FCC TEST REPORT (15.247)

REPORT NO.:	RF130410C27
MODEL NO.:	DVW323, DDW364, DVW328, DDW366
FCC ID:	XCNDXW3WB
RECEIVED:	Apr. 10, 2013
TESTED:	Apr. 22 to May 09, 2013
ISSUED:	May 17, 2013

APPLICANT:	Ubee Interactive Corp.
ADDRESS:	10F-1, No. 5, Taiyuan 1st St. Jhubei Ci, Hsinchu County 302, 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, 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.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130410C27	Original release	May 17, 2013

1. CERTIFICATION

PRODUCT:	Wireless eMTA
BRAND NAME:	Ubee Interactive Corp.
MODEL NO.:	DVW323, DDW364, DVW328, DDW366
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	Ubee Interactive Corp.
TESTED:	Apr. 22 to May 09, 2013
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)** ANSI C63.10-2009

The above equipment (Model: DVW323) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE:** *May 17, 2013*
(Lori Chung, Specialist)

APPROVED BY : _____ , **DATE:** *May 17, 2013*
(May Chen, Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz, 2400~2483.5MHz Band

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 -12.88dB at 0.61875MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 2483.500MHz.
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	Antenna connector is HRS not a standard connector.

For 5GHz, 5725~5850MHz Band

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 -13.02dB at 0.59922MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 5437.73MHz & 5362.21MHz.
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	Antenna connector is HRS not a standard connector.

NOTE: The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2.400 ~ 2.4835GHz and 5.725~5.850GHz. 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	2.98 dB
Radiated emissions (30MHz-1GHz)	5.59 dB
Radiated emissions (1GHz -6GHz)	3.73 dB
Radiated emissions (6GHz -18GHz)	3.90 dB
Radiated emissions (18GHz -40GHz)	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless eMTA
MODEL NO.	DVW323, DDW364, DVW328, DDW366
POWER SUPPLY	DC 12V from internal power supply or DC 6 ~ 8.4V from battery
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 450Mbps
OPERATING FREQUENCY	**For 15.407** 5.18 ~ 5.24GHz
	For 15.247 2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	**For 15.407** 4 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40)
	For 15.247 (2.4GHz) 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) **For 15.247 (5GHz)** 5 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40)

MAXIMUM OUTPUT POWER	**For 15.407** 802.11a: 44.771mW 802.11n (HT20): 40.673mW 802.11n (HT40): 47.862mW **For 15.247 (2.4GHz)** 802.11b: 400.867mW 802.11g: 494.311mW 802.11n (HT20): 990.275mW 802.11n (HT40): 436.801mW **For 15.247 (5GHz)** 802.11a: 166.341mW 802.11n (HT20): 277.363mW 802.11n (HT40): 238.284mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	RJ11 cable (Unshielded, 1.5m) RJ45 cable (Unshielded, 1.5m)
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT has four model names which are identical to each other in all aspects except for the following table:

Model	Difference
DVW323	with VoIP and MoCA accessory: RJ11 cable and RJ45 cable; battery(optional)
DDW364	without VoIP, with MoCA accessory: RJ45 cable
DVW328	with VoIP, without MoCA accessory:RJ11 cable and RJ45 cable; battery(optional)
DDW366	without VoIP and MoCA accessory: RJ45 cable

2. The EUT could be supplied with an internal power supply or battery as below:

Item	Brand	Model No.	Spec.
Internal power supply	NA	NA	AC I/P: 100~120V, 60Hz, 0.9A DC O/P: 12V, 2.92A DC O/P cable (unshielded, 1.8m)
Battery	SMP	LIION Battery Pack SMPCM10 2S1P Dumb	$V_{nomal:}$7.4V (V_{min}: 6V, V_{max}: 8.4V)

3. The antennas provided to the EUT, please refer to the following table:

Transmitter Circuit	Brand	Model	Antenna Type	Gain(dBi) Include cable loss	cable loss (dBi)	Connecter Type	Frequency range	Cable Length
Chain (0)	WHA YU	C100-4008116-AZ (250mm)	PCB Antenna	4.59	0.55	HRS	2.4~2.5GHz	154mm
				4.67	0.80		4.9~5.825GHz	
Chain (1)		C100-4008116-AZ (250mm)		3.86	0.468		2.4~2.5GHz	130mm
				4.91	0.67		4.9~5.825GHz	
Chain (2)		C100-4008116-AZ (250mm)		4.79	1.11		2.4~2.5GHz	310mm
				4.29	1.61		4.9~5.825GHz	

4. The EUT incorporates a MIMO function without beam forming.

MODULATION MODE	TX/RX FUNCTION
802.11a	1TX/1RX
802.11b	1TX/1RX
802.11g	1TX/1RX
802.11n (HT20)	3TX/3RX
802.11n (HT40)	3TX/3RX

5. Spurious emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.

6. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 23.

7. The EUT is pre-tested under following test modes :

Pre-Mode	Model	Remark
Mode A	**DVW323**	**With battery**
Mode B	DVW323	Without battery
Mode C	DDW364	Without battery
Mode D	DVW328	With battery
Mode E	DDW366	Without battery

For the above modes, the worse radiated emissions was found in **Mode A**. Therefore only the test data of the mode were recorded in this report.

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		

Operated in 5725 ~ 5850MHz band:

5 channels are provided for 802.11a, 802.11n (HT20):

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

2 channels are provided for 802.11n (HT40):

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO					DESCRIPTION
	PLC	RE < 1G	RE ³ 1G	APCM	OB	
-	√	√	√	√	√	-

Where **PLC:** Power Line Conducted Emission **RE < 1G:** Radiated Emission below 1GHz

RE ³ 1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

OB: Conducted Out-Band Emission Measurement

Note: The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on Y-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)
For 2.4 GHz 802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5
For 5 GHz 802.11n (HT20)	149 to 165	165	OFDM	BPSK	6.5

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	MODULATIO N TYPE	DATA RATE (Mbps)
For 2.4 GHz 802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5
For 5 GHz 802.11n (HT20)	149 to 165	165	OFDM	BPSK	6.5

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
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (HT40)	151 to 159	151, 159	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
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (HT40)	151 to 159	151, 159	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
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	13.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	20deg. C, 70%RH	120Vac, 60Hz	Mike Hsieh
RE<1G	25deg. C, 68%RH	120Vac, 60Hz	Tim Ho
RE≥1G	23deg. C, 72%RH 22deg. C, 64%RH	120Vac, 60Hz	Tim Ho Nelson Teng
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 v02
662911 D01 Multiple Transmitter Output v01 r02
ANSI C63.10-2009

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

Note: The EUT 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 DESCRIPTION OF SUPPORT UNITS

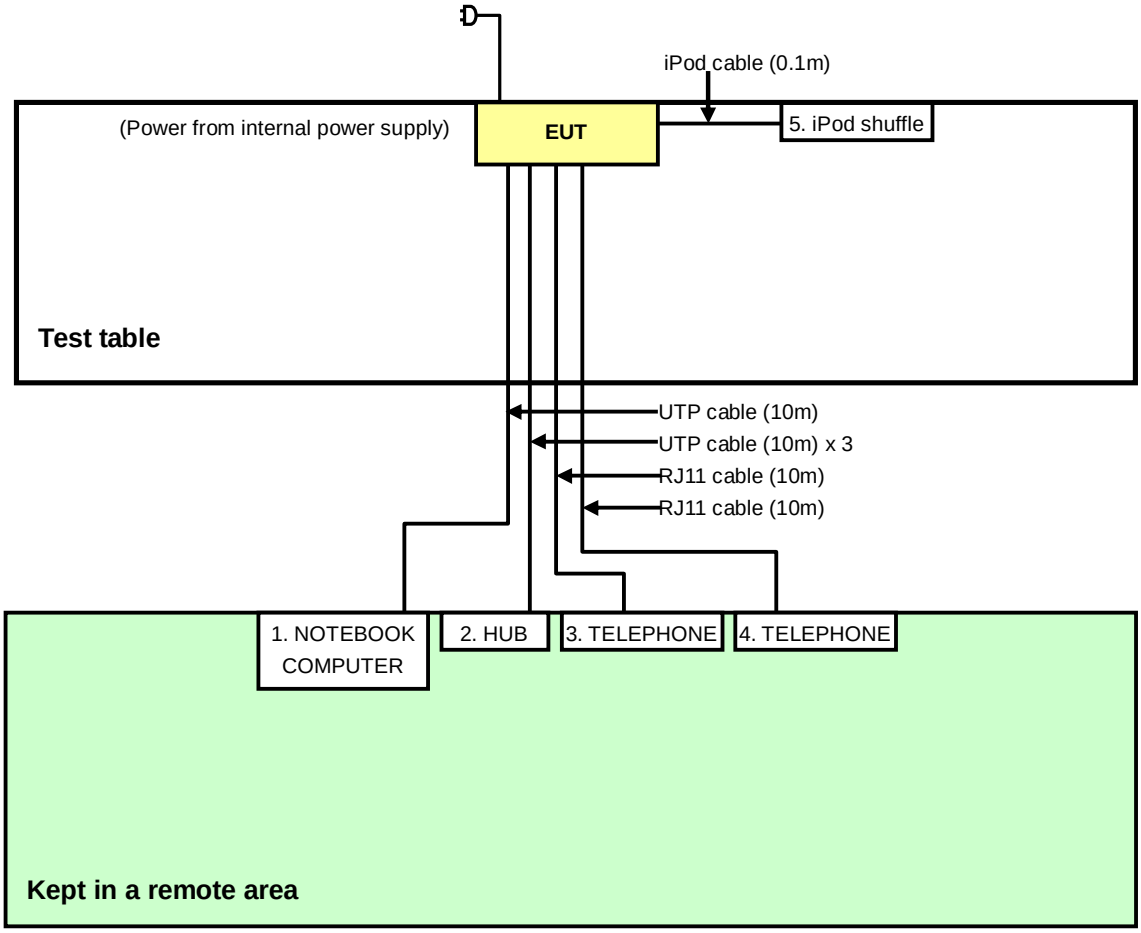
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	PP32LA	FSLB32S	FCC DoC
2	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC
3	TELEPHONE	WONDER	WD-303	7C17KA04011	NA
4	TELEPHONE	WONDER	WD-303	7C17KA04440	NA
5	iPod shuffle (For conducted emission test)	Apple	MD778TA/A	CC4JMCMXF4T1	NA
	iPod shuffle (For other test items)	Apple	MC749TA/A	CC4DMFJUDFDM	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP cable (10m)
2	UTP cable (10m)
3	RJ11 cable (10m)
4	RJ11 cable (10m)
5	iPod cable (0.1m)

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

3.5 CONFIGURATION OF SYSTEM UNDER TEST



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 (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	ESCS 30	100375	Mar. 08, 2013	Mar. 07, 2014
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 06, 2012	Sep. 05, 2013
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100072	June 08,2012	June 07,2013
RF Cable (JYEBAO)	5DFB	COCCAB-003	Mar. 11, 2013	Mar. 10, 2014
50 ohms Terminator	50	EMC-3	Sep. 25, 2012	Sep. 24, 2013
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Apr. 22, 2013

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.

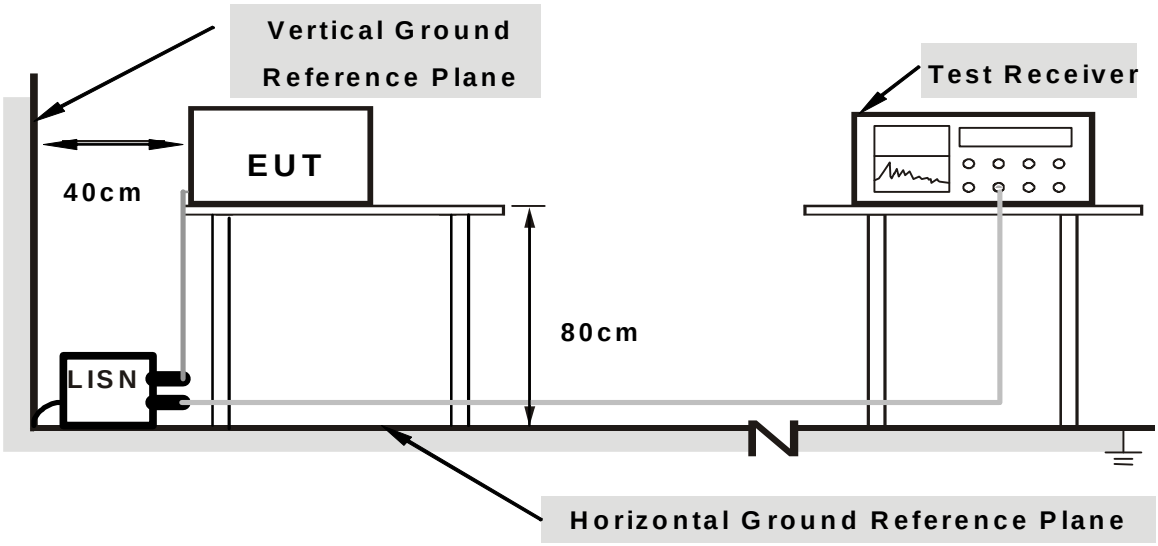
NOTE:

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. Turn on the power of EUT.
2. The communication partner run test program “HyperTerminal” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

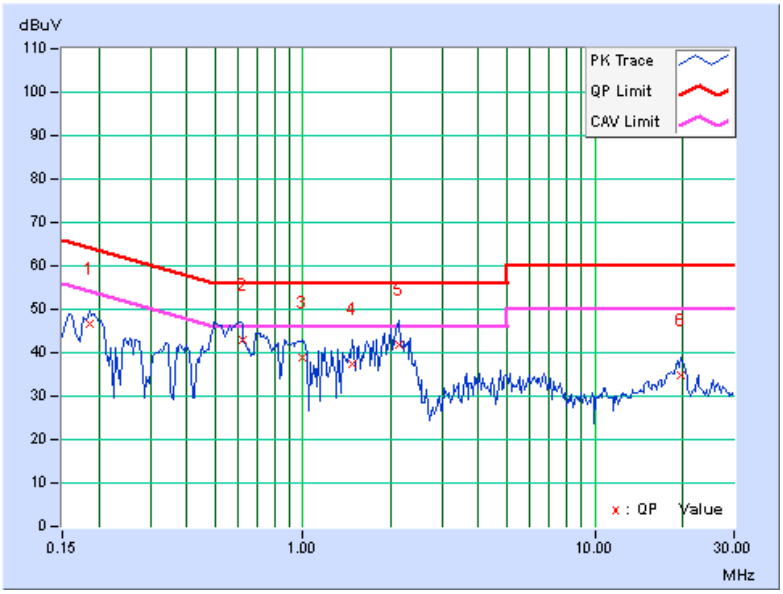
4.1.7 TEST RESULTS

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

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	0.11	46.53	32.87	46.64	32.98	64.25	54.25	-17.61	-21.27
2	**0.61875**	**0.14**	**42.98**	**30.64**	**43.12**	**30.78**	**56.00**	**46.00**	**-12.88**	**-15.22**
3	0.99766	0.17	38.56	25.90	38.73	26.07	56.00	46.00	-17.27	-19.93
4	1.47656	0.19	37.13	26.04	37.32	26.23	56.00	46.00	-18.68	-19.77
5	2.13281	0.22	41.48	32.78	41.70	33.00	56.00	46.00	-14.30	-13.00
6	19.74609	0.98	33.82	26.73	34.80	27.71	60.00	50.00	-25.20	-22.29

REMARKS:

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

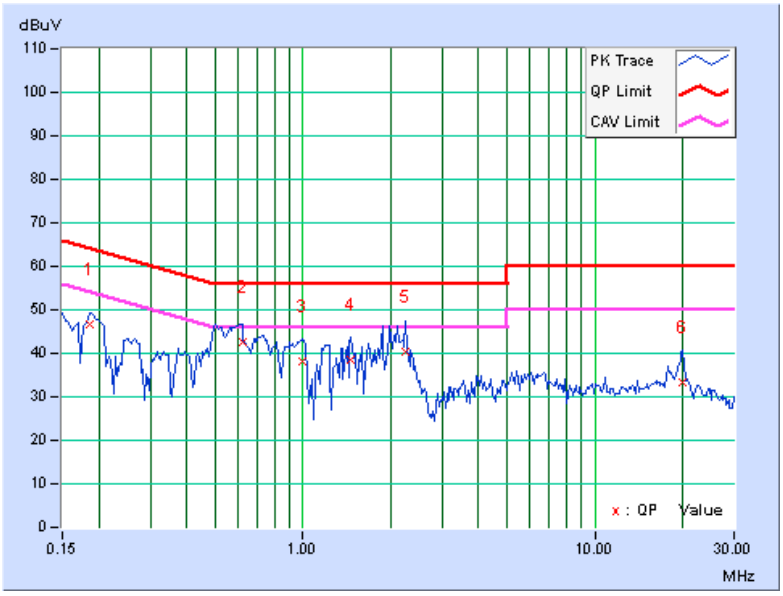


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	0.09	46.41	32.71	46.50	32.80	64.25	54.25	-17.75	-21.45
2	0.61875	0.13	42.45	30.50	42.58	30.63	56.00	46.00	-13.42	-15.37
3	0.99766	0.15	38.09	25.36	38.24	25.51	56.00	46.00	-17.76	-20.49
4	1.46484	0.17	38.25	25.74	38.42	25.91	56.00	46.00	-17.58	-20.09
5	2.24609	0.20	40.07	31.96	40.27	32.16	56.00	46.00	-15.73	-13.84
6	20.06250	0.68	32.76	26.43	33.44	27.11	60.00	50.00	-26.56	-22.89

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 30dB 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.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250253	Sep. 03, 2012	Sep. 02, 2013
MXE EMI Receiver Agilent	N9038A	MY51210105	Jan. 29,2013	Jan. 28,2014
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 14, 2012	Nov. 13, 2013
Pre-Amplifier Agilent	8449B	3008A02578	June 26, 2012	June 25, 2013
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 14, 2012	Nov. 13, 2013
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Mar. 19, 2013	Mar. 18, 2014
Horn_Antenna AISI	AIH.8018	0000320091110	Nov. 19, 2012	Nov. 18, 2013
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 12, 2012	Oct. 11, 2013
RF Cable	NA	RF104-201 RF104-203 RF104-204	Dec. 25, 2012	Dec. 24, 2013
RF Cable	NA	CHGCAB_001	Oct. 06, 2012	Oct. 05, 2013
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: Apr. 25 to May 09, 2013

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.

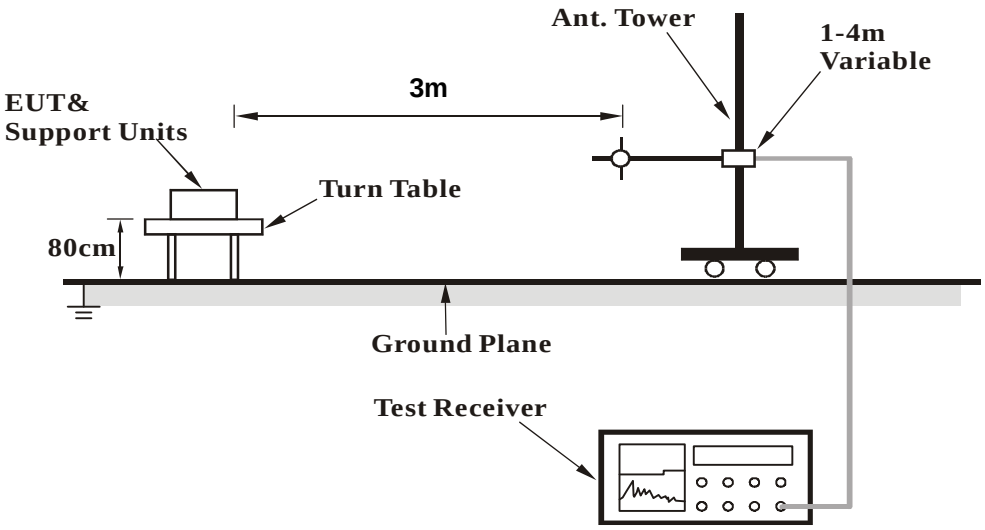
NOTE:

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 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.
4. 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



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

802.11n (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	125.01	32.8 QP	43.5	-10.7	1.50 H	88	47.83	-15.05
2	298.25	39.1 QP	46.0	-7.0	1.00 H	360	51.93	-12.88
3	374.98	37.9 QP	46.0	-8.1	2.00 H	87	48.76	-10.88
4	625.00	43.7 QP	46.0	-2.3	1.00 H	90	48.54	-4.85
5	874.97	42.3 QP	46.0	-3.7	1.50 H	110	43.25	-0.96
6	999.95	39.1 QP	54.0	-15.0	2.00 H	360	38.07	0.98
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	36.16	33.0 QP	40.0	-7.0	1.00 V	52	46.72	-13.71
2	284.33	38.1 QP	46.0	-7.9	1.50 V	24	51.42	-13.32
3	374.98	38.0 QP	46.0	-8.0	1.50 V	72	48.84	-10.88
4	625.00	41.7 QP	46.0	-4.3	1.50 V	106	46.53	-4.85
5	874.97	42.6 QP	46.0	-3.4	1.00 V	83	43.55	-0.96
6	999.95	39.2 QP	54.0	-14.8	1.00 V	63	38.26	0.98

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) if use
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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	57.4 PK	74.0	-16.6	1.00 H	289	59.03	-1.63
2	2390.00	46.5 AV	54.0	-7.5	1.00 H	289	48.13	-1.63
3	*2412.00	98.3 PK			1.00 H	289	99.83	-1.53
4	*2412.00	96.7 AV			1.00 H	289	98.23	-1.53
5	4824.00	46.6 PK	74.0	-27.4	1.00 H	12	39.35	7.25
6	4824.00	36.0 AV	54.0	-18.0	1.00 H	12	28.75	7.25
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	62.8 PK	74.0	-11.2	1.20 V	149	64.43	-1.63
2	2390.00	53.3 AV	54.0	-0.7	1.20 V	149	54.93	-1.63
3	*2412.00	109.1 PK			1.20 V	149	110.63	-1.53
4	*2412.00	107.1 AV			1.20 V	149	108.63	-1.53
5	4824.00	45.9 PK	74.0	-28.1	1.38 V	274	38.65	7.25
6	4824.00	36.9 AV	54.0	-17.1	1.38 V	274	29.65	7.25

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) if use
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	103.4 PK			1.00 H	300	104.82	-1.42
2	*2437.00	101.2 AV			1.00 H	300	102.62	-1.42
3	4874.00	46.5 PK	74.0	-27.5	1.00 H	9	39.13	7.37
4	4874.00	35.7 AV	54.0	-18.3	1.00 H	9	28.33	7.37
5	7311.00	54.0 PK	74.0	-20.0	1.00 H	213	39.05	14.95
6	7311.00	43.1 AV	54.0	-10.9	1.00 H	213	28.15	14.95
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	2374.00	64.2 PK	74.0	-9.8	1.20 V	146	65.89	-1.69
2	2374.00	53.4 AV	54.0	-0.6	1.20 V	146	55.09	-1.69
3	*2437.00	113.0 PK			1.20 V	146	114.42	-1.42
4	*2437.00	111.1 AV			1.20 V	146	112.52	-1.42
5	4874.00	45.0 PK	74.0	-29.0	1.37 V	271	37.63	7.37
6	4874.00	36.3 AV	54.0	-17.7	1.37 V	271	28.93	7.37
7	7311.00	54.7 PK	74.0	-19.3	1.02 V	192	39.75	14.95
8	7311.00	43.9 AV	54.0	-10.1	1.02 V	192	28.95	14.95

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) if use
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	98.0 PK			1.06 H	303	99.32	-1.32
2	*2462.00	96.5 AV			1.06 H	303	97.82	-1.32
3	2483.50	57.3 PK	74.0	-16.7	1.00 H	300	58.52	-1.22
4	2483.50	46.6 AV	54.0	-7.4	1.00 H	300	47.82	-1.22
5	4924.00	46.5 PK	74.0	-27.5	1.00 H	12	39.01	7.49
6	4924.00	36.2 AV	54.0	-17.8	1.00 H	12	28.71	7.49
7	7386.00	55.3 PK	74.0	-18.7	1.00 H	204	40.40	14.90
8	7386.00	44.2 AV	54.0	-9.8	1.00 H	204	29.30	14.90
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	*2462.00	108.5 PK			1.20 V	145	109.82	-1.32
2	*2462.00	106.3 AV			1.20 V	145	107.62	-1.32
3	2483.50	63.7 PK	74.0	-10.3	1.20 V	145	64.92	-1.22
4	2483.50	53.3 AV	54.0	-0.7	1.20 V	145	54.52	-1.22
5	4924.00	46.2 PK	74.0	-27.8	1.37 V	269	38.71	7.49
6	4924.00	36.9 AV	54.0	-17.1	1.37 V	269	29.41	7.49
7	7386.00	55.9 PK	74.0	-18.1	1.02 V	199	41.00	14.90
8	7386.00	44.6 AV	54.0	-9.4	1.02 V	199	29.70	14.90

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) if use
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	57.9 PK	74.0	-16.1	1.00 H	277	59.53	-1.63
2	2390.00	46.9 AV	54.0	-7.1	1.00 H	277	48.53	-1.63
3	*2412.00	95.9 PK			1.00 H	289	97.43	-1.53
4	*2412.00	86.2 AV			1.00 H	289	87.73	-1.53
5	4824.00	46.5 PK	74.0	-27.5	1.00 H	27	39.25	7.25
6	4824.00	36.2 AV	54.0	-17.8	1.00 H	27	28.95	7.25
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	68.0 PK	74.0	-6.0	1.20 V	151	69.63	-1.63
2	2390.00	53.3 AV	54.0	-0.7	1.20 V	151	54.93	-1.63
3	*2412.00	104.8 PK			1.20 V	151	106.33	-1.53
4	*2412.00	96.3 AV			1.20 V	151	97.83	-1.53
5	4824.00	44.7 PK	74.0	-29.3	1.37 V	284	37.45	7.25
6	4824.00	36.5 AV	54.0	-17.5	1.37 V	284	29.25	7.25

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) if use
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	57.8 PK	74.0	-16.2	1.00 H	295	59.43	-1.63
2	2390.00	46.9 AV	54.0	-7.1	1.00 H	295	48.53	-1.63
3	*2437.00	104.6 PK			1.00 H	281	106.02	-1.42
4	*2437.00	95.3 AV			1.00 H	281	96.72	-1.42
5	2483.50	57.7 PK	74.0	-16.3	1.00 H	311	58.92	-1.22
6	2483.50	46.7 AV	54.0	-7.3	1.00 H	311	47.92	-1.22
7	4874.00	46.2 PK	74.0	-27.8	1.00 H	10	38.83	7.37
8	4874.00	35.3 AV	54.0	-18.7	1.00 H	10	27.93	7.37
9	7311.00	54.0 PK	74.0	-20.0	1.00 H	225	39.05	14.95
10	7311.00	42.9 AV	54.0	-11.1	1.00 H	225	27.95	14.95
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	1.19 V	153	69.13	-1.63
2	2390.00	53.1 AV	54.0	-0.9	1.19 V	153	54.73	-1.63
3	*2437.00	114.2 PK			1.19 V	153	115.62	-1.42
4	*2437.00	105.1 AV			1.19 V	153	106.52	-1.42
5	2483.50	67.7 PK	74.0	-6.3	1.19 V	153	68.92	-1.22
6	2483.50	52.6 AV	54.0	-1.4	1.19 V	153	53.82	-1.22
7	4874.00	46.8 PK	74.0	-27.2	1.38 V	275	39.43	7.37
8	4874.00	37.4 AV	54.0	-16.6	1.38 V	275	30.03	7.37
9	7311.00	54.7 PK	74.0	-19.3	1.06 V	195	39.75	14.95
10	7311.00	43.7 AV	54.0	-10.3	1.06 V	195	28.75	14.95

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) if use
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	96.5 PK			1.00 H	279	97.82	-1.32
2	*2462.00	87.1 AV			1.00 H	279	88.42	-1.32
3	2483.50	57.4 PK	74.0	-16.6	1.02 H	290	58.62	-1.22
4	2483.50	46.7 AV	54.0	-7.3	1.02 H	290	47.92	-1.22
5	4924.00	46.9 PK	74.0	-27.1	1.00 H	2	39.41	7.49
6	4924.00	36.3 AV	54.0	-17.7	1.00 H	2	28.81	7.49
7	7386.00	54.9 PK	74.0	-19.1	1.06 H	215	40.00	14.90
8	7386.00	43.7 AV	54.0	-10.3	1.06 H	215	28.80	14.90
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	*2462.00	105.4 PK			1.20 V	146	106.72	-1.32
2	*2462.00	97.2 AV			1.20 V	146	98.52	-1.32
3	2483.50	64.9 PK	74.0	-9.1	1.20 V	146	66.12	-1.22
4	2483.50	53.4 AV	54.0	-0.6	1.20 V	146	54.62	-1.22
5	4924.00	46.0 PK	74.0	-28.0	1.40 V	279	38.51	7.49
6	4924.00	36.5 AV	54.0	-17.5	1.40 V	279	29.01	7.49
7	7386.00	56.2 PK	74.0	-17.8	1.00 V	189	41.30	14.90
8	7386.00	44.8 AV	54.0	-9.2	1.00 V	189	29.90	14.90

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) if use
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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	63.9 PK	74.0	-10.1	1.00 H	92	65.53	-1.63
2	2390.00	50.4 AV	54.0	-3.6	1.00 H	92	52.03	-1.63
3	*2412.00	107.3 PK			1.00 H	78	108.83	-1.53
4	*2412.00	97.6 AV			1.00 H	78	99.13	-1.53
5	4824.00	47.1 PK	74.0	-26.9	1.03 H	102	39.85	7.25
6	4824.00	36.5 AV	54.0	-17.5	1.03 H	102	29.25	7.25
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	67.7 PK	74.0	-6.3	1.00 V	153	69.33	-1.63
2	2390.00	53.0 AV	54.0	-1.0	1.00 V	153	54.63	-1.63
3	*2412.00	110.1 PK			1.00 V	153	111.63	-1.53
4	*2412.00	100.9 AV			1.00 V	153	102.43	-1.53
5	4824.00	46.0 PK	74.0	-28.0	1.22 V	197	38.75	7.25
6	4824.00	36.8 AV	54.0	-17.2	1.22 V	197	29.55	7.25

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) if use
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	2388.40	65.1 PK	74.0	-8.9	1.20 H	101	66.73	-1.63
2	2388.40	51.3 AV	54.0	-2.7	1.20 H	101	52.93	-1.63
3	*2437.00	116.1 PK			1.00 H	92	117.52	-1.42
4	*2437.00	106.7 AV			1.00 H	92	108.12	-1.42
5	2483.50	64.3 PK	74.0	-9.7	1.05 H	93	65.52	-1.22
6	2483.50	50.1 AV	54.0	-3.9	1.05 H	93	51.32	-1.22
7	4874.00	46.8 PK	74.0	-27.2	1.02 H	81	39.43	7.37
8	4874.00	35.7 AV	54.0	-18.3	1.02 H	81	28.33	7.37
9	7311.00	54.6 PK	74.0	-19.4	1.04 H	92	39.65	14.95
10	7311.00	43.4 AV	54.0	-10.6	1.04 H	92	28.45	14.95
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	2388.40	65.7 PK	74.0	-8.3	1.42 V	183	67.33	-1.63
2	2388.40	53.0 AV	54.0	-1.0	1.42 V	183	54.63	-1.63
3	*2437.00	118.3 PK			1.17 V	186	119.72	-1.42
4	*2437.00	109.4 AV			1.17 V	186	110.82	-1.42
5	2483.50	64.7 PK	74.0	-9.3	1.10 V	182	65.92	-1.22
6	2483.50	51.1 AV	54.0	-2.9	1.10 V	182	52.32	-1.22
7	4874.00	45.8 PK	74.0	-28.2	1.21 V	215	38.43	7.37
8	4874.00	36.8 AV	54.0	-17.2	1.21 V	215	29.43	7.37
9	7311.00	55.9 PK	74.0	-18.1	1.05 V	221	40.95	14.95
10	7311.00	44.6 AV	54.0	-9.4	1.05 V	221	29.65	14.95

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) if use
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	108.9 PK			1.00 H	121	110.22	-1.32
2	*2462.00	98.6 AV			1.00 H	121	99.92	-1.32
3	2483.50	64.2 PK	74.0	-9.8	1.00 H	83	65.42	-1.22
4	2483.50	50.9 AV	54.0	-3.1	1.00 H	83	52.12	-1.22
5	4924.00	46.0 PK	74.0	-28.0	1.05 H	80	38.51	7.49
6	4924.00	35.3 AV	54.0	-18.7	1.05 H	80	27.81	7.49
7	7386.00	54.3 PK	74.0	-19.7	1.05 H	101	39.40	14.90
8	7386.00	43.2 AV	54.0	-10.8	1.05 H	101	28.30	14.90
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	*2462.00	110.1 PK			1.15 V	180	111.42	-1.32
2	*2462.00	101.6 AV			1.15 V	180	102.92	-1.32
3	2483.50	64.7 PK	74.0	-9.3	1.40 V	142	65.92	-1.22
4	**2483.50**	**53.5 AV**	**54.0**	**-0.5**	**1.40 V**	**142**	**54.72**	**-1.22**
5	4924.00	45.4 PK	74.0	-28.6	1.13 V	198	37.91	7.49
6	4924.00	36.5 AV	54.0	-17.5	1.13 V	198	29.01	7.49
7	7386.00	54.3 PK	74.0	-19.7	1.01 V	128	39.40	14.90
8	7386.00	43.4 AV	54.0	-10.6	1.01 V	128	28.50	14.90

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) if use
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	62.3 PK	74.0	-11.7	1.00 H	112	63.93	-1.63
2	2390.00	49.7 AV	54.0	-4.3	1.00 H	112	51.33	-1.63
3	*2422.00	101.2 PK			1.00 H	81	102.68	-1.48
4	*2422.00	90.1 AV			1.00 H	81	91.58	-1.48
5	4844.00	46.2 PK	74.0	-27.8	1.00 H	6	38.91	7.29
6	4844.00	35.8 AV	54.0	-18.2	1.00 H	6	28.51	7.29
7	7266.00	55.2 PK	74.0	-18.8	1.00 H	199	40.19	15.01
8	7266.00	44.2 AV	54.0	-9.8	1.00 H	199	29.19	15.01
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	65.6 PK	74.0	-8.4	1.00 V	152	67.23	-1.63
2	2390.00	52.5 AV	54.0	-1.5	1.00 V	152	54.13	-1.63
3	*2422.00	103.3 PK			1.00 V	152	104.78	-1.48
4	*2422.00	93.5 AV			1.00 V	152	94.98	-1.48
5	4844.00	46.3 PK	74.0	-27.7	1.36 V	273	39.01	7.29
6	4844.00	37.3 AV	54.0	-16.7	1.36 V	273	30.01	7.29
7	7266.00	55.3 PK	74.0	-18.7	1.02 V	175	40.29	15.01
8	7266.00	44.6 AV	54.0	-9.4	1.02 V	175	29.59	15.01

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) if use
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	67.3 PK	74.0	-6.7	1.00 H	216	68.93	-1.63
2	2390.00	51.6 AV	54.0	-2.4	1.00 H	216	53.23	-1.63
3	*2437.00	107.2 PK			1.00 H	90	108.62	-1.42
4	*2437.00	98.1 AV			1.00 H	90	99.52	-1.42
5	2483.50	62.1 PK	74.0	-11.9	1.05 H	81	63.32	-1.22
6	2483.50	48.3 AV	54.0	-5.7	1.05 H	81	49.52	-1.22
7	4874.00	46.6 PK	74.0	-27.4	1.00 H	12	39.23	7.37
8	4874.00	36.4 AV	54.0	-17.6	1.00 H	12	29.03	7.37
9	7311.00	55.2 PK	74.0	-18.8	1.00 H	193	40.25	14.95
10	7311.00	44.3 AV	54.0	-9.7	1.00 H	193	29.35	14.95
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.2 PK	74.0	-4.8	1.18 V	163	70.83	-1.63
2	2390.00	53.4 AV	54.0	-0.6	1.18 V	163	55.03	-1.63
3	*2437.00	109.7 PK			1.18 V	163	111.12	-1.42
4	*2437.00	101.7 AV			1.18 V	163	103.12	-1.42
5	2483.50	63.7 PK	74.0	-10.3	1.18 V	163	64.92	-1.22
6	2483.50	49.5 AV	54.0	-4.5	1.18 V	163	50.72	-1.22
7	4874.00	44.8 PK	74.0	-29.2	1.34 V	132	37.43	7.37
8	4874.00	36.8 AV	54.0	-17.2	1.34 V	132	29.43	7.37
9	7311.00	55.1 PK	74.0	-18.9	1.02 V	189	40.15	14.95
10	7311.00	44.4 AV	54.0	-9.6	1.02 V	189	29.45	14.95

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) if use
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	103.2 PK			1.00 H	67	104.55	-1.35
2	*2452.00	95.3 AV			1.00 H	67	96.65	-1.35
3	2488.89	63.1 PK	74.0	-10.9	1.00 H	312	64.30	-1.20
4	2488.89	50.6 AV	54.0	-3.4	1.00 H	312	51.80	-1.20
5	4904.00	46.4 PK	74.0	-27.6	1.02 H	9	38.96	7.44
6	4904.00	36.4 AV	54.0	-17.6	1.02 H	9	28.96	7.44
7	7356.00	55.5 PK	74.0	-18.5	1.00 H	219	40.59	14.91
8	7356.00	44.6 AV	54.0	-9.4	1.00 H	219	29.69	14.91
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	106.4 PK			1.00 V	149	107.75	-1.35
2	*2452.00	98.1 AV			1.00 V	149	99.45	-1.35
3	2488.89	67.1 PK	74.0	-6.9	1.00 V	149	68.30	-1.20
4	2488.89	53.0 AV	54.0	-1.0	1.00 V	149	54.20	-1.20
5	4904.00	45.4 PK	74.0	-28.6	1.41 V	221	37.96	7.44
6	4904.00	36.6 AV	54.0	-17.4	1.41 V	221	29.16	7.44
7	7356.00	55.3 PK	74.0	-18.7	1.05 V	181	40.39	14.91
8	7356.00	44.8 AV	54.0	-9.2	1.05 V	181	29.89	14.91

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) if use
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
R&S SPECTRUM ANALYZER	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : May 08, 2013

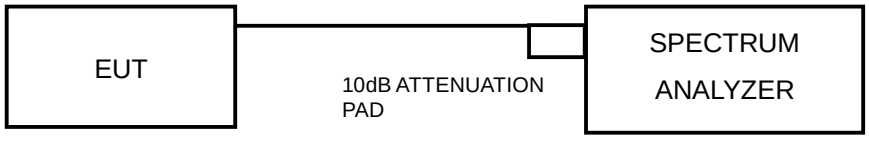
4.3.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
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
1	2412	7.81	0.5	PASS
6	2437	8.47	0.5	PASS
11	2462	8.26	0.5	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.53	0.5	PASS
6	2437	16.48	0.5	PASS
11	2462	16.50	0.5	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	17.67	17.68	17.70	0.5	PASS
6	2437	17.63	17.70	17.67	0.5	PASS
11	2462	17.66	17.70	17.67	0.5	PASS

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	35.90	35.89	36.44	0.5	PASS
6	2437	35.87	36.46	35.90	0.5	PASS
9	2452	36.07	36.48	35.88	0.5	PASS

4.4 CONDUCTED OUTPUT POWER MEASUREMENT

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

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

Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power Meter	ML2495A	0824006	May 10, 2012	May 09, 2013
Power Sensor	MA2411B	0738172	May 10, 2012	May 09, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : May 08, 2013

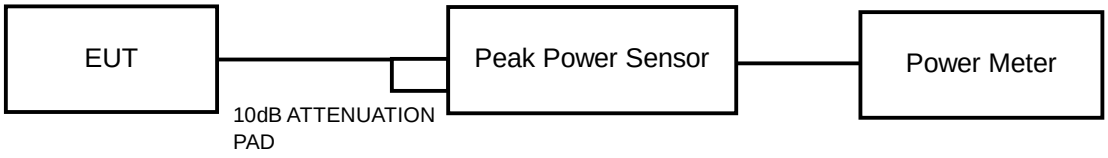
4.4.3 TEST PROCEDURES

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

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

802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	194.536	22.89	30	PASS
6	2437	400.867	26.03	30	PASS
11	2462	176.198	22.46	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	107.399	20.31	30	PASS
6	2437	494.311	26.94	30	PASS
11	2462	106.170	20.26	30	PASS

802.11n (HT20)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	17.62	17.85	17.98	181.570	22.59	30	PASS
6	2437	25.01	25.02	25.51	990.275	29.96	30	PASS
11	2462	18.64	18.92	19.15	233.321	23.68	30	PASS

802.11n (HT40)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
3	2422	17.63	17.67	18.41	185.765	22.69	30	PASS
6	2437	21.25	21.74	21.88	436.801	26.40	30	PASS
9	2452	18.28	18.43	18.95	215.485	23.33	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : May 08, 2013

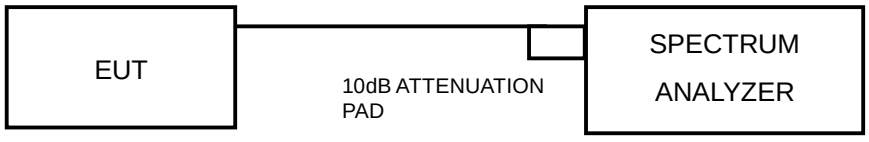
4.5.3 TEST PROCEDURE

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	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-4.41	8	PASS
6	2437	-0.76	8	PASS
11	2462	-5.88	8	PASS

802.11g

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-14.31	8	PASS
6	2437	-4.74	8	PASS
11	2462	-14.38	8	PASS

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-16.32	4.77	-11.55	4.81	PASS
	6	2437	-7.09	4.77	-2.32	4.81	PASS
	11	2462	-19.16	4.77	-14.39	4.81	PASS
1	1	2412	-16.11	4.77	-11.34	4.81	PASS
	6	2437	-8.57	4.77	-3.80	4.81	PASS
	11	2462	-15.54	4.77	-10.77	4.81	PASS
2	1	2412	-16.40	4.77	-11.63	4.81	PASS
	6	2437	-7.34	4.77	-2.57	4.81	PASS
	11	2462	-14.77	4.77	-10.00	4.81	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 9.19dBi > 6dBi , so the power density limit shall be reduced to 8-(9.19-6) = 4.81dBm

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-19.13	4.77	-14.36	4.81	PASS
	6	2437	-15.29	4.77	-10.52	4.81	PASS
	9	2452	-17.66	4.77	-12.89	4.81	PASS
1	3	2422	-19.44	4.77	-14.67	4.81	PASS
	6	2437	-13.55	4.77	-8.78	4.81	PASS
	9	2452	-16.90	4.77	-12.13	4.81	PASS
2	3	2422	-17.98	4.77	-13.21	4.81	PASS
	6	2437	-14.51	4.77	-9.74	4.81	PASS
	9	2452	-17.99	4.77	-13.22	4.81	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 9.19dBi > 6dBi , so the power density limit shall be reduced to 8-(9.19-6) = 4.81dBm

4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : May 08, 2013

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.

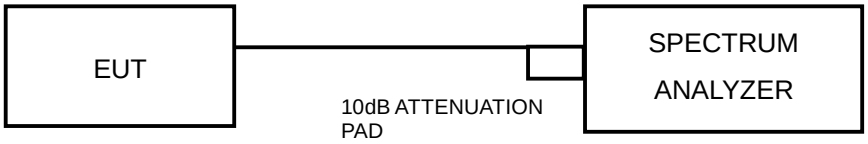
Measurement Procedure –Unwanted Emission Level

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

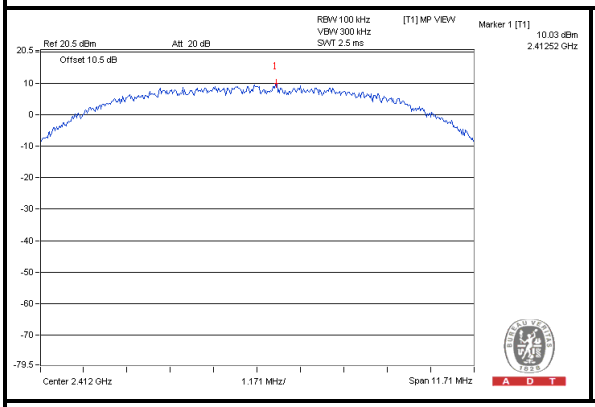
Same as Item 4.3.6

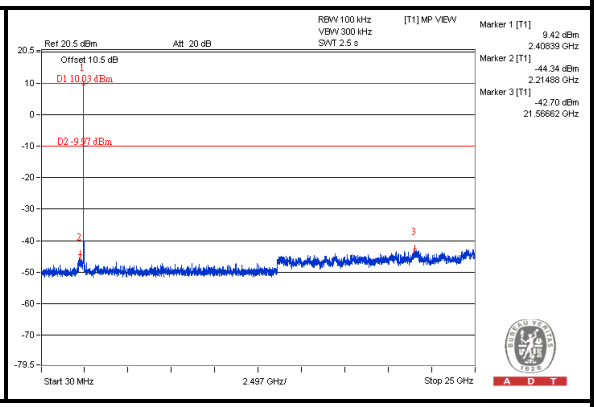
4.6.7 TEST RESULTS

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.

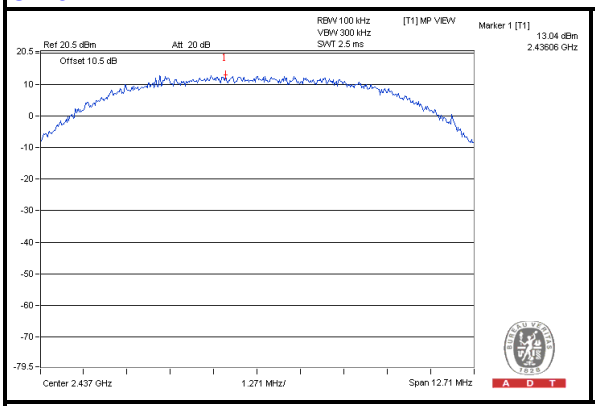
802.11b:

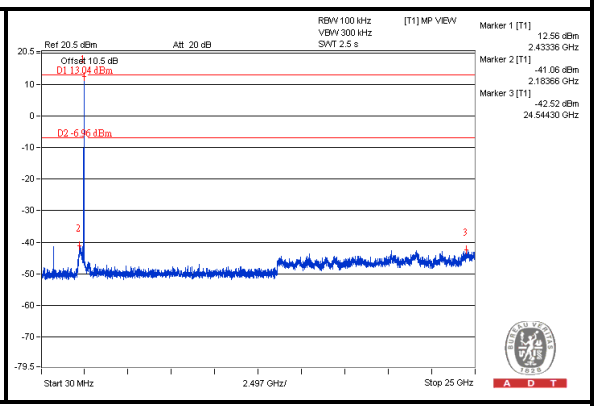
CH 1



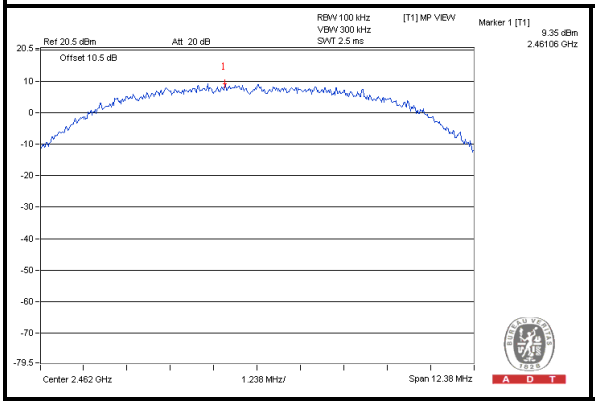


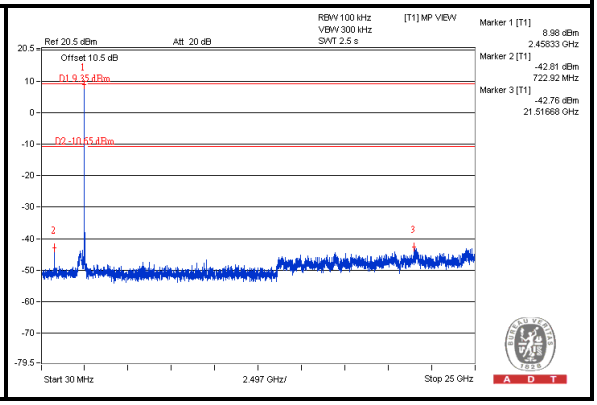
CH 6





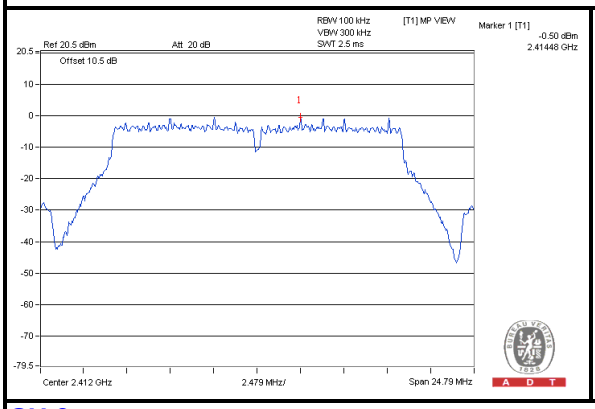
CH 11

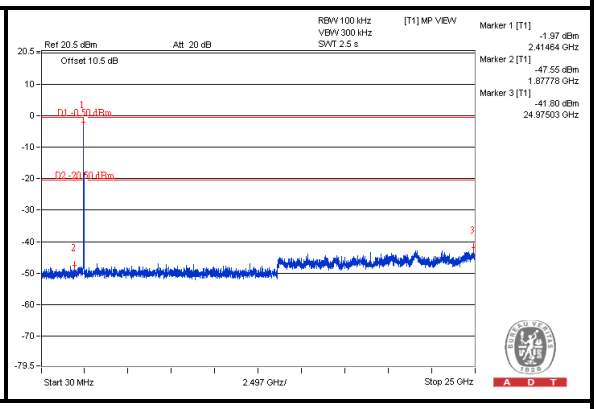




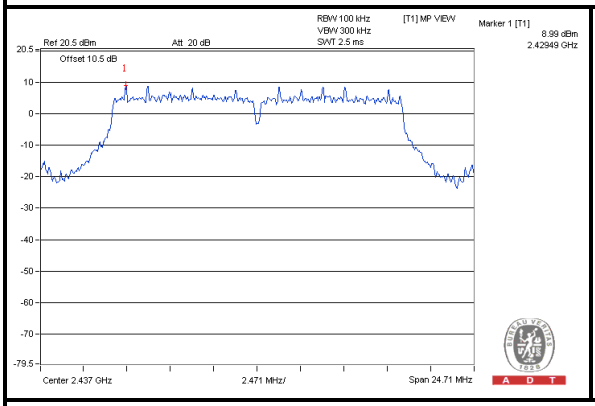
802.11g:

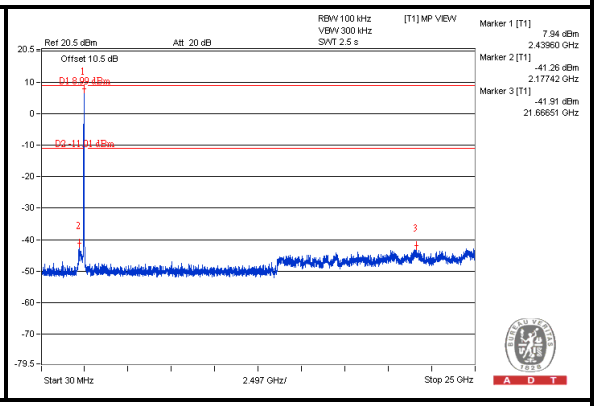
CH 1



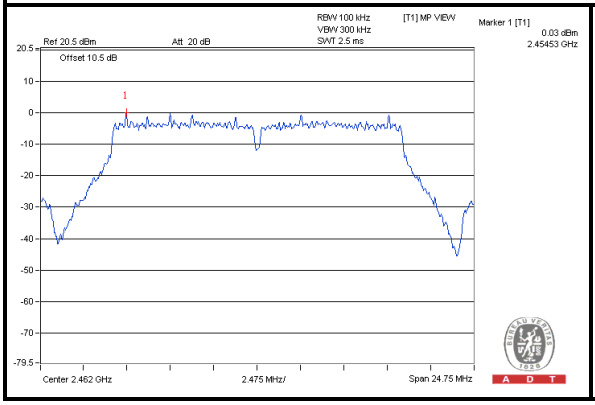


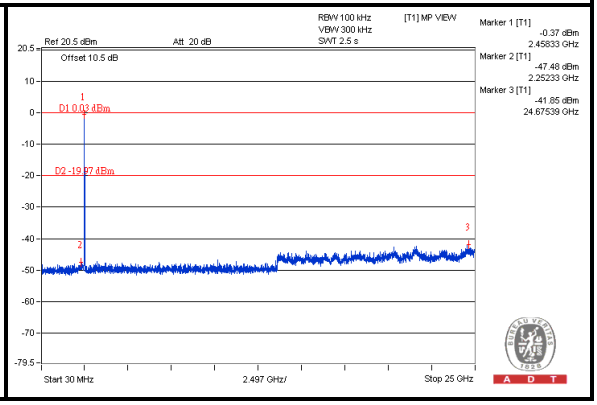
CH 6





CH 11

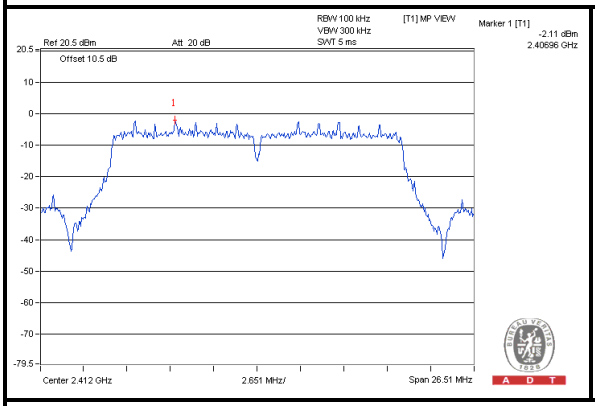


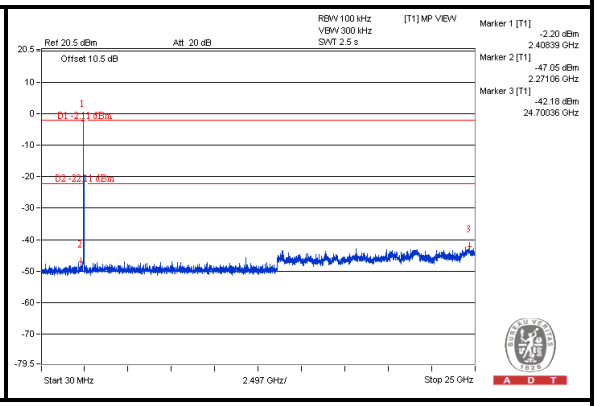


802.11n (HT20):

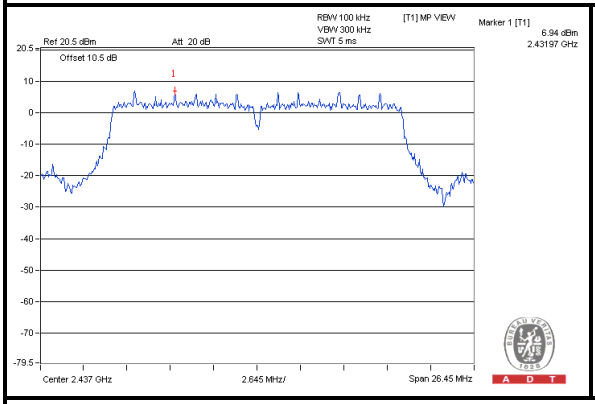
For Chain 0

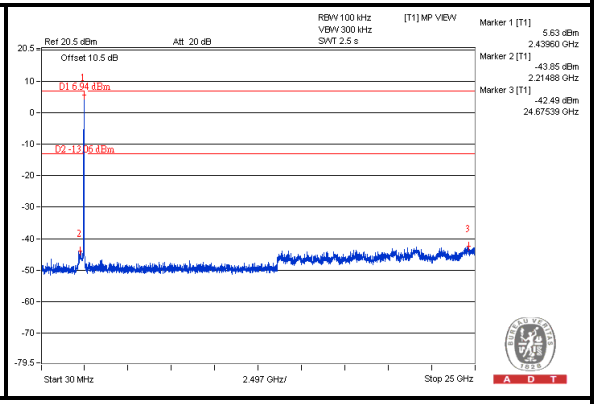
CH 1



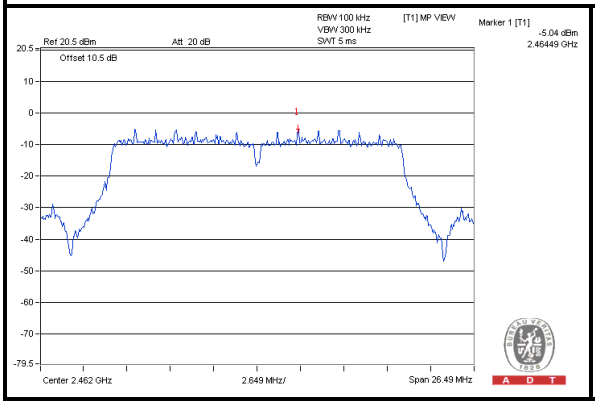


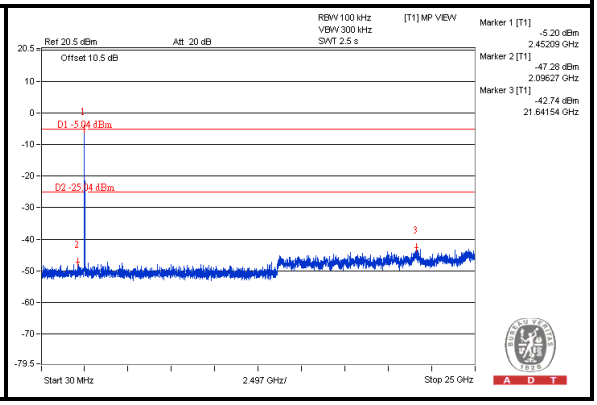
CH 6





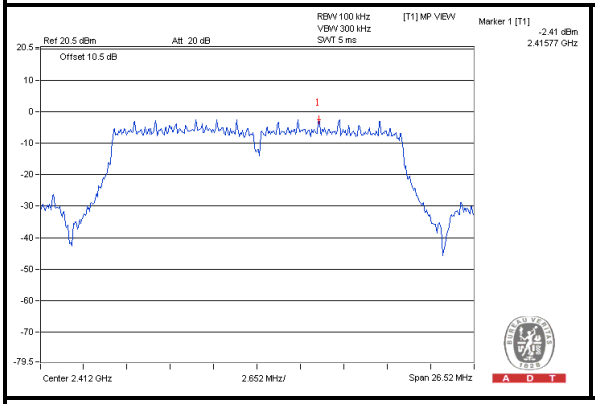
CH 11

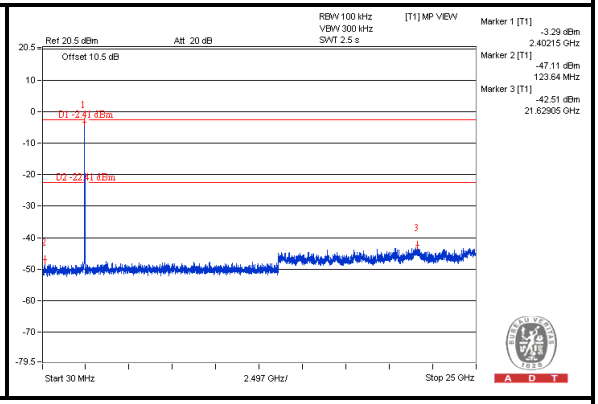




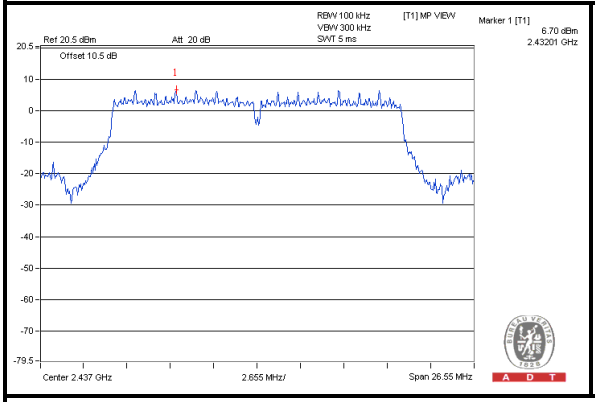
For Chain 1

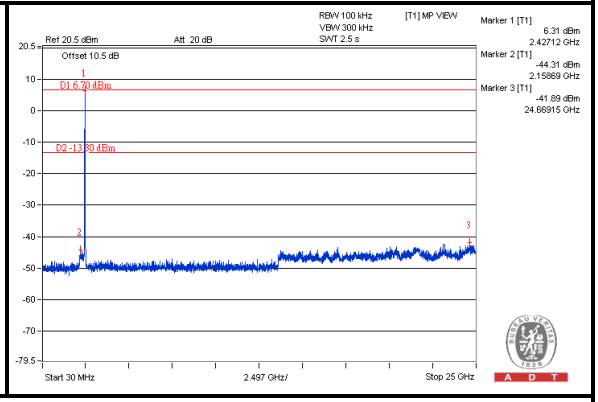
CH 1



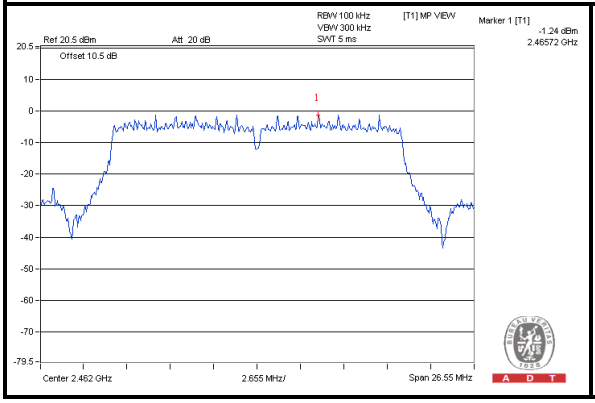


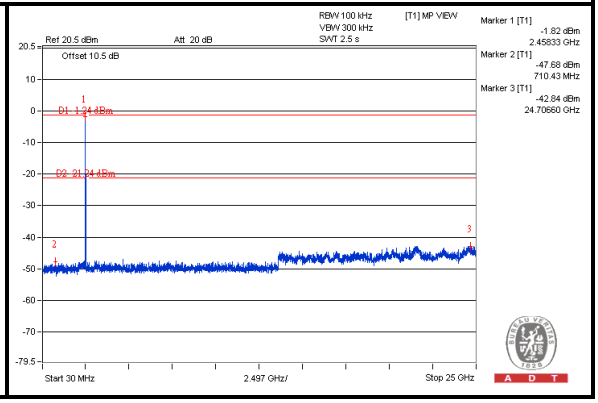
CH 6





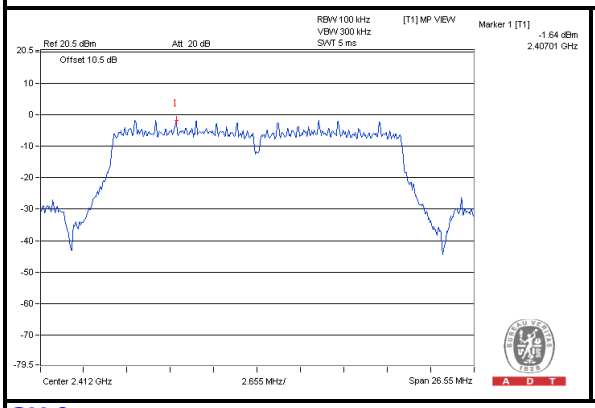
CH 11

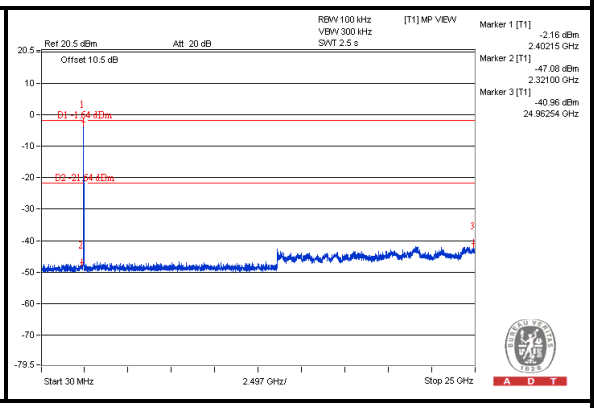




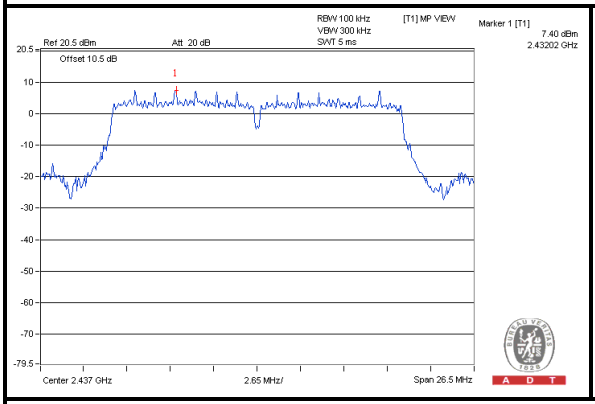
For Chain 2

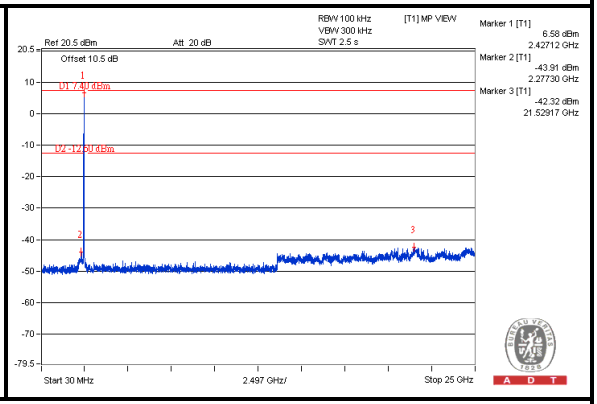
CH 1



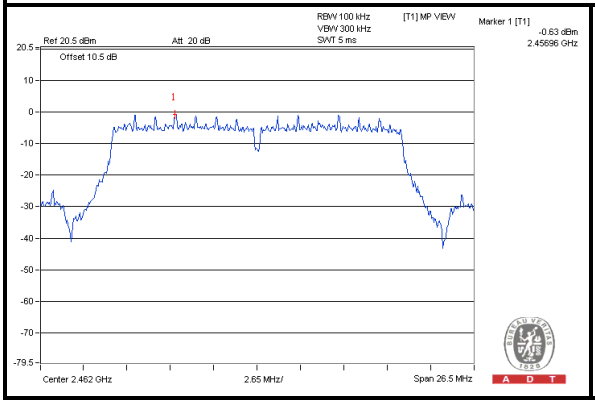


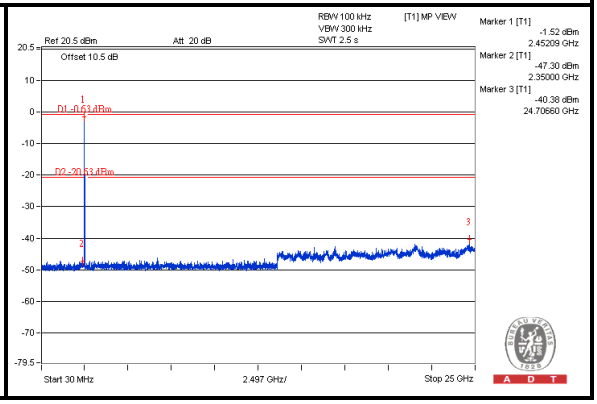
CH 6





CH 11

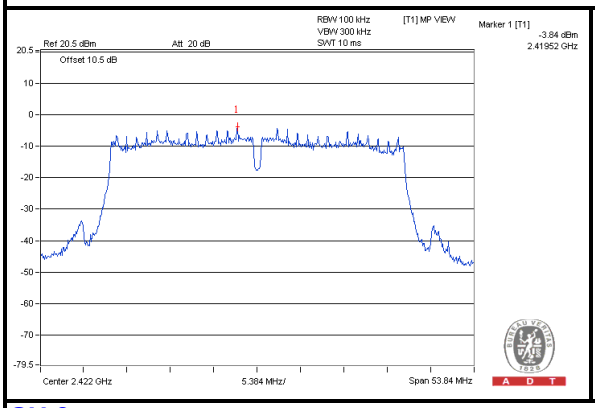


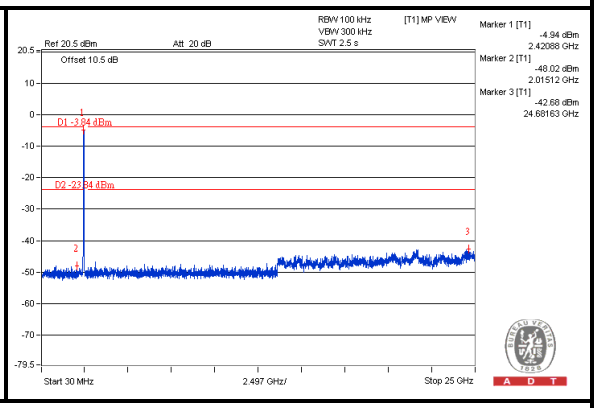


802.11n (HT40):

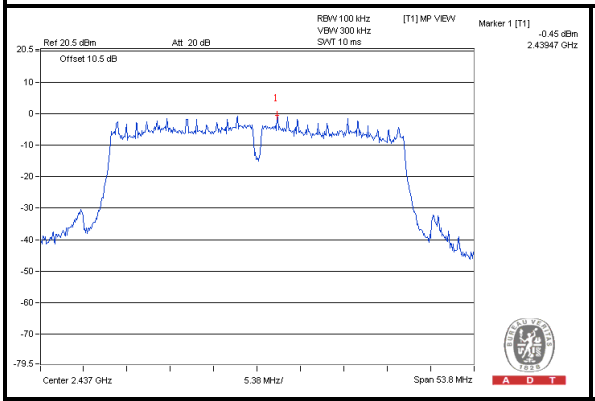
For Chain 0

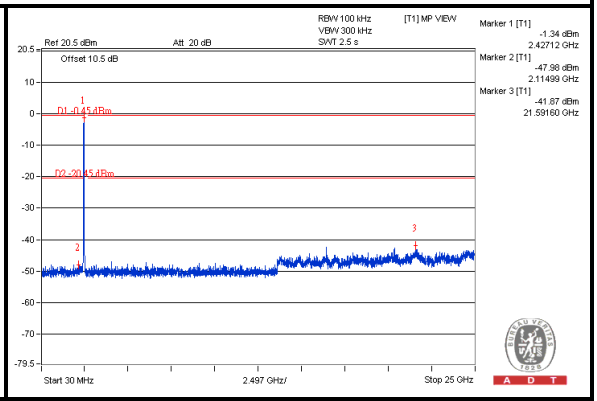
CH 3



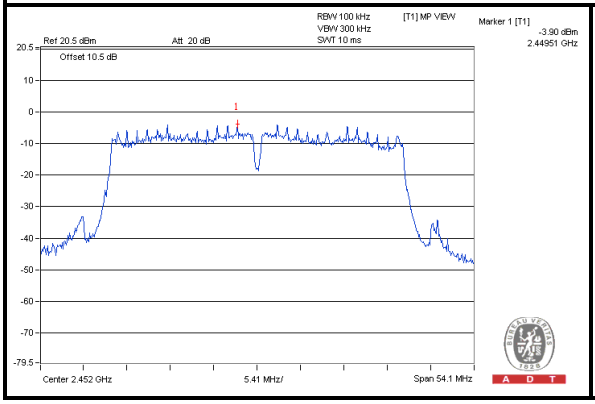


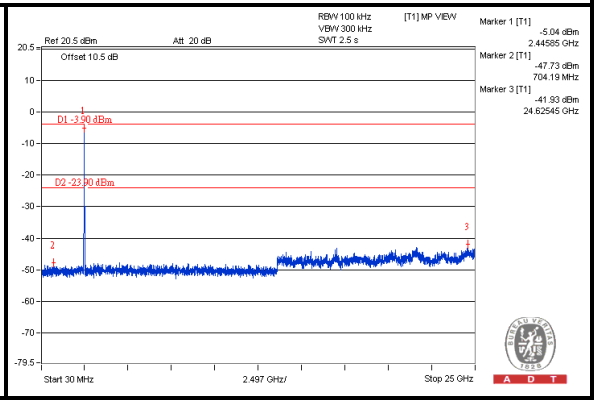
CH 6





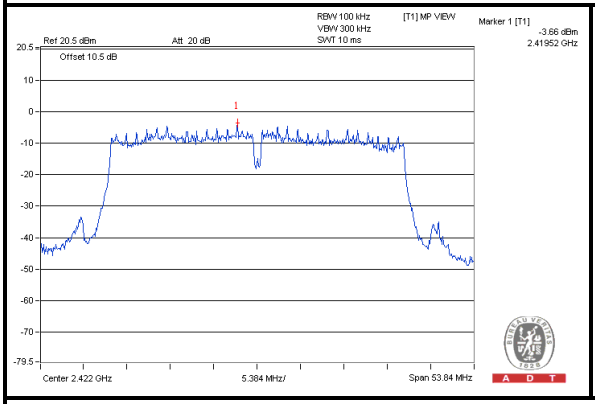
CH 9

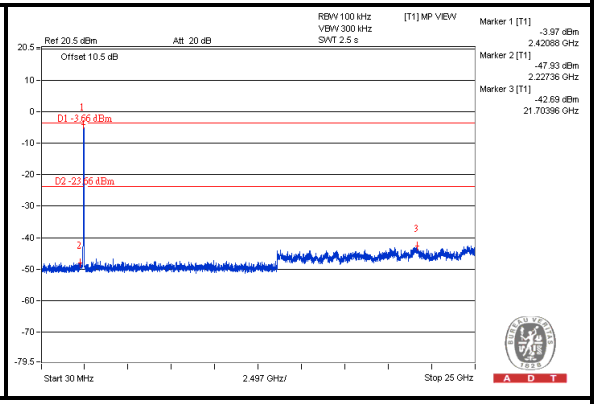




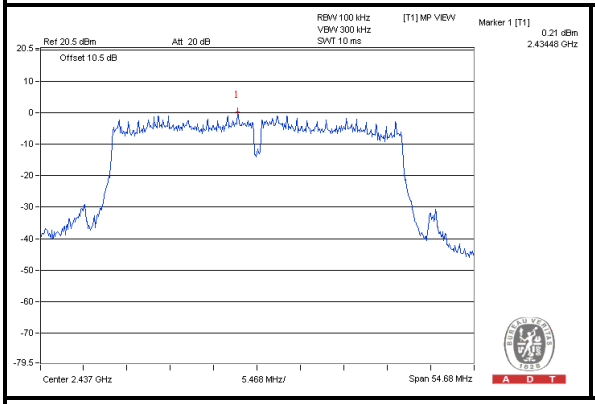
For Chain 1

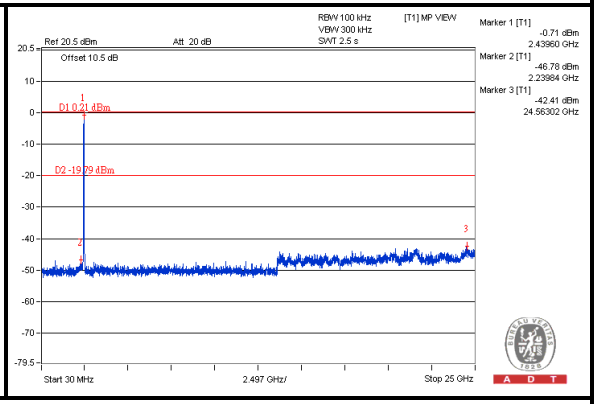
CH 3



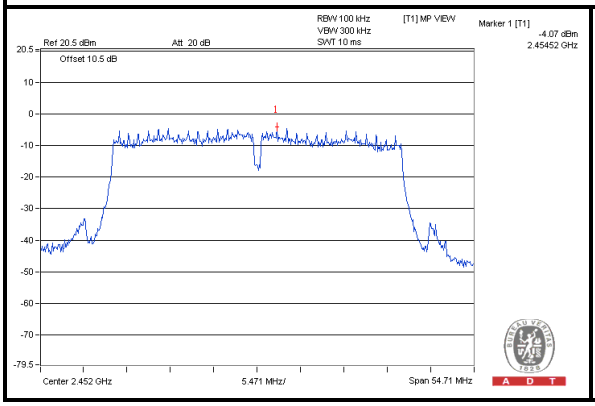


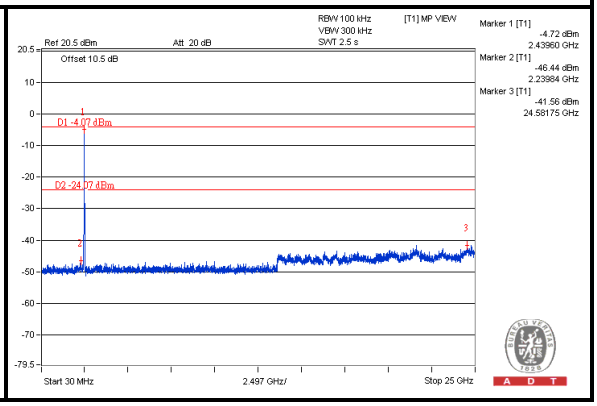
CH 6





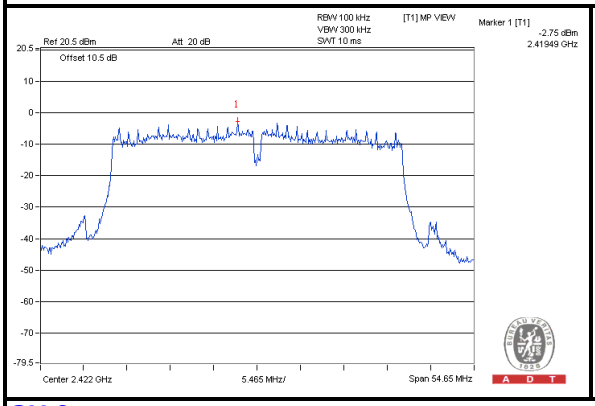
CH 9

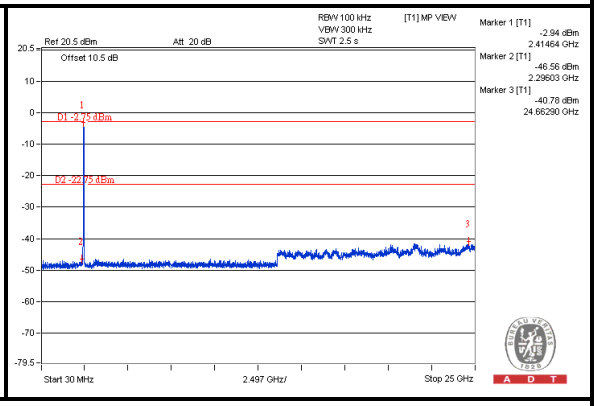




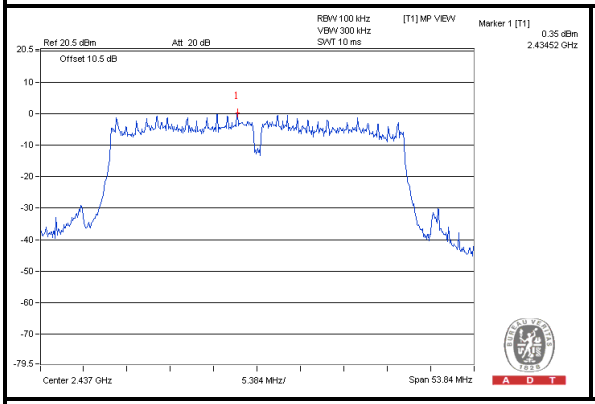
For Chain 2

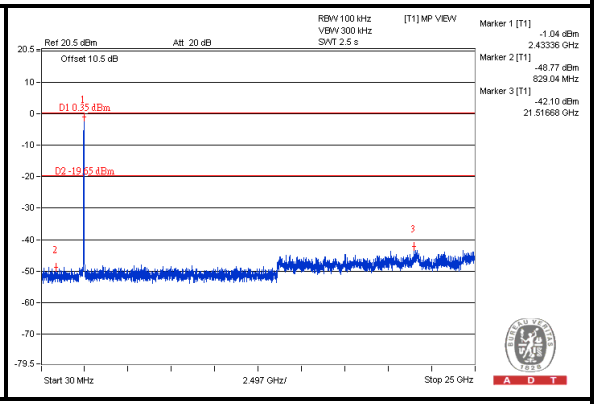
CH 3



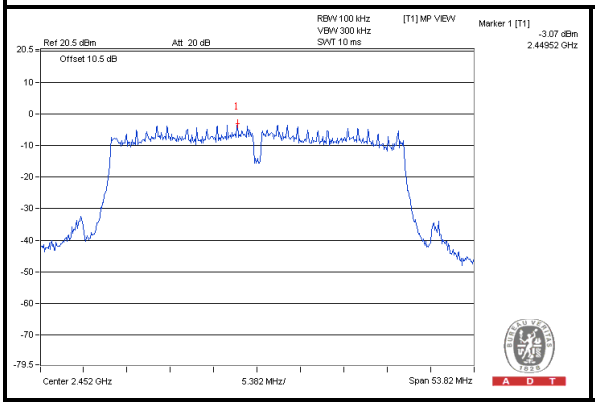


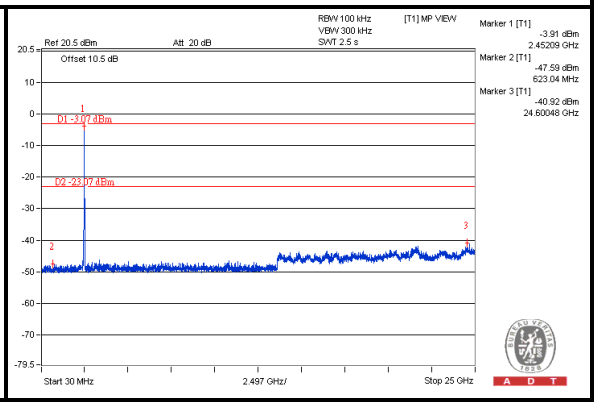
CH 6





CH 9





5. TEST TYPES AND RESULTS (FOR 5GHz, 5.725~5.850GHz Band)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 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.

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 08, 2013	Mar. 07, 2014
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 06, 2012	Sep. 05, 2013
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100072	June 08,2012	June 07,2013
RF Cable (JYEBAO)	5DFB	COCCAB-003	Mar. 11, 2013	Mar. 10, 2014
50 ohms Terminator	50	EMC-3	Sep. 25, 2012	Sep. 24, 2013
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Apr. 22, 2013

5.1.3 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.

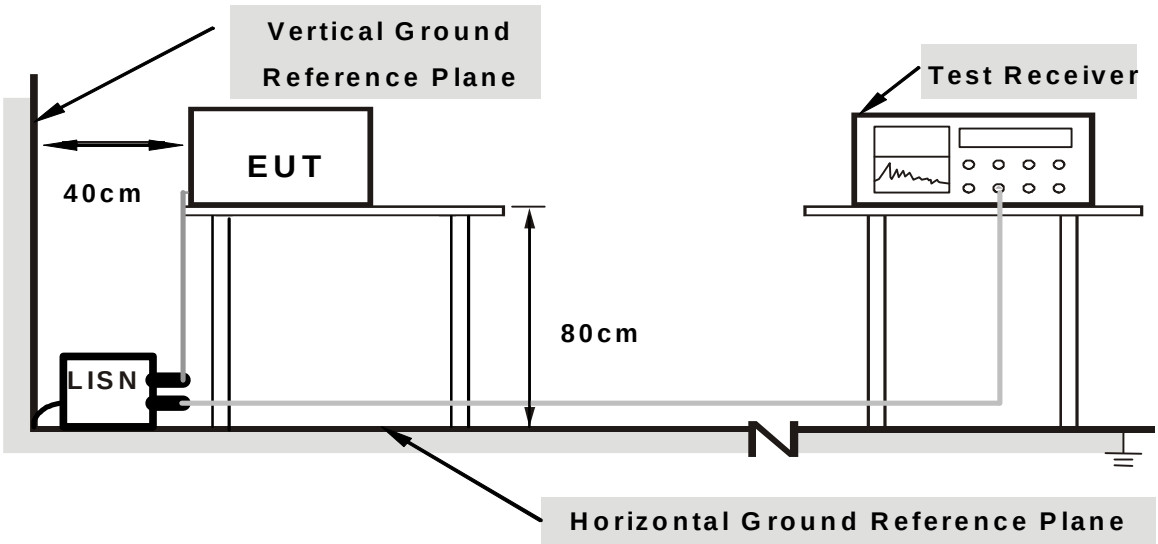
NOTE:

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

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 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.

5.1.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

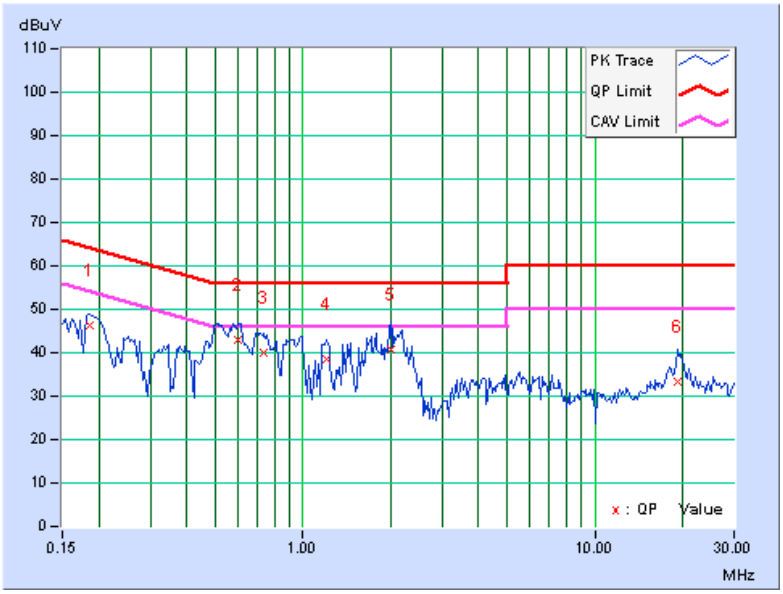
5.1.7 TEST RESULTS

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

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	0.11	46.31	32.65	46.42	32.76	64.25	54.25	-17.83	-21.49
2	**0.59922**	**0.14**	**42.84**	**29.70**	**42.98**	**29.84**	**56.00**	**46.00**	**-13.02**	**-16.16**
3	0.73594	0.15	39.94	28.51	40.09	28.66	56.00	46.00	-15.91	-17.34
4	1.20703	0.18	38.41	24.86	38.59	25.04	56.00	46.00	-17.41	-20.96
5	2.01172	0.21	40.44	30.67	40.65	30.88	56.00	46.00	-15.35	-15.12
6	19.15625	0.96	32.30	25.26	33.26	26.22	60.00	50.00	-26.74	-23.78

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

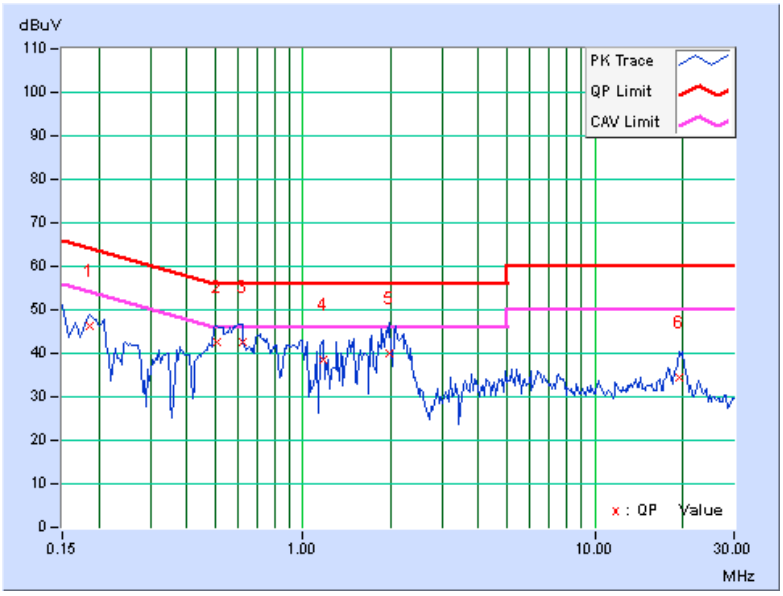


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	0.09	46.05	32.03	46.14	32.12	64.25	54.25	-18.11	-22.13
2	0.50547	0.13	42.42	30.41	42.55	30.54	56.00	46.00	-13.45	-15.46
3	0.61875	0.13	42.47	30.28	42.60	30.41	56.00	46.00	-13.40	-15.59
4	1.16797	0.16	38.27	26.35	38.43	26.51	56.00	46.00	-17.57	-19.49
5	1.98438	0.19	39.95	30.54	40.14	30.73	56.00	46.00	-15.86	-15.27
6	19.50000	0.67	33.72	27.55	34.39	28.22	60.00	50.00	-25.61	-21.78

REMARKS:

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



5.2 RADIATED AND BANDEDGE EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED AND BANDEDGE EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB 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.

5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250253	Sep. 03, 2012	Sep. 02, 2013
MXE EMI Receiver Agilent	N9038A	MY51210105	Jan. 29,2013	Jan. 28,2014
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 14, 2012	Nov. 13, 2013
Pre-Amplifier Agilent	8449B	3008A02578	June 26, 2012	June 25, 2013
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 14, 2012	Nov. 13, 2013
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Mar. 19, 2013	Mar. 18, 2014
Horn_Antenna AISI	AIH.8018	0000320091110	Nov. 19, 2012	Nov. 18, 2013
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 12, 2012	Oct. 11, 2013
RF Cable	NA	RF104-201 RF104-203 RF104-204	Dec. 25, 2012	Dec. 24, 2013
RF Cable	NA	CHGCAB_001	Oct. 06, 2012	Oct. 05, 2013
Software	ADT_Radiated _V8.7.05	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: Apr. 25 to May 07, 2013

5.2.3 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.

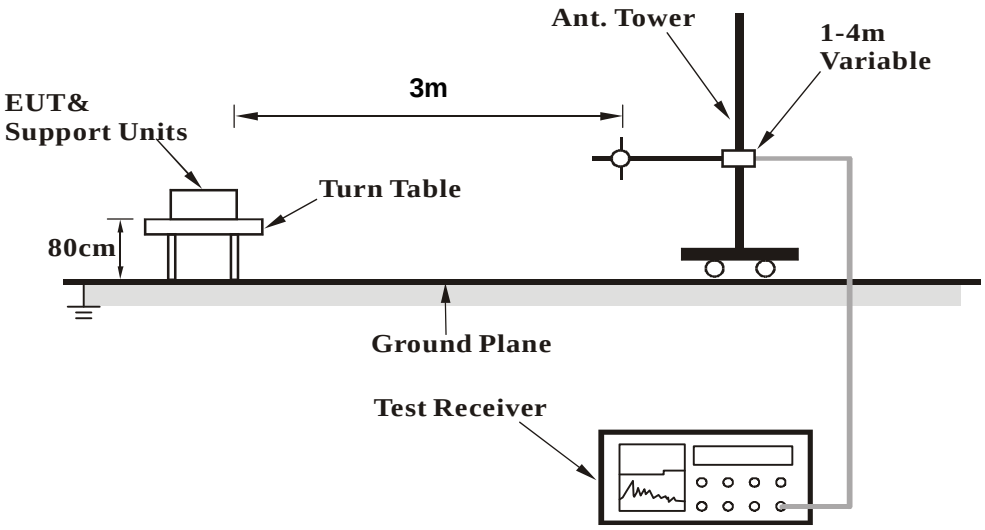
NOTE:

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 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 TEST SETUP



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

5.2.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

5.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11n (HT20)

CHANNEL	TX Channel 165	**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	125.01	33.0 QP	43.5	-10.6	1.50 H	88	48.00	-15.05
2	298.25	39.4 QP	46.0	-6.6	1.00 H	360	52.26	-12.88
3	374.98	38.1 QP	46.0	-7.9	2.00 H	87	48.98	-10.88
4	625.00	43.8 QP	46.0	-2.2	1.00 H	90	48.67	-4.84
5	874.97	42.5 QP	46.0	-3.5	1.50 H	110	43.45	-0.96
6	999.95	39.3 QP	54.0	-14.7	2.00 H	360	38.36	0.98
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	36.16	32.9 QP	40.0	-7.1	1.00 V	52	46.60	-13.71
2	284.33	38.0 QP	46.0	-8.0	1.50 V	24	51.28	-13.32
3	374.98	37.8 QP	46.0	-8.3	1.50 V	72	48.63	-10.88
4	625.00	41.5 QP	46.0	-4.5	1.50 V	106	46.30	-4.84
5	874.97	42.3 QP	46.0	-3.7	1.00 V	83	43.25	-0.96
6	999.95	38.9 QP	54.0	-15.1	1.00 V	63	37.92	0.98

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) if use
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

ABOVE 1GHz DATA

802.11a

CHANNEL	TX Channel 149	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5446.14	61.4 PK	74.0	-12.6	1.00 H	195	52.80	8.60
2	5446.14	50.7 AV	54.0	-3.3	1.00 H	195	42.10	8.60
3	*5745.00	102.4 PK			1.00 H	31	93.06	9.34
4	*5745.00	94.2 AV			1.00 H	31	84.86	9.34
5	11490.00	55.2 PK	74.0	-18.8	1.00 H	300	39.20	16.00
6	11490.00	47.6 AV	54.0	-6.4	1.00 H	300	31.60	16.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5426.67	65.1 PK	74.0	-8.9	1.03 V	116	56.56	8.54
2	5426.67	53.3 AV	54.0	-0.7	1.03 V	116	44.76	8.54
3	*5745.00	108.3 PK			1.00 V	77	98.96	9.34
4	*5745.00	100.6 AV			1.00 V	77	91.26	9.34
5	11490.00	55.0 PK	74.0	-19.0	1.00 V	215	39.00	16.00
6	11490.00	47.2 AV	54.0	-6.8	1.00 V	215	31.20	16.00

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5437.73	61.3 PK	74.0	-12.7	1.00 H	184	52.73	8.57
2	5437.73	50.9 AV	54.0	-3.1	1.00 H	184	42.33	8.57
3	*5785.00	102.7 PK			1.05 H	39	93.26	9.44
4	*5785.00	94.3 AV			1.05 H	39	84.86	9.44
5	11570.00	55.2 PK	74.0	-18.8	1.00 H	297	39.17	16.03
6	11570.00	47.7 AV	54.0	-6.3	1.00 H	297	31.67	16.03
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	5437.73	65.2 PK	74.0	-8.8	1.03 V	114	56.63	8.57
2	**5437.73**	**53.5 AV**	**54.0**	**-0.5**	**1.03 V**	**114**	**44.93**	**8.57**
3	*5785.00	108.2 PK			1.00 V	80	98.76	9.44
4	*5785.00	100.5 AV			1.00 V	80	91.06	9.44
5	11570.00	54.9 PK	74.0	-19.1	1.05 V	221	38.87	16.03
6	11570.00	47.2 AV	54.0	-6.8	1.05 V	221	31.17	16.03

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) if use
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5449.55	61.3 PK	74.0	-12.7	1.00 H	192	52.69	8.61
2	5449.55	50.8 AV	54.0	-3.2	1.00 H	192	42.19	8.61
3	*5825.00	102.7 PK			1.02 H	42	93.15	9.55
4	*5825.00	94.3 AV			1.02 H	42	84.75	9.55
5	11650.00	55.5 PK	74.0	-18.5	1.00 H	303	39.29	16.21
6	11650.00	48.0 AV	54.0	-6.0	1.00 H	303	31.79	16.21
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	5449.55	65.5 PK	74.0	-8.5	1.06 V	128	56.89	8.61
2	5449.55	53.4 AV	54.0	-0.6	1.06 V	128	44.79	8.61
3	*5825.00	108.5 PK			1.00 V	84	98.95	9.55
4	*5825.00	100.7 AV			1.00 V	84	91.15	9.55
5	11650.00	55.0 PK	74.0	-19.0	1.06 V	226	38.79	16.21
6	11650.00	47.2 AV	54.0	-6.8	1.06 V	226	30.99	16.21

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) if use
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 149	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5062.25	60.7 PK	74.0	-13.3	1.48 H	179	53.19	7.51
2	5062.25	49.6 AV	54.0	-4.4	1.48 H	179	42.09	7.51
3	5452.52	61.4 PK	74.0	-12.6	1.48 H	179	52.78	8.62
4	5452.52	50.0 AV	54.0	-4.0	1.48 H	179	41.38	8.62
5	*5745.00	104.5 PK			1.48 H	179	95.16	9.34
6	*5745.00	95.4 AV			1.48 H	179	86.06	9.34
7	11490.00	55.1 PK	74.0	-18.9	1.00 H	315	39.10	16.00
8	11490.00	47.7 AV	54.0	-6.3	1.00 H	315	31.70	16.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5095.40	59.9 PK	74.0	-14.1	1.28 V	58	52.20	7.70
2	5095.40	50.1 AV	54.0	-3.9	1.28 V	58	42.40	7.70
3	5385.75	63.8 PK	74.0	-10.2	1.28 V	58	55.39	8.41
4	5385.75	53.0 AV	54.0	-1.0	1.28 V	58	44.59	8.41
5	*5745.00	111.0 PK			1.28 V	58	101.66	9.34
6	*5745.00	102.5 AV			1.28 V	58	93.16	9.34
7	11490.00	54.7 PK	74.0	-19.3	1.06 V	226	38.70	16.00
8	11490.00	47.1 AV	54.0	-6.9	1.06 V	226	31.10	16.00

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5453.51	60.1 PK	74.0	-13.9	1.46 H	168	51.48	8.62
2	5453.51	49.8 AV	54.0	-4.2	1.46 H	168	41.18	8.62
3	*5785.00	102.1 PK			1.46 H	180	92.66	9.44
4	*5785.00	93.2 AV			1.46 H	180	83.76	9.44
5	11570.00	55.5 PK	74.0	-18.5	1.00 H	313	39.47	16.03
6	11570.00	48.1 AV	54.0	-5.9	1.00 H	313	32.07	16.03
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	5453.51	63.4 PK	74.0	-10.6	1.25 V	56	54.78	8.62
2	5453.51	52.8 AV	54.0	-1.2	1.25 V	56	44.18	8.62
3	*5785.00	109.0 PK			1.25 V	56	99.56	9.44
4	*5785.00	100.2 AV			1.25 V	56	90.76	9.44
5	11570.00	54.4 PK	74.0	-19.6	1.06 V	218	38.37	16.03
6	11570.00	46.7 AV	54.0	-7.3	1.06 V	218	30.67	16.03

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) if use
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5362.21	62.1 PK	74.0	-11.9	1.45 H	165	53.79	8.31
2	5362.21	50.2 AV	54.0	-3.8	1.45 H	165	41.89	8.31
3	*5825.00	103.2 PK			1.45 H	177	93.65	9.55
4	*5825.00	94.1 AV			1.45 H	177	84.55	9.55
5	11650.00	54.9 PK	74.0	-19.1	1.00 H	308	38.69	16.21
6	11650.00	47.7 AV	54.0	-6.3	1.00 H	308	31.49	16.21
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	5362.21	65.4 PK	74.0	-8.6	1.26 V	67	57.09	8.31
2	**5362.21**	**53.5 AV**	**54.0**	**-0.5**	**1.26 V**	**67**	**45.19**	**8.31**
3	*5825.00	109.5 PK			1.26 V	56	99.95	9.55
4	*5825.00	101.0 AV			1.26 V	56	91.45	9.55
5	11650.00	53.9 PK	74.0	-20.1	1.04 V	227	37.69	16.21
6	11650.00	46.3 AV	54.0	-7.7	1.04 V	227	30.09	16.21

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) if use
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 151	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5423.37	61.3 PK	74.0	-12.7	1.42 H	158	52.77	8.53
2	5423.37	50.1 AV	54.0	-3.9	1.42 H	158	41.57	8.53
3	*5755.00	100.1 PK			1.44 H	168	90.73	9.37
4	*5755.00	92.1 AV			1.44 H	168	82.73	9.37
5	11510.00	55.5 PK	74.0	-18.5	1.00 H	300	39.50	16.00
6	11510.00	48.1 AV	54.0	-5.9	1.00 H	300	32.10	16.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5423.37	64.3 PK	74.0	-9.7	1.05 V	62	55.77	8.53
2	5423.37	53.1 AV	54.0	-0.9	1.05 V	62	44.57	8.53
3	*5755.00	106.9 PK			1.08 V	59	97.53	9.37
4	*5755.00	98.2 AV			1.08 V	59	88.83	9.37
5	11510.00	54.0 PK	74.0	-20.0	1.07 V	218	38.00	16.00
6	11510.00	46.5 AV	54.0	-7.5	1.07 V	218	30.50	16.00

REMARKS:

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

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5363.97	61.1 PK	74.0	-12.9	1.44 H	165	52.79	8.31
2	5363.97	49.8 AV	54.0	-4.2	1.44 H	165	41.49	8.31
3	*5795.00	100.3 PK			1.44 H	165	90.85	9.45
4	*5795.00	92.4 AV			1.44 H	165	82.95	9.45
5	11590.00	55.4 PK	74.0	-18.6	1.00 H	292	39.35	16.05
6	11590.00	47.9 AV	54.0	-6.1	1.00 H	292	31.85	16.05
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	5363.97	64.3 PK	74.0	-9.7	1.07 V	54	55.99	8.31
2	5363.97	53.4 AV	54.0	-0.6	1.07 V	54	45.09	8.31
3	*5795.00	106.9 PK			1.07 V	58	97.45	9.45
4	*5795.00	98.3 AV			1.07 V	58	88.85	9.45
5	11590.00	54.3 PK	74.0	-19.7	1.10 V	213	38.25	16.05
6	11590.00	46.8 AV	54.0	-7.2	1.10 V	213	30.75	16.05

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) if use
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value
5. " * ": Fundamental frequency.

5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Apr. 26, 2013

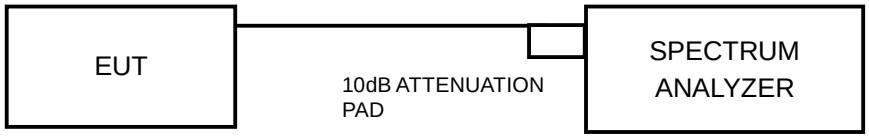
5.3.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
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

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

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

5.3.7 TEST RESULTS

802.11a

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

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	17.67	17.66	17.66	0.5	PASS
157	5785	17.62	17.65	17.65	0.5	PASS
165	5825	17.60	17.66	17.63	0.5	PASS

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	36.15	36.39	36.43	0.5	PASS
159	5795	36.35	36.47	36.47	0.5	PASS

5.4 CONDUCTED OUTPUT POWER MEASUREMENT

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 5725 –5850 MHz band: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 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.

5.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power Meter	ML2495A	0824006	May 10, 2012	May 09, 2013
Power Sensor	MA2411B	0738172	May 10, 2012	May 09, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Apr. 26, 2013

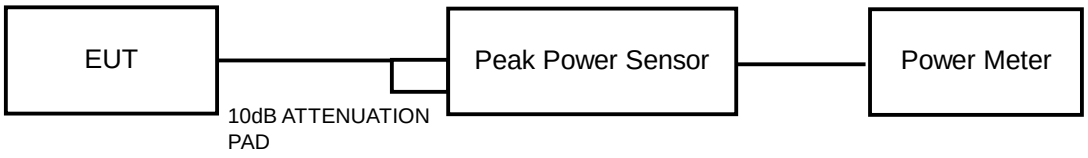
5.4.3 TEST PROCEDURES

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

5.4.4 DEVIATION FROM TEST STANDARD

No deviation.

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 5.3.6

5.4.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
149	5745	136.458	21.35	30	PASS
157	5785	156.315	21.94	30	PASS
165	5825	166.341	22.21	30	PASS

802.11n (HT20)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	19.73	19.34	19.66	272.343	24.35	30	PASS
157	5785	19.70	19.25	19.83	273.626	24.37	30	PASS
165	5825	19.82	19.33	19.81	277.363	24.43	30	PASS

802.11n (HT40)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
151	5755	19.23	18.39	19.32	238.284	23.77	30	PASS
159	5795	18.97	18.21	19.14	227.143	23.56	30	PASS

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Apr. 26, 2013

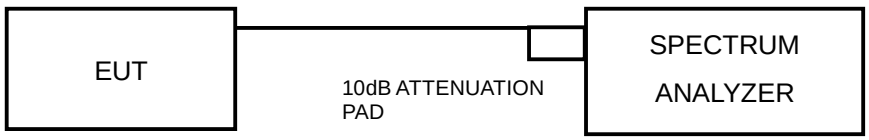
5.5.3 TEST PROCEDURE

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.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.5.7 TEST RESULTS

802.11a

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
149	5745	-10.86	8	PASS
157	5785	-9.74	8	PASS
165	5825	-9.82	8	PASS

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-12.82	4.77	-8.05	4.6	PASS
	157	5785	-13.51	4.77	-8.74	4.6	PASS
	165	5825	-13.87	4.77	-9.10	4.6	PASS
1	149	5745	-12.67	4.77	-7.90	4.6	PASS
	157	5785	-12.59	4.77	-7.82	4.6	PASS
	165	5825	-13.86	4.77	-9.09	4.6	PASS
2	149	5745	-12.67	4.77	-7.90	4.6	PASS
	157	5785	-12.85	4.77	-8.08	4.6	PASS
	165	5825	-13.96	4.77	-9.19	4.6	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 9.4dBi > 6dBi , so the power density limit shall be reduced to 8-(9.4-6) = 4.6dBm

802.11n (HT40)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-14.93	4.77	-10.16	4.6	PASS
	159	5795	-16.06	4.77	-11.29	4.6	PASS
1	151	5755	-15.99	4.77	-11.22	4.6	PASS
	159	5795	-15.30	4.77	-10.53	4.6	PASS
2	151	5755	-16.22	4.77	-11.45	4.6	PASS
	159	5795	-17.32	4.77	-12.55	4.6	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 9.4dBi > 6dBi , so the power density limit shall be reduced to 8-(9.4-6) = 4.6dBm

5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

5.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Apr. 26, 2013

5.6.3 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.

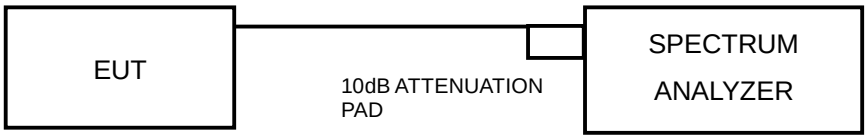
Measurement Procedure –Unwanted Emission Level

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.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



5.6.6 EUT OPERATING CONDITION

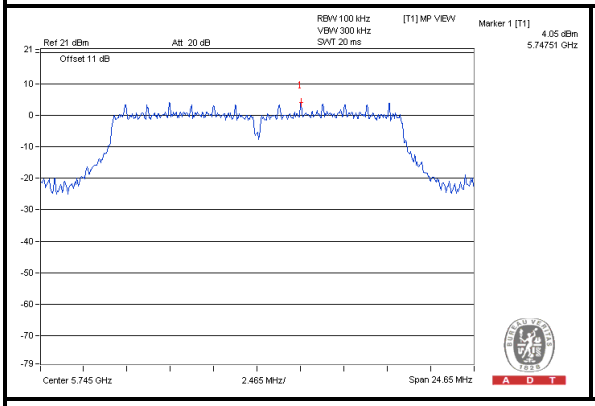
Same as Item 4.3.6

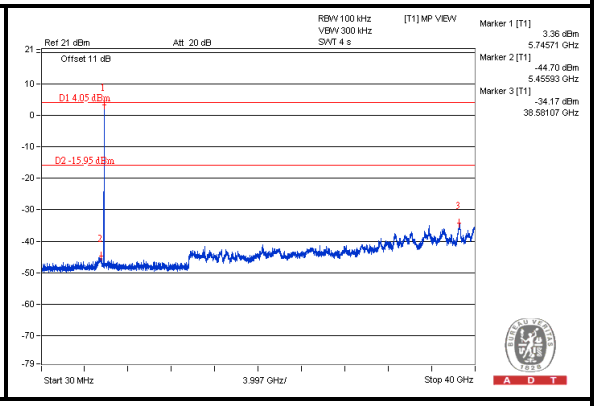
5.6.7 TEST RESULTS

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.

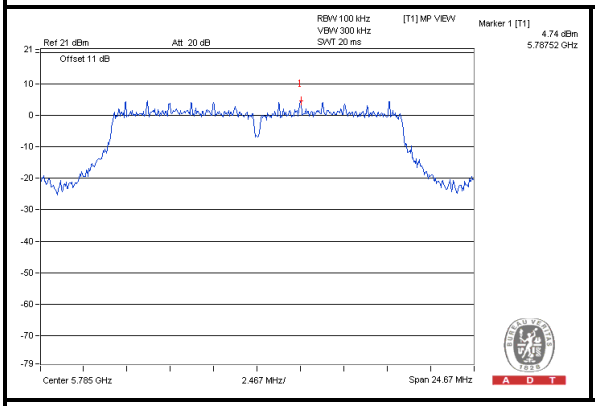
802.11a

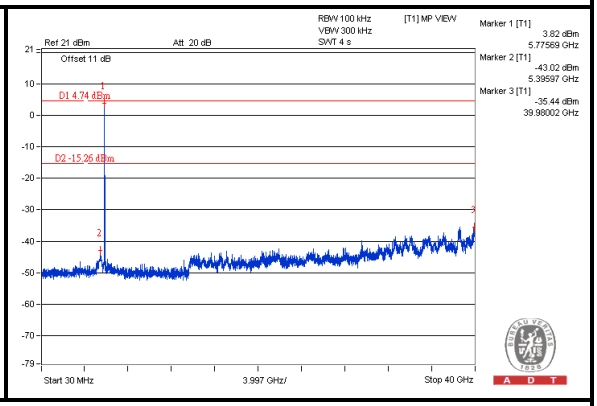
CH 149



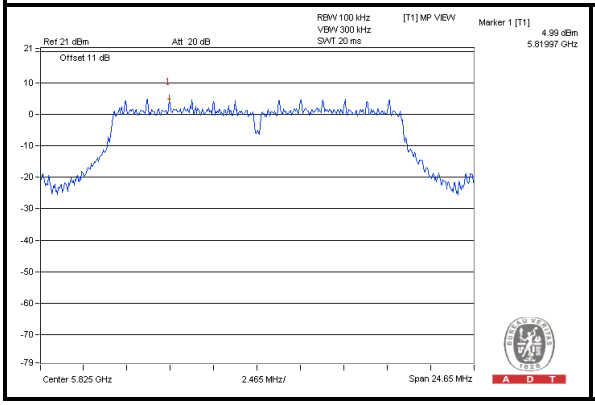


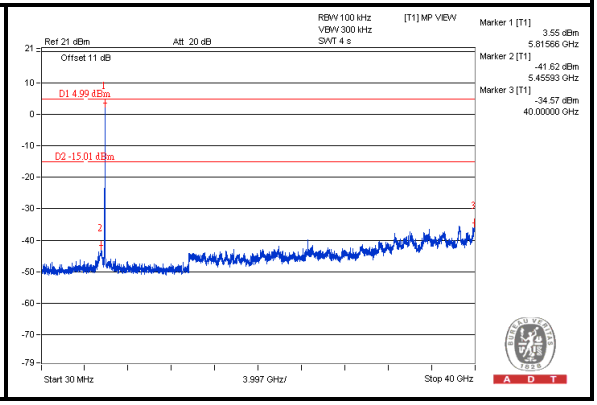
CH 157





CH 165

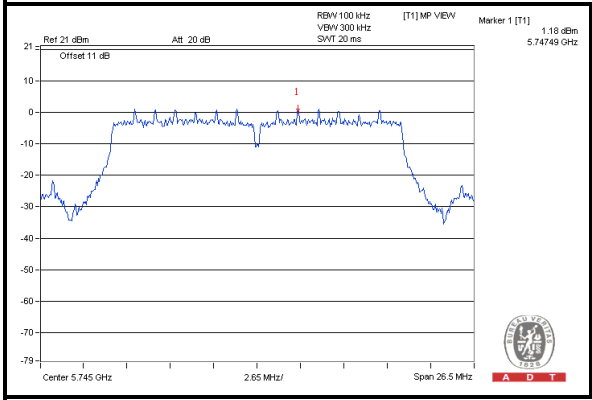


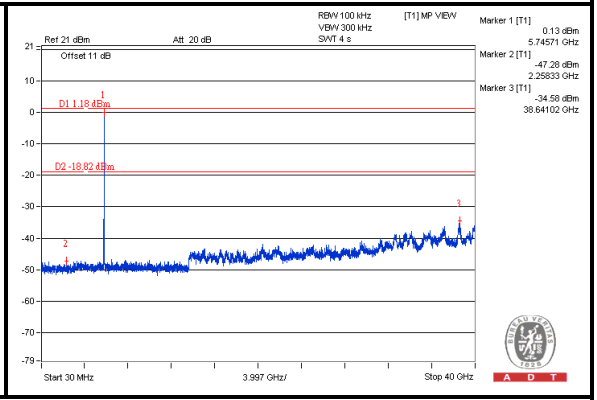


802.11n (HT20)

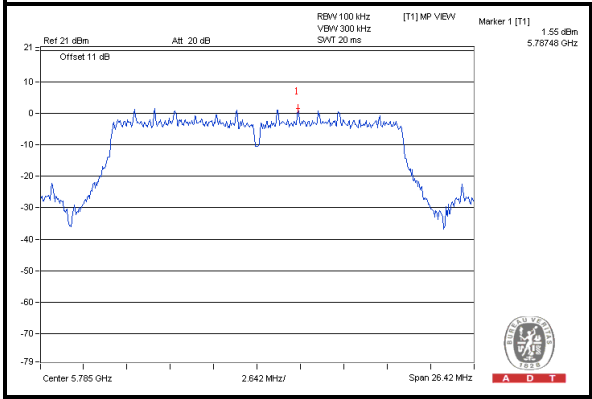
For Chain 0

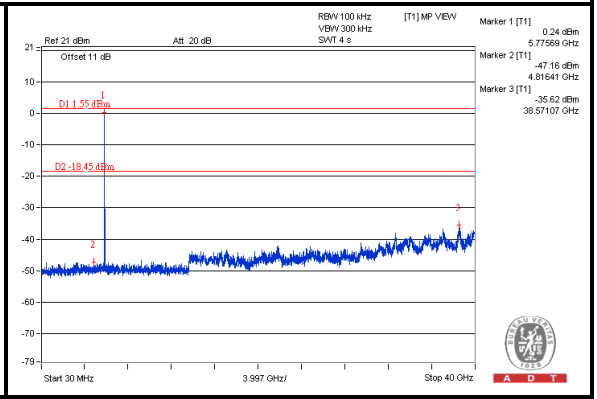
CH 149



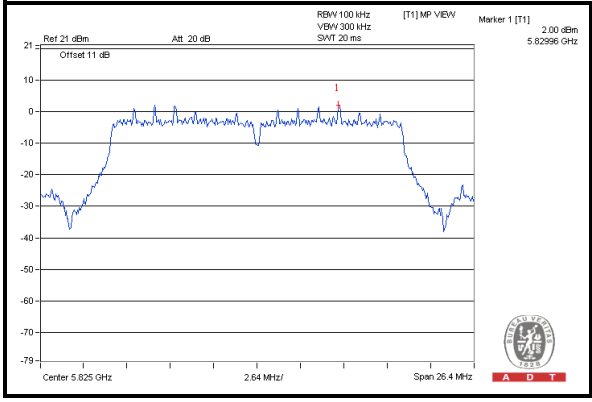


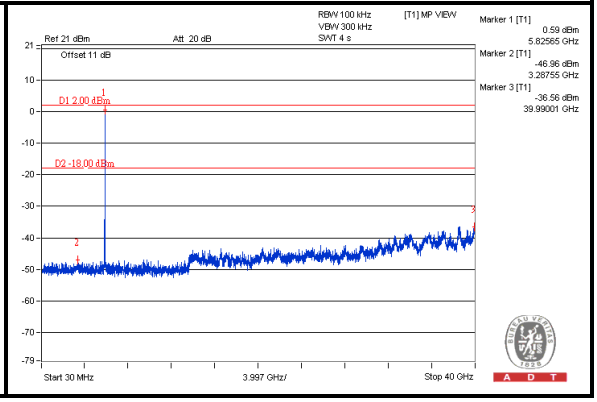
CH 157





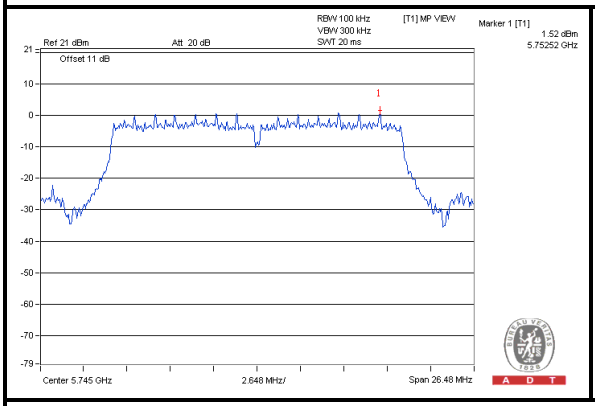
CH 165

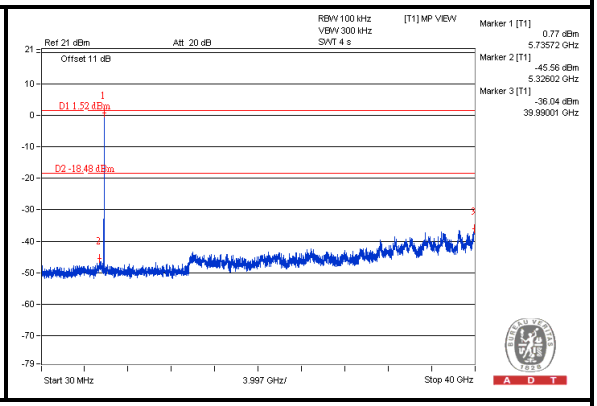




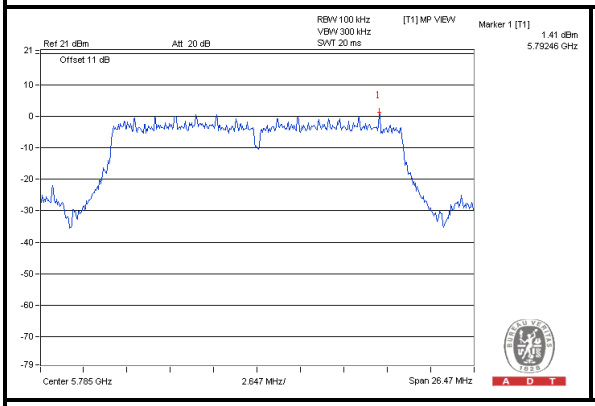
For Chain 1

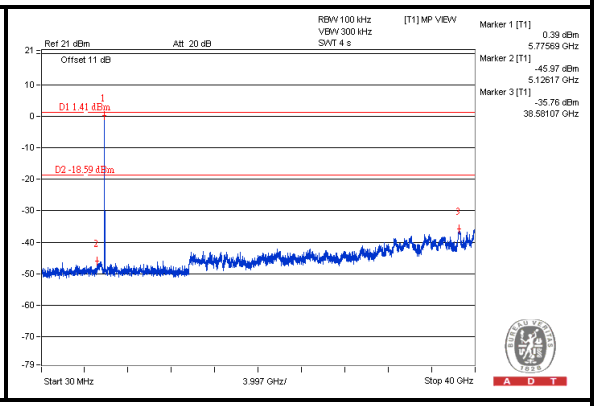
CH 149



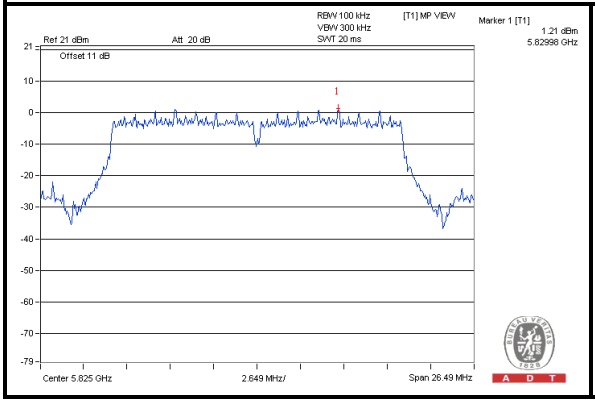


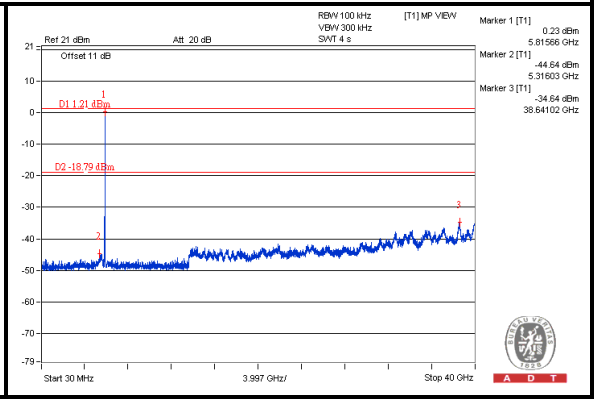
CH 157





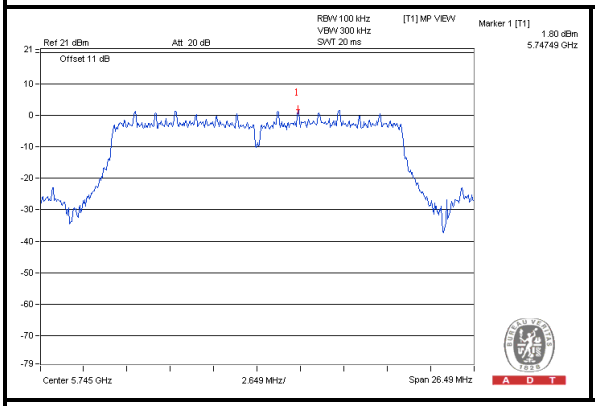
CH 165

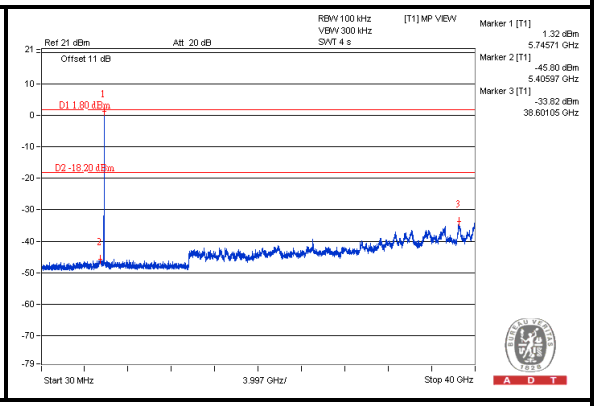




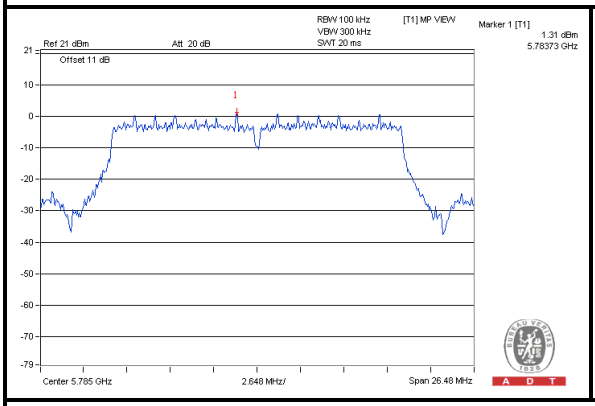
For Chain 2

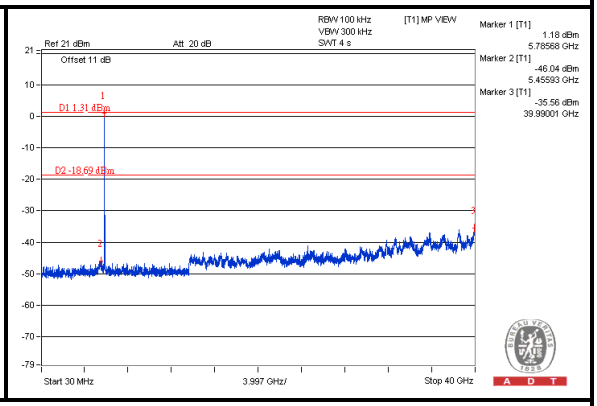
CH 149



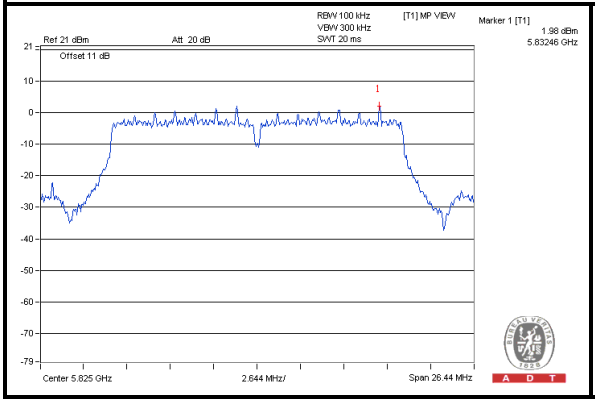


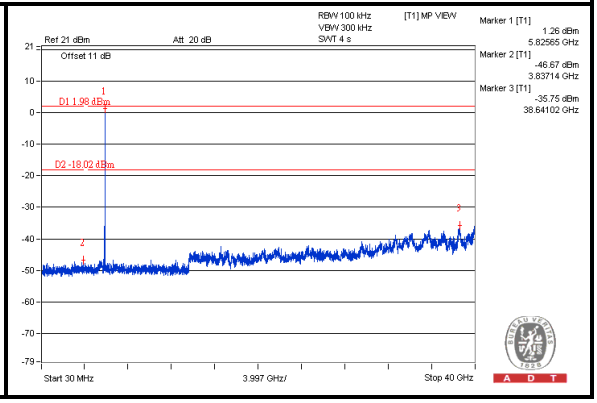
CH 157





CH 165

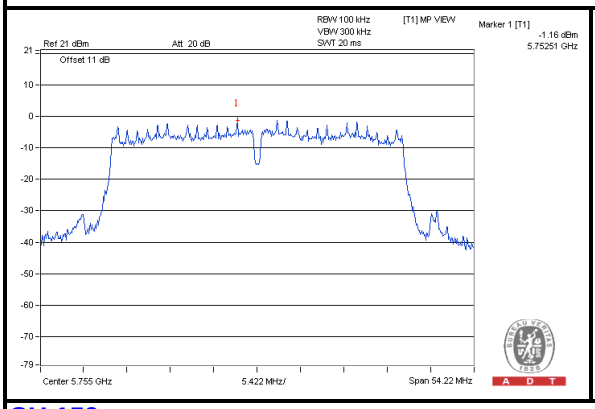


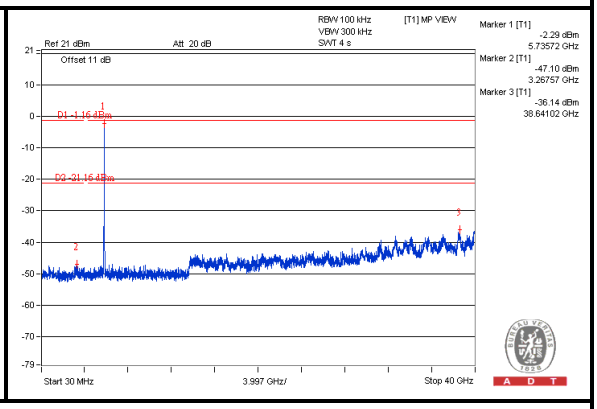


802.11n (HT40)

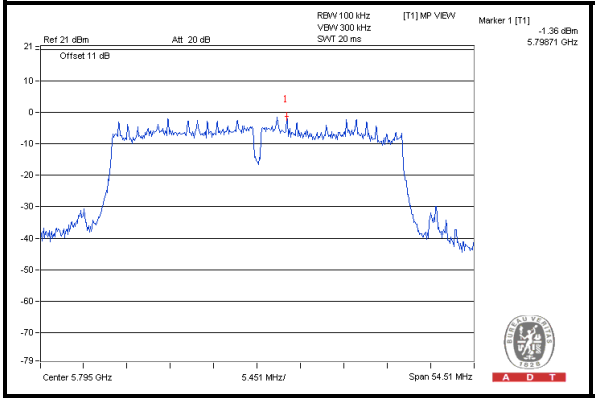
For Chain 0

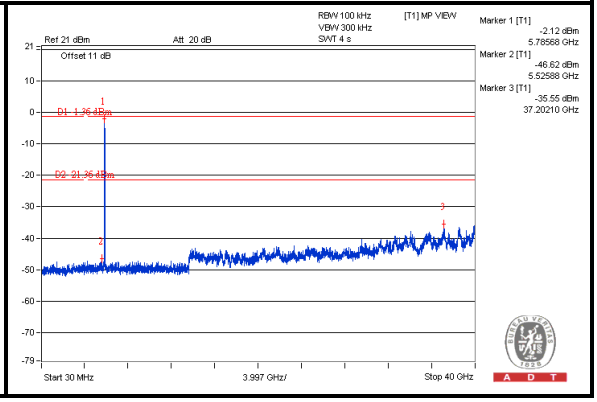
CH 151





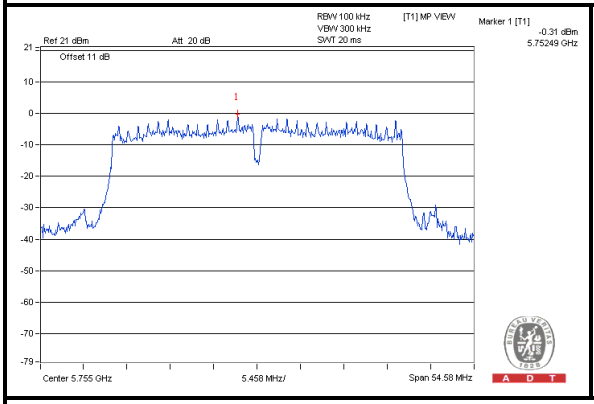
CH 159

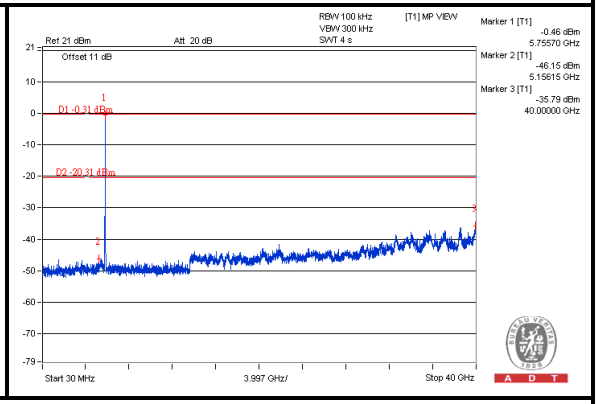




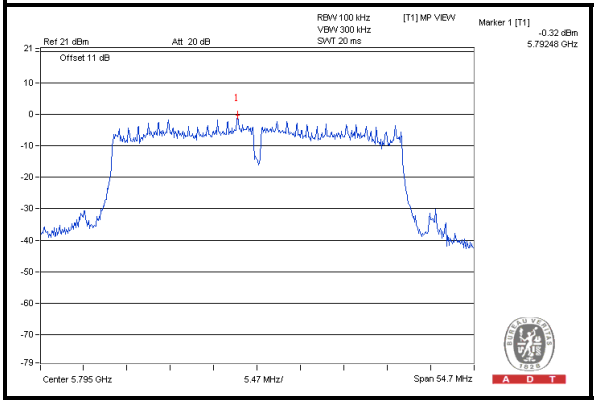
For Chain 1

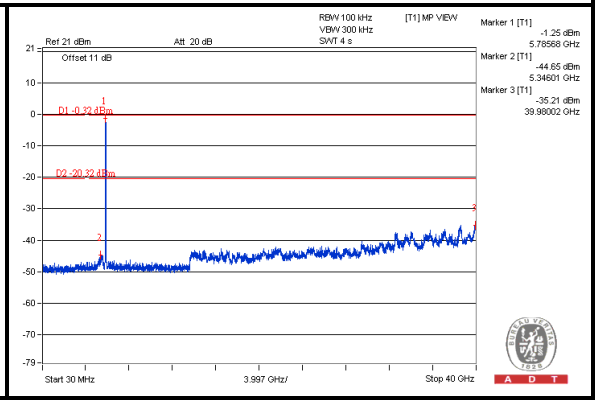
CH 151





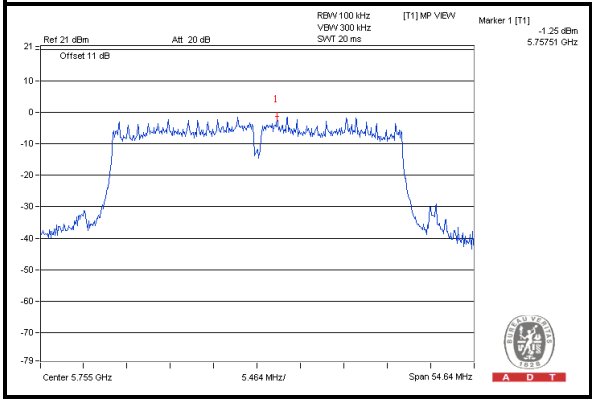
CH 159

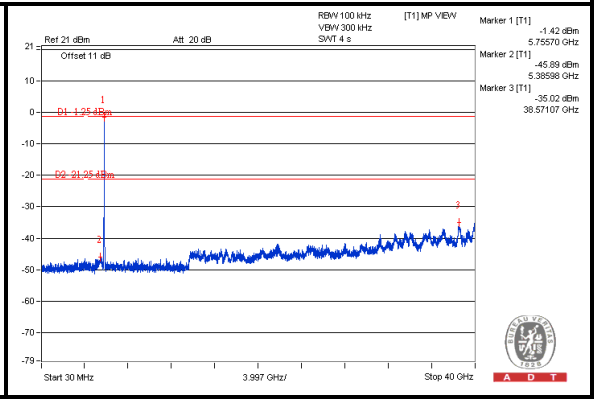




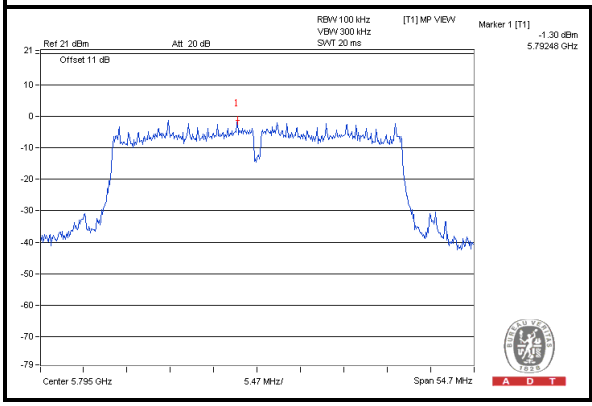
For Chain 2

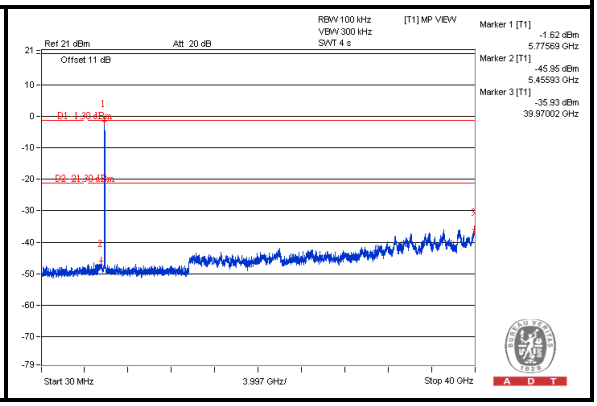
CH 151





CH 159





6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

7. INFORMATION ON THE TESTING LABORATORIES

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

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

Linko EMC/RF Lab:
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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.

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

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

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