FCC Test Report

Report No.:	RF170801C12
FCC ID:	KA2WL6620APSA1
Test Model:	DWL-6620APS
Received Date:	Aug. 01, 2017
Test Date:	Aug. 22 ~ Sep. 11, 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.)
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF170801C12	Original release.	Sep. 12, 2017

1 Certificate of Conformity

Product:	Unified AC Concurrent Dual-band PoE Access Point
Brand:	D-Link Corporation
Test Model:	DWL-6620APS
Sample Status:	Identical Prototype
Applicant:	D-Link Corporation
Test Date:	Aug. 22 ~ Sep. 11, 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 : Celine Chou , **Date:** Sep. 12, 2017

Celine Chou / Specialist

Approved by : Ken Liu , **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 -3.33dB at 0.35703MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.6dB at 4924.00MHz and 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 Concurrent Dual-band PoE Access Point
Brand	D-Link Corporation
Test Model	DWL-6620APS
Sample Status	Identical Prototype
Power Supply Rating	12Vdc from adapter 53Vdc 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	2412 ~ 2462MHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7
Output Power	CDD Mode: 589.448mW Beamforming Mode: 283.832mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Cable Supplied	NA

Note:

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

Modulation Mode	Beamforming Mode	TX Function
802.11b	Not Support	2TX
802.11g	Not Support	2TX
802.11n (HT20)	Support	2TX
802.11n (HT40)	Support	2TX

* For 802.11n, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.

2. The EUT uses following antennas.

Type	Connector	Gain (dBi)	
		2.4GHz	5GHz
Smart Antenna	I-pex	4.90	6.10

3. The EUT consumes power from the following adapters and POE. (POE for support unit only)

Adapter 1	
Brand	D-Link
Model	AMS115-1202000FU
Input Power	100-240Vac, 50-60Hz, 0.8A
Output Power	12Vdc, 2A
Power Line	1.2m power cable without core attached on adapter

Adapter 2	
Brand	D-Link
Model	WA-24Q12R
Input Power	100-240Vac, 50-60Hz, 0.7A
Output Power	12Vdc, 2A
Power Line	1.2m power cable without core attached on adapter

POE	
Brand	D-Link
Model	PGS-1210-10P
Input Power	100-240Vac
Output Power	53Vdc

4. 2.4GHz & 5GHz technology can transmit at same time.

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 **X-plane**.
2. "-" means no effect.

Radiated Emission Test (Above 1GHz):

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

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

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	1	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	1	DSSS	DBPSK	1.0

6dB Bandwidth, Power Spectral Density and Conducted Out of Band Emission 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

Conducted Output Power 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)
CDD Mode						
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
Beamforming Mode						
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:

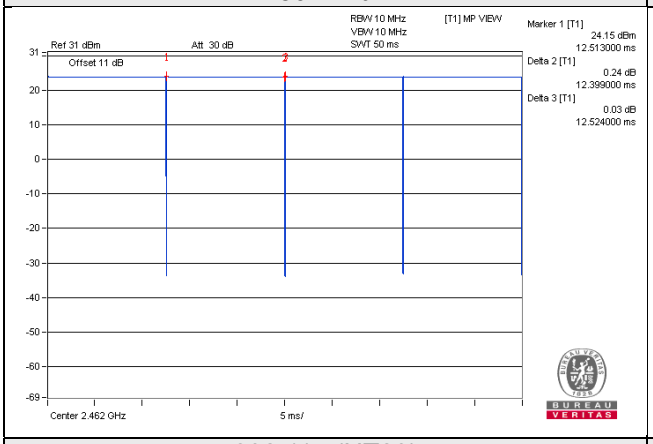
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 66% RH	120Vac, 60Hz	James Yang
RE<1G	25 deg. C, 65% RH	120Vac, 60Hz 53Vdc	James Yang
PLC	23 deg. C, 64% RH	120Vac, 60Hz 53Vdc	Willy Cheng
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Leo Tsai Frank Liu

3.3 Duty Cycle of Test Signal

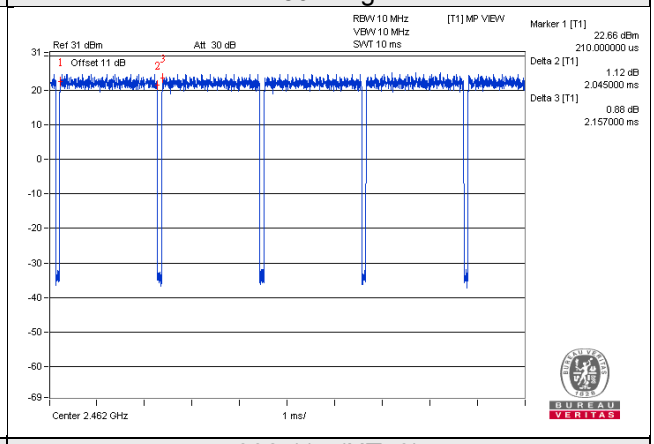
802.11b, 802.11n (HT20): Duty cycle of test signal is > 98%, duty factor is not required.
802.11g, 802.11n (HT40): Duty cycle of test signal is < 98%, duty factor is required.

802.11g: Duty cycle = 12.399/12.524 = 0.990
802.11g: Duty cycle = 2.045/2.157 = 0.948, Duty factor = 10 * log(1/0.948) = 0.23
802.11n (HT20): Duty cycle = 4.997/5.090 = 0.982
802.11n (HT40): Duty cycle = 2.417/2.512 = 0.962, Duty factor = 10 * log(1/0.962) = 0.17

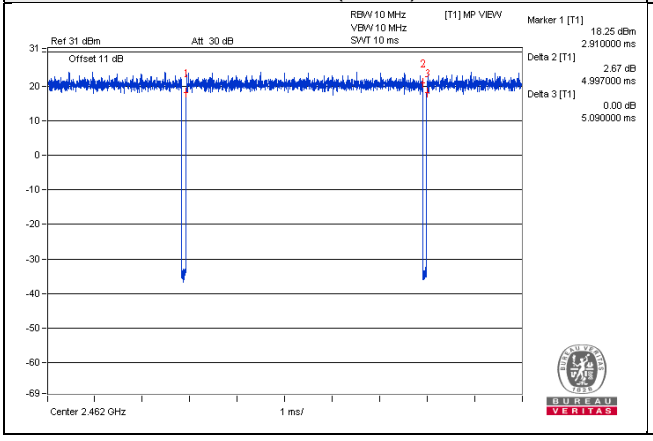
802.11b



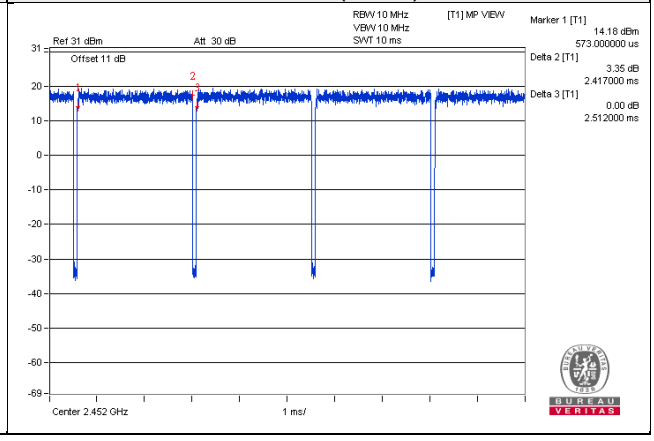
802.11g



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	DELL	E5410	6RP2YM1	FCC DoC Approved	-
B.	Load	NA	NA	NA	NA	-
C.	POE	D-Link	PGS-1210-10P	NA	NA	Provided by manufacturer

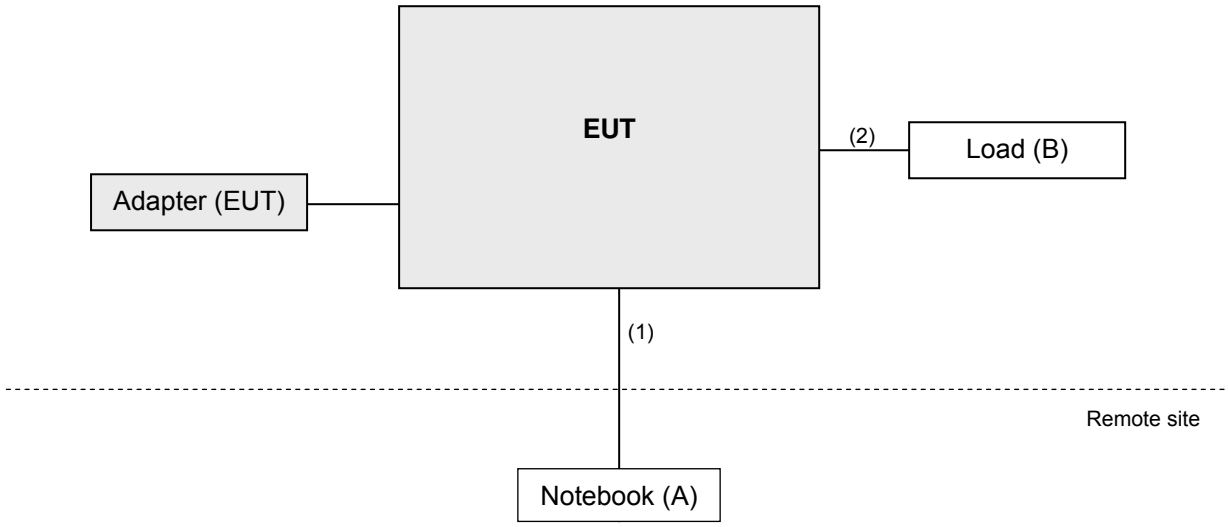
Note:

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.

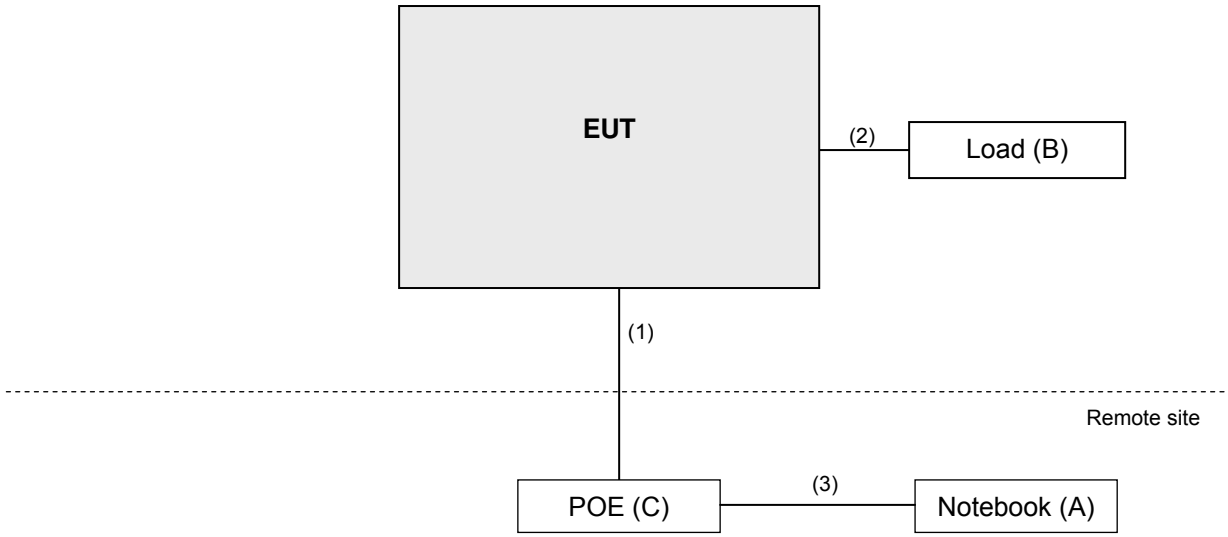
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45, Cat5e	1	3	N	0	-
2.	RJ45, Cat5e	2	1.8	N	0	-
3.	RJ45, Cat5e	1	1.8	N	0	-

3.4.1 Configuration of System under Test

Adapter Mode



POE Mode



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 EMCI	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier Agilent	8449B	3008A01638	Feb. 22, 2017	Feb. 21, 2018
Preamplifier Agilent	8447D	2944A10638	Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02 (248780+MY13377)	Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	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	0824012	Aug. 18, 2017	Aug. 17, 2018
Power Sensor	MA2411B	0738171	Aug. 18, 2017	Aug. 17, 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:

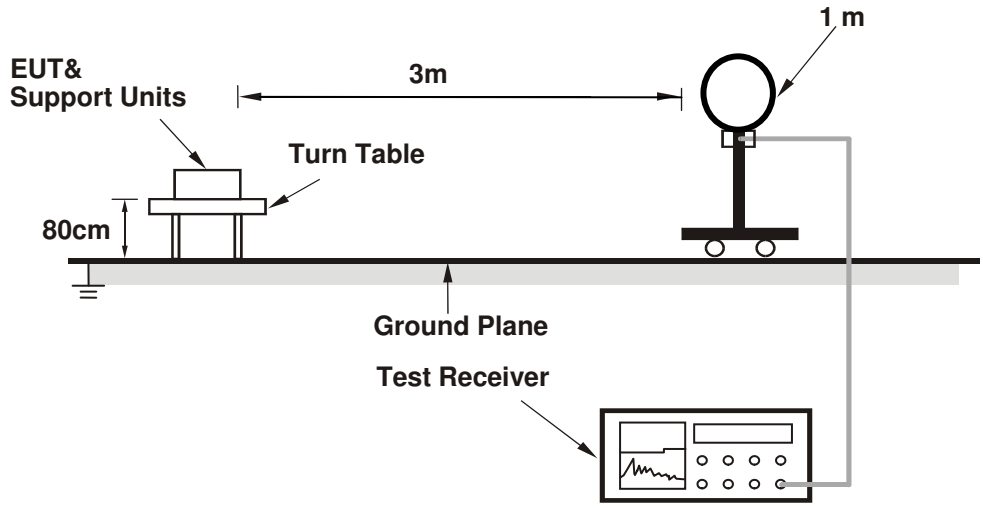
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

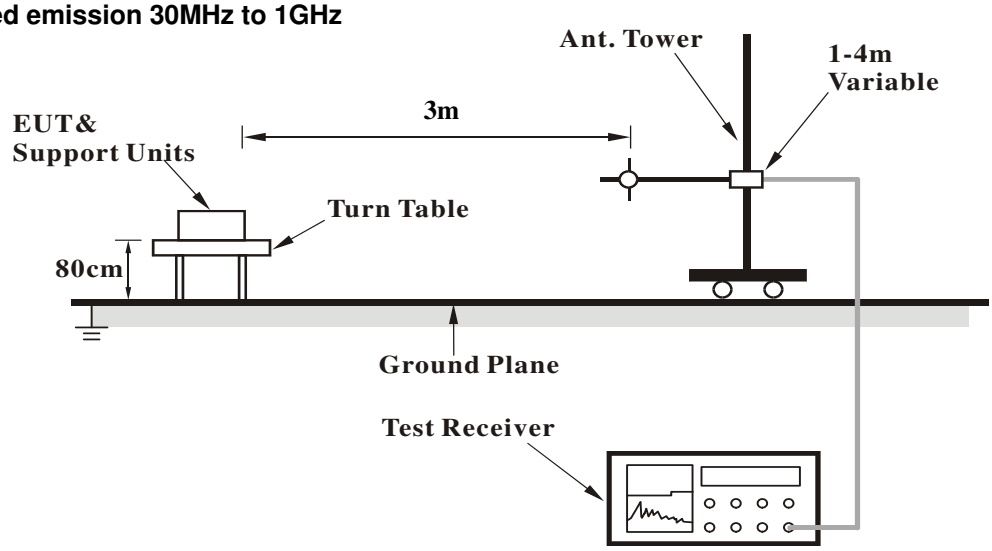
No deviation.

4.1.5 Test Setup

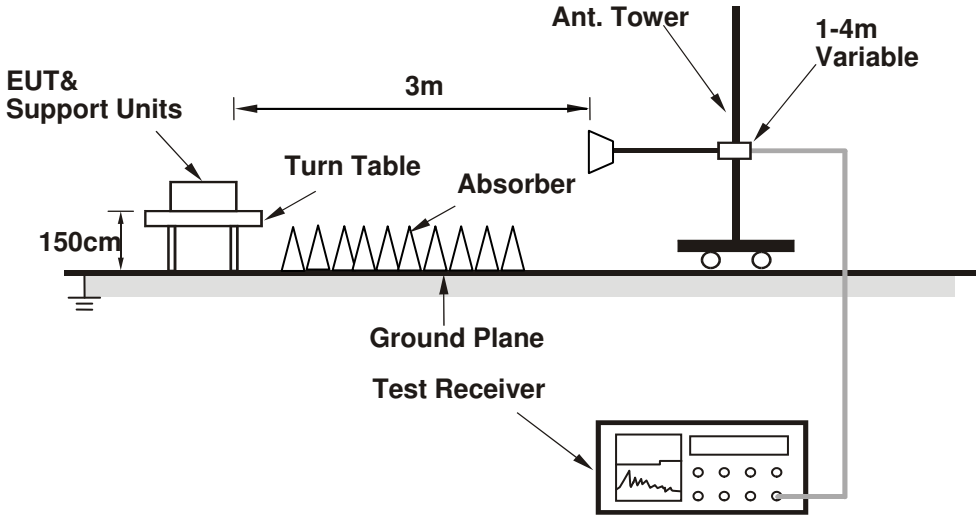
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Placed the EUT on the testing table.
b. 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 (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

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	58.1 PK	74.0	-15.9	3.51 H	188	24.7	33.4
2	2390.00	46.4 AV	54.0	-7.6	3.51 H	188	13.0	33.4
3	*2412.00	112.9 PK			3.56 H	190	79.4	33.5
4	*2412.00	109.5 AV			3.56 H	190	76.0	33.5
5	4824.00	53.9 PK	74.0	-20.1	2.50 H	98	50.2	3.7
6	4824.00	50.0 AV	54.0	-4.0	2.50 H	98	46.3	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	60.4 PK	74.0	-13.6	3.30 V	348	27.0	33.4
2	2390.00	48.8 AV	54.0	-5.2	3.30 V	348	15.4	33.4
3	*2412.00	118.5 PK			3.34 V	350	85.0	33.5
4	*2412.00	116.2 AV			3.34 V	350	82.7	33.5
5	4824.00	56.6 PK	74.0	-17.4	1.07 V	163	52.9	3.7
6	4824.00	53.1 AV	54.0	-0.9	1.07 V	163	49.4	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	*2437.00	110.0 PK			3.13 H	193	76.4	33.6
2	*2437.00	107.2 AV			3.13 H	193	73.6	33.6
3	4874.00	57.2 PK	74.0	-16.8	3.15 H	247	53.3	3.9
4	4874.00	53.2 AV	54.0	-0.8	3.15 H	247	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	*2437.00	116.5 PK			2.91 V	337	82.9	33.6
2	*2437.00	113.8 AV			2.91 V	337	80.2	33.6
3	4874.00	55.1 PK	74.0	-18.9	1.90 V	320	51.2	3.9
4	4874.00	52.8 AV	54.0	-1.2	1.90 V	320	48.9	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	109.0 PK			3.60 H	235	75.2	33.8
2	*2462.00	106.8 AV			3.60 H	235	73.0	33.8
3	2483.50	57.9 PK	74.0	-16.1	3.52 H	233	24.0	33.9
4	2483.50	46.7 AV	54.0	-7.3	3.52 H	233	12.8	33.9
5	4924.00	55.3 PK	74.0	-18.7	3.68 H	288	51.3	4.0
6	4924.00	52.2 AV	54.0	-1.8	3.68 H	288	48.2	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	119.3 PK			2.63 V	13	85.5	33.8
2	*2462.00	116.0 AV			2.63 V	13	82.2	33.8
3	2483.50	59.2 PK	74.0	-14.8	2.75 V	21	25.3	33.9
4	2483.50	47.6 AV	54.0	-6.4	2.75 V	21	13.7	33.9
5	4924.00	56.3 PK	74.0	-17.7	3.11 V	304	52.3	4.0
6	**4924.00**	**53.4 AV**	**54.0**	**-0.6**	**3.11 V**	**304**	**49.4**	**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.

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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	64.4 PK	74.0	-9.6	3.63 H	196	31.0	33.4
2	2390.00	50.0 AV	54.0	-4.0	3.63 H	196	16.6	33.4
3	*2412.00	109.1 PK			3.55 H	194	75.6	33.5
4	*2412.00	98.8 AV			3.55 H	194	65.3	33.5
5	3652.00	50.3 PK	74.0	-23.7	1.32 H	191	49.8	0.5
6	3652.00	45.1 AV	54.0	-8.9	1.32 H	191	44.6	0.5
7	4824.00	50.0 PK	74.0	-24.0	1.30 H	102	46.3	3.7
8	4824.00	43.5 AV	54.0	-10.5	1.30 H	102	39.8	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	70.0 PK	74.0	-4.0	3.70 V	157	36.6	33.4
2	2390.00	53.2 AV	54.0	-0.8	3.70 V	157	19.8	33.4
3	*2412.00	116.3 PK			3.68 V	4	82.8	33.5
4	*2412.00	106.0 AV			3.68 V	4	72.5	33.5
5	3652.00	51.5 PK	74.0	-22.5	2.60 V	92	51.0	0.5
6	3652.00	47.0 AV	54.0	-7.0	2.60 V	92	46.5	0.5
7	4824.00	54.7 PK	74.0	-19.3	1.00 V	271	51.0	3.7
8	4824.00	50.7 AV	54.0	-3.3	1.00 V	271	47.0	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	*2437.00	112.2 PK			3.08 H	293	78.6	33.6
2	*2437.00	101.7 AV			3.08 H	293	68.1	33.6
3	4874.00	52.7 PK	74.0	-21.3	1.18 H	298	48.8	3.9
4	4874.00	44.3 AV	54.0	-9.7	1.18 H	298	40.4	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	*2437.00	121.4 PK			3.59 V	5	87.8	33.6
2	*2437.00	110.7 AV			3.59 V	5	77.1	33.6
3	4874.00	56.7 PK	74.0	-17.3	1.05 V	269	52.8	3.9
4	4874.00	50.4 AV	54.0	-3.6	1.05 V	269	46.5	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 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	107.8 PK			3.11 H	189	74.0	33.8
2	*2462.00	97.6 AV			3.11 H	189	63.8	33.8
3	2483.50	61.4 PK	74.0	-12.6	3.08 H	187	27.5	33.9
4	2483.50	47.9 AV	54.0	-6.1	3.08 H	187	14.0	33.9
5	4924.00	51.3 PK	74.0	-22.7	1.21 H	296	47.3	4.0
6	4924.00	45.0 AV	54.0	-9.0	1.21 H	296	41.0	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	116.9 PK			3.54 V	6	83.1	33.8
2	*2462.00	106.2 AV			3.54 V	6	72.4	33.8
3	2483.50	67.2 PK	74.0	-6.8	3.78 V	347	33.3	33.9
4	2483.50	53.1 AV	54.0	-0.9	3.78 V	347	19.2	33.9
5	4924.00	53.1 PK	74.0	-20.9	1.18 V	268	49.1	4.0
6	4924.00	48.5 AV	54.0	-5.5	1.18 V	268	44.5	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.

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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	58.6 PK	74.0	-15.4	3.33 H	301	25.2	33.4
2	2390.00	46.7 AV	54.0	-7.3	3.33 H	301	13.3	33.4
3	*2412.00	106.9 PK			3.45 H	303	73.4	33.5
4	*2412.00	96.2 AV			3.45 H	303	62.7	33.5
5	4824.00	50.0 PK	74.0	-24.0	3.46 H	114	46.3	3.7
6	4824.00	41.6 AV	54.0	-12.4	3.46 H	114	37.9	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	69.3 PK	74.0	-4.7	3.34 V	171	35.9	33.4
2	**2390.00**	**53.4 AV**	**54.0**	**-0.6**	**3.34 V**	**171**	**20.0**	**33.4**
3	*2412.00	114.9 PK			3.33 V	14	81.4	33.5
4	*2412.00	104.2 AV			3.33 V	14	70.7	33.5
5	4824.00	51.6 PK	74.0	-22.4	3.36 V	231	47.9	3.7
6	4824.00	46.6 AV	54.0	-7.4	3.36 V	231	42.9	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) 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	113.1 PK			3.39 H	299	79.5	33.6
2	*2437.00	102.3 AV			3.39 H	299	68.7	33.6
3	4874.00	59.1 PK	74.0	-14.9	3.39 H	198	55.2	3.9
4	4874.00	44.4 AV	54.0	-9.6	3.39 H	198	40.5	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	*2437.00	122.6 PK			3.29 V	15	89.0	33.6
2	*2437.00	111.2 AV			3.29 V	15	77.6	33.6
3	4874.00	56.3 PK	74.0	-17.7	1.04 V	273	52.4	3.9
4	4874.00	50.4 AV	54.0	-3.6	1.04 V	273	46.5	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 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	105.7 PK			3.33 H	110	71.9	33.8
2	*2462.00	95.8 AV			3.33 H	110	62.0	33.8
3	2483.50	59.1 PK	74.0	-14.9	3.21 H	130	25.2	33.9
4	2483.50	47.6 AV	54.0	-6.4	3.21 H	130	13.7	33.9
5	4924.00	50.6 PK	74.0	-23.4	3.36 H	348	46.6	4.0
6	4924.00	44.4 AV	54.0	-9.6	3.36 H	348	40.4	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	115.8 PK			3.19 V	5	82.0	33.8
2	*2462.00	104.9 AV			3.19 V	5	71.1	33.8
3	2483.50	66.9 PK	74.0	-7.1	3.22 V	17	33.0	33.9
4	2483.50	53.3 AV	54.0	-0.7	3.22 V	17	19.4	33.9
5	4924.00	52.2 PK	74.0	-21.8	3.16 V	317	48.2	4.0
6	4924.00	47.3 AV	54.0	-6.7	3.16 V	317	43.3	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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.6 PK	74.0	-15.4	2.91 H	120	25.2	33.4
2	2390.00	46.6 AV	54.0	-7.4	2.91 H	120	13.2	33.4
3	*2422.00	101.6 PK			3.09 H	109	68.0	33.6
4	*2422.00	92.1 AV			3.09 H	109	58.5	33.6
5	4844.00	52.4 PK	74.0	-21.6	3.14 H	253	48.6	3.8
6	4844.00	46.0 AV	54.0	-8.0	3.14 H	253	42.2	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	68.2 PK	74.0	-5.8	3.43 V	0	34.8	33.4
2	2390.00	53.2 AV	54.0	-0.8	3.43 V	0	19.8	33.4
3	*2422.00	109.6 PK			3.27 V	13	76.0	33.6
4	*2422.00	100.1 AV			3.27 V	13	66.5	33.6
5	4844.00	54.8 PK	74.0	-19.2	3.16 V	92	51.0	3.8
6	4844.00	49.0 AV	54.0	-5.0	3.16 V	92	45.2	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	62.1 PK	74.0	-11.9	3.51 H	200	28.7	33.4
2	2390.00	48.3 AV	54.0	-5.7	3.51 H	200	14.9	33.4
3	*2437.00	106.3 PK			3.52 H	211	72.7	33.6
4	*2437.00	96.3 AV			3.52 H	211	62.7	33.6
5	2483.50	59.1 PK	74.0	-14.9	3.58 H	217	25.2	33.9
6	2483.50	47.3 AV	54.0	-6.7	3.58 H	217	13.4	33.9
7	4874.00	51.5 PK	74.0	-22.5	3.58 H	254	47.6	3.9
8	4874.00	44.5 AV	54.0	-9.5	3.58 H	254	40.6	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	68.3 PK	74.0	-5.7	3.62 V	72	34.9	33.4
2	2390.00	53.0 AV	54.0	-1.0	3.62 V	72	19.6	33.4
3	*2437.00	113.9 PK			3.60 V	9	80.3	33.6
4	*2437.00	104.9 AV			3.60 V	9	71.3	33.6
5	2483.50	68.0 PK	74.0	-6.0	3.48 V	356	34.1	33.9
6	2483.50	53.1 AV	54.0	-0.9	3.48 V	356	19.2	33.9
7	4874.00	52.8 PK	74.0	-21.2	3.78 V	325	48.9	3.9
8	4874.00	48.0 AV	54.0	-6.0	3.78 V	325	44.1	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	101.9 PK			3.10 H	189	68.1	33.8
2	*2452.00	92.7 AV			3.10 H	189	58.9	33.8
3	2483.50	59.4 PK	74.0	-14.6	3.04 H	182	25.5	33.9
4	2483.50	47.4 AV	54.0	-6.6	3.04 H	182	13.5	33.9
5	4904.00	52.5 PK	74.0	-21.5	1.00 H	296	48.5	4.0
6	4904.00	46.2 AV	54.0	-7.8	1.00 H	296	42.2	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	110.5 PK			3.22 V	10	76.7	33.8
2	*2452.00	101.5 AV			3.22 V	10	67.7	33.8
3	2483.50	64.7 PK	74.0	-9.3	3.34 V	76	30.8	33.9
4	2483.50	53.1 AV	54.0	-0.9	3.34 V	76	19.2	33.9
5	4904.00	52.9 PK	74.0	-21.1	3.33 V	328	48.9	4.0
6	4904.00	48.2 AV	54.0	-5.8	3.33 V	328	44.2	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 worst-case data: 802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 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	31.94	32.5 QP	40.0	-7.5	1.49 H	206	47.9	-15.4
2	74.62	29.3 QP	40.0	-10.7	1.49 H	110	45.7	-16.4
3	125.06	27.1 QP	43.5	-16.4	1.49 H	268	42.5	-15.4
4	260.86	31.7 QP	46.0	-14.3	1.00 H	107	45.4	-13.7
5	360.54	42.3 QP	46.0	-3.7	1.00 H	168	53.9	-11.6
6	577.08	40.0 QP	46.0	-6.0	1.49 H	168	48.1	-8.1
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	30.12	33.8 QP	40.0	-6.2	1.00 V	201	49.3	-15.5
2	60.52	33.8 QP	40.0	-6.2	1.00 V	12	48.0	-14.2
3	95.96	32.1 QP	43.5	-11.4	1.00 V	285	50.6	-18.5
4	142.52	30.4 QP	43.5	-13.1	1.00 V	114	44.2	-13.8
5	359.80	43.2 QP	46.0	-2.8	1.49 V	282	54.8	-11.6
6	579.02	34.9 QP	46.0	-11.1	1.00 V	315	43.0	-8.1

Remarks:

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

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 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	33.88	33.7 QP	40.0	-6.3	2.00 H	12	48.7	-15.0
2	92.08	34.2 QP	43.5	-9.3	2.00 H	270	53.2	-19.0
3	142.52	31.2 QP	43.5	-12.3	2.00 H	108	45.0	-13.8
4	222.06	33.3 QP	46.0	-12.7	1.49 H	132	49.3	-16.0
5	361.74	44.9 QP	46.0	-1.1	1.00 H	74	56.4	-11.5
6	575.14	39.7 QP	46.0	-6.3	1.49 H	189	47.9	-8.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	31.30	31.7 QP	40.0	-8.3	1.00 V	333	47.2	-15.5
2	58.62	33.4 QP	40.0	-6.6	1.49 V	10	47.3	-13.9
3	94.02	33.0 QP	43.5	-10.5	1.00 V	267	51.8	-18.8
4	169.68	29.8 QP	43.5	-13.7	1.00 V	287	43.7	-13.9
5	359.80	43.2 QP	46.0	-2.8	1.49 V	105	54.8	-11.6
6	590.66	34.9 QP	46.0	-11.1	1.00 V	265	42.7	-7.8

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

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 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	30.18	33.4 QP	40.0	-6.6	1.00 H	351	48.9	-15.5
2	55.22	35.9 QP	40.0	-4.1	1.49 H	184	49.6	-13.7
3	103.72	34.5 QP	43.5	-9.0	1.49 H	142	52.0	-17.5
4	167.74	39.8 QP	43.5	-3.7	1.49 H	277	53.5	-13.7
5	359.80	45.0 QP	46.0	-1.0	1.00 H	178	56.6	-11.6
6	582.90	39.4 QP	46.0	-6.6	1.49 H	353	47.4	-8.0
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	31.81	34.5 QP	40.0	-5.5	1.00 V	339	49.9	-15.4
2	53.89	37.2 QP	40.0	-2.8	1.00 V	240	50.7	-13.5
3	99.84	37.6 QP	43.5	-5.9	1.00 V	154	55.6	-18.0
4	167.74	34.3 QP	43.5	-9.2	1.00 V	212	48.0	-13.7
5	359.80	43.1 QP	46.0	-2.9	1.49 V	90	54.7	-11.6
6	586.78	31.4 QP	46.0	-14.6	1.00 V	328	39.3	-7.9

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

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
Test Receiver ROHDE & SCHWARZ	ESCS 30	100288	Aug.17, 2017	Aug. 16, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 09, 2017	Sep. 08, 2018
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 17, 2017	Jan. 16, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 02, 2017	Aug. 01, 2018
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 2.
3. The VCCI Site Registration No. is C-2047.

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.

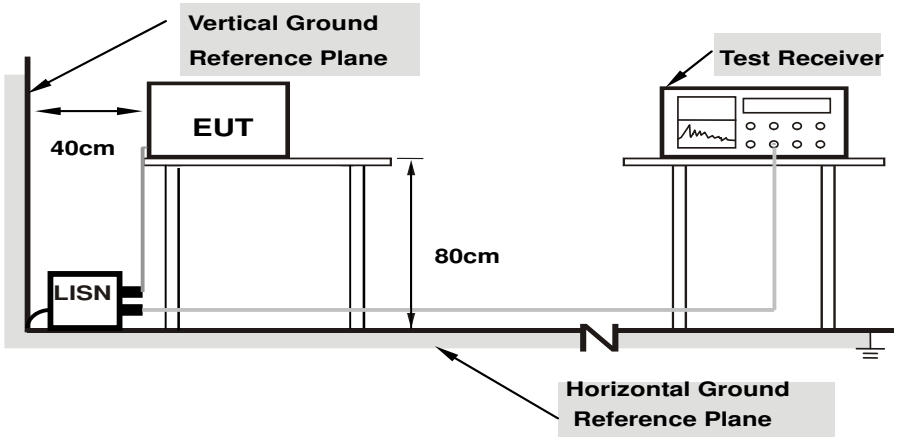
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

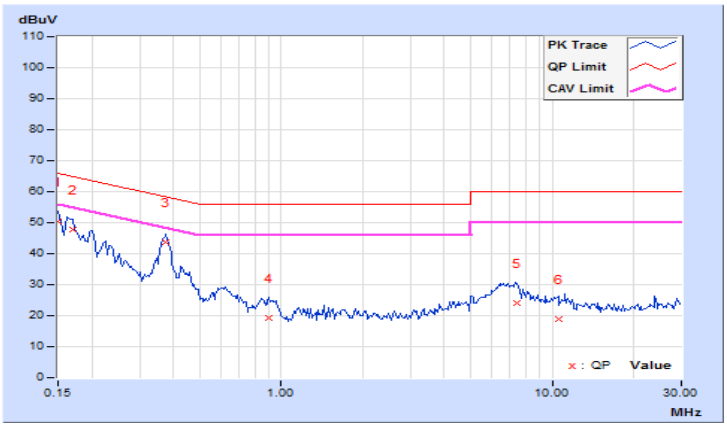
Worst-case data: 802.11b

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	0.15000	10.39	40.00	24.11	50.39	34.50	66.00	56.00	-15.61	-21.50
2	0.16953	10.40	37.28	24.16	47.68	34.56	64.98	54.98	-17.30	-20.42
3	0.37266	10.41	33.46	26.04	43.87	36.45	58.44	48.44	-14.57	-11.99
4	0.90391	10.47	8.82	2.32	19.29	12.79	56.00	46.00	-36.71	-33.21
5	7.45313	10.66	13.58	8.32	24.24	18.98	60.00	50.00	-35.76	-31.02
6	10.52344	10.71	8.32	2.68	19.03	13.39	60.00	50.00	-40.97	-36.61

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.

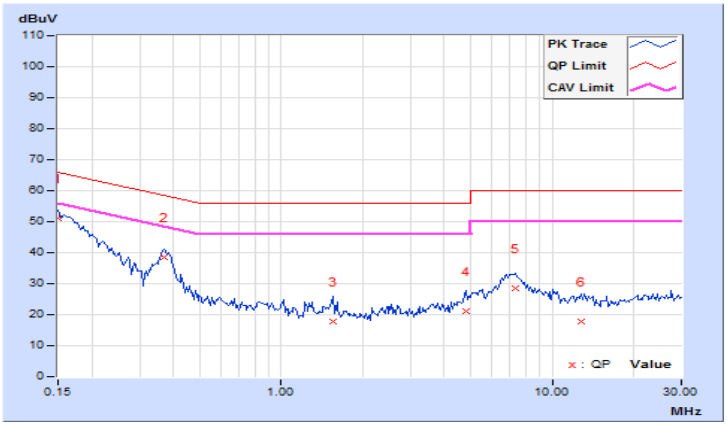


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.43	40.52	23.73	50.95	34.16	66.00	56.00	-15.05	-21.84
2	0.36875	10.37	28.12	19.89	38.49	30.26	58.53	48.53	-20.04	-18.27
3	1.55469	10.49	7.24	3.34	17.73	13.83	56.00	46.00	-38.27	-32.17
4	4.81250	10.61	10.58	1.86	21.19	12.47	56.00	46.00	-34.81	-33.53
5	7.35547	10.63	17.92	11.96	28.55	22.59	60.00	50.00	-31.45	-27.41
6	12.79688	10.74	6.99	0.94	17.73	11.68	60.00	50.00	-42.27	-38.32

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.

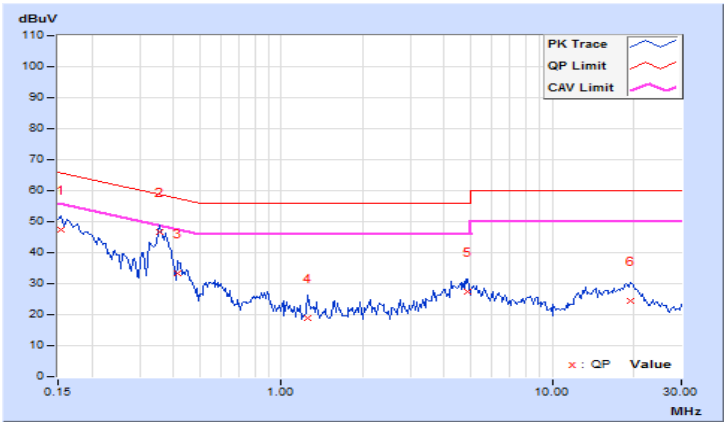


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.39	37.01	28.05	47.40	38.44	65.79	55.79	-18.39	-17.35
2	**0.35703**	**10.41**	**36.34**	**35.06**	**46.75**	**45.47**	**58.80**	**48.80**	**-12.05**	**-3.33**
3	0.41563	10.41	22.79	16.26	33.20	26.67	57.54	47.54	-24.34	-20.87
4	1.25000	10.50	8.28	1.00	18.78	11.50	56.00	46.00	-37.22	-34.50
5	4.89844	10.62	16.72	8.65	27.34	19.27	56.00	46.00	-28.66	-26.73
6	19.48828	10.88	13.44	7.87	24.32	18.75	60.00	50.00	-35.68	-31.25

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.

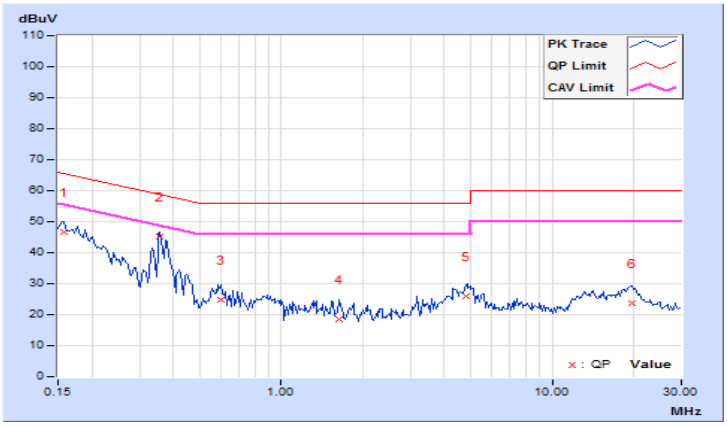


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.42	36.10	27.68	46.52	38.10	65.58	55.58	-19.06	-17.48
2	0.35703	10.37	34.89	33.16	45.26	43.53	58.80	48.80	-13.54	-5.27
3	0.59922	10.42	14.54	11.88	24.96	22.30	56.00	46.00	-31.04	-23.70
4	1.64063	10.49	7.93	0.50	18.42	10.99	56.00	46.00	-37.58	-35.01
5	4.80469	10.61	15.14	5.80	25.75	16.41	56.00	46.00	-30.25	-29.59
6	19.60547	10.98	12.72	6.50	23.70	17.48	60.00	50.00	-36.30	-32.52

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.

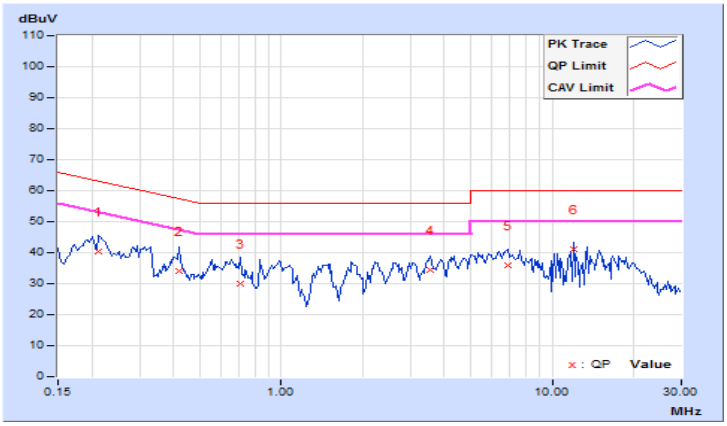


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.21250	10.42	29.92	16.17	40.34	26.59	63.11	53.11	-22.77	-26.52
2	0.41953	10.41	23.81	18.00	34.22	28.41	57.46	47.46	-23.24	-19.05
3	0.70469	10.45	19.58	13.89	30.03	24.34	56.00	46.00	-25.97	-21.66
4	3.55859	10.59	23.88	18.75	34.47	29.34	56.00	46.00	-21.53	-16.66
5	6.83594	10.65	25.44	18.77	36.09	29.42	60.00	50.00	-23.91	-20.58
6	11.95703	10.74	30.46	29.66	41.20	40.40	60.00	50.00	-18.80	-9.60

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.

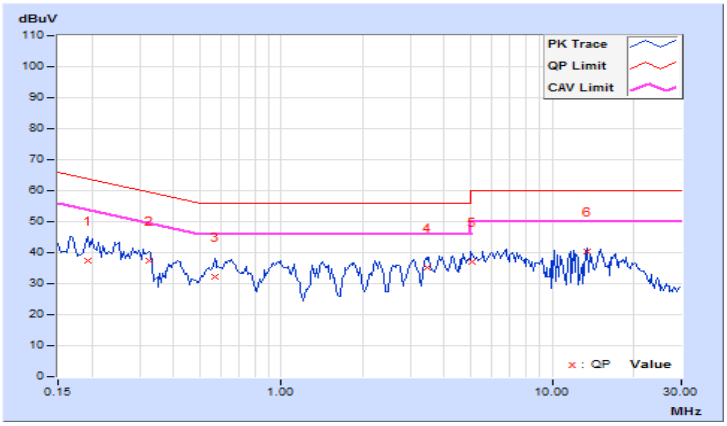


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.19297	10.37	26.91	18.27	37.28	28.64	63.91	53.91	-26.63	-25.27
2	0.32578	10.37	27.15	14.23	37.52	24.60	59.56	49.56	-22.04	-24.96
3	0.56797	10.41	21.94	16.55	32.35	26.96	56.00	46.00	-23.65	-19.04
4	3.44922	10.57	24.76	20.08	35.33	30.65	56.00	46.00	-20.67	-15.35
5	5.09375	10.61	26.45	20.90	37.06	31.51	60.00	50.00	-22.94	-18.49
6	13.48438	10.76	29.45	27.30	40.21	38.06	60.00	50.00	-19.79	-11.94

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.

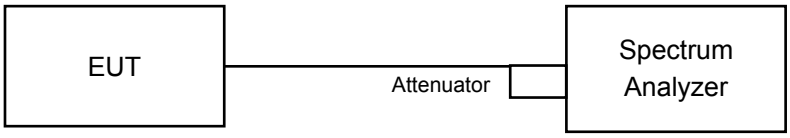


4.3 6dB Bandwidth Measurement

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 = average.

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	8.10	8.11	0.5	Pass
6	2437	8.12	8.11	0.5	Pass
11	2462	8.11	8.11	0.5	Pass

802.11g

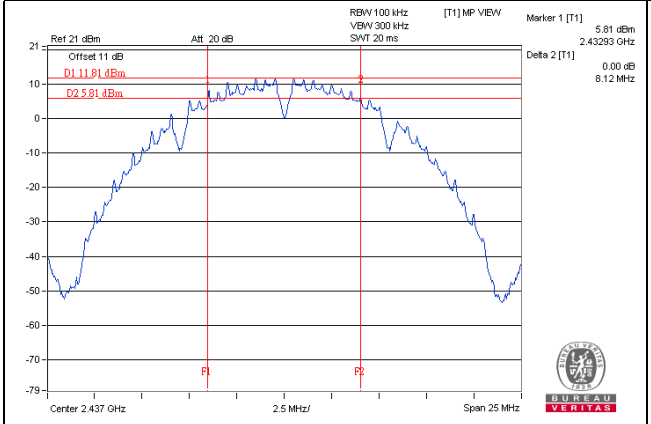
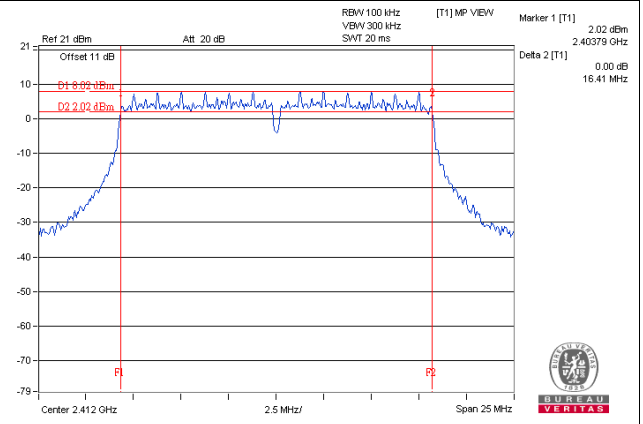
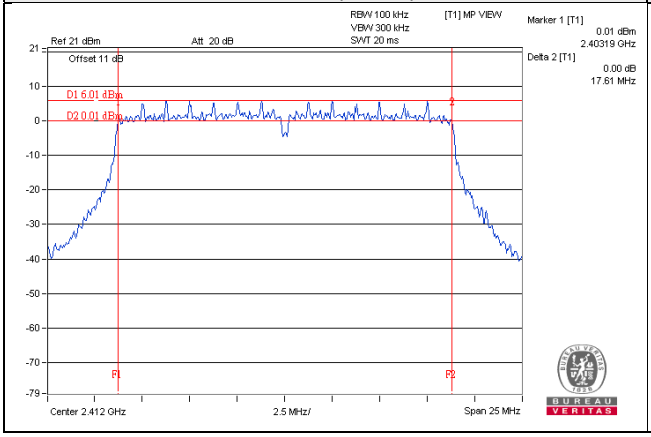
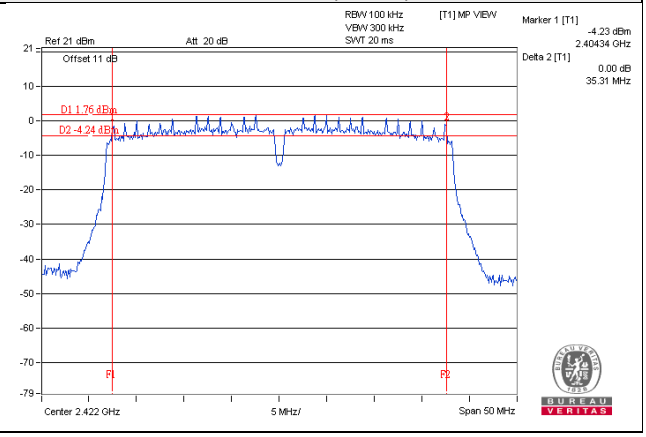
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.39	16.41	0.5	Pass
6	2437	16.34	16.34	0.5	Pass
11	2462	16.38	16.38	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.61	17.61	0.5	Pass
6	2437	17.59	16.97	0.5	Pass
11	2462	17.60	17.60	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.26	35.31	0.5	Pass
6	2437	35.20	35.24	0.5	Pass
9	2452	35.21	35.20	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

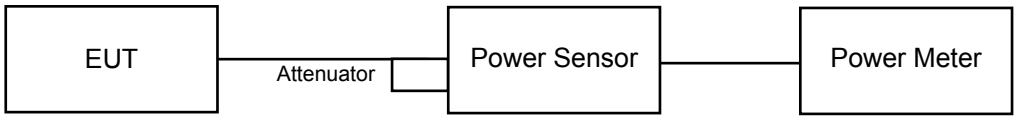
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

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

CDD Mode

802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.61	22.89	376.926	25.76	30.00	Pass
6	2437	20.64	20.62	231.223	23.64	30.00	Pass
11	2462	20.98	21.22	257.748	24.11	30.00	Pass

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.59	19.00	151.71	21.81	30.00	Pass
6	2437	24.50	24.88	**589.448**	27.70	30.00	Pass
11	2462	17.99	18.44	132.774	21.23	30.00	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	16.43	17.05	94.653	19.76	30.00	Pass
6	2437	24.31	24.74	567.626	27.54	30.00	Pass
11	2462	16.39	16.91	92.642	19.67	30.00	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	15.14	15.10	65.018	18.13	30.00	Pass
6	2437	18.76	18.99	154.412	21.89	30.00	Pass
9	2452	15.91	16.21	80.777	19.07	30.00	Pass

Beamforming Mode

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	13.42	14.04	47.330	16.75	28.09	Pass
6	2437	21.30	21.73	**283.832**	24.53	28.09	Pass
11	2462	13.38	13.90	46.324	16.66	28.09	Pass

Note: Directional gain = 4.9dBi + 10log(2) = 7.91dBi > 6dBi, so the power limit shall be reduced to 30-(7.91-6) = 28.09dBm.

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	12.13	12.09	32.512	15.12	28.09	Pass
6	2437	15.75	15.98	77.212	18.88	28.09	Pass
9	2452	12.90	13.20	40.391	16.06	28.09	Pass

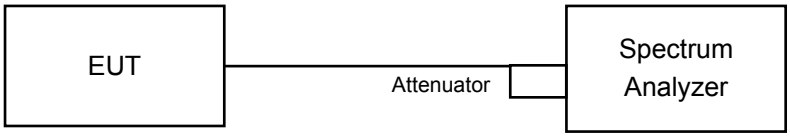
Note: Directional gain = 4.9dBi + 10log(2) = 7.91dBi > 6dBi, so the power limit shall be reduced to 30-(7.91-6) = 28.09dBm.

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 Average Power (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 Average Power (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

802.11b

TX chain	Channel	Frequency (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-3.75	3.01	-0.74	6.09	Pass
	6	2437	-5.61	3.01	-2.60	6.09	Pass
	11	2462	-5.20	3.01	-2.19	6.09	Pass
1	1	2412	-3.81	3.01	-0.80	6.09	Pass
	6	2437	-5.76	3.01	-2.75	6.09	Pass
	11	2462	-5.72	3.01	-2.71	6.09	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 = 4.9dBi + 10log(2) = 7.91dBi > 6dBi, so the power density limit shall be reduced to 8-(7.91-6) = 6.09dBm.

802.11g

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/10kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/10kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-11.28	3.01	0.23	-8.04	6.09	Pass
	6	2437	-5.46	3.01	0.23	-2.22	6.09	Pass
	11	2462	-11.90	3.01	0.23	-8.66	6.09	Pass
1	1	2412	-11.25	3.01	0.23	-8.01	6.09	Pass
	6	2437	-5.36	3.01	0.23	-2.12	6.09	Pass
	11	2462	-11.37	3.01	0.23	-8.13	6.09	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 = 4.9dBi + 10log(2) = 7.91dBi > 6dBi, so the power density limit shall be reduced to 8-(7.91-6) = 6.09dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

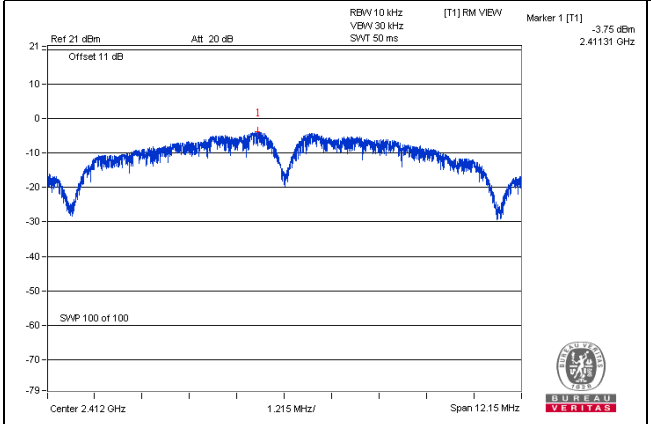
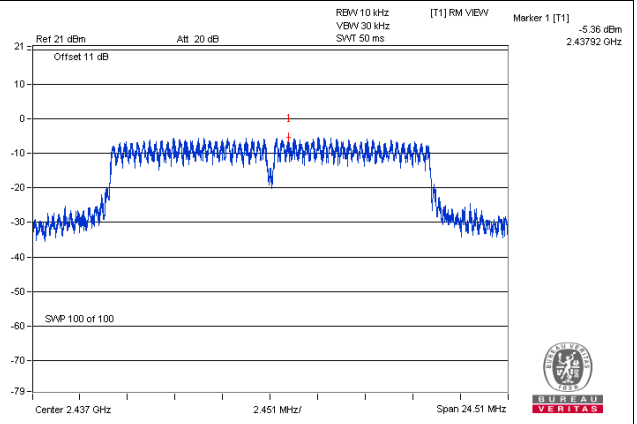
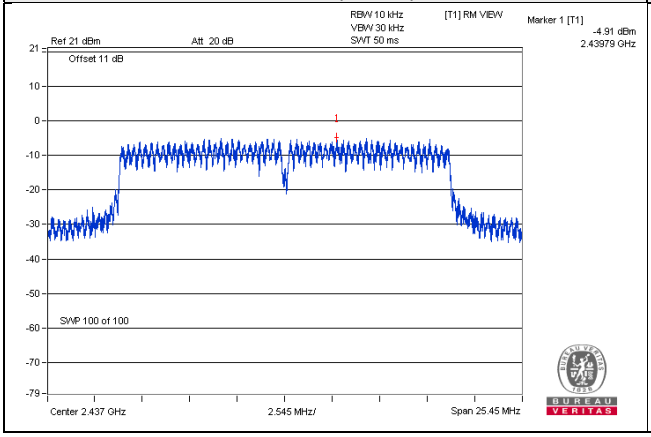
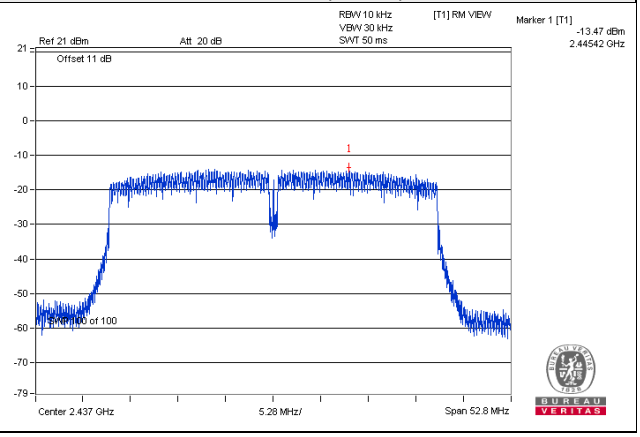
TX chain	Channel	Frequency (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-12.72	3.01	-9.71	6.09	Pass
	6	2437	-5.05	3.01	-2.04	6.09	Pass
	11	2462	-12.97	3.01	-9.96	6.09	Pass
1	1	2412	-12.51	3.01	-9.50	6.09	Pass
	6	2437	-4.91	3.01	-1.90	6.09	Pass
	11	2462	-12.30	3.01	-9.29	6.09	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 = 4.9dBi + 10log(2) = 7.91dBi > 6dBi, so the power density limit shall be reduced to 8-(7.91-6) = 6.09dBm.

802.11n (HT40)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/10kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/10kHz)	Limit (dBm/3kHz)	Pass / Fail
0	3	2422	-17.80	3.01	0.17	-14.62	6.09	Pass
	6	2437	-13.47	3.01	0.17	-10.29	6.09	Pass
	9	2452	-16.99	3.01	0.17	-13.81	6.09	Pass
1	3	2422	-17.75	3.01	0.17	-14.57	6.09	Pass
	6	2437	-13.67	3.01	0.17	-10.49	6.09	Pass
	9	2452	-16.82	3.01	0.17	-13.64	6.09	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 = 4.9dBi + 10log(2) = 7.91dBi > 6dBi, so the power density limit shall be reduced to 8-(7.91-6) = 6.09dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

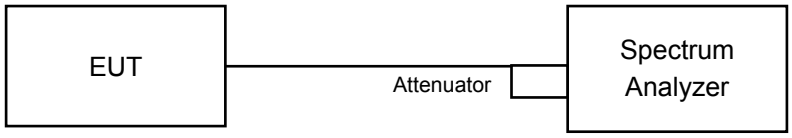
Spectrum Plot of Worst Value	
802.11b	802.11g
	
802.11n (HT20)	802.11n (HT40)
	

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. Detector = average.
d. Sweep = auto couple.
e. Trace Mode = max hold.
f. Allow trace to fully stabilize.
g. 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

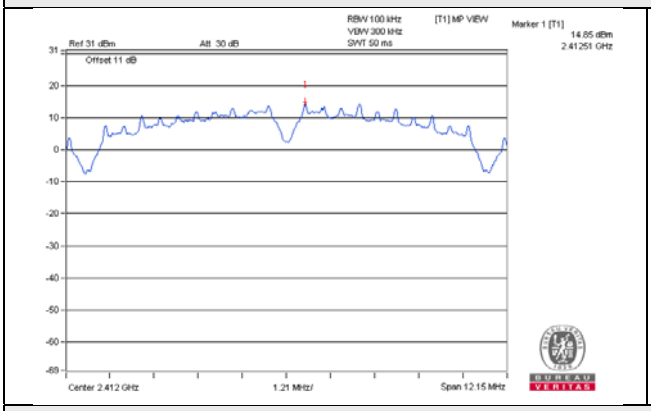
Same as item 4.3.6

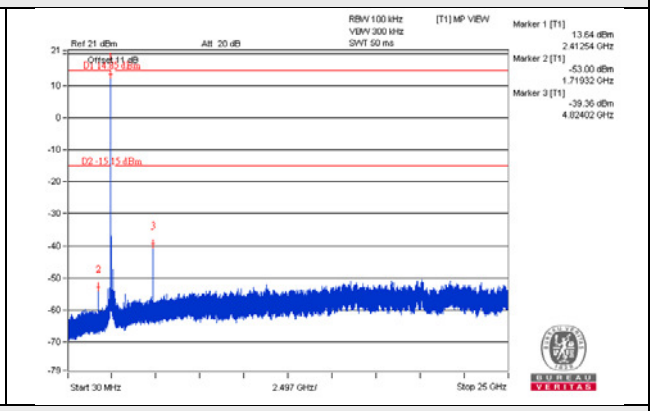
4.6.7 Test Results

The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.
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.

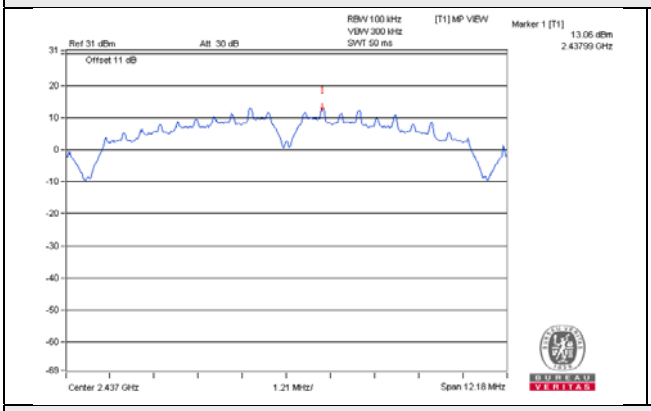
802.11b_Chain 0

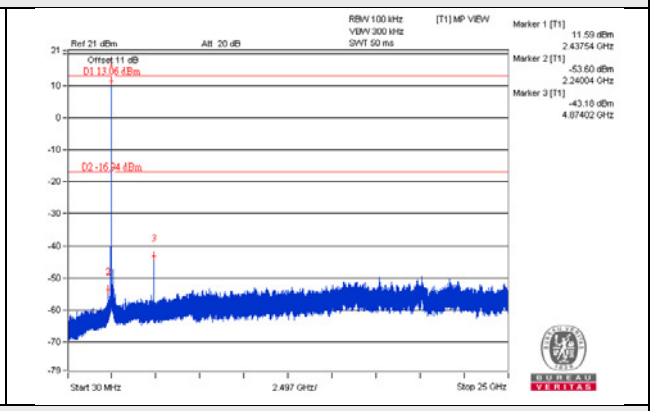
CH 1



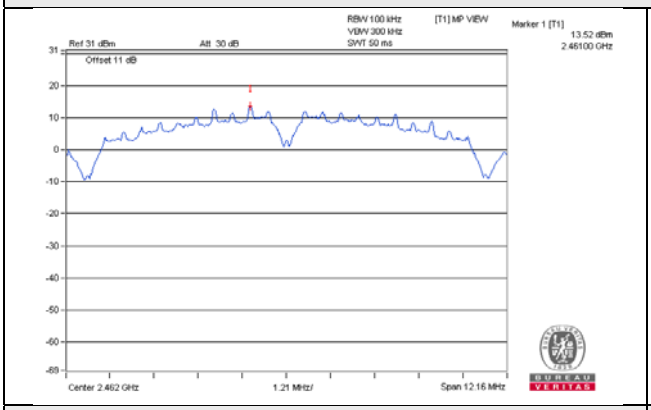


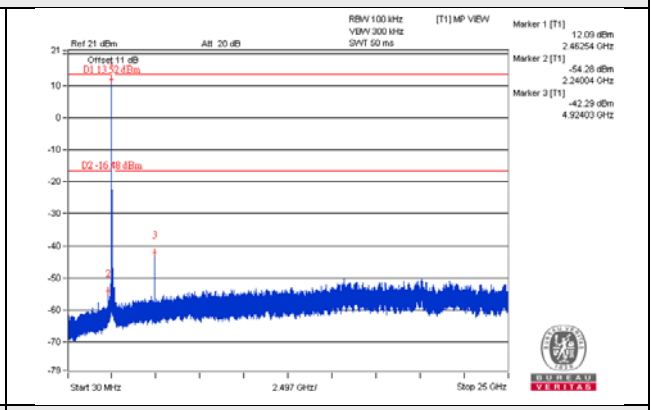
CH 6



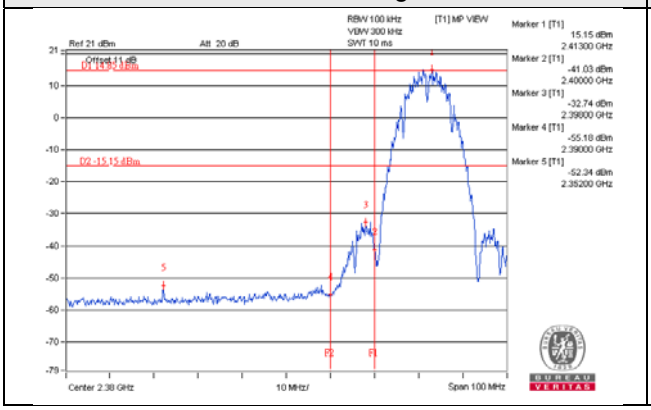


CH 11

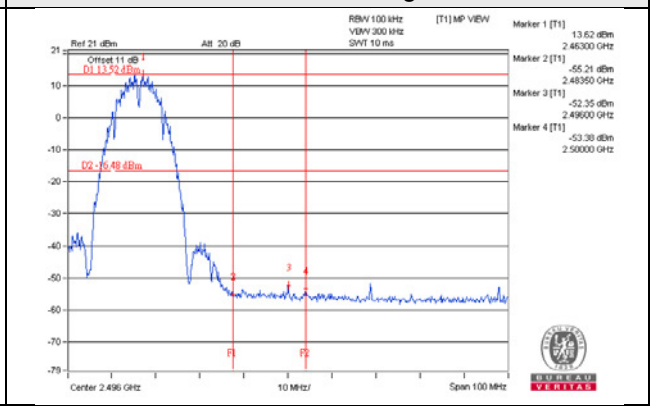




CH 1 Band edge

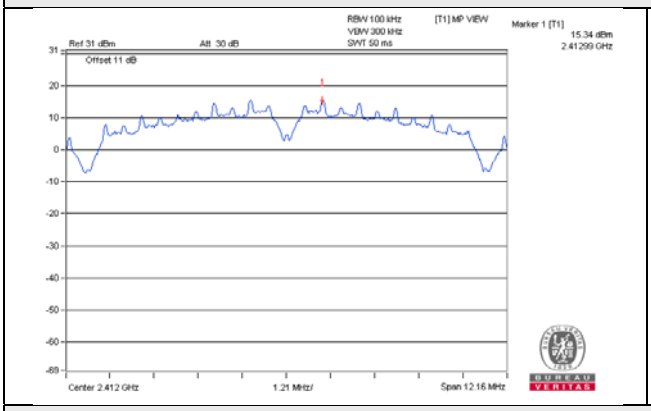


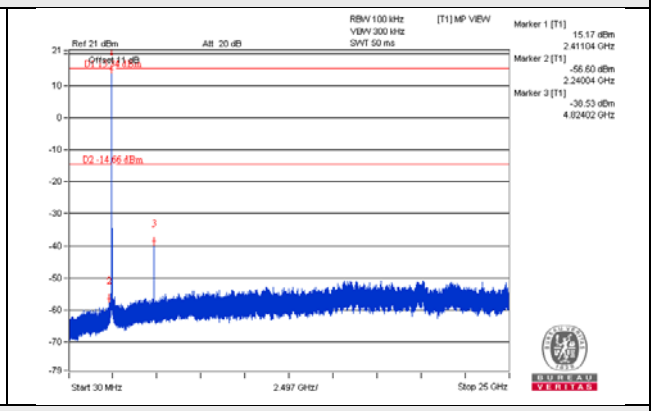
CH 11 Band edge



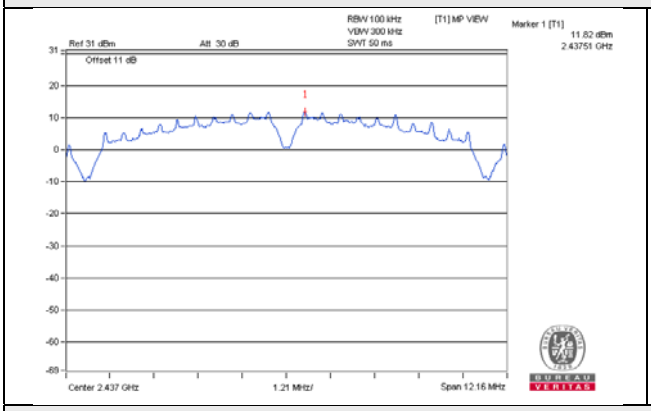
802.11b_Chain 1

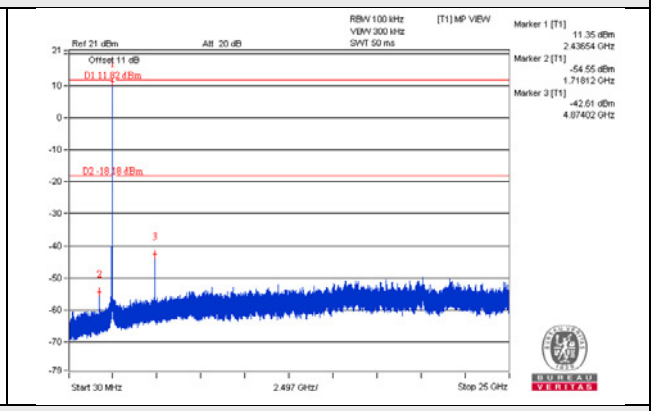
CH 1



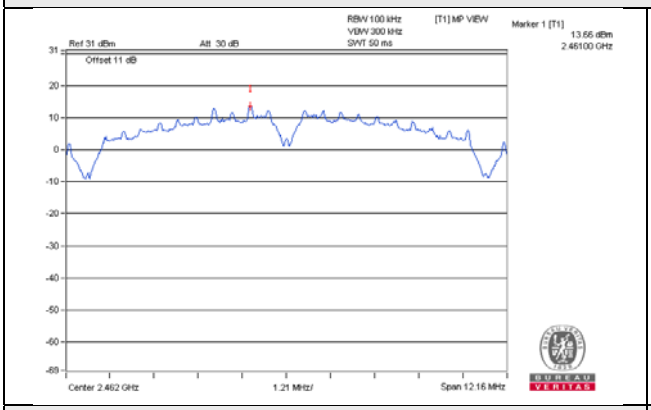


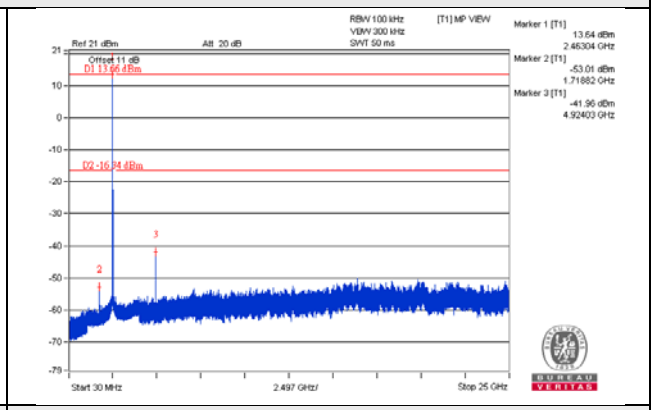
CH 6



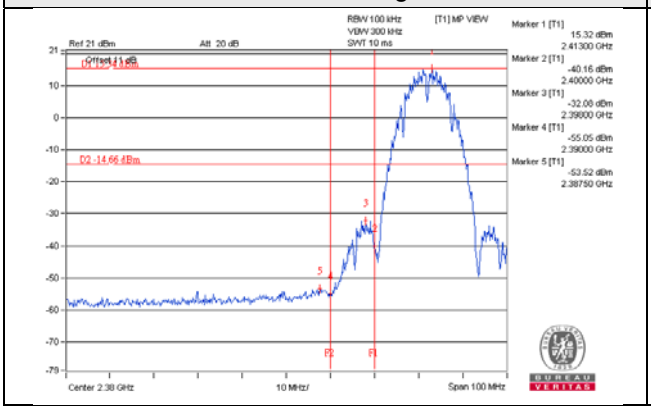


CH 11

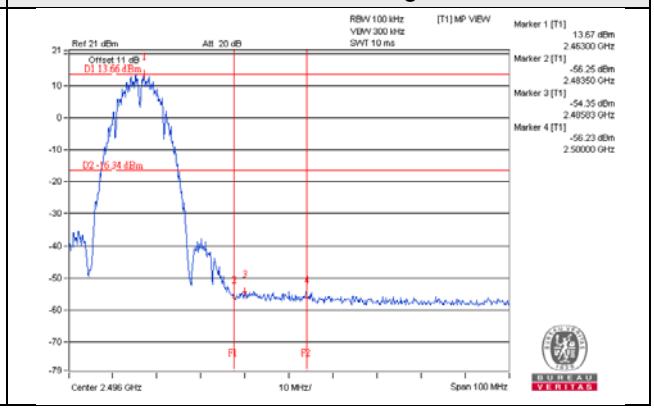




CH 1 Band edge

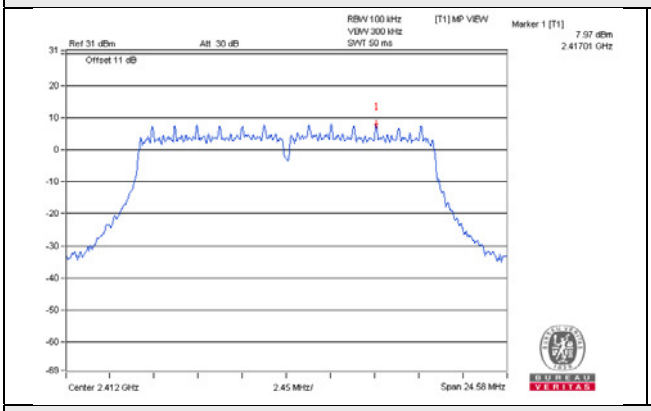


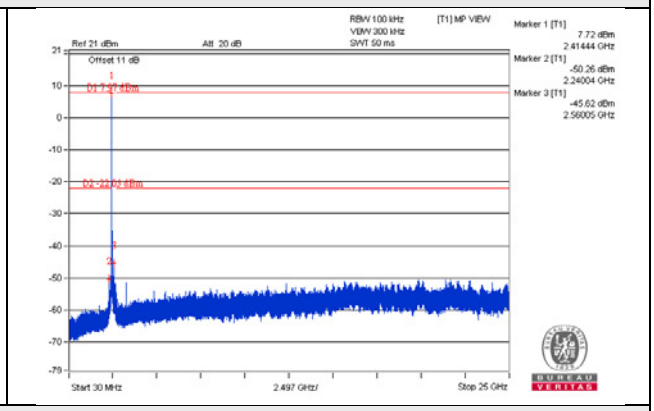
CH 11 Band edge



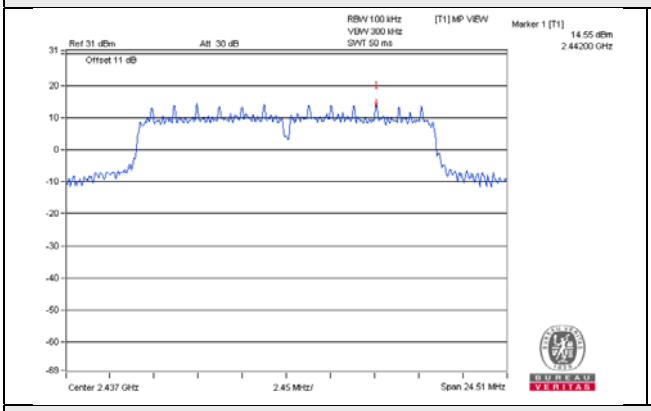
802.11g_Chain 0

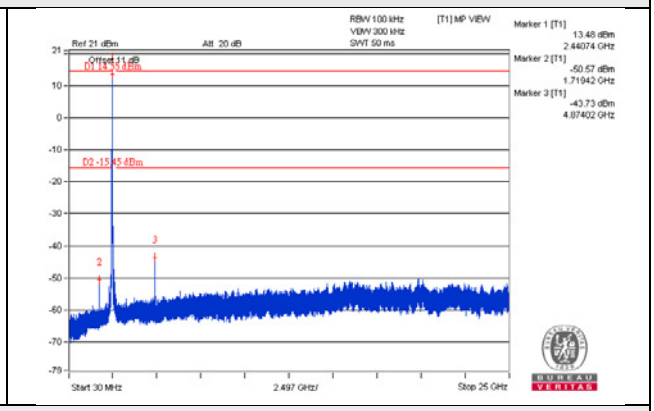
CH 1



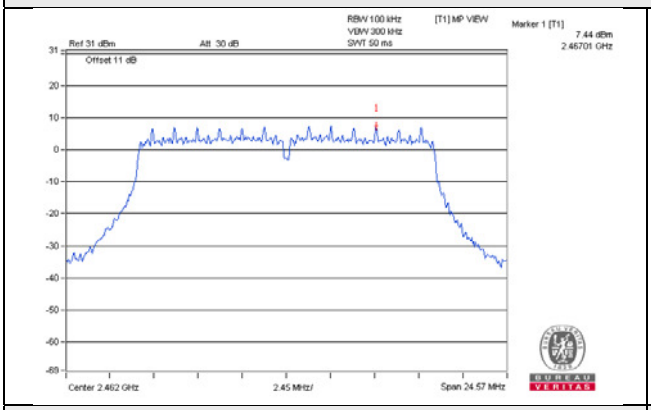


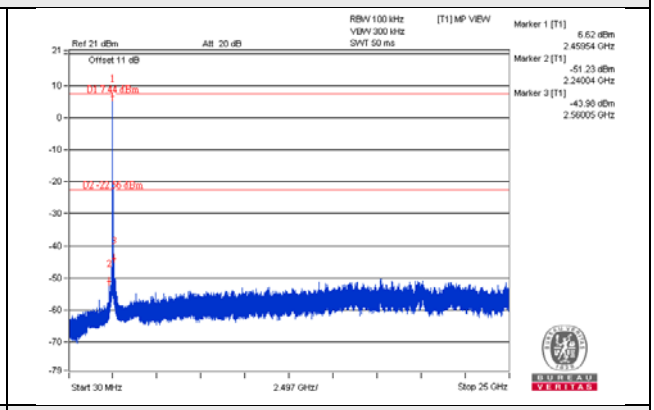
CH 6



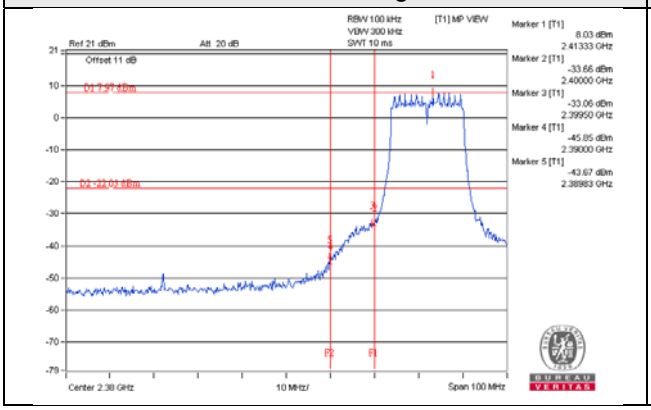


CH 11

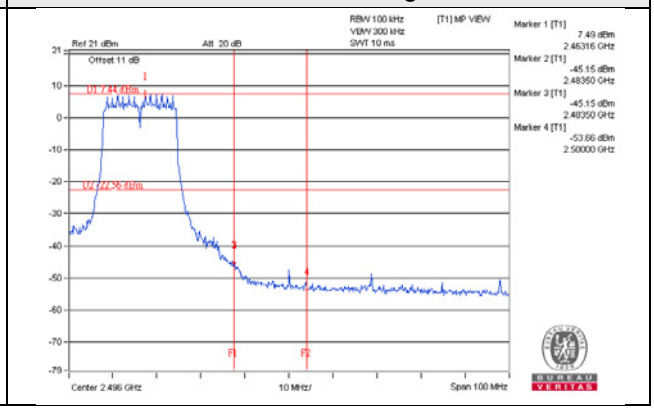




CH 1 Band edge

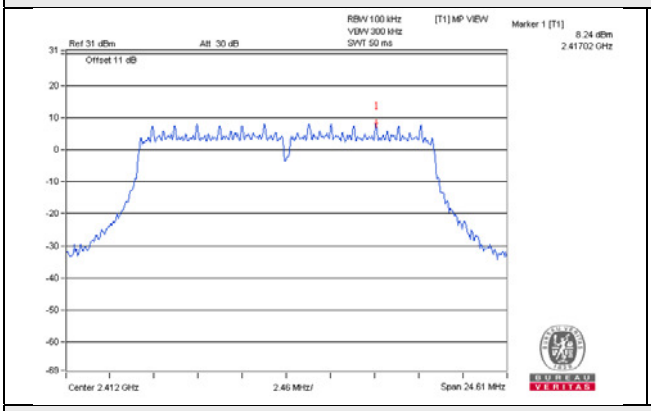


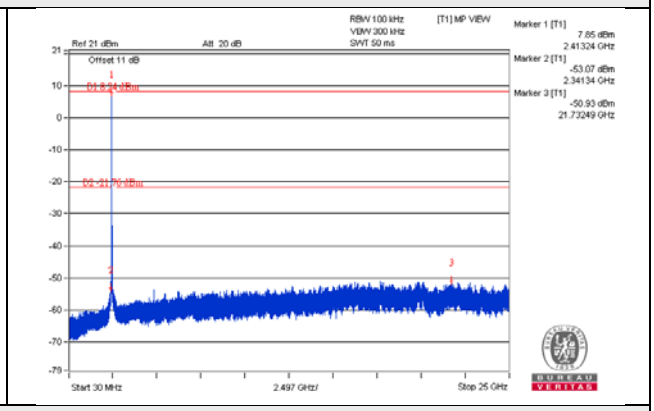
CH 11 Band edge



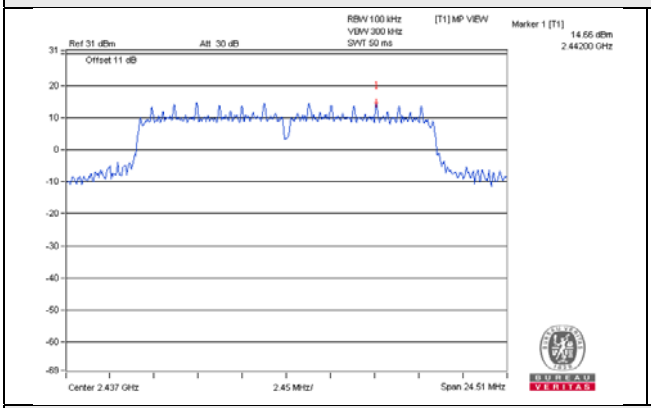
802.11g_Chain 1

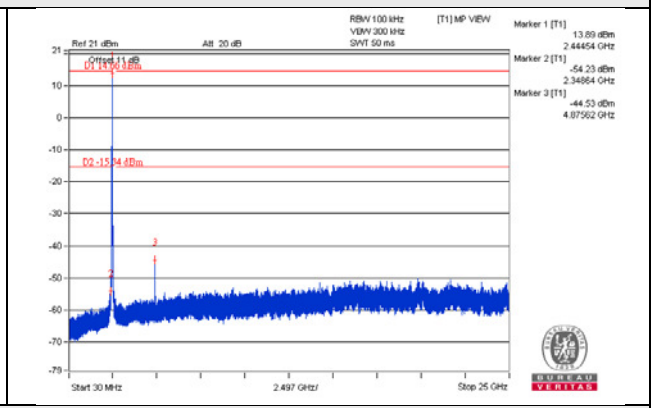
CH 1



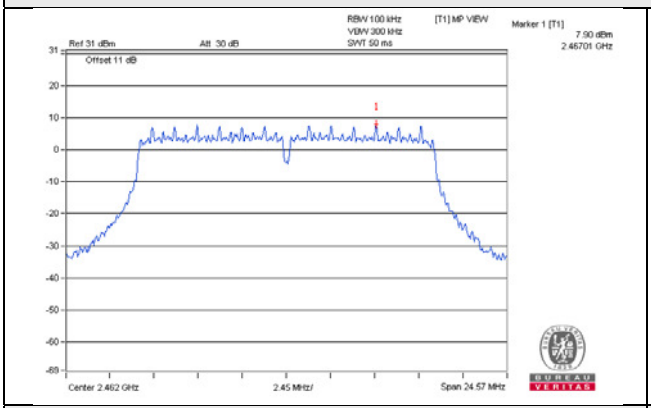


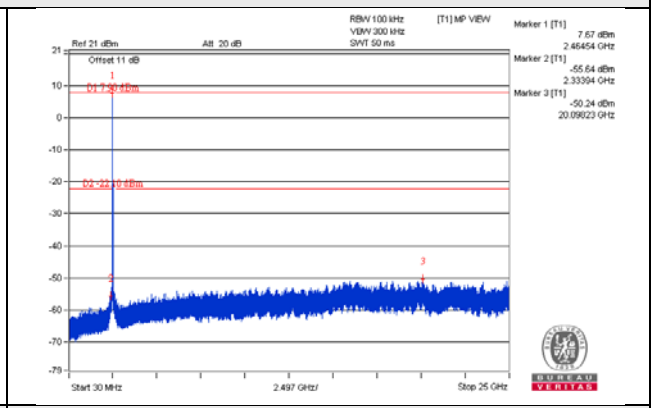
CH 6



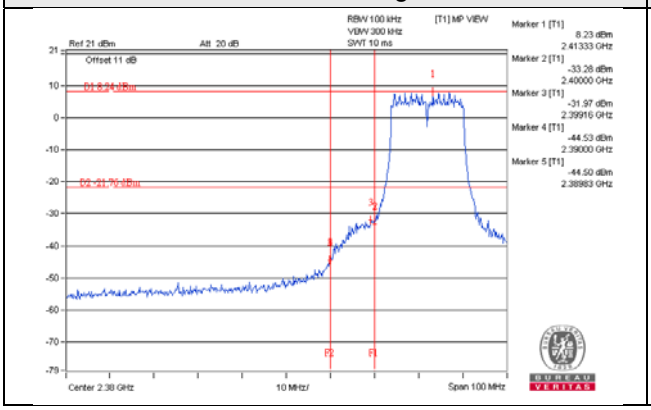


CH 11

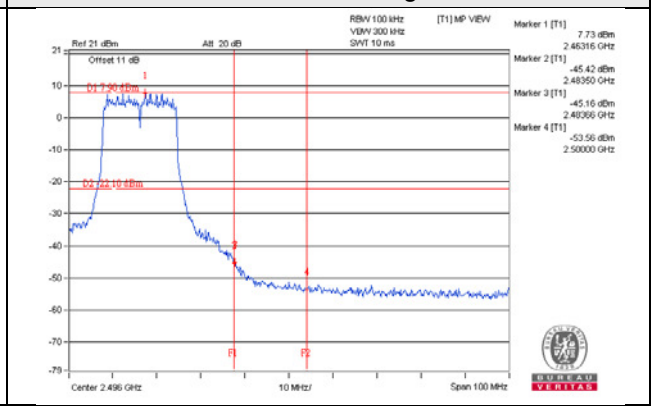




CH 1 Band edge

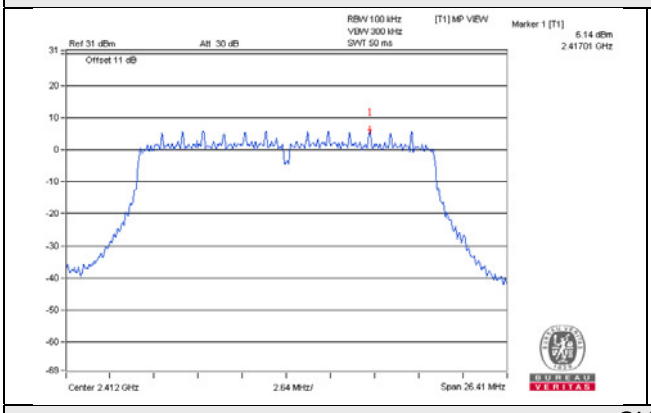


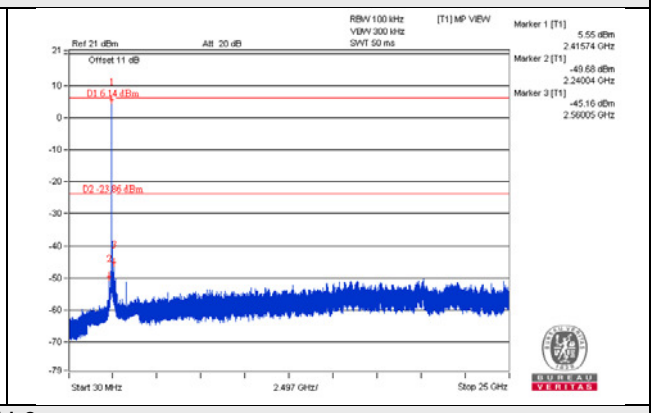
CH 11 Band edge



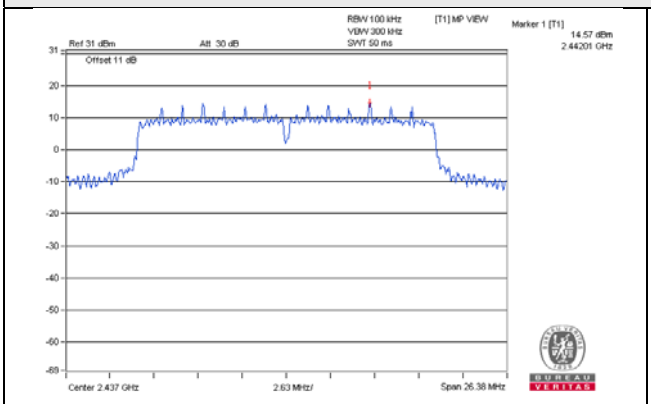
802.11n (HT20)_Chain 0

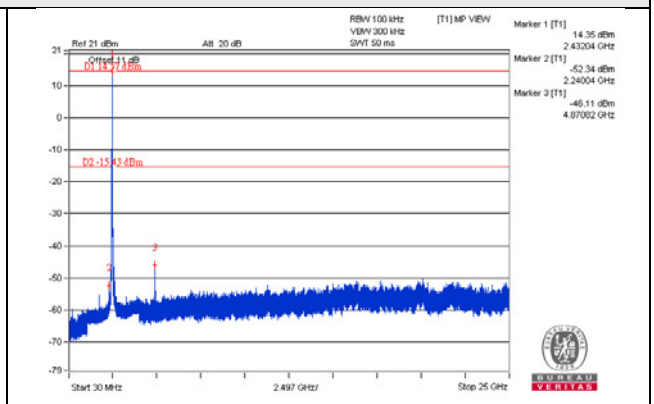
CH 1



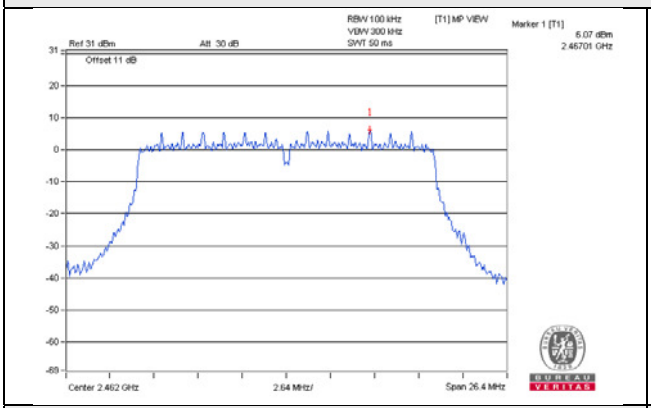


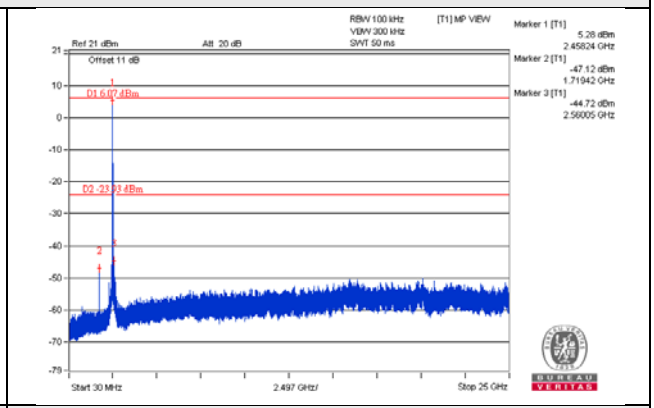
CH 6



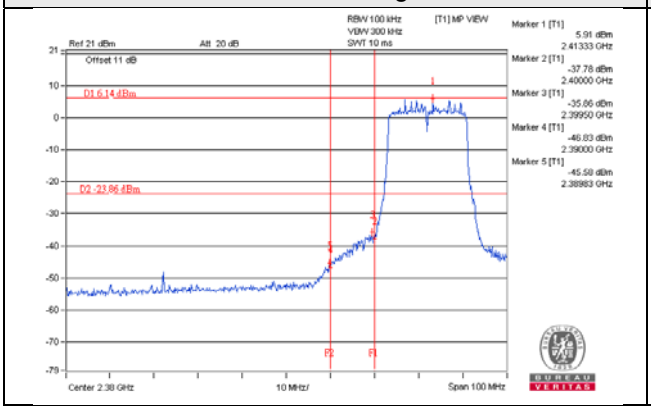


CH 11

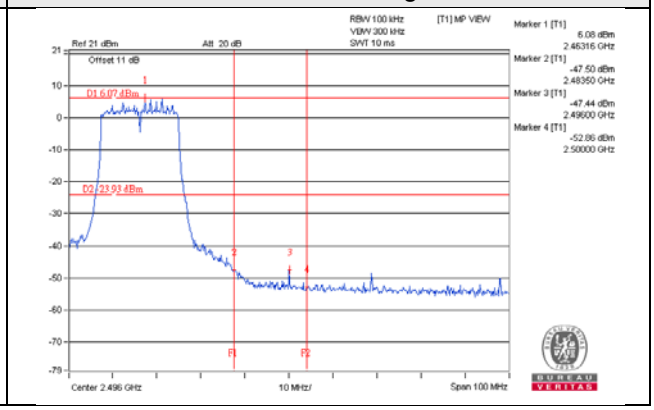




CH 1 Band edge

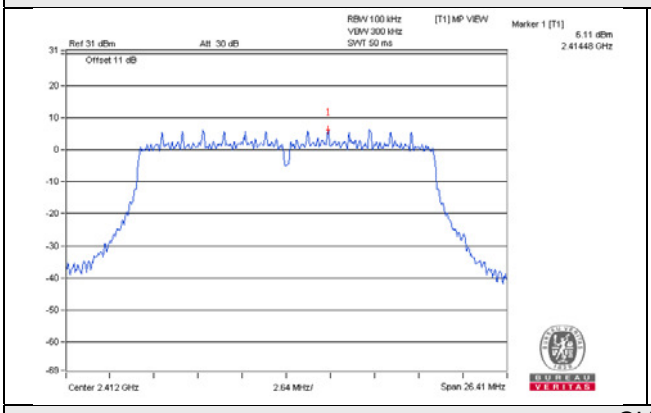


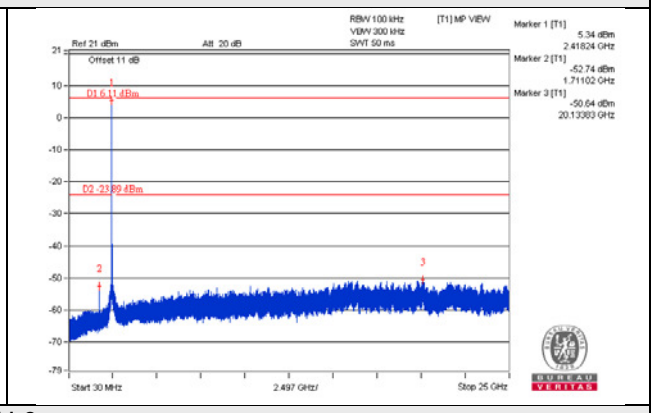
CH 11 Band edge



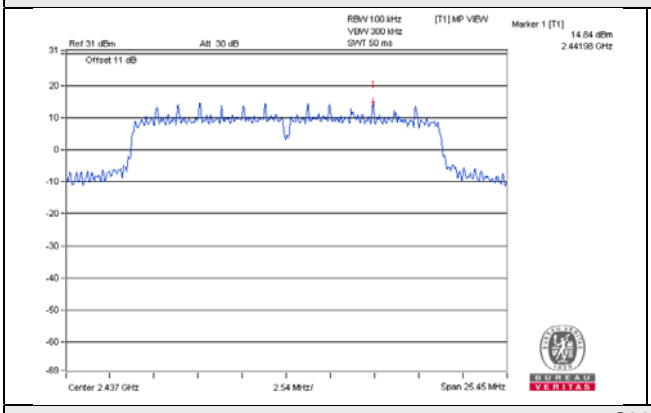
802.11n (HT20)_Chain 1

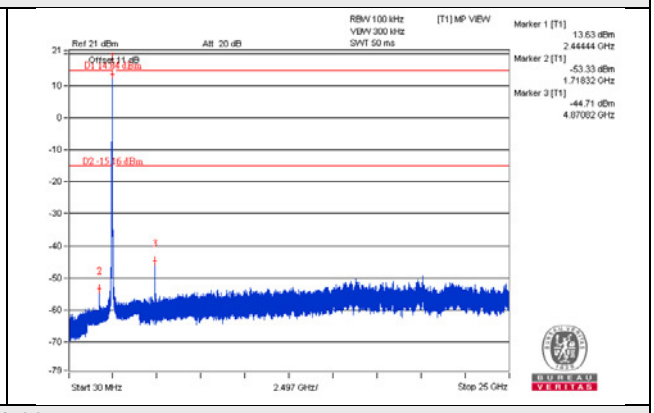
CH 1



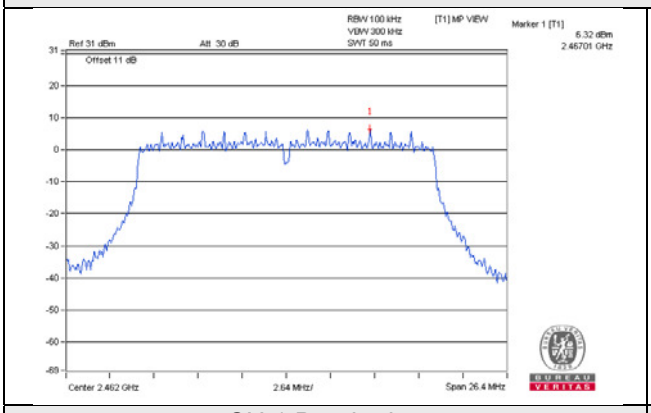


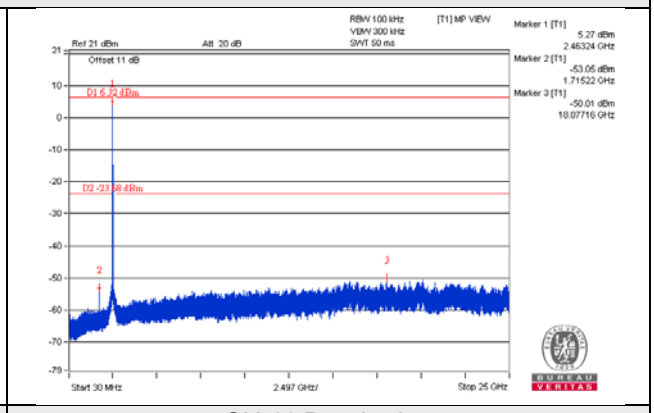
CH 6



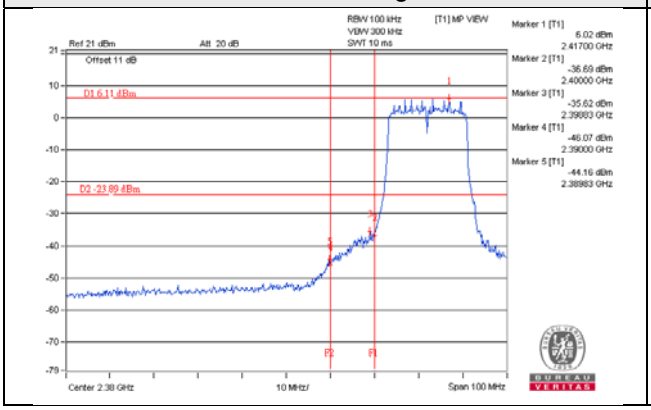


CH 11

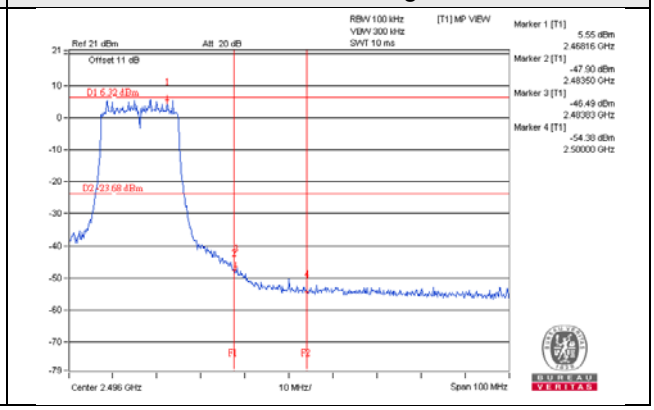




CH 1 Band edge

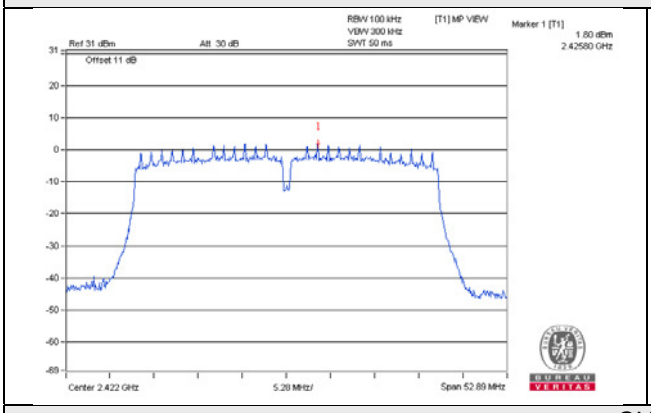


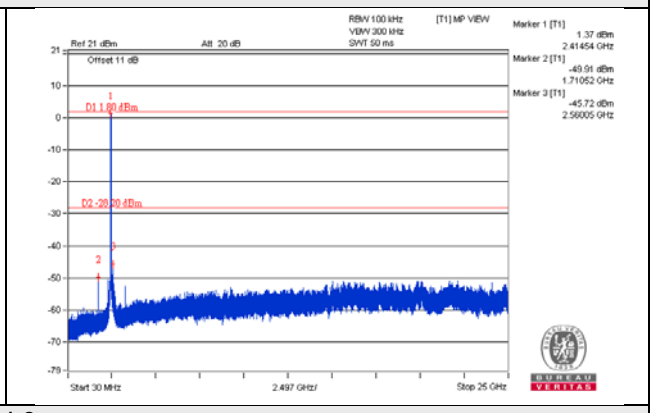
CH 11 Band edge



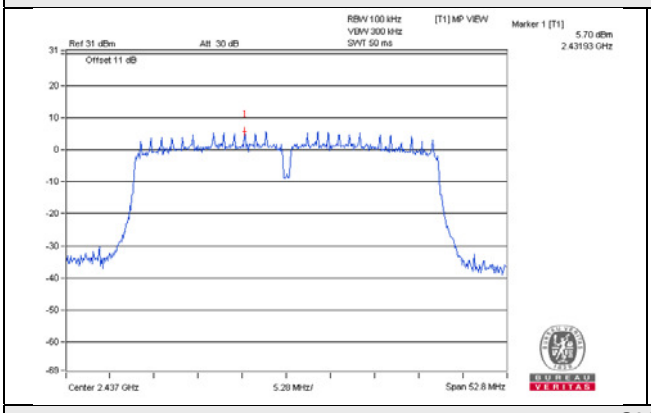
802.11n (HT40)_Chain 0

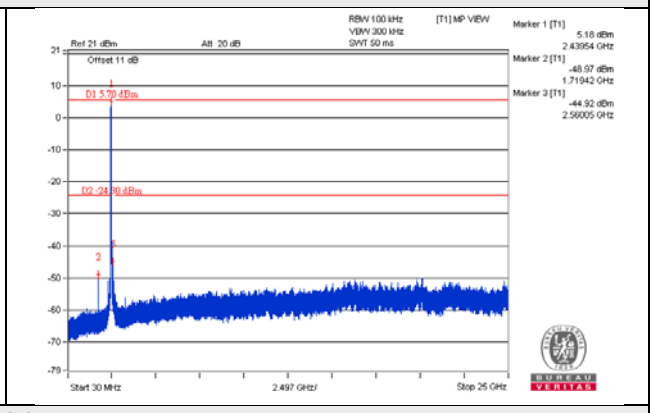
CH 3



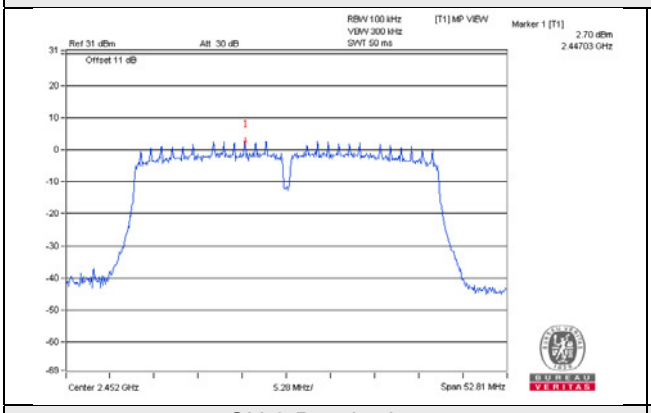


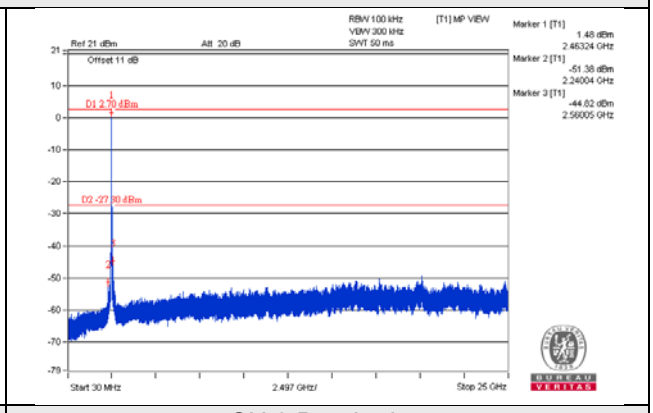
CH 6



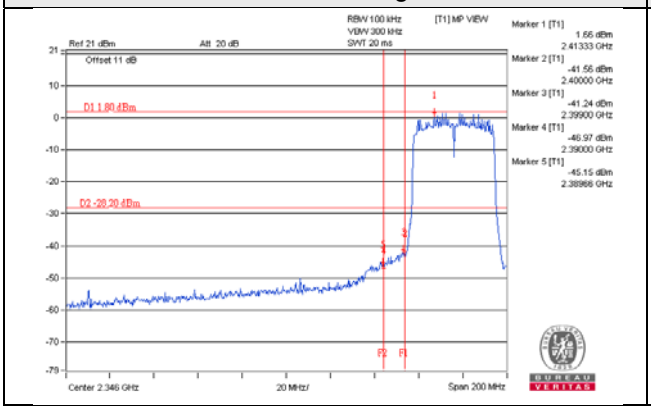


CH 9

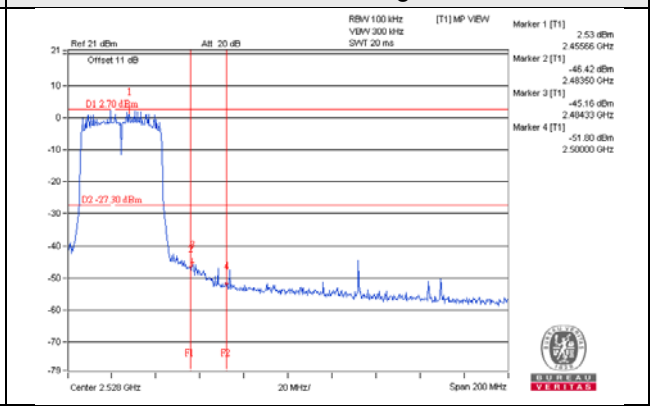




CH 3 Band edge

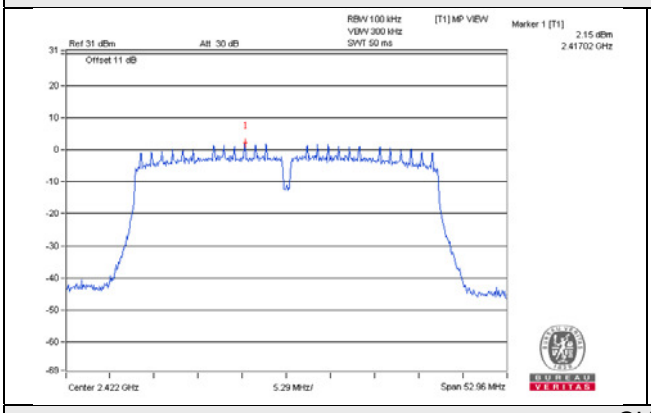


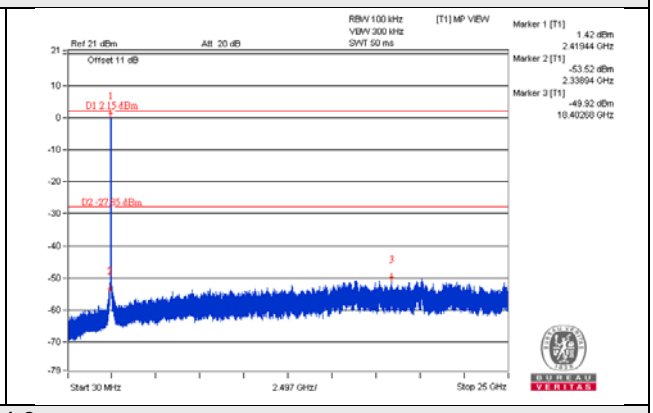
CH 9 Band edge



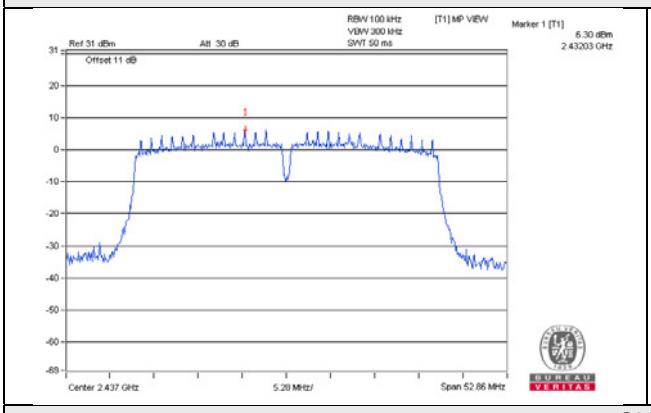
802.11n (HT40)_Chain 1

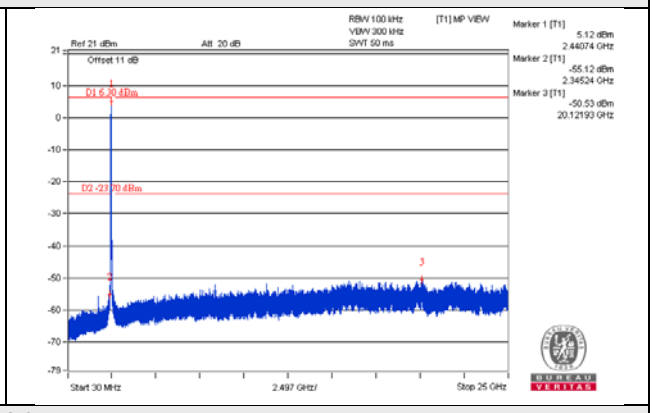
CH 3



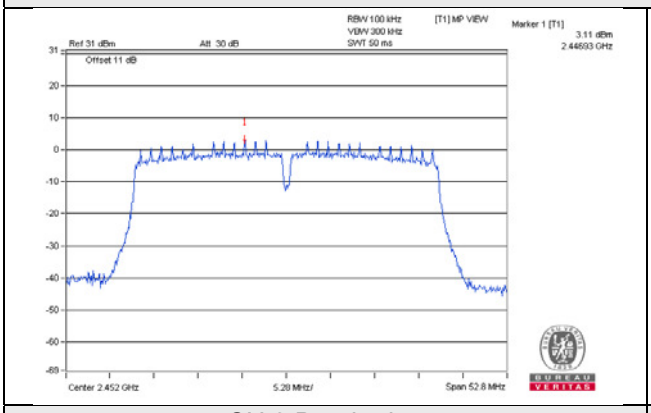


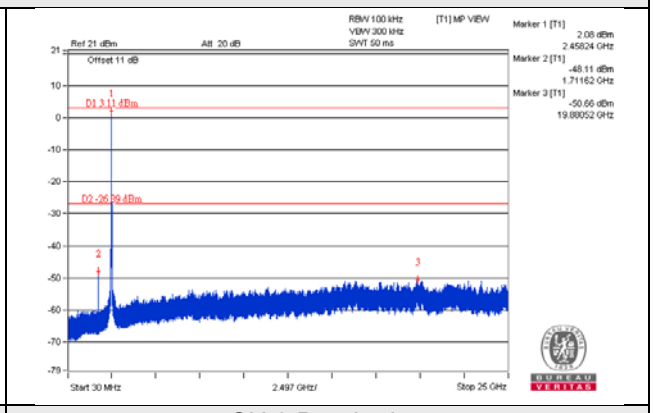
CH 6



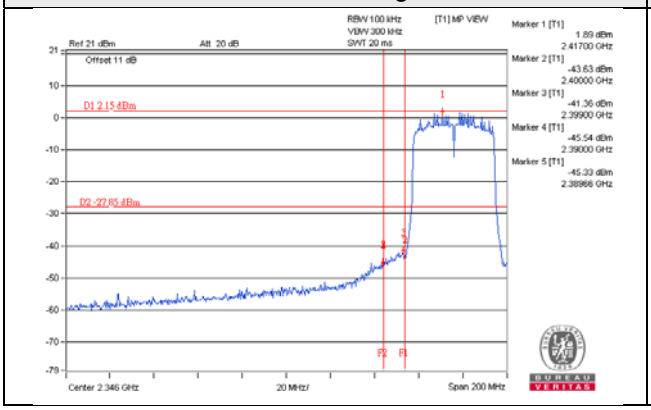


CH 9

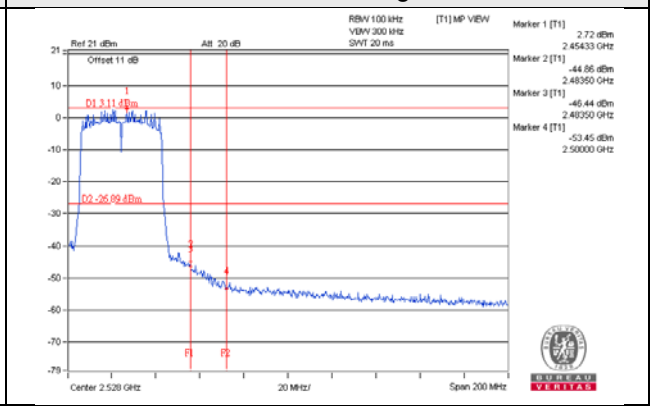




CH 3 Band edge



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:

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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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