



FCC TEST REPORT

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MODEL NO.: RTL8192SE

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ISSUED: June 04, 2009

APPLICANT: Realtek Semiconductor Corp.

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1. CERTIFICATION

PRODUCT : 802.11 b/g/n RTL8192SE miniCard

MODEL NO.: RTL8192SE

BRAND : Realtek

APPLICANT : Realtek Semiconductor Corp.

TESTED : April 22 to May 22, 2009

TEST SAMPLE : PROTOTYPE

STANDARDS : FCC Part 15, Subpart C (Section 15.247),
ANSI C63.4-2003

The above equipment (Model: RTL8192SE) 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 : Midoli Peng , **DATE:** June 03, 2009
(Midoli Peng, Specialist)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** June 03, 2009
Responsible for RF (Hank Chung, Deputy Manager)

APPROVED BY : May Chen , **DATE:** June 03, 2009
(May Chen, Deputy Manager)



2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -23.37dB at 0.272MHz.
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit : min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -0.61dB at 53.39MHz.
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

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:

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

Measurement	Value
Conducted emissions	2.44 dB
Radiated emissions (30MHz-1GHz)	3.94 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB



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3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	802.11 b/g/n RTL8192SE miniCard
MODEL NO.	RTL8192SE
FCC ID	TX2-RTL8192SE
POWER SUPPLY	DC 3.0~3.6V from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11 / 5.5 / 2 / 1Mbps 802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps Draft 802.11n (20MHz, 800ns GI): 130 / 117 / 104 / 78 / 65 / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5Mbps Draft 802.11n (40MHz, 800ns GI): 270 / 243 / 216 / 162 / 135 / 121.5 / 108 / 81 / 54 / 40.5 / 27 / 13.5Mbps Draft 802.11n (20MHz, 400ns GI): 144.444 / 130 / 115.556 / 86.667 / 72.2 / 65 / 57.8 / 57.778 / 43.333 / 43.3 / 28.9 / 28.889 / 21.7 / 14.444 / 14.4 / 7.2Mbps Draft 802.11n (40MHz, 400ns GI): 300 / 270 / 240 / 180 / 150 / 135 / 120 / 90 / 60 / 45 / 30 / 15Mbps
OPERATING FREQUENCY	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, draft 802.11n (20MHz) 7 for draft 802.11n (40MHz)
MAXIMUM OUTPUT POWER	802.11b: 226.986mW 802.11g: 354.813mW draft 802.11n (20MHz): 605.384mW draft 802.11n (40MHz): 497.819mW
ANTENNA TYPE	Please see note 1
DATA CABLE	NA
ASSOCIATED DEVICES	NA



NOTE:

1. There are seventy-five antennas provided to this EUT, please refer to the following table:

Item	Brand name	Model name	Antenna Type	Gain (dBi) With & W/O cable loss	Cable loss (dBi)	Connector Type
1	wistron	DQ661500301(Main) DQ661500301(Aux)	PIFA	3.95 3.90	N.A.	IPEX
2	Wistron	DQ661500115(Main) DQ661500115 (Aux)	PIFA	1.10 0.64	1.89 2.55	IPEX
3	Wgt	AR830WIPI01A (L) AR830WIPI02A ®	PIFA	2.17 2.39	-1.60 -2.03	IPEX
4	Wgt	AR320WIPI01B (L) AR320WIPI02B ®	PIFA	0.86 2.11	-1.43 -1.78	IPEX
5	Wgt	ARW62WIPI01G (L) ARW62WIP102G ®	PIFA	2.48 1.32	-2.39 -1.76	IPEX
6	Wgt	ARUMPWIPI02+C (L) ARUMPWIPI01+D (R)	PIFA	2.41 2.07	N.A.	IPEX
7	Foxconn	WDAN-GQMA6001-DF (Main) WDAN-GQMA6001-DF (Aux)	PIFA	2.32 1.10	-1.262 -1.813	IPEX
8	Foxconn	WDAN-GQMA6002-DF (Main) WDAN-GQMA6002-DF (Aux)	PIFA	0.74 0.78	-1.446 -2.009	IPEX
9	Galtronics	021020168NC3587 (Main) 021020168NC3587-1 (Aux)	PIFA	-0.25 3.64	1.75 2	U.FL
10	Galtronics	021020168NC3586 (Main) 021020168NC3586-1 (Aux)	PIFA	-0.04 3.25	1.9 1.85	U.FL
11	HIGH-TEK	AAFQ5050001LK0 (Main) AAFQ5050001RK0 (Aux)	PIFA	2.86 1.52	2.4 1.7	IPEX
12	Hitachi	HFT40-IV17 (Main) HMG03-IV17 (Aux)	PIFA	0.48 0.64	N.A.	IPEX
13	WNC	81.EE215.016 (Main) 81.EE215.016 (Aux)	PIFA	0.34 0.79	2.52 3.17	IPEX
14	WNC	ASAW 001(L) ASAW 001 ®	PIFA	1.34 1.25	N.A.	IPEX
15	Wgt	B1425050G00003 (Main) B1425050G00002 (Aux)	PIFA	0.03 0.63	-2.01 -2.05	IPEX



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16	TYCO	ASAT 001 (Main) ASAT 001 (Aux)	PIFA	0.61 0.16	N.A.	IPEX
17	ACON	ASAA 001 (L) ASAA 001 (R)	PIFA	1.56 1.36	N.A.	IPEX
18	Hitachi	HFT40 (Main) HFP40 (Aux)	PIFA	0.58 1.12	1.42 2.12	IPEX
19	Hitachi	HFT60 (Main) HFT60 (Aux)	PIFA	-1.65 -0.92	1.48 2.18	IPEX
20	Hitachi	HTL008 (Main) HTL008 (Aux)	PIFA	2.24 1.84	1.72 2.20	IPEX
21	Hitachi	HTL017 (Main) HTL017 (Aux)	PIFA	2.82 2.94	1.94 2.39	IPEX
22	WNC	WNC001 (Main) WNC001 (Aux)	PIFA	-1.10 1.76	1.17 1.17	IPEX
23	WNC	WNC002 (Main) WNC002 (Aux)	PIFA	1.18 1.75	2.28 2.12	IPEX
24	TYCO	TIAN01 (Main) TIAN01 (Aux)	PIFA	0.57 0.87	-1.463 -1.865	IPEX
25	TYCO	TBN001 (Main) TBN001 (Aux)	PIFA	3.45 2.41	1.45 2.13	IPEX
26	TYCO	TBN003 (Main) TBN003 (Aux)	PIFA	-1.11 -1.11	1.84 2.16	IPEX
27	Tyco	2023935-1 (Main) 2023936-1 (Aux) 2023936-1 (MIMO)	PIFA	2.95 1.90 -0.28	1.88 2.03 2.01	U.FL
28	Tyco	2023937-1 (Main) 2023937-1 (Aux) 2023934-1 (MIMO)	PIFA	1.60 0.05 -0.28	1.85 2.00 2.01	U.FL
29	Tyco	2023938-1 (Main) 2023938-1 (Aux) 2023939-1 (MIMO)	PIFA	1.41 1.24 0.04	2.17 2.40 2.35	U.FL
30	Tyco	2023954-1 (Main) 2023954-1 (Aux) 2023955-1 (MIMO)	PIFA	1.68 0.92 1.98	2.14 3.02 1.44	U.FL
31	Hitachi	HBY07 (TX1) HBY07 (TX2)	PIFA	2.19 -0.33	0.95 0.95	I-PEX
32	Hitachi	HBY051 (TX1) HBY051 (TX2)	PIFA	2.91 2.82	0.95 0.95	I-PEX
33	Hitachi	HBY052 (TX1) HBY052 (TX2)	PIFA	0.27 0.02	0.95 0.95	I-PEX
34	Hitachi	HBY061 (TX1) HBY061 (TX2)	PIFA	1.30 2.42	0.95 0.95	I-PEX
35	Hitachi	HBY062 (TX1) HBY062 (TX2)	PIFA	-1.04 -1.19	0.95 0.95	I-PEX
36	Hitachi	HFT65 (TX1) HFT65 (TX2)	PIFA	-1.74 1.16	0.95 0.95	I-PEX



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37	QUANTA	AN-090-B (Tx1) AN-090-A (Tx2)	PIFA	-1.4 -2.2	-1	IPEX
38	Hitachi	HCT01 (Main) HCT01 (Aux)	PIFA	0.87 1.94	0.89	IPEX
39	FOXCONN	WDAN-TQ (Tx1) WDAN-TQ (Tx2)	PIFA	-0.43 -0.7	2.5	IPEX
40	Tyco	TBN005 TBN006	PIFA	2.09 3.87	N.A	IPEX
41	Wha Yu	DQ652016100 (Tx1) DQ652016100 (Tx2)	PIFA	1.31 0.09	0.37 0.92	FAF
42	WNC	WNC004 (Main) WNC004 (Aux)	PIFA	2.40 1.50	1.53 1.92	IPEX
43	QUANTA	ON1 (Tx1) ON1 (Tx2)	PIFA	1.8 0.1	N.A	IPEX
44	HON HAI	WDAN-DQZM1001-DF (Tx1) WDAN-DQZM1001-DF (Tx2)	PIFA	1.67 -0.10	0.827 0.849	IPEX
45	ACON	AMM8P-700006(Tx1) AMM8P-700006 (Tx2)	PIFA	2.51 -0.8	0.97 0.90	IPEX
46	Yageo	CAN4313880012501B (Tx1) CAN4343880012501B (Tx2)	PIFA	1.12 0.7	1.05 1.08	IPEX
47	Pgatroncorp	1415-00JK000	PIFA	3.34	N.A	MHF
48	Pgatroncorp	1415-00JL000	PIFA	2.05	N.A	MHF
49	WNC	WNC001 (Main) WNC001(Aux)	PIFA	0.31 -0.75	1.98 2.01	IPEX
50	WNC	WNC003 (Main) WNC003 (Aux)	PIFA	0.52 1.07	1.49 2.13	IPEX
51	Wha Yu	DQ652015800 (Tx1) DQ652015800 (Tx2)	PIFA	1.13 0.74	1.68 2.29	FAF
52	Smart Approach	PE-AB-0370 (Main) PE-AB-0430 (Aux)	PIFA	2.95 0.94	N.A	IPEX
53	ARISTOTLE	RFA-02-P23-70-300-L	PIFA	-5	N.A	IPEX
54	ARISTOTLE	RFA-02-P23-70B-350-R	PIFA	-5	N.A	IPEX
55	ARISTOTLE	RFA-02-P24-70-305-L	PIFA	-5	N.A	IPEX
56	ARISTOTLE	RFA-02-P24-70B-340-R	PIFA	-5	N.A	IPEX
57	WNC	81.EEO15.001 (Main) 81.EEO15.002 (Aux) 81.EEO15.003 (MIMO)	PIFA	1.52 1.72 1.46	1.86 2.03 2.23	IPEX
58	HON HAI	WDAN-M1OS1001-DF(Main) WDAN-M1OS1002-DF(Aux) WDAN-M1OS1003-DF(MIMO)	PIFA	0.13 -0.13 -0.06	-1.871 -2.072 -2.278	IPEX
59	Amphenol KAE Co., Ltd	SS-03-03-099 (Main) SS-03-03-100 (Aux) SS-03-03-101 (MIMO)	PIFA	0.77 -0.90 -0.90	1.59 1.76 1.95	IPEX
60	WNC	81.EHD15.003 (Main) 81.EHD15.002 (Aux)	PIFA	0.94 -0.77	1.39 1.71	IPEX
61	Foxconn	WDAN-M1SN1002-DF(Main) WDAN-M1SN1001-DF(Aux)	PIFA	0.93 -0.53	-1.357 -1.727	IPEX
62	HON HAI	WDAN-M1NY1001-DF	PIFA	0.56	-0.054	U.FL



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63	WNC	81.EHD15.004 (Main) 81.EHD15.006 (Aux)	PIFA	0.95 -0.49	1.07 1.82	IPEX
64	HON HAI	WDAN-M1WC1001-DF(Main) WDAN-M1BN1001-DF(Aux)	PIFA	-0.28 -0.14	-1.407 2.3	IPEX
65	WNC	81.EHD15.004 (Main) 81.EHD15.007 (Aux)	PIFA	0.95 -0.09	1.07 1.60	IPEX
66	HON HAI	WDAN-M1WC1001-DF(Main) WDAN-M1MM1001-DF(Aux)	PIFA	-0.28 -1.24	-1.407 1.99	IPEX
67	WNC	81.EHD15.G09 (Tx1) 81.EHD15.G10 (Tx2)	PIFA	0.31 -1.21	1.08 1.39	IPEX
68	HON HAI	WDAN-M1PB1001-DF(Tx1) WDAN-M1PB1002-DF(Tx2)	PIFA	0.54 -1.40	0.99 1.36	IPEX
69	WNC	81.EHD15.004 (Main) 81.EHD15.005 (Aux)	PIFA	0.95 -1.51	1.07 1.61	IPEX
70	HON HAI	WDAN-M1WC1002-DF (Main) MDAN-M1WC1001-DF(Aux)	PIFA	0.18 -0.28	-0.866 -1.407	IPEX
71	JEM	M810L (WM1) M810L (WM2)	PIFA	-2.04 0.83	-1.46 -1.14	IPEX
72	wgt	M810L (WM1) M810L (WM2)	PIFA	2.1 2.99	N.A	IPEX
73	wgt	M980N (WM1) M980N (WM2)	PIFA	2.94 2.04	N.A	IPEX
74	FVC	TN120R-WLAN-1 TN120R-WLAN-2	PIFA	0.9 2.8	N.A	IPEX
75	FVC	W760 (WM1) W760 (WM2)	PIFA	2.87 2.08	N.A	IPEX

From the above antennas, the worst case was found in No. 1. Therefore only the test data of the modes were recorded in this report individually.

2. Client offers six samples for EUT, which are identical to each other in all aspects except for the following:

Sample	Description	Different
Sample 1	1st Source - Full Module Card	1. The 2nd Source different with 1st Source is brand of R,L,C and X'tal. 2. Power Down different with 1st Source is R1 NC->0R & R28 0R->NC
Sample 2	1st Source - Half Module Card	
Sample 3	2nd Source - Full Module Card	
Sample 4	2nd Source - Half Module Card	
Sample 5	Power Down - Full Module Card	
Sample 6	Power Down - Half Module Card	

From the above samples, sample 1 was selected as representative model for the test and its data was recorded in this report.

3. The EUT is 2 * 2 spatial MIMO (2Tx & 2Rx) without beam forming function. The antenna configurations are two transmitter antennas and two receiver antennas, as there are 2 PIFA Print antennas. Spatial multiplexing modes for simultaneous transmission using 2 antennas, and for simultaneous receiver using 2 antennas. The 11bg legacy mode is limited to single transmitter only.
4. The EUT complies with draft 802.11n standards and backwards compatible with 802.11b, 802.11g products.



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5. When the EUT operating in draft 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.
6. The above EUT information was 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

Eleven channels are provided for 802.11b, 802.11g, draft 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		

Seven channels are provided for draft 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2422MHz	5	2442MHz
2	2427MHz	6	2447MHz
3	2432MHz	7	2452MHz
4	2437MHz		



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3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

Where PLC: Power Line Conducted Emission

RE < 1G: Radiated Emission below 1GHz

RE ≥ 1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

ANTENNA COMBINATION MODE:

COMBINATION MODE	OPERATION MODE	TX CHAIN(0)	TX CHAIN(1)
A	802.11b	√	
B	802.11b		√
C	802.11g	√	
D	802.11g		√
E	DRAFT 802.11n(20MHz) for MCS 0~7	√	
F	DRAFT 802.11n(20MHz) for MCS 8~15	√	√
G	DRAFT 802.11n(40MHz) for MCS 0~7	√	
H	DRAFT 802.11n(40MHz) for MCS 8~15	√	√

Note:

- The above information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.
- Antenna 1 and Antenna 2 are PIFA Print antennas.

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (MBPS)	COMBINATION
802.11b	1 to 11	1	DSSS	DBPSK	1	A



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RADIATED EMISSION TEST (BELOW 1 GHZ):

- 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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (MBPS)	COMBINATION
802.11b	1 to 11	1	DSSS	DBPSK	1	A

RADIATED EMISSION TEST (ABOVE 1 GHZ):

- 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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	C
Draft 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	13	F
Draft 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	27	H

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION
802.11b	1 to 11	1, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 11	OFDM	BPSK	6	C
Draft 802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	13	F
Draft 802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	27	H



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ANTENNA PORT CONDUCTED 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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	C
Draft 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	13	F
Draft 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	27	H

3.3 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)

ANSI C63.4-2003

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.



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3.4 DESCRIPTION OF SUPPORT UNITS

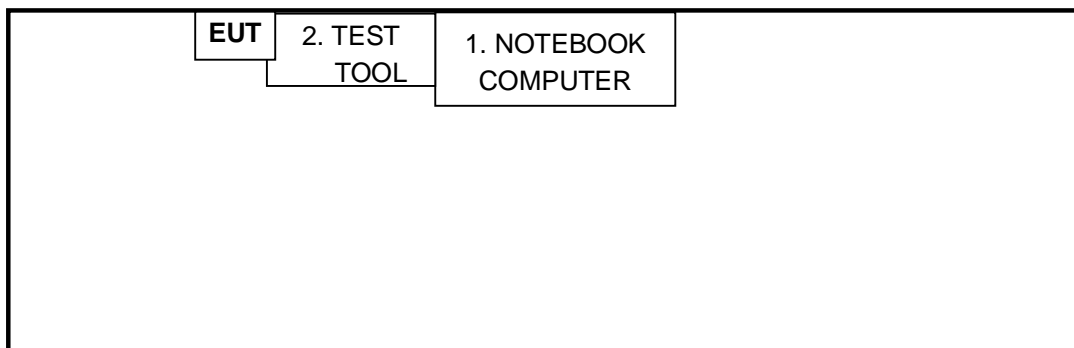
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER (For conducted test)	DELL	PP19L	CN-OHC416-70 166-5CA-0448	PIW632500516610
	NOTEBOOK COMPUTER (For radiated test)	DELL	PP21L	CN-0GD366-70 166-5B3-09ZX	QDS-BRCM1016
2	TEST TOOL	Realtek	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA

NOTE: All power cords of the above support units are non shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST





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4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 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 0.50 MHz.
 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.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 23, 2009	Mar. 22, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100071	Nov. 26, 2008	Nov. 25, 2009
Line-Impedance Stabilization Network (for EUT)	ESH3-Z5	848773/004	Nov. 05, 2008	Nov. 04, 2009
RF Cable (JYEBAO)	5DFB	COBCAB-001	Aug 15, 2008	Aug 14, 2009
50 ohms Terminator	50	3	Nov. 05, 2008	Nov. 04, 2009
Software	BV ADT_Cond_V7.3.7	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 Shielded Room No. B.
3. The VCCI Con B Registration No. is C-2193.



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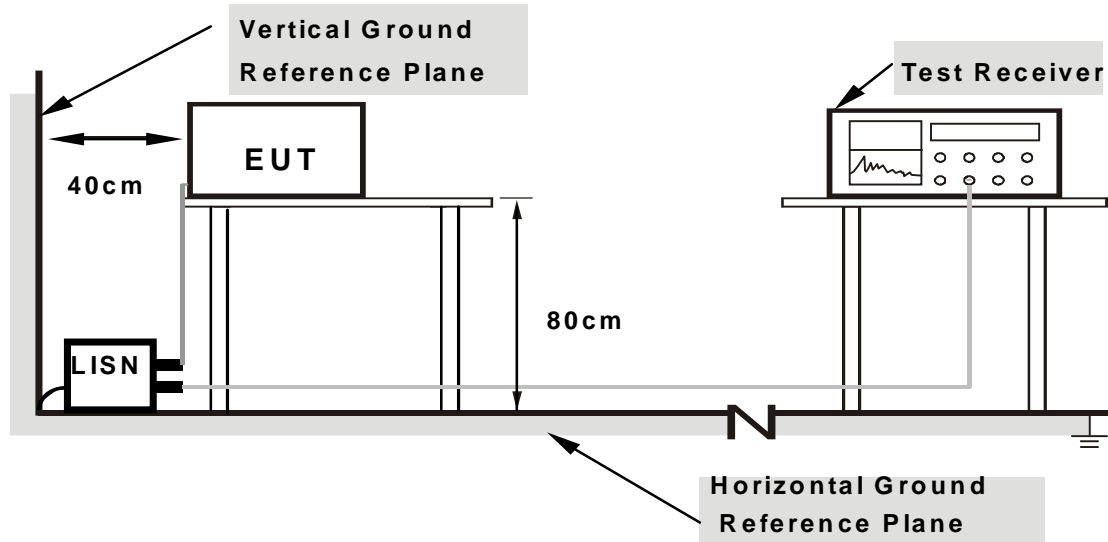
4.1.3 TEST PROCEDURES

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

- a. Connect the EUT with the support unit 1 (Notebook Computer) which placed on a testing table.
- b. The communication partner run test program “MP819xVC.exe V0.21.325.200” to enable EUT under transmission/receiving condition continuously.

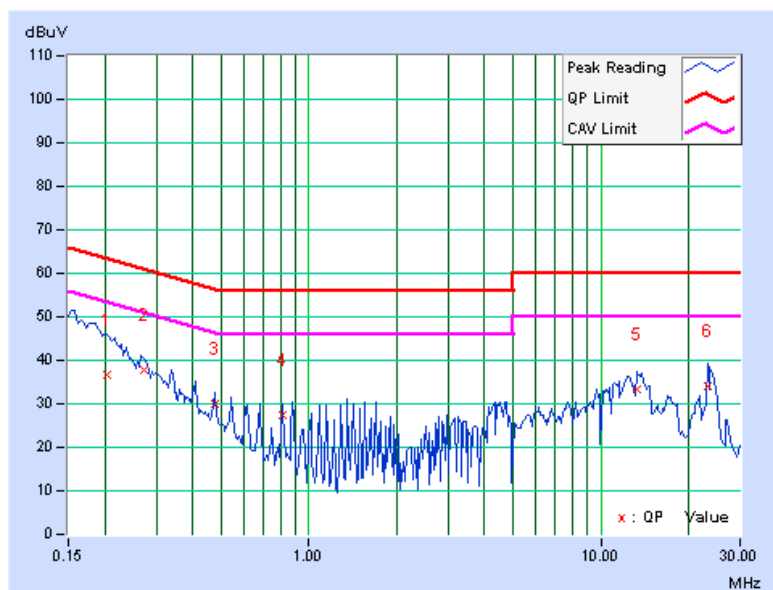
4.1.7 TEST RESULTS

802.11b DSSS MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line (L)
MODULATION TYPE	DBPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	1Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 965hPa	TESTED BY	Eric Lee

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.204	0.22	36.28	-	36.50	-	63.46	53.46	-26.95	-
+2	0.272	0.31	37.39	-	37.70	-	61.07	51.07	-23.37	-
3	0.475	0.44	29.60	-	30.04	-	56.43	46.43	-26.39	-
4	0.814	0.34	27.17	-	27.51	-	56.00	46.00	-28.49	-
5	13.273	0.96	32.36	-	33.32	-	60.00	50.00	-26.68	-
6	23.230	1.63	32.35	-	33.98	-	60.00	50.00	-26.02	-

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



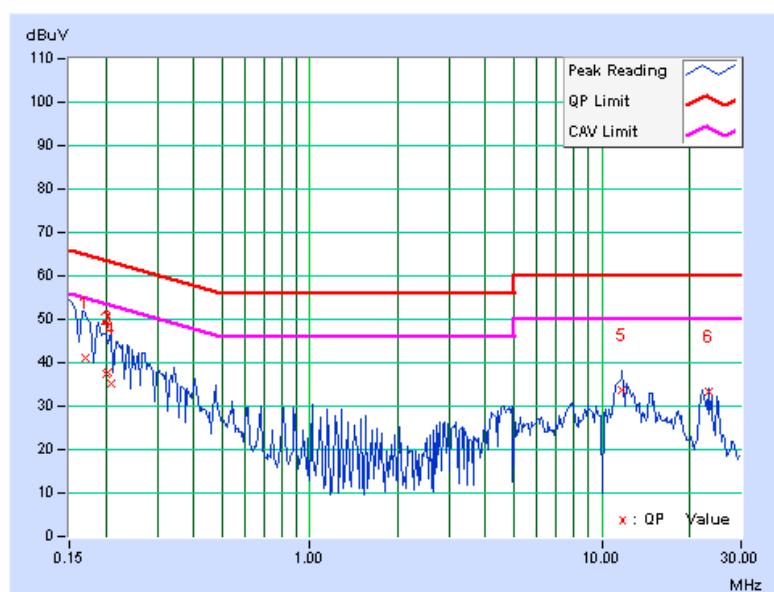


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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Neutral (N)
MODULATION TYPE	DBPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	1Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 965hPa	TESTED BY	Eric Lee

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.170	0.13	41.07	-	41.20	-	64.98
2	0.202	0.15	37.43	-	37.58	-	63.54	53.54	-25.95	-
3	0.203	0.15	37.63	-	37.78	-	63.47	53.47	-25.68	-
4	0.209	0.16	34.86	-	35.02	-	63.26	53.26	-28.24	-
+5	11.781	0.68	33.18	-	33.86	-	60.00	50.00	-26.14	-
6	23.156	1.34	32.06	-	33.40	-	60.00	50.00	-26.60	-

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





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4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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. As shown in 15.35(b), 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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4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 09, 2008	Dec. 08, 2009
HP Pre_Amplifier	8449B	3008A01923	Nov. 10, 2008	Nov. 09, 2009
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 09, 2008	Sep. 08, 2009
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	April 29, 2009	April 28, 2010
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 09, 2008	Dec. 08, 2009
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2009	Jan. 21, 2010
R&S Loop Antenna	HFH2-Z2	100070	Jan. 14, 2008	Jan. 13, 2010
RF Switches	EMH-011	08009	Oct. 07, 2008	Oct. 06, 2009
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 15, 2008	Aug. 14, 2009
RF Cable	8DFB	STCCAB-30M-1GHz	Oct. 07, 2008	Oct. 06, 2009
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	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 horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in Open Site No. C.

4. The FCC Site Registration No. is 656396.

5. The VCCI Site Registration No. is R-1626.

6. The CANADA Site Registration No. is IC 7450G-3.

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meters open area test site. 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.

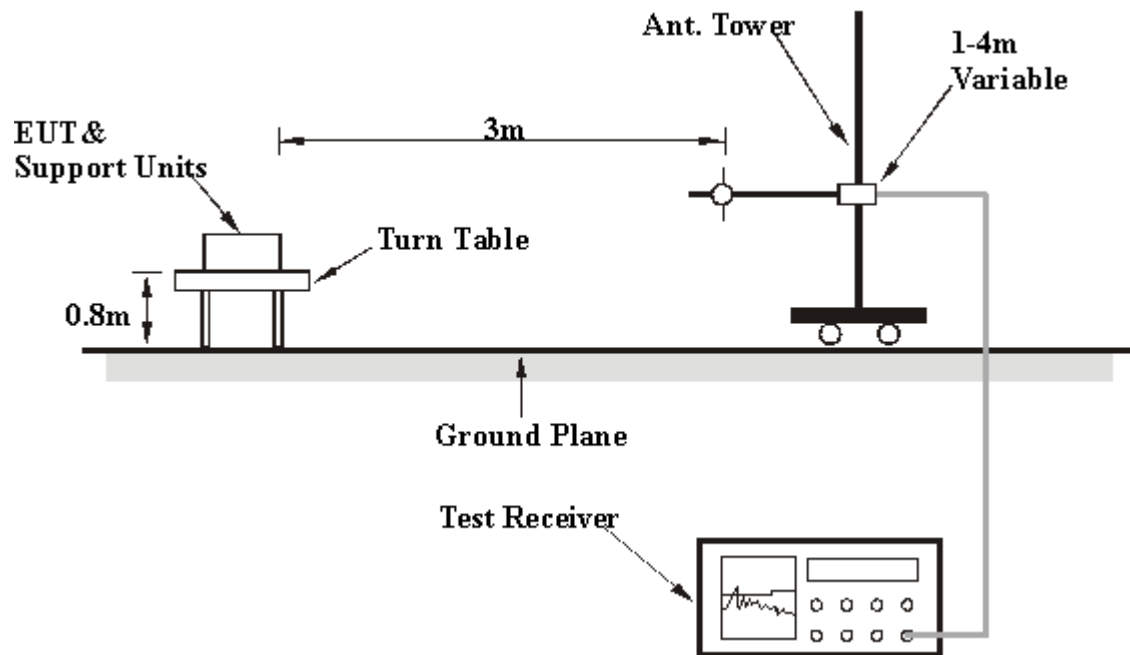
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITIONS

Same as the 4.1.6



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4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA : 802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23.0deg. C, 69.0%RH 965hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	199.92	42.50 QP	43.50	-1.00	1.43 H	301	29.51	12.99
2	214.41	37.28 QP	43.50	-6.22	1.04 H	248	23.60	13.68
3	250.00	39.21 QP	46.00	-6.79	1.33 H	107	23.79	15.42
4	299.86	44.96 QP	46.00	-1.04	1.00 H	265	27.94	17.02
5	499.87	43.14 QP	46.00	-2.86	1.68 H	177	20.48	22.66
6	699.90	39.19 QP	46.00	-6.81	1.08 H	350	12.15	27.04

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	192.24	34.15 QP	43.50	-9.35	1.58 V	95	20.57	13.58
2	199.98	37.15 QP	43.50	-6.35	1.54 V	247	24.17	12.98
3	248.69	32.90 QP	46.00	-13.10	1.02 V	55	17.54	15.36
4	300.10	39.90 QP	46.00	-6.10	1.20 V	3	22.88	17.02
5	499.99	34.25 QP	46.00	-11.75	1.11 V	8	11.59	22.66
6	701.10	38.58 QP	46.00	-7.42	1.30 V	236	11.51	27.07

- 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.



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802.11b DSSS MODULATION

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	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2386.80	60.94 PK	74.00	-13.06	1.90 H	151	30.67	30.27
2	2386.80	53.18 AV	54.00	-0.82	1.90 H	151	22.91	30.27
3	*2412.00	111.27 PK			1.90 H	151	80.91	30.36
4	*2412.00	107.45 AV			1.90 H	151	77.09	30.36
5	4824.00	49.24 PK	74.00	-24.76	1.28 H	119	12.45	36.79
6	4824.00	40.12 AV	54.00	-13.88	1.28 H	119	3.33	36.79
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2386.32	58.47 PK	74.00	-15.53	1.00 V	263	28.20	30.27
2	2386.32	47.80 AV	54.00	-6.20	1.00 V	263	17.53	30.27
3	*2412.00	104.06 PK			1.00 V	273	73.70	30.36
4	*2412.00	100.00 AV			1.00 V	273	69.64	30.36
5	4824.00	49.72 PK	74.00	-24.28	1.03 V	182	12.93	36.79
6	4824.00	43.78 AV	54.00	-10.22	1.03 V	182	6.99	36.79

- 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	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	113.78 PK			1.91 H	141	83.32	30.46
2	*2437.00	109.26 AV			1.91 H	141	78.80	30.46
3	4874.00	49.45 PK	74.00	-24.55	1.24 H	150	12.53	36.92
4	4874.00	39.94 AV	54.00	-14.06	1.24 H	150	3.02	36.92
5	7311.00	60.23 PK	74.00	-13.77	1.73 H	10	17.09	43.14
6	7311.00	52.82 AV	54.00	-1.18	1.73 H	10	9.68	43.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	111.65 PK			1.63 V	138	81.19	30.46
2	*2437.00	107.30 AV			1.63 V	138	76.84	30.46
3	4874.00	51.83 PK	74.00	-22.17	1.25 V	192	14.91	36.92
4	4874.00	45.39 AV	54.00	-8.61	1.25 V	192	8.47	36.92
5	7311.00	58.69 PK	74.00	-15.31	1.58 V	340	15.55	43.14
6	7311.00	50.43 AV	54.00	-3.57	1.58 V	340	7.29	43.14

- 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	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

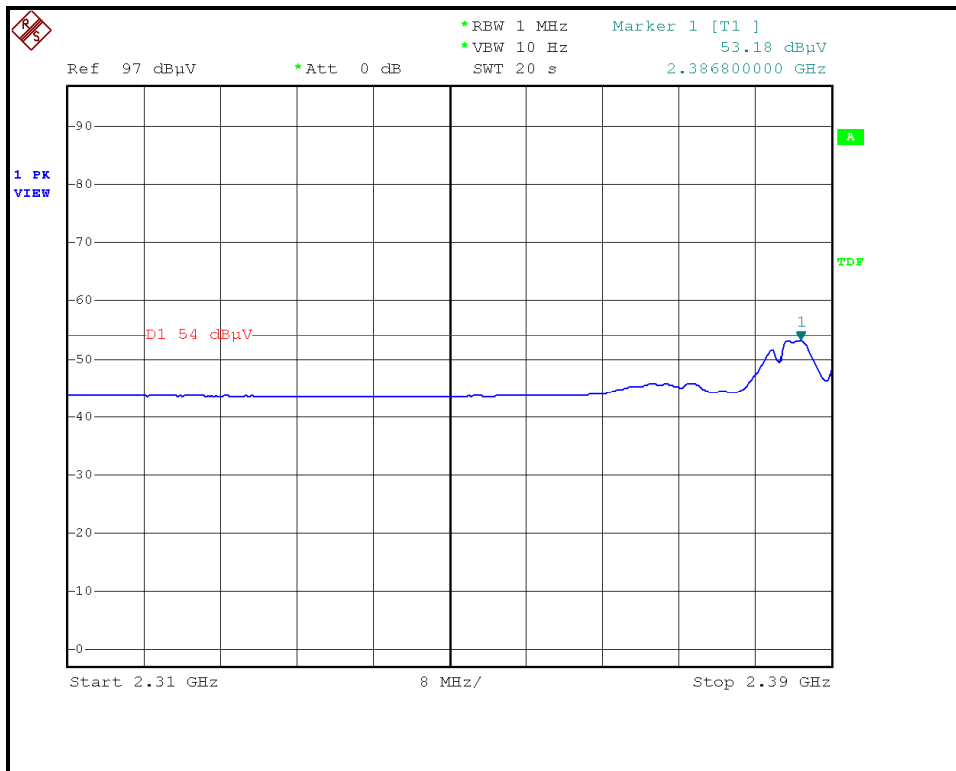
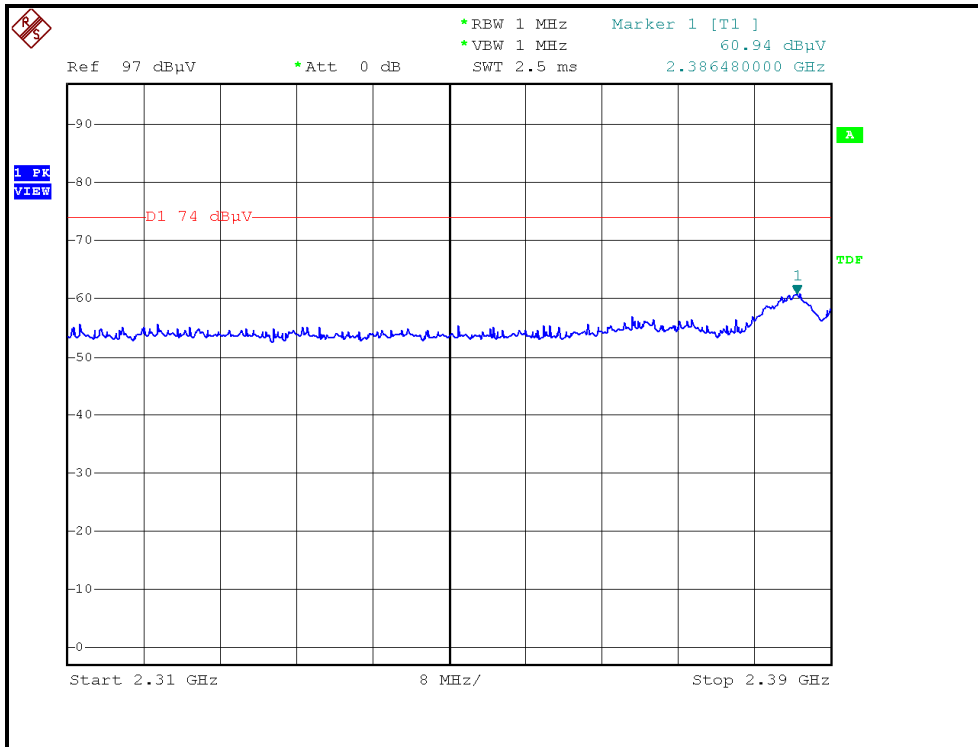
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NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.02 PK			1.90 H	140	82.47	30.55
2	*2462.00	108.56 AV			1.90 H	140	78.01	30.55
3	2488.71	61.86 PK	74.00	-12.14	1.91 H	137	31.21	30.65
4	2488.71	53.35 AV	54.00	-0.65	1.91 H	137	22.70	30.65
5	4924.00	48.41 PK	74.00	-25.59	1.30 H	21	11.35	37.06
6	4924.00	35.88 AV	54.00	-18.12	1.30 H	21	-1.18	37.06
7	7386.00	56.62 PK	74.00	-17.38	1.50 H	8	13.49	43.13
8	7386.00	46.02 AV	54.00	-7.98	1.50 H	8	2.89	43.13
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	111.14 PK			1.33 V	99	80.59	30.55
2	*2462.00	106.74 AV			1.33 V	99	76.19	30.55
3	2486.70	61.16 PK	74.00	-12.84	1.33 V	99	30.52	30.64
4	2486.70	53.24 AV	54.00	-0.76	1.33 V	99	22.60	30.64
5	4924.00	50.12 PK	74.00	-23.88	1.13 V	192	13.06	37.06
6	4924.00	41.12 AV	54.00	-12.88	1.13 V	192	4.06	37.06
7	7386.00	55.83 PK	74.00	-18.17	1.88 V	338	12.70	43.13
8	7386.00	44.88 AV	54.00	-9.12	1.88 V	338	1.75	43.13

- 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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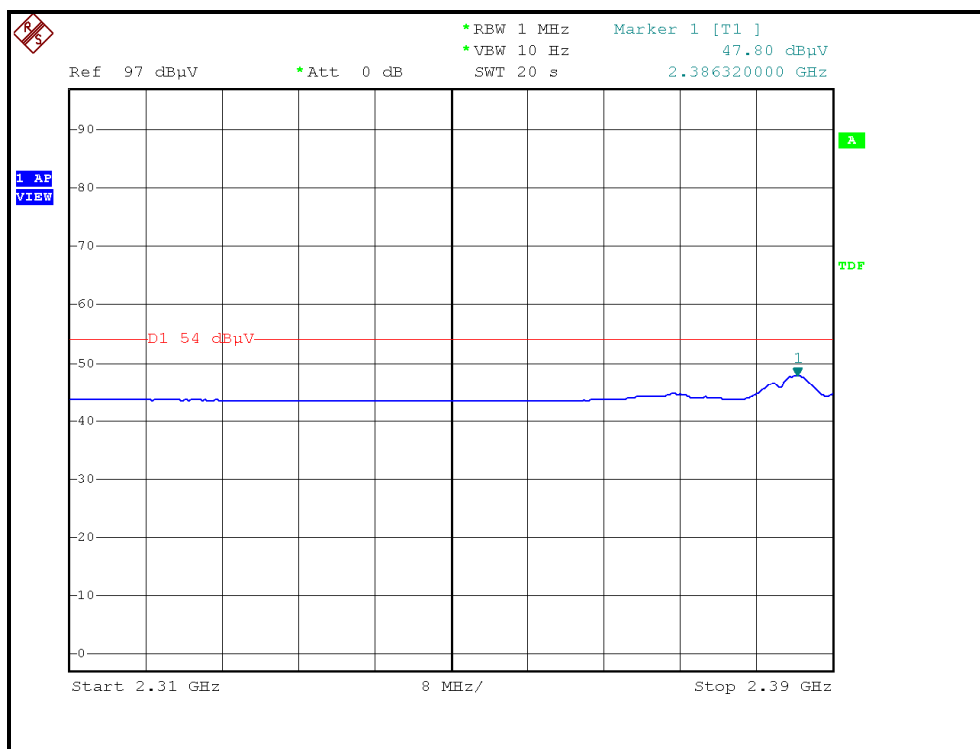
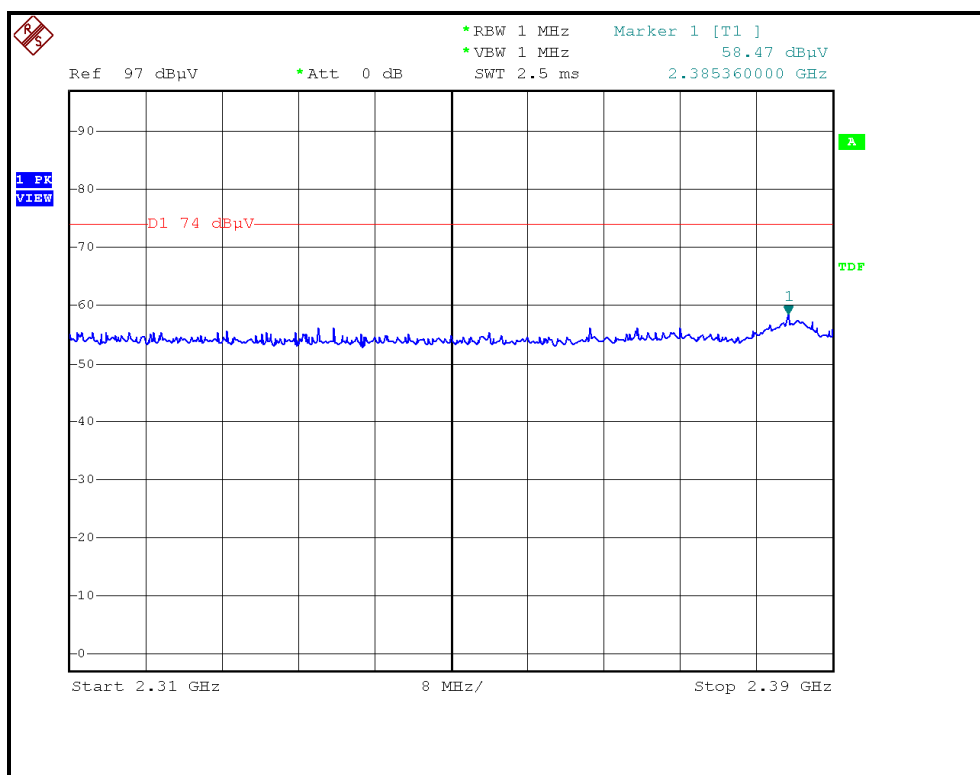
RESTRICTED BANDEDGE (802.11b MODE,CH1, HORIZONTAL)





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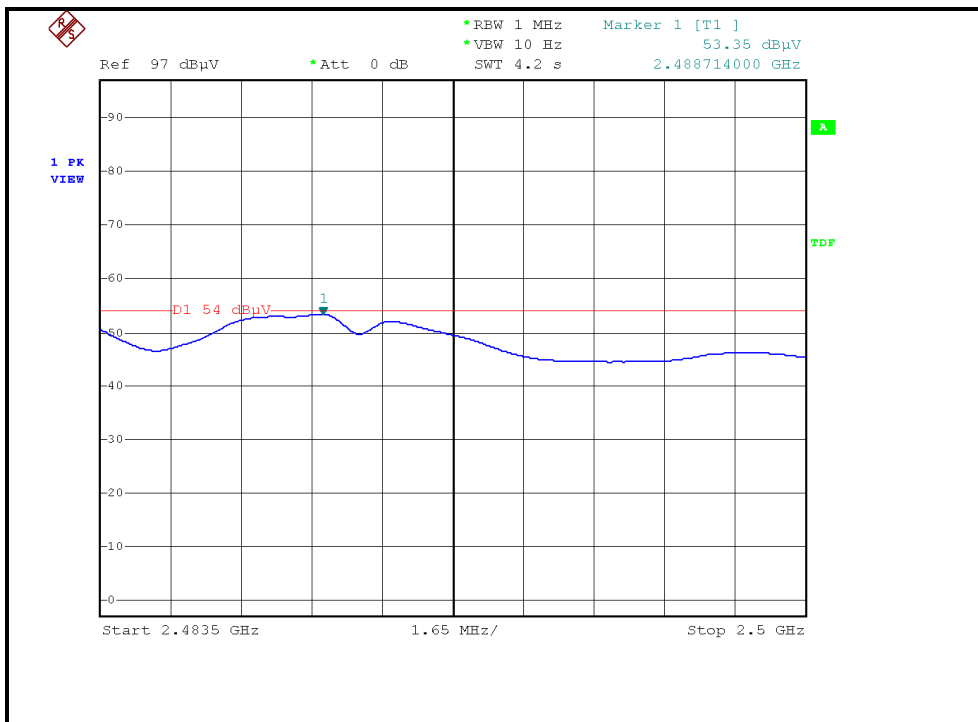
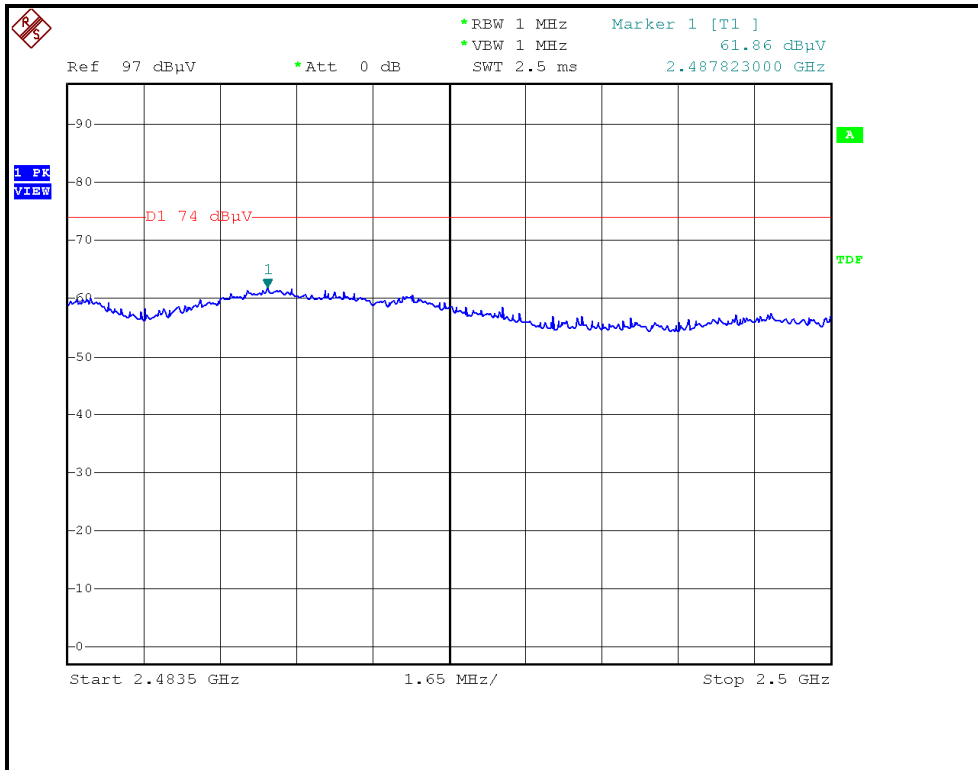
RESTRICTED BANDEGE (802.11b MODE,CH1, VERTICAL)





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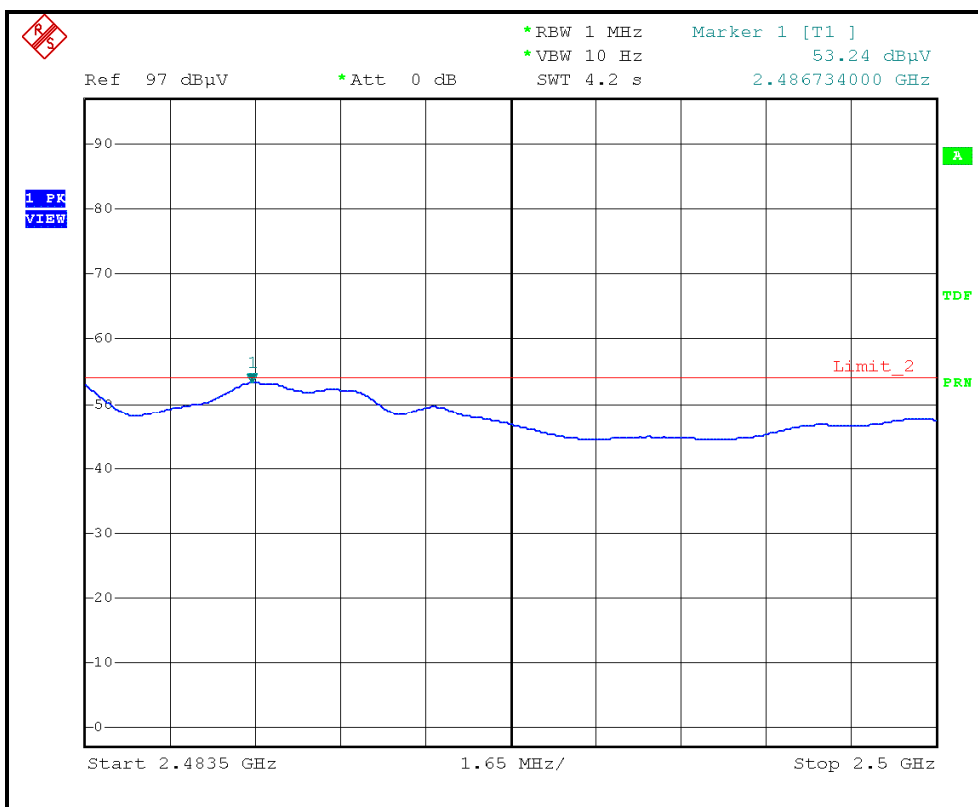
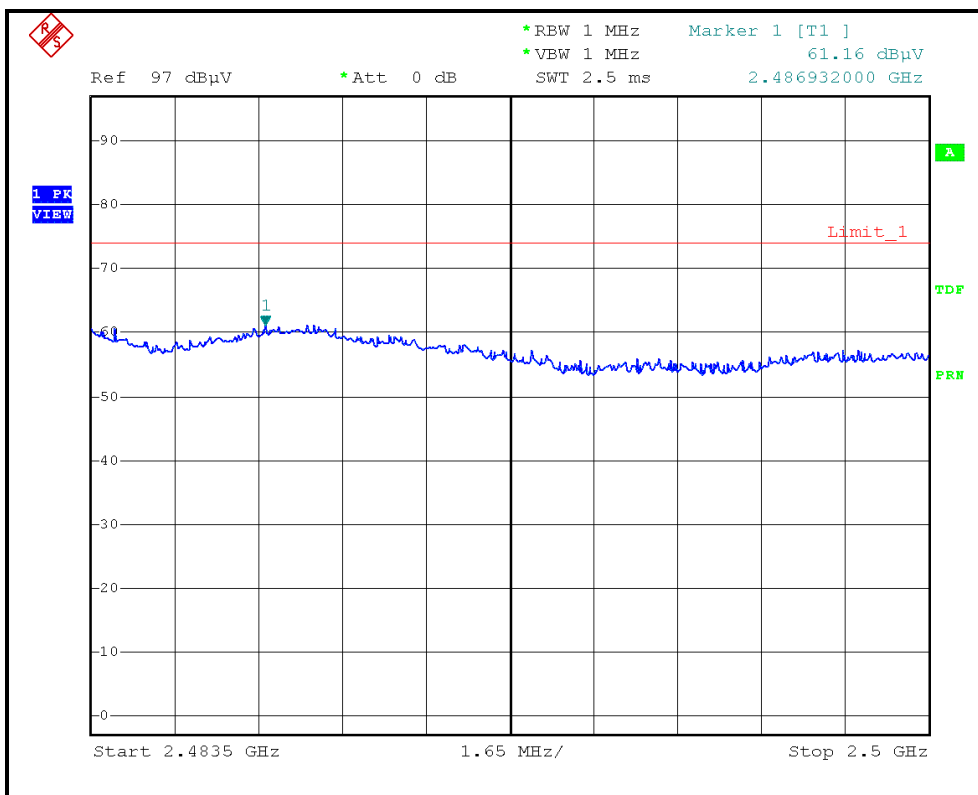
RESTRICTED BANDEDGE (802.11b MODE,CH11, HORIZONTAL)





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RESTRICTED BANDEDGE (802.11b MODE, CH11, VERTICAL)





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802.11g OFDM MODULATION

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	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.59 PK	74.00	-5.41	1.92 H	152	38.31	30.28
2	2390.00	52.61 AV	54.00	-1.39	1.92 H	152	22.33	30.28
3	*2412.00	108.73 PK			1.91 H	152	78.37	30.36
4	*2412.00	99.46 AV			1.91 H	152	69.10	30.36
5	4824.00	59.83 PK	74.00	-14.17	1.00 H	257	23.04	36.79
6	4824.00	44.62 AV	54.00	-9.38	1.00 H	257	7.83	36.79
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.66 PK	74.00	-4.34	1.38 V	100	39.38	30.28
2	2390.00	50.32 AV	54.00	-3.68	1.38 V	100	20.04	30.28
3	*2412.00	106.85 PK			1.38 V	100	76.49	30.36
4	*2412.00	96.48 AV			1.38 V	100	66.12	30.36
5	4824.00	60.83 PK	74.00	-13.17	1.00 V	161	24.04	36.79
6	4824.00	44.73 AV	54.00	-9.27	1.00 V	161	7.94	36.79
7	#7236.00	57.75 PK	86.85	-29.10	1.50 V	345	14.61	43.14
8	#7236.00	42.81 AV	76.48	-33.67	1.50 V	345	-0.33	43.14

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



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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	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

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	112.00 PK			1.94 H	139	81.54	30.46
2	*2437.00	102.50 AV			1.94 H	139	72.04	30.46
3	4874.00	59.70 PK	74.00	-14.30	1.51 H	125	22.78	36.92
4	4874.00	45.40 AV	54.00	-8.60	1.51 H	125	8.48	36.92
5	7311.00	59.00 PK	74.00	-15.00	1.79 H	147	15.86	43.14
6	7311.00	45.60 AV	54.00	-8.40	1.79 H	147	2.46	43.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	107.90 PK			1.48 V	184	77.44	30.46
2	*2437.00	98.30 AV			1.48 V	184	67.84	30.46
3	4874.00	62.60 PK	74.00	-11.40	1.12 V	237	25.68	36.92
4	4874.00	47.50 AV	54.00	-6.50	1.12 V	237	10.58	36.92
5	7311.00	56.20 PK	74.00	-17.80	1.71 V	6	13.06	43.14
6	7311.00	42.01 AV	54.00	-11.99	1.71 V	6	-1.13	43.14

- 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	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

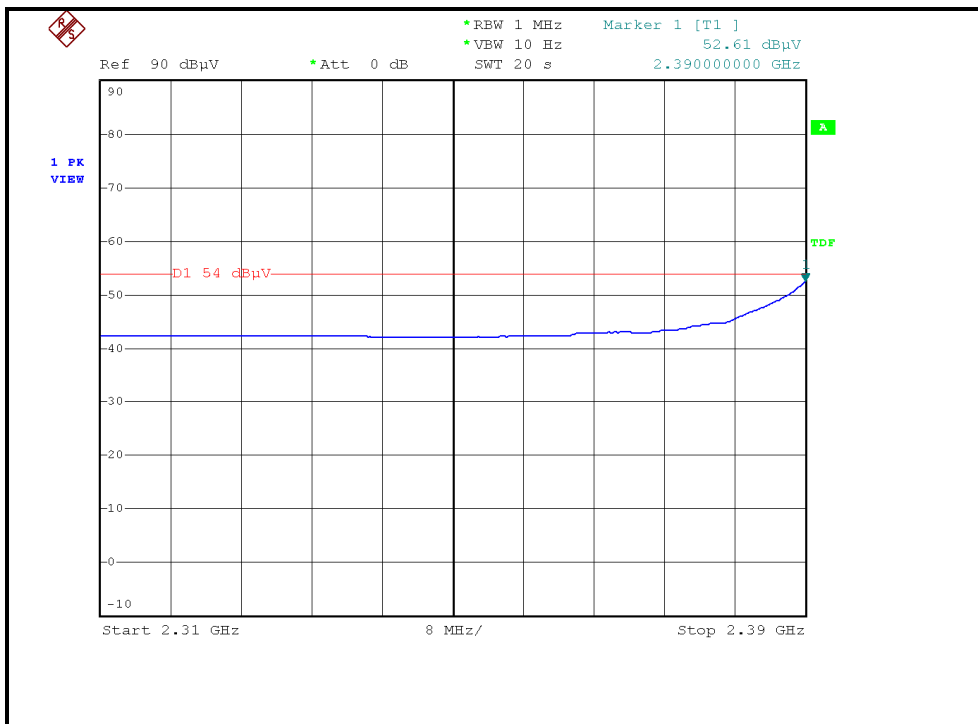
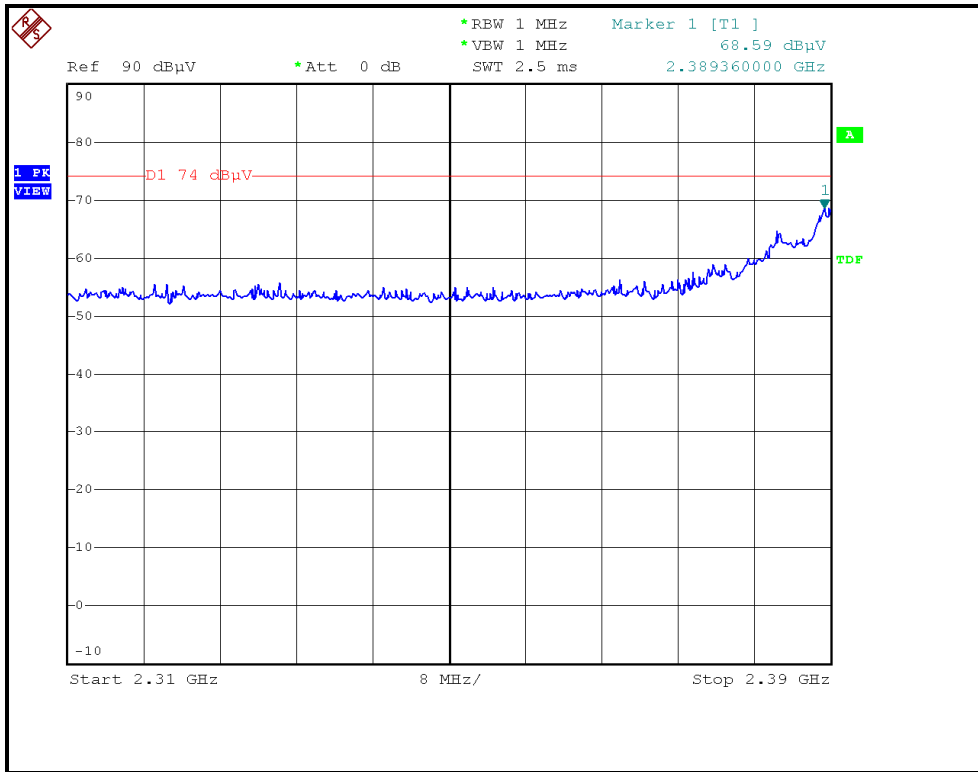
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NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.62 PK			1.89 H	137	76.07	30.55
2	*2462.00	97.29 AV			1.89 H	137	66.74	30.55
3	2483.50	69.61 PK	74.00	-4.39	1.93 H	147	38.98	30.63
4	2483.50	53.39 AV	54.00	-0.61	1.93 H	147	22.76	30.63
5	4924.00	59.77 PK	74.00	-14.23	1.00 H	266	22.71	37.06
6	4924.00	44.56 AV	54.00	-9.44	1.00 H	266	7.50	37.06
7	7386.00	55.80 PK	74.00	-18.20	1.32 H	127	12.67	43.13
8	7386.00	41.00 AV	54.00	-13.00	1.32 H	127	-2.13	43.13
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.55 PK			1.35 V	99	76.00	30.55
2	*2462.00	96.14 AV			1.35 V	99	65.59	30.55
3	2483.50	66.80 PK	74.00	-7.20	1.35 V	99	36.17	30.63
4	2483.50	48.16 AV	54.00	-5.84	1.35 V	99	17.53	30.63
5	4924.00	60.41 PK	74.00	-13.59	1.00 V	160	23.35	37.06
6	4924.00	44.68 AV	54.00	-9.32	1.00 V	160	7.62	37.06
7	7386.00	54.50 PK	74.00	-19.50	1.50 V	335	11.37	43.13
8	7386.00	40.20 AV	54.00	-13.80	1.50 V	335	-2.93	43.13

- 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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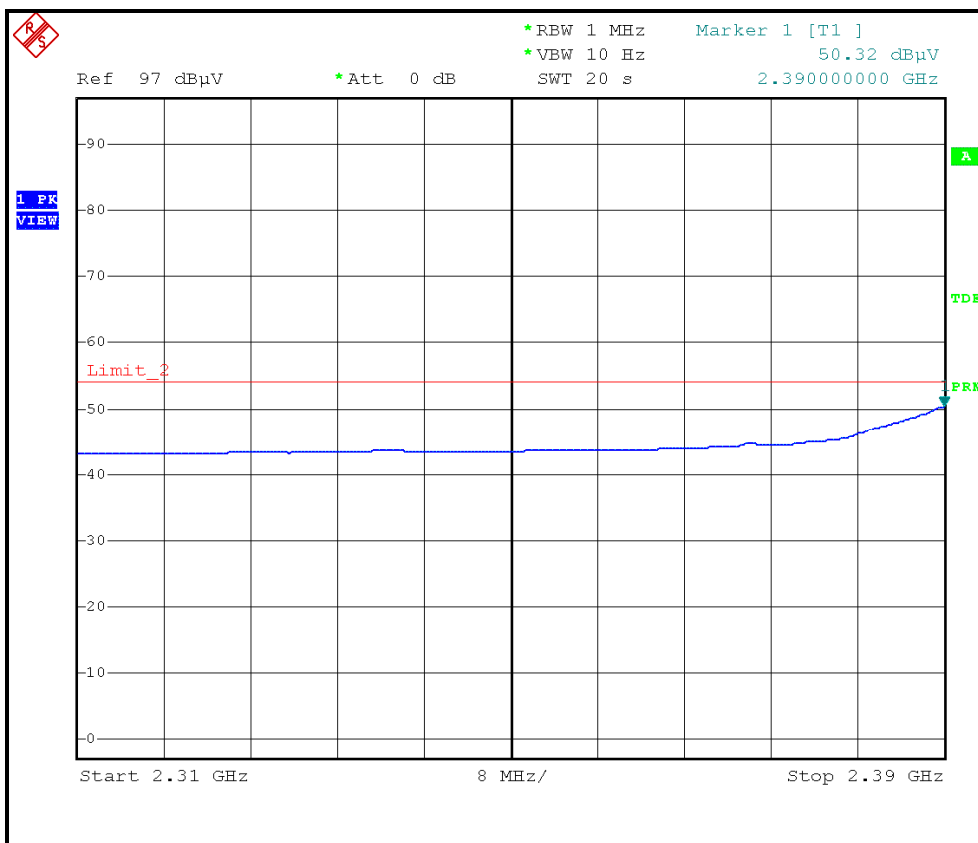
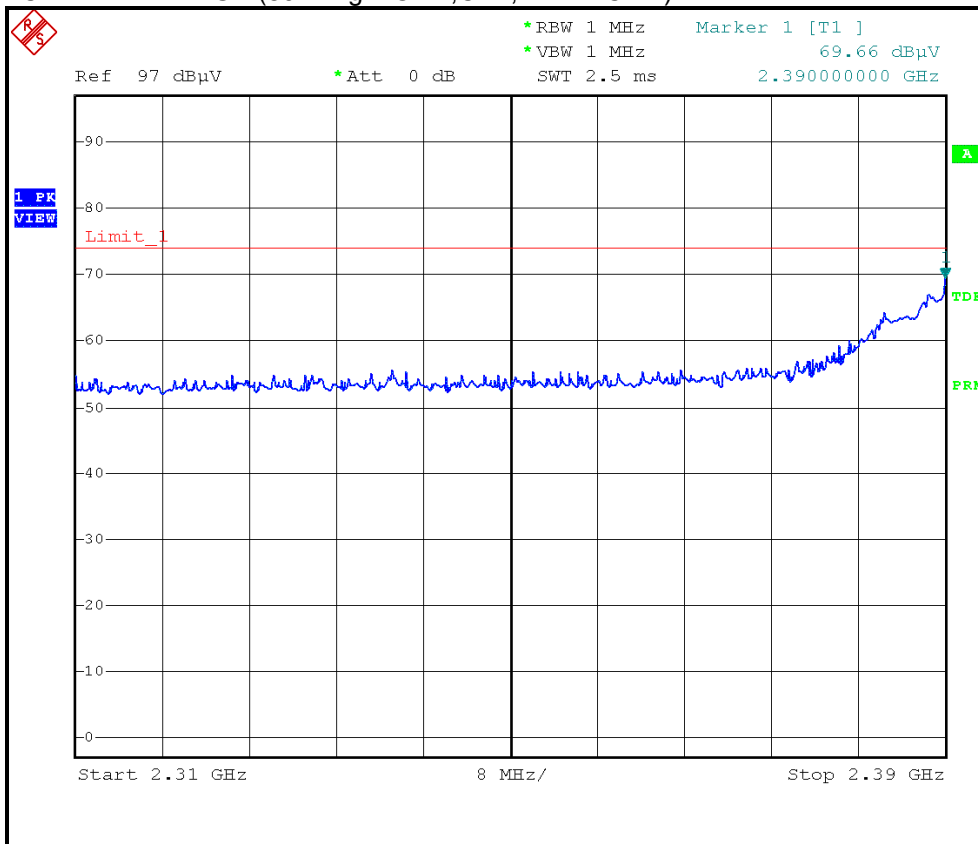
RESTRICTED BANDEDGE (802.11g MODE,CH1, HORIZONTAL)





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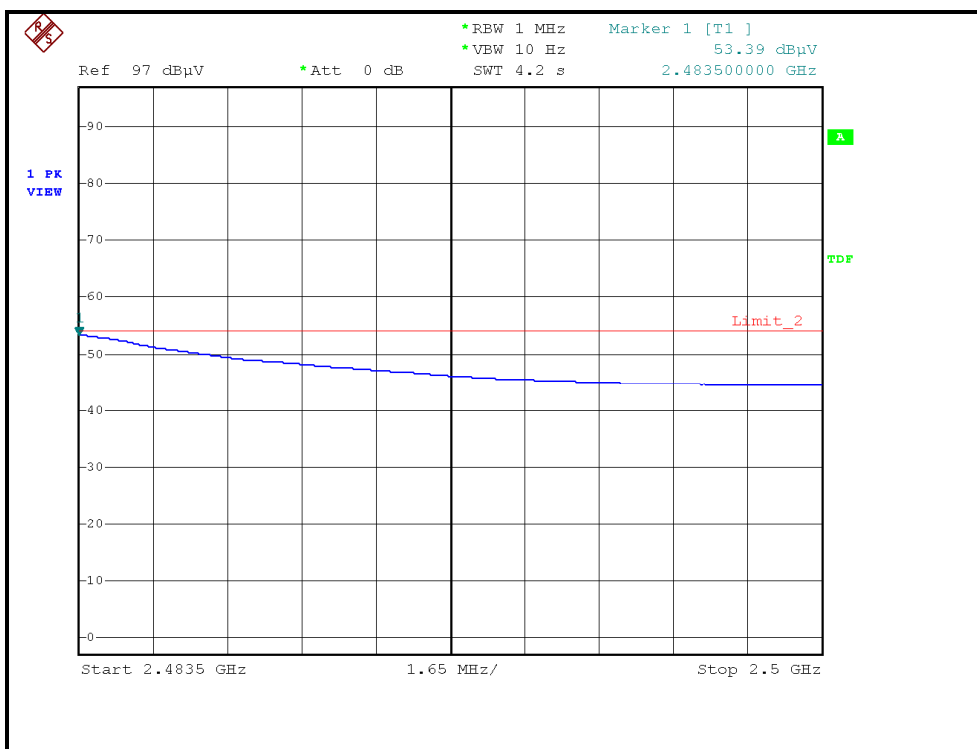
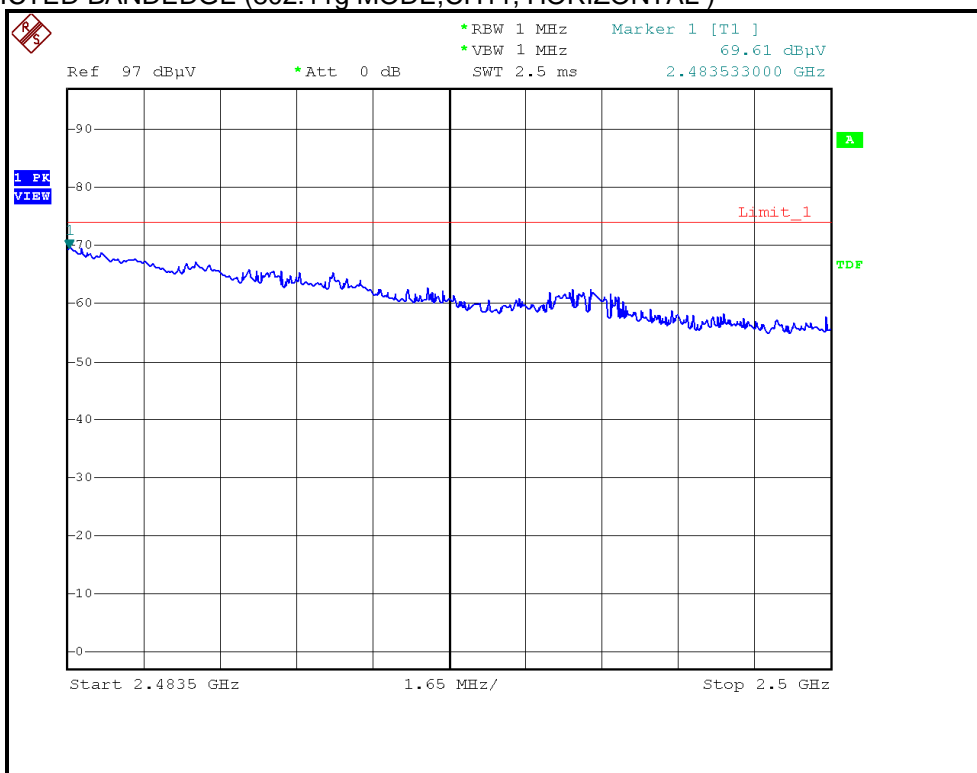
RESTRICTED BANDEDGE (802.11g MODE, CH1, VERTICAL)





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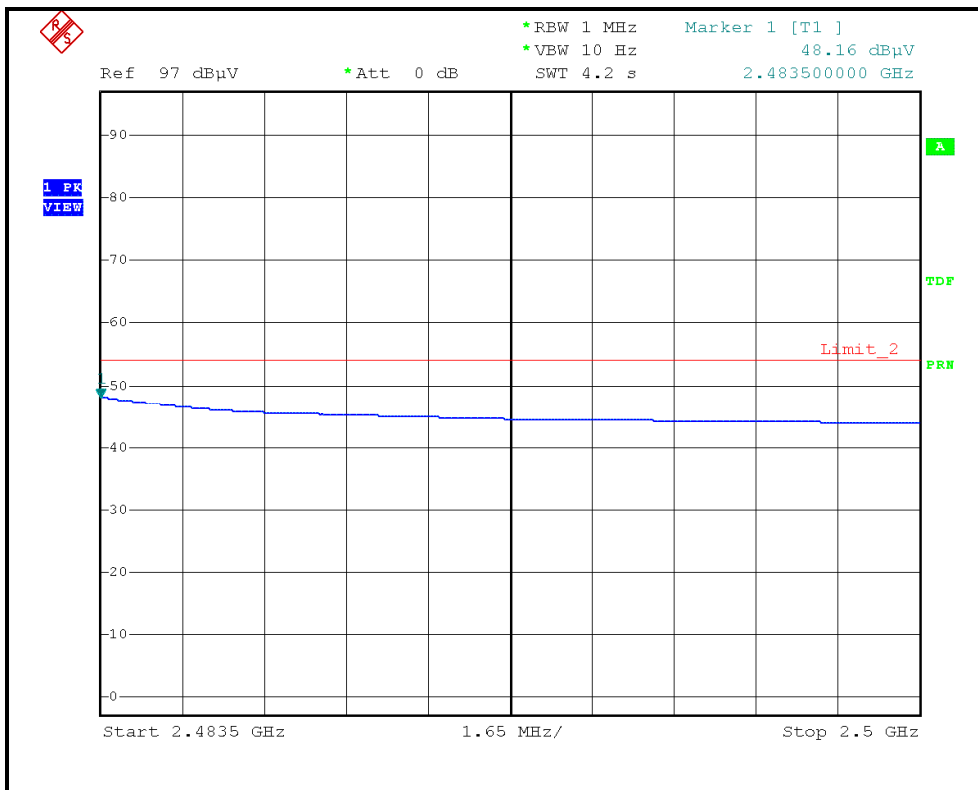
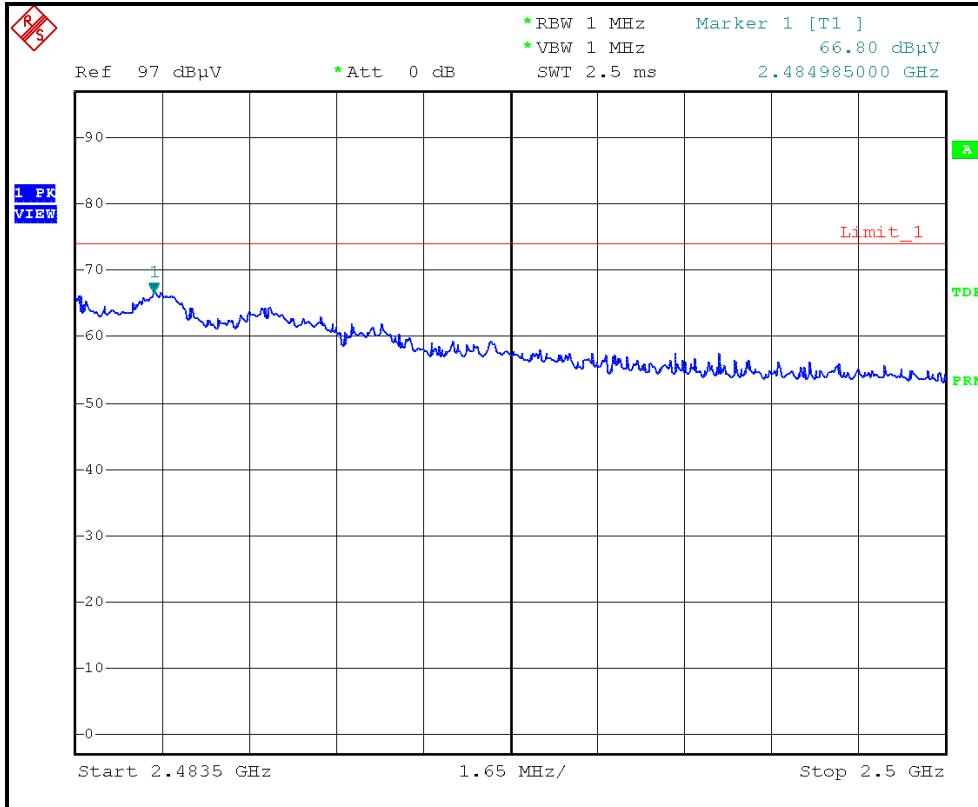
RESTRICTED BANDEDGE (802.11g MODE,CH11, HORIZONTAL)





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RESTRICTED BANDEGE (802.11g MODE,CH11, VERTICAL)





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DRAFT 802.11n (20MHz) OFDM MODULATION

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	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.50 PK	74.00	-5.50	1.92 H	16	38.22	30.28
2	2390.00	53.03 AV	54.00	-0.97	1.92 H	16	22.75	30.28
3	*2412.00	108.90 PK			1.64 H	2	78.54	30.36
4	*2412.00	97.70 AV			1.64 H	2	67.34	30.36
5	4824.00	59.77 PK	74.00	-14.23	1.00 H	266	22.98	36.79
6	4824.00	44.53 AV	54.00	-9.47	1.00 H	266	7.74	36.79
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	61.20 PK	74.00	-12.80	1.40 V	100	30.92	30.28
2	2390.00	45.50 AV	54.00	-8.50	1.40 V	100	15.22	30.28
3	*2412.00	105.58 PK			1.40 V	100	75.22	30.36
4	*2412.00	93.97 AV			1.40 V	100	63.61	30.36
5	4824.00	60.51 PK	74.00	-13.49	1.00 V	165	23.72	36.79
6	4824.00	44.68 AV	54.00	-9.32	1.00 V	165	7.89	36.79

- 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	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

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	109.60 PK			1.51 H	356	79.14	30.46
2	*2437.00	99.40 AV			1.51 H	356	68.94	30.46
3	4874.00	60.82 PK	74.00	-13.18	1.00 H	265	23.90	36.92
4	4874.00	44.78 AV	54.00	-9.22	1.00 H	265	7.86	36.92
5	7311.00	59.63 PK	74.00	-14.37	1.52 H	24	16.49	43.14
6	7311.00	44.79 AV	54.00	-9.21	1.52 H	24	1.65	43.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	106.40 PK			1.43 V	182	75.94	30.46
2	*2437.00	96.65 AV			1.43 V	182	66.19	30.46
3	4874.00	61.00 PK	74.00	-13.00	1.00 V	164	24.08	36.92
4	4874.00	45.05 AV	54.00	-8.95	1.00 V	164	8.13	36.92
5	7311.00	56.90 PK	74.00	-17.10	1.17 V	93	13.76	43.14
6	7311.00	42.70 AV	54.00	-11.30	1.17 V	93	-0.44	43.14

- 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	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

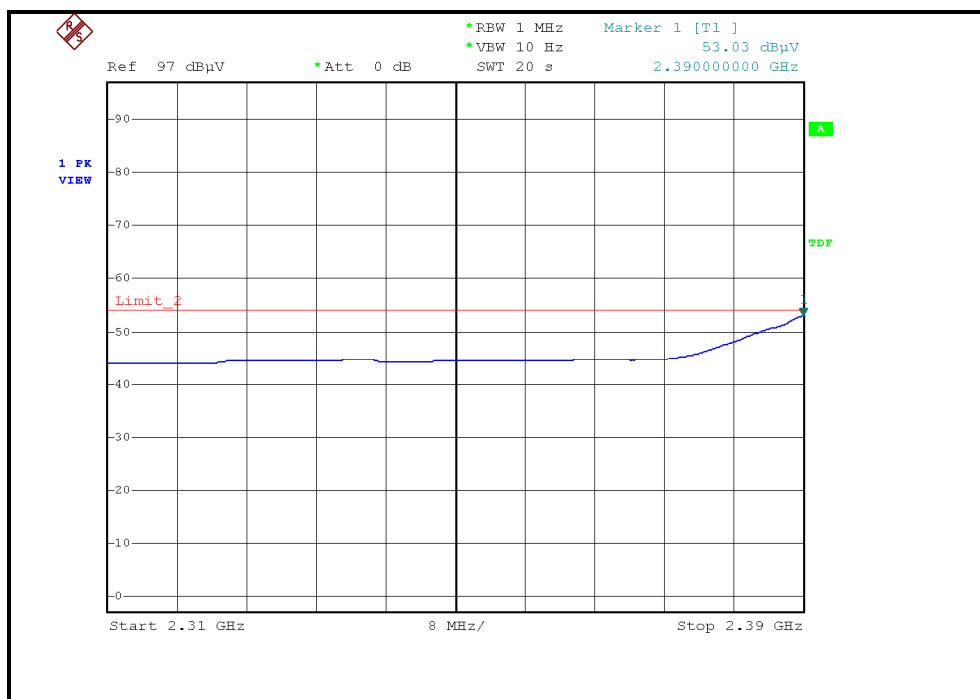
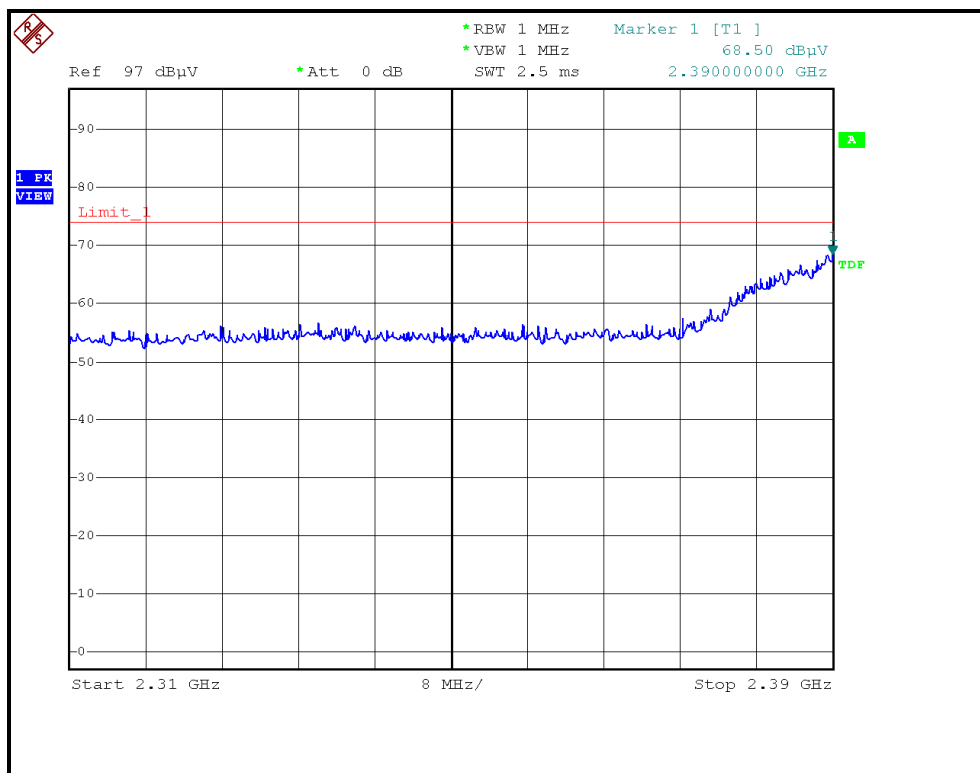
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.00 PK			1.68 H	168	75.45	30.55
2	*2462.00	95.80 AV			1.68 H	168	65.25	30.55
3	2483.50	70.10 PK	74.00	-3.90	1.69 H	171	39.47	30.63
4	2483.50	52.61 AV	54.00	-1.39	1.69 H	171	21.98	30.63
5	4924.00	59.63 PK	74.00	-14.37	1.00 H	255	22.57	37.06
6	4924.00	44.47 AV	54.00	-9.53	1.00 H	255	7.41	37.06
7	7386.00	59.41 PK	74.00	-14.59	1.57 H	28	16.28	43.13
8	7386.00	44.58 AV	54.00	-9.42	1.57 H	28	1.45	43.13
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.89 PK			1.34 V	98	75.34	30.55
2	*2462.00	95.50 AV			1.34 V	98	64.95	30.55
3	2483.50	63.15 PK	74.00	-10.85	1.34 V	98	32.52	30.63
4	2483.50	48.21 AV	54.00	-5.79	1.34 V	98	17.58	30.63
5	4924.00	60.40 PK	74.00	-13.60	1.00 V	158	23.34	37.06
6	4924.00	44.56 AV	54.00	-9.44	1.00 V	158	7.50	37.06
7	7386.00	56.31 PK	74.00	-17.69	1.21 V	88	13.18	43.13
8	7386.00	42.30 AV	54.00	-11.70	1.21 V	88	-0.83	43.13

- 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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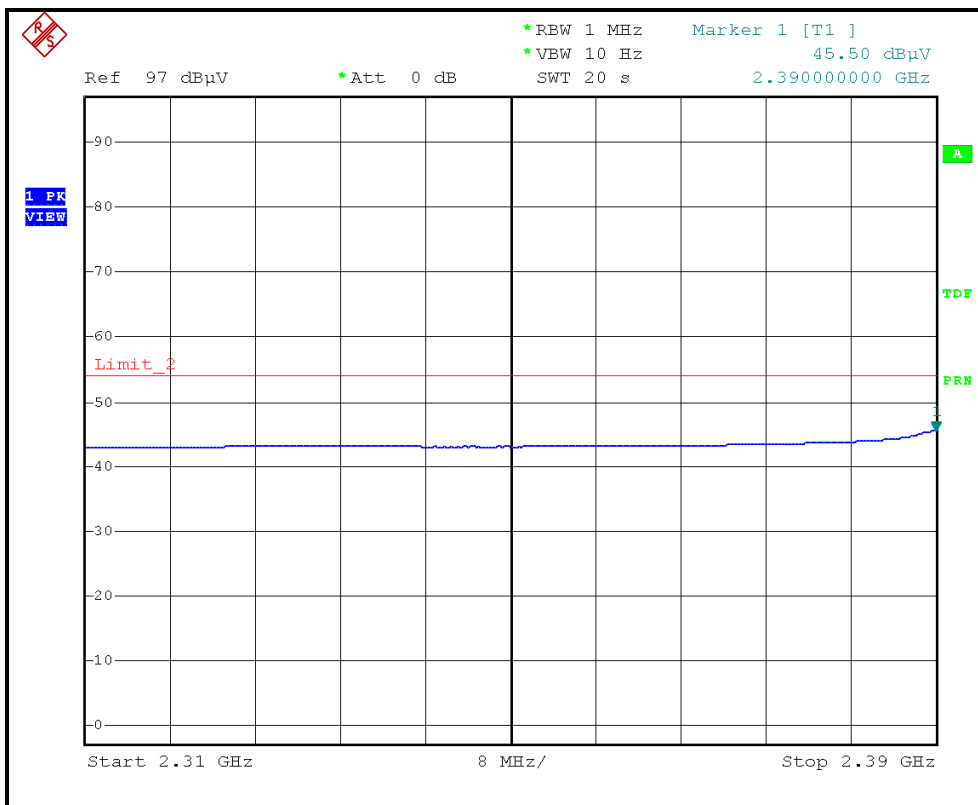
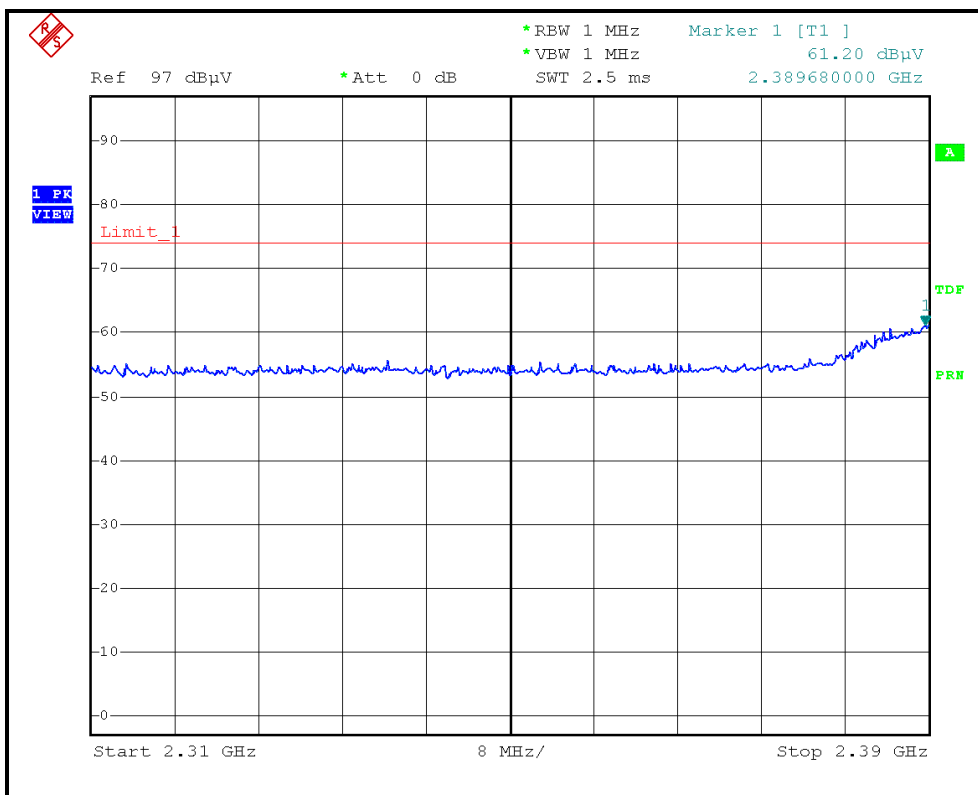
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE, CH1, HORIZONTAL)





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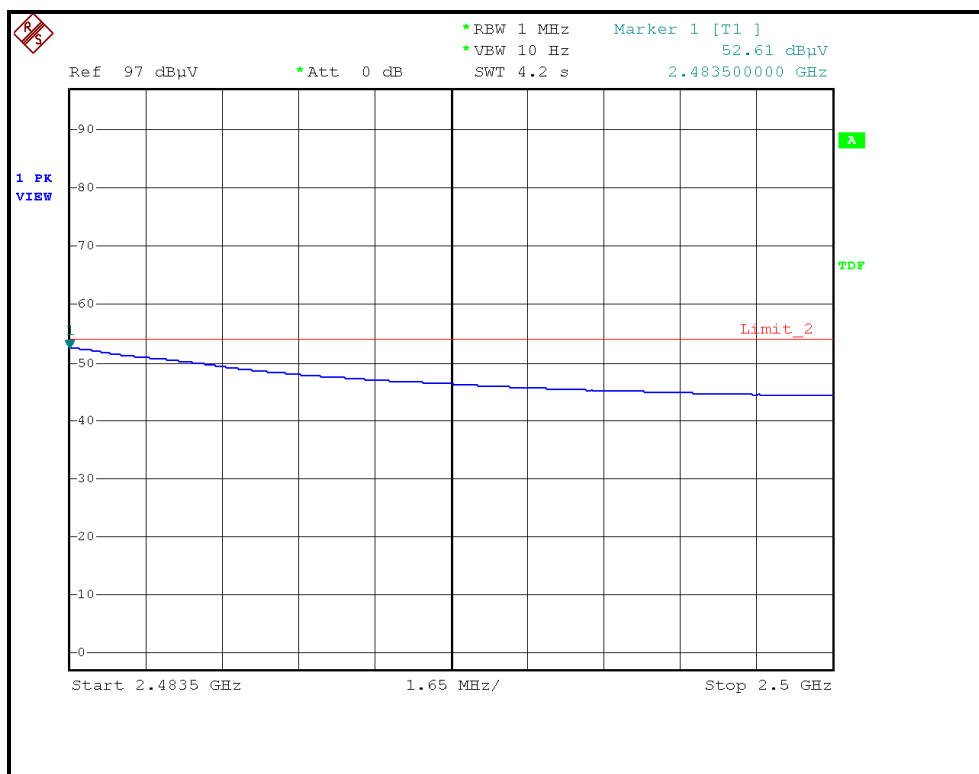
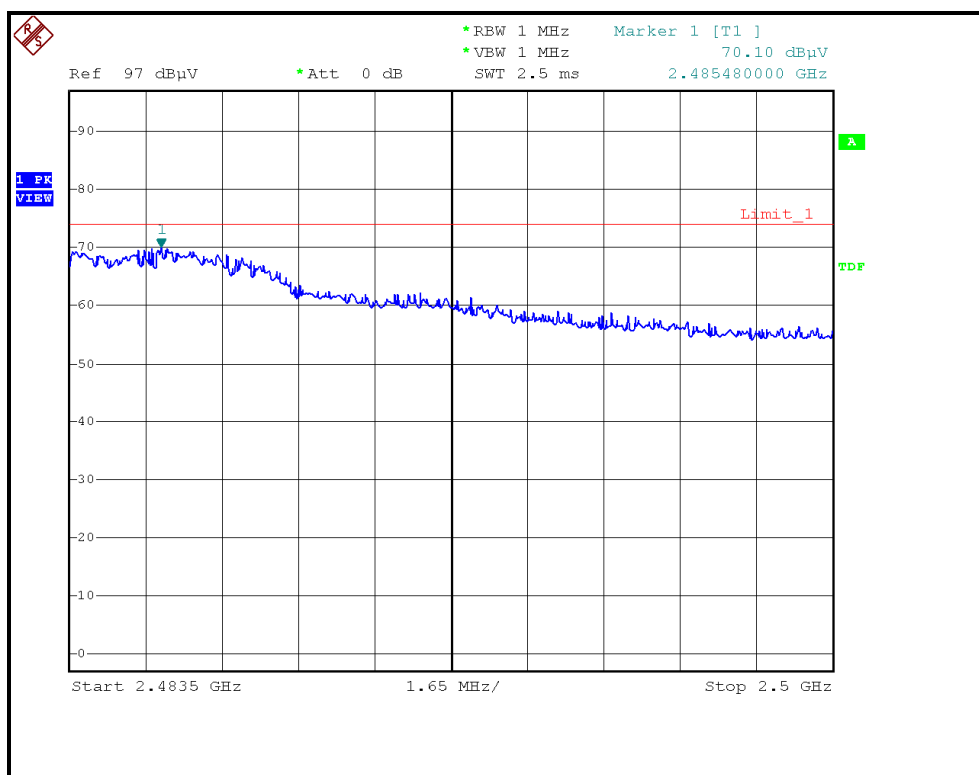
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH1, VERTICAL)





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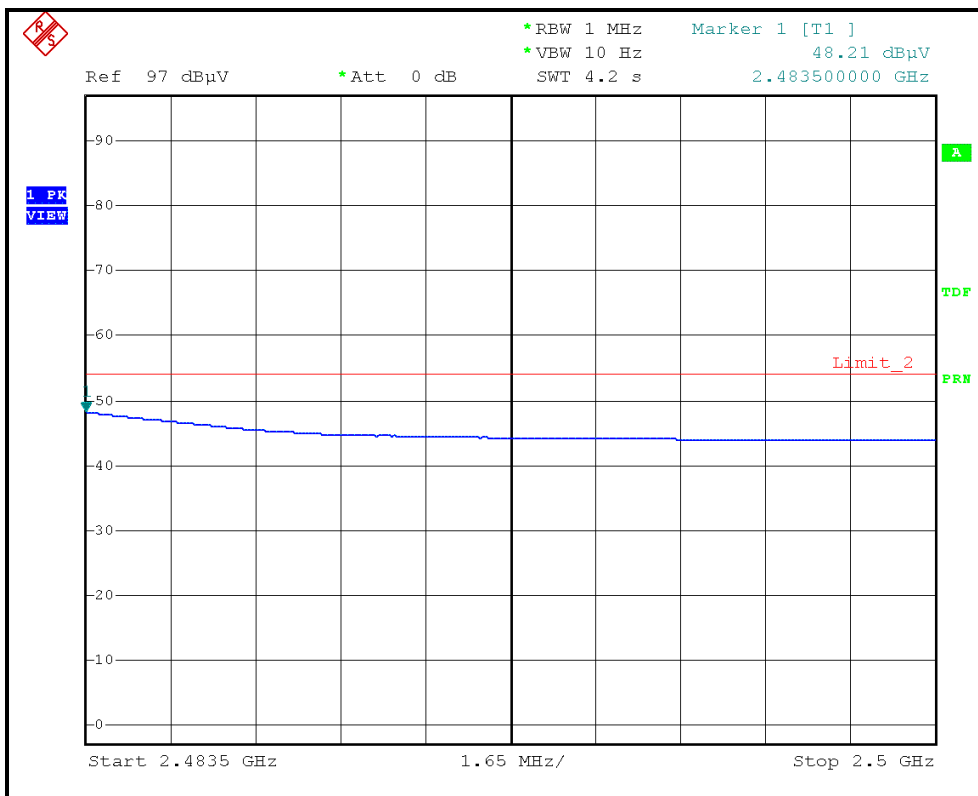
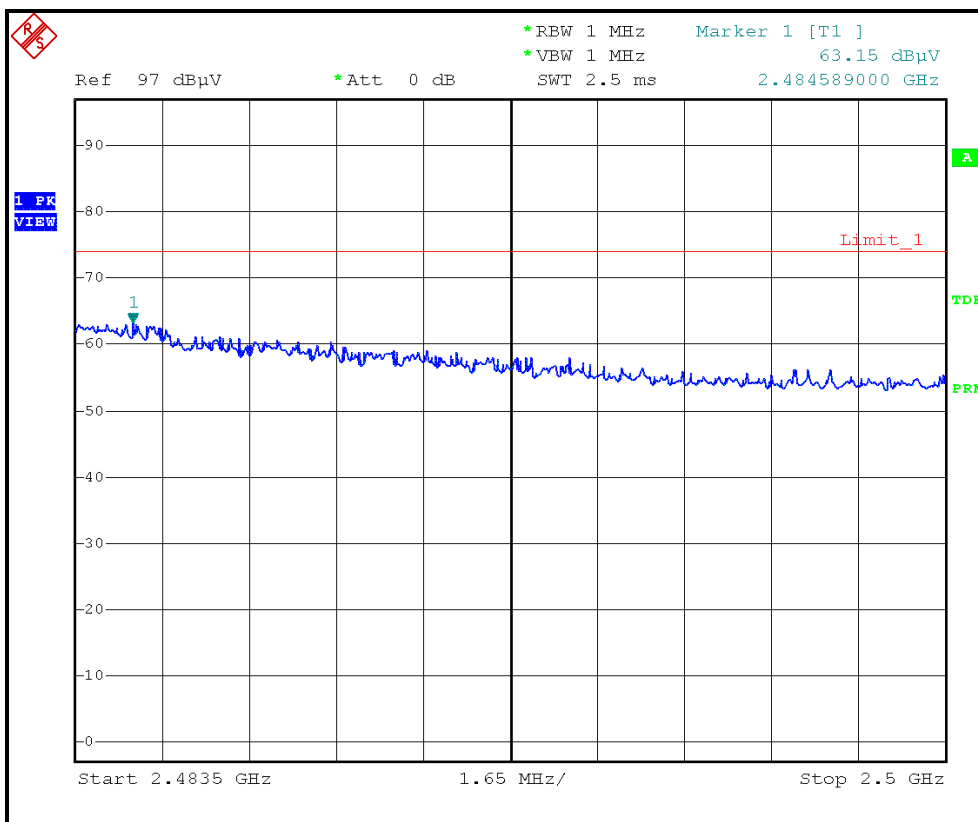
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE, CH11, HORIZONTAL)





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RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH11, VERTICAL)





DRAFT 802.11n (40MHz) OFDM MODULATION

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	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

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	2388.08	67.19 PK	74.00	-6.81	1.92 H	14	36.91	30.28
2	2388.08	52.48 AV	54.00	-1.52	1.92 H	14	22.20	30.28
3	*2422.00	105.08 PK			1.91 H	139	74.68	30.40
4	*2422.00	94.44 AV			1.91 H	139	64.04	30.40
5	4844.00	51.63 PK	74.00	-22.37	1.33 H	36	14.79	36.84
6	4844.00	38.42 AV	54.00	-15.58	1.33 H	36	1.58	36.84
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.84 PK	74.00	-14.16	1.36 V	100	29.56	30.28
2	2390.00	48.05 AV	54.00	-5.95	1.36 V	100	17.77	30.28
3	*2422.00	103.34 PK			1.36 V	100	72.94	30.40
4	*2422.00	91.50 AV			1.36 V	100	61.10	30.40
5	4844.00	53.26 PK	74.00	-20.74	1.05 V	206	16.42	36.84
6	4844.00	42.71 AV	54.00	-11.29	1.05 V	206	5.87	36.84

- 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 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

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	65.69 PK	74.00	-8.31	1.93 H	16	35.41	30.28
2	2390.00	51.17 AV	54.00	-2.83	1.93 H	16	20.89	30.28
3	*2437.00	106.30 PK			1.91 H	164	75.84	30.46
4	*2437.00	95.68 AV			1.91 H	164	65.22	30.46
5	2483.50	68.31 PK	74.00	-5.69	1.85 H	141	37.68	30.63
6	2483.50	53.35 AV	54.00	-0.65	1.85 H	141	22.72	30.63
7	4874.00	51.89 PK	74.00	-22.11	1.30 H	35	14.97	36.92
8	4874.00	38.66 AV	54.00	-15.34	1.30 H	35	1.74	36.92
9	7311.00	52.83 PK	74.00	-21.17	1.43 H	247	9.69	43.14
10	7311.00	40.30 AV	54.00	-13.70	1.43 H	247	-2.84	43.14

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	104.47 PK			1.31 V	99	74.01	30.46
2	*2437.00	92.28 AV			1.31 V	99	61.82	30.46
3	4874.00	53.46 PK	74.00	-20.54	1.07 V	210	16.54	36.92
4	4874.00	42.88 AV	54.00	-11.12	1.07 V	210	5.96	36.92
5	7311.00	54.67 PK	74.00	-19.33	1.55 V	211	11.53	43.14
6	7311.00	40.89 AV	54.00	-13.11	1.55 V	211	-2.25	43.14

- 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 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28.0deg. C, 70.0%RH 965hPa	TESTED BY	Wen Yu

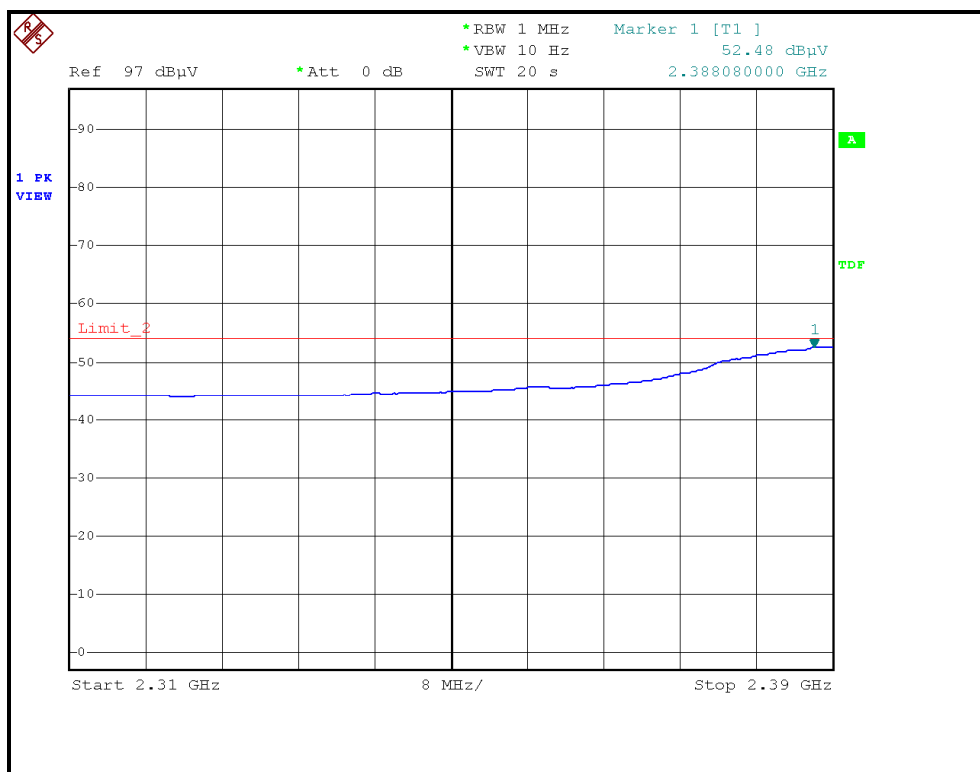
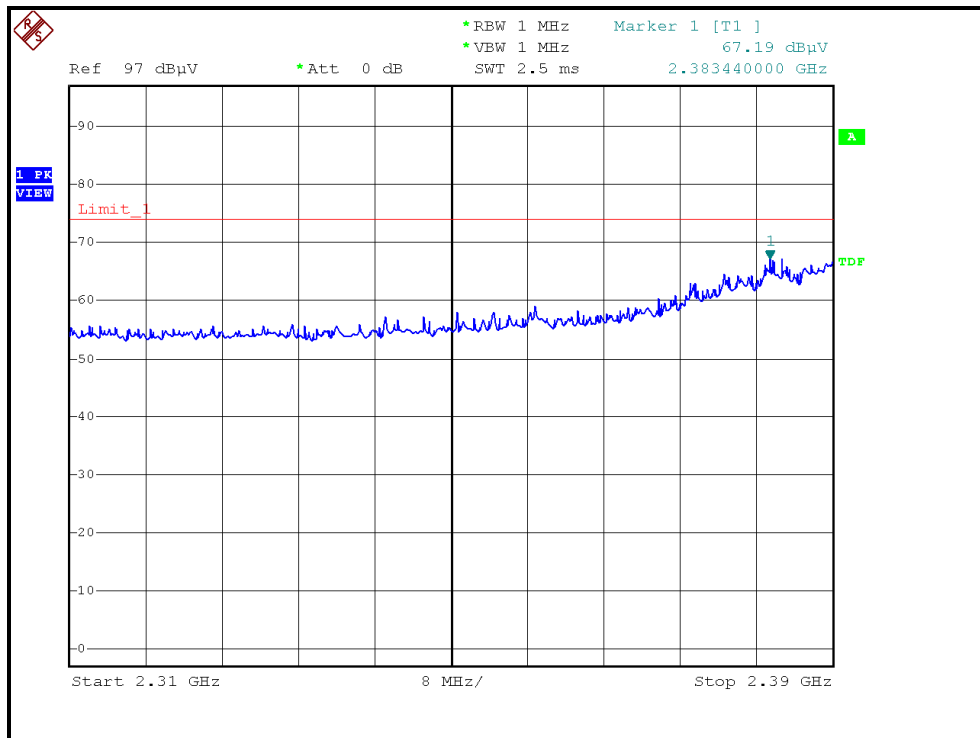
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	103.06 PK			1.85 H	142	72.55	30.51
2	*2452.00	92.70 AV			1.85 H	142	62.19	30.51
3	2483.90	69.56 PK	74.00	-4.44	1.85 H	141	38.93	30.63
4	2483.90	52.99 AV	54.00	-1.01	1.85 H	141	22.36	30.63
5	4904.00	50.70 PK	74.00	-23.30	1.28 H	32	13.70	37.00
6	4904.00	37.64 AV	54.00	-16.36	1.28 H	32	0.64	37.00
7	7356.00	53.62 PK	74.00	-20.38	1.03 H	315	10.49	43.13
8	7356.00	40.16 AV	54.00	-13.84	1.03 H	315	-2.97	43.13
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	104.02 PK			1.33 V	99	73.51	30.51
2	*2452.00	92.04 AV			1.33 V	99	61.53	30.51
3	2483.50	63.43 PK	74.00	-10.57	1.33 V	99	32.80	30.63
4	2483.50	50.15 AV	54.00	-3.85	1.33 V	99	19.52	30.63
5	4904.00	51.30 PK	74.00	-22.70	1.07 V	205	14.30	37.00
6	4904.00	40.03 AV	54.00	-13.97	1.07 V	205	3.03	37.00
7	7356.00	53.96 PK	74.00	-20.04	1.52 V	206	10.83	43.13
8	7356.00	39.94 AV	54.00	-14.06	1.52 V	206	-3.19	43.13

- 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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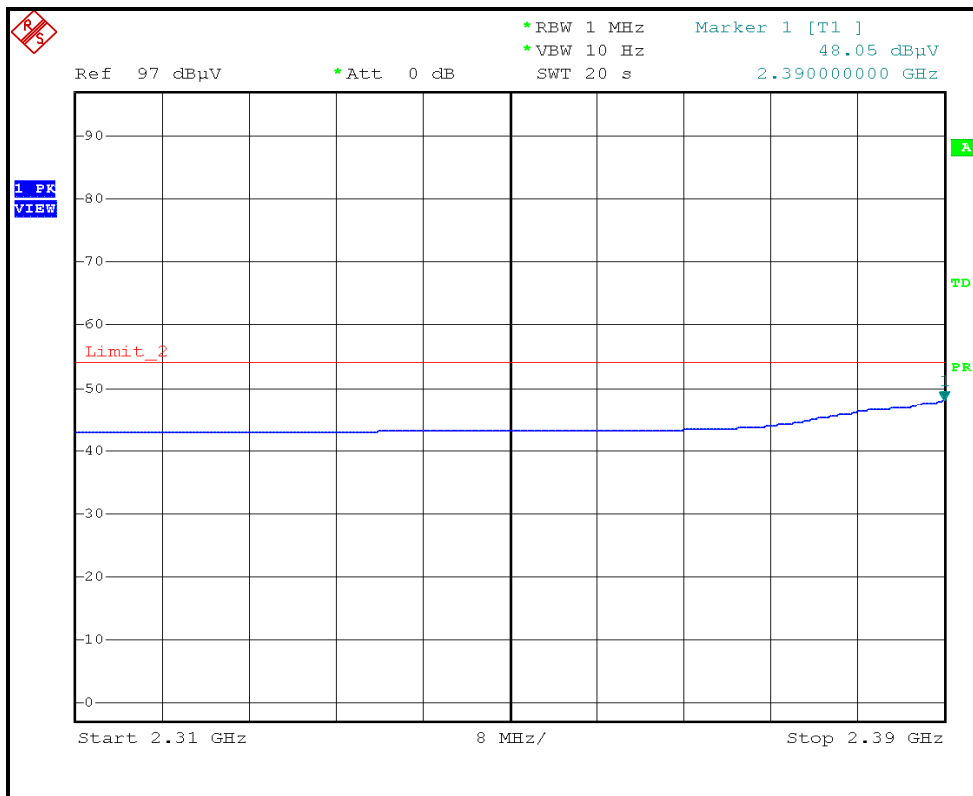
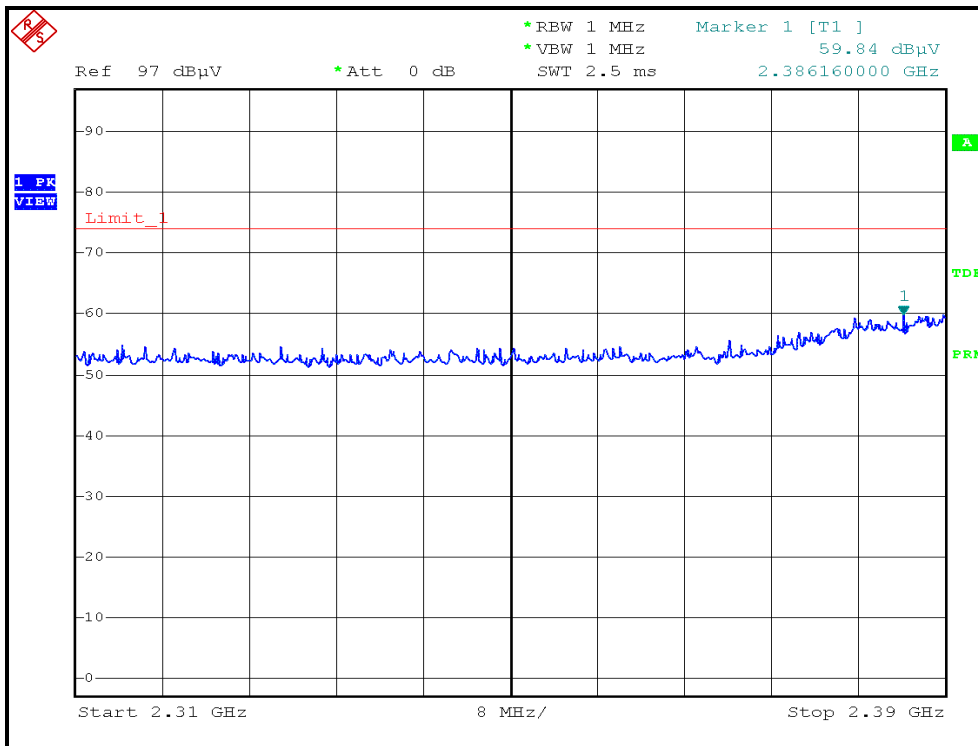
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH1, HORIZONTAL)





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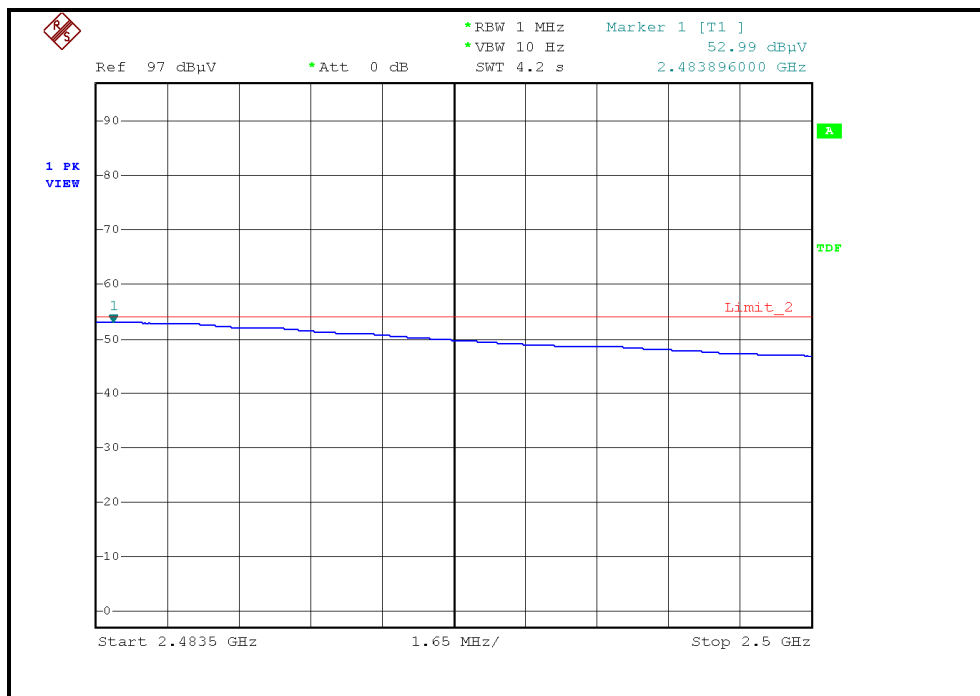
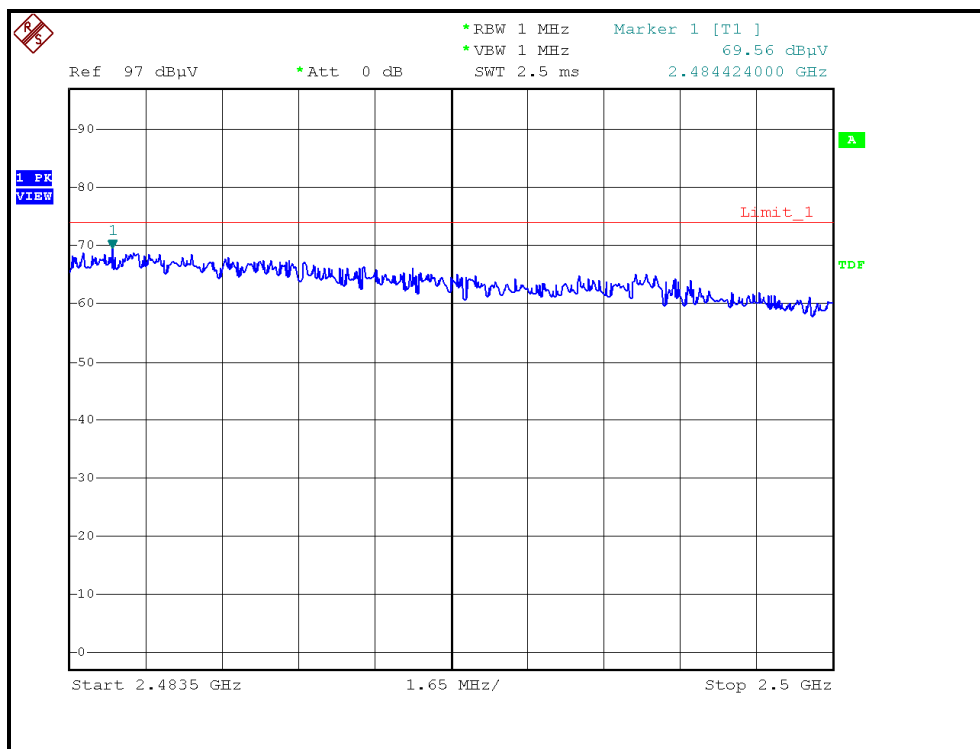
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH1, VERTICAL)





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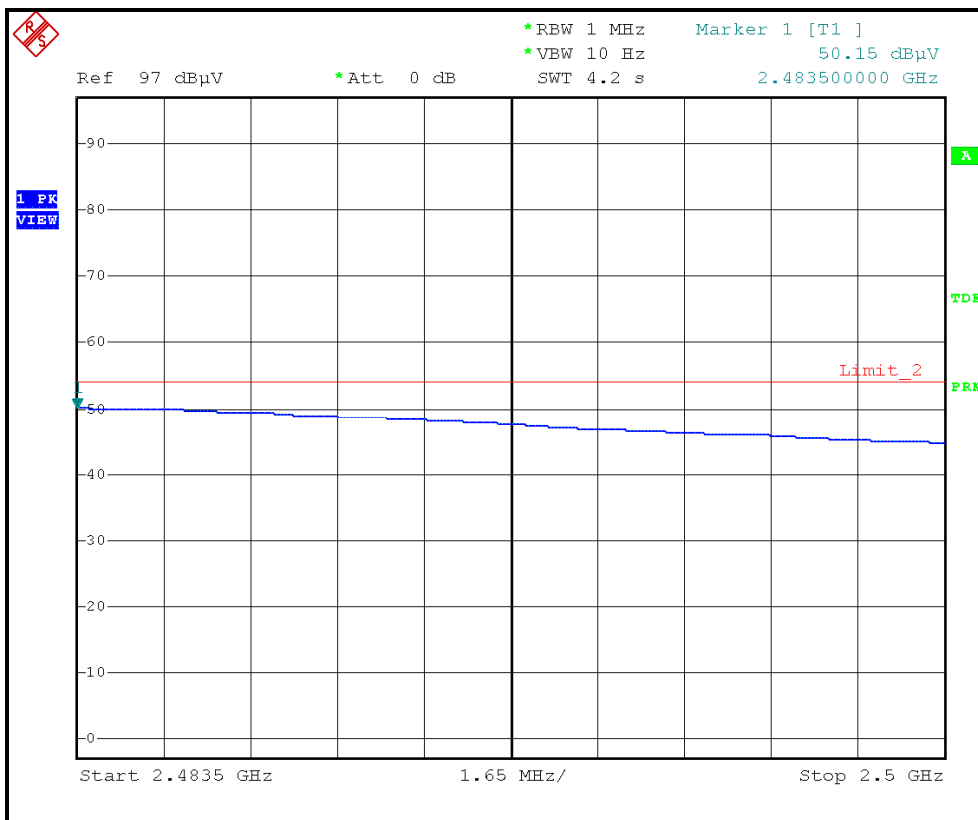
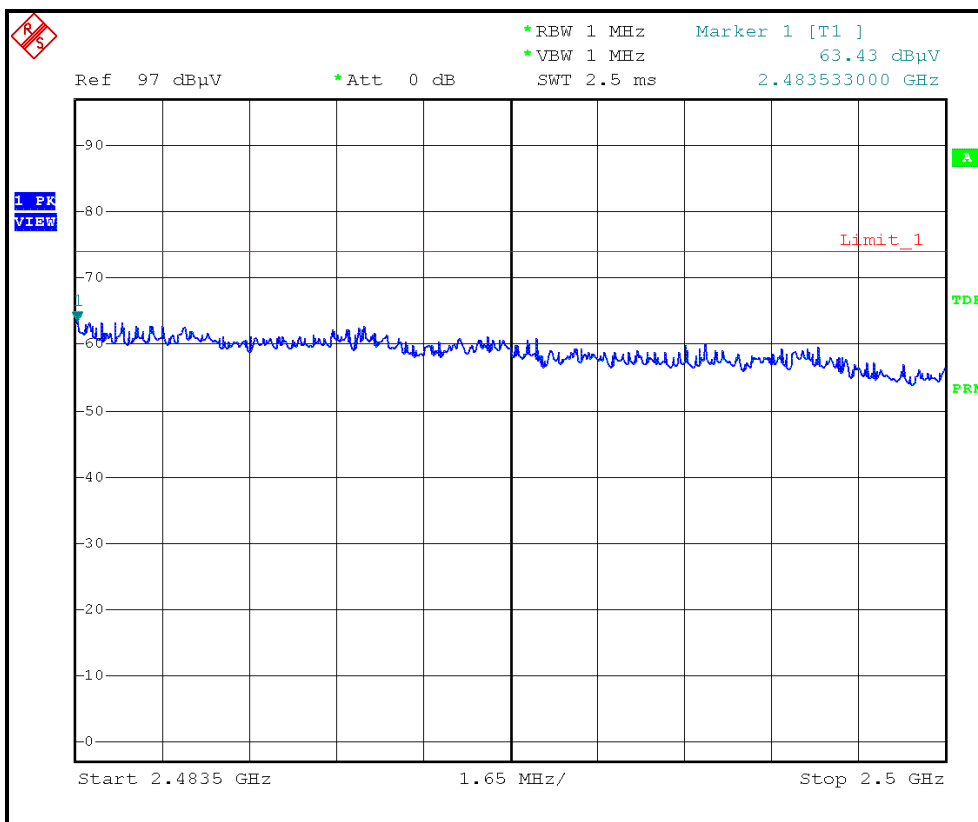
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH7, HORIZONTAL)





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RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH7, VERTICAL)





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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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

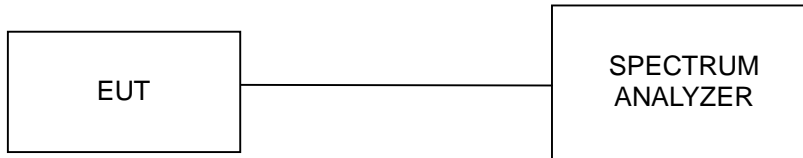
4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



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.

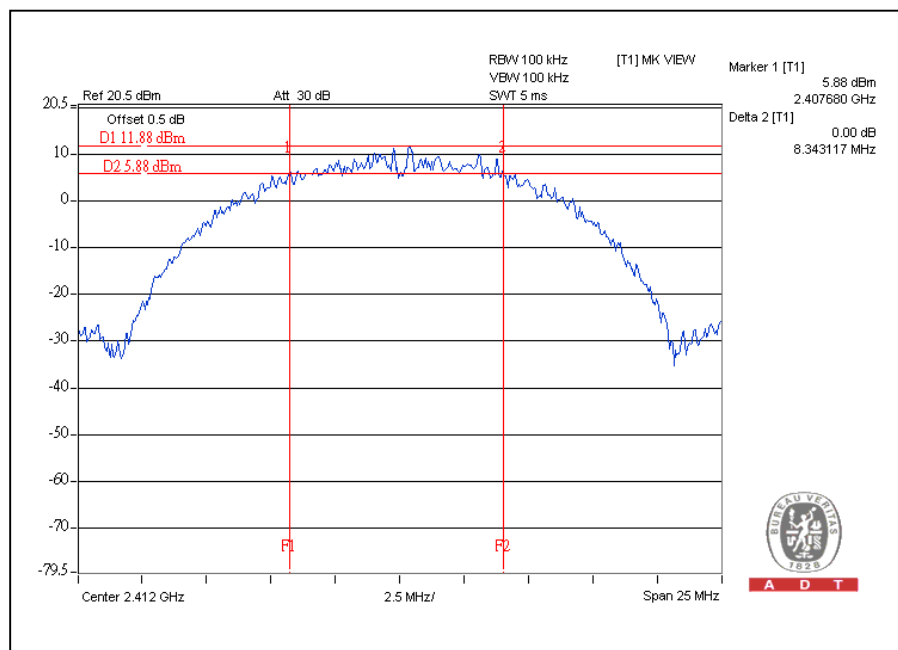
4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	8.34	0.5	PASS
6	2437	8.96	0.5	PASS
11	2462	9.06	0.5	PASS

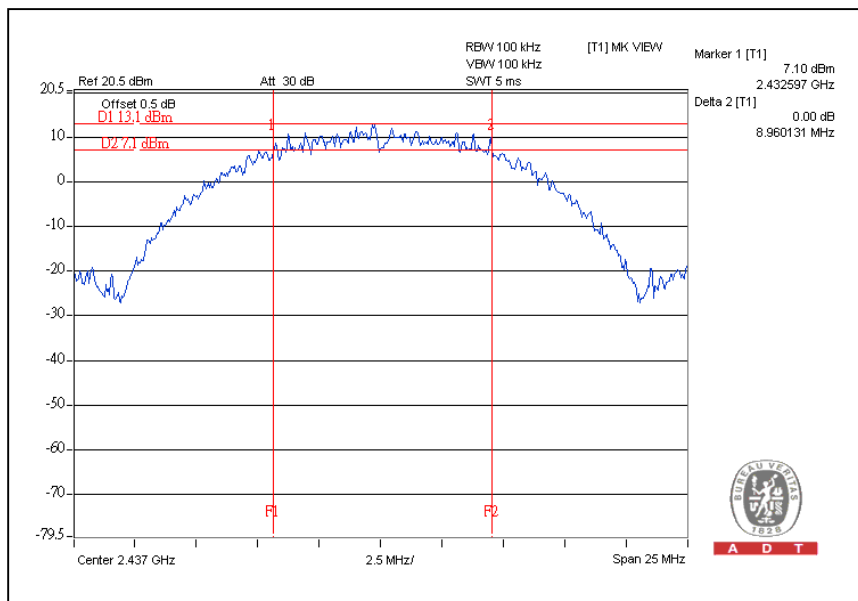
CH1



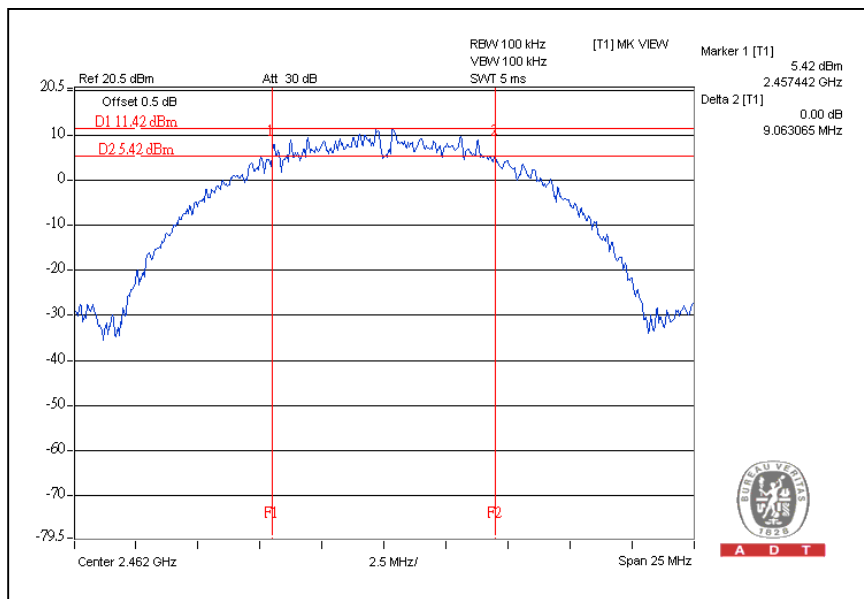


A D T

CH6



CH11





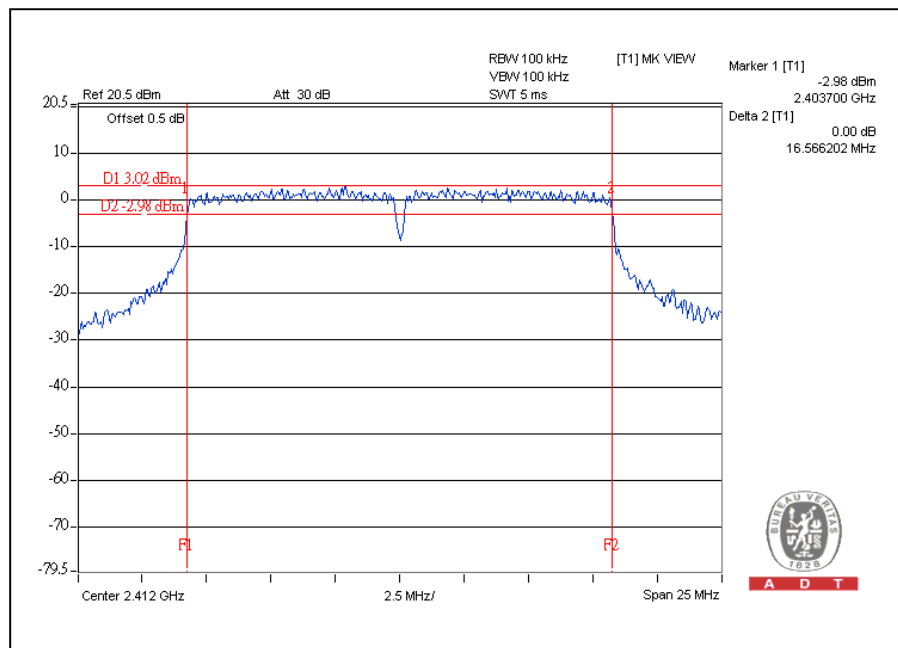
A D T

802.11g OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.57	0.5	PASS
6	2437	16.53	0.5	PASS
11	2462	16.54	0.5	PASS

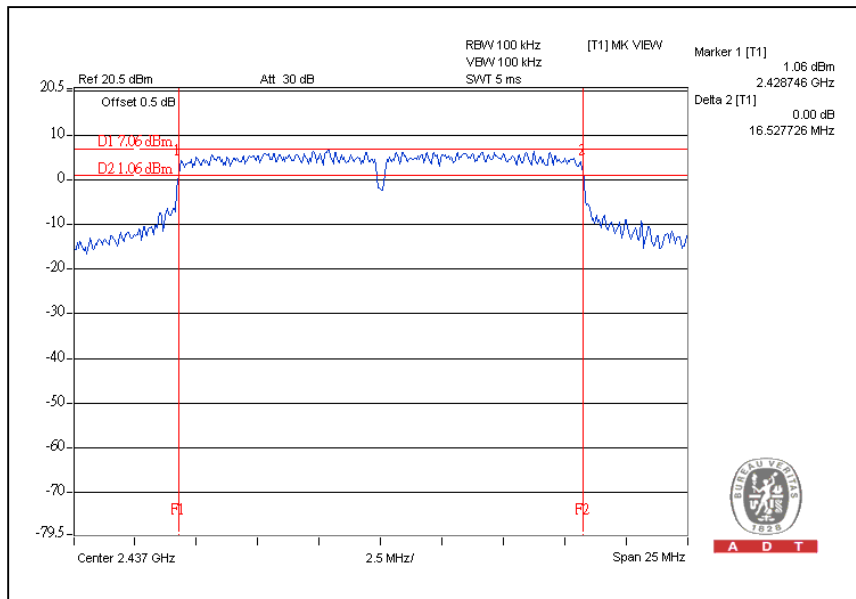
CH1



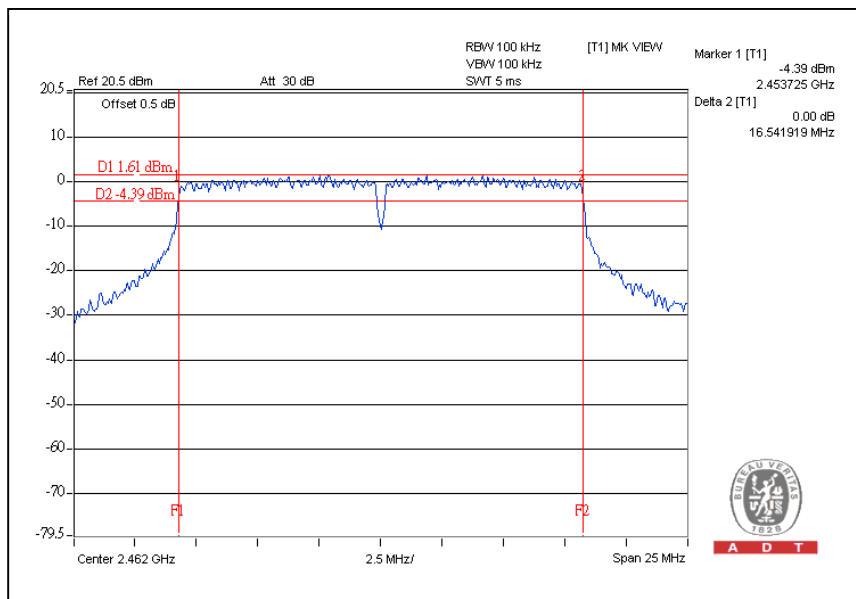


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CH6



CH11





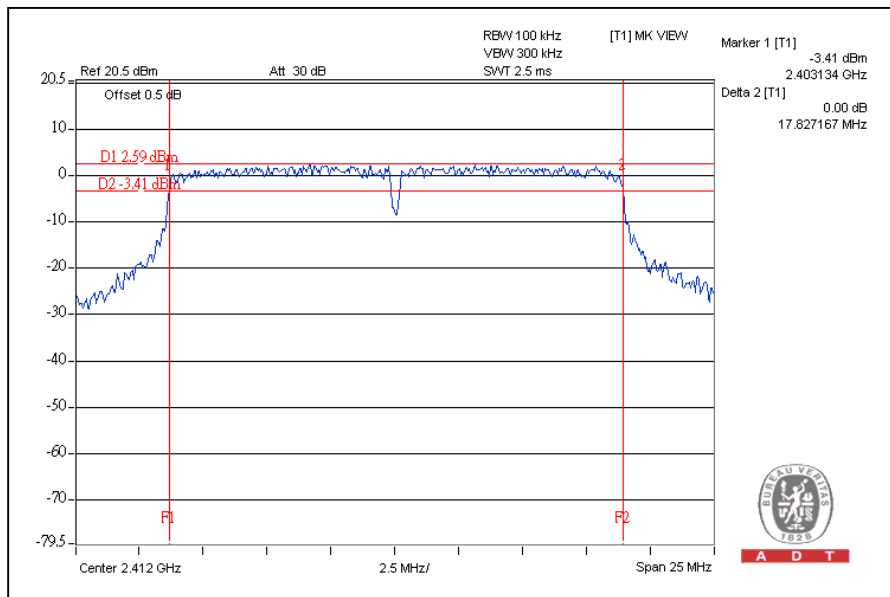
A D T

DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	13Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	17.83	17.77	0.5	PASS
6	2437	17.79	17.72	0.5	PASS
11	2462	17.86	17.76	0.5	PASS

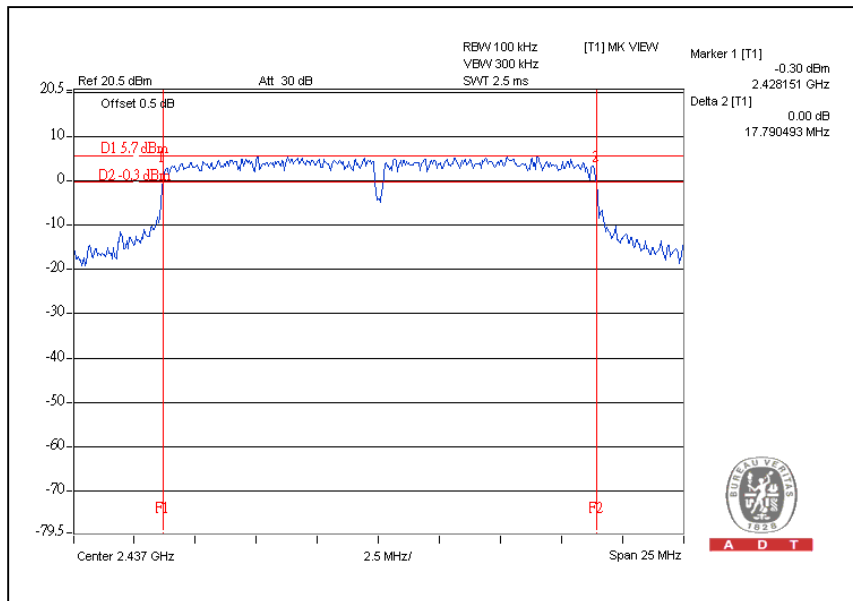
For Chain(0): CH1



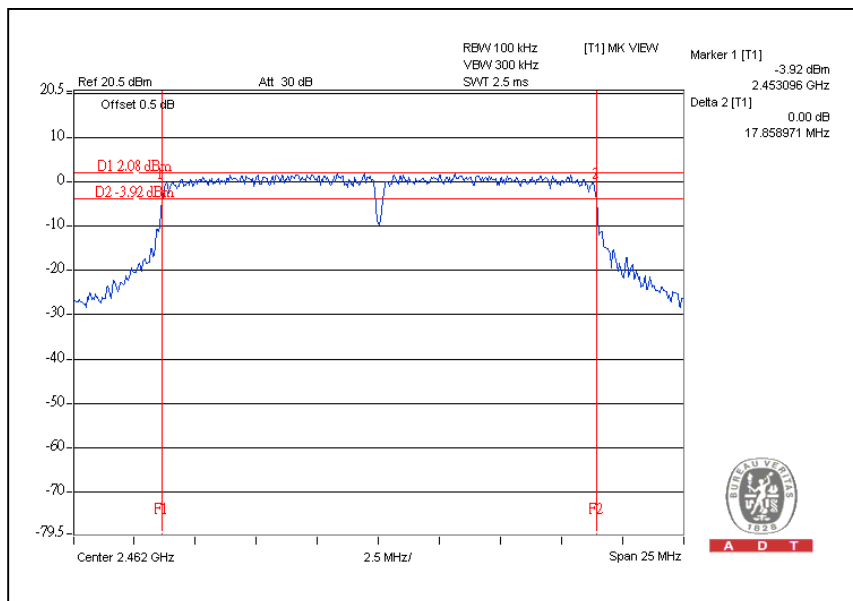


A D T

CH6



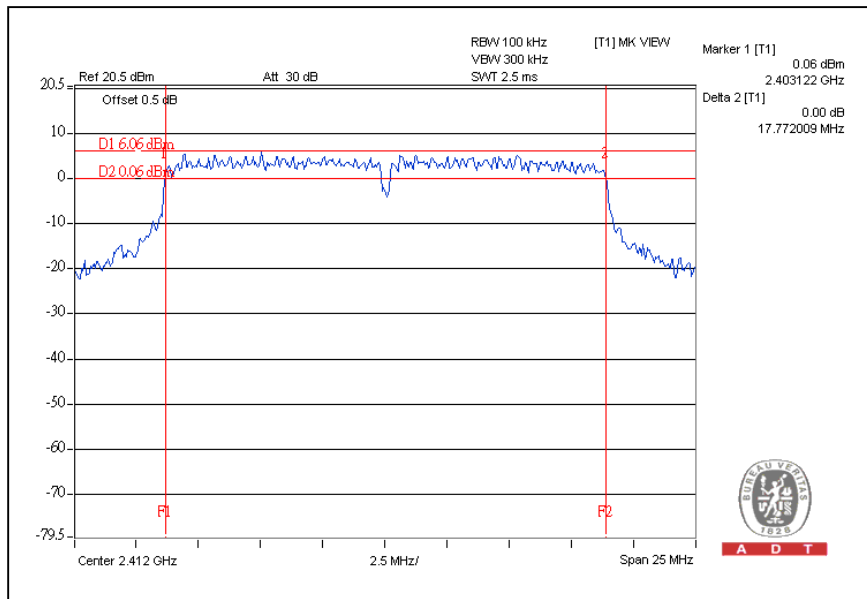
CH11



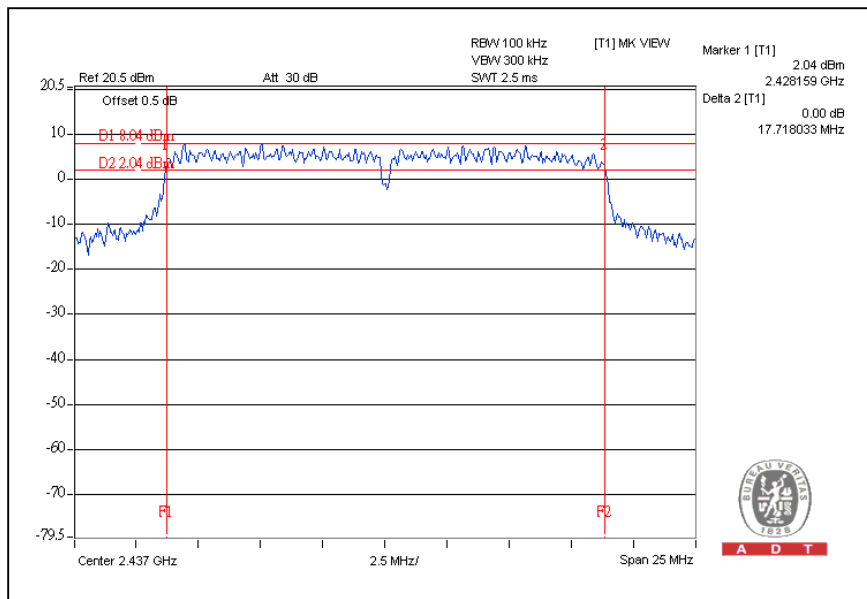


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For CHAIN(1): CH1



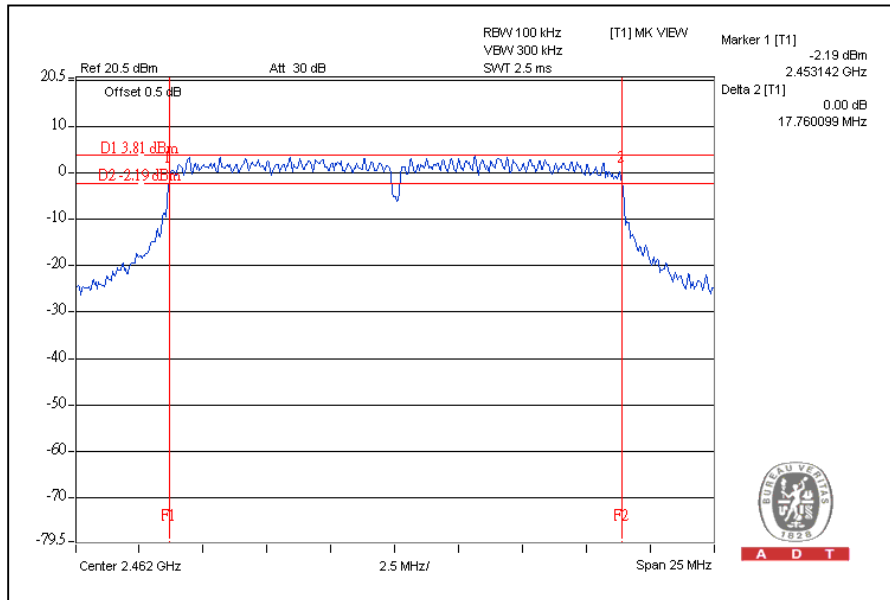
CH6





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CH11



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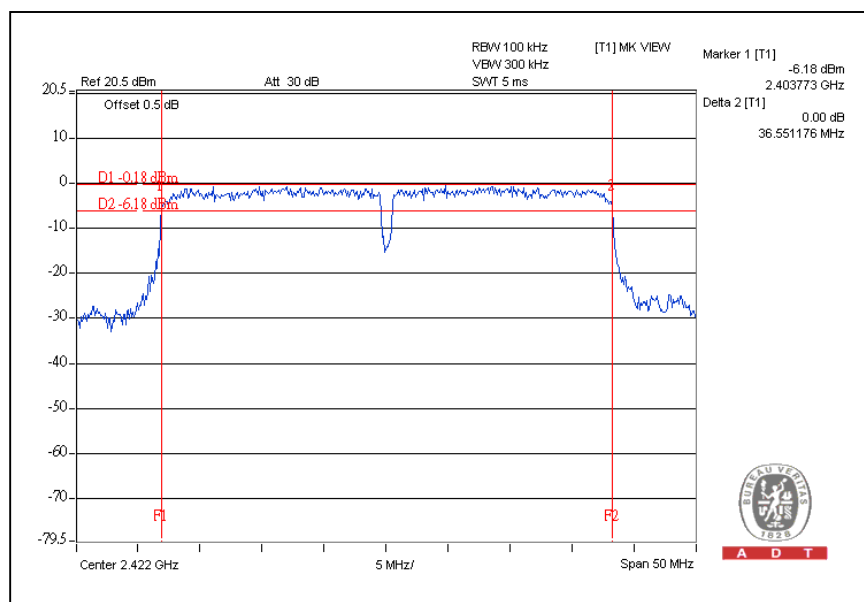
A D T

DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	27Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2422	36.55	36.44	0.5	PASS
4	2437	36.54	36.5	0.5	PASS
7	2452	36.55	36.43	0.5	PASS

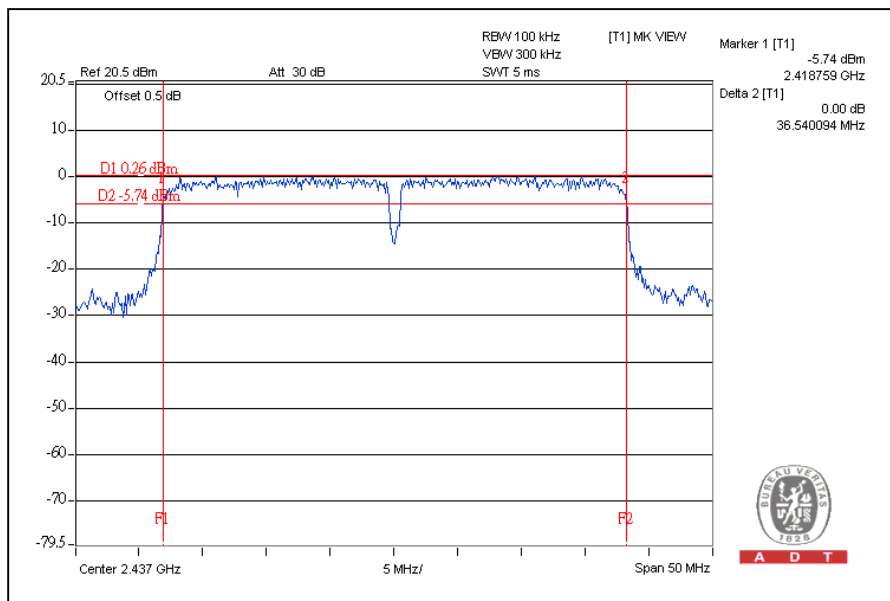
For Chain (0): CH1



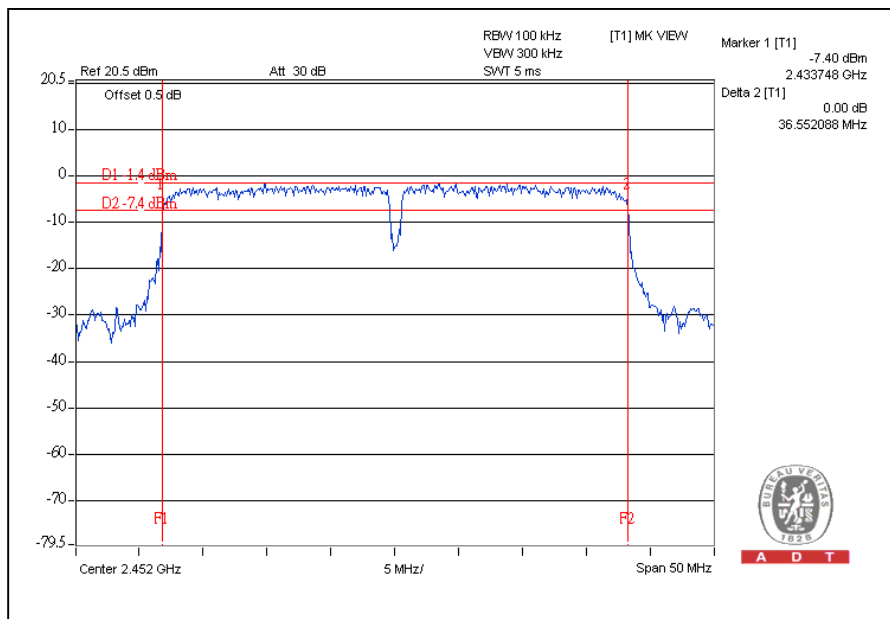


A D T

CH4



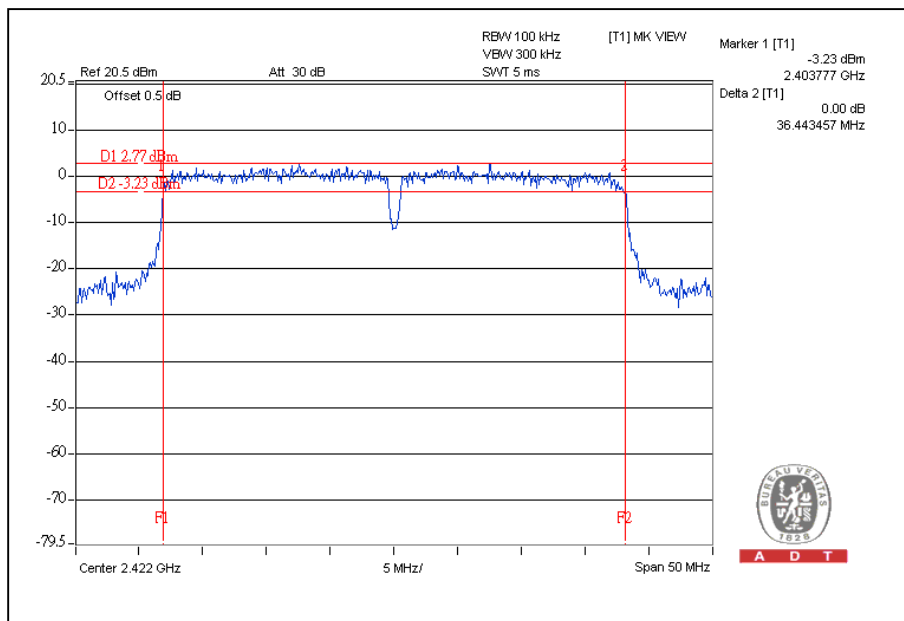
CH7



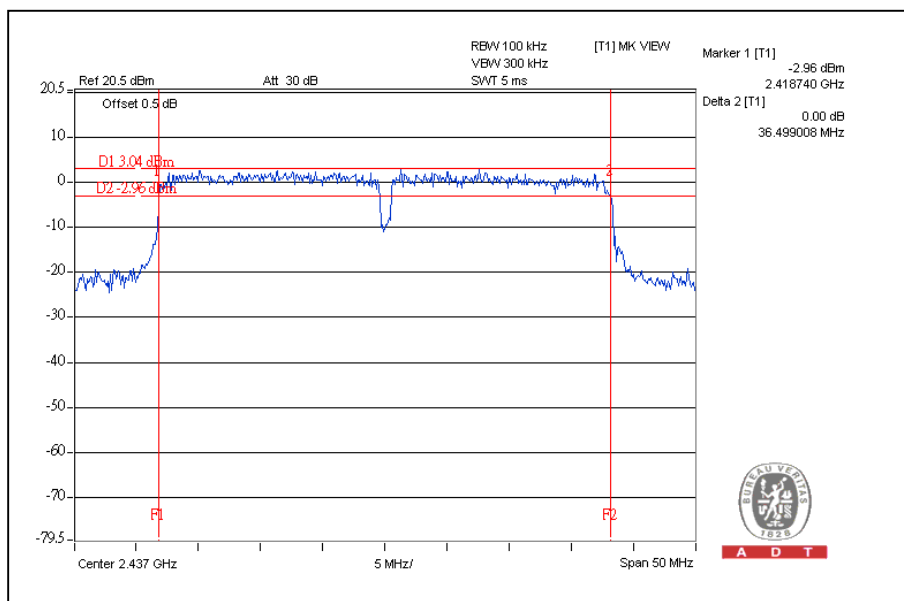


A D T

For Chain (1): CH1



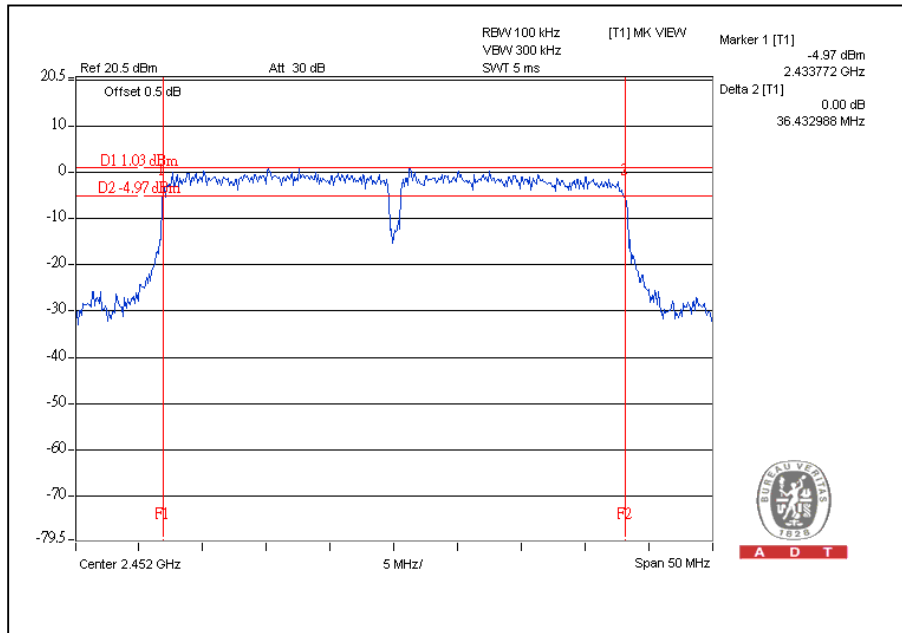
CH4





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CH7





4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	June 14, 2008	June 13, 2009
Pulse Power Sensor	MA2411B	0738172	April 25, 2008	April 24, 2009

NOTE:

The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator; the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the power level.

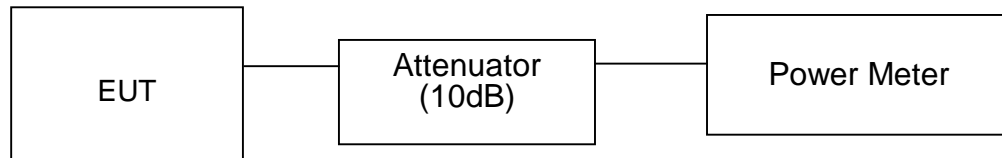
4.4.4 DEVIATION FROM TEST STANDARD

No deviation



A D T

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.1.6



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4.4.7 TEST RESULTS

802.11b DSSS MODULATION:

MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	154.882	21.90	30	PASS
6	2437	226.986	23.56	30	PASS
11	2462	156.315	21.94	30	PASS

802.11g OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	275.423	24.40	30	PASS
6	2437	354.813	25.50	30	PASS
11	2462	251.189	24.00	30	PASS



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DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	13Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)		PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(0)	CHAIN(1)				
1	2412	249.459	281.838	23.97	24.50	531.297	27.25	30	PASS
6	2437	303.389	301.995	24.82	24.80	605.384	27.82	30	PASS
11	2462	229.087	210.378	23.60	23.23	439.465	26.43	30	PASS

DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	27Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)		PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(0)	CHAIN(1)				
1	2422	253.513	228.034	24.04	23.58	481.547	26.83	30	PASS
4	2437	245.471	252.348	23.90	24.02	497.819	26.97	30	PASS
7	2452	204.174	194.984	23.10	22.90	399.158	26.01	30	PASS



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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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

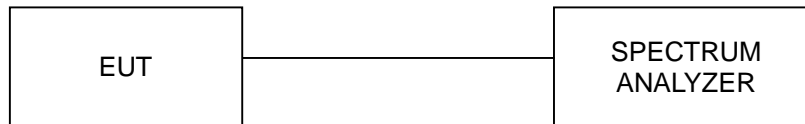
4.5.4 DEVIATION FROM TEST STANDARD

No deviation



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4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.1.6



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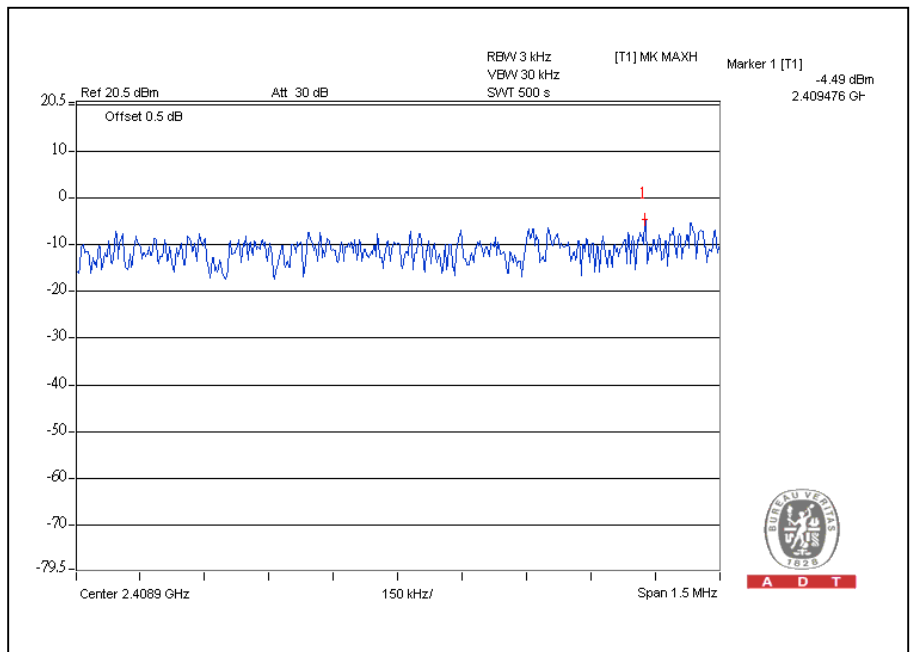
4.5.7 TEST RESULTS

802.11b DSSS MODULATION:

MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-4.49	8	PASS
6	2437	-2.12	8	PASS
11	2462	-3.77	8	PASS

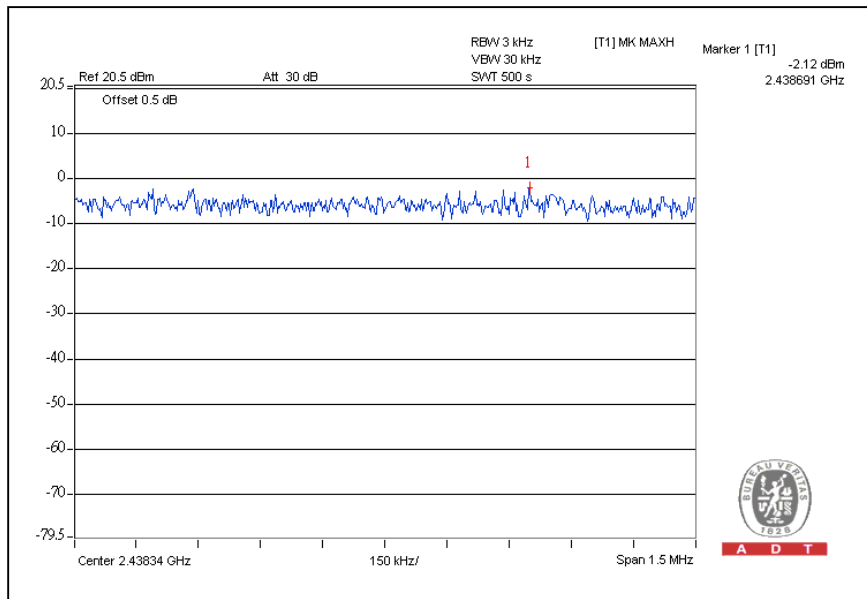
CH1



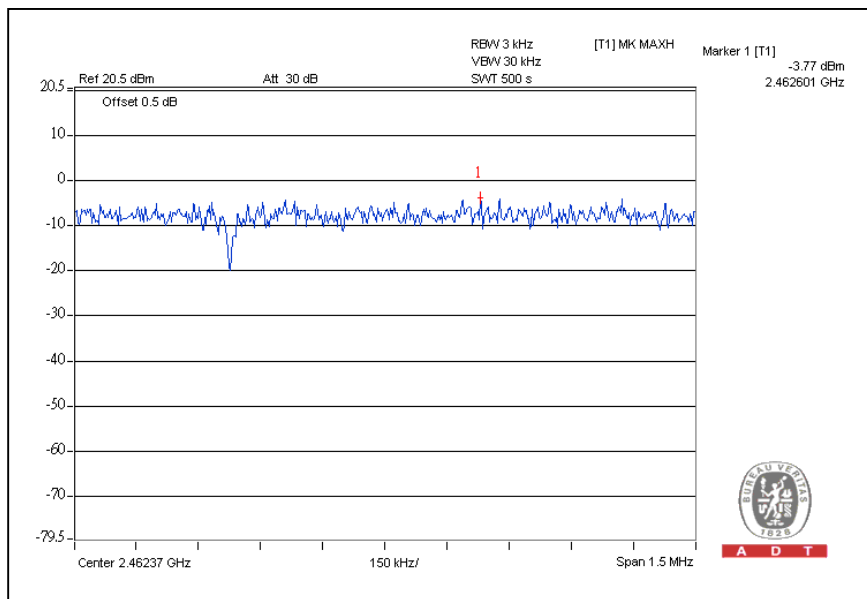


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CH6



CH11





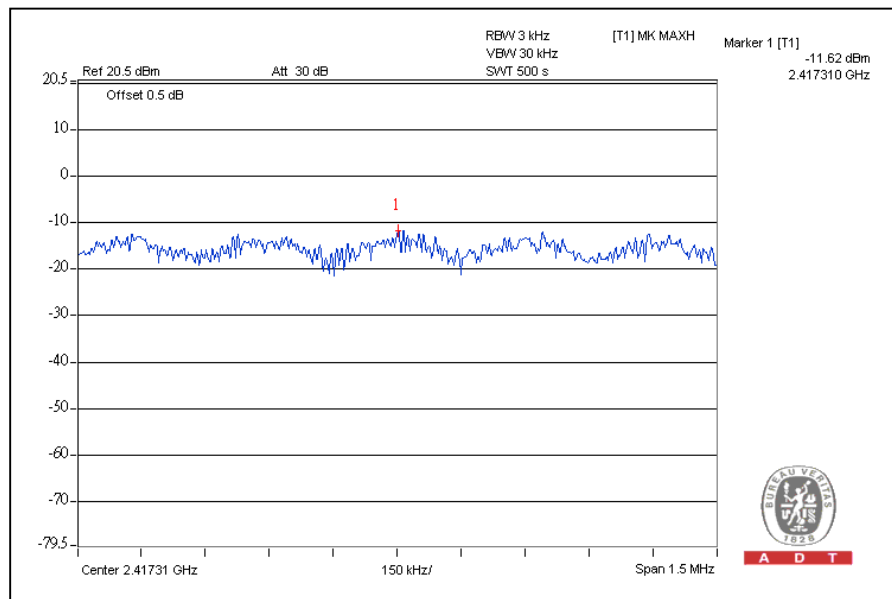
A D T

802.11g OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 966hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-11.62	8	PASS
6	2437	-7.08	8	PASS
11	2462	-12.98	8	PASS

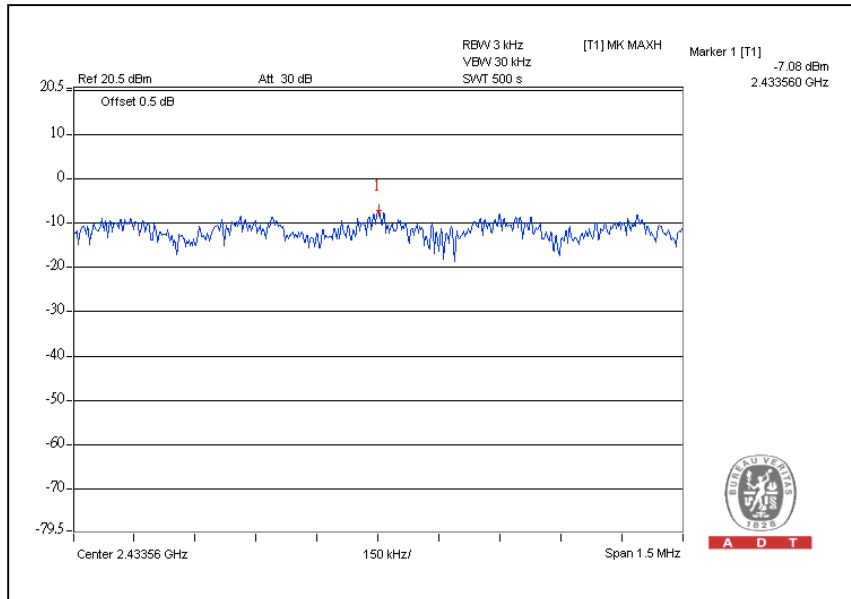
CH1



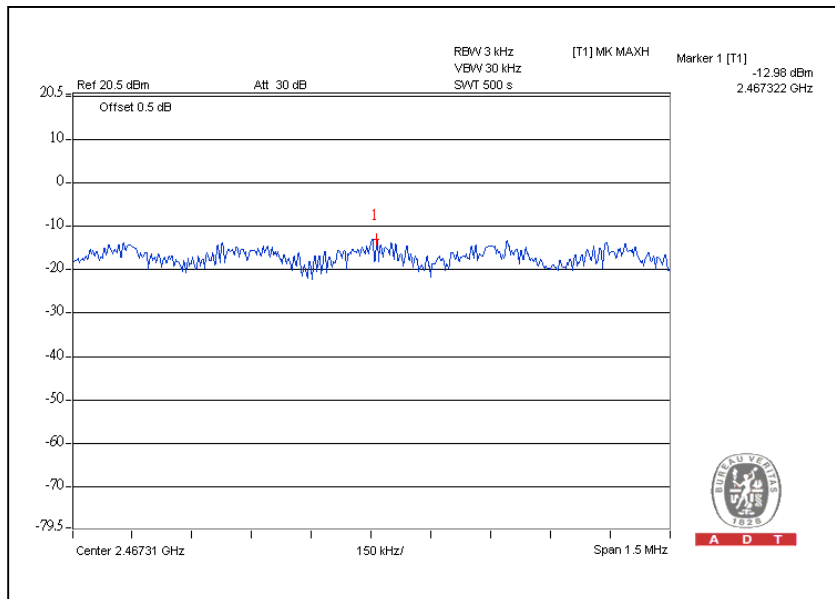


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CH6



CH11





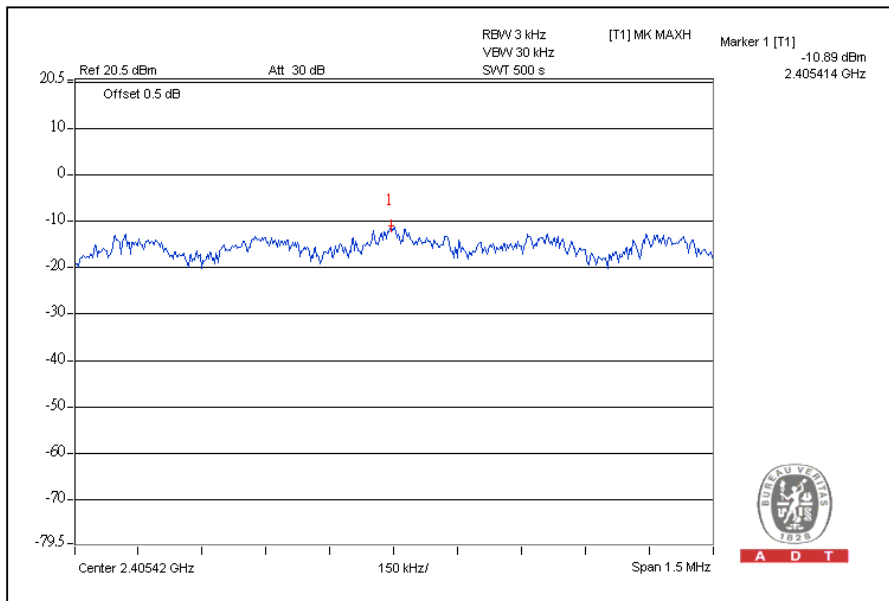
A D T

DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	13Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (mW)		RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(0)	CHAIN(1)				
1	2412	0.081	0.143	-10.89	-8.46	0.224	-6.50	8	PASS
6	2437	0.161	0.197	-7.93	-7.06	0.358	-4.46	8	PASS
11	2462	0.078	0.086	-11.09	-10.63	0.164	-7.85	8	PASS

For Chain(0): CH1

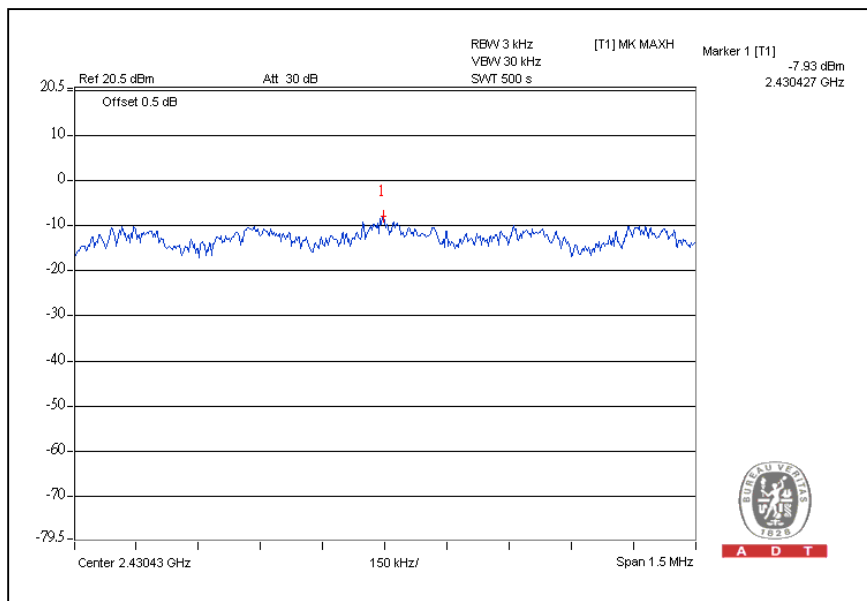


A D T

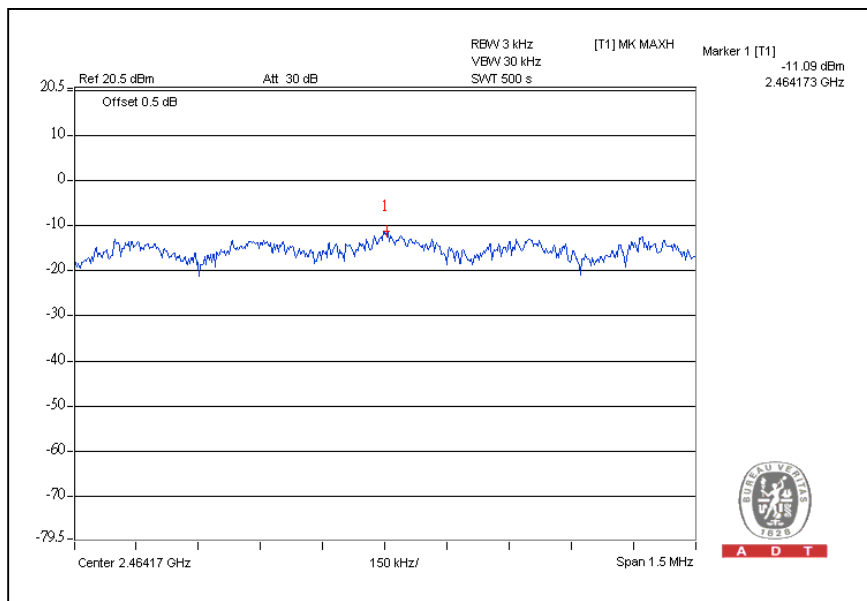


A D T

CH6



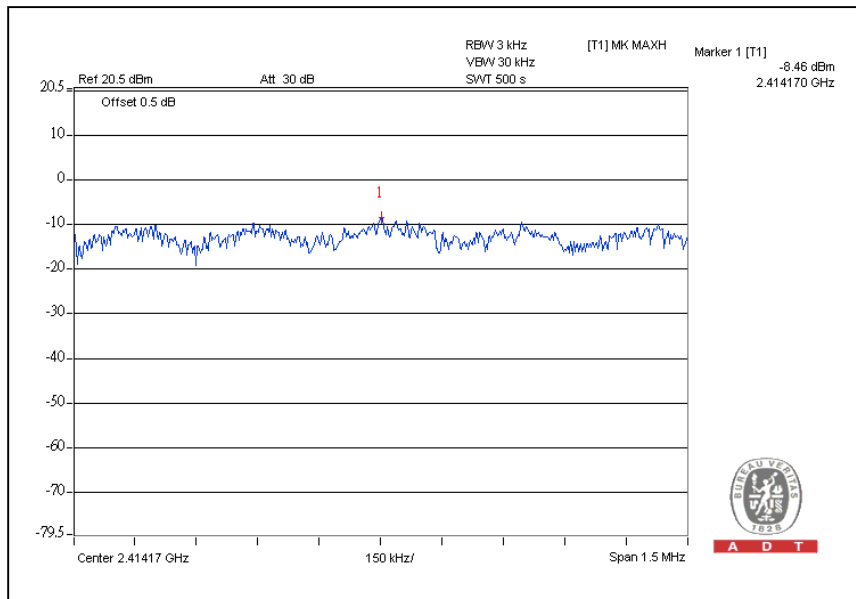
CH11



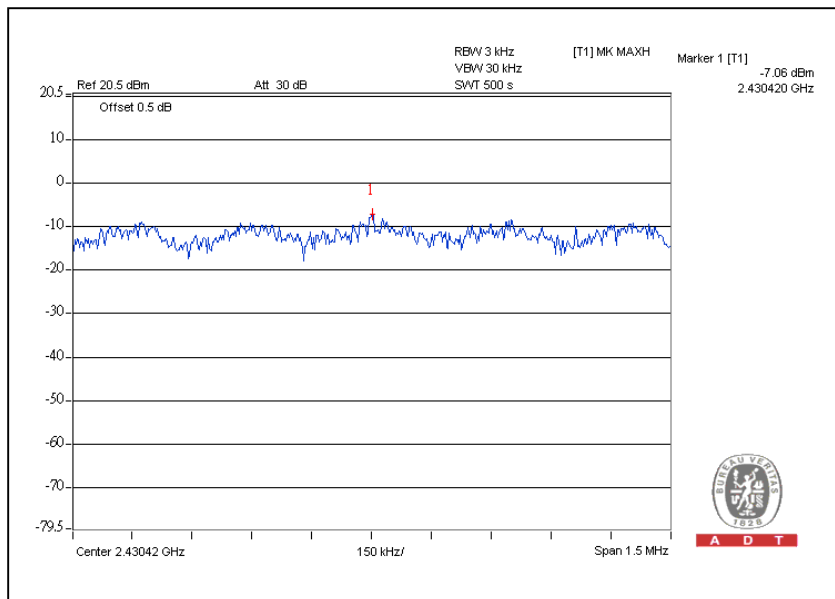


A D T

For Chain (1): CH1



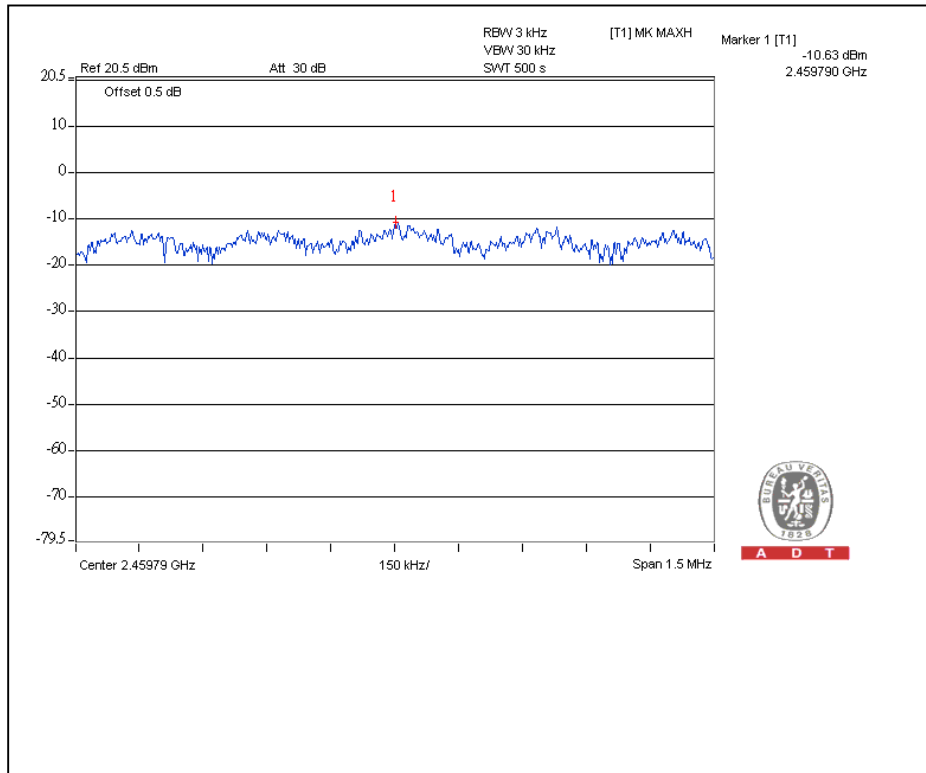
CH6





A D T

CH11





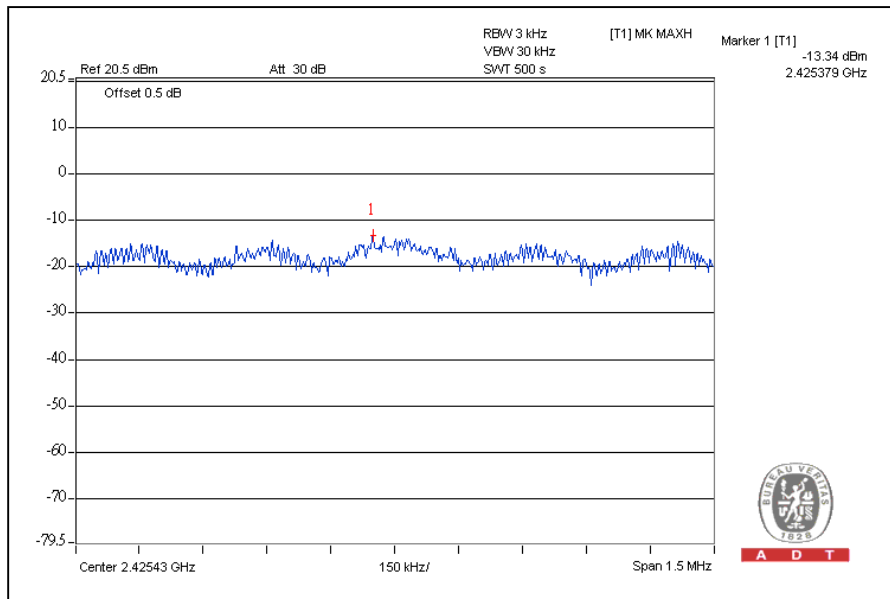
A D T

DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	27Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 962hPa
TESTED BY	WeYu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (mW)		RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(0)	CHAIN(1)				
1	2422	0.046	0.067	-13.34	-11.73	0.113	-9.47	8	PASS
4	2437	0.053	0.085	-12.75	-10.72	0.138	-8.60	8	PASS
7	2452	0.053	0.049	-12.74	-13.14	0.102	-9.91	8	PASS

For Chain (0): CH1

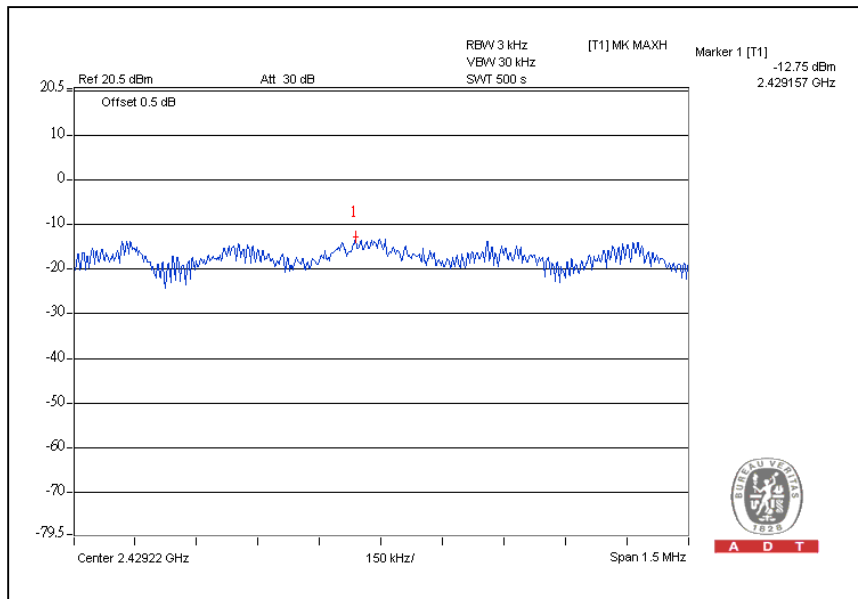


A D T

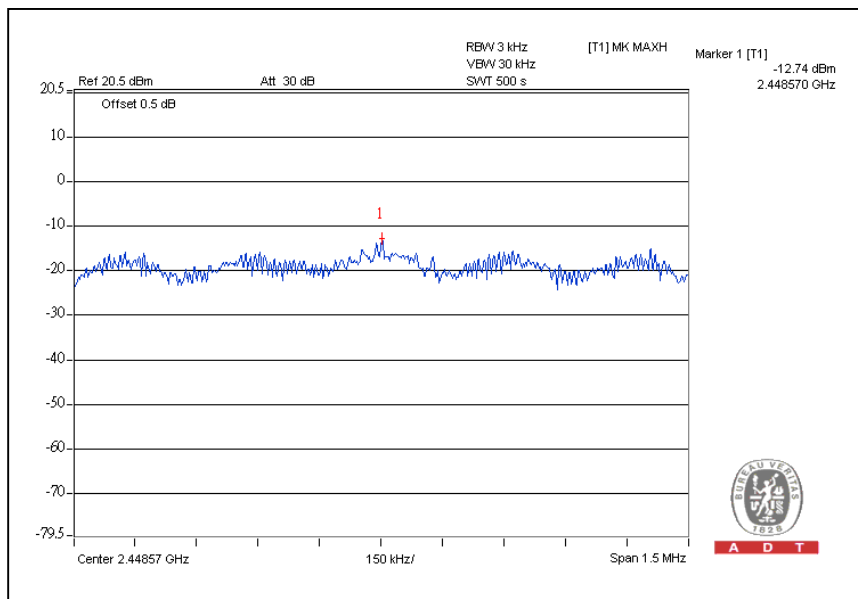


A D T

CH4



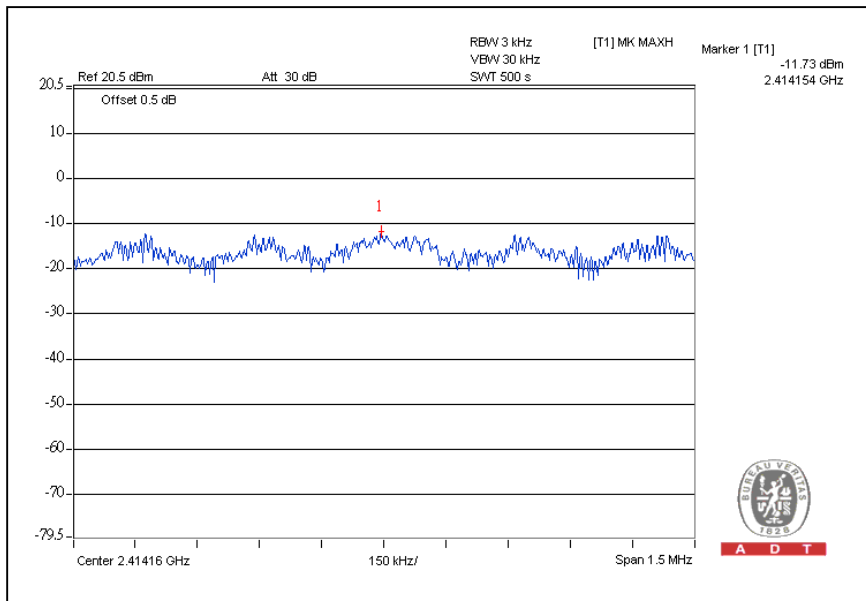
CH7



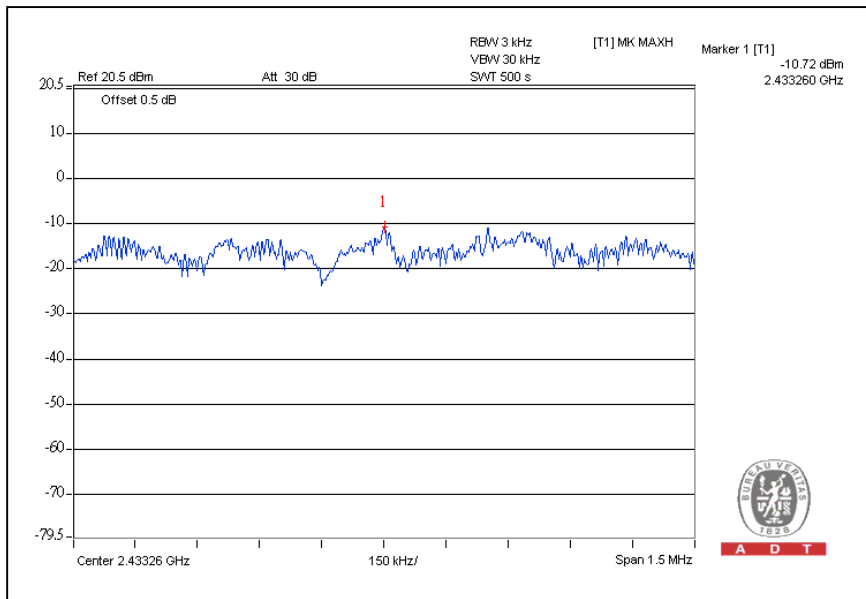


A D T

For Chain (1): CH1



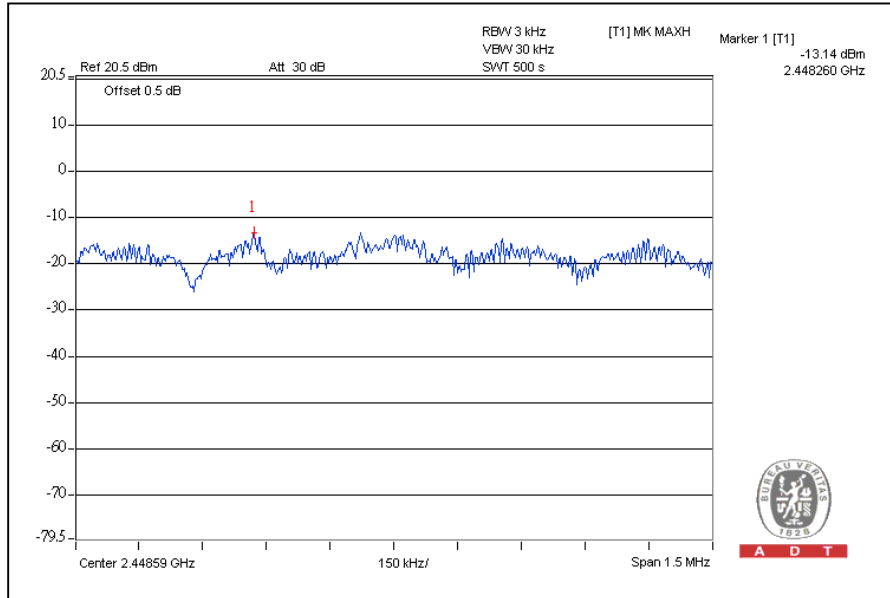
CH4





A D T

CH7





A D T

4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100 MHz bandwidth from band edge. The out-band emission was measured and recorded.

The spectrum plots (RBW = 100kHz and VBW = 300kHz) are attached on the following pages.



4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

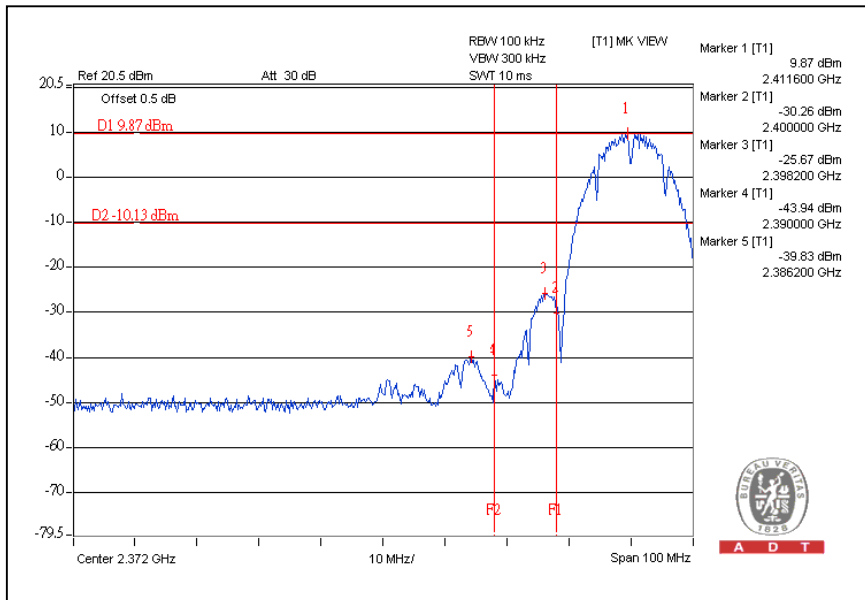
Same as Item 4.1.6

4.6.6 TEST RESULTS

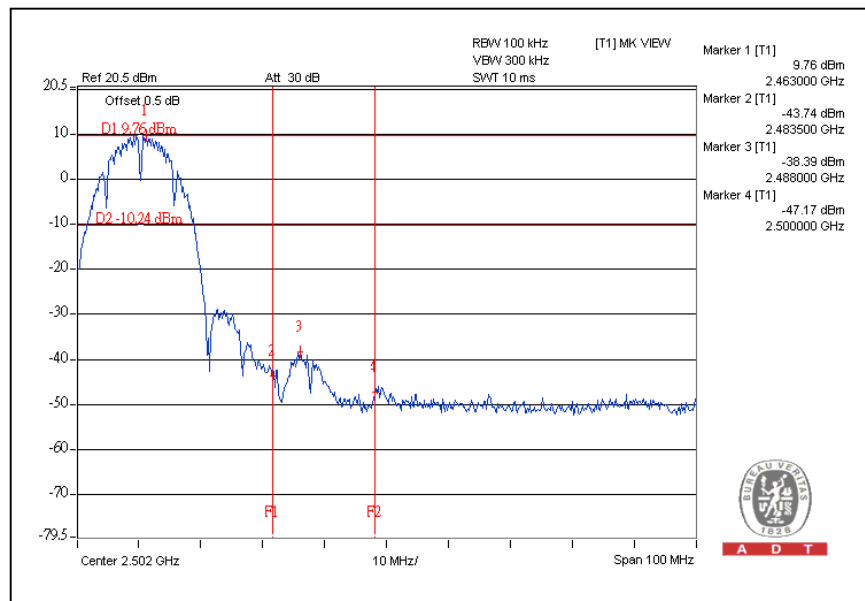
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

802.11b DSSS MODULATION:

CH1



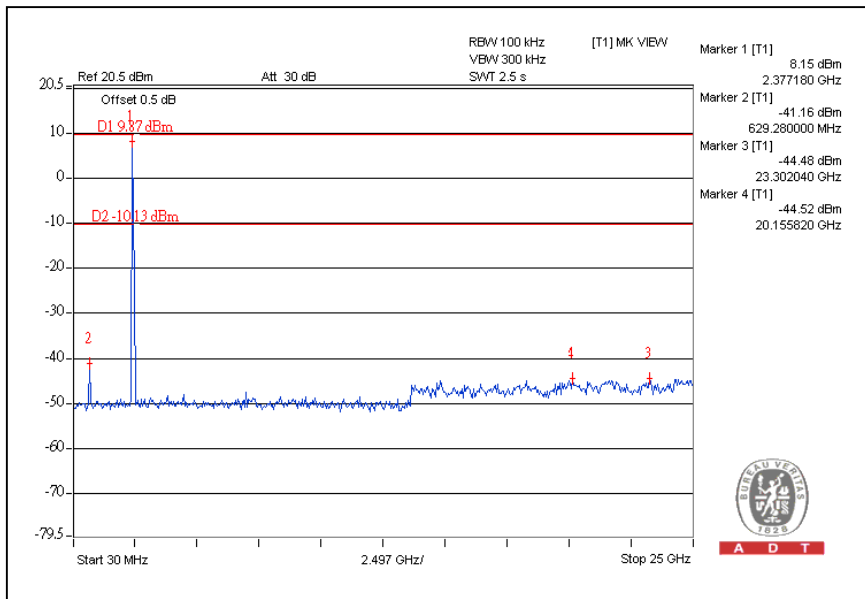
CH11



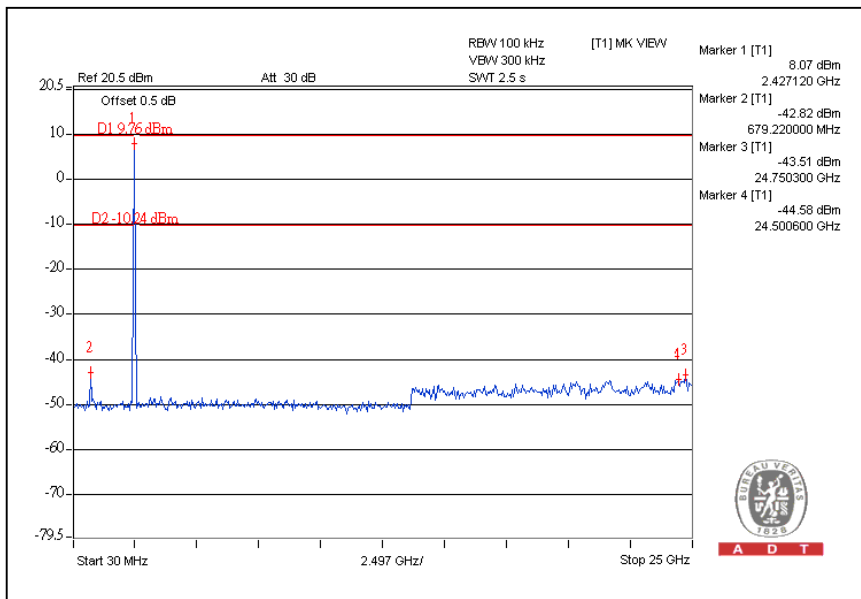


A D T

CH1

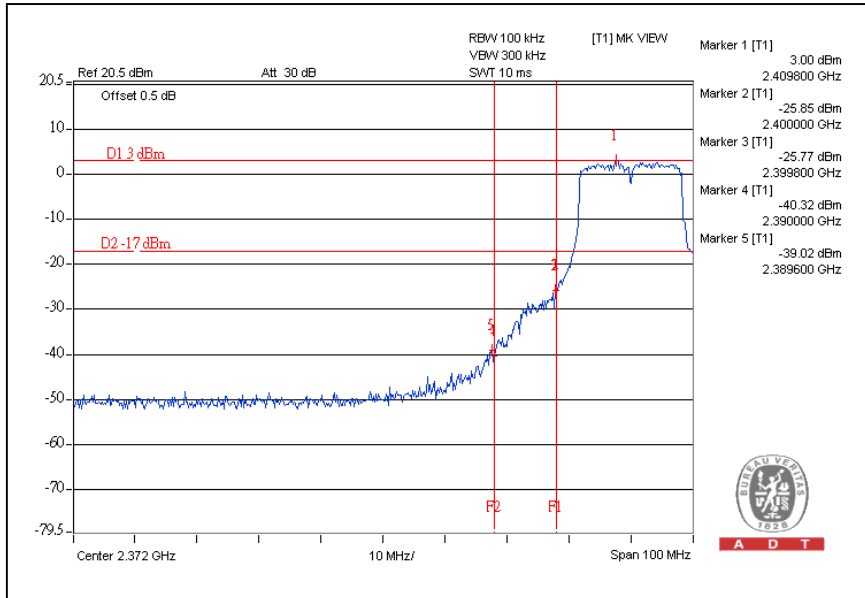


CH11

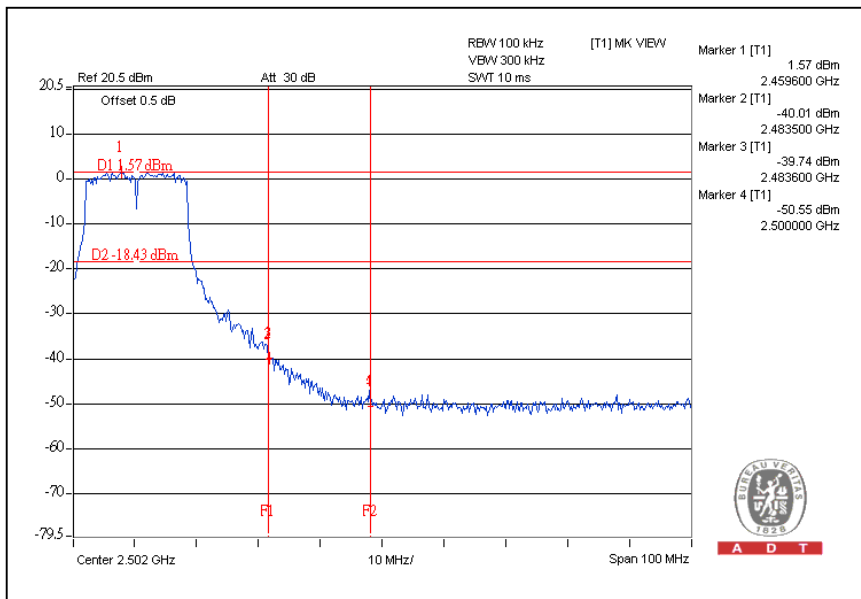


802.11g OFDM MODULATION:

CH 1



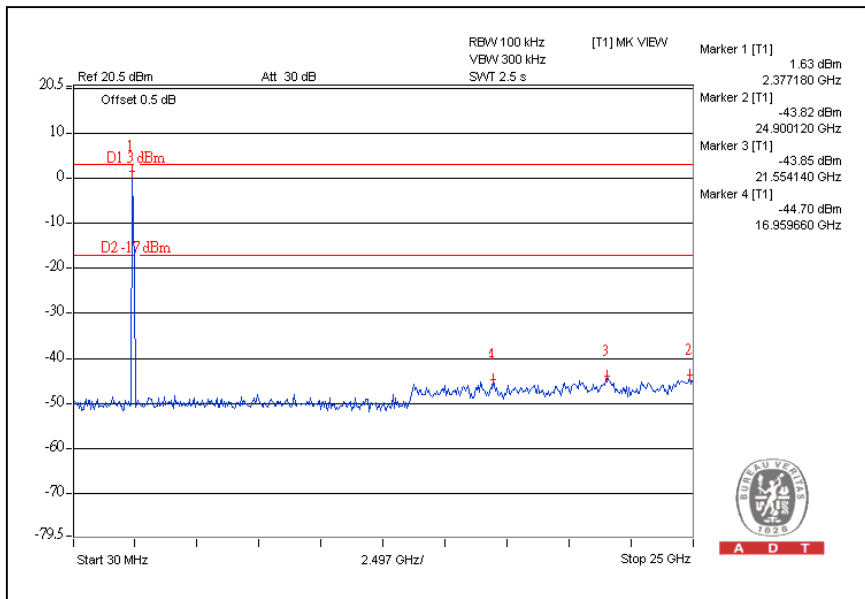
CH11



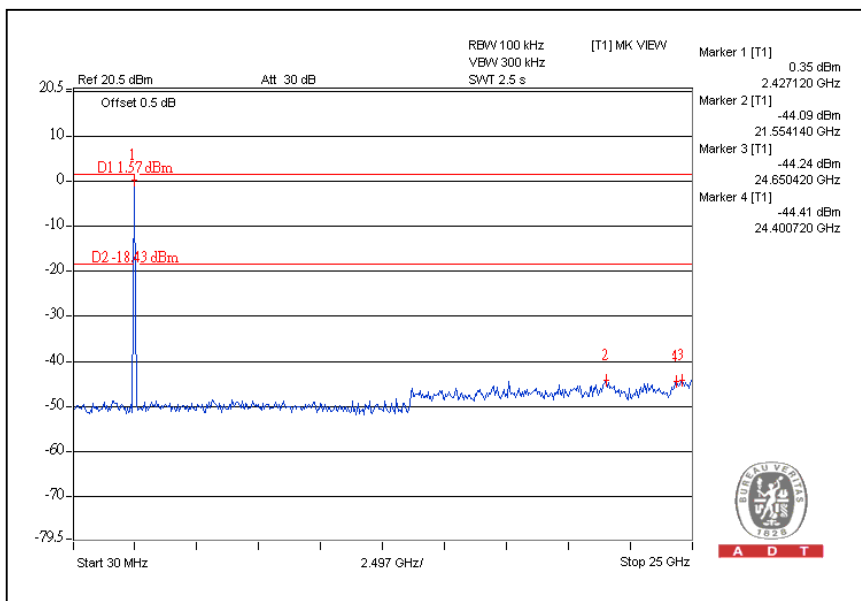


A D T

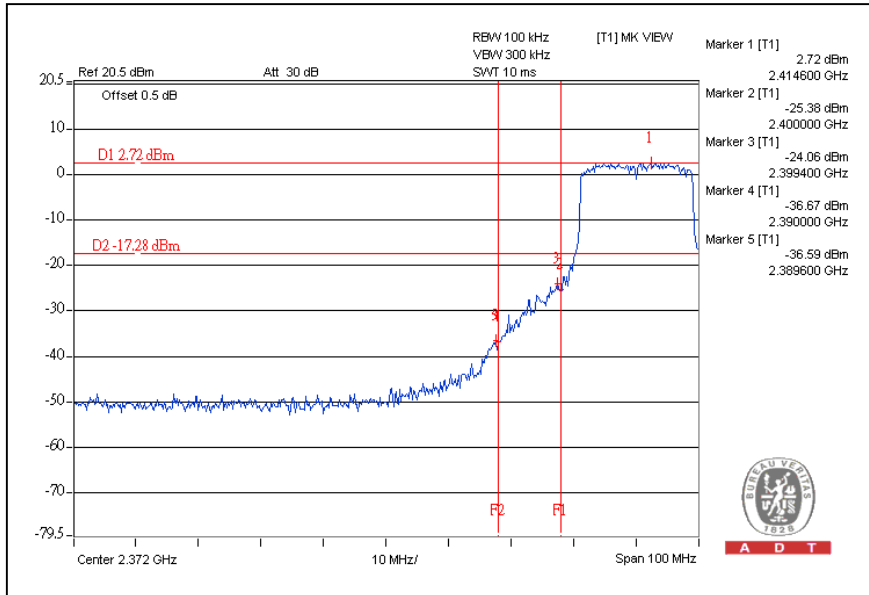
CH1



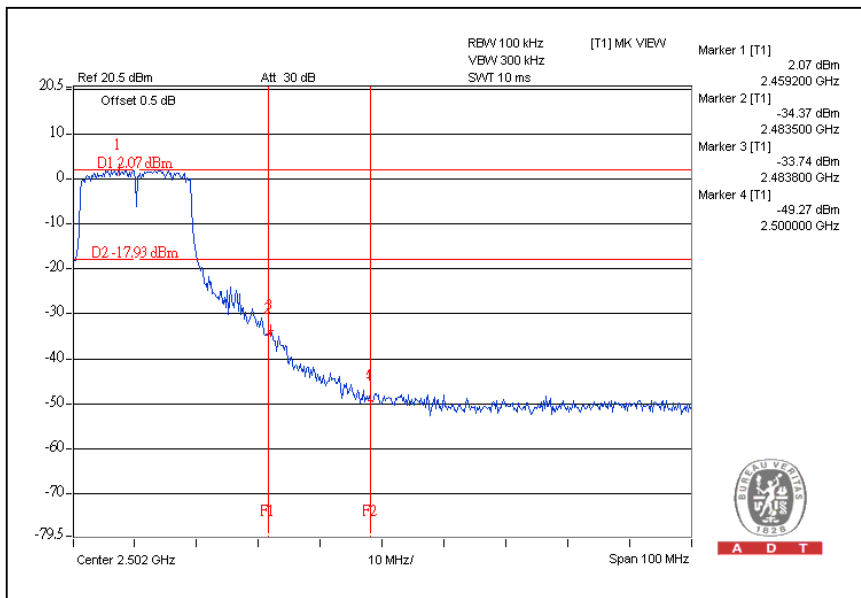
CH11



DRAFT 802.11n (20MHz) OFDM MODULATION: For Chain (0):CH1



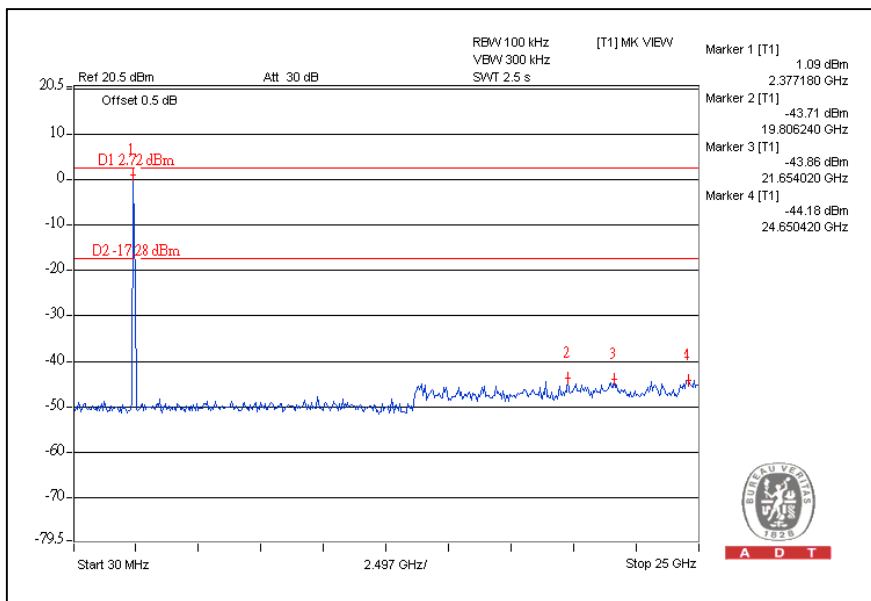
CH11



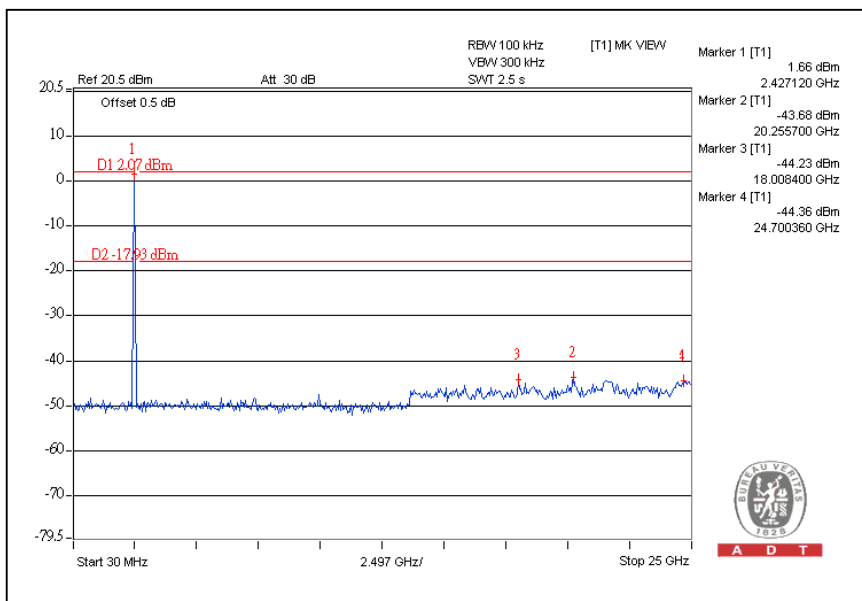


A D T

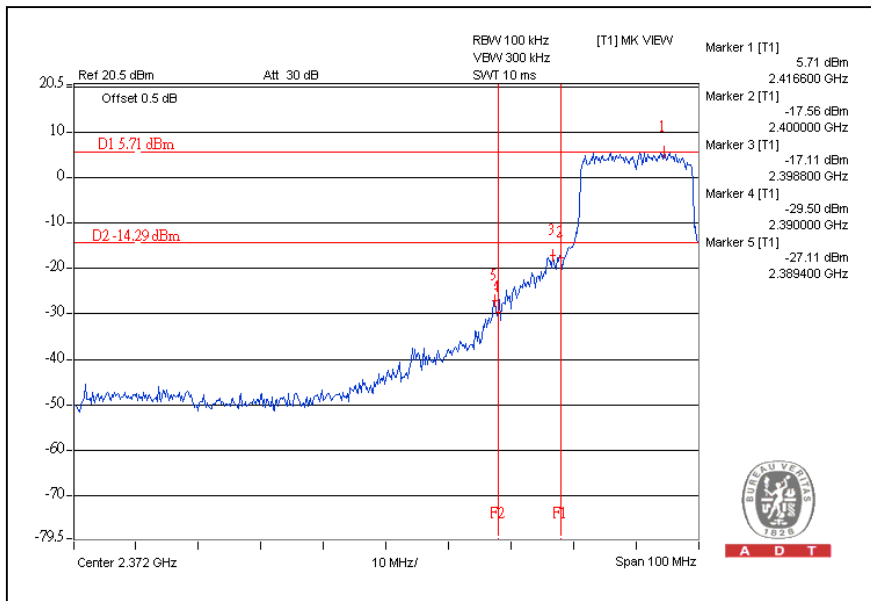
CH1



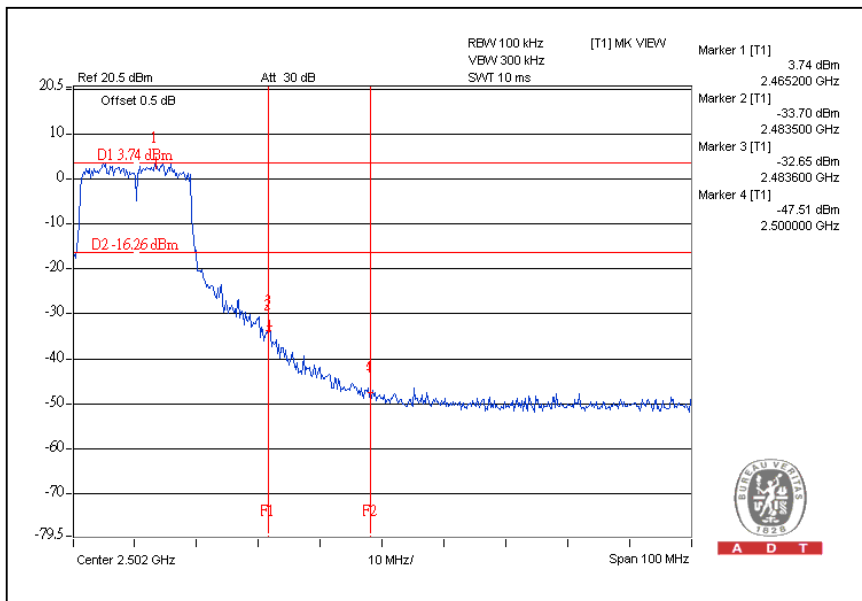
CH11



For Chain (1):CH1



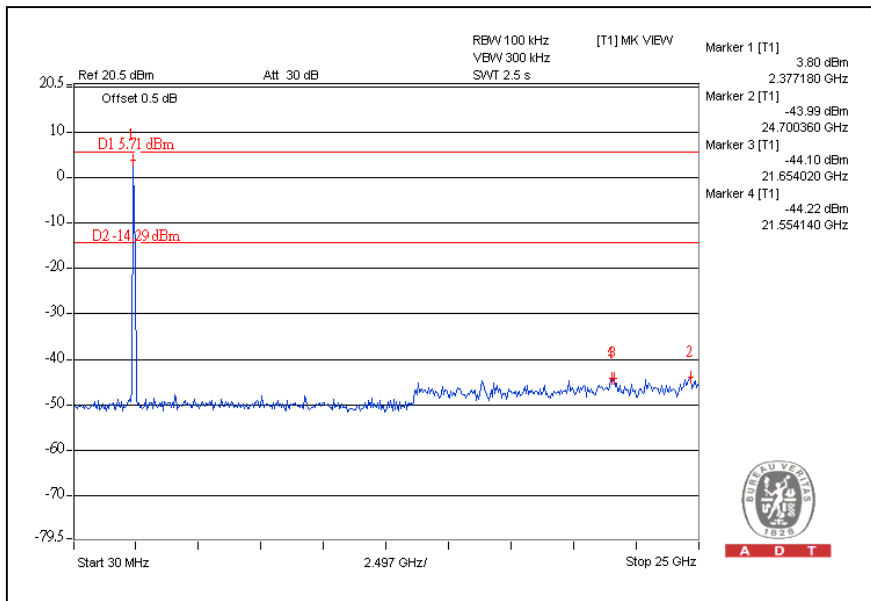
CH11



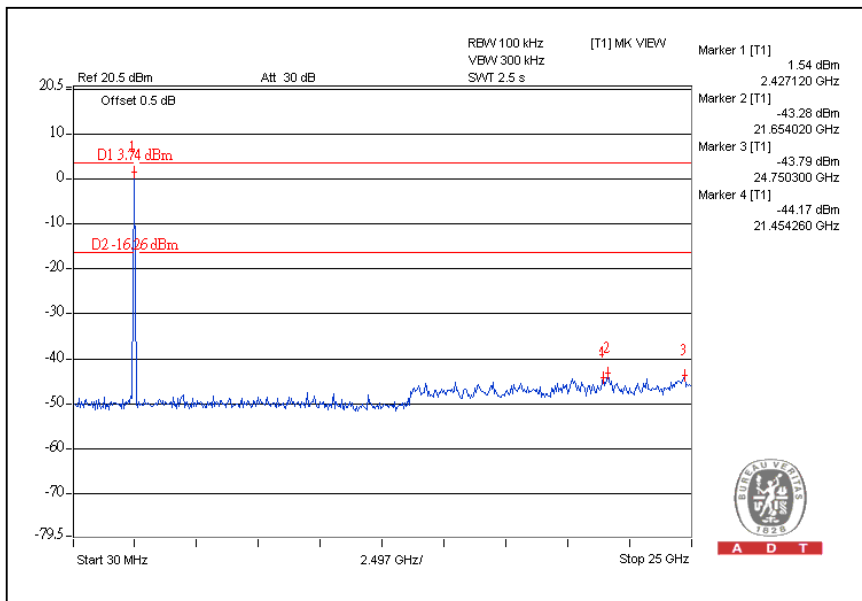


A D T

CH1



CH11

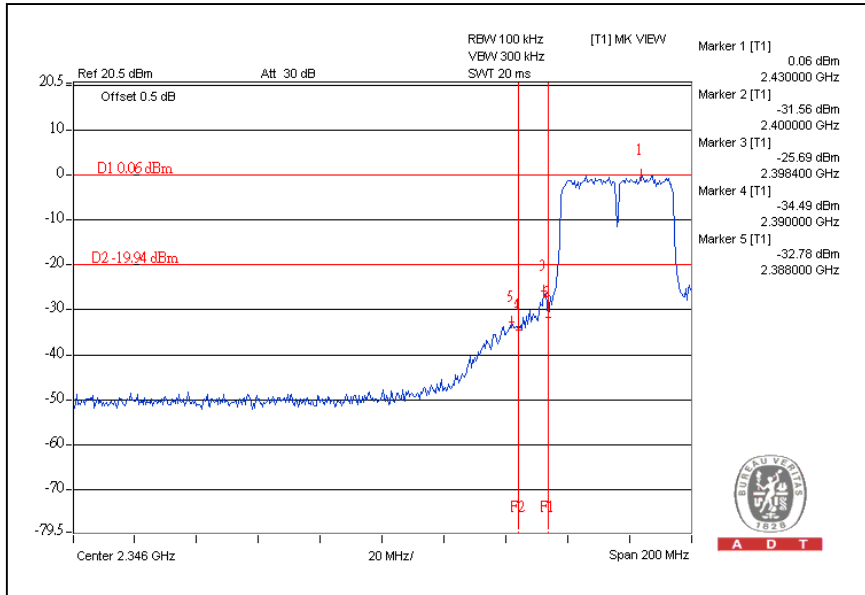




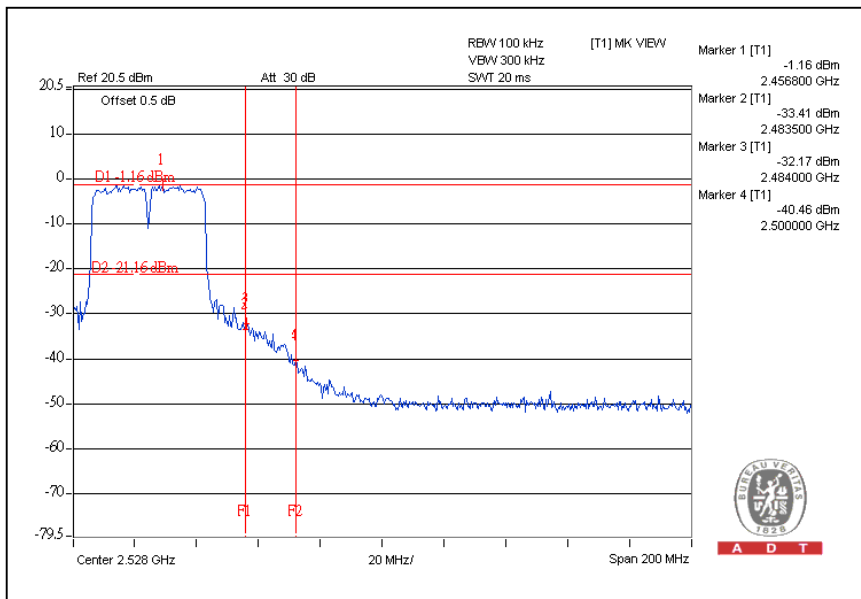
A D T

DRAFT 802.11n (40MHz) OFDM MODULATION:

For Chain (0):CH1



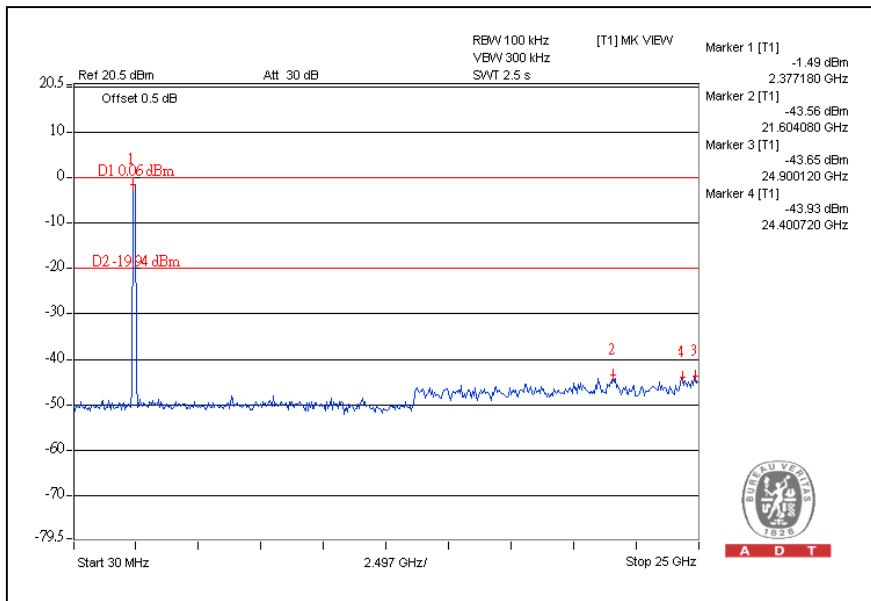
CH7



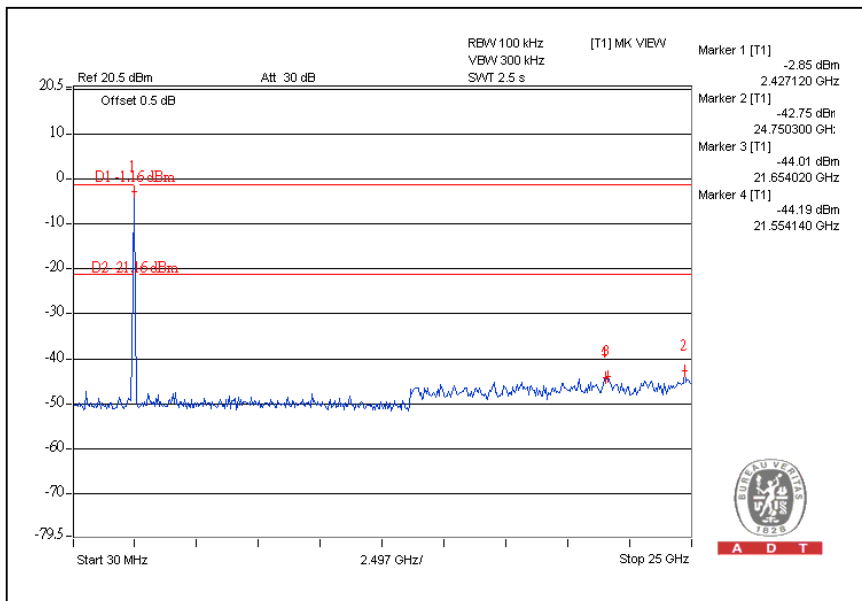


A D T

CH1



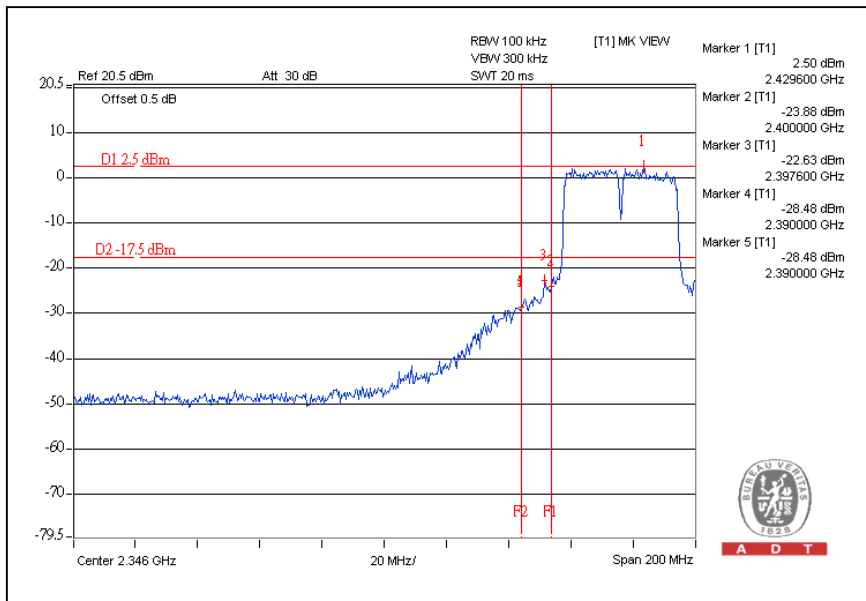
CH7



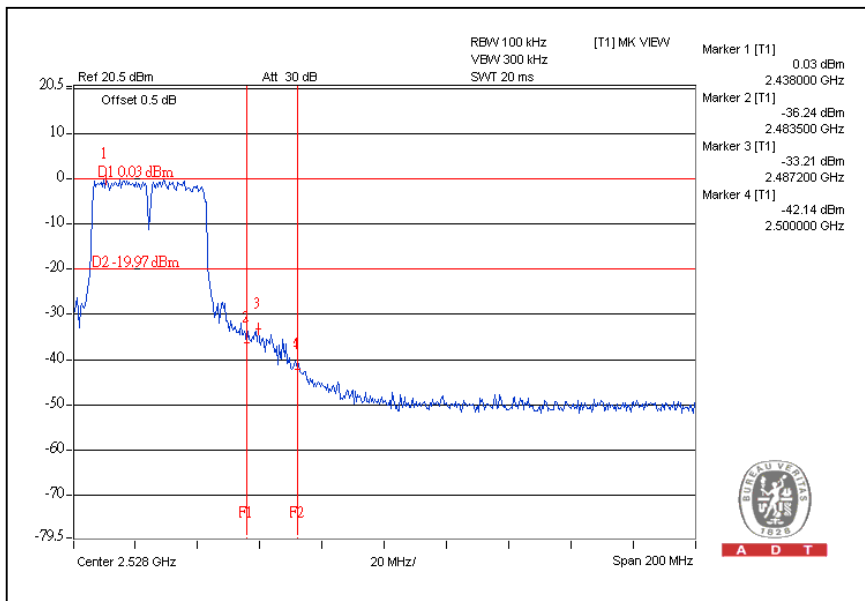


A D T

For Chain (1):CH1



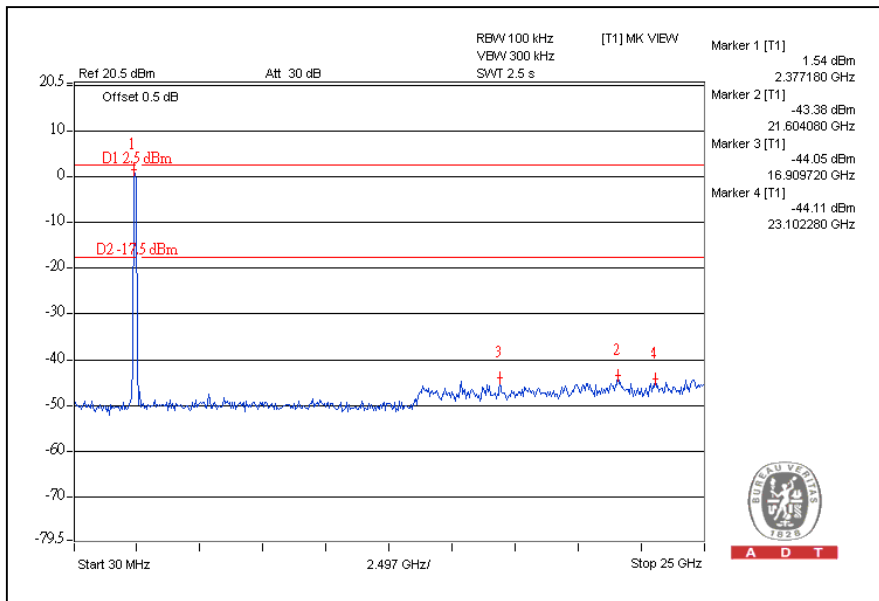
CH7



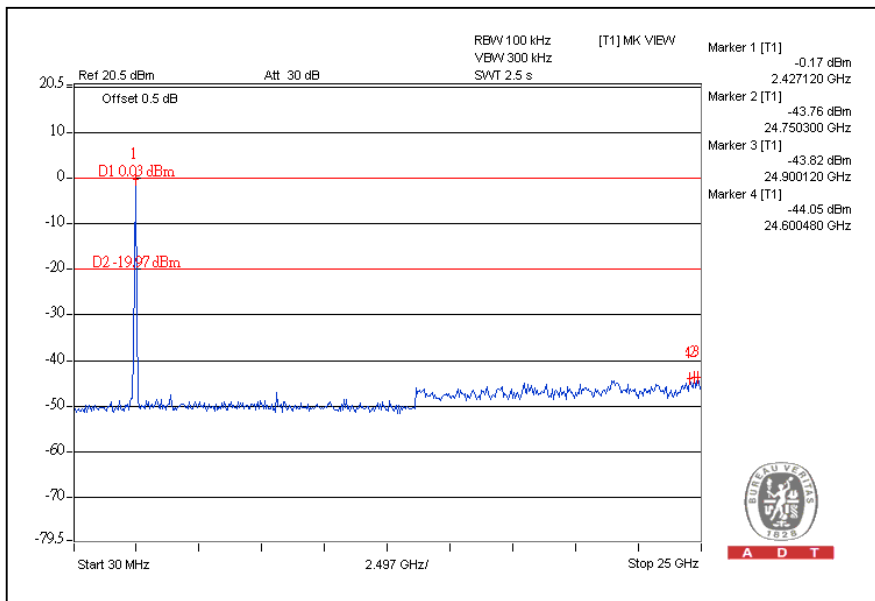


A D T

CH1



CH7



4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2 ANTENNA CONNECTED CONSTRUCTION

There are seventy-five antennas provided to this EUT, please refer to the following table:

Item	Brand name	Model name	Antenna Type	Gain (dBi) With & W/O cable loss	Cable loss (dBi)	Connector Type
1	wistron	DQ661500301(Main) DQ661500301(Aux)	PIFA	3.95 3.90	N.A.	IPEX
2	Wistron	DQ661500115(Main) DQ661500115 (Aux)	PIFA	1.10 0.64	1.89 2.55	IPEX
3	Wgt	AR830WIPI01A (L) AR830WIPI02A ®	PIFA	2.17 2.39	-1.60 -2.03	IPEX
4	Wgt	AR320WIPI01B (L) AR320WIPI02B ®	PIFA	0.86 2.11	-1.43 -1.78	IPEX
5	Wgt	ARW62WIPI01G (L) ARW62WIP102G ®	PIFA	2.48 1.32	-2.39 -1.76	IPEX
6	Wgt	ARUMPWIPI02+C (L) ARUMPWIPI01+D (R)	PIFA	2.41 2.07	N.A.	IPEX
7	Foxconn	WDAN-GQMA6001-DF (Main) WDAN-GQMA6001-DF (Aux)	PIFA	2.32 1.10	-1.262 -1.813	IPEX
8	Foxconn	WDAN-GQMA6002-DF (Main) WDAN-GQMA6002-DF (Aux)	PIFA	0.74 0.78	-1.446 -2.009	IPEX
9	Galtronics	021020168NC3587 (Main) 021020168NC3587-1 (Aux)	PIFA	-0.25 3.64	1.75 2	U.FL



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10	Galtronics	021020168NC3586 (Main) 021020168NC3586-1 (Aux)	PIFA	-0.04 3.25	1.9 1.85	U.FL
11	HIGH-TEK	AAFQ5050001LK0 (Main) AAFQ5050001RK0 (Aux)	PIFA	2.86 1.52	2.4 1.7	IPEX
12	Hitachi	HFT40-IV17 (Main) HMG03-IV17 (Aux)	PIFA	0.48 0.64	N.A.	IPEX
13	WNC	81.EE215.016 (Main) 81.EE215.016 (Aux)	PIFA	0.34 0.79	2.52 3.17	IPEX
14	WNC	ASAW 001(L) ASAW 001 ®	PIFA	1.34 1.25	N.A.	IPEX
15	Wgt	B1425050G00003 (Main) B1425050G00002 (Aux)	PIFA	0.03 0.63	-2.01 -2.05	IPEX
16	TYCO	ASAT 001 (Main) ASAT 001 (Aux)	PIFA	0.61 0.16	N.A.	IPEX
17	ACON	ASAA 001 (L) ASAA 001 (R)	PIFA	1.56 1.36	N.A.	IPEX
18	Hitachi	HFT40 (Main) HFP40 (Aux)	PIFA	0.58 1.12	1.42 2.12	IPEX
19	Hitachi	HFT60 (Main) HFT60 (Aux)	PIFA	-1.65 -0.92	1.48 2.18	IPEX
20	Hitachi	HTL008 (Main) HTL008 (Aux)	PIFA	2.24 1.84	1.72 2.20	IPEX
21	Hitachi	HTL017 (Main) HTL017 (Aux)	PIFA	2.82 2.94	1.94 2.39	IPEX
22	WNC	WNC001 (Main) WNC001 (Aux)	PIFA	-1.10 1.76	1.17 1.17	IPEX
23	WNC	WNC002 (Main) WNC002 (Aux)	PIFA	1.18 1.75	2.28 2.12	IPEX
24	TYCO	TIAN01 (Main) TIAN01 (Aux)	PIFA	0.57 0.87	-1.463 -1.865	IPEX
25	TYCO	TBN001 (Main) TBN001 (Aux)	PIFA	3.45 2.41	1.45 2.13	IPEX
26	TYCO	TBN003 (Main) TBN003 (Aux)	PIFA	-1.11 -1.11	1.84 2.16	IPEX
27	Tyco	2023935-1 (Main) 2023936-1 (Aux) 2023936-1 (MIMO)	PIFA	2.95 1.90 -0.28	1.88 2.03 2.01	U.FL
28	Tyco	2023937-1 (Main) 2023937-1 (Aux) 2023934-1 (MIMO)	PIFA	1.60 0.05 -0.28	1.85 2.00 2.01	U.FL
29	Tyco	2023938-1 (Main) 2023938-1 (Aux) 2023939-1 (MIMO)	PIFA	1.41 1.24 0.04	2.17 2.40 2.35	U.FL



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30	Tyco	2023954-1 (Main) 2023954-1 (Aux) 2023955-1 (MIMO)	PIFA	1.68 0.92 1.98	2.14 3.02 1.44	U.FL
31	Hitachi	HBY07 (TX1) HBY07 (TX2)	PIFA	2.19 -0.33	0.95 0.95	I-PEX
32	Hitachi	HBY051 (TX1) HBY051 (TX2)	PIFA	2.91 2.82	0.95 0.95	I-PEX
33	Hitachi	HBY052 (TX1) HBY052 (TX2)	PIFA	0.27 0.02	0.95 0.95	I-PEX
34	Hitachi	HBY061 (TX1) HBY061 (TX2)	PIFA	1.30 2.42	0.95 0.95	I-PEX
35	Hitachi	HBY062 (TX1) HBY062 (TX2)	PIFA	-1.04 -1.19	0.95 0.95	I-PEX
36	Hitachi	HFT65 (TX1) HFT65 (TX2)	PIFA	-1.74 1.16	0.95 0.95	I-PEX
37	QUANTA	AN-090-B (Tx1) AN-090-A (Tx2)	PIFA	-1.4 -2.2	-1	IPEX
38	Hitachi	HCT01 (Main) HCT01 (Aux)	PIFA	0.87 1.94	0.89	IPEX
39	FOXCONN	WDAN-TQ (Tx1) WDAN-TQ (Tx2)	PIFA	-0.43 -0.7	2.5	IPEX
40	Tyco	TBN005 TBN006	PIFA	2.09 3.87	N.A	IPEX
41	Wha Yu	DQ652016100 (Tx1) DQ652016100 (Tx2)	PIFA	1.31 0.09	0.37 0.92	FAF
42	WNC	WNC004 (Main) WNC004 (Aux)	PIFA	2.40 1.50	1.53 1.92	IPEX
43	QUANTA	ON1 (Tx1) ON1 (Tx2)	PIFA	1.8 0.1	N.A	IPEX
44	HON HAI	WDAN-DQZM1001-DF (Tx1) WDAN-DQZM1001-DF (Tx2)	PIFA	1.67 -0.10	0.827 0.849	IPEX
45	ACON	AMM8P-700006(Tx1) AMM8P-700006 (Tx2)	PIFA	2.51 -0.8	0.97 0.90	IPEX
46	Yageo	CAN4313880012501B (Tx1) CAN4343880012501B (Tx2)	PIFA	1.12 0.7	1.05 1.08	IPEX
47	Pgatroncorp	1415-00JK000	PIFA	3.34	N.A	MHF
48	Pgatroncorp	1415-00JL000	PIFA	2.05	N.A	MHF
49	WNC	WNC001 (Main) WNC001(Aux)	PIFA	0.31 -0.75	1.98 2.01	IPEX
50	WNC	WNC003 (Main) WNC003 (Aux)	PIFA	0.52 1.07	1.49 2.13	IPEX
51	Wha Yu	DQ652015800 (Tx1) DQ652015800 (Tx2)	PIFA	1.13 0.74	1.68 2.29	FAF
52	Smart Approach	PE-AB-0370 (Main) PE-AB-0430 (Aux)	PIFA	2.95 0.94	N.A	IPEX
53	ARISTOTLE	RFA-02-P23-70-300-L	PIFA	-5	N.A	IPEX



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54	ARISTOTLE	RFA-02-P23-70B-350-R	PIFA	-5	N.A	IPEX
55	ARISTOTLE	RFA-02-P24-70-305-L	PIFA	-5	N.A	IPEX
56	ARISTOTLE	RFA-02-P24-70B-340-R	PIFA	-5	N.A	IPEX
57	WNC	81.EEO15.001 (Main) 81.EEO15.002 (Aux) 81.EEO15.003 (MIMO)	PIFA	1.52 1.72 1.46	1.86 2.03 2.23	IPEX
58	HON HAI	WDAN-M1OS1001-DF(Main) WDAN-M1OS1002-DF(Aux) WDAN-M1OS1003-DF(MIMO)	PIFA	0.13 -0.13 -0.06	-1.871 -2.072 -2.278	IPEX
59	Amphenol KAE Co., Ltd	SS-03-03-099 (Main) SS-03-03-100 (Aux) SS-03-03-101 (MIMO)	PIFA	0.77 -0.90 -0.90	1.59 1.76 1.95	IPEX
60	WNC	81.EHD15.003 (Main) 81.EHD15.002 (Aux)	PIFA	0.94 -0.77	1.39 1.71	IPEX
61	Foxconn	WDAN-M1SN1002-DF(Main) WDAN-M1SN1001-DF(Aux)	PIFA	0.93 -0.53	-1.357 -1.727	IPEX
62	HON HAI	WDAN-M1NY1001-DF	PIFA	0.56	-0.054	U.FL
63	WNC	81.EHD15.004 (Main) 81.EHD15.006 (Aux)	PIFA	0.95 -0.49	1.07 1.82	IPEX
64	HON HAI	WDAN-M1WC1001-DF(Main) WDAN-M1BN1001-DF(Aux)	PIFA	-0.28 -0.14	-1.407 2.3	IPEX
65	WNC	81.EHD15.004 (Main) 81.EHD15.007 (Aux)	PIFA	0.95 -0.09	1.07 1.60	IPEX
66	HON HAI	WDAN-M1WC1001-DF(Main) WDAN-M1MM1001-DF(Aux)	PIFA	-0.28 -1.24	-1.407 1.99	IPEX
67	WNC	81.EHD15.G09 (Tx1) 81.EHD15.G10 (Tx2)	PIFA	0.31 -1.21	1.08 1.39	IPEX
68	HON HAI	WDAN-M1PB1001-DF(Tx1) WDAN-M1PB1002-DF(Tx2)	PIFA	0.54 -1.40	0.99 1.36	IPEX
69	WNC	81.EHD15.004 (Main) 81.EHD15.005 (Aux)	PIFA	0.95 -1.51	1.07 1.61	IPEX
70	HON HAI	WDAN-M1WC1002-DF (Main) MDAN-M1WC1001-DF(Aux)	PIFA	0.18 -0.28	-0.866 -1.407	IPEX
71	JEM	M810L (WM1) M810L (WM2)	PIFA	-2.04 0.83	-1.46 -1.14	IPEX
72	wgt	M810L (WM1) M810L (WM2)	PIFA	2.1 2.99	N.A	IPEX
73	wgt	M980N (WM1) M980N (WM2)	PIFA	2.94 2.04	N.A	IPEX
74	FVC	TN120R-WLAN-1 TN120R-WLAN-2	PIFA	0.9 2.8	N.A	IPEX
75	FVC	W760 (WM1) W760 (WM2)	PIFA	2.87 2.08	N.A	IPEX

From the above antennas, the worst case was found in No. 1. Therefore only the test data of the modes were recorded in this report individually.



5. 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 by the following approval agencies according to ISO/IEC 17025.

USA	FCC, NVLAP
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	TAF, BSMI, NCC
Netherlands	Telefication
Singapore	GOST-ASIA(MOU)
Russia	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.



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6. APPENDIX - A MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

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