



A D T

FCC TEST REPORT

REPORT NO.: RF140324C28

MODEL NO.: ENH202v2

FCC ID: A8J-ENH202

RECEIVED: Mar. 24, 2014

TESTED: Apr. 02 ~ Jun. 25, 2014

ISSUED: Jul. 02, 2014

APPLICANT: EnGenius Technologies

ADDRESS: 1580 Scenic Avenue, Costa Mesa, CA92626

ISSUED BY: Bureau Veritas Consumer Products Services
(H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 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 Tsuen, Kwei
Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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



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.



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.....	9
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	10
3.3 DUTY CYCLE OF TEST SIGNAL.....	12
3.4 DESCRIPTION OF SUPPORT UNITS.....	13
3.4.1 CONFIGURATION OF SYSTEM UNDER TEST.....	14
3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	15
4. TEST TYPES AND RESULTS.....	16
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT.....	16
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT.....	16
4.1.2 TEST INSTRUMENTS.....	17
4.1.3 TEST PROCEDURES.....	18
4.1.4 DEVIATION FROM TEST STANDARD.....	18
4.1.5 TEST SETUP.....	19
4.1.6 EUT OPERATING CONDITIONS.....	20
4.1.7 TEST RESULTS.....	21
4.2 CONDUCTED EMISSION MEASUREMENT.....	34
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT.....	34
4.2.2 TEST INSTRUMENTS.....	34
4.2.3 TEST PROCEDURES.....	35
4.2.4 DEVIATION FROM TEST STANDARD.....	35
4.2.5 TEST SETUP.....	35
4.2.6 EUT OPERATING CONDITIONS.....	35
4.2.7 TEST RESULTS.....	36
4.3 6dB BANDWIDTH MEASUREMENT.....	38
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT.....	38
4.3.2 TEST SETUP.....	38
4.3.3 TEST INSTRUMENTS.....	38
4.3.4 TEST PROCEDURE.....	38
4.3.5 DEVIATION FROM TEST STANDARD.....	38
4.3.6 EUT OPERATING CONDITIONS.....	38
4.3.7 TEST RESULTS.....	39
4.4 CONDUCTED OUTPUT POWER.....	41
4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT.....	41
4.4.2 TEST SETUP.....	41



A D T

4.4.3	TEST INSTRUMENTS	41
4.4.4	TEST PROCEDURES.....	41
4.4.5	DEVIATION FROM TEST STANDARD.....	42
4.4.6	EUT OPERATING CONDITIONS	42
4.4.7	TEST RESULTS.....	43
4.5	POWER SPECTRAL DENSITY MEASUREMENT	44
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	44
4.5.2	TEST SETUP	44
4.5.3	TEST INSTRUMENTS	44
4.5.4	TEST PROCEDURE	44
4.5.5	DEVIATION FROM TEST STANDARD.....	44
4.5.6	EUT OPERATING CONDITION.....	44
4.5.7	TEST RESULTS.....	45
4.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT.....	48
4.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT	48
4.6.2	TEST SETUP	48
4.6.3	TEST INSTRUMENTS	48
4.6.4	TEST PROCEDURE	49
4.6.5	DEVIATION FROM TEST STANDARD.....	49
4.6.6	EUT OPERATING CONDITION.....	49
4.6.7	TEST RESULTS.....	49
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	58
6.	INFORMATION ON THE TESTING LABORATORIES	59
7.	APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	60



A D T

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140324C28	Original release.	Jul. 02, 2014




A D T

1. CERTIFICATION

PRODUCT: 2.4GHz/b/g/n 2T2R CPE
MODEL NO.: ENH202v2
BRAND: EnGenius
APPLICANT: EnGenius Technologies
TESTED: Apr. 02 ~ Jun. 25, 2014
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (model: ENH202v2) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY :  , **DATE :** Jul. 02, 2014
Suntee Liu / Specialist

APPROVED BY :  , **DATE :** Jul. 02, 2014
Ken Liu / Senior Manager



2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -16.52dB at 0.29429MHz.
15.205 & 209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2483.50MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2483.50MHz.
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 IPEX 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	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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



A D T

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	2.4GHz/b/g/n 2T2R CPE
MODEL NO.	ENH202v2
POWER SUPPLY	24Vdc (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 (20MHz): 11 802.11n (40MHz): 7
OUTPUT POWER	443.234mW
ANTENNA TYPE	PIFA antenna with 9.5dBi gain
ANTENNA CONNECTOR	IPEX
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	PoE



A D T

NOTE:

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

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

2. The EUT uses following PoE.

PoE	
Brand	EnGenius
Model	EPE-24R

PoE's Adapter	
Brand	Powertron Electronics Corp.
Model	PA1015-3HU
P/N	PA1015-240HUB
Input Power	100-240Vac, 50-60Hz, 0.4A
Output Power	24Vdc, 0.6A, 14.4W Max
Power Line	1.55m cable without core attached on adapter

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



3.2 DESCRIPTION OF TEST MODES

11 channels are provided for 802.11b, 802.11g, 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

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.

RADIATED EMISSION TEST (ABOVE 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

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 (SYSTEM)	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Jones Chang
RE<1G	21deg. C, 64%RH	120Vac, 60Hz	Jones Chang
PLC	25deg. C, 70%RH	120Vac, 60Hz	Jones Chang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Johnny Yu

3.3 DUTY CYCLE OF TEST SIGNAL

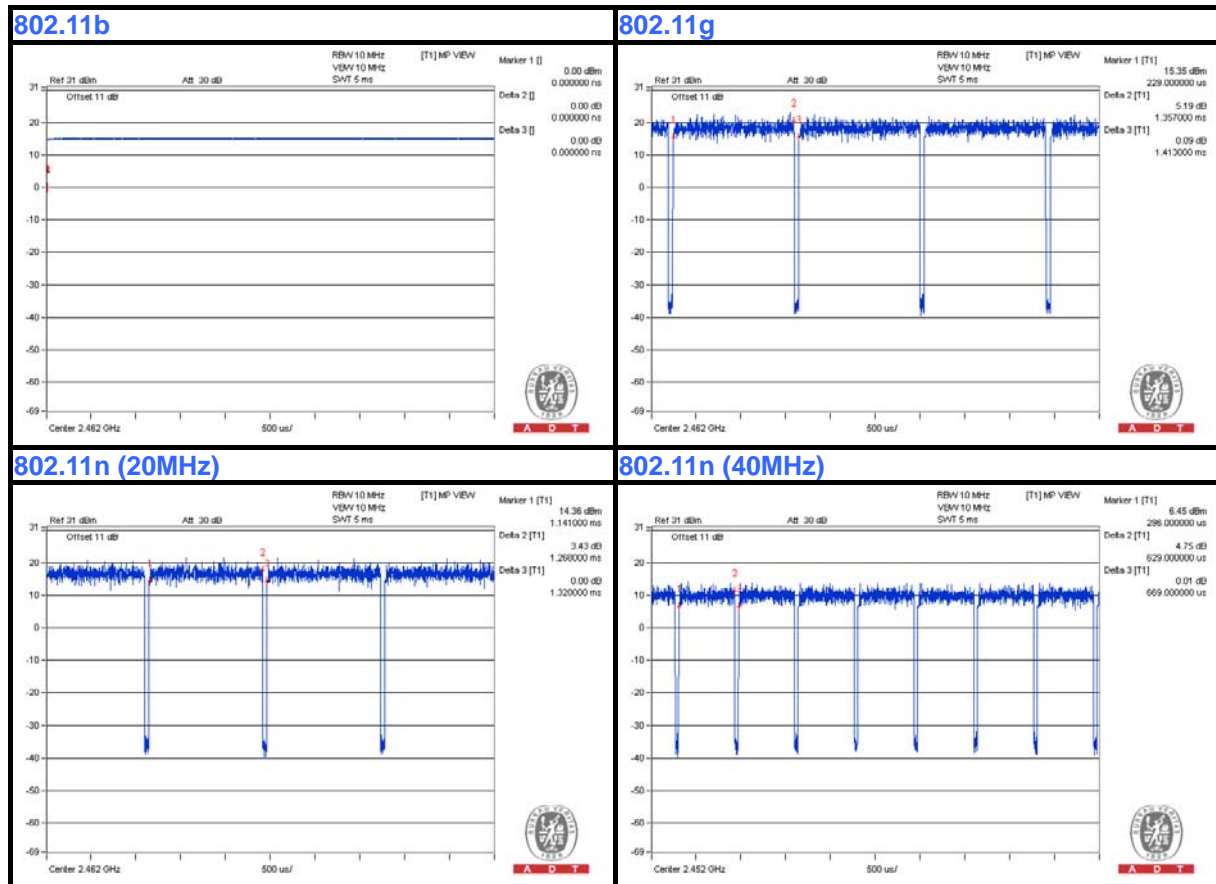
If duty cycle is < 98%, duty factor shall be considered.

802.11b: Duty cycle of test signal is 100 %

802.11g: Duty cycle = $1.357/1.413 = 0.96$, Duty factor = $10 * \log(1/0.96) = 0.18$

802.11n (20MHz): Duty cycle = $1.268/1.32 = 0.961$, Duty factor = $10 * \log(1/0.961) = 0.17$

802.11n (40MHz): Duty cycle = $0.629/0.669 = 0.94$, Duty factor = $10 * \log(1/0.94) = 0.27$





A D T

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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved

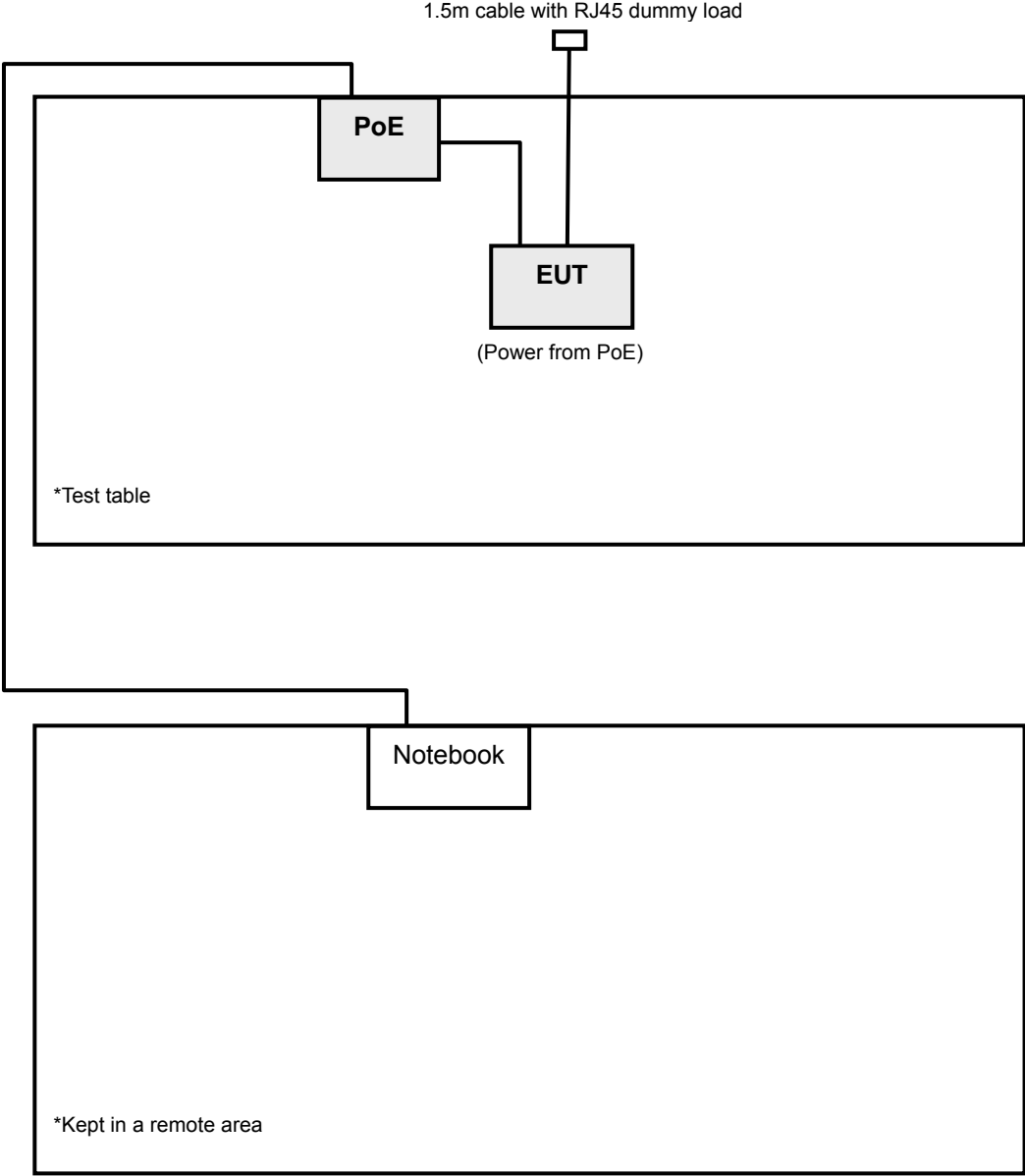
NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	3m RJ45 cable

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.



3.4.1 CONFIGURATION OF SYSTEM UNDER TEST





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 v03r02

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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.



A D T

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	ESIB7	100187	Jan. 02, 2014	Jan. 01, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Mar. 03, 2014	Mar. 02, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 26, 2014	Feb. 25, 2015
HORN Antenna SCHWARZBECK	9120D	209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8447D	2944A10633	Oct. 07, 2013	Oct. 06, 2014
Preamplifier Agilent	8449B	3008A01964	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6 +309224/4	Aug. 26, 2013	Aug. 25, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
High Speed Peak Power Meter	ML2495A	0824011	Jul. 29, 2013	Jul. 28, 2014
Power Sensor	MA2411B	0738171	Jul. 29, 2013	Jul. 28, 2014

- 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 3.
 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 988962.
 5. The IC Site Registration No. is IC 7450F-3.



A D T

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. 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 antenna is a broadband antenna, and its height 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

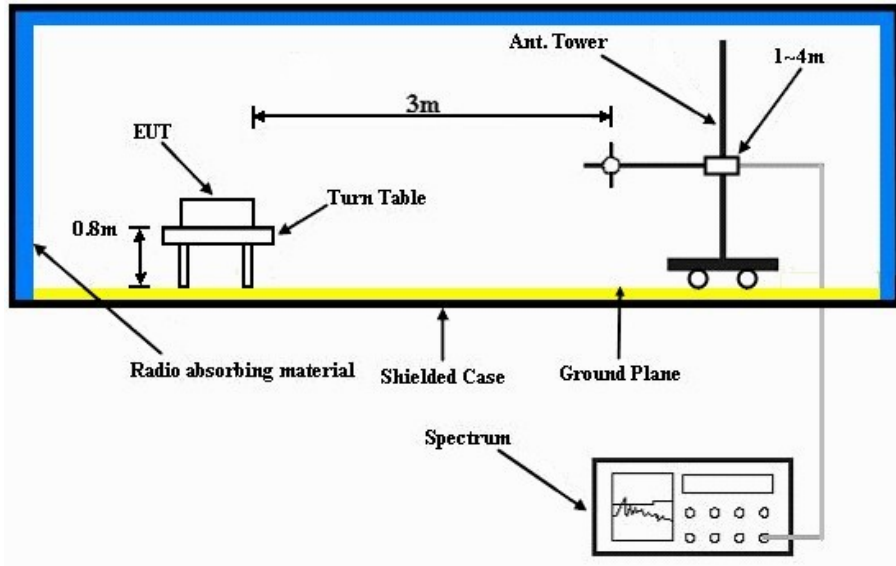
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

4.1.4 DEVIATION FROM TEST STANDARD

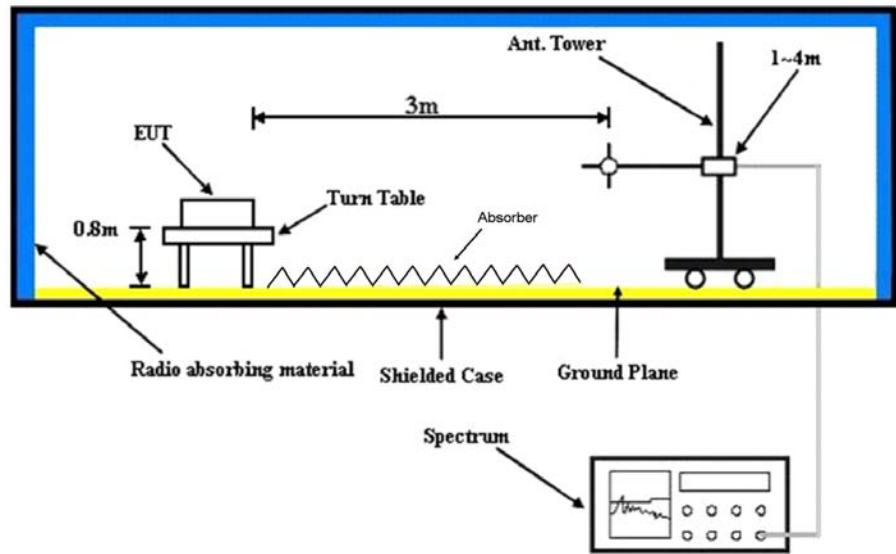
No deviation.

4.1.5 TEST SETUP

Frequency range 30MHz~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 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 partners sent data to EUT by command "PING".
- e. The necessary accessories enabled the system in full functions.



A D T

4.1.7 TEST RESULTS

ABOVE 1GHz DATA :

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	2386.00	71.6 PK	74.0	-2.4	1.10 H	25	40.60	31.00
2	2386.00	51.4 AV	54.0	-2.6	1.10 H	25	20.40	31.00
3	2390.00	72.3 PK	74.0	-1.7	1.00 H	10	41.30	31.00
4	2390.00	52.0 AV	54.0	-2.0	1.00 H	10	21.00	31.00
5	*2412.00	112.1 PK			1.19 H	7	81.00	31.10
6	*2412.00	108.1 AV			1.19 H	7	77.00	31.10
7	4824.00	54.5 PK	74.0	-19.5	1.00 H	343	49.60	4.90
8	4824.00	51.5 AV	54.0	-2.5	1.00 H	343	46.60	4.90

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	2386.00	68.6 PK	74.0	-5.4	1.03 V	3	37.60	31.00
2	2386.00	52.8 AV	54.0	-1.2	1.03 V	3	21.80	31.00
3	2390.00	71.6 PK	74.0	-2.4	1.05 V	10	40.60	31.00
4	2390.00	52.3 AV	54.0	-1.7	1.05 V	10	21.30	31.00
5	*2412.00	117.1 PK			1.02 V	358	86.00	31.10
6	*2412.00	113.5 AV			1.02 V	358	82.40	31.10
7	4824.00	51.6 PK	74.0	-22.4	1.00 V	6	46.70	4.90
8	4824.00	46.3 AV	54.0	-7.7	1.00 V	6	41.40	4.90

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.5 PK	74.0	-13.5	1.00 H	344	29.50	31.00
2	2390.00	49.1 AV	54.0	-4.9	1.00 H	344	18.10	31.00
3	*2437.00	116.6 PK			1.12 H	358	85.40	31.20
4	*2437.00	112.9 AV			1.12 H	358	81.70	31.20
5	2483.50	63.9 PK	74.0	-10.1	1.18 H	1	32.50	31.40
6	2483.50	45.9 AV	54.0	-8.1	1.18 H	1	14.50	31.40
7	4874.00	55.8 PK	74.0	-18.2	1.02 H	345	50.80	5.00
8	4874.00	52.7 AV	54.0	-1.3	1.02 H	345	47.70	5.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.0 PK	74.0	-11.0	1.00 V	0	32.00	31.00
2	2390.00	50.5 AV	54.0	-3.5	1.00 V	0	19.50	31.00
3	*2437.00	119.4 PK			1.00 V	346	88.20	31.20
4	*2437.00	115.7 AV			1.00 V	346	84.50	31.20
5	2483.50	61.9 PK	74.0	-12.1	1.00 V	350	30.50	31.40
6	2483.50	48.9 AV	54.0	-5.1	1.00 V	350	17.50	31.40
7	4874.00	54.3 PK	74.0	-19.7	1.00 V	351	49.30	5.00
8	4874.00	51.5 AV	54.0	-2.5	1.00 V	351	46.50	5.00

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	110.0 PK			1.15 H	357	78.70	31.30
2	*2462.00	106.4 AV			1.15 H	357	75.10	31.30
3	2483.50	72.8 PK	74.0	-1.2	1.18 H	358	41.40	31.40
4	2483.50	49.2 AV	54.0	-4.8	1.18 H	358	17.80	31.40
5	4924.00	53.2 PK	74.0	-20.8	1.43 H	315	48.00	5.20
6	4924.00	49.3 AV	54.0	-4.7	1.43 H	315	44.10	5.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	110.2 PK			1.00 V	355	78.90	31.30
2	*2462.00	106.5 AV			1.00 V	355	75.20	31.30
3	2483.50	71.4 PK	74.0	-2.6	1.13 V	347	40.00	31.40
4	2483.50	51.7 AV	54.0	-2.3	1.13 V	347	20.30	31.40
5	4924.00	52.3 PK	74.0	-21.7	1.43 V	301	47.10	5.20
6	4924.00	46.9 AV	54.0	-7.1	1.43 V	301	41.70	5.20

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.3 PK	74.0	-5.7	1.00 H	345	37.30	31.00
2	2390.00	51.9 AV	54.0	-2.1	1.00 H	345	20.90	31.00
3	*2412.00	112.5 PK			1.21 H	354	81.40	31.10
4	*2412.00	102.0 AV			1.21 H	354	70.90	31.10
5	4824.00	46.9 PK	74.0	-27.1	1.11 H	6	42.00	4.90
6	4824.00	34.3 AV	54.0	-19.7	1.11 H	6	29.40	4.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.8 PK	74.0	-6.2	1.02 V	3	36.80	31.00
2	2390.00	52.4 AV	54.0	-1.6	1.02 V	3	21.40	31.00
3	*2412.00	114.6 PK			1.04 V	351	83.50	31.10
4	*2412.00	104.9 AV			1.04 V	351	73.80	31.10
5	4824.00	48.1 PK	74.0	-25.9	1.05 V	89	43.20	4.90
6	4824.00	35.0 AV	54.0	-19.0	1.05 V	89	30.10	4.90

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	2360.00	67.4 PK	74.0	-6.6	1.00 H	356	36.50	30.90
2	2360.00	52.3 AV	54.0	-1.7	1.00 H	356	21.40	30.90
3	2390.00	67.0 PK	74.0	-7.0	1.02 H	358	36.00	31.00
4	2390.00	52.0 AV	54.0	-2.0	1.02 H	358	21.00	31.00
5	*2437.00	121.6 PK			1.21 H	353	90.40	31.20
6	*2437.00	111.1 AV			1.21 H	353	79.90	31.20
7	2483.50	63.3 PK	74.0	-10.7	1.16 H	355	31.90	31.40
8	2483.50	47.7 AV	54.0	-6.3	1.16 H	355	16.30	31.40
9	4874.00	56.0 PK	74.0	-18.0	1.00 H	354	51.00	5.00
10	4874.00	42.6 AV	54.0	-11.4	1.00 H	354	37.60	5.00

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	2360.00	62.6 PK	74.0	-11.4	1.00 V	350	31.70	30.90
2	2360.00	49.4 AV	54.0	-4.6	1.00 V	350	18.50	30.90
3	2390.00	67.3 PK	74.0	-6.7	1.02 V	357	36.30	31.00
4	2390.00	52.3 AV	54.0	-1.7	1.02 V	357	21.30	31.00
5	*2437.00	122.2 PK			1.05 V	355	91.00	31.20
6	*2437.00	112.8 AV			1.05 V	355	81.60	31.20
7	2483.50	67.2 PK	74.0	-6.8	1.21 V	347	35.80	31.40
8	2483.50	50.7 AV	54.0	-3.3	1.21 V	347	19.30	31.40
9	4874.00	55.4 PK	74.0	-18.6	1.00 V	345	50.40	5.00
10	4874.00	41.1 AV	54.0	-12.9	1.00 V	345	36.10	5.00

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	115.6 PK			1.17 H	3	84.30	31.30
2	*2462.00	105.7 AV			1.17 H	3	74.40	31.30
3	2483.50	68.3 PK	74.0	-5.7	1.16 H	357	36.90	31.40
4	2483.50	51.5 AV	54.0	-2.5	1.16 H	357	20.10	31.40
5	4924.00	49.2 PK	74.0	-24.8	1.26 H	19	44.00	5.20
6	4924.00	35.7 AV	54.0	-18.3	1.26 H	19	30.50	5.20
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	114.6 PK			1.00 V	357	83.30	31.30
2	*2462.00	105.1 AV			1.00 V	357	73.80	31.30
3	2483.50	71.0 PK	74.0	-3.0	1.00 V	350	39.60	31.40
4	2483.50	52.8 AV	54.0	-1.2	1.00 V	350	21.40	31.40
5	4924.00	48.1 PK	74.0	-25.9	1.19 V	279	42.90	5.20
6	4924.00	35.2 AV	54.0	-18.8	1.19 V	279	30.00	5.20

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)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	64.1 PK	74.0	-9.9	1.00 H	0	33.10	31.00
2	2390.00	50.0 AV	54.0	-4.0	1.00 H	0	19.00	31.00
3	*2412.00	109.3 PK			1.00 H	2	78.20	31.10
4	*2412.00	99.9 AV			1.00 H	2	68.80	31.10
5	4824.00	47.5 PK	74.0	-26.5	1.23 H	211	42.60	4.90
6	4824.00	34.8 AV	54.0	-19.2	1.23 H	211	29.90	4.90

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	69.6 PK	74.0	-4.4	1.05 V	355	38.60	31.00
2	2390.00	52.9 AV	54.0	-1.1	1.05 V	355	21.90	31.00
3	*2412.00	112.0 PK			1.06 V	354	80.90	31.10
4	*2412.00	102.2 AV			1.06 V	354	71.10	31.10
5	4824.00	47.2 PK	74.0	-26.8	1.08 V	307	42.30	4.90
6	4824.00	34.5 AV	54.0	-19.5	1.08 V	307	29.60	4.90

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	2360.00	67.1 PK	74.0	-6.9	1.00 H	350	36.20	30.90
2	2360.00	51.8 AV	54.0	-2.2	1.00 H	350	20.90	30.90
3	2390.00	65.0 PK	74.0	-9.0	1.00 H	353	34.00	31.00
4	2390.00	50.9 AV	54.0	-3.1	1.00 H	353	19.90	31.00
5	*2437.00	120.4 PK			1.00 H	357	89.20	31.20
6	*2437.00	110.2 AV			1.00 H	357	79.00	31.20
7	2483.50	64.1 PK	74.0	-9.9	1.17 H	354	32.70	31.40
8	2483.50	48.4 AV	54.0	-5.6	1.17 H	354	17.00	31.40
9	4874.00	55.0 PK	74.0	-19.0	1.00 H	333	50.00	5.00
10	4874.00	41.8 AV	54.0	-12.2	1.00 H	333	36.80	5.00

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	2360.00	60.9 PK	74.0	-13.1	1.00 V	0	30.00	30.90
2	2360.00	47.7 AV	54.0	-6.3	1.00 V	0	16.80	30.90
3	2390.00	68.5 PK	74.0	-5.5	1.01 V	358	37.50	31.00
4	2390.00	52.7 AV	54.0	-1.3	1.01 V	358	21.70	31.00
5	*2437.00	120.9 PK			1.02 V	354	89.70	31.20
6	*2437.00	111.4 AV			1.02 V	354	80.20	31.20
7	2483.50	68.1 PK	74.0	-5.9	1.01 V	1	36.70	31.40
8	2483.50	50.3 AV	54.0	-3.7	1.01 V	1	18.90	31.40
9	4874.00	53.5 PK	74.0	-20.5	1.00 V	345	48.50	5.00
10	4874.00	39.3 AV	54.0	-14.7	1.00 V	345	34.30	5.00

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	111.6 PK			1.19 H	354	80.30	31.30
2	*2462.00	101.9 AV			1.19 H	354	70.60	31.30
3	2483.50	67.1 PK	74.0	-6.9	1.20 H	0	35.70	31.40
4	2483.50	49.9 AV	54.0	-4.1	1.20 H	0	18.50	31.40
5	4924.00	47.9 PK	74.0	-26.1	1.24 H	6	42.70	5.20
6	4924.00	35.0 AV	54.0	-19.0	1.24 H	6	29.80	5.20
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	112.2 PK			1.00 V	9	80.90	31.30
2	*2462.00	101.8 AV			1.00 V	9	70.50	31.30
3	2483.50	70.5 PK	74.0	-3.5	1.20 V	350	39.10	31.40
4	2483.50	53.0 AV	54.0	-1.0	1.20 V	350	21.60	31.40
5	4924.00	48.2 PK	74.0	-25.8	1.16 V	23	43.00	5.20
6	4924.00	35.8 AV	54.0	-18.2	1.16 V	23	30.60	5.20

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)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.2 PK	74.0	-6.8	1.00 H	355	36.20	31.00
2	2390.00	49.9 AV	54.0	-4.1	1.00 H	355	18.90	31.00
3	*2422.00	102.8 PK			1.00 H	353	71.60	31.20
4	*2422.00	92.9 AV			1.00 H	353	61.70	31.20
5	4844.00	47.5 PK	74.0	-26.5	1.18 H	18	42.50	5.00
6	4844.00	34.0 AV	54.0	-20.0	1.18 H	18	29.00	5.00

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	70.1 PK	74.0	-3.9	1.04 V	359	39.10	31.00
2	2390.00	52.5 AV	54.0	-1.5	1.04 V	359	21.50	31.00
3	*2422.00	106.5 PK			1.03 V	348	75.30	31.20
4	*2422.00	96.3 AV			1.03 V	348	65.10	31.20
5	4844.00	47.0 PK	74.0	-27.0	1.08 V	66	42.00	5.00
6	4844.00	33.7 AV	54.0	-20.3	1.08 V	66	28.70	5.00

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	62.4 PK	74.0	-11.6	1.00 H	355	31.40	31.00
2	2390.00	49.9 AV	54.0	-4.1	1.00 H	355	18.90	31.00
3	*2437.00	108.3 PK			1.21 H	353	77.10	31.20
4	*2437.00	99.3 AV			1.21 H	353	68.10	31.20
5	4874.00	47.4 PK	74.0	-26.6	1.20 H	313	42.40	5.00
6	4874.00	34.1 AV	54.0	-19.9	1.20 H	313	29.10	5.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.2 PK	74.0	-6.8	1.05 V	358	36.20	31.00
2	2390.00	52.8 AV	54.0	-1.2	1.05 V	358	21.80	31.00
3	*2437.00	111.3 PK			1.00 V	34	80.10	31.20
4	*2437.00	101.5 AV			1.00 V	34	70.30	31.20
5	4874.00	48.2 PK	74.0	-25.8	1.09 V	339	43.20	5.00
6	4874.00	35.3 AV	54.0	-18.7	1.09 V	339	30.30	5.00

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	104.8 PK			1.19 H	359	73.50	31.30
2	*2452.00	95.0 AV			1.19 H	359	63.70	31.30
3	2483.50	68.5 PK	74.0	-5.5	1.16 H	356	37.10	31.40
4	2483.50	50.2 AV	54.0	-3.8	1.16 H	356	18.80	31.40
5	4904.00	47.3 PK	74.0	-26.7	1.00 H	122	42.20	5.10
6	4904.00	34.3 AV	54.0	-19.7	1.00 H	122	29.20	5.10
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	107.7 PK			1.00 V	4	76.40	31.30
2	*2452.00	97.2 AV			1.00 V	4	65.90	31.30
3	2483.50	69.9 PK	74.0	-4.1	1.21 V	355	38.50	31.40
4	2483.50	52.4 AV	54.0	-1.6	1.21 V	355	21.00	31.40
5	4904.00	47.0 PK	74.0	-27.0	1.11 V	305	41.90	5.10
6	4904.00	33.9 AV	54.0	-20.1	1.11 V	305	28.80	5.10

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.
5. " * " : Fundamental frequency.



A D T

BELOW 1GHz WORST-CASE DATA : 802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21deg. C, 64%RH	TESTED BY	Jones Chang

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	57.12	33.1 QP	40.0	-6.9	2.49 H	327	47.70	-14.60
2	84.34	32.1 QP	40.0	-7.9	1.99 H	29	51.50	-19.40
3	107.67	34.3 QP	43.5	-9.2	1.50 H	84	51.80	-17.50
4	179.61	35.9 QP	43.5	-7.6	1.50 H	78	50.90	-15.00
5	230.16	29.1 QP	46.0	-16.9	1.50 H	224	45.10	-16.00
6	294.32	30.6 QP	46.0	-15.4	1.00 H	174	43.00	-12.40

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	32.06	37.4 QP	40.0	-2.6	1.00 V	204	53.30	-15.90
2	72.51	37.6 QP	40.0	-2.4	1.00 V	182	54.40	-16.80
3	109.62	35.8 QP	43.5	-7.7	1.49 V	114	53.00	-17.20
4	140.72	36.3 QP	43.5	-7.2	1.00 V	77	50.70	-14.40
5	193.22	32.8 QP	43.5	-10.7	1.49 V	16	49.20	-16.40
6	276.82	28.2 QP	46.0	-17.8	1.00 V	150	41.00	-12.80

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 OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	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	ESCS30	100289	Nov. 29, 2013	Nov. 28, 2014
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 13, 2014	Feb. 12, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 17, 2013	Jul. 16, 2014
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

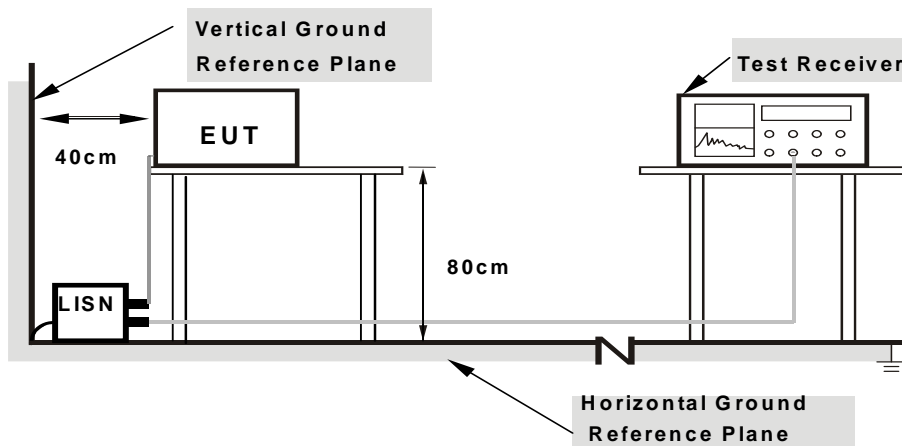
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

4.2.7 TEST RESULTS

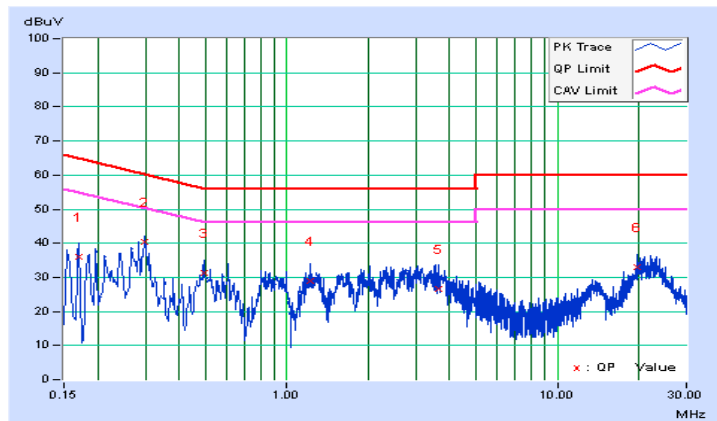
CONDUCTED WORST-CASE DATA : 802.11g

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16955	0.10	35.85	17.24	35.95	17.34	64.98	54.98	-29.03	-37.64
2	0.29858	0.10	40.36	30.67	40.46	30.77	60.28	50.28	-19.82	-19.51
3	0.49408	0.13	31.09	21.83	31.22	21.96	56.10	46.10	-24.88	-24.14
4	1.22525	0.22	28.74	19.58	28.96	19.80	56.00	46.00	-27.04	-26.20
5	3.62208	0.26	26.50	15.32	26.76	15.58	56.00	46.00	-29.24	-30.42
6	19.71173	1.09	31.88	22.54	32.97	23.63	60.00	50.00	-27.03	-26.37

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.





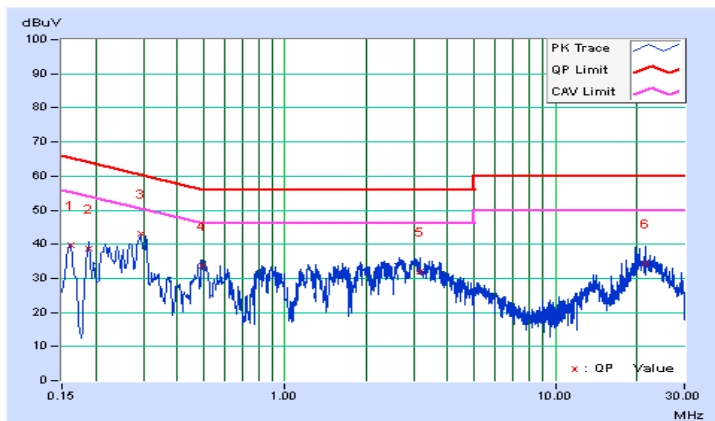
A D T

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16173	0.06	39.66	28.79	39.72	28.85	65.37	55.37	-25.66	-26.53
2	0.18903	0.08	38.63	28.21	38.71	28.29	64.08	54.08	-25.37	-25.79
3	0.29429	0.13	43.11	33.75	43.24	33.88	60.40	50.40	-17.16	-16.52
4	0.49408	0.18	33.52	23.93	33.70	24.11	56.10	46.10	-22.40	-21.99
5	3.18025	0.24	31.84	19.28	32.08	19.52	56.00	46.00	-23.92	-26.48
6	21.66673	1.06	33.37	27.17	34.43	28.23	60.00	50.00	-25.57	-21.77

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.

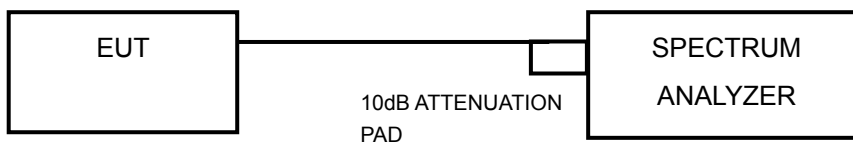


4.3 6dB BANDWIDTH MEASUREMENT

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) $\geq 3 \times$ 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.



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	10.10	0.5	PASS
6	2437	10.12	10.11	0.5	PASS
11	2462	10.12	10.12	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.38	16.38	0.5	PASS
6	2437	16.40	16.38	0.5	PASS
11	2462	16.37	16.40	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.62	17.36	0.5	PASS
6	2437	17.59	17.62	0.5	PASS
11	2462	17.58	17.19	0.5	PASS

802.11n (40MHz)

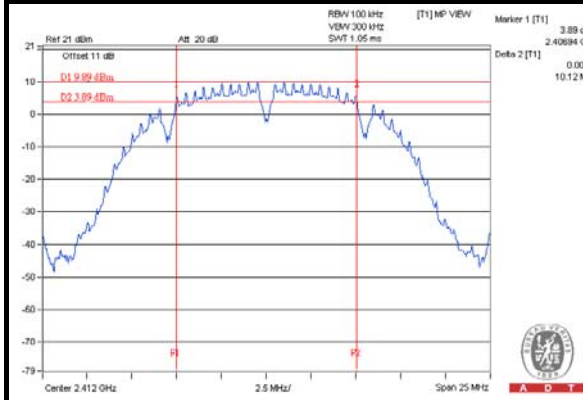
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.14	35.93	0.5	PASS
6	2437	36.44	36.42	0.5	PASS
9	2452	35.87	36.17	0.5	PASS



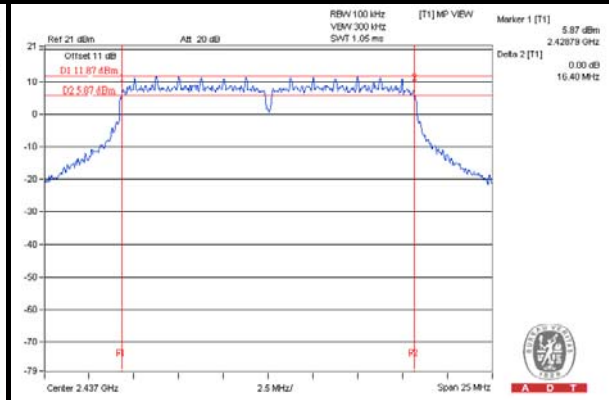
A D T

SPECTRUM PLOT OF WORST VALUE

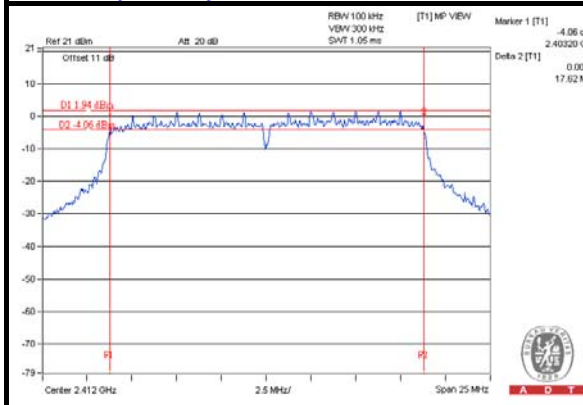
802.11b



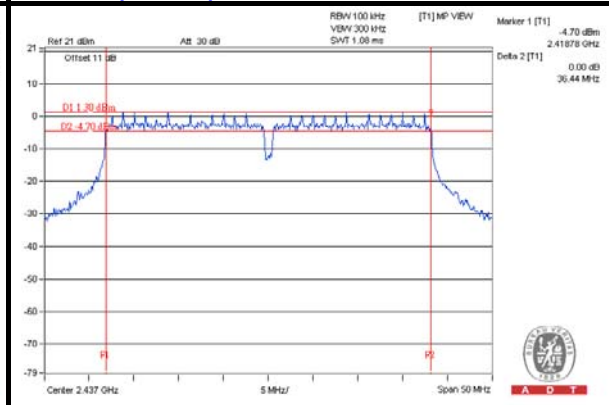
802.11g



802.11n (20MHz)



802.11n (40MHz)



4.4 CONDUCTED OUTPUT POWER

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 v02r01 Method of conducted output power measurement on IEEE 802.11 devices,

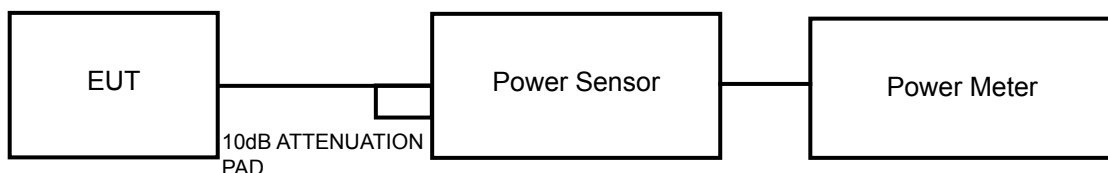
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

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

Array Gain = $5 \log(NANT/NSS)$ dB or 3 dB, whichever is less for 20-MHz channel widths with $NANT \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(NANT/NSS)$ dB.

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.4 TEST PROCEDURES

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



A D T

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

802.11b

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)
		CHAIN 0	CHAIN 1			
1	2412	18.85	18.50	147.531	21.69	30
6	2437	23.11	22.13	367.949	25.66	30
11	2462	14.81	14.42	57.938	17.63	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	13.45	48.738	16.88	30
6	2437	23.55	23.36	443.234	26.47	30
11	2462	17.36	16.57	99.844	19.99	30

802.11n (20MHz)

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)
		CHAIN 0	CHAIN 1			
1	2412	12.66	12.24	35.199	15.47	30
6	2437	23.53	22.47	402.028	26.04	30
11	2462	17.36	16.57	99.844	19.99	30

802.11n (40MHz)

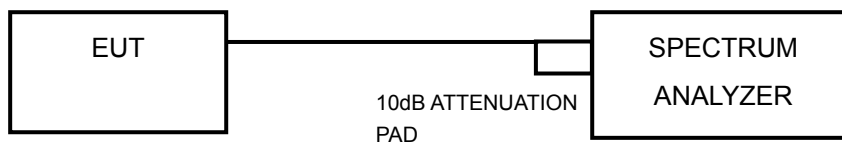
CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)
		CHAIN 0	CHAIN 1			
3	2422	9.77	8.40	16.402	12.15	30
6	2437	15.95	13.64	62.476	17.96	30
9	2452	11.45	10.14	24.292	13.85	30

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

- Set the RBW = 3 kHz, VBW = 10 kHz, Detector = peak.
- Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6.



A D T

4.5.7 TEST RESULTS

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-13.66	3.01	-10.65	1.49	PASS
	6	2437	-10.78	3.01	-7.77	1.49	PASS
	11	2462	-19.71	3.01	-16.70	1.49	PASS
1	1	2412	-13.16	3.01	-10.15	1.49	PASS
	6	2437	-10.06	3.01	-7.05	1.49	PASS
	11	2462	-19.52	3.01	-16.51	1.49	PASS

NOTE: Directional gain = 9.5dBi + 10log(2) = 12.51dBi > 6dBi , so the power density limit shall be reduced to 8-(12.51-6) = 1.49dBm.

802.11g

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD w/o Duty Factor (dBm/3kHz)	Duty Factor	Total PSD with Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-19.92	3.01	-16.91	0.18	-16.73	1.49	PASS
	6	2437	-11.68	3.01	-8.67	0.18	-8.49	1.49	PASS
	11	2462	-19.51	3.01	-16.50	0.18	-16.32	1.49	PASS
1	1	2412	-19.84	3.01	-16.83	0.18	-16.65	1.49	PASS
	6	2437	-11.71	3.01	-8.70	0.18	-8.52	1.49	PASS
	11	2462	-18.46	3.01	-15.45	0.18	-15.27	1.49	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 = 9.5dBi + 10log(2) = 12.51dBi > 6dBi , so the power density limit shall be reduced to 8-(12.51-6) = 1.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.



802.11n (20MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD w/o Duty Factor (dBm/3kHz)	Duty Factor	Total PSD with Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-21.78	3.01	-18.77	0.17	-18.60	1.49	PASS
	6	2437	-12.26	3.01	-9.25	0.17	-9.08	1.49	PASS
	11	2462	-20.85	3.01	-17.84	0.17	-17.67	1.49	PASS
1	1	2412	-21.66	3.01	-18.65	0.17	-18.48	1.49	PASS
	6	2437	-11.30	3.01	-8.29	0.17	-8.12	1.49	PASS
	11	2462	-19.38	3.01	-16.37	0.17	-16.20	1.49	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 = 9.5dBi + 10log(2) = 12.51dBi > 6dBi , so the power density limit shall be reduced to 8-(12.51-6) = 1.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD w/o Duty Factor (dBm/3kHz)	Duty Factor	Total PSD with Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2412	-27.55	3.01	-24.54	0.27	-24.27	1.49	PASS
	6	2437	-20.54	3.01	-17.53	0.27	-17.26	1.49	PASS
	9	2462	-26.24	3.01	-23.23	0.27	-22.96	1.49	PASS
1	3	2412	-27.39	3.01	-24.38	0.27	-24.11	1.49	PASS
	6	2437	-20.80	3.01	-17.79	0.27	-17.52	1.49	PASS
	9	2462	-26.58	3.01	-23.57	0.27	-23.30	1.49	PASS

NOTE:

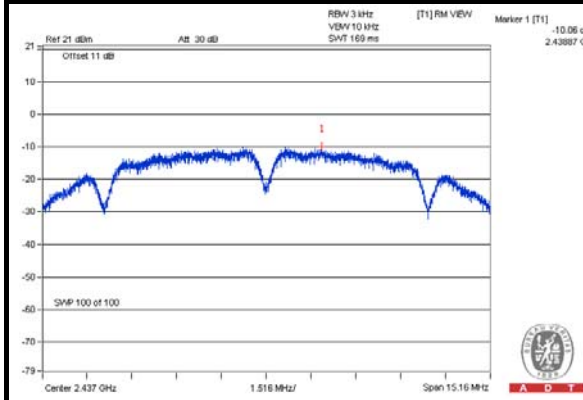
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 9.5dBi + 10log(2) = 12.51dBi > 6dBi , so the power density limit shall be reduced to 8-(12.51-6) = 1.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.



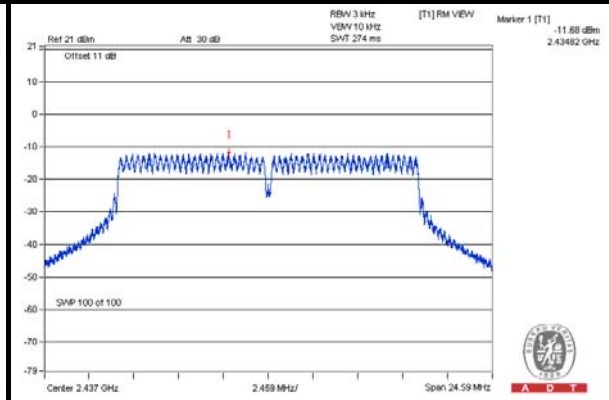
A D T

SPECTRUM PLOT OF WORST VALUE

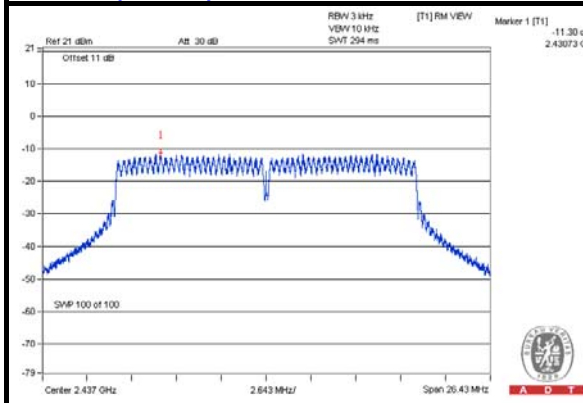
802.11b



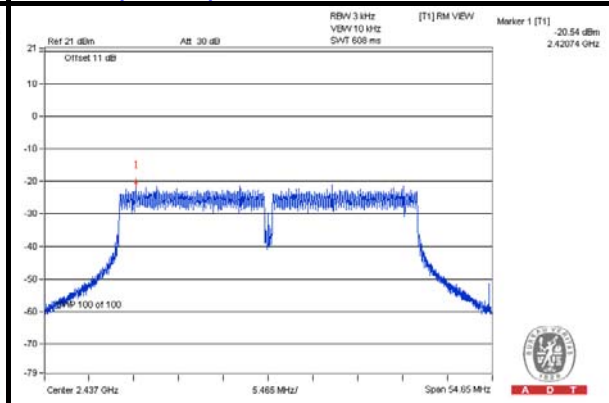
802.11g



802.11n (20MHz)



802.11n (40MHz)

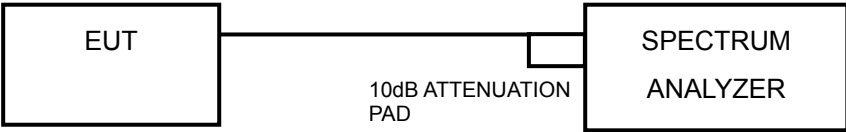


4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

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.



A D T

4.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOB

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

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.7 TEST RESULTS

The 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.

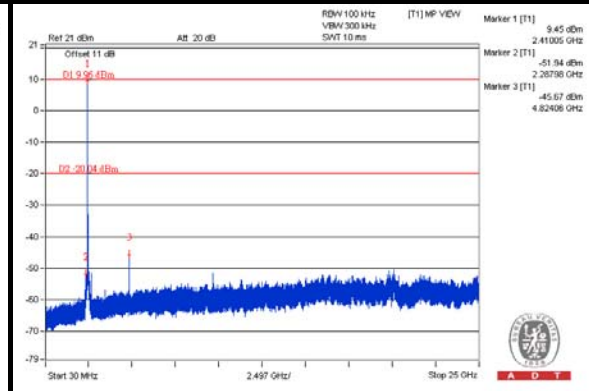
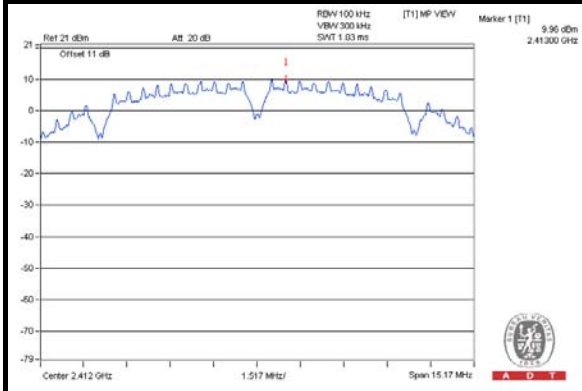
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.



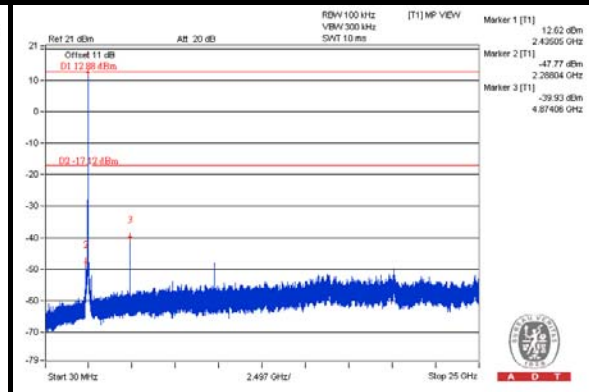
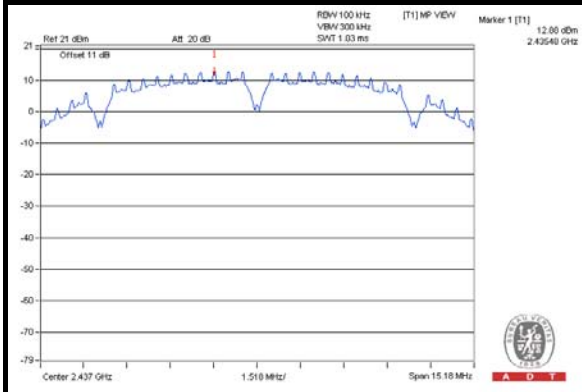
A D T

802.11b
CHAIN 0

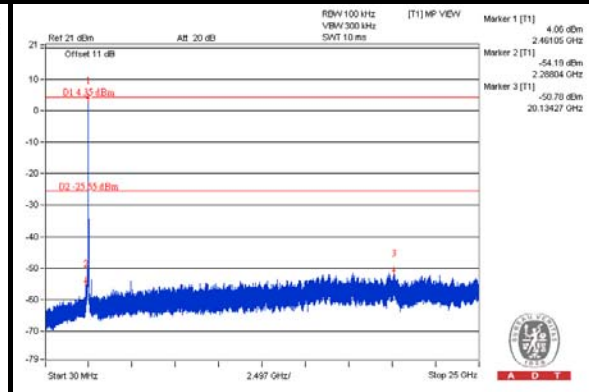
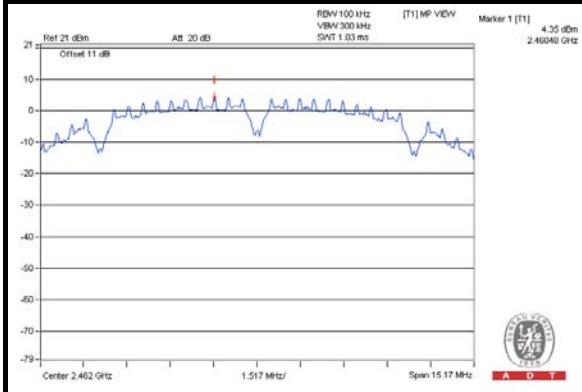
CH 1



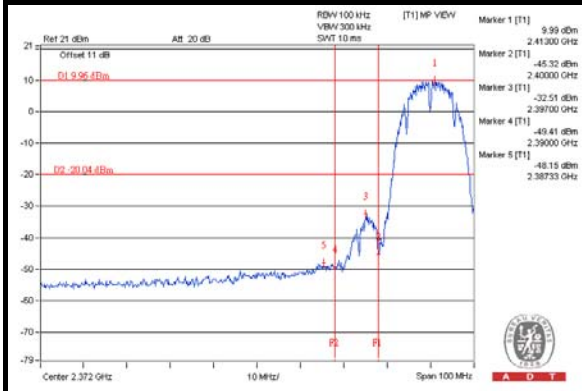
CH 6



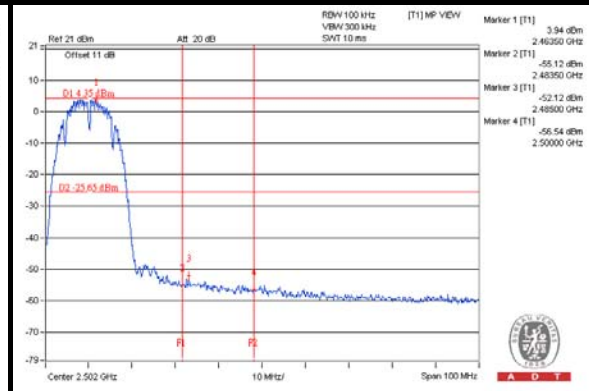
CH 11



CH 1 Band edge



CH 11 Band edge

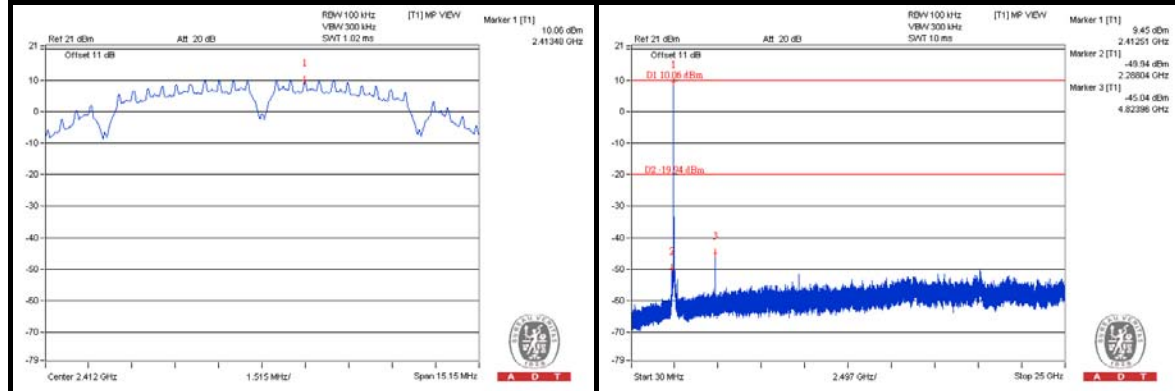




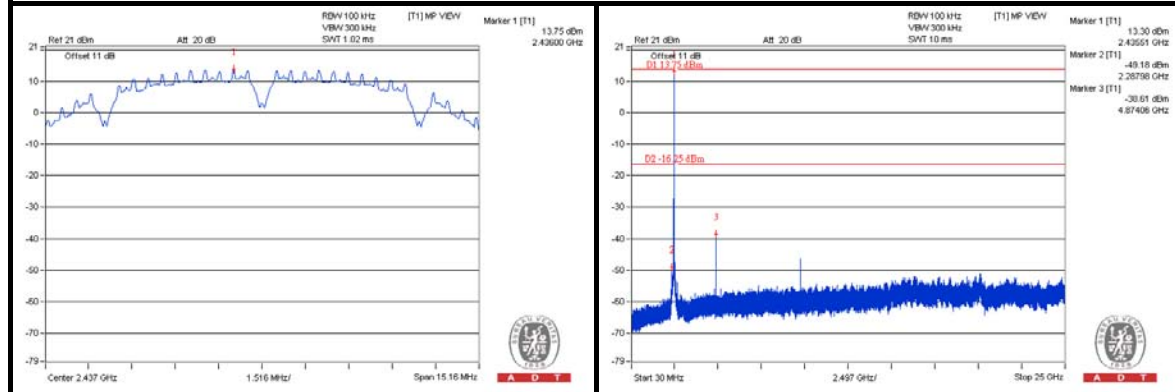
A D T

CHAIN 1

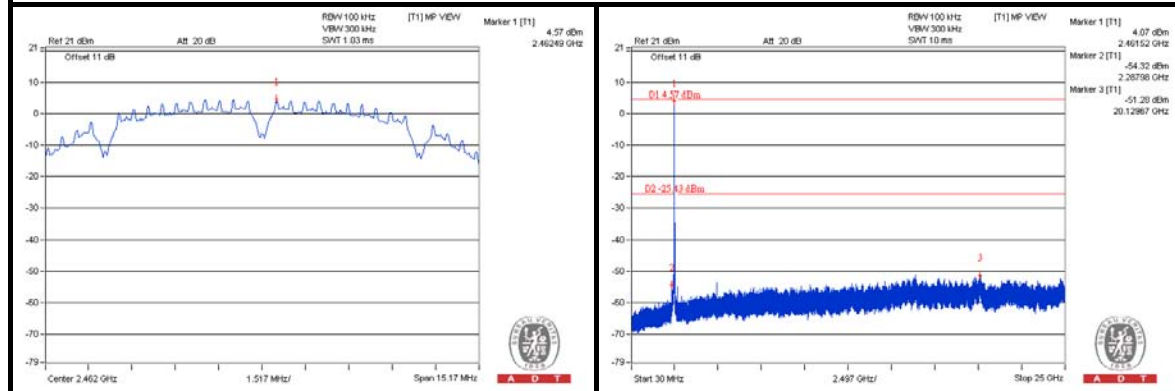
CH 1



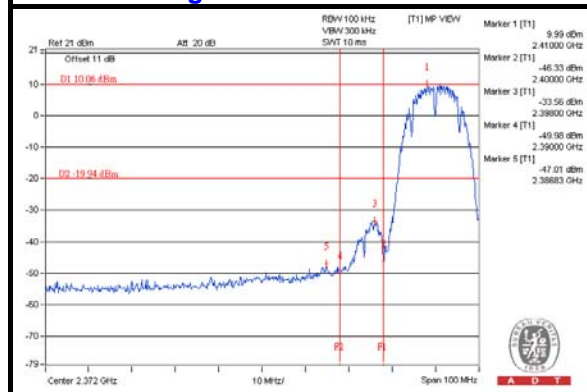
CH 6



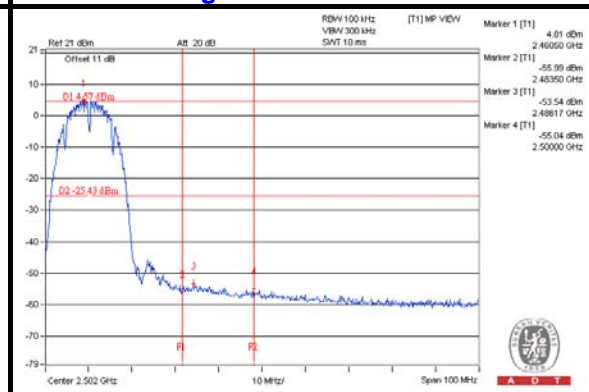
CH 11



CH 1 Band edge

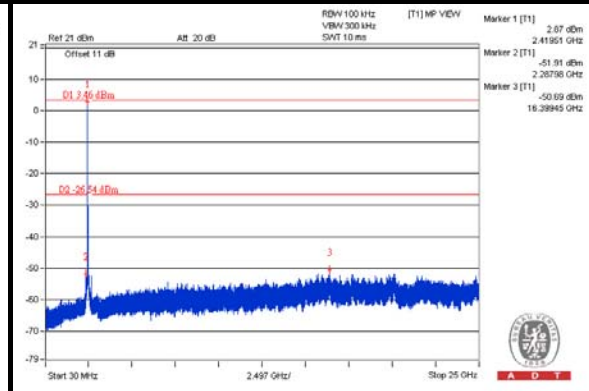
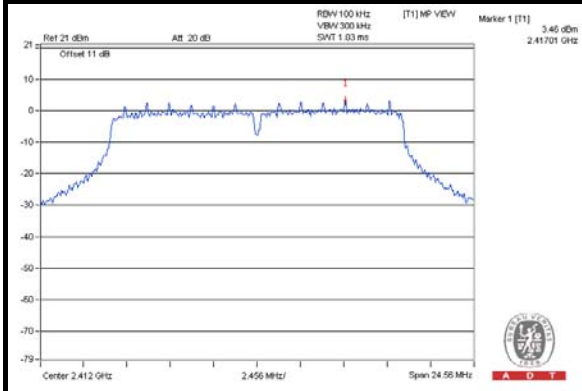


CH 11 Band edge

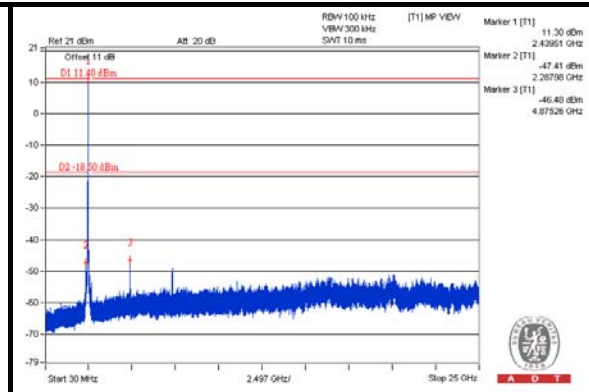
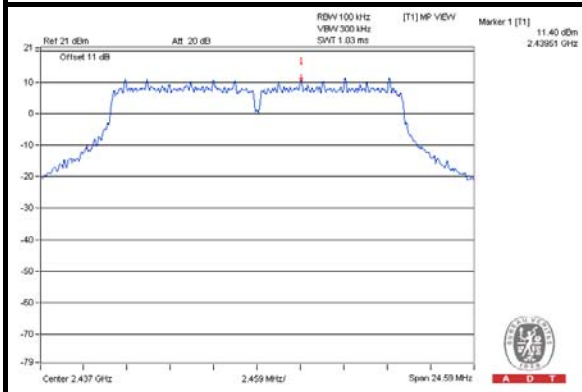


802.11g
CHAIN 0

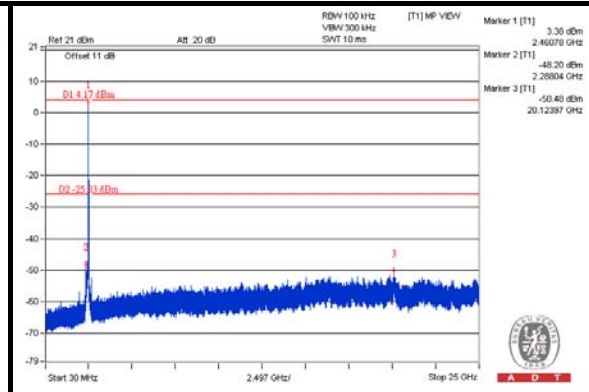
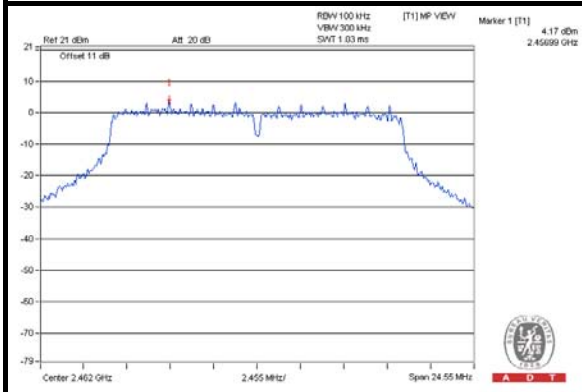
CH 1



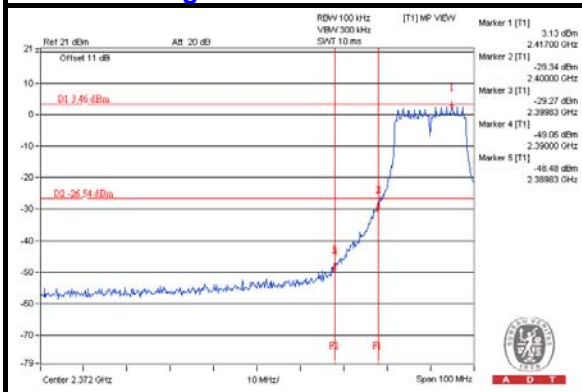
CH 6



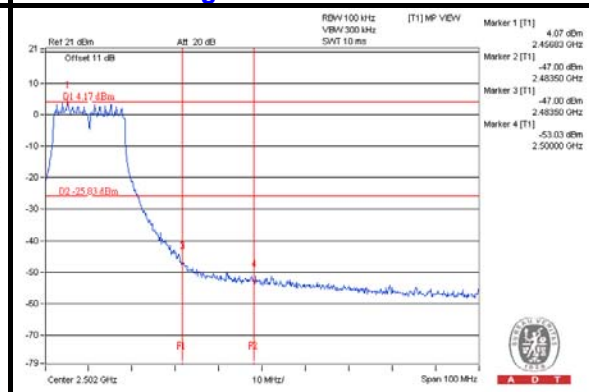
CH 11



CH 1 Band edge



CH 11 Band edge

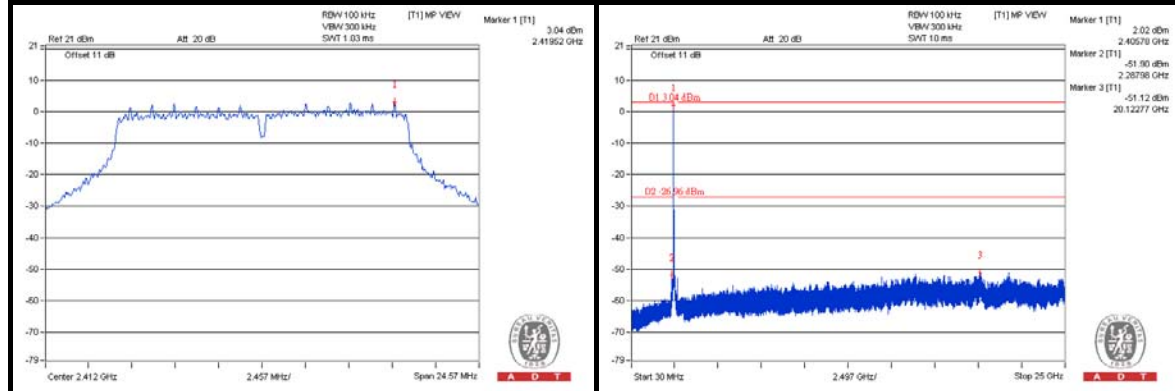




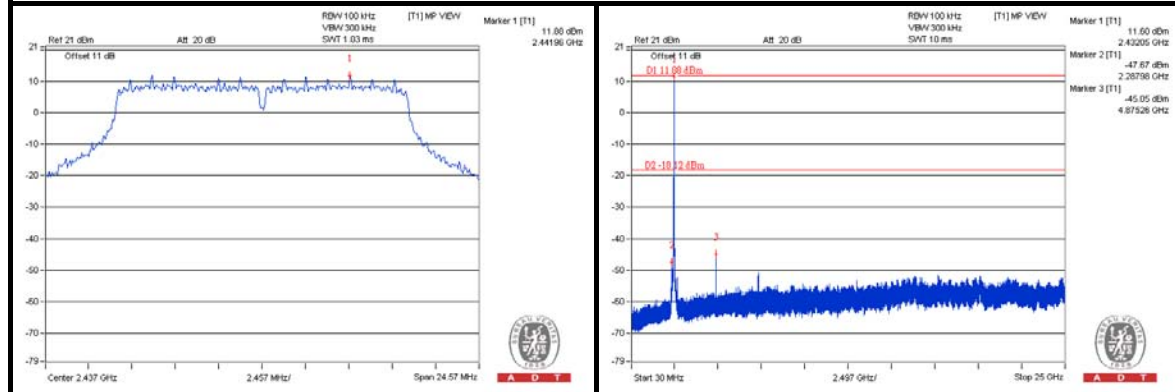
A D T

CHAIN 1

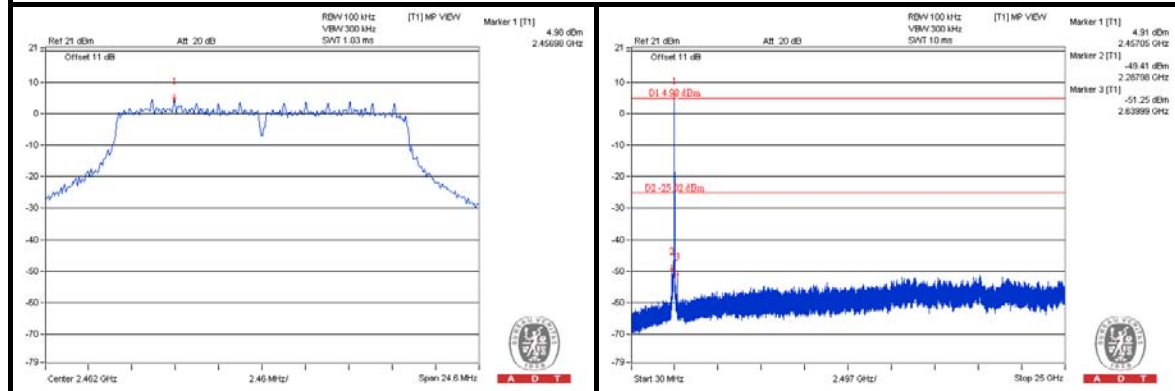
CH 1



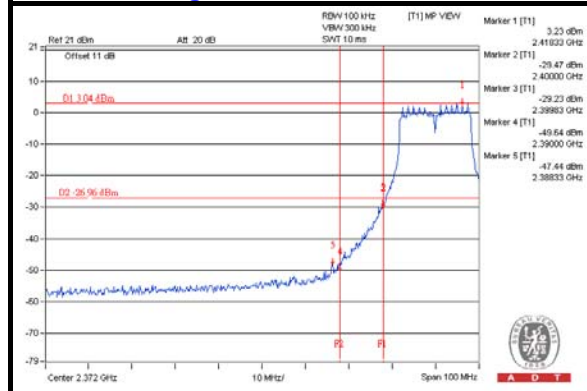
CH 6



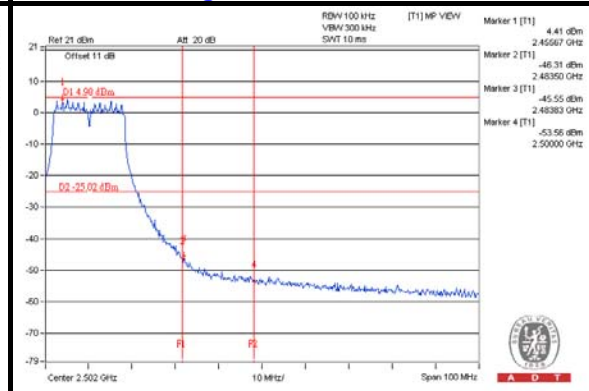
CH 11



CH 1 Band edge



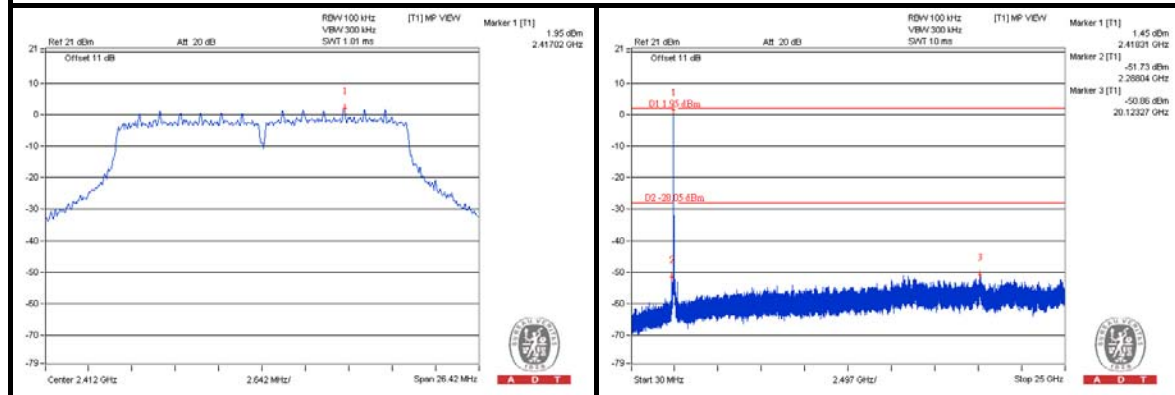
CH 11 Band edge



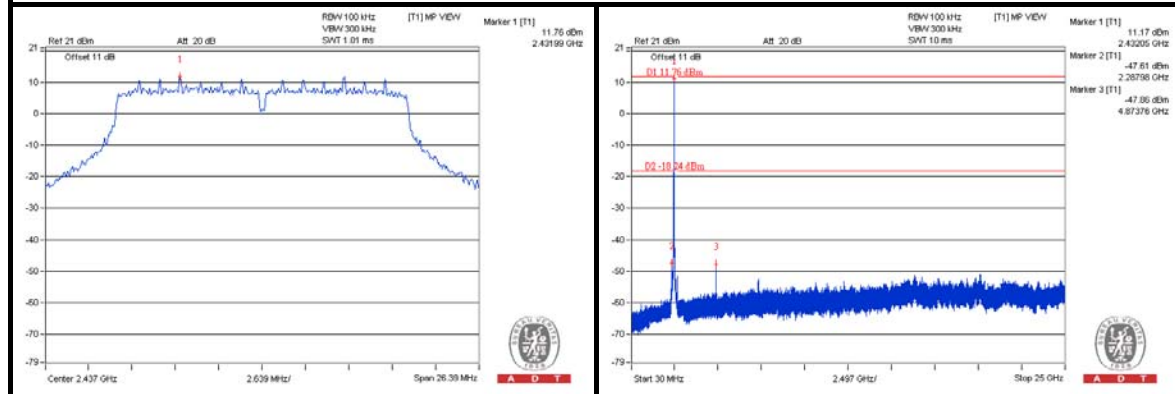
802.11n (20MHz)

CHAIN 0

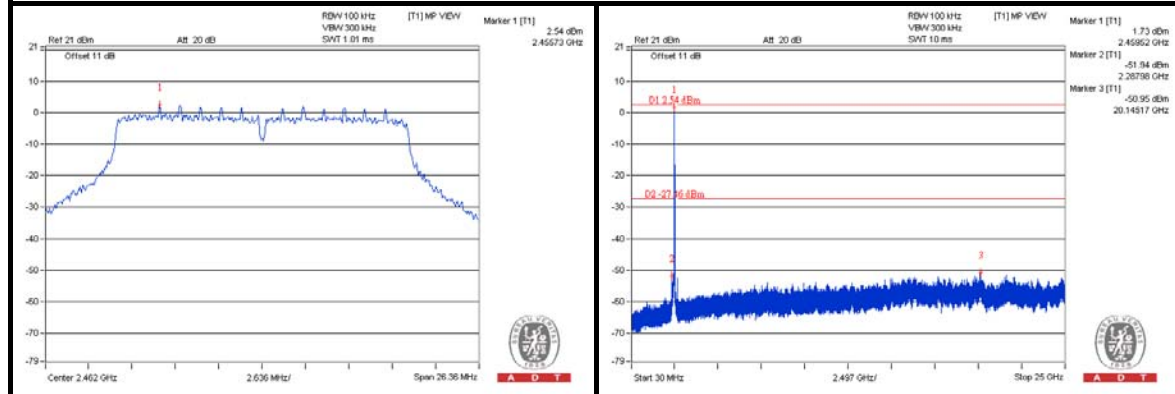
CH 1



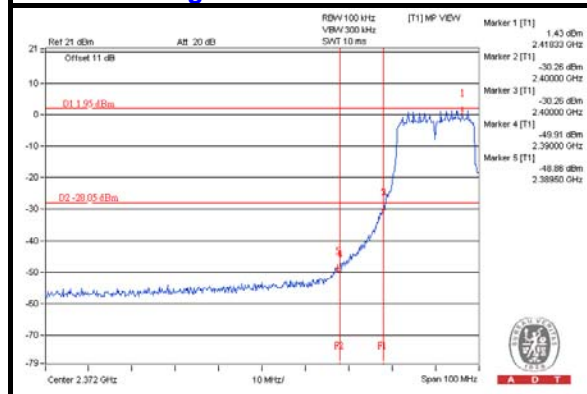
CH 6



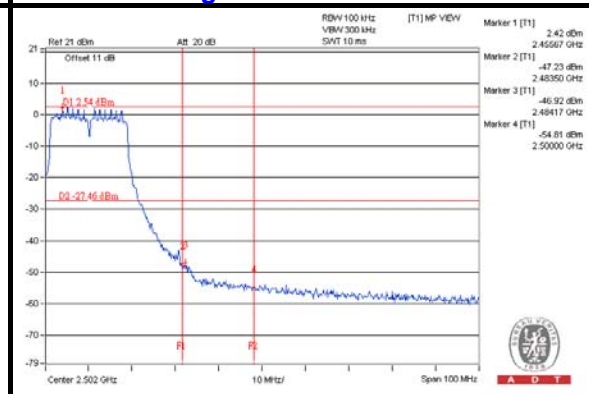
CH 11



CH 1 Band edge



CH 11 Band edge

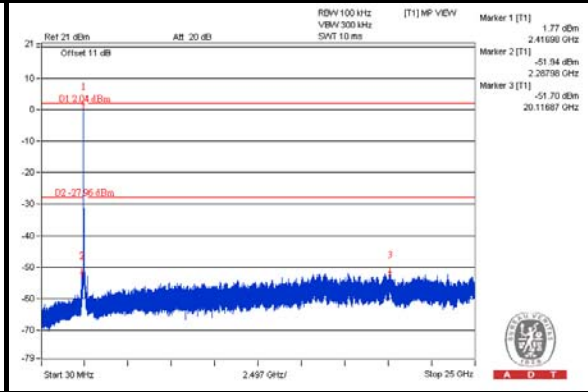
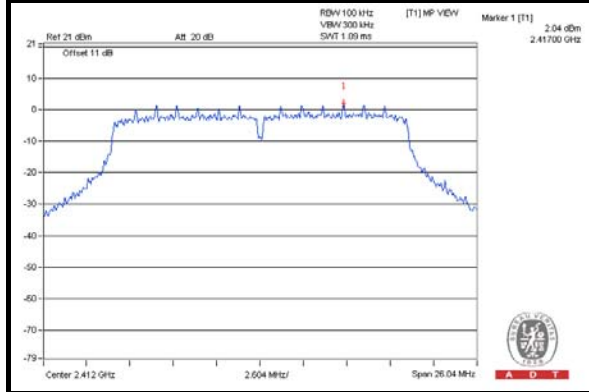




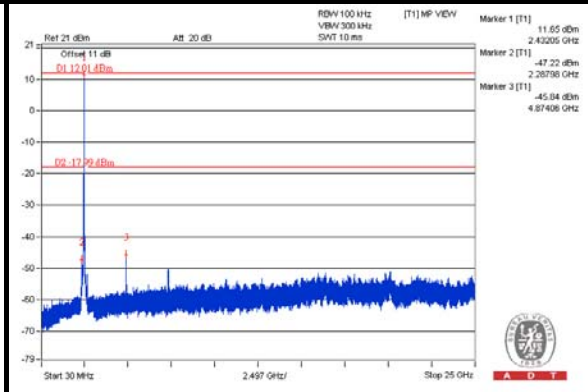
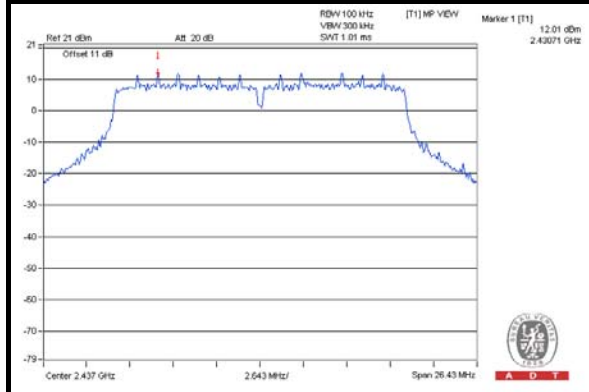
A D T

CHAIN 1

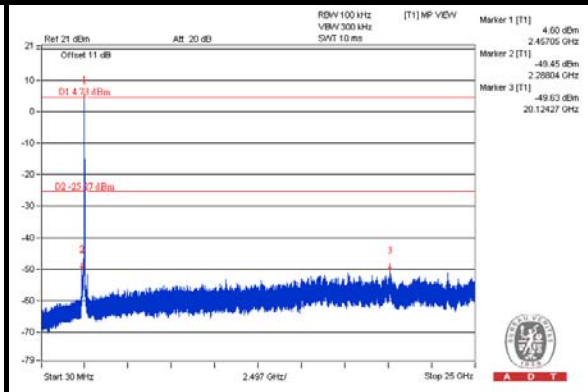
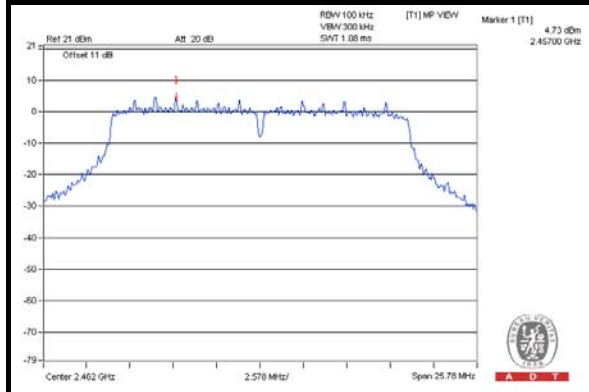
CH 1



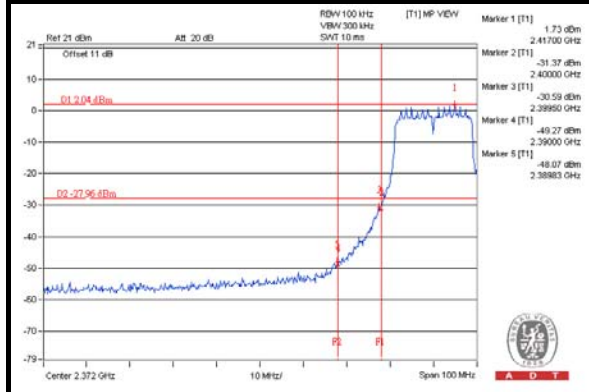
CH 6



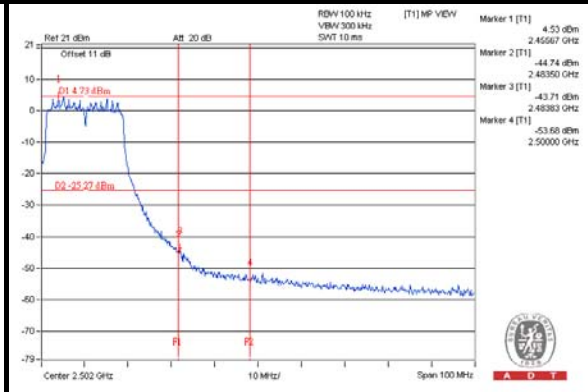
CH 11



CH 1 Band edge



CH 11 Band edge



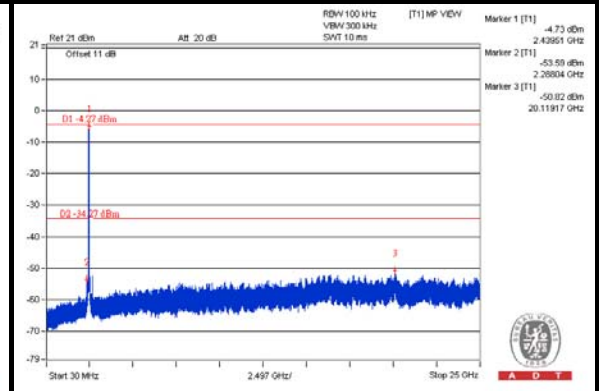
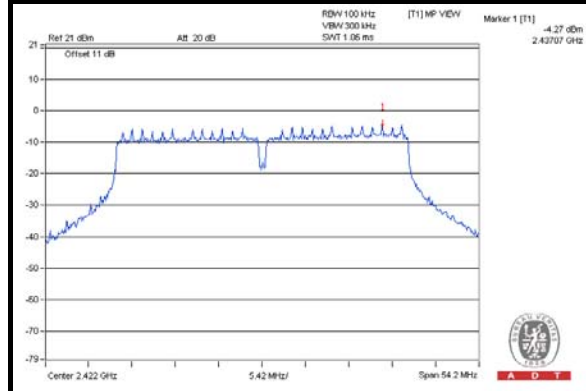


A D T

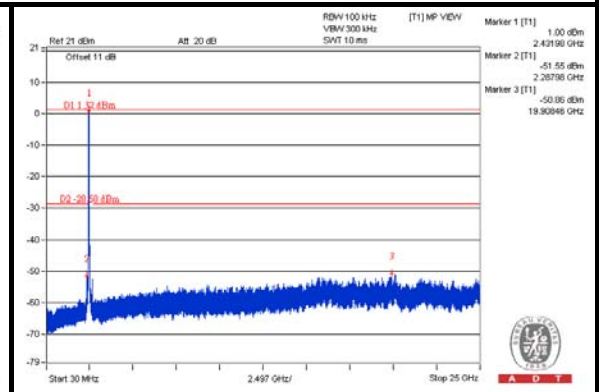
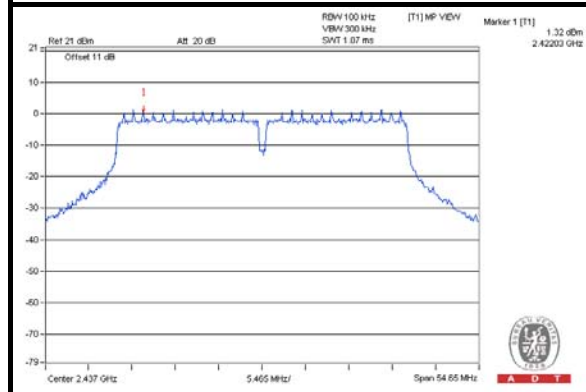
802.11n (40MHz)

CHAIN 0

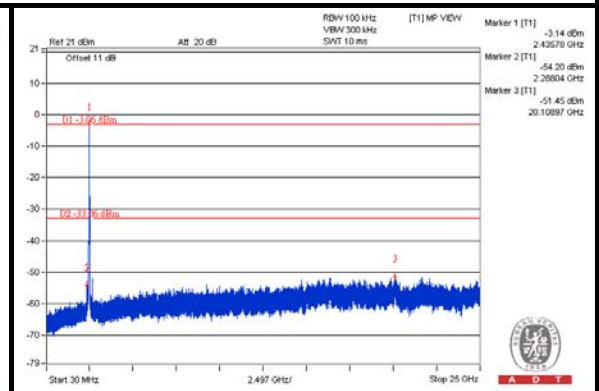
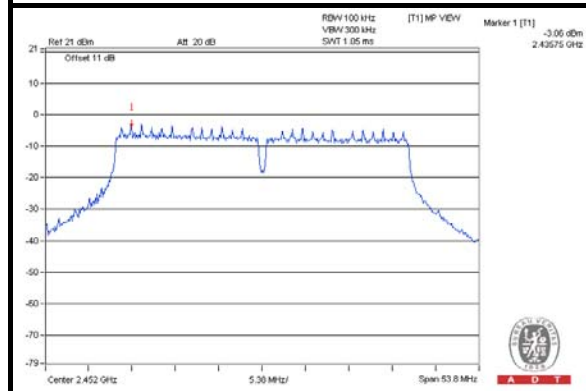
CH 3



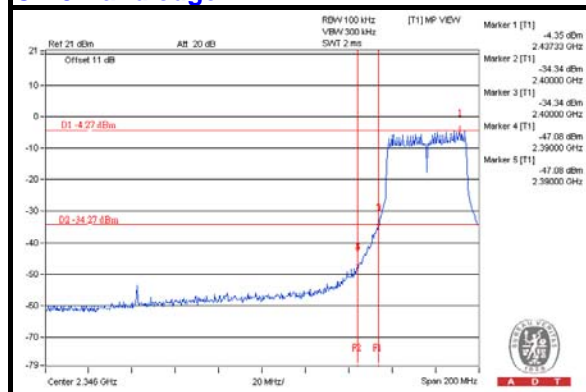
CH 6



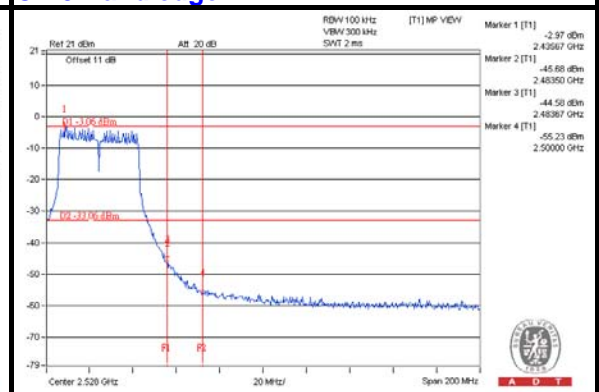
CH 9



CH 3 Band edge



CH 9 Band edge

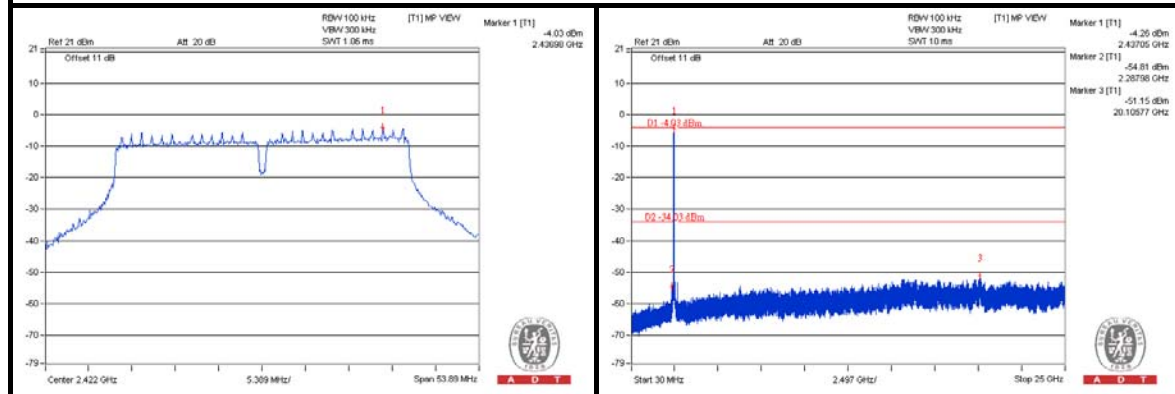




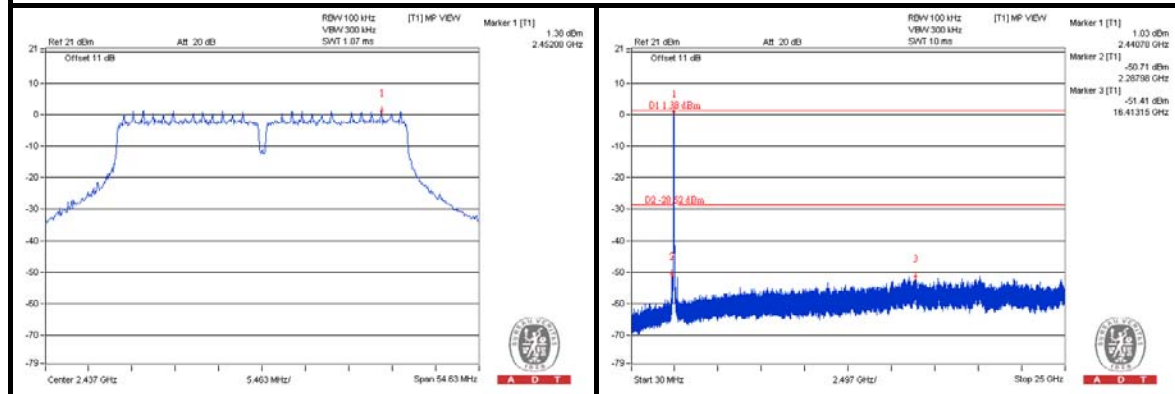
A D T

CHAIN 1

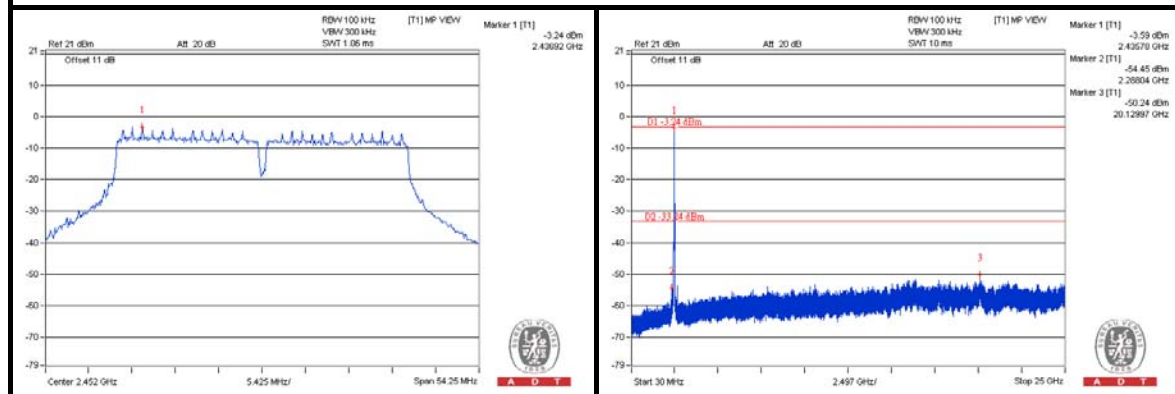
CH 3



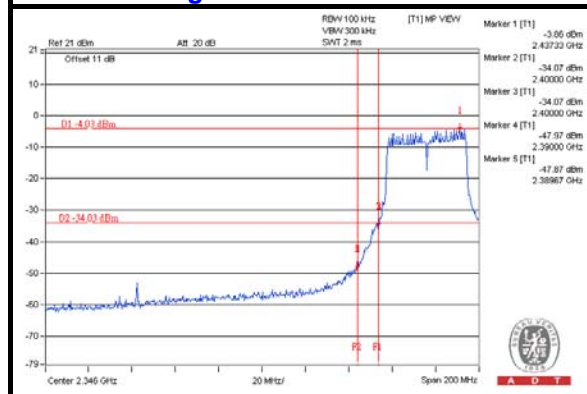
CH 6



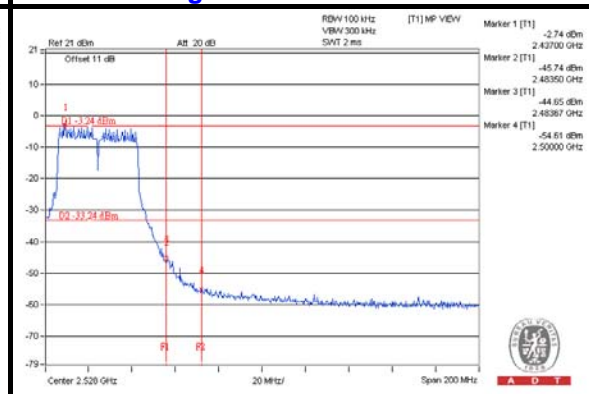
CH 9



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 Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom 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---