中认信通
CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)

ACCREDITED
TESTING LABORATORY
CERTIFICATE # 6356.01

TEST REPORT

Applicant: **Hangzhou Meari Technology Co., Ltd.**

Address: Room 604-605,Building 1,No.768 Jianghong Road, Changhe street, Binjiang District, Hangzhou, Zhejiang, China

FCC ID: **2AG7C-MINI8-A5**

Product Name: **IP CAMERA**

Standard(s): **47 CFR Part 15, Subpart C(15.247)**
ANSI C63.10-2013
KDB 558074 D01 15.247 Meas Guidance v05r02

The above equipment has been tested and found compliance with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

Report Number: **CR21110046-00**

Date Of Issue: **2021-12-01**

Reviewed By: **Sun Zhong** Sun Zhong

Title: Manager

Test Laboratory: **China Certification ICT Co., Ltd (Dongguan)**
No. 113, Pingkang Road, Dalang Town, Dongguan,
Guangdong, China
Tel: +86-769-82016888

Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 442868, the FCC Designation No. : CN1314.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0123.

Declarations

China Certification ICT Co., Ltd (Dongguan) is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

This report cannot be reproduced except in full, without prior written approval of the Company.

This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk "★".

CONTENTS

TEST FACILITY 2

DECLARATIONS 2

1. GENERAL INFORMATION 5

1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 5

1.2 DESCRIPTION OF TEST CONFIGURATION 7

1.2.2 Support Equipment List and Details 7
1.2.3 Support Cable List and Details 7
1.2.4 Block Diagram of Test Setup 8

1.3 MEASUREMENT UNCERTAINTY 9

2. SUMMARY OF TEST RESULTS 10

3. REQUIREMENTS AND TEST PROCEDURES 11

3.1 AC LINE CONDUCTED EMISSIONS 11

3.1.1 Applicable Standard 11
3.1.2 EUT Setup 12
3.1.3 EMI Test Receiver Setup 12
3.1.4 Test Procedure 13
3.1.5 Corrected Amplitude & Margin Calculation 13

3.2 RADIATION SPURIOUS EMISSIONS 14

3.2.1 Applicable Standard 14
3.2.2 EUT Setup 14
3.2.3 EMI Test Receiver & Spectrum Analyzer Setup 15
3.2.4 Test Procedure 15
3.2.5 Corrected Amplitude & Margin Calculation 15

3.3 6 DB EMISSION BANDWIDTH: 16

3.3.1 Applicable Standard 16
3.3.2 EUT Setup 16
3.3.3Test Procedure 16

3.4 99% OCCUPIED BANDWIDTH: 17

3.4.1 EUT Setup 17
3.4.2Test Procedure 17

3.5 MAXIMUM PEAK CONDUCTED OUTPUT POWER: 18

3.5.1 Applicable Standard 18
3.5.2 EUT Setup 18
3.5.3Test Procedure 18

3.6 MAXIMUM POWER SPECTRAL DENSITY: 19

3.6.1 Applicable Standard 19
3.6.2 EUT Setup 19
3.6.3Test Procedure 19

3.7 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE: 20

3.7.1 Applicable Standard 20
3.7.2 EUT Setup 20

3.7.3 Test Procedure 20
3.8 DUTY CYCLE: 21
3.8.1 EUT Setup 21
3.8.2Test Procedure 21
3.9 ANTENNA REQUIREMENT 21
3.9.1 Applicable Standard 21
3.9.2 Judgment 21
4. Test DATA AND RESULTS 22
4.1 AC LINE CONDUCTED EMISSIONS 22
4.2 RADIATION SPURIOUS EMISSIONS 31
4.3 6 DB EMISSION BANDWIDTH: 46
4.5 MAXIMUM PEAK CONDUCTED OUTPUT POWER: 51
4.6 MAXIMUM POWER SPECTRAL DENSITY: 52
4.7 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE: 57
4.8 DUTY CYCLE: 62
5. RF EXPOSURE EVALUATION 64
5.1 MAXIMUM PERMISSIBLE EXPOSURE (MPE) 64
5.1.1 APPLICABLE STANDARD 64
5.1.2 PROCEDURE 64
5.1.3 CALCULATED RESULT 64

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	IP CAMERA
EUT Model:	Mini 12S
Multiple Model:	Mini 8S, Mini 8T, Mini 9S ,Mini 9T, Mini 16S, Mini 16T, M1, M1C, IN1, IN1T, M4, M4T, LV-PWF1
Operation Frequency:	2412-2462 MHz(802.11b/g/n ht20), 2422-2452 MHz(802.11n ht40)
Maximum Peak Output Power (Conducted):	18.84 dBm
Modulation Type:	DSSS, OFDM
Rated Input Voltage:	DC 5V from adapter
Serial Number:	CR21110046-RF-S1 (Mini 16S) CR21110046-RF-S2 (Mini 12S)
EUT Received Date:	2021.11.12
EUT Received Status:	Good
Note: The Multiple models are identical with Test model, please refer to the declaration letter for more detail, which was provided by manufacturer. Mini 12S and Mini 16S were tested with AC line conducted emissions and Spurious emissions Below 1GHz, other item test model is Mini 12S.	

Operation Frequency Detail:

For 802.11b/g/n ht20:

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

Per section 15.31(m), the lowest frequency, middle frequency, and highest frequency were performed the test as below:

Test Channel	Frequency (MHz)
Lowest	2412
Middle	2437
Highest	2462

For 802.11n ht40:

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

Per section 15.31(m), the lowest frequency, middle frequency, and highest frequency were performed the test as below:

Test Channel	Frequency (MHz)
Lowest	2422
Middle	2437
Highest	2452

Antenna Information Detail▲:

Antenna Manufacturer	Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range	§15.203 Requirement
Hangzhou Meari Technology Co., Ltd.	PIFA	50	3.0 dBi/2.4~2.5GHz	**Compliance**
The Method of §15.203 Compliance: ☒Antenna must be permanently attached to the unit. ☐Antenna must use a unique type of connector to attach to the EUT. ☐Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.				

Accessory Information:

Accessory Description	Manufacturer	Model	Parameters
Adapter #1	Dongguan Green Power One Co., Ltd	GTA92-0501000US	Input: AC100V-240V 50/60Hz 300mA Output: DC 5V 1A
Adapter #2	Shenzhen Tianyin Electronics Co., Ltd	TPA-46B050100UU	Input: AC100V-240V 50/60Hz 200mA Output: DC 5V 1A
USB Cable	Unknown	Unknown	Unshielding, 1m

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

For 802.11b/g/n:

EUT Operation Mode:	The system was configured for testing in Engineering Mode, which was provided by the manufacturer.
Equipment Modifications:	No
EUT Exercise Software:	SecureCRT

The software " SecureCRT "was provided by manufacturer. The maximum power was configured as below, that was provided by the manufacturer▲:

Test Modes	Data Rate	Power Level Setting		
		Lowest Channel	Middle Channel	Highest Channel
802.11b	1Mbps	Default	Default	Default
802.11g	6Mbps	Default	Default	Default
802.11n ht20	MCS0	Default	Default	Default
802.11n ht40	MCS0	Default	Default	Default

The above are the worst-case data rates, which are determined for each mode based upon investigations by measuring the average power and PSD across all data rates, bandwidths, and modulations.

1.2.2 Support Equipment List and Details

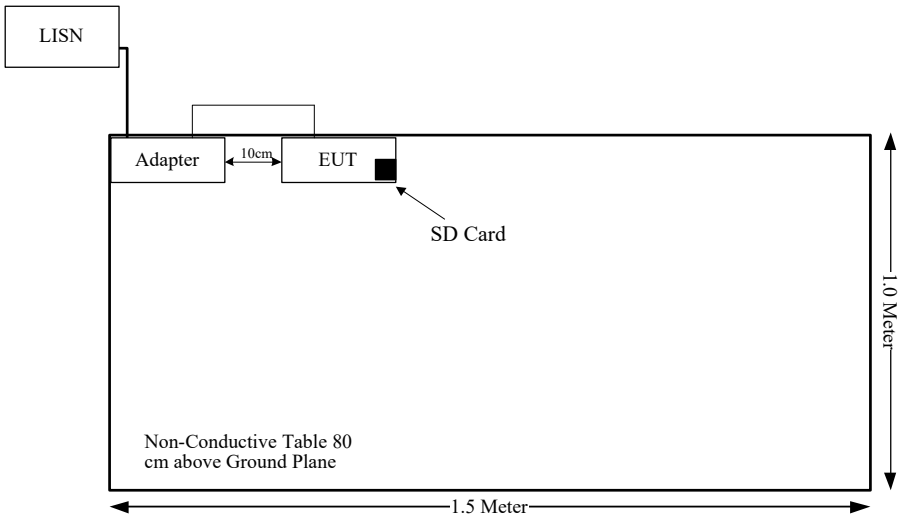
Manufacturer	Description	Model	Serial Number
Sandisk	SD card	32G	72810VCP912S

1.2.3 Support Cable List and Details

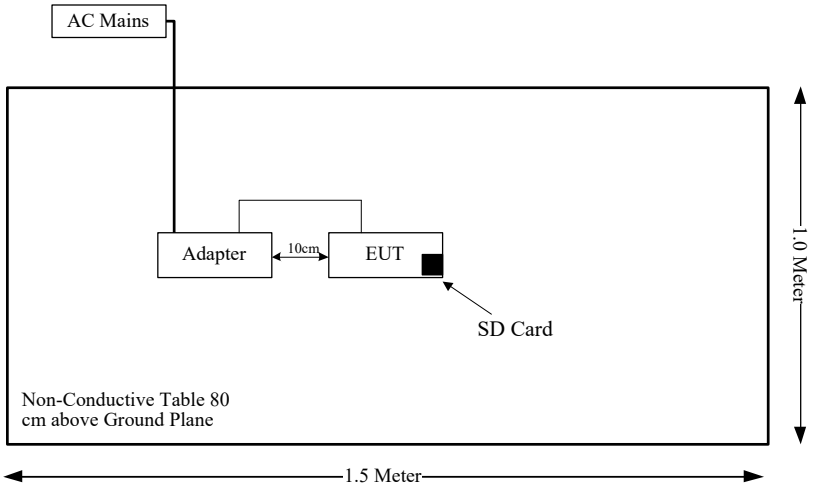
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
AC power cable	No	No	1	Adapter	LISN/AC Mains
USB cable	No	No	2	EUT	Adapter

1.2.4 Block Diagram of Test Setup

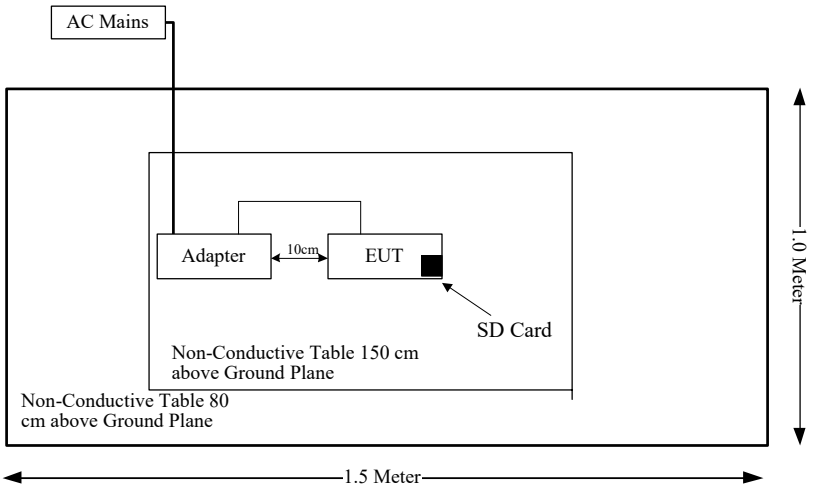
CE



RE below 1G



RE above 1G



1.3 Measurement Uncertainty

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	30M~200MHz: 4.15 dB,200M~1GHz: 5.61 dB,1G~6GHz: 5.14 dB, 6G~18GHz: 5.93 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Unwanted Emissions, conducted	±1.26 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)

2. SUMMARY OF TEST RESULTS

Standard(s) Section	Test Items	Result
§15.207(a)	AC line conducted emissions	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Bandwidth	Compliance
§15.247(b)(3)	Maximum Conducted Output Power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance
§15.203	Antenna Requirement	Compliance
§15.247 (i) & §1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	Compliance

3. REQUIREMENTS AND TEST PROCEDURES

3.1 AC Line Conducted Emissions

3.1.1 Applicable Standard

FCC§15.207(a).

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator 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, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

	Conducted limit (dBμV)	
Frequency of emission (MHz)	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.

(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

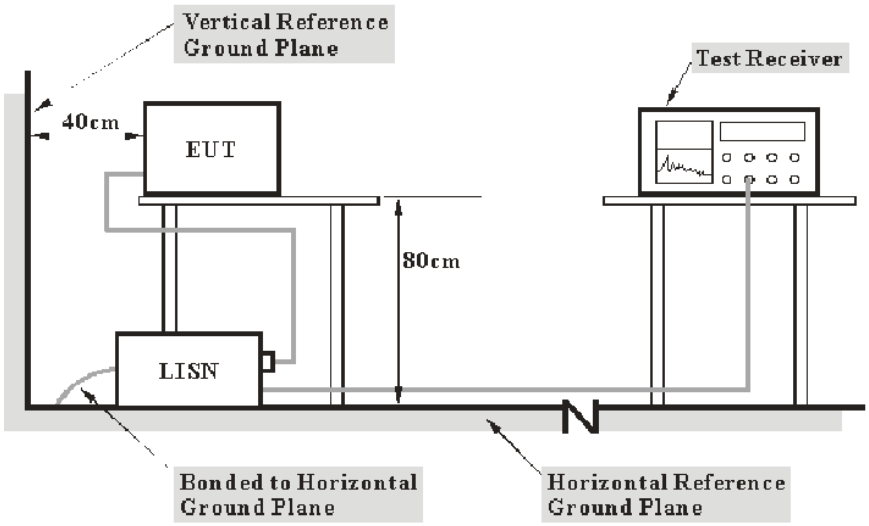
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 μV within the frequency band 535-1705 kHz, as measured using a 50 μH/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtainig their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

3.1.2 EUT Setup



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

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter or EUT was connected to the main LISN with a 120 V/60 Hz AC power source.

3.1.3 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

3.1.4 Test Procedure

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase ("hot") line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

3.1.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor
Factor = attenuation caused by cable loss + voltage division factor of AMN

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

3.2 Radiation Spurious Emissions

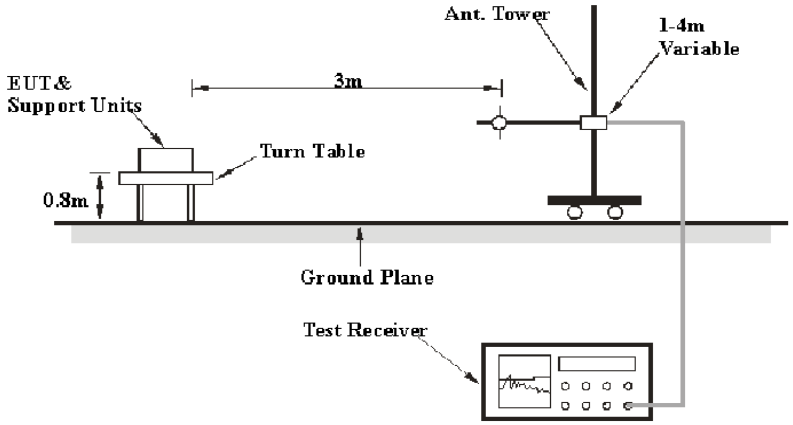
3.2.1 Applicable Standard

FCC §15.247 (d);

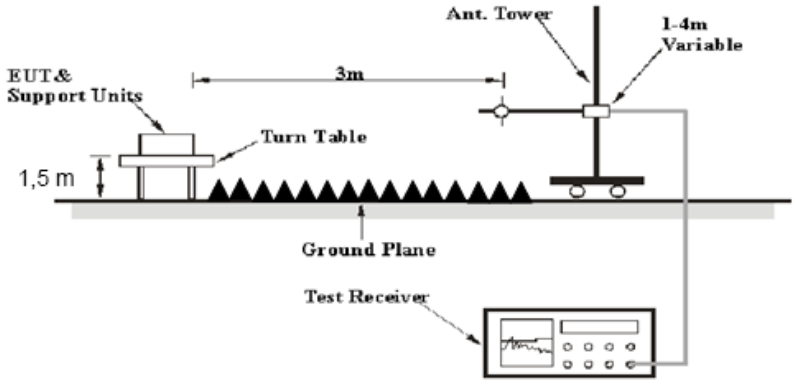
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

3.2.2 EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emissions were performed in the 3 meters distance, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

3.2.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

30MHz-1000MHz:

Measurement	RBW	Video B/W	IF B/W
QP	120 kHz	300 kHz	120kHz

1GHz- 25GHz:

Measurement	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
AV	>98%	1MHz	10 Hz
	<98%	1MHz	1/T

Note: T is minimum transmission duration

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

3.2.4 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

3.2.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor
Factor = Antenna Factor + Cable Loss- Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

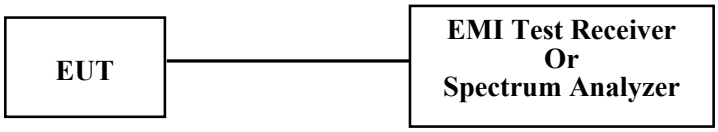
3.3 6 dB Emission Bandwidth:

3.3.1 Applicable Standard

FCC §15.247 (a)(2)

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

3.3.2 EUT Setup



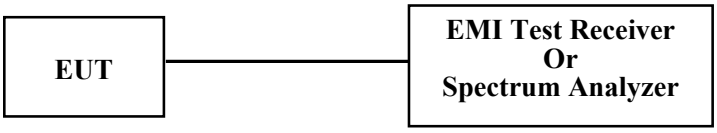
3.3.3Test Procedure

According to ANSI C63.10-2013 Section 11.8

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

3.4 99% Occupied Bandwidth:

3.4.1 EUT Setup



3.4.2Test Procedure

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:
• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
• The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.
• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.
Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.
For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

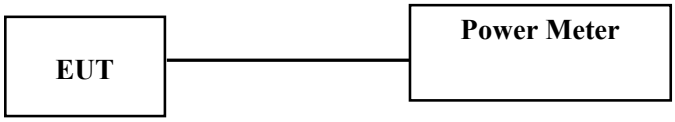
3.5 Maximum peak conducted output power:

3.5.1 Applicable Standard

FCC §15.247 (b)(3)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

3.5.2 EUT Setup



3.5.3Test Procedure

According to ANSI C63.10-2013 Section 11.9.1.3

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

a) Set the EUT in transmitting mode.
b) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to test equipment.
c) Add a correction factor to the display.
d) Set the power meter to test peak output power, record the result.

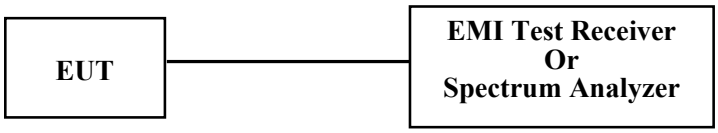
3.6 Maximum power spectral density:

3.6.1 Applicable Standard

FCC §15.247 (e)

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. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

3.6.2 EUT Setup



3.6.3Test Procedure

According to ANSI C63.10-2013 Section 11.10.2

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ [3 · RBW].
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

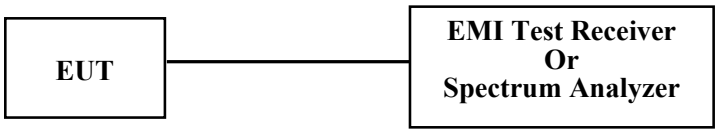
3.7 100 kHz Bandwidth of Frequency Band Edge:

3.7.1 Applicable Standard

FCC §15.247 (d);

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

3.7.2 EUT Setup



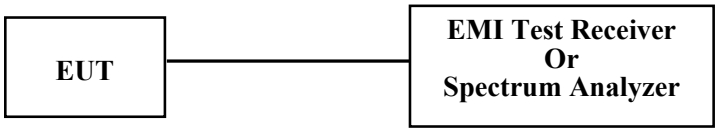
3.7.3 Test Procedure

According to ANSI C63.10-2013 Section 11.11

a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ [3 × RBW].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

3.8 Duty Cycle:

3.8.1 EUT Setup



3.8.2Test Procedure

According to ANSI C63.10-2013 Section 11.6

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:
1) Set the center frequency of the instrument to the center frequency of the transmission.
2) Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value.
3) Set VBW ≥ RBW. Set detector = peak or average.
4) The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if T ≤ 16.7 μs.)

3.9 Antenna Requirement

3.9.1 Applicable Standard

FCC §15.203

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

3.9.2 Judgment

Please refer to the Antenna Information detail in Section 1.

4. Test DATA AND RESULTS

4.1 AC Line Conducted Emissions

Serial Number:	CR21110046-RF-S1 CR21110046-RF-S2	Test Date:	2021-11-16~2021-11-24
Test Site:	CE	Test Mode:	Transmitting (802.11b Middle channel was the worst)
Tester:	Nick Tang, Allen Wu	Test Result:	Pass

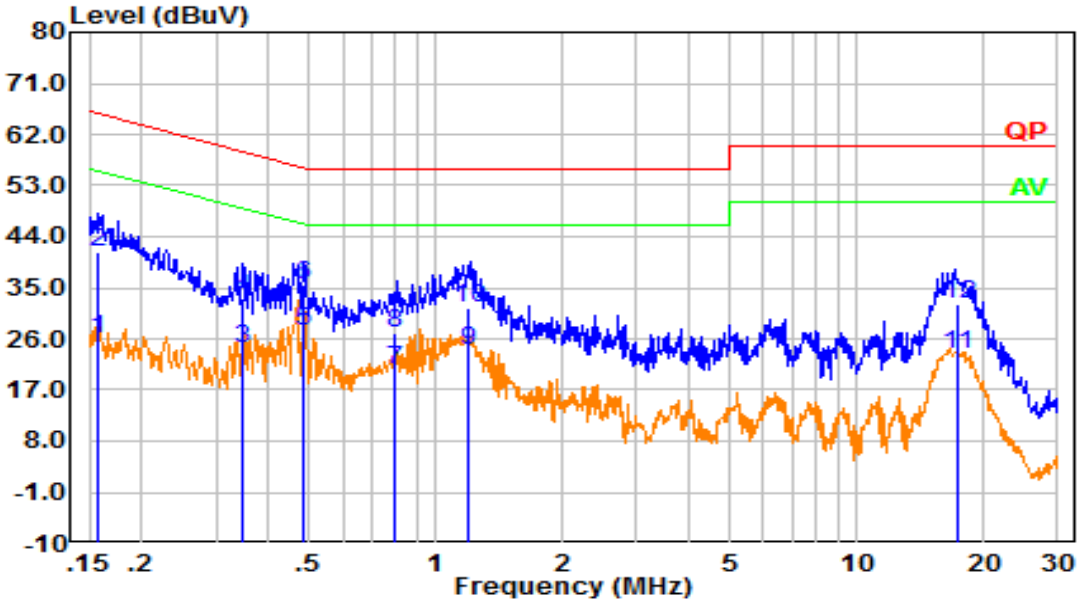
Environmental Conditions:					
Temperature: (℃)	24~24.3	Relative Humidity: (%)	36~64	ATM Pressure: (kPa)	100.9~101.7

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101134	2021-04-25	2022-04-24
R&S	EMI Test Receiver	ESR3	102726	2021-07-22	2022-07-21
MICRO-COAX	Coaxial Cable	UTIFLEX	C-0200-01	2021-08-08	2022-08-07
Audix	Test Software	E3	190306 (V9)	N/A	N/A

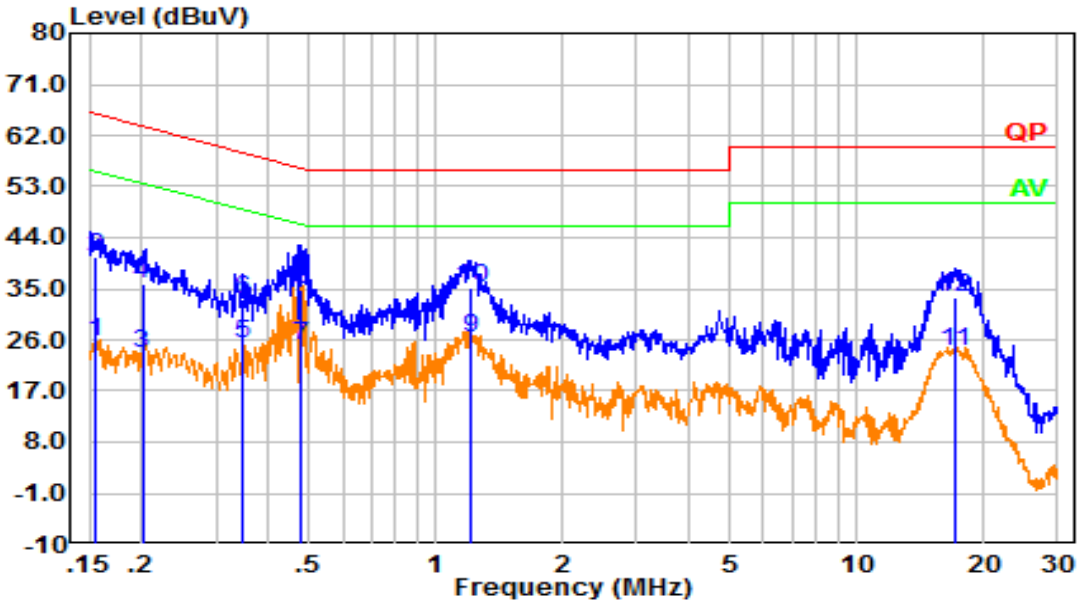
** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Mini 12S:
Adapter #1:
Line:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.156	16.29	9.61	25.90	55.66	29.76	Average
2	0.156	31.74	9.61	41.35	65.66	24.31	QP
3	0.346	14.73	9.61	24.34	49.06	24.72	Average
4	0.346	23.50	9.61	33.11	59.06	25.95	QP
5	0.483	17.70	9.61	27.31	46.29	18.98	Average
6	0.483	25.96	9.61	35.57	56.29	20.72	QP
7	0.803	10.84	9.62	20.46	46.00	25.54	Average
8	0.803	17.38	9.62	27.00	56.00	29.00	QP
9	1.194	14.31	9.62	23.93	46.00	22.07	Average
10	1.194	21.81	9.62	31.43	56.00	24.57	QP
11	17.287	13.63	9.74	23.36	50.00	26.64	Average
12	17.287	22.45	9.74	32.18	60.00	27.82	QP

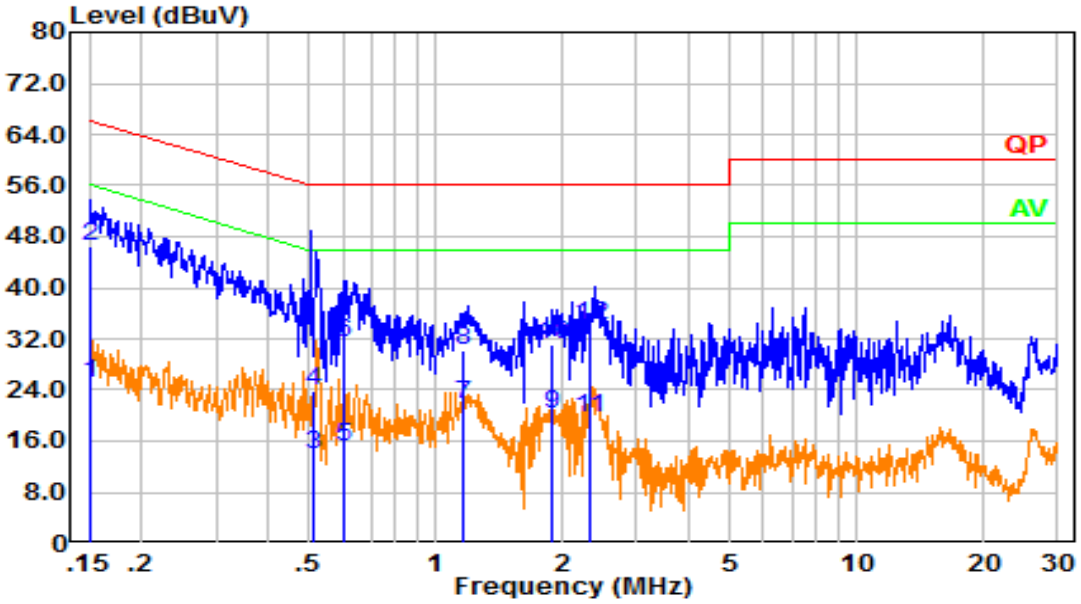
Neutral:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.155	16.19	9.61	25.80	55.70	29.90	Average
2	0.155	31.11	9.61	40.72	65.70	24.98	QP
3	0.200	14.07	9.61	23.68	53.59	29.91	Average
4	0.200	26.14	9.61	35.75	63.59	27.84	QP
5	0.347	15.82	9.61	25.43	49.04	23.61	Average
6	0.347	23.68	9.61	33.29	59.04	25.75	QP
7	0.478	15.51	9.61	25.12	46.37	21.25	Average
8	0.478	25.38	9.61	34.99	56.37	21.38	QP
9	1.204	16.88	9.62	26.50	46.00	19.50	Average
10	1.204	25.69	9.62	35.31	56.00	20.69	QP
11	17.027	14.38	9.69	24.07	50.00	25.93	Average
12	17.027	23.84	9.69	33.53	60.00	26.47	QP

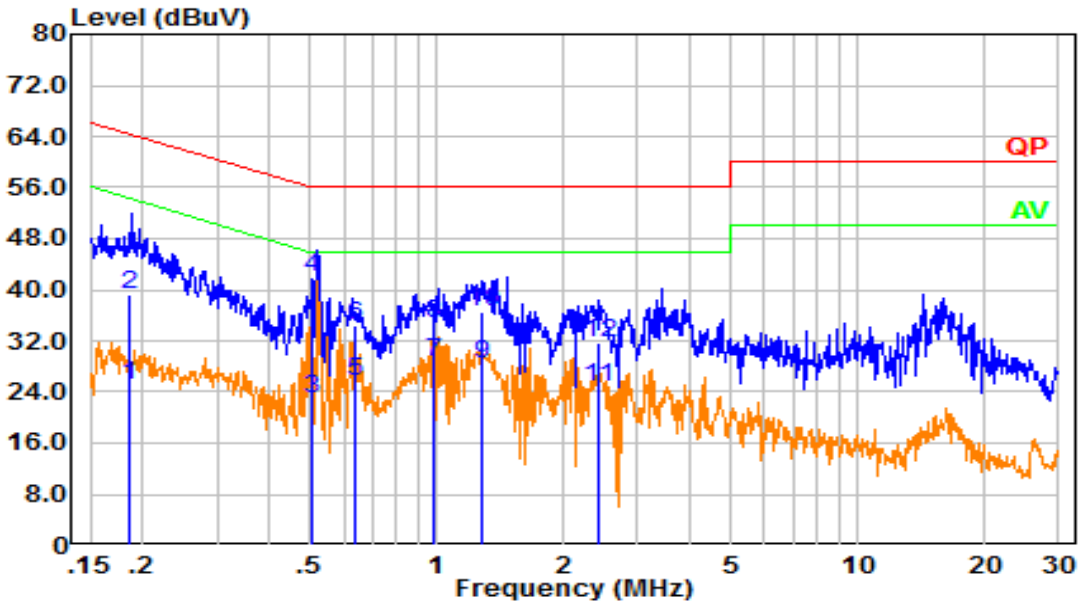
Adapter #2:

Line:



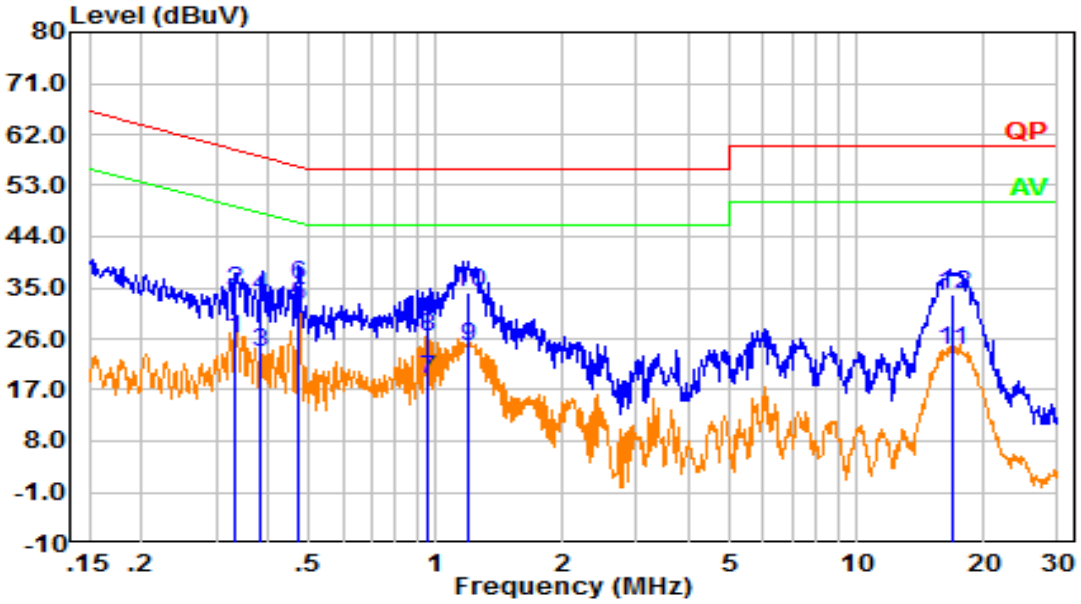
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.152	15.57	9.61	25.18	55.90	30.72	Average
2	0.152	36.99	9.61	46.60	65.90	19.30	QP
3	0.512	4.14	9.61	13.75	46.00	32.25	Average
4	0.512	14.36	9.61	23.97	56.00	32.03	QP
5	0.608	5.38	9.62	15.00	46.00	31.00	Average
6	0.608	21.79	9.62	31.41	56.00	24.59	QP
7	1.156	11.99	9.62	21.61	46.00	24.39	Average
8	1.156	20.52	9.62	30.15	56.00	25.85	QP
9	1.897	10.69	9.63	20.32	46.00	25.68	Average
10	1.897	21.35	9.63	30.98	56.00	25.02	QP
11	2.314	9.87	9.64	19.50	46.00	26.50	Average
12	2.314	24.35	9.64	33.99	56.00	22.01	QP

Neutral:



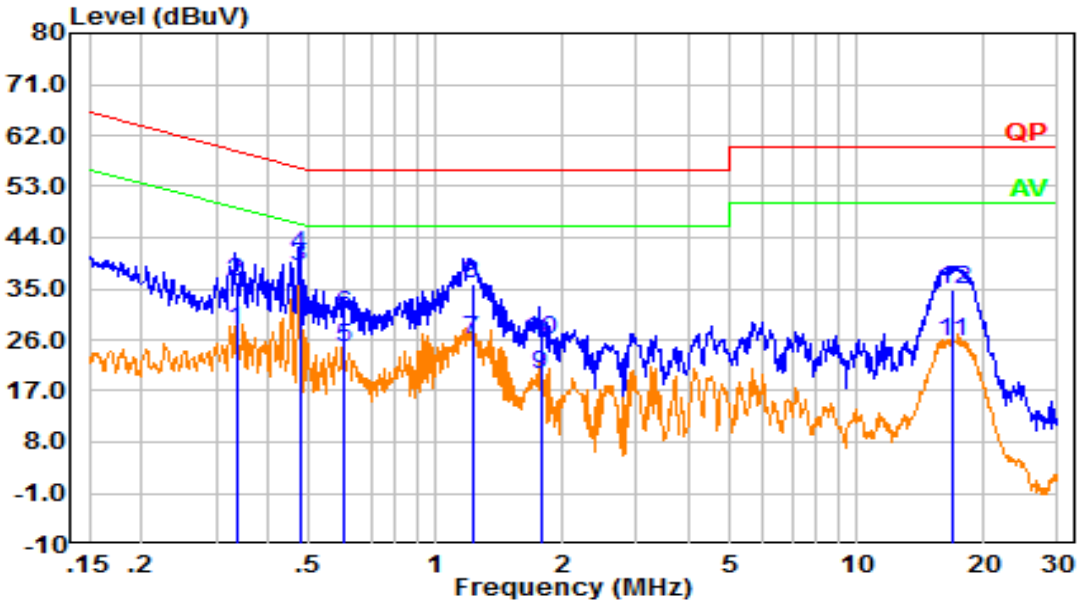
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.186	15.52	9.61	25.13	54.21	29.08	Average
2	0.186	29.77	9.61	39.38	64.21	24.83	QP
3	0.508	13.29	9.61	22.90	46.00	23.10	Average
4	0.508	32.22	9.61	41.83	56.00	14.17	QP
5	0.640	16.10	9.62	25.72	46.00	20.28	Average
6	0.640	24.93	9.62	34.55	56.00	21.45	QP
7	0.977	19.20	9.62	28.82	46.00	17.18	Average
8	0.977	25.22	9.62	34.84	56.00	21.16	QP
9	1.277	18.76	9.62	28.38	46.00	17.62	Average
10	1.277	26.99	9.62	36.62	56.00	19.38	QP
11	2.407	15.22	9.64	24.86	46.00	21.14	Average
12	2.407	22.18	9.64	31.82	56.00	24.18	QP

Mini 16S:
Adapter #1:
Line:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.335	16.39	9.61	26.00	49.33	23.33	Average
2	0.335	24.86	9.61	34.47	59.33	24.86	QP
3	0.383	13.98	9.61	23.59	48.20	24.61	Average
4	0.383	23.87	9.61	33.48	58.20	24.72	QP
5	0.472	22.21	9.61	31.82	46.48	14.66	Average
6	0.472	25.86	9.61	35.47	56.48	21.01	QP
7	0.959	9.42	9.62	19.04	46.00	26.96	Average
8	0.959	16.65	9.62	26.27	56.00	29.73	QP
9	1.189	15.06	9.62	24.69	46.00	21.31	Average
10	1.189	24.36	9.62	33.99	56.00	22.01	QP
11	16.913	14.32	9.73	24.05	50.00	25.95	Average
12	16.913	24.11	9.73	33.84	60.00	26.16	QP

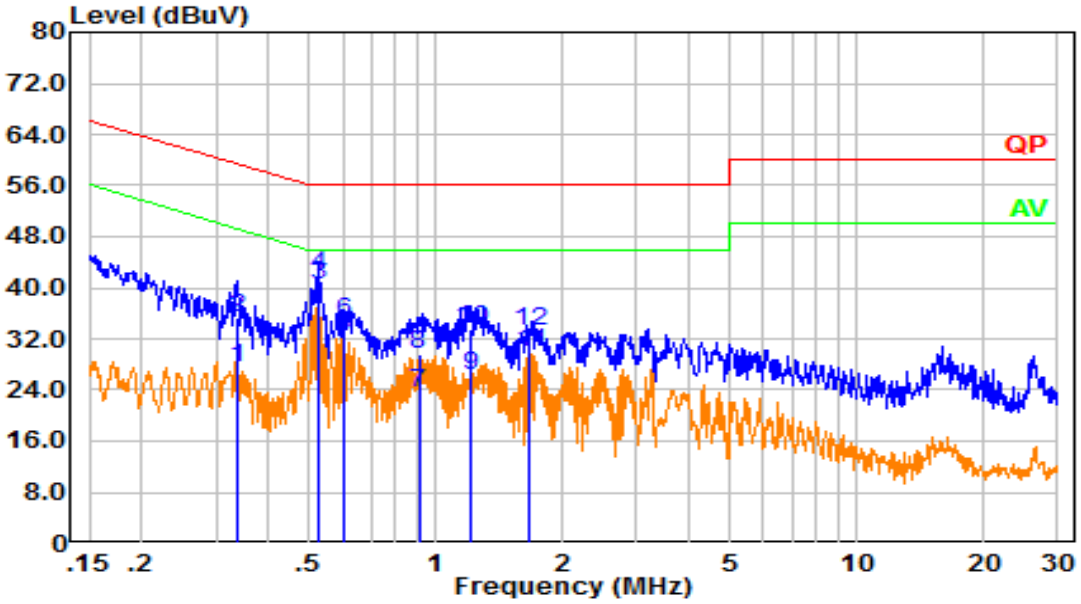
Neutral:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.335	17.94	9.61	27.55	49.33	21.78	Average
2	0.335	26.43	9.61	36.04	59.33	23.29	QP
3	0.474	29.28	9.61	38.89	46.45	7.54	Average
4	0.474	31.35	9.61	40.96	56.45	15.49	QP
5	0.601	14.85	9.62	24.47	46.00	21.53	Average
6	0.601	20.70	9.62	30.32	56.00	25.68	QP
7	1.218	16.40	9.62	26.02	46.00	19.98	Average
8	1.218	26.09	9.62	35.72	56.00	20.28	QP
9	1.772	10.36	9.63	19.99	46.00	26.01	Average
10	1.772	16.28	9.63	25.90	56.00	30.10	QP
11	16.892	15.82	9.69	25.51	50.00	24.49	Average
12	16.892	25.18	9.69	34.87	60.00	25.13	QP

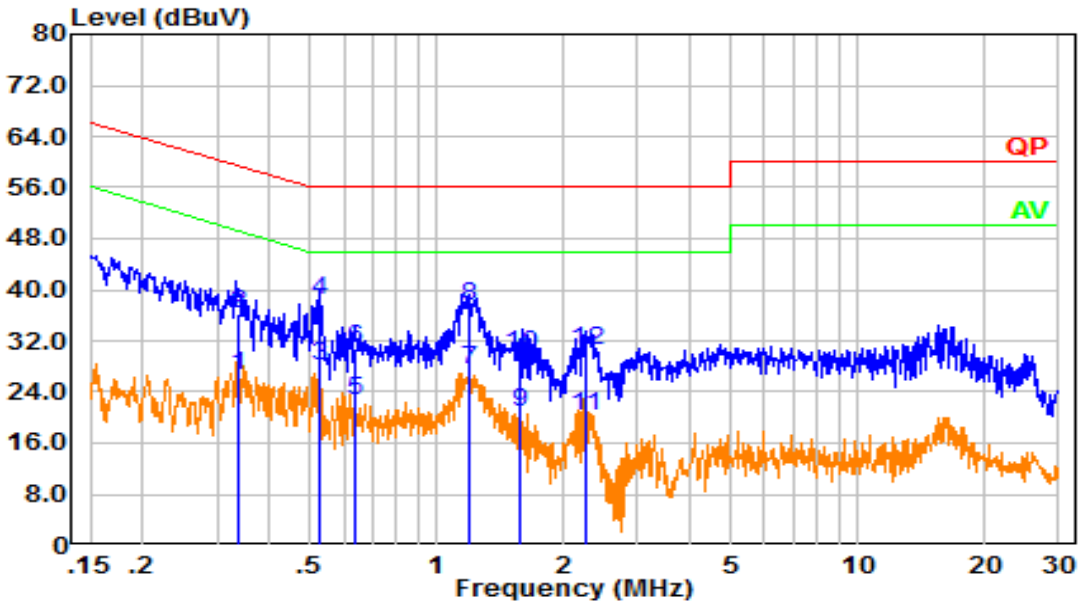
Adapter #2:

Line:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.337	17.73	9.61	27.34	49.28	21.94	Average
2	0.337	25.76	9.61	35.37	59.28	23.91	QP
3	0.526	30.71	9.61	40.32	46.00	5.68	Average
4	0.526	32.36	9.61	41.97	56.00	14.03	QP
5	0.601	22.96	9.62	32.58	46.00	13.42	Average
6	0.601	25.24	9.62	34.86	56.00	21.14	QP
7	0.910	13.78	9.62	23.40	46.00	22.60	Average
8	0.910	19.84	9.62	29.46	56.00	26.54	QP
9	1.204	16.53	9.62	26.15	46.00	19.85	Average
10	1.204	24.03	9.62	33.66	56.00	22.34	QP
11	1.672	20.23	9.63	29.86	46.00	16.14	Average
12	1.672	23.57	9.63	33.20	56.00	22.80	QP

Neutral:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.339	16.87	9.61	26.48	49.24	22.76	Average
2	0.339	26.47	9.61	36.08	59.24	23.16	QP
3	0.527	18.46	9.61	28.07	46.00	17.93	Average
4	0.527	28.73	9.61	38.35	56.00	17.65	QP
5	0.637	13.05	9.62	22.67	46.00	23.33	Average
6	0.637	21.09	9.62	30.71	56.00	25.29	QP
7	1.193	17.89	9.62	27.52	46.00	18.48	Average
8	1.193	27.80	9.62	37.42	56.00	18.58	QP
9	1.577	11.08	9.63	20.70	46.00	25.30	Average
10	1.577	20.38	9.63	30.00	56.00	26.00	QP
11	2.250	10.53	9.63	20.17	46.00	25.83	Average
12	2.250	20.86	9.63	30.50	56.00	25.50	QP

4.2 Radiation Spurious Emissions

Serial Number:	CR21110046-RF-S1 CR21110046-RF-S2	Test Date:	2021-11-16~2021-11-25
Test Site:	966-1, 966-2	Test Mode:	Transmitting
Tester:	Allen Wu	Test Result:	Pass

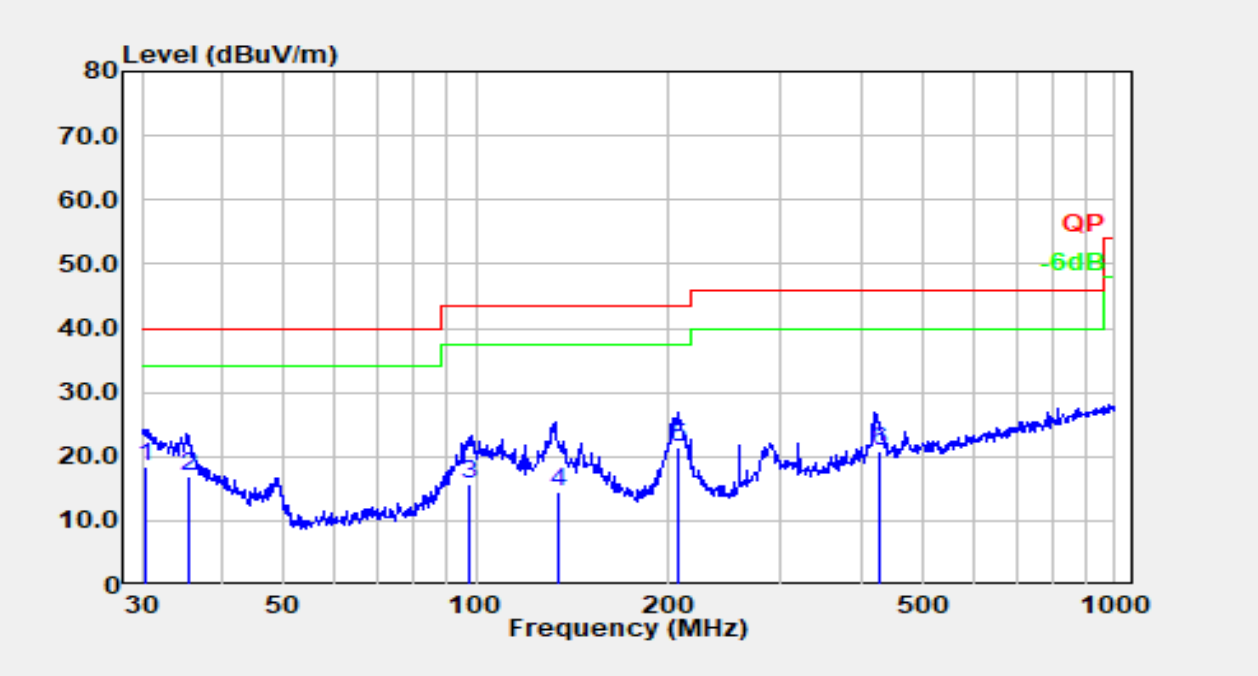
Environmental Conditions:					
Temperature: (℃)	22.8~22.9	Relative Humidity: (%)	50~63	ATM Pressure: (kPa)	101.4

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB6	A082520-5	2020-10-19	2023-10-18
R&S	EMI Test Receiver	ESR3	102724	2021-07-22	2022-07-21
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2021-07-18	2022-07-17
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2021-07-18	2022-07-17
Sonoma	Amplifier	310N	186165	2021-07-18	2022-07-17
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020-10-13	2023-10-12
PASTERNACK	Horn Atenna	PE9852/2F-20	112002	2021-02-05	2023-02-04
R&S	Spectrum Analyzer	FSV40	101591	2021-07-22	2022-07-21
MICRO-COAX	Coaxial Cable	UFA210A-1-1200-70U300	217423-008	2021-08-08	2022-08-07
MICRO-COAX	Coaxial Cable	UFA210A-1-2362-300300	235780-001	2021-08-08	2022-08-07
MICRO-COAX	Coaxial Cable	UFB142A-1-2362-200200	235772-001	2021-08-08	2022-08-07
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2021-11-10	2022-11-09
AH	Preamplifier	PAM-1840VH	190	2021-11-19	2022-11-18
Audix	Test Software	E3	201021 (V9)	N/A	N/A
E-Microwave	Band Rejection Filter	2400-2483.5MHz	OE01902424	2021-08-08	2022-08-07

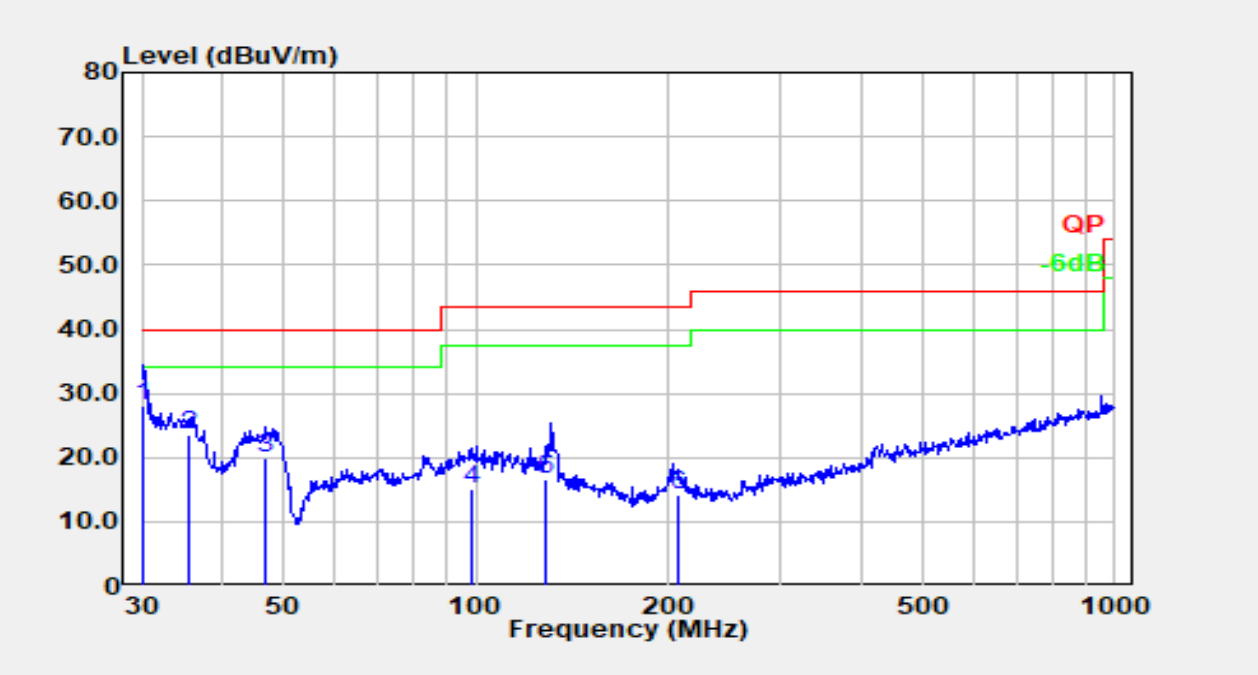
** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

1) 30MHz-1GHz(802.11b Low channel was the worst)
Mini 12S:
Adapter #1:
Horizontal:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.308	22.36	-4.03	18.33	40.00	21.67	QP
2	35.407	24.77	-7.98	16.80	40.00	23.20	QP
3	97.194	31.12	-15.28	15.83	43.50	27.67	QP
4	134.295	26.21	-11.81	14.39	43.50	29.11	QP
5	207.609	33.95	-12.57	21.38	43.50	22.12	QP
6	427.894	28.53	-7.80	20.73	46.00	25.27	QP

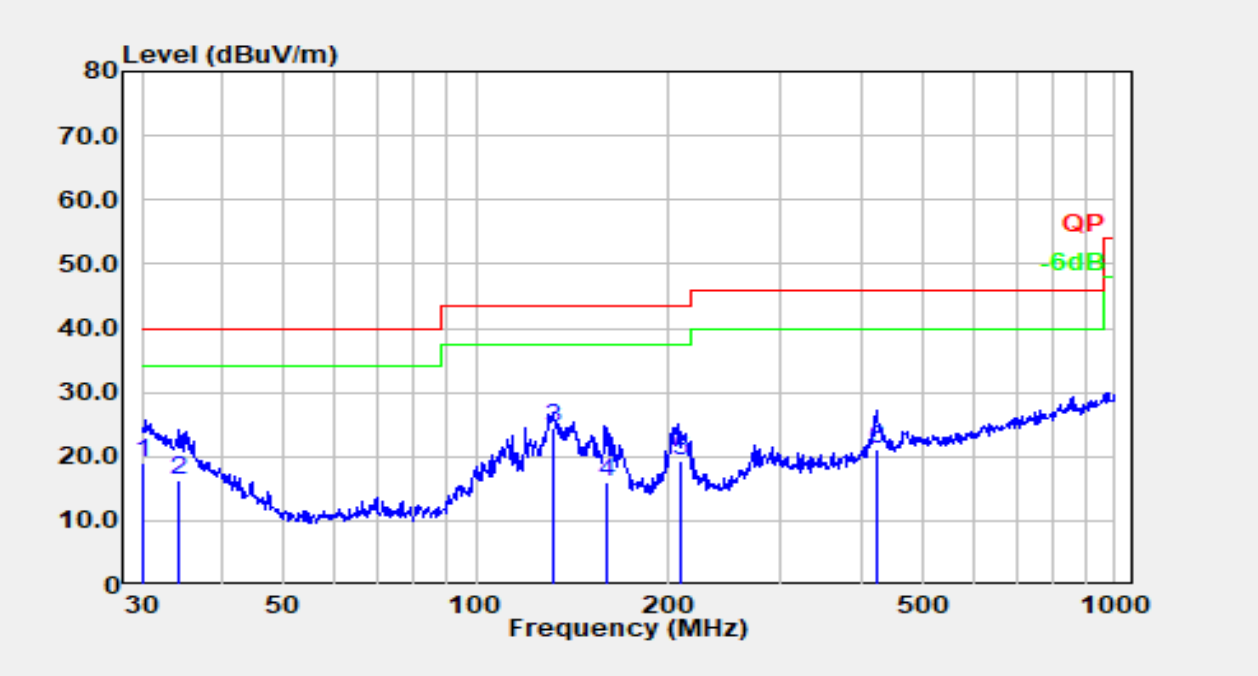
Vertical:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.118	32.10	-3.88	28.22	40.00	11.78	QP
2	35.410	31.52	-7.98	23.55	40.00	16.45	QP
3	46.843	35.51	-15.56	19.95	40.00	20.05	QP
4	98.699	30.11	-14.88	15.23	43.50	28.27	QP
5	128.605	28.12	-11.53	16.59	43.50	26.91	QP
6	206.410	26.71	-12.55	14.16	43.50	29.34	QP

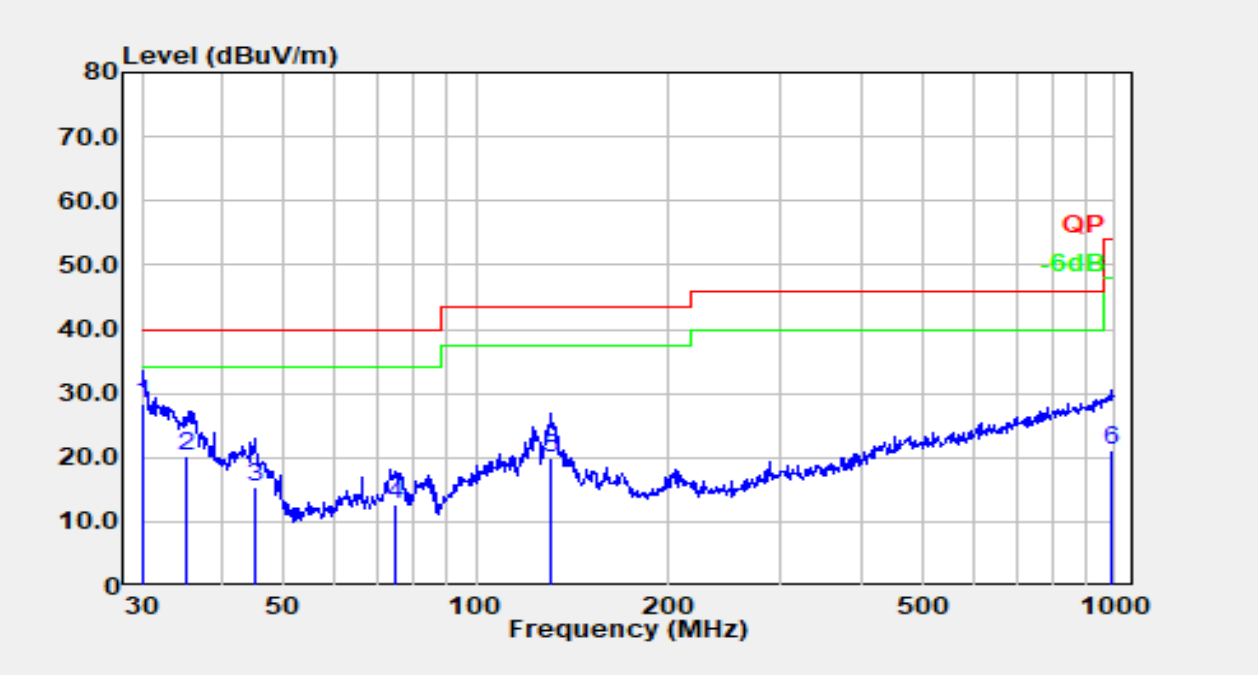
Adapter #2:

Horizontal:



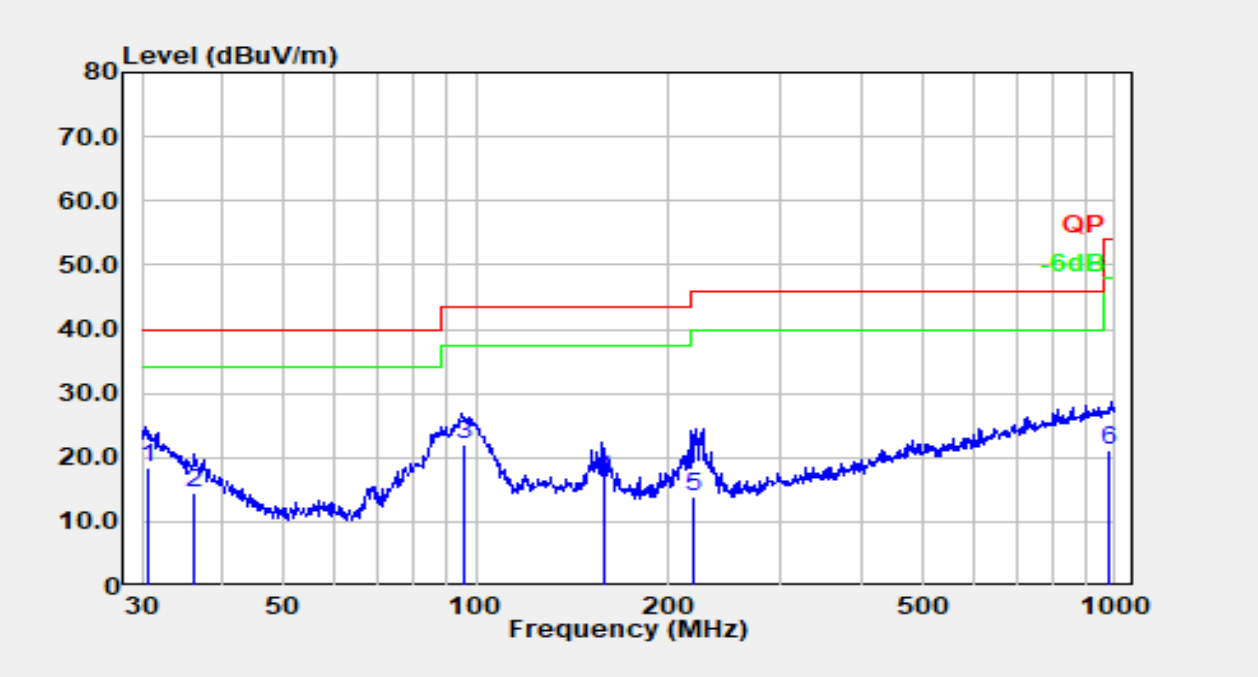
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.136	22.86	-3.89	18.97	40.00	21.03	QP
2	34.366	23.57	-7.16	16.42	40.00	23.58	QP
3	131.747	36.21	-11.63	24.58	43.50	18.92	QP
4	159.543	28.38	-12.28	16.10	43.50	27.40	QP
5	209.103	31.83	-12.59	19.24	43.50	24.26	QP
6	425.199	28.94	-7.92	21.01	46.00	24.99	QP

Vertical:



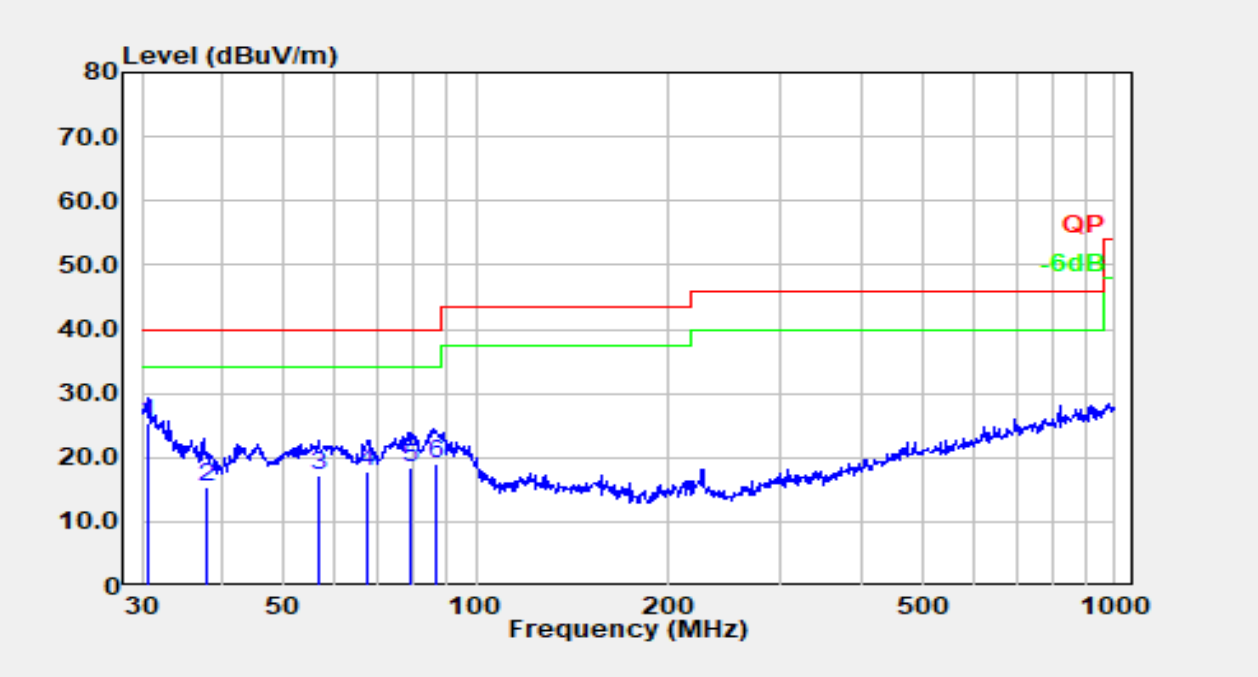
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.000	32.16	-3.79	28.37	40.00	11.63	QP
2	35.222	28.14	-7.84	20.31	40.00	19.69	QP
3	45.253	30.11	-14.60	15.51	40.00	24.49	QP
4	74.570	29.96	-17.16	12.80	40.00	27.20	QP
5	131.192	31.50	-11.60	19.89	43.50	23.61	QP
6	991.075	20.69	0.52	21.21	54.00	32.79	QP

Mini 16S:
Adapter #1:
Horizontal:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.691	22.67	-4.32	18.35	40.00	21.65	QP
2	36.173	22.91	-8.55	14.36	40.00	25.64	QP
3	96.168	37.68	-15.55	22.13	43.50	21.37	QP
4	158.526	28.98	-12.30	16.68	43.50	26.82	QP
5	218.369	26.93	-12.91	14.03	46.00	31.97	QP
6	975.594	21.03	0.18	21.20	54.00	32.80	QP

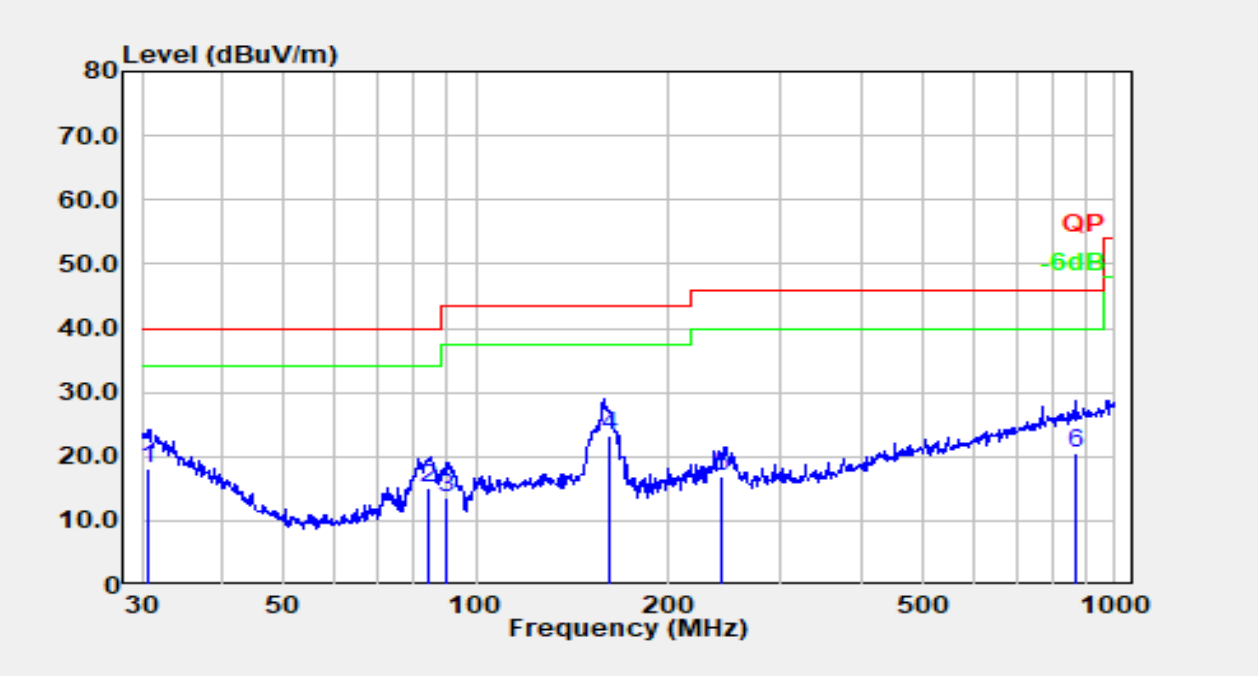
Vertical:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.598	29.49	-4.25	25.24	40.00	14.76	QP
2	38.040	25.27	-9.94	15.33	40.00	24.67	QP
3	56.760	34.75	-17.53	17.22	40.00	22.78	QP
4	67.767	34.81	-16.93	17.88	40.00	22.12	QP
5	79.220	36.14	-17.62	18.51	40.00	21.49	QP
6	86.403	36.48	-17.37	19.11	40.00	20.89	QP

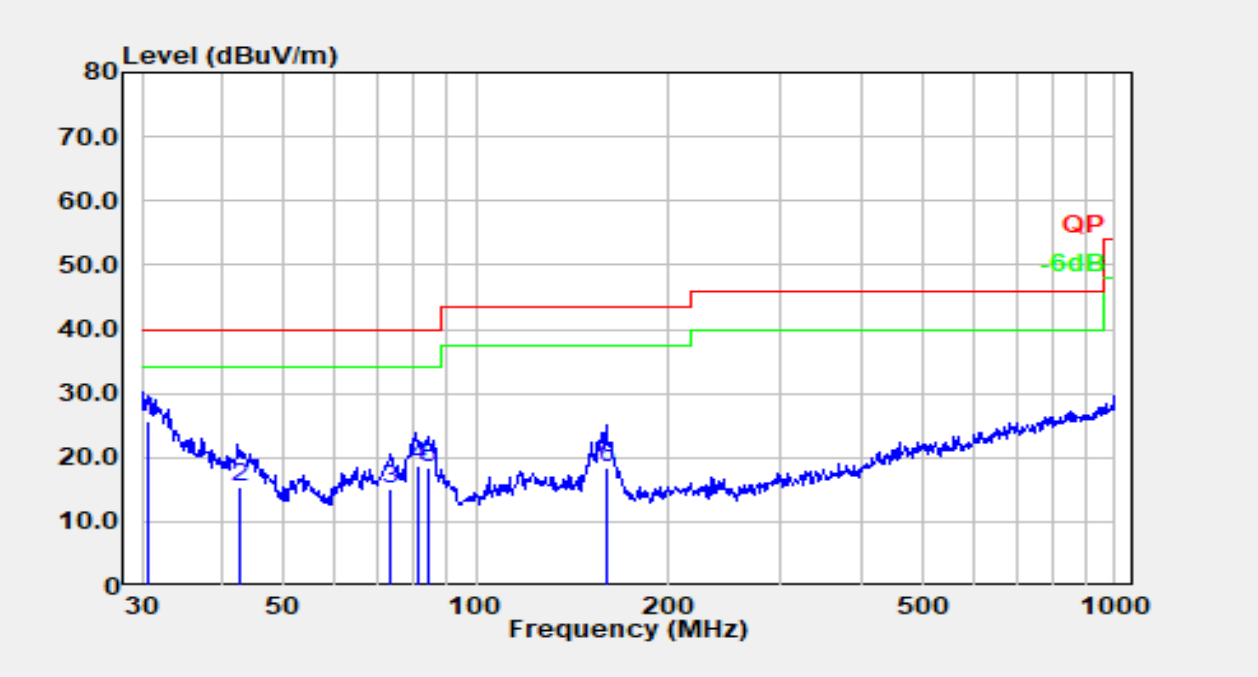
Adapter #2:

Horizontal:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.749	22.48	-4.37	18.11	40.00	21.89	QP
2	84.157	32.67	-17.48	15.19	40.00	24.81	QP
3	89.719	30.91	-17.20	13.71	43.50	29.79	QP
4	161.006	35.54	-12.39	23.15	43.50	20.35	QP
5	242.189	30.02	-13.15	16.87	46.00	29.13	QP
6	865.984	21.85	-1.41	20.44	46.00	25.56	QP

Vertical:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.592	30.01	-4.25	25.76	40.00	14.24	QP
2	42.710	28.50	-13.12	15.38	40.00	24.62	QP
3	73.426	32.12	-17.05	15.07	40.00	24.93	QP
4	80.970	36.39	-17.63	18.76	40.00	21.24	QP
5	84.281	35.84	-17.47	18.37	40.00	21.63	QP
6	159.667	30.83	-12.28	18.55	43.50	24.95	QP

2) 1-25GHz:
(Test only performed with Adapter #1)
802.11b Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 2412 MHz							
2412.00	70.09	PK	H	31.53	101.62	N/A	N/A
2412.00	67.11	AV	H	31.53	98.64	N/A	N/A
2412.00	65.43	PK	V	31.53	96.96	N/A	N/A
2412.00	62.06	AV	V	31.53	93.59	N/A	N/A
2390.00	30.10	PK	H	31.46	61.56	74.00	12.44
2390.00	17.24	AV	H	31.46	48.70	54.00	5.30
4824.00	40.38	PK	H	10.94	51.32	74.00	22.68
4824.00	34.72	AV	H	10.94	45.66	54.00	8.34
7236.00	36.84	PK	H	14.44	51.28	74.00	22.72
7236.00	24.12	AV	H	14.44	38.56	54.00	15.44
Middle Channel: 2437 MHz							
2437.00	70.00	PK	H	31.60	101.60	N/A	N/A
2437.00	66.25	AV	H	31.60	97.85	N/A	N/A
2437.00	66.09	PK	V	31.60	97.69	N/A	N/A
2437.00	62.71	AV	V	31.60	94.31	N/A	N/A
4874.00	40.99	PK	H	11.05	52.04	74.00	21.96
4874.00	35.42	AV	H	11.05	46.47	54.00	7.53
7311.00	36.17	PK	H	14.80	50.97	74.00	23.03
7311.00	24.10	AV	H	14.80	38.90	54.00	15.10
High Channel: 2462MHz							
2462.00	70.07	PK	H	31.63	101.70	N/A	N/A
2462.00	66.69	AV	H	31.63	98.32	N/A	N/A
2462.00	66.10	PK	V	31.63	97.73	N/A	N/A
2462.00	62.75	AV	V	31.63	94.38	N/A	N/A
2483.50	28.59	PK	H	31.64	60.23	74.00	13.77
2483.50	17.49	AV	H	31.64	49.13	54.00	4.87
4924.00	41.95	PK	H	11.18	53.13	74.00	20.87
4924.00	37.24	AV	H	11.18	48.42	54.00	5.58
7386.00	36.38	PK	H	14.89	51.27	74.00	22.73
7386.00	23.67	AV	H	14.89	38.56	54.00	15.44

802.11g Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 2412 MHz							
2412.00	71.22	PK	H	31.53	102.75	N/A	N/A
2412.00	61.80	AV	H	31.53	93.33	N/A	N/A
2412.00	67.10	PK	V	31.53	98.63	N/A	N/A
2412.00	57.96	AV	V	31.53	89.49	N/A	N/A
2390.00	29.05	PK	H	31.46	60.51	74.00	13.49
2390.00	17.22	AV	H	31.46	48.68	54.00	5.32
4824.00	38.82	PK	H	10.94	49.76	74.00	24.24
4824.00	26.03	AV	H	10.94	36.97	54.00	17.03
7236.00	36.79	PK	H	14.44	51.23	74.00	22.77
7236.00	24.11	AV	H	14.44	38.55	54.00	15.45
Middle Channel: 2437 MHz							
2437.00	71.77	PK	H	31.60	103.37	N/A	N/A
2437.00	62.54	AV	H	31.60	94.14	N/A	N/A
2437.00	67.24	PK	V	31.60	98.84	N/A	N/A
2437.00	57.89	AV	V	31.60	89.49	N/A	N/A
4874.00	38.74	PK	H	11.05	49.79	74.00	24.21
4874.00	26.12	AV	H	11.05	37.17	54.00	16.83
7311.00	37.07	PK	H	14.80	51.87	74.00	22.13
7311.00	24.09	AV	H	14.80	38.89	54.00	15.11
High Channel: 2462MHz							
2462.00	72.22	PK	H	31.63	103.85	N/A	N/A
2462.00	61.29	AV	H	31.63	92.92	N/A	N/A
2462.00	67.30	PK	V	31.63	98.93	N/A	N/A
2462.00	58.12	AV	V	31.63	89.75	N/A	N/A
2483.50	30.88	PK	H	31.64	62.52	74.00	11.48
2483.50	17.76	AV	H	31.64	49.40	54.00	4.60
4924.00	40.43	PK	H	11.18	51.61	74.00	22.39
4924.00	27.16	AV	H	11.18	38.34	54.00	15.66
7386.00	36.22	PK	H	14.89	51.11	74.00	22.89
7386.00	23.60	AV	H	14.89	38.49	54.00	15.51

802.11n ht20 Mode:

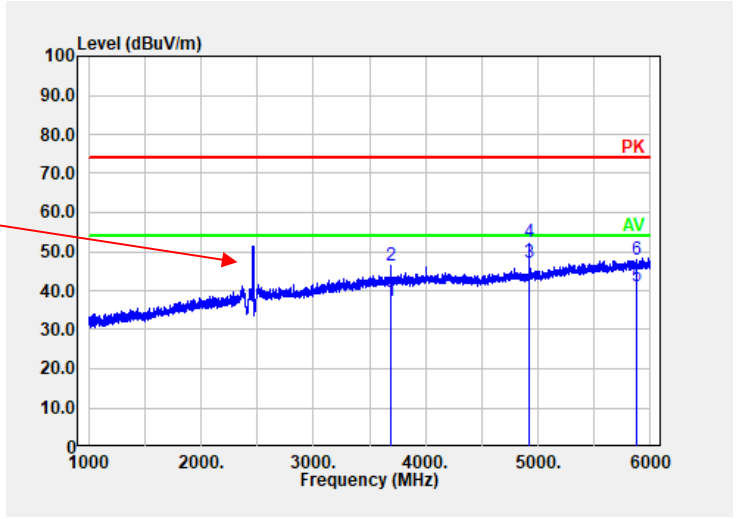
Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 2412 MHz							
2412.00	70.66	PK	H	31.53	102.19	N/A	N/A
2412.00	61.42	AV	H	31.53	92.95	N/A	N/A
2412.00	67.37	PK	V	31.53	98.90	N/A	N/A
2412.00	57.80	AV	V	31.53	89.33	N/A	N/A
2390.00	32.61	PK	H	31.46	64.07	74.00	9.93
2390.00	17.26	AV	H	31.46	48.72	54.00	5.28
4824.00	38.17	PK	H	10.94	49.11	74.00	24.89
4824.00	25.64	AV	H	10.94	36.58	54.00	17.42
7236.00	37.95	PK	H	14.44	52.39	74.00	21.61
7236.00	24.13	AV	H	14.44	38.57	54.00	15.43
Middle Channel: 2437 MHz							
2437.00	71.62	PK	H	31.60	103.22	N/A	N/A
2437.00	62.12	AV	H	31.60	93.72	N/A	N/A
2437.00	67.25	PK	V	31.60	98.85	N/A	N/A
2437.00	57.42	AV	V	31.60	89.02	N/A	N/A
4874.00	38.34	PK	H	11.05	49.39	74.00	24.61
4874.00	25.63	AV	H	11.05	36.68	54.00	17.32
7311.00	36.74	PK	H	14.80	51.54	74.00	22.46
7311.00	24.14	AV	H	14.80	38.94	54.00	15.06
High Channel: 2462MHz							
2462.00	71.26	PK	H	31.63	102.89	N/A	N/A
2462.00	61.78	AV	H	31.63	93.41	N/A	N/A
2462.00	67.27	PK	V	31.63	98.90	N/A	N/A
2462.00	57.86	AV	V	31.63	89.49	N/A	N/A
2483.50	33.67	PK	H	31.64	65.31	74.00	8.69
2483.50	17.79	AV	H	31.64	49.43	54.00	4.57
4924.00	38.69	PK	H	11.18	49.87	74.00	24.13
4924.00	26.67	AV	H	11.18	37.85	54.00	16.15
7386.00	36.17	PK	H	14.89	51.06	74.00	22.94
7386.00	23.64	AV	H	14.89	38.53	54.00	15.47

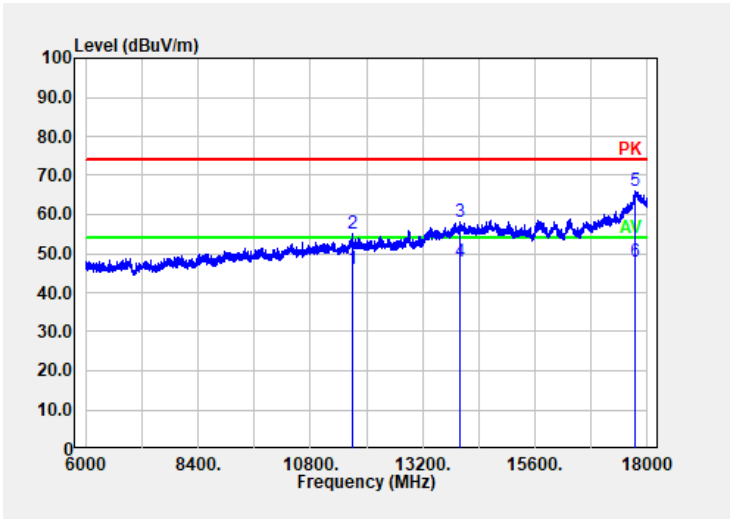
802.11n ht40 Mode:

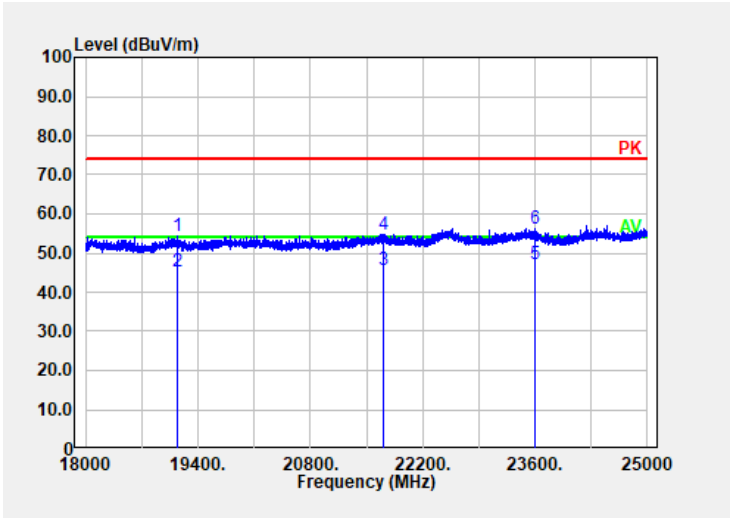
Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 2422 MHz							
2422.00	67.60	PK	H	31.56	99.16	N/A	N/A
2422.00	57.69	AV	H	31.56	89.25	N/A	N/A
2422.00	63.11	PK	V	31.56	94.67	N/A	N/A
2422.00	53.27	AV	V	31.56	84.83	N/A	N/A
2390.00	31.30	PK	H	31.46	62.76	74.00	11.24
2390.00	17.35	AV	H	31.46	48.81	54.00	5.19
4844.00	38.06	PK	H	10.96	49.02	74.00	24.98
4844.00	24.83	AV	H	10.96	35.79	54.00	18.21
7266.00	36.67	PK	H	14.63	51.30	74.00	22.70
7266.00	24.18	AV	H	14.63	38.81	54.00	15.19
Middle Channel: 2437 MHz							
2437.00	68.06	PK	H	31.60	99.66	N/A	N/A
2437.00	58.12	AV	H	31.60	89.72	N/A	N/A
2437.00	62.77	PK	V	31.60	94.37	N/A	N/A
2437.00	52.96	AV	V	31.60	84.56	N/A	N/A
4874.00	37.42	PK	H	11.05	48.47	74.00	25.53
4874.00	25.76	AV	H	11.05	36.81	54.00	17.19
7311.00	36.83	PK	H	14.80	51.63	74.00	22.37
7311.00	24.12	AV	H	14.80	38.92	54.00	15.08
High Channel: 2452MHz							
2452.00	66.59	PK	H	31.63	98.22	N/A	N/A
2452.00	56.92	AV	H	31.63	88.55	N/A	N/A
2452.00	62.45	PK	V	31.63	94.08	N/A	N/A
2452.00	52.67	AV	V	31.63	84.30	N/A	N/A
2483.50	29.70	PK	H	31.64	61.34	74.00	12.66
2483.50	17.87	AV	H	31.64	49.51	54.00	4.49
4904.00	37.72	PK	H	11.14	48.86	74.00	25.14
4904.00	24.90	AV	H	11.14	36.04	54.00	17.96
7356.00	36.39	PK	H	14.80	51.19	74.00	22.81
7356.00	23.76	AV	H	14.80	38.56	54.00	15.44

Worst Test plots(802.11b High channel was the worst)
Horizontal:

Fundamental Test with Band Rejection ~~Filter~~

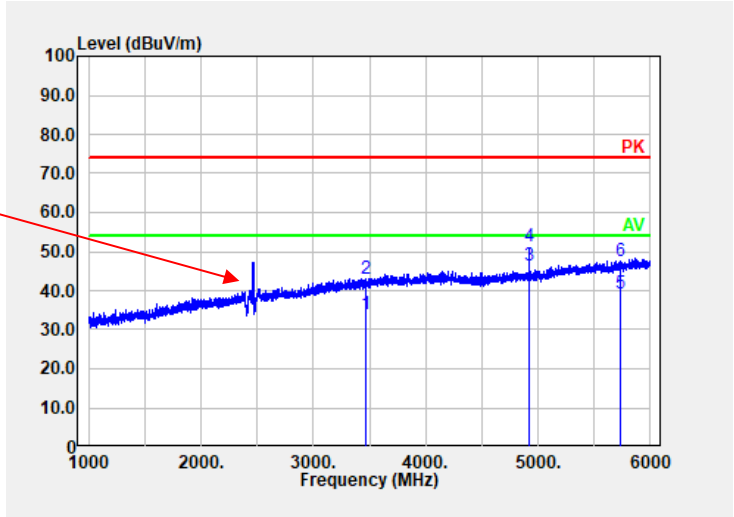


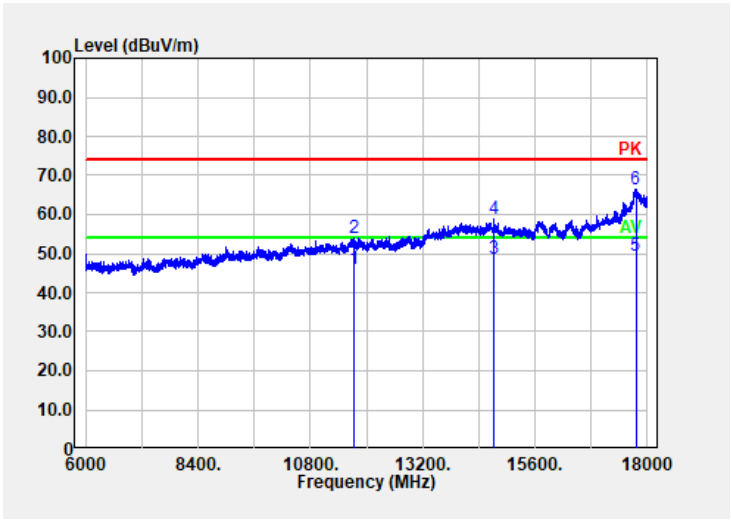


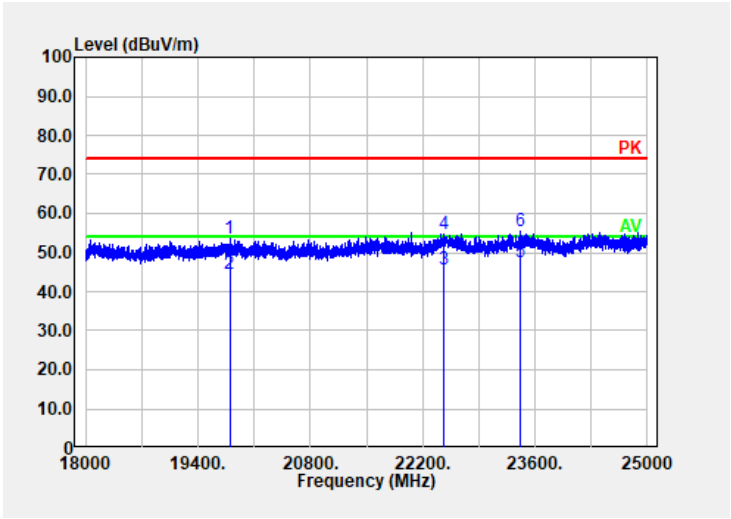


Vertical:

Fundamental Test with Band Rejection Filter







4.3 6 dB Emission Bandwidth:

Serial Number:	CR21110046-RF-S2	Test Date:	2021/11/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Mark Wang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	22.7	Relative Humidity: (%)	50	ATM Pressure: (kPa)	101.1

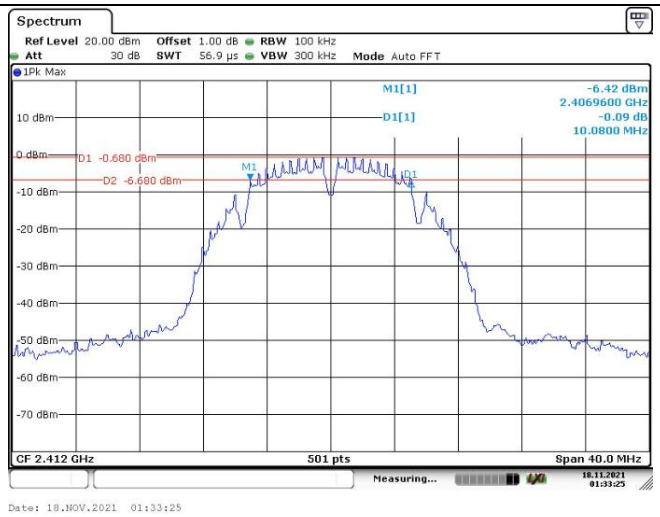
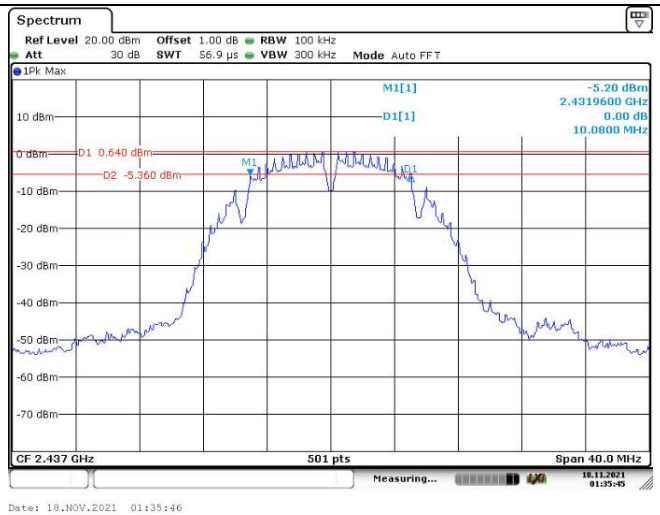
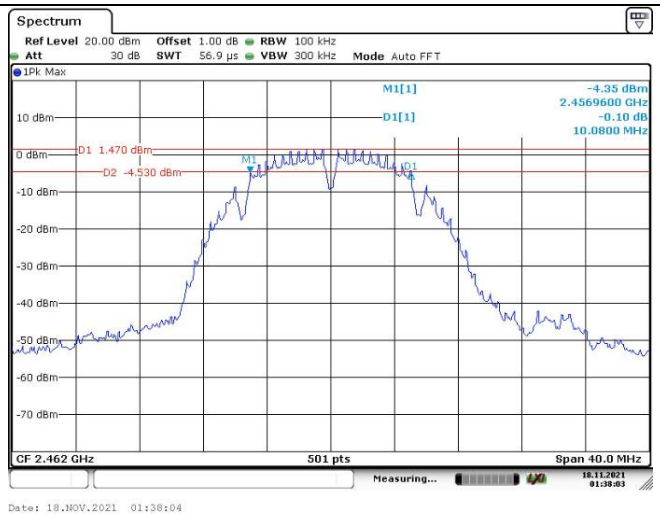
Test Equipment List and Details:

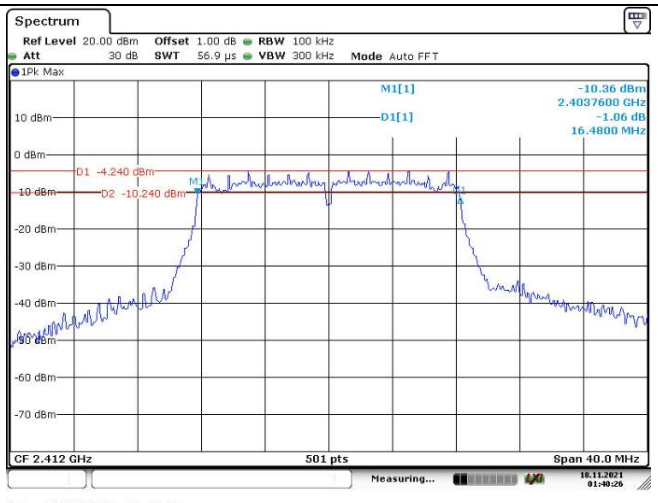
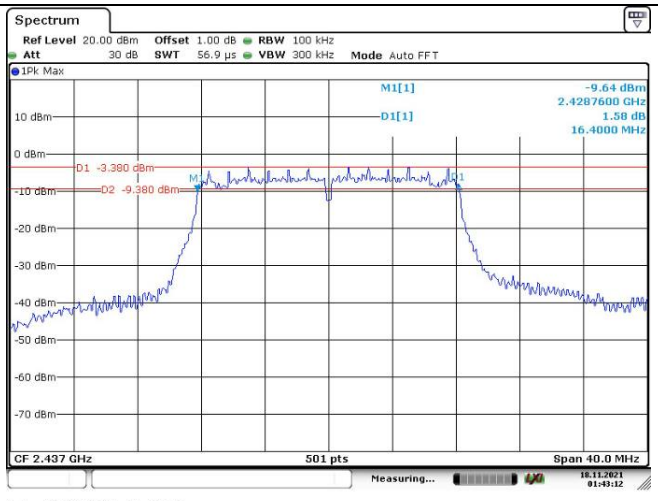
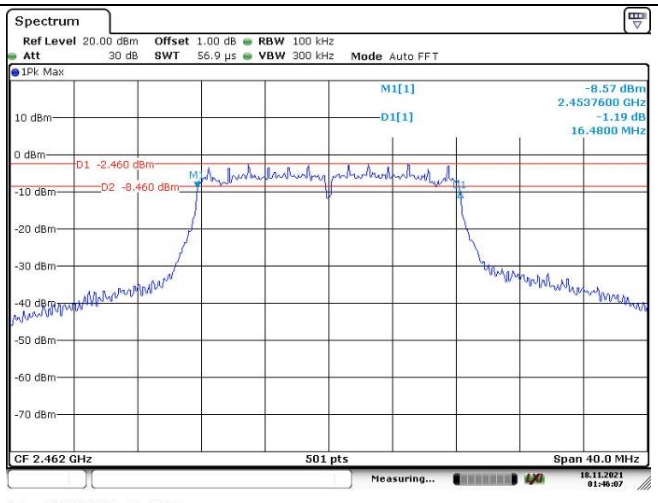
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101943	2021-10-10	2022-10-09
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	2021-08-08	2022-08-07

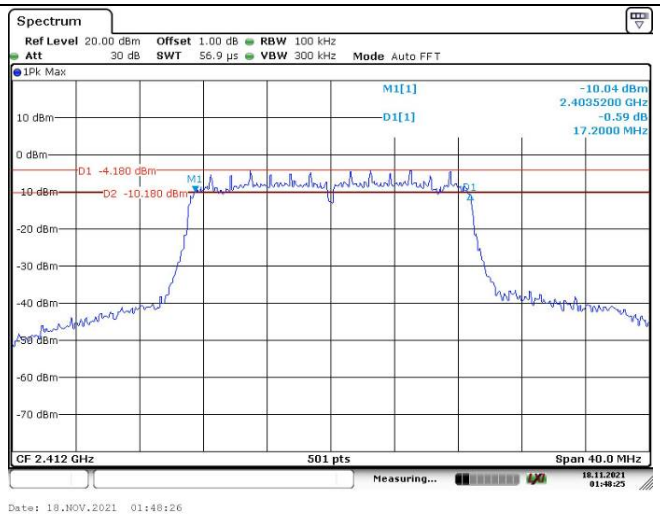
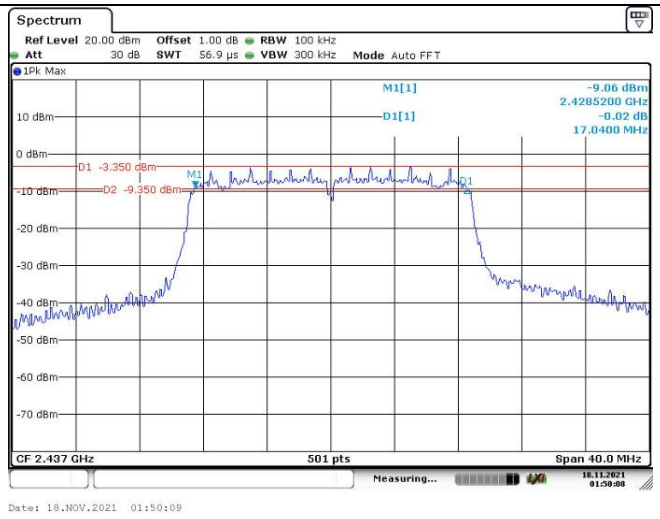
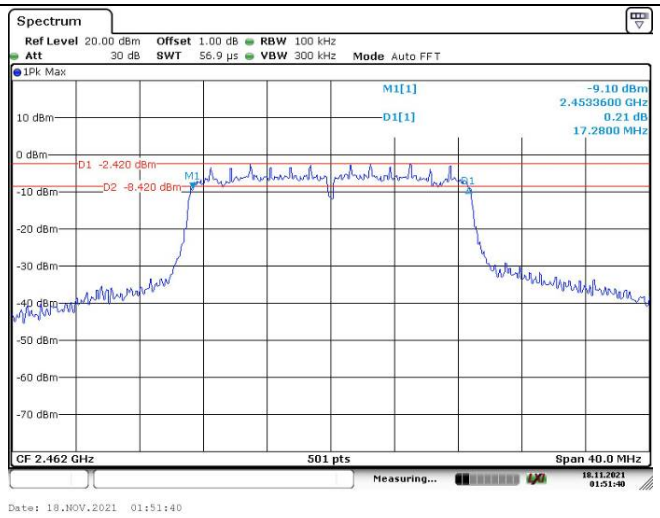
** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

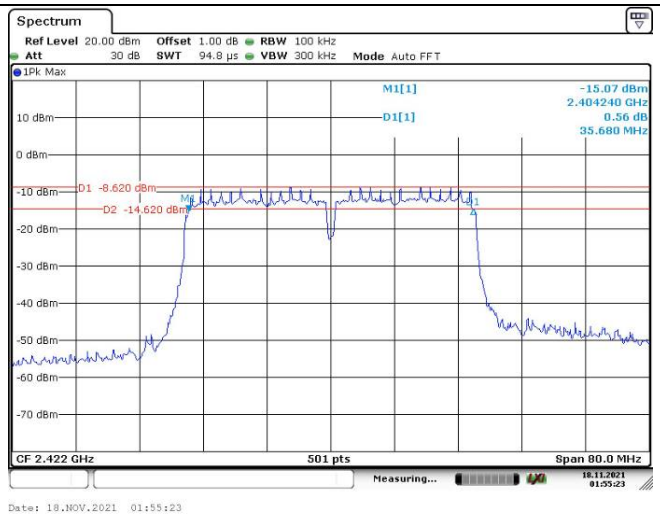
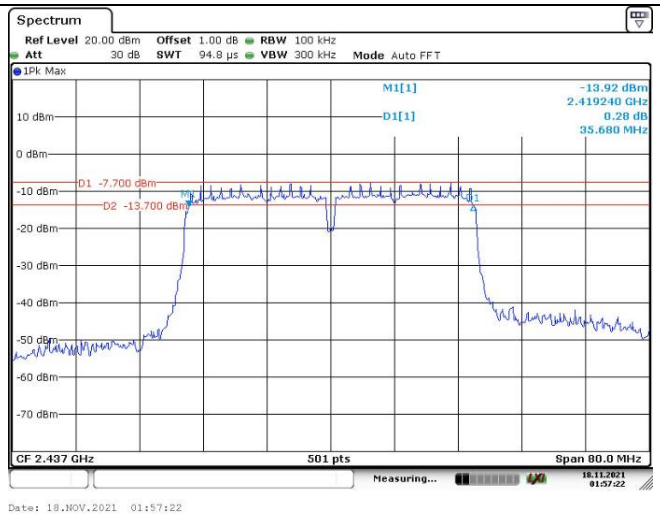
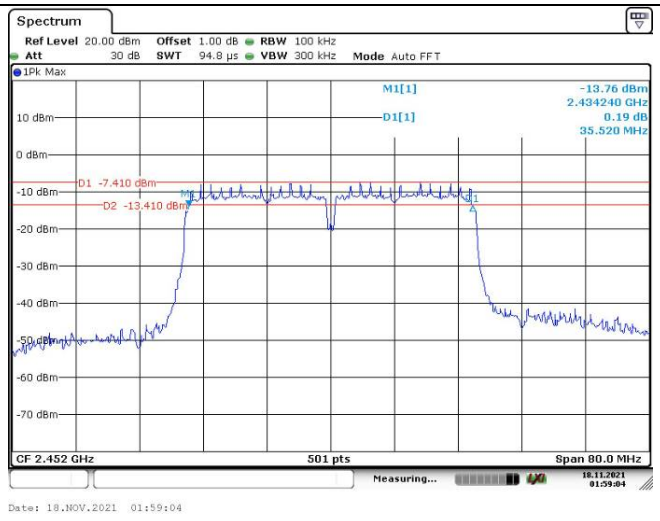
Test Data:

Test Modes	Test Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
802.11b	2412	10.080	0.5
	2437	10.080	0.5
	2462	10.080	0.5
802.11g	2412	16.480	0.5
	2437	16.400	0.5
	2462	16.480	0.5
802.11n ht20	2412	17.200	0.5
	2437	17.040	0.5
	2462	17.280	0.5
802.11n ht40	2422	35.680	0.5
	2437	35.680	0.5
	2452	35.520	0.5

6dB Emission Bandwidth	
802.11b Lowest Channel	
802.11b Middle Channel	
802.11b Highest Channel	

6dB Emission Bandwidth	
802.11g Lowest Channel	
802.11g Middle Channel	
802.11g Highest Channel	

6dB Emission Bandwidth	
802.11n ht20 Lowest Channel	
802.11n ht20 Middle Channel	
802.11n ht20 Highest Channel	

6dB Emission Bandwidth	
802.11n ht40 Lowest Channel	
802.11n ht40 Middle Channel	
802.11n ht40 Highest Channel	

4.5 Maximum peak conducted output power:

Serial Number:	CR21110046-RF-S2	Test Date:	2021/11/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Mark Wang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	22.7	Relative Humidity: (%)	50	ATM Pressure: (kPa)	101.1

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060302	2021-08-08	2022-08-07
Agilent	USB Wideband Power Sensor	U2021XA	MY54080015	2021-07-22	2022-07-21

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Test Modes	Test Channel	Test Frequency (MHz)	Maximum Conducted Peak Output Power (dBm)	Limit (dBm)
802.11b	Lowest	2412	11.23	30
	Middle	2437	12.44	30
	Highest	2462	13.66	30
802.11g	Lowest	2412	18.13	30
	Middle	2437	18.42	30
	Highest	2462	18.84	30
802.11n ht20	Lowest	2412	17.87	30
	Middle	2437	18.00	30
	Highest	2462	18.22	30
802.11n ht40	Lowest	2422	15.09	30
	Middle	2437	16.07	30
	Highest	2452	16.22	30

4.6 Maximum power spectral density:

Serial Number:	CR21110046-RF-S2	Test Date:	2021/11/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Mark Wang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	22.7	Relative Humidity: (%)	50	ATM Pressure: (kPa)	101.1

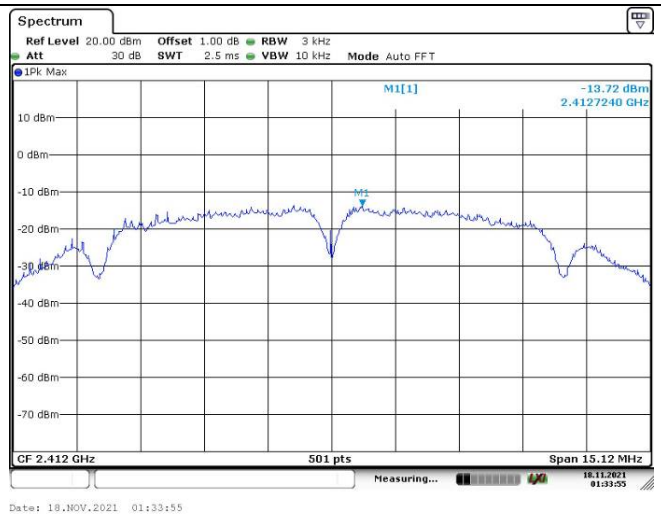
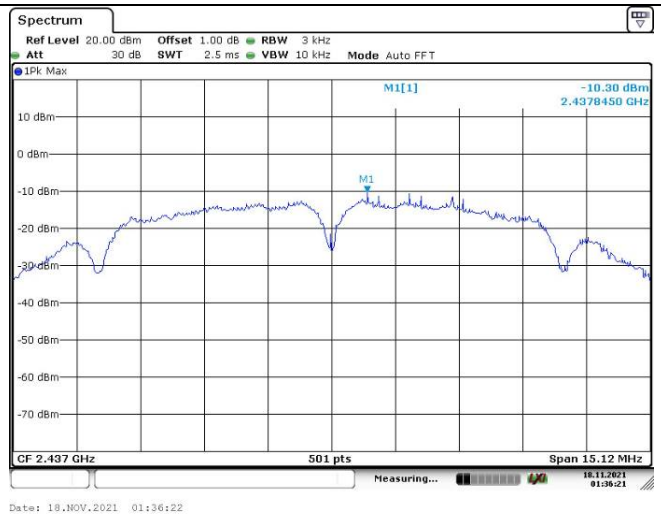
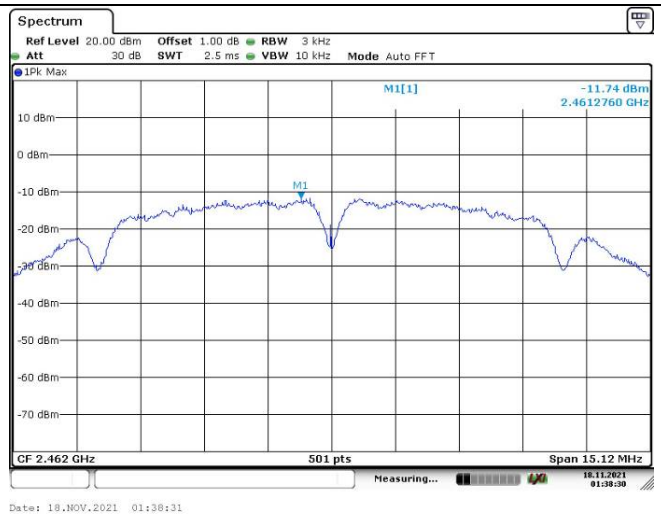
Test Equipment List and Details:

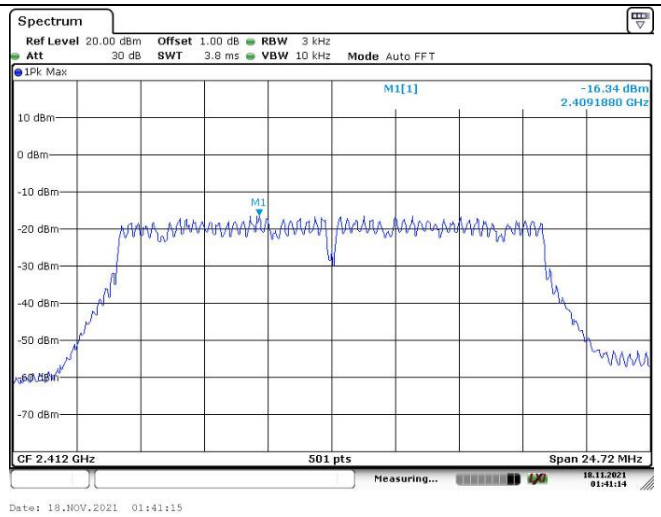
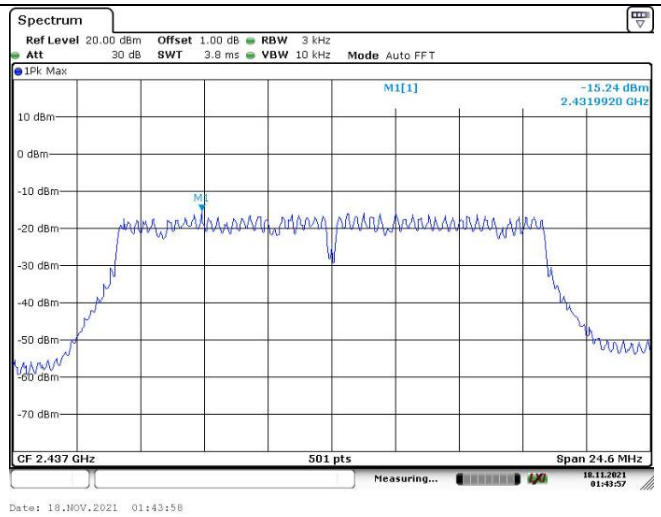
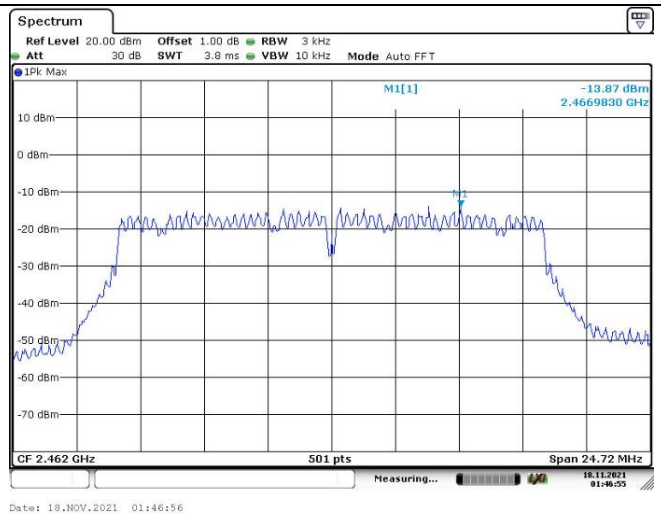
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101943	2021-10-10	2022-10-09
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	2021-08-08	2022-08-07

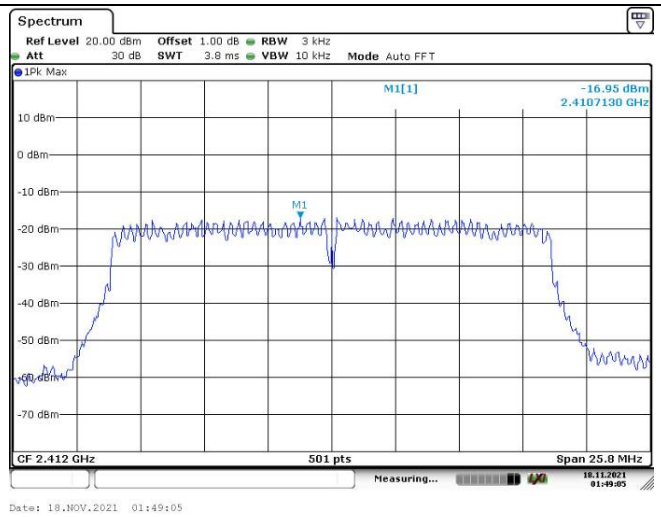
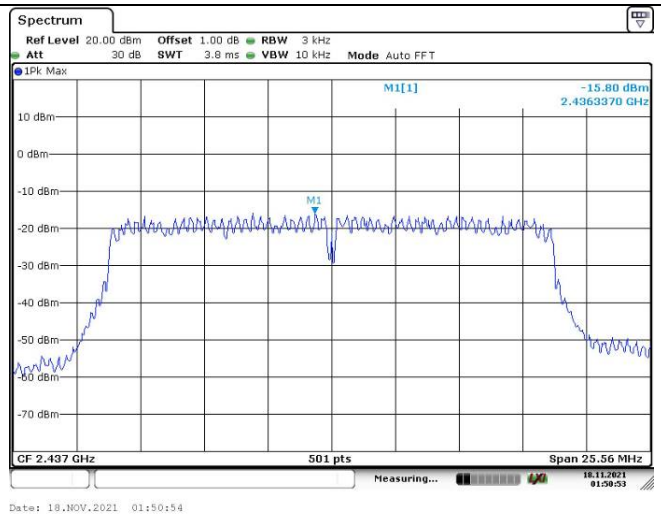
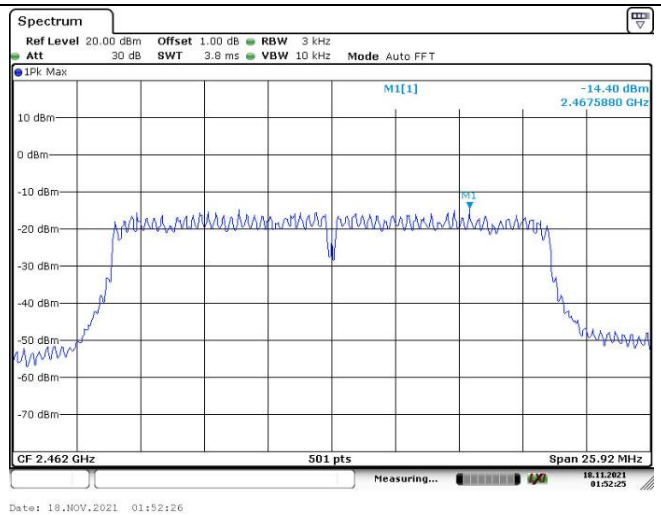
** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

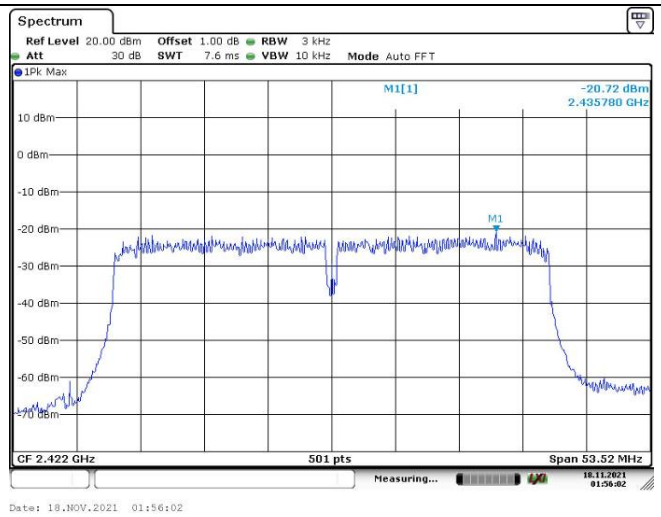
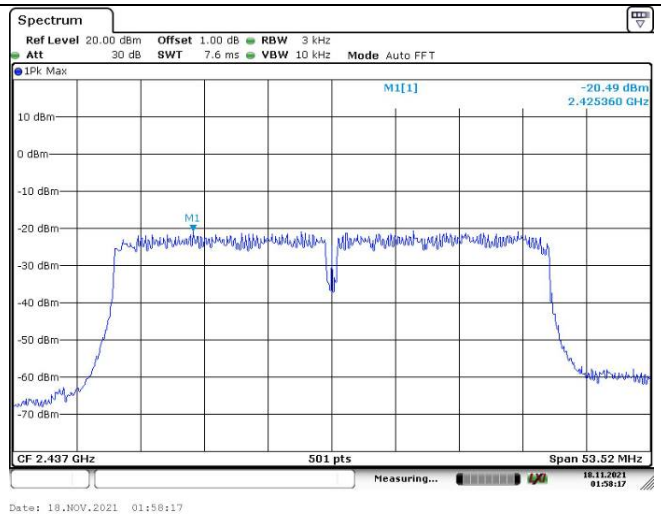
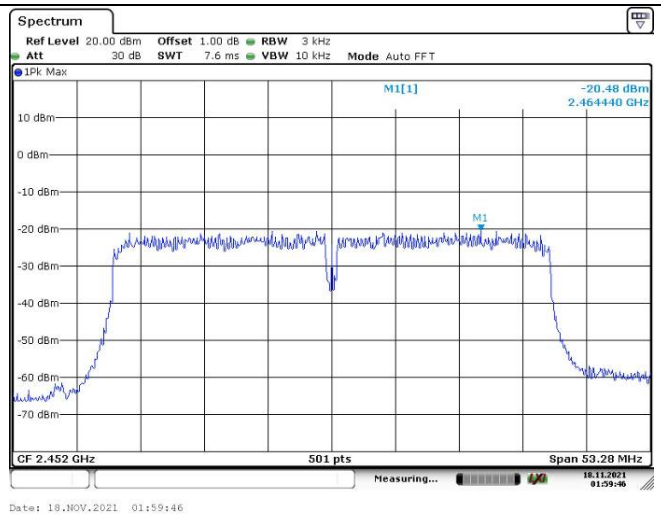
Test Data:

Test Channel	Test Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	2412	-13.72	8.00
	2437	-10.30	8.00
	2462	-11.74	8.00
802.11g	2412	-16.34	8.00
	2437	-15.24	8.00
	2462	-13.87	8.00
802.11n ht20	2412	-16.95	8.00
	2437	-15.80	8.00
	2462	-14.40	8.00
802.11n ht40	2422	-20.72	8.00
	2437	-20.49	8.00
	2452	-20.48	8.00

Maximum power spectral density	
802.11b Lowest Channel	
802.11b Middle Channel	
802.11b Highest Channel	

Maximum power spectral density	
802.11g Lowest Channel	
802.11g Middle Channel	
802.11g Highest Channel	

Maximum power spectral density	
802.11n ht20 Lowest Channel	
802.11n ht20 Middle Channel	
802.11n ht20 Highest Channel	

Maximum power spectral density	
802.11n ht40 Lowest Channel	
802.11n ht40 Middle Channel	
802.11n ht40 Highest Channel	

4.7 100 kHz Bandwidth of Frequency Band Edge:

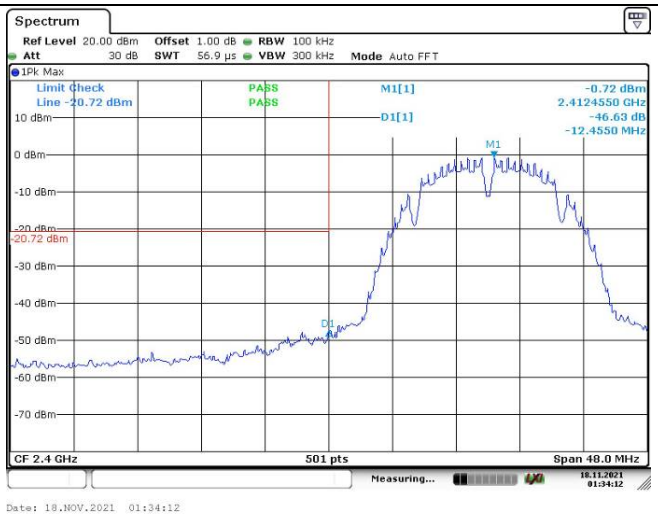
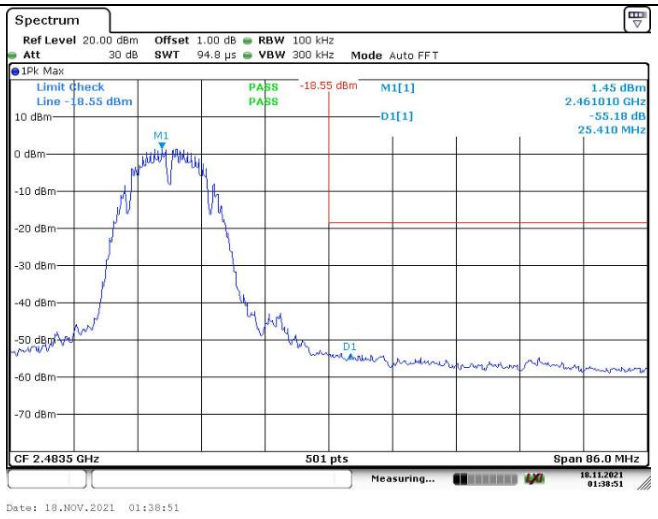
Serial Number:	CR21110046-RF-S2	Test Date:	2021/11/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Mark Wang	Test Result:	Pass

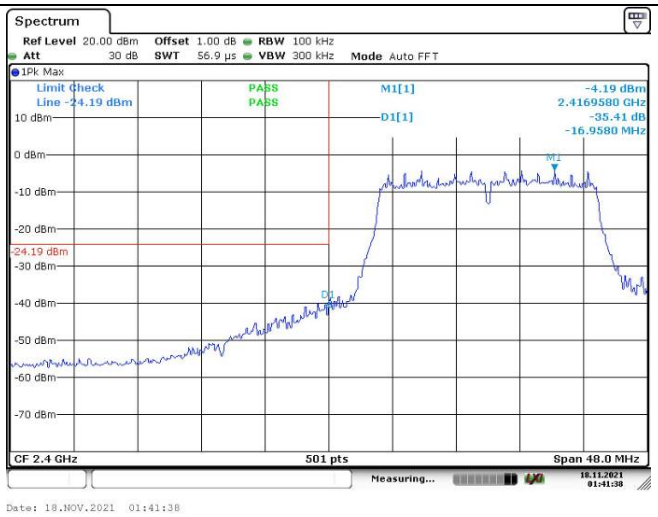
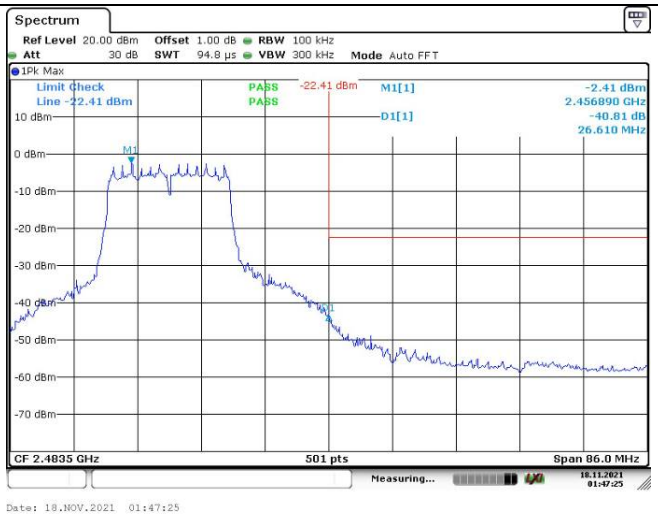
Environmental Conditions:					
Temperature: (℃)	22.7	Relative Humidity: (%)	50	ATM Pressure: (kPa)	101.1

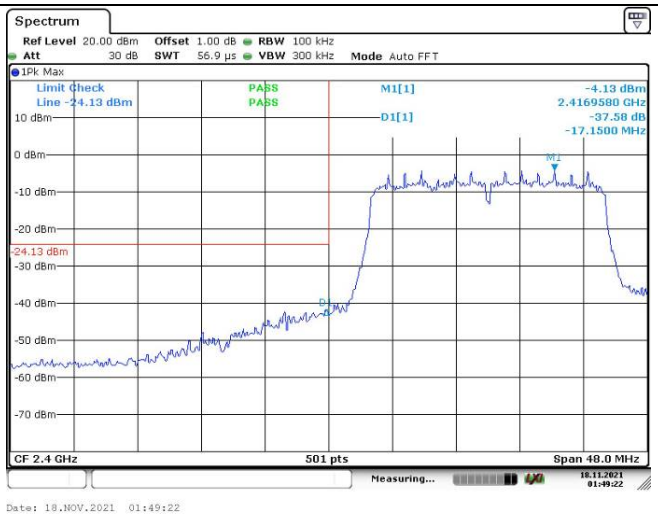
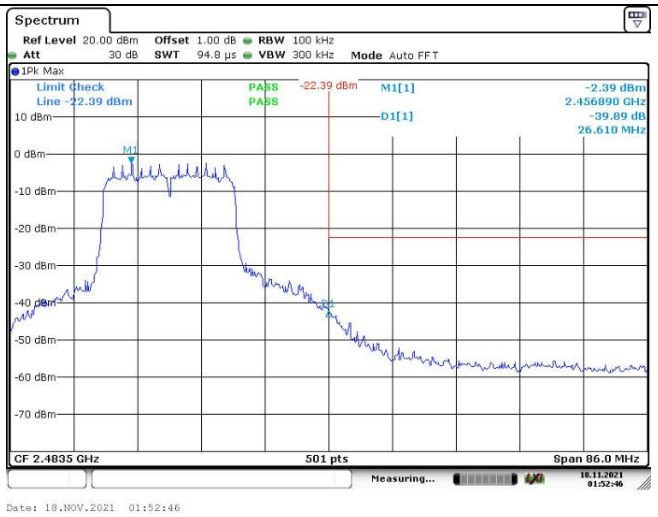
Test Equipment List and Details:

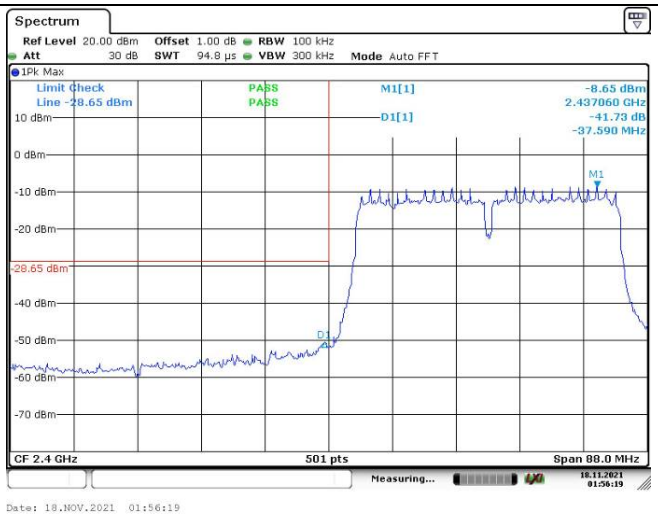
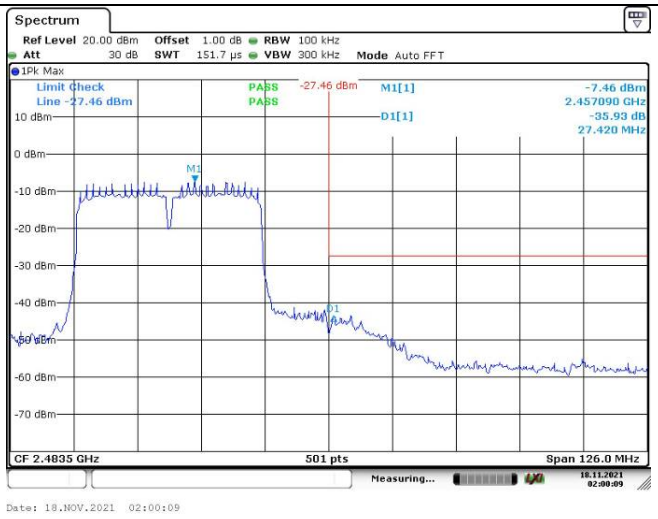
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101943	2021-10-10	2022-10-09
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	2021-08-08	2022-08-07

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

100 kHz Bandwidth of Frequency Band Edge	
802.11b Lowest Band edge	
802.11b Highest Band edge	

100 kHz Bandwidth of Frequency Band Edge	
802.11g Lowest Band edge	
802.11g Highest Band edge	

100 kHz Bandwidth of Frequency Band Edge	
802.11n ht20 Lowest Band edge	
802.11n ht20 Highest Band edge	

100 kHz Bandwidth of Frequency Band Edge	
802.11n ht40 Lowest Band edge	
802.11n ht40 Highest Band edge	

4.8 Duty Cycle:

Serial Number:	CR21110046-RF-S2	Test Date:	2021/11/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Mark Wang	Test Result:	N/A

Environmental Conditions:					
Temperature: (℃)	22.7	Relative Humidity: (%)	50	ATM Pressure: (kPa)	101.1

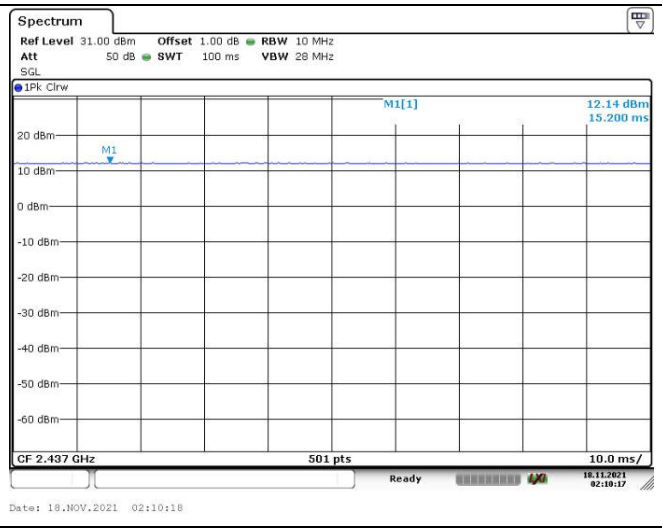
Test Equipment List and Details:

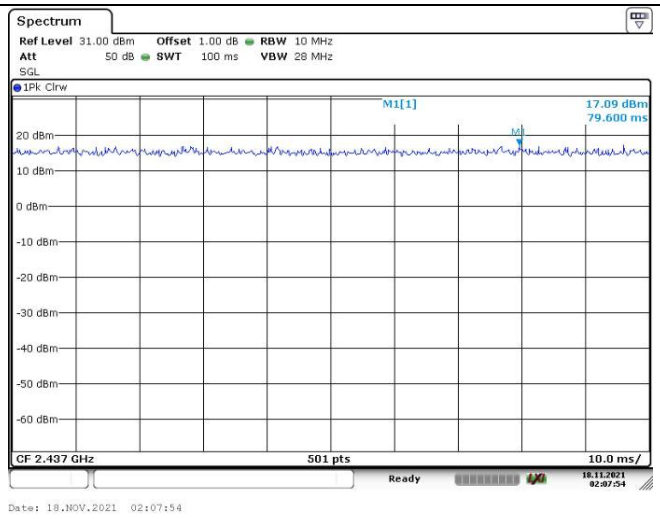
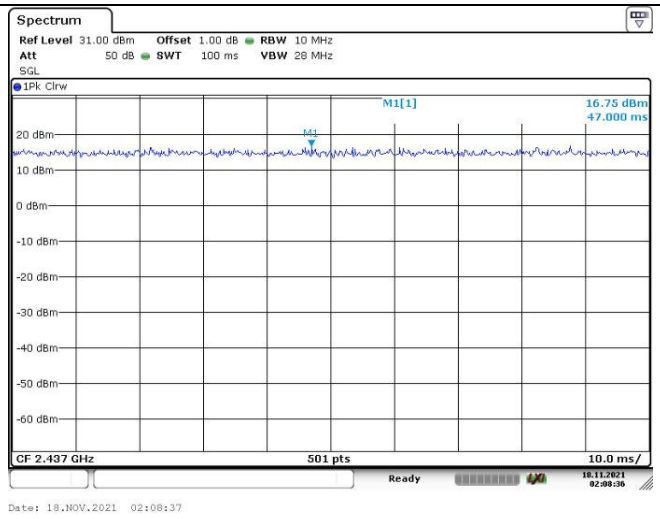
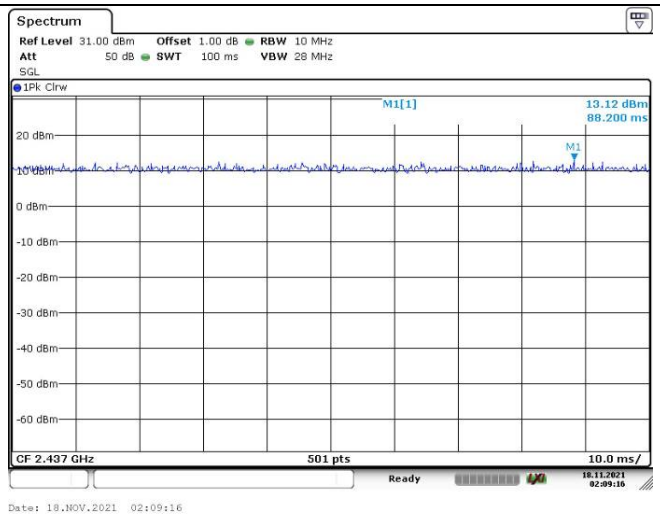
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101943	2021-10-10	2022-10-09
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	2021-08-08	2022-08-07

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Test Modes	Ton (ms)	Ton+off (ms)	Duty cycle (%)
802.11b	100	100	100.00
802.11g	100	100	100.00
802.11n ht20	100	100	100.00
802.11n ht40	100	100	100.00

Duty Cycle	
802.11b	

Duty Cycle	
802.11g	
802.11n ht20	
802.11n ht40	

5. RF EXPOSURE EVALUATION

5.1 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

5.1.1 Applicable Standard

FCC §15.247 (i) & §1.1310 & §2.1091

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See §1.1307(b)(1) of this chapter.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

5.1.2 Procedure

Prediction of power density at the distance of the applicable MPE limit
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

5.1.3 Calculated Result

Operation Modes	**Frequency (MHz)**	**Antenna Gain**		**Conducted output power including Tune-up Tolerance**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
		(dBi)	**(numeric)**	**(dBm)**	**(mW)**			
Wi-Fi	2412-2462	3	2.00	19	79.43	20.00	0.0316	1.0

Result: The device meet FCC MPE at 20 cm distance.

===== END OF REPORT =====