

FCC Test Report (WLAN)

Report No.: RF190628E01

FCC ID: RAS-MT7663

Test Model: MT7663

Received Date: June 28, 2019

Test Date: Sep. 05 to 10, 2019

Issued Date: Dec. 31, 2019

Applicant: MediaTek Inc.

Address: No.1, Duxing 1st Rd., East District, Hsinchu City 300, Taiwan (R.O.C.)

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan

Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan

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



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT (WLAN)	7
Chain 0	8
Chain 1	8
Chain 0	8
Chain 1	8
Chain 0	8
3.2 Description of Test Modes	9
3.2.1 Test Mode Applicability and Tested Channel Detail	10
3.3 Duty Cycle of Test Signal	12
3.4 Description of Support Units	13
3.4.1 Configuration of System under Test	14
3.5 General Description of Applied Standards	15
4 Test Types and Results	16
4.1 Radiated Emission and Bandedge Measurement	16
4.1.1 Limits of Radiated Emission and Bandedge Measurement	16
4.1.2 Test Instruments	17
4.1.3 Test Procedures	18
4.1.4 Deviation from Test Standard	18
4.1.5 Test Setup	19
4.1.6 EUT Operating Conditions	20
4.1.7 Test Results (Mode 1)	21
4.1.8 Test Results (Mode 2)	35
4.2 Conducted Emission Measurement	49
4.2.1 Limits of Conducted Emission Measurement	49
4.2.2 Test Instruments	49
4.2.3 Test Procedures	50
4.2.4 Deviation from Test Standard	50
4.2.5 Test Setup	50
4.2.6 EUT Operating Conditions	50
4.2.7 Test Results	51
4.3 6dB Bandwidth Measurement	53
4.3.1 Limits of 6dB Bandwidth Measurement	53
4.3.2 Test Setup	53
4.3.3 Test Instruments	53
4.3.4 Test Procedure	53
4.3.5 Deviation from Test Standard	53
4.3.6 EUT Operating Conditions	53
4.3.7 Test Result	54
4.4 Conducted Output Power Measurement	56
4.4.1 Limits of Conducted Output Power Measurement	56
4.4.2 Test Setup	56
4.4.3 Test Instruments	56
4.4.4 Test Procedures	56
4.4.5 Deviation from Test Standard	56

4.4.6 EUT Operating Conditions.....	56
4.4.7 Test Results	57
4.5 Power Spectral Density Measurement.....	58
4.5.1 Limits of Power Spectral Density Measurement	58
4.5.2 Test Setup.....	58
4.5.3 Test Instruments	58
4.5.4 Test Procedure	58
4.5.5 Deviation from Test Standard	58
4.5.6 EUT Operating Condition	58
4.5.7 Test Results	59
4.6 Conducted Out of Band Emission Measurement.....	62
4.6.1 Limits of Conducted Out of Band Emission Measurement	62
4.6.2 Test Setup.....	62
4.6.3 Test Instruments	62
4.6.4 Test Procedure	62
4.6.5 Deviation from Test Standard	62
4.6.6 EUT Operating Condition	62
4.6.7 Test Results	62
5 Pictures of Test Arrangements.....	71
Appendix – Information of the Testing Laboratories	72

Release Control Record

Issue No.	Description	Date Issued
RF190628E01	Original release.	Dec. 31, 2019

1 Certificate of Conformity

Product: 2TX 11ac + BLE Combo Card

Brand: MTK

Test Model: MT7663

Sample Status: ENGINEERING SAMPLE

Applicant: MediaTek Inc.

Test Date: Sep. 05 to 10, 2019

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

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

Prepared by : Joyce Kuo , **Date:** Dec. 31, 2019
Joyce Kuo / Specialist

Approved by : Clark Lin , **Date:** Dec. 31, 2019
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 -15.92dB at 0.20859MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.4dB at 7311.00MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex(MHF), R-SMA not a standard connector.

Note:

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) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.8 dB
Conducted Emissions	-	3.1 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.0 dB
	30MHz ~ 1GHz	5.1 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.1 dB
	6GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.2 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (WLAN)

Product	2TX 11ac + BLE Combo Card
Brand	MTK
Test Model	MT7663
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 3.3V from host equipment
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.18 ~ 5.24GHz, 5.26GHz ~ 5.32GHz, 5.50GHz ~ 5.72GHz, 5.745 ~ 5.825GHz
Number of Channel	2.4GHz: 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 5GHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 25 802.11n (HT40), 802.11ac (VHT40): 12 802.11ac (VHT80): 6
Output Power	2.4GHz: 195.924mW 5.18 ~ 5.24GHz: 160.801 mW 5.26 ~ 5.32GHz: 157.614 mW 5.5 ~ 5.72GHz: 157.067 mW 5.745 ~ 5.825GHz: 186.71 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. There are WLAN, BT technology used for the EUT.
2. The EUT has two interfaces. The main difference is interface, but RF is the same. Please refer to the following table:

Interface	Difference
PCIe	PCIe and SDIO interface signal switch by IC bonding on the same pin, Most of the layout including RF, PMU, and the control signal is the same.
SDIO	

From the above Interface, the worst case was found in PCIe interface. Therefore only the test data of the modes were recorded in this report.

3. Simultaneously transmission condition.

Condition	Technology	
1	WLAN 2.4GHz	Bluetooth
2	WLAN 5GHz	Bluetooth

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

Antenna Set	RF Chain No.	Brand	Model	Ant. Net Gain (dBi)	Frequency range (GHz)	Antenna Type	Connector Type	Cable Length
1	Chain 0	LYNwave	ALA110-222050-300011	3.5	2.4~2.4835	PIFA	i-pex(MHF)	55mm
				5	5.15~5.85			
	Chain 1	LYNwave	ALA110-222050-300011	3.5	2.4~2.4835	PIFA	i-pex(MHF)	55mm
				5	5.15~5.85			
2	Chain 0	Cortec	AN2450-4902BRS	2.42	2.4~2.4835	Dipole	R-SMA	150mm
				3.87	5.15~5.85			
	Chain 1	Cortec	AN2450-4902BRS	2.42	2.4~2.4835	Dipole	R-SMA	150mm
				3.87	5.15~5.85			
3	Chain 0	PSA	RFMTA340718EMLB301	2.92	2.4~2.4835	PIFA	i-pex(MHF)	199.4mm
				4.94	5.15~5.85			
	Chain 1	PSA	RFMTA340718EMLB301	2.92	2.4~2.4835	PIFA	i-pex(MHF)	199.4mm
				4.94	5.15~5.85			

Note: The Max. gain was selected for Radiated Emission Measurement test.

5. The EUT incorporates a MIMO function.

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

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

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

3.2 Description of Test Modes

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

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):

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	√	√	√	√	PIFA antenna
2	√	√	-	-	Dipole antenna

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's PIFA antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Y-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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Radiated Emission Test (Below 1GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	6	DSSS	DBPSK	1

Power Line Conducted Emission Test:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	6	DSSS	DBPSK	1

Antenna Port Conducted Measurement:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (System)	TESTED BY
RE $\geq$ 1G	24deg. C, 65%RH	120Vac, 60Hz	Nelson Teng Tank Wu
RE<1G	22deg. C, 67%RH	120Vac, 60Hz	Ryan Du
PLC	24deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

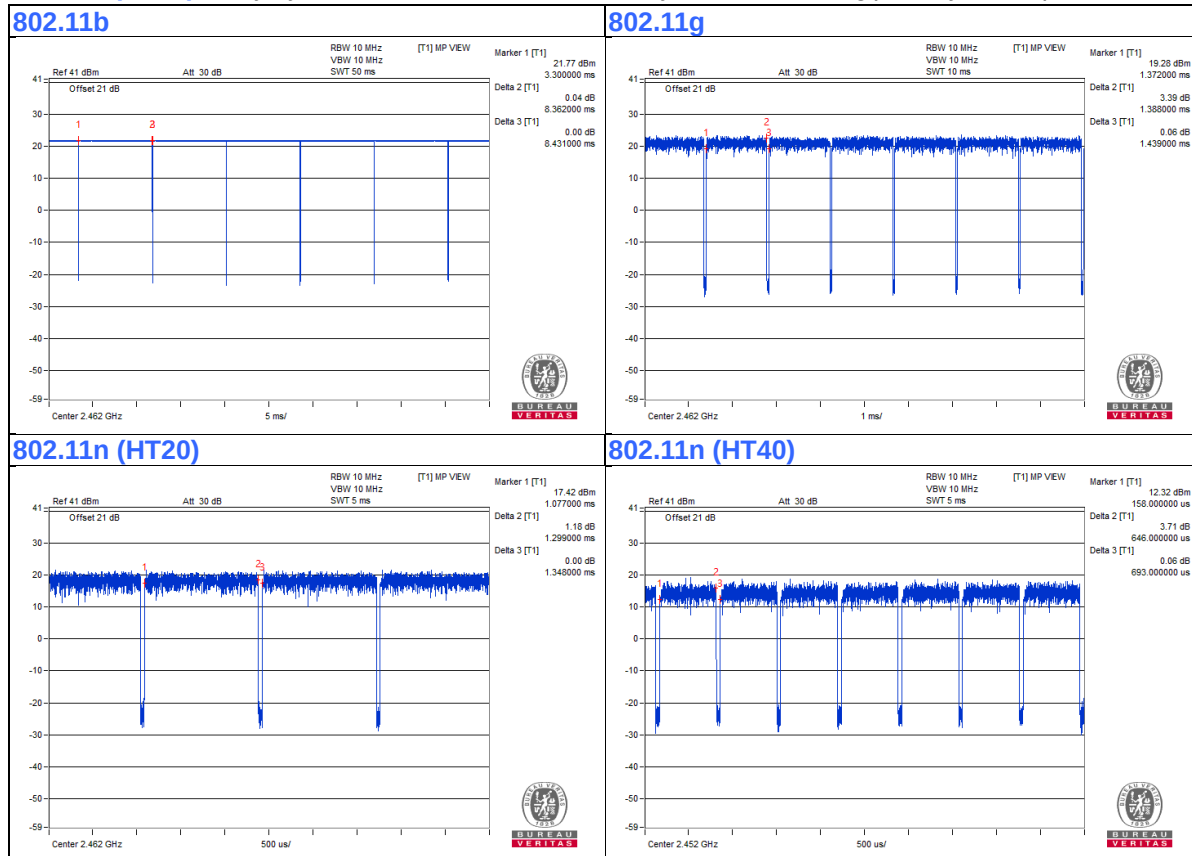
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11b: Duty cycle = $8.362/8.431 = 0.992$.

802.11g: Duty cycle = $1.388/1.439 = 0.965$, Duty factor = $10 * \log(1/\text{Duty factor}) = 0.16$

802.11n (HT20): Duty cycle = $1.299/1.348 = 0.964$, Duty factor = $10 * \log(1/\text{Duty factor}) = 0.16$

802.11n (HT40): Duty cycle = $0.646/0.693 = 0.932$, Duty factor = $10 * \log(1/\text{Duty factor}) = 0.31$



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	GM1SKV1	FCC DoC	Provided by Lab
B.	Test Tool	MTK	NA	NA	NA	Supplied by client
C.	Adapter	DELL	DA90PM111	NA	NA	Provided by Lab
D.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab (For Conduction)

Note:

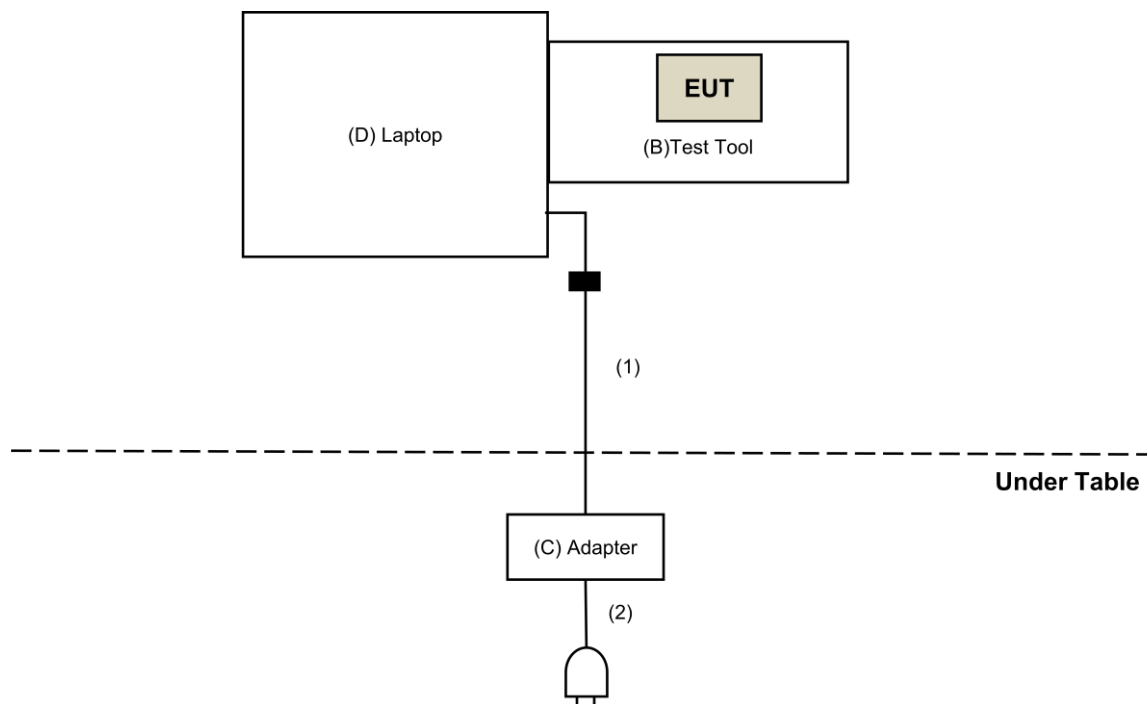
1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.8	No	1	Provided by Lab
2.	AC Cable	1	0.9	No	0	Provided by Lab

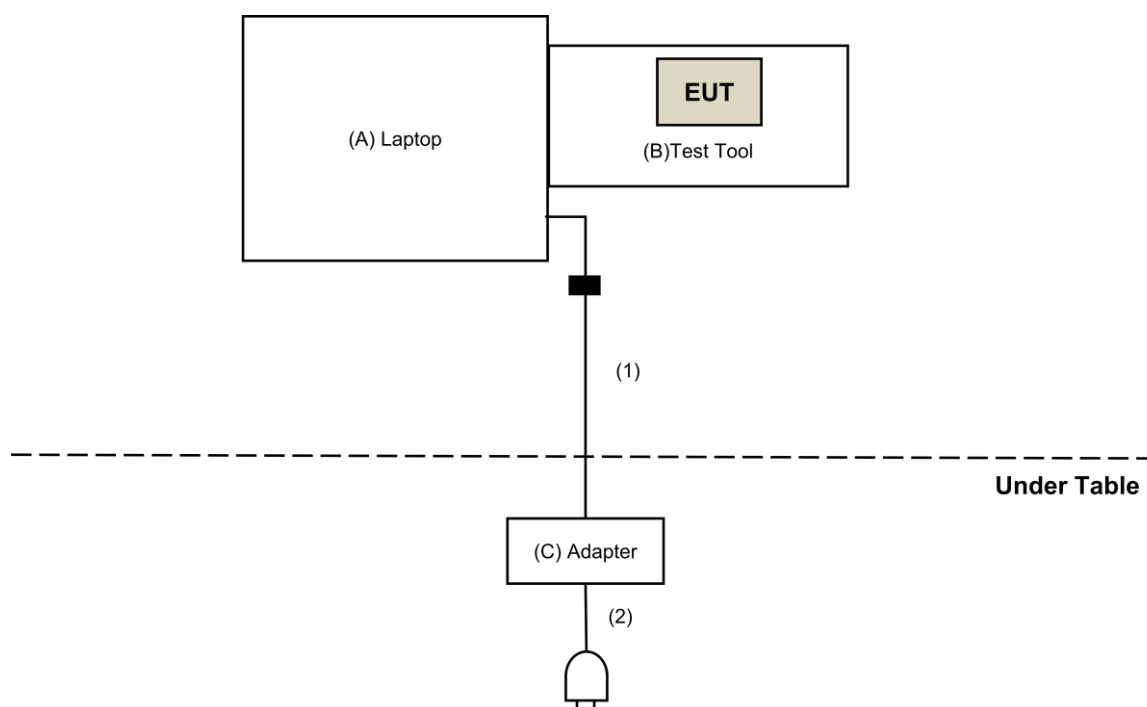
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

For Conducted Emissions test:



For other test:



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)

KDB 558074 D01 15.247 Meas Guidance v05r02

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 17, 2019	July 16, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 30, 2019	May 29, 2020
Loop Antenna Electro-Metrics	EM-6879	264	Jan. 22, 2019	Jan. 21, 2020
RF Cable	NA	LOOPCAB-001	Jan. 14, 2019	Jan. 13, 2020
RF Cable	NA	LOOPCAB-002	Jan. 14, 2019	Jan. 13, 2020
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 30, 2019	Apr. 29, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 22, 2018	Nov. 21, 2019
RF Cable	8D	966-3-1	Mar. 18, 2019	Mar. 17, 2020
RF Cable	8D	966-3-2	Mar. 18, 2019	Mar. 17, 2020
RF Cable	8D	966-3-3	Mar. 18, 2019	Mar. 17, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 25, 2018	Nov. 24, 2019
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC104-SM-SM-1200	160922	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC104-SM-SM-2000	180601	June 10, 2019	June 09, 2020
RF Cable	EMC104-SM-SM-6000	180602	June 10, 2019	June 09, 2020
Spectrum Analyzer Keysight	N9030A	MY54490679	July 17, 2019	July 16, 2020
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 28, 2019	Jan. 27, 2020
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 25, 2018	Nov. 24, 2019
RF Cable	EMC102-KM-KM-1200	160924	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC102-KM-KM-1200	160925	Jan. 28, 2019	Jan. 27, 2020
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 04, 2019	June 03, 2020
Power meter Anritsu	ML2495A	1014008	May 13, 2019	May 12, 2020
Power sensor Anritsu	MA2411B	0917122	May 13, 2019	May 12, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020

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. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Sep. 05 to 10, 2019

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:

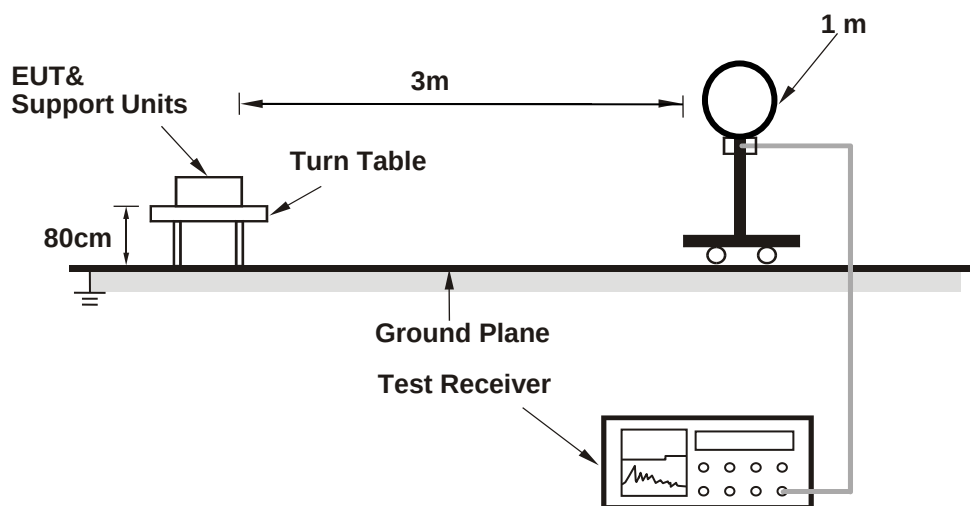
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

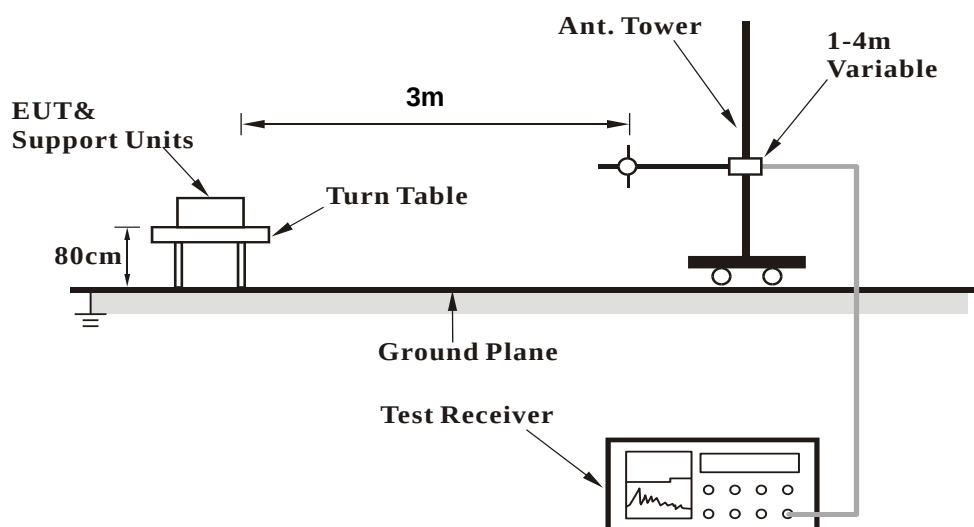
No deviation.

4.1.5 Test Setup

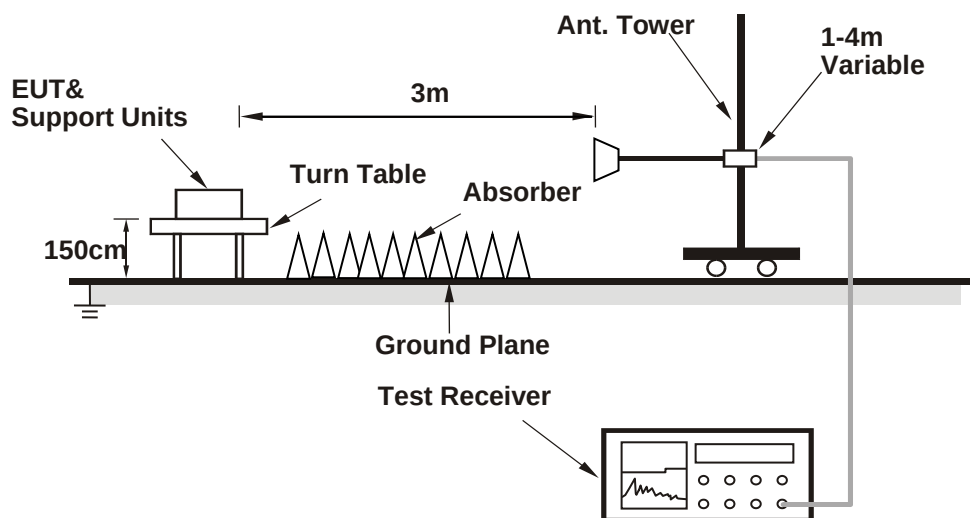
For Radiated emission below 30MHz



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

- Connected the EUT with the Laptop Computer which is placed on the testing table.
- Controlling software (QA tool (0.0.2.6)) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results (Mode 1)

Above 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.0 PK	74.0	-19.0	1.19 H	20	57.0	-2.0
2	2390.00	44.5 AV	54.0	-9.5	1.19 H	20	46.5	-2.0
3	*2412.00	100.2 PK			1.19 H	20	102.2	-2.0
4	*2412.00	98.5 AV			1.19 H	20	100.5	-2.0
5	4824.00	47.8 PK	74.0	-26.2	1.48 H	184	45.5	2.3
6	4824.00	44.3 AV	54.0	-9.7	1.48 H	184	42.0	2.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.2 PK	74.0	-16.8	1.22 V	303	59.2	-2.0
2	2390.00	46.4 AV	54.0	-7.6	1.22 V	303	48.4	-2.0
3	*2412.00	111.8 PK			1.22 V	303	113.8	-2.0
4	*2412.00	109.8 AV			1.22 V	303	111.8	-2.0
5	4824.00	45.6 PK	74.0	-28.4	1.57 V	206	43.3	2.3
6	4824.00	42.2 AV	54.0	-11.8	1.57 V	206	39.9	2.3

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	100.1 PK			1.15 H	35	102.2	-2.1
2	*2437.00	98.2 AV			1.15 H	35	100.3	-2.1
3	4874.00	43.9 PK	74.0	-30.1	1.46 H	186	41.6	2.3
4	4874.00	40.2 AV	54.0	-13.8	1.46 H	186	37.9	2.3
5	7311.00	56.3 PK	74.0	-17.7	2.49 H	180	48.0	8.3
6	7311.00	53.6 AV	54.0	-0.4	2.49 H	180	45.3	8.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	112.5 PK			1.00 V	323	114.6	-2.1
2	*2437.00	110.5 AV			1.00 V	323	112.6	-2.1
3	4874.00	45.9 PK	74.0	-28.1	1.51 V	203	43.6	2.3
4	4874.00	42.3 AV	54.0	-11.7	1.51 V	203	40.0	2.3
5	7311.00	49.2 PK	74.0	-24.8	1.36 V	43	40.9	8.3
6	7311.00	45.0 AV	54.0	-9.0	1.36 V	43	36.7	8.3

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	99.9 PK			1.20 H	33	102.1	-2.2
2	*2462.00	98.3 AV			1.20 H	33	100.5	-2.2
3	2483.50	55.1 PK	74.0	-18.9	1.20 H	33	57.3	-2.2
4	2483.50	44.7 AV	54.0	-9.3	1.20 H	33	46.9	-2.2
5	4924.00	45.6 PK	74.0	-28.4	1.64 H	169	43.1	2.5
6	4924.00	40.5 AV	54.0	-13.5	1.64 H	169	38.0	2.5
7	7386.00	56.2 PK	74.0	-17.8	2.46 H	180	47.9	8.3
8	7386.00	53.4 AV	54.0	-0.6	2.46 H	180	45.1	8.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.1 PK			1.65 V	337	114.3	-2.2
2	*2462.00	110.2 AV			1.65 V	337	112.4	-2.2
3	2483.50	57.2 PK	74.0	-16.8	1.65 V	337	59.4	-2.2
4	2483.50	46.3 AV	54.0	-7.7	1.65 V	337	48.5	-2.2
5	4924.00	45.7 PK	74.0	-28.3	1.51 V	191	43.2	2.5
6	4924.00	42.1 AV	54.0	-11.9	1.51 V	191	39.6	2.5
7	7386.00	48.9 PK	74.0	-25.1	1.41 V	29	40.6	8.3
8	7386.00	44.6 AV	54.0	-9.4	1.41 V	29	36.3	8.3

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.4 PK	74.0	-10.6	1.17 H	28	65.4	-2.0
2	2390.00	48.6 AV	54.0	-5.4	1.17 H	28	50.6	-2.0
3	*2412.00	104.3 PK			1.17 H	28	106.3	-2.0
4	*2412.00	94.5 AV			1.17 H	28	96.5	-2.0
5	4824.00	40.4 PK	74.0	-33.6	1.63 H	172	38.1	2.3
6	4824.00	30.3 AV	54.0	-23.7	1.63 H	172	28.0	2.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.8 PK	74.0	-7.2	1.22 V	294	68.8	-2.0
2	2390.00	52.2 AV	54.0	-1.8	1.22 V	294	54.2	-2.0
3	*2412.00	115.6 PK			1.22 V	294	117.6	-2.0
4	*2412.00	106.0 AV			1.22 V	294	108.0	-2.0
5	4824.00	40.5 PK	74.0	-33.5	1.56 V	200	38.2	2.3
6	4824.00	30.5 AV	54.0	-23.5	1.56 V	200	28.2	2.3

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	103.9 PK			1.21 H	18	106.0	-2.1
2	*2437.00	94.3 AV			1.21 H	18	96.4	-2.1
3	4874.00	40.9 PK	74.0	-33.1	1.67 H	171	38.6	2.3
4	4874.00	30.7 AV	54.0	-23.3	1.67 H	171	28.4	2.3
5	7311.00	59.8 PK	74.0	-14.2	2.41 H	144	51.5	8.3
6	7311.00	48.0 AV	54.0	-6.0	2.41 H	144	39.7	8.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	115.3 PK			1.00 V	284	117.4	-2.1
2	*2437.00	105.9 AV			1.00 V	284	108.0	-2.1
3	4874.00	40.3 PK	74.0	-33.7	1.47 V	204	38.0	2.3
4	4874.00	30.3 AV	54.0	-23.7	1.47 V	204	28.0	2.3
5	7311.00	50.5 PK	74.0	-23.5	1.54 V	183	42.2	8.3
6	7311.00	38.4 AV	54.0	-15.6	1.54 V	183	30.1	8.3

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.7 PK			1.23 H	26	105.9	-2.2
2	*2462.00	94.4 AV			1.23 H	26	96.6	-2.2
3	2483.50	61.7 PK	74.0	-12.3	1.23 H	26	63.9	-2.2
4	2483.50	46.5 AV	54.0	-7.5	1.23 H	26	48.7	-2.2
5	4924.00	41.0 PK	74.0	-33.0	1.65 H	178	38.5	2.5
6	4924.00	30.9 AV	54.0	-23.1	1.65 H	178	28.4	2.5
7	7386.00	60.0 PK	74.0	-14.0	2.42 H	157	51.7	8.3
8	7386.00	47.9 AV	54.0	-6.1	2.42 H	157	39.6	8.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.7 PK			1.02 V	292	116.9	-2.2
2	*2462.00	105.8 AV			1.02 V	292	108.0	-2.2
3	2483.50	70.3 PK	74.0	-3.7	1.02 V	292	72.5	-2.2
4	2483.50	50.2 AV	54.0	-3.8	1.02 V	292	52.4	-2.2
5	4924.00	40.4 PK	74.0	-33.6	1.49 V	202	37.9	2.5
6	4924.00	30.7 AV	54.0	-23.3	1.49 V	202	28.2	2.5
7	7386.00	50.2 PK	74.0	-23.8	1.53 V	196	41.9	8.3
8	7386.00	37.9 AV	54.0	-16.1	1.53 V	196	29.6	8.3

REMARKS:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.5 PK	74.0	-15.5	1.29 H	21	60.5	-2.0
2	2390.00	47.7 AV	54.0	-6.3	1.29 H	21	49.7	-2.0
3	*2412.00	103.8 PK			1.29 H	21	105.8	-2.0
4	*2412.00	94.6 AV			1.29 H	21	96.6	-2.0
5	4824.00	41.2 PK	74.0	-32.8	1.71 H	175	38.9	2.3
6	4824.00	31.0 AV	54.0	-23.0	1.71 H	175	28.7	2.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.4 PK	74.0	-11.6	1.02 V	294	64.4	-2.0
2	2390.00	51.5 AV	54.0	-2.5	1.02 V	294	53.5	-2.0
3	*2412.00	114.3 PK			1.02 V	294	116.3	-2.0
4	*2412.00	106.1 AV			1.02 V	294	108.1	-2.0
5	4824.00	40.5 PK	74.0	-33.5	1.46 V	197	38.2	2.3
6	4824.00	30.9 AV	54.0	-23.1	1.46 V	197	28.6	2.3

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	104.1 PK			1.24 H	30	106.2	-2.1
2	*2437.00	95.0 AV			1.24 H	30	97.1	-2.1
3	4874.00	40.6 PK	74.0	-33.4	1.67 H	163	38.3	2.3
4	4874.00	30.5 AV	54.0	-23.5	1.67 H	163	28.2	2.3
5	7311.00	60.3 PK	74.0	-13.7	2.38 H	165	52.0	8.3
6	7311.00	48.0 AV	54.0	-6.0	2.38 H	165	39.7	8.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	114.1 PK			1.01 V	294	116.2	-2.1
2	*2437.00	106.2 AV			1.01 V	294	108.3	-2.1
3	4874.00	41.1 PK	74.0	-32.9	1.53 V	216	38.8	2.3
4	4874.00	31.1 AV	54.0	-22.9	1.53 V	216	28.8	2.3
5	7311.00	50.0 PK	74.0	-24.0	1.54 V	202	41.7	8.3
6	7311.00	37.5 AV	54.0	-16.5	1.54 V	202	29.2	8.3

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.2 PK			1.19 H	41	106.4	-2.2
2	*2462.00	94.9 AV			1.19 H	41	97.1	-2.2
3	2483.50	58.0 PK	74.0	-16.0	1.19 H	41	60.2	-2.2
4	2483.50	47.2 AV	54.0	-6.8	1.19 H	41	49.4	-2.2
5	4924.00	41.1 PK	74.0	-32.9	1.67 H	166	38.6	2.5
6	4924.00	30.7 AV	54.0	-23.3	1.67 H	166	28.2	2.5
7	7386.00	60.6 PK	74.0	-13.4	2.38 H	151	52.3	8.3
8	7386.00	48.4 AV	54.0	-5.6	2.38 H	151	40.1	8.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.3 PK			1.02 V	293	115.5	-2.2
2	*2462.00	105.1 AV			1.02 V	293	107.3	-2.2
3	2483.50	63.2 PK	74.0	-10.8	1.02 V	293	65.4	-2.2
4	2483.50	50.4 AV	54.0	-3.6	1.02 V	293	52.6	-2.2
5	4924.00	41.4 PK	74.0	-32.6	1.54 V	210	38.9	2.5
6	4924.00	31.2 AV	54.0	-22.8	1.54 V	210	28.7	2.5
7	7386.00	49.9 PK	74.0	-24.1	1.50 V	188	41.6	8.3
8	7386.00	37.2 AV	54.0	-16.8	1.50 V	188	28.9	8.3

REMARKS:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.8 PK	74.0	-15.2	1.22 H	52	60.8	-2.0
2	2390.00	48.2 AV	54.0	-5.8	1.22 H	52	50.2	-2.0
3	*2422.00	101.7 PK			1.22 H	52	103.7	-2.0
4	*2422.00	92.6 AV			1.22 H	52	94.6	-2.0
5	4844.00	40.7 PK	74.0	-33.3	1.67 H	167	38.4	2.3
6	4844.00	30.3 AV	54.0	-23.7	1.67 H	167	28.0	2.3
7	7266.00	59.2 PK	74.0	-14.8	2.39 H	154	50.8	8.4
8	7266.00	46.4 AV	54.0	-7.6	2.39 H	154	38.0	8.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.9 PK	74.0	-9.1	1.01 V	294	66.9	-2.0
2	2390.00	53.2 AV	54.0	-0.8	1.01 V	294	55.2	-2.0
3	*2422.00	110.3 PK			1.01 V	294	112.3	-2.0
4	*2422.00	102.4 AV			1.01 V	294	104.4	-2.0
5	4844.00	40.8 PK	74.0	-33.2	1.59 V	217	38.5	2.3
6	4844.00	30.9 AV	54.0	-23.1	1.59 V	217	28.6	2.3
7	7266.00	50.2 PK	74.0	-23.8	1.50 V	199	41.8	8.4
8	7266.00	37.6 AV	54.0	-16.4	1.50 V	199	29.2	8.4

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.6 PK	74.0	-15.4	1.21 H	42	60.6	-2.0
2	2390.00	48.2 AV	54.0	-5.8	1.21 H	42	50.2	-2.0
3	*2437.00	101.9 PK			1.21 H	42	104.0	-2.1
4	*2437.00	93.0 AV			1.21 H	42	95.1	-2.1
5	2483.50	58.8 PK	74.0	-15.2	1.21 H	42	61.0	-2.2
6	2483.50	48.4 AV	54.0	-5.6	1.21 H	42	50.6	-2.2
7	4874.00	40.3 PK	74.0	-33.7	1.66 H	162	38.0	2.3
8	4874.00	29.9 AV	54.0	-24.1	1.66 H	162	27.6	2.3
9	7311.00	59.2 PK	74.0	-14.8	2.35 H	142	50.9	8.3
10	7311.00	46.3 AV	54.0	-7.7	2.35 H	142	38.0	8.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.8 PK	74.0	-12.2	1.00 V	293	63.8	-2.0
2	2390.00	51.6 AV	54.0	-2.4	1.00 V	293	53.6	-2.0
3	*2437.00	111.9 PK			1.00 V	293	114.0	-2.1
4	*2437.00	103.9 AV			1.00 V	293	106.0	-2.1
5	2483.50	62.8 PK	74.0	-11.2	1.00 V	293	65.0	-2.2
6	2483.50	51.4 AV	54.0	-2.6	1.00 V	293	53.6	-2.2
7	4874.00	40.5 PK	74.0	-33.5	1.57 V	203	38.2	2.3
8	4874.00	30.8 AV	54.0	-23.2	1.57 V	203	28.5	2.3
9	7311.00	50.0 PK	74.0	-24.0	1.55 V	187	41.7	8.3
10	7311.00	37.2 AV	54.0	-16.8	1.55 V	187	28.9	8.3

REMARKS:

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

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	102.1 PK			1.17 H	51	104.3	-2.2
2	*2452.00	92.8 AV			1.17 H	51	95.0	-2.2
3	2483.50	58.9 PK	74.0	-15.1	1.17 H	51	61.1	-2.2
4	2483.50	48.2 AV	54.0	-5.8	1.17 H	51	50.4	-2.2
5	4904.00	40.1 PK	74.0	-33.9	1.65 H	177	37.7	2.4
6	4904.00	29.5 AV	54.0	-24.5	1.65 H	177	27.1	2.4
7	7356.00	59.5 PK	74.0	-14.5	2.36 H	132	51.3	8.2
8	7356.00	46.7 AV	54.0	-7.3	2.36 H	132	38.5	8.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	110.7 PK			1.00 V	293	112.9	-2.2
2	*2452.00	102.4 AV			1.00 V	293	104.6	-2.2
3	2483.50	66.1 PK	74.0	-7.9	1.00 V	293	68.3	-2.2
4	2483.50	53.3 AV	54.0	-0.7	1.00 V	293	55.5	-2.2
5	4904.00	40.7 PK	74.0	-33.3	1.59 V	200	38.3	2.4
6	4904.00	30.9 AV	54.0	-23.1	1.59 V	200	28.5	2.4
7	7356.00	50.5 PK	74.0	-23.5	1.55 V	179	42.3	8.2
8	7356.00	37.4 AV	54.0	-16.6	1.55 V	179	29.2	8.2

REMARKS:

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

Below 1GHz Data:

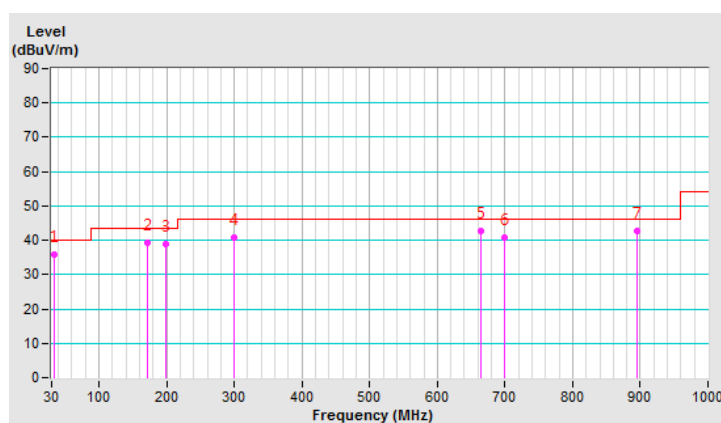
802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.23	35.8 QP	40.0	-4.2	1.00 H	296	45.3	-9.5
2	170.82	39.1 QP	43.5	-4.4	1.50 H	120	47.6	-8.5
3	199.48	38.9 QP	43.5	-4.6	1.50 H	120	49.0	-10.1
4	298.74	40.9 QP	46.0	-5.1	1.00 H	240	47.5	-6.6
5	663.85	42.6 QP	46.0	-3.4	1.50 H	135	40.8	1.8
6	698.43	40.8 QP	46.0	-5.2	1.50 H	158	38.4	2.4
7	896.16	42.8 QP	46.0	-3.2	1.00 H	158	37.1	5.7

REMARKS:

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

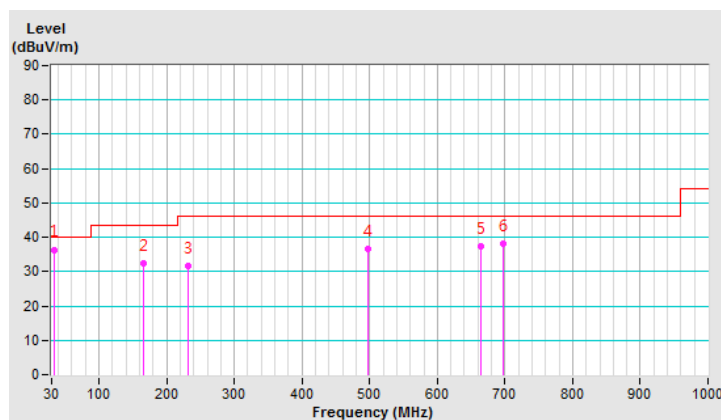


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.25	36.4 QP	40.0	-3.6	1.50 V	155	45.9	-9.5
2	165.76	32.5 QP	43.5	-11.0	1.00 V	251	40.9	-8.4
3	232.28	31.7 QP	46.0	-14.3	1.50 V	244	40.9	-9.2
4	497.88	36.6 QP	46.0	-9.4	1.00 V	360	38.1	-1.5
5	663.82	37.2 QP	46.0	-8.8	1.00 V	84	35.4	1.8
6	698.24	38.1 QP	46.0	-7.9	1.50 V	289	35.7	2.4

REMARKS:

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



4.1.8 Test Results (Mode 2)

Above 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.3 PK	74.0	-19.7	1.63 H	58	56.3	-2.0
2	2390.00	43.7 AV	54.0	-10.3	1.63 H	58	45.7	-2.0
3	*2412.00	104.4 PK			1.63 H	58	106.4	-2.0
4	*2412.00	102.6 AV			1.63 H	58	104.6	-2.0
5	4824.00	42.6 PK	74.0	-31.4	2.27 H	196	40.3	2.3
6	4824.00	33.2 AV	54.0	-20.8	2.27 H	196	30.9	2.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.2 PK	74.0	-17.8	2.21 V	72	58.2	-2.0
2	2390.00	45.3 AV	54.0	-8.7	2.21 V	72	47.3	-2.0
3	*2412.00	116.0 PK			2.21 V	72	118.0	-2.0
4	*2412.00	113.9 AV			2.21 V	72	115.9	-2.0
5	4824.00	44.6 PK	74.0	-29.4	2.57 V	206	42.3	2.3
6	4824.00	40.0 AV	54.0	-14.0	2.57 V	206	37.7	2.3

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.5 PK	74.0	-19.5	1.61 H	52	56.5	-2.0
2	2390.00	44.1 AV	54.0	-9.9	1.61 H	52	46.1	-2.0
3	*2437.00	104.6 PK			1.61 H	52	106.7	-2.1
4	*2437.00	102.9 AV			1.61 H	52	105.0	-2.1
5	2483.50	54.9 PK	74.0	-19.1	1.61 H	52	57.1	-2.2
6	2483.50	44.3 AV	54.0	-9.7	1.61 H	52	46.5	-2.2
7	4874.00	42.6 PK	74.0	-31.4	2.31 H	202	40.3	2.3
8	4874.00	32.9 AV	54.0	-21.1	2.31 H	202	30.6	2.3
9	7311.00	46.4 PK	74.0	-27.6	1.52 H	58	38.1	8.3
10	7311.00	39.7 AV	54.0	-14.3	1.52 H	58	31.4	8.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.8 PK	74.0	-18.2	2.14 V	71	57.8	-2.0
2	2390.00	44.9 AV	54.0	-9.1	2.14 V	71	46.9	-2.0
3	*2437.00	115.7 PK			2.14 V	71	117.8	-2.1
4	*2437.00	113.7 AV			2.14 V	71	115.8	-2.1
5	2483.50	56.0 PK	74.0	-18.0	2.14 V	71	58.2	-2.2
6	2483.50	45.0 AV	54.0	-9.0	2.14 V	71	47.2	-2.2
7	4874.00	45.1 PK	74.0	-28.9	2.57 V	212	42.8	2.3
8	4874.00	40.5 AV	54.0	-13.5	2.57 V	212	38.2	2.3
9	7311.00	53.0 PK	74.0	-21.0	2.64 V	33	44.7	8.3
10	7311.00	48.8 AV	54.0	-5.2	2.64 V	33	40.5	8.3

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.2 PK			1.64 H	45	106.4	-2.2
2	*2462.00	102.6 AV			1.64 H	45	104.8	-2.2
3	2483.50	55.1 PK	74.0	-18.9	1.64 H	45	57.3	-2.2
4	2483.50	44.7 AV	54.0	-9.3	1.64 H	45	46.9	-2.2
5	4924.00	42.0 PK	74.0	-32.0	2.37 H	213	39.5	2.5
6	4924.00	32.8 AV	54.0	-21.2	2.37 H	213	30.3	2.5
7	7386.00	46.5 PK	74.0	-27.5	1.49 H	48	38.2	8.3
8	7386.00	39.3 AV	54.0	-14.7	1.49 H	48	31.0	8.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.7 PK			2.16 V	86	117.9	-2.2
2	*2462.00	113.9 AV			2.16 V	86	116.1	-2.2
3	2483.50	57.2 PK	74.0	-16.8	2.16 V	86	59.4	-2.2
4	2483.50	46.3 AV	54.0	-7.7	2.16 V	86	48.5	-2.2
5	4924.00	44.5 PK	74.0	-29.5	2.61 V	200	42.0	2.5
6	4924.00	40.2 AV	54.0	-13.8	2.61 V	200	37.7	2.5
7	7386.00	52.9 PK	74.0	-21.1	2.64 V	42	44.6	8.3
8	7386.00	48.5 AV	54.0	-5.5	2.64 V	42	40.2	8.3

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.6 PK	74.0	-16.4	1.65 H	37	59.6	-2.0
2	2390.00	45.4 AV	54.0	-8.6	1.65 H	37	47.4	-2.0
3	*2412.00	106.4 PK			1.65 H	37	108.4	-2.0
4	*2412.00	99.2 AV			1.65 H	37	101.2	-2.0
5	4824.00	40.8 PK	74.0	-33.2	2.35 H	215	38.5	2.3
6	4824.00	30.6 AV	54.0	-23.4	2.35 H	215	28.3	2.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.1 PK	74.0	-4.9	2.14 V	53	71.1	-2.0
2	2390.00	53.3 AV	54.0	-0.7	2.14 V	53	55.3	-2.0
3	*2412.00	118.0 PK			2.14 V	53	120.0	-2.0
4	*2412.00	110.0 AV			2.14 V	53	112.0	-2.0
5	4824.00	39.9 PK	74.0	-34.1	2.58 V	209	37.6	2.3
6	4824.00	30.2 AV	54.0	-23.8	2.58 V	209	27.9	2.3

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.9 PK	74.0	-13.1	1.65 H	45	62.9	-2.0
2	2390.00	44.3 AV	54.0	-9.7	1.65 H	45	46.3	-2.0
3	*2437.00	106.5 PK			1.65 H	45	108.6	-2.1
4	*2437.00	99.0 AV			1.65 H	45	101.1	-2.1
5	2483.50	62.4 PK	74.0	-11.6	1.65 H	45	64.6	-2.2
6	2483.50	45.6 AV	54.0	-8.4	1.65 H	45	47.8	-2.2
7	4874.00	41.5 PK	74.0	-32.5	2.40 H	207	39.2	2.3
8	4874.00	31.1 AV	54.0	-22.9	2.40 H	207	28.8	2.3
9	7311.00	46.7 PK	74.0	-27.3	1.49 H	50	38.4	8.3
10	7311.00	39.5 AV	54.0	-14.5	1.49 H	50	31.2	8.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.1 PK	74.0	-11.9	2.17 V	42	64.1	-2.0
2	2390.00	45.5 AV	54.0	-8.5	2.17 V	42	47.5	-2.0
3	*2437.00	117.5 PK			2.17 V	42	119.6	-2.1
4	*2437.00	109.7 AV			2.17 V	42	111.8	-2.1
5	2483.50	63.0 PK	74.0	-11.0	2.17 V	42	65.2	-2.2
6	2483.50	46.2 AV	54.0	-7.8	2.17 V	42	48.4	-2.2
7	4874.00	39.8 PK	74.0	-34.2	2.63 V	194	37.5	2.3
8	4874.00	30.4 AV	54.0	-23.6	2.63 V	194	28.1	2.3
9	7311.00	52.5 PK	74.0	-21.5	2.61 V	48	44.2	8.3
10	7311.00	48.1 AV	54.0	-5.9	2.61 V	48	39.8	8.3

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.1 PK			1.59 H	44	108.3	-2.2
2	*2462.00	99.0 AV			1.59 H	44	101.2	-2.2
3	2483.50	57.6 PK	74.0	-16.4	1.59 H	44	59.8	-2.2
4	2483.50	45.2 AV	54.0	-8.8	1.59 H	44	47.4	-2.2
5	4924.00	41.4 PK	74.0	-32.6	2.33 H	218	38.9	2.5
6	4924.00	31.1 AV	54.0	-22.9	2.33 H	218	28.6	2.5
7	7386.00	46.2 PK	74.0	-27.8	1.44 H	58	37.9	8.3
8	7386.00	39.1 AV	54.0	-14.9	1.44 H	58	30.8	8.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	117.6 PK			2.54 V	54	119.8	-2.2
2	*2462.00	110.0 AV			2.54 V	54	112.2	-2.2
3	2483.50	67.2 PK	74.0	-6.8	2.54 V	54	69.4	-2.2
4	2483.50	53.1 AV	54.0	-0.9	2.54 V	54	55.3	-2.2
5	4924.00	40.2 PK	74.0	-33.8	2.62 V	180	37.7	2.5
6	4924.00	30.7 AV	54.0	-23.3	2.62 V	180	28.2	2.5
7	7386.00	53.2 PK	74.0	-20.8	2.64 V	34	44.9	8.3
8	7386.00	48.8 AV	54.0	-5.2	2.64 V	34	40.5	8.3

REMARKS:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.0 PK	74.0	-16.0	1.68 H	51	60.0	-2.0
2	2390.00	45.8 AV	54.0	-8.2	1.68 H	51	47.8	-2.0
3	*2412.00	105.4 PK			1.68 H	51	107.4	-2.0
4	*2412.00	98.6 AV			1.68 H	51	100.6	-2.0
5	4824.00	41.3 PK	74.0	-32.7	2.37 H	226	39.0	2.3
6	4824.00	31.1 AV	54.0	-22.9	2.37 H	226	28.8	2.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.2 PK	74.0	-10.8	2.13 V	52	65.2	-2.0
2	2390.00	53.5 AV	54.0	-0.5	2.13 V	52	55.5	-2.0
3	*2412.00	115.6 PK			2.13 V	52	117.6	-2.0
4	*2412.00	108.0 AV			2.13 V	52	110.0	-2.0
5	4824.00	40.6 PK	74.0	-33.4	2.61 V	173	38.3	2.3
6	4824.00	31.0 AV	54.0	-23.0	2.61 V	173	28.7	2.3

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.8 PK	74.0	-16.2	1.66 H	46	59.8	-2.0
2	2390.00	44.5 AV	54.0	-9.5	1.66 H	46	46.5	-2.0
3	*2437.00	105.9 PK			1.66 H	46	108.0	-2.1
4	*2437.00	98.9 AV			1.66 H	46	101.0	-2.1
5	2483.50	58.5 PK	74.0	-15.5	1.66 H	46	60.7	-2.2
6	2483.50	45.3 AV	54.0	-8.7	1.66 H	46	47.5	-2.2
7	4874.00	41.4 PK	74.0	-32.6	2.34 H	223	39.1	2.3
8	4874.00	30.9 AV	54.0	-23.1	2.34 H	223	28.6	2.3
9	7311.00	45.7 PK	74.0	-28.3	1.50 H	59	37.4	8.3
10	7311.00	38.7 AV	54.0	-15.3	1.50 H	59	30.4	8.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.7 PK	74.0	-15.3	2.50 V	55	60.7	-2.0
2	2390.00	45.9 AV	54.0	-8.1	2.50 V	55	47.9	-2.0
3	*2437.00	116.2 PK			2.50 V	55	118.3	-2.1
4	*2437.00	108.5 AV			2.50 V	55	110.6	-2.1
5	2483.50	59.1 PK	74.0	-14.9	2.50 V	55	61.3	-2.2
6	2483.50	46.7 AV	54.0	-7.3	2.50 V	55	48.9	-2.2
7	4874.00	40.0 PK	74.0	-34.0	2.57 V	193	37.7	2.3
8	4874.00	30.6 AV	54.0	-23.4	2.57 V	193	28.3	2.3
9	7311.00	51.3 PK	74.0	-22.7	2.60 V	33	43.0	8.3
10	7311.00	46.7 AV	54.0	-7.3	2.60 V	33	38.4	8.3

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.3 PK			1.63 H	47	108.5	-2.2
2	*2462.00	99.2 AV			1.63 H	47	101.4	-2.2
3	2483.50	58.0 PK	74.0	-16.0	1.63 H	47	60.2	-2.2
4	2483.50	45.6 AV	54.0	-8.4	1.63 H	47	47.8	-2.2
5	4924.00	41.0 PK	74.0	-33.0	2.37 H	215	38.5	2.5
6	4924.00	30.8 AV	54.0	-23.2	2.37 H	215	28.3	2.5
7	7386.00	46.9 PK	74.0	-27.1	1.46 H	49	38.6	8.3
8	7386.00	39.5 AV	54.0	-14.5	1.46 H	49	31.2	8.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	116.0 PK			2.56 V	54	118.2	-2.2
2	*2462.00	108.0 AV			2.56 V	54	110.2	-2.2
3	2483.50	64.9 PK	74.0	-9.1	2.56 V	54	67.1	-2.2
4	2483.50	53.2 AV	54.0	-0.8	2.56 V	54	55.4	-2.2
5	4924.00	39.9 PK	74.0	-34.1	2.62 V	190	37.4	2.5
6	4924.00	30.5 AV	54.0	-23.5	2.62 V	190	28.0	2.5
7	7386.00	51.6 PK	74.0	-22.4	2.60 V	41	43.3	8.3
8	7386.00	46.9 AV	54.0	-7.1	2.60 V	41	38.6	8.3

REMARKS:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.7 PK	74.0	-15.3	1.60 H	33	60.7	-2.0
2	2390.00	50.6 AV	54.0	-3.4	1.60 H	33	52.6	-2.0
3	*2422.00	100.8 PK			1.60 H	33	102.8	-2.0
4	*2422.00	93.6 AV			1.60 H	33	95.6	-2.0
5	4844.00	41.0 PK	74.0	-33.0	2.35 H	217	38.7	2.3
6	4844.00	30.5 AV	54.0	-23.5	2.35 H	217	28.2	2.3
7	7266.00	46.8 PK	74.0	-27.2	1.50 H	38	38.4	8.4
8	7266.00	39.7 AV	54.0	-14.3	1.50 H	38	31.3	8.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.3 PK	74.0	-12.7	1.51 V	69	63.3	-2.0
2	2390.00	53.3 AV	54.0	-0.7	1.51 V	69	55.3	-2.0
3	*2422.00	111.3 PK			1.51 V	69	113.3	-2.0
4	*2422.00	102.9 AV			1.51 V	69	104.9	-2.0
5	4844.00	39.8 PK	74.0	-34.2	2.68 V	180	37.5	2.3
6	4844.00	30.3 AV	54.0	-23.7	2.68 V	180	28.0	2.3
7	7266.00	50.6 PK	74.0	-23.4	2.66 V	45	42.2	8.4
8	7266.00	45.2 AV	54.0	-8.8	2.66 V	45	36.8	8.4

REMARKS:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.0 PK	74.0	-13.0	1.61 H	52	63.0	-2.0
2	2390.00	50.3 AV	54.0	-3.7	1.61 H	52	52.3	-2.0
3	*2437.00	103.1 PK			1.61 H	52	105.2	-2.1
4	*2437.00	96.0 AV			1.61 H	52	98.1	-2.1
5	2483.50	63.8 PK	74.0	-10.2	1.61 H	52	66.0	-2.2
6	2483.50	51.1 AV	54.0	-2.9	1.61 H	52	53.3	-2.2
7	4874.00	41.4 PK	74.0	-32.6	2.36 H	204	39.1	2.3
8	4874.00	31.0 AV	54.0	-23.0	2.36 H	204	28.7	2.3
9	7311.00	47.1 PK	74.0	-26.9	1.47 H	29	38.8	8.3
10	7311.00	40.2 AV	54.0	-13.8	1.47 H	29	31.9	8.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.1 PK	74.0	-10.9	1.69 V	189	65.1	-2.0
2	2390.00	52.6 AV	54.0	-1.4	1.69 V	189	54.6	-2.0
3	*2437.00	113.3 PK			1.69 V	189	115.4	-2.1
4	*2437.00	105.5 AV			1.69 V	189	107.6	-2.1
5	2483.50	65.8 PK	74.0	-8.2	1.69 V	189	68.0	-2.2
6	2483.50	53.4 AV	54.0	-0.6	1.69 V	189	55.6	-2.2
7	4874.00	40.3 PK	74.0	-33.7	2.69 V	179	38.0	2.3
8	4874.00	30.6 AV	54.0	-23.4	2.69 V	179	28.3	2.3
9	7311.00	50.3 PK	74.0	-23.7	2.63 V	41	42.0	8.3
10	7311.00	44.8 AV	54.0	-9.2	2.63 V	41	36.5	8.3

REMARKS:

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

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	100.4 PK			1.61 H	56	102.6	-2.2
2	*2452.00	93.3 AV			1.61 H	56	95.5	-2.2
3	2483.50	58.4 PK	74.0	-15.6	1.61 H	56	60.6	-2.2
4	2483.50	50.2 AV	54.0	-3.8	1.61 H	56	52.4	-2.2
5	4904.00	41.3 PK	74.0	-32.7	2.31 H	214	38.9	2.4
6	4904.00	30.5 AV	54.0	-23.5	2.31 H	214	28.1	2.4
7	7356.00	46.2 PK	74.0	-27.8	1.44 H	32	38.0	8.2
8	7356.00	39.2 AV	54.0	-14.8	1.44 H	32	31.0	8.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	111.1 PK			1.50 V	70	113.3	-2.2
2	*2452.00	103.1 AV			1.50 V	70	105.3	-2.2
3	2483.50	66.1 PK	74.0	-7.9	1.50 V	70	68.3	-2.2
4	2483.50	53.5 AV	54.0	-0.5	1.50 V	70	55.7	-2.2
5	4904.00	40.1 PK	74.0	-33.9	2.64 V	190	37.7	2.4
6	4904.00	30.7 AV	54.0	-23.3	2.64 V	190	28.3	2.4
7	7356.00	50.9 PK	74.0	-23.1	2.71 V	50	42.7	8.2
8	7356.00	45.5 AV	54.0	-8.5	2.71 V	50	37.3	8.2

REMARKS:

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

Below 1GHz Data:

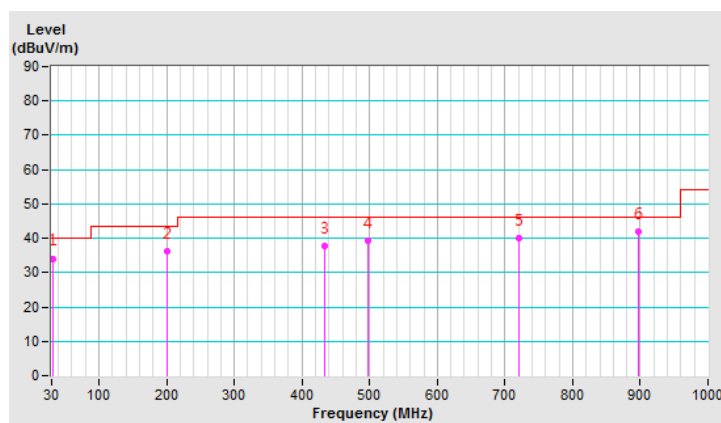
802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	32.64	34.1 QP	40.0	-5.9	1.00 H	46	43.6	-9.5
2	199.97	36.3 QP	43.5	-7.2	1.50 H	103	46.4	-10.1
3	432.87	37.7 QP	46.0	-8.3	1.50 H	103	40.9	-3.2
4	498.50	39.4 QP	46.0	-6.6	1.50 H	81	40.9	-1.5
5	720.03	39.9 QP	46.0	-6.1	1.50 H	63	37.5	2.4
6	896.90	41.8 QP	46.0	-4.2	1.50 H	77	36.1	5.7

REMARKS:

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

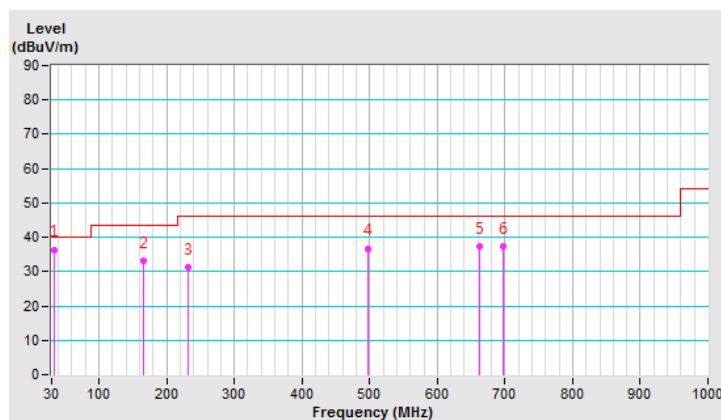


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.67	36.4 QP	40.0	-3.6	1.50 V	144	45.7	-9.3
2	165.24	33.3 QP	43.5	-10.2	1.00 V	281	41.7	-8.4
3	231.45	31.4 QP	46.0	-14.6	1.50 V	192	40.7	-9.3
4	498.38	36.8 QP	46.0	-9.2	1.50 V	232	38.3	-1.5
5	662.90	37.5 QP	46.0	-8.5	1.00 V	186	35.7	1.8
6	697.85	37.5 QP	46.0	-8.5	1.50 V	144	35.1	2.4

REMARKS:

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



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 24, 2018	Oct. 23, 2019
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 22, 2018	Oct. 21, 2019
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 17, 2019	Mar. 16, 2020
50 ohms Terminator	N/A	3	Oct. 22, 2018	Oct. 21, 2019
RF Cable	5D-FB	COCCAB-001	Sep. 28, 2018	Sep. 27, 2019
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 14, 2019	Mar. 13, 2020
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
- 3 Tested Date: Sep. 10, 2019

4.2.3 Test Procedures

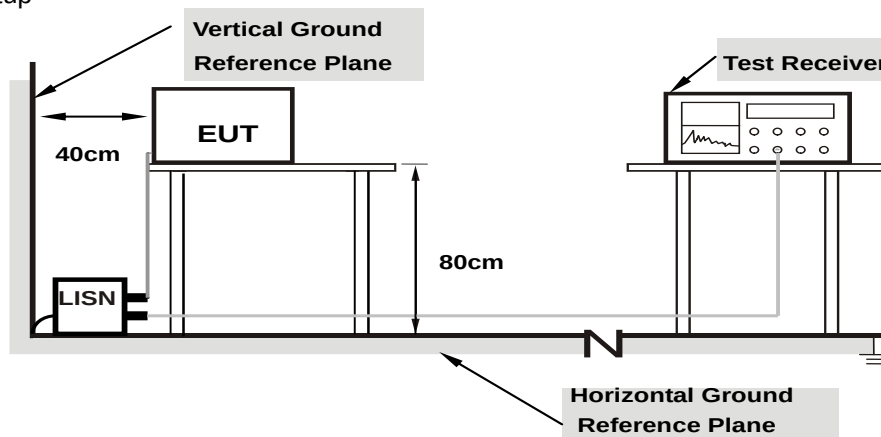
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

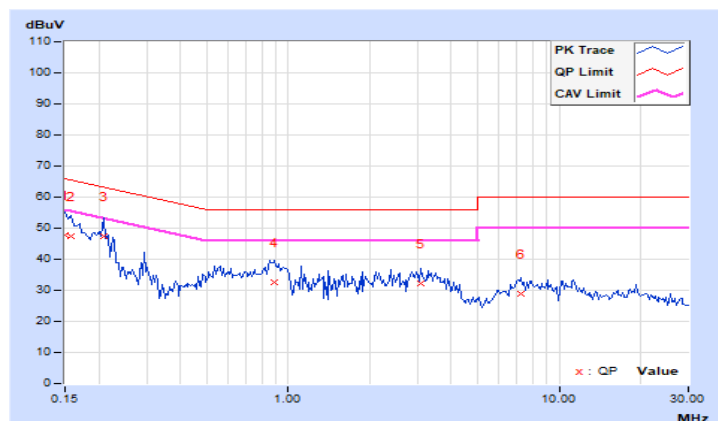
4.2.7 Test Results

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBUV)		Emission Level (dBUV)		Limit (dBUV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.95	37.70	20.61	47.65	30.56	66.00	56.00	-18.35	-25.44
2	0.15781	9.95	37.29	16.71	47.24	26.66	65.58	55.58	-18.34	-28.92
3	0.20859	9.96	37.38	19.13	47.34	29.09	63.26	53.26	-15.92	-24.17
4	0.88828	10.00	22.48	10.47	32.48	20.47	56.00	46.00	-23.52	-25.53
5	3.09375	10.12	22.23	15.03	32.35	25.15	56.00	46.00	-23.65	-20.85
6	7.19922	10.34	18.65	12.19	28.99	22.53	60.00	50.00	-31.01	-27.47

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

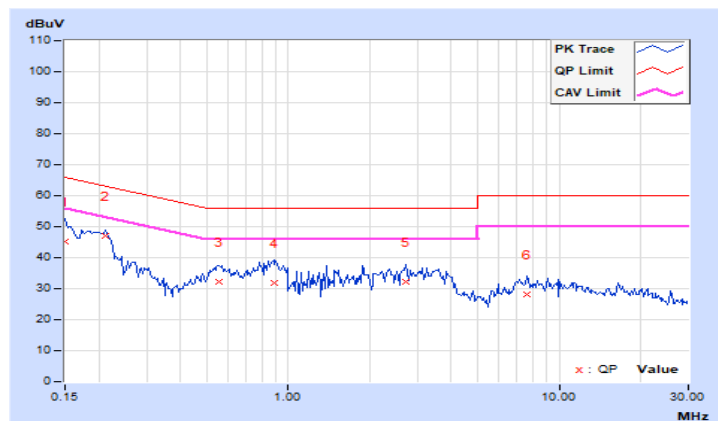


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.93	35.33	17.31	45.26	27.24	66.00	56.00	-20.74	-28.76
2	0.21250	9.94	37.22	18.32	47.16	28.26	63.11	53.11	-15.95	-24.85
3	0.55625	9.96	22.11	11.54	32.07	21.50	56.00	46.00	-23.93	-24.50
4	0.88438	9.98	21.83	10.11	31.81	20.09	56.00	46.00	-24.19	-25.91
5	2.71094	10.07	22.19	14.44	32.26	24.51	56.00	46.00	-23.74	-21.49
6	7.62500	10.27	17.90	11.86	28.17	22.13	60.00	50.00	-31.83	-27.87

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

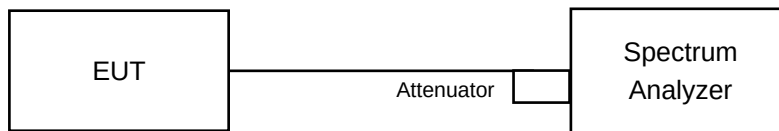


4.3 6dB Bandwidth Measurement

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

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	9.11	9.05	0.5	Pass
6	2437	8.59	9.06	0.5	Pass
11	2462	9.10	9.02	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.20	15.19	0.5	Pass
6	2437	15.20	15.21	0.5	Pass
11	2462	15.16	15.19	0.5	Pass

802.11n (HT20)

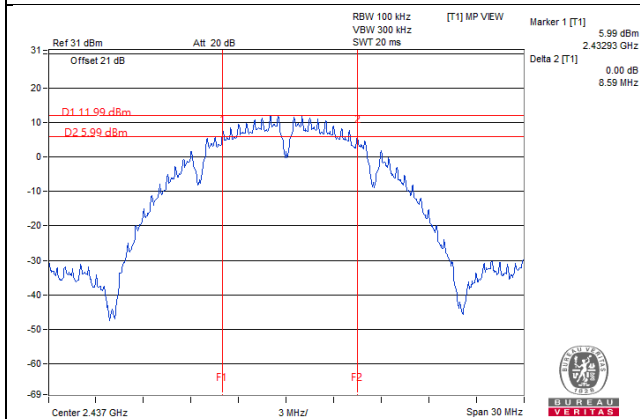
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.19	16.33	0.5	Pass
6	2437	15.15	16.27	0.5	Pass
11	2462	15.19	16.34	0.5	Pass

802.11n (HT40)

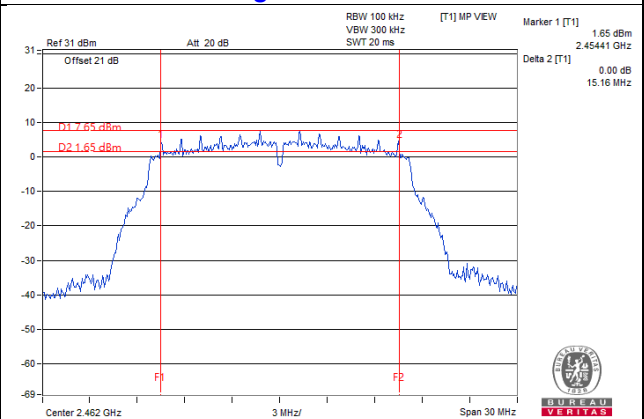
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.29	35.25	0.5	Pass
6	2437	35.15	35.18	0.5	Pass
9	2452	35.29	35.28	0.5	Pass

Spectrum Plot of Worst Value

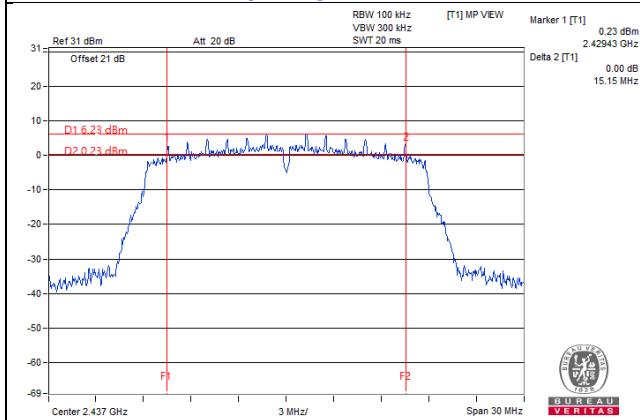
802.11b: Chain 0 / CH6



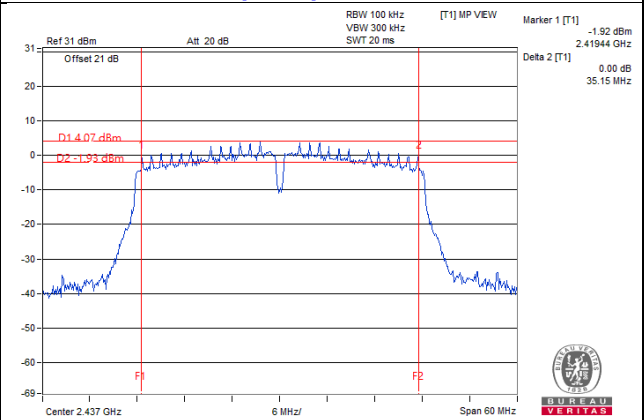
802.11g: Chain 0 / CH11



802.11n (HT20): Chain 0 / CH6



802.11n (HT40): Chain 0 / CH6

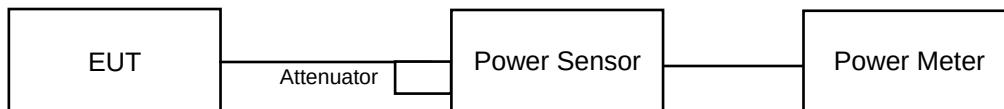


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

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

802.11b

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.74	19.45	182.294	22.61	30	Pass
6	2437	19.98	19.84	195.924	22.92	30	Pass
11	2462	19.87	19.62	188.673	22.76	30	Pass

802.11g

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.57	18.38	140.81	21.49	30	Pass
6	2437	18.99	18.71	153.552	21.86	30	Pass
11	2462	18.11	18.02	128.101	21.08	30	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2422	17.11	16.89	100.269	20.01	30	Pass
6	2437	16.83	16.42	92.048	19.64	30	Pass
11	2452	16.04	15.98	79.807	19.02	30	Pass

802.11n (HT40)

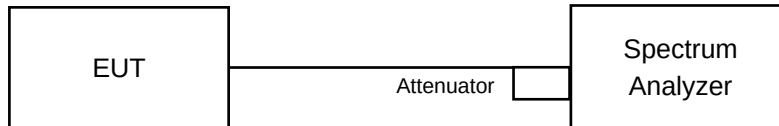
Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	14.51	14.43	55.982	17.48	30	Pass
6	2437	17.01	17.06	101.05	20.05	30	Pass
9	2452	14.67	14.63	58.349	17.66	30	Pass

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

802.11b

- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set VBW $\geq 3 \times \text{RBW}$.
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span/RBW}$.
- Sweep time = auto couple.
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.

802.11g, 802.11n (HT20), 802.11n (HT40)

- Measure the duty cycle (x).
- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set VBW $\geq 3 \times \text{RBW}$.
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span/RBW}$.
- Sweep time = auto couple.
- Do not use sweep triggering. Allow sweep to "free run".
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.
- 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

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-12.46	3.01	-9.45	7.49	Pass
	6	2437	-13.56	3.01	-10.55	7.49	Pass
	11	2462	-13.62	3.01	-10.61	7.49	Pass
1	1	2412	-13.90	3.01	-10.89	7.49	Pass
	6	2437	-13.86	3.01	-10.85	7.49	Pass
	11	2462	-13.18	3.01	-10.17	7.49	Pass

Note: Directional gain = 3.50dBi + 10 log (2) = 6.51dBi > 6dBi, so the power density limit shall be reduced to 8-(6.51-6) = 7.49dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-16.34	3.01	0.16	-13.17	7.49	Pass
	6	2437	-15.54	3.01	0.16	-12.37	7.49	Pass
	11	2462	-16.63	3.01	0.16	-13.46	7.49	Pass
1	1	2412	-16.33	3.01	0.16	-13.16	7.49	Pass
	6	2437	-16.10	3.01	0.16	-12.93	7.49	Pass
	11	2462	-16.59	3.01	0.16	-13.42	7.49	Pass

Note: 1. Directional gain = 3.50dBi + 10 log (2) = 6.51dBi > 6dBi, so the power density limit shall be reduced to 8-(6.51-6) = 7.49dBm.

2. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-17.68	3.01	0.16	-14.51	7.49	Pass
	6	2437	-18.00	3.01	0.16	-14.83	7.49	Pass
	11	2462	-18.68	3.01	0.16	-15.51	7.49	Pass
1	1	2412	-18.00	3.01	0.16	-14.83	7.49	Pass
	6	2437	-17.07	3.01	0.16	-13.90	7.49	Pass
	11	2462	-18.81	3.01	0.16	-15.64	7.49	Pass

- Note:** 1. Directional gain = $3.50\text{dBi} + 10 \log (2) = 6.51\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(6.51-6) = 7.49\text{dBm}$.
2. Refer to section 3.3 for duty cycle spectrum plot.

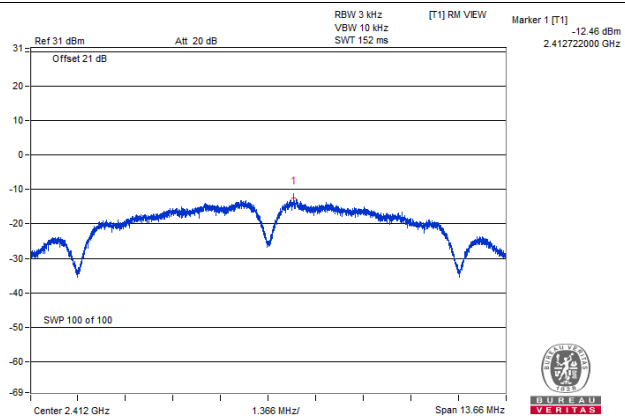
802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-21.86	3.01	0.31	-18.54	7.49	Pass
	6	2437	-19.04	3.01	0.31	-15.72	7.49	Pass
	9	2452	-21.21	3.01	0.31	-17.89	7.49	Pass
1	3	2422	-21.56	3.01	0.31	-18.24	7.49	Pass
	6	2437	-19.39	3.01	0.31	-16.07	7.49	Pass
	9	2452	-22.09	3.01	0.31	-18.77	7.49	Pass

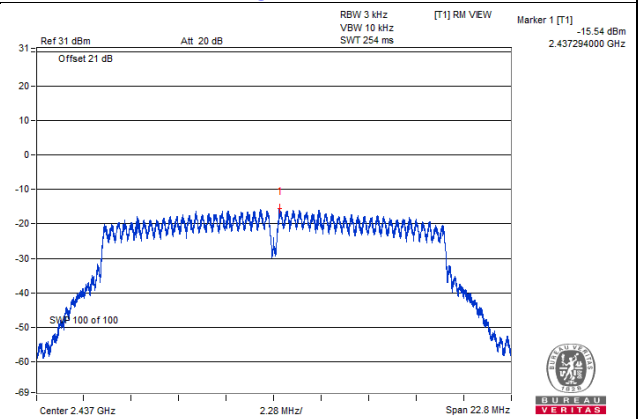
- Note:** 1. Directional gain = $3.50\text{dBi} + 10 \log (2) = 6.51\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(6.51-6) = 7.49\text{dBm}$.
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

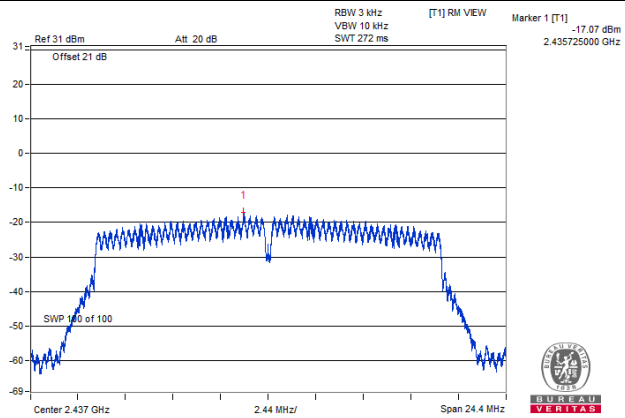
802.11b: Chain 0 / CH1



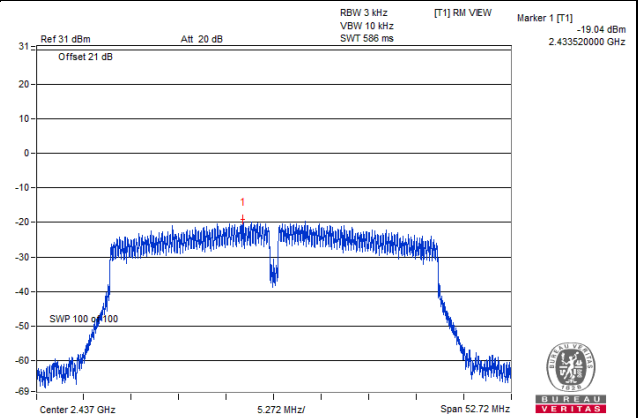
802.11g: Chain 0 / CH6



802.11n (HT20): Chain 1 / CH6



802.11n (HT40): Chain 0 / CH6

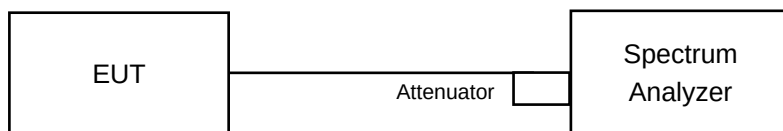


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq$ 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 OOBE

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.

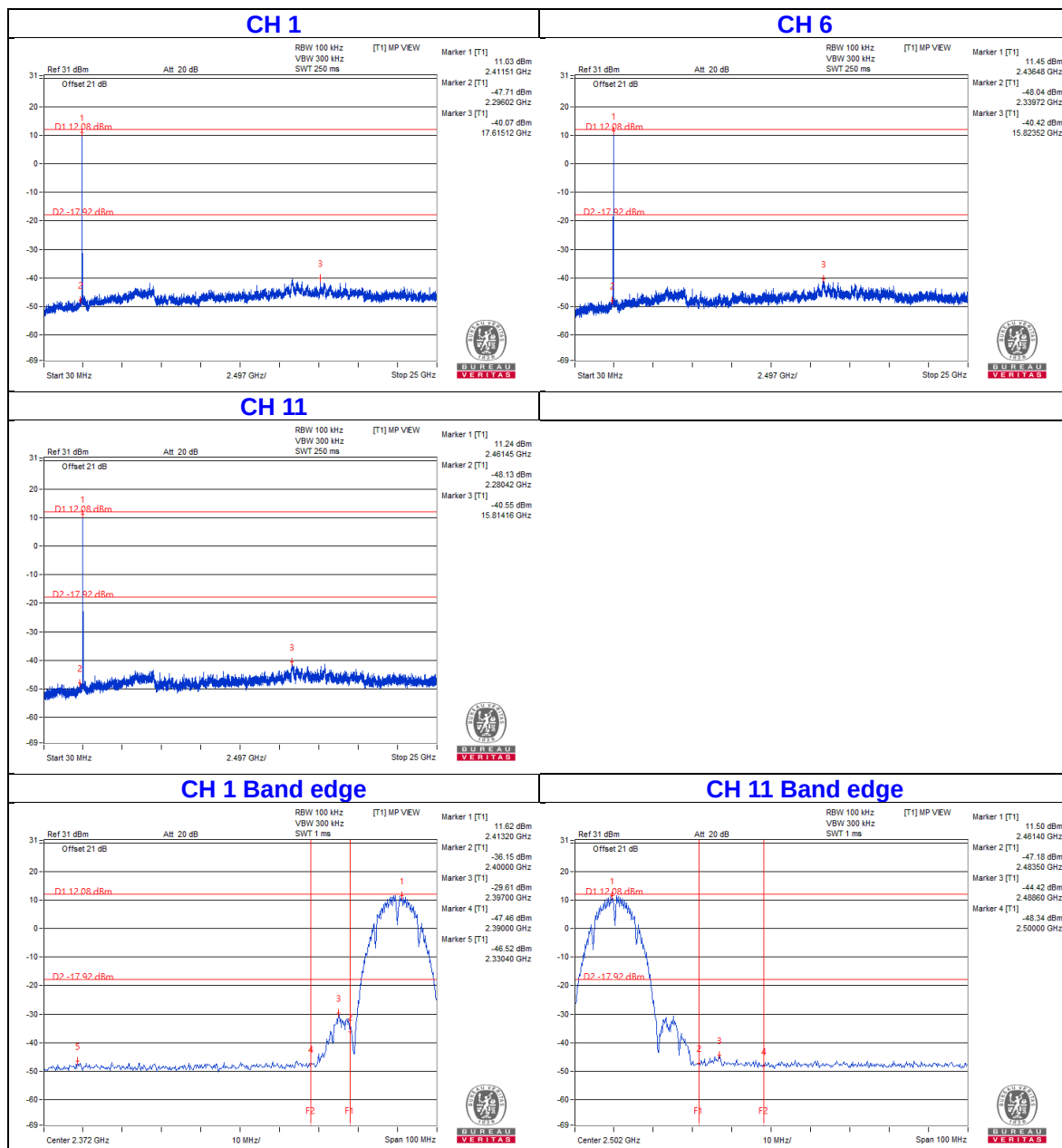
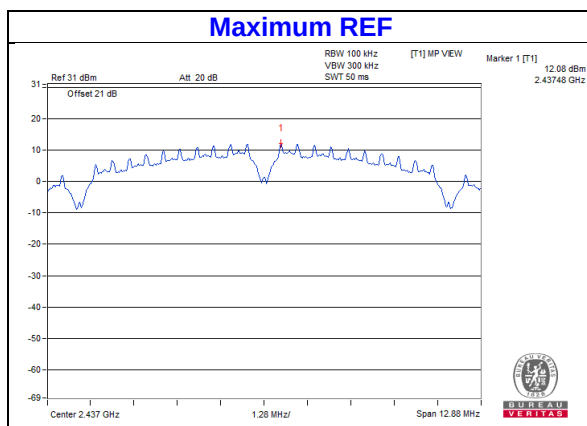
4.6.6 EUT Operating Condition

Same as Item 4.3.6

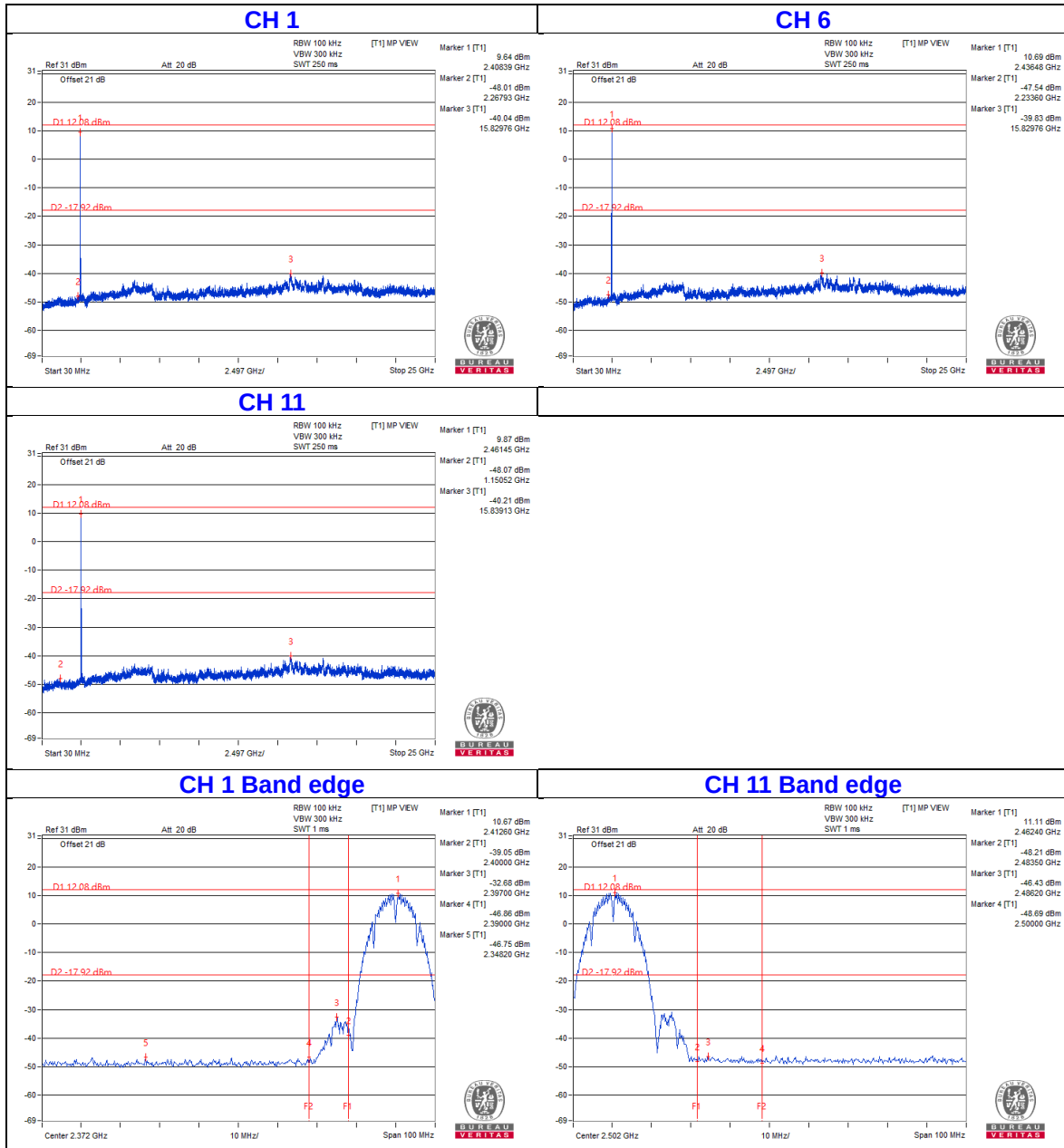
4.6.7 Test Results

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.

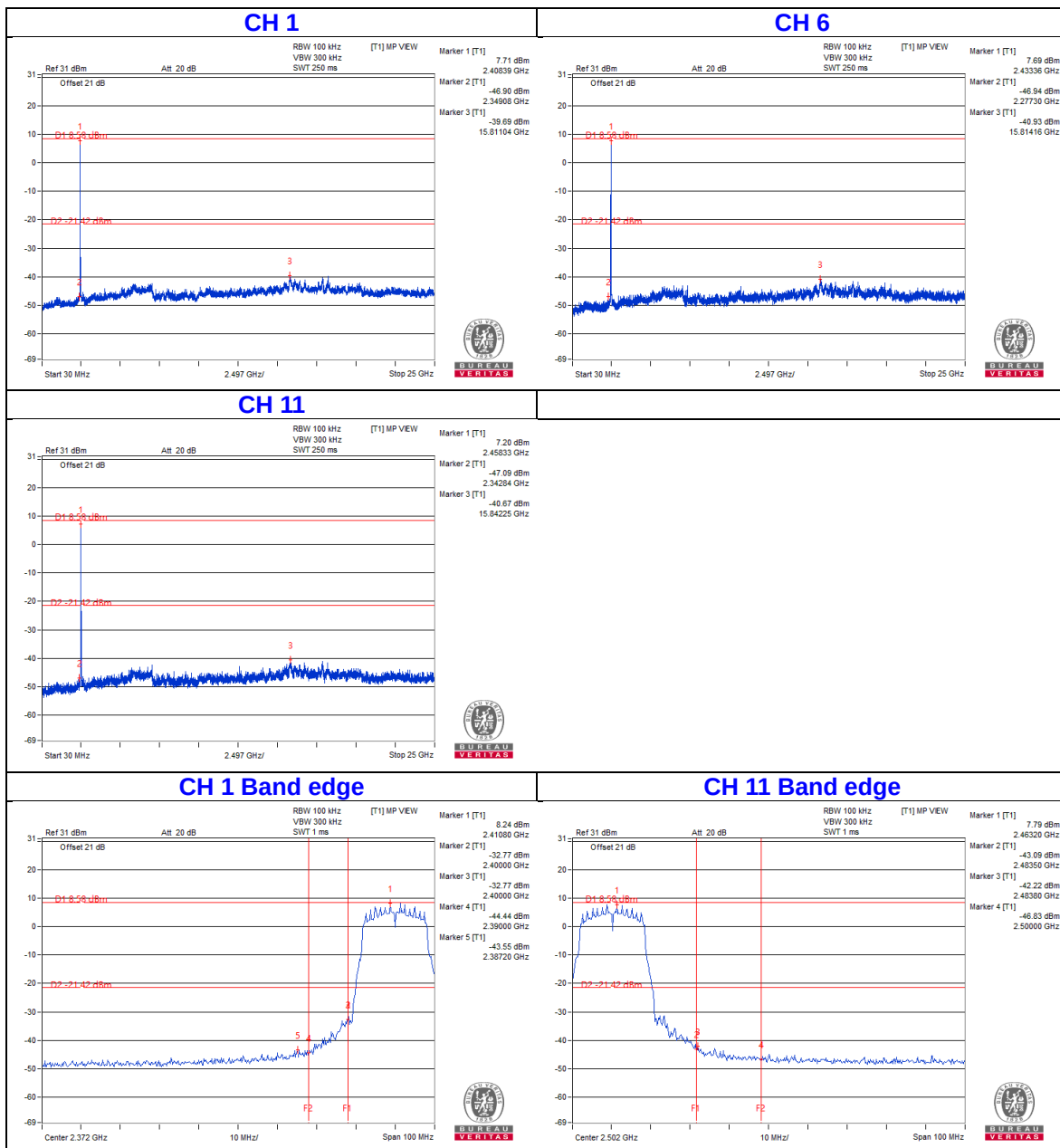
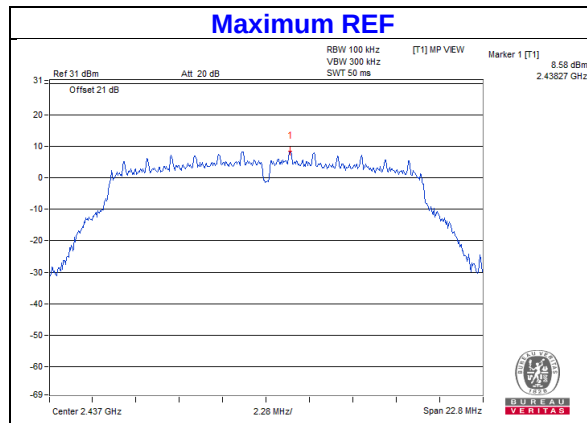
802.11b Chain0



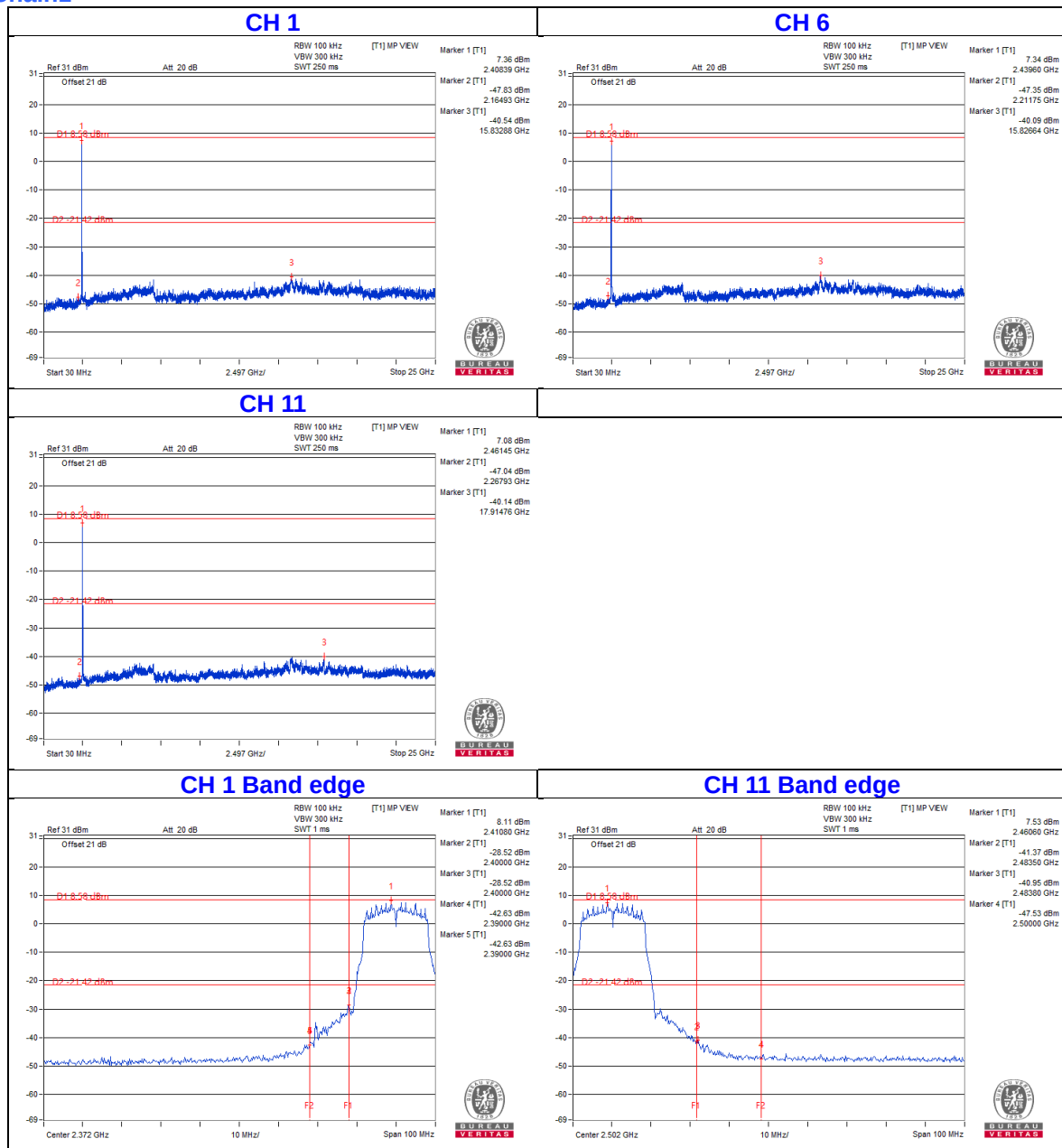
Chain1



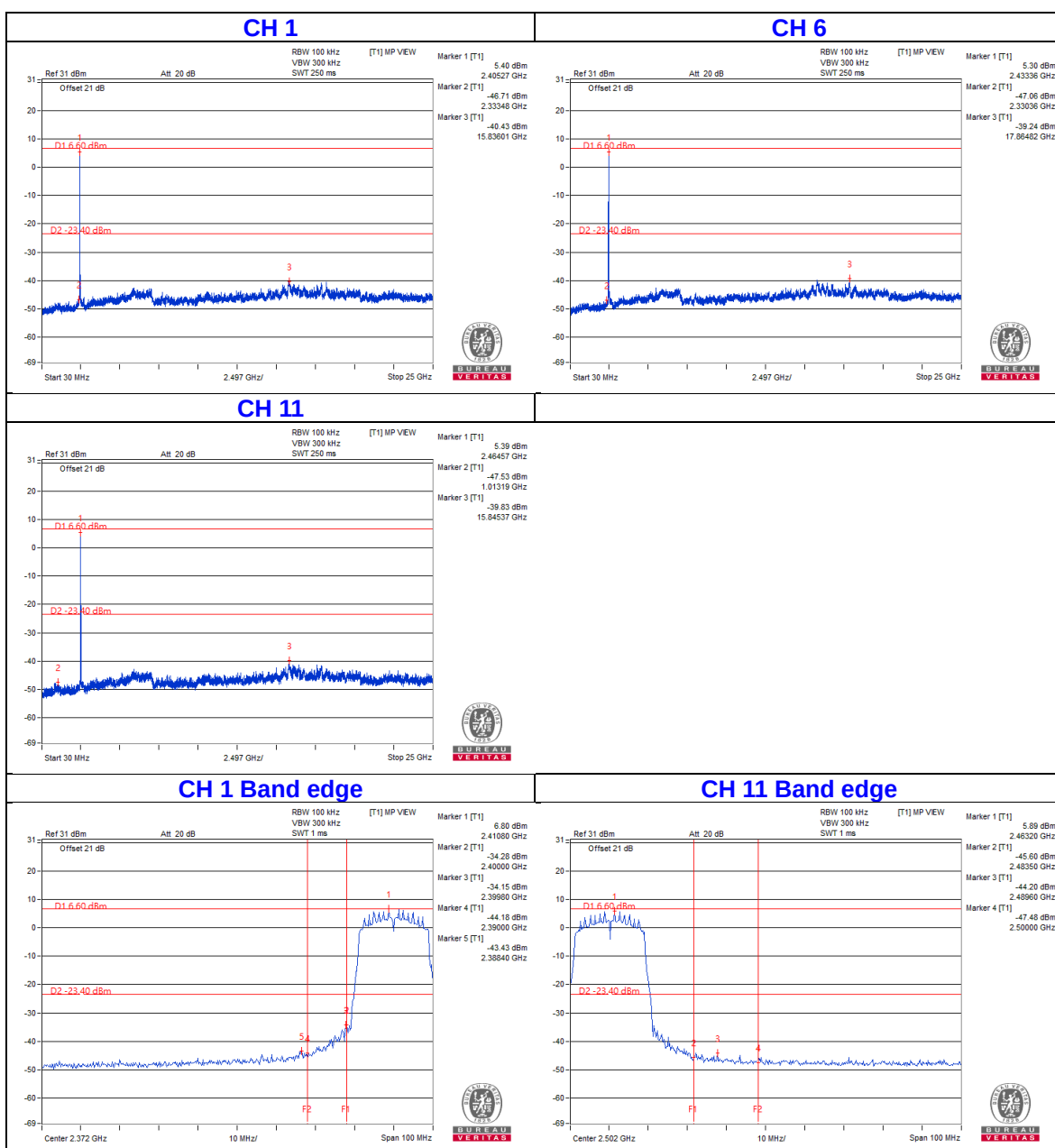
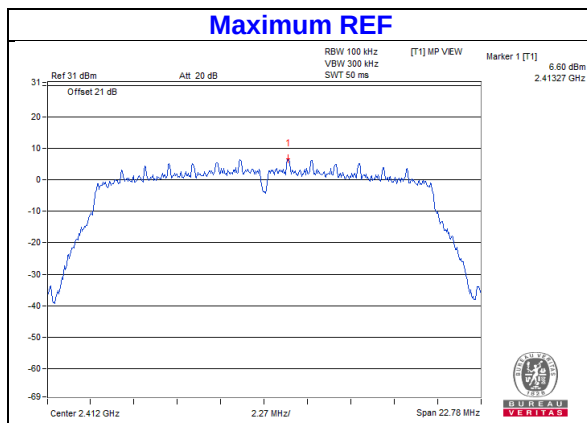
802.11g Chain0



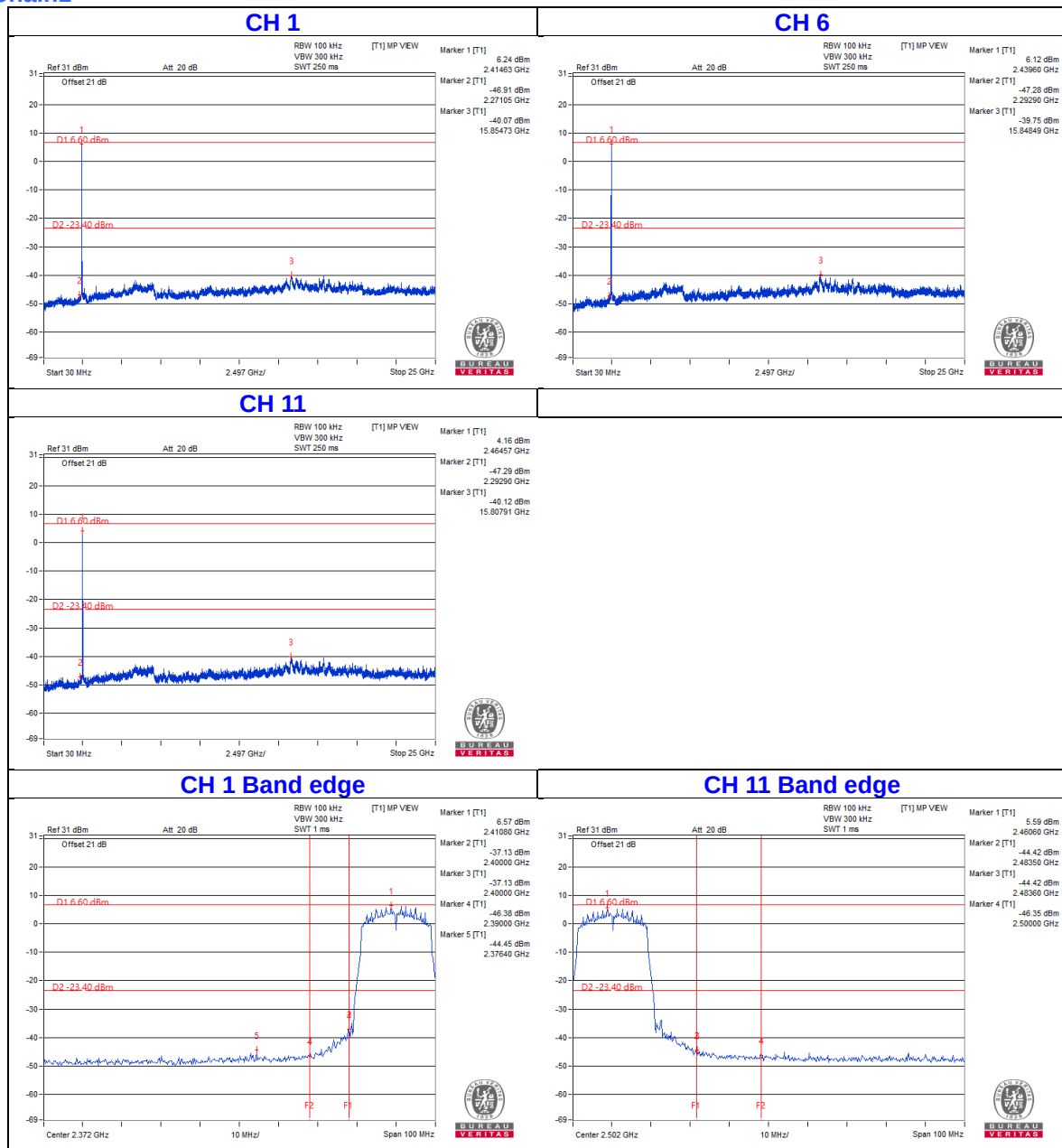
Chain1



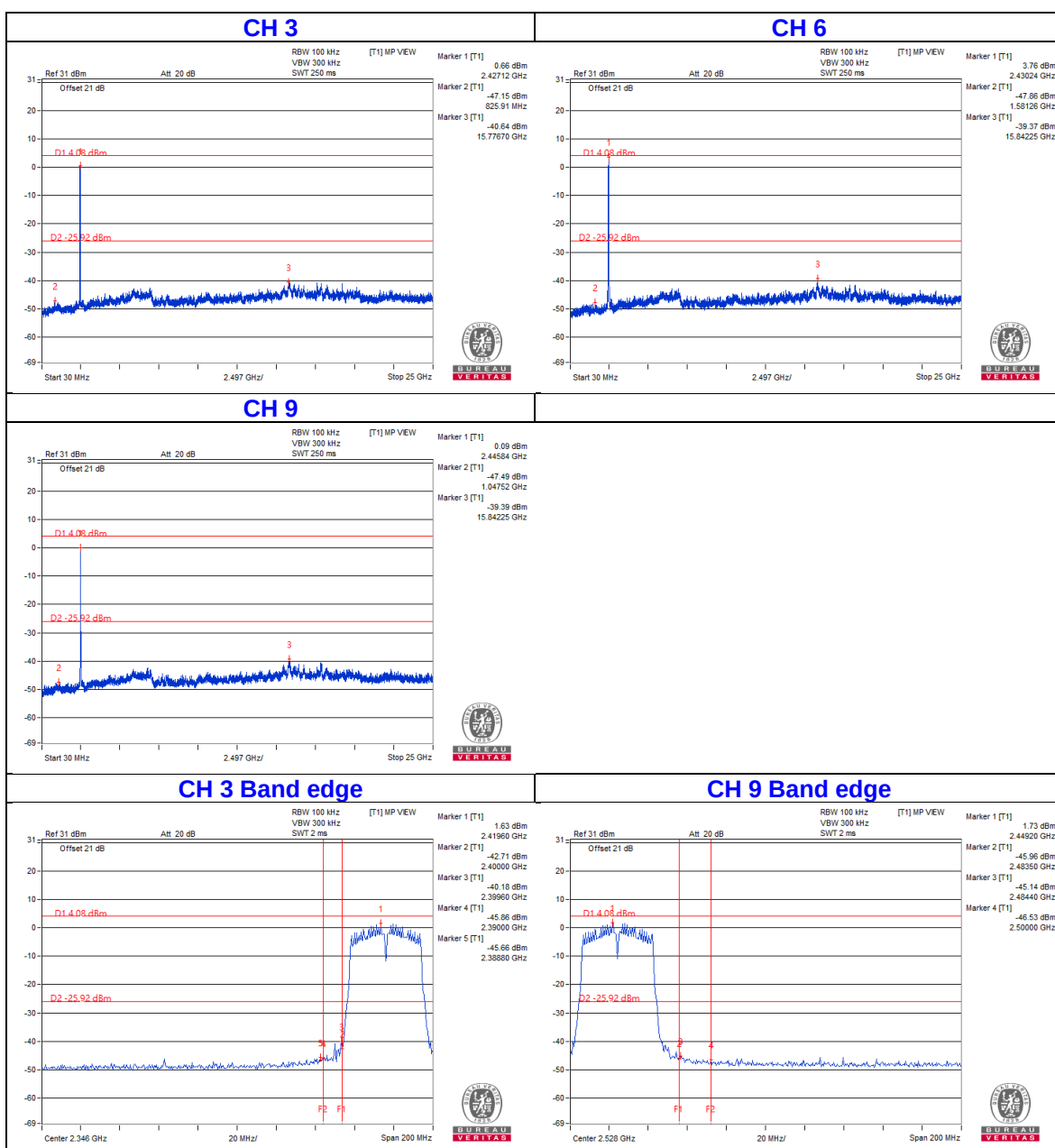
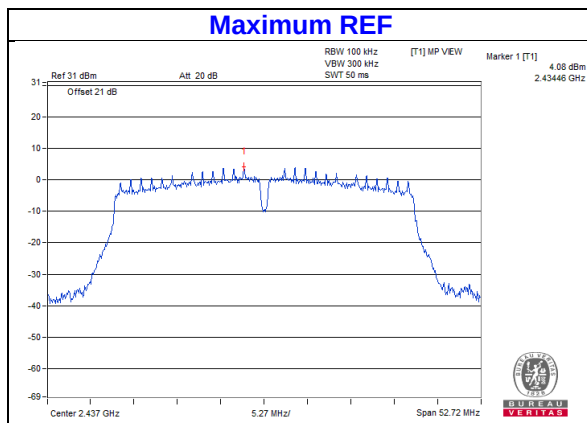
802.11n (HT20) Chain0



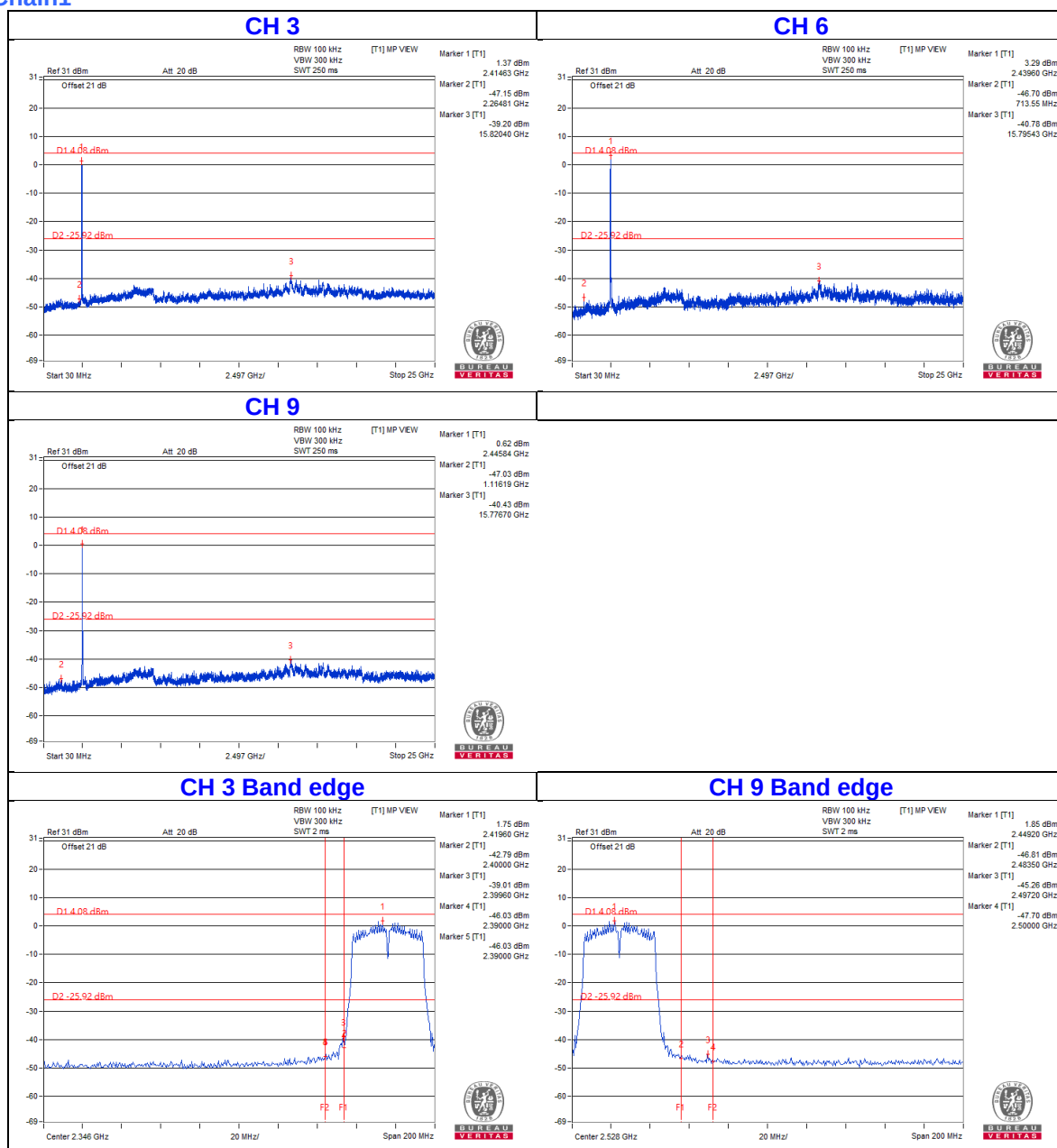
Chain1



802.11n (HT40) Chain0



Chain1



5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---