FCC Radio Test Report

FCC ID: SI5VRE3000

This report concerns: Original Grant

Project No.	:	1807T004
Equipment	:	Verizon 5G Home Wi-Fi Extender
Test Model	:	VRE3000
Series Model	:	N/A
Applicant	:	U-MEDIA Communications, Inc.
Address	:	9F, No.1, Jin-shan 7th St. Hsinchu Taiwan

Date of Receipt	:	Jul. 02, 2018
Date of Test	:	Jul. 02, 2018 ~ Aug. 13, 2018
Issued Date	:	Aug. 13, 2018
Tested by	:	BTL Inc.

Testing Engineer : Kay Wu
(Kay Wu)

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ilac-MRA TAF Testing Laboratory 0659

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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REPORT ISSUED HISTORY

Issue No.	Description	Issued Date
BTL-FCCP-2-1807T004	Original Issue.	Aug. 13, 2018

1 CERTIFICATION

Equipment	:	Verizon 5G Home Wi-Fi Extender
Brand Name	:	Verizon
Test Model	:	VRE3000
Series Model	:	N/A
Applicant	:	U-MEDIA Communications, Inc.
Manufacturer	:	U-MEDIA Communications, Inc.
Address	:	No. 90, Kuang Fu Nth.Rd., Hsinchu Industrial Park, Hu Kou, Hsinchu, 303, Taiwan
Date of Test	:	Jul. 02, 2018 ~ Aug. 13, 2018
Test Sample	:	Engineering Sample
Standard(s)	:	FCC Part15, Subpart E (§15.407) ANSI C63.10-2013

The above equipment has been tested and found in compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-2-1807T004) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

Test results included in this report is only for the RLAN 5GHz UNII-1 & UNII-3 part.

2 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards.

FCC Part15, Subpart E (§15.407)				
FCC Clause No	**Description**	**Test Result**	**Judgement**	**Remark**
§15.207 §15.407(b)	AC Power Line Conducted Emissions	APPENDIX A	Pass	------
§15.205 §15.209 §15.407(b)	Radiated Emissions	APPENDIX B APPENDIX C APPENDIX D	Pass	------
§15.407(a)	Bandwidth	APPENDIX E	Pass	------
§15.407(a)	Peak Output Power	APPENDIX F	Pass	------
§15.407(a)	Power Spectral Density	APPENDIX G	Pass	------
§15.407(g)	Frequency Stability	APPENDIX H	Pass	------
§15.203	Antenna Requirement	------	Pass	------
§15.407(c)	Automatically Discontinue Transmission	------	Pass	**NOTE (2)**

NOTE:
(1) ”N/A” denotes test is not applicable in this Test Report.
(2) During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving.
The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report:
CB05: (FCC RN:674415; FCC DN:TW0659)
No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
CB15: (VCCI RN: R-20020; FCC RN:674415; FCC DN:TW0659; ISED Assigned Code:20088-5)
No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

The reported uncertainty of measurement y ± U, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U (dB)
C05	CISPR	150 kHz ~ 30MHz	2.68	C05

B. Radiated emissions below 1 GHz test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U (dB)
CB15 (3m)	CISPR	30 MHz ~ 200 MHz	V	4.20
		30 MHz ~ 200 MHz	H	3.64
		200 MHz ~ 1,000 MHz	V	4.56
		200 MHz ~ 1,000 MHz	H	3.90

C. Radiated emissions above 1 GHz test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U (dB)
CB15 (3m)	CISPR	1 GHz ~ 6 GHz	V	4.46
		1 GHz ~ 6 GHz	H	4.40
		6 GHz ~18 GHz	V	3.88
		6 GHz ~18 GHz	H	4.00

Test Site	Method	Measurement Frequency Range	U (dB)
CB15 (1m)	CISPR	18 GHz ~ 26.5 GHz	4.62
		26.5 GHz ~ 40 GHz	5.12

D. Conducted tests:

Item	Method	U
Bandwidth	ANSI	3.8 %
Output Power	ANSI	0.95 dB
Power Spectral Density	ANSI	0.86 dB
Conducted Spurious Emissions	ANSI	2.71 dB

NOTE:
Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.
Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our U_{lab} values in CISPR 16-4-2 terminology.
Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR}, as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB
Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

3 GENERAL INFORMATION

3.1 DESCRIPTION OF EUT

Equipment	Verizon 5G Home Wi-Fi Extender	
Brand Name	Verizon	
Test Model	VRE3000	
Series Model	N/A	
Model Difference	N/A	
Power Source	DC Voltage supplied from AC/DC adapter.	
Power Rating	#1 Ktec / KSA-24W-120200HU I/P: 100-240V~50/60Hz, 0.6A O/P: 12V 2.0A #2 UMEC / UP0251M-12PA I/P: 100-240V~50/60Hz, 0.6A MAX O/P: +12V 2A, 24W MAX	
Product Specification	Operation Frequency	UNII-1: 5150 MHz to 5250 MHz UNII-3: 5725 MHz to 5850 MHz
	Modulation Type	OFDM
	Bit Rate of Transmitter	up to 1733 Mbps
	Maximum Output Power for UNII-1	IEEE 802.11a: 23.18 dBm (0.2080 W) IEEE 802.11n (HT20): 21.88 dBm (0.1541 W) IEEE 802.11n (HT40): 21.76 dBm (0.1500 W) IEEE 802.11ac (HT20): 21.25 dBm (0.1335 W) IEEE 802.11ac (HT40): 21.34 dBm (0.1362 W) IEEE 802.11ac (VHT80): 20.39 dBm (0.1094 W)
	Maximum Output Power for UNII-3	IEEE 802.11a: 22.12 dBm (0.1628 W) IEEE 802.11n (HT20): 21.21 dBm (0.1320 W) IEEE 802.11n (HT40): 19.96 dBm (0.0991 W) IEEE 802.11ac (HT20): 20.23 dBm (0.1054 W) IEEE 802.11ac (HT40): 19.58 dBm (0.0908 W) IEEE 802.11ac (VHT80): 19.61 dBm (0.0914 W)
Product Covered	2 * Adapter: (1) Ktec / KSA-24W-120200HU (2) UMEC / UP0251M-12PA	

NOTE:
(1) For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
(2) Channel List:

UNII-1					
IEEE 802.11a IEEE 802.11n (HT20) IEEE 802.11ac (HT20)		IEEE 802.11n (HT40) IEEE 802.11ac (HT40)		IEEE 802.11ac (VHT80)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

UNII-3					
IEEE 802.11a IEEE 802.11n (HT20) IEEE 802.11ac (HT20)		IEEE 802.11n (HT40) IEEE 802.11ac (HT40)		IEEE 802.11ac (VHT80)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

(3) Table for Filed Antenna:

Group 1:

UNII-1:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC1	Galtronics	02102142-06808Ax	PCB	iPEX	3.4
JC3	Galtronics	02102142-06808Ax	PCB	iPEX	3.4
JC4	Galtronics	02102142-06808Ax	PCB	iPEX	3.4
JC5	Galtronics	02102142-06808Ax	PCB	iPEX	3.4

UNII-3:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC6	Galtronics	02102140-06808Ax	PCB	iPEX	3.8
JC7	Galtronics	02102140-06808Ax	PCB	iPEX	3.8

Group 2:

UNII-1:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC1	Galtronics	02102142-06808Cx	PCB	iPEX	3.1
JC3	Galtronics	02102142-06808Cx	PCB	iPEX	3.1
JC4	Galtronics	02102142-06808Cx	PCB	iPEX	3.1
JC5	Galtronics	02102142-06808Cx	PCB	iPEX	3.1

UNII-3:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
JC6	Galtronics	02102140-06808Bx	PCB	iPEX	3.0
JC7	Galtronics	02102140-06808Bx	PCB	iPEX	3.0

NOTE:

(a) The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and receivers (UNII-1: 4T4R, UNII-3: 2T2R). 2.4 GHz and 5GHz can transmit simultaneously.

(b) For UNII-1:
All JC1, JC3, JC4 and JC5 can be used as transmitting/receiving antenna.
C1, JC3, JC4 and JC5 could transmit/receive simultaneously.
The C1 + JC3 + JC4 + JC5 generated the worst case, so it was selected to test and record in the report.
For UNII-3:
All JC6 and JC7 can be used as transmitting/receiving antenna.
JC6 and JC7 could transmit/receive simultaneously.
The C6 + JC7 generated the worst case, so it was selected to test and record in the report.

(c) The EUT UNII-1 (N mode & AC mode) is with beamforming function.
The UNII-1 beamforming gain is 4.46 dB.
The EUT UNII-3 does not support beamforming function.

(d) For Power Spectral Density
For UNII-1 (A mode in CDD mode):
Directional Gain = 10log [$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{Gn/20})^2/N_{ANT}$] = 9.42 dBi.
The Direction gain exceeds 6 dBi, so the reduced power spectral density limits =
Limit - (Directional Gain - 6 dBi) = 17 - (9.42 - 6) = 13.58 dBm/MHz.
For UNII-1 (N mode & AC mode in beamforming mode):
Directional Gain = 10log [$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{Gn/20})^2/N_{ANT}$] = 9.42 dBi.
The Direction gain exceeds 6 dBi, so the reduced power spectral density limits =
Limit - (Directional Gain + Beamforming Gain - 6 dBi) = 17 - (9.42 + 4.46 - 6) = 9.12 dBm/MHz.
For UNII-3 (CDD mode):
Directional Gain = 10log [$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{Gn/20})^2/N_{ANT}$] = 6.81 dBi.
The Direction gain exceeds 6 dBi, so the reduced power spectral density limits =
Limit - (Directional Gain - 6 dBi) = 30 - (6.81 - 6) = 29.19 dBm/MHz.

(e) For Conducted Output Power (CDD mode)
For UNII-1:
For $N_{ANT} = 4 < 5$,
Direction gain = $G_{ANT} + 0 = 3.4 + 0 = 3.4$ dBi.
The Direction gain is less than 6 dBi, so conducted power limits will not be reduced.
For UNII-3:
For $N_{ANT} = 2 < 5$,
Direction gain = $G_{ANT} + 0 = 3.8 + 0 = 3.8$ dBi.
The Direction gain is less than 6 dBi, so conducted power limits will not be reduced.

(f) For Conducted Output Power (beamforming mode)
For UNII-1 (N mode & AC mode in beamforming mode):
Directional Gain = G_{ANT} + 10log (N_{ANT}/N_{SS}) = 3.4 dBi + 10log (4/1) = 9.42 dBi.
The Direction gain exceeds 6 dBi, so the reduced conducted output power limits =
Limit - (Directional Gain + Beamforming Gain + 6 dBi) = 30 - (9.42 + 4.46 - 6) = 22.12 dBm.
For UNII-3: does not support beamforming function.

3.2 TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.
Following mode(s) as (were) found to be the worst case(s) and selected for the final test.
For CDD mode:

AC power line conducted emissions test	
Test Mode	Description
6	UNII-1_TX AC (VHT80) MODE CHANNEL 42
7	UNII-3_TX A MODE CHANNEL 149

For CDD mode:

Radiated emissions test	
Test Mode	Description
1	UNII-1_TX A MODE CHANNEL 36/40/48
2	UNII-1_TX N (HT20) MODE CHANNEL 36/40/48
3	UNII-1_TX N (HT40) MODE CHANNEL 38/46
6	UNII-1_TX AC (VHT80) MODE CHANNEL 42
7	UNII-3_TX A MODE CHANNEL 149/157/165
8	UNII-3_TX N (HT20) MODE CHANNEL 149/157/165
9	UNII-3_TX N (HT40) MODE CHANNEL 151/159
10	UNII-3_TX AC (VHT80) MODE CHANNEL 155

For CDD mode:

Conducted test	
Test Mode	Description
1	UNII-1_TX A MODE CHANNEL 36/40/48
2	UNII-1_TX N (HT20) MODE CHANNEL 36/40/48
3	UNII-1_TX N (HT40) MODE CHANNEL 38/46
6	UNII-1_TX AC (VHT80) MODE CHANNEL 42
7	UNII-3_TX A MODE CHANNEL 149/157/165
8	UNII-3_TX N (HT20) MODE CHANNEL 149/157/165
9	UNII-3_TX N (HT40) MODE CHANNEL 151/159
10	UNII-3_TX AC (VHT80) MODE CHANNEL 155

For beamforming mode:

Radiated emissions test	
Test Mode	Description
2	UNII-1_TX N (HT20) MODE CHANNEL 36/40/48
3	UNII-1_TX N (HT40) MODE CHANNEL 38/46
4	UNII-1_TX AC (HT20) MODE CHANNEL 36/40/48
5	UNII-1_TX AC (HT40) MODE CHANNEL 38/46
6	UNII-1_TX AC (VHT80) MODE CHANNEL 42

NOTE:
(1) The measurements are performed at the low, middle and high available channels.
(2) The adapter KSA-24W-120200HU was found to be the worst case and used for final test.
(3) For radiated emission tests, the highest output powers were set for final test.
(4) For radiated emission below 1 GHz test, the IEEE 802.11ac (VHT80) for UNII-1 and IEEE 802.11a for UNII-1 were found to be the worst case and recorded.
(5) The EUT contains beamforming and Multi-user MIMO (MU-MIMO) functions and the beamforming mode was found to be the worst case and recorded.
(6) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98 %.

3.3 PARAMETERS OF TEST SOFTWARE

UNII-1			
Test Software	QATool(0.0.1.85)		
Mode	5180 MHz	5200 MHz	5240 MHz
IEEE 802.11a	18	17	19
IEEE 802.11n (HT20)	12	13	12
IEEE 802.11ac (HT20)	12	13	12
Mode	5190 MHz	5230 MHz	
IEEE 802.11n (HT40)	12	11	
IEEE 802.11ac (HT40)	13	12	
Mode	5210 MHz		
IEEE 802.11ac (VHT80)	0D		

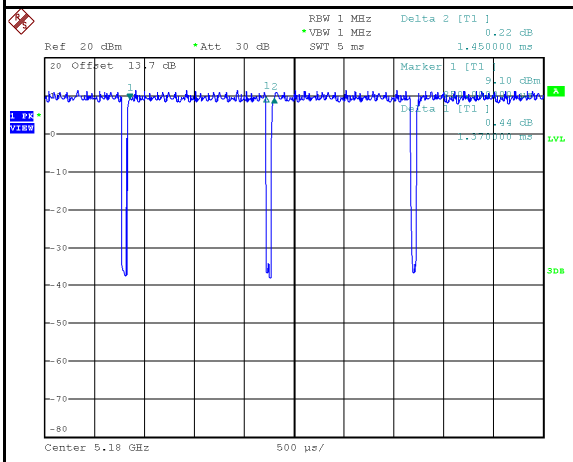
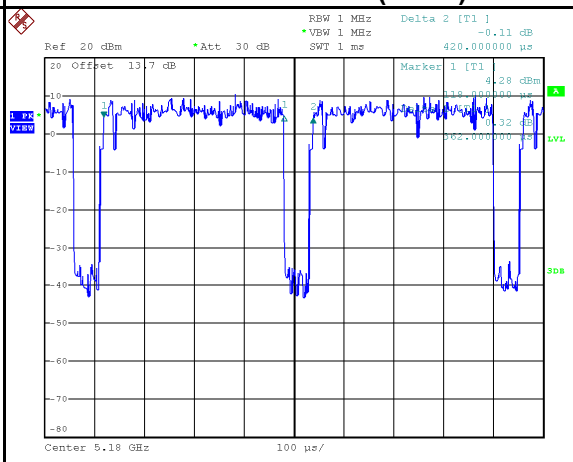
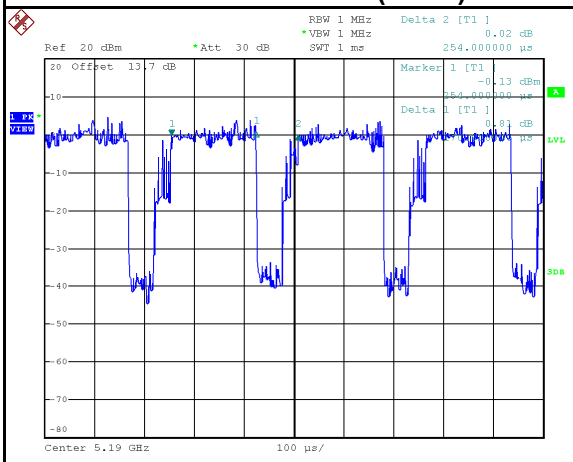
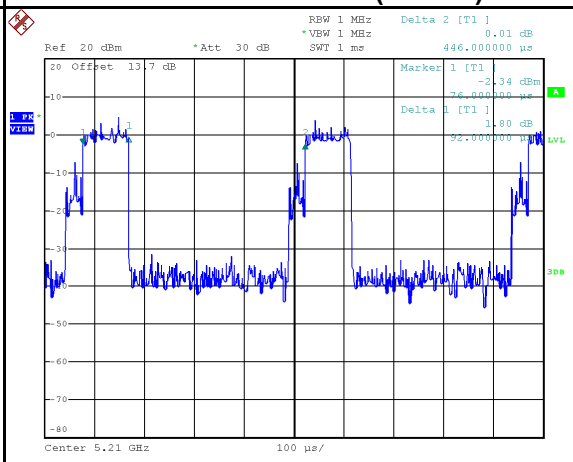
UNII-3			
Test Software	QATool(0.0.1.85)		
Mode	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	11	11	10
IEEE 802.11n (HT20)	11	10	0D
IEEE 802.11ac (HT20)	0F	0F	0B
Mode	5755 MHz	5795 MHz	
IEEE 802.11n (HT40)	10	10	
IEEE 802.11ac (HT40)	10	0F	
Mode	5775 MHz		
IEEE 802.11ac (VHT80)	0D		

NOTE:
(1) The parameter setting of CDD and beamforming mode is the same.

3.4 DUTY CYCLE

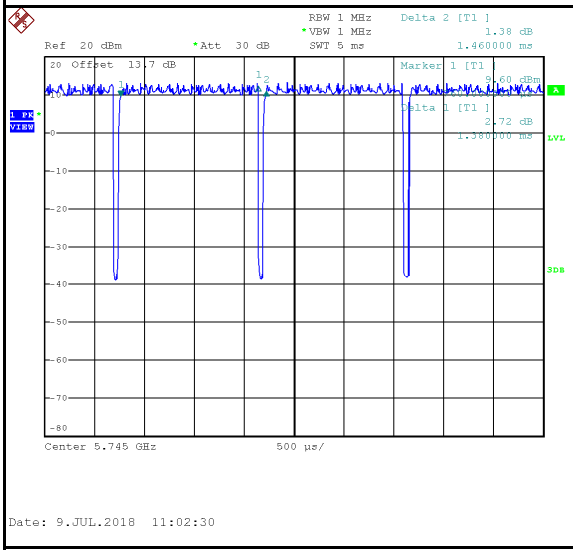
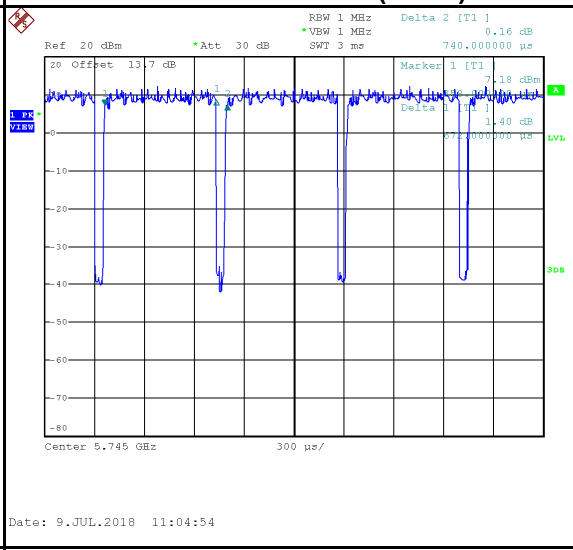
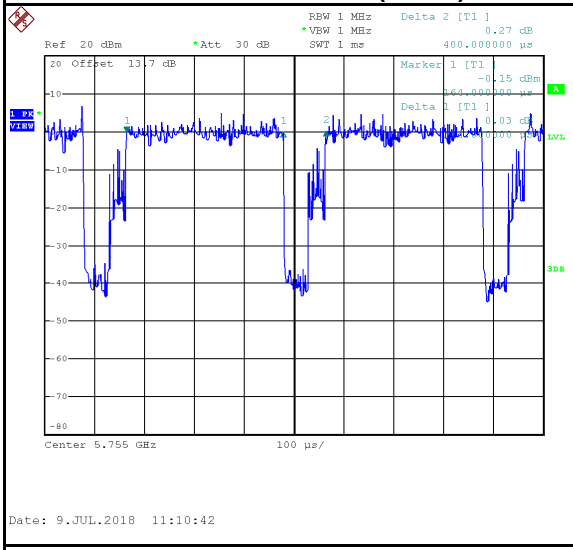
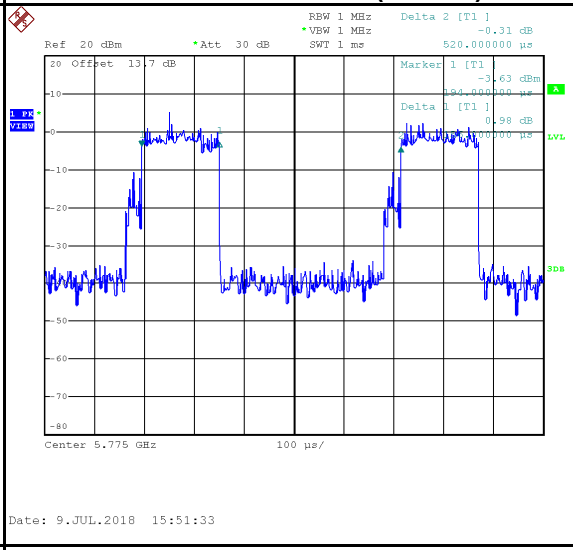
If duty cycle is ≥ 98 %, duty factor is not required.
If duty cycle is < 98 %, duty factor shall be considered.

For UNII-1:

IEEE 802.11a	IEEE 802.11n (HT20)
	
Duty cycle = 1.370 ms / 1.450 ms = 94.48 % Duty Factor = 10 * log(1 / 0.9448) = 0.25 dB	Duty cycle = 0.362 ms / 0.420 ms = 86.19 % Duty Factor = 10 * log(1 / 0.8619) = 0.65 dB
IEEE 802.11n (HT40)	**IEEE 802.11ac (VHT80)**
	
Duty cycle = 0.170 ms / 0.254 ms = 66.93 % Duty Factor = 10 * log(1 / 0.6693) = 1.74 dB	Duty cycle = 0.092 ms / 0.466 ms = 20.63 % Duty Factor = 10 * log(1 / 0.2063) = 6.86 dB

NOTE:
For IEEE 802.11a and IEEE 802.11n (HT20):
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz (Duty cycle < 98%).
For IEEE 802.11n (HT40):
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 2 kHz (Duty cycle < 98%).
For IEEE 802.11ac (VHT80):
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 kHz (Duty cycle < 98%).

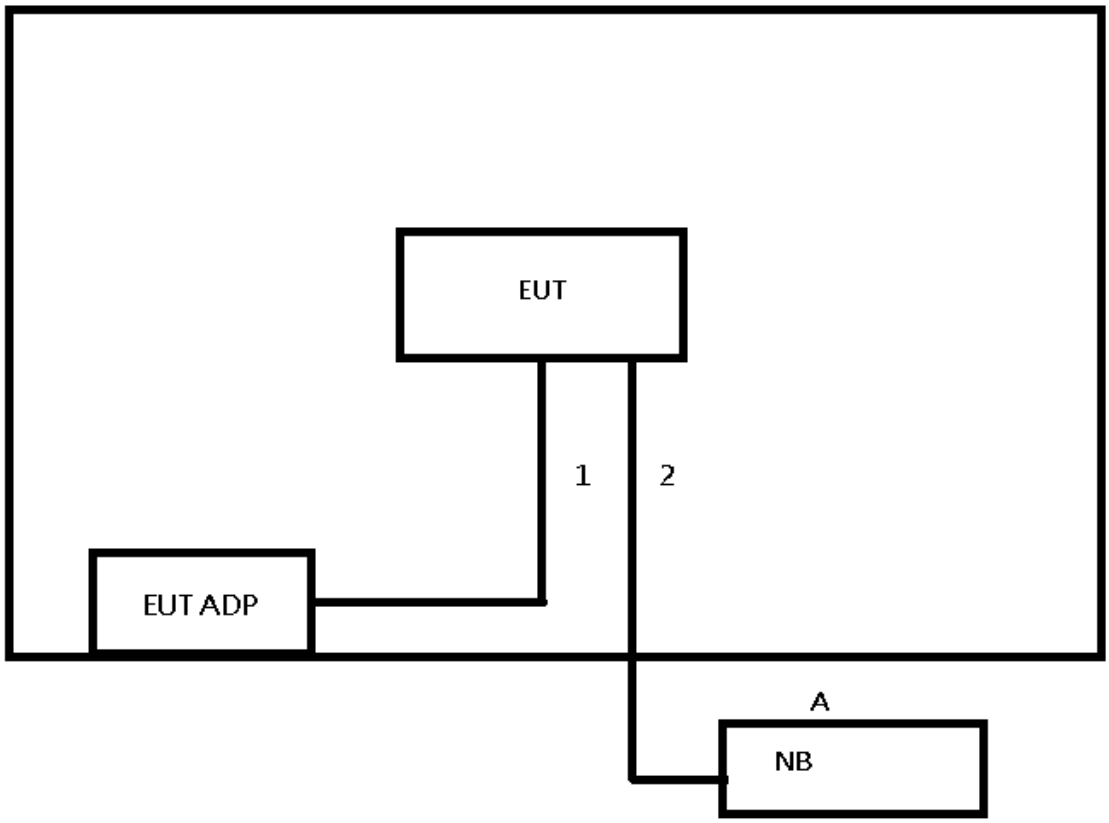
For UNII-3:

IEEE 802.11a	IEEE 802.11n (HT20)
	
Duty cycle = 1.380 ms / 1.460 ms = 94.52 % Duty Factor = 10 * log(1 / 0.9452) = 0.24 dB	Duty cycle = 0.672 ms / 0.740 ms = 90.81 % Duty Factor = 10 * log(1 / 0.9081) = 0.42 dB
IEEE 802.11n (HT40)	**IEEE 802.11ac (VHT80)**
	
Duty cycle = 0.314 ms / 0.400 ms = 78.50 % Duty Factor = 10 * log(1 / 0.7850) = 1.05 dB	Duty cycle = 0.156 ms / 0.520 ms = 30.00 % Duty Factor = 10 * log(1 / 0.3000) = 5.23 dB

NOTE:
For IEEE 802.11a and IEEE 802.11n (HT20):
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz (Duty cycle < 98%).
For IEEE 802.11n (HT40):
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 2 kHz (Duty cycle < 98%).
For IEEE 802.11ac (VHT80):
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 kHz (Duty cycle < 98%).

3.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Equipment letters and Cable numbers refer to item numbers described in the tables of clause 3.6.



3.6 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.	Remarks
A	NB	HP	TPN-I119	5CG7032BNS	Furnished at test lab

Item	Shielded	Ferrite Core	Length	Cable Type	Remarks
1	NO	NO	1 m	Power Cable	Furnished at test lab
2	NO	NO	4 m	RJ45 Cable	Furnished at test lab

4 AC POWER LINE CONDUCTED EMISSIONS TEST

4.1 LIMIT

Frequency (MHz)	Class A (dBμV)		Class B (dBμV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56 *	56 - 46 *
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE:
(1) The tighter limit applies at the band edges.
(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
(3) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor (if use)
Margin Level = Measurement Value – Limit Value

The following table is the setting of the receiver.

Receiver Parameter	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

4.2 TEST PROCEDURE

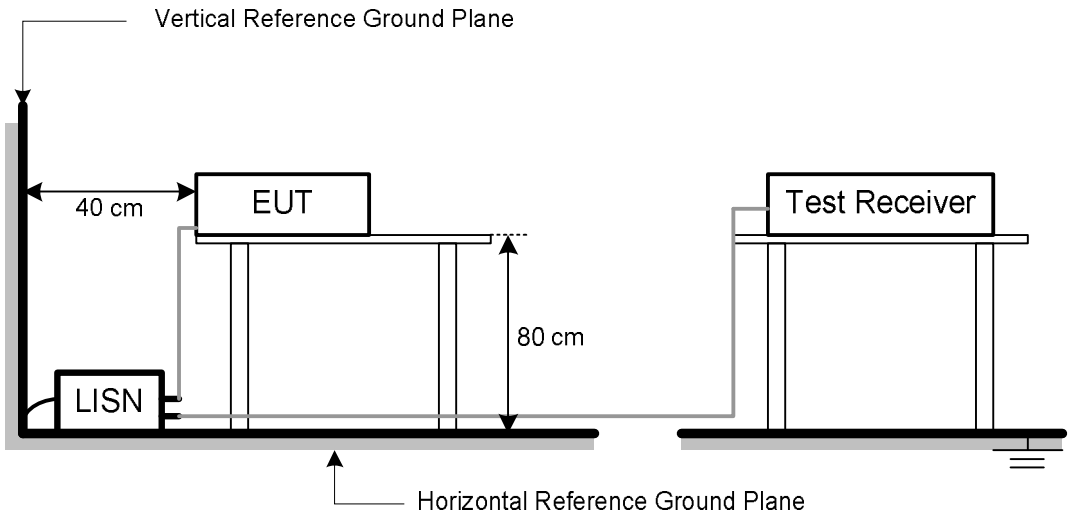
a. The EUT was placed 0.8 m above the horizontal ground plane with the EUT being connected to the power mains through a line impedance stabilization network (LISN).
All other support equipment were powered from an additional LISN(s).
The LISN provides 50 Ohm/50uH of impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle to keep the cable above 40 cm.
c. Excess I/O cables that are not connected to a peripheral shall be bundled in the center.
The end of the cable will be terminated, using the correct terminating impedance.
The overall length shall not exceed 1 m.
d. The LISN is spaced at least 80 cm from the nearest part of the EUT chassis.
e. For the actual test configuration, please refer to the related Item - EUT Test Photos.

NOTE:
1. In the results, each reading is marked as Peak, QP or AVG per the detector used.
BW=9 kHz (6 dB Bandwidth)
2. All readings are Peak unless otherwise stated QP or AVG in column of Note. Both the QP and the AVG readings must be less than the limit for compliance.

4.3 DEVIATION FROM TEST STANDARD

No deviation.

4.4 TEST SETUP



4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in normal link mode.

4.6 TEST RESULT

Temperature: 25 °C Relative Humidity: 45 % Test Voltage: AC 120V/50Hz

Please refer to the APPENDIX A.

5 RADIATED EMISSIONS TEST

5.1 LIMIT

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSIONS MEASUREMENT (9 kHz to 1000 MHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dBμV/m)
5150-5250	-27	68.3
5250-5350	-27	68.3
5470-5725	-27	68.3
5725-5850	-27 (NOTE 2)	68.3
	10 (NOTE 2)	105.3
	15.6 (NOTE 2)	110.9
	27 (NOTE 2)	122.3

NOTE:

1. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength: $E = \frac{1000000\sqrt{30P}}{3}$ μV/m, where P is the eirp (Watts)
2. According to FCC 16-24,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.

5.2 TEST PROCEDURE

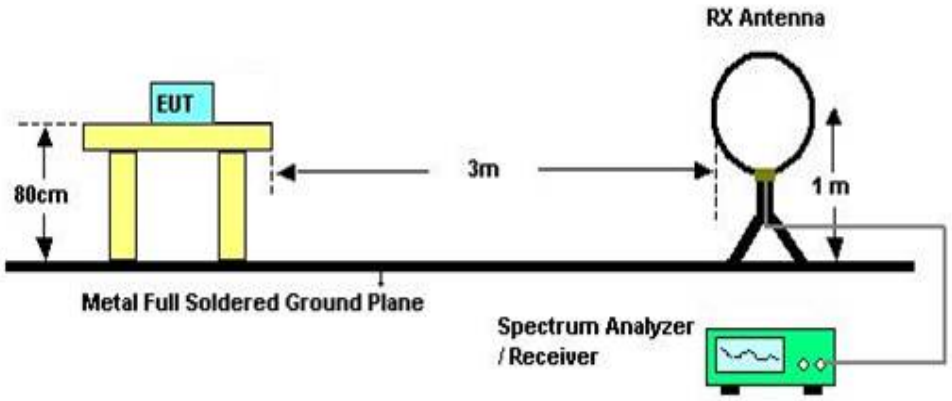
a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5 m, the height of the test antenna shall vary between 1 m to 4 m. 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 find the maximum reading (used Bore sight function).
e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform. (below 1GHz)
h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform. (above 1GHz)
i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.3 DEVIATION FROM TEST STANDARD

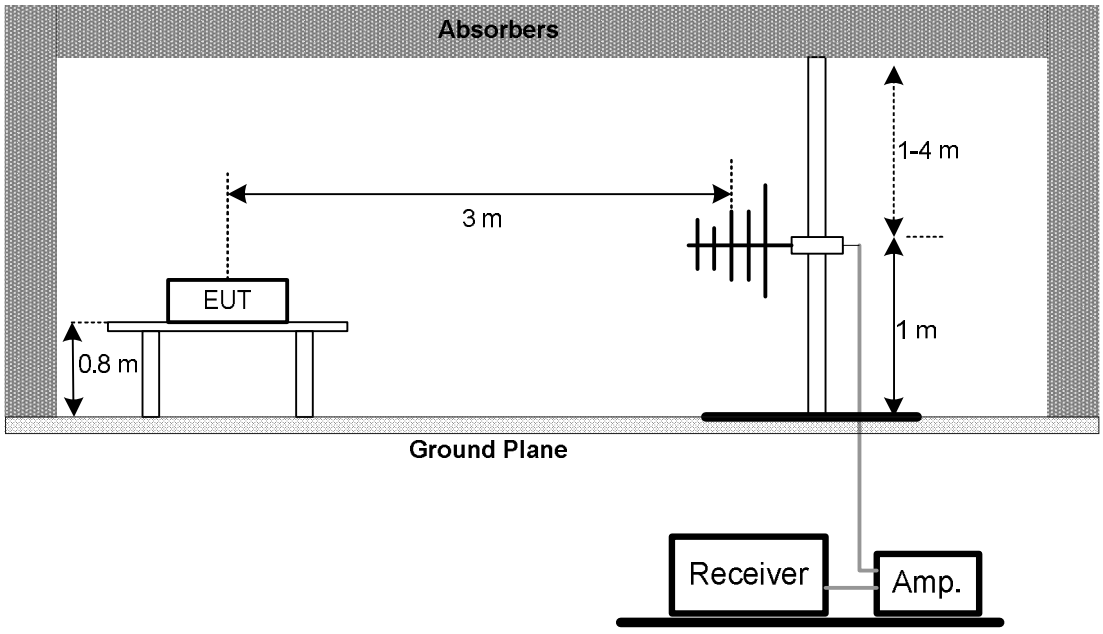
No deviation.

5.4 TEST SETUP

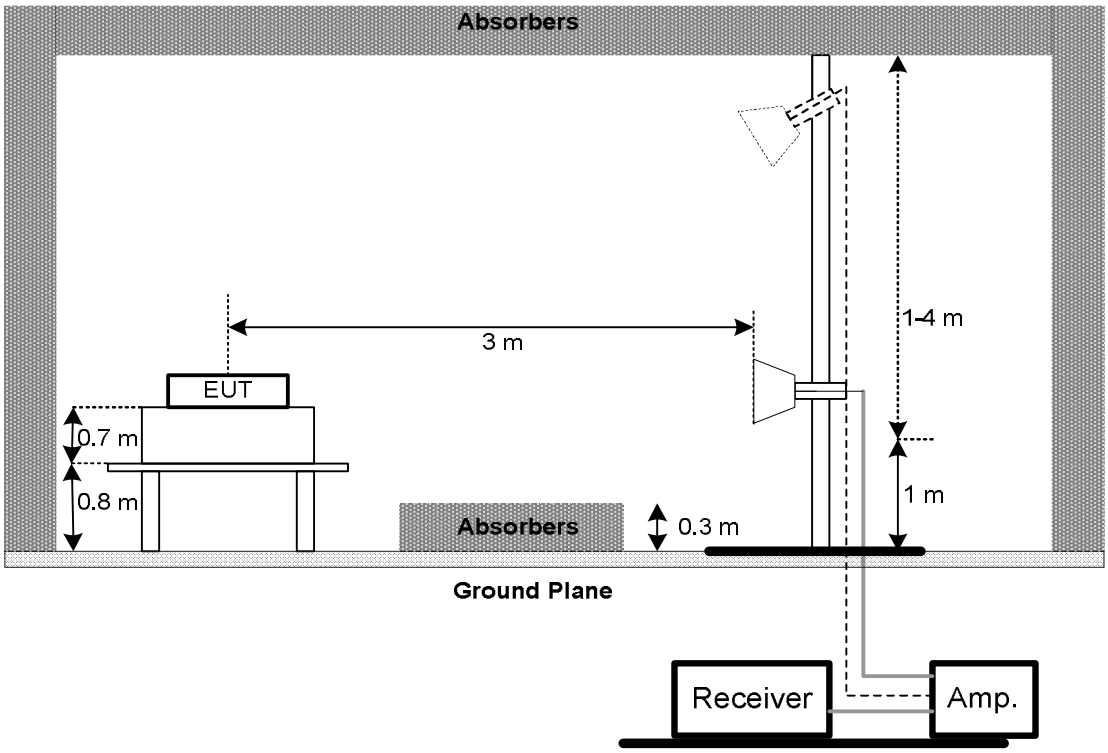
Below 30 MHz



30 MHz to 1 GHz



Above 1 GHz



5.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

5.6 TEST RESULT – 9 KHZ TO 30 MHZ

Temperature: 23 °C Relative Humidity: 70 % Test Voltage: AC 120V/50Hz

Please refer to the APPENDIX B.

NOTE:

(1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
(2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
(3) Limit line = specific limits (dBuV) + distance extrapolation factor.

5.7 TEST RESULT – 30MHZ TO 1000 MHZ

Temperature: 23 °C Relative Humidity: 70 % Test Voltage: AC 120V/50Hz

Please refer to the APPENDIX C.

5.8 TEST RESULT – ABOVE 1000 MHZ

Temperature: 23 °C Relative Humidity: 70 % Test Voltage: AC 120V/50Hz

Please refer to the APPENDIX D.

NOTE:

(1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

6 BANDWIDTH TEST

6.1 LIMIT

FCC Part15, Subpart E (§15.407)		
Section	Test Item	Frequency Range (MHz)
§15.407(a)	26 dB Bandwidth	5150-5250
	Minimum 500 kHz 6 dB Bandwidth	5725-5850

6.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting:

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> 26 dB Bandwidth
RBW	300 kHz(Bandwidth 20 MHz) 1 MHz(Bandwidth 40 MHz and 80 MHz)
VBW	1 MHz(Bandwidth 20 MHz) 3 MHz(Bandwidth 40 MHz and 80 MHz)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

6.3 DEVIATION FROM TEST STANDARD

No deviation.

6.4 TEST SETUP

6.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

6.6 TEST RESULT

Please refer to the APPENDIX E.

7 PEAK OUTPUT POWER TEST

7.1 LIMIT

FCC Part15, Subpart E (§15.407)			
Section	Test Item	Limit	Frequency Range (MHz)
§15.407(a)	Maximum Output Power	Fixed:1 Watt (30 dBm) Mobile and portable: 250 mW (24 dBm)	5150-5250
		1 Watt (30dBm)	5725-5850
Note: The maximum e.i.r.p at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW(21 dBm).			

7.2 TEST PROCEDURE

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below.
b. Spectrum Setting:

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	= 1 MHz
VBW	≥ 3 MHz
Detector	RMS
Trace	Max Hold
Sweep Time	auto

c. The maximum peak conducted output power was performed in accordance with method of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

7.3 DEVIATION FROM TEST STANDARD

No deviation.

7.4 TEST SETUP

7.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

7.6 TEST RESULT

Please refer to the APPENDIX F.

8 POWER SPECTRAL DENSITY

8.1 LIMIT

FCC Part15, Subpart E (§15.407)			
Section	Test Item	Limit	Frequency Range (MHz)
§15.407(a)	Power Spectral Density	Other than Mobile and portable: 17 dBm/MHz Mobile and portable: 11 dBm/MHz	5150-5250
		30 dBm/500 kHz	5725-5850

8.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting:

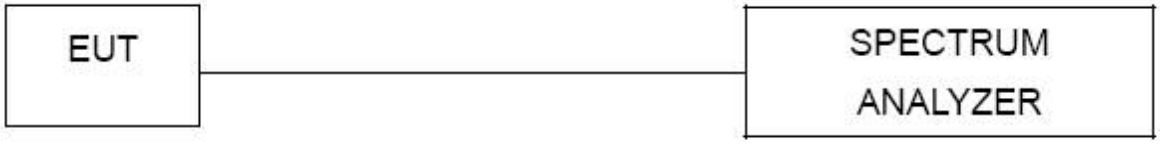
Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	= 1 MHz
VBW	≥ 3 MHz
Detector	RMS
Trace	Max Hold
Sweep Time	Auto

NOTE:
1. For UNII-3, according to FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01, it is acceptable to set RBW at 1 MHz and VBW at 3 MHz if the spectrum analyzer does not have 500 kHz RBW.
2. The value measured with RBW = 1 MHz is to be added with 10log(500 kHz/1 MHz) which is -3 dB. For example, if the measured value is +10 dBm using RBW = 1 MHz (that is +10 dBm/MHz), then the converted value will be +7 dBm/500 kHz.

8.3 DEVIATION FROM TEST STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

8.6 TEST RESULT

Please refer to the APPENDIX G.

9 FREQUENCY STABILITY

9.1 LIMIT

FCC Part15, Subpart E (§15.407)			
Section	Test Item	Limit	Frequency Range (MHz)
15.407(g)	Frequency Stability	Specified in the user's manual	5150-5250
			5725-5850

9.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting:

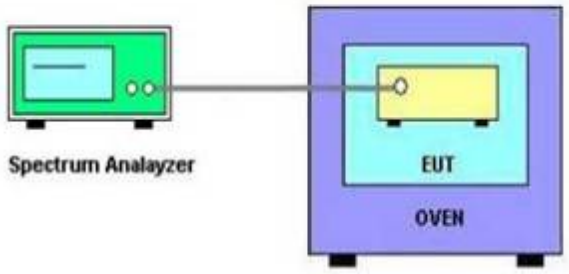
Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RBW	10 kHz
VBW	10 kHz
Sweep Time	Auto

c. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
d. User manual temperature is 0°C~40°C.

9.3 DEVIATION FROM TEST STANDARD

No deviation.

9.4 TEST SETUP



9.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

9.6 TEST RESULT

Please refer to the APPENDIX H.

10 LIST OF MEASURING EQUIPMENTS

AC Power Line Conducted Emissions					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	101050	Mar. 08, 2019
2	Test Cable	EMCI	EMCCFD300-BM-BMR-6000	170715	Aug. 08, 2018
3	EMI Test Receiver	R&S	ESR7	101433	Dec. 10, 2018
4	Measurement Software	EZ	EZ_EMC (Version NB-03A)	N/A	N/A

Radiated Emissions					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Preamplifier	EMCI	012645B	980267	Feb. 27, 2019
2	Preamplifier	EMCI	EMC02325	980217	Dec. 28, 2018
3	Preamplifier	EMCI	EMC2654045	980030	Feb. 13, 2019
4	Test Cable	EMCI	EMC104-SM-SM-8000	8m	Jan. 03, 2019
5	Test Cable	EMCI	EMC104-SM-SM-800	150207	Mar. 15, 2019
6	Test Cable	EMCI	EEMC104-SM-SM-3000	151205	Jan. 03, 2019
7	MXE EMI Receiver	Agilent	N9038A	MY55420127	Jan. 08, 2019
8	Signal Analyzer	Agilent	N9010A	MY52220990	Feb. 21, 2019
9	Loop Ant	EMCI	LPA600	274	May 03, 2019
10	Horm Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	Feb. 27, 2019
11	Horm Ant	Schwarzbeck	BBHA 9170	187	Dec. 05, 2018
12	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-548	Jan. 15, 2019
13	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0623	Jan. 15, 2019

26 dB Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 24, 2019

Peak Output Power					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Aug. 16, 2018
2	Power Sensor	Anritsu	MA2411B	1126001	Aug. 16, 2018

Power Spectral Density					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 24, 2019

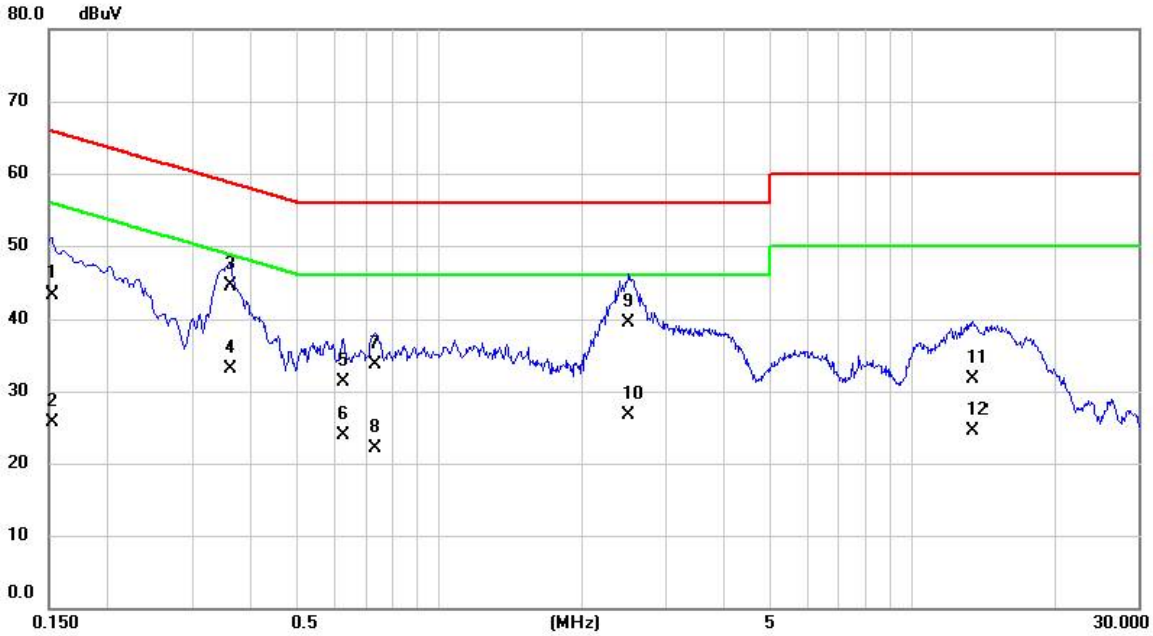
Frequency Stability					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 24, 2019

Remark: “N/A” denotes no model name, no serial no. or no calibration specified.
All calibration period of equipment list is one year.

APPENDIX A AC POWER LINE CONDUCTED EMISSIONS

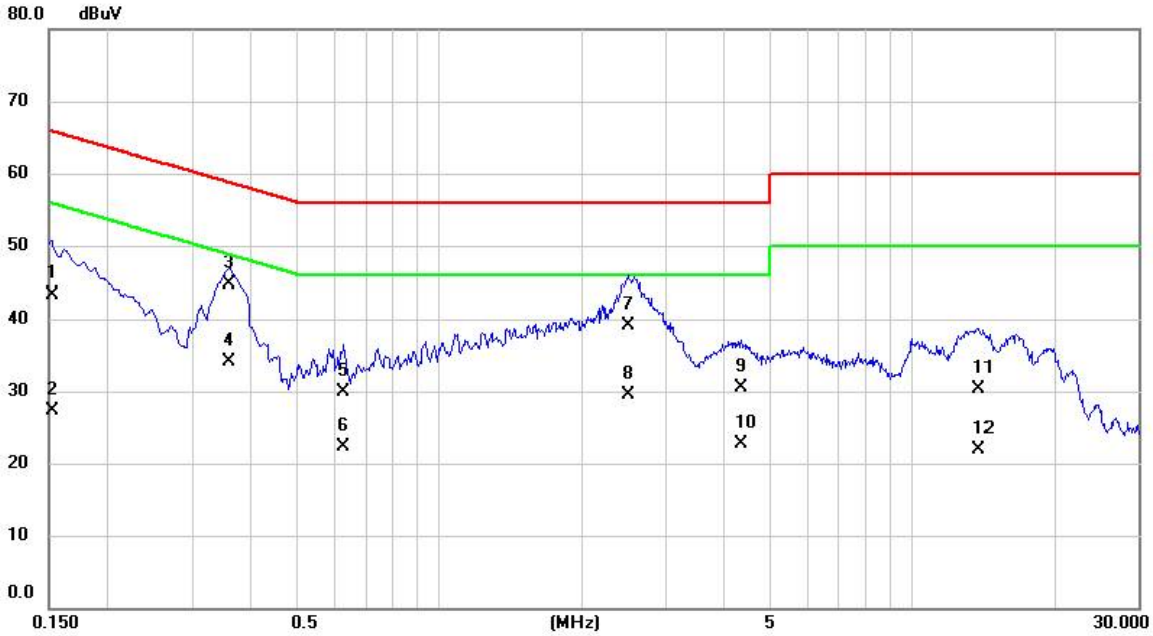
CONTINUE ON NEXT PAGE

Test Mode	UNII-1_TX AC (VHT80) MODE 5210 MHz	Phase	Line



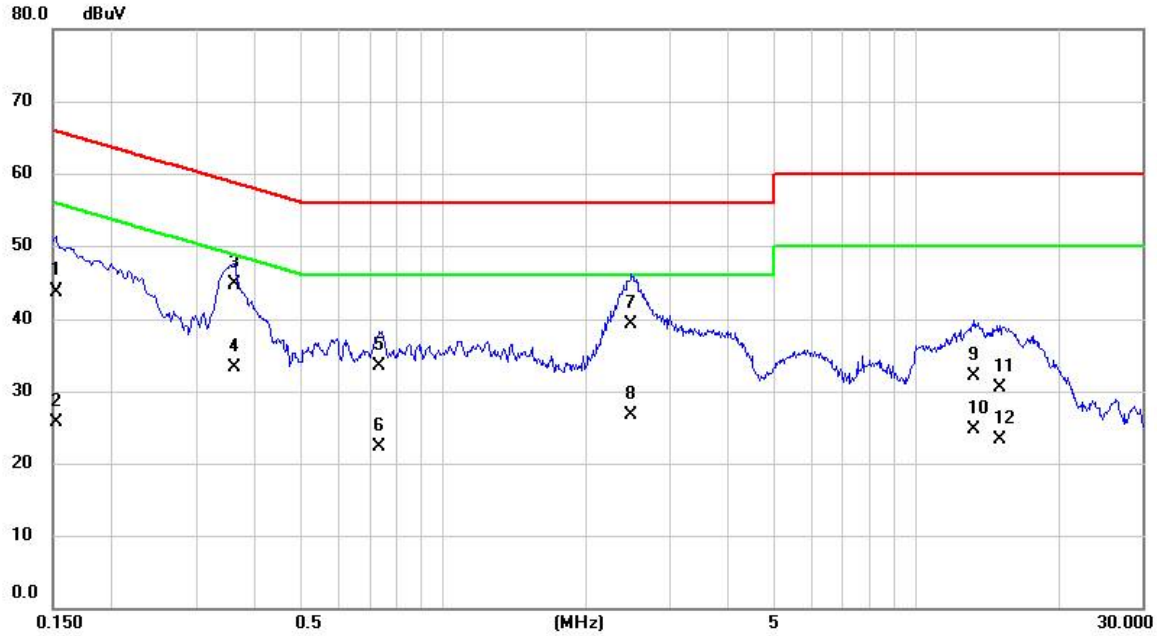
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1522	33.70	9.63	43.33	65.88	-22.55	QP	
2		0.1522	16.00	9.63	25.63	55.88	-30.25	AVG	
3	*	0.3615	34.90	9.65	44.55	58.69	-14.14	QP	
4		0.3615	23.40	9.65	33.05	48.69	-15.64	AVG	
5		0.6292	21.70	9.66	31.36	56.00	-24.64	QP	
6		0.6292	14.20	9.66	23.86	46.00	-22.14	AVG	
7		0.7350	24.10	9.67	33.77	56.00	-22.23	QP	
8		0.7350	12.40	9.67	22.07	46.00	-23.93	AVG	
9		2.5013	29.90	9.70	39.60	56.00	-16.40	QP	
10		2.5013	17.10	9.70	26.80	46.00	-19.20	AVG	
11		13.4228	21.70	9.94	31.64	60.00	-28.36	QP	
12		13.4228	14.50	9.94	24.44	50.00	-25.56	AVG	

Test Mode	UNII-1_TX AC (VHT80) MODE 5210 MHz	Phase	Neutral



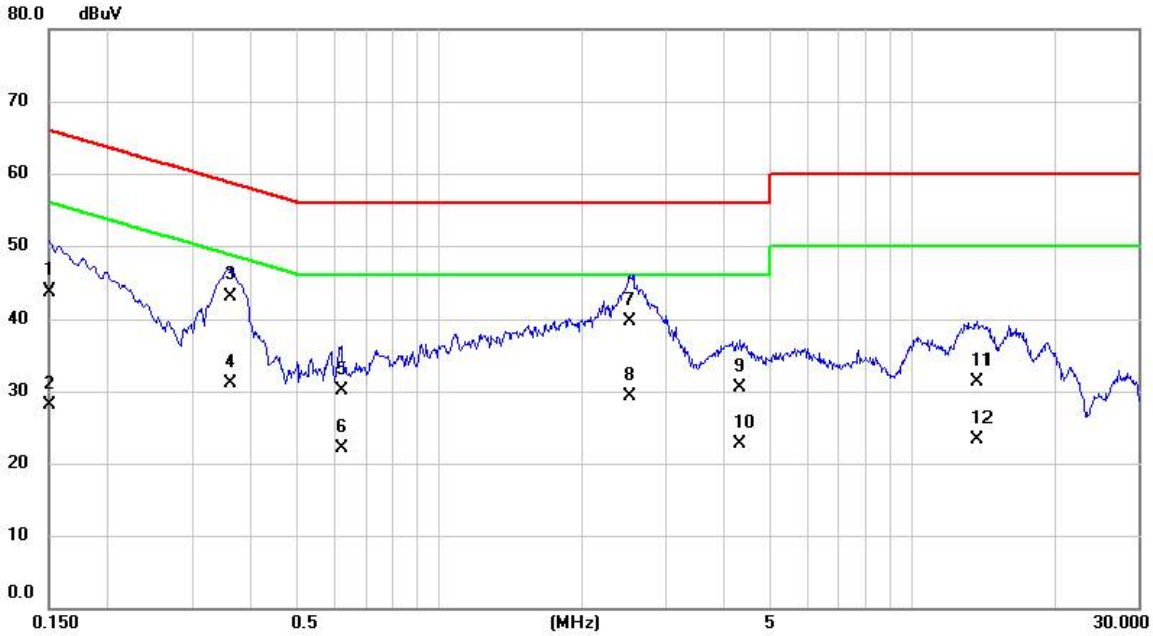
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1522	33.60	9.62	43.22	65.88	-22.66	QP	
2		0.1522	17.60	9.62	27.22	55.88	-28.66	AVG	
3	*	0.3592	35.00	9.64	44.64	58.75	-14.11	QP	
4		0.3592	24.50	9.64	34.14	48.75	-14.61	AVG	
5		0.6292	20.30	9.65	29.95	56.00	-26.05	QP	
6		0.6292	12.70	9.65	22.35	46.00	-23.65	AVG	
7		2.4968	29.50	9.68	39.18	56.00	-16.82	QP	
8		2.4968	19.90	9.68	29.58	46.00	-16.42	AVG	
9		4.3508	20.80	9.73	30.53	56.00	-25.47	QP	
10		4.3508	13.00	9.73	22.73	46.00	-23.27	AVG	
11		13.8345	20.30	9.95	30.25	60.00	-29.75	QP	
12		13.8345	11.90	9.95	21.85	50.00	-28.15	AVG	

Test Mode	UNII-3_TX A MODE 5745 MHz	Phase	Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1522	34.00	9.63	43.63	65.88	-22.25	QP	
2		0.1522	16.10	9.63	25.73	55.88	-30.15	AVG	
3	*	0.3615	35.00	9.65	44.65	58.69	-14.04	QP	
4		0.3615	23.70	9.65	33.35	48.69	-15.34	AVG	
5		0.7350	23.90	9.67	33.57	56.00	-22.43	QP	
6		0.7350	12.70	9.67	22.37	46.00	-23.63	AVG	
7		2.4945	29.60	9.70	39.30	56.00	-16.70	QP	
8		2.4945	17.00	9.70	26.70	46.00	-19.30	AVG	
9		13.2878	22.10	9.94	32.04	60.00	-27.96	QP	
10		13.2878	14.80	9.94	24.74	50.00	-25.26	AVG	
11		14.9235	20.60	9.94	30.54	60.00	-29.46	QP	
12		14.9235	13.40	9.94	23.34	50.00	-26.66	AVG	

Test Mode	UNII-3_TX A MODE 5745 MHz	Phase	Neutral

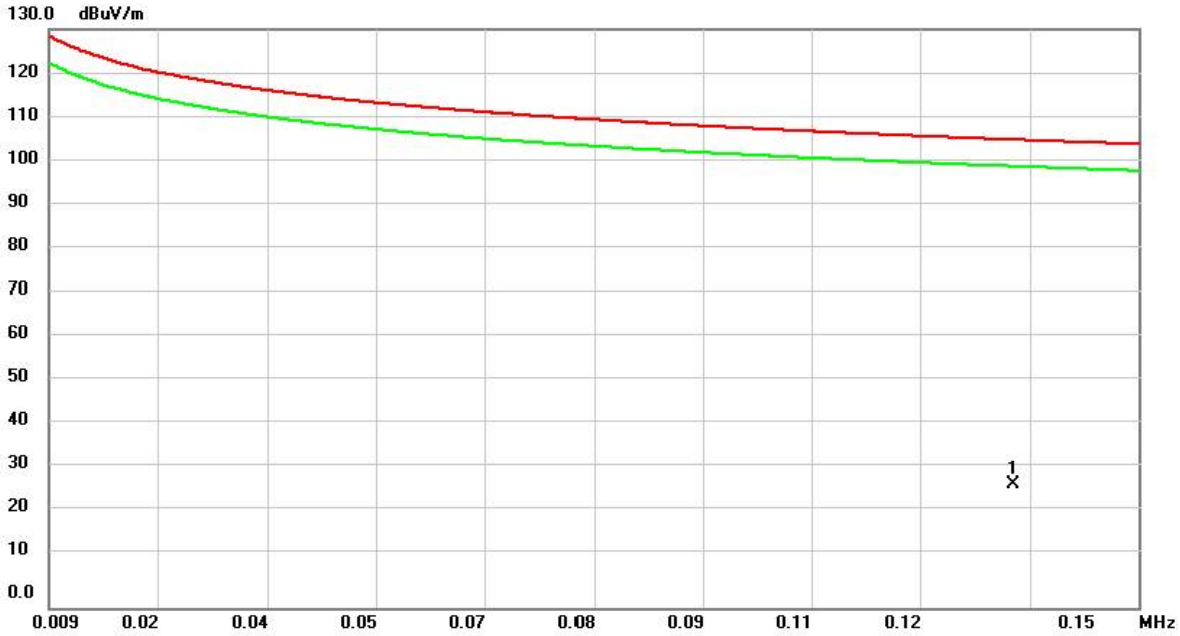


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	34.10	9.62	43.72	66.00	-22.28	QP	
2		0.1500	18.50	9.62	28.12	56.00	-27.88	AVG	
3	*	0.3615	33.50	9.64	43.14	58.69	-15.55	QP	
4		0.3615	21.50	9.64	31.14	48.69	-17.55	AVG	
5		0.6225	20.40	9.65	30.05	56.00	-25.95	QP	
6		0.6225	12.50	9.65	22.15	46.00	-23.85	AVG	
7		2.5260	30.00	9.69	39.69	56.00	-16.31	QP	
8		2.5260	19.70	9.69	29.39	46.00	-16.61	AVG	
9		4.3238	20.70	9.73	30.43	56.00	-25.57	QP	
10		4.3238	13.00	9.73	22.73	46.00	-23.27	AVG	
11		13.7288	21.30	9.94	31.24	60.00	-28.76	QP	
12		13.7288	13.30	9.94	23.24	50.00	-26.76	AVG	

APPENDIX B RADIATED EMISSIONS - 9 KHZ TO 30 MHZ

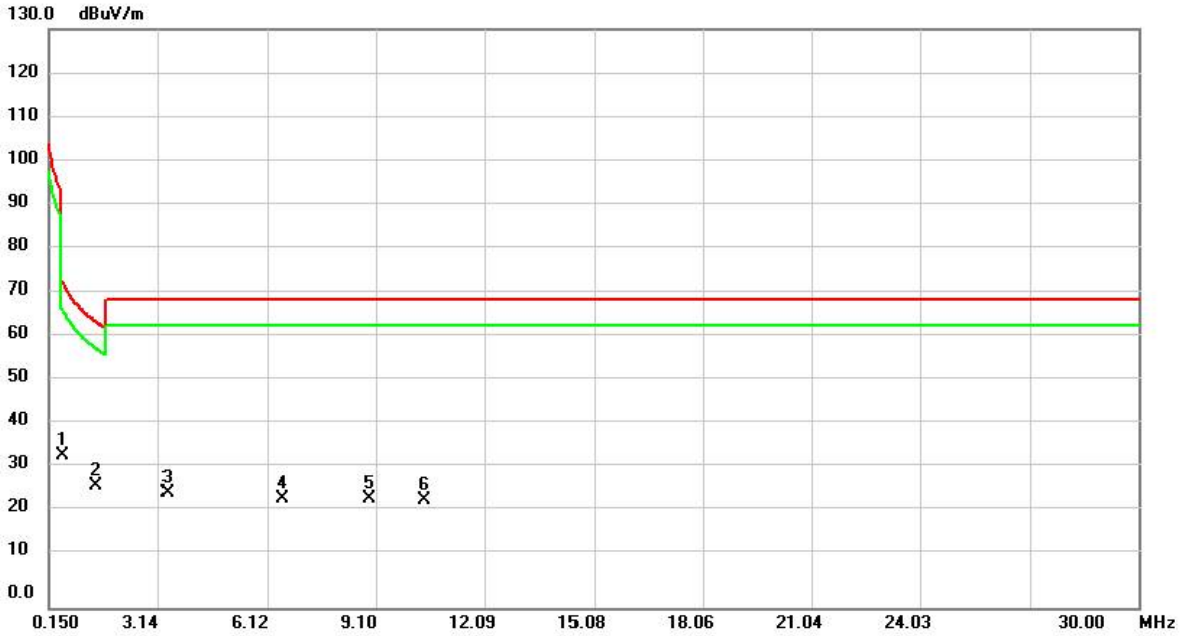
CONTINUE ON NEXT PAGE

Test Mode	UNII-1_TX AC (VHT80) MODE 5210 MHz	Azimuth Angle	90°



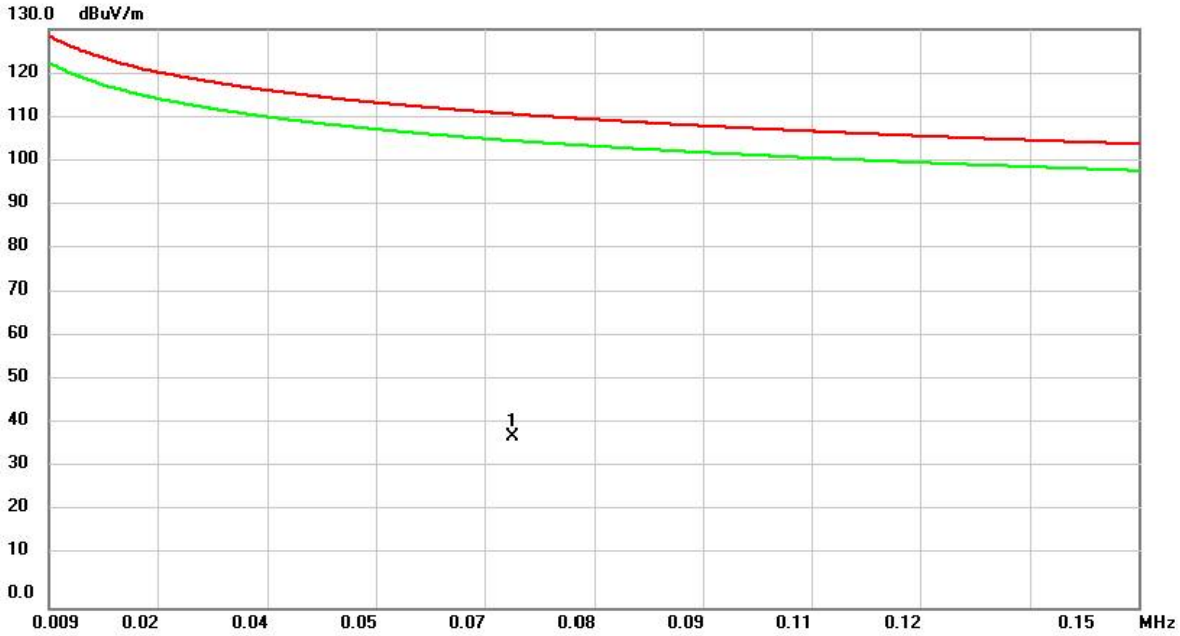
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.1338	13.82	14.11	27.93	105.08	-77.15	peak	

Test Mode	UNII-1_TX AC (VHT80) MODE 5210 MHz	Azimuth Angle	90°



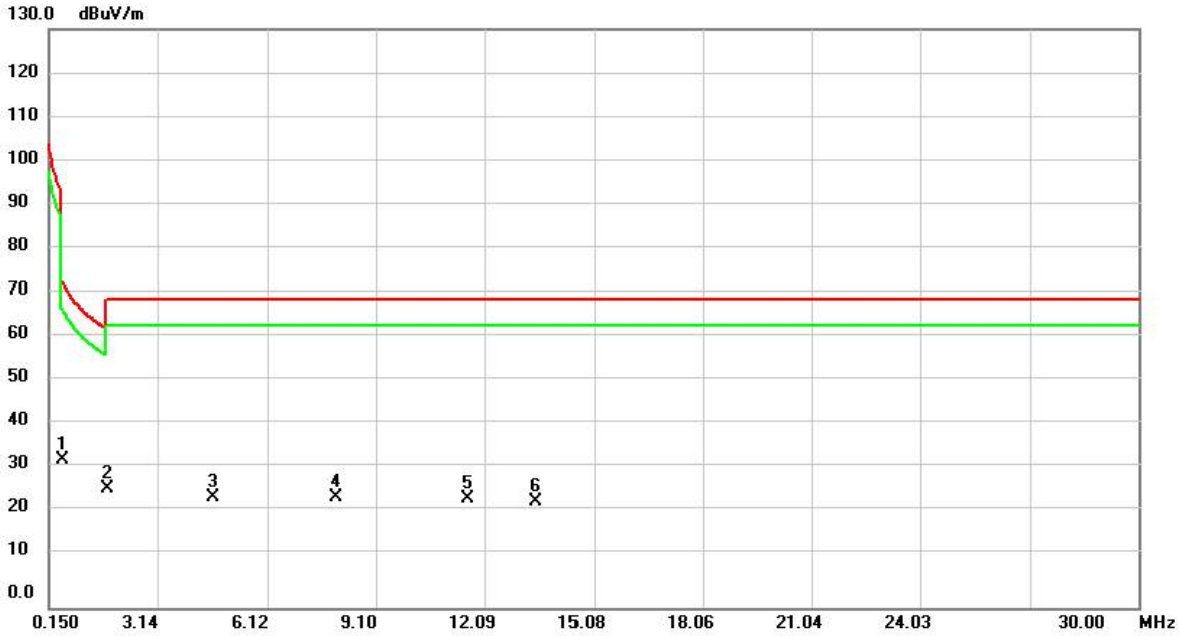
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.5082	30.85	3.43	34.28	73.48	-39.20	peak	
2	*	1.4633	29.14	-1.55	27.59	64.30	-36.71	peak	
3		3.3738	29.55	-3.71	25.84	69.54	-43.70	peak	
4		6.5180	28.77	-4.08	24.69	69.54	-44.85	peak	
5		8.9060	29.11	-4.67	24.44	69.54	-45.10	peak	
6		10.4184	28.98	-4.75	24.23	69.54	-45.31	peak	

Test Mode	UNII-1_TX AC (VHT80) MODE 5210 MHz	Azimuth Angle	0°



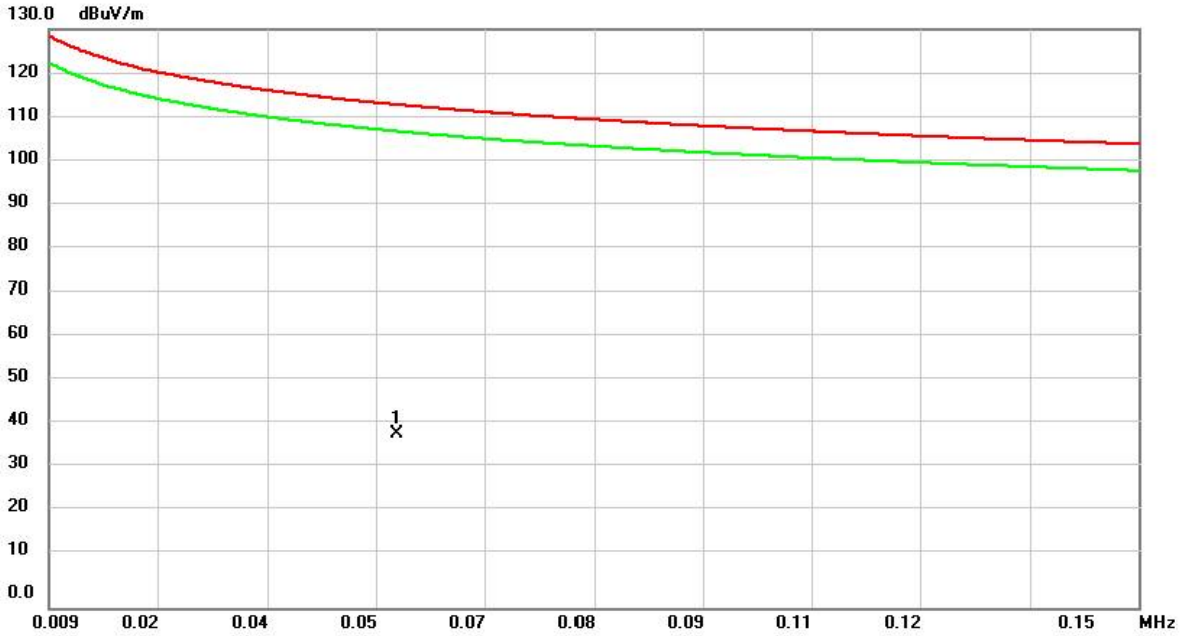
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0690	19.11	19.45	38.56	110.83	-72.27	peak	

Test Mode	UNII-1_TX AC (VHT80) MODE 5210 MHz	Azimuth Angle	0°



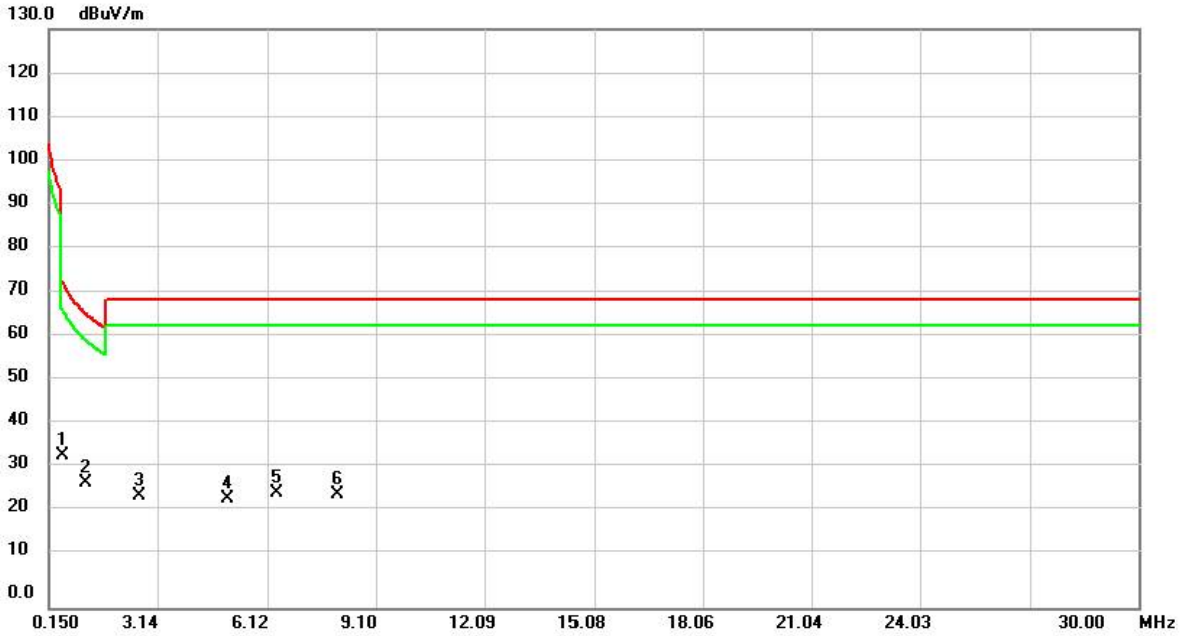
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.5082	30.03	3.43	33.46	73.48	-40.02	peak	
2		1.7420	28.98	-2.27	26.71	69.54	-42.83	peak	
3		4.6076	28.83	-3.88	24.95	69.54	-44.59	peak	
4		7.9906	29.27	-4.32	24.95	69.54	-44.59	peak	
5		11.6124	29.27	-4.81	24.46	69.54	-45.08	peak	
6		13.4830	28.87	-4.82	24.05	69.54	-45.49	peak	

Test Mode	UNII-3_TX A MODE 5745 MHz	Azimuth Angle	90°



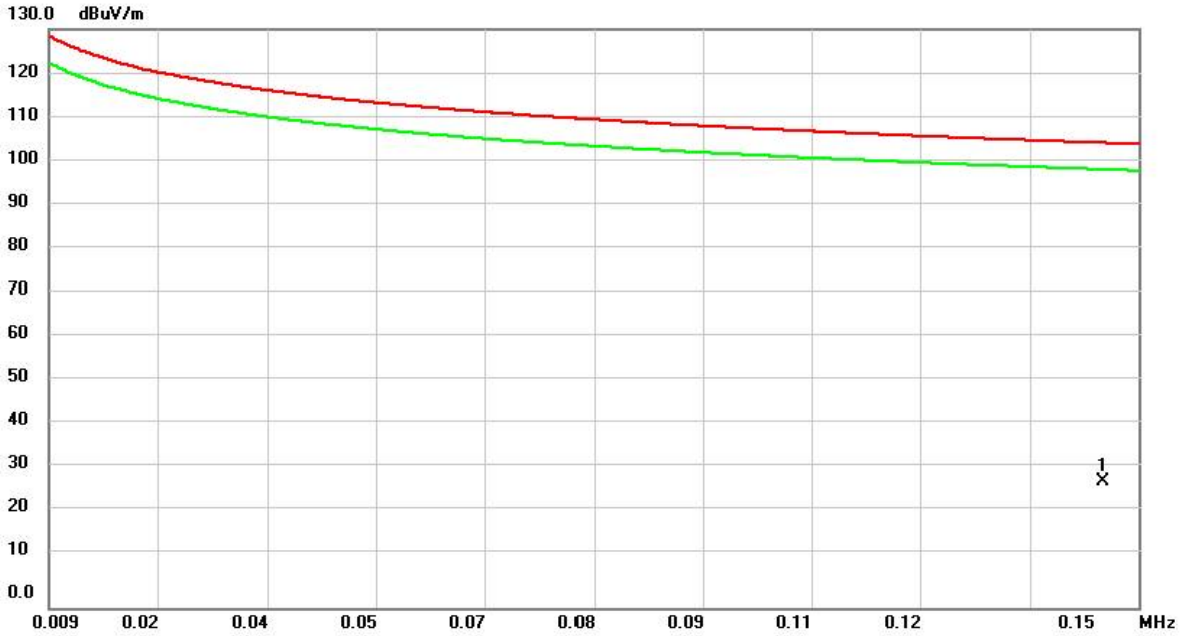
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0541	17.37	21.70	39.07	112.94	-73.87	peak	

Test Mode	UNII-3_TX A MODE 5745 MHz	Azimuth Angle	90°



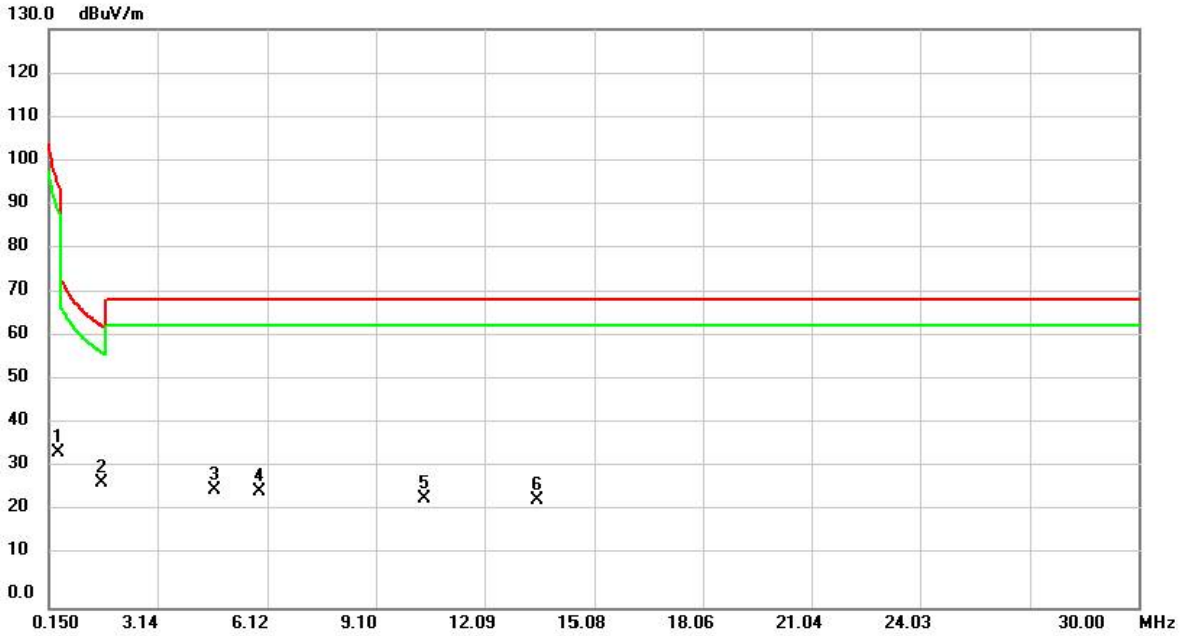
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.5082	30.85	3.43	34.28	73.48	-39.20	peak	
2	*	1.1450	28.71	-0.73	27.98	66.43	-38.45	peak	
3		2.6176	28.62	-3.38	25.24	69.54	-44.30	peak	
4		5.0453	28.36	-3.93	24.43	69.54	-45.11	peak	
5		6.3588	29.84	-4.06	25.78	69.54	-43.76	peak	
6		8.0304	29.96	-4.33	25.63	69.54	-43.91	peak	

Test Mode	UNII-3_TX A MODE 5745 MHz	Azimuth Angle	0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.1454	15.02	13.45	28.47	104.35	-75.88	peak	

Test Mode	UNII-3_TX A MODE 5745 MHz	Azimuth Angle	0°

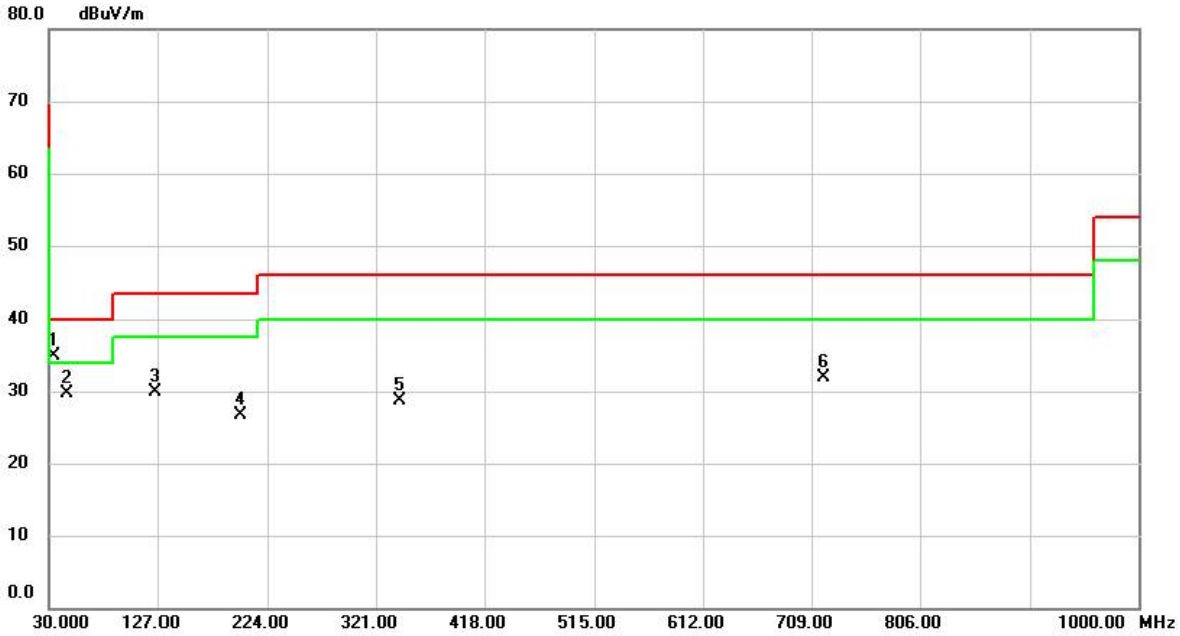


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.4187	30.30	4.60	34.90	95.17	-60.27	peak	
2	*	1.6126	29.93	-1.94	27.99	63.45	-35.46	peak	
3		4.6870	30.29	-3.89	26.40	69.54	-43.14	peak	
4		5.9111	30.30	-4.02	26.28	69.54	-43.26	peak	
5		10.4184	29.40	-4.75	24.65	69.54	-44.89	peak	
6		13.5228	28.98	-4.82	24.16	69.54	-45.38	peak	

APPENDIX C RADIATED EMISSIONS - 30 MHZ TO 1000 MHZ

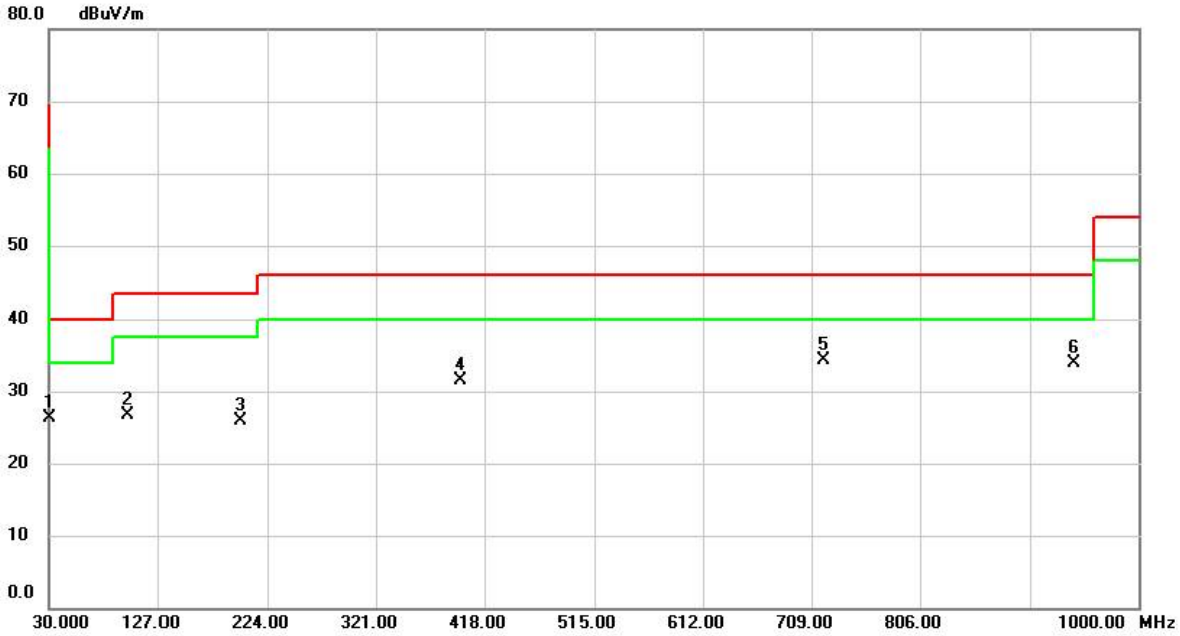
CONTINUE ON NEXT PAGE

Test Mode	UNII-1_TX AC (VHT80) MODE 5210 MHz	Polarization	Vertical



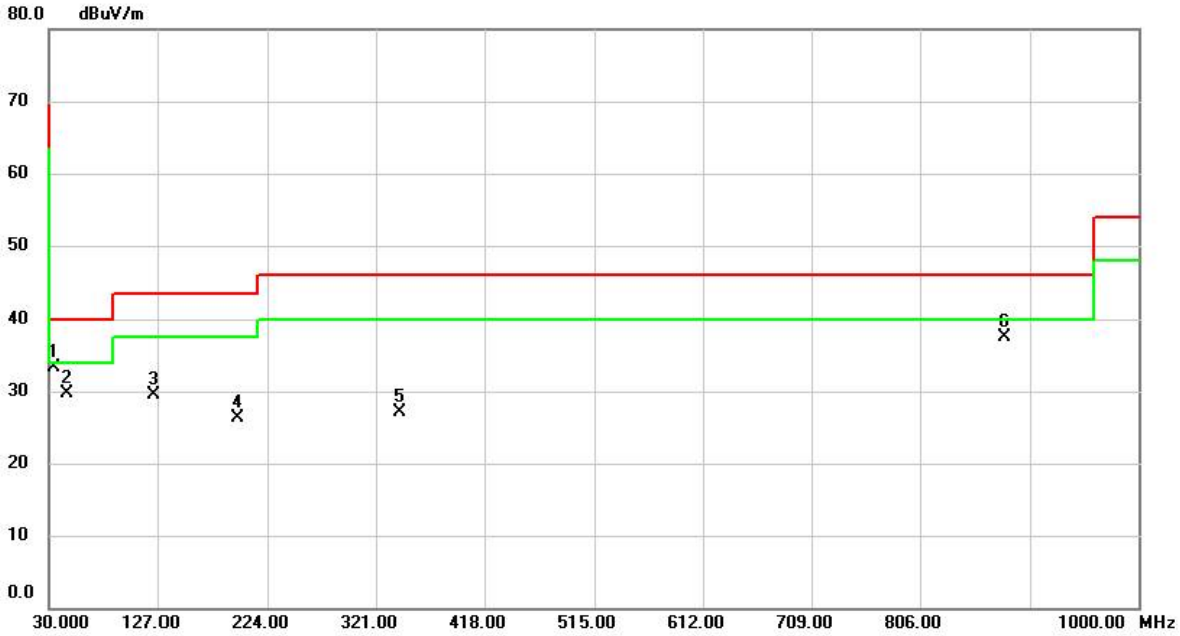
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	33.8800	44.02	-9.02	35.00	40.00	-5.00	peak	
2		45.5200	37.97	-8.20	29.77	40.00	-10.23	peak	
3		125.0600	40.22	-10.31	29.91	43.50	-13.59	peak	
4		199.7500	37.56	-10.90	26.66	43.50	-16.84	peak	
5		342.3400	35.12	-6.39	28.73	46.00	-17.27	peak	
6		719.6700	30.17	1.69	31.86	46.00	-14.14	peak	

Test Mode	UNII-1_TX AC (VHT80) MODE 5210 MHz	Polarization	Horizontal



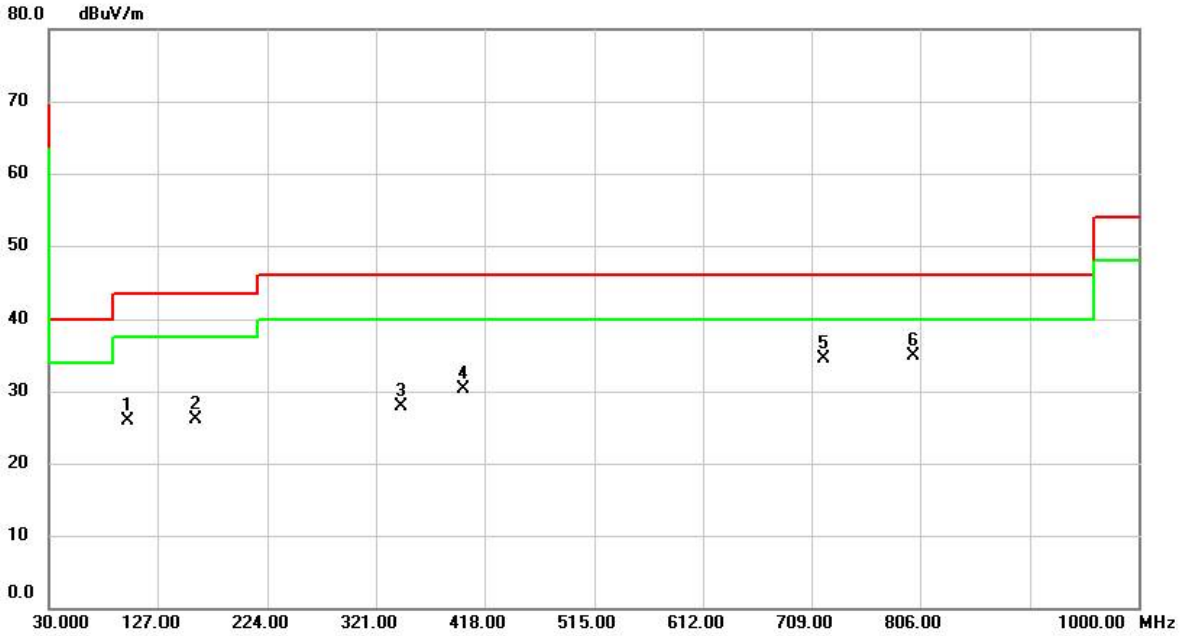
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		30.0000	35.37	-9.06	26.31	40.00	-13.69	peak	
2		99.8400	39.68	-12.92	26.76	43.50	-16.74	peak	
3		199.7500	36.76	-10.90	25.86	43.50	-17.64	peak	
4		396.6600	36.67	-5.15	31.52	46.00	-14.48	peak	
5	*	719.6700	32.58	1.69	34.27	46.00	-11.73	peak	
6		941.8000	28.18	5.66	33.84	46.00	-12.16	peak	

Test Mode	UNII-3_TX A MODE 5745 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	33.8800	42.38	-9.02	33.36	40.00	-6.64	peak	
2		45.5200	37.93	-8.20	29.73	40.00	-10.27	peak	
3		124.0900	39.85	-10.39	29.46	43.50	-14.04	peak	
4		196.8400	37.11	-10.88	26.23	43.50	-17.27	peak	
5		342.3400	33.53	-6.39	27.14	46.00	-18.86	peak	
6		879.7200	32.99	4.58	37.57	46.00	-8.43	peak	

Test Mode	UNII-3_TX A MODE 5745 MHz	Polarization	Horizontal



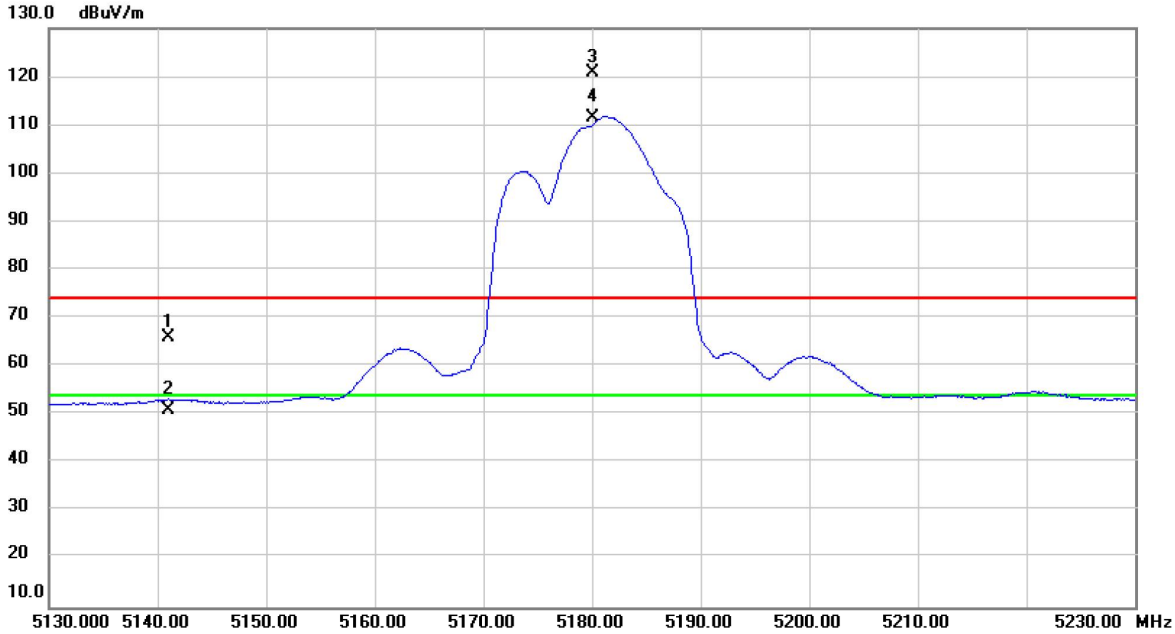
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		99.8400	38.86	-12.92	25.94	43.50	-17.56	peak	
2		159.9800	34.55	-8.54	26.01	43.50	-17.49	peak	
3		343.3100	34.26	-6.37	27.89	46.00	-18.11	peak	
4		399.5700	35.37	-5.08	30.29	46.00	-15.71	peak	
5		719.6700	32.72	1.69	34.41	46.00	-11.59	peak	
6	*	800.1800	31.91	3.06	34.97	46.00	-11.03	peak	

APPENDIX D RADIATED EMISSIONS - ABOVE 1000 MHZ

CONTINUE ON NEXT PAGE

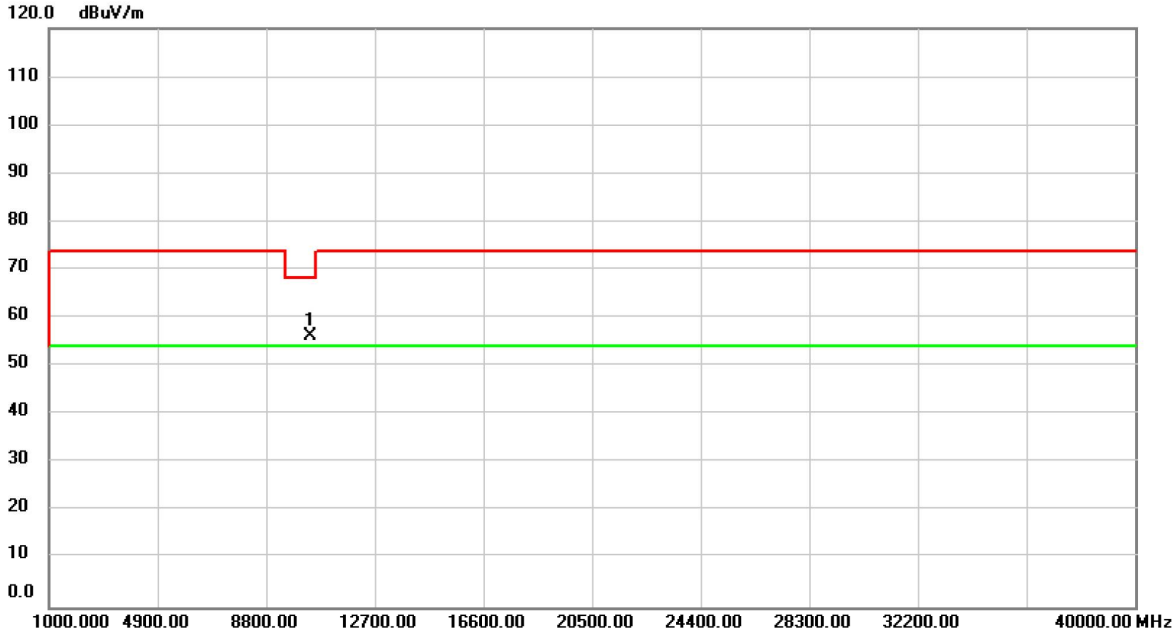
CDD Mode

Test Mode	UNII-1_TX A MODE 5180 MHz	Polarization	Vertical



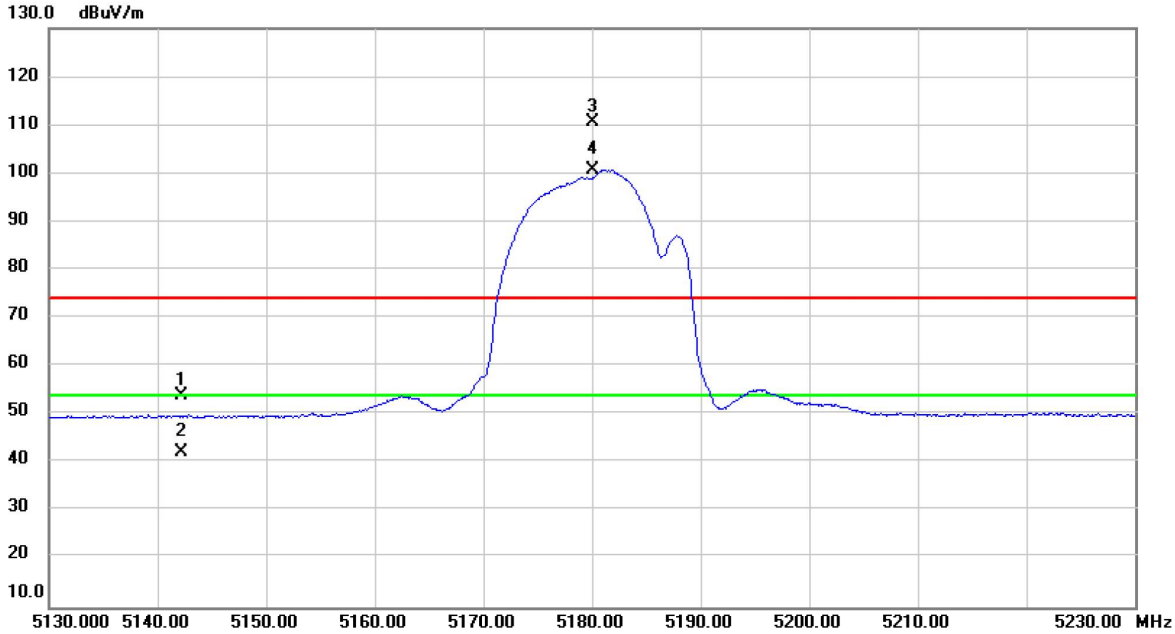
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5141.000	28.66	37.29	65.95	74.00	-8.05	peak	
2		5141.000	13.57	37.29	50.86	54.00	-3.14	AVG	
3	X	5180.000	83.51	37.34	120.85	74.00	46.85	peak	No Limit
4	*	5180.000	74.35	37.34	111.69	54.00	57.69	AVG	No Limit

Test Mode	UNII-1_TX A MODE 5180 MHz	Polarization	Vertical



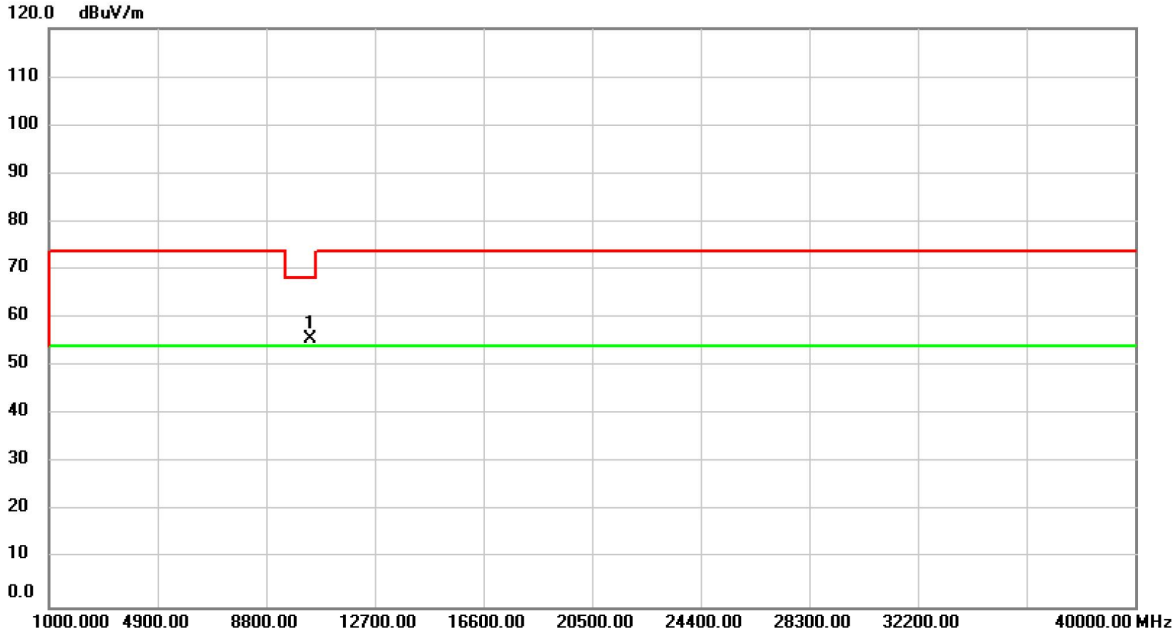
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10360.00	54.79	1.57	56.36	68.20	-11.84	peak	

Test Mode	UNII-1_TX A MODE 5180 MHz	Polarization	Horizontal



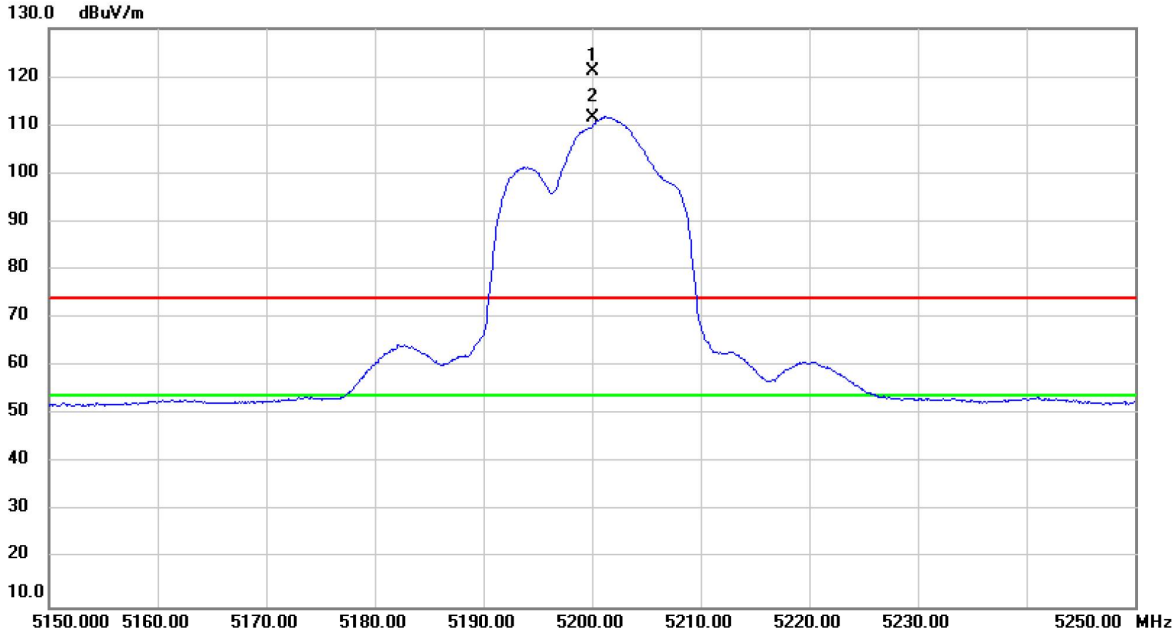
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5142.160	16.66	37.30	53.96	74.00	-20.04	peak	
2		5142.160	4.87	37.30	42.17	54.00	-11.83	AVG	
3	X	5180.000	73.17	37.34	110.51	74.00	36.51	peak	No Limit
4	*	5180.000	63.45	37.34	100.79	54.00	46.79	AVG	No Limit

Test Mode	UNII-1_TX A MODE 5180 MHz	Polarization	Horizontal



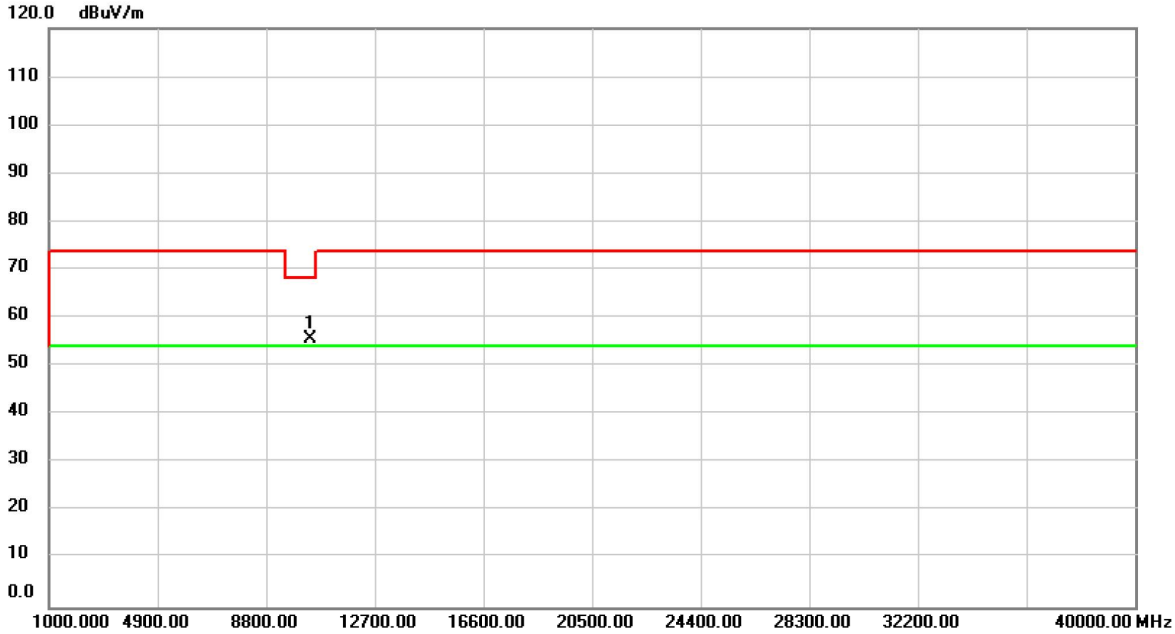
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10360.00	54.13	1.57	55.70	68.20	-12.50	peak	

Test Mode	UNII-1_TX A MODE 5200 MHz	Polarization	Vertical



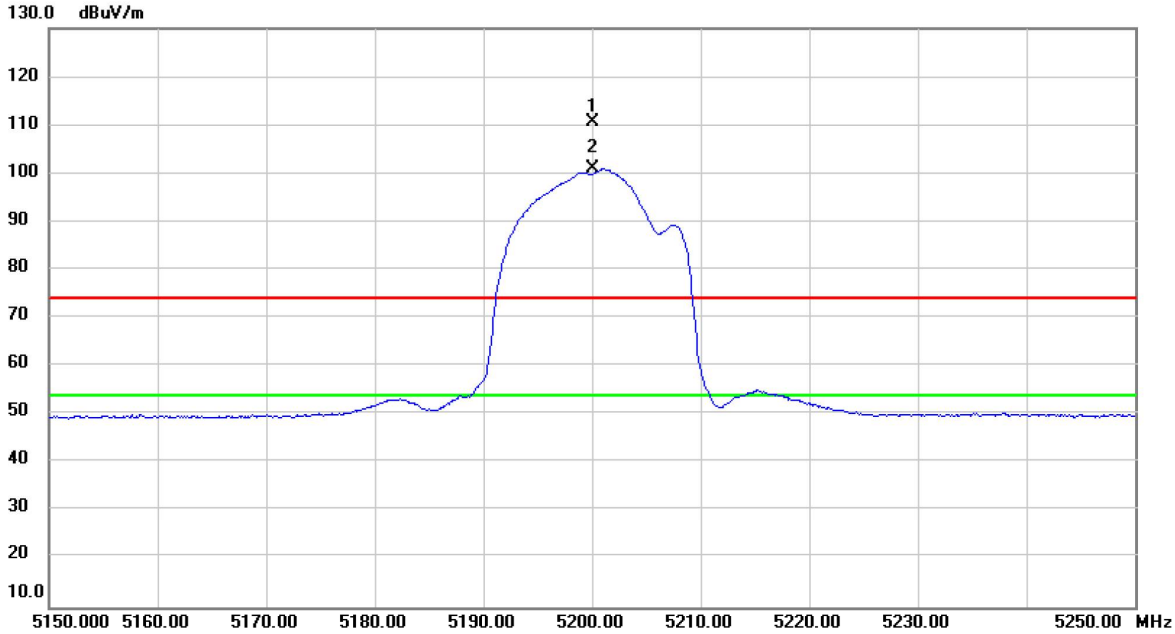
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5200.000	83.76	37.36	121.12	74.00	47.12	peak	No Limit
2	*	5200.000	74.22	37.36	111.58	54.00	57.58	AVG	No Limit

Test Mode	UNII-1_TX A MODE 5200 MHz	Polarization	Vertical



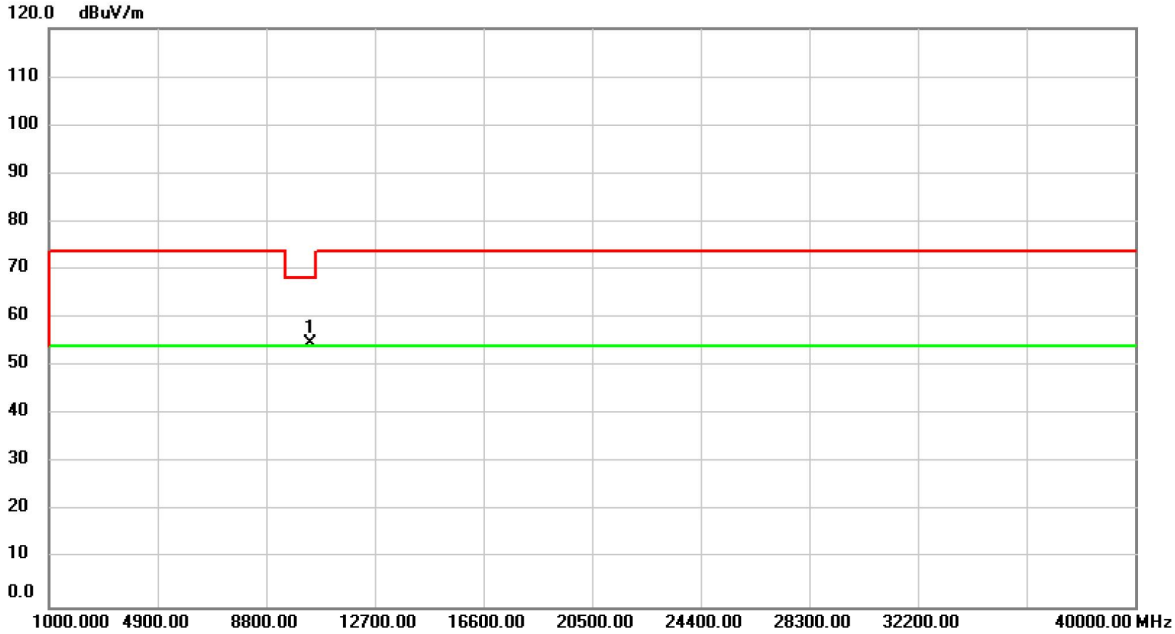
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10400.00	53.94	1.62	55.56	68.20	-12.64	peak	

Test Mode	UNII-1_TX A MODE 5200 MHz	Polarization	Horizontal



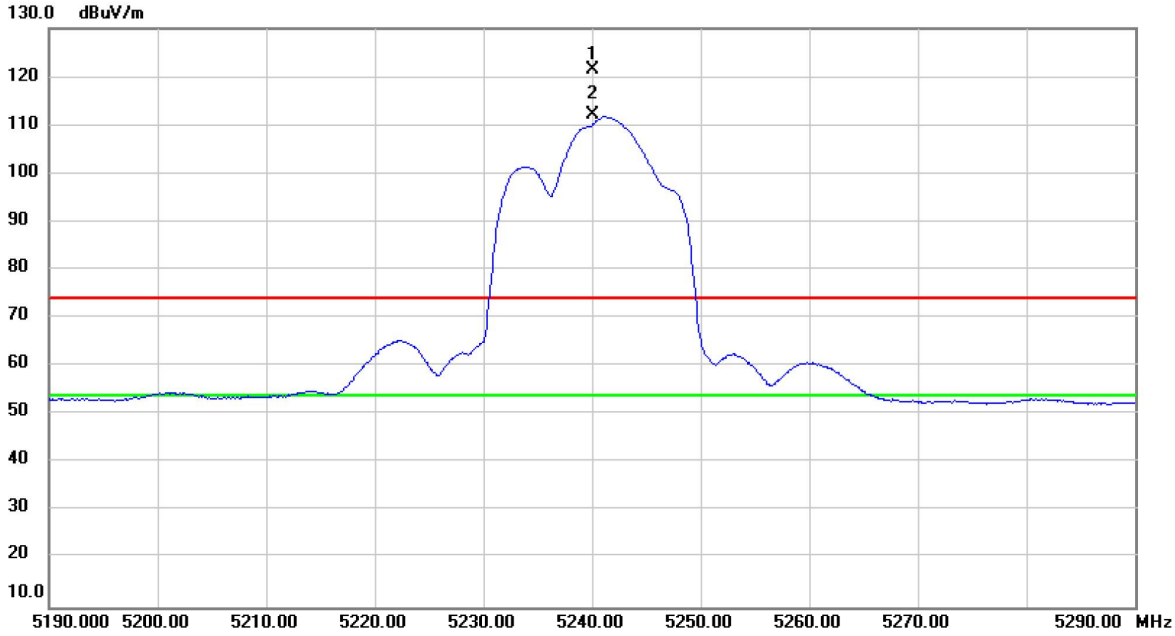
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5200.000	73.18	37.36	110.54	74.00	36.54	peak	No Limit
2	*	5200.000	63.55	37.36	100.91	54.00	46.91	AVG	No Limit

Test Mode	UNII-1_TX A MODE 5200 MHz	Polarization	Horizontal



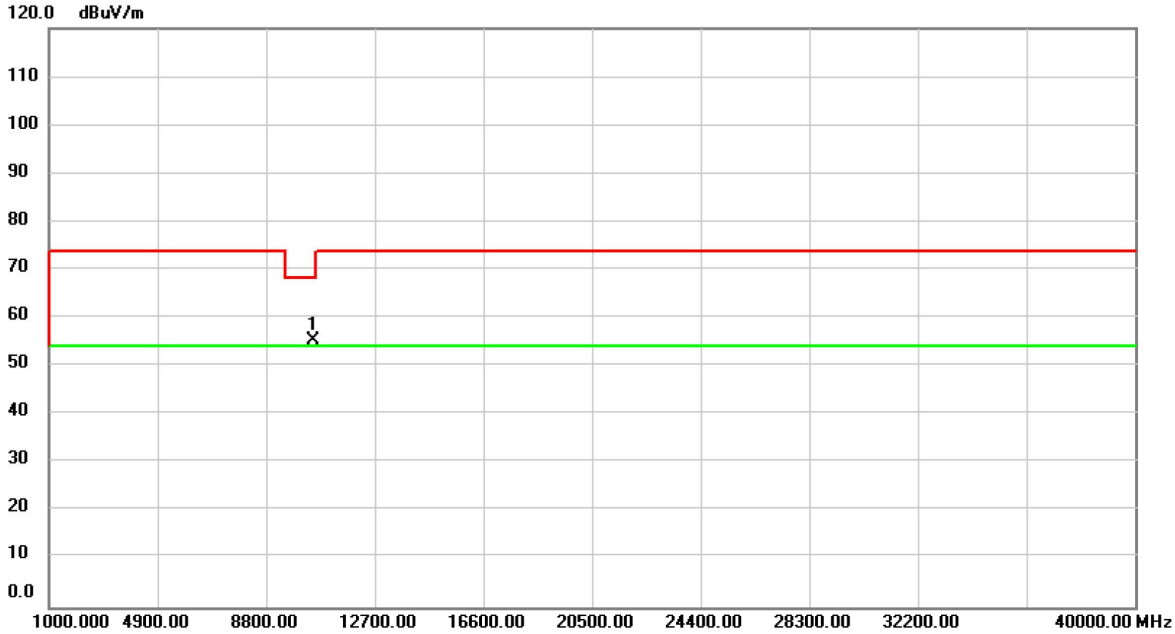
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10400.00	53.05	1.62	54.67	68.20	-13.53	peak	

Test Mode	UNII-1_TX A MODE 5240 MHz	Polarization	Vertical



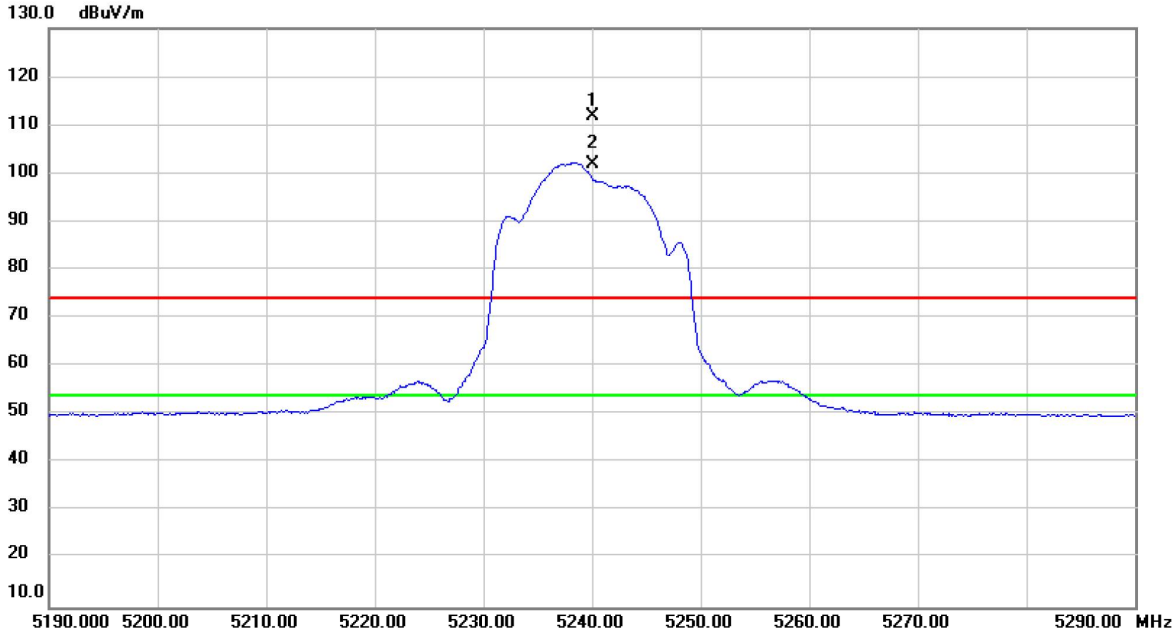
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5240.000	84.06	37.40	121.46	74.00	47.46	peak	No Limit
2	*	5240.000	74.66	37.40	112.06	54.00	58.06	AVG	No Limit

Test Mode	UNII-1_TX A MODE 5240 MHz	Polarization	Vertical



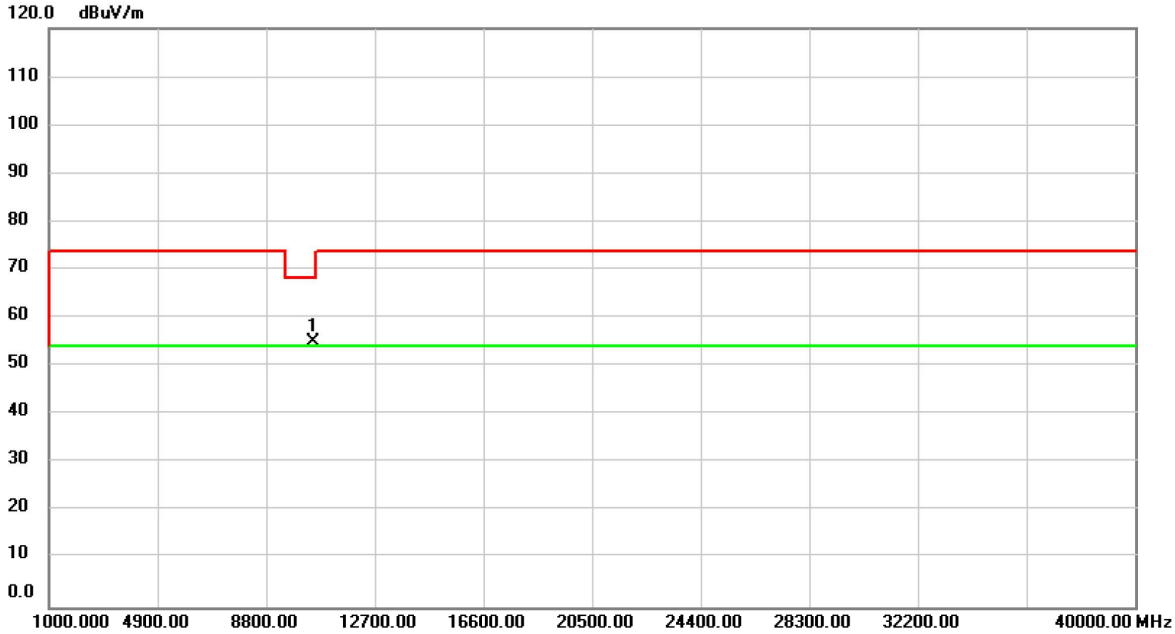
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10480.00	53.53	1.69	55.22	68.20	-12.98	peak	

Test Mode	UNII-1_TX A MODE 5240 MHz	Polarization	Horizontal



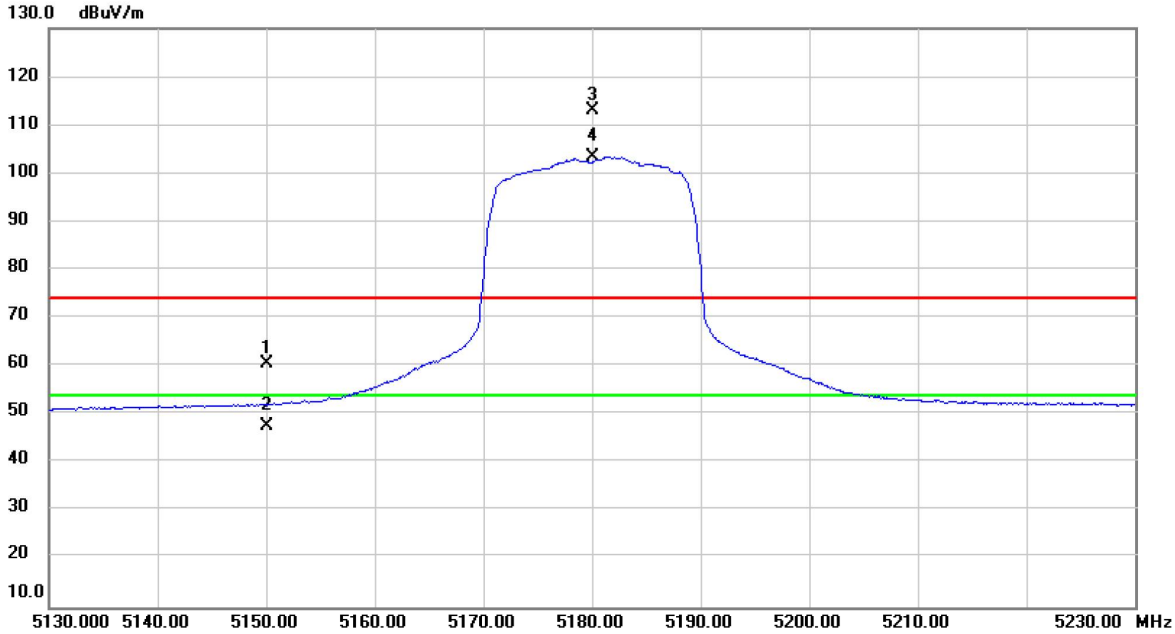
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5240.000	74.35	37.40	111.75	74.00	37.75	peak	No Limit
2	*	5240.000	64.57	37.40	101.97	54.00	47.97	AVG	No Limit

Test Mode	UNII-1_TX A MODE 5240 MHz	Polarization	Horizontal



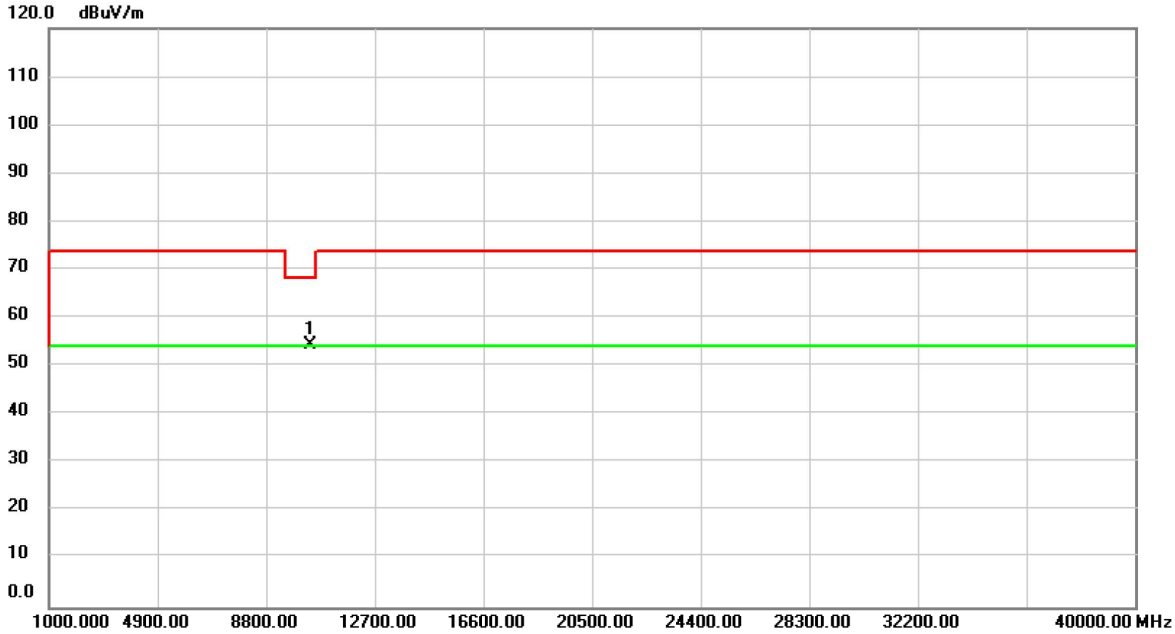
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10480.00	53.33	1.69	55.02	68.20	-13.18	peak	

Test Mode	UNII-1_TX N (HT20) MODE 5180 MHz	Polarization	Vertical



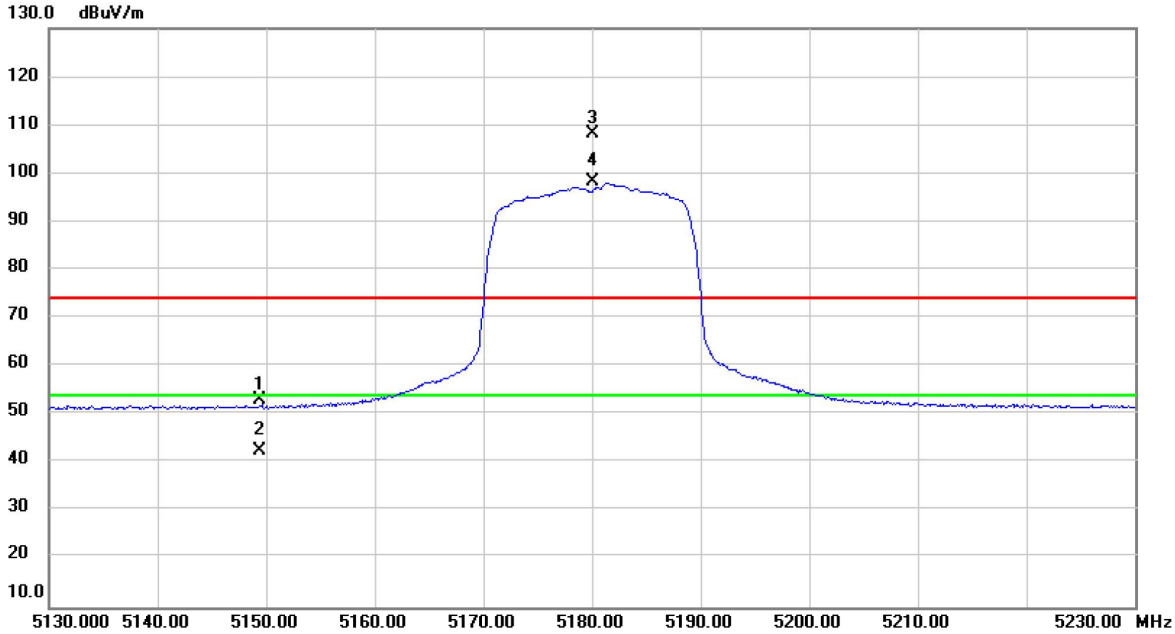
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5150.000	23.21	37.31	60.52	74.00	-13.48	peak	
2		5150.000	10.49	37.31	47.80	54.00	-6.20	AVG	
3	X	5180.000	75.72	37.34	113.06	74.00	39.06	peak	No Limit
4	*	5180.000	66.00	37.34	103.34	54.00	49.34	AVG	No Limit

Test Mode	UNII-1_TX N (HT20) MODE 5180 MHz	Polarization	Vertical



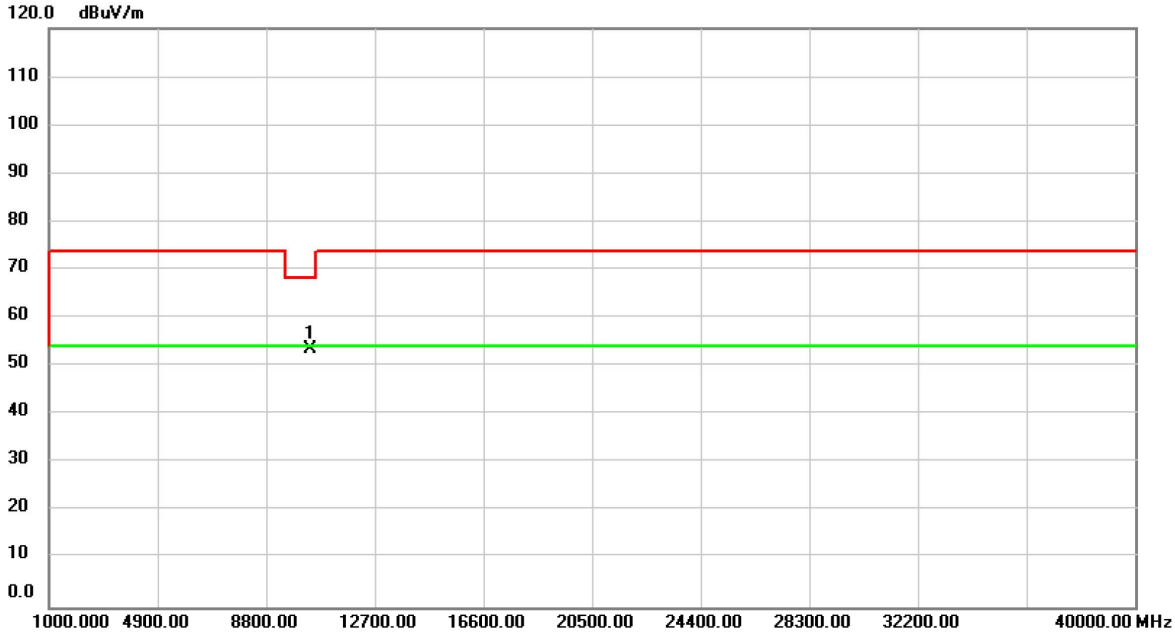
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10360.00	52.79	1.57	54.36	68.20	-13.84	peak	

Test Mode	UNII-1_TX N (HT20) MODE 5180 MHz	Polarization	Horizontal



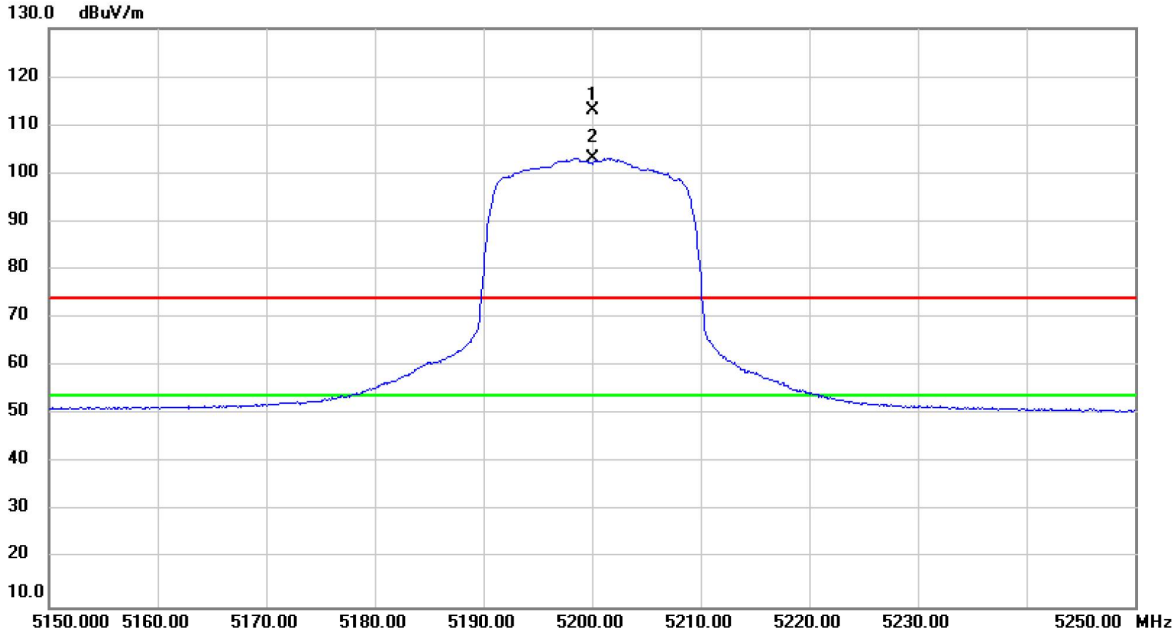
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5149.400	15.87	37.30	53.17	74.00	-20.83	peak	
2		5149.400	5.38	37.30	42.68	54.00	-11.32	AVG	
3	X	5180.000	70.79	37.34	108.13	74.00	34.13	peak	No Limit
4	*	5180.000	60.99	37.34	98.33	54.00	44.33	AVG	No Limit

Test Mode	UNII-1_TX N (HT20) MODE 5180 MHz	Polarization	Horizontal



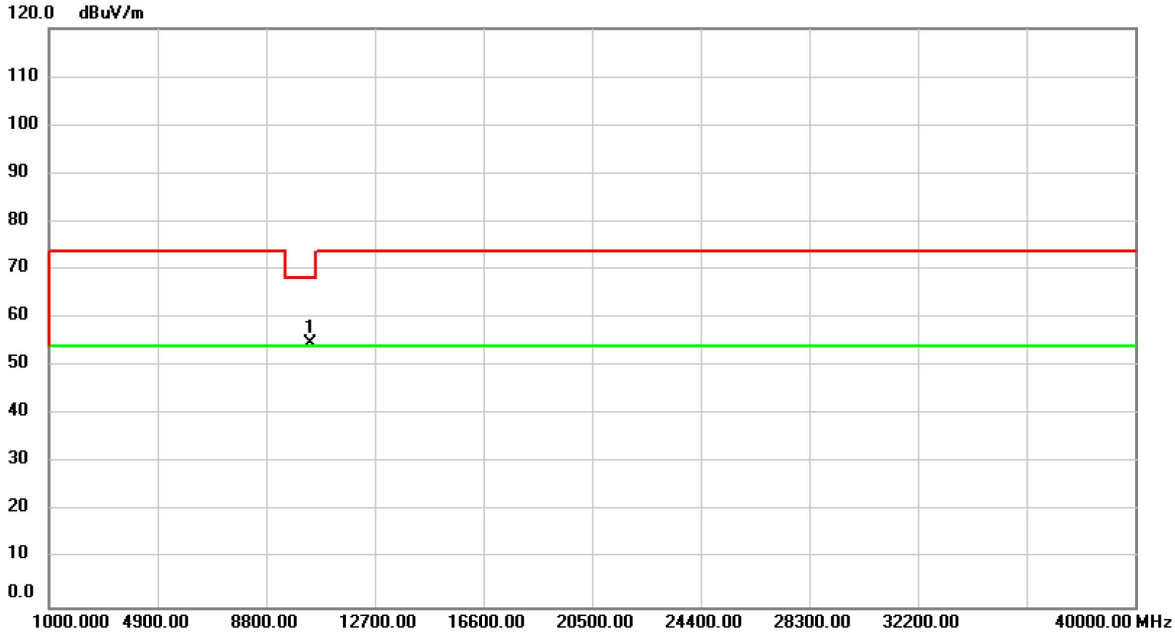
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10360.00	51.95	1.57	53.52	68.20	-14.68	peak	

Test Mode	UNII-1_TX N (HT20) MODE 5200 MHz	Polarization	Vertical



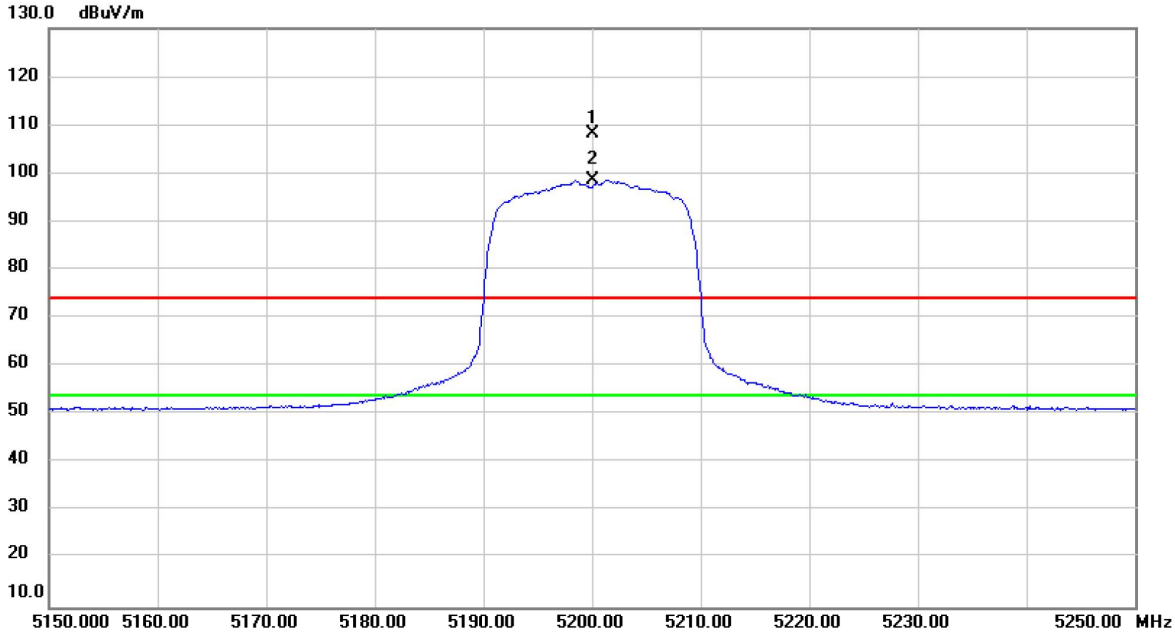
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5200.000	75.57	37.36	112.93	74.00	38.93	peak	No Limit
2	*	5200.000	65.89	37.36	103.25	54.00	49.25	AVG	No Limit

Test Mode	UNII-1_TX N (HT20) MODE 5200 MHz	Polarization	Vertical



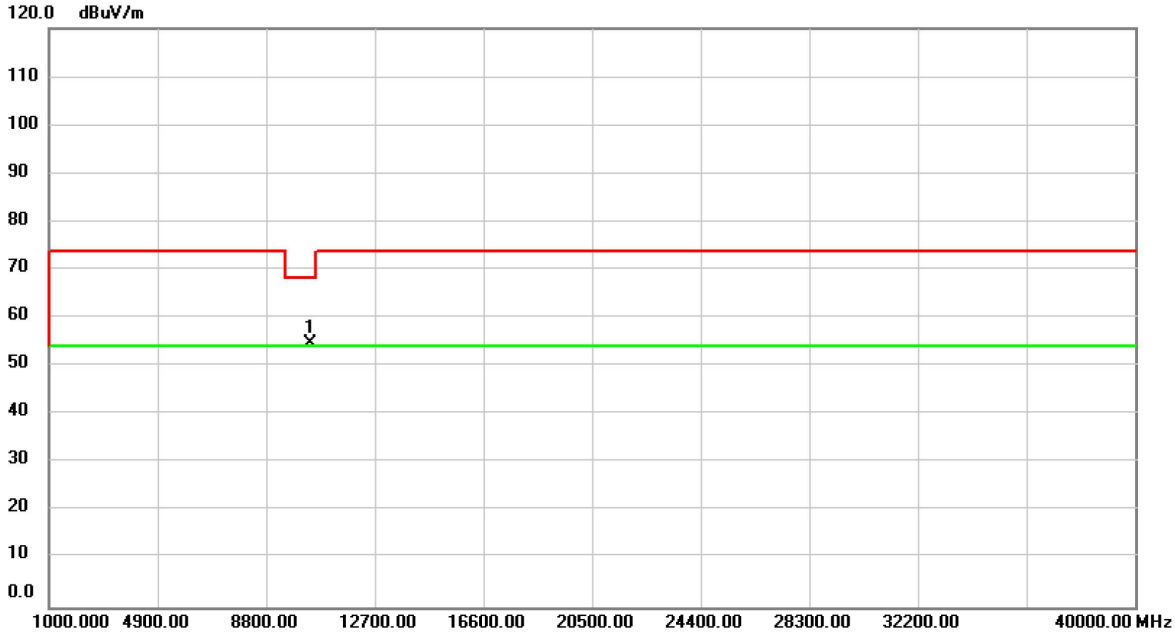
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10400.00	53.07	1.62	54.69	68.20	-13.51	peak	

Test Mode	UNII-1_TX N (HT20) MODE 5200 MHz	Polarization	Horizontal



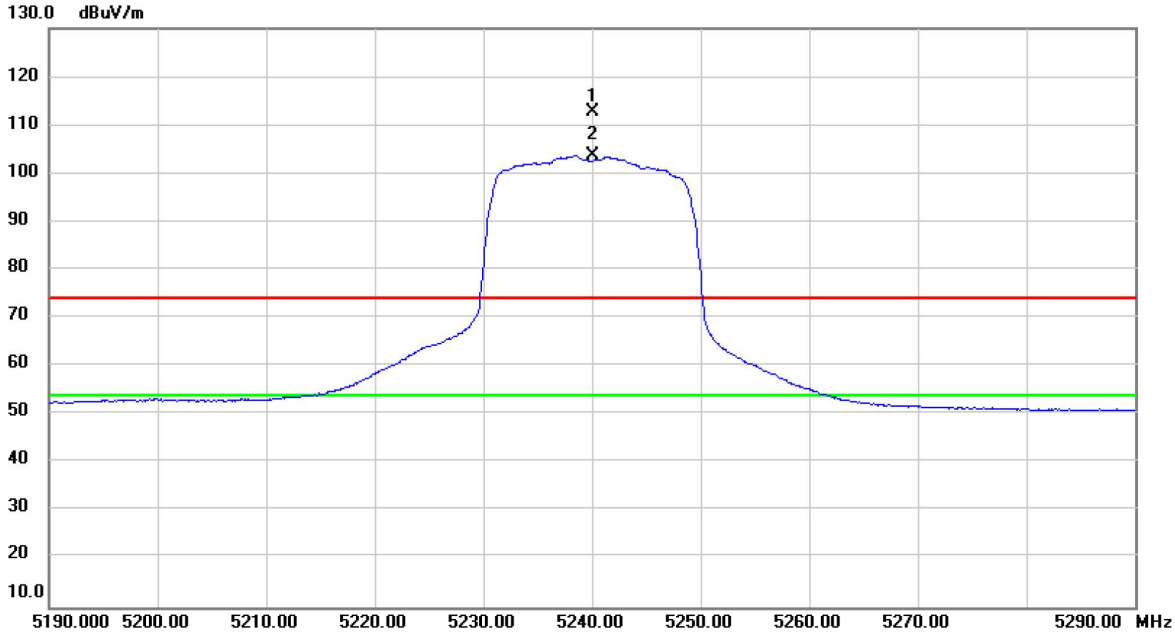
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5200.000	70.77	37.36	108.13	74.00	34.13	peak	No Limit
2	*	5200.000	61.24	37.36	98.60	54.00	44.60	AVG	No Limit

Test Mode	UNII-1_TX N (HT20) MODE 5200 MHz	Polarization	Horizontal



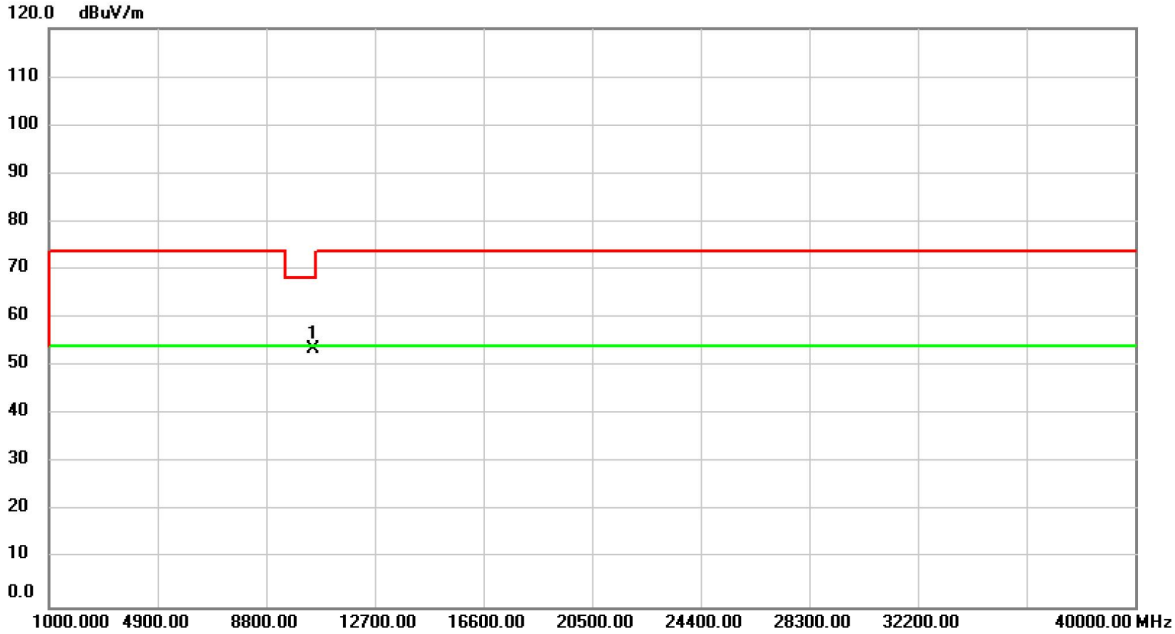
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10400.00	53.12	1.62	54.74	68.20	-13.46	peak	

Test Mode	UNII-1_TX N (HT20) MODE 5240 MHz	Polarization	Vertical



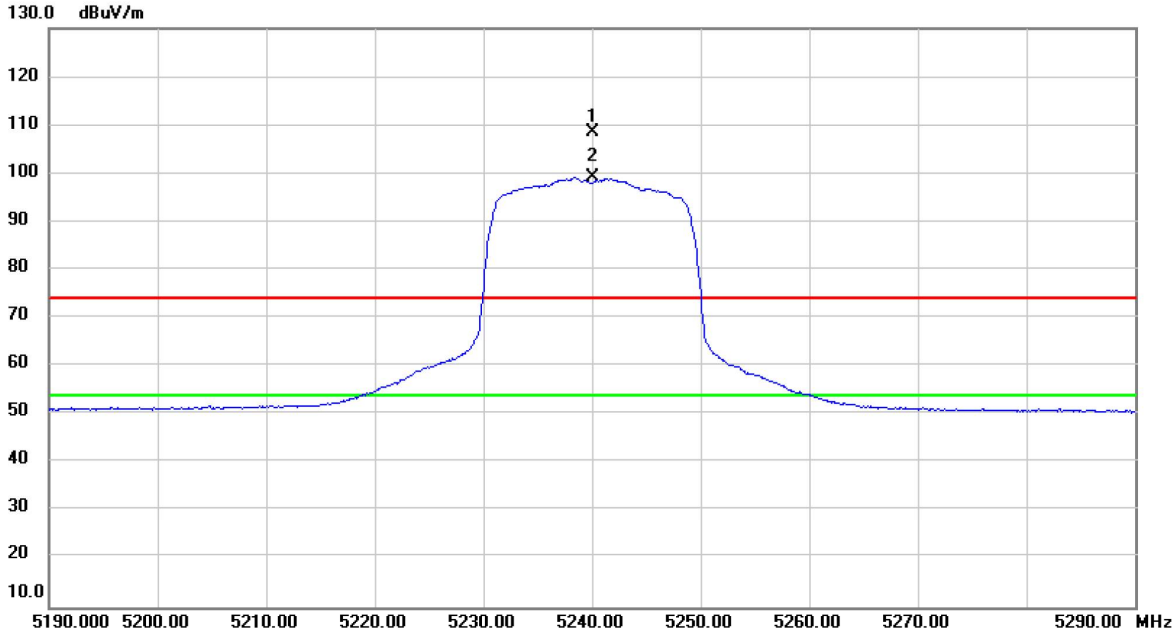
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5240.000	75.41	37.40	112.81	74.00	38.81	peak	No Limit
2	*	5240.000	66.21	37.40	103.61	54.00	49.61	AVG	No Limit

Test Mode	UNII-1_TX N (HT20) MODE 5240 MHz	Polarization	Vertical



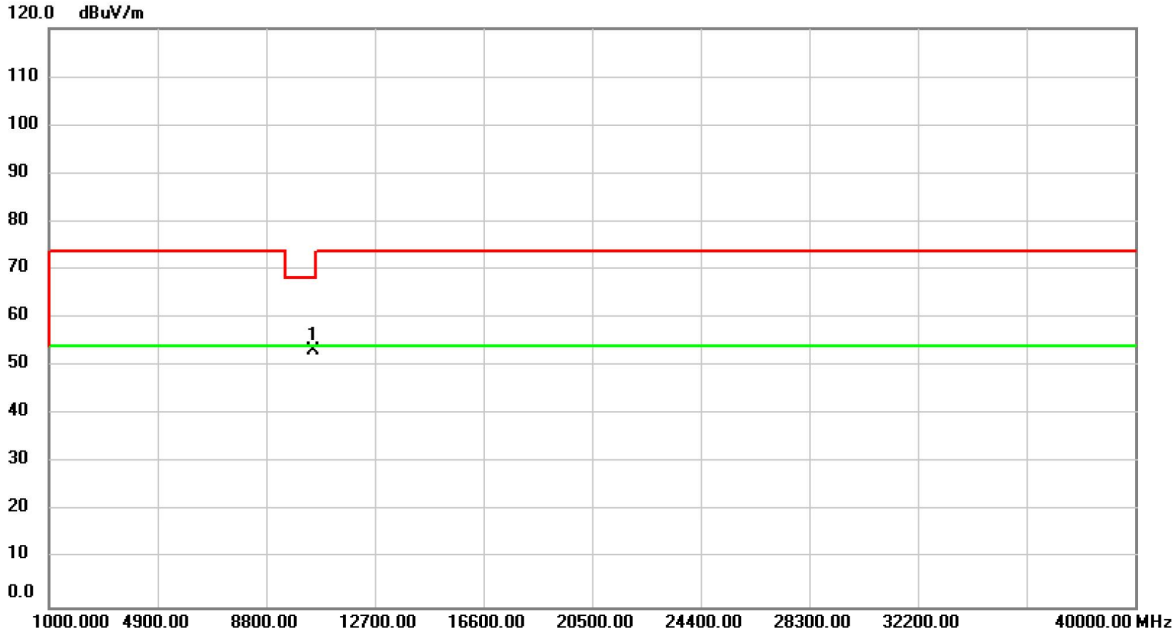
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10480.00	51.87	1.69	53.56	68.20	-14.64	peak	

Test Mode	UNII-1_TX N (HT20) MODE 5240 MHz	Polarization	Horizontal



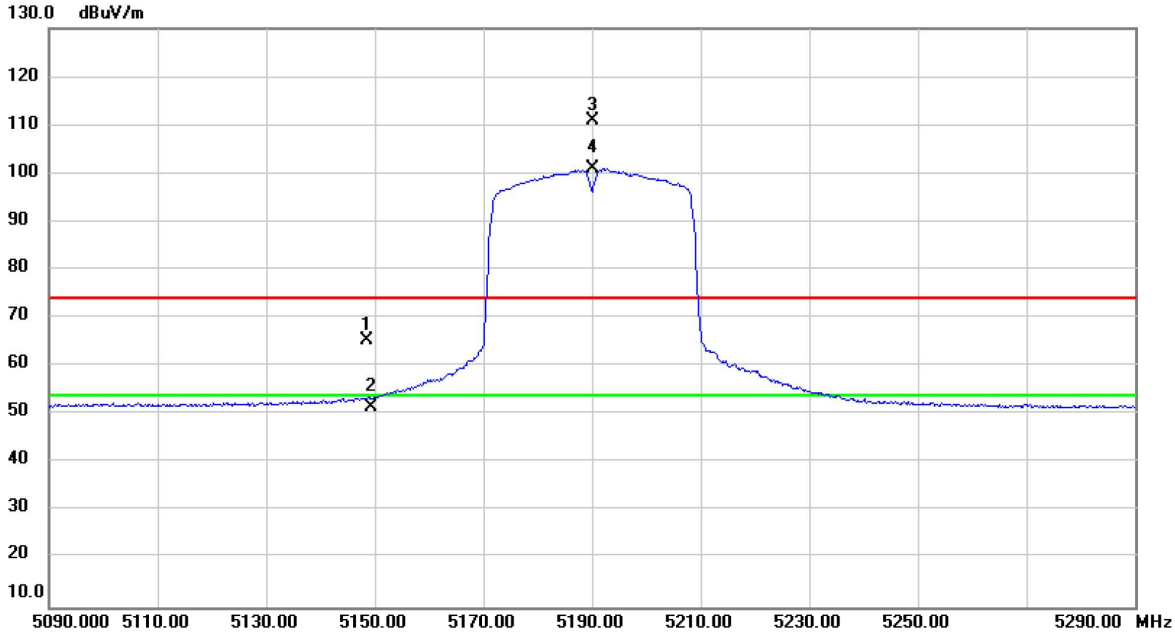
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5240.000	71.19	37.40	108.59	74.00	34.59	peak	No Limit
2	*	5240.000	61.75	37.40	99.15	54.00	45.15	AVG	No Limit

Test Mode	UNII-1_TX N (HT20) MODE 5240 MHz	Polarization	Horizontal



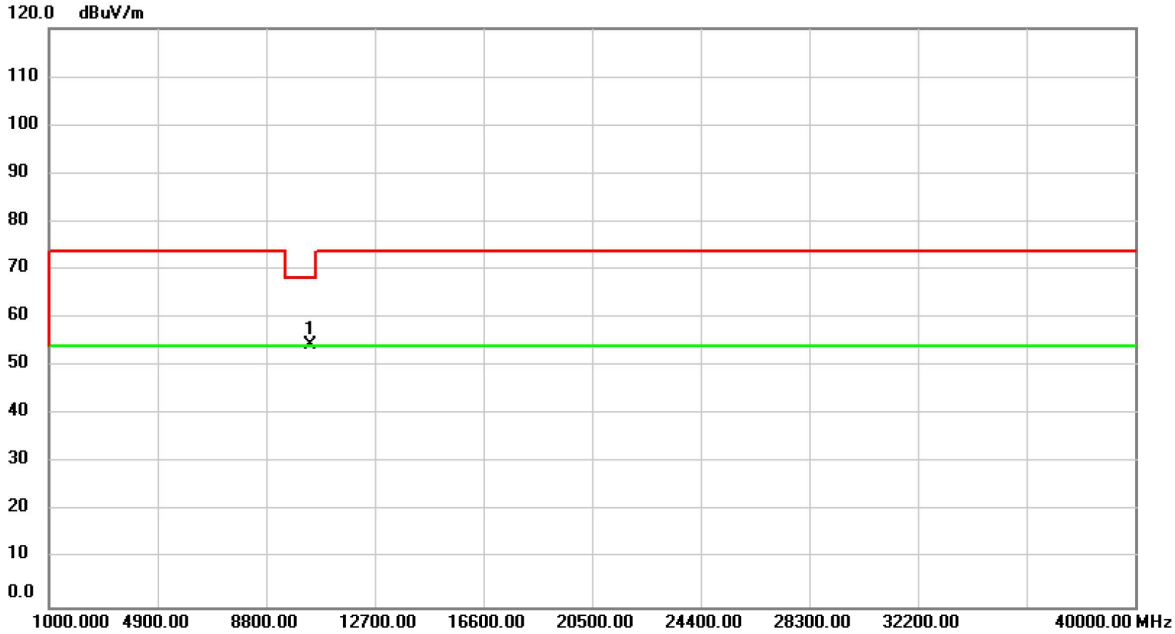
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10480.00	51.70	1.69	53.39	68.20	-14.81	peak	

Test Mode	UNII-1_TX N (HT40) MODE 5190 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5148.560	27.96	37.30	65.26	74.00	-8.74	peak	
2		5149.340	14.26	37.30	51.56	54.00	-2.44	AVG	
3	X	5190.000	73.67	37.34	111.01	74.00	37.01	peak	No Limit
4	*	5190.000	63.73	37.34	101.07	54.00	47.07	AVG	No Limit

Test Mode	UNII-1_TX N (HT40) MODE 5190 MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	10380.00	52.75	1.59	54.34	68.20	-13.86	peak	