FCC Test Report

Report No.:	RF200320E01
FCC ID:	I88C4000LZ
Test Model:	C4000LZ
Received Date:	Mar. 20, 2020
Test Date:	Apr. 12 to 30, 2020
Issued Date:	May 28, 2020
Applicant:	Zyxel Communications Corporation
Address:	No.2 Industry East RD. IX, Hsinchu Science Park, Hsinchu 30075, Taiwan
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
RF200320E01	Original release.	May 28, 2020

1 Certificate of Conformity

Product:	Dual-Band Wireless AX VDSL2 Gigabit Gateway
Brand:	CenturyLink, ZYXEL
Test Model:	C4000LZ
Sample Status:	ENGINEERING SAMPLE
Applicant:	Zyxel Communications Corporation
Test Date:	Apr. 12 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 : Joyce Kuo , **Date:** May 28, 2020

Joyce Kuo / Specialist

Approved by : , **Date:** May 28, 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 -11.74dB at 0.34531MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2377.00MHz.
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	Antenna connector is i-pex (MHF) not a standard connector.

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	5.1 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.1 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	Dual-Band Wireless AX VDSL2 Gigabit Gateway
Brand	CenturyLink, ZYXEL
Test Model	C4000LZ
CPU Model No.	GRX350
RF Chip Model No.	WAV654
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from 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 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS,OFDM, OFDMA
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 802.11ax: up to 1201.0 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, 80211ax (HE20): 11 802.11n (HT40), VHT40, 80211ax (HE40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20), 80211ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 80211ax (HE40): 4 802.11ac (VHT80), 80211ax (HE80): 2
Output Power	**Non-Beamforming Mode:** **2.412 ~ 2.462 GHz:** 832.061 mW **5.18 ~ 5.24 GHz:** 827.149 mW **5.745 ~ 5.825 GHz:** 945.395 mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 759.637 mW **5.18 ~ 5.24 GHz:** 827.149 mW **5.745 ~ 5.825 GHz:** 835.929 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	- AC Adaptor, Brand:UMEC, Model:UP0251M-12PA - AC Adaptor, Brand:DVE, Model:DSA-24PFS-12 FUS 120200 - AC Adaptor, Brand:MNC, Model:MAUS-120200 - Ethernet Cable , Non-shielded, 1.8m x1 - DSL cable , Non-shielded, 3.66m x1

Note:

1. The EUT has below brand names, which are identical to each other in all aspects except for the following table:

Brand	Model	Difference
CenturyLink	C4000LZ	Different brand names are for marketing purpose.
ZYXEL		

2. The EUT has two radios as following table:

Radio 1	Radio 2
WLAN 2.4GHz	WLAN 5GHz

3. Simultaneously transmission condition.

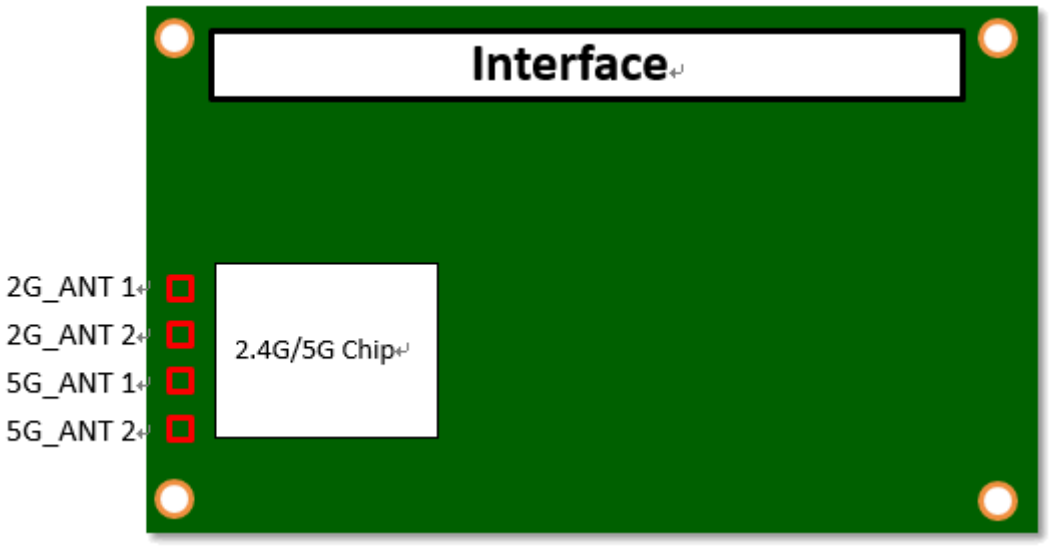
Condition	Technology	
1	WLAN (2.4GHz)	WLAN 5GHz
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

4. The EUT must be supplied one power adapter and following different models could be chosen as following table:

No.	Brand	Model No.	Spec.
1	UMEC	UP0251M-12PA	Input: 100-240Vac, 0.6A, 50/60Hz Output: 12V, 2A DC Output cable: Unshielded, 1.8m
2	DVE	DSA-24PFS-12 FUS 120200	Input: 100-240Vac, 0.8A, 50/60Hz Output: 12V, 2A DC Output cable: Unshielded, 1.8m
3	MNC	MAUS-120200	Input: 100-240Vac, 0.7A, 50/60Hz Output: 12V, 2A DC Output cable: Unshielded, 1.8m

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

Antenna NO.	Chain NO.	Brand	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length(mm)
2G_ANT1	Chain 0	M.gear	2.48	2.4~2.4835GHz	Dipole	i-pex(MHF)	150
2G_ANT2	Chain 1	M.gear	2.77	2.4~2.4835GHz	Dipole	i-pex(MHF)	150
5G_ANT1	Chain 0	M.gear	3.36	5.15~5.25GHz	Dipole	i-pex(MHF)	150
			3.45	5.25~5.35GHz			
			3.44	5.47~5.725GHz			
			3.36	5.725~5.85GHz			
5G_ANT2	Chain 0	M.gear	3.41	5.15~5.25GHz	Dipole	i-pex(MHF)	150
			3.18	5.25~5.35GHz			
			3.47	5.47~5.725GHz			
			3.47	5.725~5.85GHz			



* Antenna port location

6. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	1Tx Fixed Chain 0	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
VHT20	2TX	2RX
VHT40	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
5GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11a	2TX	2TX
802.11n (HT20)	2TX	2TX
802.11n (HT40)	2TX	2TX
802.11ac (VHT20)	2TX	2TX
802.11ac (VHT40)	2TX	2TX
802.11ac (VHT80)	2TX	2TX
802.11ax (HE20)	2TX	2TX
802.11ax (HE40)	2TX	2TX
802.11ax (HE80)	2TX	2TX

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and Non-Beamforming 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), VHT mode for 20MHz (40MHz) and 802.11ax mode for 20MHz (40MHz), therefore the manufacturer will control the power for 802.11n mode is the same as the VHT mode or more lower than it and investigated worst case to representative mode in test report. (Final test mode refer to section 3.2.1)

7. The power setting are list as below:

Non-Beamforming Mode											
802.11b		802.11g		VHT20		VHT40		802.11ax (HE20)		802.11ax (HE40)	
Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting
2412	25.5	2412	21	2412	19.5	2422	19	2412	19.5	2422	19
2437	25.5	2437	27	2437	25.5	2437	21.5	2437	25.5	2437	21.5
2462	25.5	2462	21	2462	20	2452	20	2462	20	2452	20

Beamforming Mode							
VHT20		VHT40		802.11ax (HE20)		802.11ax (HE40)	
Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting
2412	19.5	2422	19	2412	19.5	2422	19
2437	25.5	2437	21.5	2437	25.5	2437	21.5
2462	20	2452	20	2462	20	2452	20

8. 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.

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20), VHT20 and 802.11ax (HE20):

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 and 802.11ax (HE40):

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	
1	√	√	√	√	Adapter 3
2	-	√	√	-	Adapter 2
3	-	√	√	-	Adapter 1

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.

Non-Beamforming Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	Data Rate Parameter
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

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.

Non-Beamforming Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	Data Rate Parameter
802.11g	1 to 11	6	OFDM	BPSK	6Mb/s

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.

Non-Beamforming Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	Data Rate Parameter
802.11g	1 to 11	6	OFDM	BPSK	6Mb/s

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.

Non-Beamforming Mode					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**Data Rate Parameter**
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
VHT20 (Output power only)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
VHT40 (Output power only)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0
Beamforming Mode (output power only)					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**Data Rate Parameter**
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	MCS0
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

Test Condition:

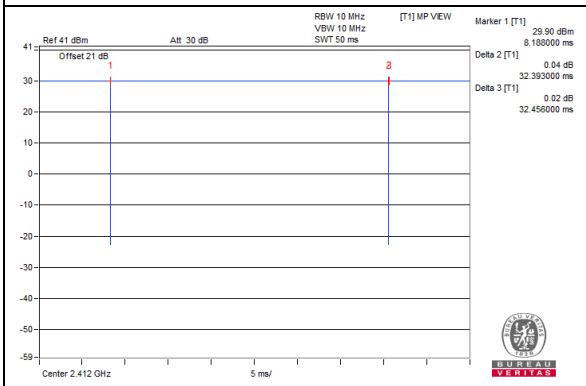
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	23deg. C, 75%RH	120Vac, 60Hz	Kevien Ko
RE<1G	21deg. C, 65%RH	120Vac, 60Hz	Ryan Du
PLC	25deg. C, 63%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

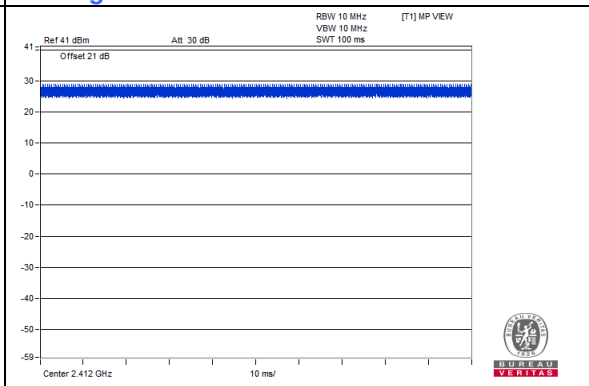
Duty cycle of test signal is 100 %, duty factor is not required.

802.11b: Duty cycle = 32.393/32.456 =0.998

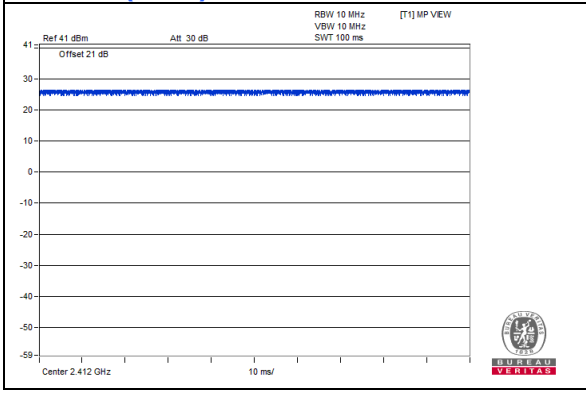
802.11b



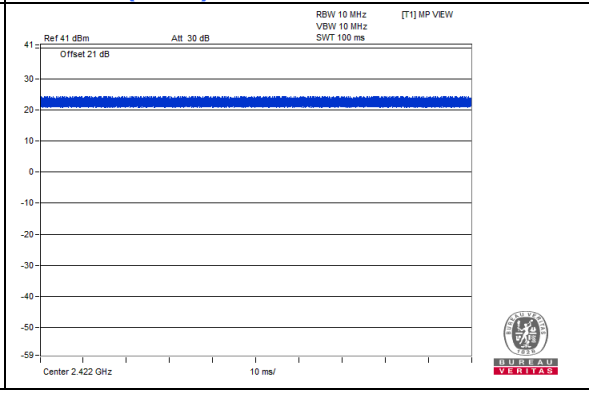
802.11g



802.11ax (HE20)



802.11ax (HE40)



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.

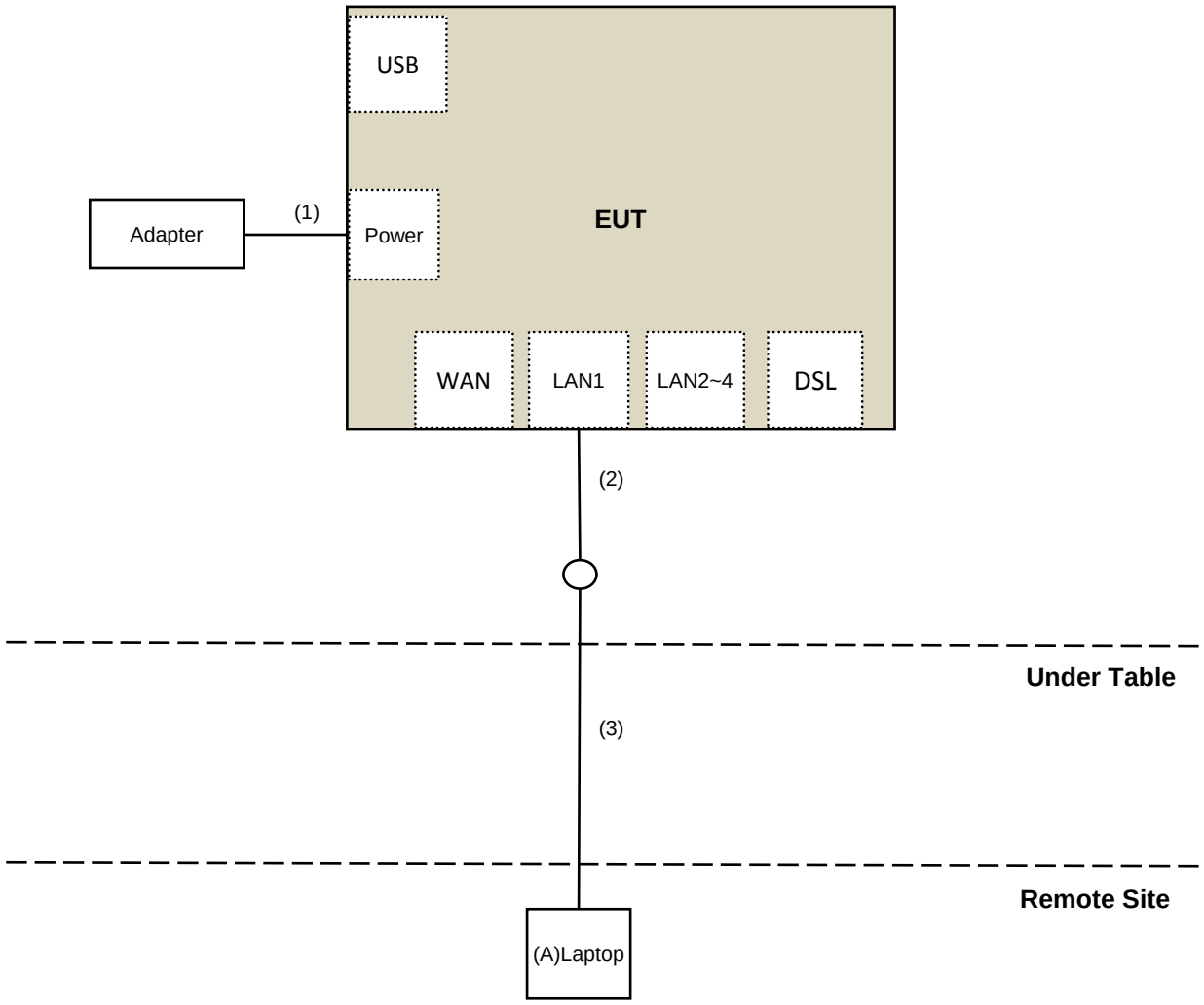
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab

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.	DC Cable	1	1.8	No	0	Supplied by client
2.	RJ-45 Cable	1	1.8	No	0	Supplied by client
3.	RJ-45 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



NOTE: The test configuration was defined by the applicant requirement.

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 test (Above 1GHz)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ESR7 R&S	ESR7	102026	Apr. 22, 2020	Apr. 21, 2021
Spectrum Analyzer Keysight	N9030B	MY57141948	May 25, 2019	May 24, 2020
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-1819	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980509	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-1500	180503	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-2000	180501	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-6000	180506	Apr. 29, 2020	Apr. 28, 2021
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
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	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. 5.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Apr. 29, 2020

For Radiated emission test (Below 1GHz)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ESR7 R&S	ESR7	102026	Apr. 24, 2019	Apr. 23, 2020
Spectrum Analyzer Keysight	N9030B	MY57141948	May 25, 2019	May 24, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 30, 2019	May 29, 2020
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 EMCI	EMC330N	980538	Apr. 30, 2019	Apr. 29, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB9168	9168-0842	Nov. 08, 2019	Nov. 07, 2020
RF Cable	8D	966-5-1	May 03, 2019	May 02, 2020
RF Cable	8D	966-5-2	May 03, 2019	May 02, 2020
RF Cable	8D	966-5-3	May 03, 2019	May 02, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	Jan. 14, 2020	Jan. 13, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	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. 5.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Apr. 13 to 15, 2020

For Bandedge test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ESR7 R&S	ESR7	102026	Apr. 24, 2019	Apr. 23, 2020
Spectrum Analyzer Keysight	N9030B	MY57141948	May 25, 2019	May 24, 2020
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-1819	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980509	May 03, 2019	May 02, 2020
RF Cable EMCI	EMC104-SM-SM-1500	180503	May 03, 2019	May 02, 2020
RF Cable EMCI	EMC104-SM-SM-2000	180501	May 03, 2019	May 02, 2020
RF Cable EMCI	EMC104-SM-SM-6000	180506	May 03, 2019	May 02, 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
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	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. 5.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Apr. 12, 2020

For other test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	June 04, 2019	June 03, 2020
Power meter Anritsu	ML2495A	1014008	May 13, 2019	May 12, 2020
Power sensor Anritsu	MA2411B	0917122	May 13, 2019	May 12, 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: Apr. 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:

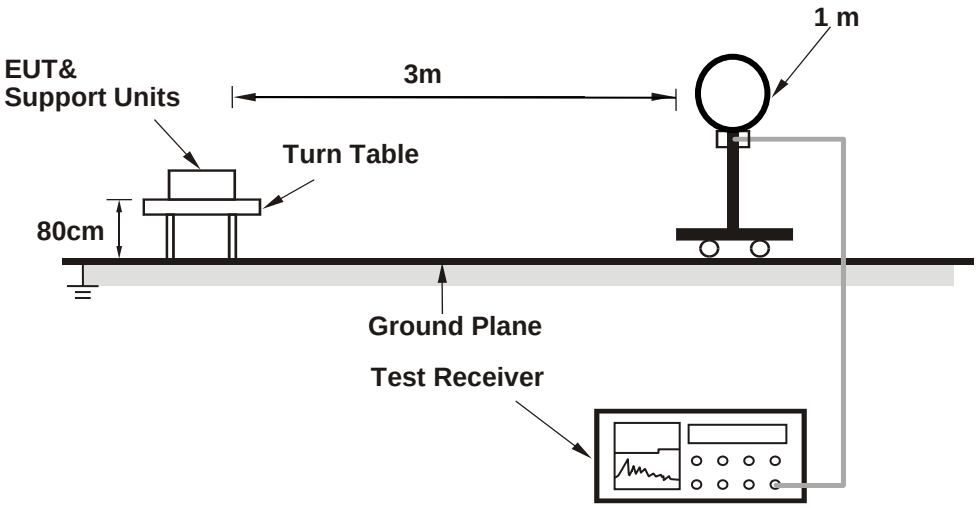
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

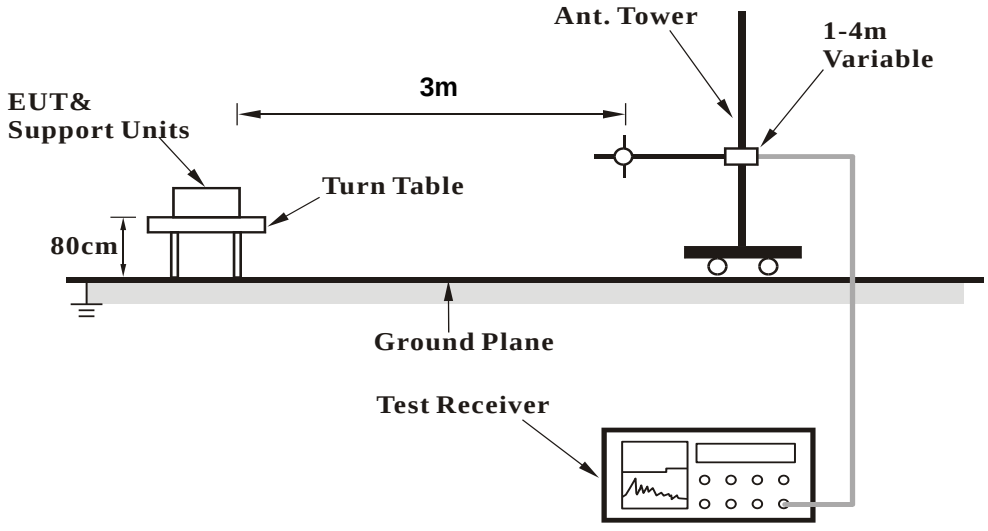
No deviation.

4.1.5 Test Setup

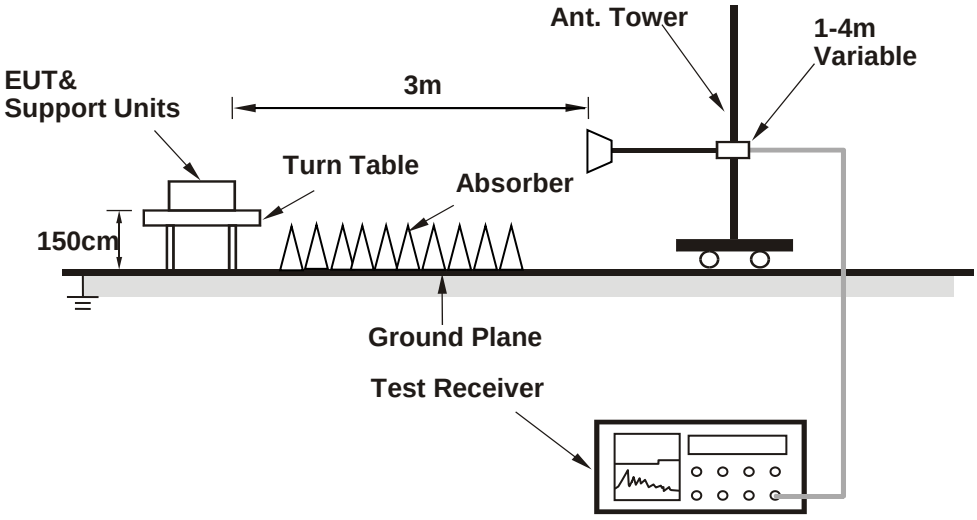
For Radiated emission below 30MHz



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 (DUT_setup.610.26) has been activated to set the EUT under transmission condition continuously at specific channel frenquency.

4.1.7 Test Results (Mode 1)

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.	**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	2390.00	62.7 PK	74.0	-11.3	2.05 H	244	65.8	-3.1
2	2390.00	53.0 AV	54.0	-1.0	2.05 H	244	56.1	-3.1
3	*2412.00	118.7 PK			2.05 H	244	121.8	-3.1
4	*2412.00	116.4 AV			2.05 H	244	119.5	-3.1
5	4824.00	39.0 PK	74.0	-35.0	1.85 H	136	37.8	1.2
6	4824.00	32.3 AV	54.0	-21.7	1.85 H	136	31.1	1.2
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	2390.00	52.8 PK	74.0	-21.2	3.30 V	190	55.9	-3.1
2	2390.00	47.4 AV	54.0	-6.6	3.30 V	190	50.5	-3.1
3	*2412.00	111.7 PK			3.30 V	190	114.8	-3.1
4	*2412.00	107.7 AV			3.30 V	190	110.8	-3.1
5	4824.00	38.0 PK	74.0	-36.0	2.16 V	306	36.8	1.2
6	4824.00	32.0 AV	54.0	-22.0	2.16 V	306	30.8	1.2

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.	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	2352.00	60.8 PK	74.0	-13.2	2.05 H	236	63.7	-2.9
2	2352.00	53.0 AV	54.0	-1.0	2.05 H	236	55.9	-2.9
3	2390.00	61.0 PK	74.0	-13.0	2.05 H	236	64.1	-3.1
4	2390.00	53.7 AV	54.0	-0.3	2.05 H	236	56.8	-3.1
5	*2437.00	118.7 PK			2.05 H	236	121.8	-3.1
6	*2437.00	116.4 AV			2.05 H	236	119.5	-3.1
7	2483.50	59.7 PK	74.0	-14.3	2.05 H	236	62.8	-3.1
8	2483.50	48.9 AV	54.0	-5.1	2.05 H	236	52.0	-3.1
9	4874.00	39.6 PK	74.0	-34.4	1.86 H	116	38.5	1.1
10	4874.00	32.7 AV	54.0	-21.3	1.86 H	116	31.6	1.1
11	7311.00	42.9 PK	74.0	-31.1	1.99 H	187	35.6	7.3
12	7311.00	33.0 AV	54.0	-21.0	1.99 H	187	25.7	7.3
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	2390.00	56.2 PK	74.0	-17.8	3.32 V	192	59.3	-3.1
2	2390.00	49.6 AV	54.0	-4.4	3.32 V	192	52.7	-3.1
3	*2437.00	112.9 PK			3.32 V	192	116.0	-3.1
4	*2437.00	108.4 AV			3.32 V	192	111.5	-3.1
5	2483.50	56.5 PK	74.0	-17.5	3.32 V	192	59.6	-3.1
6	2483.50	49.6 AV	54.0	-4.4	3.32 V	192	52.7	-3.1
7	4874.00	38.9 PK	74.0	-35.1	2.09 V	312	37.8	1.1
8	4874.00	32.7 AV	54.0	-21.3	2.09 V	312	31.6	1.1
9	7311.00	43.8 PK	74.0	-30.2	2.24 V	296	36.5	7.3
10	7311.00	34.1 AV	54.0	-19.9	2.24 V	296	26.8	7.3

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.	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	2377.00	62.2 PK	74.0	-11.8	1.99 H	236	65.3	-3.1
2	**2377.00**	**53.9 AV**	**54.0**	**-0.1**	**1.99 H**	**236**	**57.0**	**-3.1**
3	*2462.00	120.8 PK			1.99 H	236	123.9	-3.1
4	*2462.00	112.2 AV			1.99 H	236	115.3	-3.1
5	2483.50	62.4 PK	74.0	-11.6	1.99 H	236	65.5	-3.1
6	2483.50	50.8 AV	54.0	-3.2	1.99 H	236	53.9	-3.1
7	4924.00	39.4 PK	74.0	-34.6	1.83 H	124	38.2	1.2
8	4924.00	32.5 AV	54.0	-21.5	1.83 H	124	31.3	1.2
9	7386.00	43.3 PK	74.0	-30.7	2.00 H	183	35.9	7.4
10	7386.00	33.4 AV	54.0	-20.6	2.00 H	183	26.0	7.4
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	2377.00	57.3 PK	74.0	-16.7	3.86 V	205	60.4	-3.1
2	2377.00	50.1 AV	54.0	-3.9	3.86 V	205	53.2	-3.1
3	*2462.00	117.6 PK			3.86 V	205	120.7	-3.1
4	*2462.00	108.7 AV			3.86 V	205	111.8	-3.1
5	2483.50	54.6 PK	74.0	-19.4	3.86 V	205	57.7	-3.1
6	2483.50	47.6 AV	54.0	-6.4	3.86 V	205	50.7	-3.1
7	4924.00	38.5 PK	74.0	-35.5	2.11 V	303	37.3	1.2
8	4924.00	32.4 AV	54.0	-21.6	2.11 V	303	31.2	1.2
9	7386.00	43.6 PK	74.0	-30.4	2.22 V	311	36.2	7.4
10	7386.00	33.9 AV	54.0	-20.1	2.22 V	311	26.5	7.4

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.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	2390.00	64.9 PK	74.0	-9.1	2.08 H	238	68.0	-3.1
2	2390.00	53.4 AV	54.0	-0.6	2.08 H	238	56.5	-3.1
3	*2412.00	114.8 PK			2.08 H	238	117.9	-3.1
4	*2412.00	107.4 AV			2.08 H	238	110.5	-3.1
5	4824.00	39.1 PK	74.0	-34.9	1.88 H	126	37.9	1.2
6	4824.00	32.4 AV	54.0	-21.6	1.88 H	126	31.2	1.2
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	2390.00	65.1 PK	74.0	-8.9	2.21 V	150	68.2	-3.1
2	2390.00	51.4 AV	54.0	-2.6	2.21 V	150	54.5	-3.1
3	*2412.00	114.5 PK			2.21 V	150	117.6	-3.1
4	*2412.00	106.5 AV			2.21 V	150	109.6	-3.1
5	4824.00	38.4 PK	74.0	-35.6	2.13 V	304	37.2	1.2
6	4824.00	32.4 AV	54.0	-21.6	2.13 V	304	31.2	1.2

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.	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	2390.00	55.5 PK	74.0	-18.5	1.76 H	237	58.6	-3.1
2	2390.00	52.8 AV	54.0	-1.2	1.76 H	237	55.9	-3.1
3	*2437.00	120.5 PK			1.76 H	237	123.6	-3.1
4	*2437.00	112.9 AV			1.76 H	237	116.0	-3.1
5	2483.50	63.0 PK	74.0	-11.0	1.76 H	237	66.1	-3.1
6	2483.50	53.1 AV	54.0	-0.9	1.76 H	237	56.2	-3.1
7	4874.00	39.5 PK	74.0	-34.5	1.87 H	114	38.4	1.1
8	4874.00	32.9 AV	54.0	-21.1	1.87 H	114	31.8	1.1
9	7311.00	42.6 PK	74.0	-31.4	1.98 H	179	35.3	7.3
10	7311.00	33.0 AV	54.0	-21.0	1.98 H	179	25.7	7.3
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	2390.00	52.6 PK	74.0	-21.4	2.19 V	137	55.7	-3.1
2	2390.00	49.5 AV	54.0	-4.5	2.19 V	137	52.6	-3.1
3	*2437.00	119.8 PK			2.19 V	137	122.9	-3.1
4	*2437.00	111.4 AV			2.19 V	137	114.5	-3.1
5	2483.50	55.1 PK	74.0	-18.9	2.19 V	137	58.2	-3.1
6	2483.50	50.8 AV	54.0	-3.2	2.19 V	137	53.9	-3.1
7	4874.00	38.0 PK	74.0	-36.0	2.11 V	297	36.9	1.1
8	4874.00	32.2 AV	54.0	-21.8	2.11 V	297	31.1	1.1
9	7311.00	43.5 PK	74.0	-30.5	2.22 V	317	36.2	7.3
10	7311.00	33.5 AV	54.0	-20.5	2.22 V	317	26.2	7.3

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.	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	*2462.00	114.7 PK			2.01 H	236	117.8	-3.1
2	*2462.00	107.3 AV			2.01 H	236	110.4	-3.1
3	2483.50	62.1 PK	74.0	-11.9	2.01 H	236	65.2	-3.1
4	2483.50	53.4 AV	54.0	-0.6	2.01 H	236	56.5	-3.1
5	4924.00	39.5 PK	74.0	-34.5	1.84 H	119	38.3	1.2
6	4924.00	32.5 AV	54.0	-21.5	1.84 H	119	31.3	1.2
7	7386.00	43.6 PK	74.0	-30.4	2.04 H	176	36.2	7.4
8	7386.00	33.6 AV	54.0	-20.4	2.04 H	176	26.2	7.4
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	*2462.00	115.2 PK			2.22 V	72	118.3	-3.1
2	*2462.00	106.3 AV			2.22 V	72	109.4	-3.1
3	2483.50	58.4 PK	74.0	-15.6	2.22 V	72	61.5	-3.1
4	2483.50	49.7 AV	54.0	-4.3	2.22 V	72	52.8	-3.1
5	4924.00	38.3 PK	74.0	-35.7	2.07 V	296	37.1	1.2
6	4924.00	32.0 AV	54.0	-22.0	2.07 V	296	30.8	1.2
7	7386.00	43.2 PK	74.0	-30.8	2.25 V	307	35.8	7.4
8	7386.00	33.6 AV	54.0	-20.4	2.25 V	307	26.2	7.4

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.

802.11ax (HE20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	2390.00	61.1 PK	74.0	-12.9	2.10 H	235	64.2	-3.1
2	2390.00	53.2 AV	54.0	-0.8	2.10 H	235	56.3	-3.1
3	*2412.00	115.2 PK			2.10 H	235	118.3	-3.1
4	*2412.00	105.1 AV			2.10 H	235	108.2	-3.1
5	4824.00	38.9 PK	74.0	-35.1	1.78 H	121	37.7	1.2
6	4824.00	32.3 AV	54.0	-21.7	1.78 H	121	31.1	1.2
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	2390.00	59.7 PK	74.0	-14.3	1.91 V	183	62.8	-3.1
2	2390.00	49.8 AV	54.0	-4.2	1.91 V	183	52.9	-3.1
3	*2412.00	112.9 PK			1.91 V	183	116.0	-3.1
4	*2412.00	104.2 AV			1.91 V	183	107.3	-3.1
5	4824.00	38.9 PK	74.0	-35.1	2.09 V	317	37.7	1.2
6	4824.00	32.8 AV	54.0	-21.2	2.09 V	317	31.6	1.2

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.	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	2390.00	57.1 PK	74.0	-16.9	1.99 H	240	60.2	-3.1
2	2390.00	52.8 AV	54.0	-1.2	1.99 H	240	55.9	-3.1
3	*2437.00	121.5 PK			1.99 H	240	124.6	-3.1
4	*2437.00	111.9 AV			1.99 H	240	115.0	-3.1
5	2483.50	61.8 PK	74.0	-12.2	1.99 H	240	64.9	-3.1
6	2483.50	53.1 AV	54.0	-0.9	1.99 H	240	56.2	-3.1
7	4874.00	39.3 PK	74.0	-34.7	1.84 H	123	38.2	1.1
8	4874.00	32.5 AV	54.0	-21.5	1.84 H	123	31.4	1.1
9	7311.00	43.4 PK	74.0	-30.6	1.98 H	188	36.1	7.3
10	7311.00	33.5 AV	54.0	-20.5	1.98 H	188	26.2	7.3
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	2390.00	55.9 PK	74.0	-18.1	1.95 V	176	59.0	-3.1
2	2390.00	50.4 AV	54.0	-3.6	1.95 V	176	53.5	-3.1
3	*2437.00	118.4 PK			1.95 V	176	121.5	-3.1
4	*2437.00	110.1 AV			1.95 V	176	113.2	-3.1
5	2483.50	58.4 PK	74.0	-15.6	1.95 V	176	61.5	-3.1
6	2483.50	50.1 AV	54.0	-3.9	1.95 V	176	53.2	-3.1
7	4874.00	38.7 PK	74.0	-35.3	2.10 V	317	37.6	1.1
8	4874.00	32.6 AV	54.0	-21.4	2.10 V	317	31.5	1.1
9	7311.00	43.4 PK	74.0	-30.6	2.27 V	296	36.1	7.3
10	7311.00	33.6 AV	54.0	-20.4	2.27 V	296	26.3	7.3

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.	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	*2462.00	114.9 PK			2.06 H	238	118.0	-3.1
2	*2462.00	105.6 AV			2.06 H	238	108.7	-3.1
3	2483.50	57.1 PK	74.0	-16.9	2.06 H	238	60.2	-3.1
4	2483.50	53.4 AV	54.0	-0.6	2.06 H	238	56.5	-3.1
5	4924.00	39.3 PK	74.0	-34.7	1.81 H	127	38.1	1.2
6	4924.00	32.2 AV	54.0	-21.8	1.81 H	127	31.0	1.2
7	7386.00	43.2 PK	74.0	-30.8	2.04 H	184	35.8	7.4
8	7386.00	33.2 AV	54.0	-20.8	2.04 H	184	25.8	7.4
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	*2462.00	115.5 PK			1.88 V	73	118.6	-3.1
2	*2462.00	105.0 AV			1.88 V	73	108.1	-3.1
3	2483.50	57.6 PK	74.0	-16.4	1.88 V	73	60.7	-3.1
4	2483.50	50.0 AV	54.0	-4.0	1.88 V	73	53.1	-3.1
5	4924.00	38.6 PK	74.0	-35.4	2.07 V	319	37.4	1.2
6	4924.00	32.6 AV	54.0	-21.4	2.07 V	319	31.4	1.2
7	7386.00	43.4 PK	74.0	-30.6	2.20 V	299	36.0	7.4
8	7386.00	33.4 AV	54.0	-20.6	2.20 V	299	26.0	7.4

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.

802.11ax (HE40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	2390.00	58.8 PK	74.0	-15.2	1.79 H	232	61.9	-3.1
2	2390.00	53.2 AV	54.0	-0.8	1.79 H	232	56.3	-3.1
3	*2422.00	110.0 PK			1.79 H	232	113.1	-3.1
4	*2422.00	101.5 AV			1.79 H	232	104.6	-3.1
5	4844.00	39.3 PK	74.0	-34.7	1.86 H	125	38.1	1.2
6	4844.00	32.6 AV	54.0	-21.4	1.86 H	125	31.4	1.2
7	7266.00	42.8 PK	74.0	-31.2	1.96 H	193	35.7	7.1
8	7266.00	33.1 AV	54.0	-20.9	1.96 H	193	26.0	7.1
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	2390.00	58.3 PK	74.0	-15.7	1.62 V	66	61.4	-3.1
2	2390.00	50.0 AV	54.0	-4.0	1.62 V	66	53.1	-3.1
3	*2422.00	107.9 PK			1.62 V	66	111.0	-3.1
4	*2422.00	100.3 AV			1.62 V	66	103.4	-3.1
5	4844.00	38.5 PK	74.0	-35.5	2.15 V	296	37.3	1.2
6	4844.00	32.4 AV	54.0	-21.6	2.15 V	296	31.2	1.2
7	7266.00	44.0 PK	74.0	-30.0	2.16 V	317	36.9	7.1
8	7266.00	34.2 AV	54.0	-19.8	2.16 V	317	27.1	7.1

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.	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	2390.00	57.5 PK	74.0	-16.5	2.02 H	236	60.6	-3.1
2	2390.00	51.7 AV	54.0	-2.3	2.02 H	236	54.8	-3.1
3	*2437.00	114.8 PK			2.02 H	236	117.9	-3.1
4	*2437.00	104.2 AV			2.02 H	236	107.3	-3.1
5	2483.50	64.2 PK	74.0	-9.8	2.02 H	236	67.3	-3.1
6	2483.50	53.2 AV	54.0	-0.8	2.02 H	236	56.3	-3.1
7	4874.00	39.6 PK	74.0	-34.4	1.83 H	129	38.5	1.1
8	4874.00	32.8 AV	54.0	-21.2	1.83 H	129	31.7	1.1
9	7311.00	43.7 PK	74.0	-30.3	2.00 H	175	36.4	7.3
10	7311.00	33.7 AV	54.0	-20.3	2.00 H	175	26.4	7.3
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	2390.00	55.7 PK	74.0	-18.3	1.66 V	66	58.8	-3.1
2	2390.00	50.9 AV	54.0	-3.1	1.66 V	66	54.0	-3.1
3	*2437.00	112.8 PK			1.66 V	66	115.9	-3.1
4	*2437.00	103.2 AV			1.66 V	66	106.3	-3.1
5	2483.50	61.5 PK	74.0	-12.5	1.66 V	66	64.6	-3.1
6	2483.50	52.8 AV	54.0	-1.2	1.66 V	66	55.9	-3.1
7	4874.00	38.6 PK	74.0	-35.4	2.12 V	298	37.5	1.1
8	4874.00	32.3 AV	54.0	-21.7	2.12 V	298	31.2	1.1
9	7311.00	43.4 PK	74.0	-30.6	2.20 V	303	36.1	7.3
10	7311.00	33.9 AV	54.0	-20.1	2.20 V	303	26.6	7.3

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.	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	*2452.00	111.9 PK			2.08 H	239	115.0	-3.1
2	*2452.00	103.4 AV			2.08 H	239	106.5	-3.1
3	2483.50	57.5 PK	74.0	-16.5	2.08 H	239	60.6	-3.1
4	2483.50	53.2 AV	54.0	-0.8	2.08 H	239	56.3	-3.1
5	4904.00	39.7 PK	74.0	-34.3	1.84 H	117	38.5	1.2
6	4904.00	32.9 AV	54.0	-21.1	1.84 H	117	31.7	1.2
7	7356.00	43.1 PK	74.0	-30.9	1.94 H	187	35.7	7.4
8	7356.00	33.1 AV	54.0	-20.9	1.94 H	187	25.7	7.4
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	*2452.00	111.1 PK			1.96 V	78	114.2	-3.1
2	*2452.00	101.8 AV			1.96 V	78	104.9	-3.1
3	2483.50	56.5 PK	74.0	-17.5	1.96 V	78	59.6	-3.1
4	2483.50	48.9 AV	54.0	-5.1	1.96 V	78	52.0	-3.1
5	4904.00	38.9 PK	74.0	-35.1	2.13 V	315	37.7	1.2
6	4904.00	32.8 AV	54.0	-21.2	2.13 V	315	31.6	1.2
7	7356.00	43.3 PK	74.0	-30.7	2.20 V	299	35.9	7.4
8	7356.00	33.7 AV	54.0	-20.3	2.20 V	299	26.3	7.4

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:
Adapter: MAUS-120200

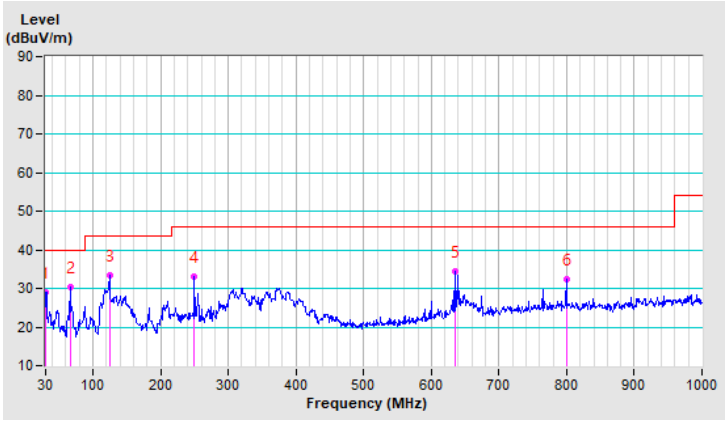
802.11g

CHANNEL	TX Channel 6	**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	30.63	29.1 QP	40.0	-10.9	1.00 H	0	43.3	-14.2
2	66.57	30.5 QP	40.0	-9.5	1.00 H	229	44.7	-14.2
3	124.97	33.4 QP	43.5	-10.1	3.00 H	124	47.8	-14.4
4	250.01	33.2 QP	46.0	-12.8	1.00 H	102	47.1	-13.9
5	635.02	34.5 QP	46.0	-11.5	1.00 H	205	39.2	-4.7
6	800.02	32.5 QP	46.0	-13.5	2.00 H	338	34.9	-2.4

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.

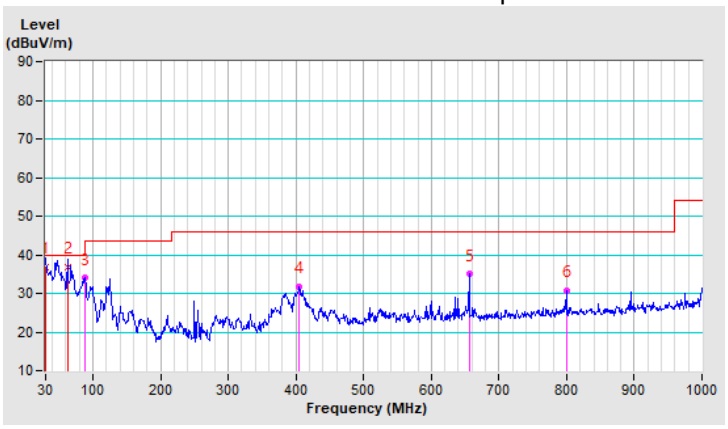


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	30.03	36.9 QP	40.0	-3.1	1.00 V	266	50.9	-14.0
2	62.46	36.8 QP	40.0	-3.2	1.00 V	342	50.5	-13.7
3	87.57	33.9 QP	40.0	-6.1	1.00 V	230	52.4	-18.5
4	404.78	31.7 QP	46.0	-14.3	1.50 V	290	41.4	-9.7
5	656.12	35.0 QP	46.0	-11.0	2.00 V	217	39.4	-4.4
6	800.02	30.8 QP	46.0	-15.2	1.50 V	202	33.2	-2.4

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.



4.1.8 Test Results (Mode 2)

Below 1GHz Data:

Adapter: DSA-24PFS-12 FUS 120200

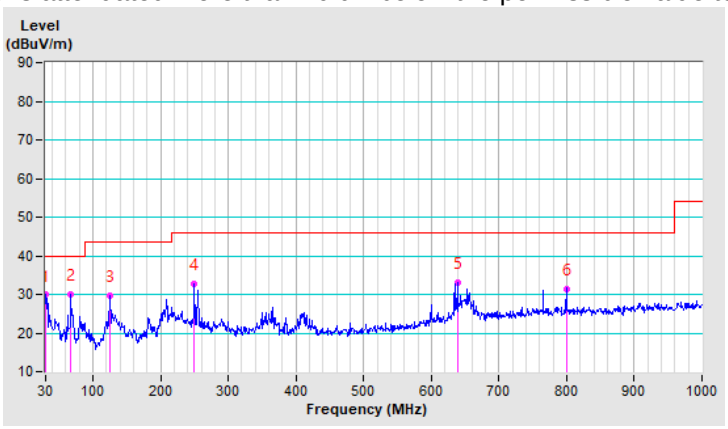
802.11g

CHANNEL	TX Channel 6	**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	30.44	29.9 QP	40.0	-10.1	1.50 H	91	44.0	-14.1
2	66.38	30.0 QP	40.0	-10.0	1.00 H	249	44.2	-14.2
3	124.97	29.8 QP	43.5	-13.7	3.00 H	112	44.2	-14.4
4	250.01	32.7 QP	46.0	-13.3	1.00 H	100	46.6	-13.9
5	640.02	33.0 QP	46.0	-13.0	1.00 H	360	37.6	-4.6
6	800.02	31.5 QP	46.0	-14.5	2.00 H	157	33.9	-2.4

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.

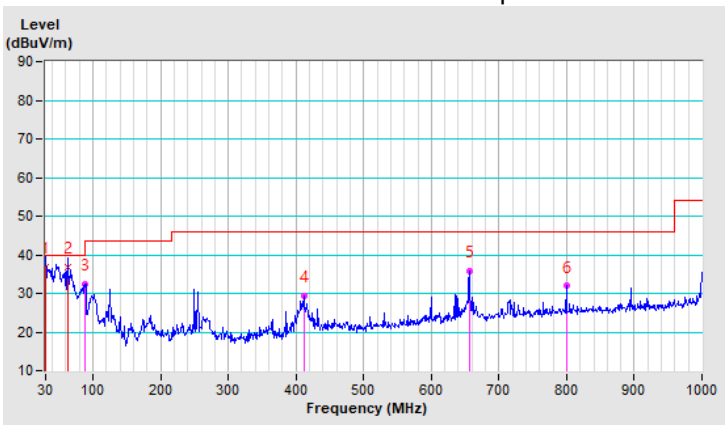


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	30.00	36.8 QP	40.0	-3.2	1.00 V	246	50.8	-14.0
2	62.50	36.9 QP	40.0	-3.1	1.00 V	9	50.7	-13.8
3	87.72	32.4 QP	40.0	-7.6	1.00 V	271	50.9	-18.5
4	411.23	29.3 QP	46.0	-16.7	1.50 V	277	38.8	-9.5
5	657.14	35.8 QP	46.0	-10.2	2.00 V	332	40.2	-4.4
6	800.02	31.9 QP	46.0	-14.1	1.50 V	193	34.3	-2.4

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.



4.1.9 Test Results (Mode 3)

Below 1GHz Data:

Adapter: UP0251M-12PA

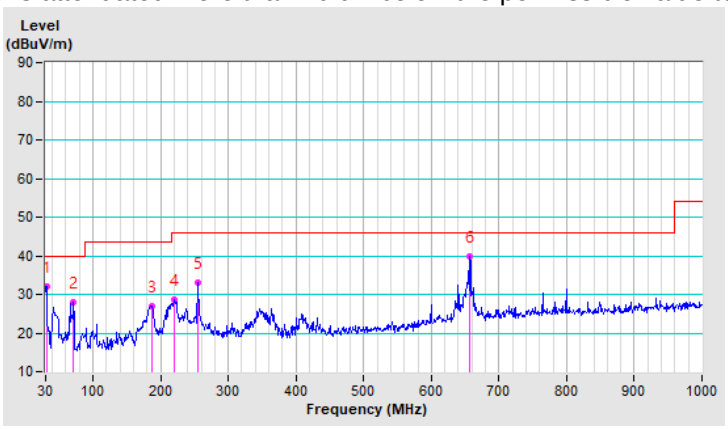
802.11g

CHANNEL	TX Channel 6	**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	31.36	32.2 QP	40.0	-7.8	1.00 H	271	46.4	-14.2
2	71.32	28.1 QP	40.0	-11.9	1.50 H	135	43.3	-15.2
3	186.66	27.1 QP	43.5	-16.4	2.00 H	105	42.3	-15.2
4	220.13	28.6 QP	46.0	-17.4	2.00 H	243	44.4	-15.8
5	255.00	33.0 QP	46.0	-13.0	3.00 H	121	46.9	-13.9
6	656.12	39.8 QP	46.0	-6.2	3.00 H	322	44.2	-4.4

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.

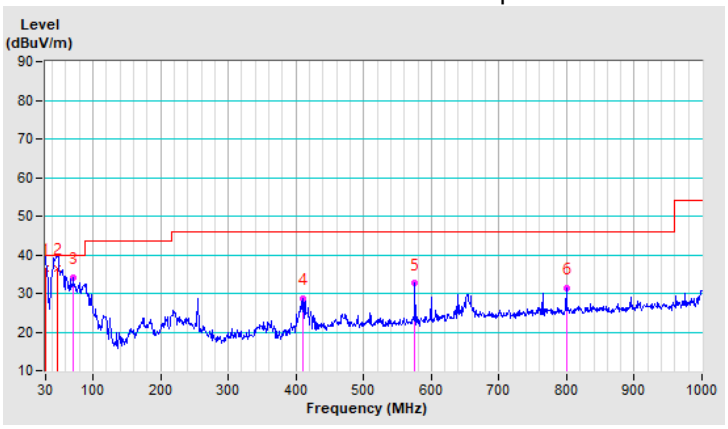


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	30.00	36.5 QP	40.0	-3.5	1.00 V	312	50.5	-14.0
2	47.51	36.4 QP	40.0	-3.6	1.00 V	123	49.1	-12.7
3	71.62	34.1 QP	40.0	-5.9	1.00 V	348	49.4	-15.3
4	409.92	28.6 QP	46.0	-17.4	1.50 V	255	38.2	-9.6
5	575.31	32.6 QP	46.0	-13.4	2.00 V	0	38.6	-6.0
6	800.02	31.5 QP	46.0	-14.5	1.50 V	186	33.9	-2.4

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: Apr. 13, 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.

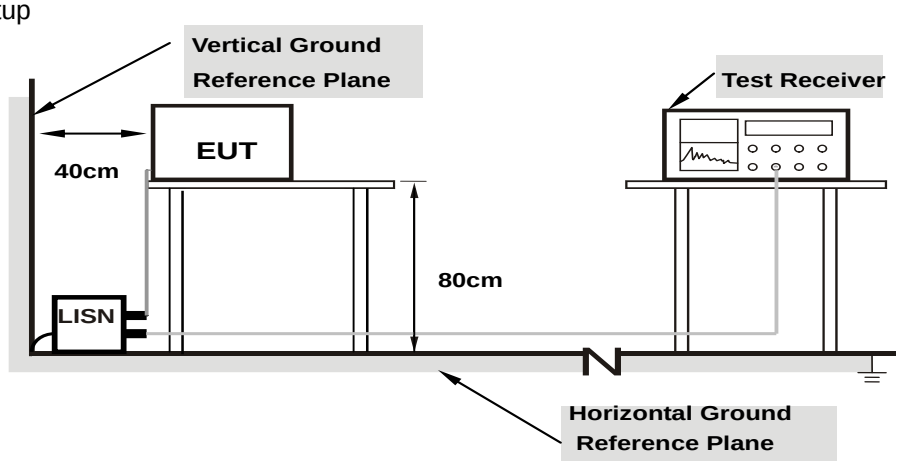
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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 (Mode 1)

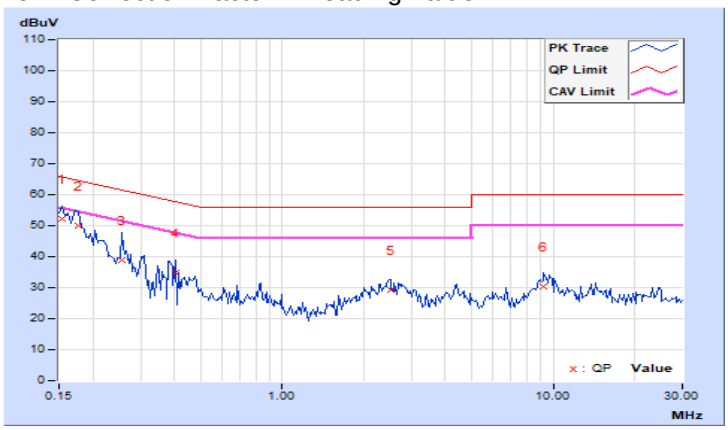
Adapter: MAUS-120200

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.99	42.06	28.47	52.05	38.46	65.79	55.79	-13.74	-17.33
2	0.17734	9.99	39.92	27.18	49.91	37.17	64.61	54.61	-14.70	-17.44
3	0.25547	9.99	29.08	19.82	39.07	29.81	61.58	51.58	-22.51	-21.77
4	0.40391	10.00	24.91	14.02	34.91	24.02	57.77	47.77	-22.86	-23.75
5	2.50391	10.16	19.09	11.15	29.25	21.31	56.00	46.00	-26.75	-24.69
6	9.24609	10.60	19.73	12.03	30.33	22.63	60.00	50.00	-29.67	-27.37

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

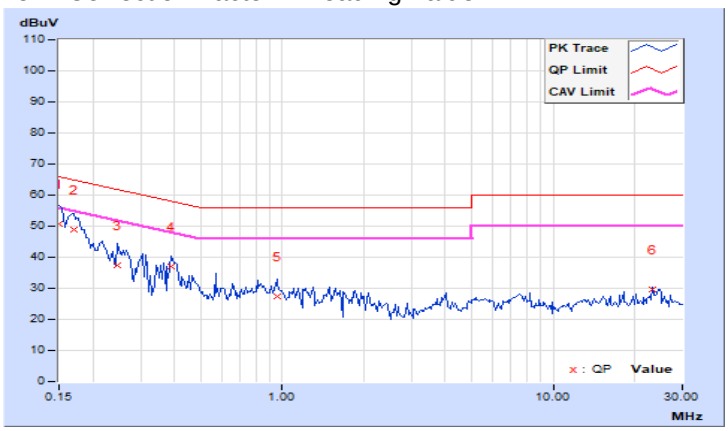


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.99	40.82	26.70	50.81	36.69	66.00	56.00	-15.19	-19.31
2	0.16953	9.99	39.06	28.82	49.05	38.81	64.98	54.98	-15.93	-16.17
3	0.24766	9.99	27.55	14.75	37.54	24.74	61.84	51.84	-24.30	-27.10
4	0.38828	10.01	27.05	19.56	37.06	29.57	58.10	48.10	-21.04	-18.53
5	0.95469	10.05	17.52	9.95	27.57	20.00	56.00	46.00	-28.43	-26.00
6	23.12891	11.19	18.30	15.20	29.49	26.39	60.00	50.00	-30.51	-23.61

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



4.2.8 Test Results (Mode 2)

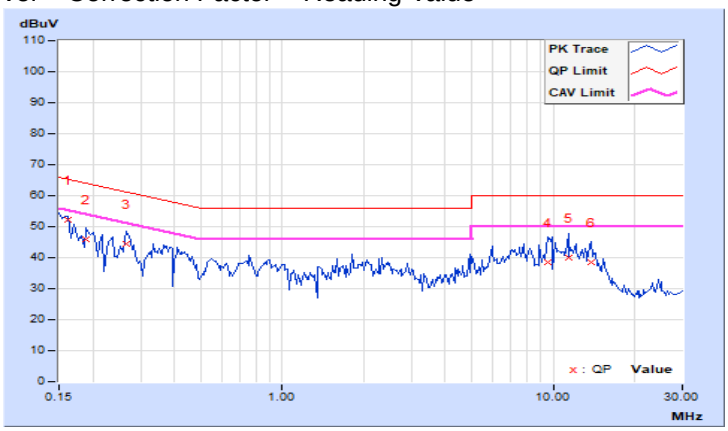
Adapter: DSA-24PFS-12 FUS 120200

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	9.99	42.06	29.12	52.05	39.11	65.38	55.38	-13.33	-16.27
2	0.18906	9.99	35.88	23.24	45.87	33.23	64.08	54.08	-18.21	-20.85
3	0.26719	9.99	34.41	20.99	44.40	30.98	61.20	51.20	-16.80	-20.22
4	9.55859	10.62	27.87	19.38	38.49	30.00	60.00	50.00	-21.51	-20.00
5	11.37891	10.75	29.40	21.69	40.15	32.44	60.00	50.00	-19.85	-17.56
6	13.83594	10.93	27.57	20.08	38.50	31.01	60.00	50.00	-21.50	-18.99

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

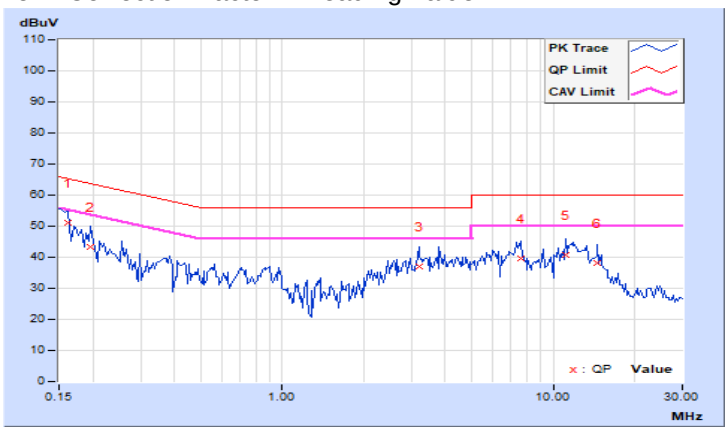


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	9.99	41.09	27.86	51.08	37.85	65.38	55.38	-14.30	-17.53
2	0.19687	9.99	33.44	17.95	43.43	27.94	63.74	53.74	-20.31	-25.80
3	3.19141	10.18	26.72	17.76	36.90	27.94	56.00	46.00	-19.10	-18.06
4	7.55859	10.43	29.16	20.78	39.59	31.21	60.00	50.00	-20.41	-18.79
5	11.08203	10.64	30.07	21.35	40.71	31.99	60.00	50.00	-19.29	-18.01
6	14.59375	10.83	27.19	18.11	38.02	28.94	60.00	50.00	-21.98	-21.06

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



4.2.9 Test Results (Mode 3)

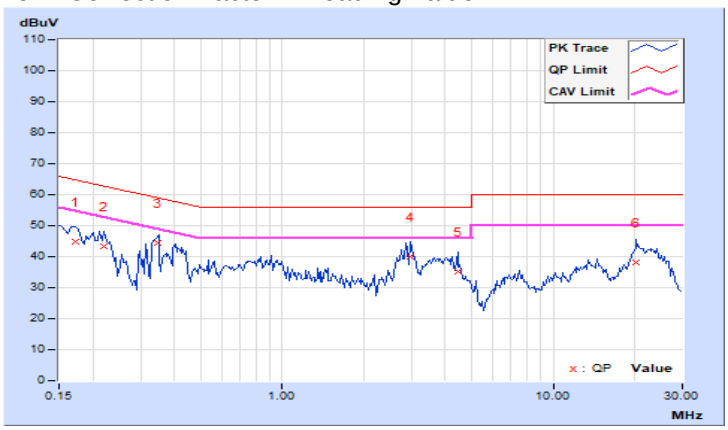
Adapter: UP0251M-12PA

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	9.99	34.75	24.41	44.74	34.40	64.79	54.79	-20.05	-20.39
2	0.22031	9.99	33.51	23.59	43.50	33.58	62.81	52.81	-19.31	-19.23
3	**0.34531**	**10.00**	**34.42**	**27.33**	**44.42**	**37.33**	**59.07**	**49.07**	**-14.65**	**-11.74**
4	2.98047	10.19	29.67	16.31	39.86	26.50	56.00	46.00	-16.14	-19.50
5	4.44922	10.29	25.01	17.22	35.30	27.51	56.00	46.00	-20.70	-18.49
6	20.24219	11.38	26.71	19.53	38.09	30.91	60.00	50.00	-21.91	-19.09

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

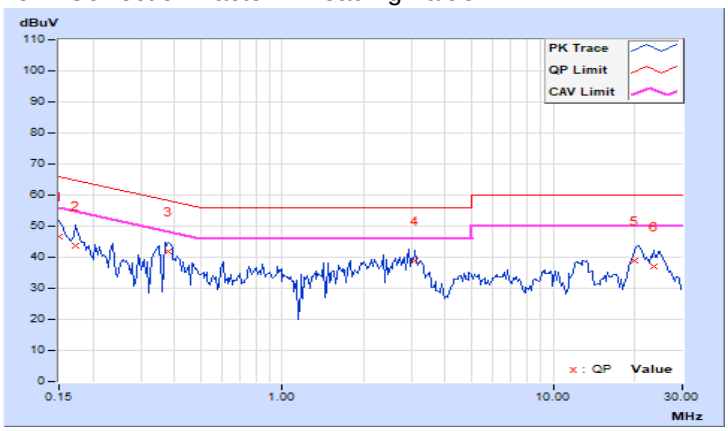


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.99	36.85	23.26	46.84	33.25	66.00	56.00	-19.16	-22.75
2	0.17344	9.99	33.57	22.15	43.56	32.14	64.79	54.79	-21.23	-22.65
3	0.38047	10.01	31.99	22.41	42.00	32.42	58.27	48.27	-16.27	-15.85
4	3.07422	10.17	28.70	18.09	38.87	28.26	56.00	46.00	-17.13	-17.74
5	20.05859	11.11	27.60	20.79	38.71	31.90	60.00	50.00	-21.29	-18.10
6	23.62500	11.20	25.96	17.91	37.16	29.11	60.00	50.00	-22.84	-20.89

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

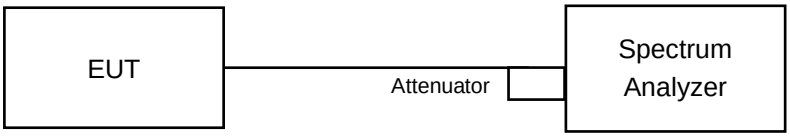


4.3 6dB Bandwidth Measurement

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

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	8.63	0.5	PASS
6	2437	8.12	0.5	PASS
11	2462	8.14	0.5	PASS

802.11g

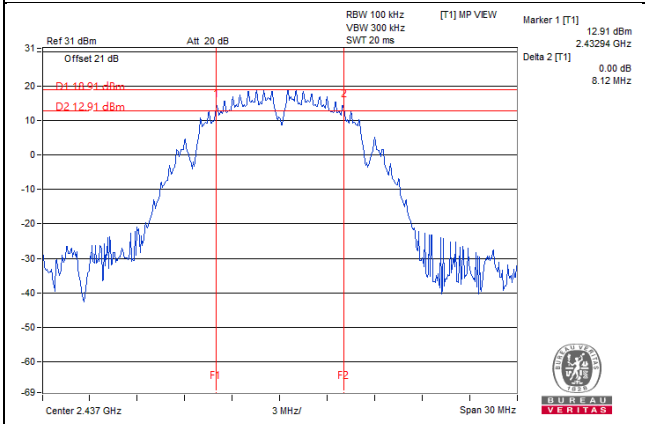
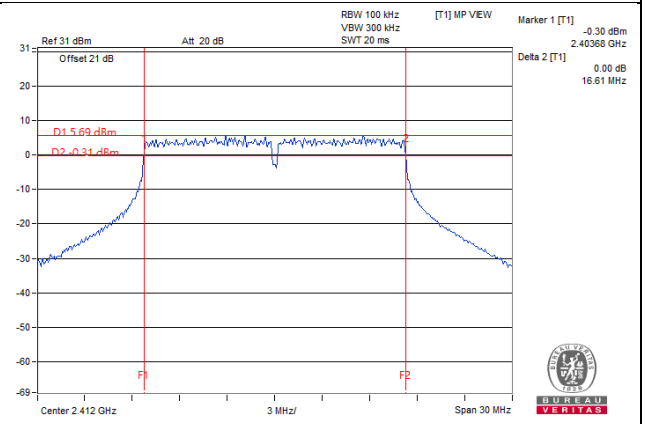
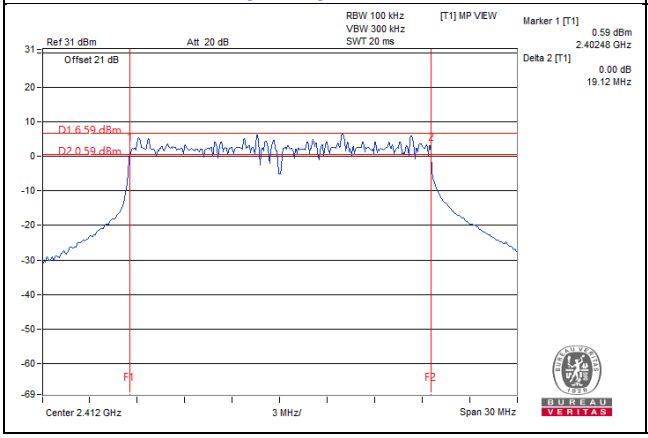
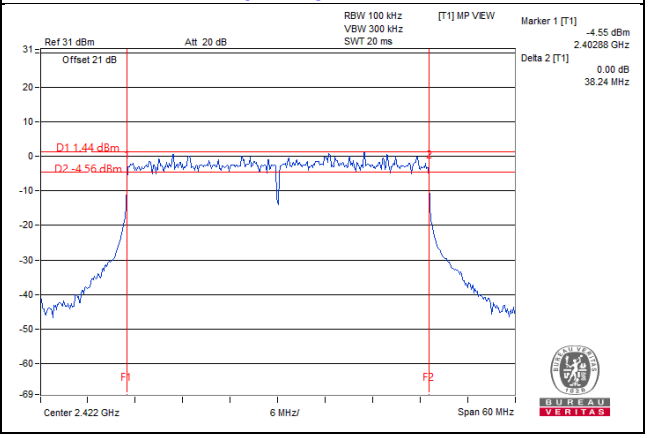
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.64	16.61	0.5	PASS
6	2437	16.64	16.62	0.5	PASS
11	2462	16.64	16.61	0.5	PASS

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	19.12	19.24	0.5	Pass
6	2437	19.12	19.12	0.5	Pass
11	2462	19.13	19.14	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	38.29	38.24	0.5	Pass
6	2437	38.26	38.32	0.5	Pass
9	2452	38.25	38.24	0.5	Pass

Spectrum Plot of Worst Value	
802.11b / CH6	**802.11g / Chain 1 : CH1**
	
802.11ax (HE20) / Chain 0 : CH1	**802.11ax (HE40) / Chain 1 : CH3**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

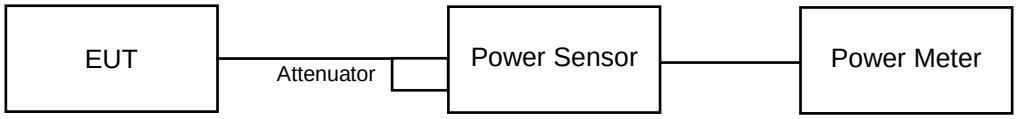
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

Non-Beamforming Mode

802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)	Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	26.83	481.948	26.83	30	Pass
6	2437	26.98	498.884	26.98	30	Pass
11	2462	26.81	479.733	26.81	30	Pass

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	21.04	21.89	281.583	24.50	30	Pass
6	2437	26.60	25.74	832.061	29.20	30	Pass
11	2462	21.36	20.76	255.897	24.08	30	Pass

VHT20

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.69	19.55	207.377	23.17	30	Pass
6	2437	26.04	25.16	729.886	28.63	30	Pass
11	2462	20.28	19.96	205.743	23.13	30	Pass

VHT40

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.99	18.32	167.69	22.25	30	Pass
6	2437	21.55	20.47	254.319	24.05	30	Pass
9	2452	20.44	19.55	200.819	23.03	30	Pass

802.11ax (HE20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.80	19.70	213.552	23.30	30	Pass
6	2437	26.20	25.35	759.637	28.81	30	Pass
11	2462	20.52	20.10	215.049	23.33	30	Pass

802.11ax (HE40)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	20.12	18.55	174.416	22.42	30	Pass
6	2437	21.75	20.66	266.036	24.25	30	Pass
9	2452	20.70	19.72	211.246	23.25	30	Pass

Beamforming Mode

VHT20

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.69	19.55	207.377	23.17	30	Pass
6	2437	26.04	25.16	729.886	28.63	30	Pass
11	2462	20.28	19.96	205.743	23.13	30	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =5.64dBi < 6dBi, so the power limit shall not be reduced.

VHT40

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.99	18.32	167.69	22.25	30	Pass
6	2437	21.55	20.47	254.319	24.05	30	Pass
9	2452	20.44	19.55	200.819	23.03	30	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =5.64dBi < 6dBi, so the power limit shall not be reduced.

802.11ax (HE20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.80	19.70	213.552	23.30	30	Pass
6	2437	26.20	25.35	759.637	28.81	30	Pass
11	2462	20.52	20.10	215.049	23.33	30	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =5.64dBi < 6dBi, so the power limit shall not be reduced.

802.11ax (HE40)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	20.12	18.55	174.416	22.42	30	Pass
6	2437	21.75	20.66	266.036	24.25	30	Pass
9	2452	20.70	19.72	211.246	23.25	30	Pass

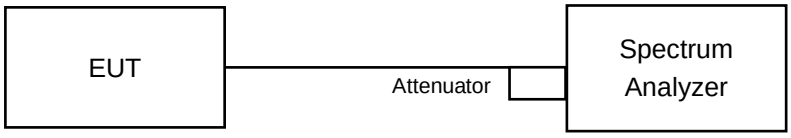
Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =5.64dBi < 6dBi, so the power limit shall not be reduced.

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

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.

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

802.11b

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
1	2412	-3.38	0.4592	-3.38	8.00	PASS
6	2437	-2.59	0.5508	-2.59	8.00	PASS
11	2462	-2.72	0.5346	-2.72	8.00	PASS

Note: 1. Directional gain = 2.48dBi < 6dBi , so the power density limit shall not be reduced.

802.11g

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1				
1	2412	-11.50	-13.59	0.11455	-9.41	8.00	PASS
6	2437	-6.88	-8.00	0.3639	-4.39	8.00	PASS
11	2462	-12.05	-13.74	0.10471	-9.80	8.00	PASS

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =5.64dBi < 6dBi , so the power density limit shall not be reduced.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1				
1	2412	-1.15	-2.19	1.3709	1.37	8.00	PASS
6	2437	4.53	4.51	5.662	7.53	8.00	PASS
11	2462	-1.13	-0.59	1.6444	2.16	8.00	PASS

Note: 1. Directional gain =10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 5.64dBi < 6dBi , so the power density limit shall not be reduced.

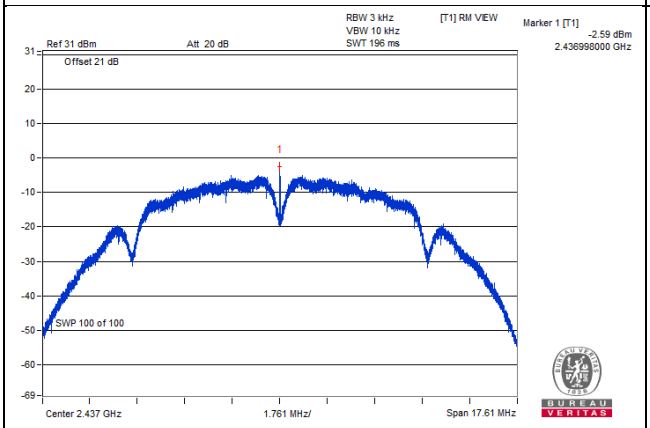
802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1				
3	2422	-5.87	-7.07	0.455	-3.42	8.00	PASS
6	2437	-4.81	-5.09	0.6397	-1.94	8.00	PASS
9	2452	-6.33	-5.68	0.5035	-2.98	8.00	PASS

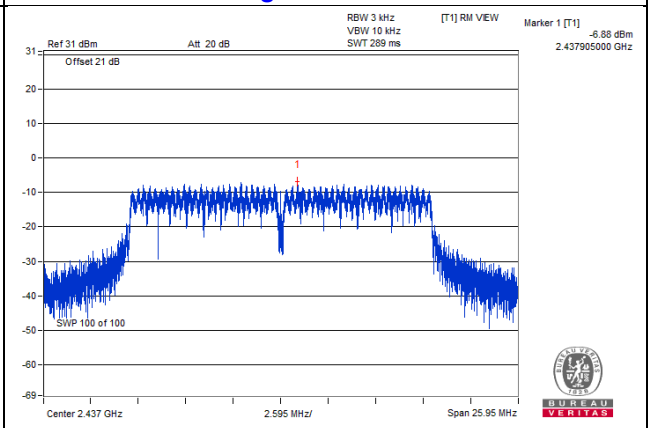
Note: 1. Directional gain =10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.64dBi < 6dBi , so the power density limit shall not be reduced.

Spectrum Plot of Worst Value

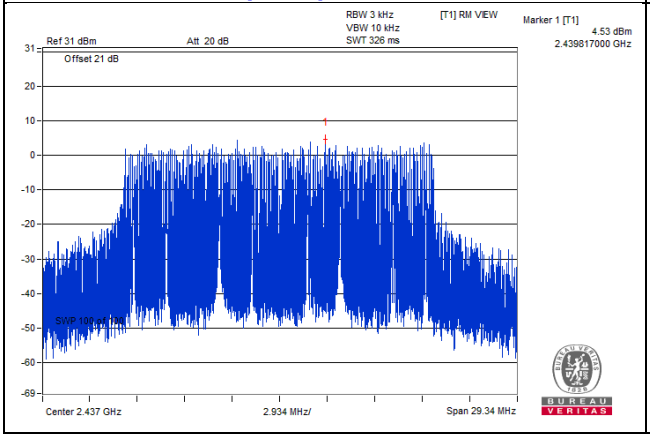
802.11b / CH6



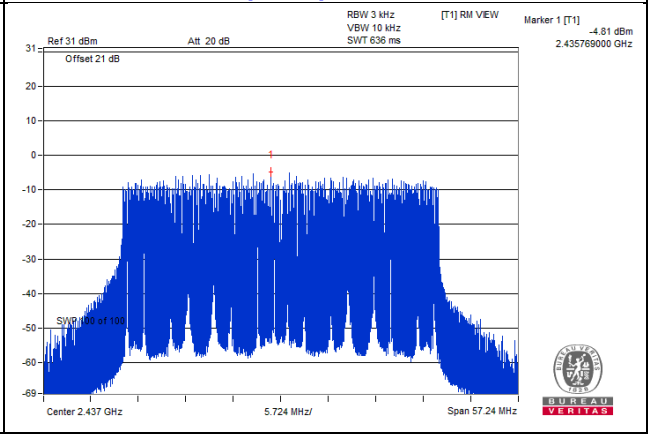
802.11g / Chain 0 : CH6



802.11ax (HE20) / Chain 0 : CH6



802.11ax (HE40) / Chain 0 : CH6

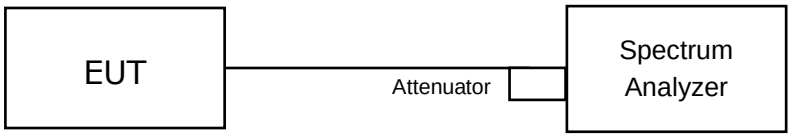


4.6 Conducted Out of Band Emission Measurement

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

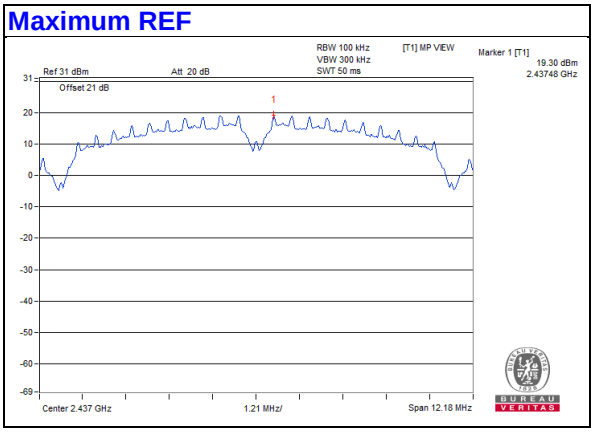
Same as Item 4.3.6

4.6.7 Test Results

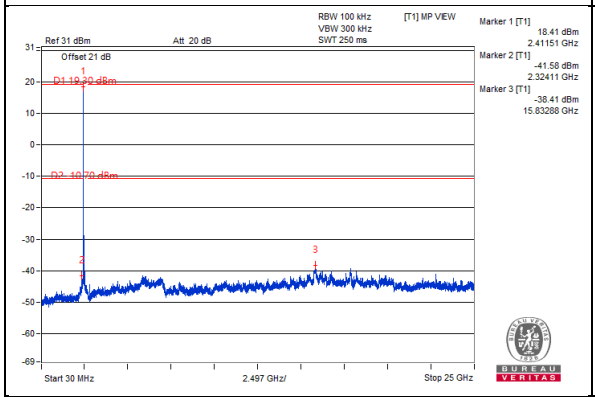
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the -30dB offset below D1. It shows compliance with the requirement.

802.11b

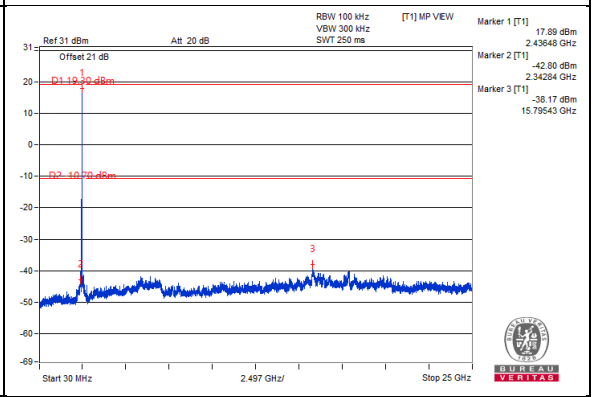
Maximum REF



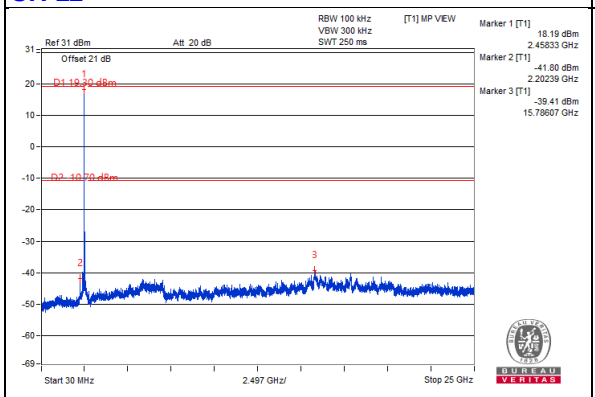
CH 1



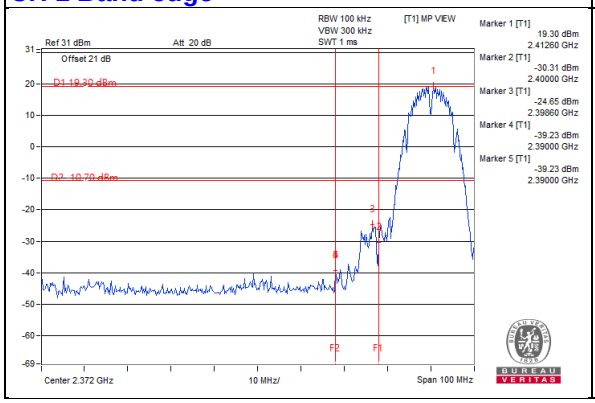
CH 6



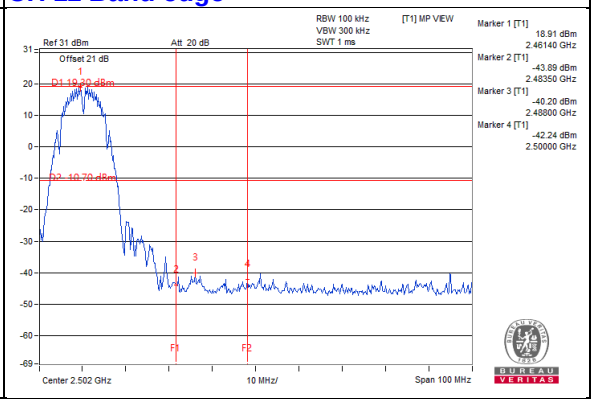
CH 11



CH 1 Band edge

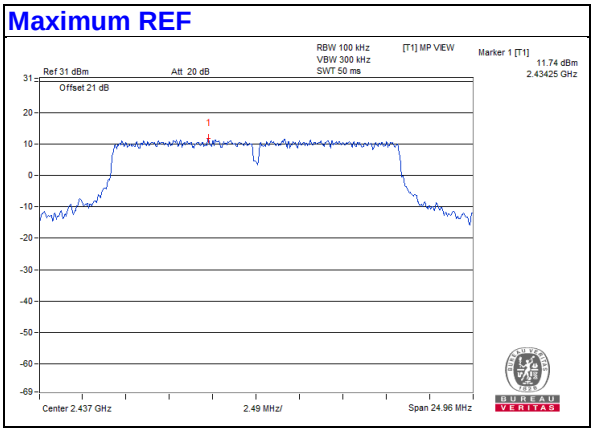


CH 11 Band edge



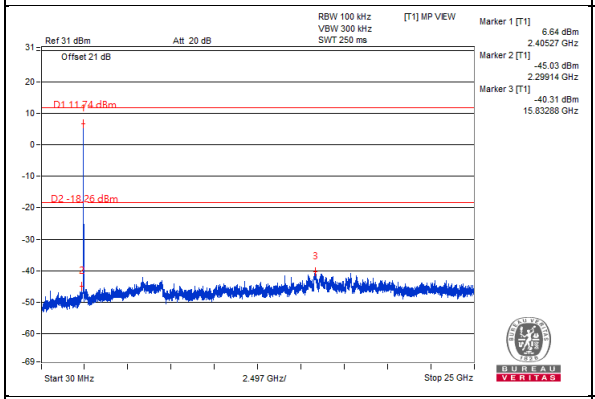
802.11g

Maximum REF

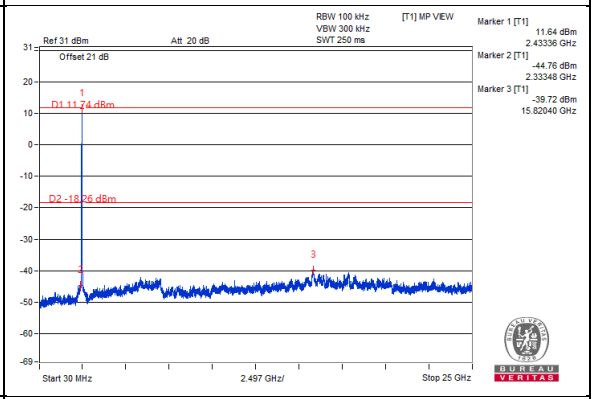


Chain 0

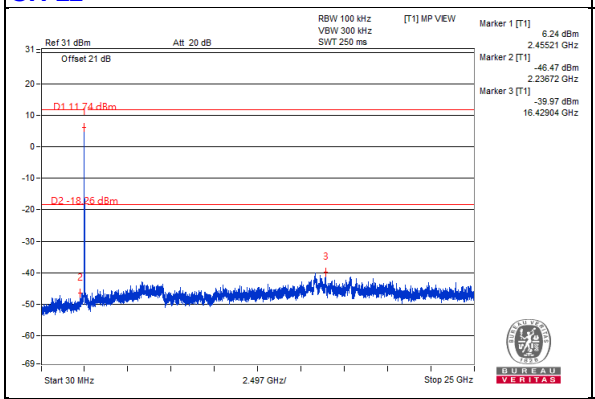
CH 1



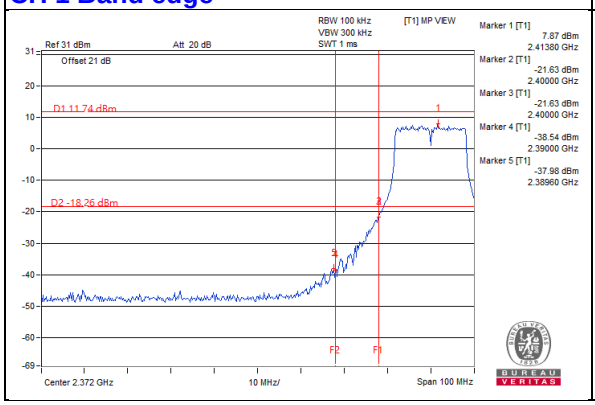
CH 6



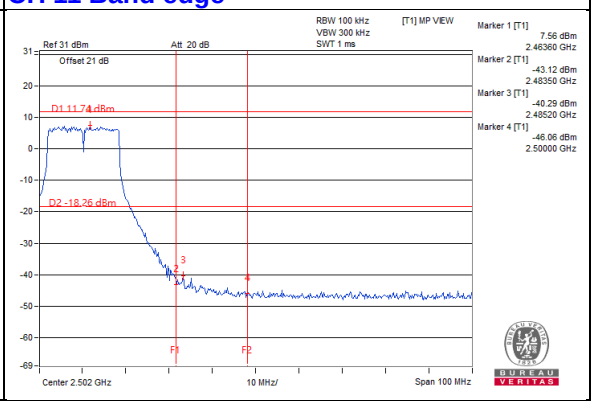
CH 11



CH 1 Band edge

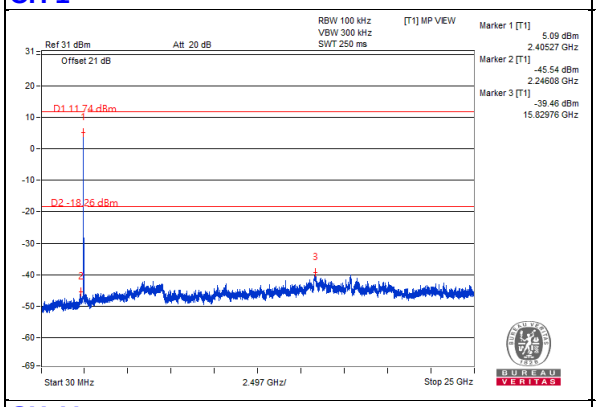


CH 11 Band edge

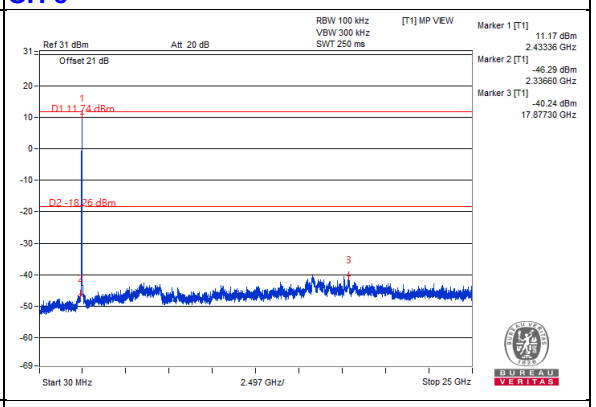


Chain 1

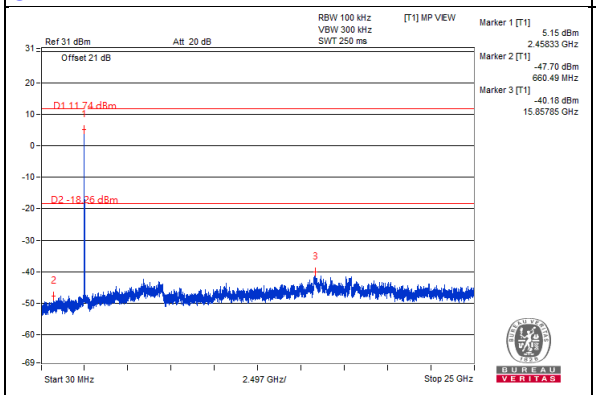
CH 1



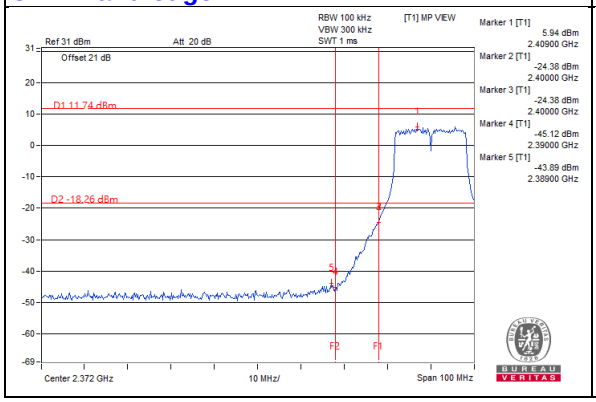
CH 6



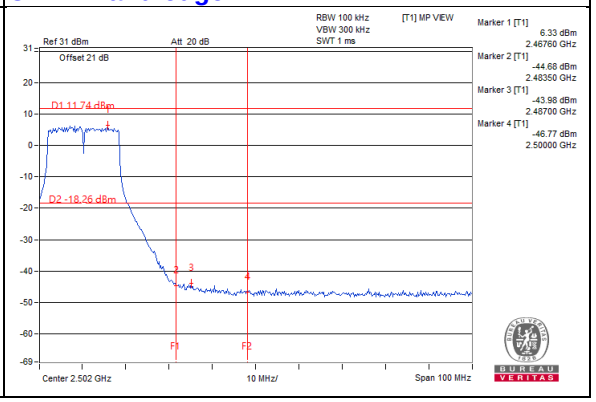
CH 11



CH 1 Band edge

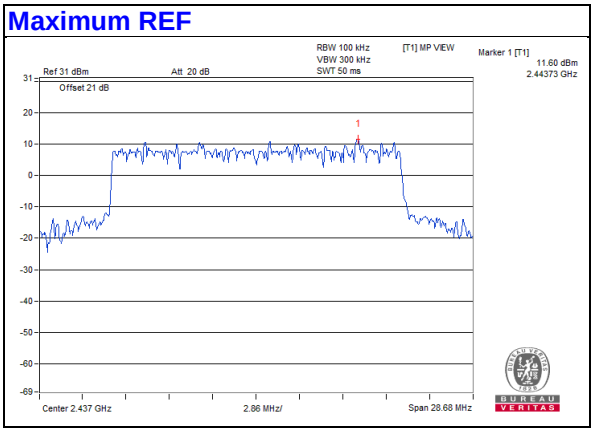


CH 11 Band edge



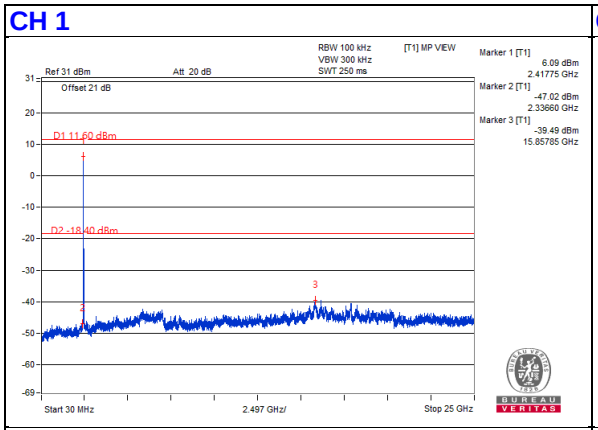
802.11ax (HE20)

Maximum REF

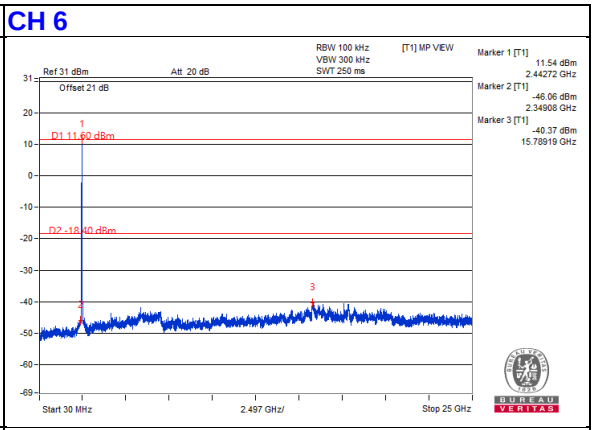


Chain 0

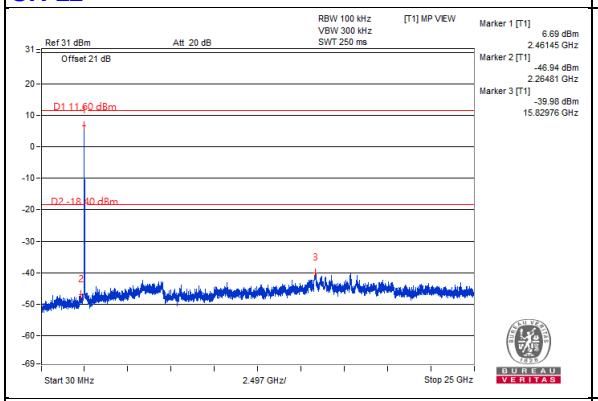
CH 1



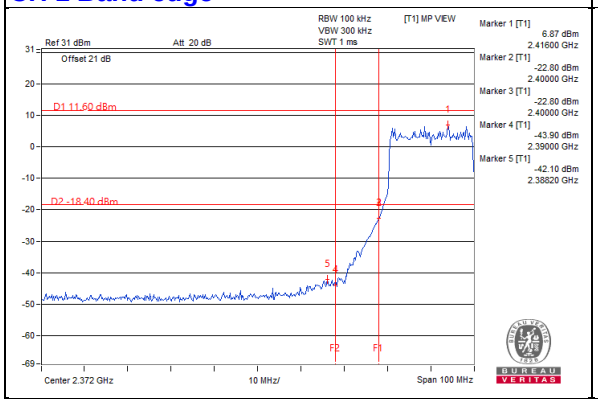
CH 6



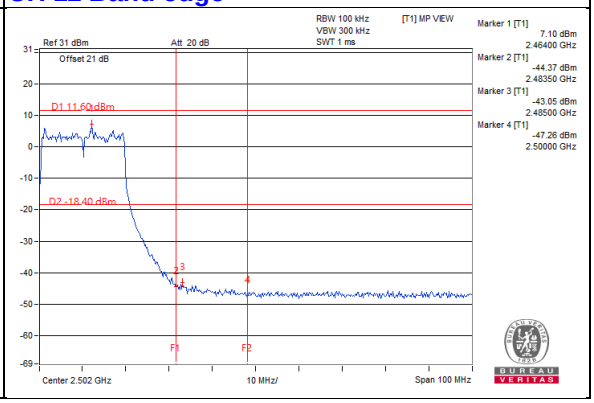
CH 11



CH 1 Band edge

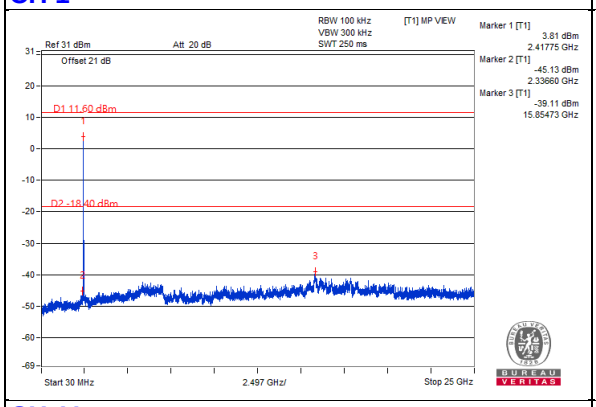


CH 11 Band edge

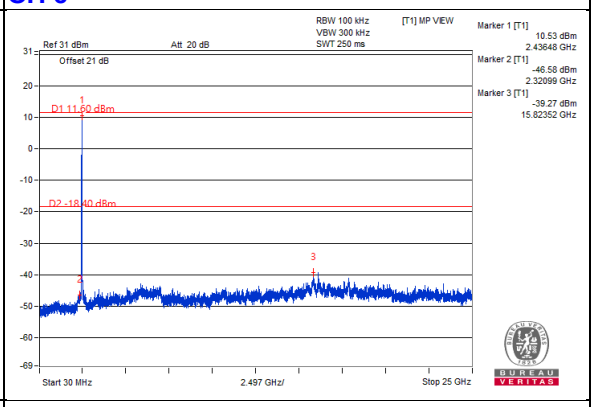


Chain 1

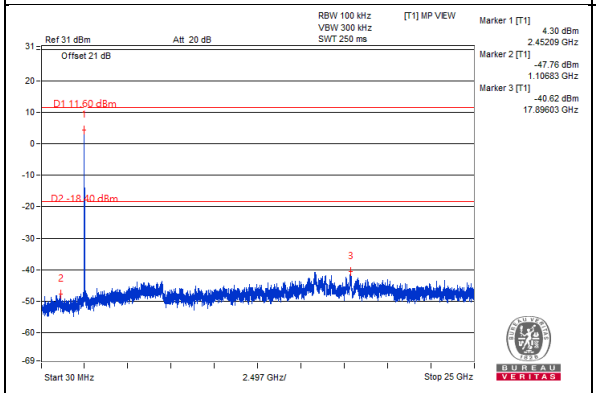
CH 1



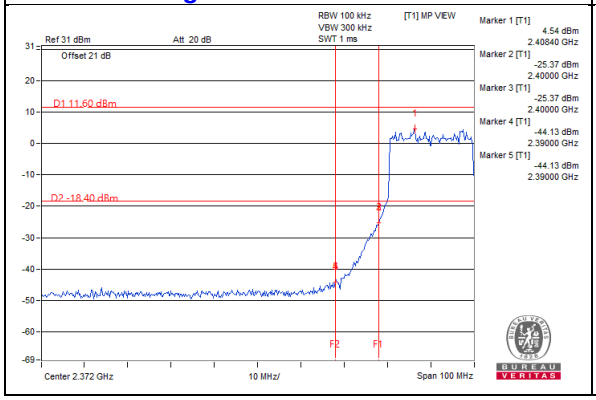
CH 6



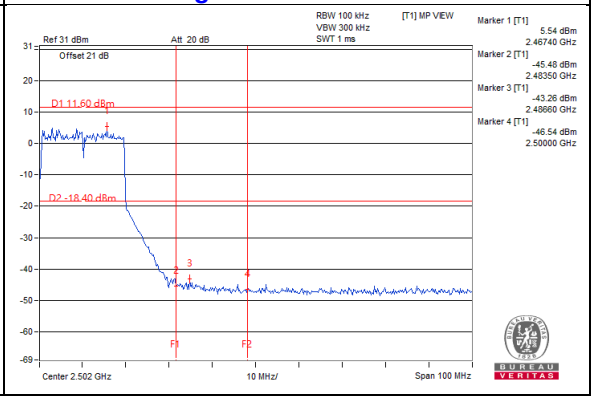
CH 11



CH 1 Band edge

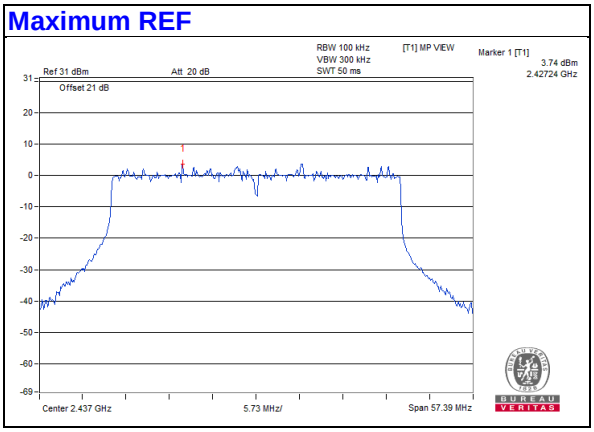


CH 11 Band edge



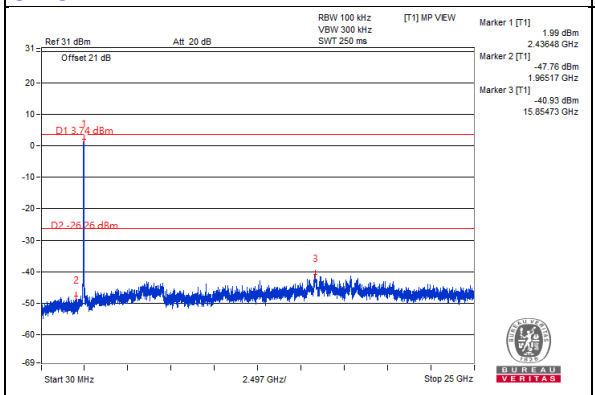
802.11ax (HE40)

Maximum REF

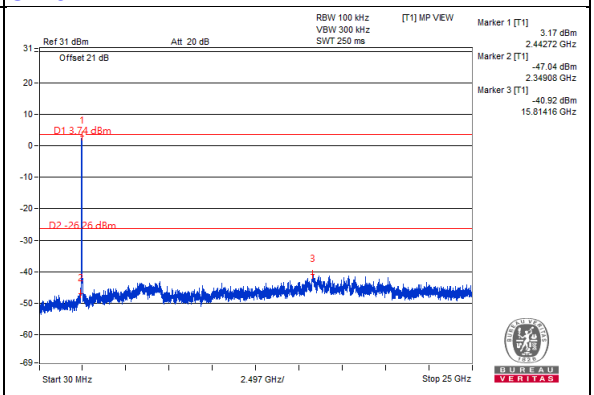


Chain 0

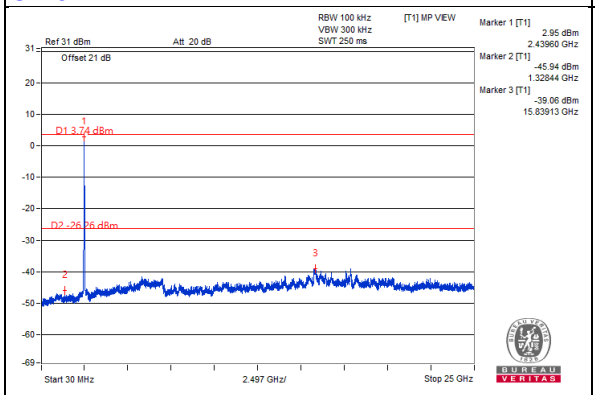
CH 3



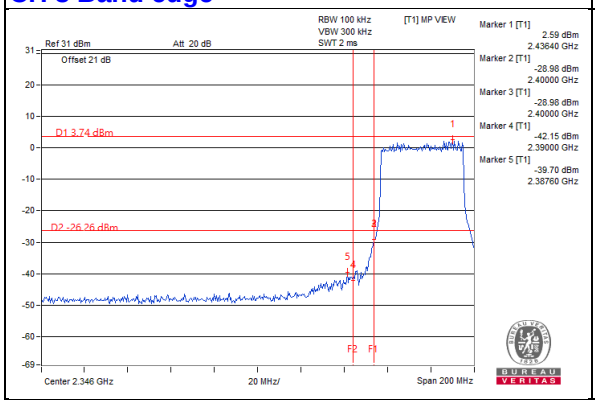
CH 6



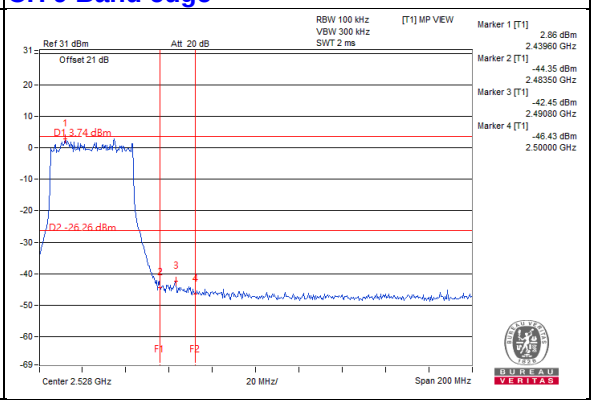
CH 9



CH 3 Band edge

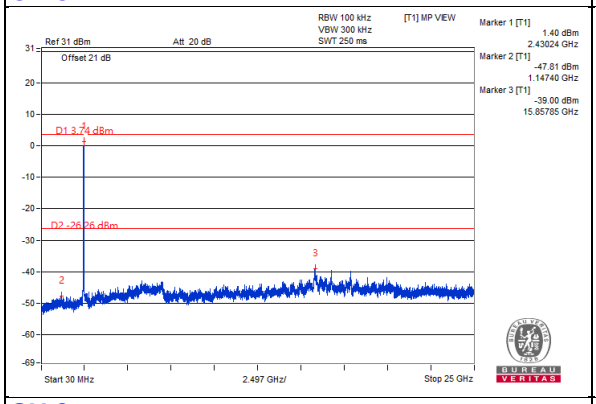


CH 9 Band edge

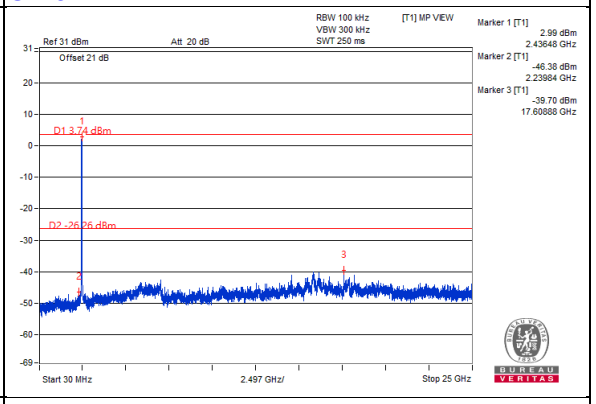


Chain 1

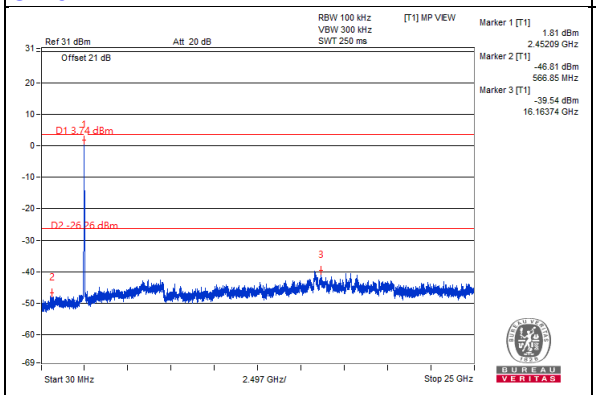
CH 3



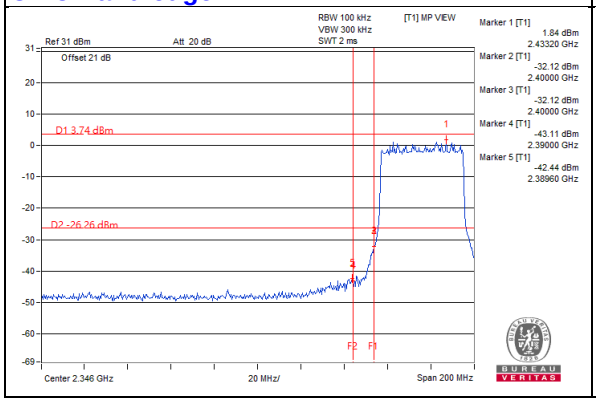
CH 6



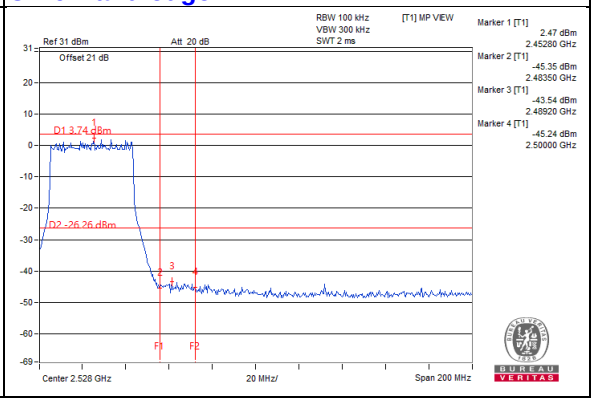
CH 9



CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

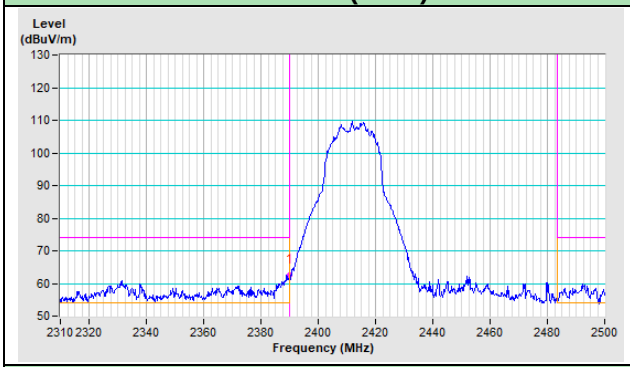
Please refer to the attached file (Test Setup Photo).

Annex A - Band-Edge Measurement

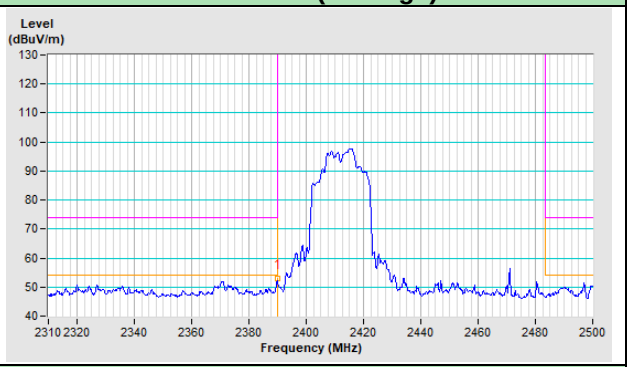
802.11b

Channel 1

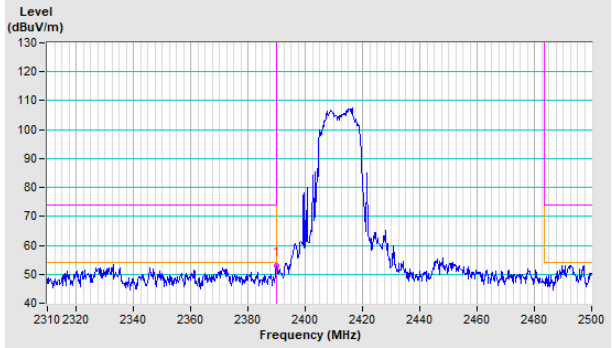
Horizontal (Peak)



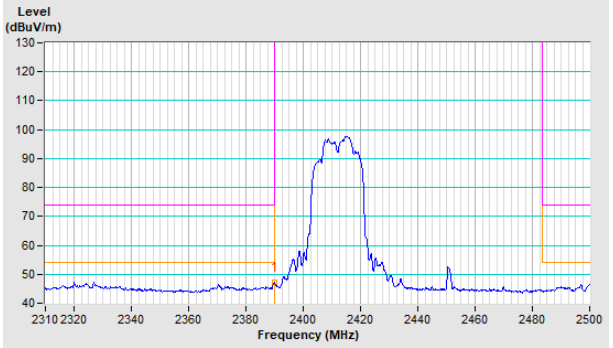
Horizontal (Average)



Vertical (Peak)

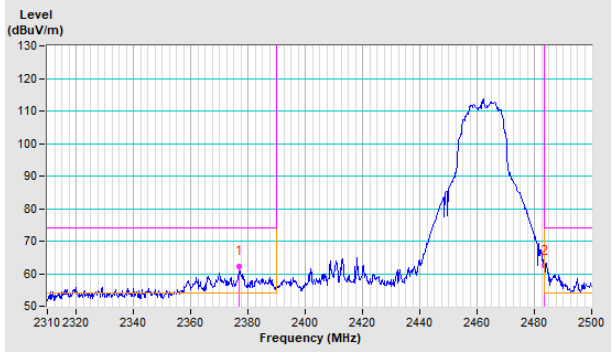


Vertical (Average)

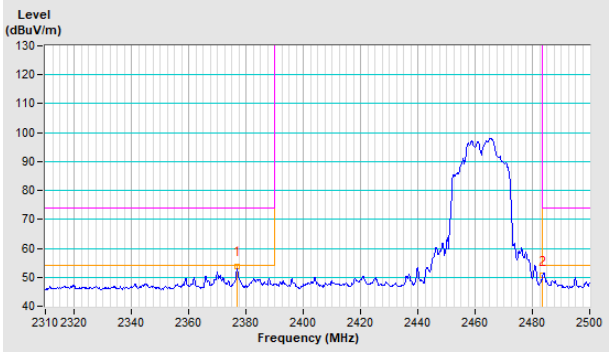


Channel 11

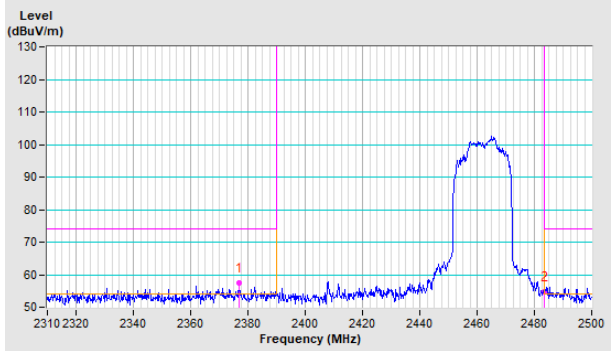
Horizontal (Peak)



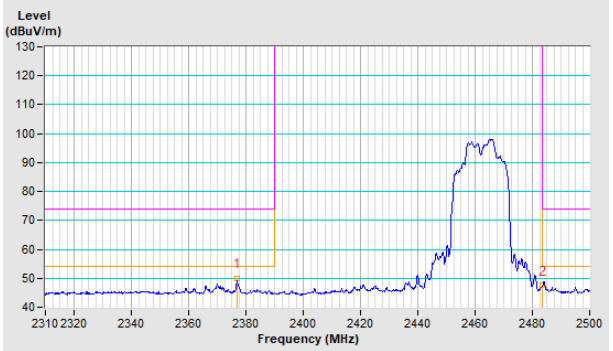
Horizontal (Average)



Vertical (Peak)



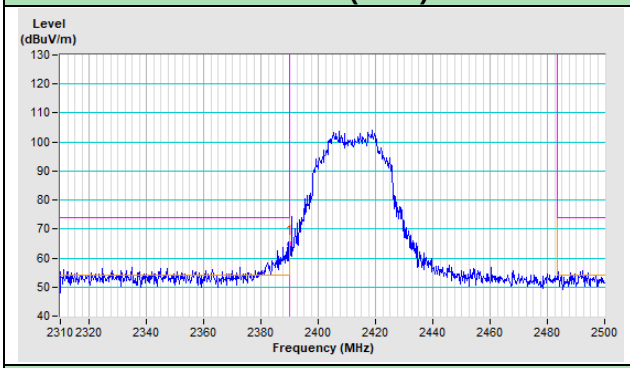
Vertical (Average)



802.11g

Channel 1

Horizontal (Peak)



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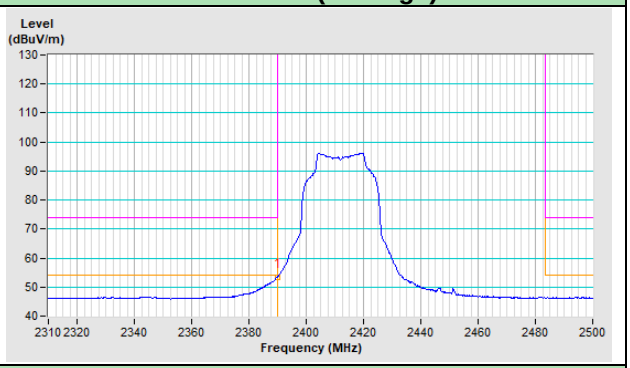
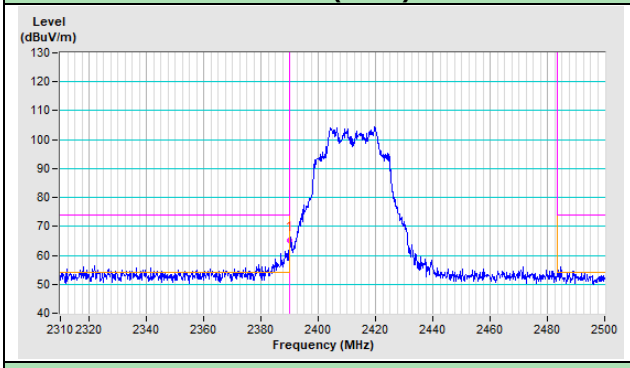


Vertical (Peak)



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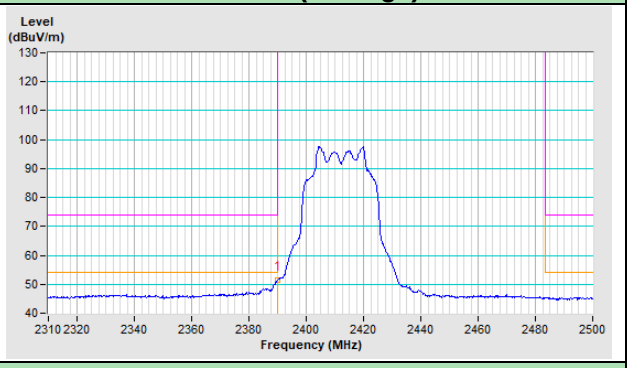
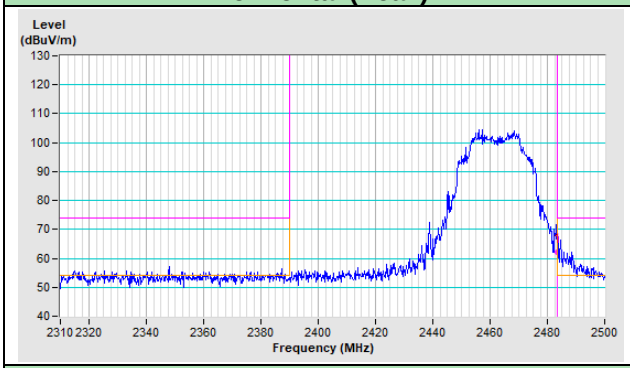
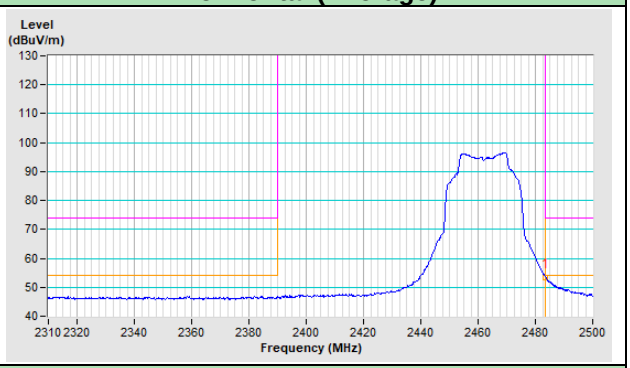


Channel 11

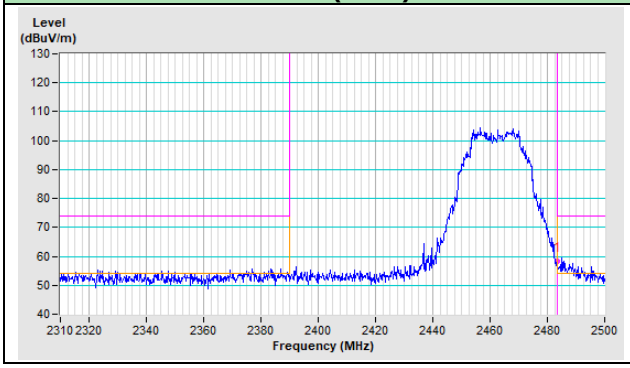
Horizontal (Peak)



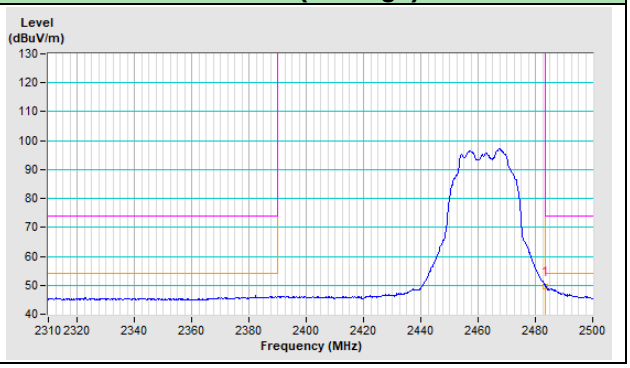
Horizontal (Average)



Vertical (Peak)



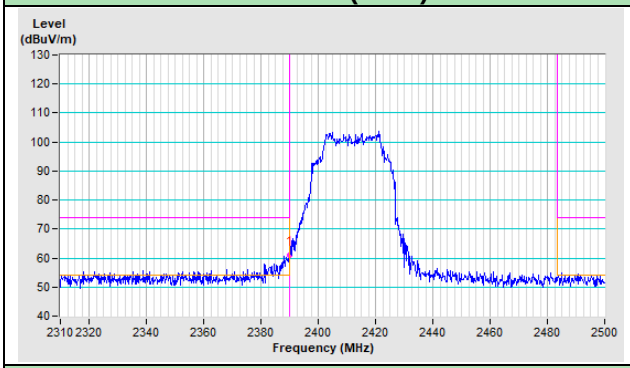
Vertical (Average)



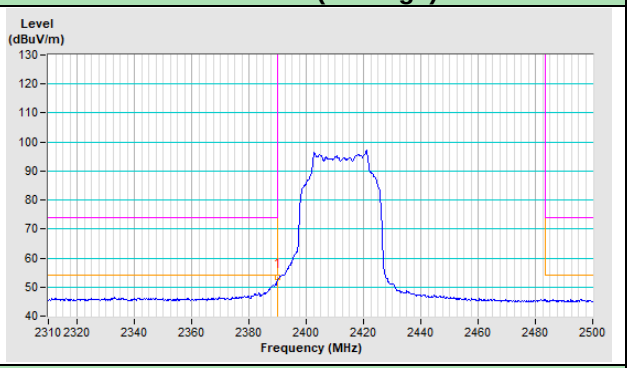
802.11ax (HE20)

Channel 1

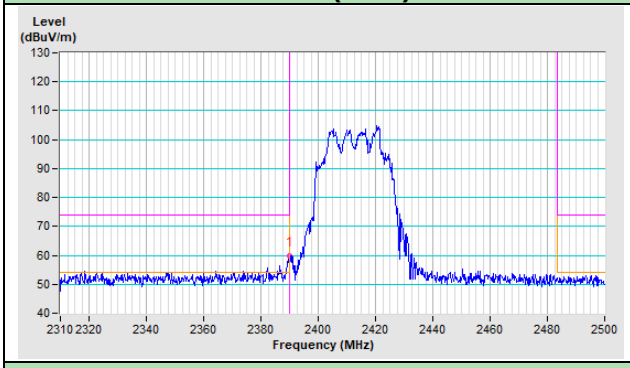
Horizontal (Peak)



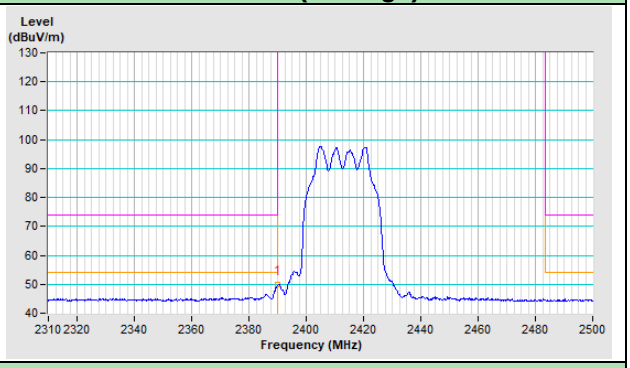
Horizontal (Average)



Vertical (Peak)

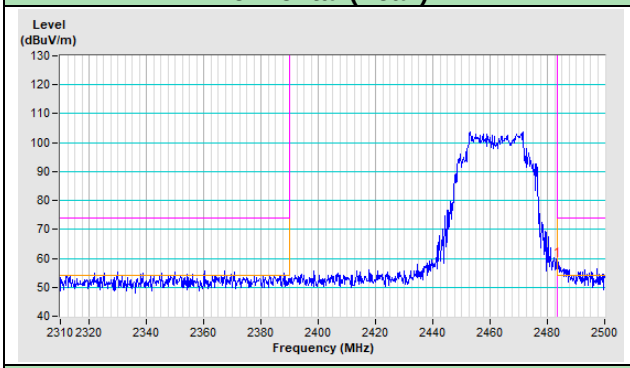


Vertical (Average)

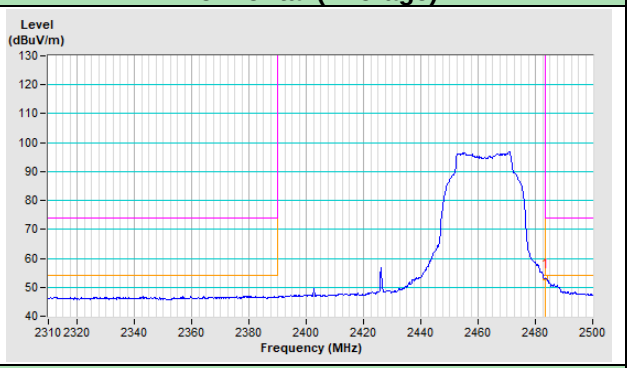


Channel 11

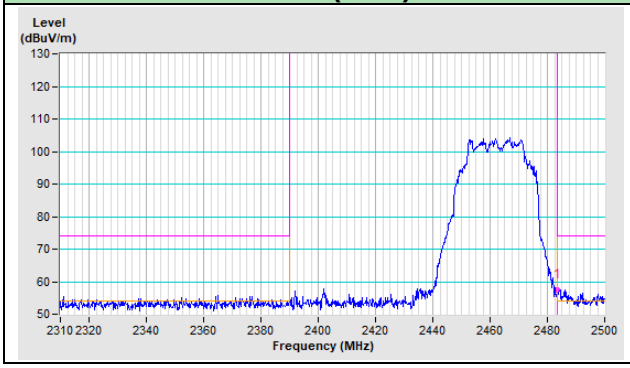
Horizontal (Peak)



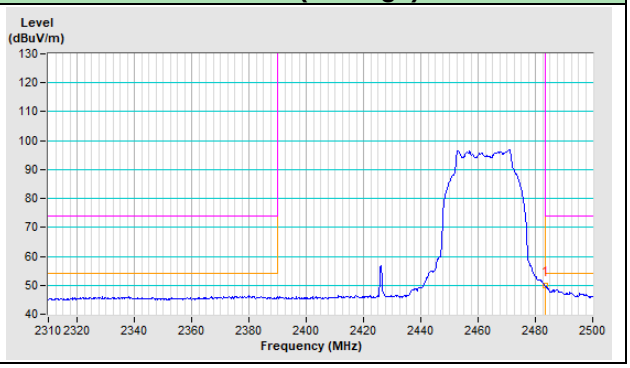
Horizontal (Average)



Vertical (Peak)



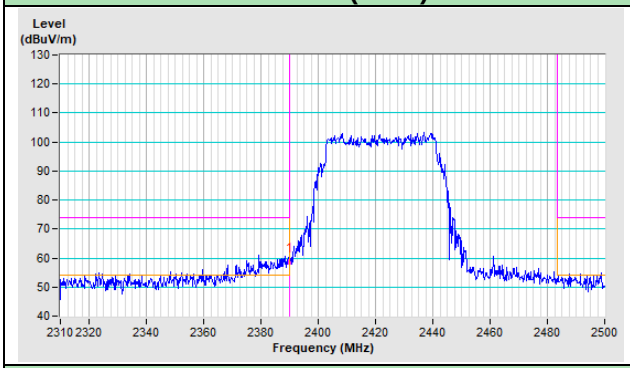
Vertical (Average)



802.11ax (HE40)

Channel 3

Horizontal (Peak)



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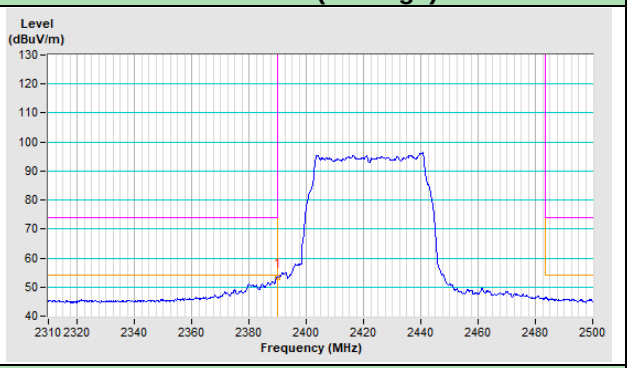
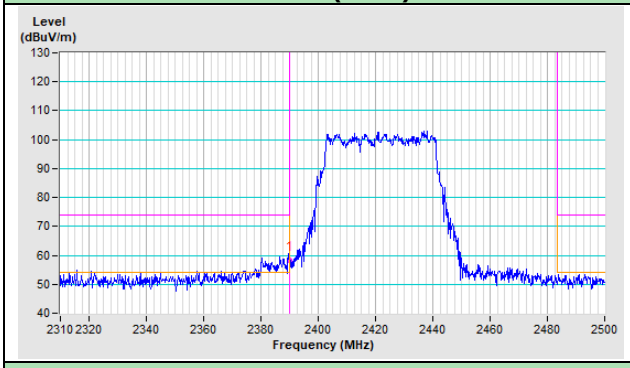
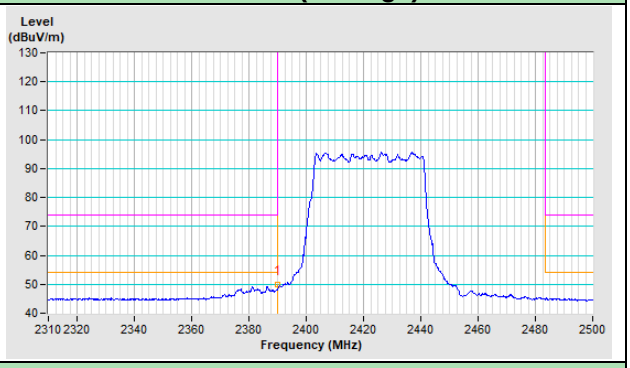


Vertical (Peak)

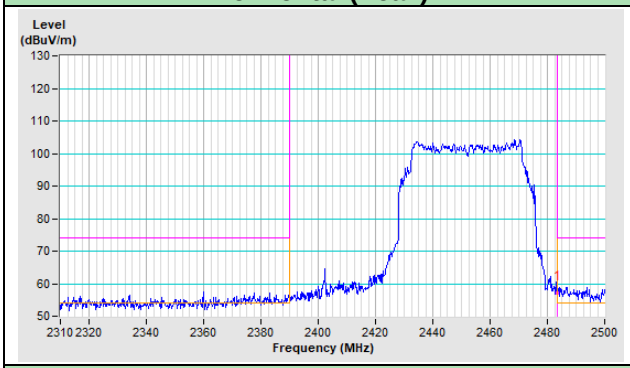


Vertical (Average)

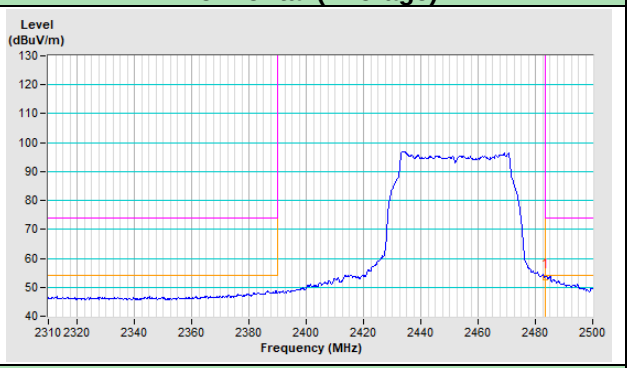


Channel 9

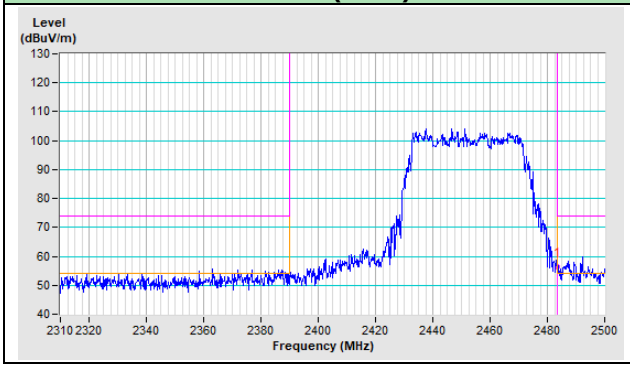
Horizontal (Peak)



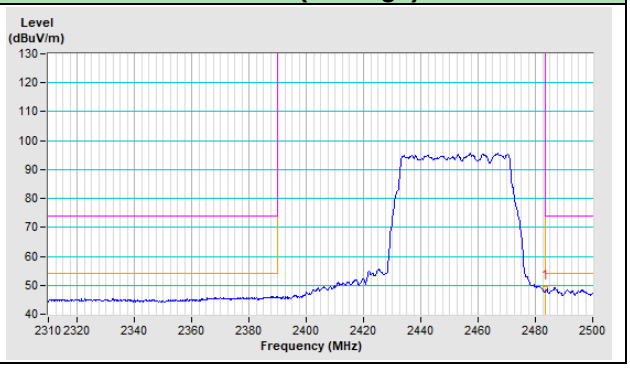
Horizontal (Average)



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 accredited and approved according to ISO/IEC 17025.

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

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Web Site: www.bureauveritas-adt.com

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

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