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FCC TEST REPORT (WLAN 15.247)

REPORT NO.: RF140611E02

MODEL NO.: NP05LM

FCC ID: RRK-NECNP05LM

RECEIVED: June 11, 2014

TESTED: June 12 to 20, 2014

ISSUED: July 14, 2014

APPLICANT: Alpha Networks Inc.

ADDRESS: No.8 Li-shing 7th Rd., Science-based
Industrial Park, Hsinchu, Taiwan, R.O.C.

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

LAB ADDRESS : No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen,
Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan,
R.O.C.

TEST LOCATION (1): No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen,
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140611E02	Original release	July 14, 2014



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1. CERTIFICATION

PRODUCT: Wireless LAN Unit
BRAND NAME: NEC
MODEL NO.: NP05LM
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: Alpha Networks Inc.
TESTED: June 12 to 20, 2014
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (Model: NP05LM) 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 : Phoenix Huang , **DATE:** July 14, 2014
(Phoenix Huang, Specialist)

APPROVED BY : May Chen , **DATE:** July 14, 2014
(May Chen, Manager)



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2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -14.82dB at 0.16562MHz
15.247(d) 15.209	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2483.50MHz
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

NOTE: 1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz. For the 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz and 5.725~5.850GHz RF parameters was recorded in another test report.



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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	2.86 dB
Radiated emissions (30MHz-1GHz)	5.37 dB
Radiated emissions (1GHz -6GHz)	3.72 dB
Radiated emissions (6GHz -18GHz)	4.00 dB
Radiated emissions (18GHz -40GHz)	4.11 dB



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT (WLAN)

PRODUCT	Wireless LAN Unit
MODEL NO.	NP05LM
POWER SUPPLY	5Vdc (from host equipment)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 300Mbps
OPERATING FREQUENCY	For 15.407 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.70GHz, 5.745 ~ 5.825GHz For 15.247 2.412 ~ 2.462GHz
NUMBER OF CHANNEL	For 15.407 21 for 802.11a, 802.11n (HT20) 9 for 802.11n (HT40) For 15.247 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
MAXIMUM OUTPUT POWER	For 15.407 802.11a: 138.357mW 802.11n (HT20): 198.713mW 802.11n (HT40): 169.13mW For 15.247 802.11b: 257.632mW 802.11g: 289.734mW 802.11n (HT20): 543.531mW 802.11n (HT40): 448.295mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	NA



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Note:

1. 2.4GHz and 5GHz technology can not transmit at same time.
2. The antennas provided to the EUT, please refer to the following table:

Antenna No.	Transmitter Circuit	Brand	Antenna Gain(dBi) < including cable loss>	Frequency range (GHz ~ GHz)	Antenna Type	Connector Type
1	Chain (0)	ALPHA	2.0	2.4~2.4835	Monopole	None (like solder)
			2.88	5.15~5.850		
2	Chain (1)	ALPHA	2.38	2.4~2.4835	Monopole	None (like solder)
			2.61	5.15~5.850		

NOTE:

1. From the above antennas, Ant. 2 was selected as representative antenna for the 802.11b/g test and its data was recorded in this report.
2. From the above antennas, Ant. 1 was selected as representative antenna for the 802.11a test and its data was recorded in this report.

3. The EUT incorporates a MIMO function without beamforming.

MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	1TX (Diversity)	2RX
802.11b	1 ~ 11Mbps	1TX (Diversity)	1RX (Diversity)
802.11g	6 ~ 54Mbps	1TX (Diversity)	2RX
802.11n (HT20)	MCS 0~7	1TX (Diversity)	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	1TX (Diversity)	2RX
	MCS 8~15	2TX	2RX

4. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.



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3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20):

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

7 channels are provided for 802.11n (HT40):

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



3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

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

NOTE: 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**

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)
802.11n (HT20)	1 to 11	6	OFDM	BPSK	13

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)
802.11n (HT20)	1 to 11	6	OFDM	BPSK	13



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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)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	13
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	27

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)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	13
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	27

CONDUCTED OUT-BAND EMISSION 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)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	13
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	27



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TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	25deg. C, 70%RH	120Vac, 60Hz	Mike Hsieh
RE<1G	22deg. C, 68%RH	120Vac, 60Hz	Andy Ho
RE≥1G	22deg. C, 72%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng
OB	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

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)

558074 D01 DTS Meas Guidance v03r01

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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

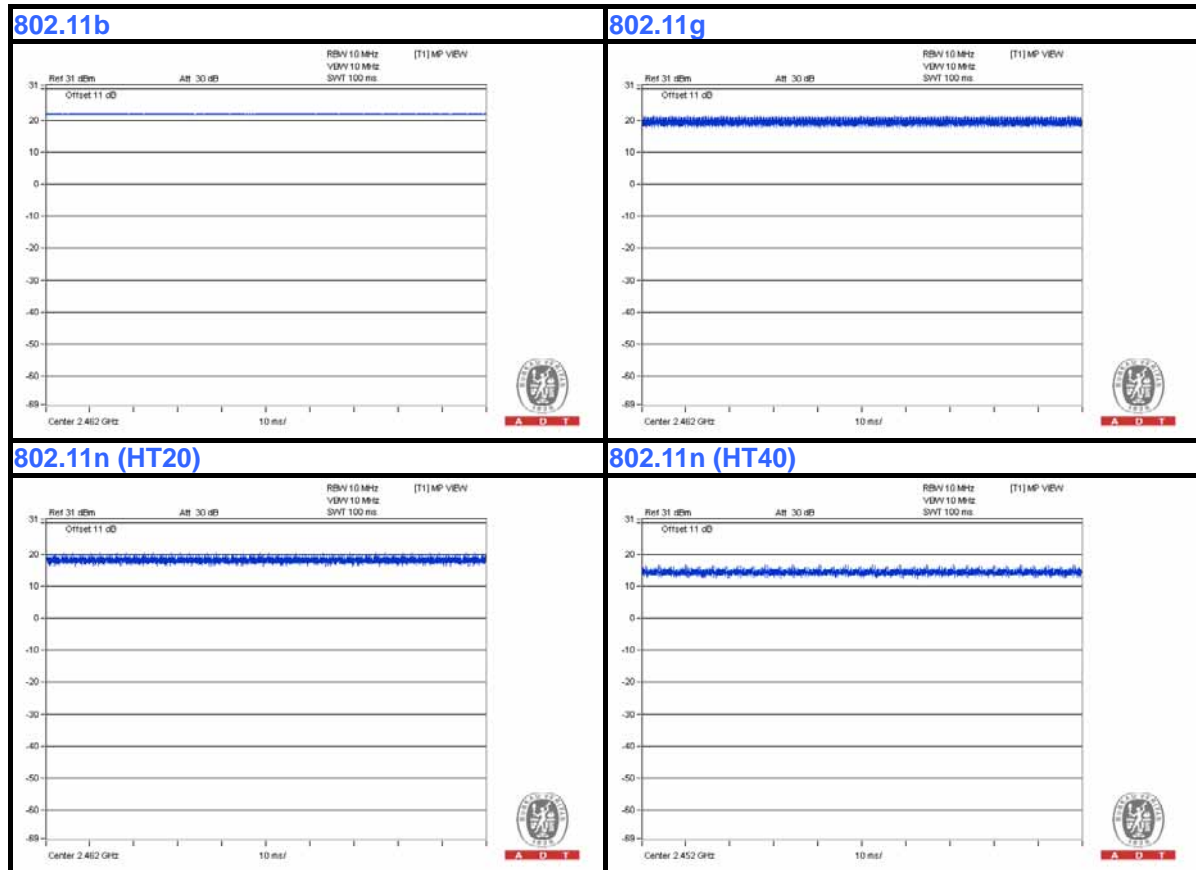
Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



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3.4 DUTY CYCLE OF TEST SIGNAL

Duty cycle of test signal is 100 %, duty factor is not required.





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3.5 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.

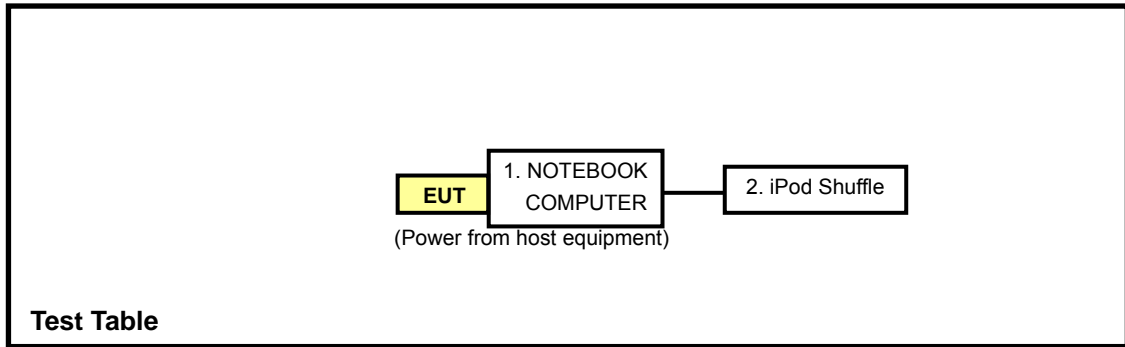
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	HSLB32S	FCC DoC
2	iPod Shuffle	Apple	MC749TA/A	CC4DN25WDFDM	NA

No.	Signal cable description
1	USB to USB cable (0.2m)
2	USB cable (0.1m)

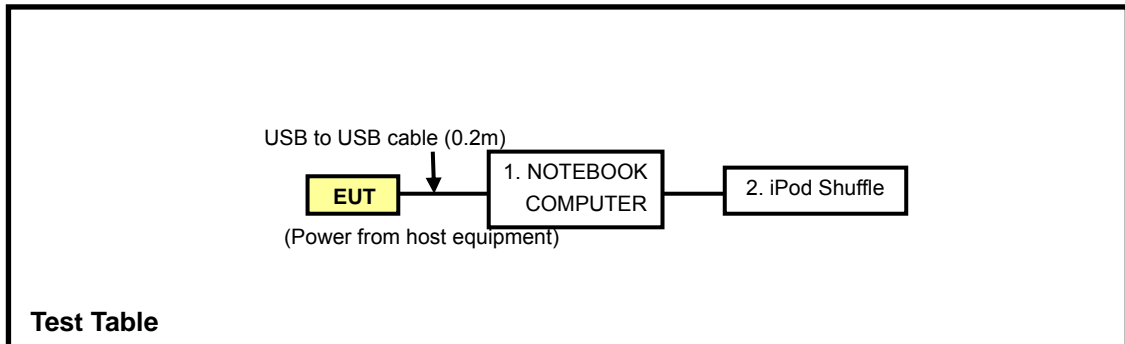
Note: The power cords of the above support units were unshielded (1.8m).

3.6 CONFIGURATION OF SYSTEM UNDER TEST

For conducted emission test:



For other test items:





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4. TEST TYPES AND RESULTS (FOR 2.4GHz, 2.400 ~ 2.4835GHz Band)

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.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 12, 2013	Sep. 11, 2014
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100071	Nov. 13, 2013	Nov. 12, 2014
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10, 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 24, 2013	Sep. 23, 2014
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2013	Sep. 30, 2014
Software ADT	BV ADT_Cond_V7.3.7. 3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: June 13, 2014

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.
- b. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- c. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- d. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

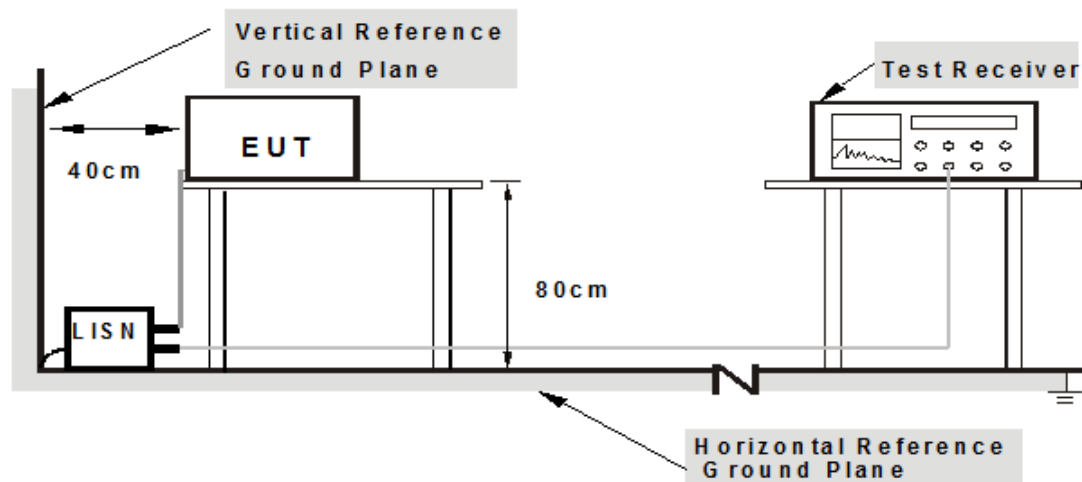
NOTE:

1. The resolution bandwidth of test receiver is 9kHz for Quasi-peak detection (QP) & Average detection (AV).

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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



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4.1.6 EUT OPERATING CONDITIONS

1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “MP Tool[Ver 1.0.0.0]” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

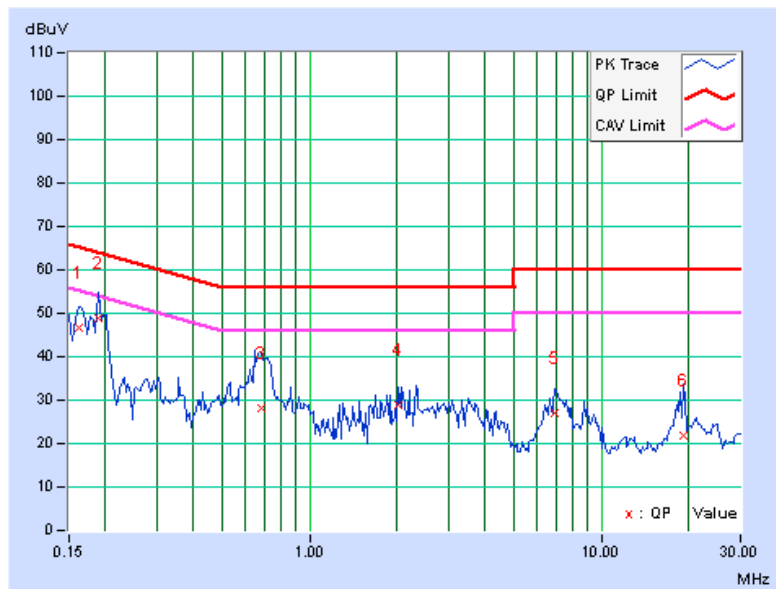
4.1.7 TEST RESULTS

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
-------	----------	-------------------	--------------------------------

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	0.16172	0.07	46.45	34.66	46.52	34.73	65.38
2	0.18906	0.07	48.67	31.65	48.74	31.72	64.08	54.08	-15.34	-22.36
3	0.68125	0.11	28.02	18.71	28.13	18.82	56.00	46.00	-27.87	-27.18
4	2.01953	0.17	28.67	20.53	28.84	20.70	56.00	46.00	-27.16	-25.30
5	6.92578	0.35	26.78	19.20	27.13	19.55	60.00	50.00	-32.87	-30.45
6	19.13281	0.69	21.13	16.23	21.82	16.92	60.00	50.00	-38.18	-33.08

REMARKS:

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

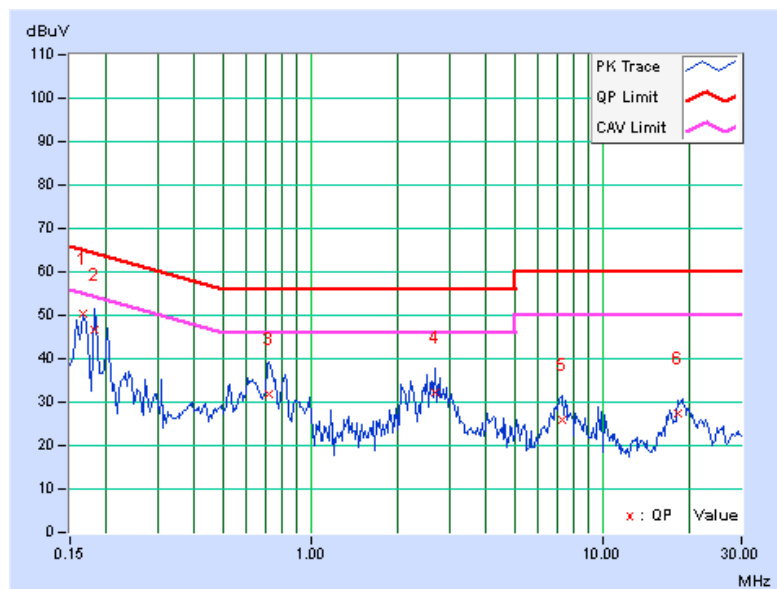


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.07	50.28	38.49	50.35	38.56	65.18	55.18	-14.82	-16.61
2	0.18125	0.07	46.56	30.08	46.63	30.15	64.43	54.43	-17.80	-24.28
3	0.72031	0.11	31.74	24.57	31.85	24.68	56.00	46.00	-24.15	-21.32
4	2.66797	0.21	31.96	22.29	32.17	22.50	56.00	46.00	-23.83	-23.50
5	7.25391	0.36	25.58	18.73	25.94	19.09	60.00	50.00	-34.06	-30.91
6	18.17578	0.66	26.73	22.91	27.39	23.57	60.00	50.00	-32.61	-26.43

REMARKS:

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





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4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

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



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4.2.2 TEST INSTRUMENTS

For Below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	Jan. 21, 2014	Jan. 20, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 26, 2014	Feb. 25, 2015
RF Cable	NA	CHGCAB_001	Oct. 05, 2013	Oct. 04, 2014
Spectrum Analyzer R&S	FSV40	100964	July 15, 2013	July 14, 2014
Horn_Antenna AISi	AIH.8018	0000320091110	Nov. 18, 2013	Nov. 17, 2014
Pre-Amplifier Agilent	8449B	3008A02578	June 25, 2013	June 24, 2014
RF Cable	NA	RF104-201 RF104-203 RF104-204	Dec. 12, 2013	Dec. 11, 2014
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 28, 2013	Aug. 27, 2014
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 08, 2013	Oct. 07, 2014
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	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, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. G.
4. The FCC Site Registration No. is 966073.
5. The VCCI Site Registration No. is G-137.
6. The CANADA Site Registration No. is IC 7450H-2.
7. Tested Date: June 12, 2014



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For Above 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Jan. 15, 2014	Jan. 14, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 27, 2014	Feb. 26, 2015
RF Cable	NA	CHHCAB_001	Oct. 06, 2013	Oct. 05, 2014
Spectrum Analyzer R&S	FSV40	100964	July 15, 2013	July 14, 2014
Horn_Antenna AISI	AIH.8018	0000220091110	Dec. 06, 2013	Dec. 05, 2014
Pre-Amplifier Agilent	8449B	3008A01923	Oct. 29, 2013	Oct. 28, 2014
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 12, 2013	Dec. 11, 2014
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 28, 2013	Aug. 27, 2014
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 08, 2013	Oct. 07, 2014
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	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, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 3 The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
- 5 The CANADA Site Registration No. is IC 7450H-3.
- 6 Tested Date: June 14, 2014

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. 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 height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

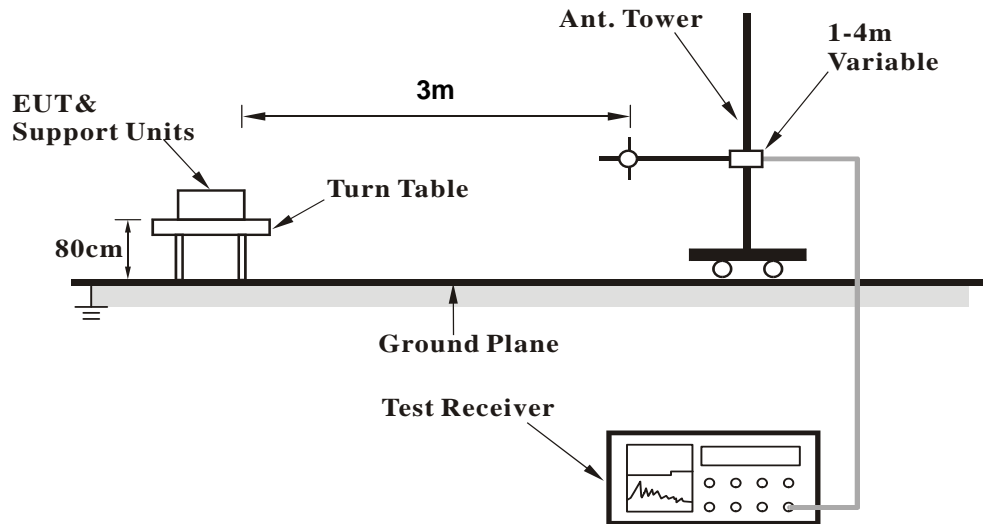
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

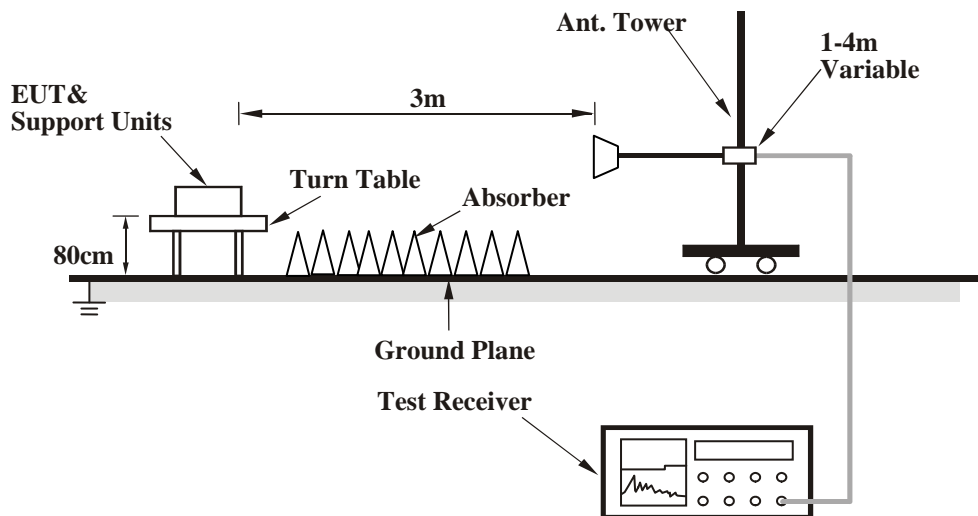
No deviation

4.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6



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4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11n (HT20)

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

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	148.49	33.9 QP	43.5	-9.7	2.00 H	280	47.00	-13.15
2	213.43	39.6 QP	43.5	-4.0	1.50 H	64	55.80	-16.25
3	232.49	36.4 QP	46.0	-9.6	1.50 H	74	51.94	-15.56
4	307.57	35.1 QP	46.0	-10.9	1.00 H	91	47.22	-12.13
5	666.56	34.9 QP	46.0	-11.1	1.00 H	222	38.88	-3.99
6	959.99	36.7 QP	46.0	-9.3	1.50 H	78	35.63	1.06

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	33.25	30.7 QP	40.0	-9.3	1.00 V	312	45.10	-14.38
2	166.58	33.6 QP	43.5	-9.9	1.50 V	360	47.11	-13.52
3	191.55	34.7 QP	43.5	-8.9	1.00 V	244	50.58	-15.93
4	213.48	35.4 QP	43.5	-8.1	1.00 V	283	51.67	-16.25
5	340.84	36.7 QP	46.0	-9.3	1.50 V	360	47.98	-11.30
6	663.85	35.6 QP	46.0	-10.4	1.50 V	287	39.64	-4.03

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



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ABOVE 1GHz DATA

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	2386.20	59.0 PK	74.0	-15.0	1.15 H	322	25.11	33.89
2	2386.20	53.4 AV	54.0	-0.6	1.15 H	322	19.51	33.89
3	*2412.00	110.5 PK			1.15 H	322	76.54	33.96
4	*2412.00	108.0 AV			1.15 H	322	74.04	33.96
5	2492.78	53.8 PK	74.0	-20.2	1.15 H	322	19.63	34.17
6	2492.78	47.4 AV	54.0	-6.6	1.15 H	322	13.23	34.17
7	4824.00	48.4 PK	74.0	-25.6	1.57 H	73	5.24	43.16
8	4824.00	42.2 AV	54.0	-11.8	1.57 H	73	-0.96	43.16

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	2386.20	56.4 PK	74.0	-17.6	1.05 V	360	22.51	33.89
2	2386.20	50.8 AV	54.0	-3.2	1.05 V	360	16.91	33.89
3	*2412.00	107.6 PK			1.05 V	360	73.64	33.96
4	*2412.00	105.4 AV			1.05 V	360	71.44	33.96
5	2492.78	55.1 PK	74.0	-18.9	1.05 V	360	20.93	34.17
6	2492.78	47.0 AV	54.0	-7.0	1.05 V	360	12.83	34.17
7	4824.00	48.5 PK	74.0	-25.5	1.10 V	117	5.34	43.16
8	4824.00	43.6 AV	54.0	-10.4	1.10 V	117	0.44	43.16

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



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CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	56.9 PK	74.0	-17.1	1.11 H	326	22.99	33.91
2	2390.00	50.3 AV	54.0	-3.7	1.11 H	326	16.39	33.91
3	*2437.00	114.6 PK			1.11 H	326	80.58	34.02
4	*2437.00	112.1 AV			1.11 H	326	78.08	34.02
5	2495.00	58.4 PK	74.0	-15.6	1.11 H	326	24.23	34.17
6	2495.00	53.4 AV	54.0	-0.6	1.11 H	326	19.23	34.17
7	4874.00	49.6 PK	74.0	-24.4	1.52 H	73	6.49	43.11
8	4874.00	43.4 AV	54.0	-10.6	1.52 H	73	0.29	43.11
9	7311.00	56.1 PK	74.0	-17.9	1.03 H	108	8.03	48.07
10	7311.00	43.3 AV	54.0	-10.7	1.03 H	108	-4.77	48.07

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	54.8 PK	74.0	-19.2	1.03 V	360	20.89	33.91
2	2390.00	47.7 AV	54.0	-6.3	1.03 V	360	13.79	33.91
3	*2437.00	110.3 PK			1.03 V	360	76.28	34.02
4	*2437.00	107.9 AV			1.03 V	360	73.88	34.02
5	2495.00	57.1 PK	74.0	-16.9	1.03 V	360	22.93	34.17
6	2495.00	47.5 AV	54.0	-6.5	1.03 V	360	13.33	34.17
7	4874.00	50.3 PK	74.0	-23.7	1.11 V	125	7.19	43.11
8	4874.00	45.2 AV	54.0	-8.8	1.11 V	125	2.09	43.11
9	7311.00	54.1 PK	74.0	-19.9	1.00 V	176	6.03	48.07
10	7311.00	40.9 AV	54.0	-13.1	1.00 V	176	-7.17	48.07

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



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CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	110.9 PK			1.10 H	328	76.81	34.09
2	*2462.00	108.6 AV			1.10 H	328	74.51	34.09
3	2483.50	58.9 PK	74.0	-15.1	1.10 H	328	24.75	34.15
4	2483.50	53.5 AV	54.0	-0.5	1.10 H	328	19.35	34.15
5	4924.00	48.1 PK	74.0	-25.9	1.57 H	86	5.02	43.08
6	4924.00	41.7 AV	54.0	-12.3	1.57 H	86	-1.38	43.08
7	7386.00	54.6 PK	74.0	-19.4	1.00 H	112	6.29	48.31
8	7386.00	41.7 AV	54.0	-12.3	1.00 H	112	-6.61	48.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.8 PK			1.01 V	100	69.71	34.09
2	*2462.00	100.9 AV			1.01 V	100	66.81	34.09
3	2483.50	54.1 PK	74.0	-19.9	1.01 V	100	19.95	34.15
4	2483.50	47.1 AV	54.0	-6.9	1.01 V	100	12.95	34.15
5	4924.00	48.4 PK	74.0	-25.6	1.11 V	133	5.32	43.08
6	4924.00	43.3 AV	54.0	-10.7	1.11 V	133	0.22	43.08
7	7386.00	54.4 PK	74.0	-19.6	1.00 V	175	6.09	48.31
8	7386.00	41.3 AV	54.0	-12.7	1.00 V	175	-7.01	48.31

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



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802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	73.2 PK	74.0	-0.8	1.08 H	329	39.29	33.91
2	2390.00	53.6 AV	54.0	-0.4	1.08 H	329	19.69	33.91
3	*2412.00	110.2 PK			1.08 H	329	76.24	33.96
4	*2412.00	101.4 AV			1.08 H	329	67.44	33.96
5	4824.00	47.0 PK	74.0	-27.0	1.08 H	87	3.84	43.16
6	4824.00	36.6 AV	54.0	-17.4	1.08 H	87	-6.56	43.16

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.5 PK	74.0	-6.5	1.05 V	360	33.59	33.91
2	2390.00	50.1 AV	54.0	-3.9	1.05 V	360	16.19	33.91
3	*2412.00	105.8 PK			1.05 V	360	71.84	33.96
4	*2412.00	98.0 AV			1.05 V	360	64.04	33.96
5	4824.00	47.2 PK	74.0	-26.8	1.35 V	83	4.04	43.16
6	4824.00	37.4 AV	54.0	-16.6	1.35 V	83	-5.76	43.16

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



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CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	63.4 PK	74.0	-10.6	1.10 H	328	29.49	33.91
2	2390.00	45.2 AV	54.0	-8.8	1.10 H	328	11.29	33.91
3	*2437.00	115.1 PK			1.10 H	328	81.08	34.02
4	*2437.00	106.0 AV			1.10 H	328	71.98	34.02
5	2483.50	72.4 PK	74.0	-1.6	1.10 H	328	38.25	34.15
6	2483.50	53.5 AV	54.0	-0.5	1.10 H	328	19.35	34.15
7	4874.00	47.5 PK	74.0	-26.5	1.00 H	118	4.39	43.11
8	4874.00	37.0 AV	54.0	-17.0	1.00 H	118	-6.11	43.11
9	7311.00	54.6 PK	74.0	-19.4	1.32 H	111	6.53	48.07
10	7311.00	42.2 AV	54.0	-11.8	1.32 H	111	-5.87	48.07

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.7 PK	74.0	-15.3	1.03 V	360	24.79	33.91
2	2390.00	44.8 AV	54.0	-9.2	1.03 V	360	10.89	33.91
3	*2437.00	110.5 PK			1.03 V	360	76.48	34.02
4	*2437.00	102.4 AV			1.03 V	360	68.38	34.02
5	2483.50	63.2 PK	74.0	-10.8	1.03 V	360	29.05	34.15
6	2483.50	48.8 AV	54.0	-5.2	1.03 V	360	14.65	34.15
7	4874.00	50.1 PK	74.0	-23.9	1.36 V	94	6.99	43.11
8	4874.00	39.5 AV	54.0	-14.5	1.36 V	94	-3.61	43.11
9	7311.00	52.3 PK	74.0	-21.7	1.33 V	103	4.23	48.07
10	7311.00	40.3 AV	54.0	-13.7	1.33 V	103	-7.77	48.07

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



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CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	110.4 PK			1.09 H	329	76.31	34.09
2	*2462.00	101.2 AV			1.09 H	329	67.11	34.09
3	2483.50	73.0 PK	74.0	-1.0	1.09 H	329	38.85	34.15
4	2483.50	53.8 AV	54.0	-0.2	1.09 H	329	19.65	34.15
5	4924.00	47.1 PK	74.0	-26.9	1.04 H	103	4.02	43.08
6	4924.00	36.4 AV	54.0	-17.6	1.04 H	103	-6.68	43.08
7	7386.00	55.6 PK	74.0	-18.4	1.03 H	103	7.29	48.31
8	7386.00	43.1 AV	54.0	-10.9	1.03 H	103	-5.21	48.31

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	106.1 PK			1.00 V	360	72.01	34.09
2	*2462.00	98.1 AV			1.00 V	360	64.01	34.09
3	2483.50	67.0 PK	74.0	-7.0	1.00 V	360	32.85	34.15
4	2483.50	49.6 AV	54.0	-4.4	1.00 V	360	15.45	34.15
5	4924.00	47.1 PK	74.0	-26.9	1.34 V	98	4.02	43.08
6	4924.00	37.4 AV	54.0	-16.6	1.34 V	98	-5.68	43.08
7	7386.00	51.1 PK	74.0	-22.9	1.25 V	89	2.79	48.31
8	7386.00	39.0 AV	54.0	-15.0	1.25 V	89	-9.31	48.31

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



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802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.1 PK	74.0	-1.9	1.15 H	324	38.19	33.91
2	2390.00	53.3 AV	54.0	-0.7	1.15 H	324	19.39	33.91
3	*2412.00	111.5 PK			1.15 H	324	77.54	33.96
4	*2412.00	100.9 AV			1.15 H	324	66.94	33.96
5	4824.00	46.2 PK	74.0	-27.8	1.03 H	108	3.04	43.16
6	4824.00	34.9 AV	54.0	-19.1	1.03 H	108	-8.26	43.16

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.2 PK	74.0	-10.8	1.02 V	94	29.29	33.91
2	2390.00	44.8 AV	54.0	-9.2	1.02 V	94	10.89	33.91
3	*2412.00	106.5 PK			1.02 V	94	72.54	33.96
4	*2412.00	97.6 AV			1.02 V	94	63.64	33.96
5	4824.00	49.8 PK	74.0	-24.2	1.34 V	83	6.64	43.16
6	4824.00	39.0 AV	54.0	-15.0	1.34 V	83	-4.16	43.16

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



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CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.8 PK	74.0	-11.2	1.14 H	325	28.89	33.91
2	2390.00	49.2 AV	54.0	-4.8	1.14 H	325	15.29	33.91
3	*2437.00	114.5 PK			1.14 H	325	80.48	34.02
4	*2437.00	105.3 AV			1.14 H	325	71.28	34.02
5	2483.50	67.5 PK	74.0	-6.5	1.14 H	325	33.35	34.15
6	2483.50	50.2 AV	54.0	-3.8	1.14 H	325	16.05	34.15
7	4874.00	47.4 PK	74.0	-26.6	1.00 H	115	4.29	43.11
8	4874.00	36.7 AV	54.0	-17.3	1.00 H	115	-6.41	43.11
9	7311.00	56.0 PK	74.0	-18.0	1.07 H	102	7.93	48.07
10	7311.00	43.2 AV	54.0	-10.8	1.07 H	102	-4.87	48.07

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	59.1 PK	74.0	-14.9	1.00 V	360	25.19	33.91
2	2390.00	45.2 AV	54.0	-8.8	1.00 V	360	11.29	33.91
3	*2437.00	110.6 PK			1.00 V	360	76.58	34.02
4	*2437.00	102.4 AV			1.00 V	360	68.38	34.02
5	2483.50	63.0 PK	74.0	-11.0	1.00 V	360	28.85	34.15
6	2483.50	48.8 AV	54.0	-5.2	1.00 V	360	14.65	34.15
7	4874.00	47.2 PK	74.0	-26.8	1.34 V	101	4.09	43.11
8	4874.00	37.6 AV	54.0	-16.4	1.34 V	101	-5.51	43.11
9	7311.00	51.4 PK	74.0	-22.6	1.29 V	98	3.33	48.07
10	7311.00	41.2 AV	54.0	-12.8	1.29 V	98	-6.87	48.07

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



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CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.8 PK			1.11 H	324	77.71	34.09
2	*2462.00	101.2 AV			1.11 H	324	67.11	34.09
3	2483.50	72.5 PK	74.0	-1.5	1.11 H	324	38.35	34.15
4	2483.50	52.8 AV	54.0	-1.2	1.11 H	324	18.65	34.15
5	4924.00	46.3 PK	74.0	-27.7	1.00 H	104	3.22	43.08
6	4924.00	34.2 AV	54.0	-19.8	1.00 H	104	-8.88	43.08
7	7386.00	54.3 PK	74.0	-19.7	1.03 H	117	5.99	48.31
8	7386.00	41.6 AV	54.0	-12.4	1.03 H	117	-6.71	48.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.4 PK			1.00 V	360	73.31	34.09
2	*2462.00	98.4 AV			1.00 V	360	64.31	34.09
3	2483.50	63.4 PK	74.0	-10.6	1.03 V	360	29.25	34.15
4	2483.50	48.8 AV	54.0	-5.2	1.03 V	360	14.65	34.15
5	4924.00	47.6 PK	74.0	-26.4	1.34 V	99	4.52	43.08
6	4924.00	36.1 AV	54.0	-17.9	1.34 V	99	-6.98	43.08
7	7386.00	52.4 PK	74.0	-21.6	1.37 V	109	4.09	48.31
8	7386.00	40.1 AV	54.0	-13.9	1.37 V	109	-8.21	48.31

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



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802.11n (HT40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.4 PK	74.0	-7.6	1.14 H	322	32.49	33.91
2	2390.00	53.5 AV	54.0	-0.5	1.14 H	322	19.59	33.91
3	*2422.00	108.0 PK			1.14 H	322	74.01	33.99
4	*2422.00	97.3 AV			1.14 H	322	63.31	33.99
5	4844.00	45.9 PK	74.0	-28.1	1.00 H	106	2.75	43.15
6	4844.00	33.9 AV	54.0	-20.1	1.00 H	106	-9.25	43.15
7	7266.00	54.2 PK	74.0	-19.8	1.00 H	124	6.30	47.90
8	7266.00	41.7 AV	54.0	-12.3	1.00 H	124	-6.20	47.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.4 PK	74.0	-10.6	1.00 V	107	29.49	33.91
2	2390.00	45.0 AV	54.0	-9.0	1.00 V	107	11.09	33.91
3	*2422.00	105.1 PK			1.04 V	89	71.11	33.99
4	*2422.00	95.4 AV			1.04 V	89	61.41	33.99
5	4844.00	46.9 PK	74.0	-27.1	1.33 V	86	3.75	43.15
6	4844.00	35.3 AV	54.0	-18.7	1.33 V	86	-7.85	43.15
7	7266.00	52.6 PK	74.0	-21.4	1.33 V	117	4.70	47.90
8	7266.00	40.1 AV	54.0	-13.9	1.33 V	117	-7.80	47.90

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



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CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.0 PK	74.0	-8.0	1.10 H	326	32.09	33.91
2	2390.00	50.4 AV	54.0	-3.6	1.10 H	326	16.49	33.91
3	*2437.00	109.7 PK			1.10 H	325	75.68	34.02
4	*2437.00	99.4 AV			1.10 H	325	65.38	34.02
5	2483.50	68.0 PK	74.0	-6.0	1.10 H	326	33.85	34.15
6	2483.50	53.5 AV	54.0	-0.5	1.10 H	326	19.35	34.15
7	4874.00	46.7 PK	74.0	-27.3	1.00 H	102	3.59	43.11
8	4874.00	34.6 AV	54.0	-19.4	1.00 H	102	-8.51	43.11
9	7311.00	55.6 PK	74.0	-18.4	1.02 H	129	7.53	48.07
10	7311.00	42.3 AV	54.0	-11.7	1.02 H	129	-5.77	48.07

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.5 PK	74.0	-10.5	1.00 V	121	29.59	33.91
2	2390.00	45.1 AV	54.0	-8.9	1.00 V	121	11.19	33.91
3	*2437.00	106.7 PK			1.04 V	94	72.68	34.02
4	*2437.00	96.3 AV			1.04 V	94	62.28	34.02
5	2483.50	64.2 PK	74.0	-9.8	1.00 V	121	30.05	34.15
6	2483.50	45.1 AV	54.0	-8.9	1.00 V	121	10.95	34.15
7	4874.00	47.6 PK	74.0	-26.4	1.33 V	76	4.49	43.11
8	4874.00	36.4 AV	54.0	-17.6	1.33 V	76	-6.71	43.11
9	7311.00	52.4 PK	74.0	-21.6	1.34 V	124	4.33	48.07
10	7311.00	39.7 AV	54.0	-14.3	1.34 V	124	-8.37	48.07

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.



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CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	106.6 PK			1.10 H	326	72.54	34.06
2	*2452.00	97.2 AV			1.10 H	326	63.14	34.06
3	2483.50	69.3 PK	74.0	-4.7	1.10 H	326	35.15	34.15
4	2483.50	53.5 AV	54.0	-0.5	1.10 H	326	19.35	34.15
5	4904.00	46.3 PK	74.0	-27.7	1.00 H	98	3.21	43.09
6	4904.00	34.1 AV	54.0	-19.9	1.00 H	98	-8.99	43.09
7	7356.00	54.5 PK	74.0	-19.5	1.00 H	131	6.28	48.22
8	7356.00	41.8 AV	54.0	-12.2	1.00 H	131	-6.42	48.22

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	105.2 PK			1.03 V	90	71.14	34.06
2	*2452.00	95.5 AV			1.03 V	90	61.44	34.06
3	2483.50	63.9 PK	74.0	-10.1	1.02 V	112	29.75	34.15
4	2483.50	45.3 AV	54.0	-8.7	1.02 V	112	11.15	34.15
5	4904.00	47.9 PK	74.0	-26.1	1.38 V	76	4.81	43.09
6	4904.00	34.7 AV	54.0	-19.3	1.38 V	76	-8.39	43.09
7	7356.00	52.7 PK	74.0	-21.3	1.39 V	116	4.48	48.22
8	7356.00	40.2 AV	54.0	-13.8	1.39 V	116	-8.02	48.22

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

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
SPECTRUM ANALYZER R&S	FSV 40	100964	July 15, 2013	July 14, 2014

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : June 14, 2014

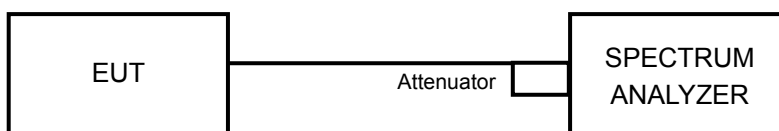
4.3.3 TEST PROCEDURE

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

4.3.4 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

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.15	0.5	PASS
6	2437	11.12	0.5	PASS
11	2462	10.19	0.5	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.62	0.5	PASS
6	2437	16.61	0.5	PASS
11	2462	16.61	0.5	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.81	17.77	0.5	PASS
6	2437	17.83	17.79	0.5	PASS
11	2462	17.84	17.77	0.5	PASS

802.11n (HT40)

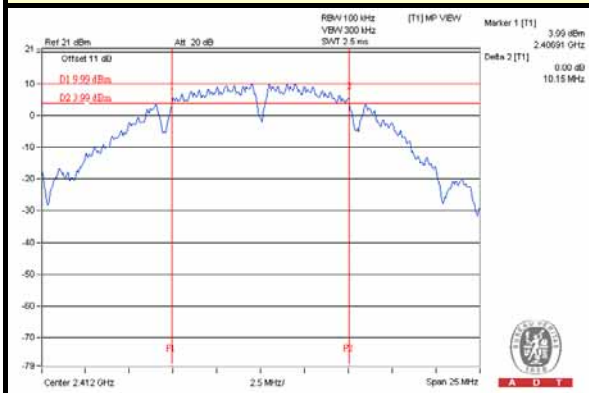
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.56	36.55	0.5	PASS
6	2437	36.57	36.54	0.5	PASS
9	2452	36.57	36.53	0.5	PASS



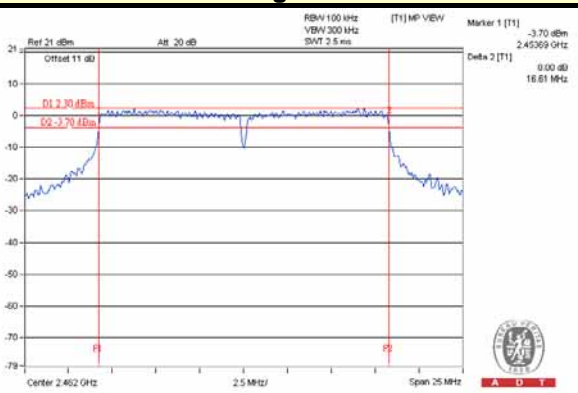
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SPECTRUM PLOT OF WORST VALUE

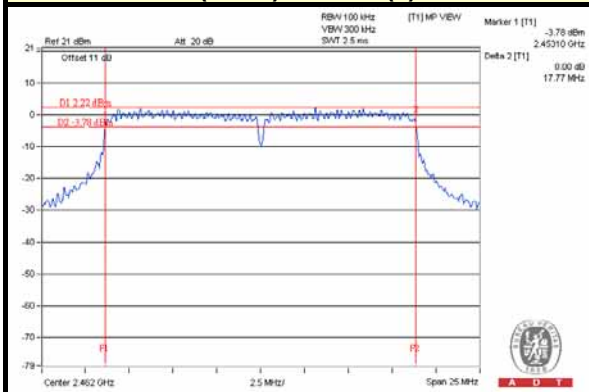
802.11b / CH1



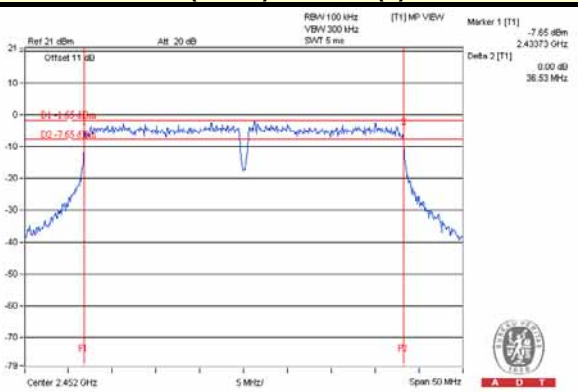
802.11g / CH11



802.11n (HT20) / Chain (1) : CH11



802.11n (HT40) / Chain (1) : CH9





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4.4 CONDUCTED OUTPUT POWER MEASUREMENT

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

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

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

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

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

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter Anritsu	ML2495A	1014008	Apr. 30, 2014	Apr. 29, 2015
Power sensor Anritsu	MA2411B	0917122	Apr. 30, 2014	Apr. 29, 2015

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. Tested date : June 14, 2014

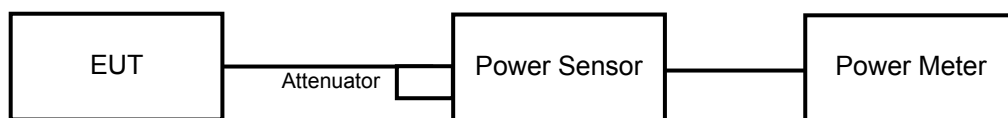
4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



4.4.7 TEST RESULTS

FOR PEAK POWER

802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	188.799	22.76	30	PASS
6	2437	257.632	24.11	30	PASS
11	2462	170.216	22.31	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	269.774	24.31	30	PASS
6	2437	289.734	24.62	30	PASS
11	2462	251.768	24.01	30	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	23.06	22.91	397.736	26.00	30	PASS
6	2437	24.47	24.21	543.531	27.35	30	PASS
11	2462	23.65	22.85	424.491	26.28	30	PASS

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
3	2422	22.61	22.65	366.467	25.64	30	PASS
6	2437	23.56	23.45	448.295	26.52	30	PASS
9	2452	22.85	21.65	338.97	25.30	30	PASS



A D T

FOR AVERAGE POWER

802.11b

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
1	2412	118.577	20.74
6	2437	193.642	22.87
11	2462	114.025	20.57

802.11g

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
1	2412	44.361	16.47
6	2437	117.761	20.71
11	2462	43.351	16.37

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	14.07	15.21	58.716	17.69
6	2437	19.37	19.45	174.602	22.42
11	2462	14.82	15.57	66.397	18.22

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
3	2422	14.24	15.31	60.509	17.82
6	2437	16.74	16.83	95.401	19.80
9	2452	14.67	14.11	55.072	17.41



A D T

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
SPECTRUM ANALYZER R&S	FSV 40	100964	July 15, 2013	July 14, 2014

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : June 14, 2014

4.5.3 TEST PROCEDURE

1. Set the RBW = 3 kHz, VBW =10 kHz, Detector = peak.
2. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
3. Use the peak marker function to determine the maximum amplitude level.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



4.5.7 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
1	2412	-10.14	8	PASS
6	2437	-8.69	8	PASS
11	2462	-10.74	8	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
1	2412	-12.50	8	PASS
6	2437	-8.14	8	PASS
11	2462	-12.32	8	PASS

802.11n (HT20)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-12.49	3.01	-9.48	8	PASS
	6	2437	-8.28	3.01	-5.27	8	PASS
	11	2462	-12.43	3.01	-9.42	8	PASS
1	1	2412	-12.28	3.01	-9.27	8	PASS
	6	2437	-8.58	3.01	-5.57	8	PASS
	11	2462	-11.76	3.01	-8.75	8	PASS

802.11n (HT40)

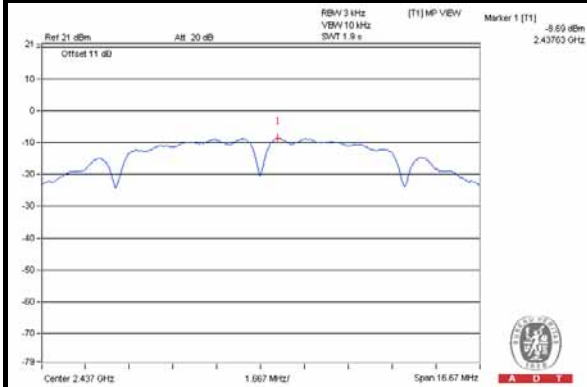
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	3	2422	-16.55	3.01	-13.54	8	PASS
	6	2437	-14.55	3.01	-11.54	8	PASS
	9	2452	-16.36	3.01	-13.35	8	PASS
1	3	2422	-15.75	3.01	-12.74	8	PASS
	6	2437	-14.40	3.01	-11.39	8	PASS
	9	2452	-17.03	3.01	-14.02	8	PASS



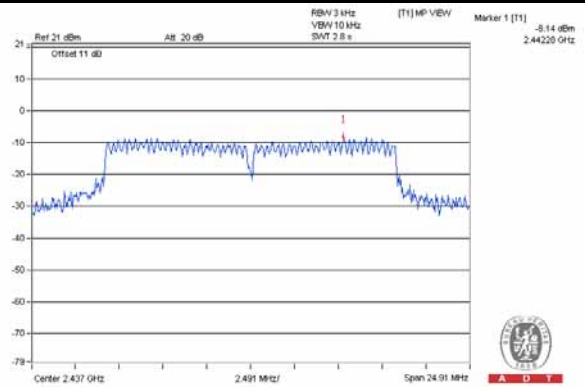
A D T

SPECTRUM PLOT OF WORST VALUE

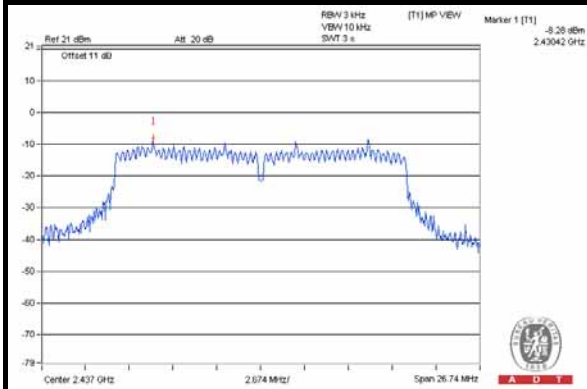
802.11b / CH6



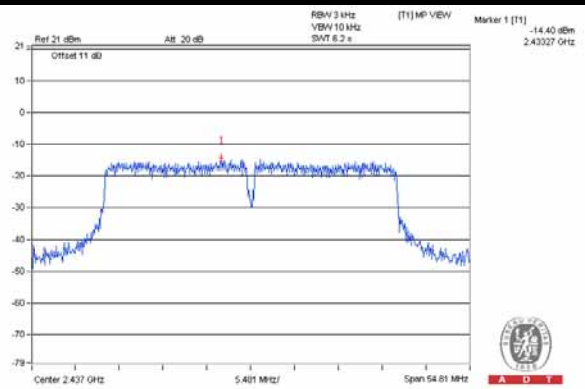
802.11g / CH6



802.11n (HT20) / Chain(0) : CH6



802.11n (HT40) / Chain(1) : CH6





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
SPECTRUM ANALYZER R&S	FSV 40	100964	July 15, 2013	July 14, 2014

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : June 14, 2014

4.6.3 TEST PROCEDURE

Measurement Procedure - Reference Level

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

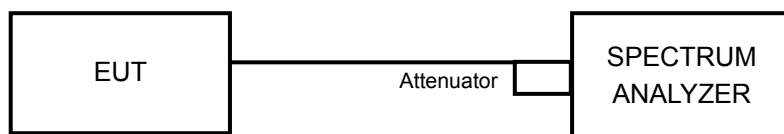
Measurement Procedure –Unwanted Emission Level

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.7 TEST RESULTS

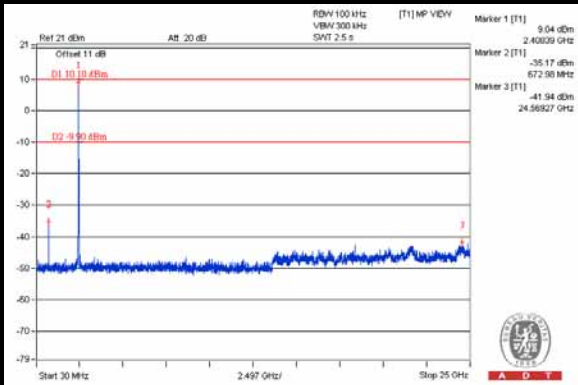
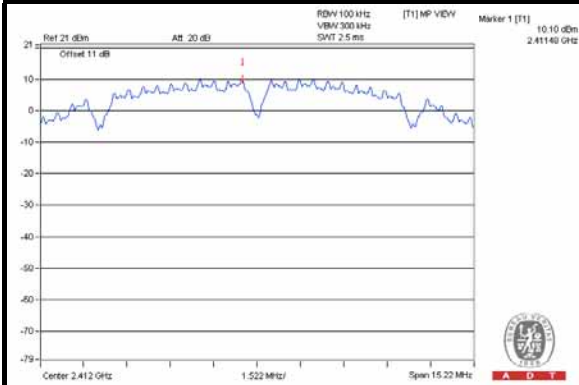
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



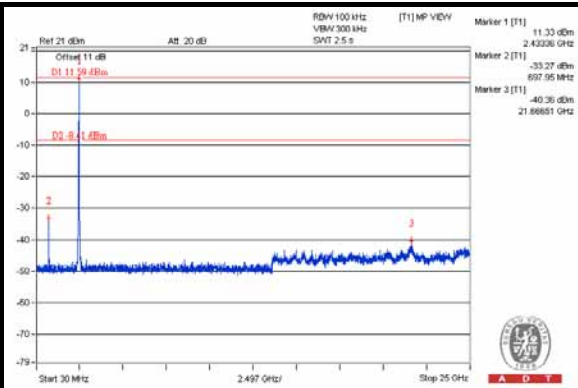
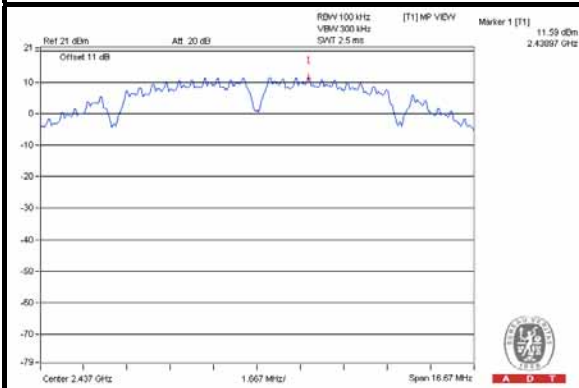
A D T

802.11b

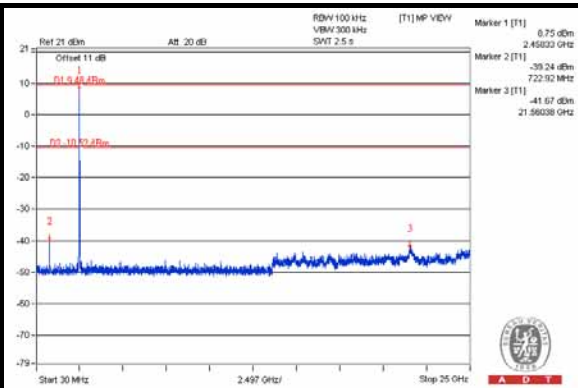
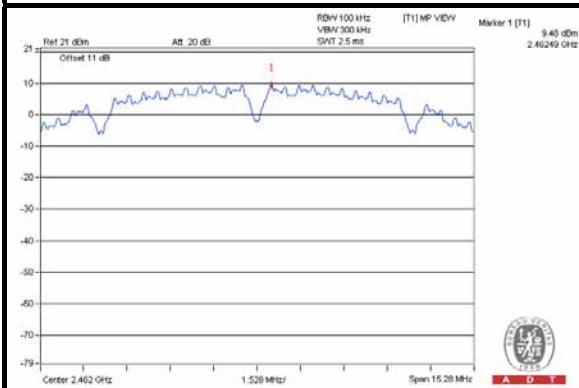
CH 1



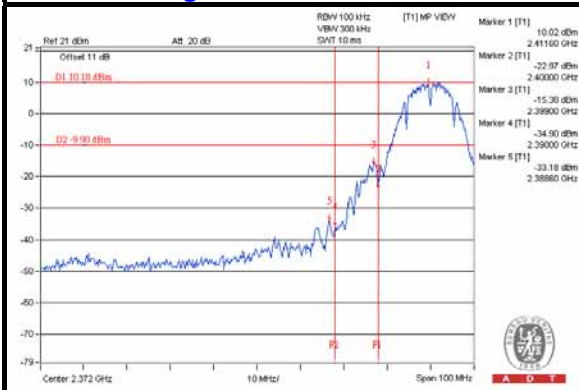
CH 6



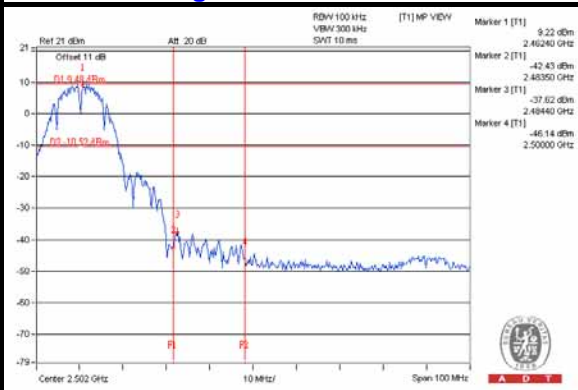
CH 11



CH 1 Band edge



CH 11 Band edge

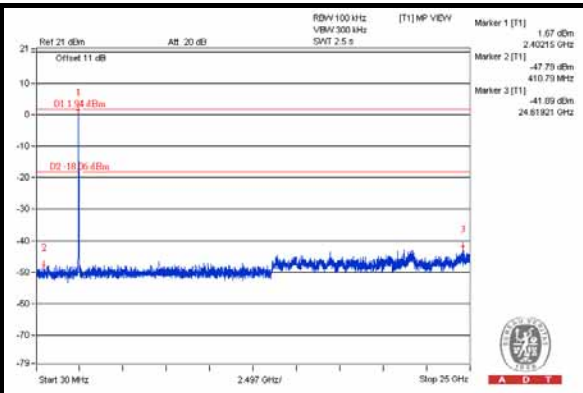
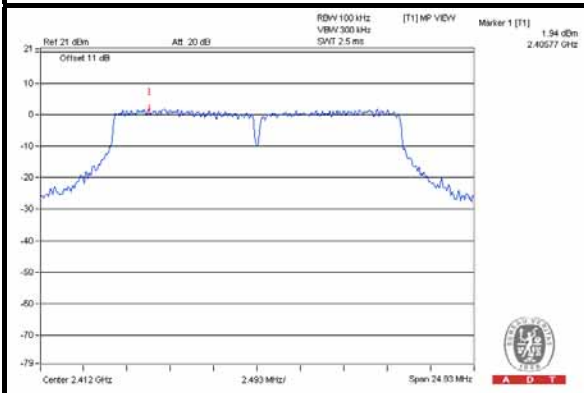




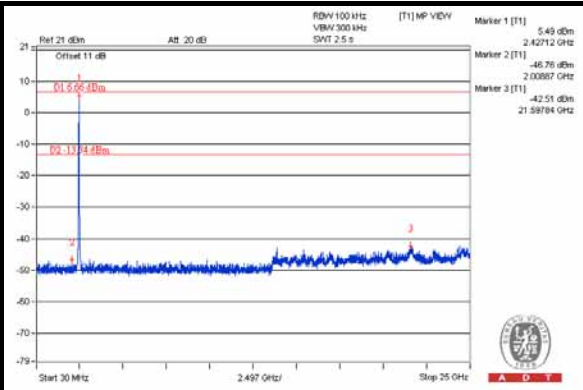
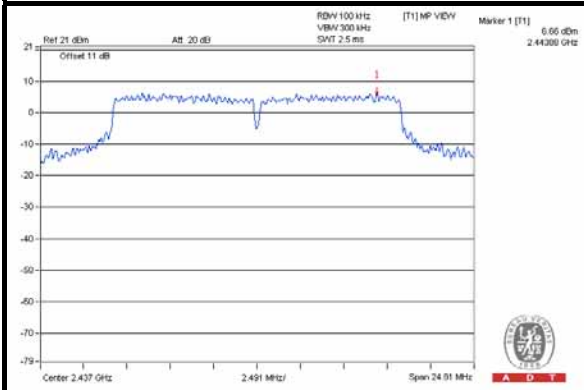
A D T

802.11g

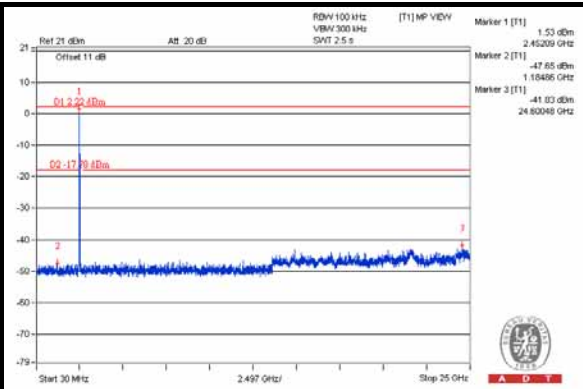
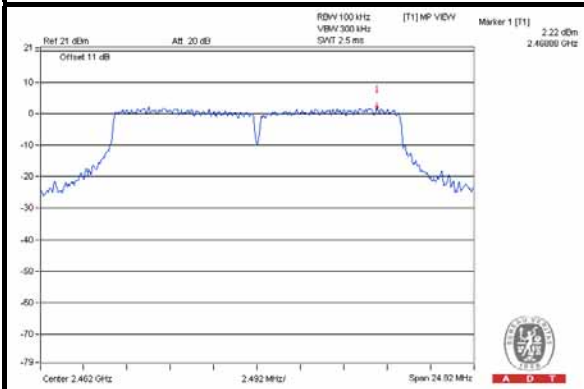
CH 1



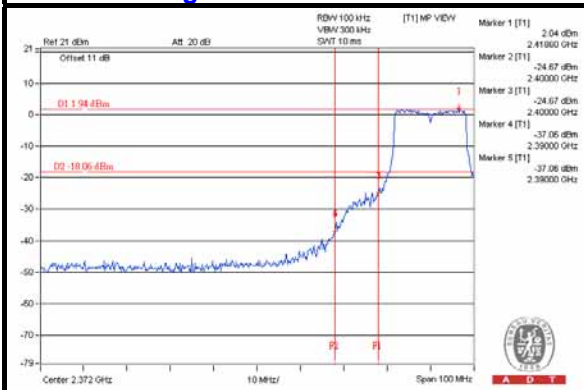
CH 6



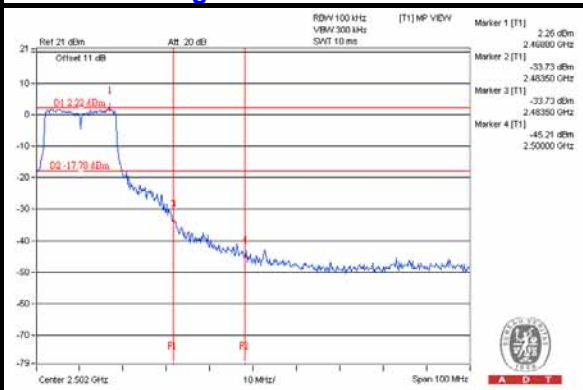
CH 11



CH 1 Band edge



CH 11 Band edge



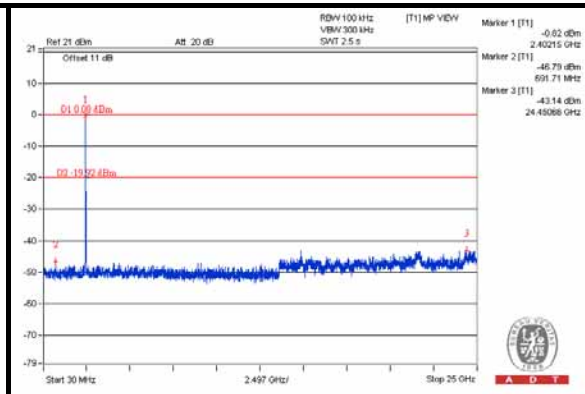
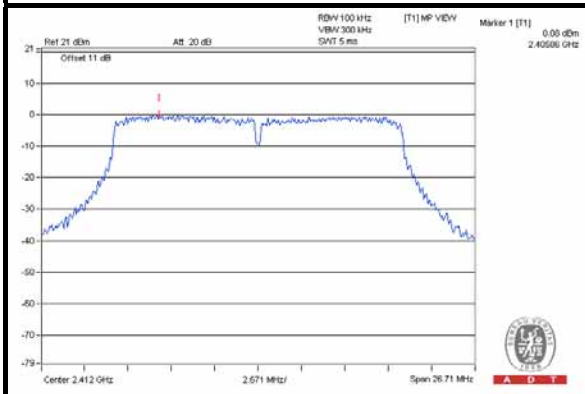


A D T

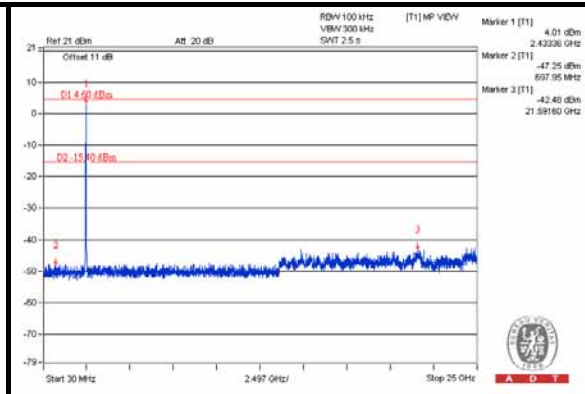
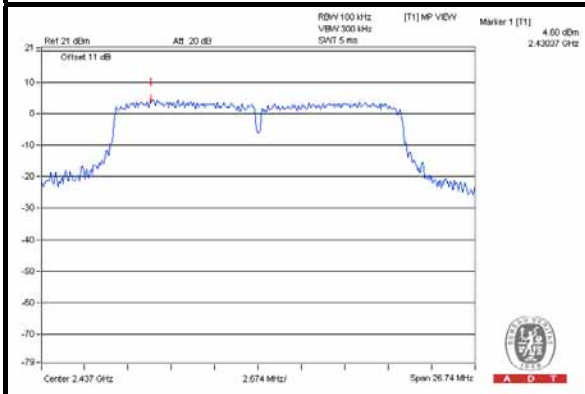
802.11n (HT20)

Chain (0)

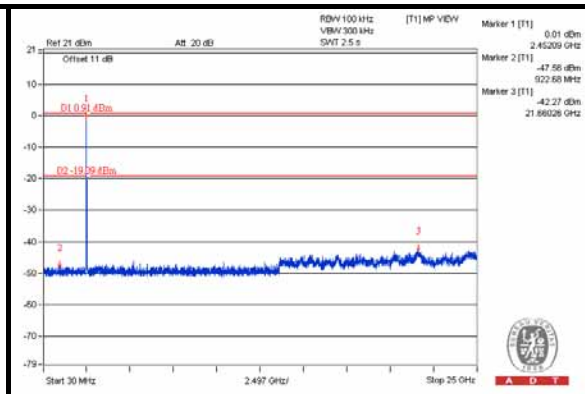
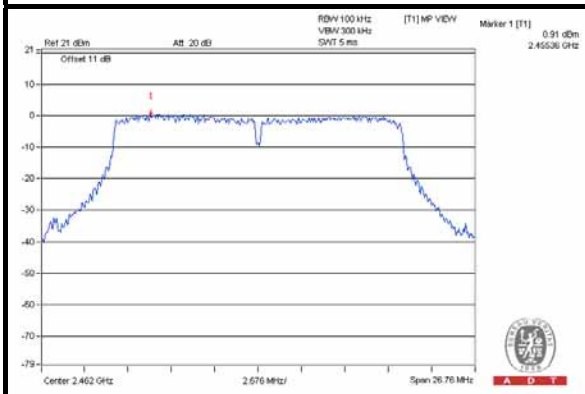
CH 1



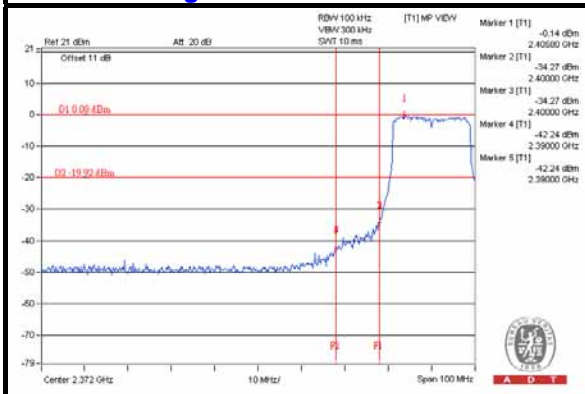
CH 6



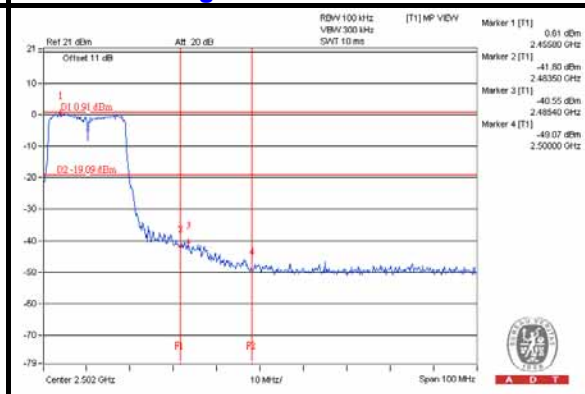
CH 11



CH 1 Band edge



CH 11 Band edge

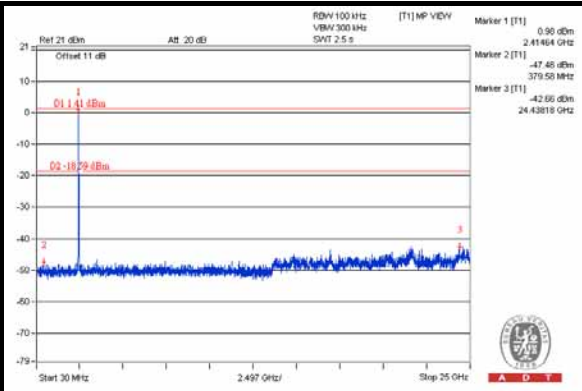
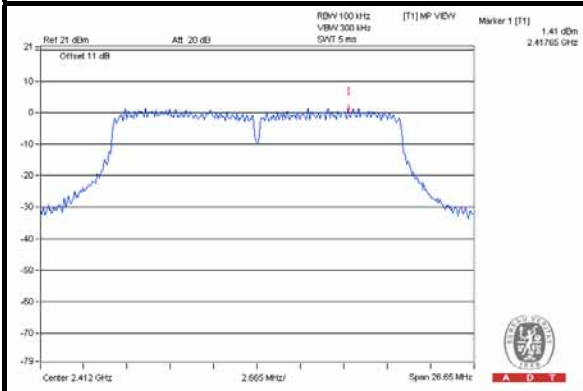




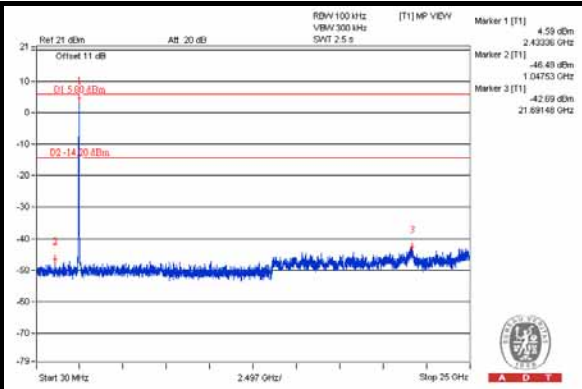
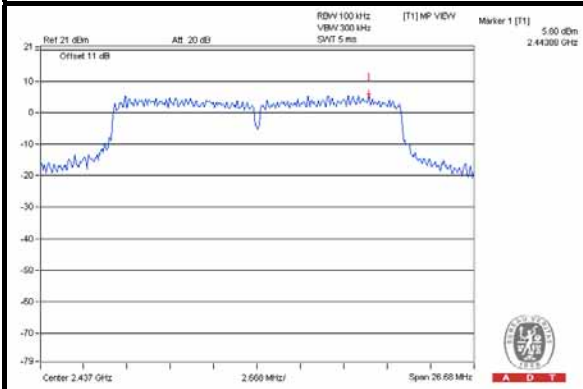
A D T

Chain (1)

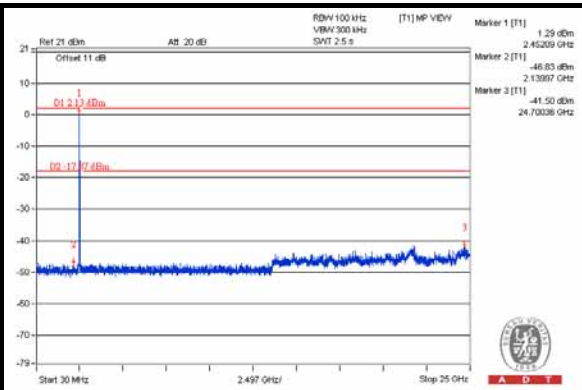
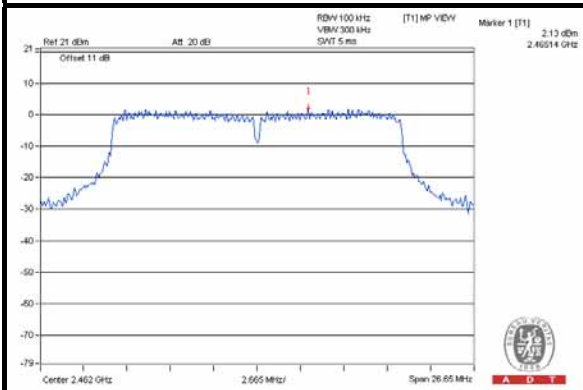
CH 1



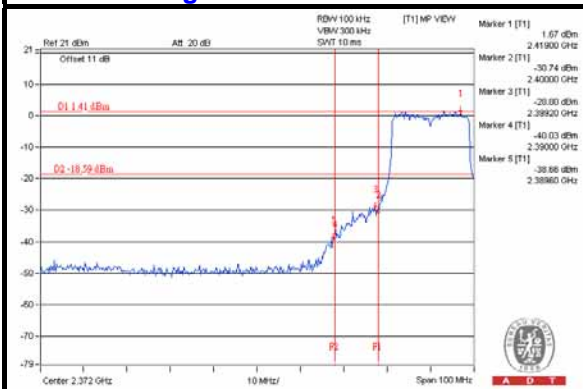
CH 6



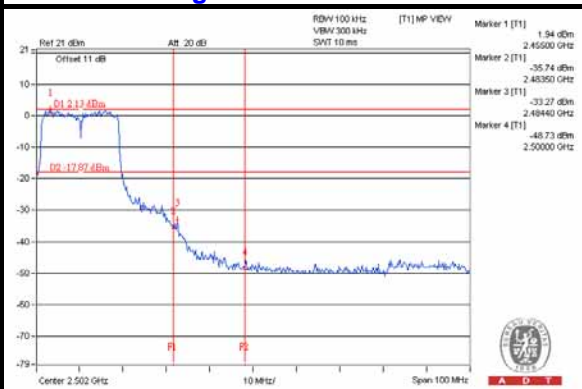
CH 11



CH 1 Band edge



CH 11 Band edge



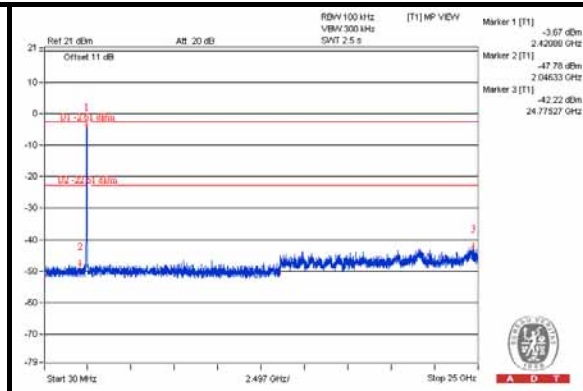
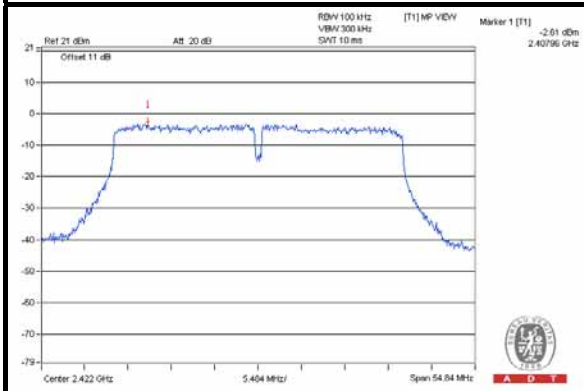


A D T

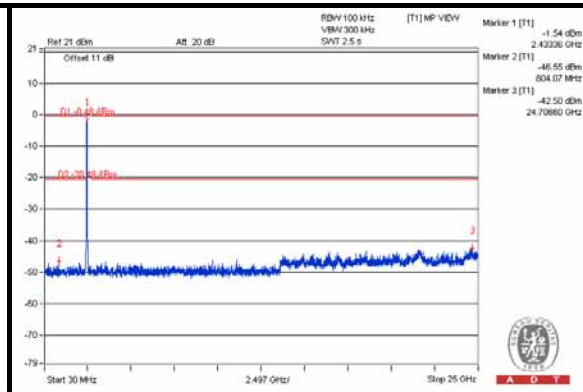
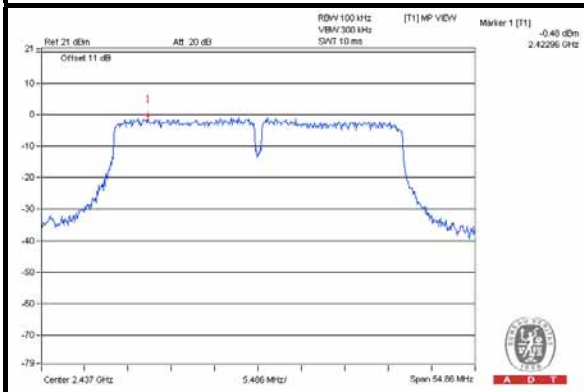
802.11n (HT40)

Chain (0)

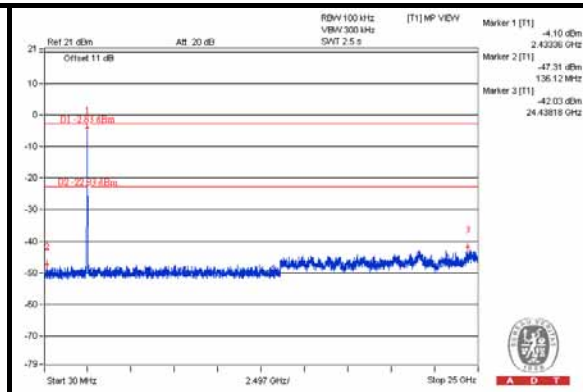
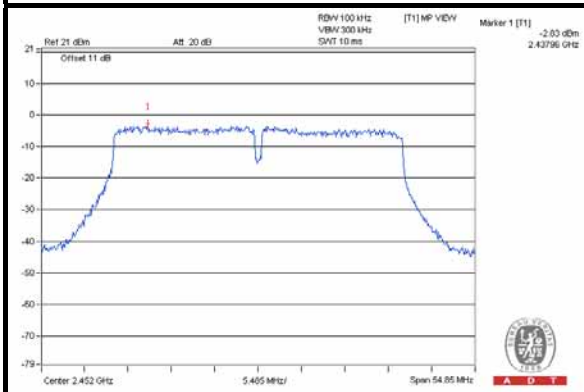
CH 3



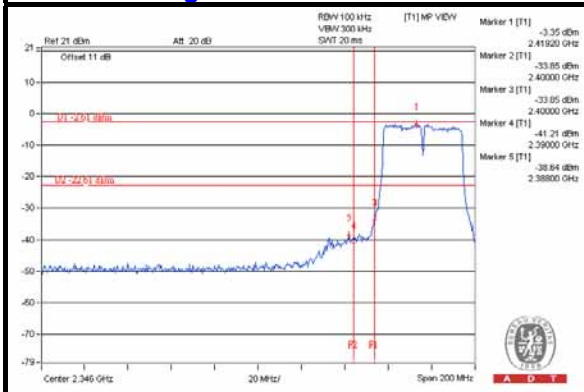
CH 6



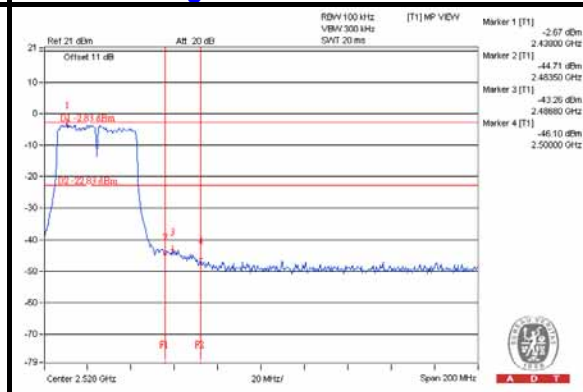
CH 9



CH 3 Band edge



CH 9 Band edge

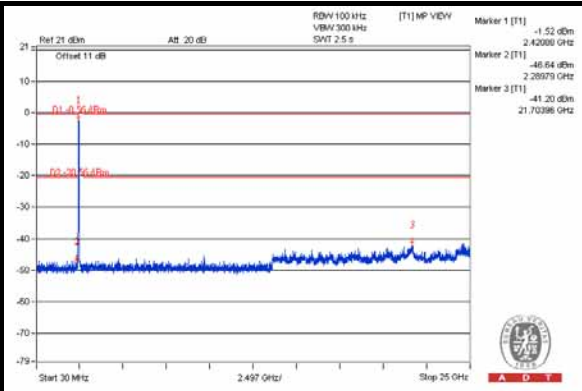
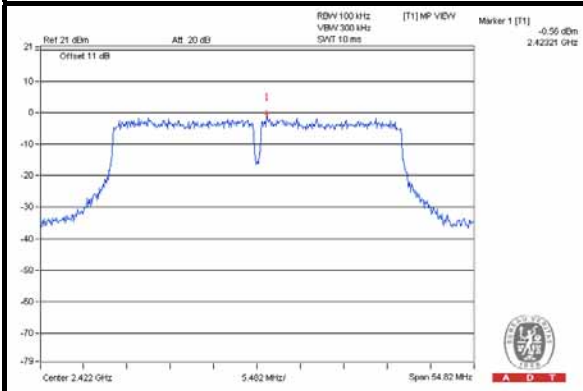




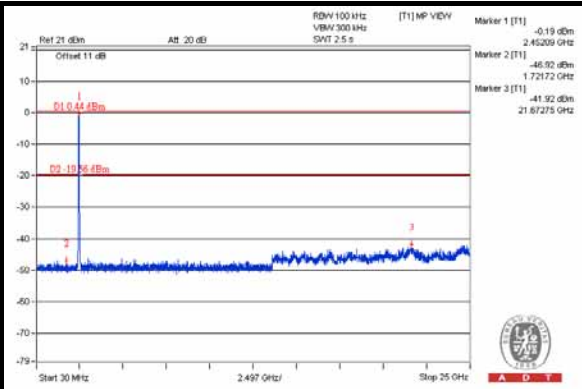
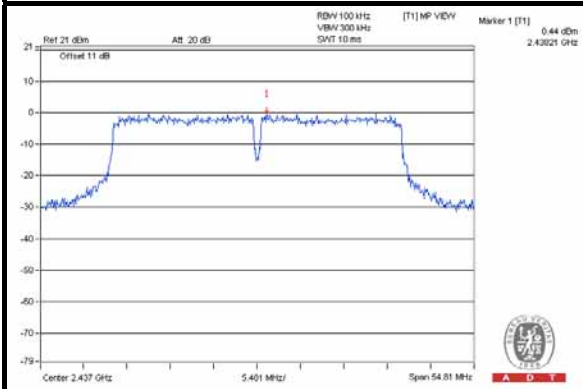
A D T

Chain (1)

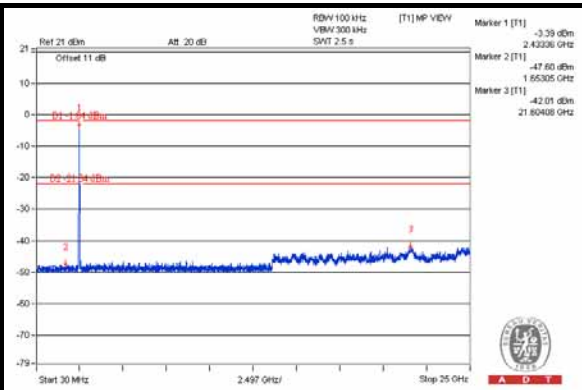
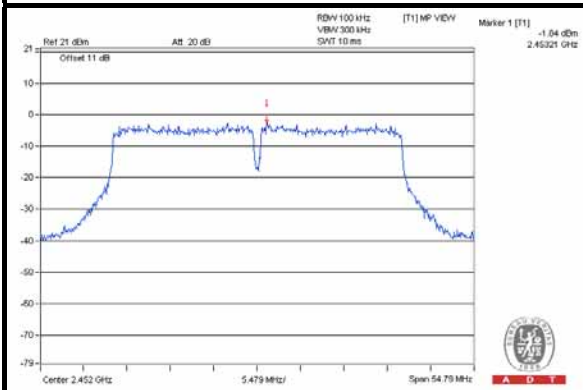
CH 3



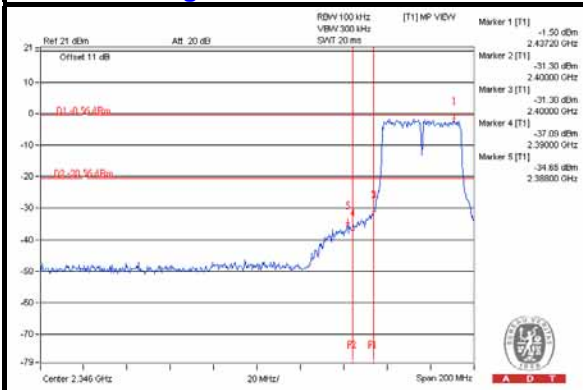
CH 6



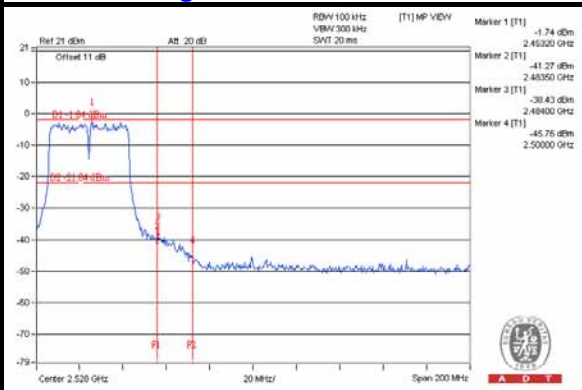
CH 9



CH 3 Band edge



CH 9 Band edge





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5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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





6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

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Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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



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

No modifications were made to the EUT by the lab during the test.

--- END ---