FCC Test Report

Report No.:	RF180615D14
FCC ID:	2AI9TOAW-AP1201H
Test Model:	OAW-AP1201H
Received Date:	Apr. 25, 2018
Test Date:	May 4 ~ Jun. 27, 2018
Issued Date:	Jul. 6, 2018
Applicant:	ALE USA Inc.
Address:	26801 West Agoura Road, Calabasas, CA 91301
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)
FCC Registration / Designation Number:	198487 / TW2021

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF180615D14	Original release.	Jul. 6, 2018

1 Certificate of Conformity

Product:	OmniAccess Stellar
Brand:	Alcatel-Lucent Enterprise
Test Model:	OAW-AP1201H
Sample Status:	Engineering sample
Applicant:	ALE USA Inc.
Test Date:	May 4 ~ Jun. 27, 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 RF characteristics under the conditions specified in this report.

Prepared by : Annie Chang , **Date:** Jul. 6, 2018

Annie Chang / Senior Specialist

Approved by : Rex. Lai , **Date:** Jul. 6, 2018

Rex Lai / Associate Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -3.42dB at 15.07422MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.00dB at 2390.00MHz.
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	No antenna connector is used.

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	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.38 dB
	30MHz ~ 1000MHz	5.54 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.77 dB
	6GHz ~ 18GHz	5.48 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	OmniAccess Stellar
Brand	Alcatel-Lucent Enterprise
Test Model	OAW-AP1201H
Status of EUT	Engineering sample
Power Supply Rating	48Vdc from Adapter or 55Vdc from PoE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b:11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
Output Power	360.229mW
Antenna Type	Printed antenna with 4dBi gain
Antenna Connector	N/A
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. The EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	TX Function
802.11b	2TX
802.11g	2TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX

2. The EUT uses following adapter or PoE Adapter (Support unit only):

Item	Brand	Model No.	Rating
Adapter	DELTA	ADP-30HR B	AC I/P: 100-240V, 50-60Hz, 1A DC O/P: 48V, 0.66A Non-shielded DC (1.5m) with one ferrite core
PoE Adapter	Microsemi	PD-9001GR/AT/AC	AC I/P: 100-240V, 50/60Hz, 0.67A DC O/P: 55V, 0.6A

3. For Radiated test, the EUT was pre-tested with the following modes:
   - ✧ Operating Mode, Powered from Adapter
   - ✧ Operating Mode, Powered from PoE

   The worst emission level was found when the EUT tested under **Operating Mode, Powered from Adapter,** therefore, only its test data was recorded in this report.

4. 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 (20MHz):

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 (40MHz):

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	
A	√	√	√	√	Powered from Adapter
B	-	-	√	-	Powered from PoE

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 **Y-plane**.
NOTE: "-"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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
A	802.11g	1 to 11	1, 2, 6, 10, 11	OFDM	BPSK	6
A	802.11n (20MHz)	1 to 11	1, 2, 6, 10, 11	OFDM	BPSK	6.5
A	802.11n (40MHz)	3 to 9	3, 4, 6, 8, 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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11g	1 to 11	6	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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A & B	802.11g	1 to 11	6	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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
A	802.11g	1 to 11	1, 2, 6, 10, 11	OFDM	BPSK	6
A	802.11n (20MHz)	1 to 11	1, 2, 6, 10, 11	OFDM	BPSK	6.5
A	802.11n (40MHz)	3 to 9	3, 4, 6, 8, 9	OFDM	BPSK	13.5

Test Condition:

Applicable To	EUT Configure Mode	Environmental Conditions	Input Power	Tested By
RE≥1G	A	22deg. C, 76%RH	120Vac, 60Hz	James Wei
RE<1G	A	23deg. C, 74%RH	120Vac, 60Hz	James Wei
PLC	A	25deg. C, 78%RH	120Vac, 60Hz	StarItaly Wu
	B	25deg. C, 75%RH	120Vac, 60Hz	StarItaly Wu
APCM	A	25deg. C, 76%RH	120Vac, 60Hz	Saxon Lee

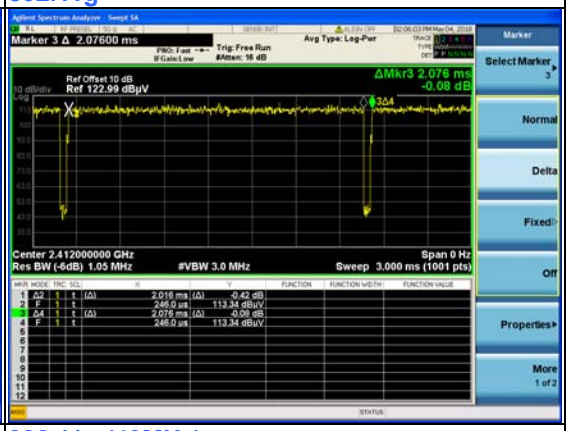
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

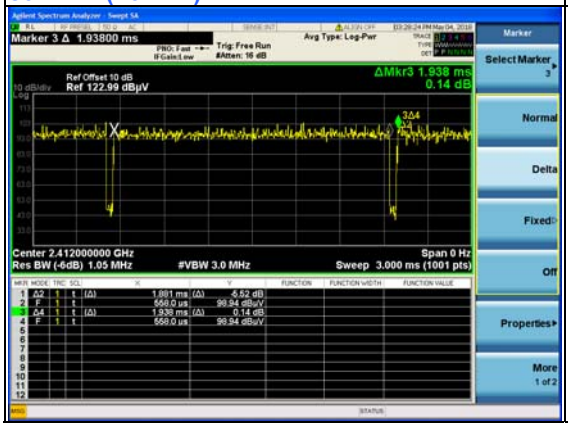
802.11b: Duty cycle = 100%
802.11g: Duty cycle = 2.016/2.076 = 0.971, Duty factor = 10 * log(1/0.971) = 0.13
802.11n (20MHz): Duty cycle = 1.881/1.938 = 0.971, Duty factor = 10 * log(1/0.971) = 0.13
802.11n (40MHz): Duty cycle = 0.892/0.964 = 0.925, Duty factor = 10 * log(1/0.925) = 0.34

802.11b

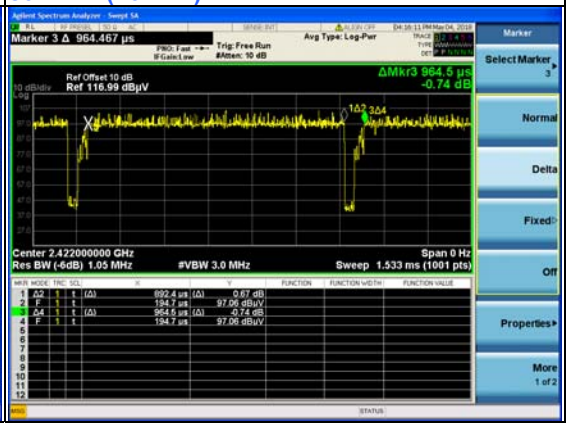
802.11g



802.11n (20MHz)



802.11n (40MHz)



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.	Adapter	DELTA	ADP-30HR B	N/A	N/A	Supplied by client
B.	Notebook PC	DELL	PP27L	8SNZ12S	FCC DoC Approved	Provided by Lab
C.	PoE Adapter	Microsemi	PD-9001GR/AT/AC	N/A	N/A	Supplied by client

Note:

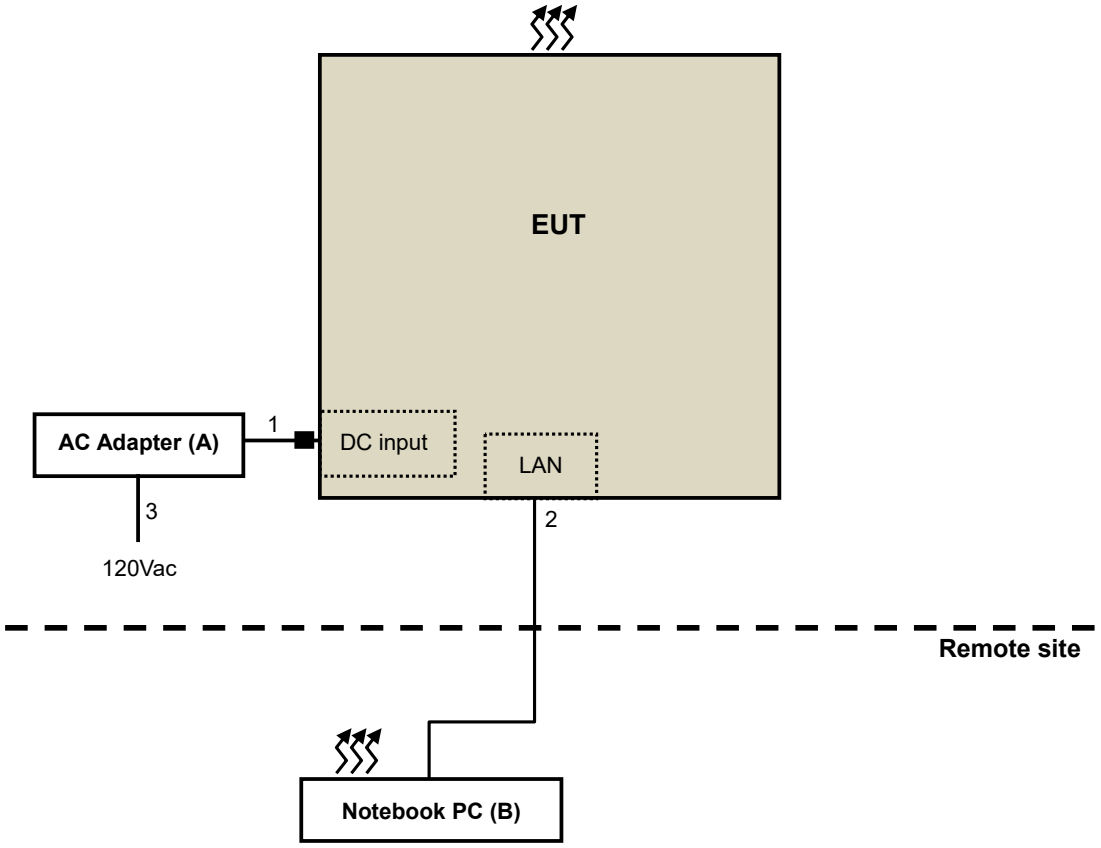
1. All power cords of the above support units are non-shielded (1.8m).
2. Item B acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC cable	1	1.5	N	0	Supplied by client
2.	LAN cable	1	10	N	0	Provided by Lab
3.	AC Cable	1	1.8	N	0	Provided by Lab
4.	LAN cable	1	1.5	N	0	Provided by Lab
5.	AC Cable	1	1.8	N	0	Provided by Lab

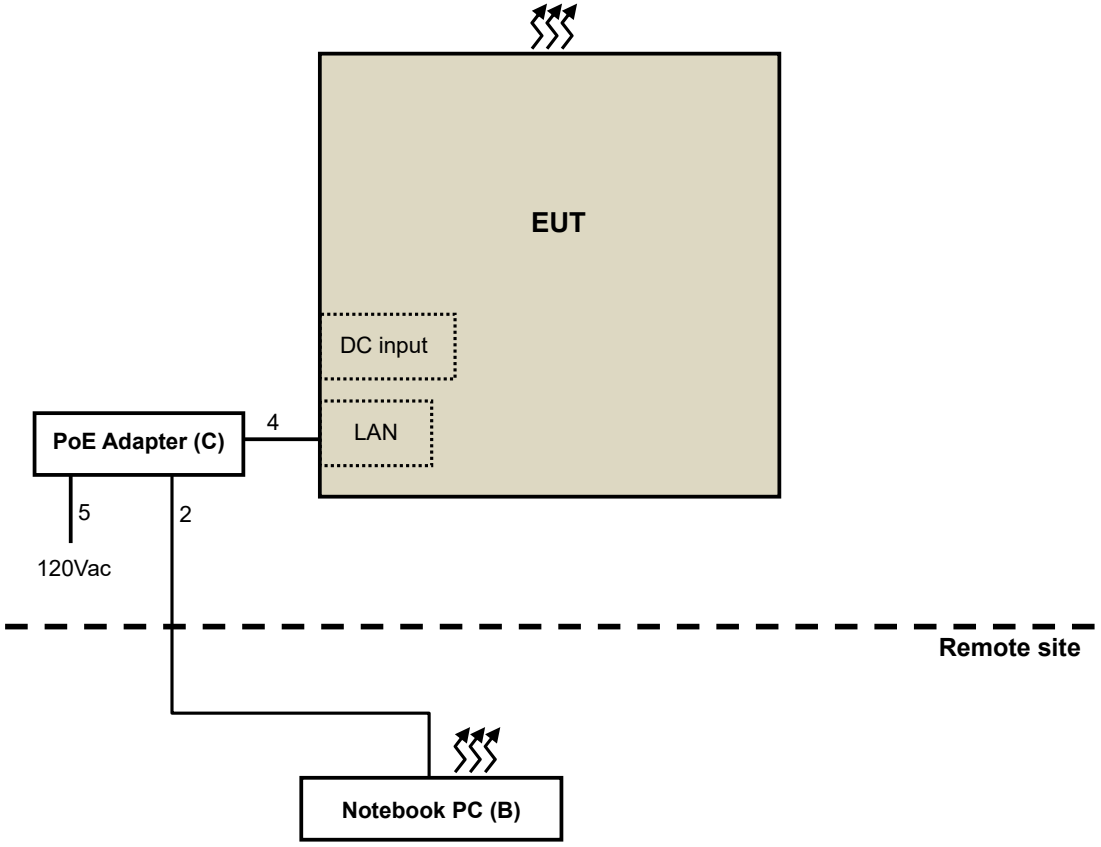
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

For Mode A:



For Mode B:



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 DTS Meas Guidance v04
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
HP Preamplifier	8447D	2432A03504	Feb. 21, 2018	Feb. 20, 2019
HP Preamplifier	8449B	3008A01201	Feb. 22, 2018	Feb. 21, 2019
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 21, 2018	Feb. 20, 2019
Agilent TEST RECEIVER	N9038A	MY51210129	Feb. 6, 2018	Feb. 5, 2019
Schwarzbeck Antenna	VULB 9168	139	Nov. 29, 2017	Nov. 28, 2018
Schwarzbeck Antenna	VHBA 9123	480	May 19, 2017	May 18, 2019
Schwarzbeck Horn Antenna	BBHA-9170	212	Dec. 1, 2017	Nov. 30, 2018
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Dec. 1, 2017	Nov. 30, 2018
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF104	CABLE-CH6	Aug. 14, 2017	Aug. 13, 2018
SUHNER RF cable With 3dB PAD	SF102	Cable-CH8-3.6m	Aug. 14, 2017	Aug. 13, 2018
Loop Antenna EMCI	LPA600	270	Aug. 11, 2017	Aug. 10, 2019
EMCO Horn Antenna	3115	00028257	Nov. 30, 2017	Nov. 29, 2018
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 29, 2017	Sep. 28, 2018
Anritsu Power Sensor	MA2411B	0738404	Apr. 26, 2018	Apr. 25, 2019
Anritsu Power Meter	ML2495A	0842014	Apr. 26, 2018	Apr. 25, 2019

NOTE: 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. Tested Date: May 4 ~ 17, 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:

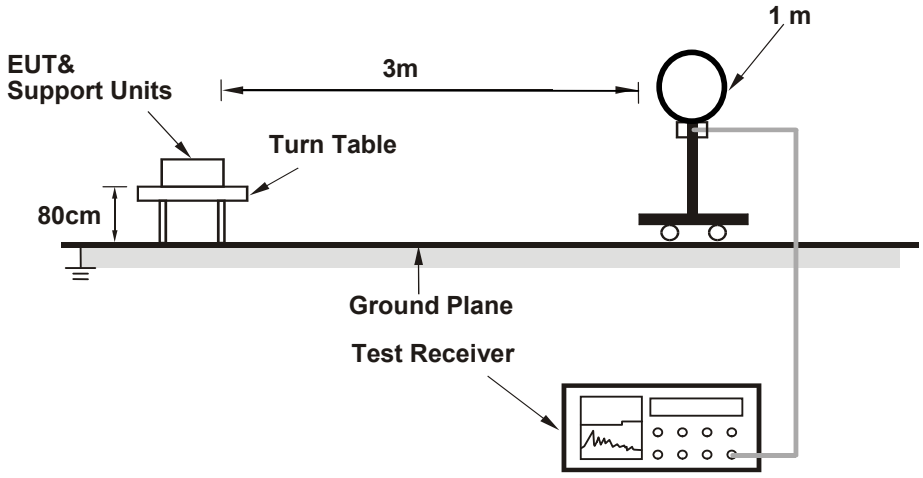
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

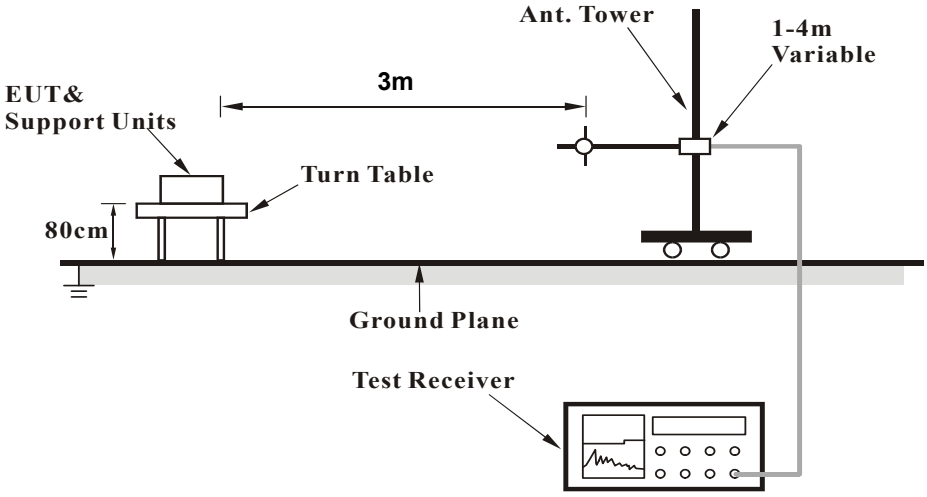
No deviation.

4.1.5 Test Setup

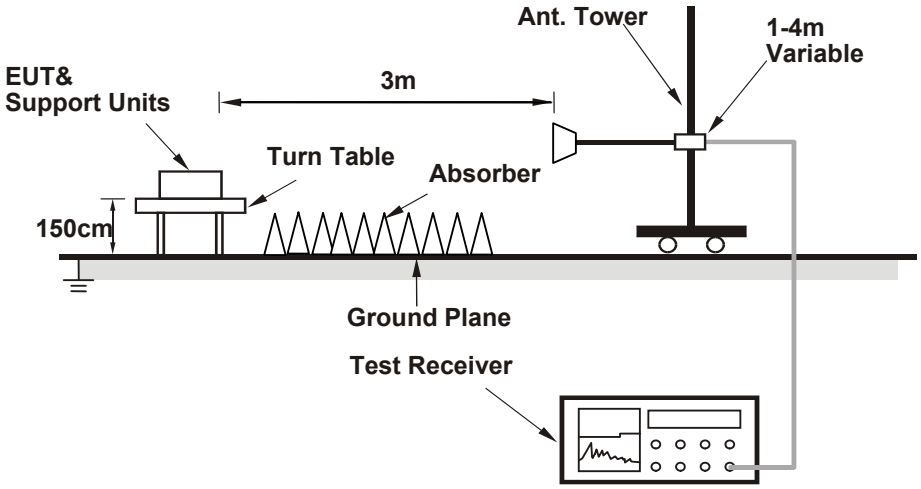
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Connected the EUT with AC adapter placed on testing table.
b. Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Mode A

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	63.36 PK	74.00	-10.64	1.00 H	230	65.74	-2.38
2	2390.00	52.95 AV	54.00	-1.05	1.00 H	230	55.33	-2.38
3	*2412.00	110.57 PK			1.00 H	230	113.08	-2.51
4	*2412.00	107.61 AV			1.00 H	230	110.12	-2.51
5	4824.00	49.22 PK	74.00	-24.78	1.52 H	284	45.89	3.33
6	4824.00	42.36 AV	54.00	-11.64	1.52 H	284	39.03	3.33
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.28 PK	74.00	-12.72	2.22 V	221	63.66	-2.38
2	2390.00	52.51 AV	54.00	-1.49	2.22 V	221	54.89	-2.38
3	*2412.00	109.65 PK			2.22 V	221	112.16	-2.51
4	*2412.00	106.72 AV			2.22 V	221	109.23	-2.51
5	4824.00	47.05 PK	74.00	-26.95	3.45 V	257	43.72	3.33
6	4824.00	41.29 AV	54.00	-12.71	3.45 V	257	37.96	3.33

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) 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	113.11 PK			1.60 H	78	115.75	-2.64
2	*2437.00	109.40 AV			1.60 H	78	112.04	-2.64
3	4874.00	50.07 PK	74.00	-23.93	1.31 H	149	46.72	3.35
4	4874.00	42.94 AV	54.00	-11.06	1.31 H	149	39.59	3.35
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	111.74 PK			2.62 V	181	114.38	-2.64
2	*2437.00	108.37 AV			2.62 V	181	111.01	-2.64
3	4874.00	47.34 PK	74.00	-26.66	3.22 V	264	43.99	3.35
4	4874.00	41.45 AV	54.00	-12.55	3.22 V	264	38.10	3.35

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) 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	112.11 PK			1.26 H	80	114.64	-2.53
2	*2462.00	108.89 AV			1.26 H	80	111.42	-2.53
3	2483.50	62.19 PK	74.00	-11.81	1.26 H	80	64.43	-2.24
4	2483.50	52.92 AV	54.00	-1.08	1.26 H	80	55.16	-2.24
5	4924.00	49.82 PK	74.00	-24.18	1.44 H	152	46.58	3.24
6	4924.00	42.76 AV	54.00	-11.24	1.44 H	152	39.52	3.24
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	110.89 PK			2.71 V	177	113.42	-2.53
2	*2462.00	107.76 AV			2.71 V	177	110.29	-2.53
3	2483.50	60.49 PK	74.00	-13.51	2.71 V	177	62.73	-2.24
4	2483.50	51.25 AV	54.00	-2.75	2.71 V	177	53.49	-2.24
5	4924.00	47.13 PK	74.00	-26.87	3.01 V	263	43.89	3.24
6	4924.00	41.28 AV	54.00	-12.72	3.01 V	263	38.04	3.24

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) 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**	**73.00 PK**	**74.00**	**-1.00**	**1.13 H**	**100**	**75.38**	**-2.38**
2	2390.00	51.13 AV	54.00	-2.87	1.13 H	100	53.51	-2.38
3	*2412.00	112.57 PK			1.13 H	100	115.08	-2.51
4	*2412.00	101.81 AV			1.13 H	100	104.32	-2.51
5	4824.00	42.91 PK	74.00	-31.09	1.12 H	241	39.58	3.33
6	4824.00	29.28 AV	54.00	-24.72	1.12 H	241	25.95	3.33
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	68.49 PK	74.00	-5.51	1.92 V	85	70.87	-2.38
2	2390.00	46.86 AV	54.00	-7.14	1.92 V	85	49.24	-2.38
3	*2412.00	107.74 PK			1.92 V	85	110.25	-2.51
4	*2412.00	97.06 AV			1.92 V	85	99.57	-2.51
5	4824.00	41.60 PK	74.00	-32.40	1.00 V	103	38.27	3.33
6	4824.00	27.92 AV	54.00	-26.08	1.00 V	103	24.59	3.33

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 2	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	72.74 PK	74.00	-1.26	1.13 H	101	75.12	-2.38
2	2390.00	51.48 AV	54.00	-2.52	1.13 H	101	53.86	-2.38
3	*2417.00	112.77 PK			1.13 H	101	115.31	-2.54
4	*2417.00	102.01 AV			1.13 H	101	104.55	-2.54
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	68.28 PK	74.00	-5.72	1.99 V	88	70.66	-2.38
2	2390.00	47.20 AV	54.00	-6.80	1.99 V	88	49.58	-2.38
3	*2417.00	107.97 PK			1.99 V	88	110.51	-2.54
4	*2417.00	97.16 AV			1.99 V	88	99.70	-2.54

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) 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	72.95 PK	74.00	-1.05	1.12 H	79	75.33	-2.38
2	2390.00	52.75 AV	54.00	-1.25	1.12 H	79	55.13	-2.38
3	*2437.00	116.00 PK			1.12 H	79	118.64	-2.64
4	*2437.00	106.63 AV			1.12 H	79	109.27	-2.64
5	4874.00	46.32 PK	74.00	-27.68	1.57 H	188	42.97	3.35
6	4874.00	33.23 AV	54.00	-20.77	1.57 H	188	29.88	3.35
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	70.24 PK	74.00	-3.76	1.57 V	221	72.62	-2.38
2	2390.00	51.44 AV	54.00	-2.56	1.57 V	221	53.82	-2.38
3	*2437.00	110.83 PK			1.57 V	221	113.47	-2.64
4	*2437.00	100.91 AV			1.57 V	221	103.55	-2.64
5	4874.00	44.57 PK	74.00	-29.43	1.02 V	175	41.22	3.35
6	4874.00	31.48 AV	54.00	-22.52	1.02 V	175	28.13	3.35

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 10	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	*2457.00	113.84 PK			1.27 H	101	116.44	-2.60
2	*2457.00	103.76 AV			1.27 H	101	106.36	-2.60
3	2483.50	72.97 PK	74.00	-1.03	1.27 H	101	75.21	-2.24
4	2483.50	50.34 AV	54.00	-3.66	1.27 H	101	52.58	-2.24
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	*2457.00	108.98 PK			1.89 V	97	111.58	-2.60
2	*2457.00	98.82 AV			1.89 V	97	101.42	-2.60
3	2483.50	68.64 PK	74.00	-5.36	1.89 V	97	70.88	-2.24
4	2483.50	47.84 AV	54.00	-6.16	1.89 V	97	50.08	-2.24

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) 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	112.31 PK			1.27 H	97	114.84	-2.53
2	*2462.00	102.30 AV			1.27 H	97	104.83	-2.53
3	2483.50	72.95 PK	74.00	-1.05	1.27 H	97	75.19	-2.24
4	2483.50	48.86 AV	54.00	-5.14	1.27 H	97	51.10	-2.24
5	4924.00	42.65 PK	74.00	-31.35	1.34 H	255	39.41	3.24
6	4924.00	29.12 AV	54.00	-24.88	1.34 H	255	25.88	3.24
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	107.45 PK			1.99 V	95	109.98	-2.53
2	*2462.00	96.69 AV			1.99 V	95	99.22	-2.53
3	2483.50	68.57 PK	74.00	-5.43	1.99 V	95	70.81	-2.24
4	2483.50	46.87 AV	54.00	-7.13	1.99 V	95	49.11	-2.24
5	4924.00	41.42 PK	74.00	-32.58	1.00 V	88	38.18	3.24
6	4924.00	27.76 AV	54.00	-26.24	1.00 V	88	24.52	3.24

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 (20MHz)

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	72.96 PK	74.00	-1.04	3.44 H	97	75.34	-2.38
2	2390.00	48.16 AV	54.00	-5.84	3.44 H	97	50.54	-2.38
3	*2412.00	109.49 PK			3.44 H	97	112.00	-2.51
4	*2412.00	98.43 AV			3.44 H	97	100.94	-2.51
5	4824.00	42.99 PK	74.00	-31.01	1.88 H	206	39.66	3.33
6	4824.00	29.06 AV	54.00	-24.94	1.88 H	206	25.73	3.33
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.36 PK	74.00	-4.64	1.51 V	84	71.74	-2.38
2	2390.00	46.11 AV	54.00	-7.89	1.51 V	84	48.49	-2.38
3	*2412.00	107.68 PK			1.51 V	84	110.19	-2.51
4	*2412.00	97.13 AV			1.51 V	84	99.64	-2.51
5	4824.00	41.60 PK	74.00	-32.40	1.02 V	122	38.27	3.33
6	4824.00	27.84 AV	54.00	-26.16	1.02 V	122	24.51	3.33

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 2	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	72.90 PK	74.00	-1.10	1.30 H	98	75.28	-2.38
2	2390.00	51.83 AV	54.00	-2.17	1.30 H	98	54.21	-2.38
3	*2417.00	112.56 PK			1.30 H	98	115.10	-2.54
4	*2417.00	102.11 AV			1.30 H	98	104.65	-2.54
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.30 PK	74.00	-4.70	1.88 V	91	71.68	-2.38
2	2390.00	50.43 AV	54.00	-3.57	1.88 V	91	52.81	-2.38
3	*2417.00	110.48 PK			1.88 V	91	113.02	-2.54
4	*2417.00	101.18 AV			1.88 V	91	103.72	-2.54

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) 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	72.97 PK	74.00	-1.03	1.27 H	99	75.35	-2.38
2	2390.00	50.60 AV	54.00	-3.40	1.27 H	99	52.98	-2.38
3	*2437.00	116.05 PK			1.27 H	99	118.69	-2.64
4	*2437.00	105.03 AV			1.27 H	99	107.67	-2.64
5	4874.00	48.00 PK	74.00	-26.00	1.67 H	215	44.65	3.35
6	4874.00	33.06 AV	54.00	-20.94	1.67 H	215	29.71	3.35
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.43 PK	74.00	-4.57	1.48 V	80	71.81	-2.38
2	2390.00	46.17 AV	54.00	-7.83	1.48 V	80	48.55	-2.38
3	*2437.00	113.67 PK			1.48 V	80	116.31	-2.64
4	*2437.00	103.78 AV			1.48 V	80	106.42	-2.64
5	4874.00	46.62 PK	74.00	-27.38	1.00 V	132	43.27	3.35
6	4874.00	31.88 AV	54.00	-22.12	1.00 V	132	28.53	3.35

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 10	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	*2457.00	112.26 PK			1.27 H	102	114.86	-2.60
2	*2457.00	101.94 AV			1.27 H	102	104.54	-2.60
3	2483.50	72.56 PK	74.00	-1.44	1.27 H	102	74.80	-2.24
4	2483.50	49.16 AV	54.00	-4.84	1.27 H	102	51.40	-2.24
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	*2457.00	99.98 PK			1.66 V	97	102.58	-2.60
2	*2457.00	100.61 AV			1.66 V	97	103.21	-2.60
3	2483.50	69.05 PK	74.00	-4.95	1.66 V	97	71.29	-2.24
4	2483.50	46.92 AV	54.00	-7.08	1.66 V	97	49.16	-2.24

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) 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	109.05 PK			1.26 H	95	111.58	-2.53
2	*2462.00	98.34 AV			1.26 H	95	100.87	-2.53
3	2483.50	72.77 PK	74.00	-1.23	1.26 H	95	75.01	-2.24
4	2483.50	46.12 AV	54.00	-7.88	1.26 H	95	48.36	-2.24
5	4924.00	42.78 PK	74.00	-31.22	1.87 H	189	39.54	3.24
6	4924.00	28.85 AV	54.00	-25.15	1.87 H	189	25.61	3.24
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	107.22 PK			1.69 V	88	109.75	-2.53
2	*2462.00	96.95 AV			1.69 V	88	99.48	-2.53
3	2483.50	69.24 PK	74.00	-4.76	1.69 V	88	71.48	-2.24
4	2483.50	44.35 AV	54.00	-9.65	1.69 V	88	46.59	-2.24
5	4924.00	41.40 PK	74.00	-32.60	1.00 V	103	38.16	3.24
6	4924.00	27.66 AV	54.00	-26.34	1.00 V	103	24.42	3.24

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 (40MHz)

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	72.89 PK	74.00	-1.11	1.28 H	98	75.27	-2.38
2	2390.00	50.09 AV	54.00	-3.91	1.28 H	98	52.47	-2.38
3	*2422.00	108.42 PK			1.28 H	98	110.98	-2.56
4	*2422.00	98.02 AV			1.28 H	98	100.58	-2.56
5	4844.00	44.04 PK	74.00	-29.96	2.45 H	111	40.66	3.38
6	4844.00	30.87 AV	54.00	-23.13	2.45 H	111	27.49	3.38
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	67.36 PK	74.00	-6.64	1.52 V	88	69.74	-2.38
2	2390.00	45.58 AV	54.00	-8.42	1.52 V	88	47.96	-2.38
3	*2422.00	102.87 PK			1.52 V	88	105.43	-2.56
4	*2422.00	93.08 AV			1.52 V	88	95.64	-2.56
5	4844.00	41.96 PK	74.00	-32.04	1.86 V	103	38.58	3.38
6	4844.00	28.82 AV	54.00	-25.18	1.86 V	103	25.44	3.38

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 4	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	72.94 PK	74.00	-1.06	1.28 H	82	75.32	-2.38
2	2390.00	52.86 AV	54.00	-1.14	1.28 H	82	55.24	-2.38
3	*2427.00	109.80 PK			1.28 H	82	112.39	-2.59
4	*2427.00	99.62 AV			1.28 H	82	102.21	-2.59
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	67.51 PK	74.00	-6.49	1.55 V	72	69.89	-2.38
2	2390.00	46.43 AV	54.00	-7.57	1.55 V	72	48.81	-2.38
3	*2427.00	104.39 PK			1.55 V	72	106.98	-2.59
4	*2427.00	94.69 AV			1.55 V	72	97.28	-2.59

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) 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	67.48 PK	74.00	-6.52	1.77 H	102	69.86	-2.38
2	2390.00	52.93 AV	54.00	-1.07	1.77 H	102	55.31	-2.38
3	*2437.00	112.66 PK			1.77 H	102	115.30	-2.64
4	*2437.00	102.44 AV			1.77 H	102	105.08	-2.64
5	4874.00	46.07 PK	74.00	-27.93	2.55 H	101	42.72	3.35
6	4874.00	32.23 AV	54.00	-21.77	2.55 H	101	28.88	3.35
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.61 PK	74.00	-12.39	1.58 V	69	63.99	-2.38
2	2390.00	48.85 AV	54.00	-5.15	1.58 V	69	51.23	-2.38
3	*2437.00	107.38 PK			1.58 V	69	110.02	-2.64
4	*2437.00	97.53 AV			1.58 V	69	100.17	-2.64
5	4874.00	43.64 PK	74.00	-30.36	1.88 V	103	40.29	3.35
6	4874.00	30.64 AV	54.00	-23.36	1.88 V	103	27.29	3.35

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 8	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	*2447.00	110.48 PK			1.27 H	83	113.17	-2.69
2	*2447.00	100.07 AV			1.27 H	83	102.76	-2.69
3	2483.50	72.99 PK	74.00	-1.01	1.27 H	83	75.23	-2.24
4	2483.50	52.91 AV	54.00	-1.09	1.27 H	83	55.15	-2.24
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	*2447.00	105.14 PK			1.57 V	133	107.83	-2.69
2	*2447.00	94.90 AV			1.57 V	133	97.59	-2.69
3	2483.50	68.31 PK	74.00	-5.69	1.57 V	133	70.55	-2.24
4	2483.50	48.18 AV	54.00	-5.82	1.57 V	133	50.42	-2.24

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) 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	106.87 PK			1.58 H	99	109.55	-2.68
2	*2452.00	96.43 AV			1.58 H	99	99.11	-2.68
3	2483.50	71.61 PK	74.00	-2.39	1.58 H	99	73.85	-2.24
4	2483.50	52.94 AV	54.00	-1.06	1.58 H	99	55.18	-2.24
5	4904.00	43.52 PK	74.00	-30.48	2.58 H	129	40.23	3.29
6	4904.00	30.50 AV	54.00	-23.50	2.58 H	129	27.21	3.29
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	101.60 PK			1.55 V	135	104.28	-2.68
2	*2452.00	91.59 AV			1.55 V	135	94.27	-2.68
3	2483.50	65.98 PK	74.00	-8.02	1.55 V	135	68.22	-2.24
4	2483.50	48.23 AV	54.00	-5.77	1.55 V	135	50.47	-2.24
5	4904.00	41.71 PK	74.00	-32.29	1.80 V	100	38.42	3.29
6	4904.00	28.60 AV	54.00	-25.40	1.80 V	100	25.31	3.29

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:

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	42.95	24.62 QP	40.00	-15.38	3.11 H	119	32.11	-7.49
2	92.71	19.54 QP	43.50	-23.96	2.08 H	94	32.06	-12.52
3	520.38	30.69 QP	46.00	-15.31	2.24 H	77	31.25	-0.56
4	580.72	31.91 QP	46.00	-14.09	2.03 H	84	31.23	0.68
5	716.18	33.64 QP	46.00	-12.36	1.46 H	310	30.59	3.05
6	746.93	35.17 QP	46.00	-10.83	3.09 H	301	31.43	3.74
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	42.92	36.70 QP	40.00	-3.30	1.03 V	205	44.19	-7.49
2	92.66	25.75 QP	43.50	-17.75	1.15 V	266	38.28	-12.53
3	592.70	33.29 QP	46.00	-12.71	1.86 V	134	32.14	1.15
4	678.15	33.13 QP	46.00	-12.87	1.76 V	82	30.69	2.44
5	746.93	35.91 QP	46.00	-10.09	2.04 V	160	32.17	3.74
6	851.30	34.37 QP	46.00	-11.63	2.26 V	240	28.99	5.38

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

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.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESR3	102413	Feb. 8, 2018	Feb. 7, 2019
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	100104	Dec. 6, 2017	Dec. 5, 2018
LISN With Adapter (for EUT)	AD10	C09Ada-001	Dec. 6, 2017	Dec. 5, 2018
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	847265/023	Nov. 03, 2017	Nov. 02, 2018
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 3, 2018	May 2, 2019
Software	Cond_V7.3.7.4	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C09.01	Feb. 21, 2018	Feb. 20, 2019
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010789	May 8, 2018	May 7, 2019

Notes: 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 Shielded Room No. 9.
3. Tested Date: Jun. 1 ~ 27, 2018

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.

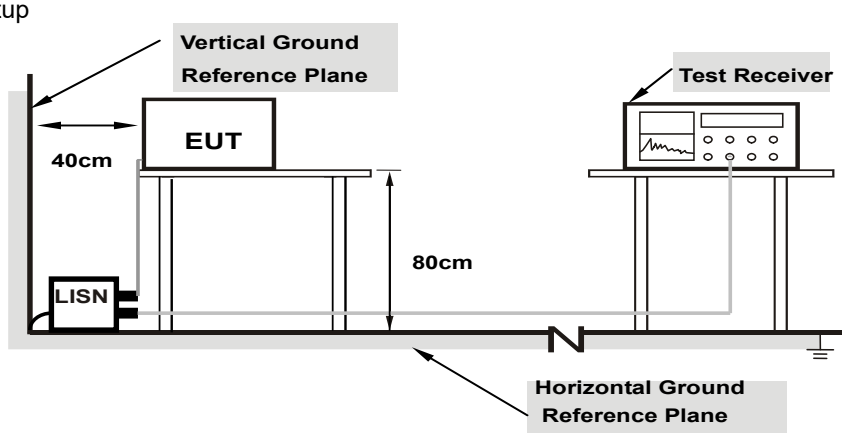
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

Mode A:

a. Connected the EUT with AC adapter placed on testing table.

b. Set the EUT under transmission condition continuously at specific channel frequency.

Mode B:

a. Connected the EUT with PoE adapter placed on testing table.

b. Set the EUT under transmission condition continuously at specific channel frequency.

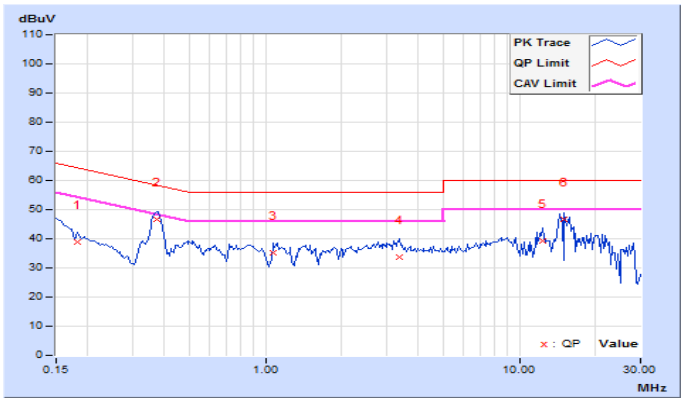
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18125	10.12	28.82	17.79	38.94	27.91	64.43	54.43	-25.49	-26.52
2	0.37266	10.15	36.63	30.57	46.78	40.72	58.44	48.44	-11.66	-7.72
3	1.07422	10.26	24.82	16.18	35.08	26.44	56.00	46.00	-20.92	-19.56
4	3.35547	10.42	23.31	15.07	33.73	25.49	56.00	46.00	-22.27	-20.51
5	12.40234	10.77	28.54	25.40	39.31	36.17	60.00	50.00	-20.69	-13.83
6	**15.07422**	**10.89**	**35.80**	**35.69**	**46.69**	**46.58**	**60.00**	**50.00**	**-13.31**	**-3.42**

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.

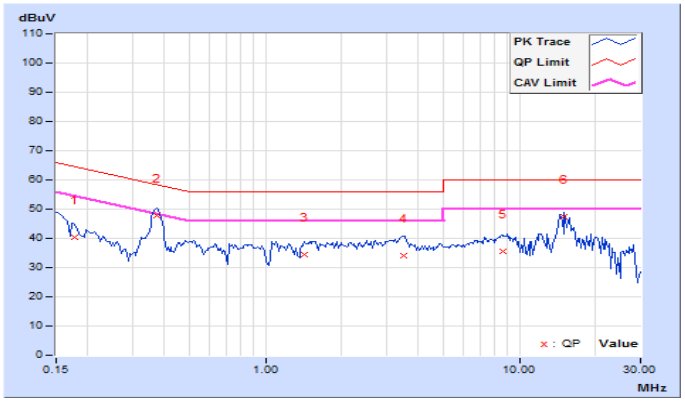


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	Mode A		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	10.13	30.36	17.46	40.49	27.59	64.61	54.61	-24.12	-27.02
2	0.37266	10.16	37.64	31.48	47.80	41.64	58.44	48.44	-10.64	-6.80
3	1.42969	10.30	24.30	15.46	34.60	25.76	56.00	46.00	-21.40	-20.24
4	3.50000	10.45	23.62	14.60	34.07	25.05	56.00	46.00	-21.93	-20.95
5	8.61719	10.61	25.13	20.26	35.74	30.87	60.00	50.00	-24.26	-19.13
6	15.07422	10.77	36.78	35.20	47.55	45.97	60.00	50.00	-12.45	-4.03

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.

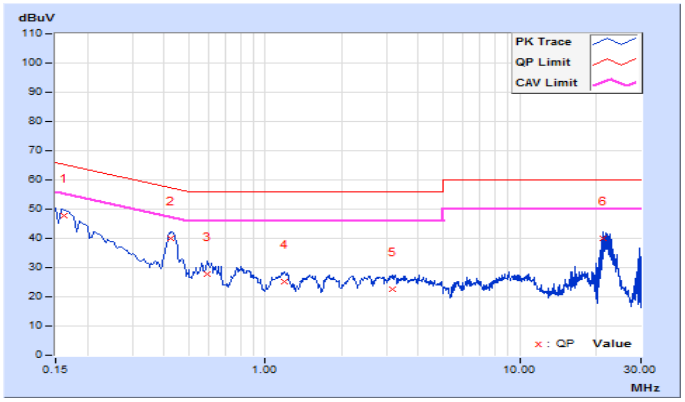


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	Mode B		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16173	10.11	37.61	27.19	47.72	37.30	65.37	55.37	-17.65	-18.07
2	0.42761	10.15	29.96	23.25	40.11	33.40	57.30	47.30	-17.19	-13.90
3	0.59142	10.18	17.74	12.15	27.92	22.33	56.00	46.00	-28.08	-23.67
4	1.19508	10.26	15.00	9.60	25.26	19.86	56.00	46.00	-30.74	-26.14
5	3.15098	10.41	12.27	8.02	22.68	18.43	56.00	46.00	-33.32	-27.57
6	21.39072	11.13	28.92	26.41	40.05	37.54	60.00	50.00	-19.95	-12.46

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.

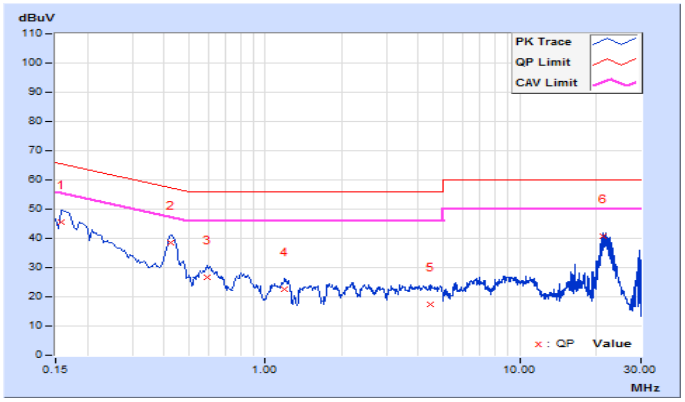


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	Mode B		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	10.12	35.29	21.12	45.41	31.24	65.58	55.58	-20.17	-24.34
2	0.42370	10.16	28.31	21.59	38.47	31.75	57.38	47.38	-18.91	-15.63
3	0.58993	10.19	16.42	10.90	26.61	21.09	56.00	46.00	-29.39	-24.91
4	1.19207	10.28	12.32	6.99	22.60	17.27	56.00	46.00	-33.40	-28.73
5	4.48038	10.50	6.91	2.55	17.41	13.05	56.00	46.00	-38.59	-32.95
6	21.39463	10.86	29.84	27.16	40.70	38.02	60.00	50.00	-19.30	-11.98

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.

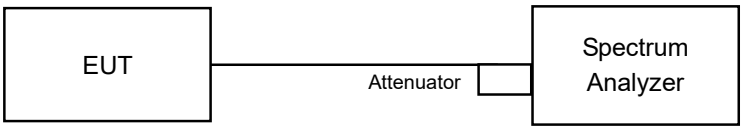


4.3 6dB Bandwidth Measurement

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 29, 2017	Sep. 28, 2018
Anritsu Power Sensor	MA2411B	0738404	Apr. 26, 2018	Apr. 25, 2019
Anritsu Power Meter	ML2495A	0842014	Apr. 26, 2018	Apr. 25, 2019

NOTE: 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Chamber No. 6.
3. The Industry Canada Reference No. IC 7450E-6.
4. Tested Date: Jun. 22, 2018

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

Mode A

802.11b

Channel	Frequency (MHz)	6db Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	7.05	7.08	0.5	PASS
6	2437	7.10	7.11	0.5	PASS
11	2462	7.05	7.09	0.5	PASS

802.11g

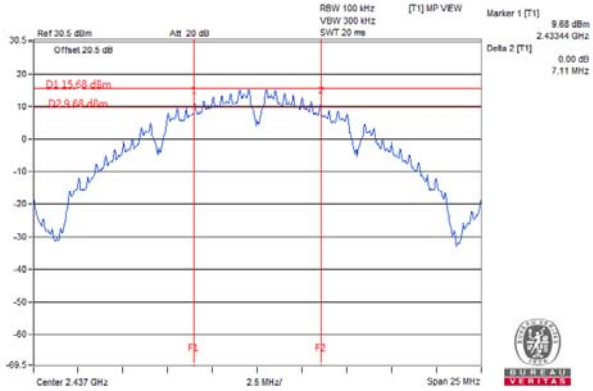
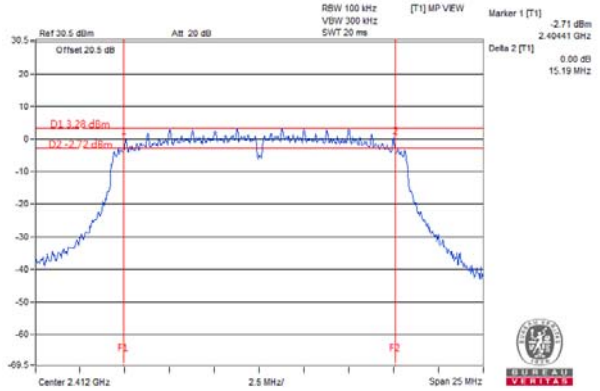
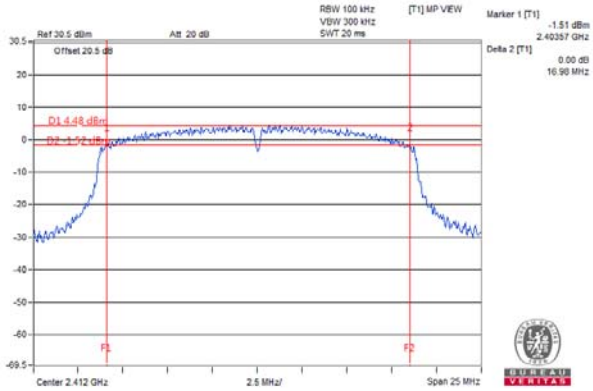
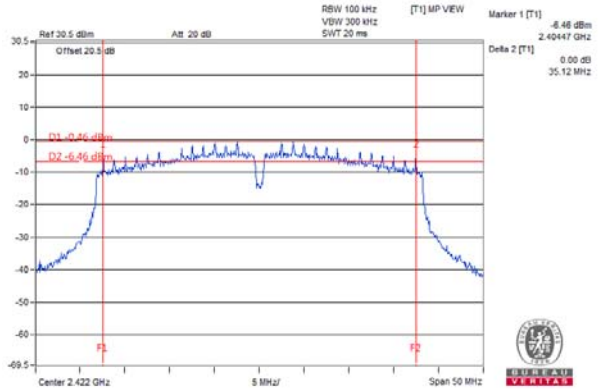
Channel	Frequency (MHz)	6db Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.17	15.19	0.5	PASS
6	2437	15.18	15.17	0.5	PASS
11	2462	15.15	15.18	0.5	PASS

802.11n (20MHz)

Channel	Frequency (MHz)	6db Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.98	16.78	0.5	PASS
6	2437	15.14	15.17	0.5	PASS
11	2462	15.16	15.14	0.5	PASS

802.11n (40MHz)

Channel	Frequency (MHz)	6db Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.10	35.12	0.5	PASS
6	2437	31.43	33.85	0.5	PASS
9	2452	35.11	35.05	0.5	PASS

Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH6	**802.11g / Chain 1 : CH1**
	
802.11n (20MHz) / Chain 0 : CH1	**802.11n (40MHz) / Chain 1 : CH3**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.4.2 Test Setup

4.4.3 Test Instruments

Refer to section 4.3.3 to get information of above instrument.

4.4.4 Test Procedures

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

Mode A

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	21.02	21.20	258.300	24.12	30	Pass
6	2437	22.49	22.62	**360.229**	25.57	30	Pass
11	2462	21.39	21.60	282.265	24.51	30	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	15.18	15.33	67.080	18.27	30	Pass
4	2417	15.76	15.84	76.041	18.81	30	Pass
6	2437	20.61	20.82	235.861	23.73	30	Pass
10	2457	17.22	17.41	107.804	20.33	30	Pass
11	2462	15.20	15.27	66.764	18.25	30	Pass

802.11n (20MHz)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.64	14.73	58.824	17.70	30	Pass
4	2417	15.18	15.34	67.159	18.27	30	Pass
6	2437	20.85	21.10	250.444	23.99	30	Pass
10	2457	13.99	14.18	51.243	17.10	30	Pass
11	2462	13.09	13.37	42.097	16.24	30	Pass

802.11n (40MHz)

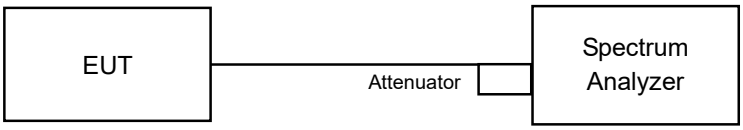
Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	12.47	12.52	35.525	15.51	30	Pass
4	2427	13.25	13.44	43.215	16.36	30	Pass
6	2437	18.50	18.57	142.740	21.55	30	Pass
8	2447	13.52	13.74	46.150	16.64	30	Pass
9	2452	12.50	12.72	36.490	15.62	30	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.3.3 to get information of above instrument.

4.5.4 Test Procedure

For duty cycle ≥ 98%
a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.

For duty cycle < 98%
a) Measure the duty cycle (x).
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 times the OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz..
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

Mode A

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	-0.61	3.01	2.40	6.99	Pass
	6	2437	1.62	3.01	4.63	6.99	Pass
	11	2462	-0.65	3.01	2.36	6.99	Pass
1	1	2412	-0.11	3.01	2.90	6.99	Pass
	6	2437	1.46	3.01	4.47	6.99	Pass
	11	2462	0.14	3.01	3.15	6.99	Pass

Note: 1. Directional gain = 4dBi + 10log(2) = 7.01dBi > 6dBi , so the power density limit shall be reduced to 8-(7.01-6) = 6.99dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11g

TX chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-9.30	3.01	0.13	-6.16	6.99	Pass
	6	2437	-5.06	3.01	0.13	-1.92	6.99	Pass
	11	2462	-9.57	3.01	0.13	-6.43	6.99	Pass
1	1	2412	-10.37	3.01	0.13	-7.23	6.99	Pass
	6	2437	-4.24	3.01	0.13	-1.10	6.99	Pass
	11	2462	-9.53	3.01	0.13	-6.39	6.99	Pass

Note: 1. Directional gain = 4dBi + 10log(2) = 7.01dBi > 6dBi , so the power density limit shall be reduced to 8-(7.01-6) = 6.99dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-7.37	3.01	0.13	-4.23	6.99	Pass
	6	2437	-4.58	3.01	0.13	-1.44	6.99	Pass
	11	2462	-12.08	3.01	0.13	-8.94	6.99	Pass
1	1	2412	-6.71	3.01	0.13	-3.57	6.99	Pass
	6	2437	-3.92	3.01	0.13	-0.78	6.99	Pass
	11	2462	-11.20	3.01	0.13	-8.06	6.99	Pass

Note: 1. Directional gain = 4dBi + 10log(2) = 7.01dBi > 6dBi , so the power density limit shall be reduced to 8-(7.01-6) = 6.99dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

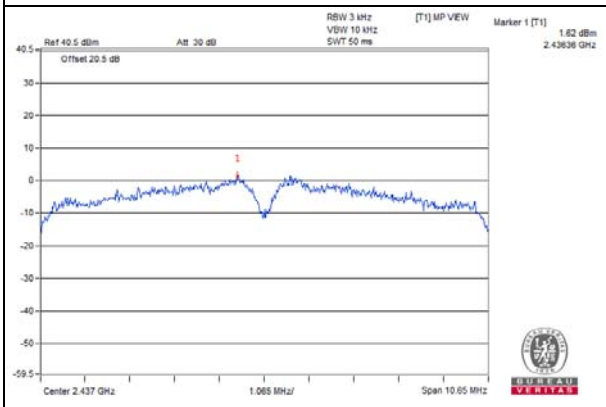
802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-16.22	3.01	0.34	-12.87	6.99	Pass
	6	2437	-9.56	3.01	0.34	-6.21	6.99	Pass
	9	2452	-16.25	3.01	0.34	-12.90	6.99	Pass
1	3	2422	-16.05	3.01	0.34	-12.70	6.99	Pass
	6	2437	-9.62	3.01	0.34	-6.27	6.99	Pass
	9	2452	-15.08	3.01	0.34	-11.73	6.99	Pass

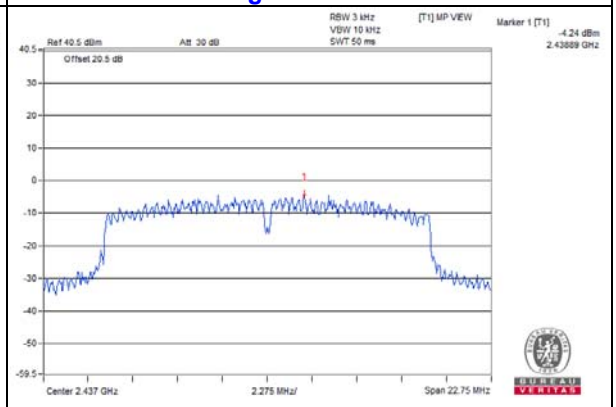
Note: 1. Directional gain = 4dBi + 10log(2) = 7.01dBi > 6dBi , so the power density limit shall be reduced to 8-(7.01-6) = 6.99dBm.
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

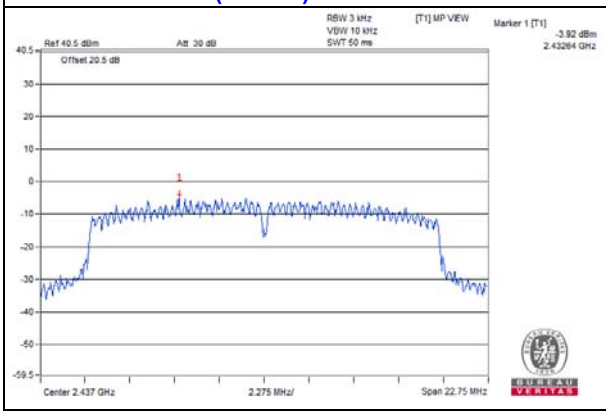
802.11b / Chain 0 : CH6



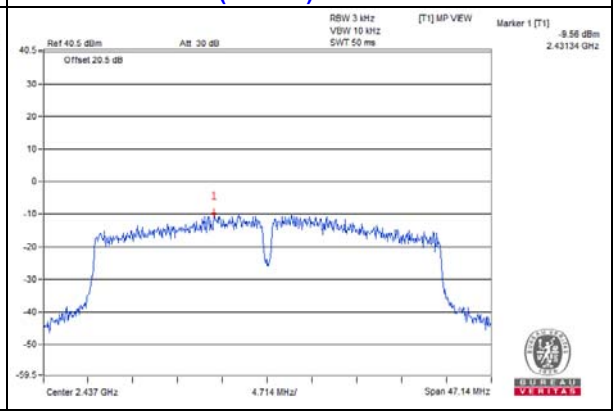
802.11g / Chain 1 : CH6



802.11n (20MHz) / Chain 1 : CH6



802.11n (40MHz) / Chain 0 : CH6

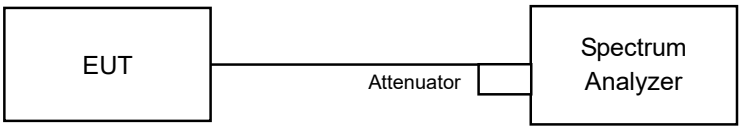


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.3.3 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

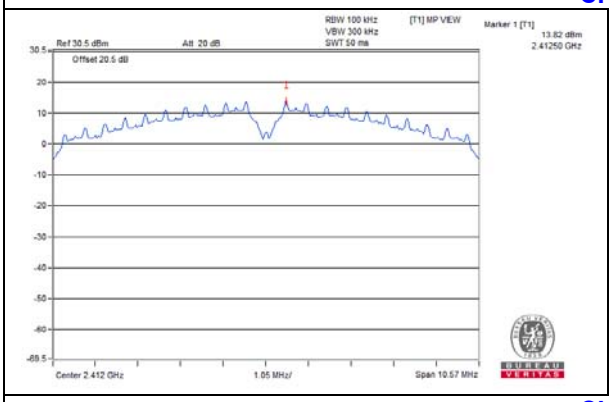
Same as Item 4.3.6

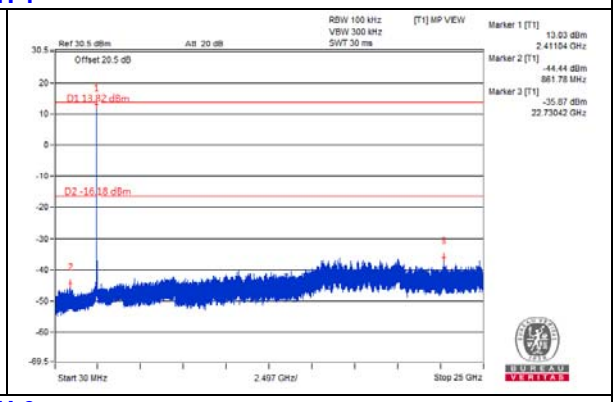
4.6.7 Test Results

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

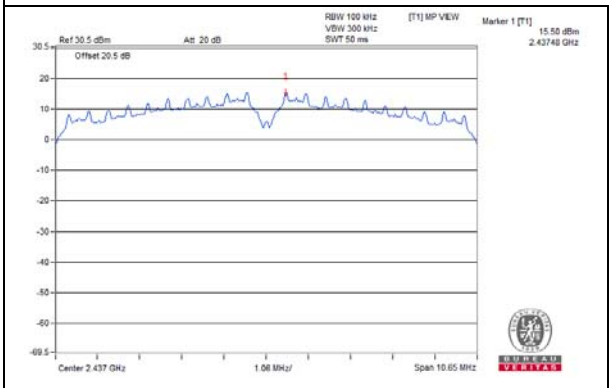
Mode A
802.11b: Chain 0

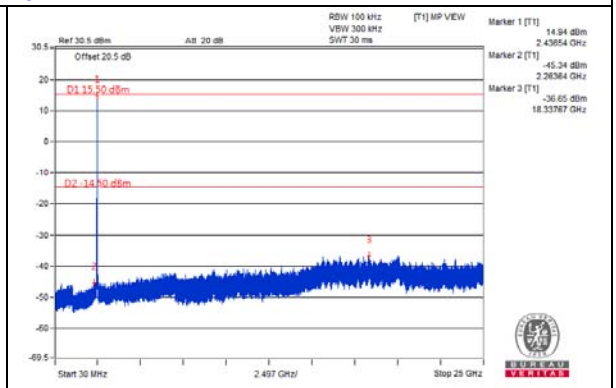
CH 1



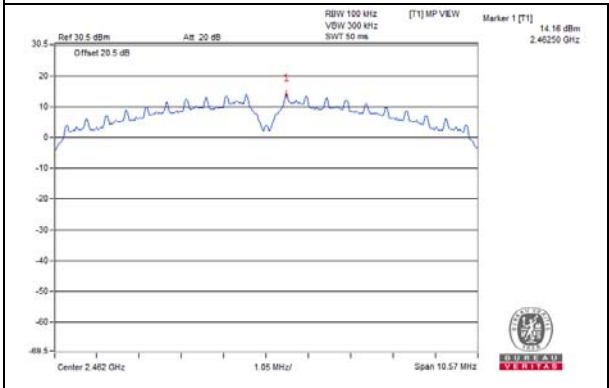


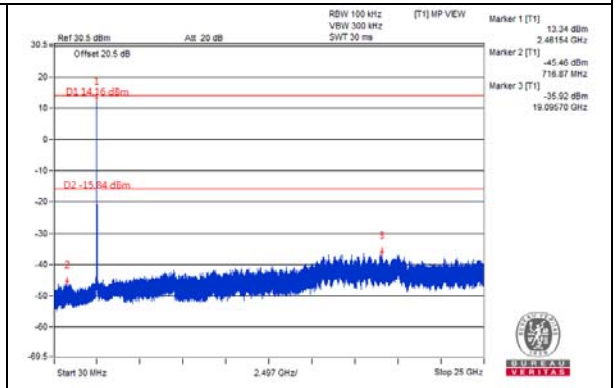
CH 6



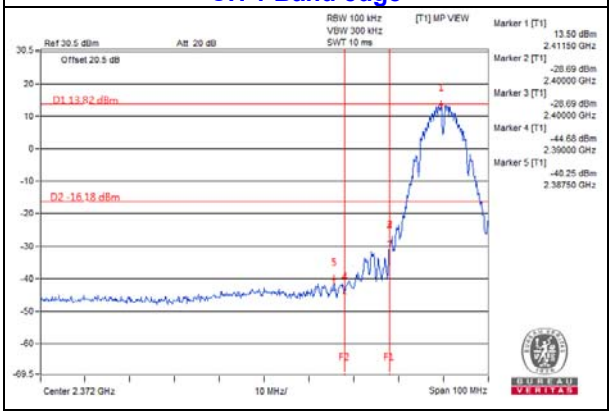


CH 11

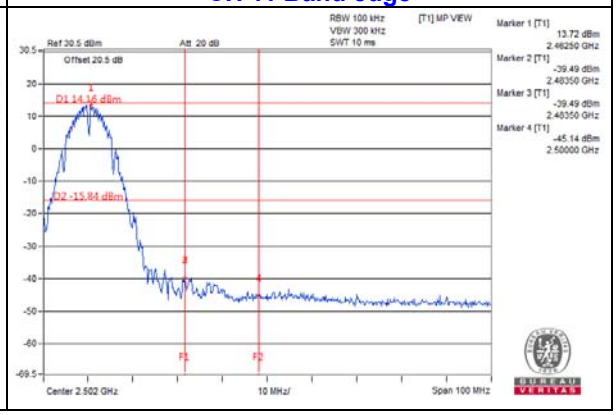




CH 1 Band edge

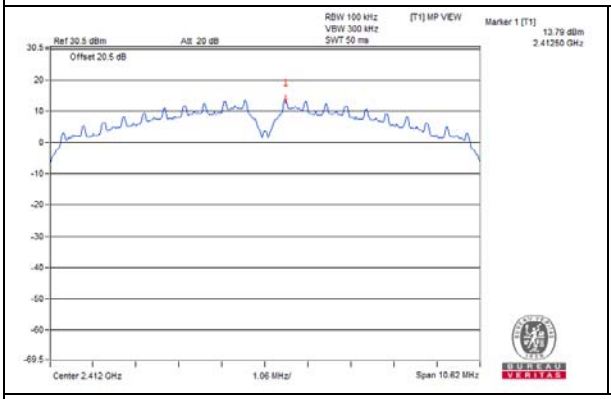


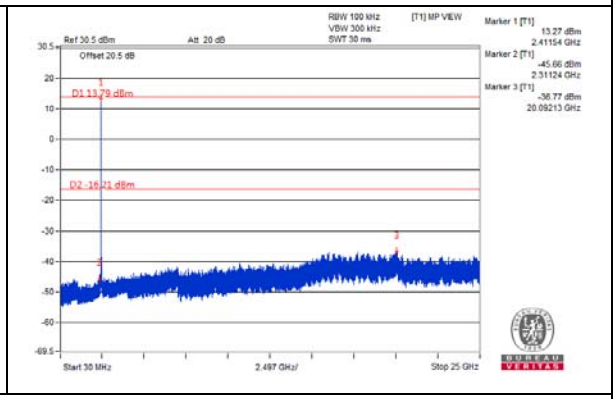
CH 11 Band edge



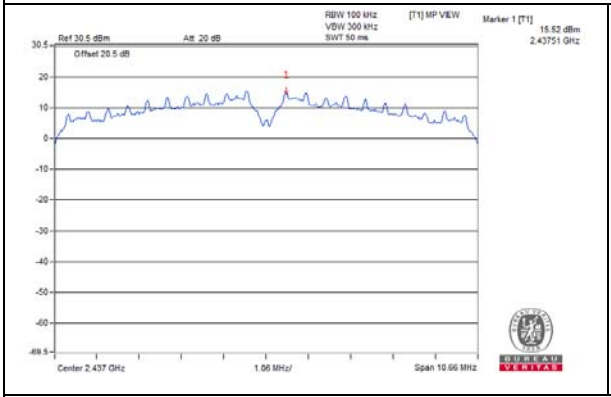
Chain 1

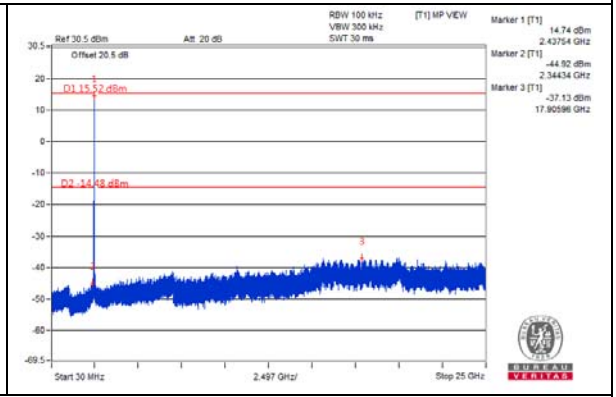
CH 1



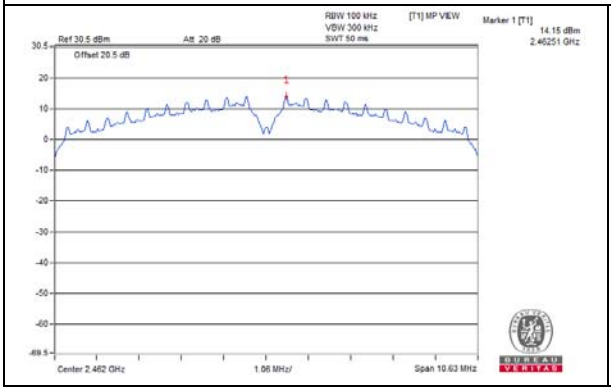


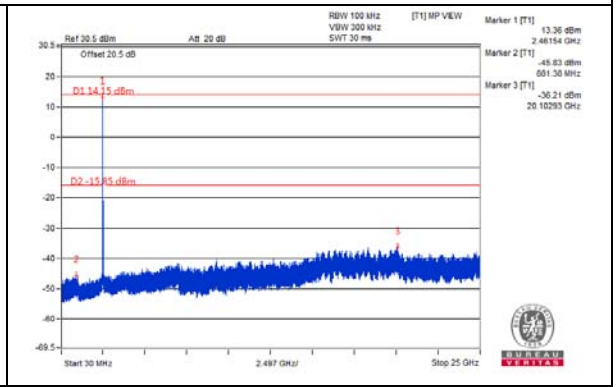
CH 6



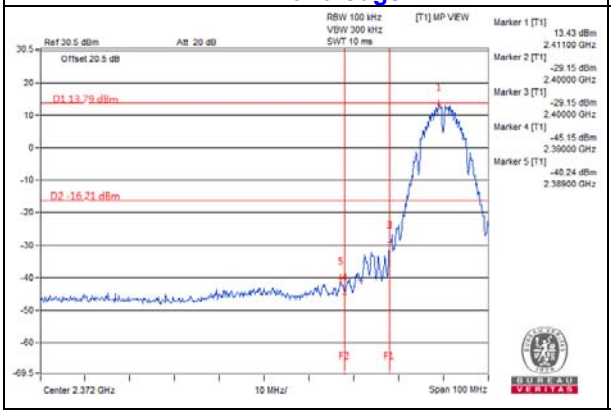


CH 11

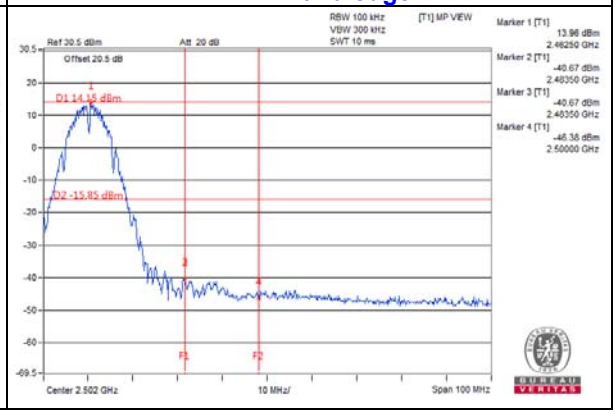




CH 1 Band edge

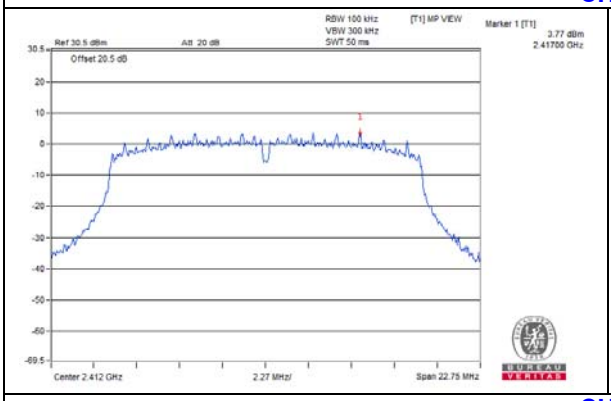


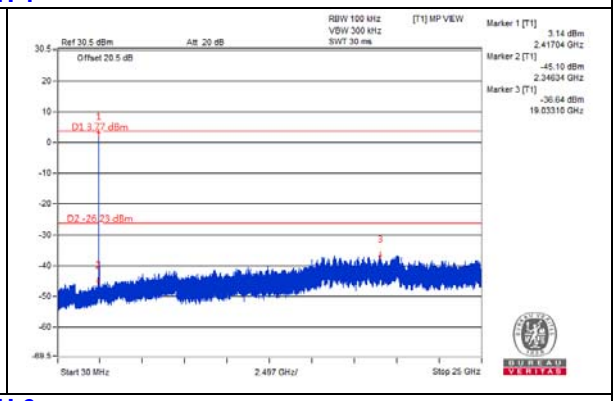
CH 11 Band edge



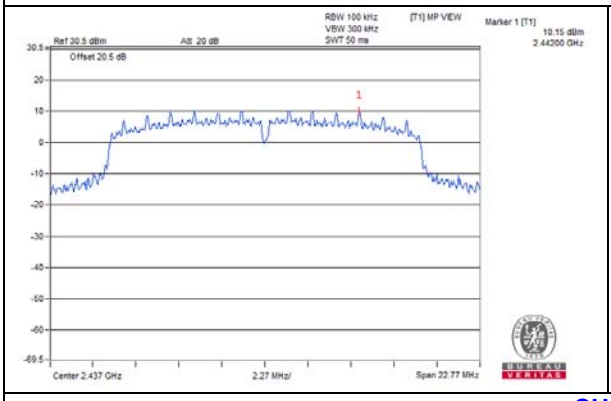
802.11g: Chain 0

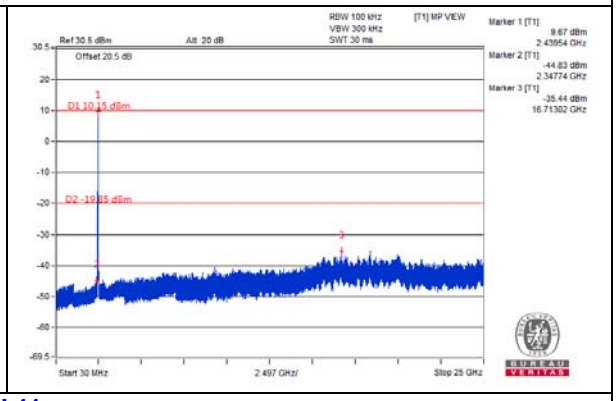
CH 1



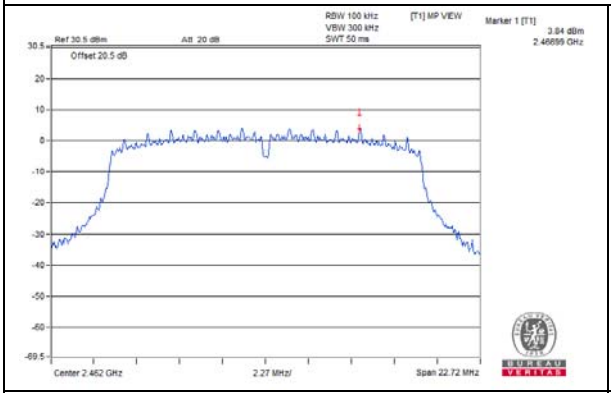


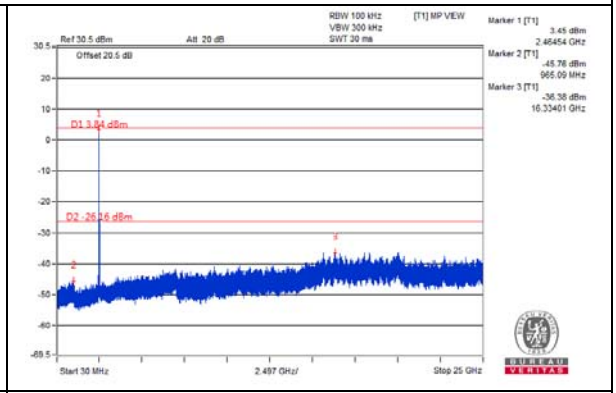
CH 6



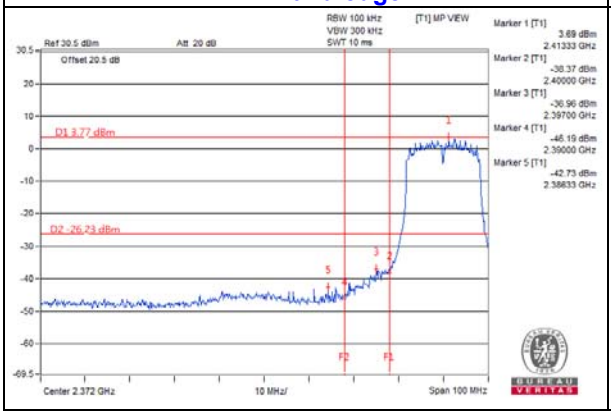


CH 11

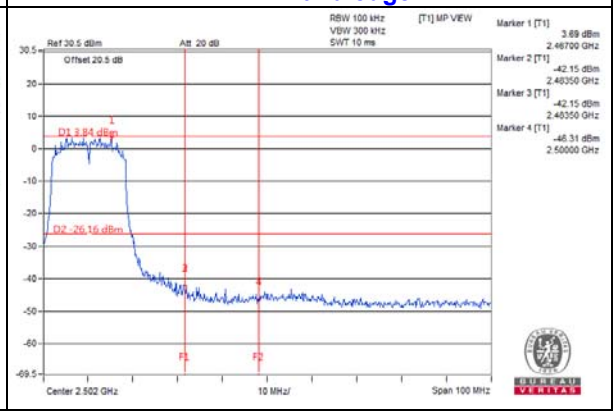




CH 1 Band edge

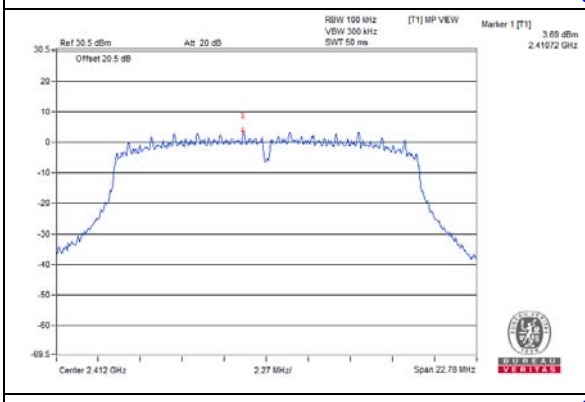


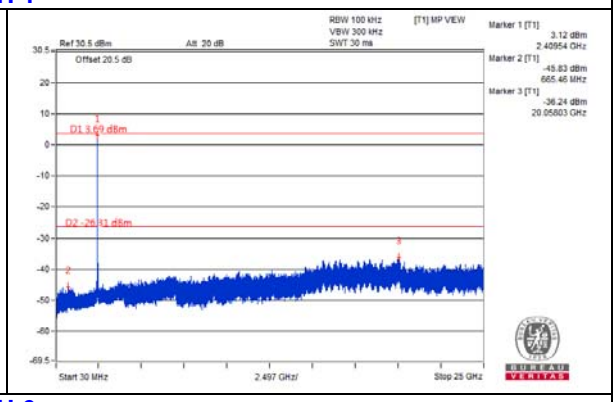
CH 11 Band edge



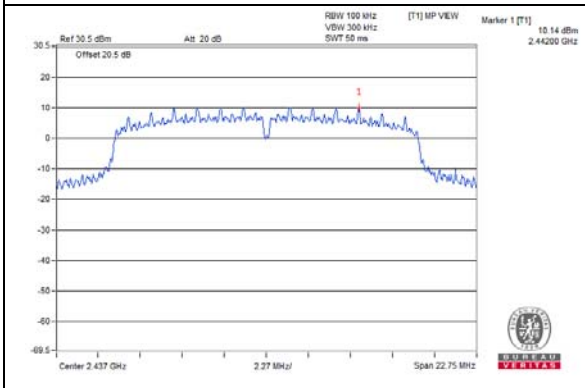
Chain 1

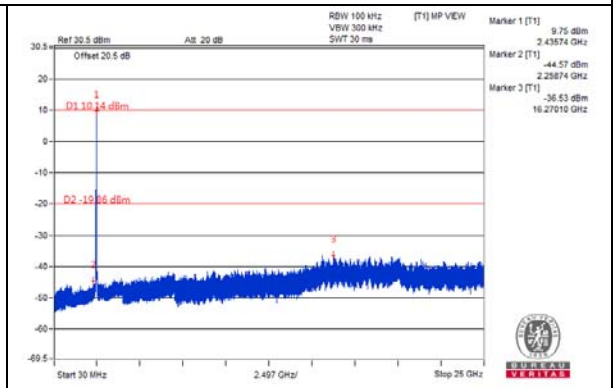
CH 1



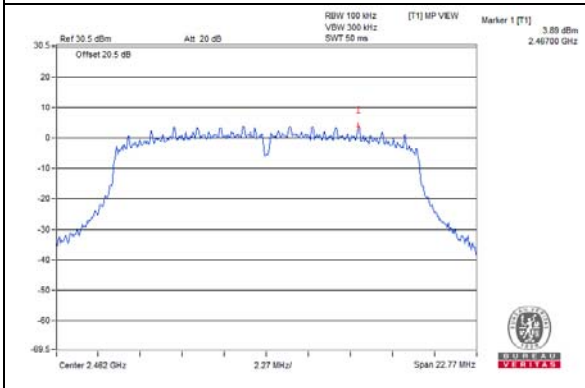


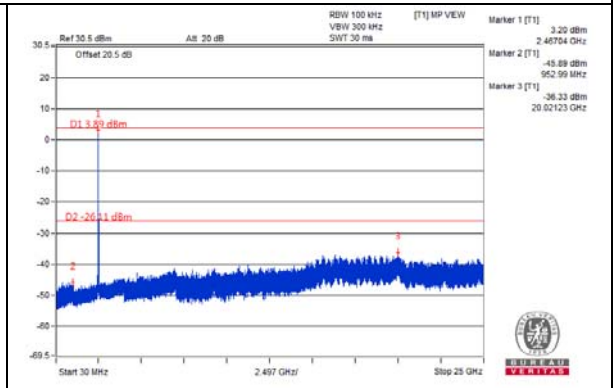
CH 6



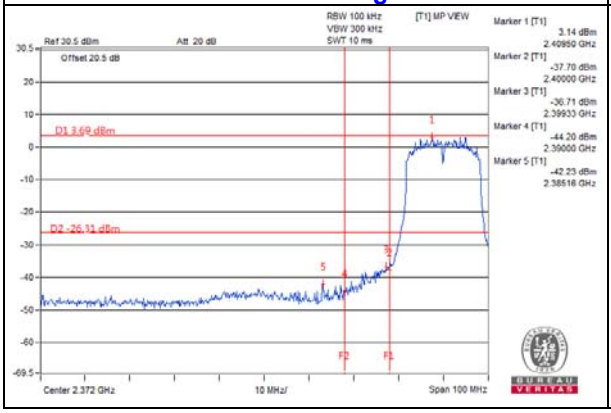


CH 11

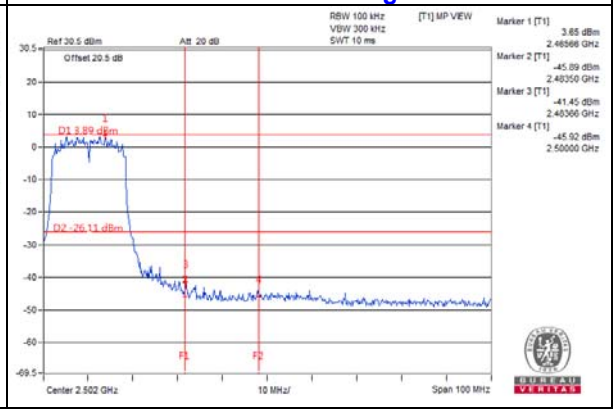




CH 1 Band edge

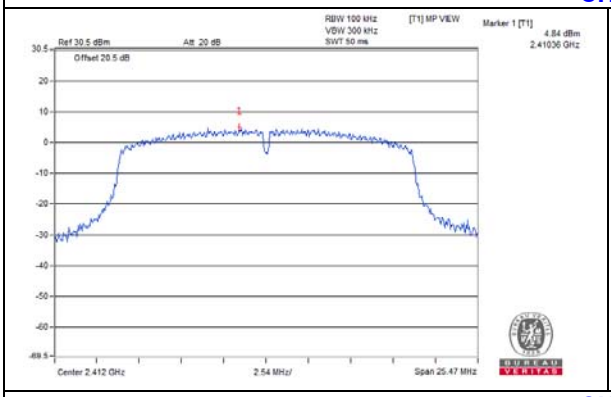


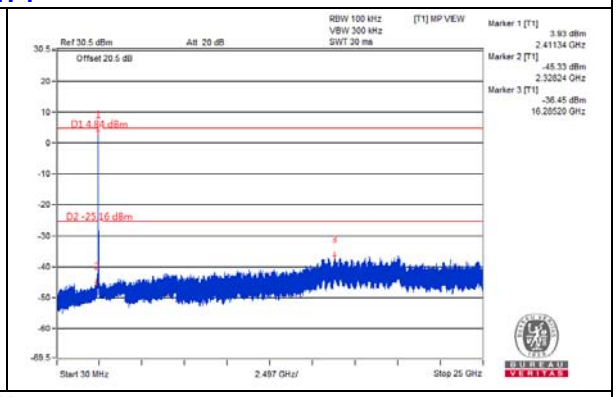
CH 11 Band edge



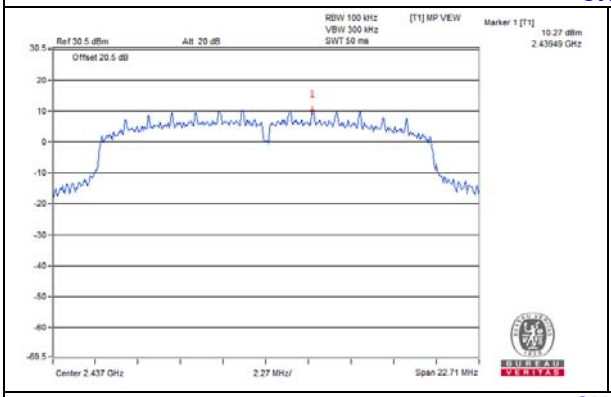
802.11n (20MHz): Chain 0

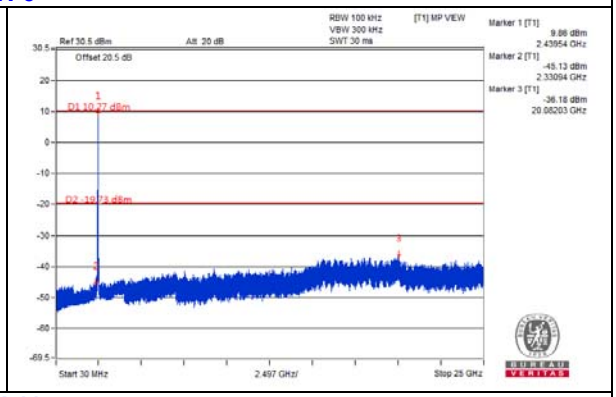
CH 1



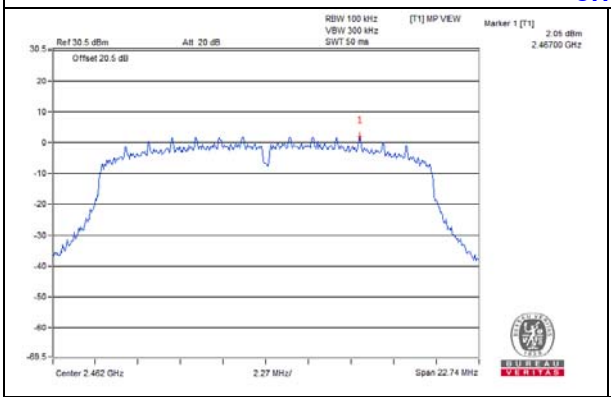


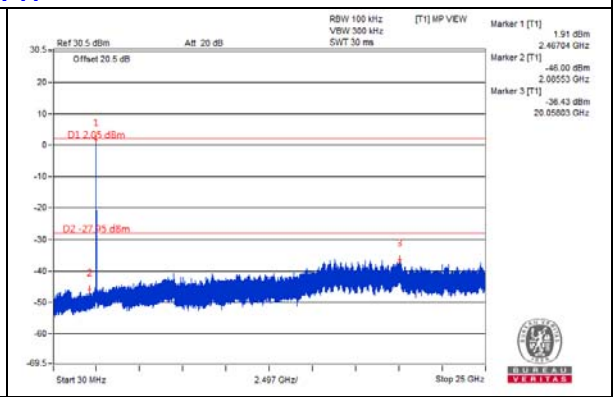
CH 6



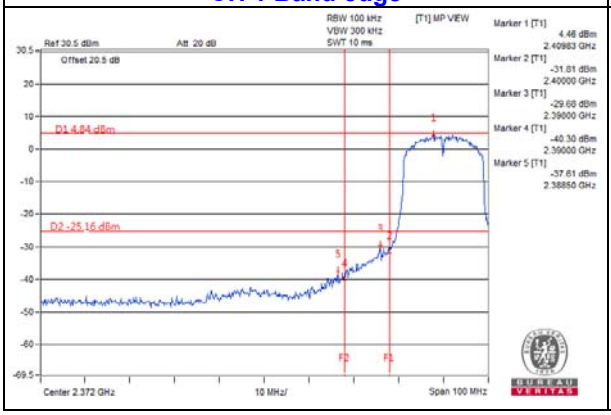


CH 11

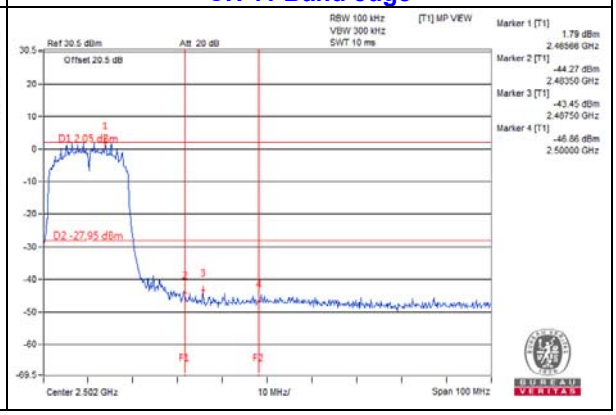




CH 1 Band edge

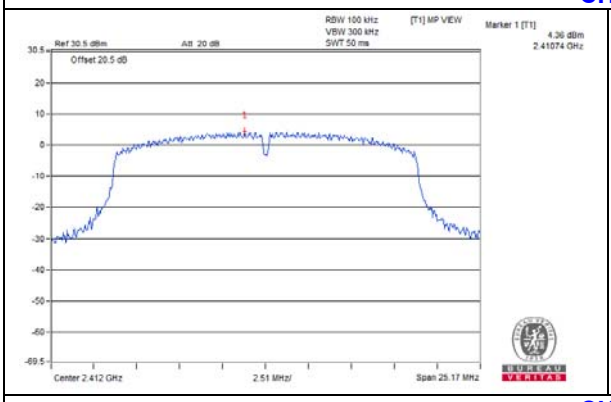


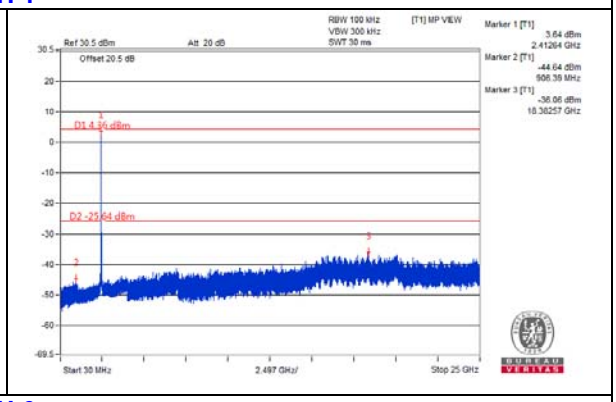
CH 11 Band edge



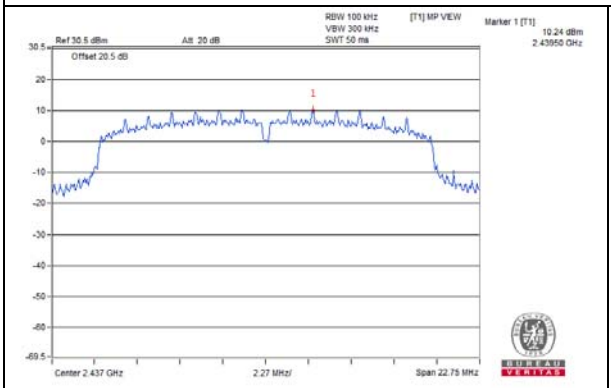
Chain 1

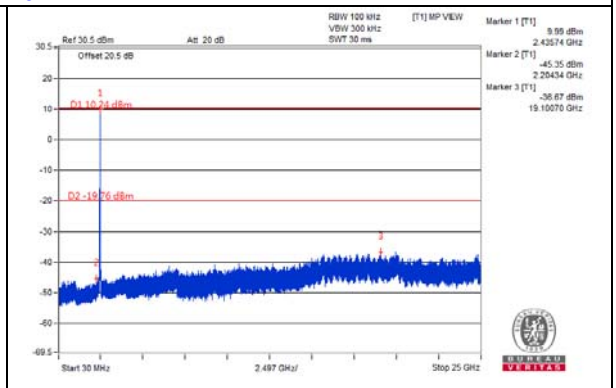
CH 1



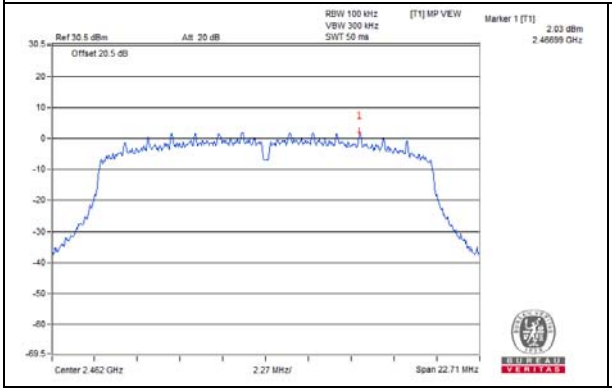


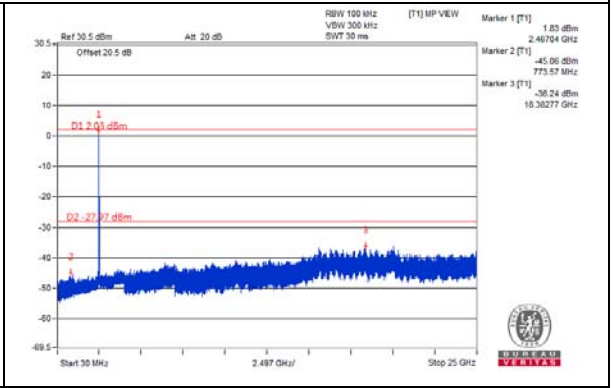
CH 6



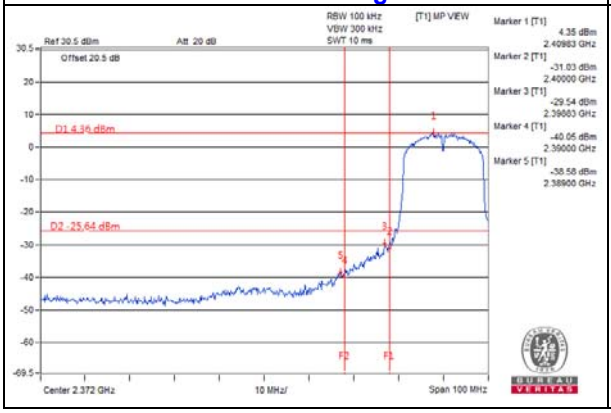


CH 11

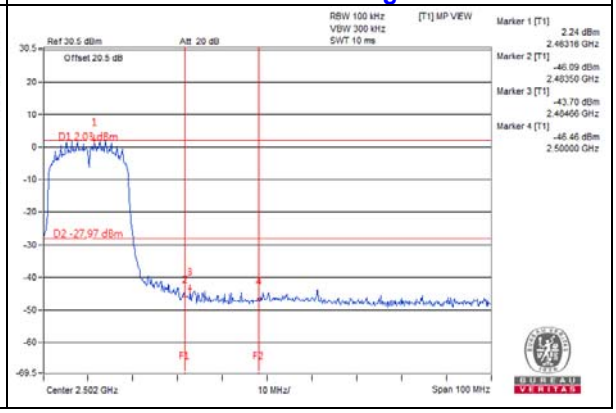




CH 1 Band edge

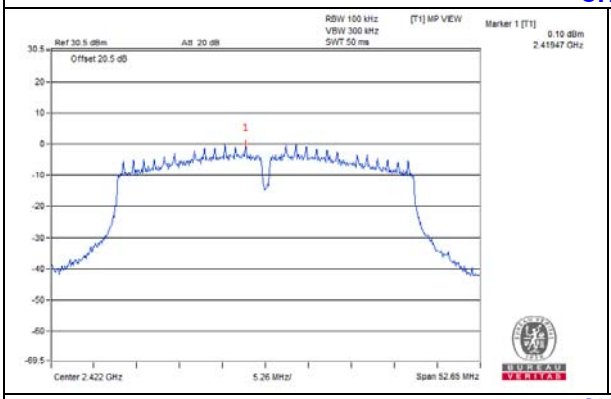


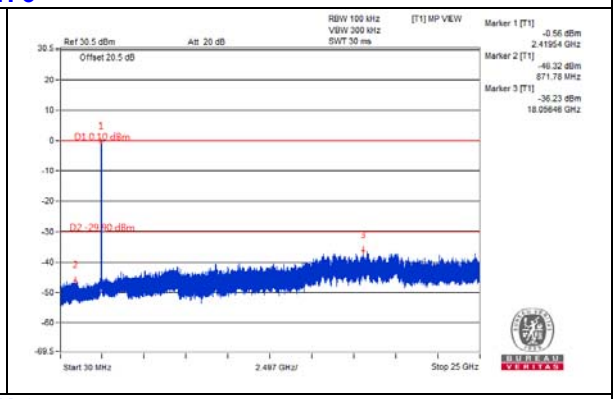
CH 11 Band edge



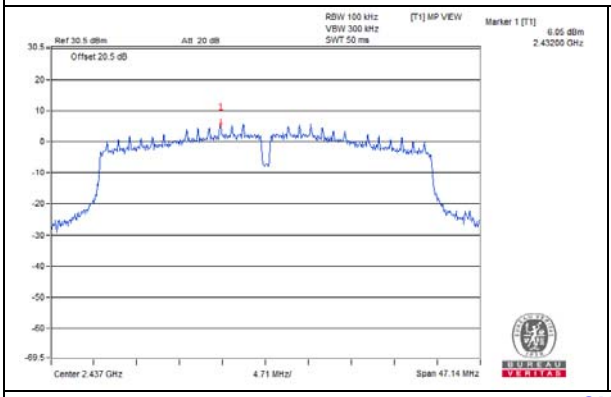
802.11n (40MHz): Chain 0

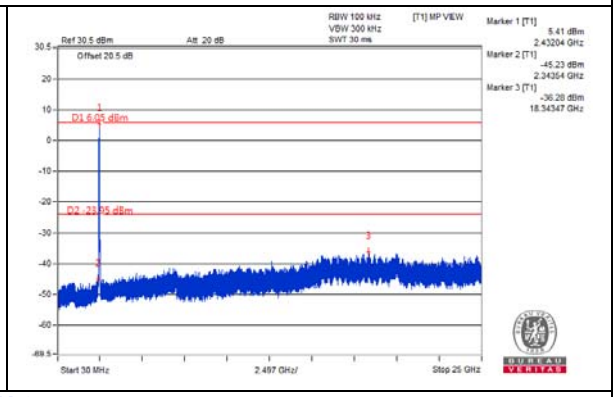
CH 3



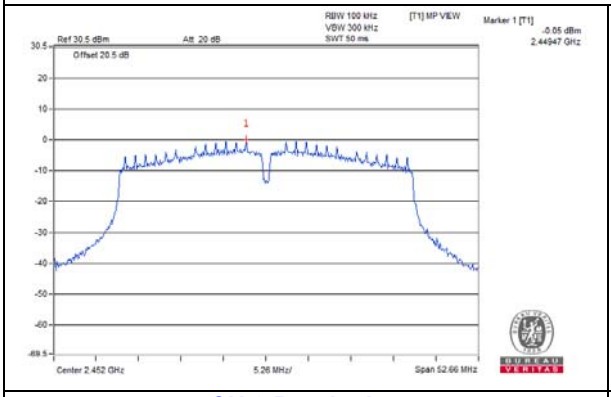


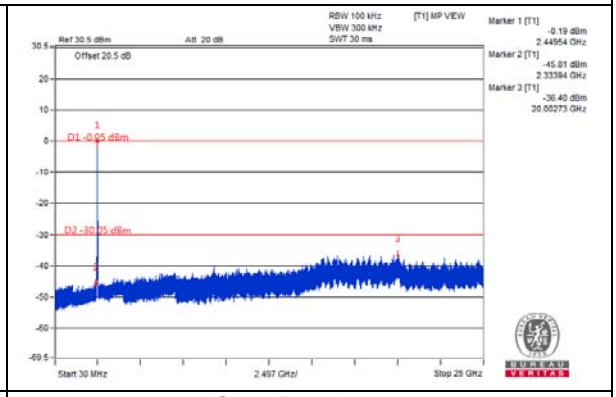
CH 6



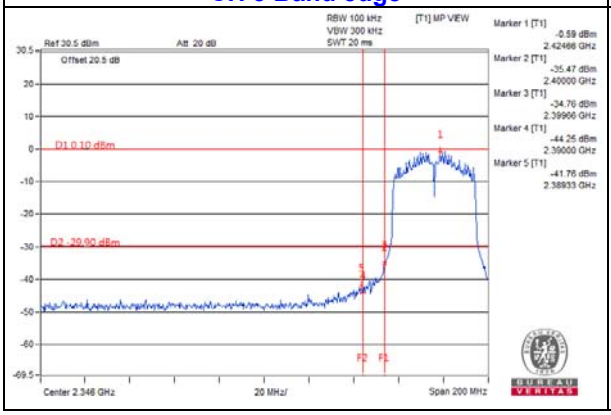


CH 9

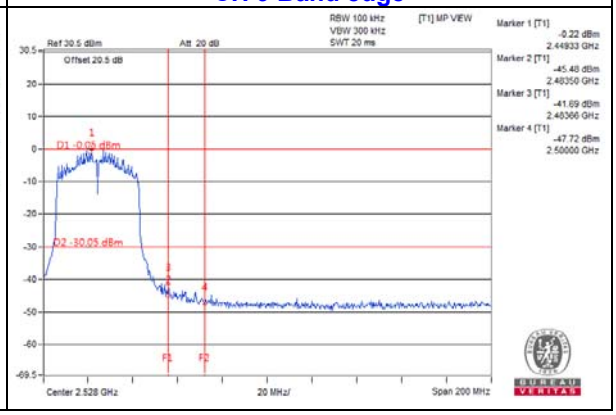




CH 3 Band edge

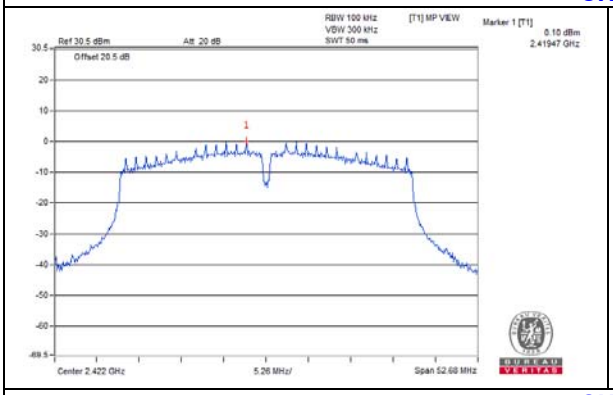


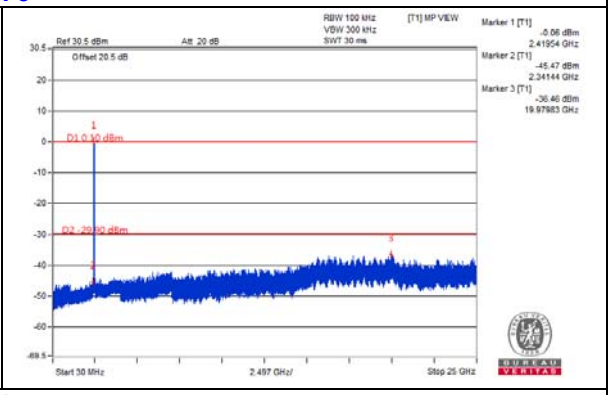
CH 9 Band edge



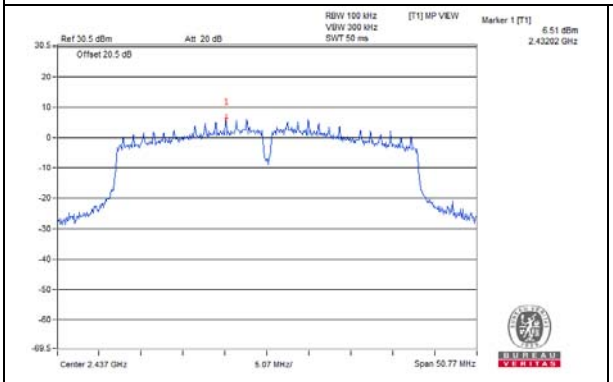
Chain 1

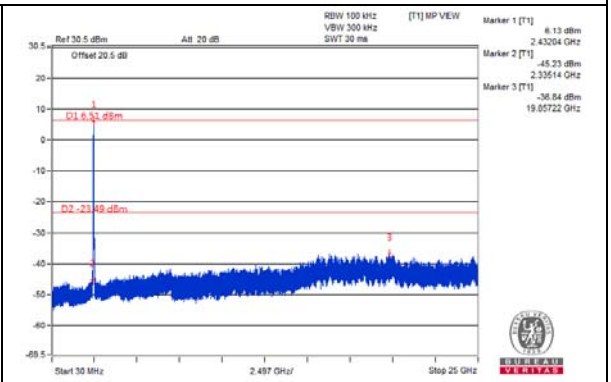
CH 3



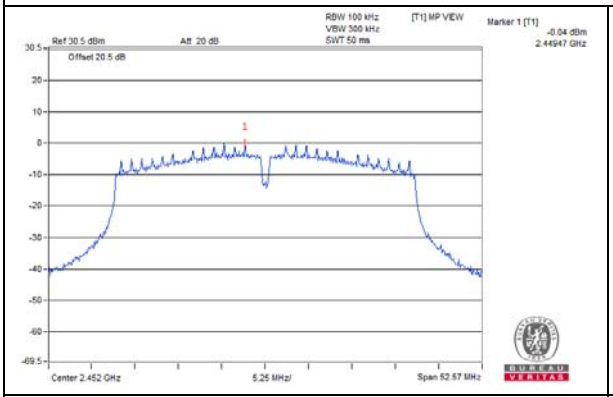


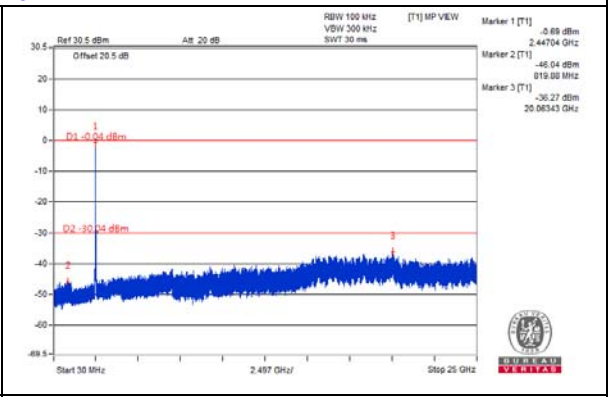
CH 6



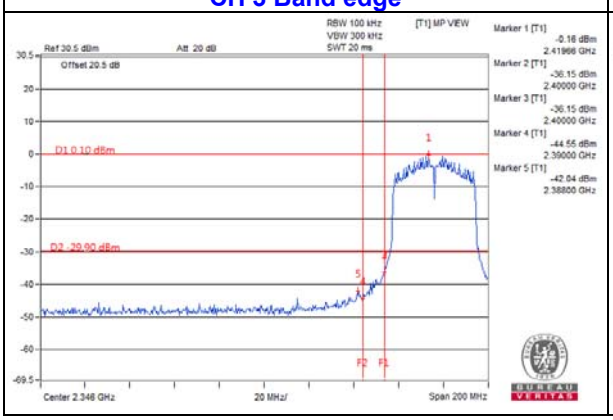


CH 9

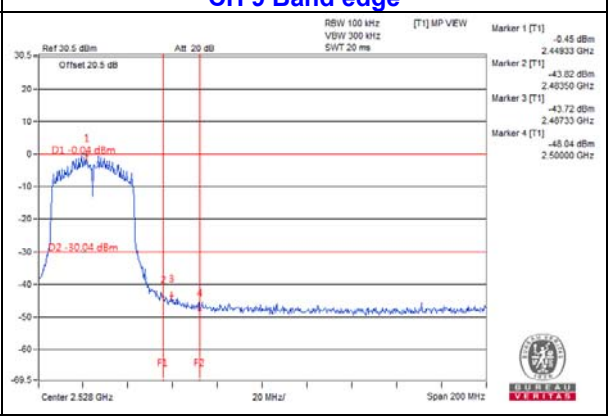




CH 3 Band edge



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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