FCC Test Report

Report No.:	RF200522E11
FCC ID:	2AWHPR201
Test Model:	UTR-201
Received Date:	May 25, 2020
Test Date:	June 11 to 30, 2020
Issued Date:	July 09, 2020
Applicant:	Space Exploration Technologies Corp.
Address:	1 Rocket Rd., Hawthorne, CA 90250 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location :	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF200522E11	Original release.	July 09, 2020

1 Certificate of Conformity

Product:	Starlink Router
Brand:	SPACEX
Test Model:	UTR-201
Sample Status:	ENGINEERING SAMPLE
Applicant:	Space Exploration Technologies Corp.
Test Date:	June 11 to 30, 2020
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Vivian Huang , **Date:** July 09, 2020

Vivian Huang / Specialist

Approved by : , **Date:** July 09, 2020

Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -17.99 dB at 0.60703 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2 dB at 2390.00MHz, 2483.50MHz and 4874.00MHz
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

Note:
1. For 2.4GHz band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 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:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Conducted Emissions	-	2.5 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.4 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Starlink Router
Brand	SPACEX
Test Model	UTR-201
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	56Vdc from PoE adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 in 2.4GHz
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11 Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 866.7 Mbps
Operating Frequency	**2.4GHz:** 2.412GHz ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**CDD Mode:** **2.412 ~ 2.462 GHz:** 990.564 mW **5.18 ~ 5.24 GHz:** 781.933 mW **5.745 ~ 5.825 GHz:** 775.408 mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 757.979 mW **5.18 ~ 5.24 GHz:** 781.933 mW **5.745 ~ 5.825 GHz:** 775.408 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	PoE adapter x 1
Data Cable Supplied	RJ45 cable x1 (shielded, 210cm)

Note:

1. The EUT has two radios as following table:

Radio 1	Radio 2
WLAN 2.4GHz	WLAN 5GHz

2. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4GHz)	WLAN (5GHz)
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

3. The EUT must be supplied with a PoE adapter as following table:

No.	Brand	Model No.	Spec.
1	Acbel	UTP-201A	AC Input: 100-240Vac, 2.5A, 50-60Hz DC Output: 56V, 0.3A

4. The antennas provided to the EUT, please refer to the following table:

Antenna NO.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length (mm)
1	1.4	2.4~2.4835GHz	PCB	None	NA
	2.3	5.15~5.85GHz			
2	2.3	2.4~2.4835GHz	PCB	None	NA
	3.6	5.15~5.85GHz			

5. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
VHT20	2TX	2RX
VHT40	2TX	2RX
5GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11a	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
802.11ac (VHT20)	2TX	2RX
802.11ac (VHT40)	2TX	2RX
802.11ac (VHT80)	2TX	2RX

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and VHT mode for 20MHz (40MHz), therefore the manufacturer will control the 802.11n mode power as same as VHT and investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

6. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.
7. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20), VHT20:

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

7 channels are provided for 802.11n (HT40), VHT40:

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5
Beamforming Mode (output power only)					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

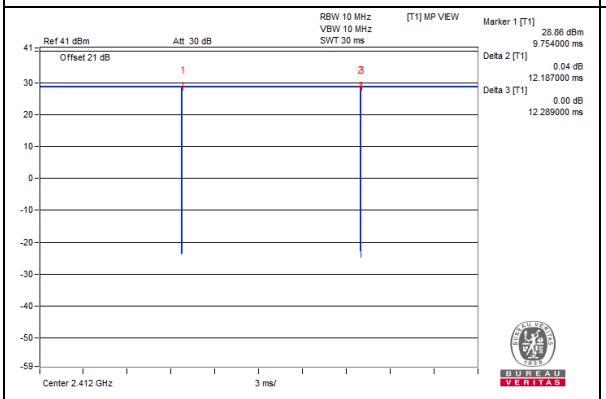
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	24deg. C, 68%RH	120Vac, 60Hz	Nick Lo
RE<1G	23deg. C, 67%RH	120Vac, 60Hz	Tom Yang
PLC	25deg. C, 68%RH	120Vac, 60Hz	Nick Lo
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

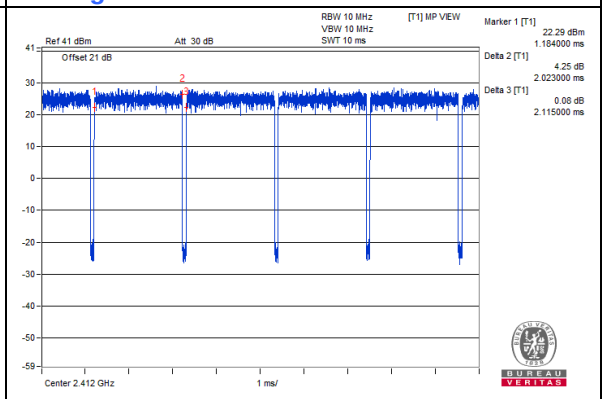
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 12.187/12.289 = 0.992
802.11g: Duty cycle = 2.023/2.115 = 0.957, Duty factor = 10 * log(1/Duty cycle) = 0.19 dB
VHT20: Duty cycle = 4.948/5.055 = 0.979, Duty factor = 10 * log(1/Duty cycle) = 0.09 dB
VHT40: Duty cycle = 2.412/ 2.499= 0.965, Duty factor = 10 * log(1/Duty cycle) = 0.15 dB

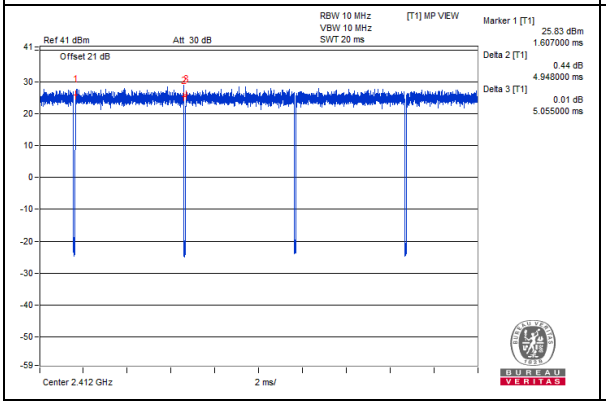
802.11b



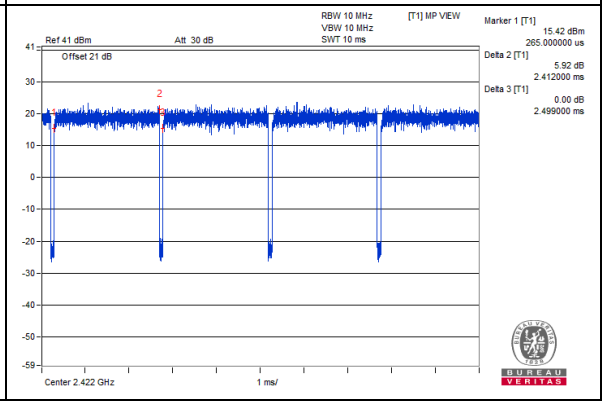
802.11g



VHT20



VHT40



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

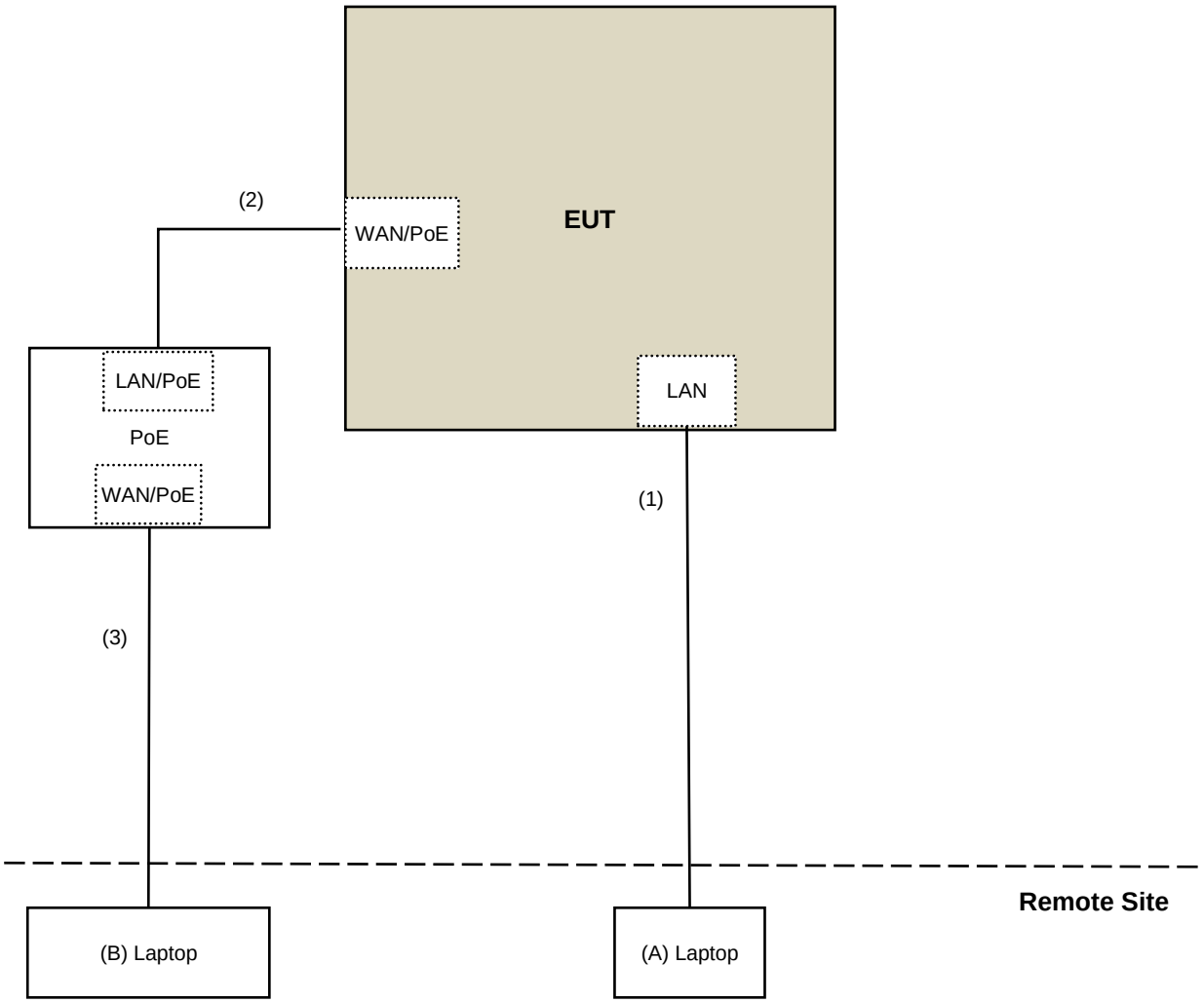
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	Yes	0	Provided by Lab
2.	RJ-45 Cable	1	2	Yes	0	Supplied by client
3.	RJ-45 Cable	1	10	Yes	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and references

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

Test standard:

FCC Part 15, Subpart C (15.247)
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

References Test Guidance :

KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 662911 D01 Multiple Transmitter Output v02r01

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

Frequencies (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
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

For Radiated Emission & Bandedge test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 03, 2019	July 02, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 11, 2019	Nov. 10, 2020
RF Cable	8D	966-3-1	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-2	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-3	Mar. 17, 2020	Mar. 16, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 26, 2019	Sep. 25, 2020
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-1200	160922	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-2000	180601	June 09, 2020	June 08, 2021
RF Cable	EMC104-SM-SM-6000	180602	June 09, 2020	June 08, 2021
Spectrum Analyzer Keysight	N9030A	MY54490679	July 17, 2019	July 16, 2020
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: June 20 to 25, 2020

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	May 29, 2020	May 28, 2021
Power meter Anritsu	ML2495A	1529002	July 26, 2019	July 25, 2020
Power sensor Anritsu	MA2411B	1339443	July 26, 2019	July 25, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE: 1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: June 30, 2020

4.1.3 Test Procedures

For Radiated emission below 30MHz

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:

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

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) 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 detects 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:

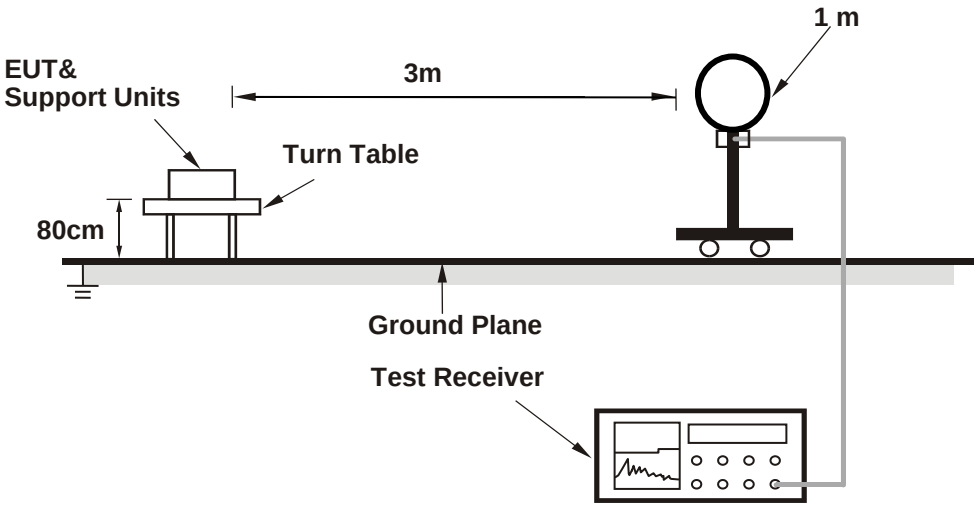
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

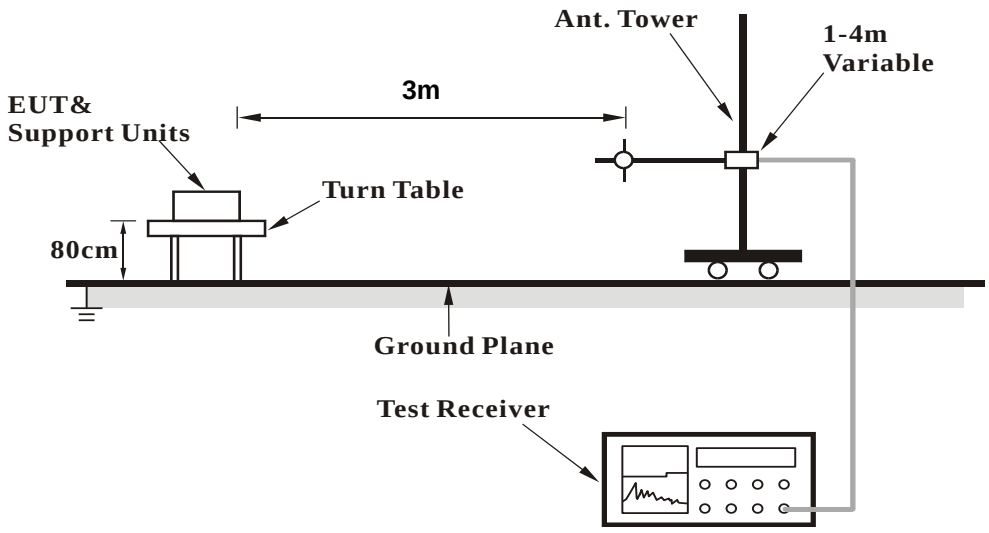
No deviation.

4.1.5 Test Setup

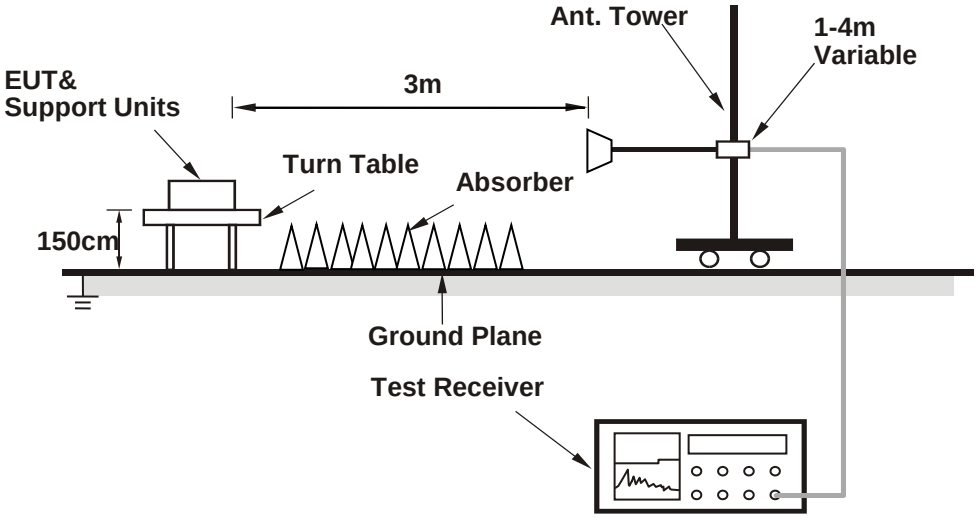
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Connected the EUT with the Laptop which is placed on remote site.
b. Controlling software (QDART 4.8.00037) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data：

802.11b

Channel	TX Channel 1	**Detector Function**	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	2387.00	61.9 PK	74.0	-12.1	1.99 H	104	63.8	-1.9
2	2387.00	53.6 AV	54.0	-0.4	1.99 H	104	55.5	-1.9
3	*2412.00	120.6 PK			1.99 H	104	122.5	-1.9
4	*2412.00	117.1 AV			1.99 H	104	119.0	-1.9
5	4824.00	53.9 PK	74.0	-20.1	1.95 H	279	51.0	2.9
6	4824.00	53.0 AV	54.0	-1.0	1.95 H	279	50.1	2.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	2387.00	60.9 PK	74.0	-13.1	1.00 V	137	62.8	-1.9
2	2387.00	52.1 AV	54.0	-1.9	1.00 V	137	54.0	-1.9
3	*2412.00	119.9 PK			1.00 V	137	121.8	-1.9
4	*2412.00	116.4 AV			1.00 V	137	118.3	-1.9
5	4824.00	53.1 PK	74.0	-20.9	1.88 V	251	50.2	2.9
6	4824.00	51.8 AV	54.0	-2.2	1.88 V	251	48.9	2.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Channel	TX Channel 6	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.2 PK	74.0	-16.8	1.89 H	97	59.1	-1.9
2	2390.00	46.5 AV	54.0	-7.5	1.89 H	97	48.4	-1.9
3	*2437.00	117.4 PK			1.89 H	97	119.4	-2.0
4	*2437.00	114.0 AV			1.89 H	97	116.0	-2.0
5	2483.50	58.1 PK	74.0	-15.9	1.89 H	97	60.0	-1.9
6	2483.50	47.4 AV	54.0	-6.6	1.89 H	97	49.3	-1.9
7	4874.00	54.5 PK	74.0	-19.5	2.11 H	278	51.7	2.8
8	4874.00	53.3 AV	54.0	-0.7	2.11 H	278	50.5	2.8
9	7311.00	43.7 PK	74.0	-30.3	1.94 H	216	34.8	8.9
10	7311.00	32.5 AV	54.0	-21.5	1.94 H	216	23.6	8.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.6 PK	74.0	-16.4	1.12 V	133	59.5	-1.9
2	2390.00	46.8 AV	54.0	-7.2	1.12 V	133	48.7	-1.9
3	*2437.00	117.5 PK			1.12 V	133	119.5	-2.0
4	*2437.00	114.3 AV			1.12 V	133	116.3	-2.0
5	2483.50	58.1 PK	74.0	-15.9	1.12 V	133	60.0	-1.9
6	2483.50	47.6 AV	54.0	-6.4	1.12 V	133	49.5	-1.9
7	4874.00	54.8 PK	74.0	-19.2	1.95 V	256	52.0	2.8
8	**4874.00**	**53.8 AV**	**54.0**	**-0.2**	**1.95 V**	**256**	**51.0**	**2.8**
9	7311.00	43.5 PK	74.0	-30.5	1.50 V	254	34.6	8.9
10	7311.00	33.3 AV	54.0	-20.7	1.50 V	254	24.4	8.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Channel	TX Channel 11	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	116.2 PK			1.90 H	108	118.1	-1.9
2	*2462.00	112.5 AV			1.90 H	108	114.4	-1.9
3	2488.50	59.8 PK	74.0	-14.2	1.90 H	108	61.7	-1.9
4	2488.50	50.8 AV	54.0	-3.2	1.90 H	108	52.7	-1.9
5	4924.00	55.2 PK	74.0	-18.8	1.92 H	275	52.5	2.7
6	4924.00	53.5 AV	54.0	-0.5	1.92 H	275	50.8	2.7
7	7386.00	43.7 PK	74.0	-30.3	1.98 H	200	34.7	9.0
8	7386.00	32.4 AV	54.0	-21.6	1.98 H	200	23.4	9.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	117.3 PK			1.09 V	135	119.2	-1.9
2	*2462.00	113.9 AV			1.09 V	135	115.8	-1.9
3	2488.00	60.9 PK	74.0	-13.1	1.09 V	135	62.8	-1.9
4	2488.00	50.4 AV	54.0	-3.6	1.09 V	135	52.3	-1.9
5	4924.00	54.5 PK	74.0	-19.5	1.72 V	240	51.8	2.7
6	4924.00	53.2 AV	54.0	-0.8	1.72 V	240	50.5	2.7
7	7386.00	44.1 PK	74.0	-29.9	1.45 V	247	35.1	9.0
8	7386.00	33.7 AV	54.0	-20.3	1.45 V	247	24.7	9.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

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Channel	TX Channel 1	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	69.3 PK	74.0	-4.7	2.19 H	86	71.2	-1.9
2	2390.00	53.0 AV	54.0	-1.0	2.19 H	86	54.9	-1.9
3	*2412.00	117.9 PK			2.19 H	86	119.8	-1.9
4	*2412.00	107.4 AV			2.19 H	86	109.3	-1.9
5	4824.00	50.8 PK	74.0	-23.2	1.96 H	210	47.9	2.9
6	4824.00	37.5 AV	54.0	-16.5	1.96 H	210	34.6	2.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	66.6 PK	74.0	-7.4	1.00 V	136	68.5	-1.9
2	2390.00	51.8 AV	54.0	-2.2	1.00 V	136	53.7	-1.9
3	*2412.00	116.5 PK			1.00 V	136	118.4	-1.9
4	*2412.00	106.3 AV			1.00 V	136	108.2	-1.9
5	4824.00	50.7 PK	74.0	-23.3	1.93 V	242	47.8	2.9
6	4824.00	37.4 AV	54.0	-16.6	1.93 V	242	34.5	2.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Channel	TX Channel 6	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	62.4 PK	74.0	-11.6	2.17 H	92	64.3	-1.9
2	2390.00	47.0 AV	54.0	-7.0	2.17 H	92	48.9	-1.9
3	*2437.00	121.2 PK			2.17 H	92	123.2	-2.0
4	*2437.00	110.8 AV			2.17 H	92	112.8	-2.0
5	2483.50	62.0 PK	74.0	-12.0	2.17 H	92	63.9	-1.9
6	2483.50	48.6 AV	54.0	-5.4	2.17 H	92	50.5	-1.9
7	4874.00	51.4 PK	74.0	-22.6	2.14 H	278	48.6	2.8
8	4874.00	39.7 AV	54.0	-14.3	2.14 H	278	36.9	2.8
9	7311.00	44.2 PK	74.0	-29.8	1.98 H	226	35.3	8.9
10	7311.00	31.0 AV	54.0	-23.0	1.98 H	226	22.1	8.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	62.4 PK	74.0	-11.6	1.08 V	142	64.3	-1.9
2	2390.00	47.2 AV	54.0	-6.8	1.08 V	142	49.1	-1.9
3	*2437.00	121.3 PK			1.08 V	142	123.3	-2.0
4	*2437.00	111.2 AV			1.08 V	142	113.2	-2.0
5	2483.50	62.4 PK	74.0	-11.6	1.08 V	142	64.3	-1.9
6	2483.50	48.9 AV	54.0	-5.1	1.08 V	142	50.8	-1.9
7	4874.00	51.1 PK	74.0	-22.9	1.90 V	241	48.3	2.8
8	4874.00	39.5 AV	54.0	-14.5	1.90 V	241	36.7	2.8
9	7311.00	44.6 PK	74.0	-29.4	1.42 V	253	35.7	8.9
10	7311.00	31.2 AV	54.0	-22.8	1.42 V	253	22.3	8.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Channel	TX Channel 11	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	117.3 PK			2.09 H	106	119.2	-1.9
2	*2462.00	106.8 AV			2.09 H	106	108.7	-1.9
3	2484.70	69.4 PK	74.0	-4.6	2.09 H	106	71.3	-1.9
4	2484.70	53.3 AV	54.0	-0.7	2.09 H	106	55.2	-1.9
5	4924.00	51.3 PK	74.0	-22.7	1.89 H	266	48.6	2.7
6	4924.00	37.9 AV	54.0	-16.1	1.89 H	266	35.2	2.7
7	7386.00	43.0 PK	74.0	-31.0	1.93 H	198	34.0	9.0
8	7386.00	30.4 AV	54.0	-23.6	1.93 H	198	21.4	9.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	117.2 PK			1.14 V	136	119.1	-1.9
2	*2462.00	106.4 AV			1.14 V	136	108.3	-1.9
3	2483.50	69.1 PK	74.0	-4.9	1.14 V	136	71.0	-1.9
4	2483.50	53.5 AV	54.0	-0.5	1.14 V	136	55.4	-1.9
5	4924.00	50.8 PK	74.0	-23.2	1.76 V	244	48.1	2.7
6	4924.00	37.6 AV	54.0	-16.4	1.76 V	244	34.9	2.7
7	7386.00	43.1 PK	74.0	-30.9	1.42 V	252	34.1	9.0
8	7386.00	30.8 AV	54.0	-23.2	1.42 V	252	21.8	9.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

VHT20

Channel	TX Channel 1	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	68.1 PK	74.0	-5.9	1.96 H	82	70.0	-1.9
2	2390.00	52.3 AV	54.0	-1.7	1.96 H	82	54.2	-1.9
3	*2412.00	116.7 PK			1.96 H	82	118.6	-1.9
4	*2412.00	106.6 AV			1.96 H	82	108.5	-1.9
5	4824.00	50.5 PK	74.0	-23.5	1.92 H	208	47.6	2.9
6	4824.00	37.2 AV	54.0	-16.8	1.92 H	208	34.3	2.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	64.7 PK	74.0	-9.3	3.57 V	354	66.6	-1.9
2	2390.00	50.7 AV	54.0	-3.3	3.57 V	354	52.6	-1.9
3	*2412.00	115.4 PK			3.57 V	354	117.3	-1.9
4	*2412.00	105.0 AV			3.57 V	354	106.9	-1.9
5	4824.00	51.1 PK	74.0	-22.9	1.89 V	233	48.2	2.9
6	4824.00	37.7 AV	54.0	-16.3	1.89 V	233	34.8	2.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Channel	TX Channel 6	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	60.6 PK	74.0	-13.4	1.93 H	80	62.5	-1.9
2	2390.00	47.7 AV	54.0	-6.3	1.93 H	80	49.6	-1.9
3	*2437.00	122.6 PK			1.93 H	80	124.6	-2.0
4	*2437.00	112.3 AV			1.93 H	80	114.3	-2.0
5	2483.50	62.3 PK	74.0	-11.7	1.93 H	80	64.2	-1.9
6	2483.50	48.8 AV	54.0	-5.2	1.93 H	80	50.7	-1.9
7	4874.00	51.5 PK	74.0	-22.5	2.18 H	277	48.7	2.8
8	4874.00	40.0 AV	54.0	-14.0	2.18 H	277	37.2	2.8
9	7311.00	45.0 PK	74.0	-29.0	1.99 H	218	36.1	8.9
10	7311.00	31.5 AV	54.0	-22.5	1.99 H	218	22.6	8.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	62.8 PK	74.0	-11.2	2.23 V	74	64.7	-1.9
2	2390.00	47.9 AV	54.0	-6.1	2.23 V	74	49.8	-1.9
3	*2437.00	121.5 PK			2.23 V	74	123.5	-2.0
4	*2437.00	110.4 AV			2.23 V	74	112.4	-2.0
5	2483.50	63.7 PK	74.0	-10.3	2.23 V	74	65.6	-1.9
6	2483.50	49.9 AV	54.0	-4.1	2.23 V	74	51.8	-1.9
7	4874.00	51.1 PK	74.0	-22.9	1.95 V	235	48.3	2.8
8	4874.00	39.6 AV	54.0	-14.4	1.95 V	235	36.8	2.8
9	7311.00	44.7 PK	74.0	-29.3	1.44 V	254	35.8	8.9
10	7311.00	31.4 AV	54.0	-22.6	1.44 V	254	22.5	8.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Channel	TX Channel 11	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	116.4 PK			1.73 H	77	118.3	-1.9
2	*2462.00	106.3 AV			1.73 H	77	108.2	-1.9
3	2483.50	68.4 PK	74.0	-5.6	1.73 H	77	70.3	-1.9
4	2483.50	53.3 AV	54.0	-0.7	1.73 H	77	55.2	-1.9
5	4924.00	51.4 PK	74.0	-22.6	1.87 H	252	48.7	2.7
6	4924.00	38.2 AV	54.0	-15.8	1.87 H	252	35.5	2.7
7	7386.00	43.3 PK	74.0	-30.7	1.90 H	199	34.3	9.0
8	7386.00	30.5 AV	54.0	-23.5	1.90 H	199	21.5	9.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	115.2 PK			1.28 V	136	117.1	-1.9
2	*2462.00	104.8 AV			1.28 V	136	106.7	-1.9
3	2483.50	67.4 PK	74.0	-6.6	1.28 V	136	69.3	-1.9
4	2483.50	53.6 AV	54.0	-0.4	1.28 V	136	55.5	-1.9
5	4924.00	50.9 PK	74.0	-23.1	1.73 V	228	48.2	2.7
6	4924.00	37.7 AV	54.0	-16.3	1.73 V	228	35.0	2.7
7	7386.00	42.8 PK	74.0	-31.2	1.46 V	239	33.8	9.0
8	7386.00	30.7 AV	54.0	-23.3	1.46 V	239	21.7	9.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

VHT40

Channel	TX Channel 3	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	65.8 PK	74.0	-8.2	1.97 H	80	67.7	-1.9
2	**2390.00**	**53.8 AV**	**54.0**	**-0.2**	**1.97 H**	**80**	**55.7**	**-1.9**
3	*2422.00	112.4 PK			1.97 H	80	114.3	-1.9
4	*2422.00	103.1 AV			1.97 H	80	105.0	-1.9
5	4844.00	49.0 PK	74.0	-25.0	2.19 H	283	46.1	2.9
6	4844.00	36.6 AV	54.0	-17.4	2.19 H	283	33.7	2.9
7	7266.00	39.5 PK	74.0	-34.5	1.95 H	204	30.7	8.8
8	7266.00	28.8 AV	54.0	-25.2	1.95 H	204	20.0	8.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	2384.00	62.6 PK	74.0	-11.4	1.00 V	137	64.5	-1.9
2	2384.00	49.8 AV	54.0	-4.2	1.00 V	137	51.7	-1.9
3	*2422.00	111.3 PK			1.00 V	137	113.2	-1.9
4	*2422.00	100.9 AV			1.00 V	137	102.8	-1.9
5	4844.00	48.7 PK	74.0	-25.3	1.79 V	242	45.8	2.9
6	4844.00	36.4 AV	54.0	-17.6	1.79 V	242	33.5	2.9
7	7266.00	39.6 PK	74.0	-34.4	1.42 V	239	30.8	8.8
8	7266.00	28.9 AV	54.0	-25.1	1.42 V	239	20.1	8.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Channel	TX Channel 6	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	65.7 PK	74.0	-8.3	2.22 H	67	67.6	-1.9
2	2390.00	52.7 AV	54.0	-1.3	2.22 H	67	54.6	-1.9
3	*2437.00	115.9 PK			2.22 H	67	117.9	-2.0
4	*2437.00	106.5 AV			2.22 H	67	108.5	-2.0
5	2483.50	67.1 PK	74.0	-6.9	2.22 H	67	69.0	-1.9
6	2483.50	51.7 AV	54.0	-2.3	2.22 H	67	53.6	-1.9
7	4874.00	51.4 PK	74.0	-22.6	1.87 H	268	48.6	2.8
8	4874.00	38.0 AV	54.0	-16.0	1.87 H	268	35.2	2.8
9	7311.00	43.5 PK	74.0	-30.5	1.92 H	190	34.6	8.9
10	7311.00	30.6 AV	54.0	-23.4	1.92 H	190	21.7	8.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	66.8 PK	74.0	-7.2	1.10 V	153	68.7	-1.9
2	2390.00	51.8 AV	54.0	-2.2	1.10 V	153	53.7	-1.9
3	*2437.00	114.1 PK			1.10 V	153	116.1	-2.0
4	*2437.00	104.2 AV			1.10 V	153	106.2	-2.0
5	2483.50	66.8 PK	74.0	-7.2	1.10 V	153	68.7	-1.9
6	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.10 V**	**153**	**55.7**	**-1.9**
7	4874.00	51.5 PK	74.0	-22.5	1.75 V	241	48.7	2.8
8	4874.00	38.1 AV	54.0	-15.9	1.75 V	241	35.3	2.8
9	7311.00	42.9 PK	74.0	-31.1	1.42 V	232	34.0	8.9
10	7311.00	31.0 AV	54.0	-23.0	1.42 V	232	22.1	8.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Channel	TX Channel 9	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	111.6 PK			2.17 H	70	113.5	-1.9
2	*2452.00	102.8 AV			2.17 H	70	104.7	-1.9
3	2486.00	67.5 PK	74.0	-6.5	2.17 H	70	69.4	-1.9
4	2486.00	53.5 AV	54.0	-0.5	2.17 H	70	55.4	-1.9
5	4904.00	49.0 PK	74.0	-25.0	1.93 H	271	46.3	2.7
6	4904.00	36.2 AV	54.0	-17.8	1.93 H	271	33.5	2.7
7	7356.00	39.3 PK	74.0	-34.7	1.92 H	197	30.4	8.9
8	7356.00	28.7 AV	54.0	-25.3	1.92 H	197	19.8	8.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	111.1 PK			1.12 V	138	113.0	-1.9
2	*2452.00	101.5 AV			1.12 V	138	103.4	-1.9
3	2483.50	66.2 PK	74.0	-7.8	1.12 V	138	68.1	-1.9
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.12 V**	**138**	**55.7**	**-1.9**
5	4904.00	48.9 PK	74.0	-25.1	1.73 V	236	46.2	2.7
6	4904.00	36.4 AV	54.0	-17.6	1.73 V	236	33.7	2.7
7	7356.00	39.7 PK	74.0	-34.3	1.45 V	233	30.8	8.9
8	7356.00	29.2 AV	54.0	-24.8	1.45 V	233	20.3	8.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Below 1GHz Data:

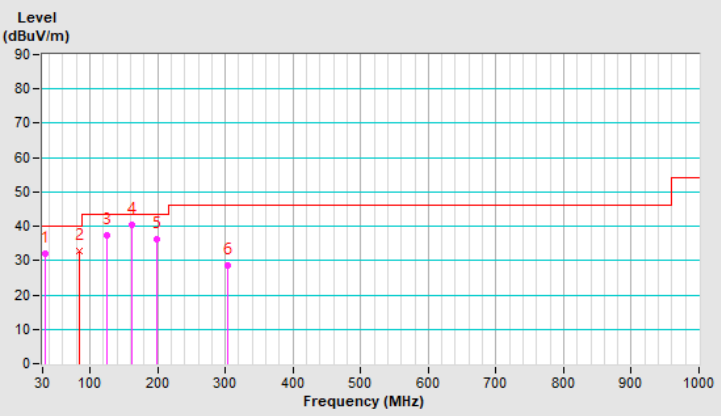
802.11b

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	33.90	32.0 QP	40.0	-8.0	3.00 H	28	40.7	-8.7
2	84.92	32.8 QP	40.0	-7.2	2.00 H	268	45.9	-13.1
3	125.79	37.4 QP	43.5	-6.1	1.50 H	293	45.8	-8.4
4	161.94	40.4 QP	43.5	-3.1	2.00 H	224	47.3	-6.9
5	197.98	36.2 QP	43.5	-7.3	1.00 H	86	46.2	-10.0
6	304.46	28.7 QP	46.0	-17.3	1.00 H	117	34.4	-5.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

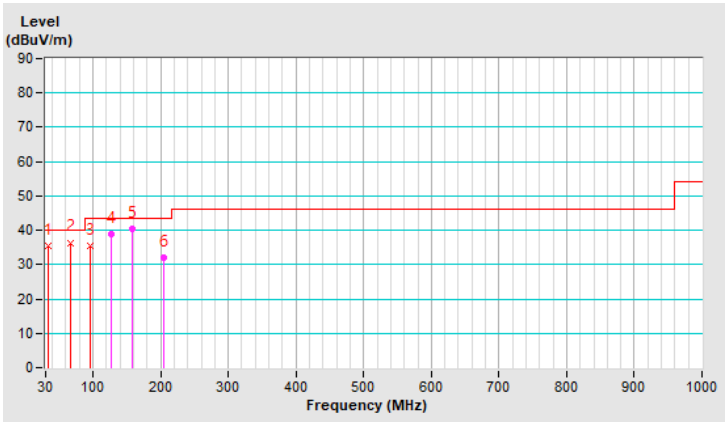


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.89	35.6 QP	40.0	-4.4	1.00 V	169	44.3	-8.7
2	67.49	36.4 QP	40.0	-3.6	1.00 V	261	45.8	-9.4
3	95.86	35.5 QP	43.5	-8.0	1.00 V	81	47.9	-12.4
4	126.95	38.9 QP	43.5	-4.6	1.00 V	327	47.4	-8.5
5	157.51	40.5 QP	43.5	-3.0	1.00 V	245	47.3	-6.8
6	205.40	32.0 QP	43.5	-11.5	1.00 V	38	41.9	-9.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 23, 2019	Oct. 22, 2020
RF Cable	5D-FB	COCCAB-001	Sep. 27, 2019	Sep. 26, 2020
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 30, 2019	Aug. 29, 2020
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3 Tested Date: June 11, 2020

4.2.3 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/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

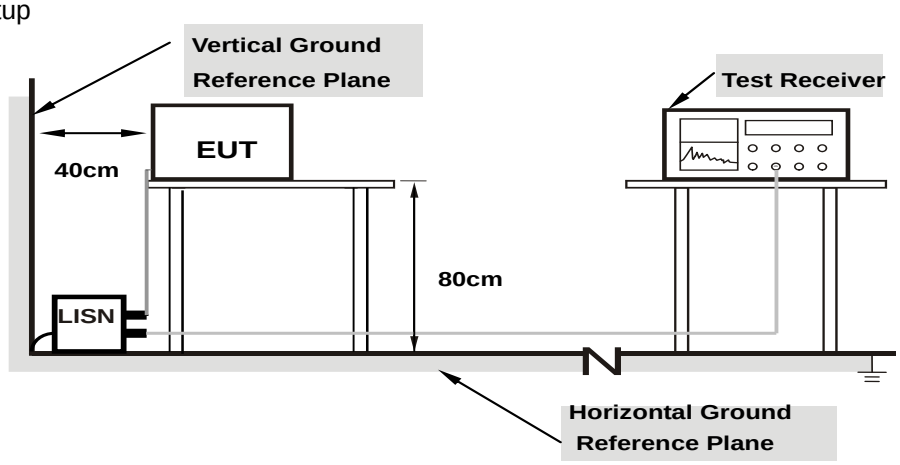
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

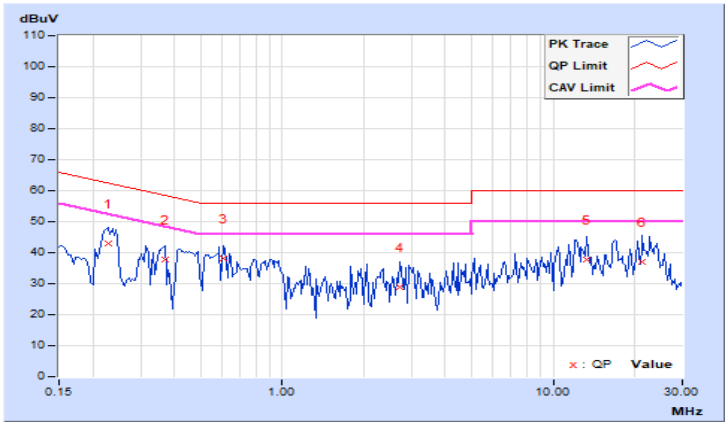
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.22812	10.02	32.84	19.03	42.86	29.05	62.52	52.52	-19.66	-23.47
2	0.36875	10.03	27.80	12.80	37.83	22.83	58.53	48.53	-20.70	-25.70
3	**0.60703**	**10.04**	**27.97**	**10.36**	**38.01**	**20.40**	**56.00**	**46.00**	**-17.99**	**-25.60**
4	2.71875	10.17	18.68	3.86	28.85	14.03	56.00	46.00	-27.15	-31.97
5	13.29297	10.77	27.02	15.48	37.79	26.25	60.00	50.00	-22.21	-23.75
6	21.39453	11.19	26.00	17.52	37.19	28.71	60.00	50.00	-22.81	-21.29

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

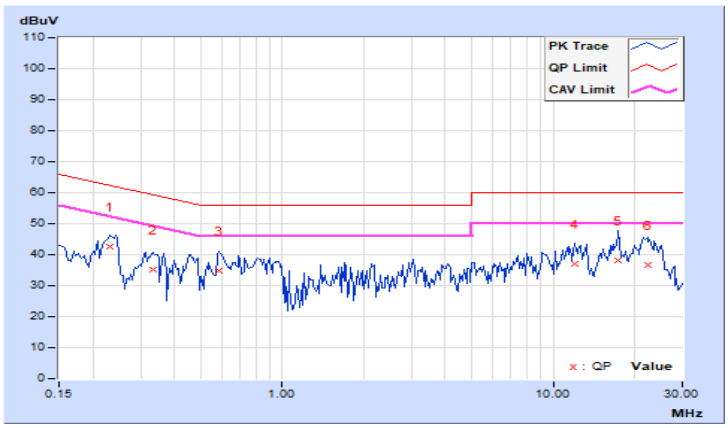


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.23203	10.01	32.51	20.03	42.52	30.04	62.38	52.38	-19.86	-22.34
2	0.33359	10.01	25.20	10.94	35.21	20.95	59.36	49.36	-24.15	-28.41
3	0.58359	10.03	24.81	8.04	34.84	18.07	56.00	46.00	-21.16	-27.93
4	12.02344	10.56	26.38	11.68	36.94	22.24	60.00	50.00	-23.06	-27.76
5	17.43750	10.78	27.43	16.36	38.21	27.14	60.00	50.00	-21.79	-22.86
6	22.40234	10.94	25.78	19.00	36.72	29.94	60.00	50.00	-23.28	-20.06

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

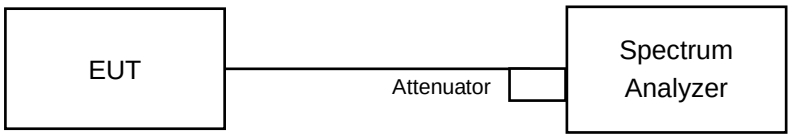


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

a. Set resolution bandwidth (RBW) = 100kHz
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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

CDD Mode

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	8.1	9.07	0.5	Pass
6	2437	8.56	8.55	0.5	Pass
11	2462	8.09	8.62	0.5	Pass

802.11g

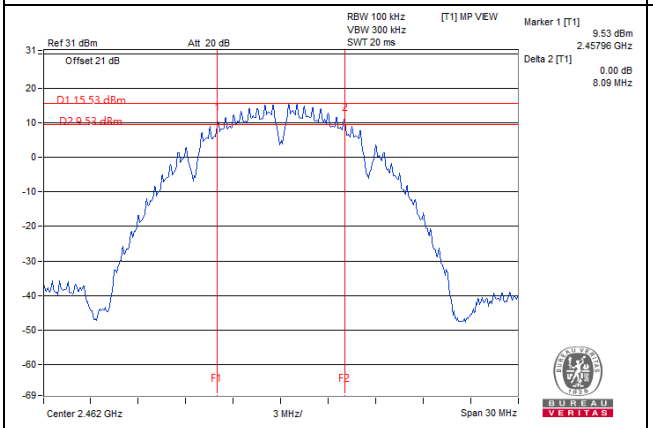
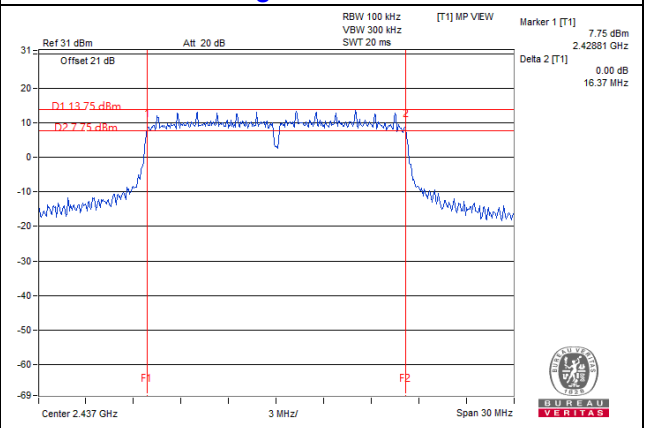
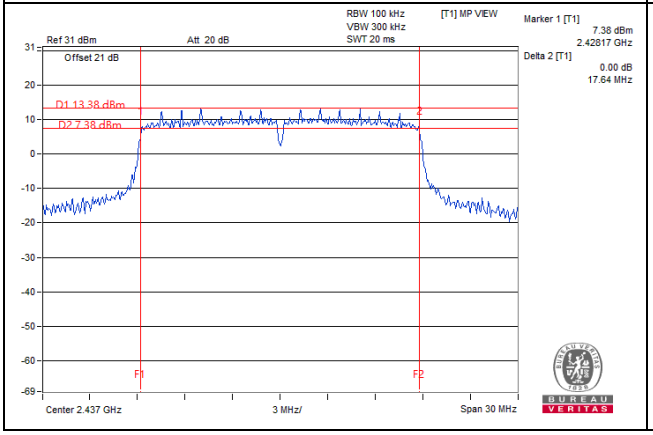
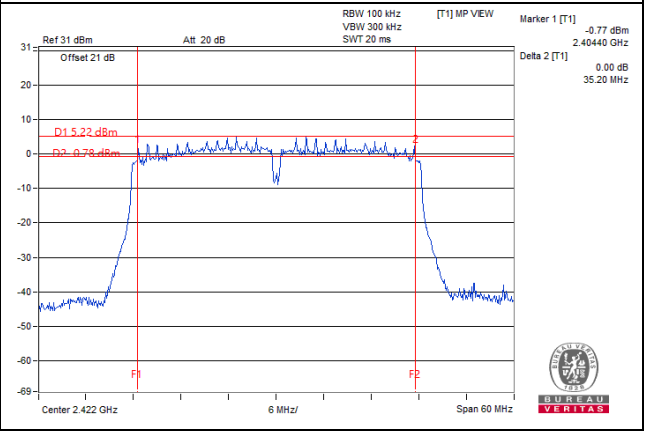
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.39	16.41	0.5	Pass
6	2437	16.39	16.37	0.5	Pass
11	2462	16.38	16.42	0.5	Pass

VHT20

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.65	17.66	0.5	Pass
6	2437	17.65	17.64	0.5	Pass
11	2462	17.66	17.65	0.5	Pass

VHT40

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.32	35.2	0.5	Pass
6	2437	35.22	35.23	0.5	Pass
9	2452	35.35	35.27	0.5	Pass

Spectrum Plot of Worst Value	
802.11b / Chain 0 : CH11	**802.11g / Chain 1 : CH6**
	
VHT20 / Chain 1 : CH6	**VHT40 / Chain 1 : CH3**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

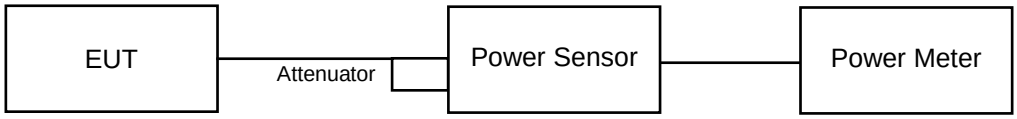
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

CDD Mode

802.11b

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	26.77	27.12	990.564	29.96	30.00	Pass
6	2437	24.31	24.42	546.468	27.38	30.00	Pass
11	2462	23.61	23.97	479.074	26.80	30.00	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	21.36	21.64	282.654	24.51	30.00	Pass
6	2437	25.74	25.79	754.288	28.78	30.00	Pass
11	2462	20.86	20.95	246.35	23.92	30.00	Pass

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.85	20.98	246.933	23.93	30.00	Pass
6	2437	25.68	25.89	757.979	28.80	30.00	Pass
11	2462	20.81	20.83	241.563	23.83	30.00	Pass

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.05	18.37	132.533	21.22	30.00	Pass
6	2437	22.03	22.23	326.697	25.14	30.00	Pass
9	2452	18.34	18.52	139.355	21.44	30.00	Pass

Beamforming Mode

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.85	20.98	246.933	23.93	30.00	Pass
6	2437	25.68	25.89	757.979	28.80	30.00	Pass
11	2462	20.81	20.83	241.563	23.83	30.00	Pass

Note: Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.87dBi < 6dBi , so the power limit shall not be reduced.

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.05	18.37	132.533	21.22	30.00	Pass
6	2437	22.03	22.23	326.697	25.14	30.00	Pass
9	2452	18.34	18.52	139.355	21.44	30.00	Pass

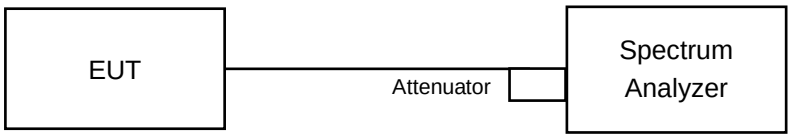
Note: Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.87dBi < 6dBi , so the power limit shall not be reduced.

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm in any 3 kHz.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For 802.11b

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.

For other modulation mode:

a) Measure the duty cycle (x).
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 times the OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz..
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

CDD Mode

802.11b

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1			
1	2412	-6.05	-5.47	-2.74	8.00	Pass
6	2437	-8.00	-8.09	-5.03	8.00	Pass
11	2462	-9.02	-8.49	-5.74	8.00	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.87 dBi < 6 dBi , so the power density limit shall not be reduced.

802.11g

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)		Duty Factor (dB)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1				
1	2412	-13.36	-12.84	0.19	-9.89	8.00	Pass
6	2437	-10.27	-10.34	0.19	-7.10	8.00	Pass
11	2462	-13.89	-13.66	0.19	-10.57	8.00	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.87 dBi < 6 dBi , so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

VHT20

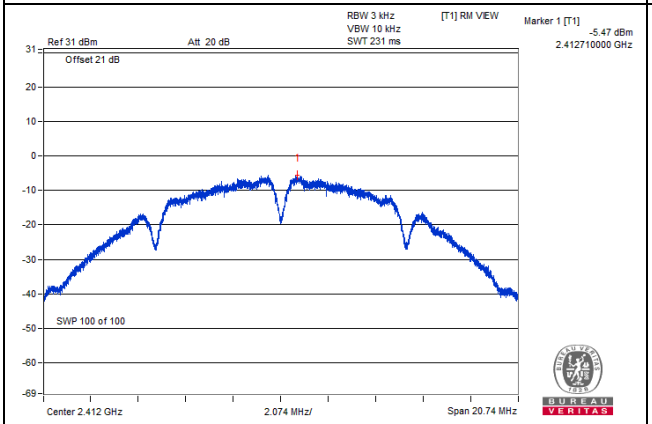
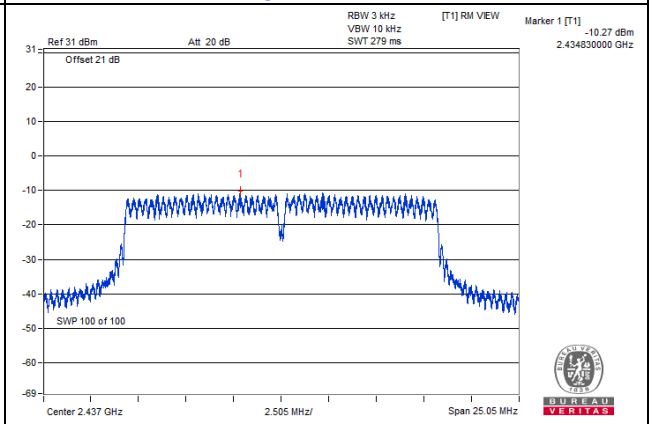
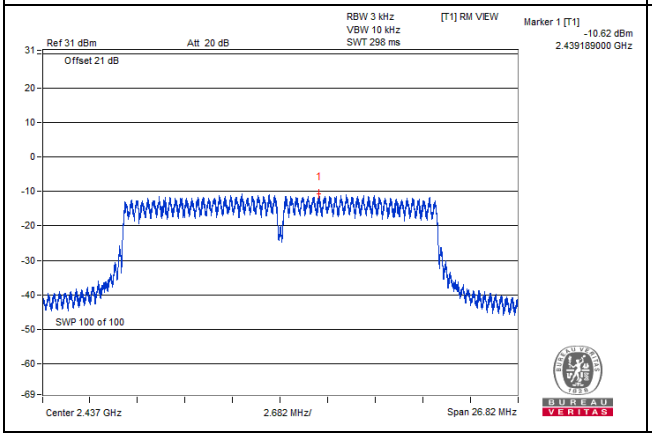
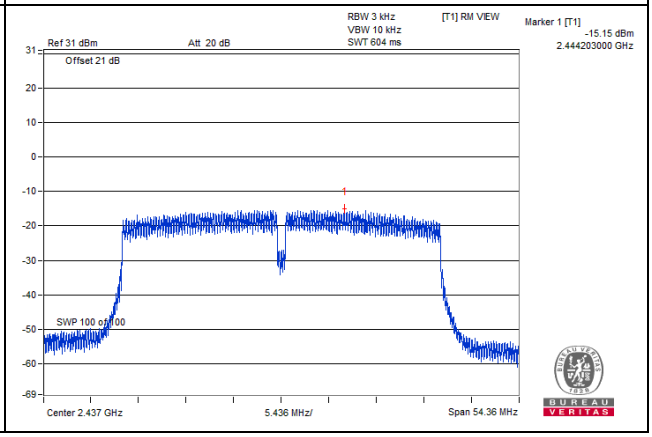
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)		Duty Factor (dB)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1				
1	2412	-14.46	-14.52	0.09	-11.39	8.00	Pass
6	2437	-10.62	-10.98	0.09	-7.70	8.00	Pass
11	2462	-14.39	-14.23	0.09	-11.21	8.00	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.87 dBi < 6 dBi , so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

VHT40

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)		Duty Factor (dB)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1				
3	2422	-19.42	-18.67	0.15	-15.87	8.00	Pass
6	2437	-15.89	-15.15	0.15	-12.34	8.00	Pass
9	2452	-18.89	-18.66	0.15	-15.61	8.00	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.87 dBi < 6 dBi , so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

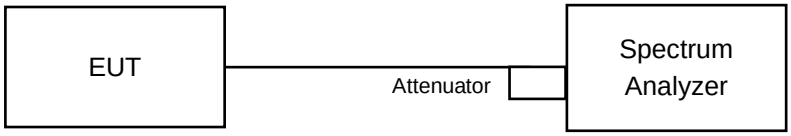
Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH1	**802.11g / Chain 0 : CH6**
	
VHT20 / Chain 0 : CH6	**VHT40 / Chain 1 : CH6**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below -30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 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.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

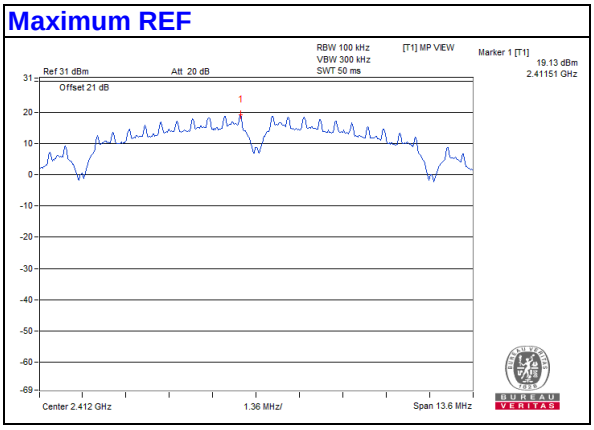
Same as Item 4.3.6

4.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

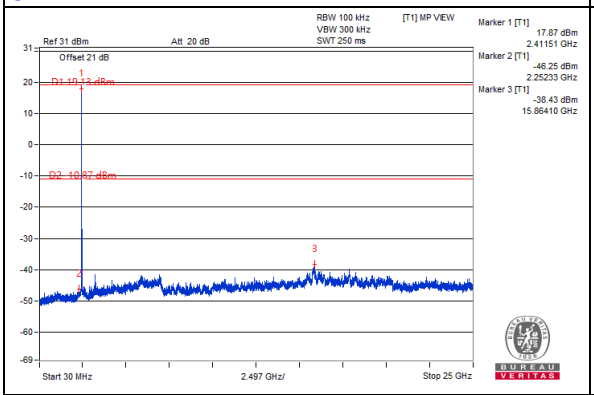
802.11b

Maximum REF

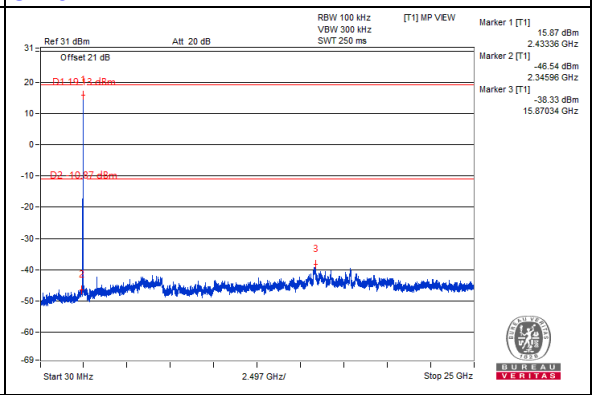


Chain 0

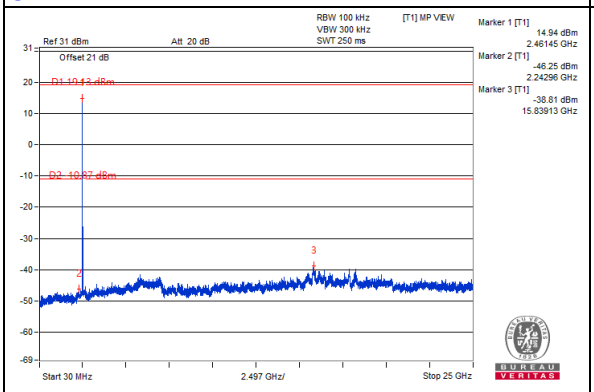
CH 1



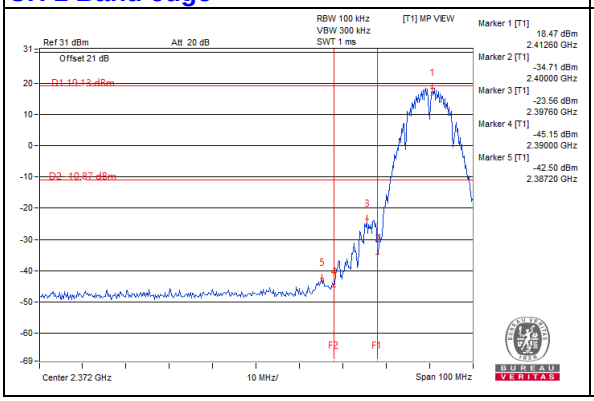
CH 6



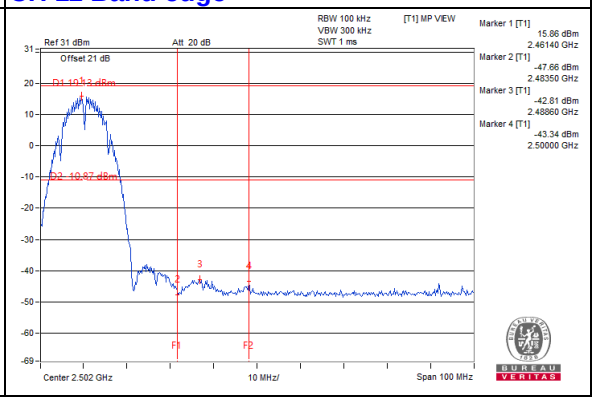
CH 11



CH 1 Band edge

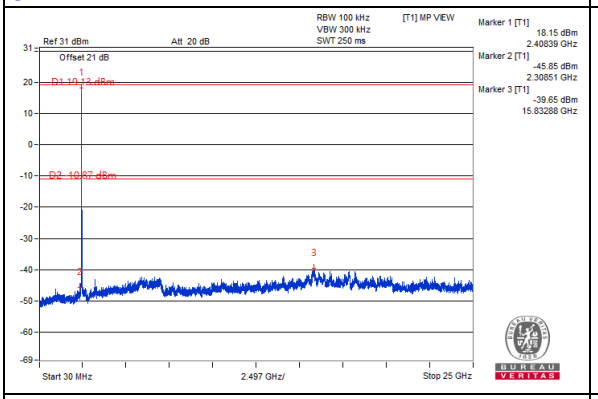


CH 11 Band edge

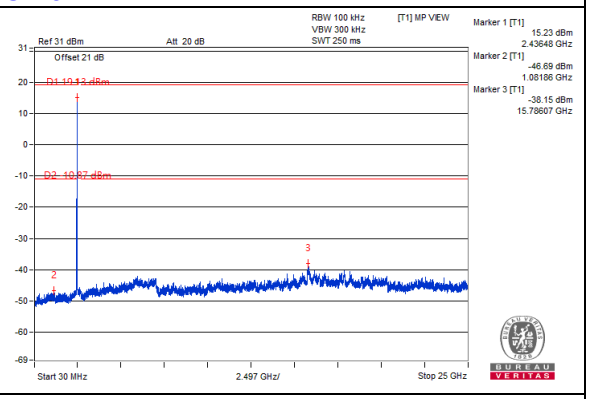


Chain 1

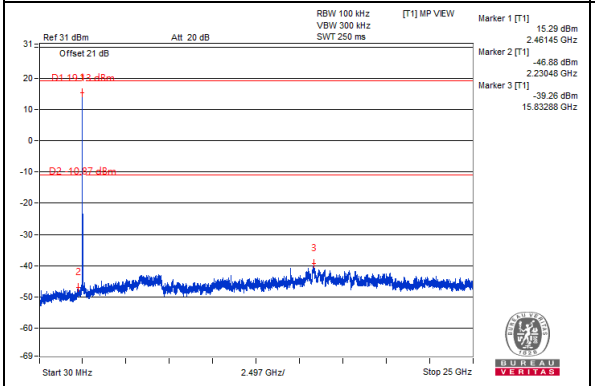
CH 1



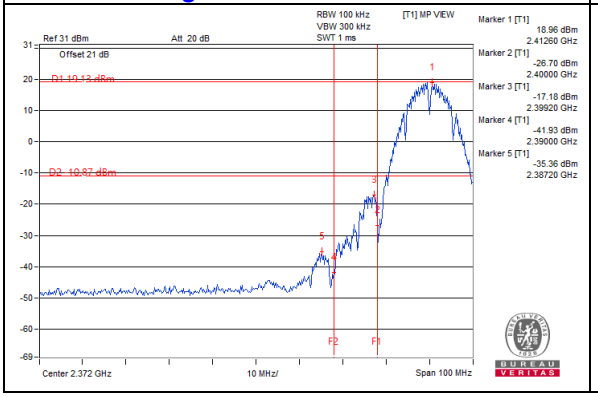
CH 6



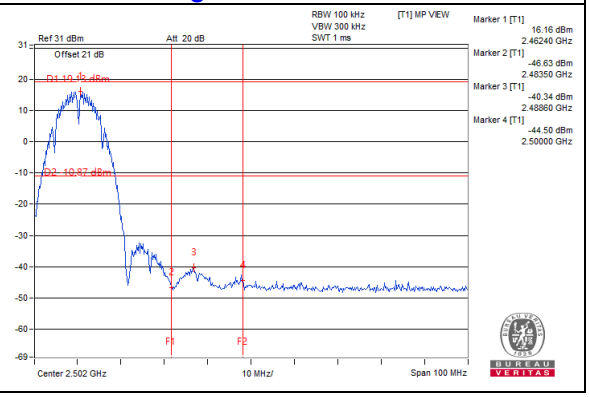
CH 11



CH 1 Band edge

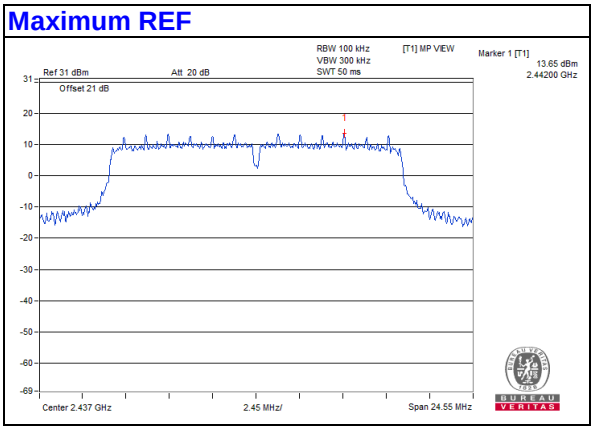


CH 11 Band edge



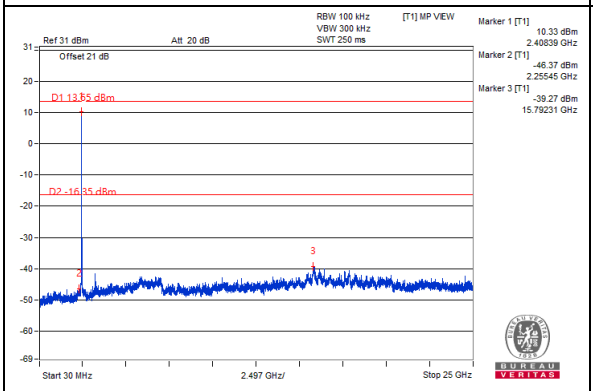
802.11g

Maximum REF

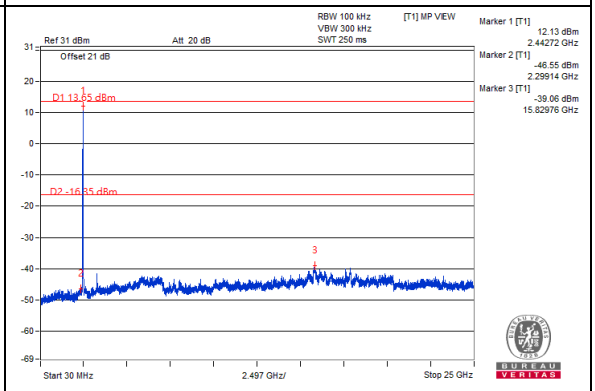


Chain 0

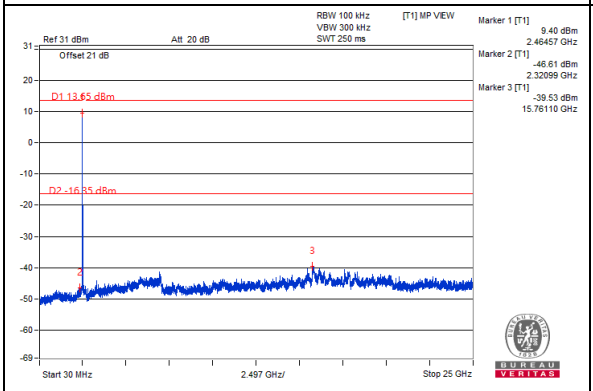
CH 1



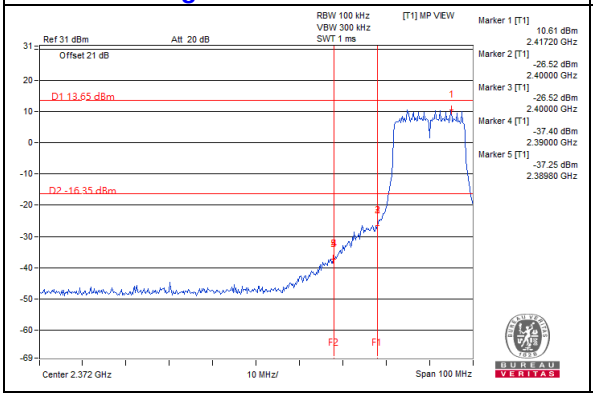
CH 6



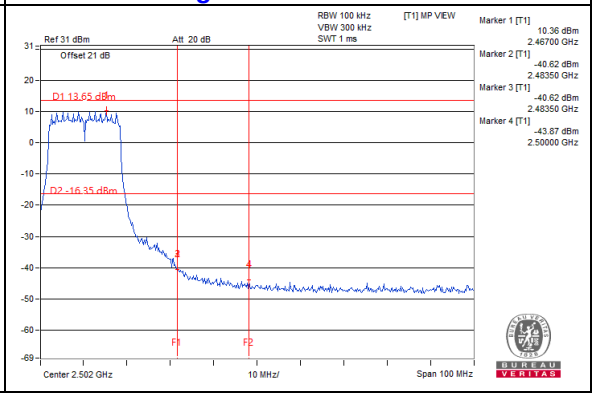
CH 11



CH 1 Band edge

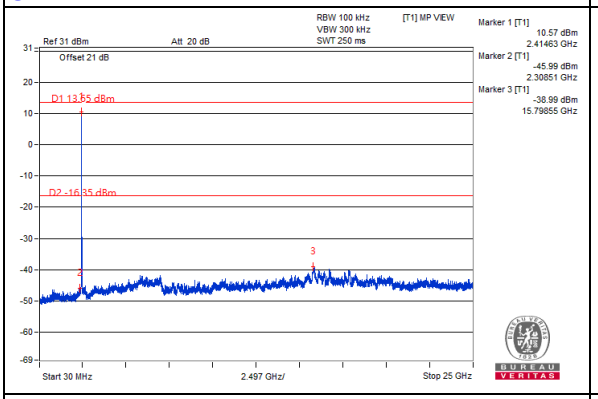


CH 11 Band edge

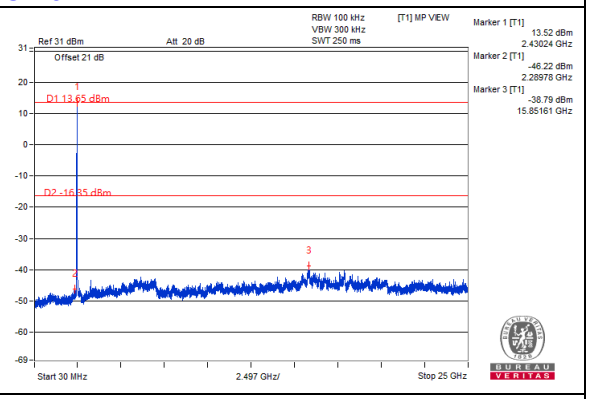


Chain 1

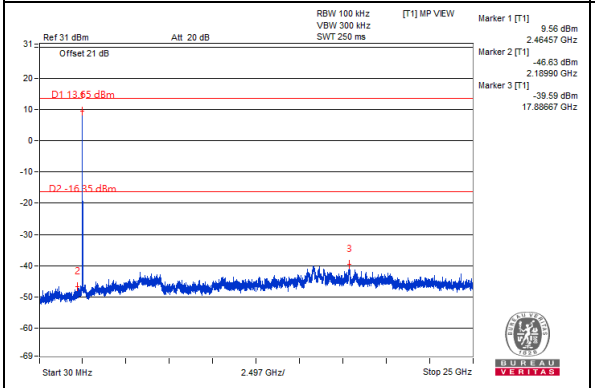
CH 1



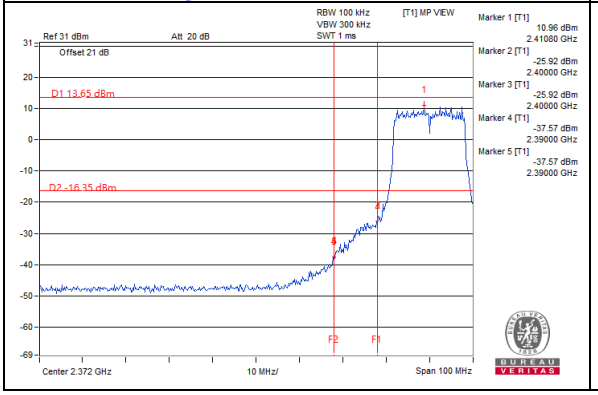
CH 6



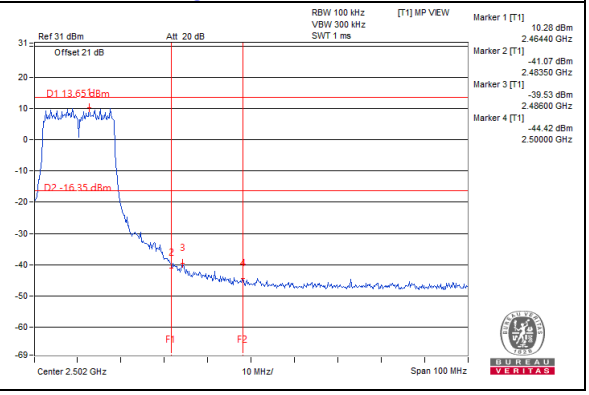
CH 11



CH 1 Band edge

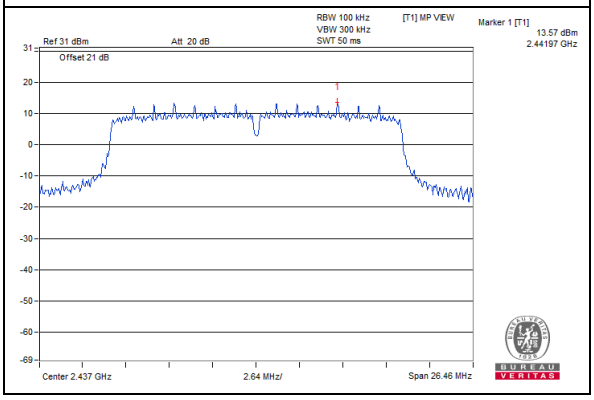


CH 11 Band edge



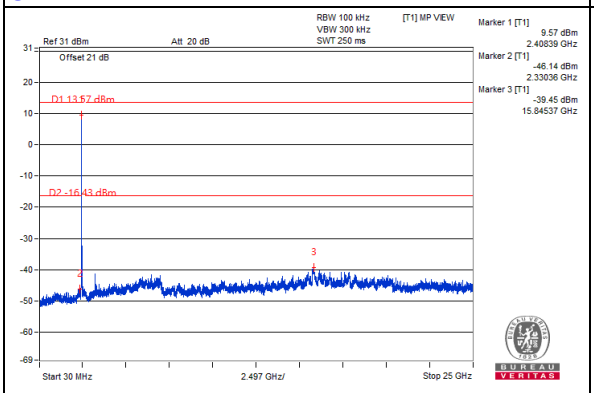
VHT20

Maximum REF

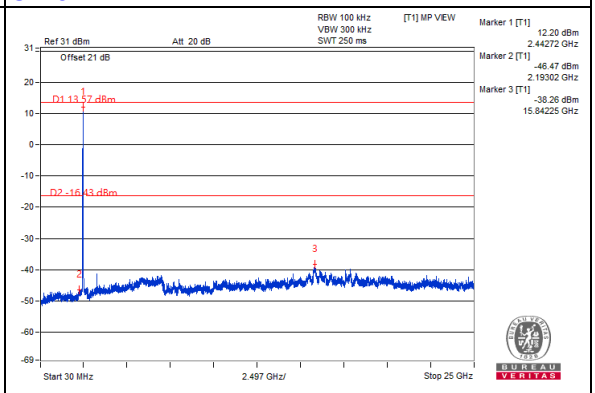


Chain 0

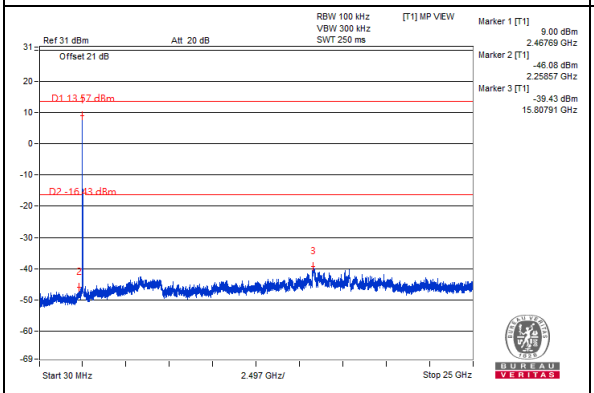
CH 1



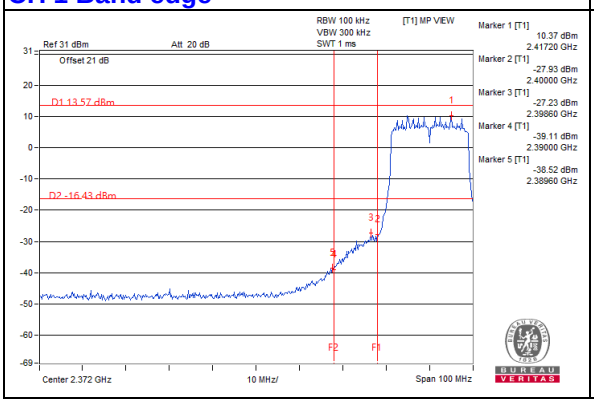
CH 6



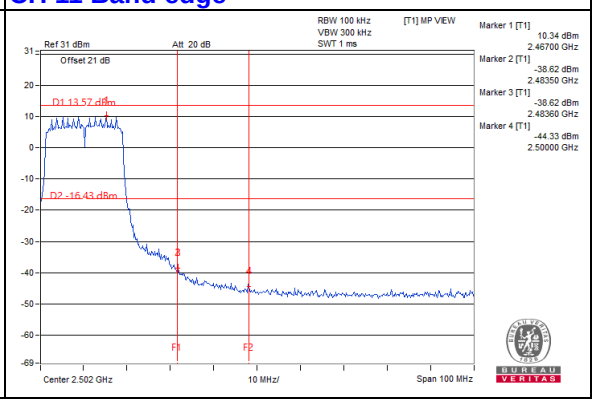
CH 11



CH 1 Band edge

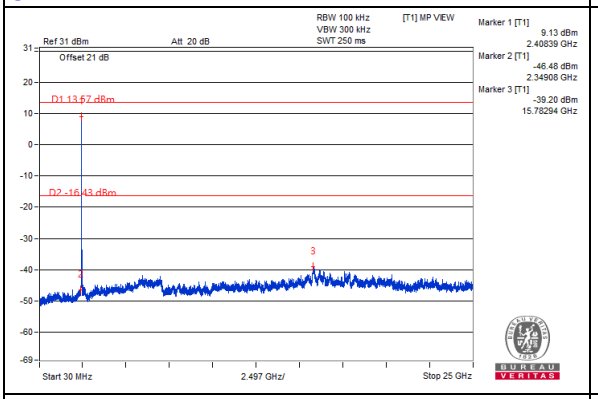


CH 11 Band edge

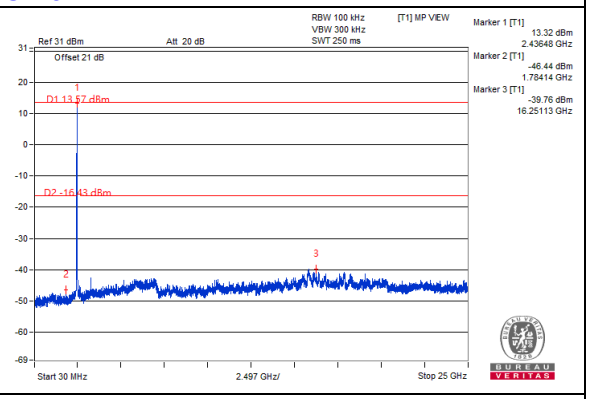


Chain 1

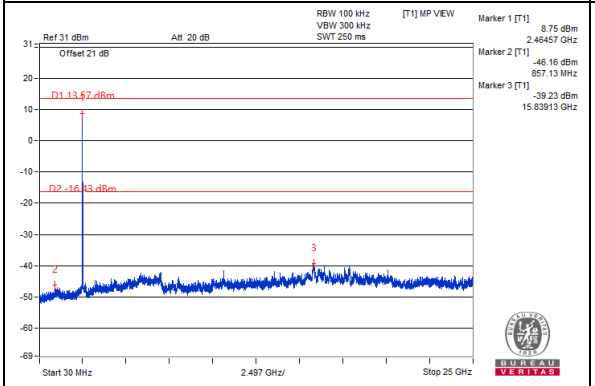
CH 1



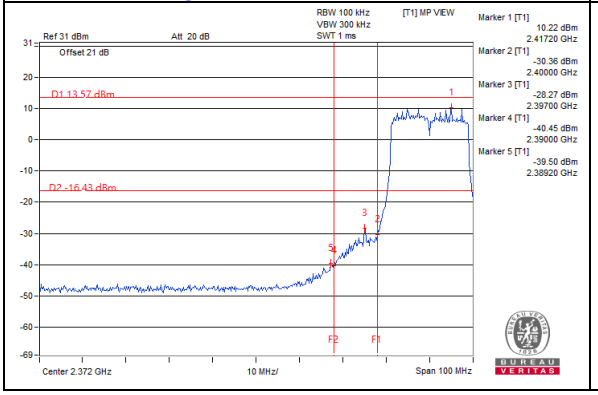
CH 6



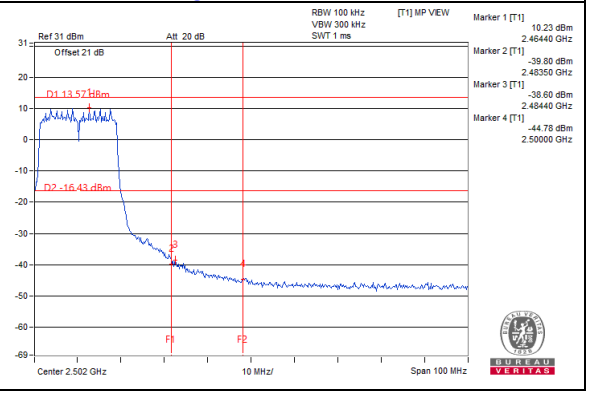
CH 11



CH 1 Band edge

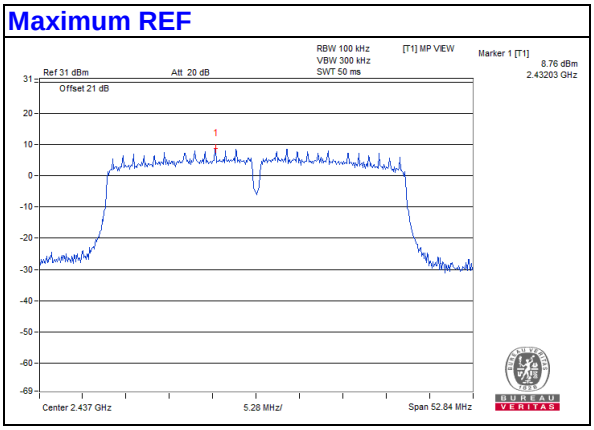


CH 11 Band edge



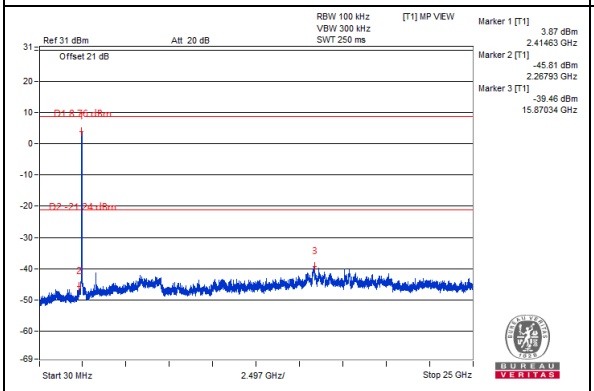
VHT40

Maximum REF

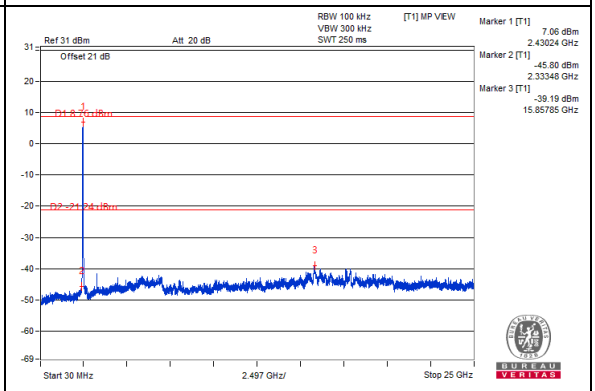


Chain 0

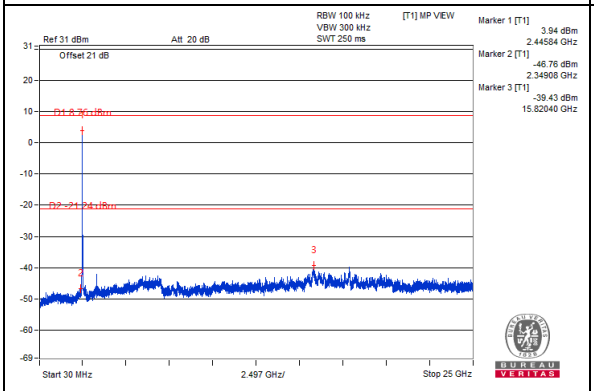
CH 3



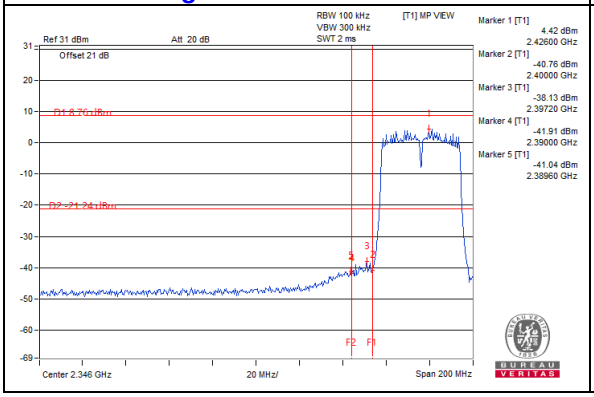
CH 6



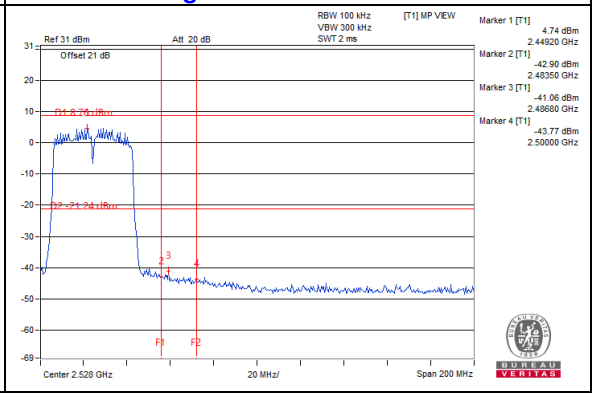
CH 9



CH 3 Band edge

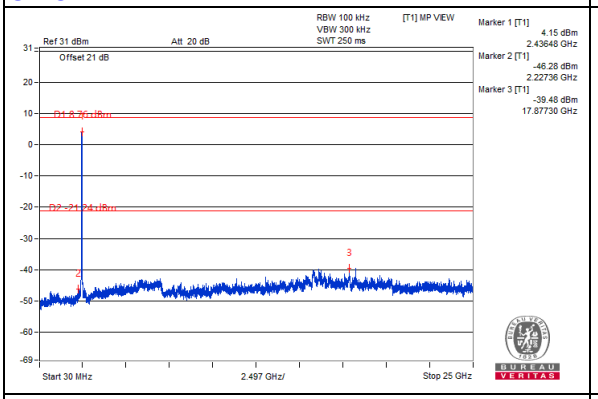


CH 9 Band edge

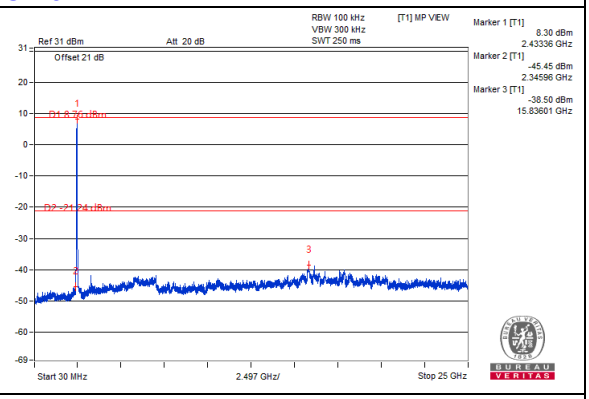


Chain 1

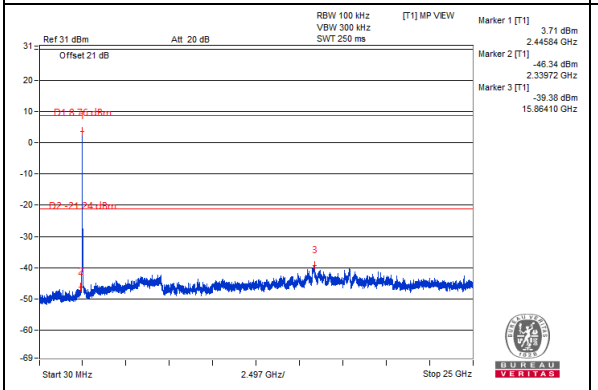
CH 3



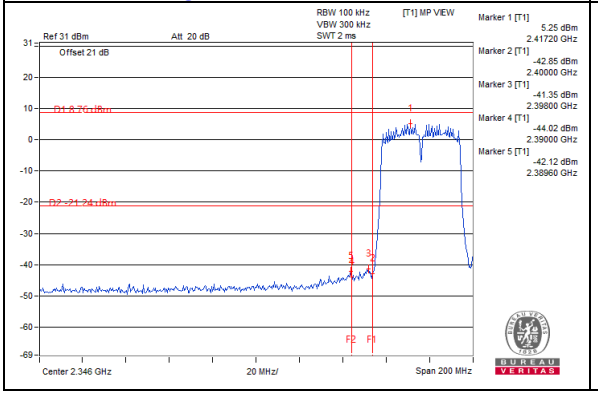
CH 6



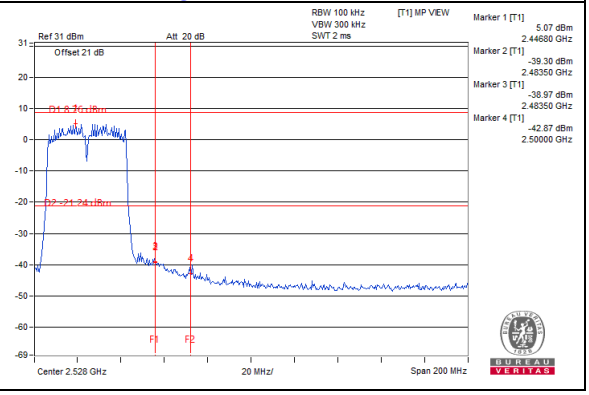
CH 9



CH 3 Band edge



CH 9 Band edge

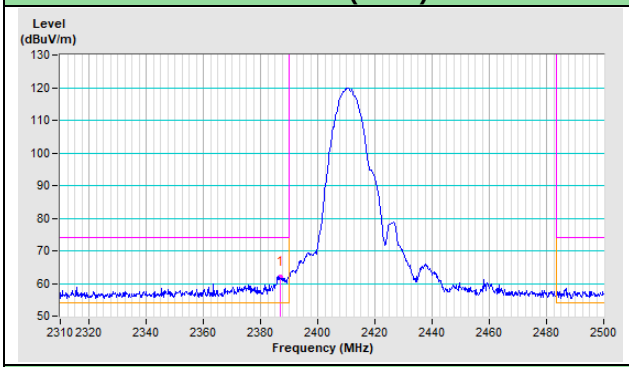
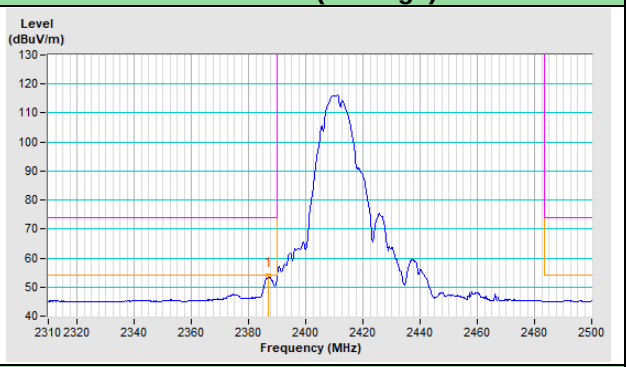
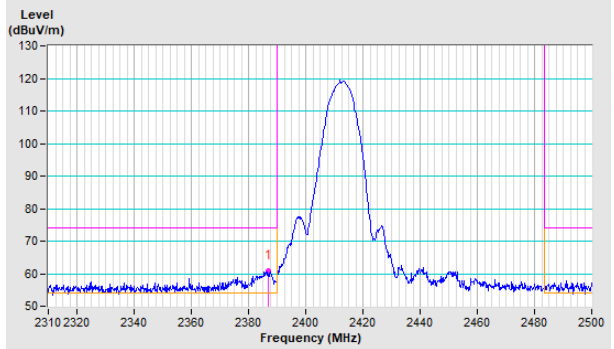
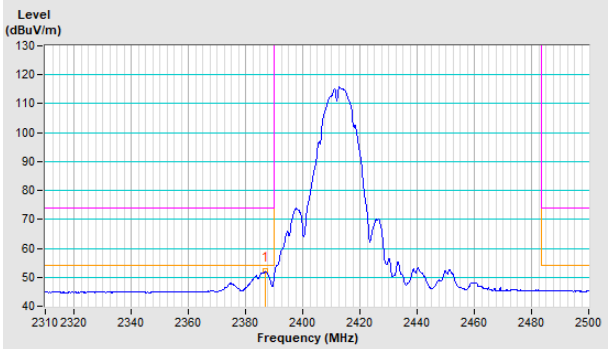
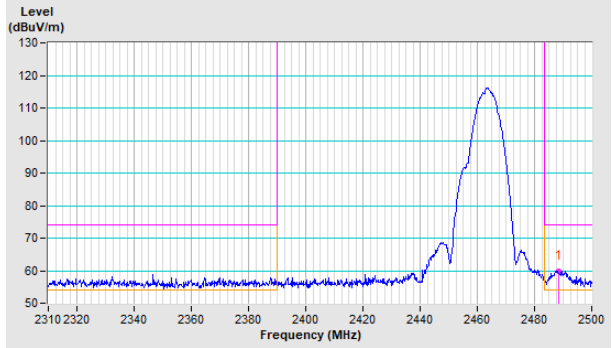
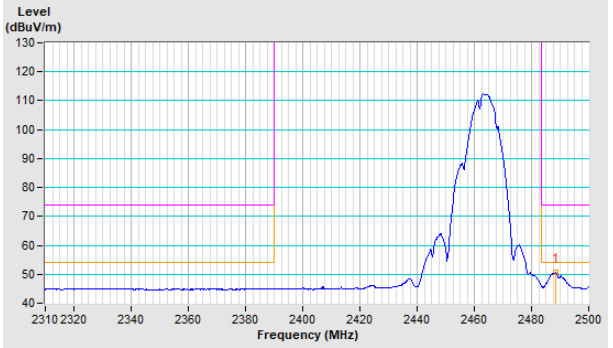
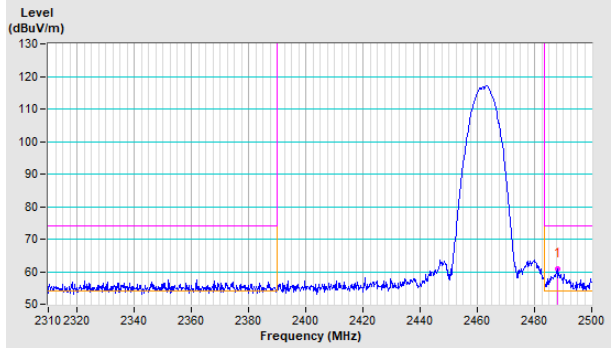
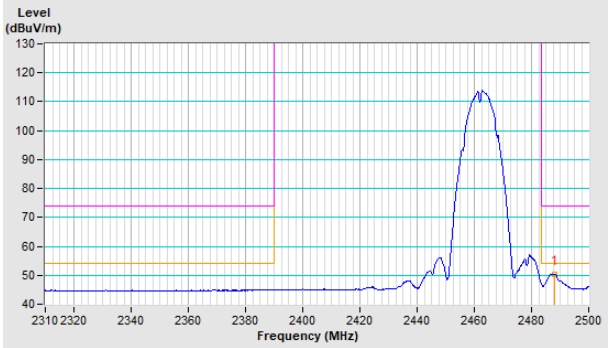


5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Annex A - Band-Edge Measurement

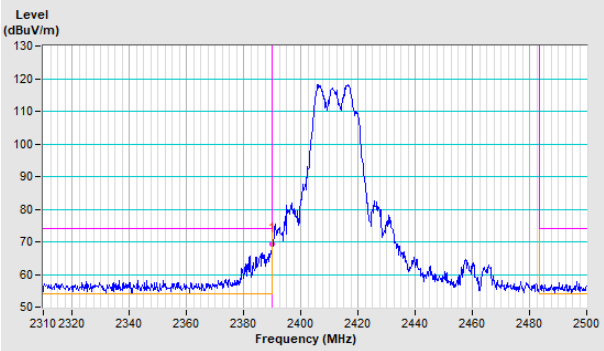
802.11b

Channel 1	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 11	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

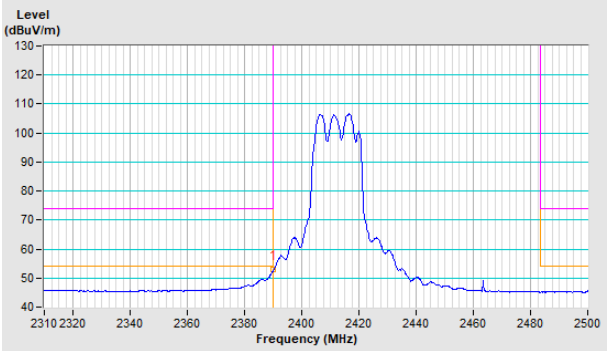
802.11g

Channel 1

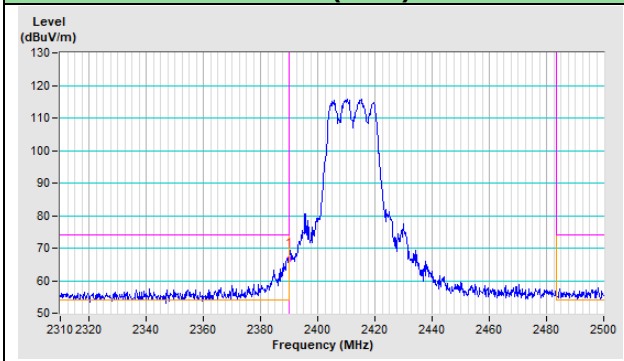
Horizontal (Peak)



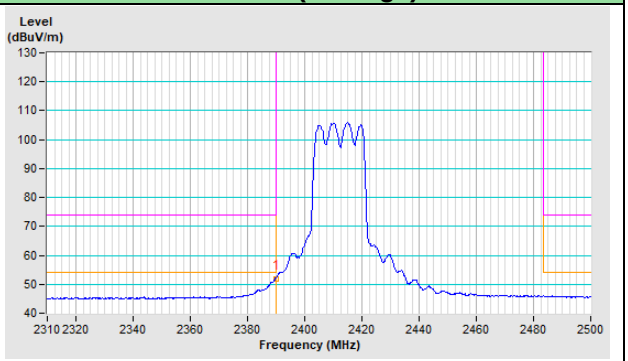
Horizontal (Average)



Vertical (Peak)

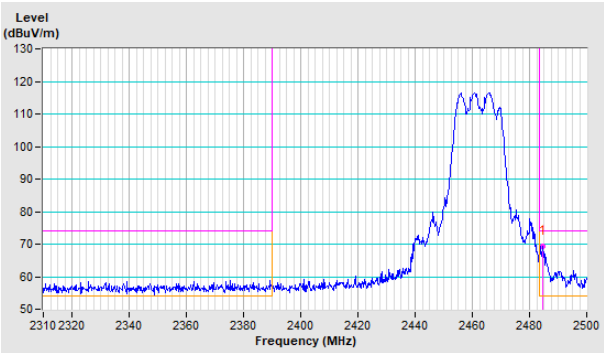


Vertical (Average)

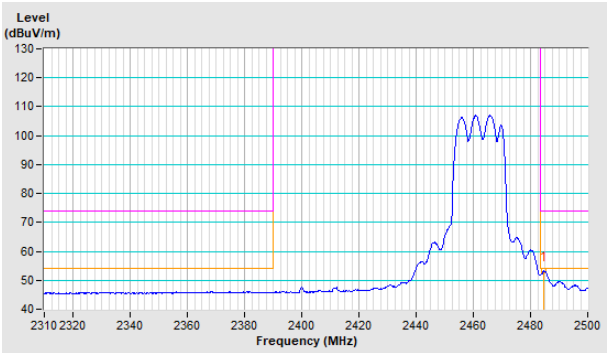


Channel 11

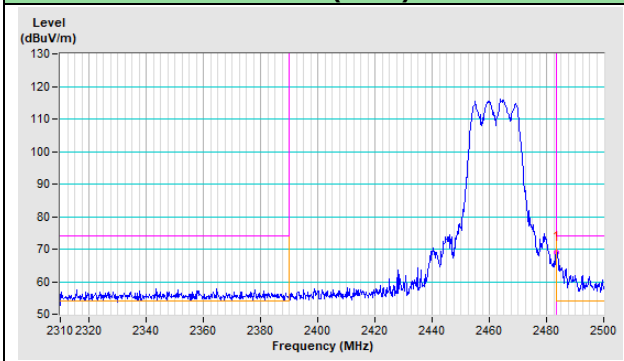
Horizontal (Peak)



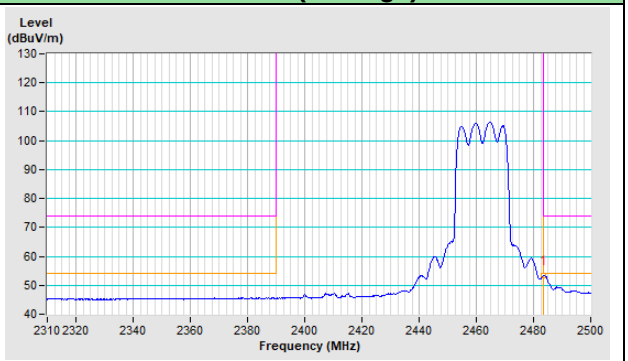
Horizontal (Average)



Vertical (Peak)



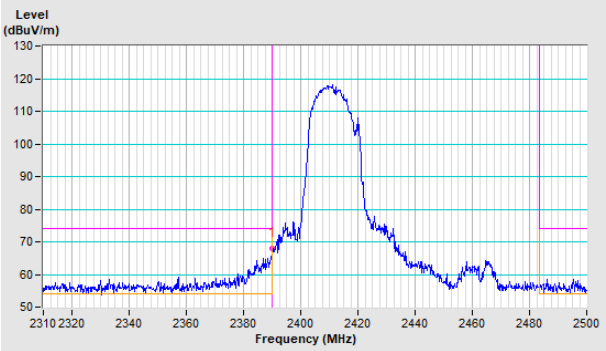
Vertical (Average)



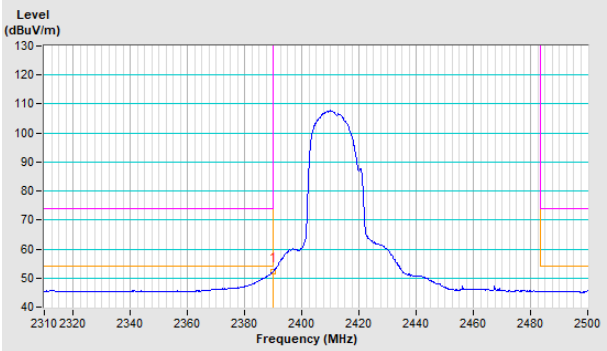
VHT20

Channel 1

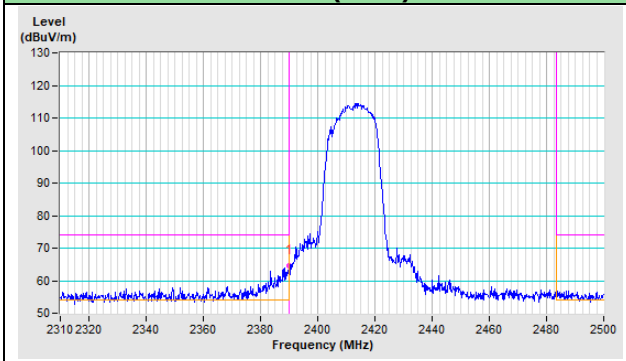
Horizontal (Peak)



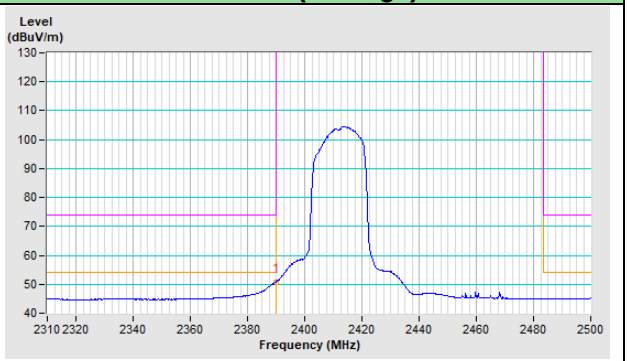
Horizontal (Average)



Vertical (Peak)

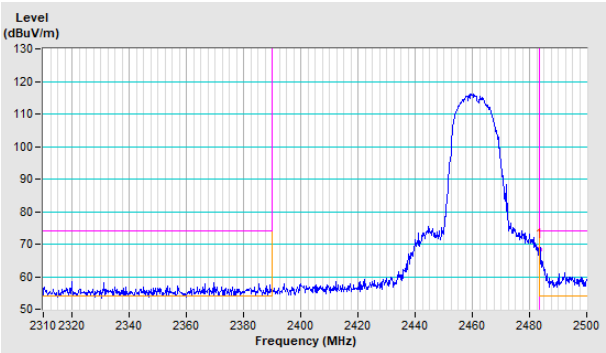


Vertical (Average)

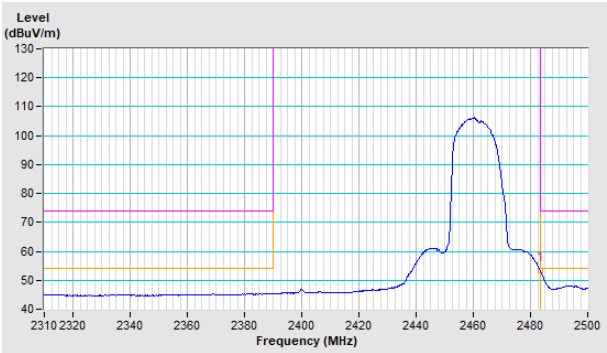


Channel 11

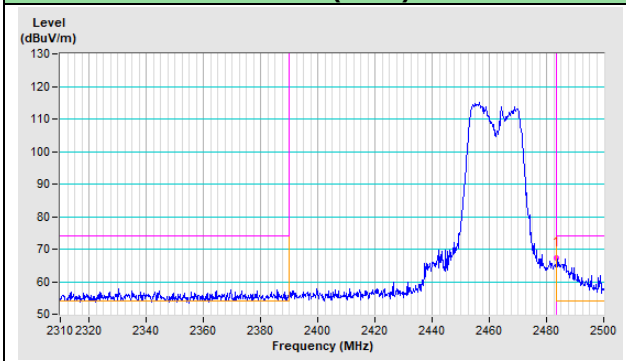
Horizontal (Peak)



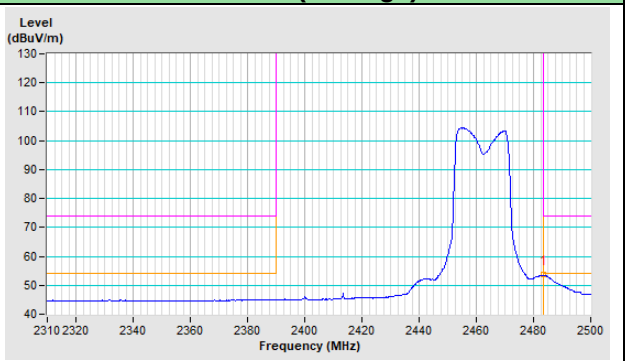
Horizontal (Average)



Vertical (Peak)



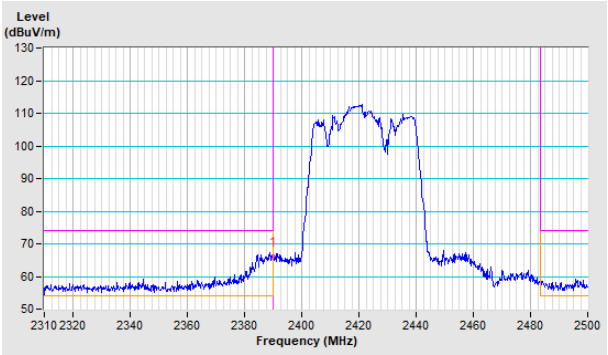
Vertical (Average)



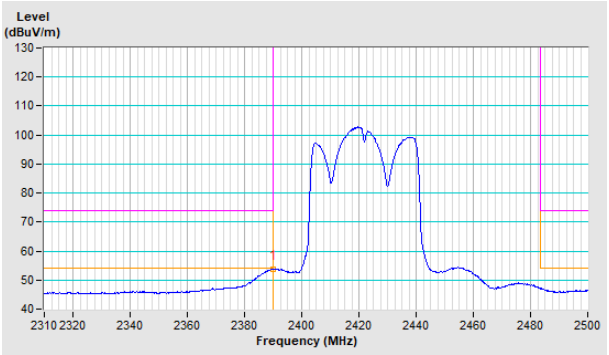
VHT40

Channel 3

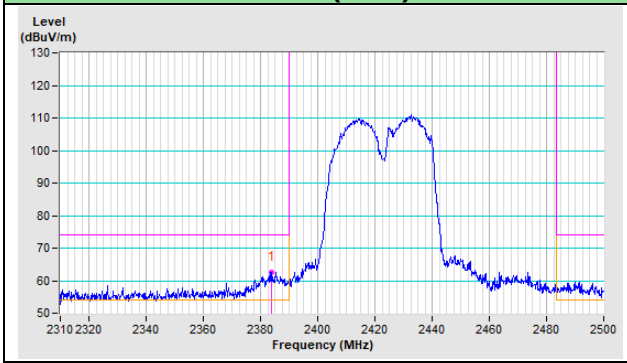
Horizontal (Peak)



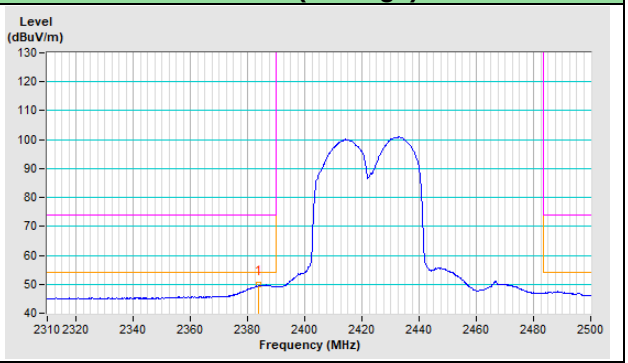
Horizontal (Average)



Vertical (Peak)

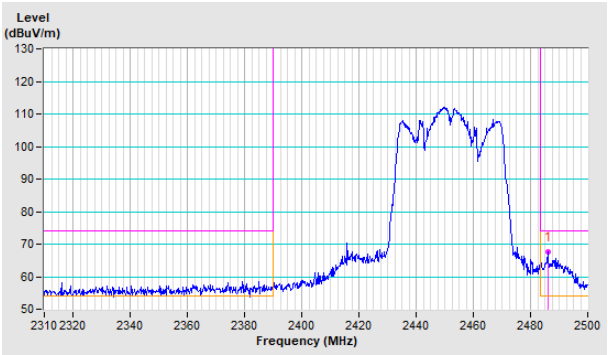


Vertical (Average)

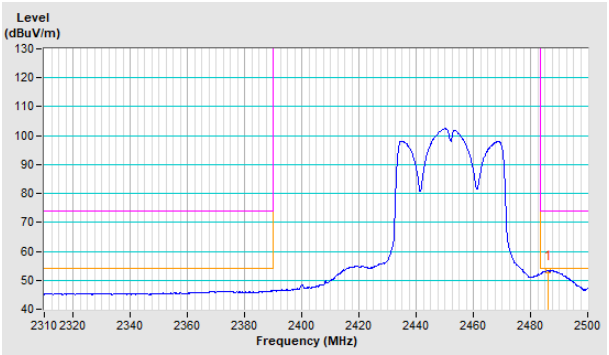


Channel 9

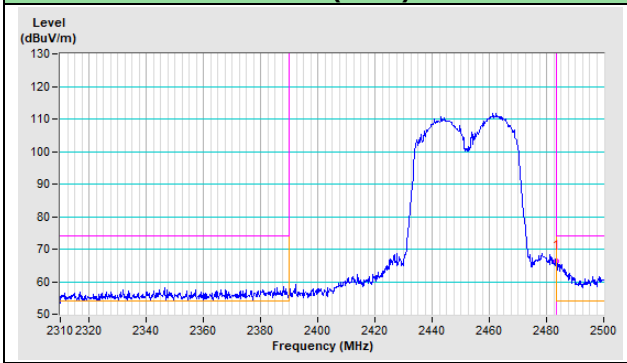
Horizontal (Peak)



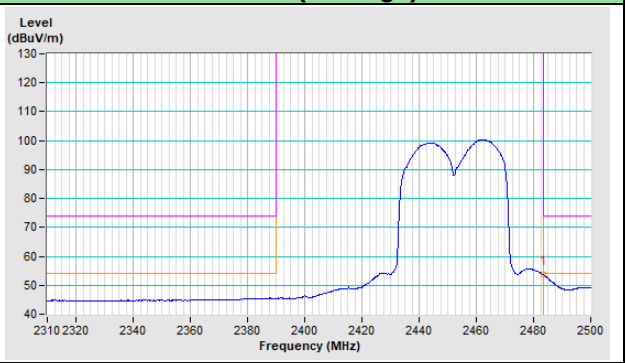
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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