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

ACCREDITED
TESTING LABORATORY
CERTIFICATE # 6356.01

TEST REPORT

Applicant: **Shenzhen Chaofan 3D technology Co.,LTD**

Address: 2nd Floor, Building 5, Zone 1,Jiademaluan Industrial Park, Pingshan District,Shenzhen Guangdong 518118 China

FCC ID: **2BBR5-A3**

Product Name: **Super3D Printer**

Standard(s): **47 CFR Part 15, Subpart E(15.407)**
ANSI C63.10-2013
KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

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

Report Number: **CR230636375-00B**

Date Of Issue: **2023/8/28**

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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.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230636375-00B	Original Report	2023/8/28

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

1.1.1 General:

EUT Name:	Super3D Printer
EUT Model:	Super3D-A3
Operation Frequency:	5180-5240 MHz (802.11a/n ht20/ac vht20) 5190-5230 MHz (802.11n ht40/ac vht40) 5210MHz (802.11ac vht80) 5745-5825 MHz (802.11a/n ht20/ac vht20) 5755-5795 MHz (802.11n ht40/ac vht40) 5775MHz (802.11ac vht80)
Maximum Average Output Power (Conducted):	12.94dBm (5150-5250 MHz) 14.01dBm (5725-5850 MHz)
Modulation Type:	OFDM-BPSK, QPSK, 16QAM, 64QAM,256QAM
Rated Input Voltage:	AC 120V, 60Hz
Serial Number:	RF:26OB-1 ; RE&CE: 26OB-2
EUT Received Date:	2023/6/26
EUT Received Status:	Good

1.1.2 Operation Frequency Detail:

For 802.11a/n ht20/ac vht20:

5150-5250MHz Band		5725-5850MHz Band	
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
36	5180	149	5745
40	5200	153	5765
44	5220	157	5785
48	5240	161	5805
/	/	165	5825
Per section 15.31(m), the below frequencies were performed the test as below:			
36	5180	149	5745
40	5200	157	5785
48	5240	165	5825

For 802.11n ht40/ac vht40:

5150-5250MHz Band		5725-5850MHz Band	
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
38	5190	151	5755
46	5230	159	5795
Per section 15.31(m), the below frequencies were performed the test as below:			
38	5190	151	5755
46	5230	159	5795

For 802.11ac vht80:

5150-5250MHz Band		5725-5850MHz Band	
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
42	5210	155	5775
Per section 15.31(m), the below frequencies were performed the test as below:			
42	5210	155	5775

1.1.3 Antenna Information Detail▲:

Antenna Type	input impedance (Ohm)	Frequency Range (MHz)	Antenna Gain (dBi)
FPC	50	5150-5250	2.36
		5725-5850	2.48

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.

1.1.4 Accessory Information:

Accessory Description	Manufacturer	Model	Parameters
Unknown	TF Card	Unknown	Unknown

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

EUT Operation Mode:	The system was configured for testing in Engineering Mode, which was provided by the manufacturer.
Equipment Modifications:	No
EUT Exercise Software:	RTL8852A MP Toolkit.exe

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

5150-5250 MHz Band:

Test Modes	Test Channels	Test Frequency (MHz)	Data rate	Power Level Setting
802.11a	Lowest	5180	6Mbps	55
	Middle	5200	6Mbps	55
	Highest	5240	6Mbps	55
802.11n ht20	Lowest	5180	MCS0	55
	Middle	5200	MCS0	55
	Highest	5240	MCS0	55
802.11n ht40	Lowest	5190	MCS0	55
	Highest	5230	MCS0	55
802.11ac vht80	Middle	5210	MCS0	55

5725-5850 MHz Band:

Test Modes	Test Channels	Test Frequency (MHz)	Data rate	Power Level Setting
802.11a	Lowest	5745	6Mbps	55
	Middle	5785	6Mbps	55
	Highest	5825	6Mbps	55
802.11n ht20	Lowest	5745	MCS0	55
	Middle	5785	MCS0	55
	Highest	5825	MCS0	55
802.11n ht40	Lowest	5755	MCS0	53
	Highest	5795	MCS0	53
802.11ac vht80	Middle	5775	MCS0	53

Note:
The system support 802.11a/n ht20/n ht40/ac vht20/vht40/vht80, the vht20/vht40 were reduced since the identical parameters with 802.11n ht20 and ht40.
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

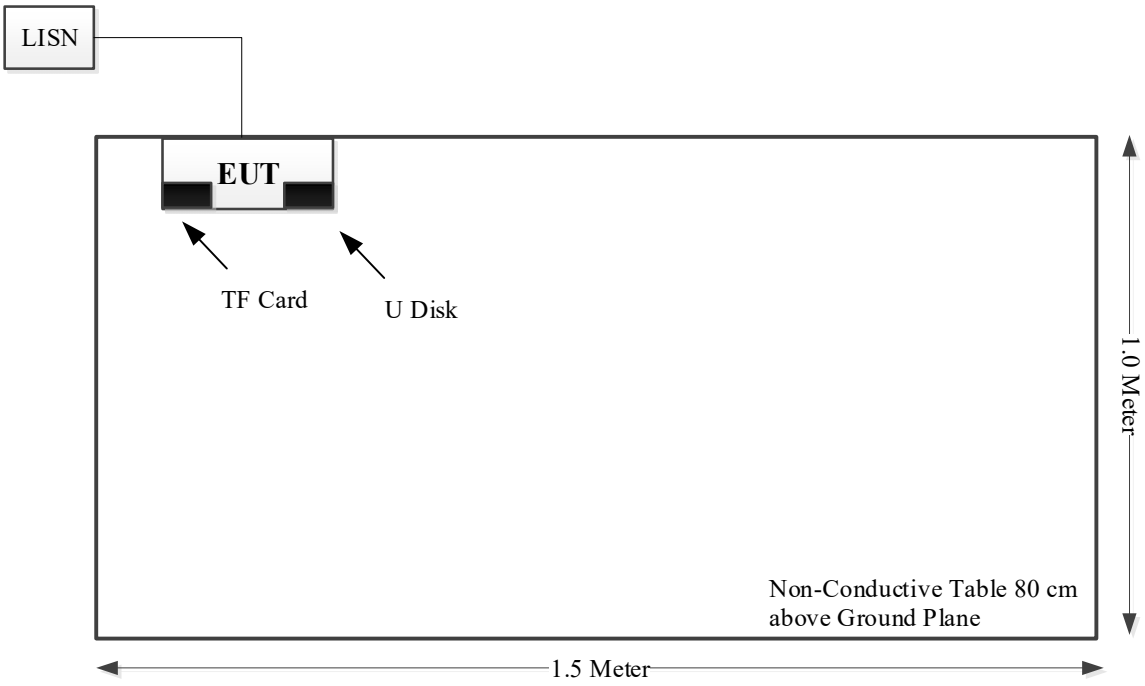
Manufacturer	Description	Model	Serial Number
Unknown	U Disk	SDCZ74	BP2203001102Z

1.2.3 Support Cable List and Details

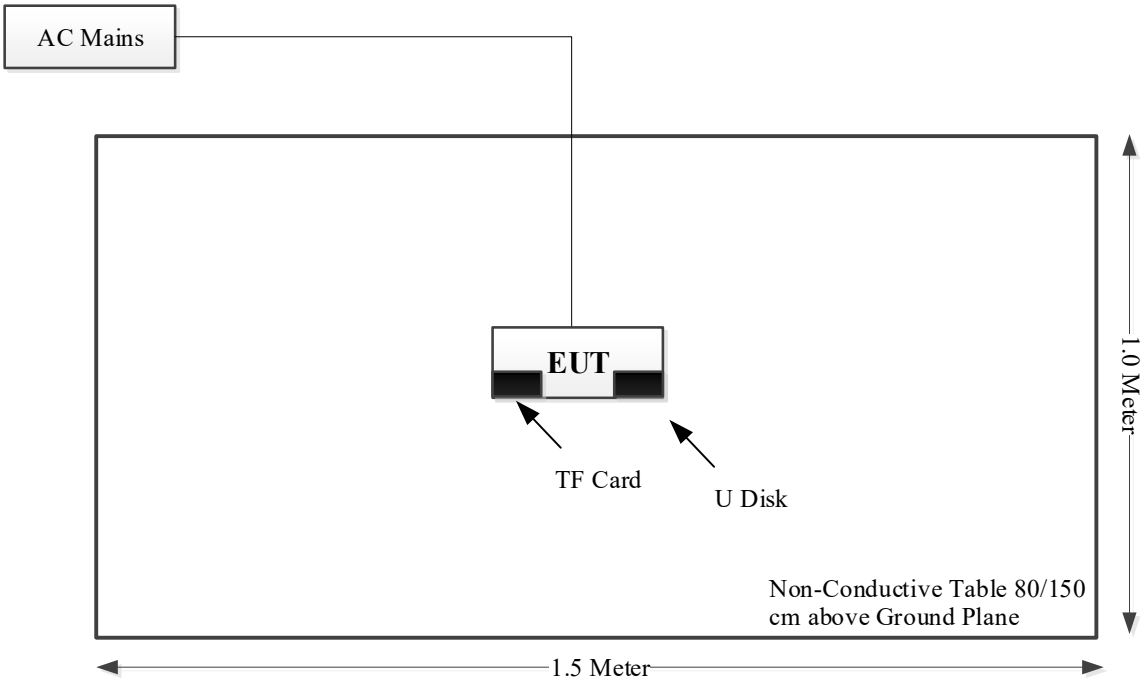
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
AC Cable	NO	NO	1.2	EUT	LISN/AC Mains

1.2.4 Block Diagram of Test Setup

AC line conducted emissions:



Spurious Emissions:



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	Compliant
FCC§15.205& §15.209 &§15.407(b)	Radiated Spurious Emissions	Compliant
FCC§15.407(a) (e)	Emission Bandwidth	Compliant
FCC§15.407(a)	Maximum Conducted Output Power	Compliant
FCC§15.407 (a)	Power Spectral Density	Compliant
§15.203	Antenna Requirement	Compliant
§15.407 & §1.1307	RF Exposure Evaluation	Compliant

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:

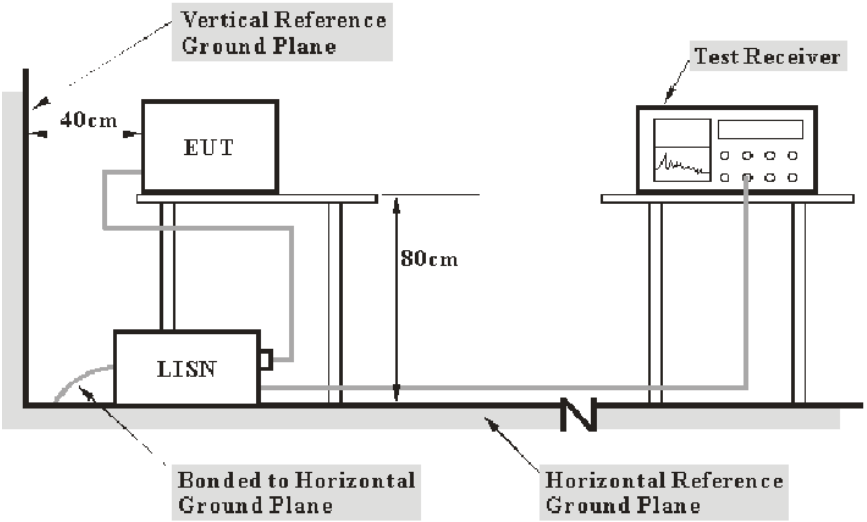
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(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

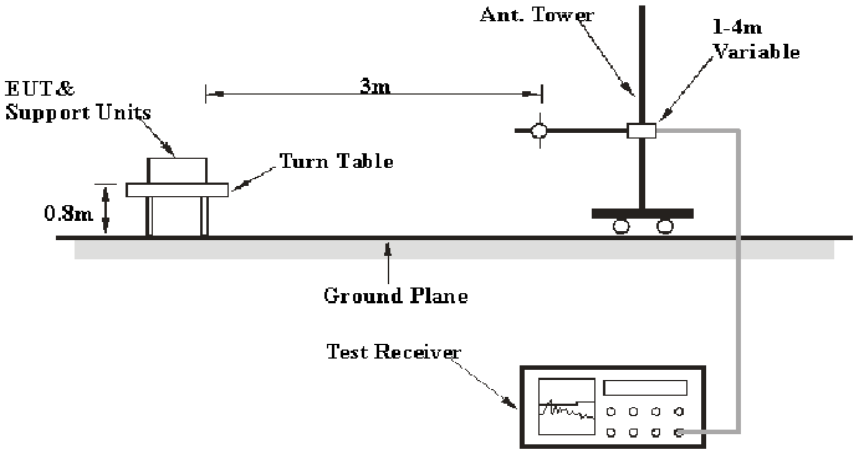
3.2.1 Applicable Standard

FCC §15.407 (b);

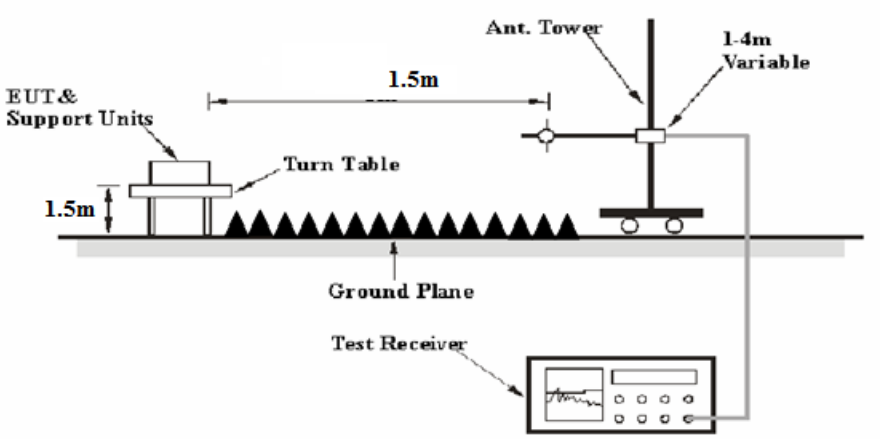
Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of – 27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of – 27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of – 27 dBm/MHz.
(4) For transmitters operating solely in the 5.725-5.850 GHz band:
(i) All emissions shall be limited to a level of – 27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in § 15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in § 15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.
(8) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
(9) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in § 15.207.
(10) The provisions of § 15.205 apply to intentional radiators operating under this section.
(11) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.
(c) The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

3.2.2 EUT Setup

Below 1GHz:



1-40 GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was FCC 15.209, FCC 15.407 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 40 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- 40GHz:

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

During the radiated emission test, the adapter was connected to the first AC floor outlet.

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

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as: E [dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

According to C63.10, the above 1G test result shall be extrapolated to the specified distance using an extrapolation Factor of 20dB/decade from 3m to 1.5m
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1.5m]) dB= 6.02 dB

All emissions under the average limit and under the noise floor have not recorded in the report.

3.2.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Factor = Antenna Factor + Cable Loss- Amplifier Gain

For 30MHz-1GHz:
Result = Reading + Factor

For 1GHz-40GHz
Result = Reading + Factor-Distance extrapolation Factor

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

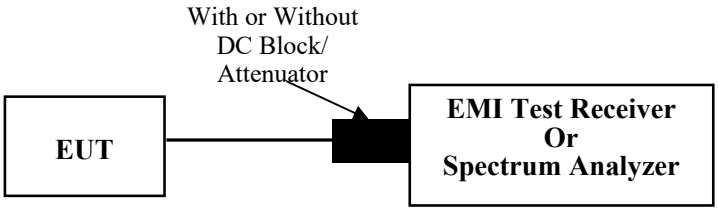
3.3 Emission Bandwidth

3.3.1 Applicable Standard

FCC §15.407 (a),(h)
(h)(2) Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems.

FCC §15.407 (e)
Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

3.3.2 EUT Setup



3.3.3 Test Procedure

26dB Emission Bandwidth:

According to ANSI C63.10-2013 Section 12.4.1

a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = peak.
d) Trace mode = max hold
e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6 dB emission bandwidth:

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

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.
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described in this section. For devices that use channel aggregation refer to III.A and III.C for determining emission bandwidth.

99% Occupied Bandwidth:

According to ANSI C63.10-2013 Section 12.4.2&6.9.3

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.
The following procedure shall be used for measuring 99% power bandwidth:
a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.
d) Step a) through step c) might require iteration to adjust within the specified range.
e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power 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; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

3.4 Maximum Conducted Output Power

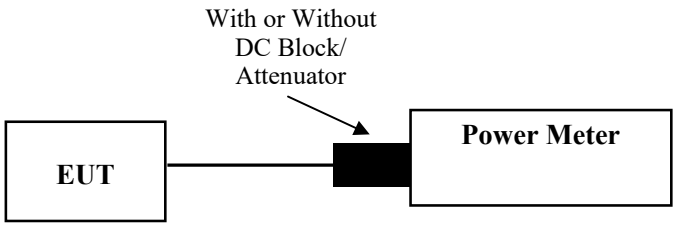
3.4.1 Applicable Standard

FCC §15.407(a) (1)(iv)
For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC §15.407(a) (2)
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC §15.407(a) (3)(i)
For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

3.4.2 EUT Setup



3.4.3 Test Procedure

According to ANSI C63.10-2013 Section 12.3.3.2

Method PM-G is measurement using a gated RF average power meter.
Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

3.5 Maximum Power Spectral Density

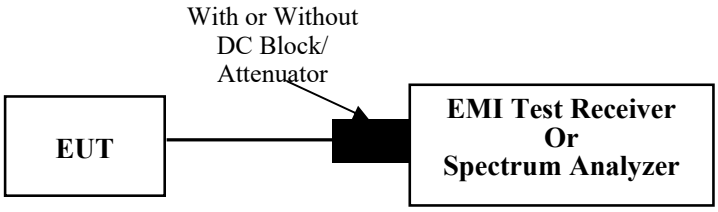
3.5.1 Applicable Standard

FCC §15.407(a) (1)(iv)
For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC §15.407(a) (2)
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC §15.407(a) (3)(i)
For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

3.5.2 EUT Setup



3.5.3 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Duty cycle ⩾98%

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Method SA-1 should be applied.

Duty cycle <98%, duty cycle variations are less than ±2%

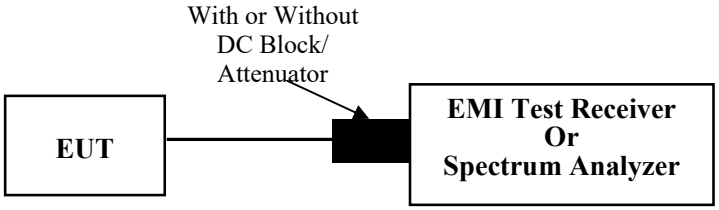
KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Method SA-2 should be applied.

Duty cycle <98%, duty cycle variations exceed ±2%

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Method SA-3 should be applied.

3.7 Duty Cycle

3.7.1 EUT Setup



3.7.2 Test Procedure

According to ANSI C63.10-2013 Section 12.2

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.)

3.8 Antenna Requirement

3.8.1 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.

3.8.2 Judgment

Result: Compliant. Please refer to the Antenna Information detail in Section 1.

4. TEST DATA AND RESULTS

4.1 AC Line Conducted Emissions

Serial Number:	26OB-2	Test Date:	2023/8/25
Test Site:	CE	Test Mode:	Transmitting (802.11 ac vht80 5775MHz was the worst)
Tester:	David Huang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	24.8	Relative Humidity: (%)	57	ATM Pressure: (kPa)	100.1

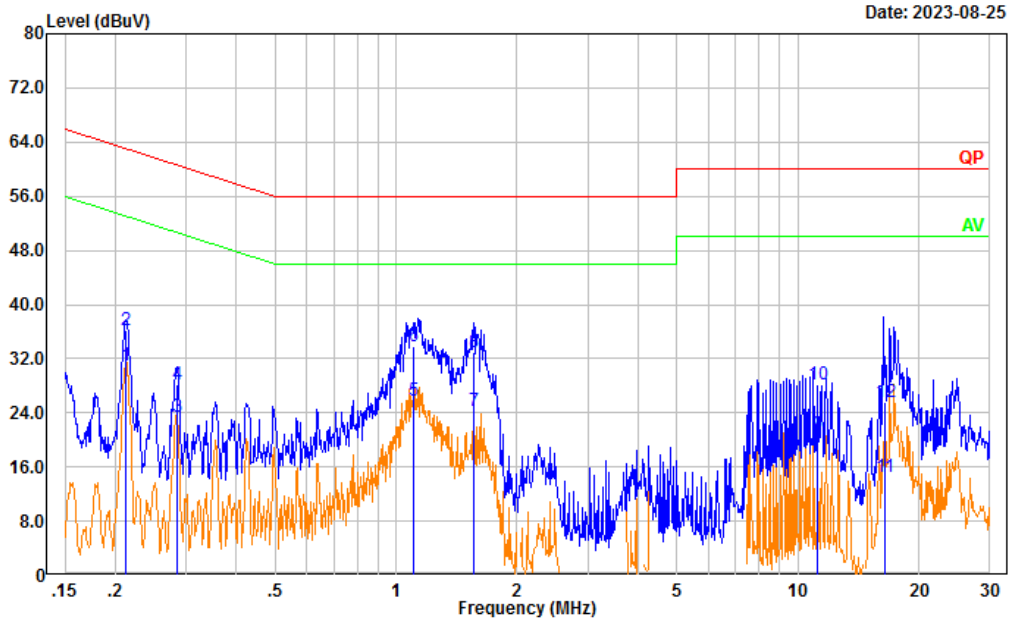
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101134	2023/03/31	2024/03/30
R&S	EMI Test Receiver	ESR3	102726	2023/03/31	2024/03/30
MICRO-COAX	Coaxial Cable	UTIFLEX	C-0200-01	2023/08/06	2024/08/05
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).*

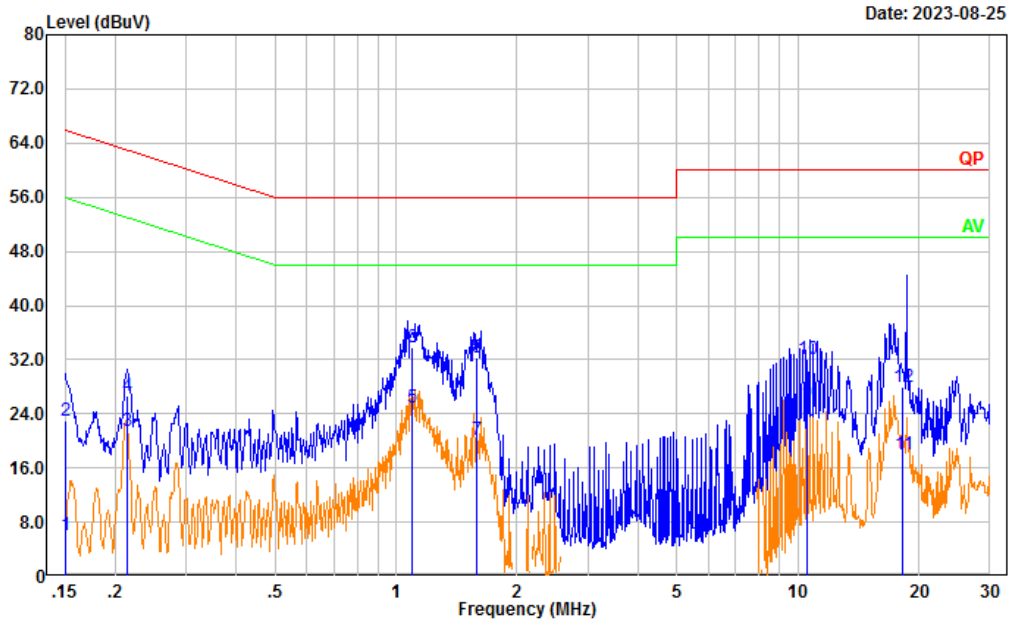
Pre-scan 802.11a/n ht20/n ht40/ac vht80 mode with low, middle, high channel, the worst case 802.11 ac vht80 5775MHz was recorded.

Test Mode: Trasmitting
Port: Line
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.213	21.31	9.61	30.92	53.07	22.15	Average
2	0.213	26.63	9.61	36.24	63.07	26.83	QP
3	0.285	13.86	9.61	23.47	50.68	27.21	Average
4	0.285	18.50	9.61	28.11	60.68	32.57	QP
5	1.110	16.15	9.62	25.77	46.00	20.23	Average
6	1.110	24.24	9.62	33.86	56.00	22.14	QP
7	1.562	14.67	9.63	24.30	46.00	21.70	Average
8	1.562	23.26	9.63	32.89	56.00	23.11	QP
9	11.144	11.25	9.67	20.92	50.00	29.08	Average
10	11.144	18.46	9.67	28.13	60.00	31.87	QP
11	16.454	4.79	9.72	14.51	50.00	35.49	Average
12	16.454	15.78	9.72	25.50	60.00	34.50	QP

Test Mode: Trasmitting
Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.150	-3.46	9.61	6.15	55.99	49.84	Average
2	0.150	13.41	9.61	23.02	65.99	42.97	QP
3	0.215	11.82	9.61	21.43	53.01	31.58	Average
4	0.215	17.05	9.61	26.66	63.01	36.35	QP
5	1.097	15.38	9.62	25.00	46.00	21.00	Average
6	1.097	24.19	9.62	33.81	56.00	22.19	QP
7	1.589	10.53	9.63	20.16	46.00	25.84	Average
8	1.589	22.75	9.63	32.38	56.00	23.62	QP
9	10.579	15.91	9.67	25.58	50.00	24.42	Average
10	10.579	22.48	9.67	32.15	60.00	27.85	QP
11	18.271	8.36	9.69	18.05	50.00	31.95	Average
12	18.271	18.26	9.69	27.95	60.00	32.05	QP

4.2 Radiation Spurious Emissions

Serial Number:	26OB-2	Test Date:	2023/8/25~2023/8/26
Test Site:	966-1, 966-2	Test Mode:	Transmitting
Tester:	Hugo Huo, Mack Huang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	25.6~26.4	Relative Humidity: (%)	54~63	ATM Pressure: (kPa)	100.1~100.2

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	2023/3/31	2024/3/30
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2023/7/16	2024/7/15
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2023/7/16	2024/7/15
Sonoma	Amplifier	310N	186165	2023/7/16	2024/7/15
Audix	Test Software	E3	201021 (V9)	N/A	N/A
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020/10/13	2023/10/12
R&S	Spectrum Analyzer	FSV40	101591	2023/3/31	2024/3/30
MICRO-COAX	Coaxial Cable	UFA210A-1-1200-70U300	217423-008	2023/8/6	2024/8/5
MICRO-COAX	Coaxial Cable	UFA210A-1-2362-300300	235780-001	2023/8/6	2024/8/5
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2022/11/9	2023/11/8
PASTERNACK	Horn Antenna	PE9852/2F-20	112002	2021/2/5	2024/2/4
Quinstar	Preamplifier	QLW-18405536-JO	15964001005	2022/9/16	2023/9/15
MICRO-COAX	Coaxial Cable	UFB142A-1-2362-200200	235772-001	2023/8/6	2024/8/5
E-Microwave	Band Rejection Filter	5150-5850MHz	OE01902423	2023/8/6	2024/8/5
Mini Circuits	High Pass Filter	VHF-6010+	31119	2023/8/6	2024/8/5
PASTERNACK	Horn Antenna	PE9850/2F-20	072001	2021/2/5	2024/2/4

** 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).*

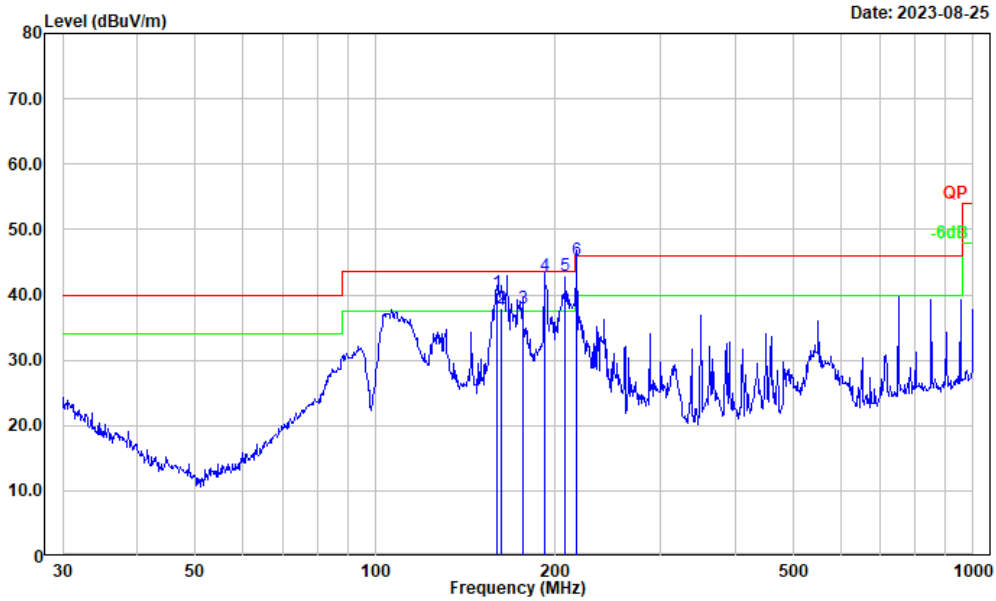
Test Data:

Please refer to the below table and plots.

1) 30MHz-1GHz (802.11 ac vht80 5775MHz was the worst)

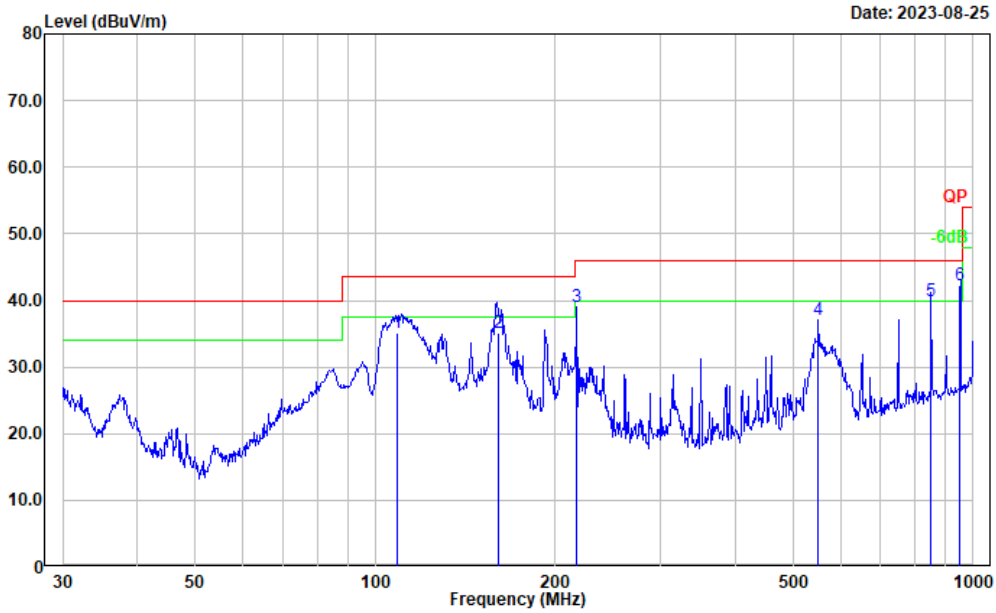
Pre-scan 802.11a/n ht20/n ht40/ac vht80 mode with low, middle, high channel, the worst case 802.11 ac vht80 5775MHz was recorded

Test Mode: Transmitting
Polarization: horizontal
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	159.951	52.37	-12.05	40.32	43.50	3.18	QP
2	162.856	50.29	-12.33	37.96	43.50	5.54	QP
3	176.283	51.22	-13.31	37.91	43.50	5.59	QP
4	191.990	56.07	-13.18	42.89	43.50	0.61	QP
5	207.676	55.38	-12.43	42.95	43.50	0.55	QP
6	217.483	57.97	-12.70	45.27	46.00	0.73	QP

Test Mode: Transmitting
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	109.005	47.66	-12.46	35.20	43.50	8.30	QP
2	160.825	47.34	-12.14	35.20	43.50	8.30	QP
3	217.544	51.73	-12.73	39.00	46.00	7.00	Peak
4	550.948	42.83	-5.74	37.09	46.00	8.91	Peak
5	850.049	41.43	-1.50	39.93	46.00	6.07	QP
6	950.039	42.40	-0.18	42.22	46.00	3.78	QP

2) 1GHz-40GHz:
5150-5250MHz
802.11a:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5180MHz							
5150.000	29.99	PK	V	38.64	62.61	74.00	11.39
5150.000	17.72	AV	V	38.64	50.34	54.00	3.66
10360.000	47.18	PK	V	19.18	60.34	68.20	7.86
Middle Channel: 5200 MHz							
10400.000	47.76	PK	V	19.16	60.90	68.20	7.30
High Channel: 5240 MHz							
5350.000	26.93	PK	V	39.03	59.94	74.00	14.06
5350.000	14.19	PK	V	39.03	47.20	74.00	26.80
10480.000	48.54	PK	V	18.86	61.38	68.20	6.82

802.11n ht20:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5180MHz							
5150.000	29.60	PK	V	38.64	62.22	74.00	11.78
5150.000	17.31	AV	V	38.64	49.93	54.00	4.07
10360.000	47.86	PK	V	19.18	61.02	68.20	7.18
Middle Channel: 5200 MHz							
10400.000	47.76	PK	V	19.16	60.90	68.20	7.30
High Channel: 5240 MHz							
5350.000	26.82	PK	V	39.03	59.83	74.00	14.17
5350.000	13.66	AV	V	39.03	46.67	54.00	7.33
10480.000	47.57	PK	V	18.86	60.41	68.20	7.79

802.11n ht40:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5190 MHz							
5150.000	33.08	PK	V	38.64	65.70	74.00	8.30
5150.000	18.54	AV	V	38.64	51.16	54.00	2.84
10380.000	47.18	PK	V	19.17	60.33	68.20	7.87
High Channel: 5230 MHz							
5350.000	26.99	PK	V	39.03	60.00	74.00	14.00
5350.000	13.62	AV	V	39.03	46.63	54.00	7.37
10460.000	47.58	PK	V	18.94	60.50	68.20	7.70

802.11ac vht80:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
5150.000	33.57	PK	V	11.46	39.01	74.00	34.99
5150.000	18.53	AV	V	11.46	23.97	54.00	30.03
5350.000	27.43	PK	V	12.25	33.66	74.00	40.34
5350.000	14.08	AV	V	12.25	20.31	54.00	33.69
10420.000	48.22	PK	V	19.09	61.29	68.20	6.91

Note:
Result = Reading + Factor- Distance extrapolation Factor
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1.5m]) dB= 6.02 dB

5725-5850MHz:
802.11a:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5745MHz							
5725.000	44.71	PK	V	39.48	78.17	122.20	44.03
5720.000	34.21	PK	V	39.49	67.68	110.80	43.12
5700.000	29.91	PK	V	39.51	63.40	105.20	41.80
5650.000	28.74	PK	V	39.49	62.21	68.20	5.99
11490.000	46.26	PK	V	20.67	60.91	74.00	13.09
11490.000	32.97	AV	V	20.67	47.62	54.00	6.38
Middle Channel: 5785 MHz							
11570.000	46.07	PK	V	20.83	60.88	74.00	13.12
11570.000	33.00	AV	V	20.83	47.81	54.00	6.19
High Channel: 5825 MHz							
5850.000	41.48	PK	V	39.49	74.95	122.20	47.25
5855.000	35.07	PK	V	39.51	68.56	110.80	42.24
5875.000	30.69	PK	V	39.60	64.27	105.20	40.93
5925.000	29.72	PK	V	39.68	63.38	68.20	4.82
11650.000	45.15	PK	V	21.07	60.20	74.00	13.80
11650.000	32.12	AV	V	21.07	47.17	54.00	6.83

802.11n ht20:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5745MHz							
5725.000	45.98	PK	V	39.48	79.44	122.20	42.76
5720.000	35.33	PK	V	39.49	68.80	110.80	42.00
5700.000	30.29	PK	V	39.51	63.78	105.20	41.42
5650.000	29.08	PK	V	39.49	62.55	68.20	5.65
11490.000	46.69	PK	V	20.67	61.34	74.00	12.66
11490.000	33.08	AV	V	20.67	47.73	54.00	6.27
Middle Channel: 5785 MHz							
11570.000	46.53	PK	V	20.83	61.34	74.00	12.66
11570.000	32.98	AV	V	20.83	47.79	54.00	6.21
High Channel: 5825 MHz							
5850.000	43.09	PK	V	39.49	76.56	122.20	45.64
5855.000	36.36	PK	V	39.51	69.85	110.80	40.95
5875.000	31.26	PK	V	39.60	64.84	105.20	40.36
5925.000	29.95	PK	V	39.68	63.61	68.20	4.59
11650.000	45.76	PK	V	21.07	60.81	74.00	13.19
11650.000	32.27	AV	V	21.07	47.32	54.00	6.68

802.11n ht40:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5755 MHz							
5725.000	47.01	PK	V	39.48	80.47	122.20	41.73
5720.000	45.32	PK	V	39.49	78.79	110.80	32.01
5700.000	32.81	PK	V	39.51	66.30	105.20	38.90
5650.000	29.25	PK	V	39.49	62.72	68.20	5.48
11510.000	46.25	PK	V	20.67	60.90	74.00	13.10
11510.000	33.17	AV	V	20.67	47.82	54.00	6.18
High Channel: 5795 MHz							
5850.000	37.79	PK	V	39.49	71.26	122.20	50.94
5855.000	35.28	PK	V	39.51	68.77	110.80	42.03
5875.000	31.64	PK	V	39.60	65.22	105.20	39.98
5925.000	30.15	PK	V	39.68	63.81	68.20	4.39
11590.000	45.90	PK	V	20.88	60.76	74.00	13.24
11590.000	32.97	AV	V	20.88	47.83	54.00	6.17

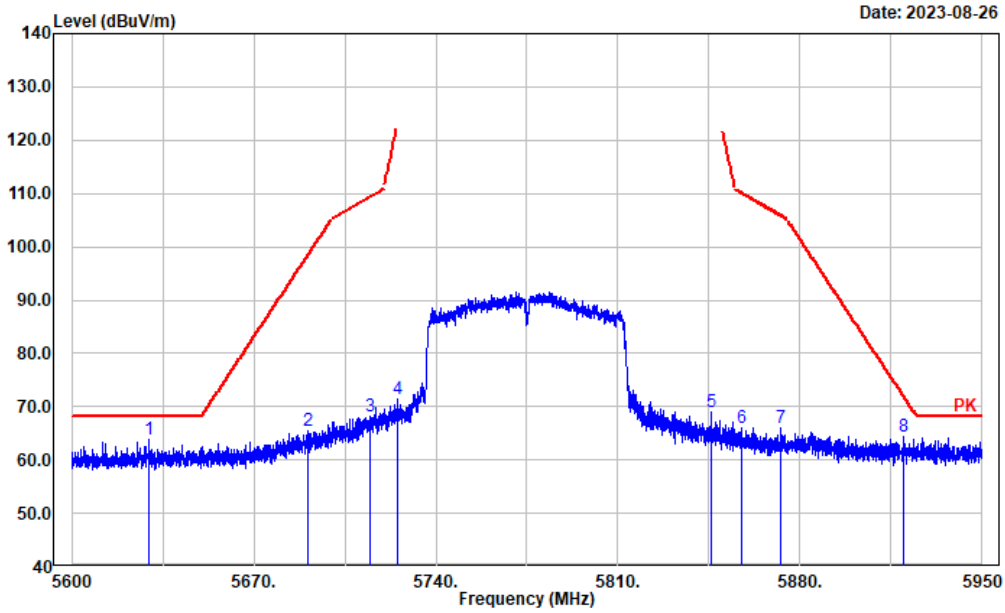
802.11ac vht80:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
5725.000	45.34	PK	V	39.48	78.80	122.20	43.40
5720.000	43.18	PK	V	39.49	76.65	110.80	34.15
5700.000	41.33	PK	V	39.51	74.82	105.20	30.38
5650.000	29.80	PK	V	39.49	63.27	68.20	4.93
5850.000	45.91	PK	V	39.49	79.38	122.20	42.82
5855.000	43.78	PK	V	39.51	77.27	110.80	33.53
5875.000	38.05	PK	V	39.60	71.63	105.20	33.57
5925.000	31.35	PK	V	39.68	65.01	68.20	3.19
11550.000	46.46	PK	V	20.78	61.22	74.00	12.78
11550.000	33.77	AV	V	20.78	48.53	54.00	5.47

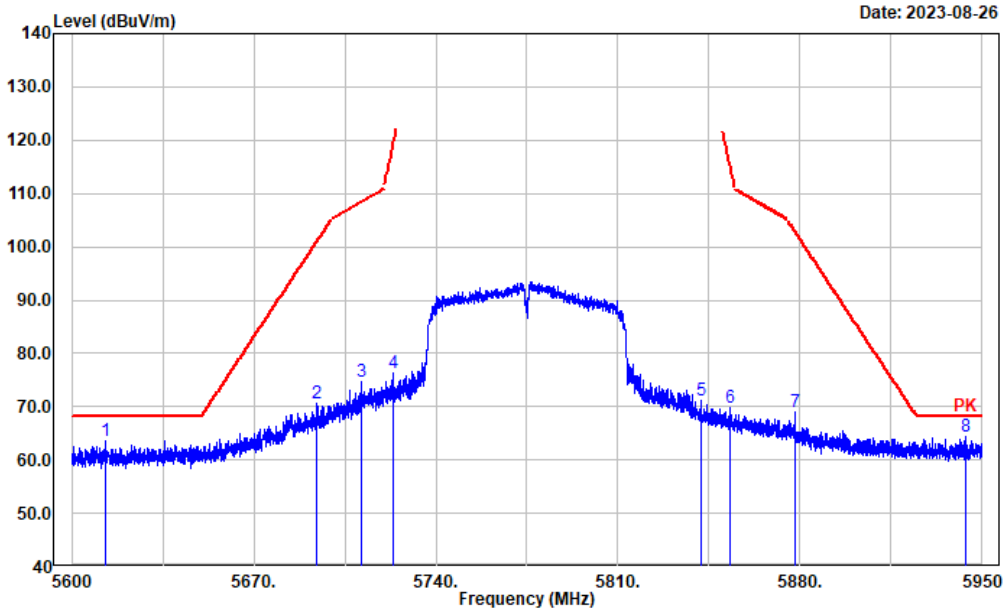
Note:
Result = Reading + Factor- Distance extrapolation Factor
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1.5m]) dB= 6.02 dB

Worst Test plots for Band Edge Measurements (Radiated) (802.11ac VHT80 5775MHz)

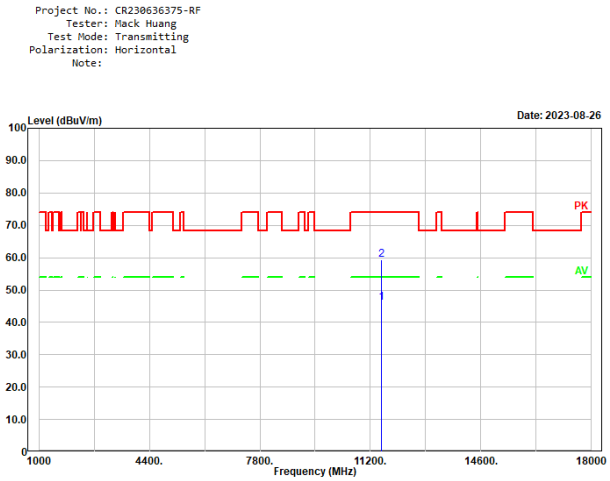
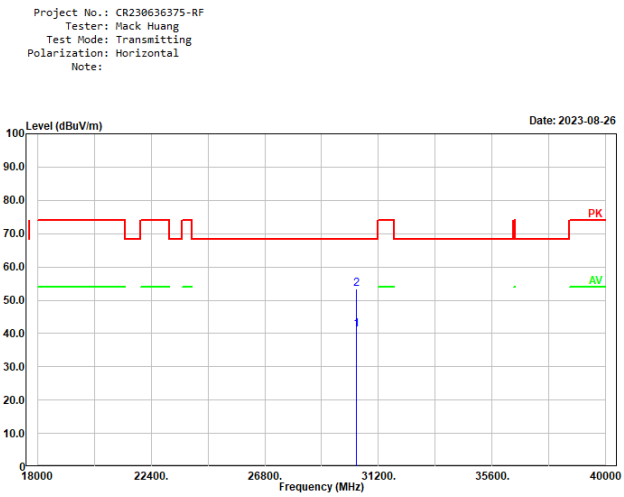
```
Project No.: CR230636375-RF
     Tester: Mack Huang
  Test Mode: Transmitting
Polarization: Horizontal
       Note:
```

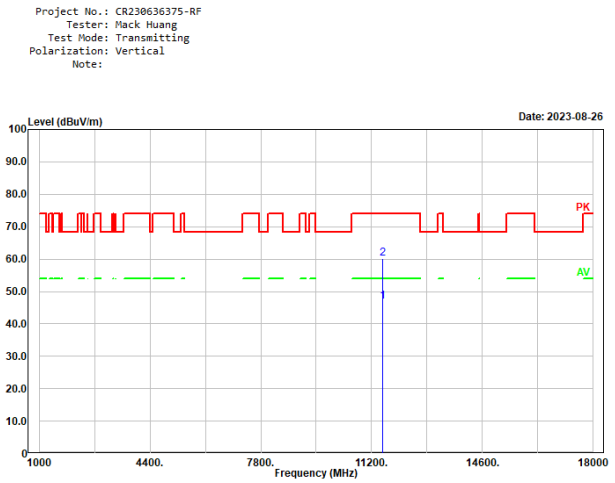
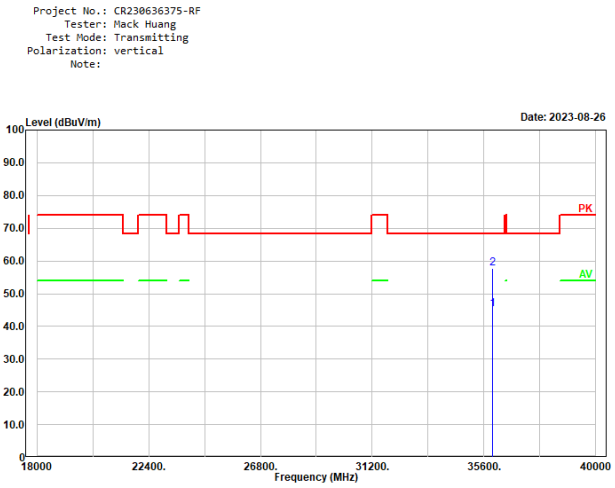


```
Project No.: CR230636375-RF
     Tester: Mack Huang
  Test Mode: Transmitting
Polarization: Vertical
       Note:
```



Worst Test plots for Harmonic Margin (802.11 ac vht80 5775MHz was the worst)

Horizontal	
1-18GHz	
18-40GHz	

Vertical	
1-18GHz	
18-40GHz	

4.3 Emission Bandwidth:

Serial Number:	26OB-1	Test Date:	2023/7/11~2023/7/12
Test Site:	RF	Test Mode:	Transmitting
Tester:	Claire Liu	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	26~26.5	Relative Humidity: (%)	58`59	ATM Pressure: (kPa)	101~103

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101943	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	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).*

Test Data:

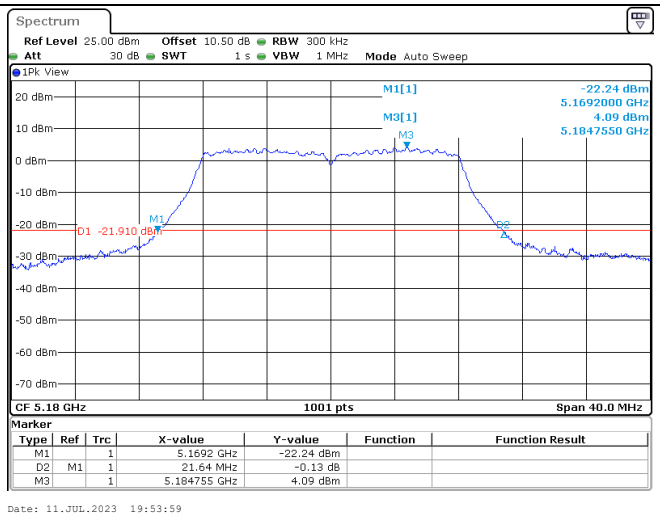
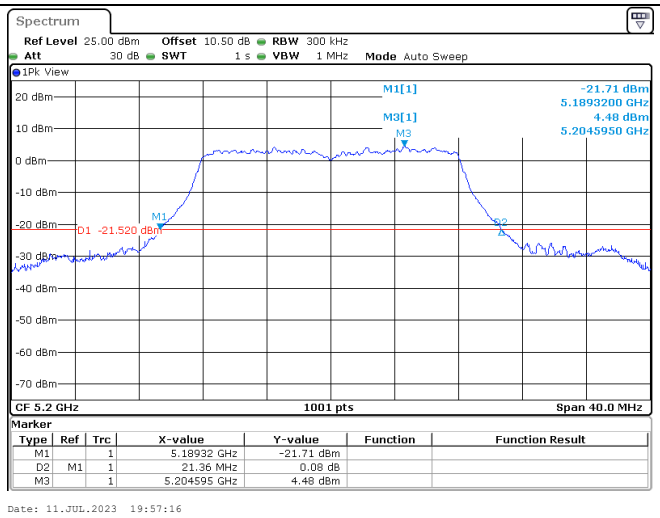
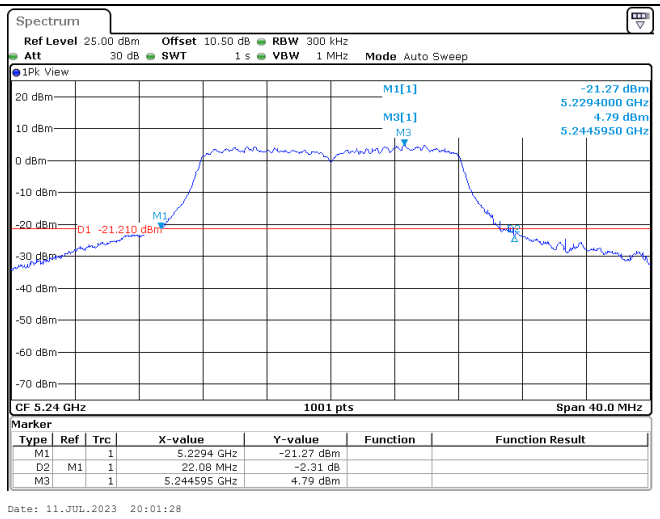
5150-5250 MHz:

Test Modes	Test Frequency (MHz)	26 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180	21.64	16.983
	5200	21.36	16.863
	5240	22.08	16.863
802.11n ht20	5180	22.2	17.942
	5200	22.16	17.822
	5240	21.88	17.782
802.11n ht40	5190	43.04	36.444
	5230	45.36	36.444
802.11ac vht80	5210	87.2	75.445
Note: The 99% Occupied Bandwidth have not fall into the band 5250-5350MHz, please refer to the test plots of 99% Occupied Bandwidth			

5725-5850 MHz:

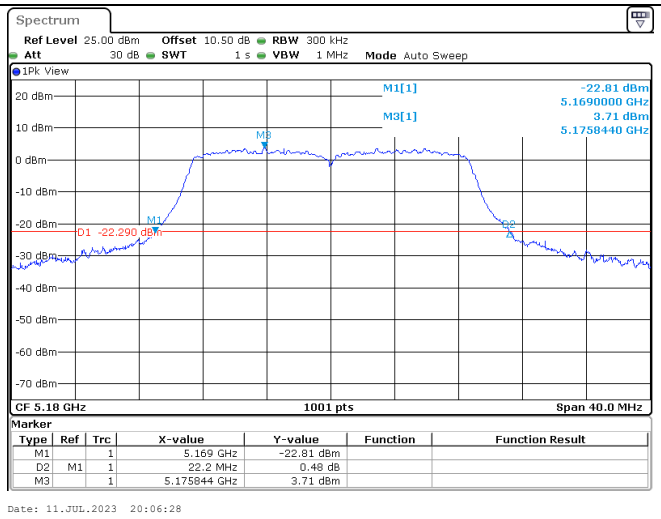
Test Modes	Test Frequency (MHz)	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5745	16.4	16.983
	5785	16.4	16.943
	5825	16.4	16.943
802.11n ht20	5745	17.12	18.102
	5785	17.08	17.902
	5825	17.36	18.062
802.11n ht40	5755	35.36	36.523
	5795	35.52	36.523
802.11ac vht80	5775	75.11	75.764
Note1:6dB Emission Bandwidth Limit: ⩾0.5 MHz Note2:The 99% Occupied Bandwidth have not fall into the band 5470-5725MHz, please refer to the test plots of 99% Occupied Bandwidth.			

5150-5250MHz:

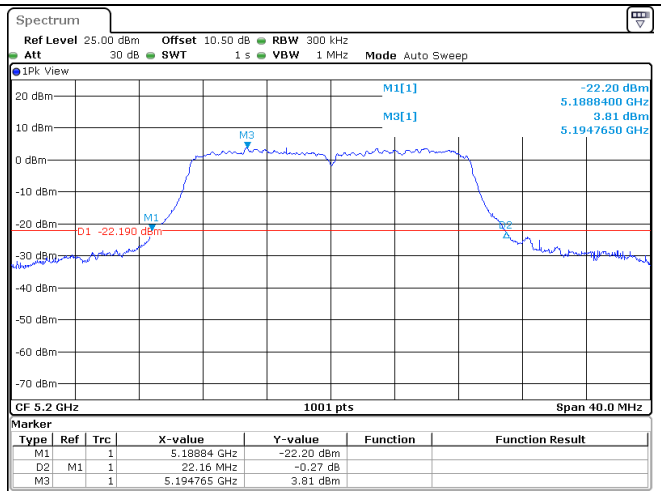
26dB Emission Bandwidth	
802.11a Lowest Channel	
802.11a Middle Channel	
802.11a Highest Channel	

26dB Emission Bandwidth

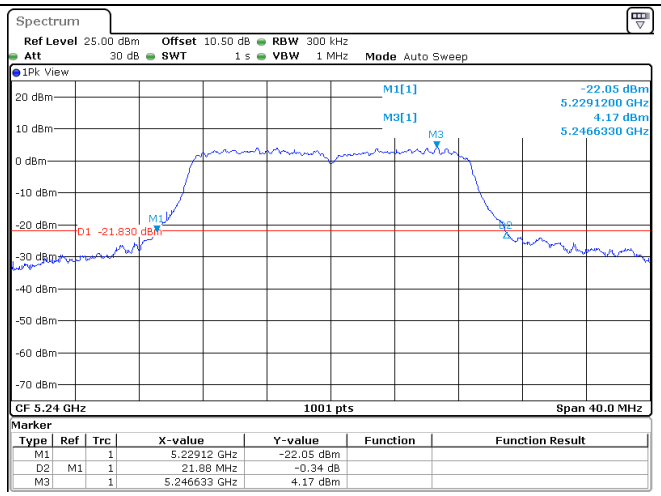
802.11n ht20
Lowest Channel



802.11n ht20
Middle Channel

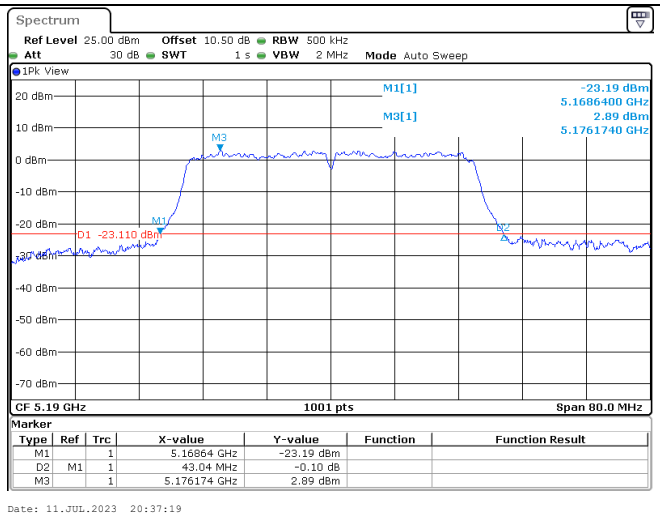


802.11n ht20
Highest Channel

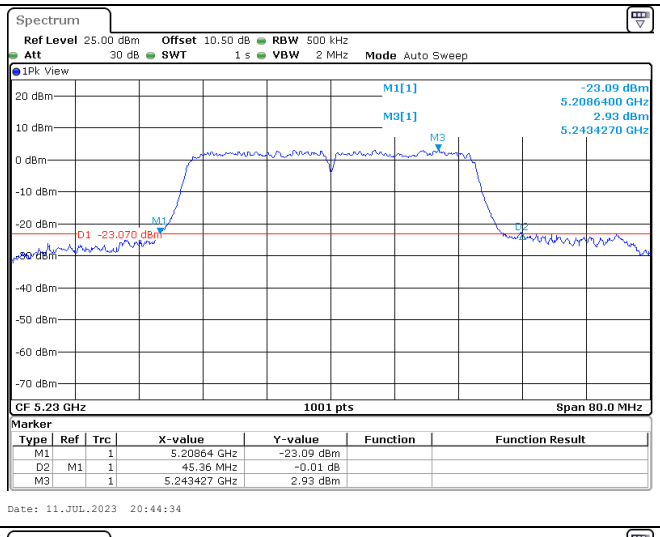


26dB Emission Bandwidth

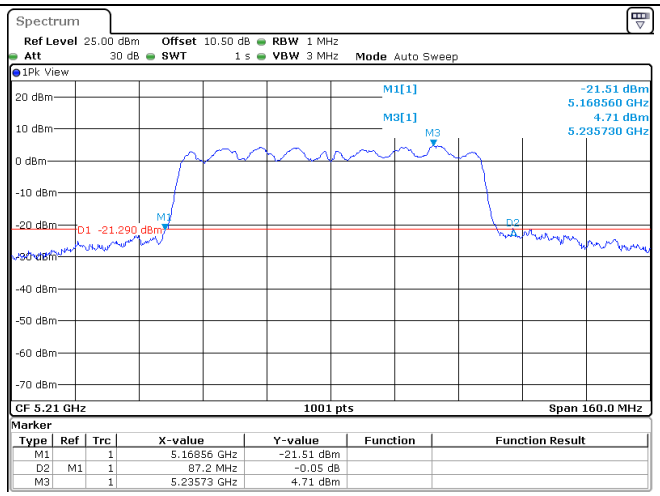
802.11n ht40
Lowest Channel



802.11n ht40
Highest Channel

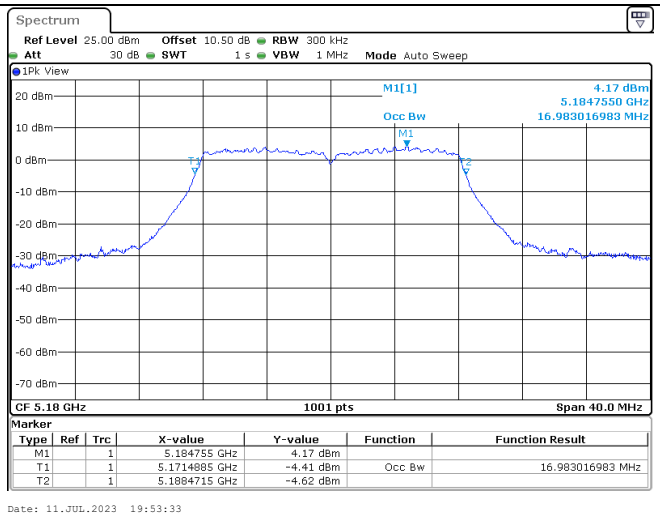


802.11ac vht80
Middle Channel

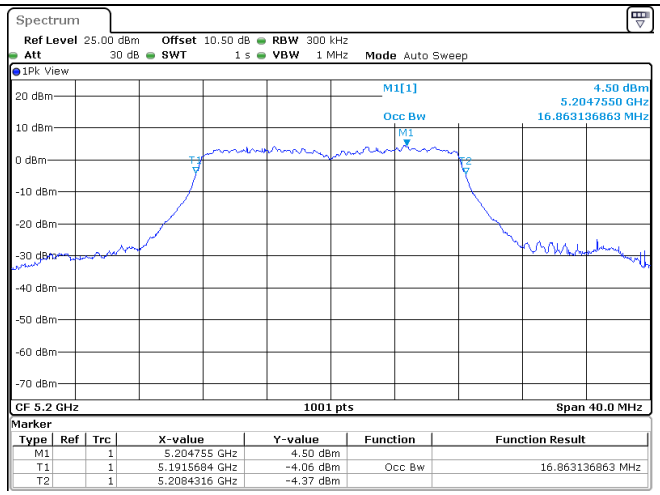


99% Emission Bandwidth

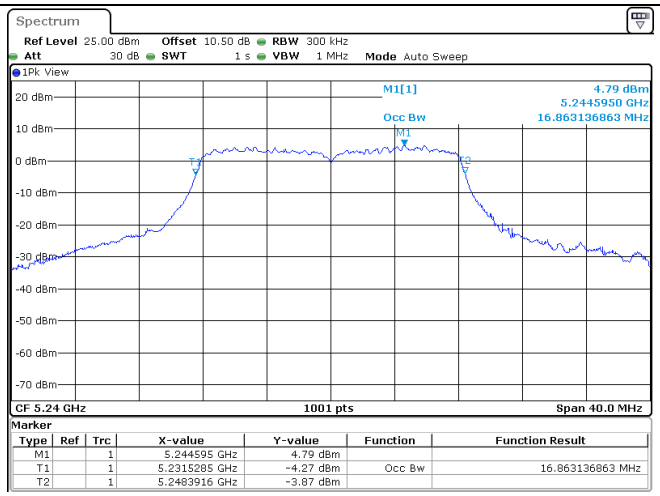
802.11a
Lowest Channel



802.11a
Middle Channel

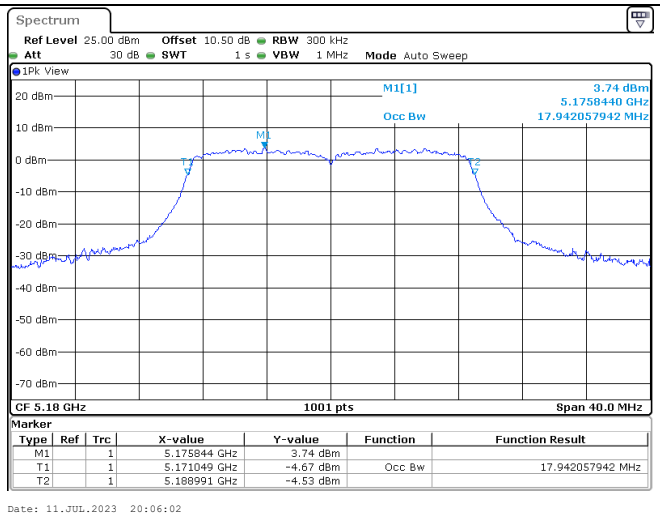


802.11a
Highest Channel

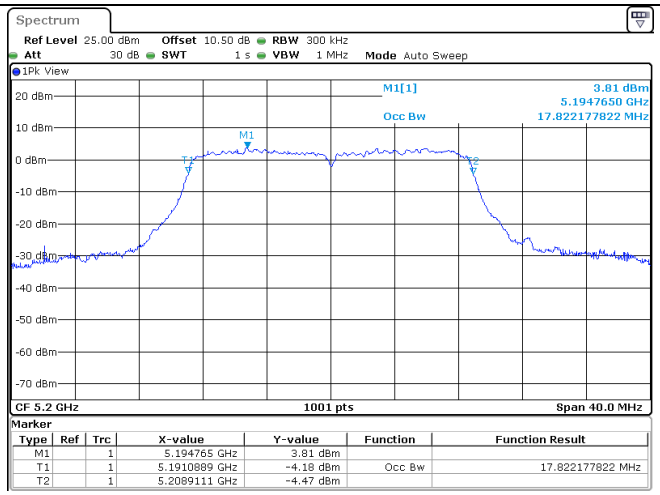


99% Emission Bandwidth

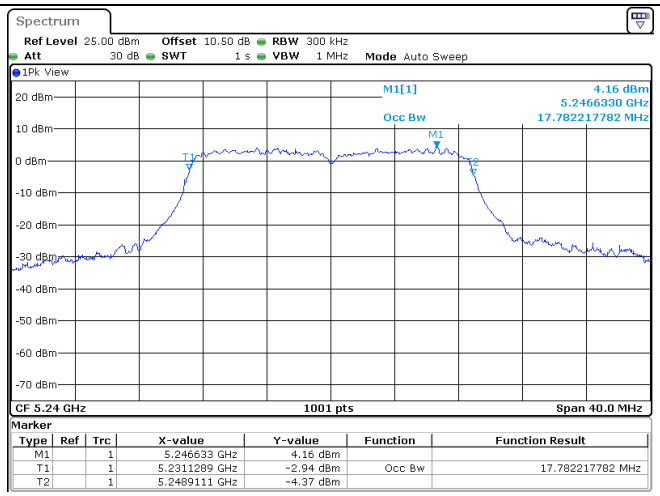
802.11n ht20
Lowest Channel



802.11n ht20
Middle Channel

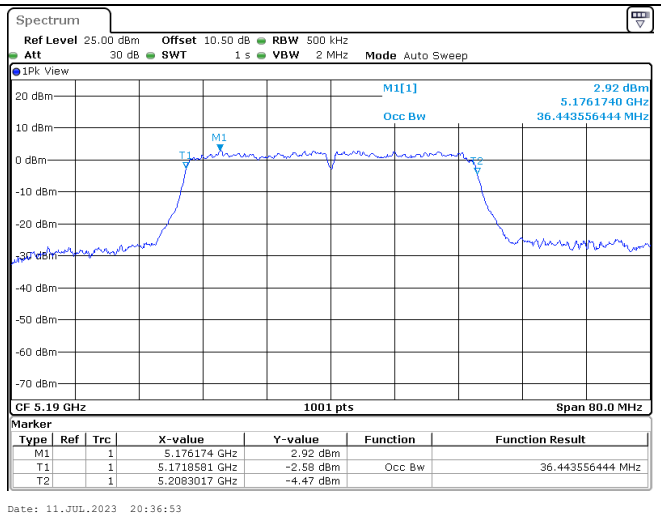


802.11n ht20
Highest Channel

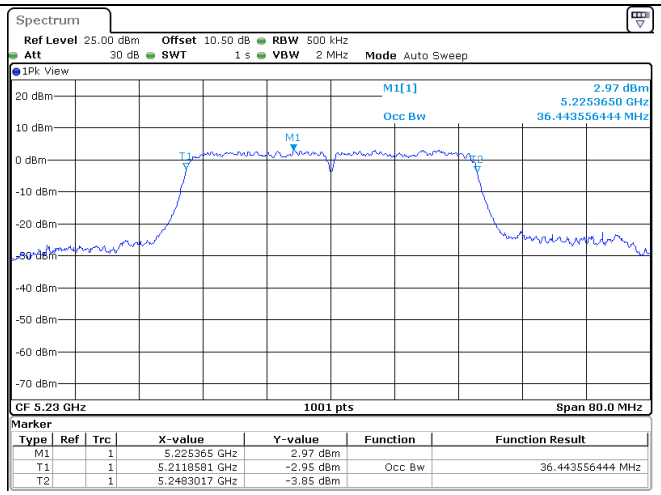


99% Emission Bandwidth

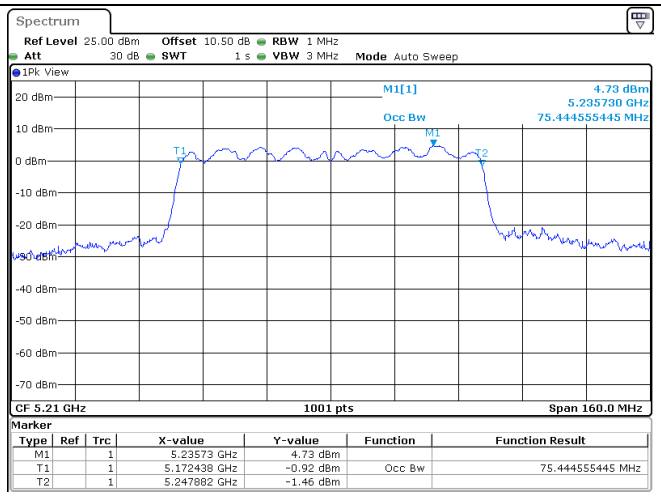
802.11n ht40
Lowest Channel



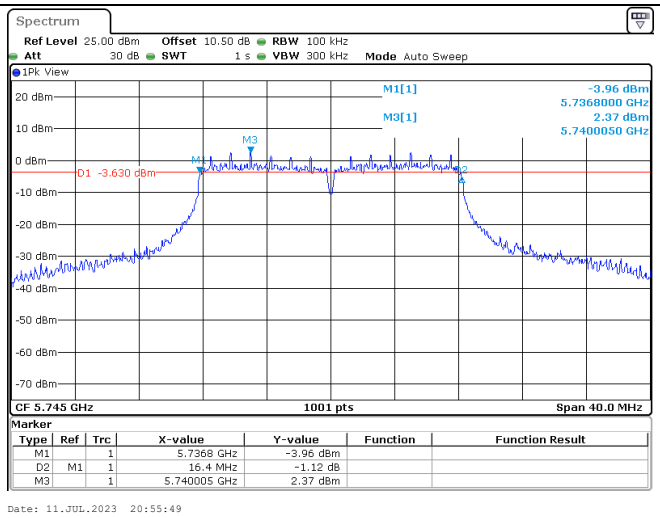
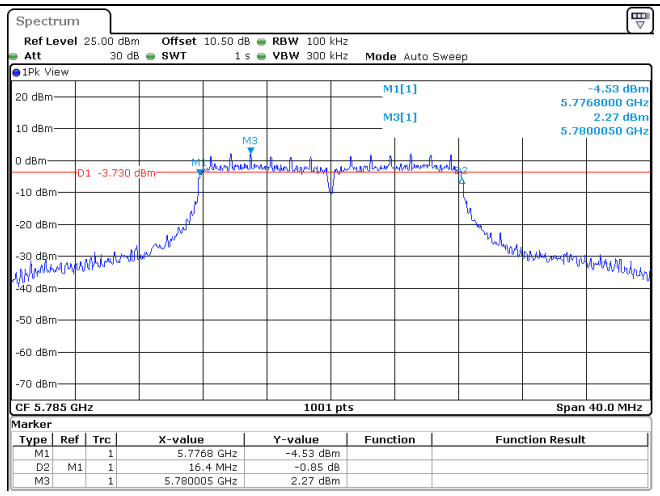
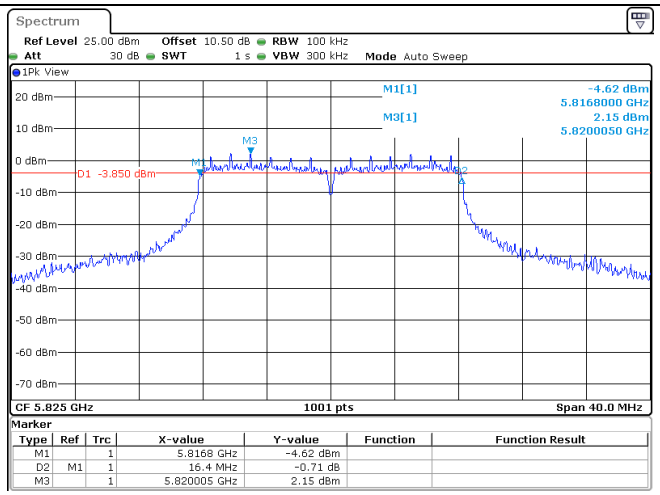
802.11n ht40
Highest Channel



802.11ac vht80
Middle Channel

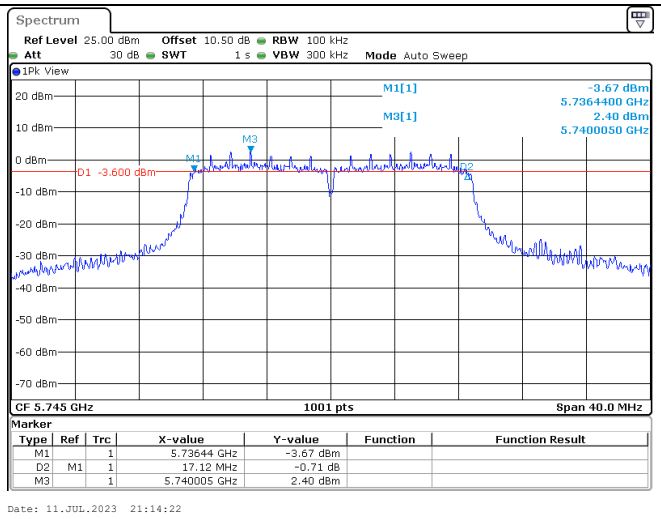


5725-5850MHz:

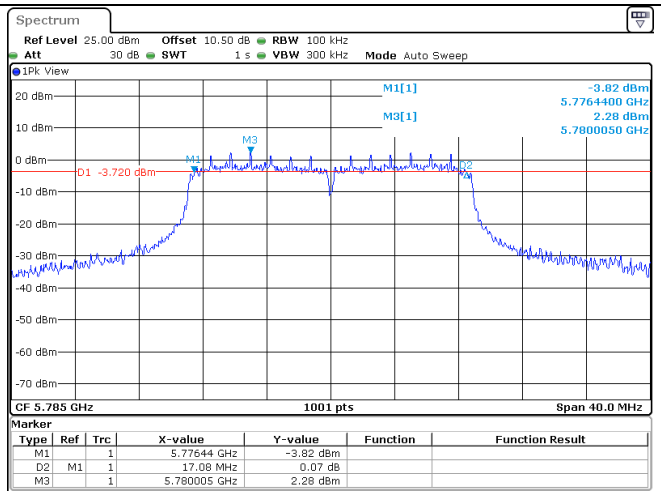
6dB Emission Bandwidth	
802.11a Lowest Channel	
802.11a Middle Channel	
802.11a Highest Channel	

6dB Emission Bandwidth

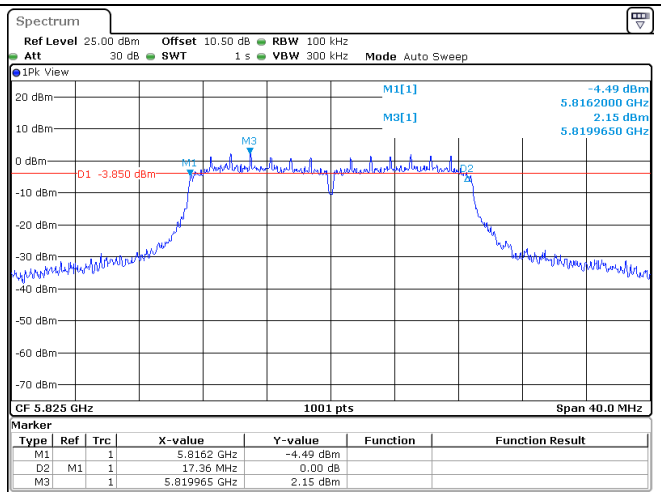
802.11n ht20
Lowest Channel



802.11n ht20
Middle Channel

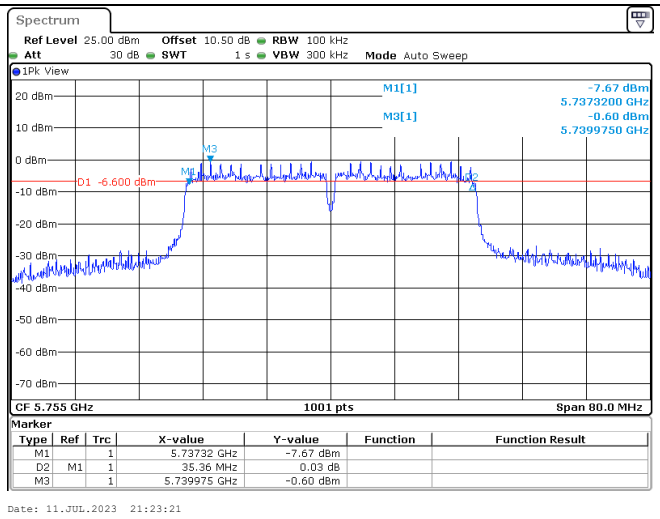


802.11n ht20
Highest Channel

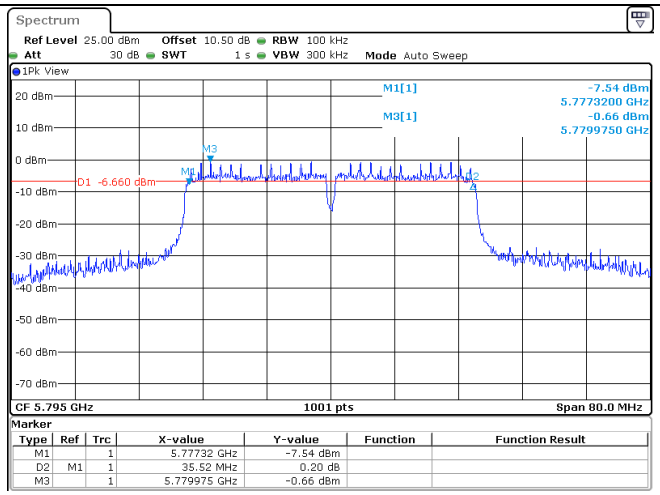


6dB Emission Bandwidth

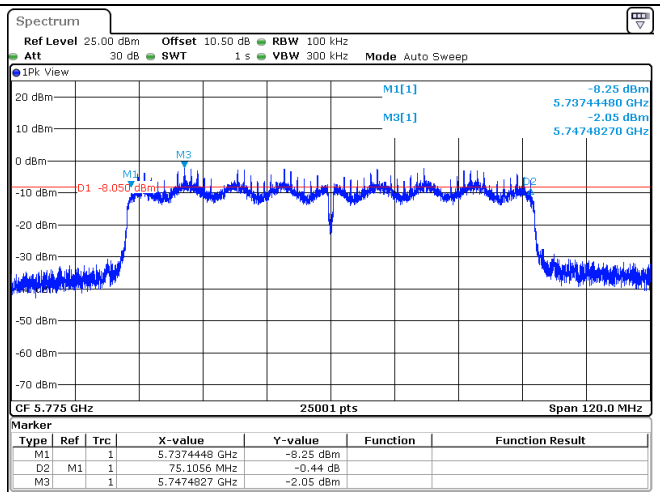
802.11n ht40
Lowest Channel



802.11n ht40
Highest Channel

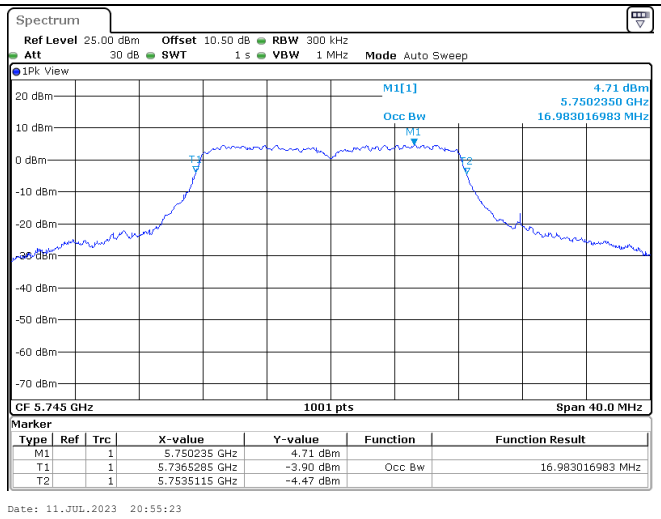


802.11ac vht80
Middle Channel

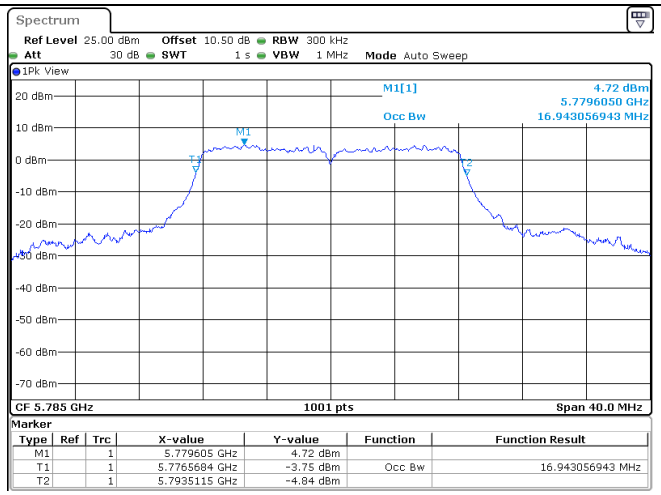


99% Emission Bandwidth

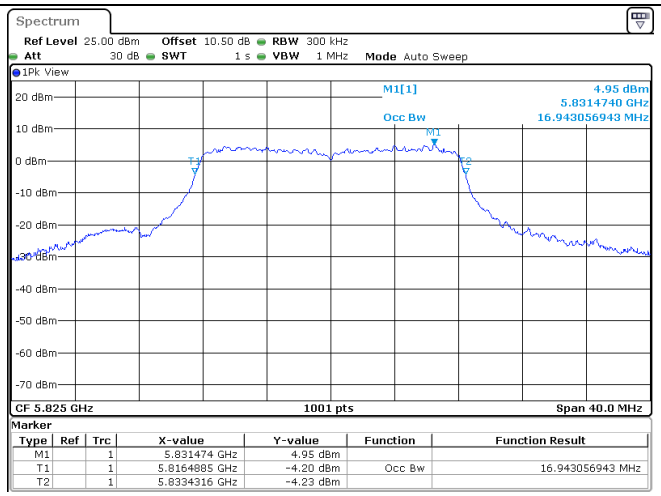
802.11a
Lowest Channel



802.11a
Middle Channel

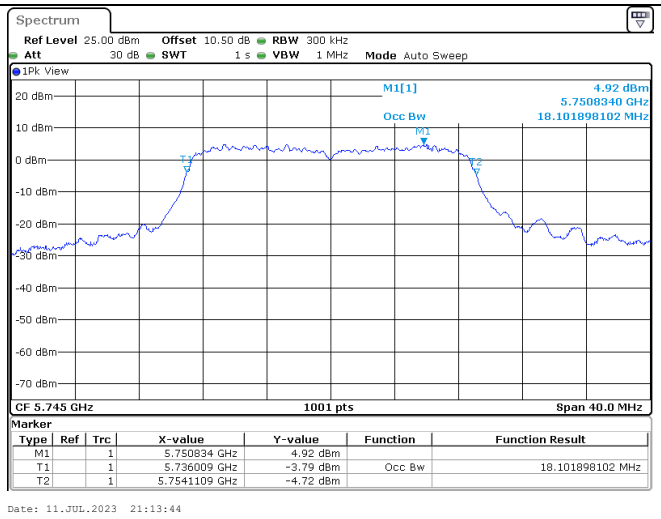


802.11a
Highest Channel

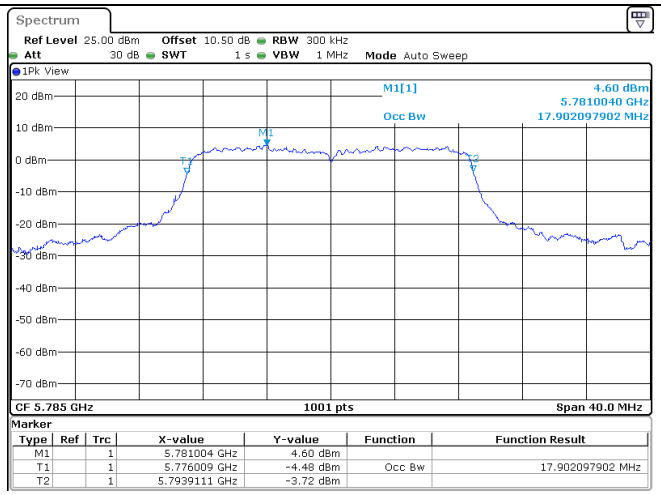


99% Emission Bandwidth

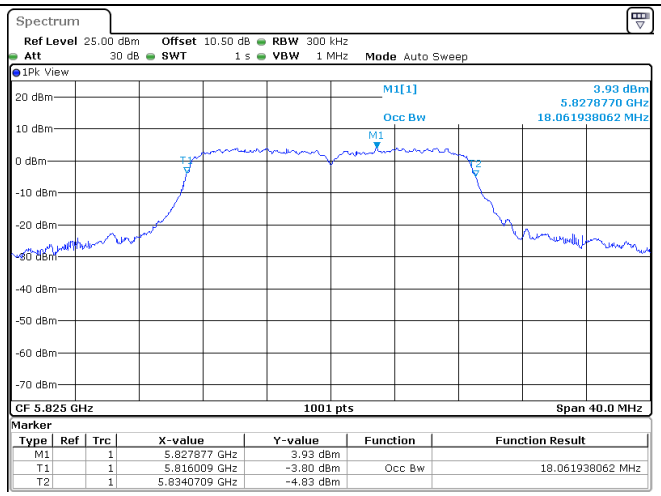
802.11n ht20
Lowest Channel



802.11n ht20
Middle Channel

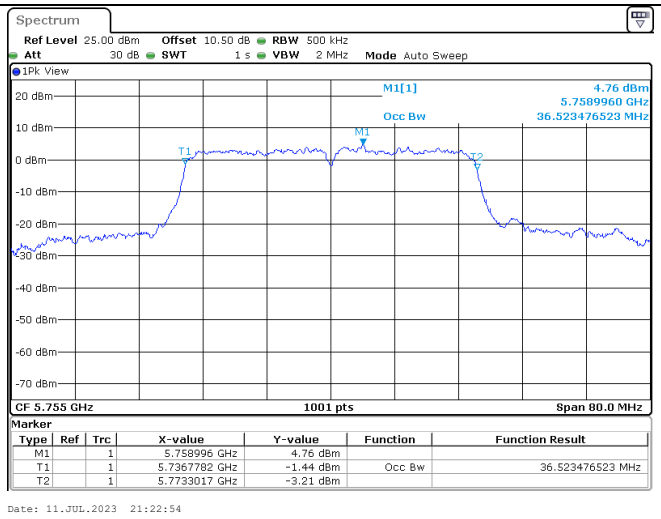


802.11n ht20
Highest Channel

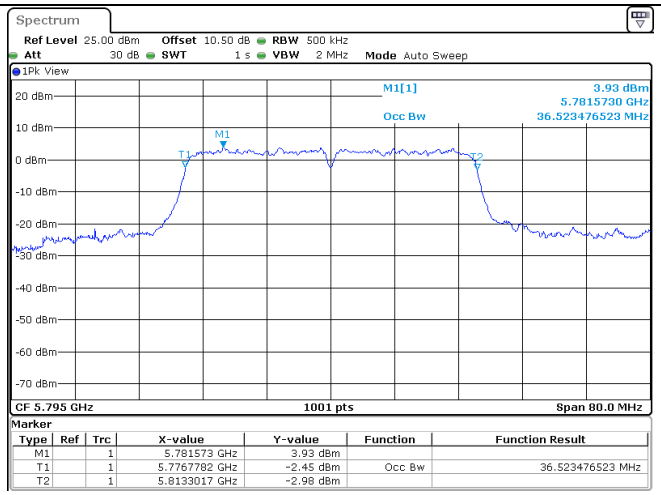


99% Emission Bandwidth

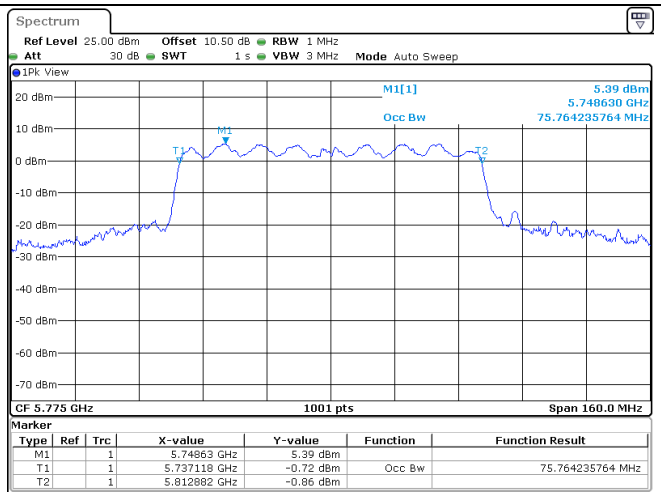
802.11n ht40
Lowest Channel



802.11n ht40
Highest Channel



802.11ac vht80
Middle Channel



4.4 Maximum Conducted Output Power:

Serial Number:	26OB-1	Test Date:	2023/7/11
Test Site:	RF	Test Mode:	Transmitting
Tester:	Claire Liu	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	26	Relative Humidity: (%)	58	ATM Pressure: (kPa)	101

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Anritsu	Pulse Power Sensor	MA2411A	10780	2022/8/5	2023/8/4
Anritsu	Power Meter	ML2495A	1106009	2022/8/5	2023/8/4
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	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).*

Test Data:

5150-5250 MHz:

Test Modes	Test Frequency (MHz)	Max. Conducted Average Output Power(dBm)	
		Result	Limit
802.11a	5180	12.57	24
	5200	12.68	24
	5240	12.94	24
802.11n ht20	5180	12.28	24
	5200	12.46	24
	5240	12.74	24
802.11n ht40	5190	12.28	24
	5230	12.88	24
802.11ac vht80	5210	12.85	24

5725-5850 MHz:

Test Modes	Test Frequency (MHz)	Max. Conducted Average Output Power(dBm)	
		Result	Limit
802.11a	5745	13.47	30
	5785	13.42	30
	5825	13.11	30
802.11n ht20	5745	13.43	30
	5785	13.32	30
	5825	13.03	30
802.11n ht40	5755	13.14	30
	5795	13.54	30
802.11ac vht80	5775	14.01	30

4.5 Maximum power spectral density:

Serial Number:	26OB-1	Test Date:	2023/7/11
Test Site:	RF	Test Mode:	Transmitting
Tester:	Claire Liu	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	26	Relative Humidity: (%)	58	ATM Pressure: (kPa)	101

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101943	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	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).*

Test Data:

5150-5250 MHz:

Test Modes	Test Frequency (MHz)	Reading dBm/MHz)	Duty Cycle Factor (dB)	Maximum Power Spectral Density (dBm/MHz)	
				Result	Limit
802.11a	5180	1.11	0.23	1.34	11
	5200	1.06	0.23	1.29	11
	5240	1.84	0.23	2.07	11
802.11n ht20	5180	1.27	0.26	1.53	11
	5200	1.20	0.26	1.46	11
	5240	1.79	0.26	2.05	11
802.11n ht40	5190	-2.02	0.59	-1.43	11
	5230	-1.79	0.59	-1.20	11
802.11ac vht80	5210	-4.12	1.39	-2.73	11

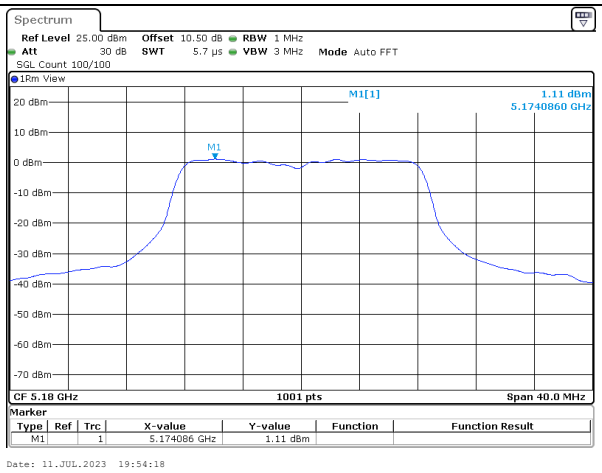
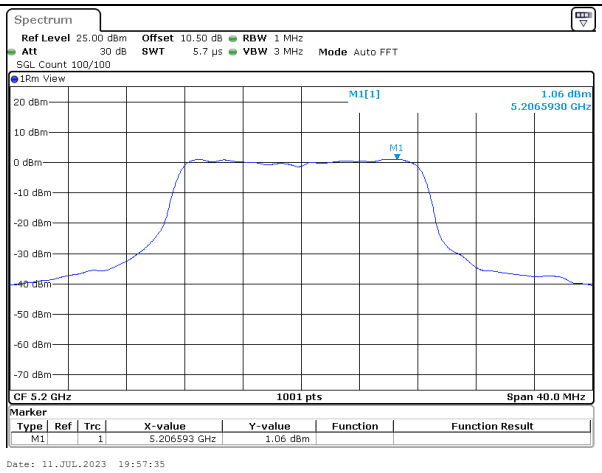
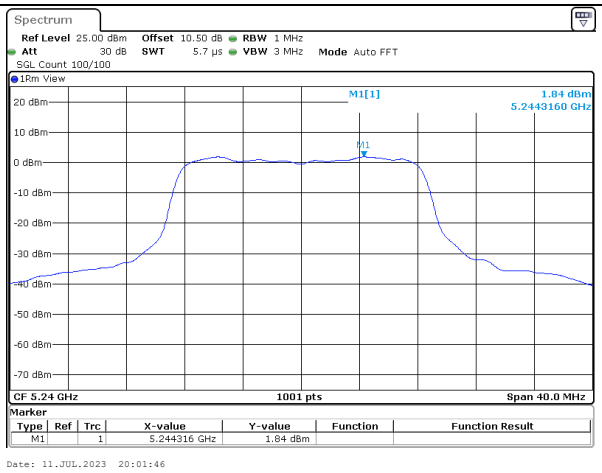
Note:
The device is a client device.
Duty cycle ⩾98%, method ANSI C63.10-2013 Section 12.3.2.2was used.
Duty cycle <98%, and duty cycle variations are less than ±2%,method ANSI C63.10-2013 Section 12.3.2.4 was used.
Duty cycle <98%, and duty cycle variations exceed ±2%, method ANSI C63.10-2013 Section 12.3.2.6.
For Duty cycle<98%, and Duty cycle be considered to be constant(variations areless than ±2%), the duty cycle factor was added into the result.

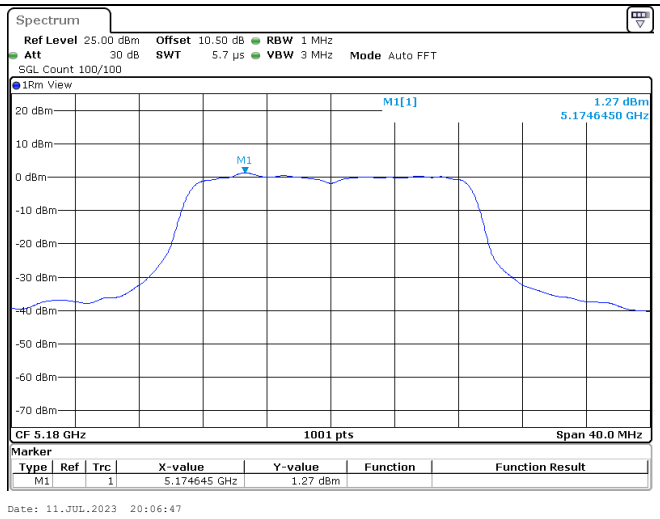
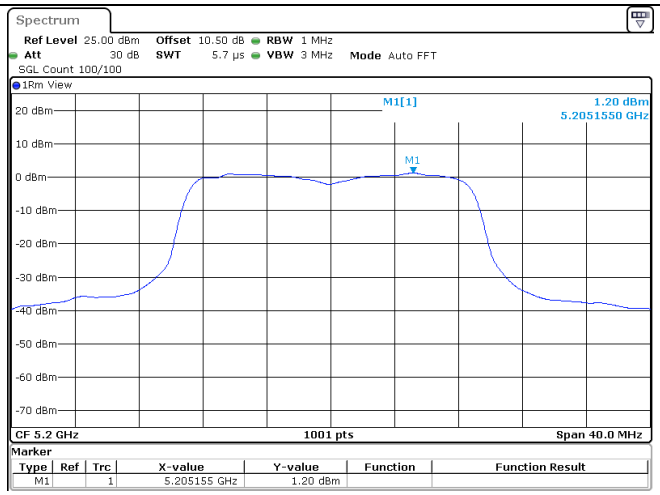
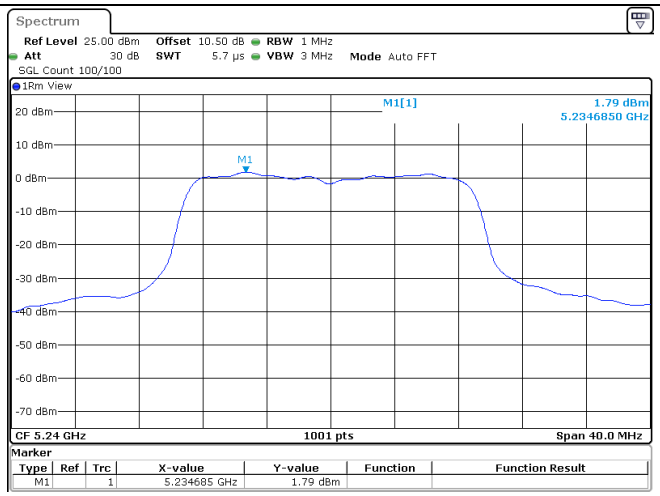
5725-5850 MHz:

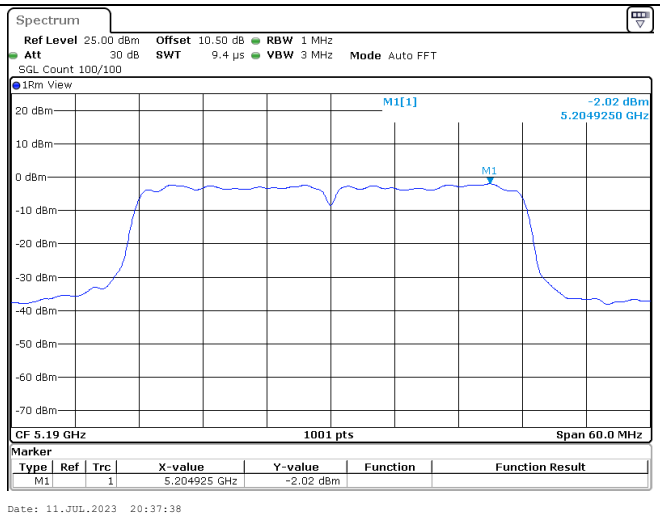
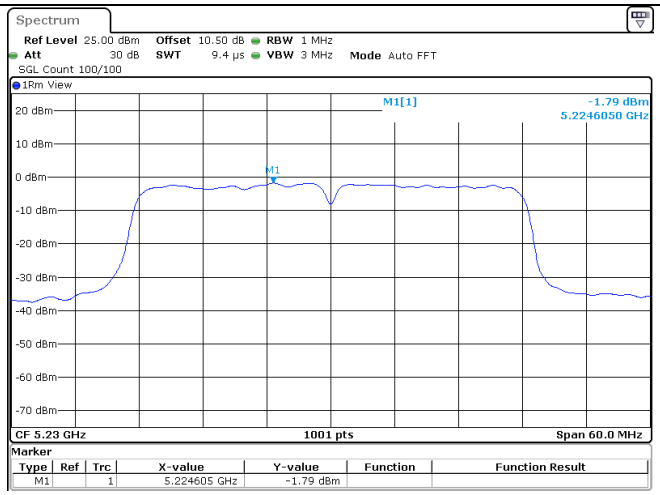
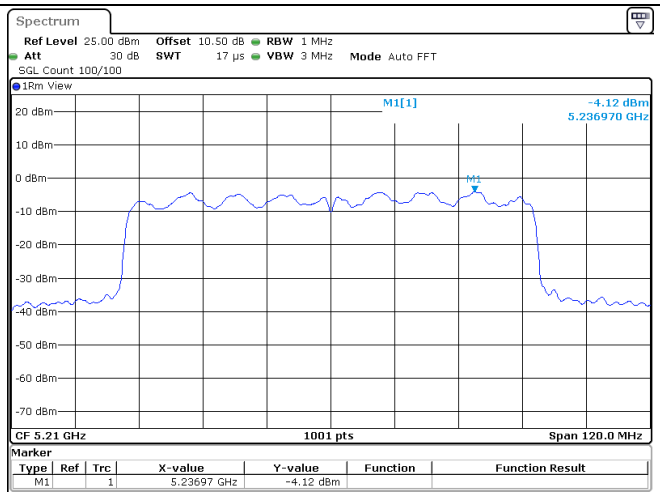
Test Modes	Test Frequency(MHz)	Reading(dBm/500kHz)	Duty Cycle Factor(dB)	Maximum Power Spectral Density(dBm/500kHz)	
				Result	Limit
802.11a	5745	-0.49	0.23	-0.26	30
	5785	-0.40	0.23	-0.17	30
	5825	-0.94	0.23	-0.71	30
802.11n ht20	5745	-1.23	0.26	-0.97	30
	5785	-1.44	0.26	-1.18	30
	5825	-1.11	0.26	-0.85	30
802.11n ht40	5755	-4.17	0.59	-3.58	30
	5795	-4.18	0.59	-3.59	30
802.11ac vht80	5775	-6.20	1.39	-4.81	30

Note:
Duty cycle ⩾98%, method ANSI C63.10-2013 Section 12.3.2.2 was used.
Duty cycle <98%, and duty cycle variations are less than ±2%,method ANSI C63.10-2013 Section 12.3.2.4was used.
Duty cycle <98%, and duty cycle variations exceed ±2%, method ANSI C63.10-2013 Section 12.3.2.6.
For Duty cycle<98%, and Duty cycle be considered to be constant(variations areless than ±2%), the duty cycle factor was added into the result.

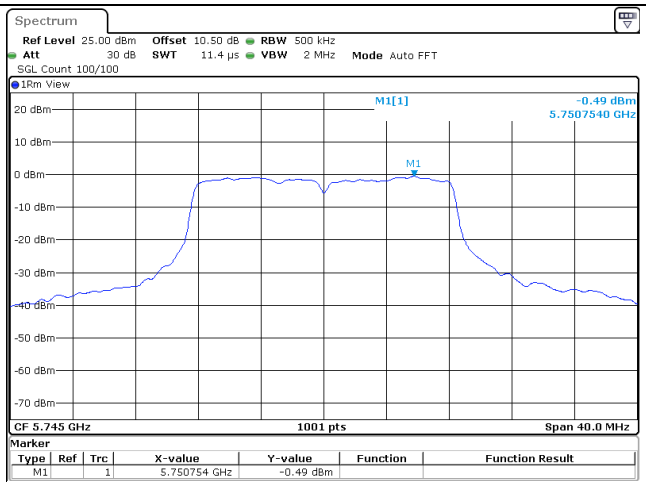
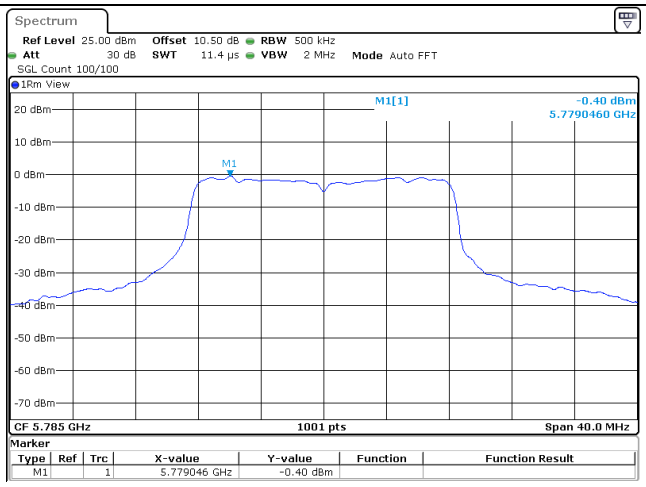
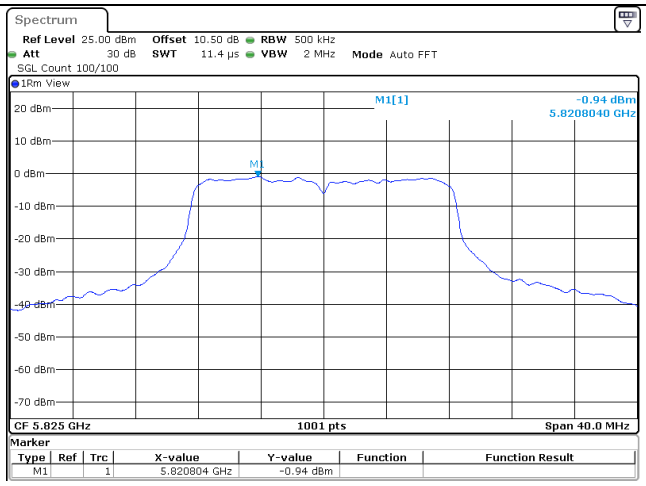
5150-5250MHz:

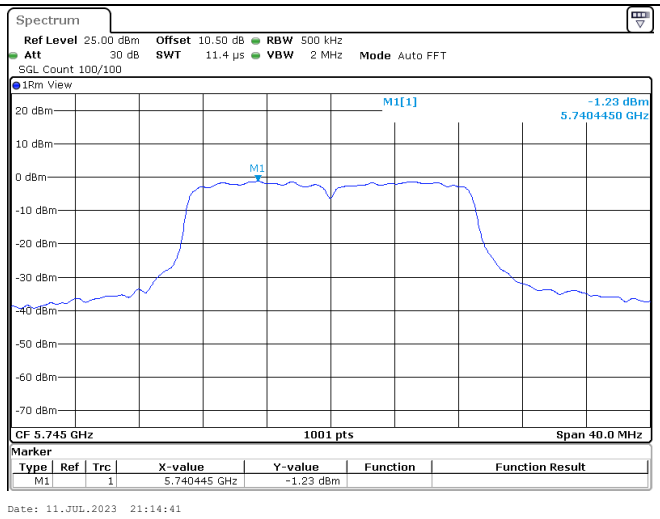
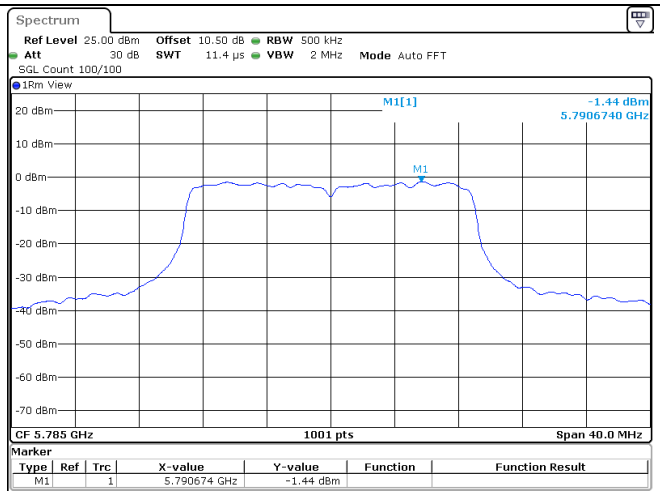
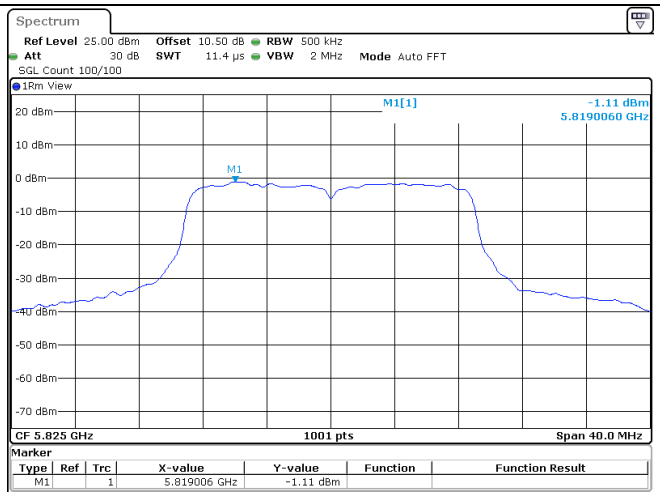
Maximum power spectral density	
802.11a Lowest Channel	
802.11a Middle Channel	
802.11a Highest Channel	

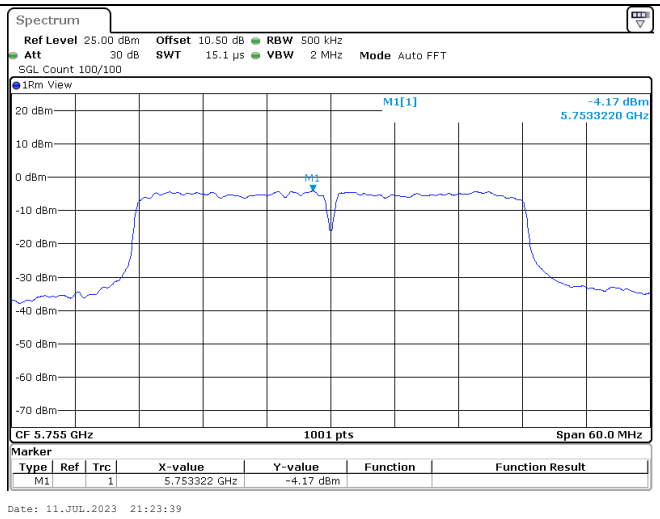
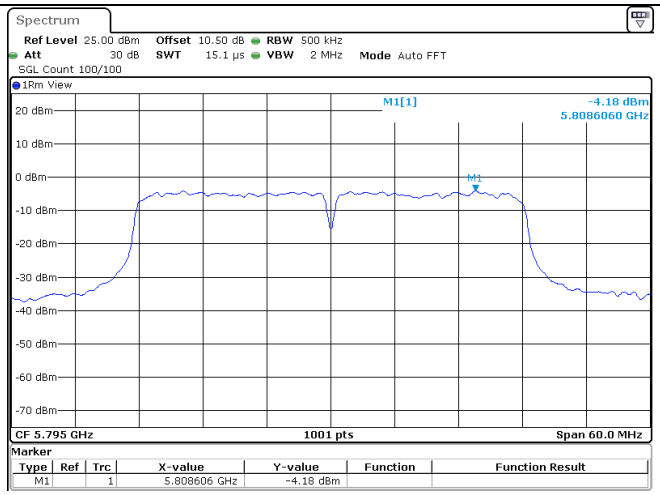
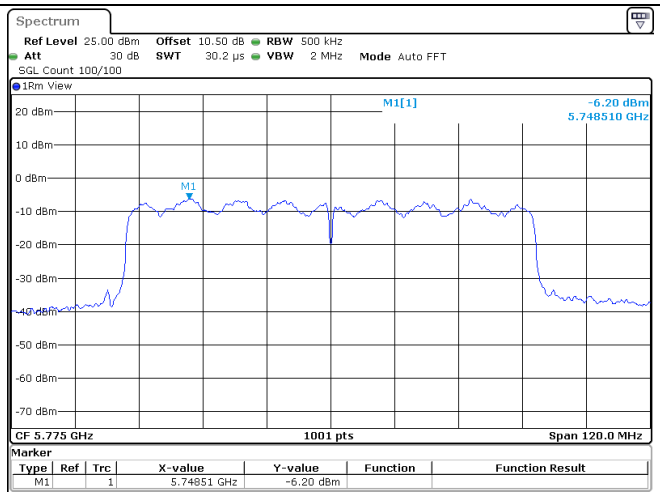
Maximum power spectral density	
802.11n ht20 Lowest Channel	
802.11n ht20 Middle Channel	
802.11n ht20 Highest Channel	

Maximum power spectral density	
802.11n ht40 Lowest Channel	
802.11n ht40 Highest Channel	
802.11ac vht80 Middle Channel	

5725-5850MHz

Maximum power spectral density	
802.11a Lowest Channel	
802.11a Middle Channel	
802.11a 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 Highest Channel	
802.11ac vht80 Middle Channel	

4.6 Duty Cycle:

Serial Number:	26OB-1	Test Date:	2023/7/11
Test Site:	RF	Test Mode:	Transmitting
Tester:	Claire Liu	Test Result:	N/A

Environmental Conditions:					
Temperature: (℃)	26	Relative Humidity: (%)	58	ATM Pressure: (kPa)	101

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101943	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	N/A

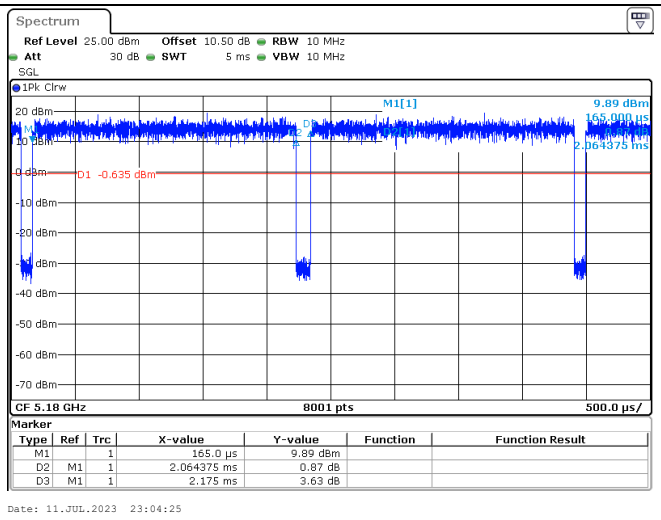
** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Test Modes	Ton (ms)	Ton+off (ms)	Duty cycle (%)	1/T (Hz)	Duty Cycle Factor (dB)	VBW Setting (kHz)
802.11a	2.064375	2.175	94.91	484	0.23	0.5
802.11n ht20	1.903125	2.019375	94.24	525	0.26	1
802.11n ht40	0.95175	1.089	87.40	1051	0.59	3
802.11ac vht80	0.45875	0.6325	72.53	2180	1.39	3

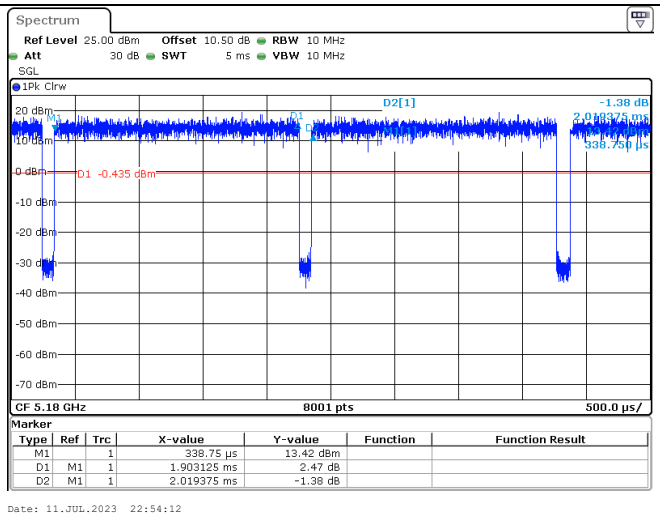
Duty Cycle

802.11a

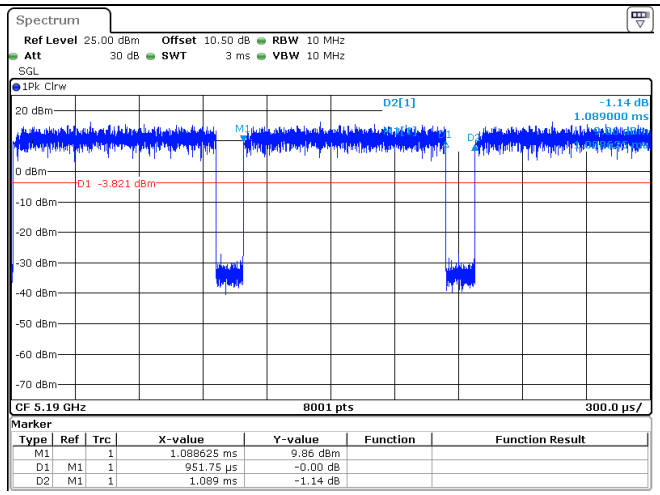


Duty Cycle

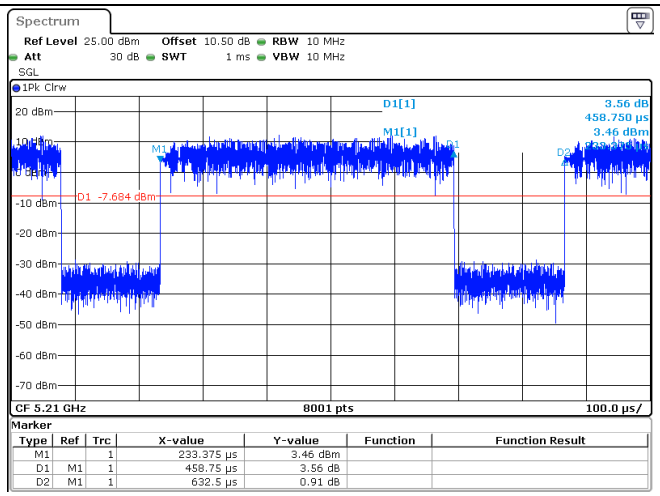
802.11n ht20



802.11n ht40



802.11ac vht80



5. RF EXPOSURE EVALUATION

5.1 Applicable Standard

FCC §15.247 (i) and subpart §1.1307

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 level in excess of the Commission's guidelines.

5. 2 Procedure

According to §1.1307(b)(3)(i)

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

5.3 Measurement Result

Radio	Frequency (MHz)	λ /2Π (mm)	Distance (mm)	Exemption ERP (mW)	Maximum Conducted Power including Tune-up Tolerance (dBm)	Antenna Gain (dBi)	ERP	
							dBm	mW
2.4G WLAN	2412-2462	19.80	200	768	24	1.41	23.26	211.84
5.2G WLAN	5180-5240	9.22	200	768	13	2.36	13.21	20.94
5.8G WLAN	5745-5825	8.31	200	768	15	2.48	15.33	34.12

Note: The Maximum Conducted Power including Tune-up Tolerance was declared by manufacturer.
The WLAN 2.4G and 5G cannot transmit simultaneously.

Result: The device compliant the MPE-Based Exemption at 20cm distances.

6. EUT PHOTOGRAPHS

Please refer to the attachment CR230636375-EXP EUT EXTERNAL PHOTOGRAPHS and CR230636375-INP EUT INTERNAL PHOTOGRAPHS

7. TEST SETUP PHOTOGRAPHS

Please refer to the attachment CR230636375-00B-TSP TEST SETUP PHOTOGRAPHS.

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