FCC Test Report

Report No.:	RF190211E06
FCC ID:	XHHBNRV700-A
Test Model:	BNRV700
Received Date:	Feb. 13, 2019
Test Date:	Mar. 07 to 27, 2019
Issued Date:	Apr. 08, 2019
Applicant:	Nook Digital LLC, subsidiary of Barnes & Noble Inc.
Address:	1166 Avenue of the Americas, 18th Floor, NY, 10036 United States
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 R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF190211E06	Original release.	Apr. 08, 2019

1 Certificate of Conformity

Product:	EBOOK READER
Brand:	Nook
Test Model:	BNRV700
Sample Status:	ENGINEERING SAMPLE
Applicant:	Nook Digital LLC, subsidiary of Barnes & Noble Inc.
Test Date:	Mar. 07 to 27, 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 : _____ , **Date:** Apr. 08, 2019

Wendy Wu / Specialist

Approved by : _____ , **Date:** Apr. 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 -15.03dB at 0.15MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2437MHz, 4874MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used

Note:

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.8 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.8 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.0 dB
	6GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	EBOOK READER
Brand	Nook
Test Model	BNRV700
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	3.7Vdc from battery or 5Vdc from USB interface
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 802.11g: up to 54Mbps 802.11n: up to 150Mbps
Operating Frequency	**2.4GHz:**2.412 ~ 2.462GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7
Output Power	**2.4GHz:** 94.842mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	USB cable (Shielded, 1m) x 1

Note:

1. There are WLAN and Bluetooth technology used for the EUT.
2. Simultaneously transmission condition.

Condition	Technology	
1	WLAN	Bluetooth
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

3. The EUT must be supplied with a rechargeable battery as following table:

Brand	Model No.	Spec.
TCL	PR-285083	Output: 3.7Vdc, 1500mAh, 5.55Wh

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

Model	Antenna Gain (dBi)	Frequency Range (GHz ~ GHz)	Antenna Type	Connector Type	Cable Length (mm)
RFPCA320806EMAB301	1.9	2.4~2.4835	PCB	mini i-Pex	60

5. The EUT must be supplied with a eMMC and the following different models could be chosen:

Brand Name	Model Name	Size	Description
Samsung	KLM8G1GETF-B041	8G Byte	1st source eMMC
Samsung	KLMBG2JETD-B041	32G Byte	2nd source eMMC

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

Test Mode	Description
Mode A	**Power from USB adapter**
Mode B	Power from Battery

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

7. For radiated emissions (above 1GHz), the EUT was pre-tested under the following modes:

Test Mode	eMMC
Mode A	8G Byte
Mode B	**32G Byte**

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

8. For conducted emissions, the EUT was pre-tested under the following modes:

Test Mode	Description
Mode A	Power from USB adapter
Mode B	**Power from Laptop**

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

9. For conducted emissions, the EUT was pre-tested under the following modes:

Test Mode	eMMC
Mode A	8G Byte
Mode B	**32G Byte**

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

10. When USB port is charging the rechargeable battery, the EUT has WiFi function under charging mode. And the USB port is connected to Host unit on transmission mod, the EUT WiFi function will be disabled.

11. The EUT incorporates a SISO function.

2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	1TX	1RX
802.11g	1TX	1RX
802.11n (HT20)	1TX	1RX
802.11n (HT40)	1TX	1TX

12. 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):

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≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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

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

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-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)
802.11g	1 to 11	1	OFDM	BPSK	6

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)
802.11g	1 to 11	1	OFDM	BPSK	6

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

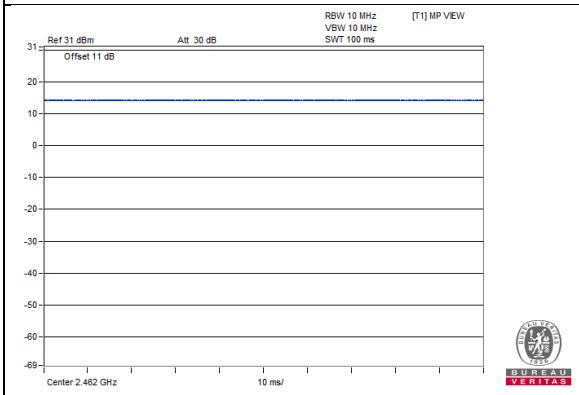
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Robert Cheng
RE<1G	22deg. C, 68%RH	120Vac, 60Hz	Robert Cheng
PLC	25deg. C, 75%RH	120Vac, 60Hz	Frank Chuang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

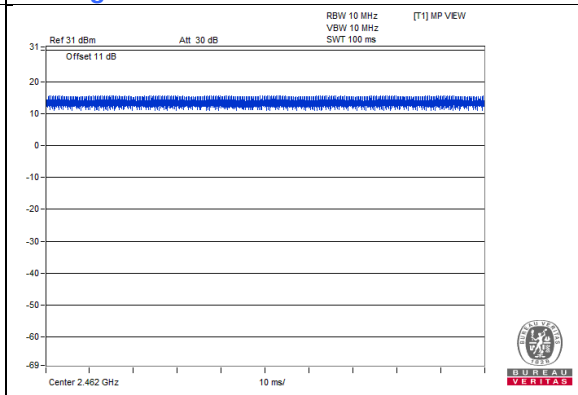
3.3 Duty Cycle of Test Signal

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

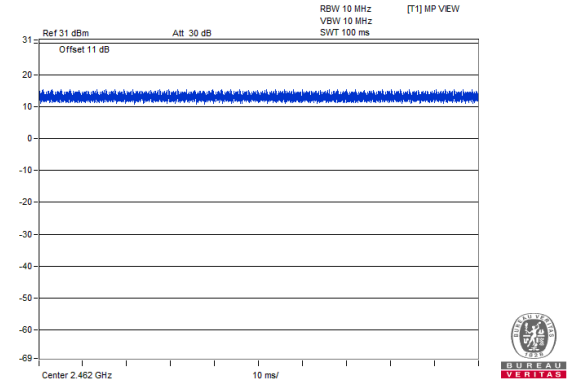
802.11b



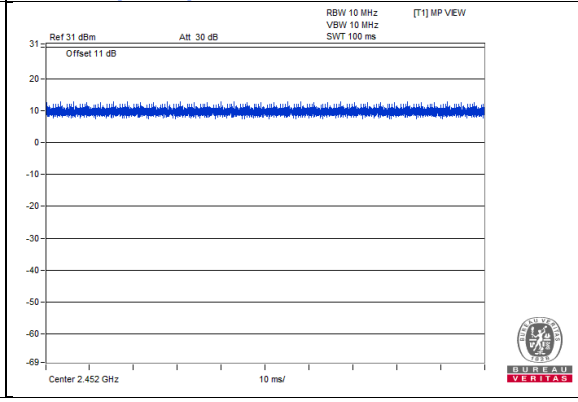
802.11g



802.11n (HT20)



802.11n (HT40)



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.	USB Adapter	BVADT2	NA	NA	NA	Provided by Lab
B.	EarphoneEarphone	Pansonic	NA	NA	NA	Provided by Lab
C.	Laptop	Toshiba	A100-04F004	37036037Q	CJ6UPA3503WL	Supplied by client

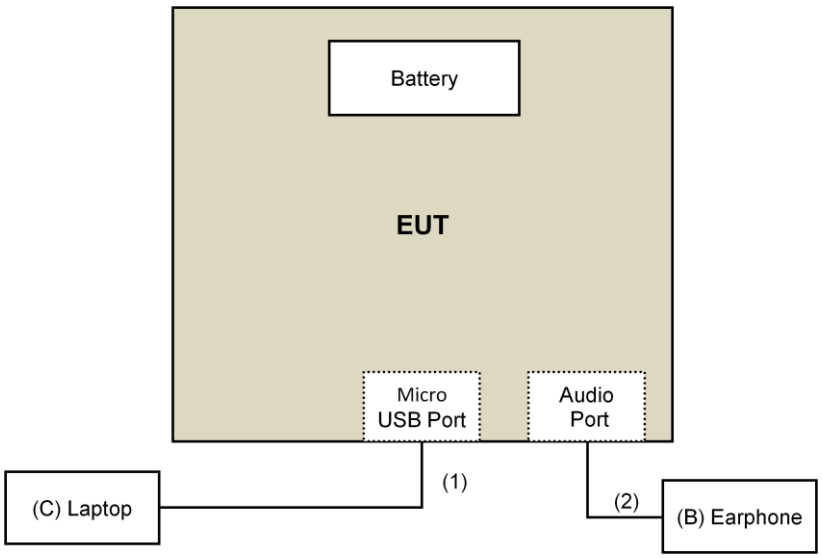
Note:

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

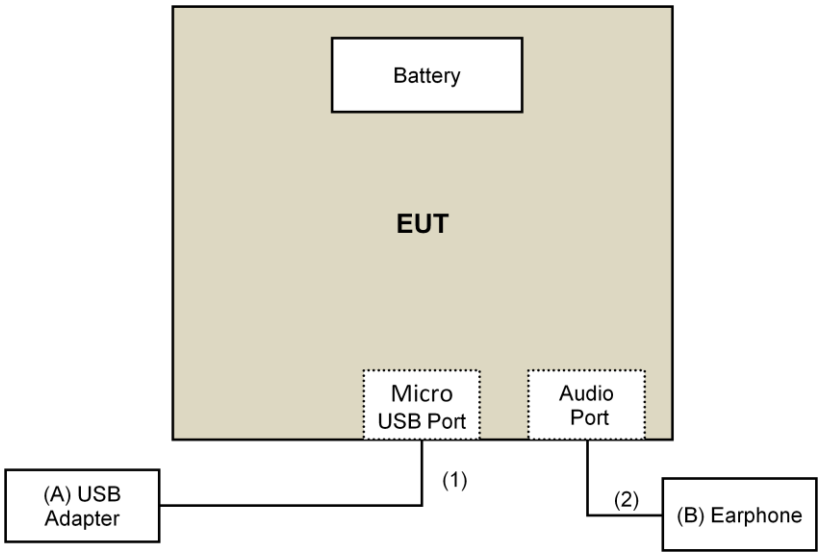
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB Cable	1	1	Yes	0	Supplied by client
2.	Aduio Cable	1	0.5	No	0	Provided by Lab

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 v05r01
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 20dB 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 ESR7 R&S	ESR7	102026	Apr. 18, 2018	Apr. 17, 2019
Spectrum Analyzer Keysight	N9030B	MY57141948	June 01, 2018	May 31, 2019
Pre-Amplifier EMCI	EMC001340	980142	Jan. 25, 2019	Jan. 24, 2020
Loop Antenna(*) Electro-Metrics	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
RF Cable	NA	LOOPCAB-001	Jan. 14, 2019	Jan. 13, 2020
RF Cable	NA	LOOPCAB-002	Jan. 14, 2019	Jan. 13, 2020
Pre-Amplifier EMCI	EMC330N	980538	May 07, 2018	May 06, 2019
Trilog Broadband Antenna SCHWARZBECK	VULB9168	AMP-ZFL-05	May 07, 2018	May 06, 2019
RF Cable	8D	966-5-1	May 07, 2018	May 06, 2019
RF Cable	8D	966-5-2	May 07, 2018	May 06, 2019
RF Cable	8D	966-5-3	May 07, 2018	May 06, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	Jan. 28, 2019	Jan. 27, 2020
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-1819	Nov. 25, 2018	Nov. 24, 2019
Pre-Amplifier EMCI	EMC12630SE	980509	May 07, 2018	May 06, 2019
RF Cable EMCI	EMC104-SM-SM-1500	180503	May 07, 2018	May 06, 2019
RF Cable EMCI	EMC104-SM-SM-2000	180501	May 07, 2018	May 06, 2019
RF Cable EMCI	EMC104-SM-SM-6000	180505	May 07, 2018	May 06, 2019
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
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 16, 2018	Apr. 15, 2019

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 5.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Mar. 07 to 27, 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:

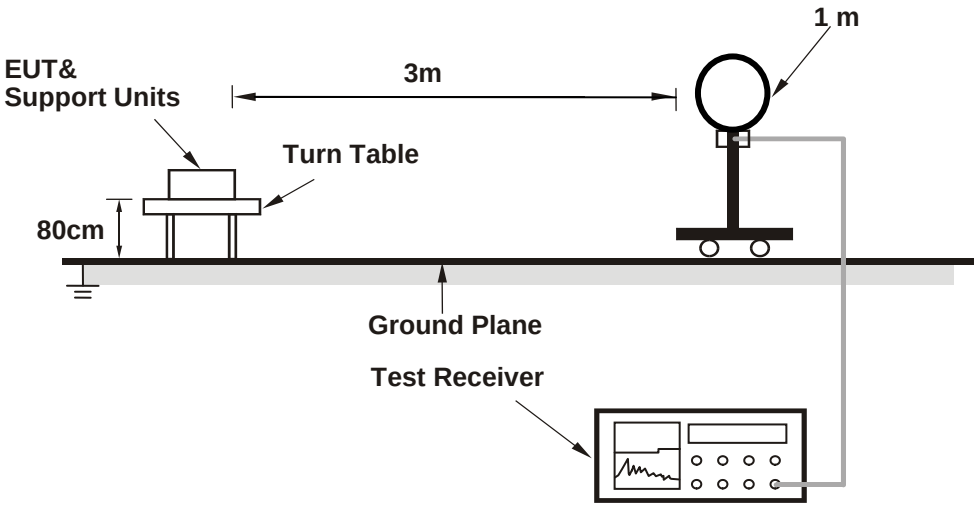
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

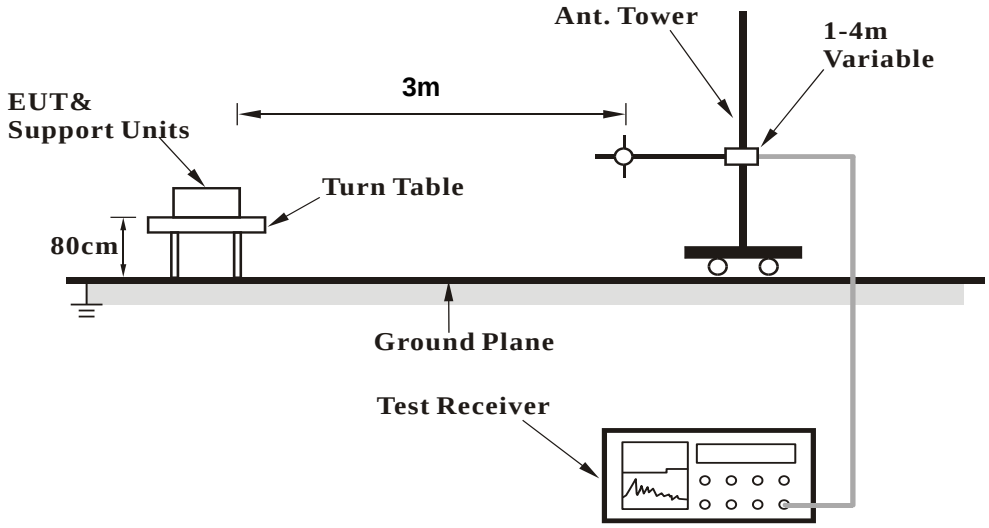
No deviation.

4.1.5 Test Setup

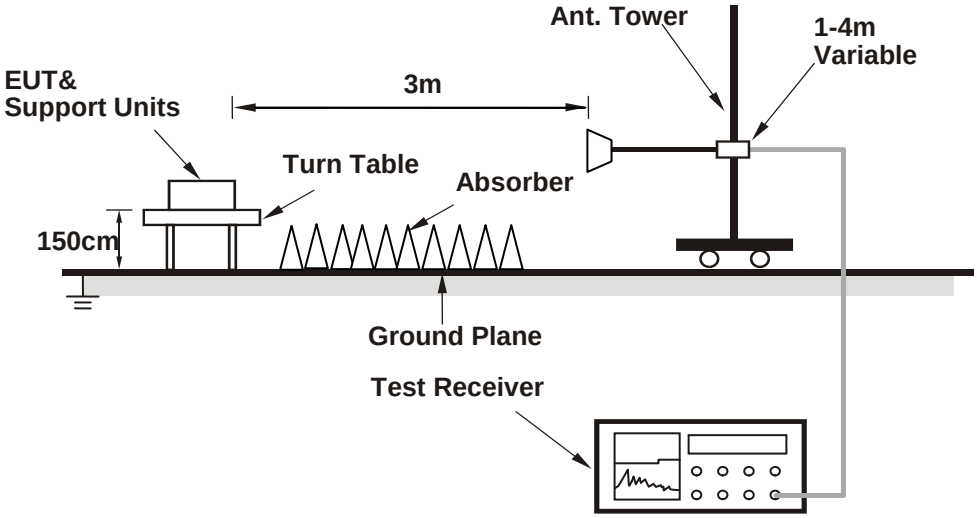
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Placed the EUT on the testing table.

b. Controlling software (Tera Term paste BNRV700_Wifi SOP_190223.doc command) has been activated to set the EUT under transmission condition continuously.

4.1.7 Test Results

Above 1GHz Data：

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**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	53.5 PK	74.0	-20.5	1.08 H	134	56.7	-3.2
2	2390.00	41.0 AV	54.0	-13.0	1.08 H	134	44.2	-3.2
3	*2412.00	102.2 PK			1.08 H	134	105.4	-3.2
4	*2412.00	99.5 AV			1.08 H	134	102.7	-3.2
5	4824.00	54.7 PK	74.0	-19.3	1.15 H	357	53.9	0.8
6	4824.00	53.2 AV	54.0	-0.8	1.15 H	357	52.4	0.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2390.00	52.2 PK	74.0	-21.8	3.78 V	184	55.4	-3.2
2	2390.00	40.1 AV	54.0	-13.9	3.78 V	184	43.3	-3.2
3	*2412.00	100.9 PK			3.78 V	184	104.1	-3.2
4	*2412.00	98.2 AV			3.78 V	184	101.4	-3.2
5	4824.00	51.6 PK	74.0	-22.4	2.81 V	183	50.8	0.8
6	4824.00	49.7 AV	54.0	-4.3	2.81 V	183	48.9	0.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	102.1 PK			1.06 H	128	105.1	-3.0
2	*2437.00	100.0 AV			1.06 H	128	103.0	-3.0
3	4874.00	54.6 PK	74.0	-19.4	1.14 H	360	53.9	0.7
4	4874.00	53.5 AV	54.0	-0.5	1.14 H	360	52.8	0.7
5	7311.00	44.7 PK	74.0	-29.3	2.75 H	347	38.0	6.7
6	7311.00	33.9 AV	54.0	-20.1	2.75 H	347	27.2	6.7
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	*2437.00	101.5 PK			3.83 V	178	104.5	-3.0
2	*2437.00	98.6 AV			3.83 V	178	101.6	-3.0
3	4874.00	51.5 PK	74.0	-22.5	2.77 V	184	50.8	0.7
4	4874.00	50.1 AV	54.0	-3.9	2.77 V	184	49.4	0.7
5	7311.00	43.0 PK	74.0	-31.0	1.58 V	300	36.3	6.7
6	7311.00	31.2 AV	54.0	-22.8	1.58 V	300	24.5	6.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.0 PK			1.05 H	131	105.1	-3.1
2	*2462.00	99.6 AV			1.05 H	131	102.7	-3.1
3	2483.50	53.8 PK	74.0	-20.2	1.05 H	131	56.9	-3.1
4	2483.50	41.2 AV	54.0	-12.8	1.05 H	131	44.3	-3.1
5	4924.00	55.1 PK	74.0	-18.9	1.17 H	357	54.3	0.8
6	4924.00	53.6 AV	54.0	-0.4	1.17 H	357	52.8	0.8
7	7386.00	44.3 PK	74.0	-29.7	2.73 H	355	37.3	7.0
8	7386.00	33.6 AV	54.0	-20.4	2.73 H	355	26.6	7.0
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	100.9 PK			3.75 V	181	104.0	-3.1
2	*2462.00	98.1 AV			3.75 V	181	101.2	-3.1
3	2483.50	52.3 PK	74.0	-21.7	3.75 V	181	55.4	-3.1
4	2483.50	40.0 AV	54.0	-14.0	3.75 V	181	43.1	-3.1
5	4924.00	51.6 PK	74.0	-22.4	2.79 V	171	50.8	0.8
6	4924.00	50.0 AV	54.0	-4.0	2.79 V	171	49.2	0.8
7	7386.00	43.2 PK	74.0	-30.8	1.62 V	288	36.2	7.0
8	7386.00	31.4 AV	54.0	-22.6	1.62 V	288	24.4	7.0

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.3 PK	74.0	-18.7	1.22 H	136	58.5	-3.2
2	2390.00	43.1 AV	54.0	-10.9	1.22 H	136	46.3	-3.2
3	*2412.00	104.3 PK			1.22 H	136	107.5	-3.2
4	*2412.00	93.7 AV			1.22 H	136	96.9	-3.2
5	4824.00	55.7 PK	74.0	-18.3	1.06 H	354	54.9	0.8
6	4824.00	53.4 AV	54.0	-0.6	1.06 H	354	52.6	0.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	52.5 PK	74.0	-21.5	3.81 V	198	55.7	-3.2
2	2390.00	40.3 AV	54.0	-13.7	3.81 V	198	43.5	-3.2
3	*2412.00	102.5 PK			3.81 V	198	105.7	-3.2
4	*2412.00	92.1 AV			3.81 V	198	95.3	-3.2
5	4824.00	51.5 PK	74.0	-22.5	2.79 V	189	50.7	0.8
6	4824.00	49.6 AV	54.0	-4.4	2.79 V	189	48.8	0.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	104.9 PK			1.17 H	138	107.9	-3.0
2	*2437.00	94.0 AV			1.17 H	138	97.0	-3.0
3	4874.00	55.7 PK	74.0	-18.3	1.02 H	360	55.0	0.7
4	4874.00	53.5 AV	54.0	-0.5	1.02 H	360	52.8	0.7
5	7311.00	44.5 PK	74.0	-29.5	2.76 H	343	37.8	6.7
6	7311.00	33.7 AV	54.0	-20.3	2.76 H	343	27.0	6.7
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	*2437.00	102.6 PK			3.79 V	195	105.6	-3.0
2	*2437.00	92.4 AV			3.79 V	195	95.4	-3.0
3	4874.00	51.0 PK	74.0	-23.0	2.81 V	187	50.3	0.7
4	4874.00	49.1 AV	54.0	-4.9	2.81 V	187	48.4	0.7
5	7311.00	42.6 PK	74.0	-31.4	1.55 V	290	35.9	6.7
6	7311.00	30.9 AV	54.0	-23.1	1.55 V	290	24.2	6.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.5 PK			1.13 H	137	107.6	-3.1
2	*2462.00	93.6 AV			1.13 H	137	96.7	-3.1
3	2483.50	53.6 PK	74.0	-20.4	1.13 H	137	56.7	-3.1
4	2483.50	41.3 AV	54.0	-12.7	1.13 H	137	44.4	-3.1
5	4924.00	57.4 PK	74.0	-16.6	1.18 H	360	56.6	0.8
6	4924.00	50.7 AV	54.0	-3.3	1.18 H	360	49.9	0.8
7	7386.00	44.8 PK	74.0	-29.2	2.73 H	353	37.8	7.0
8	7386.00	34.0 AV	54.0	-20.0	2.73 H	353	27.0	7.0
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	102.2 PK			3.80 V	190	105.3	-3.1
2	*2462.00	92.0 AV			3.80 V	190	95.1	-3.1
3	2483.50	52.4 PK	74.0	-21.6	3.80 V	190	55.5	-3.1
4	2483.50	39.8 AV	54.0	-14.2	3.80 V	190	42.9	-3.1
5	4924.00	51.4 PK	74.0	-22.6	2.76 V	190	50.6	0.8
6	4924.00	49.4 AV	54.0	-4.6	2.76 V	190	48.6	0.8
7	7386.00	42.6 PK	74.0	-31.4	1.58 V	296	35.6	7.0
8	7386.00	31.1 AV	54.0	-22.9	1.58 V	296	24.1	7.0

REMARKS:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	44.7 PK	74.0	-29.3	1.18 H	125	47.9	-3.2
2	2390.00	34.1 AV	54.0	-19.9	1.18 H	125	37.3	-3.2
3	*2412.00	104.5 PK			1.18 H	125	107.7	-3.2
4	*2412.00	93.5 AV			1.18 H	125	96.7	-3.2
5	4824.00	56.0 PK	74.0	-18.0	1.09 H	349	55.2	0.8
6	4824.00	53.5 AV	54.0	-0.5	1.09 H	349	52.7	0.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	52.3 PK	74.0	-21.7	3.80 V	193	55.5	-3.2
2	2390.00	40.1 AV	54.0	-13.9	3.80 V	193	43.3	-3.2
3	*2412.00	102.0 PK			3.80 V	193	105.2	-3.2
4	*2412.00	91.9 AV			3.80 V	193	95.1	-3.2
5	4824.00	51.1 PK	74.0	-22.9	2.80 V	179	50.3	0.8
6	4824.00	48.9 AV	54.0	-5.1	2.80 V	179	48.1	0.8

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	105.0 PK			1.09 H	132	108.0	-3.0
2	*2437.00	94.1 AV			1.09 H	132	97.1	-3.0
3	4874.00	55.8 PK	74.0	-18.2	1.07 H	360	55.1	0.7
4	4874.00	53.7 AV	54.0	-0.3	1.07 H	360	53.0	0.7
5	7311.00	43.8 PK	74.0	-30.2	2.78 H	341	37.1	6.7
6	7311.00	33.3 AV	54.0	-20.7	2.78 H	341	26.6	6.7
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	*2437.00	101.9 PK			3.78 V	190	104.9	-3.0
2	*2437.00	91.5 AV			3.78 V	190	94.5	-3.0
3	4874.00	51.4 PK	74.0	-22.6	2.80 V	174	50.7	0.7
4	4874.00	49.5 AV	54.0	-4.5	2.80 V	174	48.8	0.7
5	7311.00	42.7 PK	74.0	-31.3	1.53 V	285	36.0	6.7
6	7311.00	31.3 AV	54.0	-22.7	1.53 V	285	24.6	6.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.9 PK			1.17 H	152	107.0	-3.1
2	*2462.00	93.3 AV			1.17 H	152	96.4	-3.1
3	2483.50	53.3 PK	74.0	-20.7	1.17 H	152	56.4	-3.1
4	2483.50	40.9 AV	54.0	-13.1	1.17 H	152	44.0	-3.1
5	4924.00	57.1 PK	74.0	-16.9	1.16 H	359	56.3	0.8
6	4924.00	50.9 AV	54.0	-3.1	1.16 H	359	50.1	0.8
7	7386.00	45.2 PK	74.0	-28.8	2.68 H	344	38.2	7.0
8	7386.00	34.5 AV	54.0	-19.5	2.68 H	344	27.5	7.0
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	102.0 PK			3.75 V	178	105.1	-3.1
2	*2462.00	92.0 AV			3.75 V	178	95.1	-3.1
3	2483.50	51.9 PK	74.0	-22.1	3.75 V	178	55.0	-3.1
4	2483.50	39.5 AV	54.0	-14.5	3.75 V	178	42.6	-3.1
5	4924.00	51.7 PK	74.0	-22.3	2.73 V	197	50.9	0.8
6	4924.00	49.6 AV	54.0	-4.4	2.73 V	197	48.8	0.8
7	7386.00	42.5 PK	74.0	-31.5	1.52 V	294	35.5	7.0
8	7386.00	31.1 AV	54.0	-22.9	1.52 V	294	24.1	7.0

REMARKS:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.0 PK	74.0	-16.0	1.09 H	137	61.2	-3.2
2	2390.00	44.9 AV	54.0	-9.1	1.09 H	137	48.1	-3.2
3	*2422.00	100.1 PK			1.09 H	137	103.3	-3.2
4	*2422.00	90.2 AV			1.09 H	137	93.4	-3.2
5	4844.00	57.4 PK	74.0	-16.6	1.18 H	360	56.6	0.8
6	4844.00	53.1 AV	54.0	-0.9	1.18 H	360	52.3	0.8
7	7266.00	44.0 PK	74.0	-30.0	2.71 H	351	37.3	6.7
8	7266.00	33.2 AV	54.0	-20.8	2.71 H	351	26.5	6.7
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	52.6 PK	74.0	-21.4	1.07 V	125	55.8	-3.2
2	2390.00	40.4 AV	54.0	-13.6	1.07 V	125	43.6	-3.2
3	*2422.00	98.9 PK			1.07 V	125	102.1	-3.2
4	*2422.00	89.2 AV			1.07 V	125	92.4	-3.2
5	4844.00	57.9 PK	74.0	-16.1	1.20 V	360	57.1	0.8
6	4844.00	53.5 AV	54.0	-0.5	1.20 V	360	52.7	0.8
7	7266.00	44.0 PK	74.0	-30.0	2.74 V	339	37.3	6.7
8	7266.00	33.2 AV	54.0	-20.8	2.74 V	339	26.5	6.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	99.9 PK			1.44 H	155	102.9	-3.0
2	*2437.00	89.6 AV			1.44 H	155	92.6	-3.0
3	4874.00	56.7 PK	74.0	-17.3	1.20 H	351	56.0	0.7
4	4874.00	51.0 AV	54.0	-3.0	1.20 H	351	50.3	0.7
5	7311.00	43.8 PK	74.0	-30.2	2.64 H	360	37.1	6.7
6	7311.00	33.1 AV	54.0	-20.9	2.64 H	360	26.4	6.7
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	*2437.00	98.6 PK			1.11 V	120	101.6	-3.0
2	*2437.00	88.8 AV			1.11 V	120	91.8	-3.0
3	4874.00	57.9 PK	74.0	-16.1	1.19 V	360	57.2	0.7
4	**4874.00**	**53.8 AV**	**54.0**	**-0.2**	**1.19 V**	**360**	**53.1**	**0.7**
5	7311.00	44.5 PK	74.0	-29.5	2.68 V	342	37.8	6.7
6	7311.00	33.5 AV	54.0	-20.5	2.68 V	342	26.8	6.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	100.2 PK			1.46 H	140	103.3	-3.1
2	*2452.00	89.8 AV			1.46 H	140	92.9	-3.1
3	2483.50	60.0 PK	74.0	-14.0	1.46 H	140	63.1	-3.1
4	2483.50	44.5 AV	54.0	-9.5	1.46 H	140	47.6	-3.1
5	4904.00	57.3 PK	74.0	-16.7	1.18 H	360	56.6	0.7
6	4904.00	51.4 AV	54.0	-2.6	1.18 H	360	50.7	0.7
7	7356.00	43.7 PK	74.0	-30.3	2.69 H	360	36.8	6.9
8	7356.00	33.2 AV	54.0	-20.8	2.69 H	360	26.3	6.9
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	98.8 PK			1.03 V	117	101.9	-3.1
2	*2452.00	88.9 AV			1.03 V	117	92.0	-3.1
3	2483.50	51.5 PK	74.0	-22.5	1.03 V	117	54.6	-3.1
4	2483.50	39.1 AV	54.0	-14.9	1.03 V	117	42.2	-3.1
5	4904.00	57.8 PK	74.0	-16.2	1.22 V	349	57.1	0.7
6	4904.00	53.1 AV	54.0	-0.9	1.22 V	349	52.4	0.7
7	7356.00	52.5 PK	74.0	-21.5	2.79 V	333	45.6	6.9
8	7356.00	40.2 AV	54.0	-13.8	2.79 V	333	33.3	6.9

REMARKS:

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

Below 1GHz Data:

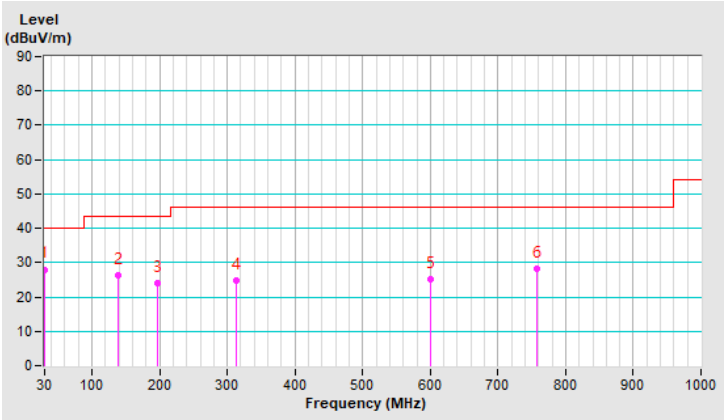
802.11g (32G Byte)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	30.02	28.0 QP	40.0	-12.0	1.12 H	360	42.7	-14.7
2	138.76	26.4 QP	43.5	-17.1	1.00 H	54	40.0	-13.6
3	196.35	23.9 QP	43.5	-19.6	1.65 H	311	39.6	-15.7
4	313.12	24.9 QP	46.0	-21.1	1.32 H	105	36.8	-11.9
5	601.06	25.2 QP	46.0	-20.8	2.00 H	82	30.4	-5.2
6	758.37	28.3 QP	46.0	-17.7	2.15 H	267	31.1	-2.8

REMARKS:

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

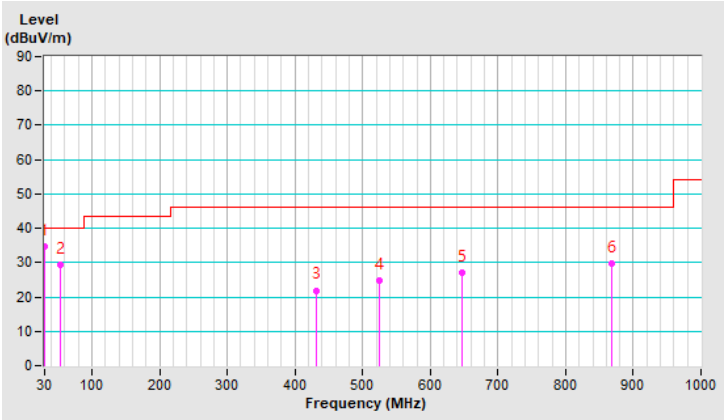


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.12	34.7 QP	40.0	-5.3	1.11 V	348	49.4	-14.7
2	54.10	29.5 QP	40.0	-10.5	1.32 V	315	42.9	-13.4
3	431.75	21.9 QP	46.0	-24.1	1.49 V	79	30.7	-8.8
4	524.58	24.6 QP	46.0	-21.4	1.75 V	100	31.7	-7.1
5	646.73	27.0 QP	46.0	-19.0	2.02 V	328	31.7	-4.7
6	867.16	29.6 QP	46.0	-16.4	1.85 V	336	31.4	-1.8

REMARKS:

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



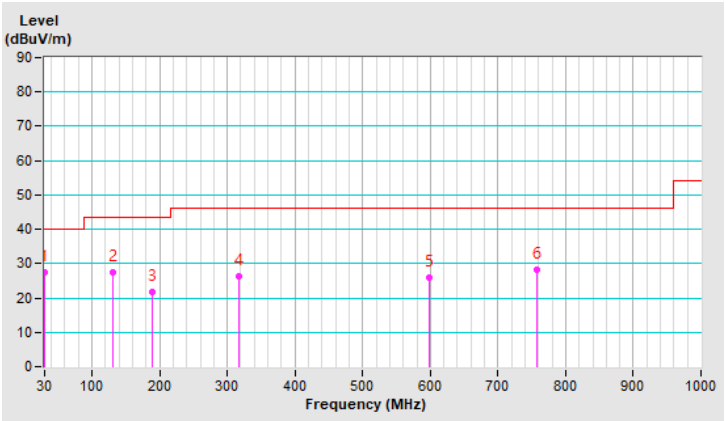
802.11g (8G Byte)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.56	27.3 QP	40.0	-12.7	1.98 H	187	42.0	-14.7
2	130.18	27.3 QP	43.5	-16.2	1.49 H	89	41.6	-14.3
3	189.40	21.8 QP	43.5	-21.7	1.54 H	302	37.3	-15.5
4	316.25	26.4 QP	46.0	-19.6	1.65 H	212	38.2	-11.8
5	598.90	25.9 QP	46.0	-20.1	1.85 H	353	31.2	-5.3
6	757.43	28.2 QP	46.0	-17.8	1.65 H	360	31.0	-2.8

REMARKS:

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

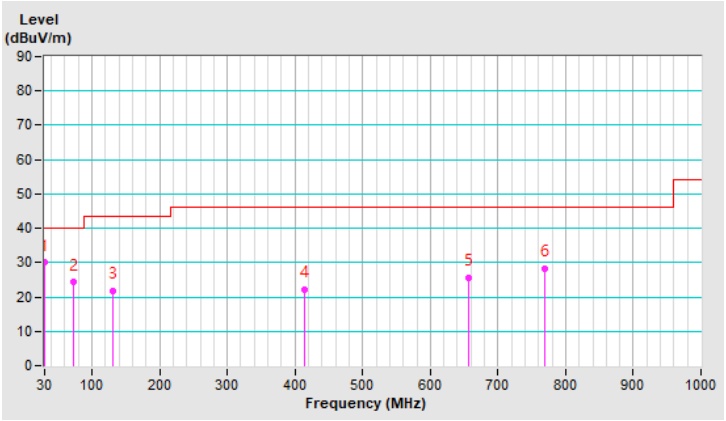


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.15	30.0 QP	40.0	-10.0	1.11 V	360	44.7	-14.7
2	72.66	24.3 QP	40.0	-15.7	1.22 V	237	40.5	-16.2
3	130.95	21.9 QP	43.5	-21.6	1.43 V	273	36.2	-14.3
4	413.63	22.3 QP	46.0	-23.7	2.17 V	317	31.9	-9.6
5	657.03	25.7 QP	46.0	-20.3	2.23 V	246	30.3	-4.6
6	769.58	28.4 QP	46.0	-17.6	2.36 V	285	30.8	-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: Mar. 26, 2019

4.2.3 Test Procedures

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

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

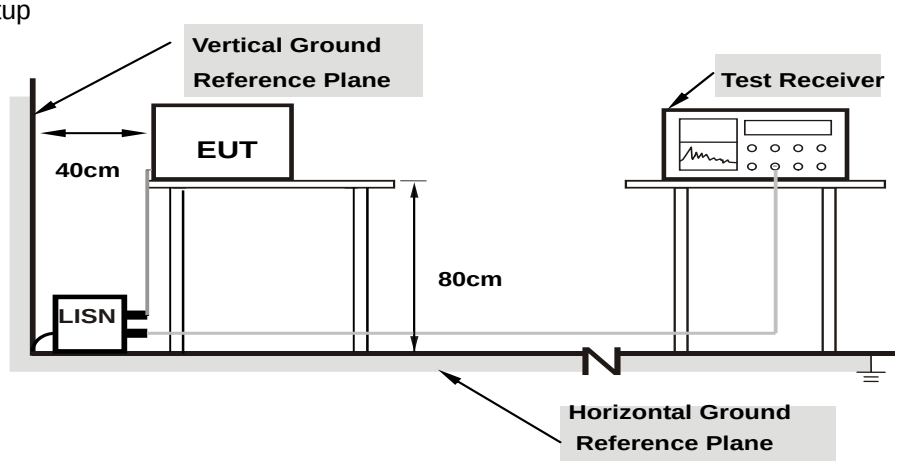
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

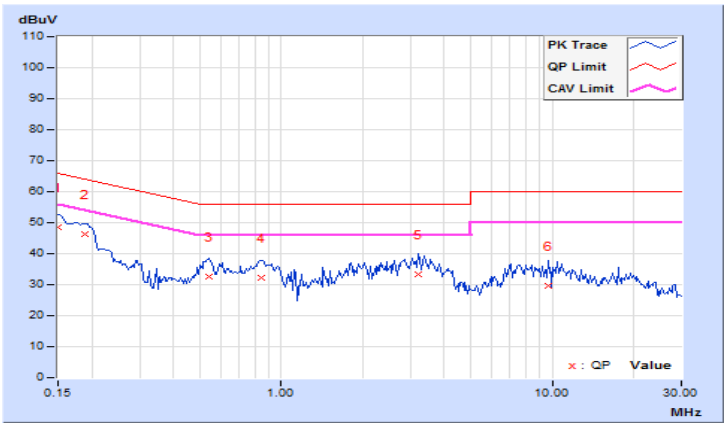
4.2.7 Test Results

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

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	10.02	38.32	18.25	48.34	28.27	66.00	56.00	-17.66	-27.73
2	0.18906	10.04	36.10	18.99	46.14	29.03	64.08	54.08	-17.94	-25.05
3	0.54453	10.08	22.38	5.37	32.46	15.45	56.00	46.00	-23.54	-30.55
4	0.84531	10.10	22.22	5.41	32.32	15.51	56.00	46.00	-23.68	-30.49
5	3.21875	10.21	23.01	14.68	33.22	24.89	56.00	46.00	-22.78	-21.11
6	9.68359	10.52	19.02	11.77	29.54	22.29	60.00	50.00	-30.46	-27.71

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

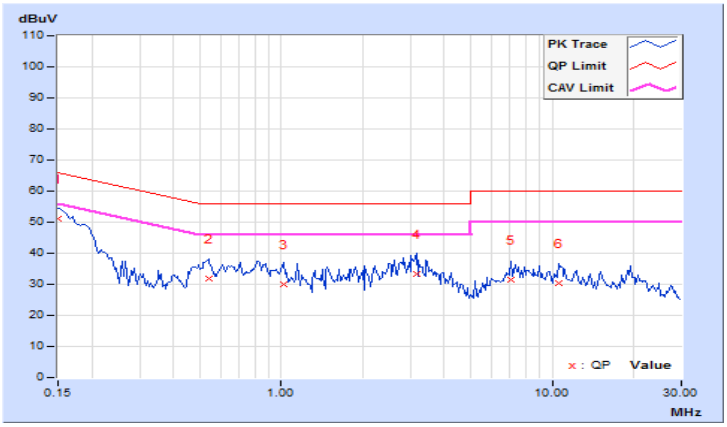


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	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**	**41.04**	**20.15**	**50.97**	**30.08**	**66.00**	**56.00**	**-15.03**	**-25.92**
2	0.54063	9.97	21.84	4.85	31.81	14.82	56.00	46.00	-24.19	-31.18
3	1.01953	9.99	19.99	7.75	29.98	17.74	56.00	46.00	-26.02	-28.26
4	3.14844	10.09	23.39	14.42	33.48	24.51	56.00	46.00	-22.52	-21.49
5	7.05469	10.25	21.08	13.54	31.33	23.79	60.00	50.00	-28.67	-26.21
6	10.56641	10.41	20.00	13.31	30.41	23.72	60.00	50.00	-29.59	-26.28

Remarks:

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

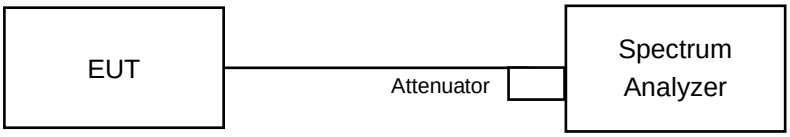


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	10.11	0.5	PASS
6	2437	10.10	0.5	PASS
11	2462	10.10	0.5	PASS

802.11g

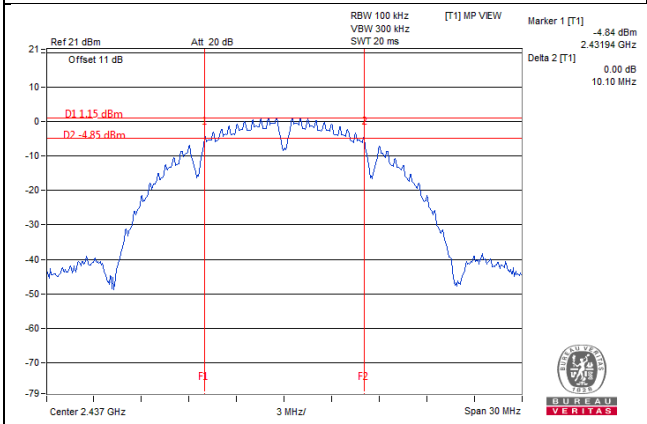
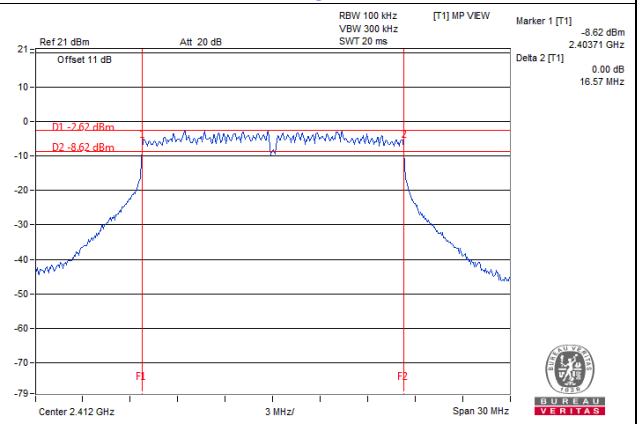
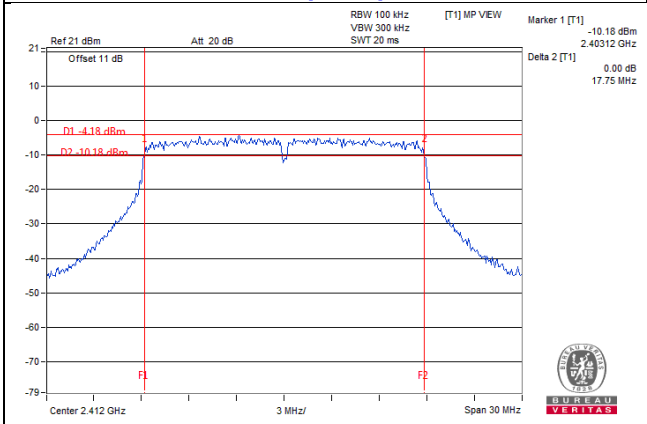
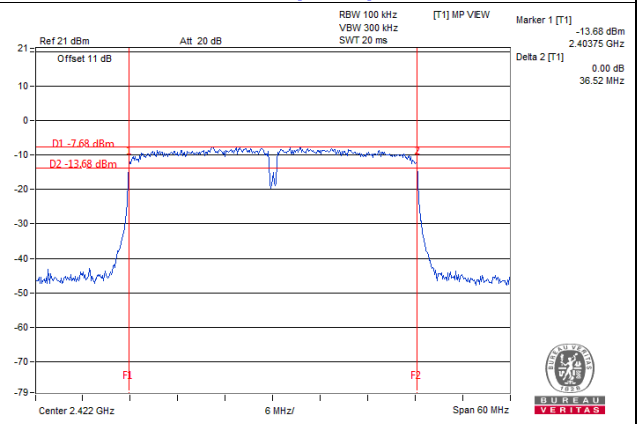
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.57	0.5	PASS
6	2437	16.58	0.5	PASS
11	2462	16.60	0.5	PASS

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.75	0.5	Pass
6	2437	17.76	0.5	Pass
11	2462	17.75	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	36.52	0.5	Pass
6	2437	36.54	0.5	Pass
9	2452	36.54	0.5	Pass

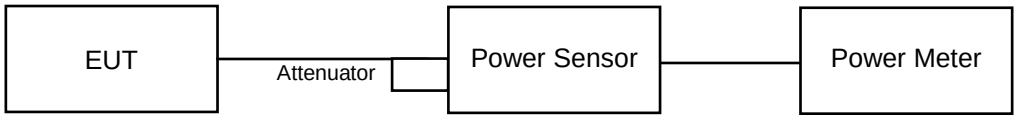
Spectrum Plot of Worst Value	
802.11b:CH6	**802.11g: CH1**
	
802.11n (HT20):CH1	**802.11n (HT40):CH3**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

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

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.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

FOR PEAK POWER

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	22.029	13.43	30	Pass
6	2437	24.044	13.81	30	Pass
11	2462	28.51	14.55	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	94.842	19.77	30	Pass
6	2437	86.696	19.38	30	Pass
11	2462	82.414	19.16	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	66.834	18.25	30	Pass
6	2437	67.92	18.32	30	Pass
11	2462	63.096	18.00	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
3	2422	64.863	18.12	30	Pass
6	2437	60.954	17.85	30	Pass
9	2452	58.749	17.69	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	13.996	11.46
6	2437	14.757	11.69
11	2462	17.418	12.41

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	10.715	10.30
6	2437	9.817	9.92
11	2462	8.933	9.51

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	9.683	9.86
6	2437	9.817	9.92
11	2462	9.162	9.62

802.11n (HT40)

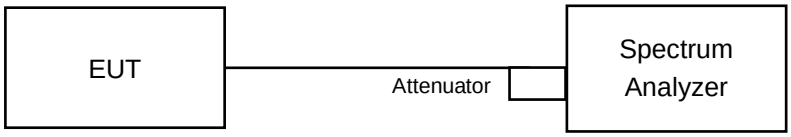
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
3	2422	9.55	9.80
6	2437	9.506	9.78
9	2452	9.29	9.68

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

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

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-19.26	8	Pass
6	2437	-18.19	8	Pass
11	2462	-18.26	8	Pass

802.11g

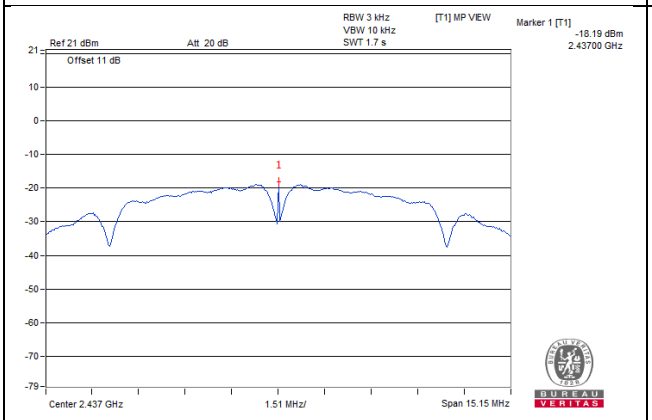
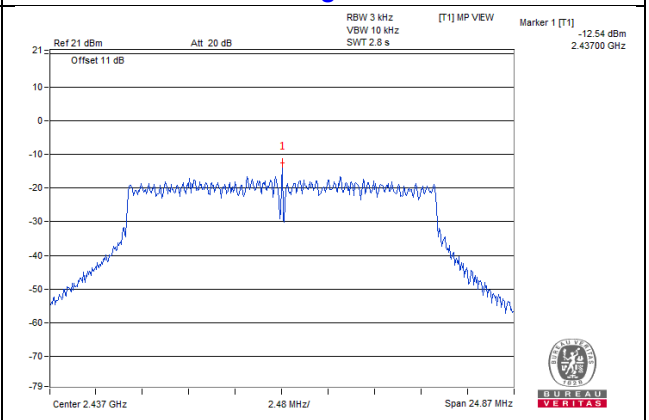
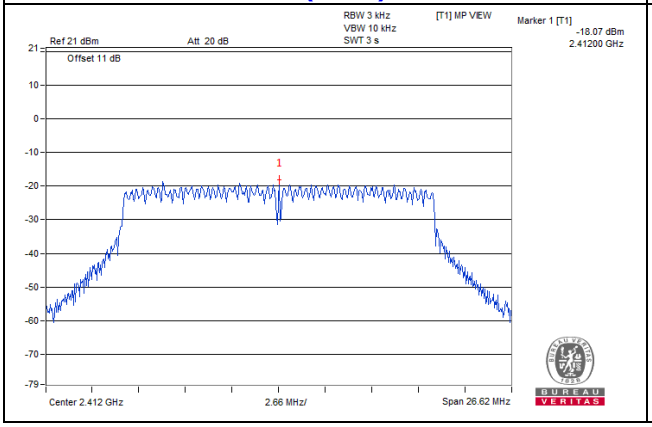
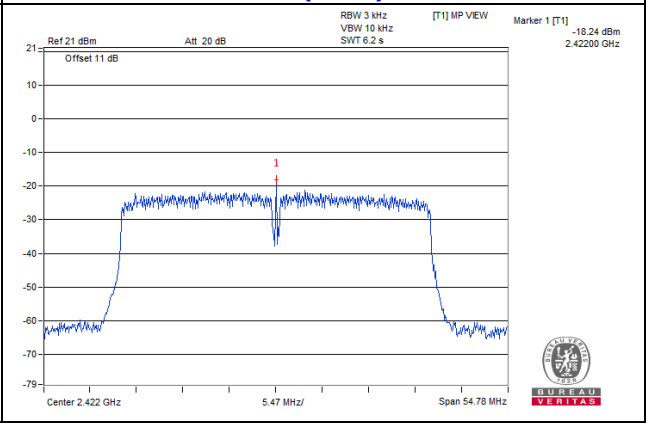
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-12.55	8	Pass
6	2437	-12.54	8	Pass
11	2462	-17.43	8	Pass

802.11n (HT20)

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-18.07	8	Pass
6	2437	-18.28	8	Pass
11	2462	-18.58	8	Pass

802.11n (HT40)

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
3	2422	-18.24	8	Pass
6	2437	-18.47	8	Pass
9	2452	-18.53	8	Pass

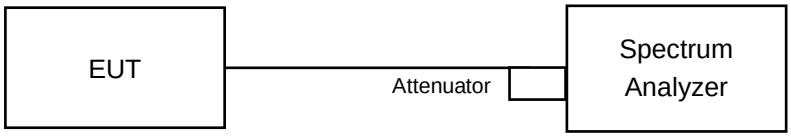
Spectrum Plot of Worst Value	
802.11b: CH6	**802.11g: CH6**
	
802.11n (HT20):CH1	**802.11n (HT40):CH3**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

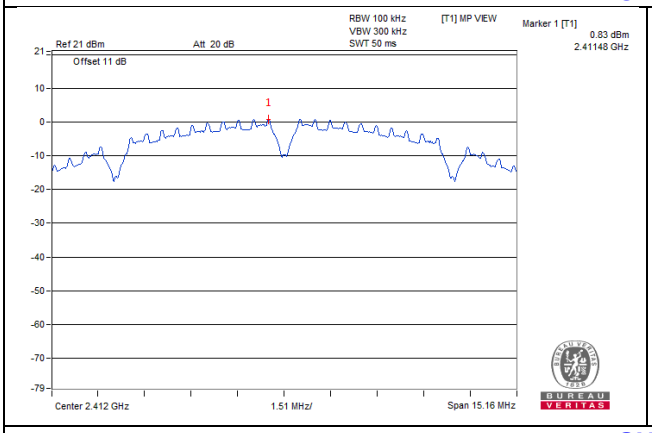
Same as Item 4.3.6

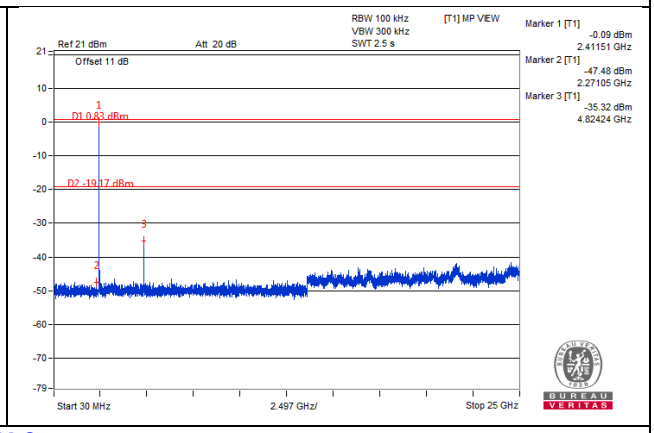
4.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20d Boffset below D1. It shows compliance with the requirement.

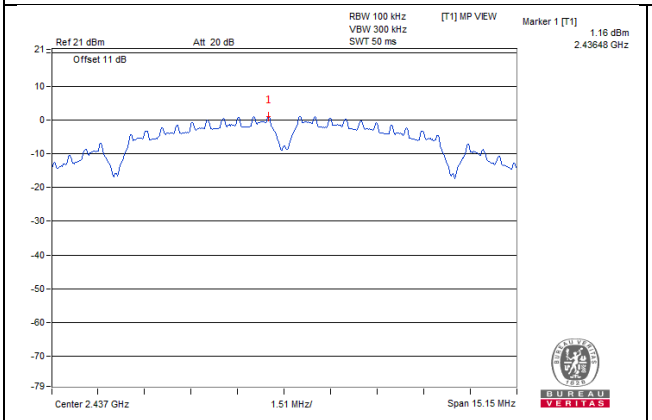
802.11b

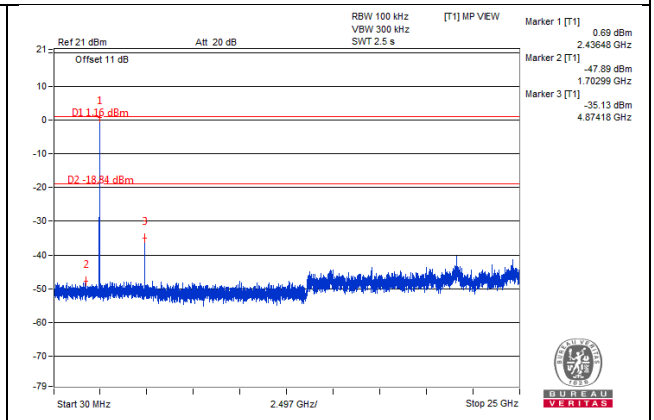
CH 1



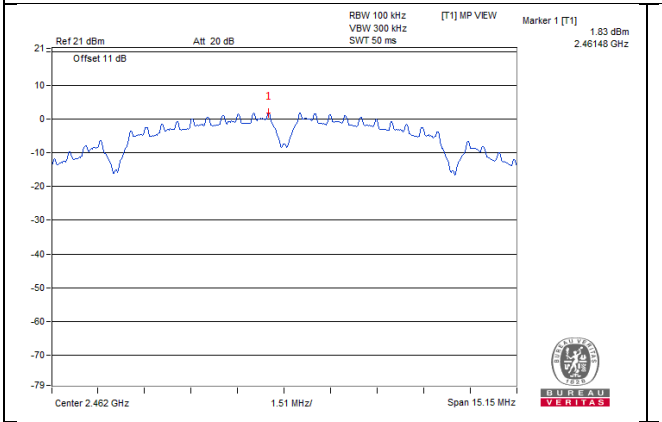


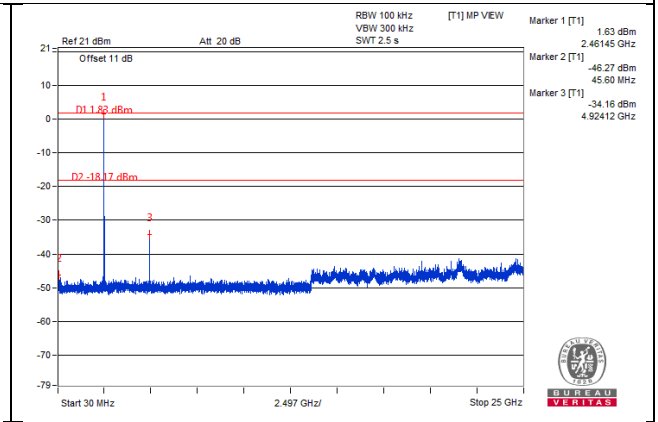
CH 6



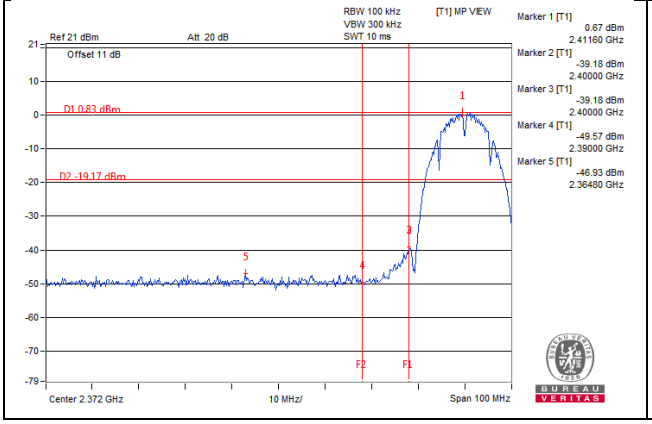


CH 11

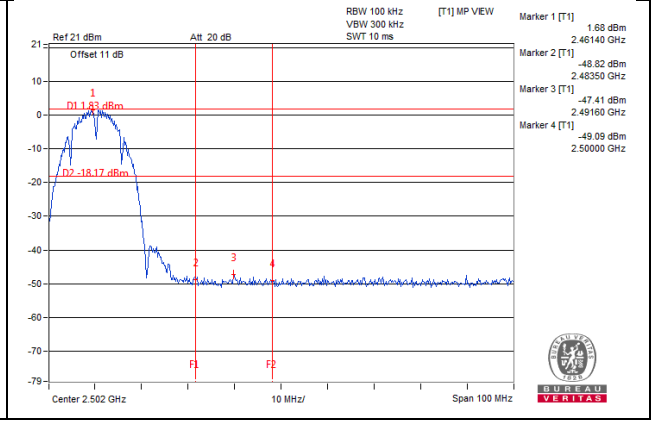




CH 1 Band edge

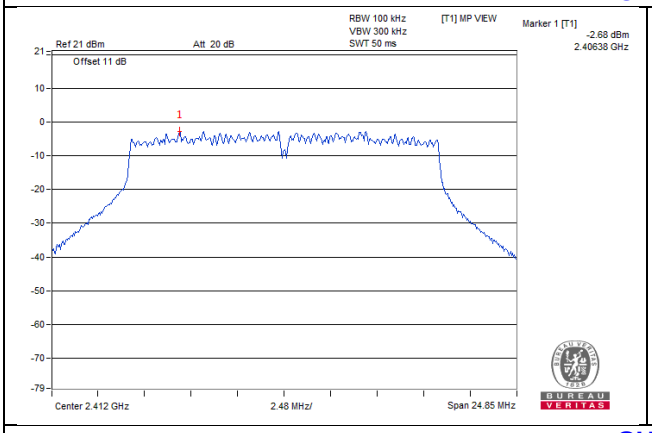


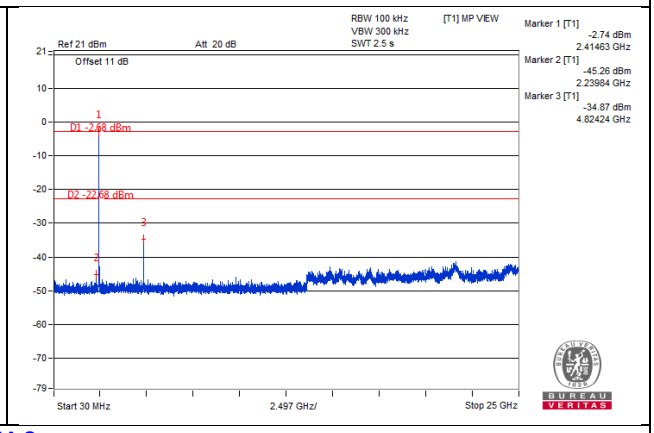
CH 11 Band edge



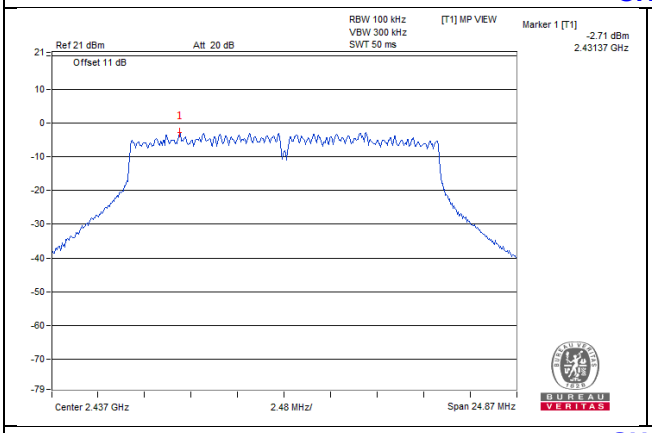
802.11g

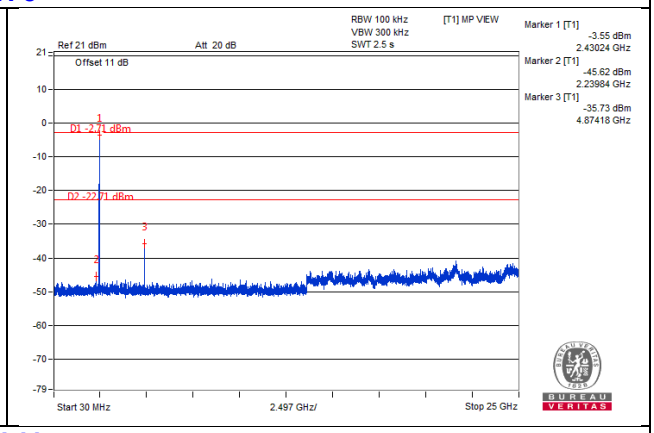
CH 1



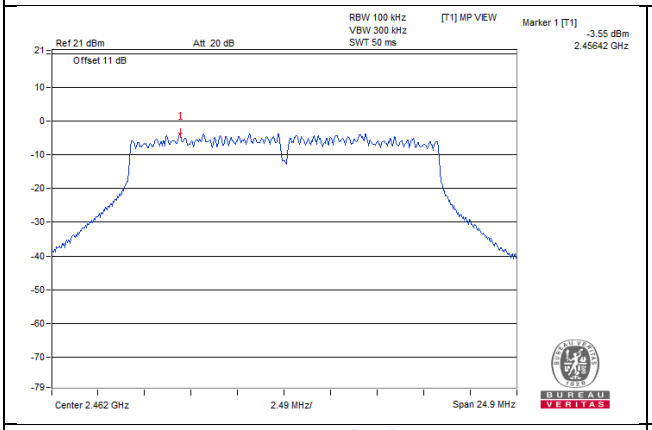


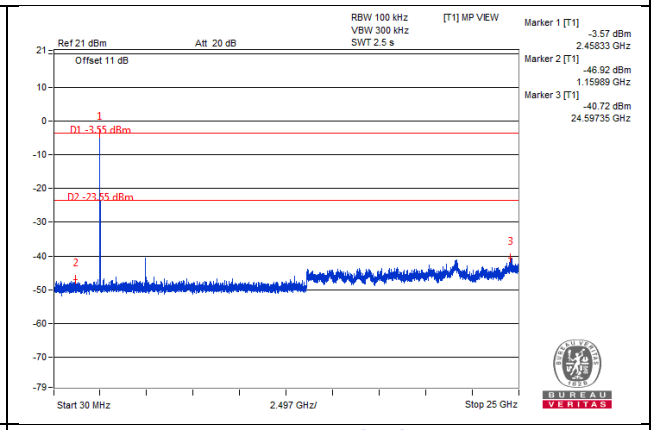
CH 6



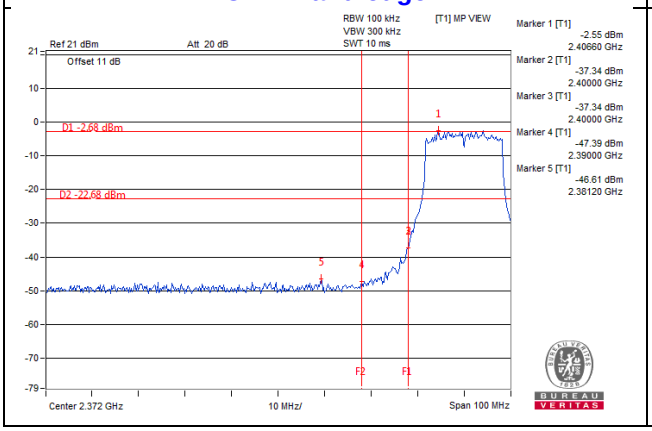


CH 11

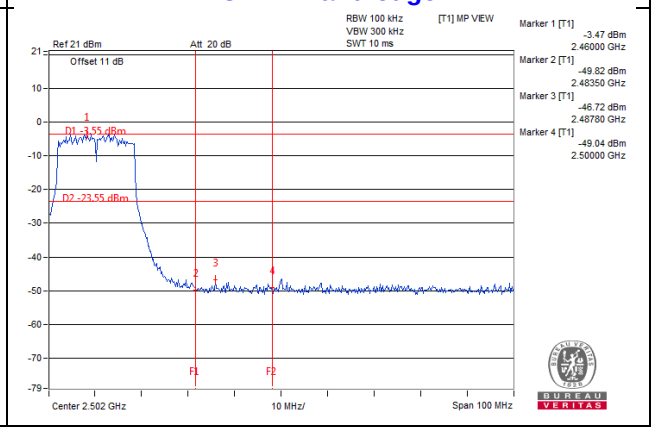




CH 1 Band edge

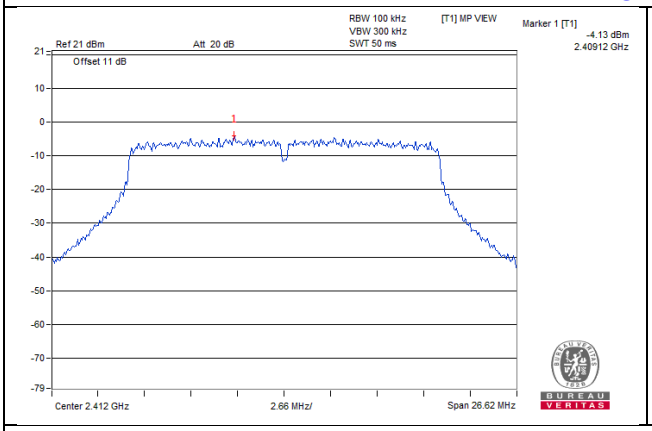


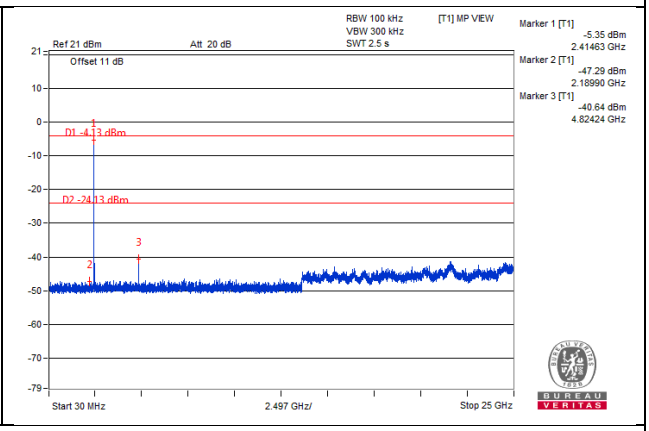
CH 11 Band edge



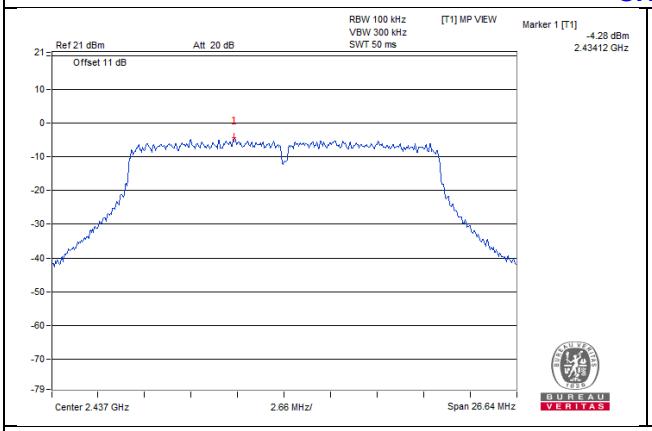
802.11n (HT20)

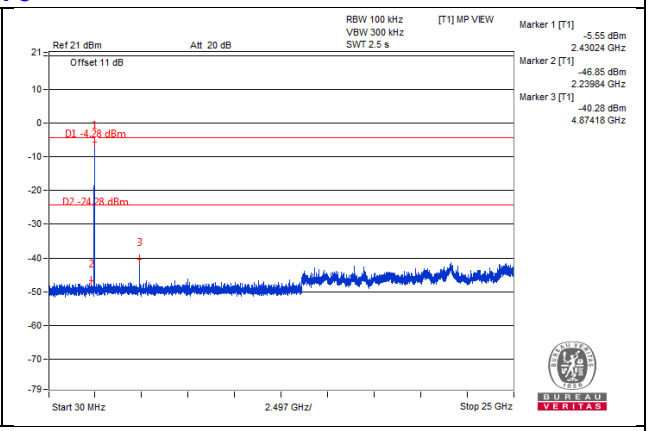
CH 1



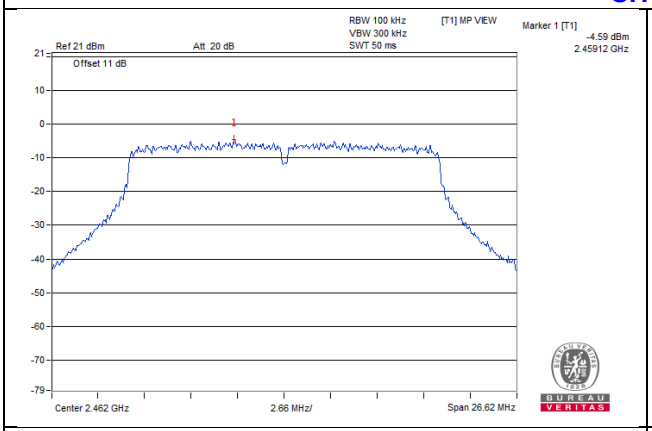


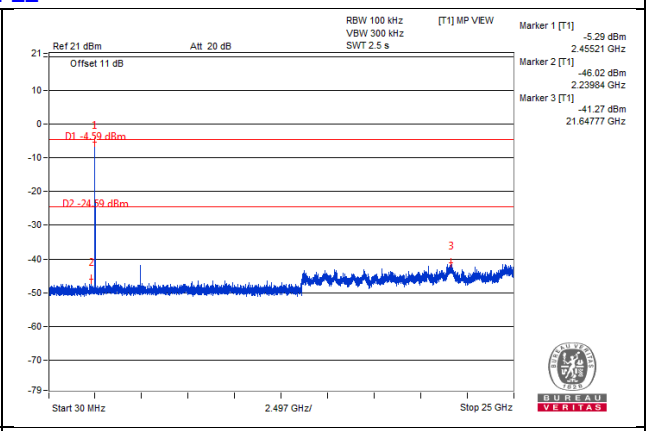
CH 6



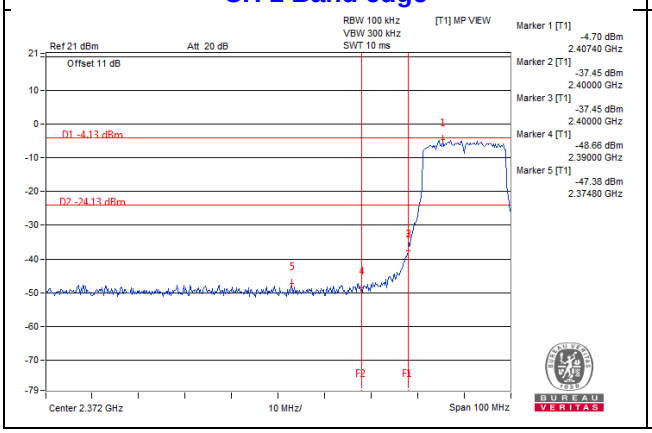


CH 11

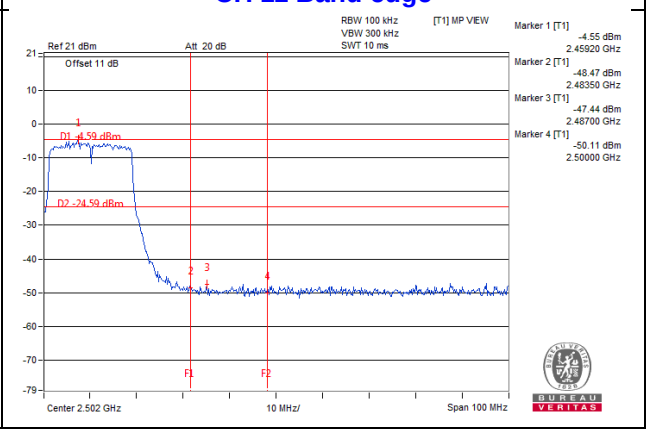




CH 1 Band edge

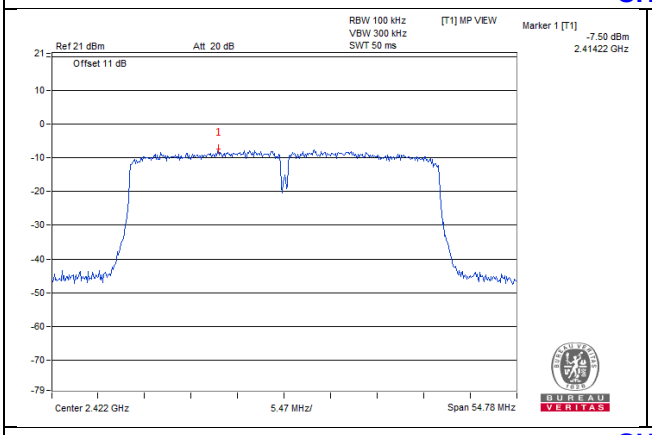


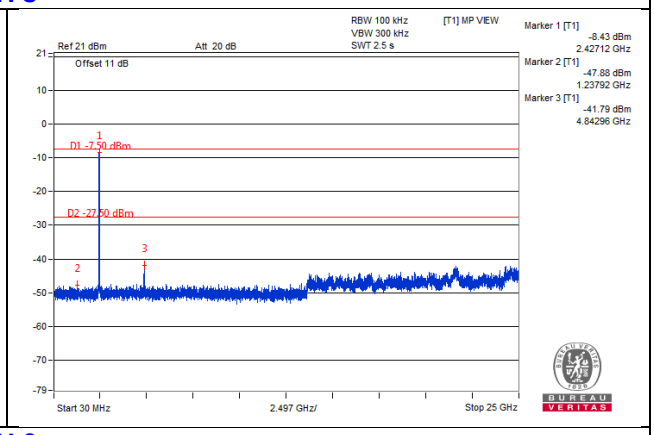
CH 11 Band edge



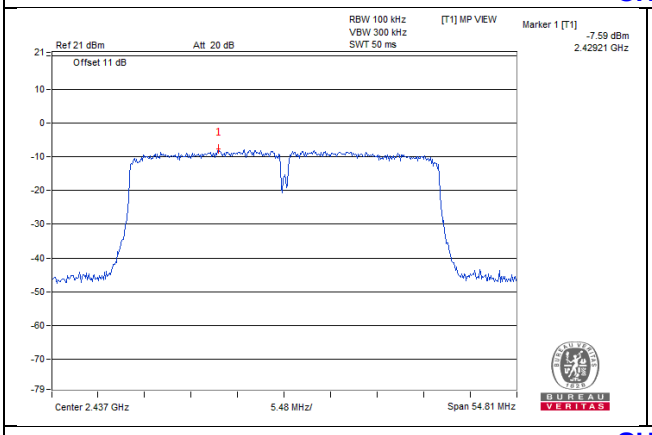
802.11n (HT40)

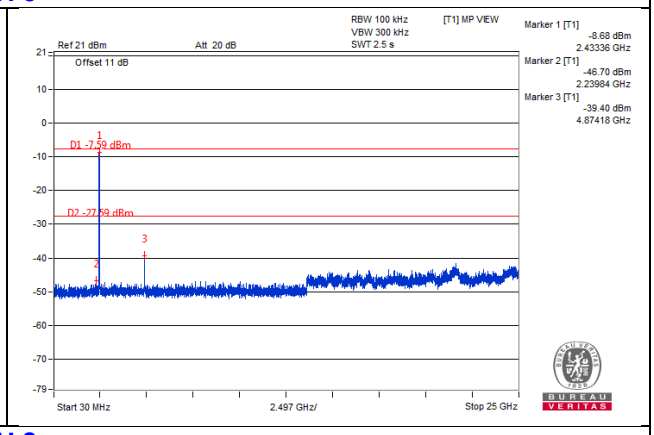
CH 3



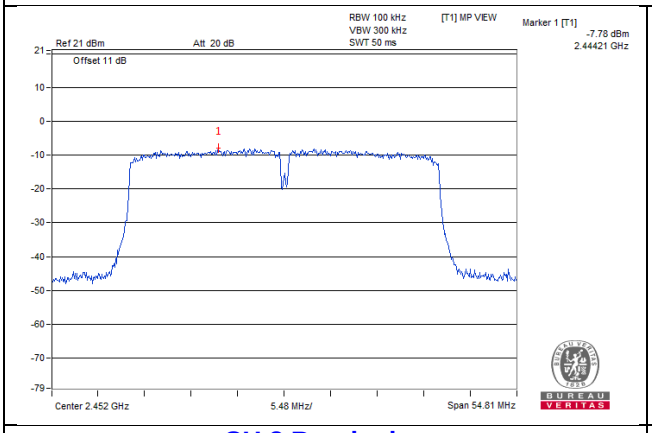


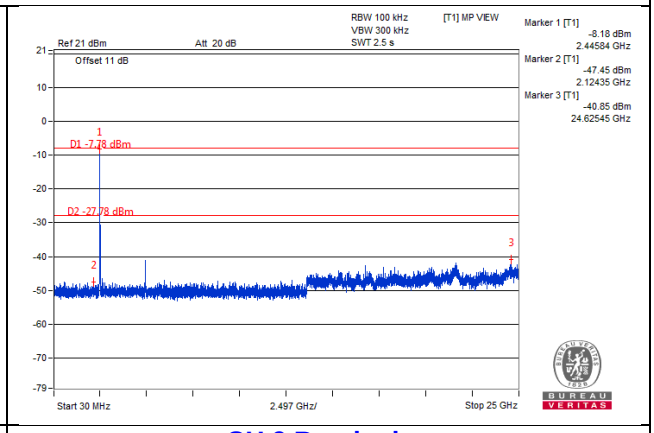
CH 6



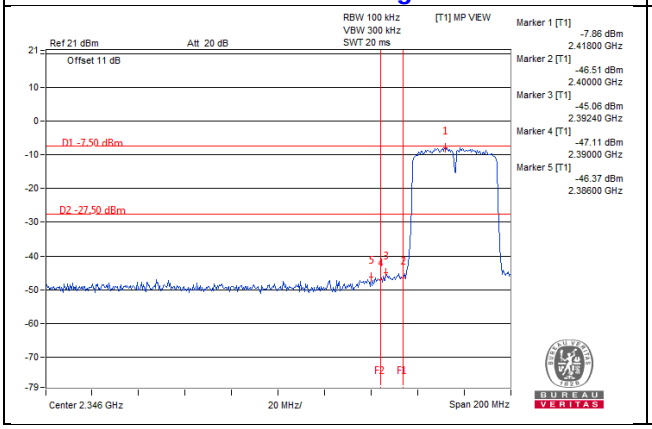


CH 9

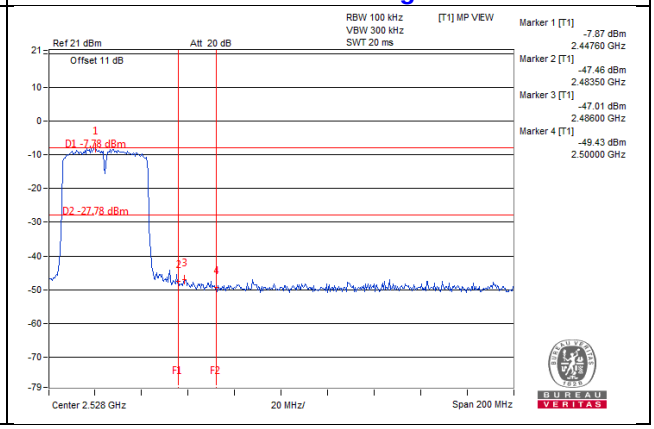




CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

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Email: service.adt@tw.bureauveritas.com
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The address and road map of all our labs can be found in our web site also.

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