

FCC TEST REPORT (15.247)

REPORT NO.: RF130218E07

MODEL NO.: Surf SOHO (Refer to 3.1 for more details)

FCC ID: U8G-P1740

RECEIVED: Feb. 18, 2013

TESTED: Mar. 07 to May 27, 2013

ISSUED: May 31, 2013

APPLICANT: Pismo Labs Technology Limited

ADDRESS: FLAT/RM A5, 5/F, HK SPINNERS IND BLDG
PHASE 6, 481 CASTLE PEAK ROAD,
CHEUNG SHA WAN, HONG KONG.

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.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130218E07	Original release	May 31, 2013

1. CERTIFICATION

PRODUCT: Pepwave / Peplink / Pismo Wireless Product
BRAND NAME: Pepwave / Peplink / Pismo
MODEL NO.: Surf SOHO (Refer to 3.1 for more details)
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: Pismo Labs Technology Limited
TESTED: Mar. 07 to May 27, 2013
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (Model: Surf SOHO) 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 31, 2013
(Elsie Hsu, Specialist)

APPROVED BY :  , **DATE:** May 31, 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 -3.74dB at 0.47422MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 2390.00MHz & 4874.00MHz.
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 I-PEX 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 -3.96dB at 0.47422MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.8B at 11650.00MHz & 11510.00MHz.
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 I-PEX 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) – 966 Chamber H	5.43 dB
Radiated emissions (1GHz -6GHz) – 966 Chamber H	3.54 dB
Radiated emissions (1GHz -6GHz) – 966 Chamber G	3.73 dB
Radiated emissions (6GHz -18GHz) – 966 Chamber H	4.08 dB
Radiated emissions (6GHz -18GHz) – 966 Chamber G	3.90 dB
Radiated emissions (18GHz -40GHz) – 966 Chamber H	4.11 dB
Radiated emissions (18GHz -40GHz) – 966 Chamber G	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Pepwave / Peplink / Pismo Wireless Product
MODEL NO.	Surf SOHO (Refer to NOTE for more details)
POWER SUPPLY	DC 12V from power adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps
OPERATING FREQUENCY	For 15.407 5.18 ~ 5.24GHz
	For 15.247 2.4GHz: 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: 46.606mW 802.11n (HT20): 47.874mW 802.11n (HT40): 44.956mW For 15.247 (2.4GHz) 802.11b: 521.745mW 802.11g: 948.977mW 802.11n (HT20): 951.796mW 802.11n (HT40): 779.724mW For 15.247 (5GHz) 802.11a: 98.407mW 802.11n (HT20): 76.439mW 802.11n (HT40): 80.746mW

ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter x 1

NOTE:

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

Brand	Model Name	Description
Pepwave / Peplink / Pismo	Surf SOHO	For marketing purposes
	Surf SOHO LTE	
	MAX	
	Surf Pro	
	AP Pro	
	Device Connector	
	Express	
	Balance	
	Pismo 734	
	CarFi	
	Flex AP	

From the above models, model: **Surf SOHO** was selected as representative model for the test and its data was recorded in this report.

- The EUT should be supplied with a power adapter as below:

Brand	Model No.	Spec.
Ten Pao	S024EM1200200	AC I/P: 100~240V, 50/60Hz, 600mA DC O/P: 12V, 2000mA DC O/P cable (shielded, 1.5m with one core)

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

Transmitter Circuit	Brand	Model	Antenna Type	Gain(dBi) Include cable loss	Connector Type	Frequency range	Cable Length
Chain (0)	SmartAnt	NA	Embedded	0.83	I-PEX	2.4~2.5GHz	20mm
				3.49		4.9~5.825GHz	
Chain (1)	SmartAnt	NA	Embedded	0.83	I-PEX	2.4~2.5GHz	20mm
				3.49		4.9~5.825GHz	

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

MODULATION MODE	TX/RX FUNCTION
802.11a	2TX/2RX
802.11b	2TX/2RX
802.11g	2TX/2RX
802.11n (HT20)	2TX/2RX
802.11n (HT40)	2TX/2RX

5. 2.4GHz and 5GHz technology cannot transmit at same time.
6. Spurious emission of the simultaneous operation (2.4GHz & 3G Device) has been evaluated and no non-compliance was found.
7. Spurious emission of the simultaneous operation (5GHz & 3G Device) has been evaluated and no non-compliance was found.
8. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.
9. 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 ≥ 1G	APCM	OB	
-	√	√	√	√	√	-

Where **PLC**: Power Line Conducted Emission

RE < 1G: Radiated Emission below 1GHz

RE ≥ 1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

OB: Conducted Out-Band Emission Measurement

Note: 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
802.11a	149 to 165	149	OFDM	BPSK	6

RADIATED EMISSION TEST (BELOW 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
For 2.4 GHz 802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5
802.11a	149 to 165	149	OFDM	BPSK	6

RADIATED EMISSION TEST (ABOVE 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
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	26deg. C, 55%RH	120Vac, 60Hz	Anderson Chen
RE<1G	24deg. C, 74%RH	120Vac, 60Hz	Tim Ho
RE ³ 1G	25deg. C, 65%RH 26deg. C, 70%RH	120Vac, 60Hz	Amos Chuang Robert Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nelson Teng James Chan
OB	25deg. C, 60%RH	120Vac, 60Hz	Nelson Teng James Chan

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.

3.4 DESCRIPTION OF SUPPORT UNITS

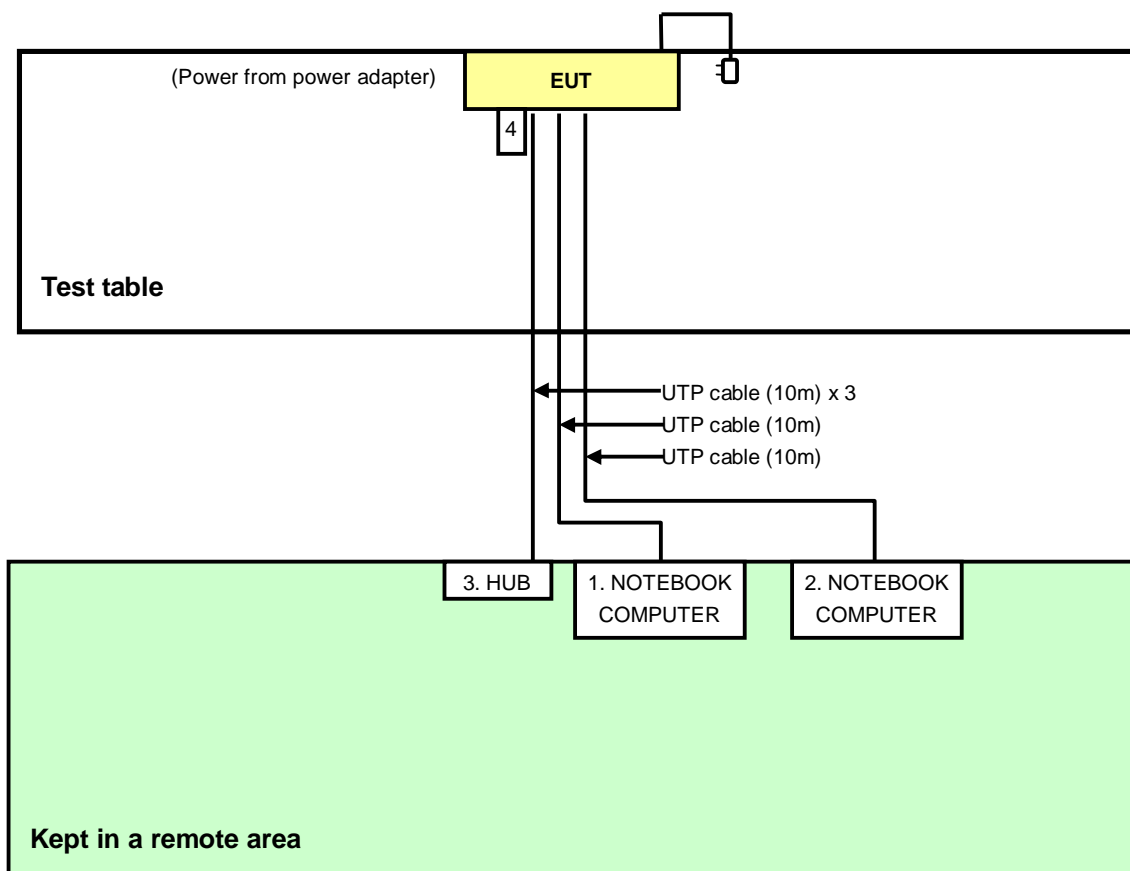
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	GSLB32S	FCC DoC
2	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
3	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC
4	Vodafone Mobile Connect	HUAWEI	K3520	D97NBB18A0804169	QISK3520

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

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

3.5 CONFIGURATION OF SYSTEM UNDER TEST



Note: Support unit 4 is a Vodafone Mobile Connect

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: May 09, 2013

4.1.3 TEST PROCEDURES

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

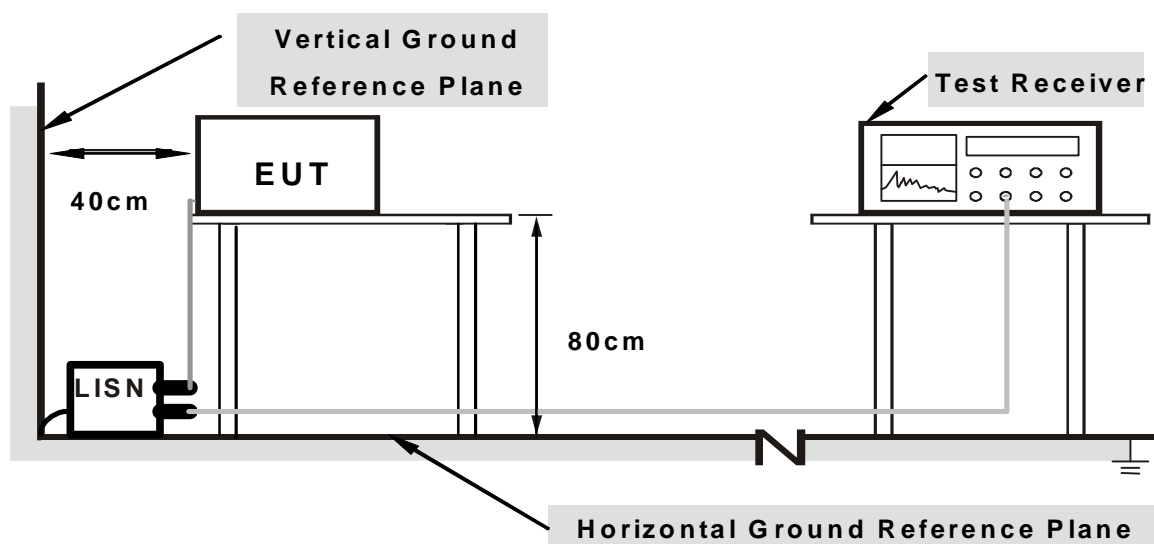
NOTE:

- 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.



A D T

4.1.6 EUT OPERATING CONDITIONS

1. Turn on the power of EUT.
2. The communication partner run test program “art.exe [R09b21]” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

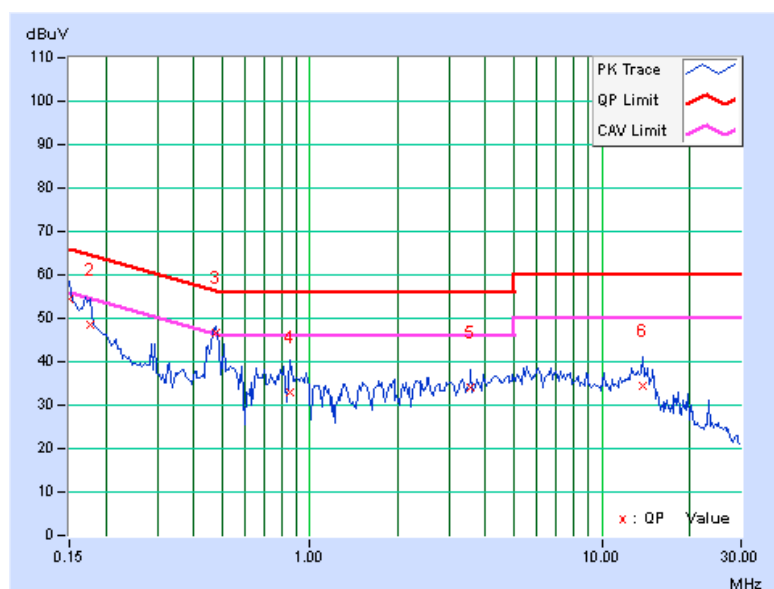
4.1.7 TEST RESULTS

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.10	54.35	41.12	54.45	41.22	66.00	56.00	-11.55	-14.78
2	0.17734	0.11	48.42	34.63	48.53	34.74	64.61	54.61	-16.08	-19.87
3	0.47872	0.14	46.53	41.18	46.67	41.32	56.36	46.36	-9.70	-5.05
4	0.85313	0.16	32.94	26.17	33.10	26.33	56.00	46.00	-22.90	-19.67
5	3.57031	0.30	33.69	28.93	33.99	29.23	56.00	46.00	-22.01	-16.77
6	13.78906	0.75	33.77	29.09	34.52	29.84	60.00	50.00	-25.48	-20.16

REMARKS:

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

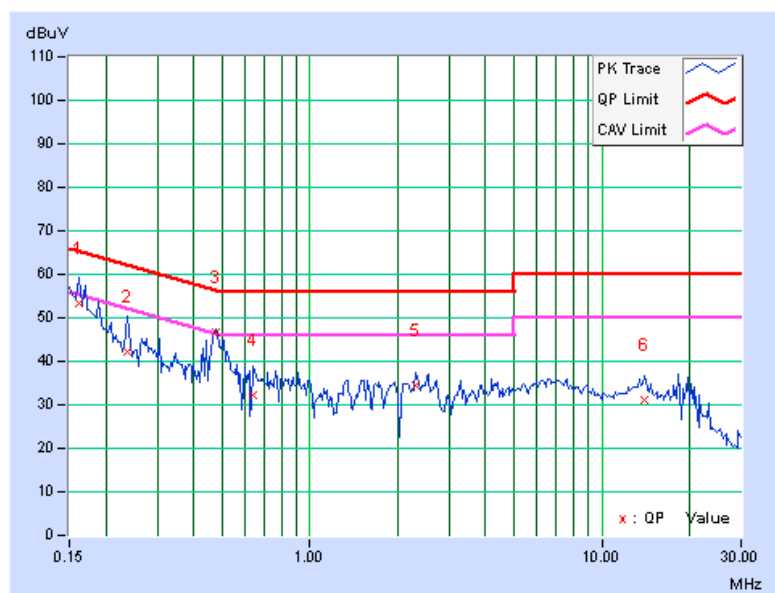


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.08	53.43	42.68	53.51	42.76	65.38	55.38	-11.86	-12.61
2	0.23594	0.10	42.23	31.37	42.33	31.47	62.24	52.24	-19.91	-20.77
3	0.47422	0.12	46.59	42.58	46.71	42.70	56.44	46.44	-9.73	-3.74
4	0.63828	0.13	32.20	24.60	32.33	24.73	56.00	46.00	-23.67	-21.27
5	2.29688	0.21	34.09	29.64	34.30	29.85	56.00	46.00	-21.70	-16.15
6	14.07031	0.55	30.63	25.27	31.18	25.82	60.00	50.00	-28.82	-24.18

REMARKS:

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



4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

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

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

NOTE:

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

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	MY50010156	Jan. 16, 2013	Jan. 15, 2014
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 14, 2012	Nov. 13, 2013
Pre-Amplifier Agilent	8449B	3008A01923	Oct. 30, 2012	Oct. 29, 2013
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 14, 2012	Nov. 13, 2013
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Apr. 06, 2012	Apr. 05, 2013
Horn_Antenna AISI	AIH.8018	0000220091110	Nov. 27, 2012	Nov. 26, 2013
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 12, 2012	Oct. 11, 2013
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 26, 2012	Dec. 25, 2013
RF Cable	NA	CHHCAB_001	Oct. 07, 2012	Oct. 06, 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. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.
6. Tested Date: Mar. 07 to 08, 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.

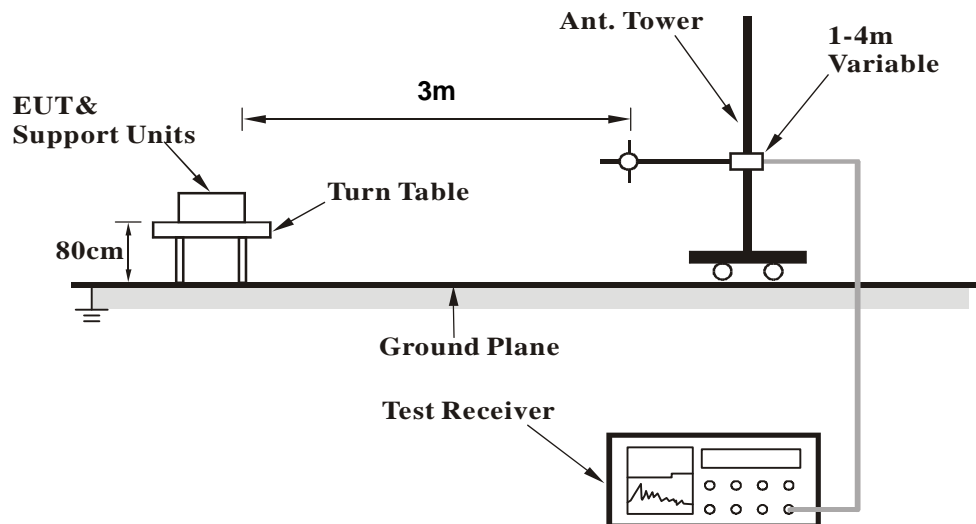
NOTE:

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	108.81	27.4 QP	43.5	-16.1	1.50 H	80	16.57	10.86
2	280.02	31.2 QP	46.0	-14.8	1.00 H	313	16.65	14.51
3	400.01	34.9 QP	46.0	-11.1	2.00 H	165	17.17	17.76
4	600.02	35.5 QP	46.0	-10.5	1.50 H	173	13.24	22.26
5	680.00	31.8 QP	46.0	-14.2	1.00 H	303	8.41	23.41
6	999.95	31.2 QP	54.0	-22.8	1.00 H	242	2.36	28.81
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	43.82	34.6 QP	40.0	-5.4	1.00 V	206	20.51	14.11
2	108.81	32.9 QP	43.5	-10.6	1.50 V	360	22.07	10.86
3	359.99	33.6 QP	46.0	-12.4	1.50 V	347	16.80	16.78
4	500.01	33.2 QP	46.0	-12.8	1.00 V	72	13.12	20.10
5	600.02	32.6 QP	46.0	-13.4	1.50 V	322	10.32	22.26
6	999.95	29.8 QP	54.0	-24.2	1.00 V	38	1.03	28.81

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)
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	1200.20	55.5 PK	74.0	-18.5	1.10 H	131	27.43	28.07
2	1200.20	49.1 AV	54.0	-4.9	1.10 H	131	21.03	28.07
3	1600.00	55.4 PK	74.0	-18.6	1.18 H	215	25.74	29.66
4	1600.00	48.1 AV	54.0	-5.9	1.18 H	215	18.44	29.66
5	2390.00	61.2 PK	74.0	-12.8	1.51 H	7	28.43	32.78
6	2390.00	53.0 AV	54.0	-1.0	1.51 H	7	20.22	32.78
7	*2412.00	111.6 PK			1.51 H	0	78.76	32.84
8	*2412.00	109.4 AV			1.51 H	0	76.56	32.84
9	4824.00	52.5 PK	74.0	-21.5	1.26 H	300	10.23	42.27
10	4824.00	43.5 AV	54.0	-10.5	1.26 H	300	1.23	42.27
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	1200.20	54.4 PK	74.0	-19.6	1.00 V	155	26.33	28.07
2	1200.20	45.4 AV	54.0	-8.6	1.00 V	155	17.33	28.07
3	1600.00	54.1 PK	74.0	-19.9	1.10 V	118	24.44	29.66
4	1600.00	42.8 AV	54.0	-11.2	1.10 V	118	13.14	29.66
5	2386.40	61.1 PK	74.0	-12.9	1.44 V	241	28.33	32.77
6	2386.40	52.1 AV	54.0	-1.9	1.44 V	241	19.33	32.77
7	*2412.00	109.4 PK			1.44 V	241	76.56	32.84
8	*2412.00	107.5 AV			1.44 V	241	74.66	32.84
9	4824.00	58.7 PK	74.0	-15.3	1.33 V	26	16.43	42.27
10	4824.00	52.9 AV	54.0	-1.1	1.33 V	26	10.63	42.27

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	59.2 PK	74.0	-14.8	1.50 H	4	26.42	32.78
2	2390.00	47.1 AV	54.0	-6.9	1.50 H	4	14.32	32.78
3	*2437.00	114.7 PK			1.50 H	4	81.79	32.91
4	*2437.00	112.6 AV			1.50 H	4	79.69	32.91
5	2483.50	61.1 PK	74.0	-12.9	1.50 H	4	28.07	33.03
6	2483.50	46.6 AV	54.0	-7.4	1.50 H	4	13.57	33.03
7	4874.00	57.7 PK	74.0	-16.3	1.01 H	330	15.38	42.32
8	4874.00	53.3 AV	54.0	-0.7	1.01 H	330	10.98	42.32
9	7311.00	57.5 PK	74.0	-16.5	1.00 H	44	10.55	46.95
10	7311.00	49.1 AV	54.0	-4.9	1.00 H	44	2.15	46.95
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	*2437.00	112.0 PK			1.40 V	239	79.09	32.91
2	*2437.00	110.2 AV			1.40 V	239	77.29	32.91
3	4874.00	58.9 PK	74.0	-15.1	1.35 V	19	16.58	42.32
4	4874.00	53.5 AV	54.0	-0.5	1.35 V	19	11.18	42.32
5	7311.00	57.1 PK	74.0	-16.9	1.20 V	69	10.15	46.95
6	7311.00	49.3 AV	54.0	-4.7	1.20 V	69	2.35	46.95

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	113.6 PK			1.50 H	4	80.63	32.97
2	*2462.00	111.6 AV			1.50 H	4	78.63	32.97
3	2483.50	61.1 PK	74.0	-12.9	1.49 H	0	28.07	33.03
4	2483.50	52.5 AV	54.0	-1.5	1.49 H	0	19.47	33.03
5	4924.00	56.6 PK	74.0	-17.4	1.23 H	303	14.28	42.32
6	4924.00	53.2 AV	54.0	-0.8	1.23 H	303	10.88	42.32
7	7386.00	57.9 PK	74.0	-16.1	1.00 H	45	10.71	47.19
8	7386.00	50.7 AV	54.0	-3.3	1.00 H	45	3.51	47.19
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	108.8 PK			1.42 V	333	75.83	32.97
2	*2462.00	106.8 AV			1.42 V	333	73.83	32.97
3	2483.50	60.3 PK	74.0	-13.7	1.42 V	333	27.27	33.03
4	2483.50	49.9 AV	54.0	-4.1	1.42 V	333	16.87	33.03
5	4924.00	55.4 PK	74.0	-18.6	1.00 V	353	13.08	42.32
6	4924.00	50.6 AV	54.0	-3.4	1.00 V	353	8.28	42.32
7	7386.00	57.2 PK	74.0	-16.8	1.20 V	77	10.01	47.19
8	7386.00	49.6 AV	54.0	-4.4	1.20 V	77	2.41	47.19

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	67.5 PK	74.0	-6.5	1.26 H	2	34.72	32.78
2	2390.00	53.0 AV	54.0	-1.0	1.26 H	2	20.22	32.78
3	*2412.00	112.2 PK			1.26 H	2	79.36	32.84
4	*2412.00	102.5 AV			1.26 H	2	69.66	32.84
5	4824.00	49.9 PK	74.0	-24.1	1.00 H	286	7.63	42.27
6	4824.00	38.2 AV	54.0	-15.8	1.00 H	286	-4.07	42.27
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	62.7 PK	74.0	-11.3	1.00 V	263	29.92	32.78
2	2390.00	50.5 AV	54.0	-3.5	1.00 V	263	17.72	32.78
3	*2412.00	109.2 PK			1.00 V	263	76.36	32.84
4	*2412.00	100.7 AV			1.00 V	263	67.86	32.84
5	4824.00	54.9 PK	74.0	-19.1	1.06 V	345	12.63	42.27
6	4824.00	42.0 AV	54.0	-12.0	1.06 V	345	-0.27	42.27

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	65.1 PK	74.0	-8.9	1.26 H	2	32.32	32.78
2	2390.00	53.5 AV	54.0	-0.5	1.26 H	2	20.72	32.78
3	*2437.00	117.8 PK			1.50 H	2	84.89	32.91
4	*2437.00	108.8 AV			1.50 H	2	75.89	32.91
5	2483.50	64.5 PK	74.0	-9.5	1.45 H	2	31.47	33.03
6	2483.50	51.6 AV	54.0	-2.4	1.45 H	2	18.57	33.03
7	4874.00	49.7 PK	74.0	-24.3	1.00 H	283	7.38	42.32
8	4874.00	41.1 AV	54.0	-12.9	1.00 H	283	-1.22	42.32
9	7311.00	59.9 PK	74.0	-14.1	1.12 H	48	12.95	46.95
10	7311.00	48.1 AV	54.0	-5.9	1.12 H	48	1.15	46.95
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	*2437.00	116.8 PK			1.00 V	258	83.89	32.91
2	*2437.00	108.2 AV			1.00 V	258	75.29	32.91
3	4874.00	58.8 PK	74.0	-15.2	1.05 V	346	16.48	42.32
4	4874.00	45.4 AV	54.0	-8.6	1.05 V	346	3.08	42.32
5	7311.00	61.1 PK	74.0	-12.9	1.25 V	70	14.15	46.95
6	7311.00	47.9 AV	54.0	-6.1	1.25 V	70	0.95	46.95

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	114.2 PK			1.46 H	6	81.23	32.97
2	*2462.00	105.1 AV			1.46 H	6	72.13	32.97
3	2483.50	68.3 PK	74.0	-5.7	1.46 H	6	35.27	33.03
4	2483.50	53.0 AV	54.0	-1.0	1.46 H	6	19.97	33.03
5	4924.00	50.1 PK	74.0	-23.9	1.00 H	298	7.78	42.32
6	4924.00	39.1 AV	54.0	-14.9	1.00 H	298	-3.22	42.32
7	7386.00	59.2 PK	74.0	-14.8	1.12 H	49	12.01	47.19
8	7386.00	47.3 AV	54.0	-6.7	1.12 H	49	0.11	47.19
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	112.6 PK			1.00 V	267	79.63	32.97
2	*2462.00	103.8 AV			1.00 V	267	70.83	32.97
3	2483.50	64.8 PK	74.0	-9.2	1.00 V	267	31.77	33.03
4	2483.50	51.2 AV	54.0	-2.8	1.00 V	267	18.17	33.03
5	4924.00	54.8 PK	74.0	-19.2	1.00 V	349	12.48	42.32
6	4924.00	41.7 AV	54.0	-12.3	1.00 V	349	-0.62	42.32
7	7386.00	56.5 PK	74.0	-17.5	1.25 V	66	9.31	47.19
8	7386.00	44.9 AV	54.0	-9.1	1.25 V	66	-2.29	47.19

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.5 PK	74.0	-7.5	1.26 H	2	33.72	32.78
2	2390.00	53.2 AV	54.0	-0.8	1.26 H	2	20.42	32.78
3	*2412.00	110.1 PK			1.26 H	2	77.26	32.84
4	*2412.00	100.5 AV			1.26 H	2	67.66	32.84
5	4824.00	48.9 PK	74.0	-25.1	1.00 H	286	6.63	42.27
6	4824.00	38.1 AV	54.0	-15.9	1.00 H	286	-4.17	42.27
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.3 PK	74.0	-12.7	1.06 V	259	28.52	32.78
2	2390.00	49.3 AV	54.0	-4.7	1.06 V	259	16.52	32.78
3	*2412.00	107.2 PK			1.06 V	259	74.36	32.84
4	*2412.00	98.9 AV			1.06 V	259	66.06	32.84
5	4824.00	54.7 PK	74.0	-19.3	1.04 V	338	12.43	42.27
6	4824.00	42.1 AV	54.0	-11.9	1.04 V	338	-0.17	42.27

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	64.5 PK	74.0	-9.5	1.26 H	2	31.72	32.78
2	2390.00	53.1 AV	54.0	-0.9	1.26 H	2	20.32	32.78
3	*2437.00	117.0 PK			1.26 H	2	84.09	32.91
4	*2437.00	107.6 AV			1.26 H	2	74.69	32.91
5	2483.50	63.7 PK	74.0	-10.3	1.45 H	2	30.67	33.03
6	2483.50	51.1 AV	54.0	-2.9	1.45 H	2	18.07	33.03
7	4874.00	52.7 PK	74.0	-21.3	1.00 H	283	10.38	42.32
8	4874.00	41.3 AV	54.0	-12.7	1.00 H	283	-1.02	42.32
9	7311.00	62.1 PK	74.0	-11.9	1.14 H	43	15.15	46.95
10	7311.00	49.6 AV	54.0	-4.4	1.14 H	43	2.65	46.95
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	*2437.00	115.4 PK			1.03 V	267	82.49	32.91
2	*2437.00	106.5 AV			1.03 V	267	73.59	32.91
3	4874.00	59.0 PK	74.0	-15.0	1.09 V	337	16.68	42.32
4	4874.00	45.4 AV	54.0	-8.6	1.09 V	337	3.08	42.32
5	7311.00	61.5 PK	74.0	-12.5	1.28 V	80	14.55	46.95
6	7311.00	48.4 AV	54.0	-5.6	1.28 V	80	1.45	46.95

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	112.7 PK			1.45 H	2	79.73	32.97
2	*2462.00	103.4 AV			1.45 H	2	70.43	32.97
3	2483.50	65.4 PK	74.0	-8.6	1.44 H	2	32.37	33.03
4	2483.50	53.2 AV	54.0	-0.8	1.44 H	2	20.17	33.03
5	4924.00	50.2 PK	74.0	-23.8	1.00 H	298	7.88	42.32
6	4924.00	38.7 AV	54.0	-15.3	1.00 H	298	-3.62	42.32
7	7386.00	57.6 PK	74.0	-16.4	1.12 H	41	10.41	47.19
8	7386.00	46.1 AV	54.0	-7.9	1.12 H	41	-1.09	47.19
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	110.6 PK			1.05 V	259	77.63	32.97
2	*2462.00	101.9 AV			1.05 V	259	68.93	32.97
3	2483.50	63.4 PK	74.0	-10.6	1.05 V	259	30.37	33.03
4	2483.50	50.2 AV	54.0	-3.8	1.05 V	259	17.17	33.03
5	4924.00	54.8 PK	74.0	-19.2	1.00 V	349	12.48	42.32
6	4924.00	41.9 AV	54.0	-12.1	1.00 V	349	-0.42	42.32
7	7386.00	56.5 PK	74.0	-17.5	1.20 V	68	9.31	47.19
8	7386.00	45.1 AV	54.0	-8.9	1.20 V	68	-2.09	47.19

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	66.5 PK	74.0	-7.5	1.27 H	1	33.72	32.78
2	2390.00	53.3 AV	54.0	-0.7	1.27 H	1	20.52	32.78
3	*2422.00	104.8 PK			1.27 H	1	71.93	32.87
4	*2422.00	95.2 AV			1.27 H	1	62.33	32.87
5	4844.00	49.8 PK	74.0	-24.2	1.00 H	250	7.51	42.29
6	4844.00	37.8 AV	54.0	-16.2	1.00 H	250	-4.49	42.29
7	7266.00	54.7 PK	74.0	-19.3	1.00 H	55	7.89	46.81
8	7266.00	43.3 AV	54.0	-10.7	1.00 H	55	-3.51	46.81
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.6 PK	74.0	-10.4	1.43 V	249	30.82	32.78
2	2390.00	51.3 AV	54.0	-2.7	1.43 V	249	18.52	32.78
3	*2422.00	103.8 PK			1.43 V	249	70.93	32.87
4	*2422.00	95.3 AV			1.43 V	249	62.43	32.87
5	4844.00	55.1 PK	74.0	-18.9	1.02 V	356	12.81	42.29
6	4844.00	42.0 AV	54.0	-12.0	1.02 V	356	-0.29	42.29
7	7266.00	56.7 PK	74.0	-17.3	1.22 V	69	9.89	46.81
8	7266.00	45.3 AV	54.0	-8.7	1.22 V	69	-1.51	46.81

REMARKS:

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.9 PK	74.0	-6.1	1.26 H	3	35.12	32.78
2	2390.00	53.1 AV	54.0	-0.9	1.26 H	3	20.32	32.78
3	*2437.00	110.2 PK			1.27 H	3	77.29	32.91
4	*2437.00	99.8 AV			1.27 H	3	66.89	32.91
5	2483.50	62.3 PK	74.0	-11.7	1.46 H	3	29.27	33.03
6	2483.50	49.1 AV	54.0	-4.9	1.46 H	3	16.07	33.03
7	4874.00	50.3 PK	74.0	-23.7	1.00 H	274	7.98	42.32
8	4874.00	37.7 AV	54.0	-16.3	1.00 H	274	-4.62	42.32
9	7311.00	55.1 PK	74.0	-18.9	1.00 H	51	8.15	46.95
10	7311.00	43.1 AV	54.0	-10.9	1.00 H	51	-3.85	46.95

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	*2437.00	109.8 PK			1.43 V	251	76.89	32.91
2	*2437.00	98.9 AV			1.43 V	251	65.99	32.91
3	4874.00	55.0 PK	74.0	-19.0	1.00 V	353	12.68	42.32
4	4874.00	41.8 AV	54.0	-12.2	1.00 V	353	-0.52	42.32
5	7311.00	56.9 PK	74.0	-17.1	1.25 V	66	9.95	46.95
6	7311.00	45.3 AV	54.0	-8.7	1.25 V	66	-1.65	46.95

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	105.3 PK			1.47 H	3	72.35	32.95
2	*2452.00	95.3 AV			1.47 H	3	62.35	32.95
3	2483.50	68.7 PK	74.0	-5.3	1.47 H	3	35.67	33.03
4	2483.50	53.2 AV	54.0	-0.8	1.47 H	3	20.17	33.03
5	4904.00	50.1 PK	74.0	-23.9	1.00 H	277	7.76	42.34
6	4904.00	38.3 AV	54.0	-15.7	1.00 H	277	-4.04	42.34
7	7356.00	54.5 PK	74.0	-19.5	1.00 H	60	7.41	47.09
8	7356.00	43.1 AV	54.0	-10.9	1.00 H	60	-3.99	47.09
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	108.0 PK			1.44 V	239	75.05	32.95
2	*2452.00	94.9 AV			1.44 V	239	61.95	32.95
3	2483.50	66.9 PK	74.0	-7.1	1.44 V	239	33.87	33.03
4	2483.50	51.9 AV	54.0	-2.1	1.44 V	239	18.87	33.03
5	4904.00	54.6 PK	74.0	-19.4	1.00 V	336	12.26	42.34
6	4904.00	41.3 AV	54.0	-12.7	1.00 V	336	-1.04	42.34
7	7356.00	56.7 PK	74.0	-17.3	1.30 V	65	9.61	47.09
8	7356.00	45.1 AV	54.0	-8.9	1.30 V	65	-1.99	47.09

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 : Mar. 08, 2013

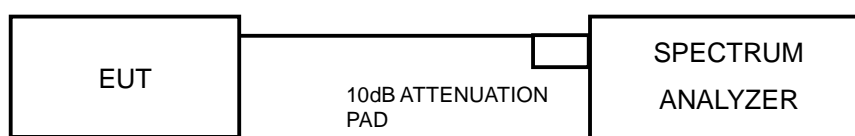
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

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

4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	12.67	12.32	0.5	PASS
6	2437	12.67	12.10	0.5	PASS
11	2462	12.29	12.79	0.5	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.14	16.45	0.5	PASS
6	2437	16.39	16.46	0.5	PASS
11	2462	16.42	16.42	0.5	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.57	17.67	0.5	PASS
6	2437	17.62	17.68	0.5	PASS
11	2462	17.63	17.67	0.5	PASS

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	35.22	36.32	0.5	PASS
6	2437	35.84	36.42	0.5	PASS
9	2452	35.47	36.31	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 $NANT \leq 4$;

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

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

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

4.4.2 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 : Mar 08, 2013

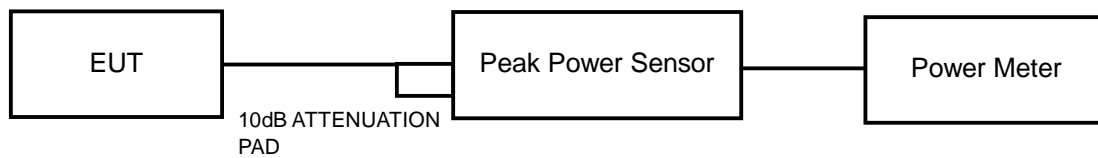
4.4.3 TEST PROCEDURES

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 (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	20.91	22.24	290.804	24.64	30	PASS
6	2437	23.54	24.71	521.745	27.17	30	PASS
11	2462	22.34	23.62	401.540	26.04	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	23.82	25.34	582.970	27.66	30	PASS
6	2437	26.67	26.74	936.578	29.72	30	PASS
11	2462	26.62	26.90	948.977	29.77	30	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	22.13	24.01	415.073	26.18	30	PASS
6	2437	26.81	26.74	951.796	29.79	30	PASS
11	2462	26.54	26.93	943.991	29.75	30	PASS

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
3	2422	20.01	21.61	245.108	23.89	30	PASS
6	2437	25.33	26.42	779.724	28.92	30	PASS
9	2452	20.43	21.82	262.463	24.19	30	PASS

4.5 AVERAGE OUTPUT POWER

4.5.1 FOR REFERENCE

4.5.2 TEST 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

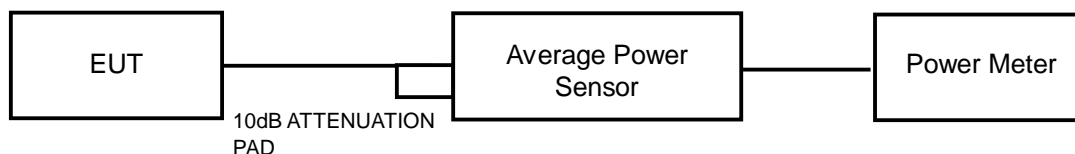
Note:

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 : Mar. 13, 2013

4.5.3 TEST PROCEDURES

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

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.5.6 TEST RESULTS

802.11b

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	18.44	19.81	165.542	22.19
6	2437	20.91	22.41	297.491	24.73
11	2462	20.11	21.32	238.084	23.77

802.11g

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	15.71	17.01	87.473	19.42
6	2437	17.61	18.23	124.204	20.94
11	2462	17.84	18.74	135.631	21.32

802.11n (HT20)

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	13.71	15.71	60.735	17.83
6	2437	17.00	18.13	115.132	20.61
11	2462	18.01	19.11	144.711	21.61

802.11n (HT40)

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
3	2422	11.93	13.73	39.201	15.93
6	2437	16.91	18.53	120.376	20.81
9	2452	12.31	13.91	41.626	16.19

4.6 POWER SPECTRAL DENSITY MEASUREMENT

4.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

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

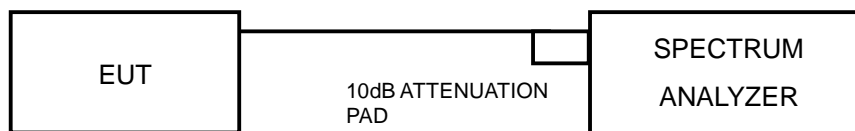
4.6.3 TEST PROCEDURE

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.

4.6.4 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

802.11b

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-3.56	3.01	-0.55	8	PASS
	6	2437	1.05	3.01	4.06	8	PASS
	11	2462	-2.92	3.01	0.09	8	PASS
1	1	2412	-3.23	3.01	-0.22	8	PASS
	6	2437	-2.20	3.01	0.81	8	PASS
	11	2462	-2.34	3.01	0.67	8	PASS

NOTE: Directional gain = $0.83\text{dBi} + 10\log(2) = 3.84\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.

802.11g

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-11.17	3.01	-8.16	8	PASS
	6	2437	-8.88	3.01	-5.87	8	PASS
	11	2462	-9.16	3.01	-6.15	8	PASS
1	1	2412	-8.69	3.01	-5.68	8	PASS
	6	2437	-5.11	3.01	-2.10	8	PASS
	11	2462	-6.63	3.01	-3.62	8	PASS

NOTE: Directional gain = $0.83\text{dBi} + 10\log(2) = 3.84\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.

802.11n (HT20)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-13.38	3.01	-10.37	8	PASS
	6	2437	-9.10	3.01	-6.09	8	PASS
	11	2462	-9.07	3.01	-6.06	8	PASS
1	1	2412	-10.02	3.01	-7.01	8	PASS
	6	2437	-1.90	3.01	1.11	8	PASS
	11	2462	-8.09	3.01	-5.08	8	PASS

NOTE: Directional gain = $0.83\text{dBi} + 10\log(2) = 3.84\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.



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802.11n (HT40)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-16.77	3.01	-13.76	8	PASS
	6	2437	-12.57	3.01	-9.56	8	PASS
	9	2452	-17.34	3.01	-14.33	8	PASS
1	3	2422	-7.03	3.01	-4.02	8	PASS
	6	2437	-6.71	3.01	-3.70	8	PASS
	9	2452	-13.68	3.01	-10.67	8	PASS

NOTE: Directional gain = $0.83\text{dBi} + 10\log(2) = 3.84\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.



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4.7 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.7.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.7.2 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 : Mar. 08, 2013

4.7.3 TEST PROCEDURE

Measurement Procedure - Reference Level

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

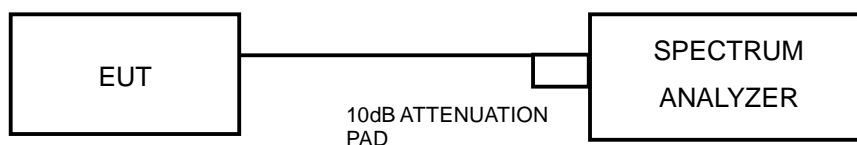
Measurement Procedure –Unwanted Emission Level

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

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



4.7.6 EUT OPERATING CONDITION

Same as Item 4.3.6

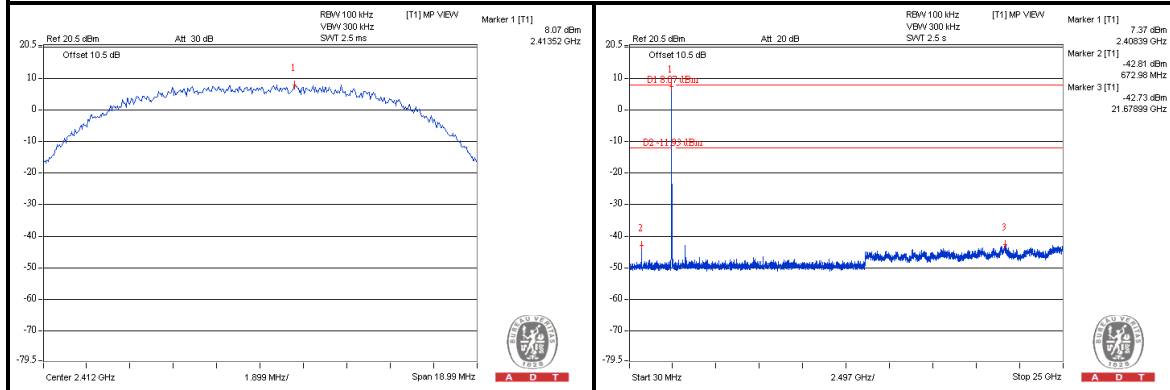
4.7.7 TEST RESULTS

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.

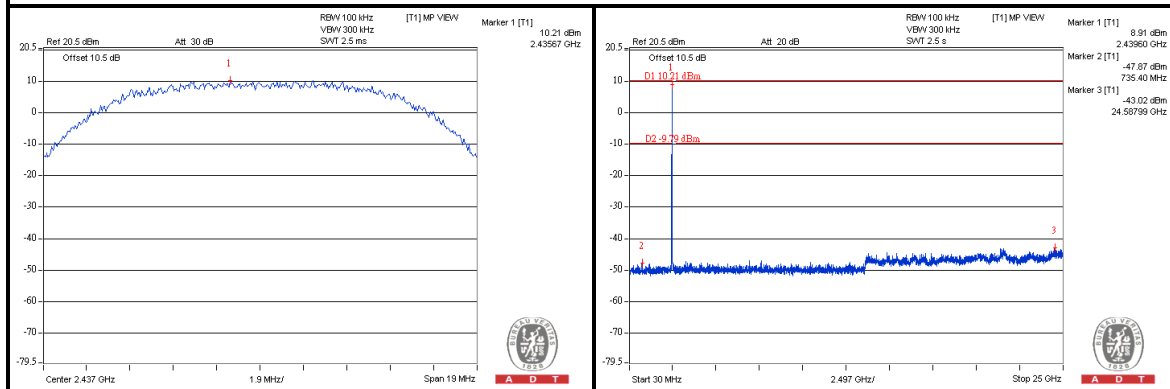
802.11b:

For Chain 0

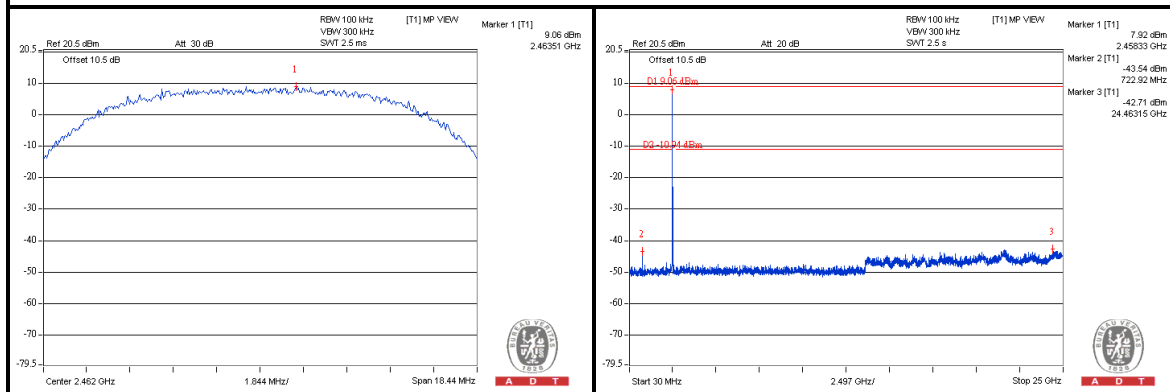
CH 1



CH 6



CH 11

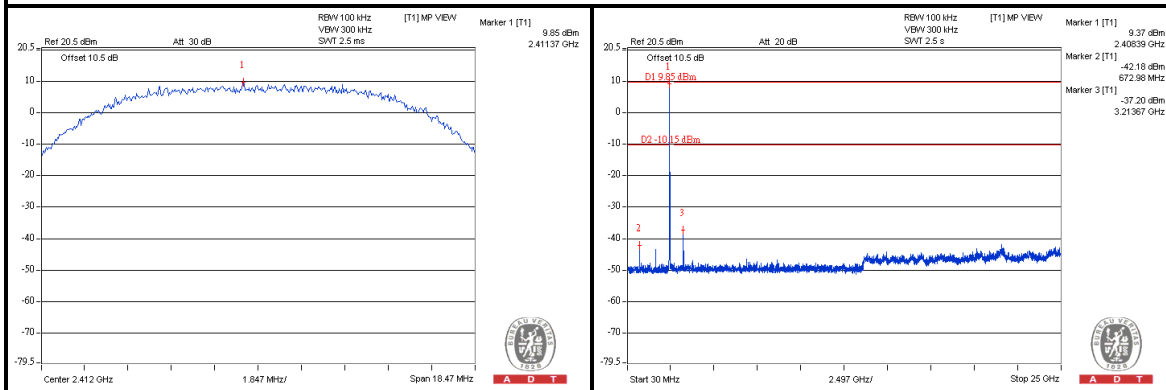




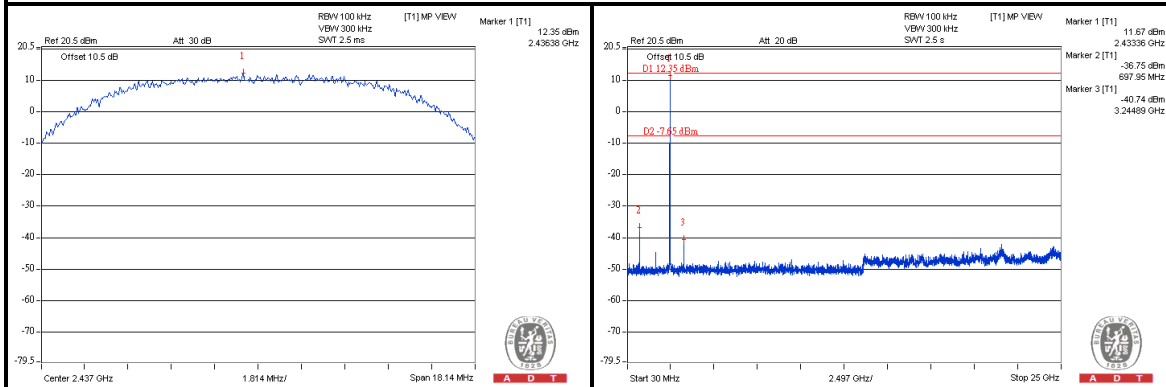
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For Chain 1

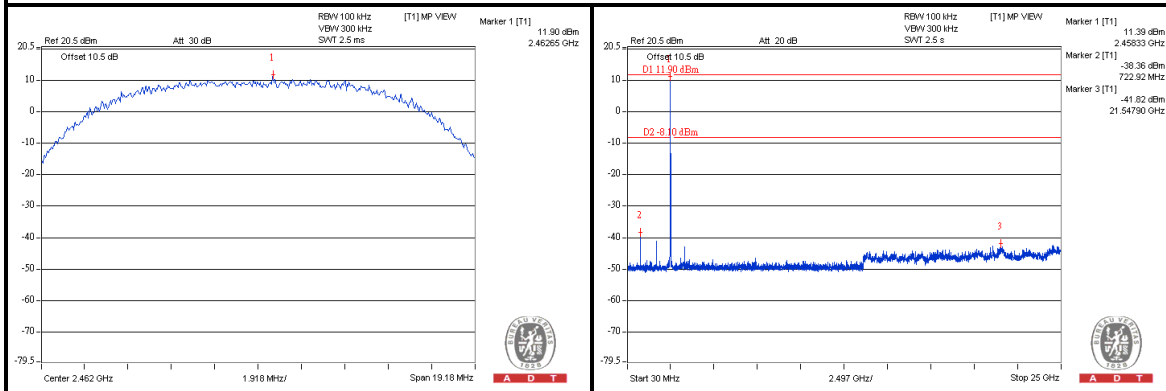
CH 1



CH 6



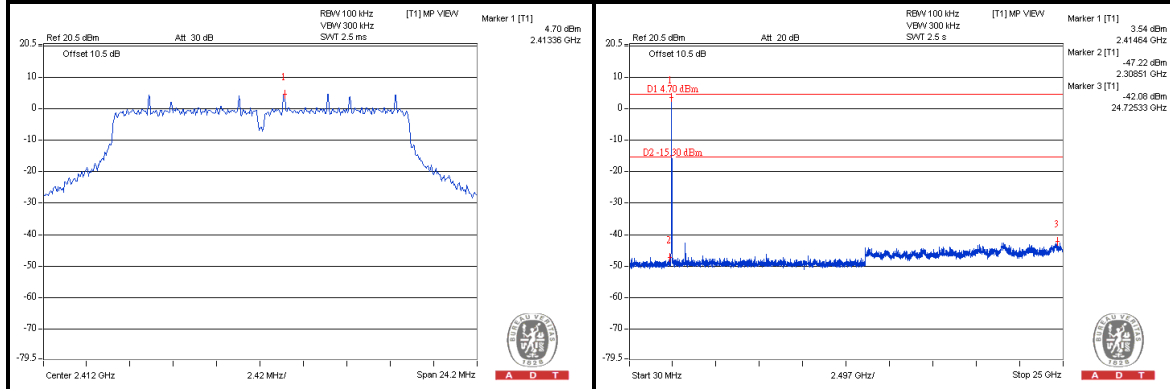
CH 11



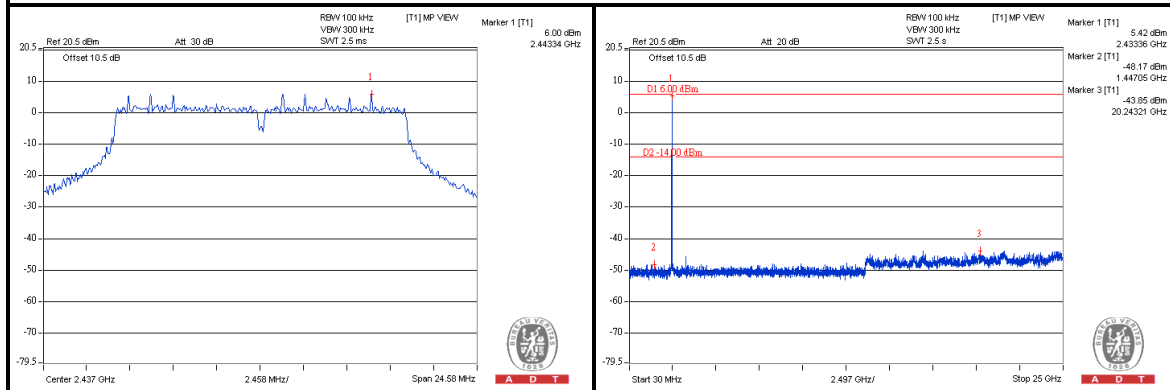
802.11g:

For Chain 0

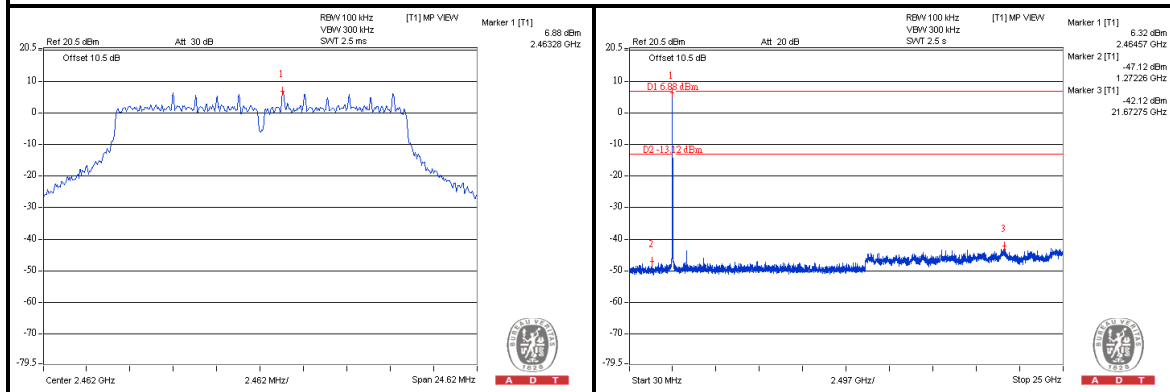
CH 1



CH 6



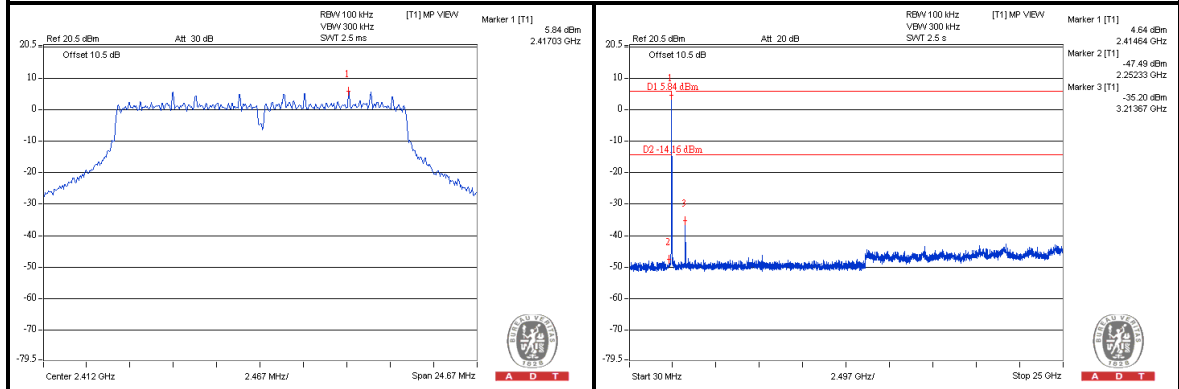
CH 11



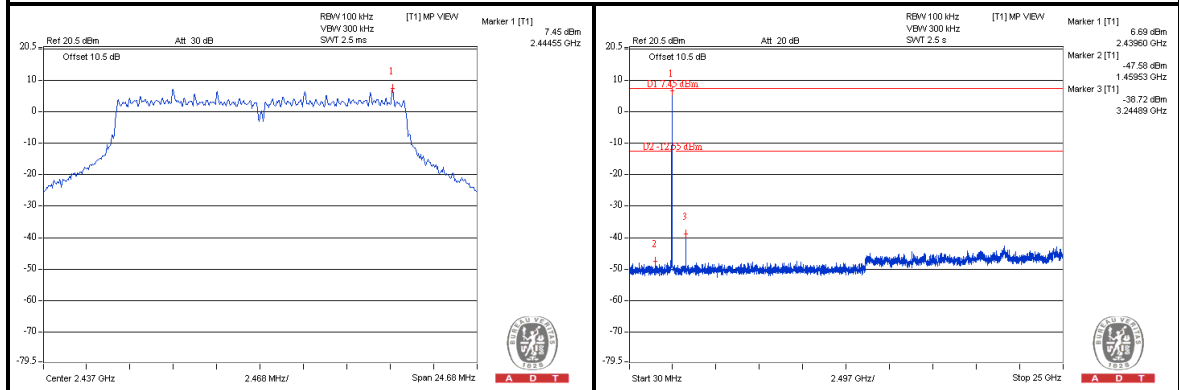


A D T

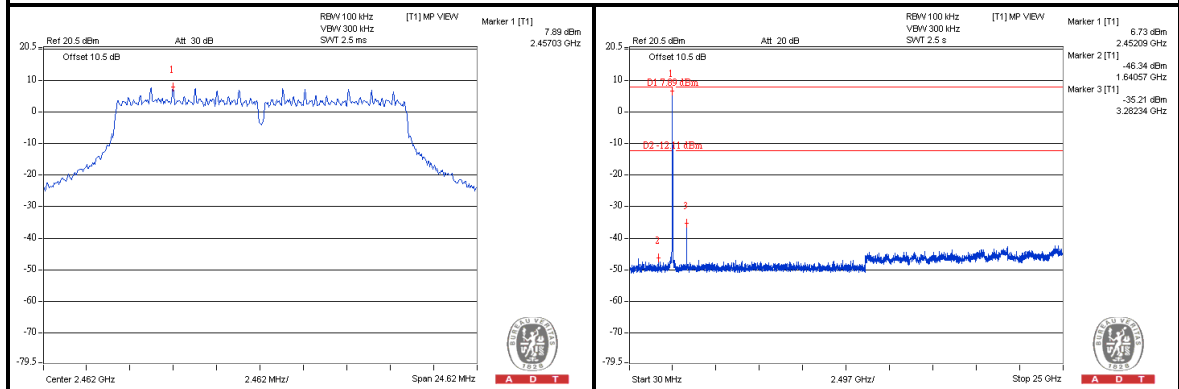
For Chain 1 CH 1



CH 6



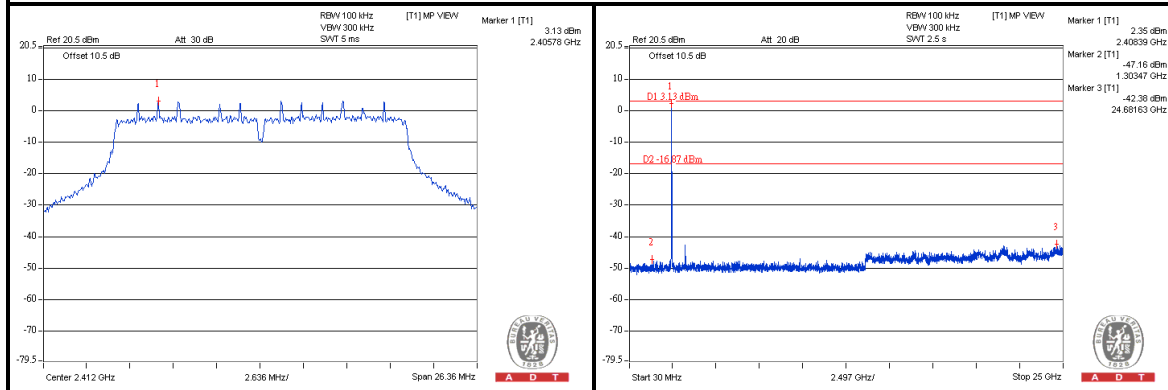
CH 11



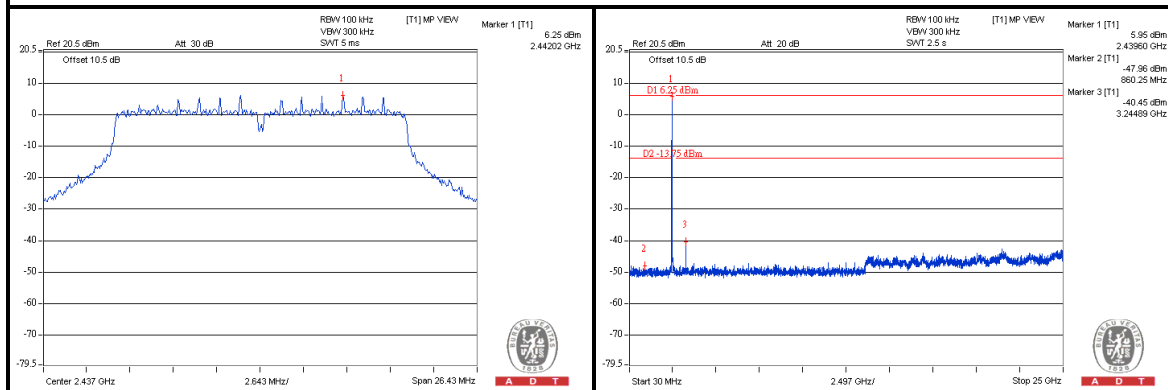
802.11n (HT20):

For Chain 0

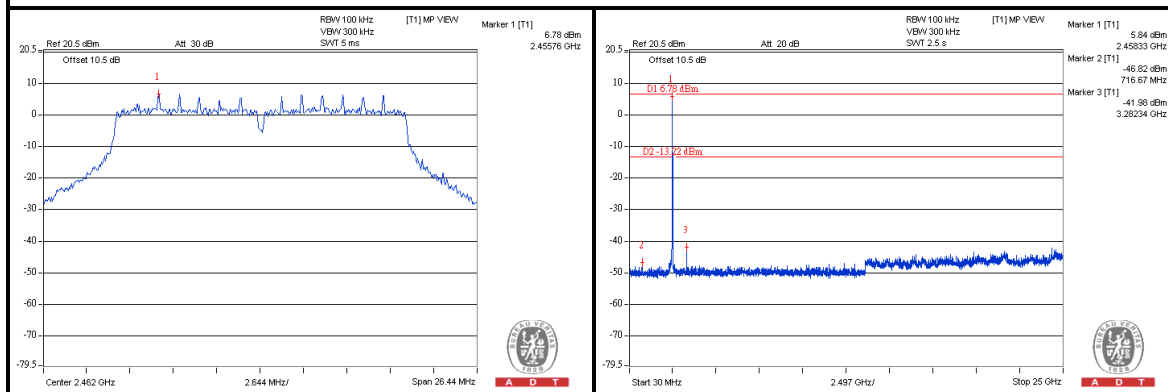
CH 1



CH 6



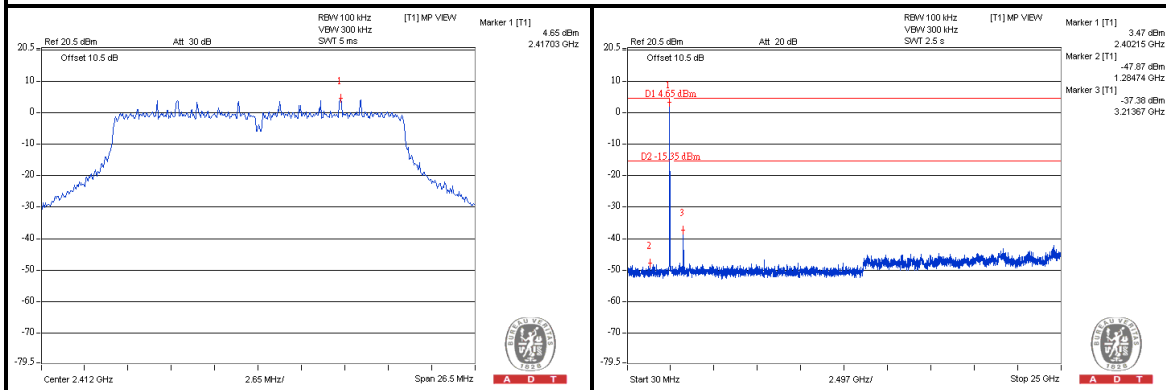
CH 11



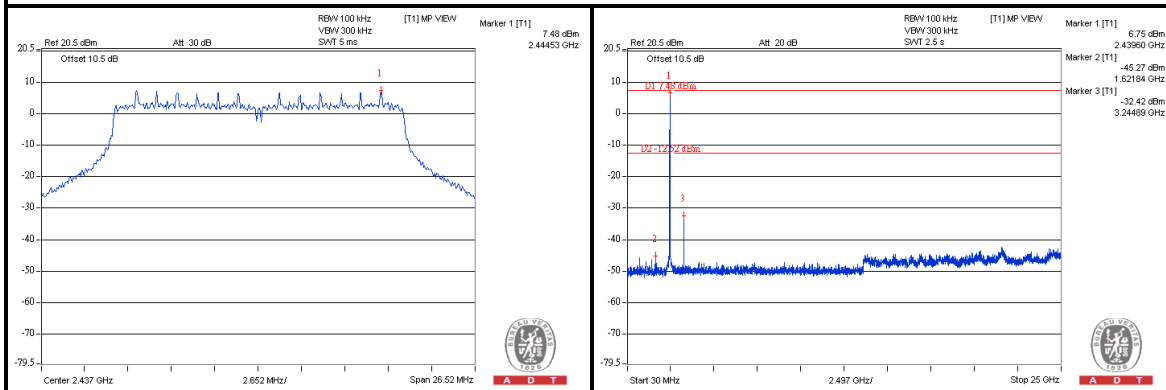


A D T

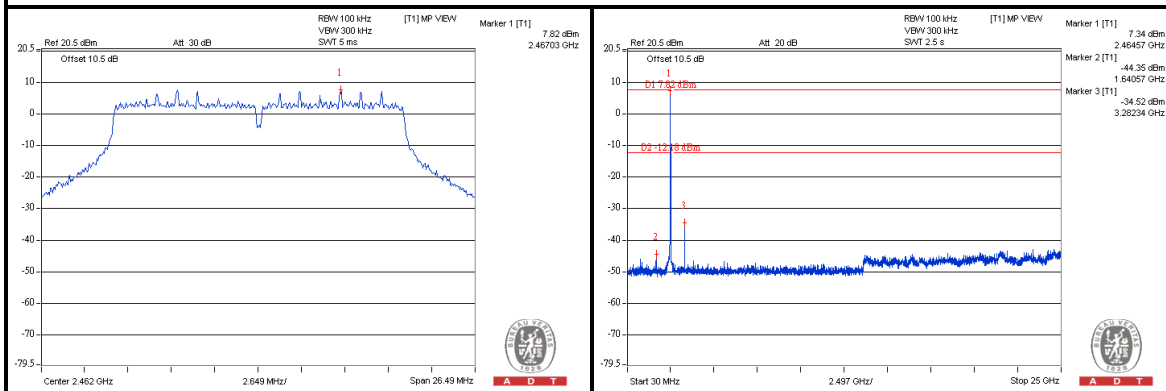
For Chain 1 CH 1



CH 6



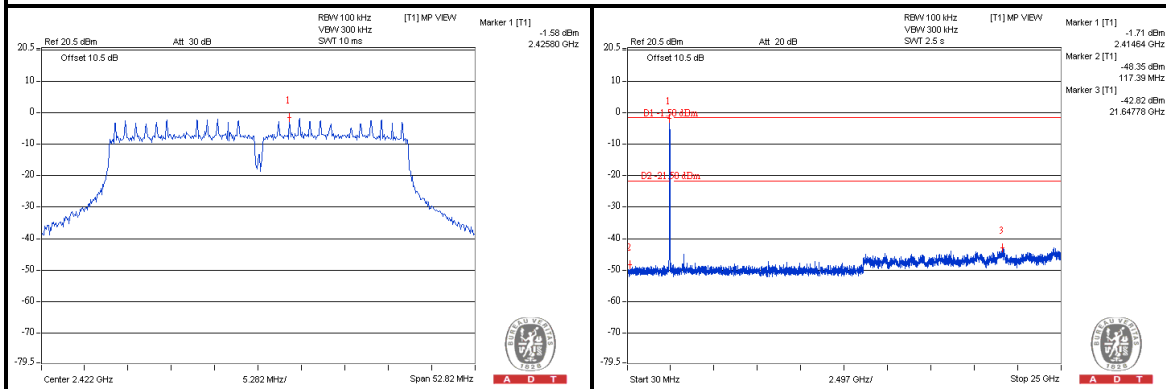
CH 11



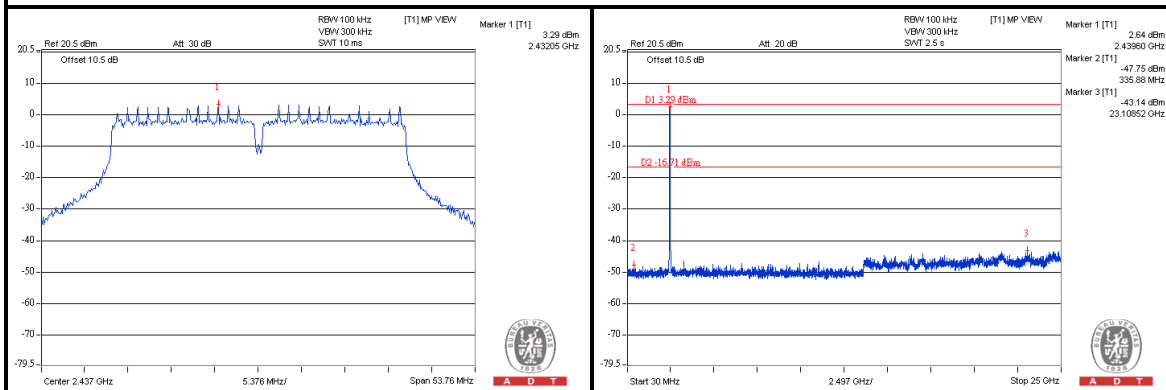
802.11n (HT40):

For Chain 0

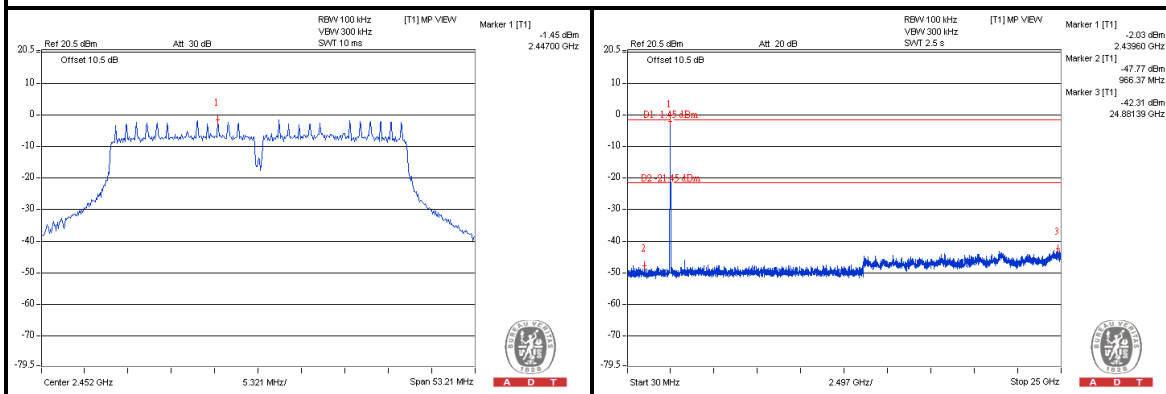
CH 3



CH 6



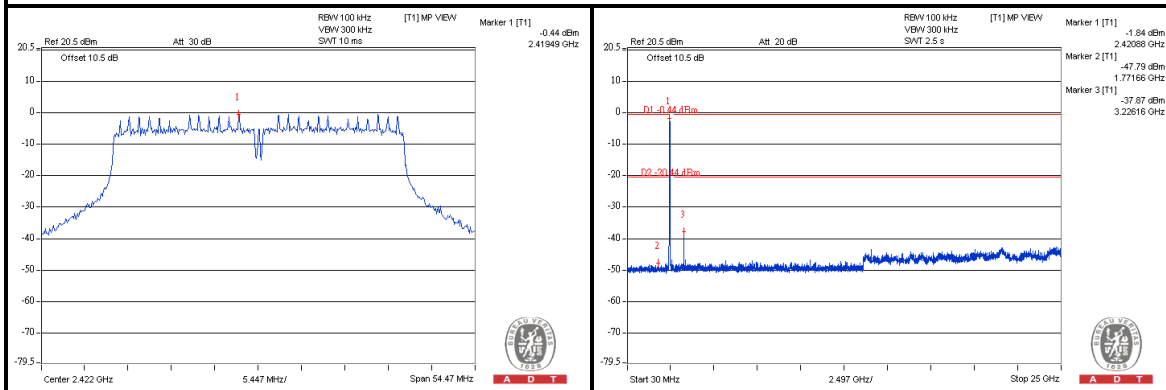
CH 9



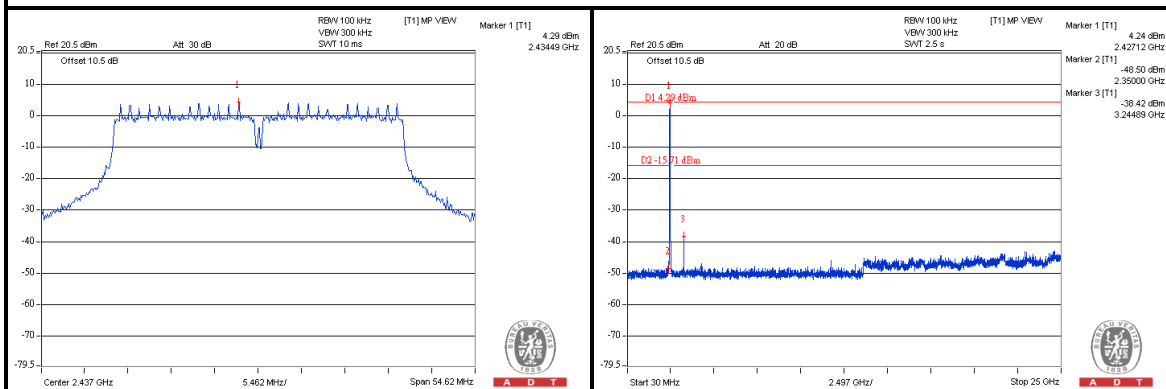


A D T

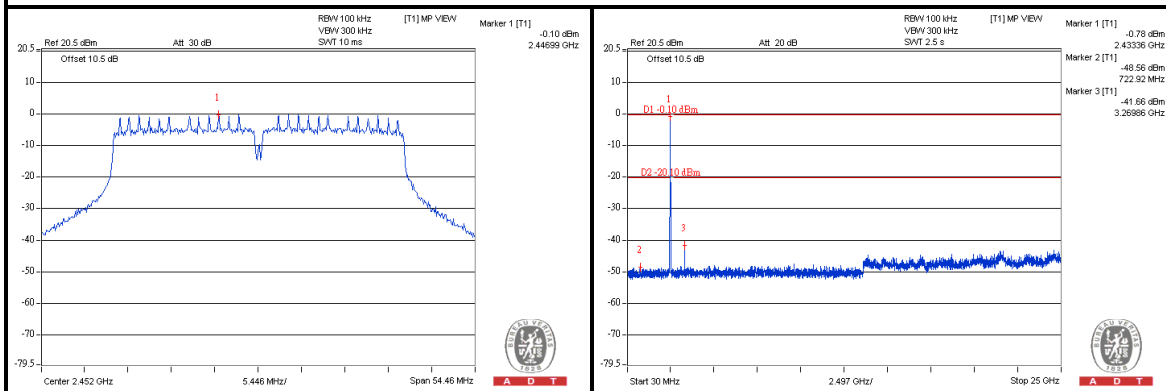
For Chain 1 CH 3



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 (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

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: May 09, 2013

5.1.3 TEST PROCEDURES

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

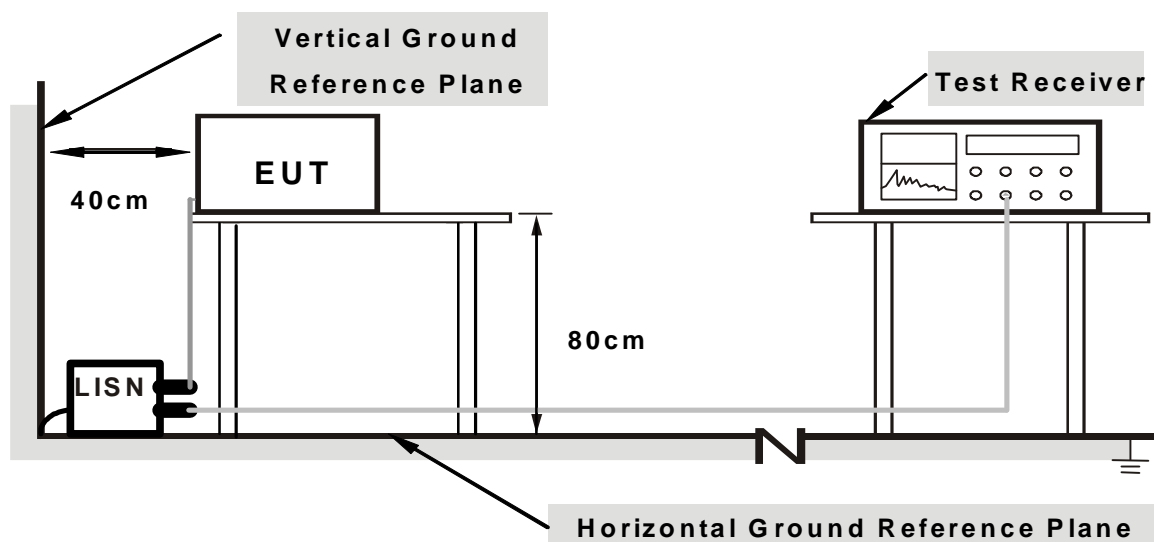
NOTE:

- 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

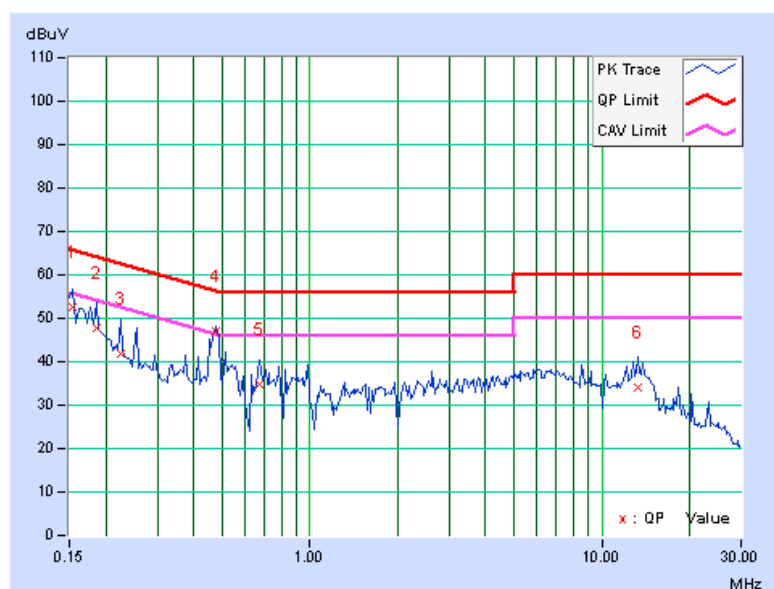
5.1.7 TEST RESULTS

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.10	52.45	37.49	52.55	37.59	65.79	55.79	-13.24	-18.20
2	0.18516	0.11	47.57	35.94	47.68	36.05	64.25	54.25	-16.57	-18.20
3	0.22422	0.11	41.82	29.70	41.93	29.81	62.66	52.66	-20.73	-22.85
4	0.47422	0.13	47.02	42.34	47.15	42.47	56.44	46.44	-9.28	-3.96
5	0.67344	0.15	34.82	30.84	34.97	30.99	56.00	46.00	-21.03	-15.01
6	13.23828	0.73	33.49	28.99	34.22	29.72	60.00	50.00	-25.78	-20.28

REMARKS:

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

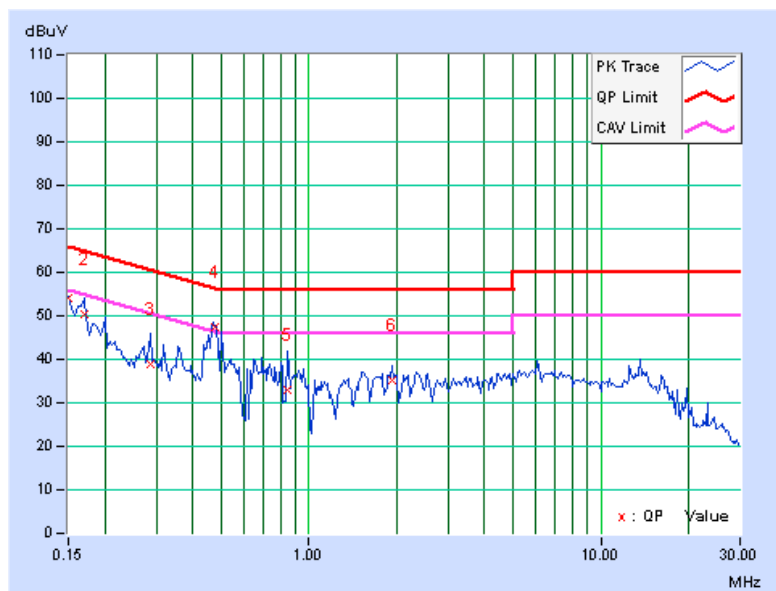


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.08	53.86	41.57	53.94	41.65	66.00	56.00	-12.06	-14.35
2	0.16953	0.08	50.12	37.05	50.20	37.13	64.98	54.98	-14.78	-17.85
3	0.28672	0.10	38.95	33.96	39.05	34.06	60.62	50.62	-21.57	-16.56
4	0.47731	0.12	47.34	42.20	47.46	42.32	56.39	46.39	-8.92	-4.06
5	0.84922	0.14	32.76	25.33	32.90	25.47	56.00	46.00	-23.10	-20.53
6	1.92578	0.19	35.02	31.06	35.21	31.25	56.00	46.00	-20.79	-14.75

REMARKS:

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



5.2 RADIATED AND BANDEGE EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED AND BANDEGE EMISSION MEASUREMENT

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

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

NOTE:

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

5.2.2 TEST INSTRUMENTS

For below 1GHz test

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	MY50010156	Jan. 16, 2013	Jan. 15, 2014
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 14, 2012	Nov. 13, 2013
Pre-Amplifier Agilent	8449B	3008A01923	Oct. 30, 2012	Oct. 29, 2013
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 14, 2012	Nov. 13, 2013
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Mar 25, 2013	Mar 24, 2014
Horn_Antenna AISI	AIH.8018	0000220091110	Nov. 27, 2012	Nov. 26, 2013
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 12, 2012	Oct. 11, 2013
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 26, 2012	Dec. 25, 2013
RF Cable	NA	CHHCAB_001	Oct. 07, 2012	Oct. 06, 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. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.
6. Tested Date: May 15, 2013

**A D T****For above 1GHz test**

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 AISl	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: May 09, 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.

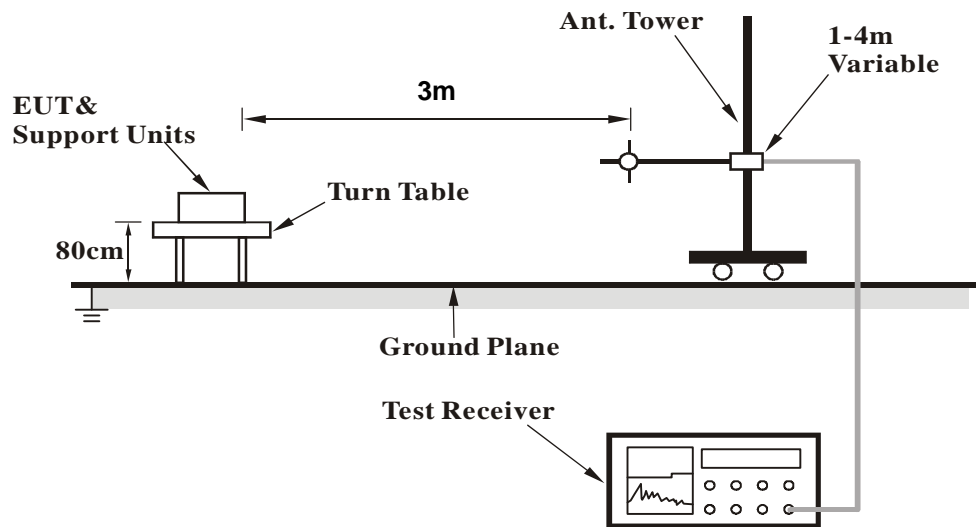
NOTE:

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

802.11a

CHANNEL	TX Channel 149	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	108.21	27.1 QP	43.5	-16.4	1.10 H	89	44.01	-16.91
2	265.01	30.4 QP	46.0	-15.6	1.24 H	300	44.26	-13.85
3	401.01	35.1 QP	46.0	-10.9	1.41 H	100	45.12	-10.00
4	598.21	35.0 QP	46.0	-11.0	1.34 H	210	40.62	-5.61
5	678.00	31.5 QP	46.0	-14.6	1.47 H	65	35.89	-4.44
6	999.78	31.0 QP	54.0	-23.0	1.45 H	31	29.47	1.54
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	43.82	34.6 QP	40.0	-5.4	1.47 V	99	48.07	-13.43
2	108.30	32.9 QP	43.5	-10.6	1.47 V	77	49.77	-16.90
3	356.00	33.5 QP	46.0	-12.5	1.24 V	22	44.56	-11.06
4	499.00	33.2 QP	46.0	-12.8	1.32 V	23	40.89	-7.73
5	600.00	32.5 QP	46.0	-13.5	1.64 V	46	38.09	-5.57
6	999.00	35.8 QP	54.0	-18.3	1.54 V	65	34.23	1.52

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)
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	3830.00	48.6 PK	74.0	-25.4	1.14 H	135	45.53	3.07
2	3830.00	40.3 AV	54.0	-13.7	1.14 H	135	37.23	3.07
3	*5745.00	103.8 PK			1.00 H	321	93.85	9.95
4	*5745.00	94.6 AV			1.00 H	321	84.65	9.95
5	7660.00	56.4 PK	74.0	-17.6	1.49 H	117	41.73	14.67
6	7660.00	44.2 AV	54.0	-9.8	1.49 H	117	29.53	14.67
7	11490.00	65.0 PK	74.0	-9.0	1.54 H	66	48.48	16.52
8	11490.00	52.8 AV	54.0	-1.2	1.54 H	66	36.28	16.52
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	3830.00	52.8 PK	74.0	-21.2	1.05 V	98	49.73	3.07
2	3830.00	48.7 AV	54.0	-5.3	1.05 V	98	45.63	3.07
3	*5745.00	106.5 PK			1.21 V	303	96.55	9.95
4	*5745.00	98.5 AV			1.21 V	303	88.55	9.95
5	7660.00	57.3 PK	74.0	-16.7	1.10 V	121	42.63	14.67
6	7660.00	44.0 AV	54.0	-10.0	1.10 V	121	29.33	14.67
7	11490.00	61.6 PK	74.0	-12.4	1.20 V	208	45.08	16.52
8	11490.00	50.4 AV	54.0	-3.6	1.20 V	208	33.88	16.52

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	3856.67	49.2 PK	74.0	-24.8	1.11 H	129	46.04	3.16
2	3856.67	40.8 AV	54.0	-13.2	1.11 H	129	37.64	3.16
3	*5785.00	103.7 PK			1.00 H	305	93.67	10.03
4	*5785.00	94.6 AV			1.00 H	305	84.57	10.03
5	7713.33	55.8 PK	74.0	-18.2	1.46 H	101	41.19	14.61
6	7713.33	43.7 AV	54.0	-10.3	1.46 H	101	29.09	14.61
7	11570.00	64.5 PK	74.0	-9.5	1.54 H	72	47.89	16.61
8	11570.00	52.5 AV	54.0	-1.5	1.54 H	72	35.89	16.61
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	3856.67	52.9 PK	74.0	-21.1	1.05 V	85	49.74	3.16
2	3856.67	48.6 AV	54.0	-5.4	1.05 V	85	45.44	3.16
3	*5785.00	106.4 PK			1.24 V	287	96.37	10.03
4	*5785.00	98.5 AV			1.24 V	287	88.47	10.03
5	7713.33	57.0 PK	74.0	-17.0	1.11 V	109	42.39	14.61
6	7713.33	43.5 AV	54.0	-10.5	1.11 V	109	28.89	14.61
7	11570.00	61.1 PK	74.0	-12.9	1.22 V	197	44.49	16.61
8	11570.00	50.0 AV	54.0	-4.0	1.22 V	197	33.39	16.61

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	3883.33	48.3 PK	74.0	-25.7	1.15 H	133	45.05	3.25
2	3883.33	40.2 AV	54.0	-13.8	1.15 H	133	36.95	3.25
3	#5177.78	56.8 PK	84.1	-27.3	1.50 H	108	48.52	8.28
4	#5177.78	44.4 AV	74.9	-30.5	1.50 H	108	36.12	8.28
5	*5825.00	104.1 PK			1.05 H	301	93.95	10.15
6	*5825.00	94.9 AV			1.05 H	301	84.75	10.15
7	11650.00	65.6 PK	74.0	-8.4	1.28 H	70	48.78	16.82
8	11650.00	53.2 AV	54.0	-0.8	1.28 H	70	36.38	16.82
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	3883.33	52.6 PK	74.0	-21.4	1.02 V	85	49.35	3.25
2	3883.33	48.3 AV	54.0	-5.7	1.02 V	85	45.05	3.25
3	#5177.78	57.6 PK	86.6	-29.0	1.11 V	109	49.32	8.28
4	#5177.78	44.4 AV	78.8	-34.4	1.11 V	109	36.12	8.28
5	*5825.00	106.6 PK			1.28 V	303	96.45	10.15
6	*5825.00	98.8 AV			1.28 V	303	88.65	10.15
7	11650.00	61.7 PK	74.0	-12.3	1.28 V	212	44.88	16.82
8	11650.00	50.5 AV	54.0	-3.5	1.28 V	212	33.68	16.82

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.
6. " # ": The radiated frequency is out of the restricted band.

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	3830.00	47.9 PK	74.0	-26.1	1.20 H	120	44.83	3.07
2	3830.00	39.9 AV	54.0	-14.1	1.20 H	120	36.83	3.07
3	*5745.00	103.4 PK			1.05 H	308	93.45	9.95
4	*5745.00	94.1 AV			1.05 H	308	84.15	9.95
5	7660.00	56.5 PK	74.0	-17.5	1.52 H	108	41.83	14.67
6	7660.00	44.1 AV	54.0	-9.9	1.52 H	108	29.43	14.67
7	11490.00	65.6 PK	74.0	-8.4	1.33 H	72	49.08	16.52
8	11490.00	52.9 AV	54.0	-1.1	1.33 H	72	36.38	16.52
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	3830.00	52.5 PK	74.0	-21.5	1.00 V	76	49.43	3.07
2	3830.00	48.4 AV	54.0	-5.6	1.00 V	76	45.33	3.07
3	*5745.00	105.8 PK			1.33 V	295	95.85	9.95
4	*5745.00	97.8 AV			1.33 V	295	87.85	9.95
5	7660.00	58.1 PK	74.0	-15.9	1.12 V	105	43.43	14.67
6	7660.00	44.8 AV	54.0	-9.2	1.12 V	105	30.13	14.67
7	11490.00	62.1 PK	74.0	-11.9	1.30 V	214	45.58	16.52
8	11490.00	50.7 AV	54.0	-3.3	1.30 V	214	34.18	16.52

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	3856.67	47.5 PK	74.0	-26.5	1.19 H	118	44.34	3.16
2	3856.67	39.6 AV	54.0	-14.4	1.19 H	118	36.44	3.16
3	*5785.00	103.4 PK			1.06 H	296	93.37	10.03
4	*5785.00	93.8 AV			1.06 H	296	83.77	10.03
5	7713.33	56.3 PK	74.0	-17.7	1.53 H	121	41.69	14.61
6	7713.33	44.0 AV	54.0	-10.0	1.53 H	121	29.39	14.61
7	11570.00	66.0 PK	74.0	-8.0	1.39 H	67	49.39	16.61
8	11570.00	53.0 AV	54.0	-1.0	1.39 H	67	36.39	16.61
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	3856.67	52.5 PK	74.0	-21.5	1.00 V	76	49.34	3.16
2	3856.67	48.4 AV	54.0	-5.6	1.00 V	76	45.24	3.16
3	*5785.00	105.8 PK			1.33 V	295	95.77	10.03
4	*5785.00	97.8 AV			1.33 V	295	87.77	10.03
5	7713.33	58.1 PK	74.0	-15.9	1.12 V	105	43.49	14.61
6	7713.33	44.8 AV	54.0	-9.2	1.12 V	105	30.19	14.61
7	11570.00	62.1 PK	74.0	-11.9	1.30 V	214	45.49	16.61
8	11570.00	50.7 AV	54.0	-3.3	1.30 V	214	34.09	16.61

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	3883.33	47.2 PK	74.0	-26.8	1.15 H	108	43.95	3.25
2	3883.33	39.6 AV	54.0	-14.4	1.15 H	108	36.35	3.25
3	#5177.78	55.8 PK	83.9	-28.1	1.53 H	112	47.52	8.28
4	#5177.78	43.7 AV	74.0	-30.3	1.53 H	112	35.42	8.28
5	*5825.00	103.9 PK			1.05 H	300	93.75	10.15
6	*5825.00	94.0 AV			1.05 H	300	83.85	10.15
7	11650.00	65.5 PK	74.0	-8.5	1.45 H	60	48.68	16.82
8	11650.00	52.7 AV	54.0	-1.3	1.45 H	60	35.88	16.82
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	3883.33	52.1 PK	74.0	-21.9	1.04 V	85	48.85	3.25
2	3883.33	48.2 AV	54.0	-5.8	1.04 V	85	44.95	3.25
3	#5177.78	58.0 PK	85.5	-27.5	1.15 V	101	49.72	8.28
4	#5177.78	44.9 AV	77.7	-32.8	1.15 V	101	36.62	8.28
5	*5825.00	105.5 PK			1.29 V	284	95.35	10.15
6	*5825.00	97.7 AV			1.29 V	284	87.55	10.15
7	11650.00	61.9 PK	74.0	-12.1	1.31 V	207	45.08	16.82
8	11650.00	50.3 AV	54.0	-3.7	1.31 V	207	33.48	16.82

REMARKS:

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



A D T

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	*5755.00	103.1 PK			1.04 H	307	93.13	9.97
2	*5755.00	90.8 AV			1.04 H	307	80.83	9.97
3	11510.00	65.4 PK	74.0	-8.6	1.46 H	68	48.89	16.51
4	11510.00	53.2 AV	54.0	-0.8	1.46 H	68	36.69	16.51
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	*5755.00	102.4 PK			1.33 V	294	92.43	9.97
2	*5755.00	93.6 AV			1.33 V	294	83.63	9.97
3	11510.00	62.4 PK	74.0	-11.6	1.25 V	226	45.89	16.51
4	11510.00	50.9 AV	54.0	-3.1	1.25 V	226	34.39	16.51

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	*5795.00	103.5 PK			1.01 H	298	93.47	10.03
2	*5795.00	91.1 AV			1.01 H	298	81.07	10.03
3	11590.00	65.2 PK	74.0	-8.8	1.43 H	59	48.55	16.65
4	11590.00	53.1 AV	54.0	-0.9	1.43 H	59	36.45	16.65
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	102.4 PK			1.33 V	283	92.37	10.03
2	*5795.00	93.9 AV			1.33 V	283	83.87	10.03
3	11590.00	62.8 PK	74.0	-11.2	1.24 V	240	46.15	16.65
4	11590.00	51.3 AV	54.0	-2.7	1.24 V	240	34.65	16.65

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 : May 27, 2013

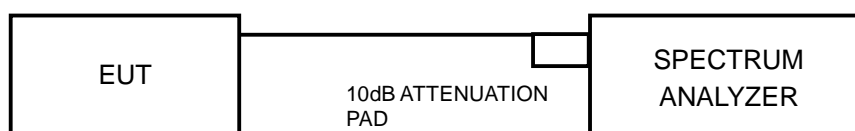
5.3.3 TEST PROCEDURE

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

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
		CHAIN 0	CHAIN 1		
149	5745	16.44	16.42	0.5	PASS
157	5785	16.44	16.43	0.5	PASS
165	5825	16.40	16.43	0.5	PASS

802.11n (HT20)

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

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	36.17	36.45	0.5	PASS
159	5795	36.44	36.41	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 $NANT \leq 4$;

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

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

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

5.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power Meter	ML2495A	0824006	May 20, 2013	May 19, 2014
Power Sensor	MA2411B	0738172	May 20, 2013	May 19, 2014

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : May 27, 2013

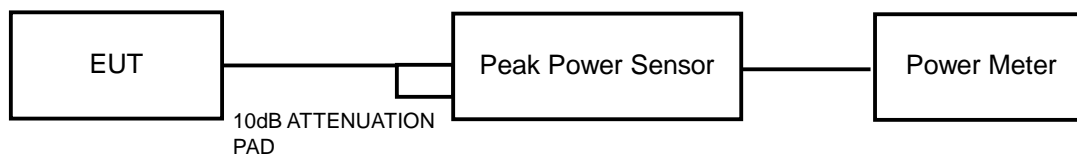
5.4.3 TEST PROCEDURES

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 (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	14.03	18.64	98.407	19.93	30	PASS
157	5785	12.17	17.71	75.502	18.78	30	PASS
165	5825	11.06	16.69	59.430	17.74	30	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	12.97	17.53	76.439	18.83	30	PASS
157	5785	11.84	17.01	65.510	18.16	30	PASS
165	5825	10.76	16.07	52.370	17.19	30	PASS

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	13.58	17.63	80.746	19.07	30	PASS
159	5795	11.84	16.95	64.821	18.12	30	PASS

5.5 AVERAGE OUTPUT POWER

5.5.1 FOR REFERENCE.

5.5.2 TEST 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

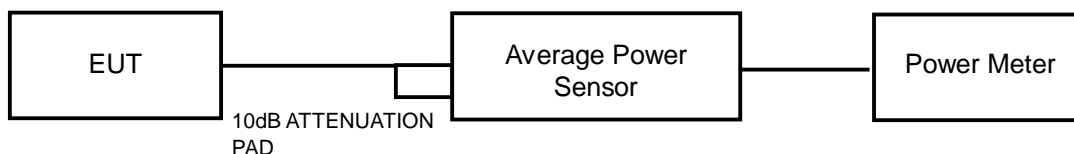
Note:

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 : Mar. 13, 2013

5.5.3 TEST PROCEDURES

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

5.5.4 TEST SETUP



5.5.5 EUT OPERATING CONDITIONS

Same as Item 4.3.6

5.5.6 TEST RESULTS

802.11a

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
149	5745	5.81	10.61	15.319	11.85
157	5785	3.96	9.63	11.672	10.67
165	5825	2.81	8.52	9.022	9.55

802.11n (HT20)

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
149	5745	4.57	9.68	12.154	10.85
157	5785	3.61	9.10	10.424	10.18
165	5825	2.57	8.20	8.414	9.25

802.11n (HT40)

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
151	5755	5.17	10.11	13.546	11.32
159	5795	3.49	9.21	10.571	10.24

5.6 POWER SPECTRAL DENSITY MEASUREMENT

5.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

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 : May 27, 2013

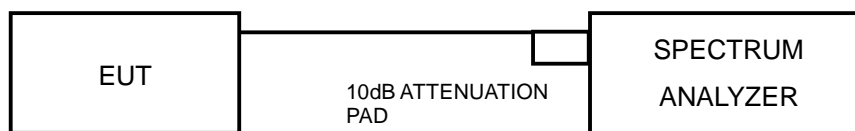
5.6.3 TEST PROCEDURE

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.

5.6.4 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

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-17.45	3.01	-14.44	7.5	PASS
	157	5785	-17.69	3.01	-14.68	7.5	PASS
	165	5825	-20.35	3.01	-17.34	7.5	PASS
1	149	5745	-16.46	3.01	-13.45	7.5	PASS
	157	5785	-17.43	3.01	-14.42	7.5	PASS
	165	5825	-17.92	3.01	-14.91	7.5	PASS

NOTE: Directional gain = 3.49dBi + 10log(2) = 6.5dBi > 6dBi , so the power density limit shall be reduced to 8-(6.5-6) = 7.5dBm.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-17.72	3.01	-14.71	7.5	PASS
	157	5785	-17.32	3.01	-14.31	7.5	PASS
	165	5825	-19.43	3.01	-16.42	7.5	PASS
1	149	5745	-17.06	3.01	-14.05	7.5	PASS
	157	5785	-18.09	3.01	-15.08	7.5	PASS
	165	5825	-19.00	3.01	-15.99	7.5	PASS

NOTE: Directional gain = 3.49dBi + 10log(2) = 6.5dBi > 6dBi , so the power density limit shall be reduced to 8-(6.5-6) = 7.5dBm.

802.11n (HT40)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-16.02	3.01	-13.01	7.5	PASS
	159	5795	-17.20	3.01	-14.19	7.5	PASS
1	151	5755	-18.92	3.01	-15.91	7.5	PASS
	159	5795	-20.73	3.01	-17.72	7.5	PASS

NOTE: Directional gain = 3.49dBi + 10log(2) = 6.5dBi > 6dBi , so the power density limit shall be reduced to 8-(6.5-6) = 7.5dBm.

5.7 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.7.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

5.7.2 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 27, 2013

5.7.3 TEST PROCEDURE

Measurement Procedure - Reference Level

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

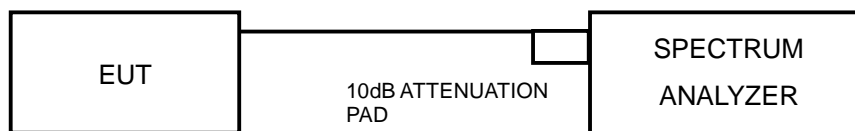
Measurement Procedure –Unwanted Emission Level

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

5.7.4 DEVIATION FROM TEST STANDARD

No deviation

5.7.5 TEST SETUP



5.7.6 EUT OPERATING CONDITION

Same as Item 4.3.6

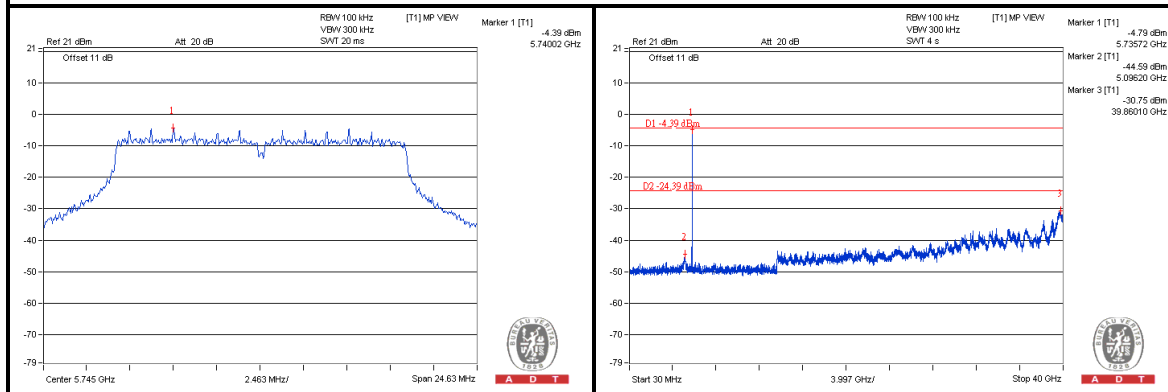
5.7.7 TEST RESULTS

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.

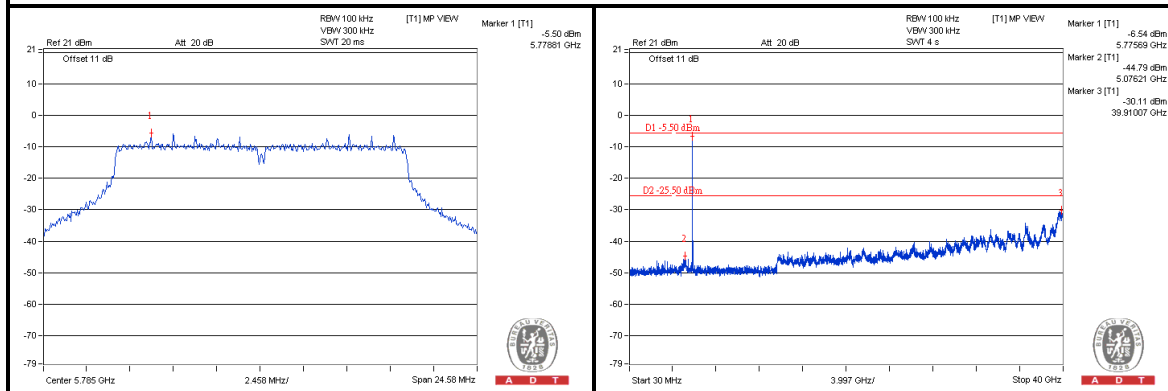
802.11a

For Chain 0

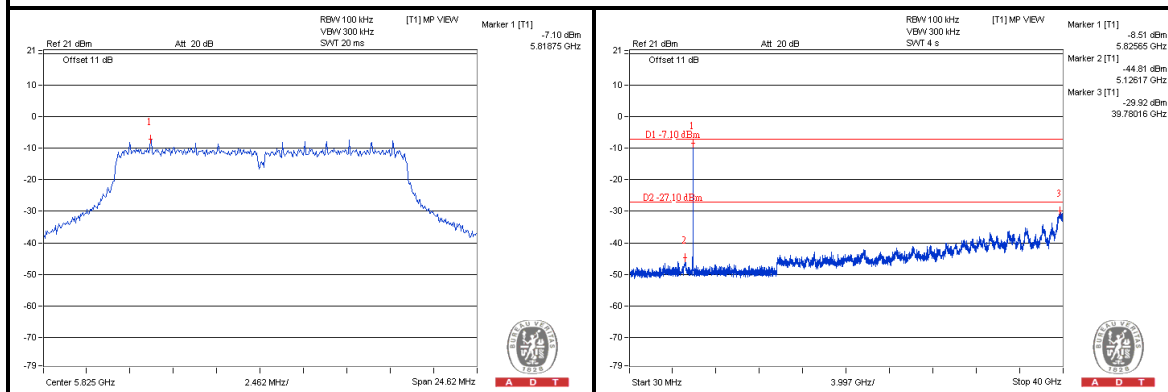
CH 149



CH 157



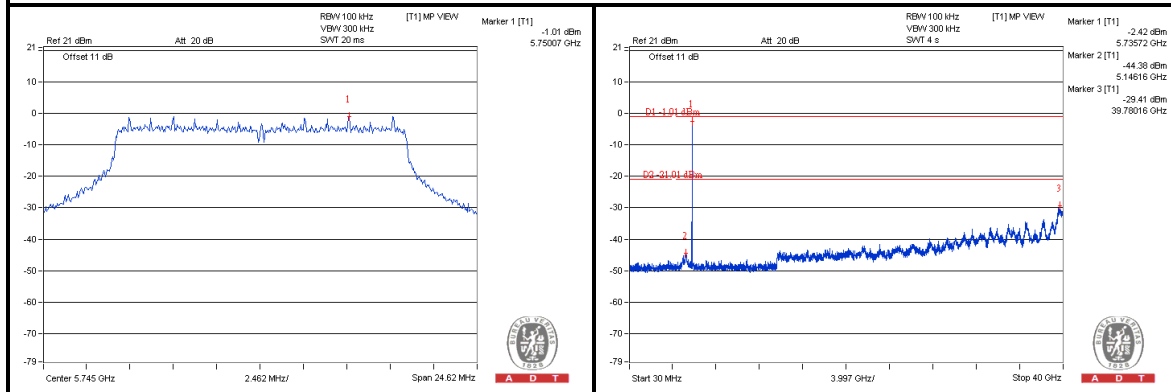
CH 165



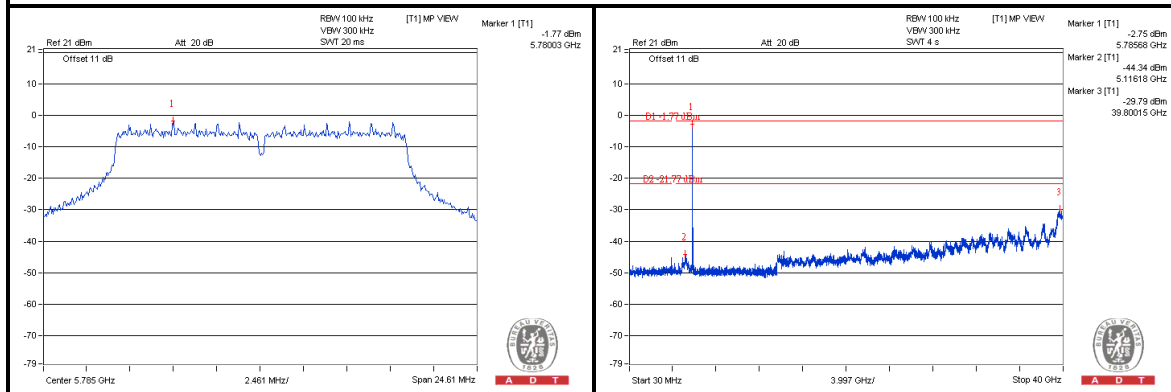


A D T

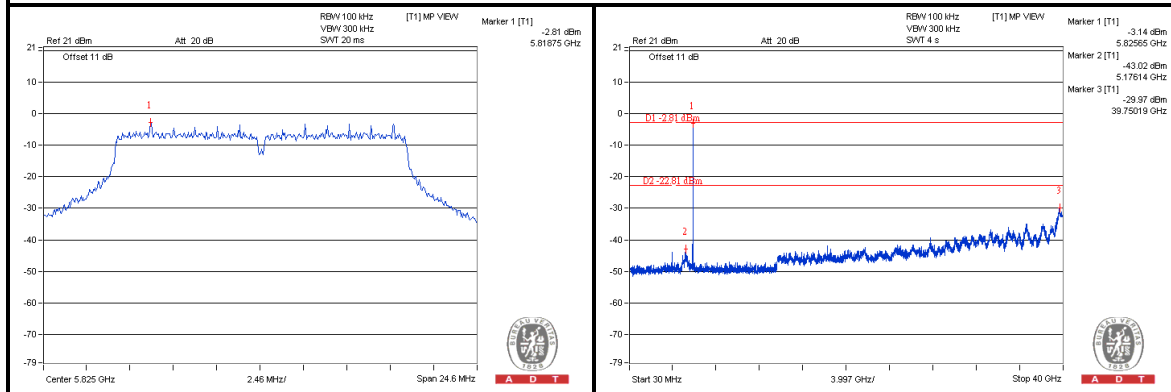
For Chain 1 CH 149



CH 157



CH 165



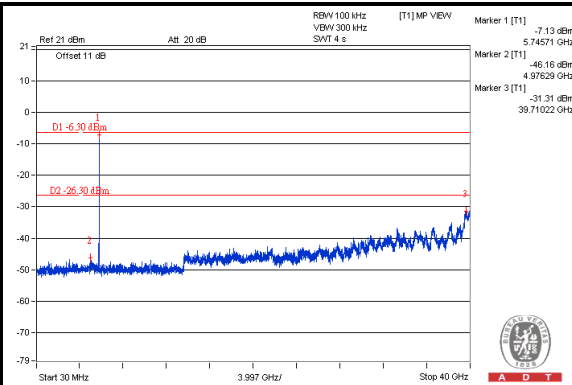
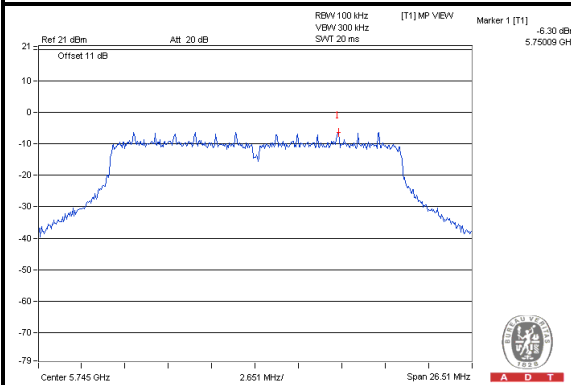


A D T

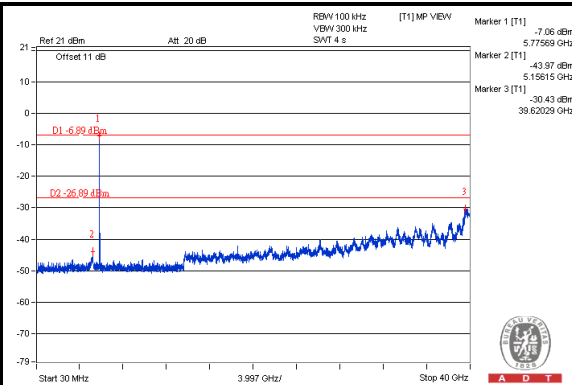
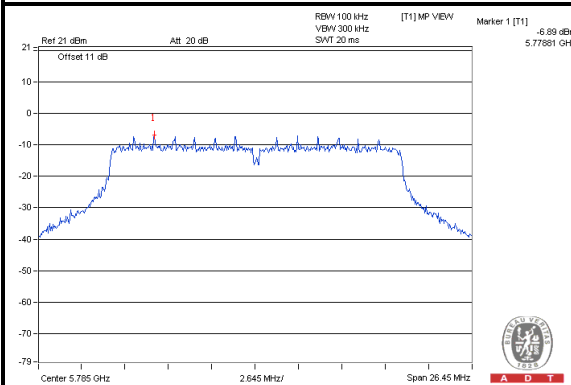
802.11n (HT20)

For Chain 0

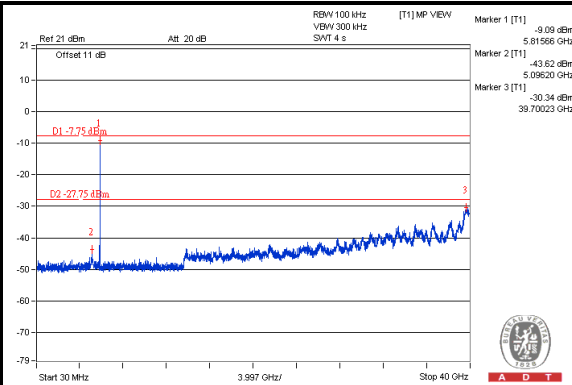
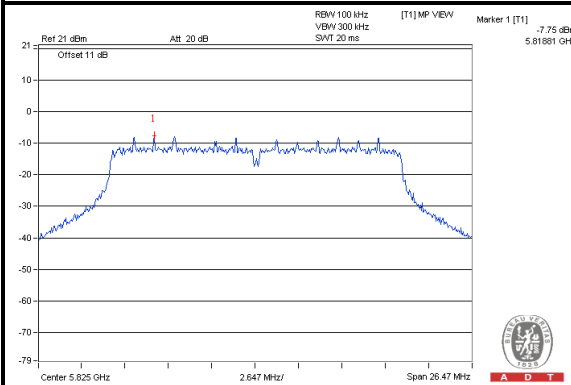
CH 149



CH 157



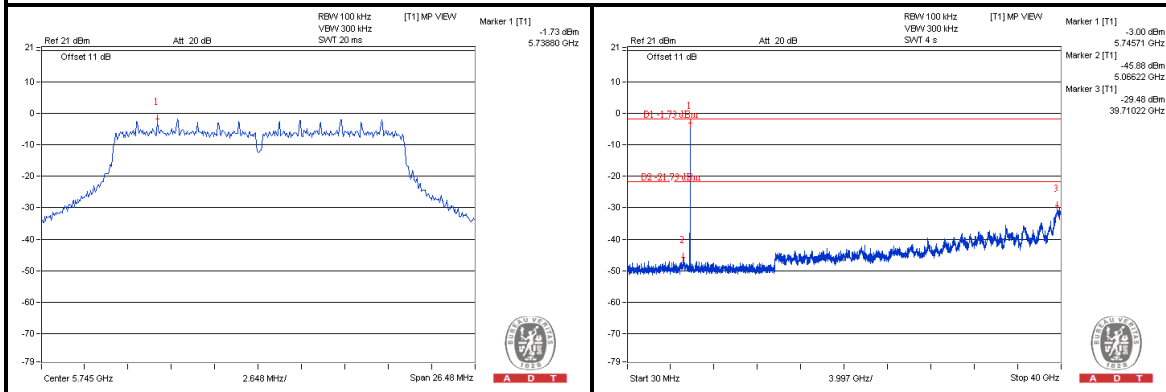
CH 165



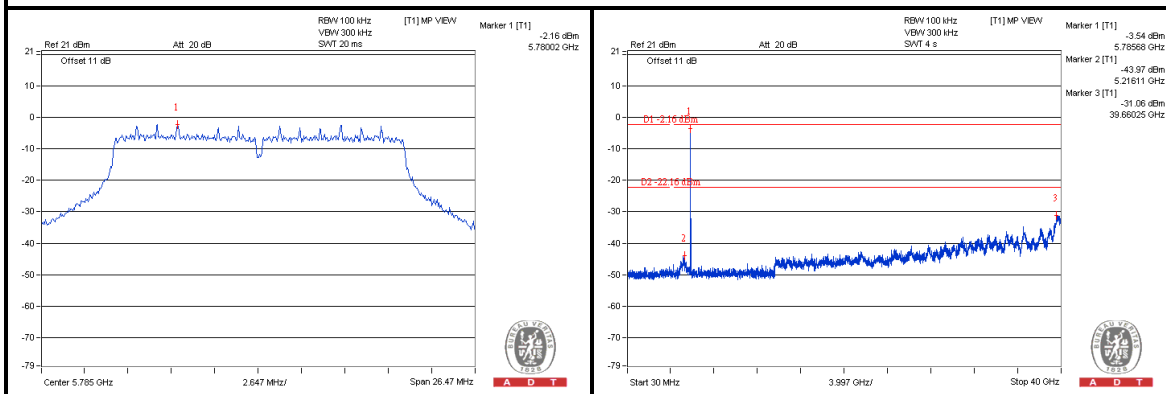


A D T

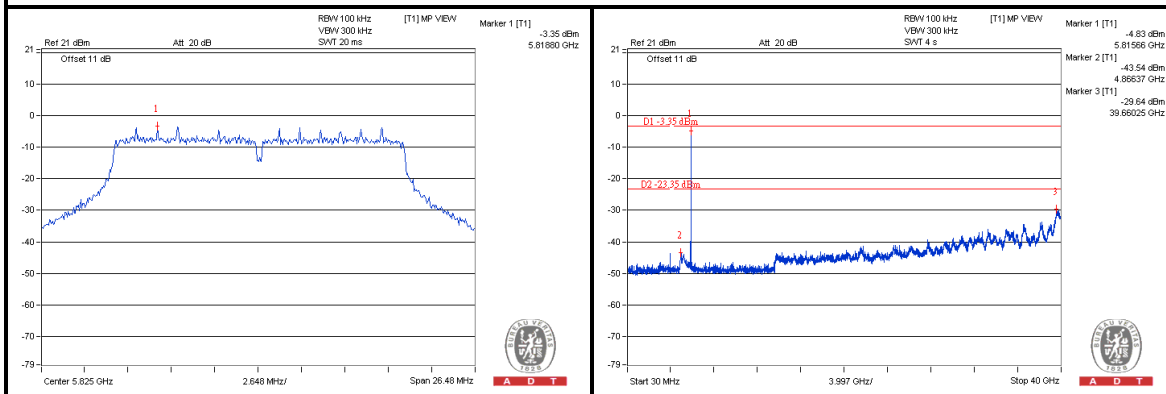
For Chain 1 CH 149



CH 157



CH 165



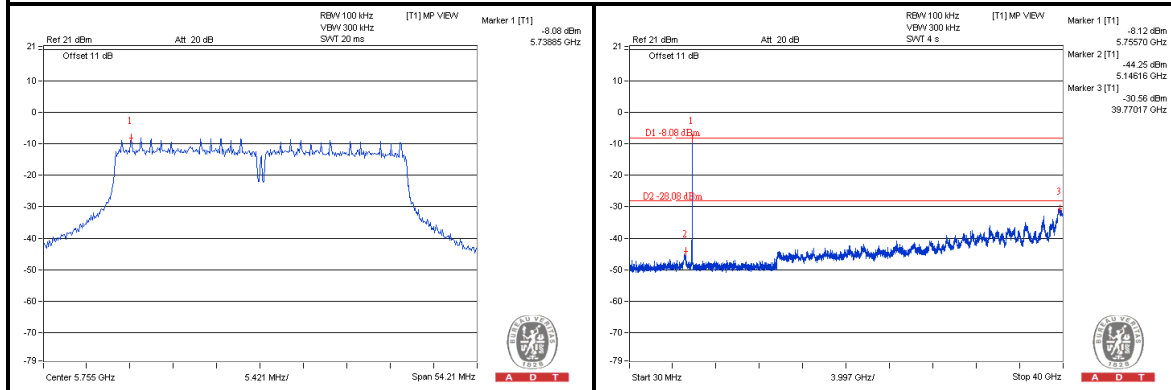


A D T

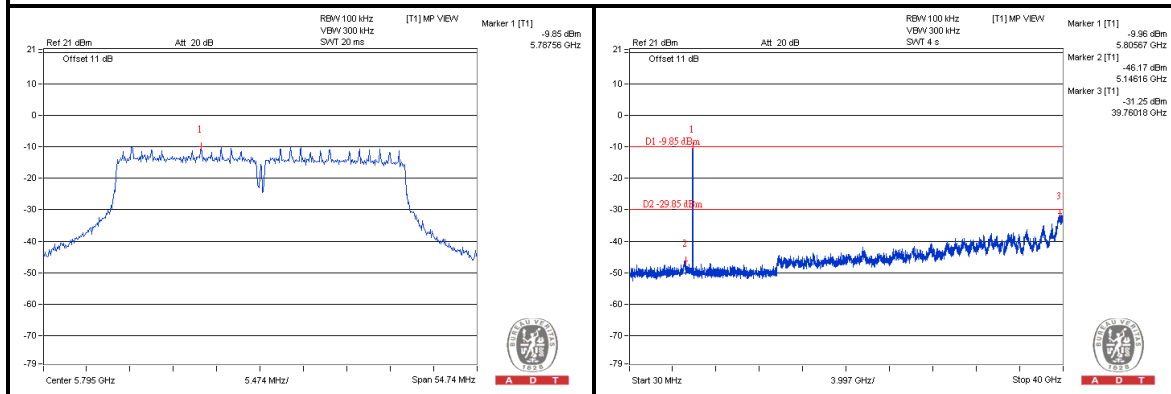
802.11n (HT40)

For Chain 0

CH 151



CH 159

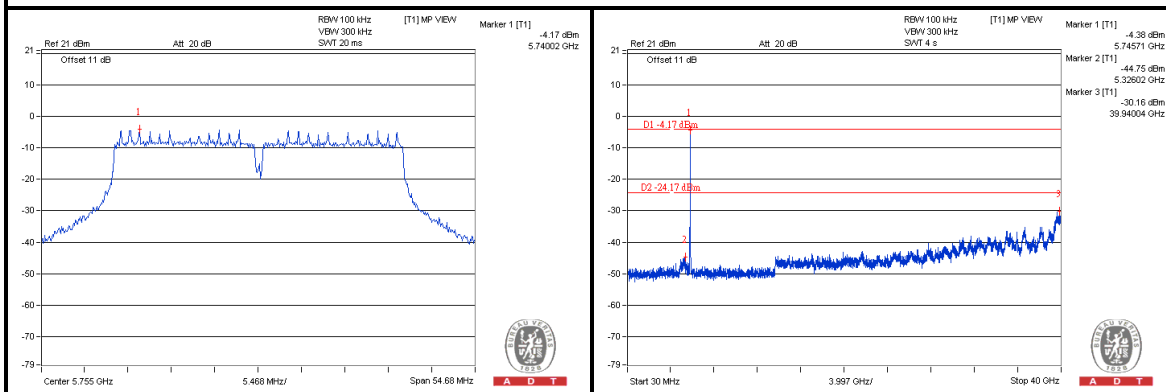




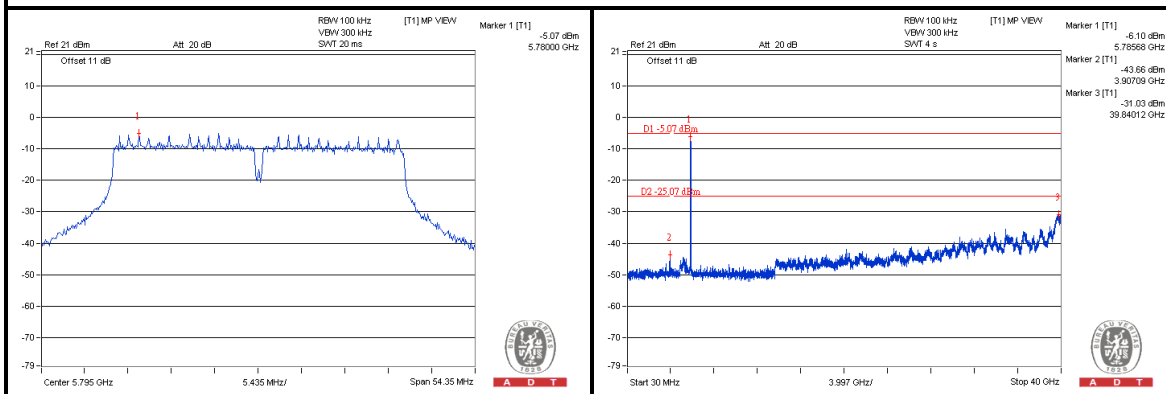
A D T

For Chain 1

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:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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



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

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

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