

FCC Test Report

Report No.: RF180328E06C

FCC ID: KA2AP2662A1

Test Model: DAP-2662

Received Date: Apr. 20, 2018

Test Date: Apr. 20 to Sep. 17, 2018

Issued Date: Mar. 08, 2019

Applicant: D-Link Corporation

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RF180328E06C	Original release.	Mar. 08, 2019

1 Certificate of Conformity

Product: Wireless AC1200 Wave 2 Dual-Band PoE Access Point

Brand: D-Link

Test Model: DAP-2662

Sample Status: ENGINEERING SAMPLE

Applicant: D-Link Corporation

Test Date: Apr. 20 to Sep. 17, 2018

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 : Phoenix Huang, **Date:** Mar. 08, 2019
Phoenix Huang / Specialist

Approved by : May Chen, **Date:** Mar. 08, 2019
May Chen / 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 -3.29dB at 0.15000MHz.
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 2390.00MHz, 2483.50MHz, 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) not a standard connector.
-	Occupied Bandwidth Measurement	-	Reference only

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	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.33 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless AC1200 Wave 2 Dual-Band PoE Access Point
Brand	D-Link
Test Model	DAP-2662
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter or 48Vdc from POE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
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, 5.745 ~ 5.825GHz
Number of Channel	2.4GHz: 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 5GHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	2.4GHz: 990.758mW 5GHz: 5.18GHz ~ 5.24GHz: CDD Mode: 690.612mW Beamforming Mode: 690.612mW 5.745GHz ~ 5.825GHz: CDD Mode: 660.014mW Beamforming Mode: 660.014mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. Simultaneously transmission condition.

Radio 1	Radio 2
WLAN (2.4GHz)	WLAN (5GHz)

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

2. The EUT must be supplied with a power adapter and the following different models could be chosen:

No	Brand	Model No.	Spec.
1	D-Link	WA-24Q12R	AC Input: 100-240V, 0.7A, 50/60Hz DC Output: 12V, 2A DC Output Cable: 1.2m unshielded
2	Asian Power Devices Inc.	WA-30P12R	Input: 100-240V, 0.9A, 50/60Hz Output: 12V, 2.5A DC Output Cable: 1.2m unshielded

3. For radiated emissions, the EUT was pre-tested under the following modes:

Test Mode	Description
Mode A	Power from POE
Mode B	Power from adapter 1
Mode C	Power from adapter 2

Note: From the above modes, the worst cases were found in **Mode A**. Therefore only the test data of the mode was recorded in this report.

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

Ant No.	Transmitter Circuit	Antenna Gain (dBi)	Frequency rang (GHz)	Antenna type	Connector type
1	Chain (1)	3.7	2.4~2.4835	PIFA	i-pex(MHF)
2	Chain (0)	3.8	2.4~2.4835	PIFA	i-pex(MHF)
3	Chain (1)	3.8	5.15~5.85	PIFA	i-pex(MHF)
4	Chain (0)	3.9	5.15~5.85	PIFA	i-pex(MHF)

5. The EUT incorporates a MIMO function:

2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
VHT20	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
VHT40	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
5GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
802.11ac (VHT40)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
802.11ac (VHT80)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX

Note:

1. All of modulation mode support beamforming function except (2.4GHz band & 802.11a) modulation mode.
 2. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and VHT 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 refer 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), VHT20:

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

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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
1	√	√	√	√	Power from POE
2	-	-	√	-	Power from adapter No.: 1
3	-	-	√	-	Power from adapter No.: 2

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: 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. "-" means no effect.

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)
802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5

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)
802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5

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	TESTED BY
RE $\geq$ 1G	23deg. C, 66%RH	120Vac, 60Hz	Steven Chiang
RE<1G	24deg. C, 69%RH	120Vac, 60Hz	Steven Chiang
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
	25deg. C, 75%RH	120Vac, 60Hz	Frank Chuang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

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

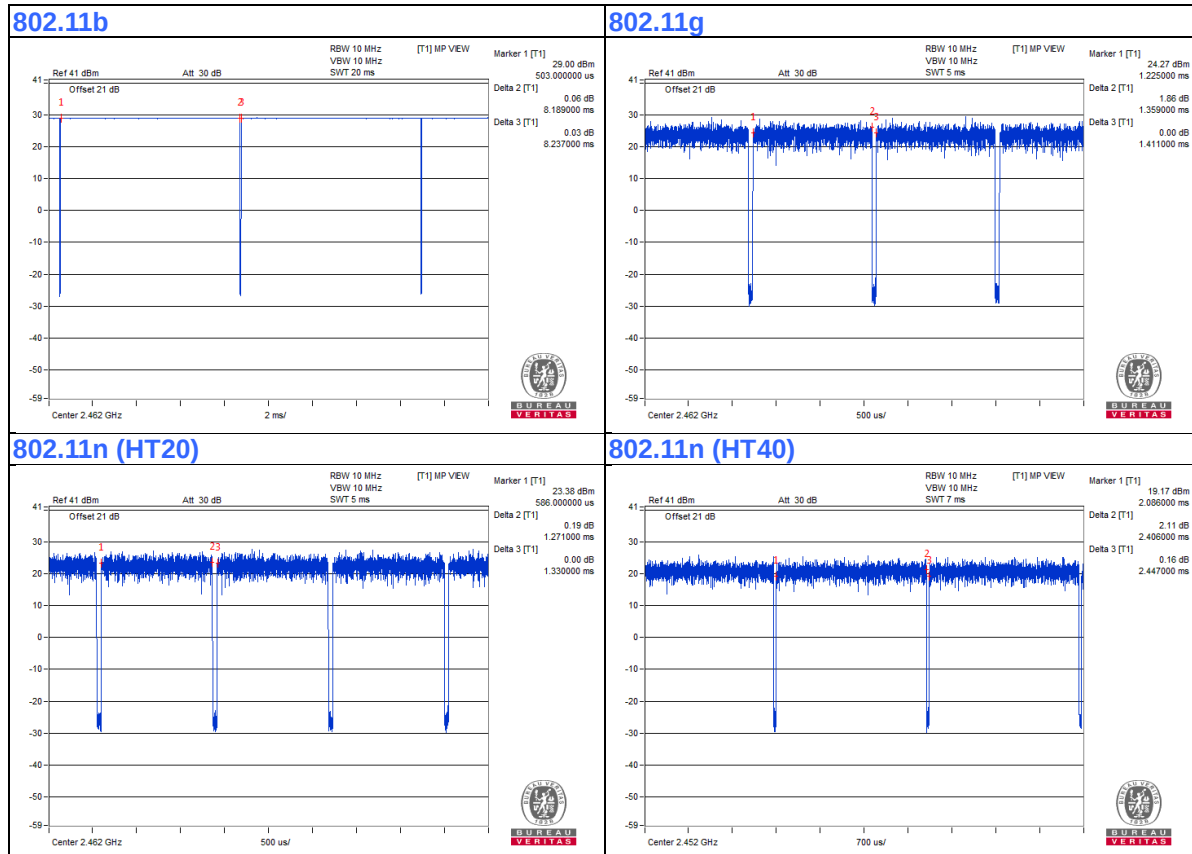
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11b: Duty cycle = $8.189/8.237 = 0.994$

802.11g: Duty cycle = $1.359/1.411 = 0.963$, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.16$

802.11n (HT20): Duty cycle = $1.271/1.33 = 0.956$, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.20$

802.11n (HT40): Duty cycle = $2.406/2.447 = 0.983$



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	NA	PCS-G300	NA	NA	Provided by Lab
B.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

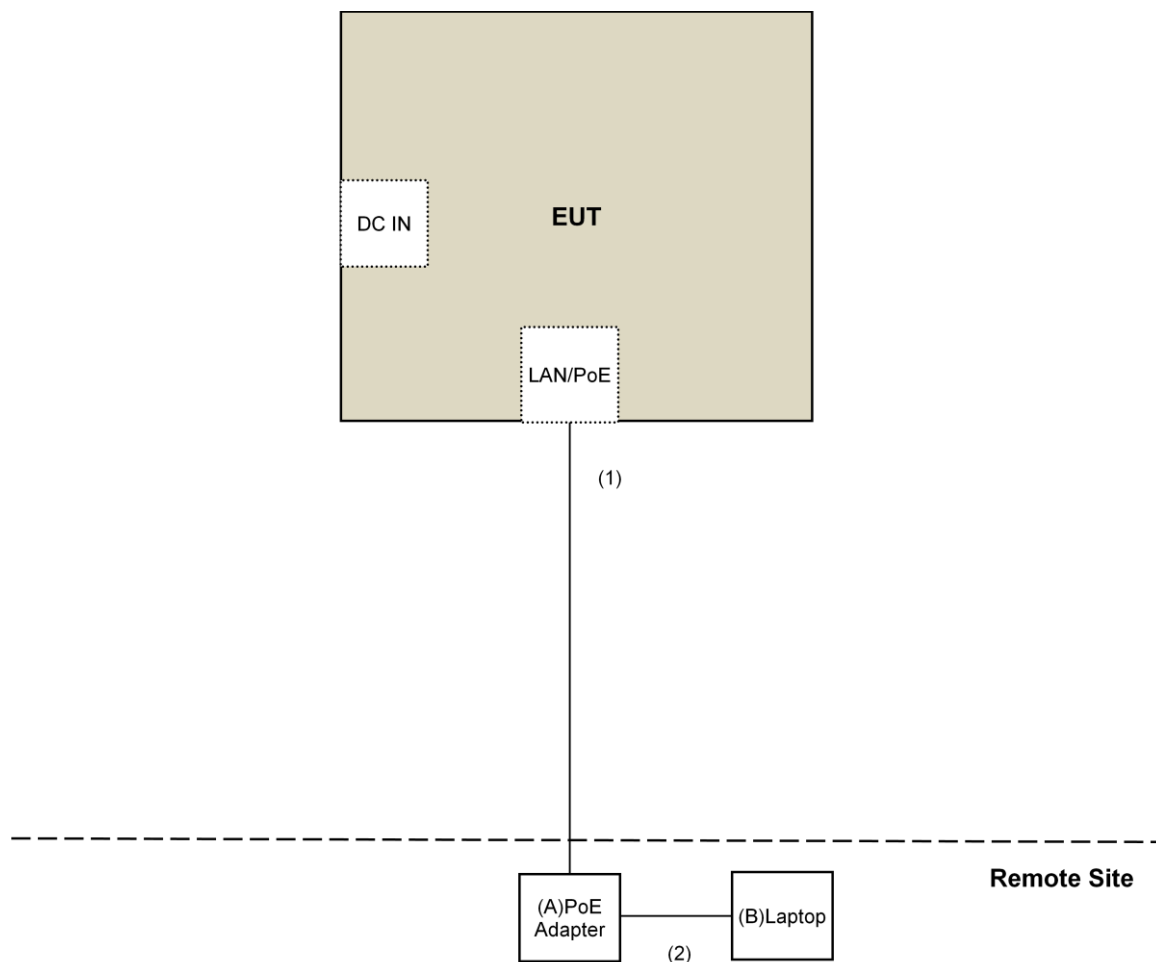
Note:

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

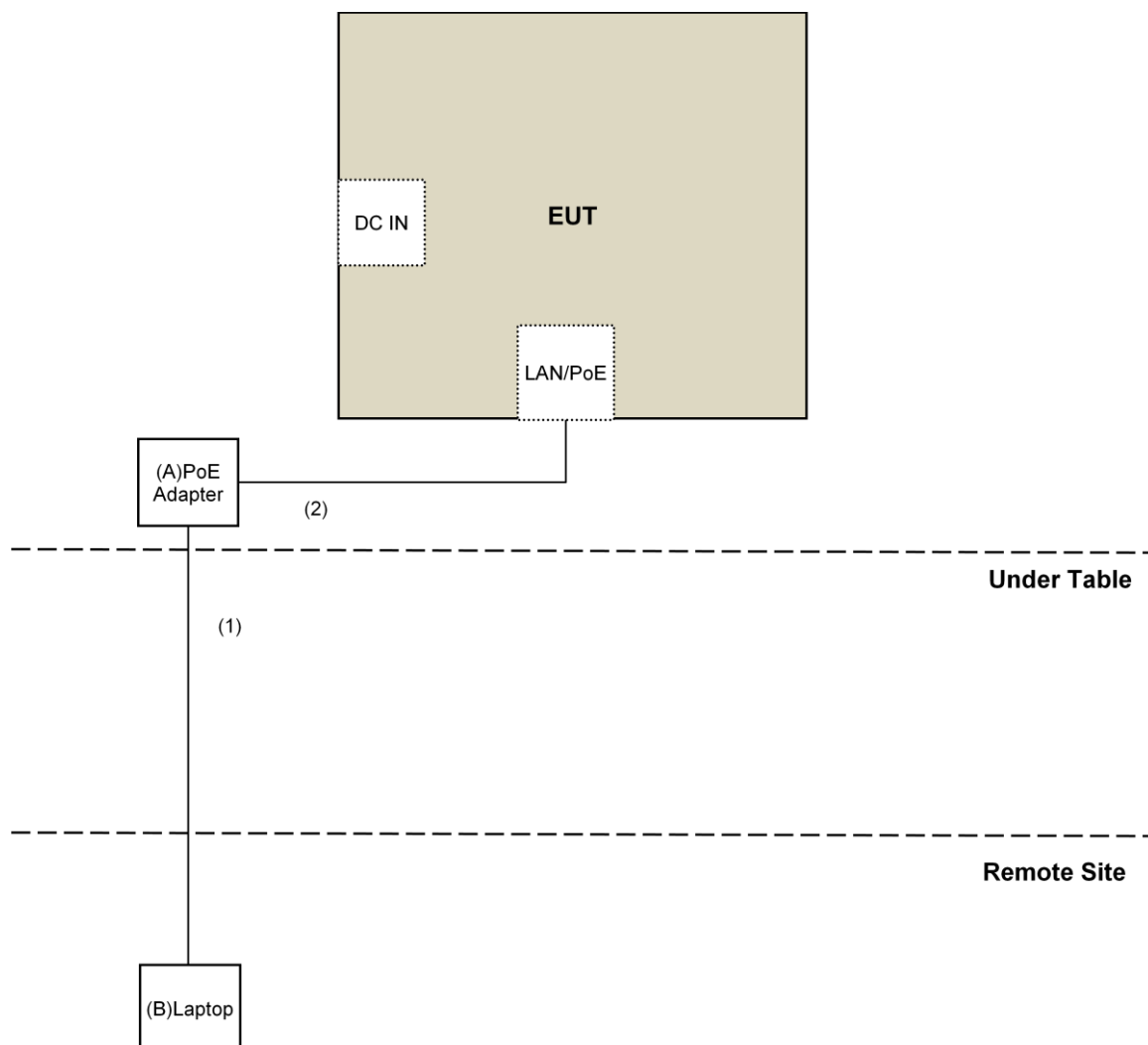
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-45 Cable	1	3	No	0	Provided by Lab
3.	DC Cable	1	1.2	No	0	Supplied by client

3.4.1 Configuration of System under Test

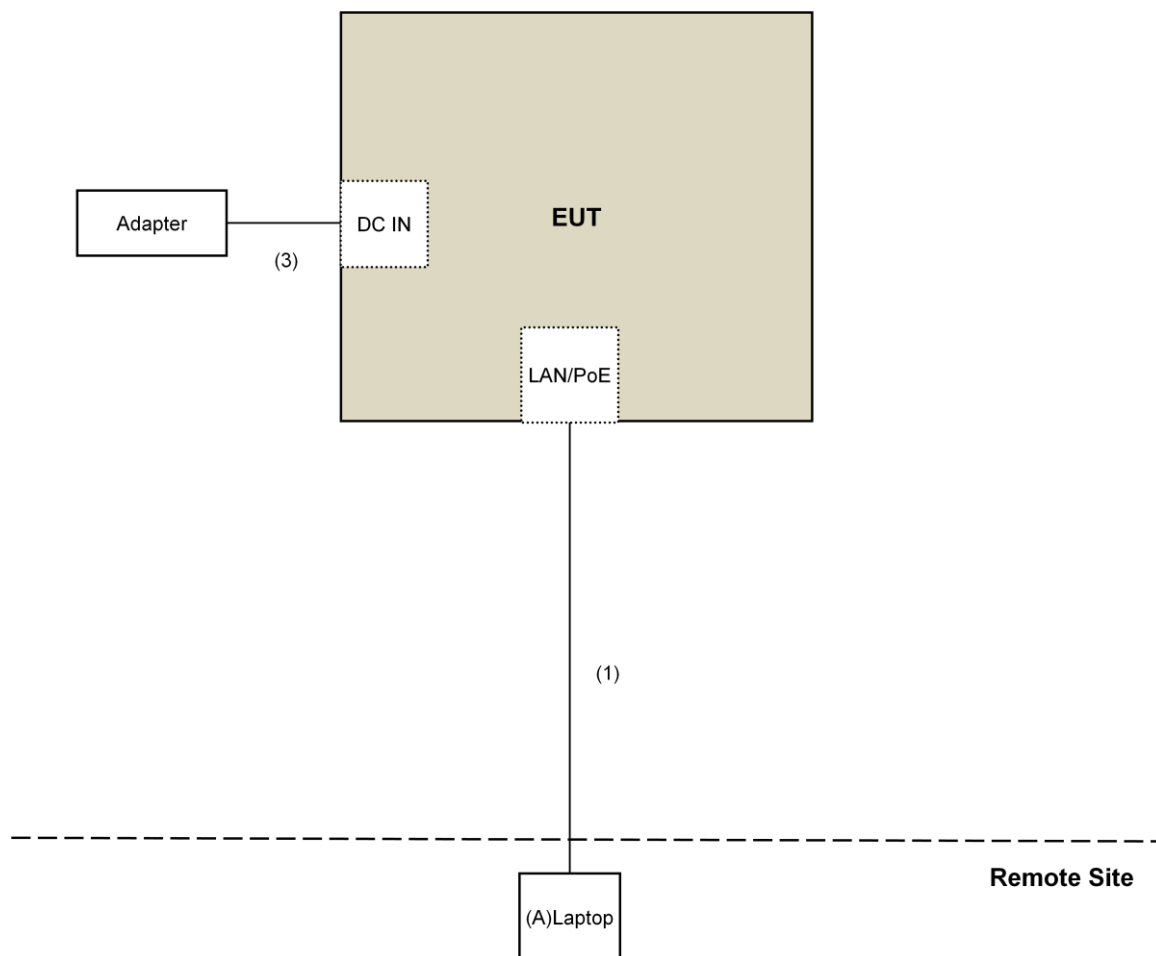
POE mode for radiated emission:



POE mode for conducted emission:



Adapter mode for conducted emission:



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 v05

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 Keysight	N9038A	MY54450088	July 08, 2017	July 07, 2018
Pre-Amplifier EMCi	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-4-1 966-4-2 966-4-3	Mar. 21, 2018	Mar. 20, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCi	EMC12630SE	980385	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160923 150318 150321	Jan. 29, 2018	Jan. 28, 2019
Pre-Amplifier EMCi	EMC184045SE	980387	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160925	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSV40	100964	July 1, 2017	June 30, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018

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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Apr. 24 to May 03, 2018

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:

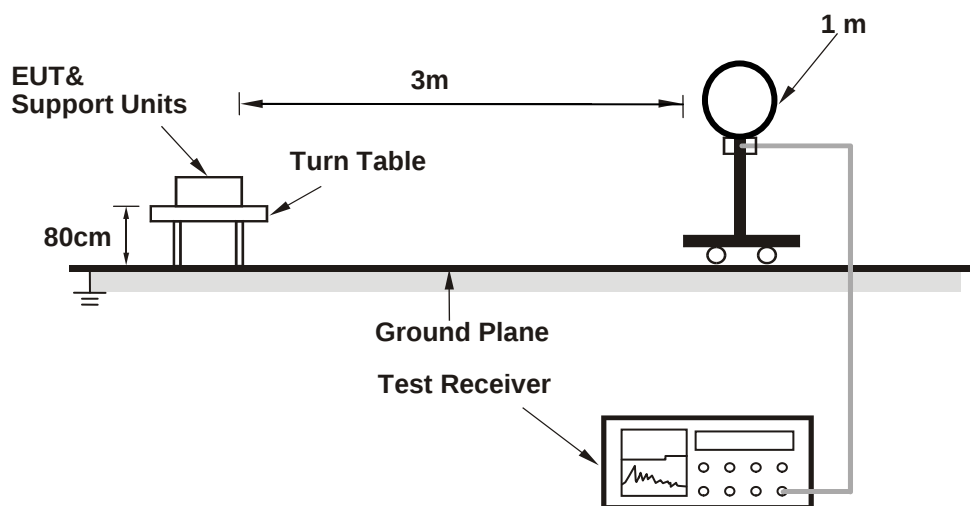
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

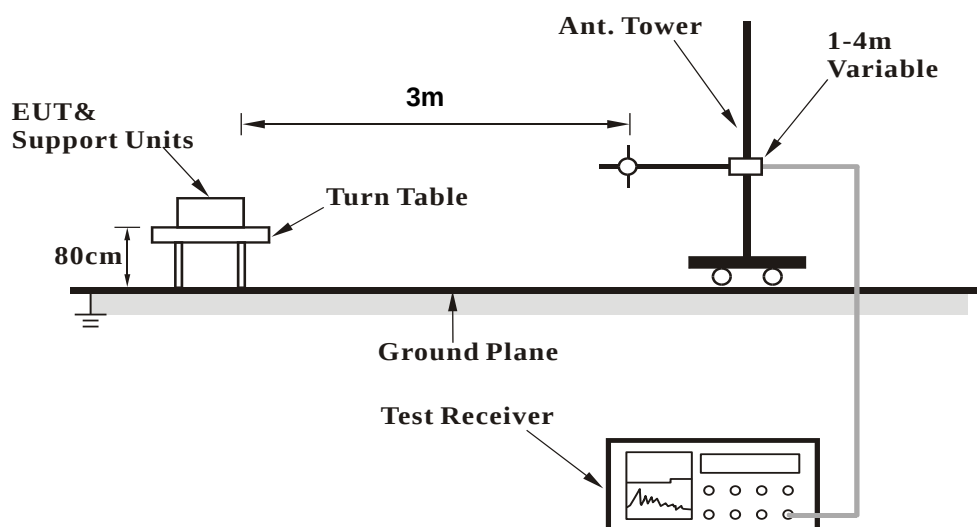
No deviation.

4.1.5 Test Setup

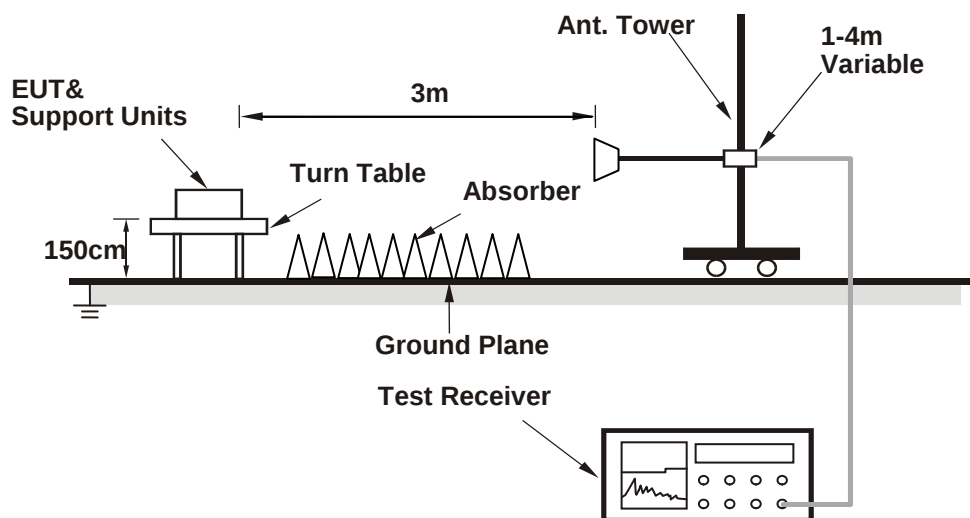
For Radiated emission below 30MHz



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

- Placed the EUT on the testing table.
- Controlling software (Art-2 GUI.exe Ver:2.3) has been activated to set the EUT on specific status.

4.1.7 Test Results

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	62.4 PK	74.0	-11.6	1.00 H	272	64.4	-2.0
2	2390.00	53.9 AV	54.0	-0.1	1.00 H	272	55.9	-2.0
3	*2412.00	113.8 PK			1.00 H	272	115.9	-2.1
4	*2412.00	111.8 AV			1.00 H	272	113.9	-2.1
5	4824.00	43.9 PK	74.0	-30.1	1.21 H	25	41.2	2.7
6	4824.00	40.5 AV	54.0	-13.5	1.21 H	25	37.8	2.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.1 PK	74.0	-14.9	1.21 V	60	61.1	-2.0
2	2390.00	50.2 AV	54.0	-3.8	1.21 V	60	52.2	-2.0
3	*2412.00	112.7 PK			1.21 V	60	114.8	-2.1
4	*2412.00	110.5 AV			1.21 V	60	112.6	-2.1
5	4824.00	48.7 PK	74.0	-25.3	3.13 V	178	46.0	2.7
6	4824.00	46.8 AV	54.0	-7.2	3.13 V	178	44.1	2.7

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	58.2 PK	74.0	-15.8	1.01 H	272	60.2	-2.0
2	2390.00	46.7 AV	54.0	-7.3	1.01 H	272	48.7	-2.0
3	*2437.00	116.2 PK			1.01 H	272	118.5	-2.3
4	*2437.00	114.0 AV			1.01 H	272	116.3	-2.3
5	2483.50	58.3 PK	74.0	-15.7	1.01 H	272	60.5	-2.2
6	2483.50	46.3 AV	54.0	-7.7	1.01 H	272	48.5	-2.2
7	4874.00	45.7 PK	74.0	-28.3	1.09 H	35	42.8	2.9
8	4874.00	42.5 AV	54.0	-11.5	1.09 H	35	39.6	2.9
9	7311.00	56.1 PK	74.0	-17.9	2.56 H	156	46.8	9.3
10	7311.00	52.3 AV	54.0	-1.7	2.56 H	156	43.0	9.3

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	54.6 PK	74.0	-19.4	1.25 V	61	56.6	-2.0
2	2390.00	44.5 AV	54.0	-9.5	1.25 V	61	46.5	-2.0
3	*2437.00	114.9 PK			1.25 V	61	117.2	-2.3
4	*2437.00	112.8 AV			1.25 V	61	115.1	-2.3
5	2483.50	55.8 PK	74.0	-18.2	1.25 V	61	58.0	-2.2
6	2483.50	45.3 AV	54.0	-8.7	1.25 V	61	47.5	-2.2
7	4874.00	51.4 PK	74.0	-22.6	1.35 V	18	48.5	2.9
8	4874.00	49.9 AV	54.0	-4.1	1.35 V	18	47.0	2.9
9	7311.00	57.8 PK	74.0	-16.2	2.72 V	24	48.5	9.3
10	7311.00	53.9 AV	54.0	-0.1	2.72 V	24	44.6	9.3

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	114.8 PK			1.02 H	270	117.1	-2.3
2	*2462.00	112.8 AV			1.02 H	270	115.1	-2.3
3	2483.50	62.2 PK	74.0	-11.8	1.02 H	270	64.4	-2.2
4	2483.50	53.9 AV	54.0	-0.1	1.02 H	270	56.1	-2.2
5	4924.00	43.5 PK	74.0	-30.5	1.15 H	20	40.5	3.0
6	4924.00	40.2 AV	54.0	-13.8	1.15 H	20	37.2	3.0
7	7386.00	51.8 PK	74.0	-22.2	1.02 H	270	42.1	9.7
8	7386.00	46.8 AV	54.0	-7.2	1.02 H	270	37.1	9.7
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	113.6 PK			1.16 V	72	115.9	-2.3
2	*2462.00	111.5 AV			1.16 V	72	113.8	-2.3
3	2483.50	59.7 PK	74.0	-14.3	1.16 V	72	61.9	-2.2
4	2483.50	51.0 AV	54.0	-3.0	1.16 V	72	53.2	-2.2
5	4924.00	48.4 PK	74.0	-25.6	3.18 V	13	45.4	3.0
6	4924.00	46.6 AV	54.0	-7.4	3.18 V	13	43.6	3.0
7	7386.00	57.1 PK	74.0	-16.9	2.61 V	103	47.4	9.7
8	7386.00	53.5 AV	54.0	-0.5	2.61 V	103	43.8	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	73.8 PK	74.0	-0.2	1.51 H	238	75.8	-2.0
2	2390.00	53.9 AV	54.0	-0.1	1.51 H	238	55.9	-2.0
3	*2412.00	114.5 PK			1.51 H	238	116.6	-2.1
4	*2412.00	104.0 AV			1.51 H	238	106.1	-2.1
5	4824.00	52.0 PK	74.0	-22.0	1.17 H	61	49.3	2.7
6	4824.00	39.2 AV	54.0	-14.8	1.17 H	61	36.5	2.7
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	60.2 PK	74.0	-13.8	1.30 V	76	62.2	-2.0
2	2390.00	51.5 AV	54.0	-2.5	1.30 V	76	53.5	-2.0
3	*2412.00	112.0 PK			1.30 V	76	114.1	-2.1
4	*2412.00	102.5 AV			1.30 V	76	104.6	-2.1
5	4824.00	43.5 PK	74.0	-30.5	1.49 V	14	40.8	2.7
6	4824.00	41.2 AV	54.0	-12.8	1.49 V	14	38.5	2.7

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	72.7 PK	74.0	-1.3	1.28 H	273	74.7	-2.0
2	2390.00	51.7 AV	54.0	-2.3	1.28 H	273	53.7	-2.0
3	*2437.00	117.0 PK			1.28 H	273	119.3	-2.3
4	*2437.00	107.5 AV			1.28 H	273	109.8	-2.3
5	2483.50	71.3 PK	74.0	-2.7	1.28 H	273	73.5	-2.2
6	2483.50	51.5 AV	54.0	-2.5	1.28 H	273	53.7	-2.2
7	4874.00	54.5 PK	74.0	-19.5	1.11 H	44	51.6	2.9
8	4874.00	41.6 AV	54.0	-12.4	1.11 H	44	38.7	2.9
9	7311.00	60.5 PK	74.0	-13.5	2.60 H	169	51.2	9.3
10	7311.00	48.1 AV	54.0	-5.9	2.60 H	169	38.8	9.3

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	57.6 PK	74.0	-16.4	1.28 V	56	59.6	-2.0
2	2390.00	49.2 AV	54.0	-4.8	1.28 V	56	51.2	-2.0
3	*2437.00	115.8 PK			1.28 V	56	118.1	-2.3
4	*2437.00	106.3 AV			1.28 V	56	108.6	-2.3
5	2483.50	57.7 PK	74.0	-16.3	1.28 V	56	59.9	-2.2
6	2483.50	49.0 AV	54.0	-5.0	1.28 V	56	51.2	-2.2
7	4874.00	56.1 PK	74.0	-17.9	1.50 V	19	53.2	2.9
8	4874.00	43.3 AV	54.0	-10.7	1.50 V	19	40.4	2.9
9	7311.00	62.8 PK	74.0	-11.2	2.22 V	27	53.5	9.3
10	7311.00	50.4 AV	54.0	-3.6	2.22 V	27	41.1	9.3

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	114.8 PK			1.25 H	274	117.1	-2.3
2	*2462.00	104.8 AV			1.25 H	274	107.1	-2.3
3	2483.50	73.8 PK	74.0	-0.2	1.25 H	274	76.0	-2.2
4	2483.50	53.6 AV	54.0	-0.4	1.25 H	274	55.8	-2.2
5	4924.00	51.9 PK	74.0	-22.1	1.07 H	47	48.9	3.0
6	4924.00	38.8 AV	54.0	-15.2	1.07 H	47	35.8	3.0
7	7386.00	57.7 PK	74.0	-16.3	2.57 H	151	48.0	9.7
8	7386.00	45.8 AV	54.0	-8.2	2.57 H	151	36.1	9.7
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	113.6 PK			1.24 V	64	115.9	-2.3
2	*2462.00	103.4 AV			1.24 V	64	105.7	-2.3
3	2483.50	59.1 PK	74.0	-14.9	1.24 V	64	61.3	-2.2
4	2483.50	50.8 AV	54.0	-3.2	1.24 V	64	53.0	-2.2
5	4924.00	53.3 PK	74.0	-20.7	1.51 V	27	50.3	3.0
6	4924.00	40.5 AV	54.0	-13.5	1.51 V	27	37.5	3.0
7	7386.00	59.1 PK	74.0	-14.9	2.27 V	16	49.4	9.7
8	7386.00	48.0 AV	54.0	-6.0	2.27 V	16	38.3	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	73.1 PK	74.0	-0.9	1.27 H	272	75.1	-2.0
2	2390.00	53.9 AV	54.0	-0.1	1.27 H	272	55.9	-2.0
3	*2412.00	113.8 PK			1.27 H	272	115.9	-2.1
4	*2412.00	103.7 AV			1.27 H	272	105.8	-2.1
5	4824.00	51.4 PK	74.0	-22.6	1.03 H	33	48.7	2.7
6	4824.00	38.8 AV	54.0	-15.2	1.03 H	33	36.1	2.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.8 PK	74.0	-14.2	1.31 V	48	61.8	-2.0
2	2390.00	51.2 AV	54.0	-2.8	1.31 V	48	53.2	-2.0
3	*2412.00	112.4 PK			1.31 V	48	114.5	-2.1
4	*2412.00	102.4 AV			1.31 V	48	104.5	-2.1
5	4824.00	43.0 PK	74.0	-31.0	1.44 V	21	40.3	2.7
6	4824.00	40.7 AV	54.0	-13.3	1.44 V	21	38.0	2.7

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	70.9 PK	74.0	-3.1	1.28 H	272	72.9	-2.0
2	2390.00	51.0 AV	54.0	-3.0	1.28 H	272	53.0	-2.0
3	*2437.00	117.9 PK			1.28 H	272	120.2	-2.3
4	*2437.00	108.8 AV			1.28 H	272	111.1	-2.3
5	2483.50	73.5 PK	74.0	-0.5	1.28 H	272	75.7	-2.2
6	2483.50	48.0 AV	54.0	-6.0	1.28 H	272	50.2	-2.2
7	4874.00	55.2 PK	74.0	-18.8	1.05 H	31	52.3	2.9
8	4874.00	42.0 AV	54.0	-12.0	1.05 H	31	39.1	2.9
9	7311.00	60.7 PK	74.0	-13.3	2.56 H	158	51.4	9.3
10	7311.00	48.4 AV	54.0	-5.6	2.56 H	158	39.1	9.3

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	59.5 PK	74.0	-14.5	1.22 V	60	61.5	-2.0
2	2390.00	49.8 AV	54.0	-4.2	1.22 V	60	51.8	-2.0
3	*2437.00	116.5 PK			1.22 V	60	118.8	-2.3
4	*2437.00	107.3 AV			1.22 V	60	109.6	-2.3
5	2483.50	60.1 PK	74.0	-13.9	1.22 V	60	62.3	-2.2
6	2483.50	47.2 AV	54.0	-6.8	1.22 V	60	49.4	-2.2
7	4874.00	55.8 PK	74.0	-18.2	1.45 V	31	52.9	2.9
8	4874.00	42.9 AV	54.0	-11.1	1.45 V	31	40.0	2.9
9	7311.00	62.9 PK	74.0	-11.1	2.22 V	38	53.6	9.3
10	7311.00	50.6 AV	54.0	-3.4	2.22 V	38	41.3	9.3

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	113.1 PK			1.25 H	273	115.4	-2.3
2	*2462.00	103.5 AV			1.25 H	273	105.8	-2.3
3	2483.50	73.9 PK	74.0	-0.1	1.25 H	273	76.1	-2.2
4	2483.50	50.2 AV	54.0	-3.8	1.25 H	273	52.4	-2.2
5	4924.00	51.6 PK	74.0	-22.4	1.09 H	22	48.6	3.0
6	4924.00	38.6 AV	54.0	-15.4	1.09 H	22	35.6	3.0
7	7386.00	57.8 PK	74.0	-16.2	2.55 H	150	48.1	9.7
8	7386.00	45.9 AV	54.0	-8.1	2.55 H	150	36.2	9.7
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	111.8 PK			1.30 V	72	114.1	-2.3
2	*2462.00	102.4 AV			1.30 V	72	104.7	-2.3
3	2483.50	61.0 PK	74.0	-13.0	1.30 V	72	63.2	-2.2
4	2483.50	48.3 AV	54.0	-5.7	1.30 V	72	50.5	-2.2
5	4924.00	53.7 PK	74.0	-20.3	1.56 V	26	50.7	3.0
6	4924.00	40.9 AV	54.0	-13.1	1.56 V	26	37.9	3.0
7	7386.00	59.2 PK	74.0	-14.8	2.33 V	14	49.5	9.7
8	7386.00	48.4 AV	54.0	-5.6	2.33 V	14	38.7	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	69.0 PK	74.0	-5.0	1.59 H	273	71.0	-2.0
2	2390.00	53.9 AV	54.0	-0.1	1.59 H	273	55.9	-2.0
3	*2422.00	108.5 PK			1.59 H	273	110.7	-2.2
4	*2422.00	99.5 AV			1.59 H	273	101.7	-2.2
5	4844.00	51.5 PK	74.0	-22.5	1.14 H	47	48.8	2.7
6	4844.00	38.5 AV	54.0	-15.5	1.14 H	47	35.8	2.7
7	7266.00	57.9 PK	74.0	-16.1	2.55 H	168	48.8	9.1
8	7266.00	46.1 AV	54.0	-7.9	2.55 H	168	37.0	9.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.5 PK	74.0	-6.5	1.23 V	58	69.5	-2.0
2	2390.00	50.2 AV	54.0	-3.8	1.23 V	58	52.2	-2.0
3	*2422.00	106.9 PK			1.23 V	58	109.1	-2.2
4	*2422.00	97.8 AV			1.23 V	58	100.0	-2.2
5	4844.00	56.3 PK	74.0	-17.7	1.42 V	22	53.6	2.7
6	4844.00	43.2 AV	54.0	-10.8	1.42 V	22	40.5	2.7
7	7266.00	62.8 PK	74.0	-11.2	2.21 V	36	53.7	9.1
8	7266.00	50.5 AV	54.0	-3.5	2.21 V	36	41.4	9.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	69.2 PK	74.0	-4.8	1.00 H	274	71.2	-2.0
2	2390.00	53.8 AV	54.0	-0.2	1.00 H	274	55.8	-2.0
3	*2437.00	112.6 PK			1.00 H	274	114.9	-2.3
4	*2437.00	103.4 AV			1.00 H	274	105.7	-2.3
5	2483.50	70.8 PK	74.0	-3.2	1.00 H	274	73.0	-2.2
6	2483.50	49.4 AV	54.0	-4.6	1.00 H	274	51.6	-2.2
7	4874.00	55.0 PK	74.0	-19.0	1.07 H	26	52.1	2.9
8	4874.00	42.1 AV	54.0	-11.9	1.07 H	26	39.2	2.9
9	7311.00	60.2 PK	74.0	-13.8	2.52 H	170	50.9	9.3
10	7311.00	48.1 AV	54.0	-5.9	2.52 H	170	38.8	9.3

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	67.2 PK	74.0	-6.8	1.27 V	47	69.2	-2.0
2	2390.00	51.8 AV	54.0	-2.2	1.27 V	47	53.8	-2.0
3	*2437.00	111.8 PK			1.27 V	47	114.1	-2.3
4	*2437.00	102.1 AV			1.27 V	47	104.4	-2.3
5	2483.50	66.9 PK	74.0	-7.1	1.27 V	47	69.1	-2.2
6	2483.50	47.3 AV	54.0	-6.7	1.27 V	47	49.5	-2.2
7	4874.00	56.7 PK	74.0	-17.3	1.46 V	17	53.8	2.9
8	4874.00	44.6 AV	54.0	-9.4	1.46 V	17	41.7	2.9
9	7311.00	64.7 PK	74.0	-9.3	2.27 V	38	55.4	9.3
10	7311.00	52.2 AV	54.0	-1.8	2.27 V	38	42.9	9.3

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	111.2 PK			1.55 H	274	113.5	-2.3
2	*2452.00	101.9 AV			1.55 H	274	104.2	-2.3
3	2483.50	73.5 PK	74.0	-0.5	1.55 H	274	75.7	-2.2
4	2483.50	52.1 AV	54.0	-1.9	1.55 H	274	54.3	-2.2
5	4904.00	51.6 PK	74.0	-22.4	1.12 H	33	48.7	2.9
6	4904.00	38.6 AV	54.0	-15.4	1.12 H	33	35.7	2.9
7	7356.00	57.1 PK	74.0	-16.9	2.51 H	146	47.4	9.7
8	7356.00	45.5 AV	54.0	-8.5	2.51 H	146	35.8	9.7
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	110.8 PK			1.22 V	76	113.1	-2.3
2	*2452.00	100.7 AV			1.22 V	76	103.0	-2.3
3	2483.50	69.5 PK	74.0	-4.5	1.22 V	76	71.7	-2.2
4	2483.50	50.8 AV	54.0	-3.2	1.22 V	76	53.0	-2.2
5	4904.00	55.6 PK	74.0	-18.4	1.40 V	42	52.7	2.9
6	4904.00	42.6 AV	54.0	-11.4	1.40 V	42	39.7	2.9
7	7356.00	63.6 PK	74.0	-10.4	2.21 V	27	53.9	9.7
8	7356.00	51.0 AV	54.0	-3.0	2.21 V	27	41.3	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Data:

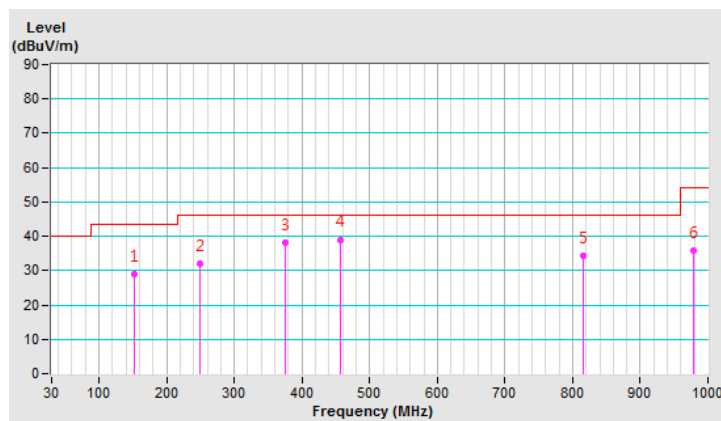
802.11n (HT20)

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	151.54	28.8 QP	43.5	-14.7	2.00 H	68	36.4	-7.6
2	250.02	31.9 QP	46.0	-14.1	1.50 H	246	40.8	-8.9
3	375.00	38.2 QP	46.0	-7.8	1.00 H	26	43.0	-4.8
4	457.58	39.1 QP	46.0	-6.9	1.00 H	307	41.7	-2.6
5	816.26	34.4 QP	46.0	-11.6	1.00 H	46	30.4	4.0
6	978.32	35.9 QP	54.0	-18.1	2.00 H	247	29.5	6.4

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 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.

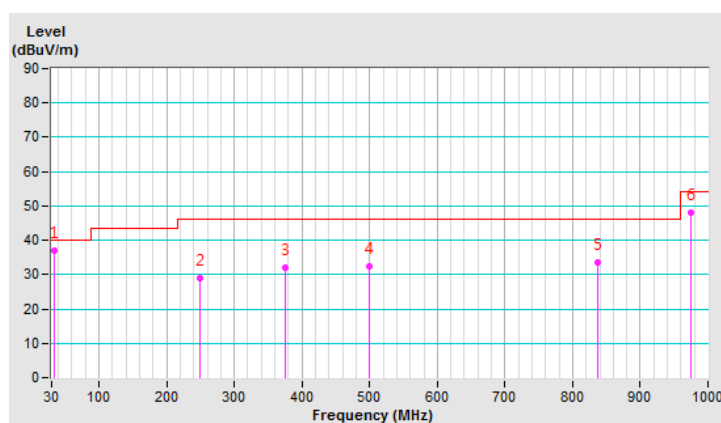


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	33.37	37.1 QP	40.0	-2.9	1.50 V	50	46.1	-9.0
2	250.00	29.0 QP	46.0	-17.0	1.50 V	359	37.9	-8.9
3	374.98	32.1 QP	46.0	-13.9	1.50 V	2	36.9	-4.8
4	500.01	32.3 QP	46.0	-13.7	1.00 V	27	34.1	-1.8
5	837.14	33.7 QP	46.0	-12.3	1.00 V	112	29.2	4.5
6	974.95	48.0 QP	54.0	-6.0	1.50 V	336	41.5	6.5

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 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

For Mode 1~2:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Nov. 01, 2017	Oct. 31, 2018
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
Fixed attenuator EMEC	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3. Tested Date: Apr. 20 to 24, 2018

For Mode 3:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Nov. 01, 2017	Oct. 31, 2018
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 04, 2018	June 03, 2019
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019
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. 17, 2018

4.2.3 Test Procedures

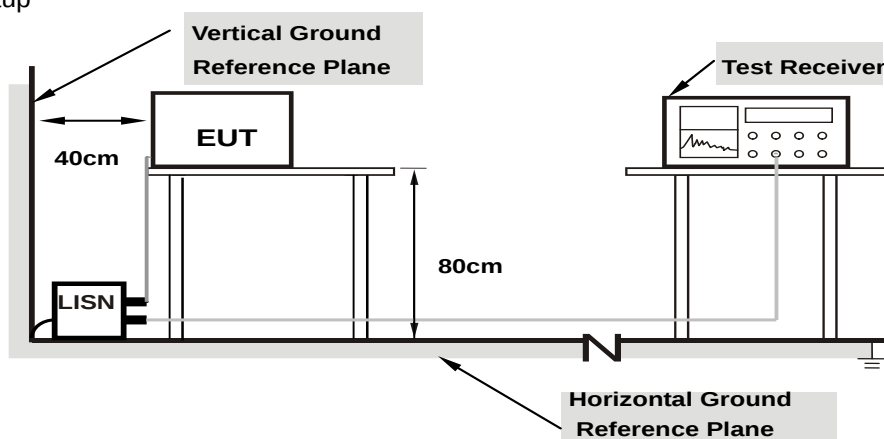
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

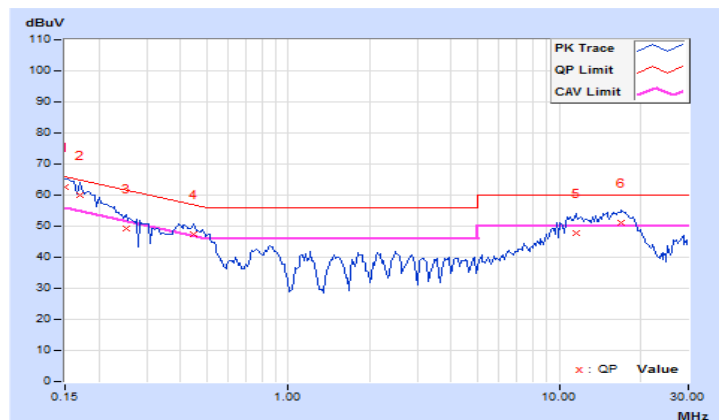
4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.03	52.68	36.29	62.71	46.32	66.00	56.00	-3.29	-9.68
2	0.16953	10.04	49.85	34.76	59.89	44.80	64.98	54.98	-5.09	-10.18
3	0.25156	10.07	39.18	27.58	49.25	37.65	61.71	51.71	-12.46	-14.06
4	0.44688	10.11	37.45	33.23	47.56	43.34	56.93	46.93	-9.37	-3.59
5	11.55078	10.63	37.04	28.30	47.67	38.93	60.00	50.00	-12.33	-11.07
6	17.04297	10.94	40.07	34.51	51.01	45.45	60.00	50.00	-8.99	-4.55

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

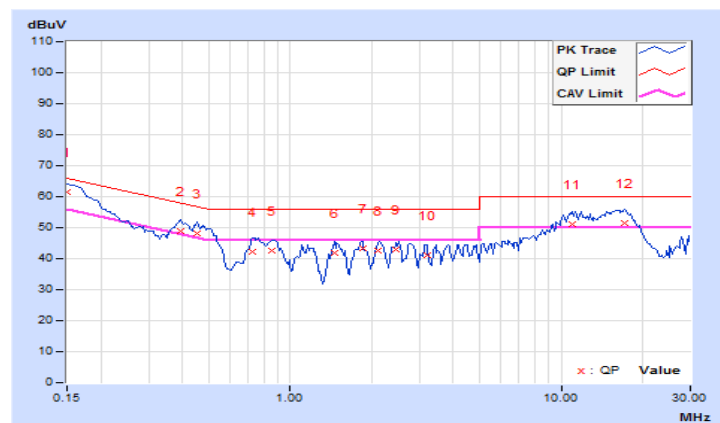


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.94	51.66	36.05	61.60	45.99	66.00	56.00	-4.40	-10.01
2	0.39219	10.00	38.81	33.77	48.81	43.77	58.02	48.02	-9.21	-4.25
3	0.45078	10.00	38.20	32.76	48.20	42.76	56.86	46.86	-8.66	-4.10
4	0.72813	10.02	32.05	24.29	42.07	34.31	56.00	46.00	-13.93	-11.69
5	0.85703	10.02	32.69	25.08	42.71	35.10	56.00	46.00	-13.29	-10.90
6	1.45313	10.05	31.83	26.25	41.88	36.30	56.00	46.00	-14.12	-9.70
7	1.85547	10.06	33.43	29.78	43.49	39.84	56.00	46.00	-12.51	-6.16
8	2.11328	10.07	32.61	25.82	42.68	35.89	56.00	46.00	-13.32	-10.11
9	2.46484	10.09	32.70	26.11	42.79	36.20	56.00	46.00	-13.21	-9.80
10	3.18750	10.11	30.93	24.56	41.04	34.67	56.00	46.00	-14.96	-11.33
11	10.97266	10.44	40.53	32.00	50.97	42.44	60.00	50.00	-9.03	-7.56
12	17.24609	10.77	40.86	34.68	51.63	45.45	60.00	50.00	-8.37	-4.55

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



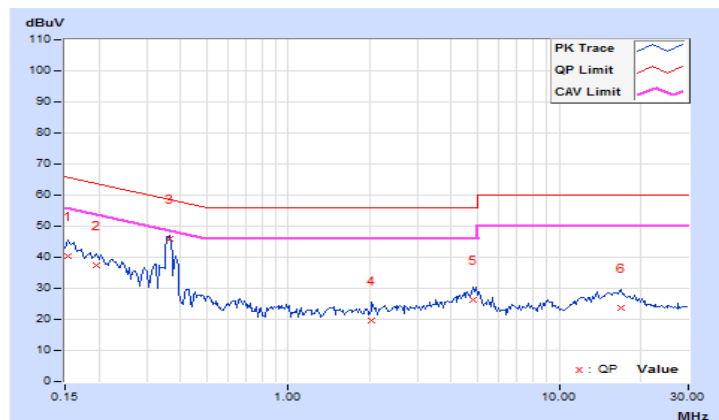
4.2.8 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.05	30.32	23.15	40.37	33.20	65.79	55.79	-25.42	-22.59
2	0.19687	10.07	27.29	22.08	37.36	32.15	63.74	53.74	-26.38	-21.59
3	0.36484	10.11	35.66	34.60	45.77	44.71	58.62	48.62	-12.85	-3.91
4	2.03125	10.22	9.23	4.32	19.45	14.54	56.00	46.00	-36.55	-31.46
5	4.81641	10.39	16.05	6.08	26.44	16.47	56.00	46.00	-29.56	-29.53
6	16.90234	11.19	12.44	7.38	23.63	18.57	60.00	50.00	-36.37	-31.43

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)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.95	30.69	21.71	40.64	31.66	66.00	56.00	-25.36	-24.34
2	0.22812	9.98	25.17	19.92	35.15	29.90	62.52	52.52	-27.37	-22.62
3	0.36484	10.01	32.86	31.39	42.87	41.40	58.62	48.62	-15.75	-7.22
4	0.69297	10.03	7.61	2.37	17.64	12.40	56.00	46.00	-38.36	-33.60
5	4.76563	10.23	14.87	4.32	25.10	14.55	56.00	46.00	-30.90	-31.45
6	16.04688	10.93	11.41	5.85	22.34	16.78	60.00	50.00	-37.66	-33.22

Remarks:

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



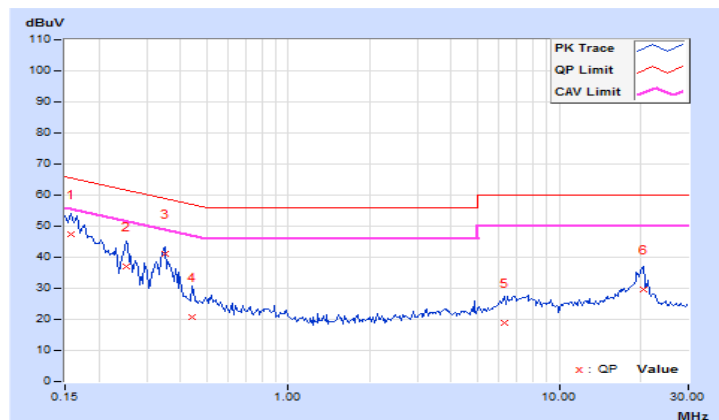
4.2.9 Test Results (Mode 3)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.05	37.45	21.57	47.50	31.62	65.58	55.58	-18.08	-23.96
2	0.25156	10.08	26.90	17.04	36.98	27.12	61.71	51.71	-24.73	-24.59
3	0.34922	10.11	30.91	28.14	41.02	38.25	58.98	48.98	-17.96	-10.73
4	0.43906	10.12	10.69	-1.48	20.81	8.64	57.08	47.08	-36.27	-38.44
5	6.26953	10.48	8.39	1.37	18.87	11.85	60.00	50.00	-41.13	-38.15
6	20.41016	11.40	18.19	12.02	29.59	23.42	60.00	50.00	-30.41	-26.58

Remarks:

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

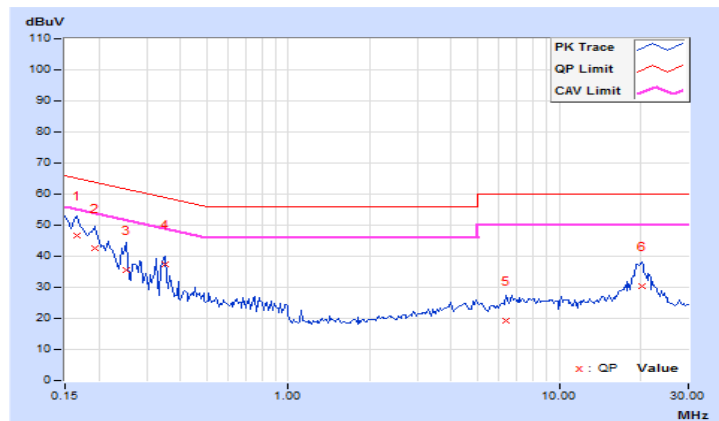


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	9.96	36.60	20.31	46.56	30.27	65.18	55.18	-18.62	-24.91
2	0.19297	9.97	32.72	18.59	42.69	28.56	63.91	53.91	-21.22	-25.35
3	0.25156	9.98	25.41	14.73	35.39	24.71	61.71	51.71	-26.32	-27.00
4	0.34922	10.01	27.43	23.59	37.44	33.60	58.98	48.98	-21.54	-15.38
5	6.34375	10.33	9.07	2.91	19.40	13.24	60.00	50.00	-40.60	-36.76
6	20.15625	11.17	19.29	12.72	30.46	23.89	60.00	50.00	-29.54	-26.11

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

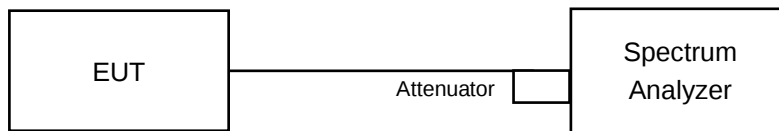


4.3 6dB Bandwidth Measurement

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	7.11	7.08	0.5	Pass
6	2437	7.11	7.07	0.5	Pass
11	2462	7.09	7.10	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.15	15.16	0.5	Pass
6	2437	15.13	15.17	0.5	Pass
11	2462	15.16	15.15	0.5	Pass

802.11n (HT20)

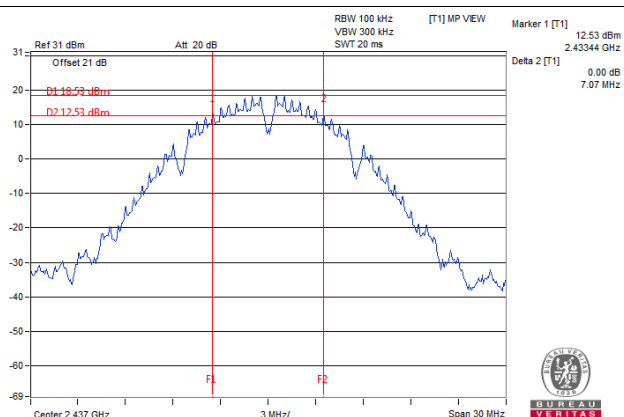
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.14	15.16	0.5	Pass
6	2437	15.15	15.17	0.5	Pass
11	2462	15.15	15.16	0.5	Pass

802.11n (HT40)

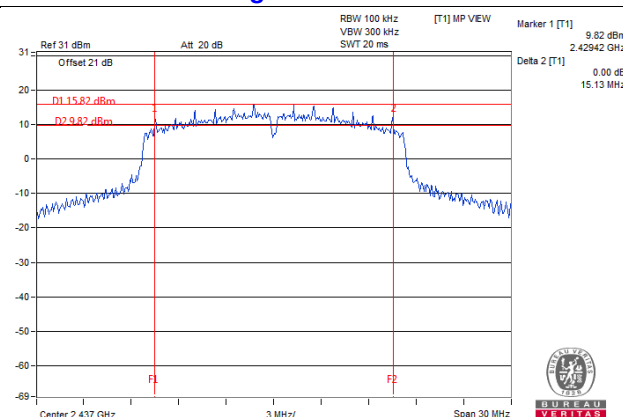
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	31.34	31.39	0.5	Pass
6	2437	31.33	31.37	0.5	Pass
9	2452	30.16	30.22	0.5	Pass

Spectrum Plot of Worst Value

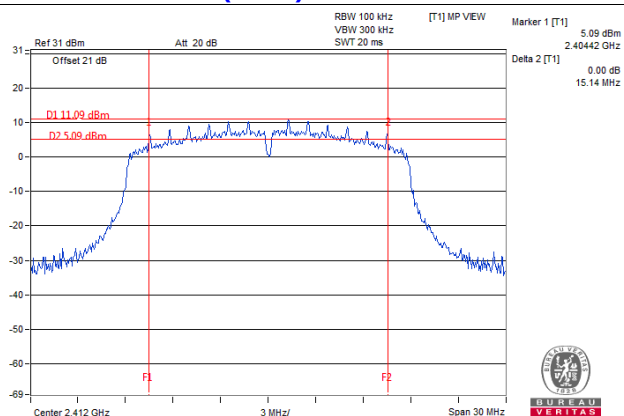
802.11b / Chain 1 : CH6



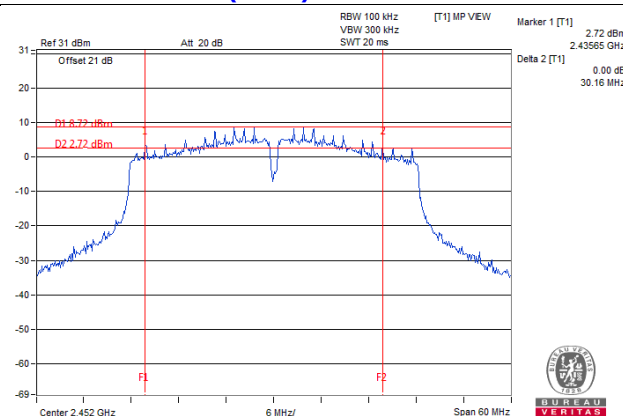
802.11g / Chain 0 : CH6



802.11n (HT20) / Chain 0 : CH1

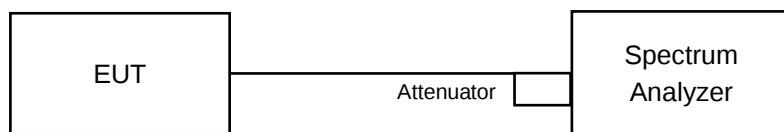


802.11n (HT40) / Chain 0 : CH9



4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.4.4 Deviation from Test Standard

No deviation.

4.4.5 EUT Operating Conditions

Same as Item 4.3.6.

4.4.6 Test Results

802.11b

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
1	2412	11.88	11.88
6	2437	12.12	12.12
11	2462	12.12	12.12

802.11g

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
1	2412	16.32	16.32
6	2437	16.56	16.44
11	2462	16.32	16.20

802.11n (HT20)

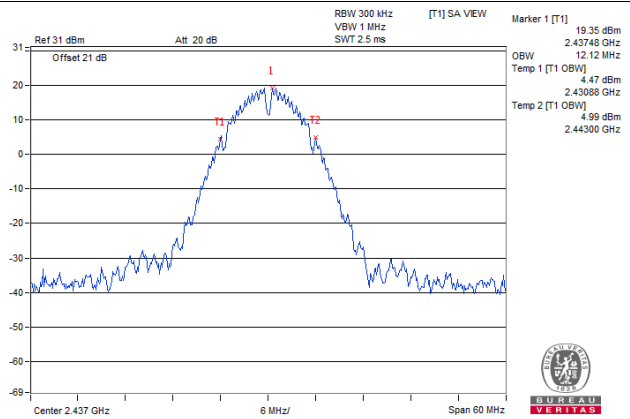
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
1	2412	17.40	17.40
6	2437	17.76	17.64
11	2462	17.40	16.32

802.11n (HT40)

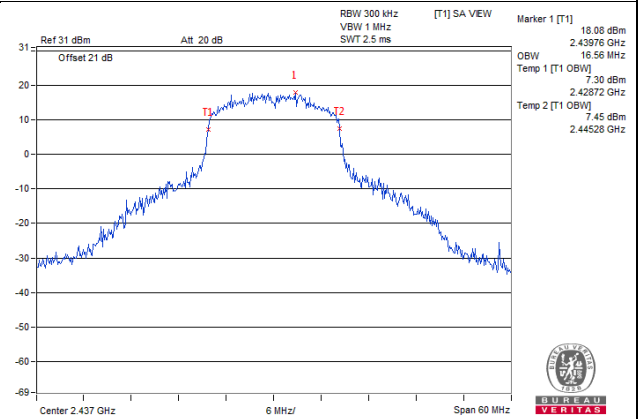
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
3	2422	36.24	36.00
6	2437	36.00	36.24
9	2452	36.24	36.24

Spectrum Plot of Max Value

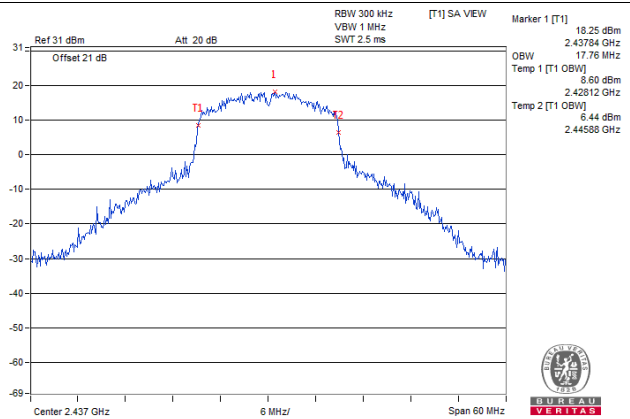
802.11b / Chain 0 : CH6



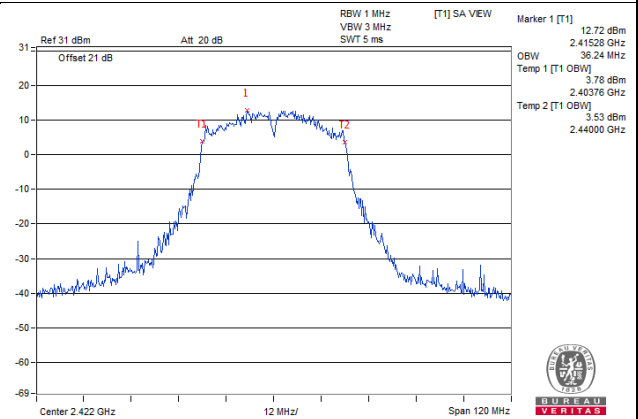
802.11g / Chain 0 : CH6



802.11n (HT20) / Chain 0 : CH6



802.11n (HT40) / Chain 0 : CH3



4.5 Conducted Output Power Measurement

4.5.1 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,

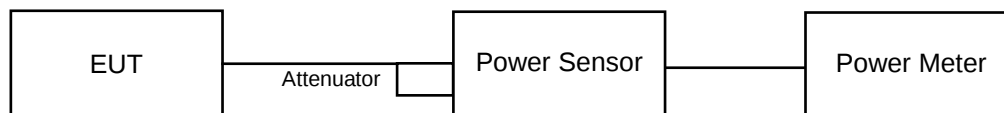
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as Item 4.3.6.

4.5.7 Test Results

802.11b

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	25.16	25.70	699.63	28.45	30.00	Pass
6	2437	26.98	26.84	981.943	29.92	30.00	Pass
11	2462	26.68	26.36	898.1	29.53	30.00	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.48	22.73	364.51	25.62	30.00	Pass
6	2437	26.86	26.55	937.145	29.72	30.00	Pass
11	2462	22.07	21.53	303.298	24.82	30.00	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	21.35	21.88	290.628	24.63	30.00	Pass
6	2437	27.14	26.75	990.758	29.96	30.00	Pass
11	2462	20.65	19.87	213.196	23.29	30.00	Pass

802.11n (HT40)

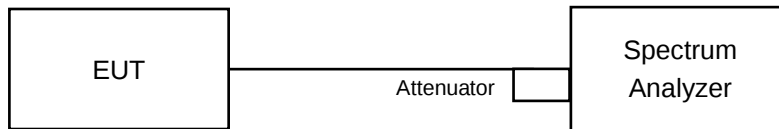
Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.93	19.08	159.073	22.02	30.00	Pass
6	2437	23.40	22.96	416.473	26.20	30.00	Pass
9	2452	21.80	21.30	286.252	24.57	30.00	Pass

4.6 Power Spectral Density Measurement

4.6.1 Limits of Power Spectral Density Measurement

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

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

802.11b, 802.11n (HT40)

- 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 $\geq 2 \times \text{span}/\text{RBW}$.
- 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)

- 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 $\geq 2 \times \text{span}/\text{RBW}$.
- 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.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Same as Item 4.3.6

4.6.7 Test Results

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	-5.68	3.01	-2.67	7.24	Pass
	6	2437	-3.79	3.01	-0.78	7.24	Pass
	11	2462	-3.59	3.01	-0.58	7.24	Pass
1	1	2412	-4.12	3.01	-1.11	7.24	Pass
	6	2437	-4.31	3.01	-1.30	7.24	Pass
	11	2462	-3.99	3.01	-0.98	7.24	Pass

Note: 1. Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 6.76\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(6.76-6) = 7.24\text{dBm}$.

802.11g

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	-8.87	3.01	-5.70	7.24	Pass
	6	2437	-6.13	3.01	-2.96	7.24	Pass
	11	2462	-9.10	3.01	-5.93	7.24	Pass
1	1	2412	-9.90	3.01	-6.73	7.24	Pass
	6	2437	-6.30	3.01	-3.13	7.24	Pass
	11	2462	-9.61	3.01	-6.44	7.24	Pass

Note: 1. Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 6.76\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(6.76-6) = 7.24\text{dBm}$.

802.11n (HT20)

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	-11.26	3.01	-8.05	7.24	Pass
	6	2437	-4.98	3.01	-1.77	7.24	Pass
	11	2462	-11.44	3.01	-8.23	7.24	Pass
1	1	2412	-10.42	3.01	-7.21	7.24	Pass
	6	2437	-5.68	3.01	-2.47	7.24	Pass
	11	2462	-12.41	3.01	-9.20	7.24	Pass

Note: 1. Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 6.76\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(6.76-6) = 7.24\text{dBm}$.

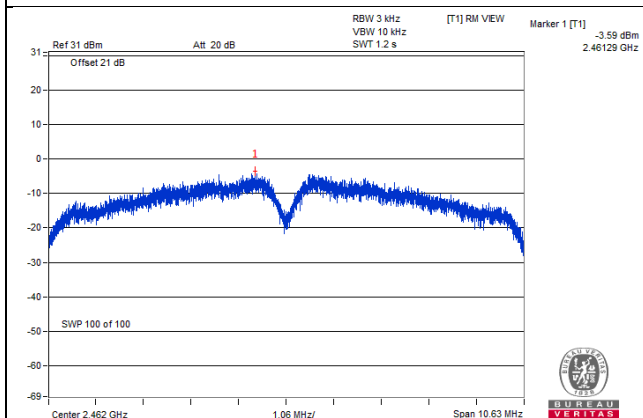
802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-15.01	3.01	-12.00	7.24	Pass
	6	2437	-11.25	3.01	-8.24	7.24	Pass
	9	2452	-13.07	3.01	-10.06	7.24	Pass
1	3	2422	-15.32	3.01	-12.31	7.24	Pass
	6	2437	-12.12	3.01	-9.11	7.24	Pass
	9	2452	-13.51	3.01	-10.50	7.24	Pass

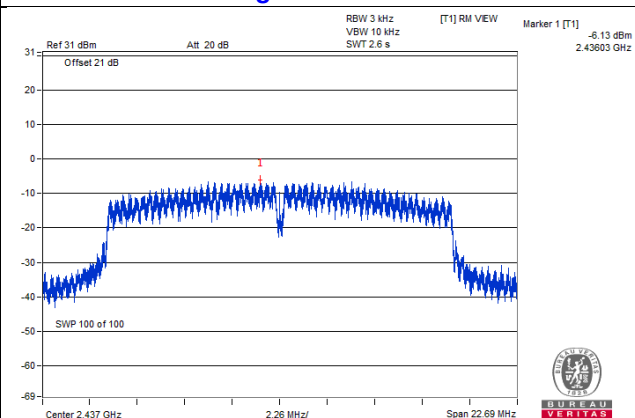
Note: 1. Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 6.76\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(6.76-6) = 7.24\text{dBm}$.

Spectrum Plot of Worst Value

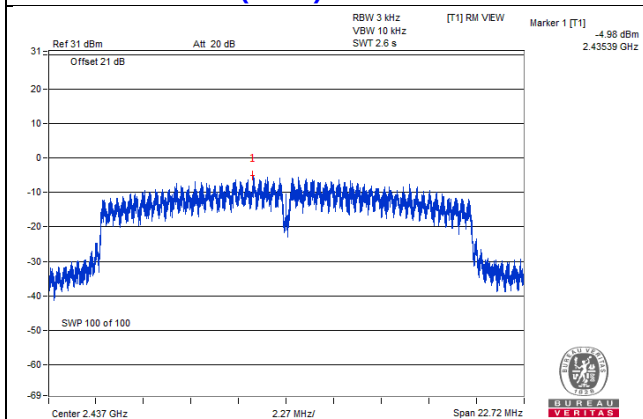
802.11b / Chain 0 : CH11



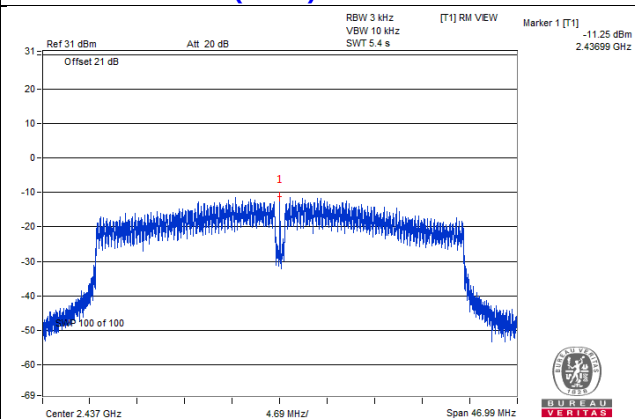
802.11g / Chain 0 : CH6



802.11n (HT20) / Chain 0 : CH6



802.11n (HT40) / Chain 0 : CH6

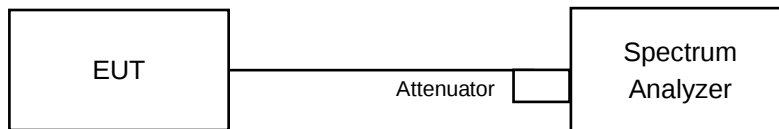


4.7 Conducted Out of Band Emission Measurement

4.7.1 Limits of Conducted Out of Band Emission Measurement

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

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 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.

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

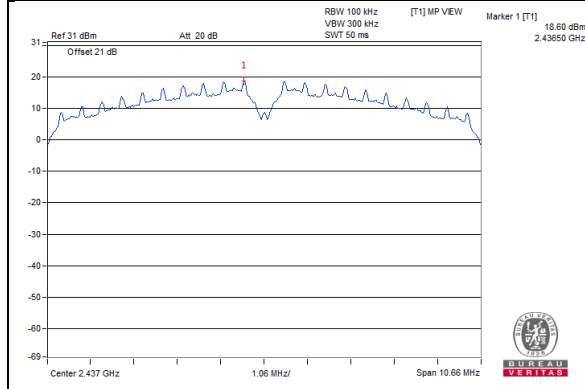
Same as Item 4.3.6

4.7.7 Test Results

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

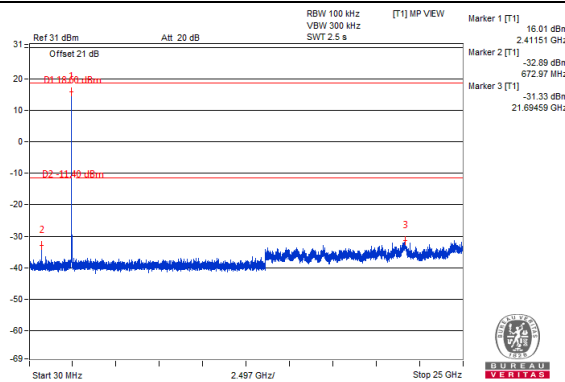
802.11b

Maximum REF

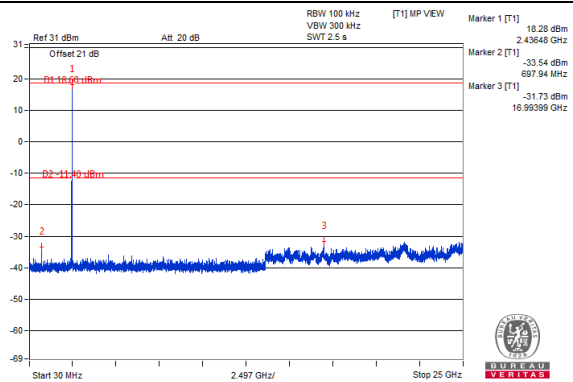


Chain 0

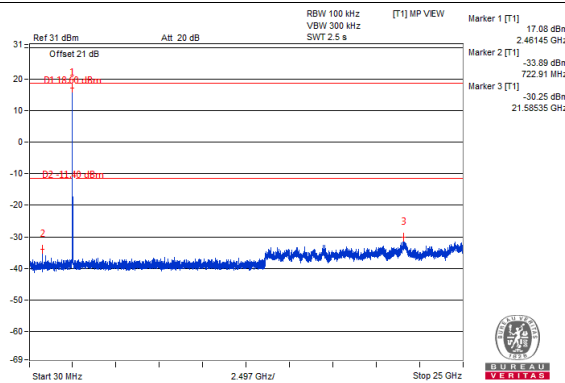
CH 1



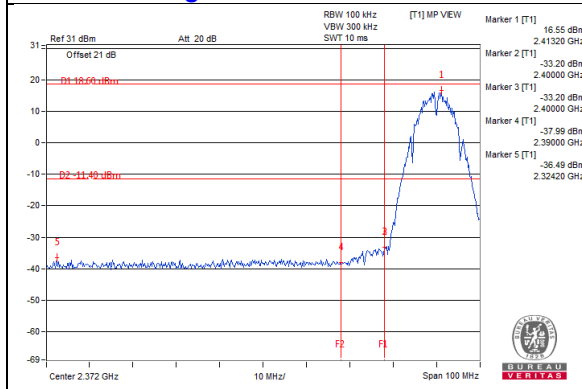
CH 6



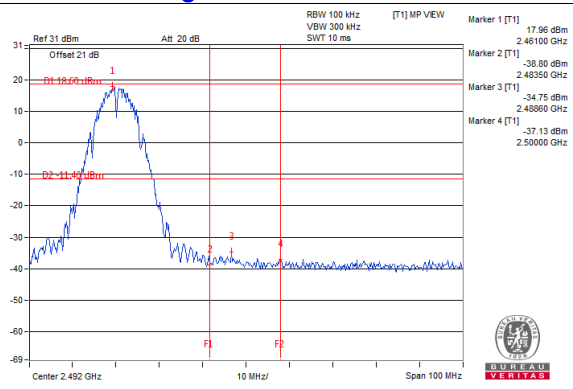
CH 11



CH 1 Band edge

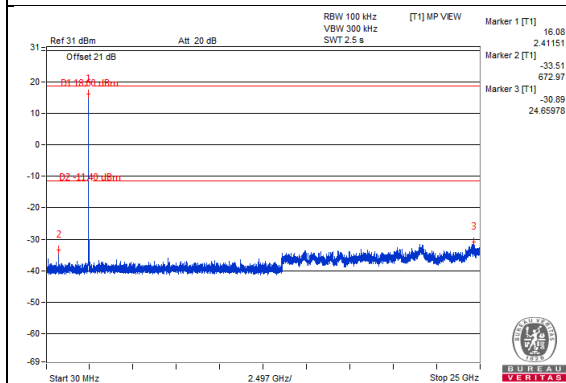


CH 11 Band edge

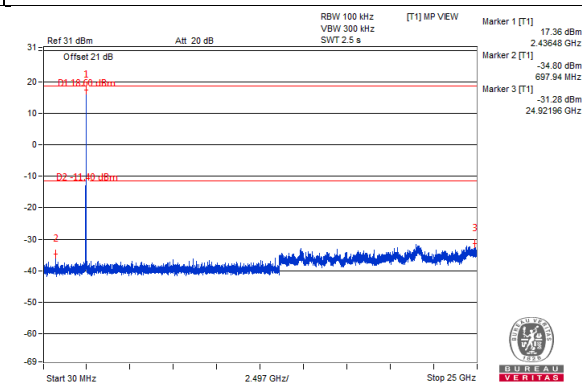


Chain 1

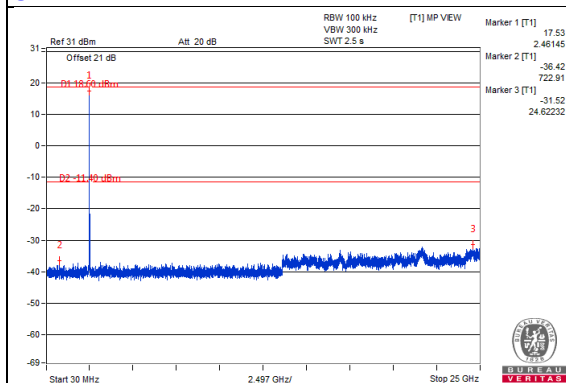
CH 1



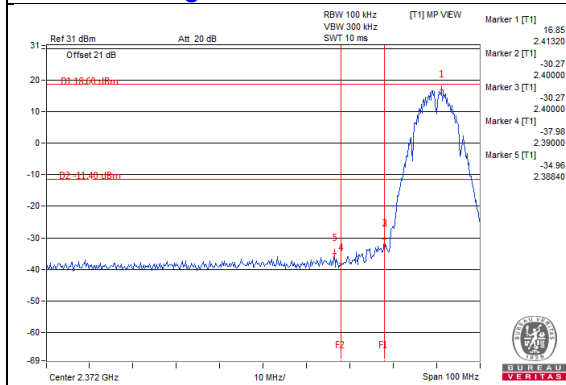
CH 6



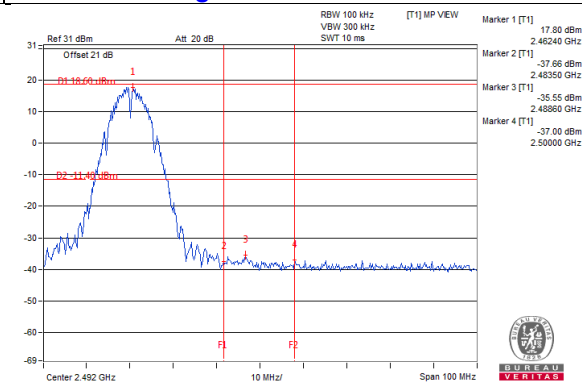
CH 11



CH 1 Band edge

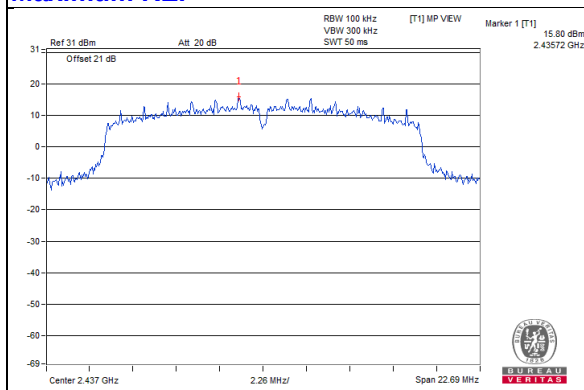


CH 11 Band edge



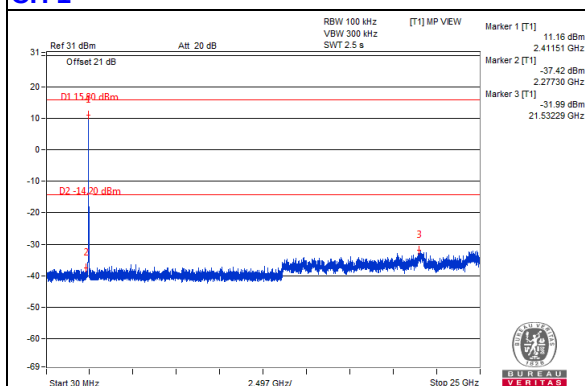
802.11g

Maximum REF

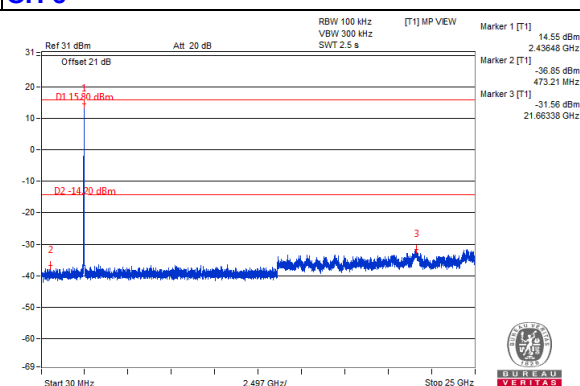


Chain 0

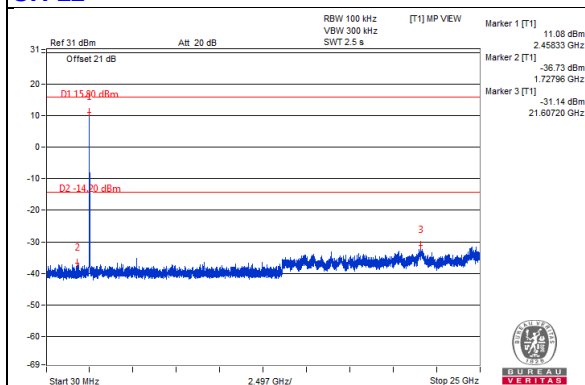
CH 1



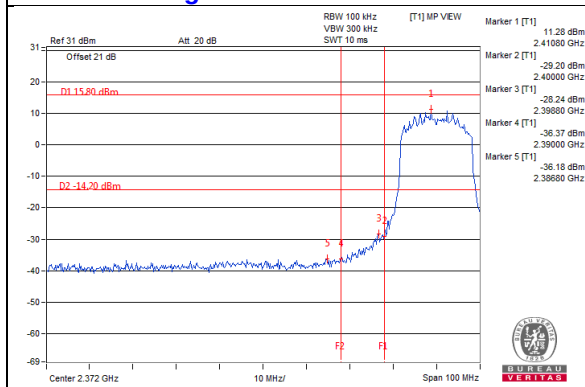
CH 6



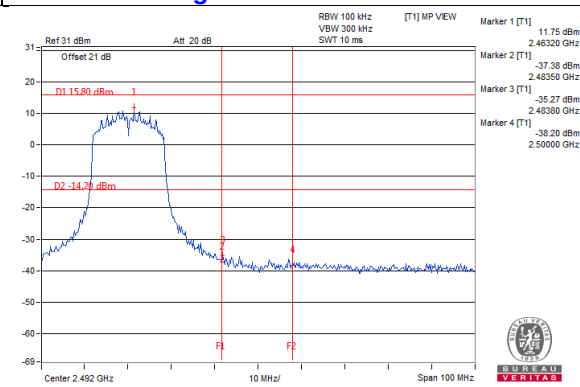
CH 11



CH 1 Band edge

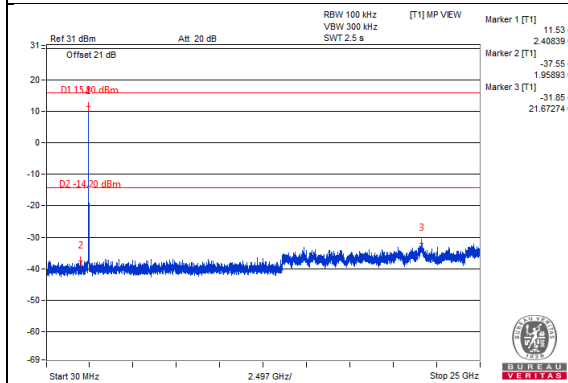


CH 11 Band edge

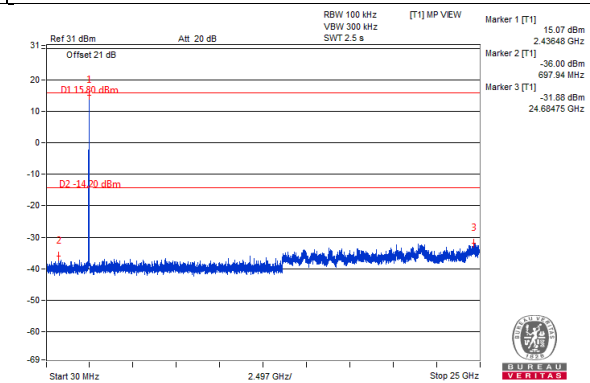


Chain 1

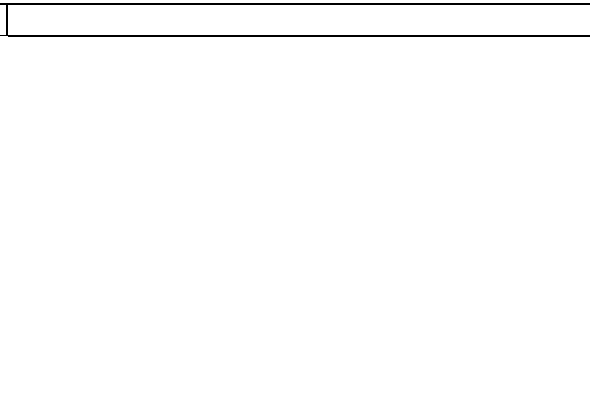
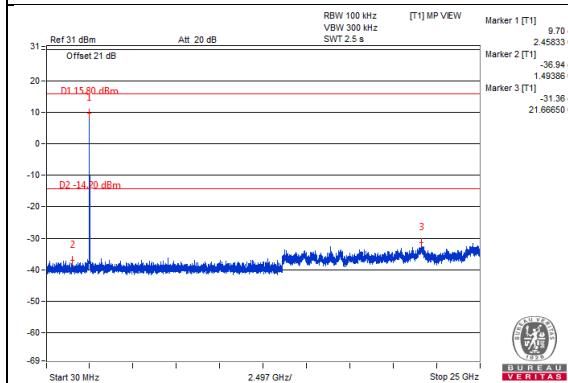
CH 1



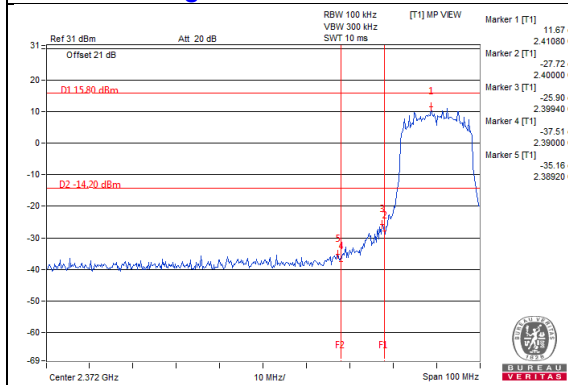
CH 6



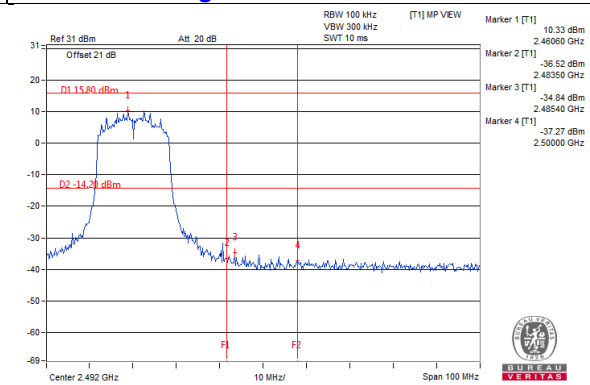
CH 11



CH 1 Band edge

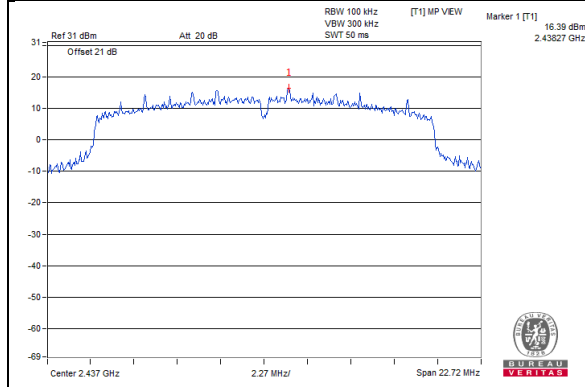


CH 11 Band edge



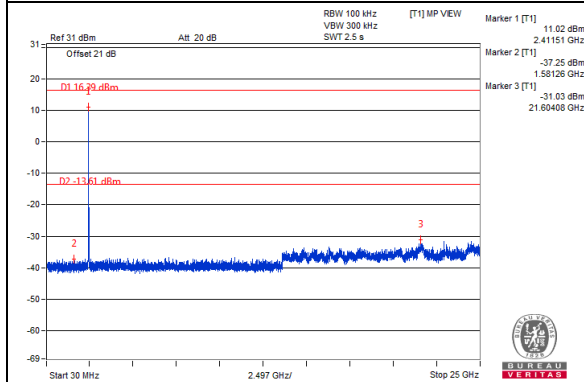
802.11n (HT20)

Maximum REF

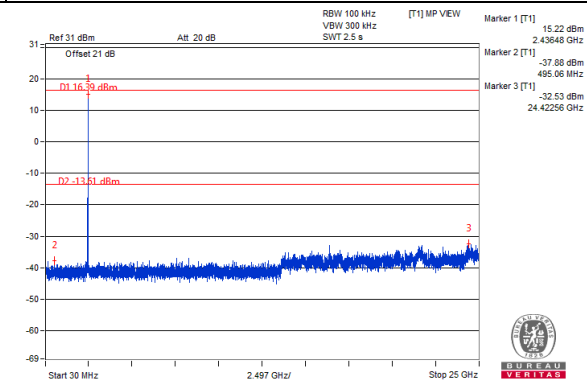


Chain 0

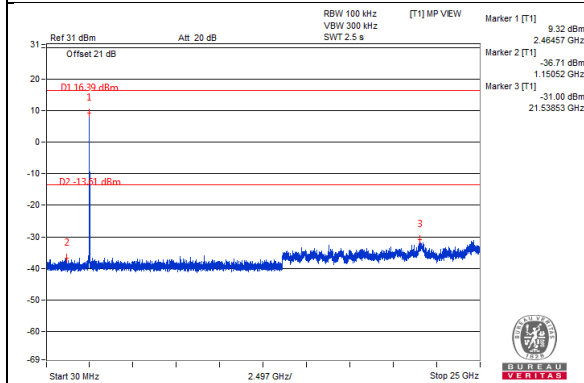
CH 1



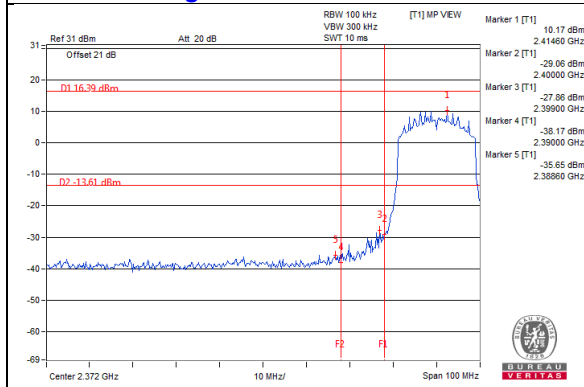
CH 6



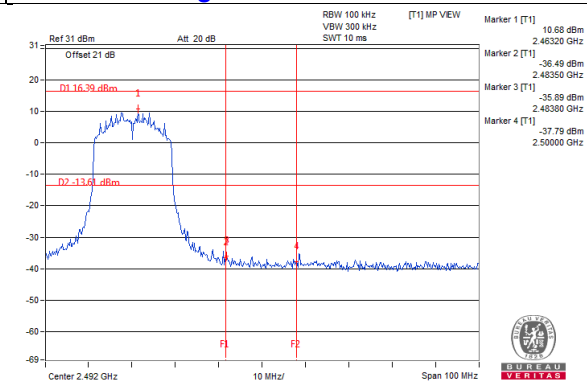
CH 11



CH 1 Band edge

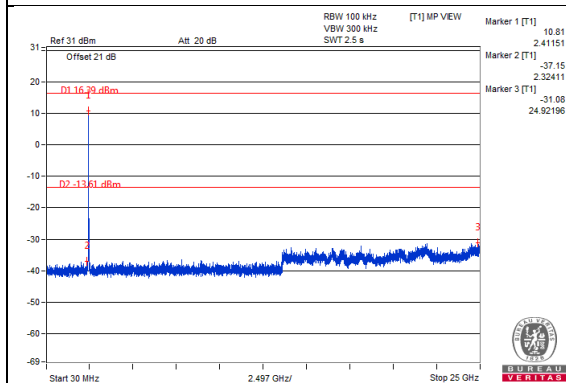


CH 11 Band edge

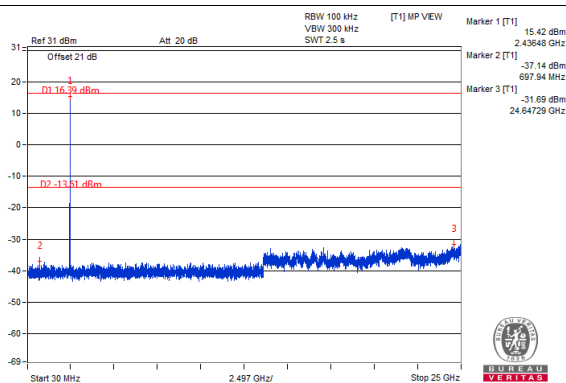


Chain 1

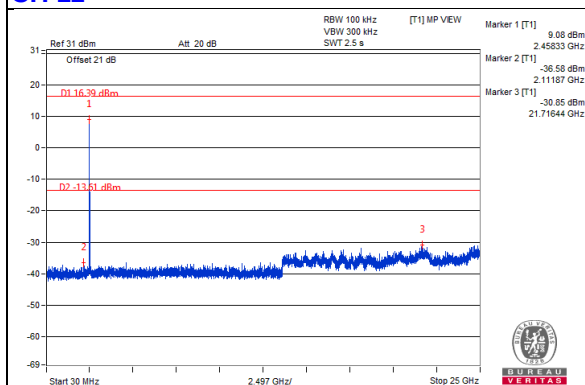
CH 1



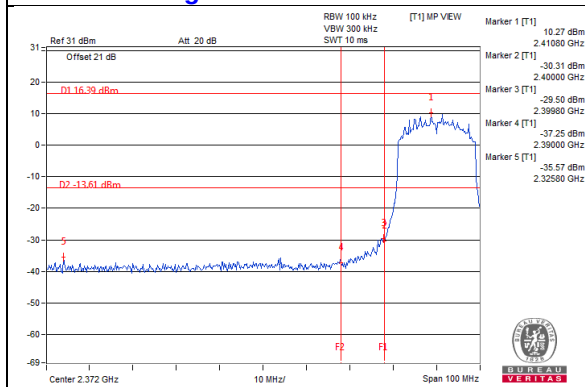
CH 6



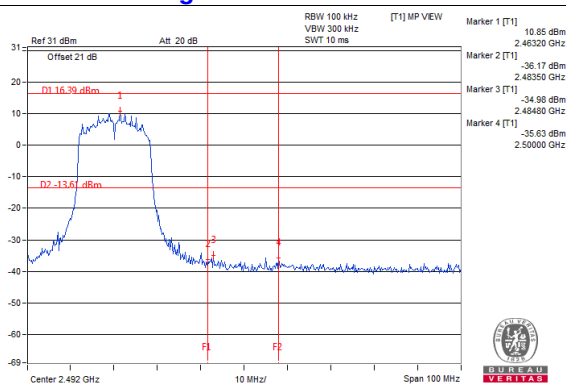
CH 11



CH 1 Band edge

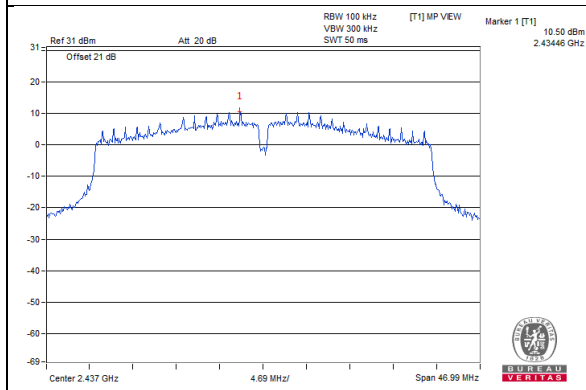


CH 11 Band edge



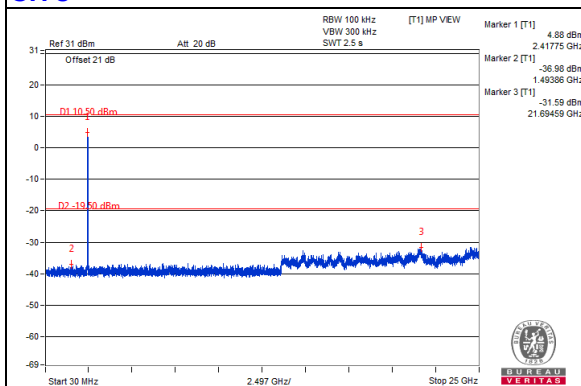
802.11n (HT40)

Maximum REF

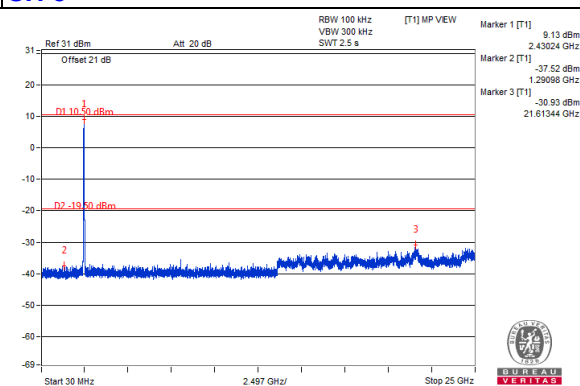


Chain 0

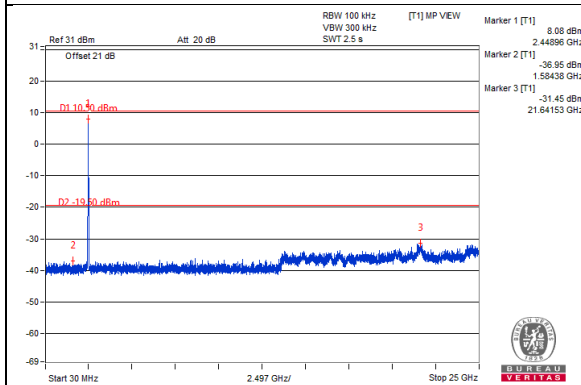
CH 3



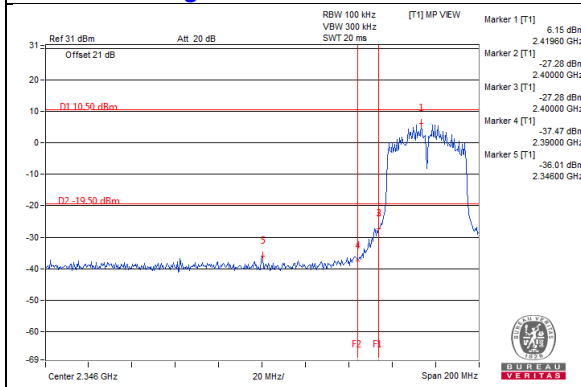
CH 6



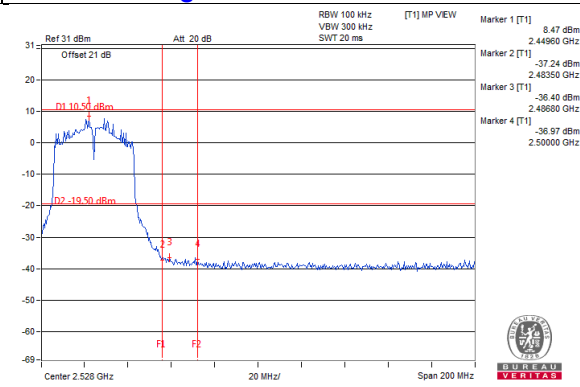
CH 9



CH 3 Band edge

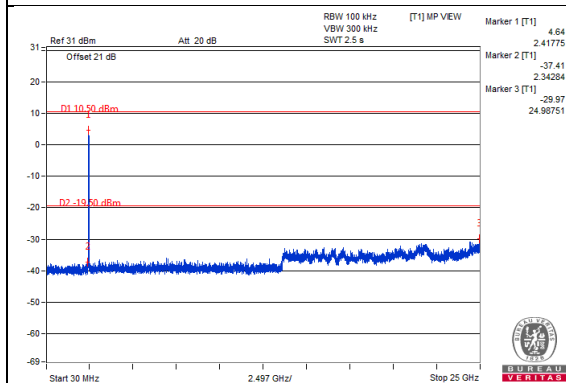


CH 9 Band edge

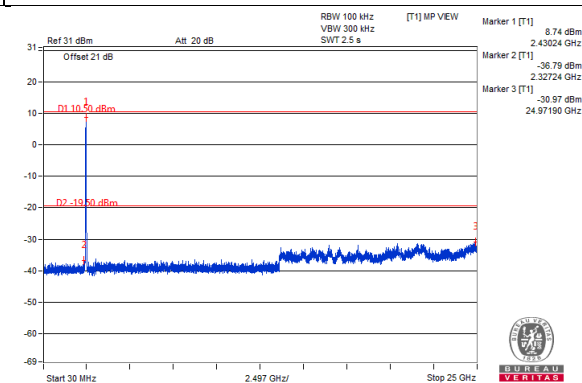


Chain 1

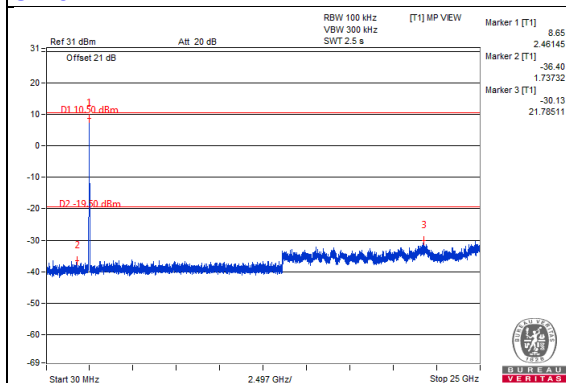
CH 3



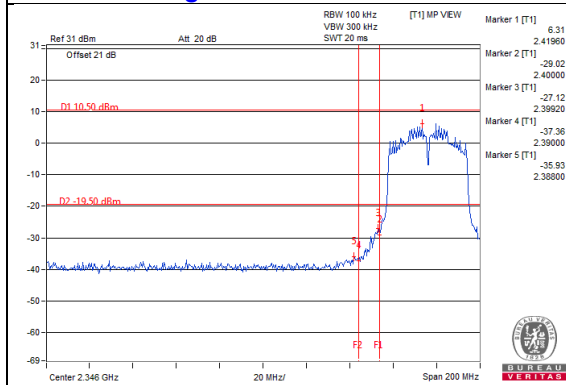
CH 6



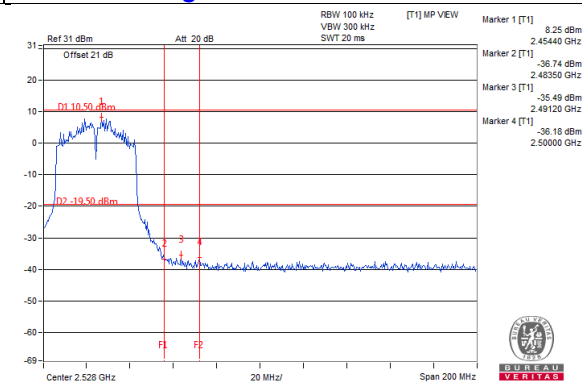
CH 9



CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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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.

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