	6.46	47.66	74.00	-26.34	peak	100	213	
6	4904.000	29.96	6.46	36.42	54.00	-17.58	AVG	100	213	
7	7356.000	40.43	12.25	52.68	74.00	-21.32	peak	100	165	
8	7356.000	28.29	12.25	40.54	54.00	-13.46	AVG	100	165	
Antennal Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1 *	2452.000	99.88	-0.61	99.27			peak	248	309	
2 *	2452.000	87.08	-0.61	86.47			AVG	248	309	
3	2483.500	57.62	-0.51	57.11	74.00	-16.89	peak	248	309	
4	2483.500	43.83	-0.51	43.32	54.00	-10.68	AVG	248	309	
5	4904.000	41.03	6.46	47.49	74.00	-26.51	peak	100	298	
6	4904.000	30.02	6.46	36.48	54.00	-17.52	AVG	100	298	
7	7356.000	38.68	12.25	50.93	74.00	-23.07	peak	100	175	
8	7356.000	28.18	12.25	40.43	54.00	-13.57	AVG	100	175	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
2. Margin value = Emission level – Limit value
3. 2452MHz: Fundamental frequency.

3.2 Conducted Emission Measurement

3.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Due Date of Calibration
EMI Test Receiver Rohde&Schwarz	ESCI3	101418	2020-09-17
Artificial Mains Network Rohde&Schwarz	ENV216	3560.6550.15	2020-10-17
Test software FARAD	EZ_EMC V1.1.4.2	N/A	N/A
Hygrothermograph Yuhuaze	HTC-1	NA	2020-10-17
Digital Multimeter FLUKE	15B+	43512617WS	2020-10-17

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA.
2. The test was performed in Shielded Room 1.

3.2.3 Test Procedures

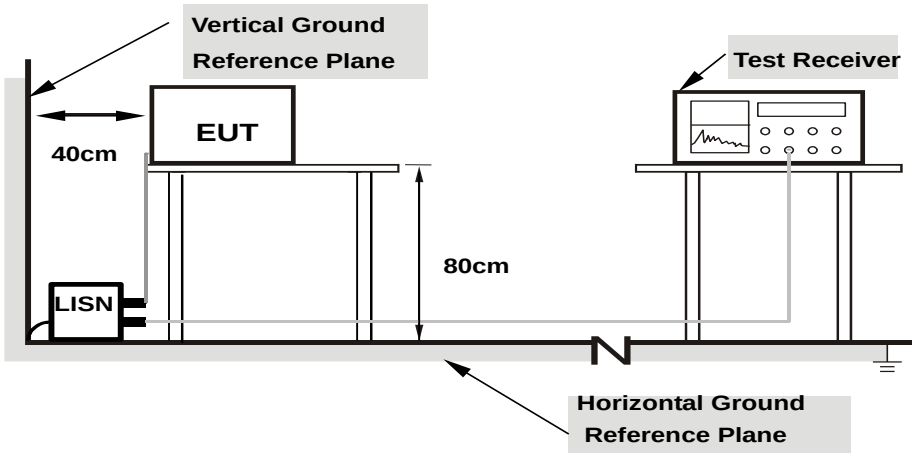
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit – 20dB)was not recorded.

Note: All modes of operation were investigated and the worst-case emissions are reported.

3.2.4 Deviationfrom Test Standard

No deviation.

3.2.5 Test setup



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.2.6 EUT Operating Conditions

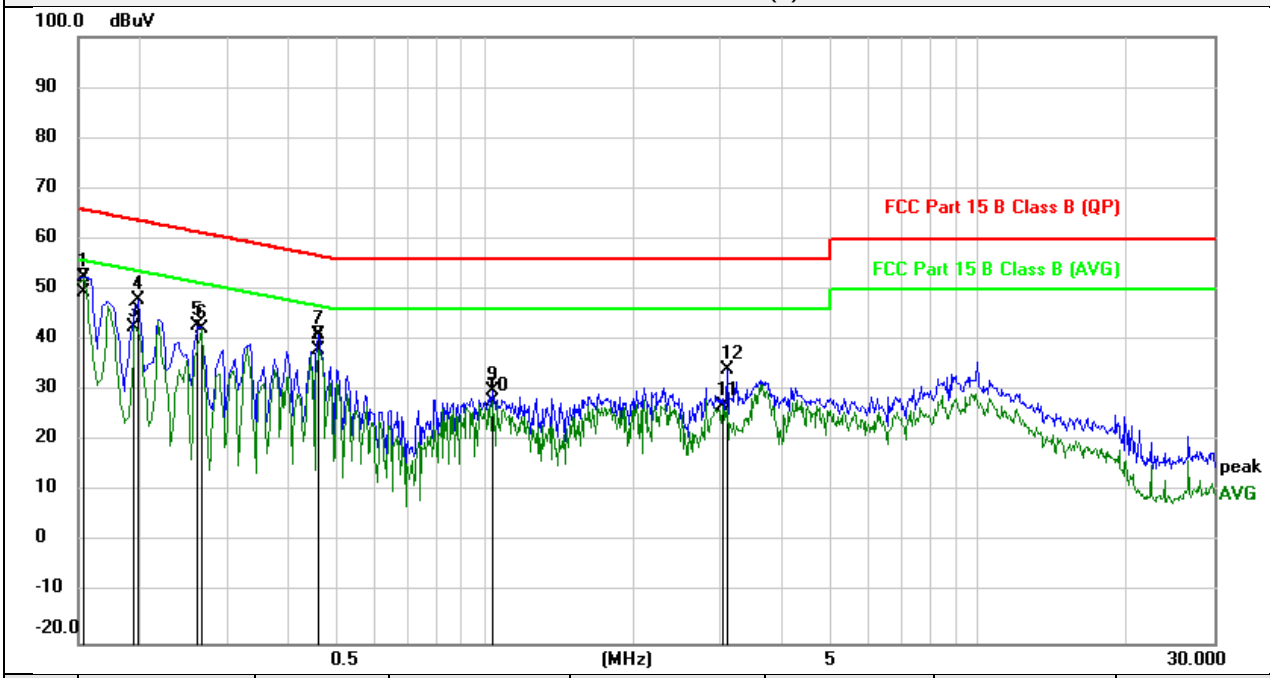
a. Placed the EUT on the testing table.
b. Set the EUT under transmission condition continuously at specific channel frequency.

3.2.7 Test Results

Conducted worst-case data (802.11b CH1)

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution andwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Power supply	DC 19V from adapter AC 120V/60Hz	Environmental Conditions	25℃, 60%RH
Tested by	Tank Tan	Test Date	2020/04/24

Phase Of Power: Line (L)



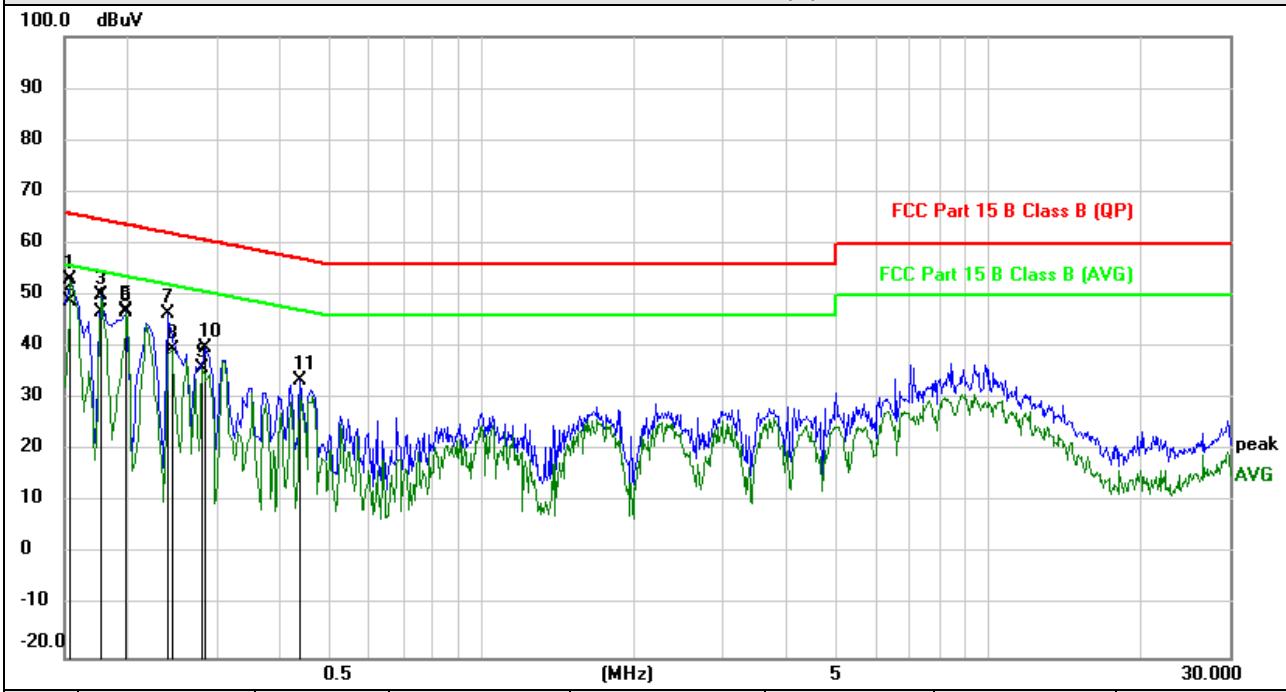
No.	Frequency	Reading	Correct Factor	Emission Level	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	Detecter
1	0.1545	42.92	9.65	52.57	65.75	-13.18	QP
2	0.1545	39.75	9.65	49.40	55.75	-6.35	AVG
3	0.1995	38.30	9.62	47.92	63.63	-15.71	QP
4	0.1949	33.05	9.62	42.67	53.83	-11.16	AVG
5	0.2625	33.11	9.62	42.73	61.35	-18.62	QP
6	0.2670	32.59	9.62	42.21	51.21	-9.00	AVG
7	0.4605	31.43	9.59	41.02	56.68	-15.66	QP
8	0.4605	28.34	9.59	37.93	46.68	-8.75	AVG
9	1.0365	20.28	9.55	29.83	56.00	-26.17	QP
10	1.0365	18.38	9.55	27.93	46.00	-18.07	AVG
11	3.1020	24.50	9.57	34.07	56.00	-21.93	QP
12	3.0345	17.49	9.57	27.06	46.00	-18.94	AVG

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution andwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Power supply	DC 19V from adapter AC 120V/60Hz	Environmental Conditions	25℃, 60%RH
Tested by	Tank Tan	Test Date	2020/04/24

Phase Of Power: Neutral (N)



No.	Frequency	Reading	Correct Factor	Emission Level	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	Detecter
1	0.1545	43.30	9.65	52.95	65.75	-12.80	QP
2	0.1545	39.23	9.65	48.88	55.75	-6.87	AVG
3	0.1770	40.43	9.63	50.06	64.63	-14.57	QP
4	0.1770	37.02	9.63	46.65	54.63	-7.98	AVG
5	0.1995	37.40	9.62	47.02	63.63	-16.61	QP
6	0.1995	37.19	9.62	46.81	53.63	-6.82	AVG
7	0.2400	36.97	9.62	46.59	62.10	-15.51	QP
8	0.2445	29.92	9.62	39.54	51.94	-12.40	AVG
9	0.2850	30.36	9.61	39.97	60.67	-20.70	QP
10	0.2805	26.48	9.61	36.09	50.80	-14.71	AVG
11	0.4380	23.92	9.58	33.50	57.10	-23.60	QP

REMARKS:

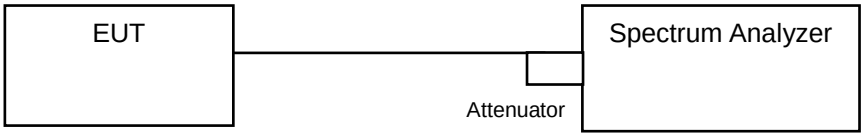
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

3.3 6dB Bandwidth Measurement

3.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

3.3.2 Test Setup



3.3.3 Test Instruments

Refer to section 10.1 to get information of above instrument.

3.3.4 Test Procedure

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associatedwith the two amplitude points (upper and lower) that are attenuated by 6 dB relative to themaximum level measured in the fundamental emission

3.3.5 DeviationfromTest Standard

No deviation.

3.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.3.7 Test Result

802.11b

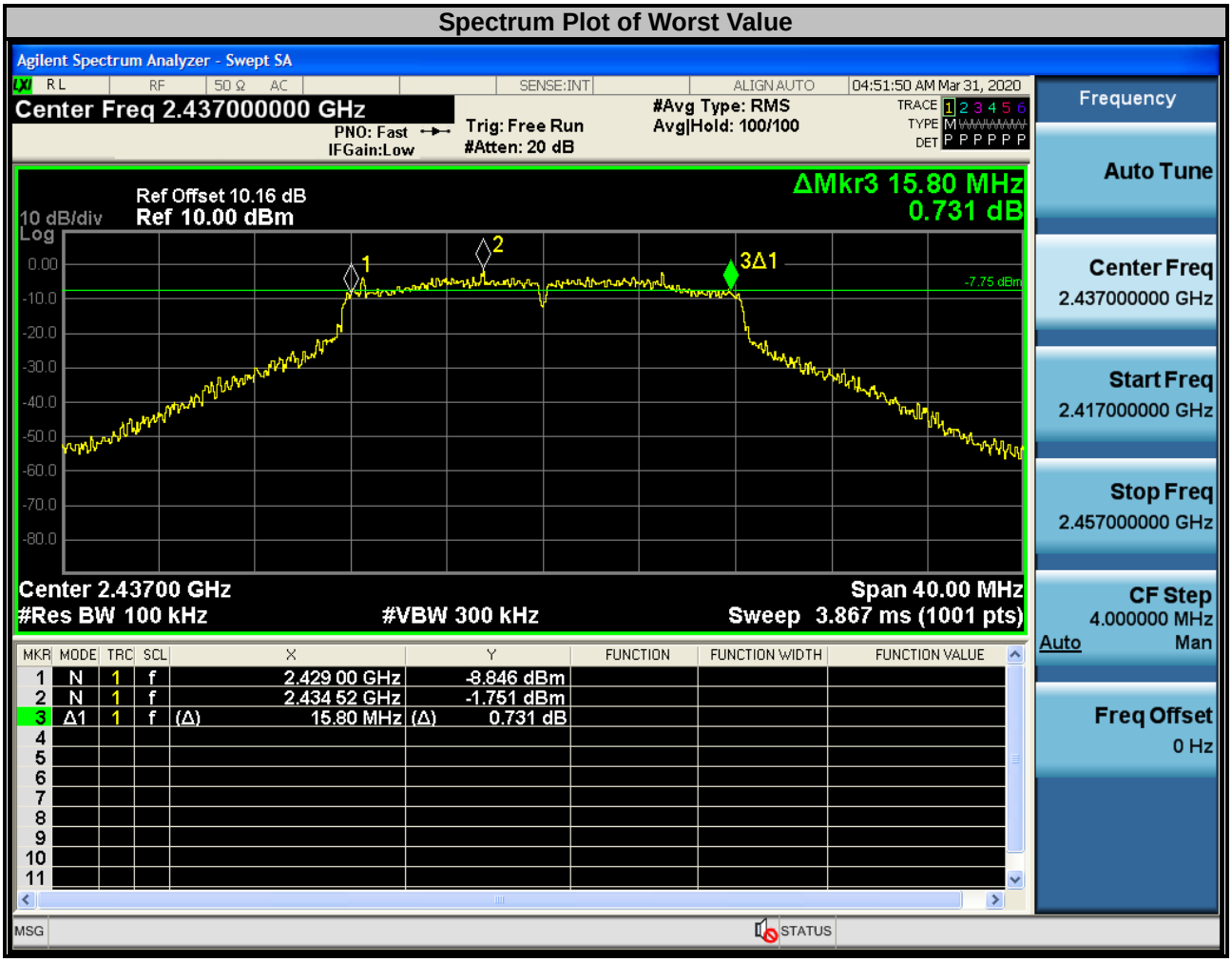
Channel	Frequency (MHz)	6dB Bandwidth(MHz)		Minimum Limit (MHz)	Pass / Fail
		Ant 0	Ant 1		
1	2412	10.12	9.88	0.5	Pass
6	2437	9.96	10.08	0.5	Pass
11	2462	10.16	10.16	0.5	Pass

Spectrum Plot of Worst Value

802.11g

Channel	Frequency (MHz)	6dB Bandwidth(MHz)		Minimum Limit (MHz)	Pass / Fail
		Ant 0	Ant 1		
1	2412	15.20	14.92	0.5	Pass
6	2437	15.80	15.24	0.5	Pass
11	2462	15.28	15.16	0.5	Pass

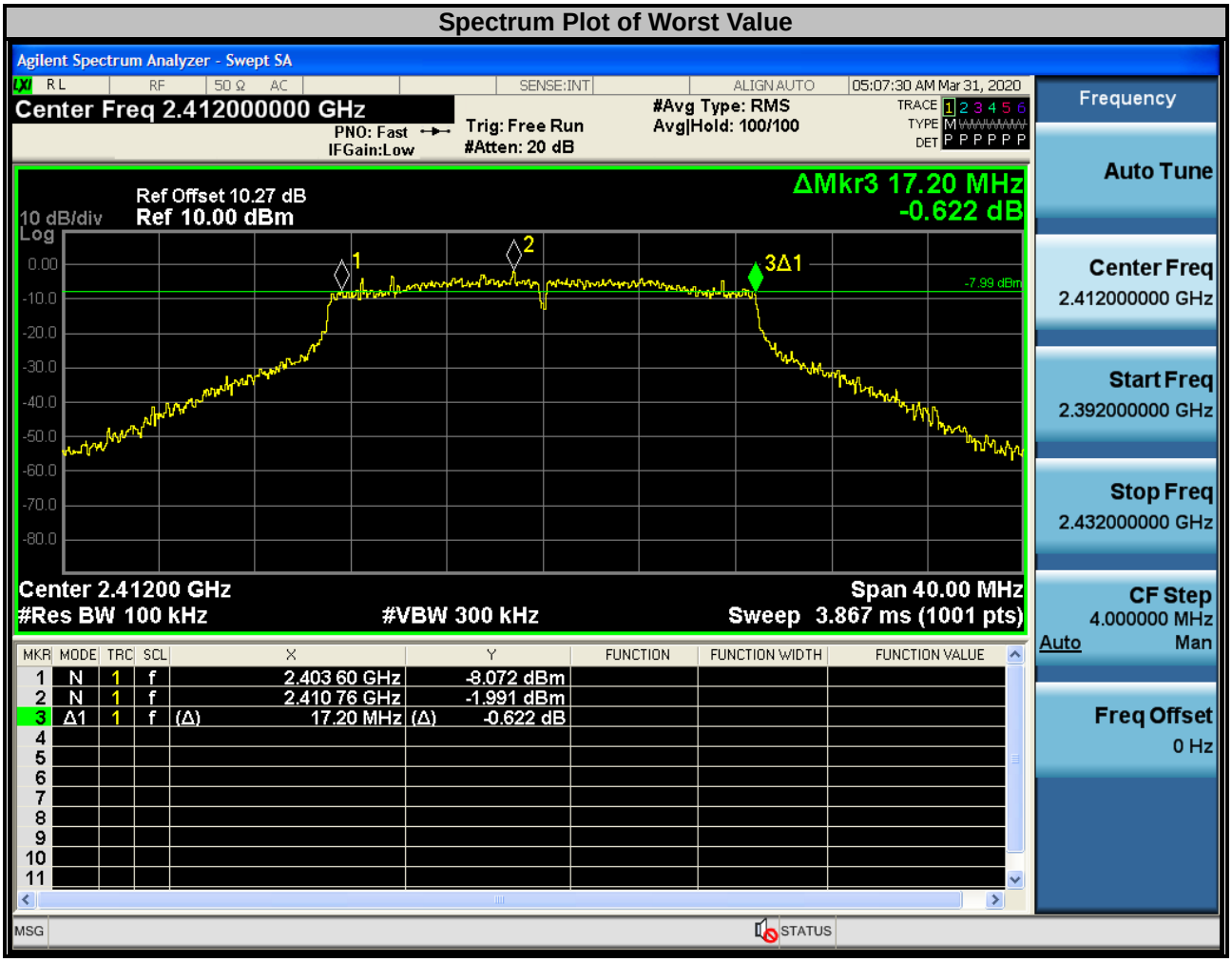
Spectrum Plot of Worst Value



802.11n HT20

Channel	Frequency (MHz)	6dB Bandwidth(MHz)		Minimum Limit (MHz)	Pass / Fail
		Ant 0	Ant 1		
1	2412	17.20	17.12	0.5	Pass
6	2437	17.14	16.94	0.5	Pass
11	2462	16.92	17.10	0.5	Pass

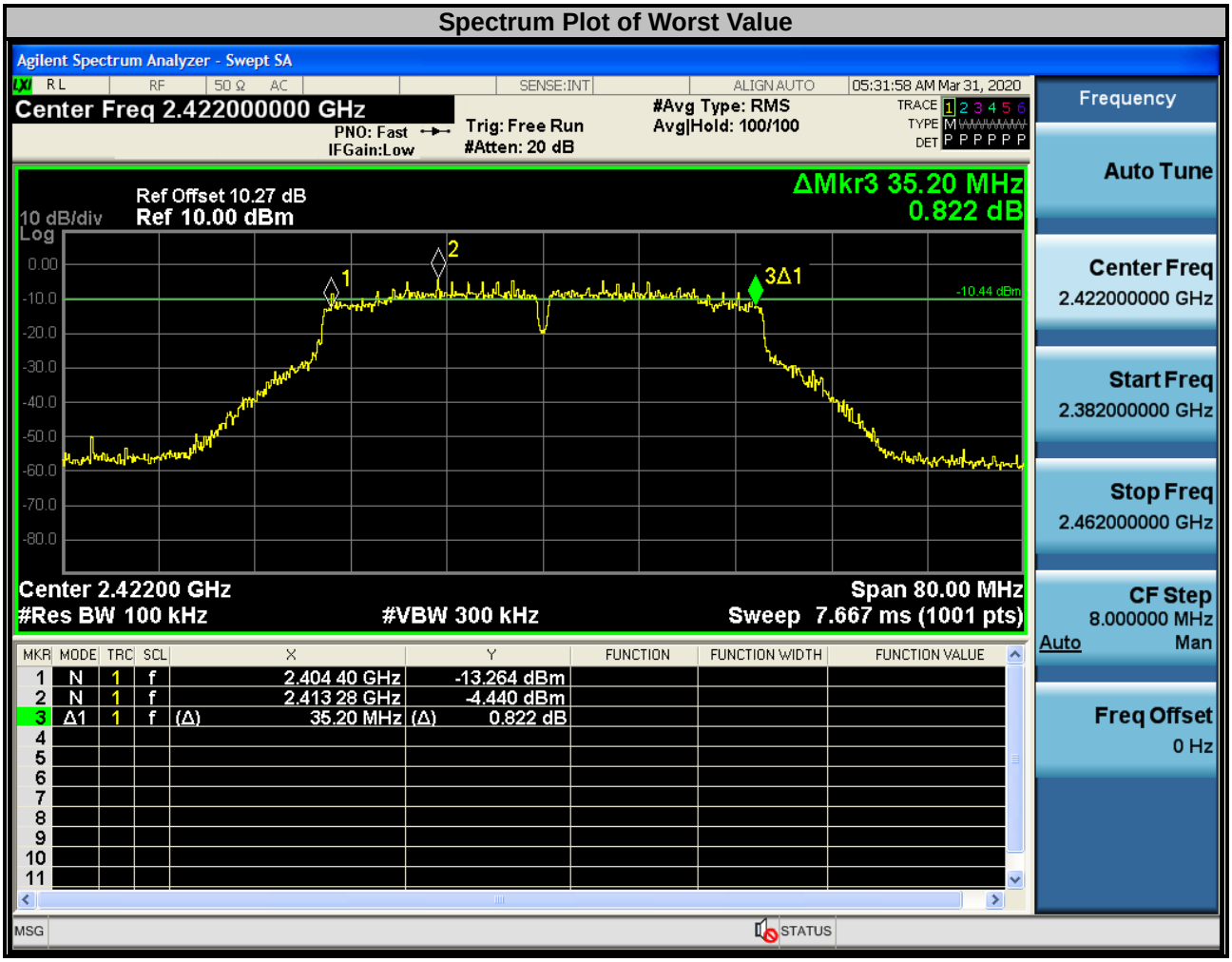
Spectrum Plot of Worst Value



802.11n HT40

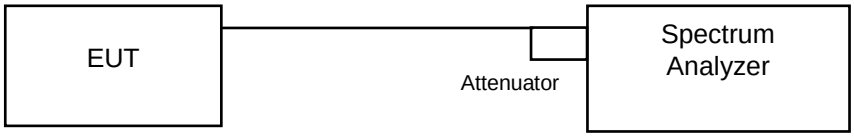
Channel	Frequency (MHz)	6dB Bandwidth(MHz)		Minimum Limit (MHz)	Pass / Fail
		Ant 0	Ant 1		
3	2422	35.20	35.20	0.5	Pass
6	2437	35.20	35.20	0.5	Pass
9	2452	34.16	35.20	0.5	Pass

Spectrum Plot of Worst Value



3.4 Occupied Bandwidth Measurement

3.4.1 Test Setup



3.4.2 Test Instruments

Refer to section 10.1 to get information of above instrument.

3.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidthand set the detector to peak. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

3.4.4 Deviation from Test Standard

No deviation.

3.4.5 EUT Operating Conditions

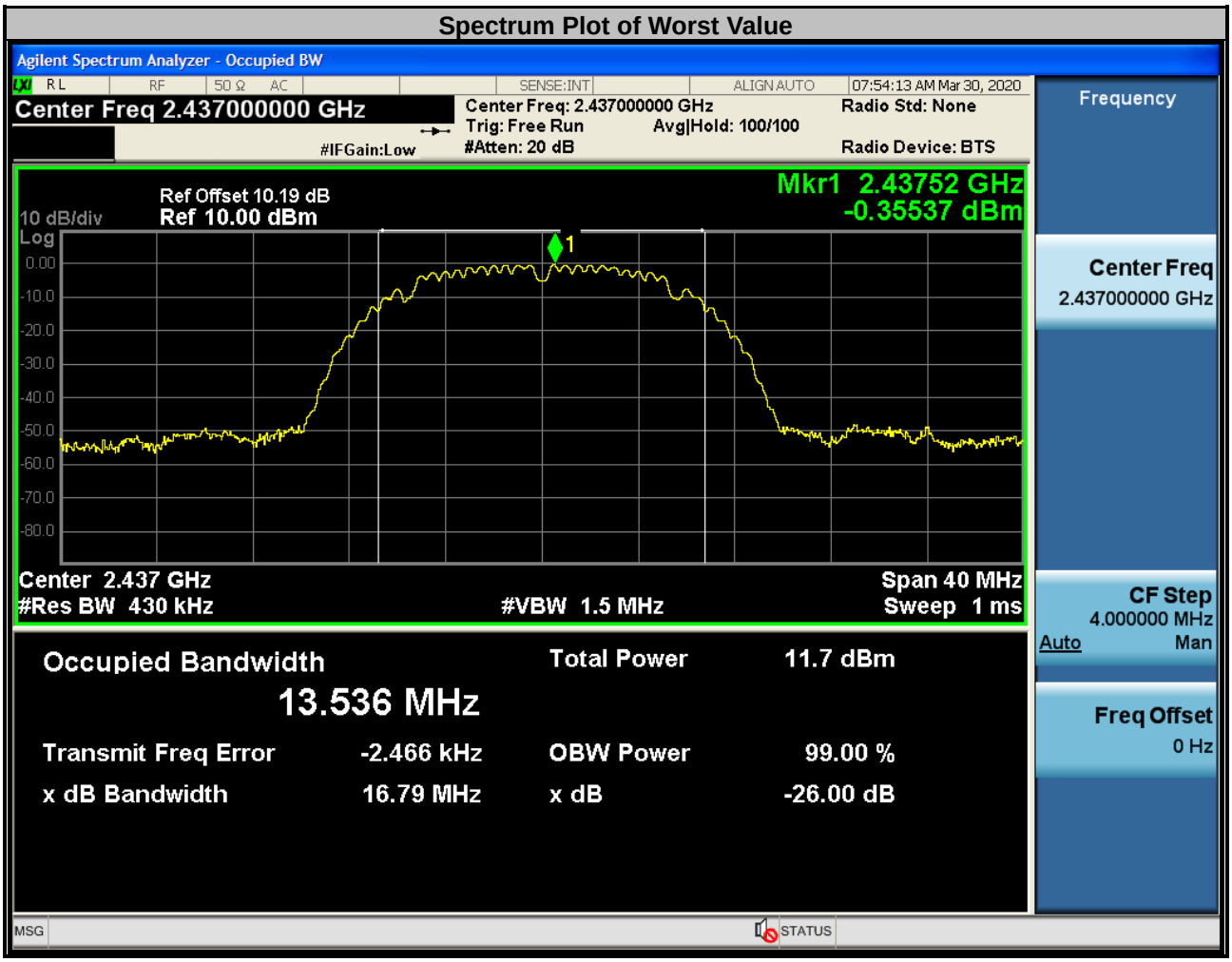
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.4.6 Test Results

802.11b

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Ant 0	Ant 1	
1	2412	13.480	13.495	Pass
6	2437	13.493	13.536	Pass
11	2462	13.531	13.510	Pass

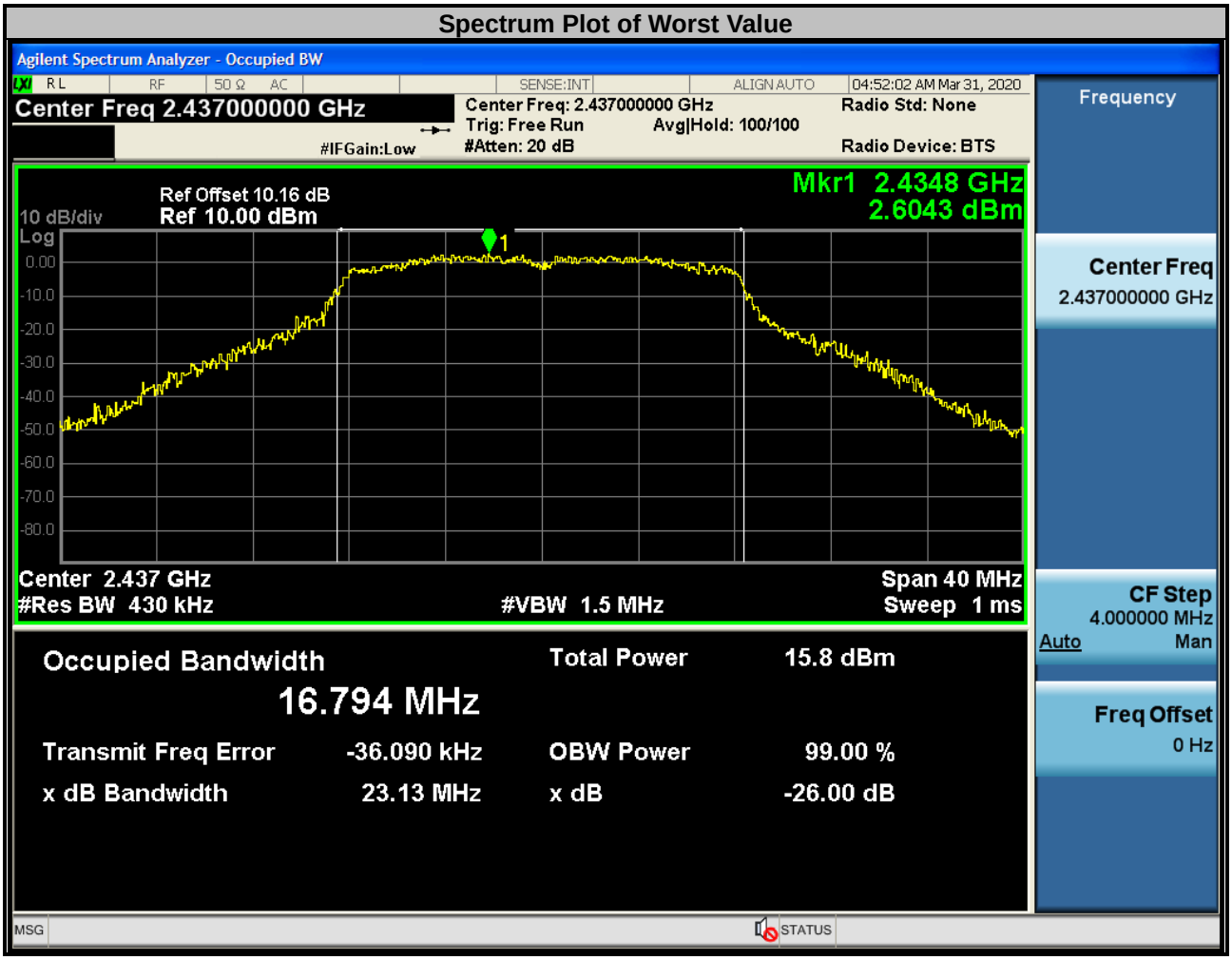
Spectrum Plot of Worst Value



802.11g

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Ant 0	Ant 1	
1	2412	16.792	16.824	Pass
6	2437	16.794	16.883	Pass
11	2462	16.780	16.726	Pass

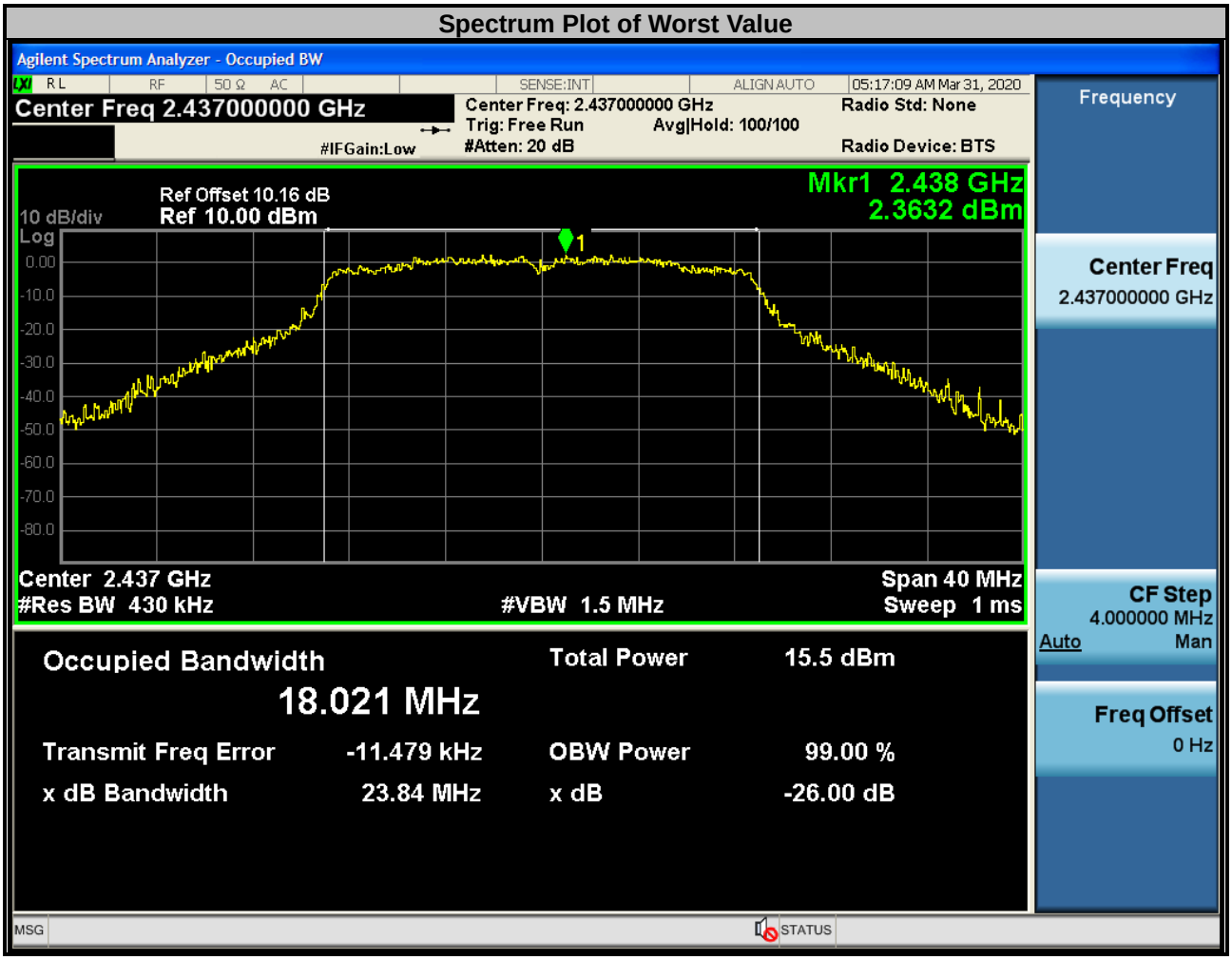
Spectrum Plot of Worst Value



802.11n HT20

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Ant 0	Ant 1	
1	2412	17.965	17.940	Pass
6	2437	18.021	17.961	Pass
11	2462	18.014	17.889	Pass

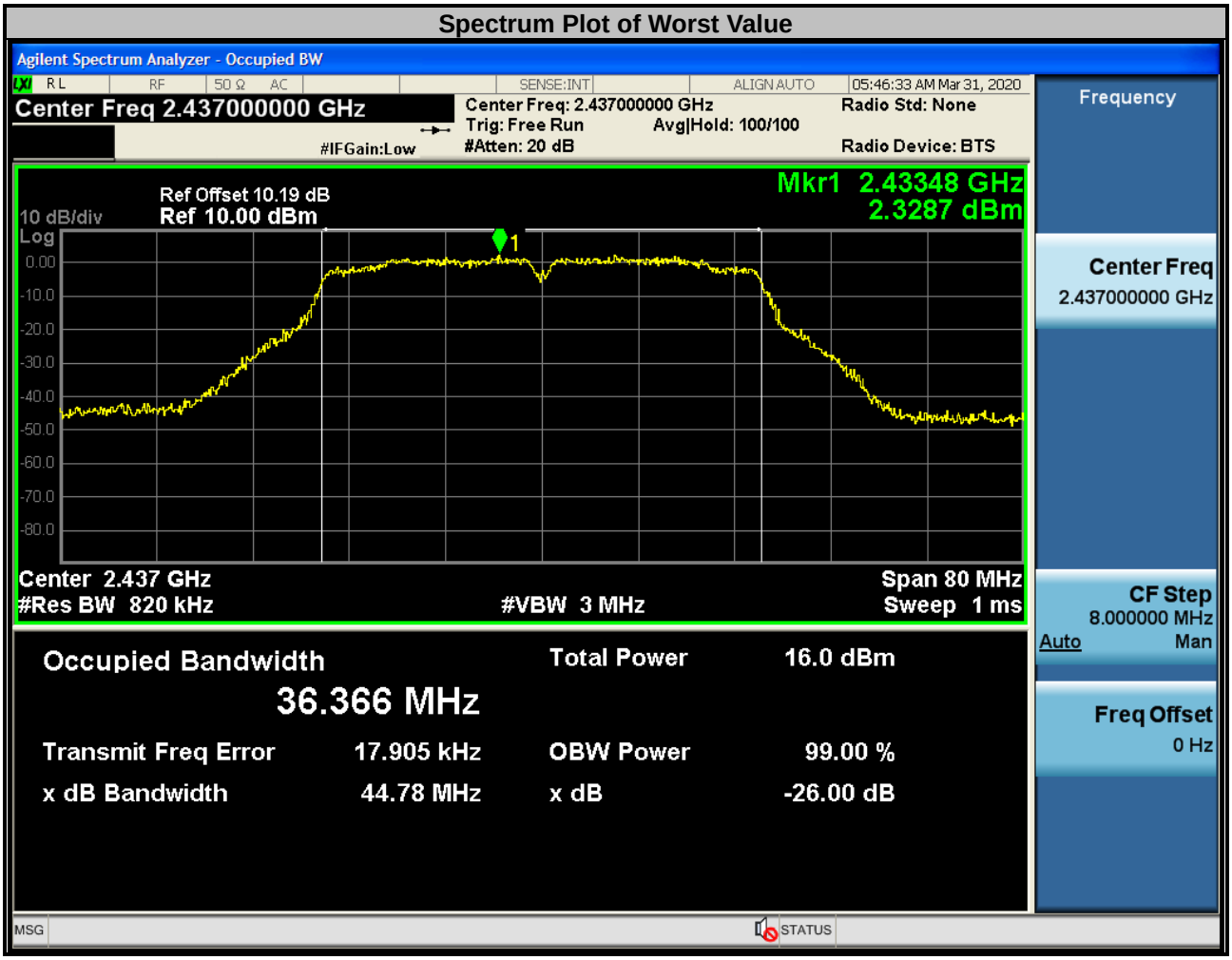
Spectrum Plot of Worst Value



802.11n HT40

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Ant 0	Ant 1	
3	2422	36.191	36.209	Pass
6	2437	36.129	36.366	Pass
9	2452	36.204	36.205	Pass

Spectrum Plot of Worst Value

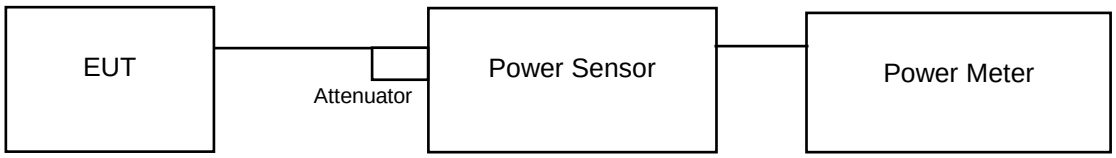


3.5 Conducted Output Power Measurement

3.5.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHzbands: 1 Watt (30dBm)

3.5.2 Test Setup



3.5.3 TestInstruments

Refer to section 10.1 to get information of above instrument.

3.5.4 Test Procedures

A peak / average power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak / average power sensor. Record the power level.

3.5.5 Deviationfrom Test Standard

No deviation.

3.5.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.5.7 Test Results

Average power:

802.11b

CH.	Fre. (MHz)	Average Power (mW)		Average Power (dBm)		Total power (mW)	Total power (dBm)	Limit (dBm)
		Ant 0	Ant1	Ant 0	Ant1			
1	2412	14.6218	12.9718	11.65	11.13	27.5936	14.41	26.96
6	2437	13.9637	13.4586	11.45	11.29	27.4223	14.38	26.96
11	2462	13.3968	13.1220	11.27	11.18	26.5188	14.24	26.96

802.11g

CH.	Fre. (MHz)	Average Power (mW)		Average Power (dBm)		Total power (mW)	Total power (dBm)	Limit (dBm)
		Ant 0	Ant1	Ant 0	Ant1			
1	2412	47.4242	40.4576	16.76	16.07	87.8818	**19.44**	26.96
6	2437	46.4515	41.9759	16.67	16.23	88.4274	19.47	26.96
11	2462	39.5367	45.2898	15.97	16.56	84.8264	19.29	26.96

802.11n HT20

CH.	Fre. (MHz)	Average Power (mW)		Average Power (dBm)		Total power (mW)	Total power (dBm)	Limit (dBm)
		Ant 0	Ant1	Ant 0	Ant1			
1	2412	47.9733	38.5478	16.81	15.86	86.5212	19.37	26.96
6	2437	42.2669	39.3550	16.26	15.95	81.6219	19.12	26.96
11	2462	39.1742	42.5598	15.93	16.29	81.7340	19.12	26.96

802.11n HT40

CH.	Fre. (MHz)	Average Power (mW)		Average Power (dBm)		Total power (mW)	Total power (dBm)	Limit (dBm)
		Ant 0	Ant1	Ant 0	Ant1			
1	2422	42.5598	40.4576	16.29	16.07	83.0174	19.19	26.96
6	2437	39.9025	40.7380	16.01	16.10	80.6405	19.07	26.96
11	2452	39.3550	35.1560	15.95	15.46	74.5111	18.72	26.96

Directional gain = 6.03dBi + 10*loq(2)=9.04dBi >6dBi, so the power density limit need to reduce 3.04dB

Peak power:

802.11b

CH.	Fre. (MHz)	Peak Power (mW)		Peake Power (dBm)		Total power (mW)	Total power (dBm)	Limit (dBm)
		Ant 0	Ant1	Ant 0	Ant1			
1	2412	26.8534	29.2415	14.29	14.66	56.0950	17.49	26.96
6	2437	28.2488	26.6686	14.51	14.26	54.9174	17.40	26.96
11	2462	28.3792	29.4442	14.53	14.69	57.8234	17.62	26.96

802.11g

CH.	Fre. (MHz)	Peak Power (mW)		Peake Power (dBm)		Total power (mW)	Total power (dBm)	Limit (dBm)
		Ant 0	Ant1	Ant 0	Ant1			
1	2412	76.2079	79.7995	18.82	19.02	156.0074	21.93	26.96
6	2437	78.3430	76.5597	18.94	18.84	154.9026	21.90	26.96
11	2462	72.6106	76.9130	18.61	18.86	149.5236	21.75	26.96

802.11n HT20

CH.	Fre. (MHz)	Peak Power (mW)		Peake Power (dBm)		Total power (mW)	Total power (dBm)	Limit (dBm)
		Ant 0	Ant1	Ant 0	Ant1			
1	2412	71.4496	72.9458	18.54	18.63	144.3954	21.60	26.96
6	2437	70.6318	73.1139	18.49	18.64	143.7457	21.58	26.96
11	2462	74.4732	71.6143	18.72	18.55	146.0875	21.65	26.96

802.11n HT40

CH.	Fre. (MHz)	Peak Power (mW)		Peake Power (dBm)		Total power (mW)	Total power (dBm)	Limit (dBm)
		Ant 0	Ant1	Ant 0	Ant1			
1	2422	65.9174	67.2977	18.19	18.28	133.2151	21.25	26.96
6	2437	78.3430	71.9449	18.94	18.57	150.2879	21.77	26.96
11	2452	70.1455	69.0240	18.46	18.39	139.1695	21.44	26.96

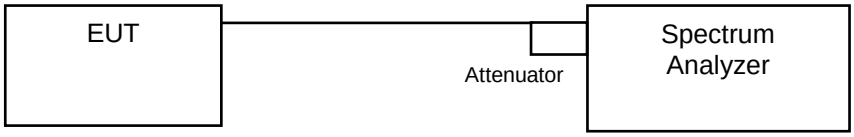
Directional gain =6.03dBi + 10*loq (2)= 9.04dBi >6dBi, so the power density limit need to reduce 3.04dB

3.6 Power Spectral Density Measurement

3.6.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

3.6.2 Test Setup



3.6.3 Test Instruments

Refer to section 10.1 to get information of above instrument.

3.6.4 Test Procedure

a. Set the RBW = 10 kHz, VBW =30 kHz, Detector = peak.
b. Sweep time = auto couple, Trace mode = max hold,allow trace to fully stabilize.
c. Use the peak marker function to determine the maximum power level in any 100 kHz bandsegment within the fundamental EBW.

3.6.5 Deviationfrom Test Standard

No deviation.

3.6.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.6.7 Test Results

802.11b:

Channel	Frequency (MHz)	PSD (dBm/10kHz)		Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass / Fail
		Ant 0	Ant 1			
1	2412	-5.931	-6.784	-3.326	4.96	Pass
6	2437	-6.282	-7.050	-3.639	4.96	Pass
11	2462	-6.524	-6.742	-3.621	4.96	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across ponding frequency bins on the various outputs by computer
2. Directional gain = 6.03dBi + 10*loq(2)= 9.04dBi >6dBi, so the power density limit need to reduce 3.04dB

Spectrum Plot of Worst Value

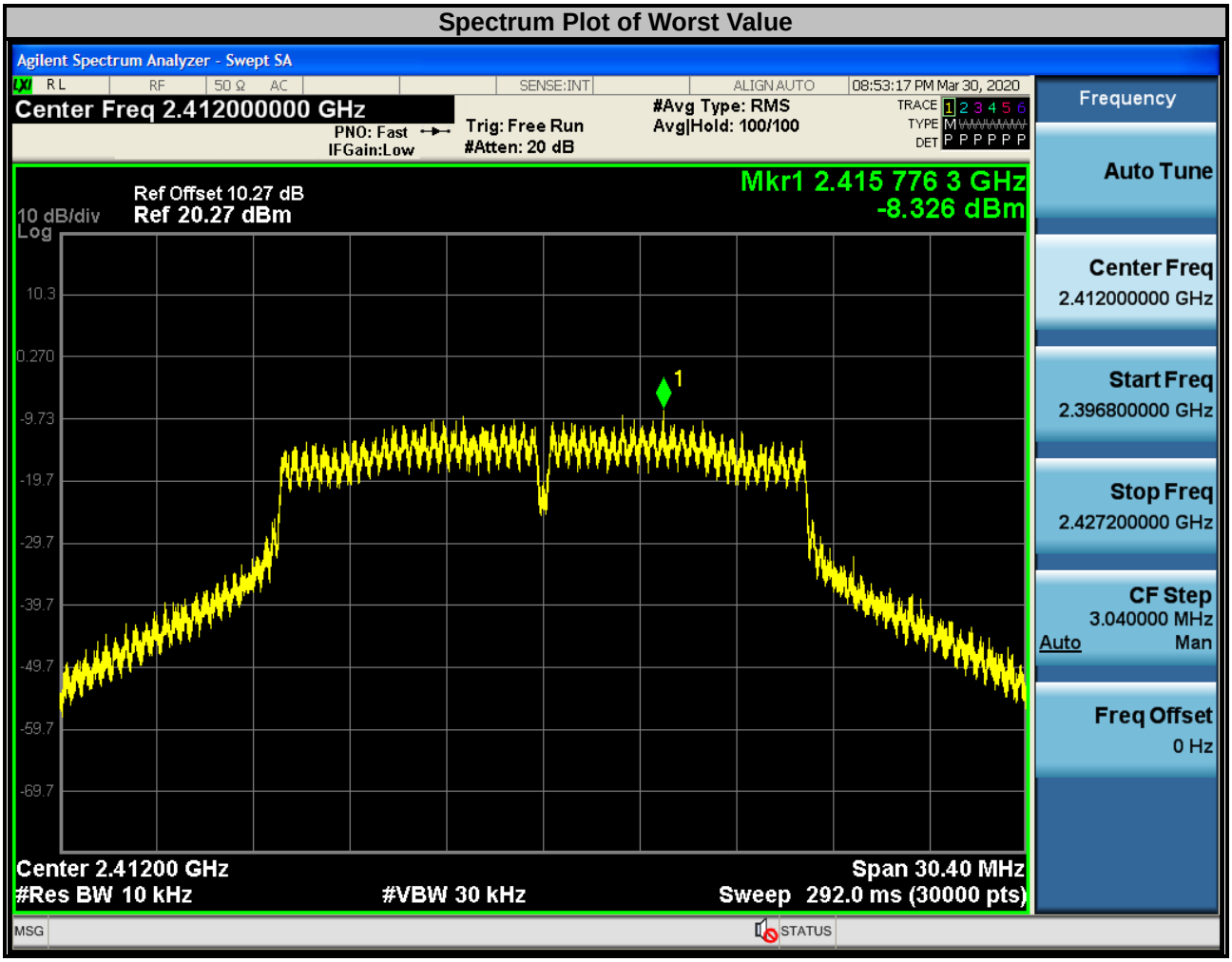
802.11g:

Channel	Frequency (MHz)	PSD (dBm/10kHz)		Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass / Fail
		Ant 0	Ant 1			
1	2412	-8.326	-9.667	-5.935	4.96	Pass
6	2437	-9.617	-9.311	-6.451	4.96	Pass
11	2462	-9.415	-9.844	-6.614	4.96	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across ponding frequency bins on the various outputs by computer
2. Directional gain =6.03dBi + 10*loq(2)= 9.04dBi >6dBi, so the power density limit need to reduce 3.04dB

Spectrum Plot of Worst Value



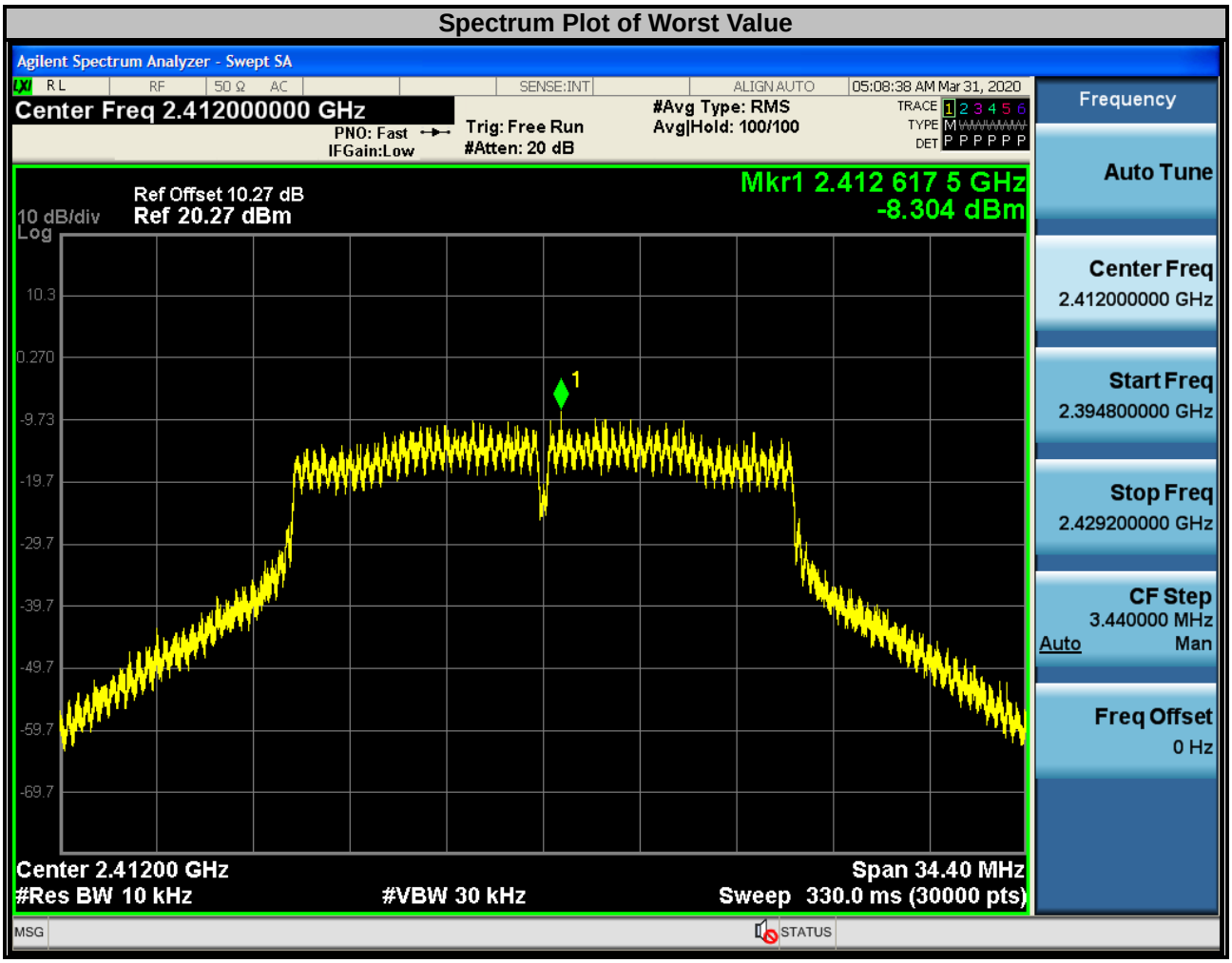
802.11n HT20:

Channel	Frequency (MHz)	PSD (dBm/10kHz)		Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass / Fail
		Ant 0	Ant 1			
1	2412	-8.304	-9.227	-5.731	4.96	Pass
6	2437	-9.349	-9.820	-6.568	4.96	Pass
11	2462	-8.443	-9.137	-5.766	4.96	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across ponding frequency bins on the various outputs by computer
2. Directional gain =6.03dBi + 10*loq(2)= 9.04dBi >6dBi, so the power density limit need to reduce 3.04dB

Spectrum Plot of Worst Value



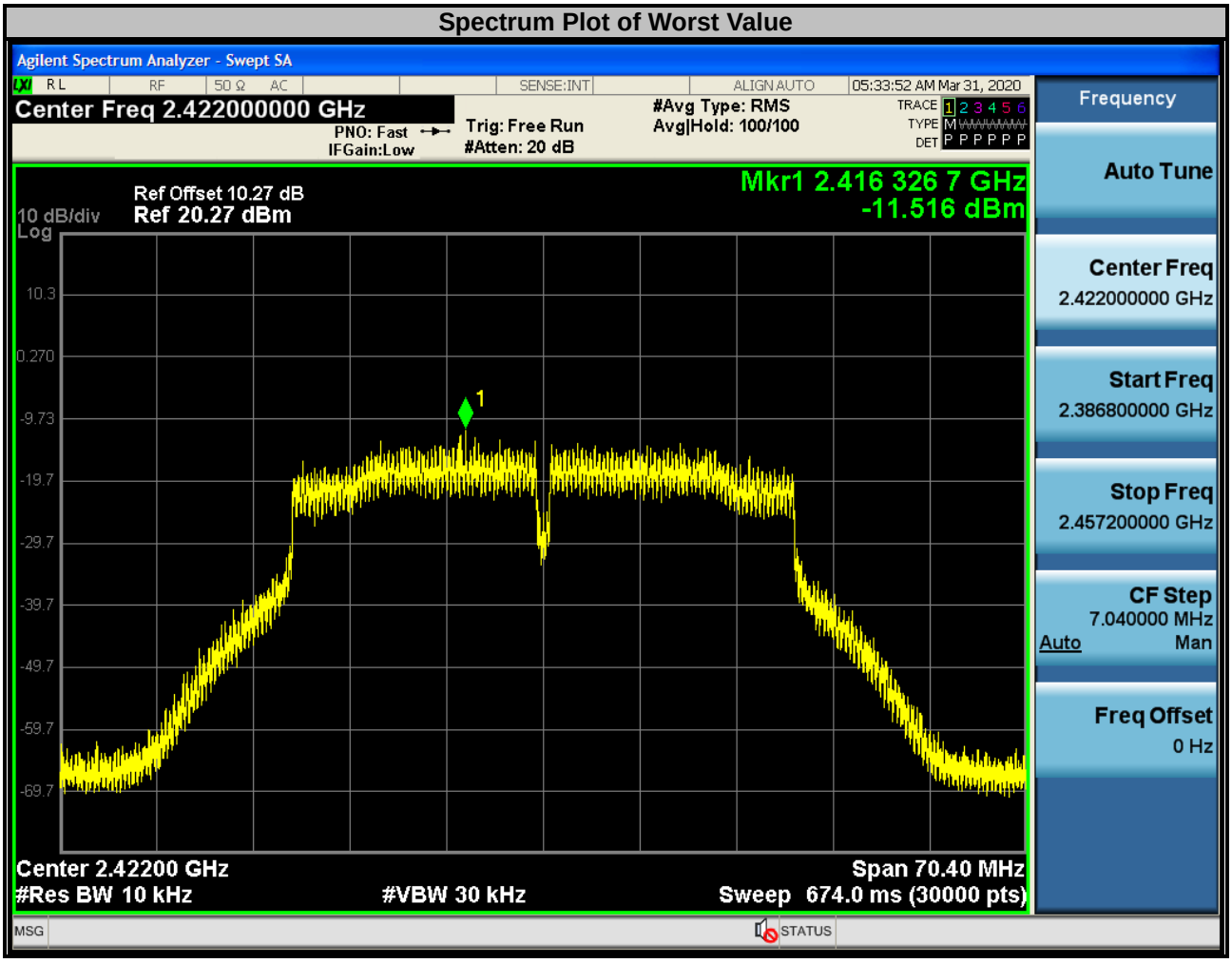
802.11n HT40:

Channel	Frequency (MHz)	PSD (dBm/10kHz)		Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass / Fail
		Ant 0	Ant 1			
3	2422	-11.516	-12.542	-8.988	4.96	Pass
6	2437	-11.810	-12.224	-9.002	4.96	Pass
9	2452	-11.969	-11.997	-8.973	4.96	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across ponding frequency bins on the various outputs by computer
2. Directional gain =6.03dBi + 10*loq(2)= 9.04dBi >6dBi, so the power density limit need to reduce 3.04dB

Spectrum Plot of Worst Value

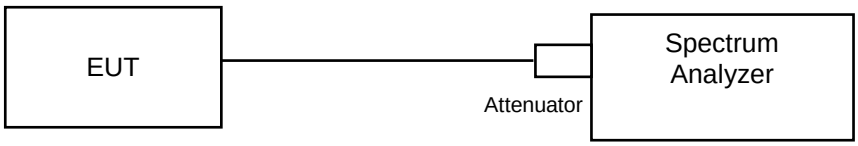


3.7 Conducted Out of Band Emission Measurement

3.7.1 Limits of Conducted Out of Band Emission Measurement

For average power: –30dBc of the highest emission level of operating band /100kHz Resolution Bandwidth.
For peak power: –20dBc of the highest emission level of operating band /100kHz Resolution Bandwidth.

3.7.2 Test Setup



3.7.3 Test Instruments

Refer to section 10.1 to get information of above instrument.

3.7.4 Test Procedure

Measurement procedure REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHzband segment within the fundamental EBW.

3.7.5 Measurement procedure OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

3.7.6 Deviation from Test Standard

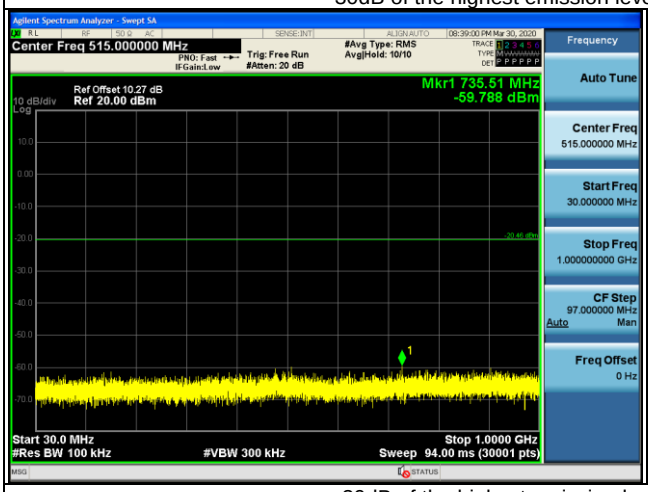
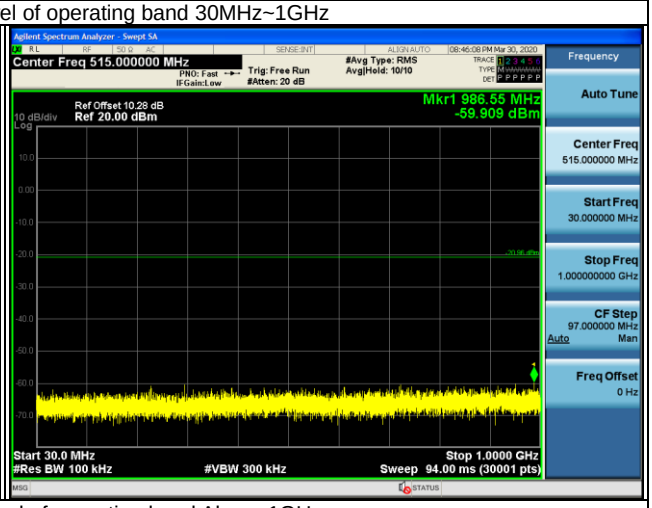
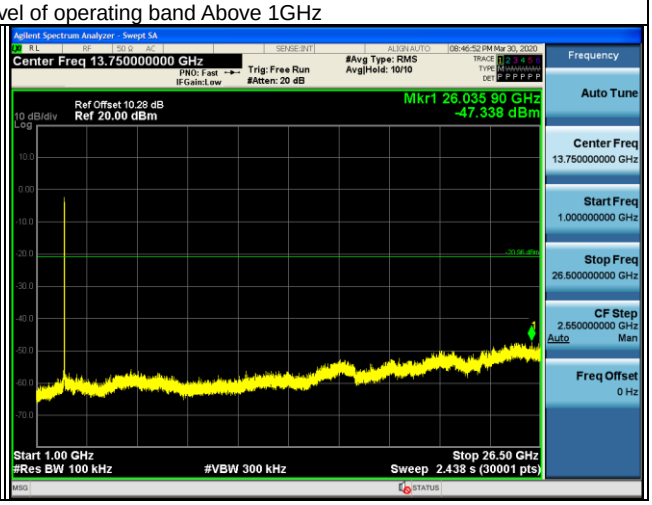
No deviation.

3.7.7 EUT Operating Condition

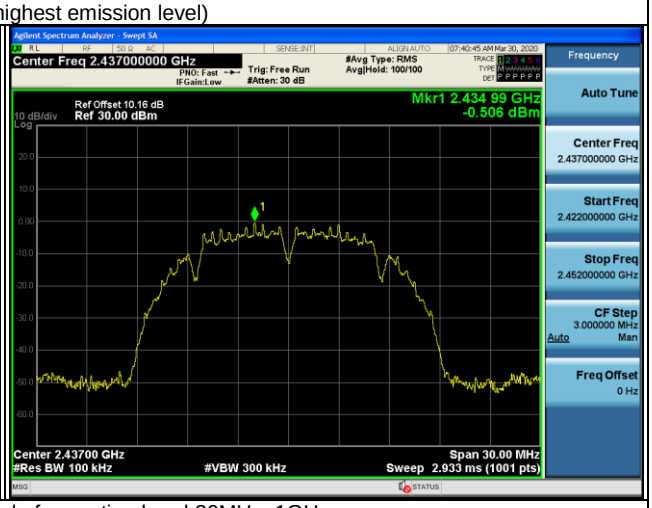
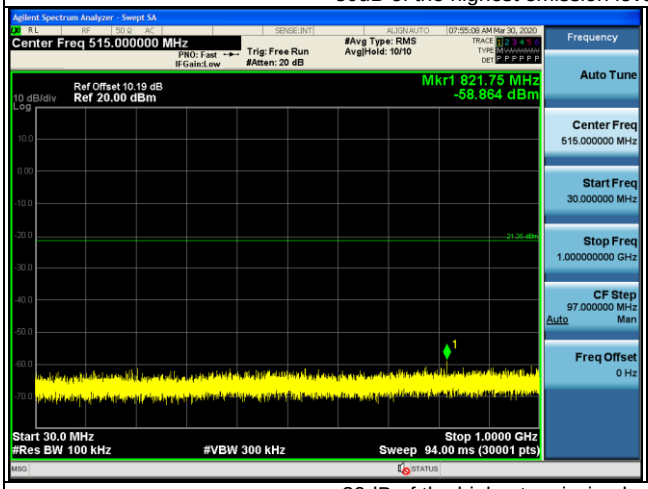
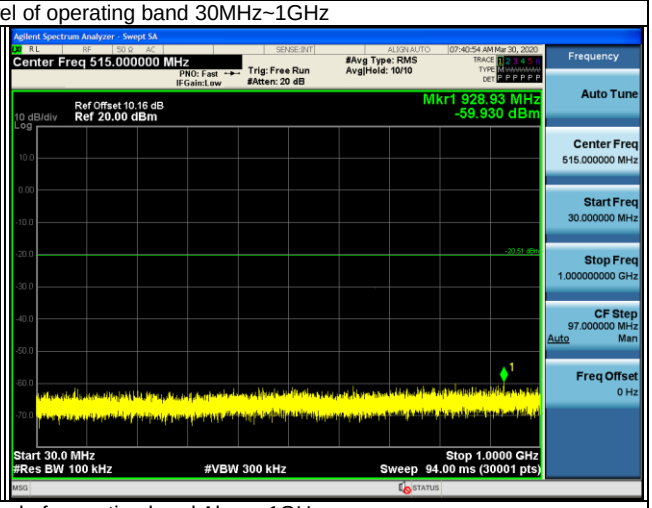
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.7.8 Test results

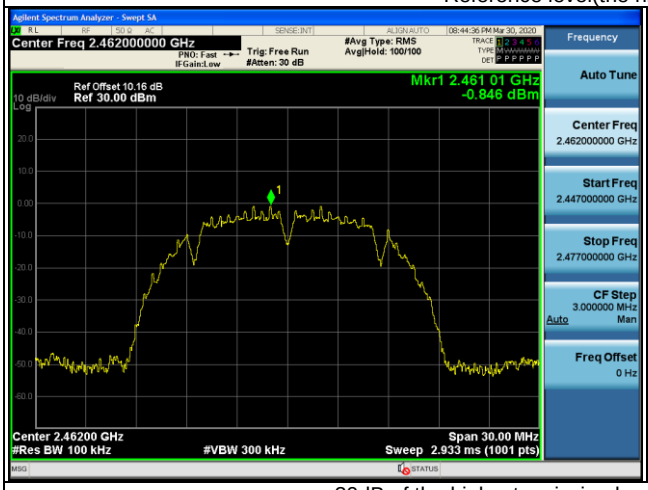
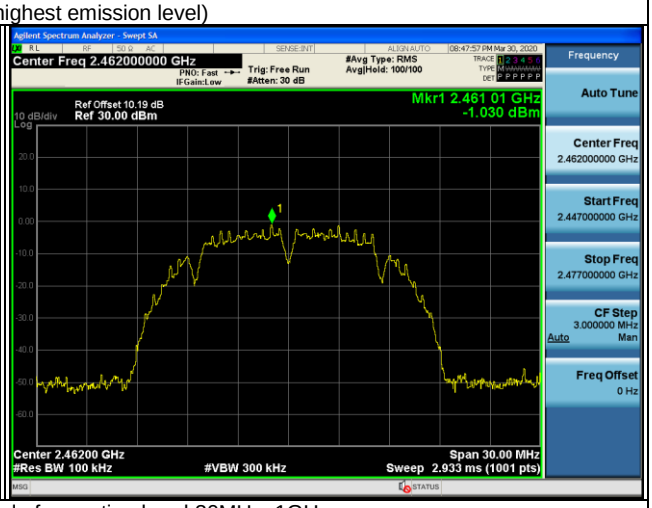
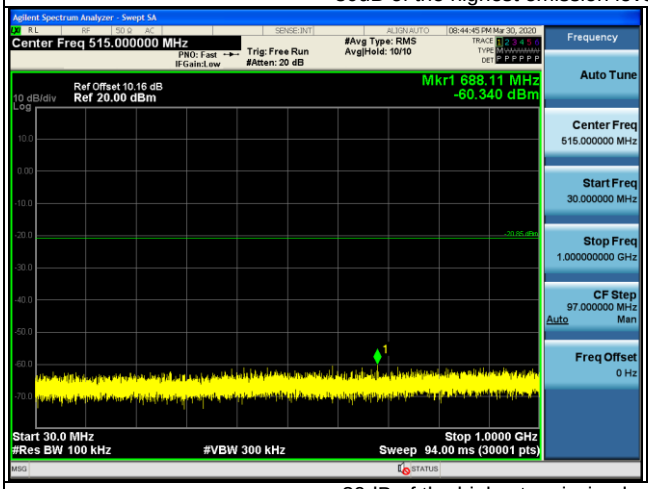
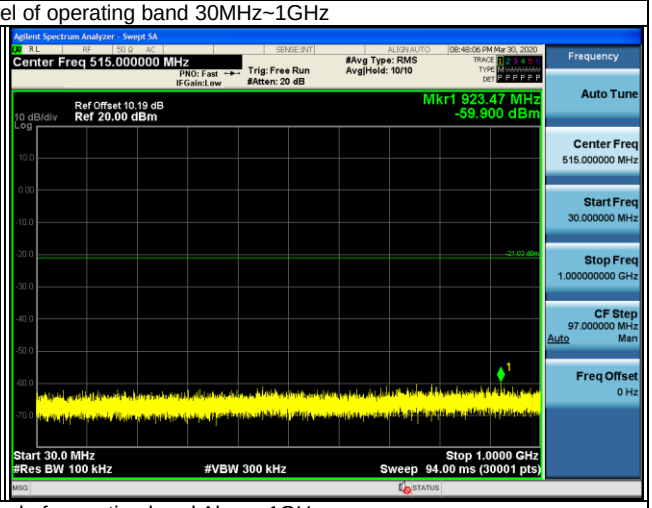
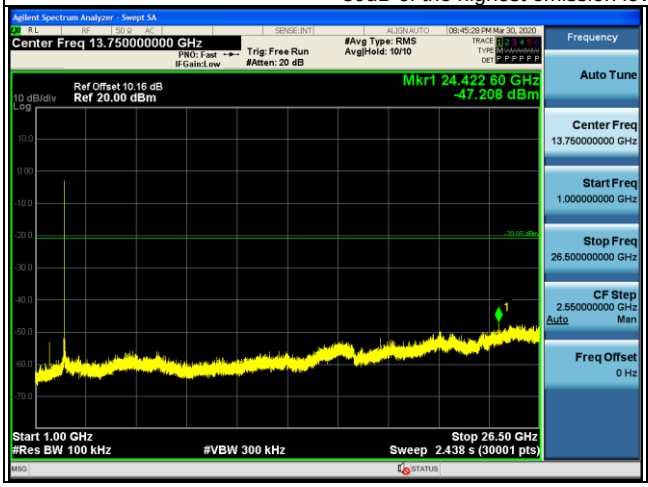
802.11b-Channel 1-2412MHz

Ant 0	Ant 1
Reference level(the highest emission level)	
	
–30dB of the highest emission level of operating band 30MHz~1GHz	
	
–30dB of the highest emission level of operating band Above 1GHz	
	

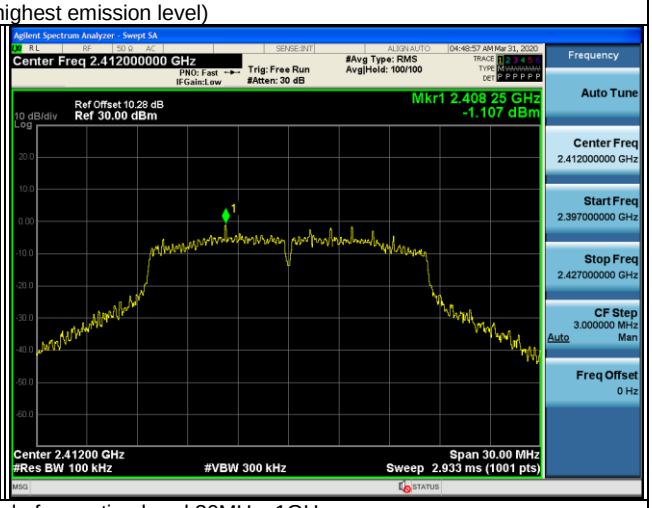
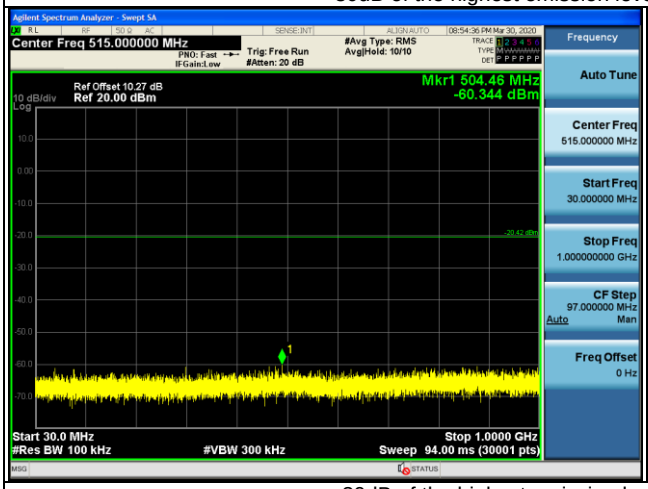
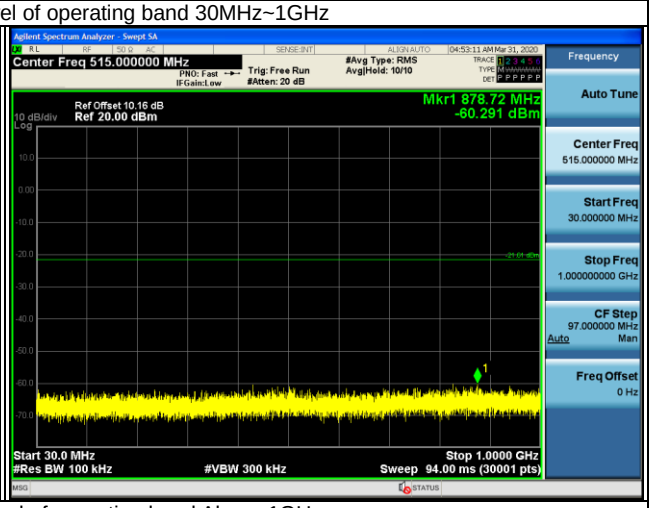
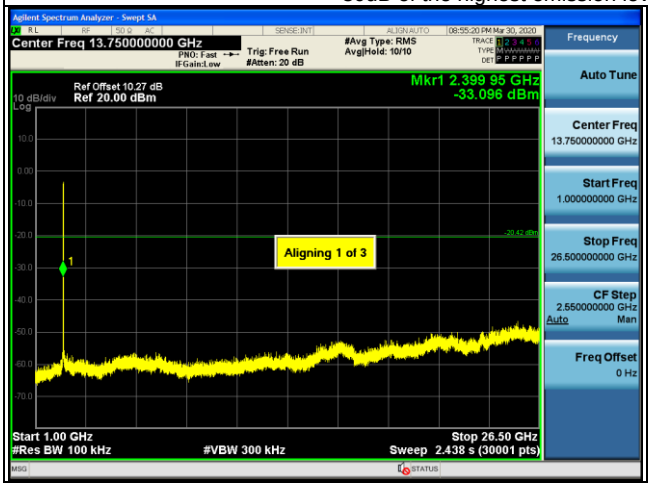
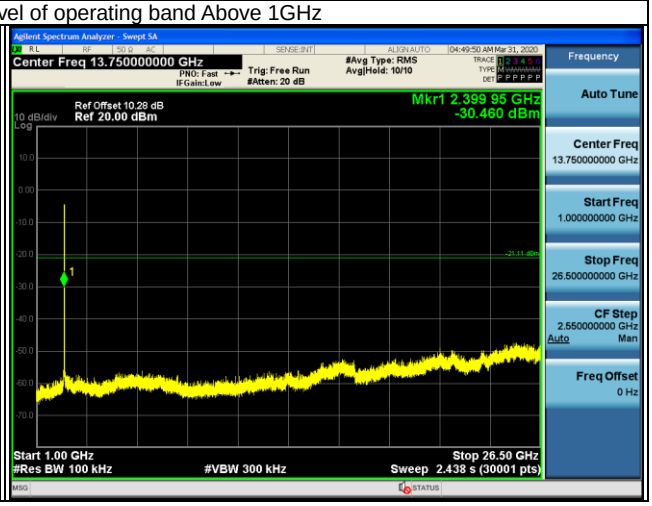
802.11b-Channel 6-2437MHz

Ant 0	Ant 1
Reference level(the highest emission level)	
	
–30dB of the highest emission level of operating band 30MHz~1GHz	
	
–30dB of the highest emission level of operating band Above 1GHz	
	

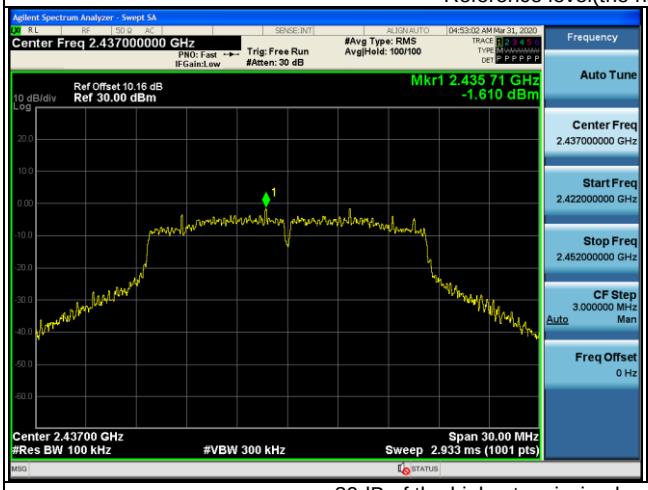
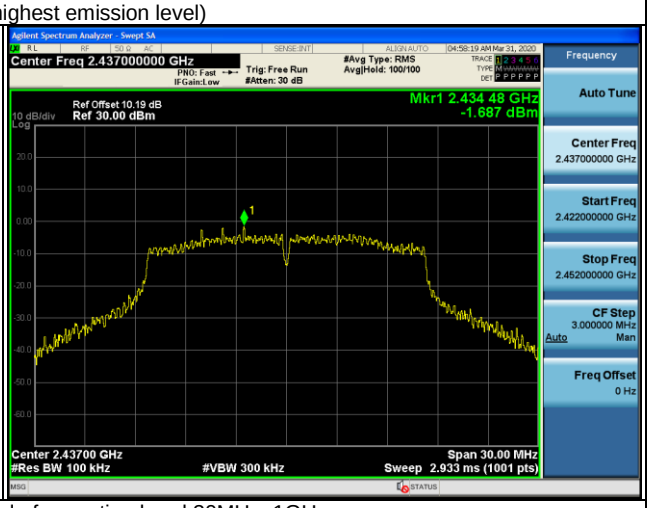
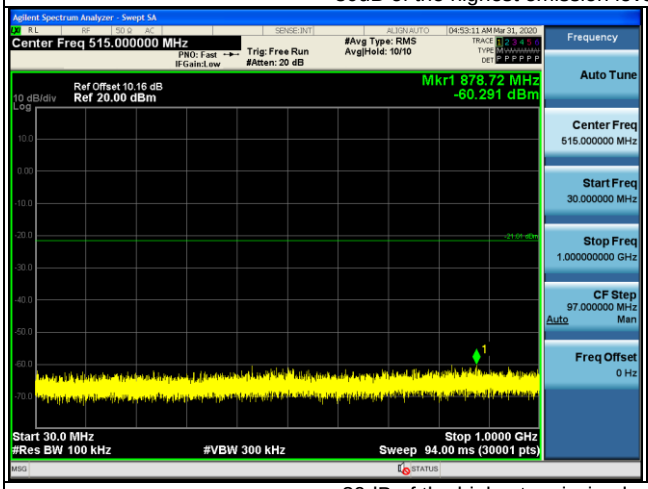
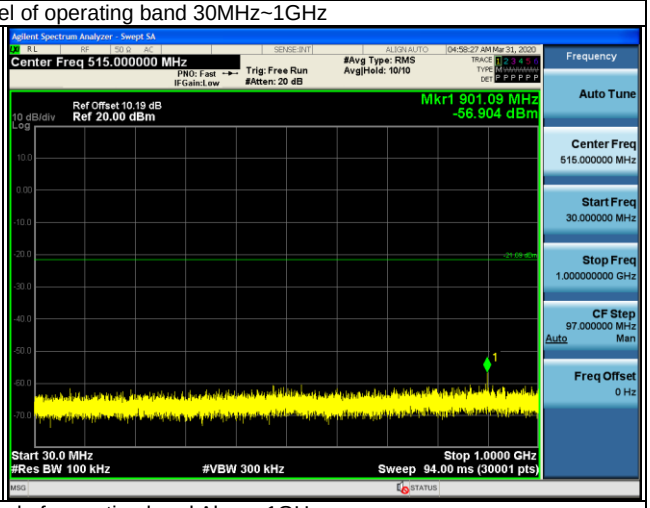
802.11b-Channel 11-2462MHz

Ant 0	Ant 1
Reference level(the highest emission level)	
	
–30dB of the highest emission level of operating band 30MHz~1GHz	
	
–30dB of the highest emission level of operating band Above 1GHz	
	

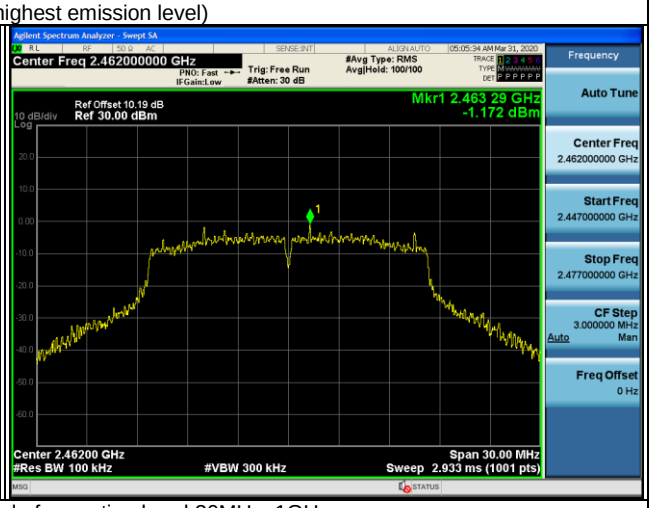
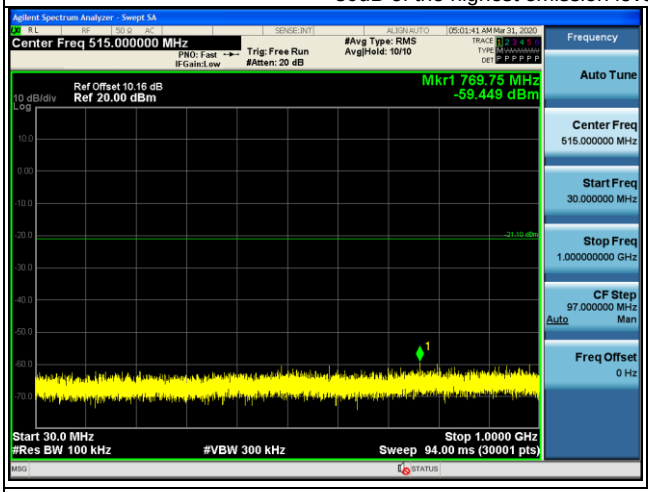
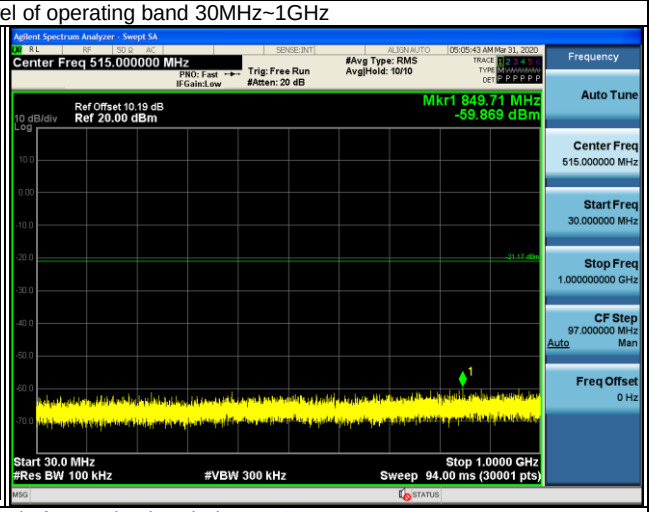
802.11g-Channel 1-2412MHz

Ant 0	Ant 1
Reference level(the highest emission level)	
	
–30dB of the highest emission level of operating band 30MHz~1GHz	
	
–30dB of the highest emission level of operating band Above 1GHz	
	

802.11g-Channel 6-2437MHz

Ant 0	Ant 1
Reference level(the highest emission level)	
	
–30dB of the highest emission level of operating band 30MHz~1GHz	
	
–30dB of the highest emission level of operating band Above 1GHz	
	

802.11g-Channel 11-2462MHz

Ant 0	Ant 1
Reference level(the highest emission level)	
	
–30dB of the highest emission level of operating band 30MHz~1GHz	
	
–30dB of the highest emission level of operating band Above 1GHz