FCC TEST REPORT (WLAN 15.247)

REPORT NO.:	RF140527E05
MODEL NO.:	QLivebox
FCC ID:	2ACFN-QLIVEBOX
RECEIVED:	May 27, 2014
TESTED:	June 13 to 19, 2014 and Sep. 18, 2014
ISSUED:	Nov. 17, 2014

APPLICANT:	QNAP Systems, Inc.
ADDRESS:	2F., No. 22, Zhongxing Rd., Xizhi Dist., New Taipei City, 221 Taiwan

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, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

Testing Laboratory
2022

Table of Contents

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140527E05	Original release	Nov. 17, 2014

1. CERTIFICATION

PRODUCT:	QLivebox
BRAND NAME:	QNAP
MODEL NO.:	QLivebox
TEST SAMPLE:	MASS-PRODUCTION
APPLICANT:	QNAP Systems, Inc.
TESTED:	June 13 to 19, 2014 and Sep. 18, 2014
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)** ANSI C63.10-2009

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

Prepared By : _____ , **Date:** Nov. 17, 2014
(Lori Chung, Specialist)

Approved By : _____ , **Date:** Nov. 17, 2014
(May Chen, Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -24.80dB at 0.53281MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2483.50MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted 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, 5.15~5.25GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz. For the 5.15~5.25GHz RF parameters was recorded in another test report.

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)	5.43 dB
Radiated emissions (1GHz -6GHz)	3.65 dB
Radiated emissions (6GHz -18GHz)	3.88 dB
Radiated emissions (18GHz -40GHz)	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT (WLAN)

PRODUCT	QLivebox
MODEL NO.	QLivebox
POWER SUPPLY	DC 12V from power adapter
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
	For 15.247 2.412 ~ 2.462GHz
NUMBER OF CHANNEL	**For 15.407** 4 for 802.11a, 802.11n (HT20) 2 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: 44.486mW 802.11n (HT20): 44.674mW 802.11n (HT40): 42.125mW **For 15.247** 802.11b: 132.05mW 802.11g: 496.964mW 802.11n (HT20): 462.538mW 802.11n (HT40): 150.356mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	HDMI cable (Shielded, 0.6m) x 1
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter x 1

NOTE:

1. There are WLAN (2.4GHz and 5GHz) and Zigbee technology used for the EUT.
2. WLAN and Zigbee technology can transmit at same time.
3. For WLAN, 2.4GHz and 5GHz technology can not transmit at same time.
4. The emission of the simultaneous operation (WLAN & Zigbee) has been evaluated and no non-compliance was found.
5. The antennas provided to the EUT, please refer to the following table:

For WLAN							
Ant. No.	Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain (dBi)	Connector type	Frequency range (GHz to GHz)
1	Chain (0)	Unictron	AA077	chip	1.4	NA	2.4~2.5
	Chain (1)						
2	Chain (0)				2.3		5.15~5.85
	Chain (1)						

For Zigbee						
Ant. No.	Brand	Model	Antenna Type	Antenna Gain (dBi)	Connector type	Frequency range (GHz to GHz)
3	Unictron	AA055	chip	2.5	NA	2.4~2.5

6. The EUT could be supplied with a power adapter as the following table:

Brand	Model No.	Spec.
Atechoem	ADS012PM-W 120100	AC I/P: 100-240V, 0.5A, 50/60Hz DC O/P: 12V, 1A DC output cable (Unshielded, 1.5m)

7. The EUT incorporates a MIMO function without beamforming.

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

8. 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

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

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)
802.11g	1 to 11	6	OFDM	BPSK	6

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)
802.11g	1 to 11	6	OFDM	BPSK	6

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	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

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	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

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	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	25deg. C, 70%RH	120Vac, 60Hz	Mike Hsieh
RE<1G	25deg. C, 73%RH	120Vac, 60Hz	Gary Cheng
RE≥1G	22deg. C, 68%RH	120Vac, 60Hz	Tim Ho
APCM	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

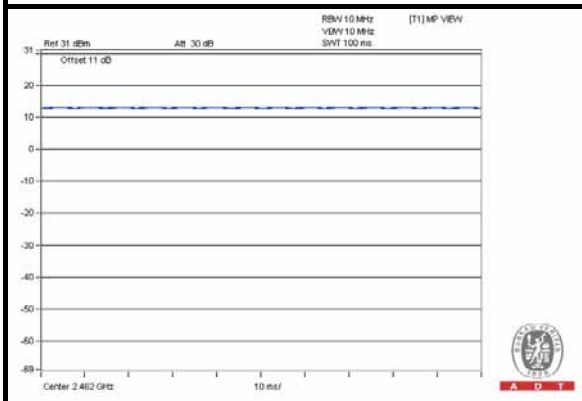
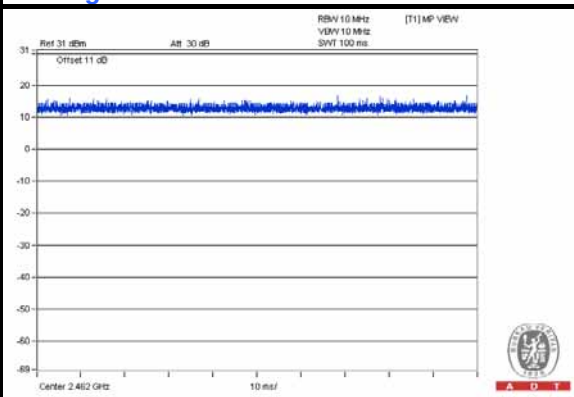
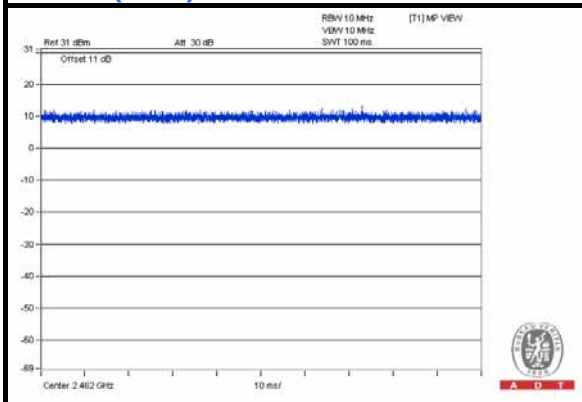
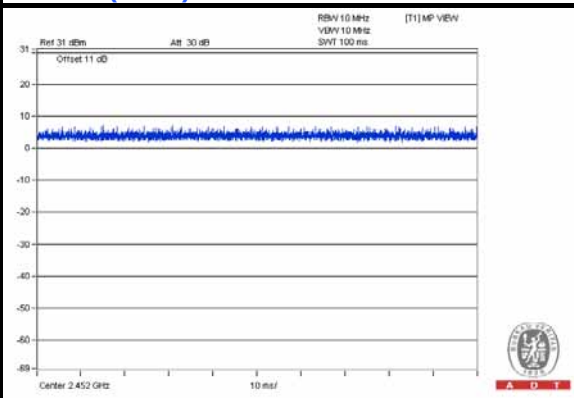
ANSI C63.10-2009

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.

3.4 DUTY CYCLE OF TEST SIGNAL

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

802.11b	802.11g
	
802.11n (HT20)	**802.11n (HT40)**
	

3.5 DESCRIPTION OF SUPPORT UNITS

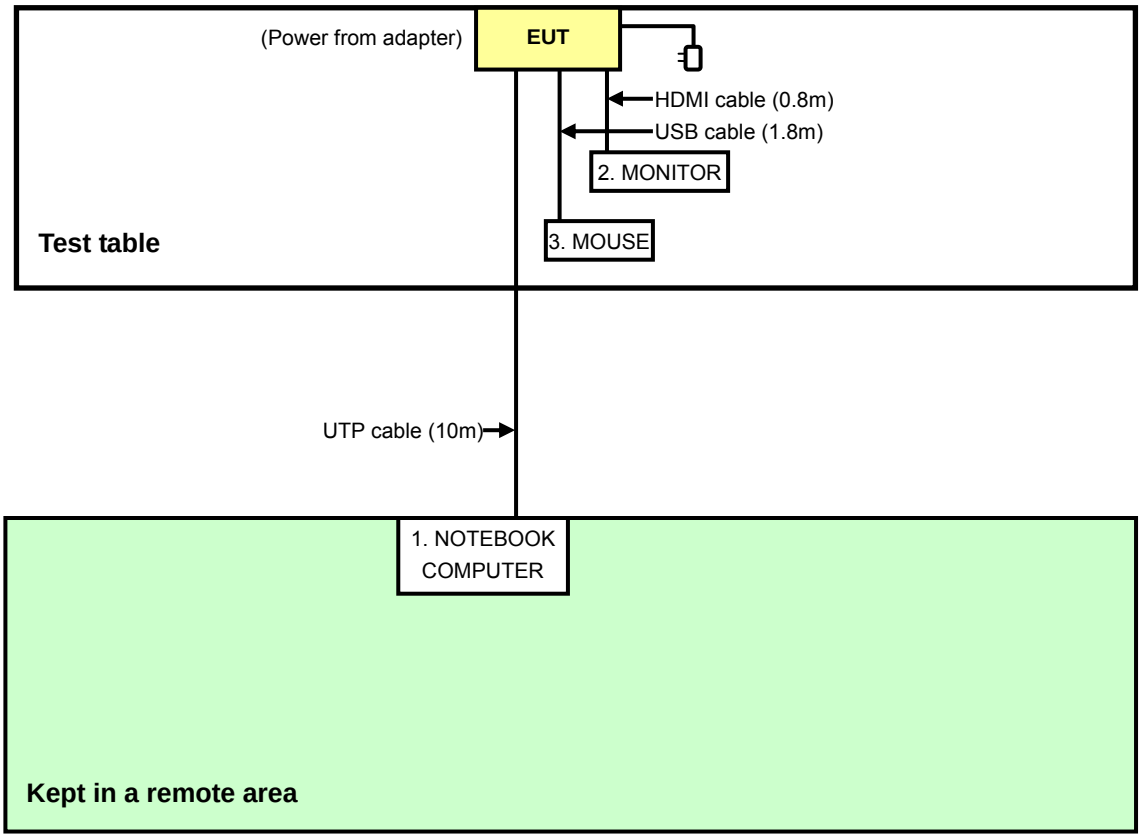
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
2	MONITOR	DELL	U2410F	CNOJ257M728729A G14ML	FCC DoC
3	MOUSE	DELL	MOC5UO	I1406CUN	FCC DoC

No.	Signal cable description
1	UTP cable (10m)
2	HDMI cable (0.8m)
3	USB cable (1.8m)

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

3.6 CONFIGURATION OF SYSTEM UNDER TEST



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	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 18, 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.

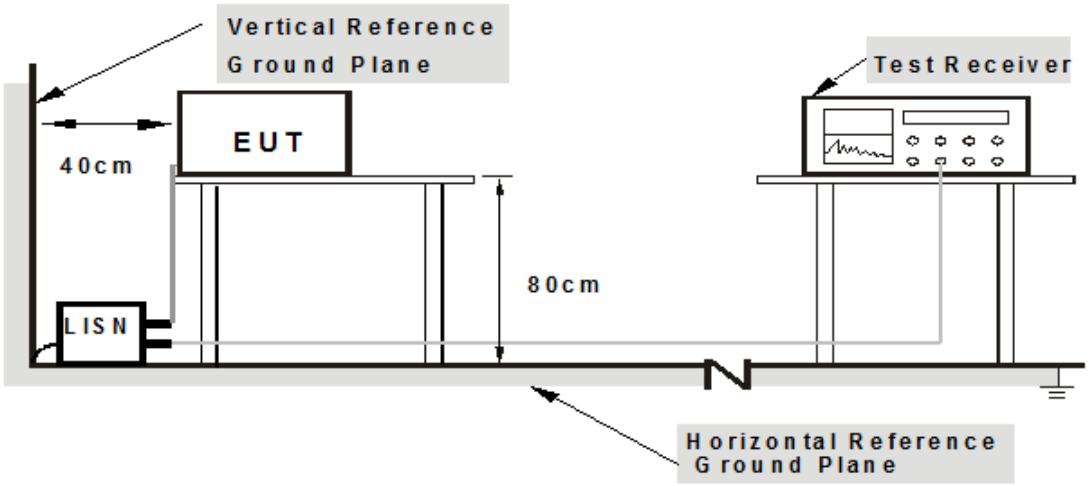
NOTE:

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.

4.1.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared computer system (support units 1) to act as communication partner.
3. The communication partner ran test program “HyperTerminal paste command” to enable EUT under transmission/receiving condition continuously.

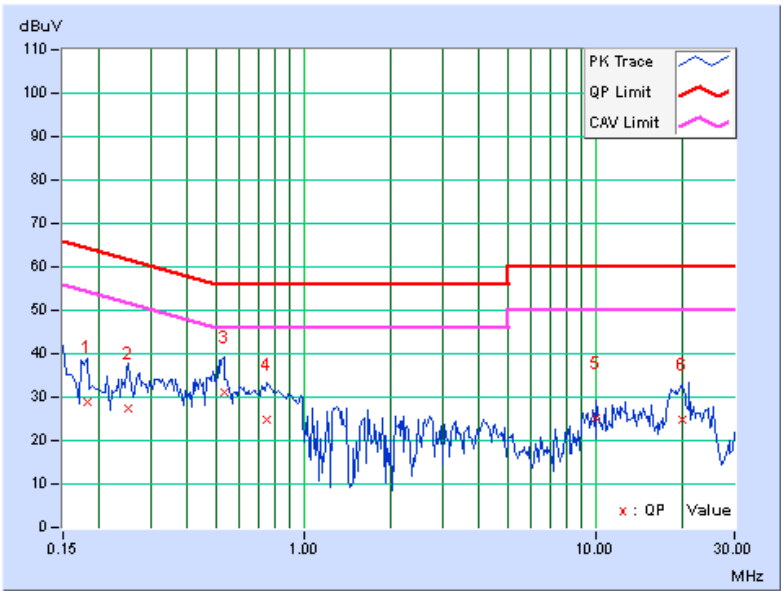
4.1.7 TEST RESULTS

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18125	0.07	28.88	6.87	28.95	6.94	64.43	54.43	-35.48	-47.49
2	0.25156	0.08	27.32	2.50	27.40	2.58	61.71	51.71	-34.31	-49.13
3	**0.53281**	**0.10**	**31.10**	**6.00**	**31.20**	**6.10**	**56.00**	**46.00**	**-24.80**	**-39.90**
4	0.75156	0.11	24.80	1.48	24.91	1.59	56.00	46.00	-31.09	-44.41
5	10.01563	0.45	24.73	17.52	25.18	17.97	60.00	50.00	-34.82	-32.03
6	19.82813	0.71	23.99	15.24	24.70	15.95	60.00	50.00	-35.30	-34.05

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

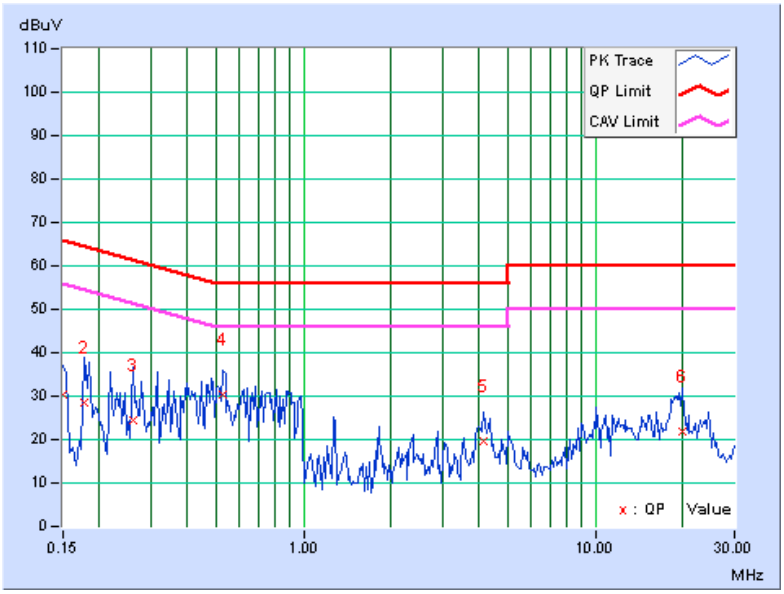


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.08	30.28	11.56	30.36	11.64	66.00	56.00	-35.64	-44.36
2	0.17734	0.07	28.35	12.11	28.42	12.18	64.61	54.61	-36.19	-42.43
3	0.25938	0.08	24.54	2.76	24.62	2.84	61.45	51.45	-36.84	-48.62
4	0.52891	0.10	30.11	5.38	30.21	5.48	56.00	46.00	-25.79	-40.52
5	4.14063	0.26	19.32	6.73	19.58	6.99	56.00	46.00	-36.42	-39.01
6	19.98438	0.70	21.20	9.78	21.90	10.48	60.00	50.00	-38.10	-39.52

REMARKS:

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



4.2 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.

4.2.2 TEST INSTRUMENTS

For below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 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 05, 2014	July 04, 2015
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
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: Sep. 18, 2014

For above 1GHz test:

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 13, 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:

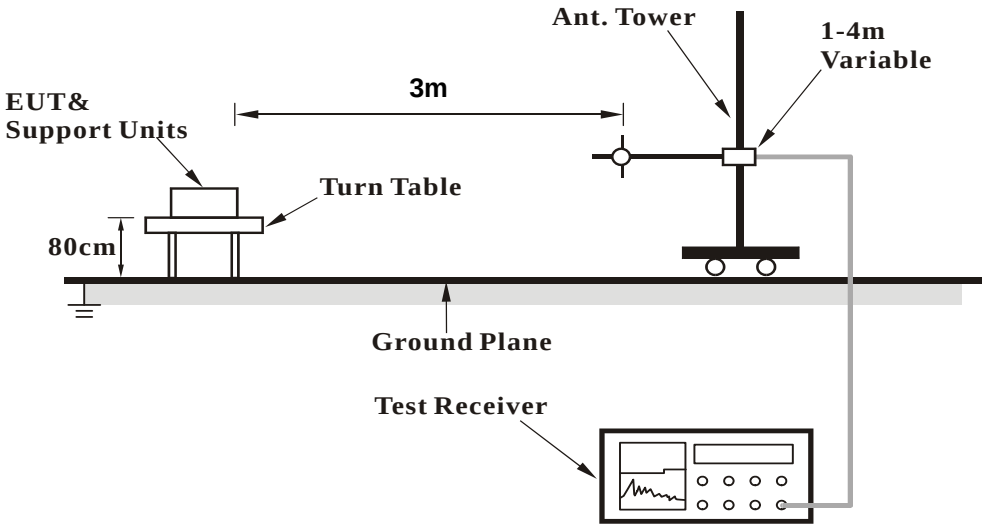
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

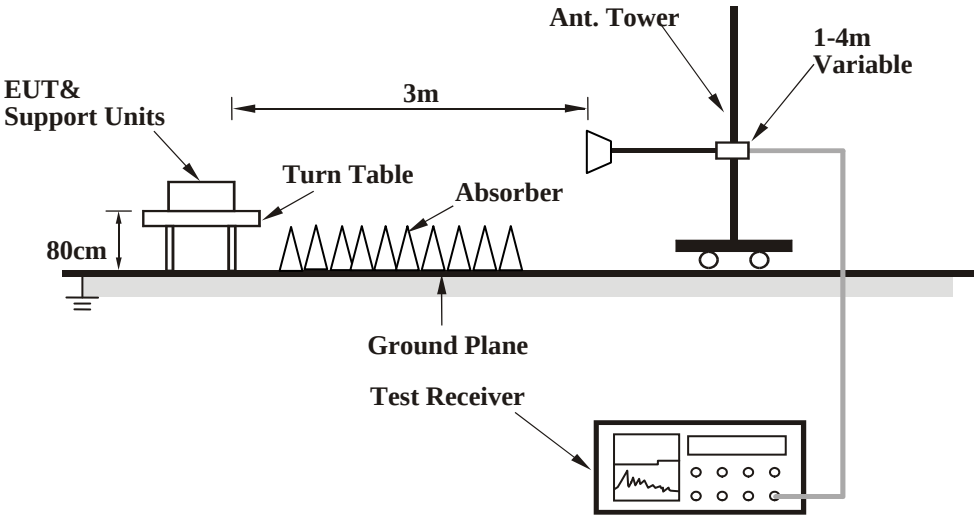
No deviation

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

4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11g

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	49.50	36.7 QP	40.0	-3.3	2.00 H	87	49.62	-12.95
2	56.97	33.9 QP	40.0	-6.1	1.50 H	256	47.06	-13.20
3	135.97	36.2 QP	43.5	-7.4	2.00 H	87	49.48	-13.33
4	146.98	39.6 QP	43.5	-3.9	1.50 H	95	52.20	-12.61
5	443.17	38.9 QP	46.0	-7.1	2.00 H	298	46.72	-7.83
6	742.51	41.2 QP	46.0	-4.8	1.00 H	0	43.09	-1.88
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	30.05	37.9 QP	40.0	-2.2	1.50 V	30	52.14	-14.29
2	49.51	33.8 QP	40.0	-6.2	2.00 V	34	46.78	-12.95
3	60.01	38.2 QP	40.0	-1.8	1.00 V	281	51.71	-13.49
4	136.12	40.4 QP	43.5	-3.1	1.00 V	253	53.70	-13.32
5	742.51	37.6 QP	46.0	-8.4	1.00 V	275	39.51	-1.88
6	903.00	39.1 QP	46.0	-6.9	2.00 V	324	38.45	0.63

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

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	2389.14	51.9 PK	74.0	-22.1	1.07 H	207	54.30	-2.40
2	2389.14	41.6 AV	54.0	-12.4	1.07 H	207	44.00	-2.40
3	*2412.00	108.8 PK			1.07 H	207	111.10	-2.30
4	*2412.00	106.8 AV			1.07 H	207	109.10	-2.30
5	4824.00	55.6 PK	74.0	-18.4	1.51 H	101	50.00	5.60
6	4824.00	51.8 AV	54.0	-2.2	1.51 H	101	46.20	5.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2386.28	47.4 PK	74.0	-26.6	1.00 V	295	49.80	-2.40
2	2386.28	36.1 AV	54.0	-17.9	1.00 V	295	38.50	-2.40
3	*2412.00	98.5 PK			1.00 V	295	100.80	-2.30
4	*2412.00	96.1 AV			1.00 V	295	98.40	-2.30
5	4824.00	56.4 PK	74.0	-17.6	1.99 V	266	50.80	5.60
6	4824.00	52.7 AV	54.0	-1.3	1.99 V	266	47.10	5.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

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	*2437.00	108.6 PK			1.10 H	199	110.90	-2.30
2	*2437.00	106.7 AV			1.10 H	199	109.00	-2.30
3	4874.00	53.8 PK	74.0	-20.2	1.89 H	197	47.90	5.90
4	4874.00	49.4 AV	54.0	-4.6	1.89 H	197	43.50	5.90
5	7311.00	54.5 PK	74.0	-19.5	1.42 H	154	41.30	13.20
6	7311.00	46.2 AV	54.0	-7.8	1.42 H	154	33.00	13.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	98.2 PK			1.00 V	300	100.50	-2.30
2	*2437.00	96.0 AV			1.00 V	300	98.30	-2.30
3	4874.00	56.2 PK	74.0	-17.8	2.00 V	242	50.30	5.90
4	4874.00	52.8 AV	54.0	-1.2	2.00 V	242	46.90	5.90
5	7311.00	53.4 PK	74.0	-20.6	1.84 V	196	40.20	13.20
6	7311.00	44.0 AV	54.0	-10.0	1.84 V	196	30.80	13.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

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	109.1 PK			1.07 H	215	111.20	-2.10
2	*2462.00	107.1 AV			1.07 H	215	109.20	-2.10
3	2483.50	58.6 PK	74.0	-15.4	1.07 H	215	60.60	-2.00
4	2483.50	53.6 AV	54.0	-0.4	1.07 H	215	55.60	-2.00
5	4924.00	54.1 PK	74.0	-19.9	1.88 H	203	48.00	6.10
6	4924.00	49.9 AV	54.0	-4.1	1.88 H	203	43.80	6.10
7	7386.00	54.1 PK	74.0	-19.9	1.44 H	146	40.90	13.20
8	7386.00	45.7 AV	54.0	-8.3	1.44 H	146	32.50	13.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	98.1 PK			1.00 V	289	100.20	-2.10
2	*2462.00	95.9 AV			1.00 V	289	98.00	-2.10
3	2483.50	46.6 PK	74.0	-27.4	1.00 V	289	48.60	-2.00
4	2483.50	35.6 AV	54.0	-18.4	1.00 V	289	37.60	-2.00
5	4924.00	55.9 PK	74.0	-18.1	1.95 V	179	49.80	6.10
6	4924.00	52.4 AV	54.0	-1.6	1.95 V	179	46.30	6.10
7	7386.00	56.5 PK	74.0	-17.5	1.51 V	188	43.30	13.20
8	7386.00	49.0 AV	54.0	-5.0	1.51 V	188	35.80	13.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

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	70.0 PK	74.0	-4.0	1.09 H	205	72.40	-2.40
2	2390.00	53.1 AV	54.0	-0.9	1.09 H	205	55.50	-2.40
3	*2412.00	106.4 PK			1.09 H	205	108.70	-2.30
4	*2412.00	98.2 AV			1.09 H	205	100.50	-2.30
5	4824.00	49.0 PK	74.0	-25.0	1.15 H	90	43.40	5.60
6	4824.00	36.5 AV	54.0	-17.5	1.15 H	90	30.90	5.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2390.00	46.8 PK	74.0	-27.2	1.00 V	289	49.20	-2.40
2	2390.00	35.8 AV	54.0	-18.2	1.00 V	289	38.20	-2.40
3	*2412.00	96.0 PK			1.00 V	289	98.30	-2.30
4	*2412.00	88.1 AV			1.00 V	289	90.40	-2.30
5	4824.00	48.4 PK	74.0	-25.6	1.37 V	222	42.80	5.60
6	4824.00	35.9 AV	54.0	-18.1	1.37 V	222	30.30	5.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

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	58.2 PK	74.0	-15.8	1.09 H	217	60.60	-2.40
2	2390.00	44.1 AV	54.0	-9.9	1.09 H	217	46.50	-2.40
3	*2437.00	113.9 PK			1.09 H	217	116.20	-2.30
4	*2437.00	105.5 AV			1.09 H	217	107.80	-2.30
5	2483.50	72.4 PK	74.0	-1.6	1.09 H	217	74.40	-2.00
6	2483.50	53.7 AV	54.0	-0.3	1.09 H	217	55.70	-2.00
7	4874.00	48.5 PK	74.0	-25.5	1.14 H	109	42.60	5.90
8	4874.00	36.4 AV	54.0	-17.6	1.14 H	109	30.50	5.90
9	7311.00	53.8 PK	74.0	-20.2	1.35 H	245	40.60	13.20
10	7311.00	40.9 AV	54.0	-13.1	1.35 H	245	27.70	13.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	103.1 PK			1.00 V	284	105.40	-2.30
2	*2437.00	95.1 AV			1.00 V	284	97.40	-2.30
3	4874.00	48.7 PK	74.0	-25.3	1.40 V	227	42.80	5.90
4	4874.00	36.1 AV	54.0	-17.9	1.40 V	227	30.20	5.90
5	7311.00	54.4 PK	74.0	-19.6	1.25 V	296	41.20	13.20
6	7311.00	41.8 AV	54.0	-12.2	1.25 V	296	28.60	13.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

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	106.7 PK			1.07 H	192	108.80	-2.10
2	*2462.00	98.4 AV			1.07 H	192	100.50	-2.10
3	2483.50	71.4 PK	74.0	-2.6	1.07 H	192	73.40	-2.00
4	2483.50	53.6 AV	54.0	-0.4	1.07 H	192	55.60	-2.00
5	4924.00	48.7 PK	74.0	-25.3	1.15 H	114	42.60	6.10
6	4924.00	36.4 AV	54.0	-17.6	1.15 H	114	30.30	6.10
7	7386.00	54.6 PK	74.0	-19.4	1.33 H	239	41.40	13.20
8	7386.00	41.4 AV	54.0	-12.6	1.33 H	239	28.20	13.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	96.4 PK			1.00 V	284	98.50	-2.10
2	*2462.00	88.3 AV			1.00 V	284	90.40	-2.10
3	2483.50	46.3 PK	74.0	-27.7	1.00 V	284	48.30	-2.00
4	2483.50	35.3 AV	54.0	-18.7	1.00 V	284	37.30	-2.00
5	4924.00	48.1 PK	74.0	-25.9	1.44 V	242	42.00	6.10
6	4924.00	35.9 AV	54.0	-18.1	1.44 V	242	29.80	6.10
7	7386.00	53.8 PK	74.0	-20.2	1.22 V	306	40.60	13.20
8	7386.00	41.4 AV	54.0	-12.6	1.22 V	306	28.20	13.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

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	66.6 PK	74.0	-7.4	1.09 H	206	69.00	-2.40
2	2390.00	52.9 AV	54.0	-1.1	1.09 H	206	55.30	-2.40
3	*2412.00	107.9 PK			1.09 H	206	110.20	-2.30
4	*2412.00	97.8 AV			1.09 H	206	100.10	-2.30
5	4824.00	48.7 PK	74.0	-25.3	1.16 H	115	43.10	5.60
6	4824.00	36.5 AV	54.0	-17.5	1.16 H	115	30.90	5.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	46.8 PK	74.0	-27.2	1.00 V	281	49.20	-2.40
2	2390.00	35.6 AV	54.0	-18.4	1.00 V	281	38.00	-2.40
3	*2412.00	96.2 PK			1.00 V	281	98.50	-2.30
4	*2412.00	87.2 AV			1.00 V	281	89.50	-2.30
5	4824.00	49.0 PK	74.0	-25.0	1.41 V	236	43.40	5.60
6	4824.00	36.7 AV	54.0	-17.3	1.41 V	236	31.10	5.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

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	58.2 PK	74.0	-15.8	1.07 H	213	60.60	-2.40
2	2390.00	42.8 AV	54.0	-11.2	1.07 H	213	45.20	-2.40
3	*2437.00	113.2 PK			1.07 H	213	115.50	-2.30
4	*2437.00	103.5 AV			1.07 H	213	105.80	-2.30
5	2483.50	68.3 PK	74.0	-5.7	1.07 H	213	70.30	-2.00
6	2483.50	53.1 AV	54.0	-0.9	1.07 H	213	55.10	-2.00
7	4874.00	48.4 PK	74.0	-25.6	1.17 H	102	42.50	5.90
8	4874.00	36.2 AV	54.0	-17.8	1.17 H	102	30.30	5.90
9	7311.00	54.3 PK	74.0	-19.7	1.36 H	233	41.10	13.20
10	7311.00	41.5 AV	54.0	-12.5	1.36 H	233	28.30	13.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	103.1 PK			1.00 V	279	105.40	-2.30
2	*2437.00	93.1 AV			1.00 V	279	95.40	-2.30
3	4874.00	49.0 PK	74.0	-25.0	1.44 V	222	43.10	5.90
4	4874.00	36.8 AV	54.0	-17.2	1.44 V	222	30.90	5.90
5	7311.00	54.8 PK	74.0	-19.2	1.18 V	294	41.60	13.20
6	7311.00	41.8 AV	54.0	-12.2	1.18 V	294	28.60	13.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

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	106.5 PK			1.07 H	194	108.60	-2.10
2	*2462.00	96.4 AV			1.07 H	194	98.50	-2.10
3	2483.50	72.6 PK	74.0	-1.4	1.07 H	194	74.60	-2.00
4	2483.50	53.3 AV	54.0	-0.7	1.07 H	194	55.30	-2.00
5	4924.00	48.7 PK	74.0	-25.3	1.16 H	109	42.60	6.10
6	4924.00	36.2 AV	54.0	-17.8	1.16 H	109	30.10	6.10
7	7386.00	53.7 PK	74.0	-20.3	1.31 H	242	40.50	13.20
8	7386.00	40.8 AV	54.0	-13.2	1.31 H	242	27.60	13.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	96.3 PK			1.00 V	265	98.40	-2.10
2	*2462.00	86.2 AV			1.00 V	265	88.30	-2.10
3	2483.50	45.9 PK	74.0	-28.1	1.00 V	265	47.90	-2.00
4	2483.50	35.1 AV	54.0	-18.9	1.00 V	265	37.10	-2.00
5	4924.00	48.5 PK	74.0	-25.5	1.40 V	232	42.40	6.10
6	4924.00	36.0 AV	54.0	-18.0	1.40 V	232	29.90	6.10
7	7386.00	53.6 PK	74.0	-20.4	1.17 V	313	40.40	13.20
8	7386.00	41.1 AV	54.0	-12.9	1.17 V	313	27.90	13.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

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	68.5 PK	74.0	-5.5	1.07 H	209	70.90	-2.40
2	2390.00	53.6 AV	54.0	-0.4	1.07 H	209	56.00	-2.40
3	*2422.00	103.9 PK			1.07 H	209	106.20	-2.30
4	*2422.00	94.3 AV			1.07 H	209	96.60	-2.30
5	4844.00	48.8 PK	74.0	-25.2	1.10 H	94	43.00	5.80
6	4844.00	36.5 AV	54.0	-17.5	1.10 H	94	30.70	5.80
7	7266.00	53.9 PK	74.0	-20.1	1.32 H	240	40.70	13.20
8	7266.00	40.9 AV	54.0	-13.1	1.32 H	240	27.70	13.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	46.9 PK	74.0	-27.1	1.00 V	254	49.30	-2.40
2	2390.00	35.8 AV	54.0	-18.2	1.00 V	254	38.20	-2.40
3	*2422.00	92.8 PK			1.00 V	254	95.10	-2.30
4	*2422.00	84.1 AV			1.00 V	254	86.40	-2.30
5	4844.00	48.7 PK	74.0	-25.3	1.45 V	253	42.90	5.80
6	4844.00	36.3 AV	54.0	-17.7	1.45 V	253	30.50	5.80
7	7266.00	53.7 PK	74.0	-20.3	1.17 V	312	40.50	13.20
8	7266.00	41.1 AV	54.0	-12.9	1.17 V	312	27.90	13.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

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	64.6 PK	74.0	-9.4	1.09 H	217	67.00	-2.40
2	2390.00	48.8 AV	54.0	-5.2	1.09 H	217	51.20	-2.40
3	*2437.00	106.1 PK			1.09 H	217	108.40	-2.30
4	*2437.00	97.7 AV			1.09 H	217	100.00	-2.30
5	2483.50	68.2 PK	74.0	-5.8	1.09 H	217	70.20	-2.00
6	2483.50	53.6 AV	54.0	-0.4	1.09 H	217	55.60	-2.00
7	4874.00	47.9 PK	74.0	-26.1	1.15 H	93	42.00	5.90
8	4874.00	35.8 AV	54.0	-18.2	1.15 H	93	29.90	5.90
9	7311.00	53.9 PK	74.0	-20.1	1.27 H	261	40.70	13.20
10	7311.00	40.9 AV	54.0	-13.1	1.27 H	261	27.70	13.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	95.8 PK			1.00 V	245	98.10	-2.30
2	*2437.00	87.6 AV			1.00 V	245	89.90	-2.30
3	4874.00	48.2 PK	74.0	-25.8	1.43 V	245	42.30	5.90
4	4874.00	36.0 AV	54.0	-18.0	1.43 V	245	30.10	5.90
5	7311.00	53.7 PK	74.0	-20.3	1.24 V	308	40.50	13.20
6	7311.00	41.1 AV	54.0	-12.9	1.24 V	308	27.90	13.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

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	102.3 PK			1.09 H	196	104.40	-2.10
2	*2452.00	94.2 AV			1.09 H	196	96.30	-2.10
3	2483.50	67.1 PK	74.0	-6.9	1.09 H	196	69.10	-2.00
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.09 H**	**196**	**55.80**	**-2.00**
5	4904.00	48.7 PK	74.0	-25.3	1.09 H	92	42.60	6.10
6	4904.00	36.3 AV	54.0	-17.7	1.09 H	92	30.20	6.10
7	7356.00	53.9 PK	74.0	-20.1	1.29 H	235	40.60	13.30
8	7356.00	41.2 AV	54.0	-12.8	1.29 H	235	27.90	13.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	92.1 PK			1.00 V	251	94.20	-2.10
2	*2452.00	84.1 AV			1.00 V	251	86.20	-2.10
3	2483.50	46.5 PK	74.0	-27.5	1.00 V	251	48.50	-2.00
4	2483.50	36.0 AV	54.0	-18.0	1.00 V	251	38.00	-2.00
5	4904.00	49.0 PK	74.0	-25.0	1.39 V	242	42.90	6.10
6	4904.00	36.8 AV	54.0	-17.2	1.39 V	242	30.70	6.10
7	7356.00	54.3 PK	74.0	-19.7	1.23 V	290	41.00	13.30
8	7356.00	41.8 AV	54.0	-12.2	1.23 V	290	28.50	13.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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 19, 2014

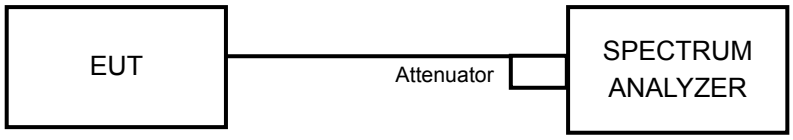
4.3.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 100kHz.
2. Set the video bandwidth (VBW) ≥ 3 x 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
		CHAIN 0	CHAIN 1		
1	2412	10.10	10.14	0.5	PASS
6	2437	10.15	10.15	0.5	PASS
11	2462	10.09	10.14	0.5	PASS

802.11g

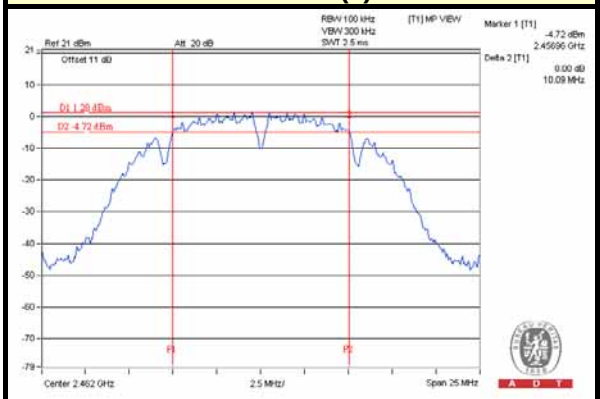
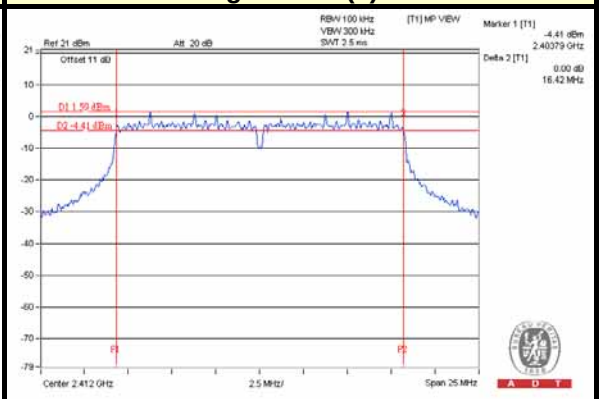
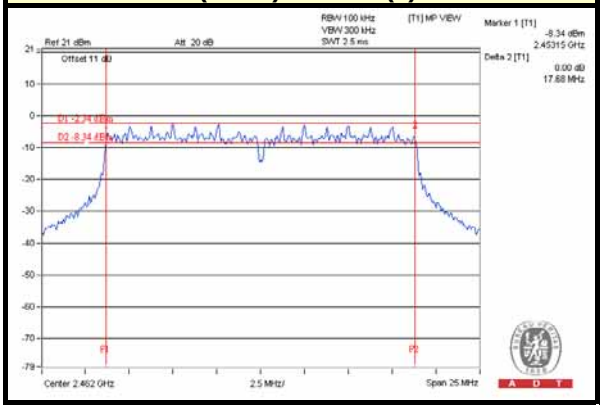
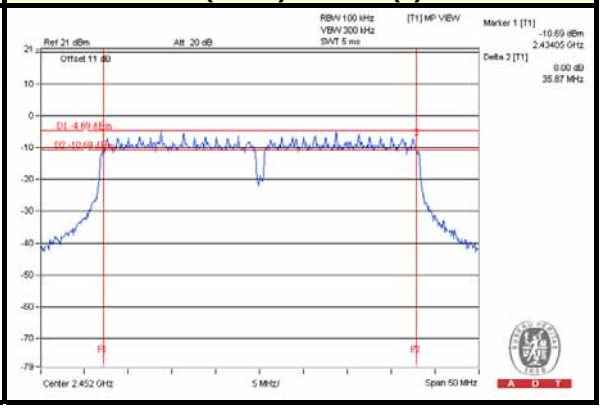
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.42	16.44	0.5	PASS
6	2437	16.43	16.44	0.5	PASS
11	2462	16.45	16.47	0.5	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.69	17.72	0.5	PASS
6	2437	17.70	17.71	0.5	PASS
11	2462	17.68	17.72	0.5	PASS

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.38	35.89	0.5	PASS
6	2437	36.47	36.18	0.5	PASS
9	2452	36.43	35.87	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11b / Chain (0) : CH11	**802.11g / Chain (0) : CH1**
	
802.11n (HT20) / Chain (0) : CH11	**802.11n (HT40) / Chain (1) : CH9**
	

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 ≤ 4;

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

Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 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 19, 2014

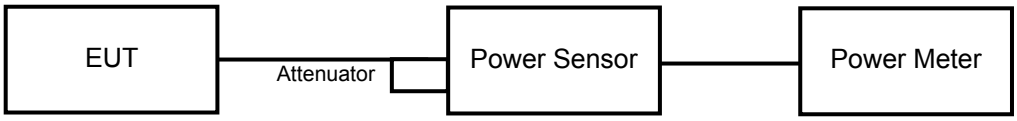
4.4.3 TEST PROCEDURES

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 (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	18.27	17.94	129.373	21.12	30	PASS
6	2437	18.06	18.33	132.05	21.21	30	PASS
11	2462	15.22	16.00	73.077	18.64	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	22.15	21.87	317.874	25.02	30	PASS
6	2437	23.79	24.11	496.964	26.96	30	PASS
11	2462	20.02	20.16	204.215	23.10	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	21.22	20.84	253.773	24.04	30	PASS
6	2437	23.25	24.00	462.538	26.65	30	PASS
11	2462	17.15	17.15	103.76	20.16	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	18.19	18.75	140.906	21.49	30	PASS
6	2437	18.26	19.21	150.356	21.77	30	PASS
9	2452	15.35	17.56	91.293	19.60	30	PASS

FOR AVERAGE POWER

802.11b

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	15.72	15.83	75.607	18.79
6	2437	15.90	16.25	81.075	19.09
11	2462	12.87	13.84	43.574	16.39

802.11g

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	13.87	13.51	46.817	16.70
6	2437	17.12	17.38	106.225	20.26
11	2462	10.82	11.10	24.960	13.97

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	12.79	12.64	37.376	15.73
6	2437	17.03	17.33	104.541	20.19
11	2462	7.98	8.77	13.815	11.40

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
3	2422	9.08	10.33	18.880	12.76
6	2437	10.37	11.59	25.310	14.03
9	2452	7.31	8.36	12.238	10.88

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 19, 2014

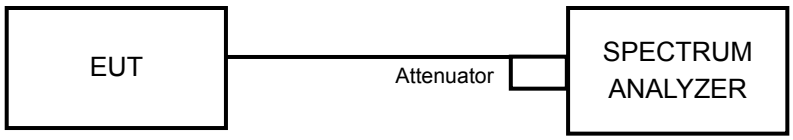
4.5.3 TEST PROCEDURE

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

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-12.09	3.01	-9.08	8	PASS
	6	2437	-11.56	3.01	-8.55	8	PASS
	11	2462	-14.27	3.01	-11.26	8	PASS
1	1	2412	-11.69	3.01	-8.68	8	PASS
	6	2437	-12.46	3.01	-9.45	8	PASS
	11	2462	-13.41	3.01	-10.40	8	PASS

NOTE: Directional gain = 1.4dBi + 10log(2) = 4.41dBi < 6dBi , so the power density limit shall not be reduced.

802.11g

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-15.23	3.01	-12.22	8	PASS
	6	2437	-6.89	3.01	-3.88	8	PASS
	11	2462	-15.24	3.01	-12.23	8	PASS
1	1	2412	-14.49	3.01	-11.48	8	PASS
	6	2437	-7.47	3.01	-4.46	8	PASS
	11	2462	-15.91	3.01	-12.90	8	PASS

NOTE: Directional gain = 1.4dBi + 10log(2) = 4.41dBi < 6dBi , so the power density limit shall not be reduced.

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	-14.98	3.01	-11.97	8	PASS
	6	2437	-9.35	3.01	-6.34	8	PASS
	11	2462	-18.01	3.01	-15.00	8	PASS
1	1	2412	-14.45	3.01	-11.44	8	PASS
	6	2437	-9.69	3.01	-6.68	8	PASS
	11	2462	-17.85	3.01	-14.84	8	PASS

NOTE: Directional gain = 1.4dBi + 10log(2) = 4.41dBi < 6dBi , so the power density limit shall not be reduced.

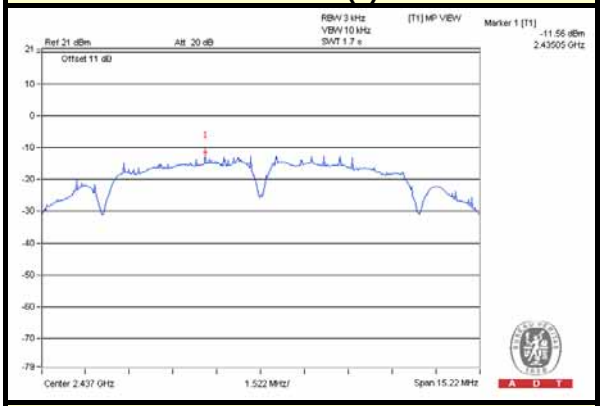
802.11n (HT40)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	3	2422	-19.20	3.01	-16.19	8	PASS
	6	2437	-17.72	3.01	-14.71	8	PASS
	9	2452	-21.22	3.01	-18.21	8	PASS
1	3	2422	-19.41	3.01	-16.40	8	PASS
	6	2437	-17.96	3.01	-14.95	8	PASS
	9	2452	-20.89	3.01	-17.88	8	PASS

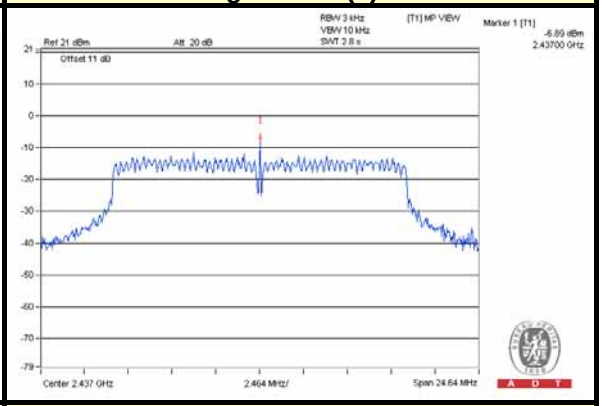
NOTE: Directional gain = 1.4dBi + 10log(2) = 4.41dBi < 6dBi , so the power density limit shall not be reduced.

SPECTRUM PLOT OF WORST VALUE

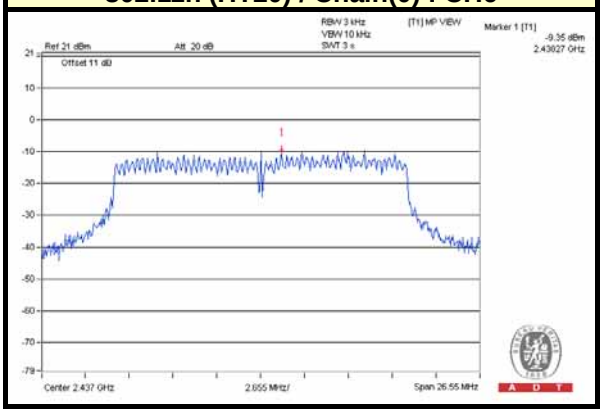
802.11b / Chain (0) : CH6



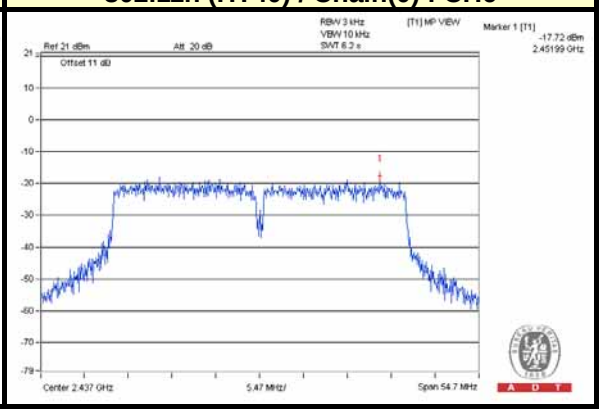
802.11g / Chain (0) : CH6



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



802.11n (HT40) / Chain(0) : CH6



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 19, 2014

4.6.3 TEST PROCEDURE

Measurement Procedure - Reference Level

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 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.

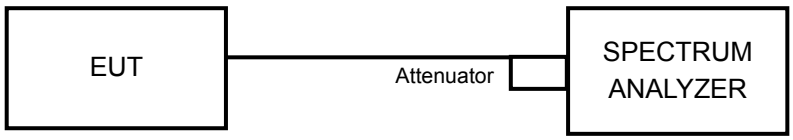
Measurement Procedure –Unwanted Emission Level

1. Set RBW = 100 kHz.
2. Set VBW ≥ 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

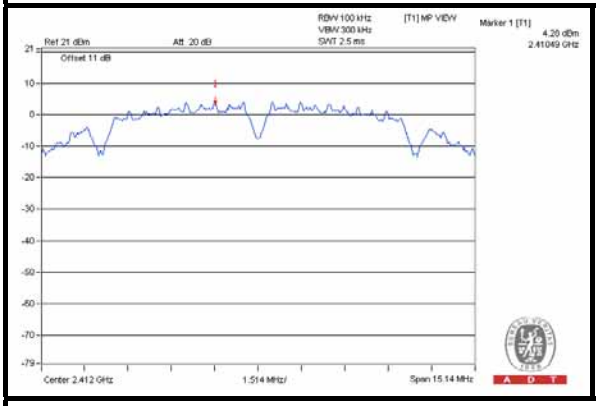
4.6.7 TEST RESULTS

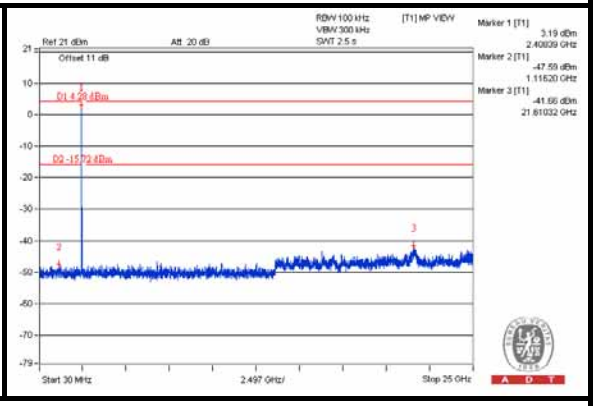
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

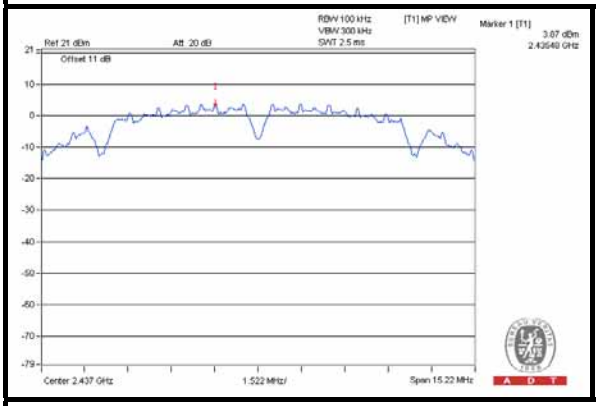
Chain (0)

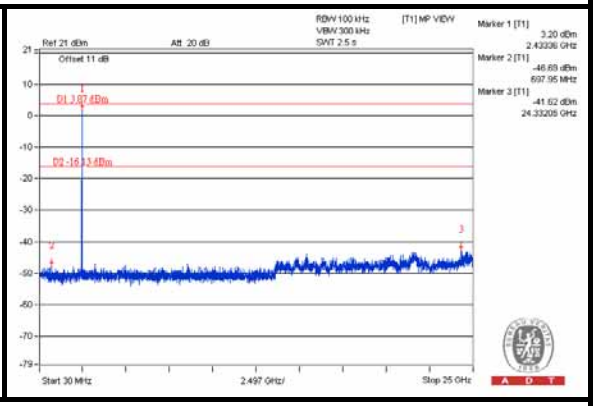
CH 1



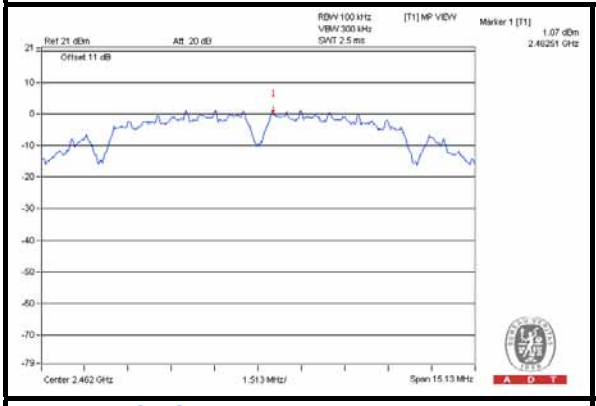


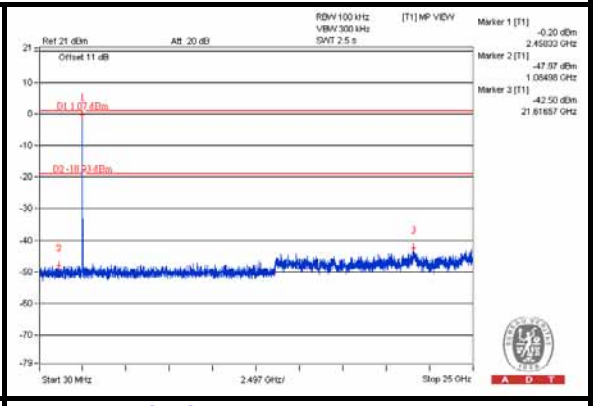
CH 6



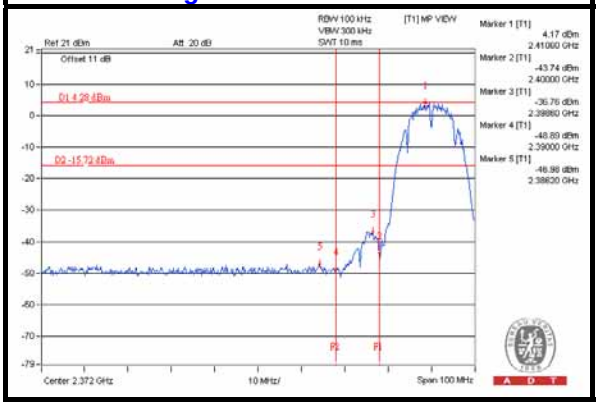


CH 11

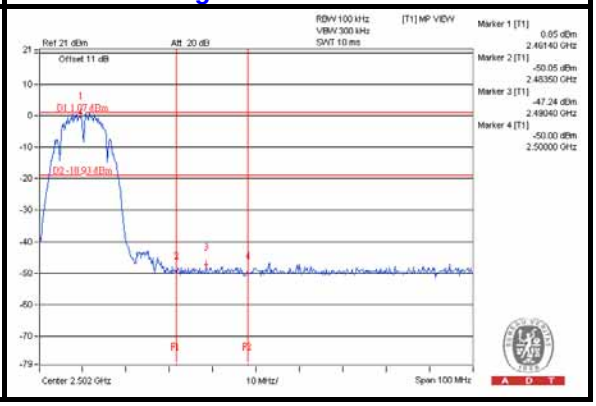




CH 1 Band edge

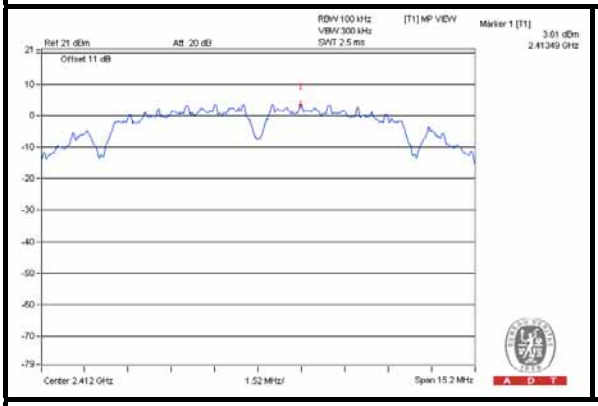


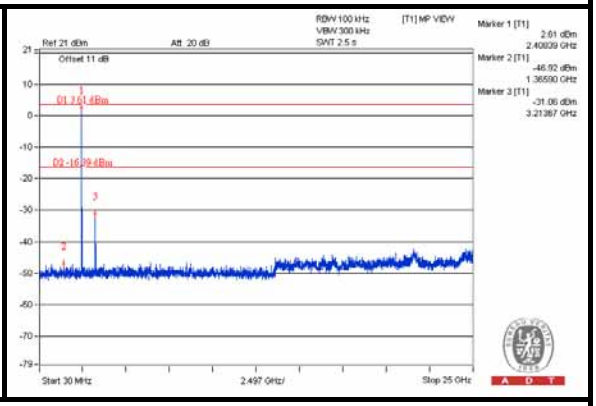
CH 11 Band edge



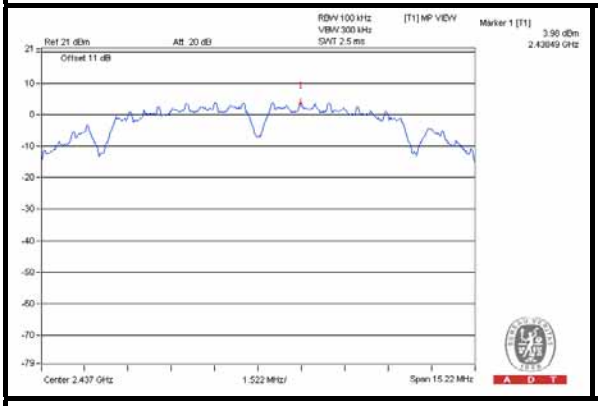
Chain (1)

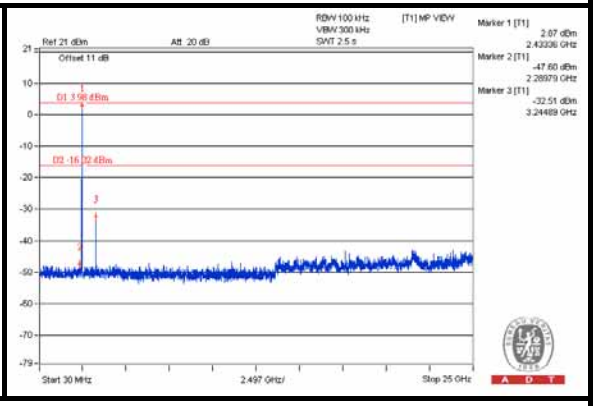
CH 1



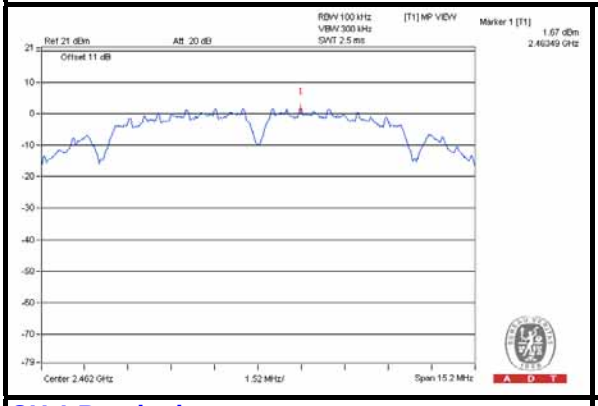


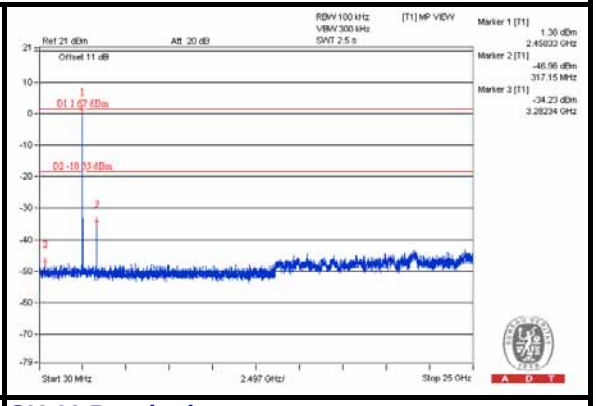
CH 6



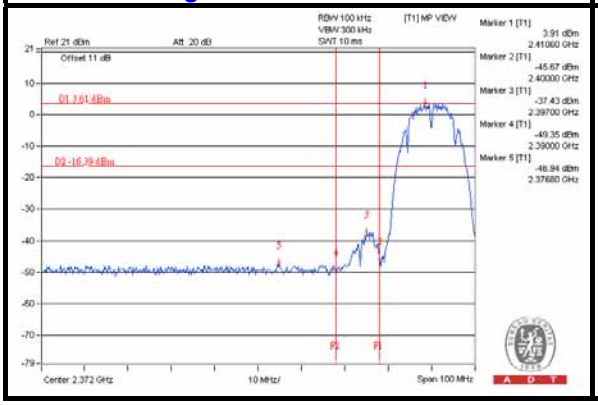


CH 11

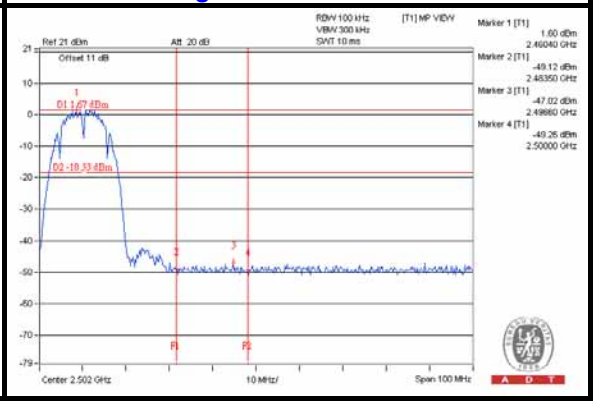




CH 1 Band edge



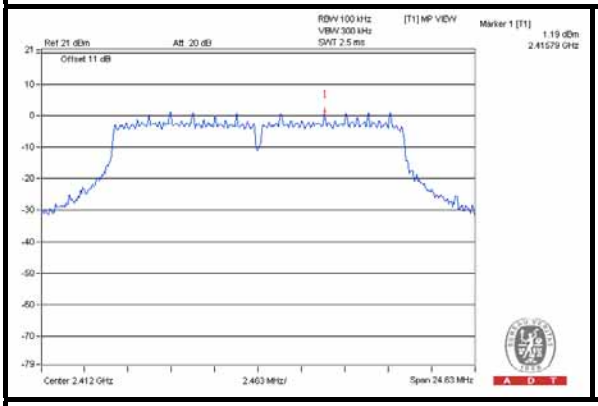
CH 11 Band edge

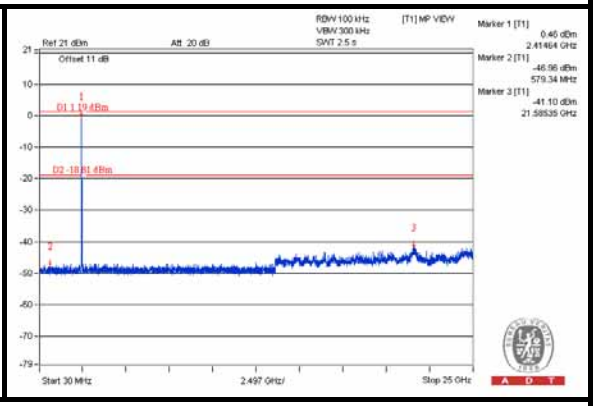


802.11g

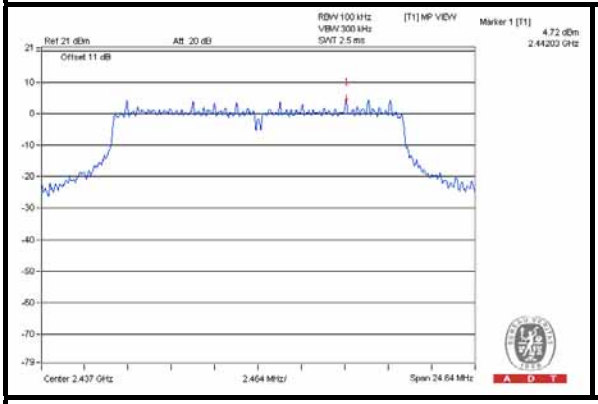
Chain (0)

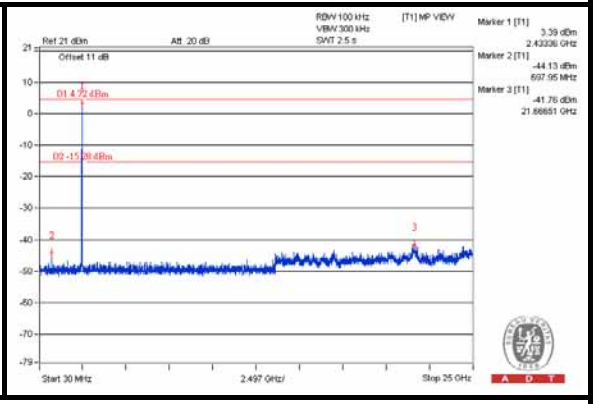
CH 1



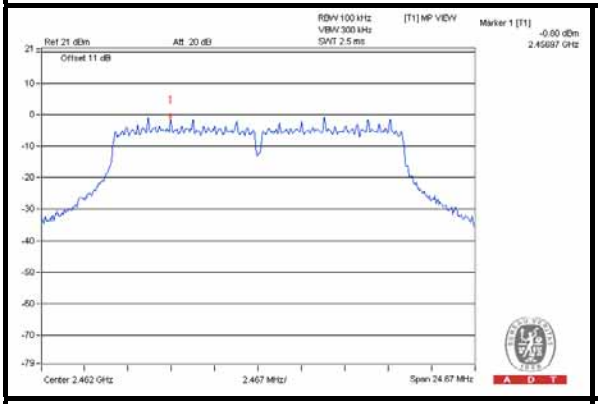


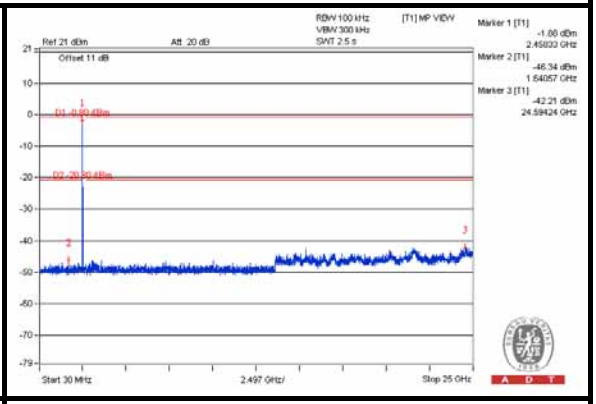
CH 6



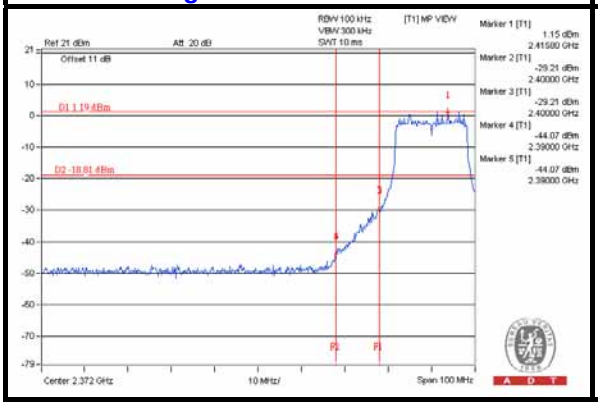


CH 11

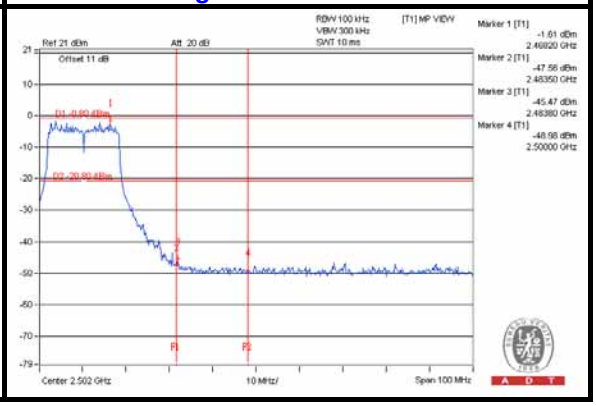




CH 1 Band edge

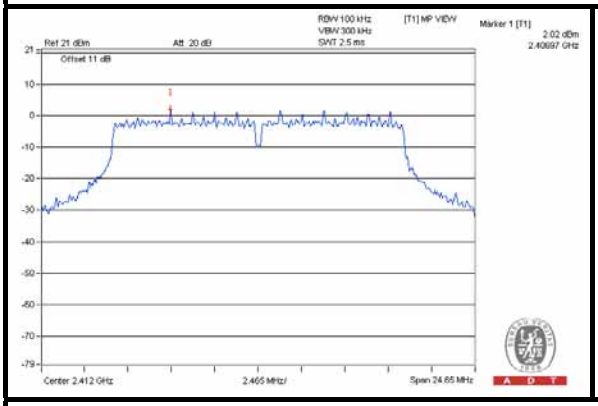


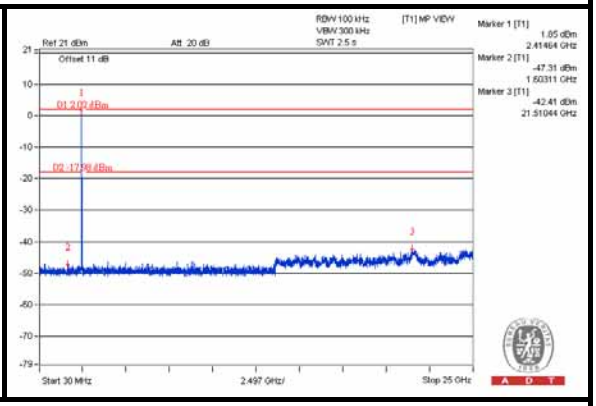
CH 11 Band edge



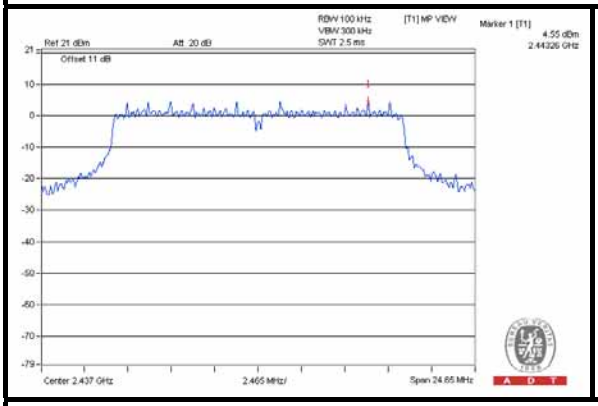
Chain (1)

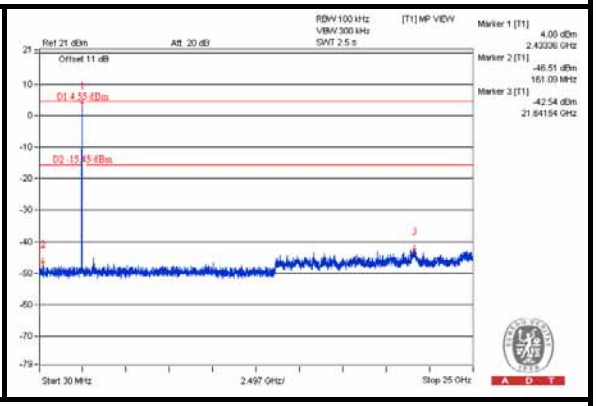
CH 1



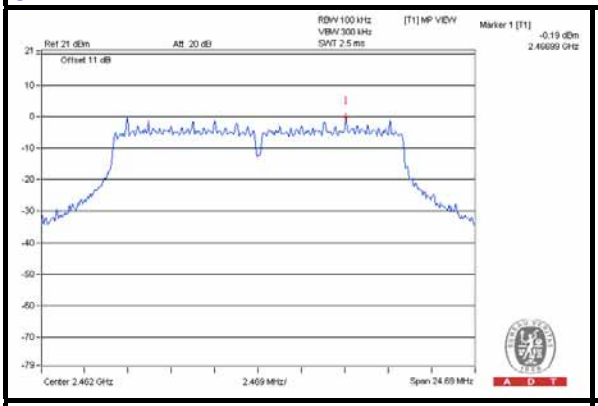


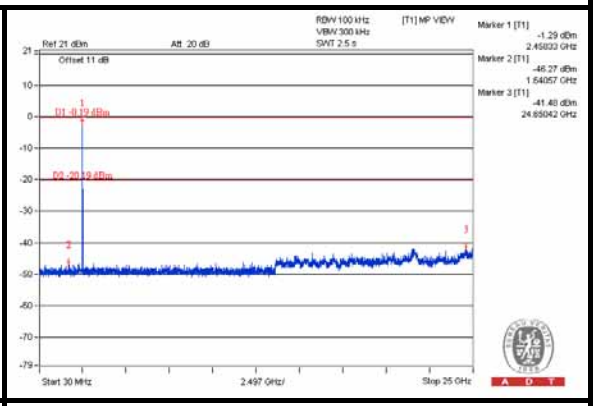
CH 6



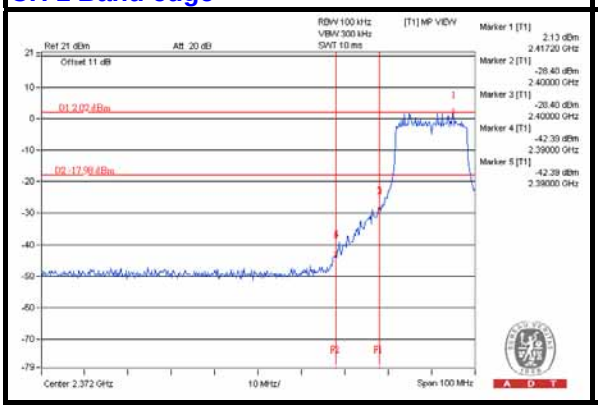


CH 11

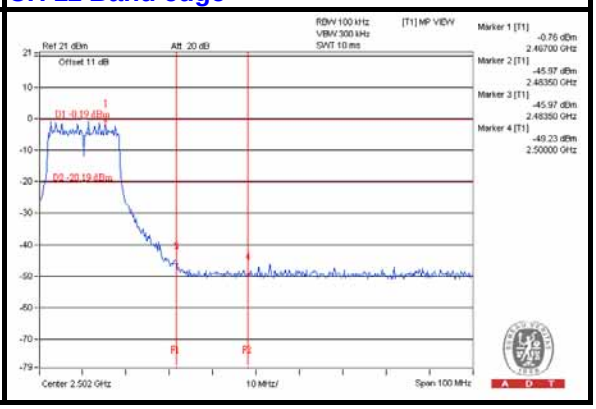




CH 1 Band edge



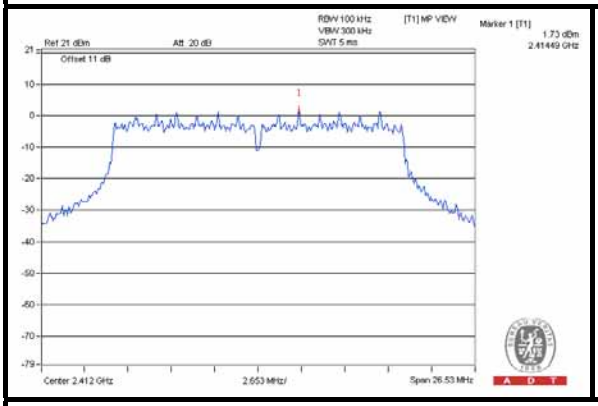
CH 11 Band edge

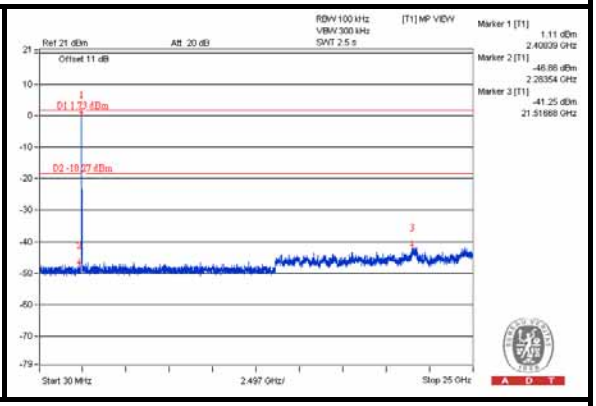


802.11n (HT20)

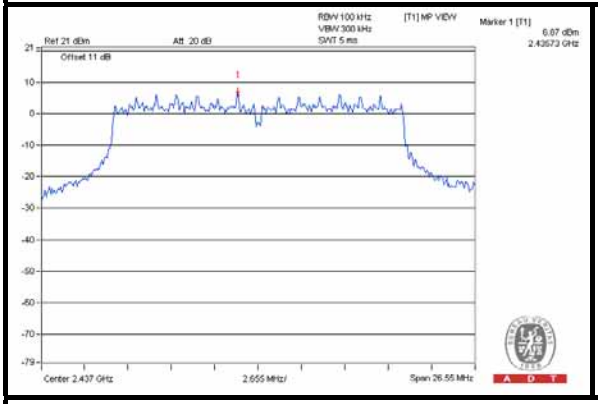
Chain (0)

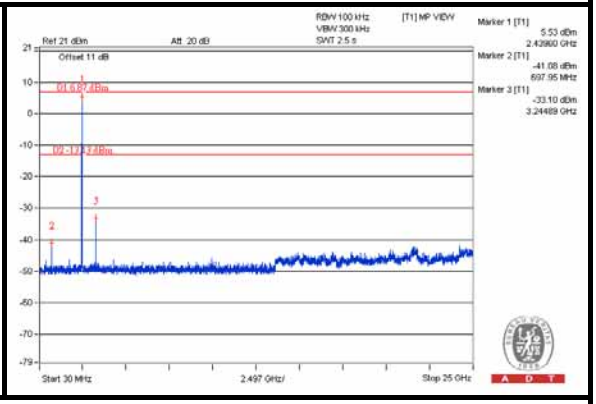
CH 1



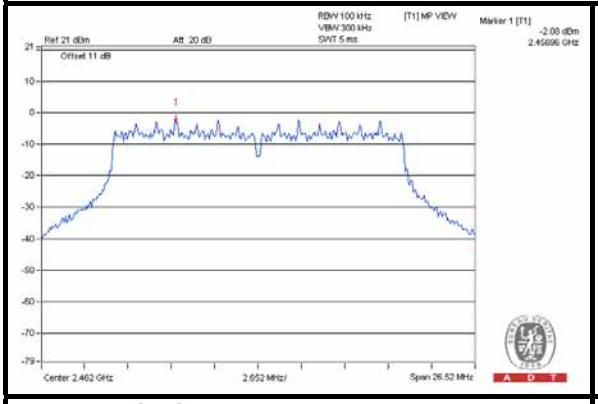


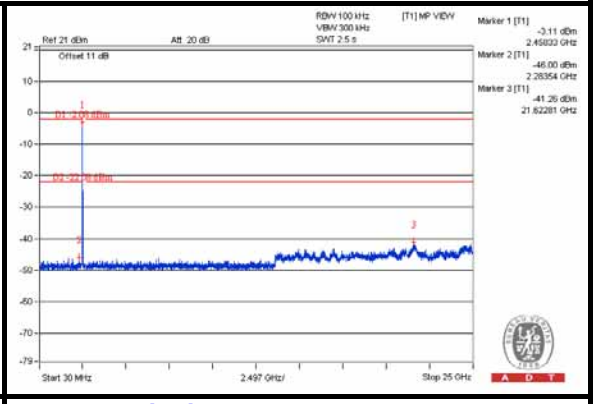
CH 6



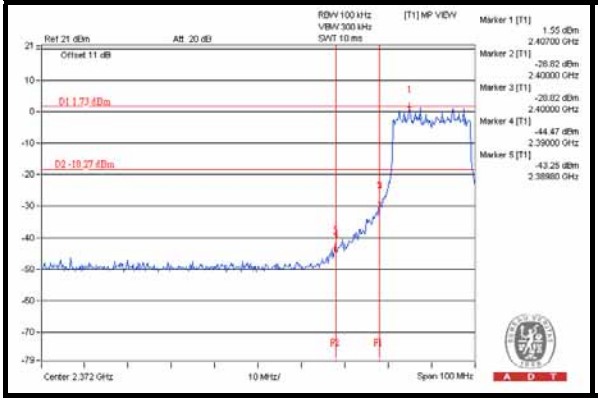


CH 11

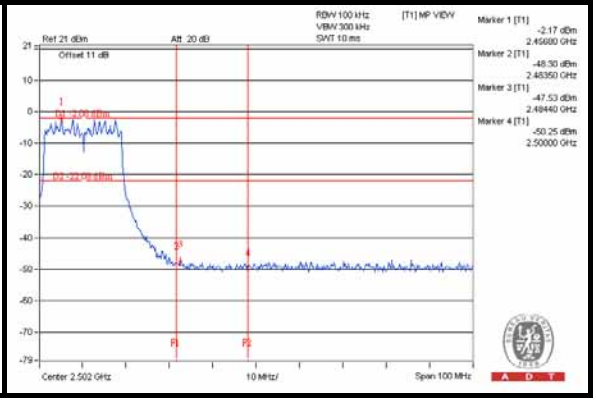




CH 1 Band edge

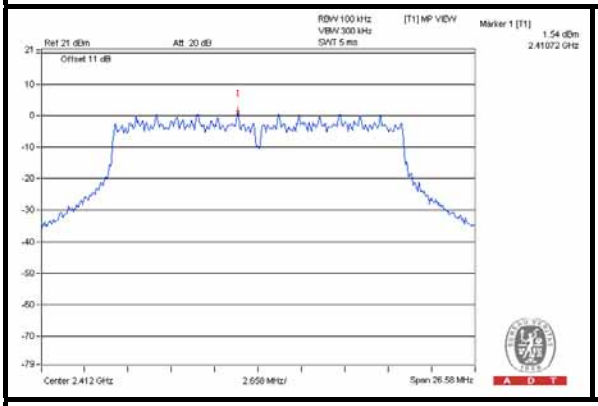


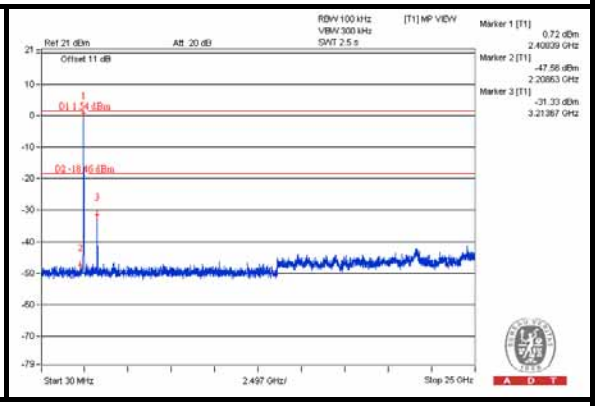
CH 11 Band edge



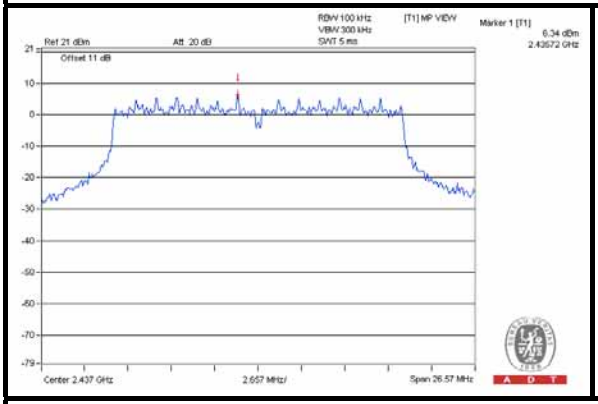
Chain (1)

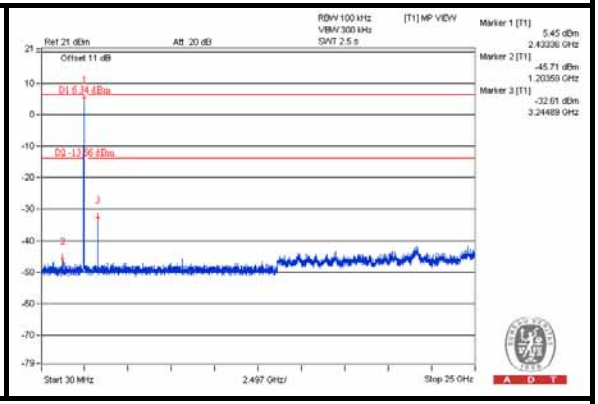
CH 1



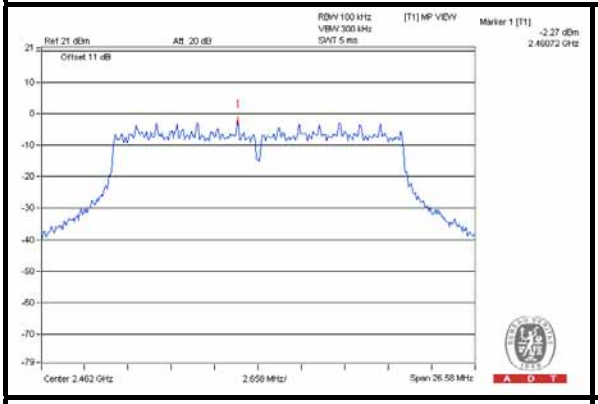


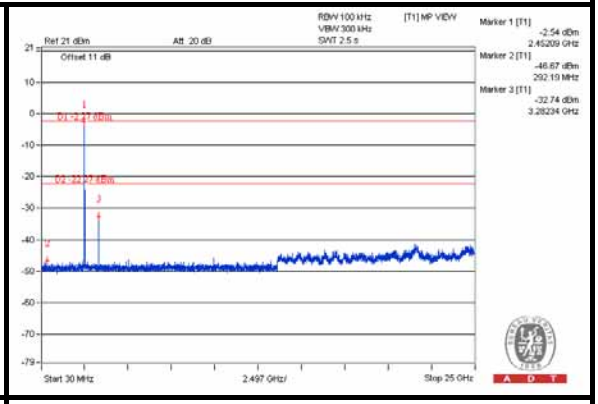
CH 6



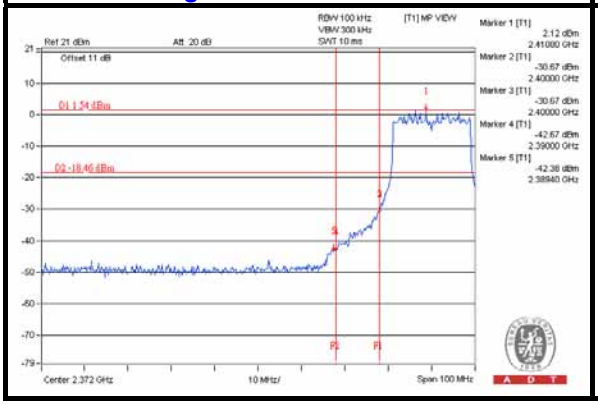


CH 11

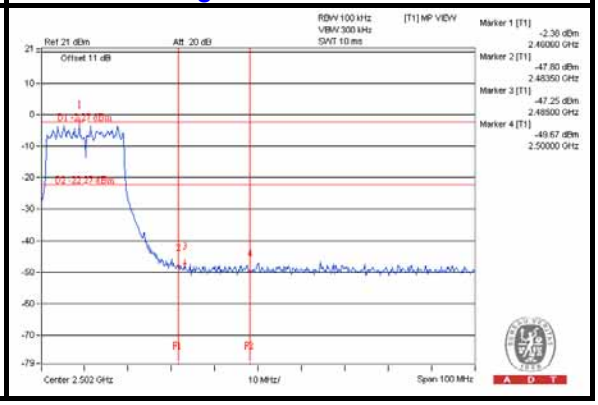




CH 1 Band edge



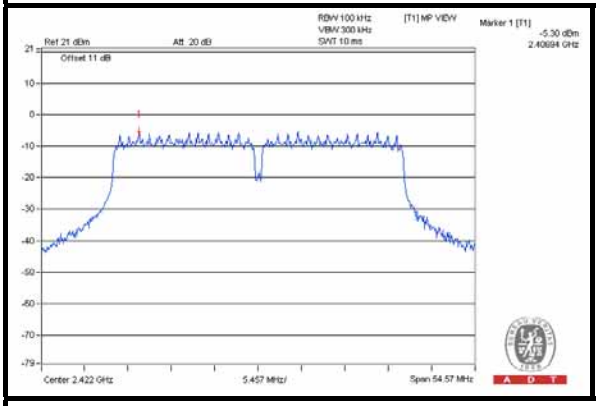
CH 11 Band edge

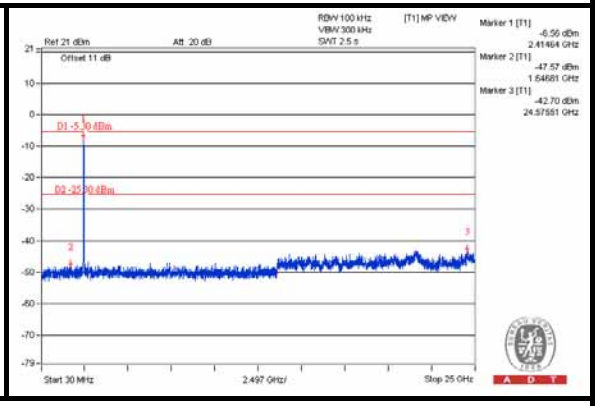


802.11n (HT40)

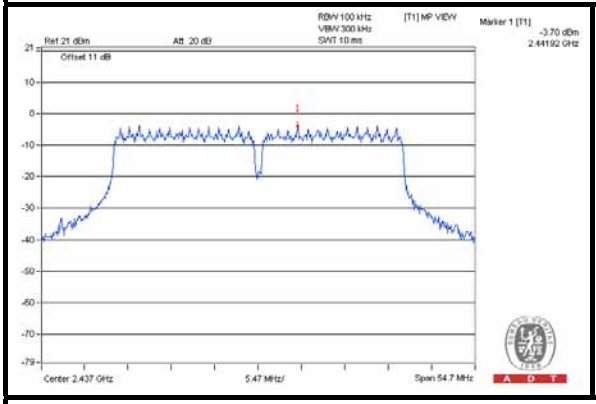
Chain (0)

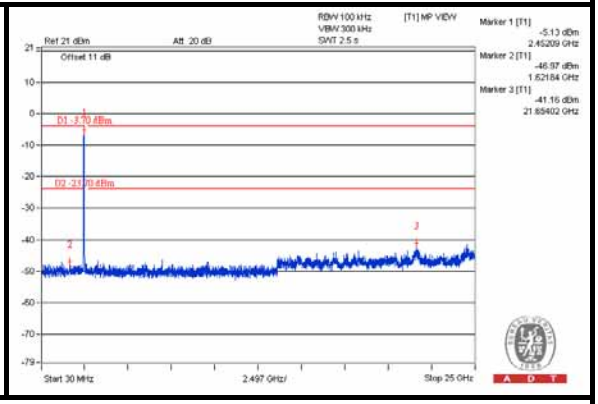
CH 3



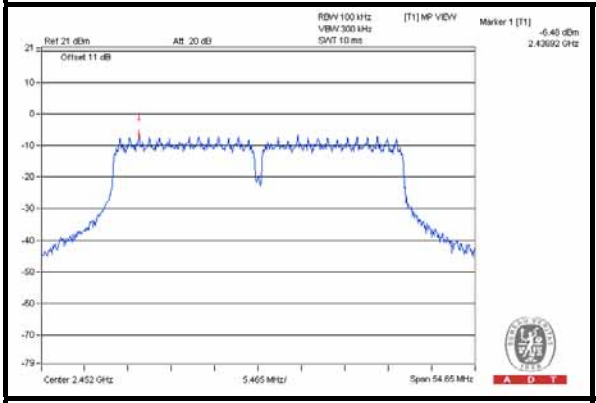


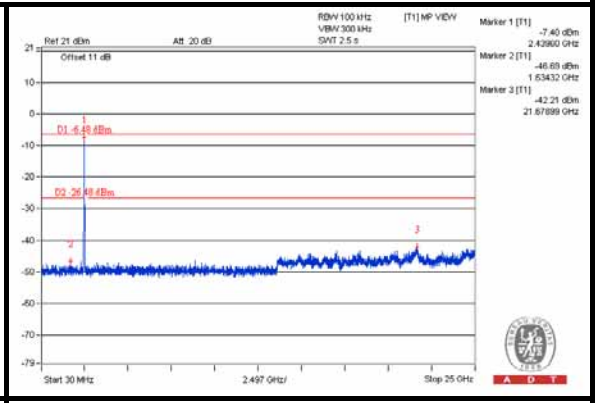
CH 6



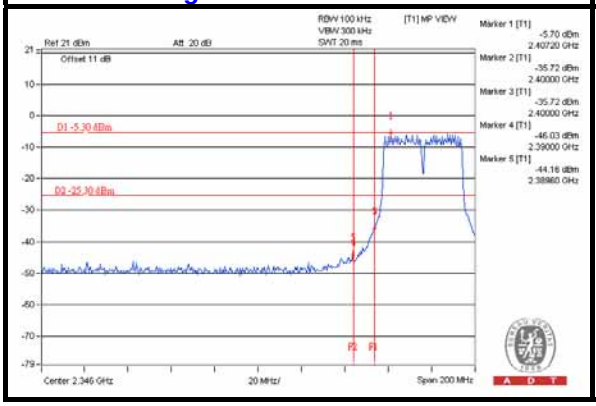


CH 9

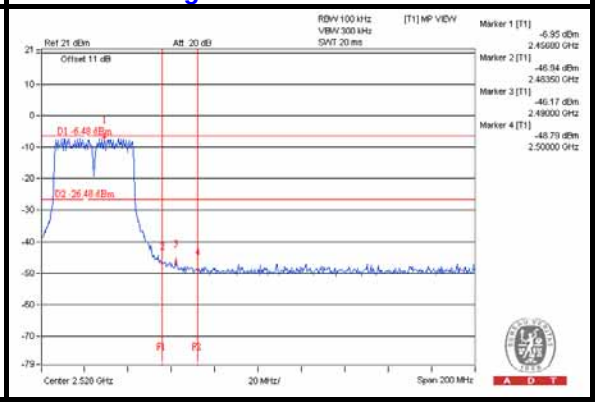




CH 3 Band edge

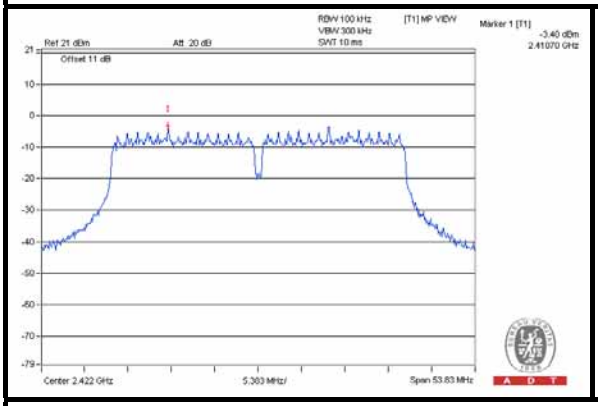


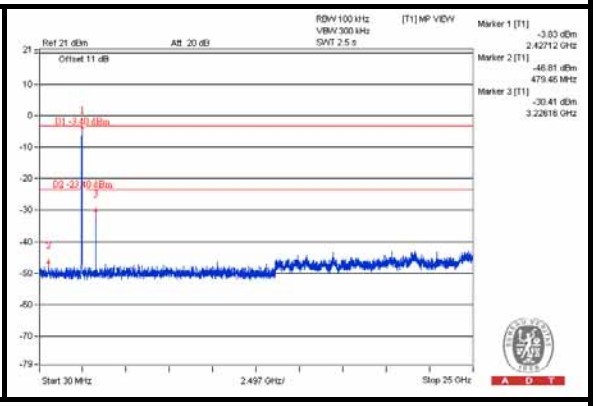
CH 9 Band edge



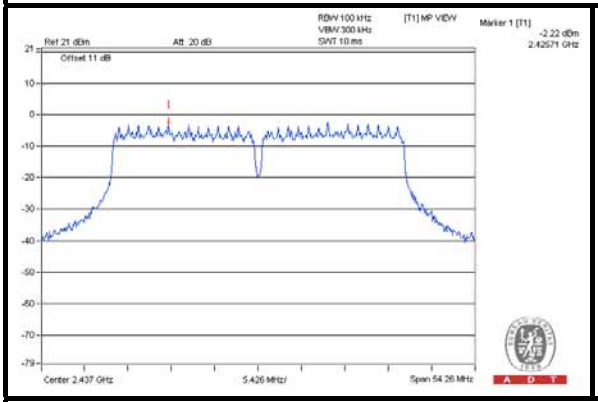
Chain (1)

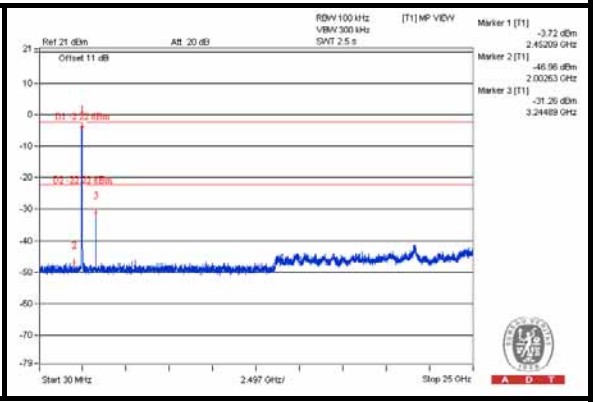
CH 3



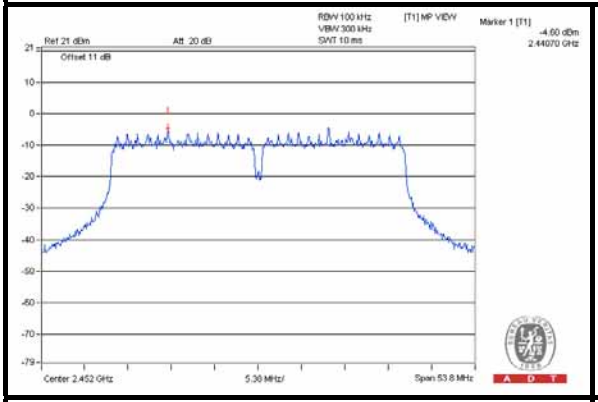


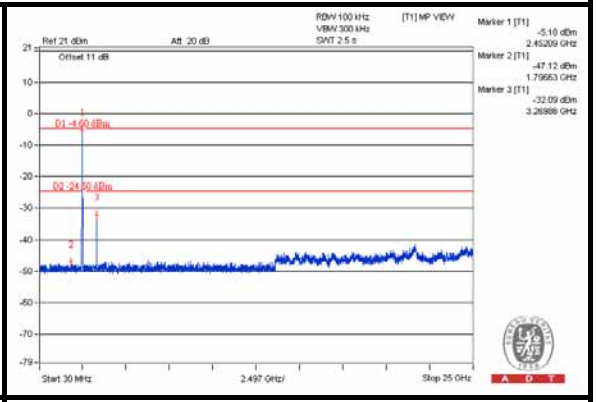
CH 6



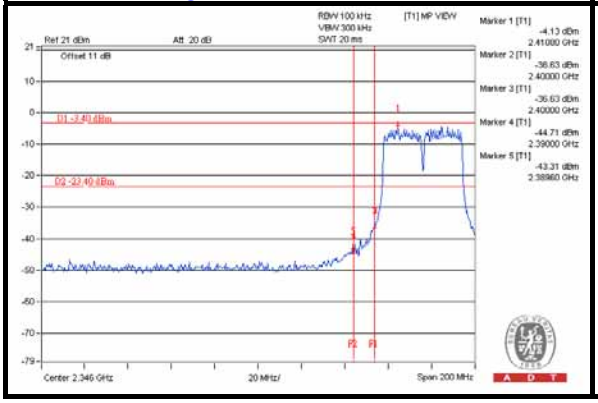


CH 9

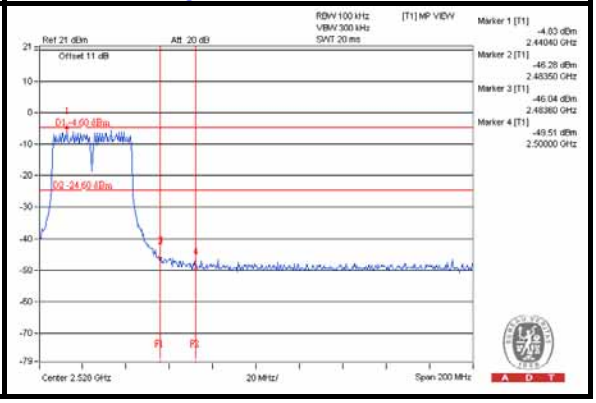




CH 3 Band edge



CH 9 Band edge



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:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

Hsin Chu EMC/RF/Telecom Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Lab:
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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 ---