



A D T

FCC TEST REPORT (15.247)

REPORT NO.: RF130422C26

MODEL NO.: DGL-5500

FCC ID: KA2GL5500A1

RECEIVED: Apr. 22, 2013

TESTED: Apr. 22 ~ May 29, 2013

ISSUED: May 29, 2013

APPLICANT: D-Link Corporation

ADDRESS: 17595 Mt. Hermann, Fountain Valley, CA 92708,
U.S.A.

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.....	5
1. CERTIFICATION.....	6
2. SUMMARY OF TEST RESULTS	7
2.1 MEASUREMENT UNCERTAINTY	7
3. GENERAL INFORMATION	8
3.1 GENERAL DESCRIPTION OF EUT	8
3.2 DESCRIPTION OF TEST MODES	10
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	11
3.3 DESCRIPTION OF SUPPORT UNITS	15
3.3.1 CONFIGURATION OF SYSTEM UNDER TEST	16
3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS	17
4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND)	18
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT.....	18
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	18
4.1.2 TEST INSTRUMENTS	19
4.1.3 TEST PROCEDURES.....	20
4.1.4 DEVIATION FROM TEST STANDARD.....	20
4.1.5 TEST SETUP	21
4.1.6 EUT OPERATING CONDITIONS	21
4.1.7 TEST RESULTS.....	22
4.2 CONDUCTED EMISSION MEASUREMENT	37
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT.....	37
4.2.2 TEST INSTRUMENTS	37
4.2.3 TEST PROCEDURES.....	38
4.2.4 DEVIATION FROM TEST STANDARD.....	38
4.2.5 TEST SETUP	38
4.2.6 EUT OPERATING CONDITIONS	38
4.2.7 TEST RESULTS.....	39
4.3 6dB BANDWIDTH MEASUREMENT	43
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT	43
4.3.2 TEST SETUP	43
4.3.3 TEST INSTRUMENTS	43
4.3.4 TEST PROCEDURE	43
4.3.5 DEVIATION FROM TEST STANDARD.....	43
4.3.6 EUT OPERATING CONDITIONS	43
4.3.7 TEST RESULTS.....	44
4.4 CONDUCTED OUTPUT POWER.....	45
4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT.....	45
4.4.2 TEST SETUP	45



A D T

4.4.3	TEST INSTRUMENTS	45
4.4.4	TEST PROCEDURES.....	45
4.4.5	DEVIATION FROM TEST STANDARD.....	46
4.4.6	EUT OPERATING CONDITIONS	46
4.4.7	TEST RESULTS.....	47
4.5	POWER SPECTRAL DENSITY MEASUREMENT	49
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	49
4.5.2	TEST SETUP	49
4.5.3	TEST INSTRUMENTS	49
4.5.4	TEST PROCEDURE	49
4.5.5	DEVIATION FROM TEST STANDARD.....	49
4.5.6	EUT OPERATING CONDITION.....	49
4.5.7	TEST RESULTS.....	50
4.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT.....	52
4.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT	52
4.6.2	TEST SETUP	52
4.6.3	TEST INSTRUMENTS	52
4.6.4	TEST PROCEDURE	52
4.6.5	DEVIATION FROM TEST STANDARD.....	53
4.6.6	EUT OPERATING CONDITION.....	53
4.6.7	TEST RESULTS.....	53
4.6.8	TEST RESULTS.....	54
5.	TEST TYPES AND RESULTS (FOR 5.0GHz BAND)	66
5.1	RADIATED EMISSION MEASUREMENT	66
5.1.1	LIMITS OF RADIATED EMISSION MEASUREMENT.....	66
5.1.2	TEST INSTRUMENTS	67
5.1.3	TEST PROCEDURES.....	67
5.1.4	DEVIATION FROM TEST STANDARD.....	67
5.1.5	TEST SETUP	67
5.1.6	EUT OPERATING CONDITIONS	67
5.1.7	TEST RESULTS.....	68
5.2	CONDUCTED EMISSION MEASUREMENT	79
5.2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT.....	79
5.2.2	TEST INSTRUMENTS	79
5.2.3	TEST PROCEDURES.....	79
5.2.4	DEVIATION FROM TEST STANDARD.....	79
5.2.5	TEST SETUP	79
5.2.6	EUT OPERATING CONDITIONS	79
5.2.7	TEST RESULTS.....	80
5.3	6dB BANDWIDTH MEASUREMENT	84
5.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	84



A D T

5.3.2	TEST SETUP	84
5.3.3	TEST INSTRUMENTS	84
5.3.4	TEST PROCEDURE	84
5.3.5	DEVIATION FROM TEST STANDARD.....	84
5.3.6	EUT OPERATING CONDITIONS	84
5.3.7	TEST RESULTS.....	85
5.4	CONDUCTED OUTPUT POWER.....	86
5.4.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	86
5.4.2	TEST SETUP	86
5.4.3	INSTRUMENTS	86
5.4.4	TEST PROCEDURES.....	87
5.4.5	DEVIATION FROM TEST STANDARD.....	87
5.4.6	EUT OPERATING CONDITIONS	87
5.4.7	TEST RESULTS.....	88
5.5	POWER SPECTRAL DENSITY MEASUREMENT	90
5.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	90
5.5.2	TEST SETUP	90
5.5.3	TEST INSTRUMENTS	90
5.5.4	TEST PROCEDURE.....	90
5.5.5	DEVIATION FROM TEST STANDARD.....	90
5.5.6	EUT OPERATING CONDITION.....	90
5.5.7	TEST RESULTS.....	91
5.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT.....	92
5.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT	92
5.6.2	TEST SETUP	92
5.6.3	TEST INSTRUMENTS	92
5.6.4	TEST PROCEDURE	92
5.6.5	DEVIATION FROM TEST STANDARD.....	92
5.6.6	EUT OPERATING CONDITION.....	92
5.6.7	TEST RESULTS.....	92
6.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	100
7.	INFORMATION ON THE TESTING LABORATORIES	101
8.	APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	102



A D T

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130422C26	Original release.	May 29, 2013



A D T

1. CERTIFICATION

PRODUCT: Wireless AC1300 Gaming Router
MODEL NO.: DGL-5500
BRAND: D-Link
APPLICANT: D-Link Corporation
TESTED: Apr. 22 ~ May 29, 2013
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (model: DGL-5500) 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 : Polly Chien , **DATE :** May 29, 2013
Polly Chien / Specialist

APPROVED BY : Ken Liu , **DATE :** May 29, 2013
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 -10.51dB at 0.15000MHz.
15.247(d) 15.209	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.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is I-PEX not a standard connector.

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 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	Wireless AC1300 Gaming Router
MODEL NO.	DGL-5500
POWER SUPPLY	12Vdc (Adapter)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only.
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11/5.5/2/1Mbps 802.11a/g: 54/48/36/24/18/12/9/6Mbps 802.11n (2.4GHz): up to 450Mbps 802.11n (5GHz): up to 300Mbps 802.11ac: up to 866.7Mbps
OPERATING FREQUENCY	2.4GHz: 2412 ~ 2462MHz 5.0GHz: 5745 ~ 5825MHz
NUMBER OF CHANNEL	2.4GHz: 802.11b, 802.11g, 802.11n (20MHz): 11 802.11n (40MHz): 7 5.0GHz: 802.11a, 802.11n (20MHz), 802.11ac (20MHz): 5 802.11n (40MHz), 802.11ac (40MHz): 2 802.11ac (80MHz): 1
OUTPUT POWER	970.050mW for 2412 ~ 2462MHz 378.791mW for 5745 ~ 5825MHz
ANTENNA TYPE	2.4GHz: Printed antenna with 0dBi gain 5.0GHz: Printed antenna with 0dBi gain
ANTENNA CONNECTOR	I-PEX
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter



A D T

NOTE:

1. The EUT incorporates a MIMO function. The EUT provides 3 completed transmitters and 3 receivers for 2.4GHz & provides 2 completed transmitters and 2 receivers for 5GHz.

MODULATION MODE	TX FUNCTION
802.11b	3TX
802.11g	3TX
802.11a	2TX
802.11n (20MHz) for 2.4GHz	3TX
802.11n (40MHz) for 2.4GHz	3TX
802.11n (20MHz) for 5GHz	2TX
802.11n (40MHz) for 5GHz	2TX
802.11ac (80MHz)	2TX

2. The EUT consumes power from the following adapters.

Adapter 1	
Brand	D-Link
Model	CG2412-B IW
Input Power	100-240Vac, 50-60Hz, 0.6A
Output Power	12Vdc, 2A
Power Line	1.2m cable without core attached on adapter

Adapter 2	
Brand	D-Link
Model	ADS0271-W 120200
Input Power	100-240Vac, 50-60Hz, 0.6A
Output Power	12Vdc, 2.0A
Power Line	1.2m cable without core attached on adapter

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



3.2 DESCRIPTION OF TEST MODES

FOR 2.4GHz:

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		

FOR 5.0GHz (5745 ~ 5825MHz):

5 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (40MHz), 802.11ac (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (80MHz):

CHANNEL	FREQUENCY
155	5775MHz



A D T

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR 2.4GHz:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE \geq 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from adapter 2

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

NOTE: "-" means no effect.

RADIATED EMISSION TEST (ABOVE 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
A	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)
A, B	802.11n (40MHz)	3 to 9	6	OFDM	BPSK	15.0

POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11n (40MHz)	3 to 9	6	OFDM	BPSK	15.0



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)
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	7.2
A	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)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
A	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	25deg. C, 71%RH	120Vac, 60Hz	Martin Lee
RE<1G	23deg. C, 76%RH	120Vac, 60Hz	Martin Lee
PLC	23deg. C, 63%RH	120Vac, 60Hz	Nick Chen
APCM	23deg. C, 76%RH	120Vac, 60Hz	Nick Chen



FOR 5.0GHz (5745 ~ 5825MHz):

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from adapter 2

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

NOTE: “-” means no effect.

RADIATED EMISSION TEST (ABOVE 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (80MHz)	155	155	OFDM	BPSK	58.5

RADIATED EMISSION TEST (BELOW 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11a	149 to 165	157	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)
A, B	802.11a	149 to 165	157	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)
A	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (80MHz)	155	155	OFDM	BPSK	58.5

ANTENNA PORT CONDUCTED MEASUREMENT:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (80MHz)	155	155	OFDM	BPSK	58.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 71%RH	120Vac, 60Hz	Martin Lee
RE<1G	23deg. C, 76%RH	120Vac, 60Hz	Martin Lee
PLC	23deg. C, 63%RH	120Vac, 60Hz	Nick Chen
APCM	23deg. C, 76%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.

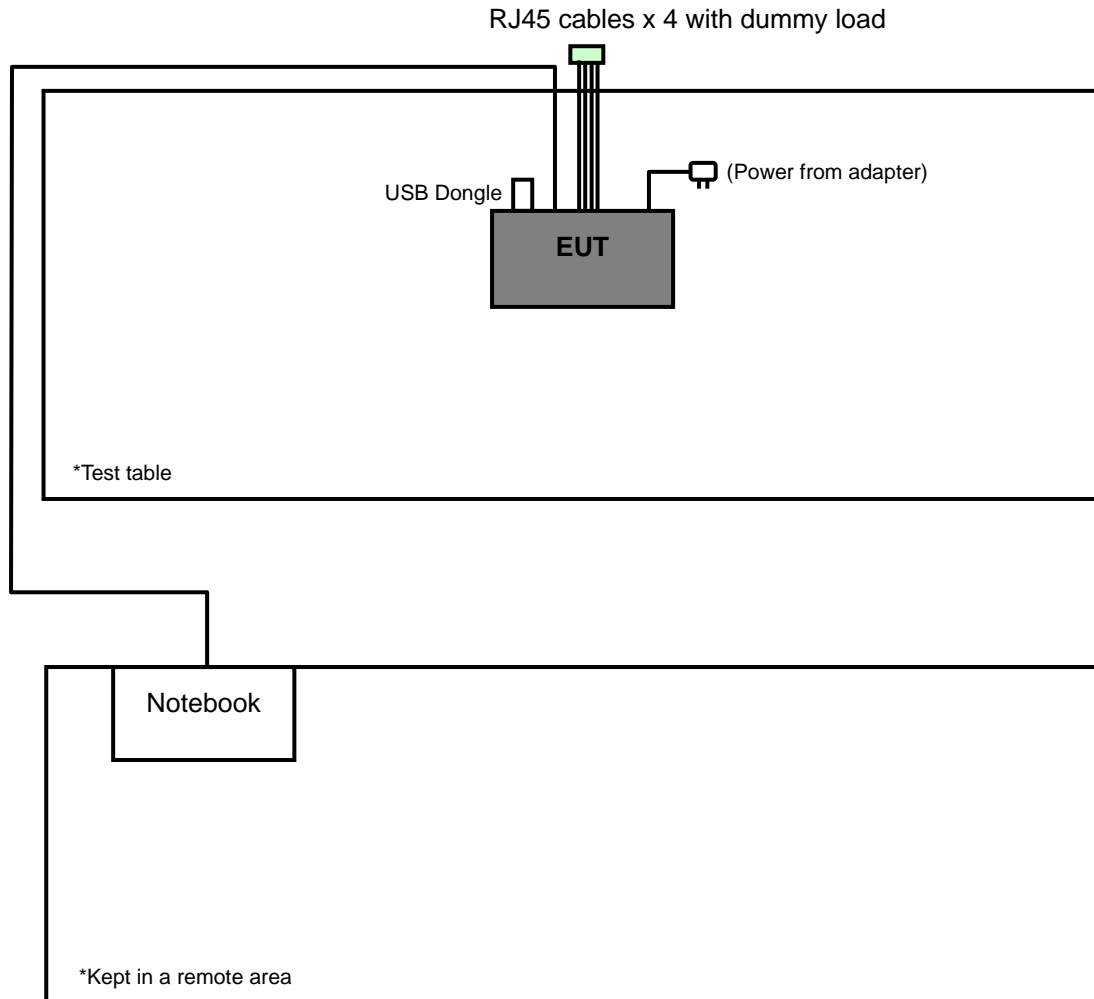
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Dummy Load	NA	NA	NA	NA
2	USB Dongle	Transcend	V85	569992-8271	NA
3	Notebook	DELL	E5520	8Y4DMQ1	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.8m RJ45 UTP cable x 4 with load connected to EUT
2	NA
3	10m RJ45 UTP cable

NOTE:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 3 acted as a communication partner to transfer data.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST





A D T

3.4 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 v02

662911 D01 Multiple Transmitter Output v01 r02

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 (FOR 2.4GHz BAND)

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 20dB below the highest level of the desired power:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



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	ESCS30	100289	Nov. 16, 2012	Nov. 15, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jan. 28, 2013	Jan. 27, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Mar. 22, 2013	Mar. 21, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-209	Sep. 03, 2012	Sep. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier Agilent	8449B	3008A01911	Oct. 25, 2012	Oct. 24, 2013
Preamplifier Agilent	8447D	2944A10638	Oct. 25, 2012	Oct. 24, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295013/4 283403/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 11, 2012	Aug. 10, 2013
Software BV ADT	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 25, 2012	Oct. 24, 2013
High Speed Peak Power Meter	ML2495A	0824011	Jul. 30, 2012	Jul. 29, 2013
Power Sensor	MA2411B	0738171	Jul. 30, 2012	Jul. 29, 2013

- 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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 3. The test was performed in HwaYa Chamber 9.
 4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 5. The FCC Site Registration No. is 460141.
 6. The IC Site Registration No. is IC 7450F-4.



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.

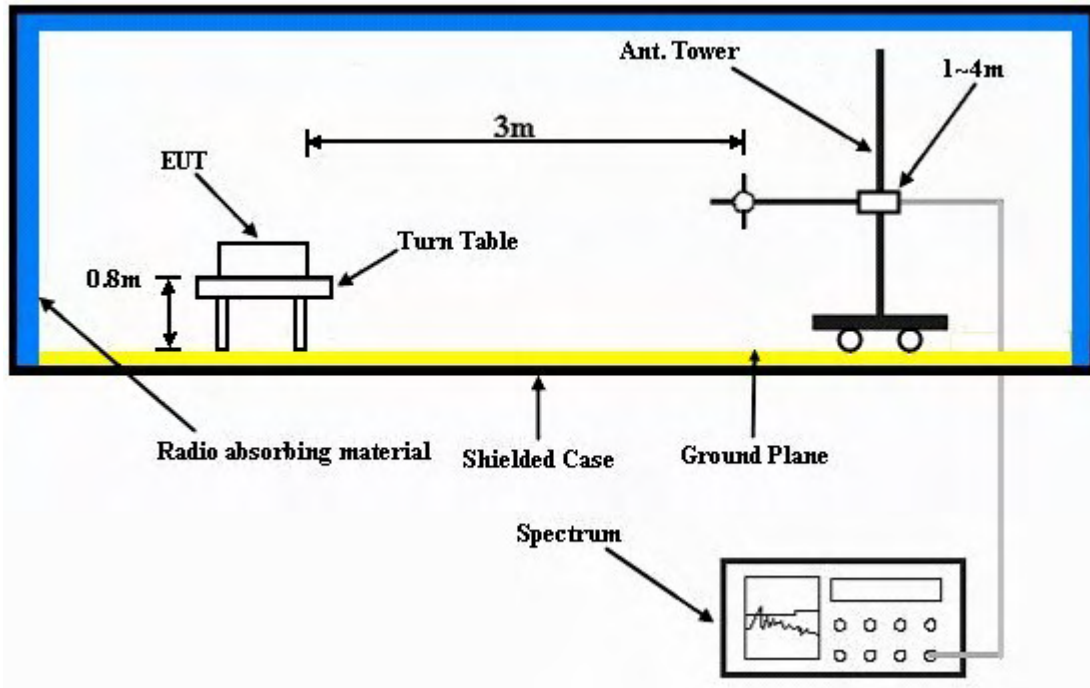
NOTE:

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 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



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

4.1.6 EUT OPERATING CONDITIONS

- Placed the EUT on the testing table.
- Prepared notebook to act as a communication partner and placed it outside of testing area.
- The communication partner connected with EUT via a RJ45 cable and run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The communication partners sent data to EUT by command "PING".
- The necessary accessories enabled the system in full functions.



A D T

4.1.7 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA :

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

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	2288.00	63.3 PK	74.0	-10.7	1.44 H	37	27.90	35.40
2	2288.00	51.2 AV	54.0	-2.8	1.44 H	37	15.80	35.40
3	2390.00	65.4 PK	74.0	-8.6	1.44 H	37	29.70	35.70
4	2390.00	52.1 AV	54.0	-1.9	1.44 H	37	16.40	35.70
5	*2412.00	115.7 PK			1.41 H	36	79.90	35.80
6	*2412.00	112.3 AV			1.41 H	36	76.50	35.80
7	4824.00	51.9 PK	74.0	-22.1	1.54 H	59	8.80	43.10
8	4824.00	44.8 AV	54.0	-9.2	1.54 H	59	1.70	43.10

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	2288.00	60.2 PK	74.0	-13.8	1.00 V	225	24.80	35.40
2	2288.00	49.6 AV	54.0	-4.4	1.00 V	225	14.20	35.40
3	2390.00	59.6 PK	74.0	-14.4	1.00 V	300	23.90	35.70
4	2390.00	49.9 AV	54.0	-4.1	1.00 V	300	14.20	35.70
5	*2412.00	110.3 PK			1.00 V	300	74.50	35.80
6	*2412.00	106.8 AV			1.00 V	300	71.00	35.80
7	4824.00	58.5 PK	74.0	-15.5	1.01 V	76	15.40	43.10
8	4824.00	52.6 AV	54.0	-1.4	1.01 V	76	9.50	43.10

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).
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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	113.8 PK			1.00 H	28	78.00	35.80
2	*2437.00	109.9 AV			1.00 H	28	74.10	35.80
3	4874.00	52.5 PK	74.0	-21.5	1.24 H	46	9.30	43.20
4	4874.00	45.3 AV	54.0	-8.7	1.24 H	46	2.10	43.20
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	*2437.00	111.8 PK			1.26 V	147	76.00	35.80
2	*2437.00	108.2 AV			1.26 V	147	72.40	35.80
3	4874.00	58.6 PK	74.0	-15.4	1.45 V	87	15.40	43.20
4	4874.00	52.7 AV	54.0	-1.3	1.45 V	87	9.50	43.20

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).
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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.4 PK			1.00 H	146	78.50	35.90
2	*2462.00	110.7 AV			1.00 H	146	74.80	35.90
3	2483.50	61.7 PK	74.0	-12.3	1.00 H	146	25.80	35.90
4	2483.50	50.8 AV	54.0	-3.2	1.00 H	146	14.90	35.90
5	#3282.00	52.4 PK	94.4	-42.0	1.00 H	53	13.10	39.30
6	#3282.00	47.7 AV	90.7	-43.0	1.00 H	53	8.40	39.30
7	4924.00	51.5 PK	74.0	-22.5	1.29 H	42	8.10	43.40
8	4924.00	40.6 AV	54.0	-13.4	1.29 H	42	-2.80	43.40
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	*2462.00	113.3 PK			1.00 V	189	77.40	35.90
2	*2462.00	109.7 AV			1.00 V	189	73.80	35.90
3	2483.50	63.1 PK	74.0	-10.9	1.00 V	189	27.20	35.90
4	2483.50	50.4 AV	54.0	-3.6	1.00 V	189	14.50	35.90
5	#3282.00	51.5 PK	93.3	-41.8	1.43 V	213	12.20	39.30
6	#3282.00	44.3 AV	89.7	-45.4	1.43 V	213	5.00	39.30
7	4924.00	53.5 PK	74.0	-20.5	1.44 V	109	10.10	43.40
8	4924.00	45.8 AV	54.0	-8.2	1.44 V	109	2.40	43.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.



A D T

802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.1 PK	74.0	-1.9	1.00 H	3	36.40	35.70
2	2390.00	52.8 AV	54.0	-1.2	1.00 H	3	17.10	35.70
3	*2412.00	108.9 PK			1.00 H	352	73.10	35.80
4	*2412.00	99.8 AV			1.00 H	352	64.00	35.80
5	4824.00	51.2 PK	74.0	-22.8	1.25 H	66	8.10	43.10
6	4824.00	37.5 AV	54.0	-16.5	1.25 H	66	-5.60	43.10
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	2390.00	67.4 PK	74.0	-6.6	1.00 V	197	31.70	35.70
2	2390.00	50.9 AV	54.0	-3.1	1.00 V	197	15.20	35.70
3	*2412.00	105.4 PK			1.00 V	197	69.60	35.80
4	*2412.00	96.5 AV			1.00 V	197	60.70	35.80
5	4824.00	50.5 PK	74.0	-23.5	1.47 V	32	7.40	43.10
6	4824.00	36.6 AV	54.0	-17.4	1.47 V	32	-6.50	43.10

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).
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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

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	2288.00	61.7 PK	74.0	-12.3	1.00 H	19	26.30	35.40
2	2288.00	50.7 AV	54.0	-3.3	1.00 H	19	15.30	35.40
3	*2437.00	112.3 PK			1.31 H	145	76.50	35.80
4	*2437.00	102.2 AV			1.31 H	145	66.40	35.80
5	4874.00	55.9 PK	74.0	-18.1	1.11 H	233	12.70	43.20
6	4874.00	40.7 AV	54.0	-13.3	1.11 H	233	-2.50	43.20
7	7311.00	68.9 PK	74.0	-5.1	1.19 H	291	21.20	47.70
8	7311.00	52.6 AV	54.0	-1.4	1.19 H	291	4.90	47.70

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	2288.00	60.6 PK	74.0	-13.4	1.45 V	22	25.20	35.40
2	2288.00	49.6 AV	54.0	-4.4	1.45 V	22	14.20	35.40
3	*2437.00	107.8 PK			1.58 V	181	72.00	35.80
4	*2437.00	98.0 AV			1.58 V	181	62.20	35.80
5	4874.00	67.1 PK	74.0	-6.9	1.62 V	104	23.90	43.20
6	4874.00	51.3 AV	54.0	-2.7	1.62 V	104	8.10	43.20
7	7311.00	59.4 PK	74.0	-14.6	1.17 V	303	11.70	47.70
8	7311.00	45.7 AV	54.0	-8.3	1.17 V	303	-2.00	47.70

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).
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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.8 PK			1.59 H	181	73.90	35.90
2	*2462.00	101.0 AV			1.59 H	181	65.10	35.90
3	2483.50	72.8 PK	74.0	-1.2	1.59 H	181	36.90	35.90
4	2483.50	53.0 AV	54.0	-1.0	1.59 H	181	17.10	35.90
5	4924.00	49.7 PK	74.0	-24.3	1.25 H	5	6.30	43.40
6	4924.00	36.7 AV	54.0	-17.3	1.25 H	5	-6.70	43.40
7	7386.00	54.3 PK	74.0	-19.7	1.05 H	66	6.20	48.10
8	7386.00	42.4 AV	54.0	-11.6	1.05 H	66	-5.70	48.10
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	*2462.00	106.3 PK			1.00 V	192	70.40	35.90
2	*2462.00	96.7 AV			1.00 V	192	60.80	35.90
3	2483.50	68.1 PK	74.0	-5.9	1.00 V	192	32.20	35.90
4	2483.50	51.7 AV	54.0	-2.3	1.00 V	192	15.80	35.90
5	4924.00	52.1 PK	74.0	-21.9	1.00 V	25	8.70	43.40
6	4924.00	39.0 AV	54.0	-15.0	1.00 V	25	-4.40	43.40
7	7386.00	53.4 PK	74.0	-20.6	1.05 V	66	5.30	48.10
8	7386.00	41.2 AV	54.0	-12.8	1.05 V	66	-6.90	48.10

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).
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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.4 PK	74.0	-2.6	1.00 H	24	35.70	35.70
2	2390.00	52.7 AV	54.0	-1.3	1.00 H	24	17.00	35.70
3	*2412.00	108.3 PK			1.17 H	355	72.50	35.80
4	*2412.00	98.6 AV			1.17 H	355	62.80	35.80
5	4824.00	50.8 PK	74.0	-23.2	1.35 H	66	7.70	43.10
6	4824.00	37.1 AV	54.0	-16.9	1.35 H	66	-6.00	43.10
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	2390.00	68.2 PK	74.0	-5.8	1.23 V	178	32.50	35.70
2	2390.00	50.9 AV	54.0	-3.1	1.23 V	178	15.20	35.70
3	*2412.00	104.1 PK			1.23 V	178	68.30	35.80
4	*2412.00	94.3 AV			1.23 V	178	58.50	35.80
5	4824.00	50.3 PK	74.0	-23.7	1.00 V	222	7.20	43.10
6	4824.00	36.2 AV	54.0	-17.8	1.00 V	222	-6.90	43.10

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).
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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

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	2288.00	61.3 PK	74.0	-12.7	1.00 H	20	25.90	35.40
2	2288.00	50.4 AV	54.0	-3.6	1.00 H	20	15.00	35.40
3	*2437.00	113.6 PK			1.32 H	150	77.80	35.80
4	*2437.00	103.1 AV			1.32 H	150	67.30	35.80
5	4874.00	56.2 PK	74.0	-17.8	1.12 H	236	13.00	43.20
6	4874.00	41.2 AV	54.0	-12.8	1.12 H	236	-2.00	43.20
7	7311.00	67.7 PK	74.0	-6.3	1.20 H	302	20.00	47.70
8	7311.00	52.7 AV	54.0	-1.3	1.20 H	302	5.00	47.70
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	2288.00	60.5 PK	74.0	-13.5	1.54 V	360	25.10	35.40
2	2288.00	49.7 AV	54.0	-4.3	1.54 V	360	14.30	35.40
3	*2437.00	109.1 PK			1.57 V	180	73.30	35.80
4	*2437.00	99.4 AV			1.57 V	180	63.60	35.80
5	4874.00	67.3 PK	74.0	-6.7	1.60 V	106	24.10	43.20
6	4874.00	51.2 AV	54.0	-2.8	1.60 V	106	8.00	43.20
7	7311.00	59.9 PK	74.0	-14.1	1.18 V	305	12.20	47.70
8	7311.00	46.3 AV	54.0	-7.7	1.18 V	305	-1.40	47.70

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).
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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

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	110.5 PK			1.12 H	187	74.60	35.90
2	*2462.00	100.7 AV			1.12 H	187	64.80	35.90
3	2483.50	68.6 PK	74.0	-5.4	1.62 H	188	32.70	35.90
4	2483.50	52.7 AV	54.0	-1.3	1.62 H	188	16.80	35.90
5	4924.00	49.5 PK	74.0	-24.5	1.25 H	5	6.10	43.40
6	4924.00	36.9 AV	54.0	-17.1	1.25 H	5	-6.50	43.40
7	7386.00	54.2 PK	74.0	-19.8	1.00 H	222	6.10	48.10
8	7386.00	42.5 AV	54.0	-11.5	1.00 H	222	-5.60	48.10
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	*2462.00	107.3 PK			1.00 V	185	71.40	35.90
2	*2462.00	97.8 AV			1.00 V	185	61.90	35.90
3	2483.50	68.7 PK	74.0	-5.3	1.00 V	185	32.80	35.90
4	2483.50	51.8 AV	54.0	-2.2	1.00 V	185	15.90	35.90
5	4924.00	52.5 PK	74.0	-21.5	1.35 V	66	9.10	43.40
6	4924.00	39.6 AV	54.0	-14.4	1.35 V	66	-3.80	43.40
7	7386.00	53.6 PK	74.0	-20.4	1.14 V	214	5.50	48.10
8	7386.00	41.8 AV	54.0	-12.2	1.14 V	214	-6.30	48.10

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).
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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

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	66.8 PK	74.0	-7.2	1.15 H	29	31.10	35.70
2	2390.00	52.8 AV	54.0	-1.2	1.15 H	29	17.10	35.70
3	*2422.00	105.9 PK			1.14 H	32	70.10	35.80
4	*2422.00	97.2 AV			1.14 H	32	61.40	35.80
5	4844.00	49.4 PK	74.0	-24.6	1.20 H	36	6.20	43.20
6	4844.00	36.2 AV	54.0	-17.8	1.20 H	36	-7.00	43.20
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	2390.00	64.8 PK	74.0	-9.2	1.00 V	212	29.10	35.70
2	2390.00	50.7 AV	54.0	-3.3	1.00 V	212	15.00	35.70
3	*2422.00	102.6 PK			1.00 V	212	66.80	35.80
4	*2422.00	93.4 AV			1.00 V	212	57.60	35.80
5	4844.00	49.5 PK	74.0	-24.5	1.02 V	32	6.30	43.20
6	4844.00	36.6 AV	54.0	-17.4	1.02 V	32	-6.60	43.20

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).
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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

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	66.1 PK	74.0	-7.9	1.16 H	185	30.40	35.70
2	2390.00	52.5 AV	54.0	-1.5	1.16 H	185	16.80	35.70
3	*2437.00	107.3 PK			1.16 H	185	71.50	35.80
4	*2437.00	97.8 AV			1.16 H	185	62.00	35.80
5	2483.50	66.1 PK	74.0	-7.9	1.16 H	183	30.20	35.90
6	2483.50	52.3 AV	54.0	-1.7	1.16 H	183	16.40	35.90
7	4874.00	48.8 PK	74.0	-25.2	1.45 H	5	5.60	43.20
8	4874.00	36.1 AV	54.0	-17.9	1.45 H	5	-7.10	43.20
9	7311.00	54.6 PK	74.0	-19.4	1.06 H	258	6.90	47.70
10	7311.00	41.3 AV	54.0	-12.7	1.06 H	258	-6.40	47.70

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.2 PK	74.0	-9.8	1.00 V	173	28.50	35.70
2	2390.00	50.8 AV	54.0	-3.2	1.00 V	173	15.10	35.70
3	*2437.00	104.8 PK			1.00 V	173	69.00	35.80
4	*2437.00	95.9 AV			1.00 V	173	60.10	35.80
5	2483.50	63.9 PK	74.0	-10.1	1.00 V	173	28.00	35.90
6	2483.50	50.8 AV	54.0	-3.2	1.00 V	173	14.90	35.90
7	4874.00	49.6 PK	74.0	-24.4	1.45 V	225	6.40	43.20
8	4874.00	36.5 AV	54.0	-17.5	1.45 V	225	-6.70	43.20
9	7311.00	53.4 PK	74.0	-20.6	1.36 V	5	5.70	47.70
10	7311.00	40.7 AV	54.0	-13.3	1.36 V	5	-7.00	47.70

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).
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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH	TESTED BY	Martin Lee

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	105.1 PK			1.01 H	146	69.20	35.90
2	*2452.00	94.7 AV			1.01 H	146	58.80	35.90
3	2483.50	66.2 PK	74.0	-7.8	1.01 H	146	30.30	35.90
4	2483.50	53.0 AV	54.0	-1.0	1.01 H	146	17.10	35.90
5	#3269.00	54.1 PK	85.1	-31.0	1.01 H	178	14.80	39.30
6	#3269.00	50.6 AV	74.7	-24.1	1.01 H	178	11.30	39.30
7	4904.00	49.6 PK	74.0	-24.4	1.25 H	55	6.30	43.30
8	4904.00	35.9 AV	54.0	-18.1	1.25 H	55	-7.40	43.30
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	103.8 PK			1.00 V	195	67.90	35.90
2	*2452.00	93.8 AV			1.00 V	195	57.90	35.90
3	2483.50	67.1 PK	74.0	-6.9	1.00 V	195	31.20	35.90
4	2483.50	52.9 AV	54.0	-1.1	1.00 V	195	17.00	35.90
5	#3269.00	50.5 PK	83.8	-33.3	1.03 V	255	11.20	39.30
6	#3269.00	45.0 AV	73.8	-28.8	1.03 V	255	5.70	39.30
7	4904.00	49.5 PK	74.0	-24.5	1.36 V	52	6.20	43.30
8	4904.00	35.9 AV	54.0	-18.1	1.36 V	52	-7.40	43.30

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. “#“: The radiated frequency is out the restricted band.



A D T

BELOW 1GHz WORST-CASE DATA : 802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	109.54	31.5 QP	43.5	-12.0	1.58 H	138	20.80	10.70
2	237.58	34.3 QP	46.0	-11.7	1.00 H	118	22.10	12.20
3	299.66	33.6 QP	46.0	-12.4	2.25 H	237	19.10	14.50
4	359.80	30.9 QP	46.0	-15.1	1.00 H	134	14.70	16.20
5	480.08	35.3 QP	46.0	-10.7	1.54 H	232	16.00	19.30
6	960.10	43.8 QP	54.0	-10.2	1.44 H	90	16.40	27.40
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	64.92	34.3 QP	40.0	-5.7	1.54 V	6	22.40	11.90
2	109.54	36.6 QP	43.5	-6.9	1.00 V	61	25.90	10.70
3	229.82	31.3 QP	46.0	-14.7	1.63 V	53	19.40	11.90
4	480.08	36.0 QP	46.0	-10.0	1.00 V	190	16.70	19.30
5	625.58	32.3 QP	46.0	-13.7	1.44 V	180	9.60	22.70
6	960.83	45.8 QP	54.0	-8.2	1.00 V	43	18.40	27.40

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	140.58	29.1 QP	43.5	-14.4	1.52 H	117	15.90	13.20
2	258.92	37.0 QP	46.0	-9.0	1.00 H	106	23.90	13.10
3	386.96	34.7 QP	46.0	-11.3	1.00 H	152	17.80	16.90
4	687.66	39.2 QP	46.0	-6.8	1.75 H	61	15.70	23.50
5	813.76	35.9 QP	46.0	-10.1	1.00 H	295	10.40	25.50
6	960.20	36.3 QP	54.0	-17.7	1.02 H	271	8.90	27.40
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	64.92	35.5 QP	40.0	-4.5	1.44 V	14	23.60	11.90
2	142.52	32.8 QP	43.5	-10.7	1.14 V	233	19.60	13.20
3	255.04	32.5 QP	46.0	-13.5	1.20 V	144	19.50	13.00
4	388.90	38.6 QP	46.0	-7.4	1.49 V	244	21.60	17.00
5	441.28	35.3 QP	46.0	-10.7	1.65 V	197	17.00	18.30
6	720.64	39.7 QP	46.0	-6.3	1.00 V	24	15.60	24.10
7	802.12	41.0 QP	46.0	-5.0	1.78 V	190	15.60	25.40

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).
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 (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	100288	Nov. 09, 2012	Nov. 08, 2013
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 28, 2012	Dec. 27, 2013
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 21, 2012	Dec. 20, 2013
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 06, 2012	Jul. 05, 2013
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 2.
3. The VCCI Site Registration No. is C-2047.

4.2.3 TEST PROCEDURES

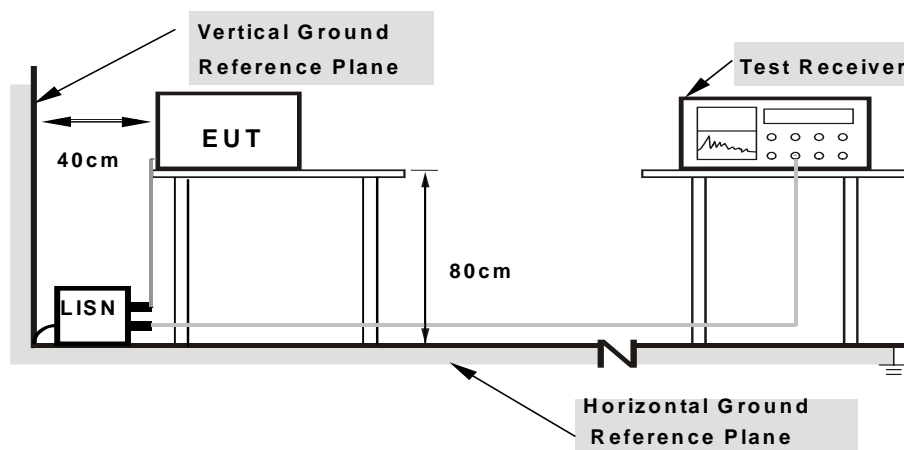
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: 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

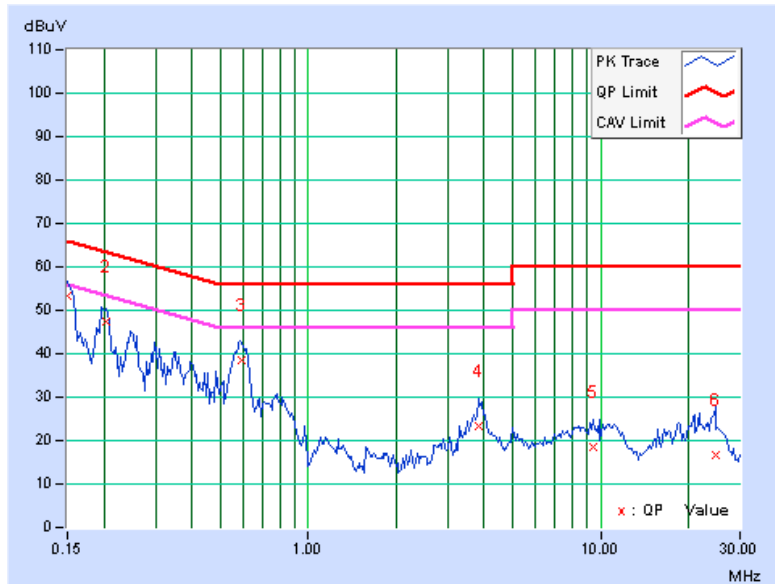
CONDUCTED WORST-CASE DATA : 802.11n (40MHz)

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.15000	0.19	53.30	45.30	53.49	45.49	66.00	56.00	-12.51	-10.51
2	0.20309	0.20	47.22	40.18	47.42	40.38	63.48	53.48	-16.06	-13.10
3	0.59363	0.24	38.31	33.11	38.55	33.35	56.00	46.00	-17.45	-12.65
4	3.81437	0.39	23.06	12.74	23.45	13.13	56.00	46.00	-32.55	-32.87
5	9.44084	0.48	17.97	12.42	18.45	12.90	60.00	50.00	-41.55	-37.10
6	24.73279	0.69	16.10	10.61	16.79	11.30	60.00	50.00	-43.21	-38.70

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.





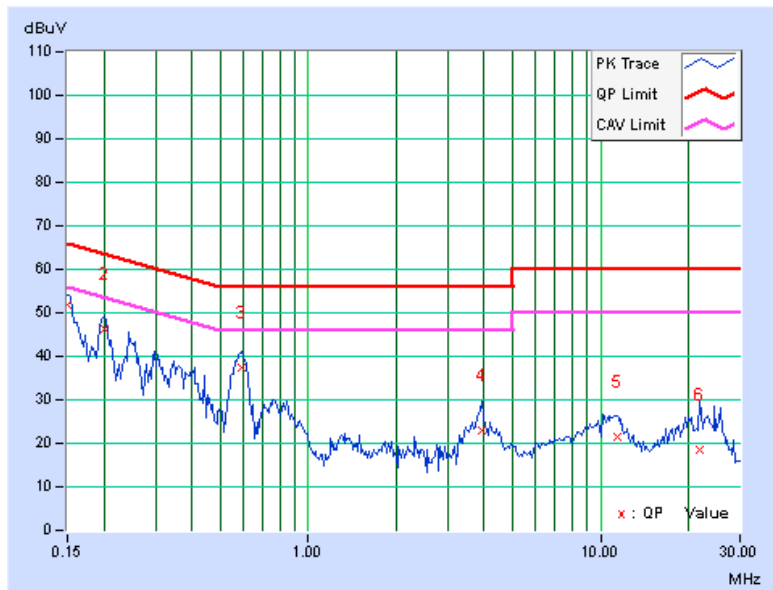
A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.15000	0.19	51.59	44.90	51.78	45.09	66.00	56.00	-14.22	-10.91
2	0.20078	0.19	46.18	40.24	46.37	40.43	63.58	53.58	-17.21	-13.15
3	0.59003	0.27	37.02	31.60	37.29	31.87	56.00	46.00	-18.71	-14.13
4	3.90822	0.44	22.56	11.38	23.00	11.82	56.00	46.00	-33.00	-34.18
5	11.36150	0.60	21.03	15.97	21.63	16.57	60.00	50.00	-38.37	-33.43
6	21.92664	0.80	17.62	12.37	18.42	13.17	60.00	50.00	-41.58	-36.83

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.





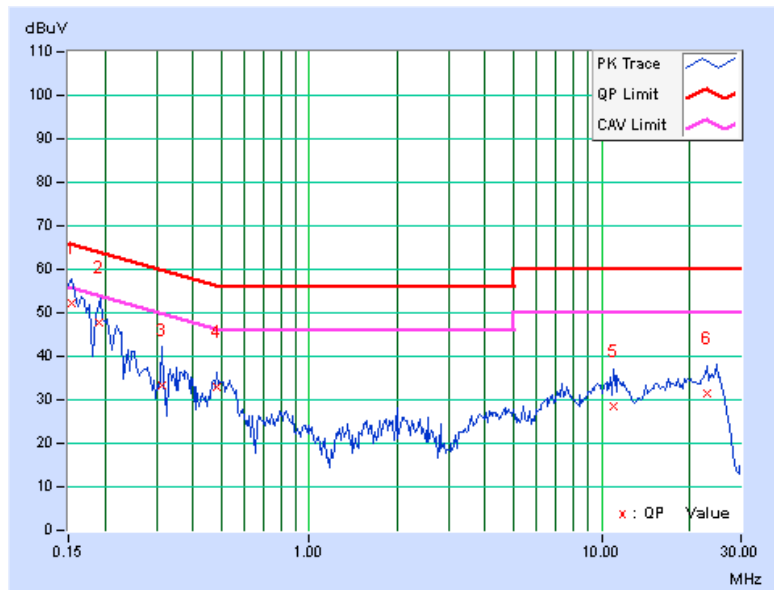
A D T

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.15392	0.19	52.08	36.22	52.27	36.41	65.79	55.79	-13.52	-19.38
2	0.19026	0.20	47.75	34.62	47.95	34.82	64.03	54.03	-16.08	-19.21
3	0.31252	0.21	33.03	21.65	33.24	21.86	59.90	49.90	-26.66	-28.04
4	0.48069	0.23	32.57	25.16	32.80	25.39	56.33	46.33	-23.53	-20.94
5	10.96731	0.51	28.12	21.41	28.63	21.92	60.00	50.00	-31.37	-28.08
6	22.94778	0.71	30.90	25.38	31.61	26.09	60.00	50.00	-28.39	-23.91

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.





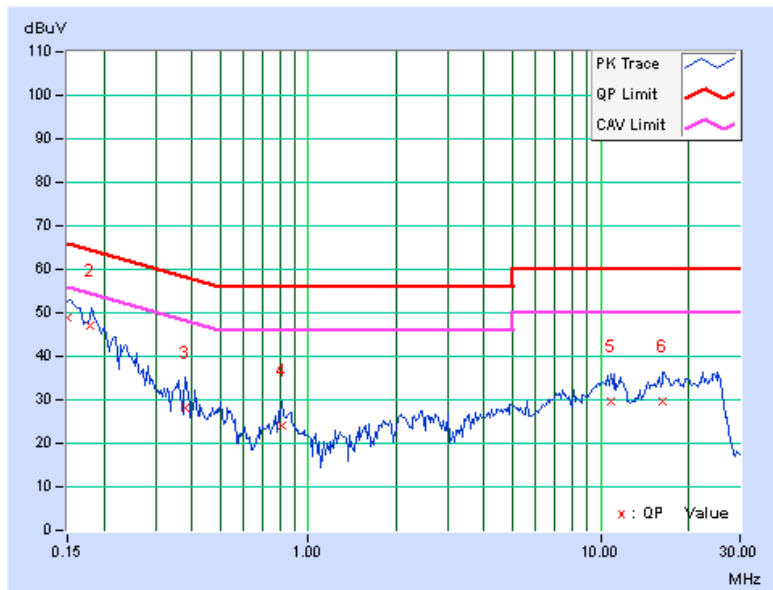
A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.15001	0.19	48.57	32.76	48.76	32.95	66.00	56.00	-17.23	-23.04
2	0.17994	0.19	46.80	34.61	46.99	34.80	64.49	54.49	-17.50	-19.69
3	0.37919	0.26	27.75	17.24	28.01	17.50	58.30	48.30	-30.29	-30.80
4	0.81272	0.26	23.90	16.06	24.16	16.32	56.00	46.00	-31.84	-29.68
5	10.88250	0.59	28.94	22.35	29.53	22.94	60.00	50.00	-30.47	-27.06
6	16.39319	0.73	28.85	23.25	29.58	23.98	60.00	50.00	-30.42	-26.02

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.

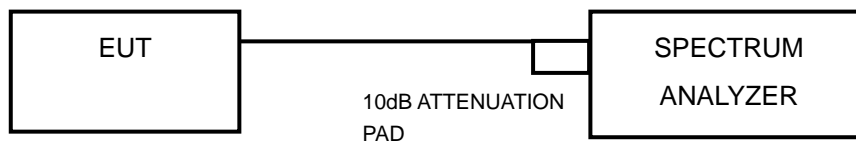


4.3 6dB BANDWIDTH MEASUREMENT

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) = approximately 1% of the emission bandwidth
- 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	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	6.08	6.10	5.17	0.5	PASS
6	2437	6.02	6.13	6.10	0.5	PASS
11	2462	6.11	6.62	5.64	0.5	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.54	16.53	16.49	0.5	PASS
6	2437	16.48	16.48	16.45	0.5	PASS
11	2462	16.54	16.47	16.44	0.5	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	17.66	17.65	17.61	0.5	PASS
6	2437	17.72	17.70	17.69	0.5	PASS
11	2462	17.70	17.68	17.69	0.5	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	36.50	36.47	36.47	0.5	PASS
6	2437	36.48	36.48	36.44	0.5	PASS
9	2452	36.40	36.37	36.41	0.5	PASS

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 v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

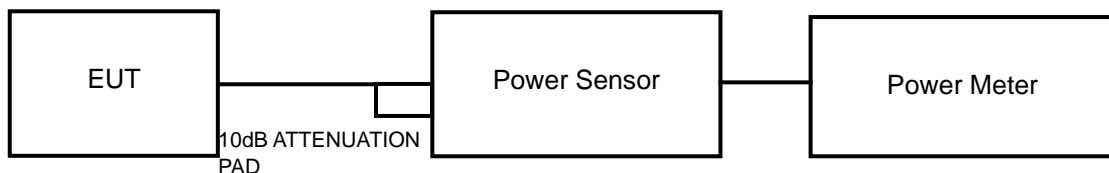
Array Gain = 0 dB (i.e., no array gain) for NANT \leq 4;

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

Array Gain = $5 \log(\text{NANT}/\text{NSS})$ 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 = $10 \log(\text{NANT}/\text{NSS})$ 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

A peak / average power sensor were used on the output port of the EUT. A power meter was used to read the response of the peak / average power sensor. Record the peak 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

FOR PEAK POWER

802.11b

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	22.53	22.72	22.97	564.282	27.51	30	PASS
6	2437	24.79	23.78	24.36	812.980	29.10	30	PASS
11	2462	24.80	23.97	23.65	783.193	28.94	30	PASS

802.11g

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	25.31	24.51	24.42	898.807	29.54	30	PASS
6	2437	25.33	24.53	24.41	901.043	29.55	30	PASS
11	2462	25.49	24.33	24.62	914.750	29.61	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	25.53	24.46	24.72	933.010	29.70	30	PASS
6	2437	25.55	24.38	24.74	930.931	29.69	30	PASS
11	2462	25.51	24.43	24.63	923.365	29.65	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
3	2422	23.82	23.44	24.69	756.233	28.79	30	PASS
6	2437	25.56	24.88	24.81	970.050	29.87	30	PASS
9	2452	23.93	23.71	24.63	772.537	28.88	30	PASS



A D T

FOR AVERAGE POWER

802.11b

CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	18.74	19.01	19.09	235.529	23.72
6	2437	21.04	20.08	20.69	346.136	25.39
11	2462	21.20	20.22	19.97	336.334	25.27

802.11g

CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.35	15.14	15.56	111.786	20.48
6	2437	16.39	15.15	15.50	111.766	20.48
11	2462	16.46	15.11	15.59	112.917	20.53

802.11n (20MHz)

CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.67	15.11	15.70	116.040	20.65
6	2437	16.58	15.14	15.68	115.141	20.61
11	2462	16.63	15.08	15.73	115.648	20.63

802.11n (40MHz)

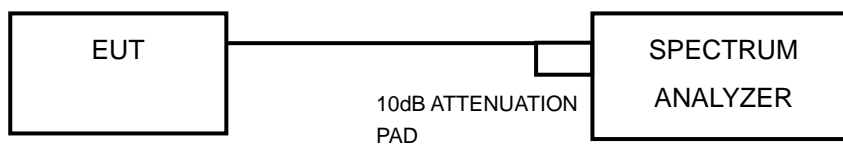
CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	13.76	13.64	13.73	70.494	18.48
6	2437	16.18	15.33	15.49	111.014	20.45
9	2452	13.82	13.29	13.97	70.375	18.47

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=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-1.22	4.77	3.55	8.00	PASS
	6	2437	-0.70	4.77	4.07	8.00	PASS
	11	2462	-1.44	4.77	3.33	8.00	PASS
1	1	2412	-2.24	4.77	2.53	8.00	PASS
	6	2437	-2.28	4.77	2.49	8.00	PASS
	11	2462	-2.33	4.77	2.44	8.00	PASS
2	1	2412	-1.90	4.77	2.87	8.00	PASS
	6	2437	-0.81	4.77	3.96	8.00	PASS
	11	2462	-1.14	4.77	3.63	8.00	PASS

NOTE: Directional gain = $0\text{dBi} + 10\log(3) = 4.8\text{dBi} < 6\text{dBi}$, so the limit no need to reduced.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-10.22	4.77	-5.45	8.00	PASS
	6	2437	-5.73	4.77	-0.96	8.00	PASS
	11	2462	-10.50	4.77	-5.73	8.00	PASS
1	1	2412	-9.87	4.77	-5.10	8.00	PASS
	6	2437	-11.26	4.77	-6.49	8.00	PASS
	11	2462	-10.89	4.77	-6.12	8.00	PASS
2	1	2412	-8.01	4.77	-3.24	8.00	PASS
	6	2437	-10.73	4.77	-5.96	8.00	PASS
	11	2462	-11.06	4.77	-6.29	8.00	PASS

NOTE: Directional gain = $0\text{dBi} + 10\log(3) = 4.8\text{dBi} < 6\text{dBi}$, so the limit no need to reduced.



802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-10.47	4.77	-5.70	8.00	PASS
	6	2437	-10.34	4.77	-5.57	8.00	PASS
	11	2462	-10.37	4.77	-5.60	8.00	PASS
1	1	2412	-11.11	4.77	-6.34	8.00	PASS
	6	2437	-10.37	4.77	-5.60	8.00	PASS
	11	2462	-11.03	4.77	-6.26	8.00	PASS
2	1	2412	-8.36	4.77	-3.59	8.00	PASS
	6	2437	-11.33	4.77	-6.56	8.00	PASS
	11	2462	-11.54	4.77	-6.77	8.00	PASS

NOTE: Directional gain = 0dBi + 10log(3) = 4.8dBi < 6dBi, so the limit no need to reduced.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-15.97	4.77	-11.20	8.00	PASS
	6	2437	-5.79	4.77	-1.02	8.00	PASS
	9	2452	-14.50	4.77	-9.73	8.00	PASS
1	3	2422	-15.38	4.77	-10.61	8.00	PASS
	6	2437	-9.64	4.77	-4.87	8.00	PASS
	9	2452	-16.35	4.77	-11.58	8.00	PASS
2	3	2422	-14.74	4.77	-9.97	8.00	PASS
	6	2437	-12.22	4.77	-7.45	8.00	PASS
	9	2452	-14.80	4.77	-10.03	8.00	PASS

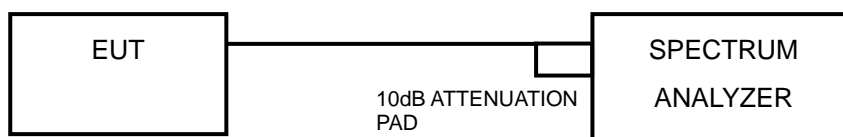
NOTE: Directional gain = 0dBi + 10log(3) = 4.8dBi < 6dBi, so the limit no need to reduced.

4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

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.



A D T

MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Set span to encompass the spectrum to be examined.
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.7 TEST RESULTS

The 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. Only worst data of each operating mode is presented.

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



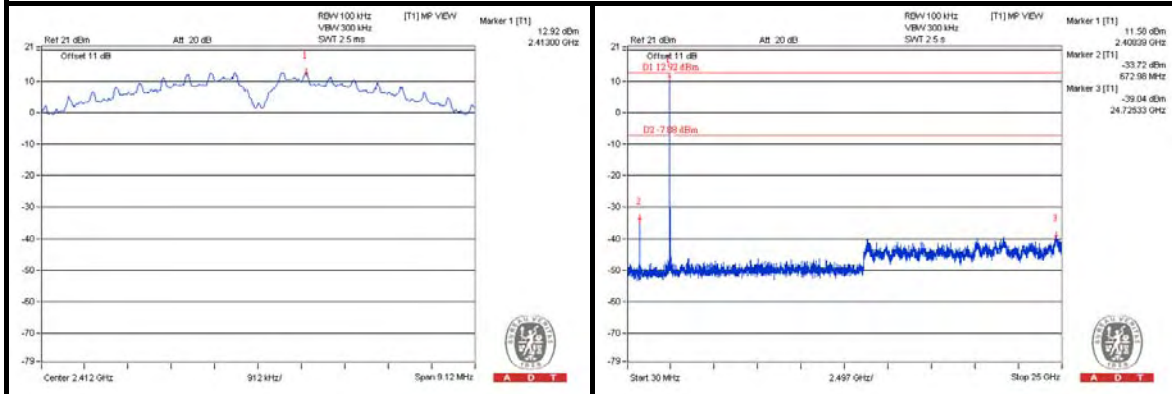
A D T

4.6.8 TEST RESULTS

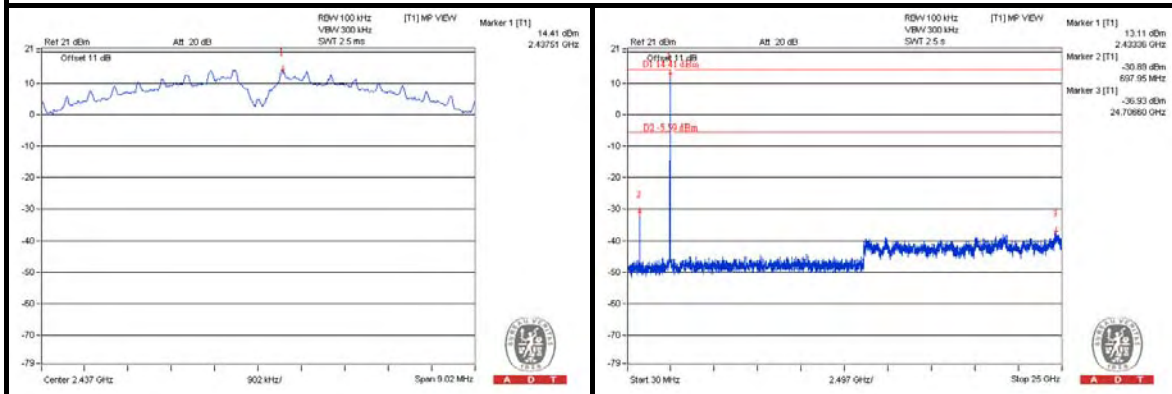
802.11b

CHAIN 0

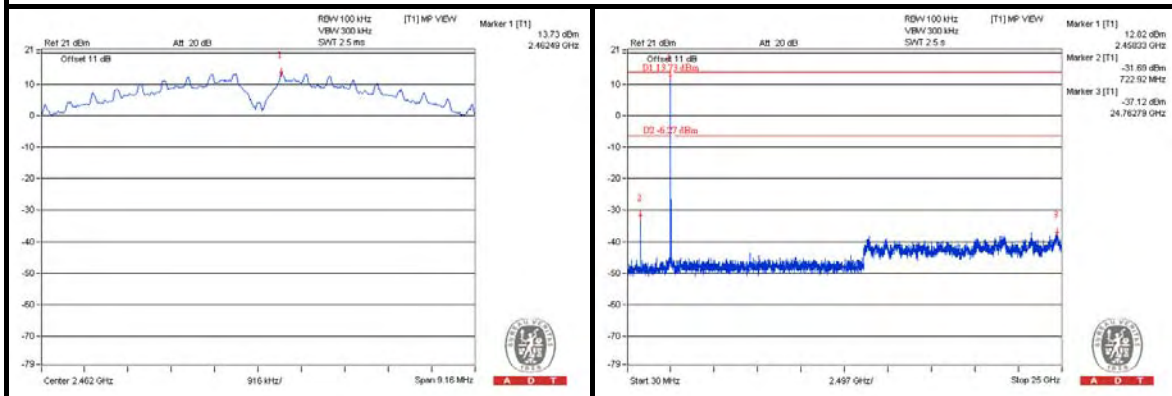
CH 1



CH 6



CH 11

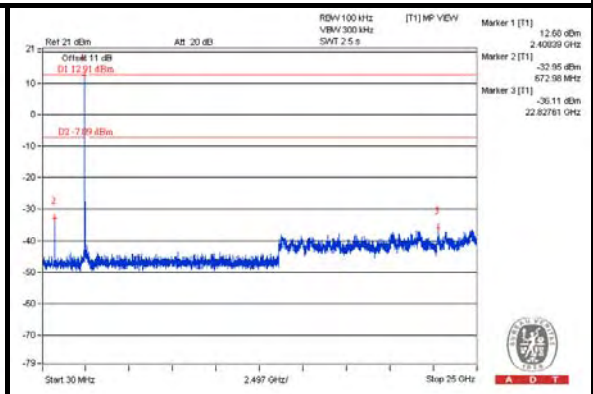
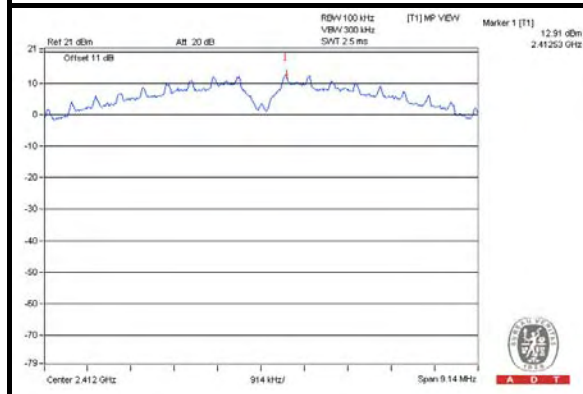




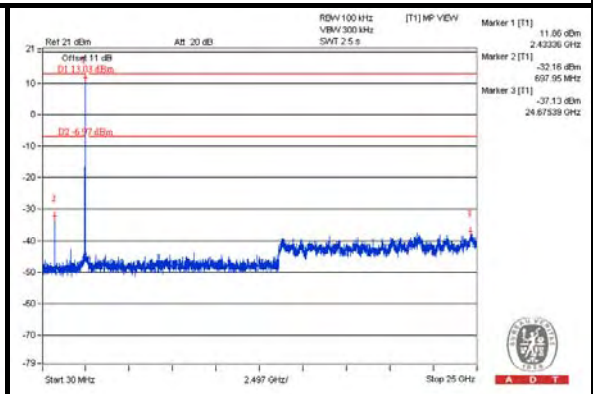
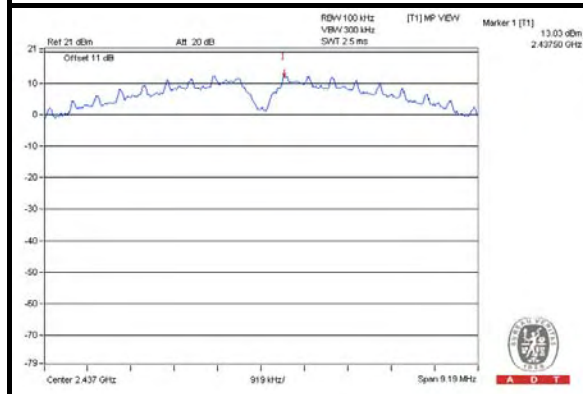
A D T

CHAIN 1

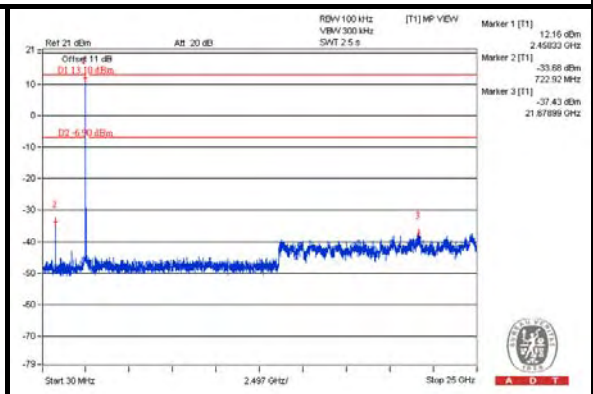
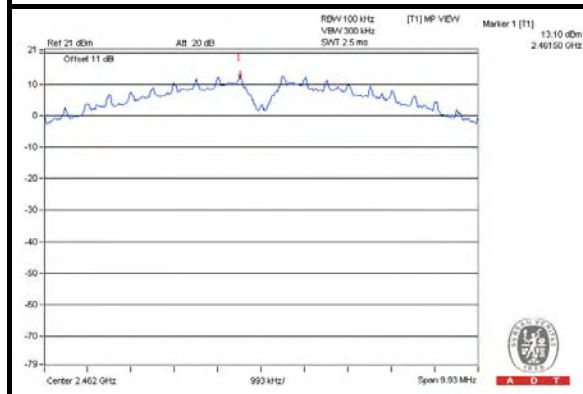
CH 1



CH 6



CH 11

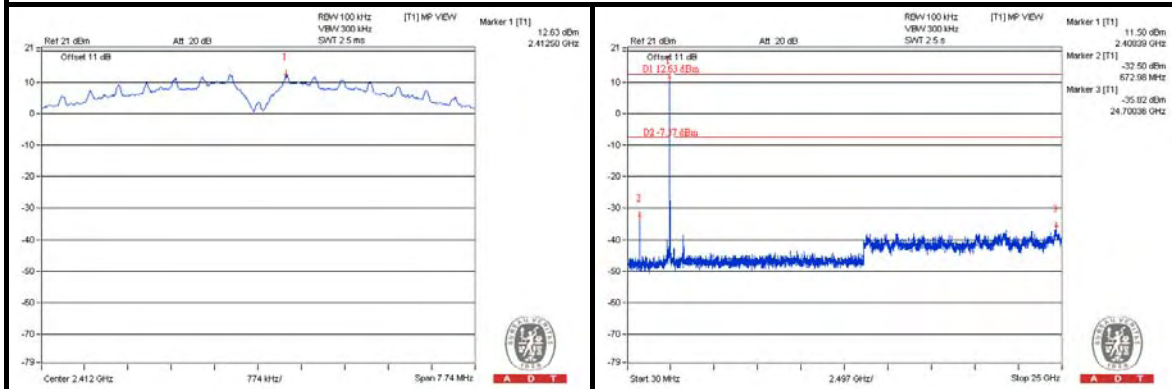




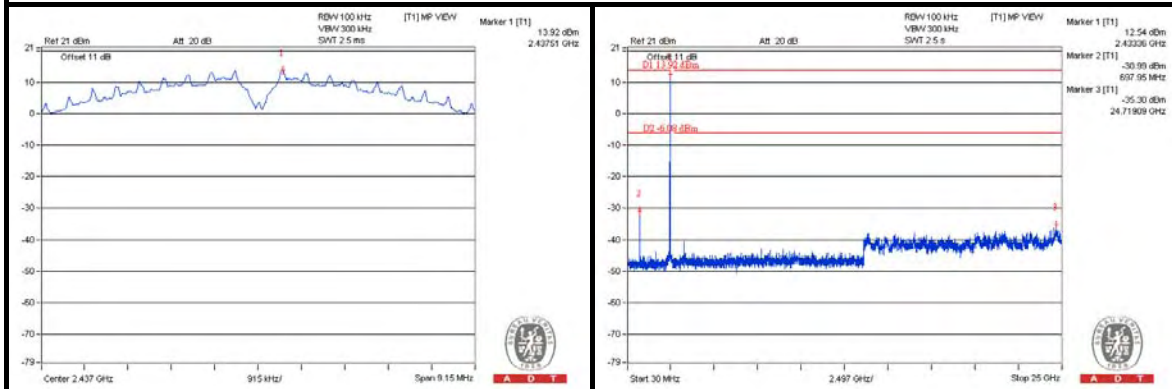
A D T

CHAIN 2

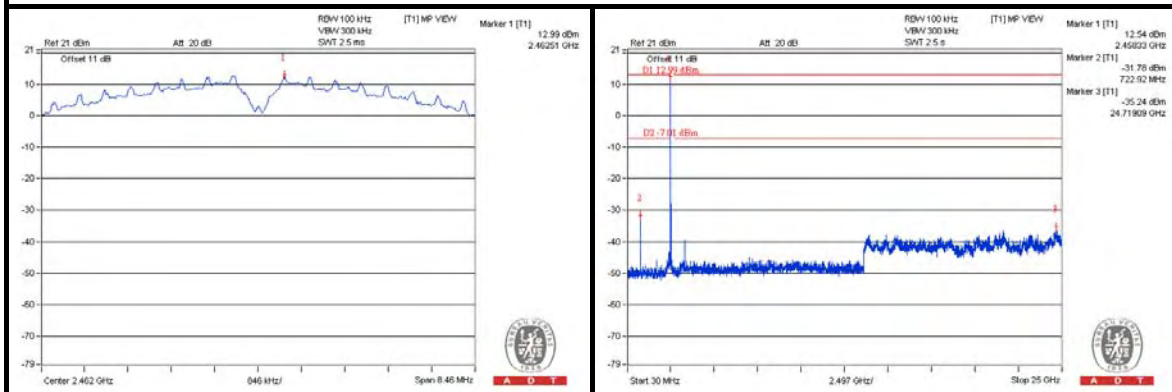
CH 1



CH 6



CH 11

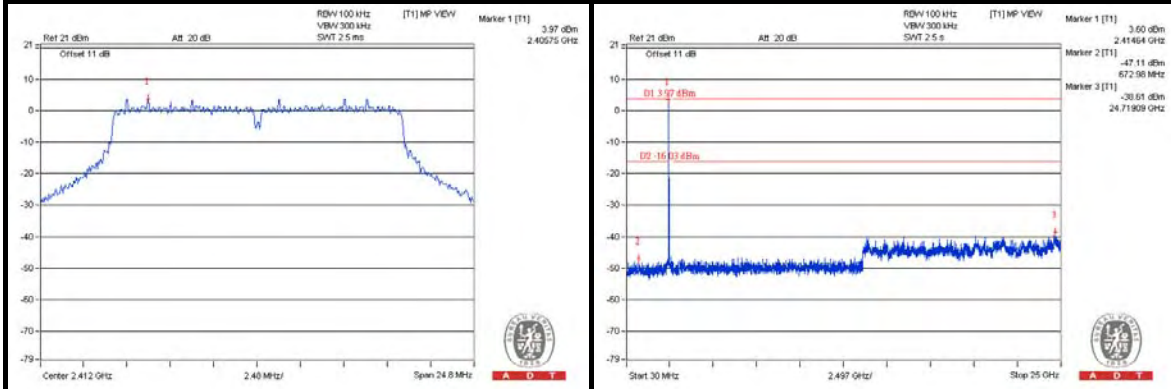




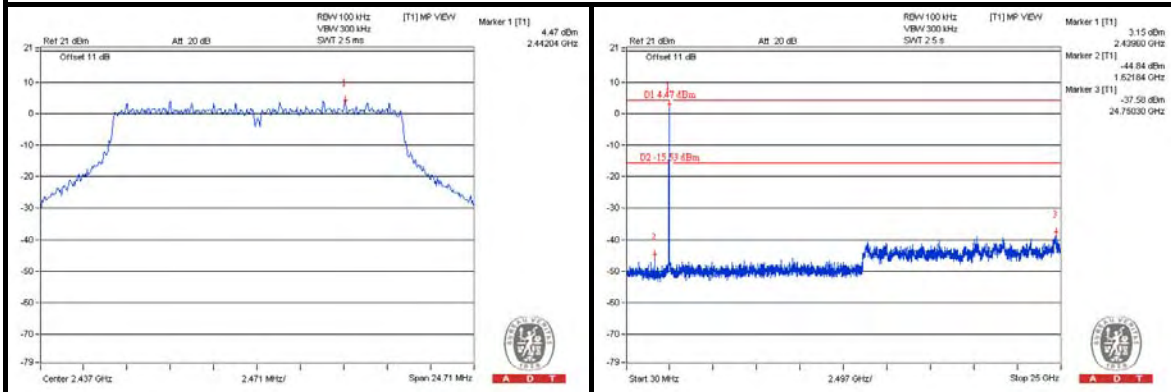
A D T

802.11g CHAIN 0

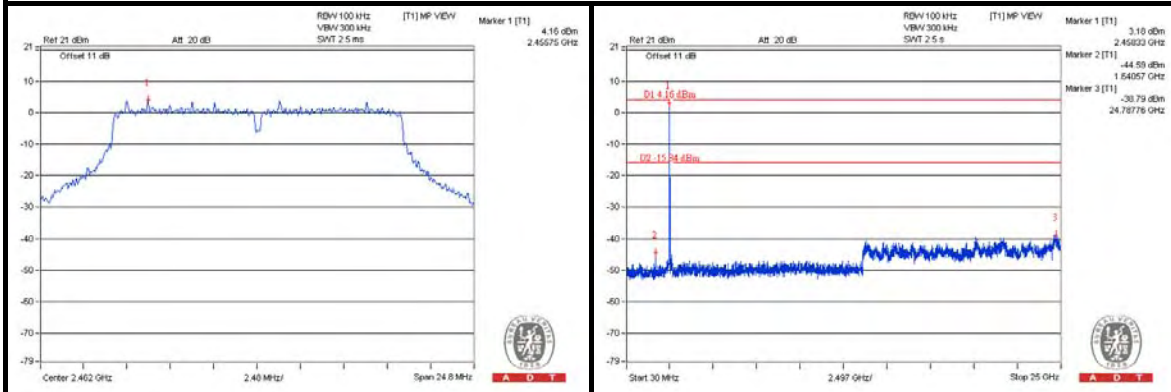
CH 1



CH 6

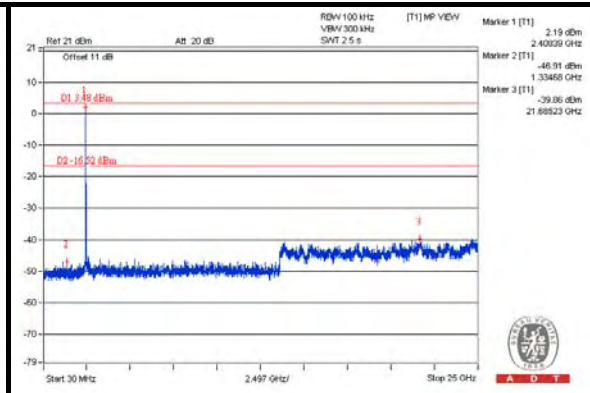
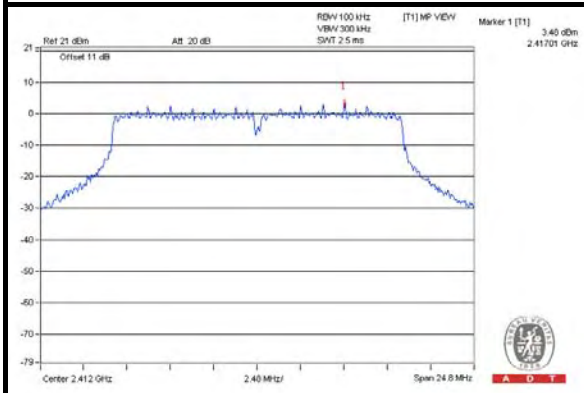


CH 11

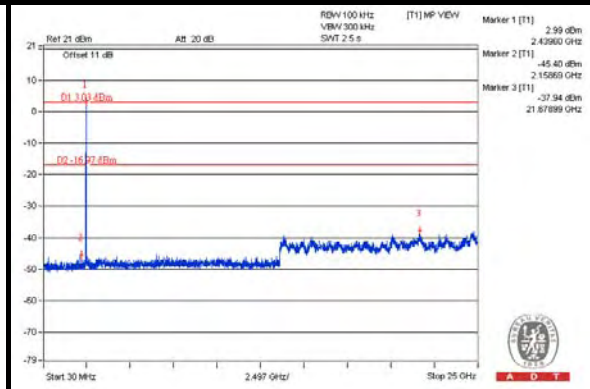
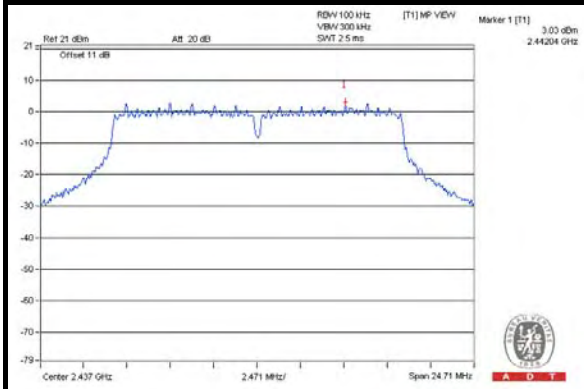


CHAIN 1

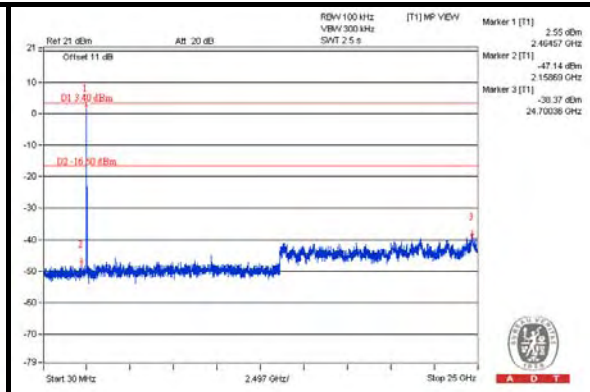
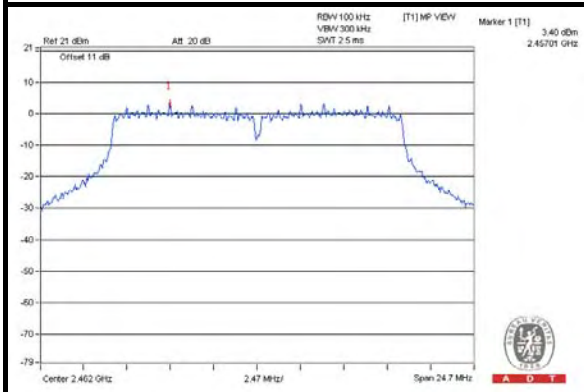
CH 1



CH 6

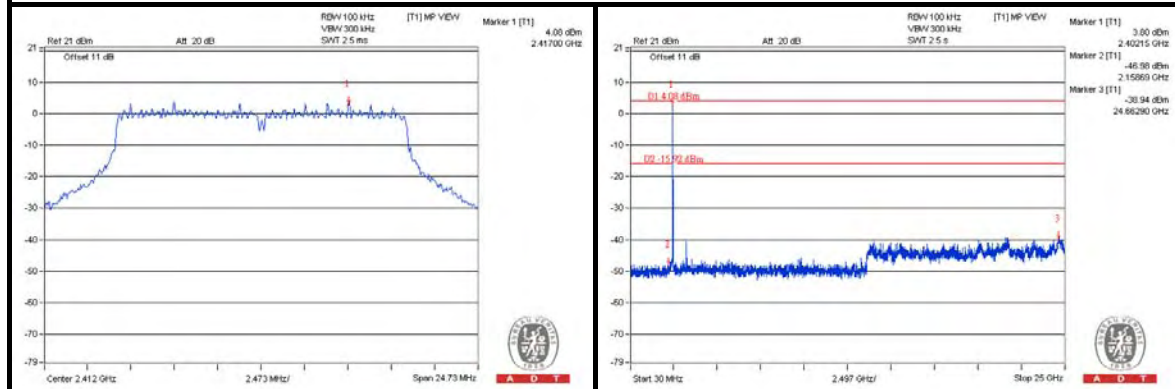


CH 11

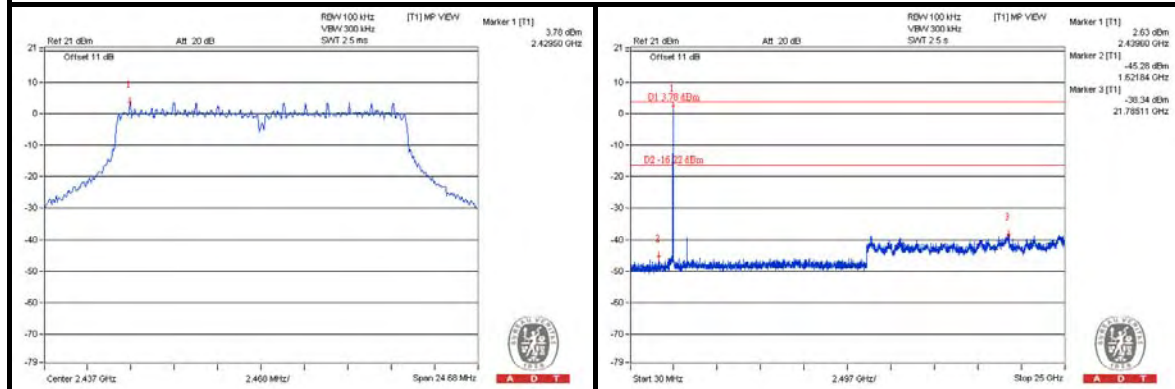


CHAIN 2

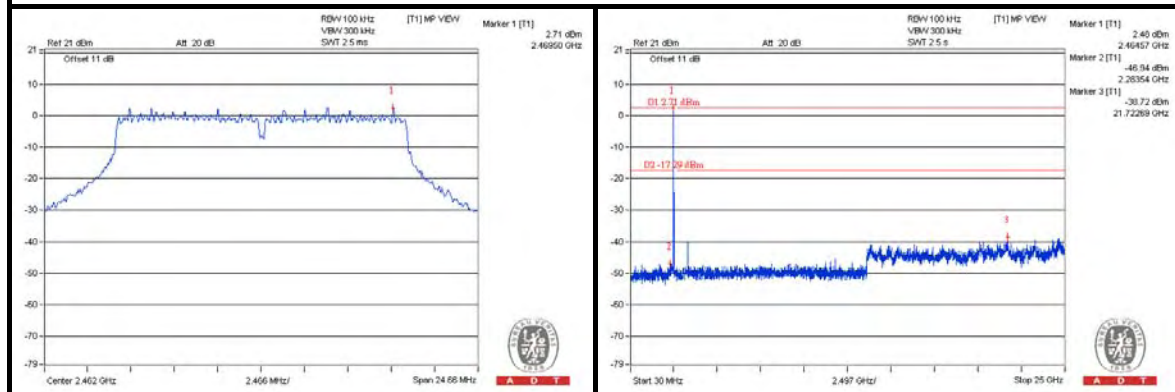
CH 1



CH 6



CH 11



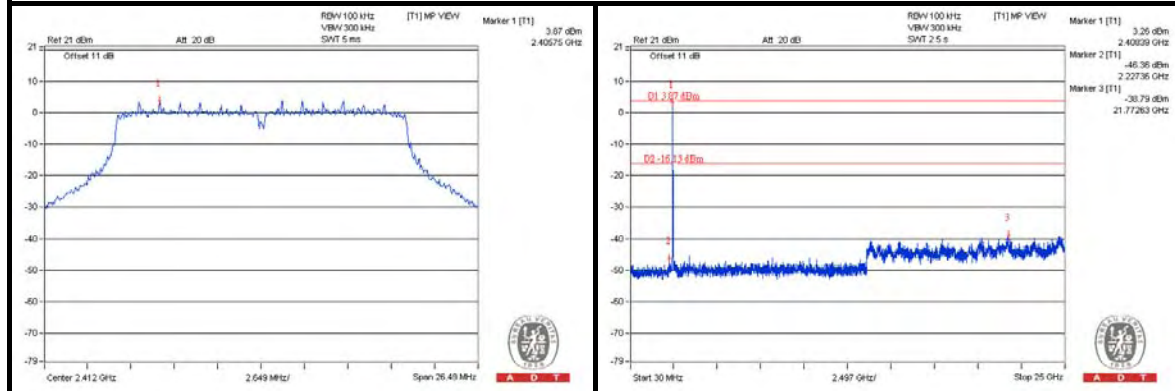


A D T

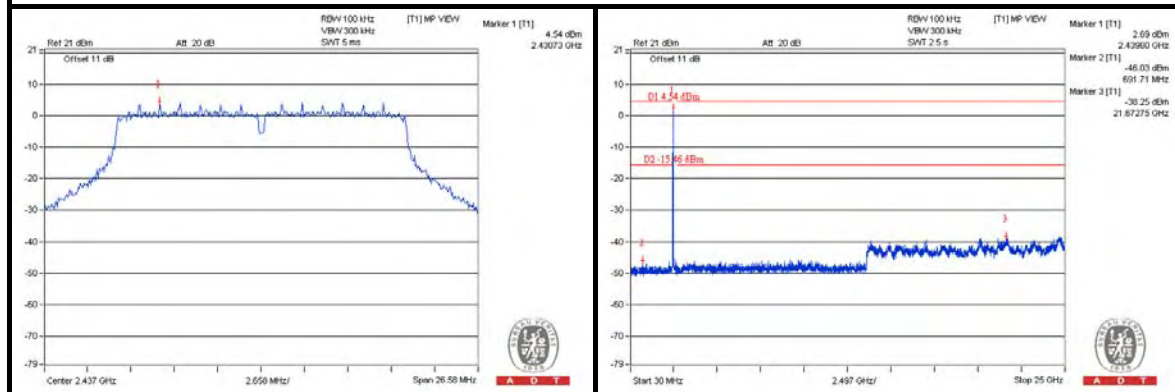
802.11n (20MHz)

CHAIN 0

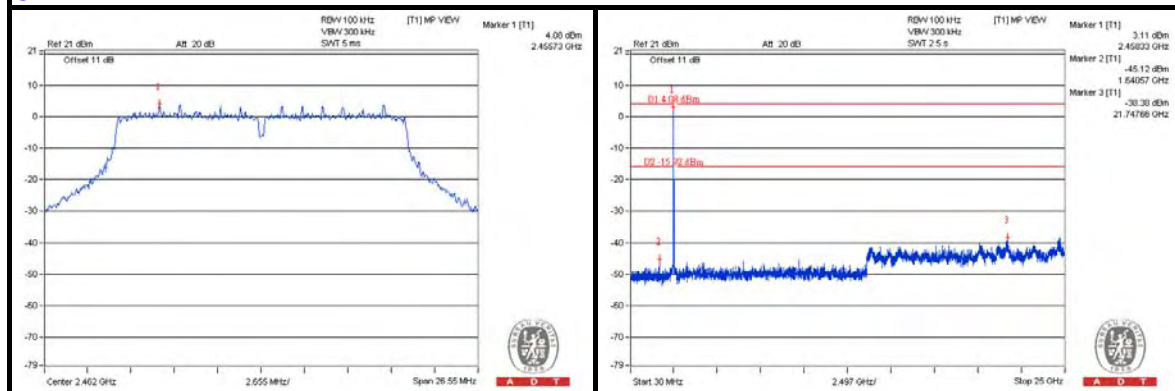
CH 1



CH 6

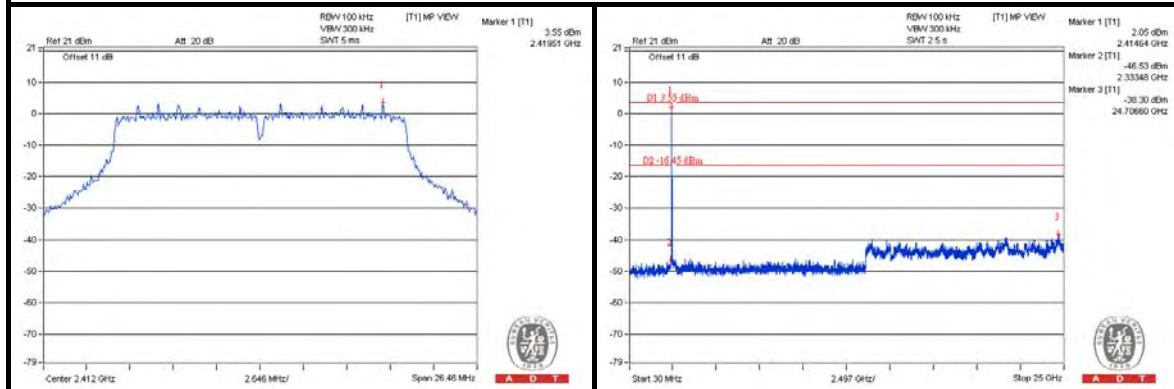


CH 11

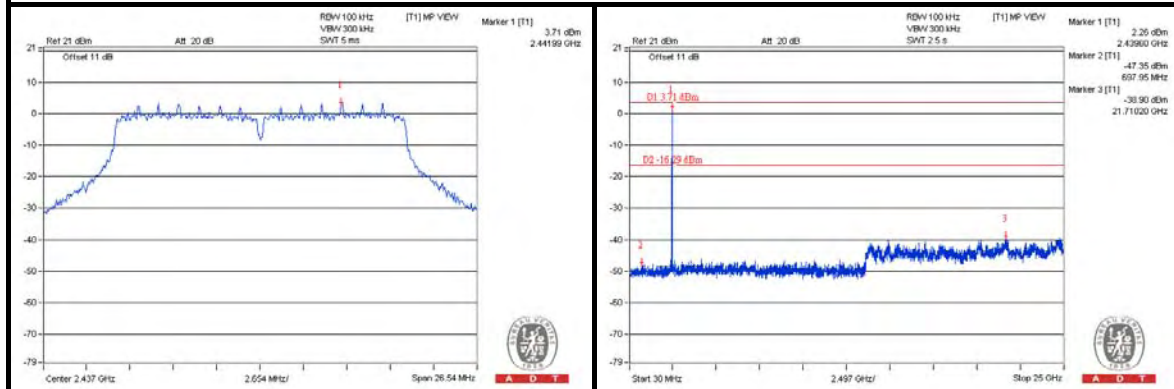


CHAIN 1

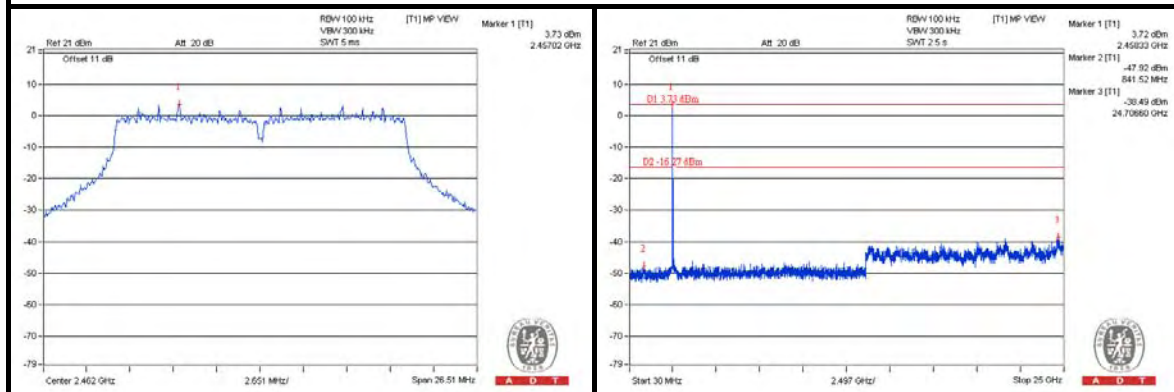
CH 1



CH 6



CH 11

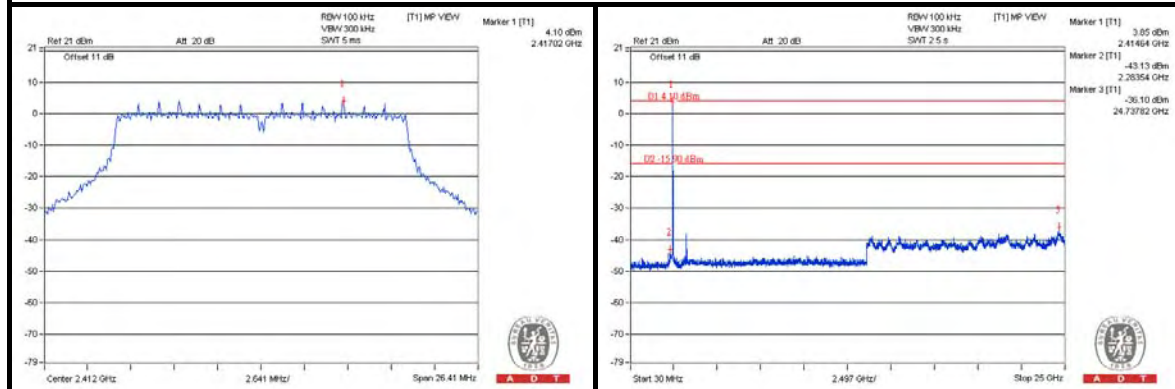




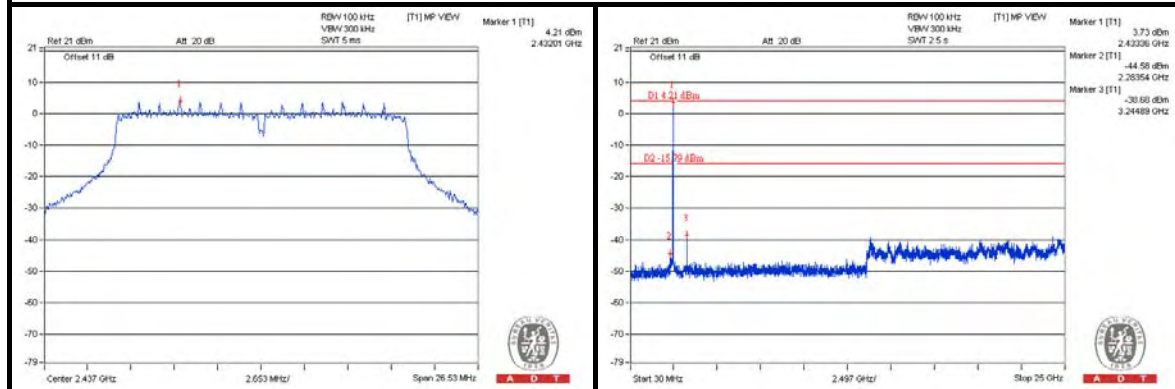
A D T

CHAIN 2

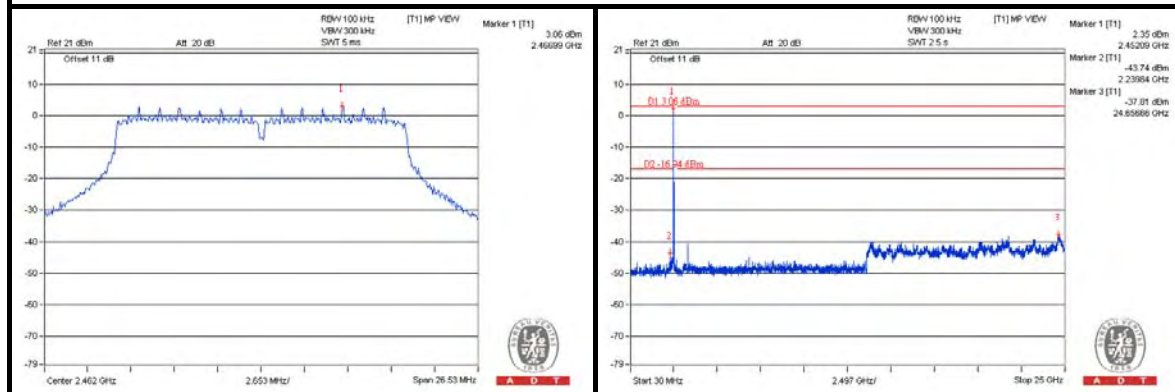
CH 1



CH 6



CH 11



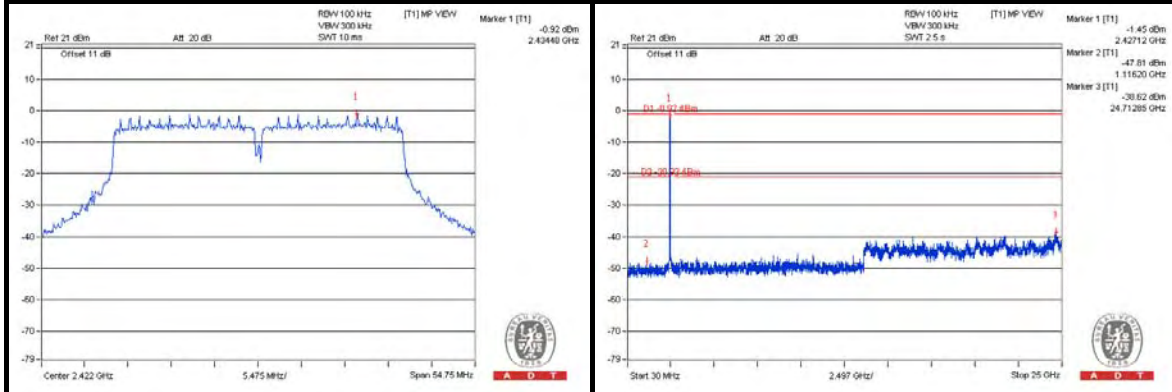


A D T

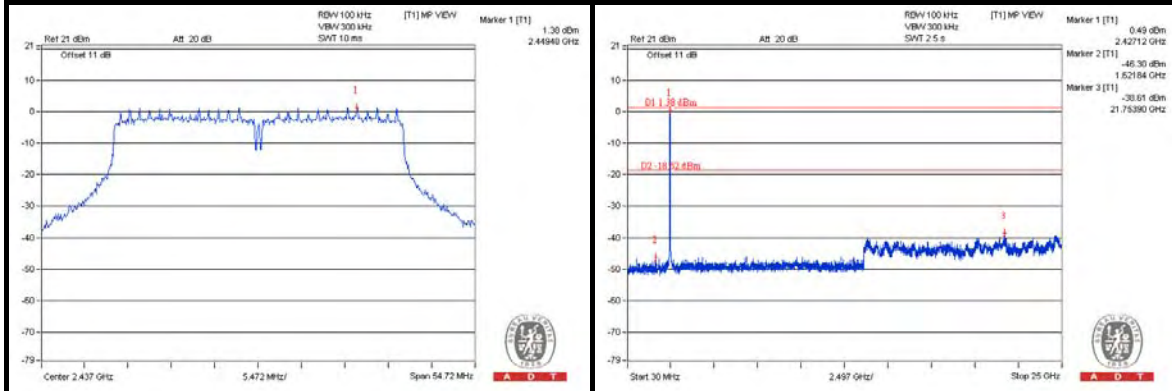
802.11n (40MHz)

CHAIN 0

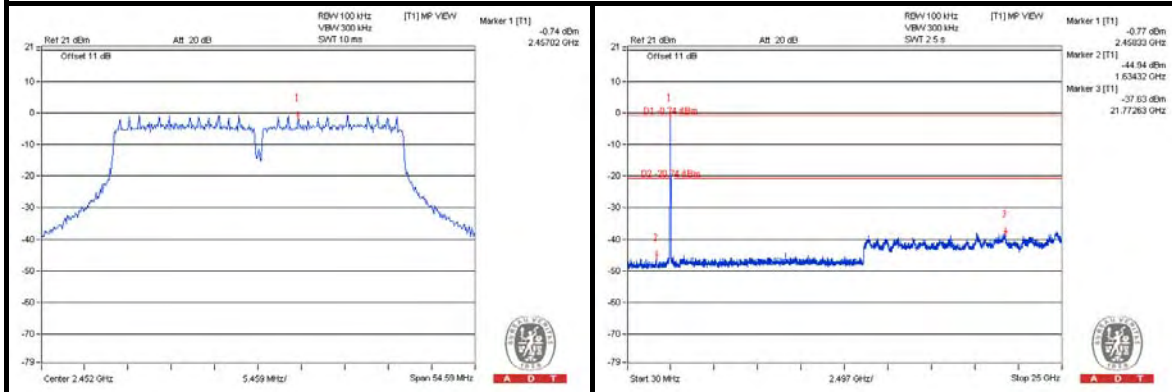
CH 3



CH 6



CH 9

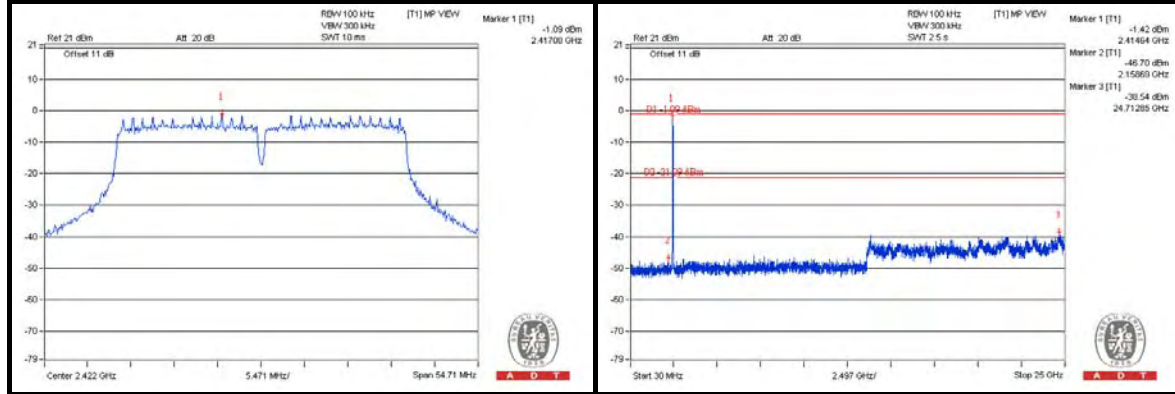




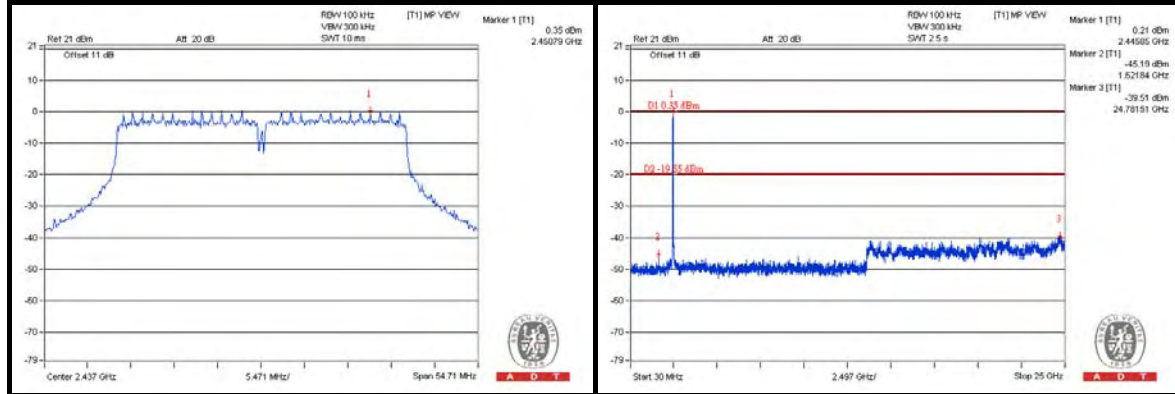
A D T

CHAIN 1

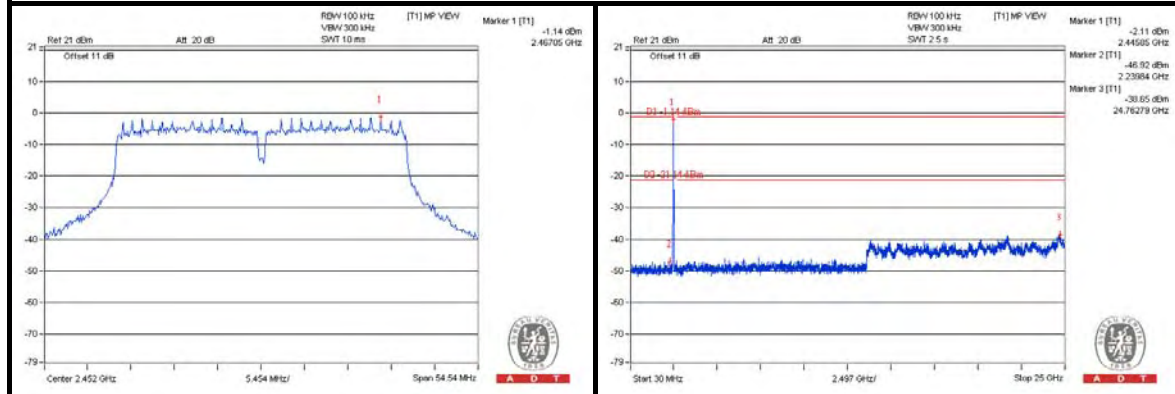
CH 3

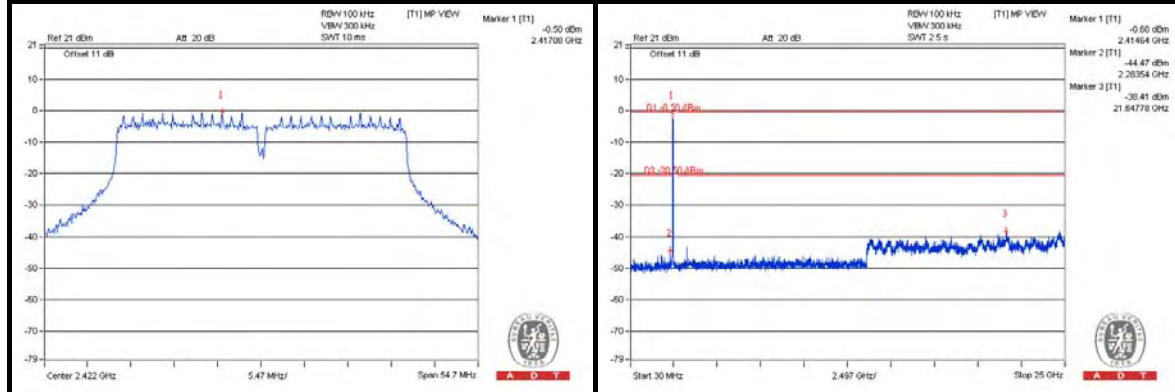
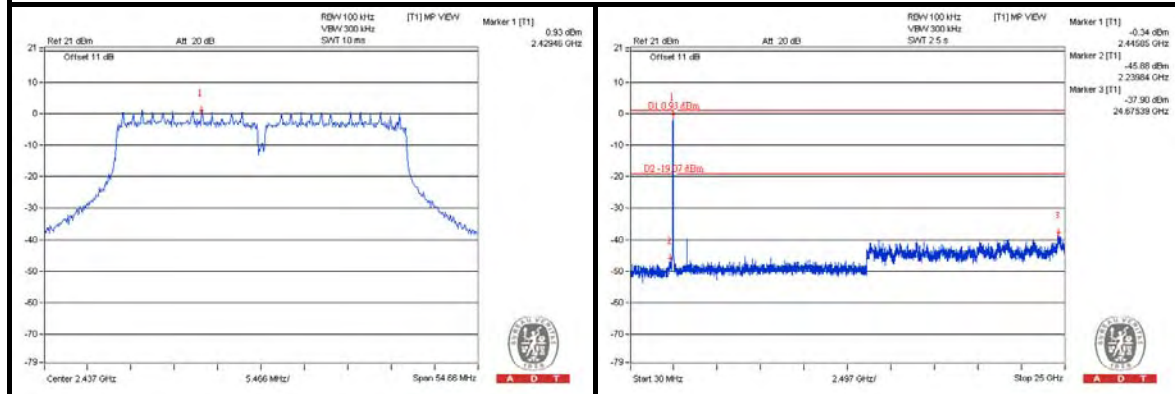
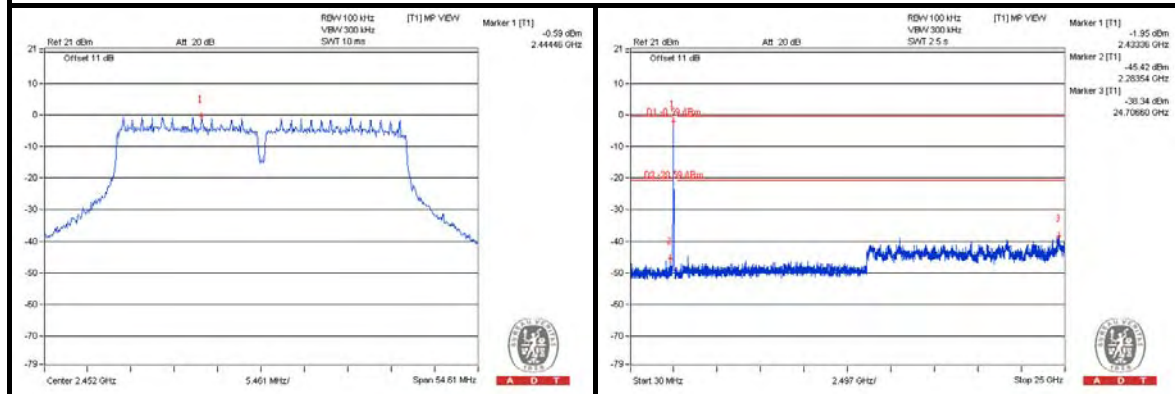


CH 6



CH 9



CHAIN 2**CH 3****CH 6****CH 9**



A D T

5. TEST TYPES AND RESULTS (FOR 5.0GHz BAND)

5.1 RADIATED EMISSION MEASUREMENT

5.1.1 LIMITS OF RADIATED EMISSION 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 20dB below the highest level of the desired power:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



A D T

5.1.2 TEST INSTRUMENTS

Same as item 4.1.2.

5.1.3 TEST PROCEDURES

Same as item 4.1.3.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation.

5.1.5 TEST SETUP

Same as item 4.1.5.

5.1.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.



A D T

5.1.7 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA :

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee

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	#5725.00	72.2 PK	92.4	-20.2	1.05 H	43	27.60	44.60
2	#5725.00	62.4 AV	82.6	-20.2	1.05 H	43	17.80	44.60
3	*5745.00	112.4 PK			1.05 H	43	67.80	44.60
4	*5745.00	102.6 AV			1.05 H	43	58.00	44.60
5	11490.00	59.3 PK	74.0	-14.7	1.25 H	55	6.70	52.60
6	11490.00	46.7 AV	54.0	-7.3	1.25 H	55	-5.90	52.60
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	#5725.00	75.5 PK	95.7	-20.2	1.08 V	165	30.90	44.60
2	#5725.00	65.3 AV	85.5	-20.2	1.08 V	165	20.70	44.60
3	*5745.00	115.7 PK			1.08 V	165	71.10	44.60
4	*5745.00	105.5 AV			1.08 V	165	60.90	44.60
5	11490.00	60.5 PK	74.0	-13.5	1.24 V	4	7.90	52.60
6	11490.00	47.0 AV	54.0	-7.0	1.24 V	4	-5.60	52.60

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee

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	*5785.00	112.5 PK			1.00 H	174	67.80	44.70
2	*5785.00	102.4 AV			1.00 H	174	57.70	44.70
3	11570.00	59.7 PK	74.0	-14.3	1.20 H	44	6.90	52.80
4	11570.00	46.4 AV	54.0	-7.6	1.20 H	44	-6.40	52.80
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	*5785.00	115.9 PK			1.12 V	13	71.20	44.70
2	*5785.00	104.8 AV			1.12 V	13	60.10	44.70
3	11570.00	60.7 PK	74.0	-13.3	1.62 V	222	7.90	52.80
4	11570.00	46.9 AV	54.0	-7.1	1.62 V	222	-5.90	52.80

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee

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	*5825.00	112.6 PK			1.00 H	175	67.80	44.80
2	*5825.00	102.6 AV			1.00 H	175	57.80	44.80
3	#5850.00	68.1 PK	92.6	-24.5	1.00 H	175	23.20	44.90
4	#5850.00	58.1 AV	82.6	-24.5	1.00 H	175	13.20	44.90
5	11650.00	59.3 PK	74.0	-14.7	1.65 H	214	6.30	53.00
6	11650.00	46.3 AV	54.0	-7.7	1.65 H	214	-6.70	53.00
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	*5825.00	116.2 PK			1.10 V	10	71.40	44.80
2	*5825.00	105.1 AV			1.10 V	10	60.30	44.80
3	#5850.00	71.7 PK	96.2	-24.5	1.10 V	10	26.80	44.90
4	#5850.00	60.6 AV	85.1	-24.5	1.10 V	10	15.70	44.90
5	11650.00	59.6 PK	74.0	-14.4	1.48 V	85	6.60	53.00
6	11650.00	47.0 AV	54.0	-7.0	1.48 V	85	-6.00	53.00

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee

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	#5725.00	72.1 PK	91.4	-19.3	1.00 H	136	27.50	44.60
2	#5725.00	62.1 AV	81.4	-19.3	1.00 H	136	17.50	44.60
3	*5745.00	111.4 PK			1.00 H	136	66.80	44.60
4	*5745.00	101.4 AV			1.00 H	136	56.80	44.60
5	11490.00	59.2 PK	74.0	-14.8	1.26 H	25	6.60	52.60
6	11490.00	46.5 AV	54.0	-7.5	1.26 H	25	-6.10	52.60
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	#5725.00	76.9 PK	96.2	-19.3	1.00 V	10	32.30	44.60
2	#5725.00	66.5 AV	85.8	-19.3	1.00 V	10	21.90	44.60
3	*5745.00	116.2 PK			1.00 V	10	71.60	44.60
4	*5745.00	105.8 AV			1.00 V	10	61.20	44.60
5	11490.00	58.2 PK	74.0	-15.8	1.00 V	254	5.60	52.60
6	11490.00	45.2 AV	54.0	-8.8	1.00 V	254	-7.40	52.60

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee

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	*5785.00	111.6 PK			1.02 H	135	66.90	44.70
2	*5785.00	101.8 AV			1.02 H	135	57.10	44.70
3	11570.00	59.6 PK	74.0	-14.4	1.08 H	145	6.80	52.80
4	11570.00	46.9 AV	54.0	-7.1	1.08 H	145	-5.90	52.80
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	*5785.00	116.7 PK			1.00 V	12	72.00	44.70
2	*5785.00	106.2 AV			1.00 V	12	61.50	44.70
3	11570.00	58.9 PK	74.0	-15.1	1.64 V	44	6.10	52.80
4	11570.00	45.9 AV	54.0	-8.1	1.64 V	44	-6.90	52.80

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee

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	*5825.00	112.2 PK			1.00 H	174	67.40	44.80
2	*5825.00	102.3 AV			1.00 H	174	57.50	44.80
3	#5850.00	71.0 PK	92.2	-21.2	1.00 H	174	26.10	44.90
4	#5850.00	61.0 AV	82.3	-21.3	1.00 H	174	16.10	44.90
5	11650.00	59.2 PK	74.0	-14.8	1.58 H	88	6.20	53.00
6	11650.00	46.3 AV	54.0	-7.7	1.58 H	88	-6.70	53.00
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	*5825.00	115.7 PK			1.00 V	291	70.90	44.80
2	*5825.00	105.2 AV			1.00 V	291	60.40	44.80
3	#5850.00	74.5 PK	95.7	-21.2	1.00 V	291	29.60	44.90
4	#5850.00	64.0 AV	85.2	-21.2	1.00 V	291	19.10	44.90
5	11650.00	60.1 PK	74.0	-13.9	1.32 V	333	7.10	53.00
6	11650.00	46.5 AV	54.0	-7.5	1.32 V	333	-6.50	53.00

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee

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	#5725.00	72.7 PK	85.7	-13.0	1.03 H	150	28.10	44.60
2	#5725.00	61.8 AV	74.8	-13.0	1.03 H	150	17.20	44.60
3	*5755.00	105.7 PK			1.03 H	150	61.00	44.70
4	*5755.00	94.8 AV			1.03 H	150	50.10	44.70
5	11510.00	58.7 PK	74.0	-15.3	1.55 H	24	6.00	52.70
6	11510.00	46.3 AV	54.0	-7.7	1.55 H	24	-6.40	52.70
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	#5725.00	79.1 PK	92.1	-13.0	1.00 V	15	34.50	44.60
2	#5725.00	66.5 AV	79.5	-13.0	1.00 V	15	21.90	44.60
3	*5755.00	112.1 PK			1.00 V	15	67.40	44.70
4	*5755.00	99.5 AV			1.00 V	15	54.80	44.70
5	11510.00	59.1 PK	74.0	-14.9	1.24 V	44	6.40	52.70
6	11510.00	46.2 AV	54.0	-7.8	1.24 V	44	-6.50	52.70

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee

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	*5795.00	106.6 PK			1.05 H	144	61.90	44.70
2	*5795.00	95.7 AV			1.05 H	144	51.00	44.70
3	#5850.00	66.0 PK	86.6	-20.6	1.05 H	144	21.10	44.90
4	#5850.00	55.1 AV	75.7	-20.6	1.05 H	144	10.20	44.90
5	11590.00	59.0 PK	74.0	-15.0	1.00 H	239	6.20	52.80
6	11590.00	46.6 AV	54.0	-7.4	1.00 H	239	-6.20	52.80
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	*5795.00	113.1 PK			1.01 V	286	68.40	44.70
2	*5795.00	100.4 AV			1.01 V	286	55.70	44.70
3	#5850.00	72.5 PK	93.1	-20.6	1.01 V	286	27.60	44.90
4	#5850.00	59.8 AV	80.4	-20.6	1.01 V	286	14.90	44.90
5	11590.00	59.1 PK	74.0	-14.9	1.24 V	78	6.30	52.80
6	11590.00	46.6 AV	54.0	-7.4	1.24 V	78	-6.20	52.80

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

802.11ac (80MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 155	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee

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	#5725.00	72.5 PK	82.7	-10.2	1.01 H	177	27.90	44.60
2	#5725.00	61.5 AV	71.7	-10.2	1.01 H	177	16.90	44.60
3	*5775.00	102.7 PK			1.01 H	177	58.00	44.70
4	*5775.00	91.7 AV			1.01 H	177	47.00	44.70
5	#5850.00	63.7 PK	82.7	-19.0	1.01 H	177	18.80	44.90
6	#5850.00	52.7 AV	71.7	-19.0	1.01 H	177	7.80	44.90
7	11550.00	59.8 PK	74.0	-14.2	1.35 H	24	7.00	52.80
8	11550.00	46.6 AV	54.0	-7.4	1.35 H	24	-6.20	52.80
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	#5725.00	76.9 PK	87.1	-10.2	1.00 V	13	32.30	44.60
2	#5725.00	66.3 AV	76.5	-10.2	1.00 V	13	21.70	44.60
3	*5775.00	107.1 PK			1.00 V	13	62.40	44.70
4	*5775.00	96.5 AV			1.00 V	13	51.80	44.70
5	#5850.00	68.1 PK	87.1	-19.0	1.00 V	13	23.20	44.90
6	#5850.00	57.5 AV	76.5	-19.0	1.00 V	13	12.60	44.90
7	11550.00	59.0 PK	74.0	-15.0	1.33 V	63	6.20	52.80
8	11550.00	46.6 AV	54.0	-7.4	1.33 V	63	-6.20	52.80

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.



A D T

BELOW 1GHz WORST-CASE DATA : 802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	64.92	25.1 QP	40.0	-14.9	1.00 H	192	13.20	11.90
2	109.54	33.4 QP	43.5	-10.1	1.49 H	139	22.70	10.70
3	237.58	34.7 QP	46.0	-11.3	1.00 H	117	22.50	12.20
4	359.80	30.7 QP	46.0	-15.3	1.00 H	145	14.50	16.20
5	480.08	35.0 QP	46.0	-11.0	1.49 H	223	15.70	19.30
6	813.76	37.9 QP	46.0	-8.1	1.49 H	311	12.40	25.50
7	960.40	45.7 QP	54.0	-8.3	1.87 H	276	18.30	27.40

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	59.10	35.3 QP	40.0	-4.7	1.50 V	13	22.80	12.50
2	64.92	36.4 QP	40.0	-3.6	1.00 V	357	24.50	11.90
3	111.48	36.6 QP	43.5	-6.9	1.25 V	87	25.70	10.90
4	225.94	31.5 QP	46.0	-14.5	1.00 V	57	19.80	11.70
5	480.08	35.2 QP	46.0	-10.8	1.50 V	184	15.90	19.30
6	960.50	45.7 QP	54.0	-8.3	1.54 V	48	18.30	27.40

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 76%RH	TESTED BY	Martin Lee
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	103.72	24.5 QP	43.5	-19.0	1.36 H	83	14.40	10.10
2	187.14	27.8 QP	43.5	-15.7	1.00 H	103	16.50	11.30
3	256.98	37.3 QP	46.0	-8.7	2.23 H	115	24.30	13.00
4	388.90	32.9 QP	46.0	-13.1	1.78 H	167	15.90	17.00
5	687.66	39.5 QP	46.0	-6.5	2.00 H	70	16.00	23.50
6	813.76	36.2 QP	46.0	-9.8	1.64 H	291	10.70	25.50
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	64.92	35.9 QP	40.0	-4.1	1.20 V	12	24.00	11.90
2	142.52	32.2 QP	43.5	-11.3	1.00 V	201	19.00	13.20
3	256.98	32.1 QP	46.0	-13.9	2.25 V	135	19.10	13.00
4	386.96	39.3 QP	46.0	-6.7	1.50 V	262	22.40	16.90
5	687.66	35.6 QP	46.0	-10.4	1.00 V	230	12.10	23.50
6	813.76	37.5 QP	46.0	-8.5	1.77 V	238	12.00	25.50

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

5.2 CONDUCTED EMISSION MEASUREMENT

5.2.1 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.

5.2.2 TEST INSTRUMENTS

Same as item 4.2.2.

5.2.3 TEST PROCEDURES

Same as item 4.2.3.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

5.2.5 TEST SETUP

Same as item 4.2.5.

5.2.6 EUT OPERATING CONDITIONS

Same as item 4.1.6

5.2.7 TEST RESULTS

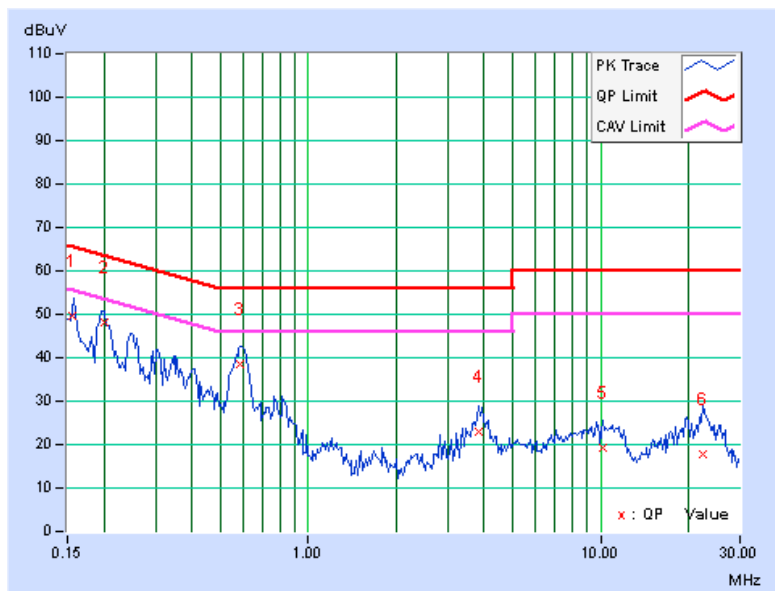
CONDUCTED WORST-CASE DATA : 802.11a

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.15633	0.19	49.28	39.06	49.47	39.25	65.66	55.66	-16.19	-16.41
2	0.20206	0.20	47.87	40.56	48.07	40.76	63.53	53.53	-15.46	-12.77
3	0.58622	0.24	38.37	33.25	38.61	33.49	56.00	46.00	-17.39	-12.51
4	3.81122	0.39	22.58	12.39	22.97	12.78	56.00	46.00	-33.03	-33.22
5	10.12763	0.49	18.71	13.62	19.20	14.11	60.00	50.00	-40.80	-35.89
6	22.51434	0.71	17.22	11.99	17.93	12.70	60.00	50.00	-42.07	-37.30

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.





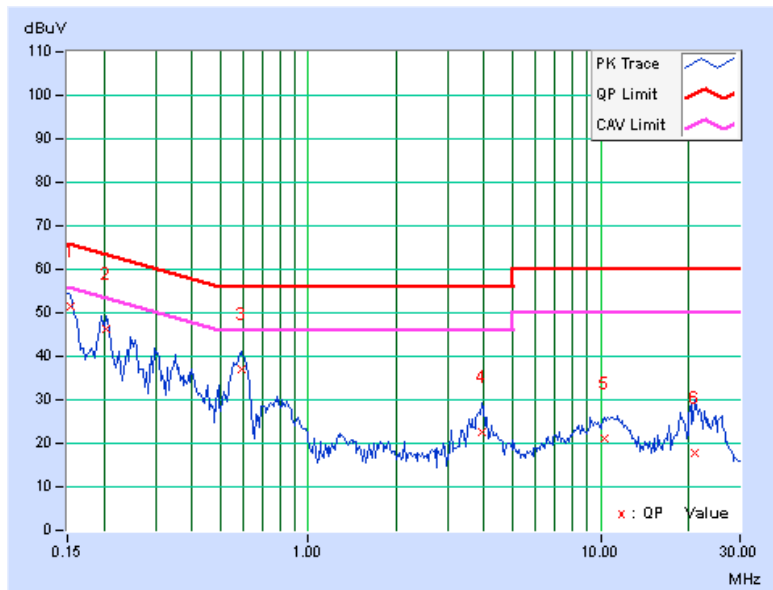
A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.15387	0.19	51.12	43.31	51.31	43.50	65.79	55.79	-14.47	-12.28
2	0.20335	0.19	46.04	39.23	46.23	39.42	63.47	53.47	-17.24	-14.05
3	0.59080	0.27	36.79	31.30	37.06	31.57	56.00	46.00	-18.94	-14.43
4	3.93221	0.45	22.25	11.14	22.70	11.59	56.00	46.00	-33.30	-34.41
5	10.36658	0.58	20.70	15.58	21.28	16.16	60.00	50.00	-38.72	-33.84
6	20.99471	0.81	16.88	11.11	17.69	11.92	60.00	50.00	-42.31	-38.08

REMARKS:

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

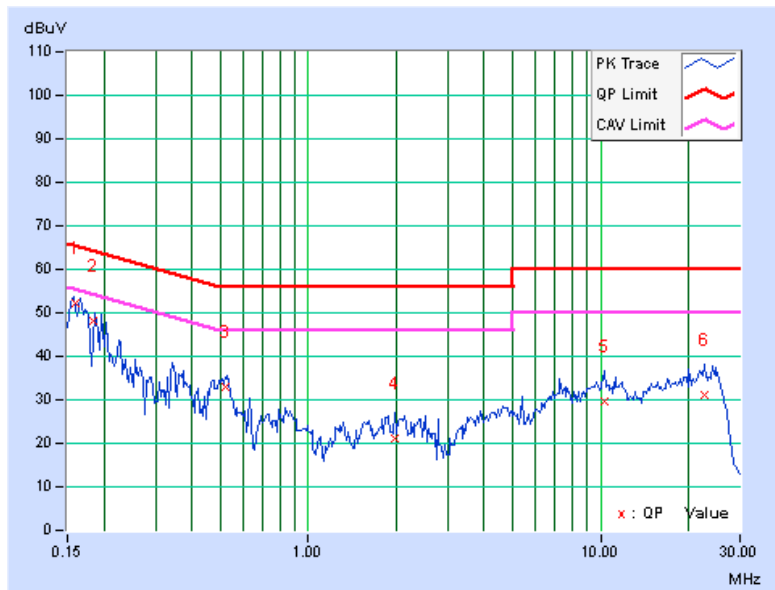


PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.15929	0.19	52.09	38.59	52.28	38.78	65.50	55.50	-13.22	-16.72
2	0.18369	0.20	47.84	35.57	48.04	35.77	64.32	54.32	-16.28	-18.55
3	0.52357	0.23	32.57	25.12	32.80	25.35	56.00	46.00	-23.20	-20.65
4	1.97512	0.32	20.74	12.49	21.06	12.81	56.00	46.00	-34.94	-33.19
5	10.35811	0.50	28.98	23.30	29.48	23.80	60.00	50.00	-30.52	-26.20
6	22.65090	0.71	30.39	25.58	31.10	26.29	60.00	50.00	-28.90	-23.71

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.





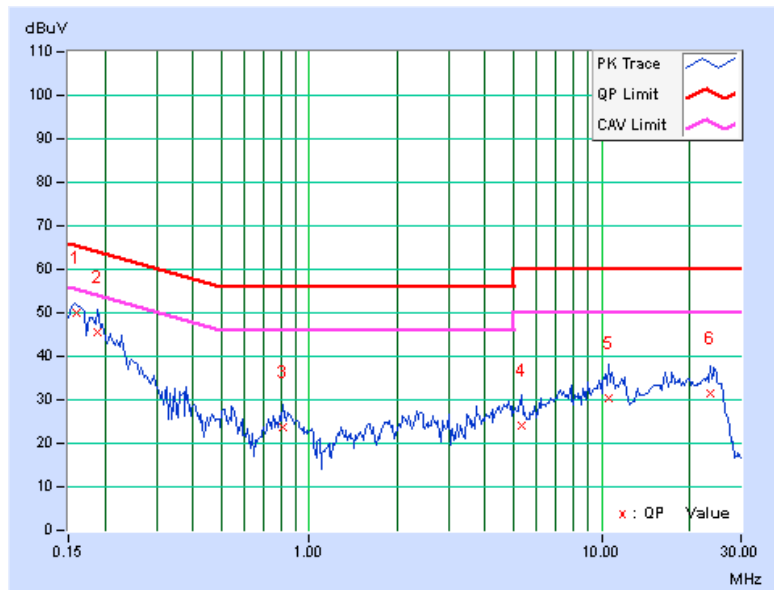
A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.15925	0.19	49.79	38.13	49.98	38.32	65.50	55.50	-15.52	-17.18
2	0.18778	0.19	45.50	33.17	45.69	33.36	64.13	54.13	-18.44	-20.77
3	0.81272	0.26	23.39	15.66	23.65	15.92	56.00	46.00	-32.35	-30.08
4	5.32159	0.48	23.61	16.99	24.09	17.47	60.00	50.00	-35.91	-32.53
5	10.59628	0.58	29.66	23.35	30.24	23.93	60.00	50.00	-29.76	-26.07
6	23.44788	0.79	30.53	25.76	31.32	26.55	60.00	50.00	-28.68	-23.45

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

5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

5.3.2 TEST SETUP

Same as item 4.3.2.

5.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.3.4 TEST PROCEDURE

Same as item 4.3.4.

5.3.5 DEVIATION FROM TEST STANDARD

No deviation.

5.3.6 EUT OPERATING CONDITIONS

Same as item 4.3.6.



A D T

5.3.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.40	16.41	0.5	PASS
157	5785	16.40	16.38	0.5	PASS
165	5825	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		
149	5745	17.60	16.97	0.5	PASS
157	5785	17.14	17.57	0.5	PASS
165	5825	17.61	17.32	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	36.40	36.15	0.5	PASS
159	5795	36.52	36.53	0.5	PASS

802.11ac (80MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
155	5775	76.06	72.64	0.5	PASS

5.4 CONDUCTED OUTPUT POWER

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 5725 –5850 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 NANT \leq 4;

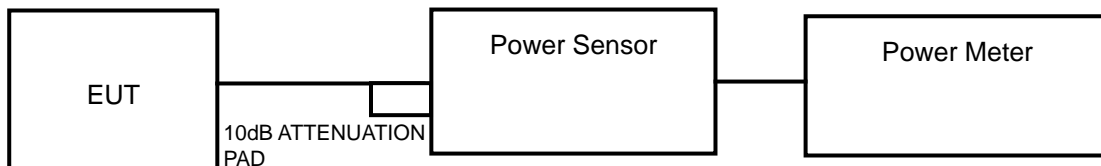
Array Gain = 0 dB (i.e., no array gain) for channel widths \geq 40 MHz for any NANT;

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

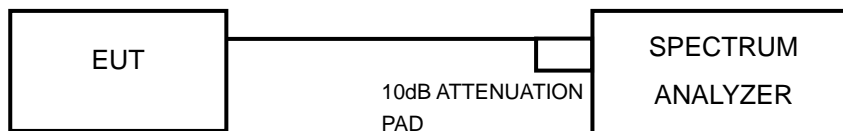
For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

5.4.2 TEST SETUP

For 802.11a, 802.11n (20MHz), 802.11n (40MHz)



For 802.11ac (80MHz)



5.4.3 INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.



5.4.4 TEST PROCEDURES

For 802.11a, 802.11n (20MHz), 802.11n (40MHz)

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

For 802.11ac (80MHz)

Method SA-1

Peak

- 1) Set the RBW \geq DTS bandwidth.
- 2) Set VBW \geq 3 x RBW.
- 3) Set span \geq RBW.
- 4) Sweep time = auto couple.
- 5) Detector = peak.
- 6) Trace mode = max hold.
- 7) Allow trace to fully stabilize.
- 8) Use peak marker function to determine the peak amplitude level.

Average

- 1) Set the analyzer span to a minimum of 1.5 times the EBW.
- 2) Set the RBW = 1 MHz.
- 3) Set the VBW = 3 MHz.
- 4) Number of measurement points in the sweep . 2 x (span/RBW).
- 5) Sweep time = auto couple.
- 6) Detector = power averaging (RMS) or sample.
- 7) Employ trace averaging in power averaging (RMS) mode over a minimum of 100 traces.
- 8) Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges.

5.4.5 DEVIATION FROM TEST STANDARD

No deviation.

5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.



A D T

5.4.7 TEST RESULTS

FOR PEAK POWER

802.11a

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	22.85	22.38	365.734	25.63	30	PASS
157	5785	23.04	22.49	378.791	25.78	30	PASS
165	5825	22.85	22.30	362.576	25.59	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	22.90	22.30	364.808	25.62	30	PASS
157	5785	22.98	22.46	374.807	25.74	30	PASS
165	5825	22.62	22.41	356.991	25.53	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	22.59	22.08	342.988	25.35	30	PASS
159	5795	22.60	22.07	343.035	25.35	30	PASS

802.11ac (80MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
155	5775	20.74	20.15	222.091	23.47	30	PASS



FOR AVERAGE POWER

802.11a

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
149	5745	18.96	18.82	154.913	21.90
157	5785	19.00	18.65	152.715	21.84
165	5825	18.95	18.84	155.084	21.91

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
149	5745	18.98	18.69	153.029	21.85
157	5785	18.99	18.54	150.700	21.78
165	5825	18.69	18.68	147.751	21.70

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
151	5755	17.86	17.65	119.304	20.77
159	5795	17.89	17.62	119.328	20.77

802.11ac (80MHz)

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
155	5775	15.62	15.38	70.989	18.51



A D T

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST SETUP

Same as item 4.5.2.

5.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.5.4 TEST PROCEDURE.

Same as item 4.5.4.

5.5.5 DEVIATION FROM TEST STANDARD

No deviation.

5.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.



5.5.7 TEST RESULTS

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-5.53	3.01	-2.52	8	PASS
	157	5785	-5.90	3.01	-2.89	8	PASS
	165	5825	-4.97	3.01	-1.96	8	PASS
1	149	5745	-4.45	3.01	-1.44	8	PASS
	157	5785	-5.14	3.01	-2.13	8	PASS
	165	5825	-4.22	3.01	-1.21	8	PASS

NOTE: Directional gain = $0\text{dBi} + 10\log(2) = 3.01\text{dBi} < 6\text{dBi}$, so the power density limit no need to reduced.

802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-6.80	3.01	-3.79	8	PASS
	157	5785	-6.02	3.01	-3.01	8	PASS
	165	5825	-6.01	3.01	-3.00	8	PASS
1	149	5745	-5.66	3.01	-2.65	8	PASS
	157	5785	-6.08	3.01	-3.07	8	PASS
	165	5825	-5.15	3.01	-2.14	8	PASS

NOTE: Directional gain = $0\text{dBi} + 10\log(2) = 3.01\text{dBi} < 6\text{dBi}$, so the power density limit no need to reduced.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-10.92	3.01	-7.91	8	PASS
	159	5795	-9.47	3.01	-6.46	8	PASS
1	151	5755	-8.83	3.01	-5.82	8	PASS
	159	5795	-9.11	3.01	-6.10	8	PASS

NOTE: Directional gain = $0\text{dBi} + 10\log(2) = 3.01\text{dBi} < 6\text{dBi}$, so the power density limit no need to reduced.

802.11ac (80MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	155	5775	-13.97	3.01	-10.96	8	PASS
1	155	5775	-14.57	3.01	-11.56	8	PASS

NOTE: Directional gain = $0\text{dBi} + 10\log(2) = 3.01\text{dBi} < 6\text{dBi}$, so the power density limit no need to reduced.



A D T

5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

5.6.2 TEST SETUP

Same as Item 4.6.2

5.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.6.4 TEST PROCEDURE

Same as Item 4.6.4

5.6.5 DEVIATION FROM TEST STANDARD

No deviation.

5.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.6.7 TEST RESULTS

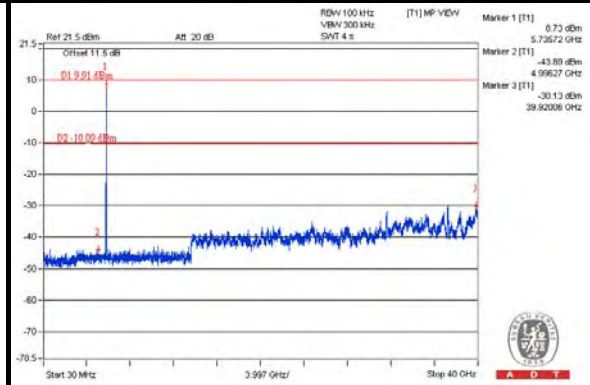
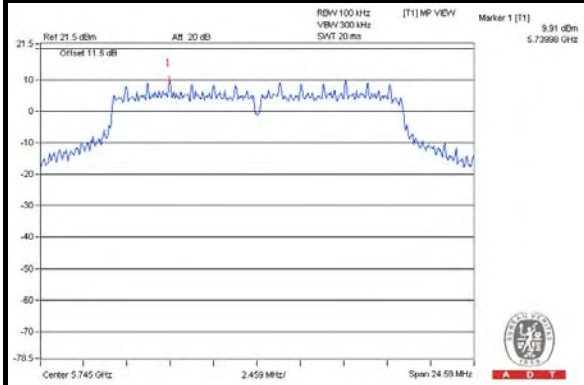
The conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit. Only worst data of each operating mode is presented.

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

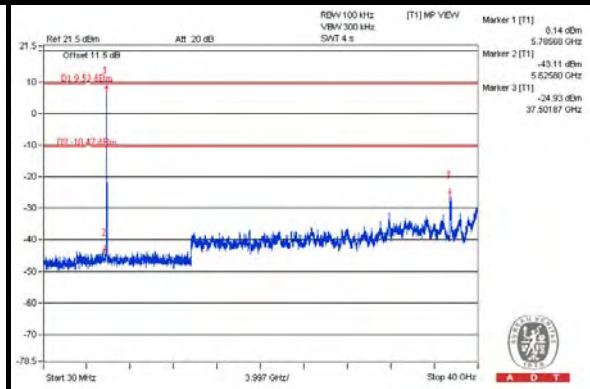
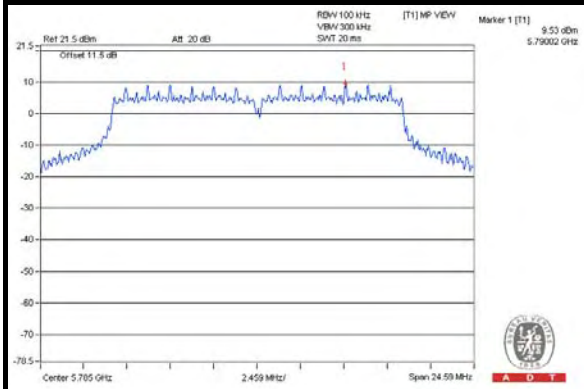


A D T

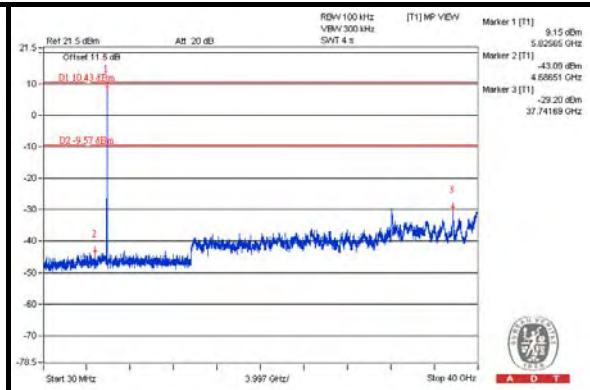
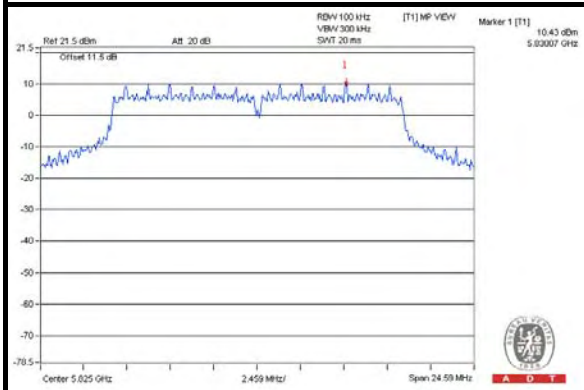
802.11a
CHAIN 0
CH 149



CH 157



CH 165

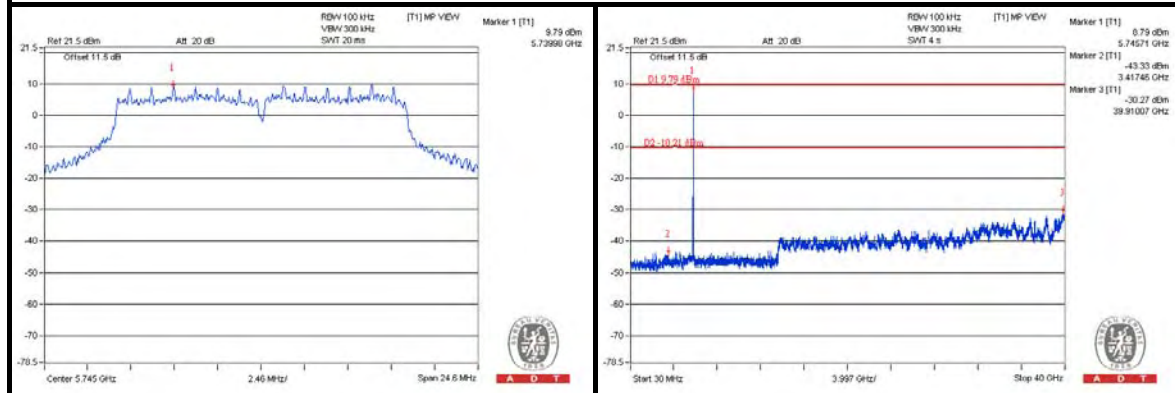




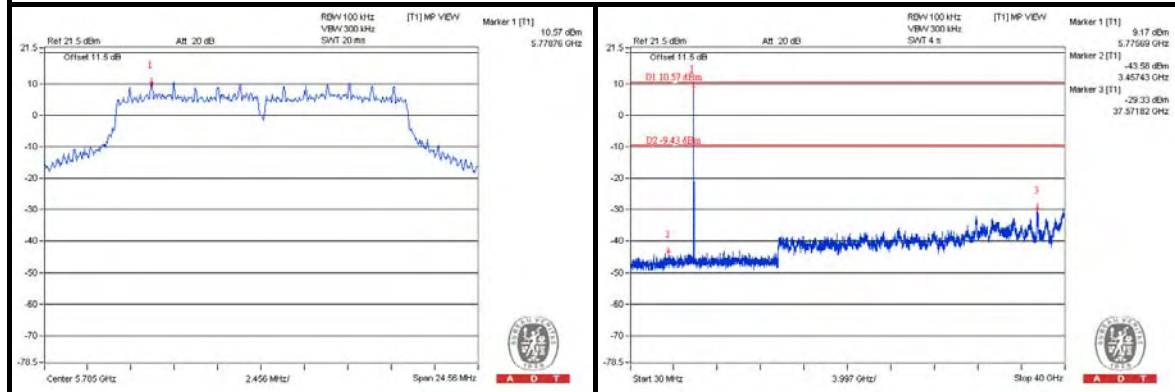
A D T

CHAIN 1

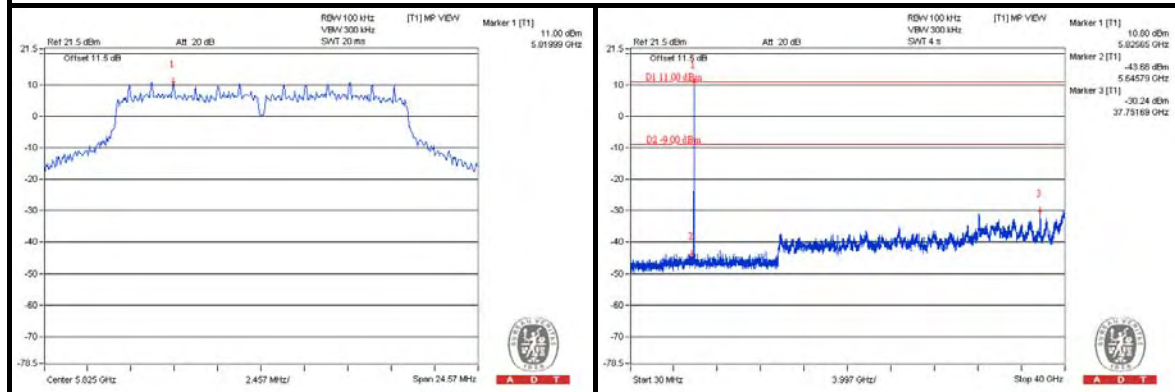
CH 149



CH 157



CH 165



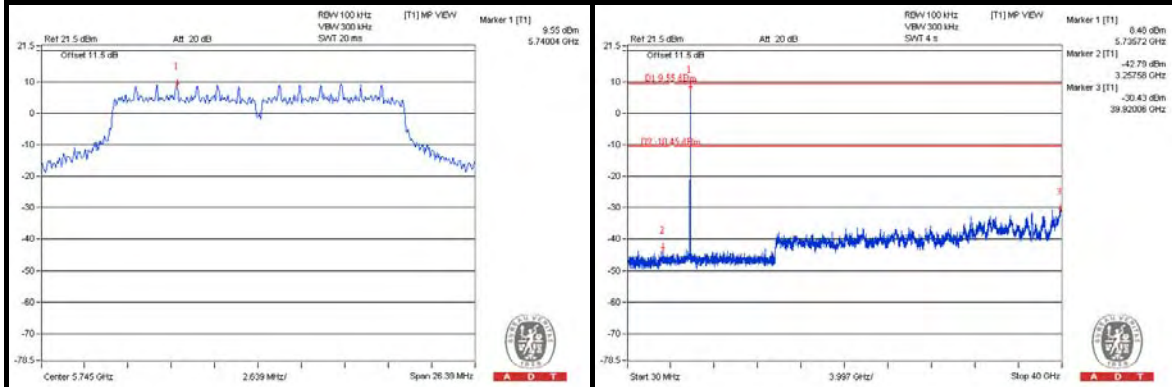


A D T

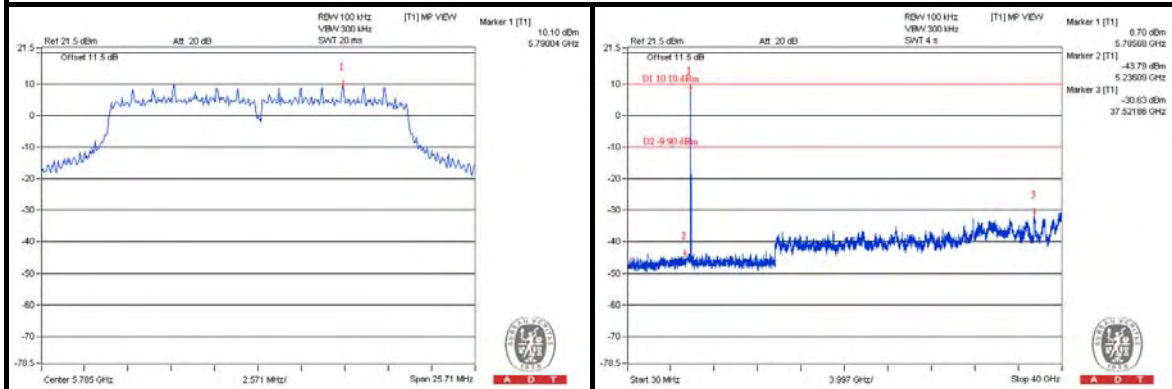
802.11n (20MHz)

CHAIN 0

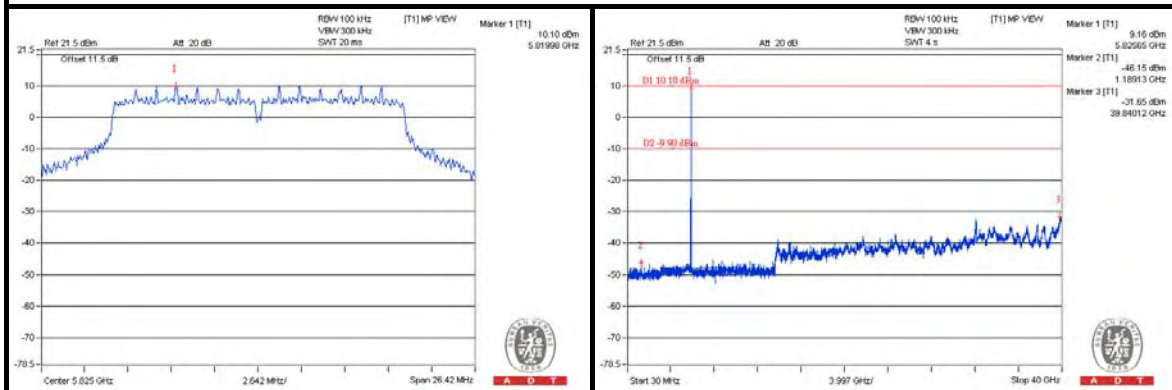
CH 149



CH 157

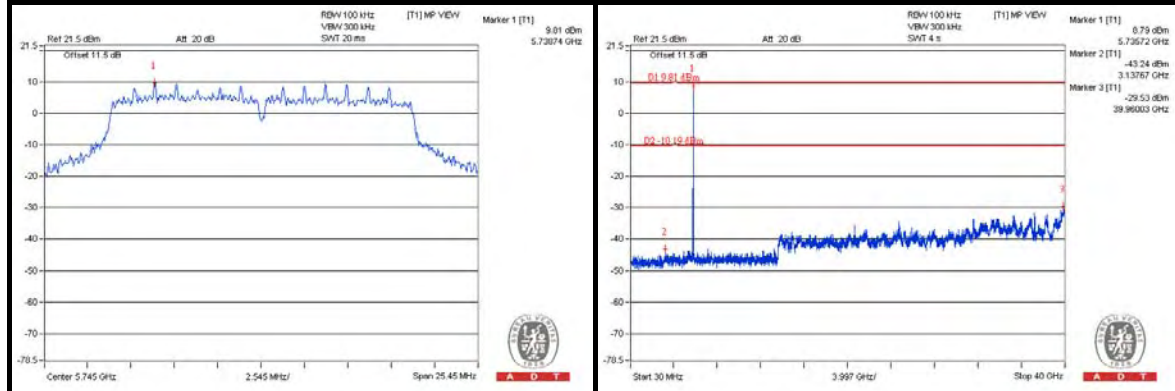


CH 165

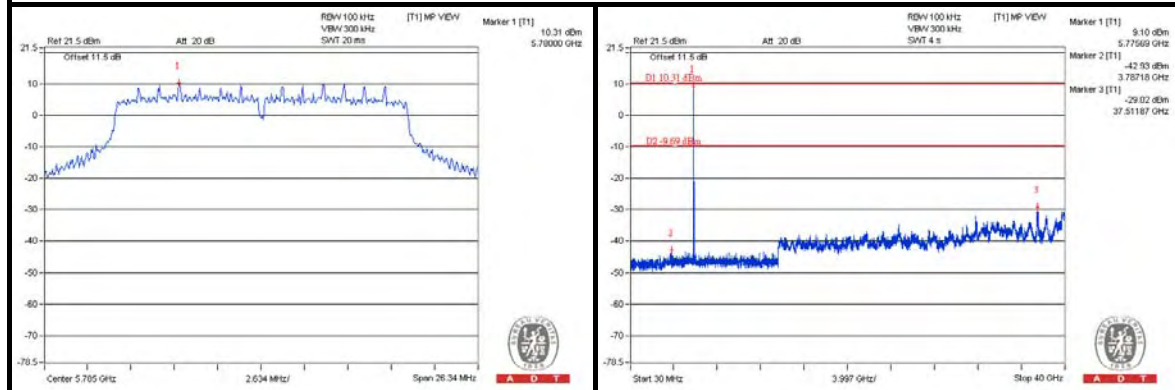


CHAIN 1

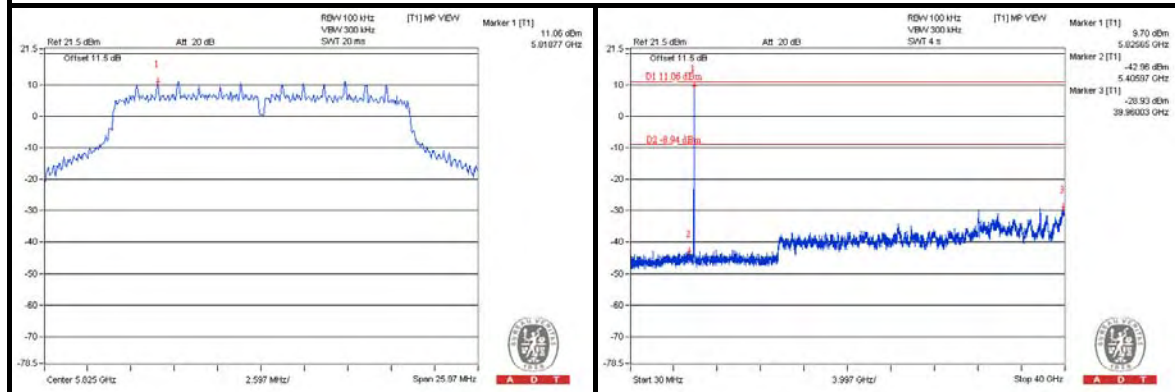
CH 149



CH 157



CH 165



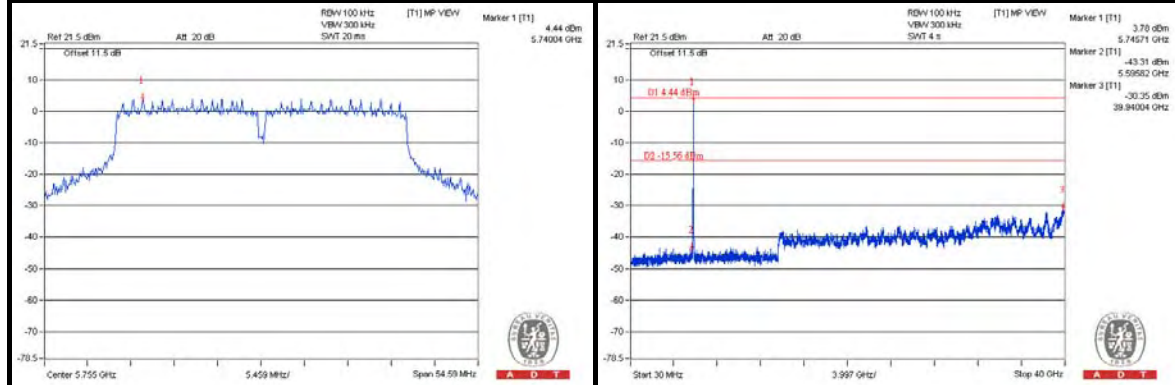


A D T

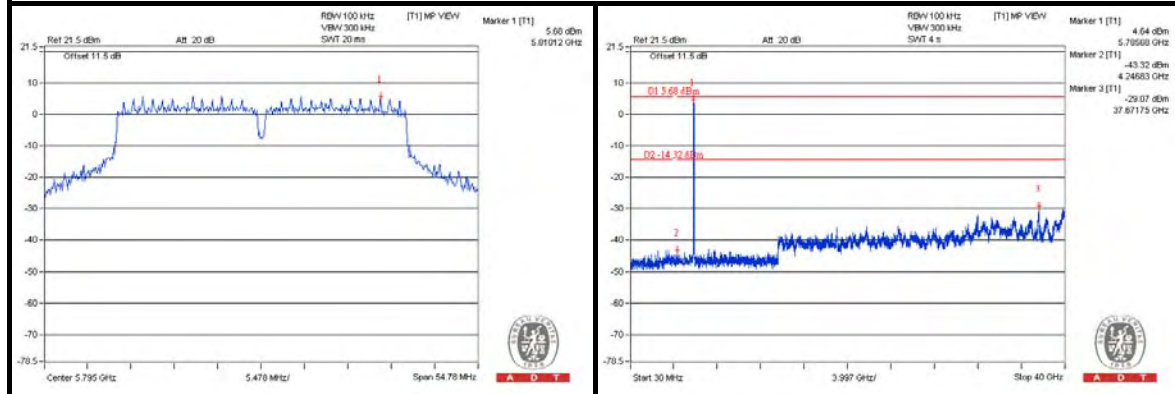
802.11n (40MHz)

CHAIN 0

CH 151



CH 159

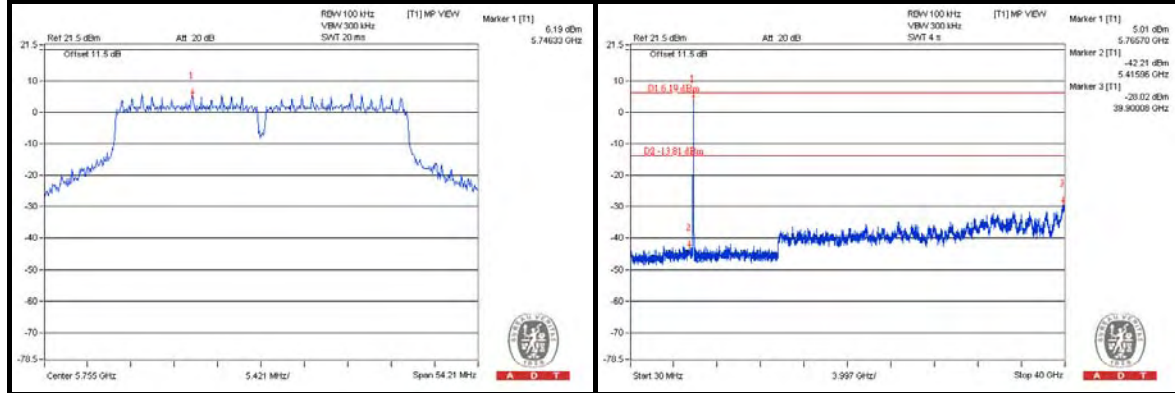




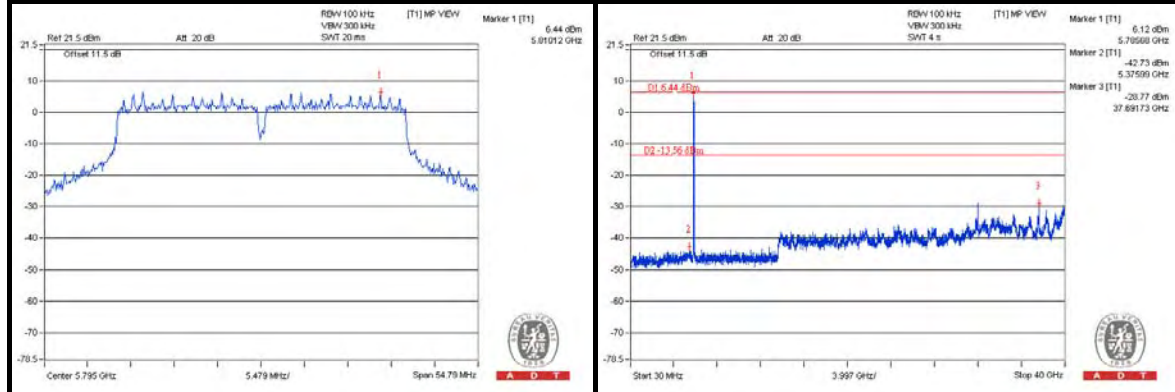
A D T

CHAIN 1

CH 151



CH 159



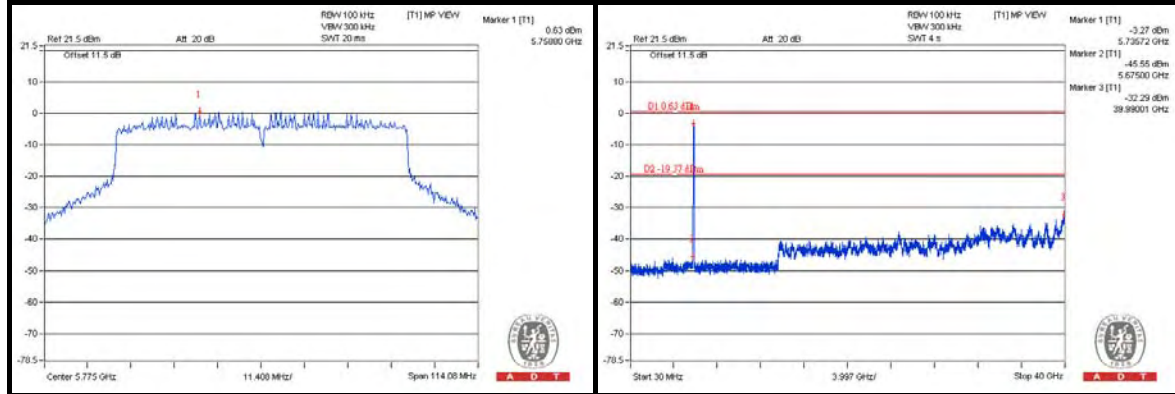


A D T

802.11ac (80MHz)

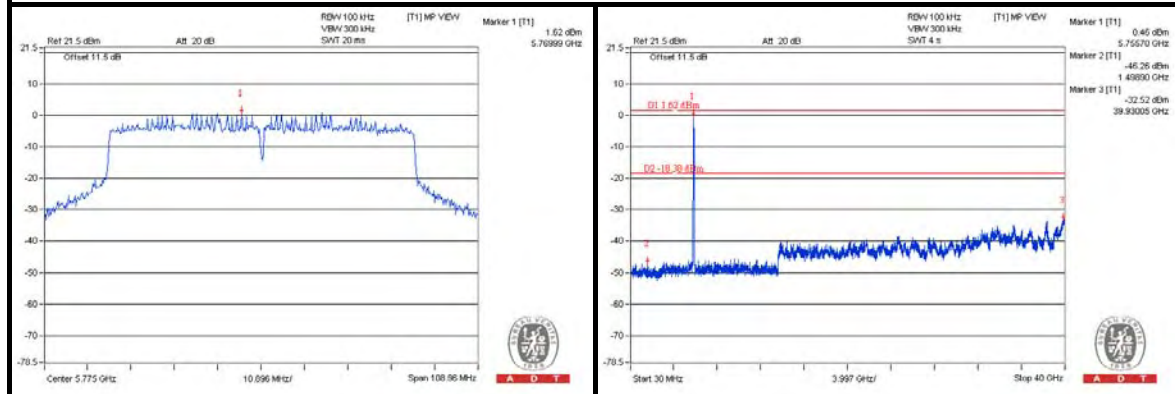
CHAIN 0

CH 155



CHAIN 1

CH 155





A D T

6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



A D T

7. 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

8. 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---