FCC Test Report

Report No.:	RF170801C10
FCC ID:	KA2WL7620APA1
Test Model:	DWL-7620AP
Received Date:	Aug. 01, 2017
Test Date:	Aug. 07 ~ Aug. 30, 2017
Issued Date:	Sep. 12, 2017
Applicant:	D-Link Corporation
Address:	17595 Mt. Herrmann, Fountain Valley, California, United States, 92708
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.
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF170801C10	Original release.	Sep. 12, 2017

1 Certificate of Conformity

Product:	Unified AC Tri-band PoE Access Point
Brand:	D-Link Corporation
Test Model:	DWL-7620AP
Sample Status:	Identical Prototype
Applicant:	D-Link Corporation
Test Date:	Aug. 07 ~ Aug. 30, 2017
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 : _____ , **Date:** Sep. 12, 2017

Pettie Chen / Senior Specialist

Approved by : _____ , **Date:** Sep. 12, 2017

Ken Liu / Senior 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 -11.83dB at 17.74891MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.5 dB 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	Antenna connector is I-PEX not a standard connector.

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	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Unified AC Tri-band PoE Access Point
Brand	D-Link Corporation
Test Model	DWL-7620AP
Status of EUT	Identical Prototype
Power Supply Rating	12Vdc (From adapter) 53Vdc (From POE)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transfer Rate	802.11b: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	CDD Mode: 524.393mW Beamforming Mode: 244.277mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Data Cable Supplied	NA

Note:
1. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitter and 2 receivers.

Band	Modulation Mode	Beamforming Mode	TX Function	Remark
2.4GHz	802.11b	Not Support	2TX	Radio 0
	802.11g	Not Support	2TX	
	802.11n (HT20)	Support	2TX	
	802.11n (HT40)	Support	2TX	

2. The EUT uses following antenna.

Type	Connector	Gain (dBi)	
		2.4GHz	5GHz
PIFA	I-PEX	3.25	4.3

3. The EUT consumes power from the following Adapter and PoE.

Adapter 1	
Brand	Channel Well Technology
Model	2ABL030F US
Input Power	100-240Vac~1.0A
Output Power	12Vdc / 2.5A
Power Cord	1.2m non-shielded power cord without core

Adapter 2	
Brand	Asian Power Devices Inc.
Model	WA-30J12R
Input Power	100-240Vac~0.9A, 50-60Hz
Output Power	12Vdc / 2.5A
Power Cord	1.2m non-shielded power cord without core

PoE (Support unit only)	
Brand	D-Link
Model	DGS-1210-10P
Input Power	100-240Vac
Output Power	53Vdc

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 (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	
A	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from adapter 2
C	-	√	√	-	Power 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:

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

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

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	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
A	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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B, C	802.11b	1 to 11	6	DSSS	DBPSK	1.0

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, C	802.11b	1 to 11	6	DSSS	DBPSK	1.0

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	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
A	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

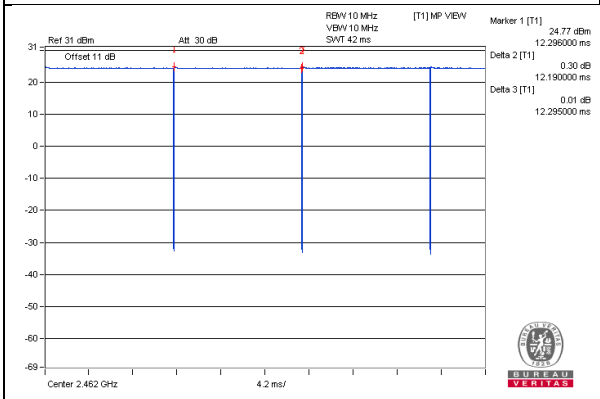
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 66%RH	120Vac, 60Hz	James Yang
RE<1G	25deg. C, 66%RH	120Vac, 60Hz	James Yang
PLC	25deg. C, 75%RH	120Vac, 60Hz	Luis Lee
APCM	25deg. C, 60%RH	120Vac, 60Hz	Frank Liu

3.3 Duty Cycle of Test Signal

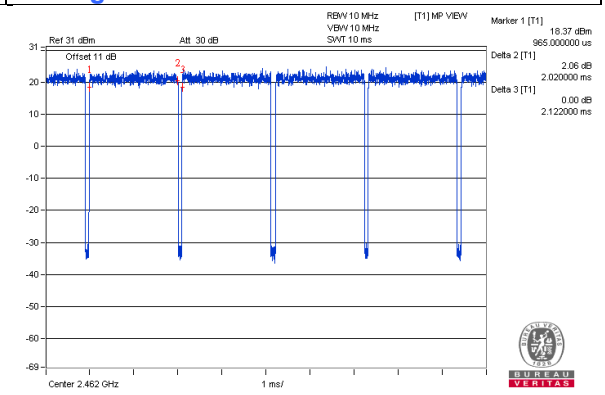
Duty cycle of test signal is > 98%, duty factor is not required
Duty cycle of test signal is < 98 %, duty factor is required

802.11b: Duty cycle = 12.19/12.295 = 0.991
802.11g: Duty cycle = 2.02/2.122 = 0.952, Duty factor = 10 * log(1/0.952) = 0.21
802.11n (HT20): Duty cycle = 4.95/5.063 = 0.978, Duty factor = 10 * log(1/0.978) = 0.10
802.11n (HT40): Duty cycle = 2.402/2.505 = 0.959, Duty factor = 10 * log(1/0.959) = 0.18

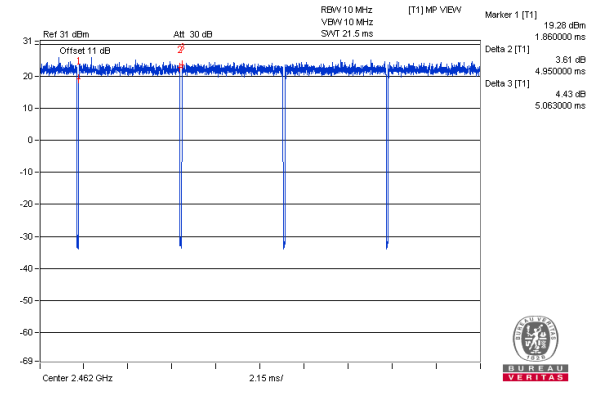
802.11b



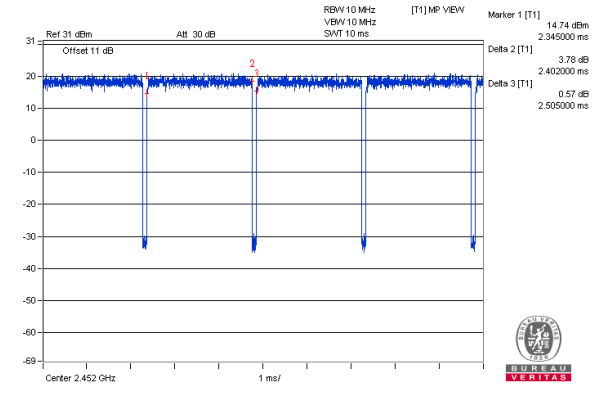
802.11g



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.	Notebook	Lenovo	X201i	NA	FCC DoC Approved	Provided by manufacturer
B.	Load	NA	NA	NA	NA	-
C.	PoE	D-Link	DGS-1210-10P	NA	NA	Provided by manufacturer

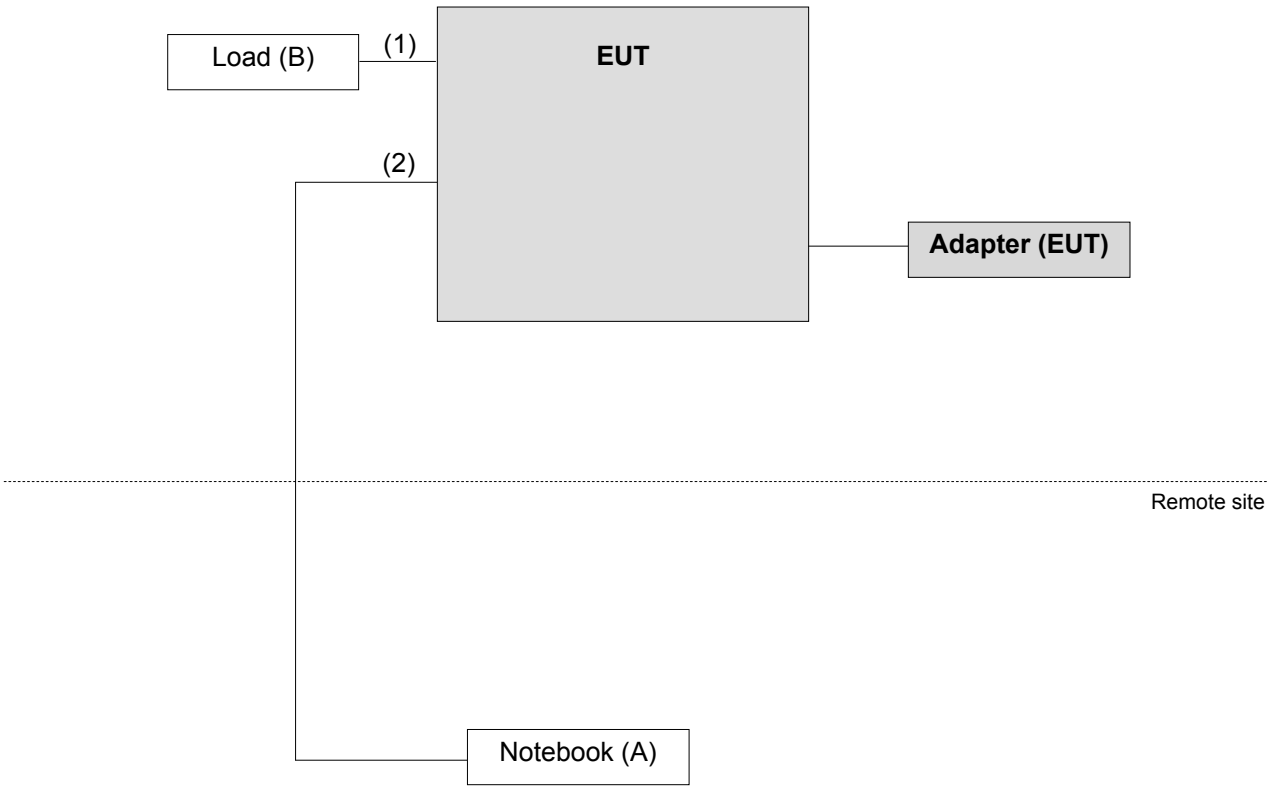
Note:

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

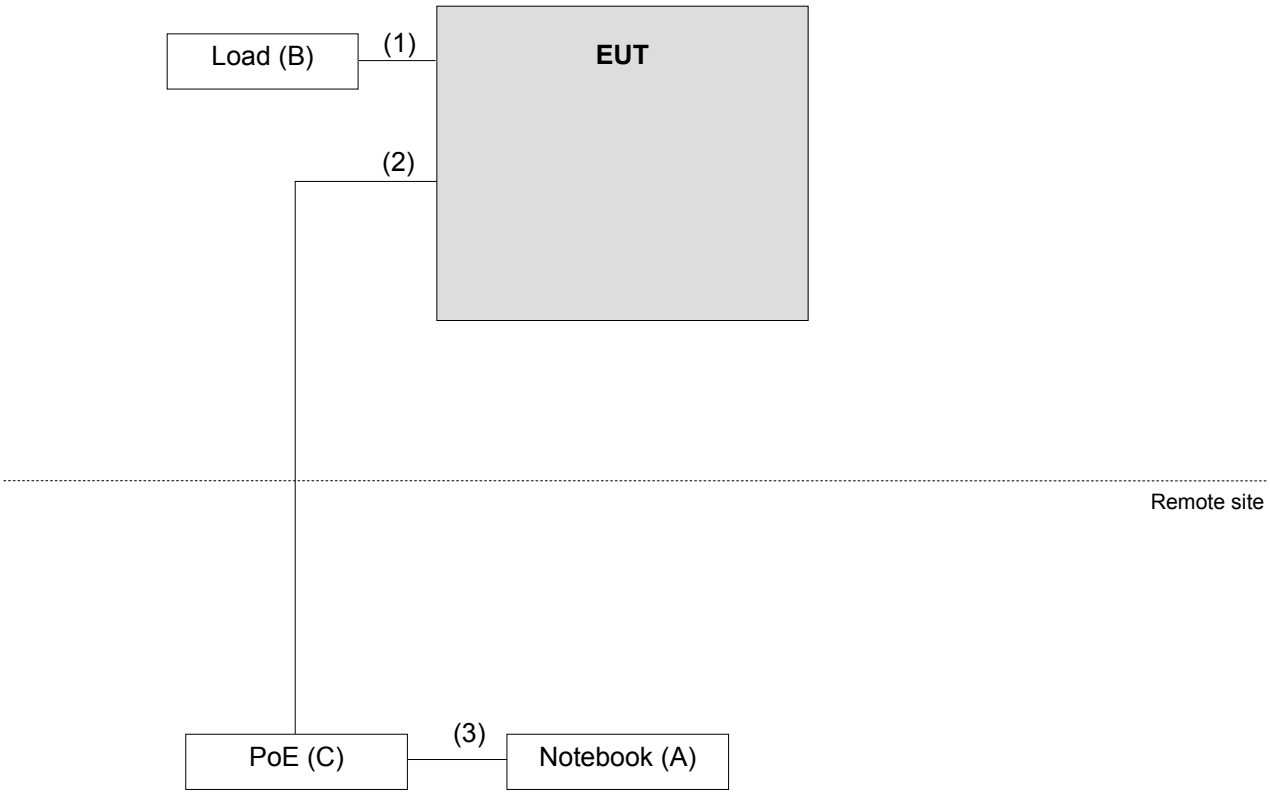
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45, Cat5e	2	1.6	N	0	-
2.	RJ45, Cat5e	1	10	N	0	-
3.	RJ45, Cat5e	1	1.8	N	0	-

3.4.1 Configuration of System under Test

Test Mode A, B



Test Mode C



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 30dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038A	MY55420137	Mar. 27, 2017	Mar. 26, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	May. 11, 2017	May. 10, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Dec. 27, 2016	Dec. 26, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna TESEQ	HLA 6121	45745	May 19, 2017	May 18, 2018
Preamplifier Agilent	8449B	3008A01638	Feb. 22, 2017	Feb. 21, 2018
Preamplifier Agilent	8447D	2944A10638	Aug. 08, 2016	Aug. 07, 2017
			Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02 (248780+MY13377)	Aug. 09, 2016	Aug. 08, 2017
			Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795 /4)	Aug. 09, 2016	Aug. 08, 2017
			Aug. 08, 2017	Aug. 07, 2018
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 01, 2017	Jul. 31, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
High Speed Peak Power Meter	ML2495A	1145013	Mar. 07, 2017	Mar. 06, 2018
Power Sensor	MA2411B	1126085	Mar. 07, 2017	Mar. 06, 2018

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
5. The IC Site Registration No. is IC 7450F-9.

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. Both X and Y axes 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 detect 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:

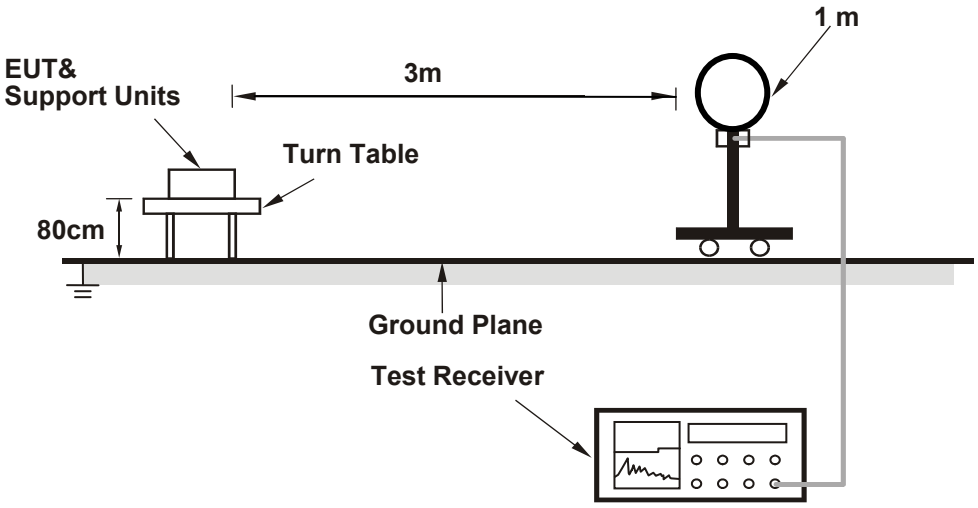
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

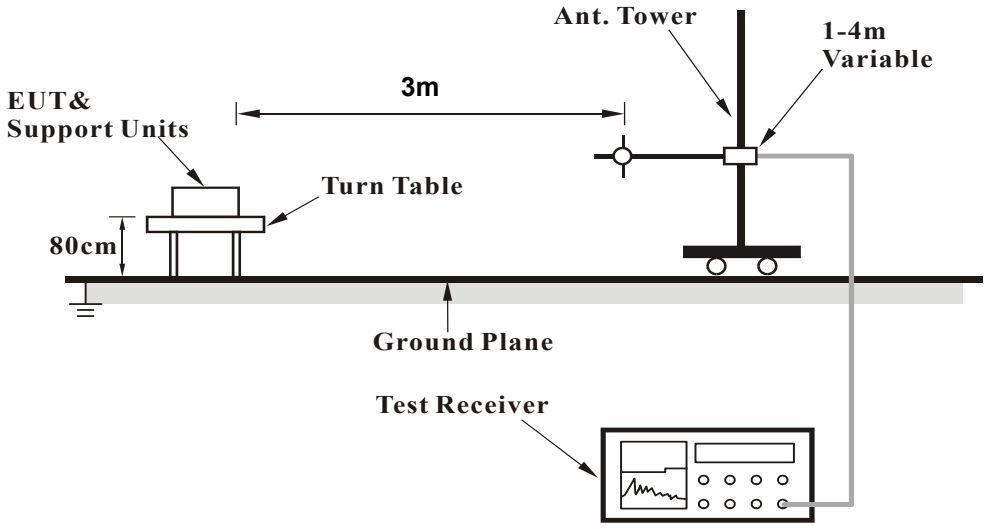
No deviation.

4.1.5 Test Set Up

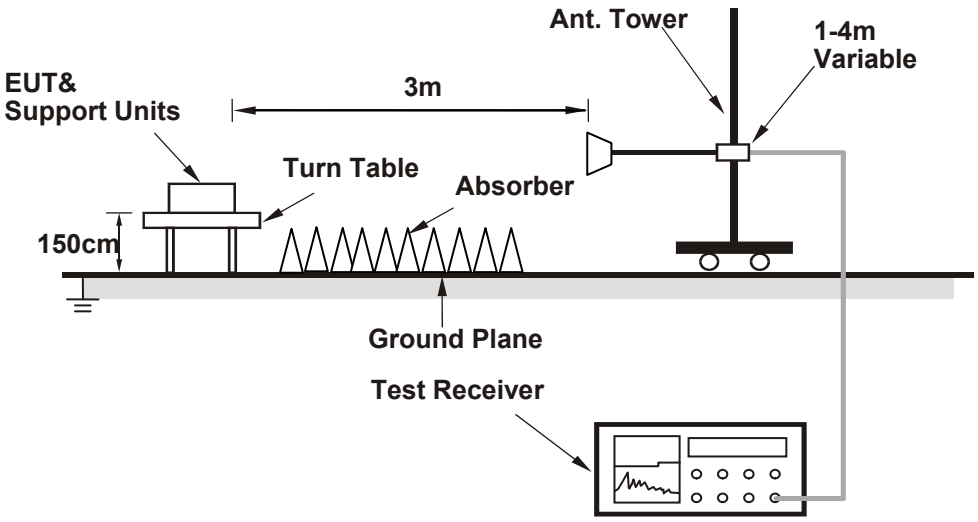
For Radiated emission below 30MHz



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. Prepared a notebook to act as a communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (QRCT 3.0.197) to enable EUT under transmission condition continuously at specific channel frequency.
d. The necessary accessories enable the system in full functions.

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	60.9 PK	74.0	-13.1	1.49 H	29	27.5	33.4
2	2390.00	53.2 AV	54.0	-0.8	1.49 H	29	19.8	33.4
3	*2412.00	121.8 PK			2.53 H	13	88.3	33.5
4	*2412.00	118.9 AV			2.53 H	13	85.4	33.5
5	4824.00	58.0 PK	74.0	-16.0	2.00 H	1	54.3	3.7
6	4824.00	52.2 AV	54.0	-1.8	2.00 H	1	48.5	3.7
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	61.0 PK	74.0	-13.0	3.19 V	41	27.6	33.4
2	2390.00	52.5 AV	54.0	-1.5	3.19 V	41	19.1	33.4
3	*2412.00	115.2 PK			3.21 V	1	81.7	33.5
4	*2412.00	113.0 AV			3.21 V	1	79.5	33.5
5	4824.00	53.3 PK	74.0	-20.7	3.84 V	352	49.6	3.7
6	4824.00	48.2 AV	54.0	-5.8	3.84 V	352	44.5	3.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)– Pre-Amplifier Factor(dB)
3. 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	60.6 PK	74.0	-13.4	3.52 H	0	27.2	33.4
2	2390.00	51.1 AV	54.0	-2.9	3.52 H	0	17.7	33.4
3	*2437.00	119.6 PK			2.74 H	13	86.0	33.6
4	*2437.00	115.3 AV			2.74 H	13	81.7	33.6
5	2483.50	62.0 PK	74.0	-12.0	3.23 H	14	28.1	33.9
6	2483.50	50.5 AV	54.0	-3.5	3.23 H	14	16.6	33.9
7	4874.00	59.3 PK	74.0	-14.7	2.22 H	3	55.4	3.9
8	4874.00	53.2 AV	54.0	-0.8	2.22 H	3	49.3	3.9
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	2390.00	57.3 PK	74.0	-16.7	3.42 V	115	23.9	33.4
2	2390.00	46.1 AV	54.0	-7.9	3.42 V	115	12.7	33.4
3	*2437.00	115.6 PK			3.87 V	101	82.0	33.6
4	*2437.00	113.0 AV			3.87 V	101	79.4	33.6
5	2483.50	58.8 PK	74.0	-15.2	2.94 V	267	24.9	33.9
6	2483.50	46.7 AV	54.0	-7.3	2.94 V	267	12.8	33.9
7	4874.00	53.9 PK	74.0	-20.1	3.87 V	165	50.0	3.9
8	4874.00	49.1 AV	54.0	-4.9	3.87 V	165	45.2	3.9

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. 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	117.1 PK			2.69 H	8	83.3	33.8
2	*2462.00	114.3 AV			2.69 H	8	80.5	33.8
3	2483.50	59.0 PK	74.0	-15.0	2.72 H	1	25.1	33.9
4	2483.50	47.5 AV	54.0	-6.5	2.72 H	1	13.6	33.9
5	4924.00	57.1 PK	74.0	-16.9	2.05 H	4	53.1	4.0
6	4924.00	53.1 AV	54.0	-0.9	2.05 H	4	49.1	4.0
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	113.7 PK			3.82 V	103	79.9	33.8
2	*2462.00	111.2 AV			3.82 V	103	77.4	33.8
3	2483.50	58.5 PK	74.0	-15.5	2.64 V	328	24.6	33.9
4	2483.50	46.9 AV	54.0	-7.1	2.64 V	328	13.0	33.9
5	4924.00	55.3 PK	74.0	-18.7	3.83 V	4	51.3	4.0
6	4924.00	51.6 AV	54.0	-2.4	3.83 V	4	47.6	4.0

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. 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	68.1 PK	74.0	-5.9	3.86 H	9	34.7	33.4
2	2390.00	53.1 AV	54.0	-0.9	3.86 H	9	19.7	33.4
3	*2412.00	116.1 PK			3.39 H	13	82.6	33.5
4	*2412.00	106.0 AV			3.39 H	13	72.5	33.5
5	4824.00	50.0 PK	74.0	-24.0	2.12 H	160	46.3	3.7
6	4824.00	41.1 AV	54.0	-12.9	2.12 H	160	37.4	3.7
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	65.5 PK	74.0	-8.5	3.26 V	79	32.1	33.4
2	2390.00	50.8 AV	54.0	-3.2	3.26 V	79	17.4	33.4
3	*2412.00	112.1 PK			3.51 V	80	78.6	33.5
4	*2412.00	102.1 AV			3.51 V	80	68.6	33.5
5	4824.00	49.5 PK	74.0	-24.5	3.79 V	191	45.8	3.7
6	4824.00	40.6 AV	54.0	-13.4	3.79 V	191	36.9	3.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.1 PK	74.0	-5.9	3.52 H	4	34.7	33.4
2	2390.00	53.0 AV	54.0	-1.0	3.52 H	4	19.6	33.4
3	*2437.00	118.8 PK			1.01 H	6	85.2	33.6
4	*2437.00	108.7 AV			1.01 H	6	75.1	33.6
5	2483.50	68.7 PK	74.0	-5.3	3.01 H	11	34.8	33.9
6	2483.50	52.0 AV	54.0	-2.0	3.01 H	11	18.1	33.9
7	4874.00	62.4 PK	74.0	-11.6	3.20 H	78	58.5	3.9
8	4874.00	47.9 AV	54.0	-6.1	3.20 H	78	44.0	3.9
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	2390.00	65.7 PK	74.0	-8.3	3.32 V	338	32.3	33.4
2	2390.00	50.5 AV	54.0	-3.5	3.32 V	338	17.1	33.4
3	*2437.00	116.7 PK			3.39 V	346	83.1	33.6
4	*2437.00	106.2 AV			3.39 V	346	72.6	33.6
5	2483.50	65.5 PK	74.0	-8.5	3.64 V	343	31.6	33.9
6	2483.50	50.1 AV	54.0	-3.9	3.64 V	343	16.2	33.9
7	4874.00	61.2 PK	74.0	-12.8	3.35 V	58	57.3	3.9
8	4874.00	45.7 AV	54.0	-8.3	3.35 V	58	41.8	3.9

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. 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	114.8 PK			3.32 H	15	81.0	33.8
2	*2462.00	104.3 AV			3.32 H	15	70.5	33.8
3	2483.50	67.3 PK	74.0	-6.7	1.33 H	198	33.4	33.9
4	2483.50	53.1 AV	54.0	-0.9	1.33 H	198	19.2	33.9
5	4924.00	48.5 PK	74.0	-25.5	1.03 H	251	44.5	4.0
6	4924.00	38.9 AV	54.0	-15.1	1.03 H	251	34.9	4.0
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	110.3 PK			3.43 V	83	76.5	33.8
2	*2462.00	100.2 AV			3.43 V	83	66.4	33.8
3	2483.50	63.5 PK	74.0	-10.5	3.08 V	83	29.6	33.9
4	2483.50	50.1 AV	54.0	-3.9	3.08 V	83	16.2	33.9
5	4924.00	48.8 PK	74.0	-25.2	2.47 V	161	44.8	4.0
6	4924.00	39.3 AV	54.0	-14.7	2.47 V	161	35.3	4.0

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) 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	69.6 PK	74.0	-4.4	2.55 H	14	36.2	33.4
2	**2390.00**	**53.5 AV**	**54.0**	**-0.5**	**2.55 H**	**14**	**20.1**	**33.4**
3	*2412.00	114.9 PK			2.80 H	13	81.4	33.5
4	*2412.00	103.9 AV			2.80 H	13	70.4	33.5
5	4824.00	49.5 PK	74.0	-24.5	2.11 H	161	45.8	3.7
6	4824.00	40.2 AV	54.0	-13.8	2.11 H	161	36.5	3.7
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	64.5 PK	74.0	-9.5	3.58 V	2	31.1	33.4
2	2390.00	49.8 AV	54.0	-4.2	3.58 V	2	16.4	33.4
3	*2412.00	110.6 PK			3.52 V	345	77.1	33.5
4	*2412.00	100.0 AV			3.52 V	345	66.5	33.5
5	4824.00	49.0 PK	74.0	-25.0	3.79 V	192	45.3	3.7
6	4824.00	40.8 AV	54.0	-13.2	3.79 V	192	37.1	3.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)– Pre-Amplifier Factor(dB)
3. 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	71.4 PK	74.0	-2.6	3.92 H	318	38.0	33.4
2	2390.00	53.3 AV	54.0	-0.7	3.92 H	318	19.9	33.4
3	*2437.00	120.9 PK			2.98 H	17	87.3	33.6
4	*2437.00	110.1 AV			2.98 H	17	76.5	33.6
5	4874.00	59.2 PK	74.0	-14.8	3.91 H	336	55.3	3.9
6	4874.00	44.6 AV	54.0	-9.4	3.91 H	336	40.7	3.9
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	2390.00	67.7 PK	74.0	-6.3	3.29 V	348	34.3	33.4
2	2390.00	50.0 AV	54.0	-4.0	3.29 V	348	16.6	33.4
3	*2437.00	117.1 PK			3.42 V	348	83.5	33.6
4	*2437.00	106.2 AV			3.42 V	348	72.6	33.6
5	4874.00	59.6 PK	74.0	-14.4	3.32 V	57	55.7	3.9
6	4874.00	43.9 AV	54.0	-10.1	3.32 V	57	40.0	3.9

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. 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	114.2 PK			3.31 H	8	80.4	33.8
2	*2462.00	103.7 AV			3.31 H	8	69.9	33.8
3	2483.50	69.1 PK	74.0	-4.9	2.93 H	5	35.2	33.9
4	2483.50	53.3 AV	54.0	-0.7	2.93 H	5	19.4	33.9
5	4924.00	48.1 PK	74.0	-25.9	1.00 H	113	44.1	4.0
6	4924.00	37.6 AV	54.0	-16.4	1.00 H	113	33.6	4.0
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	109.5 PK			3.91 V	352	75.7	33.8
2	*2462.00	99.2 AV			3.91 V	352	65.4	33.8
3	2483.50	63.8 PK	74.0	-10.2	3.34 V	347	29.9	33.9
4	2483.50	50.6 AV	54.0	-3.4	3.34 V	347	16.7	33.9
5	4924.00	49.7 PK	74.0	-24.3	4.00 V	183	45.7	4.0
6	4924.00	41.5 AV	54.0	-12.5	4.00 V	183	37.5	4.0

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK) 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	67.7 PK	74.0	-6.3	3.90 H	9	34.3	33.4
2	2390.00	53.2 AV	54.0	-0.8	3.90 H	9	19.8	33.4
3	*2422.00	107.8 PK			3.45 H	15	74.2	33.6
4	*2422.00	98.4 AV			3.45 H	15	64.8	33.6
5	4844.00	49.4 PK	74.0	-24.6	1.68 H	158	45.6	3.8
6	4844.00	40.3 AV	54.0	-13.7	1.68 H	158	36.5	3.8
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	63.9 PK	74.0	-10.1	3.67 V	351	30.5	33.4
2	2390.00	50.0 AV	54.0	-4.0	3.67 V	351	16.6	33.4
3	*2422.00	104.5 PK			3.74 V	337	70.9	33.6
4	*2422.00	94.9 AV			3.74 V	337	61.3	33.6
5	4844.00	49.9 PK	74.0	-24.1	3.74 V	187	46.1	3.8
6	4844.00	39.8 AV	54.0	-14.2	3.74 V	187	36.0	3.8

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. 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	68.3 PK	74.0	-5.7	3.52 H	3	34.9	33.4
2	2390.00	52.5 AV	54.0	-1.5	3.52 H	3	19.1	33.4
3	*2437.00	114.0 PK			3.06 H	9	80.4	33.6
4	*2437.00	104.6 AV			3.06 H	9	71.0	33.6
5	2483.50	67.9 PK	74.0	-6.1	3.56 H	5	34.0	33.9
6	2483.50	53.2 AV	54.0	-0.8	3.56 H	5	19.3	33.9
7	4874.00	47.9 PK	74.0	-26.1	1.59 H	273	44.0	3.9
8	4874.00	37.7 AV	54.0	-16.3	1.59 H	273	33.8	3.9
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	2390.00	64.5 PK	74.0	-9.5	1.97 V	59	31.1	33.4
2	2390.00	50.9 AV	54.0	-3.1	1.97 V	59	17.5	33.4
3	*2437.00	109.9 PK			3.89 V	81	76.3	33.6
4	*2437.00	100.4 AV			3.89 V	81	66.8	33.6
5	2483.50	63.2 PK	74.0	-10.8	3.90 V	39	29.3	33.9
6	2483.50	49.1 AV	54.0	-4.9	3.90 V	39	15.2	33.9
7	4874.00	49.7 PK	74.0	-24.3	3.93 V	186	45.8	3.9
8	4874.00	41.4 AV	54.0	-12.6	3.93 V	186	37.5	3.9

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. 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	110.6 PK			3.36 H	16	76.8	33.8
2	*2452.00	101.1 AV			3.36 H	16	67.3	33.8
3	2483.50	70.6 PK	74.0	-3.4	1.00 H	10	36.7	33.9
4	2483.50	53.1 AV	54.0	-0.9	1.00 H	10	19.2	33.9
5	4904.00	48.6 PK	74.0	-25.4	2.00 H	191	44.6	4.0
6	4904.00	39.8 AV	54.0	-14.2	2.00 H	191	35.8	4.0
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	*2452.00	106.9 PK			3.87 V	84	73.1	33.8
2	*2452.00	97.6 AV			3.87 V	84	63.8	33.8
3	2483.50	62.8 PK	74.0	-11.2	3.31 V	85	28.9	33.9
4	2483.50	51.0 AV	54.0	-3.0	3.31 V	85	17.1	33.9
5	4904.00	49.3 PK	74.0	-24.7	1.85 V	179	45.3	4.0
6	4904.00	39.0 AV	54.0	-15.0	1.85 V	179	35.0	4.0

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Data:

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	A

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	30.20	33.3 QP	40.0	-6.7	1.99 H	357	48.8	-15.5
2	62.98	34.2 QP	40.0	-5.8	1.49 H	191	48.7	-14.5
3	187.98	36.7 QP	43.5	-6.8	1.49 H	103	52.4	-15.7
4	270.56	39.6 QP	46.0	-6.4	1.00 H	114	52.7	-13.1
5	368.36	41.0 QP	46.0	-5.0	1.00 H	108	52.4	-11.4
6	522.76	34.8 QP	46.0	-11.2	1.49 H	330	43.8	-9.0
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	30.30	38.1 QP	40.0	-1.9	1.51 V	182	53.6	-15.5
2	49.40	38.2 QP	40.0	-1.8	1.99 V	169	51.8	-13.6
3	173.56	37.5 QP	43.5	-6.0	1.01 V	192	51.7	-14.2
4	286.08	37.7 QP	46.0	-8.3	1.99 V	189	50.3	-12.6
5	367.96	44.3 QP	46.0	-1.7	1.51 V	108	55.7	-11.4
6	547.98	33.5 QP	46.0	-12.5	1.01 V	282	42.4	-8.9

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	B

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	158.04	41.8 QP	43.5	-1.7	1.49 H	100	55.0	-13.2
2	214.79	41.2 QP	43.5	-2.3	1.00 H	120	57.4	-16.2
3	311.30	42.1 QP	46.0	-3.9	1.00 H	222	54.2	-12.1
4	366.79	42.6 QP	46.0	-3.4	1.00 H	309	54.1	-11.5
5	385.02	43.7 QP	46.0	-2.3	1.00 H	149	54.8	-11.1
6	513.06	36.2 QP	46.0	-9.8	1.49 H	345	45.3	-9.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.20	33.2 QP	40.0	-6.8	1.00 V	24	48.7	-15.5
2	53.84	36.0 QP	40.0	-4.0	1.00 V	7	49.5	-13.5
3	74.62	38.9 QP	40.0	-1.1	1.00 V	183	55.3	-16.4
4	154.16	35.3 QP	43.5	-8.2	1.00 V	207	48.6	-13.3
5	313.24	38.8 QP	46.0	-7.2	1.49 V	225	50.8	-12.0
6	367.99	44.9 QP	46.0	-1.1	1.50 V	265	56.3	-11.4

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	C

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	94.02	33.8 QP	43.5	-9.7	1.49 H	299	52.6	-18.8
2	185.20	35.1 QP	43.5	-8.4	1.01 H	182	50.5	-15.4
3	284.14	40.8 QP	46.0	-5.2	1.01 H	162	53.4	-12.6
4	369.47	41.0 QP	46.0	-5.0	1.00 H	135	52.4	-11.4
5	382.62	40.9 QP	46.0	-5.1	1.00 H	207	52.1	-11.2
6	509.18	39.2 QP	46.0	-6.8	1.49 H	157	48.4	-9.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	31.94	35.4 QP	40.0	-4.6	1.49 V	198	50.8	-15.4
2	55.22	38.4 QP	40.0	-1.6	1.00 V	33	52.1	-13.7
3	125.06	37.3 QP	43.5	-6.2	1.49 V	93	52.7	-15.4
4	286.08	40.7 QP	46.0	-5.3	1.49 V	164	53.3	-12.6
5	366.28	43.4 QP	46.0	-2.6	1.49 V	129	54.9	-11.5
6	499.48	37.5 QP	46.0	-8.5	1.00 V	153	46.9	-9.4

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. 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.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 21, 2016	Nov. 20, 2017
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100220	Nov. 08, 2016	Nov. 07, 2017
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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 HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

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.

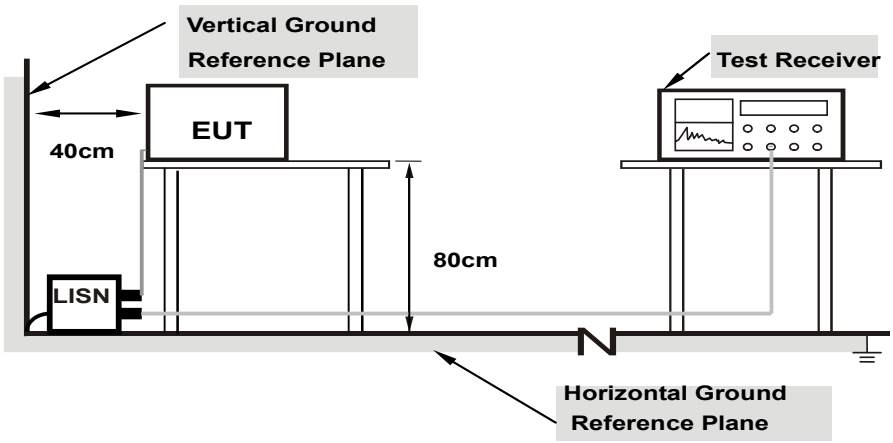
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

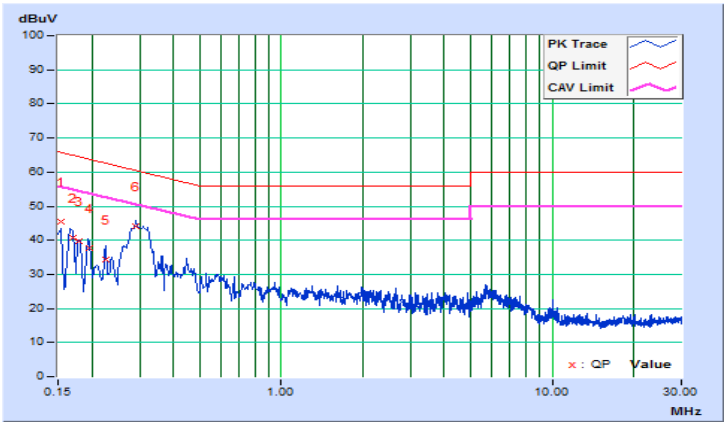
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test 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	0.15391	10.41	35.10	20.30	45.51	30.71	65.79	55.79	-20.28	-25.08
2	0.16955	10.41	30.45	16.44	40.86	26.85	64.98	54.98	-24.12	-28.13
3	0.17838	10.42	29.39	15.90	39.81	26.32	64.56	54.56	-24.75	-28.24
4	0.19692	10.43	27.25	14.43	37.68	24.86	63.74	53.74	-26.06	-28.88
5	0.22434	10.44	23.93	11.49	34.37	21.93	62.66	52.66	-28.29	-30.73
6	0.28891	10.47	33.56	26.94	44.03	37.41	60.56	50.56	-16.53	-13.15

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.

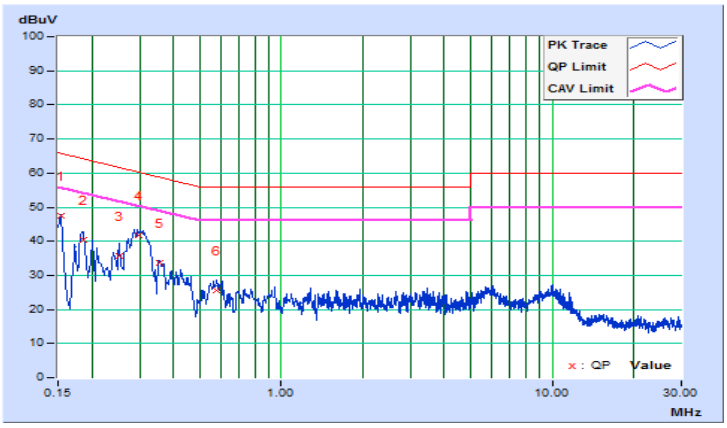


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

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	0.15391	10.16	37.38	22.59	47.54	32.75	65.79	55.79	-18.25	-23.04
2	0.18508	10.19	30.09	16.02	40.28	26.21	64.25	54.25	-23.97	-28.04
3	0.25125	10.21	25.56	14.23	35.77	24.44	61.72	51.72	-25.95	-27.28
4	0.29976	10.21	31.56	21.95	41.77	32.16	60.25	50.25	-18.48	-18.09
5	0.35389	10.22	23.46	15.39	33.68	25.61	58.87	48.87	-25.19	-23.26
6	0.57317	10.23	15.43	10.48	25.66	20.71	56.00	46.00	-30.34	-25.29

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.

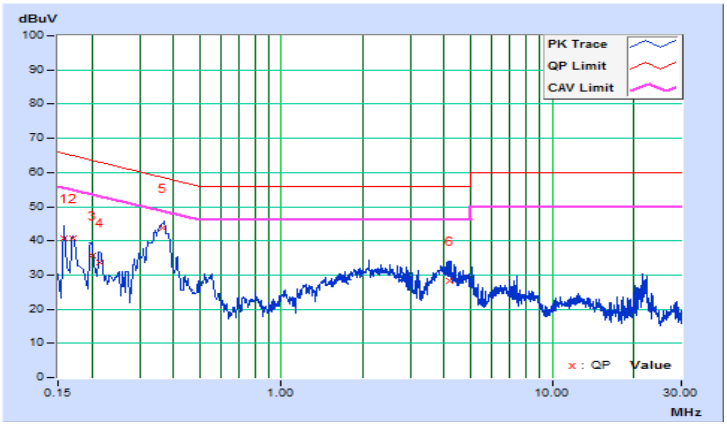


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.15719	10.41	30.34	15.31	40.75	25.72	65.61	55.61	-24.86	-29.89
2	0.16967	10.41	30.34	17.91	40.75	28.32	64.98	54.98	-24.23	-26.66
3	0.20083	10.43	25.38	14.22	35.81	24.65	63.58	53.58	-27.77	-28.93
4	0.21282	10.44	23.10	11.18	33.54	21.62	63.09	53.09	-29.55	-31.47
5	0.36623	10.50	33.40	26.25	43.90	36.75	58.59	48.59	-14.69	-11.84
6	4.17925	10.67	17.74	11.61	28.41	22.28	56.00	46.00	-27.59	-23.72

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.

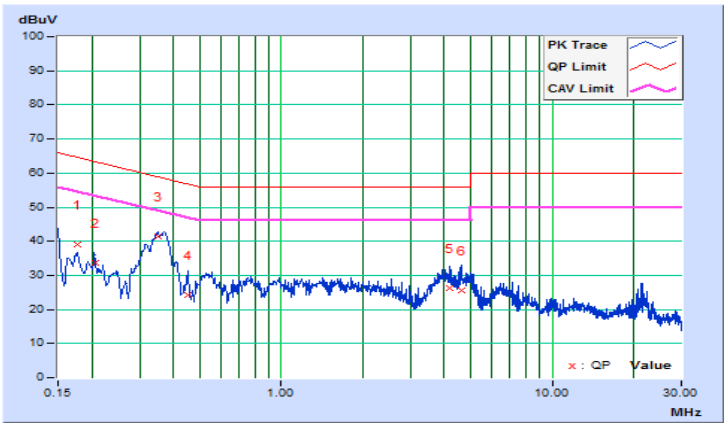


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.17605	10.18	28.72	17.08	38.90	27.26	64.67	54.67	-25.77	-27.41
2	0.20511	10.20	23.34	13.87	33.54	24.07	63.40	53.40	-29.86	-29.33
3	0.34926	10.22	31.14	24.71	41.36	34.93	58.98	48.98	-17.62	-14.05
4	0.45097	10.23	13.98	5.21	24.21	15.44	56.86	46.86	-32.65	-31.42
5	4.16166	10.43	15.99	10.26	26.42	20.69	56.00	46.00	-29.58	-25.31
6	4.62304	10.44	15.28	9.01	25.72	19.45	56.00	46.00	-30.28	-26.55

REMARKS:

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

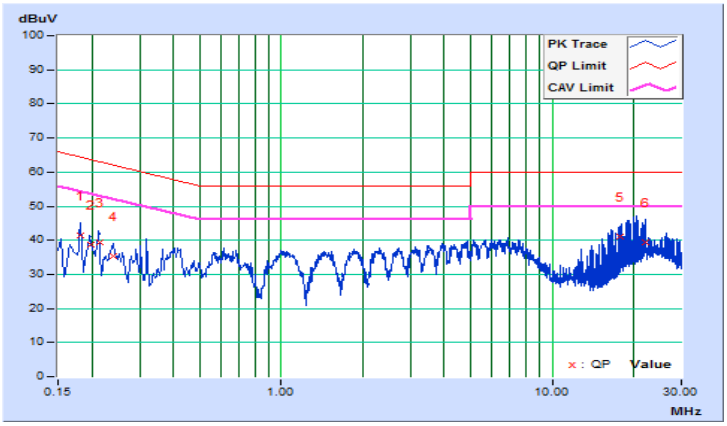


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

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	0.18075	10.42	30.87	17.70	41.29	28.12	64.45	54.45	-23.16	-26.33
2	0.19717	10.43	28.39	21.08	38.82	31.51	63.73	53.73	-24.91	-22.22
3	0.21282	10.44	29.03	16.39	39.47	26.83	63.09	53.09	-23.62	-26.26
4	0.23898	10.45	24.84	20.25	35.29	30.70	62.13	52.13	-26.84	-21.43
5	**17.74891**	**11.31**	**29.70**	**26.86**	**41.01**	**38.17**	**60.00**	**50.00**	**-18.99**	**-11.83**
6	21.99908	11.49	28.01	24.54	39.50	36.03	60.00	50.00	-20.50	-13.97

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.

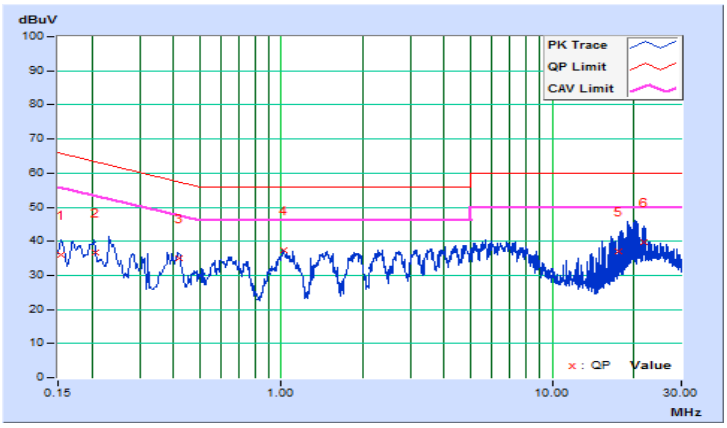


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

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	0.15391	10.16	25.90	17.55	36.06	27.71	65.79	55.79	-29.73	-28.08
2	0.20511	10.20	26.57	17.28	36.77	27.48	63.40	53.40	-26.63	-25.92
3	0.41979	10.23	24.88	20.21	35.11	30.44	57.45	47.45	-22.34	-17.01
4	1.01531	10.24	27.18	20.61	37.42	30.85	56.00	46.00	-18.58	-15.15
5	17.49867	10.95	26.01	22.07	36.96	33.02	60.00	50.00	-23.04	-16.98
6	21.74915	11.09	28.66	24.13	39.75	35.22	60.00	50.00	-20.25	-14.78

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.

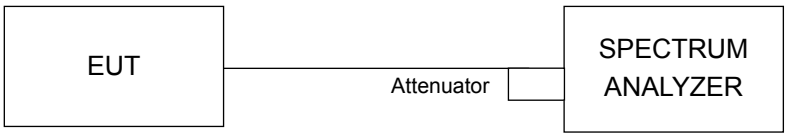


4.3 6dB Bandwidth Measurement

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
		Chain 0	Chain 1		
1	2412	9.07	9.06	0.5	Pass
6	2437	8.11	8.55	0.5	Pass
11	2462	8.10	8.10	0.5	Pass

802.11g

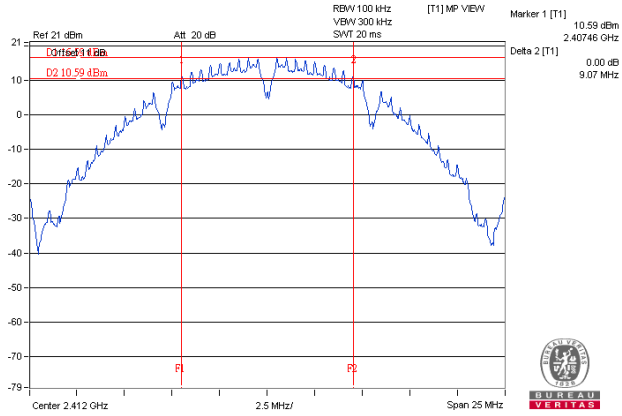
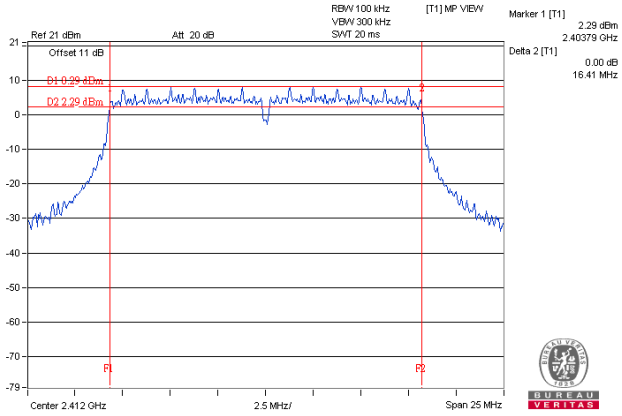
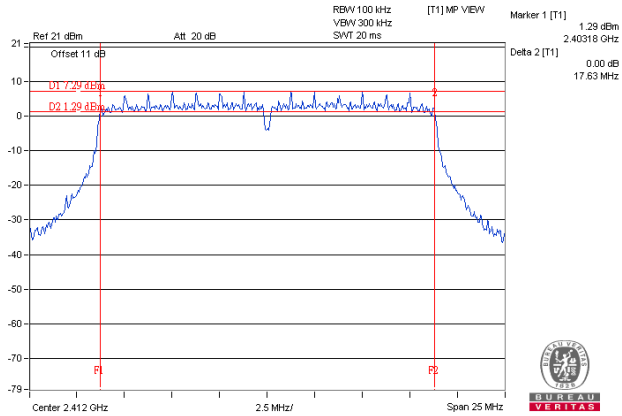
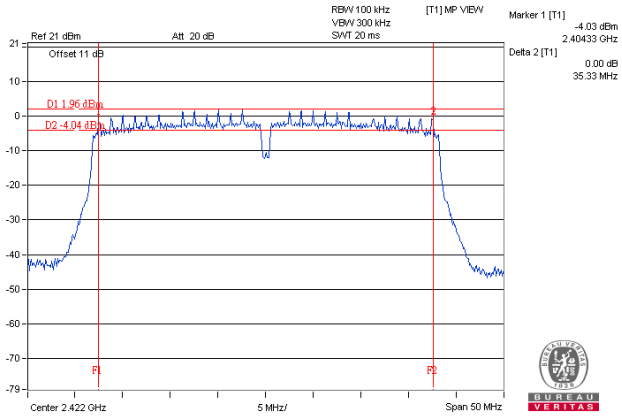
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.41	16.38	0.5	Pass
6	2437	16.37	16.36	0.5	Pass
11	2462	16.38	16.37	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.63	17.61	0.5	Pass
6	2437	17.59	17.59	0.5	Pass
11	2462	17.60	17.61	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.33	35.26	0.5	Pass
6	2437	35.27	35.19	0.5	Pass
9	2452	34.81	35.24	0.5	Pass

Spectrum Plot of Worst Value	
802.11b	**802.11g**
	
802.11n (HT20)	**802.11n (HT40)**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

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

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

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

4.4.2 Test Setup

4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

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

CDD Mode

802.11b

Chan.	Freq. (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	23.77	23.65	469.971	26.72	30	Pass
6	2437	23.54	23.62	456.088	26.59	30	Pass
11	2462	21.72	21.92	304.191	24.83	30	Pass

802.11g

Chan.	Freq. (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.91	19.31	163.114	22.12	30	Pass
6	2437	24.29	24.08	**524.393**	27.20	30	Pass
11	2462	18.43	18.69	143.624	21.57	30	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.81	18.29	127.848	21.07	30	Pass
6	2437	23.70	24.05	488.520	26.89	30	Pass
11	2462	17.84	17.92	122.758	20.89	30	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	15.42	15.48	70.152	18.46	30	Pass
6	2437	19.67	20.01	192.914	22.85	30	Pass
9	2452	17.08	17.13	102.692	20.12	30	Pass

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.80	15.28	63.929	18.06	29.74	Pass
6	2437	20.69	21.04	**244.277**	23.88	29.74	Pass
11	2462	14.83	14.91	61.383	17.88	29.74	Pass

NOTE: Directional gain = 3.25dBi + 10log(2) = 6.26dBi > 6dBi, so the power limit shall be reduced to 30-(6.26-6) = 29.74dBm.

802.11n (HT40)

Chan.	Freq. (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	12.41	12.47	35.078	15.45	29.74	Pass
6	2437	16.66	17.00	96.464	19.84	29.74	Pass
9	2452	14.07	14.12	51.350	17.11	29.74	Pass

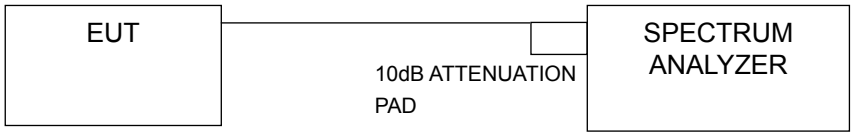
NOTE: Directional gain = 3.25dBi + 10log(2) = 6.26dBi > 6dBi, so the power limit shall be reduced to 30-(6.26-6) = 29.74dBm.

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

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

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. Don’t 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

802.11b

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-3.78	3.01	-0.77	7.74	Pass
	6	2437	-4.00	3.01	-0.99	7.74	Pass
	11	2462	-5.62	3.01	-2.61	7.74	Pass
1	1	2412	-4.29	3.01	-1.28	7.74	Pass
	6	2437	-4.39	3.01	-1.38	7.74	Pass
	11	2462	-5.81	3.01	-2.80	7.74	Pass

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.25dBi + 10log(2) = 6.26dBi > 6dBi, so the power density limit shall be reduced to 8-(6.26-6) = 7.74dBm.

802.11g

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/10kHz)	Pass / Fail
0	1	2412	-11.33	3.01	0.21	-8.11	7.74	Pass
	6	2437	-6.24	3.01	0.21	-3.02	7.74	Pass
	11	2462	-13.28	3.01	0.21	-10.06	7.74	Pass
1	1	2412	-11.95	3.01	0.21	-8.73	7.74	Pass
	6	2437	-7.31	3.01	0.21	-4.09	7.74	Pass
	11	2462	-12.39	3.01	0.21	-9.17	7.74	Pass

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.25dBi + 10log(2) = 6.26dBi > 6dBi, so the power density limit shall be reduced to 8-(6.26-6) = 7.74dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/10kHz)	Pass / Fail
0	1	2412	-13.04	3.01	0.10	-9.93	7.74	Pass
	6	2437	-6.97	3.01	0.10	-3.86	7.74	Pass
	11	2462	-12.99	3.01	0.10	-9.88	7.74	Pass
1	1	2412	-13.19	3.01	0.10	-10.08	7.74	Pass
	6	2437	-7.79	3.01	0.10	-4.68	7.74	Pass
	11	2462	-13.54	3.01	0.10	-10.43	7.74	Pass

NOTE:

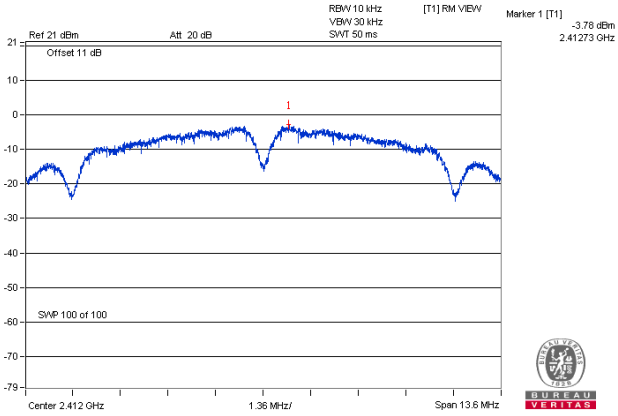
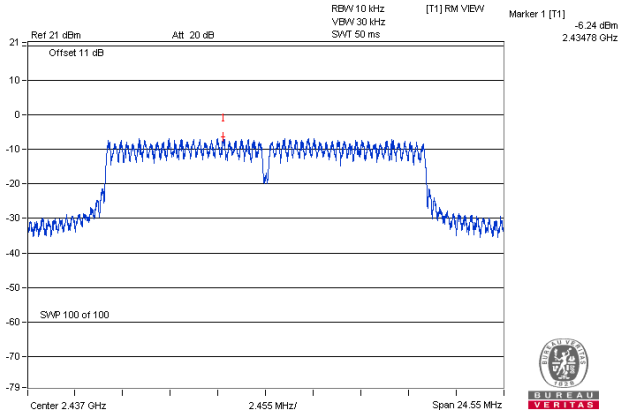
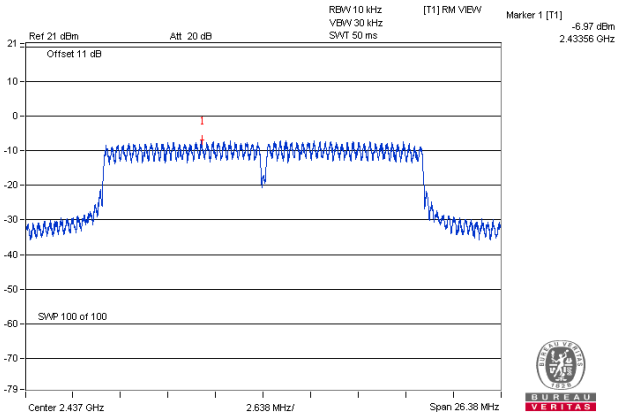
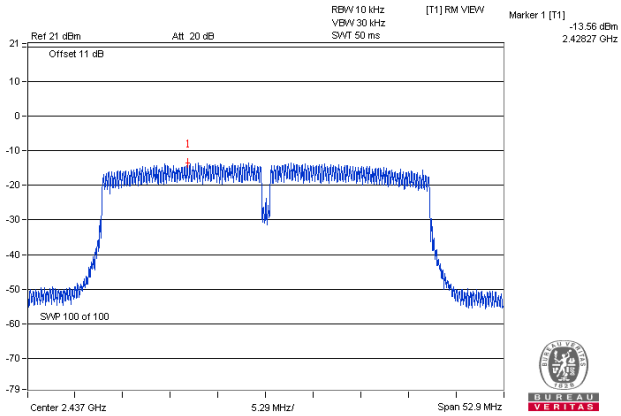
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.25dBi + 10log(2) = 6.26dBi > 6dBi, so the power density limit shall be reduced to 8-(6.26-6) = 7.74dBm.

802.11n (HT40)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Duty Factor	Total PSD with Duty Factor (dBm/10kHz)	Limit (dBm/10kHz)	Pass / Fail
0	3	2422	-18.11	3.01	0.18	-14.92	7.74	Pass
	6	2437	-13.56	3.01	0.18	-10.37	7.74	Pass
	9	2452	-15.55	3.01	0.18	-12.36	7.74	Pass
1	3	2422	-18.11	3.01	0.18	-14.92	7.74	Pass
	6	2437	-14.18	3.01	0.18	-10.99	7.74	Pass
	9	2452	-15.95	3.01	0.18	-12.76	7.74	Pass

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 3.25dBi + 10log(2) = 6.26dBi > 6dBi, so the power density limit shall be reduced to 8-(6.26-6) = 7.74dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

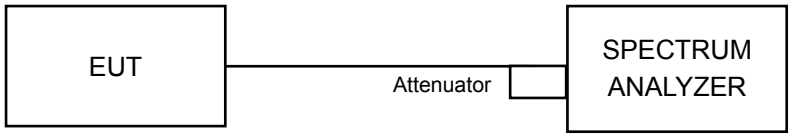
Spectrum Plot of Worst Value	
802.11b	**802.11g**
	
802.11n (HT20)	**802.11n (HT40)**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

a. Set the RBW = 100 kHz.
b. Set the VBW ≥ 300 kHz.
c. Detector = average.
d. Sweep time = auto couple.
e. Trace mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

a. Set RBW = 100 kHz.
b. Set VBW ≥ 300 kHz.
c. Ensure that the number of measurement points ≥ span/RBW
d. According to measurement points to set differ measurement span.
e. Detector = average.
f. Trace Mode = max hold.
g. Sweep = auto couple.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

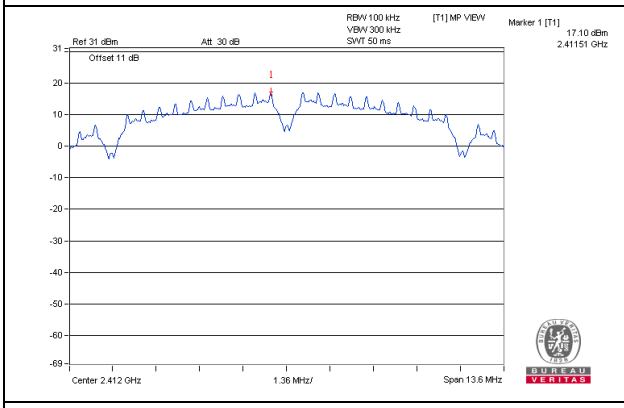
Same as Item 4.3.6

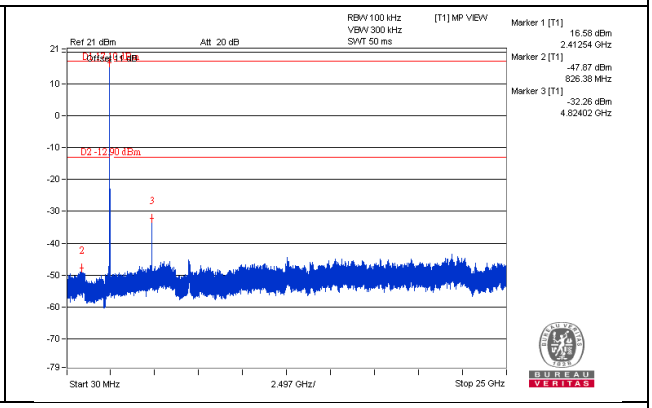
4.6.7 Test Results

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

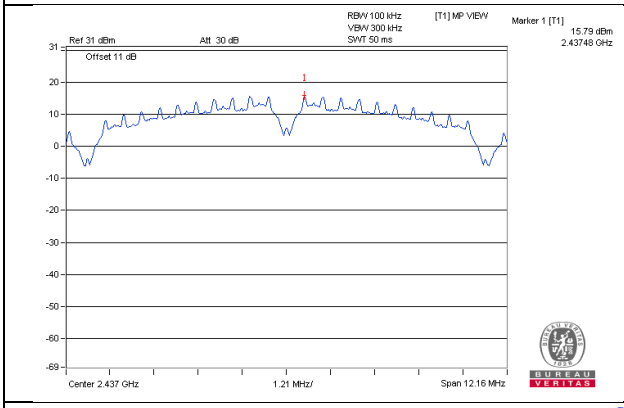
802.11b
CHAIN 0

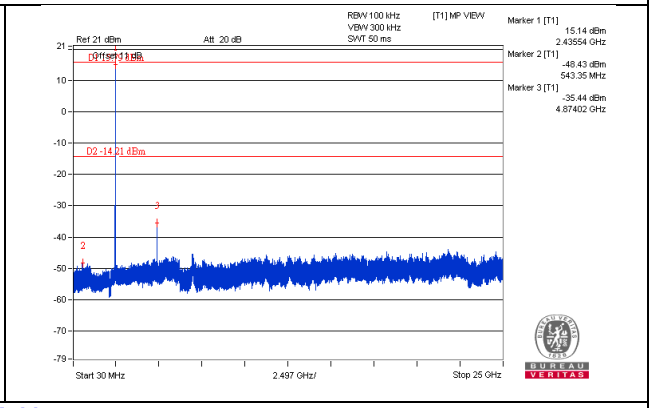
CH 1



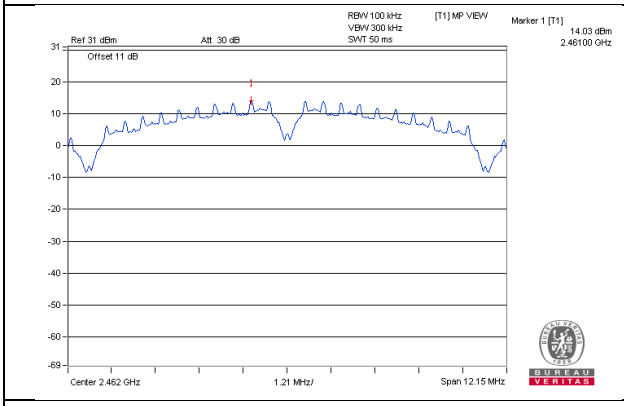


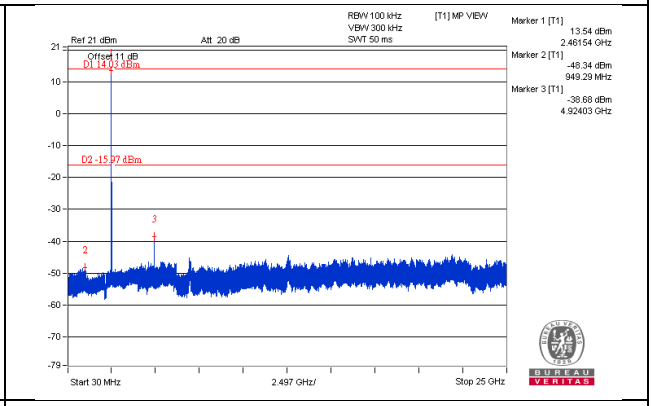
CH 6



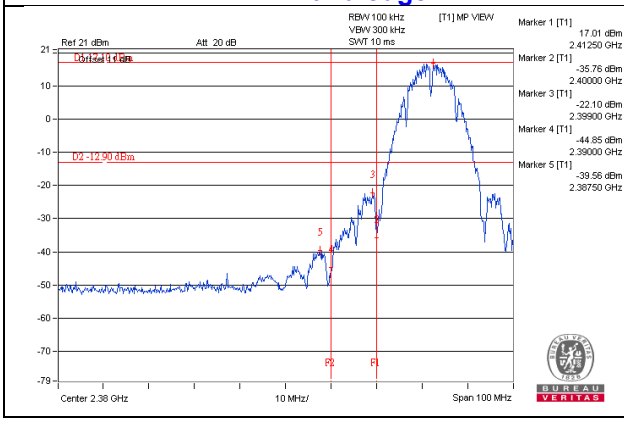


CH 11

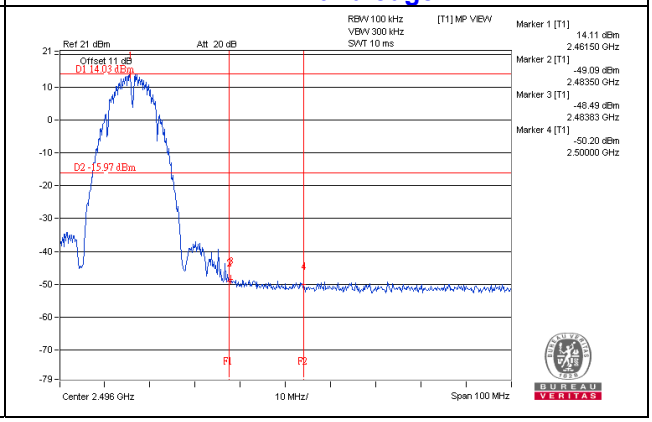




CH 1 Band edge

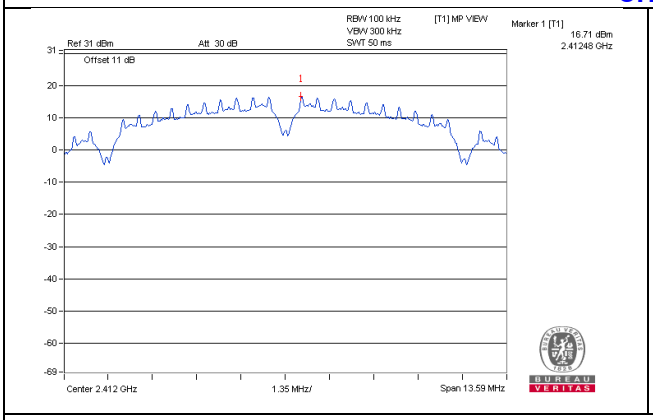


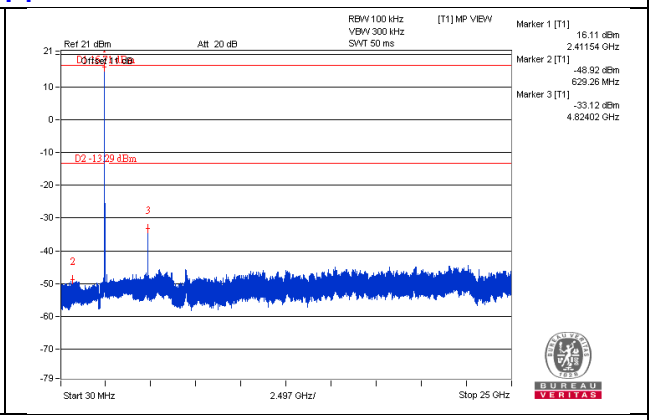
CH 11 Band edge



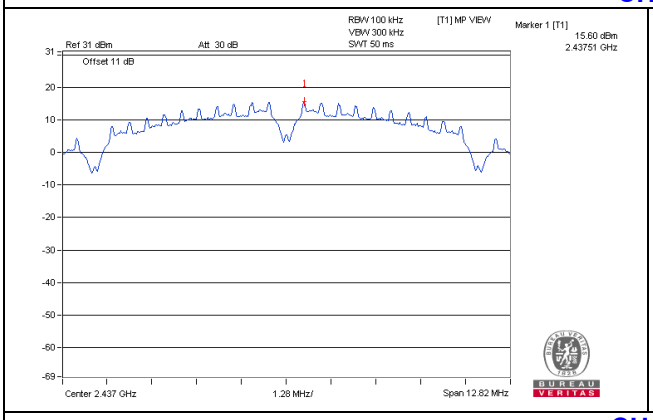
CHAIN 1

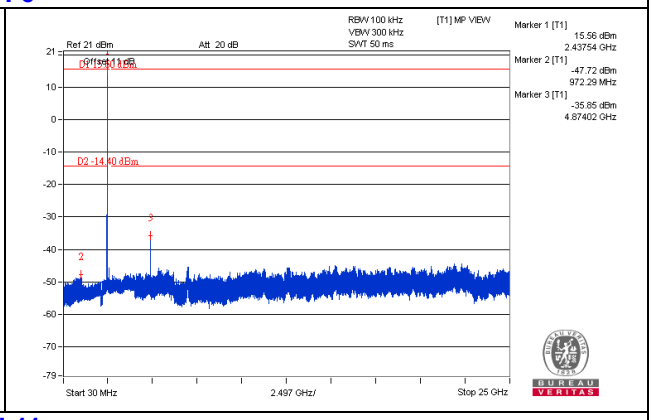
CH 1



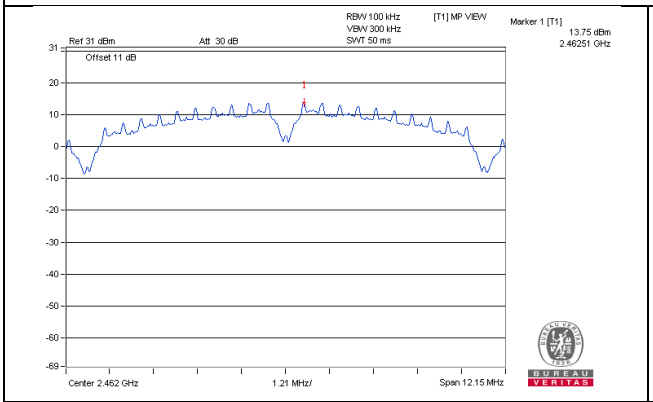


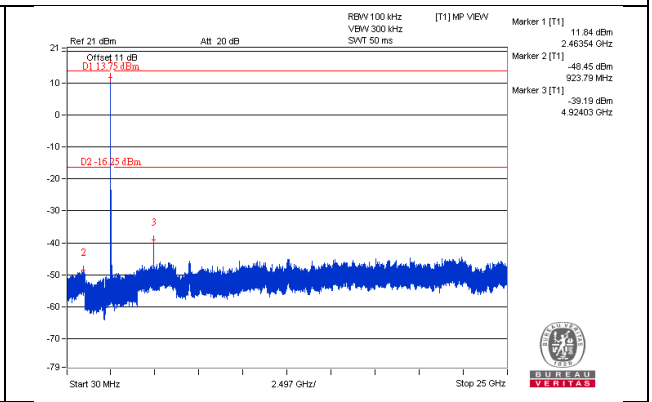
CH 6



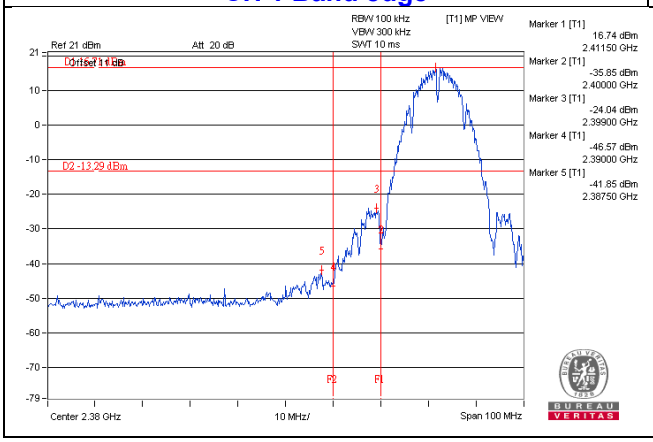


CH 11

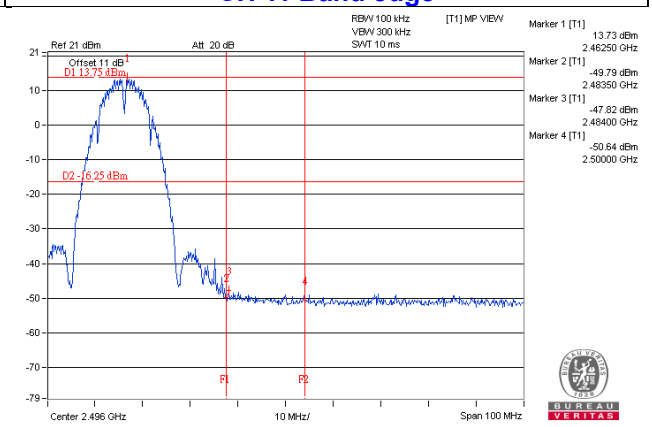




CH 1 Band edge

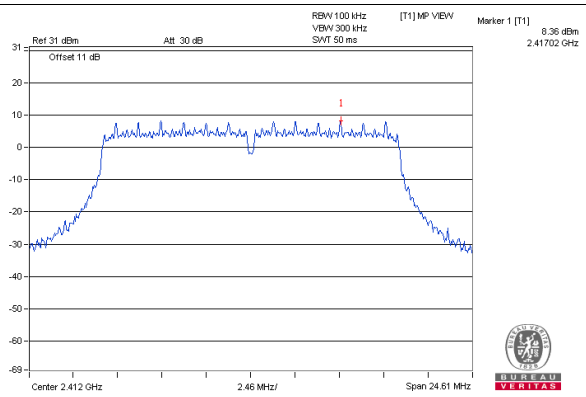


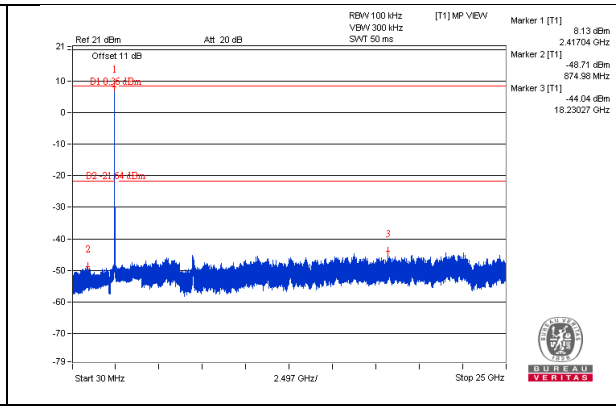
CH 11 Band edge



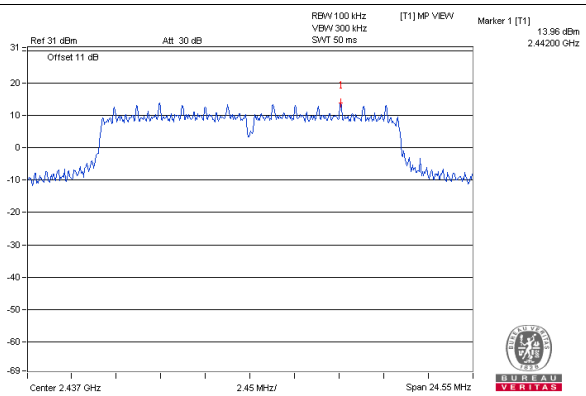
802.11g
CHAIN 0

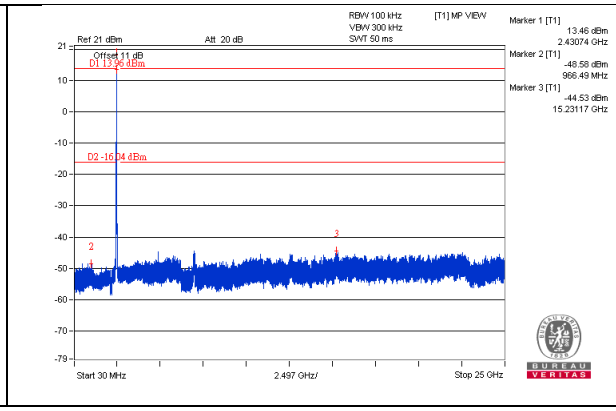
CH 1



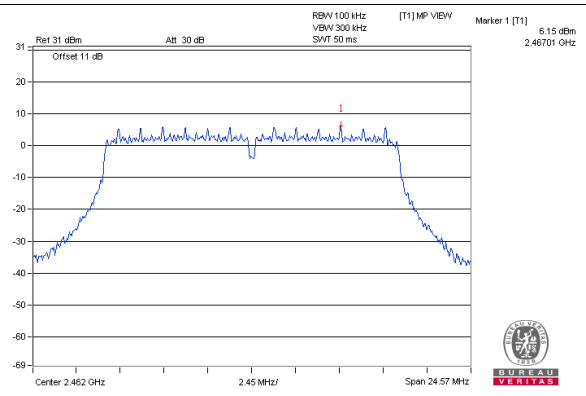


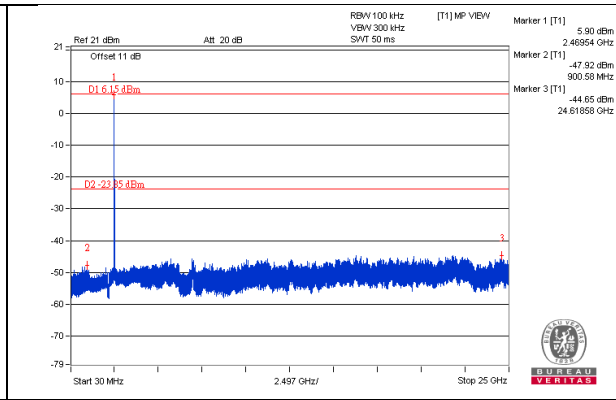
CH 6



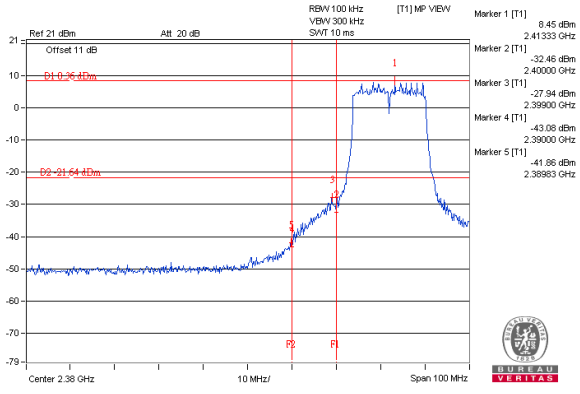


CH 11

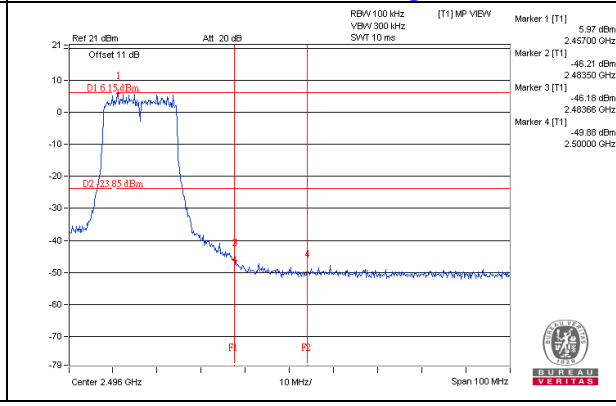




CH 1 Band edge

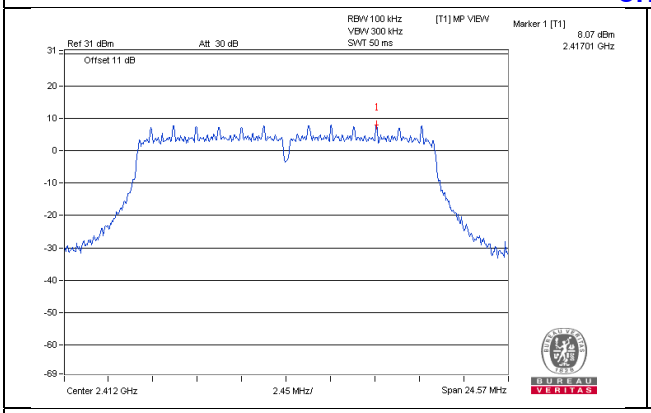


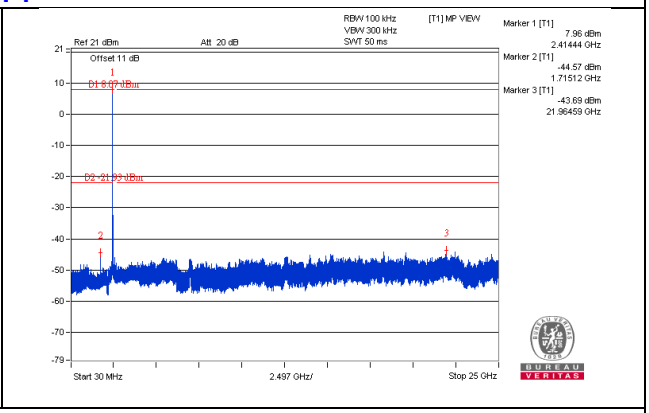
CH 11 Band edge



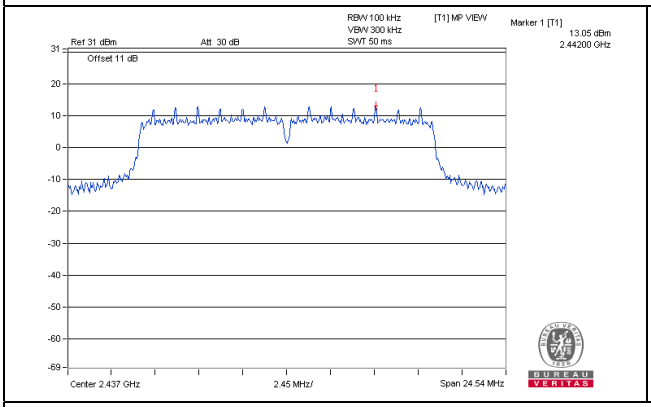
CHAIN 1

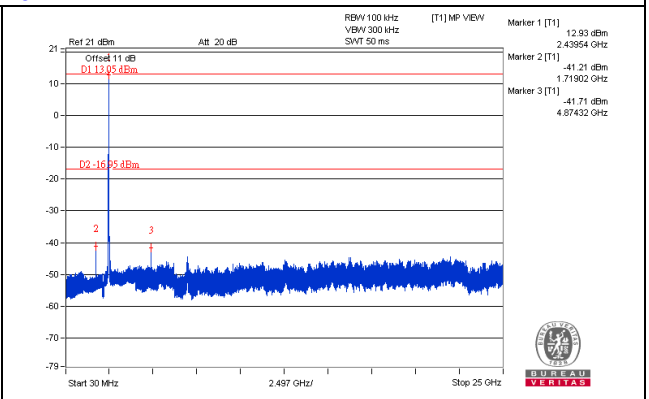
CH 1



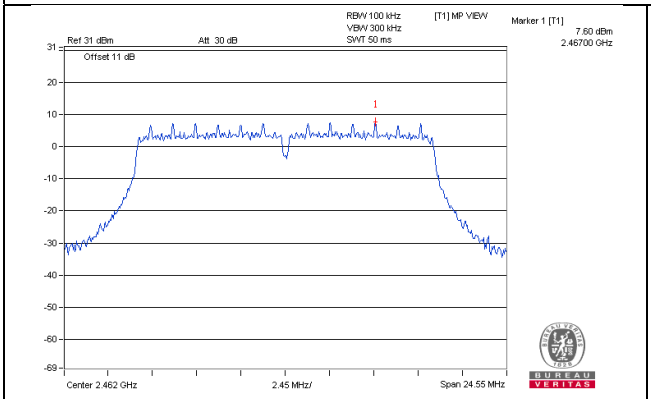


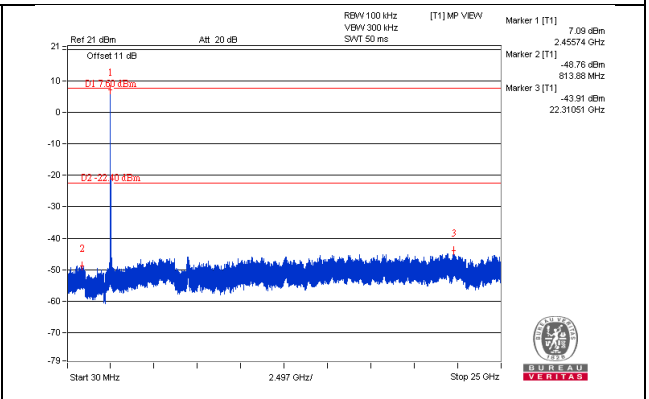
CH 6



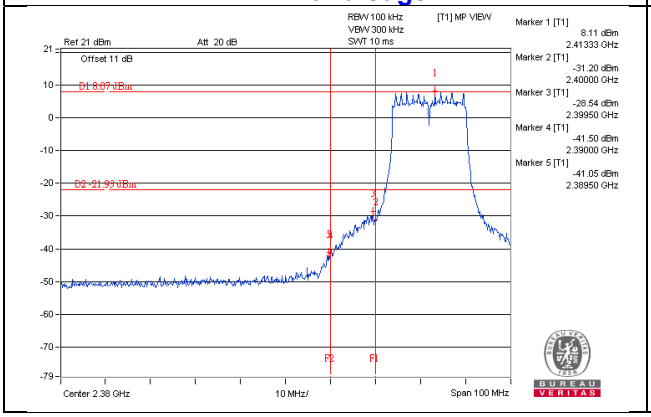


CH 11

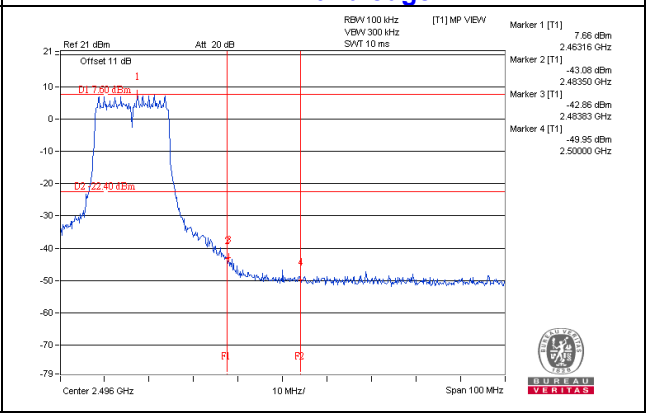




CH 1 Band edge

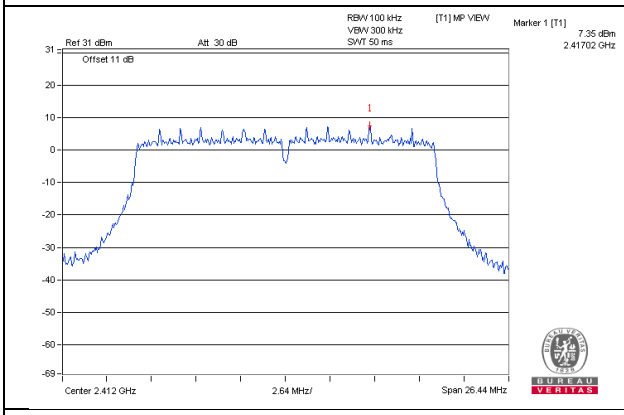


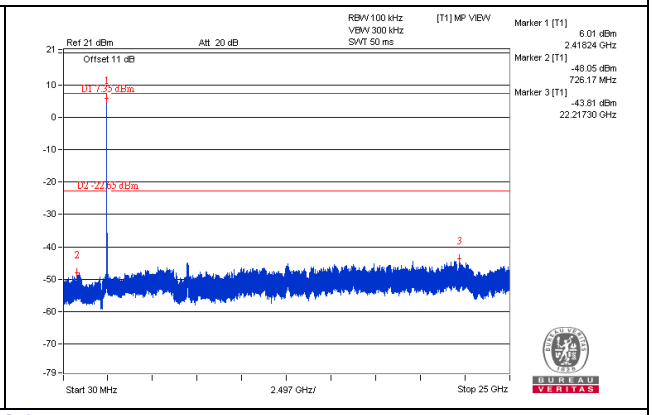
CH 11 Band edge



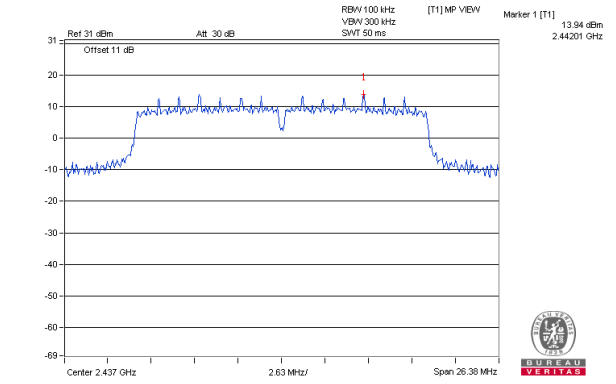
802.11n (HT20)
CHAIN 0

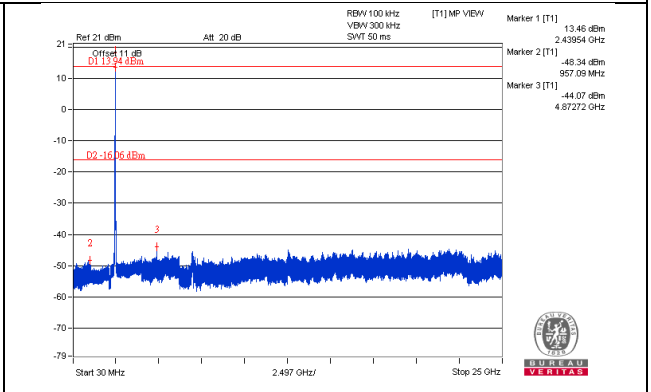
CH 1



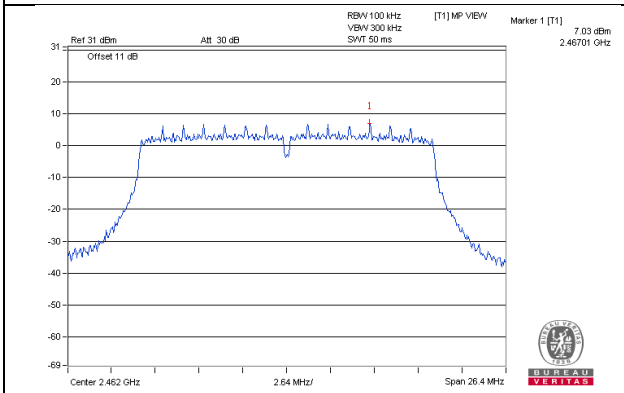


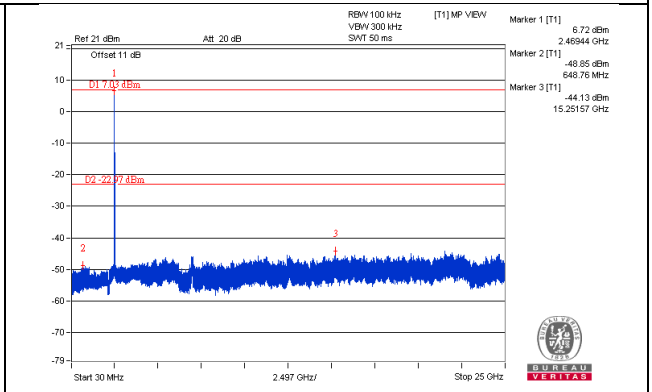
CH 6



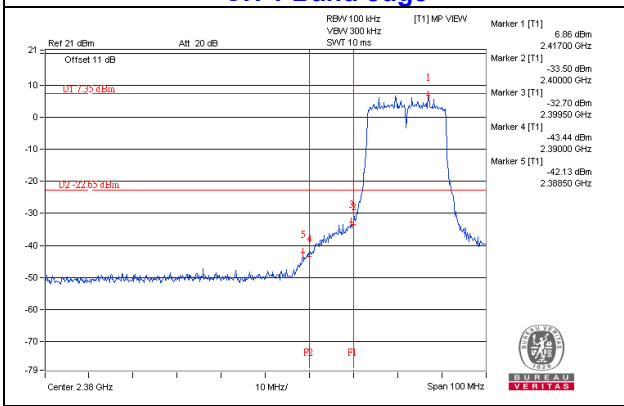


CH 11

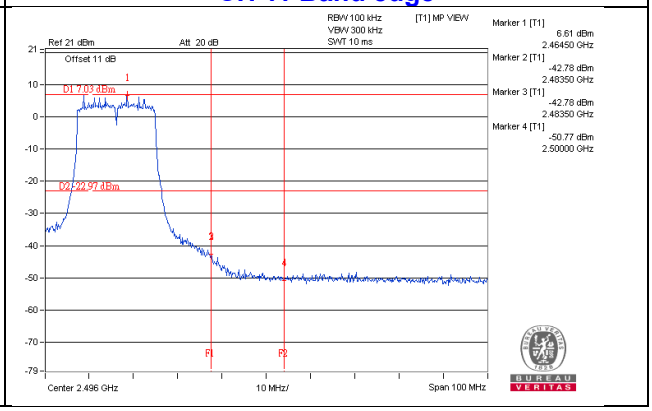




CH 1 Band edge

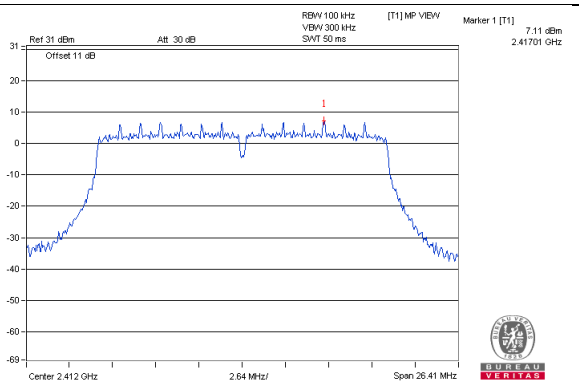


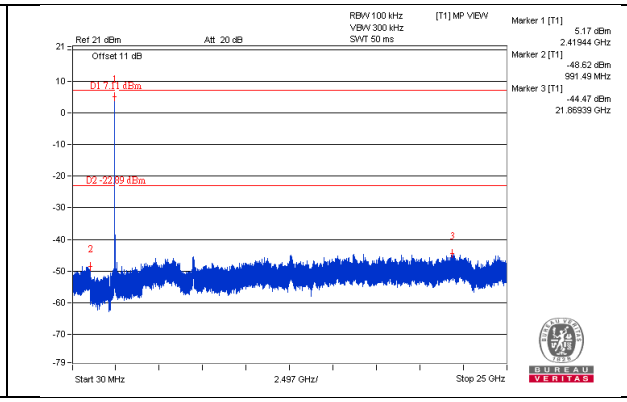
CH 11 Band edge



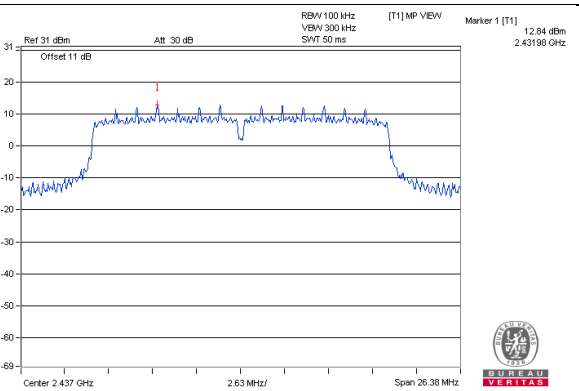
CHAIN 1

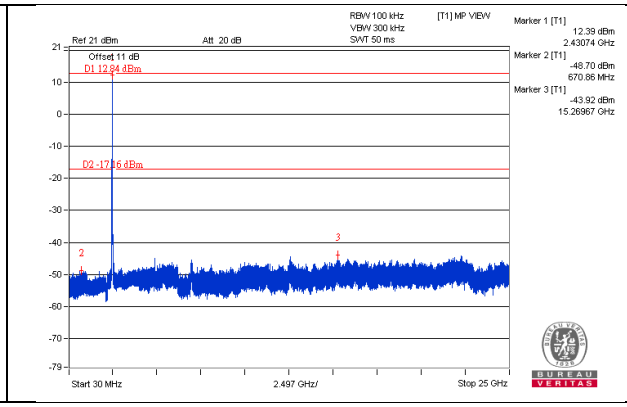
CH 1



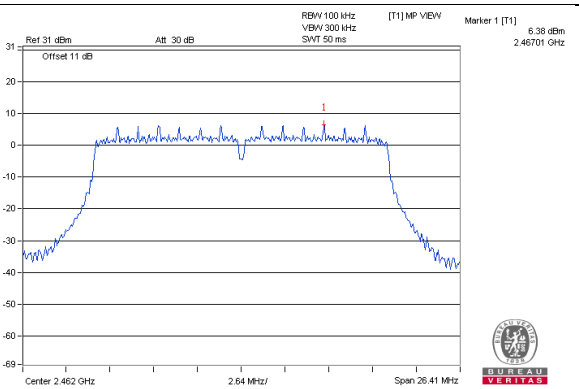


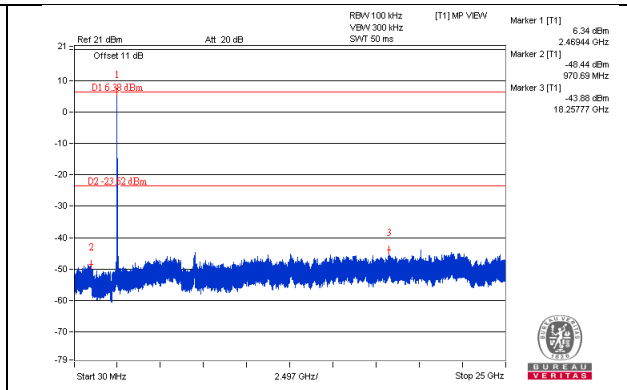
CH 6



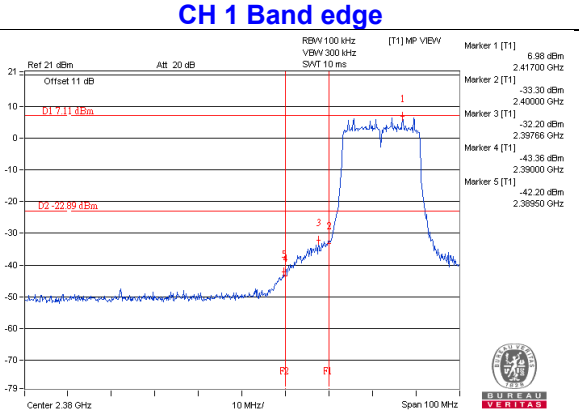


CH 11

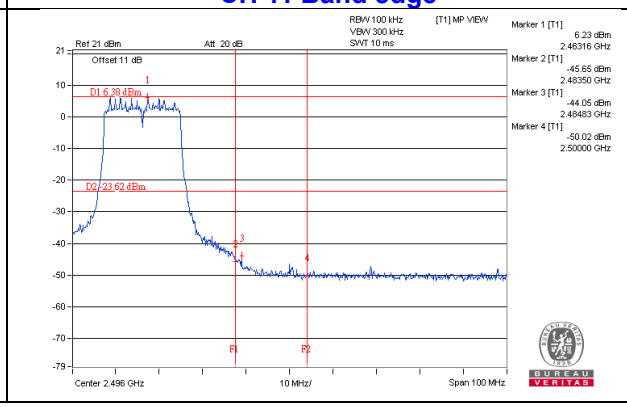




CH 1 Band edge

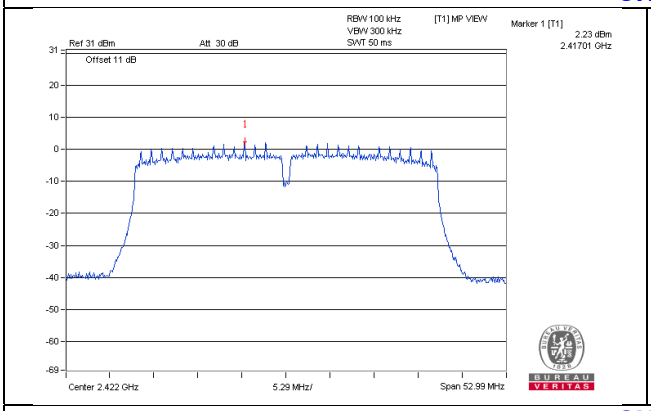


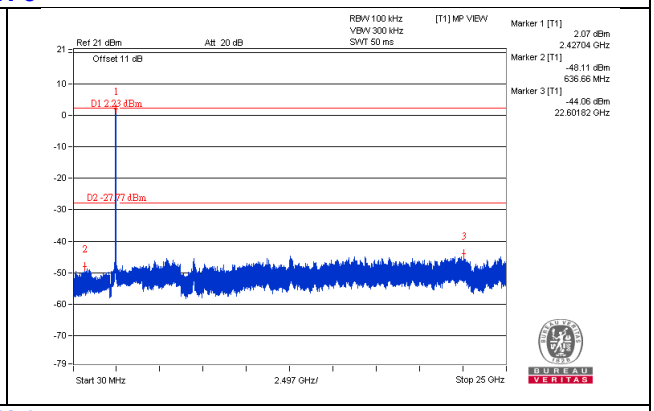
CH 11 Band edge



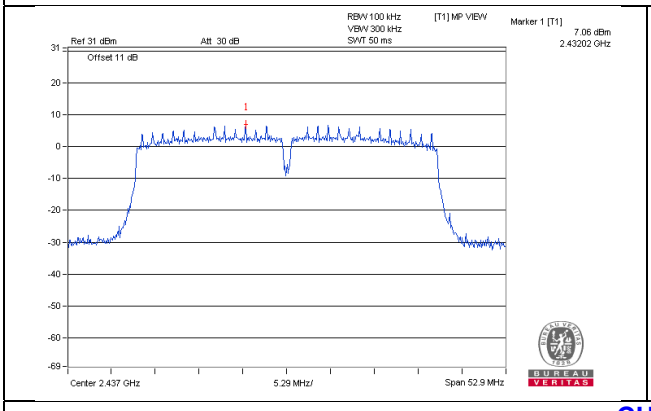
802.11n (HT40)
CHAIN 0

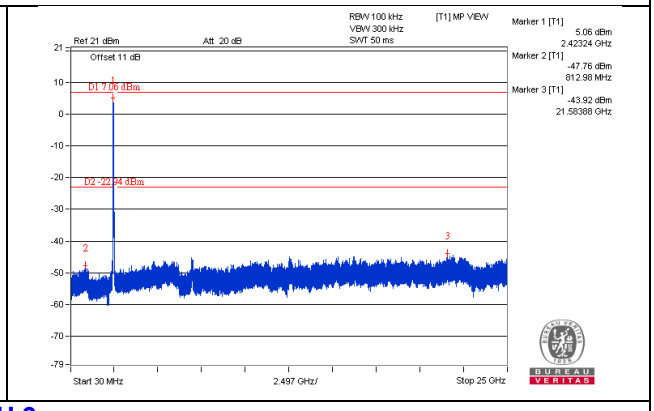
CH 3



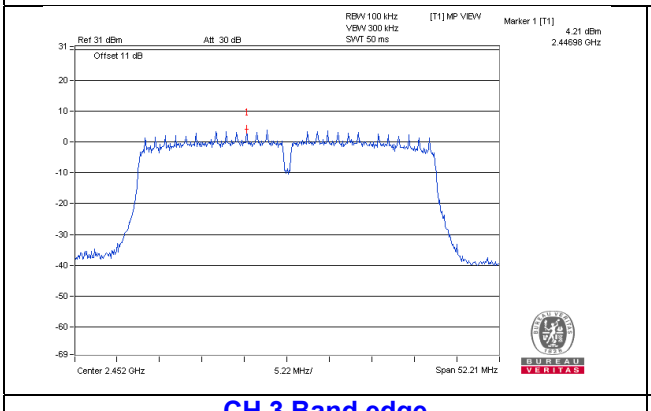


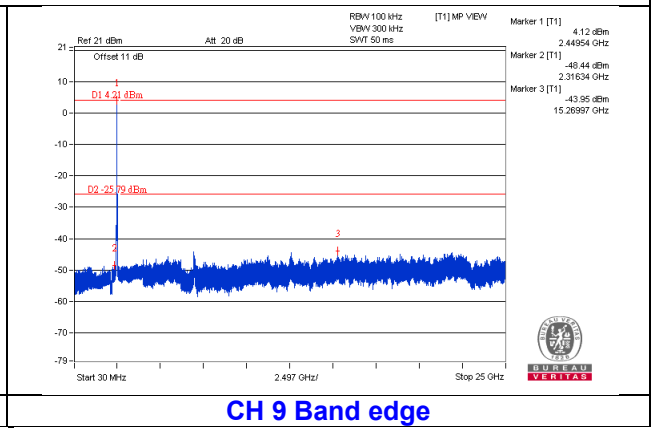
CH 6



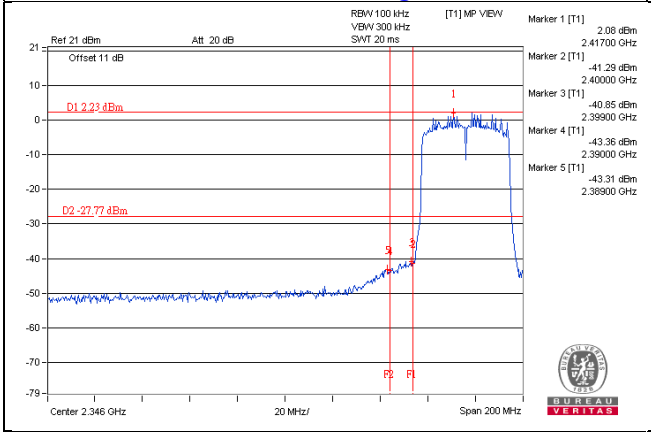


CH 9

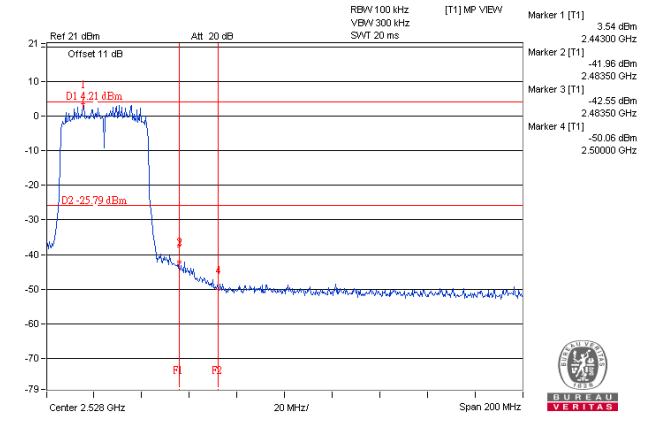




CH 3 Band edge

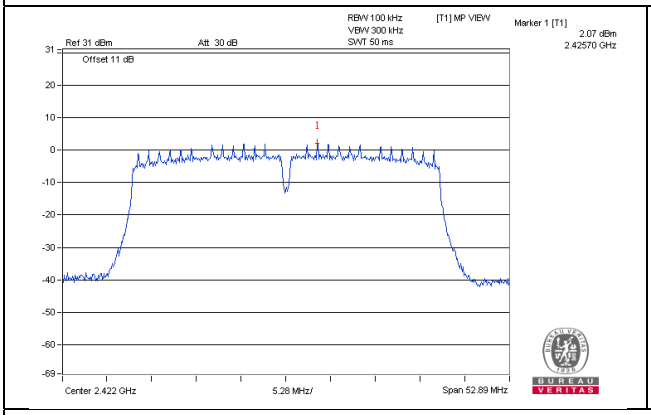


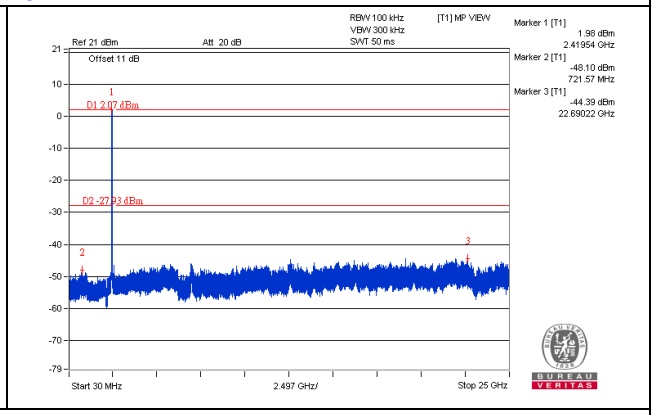
CH 9 Band edge



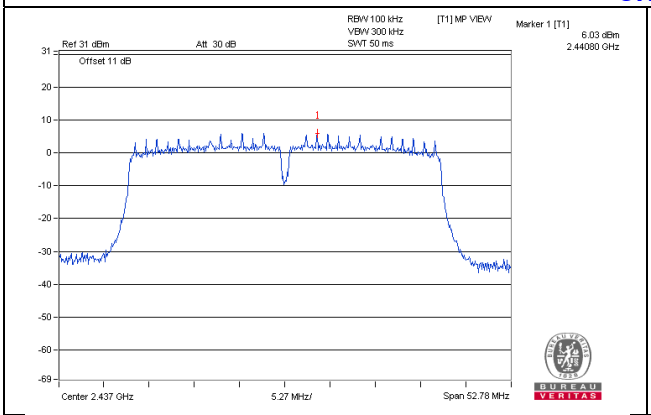
CHAIN 1

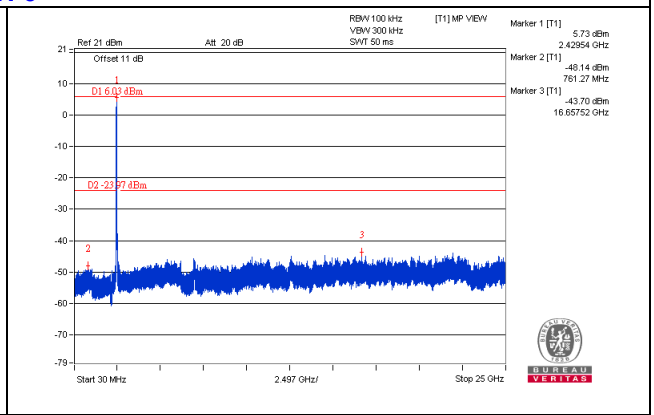
CH 3



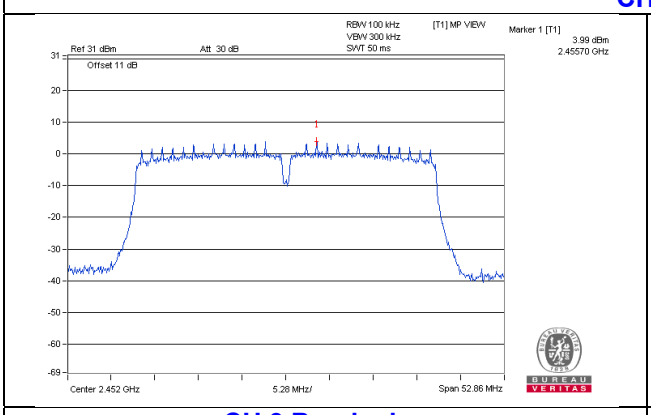


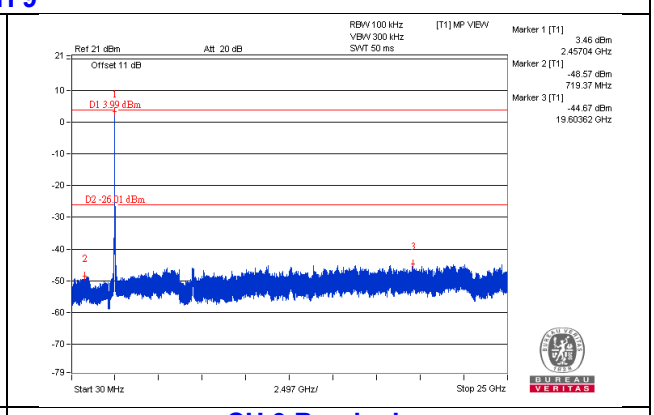
CH 6



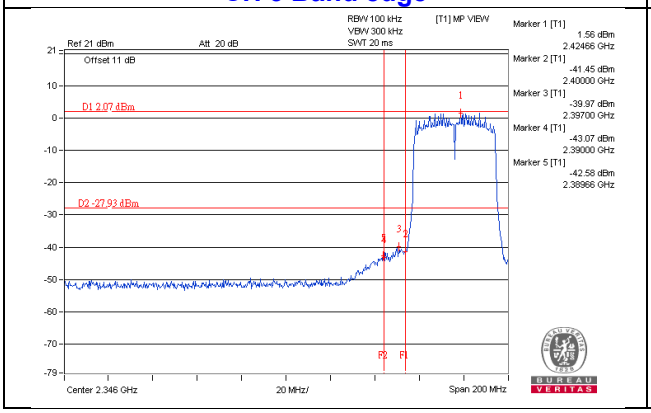


CH 9

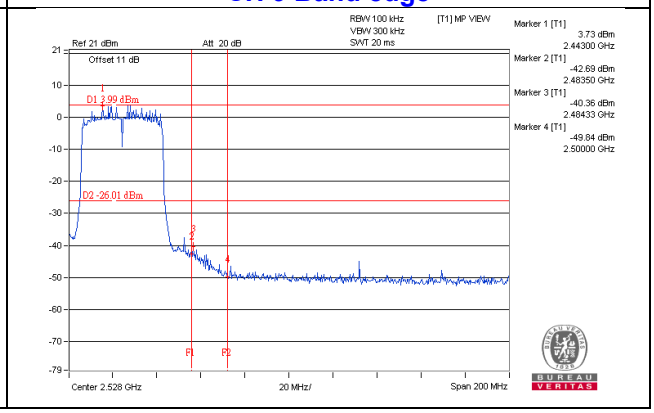




CH 3 Band edge



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 and approved according to ISO/IEC 17025.

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

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

--- END ---