



A D T

FCC TEST REPORT

REPORT NO.: RF150112C13B

MODEL NO.: NC230

FCC ID: TE7NC230

IC: 8853A-NC230

RECEIVED: Jan. 12, 2015

TESTED: Jan. 15 ~ Jul. 29, 2015

ISSUED: Nov. 03, 2015

APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.

ADDRESS: Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

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.)



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.



A D T

TABLE OF CONTENTS

RELEASE CONTROL RECORD.....	4
1. CERTIFICATION.....	5
2. SUMMARY OF TEST RESULTS.....	6
2.1 MEASUREMENT UNCERTAINTY.....	6
3. GENERAL INFORMATION.....	7
3.1 GENERAL DESCRIPTION OF EUT.....	7
3.2 DESCRIPTION OF TEST MODES.....	8
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	9
3.3 DESCRIPTION OF SUPPORT UNITS.....	11
3.3.1 CONFIGURATION OF SYSTEM UNDER TEST.....	12
3.4 DUTY CYCLE OF TEST SIGNAL.....	13
3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	14
4. TEST TYPES AND RESULTS.....	15
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT.....	15
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT.....	15
4.1.2 TEST INSTRUMENTS.....	16
4.1.3 TEST PROCEDURES.....	17
4.1.4 DEVIATION FROM TEST STANDARD.....	17
4.1.5 TEST SETUP.....	18
4.1.6 EUT OPERATING CONDITIONS.....	19
4.1.7 TEST RESULT.....	20
4.2 CONDUCTED EMISSION MEASUREMENT.....	33
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT.....	33
4.2.2 TEST INSTRUMENTS.....	33
4.2.3 TEST PROCEDURES.....	34
4.2.4 DEVIATION FROM TEST STANDARD.....	34
4.2.5 TEST SETUP.....	34
4.2.6 EUT OPERATING CONDITIONS.....	34
4.2.7 TEST RESULTS.....	35
4.3 6DB BANDWIDTH MEASUREMENT.....	37
4.3.1 LIMITS OF 6DB BANDWIDTH MEASUREMENT.....	37
4.3.2 TEST SETUP.....	37
4.3.3 TEST INSTRUMENTS.....	37
4.3.4 TEST PROCEDURE.....	37
4.3.5 DEVIATION FROM TEST STANDARD.....	37
4.3.6 EUT OPERATING CONDITIONS.....	37
4.3.7 TEST RESULTS.....	38
4.4 OCCUPIED BANDWIDTH MEASUREMENT.....	40
4.4.1 TEST SETUP.....	40
4.4.2 TEST INSTRUMENTS.....	40



A D T

4.4.3	TEST PROCEDURE	40
4.4.4	DEVIATION FROM TEST STANDARD.....	40
4.4.5	EUT OPERATING CONDITIONS	40
4.4.6	TEST RESULTS.....	41
4.5	CONDUCTED OUTPUT POWER.....	43
4.5.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT.....	43
4.5.2	TEST SETUP	43
4.5.3	TEST INSTRUMENTS	43
4.5.4	TEST PROCEDURES.....	43
4.5.5	DEVIATION FROM TEST STANDARD.....	44
4.5.6	EUT OPERATING CONDITIONS	44
4.5.7	TEST RESULTS.....	45
4.6	POWER SPECTRAL DENSITY MEASUREMENT	46
4.6.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	46
4.6.2	TEST SETUP	46
4.6.3	TEST INSTRUMENTS	46
4.6.4	TEST PROCEDURE	47
4.6.5	DEVIATION FROM TEST STANDARD.....	47
4.6.6	EUT OPERATING CONDITION.....	47
4.6.7	TEST RESULTS.....	48
4.7	CONDUCTED OUT OF BAND EMISSION MEASUREMENT.....	51
4.7.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT	51
4.7.2	TEST SETUP	51
4.7.3	TEST INSTRUMENTS	51
4.7.4	TEST PROCEDURE	52
4.7.5	DEVIATION FROM TEST STANDARD.....	52
4.7.6	EUT OPERATING CONDITION.....	52
4.7.7	TEST RESULTS.....	52
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	61
6.	INFORMATION ON THE TESTING LABORATORIES	62
7.	APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	63



A D T

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF150112C13B	Original release	Nov. 03, 2015



A D T

1. CERTIFICATION

PRODUCT: HD Day/Night Wi-Fi Cloud Camera

MODEL NO.: NC230

BRAND: TP-LINK

APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.

TESTED: Jan. 15 ~ Jul. 29, 2015

TEST SAMPLE: Prototype

STANDARDS: 47 CFR FCC Part 15, Subpart C (Section 15.247)

Canada RSS-247 Issue 1 (2015-05)

Canada RSS-Gen Issue 4 (2014-11)

ANSI C63.10:2013

The above equipment (model: NC230) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Suntee Liu , **DATE :** Nov. 03, 2015
Suntee Liu / Specialist

APPROVED BY : Ken Liu , **DATE :** Nov. 03, 2015
Ken Liu / Senior Manager



A D T

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

Applied Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247); RSS-247; RSS-Gen				
Standard Section		Test Type and Limit	Result	Remark
FCC Part 15	Canada Standard			
15.207	RSS-Gen 8.8	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -18.68dB at 0.15687MHz.
-	RSS-Gen 6.6	Occupied Bandwidth Measurement	PASS	Meet the requirement of limit.
15.247(d)	-	Antenna Port Emission	PASS	Meet the requirement of limit.
15.205 / 15.209 / 15.247(d)	RSS-247 5.5	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2483.50MHz.
15.247(a)(2)	RSS-247 5.2 (1)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	RSS-247 5.4 (4)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	RSS-247 5.2 (2)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	-	Antenna Requirement	PASS	No antenna connector is used.

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	HD Day/Night Wi-Fi Cloud Camera
MODEL NO.	NC230
TEST SOFTWARE	Telnet
POWER SUPPLY	9Vdc (adapter)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, 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 300.0Mbps
OPERATING FREQUENCY	2412 ~ 2462MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
OUTPUT POWER	222.364mW
ANTENNA TYPE	PIFA antenna with 2.86dBi gain
ANTENNA CONNECTOR	N/A
DATA CABLE	N/A
I/O PORTS	Refer to user's manual
ACCESSORY DEVICE	Adapter

NOTE:

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

MODULATION MODE	TX FUNCTION
802.11b	2TX
802.11g	2TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX

2. The EUT consumes power from following adapter.

Brand	TP-LINK TECHNOLOGIES CO., LTD.
Model	T090060-2B1
Input Power	100-240Vac, 50/60Hz, 0.3A
Output Power	9Vdc, 0.6A
Power Line	1.5m DC cable without core attached on adapter



A D T

3. The power settings are list as below.

Power Setting					
	802.11b	802.11g	802.11n (20MHz)		802.11n (40MHz)
CH 1	25	9	10	CH 3	8
CH 6	25	25	26	CH 6	16
CH 11	25	15	17	CH 9	11

4. The above EUT information is declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		



3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

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)
-	802.11g	1 to 11	6	OFDM	BPSK	6.0

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)
-	802.11g	1 to 11	6	OFDM	BPSK	6.0



BANDEDGE MEASUREMENT:

- 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)
-	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	3 to 9	3, 9	OFDM	BPSK	15.0

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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25 deg. C, 65% RH	120Vac, 60Hz	Chris Lin
RE<1G	26 deg. C, 62% RH	120Vac, 60Hz	Chris Lin
PLC	25 deg. C, 65% RH	120Vac, 60Hz	Chris Lin
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Nick Chen



A D T

3.3 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.

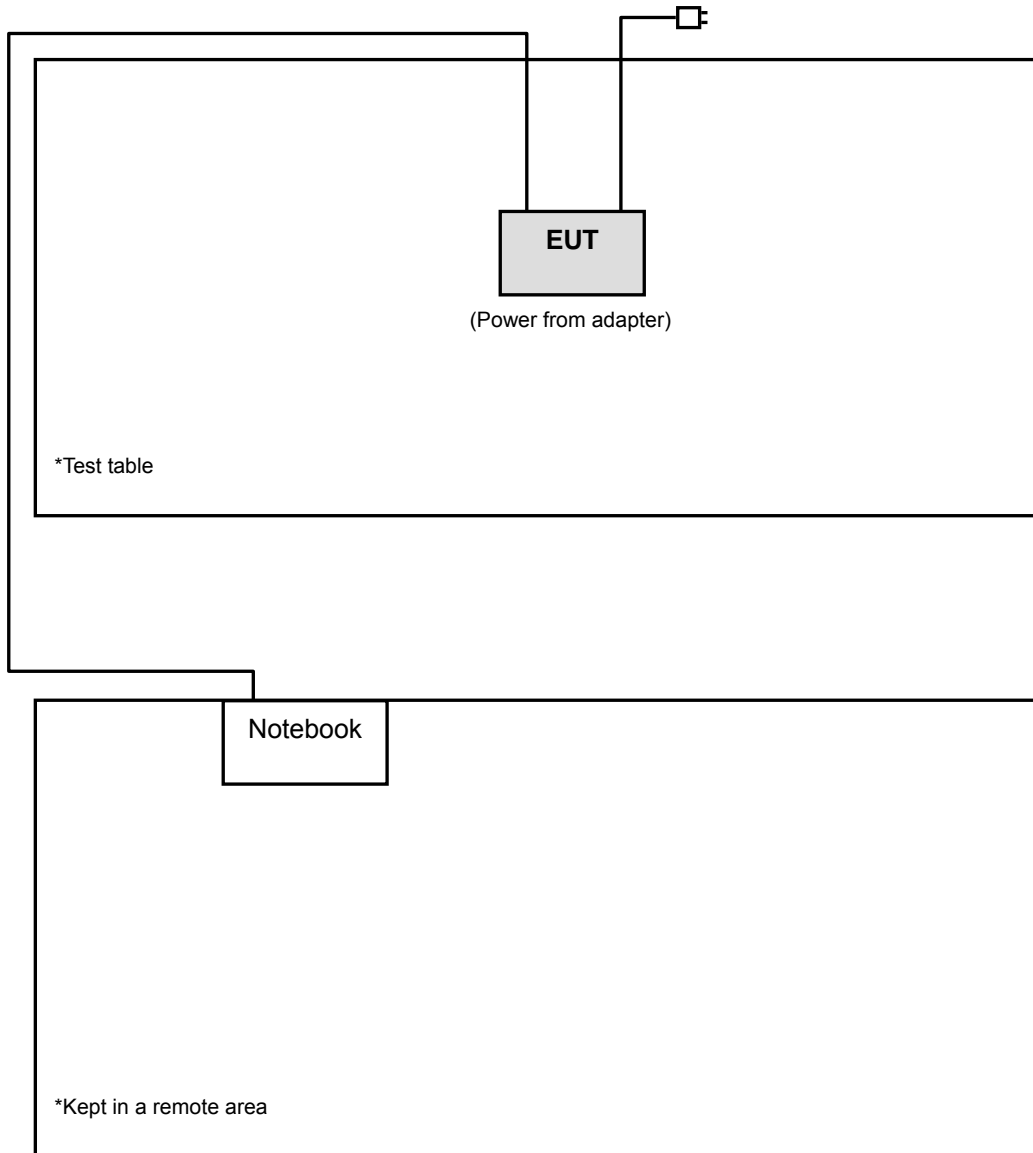
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	D531	CN-0XM006-48643-8 1U-2610	QDS-BRCM1020

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	3m RJ45 UTP cable

NOTE:

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

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST



3.4 DUTY CYCLE OF TEST SIGNAL

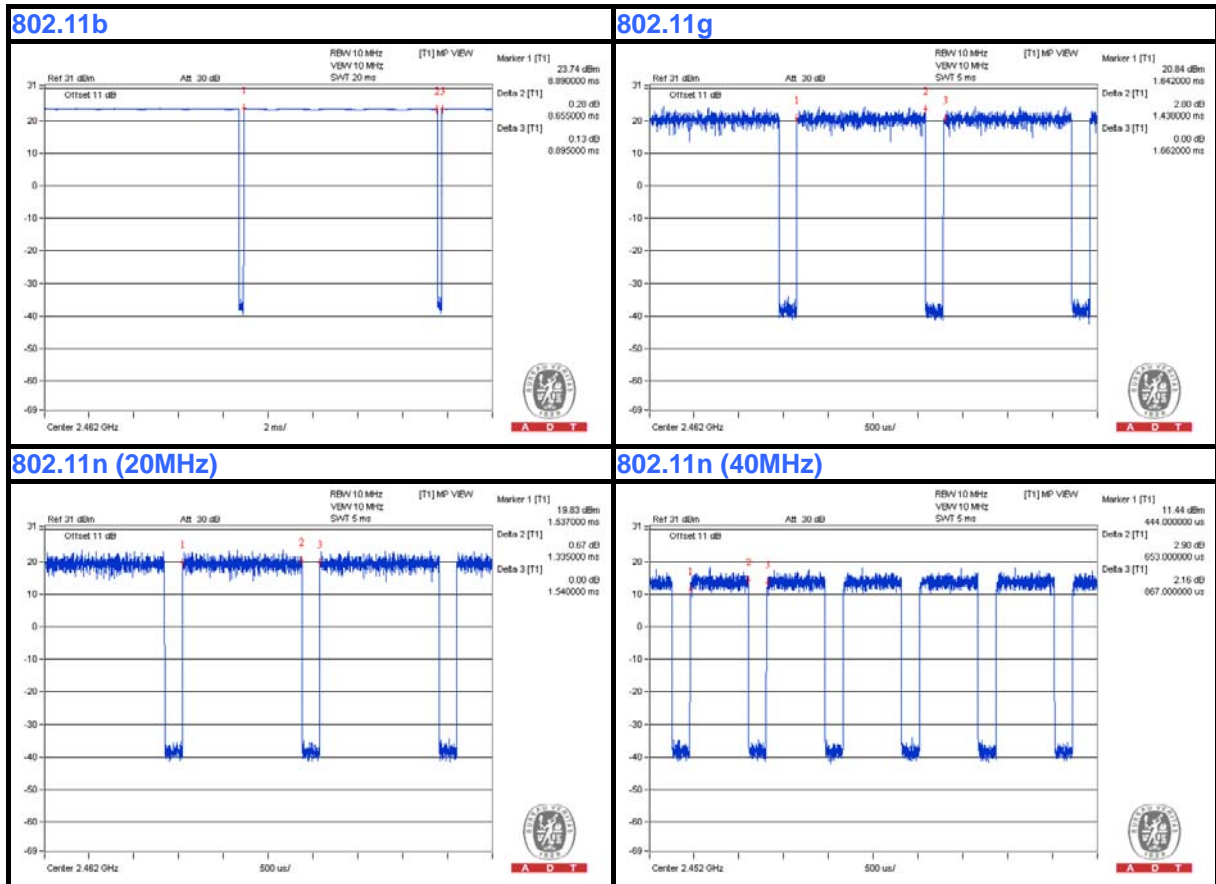
Duty cycle is < 98%, duty factor shall be considered.

802.11b: Duty cycle = $8.655/8.895 = 0.973$, Duty factor = $10 * \log(1/0.973) = 0.12$

802.11g: Duty cycle = $1.438/1.662 = 0.865$, Duty factor = $10 * \log(1/0.865) = 0.63$

802.11n (20MHz): Duty cycle = $1.335/1.540 = 0.867$, Duty factor = $10 * \log(1/0.867) = 0.62$

802.11n (40MHz): Duty cycle = $0.653/0.867 = 0.753$, Duty factor = $10 * \log(1/0.753) = 1.23$





A D T

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)

558074 D01 DTS Meas Guidance v03r03

662911 D01 Multiple Transmitter Output v02r01

Canada RSS-247 Issue 1 (2015-05)

Canada RSS-Gen Issue 4 (2014-11)

ANSI C63.10:2013

All test items have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



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.



A D T

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 06, 2014	Oct. 05, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Jul. 08, 2014	Jul. 07, 2015
			Jul. 08, 2015	Jul. 07, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Feb. 26, 2015	Feb. 25, 2015
			Feb. 06, 2015	Feb. 05, 2016
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Aug. 25, 2014	Aug. 24, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 20, 2014	Feb. 19, 2015
			Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01961	Oct. 18, 2014	Oct. 17, 2015
Preamplifier Agilent	8447D	2944A10738	Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 09, 2014	Aug. 08, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table BV ADT	TT100.	TT93021704	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021704	NA	NA
High Speed Peak Power Meter	ML2495A	0824011	Jul. 26, 2014	Jul. 25, 2015
			Jul. 09, 2015	Jul. 08, 2016
Power Sensor	MA2411B	0738171	Jul. 26, 2014	Jul. 25, 2015
			Jul. 09, 2015	Jul. 08, 2016

- 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 4.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 460141.
 5. The IC Site Registration No. is IC7450F-4.



A D T

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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:

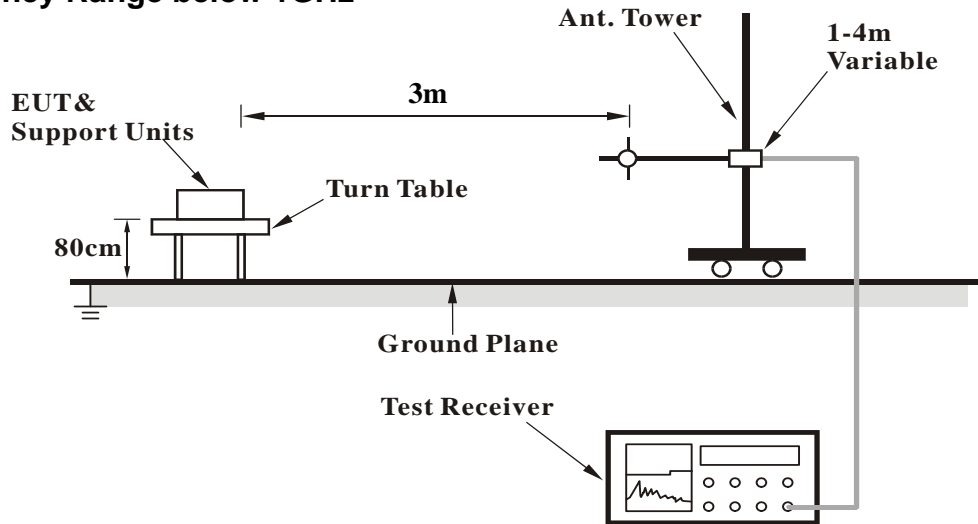
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

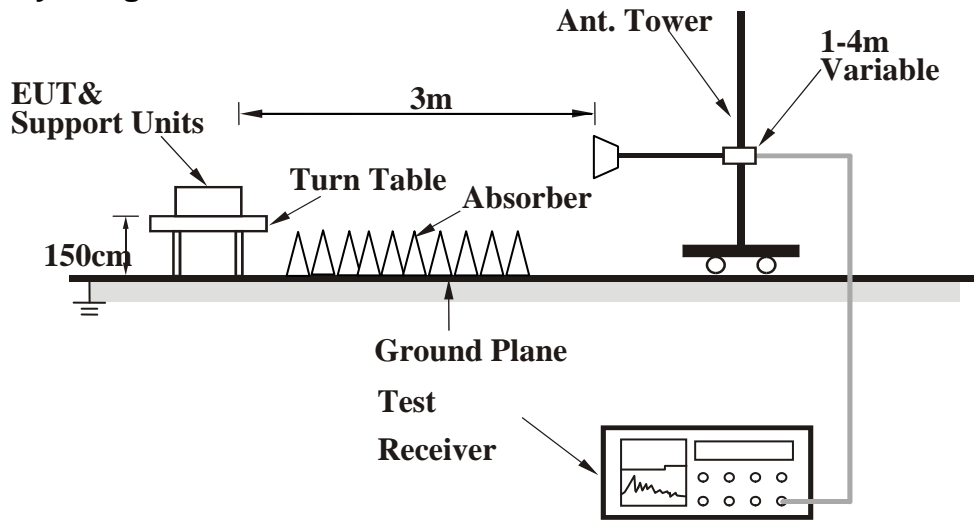
No deviation.

4.1.5 TEST SETUP

Frequency Range below 1GHz



Frequency Range above 1GHz



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



A D T

4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on the testing table.
- b. Prepared a notebook to act as 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".



A D T

4.1.7 TEST RESULT

ABOVE 1GHz WORST-CASE DATA :

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.9 PK	74.0	-10.1	1.03 H	217	31.70	32.20
2	2390.00	48.5 AV	54.0	-5.5	1.03 H	217	16.30	32.20
3	*2412.00	109.7 PK			1.01 H	228	77.50	32.20
4	*2412.00	106.2 AV			1.01 H	228	74.00	32.20
5	4824.00	50.9 PK	74.0	-23.1	1.22 H	223	45.30	5.60
6	4824.00	44.9 AV	54.0	-9.1	1.22 H	223	39.30	5.60
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	55.3 PK	74.0	-18.7	1.56 V	300	23.10	32.20
2	2390.00	45.5 AV	54.0	-8.5	1.56 V	300	13.30	32.20
3	*2412.00	105.4 PK			1.47 V	284	73.20	32.20
4	*2412.00	101.8 AV			1.47 V	284	69.60	32.20
5	4824.00	53.6 PK	74.0	-20.4	1.02 V	13	48.00	5.60
6	4824.00	49.9 AV	54.0	-4.1	1.02 V	13	44.30	5.60

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.



A D T

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	*2437.00	109.0 PK			1.01 H	225	76.80	32.20
2	*2437.00	105.2 AV			1.01 H	225	73.00	32.20
3	4874.00	51.6 PK	74.0	-22.4	1.29 H	274	46.00	5.60
4	4874.00	45.1 AV	54.0	-8.9	1.29 H	274	39.50	5.60
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	106.5 PK			1.73 V	6	74.30	32.20
2	*2437.00	102.8 AV			1.73 V	6	70.60	32.20
3	4874.00	52.4 PK	74.0	-21.6	1.62 V	343	46.80	5.60
4	4874.00	47.9 AV	54.0	-6.1	1.62 V	343	42.30	5.60

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.



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.0 PK			1.02 H	224	75.70	32.30
2	*2462.00	104.8 AV			1.02 H	224	72.50	32.30
3	2483.50	58.0 PK	74.0	-16.0	1.05 H	13	25.60	32.40
4	2483.50	45.0 AV	54.0	-9.0	1.05 H	13	12.60	32.40
5	4924.00	51.6 PK	74.0	-22.4	1.28 H	278	46.00	5.60
6	4924.00	46.1 AV	54.0	-7.9	1.28 H	278	40.50	5.60

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	105.6 PK			1.06 V	159	73.30	32.30
2	*2462.00	102.0 AV			1.06 V	159	69.70	32.30
3	2483.50	58.1 PK	74.0	-15.9	1.10 V	125	25.70	32.40
4	2483.50	45.6 AV	54.0	-8.4	1.10 V	125	13.20	32.40
5	4924.00	53.4 PK	74.0	-20.6	1.00 V	95	47.80	5.60
6	4924.00	50.1 AV	54.0	-3.9	1.00 V	95	44.50	5.60

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.



A D T

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.4 PK	74.0	-5.6	1.05 H	204	36.20	32.20
2	2390.00	53.5 AV	54.0	-0.5	1.05 H	204	21.30	32.20
3	*2412.00	109.1 PK			1.01 H	197	76.90	32.20
4	*2412.00	99.2 AV			1.01 H	197	67.00	32.20
5	4824.00	48.2 PK	74.0	-25.8	1.23 H	55	42.60	5.60
6	4824.00	35.0 AV	54.0	-19.0	1.23 H	55	29.40	5.60
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	66.3 PK	74.0	-7.7	1.84 V	4	34.10	32.20
2	2390.00	50.9 AV	54.0	-3.1	1.84 V	4	18.70	32.20
3	*2412.00	105.5 PK			1.77 V	3	73.30	32.20
4	*2412.00	95.9 AV			1.77 V	3	63.70	32.20
5	4824.00	47.2 PK	74.0	-26.8	1.23 V	87	41.60	5.60
6	4824.00	35.7 AV	54.0	-18.3	1.23 V	87	30.10	5.60

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.



A D T

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	*2437.00	112.6 PK			1.02 H	227	80.40	32.20
2	*2437.00	102.6 AV			1.02 H	227	70.40	32.20
3	4874.00	49.3 PK	74.0	-24.7	1.23 H	64	43.70	5.60
4	4874.00	37.2 AV	54.0	-16.8	1.23 H	64	31.60	5.60
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	108.9 PK			1.78 V	16	76.70	32.20
2	*2437.00	99.2 AV			1.78 V	16	67.00	32.20
3	4874.00	49.2 PK	74.0	-24.8	1.05 V	74	43.60	5.60
4	4874.00	36.8 AV	54.0	-17.2	1.05 V	74	31.20	5.60

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.



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.5 PK			1.86 H	217	76.20	32.30
2	*2462.00	98.4 AV			1.86 H	217	66.10	32.30
3	2483.50	71.6 PK	74.0	-2.4	1.00 H	221	39.20	32.40
4	2483.50	53.8 AV	54.0	-0.2	1.00 H	221	21.40	32.40
5	4924.00	47.9 PK	74.0	-26.1	1.23 H	104	42.30	5.60
6	4924.00	34.3 AV	54.0	-19.7	1.23 H	104	28.70	5.60

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	104.4 PK			1.59 V	141	72.10	32.30
2	*2462.00	95.0 AV			1.59 V	141	62.70	32.30
3	2483.50	71.7 PK	74.0	-2.3	1.59 V	141	39.30	32.40
4	2483.50	53.0 AV	54.0	-1.0	1.59 V	141	20.60	32.40
5	4924.00	47.5 PK	74.0	-26.5	1.23 V	97	41.90	5.60
6	4924.00	36.8 AV	54.0	-17.2	1.23 V	97	31.20	5.60

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.



A D T

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.1 PK	74.0	-3.9	1.04 H	202	37.90	32.20
2	2390.00	53.5 AV	54.0	-0.5	1.04 H	202	21.30	32.20
3	*2412.00	107.2 PK			1.03 H	200	75.00	32.20
4	*2412.00	97.8 AV			1.03 H	200	65.60	32.20
5	4824.00	48.2 PK	74.0	-25.8	1.23 H	58	42.60	5.60
6	4824.00	33.5 AV	54.0	-20.5	1.23 H	58	27.90	5.60
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	1.54 V	20	33.50	32.20
2	2390.00	50.9 AV	54.0	-3.1	1.54 V	20	18.70	32.20
3	*2412.00	102.4 PK			1.47 V	0	70.20	32.20
4	*2412.00	93.1 AV			1.47 V	0	60.90	32.20
5	4824.00	47.9 PK	74.0	-26.1	1.23 V	87	42.30	5.60
6	4824.00	36.2 AV	54.0	-17.8	1.23 V	87	30.60	5.60

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.



A D T

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	*2437.00	111.5 PK			1.00 H	201	79.30	32.20
2	*2437.00	102.2 AV			1.00 H	201	70.00	32.20
3	4874.00	49.3 PK	74.0	-24.7	1.05 H	19	43.70	5.60
4	4874.00	37.1 AV	54.0	-16.9	1.05 H	19	31.50	5.60
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	109.3 PK			1.45 V	19	77.10	32.20
2	*2437.00	99.9 AV			1.45 V	19	67.70	32.20
3	4874.00	49.2 PK	74.0	-24.8	1.22 V	36	43.60	5.60
4	4874.00	36.8 AV	54.0	-17.2	1.22 V	36	31.20	5.60

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.



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.8 PK			1.02 H	200	72.50	32.30
2	*2462.00	95.9 AV			1.02 H	200	63.60	32.30
3	2483.50	68.9 PK	74.0	-5.1	1.03 H	217	36.50	32.40
4	2483.50	53.5 AV	54.0	-0.5	1.03 H	217	21.10	32.40
5	4924.00	48.3 PK	74.0	-25.7	1.05 H	132	42.70	5.60
6	4924.00	33.5 AV	54.0	-20.5	1.05 H	132	27.90	5.60
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	103.5 PK			1.59 V	140	71.20	32.30
2	*2462.00	93.8 AV			1.59 V	140	61.50	32.30
3	2483.50	69.8 PK	74.0	-4.2	1.50 V	156	37.40	32.40
4	2483.50	53.5 AV	54.0	-0.5	1.50 V	156	21.10	32.40
5	4924.00	48.2 PK	74.0	-25.8	1.14 V	51	42.60	5.60
6	4924.00	36.8 AV	54.0	-17.2	1.14 V	51	31.20	5.60

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.



A D T

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.6 PK	74.0	-7.4	1.05 H	225	34.40	32.20
2	2390.00	53.7 AV	54.0	-0.3	1.05 H	225	21.50	32.20
3	*2422.00	101.4 PK			1.04 H	227	69.10	32.30
4	*2422.00	92.9 AV			1.04 H	227	60.60	32.30
5	4844.00	48.2 PK	74.0	-25.8	1.07 H	44	42.60	5.60
6	4844.00	33.5 AV	54.0	-20.5	1.07 H	44	27.90	5.60
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	66.8 PK	74.0	-7.2	1.85 V	152	34.60	32.20
2	2390.00	51.4 AV	54.0	-2.6	1.85 V	152	19.20	32.20
3	*2422.00	97.5 PK			1.94 V	141	65.20	32.30
4	*2422.00	88.0 AV			1.94 V	141	55.70	32.30
5	4844.00	48.3 PK	74.0	-25.7	1.23 V	84	42.70	5.60
6	4844.00	36.9 AV	54.0	-17.1	1.23 V	84	31.30	5.60

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.



A D T

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	68.4 PK	74.0	-5.6	1.04 H	228	36.20	32.20
2	2390.00	53.7 AV	54.0	-0.3	1.04 H	228	21.50	32.20
3	*2437.00	105.0 PK			1.02 H	200	72.80	32.20
4	*2437.00	95.0 AV			1.02 H	200	62.80	32.20
5	2483.50	63.9 PK	74.0	-10.1	1.00 H	222	31.50	32.40
6	2483.50	49.4 AV	54.0	-4.6	1.00 H	222	17.00	32.40
7	4874.00	47.9 PK	74.0	-26.1	1.08 H	77	42.30	5.60
8	4874.00	34.6 AV	54.0	-19.4	1.08 H	77	29.00	5.60
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	65.9 PK	74.0	-8.1	1.60 V	170	33.70	32.20
2	2390.00	51.6 AV	54.0	-2.4	1.60 V	170	19.40	32.20
3	*2437.00	100.3 PK			1.72 V	160	68.10	32.20
4	*2437.00	90.1 AV			1.72 V	160	57.90	32.20
5	2483.50	65.0 PK	74.0	-9.0	1.64 V	155	32.60	32.40
6	2483.50	49.3 AV	54.0	-4.7	1.64 V	155	16.90	32.40
7	4874.00	48.3 PK	74.0	-25.7	1.23 V	54	42.70	5.60
8	4874.00	37.2 AV	54.0	-16.8	1.23 V	54	31.60	5.60

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.



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	102.0 PK			1.28 H	223	69.70	32.30
2	*2452.00	93.3 AV			1.28 H	223	61.00	32.30
3	2483.50	68.3 PK	74.0	-5.7	1.05 H	220	35.90	32.40
4	2483.50	53.9 AV	54.0	-0.1	1.05 H	220	21.50	32.40
5	4904.00	47.9 PK	74.0	-26.1	1.23 H	64	42.30	5.60
6	4904.00	34.2 AV	54.0	-19.8	1.23 H	64	28.60	5.60
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	99.8 PK			1.15 V	358	67.50	32.30
2	*2452.00	90.2 AV			1.15 V	358	57.90	32.30
3	2483.50	67.2 PK	74.0	-6.8	1.26 V	340	34.80	32.40
4	2483.50	52.9 AV	54.0	-1.1	1.26 V	340	20.50	32.40
5	4904.00	49.2 PK	74.0	-24.8	1.23 V	65	43.60	5.60
6	4904.00	36.8 AV	54.0	-17.2	1.23 V	65	31.20	5.60

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.



A D T

BELOW 1GHz WORST-CASE DATA :**802.11g**

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	107.52	35.1 QP	43.5	-8.4	1.51 H	298	52.50	-17.40
2	206.48	31.5 QP	43.5	-12.0	1.26 H	138	48.00	-16.50
3	359.77	34.1 QP	46.0	-11.9	1.01 H	157	45.70	-11.60
4	456.79	35.5 QP	46.0	-10.5	2.00 H	152	45.10	-9.60
5	743.97	37.3 QP	46.0	-8.7	1.01 H	42	41.00	-3.70
6	889.50	38.3 QP	46.0	-7.7	1.51 H	63	40.10	-1.80
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	47.36	39.0 QP	40.0	-1.0	1.00 V	51	53.00	-14.00
2	142.44	30.8 QP	43.5	-12.7	1.24 V	209	45.00	-14.20
3	336.48	30.6 QP	46.0	-15.4	1.24 V	166	42.50	-11.90
4	551.87	32.1 QP	46.0	-13.9	1.00 V	306	40.40	-8.30
5	743.97	37.9 QP	46.0	-8.1	1.49 V	6	41.60	-3.70
6	916.66	41.7 QP	46.0	-4.3	1.00 V	9	42.80	-1.10

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



A D T

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	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.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100612	Sep. 30, 2014	Sep. 29, 2015
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2014	Feb. 25, 2015
			Feb. 26, 2015	Feb. 25, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 24, 2014	Jul. 23, 2015
			Jul. 24, 2015	Jul. 23, 2016
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

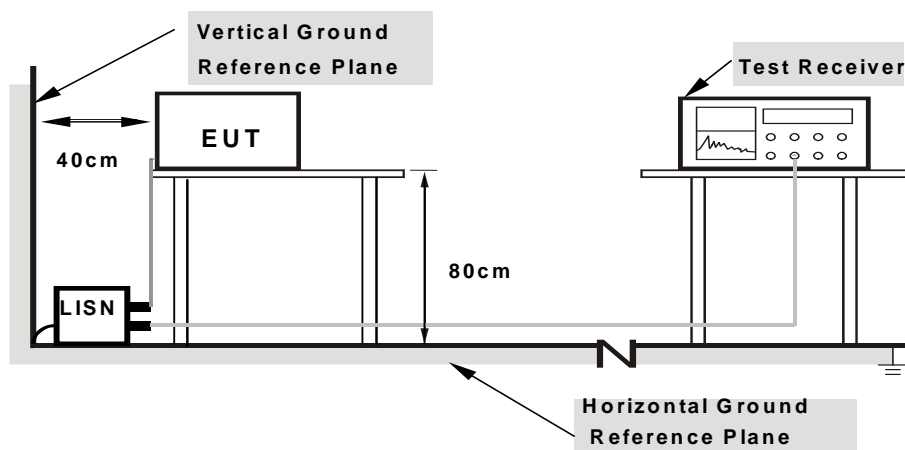
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

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.



A D T

4.2.7 TEST RESULTS

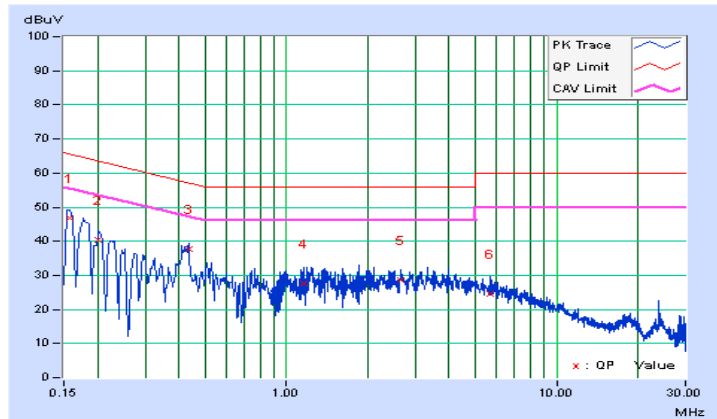
CONDUCTED WORST-CASE DATA : 802.11g

PHASE	Line 1	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15687	0.08	46.87	34.33	46.95	34.41	65.63	55.63	-18.68	-21.22
2	0.20201	0.15	40.34	28.45	40.49	28.60	63.53	53.53	-23.04	-24.93
3	0.43400	0.09	37.74	27.44	37.83	27.53	57.18	47.18	-19.35	-19.65
4	1.16600	0.19	27.57	15.28	27.76	15.47	56.00	46.00	-28.24	-30.53
5	2.63800	0.23	28.54	19.76	28.77	19.99	56.00	46.00	-27.23	-26.01
6	5.71400	0.32	24.38	14.24	24.70	14.56	60.00	50.00	-35.30	-35.44

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.





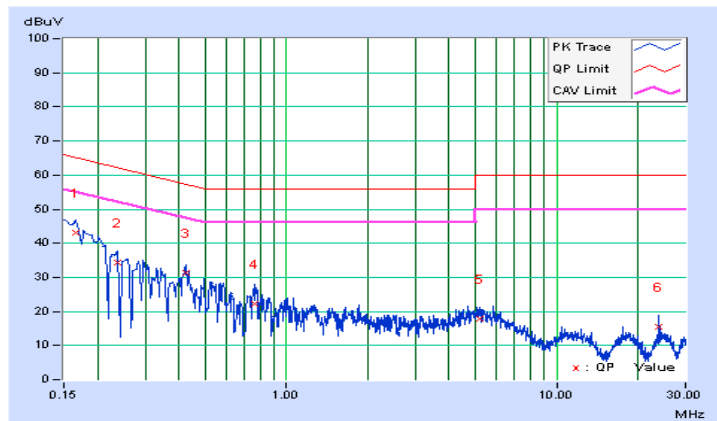
A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16579	0.16	42.88	29.79	43.04	29.95	65.17	55.17	-22.13	-25.22
2	0.23723	0.24	34.18	21.48	34.42	21.72	62.19	52.19	-27.78	-30.48
3	0.42600	0.17	31.11	20.67	31.28	20.84	57.33	47.33	-26.05	-26.49
4	0.76618	0.18	21.98	12.35	22.16	12.53	56.00	46.00	-33.84	-33.47
5	5.18200	0.42	17.31	7.95	17.73	8.37	60.00	50.00	-42.27	-41.63
6	24.00200	0.91	14.45	7.72	15.36	8.63	60.00	50.00	-44.64	-41.37

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.

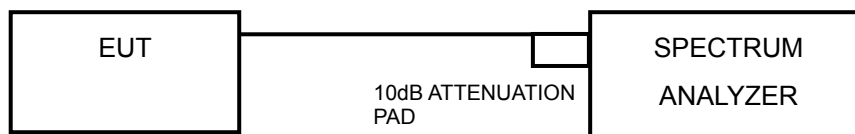


4.3 6dB BANDWIDTH MEASUREMENT

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

558074 D01 DTS Meas Guidance v03r03 section 8.1

- a. Set resolution bandwidth (RBW) = 100kHz
- b. Set the video bandwidth (VBW) $\geq 3 \times$ 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 FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

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



A D T

4.3.7 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	10.12	10.14	0.5	PASS
6	2437	10.10	10.11	0.5	PASS
11	2462	10.11	10.10	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.41	16.41	0.5	PASS
6	2437	16.38	16.39	0.5	PASS
11	2462	16.40	16.38	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.14	17.34	0.5	PASS
6	2437	17.11	17.33	0.5	PASS
11	2462	17.12	17.13	0.5	PASS

802.11n (40MHz)

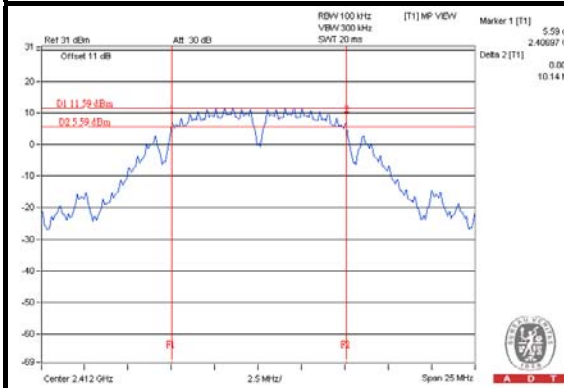
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.32	36.37	0.5	PASS
6	2437	36.27	36.01	0.5	PASS
9	2452	36.43	35.78	0.5	PASS



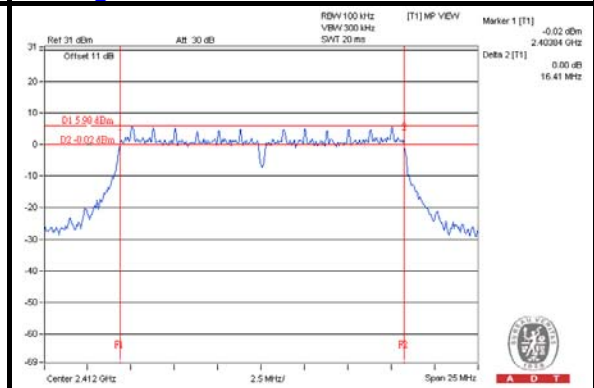
A D T

SPECTRUM PLOT OF WORST VALUE

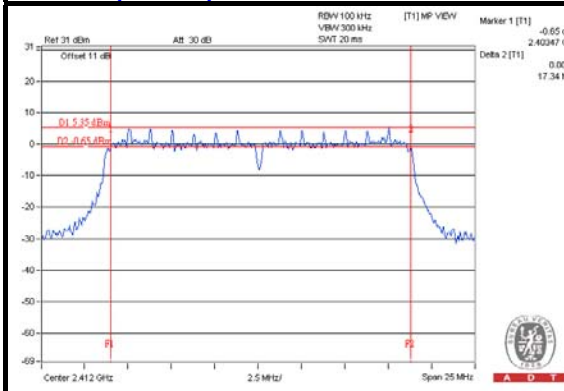
802.11b



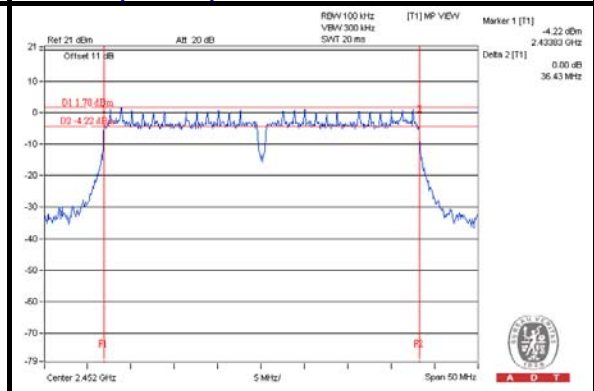
802.11g



802.11n (20MHz)

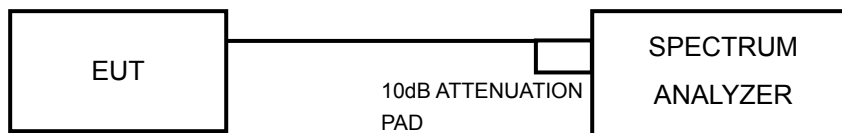


802.11n (40MHz)



4.4 OCCUPIED BANDWIDTH MEASUREMENT

4.4.1 TEST SETUP



4.4.2 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.3 TEST PROCEDURE

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 EUT OPERATING CONDITIONS

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



4.4.6 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
1	2412	12.96	13.20	PASS
6	2437	13.00	13.30	PASS
11	2462	13.00	13.20	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
1	2412	16.92	16.92	PASS
6	2437	23.30	25.10	PASS
11	2462	17.00	17.10	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
1	2412	17.76	17.76	PASS
6	2437	19.90	22.40	PASS
11	2462	17.90	18.00	PASS

802.11n (40MHz)

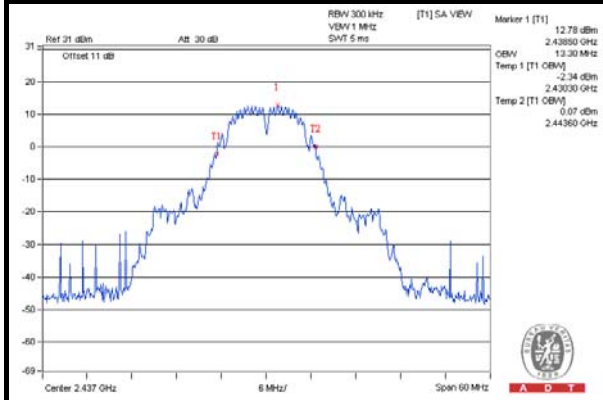
CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
3	2422	36.84	36.72	PASS
6	2437	36.90	36.90	PASS
9	2452	36.80	36.80	PASS



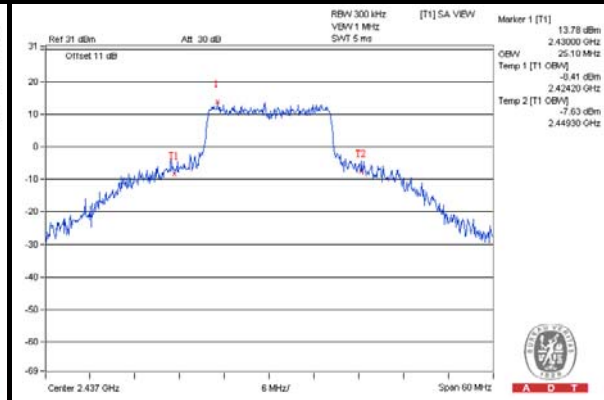
A D T

SPECTRUM PLOT OF WORST VALUE

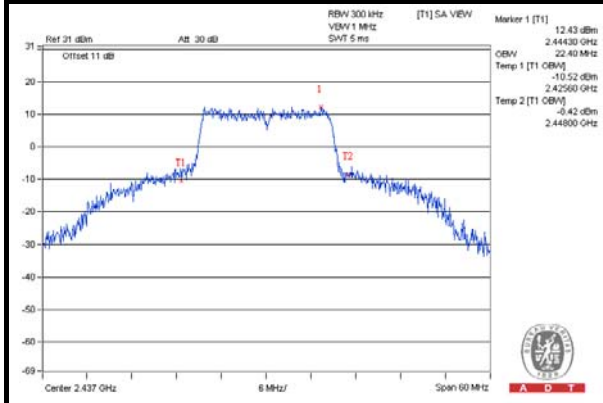
802.11b



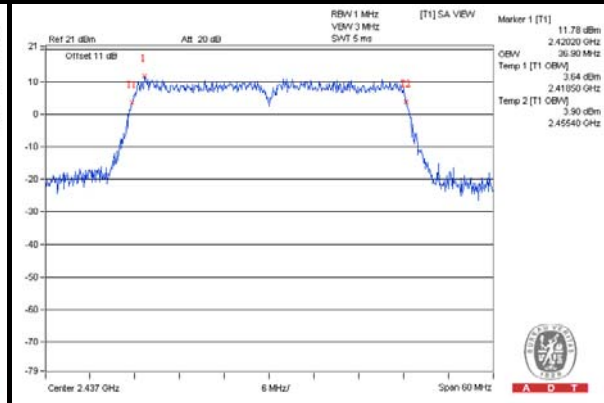
802.11g



802.11n (20MHz)



802.11n (40MHz)



4.5 CONDUCTED OUTPUT POWER

4.5.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

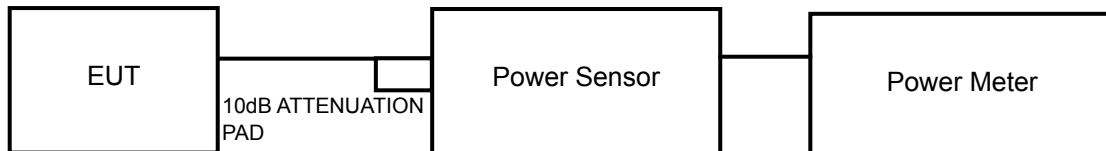
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.5.4 TEST PROCEDURES

558074 D01 DTS Meas Guidance v03r03 section 9.2.3.2

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.



A D T

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.



4.5.7 TEST RESULTS

FOR AVERAGE POWER

802.11b

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)
		CHAIN 0	CHAIN 1			
1	2412	19.53	20.65	205.888	23.14	30
6	2437	19.50	20.24	194.807	22.90	30
11	2462	19.35	19.67	178.782	22.52	30

802.11g

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)
		CHAIN 0	CHAIN 1			
1	2412	14.25	16.77	74.141	18.70	30
6	2437	20.15	20.75	222.364	23.47	30
11	2462	17.23	18.68	126.635	21.03	30

802.11n (20MHz)

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)
		CHAIN 0	CHAIN 1			
1	2412	13.38	15.14	54.436	17.36	30
6	2437	19.18	19.64	174.839	22.43	30
11	2462	16.20	18.15	107.000	20.29	30

802.11n (40MHz)

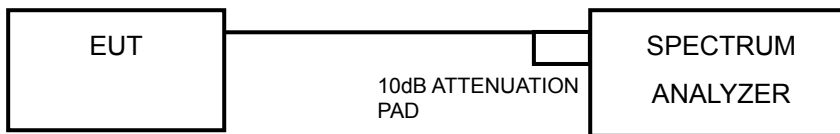
CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)
		CHAIN 0	CHAIN 1			
3	2422	12.12	14.11	42.056	16.24	30
6	2437	15.46	17.35	89.481	19.52	30
9	2452	13.40	14.96	53.211	17.26	30

4.6 POWER SPECTRAL DENSITY MEASUREMENT

4.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.



A D T

4.6.4 TEST PROCEDURE

558074 D01 DTS Meas Guidance v03r03 section 10.3

For AVG. 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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- e) Set VBW $\geq 3 \times \text{RBW}$.
- f) Detector = power averaging (RMS) or sample detector (when RMS not available).
- g) Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
- 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.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6



4.6.7 TEST RESULTS

802.11b

TX chain	Chan.	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD w/o Duty Factor (dBm)	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-7.30	3.01	-4.29	0.12	-4.17	8	PASS
	6	2437	-7.20	3.01	-4.19	0.12	-4.07	8	PASS
	11	2462	-7.59	3.01	-4.58	0.12	-4.46	8	PASS
1	1	2412	-6.62	3.01	-3.61	0.12	-3.49	8	PASS
	6	2437	-6.99	3.01	-3.98	0.12	-3.86	8	PASS
	11	2462	-7.45	3.01	-4.44	0.12	-4.32	8	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 = $2.86\text{dBi} + 10\log(2) = 5.87\text{dBi} < 6\text{dBi}$, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11g

TX chain	Chan.	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD w/o Duty Factor (dBm)	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-14.05	3.01	-11.04	0.63	-10.41	8	PASS
	6	2437	-8.47	3.01	-5.46	0.63	-4.83	8	PASS
	11	2462	-11.16	3.01	-8.15	0.63	-7.52	8	PASS
1	1	2412	-12.34	3.01	-9.33	0.63	-8.70	8	PASS
	6	2437	-8.11	3.01	-5.10	0.63	-4.47	8	PASS
	11	2462	-11.33	3.01	-8.32	0.63	-7.69	8	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 = $2.86\text{dBi} + 10\log(2) = 5.87\text{dBi} < 6\text{dBi}$, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.



802.11n (20MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD w/o Duty Factor (dBm)	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-15.50	3.01	-12.49	0.62	-11.87	8	PASS
	6	2437	-10.28	3.01	-7.27	0.62	-6.65	8	PASS
	11	2462	-12.96	3.01	-9.95	0.62	-9.33	8	PASS
1	1	2412	-14.16	3.01	-11.15	0.62	-10.53	8	PASS
	6	2437	-9.53	3.01	-6.52	0.62	-5.90	8	PASS
	11	2462	-12.39	3.01	-9.38	0.62	-8.76	8	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 = 2.86dBi + 10log(2) = 5.87dBi < 6dBi , so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD w/o Duty Factor (dBm)	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	PASS /FAIL
0	3	2422	-19.56	3.01	-16.55	1.23	-15.32	8	PASS
	6	2437	-16.00	3.01	-12.99	1.23	-11.76	8	PASS
	9	2452	-18.51	3.01	-15.50	1.23	-14.27	8	PASS
1	3	2422	-18.74	3.01	-15.73	1.23	-14.50	8	PASS
	6	2437	-14.71	3.01	-11.70	1.23	-10.47	8	PASS
	9	2452	-17.58	3.01	-14.57	1.23	-13.34	8	PASS

NOTE:

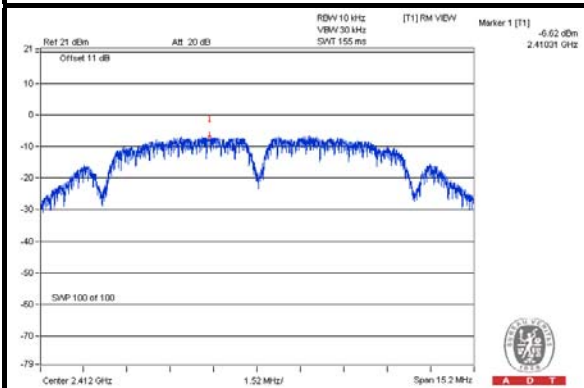
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2.86dBi + 10log(2) = 5.87dBi < 6dBi , so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.



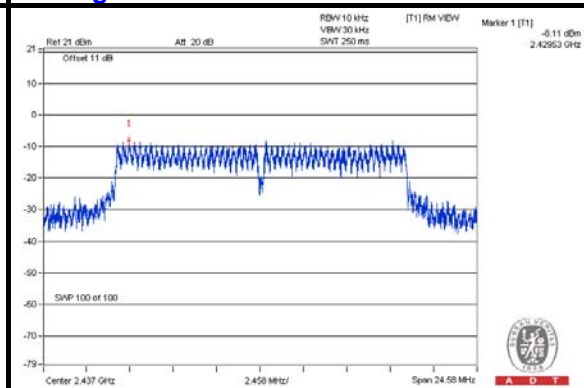
A D T

SPECTRUM PLOT OF WORST VALUE

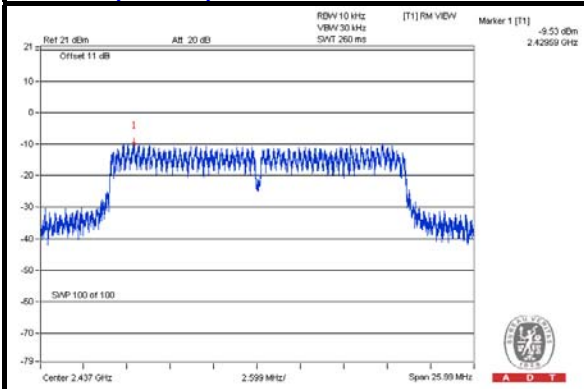
802.11b



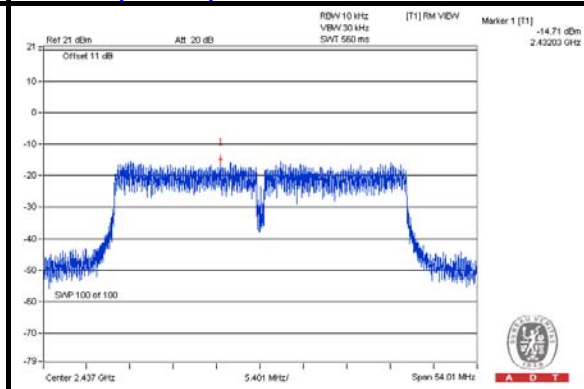
802.11g



802.11n (20MHz)



802.11n (40MHz)

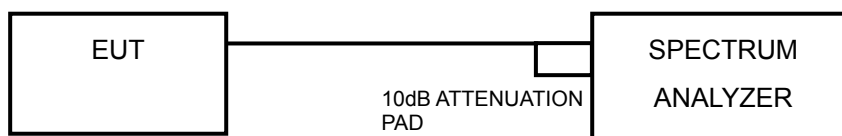


4.7 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.7.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

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

4.7.2 TEST SETUP



4.7.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.



A D T

4.7.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

558074 D01 DTS Meas Guidance v03r03 section 11.2

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

MEASUREMENT PROCEDURE OOB

558074 D01 DTS Meas Guidance v03r03 section 11.3

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Ensure that the number of measurement points \geq span/RBW
4. According to measurement points to set differ measurement span.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.

4.7.5 DEVIATION FROM TEST STANDARD

No deviation.

4.7.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.7.7 TEST RESULTS

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

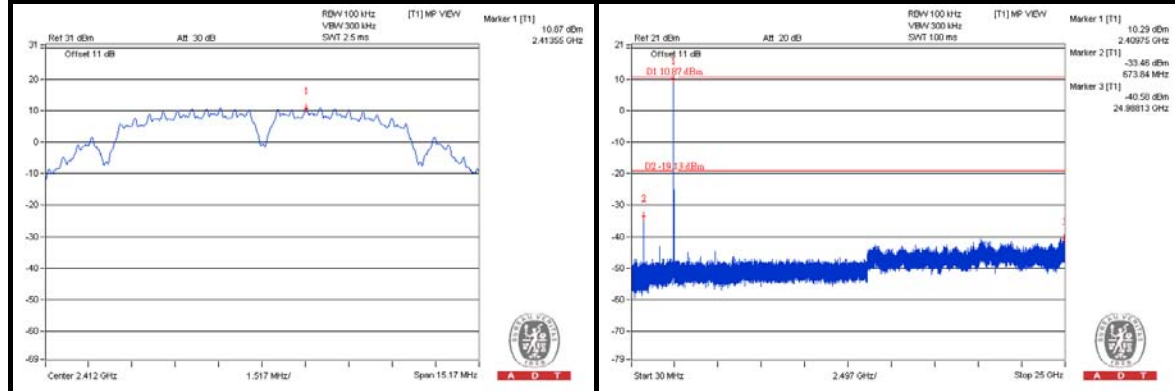
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.



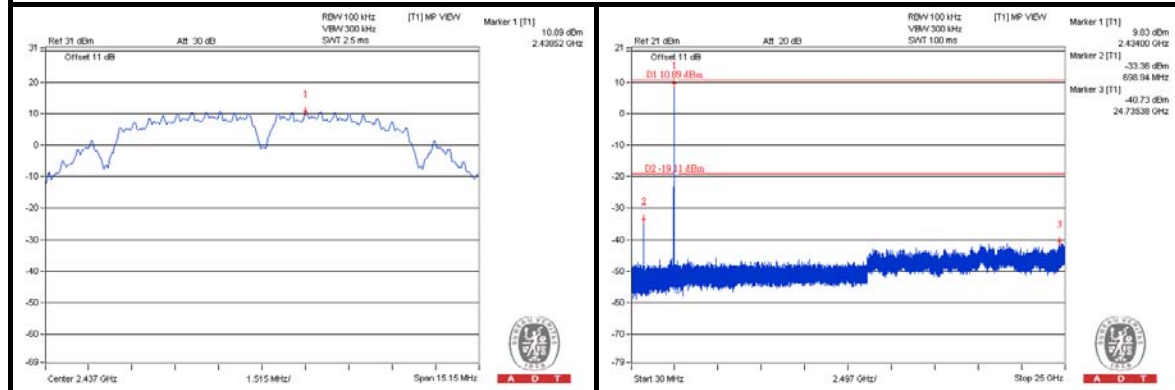
A D T

802.11b CHAIN 0

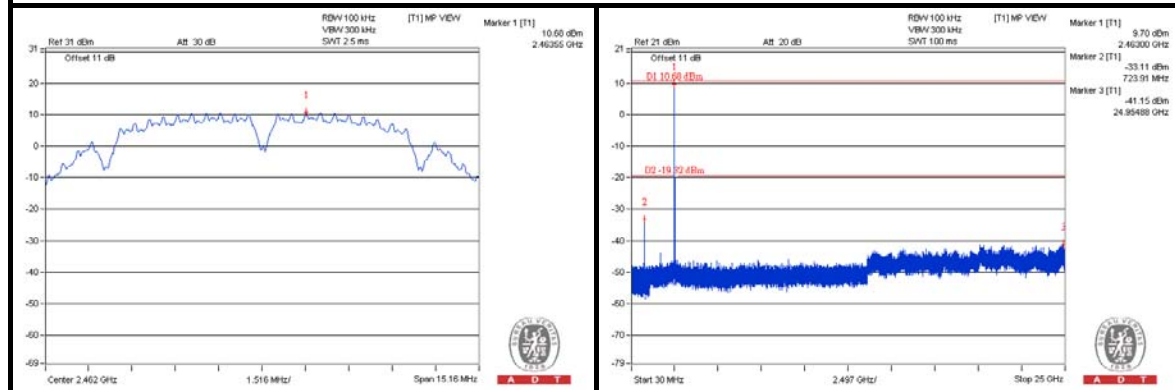
CH 1



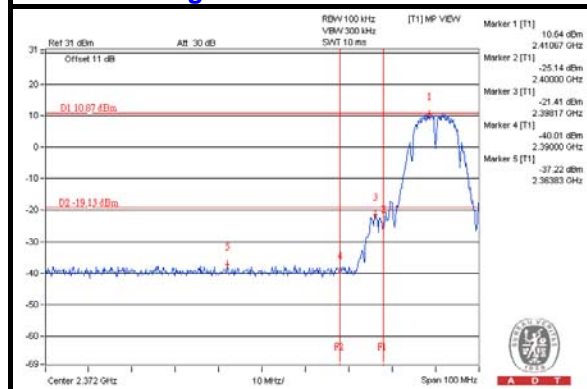
CH 6



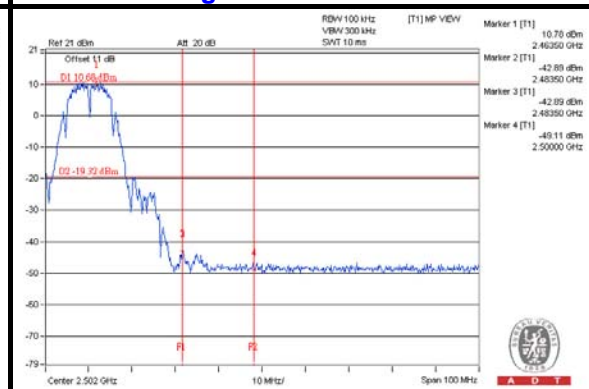
CH 11



CH 1 Band edge



CH 11 Band edge

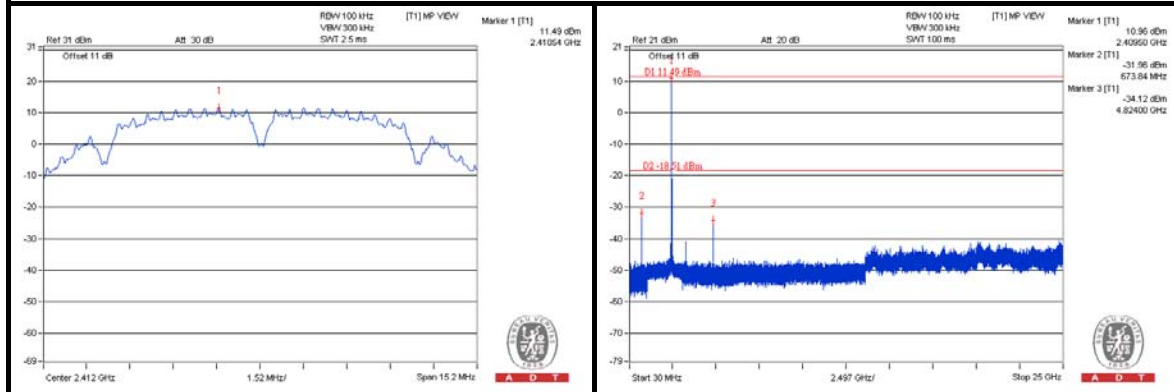




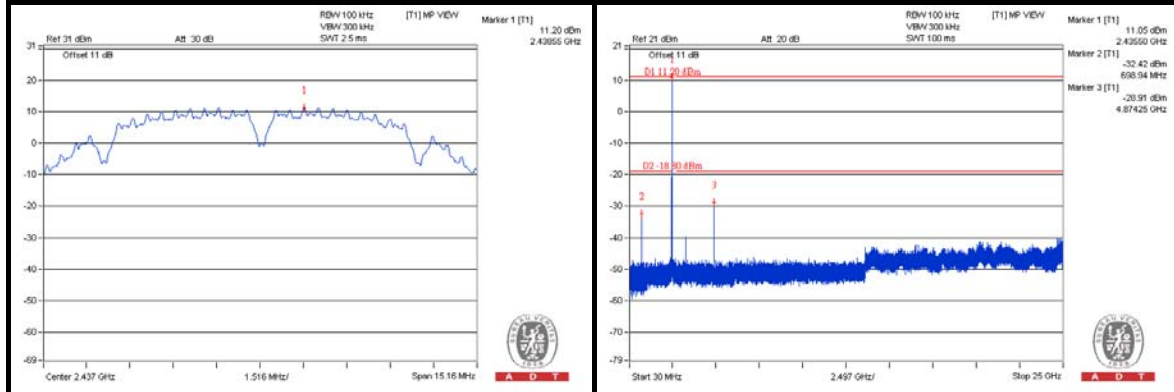
A D T

CHAIN 1

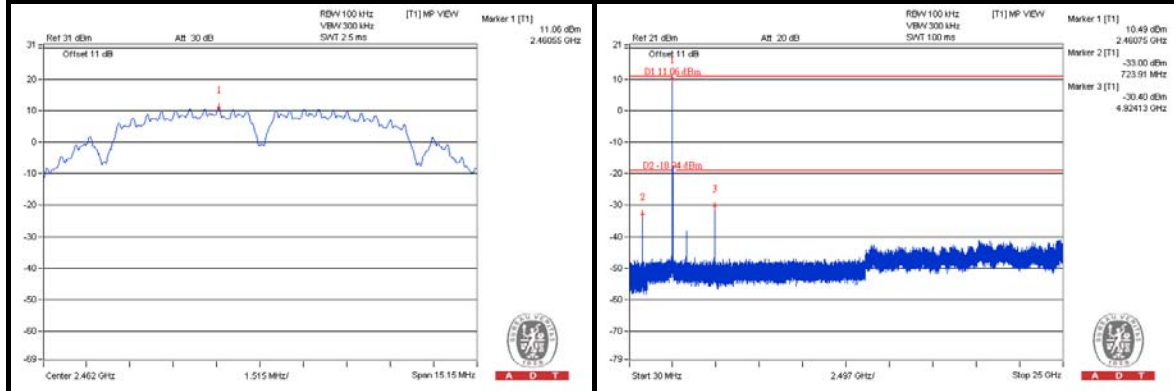
CH 1



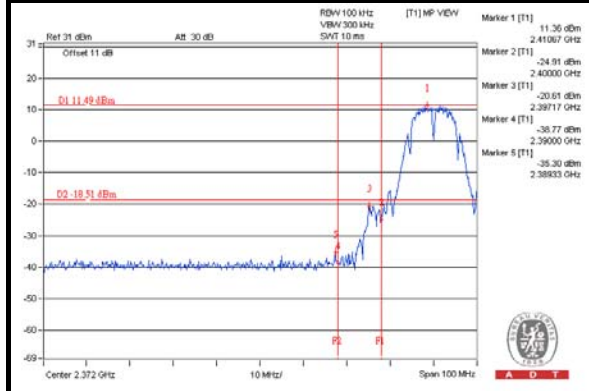
CH 6



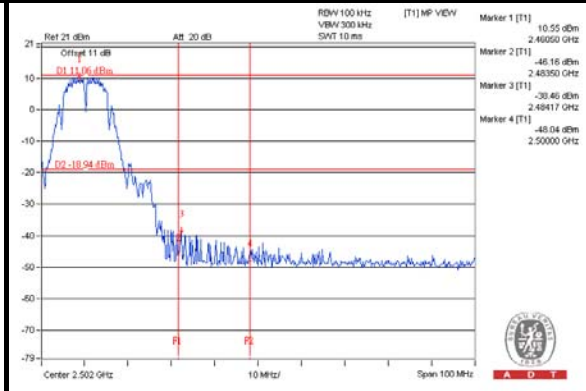
CH 11



CH 1 Band edge



CH 11 Band edge

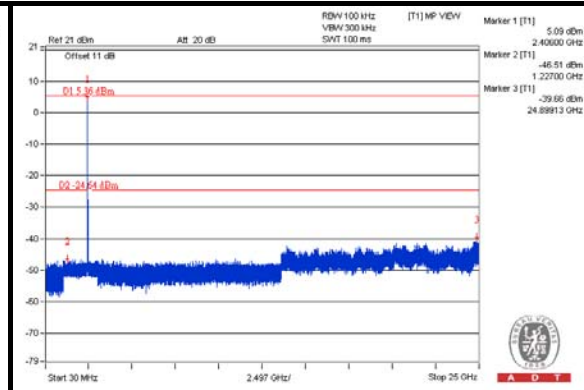
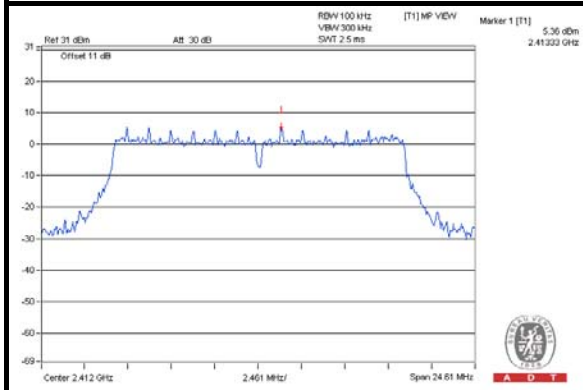




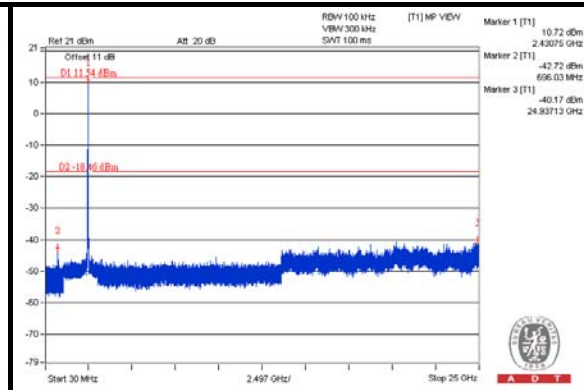
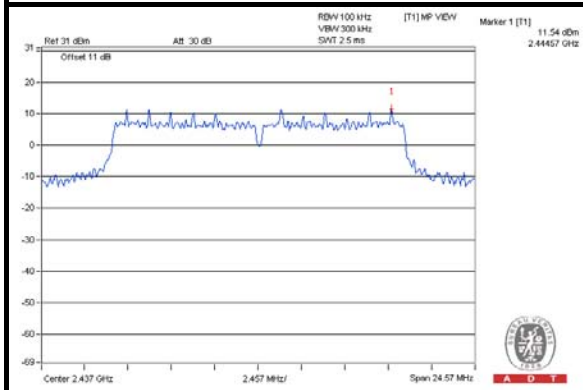
A D T

802.11g CHAIN 0

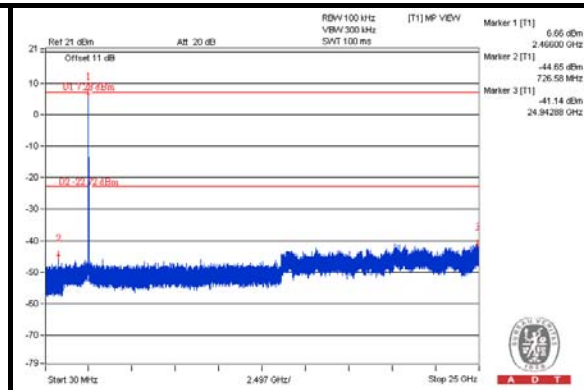
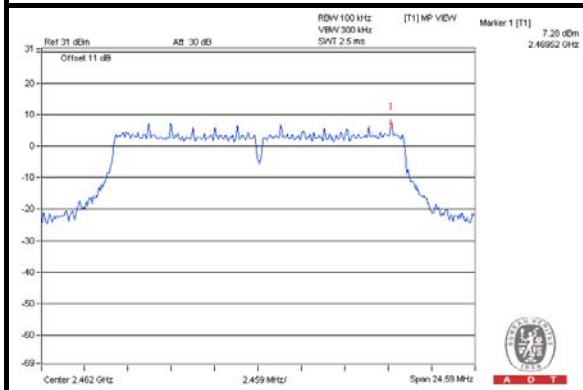
CH 1



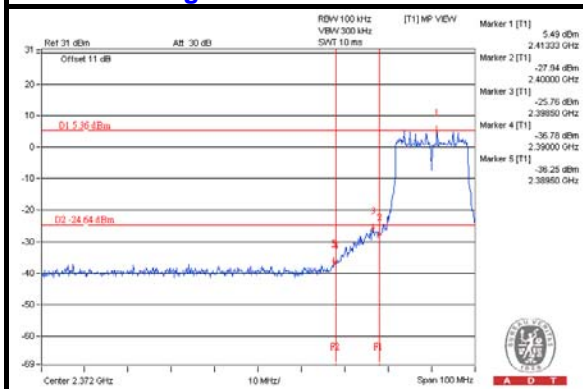
CH 6



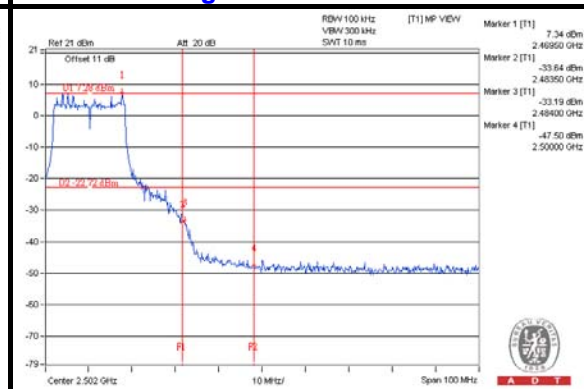
CH 11



CH 1 Band edge



CH 11 Band edge

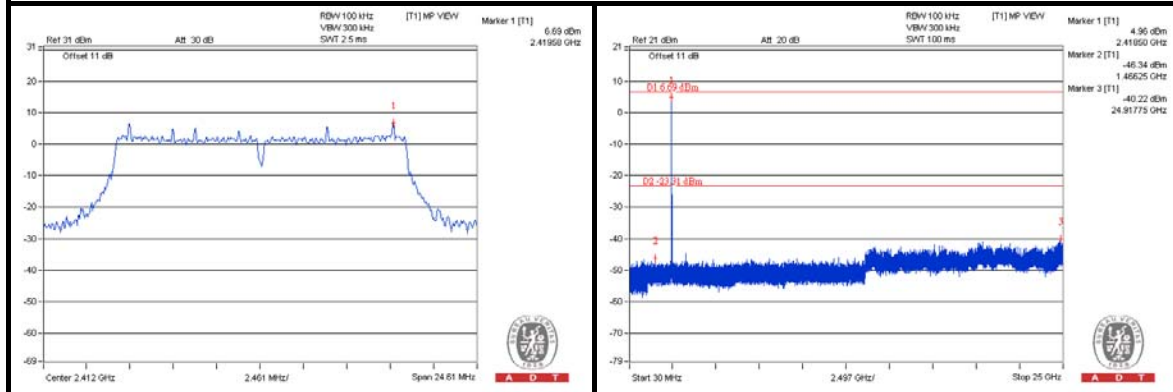




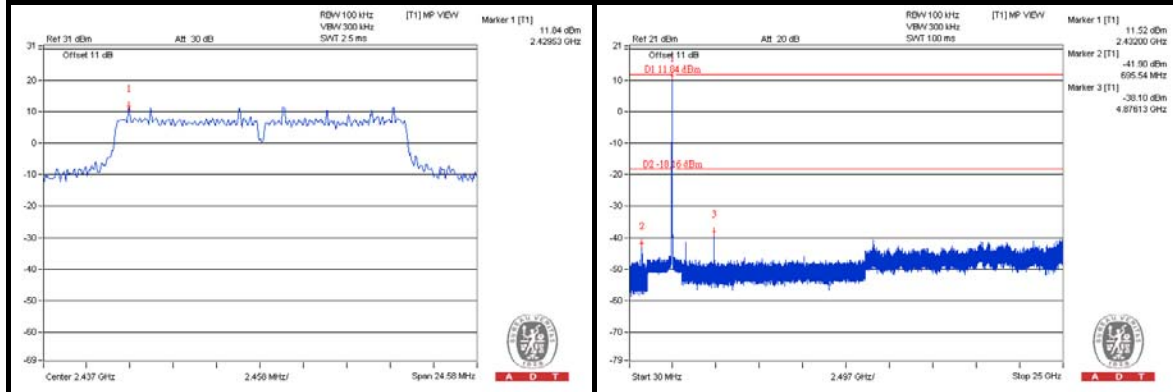
A D T

CHAIN 1

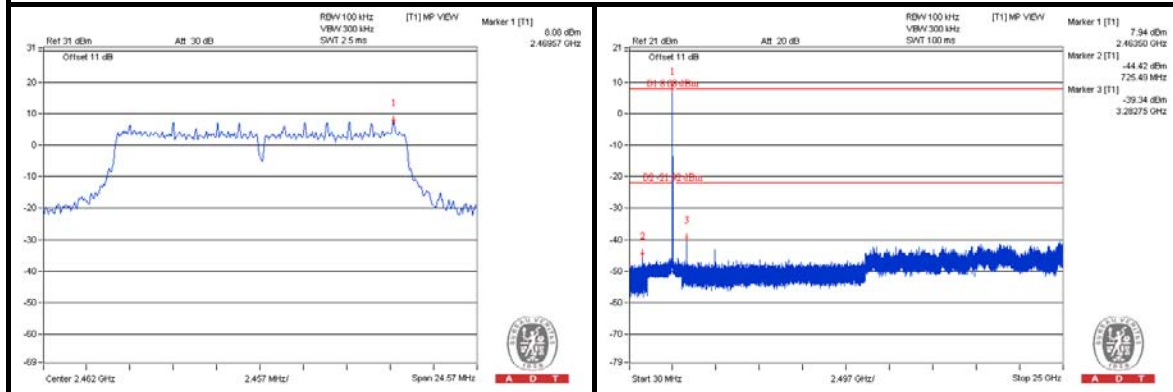
CH 1



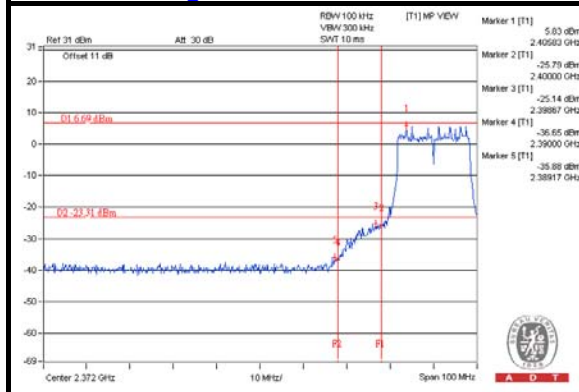
CH 6



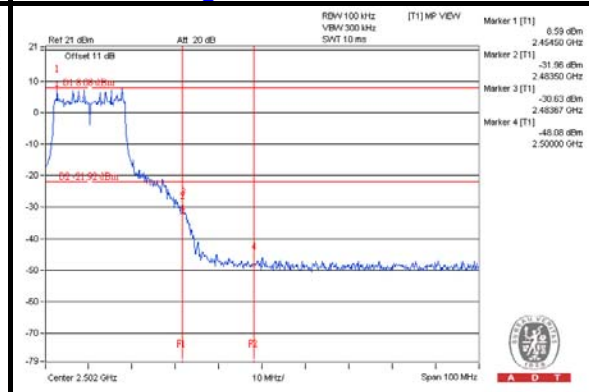
CH 11



CH 1 Band edge



CH 11 Band edge



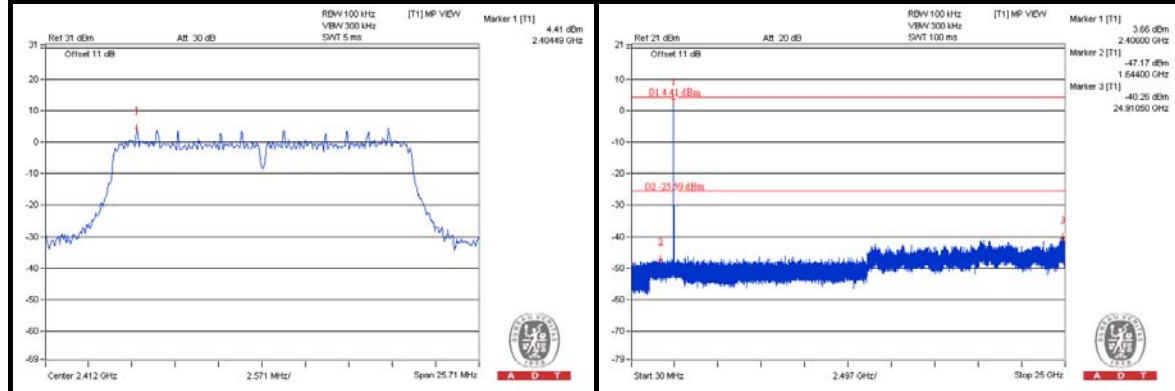


A D T

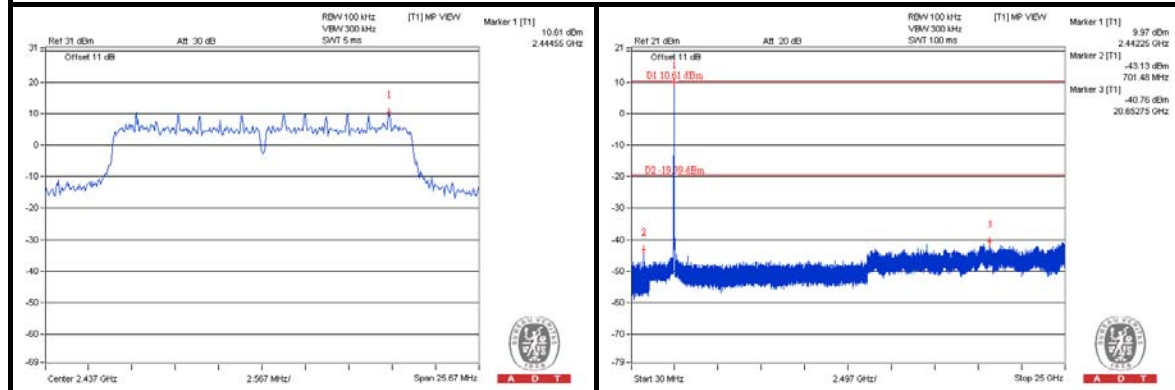
802.11n (20MHz)

CHAIN 0

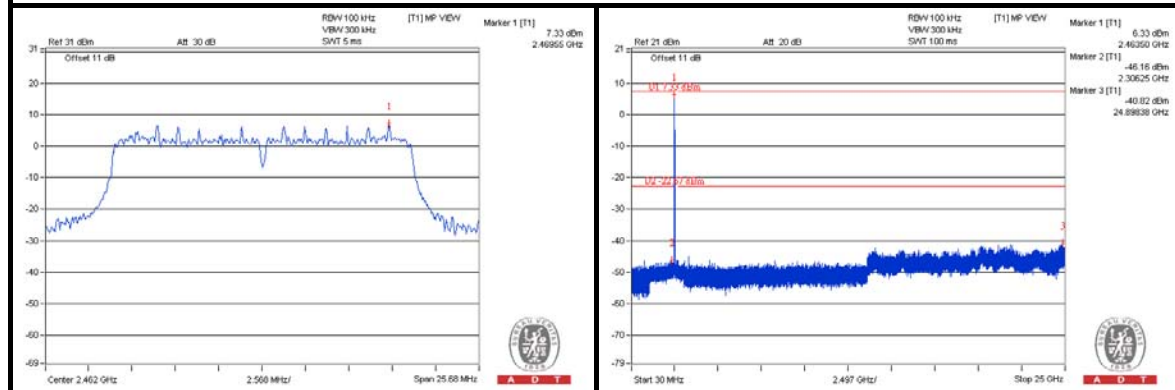
CH 1



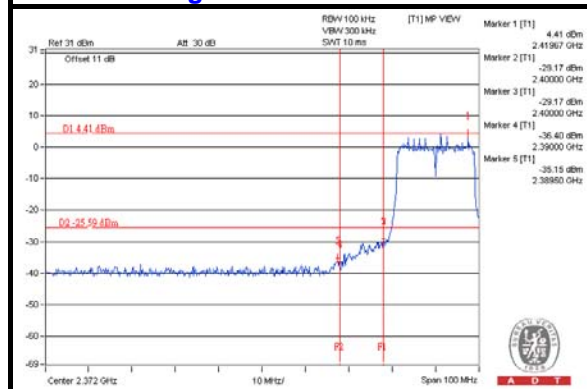
CH 6



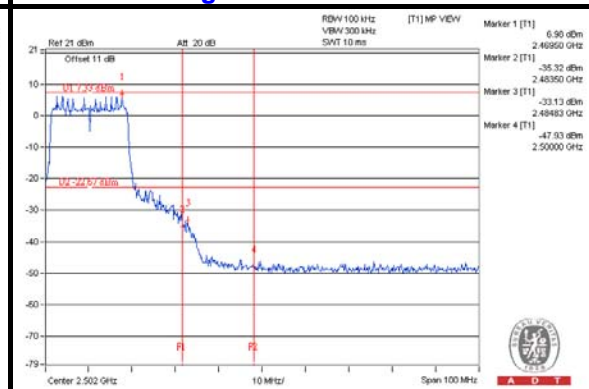
CH 11



CH 1 Band edge



CH 11 Band edge

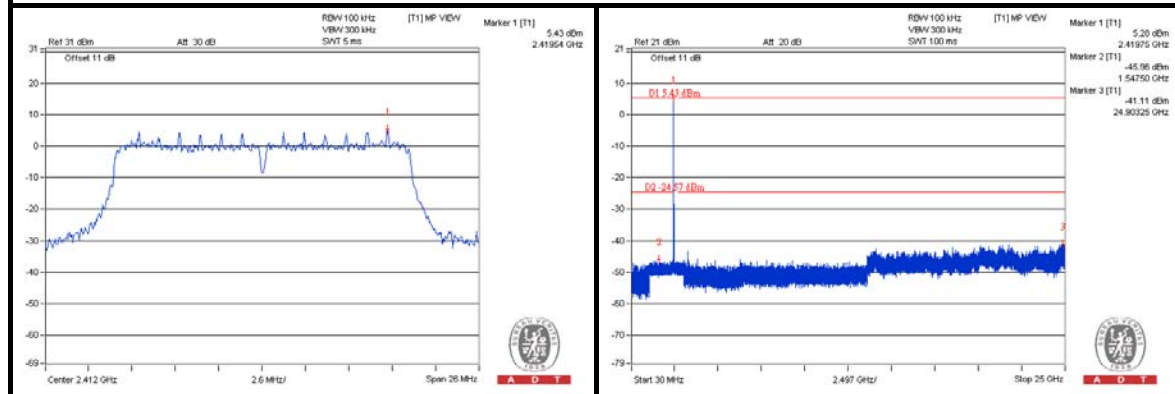




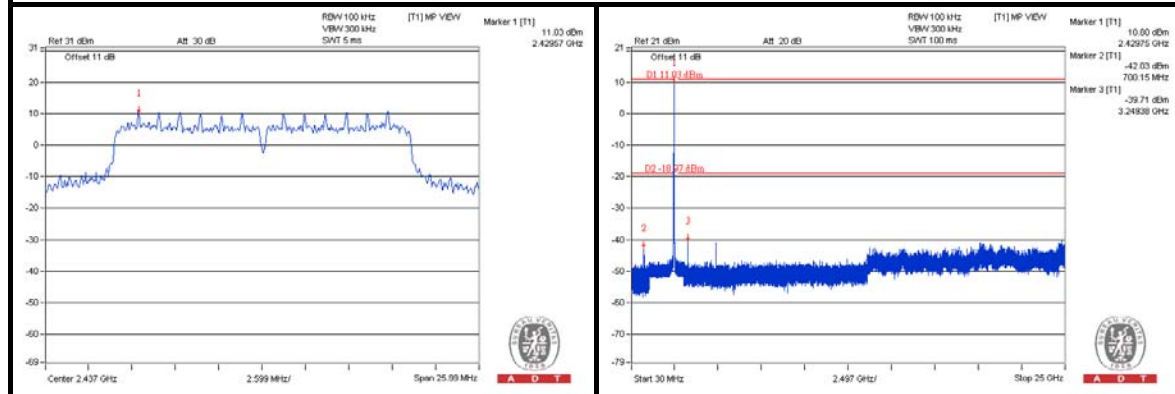
A D T

CHAIN 1

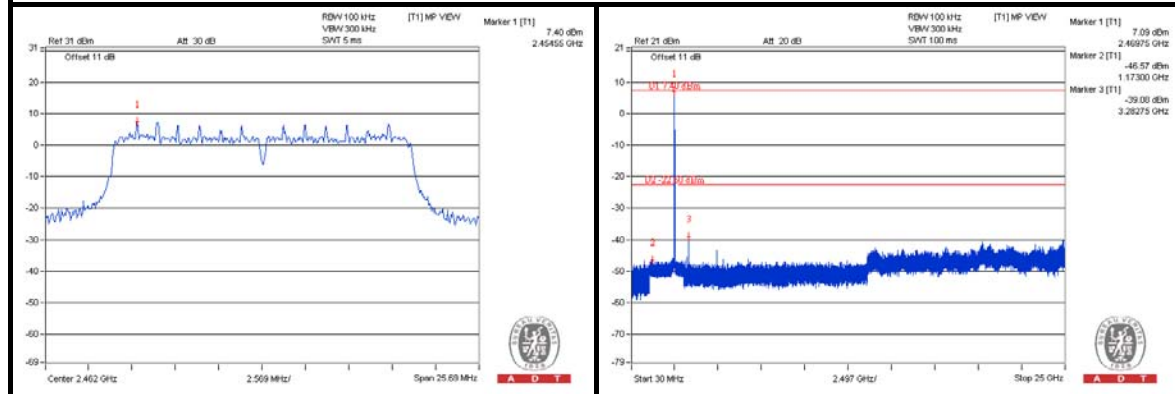
CH 1



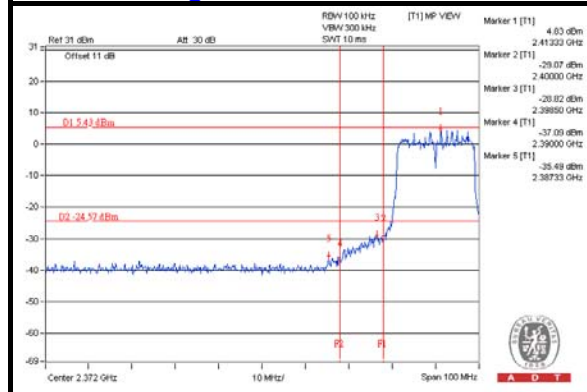
CH 6



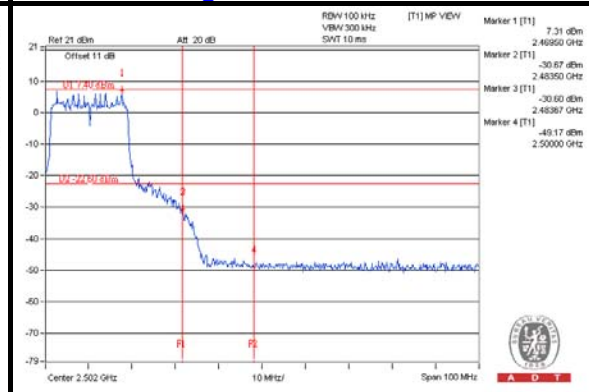
CH 11



CH 1 Band edge



CH 11 Band edge



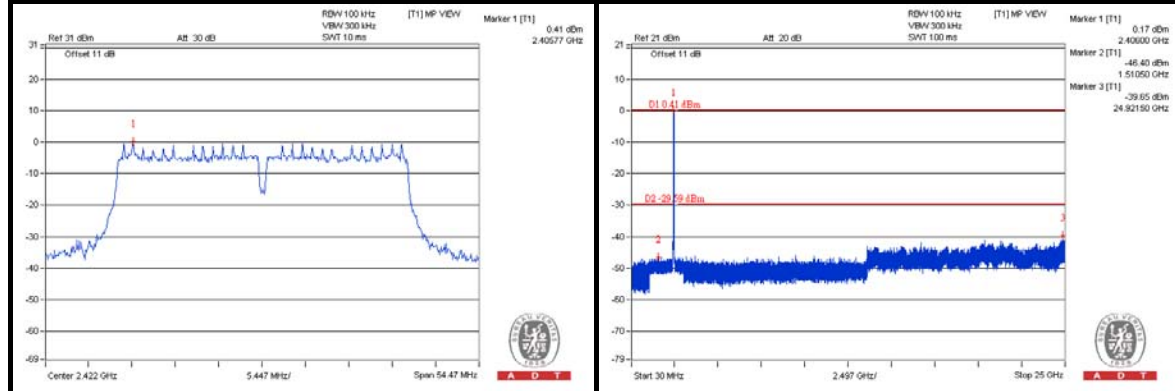


A D T

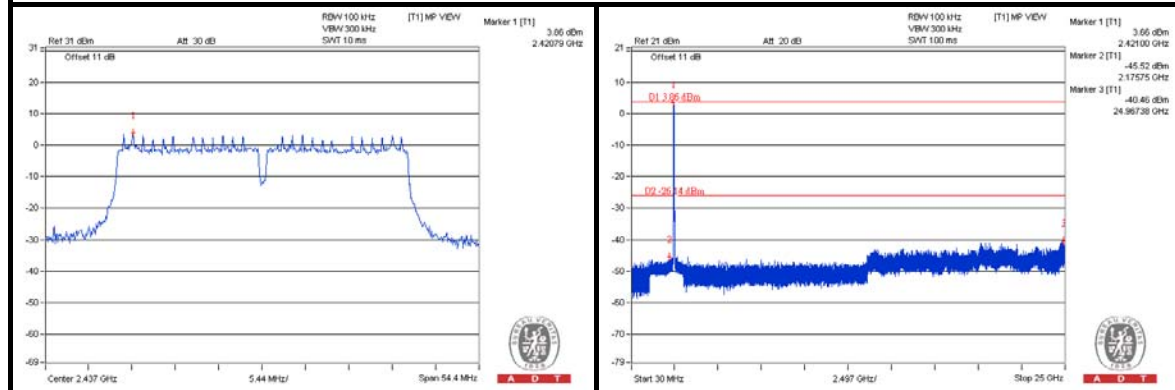
802.11n (40MHz)

CHAIN 0

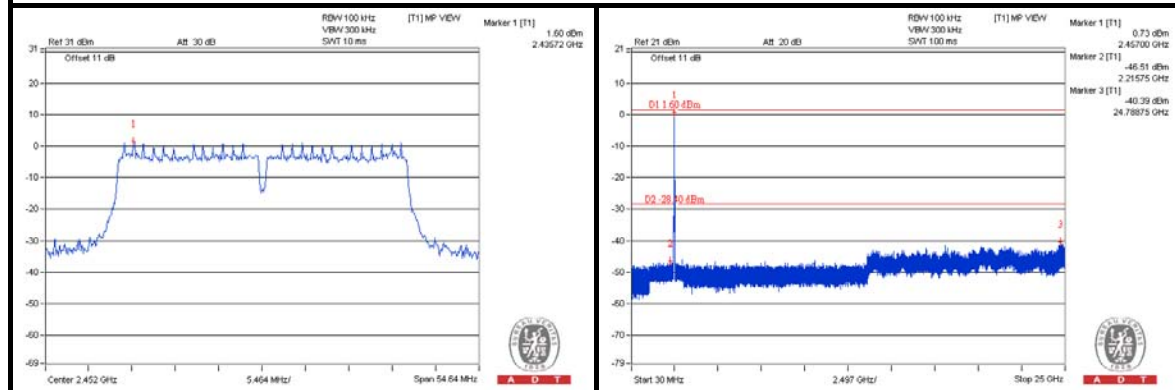
CH 3



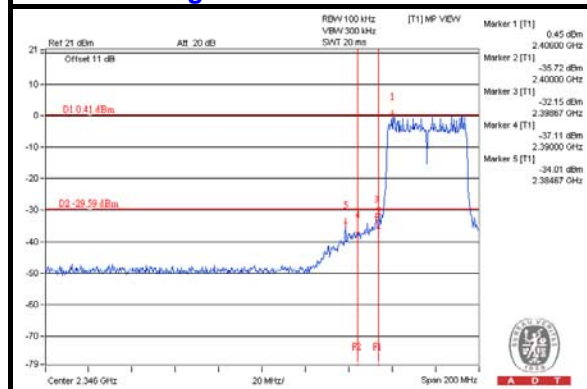
CH 6



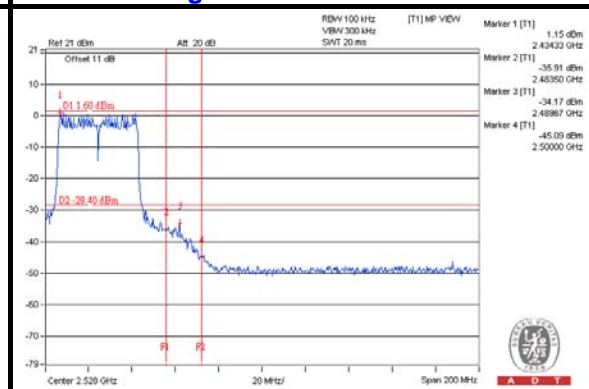
CH 9



CH 3 Band edge



CH 9 Band edge

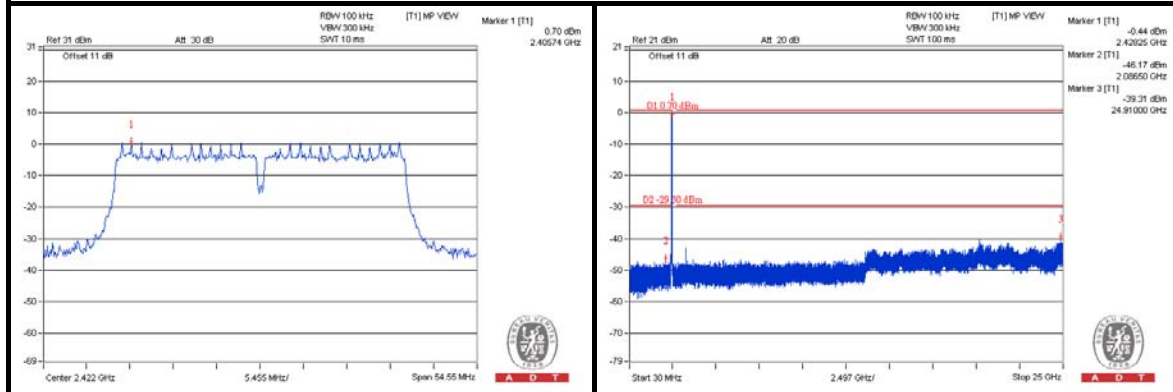




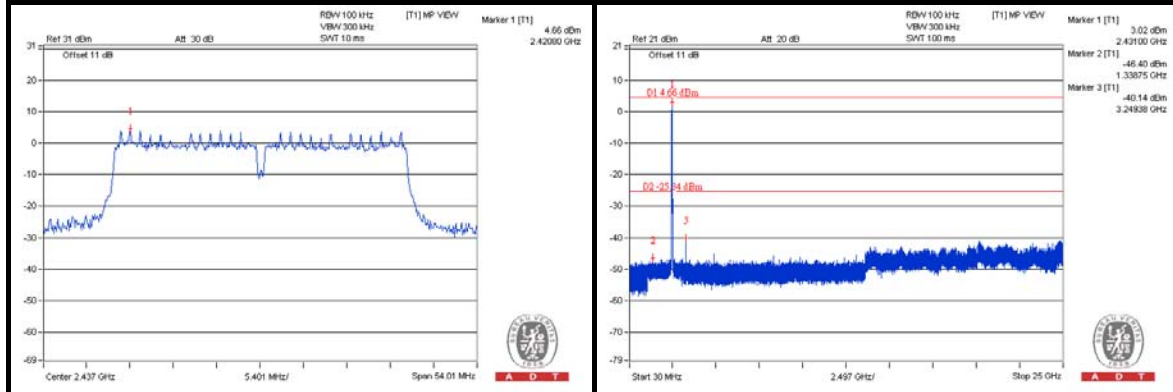
A D T

CHAIN 1

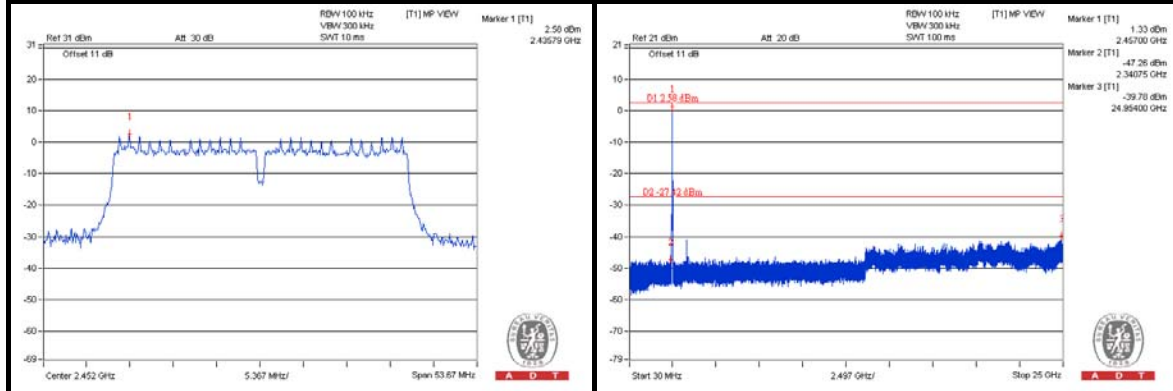
CH 3



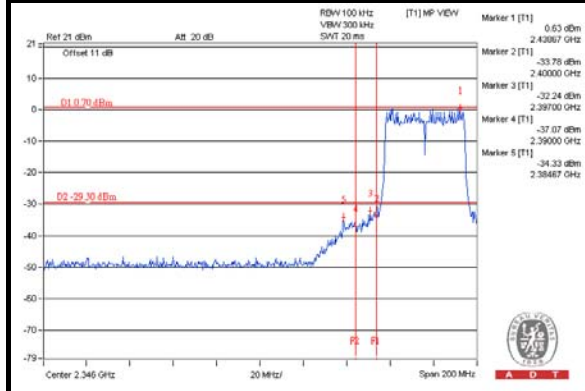
CH 6



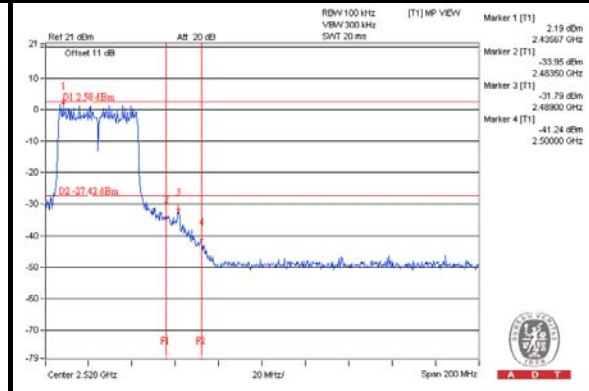
CH 9



CH 3 Band edge



CH 9 Band edge





A D T

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



A D T

6. 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 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: 886-3-5935343

Fax: 886-3-5935342

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.



A D T

7. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

---END---