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FCC TEST REPORT (15.247)

REPORT NO.: RF130315C01

MODEL NO.: AR5B22

FCC ID: PPD-AR5B22

RECEIVED: Mar. 15, 2013

TESTED: Apr. 17 ~ May 11, 2013

ISSUED: May 13, 2013

APPLICANT: Qualcomm Atheros, Inc.

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TABLE OF CONTENTS

RELEASE CONTROL RECORD	5
1. CERTIFICATION	6
2. SUMMARY OF TEST RESULTS	7
2.1 MEASUREMENT UNCERTAINTY	7
3. GENERAL INFORMATION	8
3.1 GENERAL DESCRIPTION OF EUT	8
3.2 DESCRIPTION OF TEST MODES	10
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	11
3.3 DESCRIPTION OF SUPPORT UNITS	15
3.3.1 CONFIGURATION OF SYSTEM UNDER TEST	16
3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS	17
4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND)	18
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT	18
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	18
4.1.2 TEST INSTRUMENTS	19
4.1.3 TEST PROCEDURES	20
4.1.4 DEVIATION FROM TEST STANDARD	20
4.1.5 TEST SETUP	21
4.1.6 EUT OPERATING CONDITIONS	21
4.1.7 TEST RESULTS	22
4.2 CONDUCTED EMISSION MEASUREMENT	41
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	41
4.2.2 TEST INSTRUMENTS	41
4.2.3 TEST PROCEDURES	42
4.2.4 DEVIATION FROM TEST STANDARD	42
4.2.5 TEST SETUP	42
4.2.6 EUT OPERATING CONDITIONS	43
4.2.7 TEST RESULTS	44
4.3 6dB BANDWIDTH MEASUREMENT	46
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT	46
4.3.2 TEST SETUP	46
4.3.3 TEST INSTRUMENTS	46
4.3.4 TEST PROCEDURE	46
4.3.5 DEVIATION FROM TEST STANDARD	46
4.3.6 EUT OPERATING CONDITIONS	46
4.3.7 TEST RESULTS	47
4.4 CONDUCTED OUTPUT POWER	49
4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	49
4.4.2 TEST SETUP	49
4.4.3 TEST INSTRUMENTS	49
4.4.4 TEST PROCEDURES	49
4.4.5 DEVIATION FROM TEST STANDARD	50
4.4.6 EUT OPERATING CONDITIONS	50
4.4.7 TEST RESULTS	51
4.5 POWER SPECTRAL DENSITY MEASUREMENT	53
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	53
4.5.2 TEST SETUP	53
4.5.3 TEST INSTRUMENTS	53
4.5.4 TEST PROCEDURE	53
4.5.5 DEVIATION FROM TEST STANDARD	53



4.5.6	EUT OPERATING CONDITION.....	53
4.5.7	TEST RESULTS	54
4.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT	56
4.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT	56
4.6.2	TEST SETUP	56
4.6.3	TEST INSTRUMENTS.....	56
4.6.4	TEST PROCEDURE.....	56
4.6.5	DEVIATION FROM TEST STANDARD.....	57
4.6.6	EUT OPERATING CONDITION.....	57
4.6.7	TEST RESULTS	57
5.	TEST TYPES AND RESULTS (FOR 5.0GHz BAND)	68
5.1	RADIATED EMISSION MEASUREMENT	68
5.1.1	LIMITS OF RADIATED EMISSION MEASUREMENT	68
5.1.2	TEST INSTRUMENTS.....	69
5.1.3	TEST PROCEDURES	69
5.1.4	DEVIATION FROM TEST STANDARD.....	69
5.1.5	TEST SETUP.....	69
5.1.6	EUT OPERATING CONDITIONS	69
5.1.7	TEST RESULTS	70
5.2	CONDUCTED EMISSION MEASUREMENT	82
5.2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	82
5.2.2	TEST INSTRUMENTS.....	82
5.2.3	TEST PROCEDURES	82
5.2.4	DEVIATION FROM TEST STANDARD.....	82
5.2.5	TEST SETUP.....	82
5.2.6	EUT OPERATING CONDITIONS	82
5.2.7	TEST RESULTS	83
5.3	6dB BANDWIDTH MEASUREMENT.....	85
5.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	85
5.3.2	TEST SETUP.....	85
5.3.3	TEST INSTRUMENTS.....	85
5.3.4	TEST PROCEDURE.....	85
5.3.5	DEVIATION FROM TEST STANDARD.....	85
5.3.6	EUT OPERATING CONDITIONS	85
5.3.7	TEST RESULTS	86
5.4	CONDUCTED OUTPUT POWER.....	87
5.4.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	87
5.4.2	TEST SETUP.....	87
5.4.3	INSTRUMENTS.....	87
5.4.4	TEST PROCEDURES	87
5.4.5	DEVIATION FROM TEST STANDARD.....	87
5.4.6	EUT OPERATING CONDITIONS	87
5.4.7	TEST RESULTS	88
5.5	POWER SPECTRAL DENSITY MEASUREMENT	89
5.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	89
5.5.2	TEST SETUP.....	89
5.5.3	TEST INSTRUMENTS.....	89
5.5.4	TEST PROCEDURE.....	89
5.5.5	DEVIATION FROM TEST STANDARD.....	89
5.5.6	EUT OPERATING CONDITION.....	89
5.5.7	TEST RESULTS	90
5.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT	91
5.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT	91



A D T

5.6.2	TEST SETUP.....	91
5.6.3	TEST INSTRUMENTS.....	91
5.6.4	TEST PROCEDURE.....	91
5.6.5	DEVIATION FROM TEST STANDARD.....	91
5.6.6	EUT OPERATING CONDITION.....	91
5.6.7	TEST RESULTS	91
6.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	99
7.	INFORMATION ON THE TESTING LABORATORIES	100
8.	APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	101



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130315C01	Original release	May 13, 2013



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1. CERTIFICATION

PRODUCT: PCIE 802.11a/b/g/n 2.4GHz/5GHz + USB BT 4.0 card
MODEL NO.: AR5B22
BRAND: Atheros
APPLICANT: Qualcomm Atheros, Inc.
TESTED: Apr. 17 ~ May 11, 2013
TEST SAMPLE: R&D SAMPLE
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (model: AR5B22) 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 :** May 13, 2013
Pettie Chen / Senior Specialist

APPROVED BY :  , **DATE :** May 13, 2013
Ken Liu / Senior Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -22.90dB at 0.47915MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2483.5MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is RSMA, MMCX, SMA RP Plug not a standard connector.

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.19 dB
	200MHz ~1000MHz	3.21 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	PCIE 802.11a/b/g/n 2.4GHz/5GHz + USB BT 4.0 card
MODEL NO.	AR5B22
POWER SUPPLY	3.3Vdc (host equipment)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps
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)
OUTPUT POWER	461.318mW for 2412 ~ 2462MHz 202.549mW for 5745 ~ 5825MHz
ANTENNA TYPE	Refer to Note
ANTENNA CONNECTOR	Refer to Note
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	NA

NOTE:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report to the original BVADT report no.: RF110907E02 R1. The difference compared with original design is adding second source of antenna. Therefore, all test data had been re-tested.
2. The EUT provides two completed transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11b	1TX/2TX
802.11g	1TX/2TX
802.11a	1TX/2TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX

3. There are 4 antennas for the EUT.

Type	Model	SPEC	Peak Gain (dBi)					Connector Type
			2.4GHz Band	5GHz Band (GHz)				
				5.15~5.25	5.25~5.35	5.47~5.725	5.725~5.85	
Dipole	DAMF1HM28001000	2.4G+5G	1.58	2.15	1.38	1.62	1.56	RSMA
	DAMF1HM28001400	2.4G+5G	1.58	2.15	1.38	1.62	1.56	MMCX
	DAM-I6-H-DB-800-10-17	2.4G+5G	1.29	-0.58	0.87	1.94	-0.74	SMA RP PLUG

*Model: DAMF1HM28001000 was for the final test.

4. 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

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

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)	TX FUNCTION
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	1TX/2TX
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	1TX/2TX
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	2TX
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5	2TX

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)	TX FUNCTION
-	802.11g	1 to 11	6	OFDM	BPSK	6.0	1TX

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)	TX FUNCTION
-	802.11g	1 to 11	6	OFDM	BPSK	6.0	1TX



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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)	TX FUNCTION
-	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0	1TX/2TX
-	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0	1TX/2TX
-	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5	2TX
-	802.11n (40MHz)	3 to 9	3, 9	OFDM	BPSK	13.5	2TX

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)	TX FUNCTION
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	1TX/2TX
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	1TX/2TX
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	2TX
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5	2TX

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	24deg. C, 69%RH 23deg. C, 67%RH	120Vac, 60Hz	Ted Chang Cedric Wu
RE<1G	24deg. C, 69%RH	120Vac, 60Hz	Ted Chang
PLC	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
APCM	24deg. C, 69%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

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)	TX FUNCTION
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0	1TX/2TX
-	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5	2TX
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	2TX

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)	TX FUNCTION
-	802.11a	149 to 165	165	OFDM	BPSK	6.0	2TX

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)	TX FUNCTION
-	802.11a	149 to 165	165	OFDM	BPSK	6.0	2TX

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)	TX FUNCTION
-	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0	1TX/2TX
-	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	6.5	2TX
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	2TX

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)	TX FUNCTION
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0	1TX/2TX
-	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5	2TX
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	2TX

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	24deg. C, 69%RH 23deg. C, 67%RH	120Vac, 60Hz	Ted Chang Cedric Wu
RE<1G	24deg. C, 69%RH	120Vac, 60Hz	Ted Chang
PLC	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
APCM	24deg. C, 69%RH	120Vac, 60Hz	Nick Chen

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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	BPQ7MQ1	FCC DoC Approved
2	USB 3.0 Hard Disk	BUFFALO	HD-HXUS	15564800200845	FCC DoC Approved
3	Printer	EPSON	LQ-300+	DCGY054105	FCC DoC Approved
4	Extension Card	Atheros	NA	NA	NA

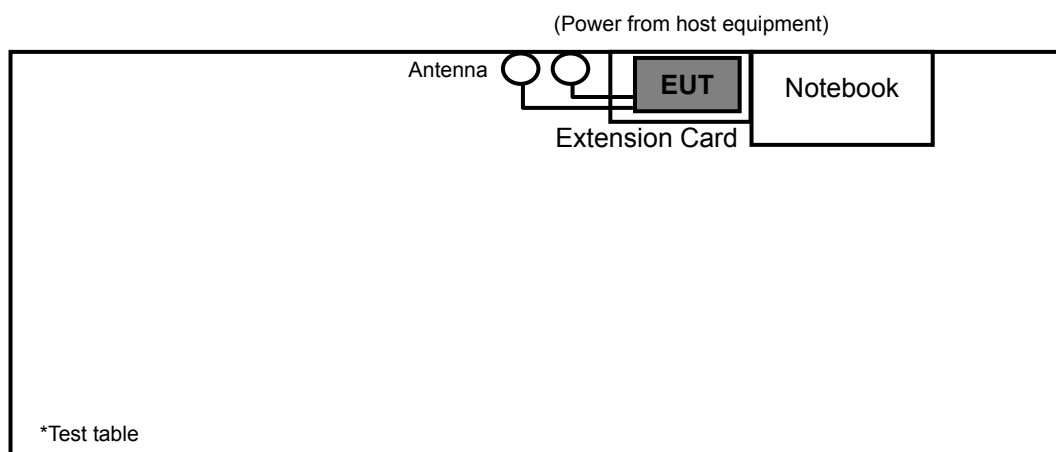
NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.0m USB cable with one core.
3	1.8m braid shielded wire, DB25 connector, w/o core.
4	NA

NOTE:

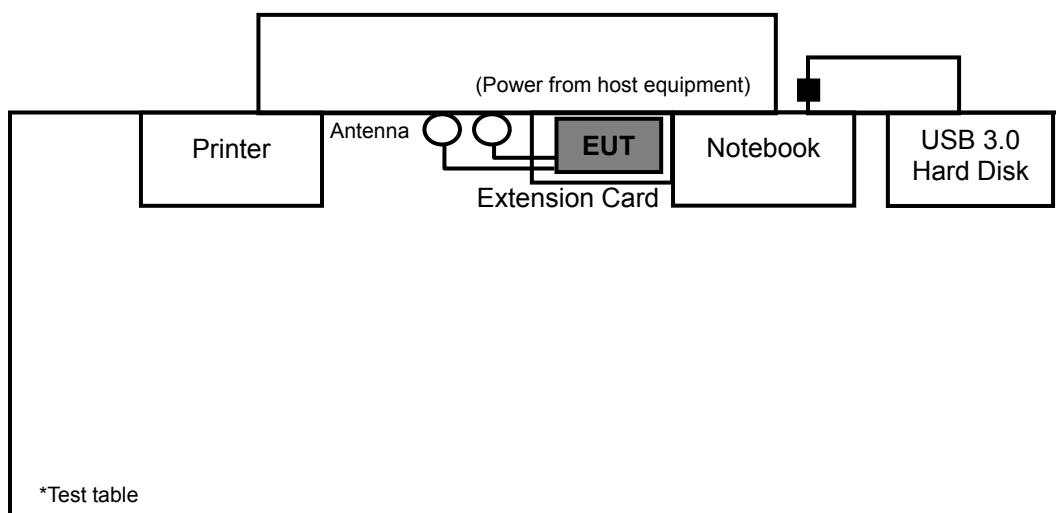
1. All power cords of the above support units are non-shielded (1.8m).
2. Item 4 was provided by client.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted Emission Test



For other tests





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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)

558074D01 DTS Meas Guidance v03r01

662911 D01 Multiple Transmitter Output v01 r02

ANSI C63.10-2009

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

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

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.

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4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Aug. 21, 2012	Aug. 20, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSU 43	100115	Oct. 25, 2012	Oct. 24, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Dec. 22, 2012	Dec. 21, 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	3008A01961	Oct. 25, 2012	Oct. 24, 2013
Preamplifier Agilent	8447D	2944A10738	Oct. 23, 2012	Oct. 22, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 28, 2012	Aug. 27, 2013
Software BV ADT	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table BV ADT	TT100.	TT93021704	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021704	NA	NA
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 4.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The FCC Site Registration No. is 460141.
6. The IC Site Registration No. is IC7450F-4.

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

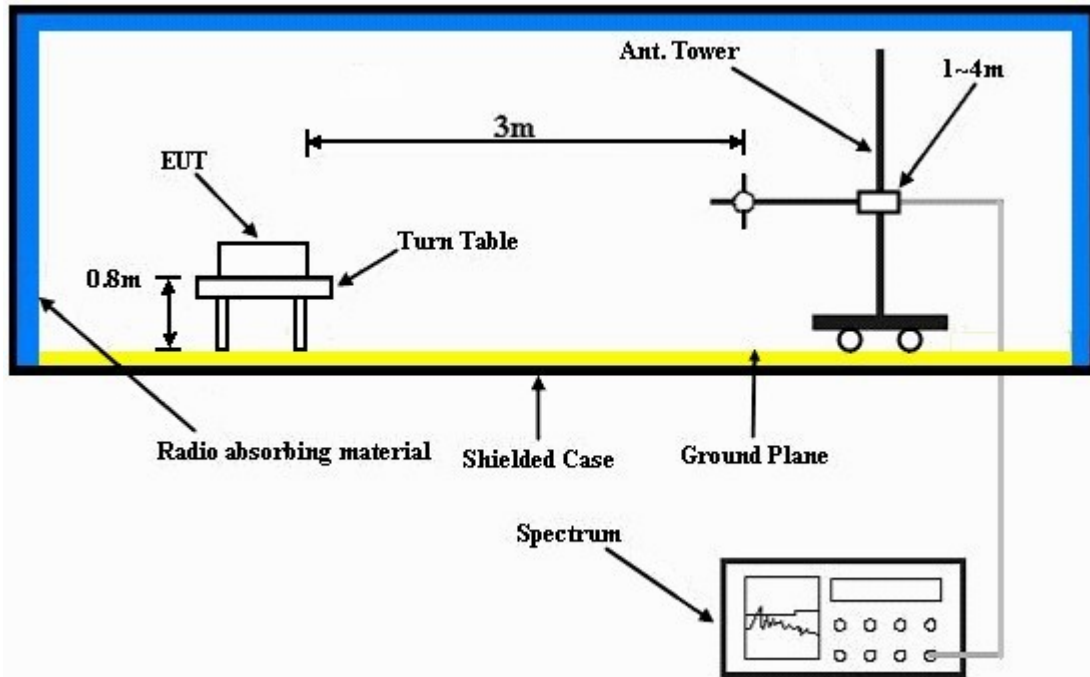
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



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

4.1.6 EUT OPERATING CONDITIONS

- Connected EUT to notebook system via the extension Card and placed on the testing table.
- The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The notebook system sent "H" patterns to its screen.
- The notebook system sent "H" patterns to the printer and the printer printed "H" patterns.
- The notebook system read/write data with the hard disk.
- Steps c ~ e were repeated.



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4.1.7 TEST RESULTS

ABOVE 1GHz DATA :

802.11b: 1TX

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	24deg. C, 69%RH	TESTED BY	Ted Chang
TX FUNCTION	1TX		

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	59.1 PK	74.0	-14.9	1.36 H	41	27.20	31.90
2	2390.00	49.0 AV	54.0	-5.0	1.36 H	41	17.10	31.90
3	*2412.00	105.6 PK			1.36 H	41	73.60	32.00
4	*2412.00	102.1 AV			1.36 H	41	70.10	32.00
5	4824.00	50.7 PK	74.0	-23.3	1.57 H	61	12.10	38.60
6	4824.00	46.4 AV	54.0	-7.6	1.57 H	61	7.80	38.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.2 PK	74.0	-15.8	1.06 V	204	26.30	31.90
2	2390.00	47.0 AV	54.0	-7.0	1.06 V	204	15.10	31.90
3	*2412.00	101.1 PK			1.06 V	204	69.10	32.00
4	*2412.00	97.5 AV			1.06 V	204	65.50	32.00
5	4824.00	48.9 PK	74.0	-25.1	1.27 V	337	10.30	38.60
6	4824.00	43.2 AV	54.0	-10.8	1.27 V	337	4.60	38.60

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.



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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	24deg. C, 69%RH	TESTED BY	Ted Chang
TX FUNCTION	1TX		

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	104.6 PK			1.35 H	41	72.50	32.10
2	*2437.00	101.0 AV			1.35 H	41	68.90	32.10
3	4874.00	52.9 PK	74.0	-21.1	1.56 H	59	14.20	38.70
4	4874.00	49.3 AV	54.0	-4.7	1.56 H	59	10.60	38.70
5	7311.00	54.4 PK	74.0	-19.6	1.00 H	254	9.10	45.30
6	7311.00	41.5 AV	54.0	-12.5	1.00 H	254	-3.80	45.30
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	*2437.00	101.3 PK			1.62 V	193	69.20	32.10
2	*2437.00	97.7 AV			1.62 V	193	65.60	32.10
3	4874.00	49.4 PK	74.0	-24.6	1.00 V	211	10.70	38.70
4	4874.00	43.6 AV	54.0	-10.4	1.00 V	211	4.90	38.70
5	7311.00	54.8 PK	74.0	-19.2	1.79 V	12	9.50	45.30
6	7311.00	45.1 AV	54.0	-8.9	1.79 V	12	-0.20	45.30

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.



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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	24deg. C, 69%RH	TESTED BY	Ted Chang
TX FUNCTION	1TX		

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	106.8 PK			1.32 H	47	74.60	32.20
2	*2462.00	103.4 AV			1.32 H	47	71.20	32.20
3	2483.50	61.4 PK	74.0	-12.6	1.32 H	47	29.20	32.20
4	2483.50	52.5 AV	54.0	-1.5	1.32 H	47	20.30	32.20
5	4924.00	54.5 PK	74.0	-19.5	1.00 H	225	15.70	38.80
6	4924.00	51.9 AV	54.0	-2.1	1.00 H	225	13.10	38.80
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	*2462.00	102.4 PK			1.05 V	202	70.20	32.20
2	*2462.00	99.1 AV			1.05 V	202	66.90	32.20
3	2483.50	59.8 PK	74.0	-14.2	1.05 V	202	27.60	32.20
4	2483.50	50.0 AV	54.0	-4.0	1.05 V	202	17.80	32.20
5	4924.00	54.8 PK	74.0	-19.2	1.60 V	211	16.00	38.80
6	4924.00	51.7 AV	54.0	-2.3	1.60 V	211	12.90	38.80

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.



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802.11b: 2TX

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	23deg. C, 67%RH	TESTED BY	Cedric Wu
TX FUNCTION	2TX		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.3 PK	74.0	-13.7	1.36 H	93	28.40	31.90
2	2390.00	51.7 AV	54.0	-2.3	1.36 H	93	19.80	31.90
3	*2412.00	107.8 PK			1.36 H	97	75.80	32.00
4	*2412.00	104.3 AV			1.36 H	97	72.30	32.00
5	4824.00	49.7 PK	74.0	-24.3	1.14 H	62	11.10	38.60
6	4824.00	44.2 AV	54.0	-9.8	1.14 H	62	5.60	38.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.2 PK	74.0	-16.8	1.60 V	137	25.30	31.90
2	2390.00	45.7 AV	54.0	-8.3	1.60 V	137	13.80	31.90
3	*2412.00	98.0 PK			1.63 V	137	66.00	32.00
4	*2412.00	94.6 AV			1.63 V	137	62.60	32.00
5	4824.00	48.7 PK	74.0	-25.3	1.00 V	144	10.10	38.60
6	4824.00	42.9 AV	54.0	-11.1	1.00 V	144	4.30	38.60

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.



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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	23deg. C, 67%RH	TESTED BY	Cedric Wu
TX FUNCTION	2TX		

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	106.4 PK			1.31 H	104	74.30	32.10
2	*2437.00	103.1 AV			1.31 H	104	71.00	32.10
3	4874.00	50.1 PK	74.0	-23.9	1.00 H	61	11.40	38.70
4	4874.00	44.9 AV	54.0	-9.1	1.00 H	61	6.20	38.70
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	98.6 PK			1.64 V	149	66.50	32.10
2	*2437.00	95.5 AV			1.64 V	149	63.40	32.10
3	4874.00	49.5 PK	74.0	-24.5	1.00 V	146	10.80	38.70
4	4874.00	43.8 AV	54.0	-10.2	1.00 V	146	5.10	38.70

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.



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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	23deg. C, 67%RH	TESTED BY	Cedric Wu
TX FUNCTION	2TX		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.4 PK			1.32 H	103	75.20	32.20
2	*2462.00	104.2 AV			1.32 H	103	72.00	32.20
3	2483.50	61.2 PK	74.0	-12.8	1.33 H	106	29.00	32.20
4	2483.50	51.7 AV	54.0	-2.3	1.33 H	106	19.50	32.20
5	4924.00	54.9 PK	74.0	-19.1	1.30 H	43	16.10	38.80
6	4924.00	52.6 AV	54.0	-1.4	1.30 H	43	13.80	38.80
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	*2462.00	100.1 PK			1.63 V	149	67.90	32.20
2	*2462.00	96.5 AV			1.63 V	149	64.30	32.20
3	2483.50	59.5 PK	74.0	-14.5	1.60 V	149	27.30	32.20
4	2483.50	46.8 AV	54.0	-7.2	1.60 V	149	14.60	32.20
5	4924.00	55.0 PK	74.0	-19.0	1.00 V	132	16.20	38.80
6	4924.00	52.4 AV	54.0	-1.6	1.00 V	132	13.60	38.80

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.



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802.11g: 1TX

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	24deg. C, 69%RH	TESTED BY	Ted Chang
TX FUNCTION	1TX		

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	69.9 PK	74.0	-4.1	1.34 H	41	38.00	31.90
2	2390.00	52.9 AV	54.0	-1.1	1.34 H	41	21.00	31.90
3	*2412.00	106.9 PK			1.34 H	41	74.90	32.00
4	*2412.00	97.1 AV			1.34 H	41	65.10	32.00
5	4824.00	50.5 PK	74.0	-23.5	1.00 H	213	11.90	38.60
6	4824.00	34.9 AV	54.0	-19.1	1.00 H	213	-3.70	38.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.8 PK	74.0	-9.2	1.08 V	202	32.90	31.90
2	2390.00	50.5 AV	54.0	-3.5	1.08 V	202	18.60	31.90
3	*2412.00	102.1 PK			1.08 V	202	70.10	32.00
4	*2412.00	92.2 AV			1.08 V	202	60.20	32.00
5	4824.00	50.6 PK	74.0	-23.4	1.00 V	255	12.00	38.60
6	4824.00	33.7 AV	54.0	-20.3	1.00 V	255	-4.90	38.60

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.



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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	24deg. C, 69%RH	TESTED BY	Ted Chang
TX FUNCTION	1TX		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	112.1 PK			1.35 H	42	80.00	32.10
2	*2437.00	101.6 AV			1.35 H	42	69.50	32.10
3	2483.50	69.2 PK	74.0	-4.8	1.35 H	42	37.00	32.20
4	2483.50	52.6 AV	54.0	-1.4	1.35 H	42	20.40	32.20
5	4874.00	56.8 PK	74.0	-17.2	1.00 H	221	18.10	38.70
6	4874.00	43.1 AV	54.0	-10.9	1.00 H	221	4.40	38.70
7	7311.00	55.3 PK	74.0	-18.7	1.02 H	136	10.00	45.30
8	7311.00	41.6 AV	54.0	-12.4	1.02 H	136	-3.70	45.30
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	*2437.00	108.9 PK			1.04 V	192	76.80	32.10
2	*2437.00	98.3 AV			1.04 V	192	66.20	32.10
3	2483.50	63.2 PK	74.0	-10.8	1.04 V	192	31.00	32.20
4	2483.50	49.6 AV	54.0	-4.4	1.04 V	192	17.40	32.20
5	4874.00	56.0 PK	74.0	-18.0	1.47 V	207	17.30	38.70
6	4874.00	42.9 AV	54.0	-11.1	1.47 V	207	4.20	38.70
7	7311.00	53.7 PK	74.0	-20.3	1.05 V	63	8.40	45.30
8	7311.00	40.9 AV	54.0	-13.1	1.05 V	63	-4.40	45.30

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.



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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	24deg. C, 69%RH	TESTED BY	Ted Chang
TX FUNCTION	1TX		

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	106.4 PK			1.34 H	49	74.20	32.20
2	*2462.00	96.2 AV			1.34 H	49	64.00	32.20
3	2483.50	71.5 PK	74.0	-2.5	1.34 H	49	39.30	32.20
4	2483.50	53.0 AV	54.0	-1.0	1.34 H	49	20.80	32.20
5	4924.00	50.9 PK	74.0	-23.1	1.03 H	327	12.10	38.80
6	4924.00	36.5 AV	54.0	-17.5	1.03 H	327	-2.30	38.80
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	*2462.00	101.7 PK			1.02 V	200	69.50	32.20
2	*2462.00	91.6 AV			1.02 V	200	59.40	32.20
3	2483.50	67.4 PK	74.0	-6.6	1.02 V	200	35.20	32.20
4	2483.50	49.6 AV	54.0	-4.4	1.02 V	200	17.40	32.20
5	4924.00	48.1 PK	74.0	-25.9	1.08 V	112	9.30	38.80
6	4924.00	34.5 AV	54.0	-19.5	1.08 V	112	-4.30	38.80

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.



A D T

802.11g: 2TX

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	23deg. C, 67%RH	TESTED BY	Cedric Wu
TX FUNCTION	2TX		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.1 PK	74.0	-9.9	1.00 H	125	37.20	26.90
2	2390.00	51.2 AV	54.0	-2.8	1.00 H	125	24.30	26.90
3	*2412.00	108.2 PK			1.00 H	128	81.20	27.00
4	*2412.00	96.5 AV			1.00 H	128	69.50	27.00
5	4824.00	49.8 PK	74.0	-24.2	1.00 H	200	18.40	31.40
6	4824.00	37.7 AV	54.0	-16.3	1.00 H	200	6.30	31.40
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	2390.00	60.4 PK	74.0	-13.6	1.00 V	320	33.50	26.90
2	2390.00	48.7 AV	54.0	-5.3	1.00 V	320	21.80	26.90
3	*2412.00	99.9 PK			1.00 V	322	72.90	27.00
4	*2412.00	88.3 AV			1.00 V	322	61.30	27.00
5	4824.00	47.5 PK	74.0	-26.5	1.05 V	222	16.10	31.40
6	4824.00	34.9 AV	54.0	-19.1	1.05 V	222	3.50	31.40

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

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	23deg. C, 67%RH	TESTED BY	Cedric Wu
TX FUNCTION	2TX		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.4 PK			1.00 H	130	82.40	27.00
2	*2437.00	96.6 AV			1.00 H	130	69.60	27.00
3	4874.00	48.0 PK	74.0	-26.0	1.00 H	207	16.50	31.50
4	4874.00	36.3 AV	54.0	-17.7	1.00 H	207	4.80	31.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	101.2 PK			1.00 V	325	74.20	27.00
2	*2437.00	88.6 AV			1.00 V	325	61.60	27.00
3	4874.00	47.6 PK	74.0	-26.4	1.00 V	227	16.10	31.50
4	4874.00	33.7 AV	54.0	-20.3	1.00 V	227	2.20	31.50

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. “ * “: 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	23deg. C, 67%RH	TESTED BY	Cedric Wu
TX FUNCTION	2TX		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.8 PK			1.00 H	108	81.70	27.10
2	*2462.00	97.1 AV			1.00 H	108	70.00	27.10
3	2483.50	62.9 PK	74.0	-11.1	1.00 H	110	35.70	27.20
4	2483.50	49.8 AV	54.0	-4.2	1.00 H	110	22.60	27.20
5	4924.00	52.3 PK	74.0	-21.7	1.00 H	197	20.70	31.60
6	4924.00	38.9 AV	54.0	-15.1	1.00 H	197	7.30	31.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.9 PK			1.00 V	311	73.80	27.10
2	*2462.00	88.5 AV			1.00 V	311	61.40	27.10
3	2483.50	61.8 PK	74.0	-12.2	1.00 V	310	34.60	27.20
4	2483.50	49.7 AV	54.0	-4.3	1.00 V	310	22.50	27.20
5	4924.00	48.0 PK	74.0	-26.0	1.00 V	315	16.40	31.60
6	4924.00	34.3 AV	54.0	-19.7	1.00 V	315	2.70	31.60

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.



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	24deg. C, 69%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	61.8 PK	74.0	-12.2	1.43 H	84	29.90	31.90
2	2390.00	48.5 AV	54.0	-5.5	1.43 H	84	16.60	31.90
3	*2412.00	105.7 PK			1.34 H	279	73.70	32.00
4	*2412.00	94.1 AV			1.34 H	279	62.10	32.00
5	4824.00	47.4 PK	74.0	-26.6	1.00 H	360	8.80	38.60
6	4824.00	35.2 AV	54.0	-18.8	1.00 H	360	-3.40	38.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.3 PK	74.0	-15.7	1.00 V	230	26.40	31.90
2	2390.00	46.5 AV	54.0	-7.5	1.00 V	230	14.60	31.90
3	*2412.00	97.5 PK			1.07 V	202	65.50	32.00
4	*2412.00	85.9 AV			1.07 V	202	53.90	32.00
5	4824.00	45.3 PK	74.0	-28.7	1.24 V	130	6.70	38.60
6	4824.00	32.7 AV	54.0	-21.3	1.24 V	130	-5.90	38.60

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.



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	24deg. C, 69%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	107.9 PK			1.32 H	319	75.80	32.10
2	*2437.00	95.5 AV			1.32 H	319	63.40	32.10
3	4874.00	47.0 PK	74.0	-27.0	1.03 H	124	8.30	38.70
4	4874.00	35.4 AV	54.0	-18.6	1.03 H	124	-3.30	38.70
5	7311.00	54.7 PK	74.0	-19.3	1.45 H	224	9.40	45.30
6	7311.00	42.6 AV	54.0	-11.4	1.45 H	224	-2.70	45.30
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	*2437.00	99.9 PK			1.29 V	325	67.80	32.10
2	*2437.00	87.6 AV			1.29 V	325	55.50	32.10
3	4874.00	46.5 PK	74.0	-27.5	1.00 V	320	7.80	38.70
4	4874.00	32.5 AV	54.0	-21.5	1.00 V	320	-6.20	38.70
5	7311.00	53.6 PK	74.0	-20.4	1.25 V	144	8.30	45.30
6	7311.00	40.5 AV	54.0	-13.5	1.25 V	144	-4.80	45.30

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

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	24deg. C, 69%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	106.0 PK			1.31 H	277	73.80	32.20
2	*2462.00	94.2 AV			1.31 H	277	62.00	32.20
3	2483.50	60.2 PK	74.0	-13.8	1.00 H	240	28.00	32.20
4	2483.50	47.7 AV	54.0	-6.3	1.00 H	240	15.50	32.20
5	4924.00	49.6 PK	74.0	-24.4	1.02 H	224	10.80	38.80
6	4924.00	36.2 AV	54.0	-17.8	1.02 H	224	-2.60	38.80
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	*2462.00	98.1 PK			1.00 V	325	65.90	32.20
2	*2462.00	85.8 AV			1.00 V	325	53.60	32.20
3	2483.50	59.2 PK	74.0	-14.8	1.00 V	321	27.00	32.20
4	2483.50	47.1 AV	54.0	-6.9	1.00 V	321	14.90	32.20
5	4924.00	46.3 PK	74.0	-27.7	1.00 V	336	7.50	38.80
6	4924.00	32.6 AV	54.0	-21.4	1.00 V	336	-6.20	38.80

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.



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	24deg. C, 69%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	62.0 PK	74.0	-12.0	1.42 H	276	30.10	31.90
2	2390.00	48.5 AV	54.0	-5.5	1.42 H	276	16.60	31.90
3	*2422.00	99.8 PK			1.34 H	276	67.80	32.00
4	*2422.00	88.2 AV			1.34 H	276	56.20	32.00
5	4844.00	50.0 PK	74.0	-24.0	1.03 H	41	11.30	38.70
6	4844.00	35.2 AV	54.0	-18.8	1.03 H	41	-3.50	38.70
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	2390.00	58.1 PK	74.0	-15.9	1.02 V	320	26.20	31.90
2	2390.00	46.6 AV	54.0	-7.4	1.02 V	320	14.70	31.90
3	*2422.00	91.1 PK			1.02 V	320	59.10	32.00
4	*2422.00	79.1 AV			1.02 V	320	47.10	32.00
5	4844.00	47.6 PK	74.0	-26.4	1.04 V	332	8.90	38.70
6	4844.00	33.5 AV	54.0	-20.5	1.04 V	332	-5.20	38.70

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 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 69%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	103.8 PK			1.32 H	169	71.70	32.10
2	*2437.00	92.5 AV			1.32 H	169	60.40	32.10
3	4874.00	50.2 PK	74.0	-23.8	1.18 H	126	11.50	38.70
4	4874.00	35.4 AV	54.0	-18.6	1.18 H	126	-3.30	38.70
5	7311.00	57.3 PK	74.0	-16.7	1.35 H	168	12.00	45.30
6	7311.00	42.6 AV	54.0	-11.4	1.35 H	168	-2.70	45.30
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	*2437.00	95.1 PK			1.00 V	323	63.00	32.10
2	*2437.00	83.8 AV			1.00 V	323	51.70	32.10
3	4874.00	46.5 PK	74.0	-27.5	1.00 V	213	7.80	38.70
4	4874.00	32.7 AV	54.0	-21.3	1.00 V	213	-6.00	38.70
5	7311.00	52.7 PK	74.0	-21.3	1.04 V	132	7.40	45.30
6	7311.00	38.9 AV	54.0	-15.1	1.04 V	132	-6.40	45.30

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

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	24deg. C, 69%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	103.6 PK			1.33 H	280	71.50	32.10
2	*2452.00	91.7 AV			1.33 H	280	59.60	32.10
3	2483.50	68.9 PK	74.0	-5.1	1.31 H	279	36.70	32.20
4	2483.50	52.2 AV	54.0	-1.8	1.31 H	279	20.00	32.20
5	4904.00	50.1 PK	74.0	-23.9	1.14 H	235	11.30	38.80
6	4904.00	36.1 AV	54.0	-17.9	1.14 H	235	-2.70	38.80
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	*2452.00	95.0 PK			1.03 V	201	62.90	32.10
2	*2452.00	83.6 AV			1.03 V	201	51.50	32.10
3	2483.50	61.6 PK	74.0	-12.4	1.03 V	201	29.40	32.20
4	2483.50	48.3 AV	54.0	-5.7	1.03 V	201	16.10	32.20
5	4904.00	46.6 PK	74.0	-27.4	1.03 V	320	7.80	38.80
6	4904.00	32.5 AV	54.0	-21.5	1.03 V	320	-6.30	38.80

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.



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	24deg. C, 69%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	82.29	34.4 QP	40.0	-5.6	1.50 H	32	25.50	8.90
2	165.73	35.9 QP	43.5	-7.6	1.00 H	101	22.50	13.40
3	210.36	34.3 QP	43.5	-9.2	1.24 H	231	23.30	11.00
4	299.62	35.9 QP	46.0	-10.1	1.00 H	270	21.60	14.30
5	344.24	33.1 QP	46.0	-12.9	1.50 H	169	17.60	15.50
6	666.35	36.0 QP	46.0	-10.0	1.24 H	49	13.40	22.60
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	82.29	27.7 QP	40.0	-12.3	1.24 V	90	18.80	8.90
2	165.73	29.0 QP	43.5	-14.5	1.00 V	159	15.60	13.40
3	336.48	32.3 QP	46.0	-13.7	1.24 V	54	17.00	15.30
4	431.56	32.6 QP	46.0	-13.4	1.00 V	187	14.90	17.70
5	575.15	26.6 QP	46.0	-19.4	1.99 V	159	5.60	21.00
6	697.40	30.4 QP	46.0	-15.6	1.00 V	70	7.40	23.00

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.

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:** 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 16, 2012	Nov. 15, 2013
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 28, 2012	Dec. 27, 2013
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 02, 2012	Jul. 01, 2013
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 04, 2013	Feb. 03, 2014
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 TEST PROCEDURES

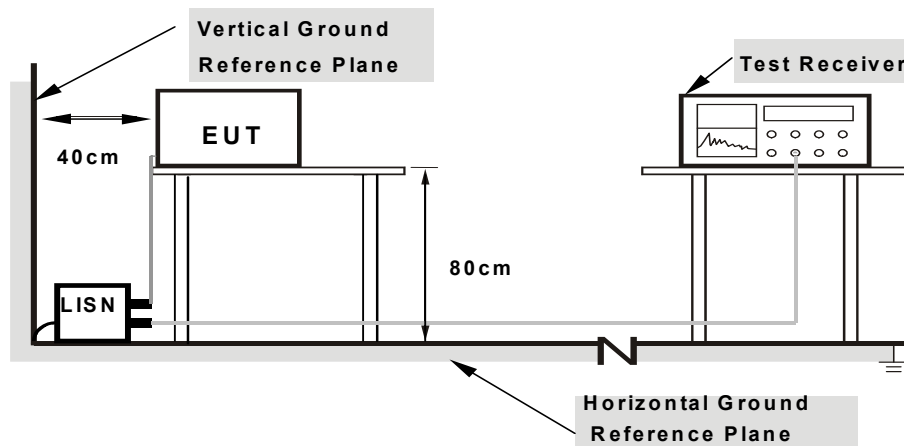
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.6 EUT OPERATING CONDITIONS

- a. Connected EUT to notebook system via the extension Card and placed on the testing table.
- b. The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- c. The notebook system sent "H" patterns to its screen.

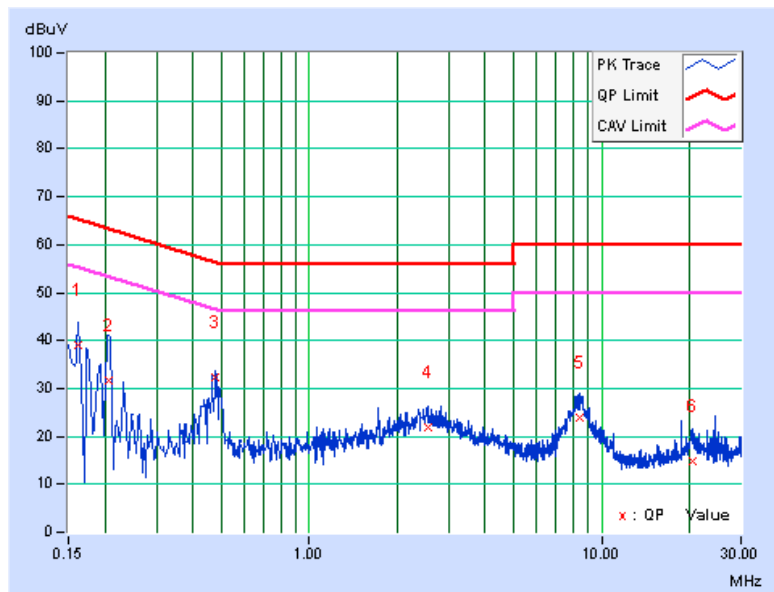
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA : 802.11g

PHASE	Line 1	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16173	0.15	38.78	23.91	38.93	24.06	65.37	55.37	-26.45	-31.32
2	0.20511	0.15	31.42	15.77	31.57	15.92	63.40	53.40	-31.83	-37.48
3	0.47915	0.20	31.96	23.25	32.16	23.45	56.35	46.35	-24.19	-22.90
4	2.53510	0.29	21.73	16.48	22.02	16.77	56.00	46.00	-33.98	-29.23
5	8.40010	0.61	23.36	16.31	23.97	16.92	60.00	50.00	-36.03	-33.08
6	20.45463	1.31	13.48	6.94	14.79	8.25	60.00	50.00	-45.21	-41.75

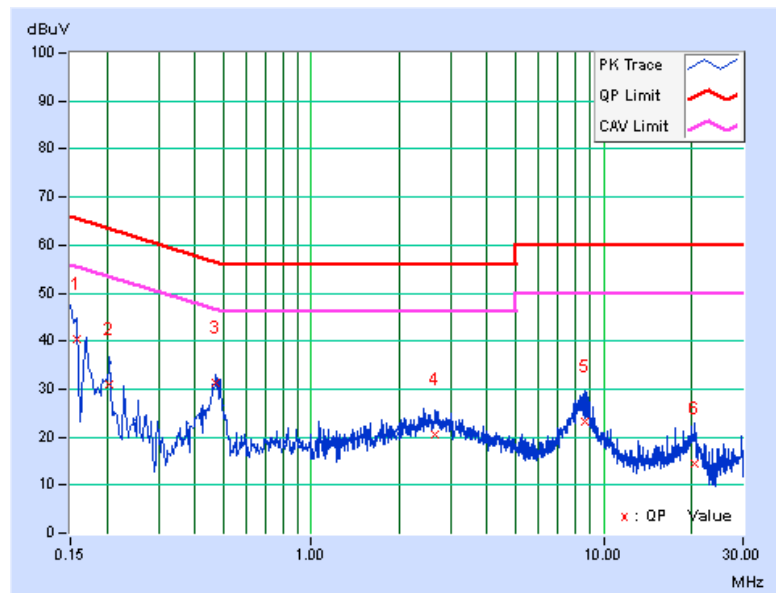
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. The emission levels of other frequencies were very low against the limit.
 3. Margin value = Emission level - Limit value
 4. Correction factor = Insertion loss + Cable loss
 5. Emission Level = Correction Factor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



PHASE	Line 2	6dB BANDWIDTH	9kHz
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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	0.15782	0.20	40.31	25.55	40.51	25.75	65.58	55.58	-25.07	-29.83
2	0.20474	0.20	30.73	14.84	30.93	15.04	63.42	53.42	-32.48	-38.37
3	0.47062	0.26	31.04	22.21	31.30	22.47	56.50	46.50	-25.20	-24.03
4	2.64458	0.34	20.12	14.87	20.46	15.21	56.00	46.00	-35.54	-30.79
5	8.64643	0.58	22.82	15.79	23.40	16.37	60.00	50.00	-36.60	-33.63
6	20.48982	0.99	13.56	6.72	14.55	7.71	60.00	50.00	-45.45	-42.29

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.

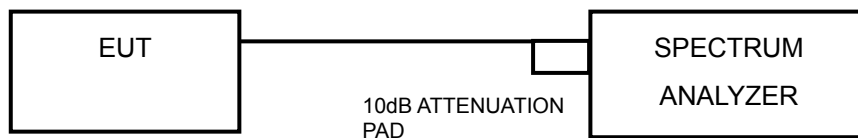


4.3 6dB BANDWIDTH MEASUREMENT

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: 1TX

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.82	0.5	PASS
6	2437	10.16	0.5	PASS
11	2462	10.15	0.5	PASS

802.11b: 2TX

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	10.08	10.09	0.5	PASS
6	2437	10.13	10.16	0.5	PASS
11	2462	10.14	10.15	0.5	PASS

802.11g: 1TX

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.48	0.5	PASS
6	2437	16.46	0.5	PASS
11	2462	16.58	0.5	PASS

802.11g: 2TX

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

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.75	17.81	0.5	PASS
6	2437	17.80	17.73	0.5	PASS
11	2462	17.72	17.73	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.22	36.53	0.5	PASS
6	2437	36.40	36.46	0.5	PASS
9	2452	36.36	36.54	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,

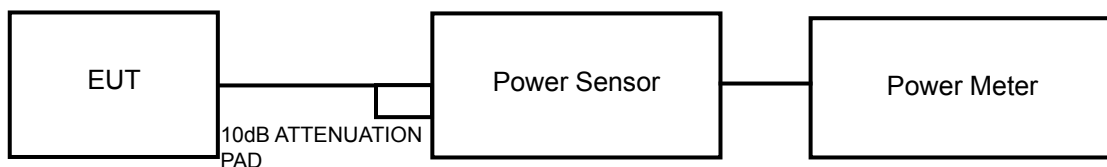
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

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

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



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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: 1TX

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	83.753	19.23	30	PASS
6	2437	126.183	21.01	30	PASS
11	2462	112.980	20.53	30	PASS

802.11b: 2TX

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	19.86	19.06	177.366	22.49	30	PASS
6	2437	17.64	19.17	140.680	21.48	30	PASS
11	2462	19.49	18.84	165.480	22.19	30	PASS

802.11g: 1TX

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	319.890	25.05	30	PASS
6	2437	461.318	26.64	30	PASS
11	2462	300.608	24.78	30	PASS

802.11g: 2TX

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	22.65	21.72	332.671	25.22	30	PASS
6	2437	23.61	23.54	455.559	26.59	30	PASS
11	2462	21.91	21.53	297.472	24.73	30	PASS

**802.11n (20MHz)**

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	20.09	20.61	217.174	23.37	30	PASS
6	2437	22.86	23.00	392.723	25.94	30	PASS
11	2462	19.01	19.15	161.840	22.09	30	PASS

802.11n (40MHz)

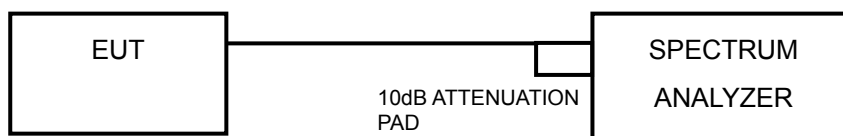
CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
3	2422	17.10	17.71	110.306	20.43	30	PASS
6	2437	21.36	21.26	270.433	24.32	30	PASS
9	2452	19.14	19.13	163.881	22.15	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.5.4 TEST PROCEDURE

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

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b: 1TX

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-6.61	8	PASS
6	2437	-6.24	8	PASS
11	2462	-5.91	8	PASS

802.11b: 2TX

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-7.55	3.01	-4.54	8	PASS
	6	2437	-6.93	3.01	-3.92	8	PASS
	11	2462	-7.36	3.01	-4.35	8	PASS
1	1	2412	-7.70	3.01	-4.69	8	PASS
	6	2437	-7.66	3.01	-4.65	8	PASS
	11	2462	-8.38	3.01	-5.37	8	PASS

NOTE: Directional gain = 1.58dBi + 10log(2) = 4.59dBi < 6dBi, so the limit no need to reduced.

802.11g: 1TX

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-9.45	8	PASS
6	2437	-2.63	8	PASS
11	2462	-9.28	8	PASS

802.11g: 2TX

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-12.58	3.01	-9.57	8	PASS
	6	2437	-9.56	3.01	-6.55	8	PASS
	11	2462	-11.14	3.01	-8.13	8	PASS
1	1	2412	-13.50	3.01	-10.49	8	PASS
	6	2437	-10.69	3.01	-7.68	8	PASS
	11	2462	-14.21	3.01	-11.20	8	PASS

NOTE: Directional gain = 1.58dBi + 10log(2) = 4.59dBi < 6dBi, so the limit no need to reduced.

802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-17.52	3.01	-14.51	8	PASS
	6	2437	-14.46	3.01	-11.45	8	PASS
	11	2462	-18.01	3.01	-15.00	8	PASS
1	1	2412	-15.17	3.01	-12.16	8	PASS
	6	2437	-13.80	3.01	-10.79	8	PASS
	11	2462	-17.11	3.01	-14.10	8	PASS

NOTE: Directional gain = 1.58dBi + 10log(2) = 4.59dBi < 6dBi, so the limit no need to reduced.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-22.52	3.01	-19.51	8	PASS
	6	2437	-17.94	3.01	-14.93	8	PASS
	9	2452	-19.86	3.01	-16.85	8	PASS
1	3	2422	-23.13	3.01	-20.12	8	PASS
	6	2437	-17.91	3.01	-14.90	8	PASS
	9	2452	-20.02	3.01	-17.01	8	PASS

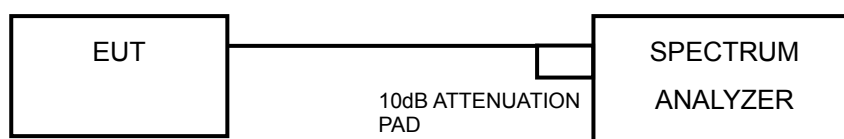
NOTE: Directional gain = 1.58dBi + 10log(2) = 4.59dBi < 6dBi, so the limit no need to reduced.

4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

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

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

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

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

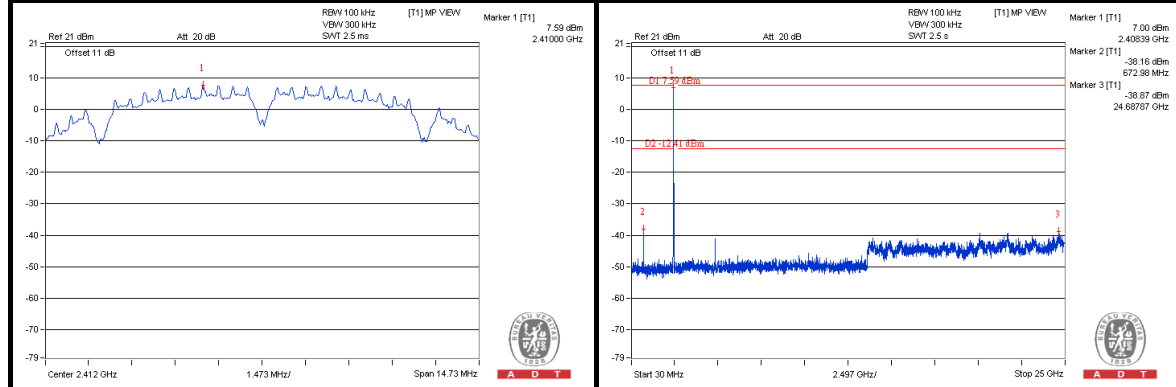
4.6.7 TEST RESULTS

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.

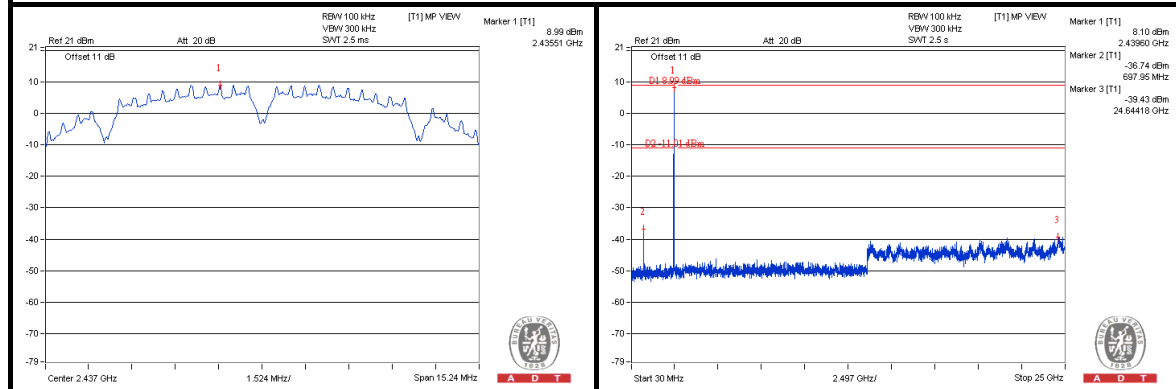
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b: 1TX

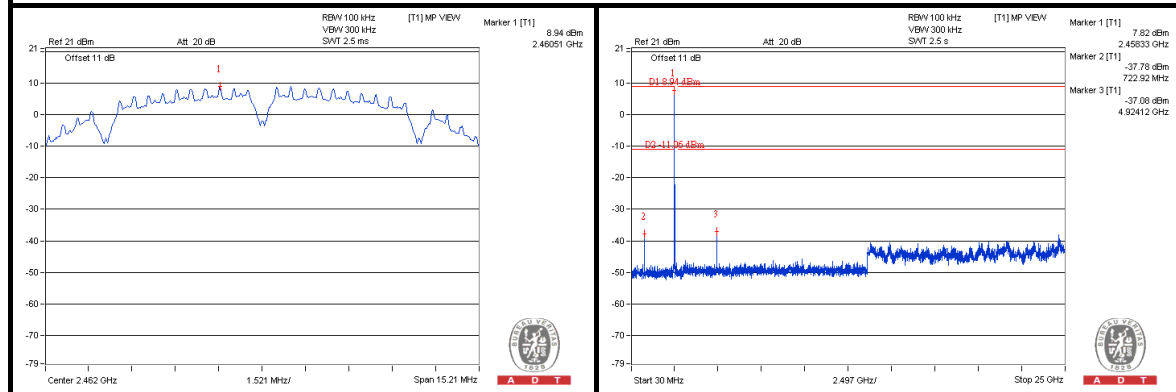
CH 1



CH 6



CH 11

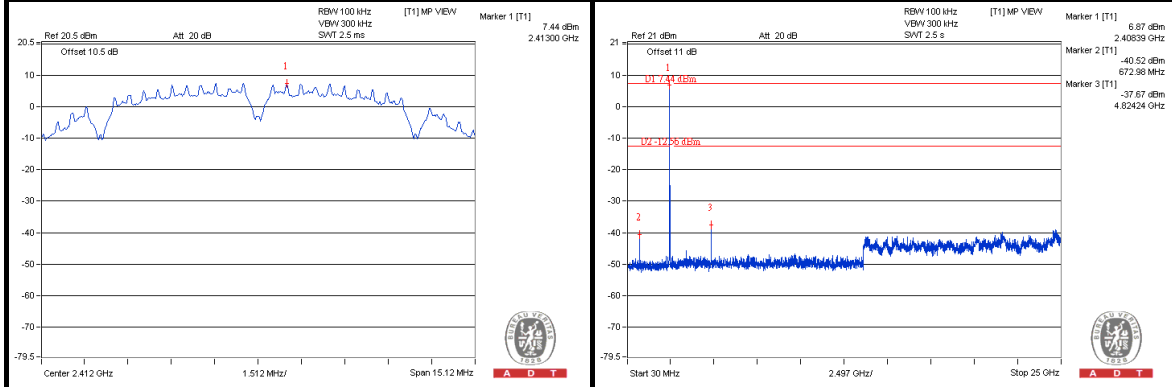




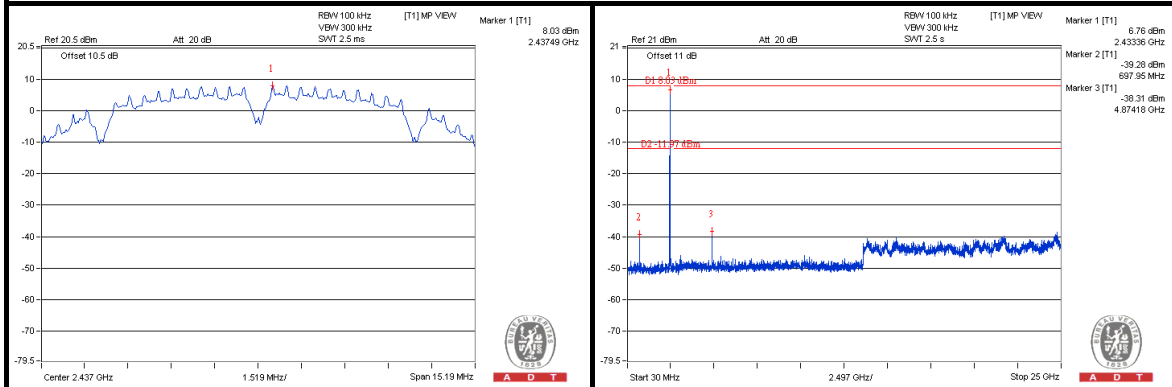
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802.11b: 2TX CHAIN 0

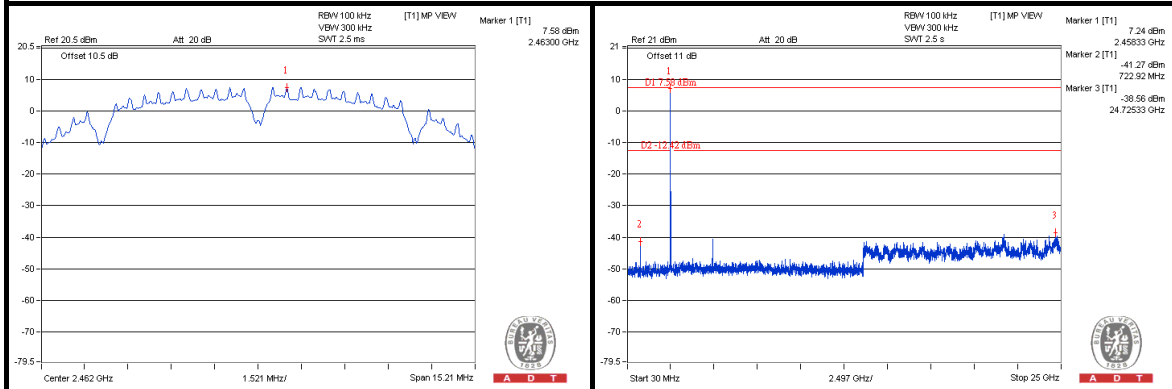
CH 1



CH 6



CH 11

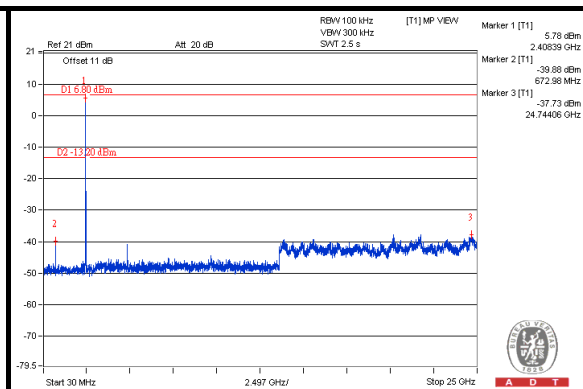
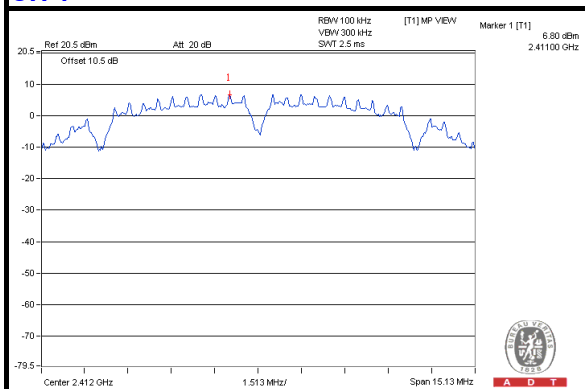




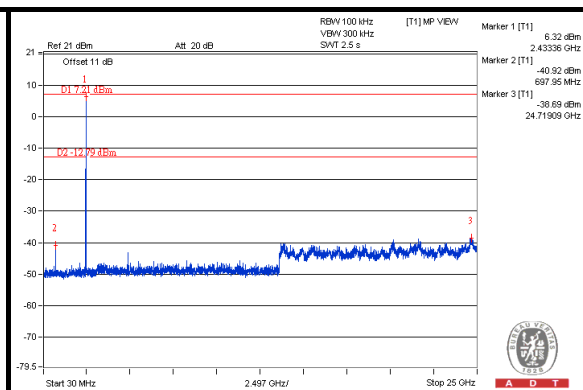
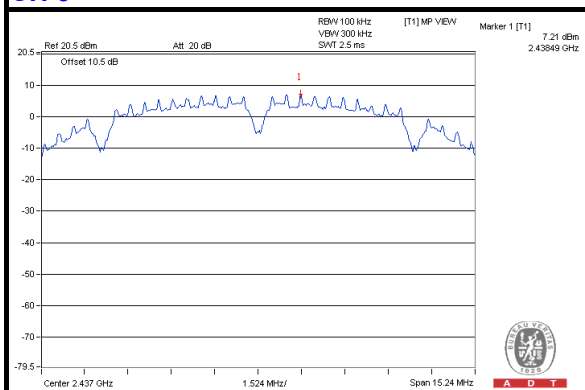
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CHAIN 1

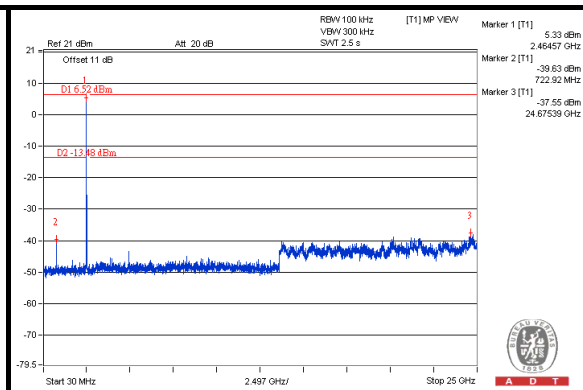
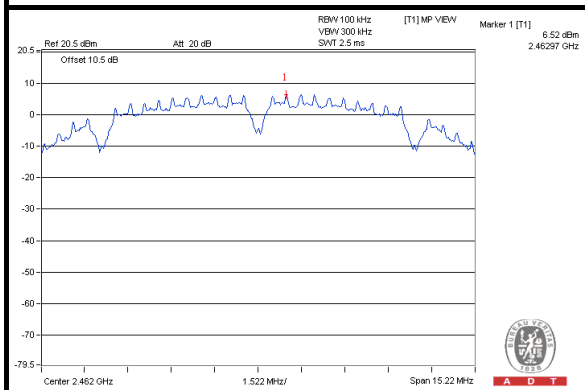
CH 1



CH 6



CH 11

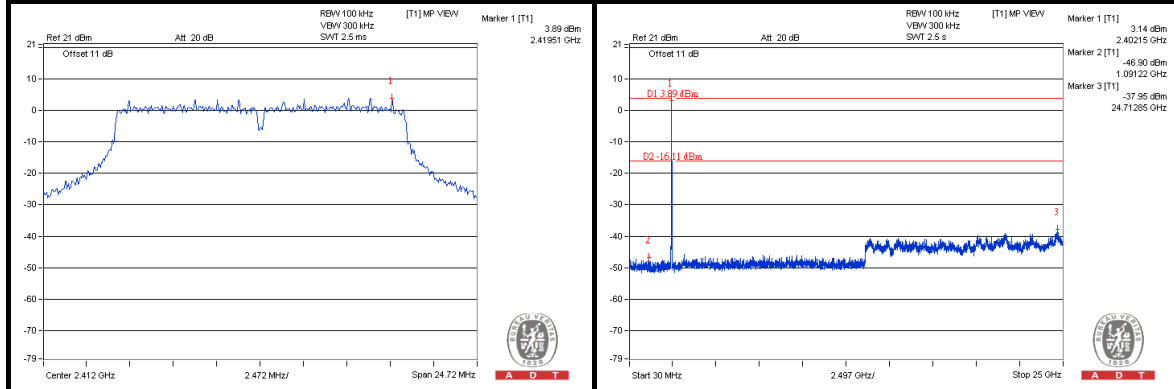




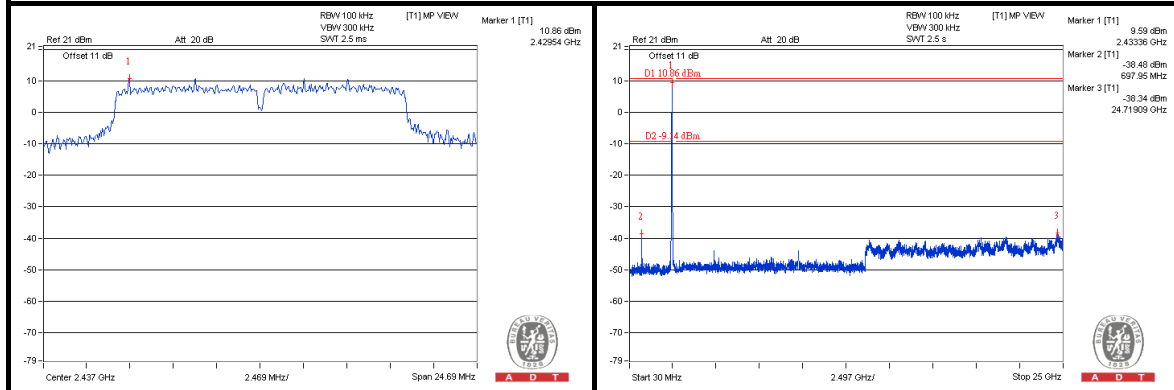
A D T

802.11g: 1TX

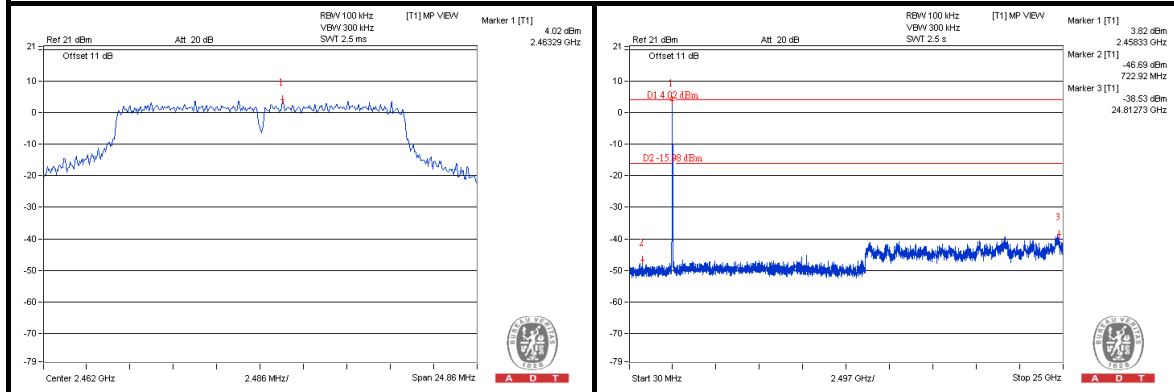
CH 1



CH 6



CH 11

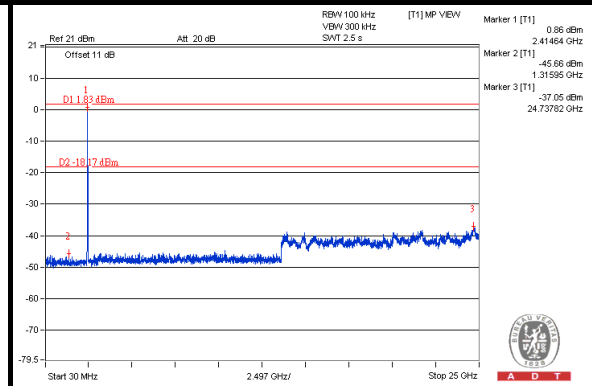
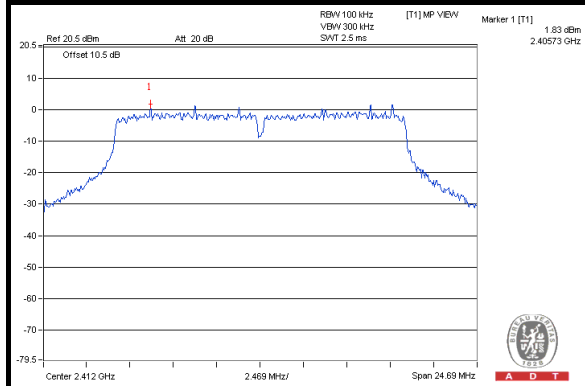




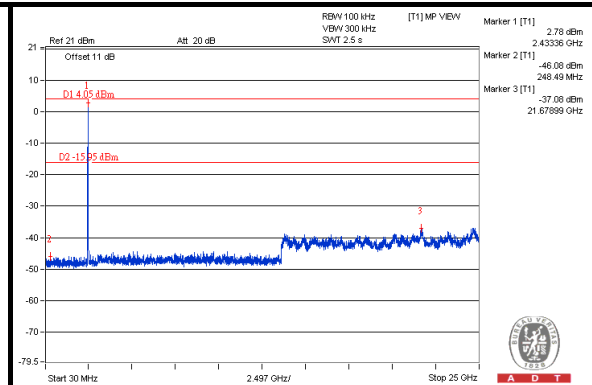
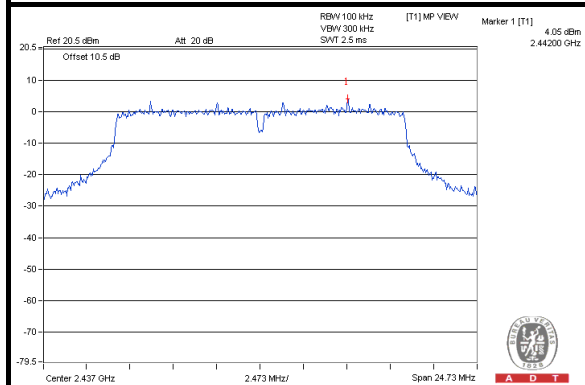
A D T

802.11g
CHAIN 0

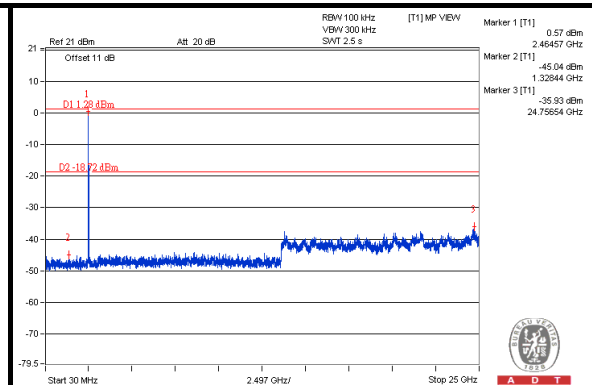
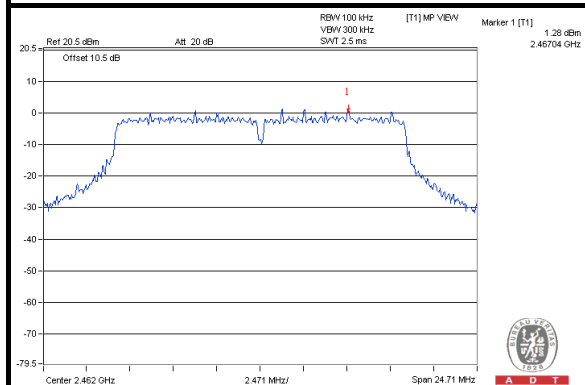
CH 1



CH 6



CH 11

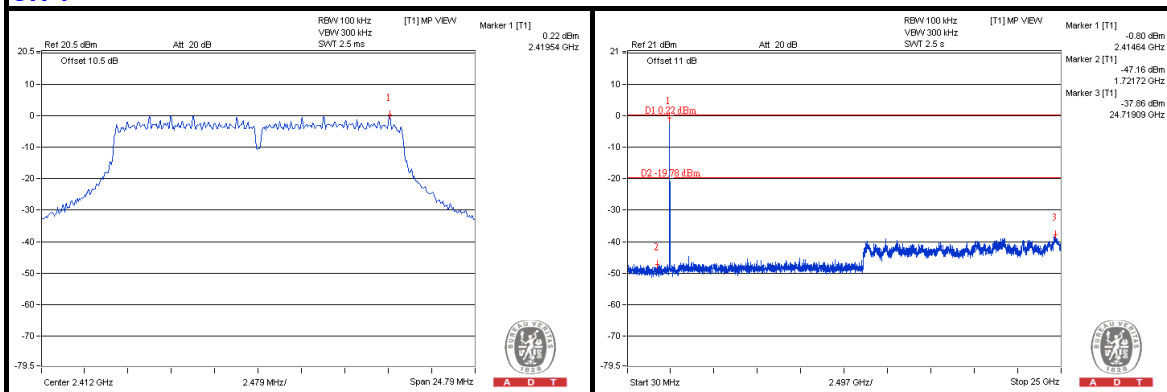




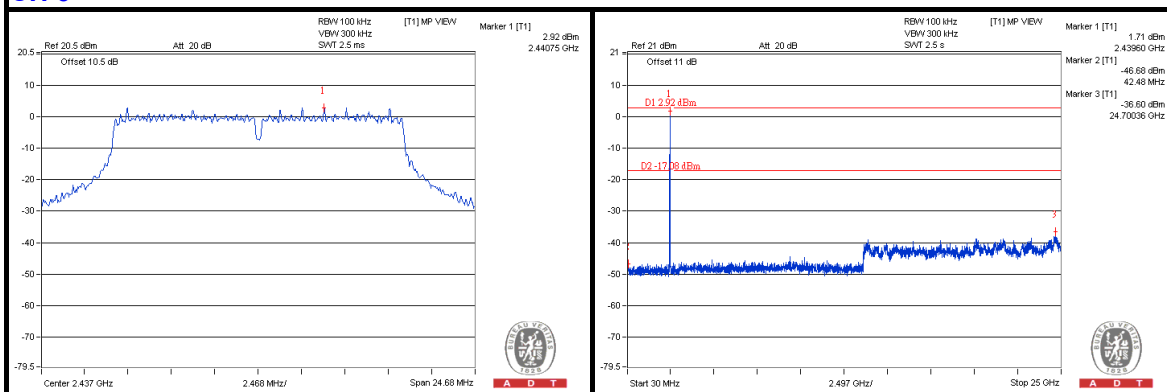
A D T

CHAIN 1

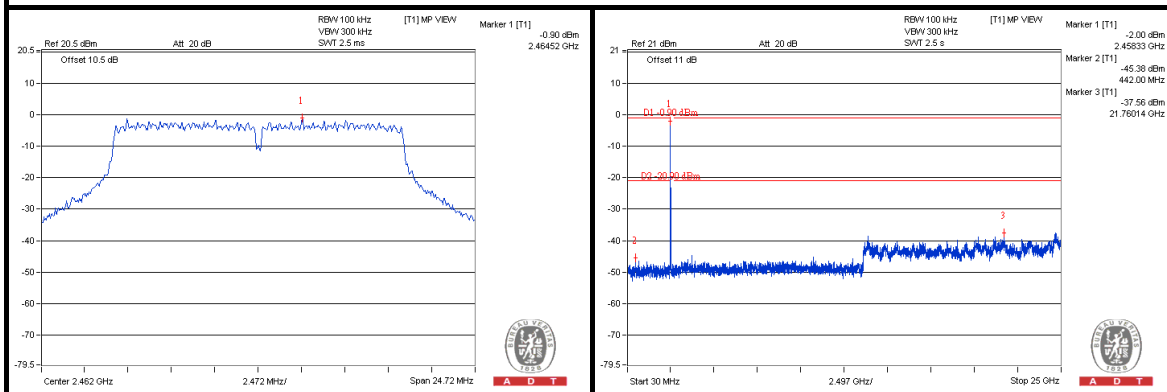
CH 1



CH 6



CH 11

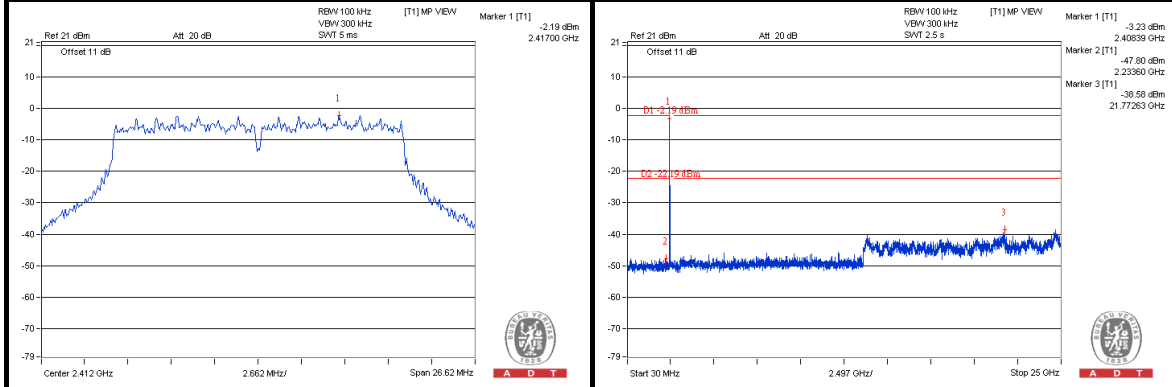




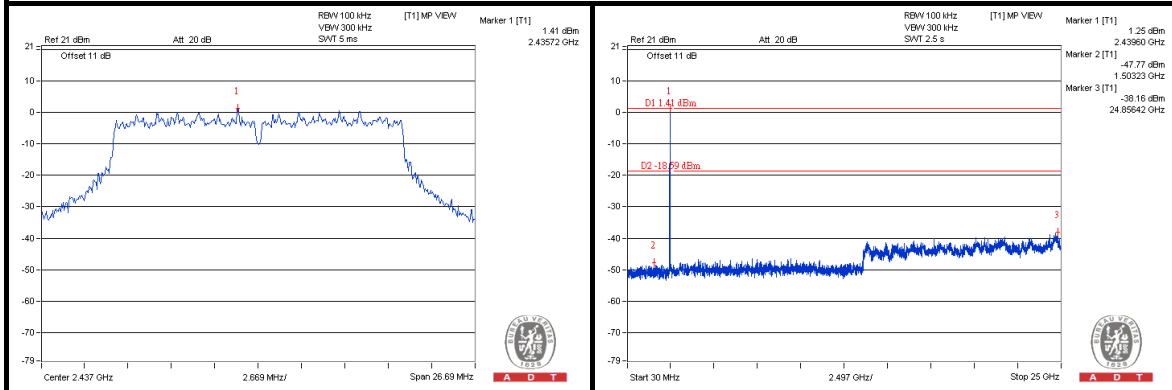
A D T

802.11n (20MHz) CHAIN 0

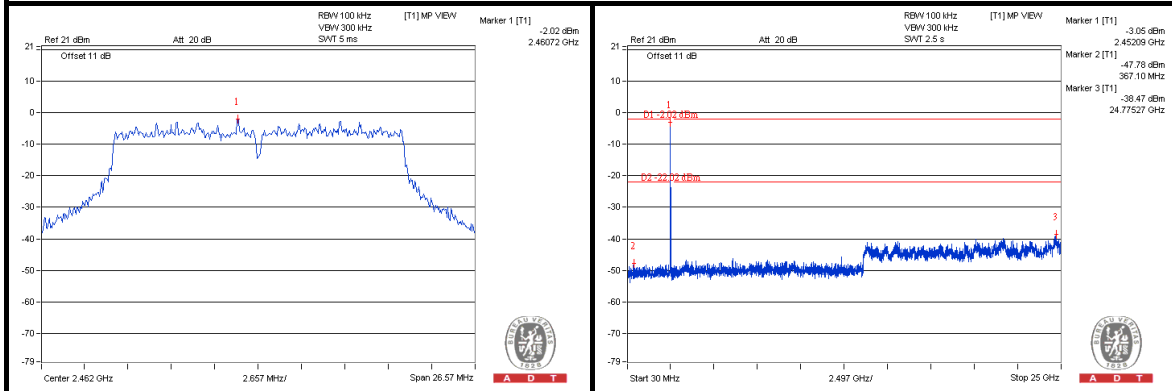
CH 1



CH 6



CH 11

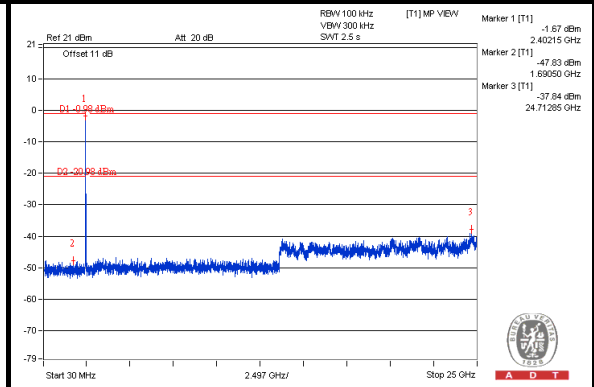
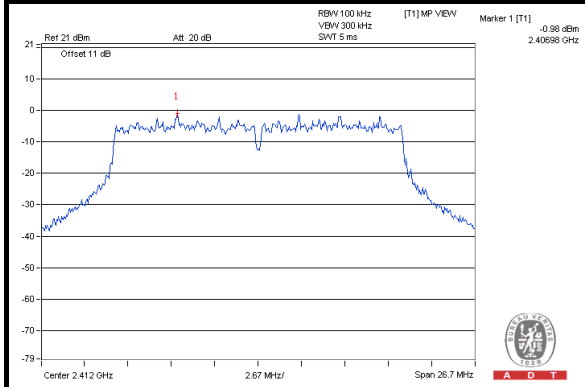




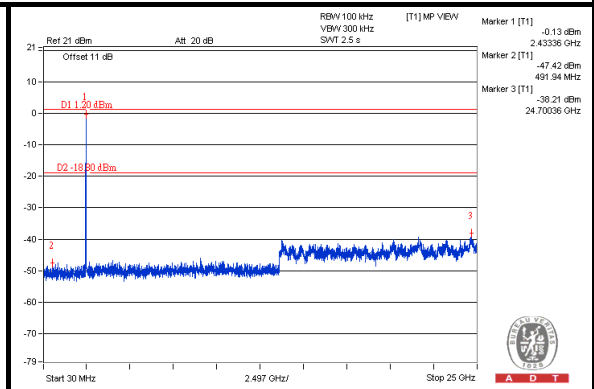
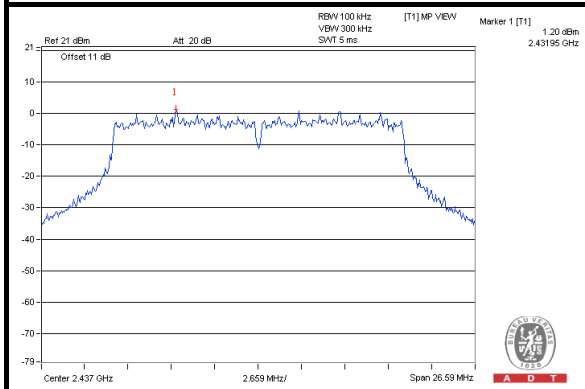
A D T

CHAIN 1

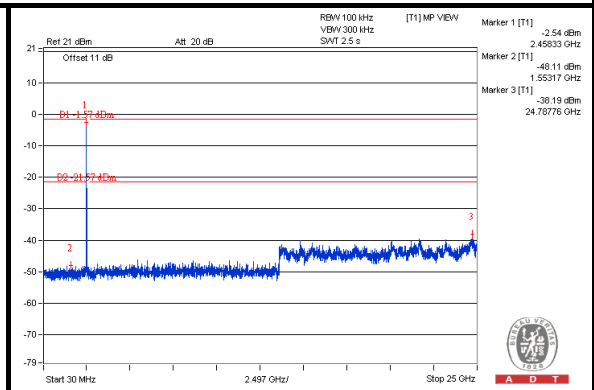
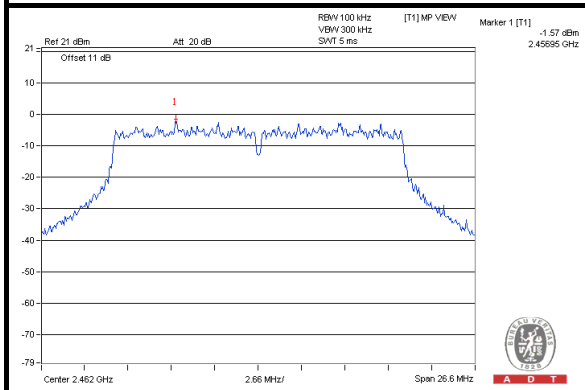
CH 1



CH 6

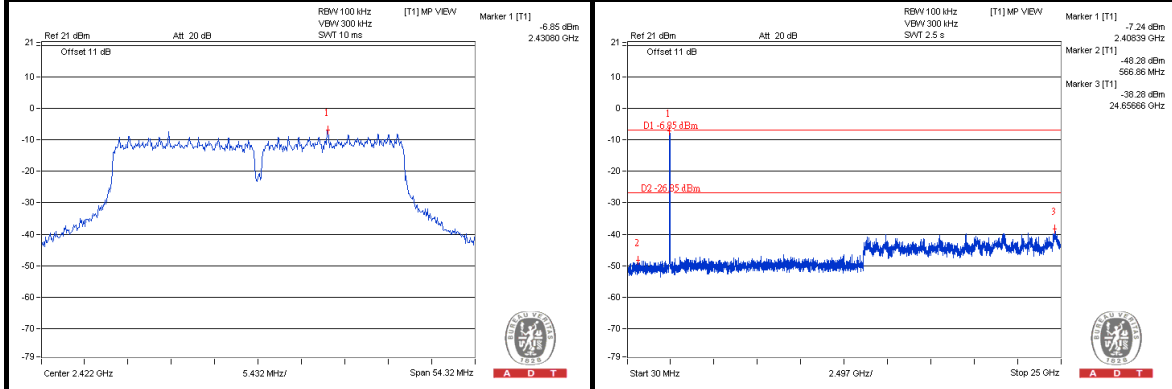


CH 11

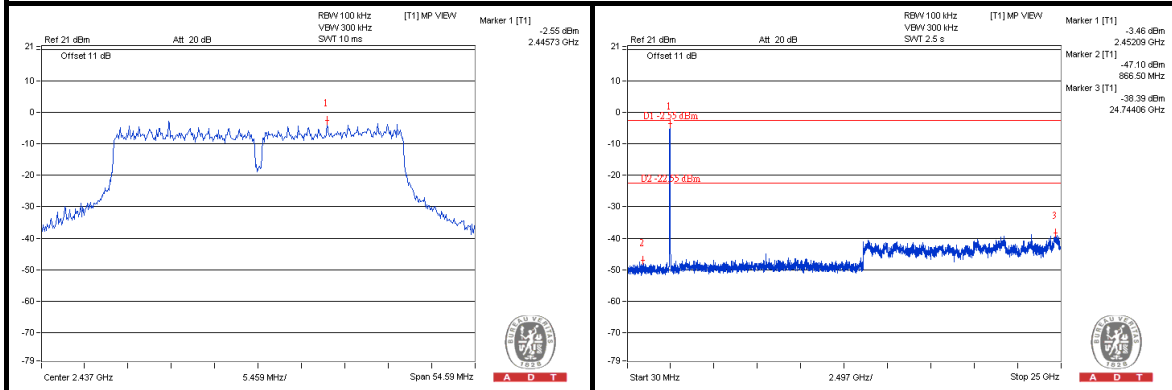


802.11n (40MHz) CHAIN 0

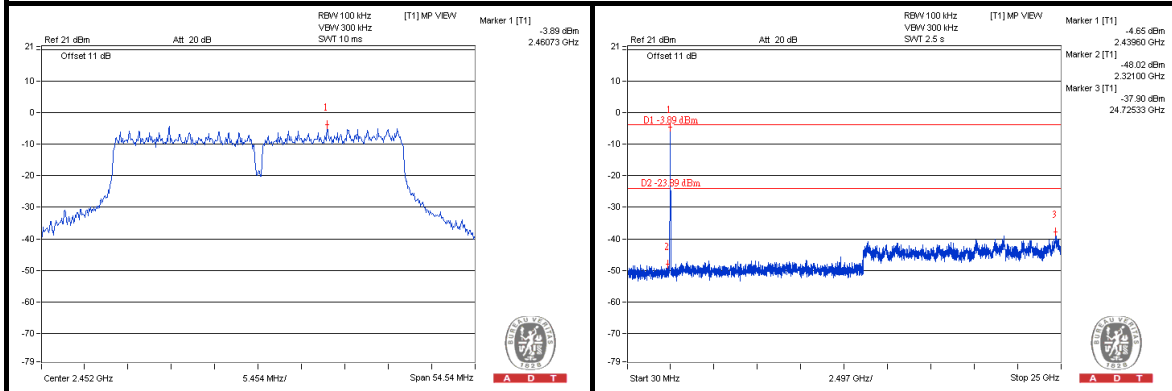
CH 3



CH 6



CH 9

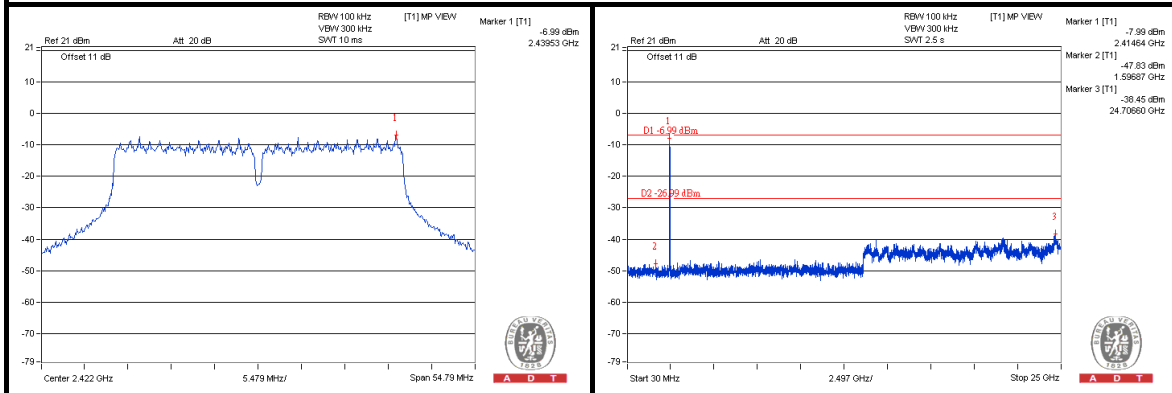




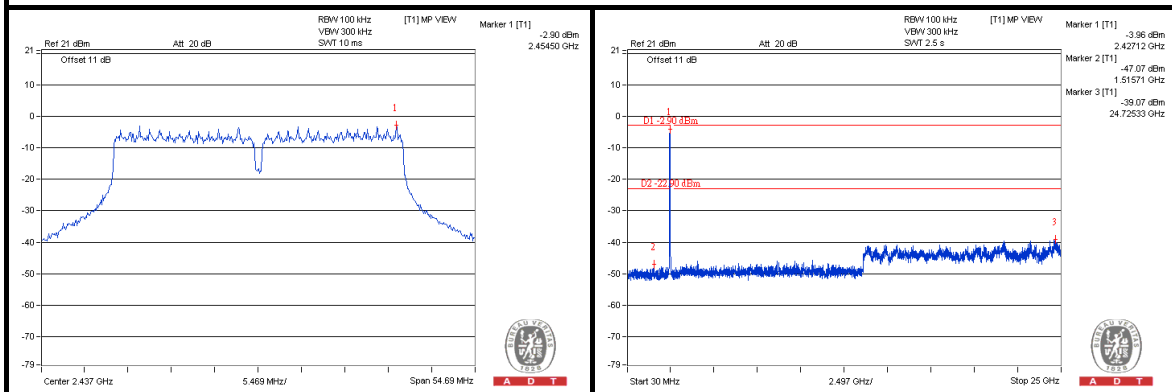
A D T

CHAIN 1

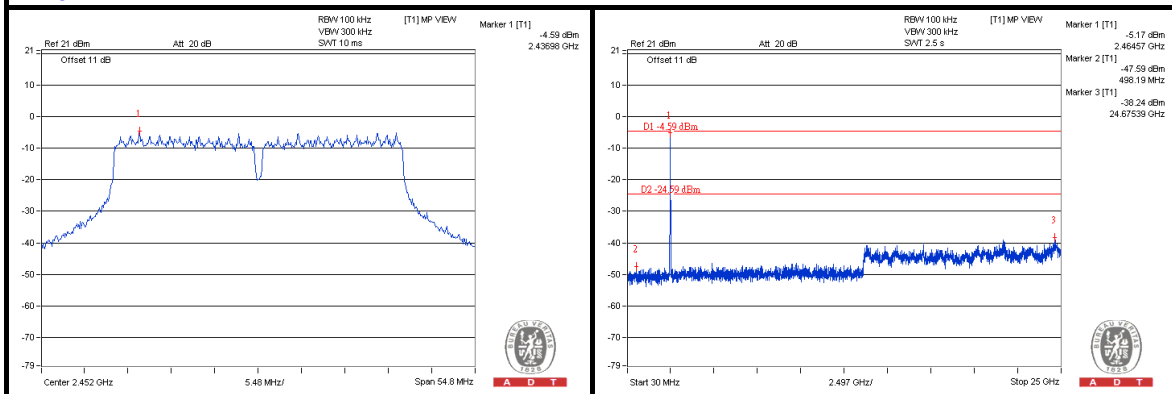
CH 3



CH 6



CH 9



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.



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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.



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5.1.7 TEST RESULTS

ABOVE 1GHz DATA :

802.11a: 1TX

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	24deg. C, 69%RH	TESTED BY	Ted Chang
TX FUNCTION	1TX		

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	63.0 PK	80.4	-17.4	1.13 H	217	22.90	40.10
2	#5725.00	52.0 AV	69.4	-17.4	1.13 H	217	11.90	40.10
3	*5745.00	100.4 PK			1.08 H	42	60.20	40.20
4	*5745.00	89.4 AV			1.08 H	42	49.20	40.20
5	11490.00	59.4 PK	74.0	-14.6	1.00 H	164	6.60	52.80
6	11490.00	46.7 AV	54.0	-7.3	1.00 H	164	-6.10	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	57.9 PK	75.3	-17.4	1.13 V	217	17.80	40.10
2	#5725.00	47.2 AV	64.6	-17.4	1.13 V	217	7.10	40.10
3	*5745.00	95.3 PK			1.00 V	216	55.10	40.20
4	*5745.00	84.6 AV			1.00 V	216	44.40	40.20
5	11490.00	63.5 PK	74.0	-10.5	1.45 V	185	10.70	52.80
6	11490.00	50.1 AV	54.0	-3.9	1.45 V	185	-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.



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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	24deg. C, 69%RH	TESTED BY	Ted Chang
TX FUNCTION	1TX		

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	98.9 PK			1.08 H	47	58.60	40.30
2	*5785.00	88.2 AV			1.08 H	47	47.90	40.30
3	11570.00	60.6 PK	74.0	-13.4	1.02 H	136	8.00	52.60
4	11570.00	46.9 AV	54.0	-7.1	1.02 H	136	-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	*5785.00	93.4 PK			1.00 V	220	53.10	40.30
2	*5785.00	83.5 AV			1.00 V	220	43.20	40.30
3	11570.00	64.3 PK	74.0	-9.7	1.48 V	188	11.70	52.60
4	11570.00	49.3 AV	54.0	-4.7	1.48 V	188	-3.30	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.



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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	24deg. C, 69%RH	TESTED BY	Ted Chang
TX FUNCTION	1TX		

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	100.0 PK			1.07 H	48	59.60	40.40
2	*5825.00	89.2 AV			1.07 H	48	48.80	40.40
3	#5850.00	59.3 PK	80.0	-20.7	1.14 H	17	18.80	40.50
4	#5850.00	48.5 AV	69.2	-20.7	1.14 H	17	8.00	40.50
5	11650.00	59.5 PK	74.0	-14.5	1.22 H	328	7.00	52.50
6	11650.00	47.6 AV	54.0	-6.4	1.22 H	328	-4.90	52.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	94.9 PK			1.00 V	226	54.50	40.40
2	*5825.00	85.1 AV			1.00 V	226	44.70	40.40
3	#5850.00	54.2 PK	74.9	-20.7	1.14 V	17	13.70	40.50
4	#5850.00	44.4 AV	65.1	-20.7	1.14 V	17	3.90	40.50
5	11650.00	62.0 PK	74.0	-12.0	1.52 V	186	9.50	52.50
6	11650.00	49.4 AV	54.0	-4.6	1.52 V	186	-3.10	52.50

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. “ * ”: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



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802.11a: 2TX

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	23deg. C, 67%RH	TESTED BY	Cedric Wu
TX FUNCTION	2TX		

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	61.8 PK	81.6	-19.8	1.00 H	210	29.50	32.30
2	#5725.00	50.8 AV	70.2	-19.4	1.00 H	210	18.50	32.30
3	*5745.00	101.6 PK			1.00 H	208	69.30	32.30
4	*5745.00	90.2 AV			1.00 H	208	57.90	32.30
5	11490.00	59.9 PK	74.0	-14.1	1.18 H	80	19.60	40.30
6	11490.00	46.9 AV	54.0	-7.1	1.18 H	80	6.60	40.30
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	#5725.00	57.6 PK	76.8	-19.2	1.00 V	50	25.30	32.30
2	#5725.00	45.0 AV	63.9	-18.9	1.00 V	50	12.70	32.30
3	*5745.00	96.8 PK			1.00 V	53	64.50	32.30
4	*5745.00	83.9 AV			1.00 V	53	51.60	32.30
5	11490.00	66.5 PK	74.0	-7.5	1.00 V	3	26.20	40.30
6	11490.00	49.3 AV	54.0	-4.7	1.00 V	3	9.00	40.30

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#": The radiated frequency is out the restricted band.



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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	23deg. C, 67%RH	TESTED BY	Cedric Wu
TX FUNCTION	2TX		

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	101.3 PK			1.00 H	199	68.90	32.40
2	*5785.00	89.8 AV			1.00 H	199	57.40	32.40
3	11570.00	59.6 PK	74.0	-14.4	1.15 H	77	19.40	40.20
4	11570.00	46.3 AV	54.0	-7.7	1.15 H	77	6.10	40.20
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	*5785.00	95.4 PK			1.00 V	58	63.00	32.40
2	*5785.00	83.3 AV			1.00 V	58	50.90	32.40
3	11570.00	61.0 PK	74.0	-13.0	1.00 V	7	20.80	40.20
4	11570.00	48.7 AV	54.0	-5.3	1.00 V	7	8.50	40.20

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.
6. The limit value is defined as per 15.247.



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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	23deg. C, 67%RH	TESTED BY	Cedric Wu
TX FUNCTION	2TX		

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	101.9 PK			1.00 H	204	69.50	32.40
2	*5825.00	89.7 AV			1.00 H	204	57.30	32.40
3	#5850.00	54.6 PK	81.9	-27.3	1.00 H	200	22.10	32.50
4	#5850.00	42.5 AV	69.7	-27.2	1.00 H	200	10.00	32.50
5	11650.00	59.0 PK	74.0	-15.0	1.10 H	90	19.00	40.00
6	11650.00	46.6 AV	54.0	-7.4	1.10 H	90	6.60	40.00
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	96.2 PK			1.00 V	36	63.80	32.40
2	*5825.00	83.7 AV			1.00 V	36	51.30	32.40
3	#5850.00	36.6 PK	76.2	-39.6	1.00 V	40	4.10	32.50
4	#5850.00	66.8 AV	63.7	3.1	1.00 V	40	34.30	32.50
5	11650.00	66.7 PK	74.0	-7.3	1.00 V	10	26.70	40.00
6	11650.00	49.7 AV	54.0	-4.3	1.00 V	10	9.70	40.00

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.



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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	24deg. C, 69%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	62.1 PK	81.5	-19.4	1.45 H	176	22.00	40.10
2	#5725.00	51.0 AV	70.4	-19.4	1.45 H	176	10.90	40.10
3	*5745.00	101.5 PK			1.10 H	44	61.30	40.20
4	*5745.00	90.4 AV			1.10 H	44	50.20	40.20
5	11490.00	59.6 PK	74.0	-14.4	1.88 H	289	6.80	52.80
6	11490.00	46.7 AV	54.0	-7.3	1.88 H	289	-6.10	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	57.2 PK	76.6	-19.4	1.45 V	176	17.10	40.10
2	#5725.00	44.5 AV	63.8	-19.3	1.45 V	176	4.40	40.10
3	*5745.00	96.6 PK			1.74 V	180	56.40	40.20
4	*5745.00	83.8 AV			1.74 V	180	43.60	40.20
5	11490.00	66.2 PK	74.0	-7.8	1.00 V	105	13.40	52.80
6	11490.00	49.0 AV	54.0	-5.0	1.00 V	105	-3.80	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

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	24deg. C, 69%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	101.6 PK			1.00 H	49	61.30	40.30
2	*5785.00	90.0 AV			1.00 H	49	49.70	40.30
3	11570.00	59.7 PK	74.0	-14.3	1.32 H	110	7.10	52.60
4	11570.00	46.5 AV	54.0	-7.5	1.32 H	110	-6.10	52.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	95.0 PK			1.11 V	217	54.70	40.30
2	*5785.00	83.0 AV			1.11 V	217	42.70	40.30
3	11570.00	60.7 PK	74.0	-13.3	1.05 V	183	8.10	52.60
4	11570.00	48.5 AV	54.0	-5.5	1.05 V	183	-4.10	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.



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	24deg. C, 69%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	101.6 PK			1.65 H	54	61.20	40.40
2	*5825.00	89.4 AV			1.65 H	54	49.00	40.40
3	#5850.00	54.4 PK	81.6	-27.2	1.62 H	51	13.90	40.50
4	#5850.00	42.2 AV	69.4	-27.2	1.62 H	51	1.70	40.50
5	11650.00	59.1 PK	74.0	-14.9	1.39 H	258	6.60	52.50
6	11650.00	46.8 AV	54.0	-7.2	1.39 H	258	-5.70	52.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	96.0 PK			1.00 V	225	55.60	40.40
2	*5825.00	83.6 AV			1.00 V	225	43.20	40.40
3	#5850.00	48.8 PK	76.0	-27.2	1.62 V	51	8.30	40.50
4	#5850.00	36.4 AV	63.6	-27.2	1.62 V	51	-4.10	40.50
5	11650.00	66.5 PK	74.0	-7.5	1.42 V	211	14.00	52.50
6	11650.00	49.4 AV	54.0	-4.6	1.42 V	211	-3.10	52.50

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. " * ": 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	24deg. C, 69%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	62.5 PK	78.4	-15.9	1.00 H	44	22.40	40.10
2	#5725.00	51.0 AV	66.6	-15.6	1.00 H	44	10.90	40.10
3	*5755.00	98.4 PK			1.09 H	45	58.20	40.20
4	*5755.00	86.6 AV			1.09 H	45	46.40	40.20
5	11510.00	61.3 PK	74.0	-12.7	1.53 H	158	8.60	52.70
6	11510.00	46.8 AV	54.0	-7.2	1.53 H	158	-5.90	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	56.4 PK	72.3	-15.9	1.00 V	44	16.30	40.10
2	#5725.00	44.5 AV	60.5	-16.0	1.00 V	44	4.40	40.10
3	*5755.00	92.3 PK			1.00 V	218	52.10	40.20
4	*5755.00	80.5 AV			1.00 V	218	40.30	40.20
5	11510.00	66.8 PK	74.0	-7.2	1.58 V	213	14.10	52.70
6	11510.00	50.7 AV	54.0	-3.3	1.58 V	213	-2.00	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	24deg. C, 69%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	99.8 PK			1.00 H	45	59.50	40.30
2	*5795.00	87.9 AV			1.00 H	45	47.60	40.30
3	#5850.00	61.1 PK	79.8	-18.7	1.07 H	177	20.60	40.50
4	#5850.00	49.2 AV	67.9	-18.7	1.07 H	177	8.70	40.50
5	11590.00	59.8 PK	74.0	-14.2	1.05 H	136	7.30	52.50
6	11590.00	46.8 AV	54.0	-7.2	1.05 H	136	-5.70	52.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	93.0 PK			2.00 V	174	52.70	40.30
2	*5795.00	81.4 AV			2.00 V	174	41.10	40.30
3	#5850.00	54.3 PK	73.0	-18.7	1.07 V	177	13.80	40.50
4	#5850.00	42.7 AV	61.4	-18.7	1.07 V	177	2.20	40.50
5	11590.00	66.0 PK	74.0	-8.0	1.69 V	249	13.50	52.50
6	11590.00	49.9 AV	54.0	-4.1	1.69 V	249	-2.60	52.50

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. “ * “: 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 : 802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 69%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	84.23	34.7 QP	40.0	-5.3	1.00 H	128	25.80	8.90
2	165.73	36.1 QP	43.5	-7.4	1.00 H	78	22.70	13.40
3	299.62	36.4 QP	46.0	-9.6	1.24 H	269	22.10	14.30
4	344.24	33.3 QP	46.0	-12.7	1.24 H	167	17.80	15.50
5	664.41	35.3 QP	46.0	-10.7	1.00 H	68	12.70	22.60
6	761.43	32.7 QP	46.0	-13.3	1.50 H	61	8.60	24.10
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	84.23	27.7 QP	40.0	-12.3	1.50 V	82	18.80	8.90
2	165.73	28.6 QP	43.5	-14.9	1.00 V	153	15.20	13.40
3	336.48	32.7 QP	46.0	-13.3	1.24 V	67	17.40	15.30
4	431.56	31.7 QP	46.0	-14.3	1.00 V	174	14.00	17.70
5	497.54	30.4 QP	46.0	-15.6	1.99 V	6	11.30	19.10
6	697.40	30.7 QP	46.0	-15.3	1.99 V	77	7.70	23.00

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.

5.2 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 4.2.6.

5.2.7 TEST RESULTS

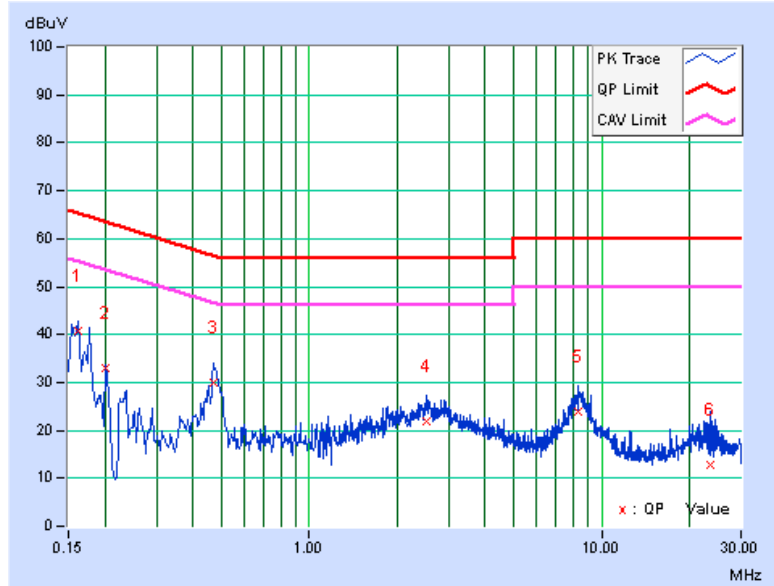
CONDUCTED WORST-CASE DATA : 802.11a

PHASE	Line 1	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16173	0.15	40.66	26.29	40.81	26.44	65.37	55.37	-24.57	-28.94
2	0.20083	0.15	32.83	19.23	32.98	19.38	63.58	53.58	-30.60	-34.20
3	0.47039	0.20	29.69	19.07	29.89	19.27	56.51	46.51	-26.61	-27.23
4	2.52728	0.29	21.75	16.55	22.04	16.84	56.00	46.00	-33.96	-29.16
5	8.35708	0.61	23.38	16.46	23.99	17.07	60.00	50.00	-36.01	-32.93
6	23.45751	1.40	11.28	4.38	12.68	5.78	60.00	50.00	-47.32	-44.22

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.

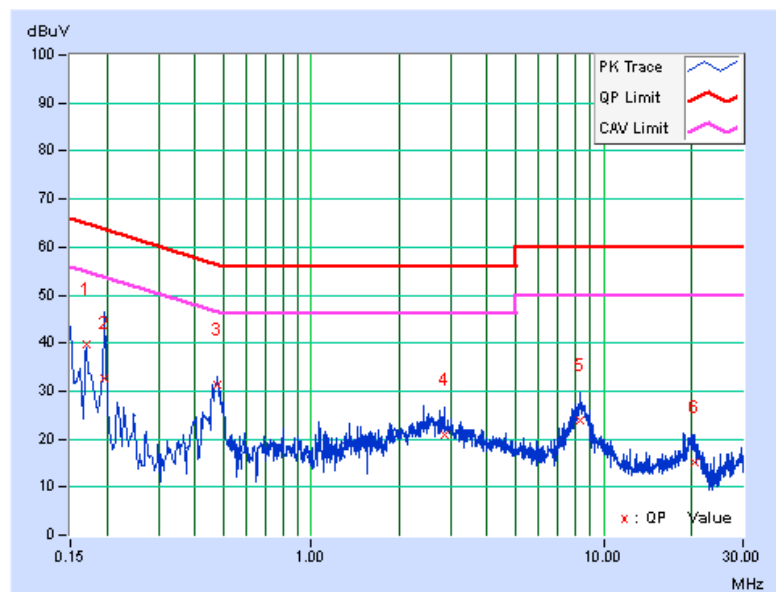


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16967	0.20	39.46	26.75	39.66	26.95	64.98	54.98	-25.32	-28.03
2	0.19692	0.20	32.38	21.07	32.58	21.27	63.74	53.74	-31.16	-32.47
3	0.47663	0.26	31.21	22.39	31.47	22.65	56.40	46.40	-24.93	-23.75
4	2.84399	0.35	20.41	14.85	20.76	15.20	56.00	46.00	-35.24	-30.80
5	8.33754	0.57	23.44	16.52	24.01	17.09	60.00	50.00	-35.99	-32.91
6	20.39207	0.99	14.31	7.33	15.30	8.32	60.00	50.00	-44.70	-41.68

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: 1TX

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.45	0.5	PASS
157	5785	16.43	0.5	PASS
165	5825	16.44	0.5	PASS

802.11a: 2TX

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.42	16.41	0.5	PASS
157	5785	16.39	16.44	0.5	PASS
165	5825	16.42	16.43	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	17.73	17.69	0.5	PASS
157	5785	17.73	17.78	0.5	PASS
165	5825	17.71	17.69	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	35.21	35.25	0.5	PASS
159	5795	35.22	35.55	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 ≥ 40 MHz for any NANT;

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

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

5.4.2 TEST SETUP

Same as Item 4.4.2.

5.4.3 INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.4.4 TEST PROCEDURES

Same as Item 4.4.4.

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: 1TX

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
149	5745	148.252	21.71	30	PASS
157	5785	146.555	21.66	30	PASS
165	5825	151.705	21.81	30	PASS

802.11a: 2TX

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	19.28	20.01	184.954	22.67	30	PASS
157	5785	19.34	20.26	192.071	22.83	30	PASS
165	5825	19.75	20.34	202.549	23.07	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	20.07	19.43	189.325	22.77	30	PASS
157	5785	20.04	19.59	191.916	22.83	30	PASS
165	5825	20.35	19.32	193.900	22.88	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	20.43	18.83	186.792	22.71	30	PASS
159	5795	20.29	19.30	192.019	22.83	30	PASS

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: 1TX

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
149	5745	-14.40	8	PASS
157	5785	-14.39	8	PASS
165	5825	-13.37	8	PASS

802.11a: 2TX

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-12.35	3.01	-9.34	8	PASS
	157	5785	-12.02	3.01	-9.01	8	PASS
	165	5825	-11.07	3.01	-8.06	8	PASS
1	149	5745	-12.55	3.01	-9.54	8	PASS
	157	5785	-12.44	3.01	-9.43	8	PASS
	165	5825	-11.64	3.01	-8.63	8	PASS

NOTE: Directional gain = 1.56dBi + 10log(2) = 4.57dBi < 6dBi, so the limit no need to reduced.

802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-15.73	3.01	-12.72	8	PASS
	157	5785	-15.11	3.01	-12.10	8	PASS
	165	5825	-14.60	3.01	-11.59	8	PASS
1	149	5745	-15.84	3.01	-12.83	8	PASS
	157	5785	-16.15	3.01	-13.14	8	PASS
	165	5825	-15.04	3.01	-12.03	8	PASS

NOTE: Directional gain = 1.56dBi + 10log(2) = 4.57dBi < 6dBi, so the limit no need to reduced.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-17.46	3.01	-14.45	8	PASS
	159	5795	-16.54	3.01	-13.53	8	PASS
1	151	5755	-18.98	3.01	-15.97	8	PASS
	159	5795	-16.92	3.01	-13.91	8	PASS

NOTE: Directional gain = 1.56dBi + 10log(2) = 4.57dBi < 6dBi, so the limit no need to reduced.

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.

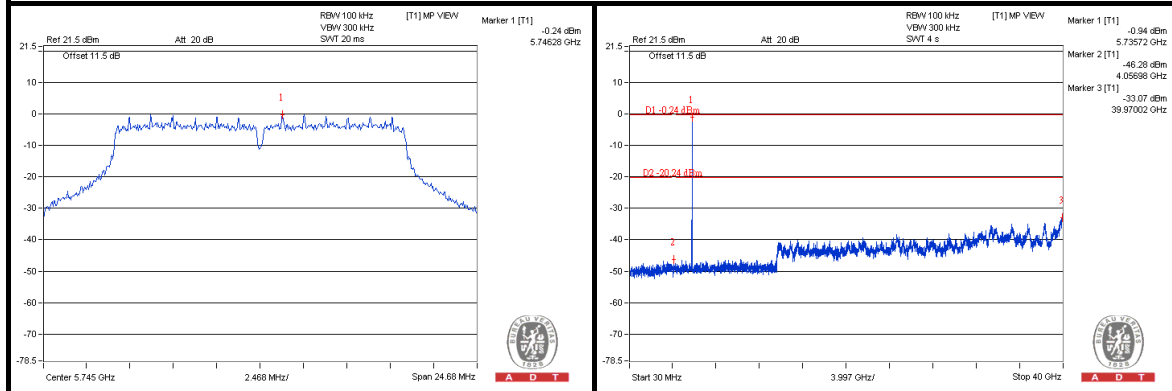
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



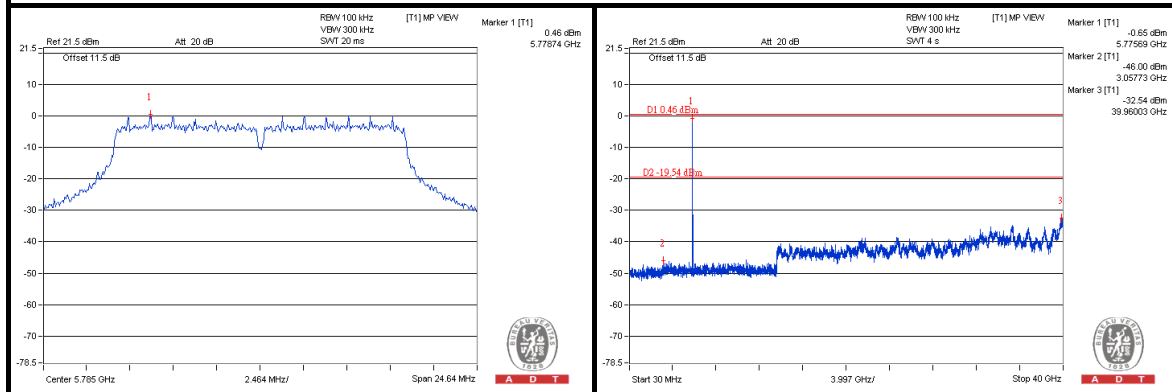
A D T

802.11a: 1TX

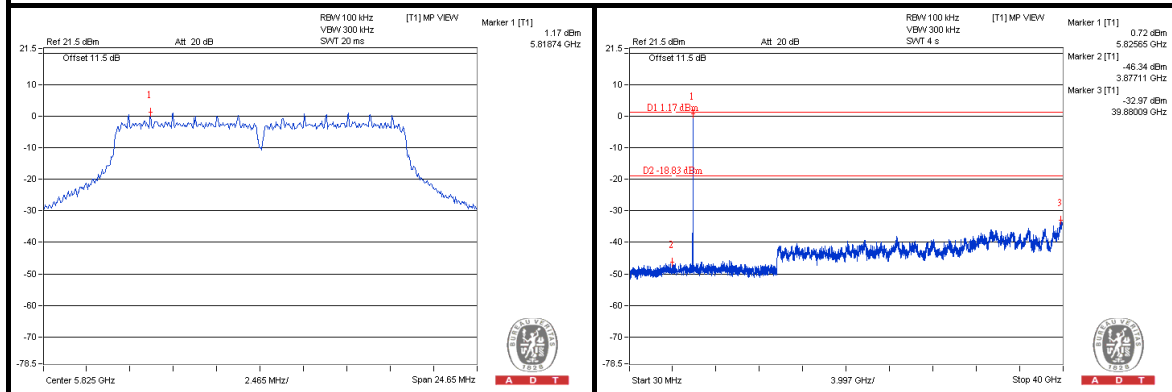
CH 149



CH 157



CH 165

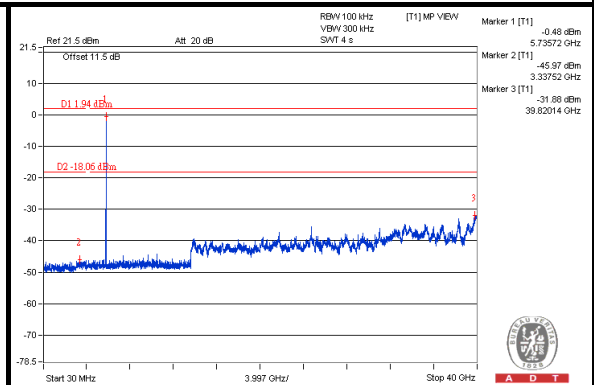
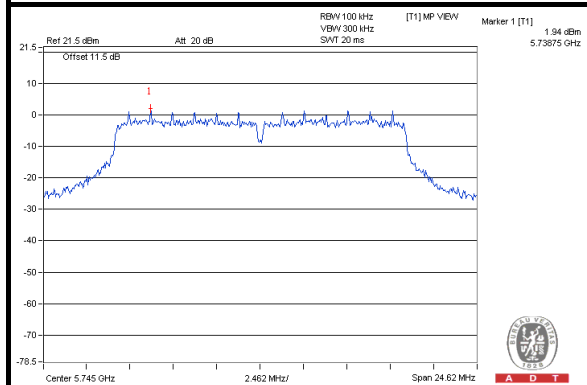




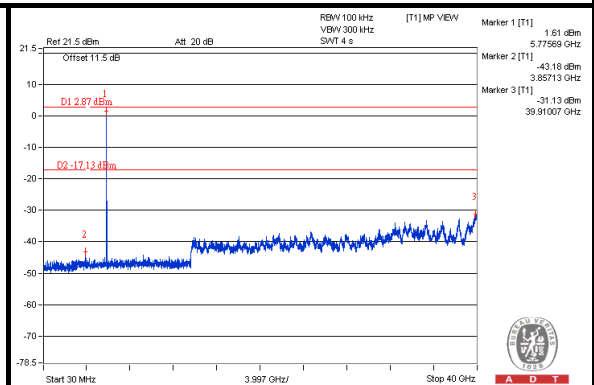
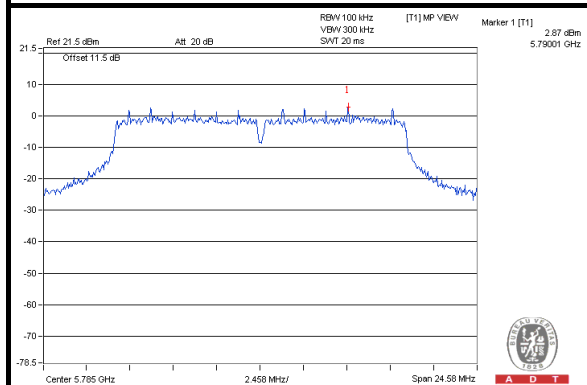
A D T

802.11a CHAIN 0

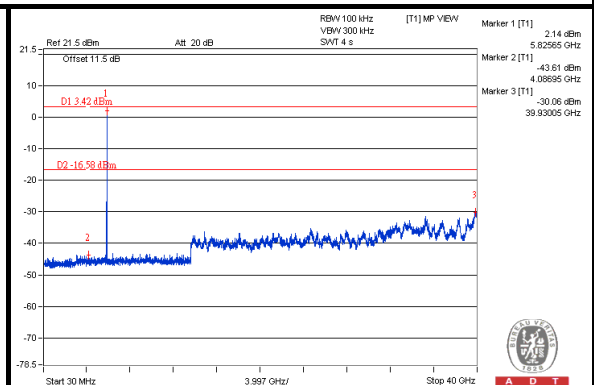
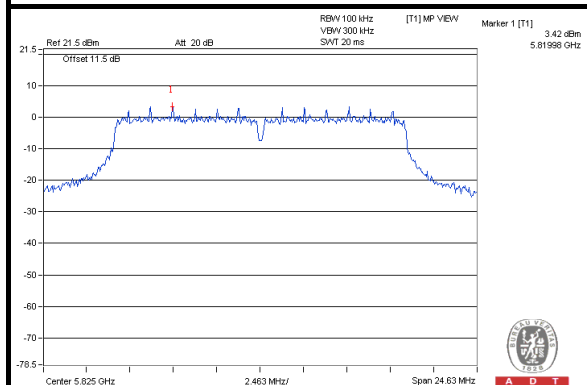
CH 149



CH 157



CH 165

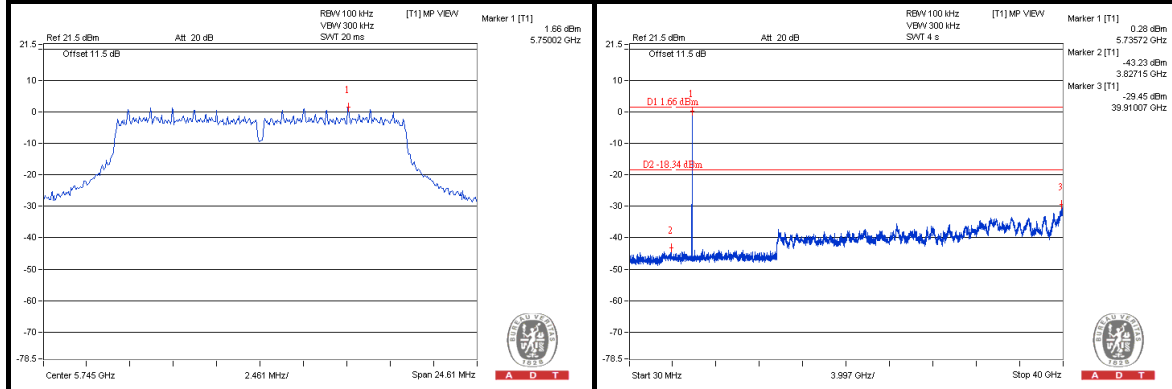




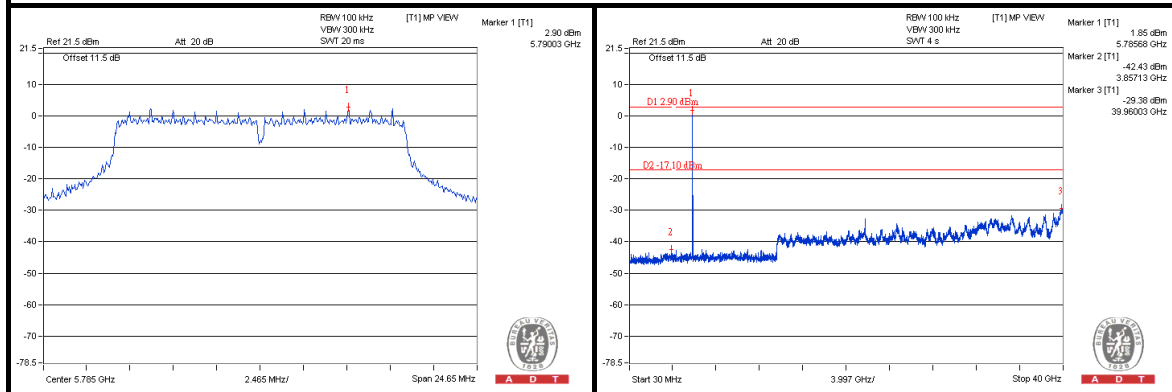
A D T

CHAIN 1

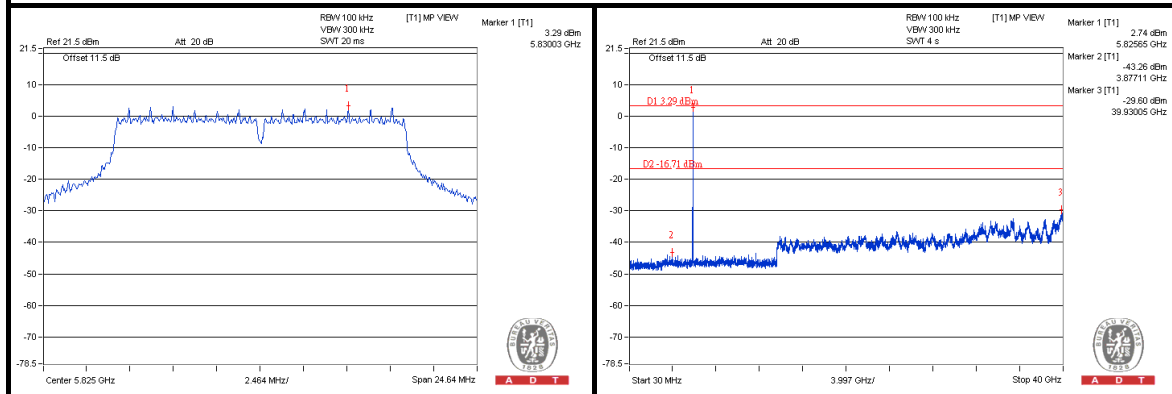
CH 149



CH 157



CH 165



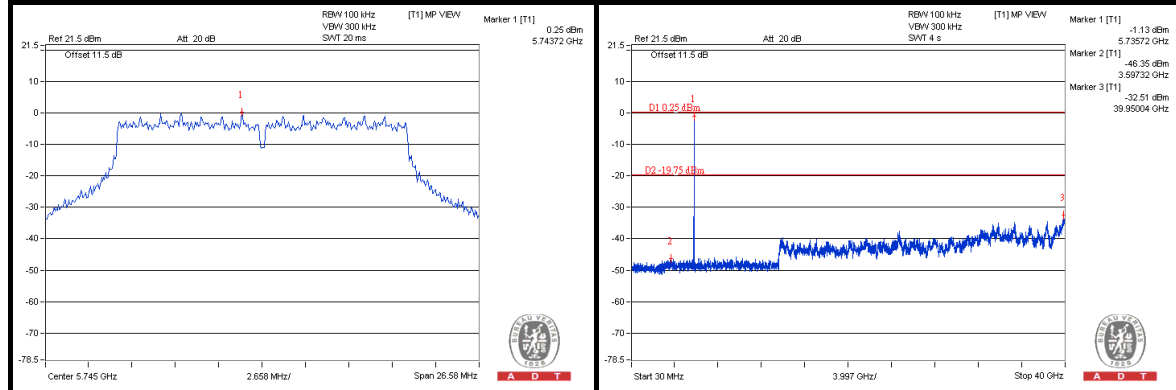


A D T

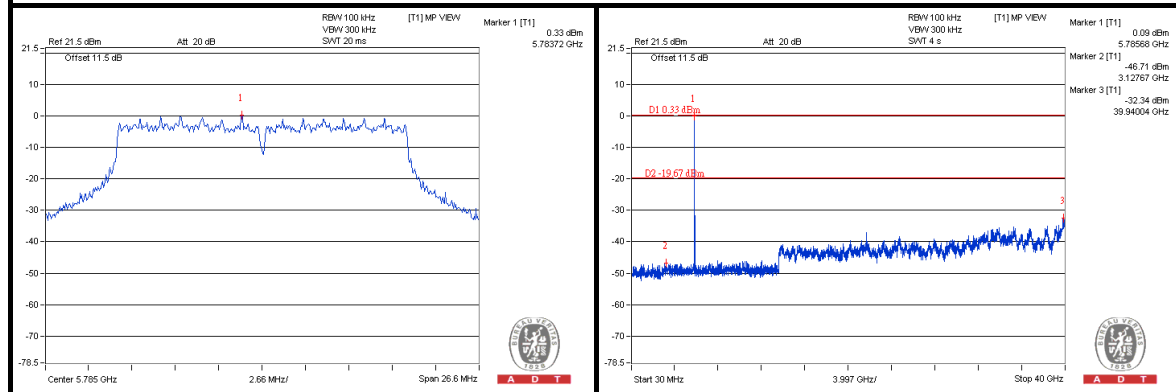
802.11n (20MHz)

CHAIN 0

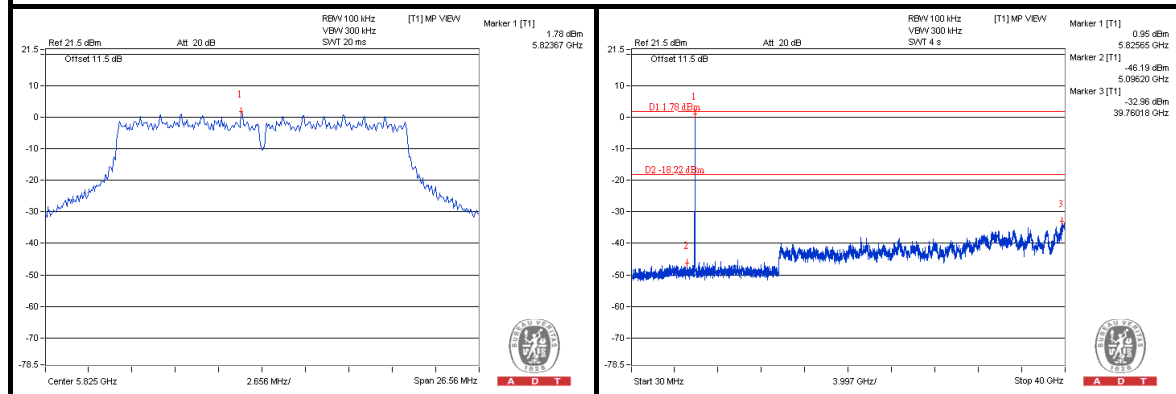
CH 149



CH 157



CH 165

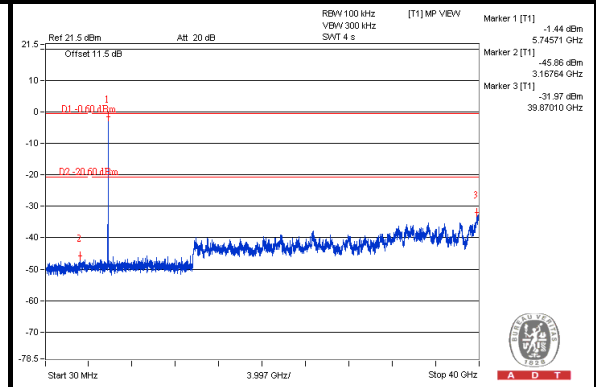
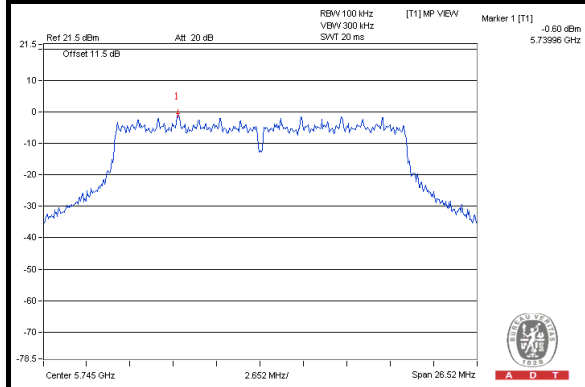




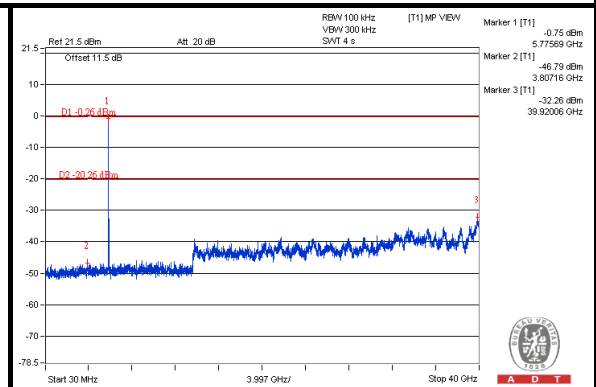
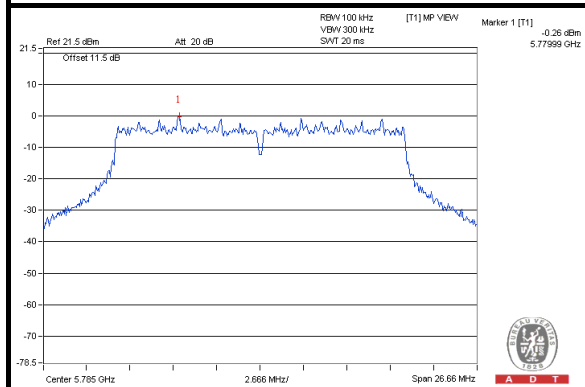
A D T

CHAIN 1

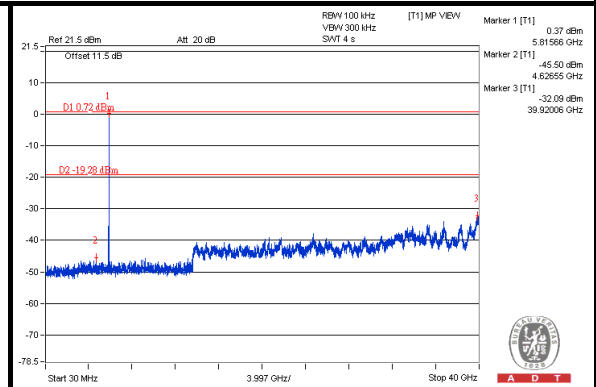
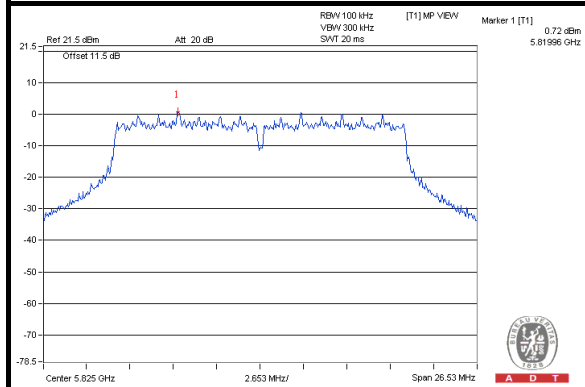
CH 149



CH 157



CH 165



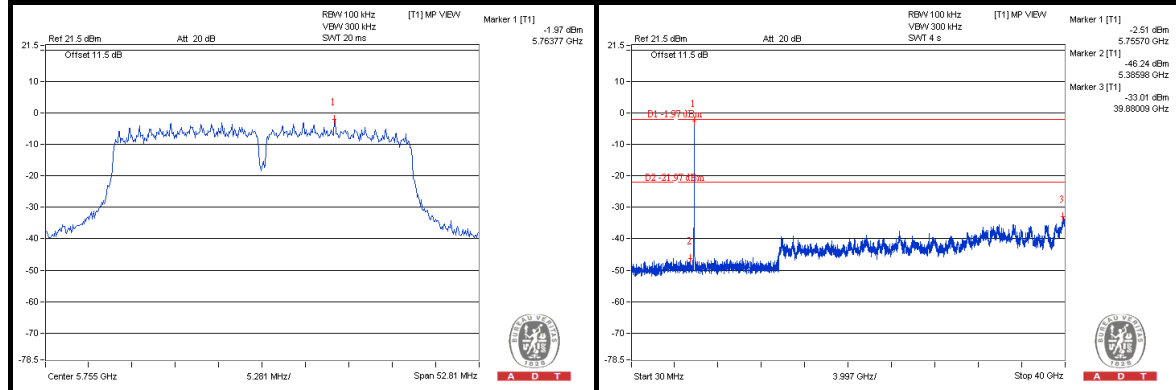


A D T

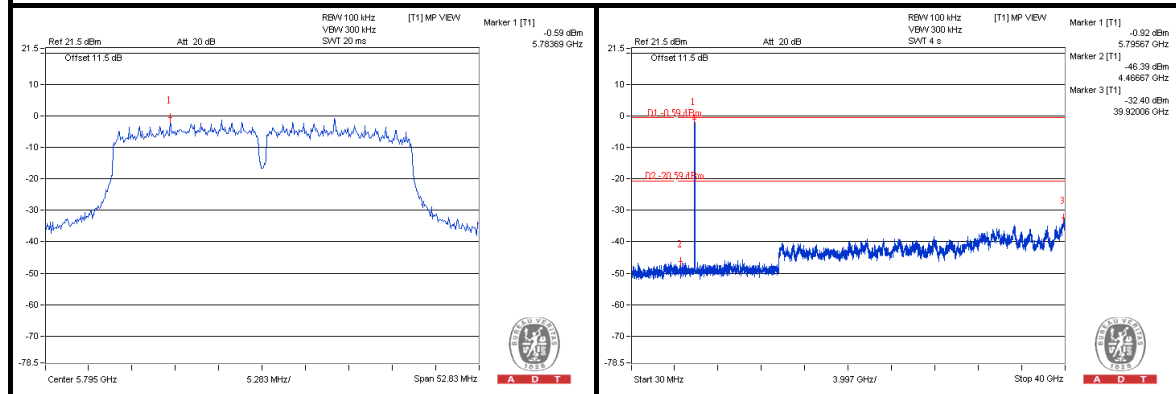
802.11n (40MHz)

CHAIN 0

CH 151



CH 159

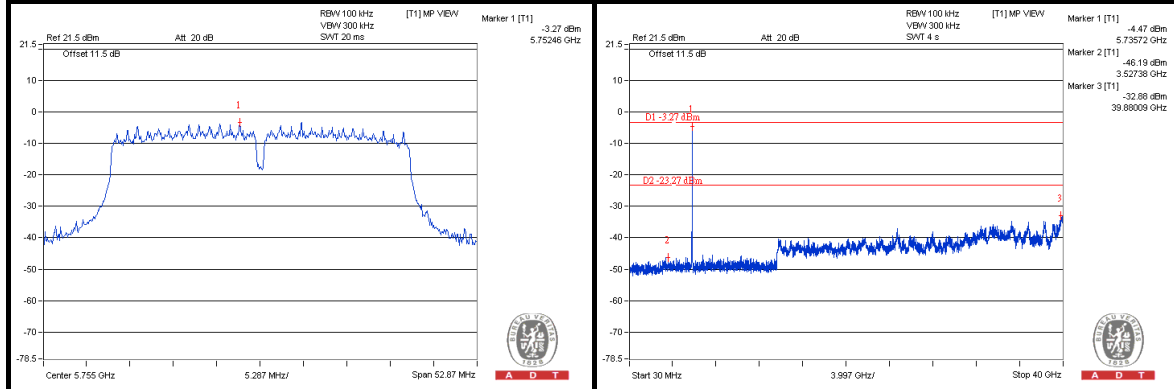




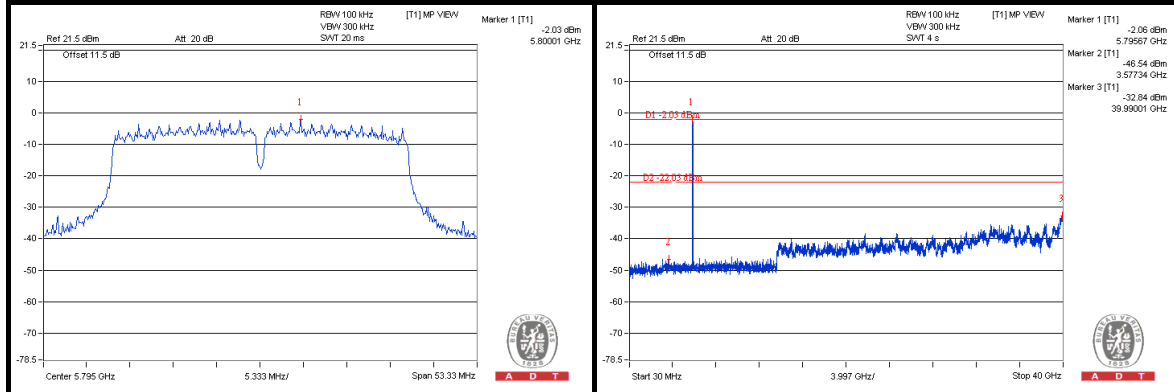
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CHAIN 1

CH 151



CH 159





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6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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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:

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Fax: 886-2-26051924

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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.



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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---