



# FCC RF Test Report

**APPLICANT** : TCL Communication Ltd.  
**EQUIPMENT** : GSM/UMTS/LTE Mobile phone  
**BRAND NAME** : TCL  
**MODEL NAME** : T608DL  
**FCC ID** : 2ACCJH170  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : (DTS) Digital Transmission System  
**TEST DATE(S)** : Nov. 16, 2022 ~ Dec. 03, 2022

We, Sporton International Inc. (Shenzhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.

*Jason Jia*



Approved by: Jason Jia

**Sporton International Inc. (ShenZhen)**

**1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055**

**People's Republic of China**



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## SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	99% Bandwidth	-	Report Only	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 0.10 dB at 2483.580 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 8.33 dB at 5.080 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass	-

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits.

**Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.



# 1 General Description

## 1.1 Applicant

TCL Communication Ltd.

5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong

## 1.2 Manufacturer

TCL Communication Ltd.

5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong

## 1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM/UMTS/LTE Mobile phone
Brand Name	TCL
Model Name	T608DL
FCC ID	2ACCJH170
IMEI Code	Conducted: 016329000012588 Conduction: 016329000012034 Radiation: 016329000012208
HW Version	03
SW Version	4DS6
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to antenna	802.11b : 21.41 dBm (0.1384 W) 802.11g : 23.93 dBm (0.2472 W) 802.11n HT20 : 23.95 dBm (0.2483 W) 802.11n HT40 : 24.15 dBm (0.2600 W)
99% Occupied Bandwidth	802.11b : 12.74MHz 802.11g : 16.93MHz 802.11n HT20 : 18.08MHz 802.11n HT40 : 36.96MHz
Antenna Type / Gain	FPC Antenna with gain 3.66 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

## 1.5 Modification of EUT

No modifications are made to the EUT during all test items.



## 1.6 Testing Location

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

<b>Test Firm</b>	Sporton International Inc. (Shenzhen)		
<b>Test Site Location</b>	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	CO01-SZ TH01-SZ	CN1256	421272

<b>Test Firm</b>	Sporton International Inc. (Shenzhen)		
<b>Test Site Location</b>	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City Guangdong Province China 518103 TEL: +86-755-33202398		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	03CH01-SZ	CN1256	421272

## 1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH01-SZ	AUDIX	E3	6.2009-8-24
2.	CO01-SZ	AUDIX	E3	6.120613b

## 1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 15 Subpart C §15.247
- ♦ FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ♦ ANSI C63.10-2013

### Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



## 2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

### 2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		



## 2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

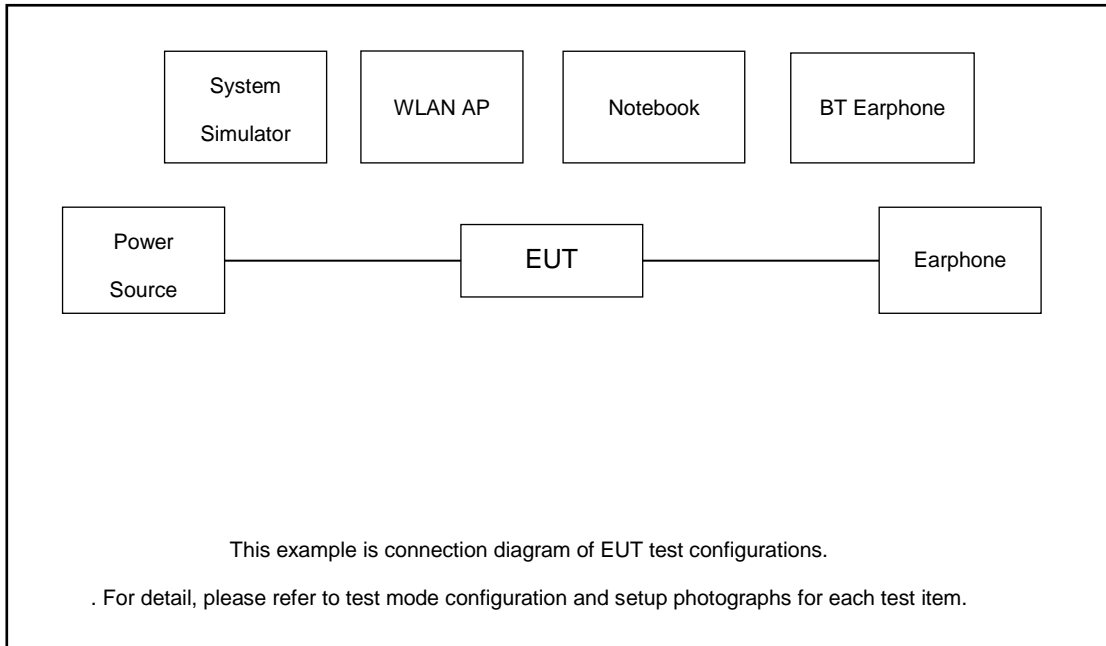
RSE Co-location
LTE Band 13 Link + BLE 1M CH39 Tx
LTE Band 13 Link + 802.11n HT40 CH09 Tx

Test Cases	
<b>AC Conducted Emission</b>	Mode 1 :GSM850 Idle + Bluetooth Link + USB Cable (Charging from Adapter 1) + Earphone + Battery Mode 2 :GSM850 Idle + WLAN Link (2.4G) + USB Cable (Charging from Adapter 1) + Earphone + Battery
<b>Remark:</b>	
<ol style="list-style-type: none"> <li>The worst case of conducted emission is mode 1; only the test data of it was reported.</li> <li>For Radiated Test Cases, The tests were performance with Adapter, Battery and USB Cable.</li> </ol>	

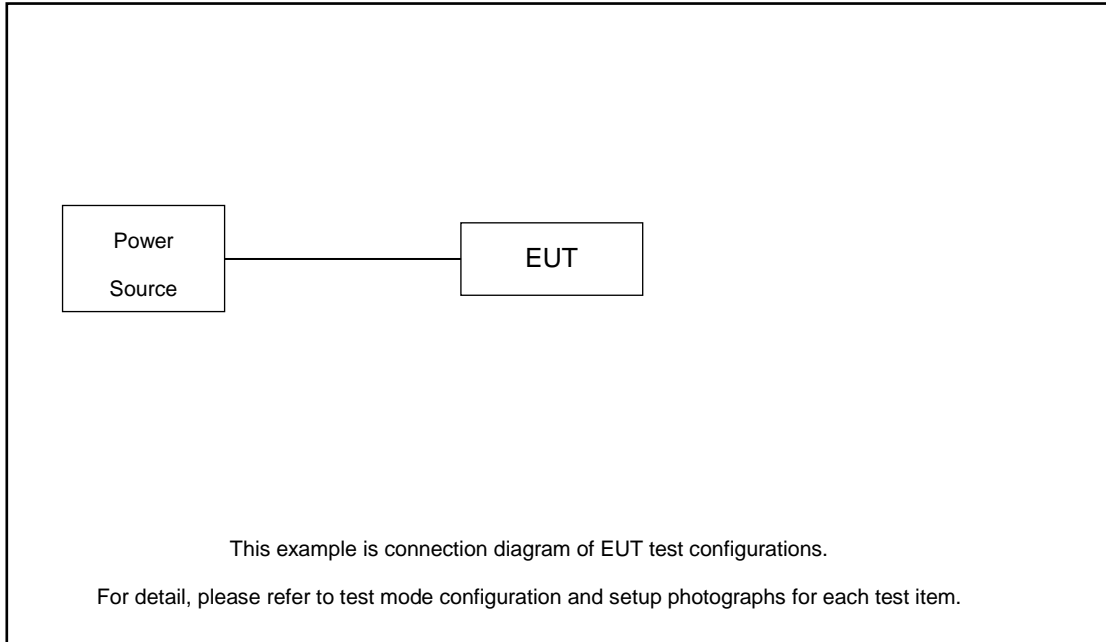


## 2.3 Connection Diagram of Test System

AC Conducted Emission:



Radiated Emission:





## 2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
2.	WLAN AP	Dlink	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
3.	Notebook	Lenovo	E540	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Samsung	EO-MG900	PYAHS-107W	N/A	N/A
5.	Earphone	Apple	DCAY1V-A900FZJW3-000	N/A	N/A	N/A

## 2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

## 2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

$$\text{Offset} = \text{RF cable loss} + \text{attenuator factor}.$$

Following shows an offset computation example with cable loss 1.5 dB and 10dB attenuator.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 1.5 + 10 = 11.5 \text{ (dB)} \end{aligned}$$

### 3 Test Result

#### 3.1 6dB and 99% Bandwidth Measurement

##### 3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

##### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

##### 3.1.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.8
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1%~5% of OBW and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

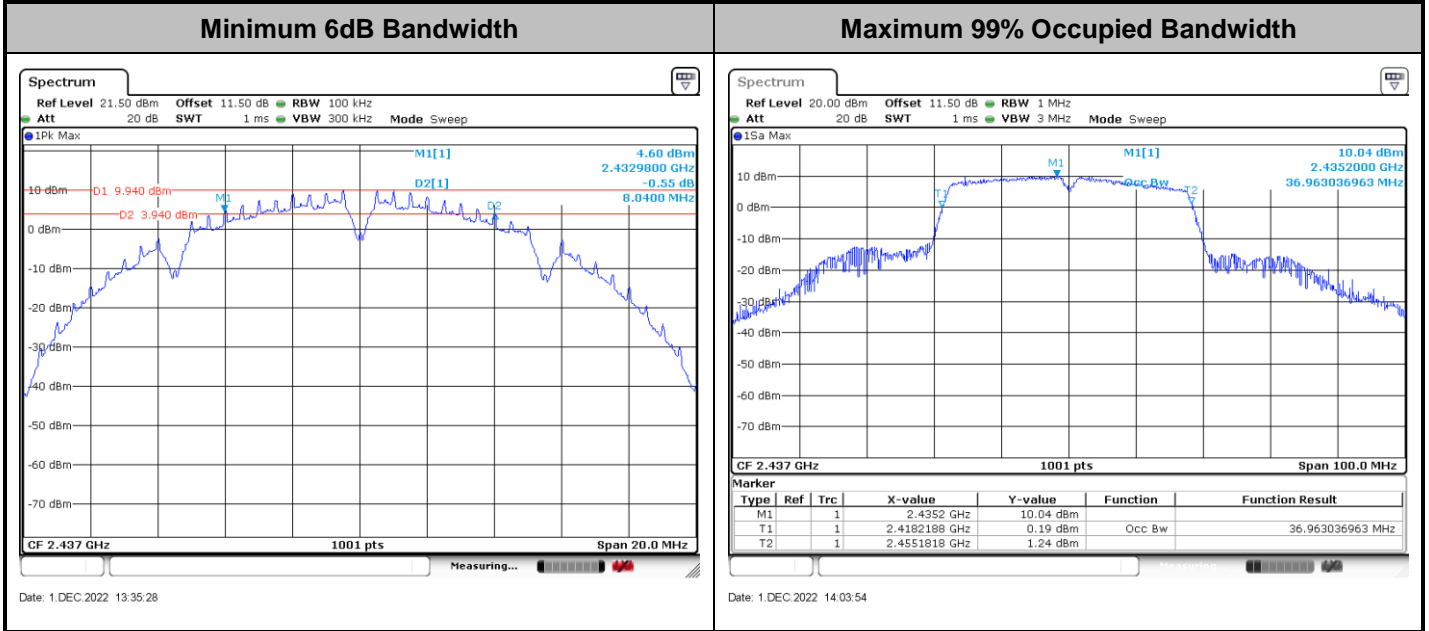
##### 3.1.4 Test Setup





### 3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.



Note : The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

## 3.2 Output Power Measurement

### 3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

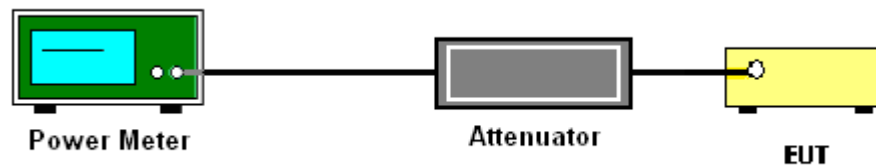
### 3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.3 PKPM1 Peak power meter or ANSI C63.10-2013 clause 11.9.2.3.1 Method AVGPM method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

### 3.2.4 Test Setup



### 3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

### 3.2.6 Test Result of Average Output Power (Reporting Only)

Please refer to Appendix A.

### 3.3 Power Spectral Density Measurement

#### 3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

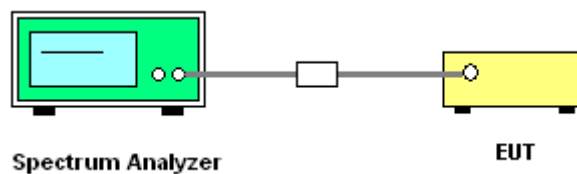
#### 3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.3.3 Test Procedures

1. The testing follows Measurement Procedure of ANSI C63.10-2013 clause 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

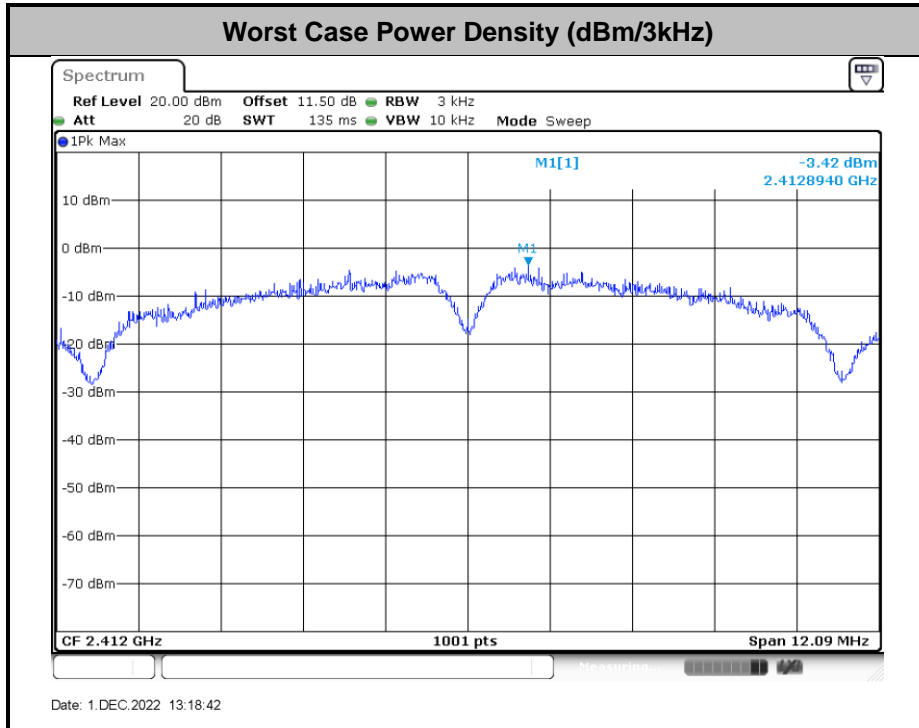
#### 3.3.4 Test Setup





### 3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



## 3.4 Conducted Band Edges and Spurious Emission Measurement

### 3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

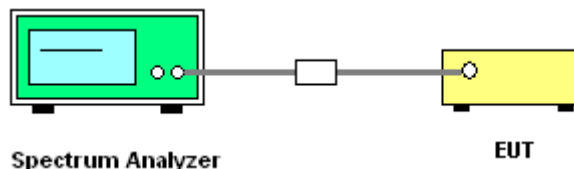
### 3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.4.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.13
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

### 3.4.4 Test Setup



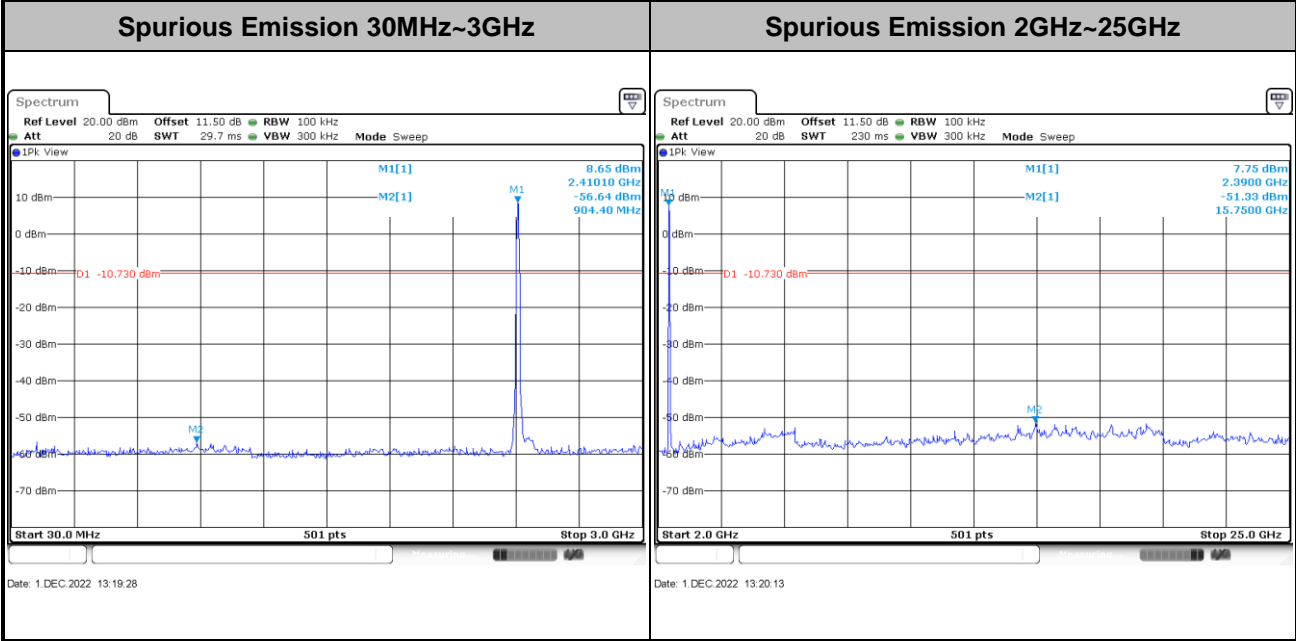
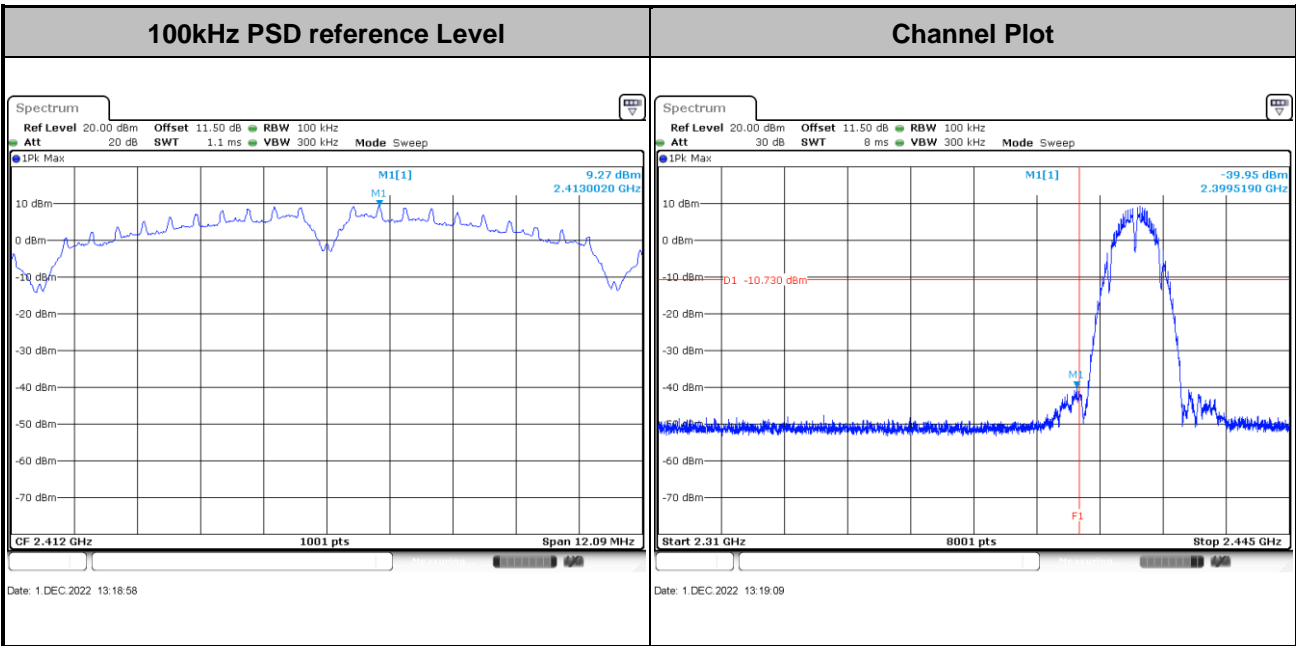




### 3.4.5 Test Result of Conducted Band Edges and Spurious Emission

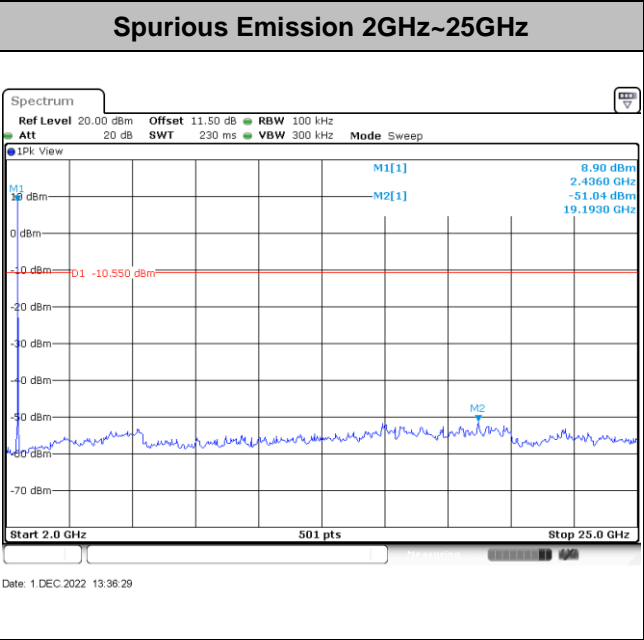
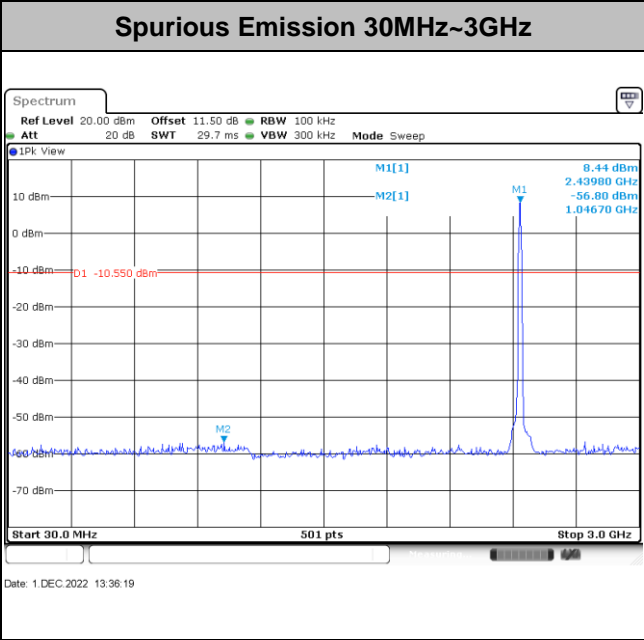
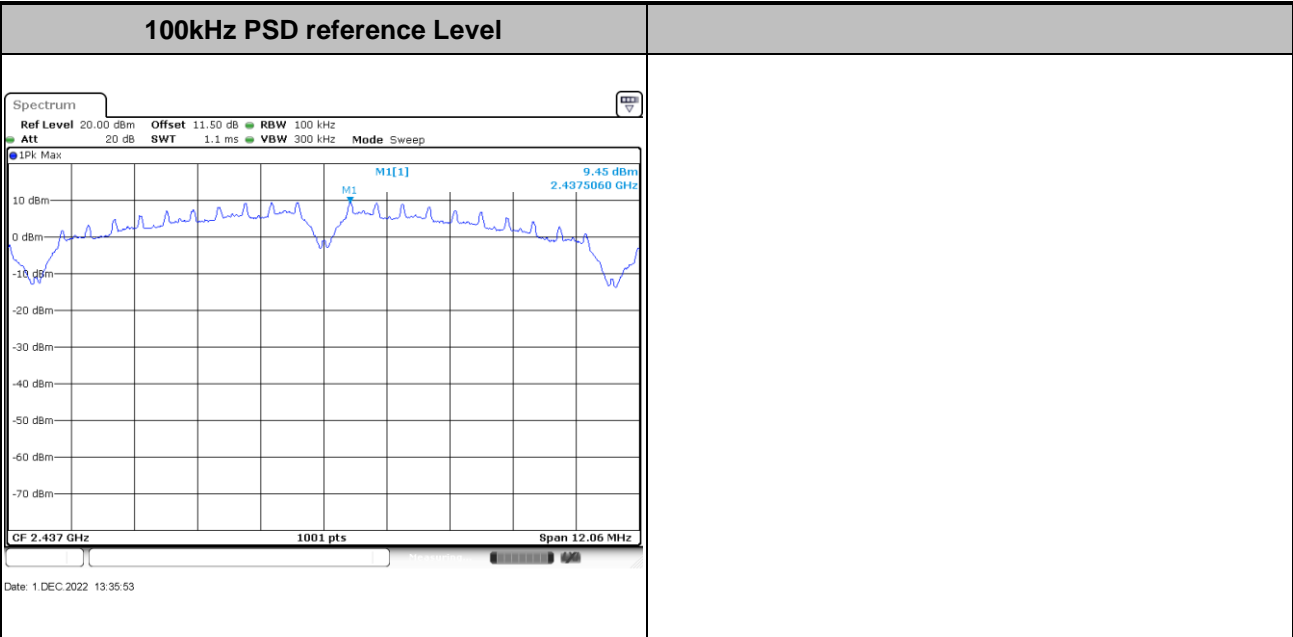
Test Engineer : Chen Ran	Temperature :	24~26°C
	Relative Humidity :	50~53%

Test Mode :	802.11b	Test Channel :	01
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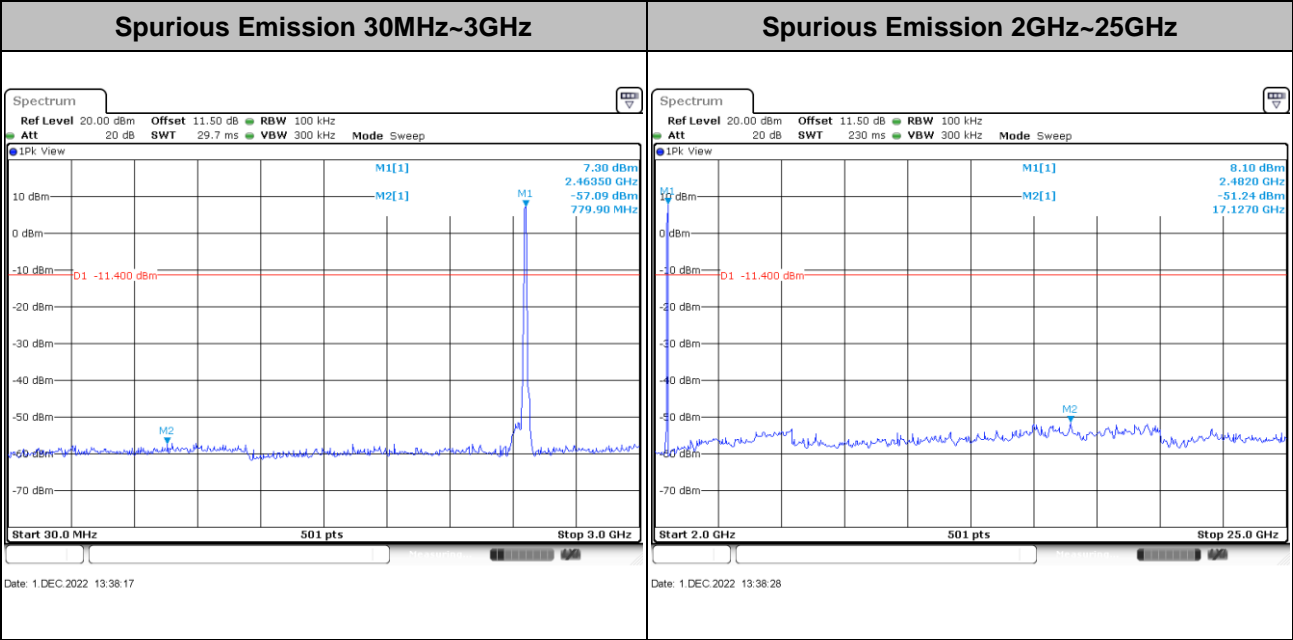
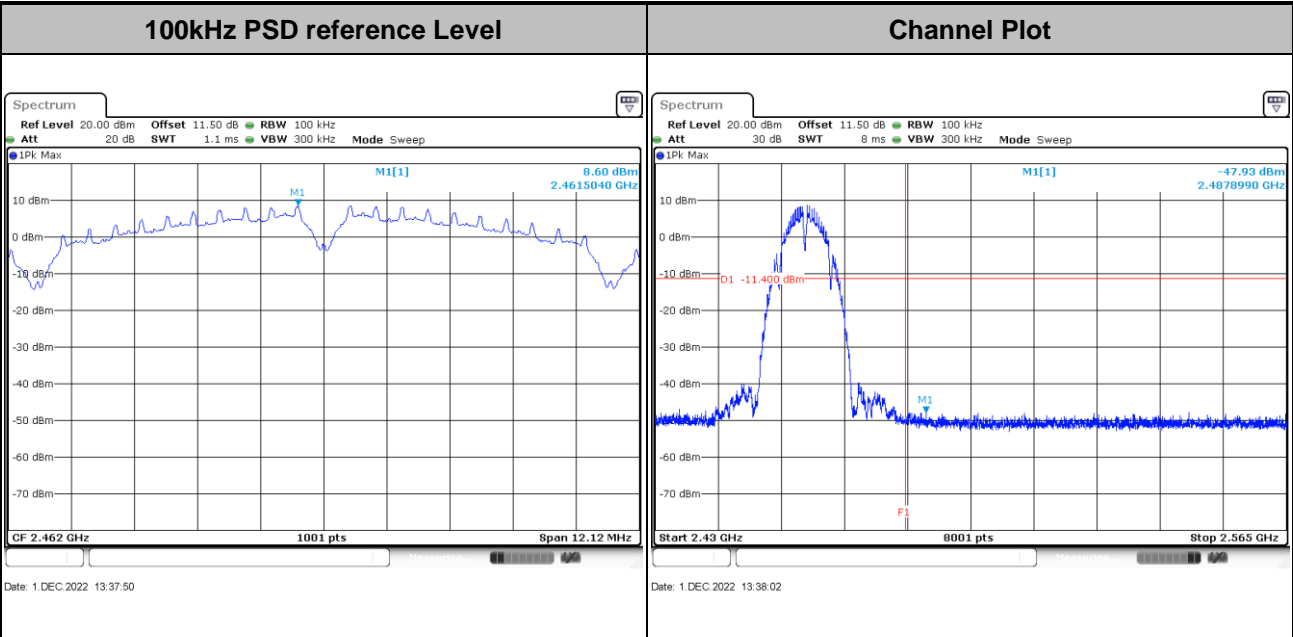


Test Mode :	802.11b	Test Channel :	06
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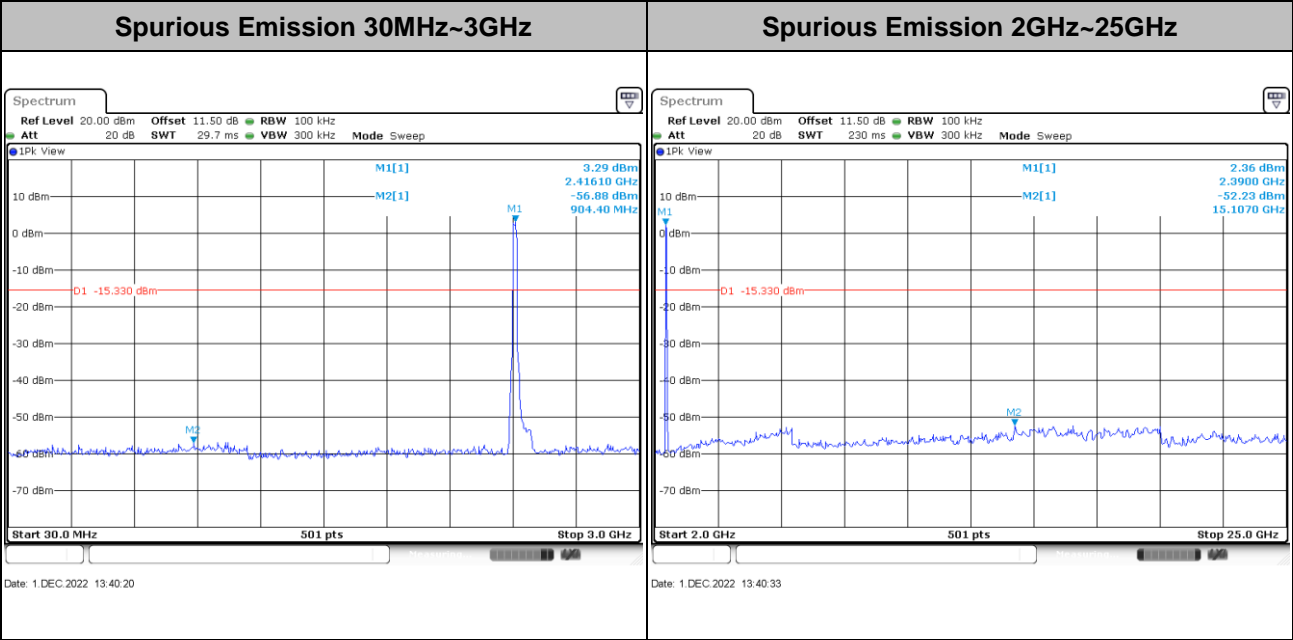
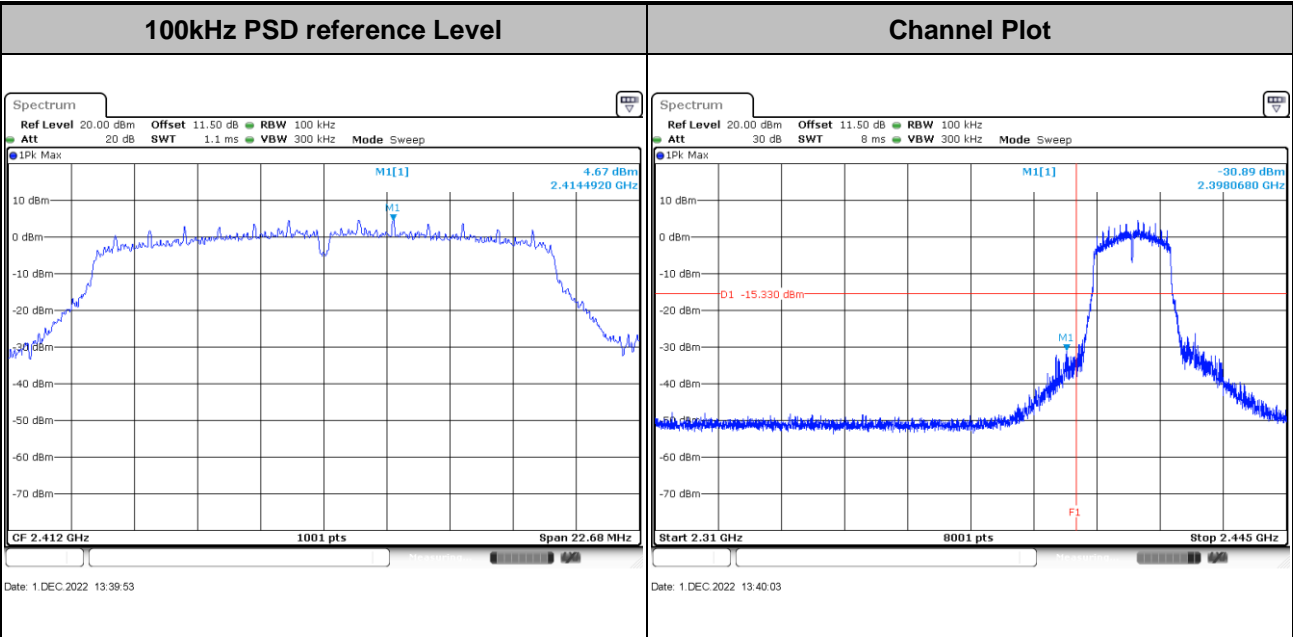


Test Mode :	802.11b	Test Channel :	11
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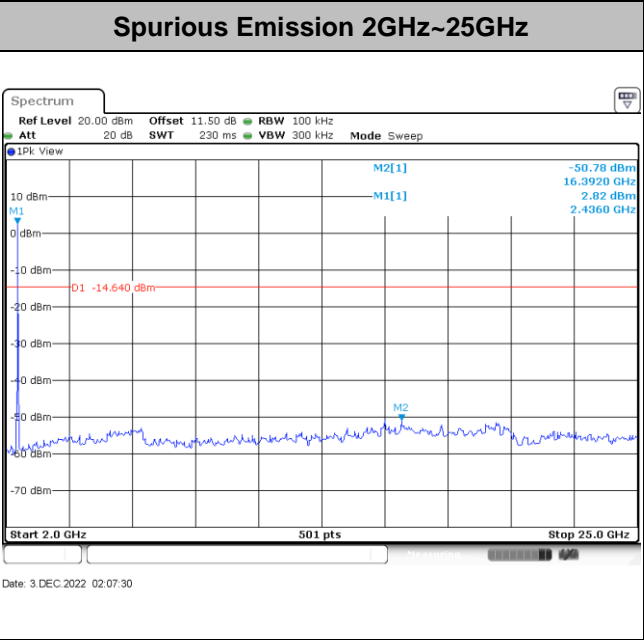
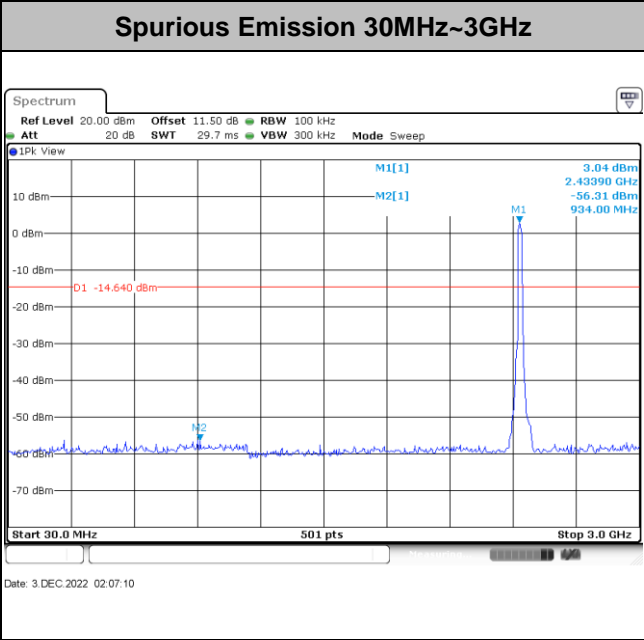
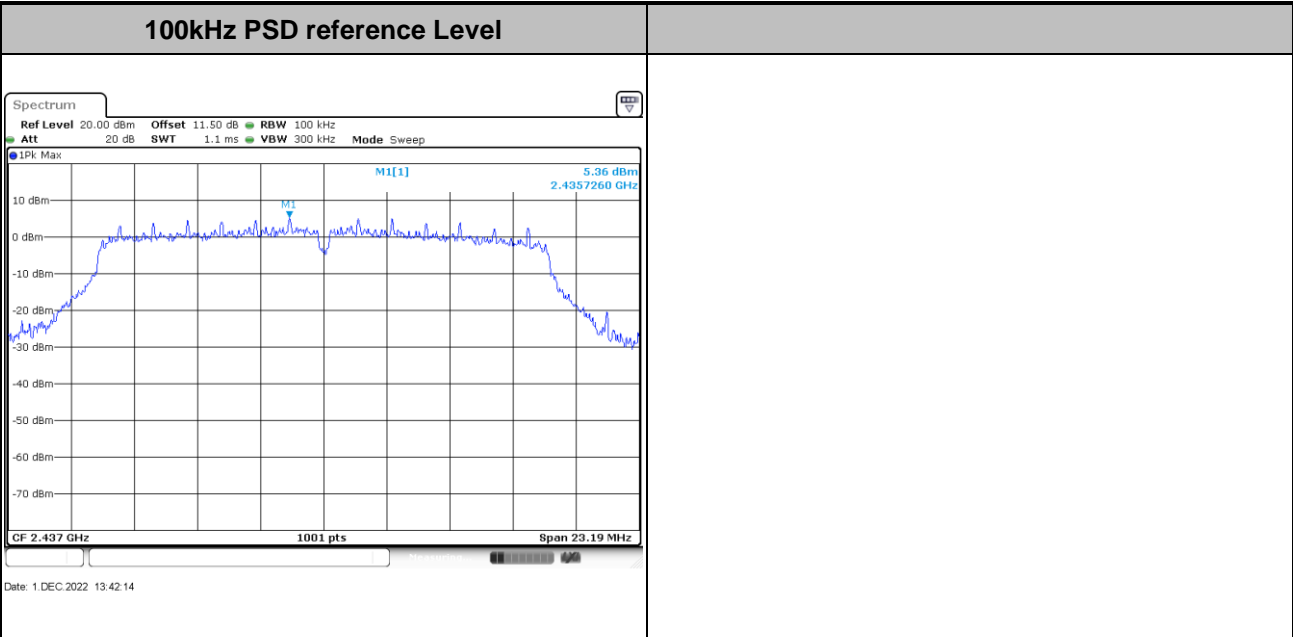


Test Mode : 802.11g Test Channel : 01



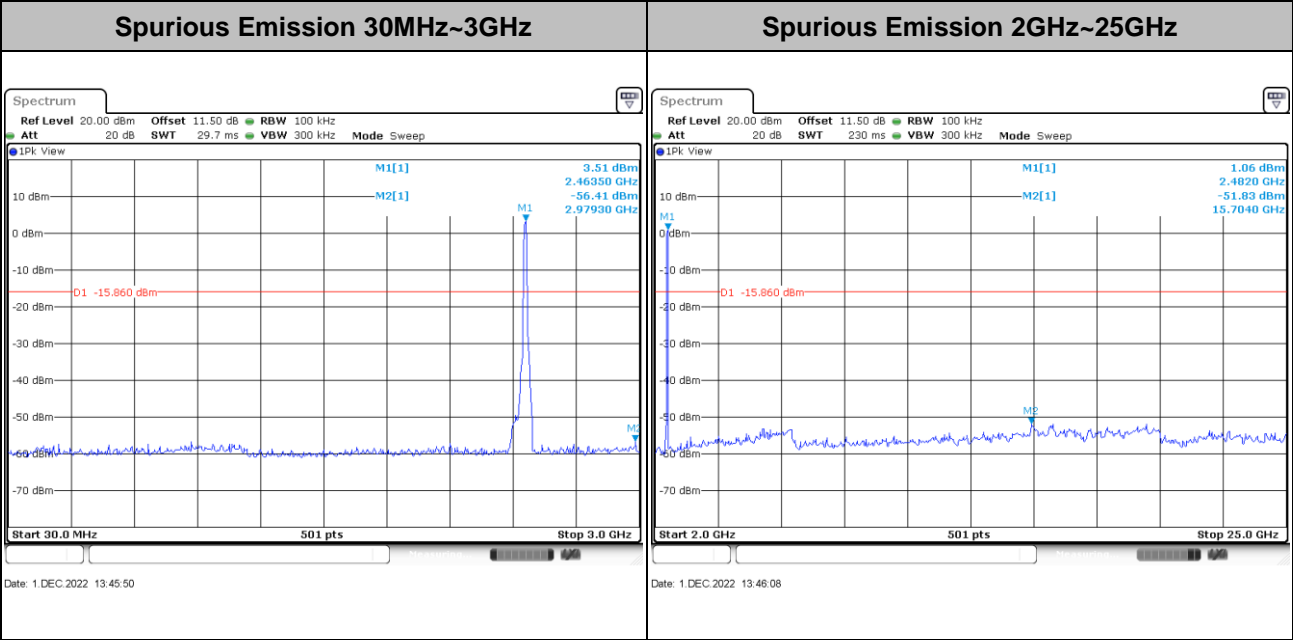
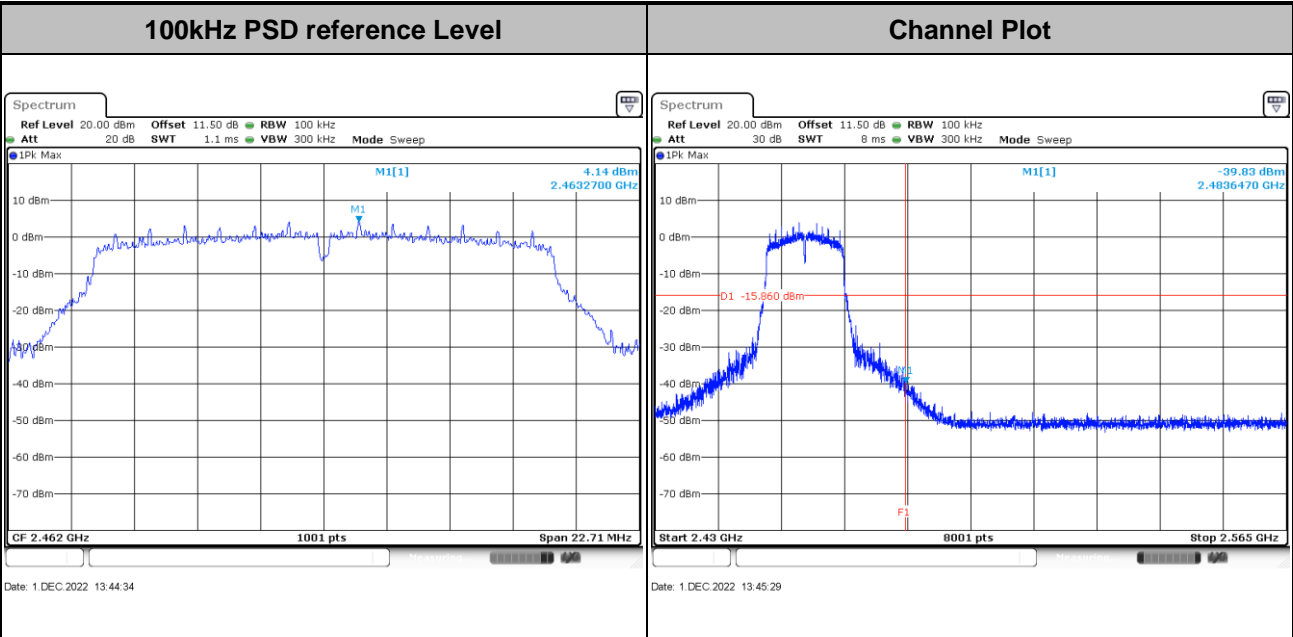


Test Mode :	802.11g	Test Channel :	06
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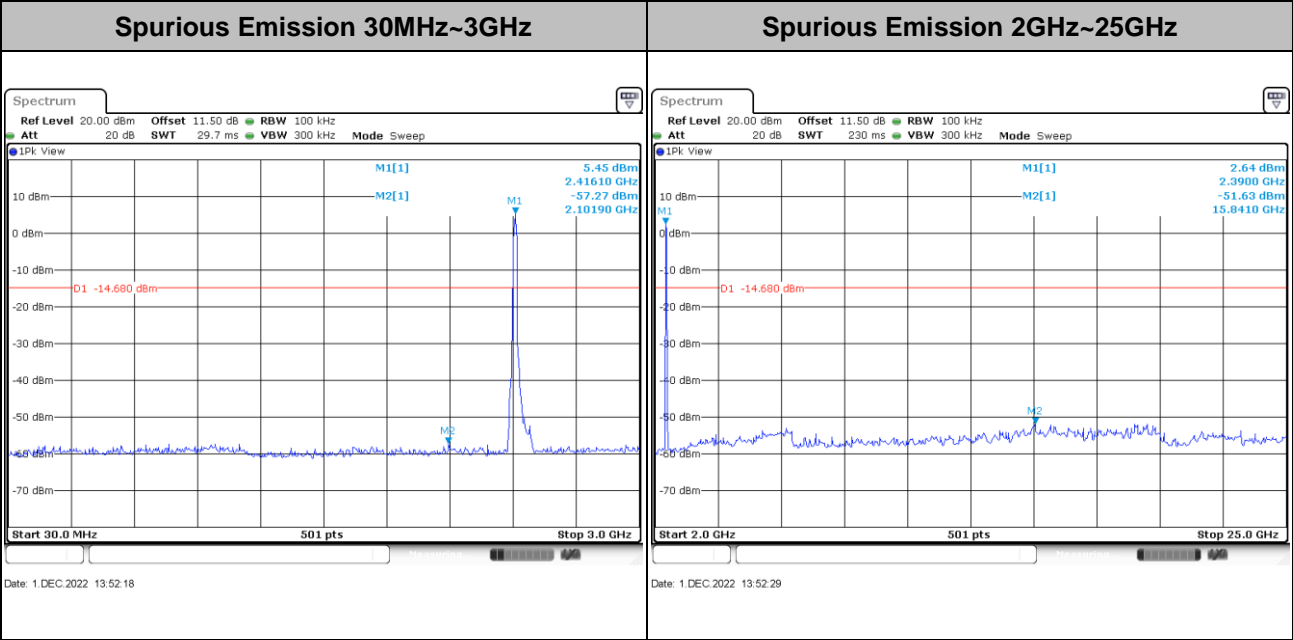
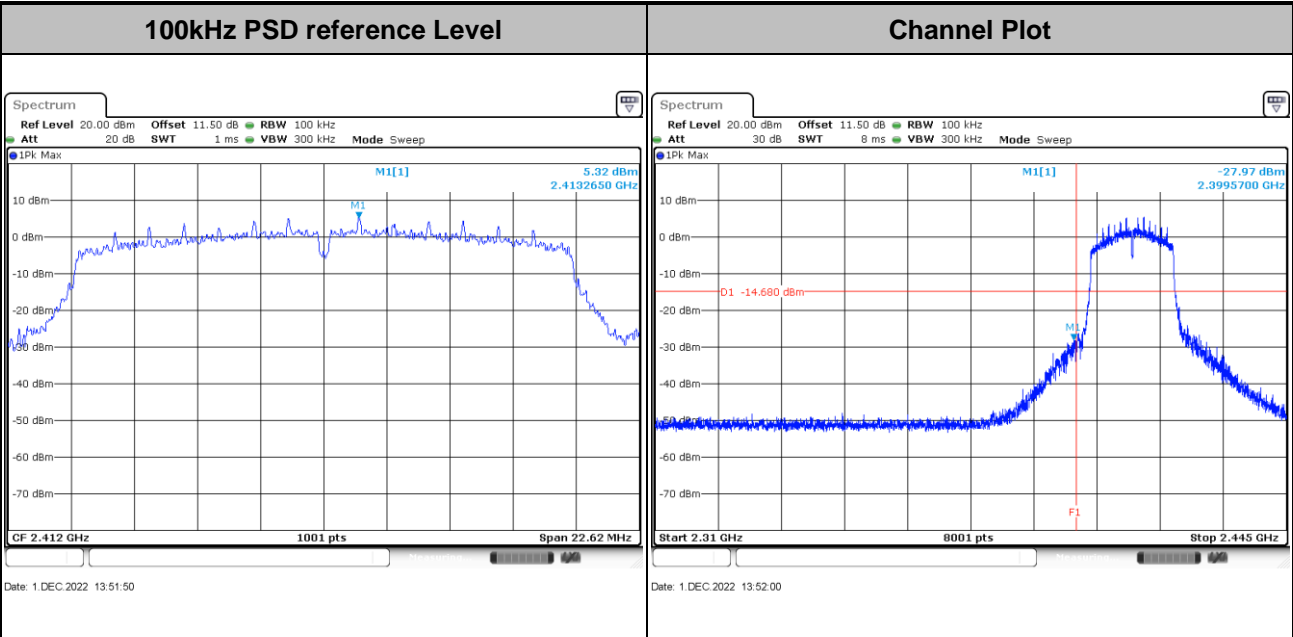


Test Mode :	802.11g	Test Channel :	11
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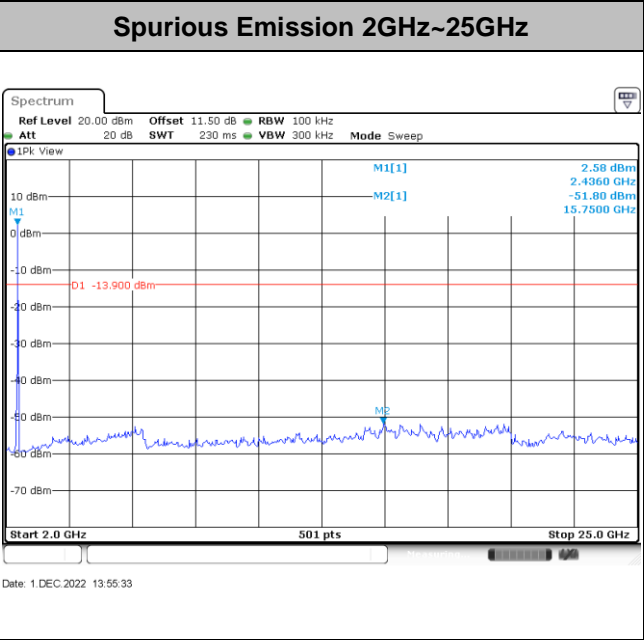
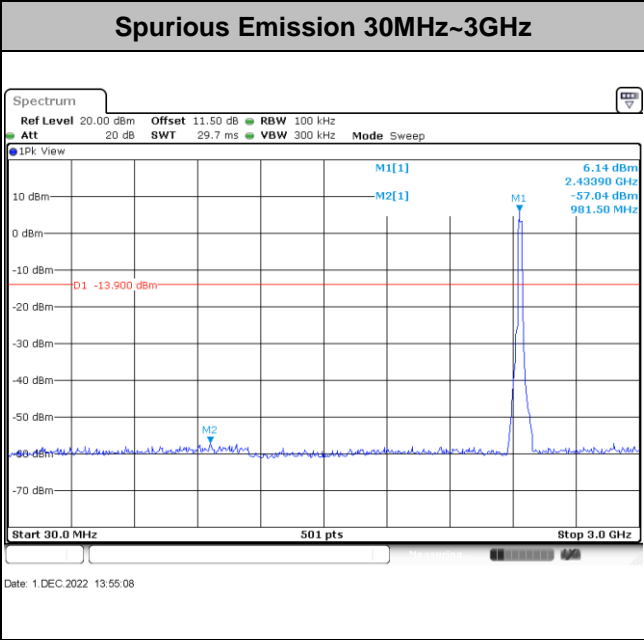
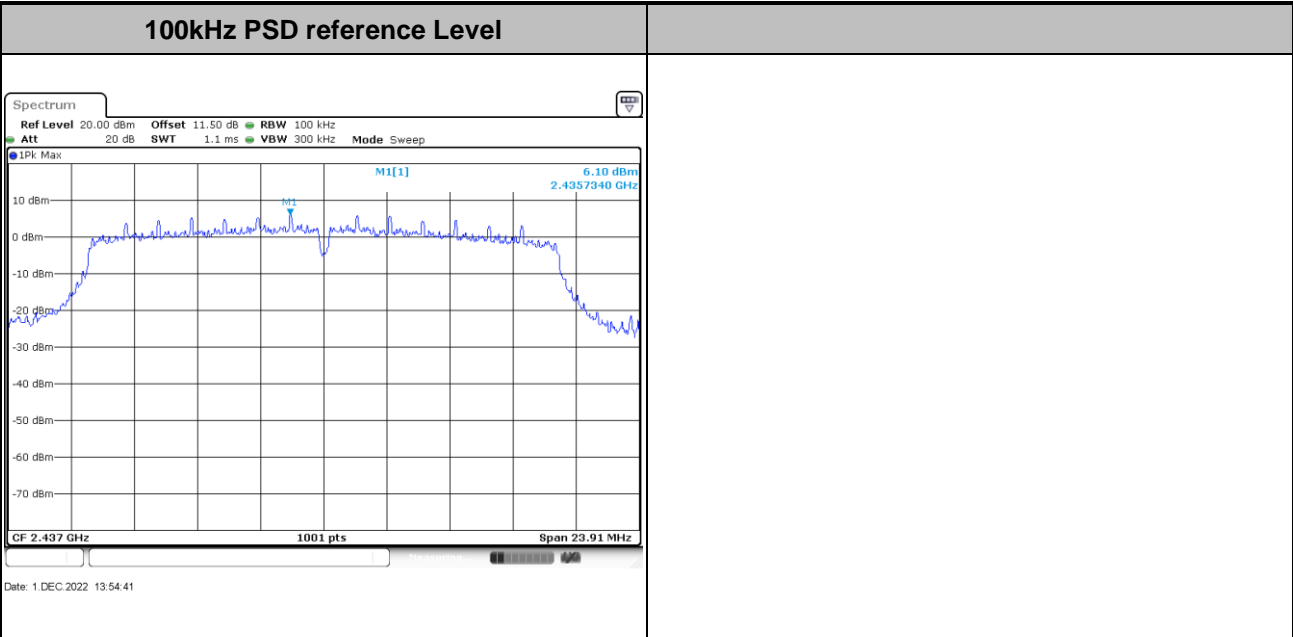


Test Mode : 802.11n HT20 Test Channel : 01





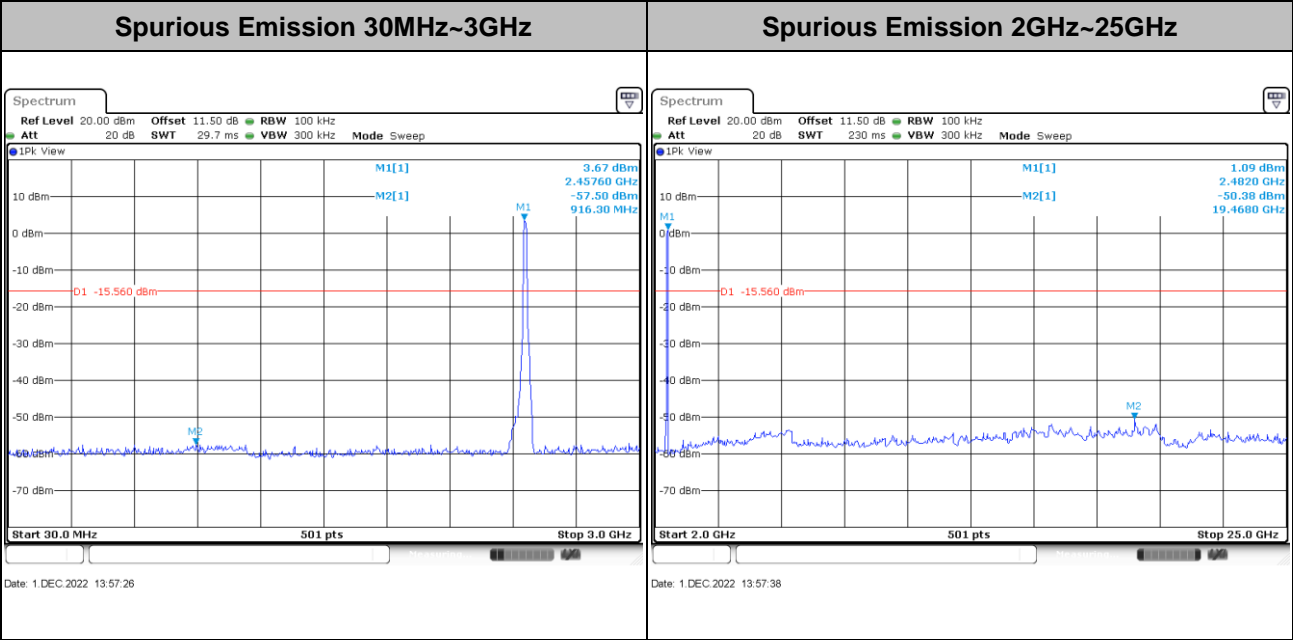
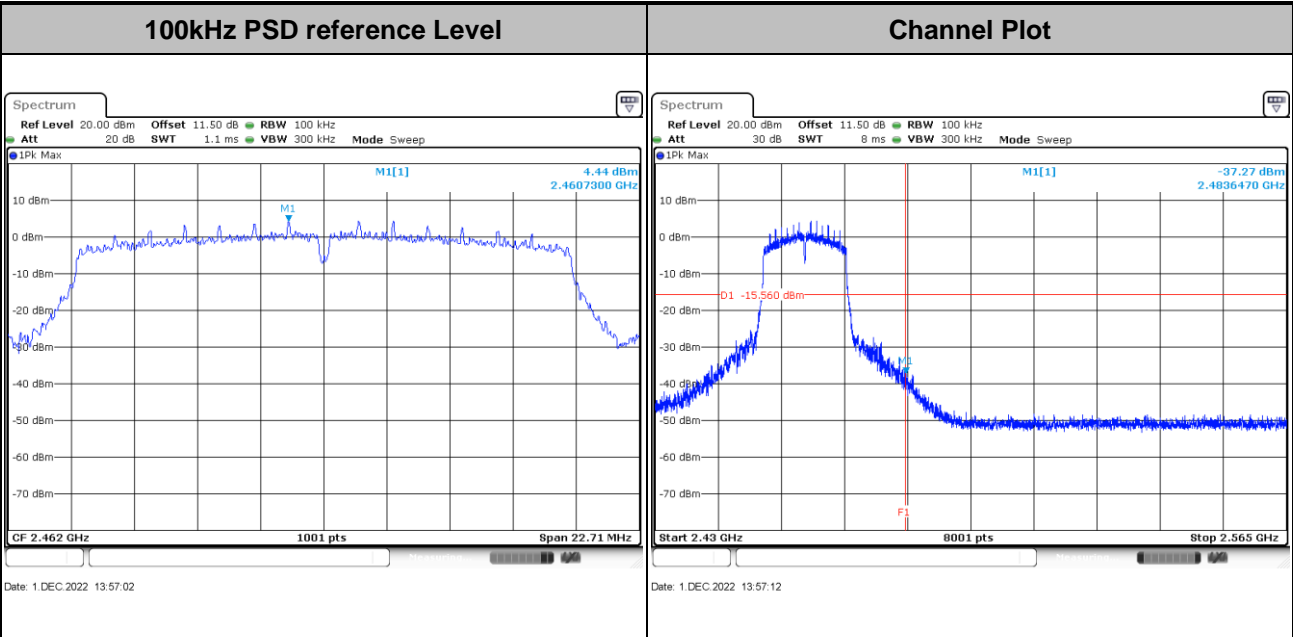
Test Mode :	802.11n HT20	Test Channel :	06
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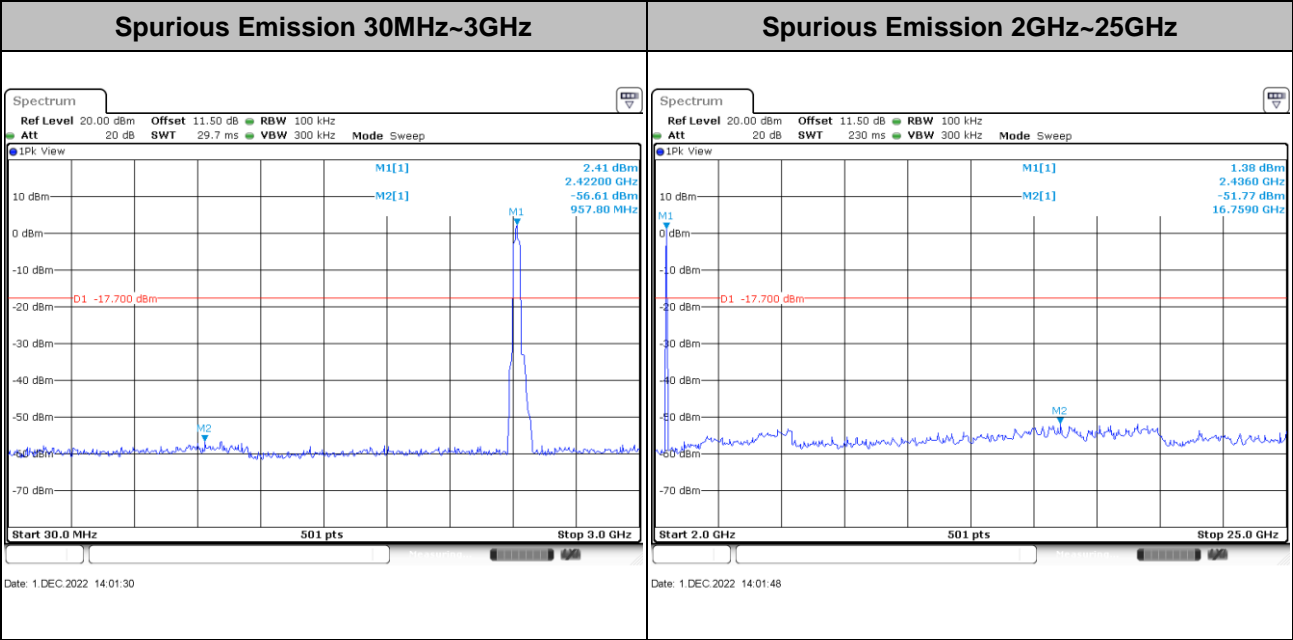
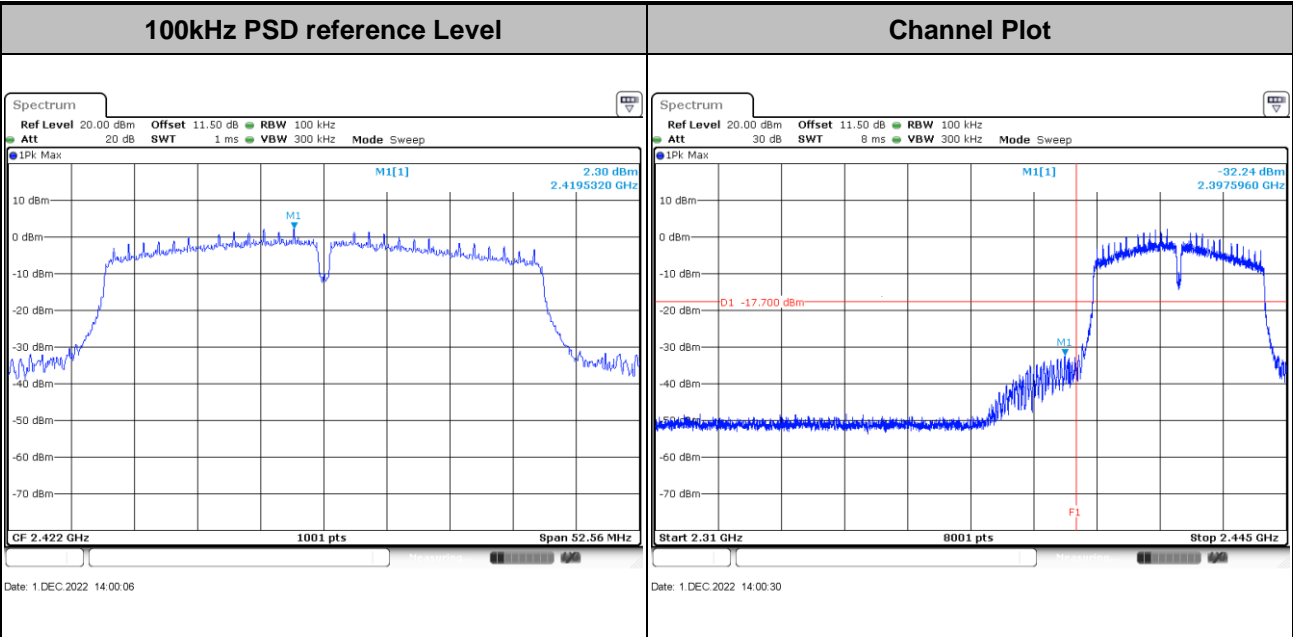


Test Mode :	802.11n HT20	Test Channel :	11
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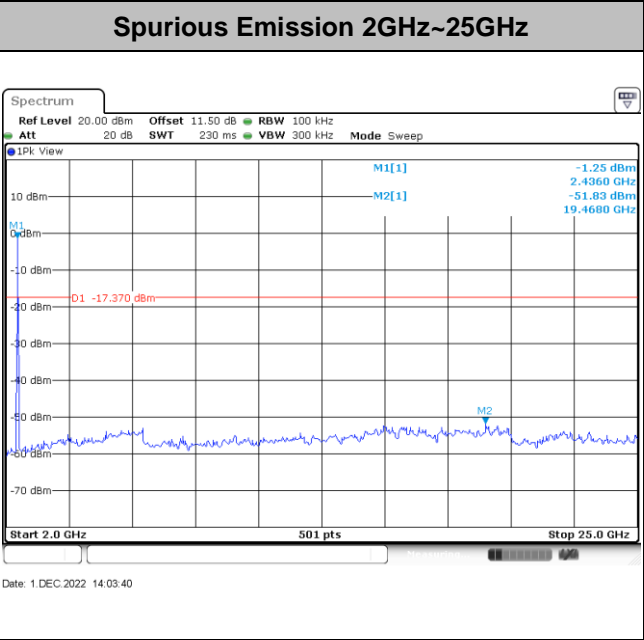
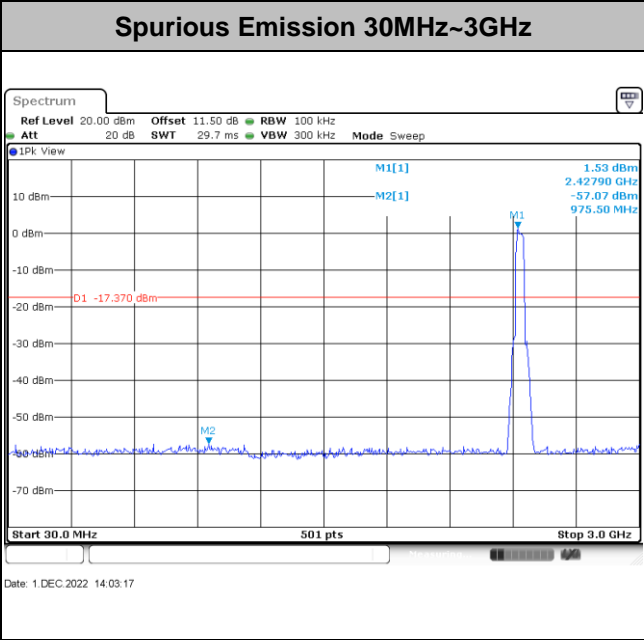
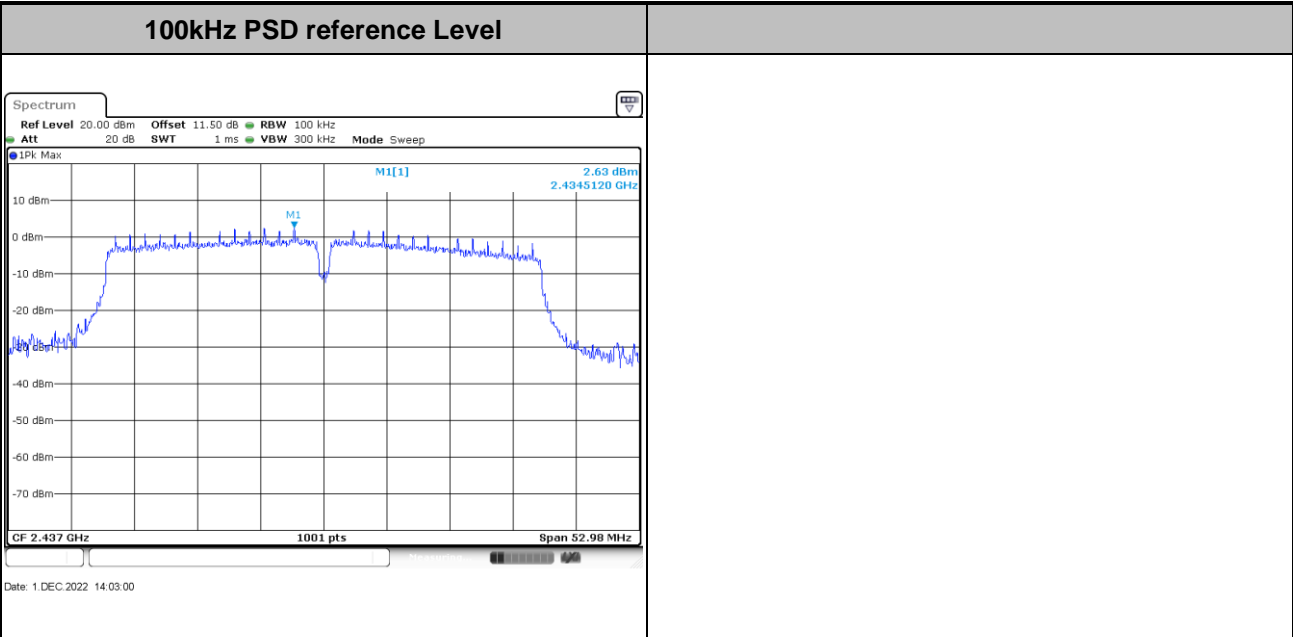


Test Mode : 802.11n HT40      Test Channel : 03



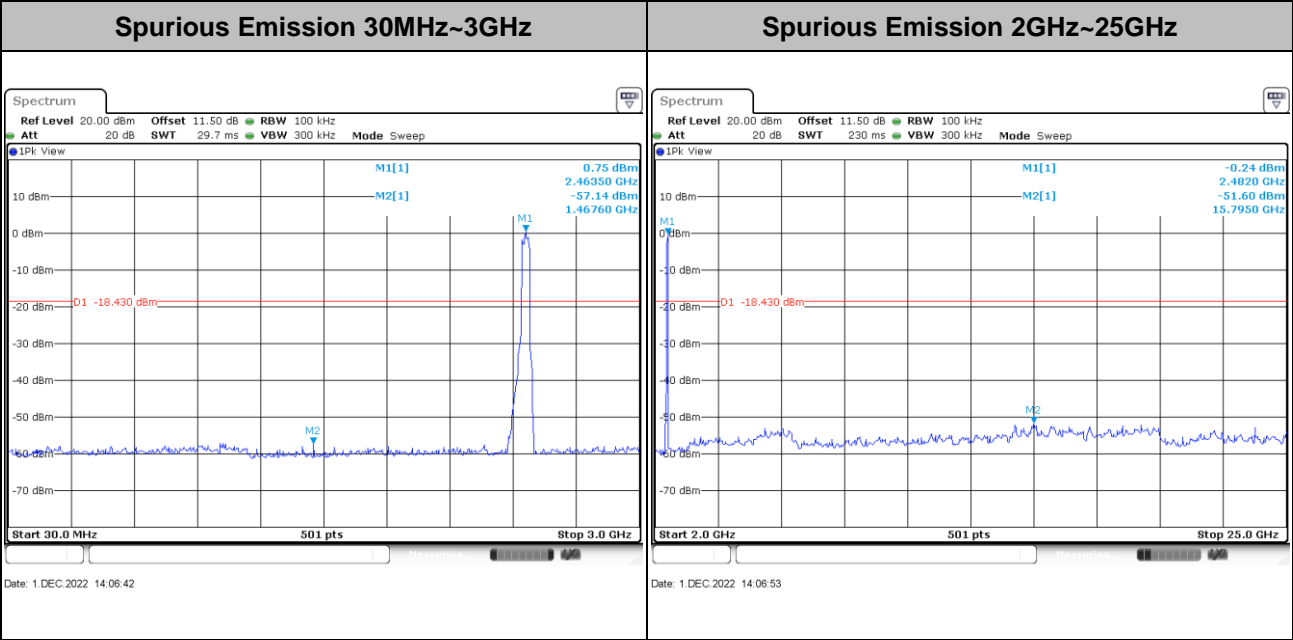
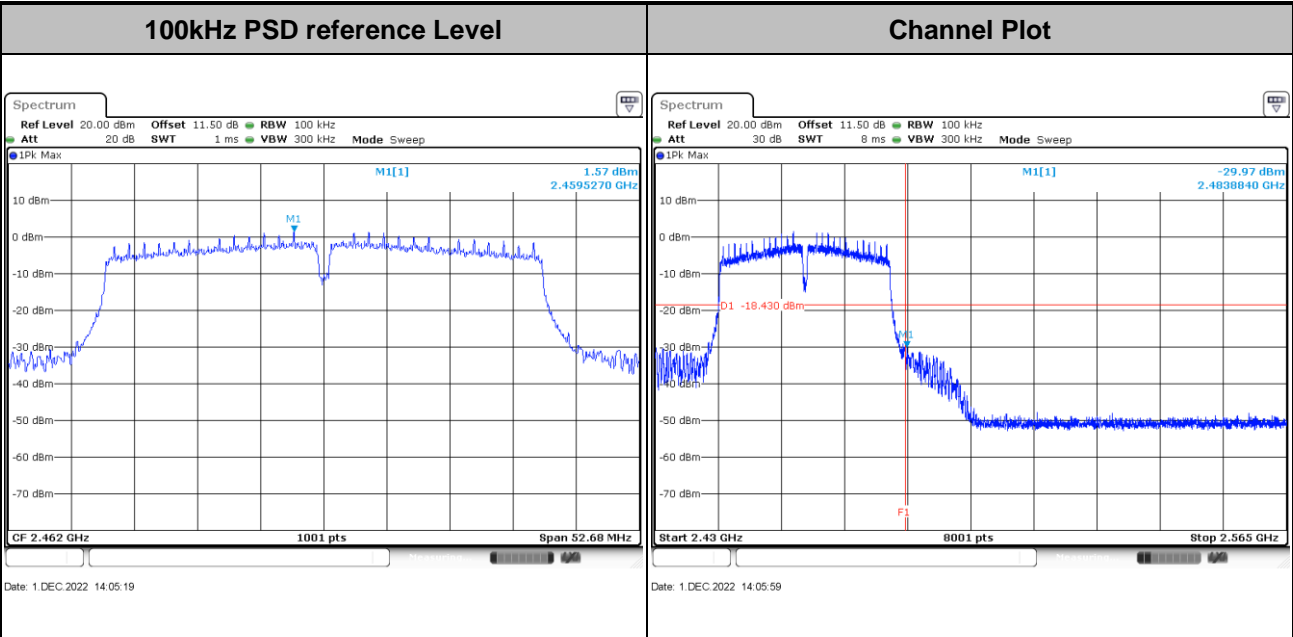


Test Mode :	802.11n HT40	Test Channel :	06
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Test Mode : 802.11n HT40      Test Channel : 09





### 3.5 Radiated Band Edges and Spurious Emission Measurement

#### 3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (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

#### 3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

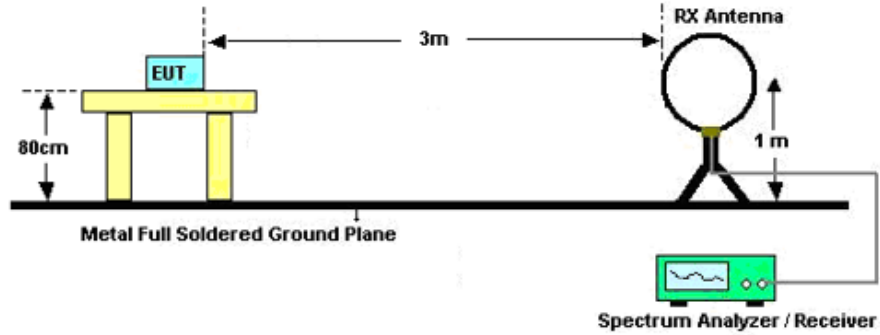


### 3.5.3 Test Procedures

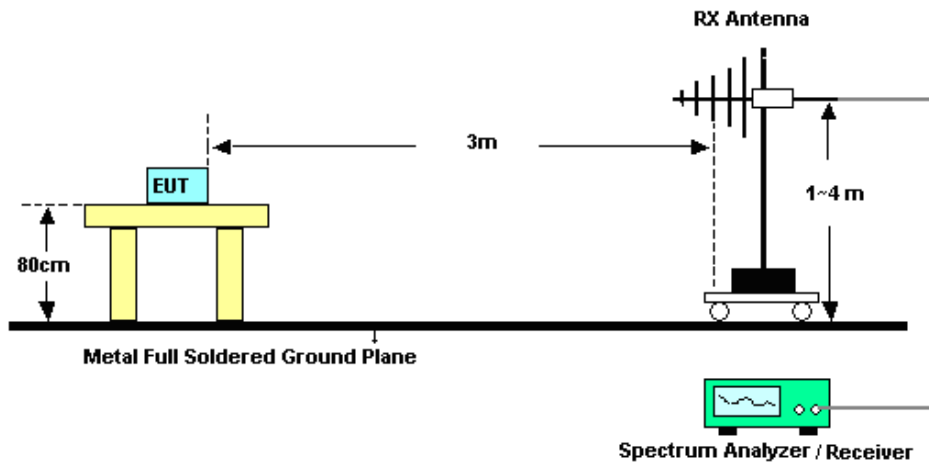
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than peak limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW=100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz, VBW= 3MHz for  $f \geq 1$  GHz for peak measurement.  
For average measurement:
    - VBW = 10 Hz, when duty cycle is no less than 98 percent.
    - VBW  $\geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

### 3.5.4 Test Setup

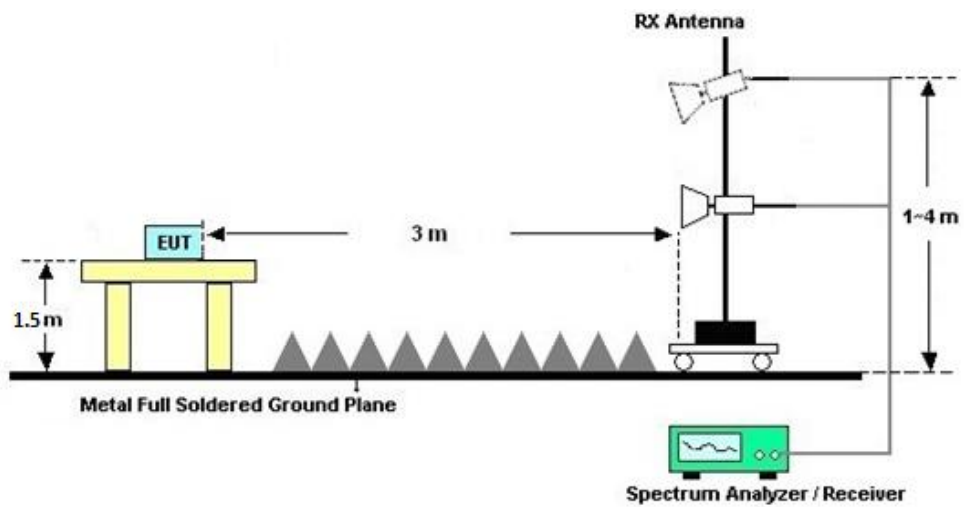
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





### **3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)**

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

### **3.5.6 Test Result of Radiated Spurious at Band Edges**

Please refer to Appendix C.

### **3.5.7 Duty Cycle**

Please refer to Appendix D.

### **3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)**

Please refer to Appendix C.





### 3.6 AC Conducted Emission Measurement

#### 3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

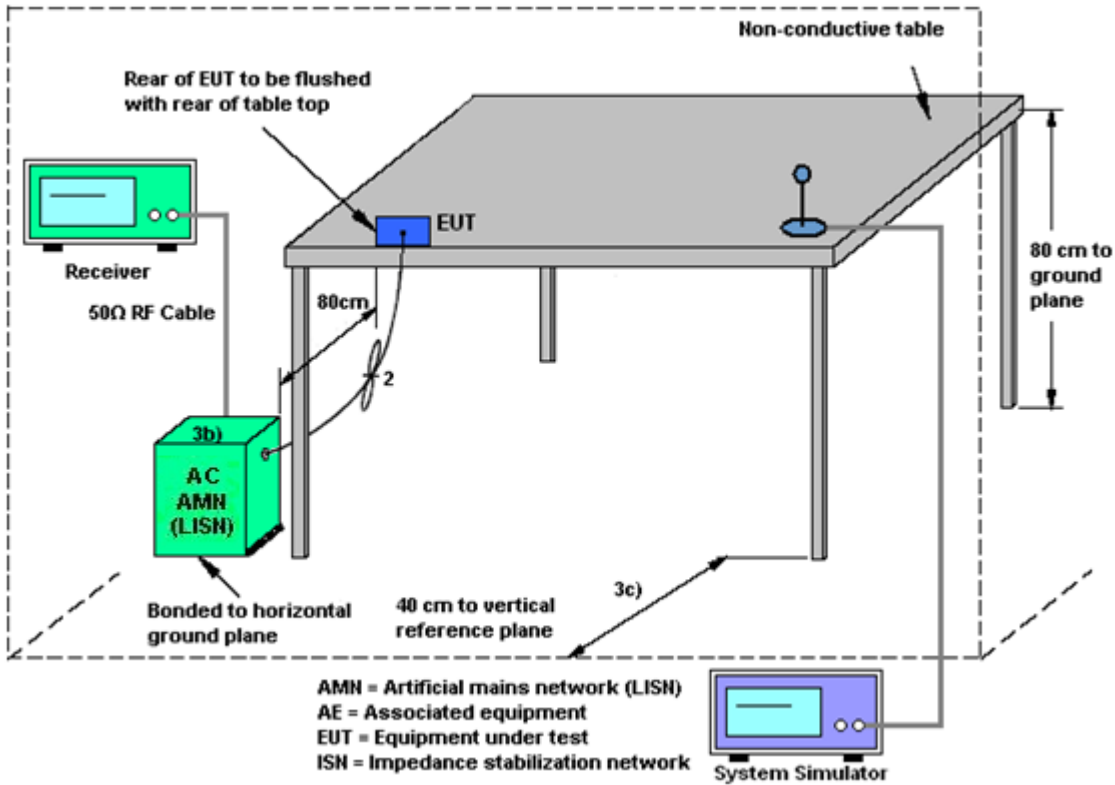
#### 3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

### 3.6.4 Test Setup



### 3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



## **3.7 Antenna Requirements**

### **3.7.1 Standard Applicable**

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. 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 rule.

### **3.7.2 Antenna Anti-Replacement Construction**

An embedded-in antenna design is used.

### **3.7.3 Antenna Gain**

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 07, 2022	Dec. 01, 2022~ Dec. 03, 2022	Apr. 08, 2023	Conducted (TH01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1339473	30MHz~40GHz	Dec. 28, 2021	Dec. 01, 2022~ Dec. 03, 2022	Dec. 27, 2022	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1542004	50MHz Bandwidth	Dec. 28, 2021	Dec. 01, 2022~ Dec. 03, 2022	Dec. 27, 2022	Conducted (TH01-SZ)
EMI Test Receiver&SA	Agilent	N9038A	MY52260185	20Hz~26.5GHz	Dec. 27, 2021	Nov. 23, 2022	Dec. 26, 2022	Radiation (03CH01-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 07, 2022	Nov. 23, 2022	Jul. 06, 2023	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jul. 28, 2022	Nov. 23, 2022	Jun. 27, 2023	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz-2GHz	Sep. 28, 2022	Nov. 23, 2022	Sep. 27, 2023	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Jul. 07, 2022	Nov. 23, 2022	Jul. 06, 2023	Radiation (03CH01-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz-40GHz	Apr. 10, 2022	Nov. 23, 2022	Apr. 09, 2023	Radiation (03CH01-SZ)
LF Amplifier	Burgeon	BPA-530	102209	0.01~3000Mhz	Apr. 06, 2022	Nov. 23, 2022	Apr. 05, 2023	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P-R	1943528	1GHz~18GHz	Oct. 19, 2022	Nov. 23, 2022	Oct. 18, 2023	Radiation (03CH01-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270105	0.5GHz~26.5GHz	Oct. 19, 2022	Nov. 23, 2022	Oct. 18, 2023	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 06, 2022	Nov. 23, 2022	Jul. 05, 2023	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	Nov. 10, 2022	Nov. 23, 2022	Nov. 09, 2023	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Nov. 23, 2022	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Nov. 23, 2022	NCR	Radiation (03CH01-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jul. 07, 2022	Nov. 16, 2022	Jul. 06, 2023	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Sep. 15, 2022	Nov. 16, 2022	Sep. 14, 2023	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 17, 2022	Nov. 16, 2022	Oct. 16, 2023	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 07, 2022	Nov. 16, 2022	Jul. 06, 2023	Conduction (CO01-SZ)

NCR: No Calibration Required



## 5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

### Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	±1.34 dB
Conducted Emissions	±1.34 dB
Occupied Channel Bandwidth	±0.13 %
Conducted Power Spectral Density	±1.32 dB

### Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.2dB
---	-------

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.2dB
---	-------

### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB
---	-------

### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.3dB
---	-------

----- THE END -----



## **Appendix A. Conducted Test Results**

Test Engineer:	Chen Ran	Temperature:	24~26	°C
Test Date:	2022/12/1~2022/12/3	Relative Humidity:	50~53	%

**TEST RESULTS DATA**  
**6dB and 99% Occupied Bandwidth**

2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
					Ant 2	Ant 2		
11b	1Mbps	1	1	2412	12.44	8.06	0.50	Pass
11b	1Mbps	1	6	2437	12.74	8.04	0.50	Pass
11b	1Mbps	1	11	2462	12.64	8.08	0.50	Pass
11g	6Mbps	1	1	2412	16.68	15.12	0.50	Pass
11g	6Mbps	1	6	2437	16.93	15.46	0.50	Pass
11g	6Mbps	1	11	2462	16.78	15.14	0.50	Pass
HT20	MCS0	1	1	2412	17.73	15.08	0.50	Pass
HT20	MCS0	1	6	2437	18.08	15.94	0.50	Pass
HT20	MCS0	1	11	2462	17.88	15.14	0.50	Pass
HT40	MCS0	1	3	2422	36.16	35.04	0.50	Pass
HT40	MCS0	1	6	2437	36.96	35.32	0.50	Pass
HT40	MCS0	1	9	2452	36.76	35.12	0.50	Pass



**TEST RESULTS DATA**  
**Peak Output Power**

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
					Ant 2	Ant 2	Ant 2	Ant 2	Ant 2	
11b	1Mbps	1	1	2412	20.85	30.00	3.66	24.51	36.00	Pass
11b	1Mbps	1	6	2437	21.41	30.00	3.66	25.07	36.00	Pass
11b	1Mbps	1	11	2462	20.88	30.00	3.66	24.54	36.00	Pass
11g	6Mbps	1	1	2412	23.93	30.00	3.66	27.59	36.00	Pass
11g	6Mbps	1	6	2437	23.85	30.00	3.66	27.51	36.00	Pass
11g	6Mbps	1	11	2462	23.53	30.00	3.66	27.19	36.00	Pass
HT20	MCS0	1	1	2412	23.95	30.00	3.66	27.61	36.00	Pass
HT20	MCS0	1	6	2437	23.90	30.00	3.66	27.56	36.00	Pass
HT20	MCS0	1	11	2462	23.34	30.00	3.66	27.00	36.00	Pass
HT40	MCS0	1	3	2422	24.15	30.00	3.66	27.81	36.00	Pass
HT40	MCS0	1	6	2437	23.88	30.00	3.66	27.54	36.00	Pass
HT40	MCS0	1	9	2452	23.48	30.00	3.66	27.14	36.00	Pass

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Average Output Power**

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
					Ant 2	Ant 2	Ant 2	Ant 2	Ant 2	
11b	1Mbps	1	1	2412	18.10	30.00	3.66	21.76	36.00	Pass
11b	1Mbps	1	6	2437	18.50	30.00	3.66	22.16	36.00	Pass
11b	1Mbps	1	11	2462	18.00	30.00	3.66	21.66	36.00	Pass
11g	6Mbps	1	1	2412	16.80	30.00	3.66	20.46	36.00	Pass
11g	6Mbps	1	6	2437	17.10	30.00	3.66	20.76	36.00	Pass
11g	6Mbps	1	11	2462	15.80	30.00	3.66	19.46	36.00	Pass
HT20	MCS0	1	1	2412	16.60	30.00	3.66	20.26	36.00	Pass
HT20	MCS0	1	6	2437	17.30	30.00	3.66	20.96	36.00	Pass
HT20	MCS0	1	11	2462	16.00	30.00	3.66	19.66	36.00	Pass
HT40	MCS0	1	3	2422	16.00	30.00	3.66	19.66	36.00	Pass
HT40	MCS0	1	6	2437	16.50	30.00	3.66	20.16	36.00	Pass
HT40	MCS0	1	9	2452	15.70	30.00	3.66	19.36	36.00	Pass

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Peak Power Spectral Density**

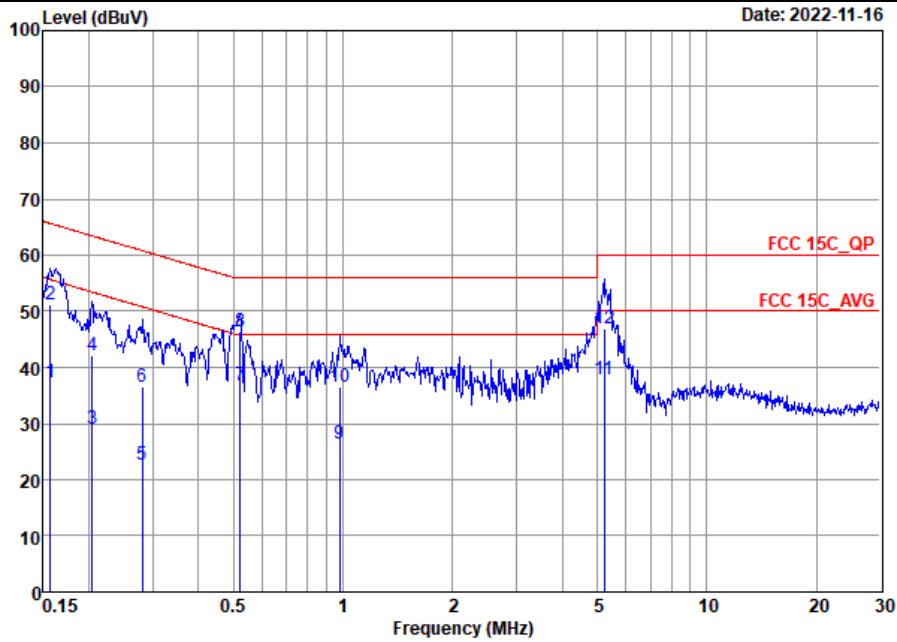
2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)	DG (dBi)	Peak PSD Limit (dBm/3kHz)	Pass/Fail
					Ant 2	Ant 2	Ant 2	
11b	1Mbps	1	1	2412	-3.42	3.66	8.00	Pass
11b	1Mbps	1	6	2437	-3.81	3.66	8.00	Pass
11b	1Mbps	1	11	2462	-5.06	3.66	8.00	Pass
11g	6Mbps	1	1	2412	-8.11	3.66	8.00	Pass
11g	6Mbps	1	6	2437	-8.66	3.66	8.00	Pass
11g	6Mbps	1	11	2462	-8.60	3.66	8.00	Pass
HT20	MCS0	1	1	2412	-9.37	3.66	8.00	Pass
HT20	MCS0	1	6	2437	-7.08	3.66	8.00	Pass
HT20	MCS0	1	11	2462	-9.66	3.66	8.00	Pass
HT40	MCS0	1	3	2422	-12.20	3.66	8.00	Pass
HT40	MCS0	1	6	2437	-12.21	3.66	8.00	Pass
HT40	MCS0	1	9	2452	-11.60	3.66	8.00	Pass

Measured power density (dBm) has offset with cable loss.



## Appendix B. AC Conducted Emission Test Results

Test Engineer :	Lily Qiu	Temperature :	21~24°C
		Relative Humidity :	39~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

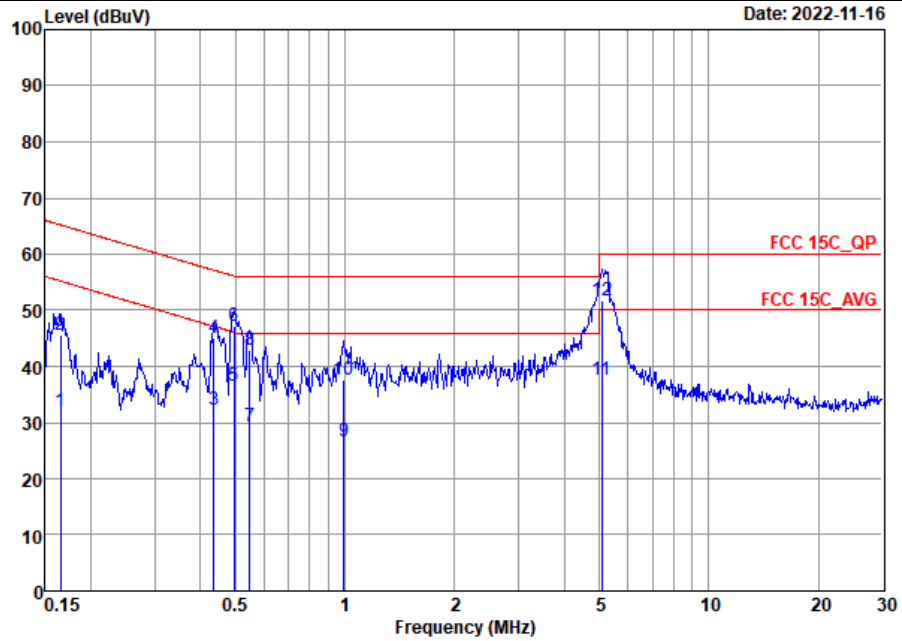


Site : CO01-SZ  
 Condition: FCC 15C\_QP LISN\_20220811\_L LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16	37.25	-18.40	55.65	16.30	10.20	10.75	Average
2	0.16	51.25	-14.40	65.65	30.30	10.20	10.75	QP
3	0.20	29.19	-24.26	53.45	8.79	10.20	10.20	Average
4	0.20	42.19	-21.26	63.45	21.79	10.20	10.20	QP
5	0.28	22.75	-28.06	50.81	1.79	10.17	10.79	Average
6	0.28	36.55	-24.26	60.81	15.59	10.17	10.79	QP
7 *	0.52	36.88	-9.12	46.00	14.99	10.12	11.77	Average
8	0.52	46.38	-9.62	56.00	24.49	10.12	11.77	QP
9	0.98	26.40	-19.60	46.00	5.99	10.12	10.29	Average
10	0.98	36.60	-19.40	56.00	16.19	10.12	10.29	QP
11	5.22	37.93	-12.07	50.00	17.71	9.98	10.24	Average
12	5.22	46.93	-13.07	60.00	26.71	9.98	10.24	QP



Test Engineer :	Lily Qiu	Temperature :	21~24°C
		Relative Humidity :	39~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ  
 Condition: FCC 15C\_QP LISN\_20220811\_N NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.17	32.02	-23.19	55.21	11.10	10.31	10.61	Average
2	0.17	45.72	-19.49	65.21	24.80	10.31	10.61	QP
3	0.44	32.19	-14.96	47.15	10.40	10.19	11.60	Average
4	0.44	45.09	-12.06	57.15	23.30	10.19	11.60	QP
5	0.49	36.53	-9.57	46.10	14.50	10.19	11.84	Average
6	0.49	47.23	-8.87	56.10	25.20	10.19	11.84	QP
7	0.55	29.27	-16.73	46.00	7.41	10.21	11.65	Average
8	0.55	43.07	-12.93	56.00	21.21	10.21	11.65	QP
9	0.99	26.56	-19.44	46.00	6.10	10.21	10.25	Average
10	0.99	37.56	-18.44	56.00	17.10	10.21	10.25	QP
11	5.08	37.57	-12.43	50.00	17.21	10.12	10.24	Average
12 *	5.08	51.67	-8.33	60.00	31.31	10.12	10.24	QP

Note:

- Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
- Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)



## Appendix C. Radiated Spurious Emission

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Margin	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11b CH 01 2412MHz		2387.7	48.22	-25.78	74	40.87	32.25	7.8	32.7	351	260	P	H
		2388.435	38.74	-15.26	54	31.39	32.25	7.8	32.7	351	260	A	H
	*	2412	106.97	-	-	99.56	32.31	7.8	32.7	351	260	P	H
		2412	105.24	-	-	97.83	32.31	7.8	32.7	351	260	A	H
		2389.905	47.69	-26.31	74	40.33	32.26	7.8	32.7	354	302	P	V
		2388.645	37.08	-16.92	54	29.72	32.26	7.8	32.7	354	302	A	V
	*	2412	104.27	-	-	96.86	32.31	7.8	32.7	354	302	P	V
		2412	102.47	-	-	95.06	32.31	7.8	32.7	354	302	A	V
802.11b CH 11 2462MHz	*	2462	105.85	-	-	98.29	32.42	7.84	32.7	338	261	P	H
		2462	104.11	-	-	96.55	32.42	7.84	32.7	338	261	A	H
		2483.56	48.92	-25.08	74	41.28	32.46	7.88	32.7	338	261	P	H
		2483.68	38.96	-15.04	54	31.32	32.46	7.88	32.7	338	261	A	H
	*	2462	104.8	-	-	97.24	32.42	7.84	32.7	340	306	P	V
		2462	102.91	-	-	95.35	32.42	7.84	32.7	340	306	A	V
		2483.52	47.81	-26.19	74	40.17	32.46	7.88	32.7	340	306	P	V
		2483.6	37.8	-16.2	54	30.16	32.46	7.88	32.7	340	306	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11b (Harmonic @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Margin (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include data for CH 01 (2412MHz), CH 06 (2437MHz), and CH 11 (2462MHz). A Remark section at the bottom states: '1. No other spurious found. 2. All results are PASS against Peak and Average limit line.'



2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Margin (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include data for 802.11g CH 01 (2412MHz) and CH 11 (2462MHz).

Remark

- 1. No other spurious found.
2. All results are PASS against Peak and Average limit line.





**2.4GHz 2400~2483.5MHz  
WIFI 802.11g (Harmonic @ 3m)**

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Margin ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	45.45	-28.55	74	51.68	34.83	11.08	52.14	-	-	P	H
		4824	45.76	-28.24	74	51.99	34.83	11.08	52.14	-	-	P	V
802.11g CH 06 2437MHz		4874	45.98	-28.02	74	52.14	34.85	11.09	52.1	-	-	P	H
		7311	47.88	-26.12	74	50.27	36.32	13.08	51.79	-	-	P	H
		4874	44.48	-29.52	74	50.64	34.85	11.09	52.1	-	-	P	V
802.11g CH 11 2462MHz		7311	47.68	-26.32	74	50.07	36.32	13.08	51.79	-	-	P	V
		4924	46.3	-27.7	74	52.36	34.87	11.13	52.06	-	-	P	H
		7386	46.88	-27.12	74	49.09	36.35	13.14	51.7	-	-	P	H
		4924	45.75	-28.25	74	51.81	34.87	11.13	52.06	-	-	P	V
		7386	47.49	-26.51	74	49.7	36.35	13.14	51.7	-	-	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz  
WIFI 802.11n HT20 (Band Edge @ 3m)**

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Margin ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11n HT20 CH 01 2412MHz		2389.485	66.22	-7.78	74	58.86	32.26	7.8	32.7	351	265	P	H
		2389.8	49.18	-4.82	54	41.82	32.26	7.8	32.7	351	265	A	H
	*	2412	107.24	-	-	99.83	32.31	7.8	32.7	351	265	P	H
		2412	100.44	-	-	93.03	32.31	7.8	32.7	351	265	A	H
		2389.38	66.02	-7.98	74	58.66	32.26	7.8	32.7	354	299	P	V
		2389.8	47.46	-6.54	54	40.1	32.26	7.8	32.7	354	299	A	V
	*	2412	106.05	-	-	98.64	32.31	7.8	32.7	354	299	P	V
802.11n HT20 CH 11 2462MHz		2412	98.94	-	-	91.53	32.31	7.8	32.7	354	299	A	V
	*	2462	106.33	-	-	98.77	32.42	7.84	32.7	303	266	P	H
		2462	99.96	-	-	92.4	32.42	7.84	32.7	303	266	A	H
		2483.72	70.9	-3.1	74	63.26	32.46	7.88	32.7	303	266	P	H
		2483.52	51.89	-2.11	54	44.25	32.46	7.88	32.7	303	266	A	H
	*	2462	103.82	-	-	96.26	32.42	7.84	32.7	385	293	P	V
		2462	97.23	-	-	89.67	32.42	7.84	32.7	385	293	A	V
	2483.6	69.73	-4.27	74	62.09	32.46	7.88	32.7	385	293	P	V	
	2483.52	48.75	-5.25	54	41.11	32.46	7.88	32.7	385	293	A	V	
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz  
WIFI 802.11n HT20 (Harmonic @ 3m)**

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Margin ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		4824	45.52	-28.48	74	51.75	34.83	11.08	52.14	-	-	P	H
		4824	46.26	-27.74	74	52.49	34.83	11.08	52.14	-	-	P	V
802.11n HT20 CH 06 2437MHz		4874	44.9	-29.1	74	51.06	34.85	11.09	52.1	-	-	P	H
		7311	48.93	-25.07	74	51.32	36.32	13.08	51.79	-	-	P	H
		4874	45.68	-28.32	74	51.84	34.85	11.09	52.1	-	-	P	V
		7311	47.42	-26.58	74	49.81	36.32	13.08	51.79	-	-	P	V
802.11n HT20 CH 11 2462MHz		4924	44.56	-29.44	74	50.62	34.87	11.13	52.06	-	-	P	H
		7386	47.15	-26.85	74	49.36	36.35	13.14	51.7	-	-	P	H
		4924	44.79	-29.21	74	50.85	34.87	11.13	52.06	-	-	P	V
		7386	48.28	-25.72	74	50.49	36.35	13.14	51.7	-	-	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz  
WIFI 802.11n HT40 (Band Edge @ 3m)**

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Margin ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11n HT40 CH 03 2422MHz		2389.8	72.58	-1.42	74	65.22	32.26	7.8	32.7	273	262	P	H
		2389.94	52.16	-1.84	54	44.8	32.26	7.8	32.7	273	262	A	H
	*	2422	103.22	-	-	95.79	32.33	7.8	32.7	273	262	P	H
		2422	95.96	-	-	88.53	32.33	7.8	32.7	273	262	A	H
		2483.55	56.14	-17.86	74	48.5	32.46	7.88	32.7	273	262	P	H
		2483.58	40.54	-13.46	54	32.9	32.46	7.88	32.7	273	262	A	H
		2389.8	72.85	-1.15	74	65.49	32.26	7.8	32.7	354	306	P	V
		2389.94	52.34	-1.66	54	44.98	32.26	7.8	32.7	354	306	A	V
	*	2422	104.04	-	-	96.61	32.33	7.8	32.7	354	306	P	V
		2422	94.87	-	-	87.44	32.33	7.8	32.7	354	306	A	V
		2483.97	50.13	-23.87	74	42.49	32.46	7.88	32.7	354	306	P	V
		2483.58	37.25	-16.75	54	29.61	32.46	7.88	32.7	354	306	A	V
802.11n HT40 CH 09 2452MHz		2387.84	53.12	-20.88	74	45.77	32.25	7.8	32.7	302	266	P	H
		2389.94	38.71	-15.29	54	31.35	32.26	7.8	32.7	302	266	A	H
	*	2452	102.33	-	-	94.8	32.39	7.84	32.7	302	266	P	H
		2452	95.22	-	-	87.69	32.39	7.84	32.7	302	266	A	H
		2483.58	73.55	-0.45	74	65.91	32.46	7.88	32.7	302	266	P	H
		2483.58	53.9	-0.1	54	46.26	32.46	7.88	32.7	302	266	A	H
		2389.38	48.82	-25.18	74	41.46	32.26	7.8	32.7	341	307	P	V
		2389.94	37.11	-16.89	54	29.75	32.26	7.8	32.7	341	307	A	V
	*	2452	100.97	-	-	93.44	32.39	7.84	32.7	341	307	P	V
		2452	93.25	-	-	85.72	32.39	7.84	32.7	341	307	A	V
	2483.58	71.11	-2.89	74	63.47	32.46	7.88	32.7	341	307	P	V	
	2483.58	51.96	-2.04	54	44.32	32.46	7.88	32.7	341	307	A	V	
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz  
WIFI 802.11n HT40 (Harmonic @ 3m)**

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Margin ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. (P/A)	Pol. (H/V)
802.11n		4844	45.74	-28.26	74	51.93	34.84	11.09	52.12	-	-	P	H
HT40		7266	46.78	-27.22	74	49.23	36.31	13.06	51.82	-	-	P	H
CH 03		4844	46.2	-27.8	74	52.39	34.84	11.09	52.12	-	-	P	V
2422MHz		7266	46.88	-27.12	74	49.33	36.31	13.06	51.82	-	-	P	V
802.11n		4874	44.91	-29.09	74	51.07	34.85	11.09	52.1	-	-	P	H
HT40		7311	47.51	-26.49	74	49.9	36.32	13.08	51.79	-	-	P	H
CH 06		4874	44.58	-29.42	74	50.74	34.85	11.09	52.1	-	-	P	V
2437MHz		7311	47.22	-26.78	74	49.61	36.32	13.08	51.79	-	-	P	V
802.11n		4904	45.26	-28.74	74	51.36	34.86	11.11	52.07	-	-	P	H
HT40		7356	47.26	-26.74	74	49.55	36.34	13.11	51.74	-	-	P	H
CH 09		4904	45.13	-28.87	74	51.23	34.86	11.11	52.07	-	-	P	V
2452MHz		7356	47.14	-26.86	74	49.43	36.34	13.11	51.74	-	-	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
Emission below 1GHz
2.4GHz WIFI 802.11n HT40 (LF)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Margin (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include frequency measurements from 50.37 to 857.41 MHz.

Remark
1. No other spurious found.
2. All results are PASS against limit line.



Co-location:

2.4GHz 2400~2483.5MHz  
WIFI 802.11g (Band Edge @ 3m)

WIFI Ant.	Note	Frequency ( MHz )	Level ( dBμV/m )	Margin ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11g HT40 CH 09 2452MHz & LTEB13 Co-colation		2388.82	51.31	-22.69	74	43.32	32.26	7.8	32.07	302	269	P	H
		2389.94	37.75	-16.25	54	29.77	32.26	7.8	32.08	302	269	A	H
	*	2452	101.59	-	-	93.45	32.39	7.84	32.09	302	269	P	H
	*	2452	94.17	-	-	86.03	32.39	7.84	32.09	302	269	A	H
		2483.58	72.75	-1.25	74	64.5	32.46	7.88	32.09	302	269	P	H
		2483.58	51.2	-2.8	54	42.95	32.46	7.88	32.09	302	269	A	H
		2389.38	51.22	-22.78	74	43.23	32.26	7.8	32.07	340	303	P	V
		2389.94	37.45	-16.55	54	29.47	32.26	7.8	32.08	340	303	A	V
	*	2452	101.15	-	-	93.01	32.39	7.84	32.09	340	303	P	V
	*	2452	93.21	-	-	85.07	32.39	7.84	32.09	340	303	A	V
		2483.58	70.18	-3.82	74	61.93	32.46	7.88	32.09	340	303	P	V
		2483.58	48.51	-5.49	54	40.26	32.46	7.88	32.09	340	303	A	V

**Remark**  
 1. No other spurious found.  
 2. All results are PASS against Peak and Average limit line.



2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Margin	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
BLE CH 39 2480MHz & LTEB13 Co-colation	*	2480	86.93	-	-	78.68	32.46	7.88	32.09	379	315	P	H
	*	2480	86.34	-	-	78.09	32.46	7.88	32.09	379	315	A	H
		2484.64	46.69	-27.31	74	38.43	32.47	7.88	32.09	379	315	P	H
		2491.76	37.46	-16.54	54	29.2	32.48	7.88	32.1	379	315	A	H
	*	2480	88.42	-	-	80.17	32.46	7.88	32.09	141	260	P	V
	*	2480	87.75	-	-	79.5	32.46	7.88	32.09	141	260	A	V
		2499.24	48.1	-25.9	74	39.82	32.5	7.88	32.1	141	260	P	V
	2488.96	38.67	-15.33	54	30.4	32.48	7.88	32.09	141	260	A	V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												





2.4GHz 2400~2483.5MHz
WIFI 802.11g (Harmonic @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Margin (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Cable Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include test data for 802.11g HT40 CH 09 and LTEB13 Co-colation, and a Remark section.



**2.4GHz 2400~2483.5MHz  
BLE (Harmonic @ 3m)**

BLE Ant.	Note	Frequency ( MHz )	Level ( dBμV/m )	Margin ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
BLE CH 39 2480MHz & LTEB13 Co-colation		1559.5	46.77	-27.23	74	43.55	29.46	6.39	32.63	-	-	P	H
		2339.25	46.42	-27.58	74	38.76	32.15	7.58	32.07	-	-	P	H
		3119	43.61	-30.39	74	52.28	34.47	8.76	51.9	-	-	P	H
		4960	46.58	-27.42	74	52.07	34.88	11.14	51.51	-	-	P	H
		7440	47.39	-26.61	74	49.21	36.38	12.99	51.19	-	-	P	H
		1559.5	45.97	-28.03	74	42.75	29.46	6.39	32.63	-	-	P	V
		2339.25	46.43	-27.57	74	38.77	32.15	7.58	32.07	-	-	P	V
		3119	43.28	-30.72	74	51.95	34.47	8.76	51.9	-	-	P	V
		4960	45.92	-28.08	74	51.41	34.88	11.14	51.51	-	-	P	V
	7440	46.92	-27.08	74	48.74	36.38	12.99	51.19	-	-	P	V	
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Note symbol

*	<b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is <b>Margin</b> line.
P/A	<b>Peak</b> or <b>Average</b>
H/V	<b>Horizontal</b> or <b>Vertical</b>



A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =  
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Margin (dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)  
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)  
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)  
= 55.45 (dBμV/m)
2. Margin (dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 55.45(dBμV/m) – 74(dBμV/m)  
= -18.55(dB)

**For Average Limit @ 2390MHz:**

1. Level(dBμV/m)  
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)  
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)  
= 43.54 (dBμV/m)
2. Margin (dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 43.54(dBμV/m) – 54(dBμV/m)  
= -10.46(dB)

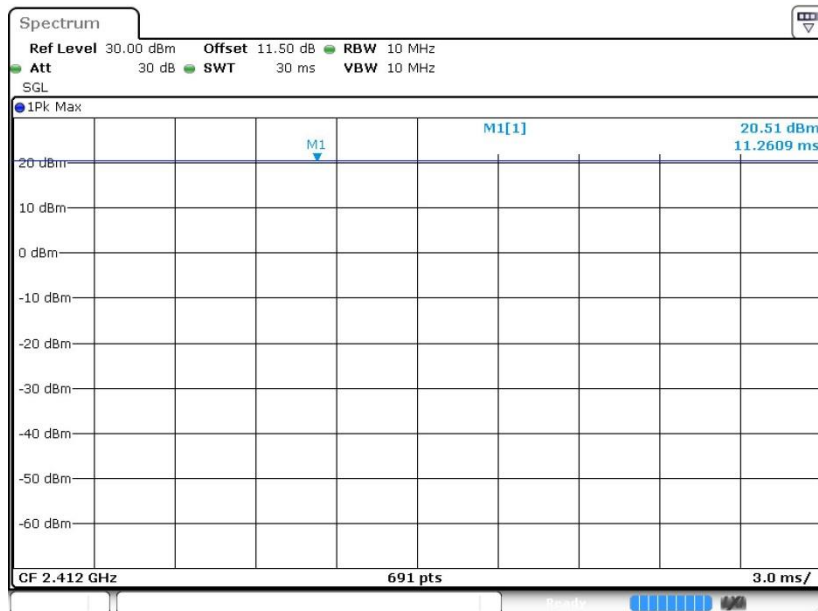
Both peak and average measured complies with the limit line, so test result is “PASS”.



### Appendix D. Duty Cycle Plots

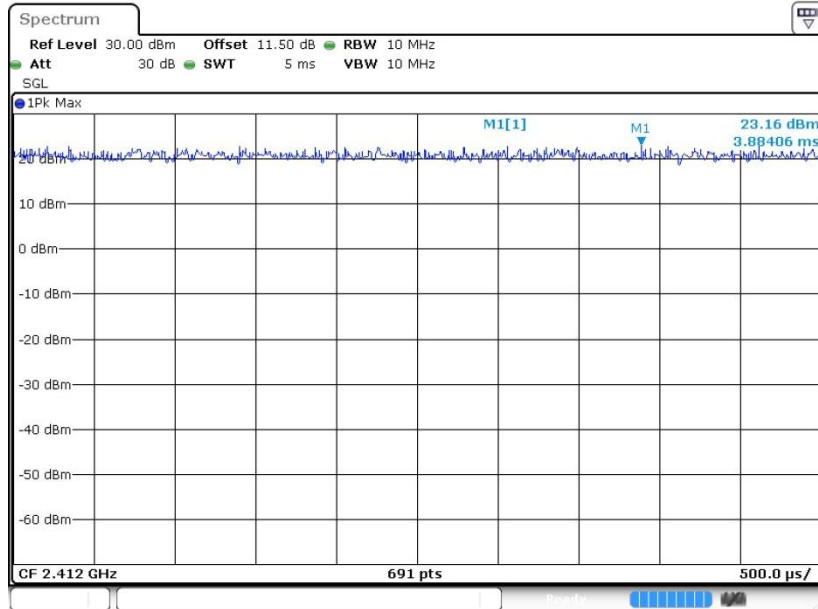
Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11b	100	-	-	10Hz
802.11g	100	-	-	10Hz
802.11an HT20	100	-	-	10Hz
802.11an HT40	100	-	-	10Hz

#### 802.11b

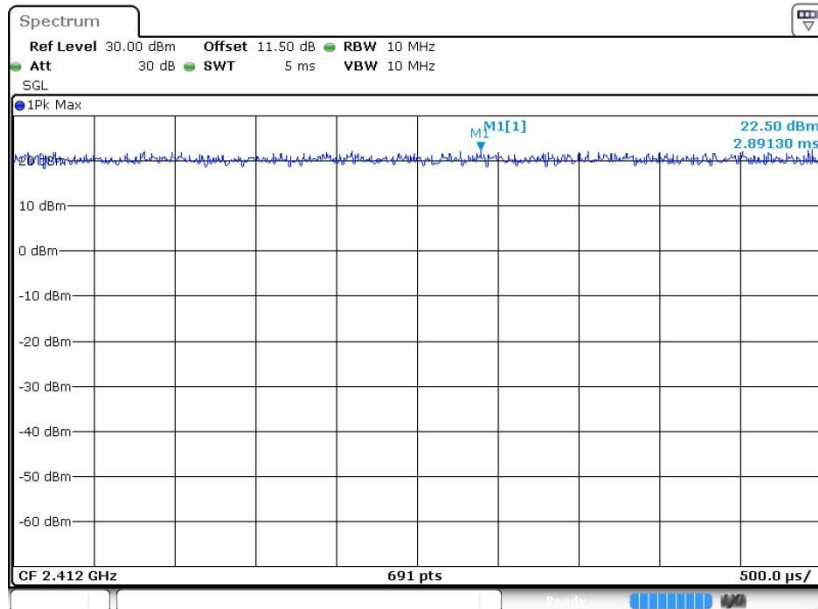




802.11g



802.11an HT20





802.11an HT40

