

FCC TEST REPORT (15.247)

REPORT NO.: RF130508C34B

MODEL NO.: C5

FCC ID: TE7C5

RECEIVED: May 08, 2013

TESTED: May 14 ~ May 21, 2013

ISSUED: Jun. 12, 2014

APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.

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

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

LAB ADDRESS: No. 47, 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	15
3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS	16
4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND)	17
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT	17
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	17
4.1.2 TEST INSTRUMENTS	18
4.1.3 TEST PROCEDURES	19
4.1.4 DEVIATION FROM TEST STANDARD	19
4.1.5 TEST SETUP	20
4.1.6 EUT OPERATING CONDITIONS	20
4.1.7 TEST RESULTS	21
4.2 CONDUCTED EMISSION MEASUREMENT	34
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	34
4.2.2 TEST INSTRUMENTS	34
4.2.3 TEST PROCEDURES	35
4.2.4 DEVIATION FROM TEST STANDARD	35
4.2.5 TEST SETUP	35
4.2.6 EUT OPERATING CONDITIONS	35
4.2.7 TEST RESULTS	36
4.3 6dB BANDWIDTH MEASUREMENT	38
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT	38
4.3.2 TEST SETUP	38
4.3.3 TEST INSTRUMENTS	38
4.3.4 TEST PROCEDURE	38
4.3.5 DEVIATION FROM TEST STANDARD	38
4.3.6 EUT OPERATING CONDITIONS	38
4.3.7 TEST RESULTS	39
4.4 CONDUCTED OUTPUT POWER	40
4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	40
4.4.2 TEST SETUP	40
4.4.3 TEST INSTRUMENTS	40
4.4.4 TEST PROCEDURES	40
4.4.5 DEVIATION FROM TEST STANDARD	41
4.4.6 EUT OPERATING CONDITIONS	41
4.4.7 TEST RESULTS	42
4.5 POWER SPECTRAL DENSITY MEASUREMENT	44
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	44
4.5.2 TEST SETUP	44
4.5.3 TEST INSTRUMENTS	44
4.5.4 TEST PROCEDURE	44



A D T

4.5.5	DEVIATION FROM TEST STANDARD.....	44
4.5.6	EUT OPERATING CONDITION.....	44
4.5.7	TEST RESULTS	45
4.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT	47
4.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT	47
4.6.2	TEST SETUP	47
4.6.3	TEST INSTRUMENTS.....	47
4.6.4	TEST PROCEDURE.....	47
4.6.5	DEVIATION FROM TEST STANDARD.....	48
4.6.6	EUT OPERATING CONDITION.....	48
4.6.7	TEST RESULTS	48
5.	TEST TYPES AND RESULTS (FOR 5.0GHz BAND)	61
5.1	RADIATED EMISSION MEASUREMENT	61
5.1.1	LIMITS OF RADIATED EMISSION MEASUREMENT	61
5.1.2	TEST INSTRUMENTS.....	62
5.1.3	TEST PROCEDURES	62
5.1.4	DEVIATION FROM TEST STANDARD.....	62
5.1.5	TEST SETUP.....	62
5.1.6	EUT OPERATING CONDITIONS	62
5.1.7	TEST RESULTS	63
5.2	CONDUCTED EMISSION MEASUREMENT	73
5.2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	73
5.2.2	TEST INSTRUMENTS.....	73
5.2.3	TEST PROCEDURES	73
5.2.4	DEVIATION FROM TEST STANDARD.....	73
5.2.5	TEST SETUP.....	73
5.2.6	EUT OPERATING CONDITIONS	73
5.2.7	TEST RESULTS	74
5.3	6dB BANDWIDTH MEASUREMENT.....	76
5.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	76
5.3.2	TEST SETUP.....	76
5.3.3	TEST INSTRUMENTS.....	76
5.3.4	TEST PROCEDURE.....	76
5.3.5	DEVIATION FROM TEST STANDARD.....	76
5.3.6	EUT OPERATING CONDITIONS	76
5.3.7	TEST RESULTS	77
5.4	CONDUCTED OUTPUT POWER.....	78
5.4.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	78
5.4.2	TEST SETUP.....	78
5.4.3	INSTRUMENTS.....	78
5.4.4	TEST PROCEDURES	79
5.4.5	DEVIATION FROM TEST STANDARD.....	79
5.4.6	EUT OPERATING CONDITIONS	79
5.4.7	TEST RESULTS	80
5.5	POWER SPECTRAL DENSITY MEASUREMENT	82
5.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	82
5.5.2	TEST SETUP.....	82
5.5.3	TEST INSTRUMENTS.....	82
5.5.4	TEST PROCEDURE.....	82
5.5.5	DEVIATION FROM TEST STANDARD.....	82
5.5.6	EUT OPERATING CONDITION.....	82
5.5.7	TEST RESULTS	83
5.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT	85



A D T

5.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT	85
5.6.2	TEST SETUP	85
5.6.3	TEST INSTRUMENTS	85
5.6.4	TEST PROCEDURE	85
5.6.5	DEVIATION FROM TEST STANDARD	85
5.6.6	EUT OPERATING CONDITION	85
5.6.7	TEST RESULTS	85
6.	PHOTOGRAPHS OF THE TEST CONFIGURATION	96
7.	INFORMATION ON THE TESTING LABORATORIES	97
8.	APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	98



A D T

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130508C34B	Original release	Jun. 12, 2014



A D T

1. CERTIFICATION

PRODUCT: AC1200 Wireless Dual Band Gigabit Router

MODEL NO.: C5

BRAND: TP-LINK

APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.

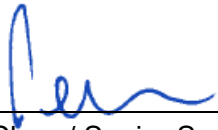
TESTED: May 14 ~ May 21, 2013

TEST SAMPLE: PROTOTYPE

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

ANSI C63.10-2009

The above equipment (model: C5) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY :  , **DATE :** Jun. 12, 2014

Pettie Chen / Senior Specialist

APPROVED BY :  , **DATE :** Jun. 12, 2014

Ken Liu / Senior Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -18.10dB at 0.15781MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2390.00, 2843.00, 4874.00, 4924.00MHz.
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 connectors are Weld for PIFA antenna, RP-SMA-F for Dipole antenna not standard connectors.

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 $k = 2$.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	AC1200 Wireless Dual Band Gigabit Router
MODEL NO.	C5
POWER SUPPLY	12Vdc (Adapter)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 450.0Mbps 802.11ac: up to 1300.0Mbps
OPERATING FREQUENCY	2.4GHz: 2412 ~ 2462MHz 5.0GHz: 5745 ~ 5825MHz
NUMBER OF CHANNEL	2.4GHz: 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) 5.0GHz: 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 1 for 802.11ac (80MHz)
OUTPUT POWER	845.731mW for 2412 ~ 2462MHz 924.272mW for 5745 ~ 5825MHz
ANTENNA TYPE	2.4GHz: PIFA antenna with 4.5dBi gain 5.0GHz: Dipole antenna with 5.0dBi gain
ANTENNA CONNECTOR	Weld for PIFA antenna RP-SMA-F for Dipole antenna
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter

NOTE:

1. The EUT provides three completed transmitters and three receivers.

MODULATION MODE	TX FUNCTION
802.11b	3TX
802.11g	3TX
802.11a	3TX
802.11n (20MHz)	3TX
802.11n (40MHz)	3TX
802.11ac (80MHz)	3TX

2. The EUT consumes power from the following adapter.

BRAND:	Ten Pao International Inc.
MODEL:	S040EU1200250
INPUT:	100-240Vac, 50/60Hz, 1.2A Max
OUTPUT:	12Vdc, 2500mA
POWER LINE:	1.5m non-shielded cable without core

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

3.2 DESCRIPTION OF TEST MODES

FOR 2.4GHz:

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

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

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

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

FOR 5.0GHz (5745 ~ 5825MHz):

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

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

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

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

CHANNEL	FREQUENCY
155	5775MHz

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	
-	√	√	√	√	-

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:

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

RADIATED EMISSION TEST (ABOVE 1GHz):

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

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

RADIATED EMISSION TEST (BELOW 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11g	1 to 11	6	OFDM	BPSK	6.0

POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11g	1 to 11	6	OFDM	BPSK	6.0



A D T

BANDEDGE MEASUREMENT:

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

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

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Ted Chang
PLC	25deg. C, 65%RH	120Vac, 60Hz	Alan Wu
APCM	24deg. C, 64%RH	120Vac, 60Hz	Nick Chen

FOR 5.0GHz (5745 ~ 5825MHz):

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

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

NOTE:

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

RADIATED EMISSION TEST (ABOVE 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (80MHz)	155	155	OFDM	BPSK	32.5

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)
-	802.11n (20MHz)	149 to 165	149	OFDM	BPSK	7.2

POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (20MHz)	149 to 165	149	OFDM	BPSK	7.2

BANDEDGE MEASUREMENT:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	7.2
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (80MHz)	155	155	OFDM	BPSK	32.5

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)
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (80MHz)	155	155	OFDM	BPSK	32.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Ted Chang
PLC	25deg. C, 65%RH	120Vac, 60Hz	Alan Wu
APCM	24deg. C, 64%RH	120Vac, 60Hz	Nick Chen

3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

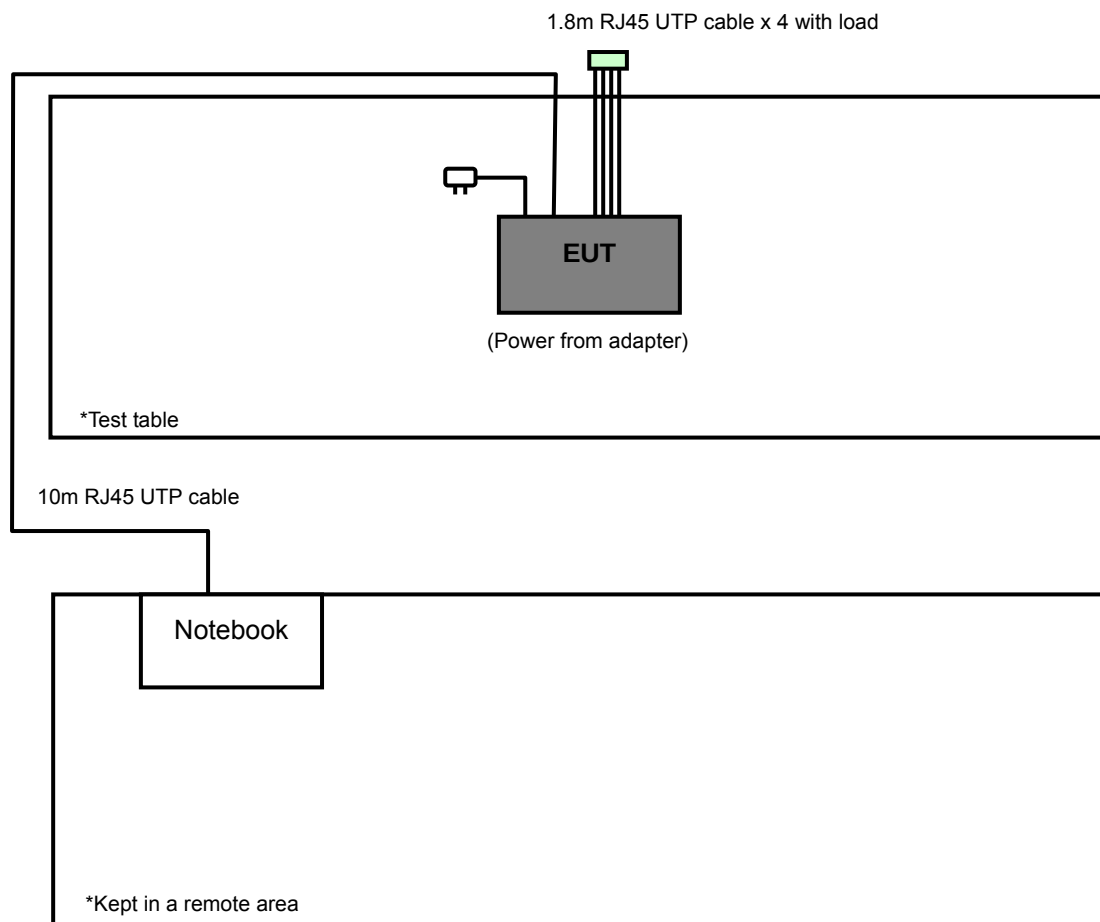
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	E5420	33MLMQ1	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m RJ45 cable

NOTE:

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

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST



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 v03r02

662911 D01 Multiple Transmitter Output v02

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.

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.

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	0824012	Aug. 22, 2012	Aug. 21, 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 215374.
 6. The IC Site Registration No. is IC 7450F-9.

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.



A D T

4.1.7 TEST RESULTS

ABOVE 1GHz DATA :

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2360.00	66.1 PK	74.0	-7.9	1.36 H	304	30.50	35.60
2	2360.00	52.9 AV	54.0	-1.1	1.36 H	304	17.30	35.60
3	2390.00	60.8 PK	74.0	-13.2	1.36 H	304	25.10	35.70
4	2390.00	50.0 AV	54.0	-4.0	1.36 H	304	14.30	35.70
5	*2412.00	117.1 PK			1.34 H	301	81.30	35.80
6	*2412.00	113.6 AV			1.34 H	301	77.80	35.80
7	4824.00	51.4 PK	74.0	-22.6	1.02 H	14	8.30	43.10
8	4824.00	43.8 AV	54.0	-10.2	1.02 H	14	0.70	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	2390.00	59.6 PK	74.0	-14.4	1.26 V	278	23.90	35.70
2	2390.00	48.5 AV	54.0	-5.5	1.26 V	278	12.80	35.70
3	*2412.00	103.9 PK			1.12 V	101	68.10	35.80
4	*2412.00	100.1 AV			1.12 V	101	64.30	35.80
5	4824.00	53.6 PK	74.0	-20.4	1.34 V	334	10.50	43.10
6	4824.00	47.8 AV	54.0	-6.2	1.34 V	334	4.70	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	116.5 PK			1.32 H	264	80.70	35.80
2	*2437.00	113.0 AV			1.32 H	264	77.20	35.80
3	4874.00	54.6 PK	74.0	-19.4	1.02 H	20	11.40	43.20
4	4874.00	49.6 AV	54.0	-4.4	1.02 H	20	6.40	43.20
5	7311.00	53.6 PK	74.0	-20.4	1.02 H	326	5.90	47.70
6	7311.00	42.6 AV	54.0	-11.4	1.02 H	326	-5.10	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	*2437.00	107.9 PK			1.06 V	275	72.10	35.80
2	*2437.00	104.3 AV			1.06 V	275	68.50	35.80
3	4874.00	57.1 PK	74.0	-16.9	1.00 V	335	13.90	43.20
4	4874.00	53.0 AV	54.0	-1.0	1.00 V	335	9.80	43.20
5	7311.00	59.1 PK	74.0	-14.9	1.79 V	345	11.40	47.70
6	7311.00	52.2 AV	54.0	-1.8	1.79 V	345	4.50	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.6 PK			1.32 H	323	78.70	35.90
2	*2462.00	110.7 AV			1.32 H	323	74.80	35.90
3	2483.50	63.6 PK	74.0	-10.4	1.29 H	289	27.70	35.90
4	2483.50	50.9 AV	54.0	-3.1	1.29 H	289	15.00	35.90
5	4924.00	53.3 PK	74.0	-20.7	1.14 H	49	9.90	43.40
6	4924.00	46.7 AV	54.0	-7.3	1.14 H	49	3.30	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	103.4 PK			1.05 V	276	67.50	35.90
2	*2462.00	99.6 AV			1.05 V	276	63.70	35.90
3	2483.50	59.9 PK	74.0	-14.1	1.16 V	96	24.00	35.90
4	2483.50	49.2 AV	54.0	-4.8	1.16 V	96	13.30	35.90
5	4924.00	56.6 PK	74.0	-17.4	1.08 V	336	13.20	43.40
6	4924.00	53.0 AV	54.0	-1.0	1.08 V	336	9.60	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.



A D T

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.5 PK	74.0	-14.5	1.34 H	283	23.80	35.70
2	2390.00	52.3 AV	54.0	-1.7	1.34 H	283	16.60	35.70
3	*2412.00	113.2 PK			1.34 H	297	77.40	35.80
4	*2412.00	103.5 AV			1.34 H	297	67.70	35.80
5	4824.00	50.2 PK	74.0	-23.8	1.00 H	214	7.10	43.10
6	4824.00	35.3 AV	54.0	-18.7	1.00 H	214	-7.80	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	60.1 PK	74.0	-13.9	1.10 V	105	24.40	35.70
2	2390.00	48.9 AV	54.0	-5.1	1.10 V	105	13.20	35.70
3	*2412.00	99.8 PK			1.12 V	108	64.00	35.80
4	*2412.00	90.7 AV			1.12 V	108	54.90	35.80
5	4824.00	52.4 PK	74.0	-21.6	1.42 V	198	9.30	43.10
6	4824.00	39.1 AV	54.0	-14.9	1.42 V	198	-4.00	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	120.9 PK			1.34 H	296	85.10	35.80
2	*2437.00	111.0 AV			1.34 H	296	75.20	35.80
3	2483.50	67.4 PK	74.0	-6.6	1.31 H	292	31.50	35.90
4	2483.50	52.8 AV	54.0	-1.2	1.31 H	292	16.90	35.90
5	4874.00	50.0 PK	74.0	-24.0	1.47 H	69	6.80	43.20
6	4874.00	37.8 AV	54.0	-16.2	1.47 H	69	-5.40	43.20
7	7311.00	71.9 PK	74.0	-2.1	1.00 H	16	24.20	47.70
8	7311.00	52.3 AV	54.0	-1.7	1.00 H	16	4.60	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	*2437.00	106.9 PK			1.02 V	256	71.10	35.80
2	*2437.00	96.7 AV			1.02 V	256	60.90	35.80
3	4874.00	53.8 PK	74.0	-20.2	1.00 V	339	10.60	43.20
4	4874.00	40.9 AV	54.0	-13.1	1.00 V	339	-2.30	43.20
5	7311.00	71.9 PK	74.0	-2.1	1.28 V	74	24.20	47.70
6	7311.00	50.4 AV	54.0	-3.6	1.28 V	74	2.70	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.6 PK			1.30 H	290	76.70	35.90
2	*2462.00	102.6 AV			1.30 H	290	66.70	35.90
3	2483.50	69.0 PK	74.0	-5.0	1.28 H	311	33.10	35.90
4	2483.50	53.0 AV	54.0	-1.0	1.28 H	311	17.10	35.90
5	4924.00	47.8 PK	74.0	-26.2	1.14 H	342	4.40	43.40
6	4924.00	35.4 AV	54.0	-18.6	1.14 H	342	-8.00	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	101.2 PK			1.03 V	110	65.30	35.90
2	*2462.00	91.8 AV			1.03 V	110	55.90	35.90
3	2483.50	59.9 PK	74.0	-14.1	1.11 V	196	24.00	35.90
4	2483.50	48.5 AV	54.0	-5.5	1.11 V	196	12.60	35.90
5	4924.00	50.0 PK	74.0	-24.0	1.54 V	115	6.60	43.40
6	4924.00	37.6 AV	54.0	-16.4	1.54 V	115	-5.80	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.



A D T

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.1 PK	74.0	-5.9	1.37 H	296	32.40	35.70
2	2390.00	52.5 AV	54.0	-1.5	1.37 H	296	16.80	35.70
3	*2412.00	113.0 PK			1.35 H	297	77.20	35.80
4	*2412.00	103.0 AV			1.35 H	297	67.20	35.80
5	4824.00	50.0 PK	74.0	-24.0	1.42 H	181	6.90	43.10
6	4824.00	35.2 AV	54.0	-18.8	1.42 H	181	-7.90	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	59.8 PK	74.0	-14.2	1.44 V	321	24.10	35.70
2	2390.00	48.6 AV	54.0	-5.4	1.44 V	321	12.90	35.70
3	*2412.00	99.6 PK			1.11 V	108	63.80	35.80
4	*2412.00	90.3 AV			1.11 V	108	54.50	35.80
5	4824.00	52.8 PK	74.0	-21.2	1.56 V	65	9.70	43.10
6	4824.00	40.4 AV	54.0	-13.6	1.56 V	65	-2.70	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	120.1 PK			1.32 H	288	84.30	35.80
2	*2437.00	110.5 AV			1.32 H	288	74.70	35.80
3	2483.50	66.7 PK	74.0	-7.3	1.31 H	290	30.80	35.90
4	2483.50	52.1 AV	54.0	-1.9	1.31 H	290	16.20	35.90
5	4874.00	51.0 PK	74.0	-23.0	1.60 H	69	7.80	43.20
6	4874.00	37.9 AV	54.0	-16.1	1.60 H	69	-5.30	43.20
7	7311.00	71.2 PK	74.0	-2.8	1.00 H	15	23.50	47.70
8	7311.00	51.5 AV	54.0	-2.5	1.00 H	15	3.80	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	*2437.00	108.9 PK			1.08 V	105	73.10	35.80
2	*2437.00	98.9 AV			1.08 V	105	63.10	35.80
3	4874.00	53.7 PK	74.0	-20.3	1.00 V	335	10.50	43.20
4	4874.00	40.8 AV	54.0	-13.2	1.00 V	335	-2.40	43.20
5	7311.00	70.4 PK	74.0	-3.6	1.04 V	50	22.70	47.70
6	7311.00	50.9 AV	54.0	-3.1	1.04 V	50	3.20	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.8 PK			1.30 H	292	75.90	35.90
2	*2462.00	102.9 AV			1.30 H	292	67.00	35.90
3	2483.50	67.7 PK	74.0	-6.3	1.30 H	292	31.80	35.90
4	2483.50	52.9 AV	54.0	-1.1	1.30 H	292	17.00	35.90
5	4924.00	47.6 PK	74.0	-26.4	1.54 H	174	4.20	43.40
6	4924.00	35.2 AV	54.0	-18.8	1.54 H	174	-8.20	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	100.9 PK			1.03 V	109	65.00	35.90
2	*2462.00	91.7 AV			1.03 V	109	55.80	35.90
3	2483.50	60.3 PK	74.0	-13.7	1.01 V	107	24.40	35.90
4	2483.50	48.5 AV	54.0	-5.5	1.01 V	107	12.60	35.90
5	4924.00	52.4 PK	74.0	-21.6	1.54 V	151	9.00	43.40
6	4924.00	39.6 AV	54.0	-14.4	1.54 V	151	-3.80	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.



A D T

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.1 PK	74.0	-6.9	1.33 H	289	31.40	35.70
2	2390.00	52.6 AV	54.0	-1.4	1.33 H	289	16.90	35.70
3	*2422.00	106.3 PK			1.33 H	289	70.50	35.80
4	*2422.00	94.2 AV			1.33 H	289	58.40	35.80
5	4844.00	47.9 PK	74.0	-26.1	1.06 H	324	4.70	43.20
6	4844.00	35.2 AV	54.0	-18.8	1.06 H	324	-8.00	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	60.4 PK	74.0	-13.6	1.10 V	105	24.70	35.70
2	2390.00	48.5 AV	54.0	-5.5	1.10 V	105	12.80	35.70
3	*2422.00	94.8 PK			1.12 V	107	59.00	35.80
4	*2422.00	82.1 AV			1.12 V	107	46.30	35.80
5	4844.00	51.5 PK	74.0	-22.5	1.64 V	245	8.30	43.20
6	4844.00	37.5 AV	54.0	-16.5	1.64 V	245	-5.70	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.4 PK	74.0	-9.6	1.34 H	296	28.70	35.70
2	2390.00	53.0 AV	54.0	-1.0	1.34 H	296	17.30	35.70
3	*2437.00	109.9 PK			1.33 H	298	74.10	35.80
4	*2437.00	97.1 AV			1.33 H	298	61.30	35.80
5	4874.00	48.3 PK	74.0	-25.7	1.00 H	343	5.10	43.20
6	4874.00	35.5 AV	54.0	-18.5	1.00 H	343	-7.70	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	60.4 PK	74.0	-13.6	1.09 V	112	24.70	35.70
2	2390.00	48.6 AV	54.0	-5.4	1.09 V	112	12.90	35.70
3	*2437.00	99.2 PK			1.11 V	109	63.40	35.80
4	*2437.00	87.0 AV			1.11 V	109	51.20	35.80
5	4874.00	52.5 PK	74.0	-21.5	1.74 V	215	9.30	43.20
6	4874.00	40.2 AV	54.0	-13.8	1.74 V	215	-3.00	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 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	106.5 PK			1.30 H	295	70.60	35.90
2	*2452.00	93.6 AV			1.30 H	295	57.70	35.90
3	2483.50	67.8 PK	74.0	-6.2	1.30 H	295	31.90	35.90
4	2483.50	52.5 AV	54.0	-1.5	1.30 H	295	16.60	35.90
5	4904.00	48.9 PK	74.0	-25.1	1.42 H	334	5.60	43.30
6	4904.00	36.3 AV	54.0	-17.7	1.42 H	334	-7.00	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	95.2 PK			1.07 V	111	59.30	35.90
2	*2452.00	82.6 AV			1.07 V	111	46.70	35.90
3	2483.50	61.6 PK	74.0	-12.4	1.05 V	110	25.70	35.90
4	2483.50	48.5 AV	54.0	-5.5	1.05 V	110	12.60	35.90
5	4904.00	51.6 PK	74.0	-22.4	1.24 V	247	8.30	43.30
6	4904.00	39.3 AV	54.0	-14.7	1.24 V	247	-4.00	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.



A D T

BELOW 1GHz WORST-CASE DATA : 802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	161.92	41.1 QP	43.5	-2.4	1.49 H	346	27.50	13.60
2	249.22	29.6 QP	46.0	-16.4	1.00 H	316	16.80	12.80
3	375.32	34.9 QP	46.0	-11.1	1.00 H	318	18.30	16.60
4	625.58	41.4 QP	46.0	-4.6	1.24 H	151	18.70	22.70
5	749.74	33.0 QP	46.0	-13.0	1.00 H	138	8.50	24.50
6	961.20	40.3 QP	54.0	-13.7	1.49 H	315	12.90	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	161.92	38.7 QP	43.5	-4.8	1.25 V	241	25.10	13.60
2	375.32	37.3 QP	46.0	-8.7	1.25 V	187	20.70	16.60
3	499.48	35.7 QP	46.0	-10.3	1.00 V	256	15.90	19.80
4	625.58	39.4 QP	46.0	-6.6	1.00 V	54	16.70	22.70
5	875.84	36.7 QP	46.0	-9.3	1.50 V	186	10.20	26.50
6	961.20	37.9 QP	54.0	-16.1	1.25 V	16	10.50	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.

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

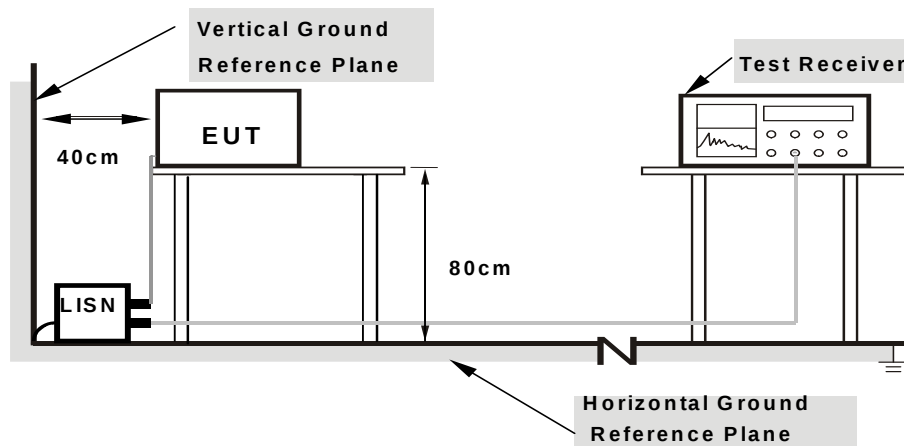
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 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 from other units and other metal planes

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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

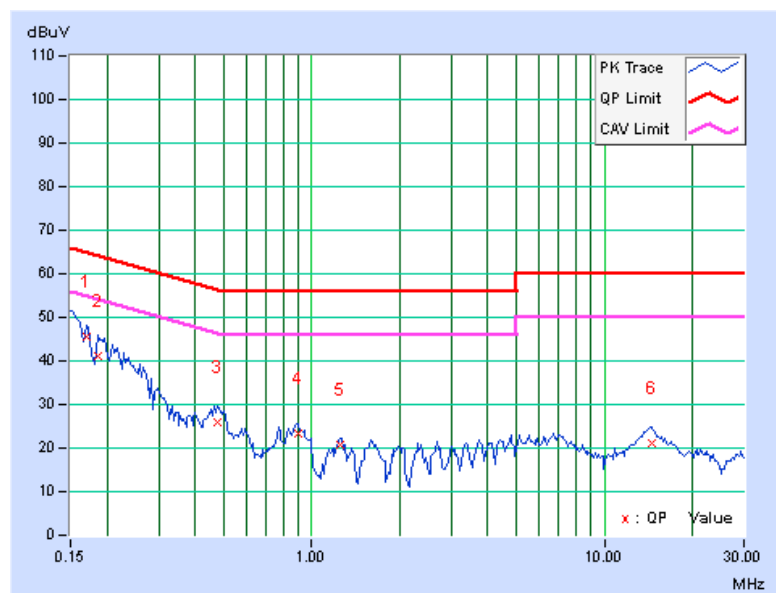
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA : 802.11g

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16953	0.17	45.27	27.45	45.44	27.62	64.98	54.98	-19.54	-27.36
2	0.18516	0.17	40.80	23.06	40.97	23.23	64.25	54.25	-23.28	-31.02
3	0.47813	0.22	25.75	18.36	25.97	18.58	56.37	46.37	-30.40	-27.79
4	0.89609	0.26	23.14	17.27	23.40	17.53	56.00	46.00	-32.60	-28.47
5	1.25781	0.27	20.52	14.36	20.79	14.63	56.00	46.00	-35.21	-31.37
6	14.45313	0.52	20.60	15.36	21.12	15.88	60.00	50.00	-38.88	-34.12

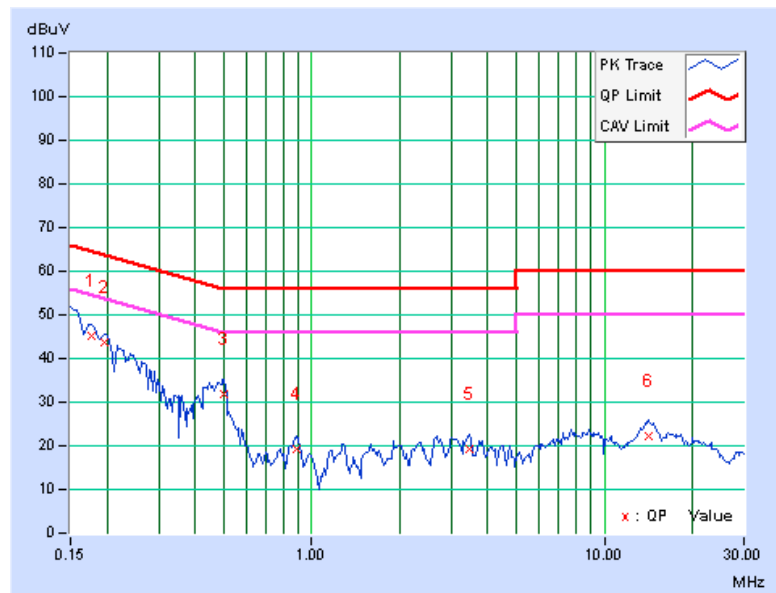
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor +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



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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	0.18	45.19	31.56	45.37	31.74	64.61	54.61	-19.24	-22.87
2	0.19687	0.18	43.39	29.80	43.57	29.98	63.74	53.74	-20.17	-23.76
3	0.50156	0.25	31.65	26.05	31.90	26.30	56.00	46.00	-24.10	-19.70
4	0.89219	0.23	18.96	12.77	19.19	13.00	56.00	46.00	-36.81	-33.00
5	3.44531	0.36	18.90	12.87	19.26	13.23	56.00	46.00	-36.74	-32.77
6	14.18750	0.58	21.69	16.50	22.27	17.08	60.00	50.00	-37.73	-32.92

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.

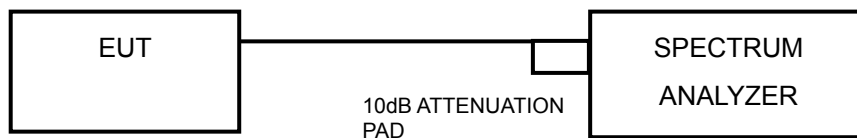


4.3 6dB BANDWIDTH MEASUREMENT

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

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

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

4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	6.11	5.64	6.10	0.5	PASS
6	2437	6.13	6.10	6.58	0.5	PASS
11	2462	6.08	6.06	6.13	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	16.45	16.46	16.45	0.5	PASS
6	2437	16.44	16.49	16.45	0.5	PASS
11	2462	16.49	16.46	16.48	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	17.65	17.67	17.69	0.5	PASS
6	2437	17.66	17.69	17.64	0.5	PASS
11	2462	17.67	17.71	17.70	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	35.97	36.56	36.56	0.5	PASS
6	2437	35.99	36.63	36.61	0.5	PASS
9	2452	35.93	36.62	36.60	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,

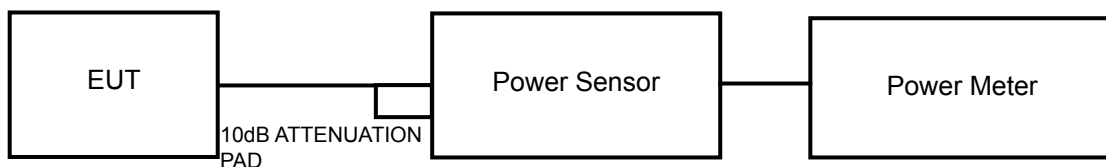
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

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

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

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.4 TEST PROCEDURES

Follow KDB 558074 D01 DTS Meas Guidance v03r01 section 9.1.3

A peak / average power sensor was 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.

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	17.51	17.49	17.16	164.469	22.16	30	PASS
6	2437	23.12	23.28	23.45	639.239	28.06	30	PASS
11	2462	18.95	18.49	18.97	228.042	23.58	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	20.37	20.70	20.34	334.526	25.24	30	PASS
6	2437	24.44	24.76	24.29	845.731	29.27	30	PASS
11	2462	20.42	20.23	22.65	399.670	26.02	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	20.42	20.64	20.76	345.156	25.38	30	PASS
6	2437	24.24	24.50	24.31	817.073	29.12	30	PASS
11	2462	20.42	19.24	20.28	300.760	24.78	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	17.15	18.02	16.64	161.399	22.08	30	PASS
6	2437	20.74	20.24	20.72	342.291	25.34	30	PASS
9	2452	19.87	18.79	18.93	250.897	23.99	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	14.12	14.12	13.84	75.856	18.80
6	2437	19.54	19.65	19.99	281.977	24.50
11	2462	15.68	15.12	15.72	106.817	20.29

802.11g

CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	12.68	12.72	12.73	55.992	17.48
6	2437	18.58	19.00	19.06	232.082	23.66
11	2462	12.96	12.48	13.45	59.602	17.75

802.11n (20MHz)

CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	12.87	12.68	13.11	58.363	17.66
6	2437	18.88	18.95	18.90	233.417	23.68
11	2462	11.77	10.89	11.94	42.936	16.33

802.11n (40MHz)

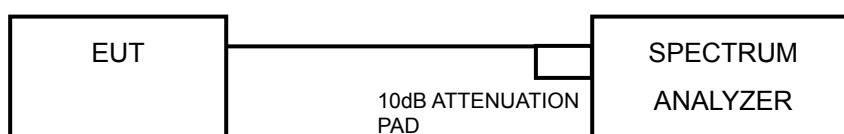
CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	8.84	9.55	8.82	24.293	13.85
6	2437	13.17	12.93	13.08	60.707	17.83
9	2452	9.58	9.59	10.12	28.457	14.54

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

Follow KDB 558074 D01 DTS Meas Guidance v03r01 section 10.2

- 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

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	-7.33	4.77	-2.56	4.73	PASS
	6	2437	-3.02	4.77	1.75	4.73	PASS
	11	2462	-5.76	4.77	-0.99	4.73	PASS
1	1	2412	-8.03	4.77	-3.26	4.73	PASS
	6	2437	-2.02	4.77	2.75	4.73	PASS
	11	2462	-6.45	4.77	-1.68	4.73	PASS
2	1	2412	-6.73	4.77	-1.96	4.73	PASS
	6	2437	-1.70	4.77	3.07	4.73	PASS
	11	2462	-5.08	4.77	-0.31	4.73	PASS

NOTE: Directional gain = 4.5dBi + 10log(3) = 9.27dBi > 6dBi , so the power density limit shall be reduced to 8-(9.27-6) = 4.73dBm.

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	-13.19	4.77	-8.42	4.73	PASS
	6	2437	-5.45	4.77	-0.68	4.73	PASS
	11	2462	-13.55	4.77	-8.78	4.73	PASS
1	1	2412	-13.25	4.77	-8.48	4.73	PASS
	6	2437	-5.32	4.77	-0.55	4.73	PASS
	11	2462	-13.15	4.77	-8.38	4.73	PASS
2	1	2412	-7.98	4.77	-3.21	4.73	PASS
	6	2437	-3.86	4.77	0.91	4.73	PASS
	11	2462	-11.88	4.77	-7.11	4.73	PASS

NOTE: Directional gain = 4.5dBi + 10log(3) = 9.27dBi > 6dBi , so the power density limit shall be reduced to 8-(9.27-6) = 4.73dBm.

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	-12.53	4.77	-7.76	4.73	PASS
	6	2437	-5.94	4.77	-1.17	4.73	PASS
	11	2462	-13.26	4.77	-8.49	4.73	PASS
1	1	2412	-13.41	4.77	-8.64	4.73	PASS
	6	2437	-6.34	4.77	-1.57	4.73	PASS
	11	2462	-15.94	4.77	-11.17	4.73	PASS
2	1	2412	-11.30	4.77	-6.53	4.73	PASS
	6	2437	-5.44	4.77	-0.67	4.73	PASS
	11	2462	-14.00	4.77	-9.23	4.73	PASS

NOTE: Directional gain = 4.5dBi + 10log(3) = 9.27dBi > 6dBi , so the power density limit shall be reduced to 8-(9.27-6) = 4.73dBm.

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	-20.03	4.77	-15.26	4.73	PASS
	6	2437	-15.66	4.77	-10.89	4.73	PASS
	9	2452	-19.85	4.77	-15.08	4.73	PASS
1	3	2422	-19.61	4.77	-14.84	4.73	PASS
	6	2437	-15.82	4.77	-11.05	4.73	PASS
	9	2452	-19.58	4.77	-14.81	4.73	PASS
2	3	2422	-20.03	4.77	-15.26	4.73	PASS
	6	2437	-11.67	4.77	-6.90	4.73	PASS
	9	2452	-19.41	4.77	-14.64	4.73	PASS

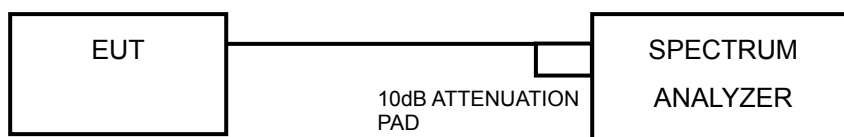
NOTE: Directional gain = 4.5dBi + 10log(3) = 9.27dBi > 6dBi , so the power density limit shall be reduced to 8-(9.27-6) = 4.73dBm.

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.

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.

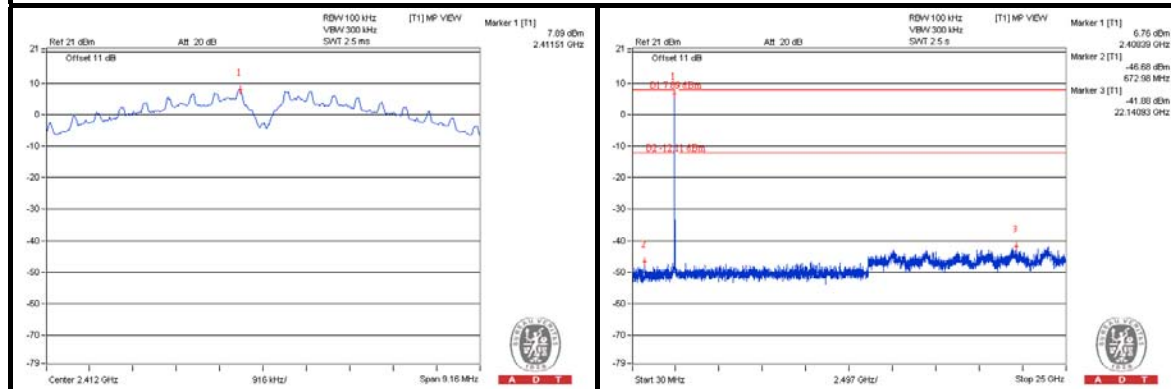
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



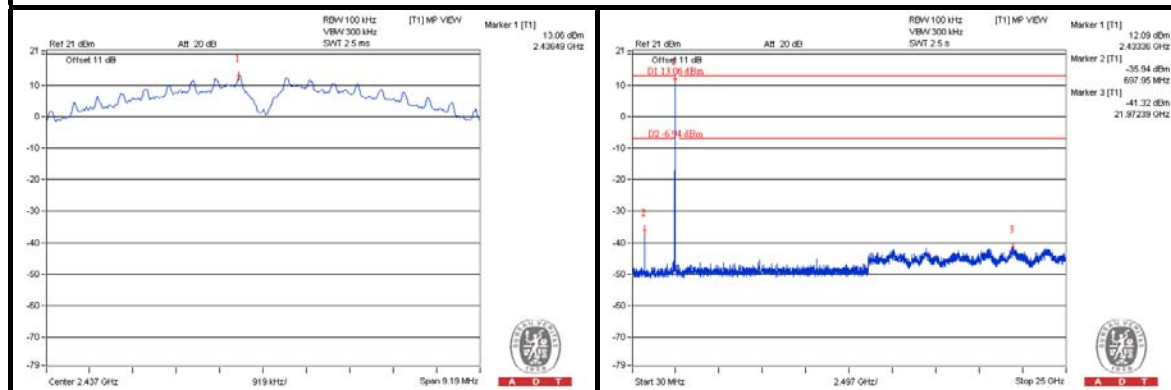
A D T

802.11b CHAIN 0

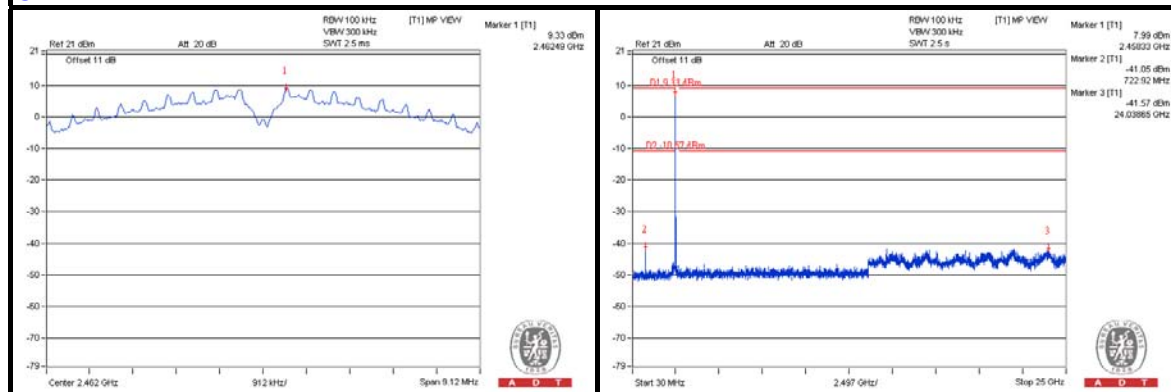
CH 1



CH 6



CH 11

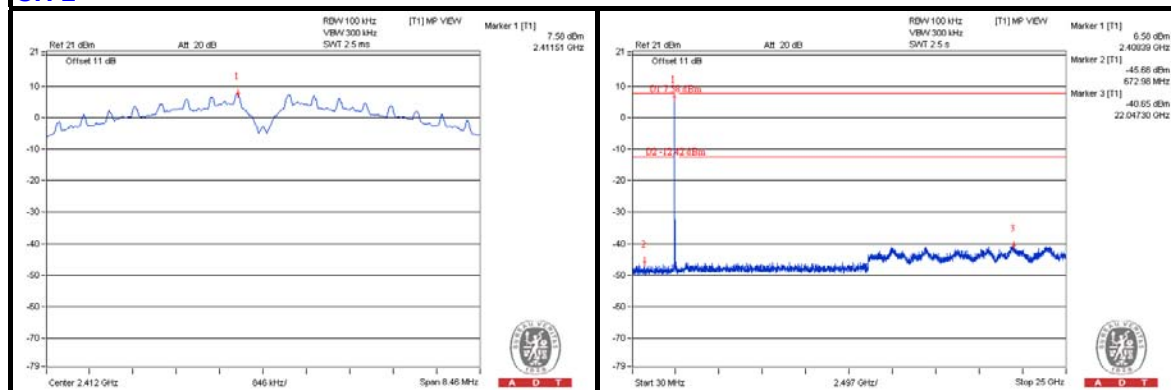




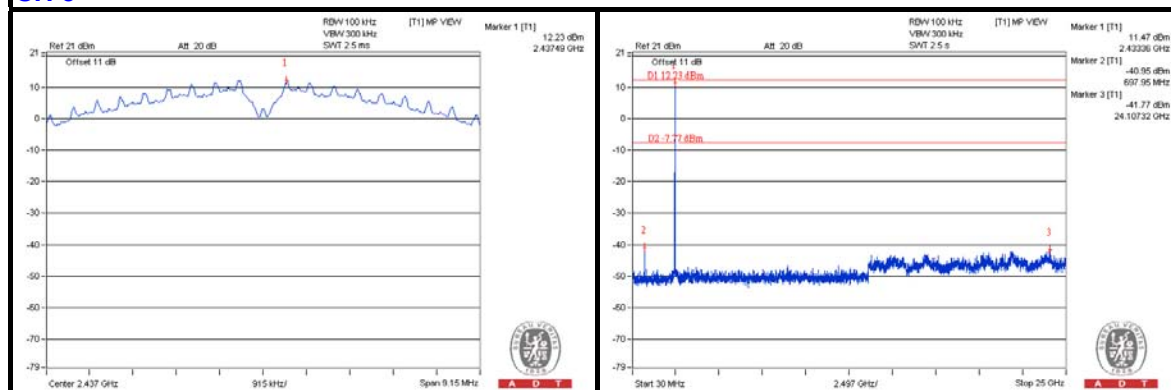
A D T

CHAIN 1

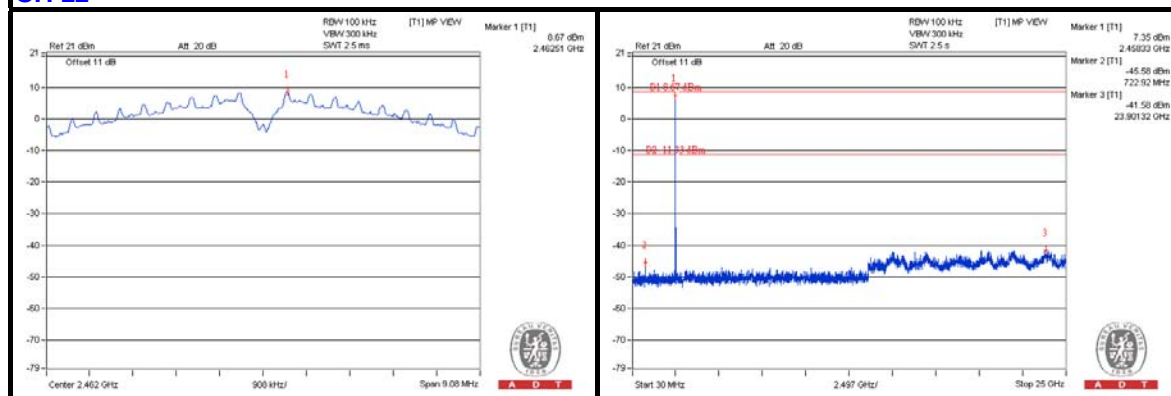
CH 1



CH 6



CH 11

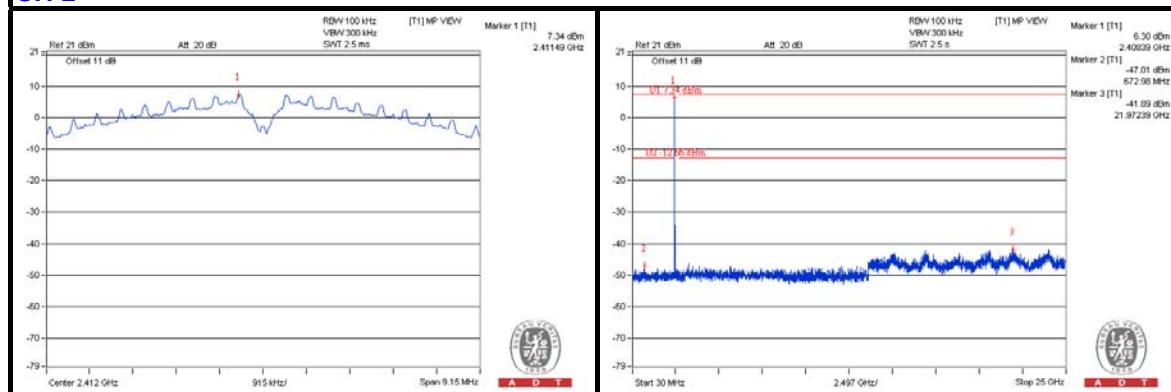




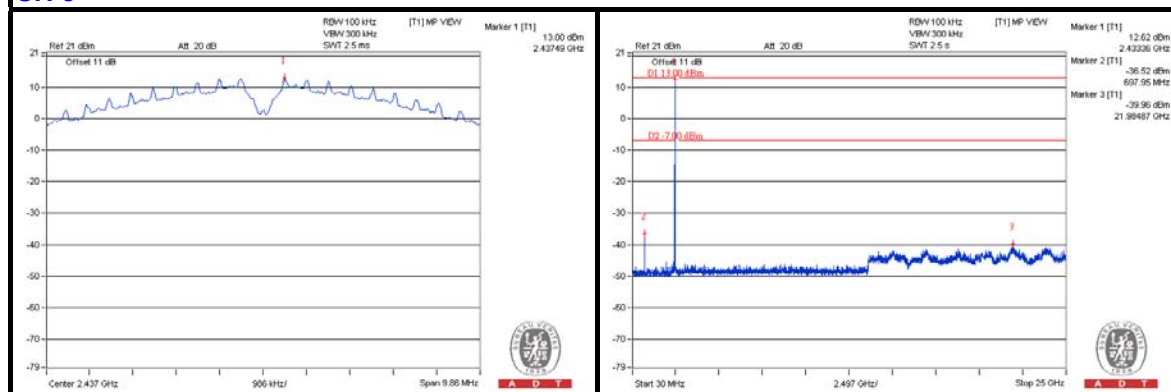
A D T

CHAIN 2

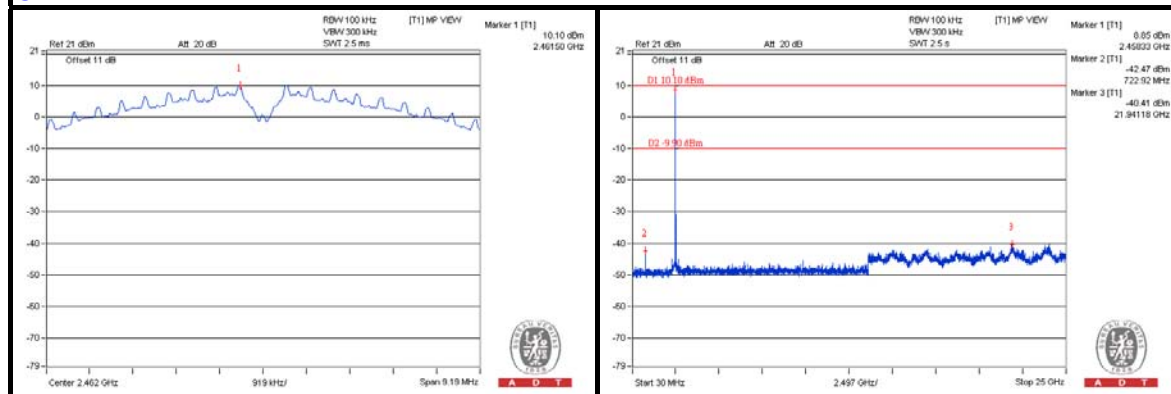
CH 1



CH 6



CH 11

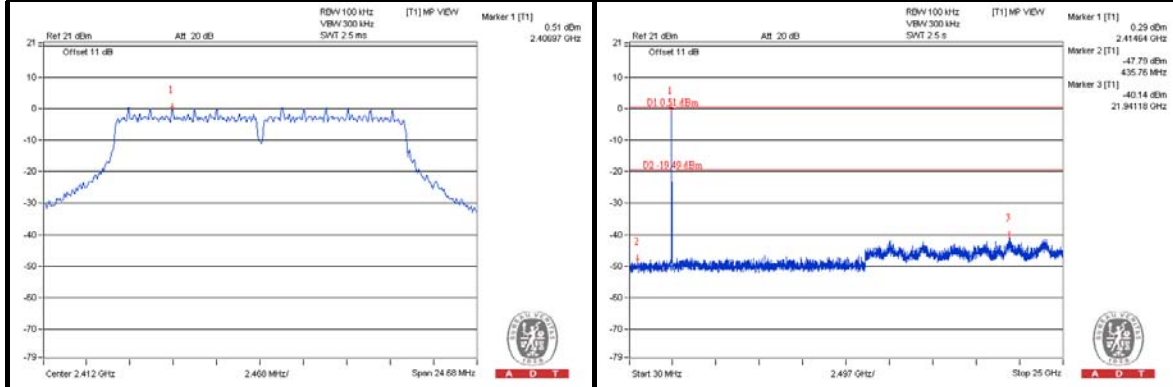




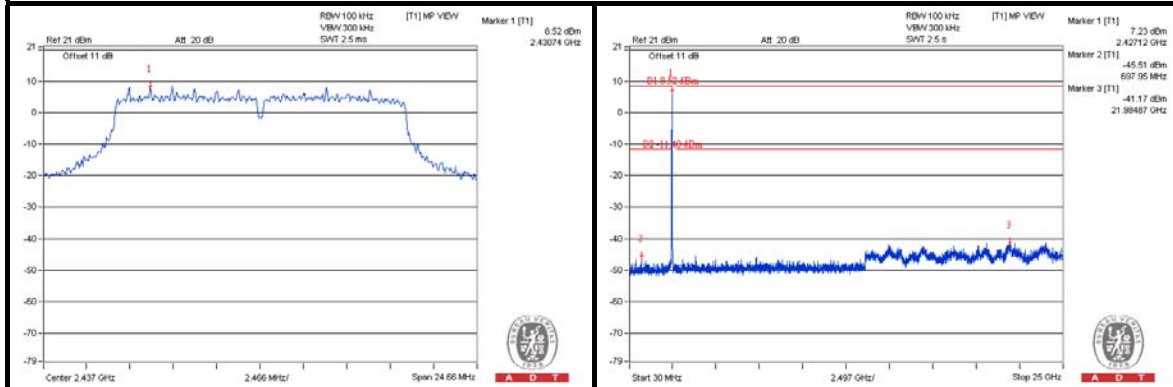
A D T

802.11g
CHAIN 0

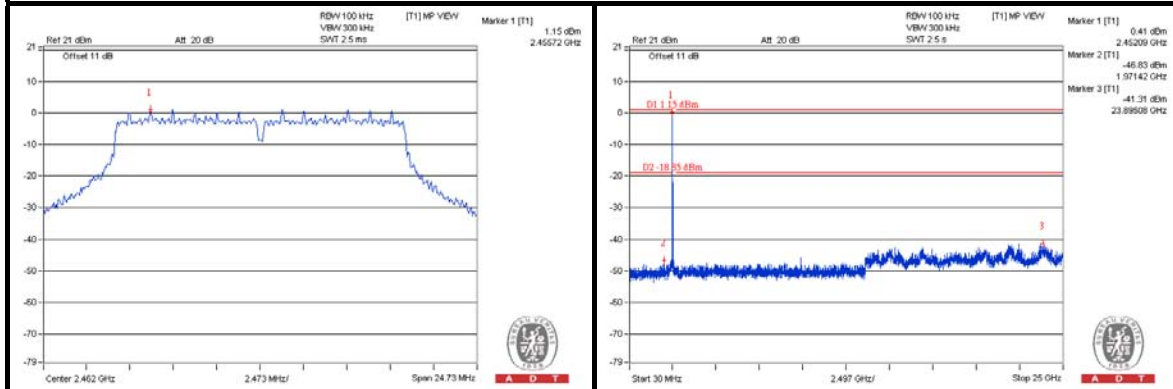
CH 1



CH 6



CH 11

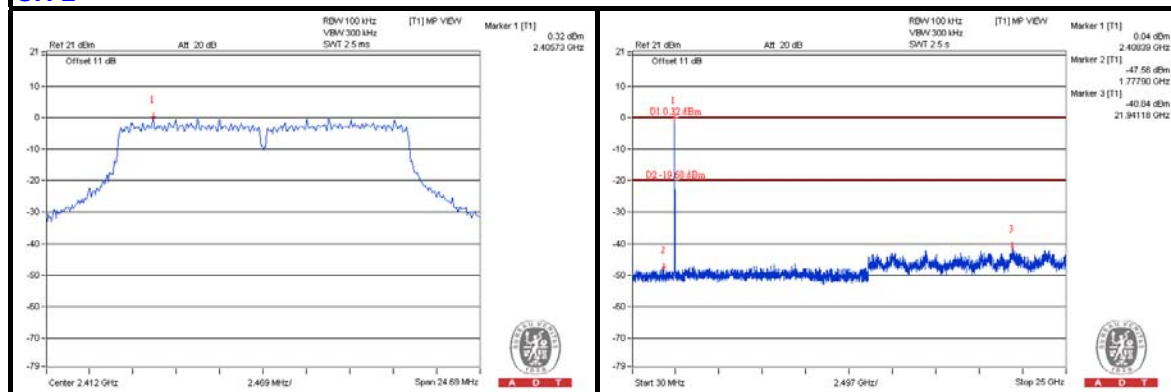




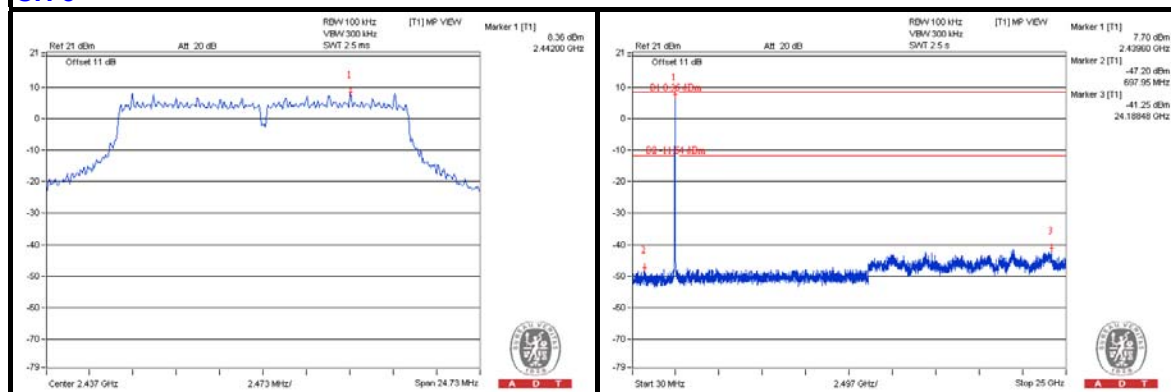
A D T

CHAIN 1

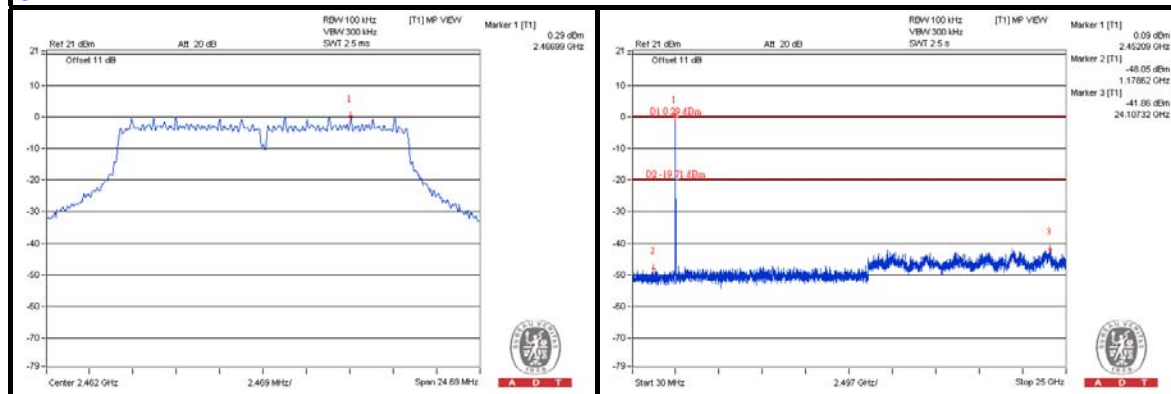
CH 1



CH 6



CH 11

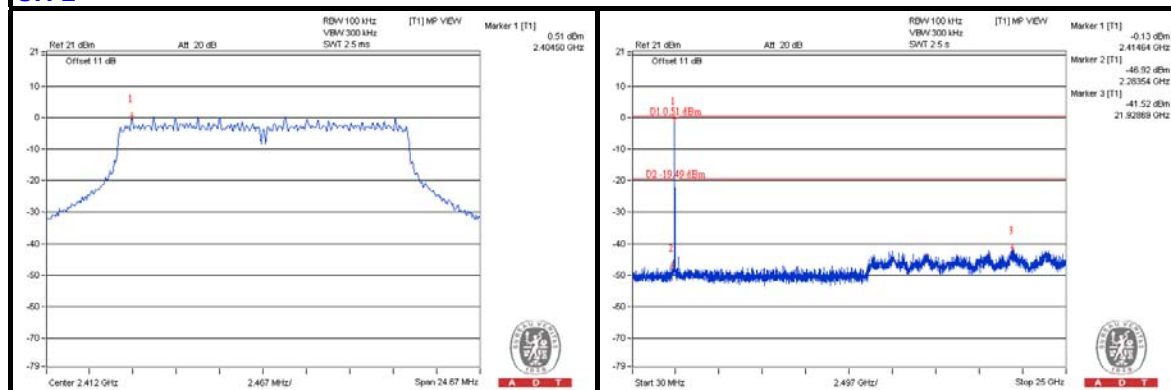




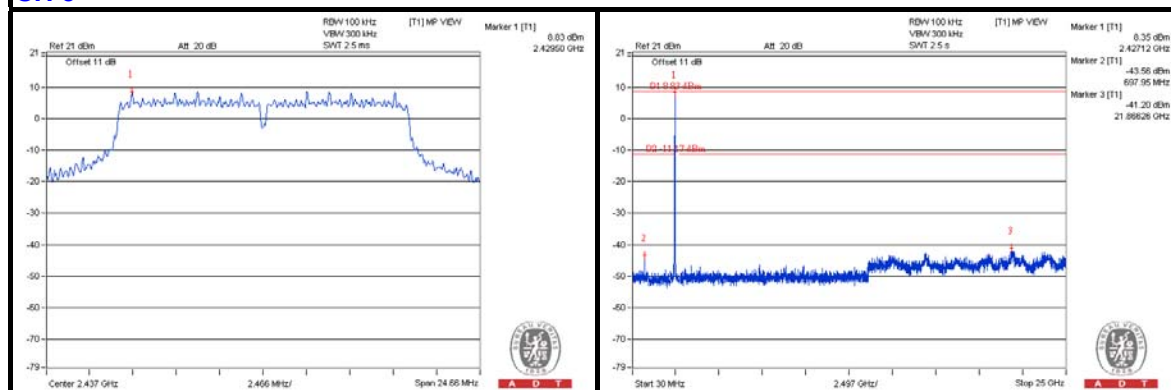
A D T

CHAIN 2

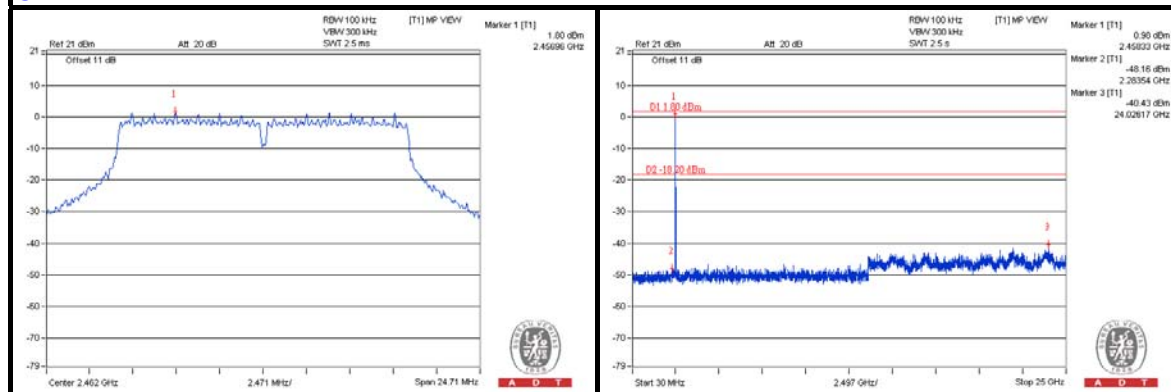
CH 1



CH 6



CH 11



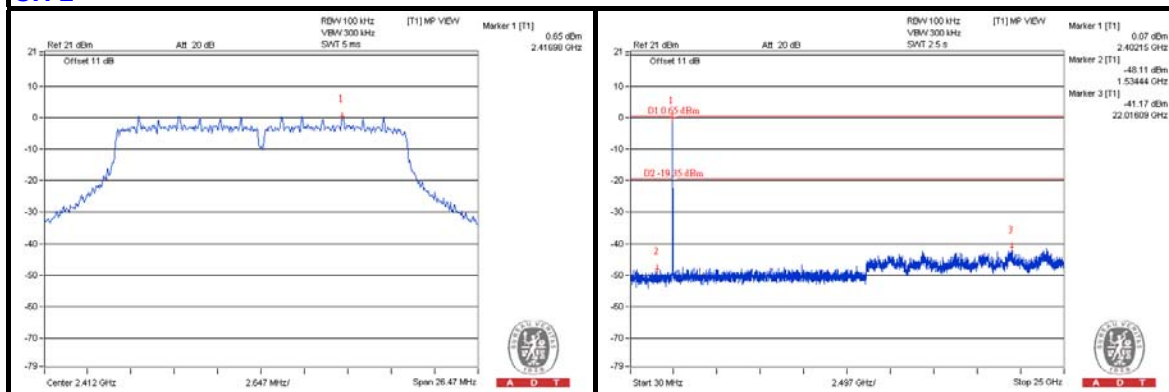


A D T

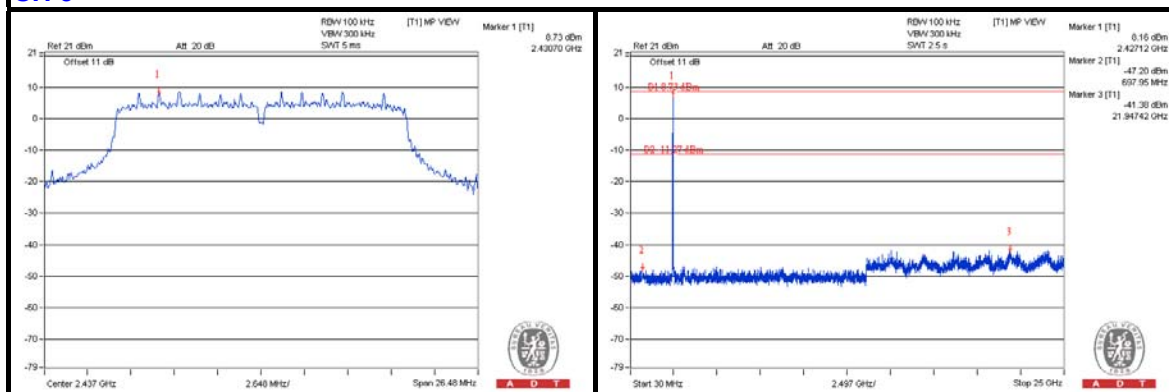
802.11n (20MHz)

CHAIN 0

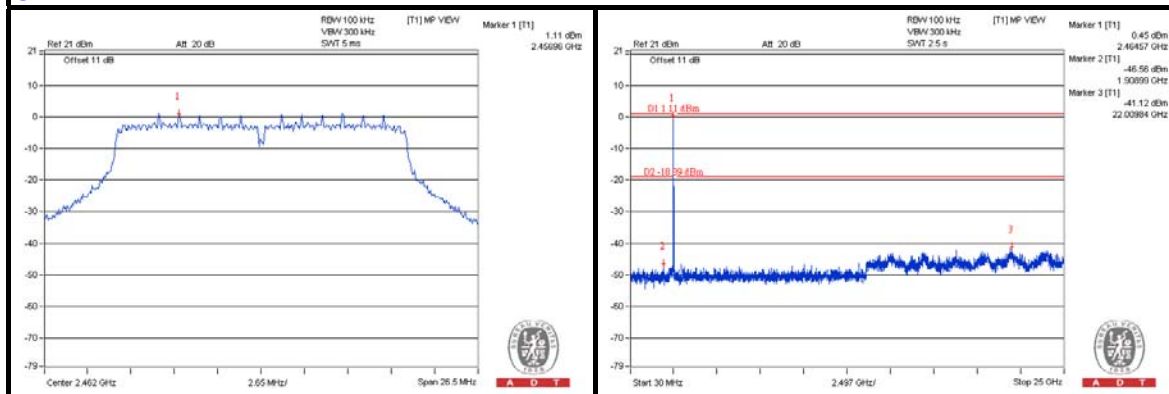
CH 1



CH 6



CH 11

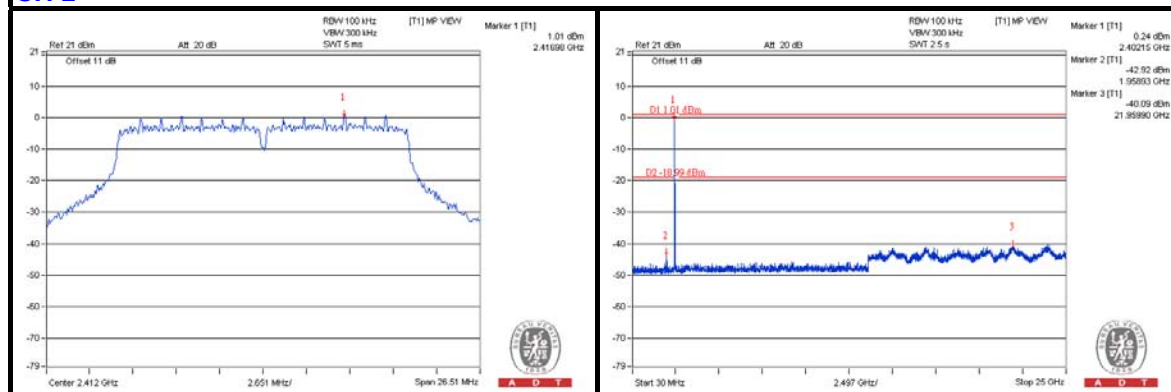




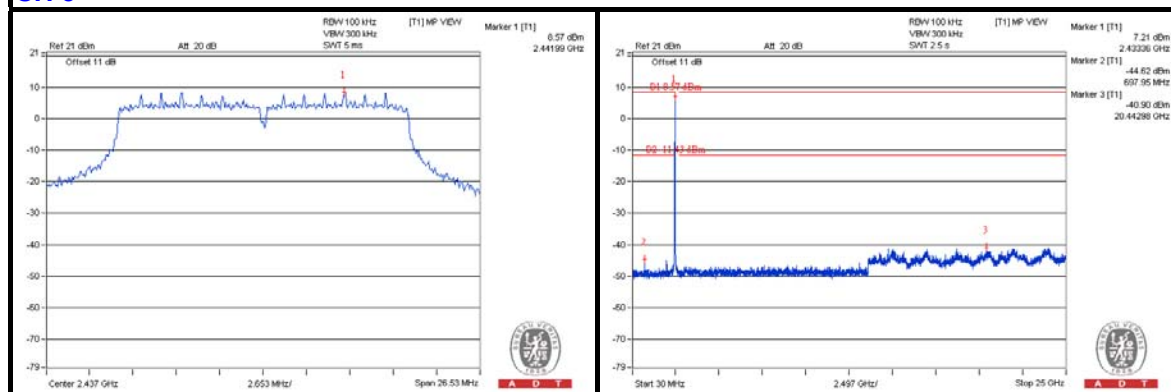
A D T

CHAIN 1

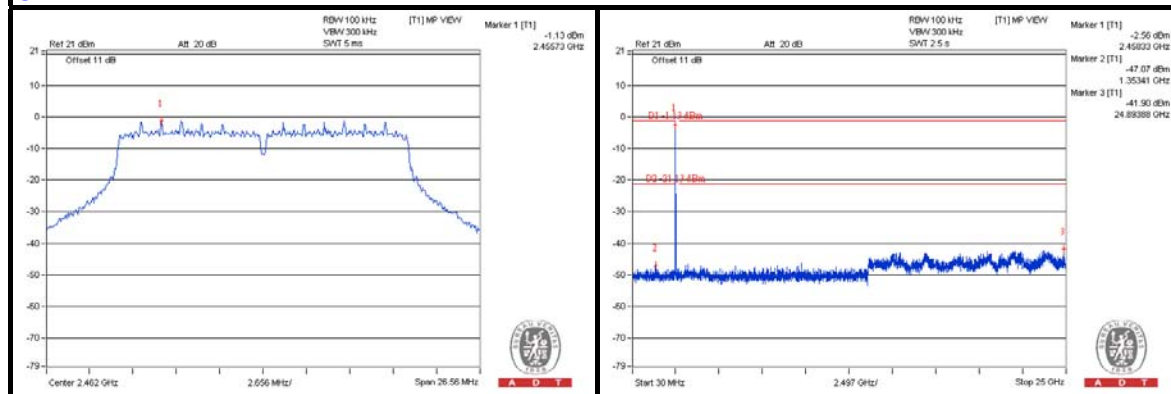
CH 1



CH 6



CH 11

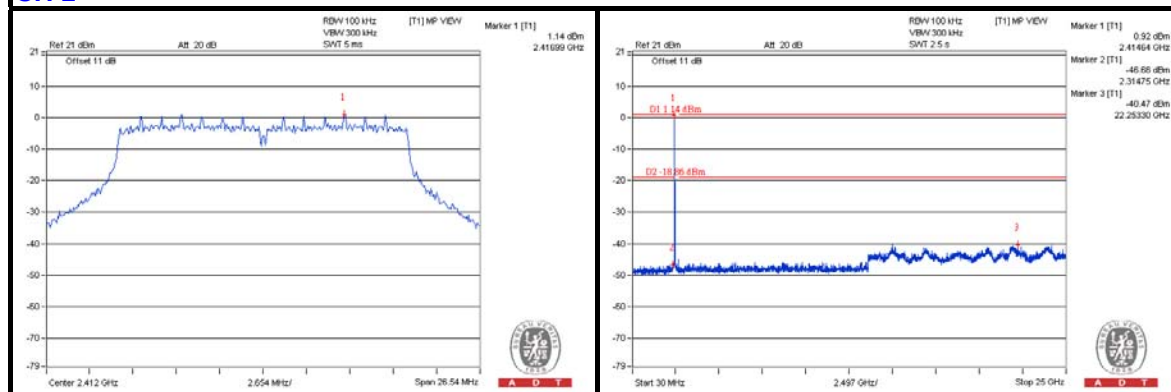




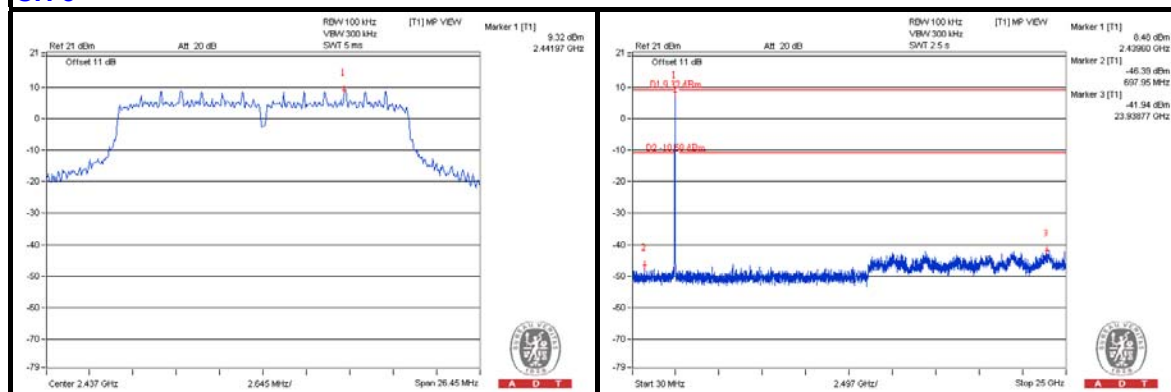
A D T

CHAIN 2

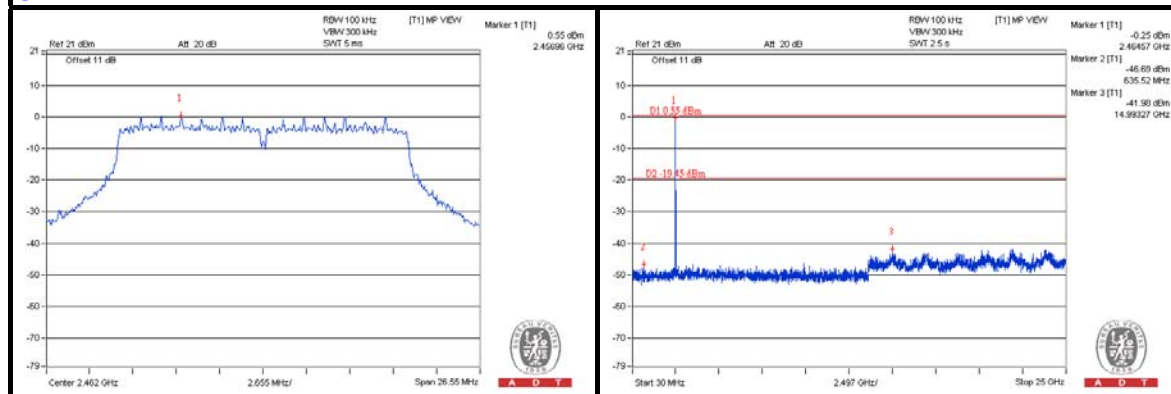
CH 1



CH 6

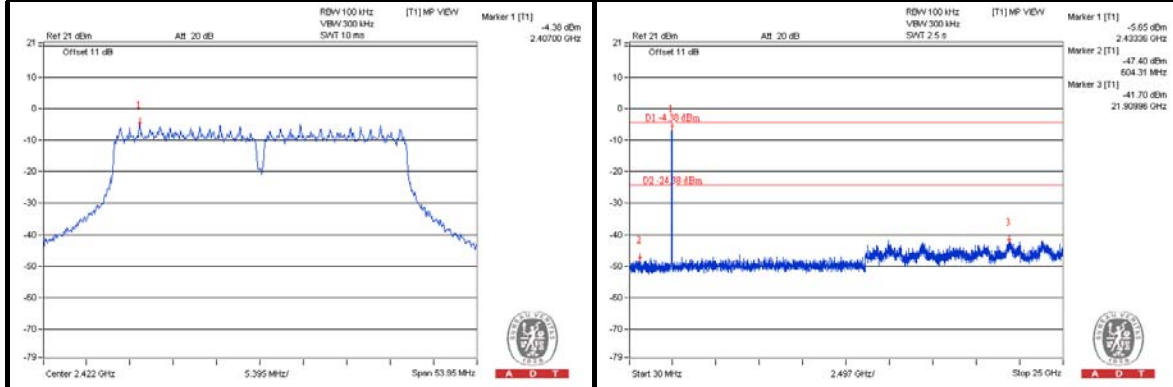


CH 11

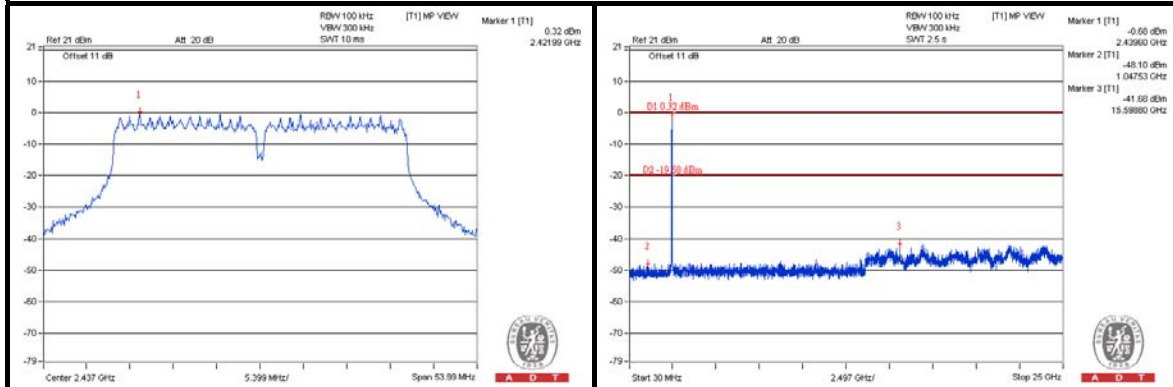


802.11n (40MHz) CHAIN 0

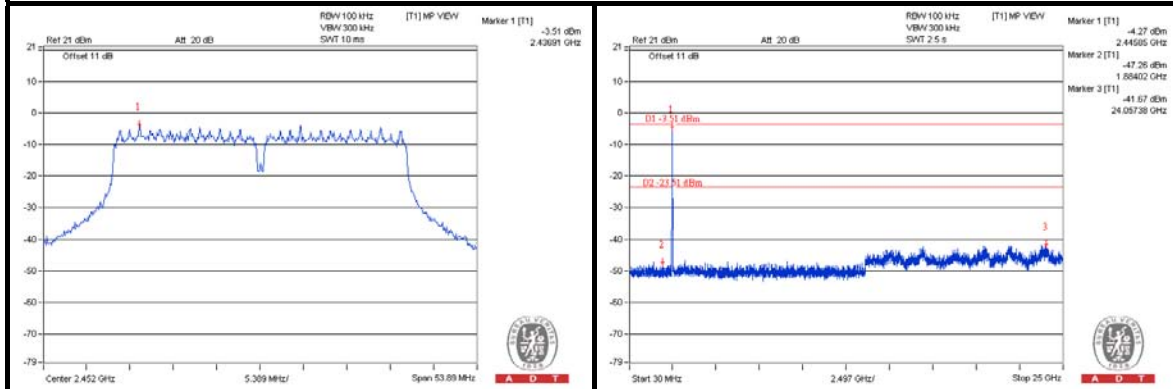
CH 3



CH 6



CH 9

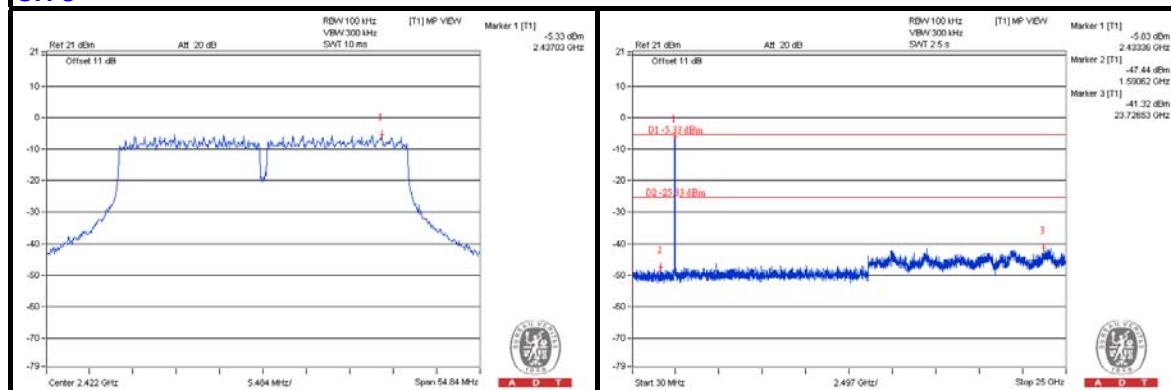




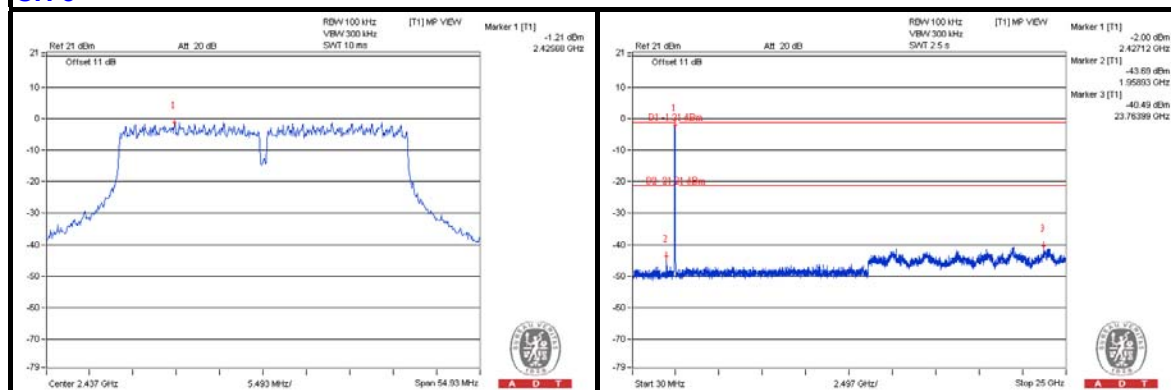
A D T

CHAIN 1

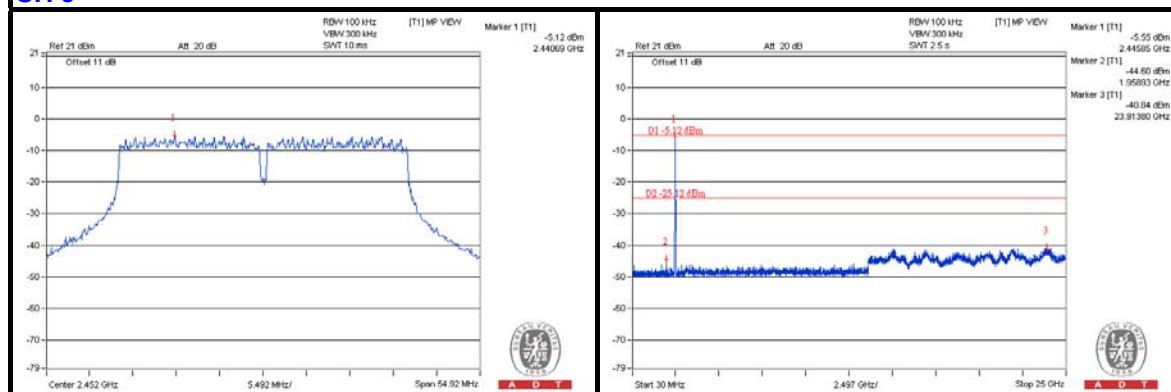
CH 3



CH 6



CH 9

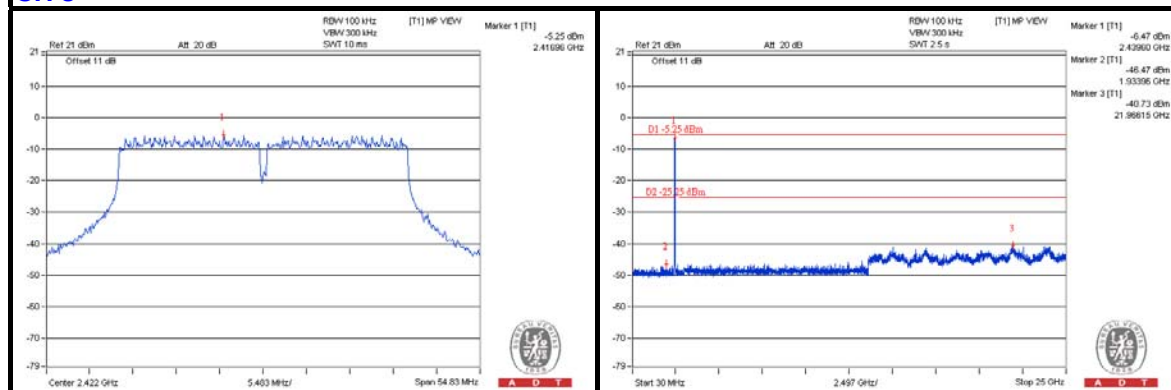




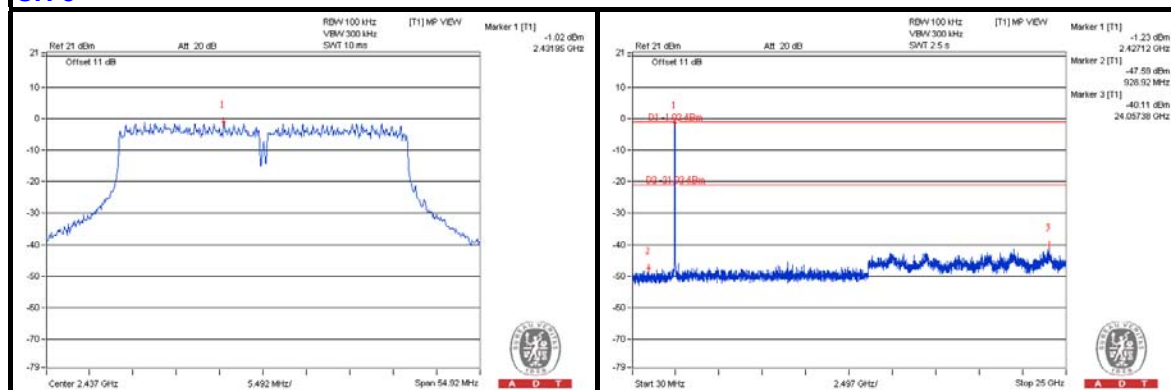
A D T

CHAIN 2

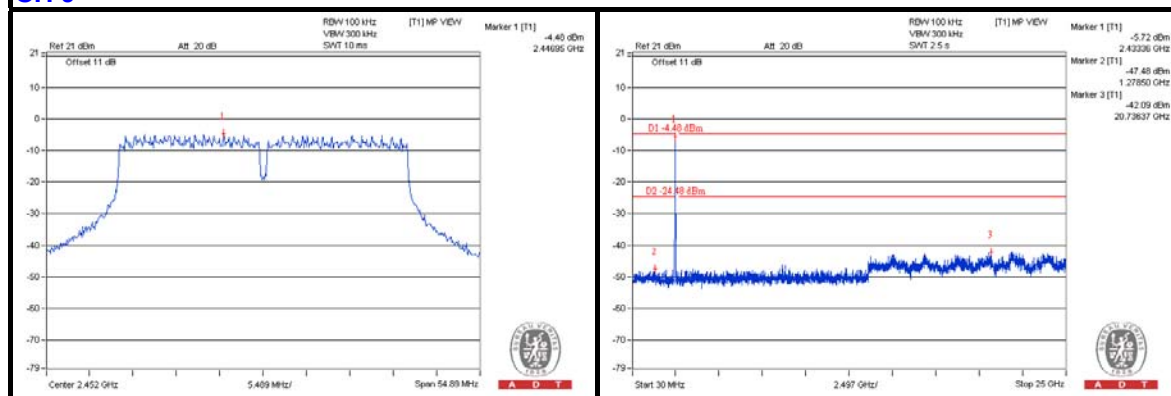
CH 3



CH 6



CH 9



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 DATA :

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	55.6 PK	82.4	-26.8	1.07 H	192	11.00	44.60
2	#5725.00	45.4 AV	72.2	-26.8	1.07 H	192	0.80	44.60
3	*5745.00	102.4 PK			1.00 H	153	57.80	44.60
4	*5745.00	92.2 AV			1.00 H	153	47.60	44.60
5	11490.00	58.1 PK	74.0	-15.9	1.44 H	162	5.50	52.60
6	11490.00	44.9 AV	54.0	-9.1	1.44 H	162	-7.70	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	72.3 PK	99.1	-26.8	1.07 V	192	27.70	44.60
2	#5725.00	61.5 AV	88.3	-26.8	1.07 V	192	16.90	44.60
3	*5745.00	119.1 PK			1.07 V	192	74.50	44.60
4	*5745.00	108.3 AV			1.07 V	192	63.70	44.60
5	11490.00	58.9 PK	74.0	-15.1	1.33 V	235	6.30	52.60
6	11490.00	47.0 AV	54.0	-7.0	1.33 V	235	-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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	104.1 PK			1.00 H	153	59.40	44.70
2	*5785.00	93.7 AV			1.00 H	153	49.00	44.70
3	11570.00	58.0 PK	74.0	-16.0	1.65 H	131	5.20	52.80
4	11570.00	46.9 AV	54.0	-7.1	1.65 H	131	-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	119.4 PK			1.07 V	190	74.70	44.70
2	*5785.00	109.2 AV			1.07 V	190	64.50	44.70
3	11570.00	63.0 PK	74.0	-11.0	1.57 V	124	10.20	52.80
4	11570.00	49.9 AV	54.0	-4.1	1.57 V	124	-2.90	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	102.5 PK			1.00 H	169	57.70	44.80
2	*5825.00	92.5 AV			1.00 H	169	47.70	44.80
3	#5850.00	57.0 PK	82.5	-25.5	1.07 H	40	12.10	44.90
4	#5850.00	47.0 AV	72.5	-25.5	1.07 H	40	2.10	44.90
5	11650.00	58.1 PK	74.0	-15.9	1.32 H	245	5.10	53.00
6	11650.00	47.0 AV	54.0	-7.0	1.32 H	245	-6.00	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	119.2 PK			1.08 V	12	74.40	44.80
2	*5825.00	109.2 AV			1.08 V	12	64.40	44.80
3	#5850.00	73.7 PK	99.2	-25.5	1.07 V	40	28.80	44.90
4	#5850.00	63.7 AV	89.2	-25.5	1.07 V	40	18.80	44.90
5	11650.00	61.3 PK	74.0	-12.7	1.12 V	351	8.30	53.00
6	11650.00	51.0 AV	54.0	-3.0	1.12 V	351	-2.00	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	54.5 PK	82.0	-27.5	1.00 H	7	9.90	44.60
2	#5725.00	44.4 AV	71.9	-27.5	1.00 H	7	-0.20	44.60
3	*5745.00	102.0 PK			1.00 H	153	57.40	44.60
4	*5745.00	91.9 AV			1.00 H	153	47.30	44.60
5	11490.00	58.0 PK	74.0	-16.0	1.44 H	195	5.40	52.60
6	11490.00	46.9 AV	54.0	-7.1	1.44 H	195	-5.70	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	71.5 PK	99.1	-27.6	1.00 V	7	26.90	44.60
2	#5725.00	61.5 AV	89.1	-27.6	1.00 V	7	16.90	44.60
3	*5745.00	119.1 PK			1.00 V	20	74.50	44.60
4	*5745.00	109.1 AV			1.00 V	20	64.50	44.60
5	11490.00	62.0 PK	74.0	-12.0	1.95 V	163	9.40	52.60
6	11490.00	49.6 AV	54.0	-4.4	1.95 V	163	-3.00	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	103.8 PK			1.00 H	154	59.10	44.70
2	*5785.00	93.5 AV			1.00 H	154	48.80	44.70
3	11570.00	58.2 PK	74.0	-15.8	1.74 H	28	5.40	52.80
4	11570.00	48.6 AV	54.0	-5.4	1.74 H	28	-4.20	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	*5785.00	119.3 PK			1.07 V	191	74.60	44.70
2	*5785.00	109.0 AV			1.07 V	191	64.30	44.70
3	11570.00	61.6 PK	74.0	-12.4	1.22 V	65	8.80	52.80
4	11570.00	49.8 AV	54.0	-4.2	1.22 V	65	-3.00	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	102.2 PK			1.00 H	172	57.40	44.80
2	*5825.00	92.2 AV			1.00 H	172	47.40	44.80
3	#5850.00	55.8 PK	82.2	-26.4	1.35 H	350	10.90	44.90
4	#5850.00	45.8 AV	72.2	-26.4	1.35 H	350	0.90	44.90
5	11650.00	59.0 PK	74.0	-15.0	1.77 H	191	6.00	53.00
6	11650.00	47.0 AV	54.0	-7.0	1.77 H	191	-6.00	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	119.0 PK			1.08 V	11	74.20	44.80
2	*5825.00	109.0 AV			1.08 V	11	64.20	44.80
3	#5850.00	72.6 PK	99.0	-26.4	1.35 V	350	27.70	44.90
4	#5850.00	62.6 AV	89.0	-26.4	1.35 V	350	17.70	44.90
5	11650.00	61.7 PK	74.0	-12.3	1.69 V	220	8.70	53.00
6	11650.00	50.0 AV	54.0	-4.0	1.69 V	220	-3.00	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 (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	60.6 PK	79.5	-18.9	1.00 H	340	16.00	44.60
2	#5725.00	51.5 AV	70.4	-18.9	1.00 H	340	6.90	44.60
3	*5755.00	99.5 PK			1.00 H	147	54.80	44.70
4	*5755.00	90.4 AV			1.00 H	147	45.70	44.70
5	11510.00	58.5 PK	74.0	-15.5	1.96 H	341	5.80	52.70
6	11510.00	46.5 AV	54.0	-7.5	1.96 H	341	-6.20	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	78.6 PK	97.5	-18.9	1.00 V	340	34.00	44.60
2	#5725.00	69.2 AV	88.1	-18.9	1.00 V	340	24.60	44.60
3	*5755.00	117.5 PK			1.00 V	37	72.80	44.70
4	*5755.00	108.1 AV			1.00 V	37	63.40	44.70
5	11510.00	61.6 PK	74.0	-12.4	1.41 V	112	8.90	52.70
6	11510.00	49.2 AV	54.0	-4.8	1.41 V	112	-3.50	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	101.9 PK			1.00 H	154	57.20	44.70
2	*5795.00	92.7 AV			1.00 H	154	48.00	44.70
3	#5850.00	59.1 PK	81.9	-22.8	1.31 H	99	14.20	44.90
4	#5850.00	50.0 AV	72.7	-22.7	1.31 H	99	5.10	44.90
5	11590.00	58.3 PK	74.0	-15.7	1.27 H	195	5.50	52.80
6	11590.00	46.9 AV	54.0	-7.1	1.27 H	195	-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	*5795.00	114.7 PK			1.00 V	9	70.00	44.70
2	*5795.00	105.4 AV			1.00 V	9	60.70	44.70
3	#5850.00	72.0 PK	94.7	-22.7	1.31 V	99	27.10	44.90
4	#5850.00	62.6 AV	85.4	-22.8	1.31 V	99	17.70	44.90
5	11590.00	63.0 PK	74.0	-11.0	1.42 V	164	10.20	52.80
6	11590.00	50.1 AV	54.0	-3.9	1.42 V	164	-2.70	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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	58.9 PK	75.2	-16.3	1.02 H	38	14.30	44.60
2	#5725.00	49.9 AV	66.2	-16.3	1.02 H	38	5.30	44.60
3	*5775.00	95.2 PK			1.00 H	9	50.50	44.70
4	*5775.00	86.2 AV			1.00 H	9	41.50	44.70
5	#5850.00	61.2 PK	75.2	-14.0	1.00 H	219	16.30	44.90
6	#5850.00	52.2 AV	66.2	-14.0	1.00 H	219	7.30	44.90
7	11550.00	57.9 PK	74.0	-16.1	1.54 H	331	5.10	52.80
8	11550.00	48.0 AV	54.0	-6.0	1.54 H	331	-4.80	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	75.6 PK	91.9	-16.3	1.02 V	38	31.00	44.60
2	#5725.00	65.5 AV	81.8	-16.3	1.02 V	38	20.90	44.60
3	*5775.00	111.9 PK			1.02 V	38	67.20	44.70
4	*5775.00	101.8 AV			1.02 V	38	57.10	44.70
5	#5850.00	77.9 PK	91.9	-14.0	1.00 V	219	33.00	44.90
6	#5850.00	67.8 AV	81.8	-14.0	1.00 V	219	22.90	44.90
7	11550.00	61.2 PK	74.0	-12.8	1.62 V	199	8.40	52.80
8	11550.00	50.9 AV	54.0	-3.1	1.62 V	199	-1.90	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.
7. "#":The radiated frequency is out the restricted band.



A D T

BELOW 1GHz WORST-CASE DATA : 802.11n(20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	159.98	39.9 QP	43.5	-3.6	1.24 H	347	26.20	13.70
2	249.22	29.2 QP	46.0	-16.8	1.00 H	311	16.40	12.80
3	375.32	35.4 QP	46.0	-10.6	1.00 H	318	18.80	16.60
4	625.58	37.4 QP	46.0	-8.6	1.50 H	153	14.70	22.70
5	749.74	32.2 QP	46.0	-13.8	1.24 H	138	7.70	24.50
6	961.20	34.8 QP	54.0	-19.2	1.50 H	316	7.40	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	62.98	32.9 QP	40.0	-7.1	1.24 V	11	20.80	12.10
2	159.98	37.8 QP	43.5	-5.7	1.00 V	215	24.10	13.70
3	375.32	35.9 QP	46.0	-10.1	1.00 V	190	19.30	16.60
4	499.48	36.5 QP	46.0	-9.5	1.50 V	251	16.70	19.80
5	625.58	39.6 QP	46.0	-6.4	1.00 V	34	16.90	22.70
6	875.84	34.3 QP	46.0	-11.7	1.24 V	11	7.80	26.50

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

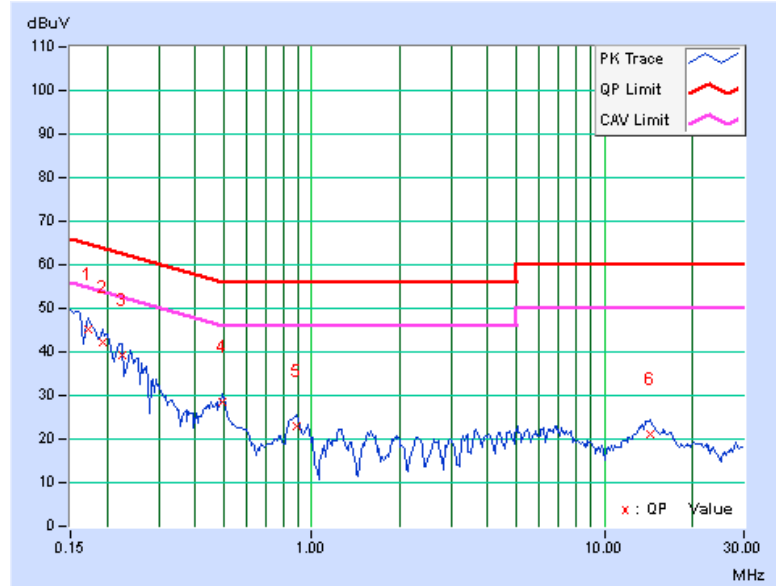
CONDUCTED WORST-CASE DATA : 802.11n(20MHz)

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	0.17	45.02	30.39	45.19	30.56	64.79	54.79	-19.60	-24.23
2	0.19297	0.17	42.02	25.54	42.19	25.71	63.91	53.91	-21.72	-28.20
3	0.22422	0.17	39.07	25.32	39.24	25.49	62.66	52.66	-23.42	-27.17
4	0.49375	0.22	28.12	21.96	28.34	22.18	56.10	46.10	-27.77	-23.93
5	0.88828	0.26	22.63	16.75	22.89	17.01	56.00	46.00	-33.11	-28.99
6	14.44141	0.52	20.56	15.81	21.08	16.33	60.00	50.00	-38.92	-33.67

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.

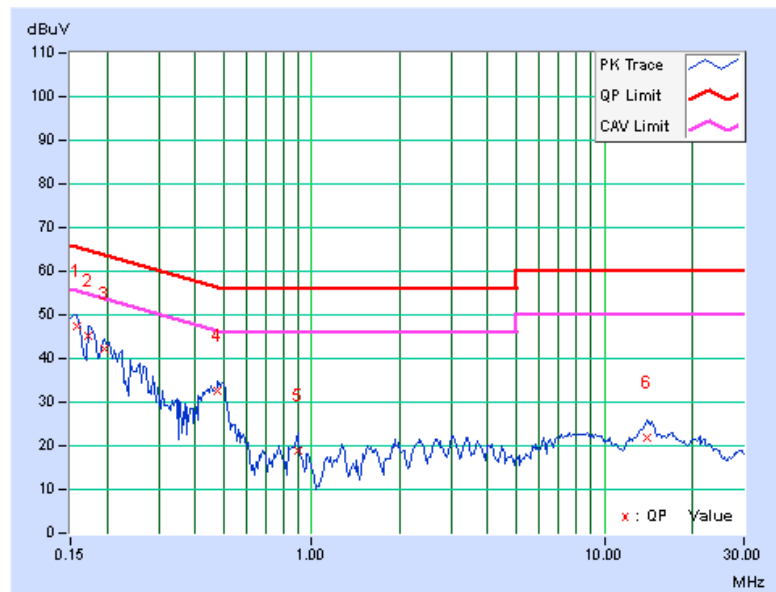


PHASE	Line 2	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

No	Freq.	Corr. Factor	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	0.15781	0.18	47.29	33.07	47.47	33.25	65.58	55.58	-18.10	-22.32
2	0.17344	0.18	44.94	30.57	45.12	30.75	64.79	54.79	-19.67	-24.04
3	0.19687	0.18	41.99	28.35	42.17	28.53	63.74	53.74	-21.57	-25.21
4	0.47813	0.25	32.28	27.04	32.53	27.29	56.37	46.37	-23.84	-19.08
5	0.89609	0.23	18.80	12.76	19.03	12.99	56.00	46.00	-36.97	-33.01
6	14.03125	0.58	21.37	15.40	21.95	15.98	60.00	50.00	-38.05	-34.02

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.



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.

5.3.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.40	16.40	16.40	0.5	PASS
157	5785	16.40	16.37	16.39	0.5	PASS
165	5825	16.40	16.40	16.39	0.5	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	17.61	17.63	17.64	0.5	PASS
157	5785	17.66	17.65	17.63	0.5	PASS
165	5825	17.62	17.62	17.62	0.5	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	36.57	36.55	36.53	0.5	PASS
159	5795	36.56	36.48	36.58	0.5	PASS

802.11ac (80MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
155	5775	76.14	75.88	76.20	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;

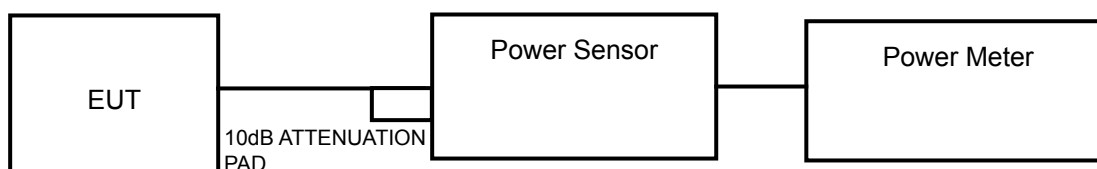
Array Gain = 0 dB (i.e., no array gain) for channel widths $\geq$ 40 MHz for any NANT;

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

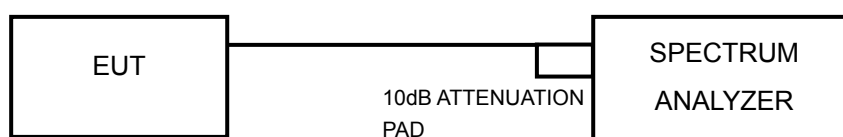
For power measurements on all other devices: Array Gain = $10 \log(\text{NANT}/\text{NSS})$ dB.

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

Follow KDB 558074 D01 DTS Meas Guidance v03r01 section 9.1.3

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.

Follow KDB 558074 D01 DTS Meas Guidance v03r01 section 9.1.2

For 802.11ac (80MHz)

Integrated band power method

This procedure may be used when the maximum available RBW of the measurement instrument is less than the DTS bandwidth.

- 1) Set the RBW = 1 MHz.
- 2) Set the VBW $\geq$ 3 RBW
- 3) Set the span $\geq$ 1.5 x DTS bandwidth.
- 4) Detector = peak.
- 5) Sweep time = auto couple.
- 6) Trace mode = max hold.
- 7) Allow trace to fully stabilize.

5.4.5 DEVIATION FROM TEST STANDARD

No deviation.

5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

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	CHAIN 2				
149	5745	20.78	21.07	21.91	402.851	26.05	30	PASS
157	5785	21.01	20.96	21.49	391.850	25.93	30	PASS
165	5825	20.99	21.11	21.44	394.041	25.96	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				
149	5745	20.99	21.02	21.94	408.392	26.11	30	PASS
157	5785	21.08	20.99	21.50	395.090	25.97	30	PASS
165	5825	20.96	20.72	21.39	380.491	25.80	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				
151	5755	24.13	24.45	24.11	795.065	29.00	30	PASS
159	5795	24.59	24.40	24.79	864.464	29.37	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	CHAIN 2				
155	5775	25.36	24.20	25.02	924.272	29.66	30	PASS



A D T

FOR AVERAGE POWER

802.11a

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.71	16.60	17.42	147.798	21.70
157	5785	16.64	16.45	17.36	144.739	21.61
165	5825	16.57	16.82	17.34	147.678	21.69

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.43	16.61	17.49	145.873	21.64
157	5785	16.39	16.57	17.19	141.305	21.50
165	5825	16.43	16.54	17.07	139.969	21.46

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	16.12	16.30	16.35	126.736	21.03
159	5795	16.29	16.20	16.42	128.100	21.08

802.11ac (80MHz)

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
155	5775	16.05	16.18	16.41	125.519	20.99

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=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-9.38	4.77	-4.61	4.23	PASS
	157	5785	-8.92	4.77	-4.15	4.23	PASS
	165	5825	-8.91	4.77	-4.14	4.23	PASS
1	149	5745	-8.47	4.77	-3.70	4.23	PASS
	157	5785	-9.08	4.77	-4.31	4.23	PASS
	165	5825	-9.12	4.77	-4.35	4.23	PASS
2	149	5745	-9.16	4.77	-4.39	4.23	PASS
	157	5785	-8.78	4.77	-4.01	4.23	PASS
	165	5825	-8.36	4.77	-3.59	4.23	PASS

NOTE: Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi , so the power density limit shall be reduced to 8-(9.77-6) = 4.23dBm.

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	149	5745	-9.95	4.77	-5.18	4.23	PASS
	157	5785	-9.51	4.77	-4.74	4.23	PASS
	165	5825	-9.69	4.77	-4.92	4.23	PASS
1	149	5745	-9.73	4.77	-4.96	4.23	PASS
	157	5785	-9.67	4.77	-4.90	4.23	PASS
	165	5825	-9.10	4.77	-4.33	4.23	PASS
2	149	5745	-8.72	4.77	-3.95	4.23	PASS
	157	5785	-7.91	4.77	-3.14	4.23	PASS
	165	5825	-9.62	4.77	-4.85	4.23	PASS

NOTE: Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi , so the power density limit shall be reduced to 8-(9.77-6) = 4.23dBm.

**A D T****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	151	5755	-13.72	4.77	-8.95	4.23	PASS
	159	5795	-12.76	4.77	-7.99	4.23	PASS
1	151	5755	-12.78	4.77	-8.01	4.23	PASS
	159	5795	-12.81	4.77	-8.04	4.23	PASS
2	151	5755	-11.50	4.77	-6.73	4.23	PASS
	159	5795	-10.71	4.77	-5.94	4.23	PASS

NOTE: Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi , so the power density limit shall be reduced to 8-(9.77-6) = 4.23dBm.

802.11ac (80MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	155	5775	-14.12	4.77	-9.35	4.23	PASS
1	155	5775	-14.51	4.77	-9.74	4.23	PASS
2	155	5775	-12.94	4.77	-8.17	4.23	PASS

NOTE: Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi , so the power density limit shall be reduced to 8-(9.77-6) = 4.23dBm.

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 10log (N) since the limit is relative emission limit.

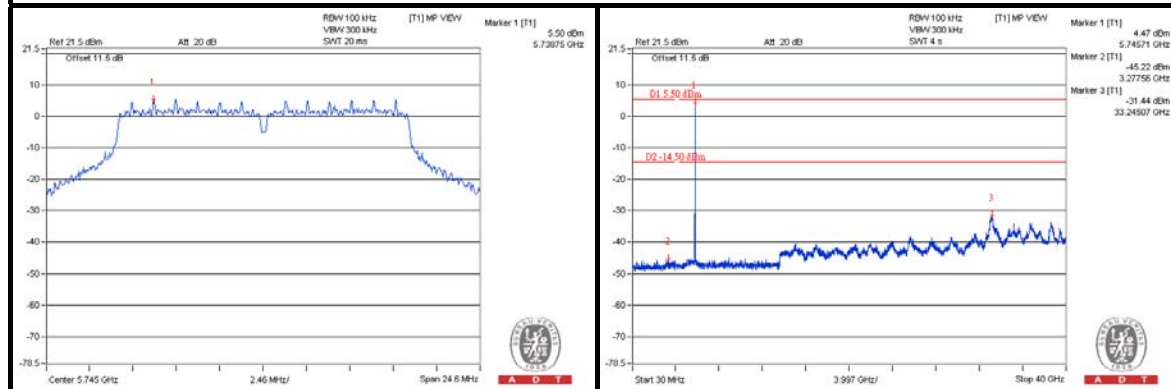
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



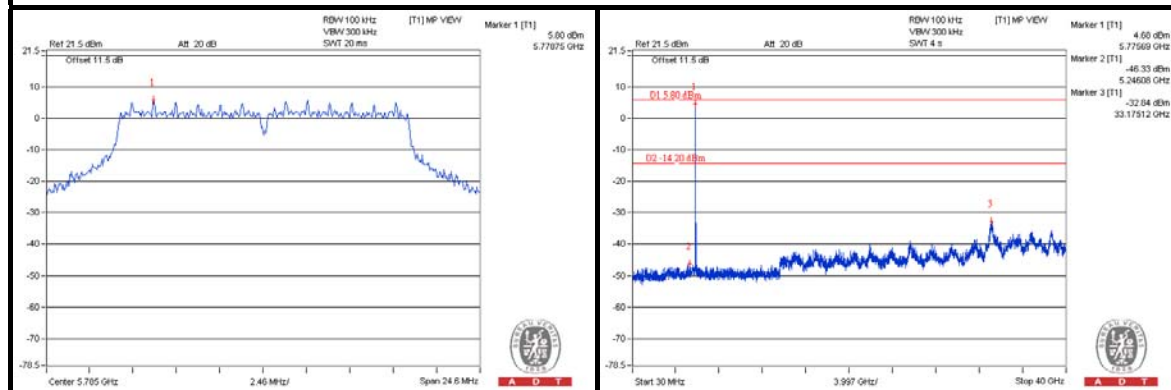
A D T

802.11a
CHAIN 0

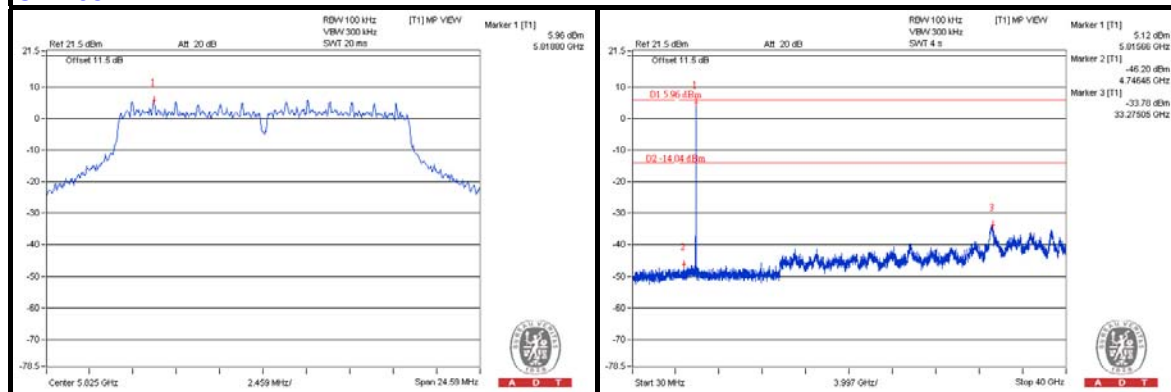
CH 149



CH 157

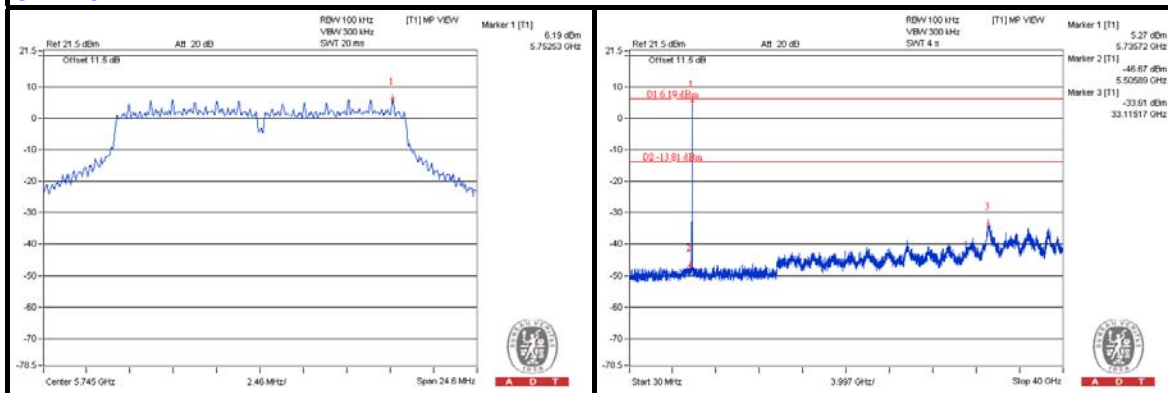


CH 165

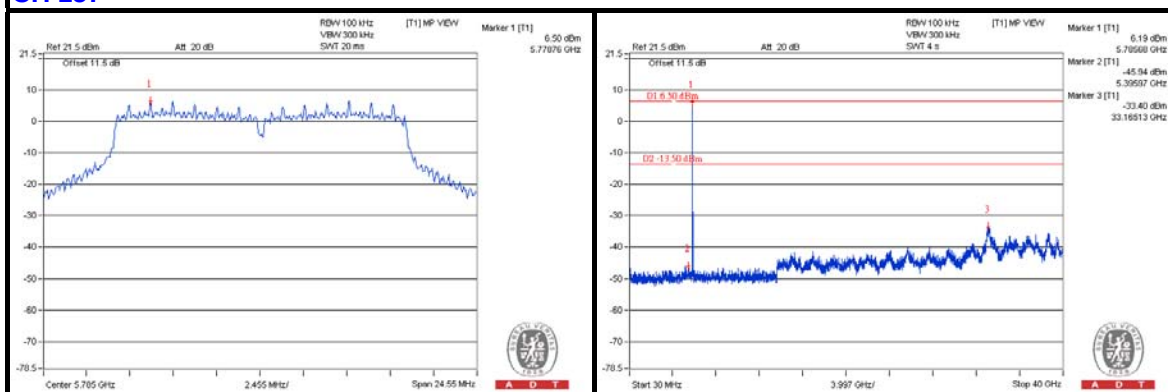


CHAIN 1

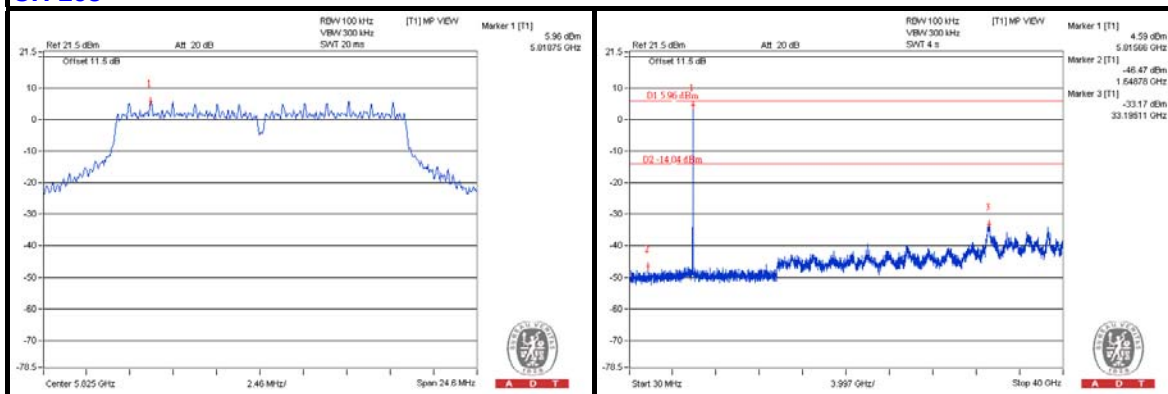
CH 149



CH 157

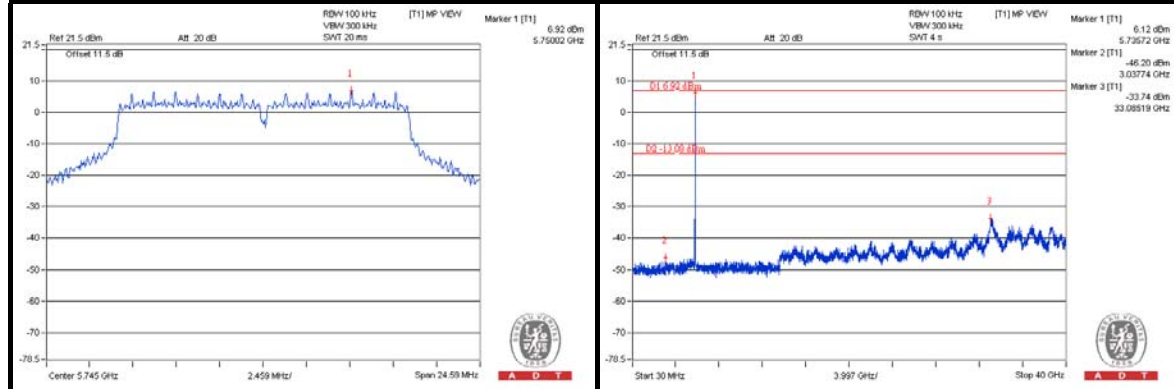


CH 165

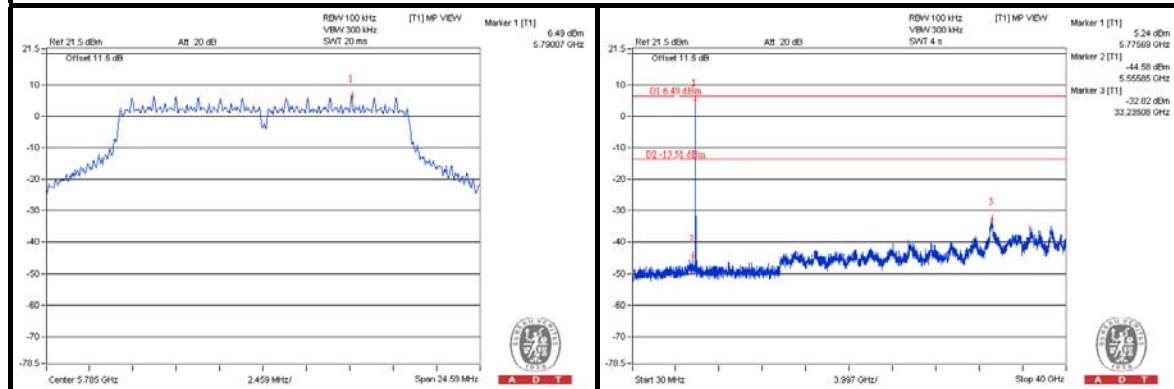


CHAIN 2

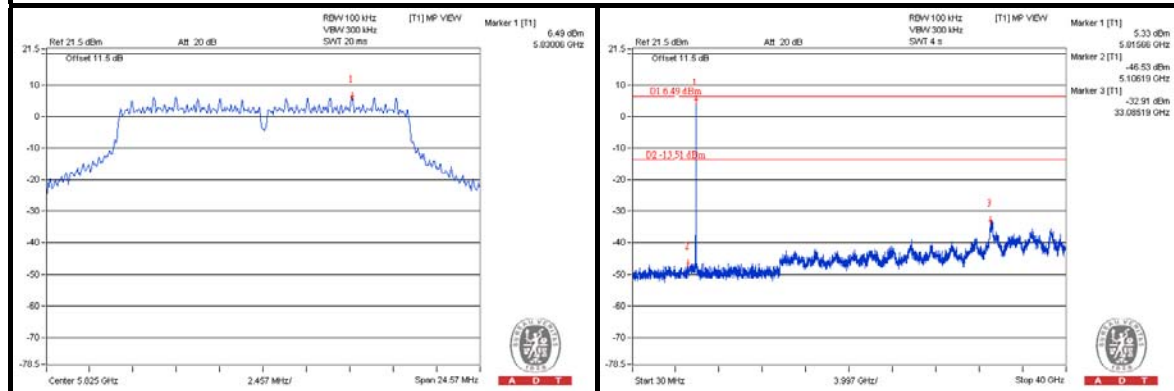
CH 149



CH 157



CH 165



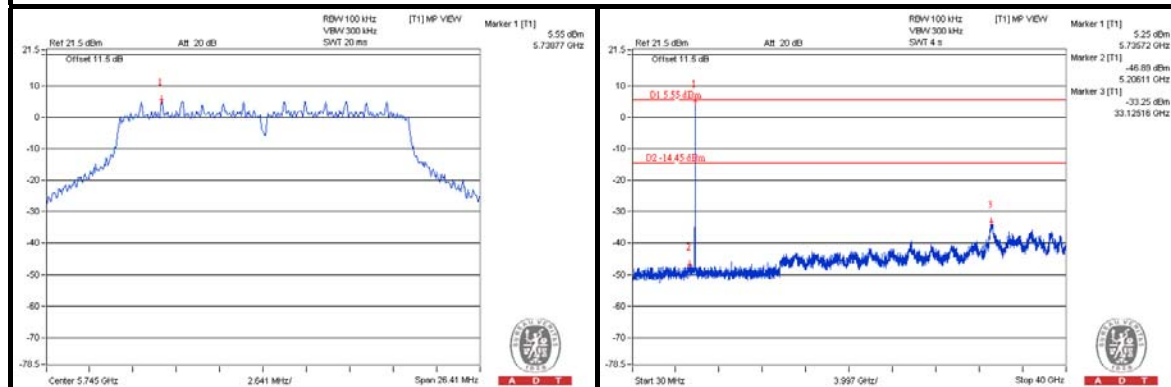


A D T

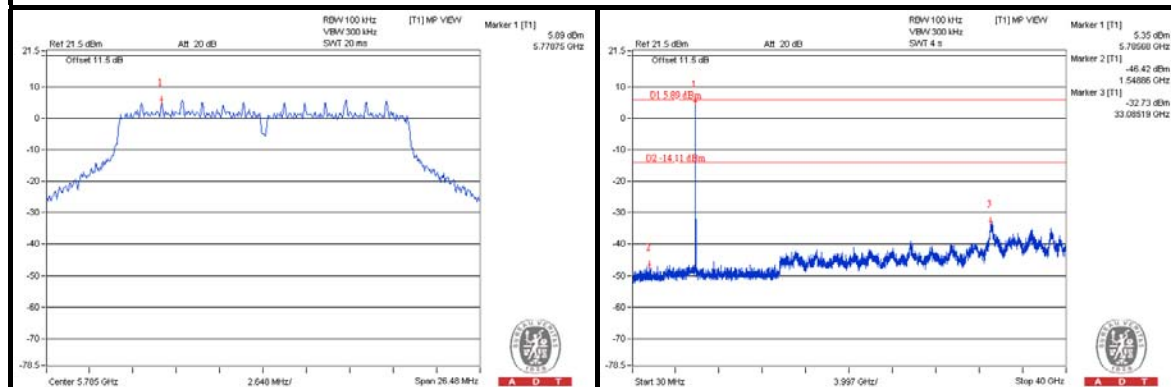
802.11n (20MHz)

CHAIN 0

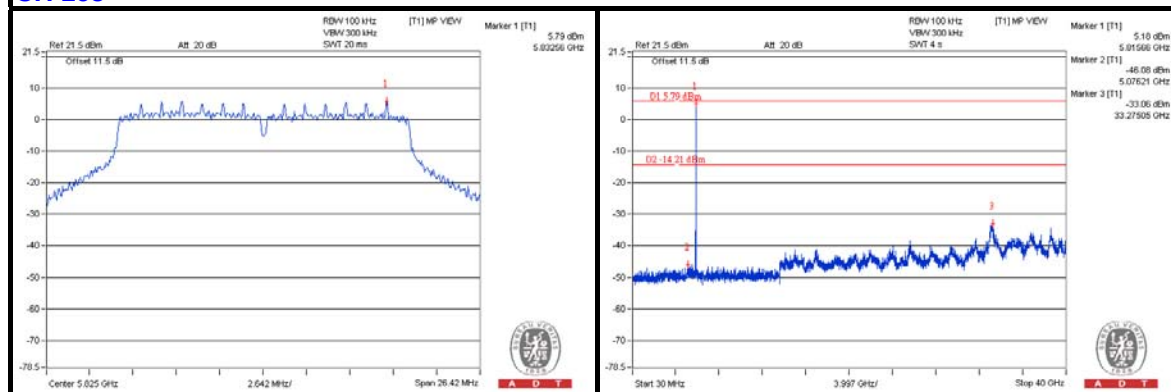
CH 149



CH 157



CH 165

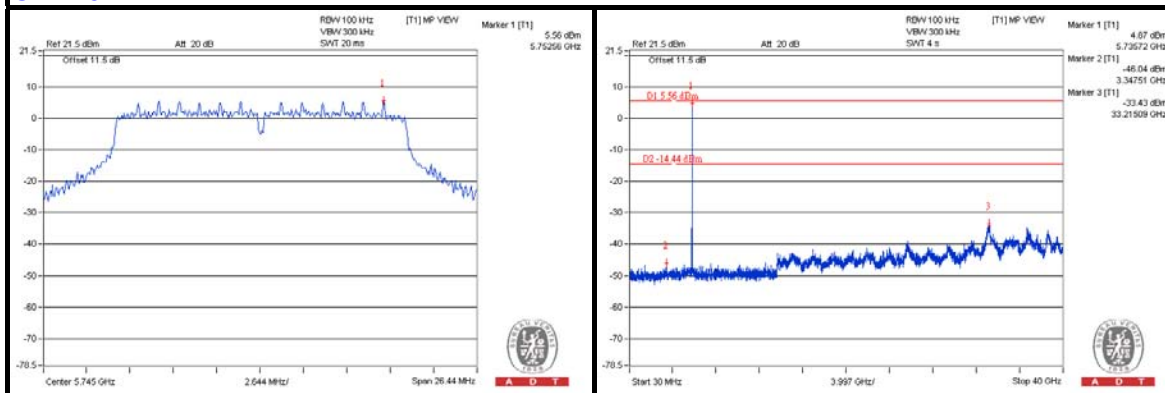




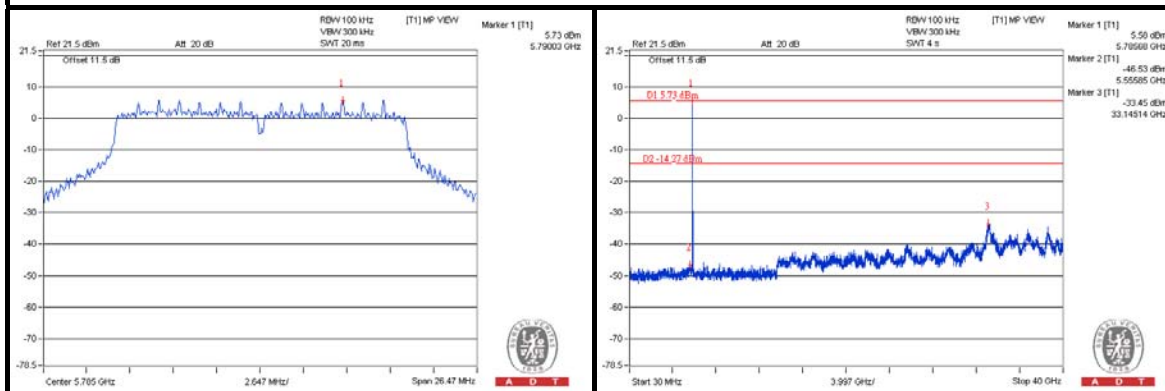
A D T

CHAIN 1

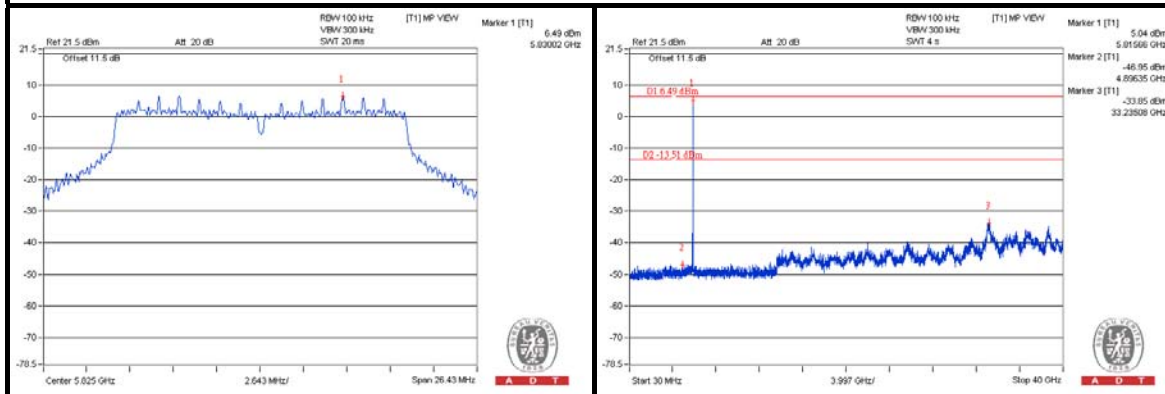
CH 149



CH 157



CH 165

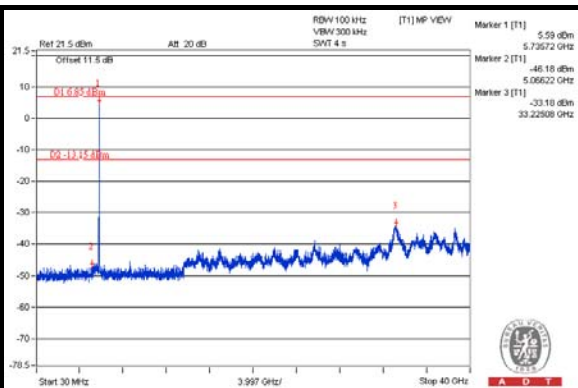
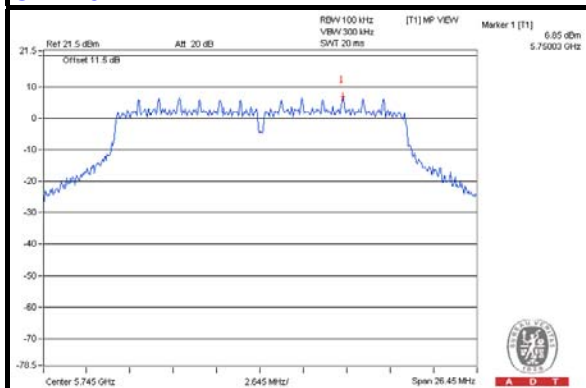




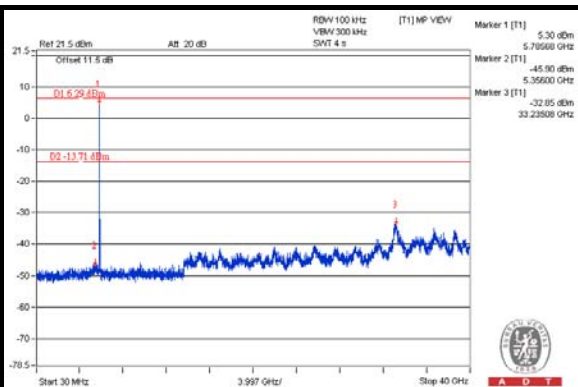
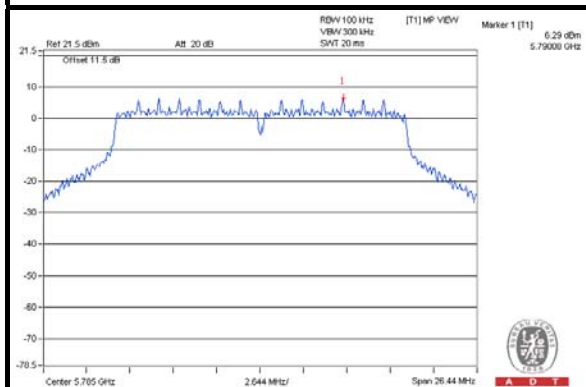
A D T

CHAIN 2

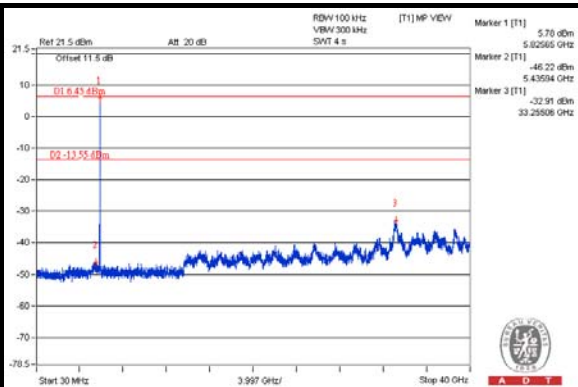
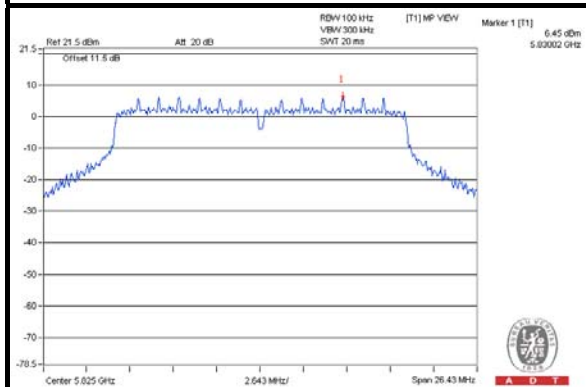
CH 149



CH 157



CH 165



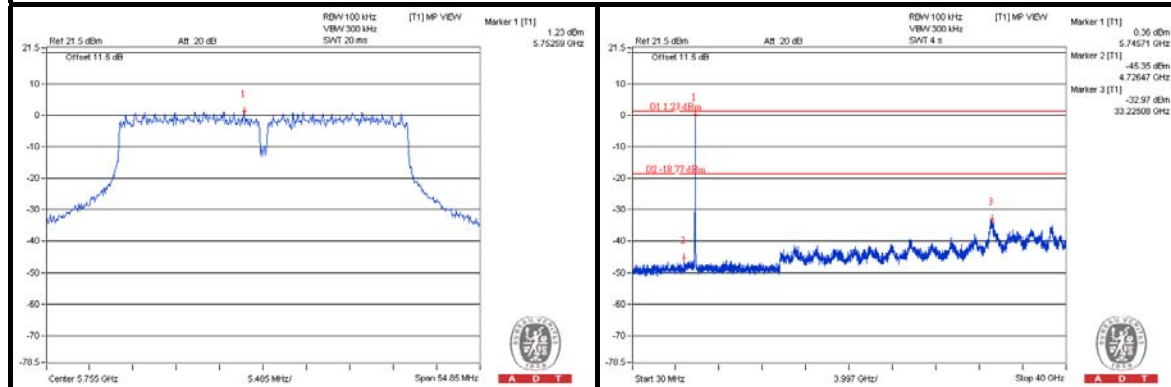


A D T

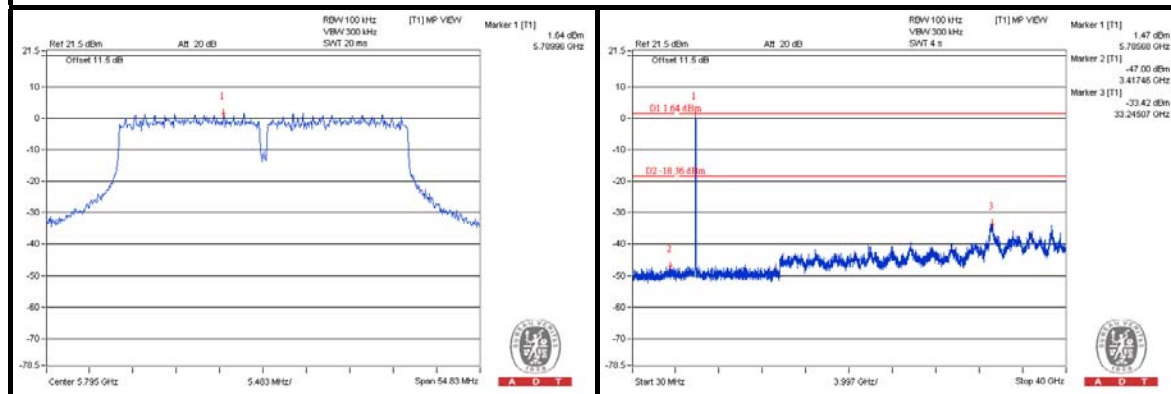
802.11n (40MHz)

CHAIN 0

CH 151



CH 159

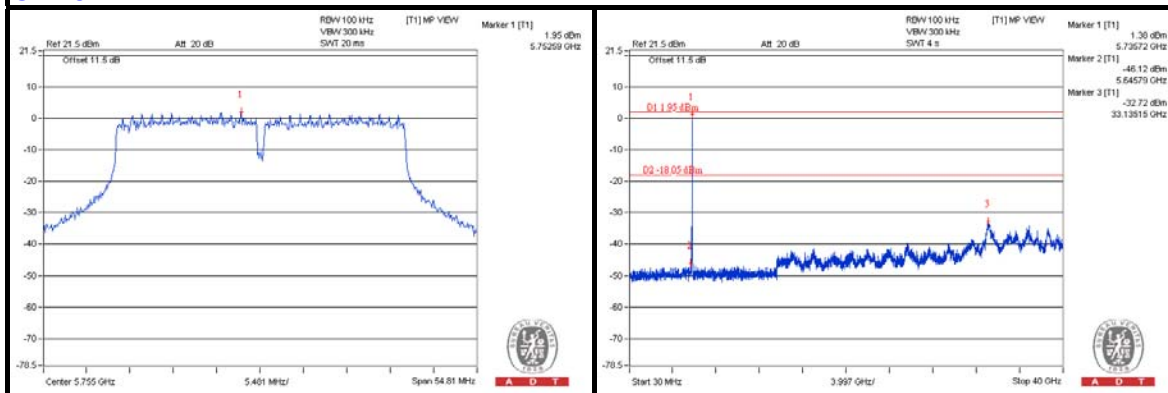




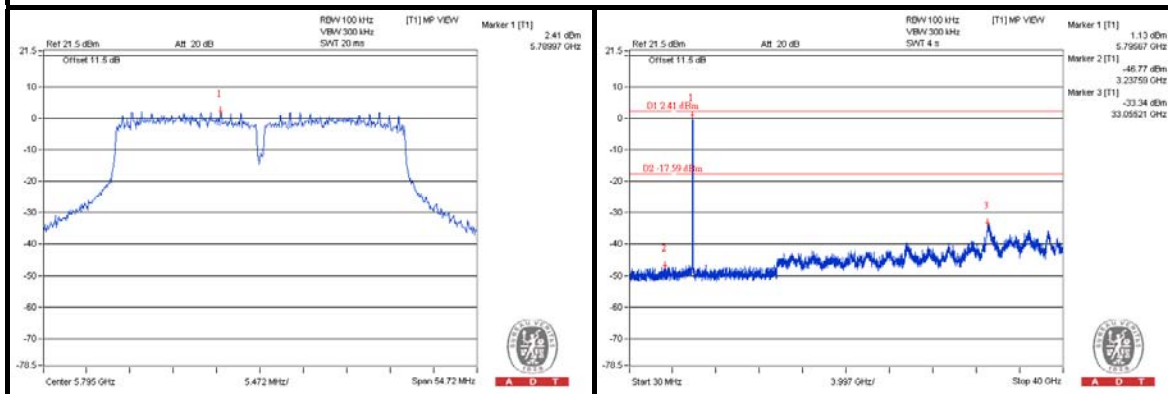
A D T

CHAIN 1

CH 151



CH 159

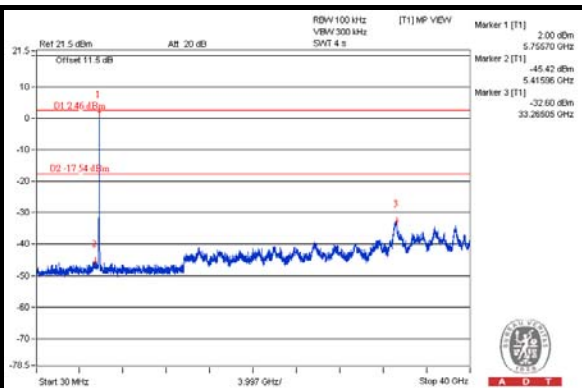
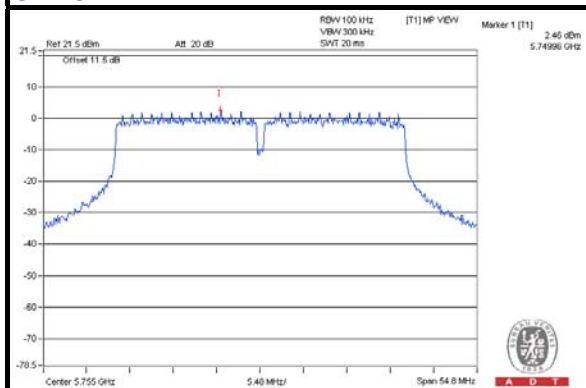




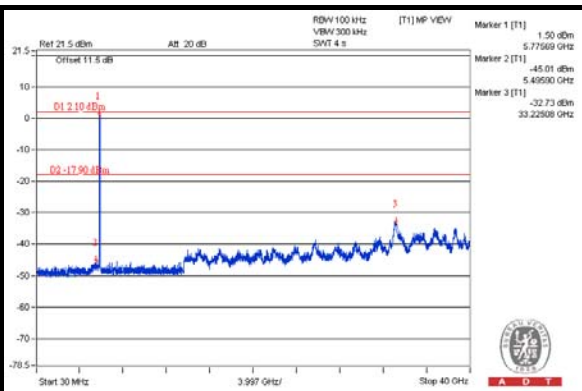
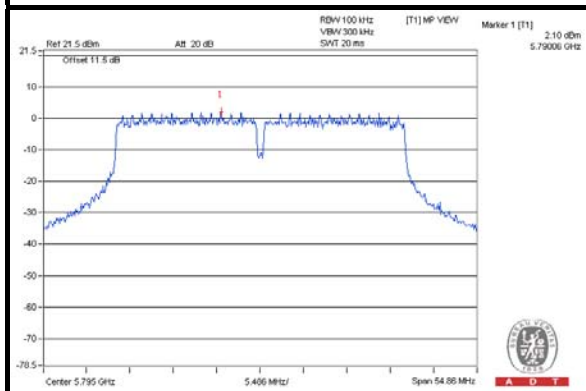
A D T

CHAIN 2

CH 151



CH 159



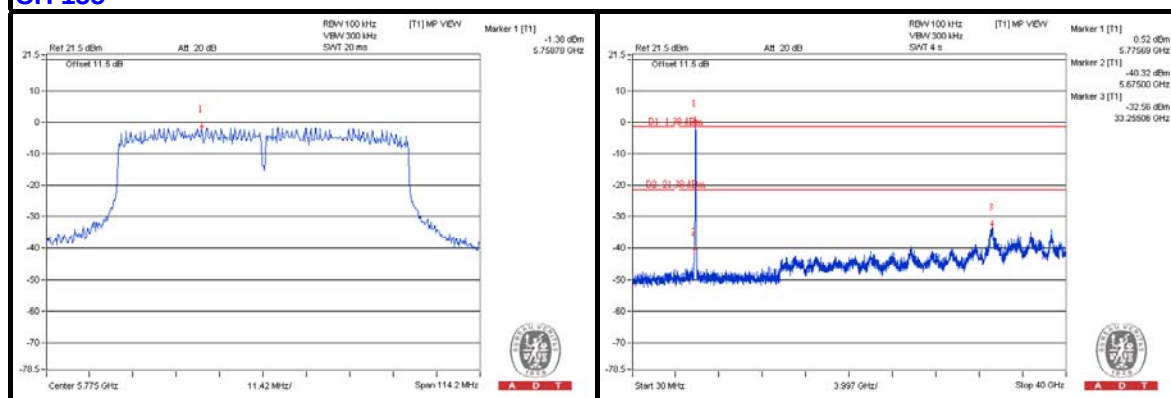


A D T

802.11ac (80MHz)

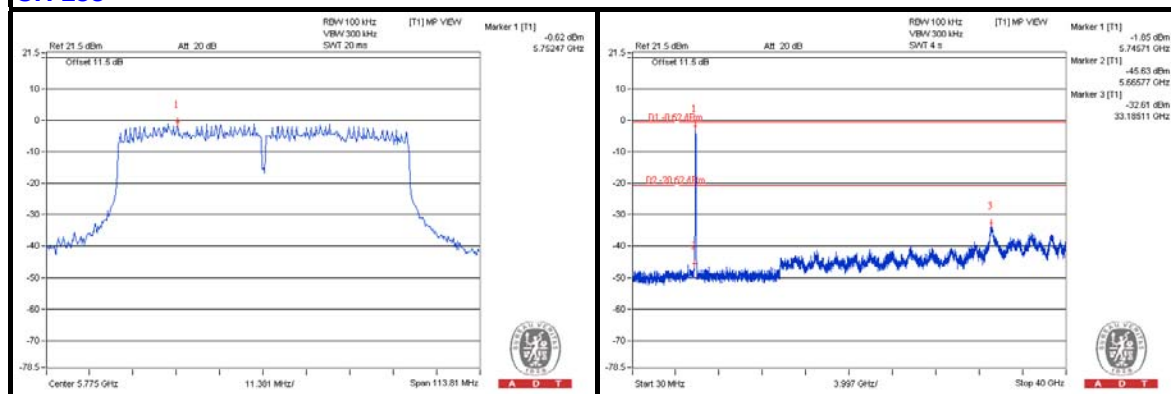
CHAIN 0

CH 155



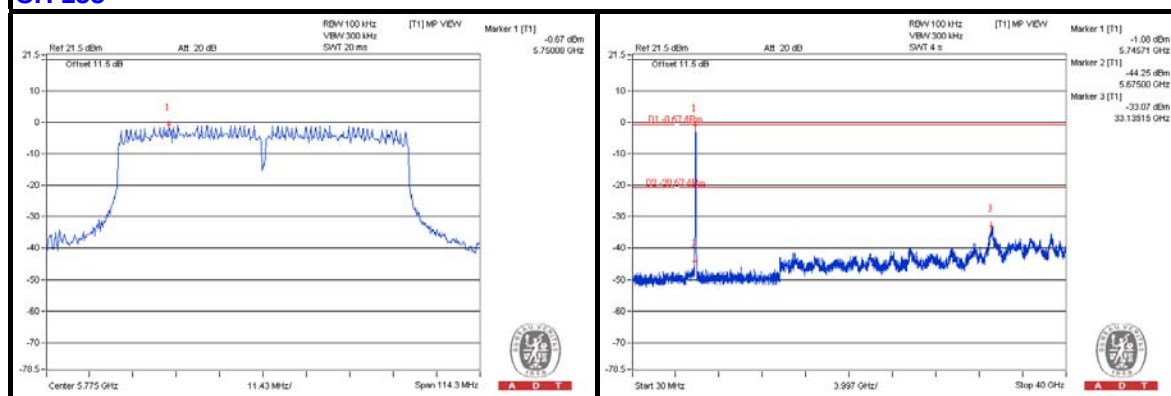
CHAIN 1

CH 155



CHAIN 2

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---