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FCC PART 15 SUBPART C
FCC PART 15.247
TEST REPORT

FCC ID:2BO5R-BW-W26L

Report No:	CTSL2620230167ER02
Product Name:	CarPlay Dongle Box
Main Test Model:	BW-W26L
Series Models:	BW-W26,BW-W25,BW-W27 ,BW-W35,BW-W55, BW-W56,BW-W57（PCB board, structure and internal of these model(s) are the same, only differing in appearance and color. So no additional models were tested）
Applicant:	Shenzhen Beneworld Technology Co., Ltd

EXECUTIVE SUMMARY

A sample of this product was tested and found to be in compliance with FCC PART 15 SUBPART C (15.247).

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CTSL Testing (Dongguan) Co., Ltd.
Main company address: Building1, Houjie Road Houjie Town,Guangdong Province, Dongguan City P.R.C.

Test Report

FCC ID:2BO5R-BW-W26L

Applicant Name	Shenzhen Beneworld Technology Co., Ltd				
Applicant Address	Building 3, Huangtian Industrial Park, Xixiang, Baoan District, Shenzhen, Guangdong, China				
Manufacturer Name	Shenzhen Beneworld Technology Co., Ltd				
Manufacturer Address	Building 3, Huangtian Industrial Park, Xixiang, Baoan District, Shenzhen, Guangdong, China				
Trade Mark	N/A				
Product name	CarPlay Dongle Box				
Main Test Model	BW-W26L				
Series Models	Please refer to the first page of the report				
Standard	**FCC Part 15 Subpart C (15.247)** **ANSI C63.10:2020** **FCC KDB 558074 D01 15.247 Meas Guidance v05r02**				
Test Location	ISO/IEC 17025 by ILAC-MRA is A2LA 7556.01 CTSL Testing (Dongguan) Co., Ltd. Room 112, Building 1, No. 15, Jiaoyuansongshan Hetian Village, Houjie Town Dongguan City, Guangdong, People's Republic of China				
Receipt Date	2026.2.2	**Test period**	2026.2.2-2026.2.24	**Issue Date**	2026.2.24
Conclusion	**The equipment under test was found to be compliance with the requirements of the standards applied.**				
Performs Testing:	Ethan Zhao	Ethan zhao			
Test Report Reviewer:	Steve Qin	steve qin			
Test Report Authorizer:	Alan Li	Alan Li			

CTSL Testing (Dongguan) Co.,ltd CTSL Approve (Special Seal)

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1. General Information

1.1. General Description of EUT (Equipment Under Test)

Product Information		
Product Name	:	CarPlay Dongle Box
Main Test Model	:	BW-W26L
Series Models	:	See the first page of the report
Power supply	:	DC 3.3V
Battery	:	--
Software Version	:	V1.0
Hardware Version	:	V1.0
Equipment Under Test		
Test supplied	:	☐ supplied by the manufacturer ☒ supplied by the lab (Auxiliary test supplied by test Lab)
Switching Power Supply information	:	Switching Power Supply Input: 100-240V~ 50/60Hz 2.5A Max Input: DC 12V, 10.0A 120W
Wireless Specification		
Supported Type	:	2.4G WLAN: 802.11b/802.11g/802.11n(HT20)
Modulation Type	:	IEEE 802.11b mode: DSSS(CCK/QPSK/BPSK) IEEE 802.11g mode: OFDM (BPSK/QPSK/16QAM/64QAM) IEEE 802.11n HT20& mode: OFDM (BPSK/QPSK/16QAM/64QAM)
Transmit data rate (WLan)	:	IEEE 802.11b: 1/2/5.5/11Mbps IEEE 802.11g: 6/9/12/18/24/36/48/54Mbps IEEE 802.11n HT20: up to 72.2Mbps
Operation frequency	:	IEEE 802.11b/g/n HT20: 2412MHz-2462MHz
Number of channels	:	IEEE 802.11b/g/n HT20: 11 Channels
Antenna Gain& type	:	Refer to Section 1.2 of the report.
Sample Type	:	Prototype production
Type of Device	:	☐ Portable Device; ☒ Mobile Device; ☐ Modular Device

Note: For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

1.2. Antenna Information

Ant No.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PCB Antenna	N/A	4.29

Note:
1. The antenna gain is declared by the customer and the laboratory is not responsible for the accuracy of the antenna gain.
2.The test results of this report only apply to the sample as received.

2. SUMMARY OF TEST

2.1. Test Standards

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
ANSI C63.10:2020: American National Standard for Testing Unlicensed Wireless Devices
FCC KDB 558074 D01 15.247 Meas Guidance v05r02

2.2. Summary of test result

No.	Description of Test Item	FCC Standard Section	Results
1	6dB Bandwidth & 99% Bandwidth	§15.247(a)(2)	PASS
2	Maximum Peak Output Power	15.247(b)(3)	PASS
3	Power Spectral Density	15.247(e)	PASS
4	Conducted Band Edge	15.247(d)	PASS
5	Conducted Spurious Emissions	15.247(d)	PASS
6	Radiated Spurious Emissions and Band Edge	15.109/ 15.205/ 15.209/ 15.247(d)	PASS
7	AC Power Line Conducted Emissions	15.207(a)	N/A
8	Antenna Requirement	15.203	PASS

Note: “N/A” denotes test is not applicable in this test report.

2.3. Test Facilities

EMC Lab :

A2LA Certificate Number: 7556.01;
CTSL Testing (Dongguan) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.
The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

FCC-Registration No.: 0037614732;
Test Firm Registration Number:750639;
CTSL Testing (Dongguan) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

Industry Canada Registration Number. Is: 34801;
CAB identifier: CN0192;
CTSL Testing (Dongguan) Co., Ltd. The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

Name of Firm : CTSL Testing (Dongguan) Co.,ltd.

EMC test location/satellite location:
Room 112, Building 1, No. 15, Jiaoyuansongshan Hetian Village, Houjie Town Dongguan City, Guangdong, People's Republic of China City, Guangdong, China

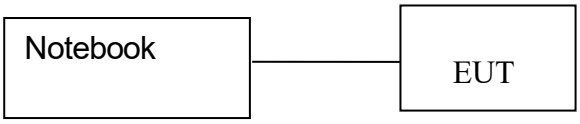
2.4. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	±3.48dB
Uncertainty for spurious emissions test (Below 30MHz)	±1.62 dB
Uncertainty for spurious emissions test (30MHz-1GHz)	±4.60 dB(Polarize: H)
	±4.68 dB(Polarize: V)
Uncertainty for spurious emissions test (1GHz to 25GHz)	±4.96dB
Uncertainty for radio frequency	7×10^{-8}
Uncertainty for conducted RF Power	1.08dB
Uncertainty for Power density test	0.26dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately The 95% confidence level using a coverage factor of k=2.

2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground. EUT was beset into Bluetooth test mode by software before test.



2.6. Assistant equipment used for test

Item	Equipment	Brand	Model Name/Type No.	FCC ID	Series No.
1	Notebook	Lenovo	ThinkPad E495	-	-

Supported cables				
Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	-
-	-	-	-	-

2.7. Test mode

Combining all the rates, modulations, and packet types, the Pre-scans had been carried out. The worst-case test mode was selected for the final test as listed below.

Test Item	Mode	Date Rate	Test Channel
6dB Bandwidth	IEEE 802.11b	1Mbps	Low / Middle / High
	IEEE 802.11g	6Mbps	Low / Middle / High
	IEEE 802.11n HT20	MCS0	Low / Middle / High
Maximum Peak Output Power	IEEE 802.11b	1Mbps	Low / Middle / High
	IEEE 802.11g	6Mbps	Low / Middle / High
	IEEE 802.11n HT20	MCS0	Low / Middle / High
Power Spectral Density	IEEE 802.11b	1Mbps	Low / Middle / High
	IEEE 802.11g	6Mbps	Low / Middle / High
	IEEE 802.11n HT20	MCS0	Low / Middle / High
Conducted Band Edge	IEEE 802.11b	1Mbps	Low / High
	IEEE 802.11g	6Mbps	Low / High
	IEEE 802.11n HT20	MCS0	Low / High
Conducted Spurious Emissions	IEEE 802.11b	1Mbps	Low / Middle / High
	IEEE 802.11g	6Mbps	Low / Middle / High
	IEEE 802.11n HT20	MCS0	Low / Middle / High
Radiated Spurious Emissions (Below 1GHz)	IEEE 802.11b	1Mbps	Low / Middle / High
	IEEE 802.11g	6Mbps	Low / Middle / High
	IEEE 802.11n HT20	MCS0	Low / Middle / High
Radiated Spurious Emissions (Above 1GHz)	IEEE 802.11b	1Mbps	Low / Middle / High
	IEEE 802.11g	6Mbps	Low / Middle / High
	IEEE 802.11n HT20	MCS0	Low / Middle / High
Radiated Band Edge	IEEE 802.11b	1Mbps	Low / High
	IEEE 802.11g	6Mbps	Low / High
	IEEE 802.11n HT20	MCS0	Low / High
AC Power Line Conducted Emissions	IEEE 802.11b	1Mbps	Low / Middle / High
	IEEE 802.11g	6Mbps	Low / Middle / High
	IEEE 802.11n HT20	MCS0	Low / Middle / High

Note: In radiated measurement, the EUT had been pre-scan on the positioned of each 3 axis (X, Y, Z), the worst case was found when positioned on **X-plane.**

2.8. Channel List

IEEE 802.11b/802.11g/802.11n HT20							
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
01	**2412**	02	2417	03	2422	04	2427
05	2432	**06**	**2437**	07	2442	08	2447
09	2452	10	2457	**11**	**2462**		

2.9. Power Setting of Test Software

Software Name	Use cmd to schedule frequency		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b Setting	Default	Default	Default
IEEE 802.11g Setting	Default	Default	Default
IEEE 802.11n HT20 Setting	Default	Default	Default

Note: This information is provided by the applicant.

2.10. Test Equipment

For Conducted Emission Test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI 3	AT005	GUANGZHOU NEM	May 16,25	May 15,26
LISN	Rohde & Schwarz	ENV216	AT006	LISAI	July 31,25	July 30,26
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	AT007	CCIC (Shenzhen)	July 10,25	July 09,26
CE Cable	Times Microwave	LMR195UF-NMNM-1.50M	AT041	GUANGZHOU NEM	May 16,25	May 15,26
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A

For Radiated Emission Test (9kHz-30MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI TestReceiver	Rohde& Schwarz	ESCI 7	AT001	Ti Group	July 31,24	July 30,26
Active Loop Antenna	ZHINAN	ZN30900C	AT063	LISAI	Aug 03,24	Aug 02,26
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A
9kHz-30MHz Cable	Times Microwave	LMR195UF-NMNM-9M	AT045	GUANGZHOU NEM	May 16,25	May 15,26

For Radiated Emissions Test (30MHz-1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde& Schwarz	ESCI 7	AT001	Ti Group	Jun 12,25	Jun 11,26
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	AT002	LISAI	Aug 03,24	Aug 02,26
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	May 16,25	May 15,26
30-1000MHz Cable	Times Microwave Systems	LMR195UF-NMRNMR-3.00M+ LMR400UF-NMNM-3.00M+ LMR400UF-NMNM-3.00M	AT042+AT043+AT044	GUANGZHOU NEM	May 16,25	May 15,26

For Radiated Emission test (Above 1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Horn Antenna 1-18G	SCHWARZBECK	BBHA 9120 D	AT003	Shenzhen Academy of Metrology & Quality Inspection	Sep 23,24	Sep 22,26
Horn Antenna 18-40GHz	XIBAO	XB-WDB18-40K	AT064	LISAI	Feb 25,25	Feb 24,26
Broadband Preamplifier	SCHWARZBECK	BBV 9718 D	AT004	CCIC (Shenzhen)	July 10,25	July 9,26
Low Noise Amplifier	MWRFtest	DLA8-18-40G-2078	AT065	GUANGZHOU NEM	July 10,25	July 9,26
Spectrum Analyzer 40G	Keysight	N9020B	AT066	GUANGZHOU NEM	May 13,25	May 12,26
Spectrum Analyzer 26.5G	Keysight	N9020A	AT050	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Radio switching unit	TiGroup	SU319	AT055	N/A	N/A	N/A
Filtering unit	TiGroup	SU319F	AT056	N/A	N/A	N/A
Test Software	BL	BL410-E V25.5 en	N/A	N/A	N/A	N/A
Above 1GHz Cable	Times Microwave Systems	SFT205-NMNM-7.0M+ SFT205-NMNM-2.0M	AT057+ AT058	N/A	N/A	N/A

For Connect EUT Antenna Terminal Test (RF Test system)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Spectrum analyzer	Keysight	N9020A	AT050	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Analog signal source	Keysight	N5173B	AT051	GUANGZHOU NEM	Jun 12,25	Jun 11,26
WIDEBAND RADIO COMMUNICATION TESTER	Rohde& Schwarz	CMW500	AT052	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Power probe unit	Ti Group	SU319P	AT053	GUANGZHOU NEM	Jun 12,25	Jun 11,26
Switch unit	Ti Group	SU319S	AT054	N/A	N/A	N/A
Test Software	BL	BL410R 3.5.2.621	N/A	N/A	N/A	N/A

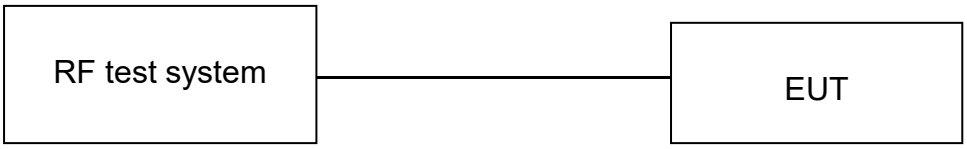
Remark: The power sensor is integrated into the Power Probe unit

3. 6DB BANDWIDTH

3.1. Limit

Systems using digital modulation techniques operate in the 2400-2483.5 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

3.2. Test Setup



3.3. Spectrum Analyzer Setting

6dB Bandwidth

Spectrum Parameters	Setting
RBW	300KHz
VBW	1MHz
Span	30MHz(20MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

3.4. Test Procedure

a. The test according to ANSI C63.10 clause 11.8.
b. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
c. Spectrum analyzer setting parameters in accordance with section 3.3.
d. Set the EUT transmit continuously with maximum output power.
e. Allow trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
f. Repeat above procedures until all channels and test modes were measured.
g. Record the results in the test report.

3.5. Test Result

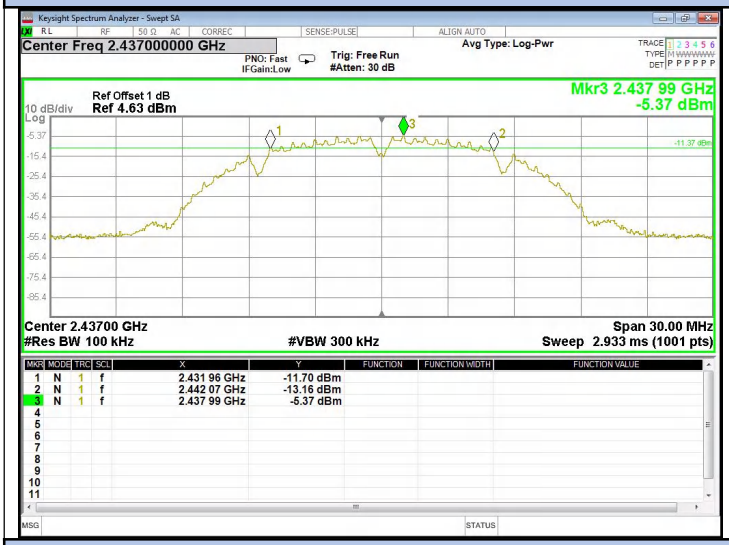
Test Mode	Antenna	Channel& Frequency	6dB Bandwidth	6dB Bandwidth Conducted Limit	Result
		MHz	MHz	KHz	
IEEE 802.11b	Ant1	CH01 2412	9.570	≥500	PASS
		CH06 2437	10.110		
		CH11 2462	10.110		
IEEE 802.11g	Ant1	CH01 2412	16.380	≥500	PASS
		CH06 2437	16.380		
		CH11 2462	16.410		
IEEE 802.11n HT20	Ant1	CH01 2412	17.640	≥500	PASS
		CH06 2437	17.640		
		CH11 2462	17.640		

3.6.Original Test record

IEEE 802.11b_Ant1_CH01 2412MHz

IEEE 802.11g_Ant1_CH01 2412MHz

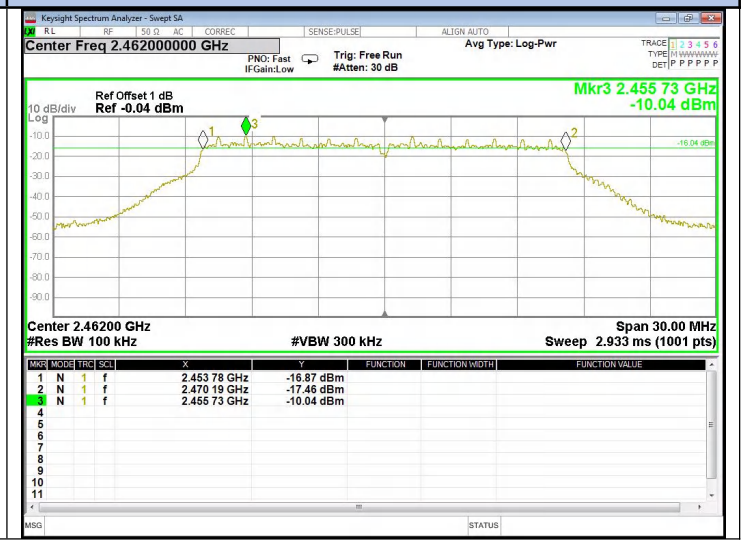
IEEE 802.11b_Ant1_CH06 2437MHz



IEEE 802.11g_Ant1_CH06 2437MHz

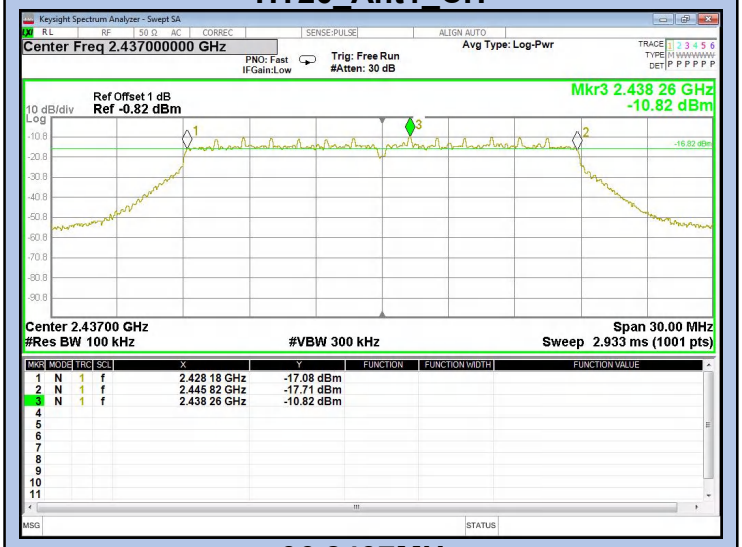
IEEE 802.11b_Ant1_CH11 2462MHz

IEEE 802.11g_Ant1_CH11 2462MHz



IEEE 802.11n HT20_Ant1_CH01 2412MHz

IEEE 802.11n HT20_Ant1_CH



06 2437MHz

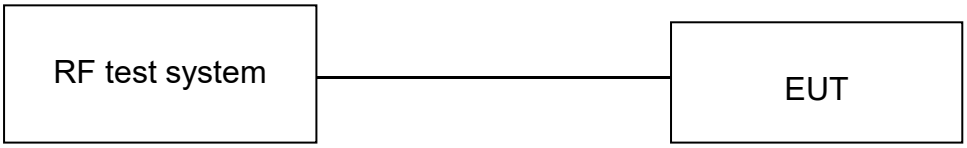
IEEE 802.11n HT20_Ant1_CH11 2462MHz

4. 99% BANDWIDTH

4.1.Limit

None; for reporting purpose only.

4.2. Test Setup



4.3. Spectrum Analyzer Setting

99% Occupied Bandwidth

Spectrum Parameters	Setting
RBW	200KHz
VBW	620KHz
Span	30MHz(20MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

4.4. Test Procedure

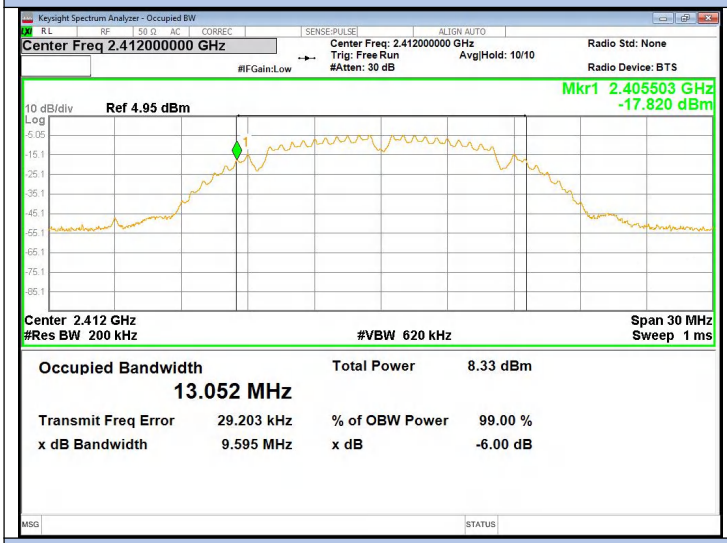
a. The test according to ANSI C63.10 clause 6.9.3.
b. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
c. Spectrum analyzer setting parameters in accordance with section 4.3.
d. Set the EUT transmit continuously with maximum output power.
e. Repeat above procedures until all channels and test modes were measured.
f. Record the results in the test report.

4.5.Test Data

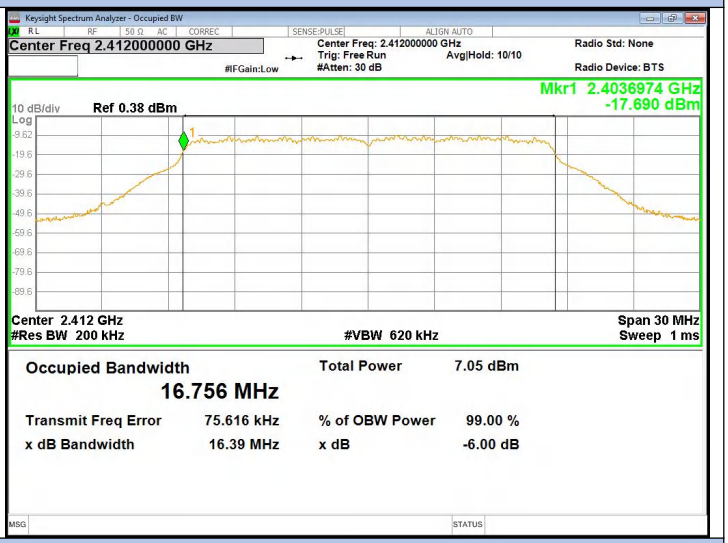
Test Mode	Antenna	Channel& Frequency	Occupied Channel Bandwidth
		MHz	MHz
IEEE 802.11b	Ant1	CH01 2412	13.052
		CH06 2437	13.116
		CH11 2462	13.186
IEEE 802.11g	Ant1	CH01 2412	16.756
		CH06 2437	16.819
		CH11 2462	16.836
IEEE 802.11n HT20	Ant1	CH01 2412	17.860
		CH06 2437	17.899
		CH11 2462	17.919

4.6.Original Test record

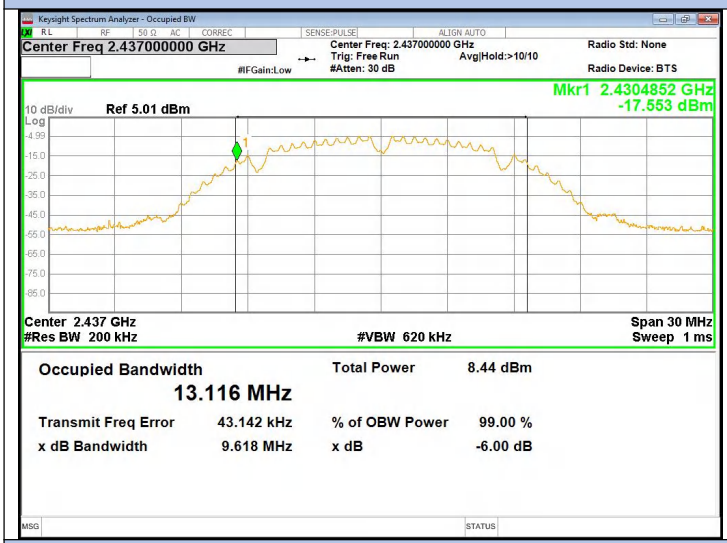
IEEE 802.11b_Ant1_CH01 2412MHz



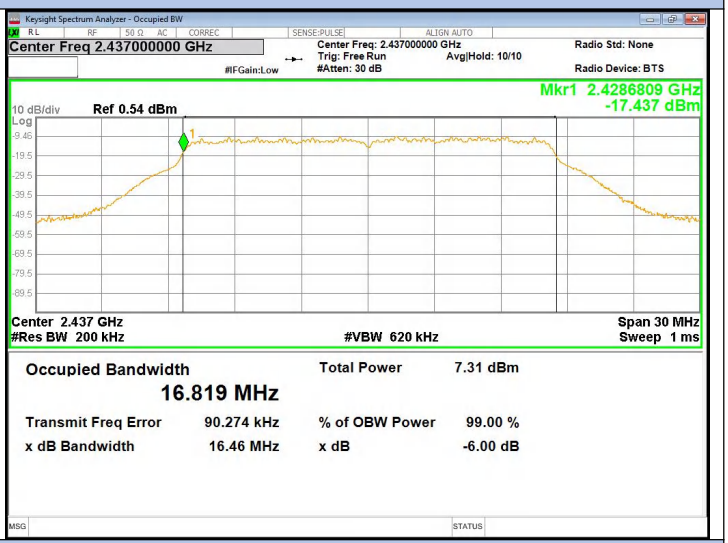
IEEE 802.11g Ant1_CH01 2412MHz



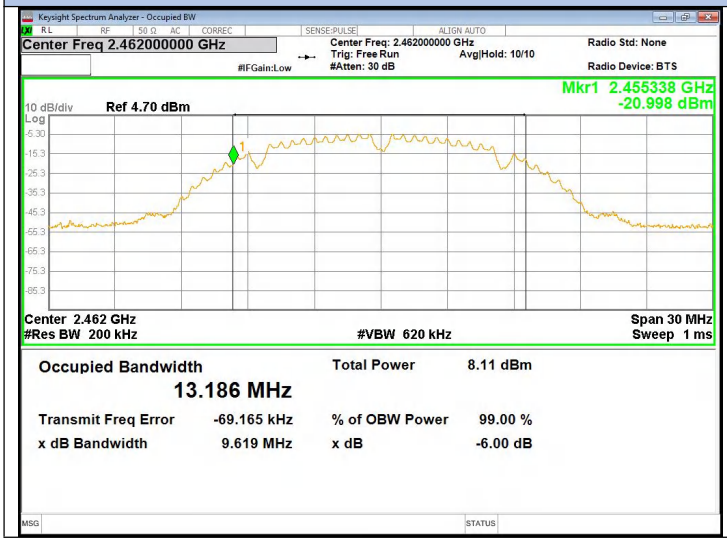
IEEE 802.11b_Ant1_CH06 2437MHz



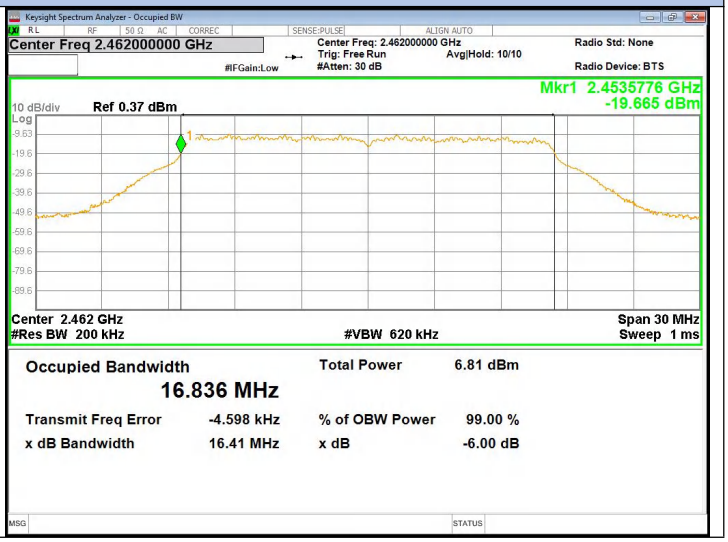
IEEE 802.11g Ant1_CH06 2437MHz



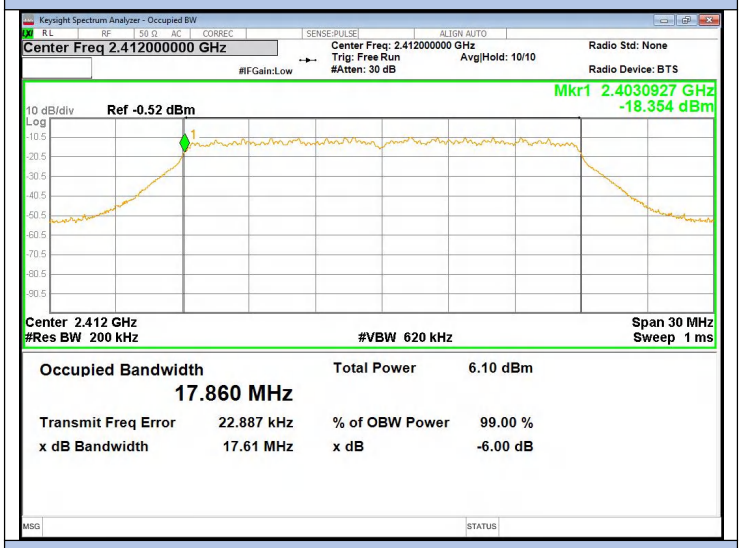
IEEE 802.11b_Ant1_CH11 2462MHz



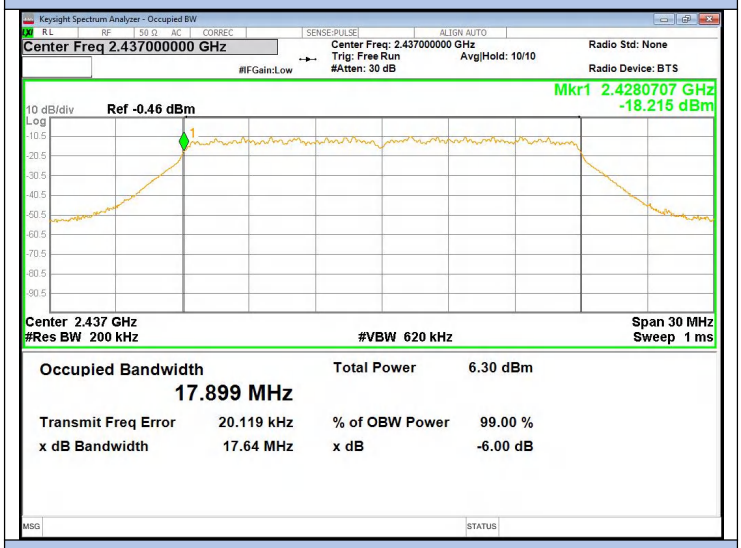
IEEE 802.11g Ant1_CH11 2462MHz



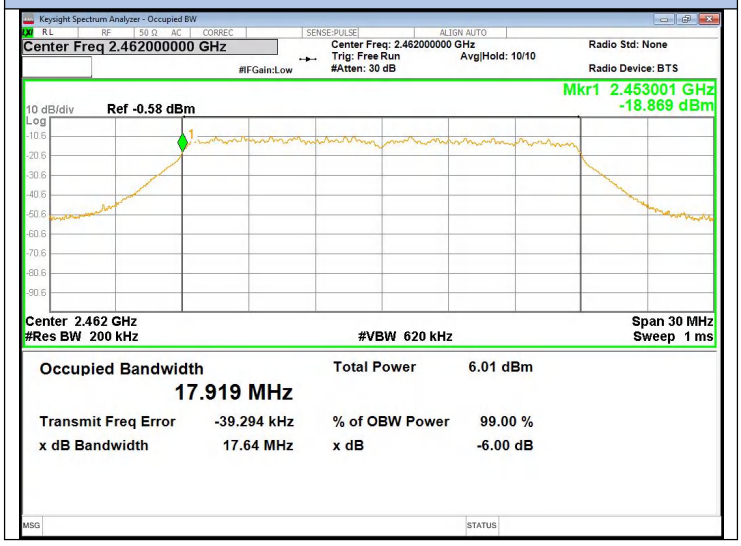
IEEE 802.11n HT20 Ant1_CH01 2412MHz



IEEE 802.11n HT20 Ant1_CH06 2437MHz



IEEE 802.11n HT20 Ant1_CH11 2462MHz



5. MAXIMUM PEAK OUTPUT POWER

5.1. Limit

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi..

5.2. Test Setup

5.3. Test Procedure

a. Connect each EUT's antenna output to power sensor by RF cable.
b. Measure the PK output power of each antenna port by power sensor.

5.4. Test Result

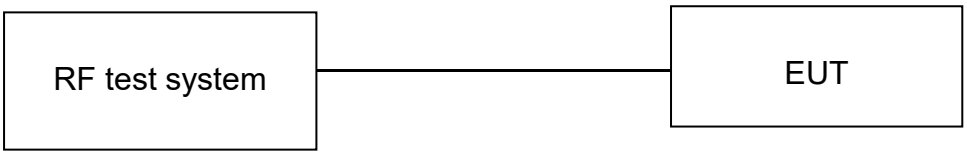
Test Mode	Antenna	Channel& Frequency	Result	Limit	Result
		MHz	dBm	dBm	
IEEE 802.11b	Ant1	CH01 2412	5.66	30	PASS
		CH06 2437	5.78		
		CH11 2462	5.42		
IEEE 802.11g	Ant1	CH01 2412	7.77	30	PASS
		CH06 2437	7.82		
		CH11 2462	7.57		
IEEE 802.11n HT20	Ant1	CH01 2422	6.79	30	PASS
		CH06 2437	6.97		
		CH11 2452	6.68		

6. POWER SPECTRAL DENSITY

6.1.Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

6.2.Test Setup



6.3.Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	3KHz
VBW	10KHz
Span	1.5 times the DTS bandwidth
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

6.4.Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 6.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission.
e. Repeat above procedures until all modes and channels were measured.
f. Record the results in the test report.

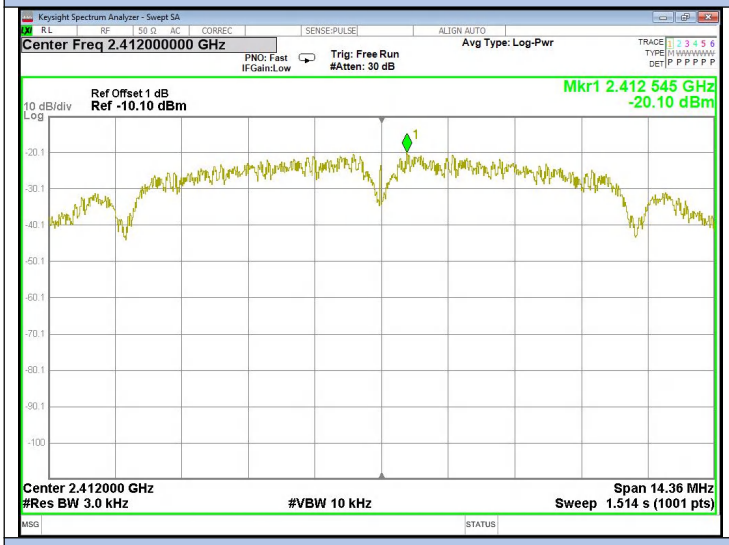
6.5.Test Result

Test Mode	Antenna	Channel& Frequency	Peak Power Spectral Density	Limit	Result
		MHz	dBm/3KHz	dBm/3KHz	
IEEE 802.11b	Ant1	CH01 2412	-20.10	8.00	PASS
		CH06 2437	-20.07		
		CH11 2462	-20.50		
IEEE 802.11g	Ant1	CH01 2412	-24.63	8.00	PASS
		CH06 2437	-24.85		
		CH11 2462	-25.00		
IEEE 802.11n HT20	Ant1	CH01 2422	-25.74	8.00	PASS
		CH06 2437	-25.65		
		CH11 2452	-25.52		

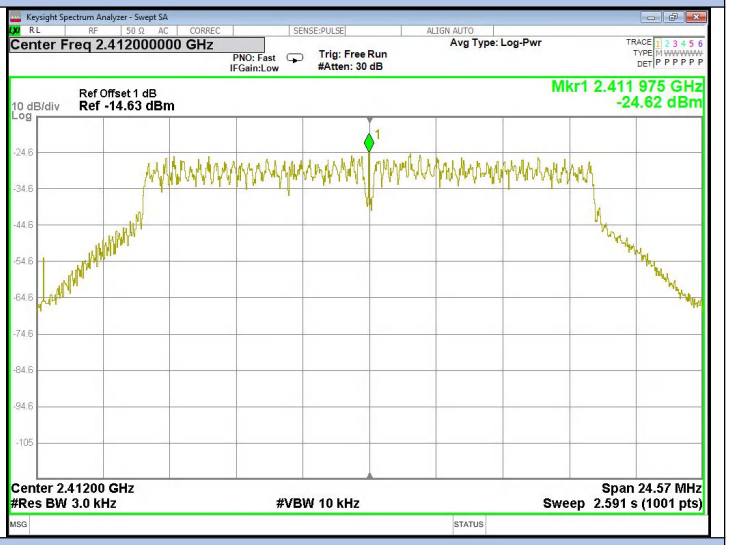
Note:
1) If the test results under the Peak detector meet the limit requirements, then there is no need to consider the coefficient obtained by multiplying by the Duty cycle.

6.6.Original Test record

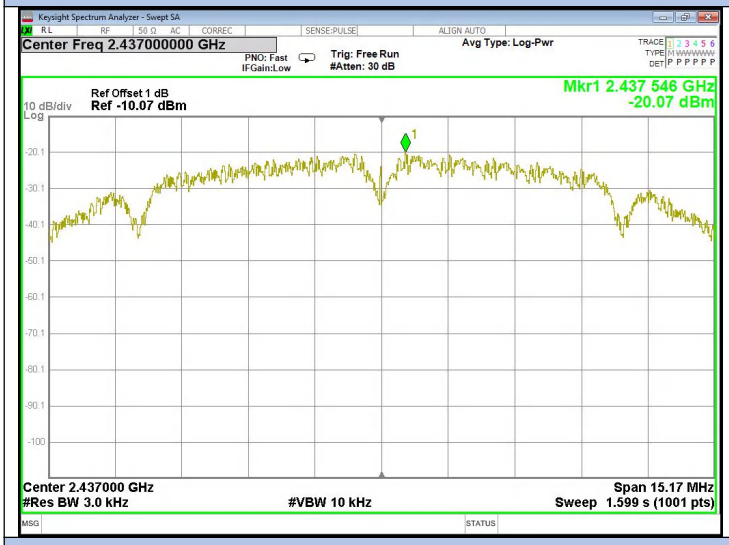
IEEE 802.11b_Ant1_CH01 2412MHz



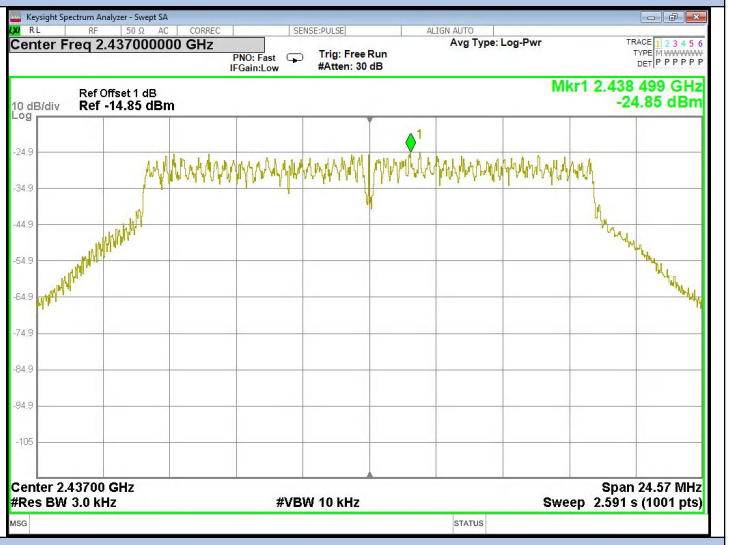
IEEE 802.11g Ant1_CH01 2412MHz



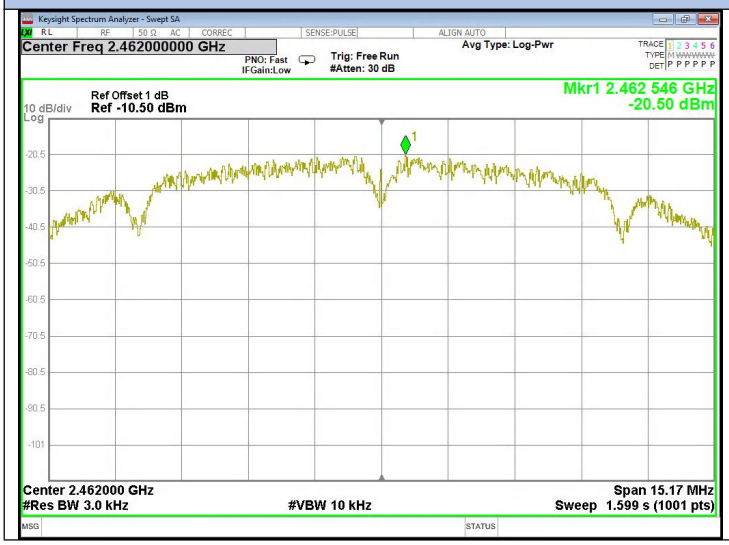
IEEE 802.11b_Ant1_CH06 2437MHz



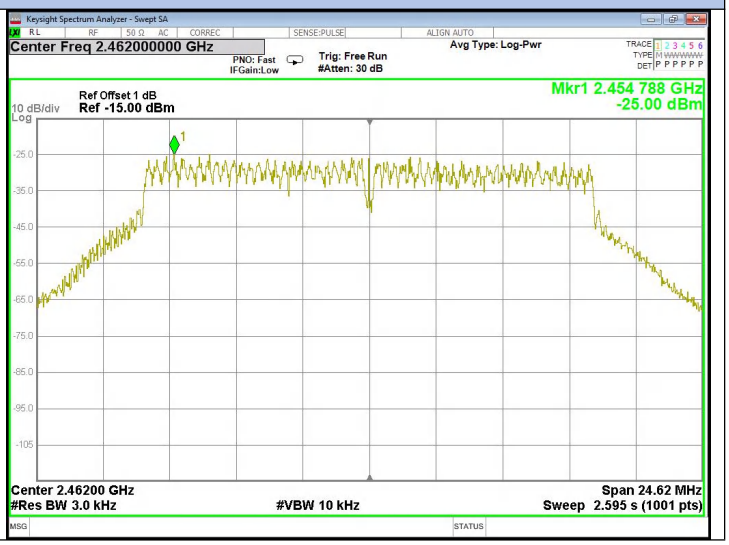
IEEE 802.11g Ant1_CH06 2437MHz



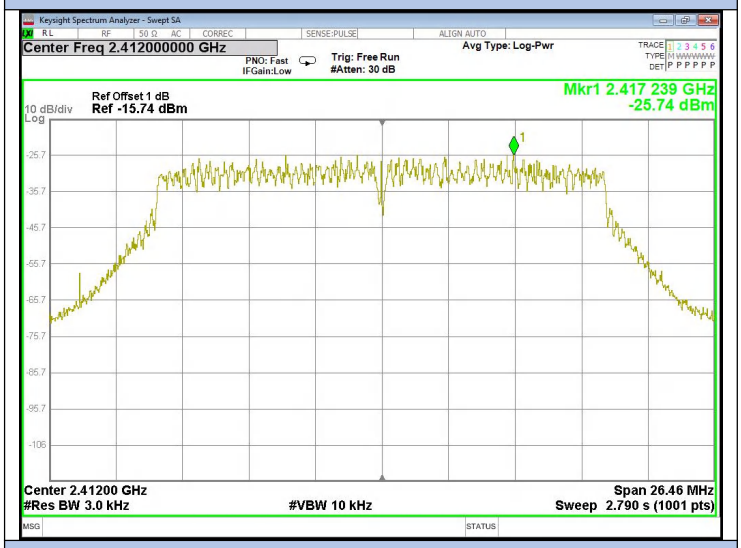
IEEE 802.11b_Ant1_CH11 2462MHz



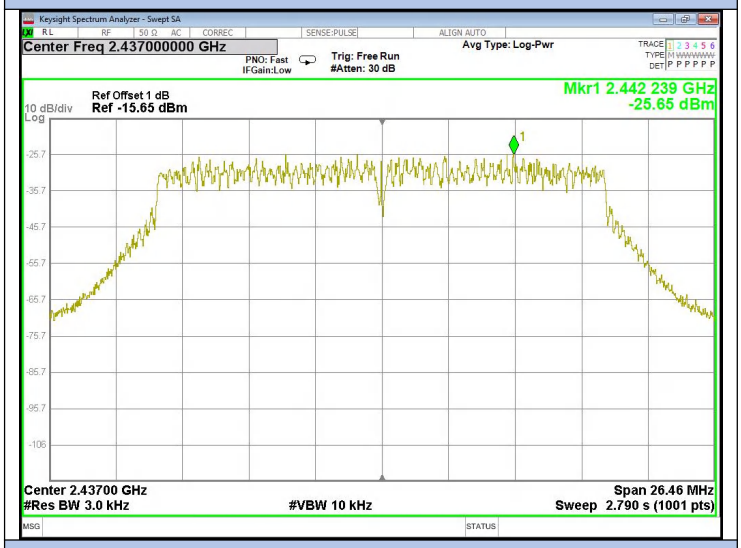
IEEE 802.11g Ant1_CH11 2462MHz



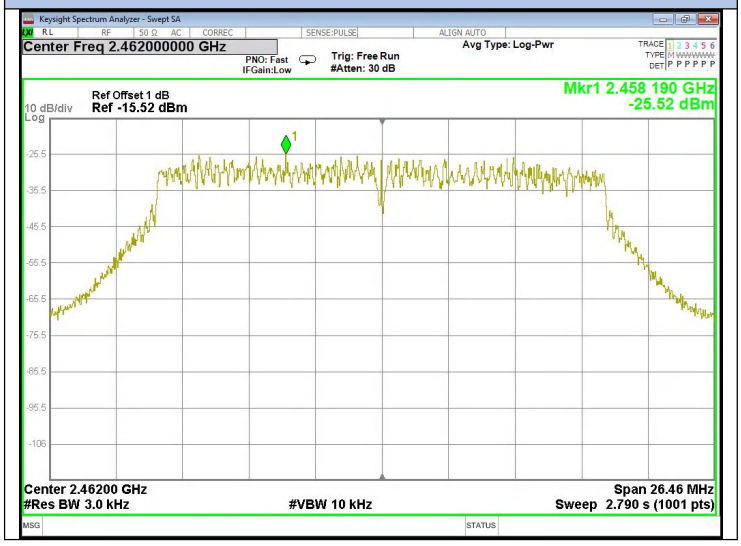
IEEE 802.11n HT20 Ant1_CH01 2412MHz



IEEE 802.11n HT20 Ant1_CH06 2437MHz



IEEE 802.11n HT20 Ant1_CH11 2462MHz

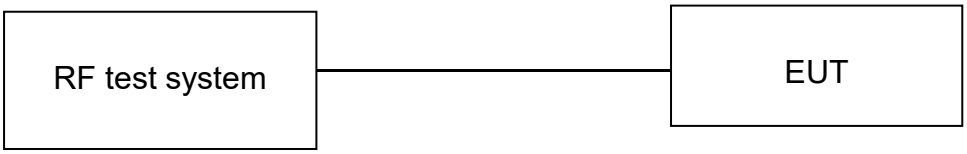


7. Conducted Band Edge

7.1. Limit

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

7.2. Test Setup



7.3. Spectrum Analyzer Setting

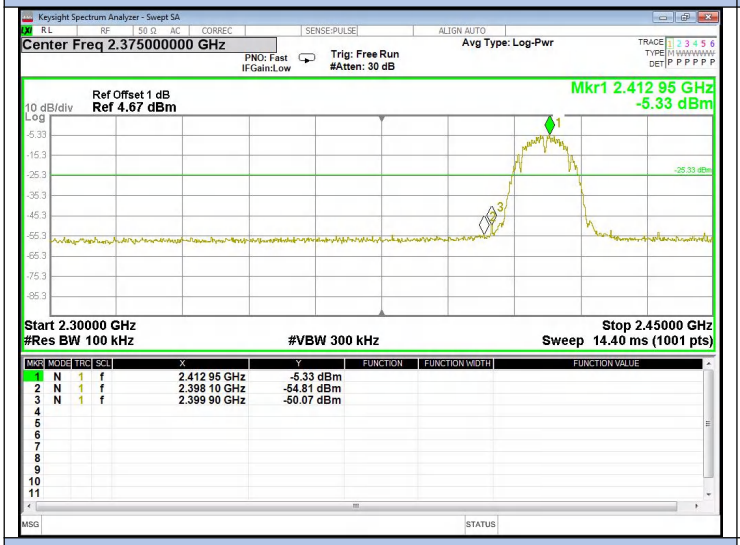
Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Span	1.5times the DTS bandwidth
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

7.4. Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 7.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the marker function to mark the highest emission level outside the authorized band.
e. Repeat above procedures until all modes and channels were measured.
f. Record the results in the test report
g. IEEE 802.11b, IEEE 802.11g, IEEE 802.11n HT20, all have been tested, the test data was recorded in report.

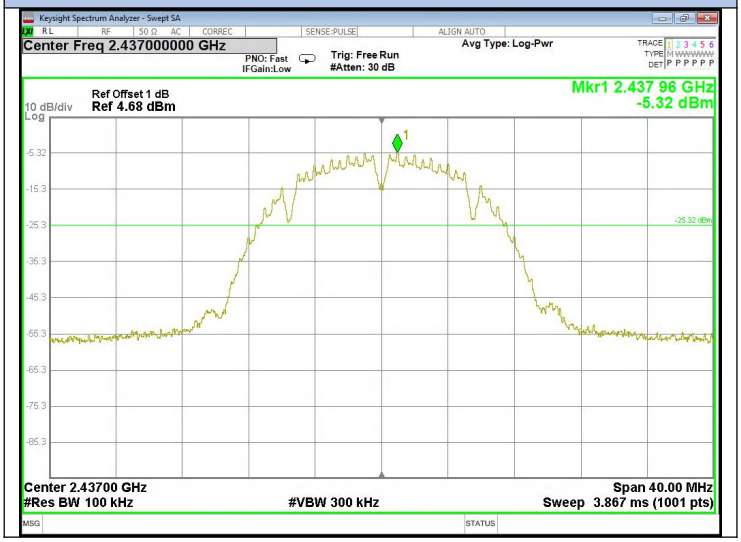
7.5.Test Result

IEEE 802.11b_Ant1_Low_CH01 2412MHz

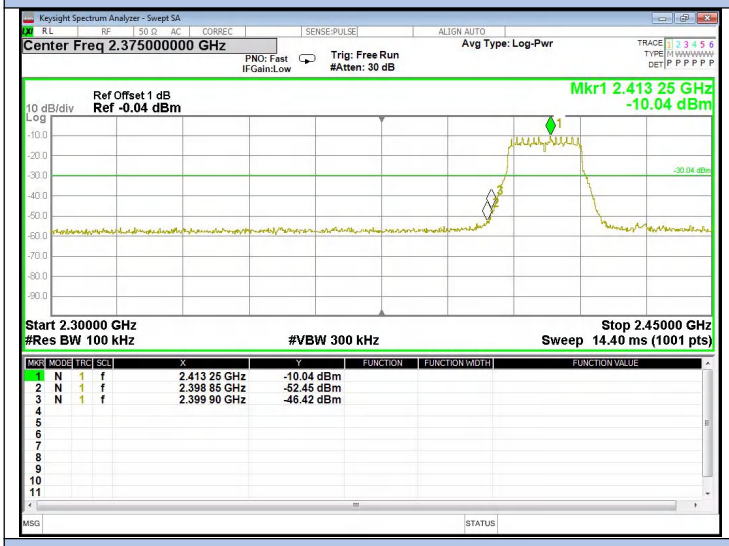


IEEE 802.11b_Ant1_High_CH11 2462MHz

IEEE 802.11b_Ant1_Middle_CH06 2437MHz

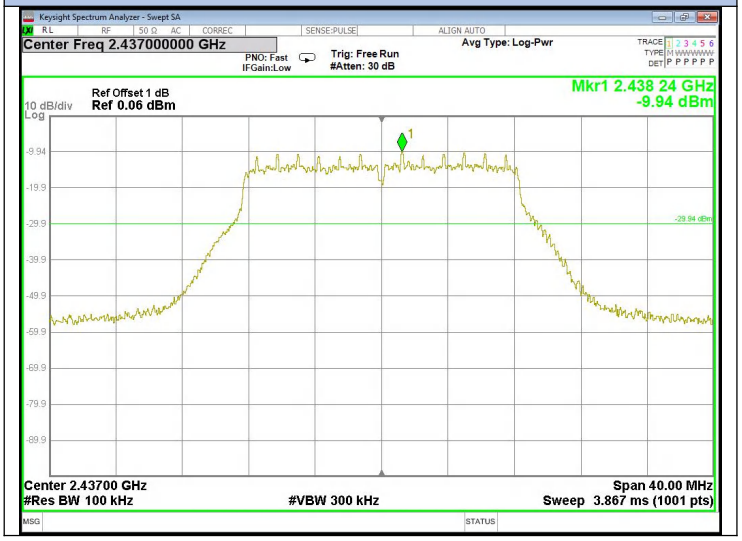


IEEE 802.11g_Ant1_Low_CH01 2412MHz

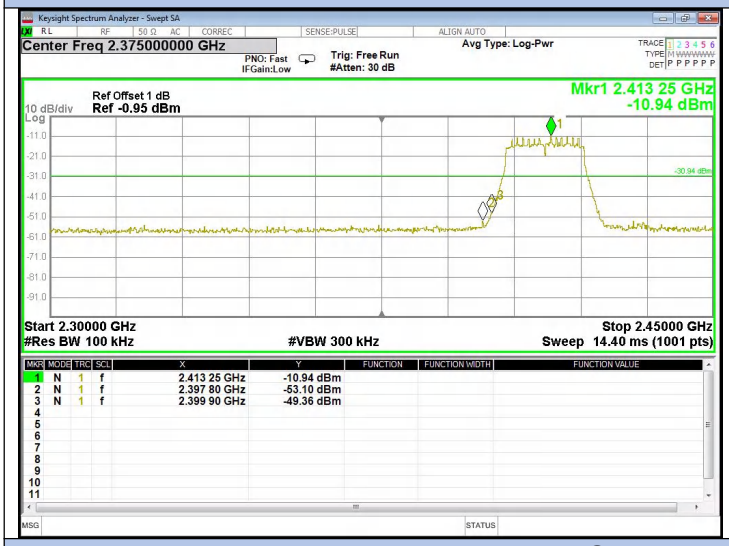


IEEE 802.11g_Ant1_High_CH11 2462MHz

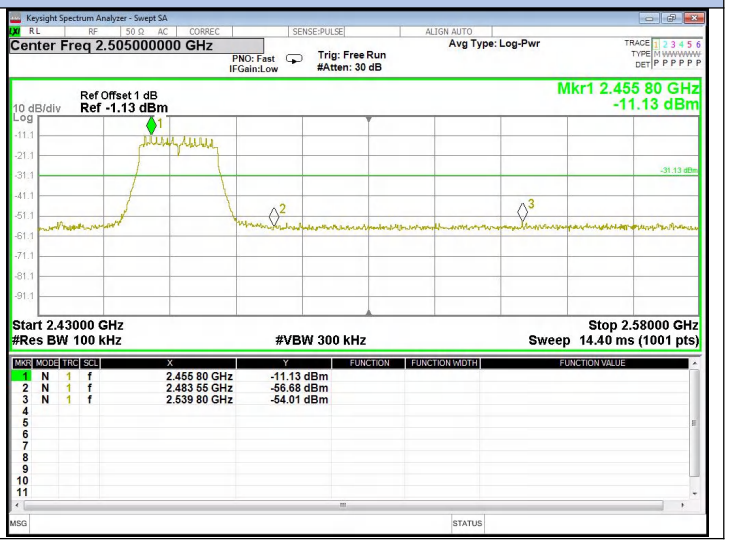
IEEE 802.11g_Ant1_Middle_CH06 2437MHz



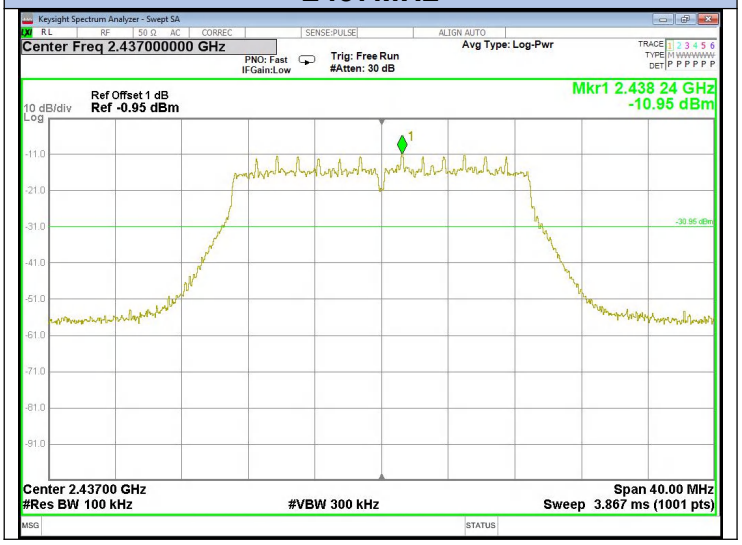
IEEE 802.11n HT20_Ant1_Low_CH01 2412MHz



IEEE 802.11n HT20_Ant1_High_CH11 2462MHz



IEEE 802.11n HT20_Ant1_Middle_CH06 2437MHz

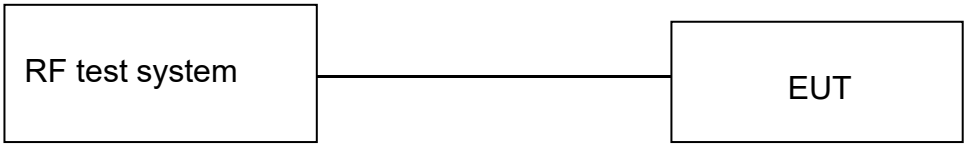


8. Conducted Spurious Emissions

8.1. Limit

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

8.2. Test Setup



8.3. Spectrum Analyzer Setting

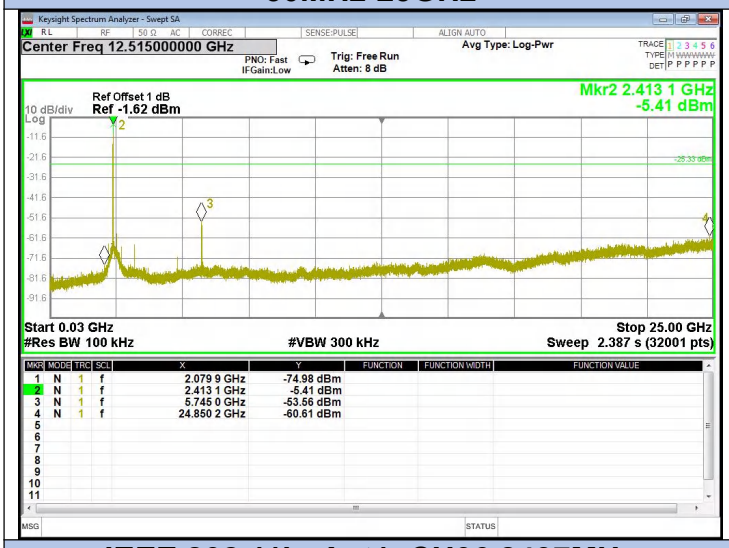
Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Start frequency	30MHz
Stop frequency	25.0GHz
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

8.4. Test Procedure

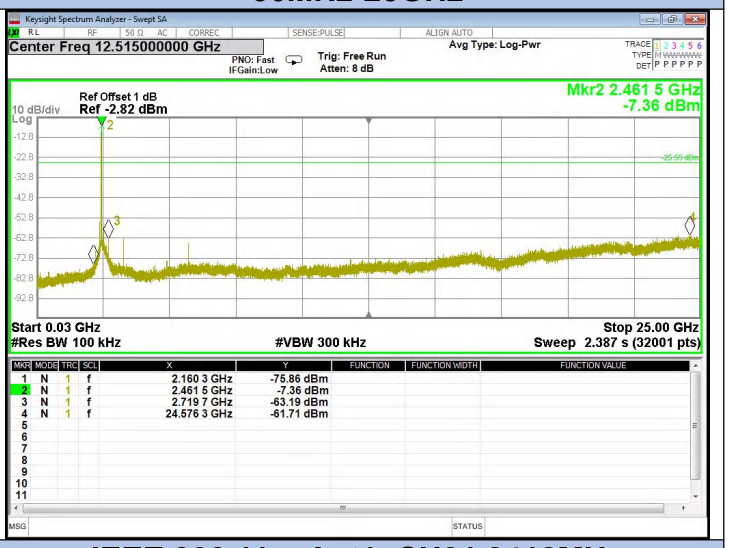
a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 8.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the marker function to mark the highest emission level outside the authorized band.
e. Repeat above procedures until all modes and channels were measured.
f. Record the results in the test report.
g. IEEE 802.11b, IEEE 802.11g, IEEE 802.11n HT20, all have been tested, the test data was recorded in report.

8.5.Test Result

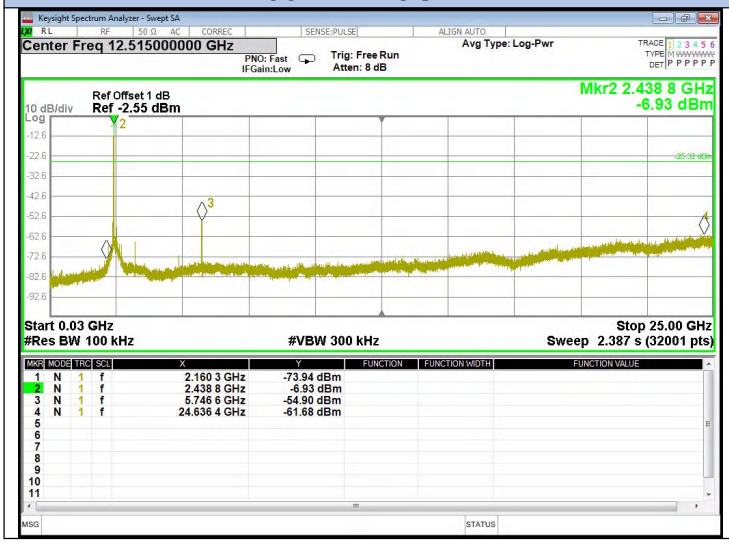
IEEE 802.11b_Ant1_CH01 2412MHz 30MHz-25GHz



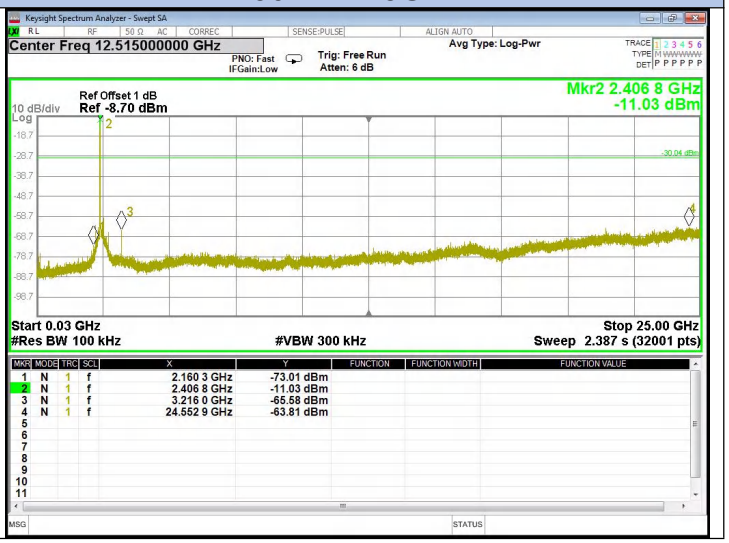
IEEE 802.11b_Ant1_CH11 2462MHz 30MHz-25GHz



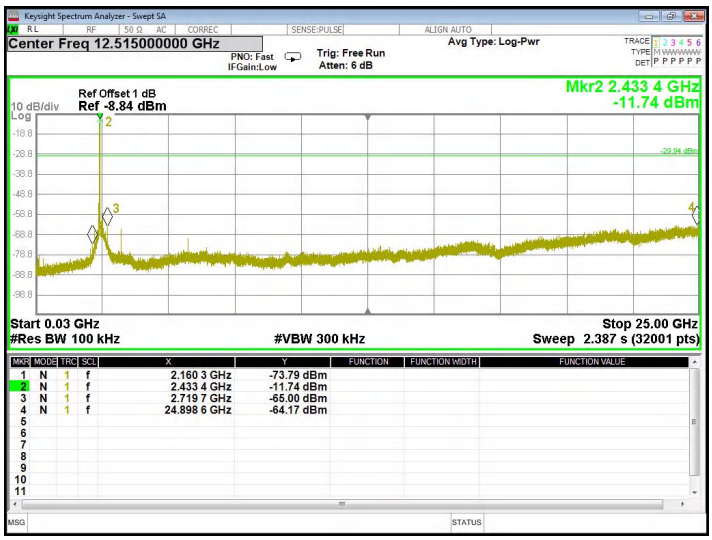
IEEE 802.11b_Ant1_CH06 2437MHz 30MHz-25GHz



IEEE 802.11g_Ant1_CH01 2412MHz 30MHz-25GHz

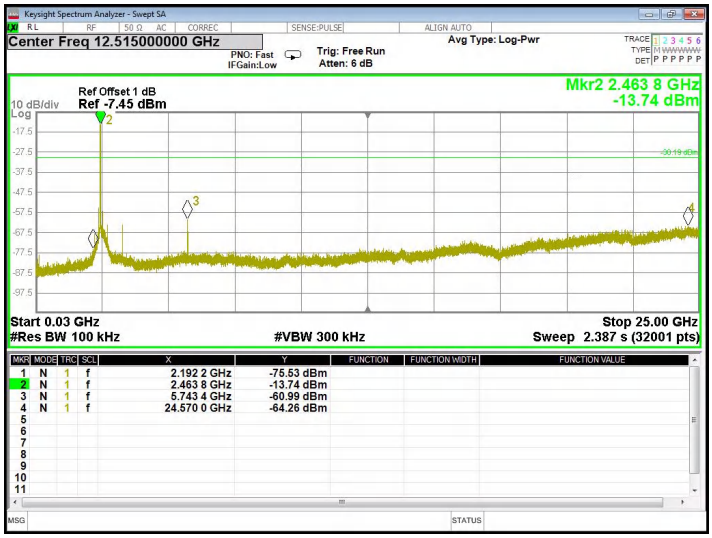


IEEE 802.11g_Ant1_CH06 2437MHz 30MHz-25GHz



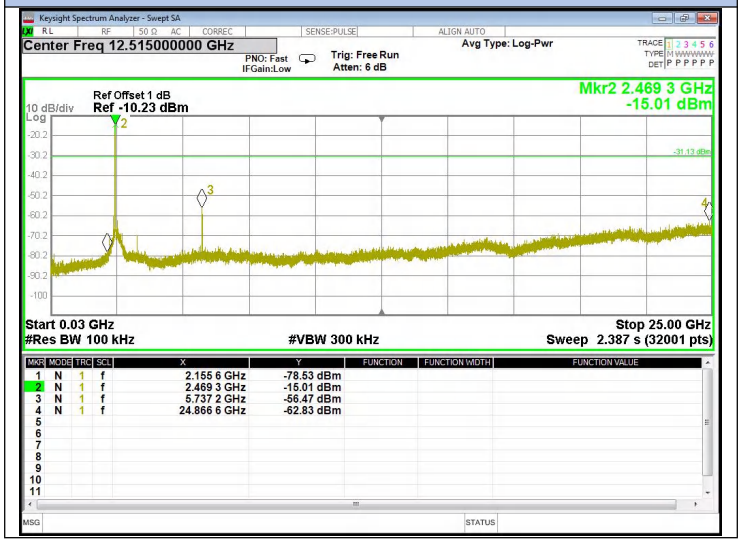
IEEE 802.11n HT20_Ant1_CH01 2412MHz 30MHz-25GHz

IEEE 802.11g_Ant1_CH11 2462MHz 30MHz-25GHz



IIEEE 802.11n HT20_Ant1_CH06 2437MHz 30MHz-25GHz

IIEEE 802.11n HT20_Ant1_CH11 2462MHz 30MHz-25GHz



9. Radiated Spurious Emissions and Band Edge

9.1. Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

15.209 Limit

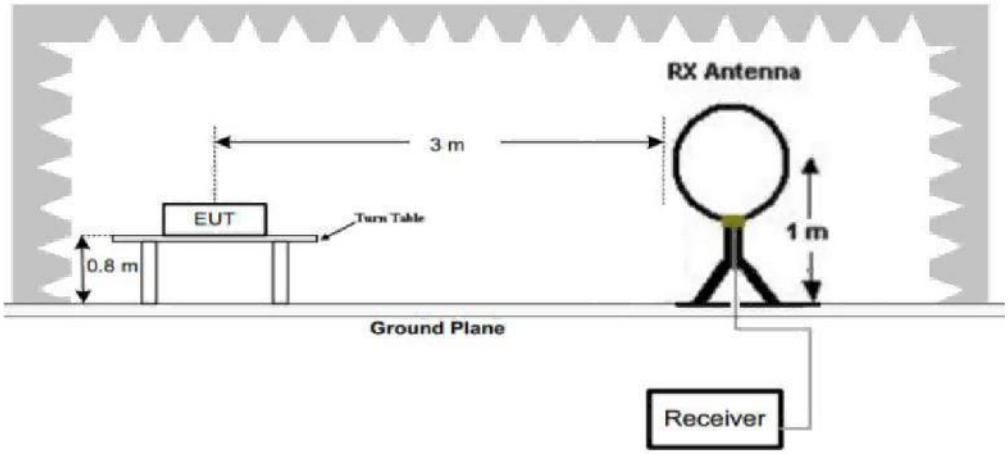
Frequency (MHz)	Field Strength(μV/m)	Distance(m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

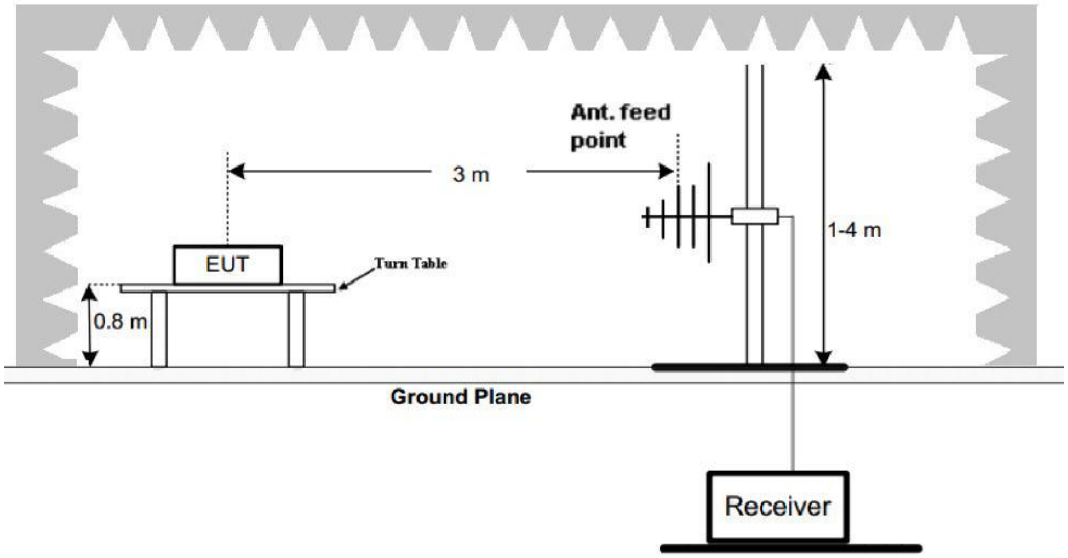
(1) Emission level dBμV = 20 log Emission level μV/m.
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

9.2. Test Setup

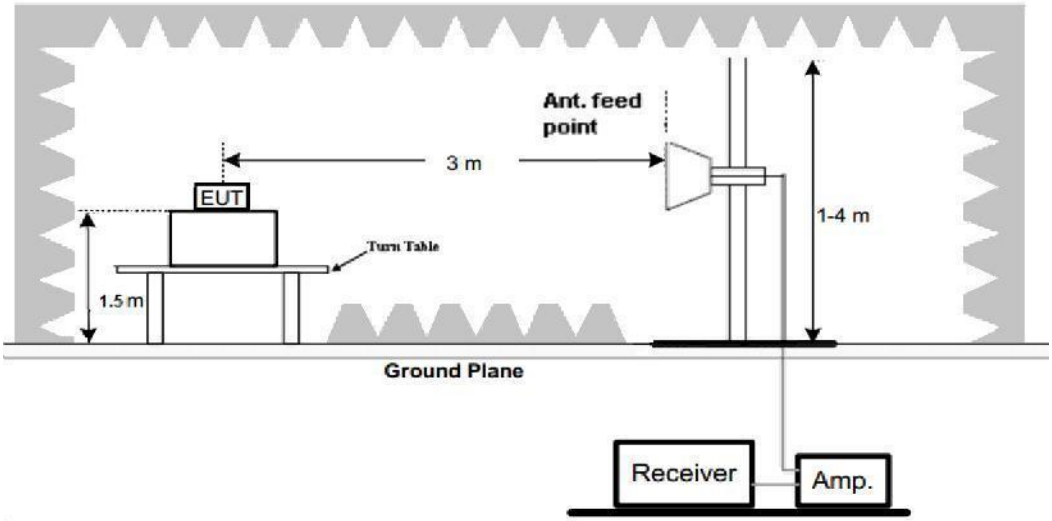
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz

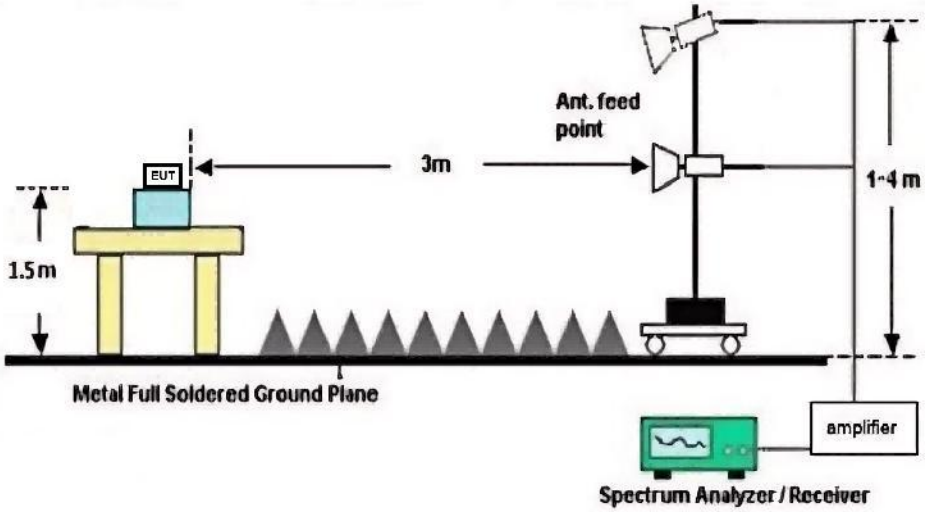


(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1GHz





9.3. Spectrum Analyzer Setting

For 9KHz-150KHz

Spectrum Parameters	Setting
RBW	300Hz (for Peak&AVG)/CISPR 200Hz (for QP)
VBW	300Hz (for Peak&AVG)/CISPR 200Hz (for QP)
Start frequency	9KHz
Stop frequency	150KHz
Sweep Time	Auto
Detector	PEAK/QP/AVG
Trace Mode	Max Hold

For 150KHz-30MHz

Spectrum Parameters	Setting
RBW	9KHz
VBW	9KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For 30MHz-1GHz

Spectrum Parameters	Setting
RBW	120KHz
VBW	300KHz
Start frequency	30MHz
Stop frequency	1GHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For Above 1GHz

Spectrum Parameters	Setting	
RBW	1MHz	
VBW	PEAK Measurement	AVG Measurement
	3MHz	Duty cycle≥98%, VBW=10Hz
		Duty cycle＜98%,VBW≥1/T
Start frequency	1GHz	
Stop frequency	25GHz	
Sweep Time	Auto	
Detector	PEAK	
Trace Mode	Max Hold	

9.4. Test Procedure

a. EUT was placed on a turn table, which is 0.8-meter high above ground for below 1GHz test, and which is 1.5-meter high above ground for above 1GHz test.
b. The diameter of the turntable is 2 meters. The EUT is located at the center of the edge of the test support table. Since the turntable is large enough, the EUT is placed at the center of the edge of the test support table as well as at the center of the turntable.
c. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
d. Set the EUT transmit continuously with maximum output power.
e. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
f. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.
g. EMI TestReceiver setting parameters in accordance with section 9.3.
h. Repeat above procedures until all channels and test modes were measured.
i. Record the results in the test report.

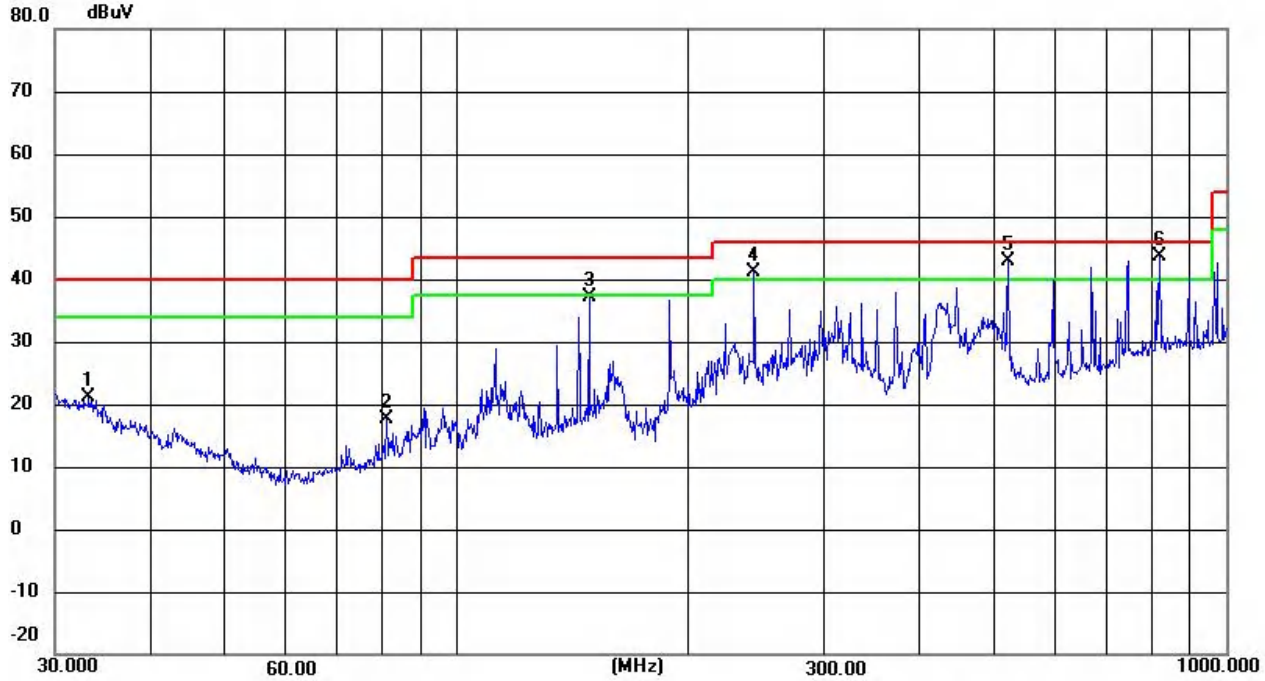
Note:

1. For emissions above 1GHz, if peak level complies with average limit, then the average level is deemed to comply with average limit.
2. The frequency 2412MHz ,2437MHz and 2462MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.
3. For 30-1000MHz Radiation emissions, IEEE 802.11b, IEEE 802.11g, IEEE 802.11n HT20 mode all have been tested, only worse case: IEEE 802.11g mode with CH6 2437MHz is reported. it was conducted under both DC 3.3V input voltages. There was no significant change in radiation emission. Only the test data under DC 3.3V voltage was recorded and included in the report.
4. Radiated emission test from 9KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9KHz to 30MHz and not recorded in this report.
5. The amplitude of 18GHz to 25GHz spurious emission-that-is attenuated by more than 20dB below the-permissible-limit has no need-to-be-reported.

9.5. Test Result

Radiated Emissions 30-1000MHz

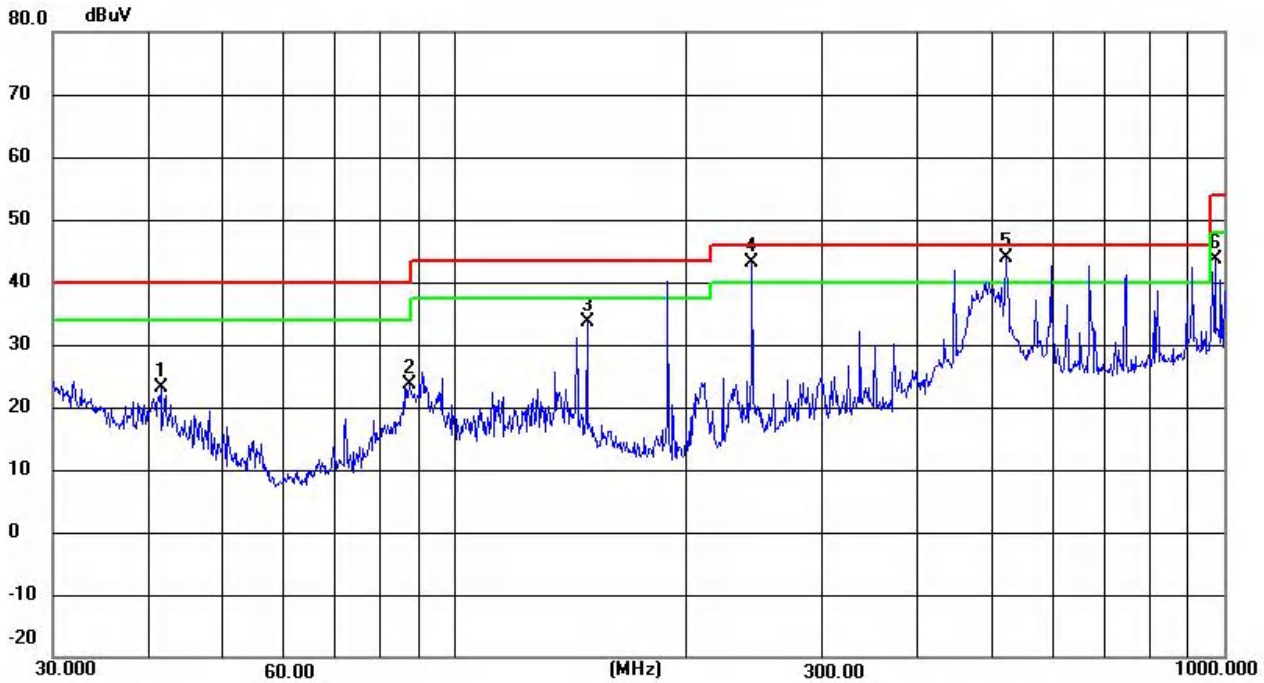
EUT: CarPlay Dongle Box
M/N: BW-W26L
Test Voltage: DC 5V
Ant. Pol.: Horizontal
Test Mode: TX Mode
Note: only worse case: IEEE 802.11b mode with CH06 2437MHz is reported
Detailed results are shown below



Remarks: 1. Margin = Result (Result =Reading + Factor)–Limit
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	33.2112	30.54	-9.34	21.20	40.00	-18.80	QP
2	80.9275	49.73	-32.16	17.57	40.00	-22.43	QP
3	148.4410	69.26	-32.13	37.13	43.50	-6.37	QP
4	243.3772	73.00	-31.98	41.02	46.00	-4.98	QP
5	520.8882	74.27	-31.27	43.00	46.00	-3.00	QP
6	818.8341	74.50	-30.78	43.72	46.00	-2.28	QP

EUT: CarPlay Dongle Box
M/N: BW-W26L
Test Voltage: DC 5V
Ant. Pol.: Vertical
Test Mode: TX Mode
Note: only worse case: IEEE 802.11b mode with CH06 2437MHz is reported
Detailed results are shown below



Remarks: 1. Margin = Result (Result =Reading + Factor)–Limit
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	41.4215	37.27	-14.24	23.03	40.00	-16.97	QP
2	87.1116	55.90	-32.17	23.73	40.00	-16.27	QP
3	148.4410	65.81	-32.13	33.68	43.50	-9.82	QP
4	243.3771	74.99	-31.98	43.01	46.00	-2.99	QP
5	520.8882	75.21	-31.27	43.94	46.00	-2.06	QP
6	972.3373	74.27	-30.63	43.64	54.00	-10.36	QP

(1GHz~25GHz) Restricted band and Spurious emission Requirements

802.11b(Worst)-Low

Peak

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824	36.45	31.78	8.6	32.09	44.74	74	-29.26	Vertical
7236	34.44	36.15	11.65	32	50.24	74	-23.76	Vertical
9648	35.32	37.95	14.14	31.62	55.79	74	-18.21	Vertical
12060	*					74		Vertical
14472	*					74		Vertical
16884	*					74		Vertical
4824	39.05	31.78	8.6	32.09	47.34	74	-26.66	Horizontal
7236	34.24	36.15	11.65	32	50.04	74	-23.96	Horizontal
9648	33.37	37.95	14.14	31.62	53.84	74	-20.16	Horizontal
12060	*					74		Horizontal
14472	*					74		Horizontal
16884	*					74		Horizontal

Avg

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824	29.15	31.78	8.6	32.09	37.44	54	-16.56	Vertical
7236	21.29	36.15	11.65	32	37.09	54	-16.91	Vertical
9648	20.03	37.95	14.14	31.62	40.5	54	-13.5	Vertical
12060	*					54		Vertical
14472	*					54		Vertical
16884	*					54		Vertical
4824	33.17	31.78	8.6	32.09	41.46	54	-12.54	Horizontal
7236	23.11	36.15	11.65	32	38.91	54	-15.09	Horizontal
9648	20.22	37.95	14.14	31.62	40.69	54	-13.31	Horizontal
12060	*					54		Horizontal
14472	*					54		Horizontal
16884	*					54		Horizontal

Remark:
Final Level =Receiver Read level + Antenna Factor + Cable Loss- Preamplifier Factor
The emission levels of other frequencies are very lower than the limit and not show in test report.
3. “*", means this data is the too weak instrument of signal is unable to test.

802.11b(Worst)-Middle

Peak

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874	37.93	31.85	8.67	32.12	46.33	74	-27.67	Vertical
7311	32.14	36.37	11.72	31.89	48.34	74	-25.66	Vertical
9748	32.21	38.35	14.25	31.62	53.19	74	-20.81	Vertical
12185	*					74		Vertical
14622	*					74		Vertical
17059	*					74		Vertical
4874	42.35	31.85	8.67	32.12	50.75	74	-23.25	Horizontal
7311	34.04	36.37	11.72	31.89	50.24	74	-23.76	Horizontal
9748	34.12	38.35	14.25	31.62	55.1	74	-18.9	Horizontal
12185	*					74		Horizontal
14622	*					74		Horizontal
17059	*					74		Horizontal

Avg

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874	27.21	31.85	8.67	32.12	35.61	54	-18.39	Vertical
7311	22.14	36.37	11.72	31.89	38.34	54	-15.66	Vertical
9748	18.23	38.35	14.25	31.62	39.21	54	-14.79	Vertical
12185	*					54		Vertical
14622	*					54		Vertical
17059	*					54		Vertical
4874	29.5	31.85	8.67	32.12	37.9	54	-16.1	Horizontal
7311	22.97	36.37	11.72	31.89	39.17	54	-14.83	Horizontal
9748	22.09	38.35	14.25	31.62	43.07	54	-10.93	Horizontal
12185	*					54		Horizontal
14622	*					54		Horizontal
17059	*					54		Horizontal

Remark:
1.Final Level =Receiver Read level + Antenna Factor + Cable Loss- Preamplifier Factor
2.The emission levels of other frequencies are very lower than the limit and not show in test report.
3. “*", means this data is the too weak instrument of signal is unable to test.

802.11b(Worst)-High

Peak

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924	35.17	31.93	8.73	32.16	43.67	74	-30.33	Vertical
7386	33.99	36.59	11.79	31.78	50.59	74	-23.41	Vertical
9848	34.38	38.81	14.38	31.88	55.69	74	-18.31	Vertical
12310	*					74		Vertical
14772	*					74		Vertical
17234	*					74		Vertical
4924	39.74	31.93	8.73	32.16	48.24	74	-25.76	Horizontal
7386	35.53	36.59	11.79	31.78	52.13	74	-21.87	Horizontal
9848	33.11	38.81	14.38	31.88	54.42	74	-19.58	Horizontal
12310	*					74		Horizontal
14772	*					74		Horizontal
17234	*					74		Horizontal

Avg

Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924	25.24	31.93	8.73	32.16	33.74	54	-20.26	Vertical
7386	19.35	36.59	11.79	31.78	35.95	54	-18.05	Vertical
9848	18.47	38.81	14.38	31.88	39.78	54	-14.22	Vertical
12310	*					54		Vertical
14772	*					54		Vertical
17234	*					54		Vertical
4924	33.69	31.93	8.73	32.16	42.19	54	-11.81	Horizontal
7386	23.63	36.59	11.79	31.78	40.23	54	-13.77	Horizontal
9848	20.85	38.81	14.38	31.88	42.16	54	-11.84	Horizontal
12310	*					54		Horizontal
14772	*					54		Horizontal
17234	*					54		Horizontal

Remark:
1.Final Level =Receiver Read level + Antenna Factor + Cable Loss- Preamplifier Factor
2.The emission levels of other frequencies are very lower than the limit and not show in test report.
3. “*", means this data is the too weak instrument of signal is unable to test
4.The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

802.11 b low CH

Peak value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2390	50.75	27.59	5.38	30.18	53.54	74	-20.46	Horizontal
2400	54.23	27.58	5.39	30.18	57.02	74	-16.98	Horizontal
2390	49.63	27.59	5.38	30.18	52.42	74	-21.58	Vertical
2400	55.08	27.58	5.39	30.18	57.87	74	-16.13	Vertical
Average value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2390	39.77	27.59	5.38	30.18	42.56	54	-11.44	Horizontal
2400	42.86	27.58	5.39	30.18	48.47	54	-5.53	Horizontal
2390	37.98	27.59	5.38	30.18	40.77	54	-13.23	Vertical
2400	42.54	27.58	5.39	30.18	45.33	54	-8.67	Vertical

802.11 b High CH

Peak value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2483.5	50.09	27.53	5.47	29.93	53.16	74	-20.84	Horizontal
2500	47.73	27.55	5.49	29.93	50.84	74	-23.16	Horizontal
2483.5	49.54	27.53	5.47	29.93	52.61	74	-21.39	Vertical
2500	45.91	27.55	5.49	29.93	49.02	74	-24.98	Vertical
Average value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2483.5	39.63	27.53	5.47	29.93	42.7	54	-11.3	Horizontal
2500	36.3	27.55	5.49	29.93	39.41	54	-14.59	Horizontal
2483.5	37.15	27.53	5.47	29.93	40.22	54	-13.78	Vertical
2500	34.3	27.55	5.49	29.93	37.41	54	-16.59	Vertical

The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

802.11 g Low CH

Peak value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2390	63.8	27.59	5.38	30.18	66.59	74	-7.41	Horizontal
2400	64.08	27.58	5.39	30.18	66.87	74	-7.13	Horizontal
2390	59.97	27.59	5.38	30.18	62.76	74	-11.24	Vertical
2400	62.19	27.58	5.39	30.18	64.98	74	-9.02	Vertical
Average value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2390	46.1	27.59	5.38	30.18	48.89	54	-5.11	Horizontal
2400	42.86	27.58	5.39	30.18	44.88	54	-9.12	Horizontal
2390	43.64	27.59	5.38	30.18	46.43	54	-7.57	Vertical
2400	42.19	27.58	5.39	30.18	44.98	54	-9.02	Vertical

802.11 g High CH

Peak value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2483.5	55.68	27.53	5.47	29.93	58.75	74	-15.25	Horizontal
2500	48.93	27.55	5.49	29.93	52.04	74	-21.96	Horizontal
2483.5	50.77	27.53	5.47	29.93	53.84	74	-20.16	Vertical
2500	47.22	27.55	5.49	29.93	50.33	74	-23.67	Vertical
Average value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2483.5	38.56	27.53	5.47	29.93	41.63	54	-12.37	Horizontal
2500	36.66	27.55	5.49	29.93	39.77	54	-14.23	Horizontal
2483.5	37.11	27.53	5.47	29.93	40.18	54	-13.82	Vertical
2500	34.97	27.55	5.49	29.93	38.08	54	-15.92	Vertical

The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

802.11 N 20 Low CH

Peak value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2390	63.84	27.59	5.38	30.18	66.63	74	-7.37	Horizontal
2400	64.37	27.58	5.39	30.18	67.16	74	-6.84	Horizontal
2390	59.75	27.59	5.38	30.18	62.54	74	-11.46	Vertical
2400	62.17	27.58	5.39	30.18	64.96	74	-9.04	Vertical
Average value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2390	41.85	27.59	5.38	30.18	44.64	54	-9.36	Horizontal
2400	42.86	27.58	5.39	30.18	49.82	54	-4.18	Horizontal
2390	44.39	27.59	5.38	30.18	47.18	54	-6.82	Vertical
2400	42.19	27.58	5.39	30.18	44.98	54	-9.02	Vertical

802.11 N 20 High CH

Peak value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2483.5	54.59	27.53	5.47	29.93	57.66	74	-16.34	Horizontal
2500	49.01	27.55	5.49	29.93	52.12	74	-21.88	Horizontal
2483.5	50.74	27.53	5.47	29.93	53.81	74	-20.19	Vertical
2500	47.12	27.55	5.49	29.93	50.23	74	-23.77	Vertical
Average value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2483.5	38.54	27.53	5.47	29.93	41.61	54	-12.39	Horizontal
2500	36.7	27.55	5.49	29.93	39.81	54	-14.19	Horizontal
2483.5	37.37	27.53	5.47	29.93	40.44	54	-13.56	Vertical
2500	34.99	27.55	5.49	29.93	38.1	54	-15.9	Vertical

The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

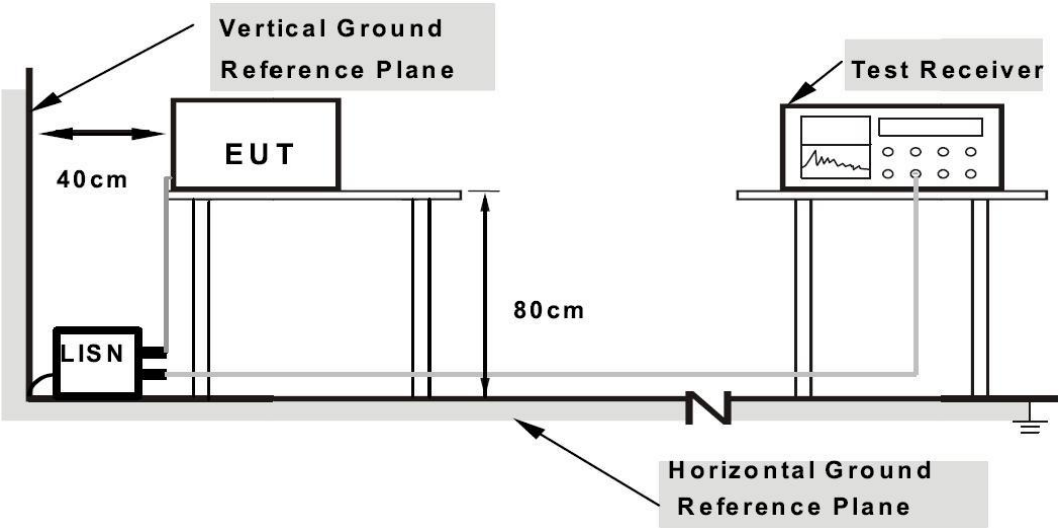
10. AC Power Line Conducted Emissions

10.1. Limit

Frequency			Maximum RF Line Voltage	
			Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz	~	500kHz	66 ~ 56*	56 ~ 46*
500kHz	~	5MHz	56	46
5MHz	~	30MHz	60	50

Note:
1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

10.2. Test Setup



10.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	9KHz
VBW	9KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP/AVG
Trace Mode	Max Hold

10.4. Test Procedure

a. The EUT was placed on a non-metallic table, 80cm above the ground plane.
b. The EUT Power connected to the power mains through a line impedance stabilization network.
c. Provides a 50ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs).
d. Set the EUT transmit continuously with maximum output power.
e. EMI TestReceiver setting parameters in accordance with section 10.3.
f. The AC line is checked to find out the maximum conducted emission. To find the maximum emission levels, the relative positions of equipment and all the interface cables shall be changed according to ANSI C63.10:2020 on Conducted Emission Test.
g. Record the results in the test report. (only worse case: IEEE 802.11b mode with CH6 2437MHz is reported)

10.5. Test Result

Note: The EUT is powered by DC power supply and cannot be directly connected to the public AC power network. This test is not applicable.

11. ANTENNA REQUIREMENTS

11.1. Limit

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

11.2. Test Result

The antennas used for this product is PCB antenna, so compliance with antenna requirements. (Please refer to the EUT Internal Photos for details)

12.APPENDIX

"EUT of External Photos, EUT Internal Photos & Test Setup Photos" Please refer to the Annex A, Annex B& Annex C document.

CTSLCTSL2620230167ER Annex A. EUT External Photos
CTSLCTSL2620230167ER Annex B. EUT Internal Photos
CTSLCTSL2620230167ER Annex C. Test Setup Photos

----------*End of Test Report*----------