

FCC Test Report

Report No.: RFBDYL-WTW-P21050433

FCC ID: 2ARF9CSW630

Test Model: CSW630

Received Date: 2021/05/12

Test Date: 2021/5/31 ~ 2021/08/18

Issued Date: 2021/9/8

Applicant: Versa Networks

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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RFBDYL-WTW-P21050433	Original release.	2021/9/8

1 Certificate of Conformity

Product: Versa Cloud Services Access Point

Brand: Versa Networks

Test Model: CSW630

Sample Status: Engineering sample

Applicant: Versa Networks

Test Date: 2021/5/31 ~ 2021/08/18

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10: 2013

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

Prepared by : Vivian Huang , **Date:** 2021/9/8
Vivian Huang / Specialist

Approved by : Clark Lin , **Date:** 2021/9/8
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 -8.56dB at 0.46250MHz.
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 2483.50MHz.
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:

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

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Versa Cloud Services Access Point
Brand	Versa Networks
Test Model	CSW630
Status of EUT	Engineering sample
Power Supply Rating	DC 48V from POE DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in VHT mode 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: up to 11 Mbps 802.11g: up to 54 Mbps 802.11n: up to 600 Mbps 802.11ax: up to 1147.1 Mbps
Operating Frequency	2.412 ~ 2.462 GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 11 802.11n (HT40), VHT40, 802.11ax (HE40): 7
Output Power	For 4TX CDD Mode: 2.412 ~ 2.462 GHz: 597.648 mW Beamforming Mode: 2.412 ~ 2.462 GHz: 359.468 mW For 1TX (Scanning Radio): 2.412 ~ 2.462 GHz: 59.979 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Cable Supplied	NA

Note:

1. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3	Radio 4
WLAN (2.4GHz + 5GHz)	WLAN (5GHz)	Bluetooth	2.4GHz / 5GHz Scanning Radio

2. Simultaneously transmission condition.

Condition	Technology			
1	WLAN (2.4GHz)	WLAN (8TX_5GHz)	Bluetooth	2.4GHz Scanning Radio
2	WLAN (2.4GHz)	WLAN (8TX_5GHz)	Bluetooth	5GHz Scanning Radio
3	WLAN (2.4GHz)	WLAN (4TX_5GHz Low band)	Bluetooth	2.4GHz Scanning Radio
4	WLAN (2.4GHz)	WLAN (4TX_5GHz Low band)	Bluetooth	5GHz Scanning Radio

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

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

Antenna NO.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
5G0_baseline	5.7	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
5G1_baseline	5.9	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
5G2_baseline	5.3	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
5G3_baseline	5.6	DBS:5.15~5.85GHz/SBS:5.15~5.35GHz	PIFA	i-pex(MHF)
DUAL0	5.1	2.4~2.4835GHz	PIFA	i-pex(MHF)
	6.3	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
DUAL1	3.4	2.4~2.4835GHz	PIFA	i-pex(MHF)
	5.9	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
DUAL2	4.7	2.4~2.4835GHz	PIFA	i-pex(MHF)
	5.8	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
DUAL3	4.1	2.4~2.4835GHz	PIFA	i-pex(MHF)
	6	DBS:5.15~5.85GHz/SBS:5.47~5.85GHz		
BLE_baseline	4.5	2.4~2.4835GHz	PIFA	i-pex(MHF)
SCANNING_baseline	5.1	2.4~2.4835GHz	PIFA	i-pex(MHF)
	5.2	5.15~5.85GHz		

4. The EUT was pre-tested under the following modes:

Pre-test Mode	Description
Mode A	Power from adapter
Mode B	Power from PoE, ETH1
Mode C	Power from PoE, ETH2
Mode D	Power from PoE, ETH1+2

From the above modes, the worst case Radiated Emission was found in **Mode D** and Conducted Emission was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

5. The EUT incorporates a MIMO function.

Modulation Mode	Radio 1 - 2.4GHz Band		Radio 4 - 2.4GHz Band (Scanning Radio)	
	TX & RX Configuration		TX & RX Configuration	
802.11b	4TX	4RX	1TX	1RX
802.11g	4TX	4RX	1TX	1RX
802.11n (HT20)	4TX	4RX	1TX	1RX
802.11n (HT40)	4TX	4RX	1TX	1RX
VHT20	4TX	4RX	-	-
VHT40	4TX	4RX	-	-
802.11ax (HE20)	4TX	4RX	-	-
802.11ax (HE40)	4TX	4RX	-	-

Note:

1. All of modulation mode support beamforming function except 802.11b/g modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), VHT mode for 20MHz (40MHz) and 802.11ax mode for 20MHz (40MHz), therefore the manufacturer will control the power for 802.11n/ac mode is the same as the 802.11ax or more lower than it and investigated worst case to representative mode in test report.

6. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

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

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20), VHT20 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 \geq 1G	RE $<$ 1G	PLC	APCM	
1	√	√	√	√	4TX
2	√	√	√	√	1TX (Scanning Radio)

Where **RE \geq 1G**: Radiated Emission above 1GHz & Bandedge Measurement
RE $<$ 1G: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission
APCM: Antenna Port Conducted Measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.

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.

Mode 1					
CDD 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
Mode 2					
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
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	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.

Mode 1					
CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE PARAMETER
802.11b	1 to 11	6	DSSS	DBPSK	1Mb/s
Mode 2					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE PARAMETER
802.11b	1 to 11	11	DSSS	DBPSK	1Mb/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.

Mode 1					
CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE PARAMETER
802.11b	1 to 11	6	DSSS	DBPSK	1Mb/s
Mode 2					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE PARAMETER
802.11b	1 to 11	11	DSSS	DBPSK	1Mb/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.

Mode 1					
CDD 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
Mode 2					
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
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE \geq 1G	24deg. C, 69%RH	120Vac, 60Hz	Gary Cheng
RE<1G	20deg. C, 70%RH	120Vac, 60Hz	Ryan Du
PLC	25deg. C, 75%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Leon Dai

3.3 Duty Cycle of Test Signal

For 4TX

Duty cycle of test signal is < 98%, duty factor shall be considered.

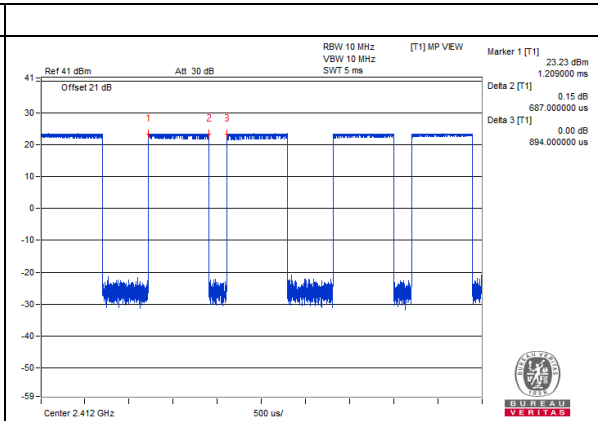
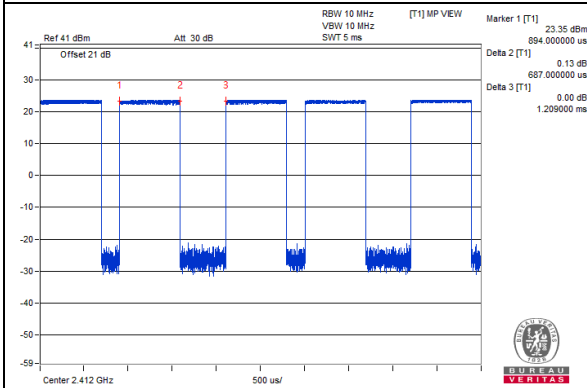
802.11b: Duty cycle = 1.374 ms / 2.103 ms = 0.653, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 1.85 \text{ dB}$

802.11g: Duty cycle = 1.971 ms / 2.081 ms = 0.947, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.24 \text{ dB}$

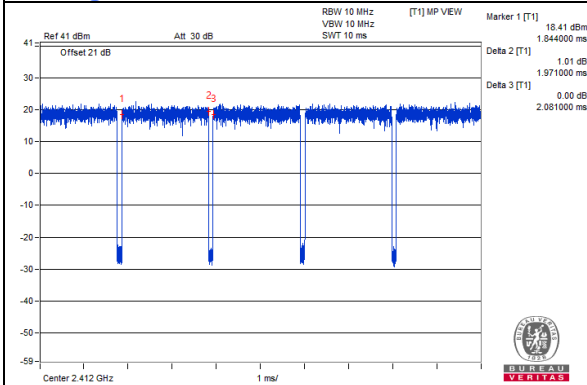
802.11ax (HE20): Duty cycle = 5.443 ms / 5.68 ms = 0.958, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.19 \text{ dB}$

802.11ax (HE40): Duty cycle = 5.432 ms / 5.76 ms = 0.943, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.25 \text{ dB}$

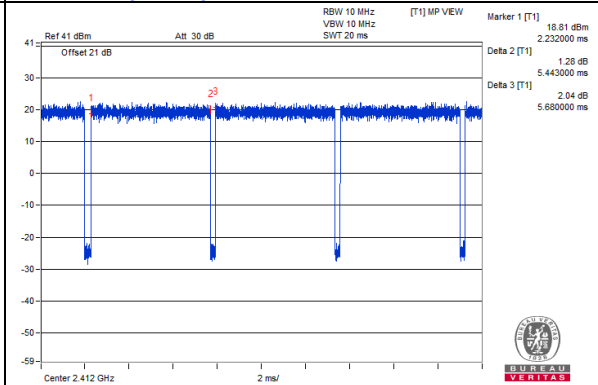
802.11b



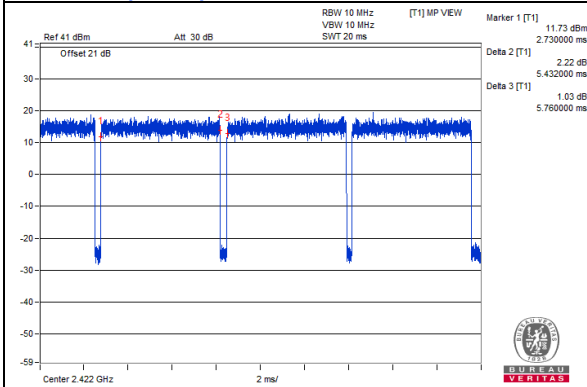
802.11g



802.11ax (HE20)



802.11ax (HE40)



For 1TX (Scanning Radio)

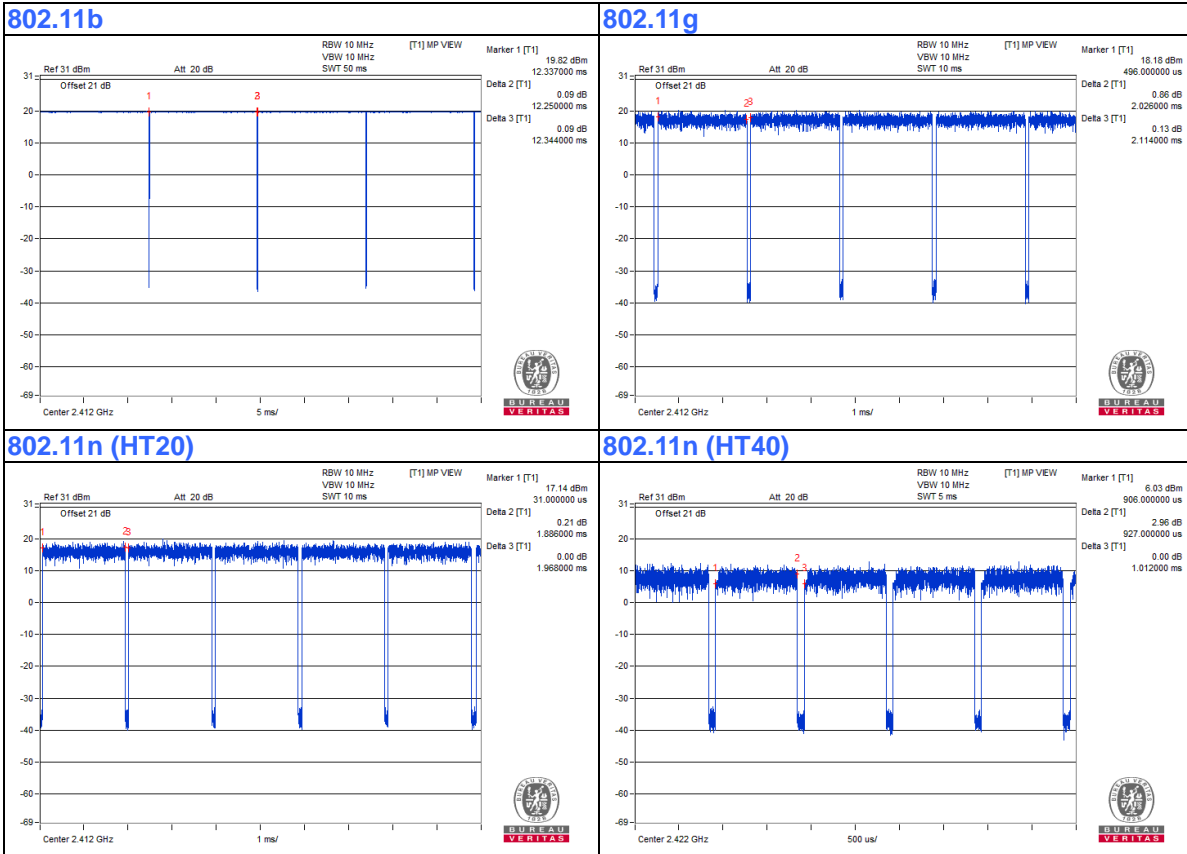
Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 12.25 ms /12.344 ms=0.992

802.11g: Duty cycle = 2.026 ms /2.114 ms=0.958, Duty factor = 10 * log (1/Duty cycle) = 0.18 dB

802.11n (HT20): Duty cycle = 1.886 ms /1.968 ms=0.958, Duty factor = 10 * log (1/Duty cycle) = 0.18 dB

802.11n (HT40): Duty cycle = 0.927 ms /1.012 ms=0.916, Duty factor = 10 * log (1/Duty cycle) = 0.38 dB



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.	PoE Adapter	GME	GME40B-480135FDA	NA	NA	Supplied by client
B.	Laptop	Lenovo	20U5S01X00 L14	PF-28LKK7	NA	Provided by Lab
C.	Laptop	Lenovo	20U5S01X00 L14	PF-1ANPYA	NA	Provided by Lab
D.	USB Disk	SanDisk	BM181225896Z	NA	NA	Provided by Lab
E.	PoE Adapter	MICROELECTRONICS TECH. INC.	TR60A-POE-L	NA	NA	Supplied by client

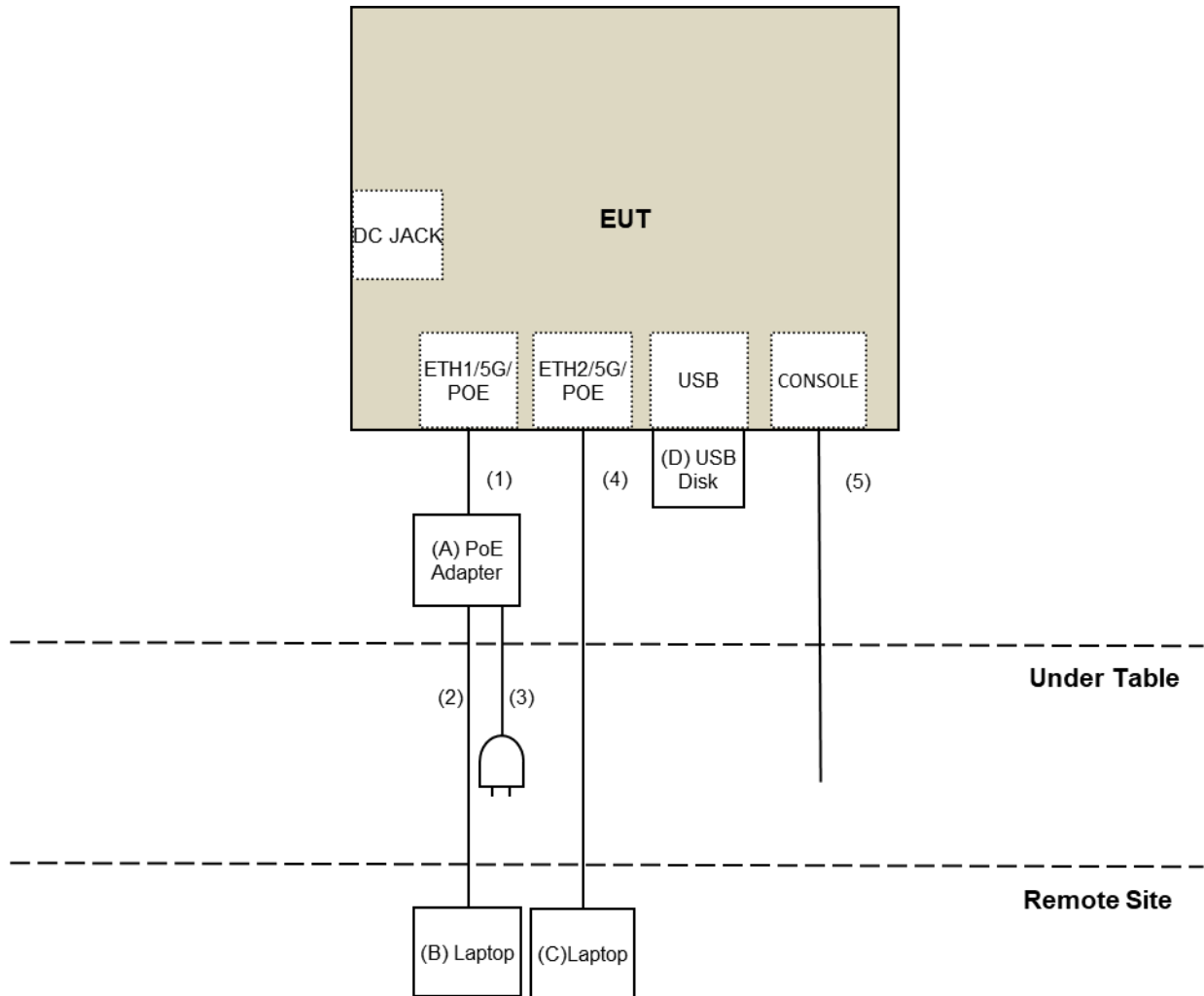
Note:

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

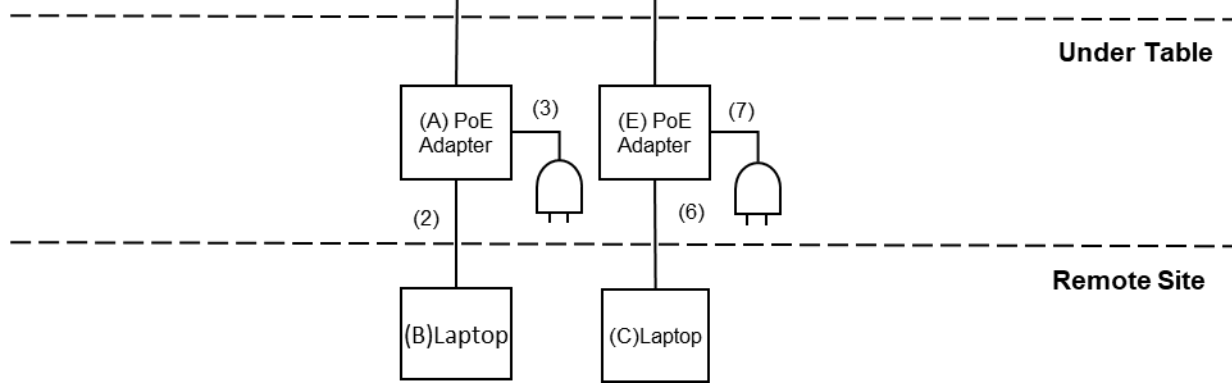
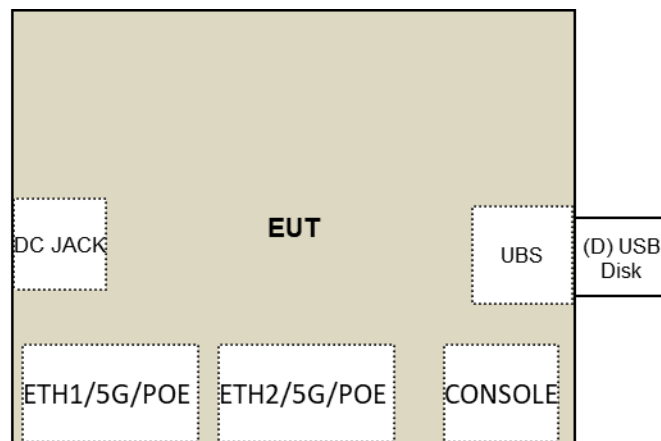
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	3	No	0	Provided by Lab
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	AC Cable	1	1.8	No	0	Provided by Lab
4.	RJ-45 Cable	1	10	No	0	Provided by Lab
5.	Console Cable	1	1.8	No	0	Provided by Lab
6.	RJ-45 Cable	1	10	No	0	Provided by Lab
7.	AC Cable	1	1.8	No	0	Provided by Lab

3.4.1 Configuration of System under Test

AC Power Conducted Emissions test



Radiated Emissions test:



3.5 General Description of Applied Standards and References

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

Test Standard:

FCC Part 15, Subpart C (15.247)

ANSI C63.10-2013

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

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02

KDB 662911 D01 Multiple Transmitter Output v02r01

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

4.1.2 Test Instruments

For Bandedge test:

Description & Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Test Receiver Agilent	N9038A	MY50010156	2020/7/24	2021/7/23
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Horn Antenna Schwarzbeck	BBHA9120-D	9120D-406	2020/11/22	2021/11/21
Pre_Amplifier EMCI	EMC12630SE	980384	2021/1/11	2022/1/10
RF Coaxial Cable EMCI	EMC104-SM-SM-1500	180504	2021/4/26	2022/4/25
RF Coaxial Cable EMCI	EMC104-SM-SM-2000	180601	2020/6/9	2021/6/8
RF Coaxial Cable EMCI	EMC104-SM-SM-6000	210201	2021/5/13	2022/5/12
Fix tool for Boresight antenna tower LIOW GUU	FBA-01	FBA_SIP01	NA	NA
Spectrum Analyzer Keysight	N9030A	MY54490679	2020/7/13	2021/7/12
Pre_Amplifier EMCI	EMC184045SE	980387	2021/1/11	2022/1/10
SHF-EHF Horn Schwarzbeck	BBHA 9170	BBHA9170519	2020/11/22	2021/11/21
RF Cable-Frequency range: 1-40GHz EMCI	EMC102-KM-KM-1200	160924	2021/1/11	2022/1/10
RF cable (40GHz) EMCI	EMC-KM-KM-4000	200214	2021/3/10	2022/3/9

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: 2021/5/31 ~ 2021/6/2

For Radiated emission test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	2021/7/22	2022/7/21
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Pre_Amplifier EMCI	EMC001340	980142	2021/5/24	2022/5/23
LOOP ANTENNA Electro-Metrics	EM-6879	264	2021/3/5	2022/3/4
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-001	2021/1/7	2022/1/6
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-002	2021/1/7	2022/1/6
Pre_Amplifier Mini-Circuits	ZFL-1000VH2	QA0838008	2020/10/20	2021/10/19
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	2020/11/5	2021/11/4
RF Coaxial Cable COMMATE/PEWC	8D	966-3-1	2021/3/16	2022/3/15
RF Coaxial Cable COMMATE/PEWC	8D	966-3-2	2021/3/16	2022/3/15
RF Coaxial Cable COMMATE/PEWC	8D	966-3-3	2021/3/16	2022/3/15
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	2020/9/24	2021/9/23
Horn Antenna Schwarzbeck	BBHA9120-D	9120D-406	2020/11/22	2021/11/21
Pre_Amplifier EMCI	EMC12630SE	980384	2021/1/11	2022/1/10
RF Coaxial Cable EMCI	EMC104-SM-SM-1500	180504	2021/4/26	2022/4/25
RF Coaxial Cable EMCI	EMC104-SM-SM-2000	180601	2021/6/8	2022/6/7
RF Coaxial Cable EMCI	EMC104-SM-SM-6000	210201	2021/5/13	2022/5/12
Fix tool for Boresight antenna tower LIOW GUU	FBA-01	FBA_SIP01	NA	NA
Spectrum Analyzer Keysight	N9030A	MY54490679	2021/7/9	2022/7/8
Pre_Amplifier EMCI	EMC184045SE	980387	2021/1/11	2022/1/10
SHF-EHF Horn Schwarzbeck	BBHA 9170	BBHA9170519	2020/11/22	2021/11/21
RF Cable-Frequency range: 1-40GHz EMCI	EMC102-KM-KM-1200	160924	2021/1/11	2022/1/10
RF cable (40GHz) EMCI	EMC-KM-KM-4000	200214	2021/3/10	2022/3/9

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: 2021/7/31 ~ 2021/8/4

For other test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	101516	2021/3/8	2022/3/7
Power Meter Anritsu	ML2495A	1529002	2021/6/21	2022/6/20
Pulse Power Sensor Anritsu	MA2411B	1339443	2021/5/31	2022/5/30
Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	2021/4/13	2022/4/12
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: 2021/8/18

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:

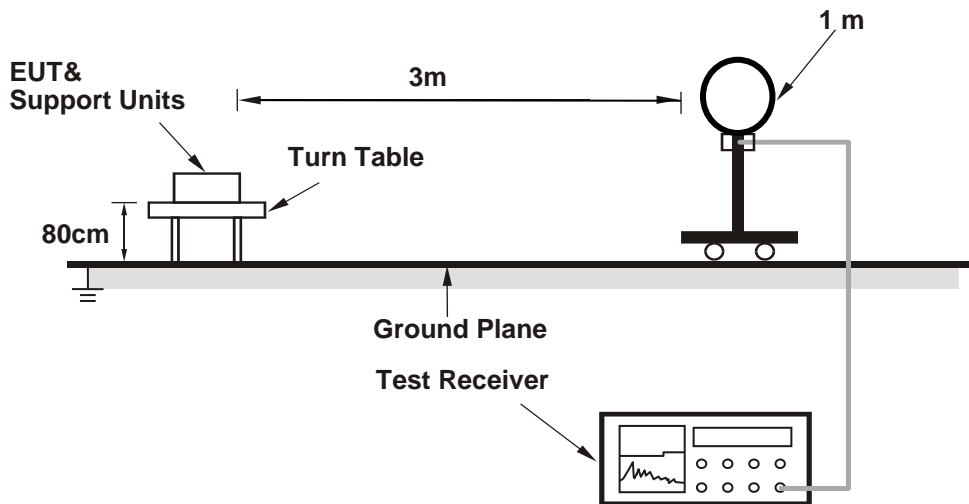
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) 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

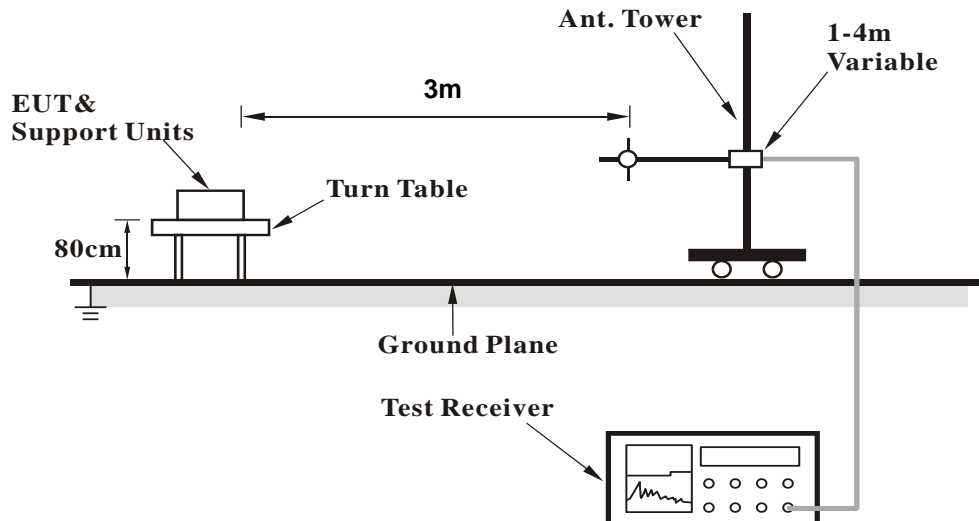
No deviation.

4.1.5 Test Setup

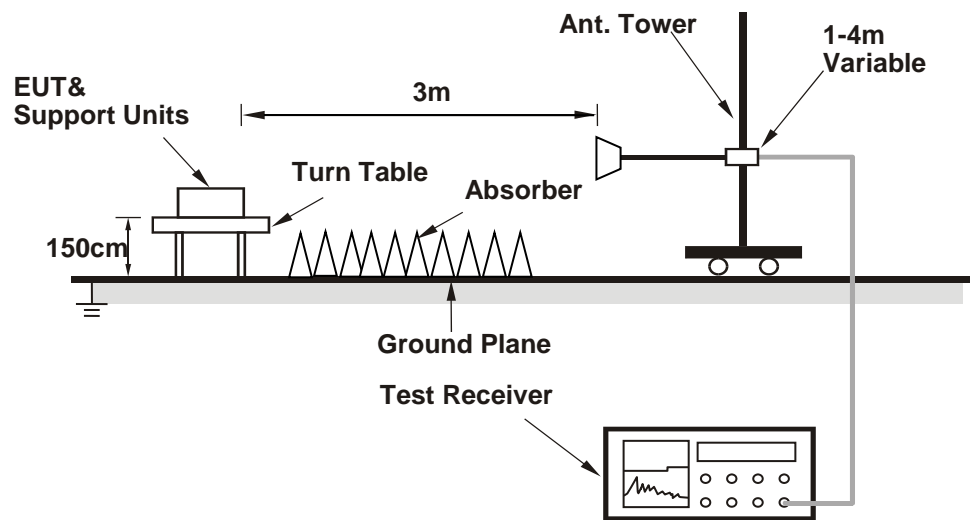
For Radiated emission below 30MHz



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 (QSPR Version 5.0-00188) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results (Mode 1)

For 4TX

Above 1GHz Data :

RF Mode	TX 802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2387.20	59.6 PK	74.0	-14.4	2.31 H	40	60.8	-1.2
2	2387.20	52.6 AV	54.0	-1.4	2.31 H	40	53.8	-1.2
3	*2412.00	118.1 PK			2.31 H	40	119.3	-1.2
4	*2412.00	115.9 AV			2.31 H	40	117.1	-1.2
5	4824.00	45.3 PK	74.0	-28.7	1.64 H	342	41.6	3.7
6	4824.00	41.2 AV	54.0	-12.8	1.64 H	342	37.5	3.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2387.32	58.0 PK	74.0	-16.0	3.48 V	332	59.2	-1.2
2	2387.32	49.5 AV	54.0	-4.5	3.48 V	332	50.7	-1.2
3	*2412.00	112.7 PK			3.48 V	332	113.9	-1.2
4	*2412.00	110.5 AV			3.48 V	332	111.7	-1.2
5	4824.00	47.9 PK	74.0	-26.1	1.68 V	317	44.2	3.7
6	4824.00	45.1 AV	54.0	-8.9	1.68 V	317	41.4	3.7

Remarks:

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

RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	59.7 PK	74.0	-14.3	2.27 H	42	60.9	-1.2
2	2390.00	52.1 AV	54.0	-1.9	2.27 H	42	53.3	-1.2
3	*2437.00	119.8 PK			2.27 H	42	121.0	-1.2
4	*2437.00	117.7 AV			2.27 H	42	118.9	-1.2
5	2483.50	60.8 PK	74.0	-13.2	2.27 H	42	62.0	-1.2
6	2483.50	53.6 AV	54.0	-0.4	2.27 H	42	54.8	-1.2
7	4874.00	45.7 PK	74.0	-28.3	1.66 H	343	41.9	3.8
8	4874.00	41.1 AV	54.0	-12.9	1.66 H	343	37.3	3.8
9	7311.00	45.0 PK	74.0	-29.0	1.93 H	236	35.3	9.7
10	7311.00	32.9 AV	54.0	-21.1	1.93 H	236	23.2	9.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.2 PK	74.0	-15.8	3.53 V	334	59.4	-1.2
2	2390.00	49.1 AV	54.0	-4.9	3.53 V	334	50.3	-1.2
3	*2437.00	114.4 PK			3.53 V	334	115.6	-1.2
4	*2437.00	112.5 AV			3.53 V	334	113.7	-1.2
5	2483.50	59.3 PK	74.0	-14.7	3.53 V	334	60.5	-1.2
6	2483.50	50.2 AV	54.0	-3.8	3.53 V	334	51.4	-1.2
7	4874.00	47.7 PK	74.0	-26.3	1.61 V	327	43.9	3.8
8	4874.00	45.0 AV	54.0	-9.0	1.61 V	327	41.2	3.8
9	7311.00	44.7 PK	74.0	-29.3	1.94 V	130	35.0	9.7
10	7311.00	32.9 AV	54.0	-21.1	1.94 V	130	23.2	9.7

Remarks:

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

RF Mode	TX 802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	116.0 PK			2.26 H	40	117.2	-1.2
2	*2462.00	113.6 AV			2.26 H	40	114.8	-1.2
3	2486.92	58.9 PK	74.0	-15.1	2.26 H	40	60.1	-1.2
4	2486.92	52.4 AV	54.0	-1.6	2.26 H	40	53.6	-1.2
5	4924.00	45.2 PK	74.0	-28.8	1.67 H	356	41.3	3.9
6	4924.00	40.8 AV	54.0	-13.2	1.67 H	356	36.9	3.9
7	7386.00	45.2 PK	74.0	-28.8	1.89 H	225	35.5	9.7
8	7386.00	33.3 AV	54.0	-20.7	1.89 H	225	23.6	9.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	111.6 PK			3.17 V	340	112.8	-1.2
2	*2462.00	109.7 AV			3.17 V	340	110.9	-1.2
3	2487.25	57.8 PK	74.0	-16.2	3.17 V	340	59.0	-1.2
4	2487.25	47.7 AV	54.0	-6.3	3.17 V	340	48.9	-1.2
5	4924.00	47.3 PK	74.0	-26.7	1.66 V	331	43.4	3.9
6	4924.00	44.6 AV	54.0	-9.4	1.66 V	331	40.7	3.9
7	7386.00	44.9 PK	74.0	-29.1	1.88 V	129	35.2	9.7
8	7386.00	33.2 AV	54.0	-20.8	1.88 V	129	23.5	9.7

Remarks:

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

RF Mode	TX 802.11g	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2387.92	67.4 PK	74.0	-6.6	1.56 H	288	68.6	-1.2
2	2387.92	52.6 AV	54.0	-1.4	1.56 H	288	53.8	-1.2
3	*2412.00	116.3 PK			1.56 H	288	117.5	-1.2
4	*2412.00	107.1 AV			1.56 H	288	108.3	-1.2
5	4824.00	44.6 PK	74.0	-29.4	1.69 H	353	40.9	3.7
6	4824.00	40.5 AV	54.0	-13.5	1.69 H	353	36.8	3.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	67.3 PK	74.0	-6.7	3.88 V	347	68.5	-1.2
2	2390.00	51.6 AV	54.0	-2.4	3.88 V	347	52.8	-1.2
3	*2412.00	114.0 PK			3.88 V	347	115.2	-1.2
4	*2412.00	103.9 AV			3.88 V	347	105.1	-1.2
5	4824.00	47.2 PK	74.0	-26.8	1.69 V	318	43.5	3.7
6	4824.00	44.7 AV	54.0	-9.3	1.69 V	318	41.0	3.7

Remarks:

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

RF Mode	TX 802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	63.7 PK	74.0	-10.3	1.66 H	271	64.9	-1.2
2	2390.00	50.3 AV	54.0	-3.7	1.66 H	271	51.5	-1.2
3	*2437.00	122.2 PK			1.66 H	271	123.4	-1.2
4	*2437.00	112.3 AV			1.66 H	271	113.5	-1.2
5	2483.50	69.8 PK	74.0	-4.2	1.66 H	271	71.0	-1.2
6	2483.50	53.7 AV	54.0	-0.3	1.66 H	271	54.9	-1.2
7	4874.00	44.7 PK	74.0	-29.3	1.66 H	341	40.9	3.8
8	4874.00	40.3 AV	54.0	-13.7	1.66 H	341	36.5	3.8
9	7311.00	45.8 PK	74.0	-28.2	1.91 H	228	36.1	9.7
10	7311.00	33.7 AV	54.0	-20.3	1.91 H	228	24.0	9.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	63.4 PK	74.0	-10.6	3.86 V	341	64.6	-1.2
2	2390.00	48.9 AV	54.0	-5.1	3.86 V	341	50.1	-1.2
3	*2437.00	120.3 PK			3.86 V	341	121.5	-1.2
4	*2437.00	109.1 AV			3.86 V	341	110.3	-1.2
5	2483.50	68.4 PK	74.0	-5.6	3.86 V	341	69.6	-1.2
6	2483.50	52.4 AV	54.0	-1.6	3.86 V	341	53.6	-1.2
7	4874.00	47.7 PK	74.0	-26.3	1.68 V	339	43.9	3.8
8	4874.00	45.0 AV	54.0	-9.0	1.68 V	339	41.2	3.8
9	7311.00	44.3 PK	74.0	-29.7	1.89 V	118	34.6	9.7
10	7311.00	32.7 AV	54.0	-21.3	1.89 V	118	23.0	9.7

Remarks:

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

RF Mode	TX 802.11g	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	118.4 PK			2.52 H	294	119.6	-1.2
2	*2462.00	108.4 AV			2.52 H	294	109.6	-1.2
3	2484.49	66.1 PK	74.0	-7.9	2.52 H	294	67.3	-1.2
4	2484.49	53.6 AV	54.0	-0.4	2.52 H	294	54.8	-1.2
5	4924.00	45.1 PK	74.0	-28.9	1.70 H	360	41.2	3.9
6	4924.00	40.5 AV	54.0	-13.5	1.70 H	360	36.6	3.9
7	7386.00	45.0 PK	74.0	-29.0	1.85 H	234	35.3	9.7
8	7386.00	33.3 AV	54.0	-20.7	1.85 H	234	23.6	9.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	114.2 PK			4.00 V	339	115.4	-1.2
2	*2462.00	105.1 AV			4.00 V	339	106.3	-1.2
3	2483.50	65.0 PK	74.0	-9.0	4.00 V	339	66.2	-1.2
4	2483.50	52.4 AV	54.0	-1.6	4.00 V	339	53.6	-1.2
5	4924.00	47.2 PK	74.0	-26.8	1.69 V	337	43.3	3.9
6	4924.00	44.3 AV	54.0	-9.7	1.69 V	337	40.4	3.9
7	7386.00	45.0 PK	74.0	-29.0	1.88 V	140	35.3	9.7
8	7386.00	33.4 AV	54.0	-20.6	1.88 V	140	23.7	9.7

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	68.6 PK	74.0	-5.4	2.83 H	314	69.8	-1.2
2	2390.00	53.7 AV	54.0	-0.3	2.83 H	314	54.9	-1.2
3	*2412.00	119.2 PK			2.83 H	314	120.4	-1.2
4	*2412.00	107.2 AV			2.83 H	314	108.4	-1.2
5	4824.00	44.9 PK	74.0	-29.1	1.63 H	341	41.2	3.7
6	4824.00	40.7 AV	54.0	-13.3	1.63 H	341	37.0	3.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	65.9 PK	74.0	-8.1	3.86 V	329	67.1	-1.2
2	2390.00	51.3 AV	54.0	-2.7	3.86 V	329	52.5	-1.2
3	*2412.00	116.4 PK			3.86 V	329	117.6	-1.2
4	*2412.00	105.0 AV			3.86 V	329	106.2	-1.2
5	4824.00	47.7 PK	74.0	-26.3	1.62 V	320	44.0	3.7
6	4824.00	45.0 AV	54.0	-9.0	1.62 V	320	41.3	3.7

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	64.2 PK	74.0	-9.8	1.30 H	291	65.4	-1.2
2	2390.00	50.1 AV	54.0	-3.9	1.30 H	291	51.3	-1.2
3	*2437.00	122.5 PK			1.30 H	291	123.7	-1.2
4	*2437.00	112.0 AV			1.30 H	291	113.2	-1.2
5	2483.50	70.6 PK	74.0	-3.4	1.30 H	291	71.8	-1.2
6	2483.50	53.9 AV	54.0	-0.1	1.30 H	291	55.1	-1.2
7	4874.00	44.6 PK	74.0	-29.4	1.63 H	341	40.8	3.8
8	4874.00	40.3 AV	54.0	-13.7	1.63 H	341	36.5	3.8
9	7311.00	45.1 PK	74.0	-28.9	1.93 H	233	35.4	9.7
10	7311.00	33.4 AV	54.0	-20.6	1.93 H	233	23.7	9.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	62.3 PK	74.0	-11.7	3.86 V	332	63.5	-1.2
2	2390.00	48.4 AV	54.0	-5.6	3.86 V	332	49.6	-1.2
3	*2437.00	120.2 PK			3.86 V	332	121.4	-1.2
4	*2437.00	110.2 AV			3.86 V	332	111.4	-1.2
5	2483.50	68.8 PK	74.0	-5.2	3.86 V	332	70.0	-1.2
6	2483.50	51.4 AV	54.0	-2.6	3.86 V	332	52.6	-1.2
7	4874.00	46.9 PK	74.0	-27.1	1.71 V	339	43.1	3.8
8	4874.00	44.1 AV	54.0	-9.9	1.71 V	339	40.3	3.8
9	7311.00	44.5 PK	74.0	-29.5	1.82 V	131	34.8	9.7
10	7311.00	33.0 AV	54.0	-21.0	1.82 V	131	23.3	9.7

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	116.8 PK			1.00 H	289	118.0	-1.2
2	*2462.00	104.0 AV			1.00 H	289	105.2	-1.2
3	2483.50	66.7 PK	74.0	-7.3	1.00 H	289	67.9	-1.2
4	2483.50	53.8 AV	54.0	-0.2	1.00 H	289	55.0	-1.2
5	4924.00	44.9 PK	74.0	-29.1	1.67 H	343	41.0	3.9
6	4924.00	40.7 AV	54.0	-13.3	1.67 H	343	36.8	3.9
7	7386.00	45.3 PK	74.0	-28.7	1.84 H	222	35.6	9.7
8	7386.00	33.2 AV	54.0	-20.8	1.84 H	222	23.5	9.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	115.4 PK			3.77 V	346	116.6	-1.2
2	*2462.00	102.8 AV			3.77 V	346	104.0	-1.2
3	2485.90	60.8 PK	74.0	-13.2	3.77 V	346	62.0	-1.2
4	2485.90	47.5 AV	54.0	-6.5	3.77 V	346	48.7	-1.2
5	4924.00	47.7 PK	74.0	-26.3	1.70 V	322	43.8	3.9
6	4924.00	44.7 AV	54.0	-9.3	1.70 V	322	40.8	3.9
7	7386.00	44.5 PK	74.0	-29.5	1.94 V	141	34.8	9.7
8	7386.00	32.7 AV	54.0	-21.3	1.94 V	141	23.0	9.7

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 3 : 2422 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	69.6 PK	74.0	-4.4	1.11 H	296	70.8	-1.2
2	2390.00	53.5 AV	54.0	-0.5	1.11 H	296	54.7	-1.2
3	*2422.00	113.7 PK			1.11 H	296	114.9	-1.2
4	*2422.00	103.9 AV			1.11 H	296	105.1	-1.2
5	4844.00	44.5 PK	74.0	-29.5	1.66 H	349	40.7	3.8
6	4844.00	40.3 AV	54.0	-13.7	1.66 H	349	36.5	3.8
7	7266.00	45.7 PK	74.0	-28.3	1.89 H	223	36.2	9.5
8	7266.00	33.7 AV	54.0	-20.3	1.89 H	223	24.2	9.5

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	67.6 PK	74.0	-6.4	3.72 V	345	68.8	-1.2
2	2390.00	51.9 AV	54.0	-2.1	3.72 V	345	53.1	-1.2
3	*2422.00	113.1 PK			3.72 V	345	114.3	-1.2
4	*2422.00	102.4 AV			3.72 V	345	103.6	-1.2
5	4844.00	47.1 PK	74.0	-26.9	1.68 V	341	43.3	3.8
6	4844.00	44.3 AV	54.0	-9.7	1.68 V	341	40.5	3.8
7	7266.00	45.2 PK	74.0	-28.8	1.86 V	118	35.7	9.5
8	7266.00	33.6 AV	54.0	-20.4	1.86 V	118	24.1	9.5

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.

RF Mode	TX 802.11ax (HE40)	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	63.3 PK	74.0	-10.7	1.29 H	286	64.5	-1.2
2	2390.00	50.4 AV	54.0	-3.6	1.29 H	286	51.6	-1.2
3	*2437.00	116.3 PK			1.29 H	286	117.5	-1.2
4	*2437.00	105.1 AV			1.29 H	286	106.3	-1.2
5	2483.50	66.5 PK	74.0	-7.5	1.29 H	286	67.7	-1.2
6	2483.50	53.7 AV	54.0	-0.3	1.29 H	286	54.9	-1.2
7	4874.00	45.8 PK	74.0	-28.2	1.66 H	360	42.0	3.8
8	4874.00	41.1 AV	54.0	-12.9	1.66 H	360	37.3	3.8
9	7311.00	45.1 PK	74.0	-28.9	1.90 H	226	35.4	9.7
10	7311.00	33.4 AV	54.0	-20.6	1.90 H	226	23.7	9.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	59.7 PK	74.0	-14.3	3.73 V	353	60.9	-1.2
2	2390.00	48.1 AV	54.0	-5.9	3.73 V	353	49.3	-1.2
3	*2437.00	113.7 PK			3.73 V	353	114.9	-1.2
4	*2437.00	103.9 AV			3.73 V	353	105.1	-1.2
5	2483.50	63.8 PK	74.0	-10.2	3.73 V	353	65.0	-1.2
6	2483.50	50.8 AV	54.0	-3.2	3.73 V	353	52.0	-1.2
7	4874.00	47.4 PK	74.0	-26.6	1.60 V	324	43.6	3.8
8	4874.00	44.6 AV	54.0	-9.4	1.60 V	324	40.8	3.8
9	7311.00	44.8 PK	74.0	-29.2	1.82 V	143	35.1	9.7
10	7311.00	33.0 AV	54.0	-21.0	1.82 V	143	23.3	9.7

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 9 : 2452 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	112.6 PK			1.33 H	289	113.8	-1.2
2	*2452.00	101.7 AV			1.33 H	289	102.9	-1.2
3	2486.64	64.1 PK	74.0	-9.9	1.33 H	289	65.3	-1.2
4	2486.64	53.7 AV	54.0	-0.3	1.33 H	289	54.9	-1.2
5	4904.00	45.7 PK	74.0	-28.3	1.67 H	360	41.8	3.9
6	4904.00	41.2 AV	54.0	-12.8	1.67 H	360	37.3	3.9
7	7356.00	45.4 PK	74.0	-28.6	1.92 H	238	35.5	9.9
8	7356.00	33.6 AV	54.0	-20.4	1.92 H	238	23.7	9.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	111.5 PK			3.68 V	351	112.7	-1.2
2	*2452.00	100.5 AV			3.68 V	351	101.7	-1.2
3	2486.21	63.1 PK	74.0	-10.9	3.68 V	351	64.3	-1.2
4	2486.21	52.2 AV	54.0	-1.8	3.68 V	351	53.4	-1.2
5	4904.00	47.0 PK	74.0	-27.0	1.64 V	336	43.1	3.9
6	4904.00	44.4 AV	54.0	-9.6	1.64 V	336	40.5	3.9
7	7356.00	44.9 PK	74.0	-29.1	1.86 V	128	35.0	9.9
8	7356.00	33.1 AV	54.0	-20.9	1.86 V	128	23.2	9.9

Remarks:

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

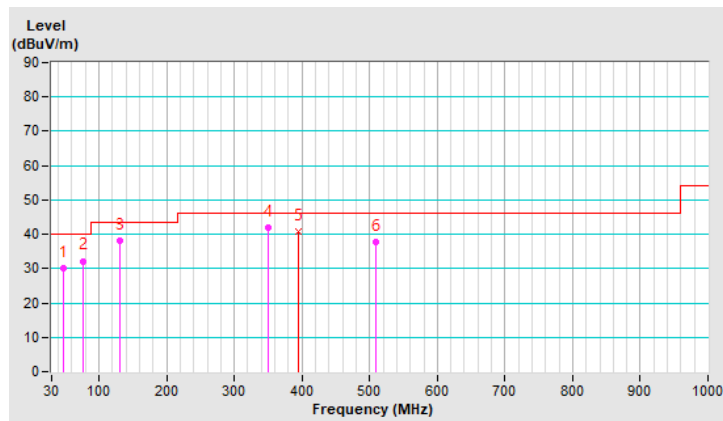
Below 1GHz Data:

RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	47.02	30.1 QP	40.0	-9.9	2.50 H	360	38.3	-8.2
2	76.97	32.2 QP	40.0	-7.8	2.00 H	284	44.5	-12.3
3	131.63	38.2 QP	43.5	-5.3	1.50 H	262	46.9	-8.7
4	350.29	41.9 QP	46.0	-4.1	1.00 H	118	47.1	-5.2
5	395.35	40.9 QP	46.0	-5.1	1.00 H	360	44.9	-4.0
6	509.30	37.7 QP	46.0	-8.3	1.50 H	340	38.4	-0.7

Remarks:

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

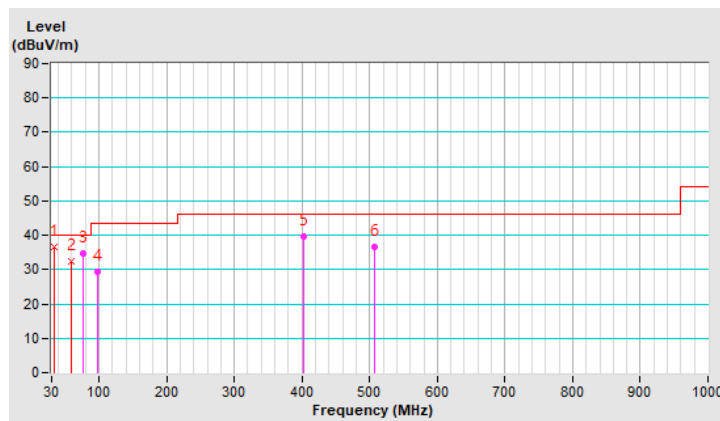


RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	33.65	36.5 QP	40.0	-3.5	1.00 V	125	45.7	-9.2
2	59.32	32.5 QP	40.0	-7.5	1.00 V	360	41.1	-8.6
3	75.78	34.6 QP	40.0	-5.4	1.00 V	181	46.5	-11.9
4	98.51	29.5 QP	43.5	-14.0	1.00 V	160	42.1	-12.6
5	401.95	39.7 QP	46.0	-6.3	1.00 V	319	43.4	-3.7
6	507.02	36.4 QP	46.0	-9.6	1.00 V	343	37.2	-0.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit 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)
 For 1TX (Scanning Radio)

Above 1GHz Data :

RF Mode	TX 802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.3 PK	74.0	-17.7	3.28 H	147	57.5	-1.2
2	2390.00	44.7 AV	54.0	-9.3	3.28 H	147	45.9	-1.2
3	*2412.00	106.4 PK			3.28 H	147	107.6	-1.2
4	*2412.00	104.0 AV			3.28 H	147	105.2	-1.2
5	4824.00	47.1 PK	74.0	-26.9	1.06 H	193	43.4	3.7
6	4824.00	43.0 AV	54.0	-11.0	1.06 H	193	39.3	3.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.8 PK	74.0	-17.2	1.26 V	334	58.0	-1.2
2	2390.00	43.9 AV	54.0	-10.1	1.26 V	334	45.1	-1.2
3	*2412.00	101.0 PK			1.26 V	334	102.2	-1.2
4	*2412.00	99.0 AV			1.26 V	334	100.2	-1.2
5	4824.00	46.6 PK	74.0	-27.4	1.43 V	150	42.9	3.7
6	4824.00	41.9 AV	54.0	-12.1	1.43 V	150	38.2	3.7

Remarks:

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

RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.2 PK	74.0	-17.8	3.27 H	134	57.4	-1.2
2	2390.00	44.5 AV	54.0	-9.5	3.27 H	134	45.7	-1.2
3	*2437.00	106.6 PK			3.27 H	134	107.8	-1.2
4	*2437.00	104.4 AV			3.27 H	134	105.6	-1.2
5	2483.50	55.9 PK	74.0	-18.1	3.27 H	134	57.1	-1.2
6	2483.50	43.6 AV	54.0	-10.4	3.27 H	134	44.8	-1.2
7	4874.00	46.8 PK	74.0	-27.2	1.03 H	177	43.0	3.8
8	4874.00	42.8 AV	54.0	-11.2	1.03 H	177	39.0	3.8
9	7311.00	44.1 PK	74.0	-29.9	3.28 H	113	34.4	9.7
10	7311.00	33.3 AV	54.0	-20.7	3.28 H	113	23.6	9.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	55.9 PK	74.0	-18.1	3.61 V	164	57.1	-1.2
2	2390.00	44.3 AV	54.0	-9.7	3.61 V	164	45.5	-1.2
3	*2437.00	101.3 PK			3.61 V	164	102.5	-1.2
4	*2437.00	99.2 AV			3.61 V	164	100.4	-1.2
5	2483.50	55.9 PK	74.0	-18.1	3.61 V	164	57.1	-1.2
6	2483.50	43.9 AV	54.0	-10.1	3.61 V	164	45.1	-1.2
7	4874.00	46.3 PK	74.0	-27.7	1.35 V	154	42.5	3.8
8	4874.00	41.6 AV	54.0	-12.4	1.35 V	154	37.8	3.8
9	7311.00	44.4 PK	74.0	-29.6	1.67 V	76	34.7	9.7
10	7311.00	33.0 AV	54.0	-21.0	1.67 V	76	23.3	9.7

Remarks:

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

RF Mode	TX 802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	105.5 PK			3.48 H	132	106.7	-1.2
2	*2462.00	103.3 AV			3.48 H	132	104.5	-1.2
3	2483.50	55.7 PK	74.0	-18.3	3.48 H	132	56.9	-1.2
4	2483.50	43.7 AV	54.0	-10.3	3.48 H	132	44.9	-1.2
5	4924.00	47.5 PK	74.0	-26.5	1.01 H	177	43.6	3.9
6	4924.00	43.3 AV	54.0	-10.7	1.01 H	177	39.4	3.9
7	7386.00	44.3 PK	74.0	-29.7	3.33 H	109	34.6	9.7
8	7386.00	33.8 AV	54.0	-20.2	3.33 H	109	24.1	9.7

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	101.5 PK			3.64 V	163	102.7	-1.2
2	*2462.00	99.1 AV			3.64 V	163	100.3	-1.2
3	2483.50	56.6 PK	74.0	-17.4	3.64 V	163	57.8	-1.2
4	2483.50	43.4 AV	54.0	-10.6	3.64 V	163	44.6	-1.2
5	4924.00	46.4 PK	74.0	-27.6	1.39 V	145	42.5	3.9
6	4924.00	41.8 AV	54.0	-12.2	1.39 V	145	37.9	3.9
7	7386.00	44.2 PK	74.0	-29.8	1.70 V	74	34.5	9.7
8	7386.00	32.5 AV	54.0	-21.5	1.70 V	74	22.8	9.7

Remarks:

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

RF Mode	TX 802.11g	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	68.4 PK	74.0	-5.6	3.28 H	132	69.6	-1.2
2	2390.00	52.4 AV	54.0	-1.6	3.28 H	132	53.6	-1.2
3	*2412.00	108.3 PK			3.28 H	132	109.5	-1.2
4	*2412.00	98.1 AV			3.28 H	132	99.3	-1.2
5	4824.00	43.4 PK	74.0	-30.6	1.06 H	165	39.7	3.7
6	4824.00	32.7 AV	54.0	-21.3	1.06 H	165	29.0	3.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	66.4 PK	74.0	-7.6	1.20 V	337	67.6	-1.2
2	2390.00	50.0 AV	54.0	-4.0	1.20 V	337	51.2	-1.2
3	*2412.00	102.7 PK			1.20 V	337	103.9	-1.2
4	*2412.00	92.7 AV			1.20 V	337	93.9	-1.2
5	4824.00	42.2 PK	74.0	-31.8	1.33 V	151	38.5	3.7
6	4824.00	31.7 AV	54.0	-22.3	1.33 V	151	28.0	3.7

Remarks:

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

RF Mode	TX 802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.2 PK	74.0	-16.8	3.51 H	140	58.4	-1.2
2	2390.00	46.1 AV	54.0	-7.9	3.51 H	140	47.3	-1.2
3	*2437.00	107.3 PK			3.51 H	140	108.5	-1.2
4	*2437.00	97.8 AV			3.51 H	140	99.0	-1.2
5	2483.50	56.7 PK	74.0	-17.3	3.51 H	140	57.9	-1.2
6	2483.50	45.1 AV	54.0	-8.9	3.51 H	140	46.3	-1.2
7	4874.00	43.0 PK	74.0	-31.0	1.08 H	157	39.2	3.8
8	4874.00	32.5 AV	54.0	-21.5	1.08 H	157	28.7	3.8
9	7311.00	43.9 PK	74.0	-30.1	3.24 H	124	34.2	9.7
10	7311.00	33.2 AV	54.0	-20.8	3.24 H	124	23.5	9.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.3 PK	74.0	-16.7	1.36 V	336	58.5	-1.2
2	2390.00	45.2 AV	54.0	-8.8	1.36 V	336	46.4	-1.2
3	*2437.00	102.0 PK			1.36 V	336	103.2	-1.2
4	*2437.00	92.3 AV			1.36 V	336	93.5	-1.2
5	2483.50	56.4 PK	74.0	-17.6	1.36 V	336	57.6	-1.2
6	2483.50	44.3 AV	54.0	-9.7	1.36 V	336	45.5	-1.2
7	4874.00	42.3 PK	74.0	-31.7	1.33 V	150	38.5	3.8
8	4874.00	32.0 AV	54.0	-22.0	1.33 V	150	28.2	3.8
9	7311.00	44.1 PK	74.0	-29.9	1.65 V	61	34.4	9.7
10	7311.00	32.3 AV	54.0	-21.7	1.65 V	61	22.6	9.7

Remarks:

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

RF Mode	TX 802.11g	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	107.3 PK			3.52 H	130	108.5	-1.2
2	*2462.00	96.9 AV			3.52 H	130	98.1	-1.2
3	2483.50	64.8 PK	74.0	-9.2	3.52 H	130	66.0	-1.2
4	2483.50	49.4 AV	54.0	-4.6	3.52 H	130	50.6	-1.2
5	4924.00	42.7 PK	74.0	-31.3	1.12 H	153	38.8	3.9
6	4924.00	32.2 AV	54.0	-21.8	1.12 H	153	28.3	3.9
7	7386.00	43.2 PK	74.0	-30.8	3.28 H	136	33.5	9.7
8	7386.00	32.7 AV	54.0	-21.3	3.28 H	136	23.0	9.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	100.1 PK			1.52 V	326	101.3	-1.2
2	*2462.00	90.7 AV			1.52 V	326	91.9	-1.2
3	2483.50	59.1 PK	74.0	-14.9	1.52 V	326	60.3	-1.2
4	2483.50	45.9 AV	54.0	-8.1	1.52 V	326	47.1	-1.2
5	4924.00	42.2 PK	74.0	-31.8	1.32 V	160	38.3	3.9
6	4924.00	31.8 AV	54.0	-22.2	1.32 V	160	27.9	3.9
7	7386.00	44.4 PK	74.0	-29.6	1.67 V	55	34.7	9.7
8	7386.00	32.5 AV	54.0	-21.5	1.67 V	55	22.8	9.7

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	67.4 PK	74.0	-6.6	3.26 H	132	68.6	-1.2
2	2390.00	53.4 AV	54.0	-0.6	3.26 H	132	54.6	-1.2
3	*2412.00	106.2 PK			3.26 H	132	107.4	-1.2
4	*2412.00	96.7 AV			3.26 H	132	97.9	-1.2
5	4824.00	43.7 PK	74.0	-30.3	1.01 H	179	40.0	3.7
6	4824.00	32.7 AV	54.0	-21.3	1.01 H	179	29.0	3.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	63.7 PK	74.0	-10.3	1.35 V	319	64.9	-1.2
2	2390.00	49.6 AV	54.0	-4.4	1.35 V	319	50.8	-1.2
3	*2412.00	100.7 PK			1.35 V	319	101.9	-1.2
4	*2412.00	91.3 AV			1.35 V	319	92.5	-1.2
5	4824.00	41.7 PK	74.0	-32.3	1.33 V	165	38.0	3.7
6	4824.00	31.4 AV	54.0	-22.6	1.33 V	165	27.7	3.7

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.1 PK	74.0	-16.9	3.56 H	134	58.3	-1.2
2	2390.00	46.0 AV	54.0	-8.0	3.56 H	134	47.2	-1.2
3	*2437.00	107.1 PK			3.56 H	134	108.3	-1.2
4	*2437.00	97.5 AV			3.56 H	134	98.7	-1.2
5	2483.50	57.3 PK	74.0	-16.7	3.56 H	134	58.5	-1.2
6	2483.50	45.4 AV	54.0	-8.6	3.56 H	134	46.6	-1.2
7	4874.00	43.4 PK	74.0	-30.6	1.07 H	151	39.6	3.8
8	4874.00	32.8 AV	54.0	-21.2	1.07 H	151	29.0	3.8
9	7311.00	42.8 PK	74.0	-31.2	3.18 H	124	33.1	9.7
10	7311.00	32.4 AV	54.0	-21.6	3.18 H	124	22.7	9.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.3 PK	74.0	-16.7	1.30 V	332	58.5	-1.2
2	2390.00	45.1 AV	54.0	-8.9	1.30 V	332	46.3	-1.2
3	*2437.00	101.9 PK			1.30 V	332	103.1	-1.2
4	*2437.00	92.3 AV			1.30 V	332	93.5	-1.2
5	2483.50	56.9 PK	74.0	-17.1	1.30 V	332	58.1	-1.2
6	2483.50	44.6 AV	54.0	-9.4	1.30 V	332	45.8	-1.2
7	4874.00	42.7 PK	74.0	-31.3	1.27 V	144	38.9	3.8
8	4874.00	32.2 AV	54.0	-21.8	1.27 V	144	28.4	3.8
9	7311.00	44.1 PK	74.0	-29.9	1.66 V	69	34.4	9.7
10	7311.00	32.3 AV	54.0	-21.7	1.66 V	69	22.6	9.7

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	106.3 PK			3.49 H	137	107.5	-1.2
2	*2462.00	96.7 AV			3.49 H	137	97.9	-1.2
3	2483.50	65.4 PK	74.0	-8.6	3.49 H	137	66.6	-1.2
4	2483.50	51.0 AV	54.0	-3.0	3.49 H	137	52.2	-1.2
5	4924.00	43.3 PK	74.0	-30.7	1.07 H	154	39.4	3.9
6	4924.00	32.9 AV	54.0	-21.1	1.07 H	154	29.0	3.9
7	7386.00	43.9 PK	74.0	-30.1	3.26 H	126	34.2	9.7
8	7386.00	33.1 AV	54.0	-20.9	3.26 H	126	23.4	9.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	100.2 PK			1.09 V	336	101.4	-1.2
2	*2462.00	90.4 AV			1.09 V	336	91.6	-1.2
3	2483.50	59.6 PK	74.0	-14.4	1.09 V	336	60.8	-1.2
4	2483.50	48.6 AV	54.0	-5.4	1.09 V	336	49.8	-1.2
5	4924.00	41.7 PK	74.0	-32.3	1.35 V	143	37.8	3.9
6	4924.00	31.4 AV	54.0	-22.6	1.35 V	143	27.5	3.9
7	7386.00	44.2 PK	74.0	-29.8	1.65 V	56	34.5	9.7
8	7386.00	32.4 AV	54.0	-21.6	1.65 V	56	22.7	9.7

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 3 : 2422 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	64.9 PK	74.0	-9.1	3.27 H	131	66.1	-1.2
2	2390.00	53.3 AV	54.0	-0.7	3.27 H	131	54.5	-1.2
3	*2422.00	100.4 PK			3.27 H	131	101.6	-1.2
4	*2422.00	90.9 AV			3.27 H	131	92.1	-1.2
5	4844.00	43.0 PK	74.0	-31.0	1.10 H	149	39.2	3.8
6	4844.00	32.3 AV	54.0	-21.7	1.10 H	149	28.5	3.8
7	7266.00	43.6 PK	74.0	-30.4	3.26 H	112	34.1	9.5
8	7266.00	32.9 AV	54.0	-21.1	3.26 H	112	23.4	9.5

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	59.9 PK	74.0	-14.1	1.09 V	332	61.1	-1.2
2	2390.00	49.3 AV	54.0	-4.7	1.09 V	332	50.5	-1.2
3	*2422.00	94.6 PK			1.09 V	332	95.8	-1.2
4	*2422.00	85.4 AV			1.09 V	332	86.6	-1.2
5	4844.00	42.4 PK	74.0	-31.6	1.38 V	164	38.6	3.8
6	4844.00	31.6 AV	54.0	-22.4	1.38 V	164	27.8	3.8
7	7266.00	44.1 PK	74.0	-29.9	1.65 V	60	34.6	9.5
8	7266.00	32.4 AV	54.0	-21.6	1.65 V	60	22.9	9.5

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.

RF Mode	TX 802.11ax (HE40)	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	64.9 PK	74.0	-9.1	3.58 H	136	66.1	-1.2
2	2390.00	52.1 AV	54.0	-1.9	3.58 H	136	53.3	-1.2
3	*2437.00	104.6 PK			3.58 H	136	105.8	-1.2
4	*2437.00	94.8 AV			3.58 H	136	96.0	-1.2
5	2483.50	62.7 PK	74.0	-11.3	3.58 H	136	63.9	-1.2
6	2483.50	49.5 AV	54.0	-4.5	3.58 H	136	50.7	-1.2
7	4874.00	43.1 PK	74.0	-30.9	1.10 H	142	39.3	3.8
8	4874.00	32.7 AV	54.0	-21.3	1.10 H	142	28.9	3.8
9	7311.00	44.1 PK	74.0	-29.9	3.23 H	98	34.4	9.7
10	7311.00	33.3 AV	54.0	-20.7	3.23 H	98	23.6	9.7

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	62.6 PK	74.0	-11.4	1.33 V	333	63.8	-1.2
2	2390.00	49.8 AV	54.0	-4.2	1.33 V	333	51.0	-1.2
3	*2437.00	98.7 PK			1.33 V	333	99.9	-1.2
4	*2437.00	89.3 AV			1.33 V	333	90.5	-1.2
5	2483.50	58.6 PK	74.0	-15.4	1.33 V	333	59.8	-1.2
6	2483.50	47.3 AV	54.0	-6.7	1.33 V	333	48.5	-1.2
7	4874.00	42.7 PK	74.0	-31.3	1.39 V	142	38.9	3.8
8	4874.00	32.2 AV	54.0	-21.8	1.39 V	142	28.4	3.8
9	7311.00	44.6 PK	74.0	-29.4	1.73 V	82	34.9	9.7
10	7311.00	32.9 AV	54.0	-21.1	1.73 V	82	23.2	9.7

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 9 : 2452 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	101.3 PK			3.56 H	135	102.5	-1.2
2	*2452.00	91.7 AV			3.56 H	135	92.9	-1.2
3	2483.50	65.3 PK	74.0	-8.7	3.56 H	135	66.5	-1.2
4	2483.50	53.2 AV	54.0	-0.8	3.56 H	135	54.4	-1.2
5	4904.00	43.2 PK	74.0	-30.8	1.12 H	156	39.3	3.9
6	4904.00	32.6 AV	54.0	-21.4	1.12 H	156	28.7	3.9
7	7356.00	43.3 PK	74.0	-30.7	3.26 H	110	33.4	9.9
8	7356.00	32.5 AV	54.0	-21.5	3.26 H	110	22.6	9.9

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	95.6 PK			1.10 V	333	96.8	-1.2
2	*2452.00	86.1 AV			1.10 V	333	87.3	-1.2
3	2483.50	61.2 PK	74.0	-12.8	1.10 V	333	62.4	-1.2
4	2483.50	49.2 AV	54.0	-4.8	1.10 V	333	50.4	-1.2
5	4904.00	41.9 PK	74.0	-32.1	1.38 V	161	38.0	3.9
6	4904.00	31.6 AV	54.0	-22.4	1.38 V	161	27.7	3.9
7	7356.00	44.3 PK	74.0	-29.7	1.69 V	58	34.4	9.9
8	7356.00	32.7 AV	54.0	-21.3	1.69 V	58	22.8	9.9

Remarks:

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

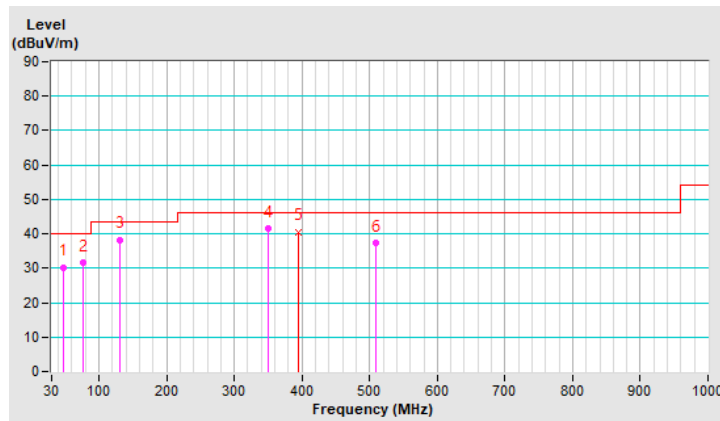
Below 1GHz Data:

RF Mode	TX 802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	46.59	30.3 QP	40.0	-9.7	2.50 H	317	38.5	-8.2
2	76.82	31.8 QP	40.0	-8.2	2.00 H	264	44.0	-12.2
3	131.45	38.3 QP	43.5	-5.2	1.50 H	241	47.0	-8.7
4	350.16	41.6 QP	46.0	-4.4	1.00 H	175	46.8	-5.2
5	395.18	40.6 QP	46.0	-5.4	1.00 H	306	44.6	-4.0
6	509.07	37.3 QP	46.0	-8.7	1.50 H	342	38.0	-0.7

Remarks:

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

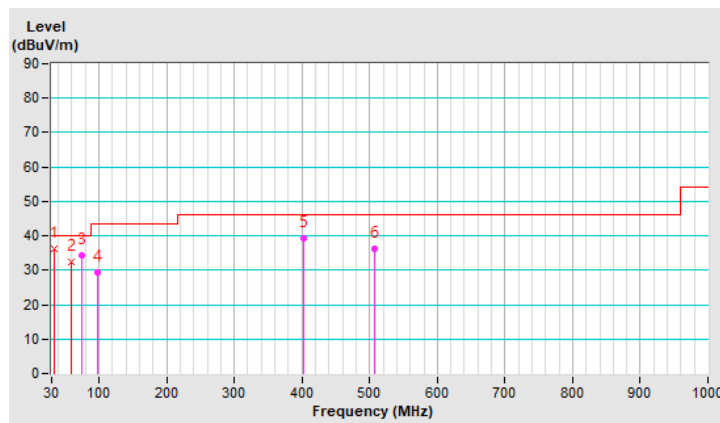


RF Mode	TX 802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	33.34	36.1 QP	40.0	-3.9	1.00 V	127	45.4	-9.3
2	59.20	32.5 QP	40.0	-7.5	1.00 V	326	41.1	-8.6
3	75.44	34.3 QP	40.0	-5.7	1.00 V	154	46.1	-11.8
4	98.16	29.5 QP	43.5	-14.0	1.00 V	155	42.2	-12.7
5	401.53	39.3 QP	46.0	-6.7	1.00 V	279	43.0	-3.7
6	506.73	36.1 QP	46.0	-9.9	1.00 V	276	36.9	-0.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit 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	2020/10/20	2021/10/19
LISN R&S	ESH3-Z5	848773/004	2020/10/27	2021/10/26
LISN R & S	ESH3-Z5	835239/001	2021/3/26	2022/3/25
50 ohms Terminator	50	3	2020/10/26	2021/10/25
RF Coaxial Cable JYEBO	5D-FB	COCCAB-001	2020/9/26	2021/9/25
Fixed attenuator STI	STI02-2200-10	005	2020/8/29	2021/8/28
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: 2021/8/4

4.2.3 Test Procedures

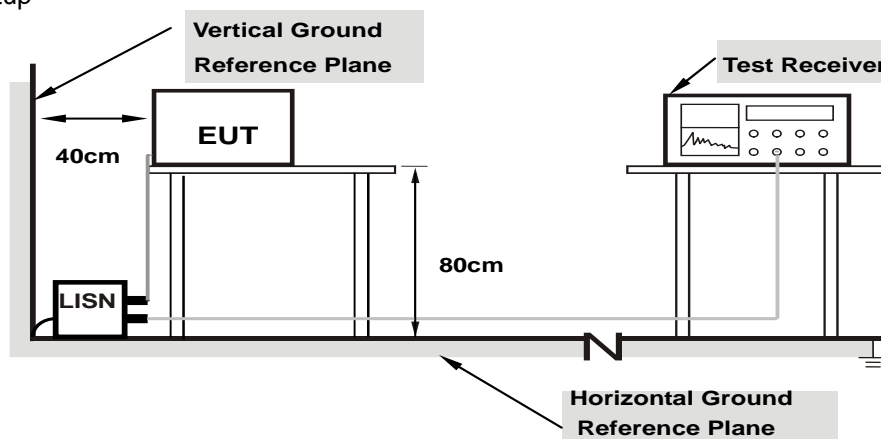
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 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)

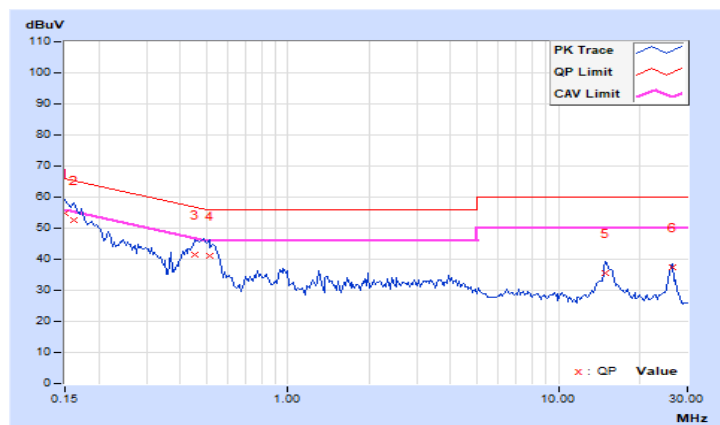
For 4TX

RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.95	44.90	32.82	54.85	42.77	66.00	56.00	-11.15	-13.23
2	0.16172	9.95	42.69	28.22	52.64	38.17	65.38	55.38	-12.74	-17.21
3	0.45469	9.99	31.63	26.45	41.62	36.44	56.79	46.79	-15.17	-10.35
4	0.51328	10.00	30.98	25.75	40.98	35.75	56.00	46.00	-15.02	-10.25
5	14.91406	10.82	24.72	19.22	35.54	30.04	60.00	50.00	-24.46	-19.96
6	26.55078	11.25	26.28	19.40	37.53	30.65	60.00	50.00	-22.47	-19.35

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

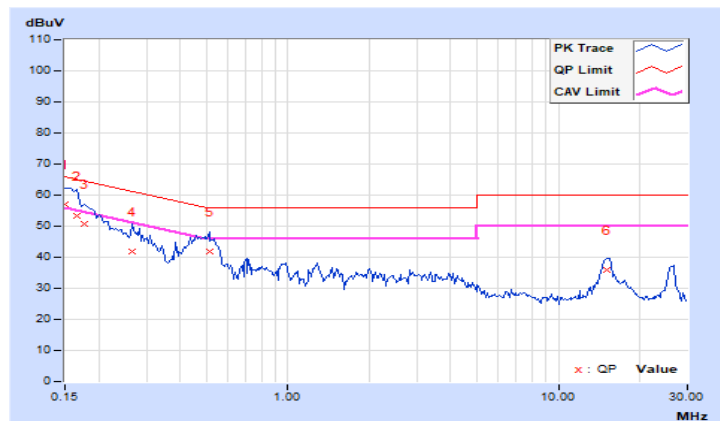


RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.92	46.94	34.66	56.86	44.58	66.00	56.00	-9.14	-11.42
2	0.16562	9.93	43.52	29.20	53.45	39.13	65.18	55.18	-11.73	-16.05
3	0.17734	9.94	40.98	27.93	50.92	37.87	64.61	54.61	-13.69	-16.74
4	0.26719	9.95	31.75	22.66	41.70	32.61	61.20	51.20	-19.50	-18.59
5	0.51328	9.97	32.06	27.12	42.03	37.09	56.00	46.00	-13.97	-8.91
6	15.06250	10.64	25.27	19.89	35.91	30.53	60.00	50.00	-24.09	-19.47

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)

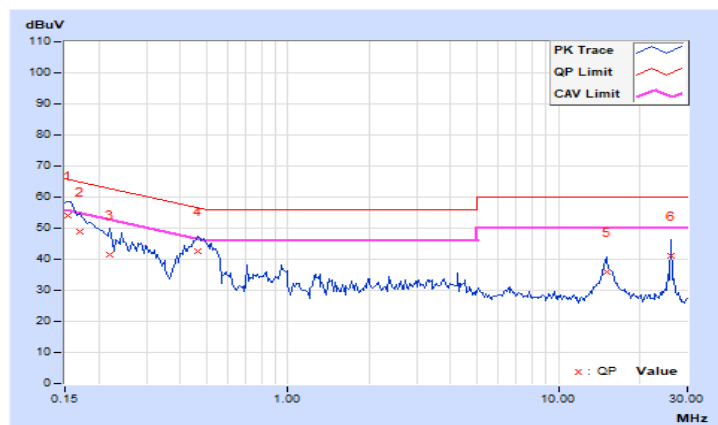
For 1TX (Scanning Radio)

RF Mode	TX 802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.95	44.03	30.02	53.98	39.97	65.79	55.79	-11.81	-15.82
2	0.16953	9.96	39.08	25.07	49.04	35.03	64.98	54.98	-15.94	-19.95
3	0.22031	9.97	31.54	20.53	41.51	30.50	62.81	52.81	-21.30	-22.31
4	0.46641	9.99	32.54	27.57	42.53	37.56	56.58	46.58	-14.05	-9.02
5	15.05469	10.83	24.97	19.53	35.80	30.36	60.00	50.00	-24.20	-19.64
6	25.95703	11.24	29.74	28.27	40.98	39.51	60.00	50.00	-19.02	-10.49

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

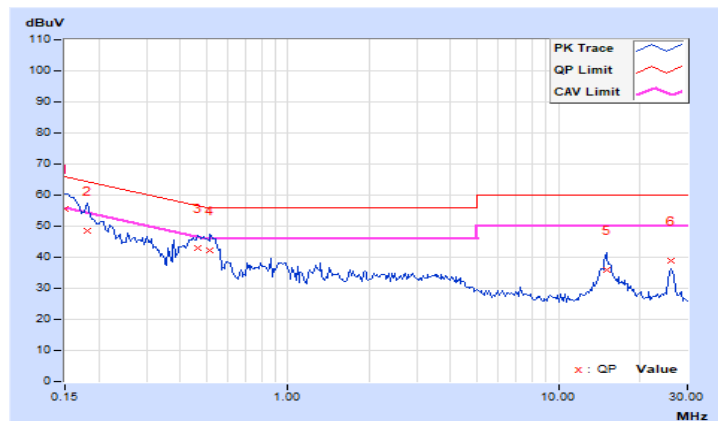


RF Mode	TX 802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.92	45.80	33.46	55.72	43.38	66.00	56.00	-10.28	-12.62
2	0.18125	9.94	38.54	25.99	48.48	35.93	64.43	54.43	-15.95	-18.50
3	0.46250	9.96	33.04	28.13	43.00	38.09	56.65	46.65	-13.65	-8.56
4	0.51719	9.97	32.42	27.22	42.39	37.19	56.00	46.00	-13.61	-8.81
5	15.05859	10.64	25.23	19.87	35.87	30.51	60.00	50.00	-24.13	-19.49
6	26.24609	10.91	28.01	22.42	38.92	33.33	60.00	50.00	-21.08	-16.67

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

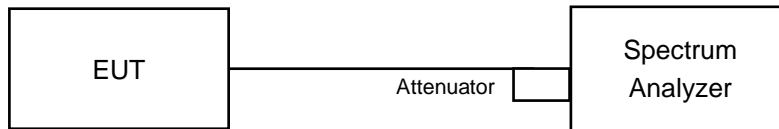


4.3 6dB Bandwidth Measurement

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) $\geq 3 \times$ 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 (Mode 1)

For 4TX

CDD Mode

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	9.1	9.12	9.11	8.62	0.5	PASS
6	2437	11.09	9.62	9.09	10.13	0.5	PASS
11	2462	9.07	9.57	9.08	9.1	0.5	PASS

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	16.41	16.15	16.41	16.4	0.5	PASS
6	2437	16.38	16.44	16.36	16.36	0.5	PASS
11	2462	16.43	15.83	15.98	16.4	0.5	PASS

802.11ax (HE20)

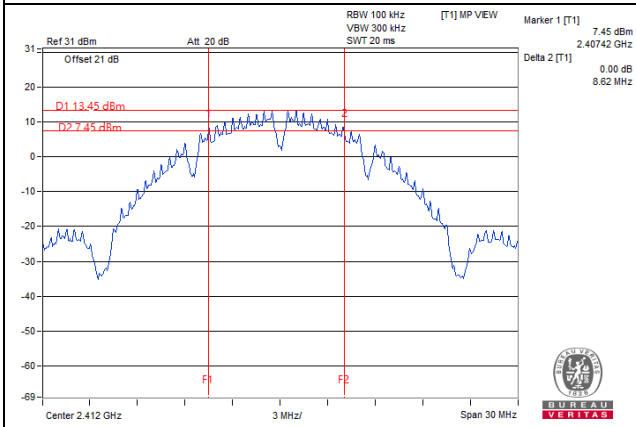
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	19.04	18.82	17.65	18.93	0.5	PASS
6	2437	18.73	18.88	18.12	18.9	0.5	PASS
11	2462	18.8	19.12	19.05	19.06	0.5	PASS

802.11ax (HE40)

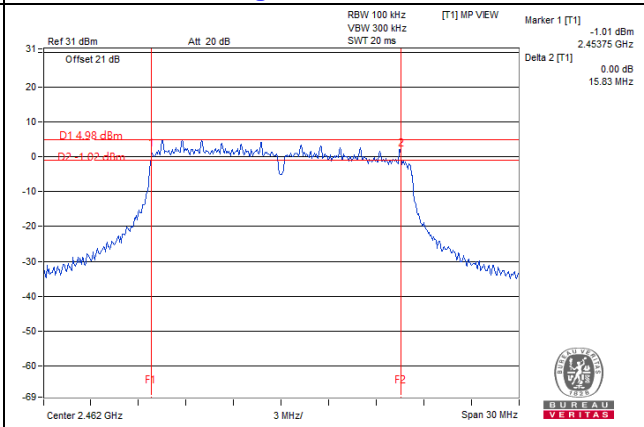
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
3	2422	38.08	38.21	38.23	38.19	0.5	PASS
6	2437	36.87	36.64	36.68	38.03	0.5	PASS
9	2452	37.35	36.05	34.87	37.16	0.5	PASS

Spectrum Plot of Worst Value

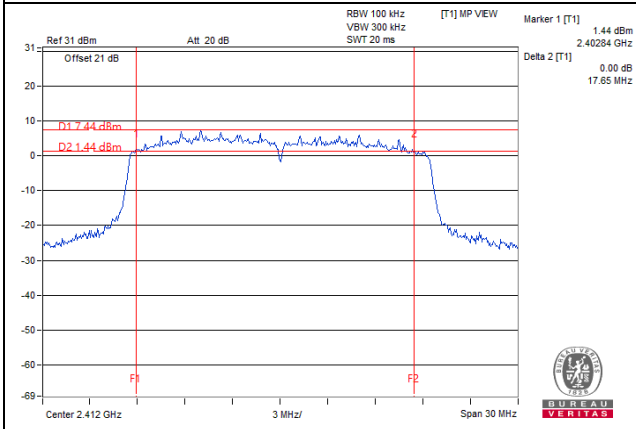
802.11b / Chain 3 : CH1



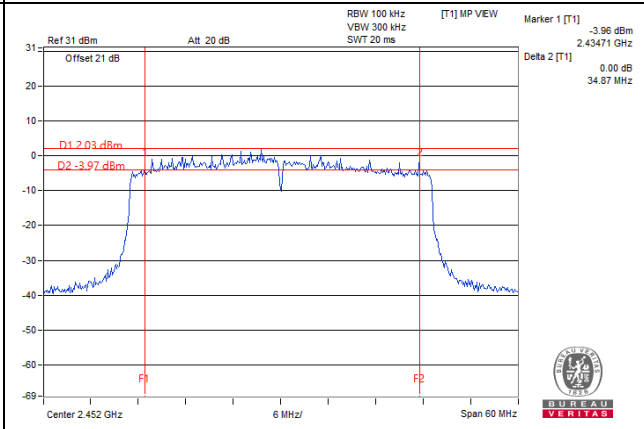
802.11g / Chain 1 : CH1



802.11ax (HE20) / Chain 2 : CH1



802.11ax (HE40) / Chain 2 : CH9



4.3.8 Test Result (Mode 2)
 For 1TX (Scanning Radio)

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	7.11	0.5	Pass
6	2437	7.09	0.5	Pass
11	2462	7.12	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.36	0.5	Pass
6	2437	16.36	0.5	Pass
11	2462	16.34	0.5	Pass

802.11n (HT20)

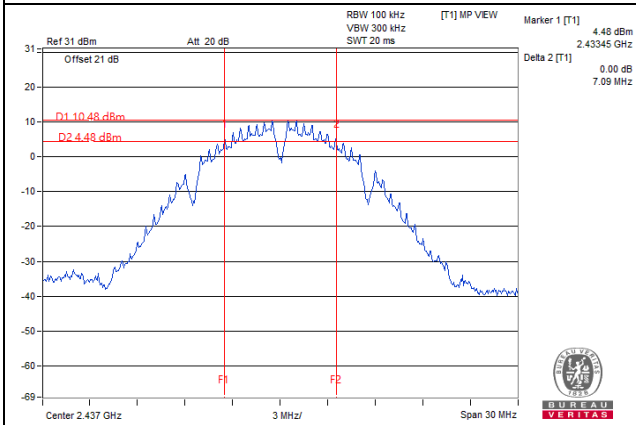
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.53	0.5	Pass
6	2437	17.19	0.5	Pass
11	2462	16.71	0.5	Pass

802.11n (HT40)

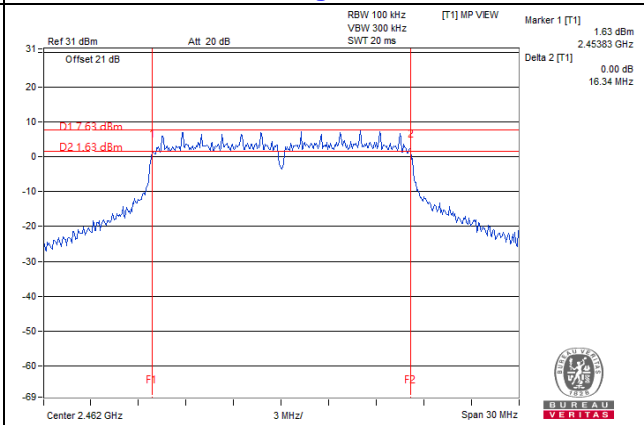
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	35.55	0.5	Pass
6	2437	35.54	0.5	Pass
9	2452	35.84	0.5	Pass

Spectrum Plot of Worst Value

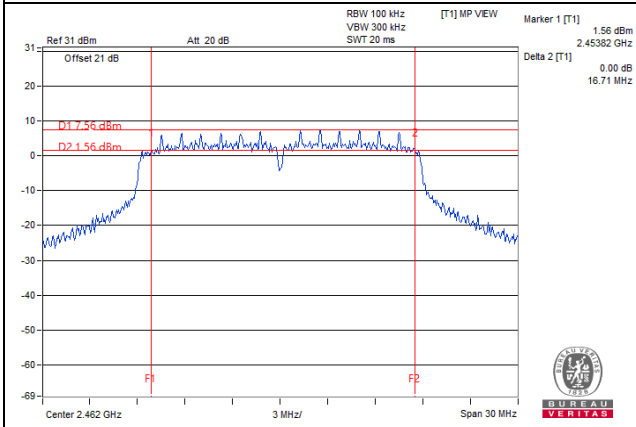
802.11b / CH6



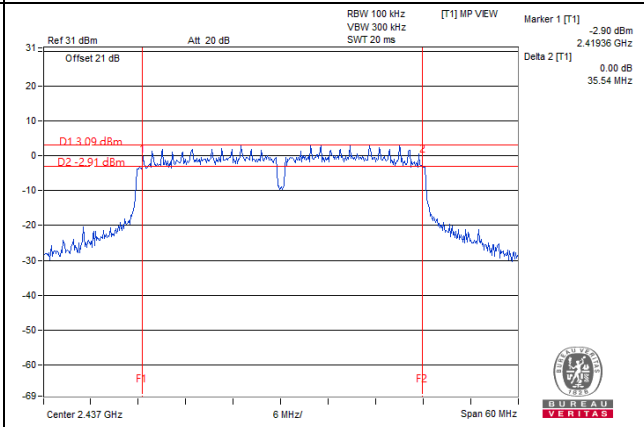
802.11g / CH11



802.11n (HT20) / CH11



802.11n (HT40) / CH6



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,

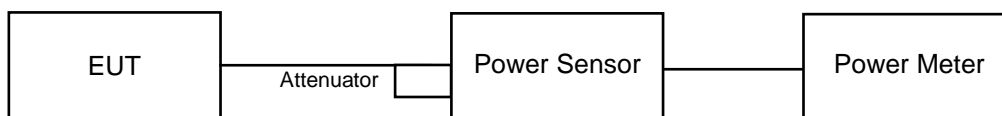
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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 (Mode 1)

For 4TX

CDD Mode

802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	20.11	20.16	20.63	19.55	412.086	26.15	30	Pass
6	2437	22.01	21.48	21.53	21.93	597.648	27.76	30	Pass
11	2462	19.98	20.32	20.42	20.21	422.295	26.26	30	Pass

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	16.80	16.64	17.12	16.99	195.521	22.91	30	Pass
6	2437	20.69	20.35	20.59	20.56	453.926	26.57	30	Pass
11	2462	15.74	15.62	15.52	15.66	146.431	21.66	30	Pass

VHT20

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	16.73	16.65	17.24	16.92	195.506	22.91	30	Pass
6	2437	20.71	20.38	20.61	20.38	451.129	26.54	30	Pass
11	2462	16.04	16.08	16.23	16.32	165.561	22.19	30	Pass

VHT40

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	15.98	15.91	16.18	16.02	160.112	22.04	30	Pass
6	2437	17.25	17.01	17.11	16.89	203.592	23.09	30	Pass
9	2452	15.01	14.84	14.88	14.98	124.413	20.95	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	Chain 2	Chain 3				
1	2412	17.56	17.66	17.87	17.75	236.162	23.73	30	Pass
6	2437	20.77	20.51	20.69	20.45	459.996	26.63	30	Pass
11	2462	16.17	16.23	16.52	16.49	172.816	22.38	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	Chain 2	Chain 3				
3	2422	16.03	15.97	16.25	16.13	162.813	22.12	30	Pass
6	2437	17.31	17.08	17.24	16.97	207.618	23.17	30	Pass
9	2452	14.84	14.91	15.16	15.11	126.697	21.03	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	Chain 2	Chain 3				
1	2412	16.73	16.65	17.24	16.92	195.506	22.91	25.63	Pass
6	2437	19.68	19.34	19.56	19.32	354.67	25.50	25.63	Pass
11	2462	16.04	16.08	16.23	16.32	165.561	22.19	25.63	Pass

Note: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4]$ = 10.37dBi > 6dBi , so the power limit shall be reduced to $30 - (10.37 - 6) = 25.63$.

VHT40

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	15.98	15.91	16.18	16.02	160.112	22.04	25.63	Pass
6	2437	17.25	17.01	17.11	16.89	203.592	23.09	25.63	Pass
9	2452	15.01	14.84	14.88	14.98	124.413	20.95	25.63	Pass

Note: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4]$ = 10.37dBi > 6dBi , so the power limit shall be reduced to $30 - (10.37 - 6) = 25.63$.

802.11ax (HE20)

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	17.56	17.66	17.87	17.75	236.162	23.73	25.63	Pass
6	2437	19.63	19.48	19.62	19.41	359.468	25.56	25.63	Pass
11	2462	16.17	16.23	16.52	16.49	172.816	22.38	25.63	Pass

Note: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4]$ = 10.37dBi > 6dBi , so the power limit shall be reduced to $30 - (10.37 - 6) = 25.63$.

802.11ax (HE40)

Chan.	Frequency (MHz)	Avg. Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	16.03	15.97	16.25	16.13	162.813	22.12	25.63	Pass
6	2437	17.31	17.08	17.24	16.97	207.618	23.17	25.63	Pass
9	2452	14.84	14.91	15.16	15.11	126.697	21.03	25.63	Pass

Note: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4]$ = 10.37dBi > 6dBi , so the power limit shall be reduced to $30 - (10.37 - 6) = 25.63$.

4.4.8 Test Results (Mode 2) For 1TX (Scanning Radio)

802.11b

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	50.234	17.01	30	Pass
6	2437	55.59	17.45	30	Pass
11	2462	59.979	17.78	30	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	44.978	16.53	30	Pass
6	2437	53.088	17.25	30	Pass
11	2462	54.828	17.39	30	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	28.973	14.62	30	Pass
6	2437	44.875	16.52	30	Pass
11	2462	49.774	16.97	30	Pass

802.11n (HT40)

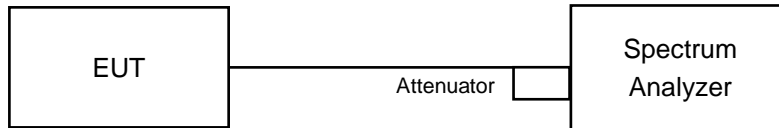
Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	9.863	9.94	30	Pass
6	2437	42.462	16.28	30	Pass
9	2452	25.763	14.11	30	Pass

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results (Mode 1)

For 4TX

CDD Mode

802.11b

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)				Duty Factor (dB)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	-9.49	-10.39	-10.12	-8.53	1.85	-1.70	3.63	PASS
6	2437	-9.95	-9.98	-9.68	-8.63	1.85	-1.65	3.63	PASS
11	2462	-8.10	-9.88	-9.30	-9.13	1.85	-1.19	3.63	PASS

- Note:**
- Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 - Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.37\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(10.37-6) = 3.63\text{dBm}$.
 - Refer to section 3.3 for duty cycle spectrum plot.

802.11g

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)				Duty Factor (dB)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	-15.31	-15.62	-15.13	-15.58	0.24	-9.15	3.63	PASS
6	2437	-11.68	-11.39	-12.34	-12.18	0.24	-5.62	3.63	PASS
11	2462	-16.49	-16.86	-15.82	-16.21	0.24	-10.07	3.63	PASS

- Note:**
- Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 - Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.37\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(10.37-6) = 3.63\text{dBm}$.
 - Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

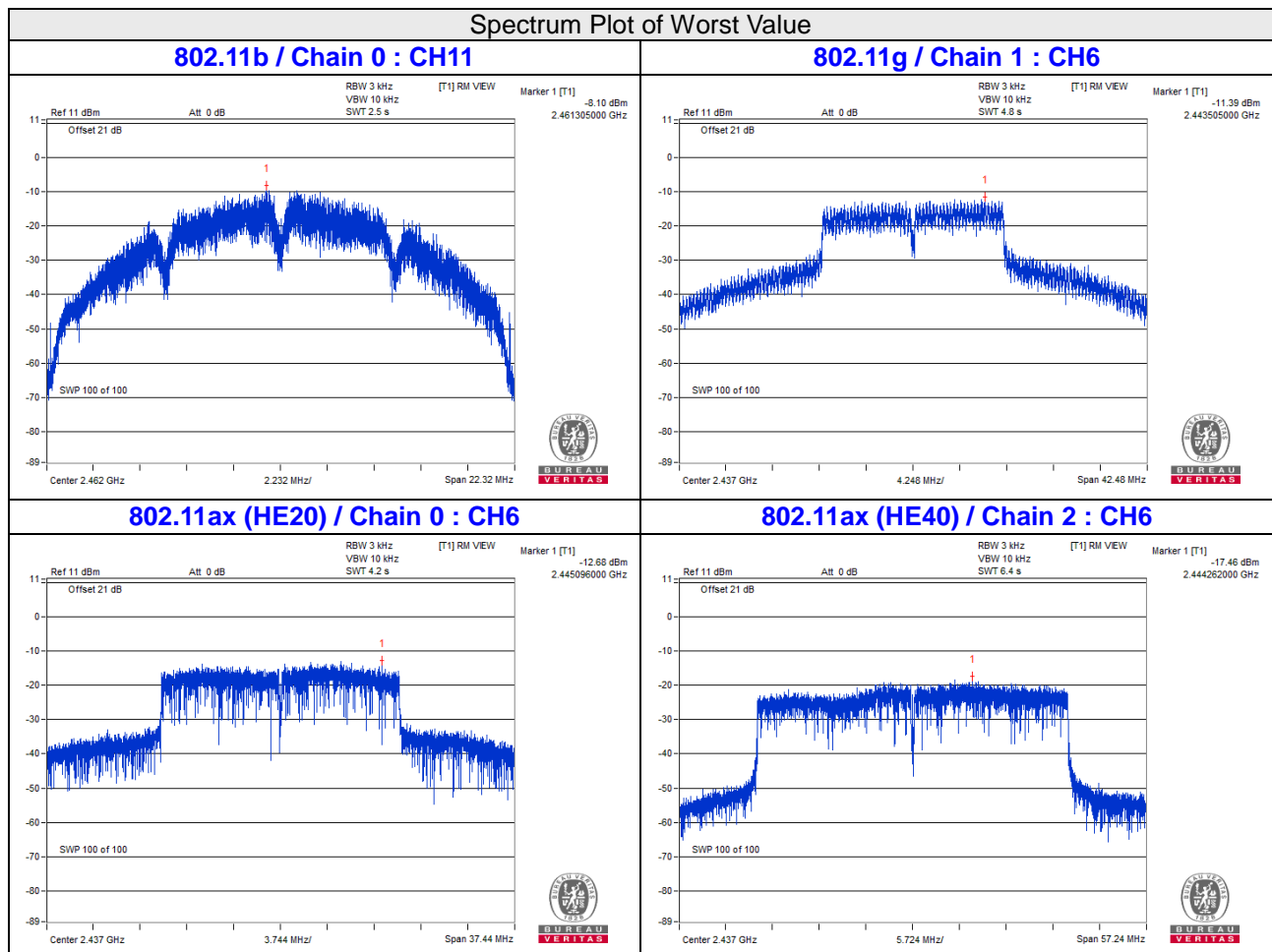
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)				Duty Factor (dB)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	-16.15	-15.72	-15.00	-15.98	0.19	-9.48	3.63	PASS
6	2437	-12.68	-12.73	-13.55	-13.34	0.19	-6.85	3.63	PASS
11	2462	-18.10	-17.74	-17.68	-17.25	0.19	-11.48	3.63	PASS

- Note:**
- Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 - Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.37\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(10.37-6) = 3.63\text{dBm}$.
 - Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)				Duty Factor (dB)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	-20.15	-21.31	-19.06	-20.33	0.25	-13.86	3.63	PASS
6	2437	-18.32	-18.63	-17.46	-19.98	0.25	-12.23	3.63	PASS
9	2452	-20.35	-20.21	-20.32	-21.69	0.25	-14.33	3.63	PASS

- Note:**
- Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 - Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.37 \text{dBi} > 6 \text{dBi}$, so the power density limit shall be reduced to $8 - (10.37 - 6) = 3.63 \text{dBm}$.
 - Refer to section 3.3 for duty cycle spectrum plot.



4.5.8 Test Results (Mode 2) For 1TX (Scanning Radio)

802.11b

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-12.62	8	Pass
6	2437	-11.90	8	Pass
11	2462	-11.41	8	Pass

802.11g

Channel	Freq. (MHz)	Duty Factor (dB)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	0.18	-16.48	8	Pass
6	2437	0.18	-16.41	8	Pass
11	2462	0.18	-14.30	8	Pass

802.11n (HT20)

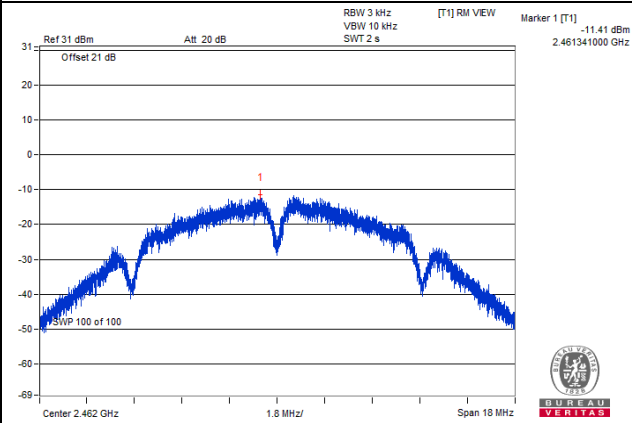
Channel	Freq. (MHz)	Duty Factor (dB)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	0.18	-17.83	8	Pass
6	2437	0.18	-16.66	8	Pass
11	2462	0.18	-15.37	8	Pass

802.11n (HT40)

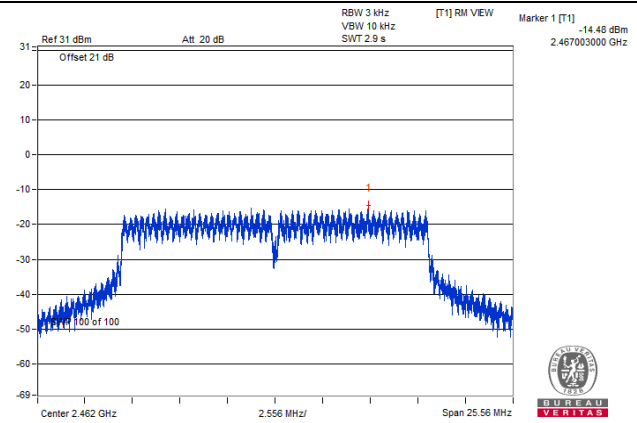
Channel	Freq. (MHz)	Duty Factor (dB)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
3	2422	0.38	-24.48	8	Pass
6	2437	0.38	-17.84	8	Pass
9	2452	0.38	-21.93	8	Pass

Spectrum Plot of Worst Value

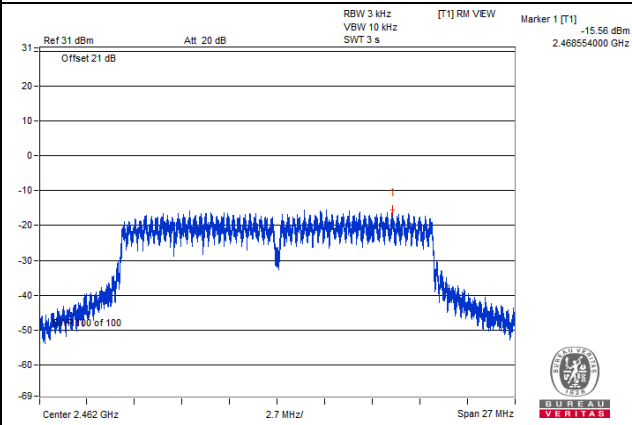
802.11b / CH11



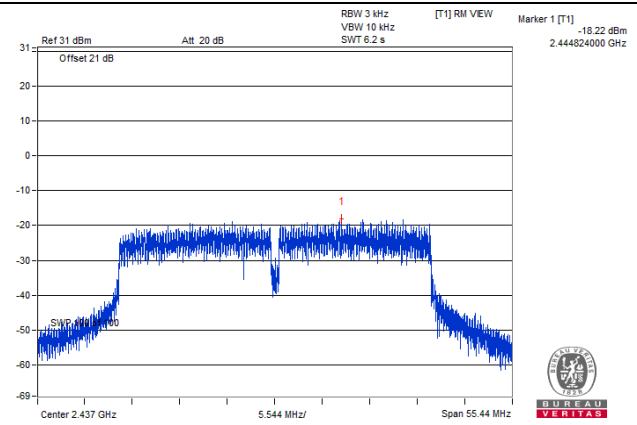
802.11g / CH11



802.11n (HT20) / CH11



802.11n (HT40) / CH6

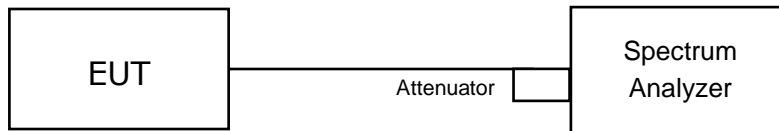


4.6 Conducted Out of Band Emission Measurement

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 \geq 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 OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 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.

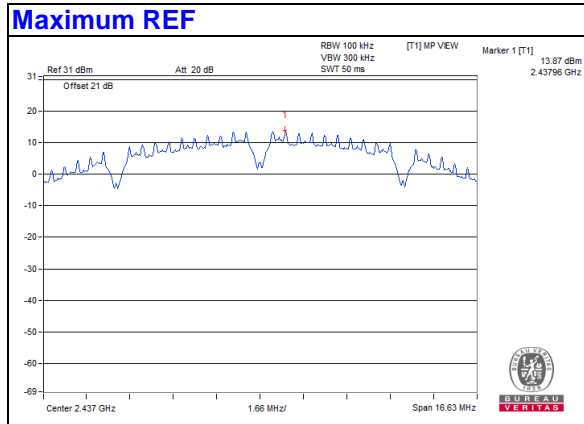
4.6.6 EUT Operating Condition

Same as Item 4.3.6

4.6.7 Test Results

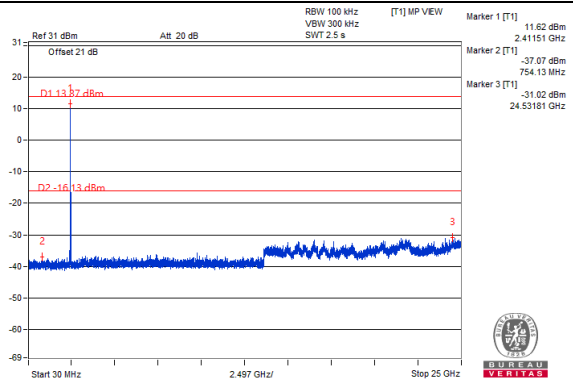
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

For 4TX
802.11b

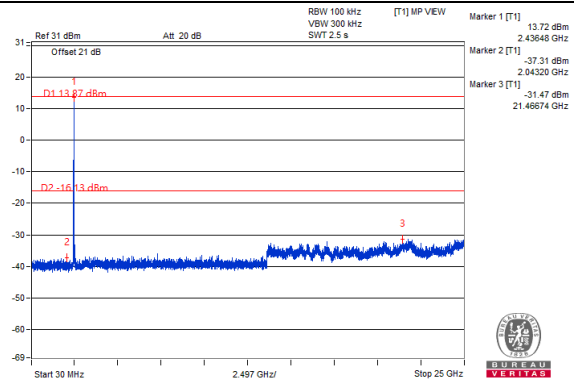


Chain 0

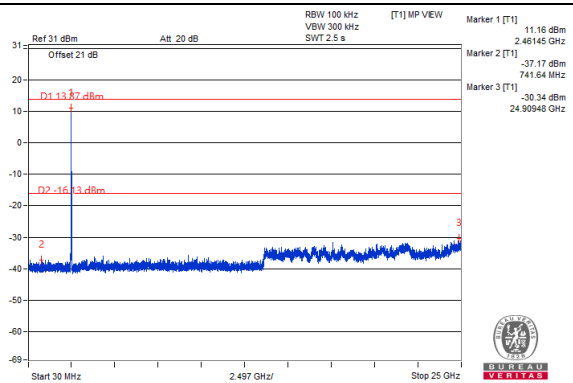
CH 1



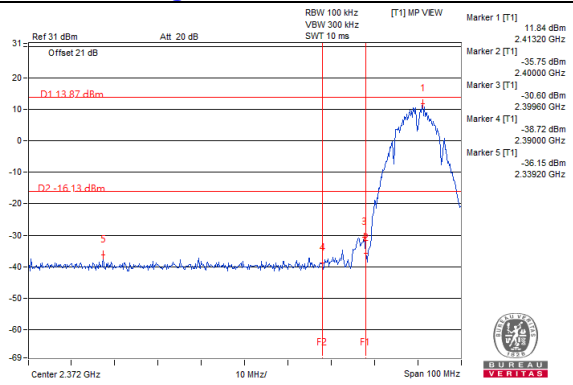
CH 6



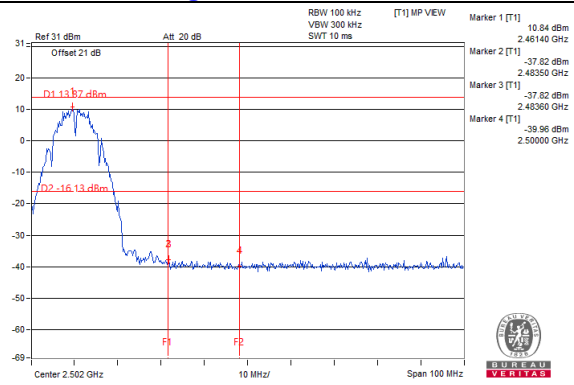
CH 11



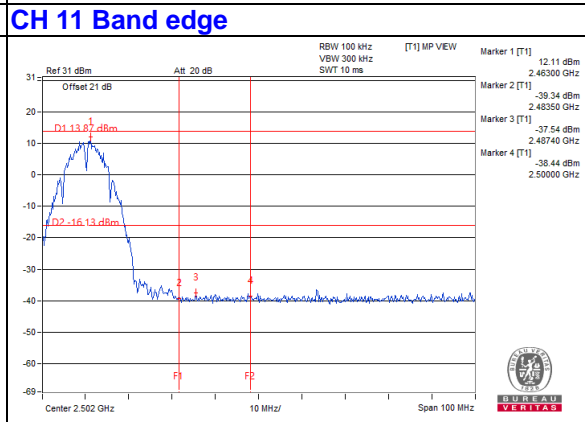
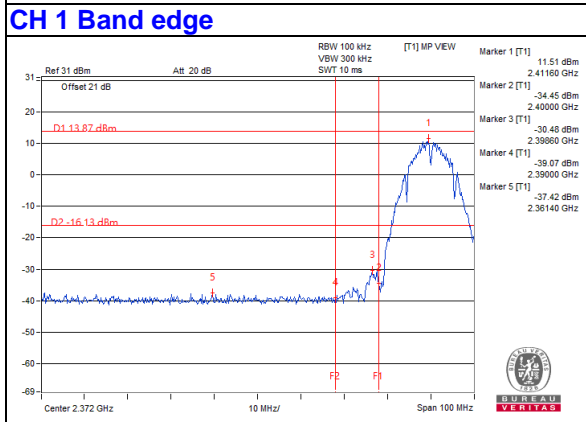
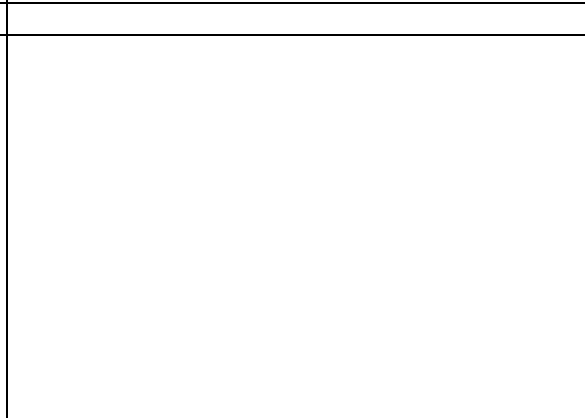
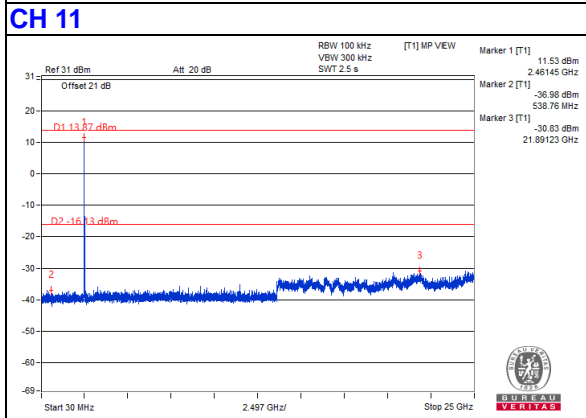
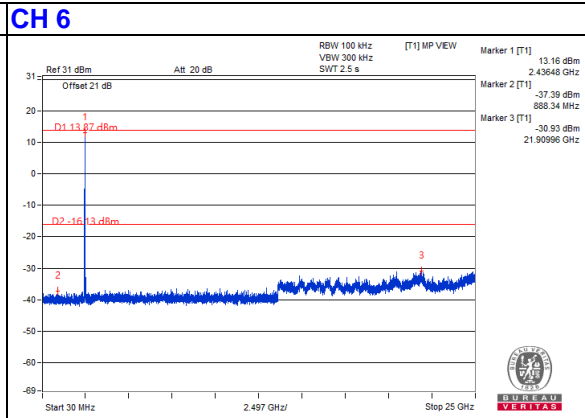
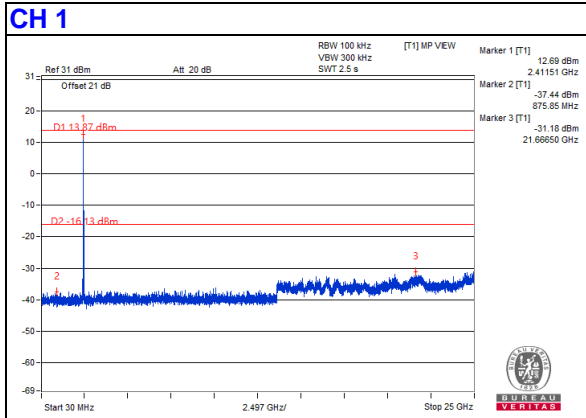
CH 1 Band edge



CH 11 Band edge

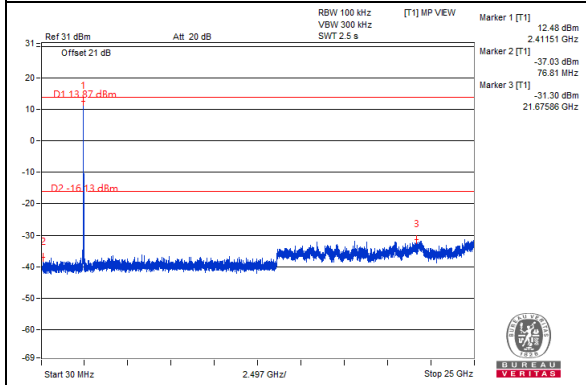


Chain 1

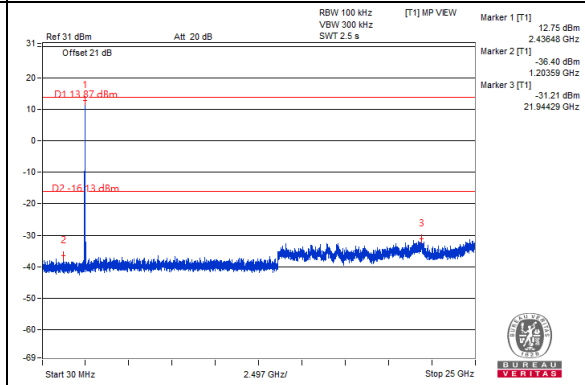


Chain 2

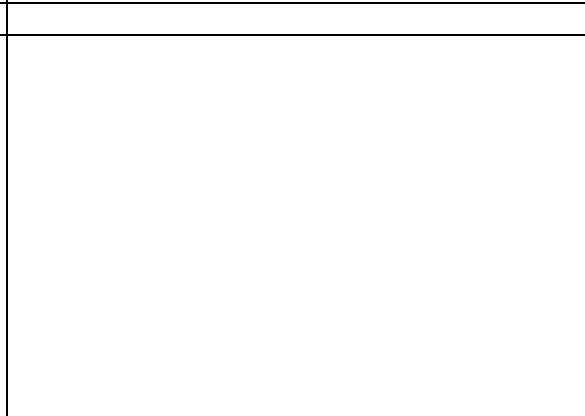
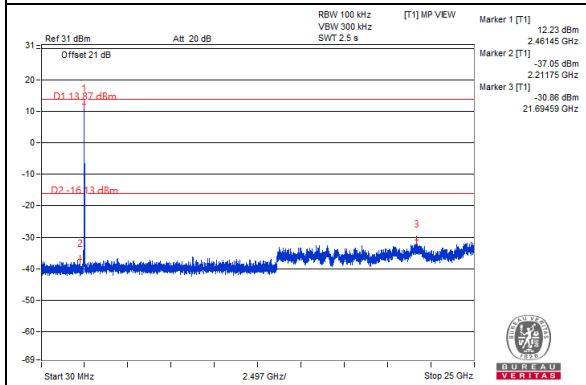
CH 1



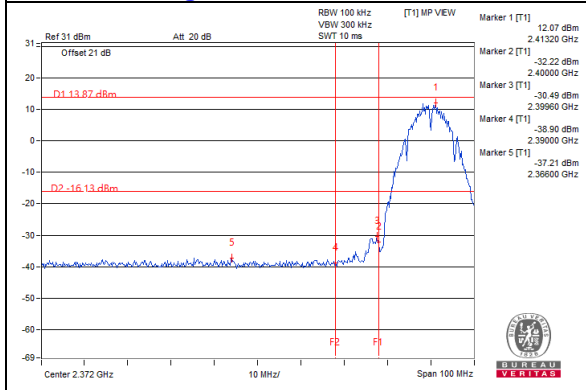
CH 6



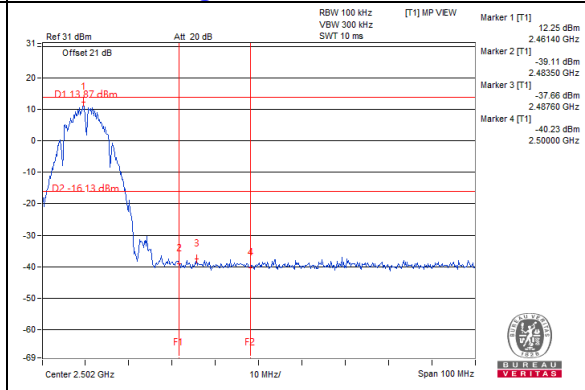
CH 11



CH 1 Band edge

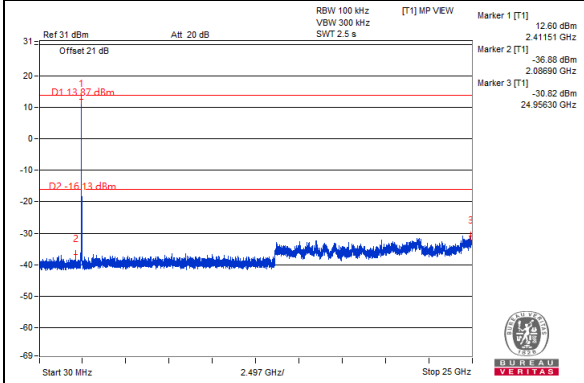


CH 11 Band edge

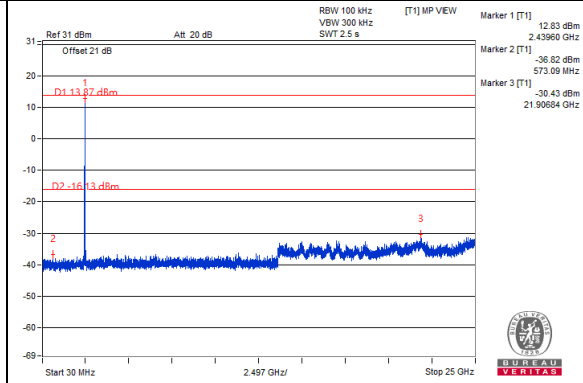


Chain 3

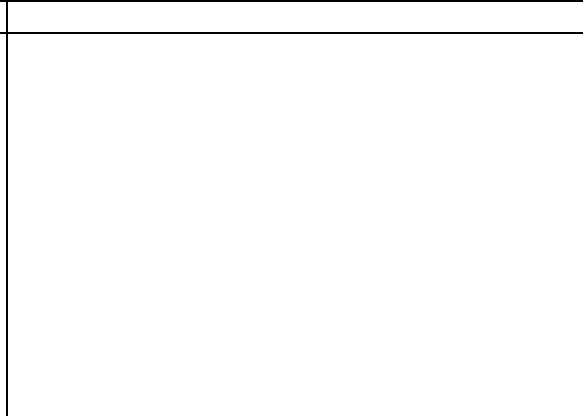
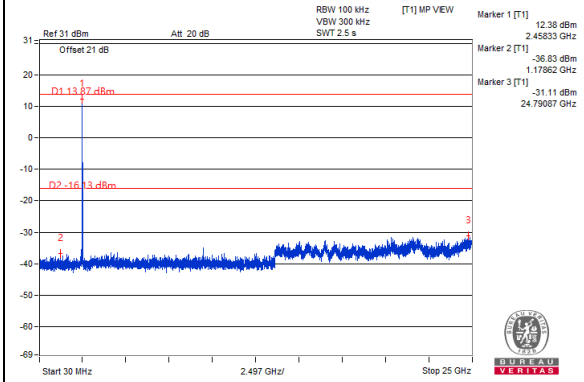
CH 1



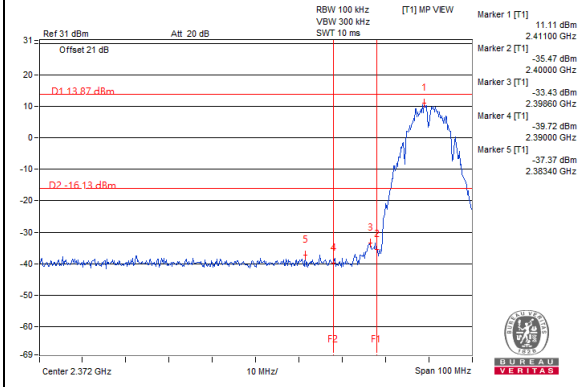
CH 6



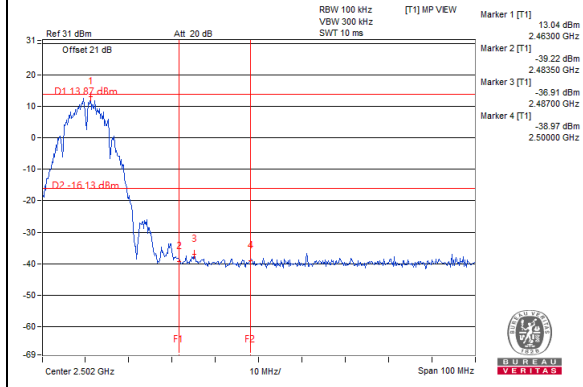
CH 11



CH 1 Band edge

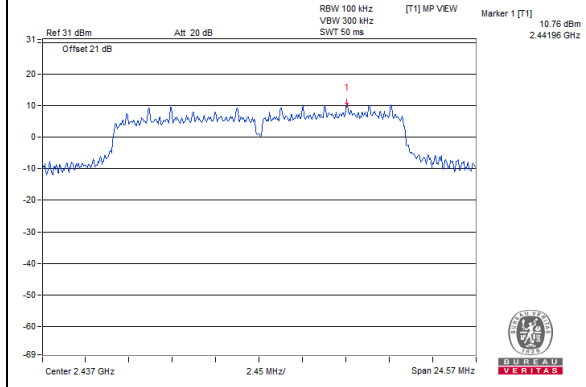


CH 11 Band edge



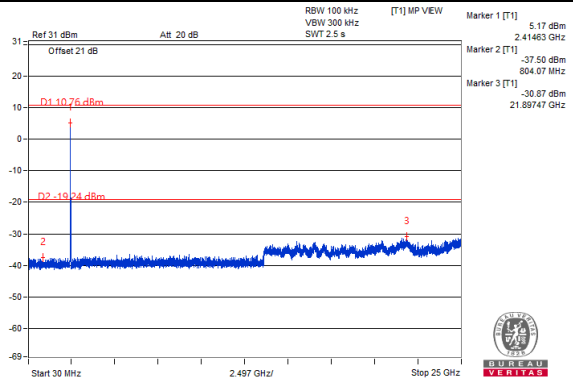
802.11g

Maximum REF

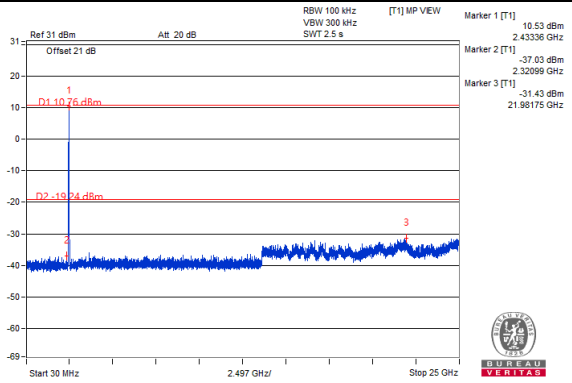


Chain 0

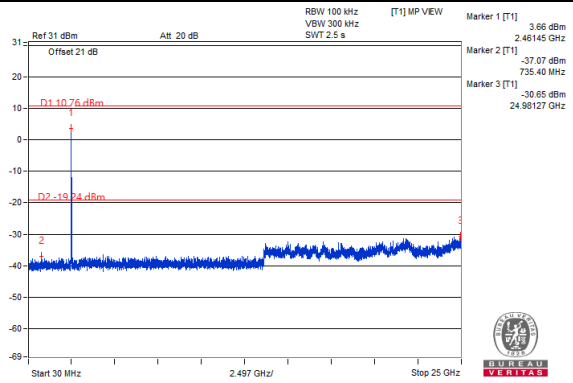
CH 1



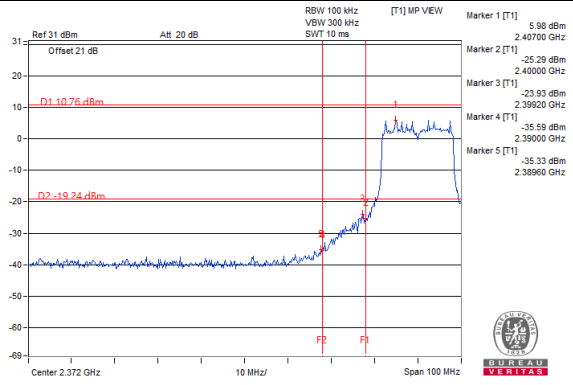
CH 6



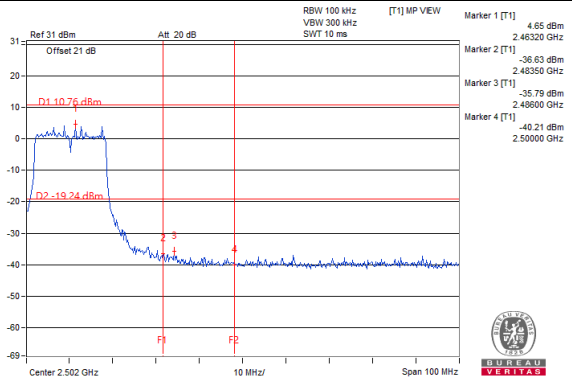
CH 11



CH 1 Band edge

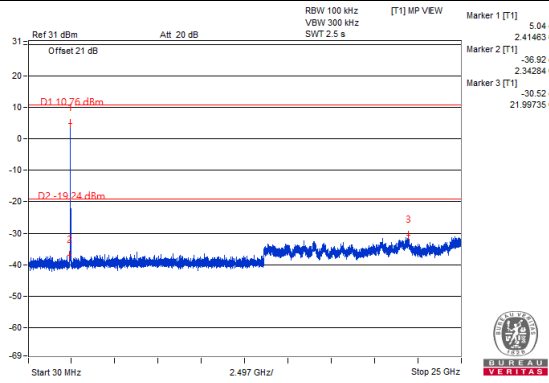


CH 11 Band edge

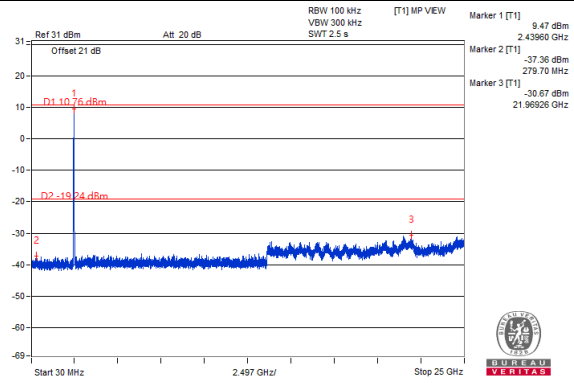


Chain 1

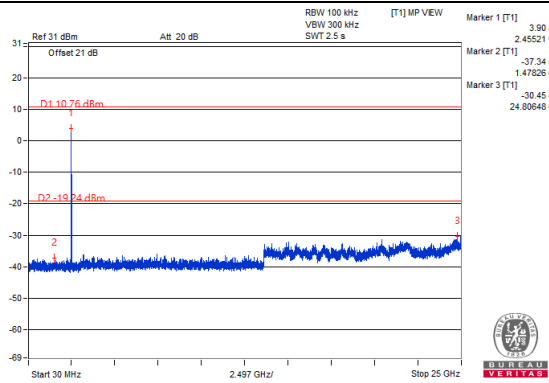
CH 1



CH 6

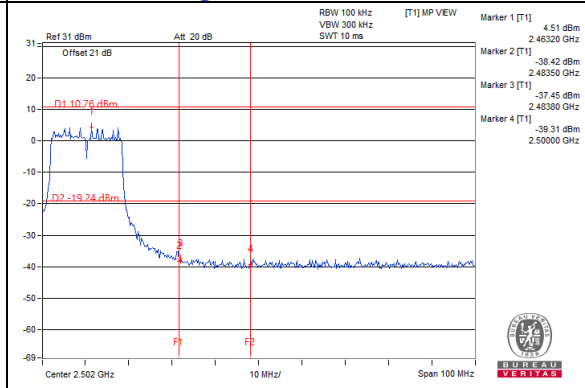
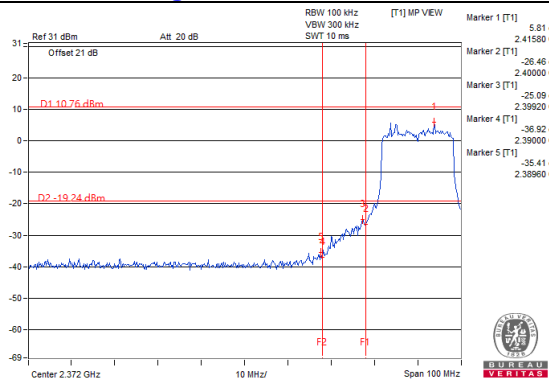


CH 11



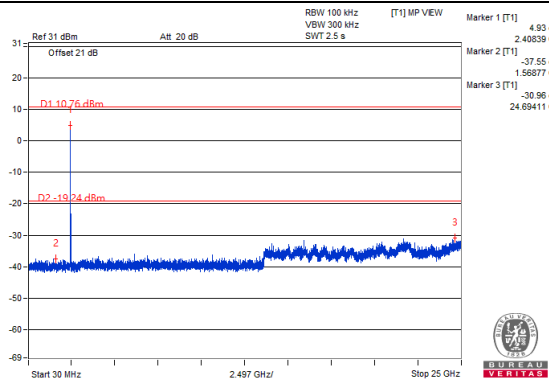
CH 11 Band edge

CH 1 Band edge

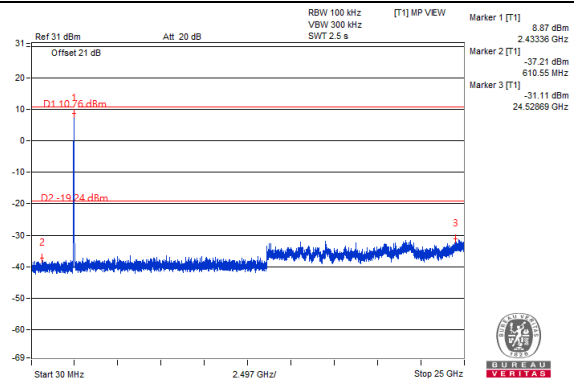


Chain 2

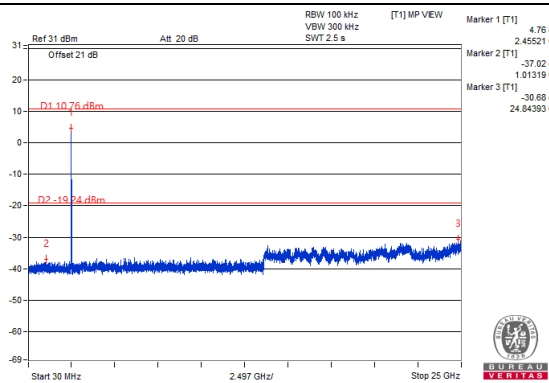
CH 1



CH 6

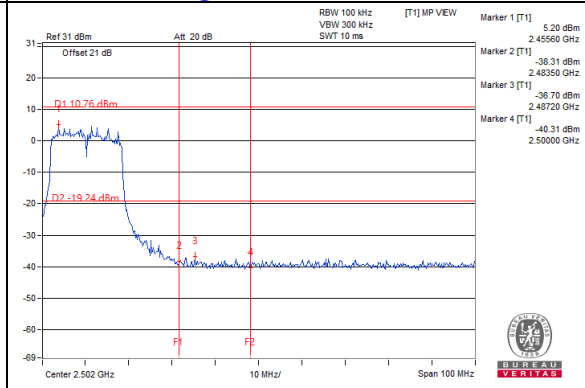
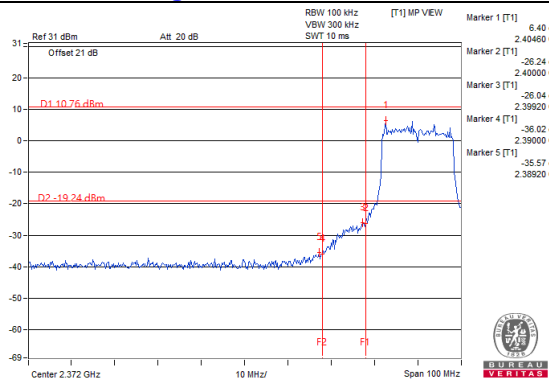


CH 11



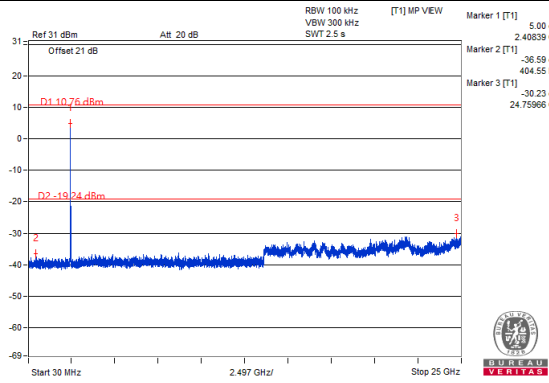
CH 11 Band edge

CH 1 Band edge

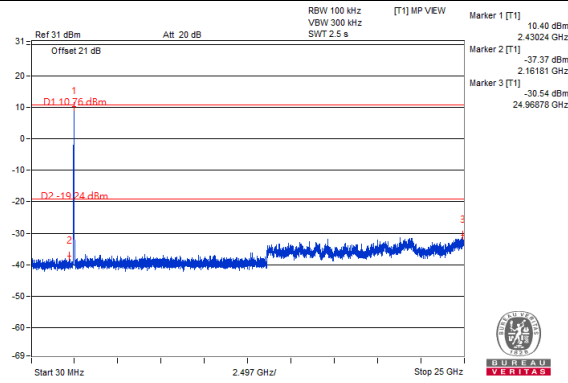


Chain 3

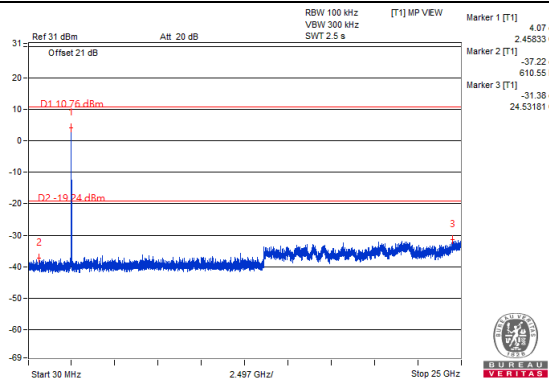
CH 1



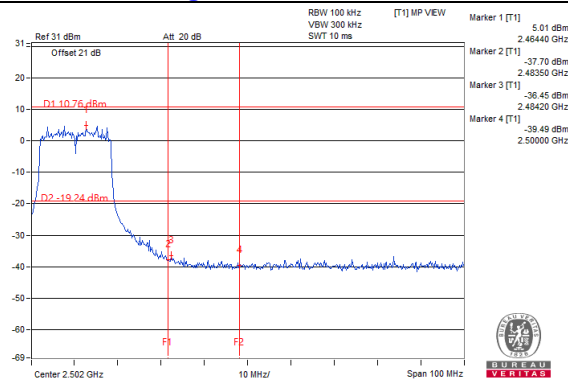
CH 6



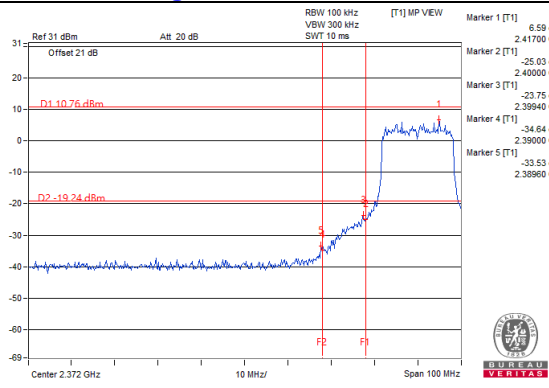
CH 11



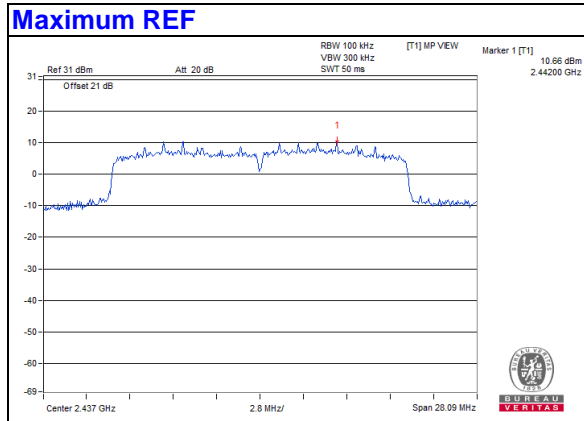
CH 11 Band edge



CH 1 Band edge

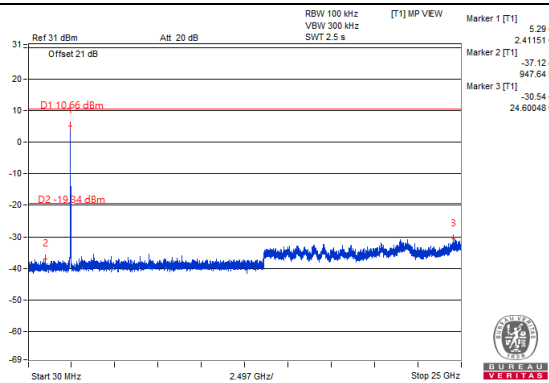


802.11ax (HE20)

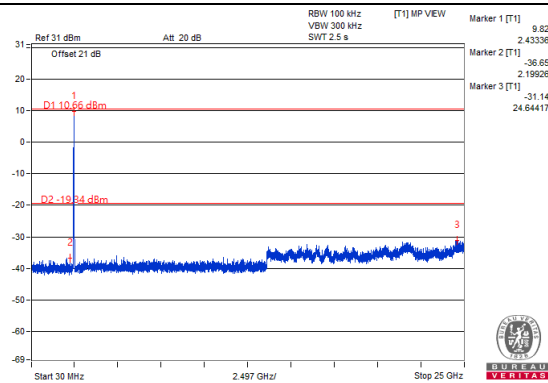


Chain 0

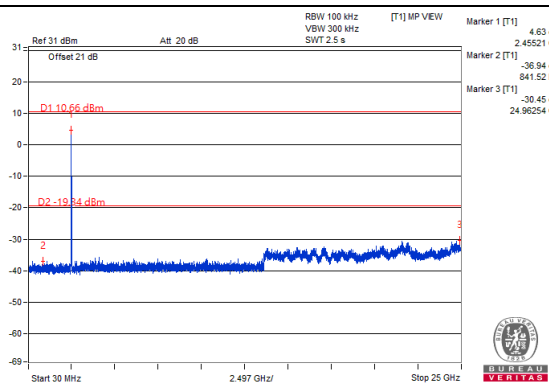
CH 1



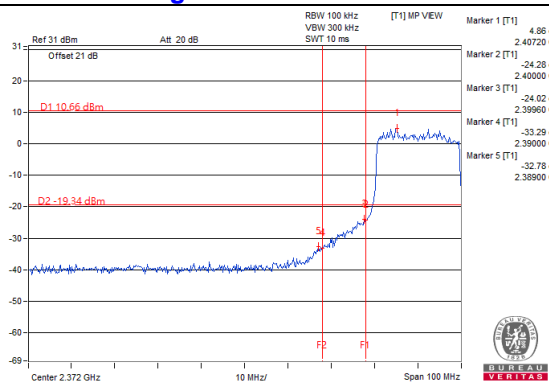
CH 6



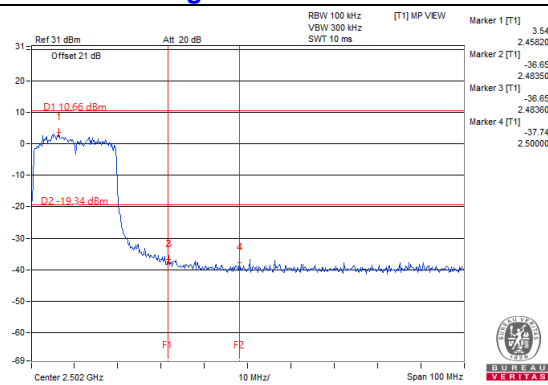
CH 11



CH 1 Band edge

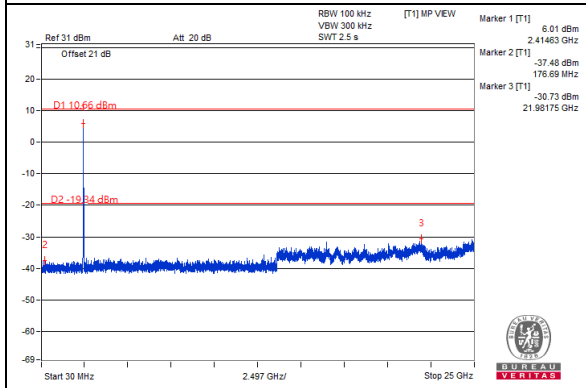


CH 11 Band edge

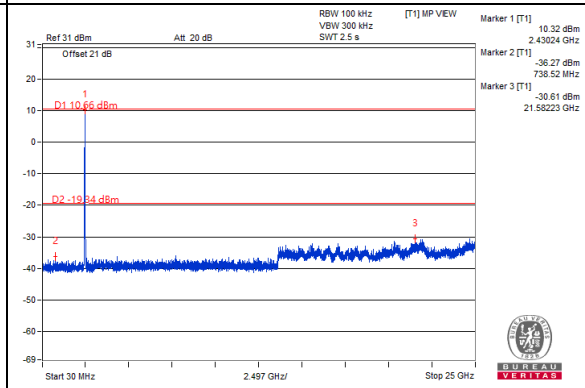


Chain 1

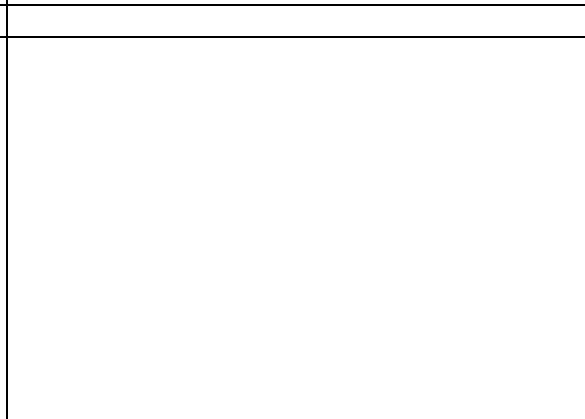
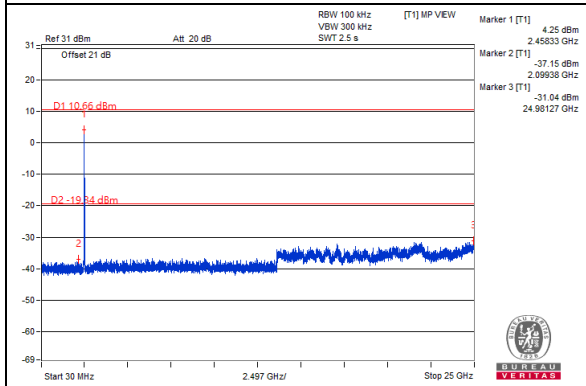
CH 1



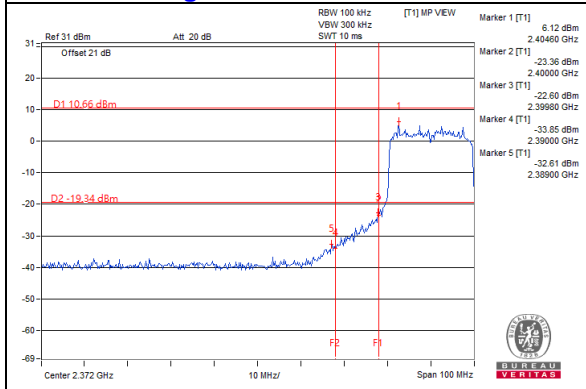
CH 6



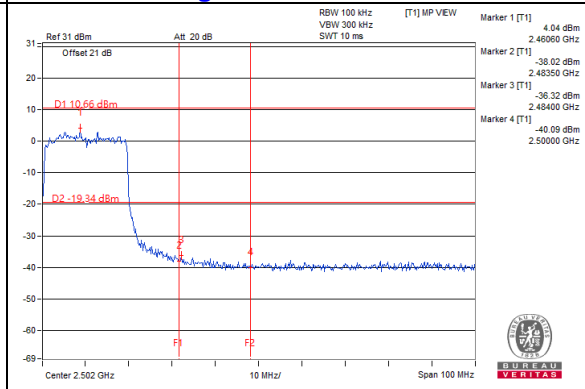
CH 11



CH 1 Band edge

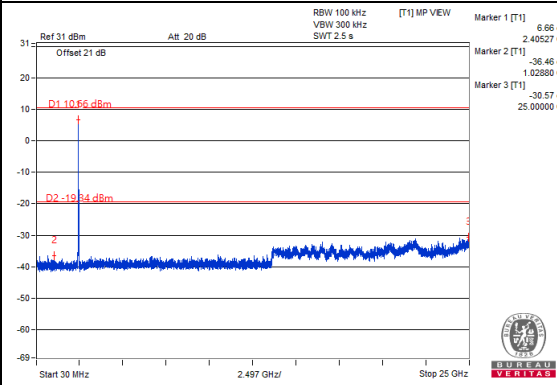


CH 11 Band edge

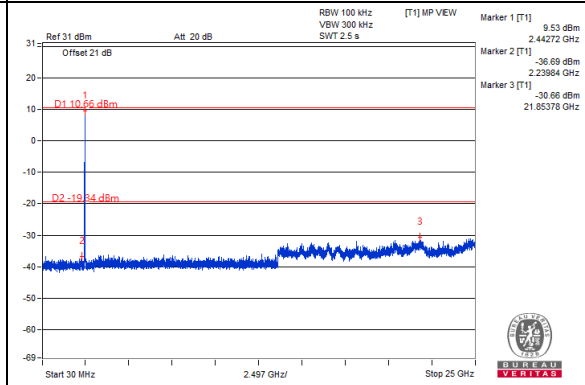


Chain 2

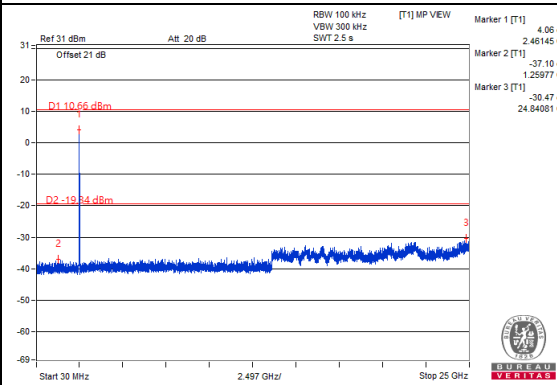
CH 1



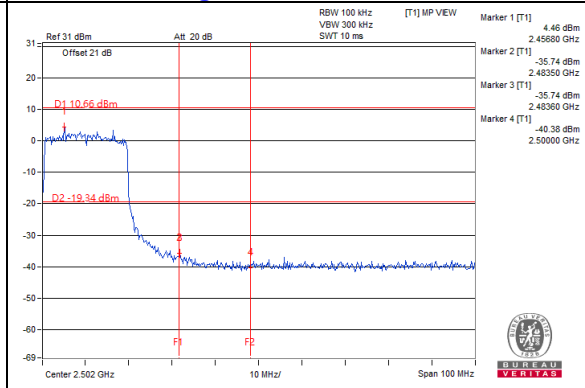
CH 6



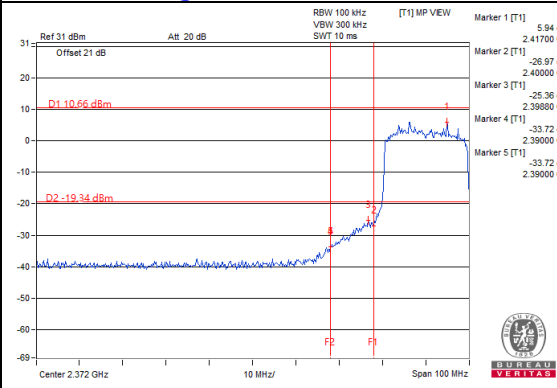
CH 11



CH 11 Band edge

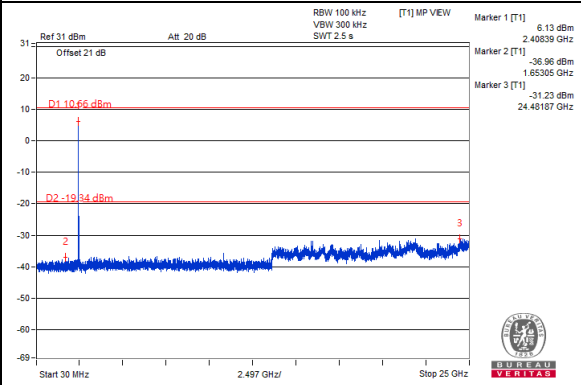


CH 1 Band edge

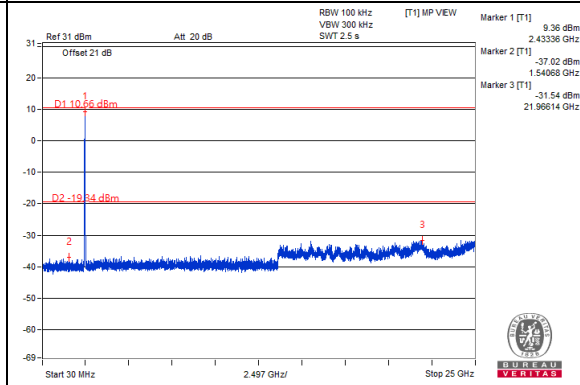


Chain 3

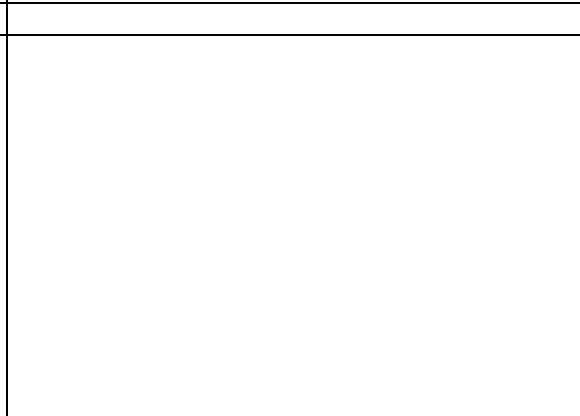
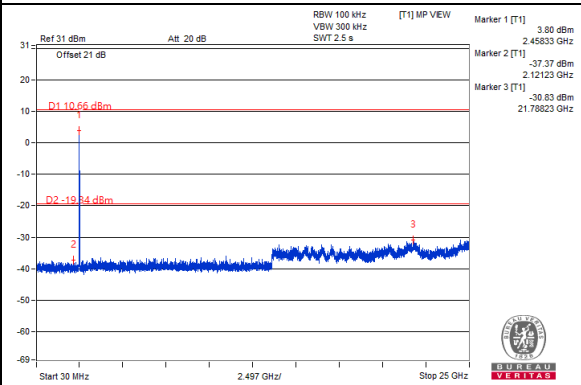
CH 1



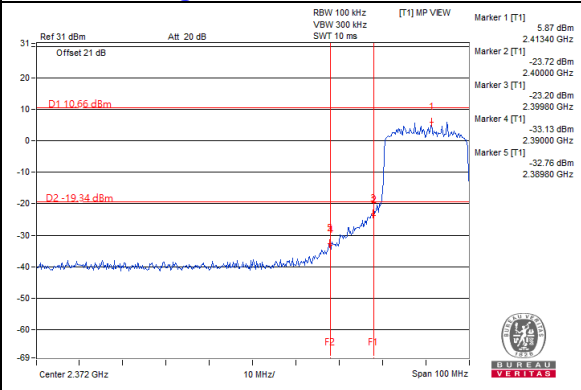
CH 6



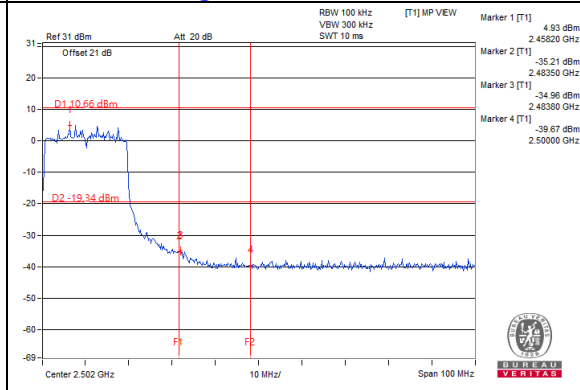
CH 11



CH 1 Band edge

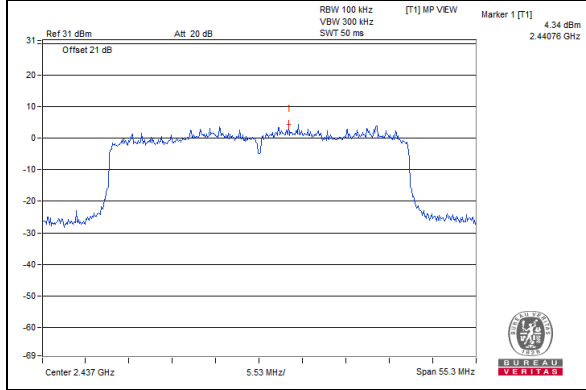


CH 11 Band edge



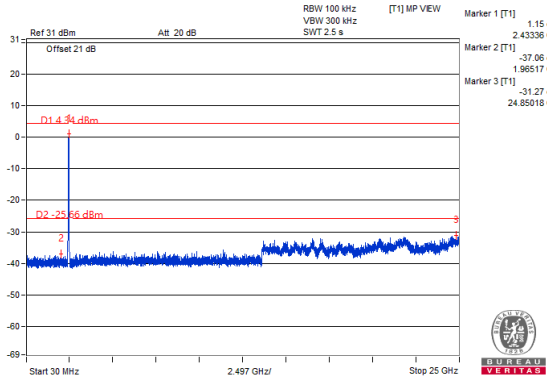
802.11ax (HE40)

Maximum REF

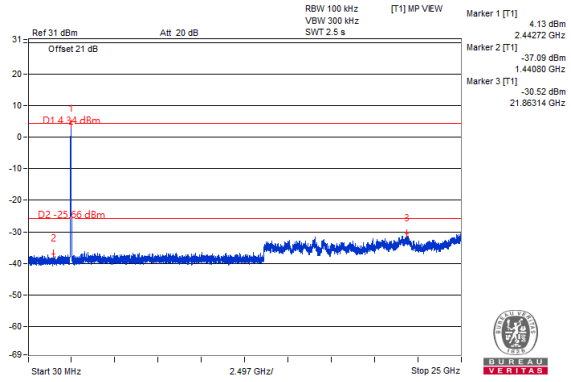


Chain 0

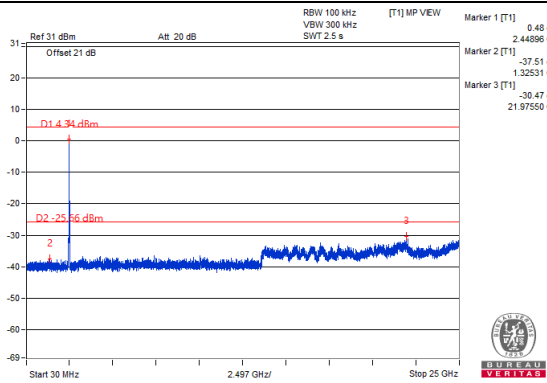
CH 3



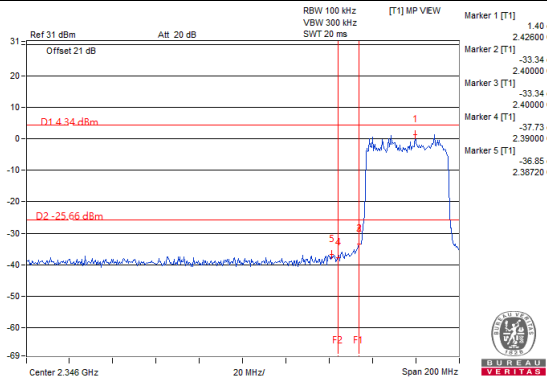
CH 6



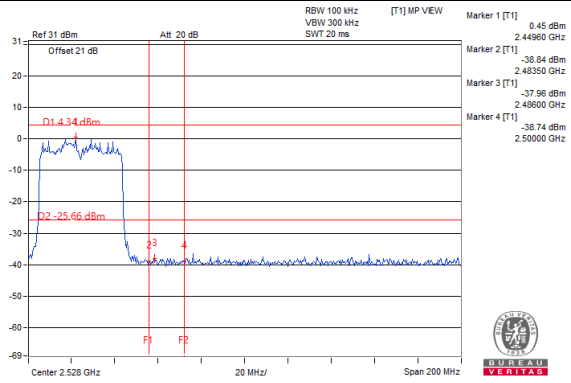
CH 9



CH 3 Band edge

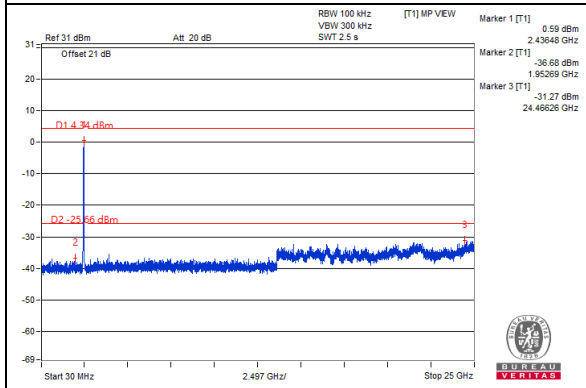


CH 9 Band edge

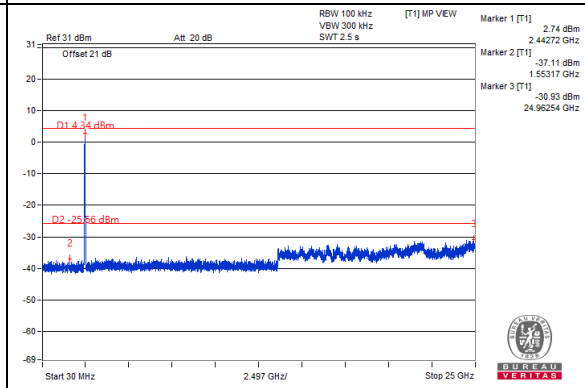


Chain 1

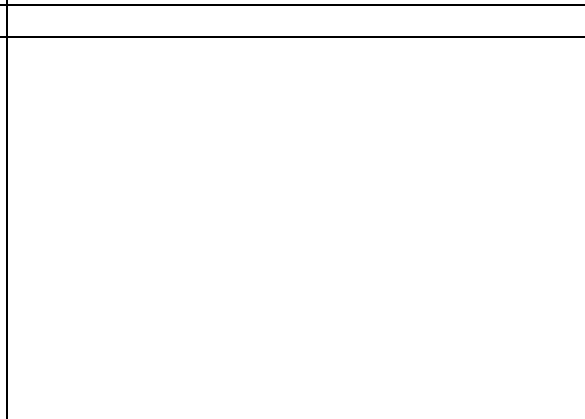
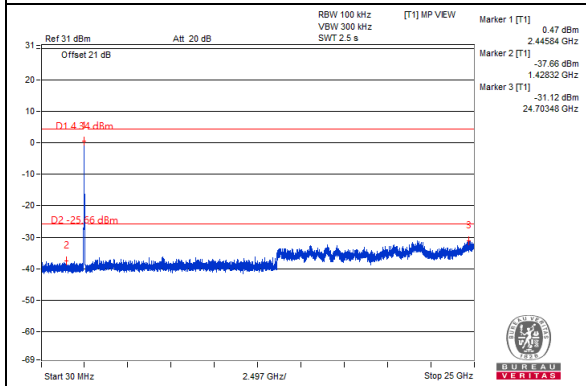
CH 3



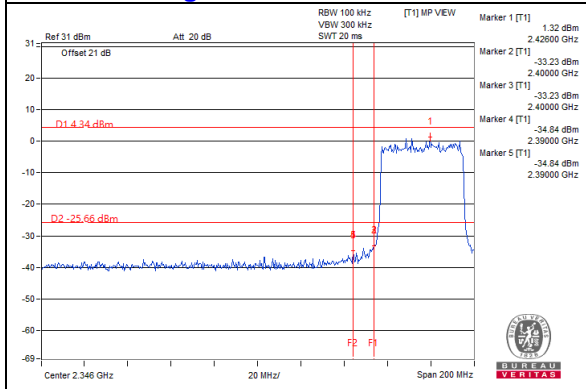
CH 6



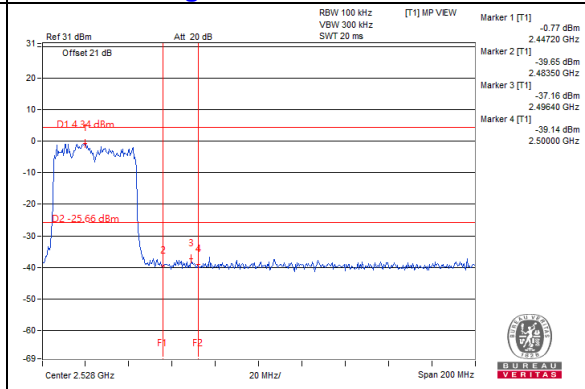
CH 9



CH 3 Band edge

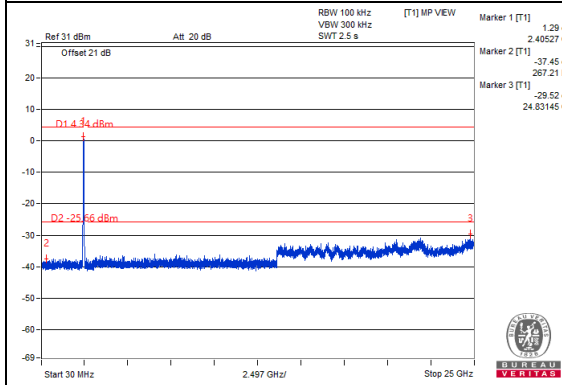


CH 9 Band edge

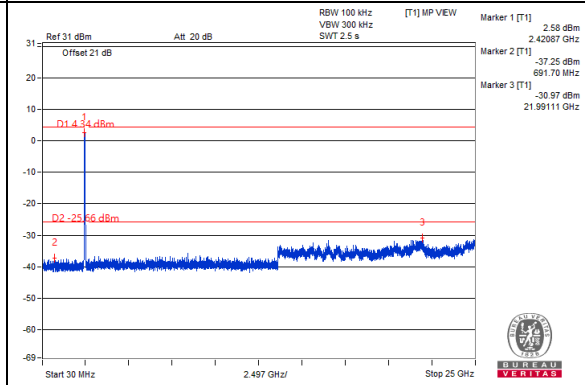


Chain 2

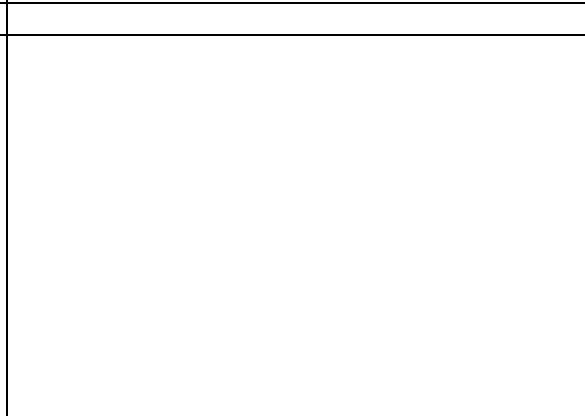
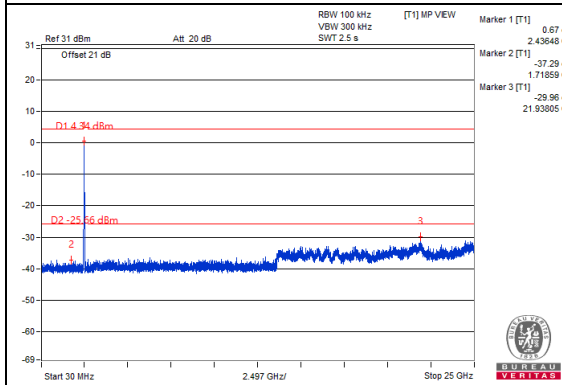
CH 3



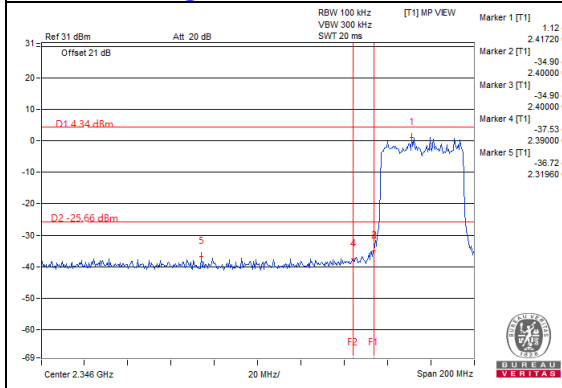
CH 6



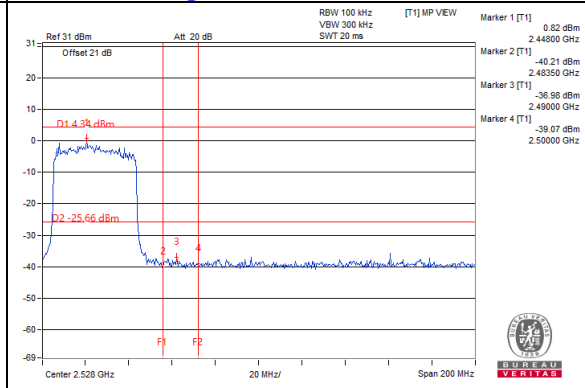
CH 9



CH 3 Band edge

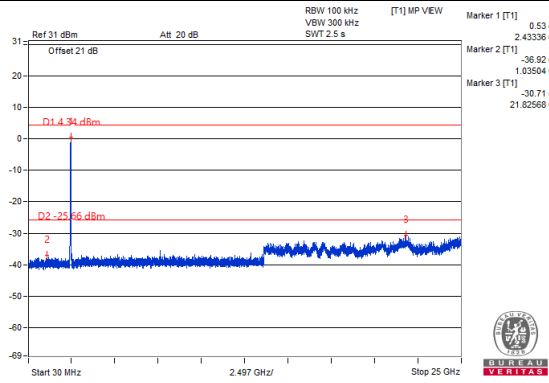


CH 9 Band edge

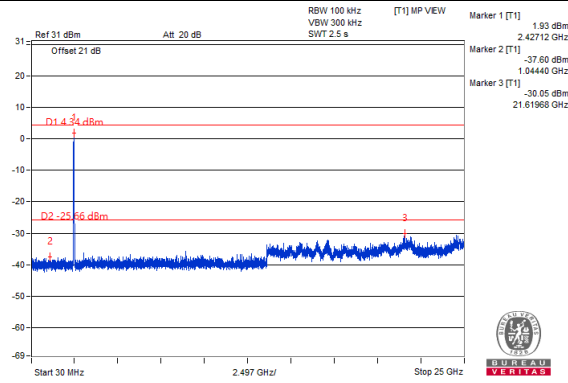


Chain 3

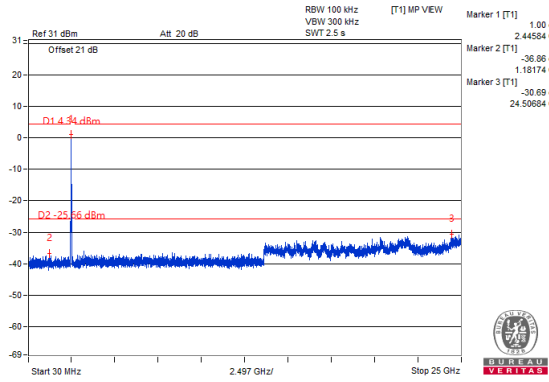
CH 3



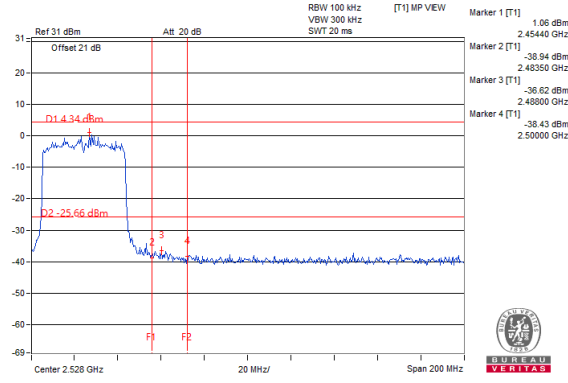
CH 6



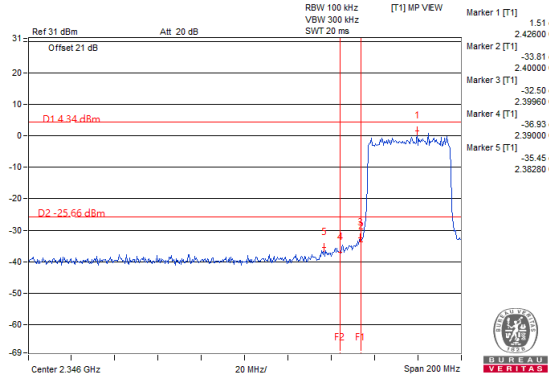
CH 9



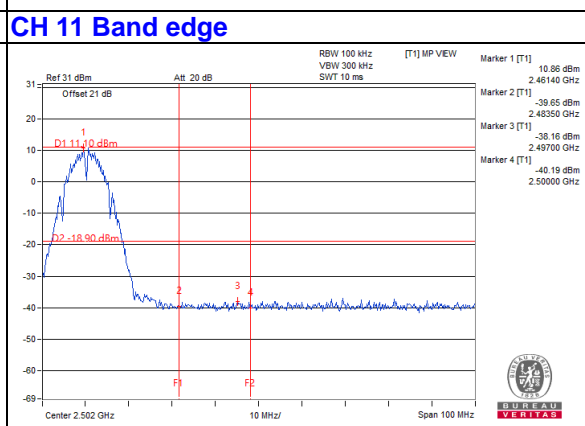
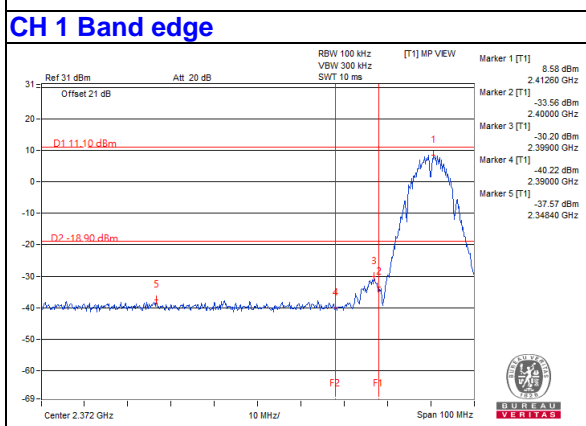
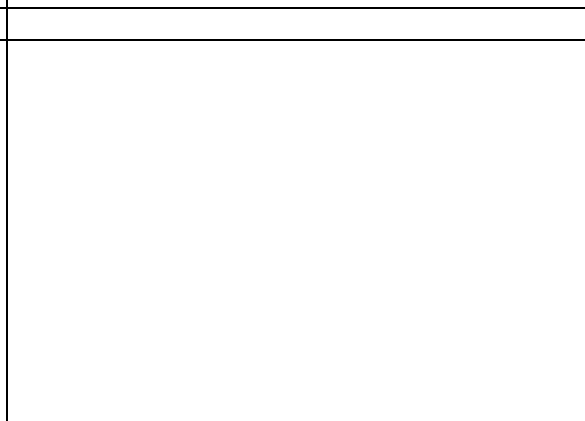
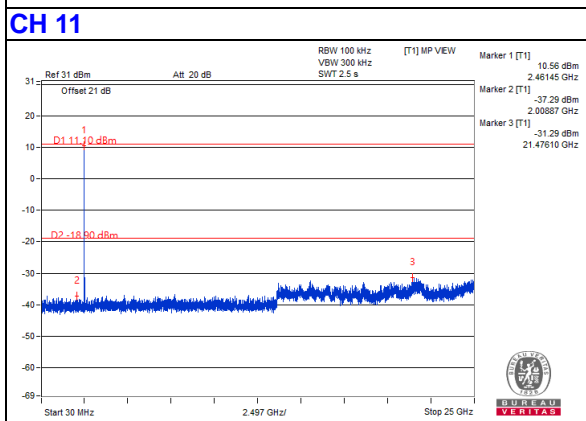
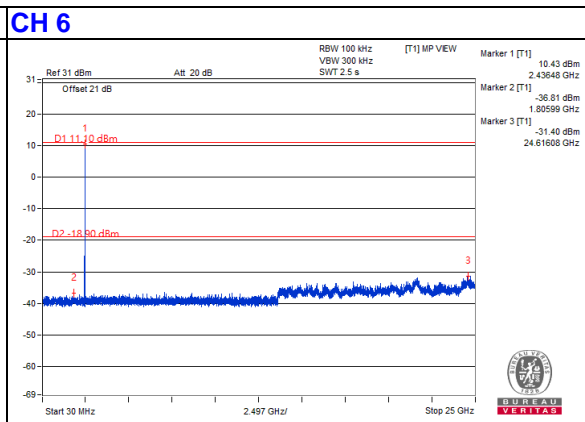
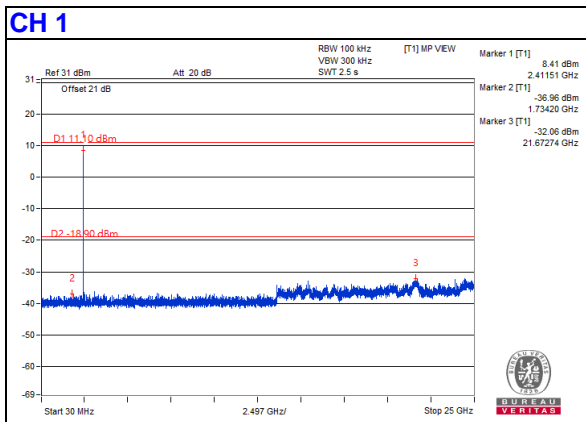
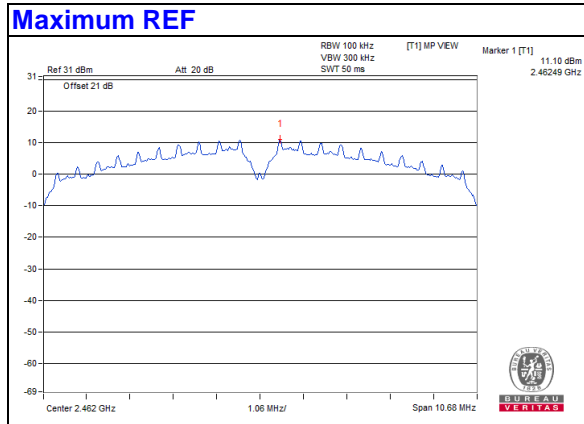
CH 9 Band edge



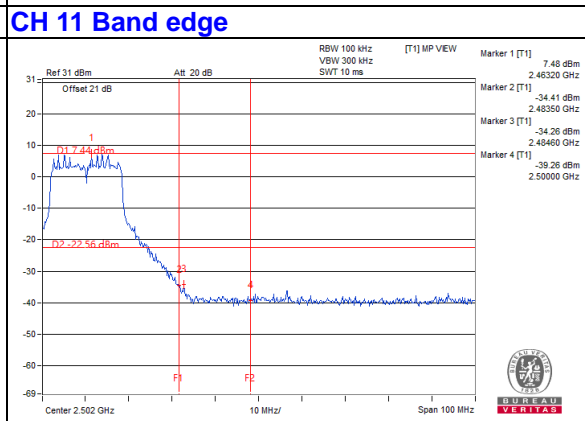
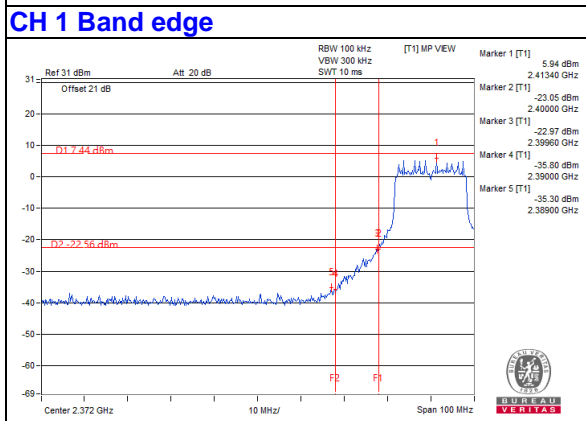
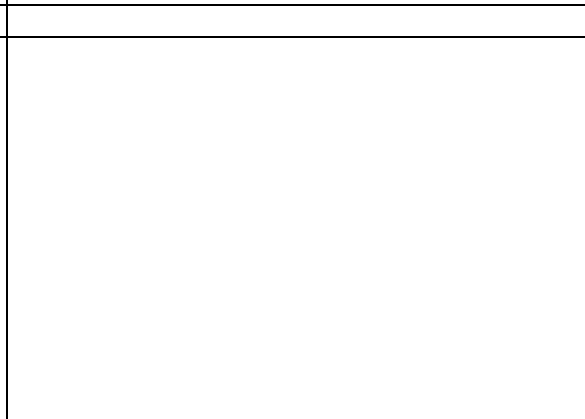
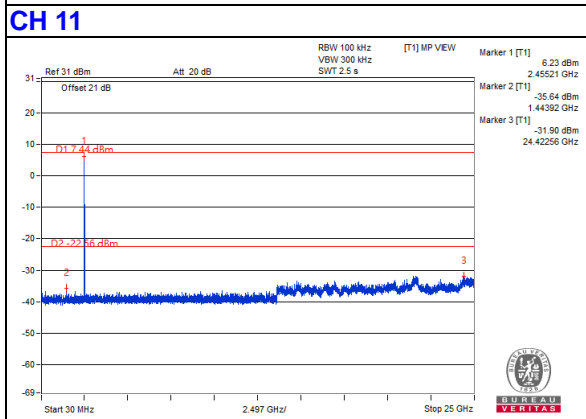
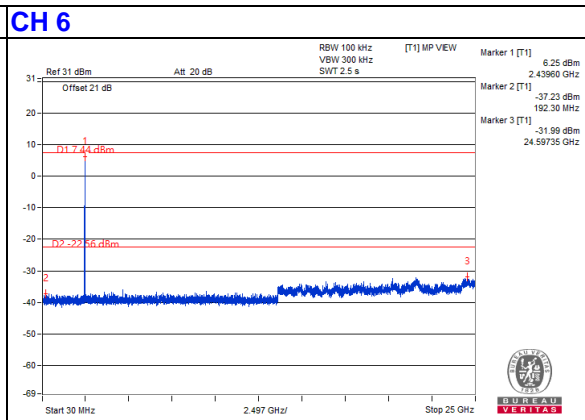
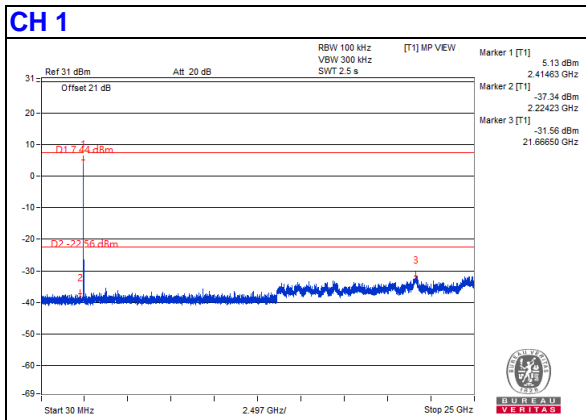
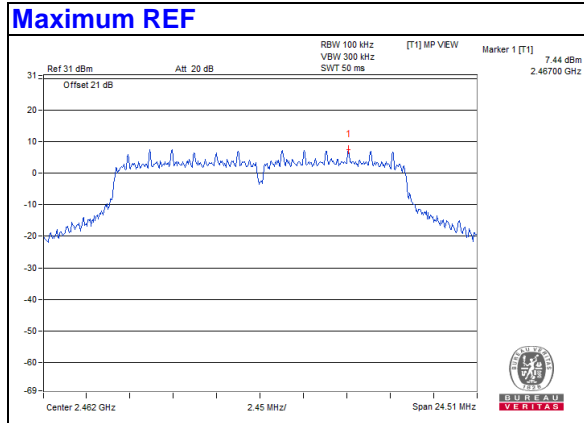
CH 3 Band edge



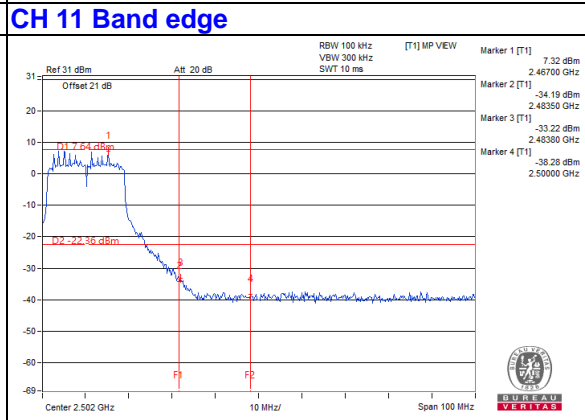
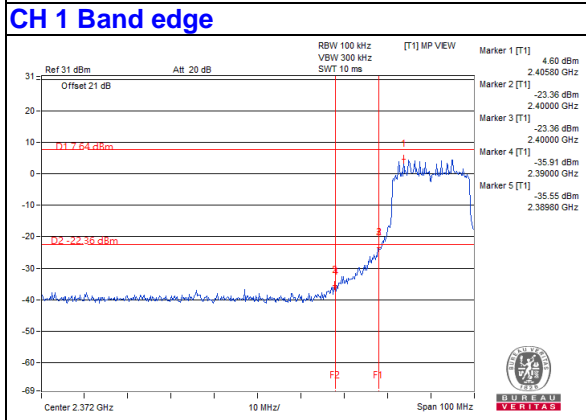
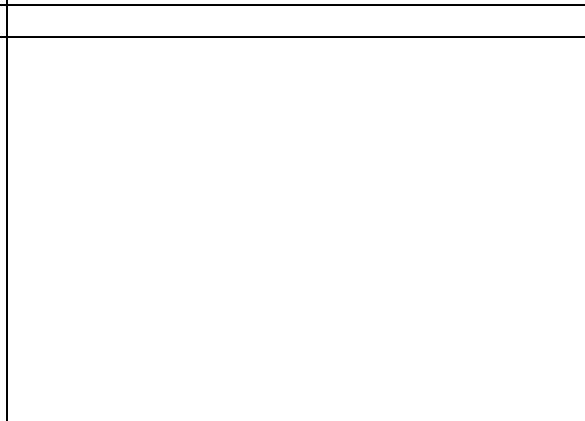
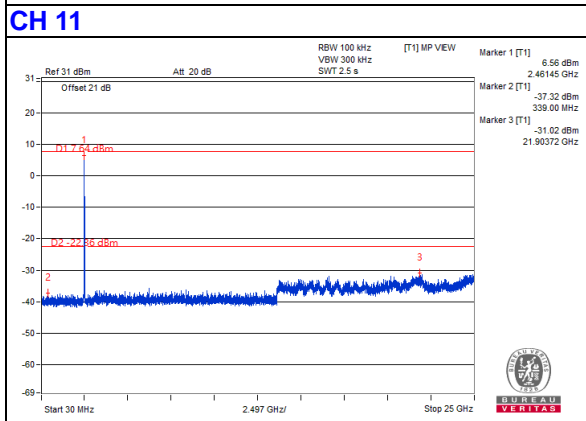
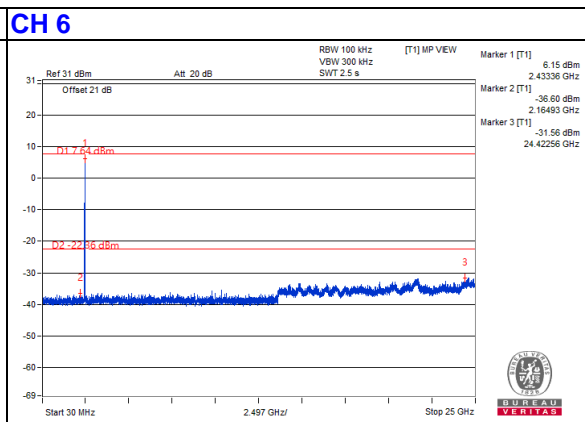
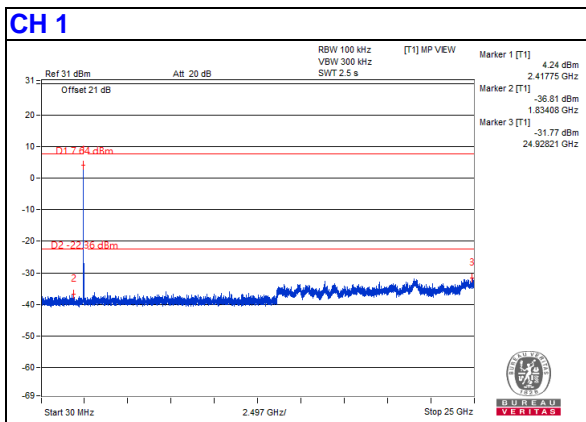
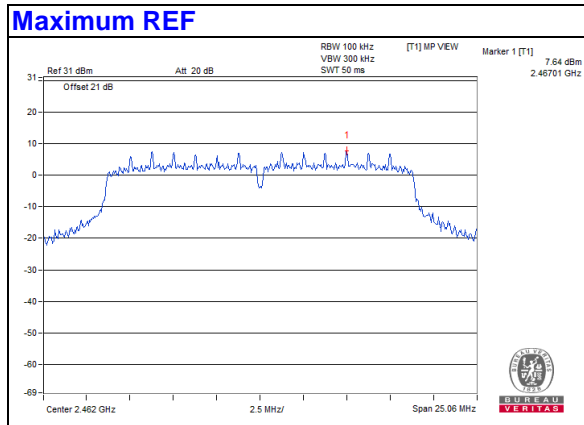
For 1TX (Scanning Radio)
802.11b



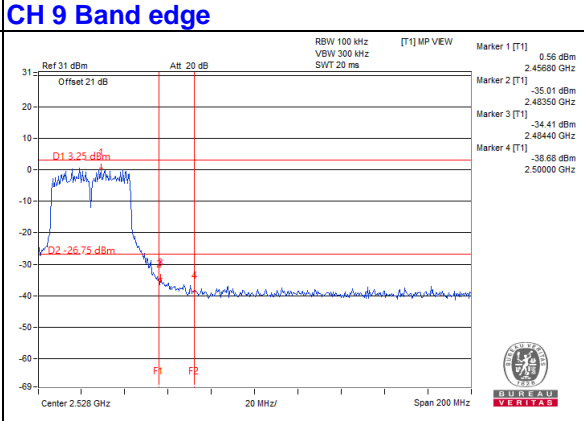
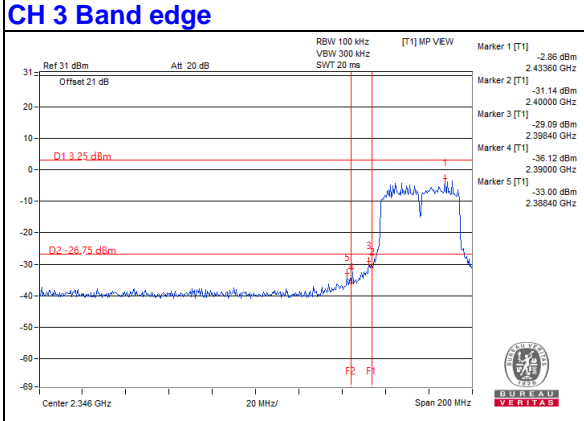
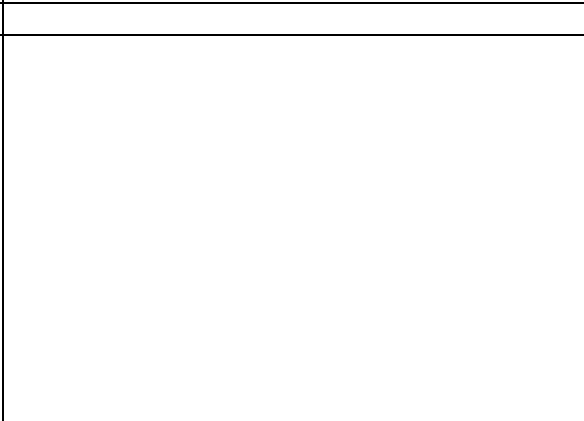
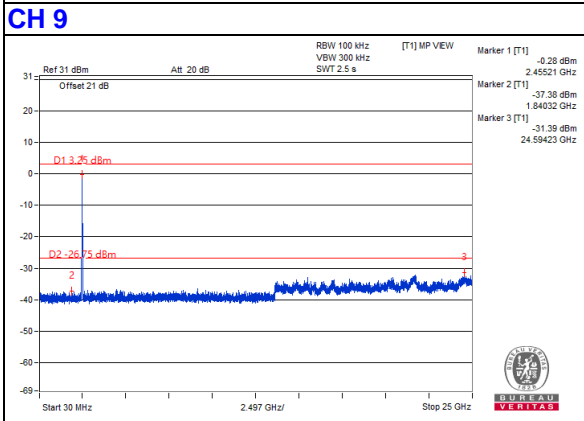
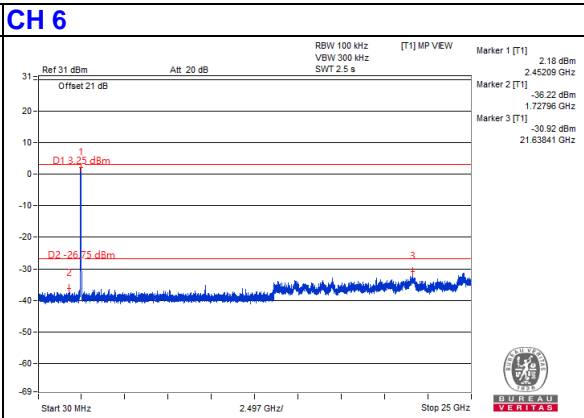
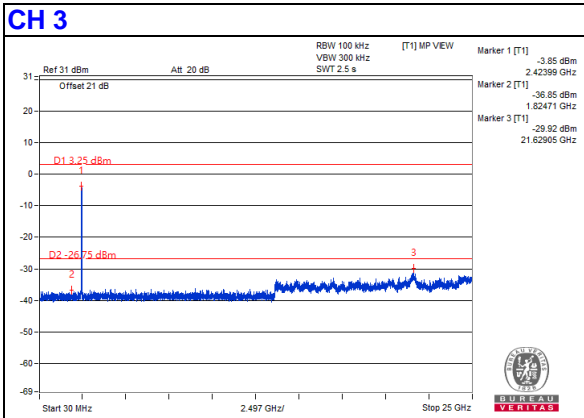
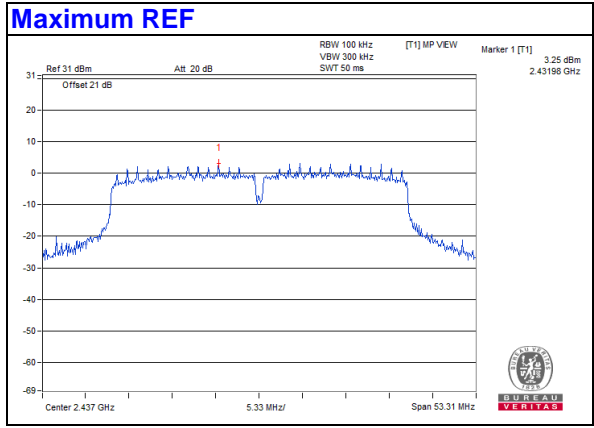
802.11g



802.11n (HT20)



802.11n (HT40)

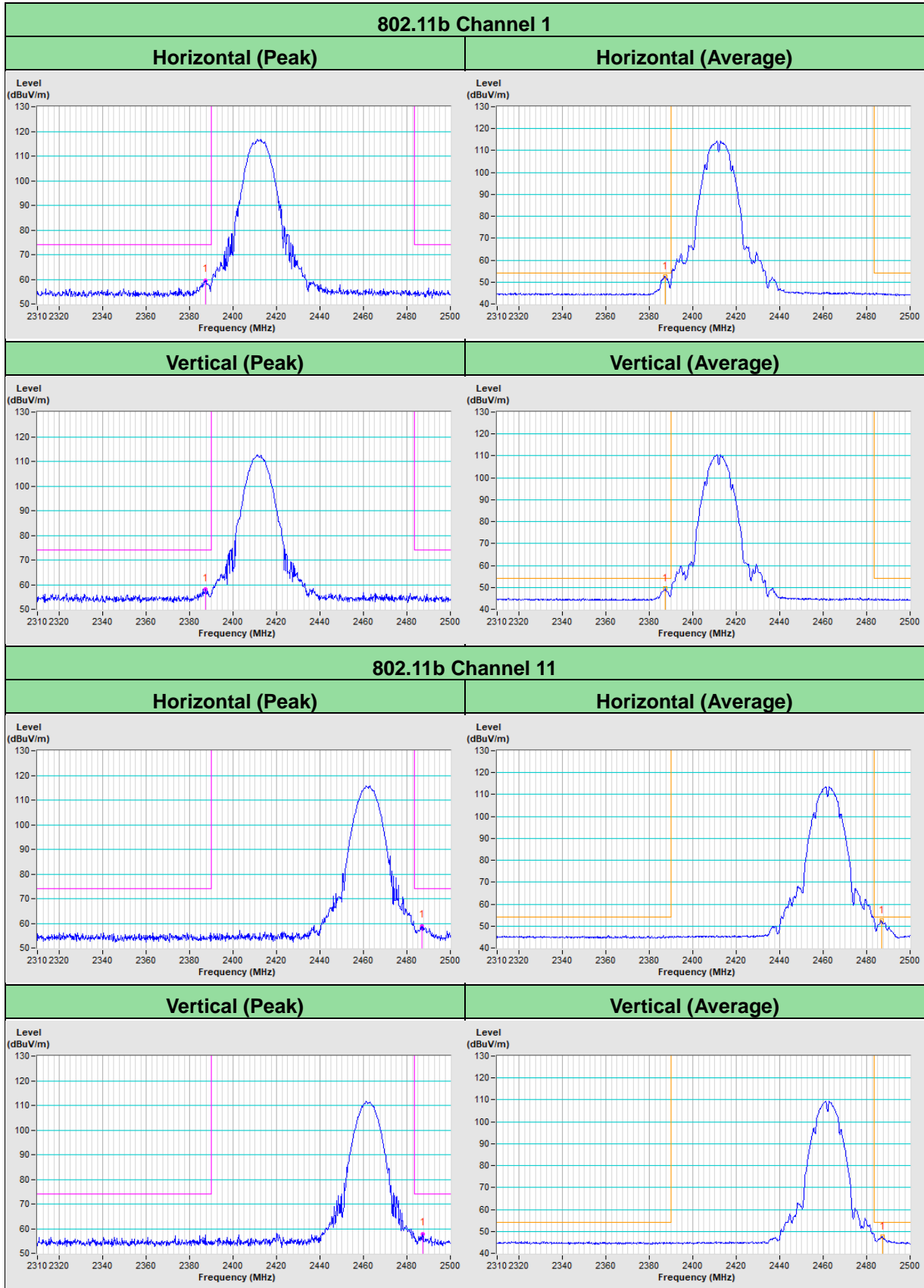


5 Pictures of Test Arrangements

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

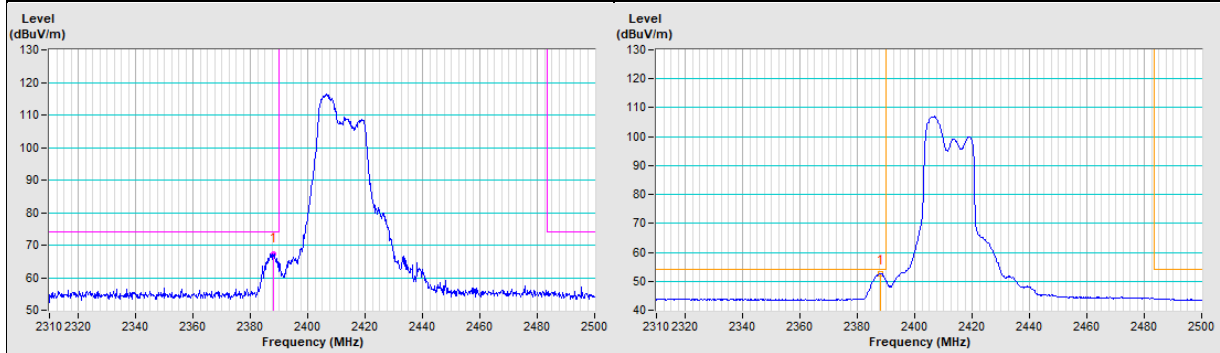
Annex A - Band-Edge Measurement

For 4TX

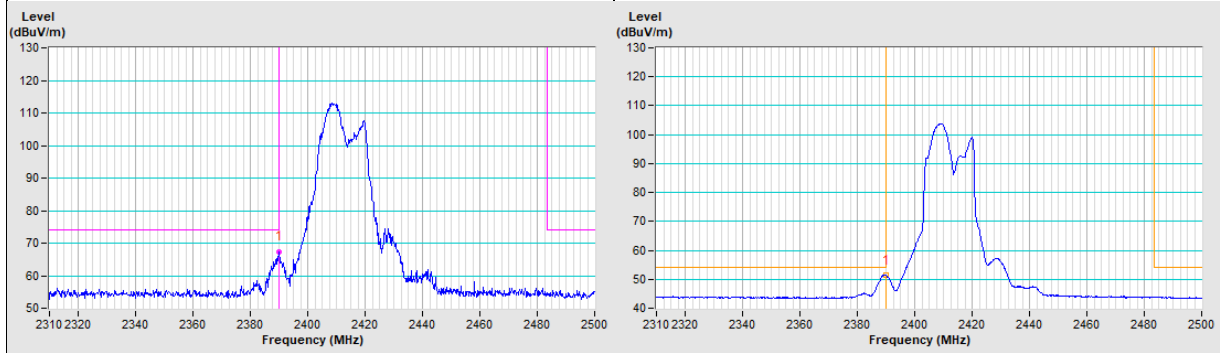


802.11g Channel 1

Horizontal (Peak)	Horizontal (Average)
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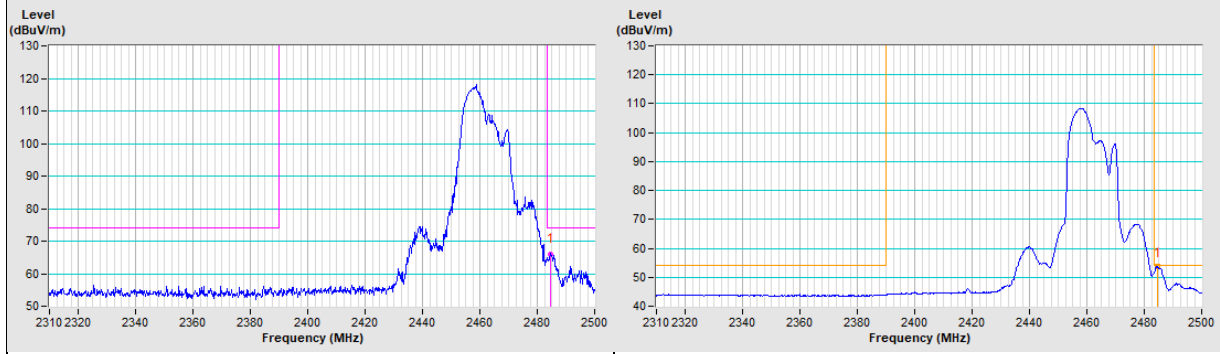


Vertical (Peak)	Vertical (Average)
-----------------	--------------------

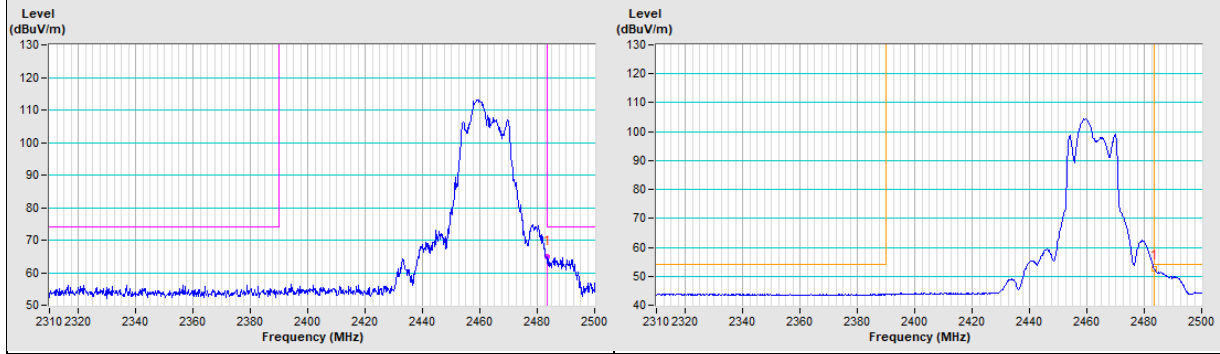


802.11g Channel 11

Horizontal (Peak)	Horizontal (Average)
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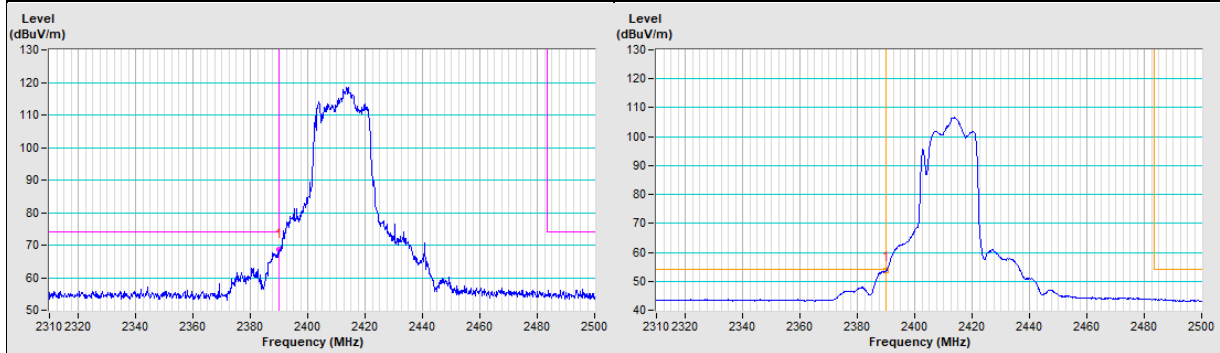


Vertical (Peak)	Vertical (Average)
-----------------	--------------------

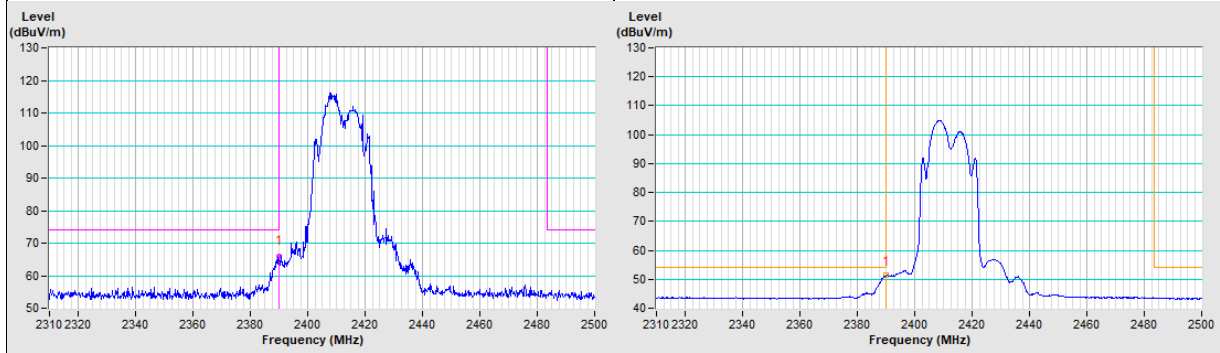


802.11ax (HE20) Channel 1

Horizontal (Peak)	Horizontal (Average)
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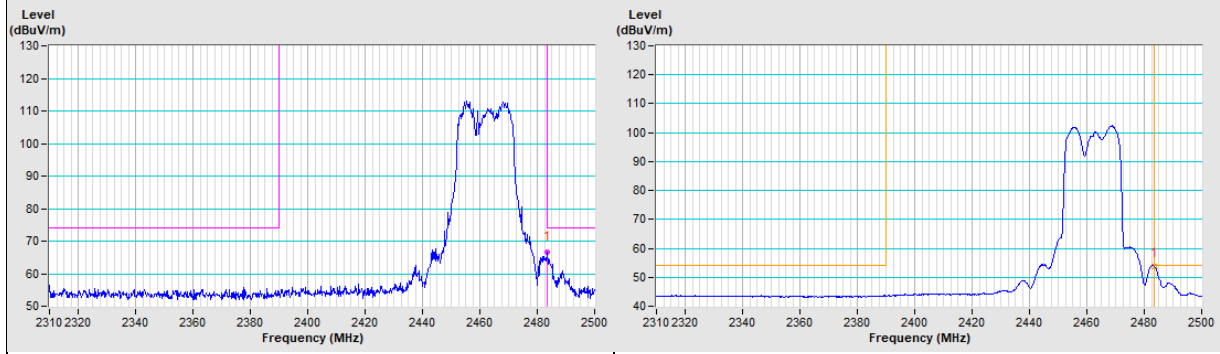


Vertical (Peak)	Vertical (Average)
-----------------	--------------------

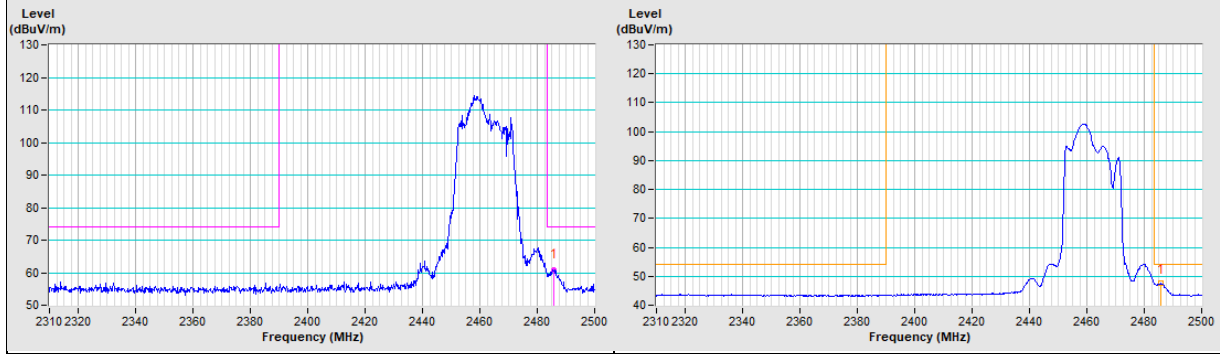


802.11ax (HE20) Channel 11

Horizontal (Peak)	Horizontal (Average)
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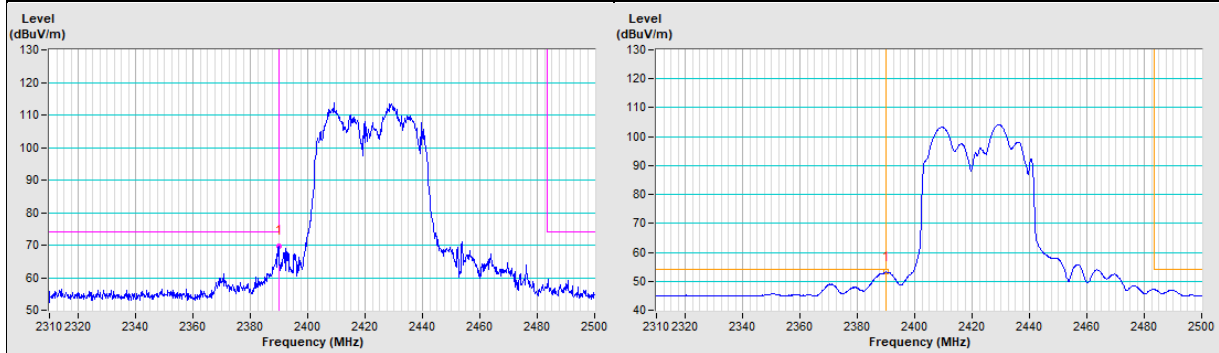


Vertical (Peak)	Vertical (Average)
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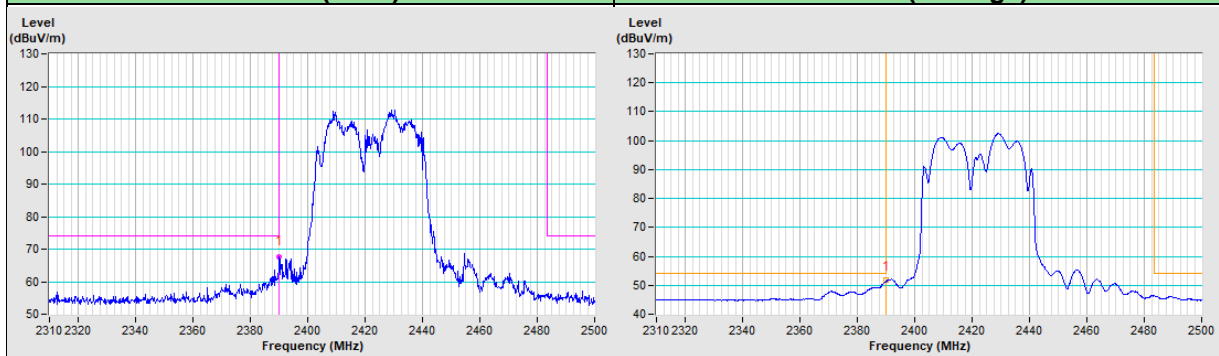


802.11ax (HE40) Channel 3

Horizontal (Peak)	Horizontal (Average)
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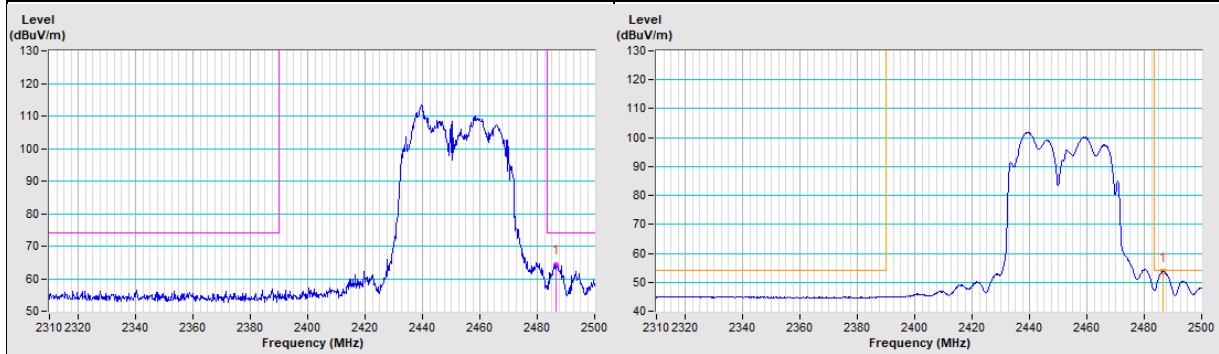


Vertical (Peak)	Vertical (Average)
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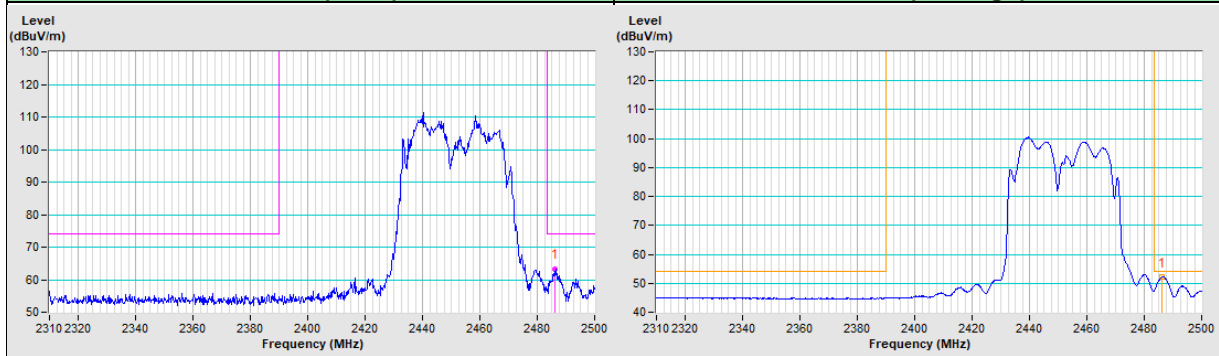


802.11ax (HE40) Channel 9

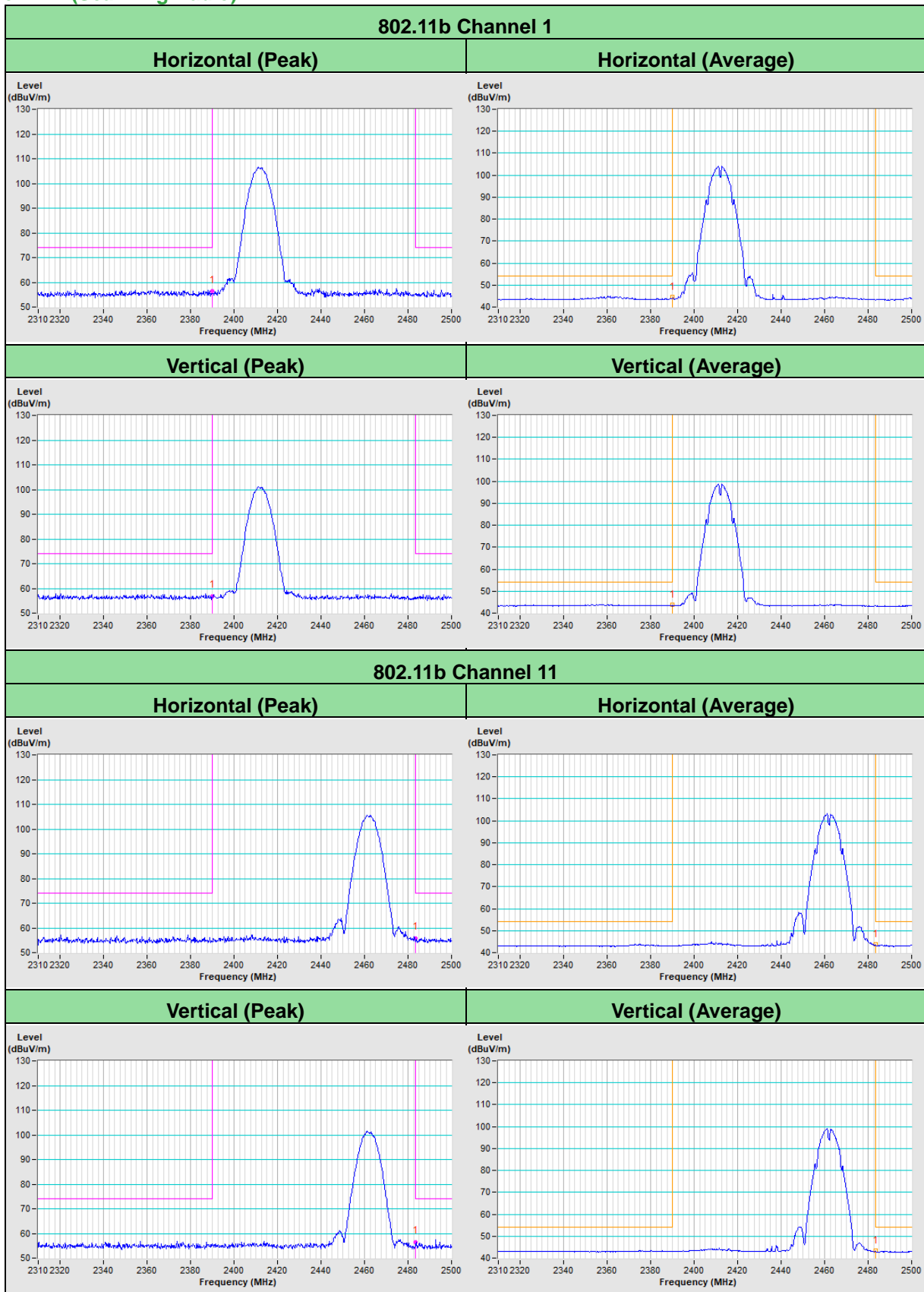
Horizontal (Peak)	Horizontal (Average)
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Vertical (Peak)	Vertical (Average)
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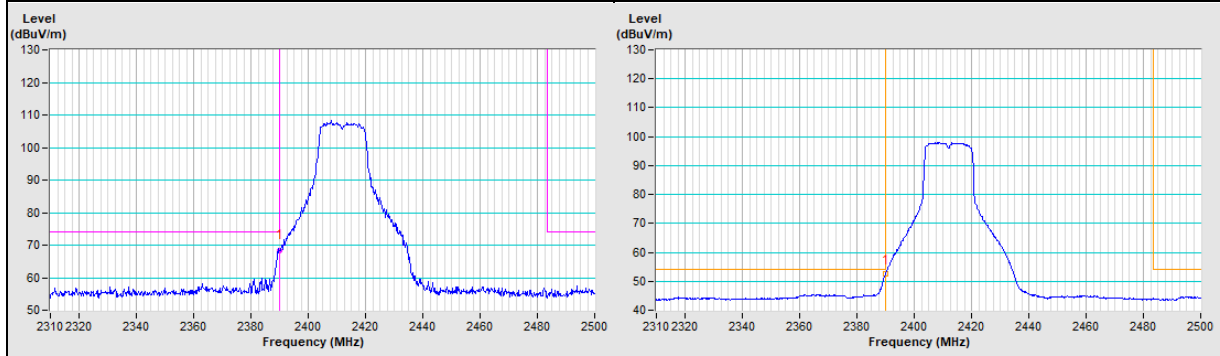


For 1TX (Scanning Radio)

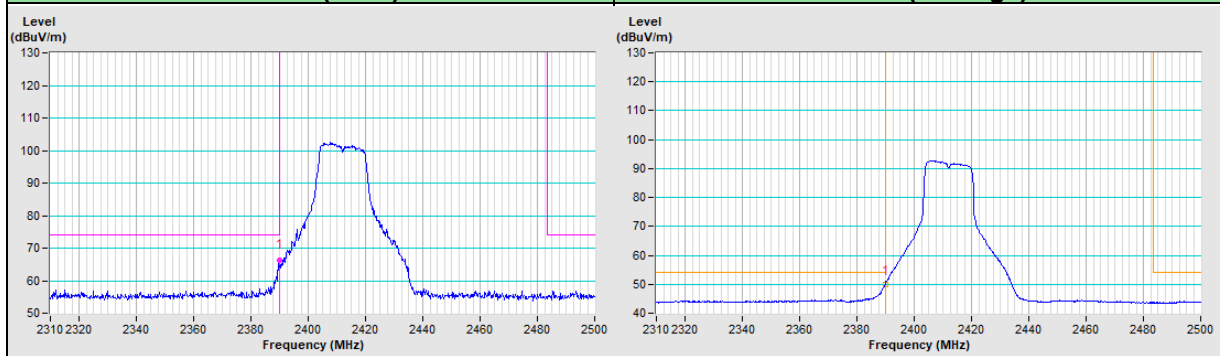


802.11g Channel 1

Horizontal (Peak)	Horizontal (Average)
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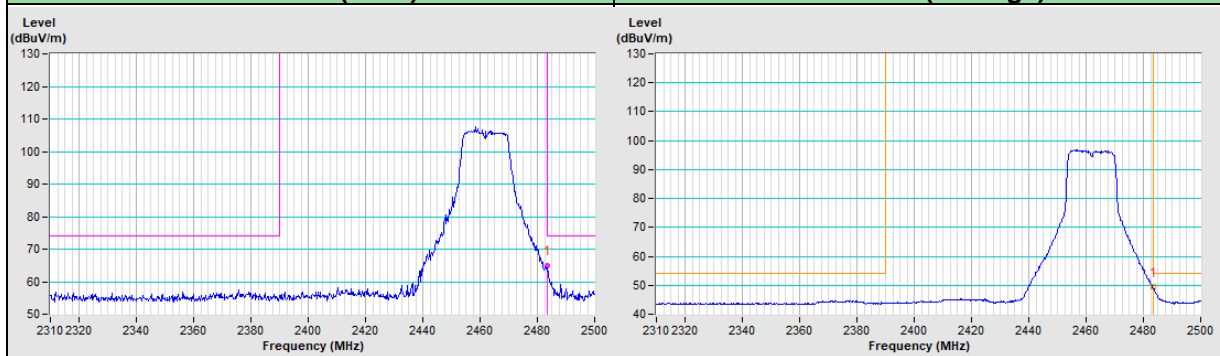


Vertical (Peak)	Vertical (Average)
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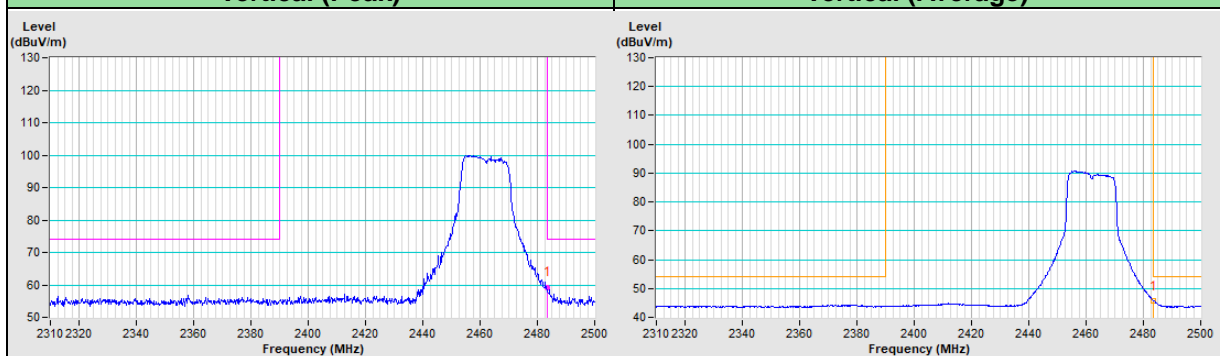


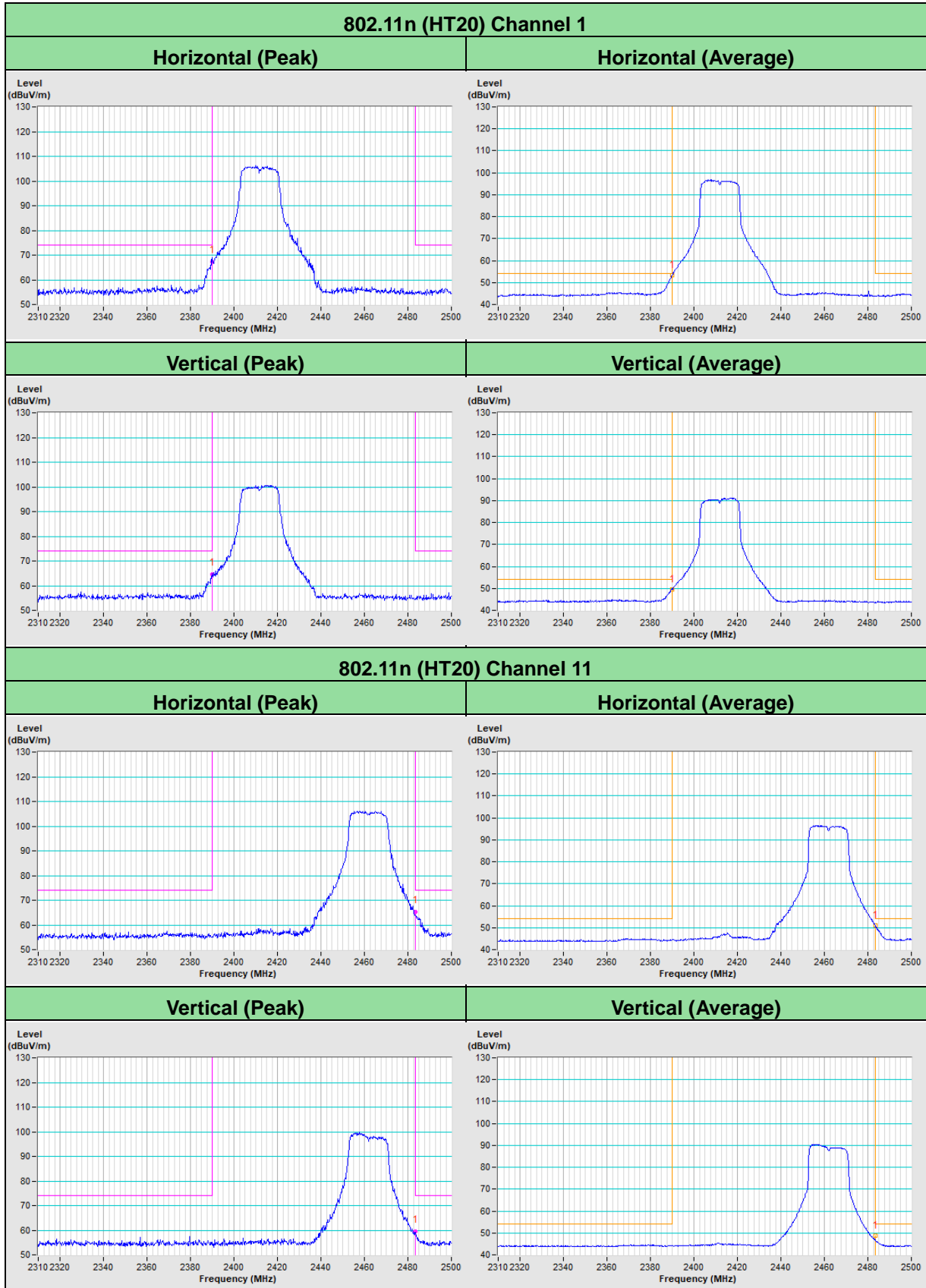
802.11g Channel 11

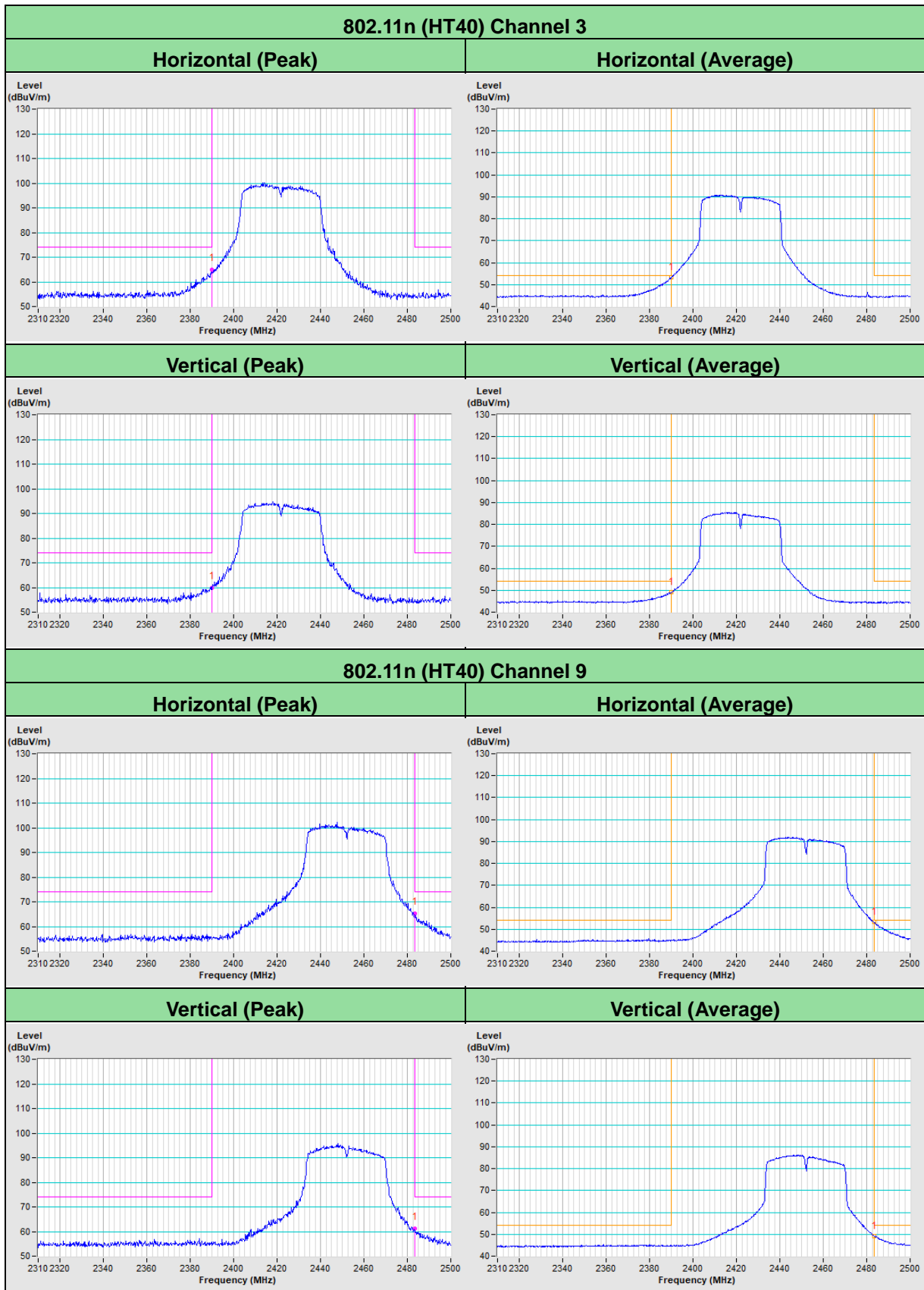
Horizontal (Peak)	Horizontal (Average)
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Vertical (Peak)	Vertical (Average)
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Appendix – Information of the Testing Laboratories

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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