Prüfbericht-Nr.: *Test report no.:*	60369885 001	**Auftrags-Nr.:** *Order no.:*	238485609	Seite 1 von 31 *Page 1 of 31*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	23-Apr-2020	
Auftraggeber: *Client:*	Corsair Memory Inc. 47100 Bayside Parkway 94538 Fremont, CA United States			
Prüfgegenstand: *Test item:*	Ring Light			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	20LAC9901			
Auftrags-Inhalt: *Order content:*	FCC Part 15C Test report (WiFi 2.4GHz)			
Prüfgrundlage: *Test specification:*	FCC 47CFR Part 15: Subpart C Section 15.247			
Wareneingangsdatum: *Date of sample receipt:*	06-May-2020			
Prüfmuster-Nr.: *Test sample no:*	A002819929-002 A002819929-004			
Prüfzeitraum: *Testing period:*	08-May-2020 – 24-Jun-2020			
Ort der Prüfung: *Place of testing:*	EMC/RF Laboratory Taipei			
Prüflaboratorium: *Testing laboratory:*	Taipei Testing Laboratories			
Prüfergebnis*: *Test result*:*	Pass			
überprüft von: *reviewed by:*		**genehmigt von** *authorized by:*		
Datum: 03-Sep-2020 *Date:*		**Datum:** 03-Sep-2020 *Date:*		
Stellung / *Position:*	Mars Y.J. Lin Project Engineer	**Stellung** / *Position:*	Brenda S.H. Chen Project Manager	
Sonstiges / *Other:*				
Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery:*	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*			

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.
This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.

V05

TEST SUMMARY

Report Section	FCC Clause	Test Item	Result
5.1.1	15.247(b) & 15.203	Antenna Requirement	Pass
5.1.2	15.247(b)	Peak Output Power	Pass
5.1.3	15.247(a)(2)	6 dB Bandwidth	Pass
5.1.3	2.1049	99% Occupied Bandwidth	Pass
5.1.4	15.247(e)	Power Spectral Density	Pass
5.1.5	15.247(d)	Conducted Spurious Emissions and Band Edges	Pass
5.1.6	15.247(d) & 15.205 & 15.209	Radiated Spurious Emissions and Band Edges	Pass
5.2.1	15.207	Mains Conducted Emission	Pass
6.1	2.1091	RF Exposure Compliance	Pass

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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APPENDIX B - TEST RESULT OF RADIATED SPURIOUS EMISSIONS & MAINS CONDUCTED EMISSION

APPENDIX SP - PHOTO DOCUMENTATION_TEST SETUP PHOTO

APPENDIX EP - PHOTO DOCUMENTATION_EUT PHOTO

HISTORY OF THIS TEST REPORT

Report No.	Description	Date Issued
60369885 001	Original Release	03-Sep-2020

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:
Appendix A - Test Result of Conducted
Appendix B - Test Result of Radiated Spurious Emissions & Mains Conducted Emission
Appendix SP - Photo Documentation_Test Setup Photo
Appendix EP - Photo Documentation_EUT Photo

Applied Standard and Test Levels

Radio
FCC 47CFR Part 15: Subpart C Section 15.247
FCC 47CFR Part 2: Subpart J Section 2.1091
ANSI C63.10:2013
KDB447498 D01 General RF Exposure Guidance v06
KDB558074 D01 DTS Meas Guidance v05

1.2 Decision Rule of Conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.

2. Test Sites

2.1 Test Laboratory

Taipei Testing Laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

2.2 Test Facility

Taipei Testing Laboratories

No.458-18, Sec. 2, Fenliao Rd., Linkou Dist.,
New Taipei City 244
Taiwan (R.O.C.)
(Conducted Test & Radiated Spurious Emissions)
FCC Registration No.: 226631
ISED Registration No.: 25563

Testing Laboratory
3567

2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are:

Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 0.1 ppm
RF power, conducted	± 1.5 dB
Adjacent channel power	± 3 dB
Radiated emission of transmitter, valid up to 26 GHz	± 6 dB
Radiated emission of receiver, valid up to 26 GHz	± 6 dB
Temperature	± 2 ºC
Humidity	± 10 %

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a Ring Light. It contains a WLAN compatible module enabling the user to communicate data through a Wireless interface.
For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 System Details and Ratings

Basic Information of EUT

Item	EUT information
Kind of Equipment/Test Item	Ring Light
Type Identification	20LAC9901
FCC ID	2AAFM-20LAC9901

Technical Specification of EUT

Item	EUT information
Operating Frequency	2412 MHz ~ 2462 MHz
Channel Spacing	5 MHz
Channel number	802.11b/g/n HT20: 11
Data Rate	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to MCS7
Operation Voltage	110Vac
Modulation	DSSS (DBPSK, DQPSK, CCK) OFDM (BPSK, QPSK, 16QAM, 64QAM)
Maximum Output Power (mW)	802.11b: 263.63 802.11g: 421.7 802.11n HT20: 437.52
Antenna Information	Refer to 5.1.1
Accessory Device	Refer to 4.4

3.3 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.4 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The test modes were adapted accordingly in reference to the instructions for use.
During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output expected by the customer and is going to be fixed on the firmware of the final end product.

Table for Parameters of Test Software Setting

802.11b		802.11g		802.11n HT20	
Channel	Power Setting	Channel	Power Setting	Channel	Power Setting
1	126	1	105	1	106
6	112	6	105	6	109
11	112	11	96	11	92

4.2 Carrier Frequency and Channel

802.11b, 802.11g and 802.11n 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		

4.3 Test Operation and Test Software

Setup for testing: Test samples are provided with a USB interface which makes it possible to control them through a test software installed on a notebook computer.
This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed as below.

Test Software	Mptool.exe

The samples were used as follows:
A002819929-002 for conducted
A002819929-004 for radiated
Full test was applied on all test modes, but only worst case was shown.

Modulation Mode	Tx Function
802.11b	1TX (SISO)
802.11g	1TX (SISO)
802.11n HT20	1TX (SISO)

EUT Configure Mode	Applicable To				Description
	Antenna Port Conducted Measurement	Radiated Spurious Emissions above 1 GHz	Radiated Spurious Emissions below 1 GHz	Mains Conducted Emission	
-	√	√	√	√	-

Note:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when position on **Z-plane**.
2. "-" means no effect.

Antenna Port Conducted Measurement

☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Date Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	1.0
-	802.11g	1 to 11	1, 6, 11	6.0
-	802.11n HT20	1 to 11	1, 6, 11	MCS0

Radiated Spurious Emissions (Above 1 GHz)

☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Date Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	1.0
-	802.11g	1 to 11	1, 6, 11	6.0
-	802.11n HT20	1 to 11	1, 6, 11	MCS0

Radiated Spurious Emissions (Below 1 GHz)

☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Date Rate (Mbps)
-	802.11n HT20	1 to 11	1	1.0

Mains Conducted Emission

☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Date Rate (Mbps)
-	802.11n HT20	1 to 11	1	1.0

Test Condition

Test Item	Ambient Temperature	Relative Humidity	Tested by
Conducted Measurement	22-26 °C	50-65 %	Morrison Huang
Radiated Spurious Emissions above 1 GHz	22-26 °C	50-65 %	Simon Tsai
Radiated Spurious Emissions below 1 GHz	22-26 °C	50-65 %	Simon Tsai
Mains Conducted Emission	22-26 °C	50-65 %	Chun-Yi Wu

4.4 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

Accessory of EUT

N/A

Support Unit

Support Unit					
No.	Description	Brand	Model	S/N	Remark
1	UART	N/A	CP2102	N/A	For radiation
2	Notebook	Lenovo	81BL	MP1DCD6Y	
3	Adapter	ULL Power	ICP65-130-4000	N/A	
4	Adapter	Lenovo	ADLX65NCC3A	N/A	
1	Notebook	Lenovo	81BL	MP1DCD6Y	For conduction
2	UART	N/A	CP2102	N/A	
3	Adapter	ULL Power	ICP65-130-4000	N/A	

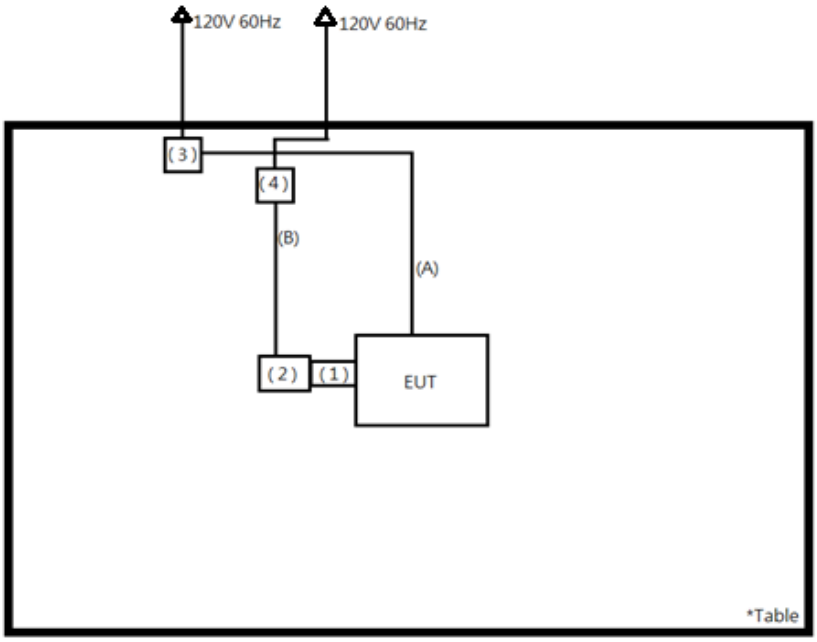
Interface Cable					
No.	Description	Shielded Type	Ferrite Core (Qty)	Length (m)	Remark
A	Adapter Cable	NO	0	2.5	For radiation and conduction
B	Adapter Cable	YES	1	1.5	For radiation

4.5 Countermeasures to Achieve EMC Compliance

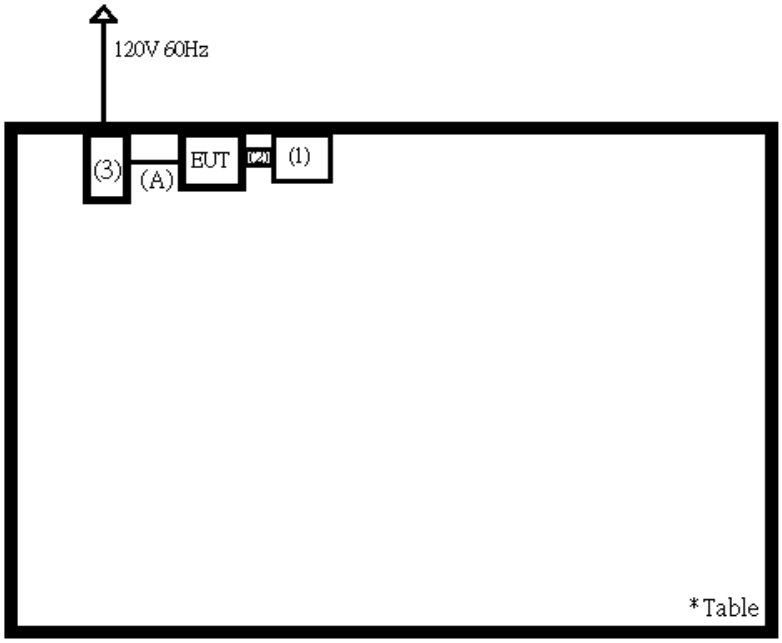
The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.6 Test Setup Diagram

<Radiated Spurious Emissions>



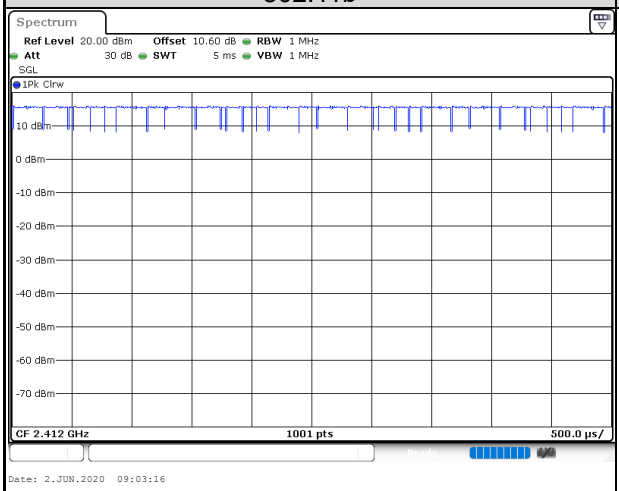
<Mains Conducted Emission mode >



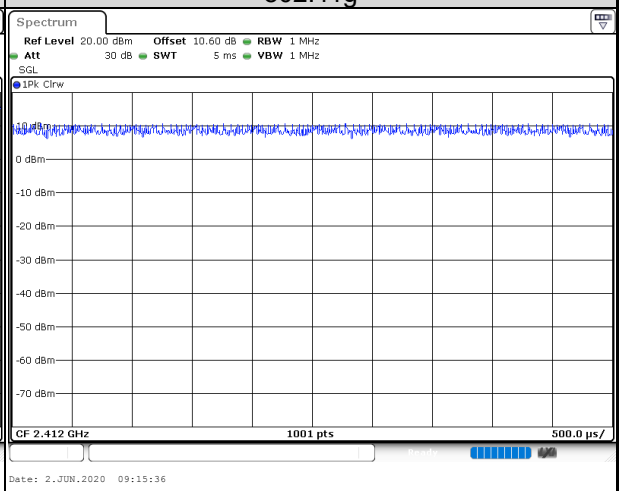
4.7 Duty Cycle of Test Signal

Mode	On Time (ms)	On + Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11b	1	1	100.00	0.00
802.11g	1	1	100.00	0.00
802.11n HT20	1	1	100.00	0.00

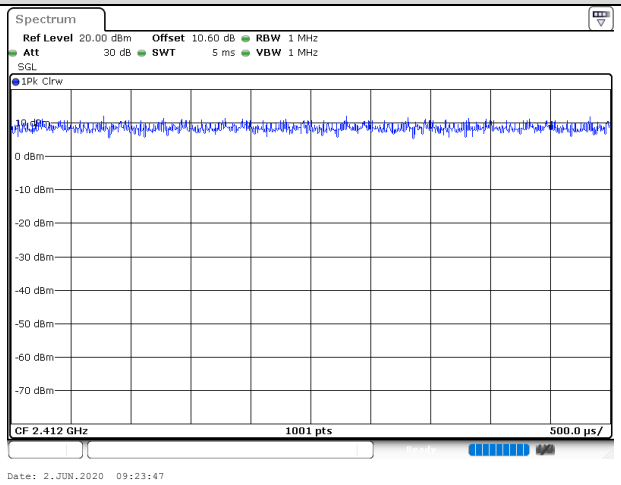
802.11b



802.11g



802.11n HT20



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

Requirement Use of approved antennas only

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 1.0 dBi. The antenna is a Chip Antenna soldered to the PCB with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

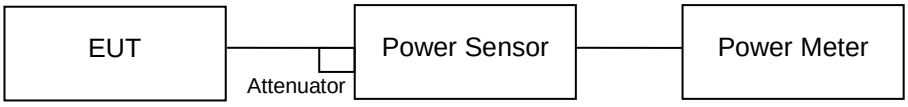
Refer to EUT photo for details.

5.1.2 Peak Output Power

Limit 1 watt

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Power Meter	Anritsu	ML2495A	1901008	2020/4/6	2021/4/5
Power Sensor	Anritsu	MA2411B	1725269	2020/4/7	2021/4/6

Test Procedures

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

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

Test Result

Peak Output Power

<802.11b>

Channel	Channel Frequency (MHz)	Peak Output Power		Limit (mW)
		(dBm)	(mW)	
1	2412	24.21	263.63	1000
6	2437	22.15	164.06	1000
11	2462	22.50	177.83	1000

<802.11g>

Channel	Channel Frequency (MHz)	Peak Output Power		Limit (mW)
		(dBm)	(mW)	
1	2412	26.11	408.32	1000
6	2437	26.25	421.70	1000
11	2462	25.56	359.75	1000

<802.11n HT20>

Channel	Channel Frequency (MHz)	Peak Output Power		Limit (mW)
		(dBm)	(mW)	
1	2412	26.08	405.51	1000
6	2437	26.41	437.52	1000
11	2462	24.32	270.40	1000

Average Power

<802.11b>

Channel	Channel Frequency (MHz)	Average Power	
		(dBm)	(mW)
1	2412	22.25	167.88
6	2437	19.84	96.38
11	2462	20.22	105.20

<802.11g>

Channel	Channel Frequency (MHz)	Average Power	
		(dBm)	(mW)
1	2412	17.81	60.39
6	2437	18.66	73.45
11	2462	16.47	44.36

<802.11n HT20>

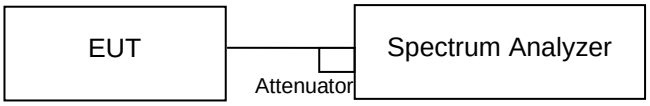
Channel	Channel Frequency (MHz)	Average Power	
		(dBm)	(mW)
1	2412	17.77	59.84
6	2437	19.32	85.51
11	2462	15.45	35.08

5.1.3 6dB Bandwidth and 99% Occupied Bandwidth

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

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV40	101509	2020/5/5	2021/5/4

Test Procedure

For 6dB Bandwidth

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

For 99% Occupied Bandwidth

a. For 99% occupied bandwidth measurement, the transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to PEAK. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean power of a given emission.

Test Results

Please refer to Appendix A.

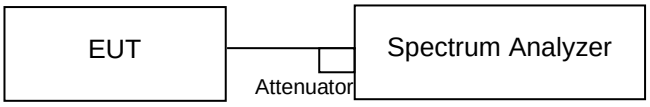
5.1.4 Power Spectral Density

Limit

The power spectral density shall not be greater than 8 dBm in any 3 kHz band.

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV40	101512	2020/2/18	2021/2/17

Test Procedure

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.

Test Results

Please refer to Appendix A.

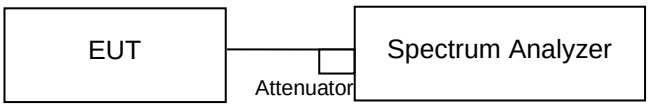
5.1.5 Conducted Spurious Emissions and Frequency Band Edges measured in 100kHz Bandwidth

Limit

20dB (below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.)

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV40	101512	2020/2/18	2021/2/17

Test Procedure

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

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

Test Results

Please refer to Appendix A.

5.1.6 Radiated Spurious Emissions and Band Edges

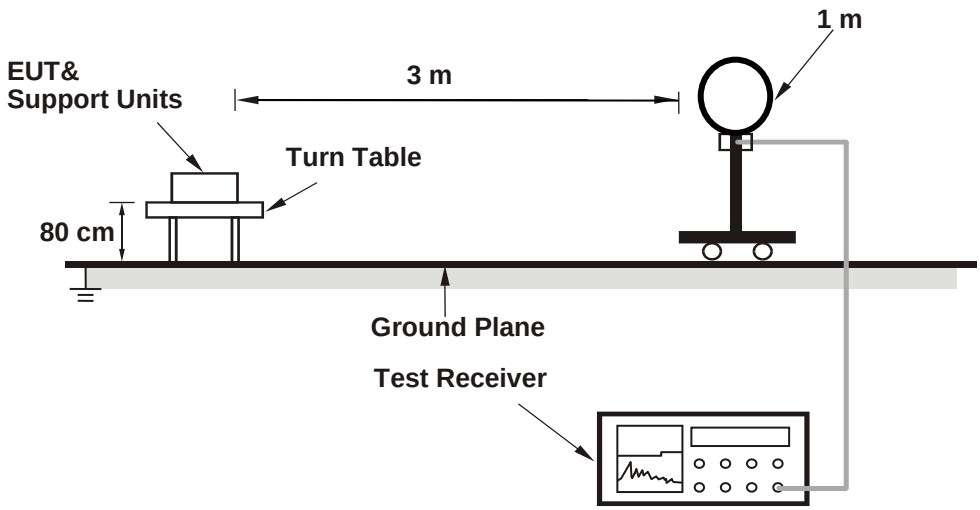
Limit

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).
Emissions radiated outside the restricted and authorized frequency bands must either comply with the radiated emission limits specified for the restricted bands or in §15.247(d).

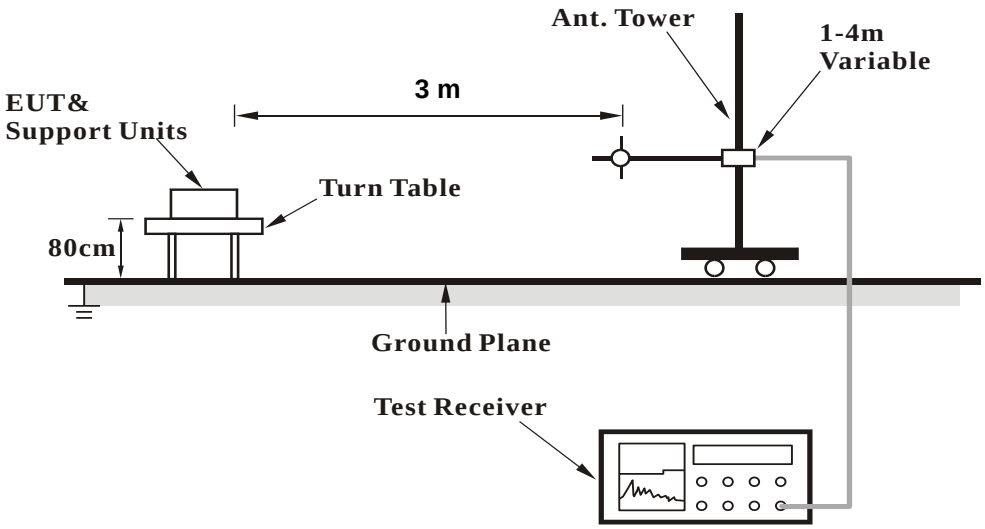
Kind of Test Site 3m Semi-Anechoic Chamber

Test Setup

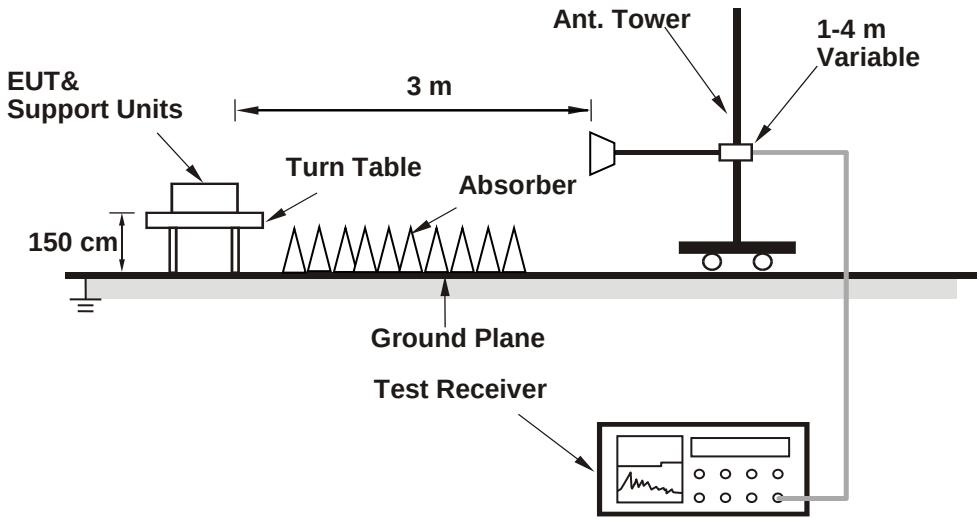
<Radiated Emissions below 30 MHz>



<Radiated Emissions 30 MHz to 1 GHz>



<Radiated Emissions above 1 GHz>



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

Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV40	101509	2020/3/30	2021/3/29
Receiver	R&S	ESR7	102109	2020/3/30	2021/3/29
Bilog Antenna	SCHWARZBECK	VULB-9168	00950	2020/1/20	2021/1/18
Horn Antenna	ETS-Lindgren	3117	00218929	2019/11/27	2020/11/25
LF-AMP	Agilent	8447D	2727A05146	2020/2/17	2021/2/15
HF-AMP + AC source	EMCI	EMC051845SE	980635	2020/2/11	2021/2/9
HF-AMP + AC source	EMCI	EMC184045SE	980656	2020/2/11	2021/2/9
Horn Antenna	SCHWARZBECK	BBHA 9170	00890	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104EA	800057/4EA	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	802244/4	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	MY37203/4	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800897/2EA	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800902/2EA	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	801026/2EA	2020/3/25	2021/3/24
Loop Antenna	Chance Most	EMCILPA600 +calibration	287	2020/1/9	2021/1/7

Test Procedures

For Radiated Emissions below 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

For Radiated Emissions above 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The worst-case Axis orientation is recorded in this test report.

Test Results

Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
Level (dBuV/m) = Reading (dBuV) + Factor (dB/m)

Please refer to Appendix B.

5.2 Mains Emission

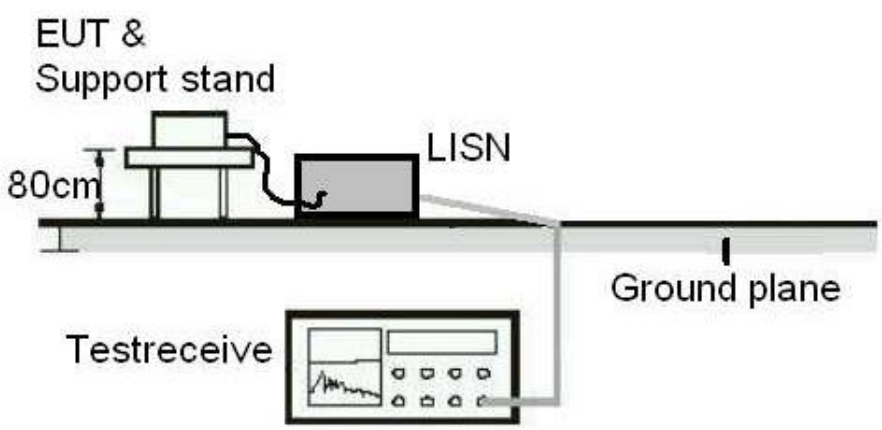
5.2.1 Mains Conducted Emission

Limit

Mains Conducted Emission as defined in §15.207 must comply with the mains conducted emission limits.

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
TWO-LINE V-NETWORK	SCHHWARZBECK	NSLK 8127	8127-00976	2019/10/2	2020/9/30
EMI Test Receiver	R&S	ESR7	102108	2020/4/22	2021/4/21
10dB attenuation	SCHHWARZBECK	VTSD 9561 F-N	660	2020/2/24	2021/2/23
Measurement Software	EZ	EZ_EMC (Version NB-03A)	N/A	N/A	N/A

Test Procedures

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

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.

Test Results

Please refer to Appendix B.

6. Safety Human Exposure

6.1 RF Exposure Compliance

6.1.1 Power Density

Results

Separation distance is more than 20 cm, thus mobile device exposure limits can be applied.

Maximum Exposure:

Power to Antenna (mW)	437.52 mW
Power to Antenna (dBm)	26.4 dBm
Antenna Gain	1 dBi
Power+Ant Gain	550.8 mW
Distance	20 cm
S=	0.110 mW/cm^2

Limit: 1 mW/cm^2

Limit

0.3-1.34 MHz	(100) mW/cm^2
1.34-30 MHz	(180/f^2) mW/cm^2
30-300 MHz	0.2 mW/cm^2
300-1500 MHz	f/1500 mW/cm^2
1500-100,000 MHz	1.0 mW/cm^2

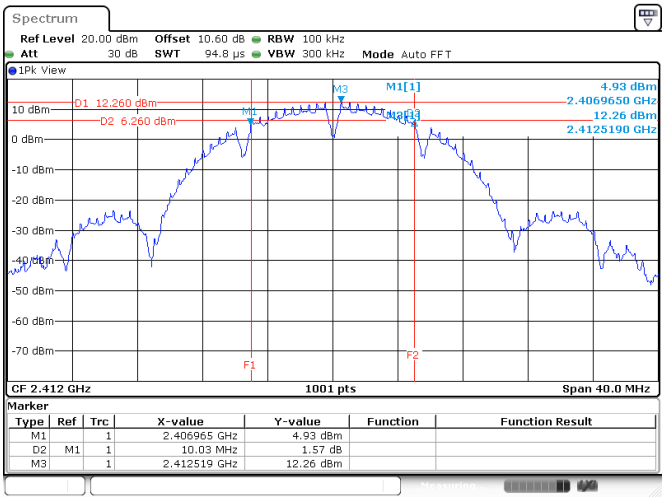
Appendix A: Test Results of Conducted Test

Test Result of 6 dB Bandwidth

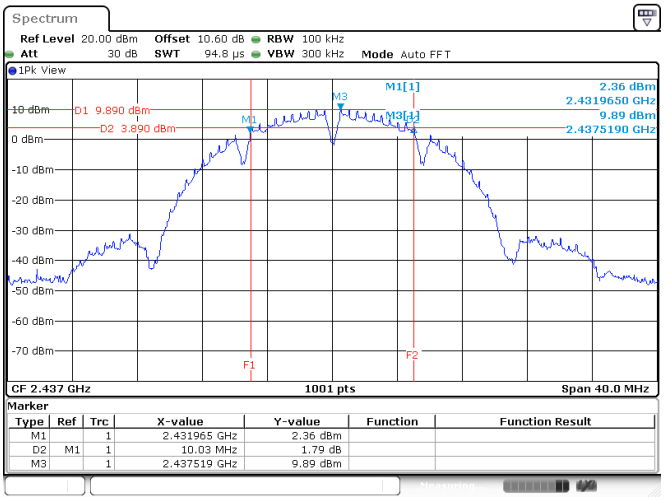
802.11b

Channel	Channel Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
Low Channel	2412	10.03	> 0.5	Pass
Middle Channel	2437	10.03	> 0.5	Pass
High Channel	2462	10.03	> 0.5	Pass

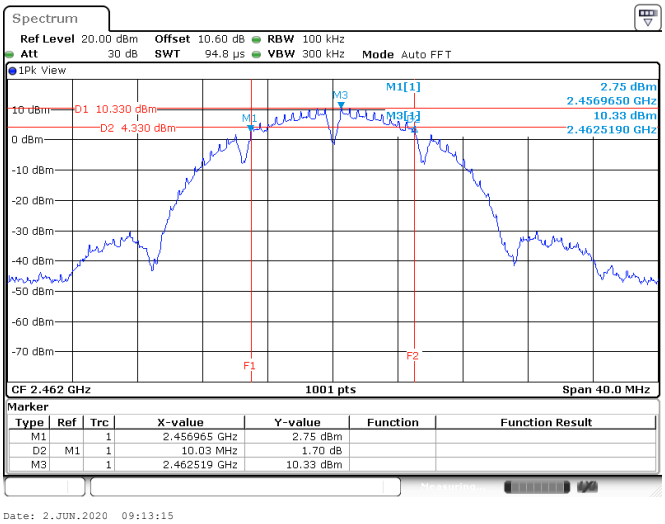
Low Channel



Middle Channel



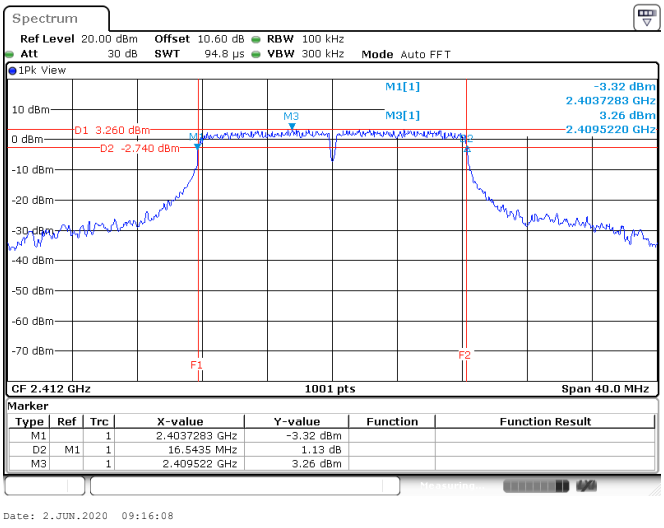
High Channel



802.11g

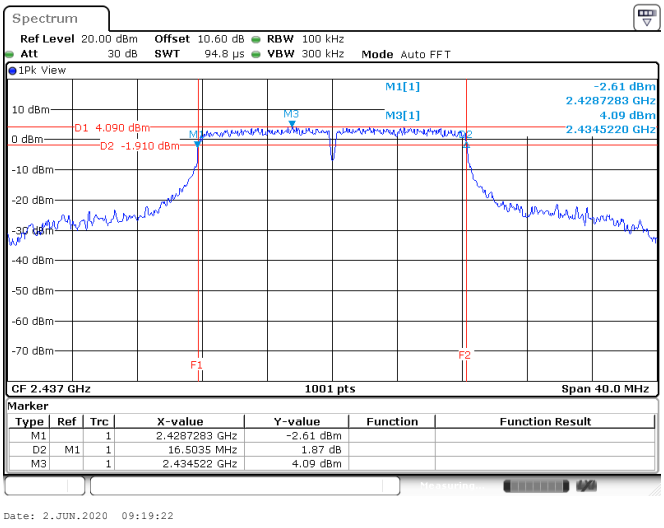
Channel	Channel Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
Low Channel	2412	16.54	> 0.5	Pass
Middle Channel	2437	16.50	> 0.5	Pass
High Channel	2462	16.50	> 0.5	Pass

Low Channel



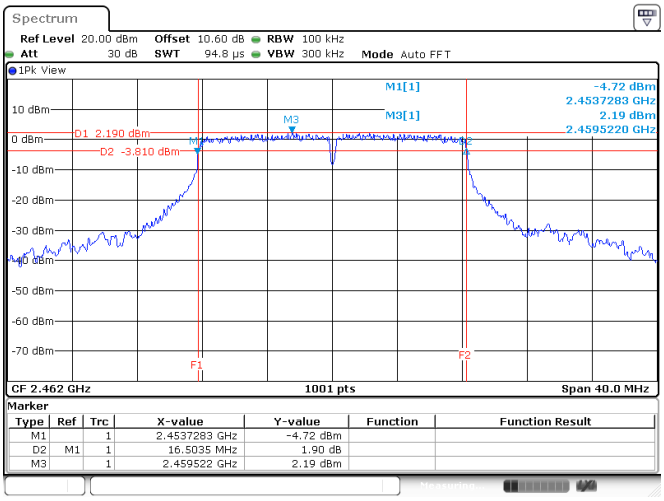
Date: 2.JUN.2020 09:16:08

Middle Channel



Date: 2.JUN.2020 09:19:22

High Channel

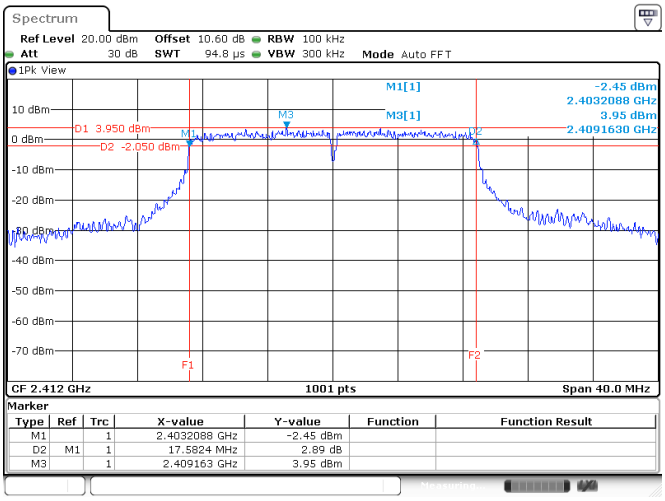


Date: 2.JUN.2020 09:21:27

802.11n HT20

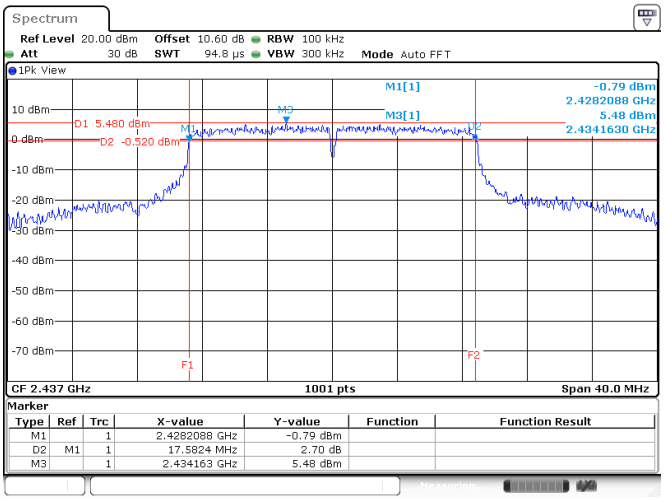
Channel	Channel Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
Low Channel	2412	17.58	> 0.5	Pass
Middle Channel	2437	17.58	> 0.5	Pass
High Channel	2462	17.58	> 0.5	Pass

Low Channel



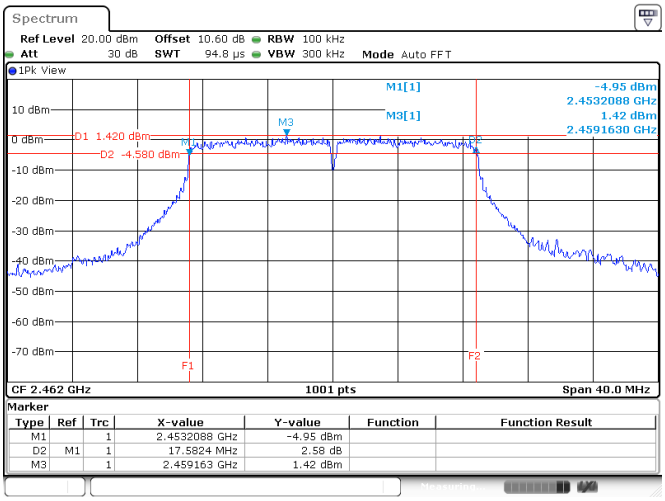
Date: 2.JUN.2020 09:24:22

Middle Channel



Date: 2.JUN.2020 09:26:52

High Channel



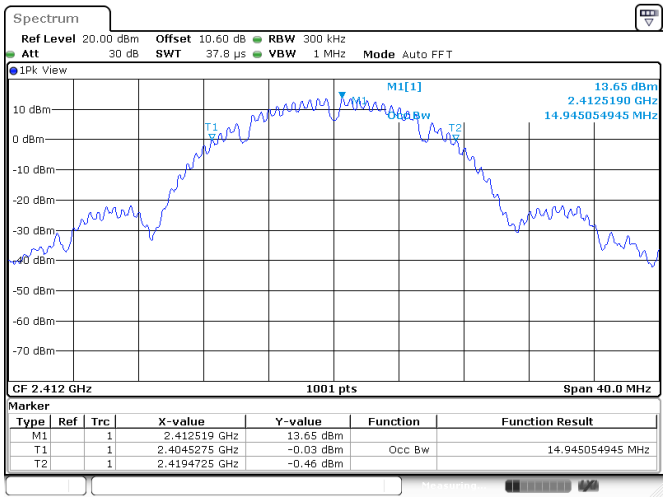
Date: 2.JUN.2020 09:29:15

Test Result of 99% Occupied Bandwidth

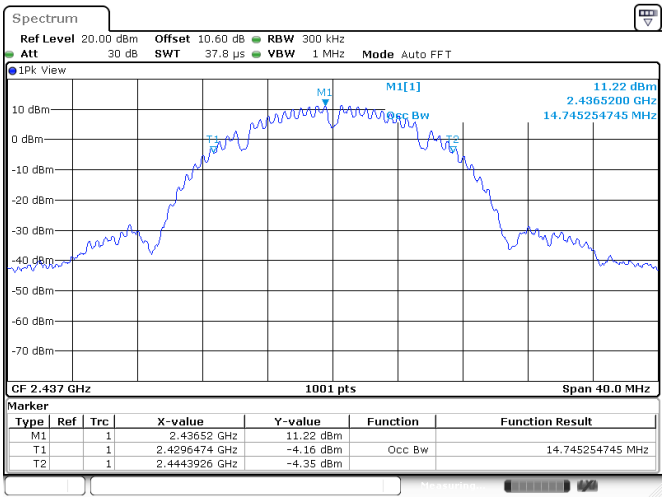
802.11b

Channel	Channel Frequency (MHz)	99% Bandwidth (MHz)
Low Channel	2412	14.95
Middle Channel	2437	14.75
High Channel	2462	14.75

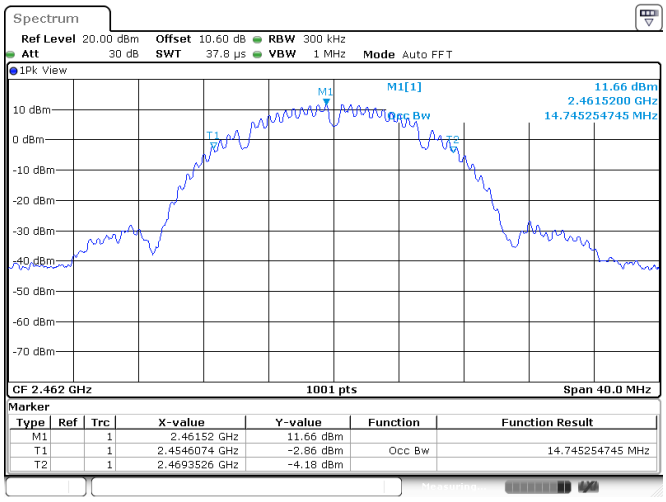
Low Channel



Middle Channel



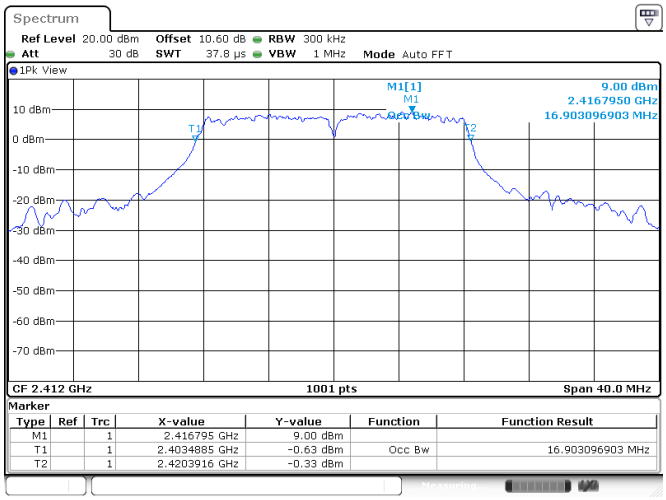
High Channel



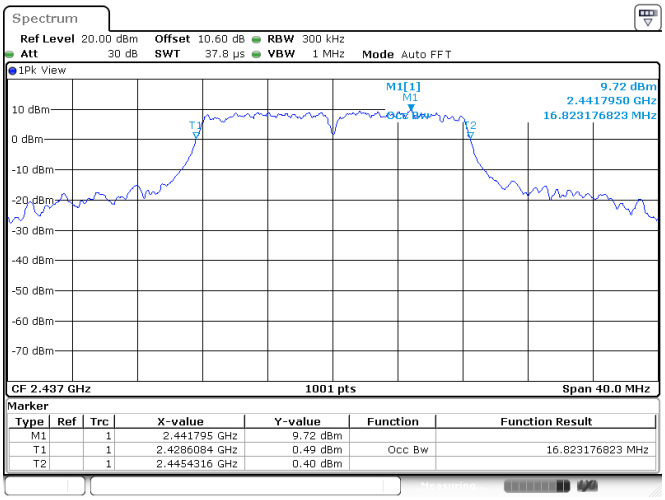
802.11g

Channel	Channel Frequency (MHz)	99% Bandwidth (MHz)
Low Channel	2412	16.90
Middle Channel	2437	16.82
High Channel	2462	16.78

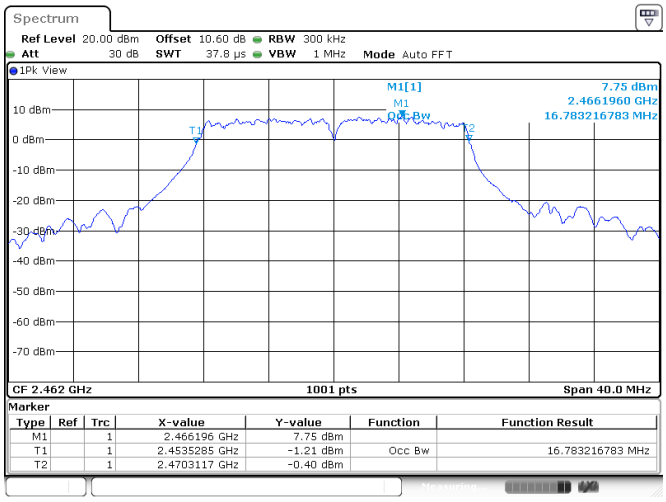
Low Channel



Middle Channel



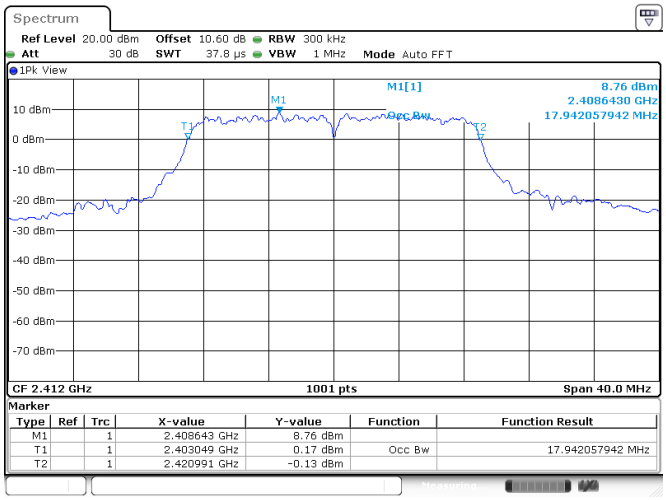
High Channel



802.11n HT20

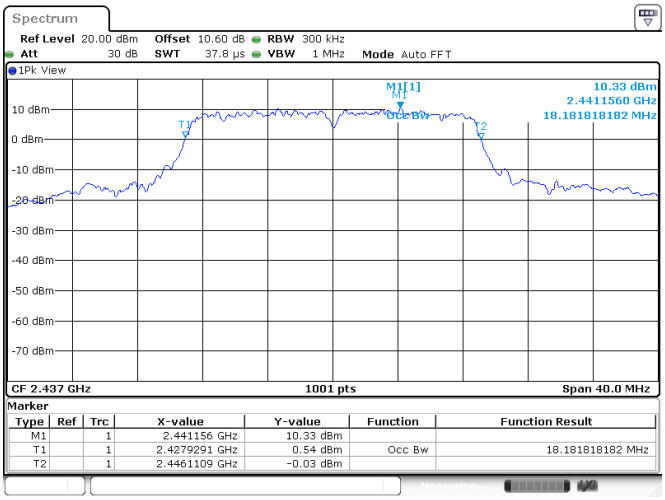
Channel	Channel Frequency (MHz)	99% Bandwidth (MHz)
Low Channel	2412	17.94
Middle Channel	2437	18.18
High Channel	2462	17.82

Low Channel



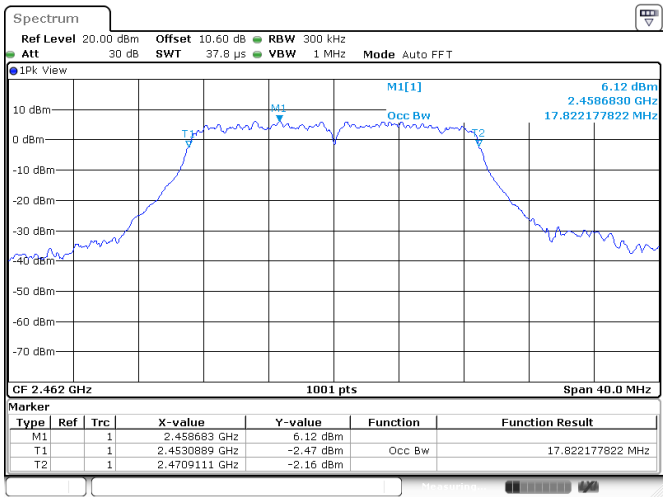
Date: 2.JUN.2020 09:24:46

Middle Channel



Date: 2.JUN.2020 09:27:27

High Channel



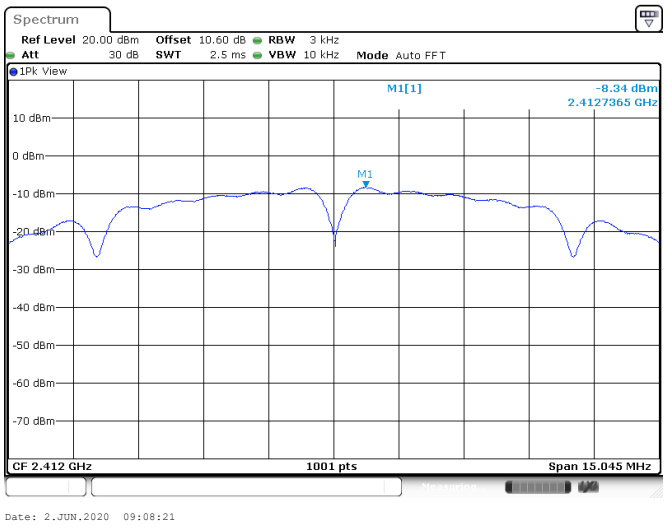
Date: 2.JUN.2020 09:29:37

Test Result of Power Spectral Density

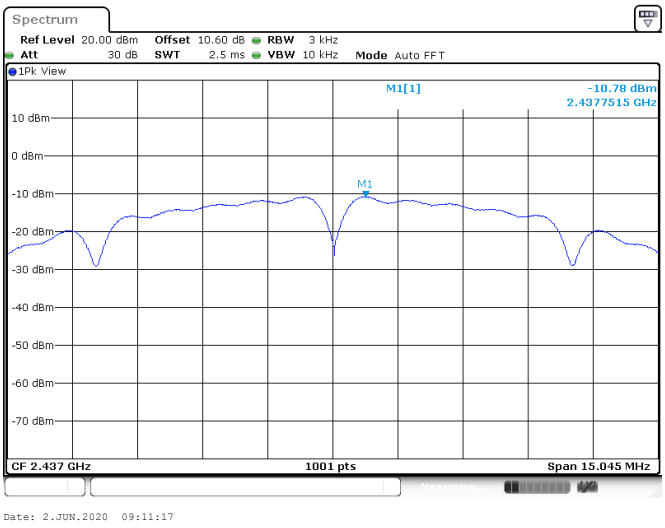
802.11b

Channel	Channel Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Low Channel	2412	-8.34	8	Pass
Middle Channel	2437	-10.78	8	Pass
High Channel	2462	-10.38	8	Pass

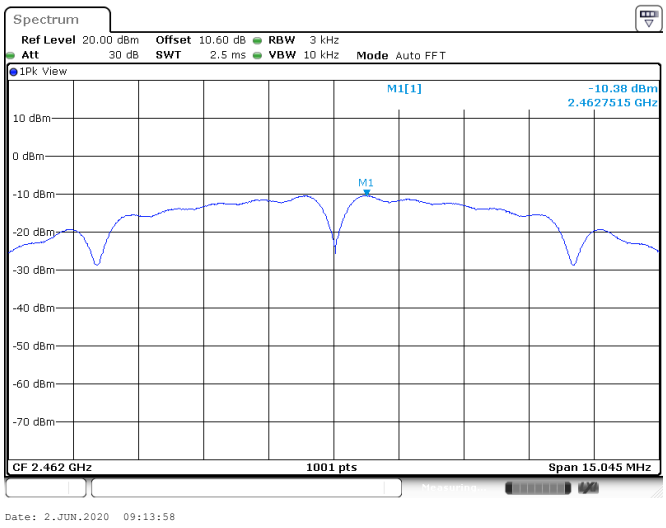
Low Channel



Middle Channel



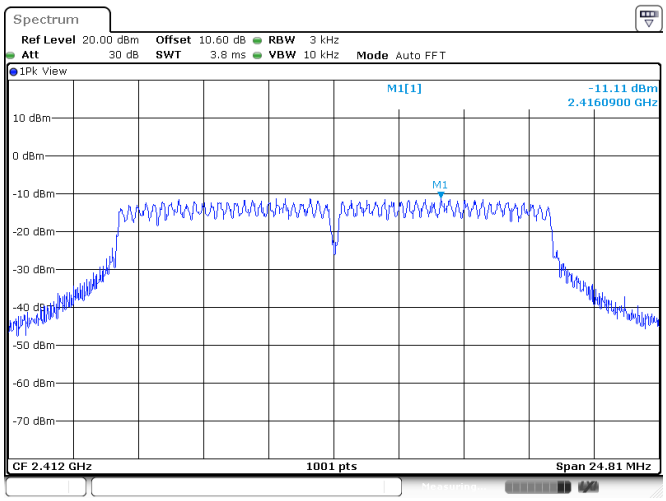
High Channel



802.11g

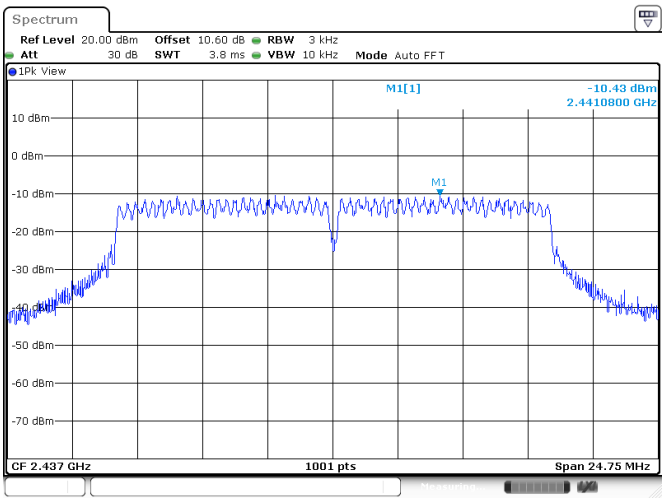
Channel	Channel Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Low Channel	2412	-11.11	8	Pass
Middle Channel	2437	-10.43	8	Pass
High Channel	2462	-12.32	8	Pass

Low Channel



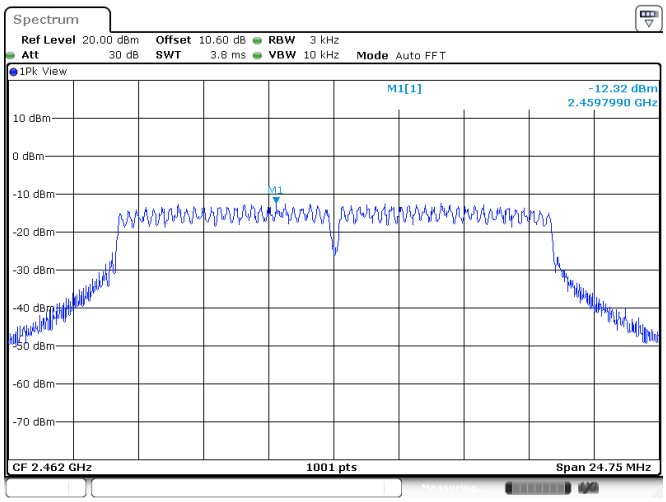
Date: 2.JUN.2020 09:17:19

Middle Channel



Date: 2.JUN.2020 09:20:18

High Channel

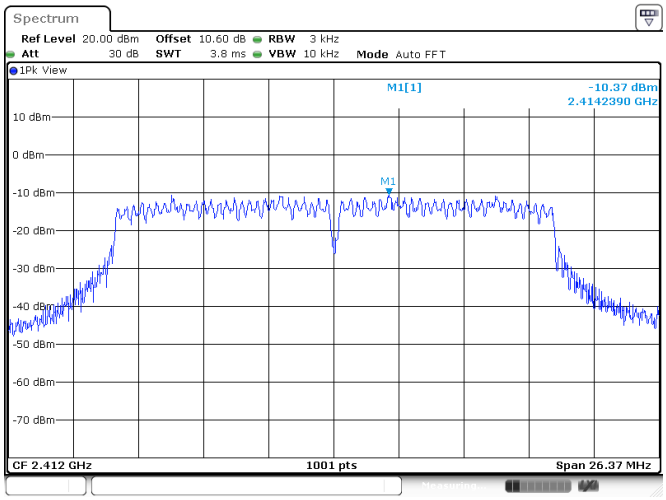


Date: 2.JUN.2020 09:22:18

802.11n HT20

Channel	Channel Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Low Channel	2412	-10.37	8	Pass
Middle Channel	2437	-8.81	8	Pass
High Channel	2462	-12.91	8	Pass

Low Channel



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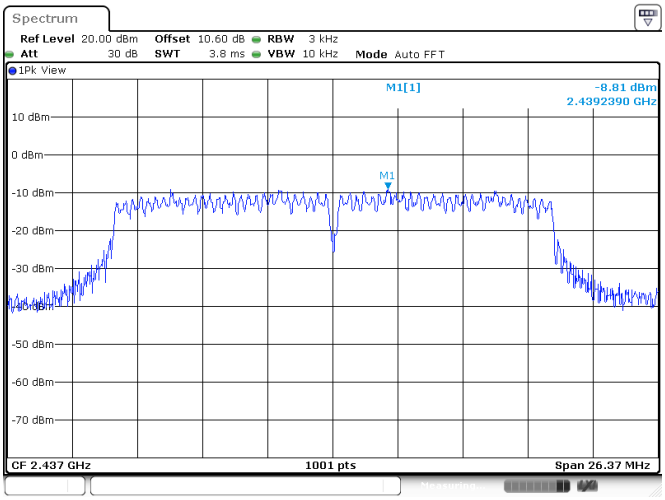
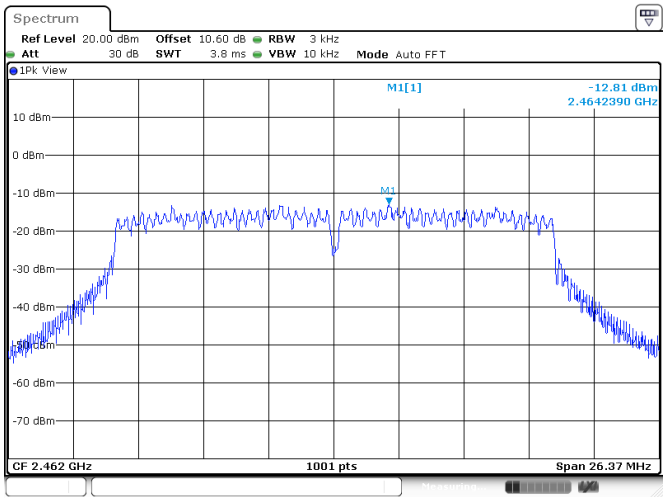
Middle Channel



Date: 2.JUN.2020 09:28:05

High Channel

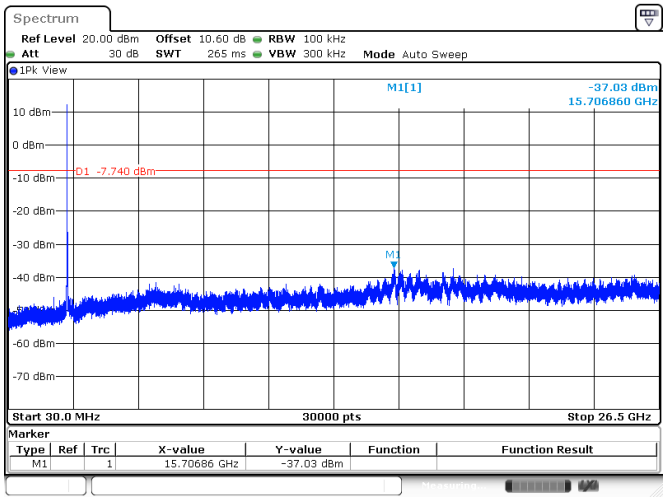


Date: 2.JUN.2020 09:30:07

Test Result of Conducted Spurious Emissions

802.11b

Low Channel



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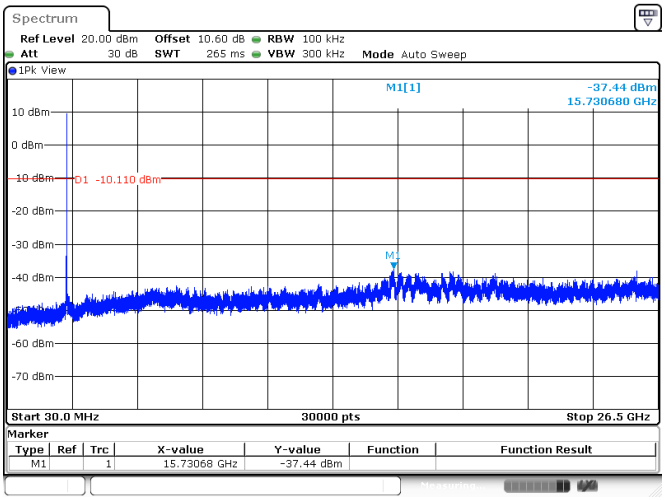
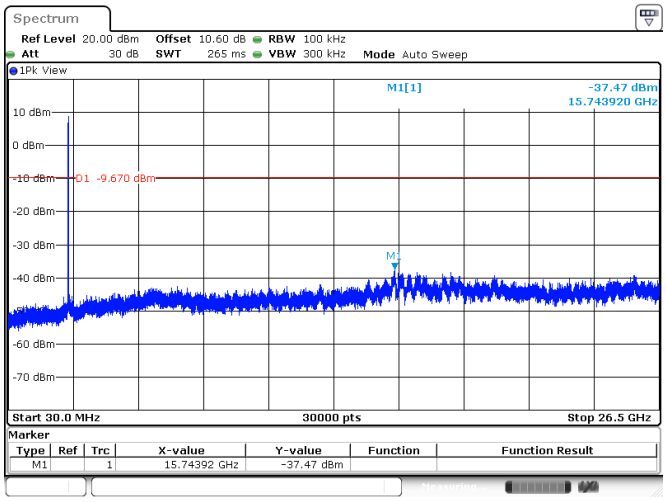
Middle Channel



Date: 2.JUN.2020 09:12:31

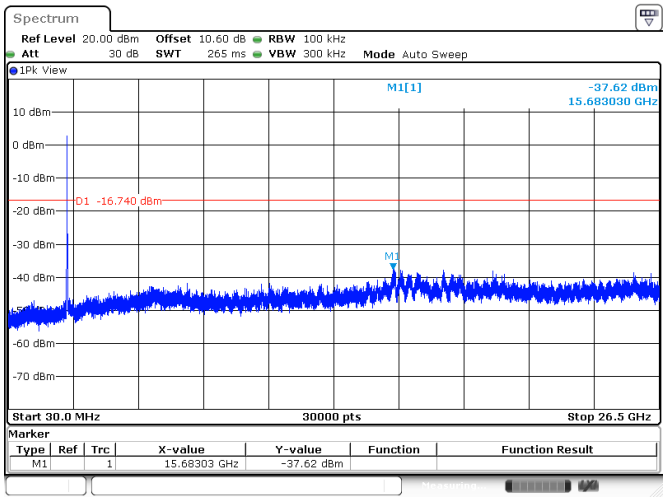
High Channel



Date: 2.JUN.2020 09:14:39

802.11g

Low Channel



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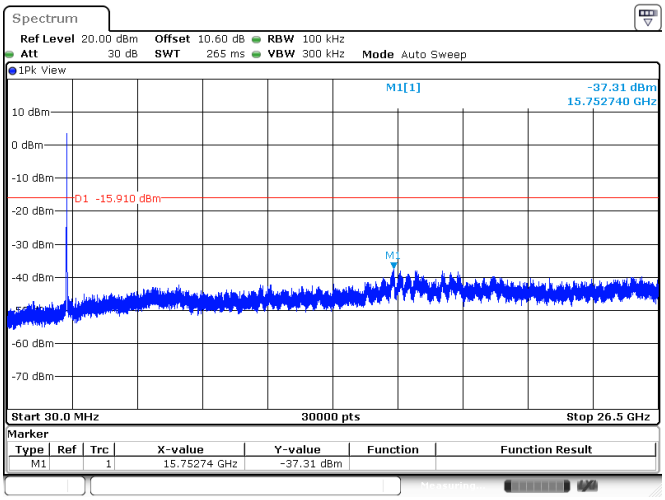
Middle Channel



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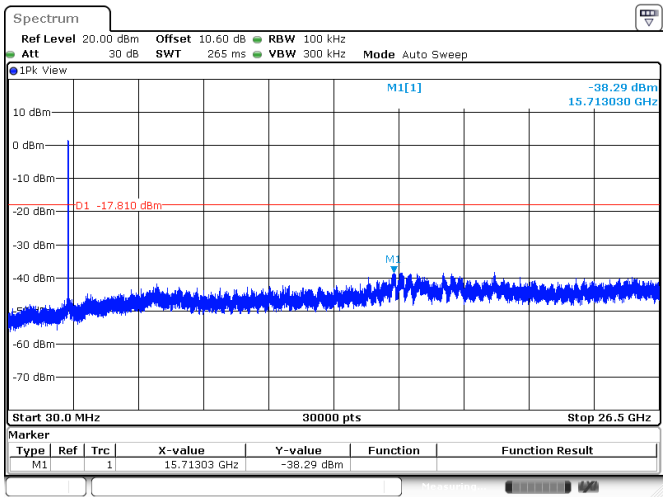
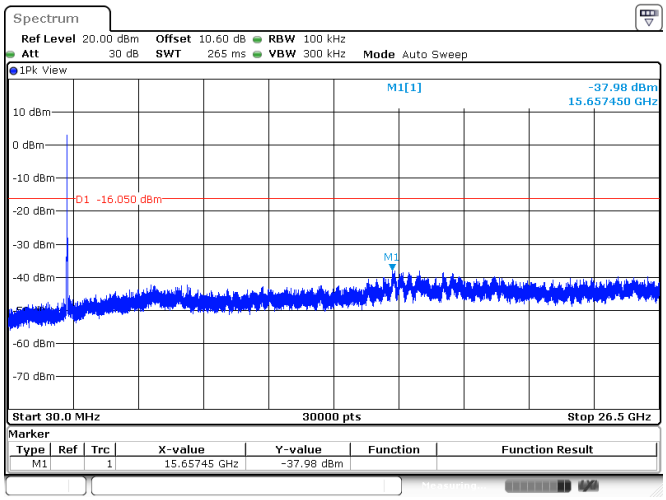
High Channel



Date: 2.JUN.2020 09:23:04

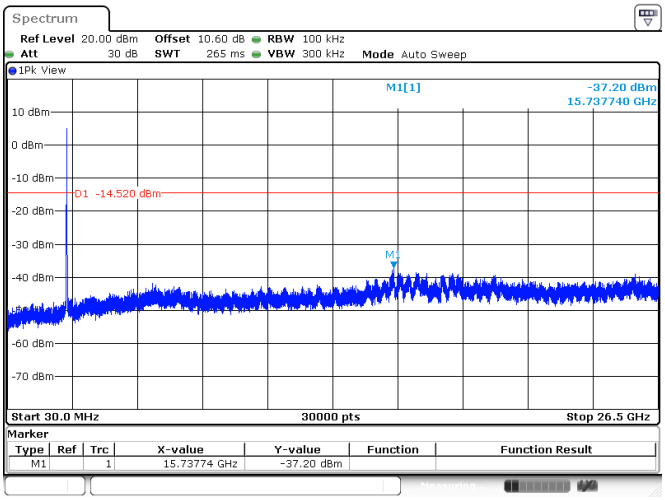
802.11n HT20

Low Channel



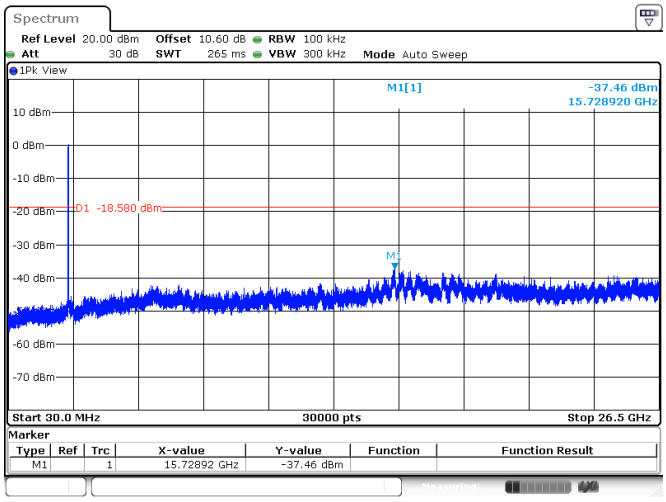
Date: 2.JUN.2020 09:26:08

Middle Channel



Date: 2.JUN.2020 09:28:27

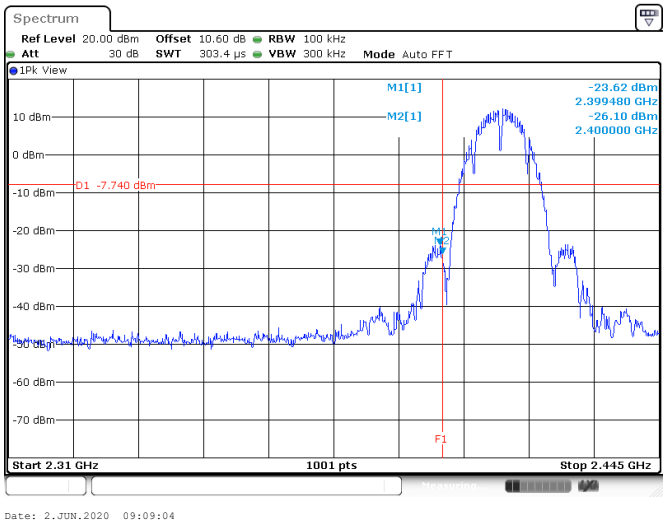
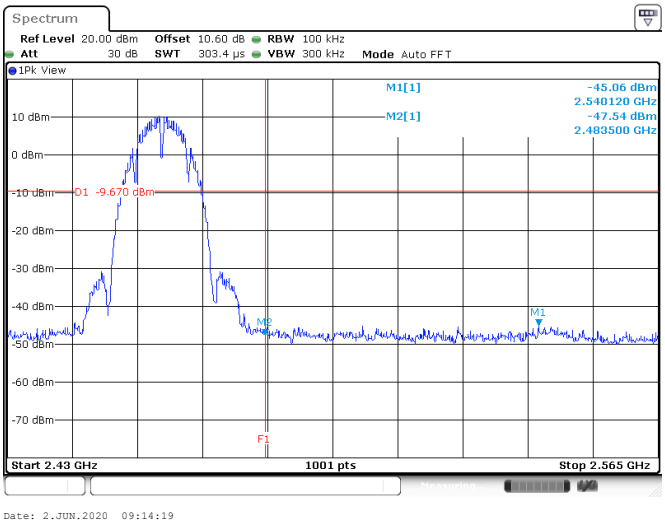
High Channel



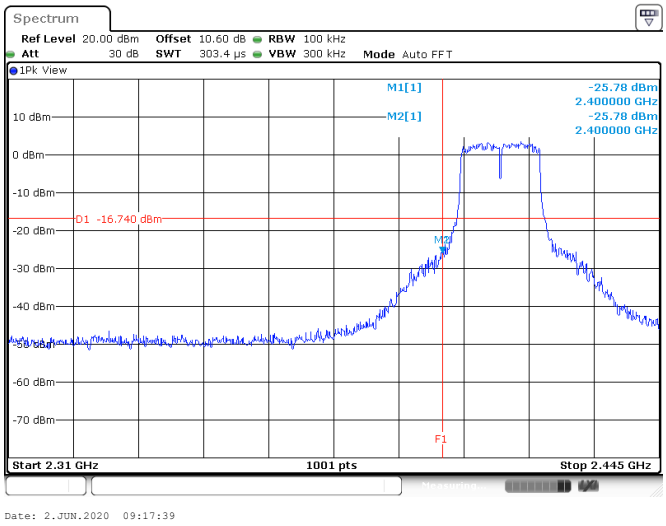
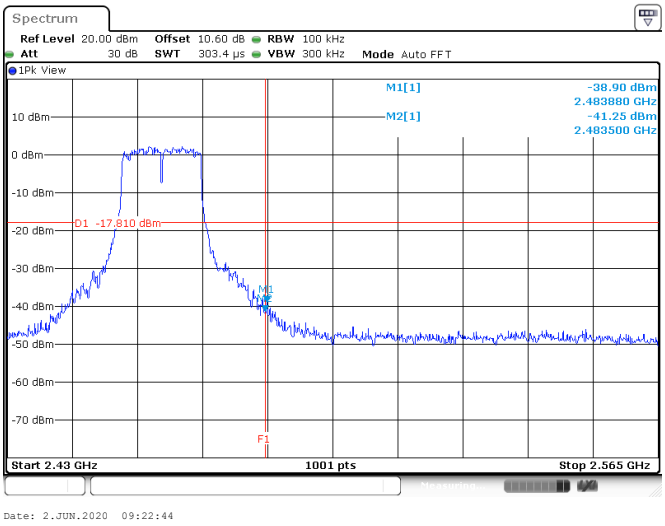
Date: 2.JUN.2020 09:30:54

Test Result of Conducted Bandedge, Tx Mode

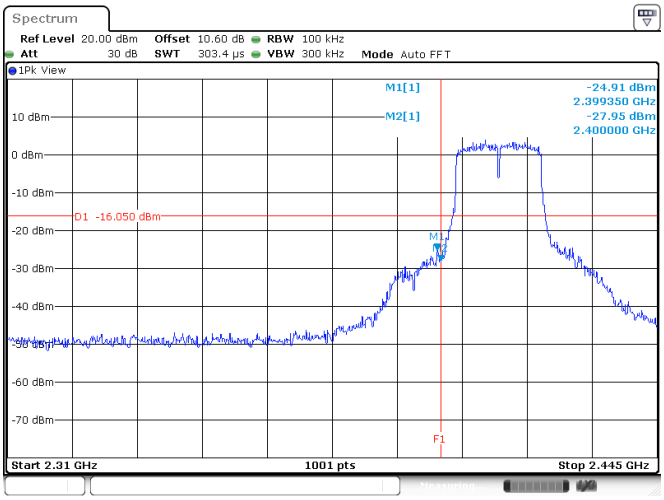
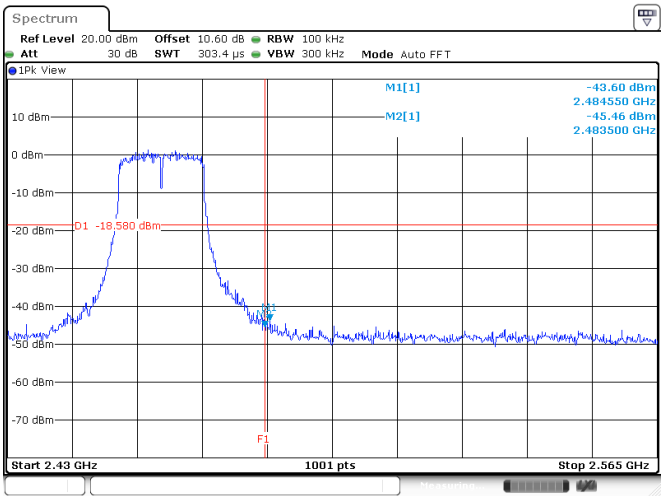
802.11b

Low Channel	High Channel
	

802.11g

Low Channel	High Channel
	

802.11n HT20

Low Channel	High Channel
	

Date: 2.JUN.2020 09:25:48

Date: 2.JUN.2020 09:30:35

Appendix B: Test Results of Radiated Spurious Emissions & Mains Conducted Emission Test

Band Edges, 2.31GHz ~ 2.9GHz

802.11b	
Low Channel (Horizontal) Peak	**Low Channel (Vertical) Peak**

TÜV Rheinland Taiwan Ltd.
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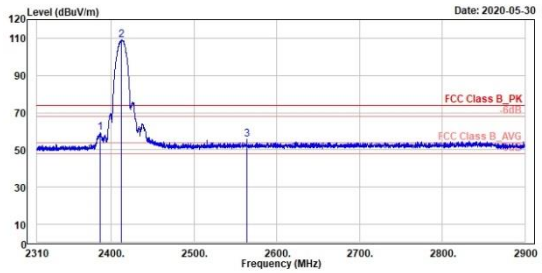

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2386.11	59.25	21.93	37.32	74.00	-14.75	249	294	Peak	Horizontal	
2 *	2412.00	109.22	71.82	37.40	74.00	35.22	346	39	Peak	Horizontal	
3	2563.70	55.50	17.62	37.88	74.00	-18.50	346	39	Peak	Horizontal	

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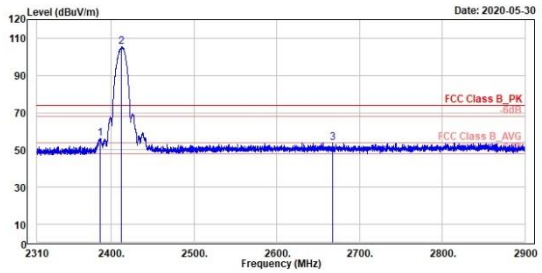

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2386.58	56.10	18.78	37.32	74.00	-17.90	377	259	Peak	Vertical	
2 *	2412.00	105.25	67.85	37.40	74.00	31.25	377	259	Peak	Vertical	
3	2667.42	53.98	16.15	37.83	74.00	-20.02	377	259	Peak	Vertical	

802.11b

Low Channel (Horizontal) Average

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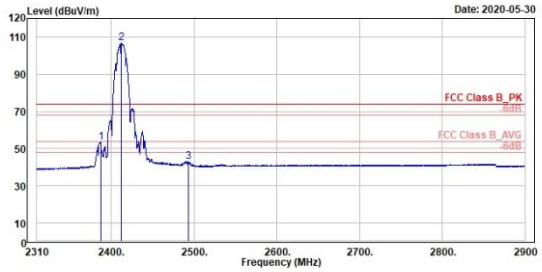

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1 !	2387.05	53.29	15.97	37.32	54.00	-0.71	249	294	Average	Horizontal	
2 *	2412.00	106.69	69.29	37.40	54.00	52.69	346	39	Average	Horizontal	
3	2492.90	42.95	5.38	37.57	54.00	-11.05	346	39	Average	Horizontal	

Low Channel (Vertical) Average

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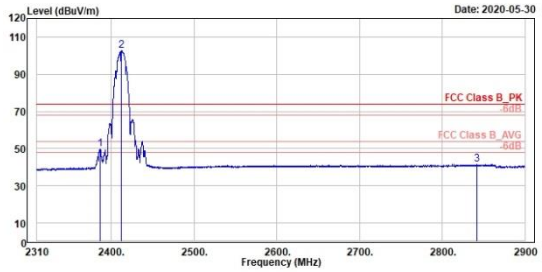

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1 !	2385.99	49.54	12.22	37.32	54.00	-4.46	377	259	Average	Vertical	
2 *	2412.00	102.71	65.31	37.40	54.00	48.71	377	259	Average	Vertical	
3	2842.42	41.40	3.36	38.04	54.00	-12.60	377	259	Average	Vertical	

802.11b

High Channel (Horizontal) Peak

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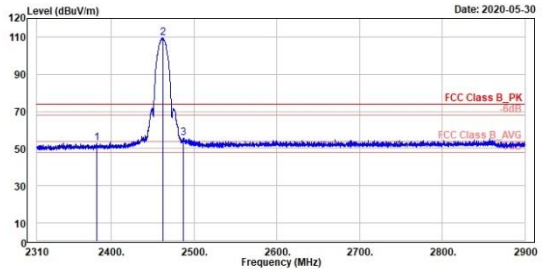

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2382.10	53.04	15.74	37.30	74.00	-20.96	381	326	Peak	Horizontal	
2 *	2462.00	109.43	71.89	37.54	74.00	35.43	381	326	Peak	Horizontal	
3	2487.00	55.80	18.24	37.56	74.00	-18.20	369	38	Peak	Horizontal	

High Channel (Vertical) Peak

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No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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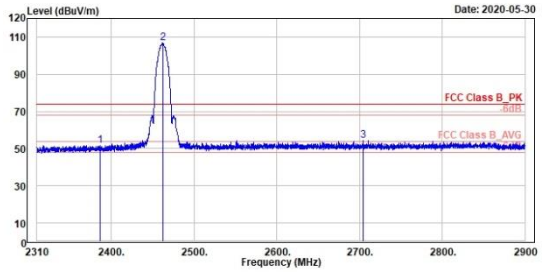

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2386.23	51.69	14.37	37.32	74.00	-22.31	261	246	Peak	Vertical	
2 *	2462.00	106.64	69.10	37.54	74.00	32.64	261	246	Peak	Vertical	
3	2704.59	54.43	16.62	37.81	74.00	-19.57	261	246	Peak	Vertical	

802.11b

High Channel (Horizontal) Average

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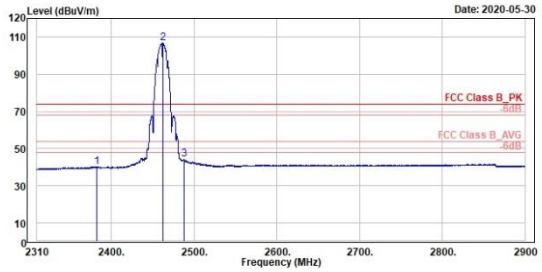

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2382.69	40.37	3.06	37.31	54.00	-13.63	381	326	Average	Horizontal	
2 *	2462.00	106.71	69.17	37.54	54.00	52.71	381	326	Average	Horizontal	
3	2487.94	44.22	6.65	37.57	54.00	-9.78	369	38	Average	Horizontal	

High Channel (Vertical) Average

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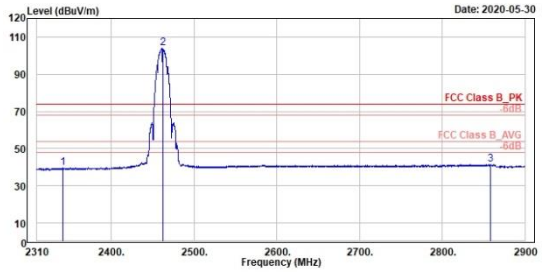

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2340.92	39.91	2.73	37.18	54.00	-14.09	261	246	Average	Vertical	
2 *	2462.00	103.89	66.35	37.54	54.00	49.89	261	246	Average	Vertical	
3	2858.23	41.47	3.37	38.10	54.00	-12.53	261	246	Average	Vertical	

802.11g

Low Channel (Horizontal) Peak

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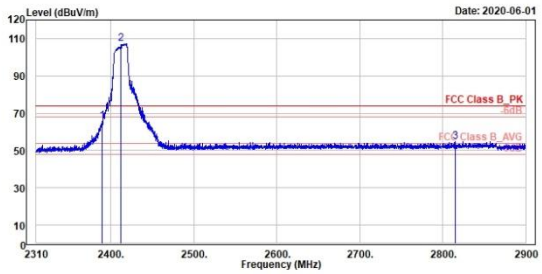

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2389.89	65.88	28.55	37.33	74.00	-8.12	249	295	Peak	Horizontal	
2 *	2412.00	107.04	69.64	37.40	74.00	33.04	346	39	Peak	Horizontal	
3	2814.92	54.70	16.74	37.96	74.00	-19.30	346	39	Peak	Horizontal	

Low Channel (Vertical) Peak

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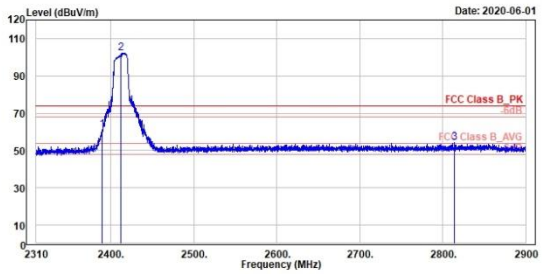

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2389.77	61.20	23.87	37.33	74.00	-12.80	377	259	Peak	Vertical	
2 *	2412.00	102.27	64.87	37.40	74.00	28.27	377	259	Peak	Vertical	
3	2814.80	54.49	16.53	37.96	74.00	-19.51	377	259	Peak	Vertical	

802.11g

Low Channel (Horizontal) Average

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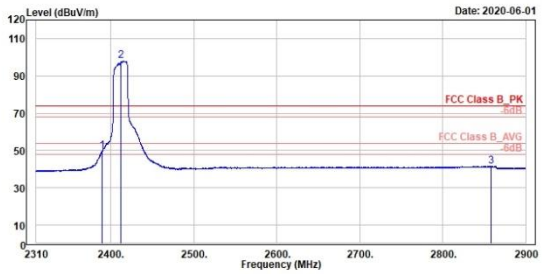

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	!	2390.00	49.84	12.51	37.33	54.00	-4.16	249	295	Average	Horizontal	
2	*	2412.00	97.91	60.51	37.40	54.00	43.91	346	39	Average	Horizontal	
3		2858.35	41.45	3.35	38.10	54.00	-12.55	346	39	Average	Horizontal	

Low Channel (Vertical) Average

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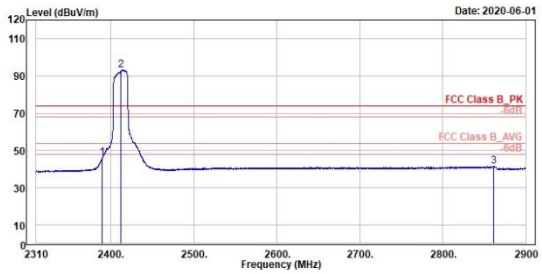
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1		2389.89	46.03	8.70	37.33	54.00	-7.97	377	259	Average	Vertical	
2	*	2412.00	93.23	55.83	37.40	54.00	39.23	377	259	Average	Vertical	
3		2861.18	41.53	3.41	38.12	54.00	-12.47	377	259	Average	Vertical	

802.11g

High Channel (Horizontal) Peak

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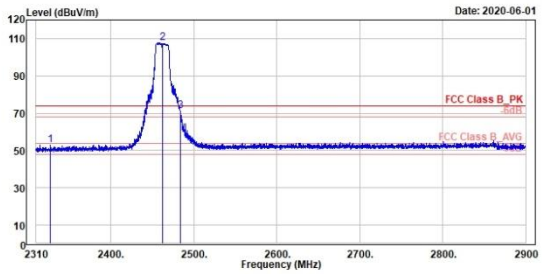

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	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2327.35	53.00	15.87	37.13	74.00	-21.00	381	325	Peak	Horizontal	
2 *	2462.00	107.72	70.18	37.54	74.00	33.72	381	325	Peak	Horizontal	
3 !	2483.50	71.31	33.75	37.56	74.00	-2.69	369	38	Peak	Horizontal	

High Channel (Vertical) Peak

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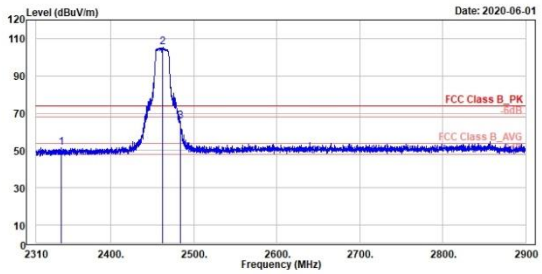

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2340.68	51.46	14.28	37.18	74.00	-22.54	261	246	Peak	Vertical	
2 *	2462.00	105.36	67.82	37.54	74.00	31.36	261	246	Peak	Vertical	
3	2483.50	65.86	28.30	37.56	74.00	-8.14	261	246	Peak	Vertical	

802.11g

High Channel (Horizontal) Average

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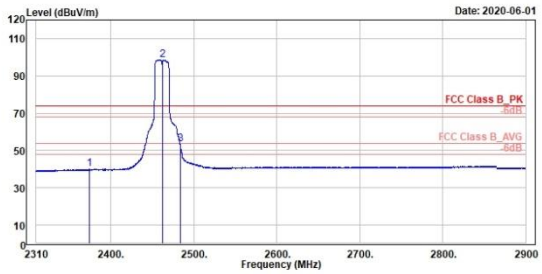

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2373.96	40.03	2.75	37.28	54.00	-13.97	381	325	Average	Horizontal	
2 *	2462.00	98.76	61.22	37.54	54.00	44.76	381	325	Average	Horizontal	
3 !	2483.50	53.24	15.68	37.56	54.00	-0.76	369	38	Average	Horizontal	

High Channel (Vertical) Average

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No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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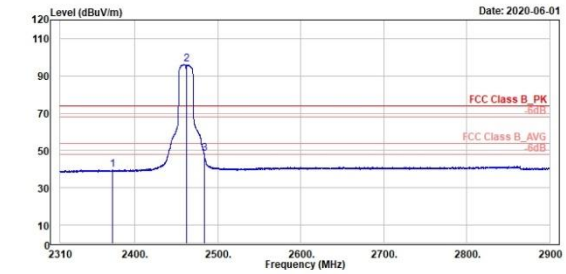

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2373.01	39.63	2.35	37.28	54.00	-14.37	261	246	Average	Vertical	
2 *	2462.00	96.27	58.73	37.54	54.00	42.27	261	246	Average	Vertical	
3 !	2483.50	48.49	10.93	37.56	54.00	-5.51	261	246	Average	Vertical	

802.11n HT20

Low Channel (Horizontal) Peak

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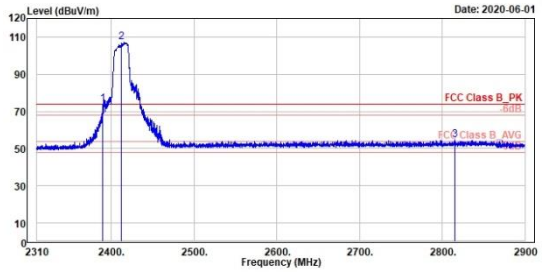

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	!	2389.99	73.75	36.42	37.33	74.00	-0.25	249	295	Peak	Horizontal	
2	*	2412.00	107.02	69.62	37.40	74.00	33.02	346	39	Peak	Horizontal	
3		2814.92	54.81	16.85	37.96	74.00	-19.19	346	39	Peak	Horizontal	

Low Channel (Vertical) Peak

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No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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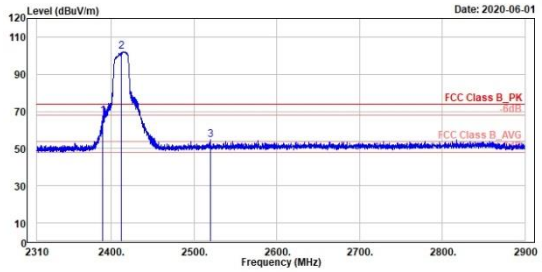

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1		2389.89	67.73	30.40	37.33	74.00	-6.27	377	259	Peak	Vertical	
2	*	2412.00	102.20	64.80	37.40	74.00	28.20	377	259	Peak	Vertical	
3		2520.16	54.77	17.09	37.68	74.00	-19.23	377	259	Peak	Vertical	

802.11n HT20

Low Channel (Horizontal) Average

TUV Rheinland Taiwan Ltd.
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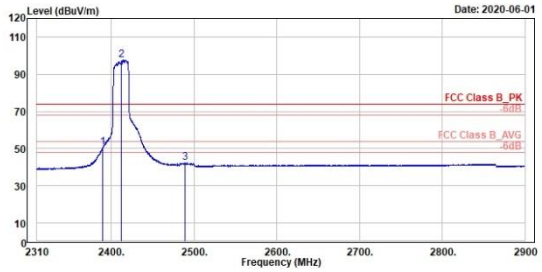

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	!	2389.89	50.69	13.36	37.33	54.00	-3.31	249	295	Average	Horizontal	
2	*	2412.00	97.67	60.27	37.40	54.00	43.67	346	39	Average	Horizontal	
3		2488.89	42.35	4.78	37.57	54.00	-11.65	346	39	Average	Horizontal	

Low Channel (Vertical) Average

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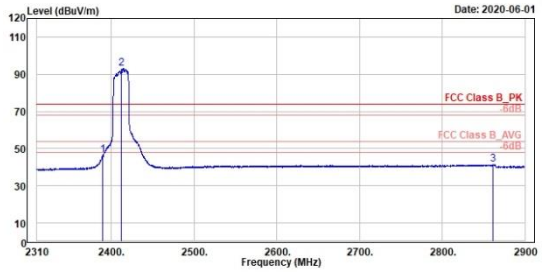
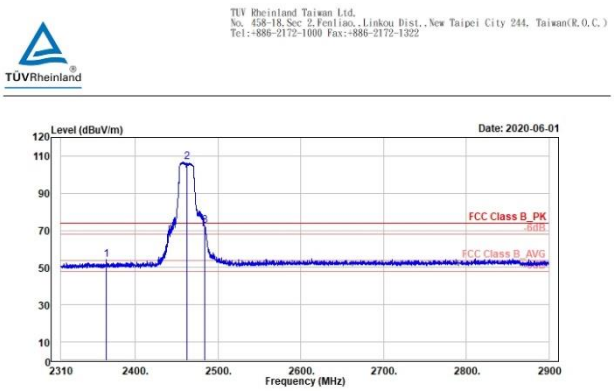


		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1		2390.00	46.38	9.05	37.33	54.00	-7.62	377	259	Average	Vertical	
2	*	2412.00	93.01	55.61	37.40	54.00	39.01	377	259	Average	Vertical	
3		2862.00	41.41	3.28	38.13	54.00	-12.59	377	259	Average	Vertical	

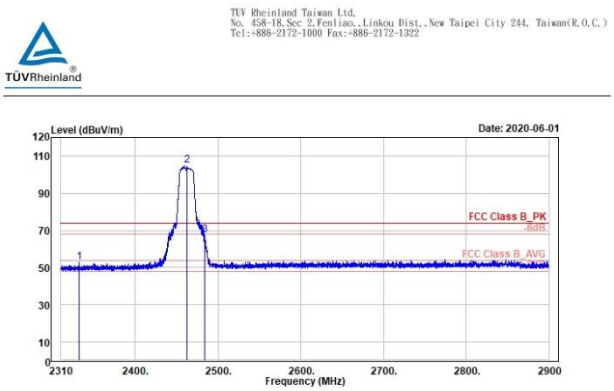
802.11n HT20

High Channel (Horizontal) Peak



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2364.99	54.25	17.00	37.25	74.00	-19.75	381	325	Peak	Horizontal	
2 *	2462.00	106.61	69.07	37.54	74.00	32.61	381	325	Peak	Horizontal	
3 !	2483.70	72.73	35.17	37.56	74.00	-1.27	371	37	Peak	Horizontal	

High Channel (Vertical) Peak



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2332.54	52.70	15.54	37.16	74.00	-21.30	261	246	Peak	Vertical	
2 *	2462.00	105.14	67.60	37.54	74.00	31.14	261	246	Peak	Vertical	
3	2483.50	67.39	29.83	37.56	74.00	-6.61	261	246	Peak	Vertical	

802.11n HT20

High Channel (Horizontal) Average

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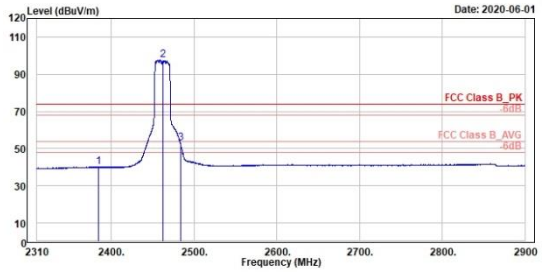

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2384.34	40.18	2.86	37.32	54.00	-13.82	381	325	Average	Horizontal	
2 *	2462.00	97.64	60.10	37.54	54.00	43.64	381	325	Average	Horizontal	
3 !	2483.50	52.78	15.22	37.56	54.00	-1.22	371	37	Average	Horizontal	

High Channel (Vertical) Average

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No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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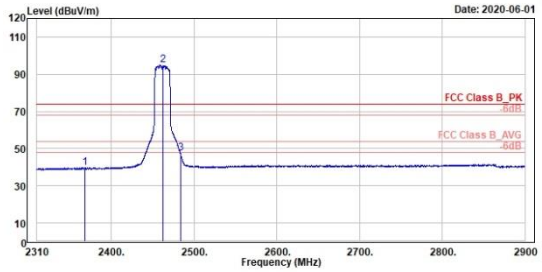

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2368.29	39.65	2.38	37.27	54.00	-14.35	261	246	Average	Vertical	
2 *	2462.00	94.93	57.39	37.54	54.00	40.93	261	246	Average	Vertical	
3	2483.50	47.26	9.70	37.56	54.00	-6.74	261	246	Average	Vertical	

Spurious Emissions, Tx Mode, 9kHz ~ 30MHz

802.11n HT20

Low Channel 9kHz~150kHz

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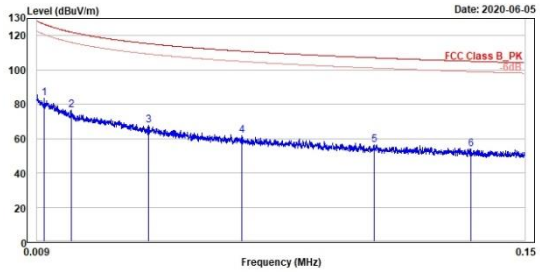

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	0.01	83.53	5.39	78.14	126.67	-43.14	100	355	QP	vertical	
2	0.02	76.60	3.35	73.25	122.07	-45.47	100	47	QP	vertical	
3	0.04	67.82	0.57	67.25	115.29	-47.47	100	73	QP	vertical	
4	0.07	61.98	-0.59	62.57	110.91	-48.93	100	348	QP	vertical	
5	0.11	56.47	-2.41	58.88	107.06	-50.59	100	54	QP	vertical	
6	0.13	54.12	-3.14	57.26	105.03	-50.91	100	197	QP	vertical	

Low Channel 150kHz~30MHz

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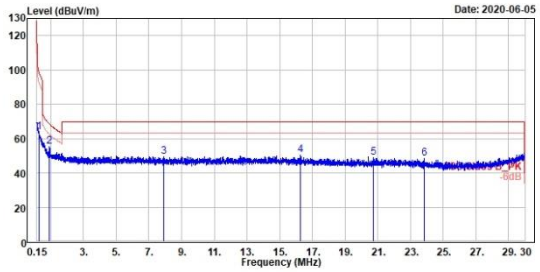

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	0.30	63.52	12.95	50.57	98.17	-34.65	100	342	QP	vertical	
2	0.93	55.20	14.54	40.66	68.27	-13.07	100	279	QP	vertical	
3	7.91	49.56	11.46	38.10	69.50	-19.94	100	115	QP	vertical	
4	16.29	50.28	12.87	37.41	69.50	-19.22	100	285	QP	vertical	
5	20.74	48.69	12.58	36.11	69.50	-20.81	100	230	QP	vertical	
6	23.84	48.63	13.64	34.99	69.50	-20.87	100	232	QP	vertical	

Spurious Emissions, Tx Mode, 30MHz ~ 1GHz

802.11n HT20

Low Channel (Horizontal)

TUV Rheinland Taiwan Ltd.
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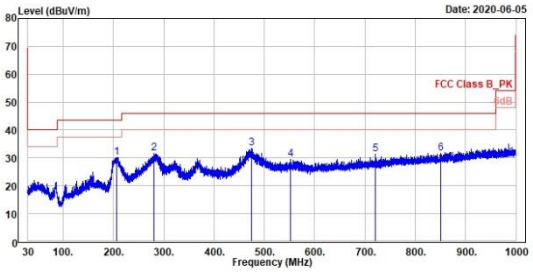

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	205.96	30.21	40.06	-9.85	43.50	-13.29	200	271	QP	horizontal	
2	280.55	31.48	38.44	-6.96	46.00	-14.52	100	37	QP	horizontal	
3	475.04	33.48	37.15	-3.67	46.00	-12.52	200	253	QP	horizontal	
4	552.83	29.59	31.93	-2.34	46.00	-16.41	200	103	QP	horizontal	
5	720.35	31.21	30.70	0.51	46.00	-14.79	400	131	QP	horizontal	
6	850.14	31.74	29.36	2.38	46.00	-14.26	200	279	QP	horizontal	

Low Channel (Vertical)

TUV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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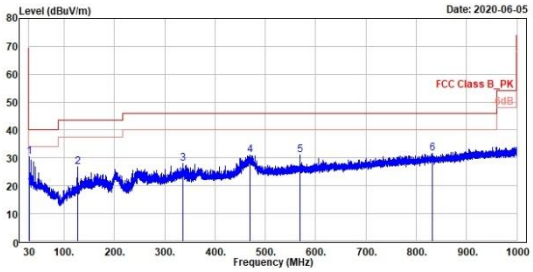

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	30.68	30.45	39.58	-9.13	40.00	-9.55	100	181	QP	vertical	
2	126.42	26.72	36.26	-9.54	43.50	-16.78	100	256	QP	vertical	
3	336.91	27.84	33.54	-5.70	46.00	-18.16	100	11	QP	vertical	
4	470.09	30.88	34.56	-3.68	46.00	-15.12	200	214	QP	vertical	
5	569.42	30.97	32.82	-1.85	46.00	-15.03	100	318	QP	vertical	
6	831.61	31.78	29.52	2.26	46.00	-14.22	261	0	QP	vertical	

Spurious Emissions, Tx Mode, 1GHz ~ 26.5GHz

802.11b

Low Channel (Horizontal)

TÜV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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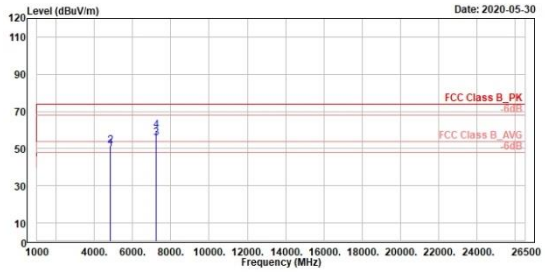
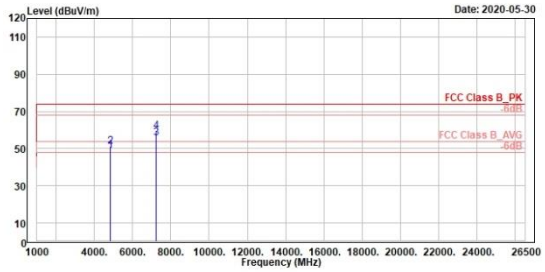


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1 !	4824.00	49.53	59.67	-10.14	54.00	-4.47	112	61	Average	horizontal	
2	4824.00	51.37	61.51	-10.14	74.00	-22.63	112	61	Peak	horizontal	
3	7236.00	55.75	63.53	-7.78	86.69	-30.94	263	5	Average	horizontal	Non_RB
4	7236.00	59.62	67.40	-7.78	89.22	-29.60	263	5	Peak	horizontal	Non_RB

Low Channel (Vertical)

TÜV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1 !	4824.00	48.84	58.98	-10.14	54.00	-5.16	394	27	Average	vertical	
2	4824.00	51.06	61.20	-10.14	74.00	-22.94	394	27	Peak	vertical	
3	7236.00	55.64	63.42	-7.78	82.71	-27.07	277	23	Average	vertical	Non_RB
4	7236.00	59.48	67.26	-7.78	85.25	-25.77	277	23	Peak	vertical	Non_RB

802.11b

Middle Channel (Horizontal)

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No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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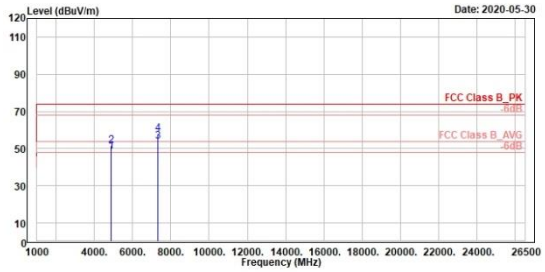

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1 !	4874.00	48.29	58.34	-10.05	54.00	-5.71	301	333	Average	horizontal	
2	4874.00	51.39	61.44	-10.05	74.00	-22.61	301	333	Peak	horizontal	
3 !	7311.00	53.70	61.46	-7.76	54.00	-0.30	268	4	Average	horizontal	
4	7311.00	57.87	65.63	-7.76	74.00	-16.13	268	4	Peak	horizontal	

Middle Channel (Vertical)

TÜV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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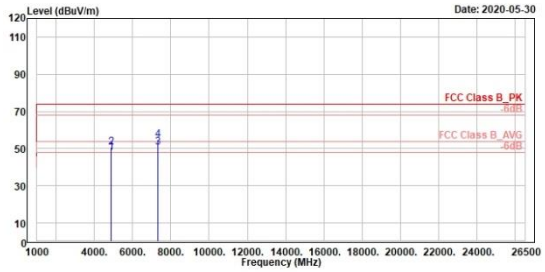

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4874.00	47.72	57.77	-10.05	54.00	-6.28	226	68	Average	vertical	
2	4874.00	50.66	60.71	-10.05	74.00	-23.34	226	68	Peak	vertical	
3 !	7311.00	50.62	58.38	-7.76	54.00	-3.38	279	29	Average	vertical	
4	7311.00	54.89	62.65	-7.76	74.00	-19.11	279	29	Peak	vertical	

802.11b

High Channel (Horizontal)

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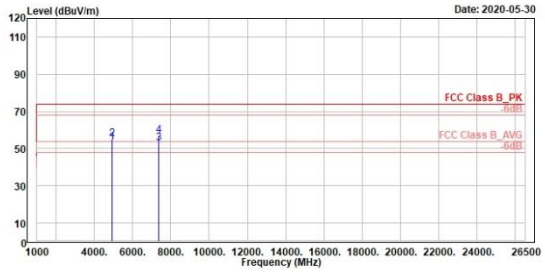

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1 !	4924.00	53.22	63.10	-9.88	54.00	-0.78	313	12	Average	horizontal	
2	4924.00	55.33	65.21	-9.88	74.00	-18.67	313	12	Peak	horizontal	
3 !	7386.00	53.00	60.70	-7.70	54.00	-1.00	272	20	Average	horizontal	
4	7386.00	57.02	64.72	-7.70	74.00	-16.98	272	20	Peak	horizontal	

High Channel (Vertical)

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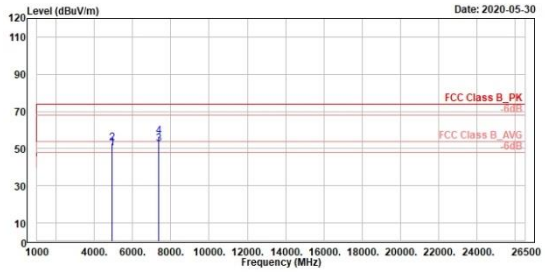

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1 !	4924.00	50.29	60.17	-9.88	54.00	-3.71	320	276	Average	vertical	
2	4924.00	52.79	62.67	-9.88	74.00	-21.21	320	276	Peak	vertical	
3 !	7386.00	52.26	59.96	-7.70	54.00	-1.74	300	37	Average	vertical	
4	7386.00	56.73	64.43	-7.70	74.00	-17.27	300	37	Peak	vertical	

802.11g

Low Channel (Horizontal)

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No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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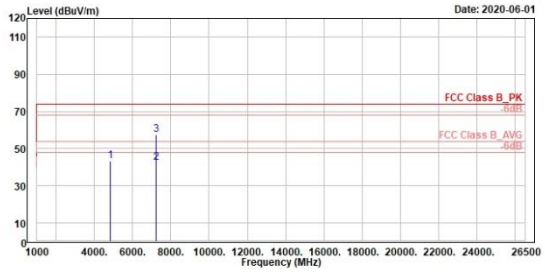

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4824.00	43.45	53.59	-10.14	74.00	-30.55	100	73	Peak	horizontal	
2	7236.00	42.64	50.42	-7.78	54.00	-11.36	282	4	Average	horizontal	
3	7236.00	57.27	65.05	-7.78	74.00	-16.73	282	4	Peak	horizontal	

Low Channel (Vertical)

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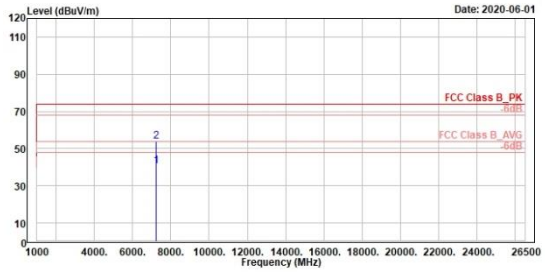
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	7236.00	40.59	48.37	-7.78	54.00	-13.41	100	147	Average	vertical	
2	7236.00	53.97	61.75	-7.78	74.00	-20.03	100	147	Peak	vertical	

802.11g

Middle Channel (Horizontal)

TUV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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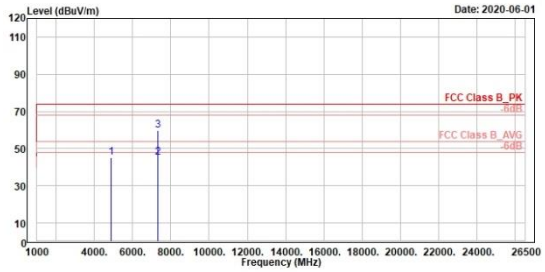

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4874.00	45.26	55.31	-10.05	74.00	-28.74	100	360	Peak	horizontal	
2	7311.00	44.97	52.73	-7.76	54.00	-9.03	276	326	Average	horizontal	
3	7311.00	59.56	67.32	-7.76	74.00	-14.44	276	326	Peak	horizontal	

Middle Channel (Vertical)

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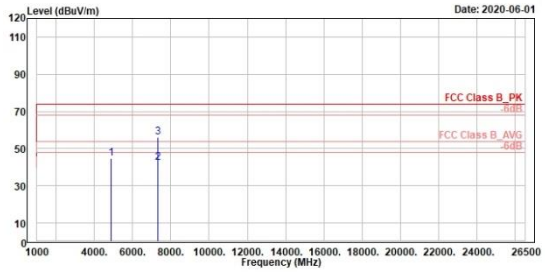

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4874.00	44.90	54.95	-10.05	74.00	-29.10	400	326	Peak	vertical	
2	7311.00	42.58	50.34	-7.76	54.00	-11.42	226	176	Average	vertical	
3	7311.00	56.34	64.10	-7.76	74.00	-17.66	226	176	Peak	vertical	

802.11g

High Channel (Horizontal)

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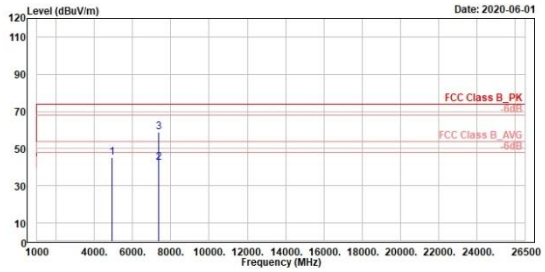

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4924.00	45.28	55.16	-9.88	74.00	-28.72	113	360	Peak	horizontal	
2	7386.00	42.32	50.02	-7.70	54.00	-11.68	275	337	Average	horizontal	
3	7386.00	58.83	66.53	-7.70	74.00	-15.17	275	337	Peak	horizontal	

High Channel (Vertical)

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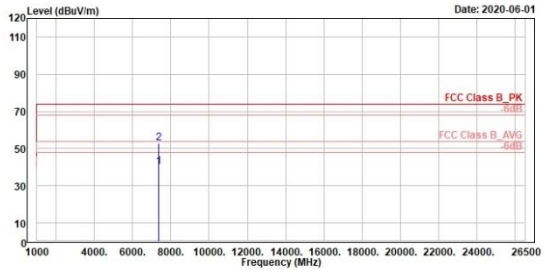

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	7386.00	39.98	47.68	-7.70	54.00	-14.02	400	18	Average	vertical	
2	7386.00	52.87	60.57	-7.70	74.00	-21.13	400	18	Peak	vertical	

802.11n HT20

Low Channel (Horizontal)

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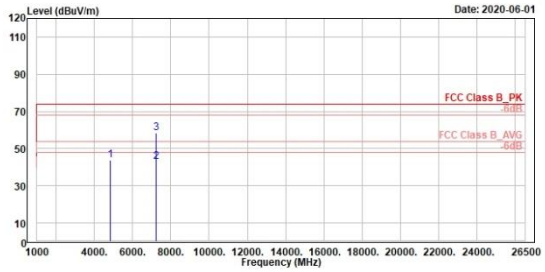

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4824.00	43.84	53.98	-10.14	74.00	-30.16	300	344	Peak	horizontal	
2	7236.00	42.77	50.55	-7.78	54.00	-11.23	274	6	Average	horizontal	
3	7236.00	58.20	65.98	-7.78	74.00	-15.80	274	6	Peak	horizontal	

Low Channel (Vertical)

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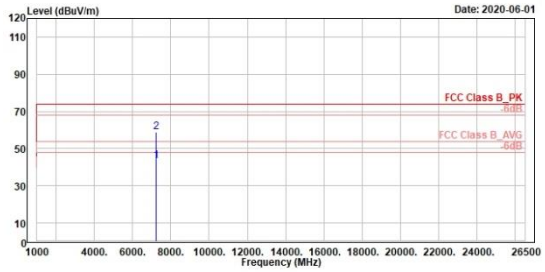

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	7236.00	43.27	51.05	-7.78	54.00	-10.73	275	23	Average	vertical	
2	7236.00	58.95	66.73	-7.78	74.00	-15.05	275	23	Peak	vertical	

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Middle Channel (Horizontal)

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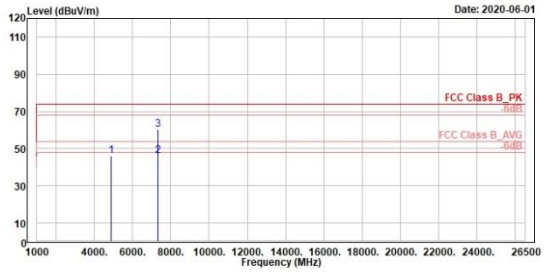

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4874.00	46.28	56.33	-10.05	74.00	-27.72	300	15	Peak	horizontal	
2	7311.00	46.05	53.81	-7.76	54.00	-7.95	269	2	Average	horizontal	
3	7311.00	60.16	67.92	-7.76	74.00	-13.84	269	2	Peak	horizontal	

Middle Channel (Vertical)

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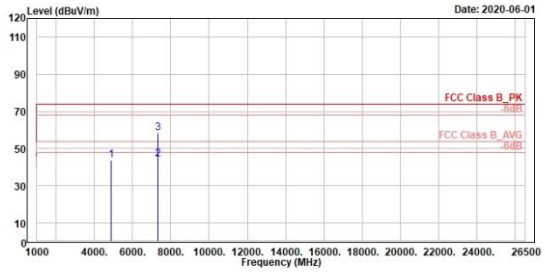

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4874.00	44.00	54.05	-10.05	74.00	-30.00	299	0	Peak	vertical	
2	7311.00	44.43	52.19	-7.76	54.00	-9.57	299	33	Average	vertical	
3	7311.00	58.40	66.16	-7.76	74.00	-15.60	299	33	Peak	vertical	

802.11n HT20

High Channel (Horizontal)

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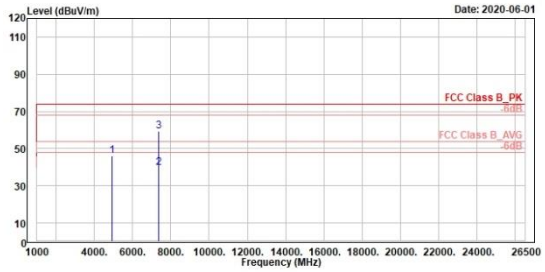

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4924.00	45.94	55.82	-9.88	74.00	-28.06	321	360	Peak	horizontal	
2	7386.00	39.52	47.22	-7.70	54.00	-14.48	272	20	Average	horizontal	
3	7386.00	59.32	67.02	-7.70	74.00	-14.68	272	20	Peak	horizontal	

High Channel (Vertical)

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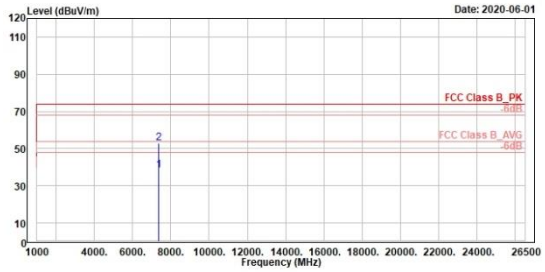

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	7386.00	38.39	46.09	-7.70	54.00	-15.61	270	9	Average	vertical	
2	7386.00	53.11	60.81	-7.70	74.00	-20.89	270	9	Peak	vertical	

Mains Conducted Emission, 150kHz ~ 30MHz

802.11n HT20 2412MHz

(Line)

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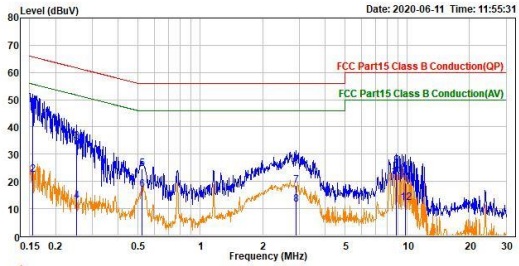

Trace: 1

	Freq MHz	Read Level dBuV	Factor dB	Level dBuV	Over Limit dB	Remark	Pol/Phase	Note
1	0.155	36.08	10.11	46.19	-19.52	QP	line1	
2	0.155	12.50	10.11	22.61	-33.10	Average	line1	
3	0.253	24.56	10.11	34.67	-26.98	QP	line1	
4	0.253	2.81	10.11	12.92	-38.73	Average	line1	
5	0.522	14.43	10.12	24.55	-31.45	QP	line1	
6	0.522	7.00	10.12	17.12	-28.88	Average	line1	
7	2.911	8.45	10.20	18.65	-37.35	QP	line1	
8	2.911	1.22	10.20	11.42	-34.58	Average	line1	
9	8.847	15.66	10.34	26.00	-34.00	QP	line1	
10	8.847	11.15	10.34	21.49	-28.51	Average	line1	
11	9.823	9.14	10.36	19.50	-40.50	QP	line1	
12	9.823	1.79	10.36	12.15	-37.85	Average	line1	

(Neutral)

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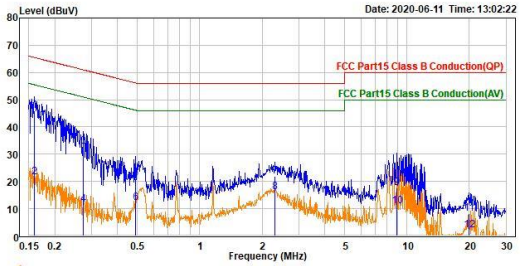

Trace: 1

	Freq MHz	Read Level dBuV	Factor dB	Level dBuV	Over Limit dB	Remark	Pol/Phase	Note
1	0.159	35.68	10.11	45.79	-19.71	QP	neutral	
2	0.159	11.53	10.11	21.64	-33.86	Average	neutral	
3	0.276	22.67	10.11	32.78	-28.17	QP	neutral	
4	0.276	1.43	10.11	11.54	-39.41	Average	neutral	
5	0.489	11.01	10.11	21.12	-35.07	QP	neutral	
6	0.489	1.91	10.11	12.02	-34.17	Average	neutral	
7	2.315	11.70	10.17	21.87	-34.13	QP	neutral	
8	2.315	5.85	10.17	16.02	-29.98	Average	neutral	
9	8.935	7.21	10.34	17.55	-42.45	QP	neutral	
10	8.935	0.69	10.34	11.03	-38.97	Average	neutral	
11	19.935	-2.34	10.57	8.23	-51.77	QP	neutral	
12	19.935	-8.30	10.57	2.27	-47.73	Average	neutral	